Illinois Department of Transportation

Memorandum

To:	Highway Standards Users
From:	Jack A. Elston
Subject:	Revision #228
Date:	August 30, 2024

Revision #228 of the Highway Standards, effective January 1, 2025, is now available on the department's website

The revisions are as follows:

Removed	Inserted	Remarks
Division 000 Index January 1, 2024	Division 000 Index January 1, 2025	Updated.
Division 200 Index January 1, 2024	Division 200 Index January 1, 2025	Updated.
Division 300 Index January 1, 2024	Division 300 Index January 1, 2025	Updated.
Division 400 Index January 1, 2024	Division 400 Index January 1, 2025	Updated.
424001-11	424001-12	Indicated "Clear Area" Location and updated cross-slopes.
424006-05	424006-06	Indicated "Clear Area" Location and updated cross-slopes.
424011-04	424011-05	Revised turning space with landing and updated cross-slopes.
424016-05	424016-06	Revised turning space with landing and updated cross-slopes.
424021-06	424021-07	Remove min running slope from note 1 and updated cross-slope.
424026-03	424026-04	Modified Section A-A and updated cross-slopes.

Removed	Inserted	Remarks
424031-02	424031-03	Updated cross-slope.
Division 500 Index January 1, 2024	Division 500 Index January 1, 2025	Updated.
Division 600 Index January 1, 2024	Division 600 Index January 1, 2025	Updated.
643001-02	643001-03	Revised TL 3 array and weights.
Division 700 Index January 1, 2024	Division 700 Index January 1, 2025	Updated.
701316-13	701316-14	Added SIGN SPACING table to revise distances per posted speed.
701321-18	701321-19	Added SIGN SPACING table to revise distances per posted speed.
701901-09	701901-10	Updated Temporary Rumble Strip Detail (sht. 3).
Division 800 Index January 1, 2024	Division 800 Index January 1, 2025	Updated.
821101-02	821101-03	Omitted the surge protective device in the light pole.
835001-02	835001-03	Omitted the surge protective device in the base of the light tower.
836001-04	836001-05	Revised pole location setback to agree with the BDE Manual.
Division B.L.R. Index January 1, 2024	Division B.L.R. Index January 1, 2025	Updated.
Standards by Subject/Title January 1, 2024	Standards by Subject/Title January 1, 2025	Updated.

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

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DIVISION 200 EARTHWORK, LANDSCAPING, and EROSION CONTROL

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202001-01	Earth Median Ditch Check
EROSION CONTROL	
280001-07	Temporary Erosion Control Systems
285001-02	Fabric Formed Concrete Revetment Mats

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DIVISION 300 SUBGRADES, SUBBASES, and BASE COURSES

STD. NO.	TITLE
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353001-05	PCC Base Course with HMA Binder and Surface Courses

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DIVISION 400 SURFACE COURSES, PAVEMENTS, REHABILITATION, AND SHOULDERS

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406101-05	Exit Ramp Terminal (Flexible Ramp Pavement Adjacent to Flexible Mainline Pavement)
406201-01	Mailbox Turnout
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420001-10	Pavement Joints
420101-07	24’ (7.2 m) Jointed PCC Pavement
420106-07	36’ (10.8 m) Jointed PCC Pavement
420111-04	PCC Pavement Roundouts
420201-12	Entrance Ramp Terminal (Jointed PCC Ramp Pavement Adjacent to Jointed PCC Mainline Pavt.)
420206-13	Entrance Ramp Terminal (Jointed PCC Ramp Pavement Adjacent to CRC Mainline Pavement)
420301-09	Exit Ramp Terminal (Jointed PCC Ramp Pavement Adjacent to Jointed PCC Mainline Pavt.)
420306-11	Exit Ramp Terminal (Jointed PCC Ramp Pavement Adjacent to CRC Mainline Pavement)
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420406	Pavement Connector (HMA) for Bridge Approach Slab
420501-07	PCC Pavement and PCC Base Course Adjacent to Railroad Grade Crossing
420701-03	Pavement Welded Wire Reinforcement
421001-03	Bar Reinforcement for CRC Pavement
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421106-10	36’ (10.8 m) CRC Pavement (With Wide Flange Beam Terminal Joint)
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421206-07	36’ (10.8 m) CRC Pavement (With Lug System)
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424006-06	Diagonal Curb Ramps for Sidewalks
424011-05	Corner Parallel Curb Ramps for Sidewalks
424016-06	Mid-block Curb Ramps for Sidewalks
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482006-03	HMA Shoulder Adjacent to Rigid Pavement
482011-03	HMA Shoulder Strips/Shoulders With Resurfacing or Widening and Resurfacing Projects
483001-06	PCC Shoulder

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542011-02	Concrete End Sections for Elliptical Pipe Culverts 15” (375 mm) thru 72” (1800 mm) Equivalent Diameter
542201-02	Reinforced Concrete End Sections for Pipe Culverts, 15” (375 mm) thru 36” (900 mm) Diameter Skewed With Roadway
542206-04	Reinforced Concrete End Sections for Pipe Culverts, 42” (1050 mm) thru 60” (1500 mm) Diameter Skewed With Roadway
542301-03	Precast Reinforced Concrete Flared End Section
542306-03	Precast Reinforced Concrete Elliptical Flared End Section
542311-07	Traversable Pipe Grate for Concrete End Section
542401-04	Metal Flared End Section for Pipe Culverts
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542411	Sloped Metal End Sections for Pipe Culverts 15” (375 mm) thru 60” (1500 mm) Diameter
542416	Sloped Metal End Sections for Pipe Arch Culverts 15” (375 mm) thru 72” (1800 mm) Equivalent Diameter
542501-02	Inlet Box Type 24 (600) A
542506-03	Inlet Box Type 24 (600) B
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602306-03	Inlet, Type B
602401-07	Precast Manhole, Type A, 4’ (1.22 m) Diameter
602402-03	Precast Manhole, Type A, 5’ (1.52 m) Diameter
602406-11	Precast Manhole, Type A, 6’ (1.83 m) Diameter
602411-09	Precast Manhole, Type A, 7’ (2.13 m) Diameter
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701011-04	Off-Road Moving Operations, 2L, 2W, Day Only
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Light Pole Foundation with 44 in. (1120 mm) Concrete Barrier 836011
Light Tower Foundation 837001
Luminaire Wiring in Pole 821101

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Mailbox Turnout, Local System BLR-24
Mailbox Turnout, State System 406201
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Manhole, Precast, Type A, 5 ft. (1.52 m) Diameter.....602402
Manhole, Precast, Type A, 6 ft. (1.83 m) Diameter.....602406
Manhole, Precast, Type A, 7 ft. (2.13 m) Diameter.....602411
Manhole, Precast, Type A, 8 ft. (2.44 m) Diameter.....602416
Manhole, Precast, Type A, 9 ft. (2.74 m) Diameter.....602421
Manhole, Precast, Type A, 10 ft. (3.05 m) Diameter.....602426
Manhole Steps 602701
Markers:
Drainage 667001
Permanent Survey 667101
Right-of-Way 666001
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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

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

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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
36' (10.8 m) Continuously Reinf. PCC With Wide Flange Beam Term. Joint 421106

36' (10.8 m) Continuously Reinforced PCC With Lug System....421206
36' (10.8 m) Jointed PCC....420106
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Connector (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
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Welded Wire Reinforcement....420701
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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

Raceways Embedded in Structure....812001
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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
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Reinforcement Bars, Areas, Weights and Spacing....001001
Revetment Mat, Fabric Formed Concrete....285001
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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
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
- Type 13 631061
- Type 14 631066

Traffic Control:
- Devices 701901
- Devices:
  - Type 1A Barricade for Non-NHS Routes ..... BLR 25
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  - Typical Application of, for Construction on Rural Local Highways ..... BLR 21
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- Lane Closure, 2L, 2W:
  - Bridge Repair, for Speeds ≥ 45 MPH 701316
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  - Day Only, for Speeds ≥ 45 MPH 701201
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  - Night Only, for Speeds ≥ 45 MPH 701206
  - Pavement Widening, for Speeds ≥ 45 MPH 701326
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- 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 ≥ 45 MPH 701411
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for Speeds ≥ 45 MPH to 55 MPH 701422
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Intermittent or Moving Operation, for Speeds ≤ 40 MPH 701427
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with Barrier, for Speeds ≥ 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:
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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
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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, Precast, Type A, 4 ft. (1.22 m) Diameter 602501
Valve Vault, Precast, Type A, 5 ft. (1.52 m) Diameter 602506

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

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DATE	REVISIONS
1-1-21	Updated fonts, abbreviations,
	and symbols.
1-1-19	Added new symbols.

STANDARD SYMBOLS, ABBREVIATIONS, AND PATTERNS

STANDARD 000001-08

ADJUSTMENT ITEMS

	EX	PR
Structure To Be Adjusted		ADJ
Structure To Be Cleaned		C
Main Structure To Be Filled		FM
Structure To Be Filled		F
Structure To Be Filled Special		FSP
Structure To Be Removed		R
Structure To Be Reconstructed		REC
Structure To Be Reconstructed Special		RSP
Frame and Grate To Be Adjusted		A
Frame and Lid To Be Adjusted		A
Domestic Service Box To Be Adjusted		A
Valve Vault To Be Adjusted		A
Special Adjustment		SP
Item To Be Abandoned		AB
Item To Be Moved		M
Item To Be Relocated		REL
Pavement Removal and Replacement		

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ALIGNMENT ITEMS

	EX	PR
Baseline		
Centerline		
Centerline Break Circle		
Baseline Symbol		
Centerline Symbol		
PI Indicator		
Point Indicator		
Horizontal Curve Data (Half Size)	EX. CURVE 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=

BOUNDARIES ITEMS

	EX	PR
Dashed Property Line		
Solid Property/Lot Line		
Section/Grant Line		
Quarter Section Line		
Quarter/Quarter Section Line		
County/Township Line		
State Line		
Chiseled Square Found		
Iron Pipe Found		
Iron Pipe Set		
Survey Marker		
Property Line Symbol		
Same Ownership Symbol (Half Size)		
Northwest Quarter Corner (Half Size)		
Section Corner (Half Size)		
Southeast Quarter Corner (Half Size)		

DRAINAGE ITEMS

	EX	PR
Channel or Stream Line		
Culvert Line		
Grading & Shaping Ditches		
Drainage Boundary Line		
Paved Ditch		
Aggregate Ditch		
Pipe Underdrain		
Storm Sewer		
Flowline		
Ditch Check		
Headwall		
Inlet		
Manhole		
Summit		
Roadway Ditch Flow		
Swale		
Catch Basin		
Culvert End Section		
Water Surface Indicator		
Riprap		

HYDRAULICS ITEMS

	EX	PR
Overflow		
Sheet Flow		
Hydrant Outlet		

STANDARD SYMBOLS, ABBREVIATIONS, AND PATTERNS

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STANDARD 000001-08

EROSION & SEDIMENT CONTROL ITEMS

	EX	PR
Cleaning & Grading Limits		
Dike		
Erosion Control Fence		
Perimeter Erosion Barrier		
Temporary Fence		
Ditch Check Temporary		
Ditch Check Permanent		
Inlet & Pipe Protection		
Sediment Basin		
Erosion Control Blanket		
Fabric Formed Concrete Revetment Mat		
Turf Reinforcement Mat		
Mulch Temporary		
Mulch Method 1		
Mulch Method 2 Stabilized		
Mulch Method 3 Hydraulic		

CONTOUR ITEMS

	EX	PR
Approx. Index Line		
Approx. Intermediate Line		
Index Contour		
Intermediate Contour		

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NON-HIGHWAY IMPROVEMENT ITEMS

	EX	PR
Noise Attn./Levee		
Field Line		
Fence		
Base of Levee		
Mailbox		
Multiple Mailboxes		
Pay Telephone		
Advertising Sign		
*ITS Camera		
Wind Turbine		
Cellular Tower		

*Intelligent Transportation Systems

LANDSCAPING ITEMS

	EX	PR
Contour Mounding Line		
Fence		
Fence Post		
Shrubs		
Mowline		
Perennial Plants		
Seeding Class 2		
Seeding Class 2A		
Seeding Class 4		
Seeding Class 4 & 5 Combined		

EXISTING LANDSCAPING ITEMS (contd.)

	EX	PR
Seeding Class 5		
Seeding Class 7		
Seedlings Type 1		
Seedlings Type 2		
Sodding		
Mowstake w/Sign		
Tree Trunk Protection		
Evergreen Tree	E	
Shade Tree	E	+

LIGHTING

	EX	PR
Duct		
Conduit		
Electrical Aerial Cable	A A A	A A A
Electrical Buried Cable	L L	L L
Controller		
Underpass Luminaire		
Power Pole		

STANDARD SYMBOLS, ABBREVIATIONS, AND PATTERNS

(Sheet 3 of 9)

STANDARD 000001-08

LIGHTING (contd.)

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

PAVEMENT (MISC.)

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

PAVEMENT MARKINGS

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

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STANDARD SYMBOLS, ABBREVIATIONS, AND PATTERNS

STANDARD 000001-08

PAVEMENT MARKINGS (contd.)

	EX	PR
CL 2Ln 2Way RRPM 12.2 m (40') o.c.		
CL 2Ln 2Way RRPM 80' (24.4 m) o.c.		
CL Multilane Div. RRPM 40' (12.2 m) o.c.		
CL Multilane Div. RRPM 80' (24.4 m) o.c.		
CL Multilane Div. Dbl. RRPM 80' (24.4 m) o.c.		
CL Multilane Undiv.		
Two Way Turn Left Line		
Urban Combination Left		
Urban Combination Right		
Urban Left Turn Arrow		
Urban Right Turn Arrow		
Urban Left Turn Only		
Urban Right Turn Only		
Urban Thru Only		
Urban LT & RT Turn Arrow		
Urban Thru Arrow		

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		

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STANDARD SYMBOLS, ABBREVIATIONS, AND PATTERNS

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STANDARD 000001-08

PAVEMENT MARKINGS (contd.)

	EX	PR
Urban U-Turn		
Urban Combined U-Turn		
Rural Combination Left		
Rural Combination Right		
Rural Left Turn Arrow		
Rural Right Turn Arrow		
Rural Left Turn Only		
Rural Right Turn Only		
Rural Thru Only		
Rural Thru Arrow		
Rural Lt & Rt Turn Arrow		
Bike Lane Symbol		
Bike Lane Text		
Bike Path Shared		
Bike Shared Roadway		
Lane Drop Symbol		
Wrong Way Arrow		

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STANDARD SYMBOLS, ABBREVIATIONS, AND PATTERNS

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STANDARD 000001-08

RIGHT OF WAY ITEMS (contd.)

	EX	PR
Access Control Line	AC	AC
Access Control Line & ROW	AC	AC
Access Control Line & ROW with Fence	AC	
Excess ROW Line		XS

ROADWAY PLAN ITEMS

	EX	PR
Cable Barrier		
Concrete Barrier		
Edge of Pavement		
Bit Shoulders, Medians and C&G Line		
Aggregate Shoulder		
Sidewalks, Driveways		
Guardrail		
Guardrail Post		
Traffic Sign		
Corrugated Median		
Impact Attenuator		
North Arrow with District Office (Half Size)	N	
Match Line		STA. 45+00
Slope Limit Line		
Typical Cross-Section Line		

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ROADWAY PROFILES

	EX	PR
P.I. Indicator		
Point Indicator		
Earthworks Balance Point		
Begin Point		
Vert. Curve Data	VPI = ELEV= L = E =	VPI = ELEV= L = E =
Ditch Profile Left Side		
Ditch Profile Right Side		
Roadway Profile Line		
Storm Sewer Profile Left Side		
Storm Sewer Profile Right Side		

SIGNING ITEMS

	EX	PR
Cone, Drum or Barricade		
Barricade Type II		
Barricade Type III		
Barricade With Edge Line		
Flashing Light Sign		
Panels I		
Panels II		
Direction of Traffic		
Sign Flag (Half Size)		

SIGNING ITEMS (contd.)

	EX	PR
Reverse Left W1-4L (Half Size)		
Reverse Right W1-4R (Half Size)		
Two Way Traffic Sign W6-3 (Half Size)		
Detour Ahead W20-2(O) (Half Size)		DETOUR AHEAD
Left Lane Closed Ahead W20-5L(O) (Half Size)		LEFT LANE CLOSED AHEAD
Right Lane Closed Ahead W20-5R(O) (Half Size)		RIGHT LANE CLOSED AHEAD
Road Closed Ahead W20-3(O) (Half Size)		ROAD CLOSED AHEAD
Road Construction Ahead W20-1-(O) (Half Size)		ROAD CONSTRUCTION AHEAD
Single Lane Ahead (Half Size)		SINGLE LANE AHEAD
Transition Left W4-2L (Half Size)		
Transition Right W4-2R (Half Size)		

STANDARD SYMBOLS, ABBREVIATIONS, AND PATTERNS

STANDARD 000001-08

SIGNING ITEMS (contd.)

	EX	PR
One Way Arrow Lrg. W1-6-(O) (Half Size)		
Two Way Arrow Large W1-7-(O) (Half Size)		
Detour M4-10L-(O) (Half Size)		DETOUR
Detour M4-10R-(O) (Half Size)		DETOUR
One Way Left R6-1L (Half Size)		ONE WAY
One Way Right R6-1R (Half Size)		ONE WAY
Left Turn Lane R3-I100L (Half Size)		LEFT TURN LANE
Keep Left R4-7AL (Half Size)		KEEP LEFT
Keep Left R4-7BL (Half Size)		KEEP LEFT
Keep Right R4-7AR (Half Size)		KEEP RIGHT
Keep Right R4-7BR (Half Size)		KEEP RIGHT
Stop Here On Red R10-6-AL (Half Size)		STOP HERE ON RED
Stop Here On Red R10-6-AR (Half Size)		STOP HERE ON RED
No Left Turn R3-2 (Half Size)		
No Right Turn R3-1 (Half Size)		
Road Closed R11-2 (Half Size)		ROAD CLOSED
Road Closed Thru Traffic R11-2 (Half Size)		ROAD CLOSED TO THRU TRAFFIC

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

STRUCTURES ITEMS

	EX	PR
Box Culvert Barrel		
Box Culvert Headwall		
Bridge Pier		
Bridge		
Retaining Wall		
Temporary Sheet Piling		

TRAFFIC SHEET ITEMS

	EX	PR
Cable Number		
Left Turn Green	G	G
Left Turn Yellow	Y	Y
Signal Backplate		
Signal Section 8" (200 mm)		
Signal Section 12" (300 mm)		
Walk/Don't Walk Letters	DW W	DW W
Walk/Don't Walk Symbols		

TRAFFIC SIGNAL ITEMS

	EX	PR
Galv. Steel Conduit		
Underground Cable		
Detector Loop Line		
Detector Loop Large		
Detector Loop Small		
Detector Loop Quadrapole		

STANDARD SYMBOLS, ABBREVIATIONS, AND PATTERNS

(Sheet 8 of 9)

STANDARD 000001-08

TRAFFIC SIGNAL ITEMS (contd.)

	EX	PR
Detector Raceway		
Aluminum Mast Arm		
Steel Mast Arm		
Veh. Detector Magnetic		
Conduit Splice		
Controller		
Gulfbox Junction		
Wood Pole		
Temp. Signal Head		
Handhole		
Double Handhole		
Heavy Duty Handhole		
Junction Box		
Ped. Pushbutton Detector		
Ped. Signal Head		
Power Pole Service		
Priority Veh. Detector		
Signal Head		
Signal Head w/Backplate		
Signal Post		
Closed Circuit TV		
Video Detector System		

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APPROVED January 1, 2021
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APPROVED January 1, 2021
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ISSUED 1-1-97

UNDERGROUND UTILITY ITEMS

	EX	PR	ABANDONED
Cable TV			
Electric Cable			
Fiber Optic			
Gas Pipe			
Oil Pipe			
Sanitary Sewer			
Telephone Cable			
Water Pipe			

UTILITIES ITEMS

	EX	PR
Controller		
Double Handhole		
Fire Hydrant		
GuyWire or Deadman Anchor		
Handhole		
Heavy Duty Handhole		
Junction Box		
Light Pole		
Manhole		
Monitoring Well (Gasoline)		
Pipeline Warning Sign		
Power Pole		
Power Pole with Light		
Sanitary Sewer Cleanout		
Splice Box Above Ground		
Telephone Splice Box Above Ground		
Telephone Pole		

UTILITY ITEMS (contd.)

	EX	PR
Traffic Signal		
Traffic Signal Control Box		
Water Meter		
Water Meter Valve Box		
Profile Line		
Aerial Power Line		

VEGETATION ITEMS

	EX	PR
Deciduous Tree		
Bush or Shrub		
Evergreen Tree		
Stump		
Orchard/Nursery Line		
Vegetation Line		
Woods & Bush Line		

WATER FEATURE ITEMS

	EX	PR
Stream or Drainage Ditch		
Waters Edge		
Water Surface Indicator		
Water Point		
Disappearing Ditch		
Marsh		
Marsh/Swamp Boundary		

STANDARD SYMBOLS, ABBREVIATIONS, AND PATTERNS

(Sheet 9 of 9)

STANDARD 000001-08

REINFORCEMENT BARS - ENGLISH (METRIC)

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

AREAS OF REINFORCEMENT BARS

STANDARD 001001-02

DECIMAL OF AN INCH AND OF A FOOT

A	B	A	B	A	B	A	B	A	B	A	B
0.0052	1/16	11/64 0.171875	2 1/16	0.3385	4 1/16	0.5052	6 1/16	43/64 0.671875	8 1/16	0.8385	10 1/16
0.0104	1/8	0.1771	2 1/8	11/32 0.34375	4 1/8	0.5104	6 1/8	0.6771	8 1/8	27/32 0.84375	10 1/8
1/64 0.015625	3/16	0.1823	2 3/16	0.3490	4 3/16	33/64 0.515625	6 3/16	0.6823	8 3/16	0.8490	10 3/16
0.0208	1/4	3/16 0.1875	2 1/4	0.3542	4 1/4	0.5208	6 1/4	11/16 0.6875	8 1/4	0.8542	10 1/4
0.0260	5/16	0.1927	2 5/16	23/64 0.359375	4 5/16	0.5260	6 5/16	0.6927	8 5/16	55/64 0.859375	10 5/16
1/32 0.03125	3/8	0.1979	2 3/8	0.3646	4 3/8	17/32 0.53125	6 3/8	0.6979	8 3/8	0.8646	10 3/8
0.0365	7/16	13/64 0.203125	2 7/16	0.3698	4 7/16	0.5365	6 7/16	45/64 0.703125	8 7/16	0.8698	10 7/16
0.0417	1/2	0.2083	2 1/2	3/8 0.3750	4 1/2	0.5417	6 1/2	0.7083	8 1/2	7/8 0.8750	10 1/2
3/64 0.046875	9/16	0.2135	2 9/16	0.3802	4 9/16	35/64 0.546875	6 9/16	0.7135	8 9/16	0.8802	10 9/16
0.0521	5/8	7/32 0.21875	2 5/8	0.3854	4 5/8	0.5521	6 5/8	23/32 0.71875	8 5/8	0.8854	10 5/8
0.0573	11/16	0.2240	2 11/16	25/64 0.390625	4 11/16	0.5573	6 11/16	0.7240	8 11/16	57/64 0.890625	10 11/16
1/16 0.0625	3/4	0.2292	2 3/4	0.3958	4 3/4	9/16 0.5625	6 3/4	0.7292	8 3/4	0.8958	10 3/4
0.0677	13/16	15/64 0.234375	2 13/16	0.4010	4 13/16	0.5677	6 13/16	47/64 0.734375	8 13/16	0.9010	10 13/16
0.0729	7/8	0.2396	2 7/8	13/32 0.40625	4 7/8	0.5729	6 7/8	0.7396	8 7/8	29/32 0.90625	10 7/8
5/64 0.078125	15/16	0.2448	2 15/16	0.4115	4 15/16	37/64 0.578125	6 15/16	0.7448	8 15/16	0.9115	10 15/16
0.0833	1	1/4 0.2500	3	0.4167	5	0.5833	7	3/4 0.7500	9	0.9167	11
0.0885	1 1/16	0.2552	3 1/16	27/64 0.421875	5 1/16	0.5885	7 1/16	0.7552	9 1/16	59/64 0.921875	11 1/16
3/32 0.09375	1 1/8	0.2604	3 1/8	0.4271	5 1/8	19/32 0.59375	7 1/8	0.7604	9 1/8	0.9271	11 1/8
0.0990	1 3/16	17/64 0.265625	3 3/16	0.4323	5 3/16	0.5990	7 3/16	49/64 0.765625	9 3/16	0.9323	11 3/16
0.1042	1 1/4	0.2708	3 1/4	7/16 0.4375	5 1/4	0.6042	7 1/4	0.7708	9 1/4	15/16 0.9375	11 1/4
7/64 0.109375	1 5/16	0.2760	3 5/16	0.4427	5 5/16	39/64 0.609375	7 5/16	0.7760	9 5/16	0.9427	11 5/16
0.1146	1 3/8	9/32 0.28125	3 3/8	0.4479	5 3/8	0.6146	7 3/8	25/32 0.78125	9 3/8	0.9479	11 3/8
0.1198	1 7/16	0.2865	3 7/16	29/64 0.453125	5 7/16	0.6198	7 7/16	0.7865	9 7/16	61/64 0.953125	11 7/16
1/8 0.1250	1 1/2	0.2917	3 1/2	0.4583	5 1/2	5/8 0.6250	7 1/2	0.7917	9 1/2	0.9583	11 1/2
0.1302	1 9/16	19/64 0.296875	3 9/16	0.4635	5 9/16	0.6302	7 9/16	51/64 0.796875	9 9/16	0.9635	11 9/16
0.1354	1 5/8	0.3021	3 5/8	15/32 0.46875	5 5/8	0.6354	7 5/8	0.8021	9 5/8	31/32 0.96875	11 5/8
9/64 0.140625	1 11/16	0.3073	3 11/16	0.4740	5 11/16	41/64 0.640625	7 11/16	0.8073	9 11/16	0.9740	11 11/16
0.1458	1 3/4	5/16 0.3125	3 3/4	0.4792	5 3/4	0.6458	7 3/4	13/16 0.8125	9 3/4	0.9792	11 3/4
0.1510	1 13/16	0.3177	3 13/16	31/64 0.484375	5 13/16	0.6510	7 13/16	0.8177	9 13/16	63/64 0.984375	11 13/16
5/32 0.15625	1 7/8	0.3229	3 7/8	0.4896	5 7/8	21/32 0.65625	7 7/8	0.8229	9 7/8	0.9896	11 7/8
0.1615	1 15/16	21/64 0.328125	3 15/16	0.4948	5 15/16	0.6615	7 15/16	53/64 0.828125	9 15/16	0.9948	11 15/16
0.1667	2	0.3333	4	1/2 0.5000	6	0.6667	8	0.8333	10	1 1.0000	12

A = Fractions of Inch or Foot

B = Inch Equivalents to Foot Fractions

Illinois Department of Transportation

APPROVED January 1, 1997
ENGINEER OF POLICY AND PROCEDURES

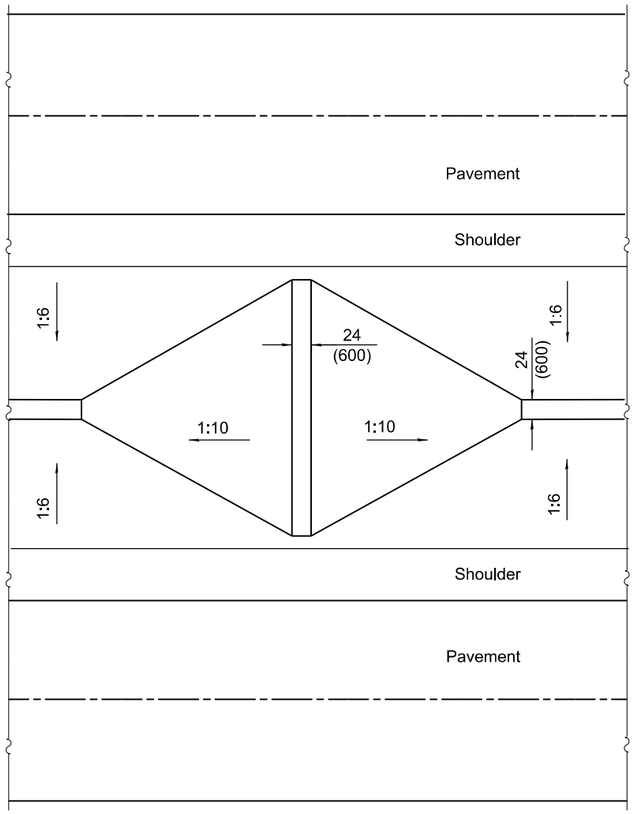
APPROVED January 1, 1997
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

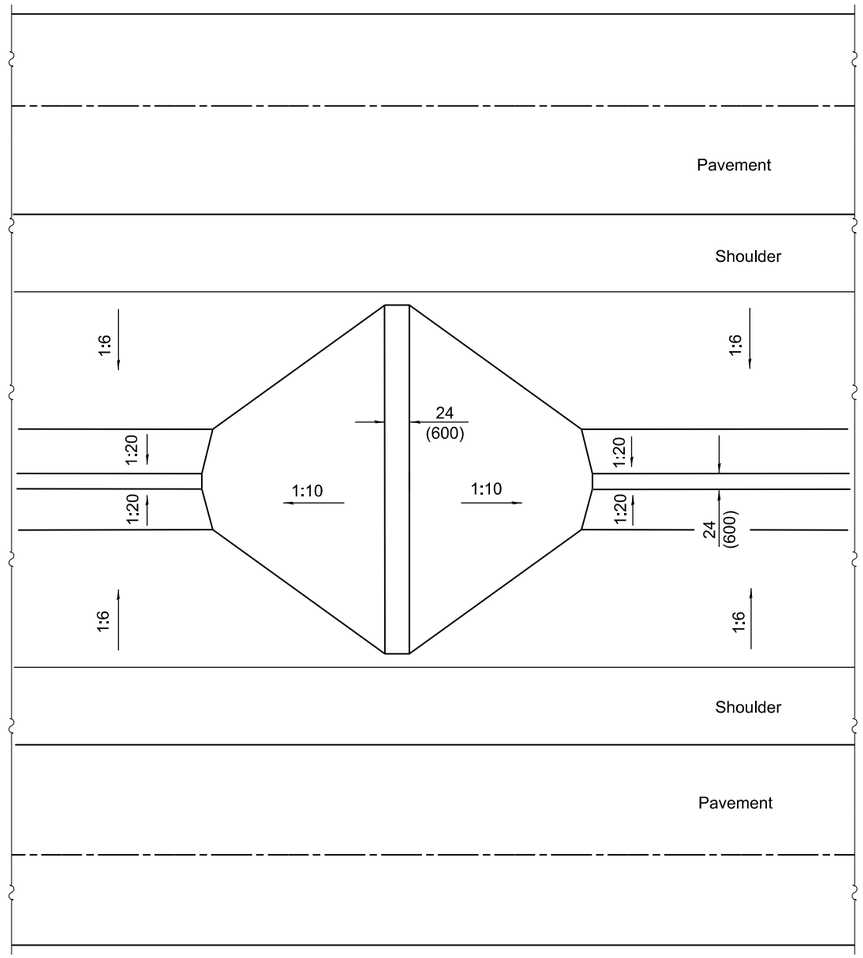
DATE	REVISIONS
1-1-97	New Standard.

DECIMAL OF AN INCH AND OF A FOOT

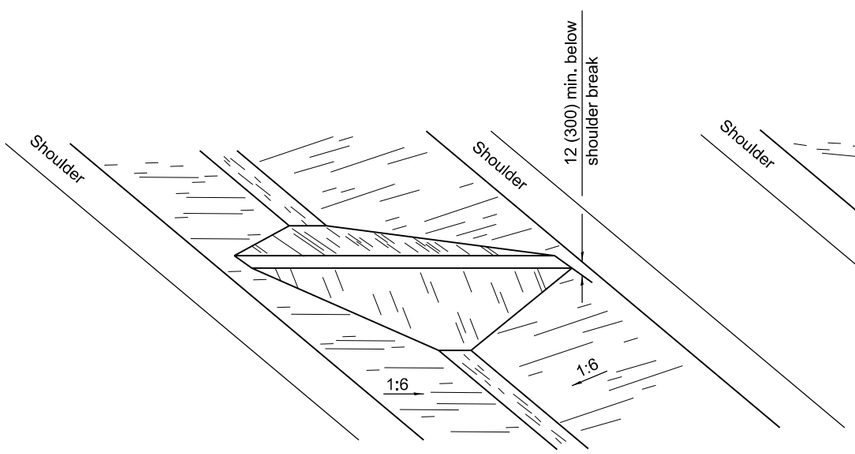
STANDARD 001006



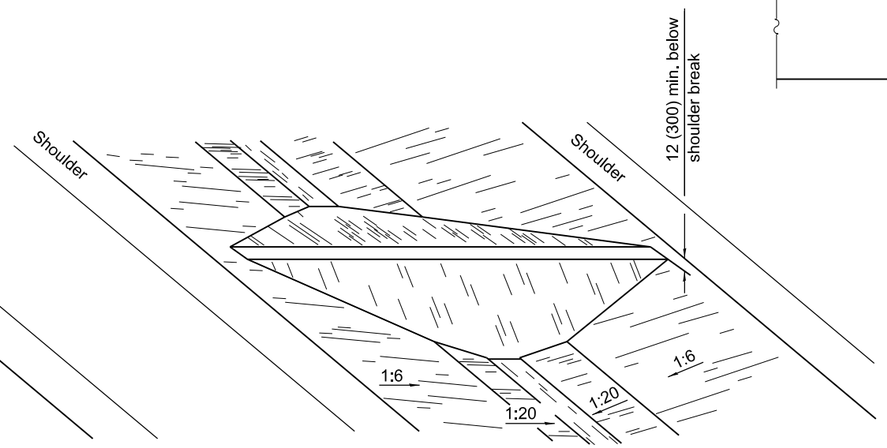
DITCH CHECK FOR NARROW MEDIAN



DITCH CHECK FOR WIDE MEDIAN



VIEW OF NARROW MEDIAN



VIEW OF WIDE MEDIAN

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED January 1, 2008
ENGINEER OF POLICY AND PROCEDURES

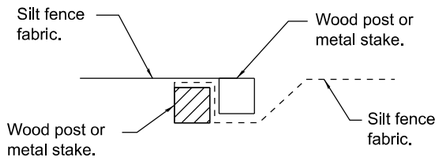
APPROVED January 1, 2008
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

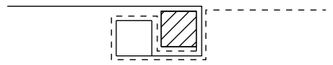
EARTH MEDIAN DITCH CHECK

STANDARD 202001-01



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

STEP 1

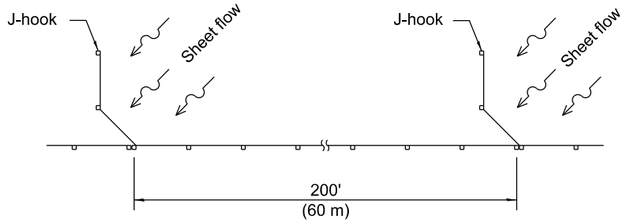


Rotate posts (stakes) together 180° clockwise and drive both posts (stakes) 18 (450) into ground.

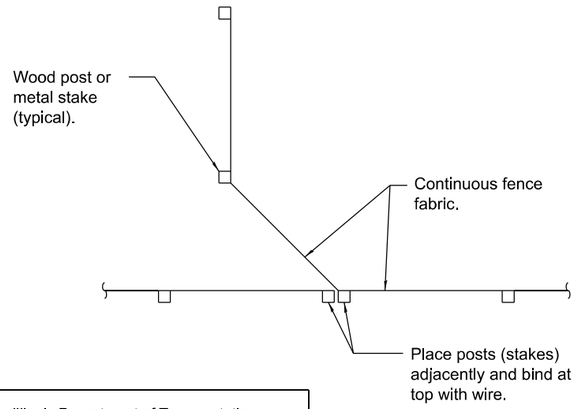
STEP 2

ATTACHING TWO SILT FILTER FENCES

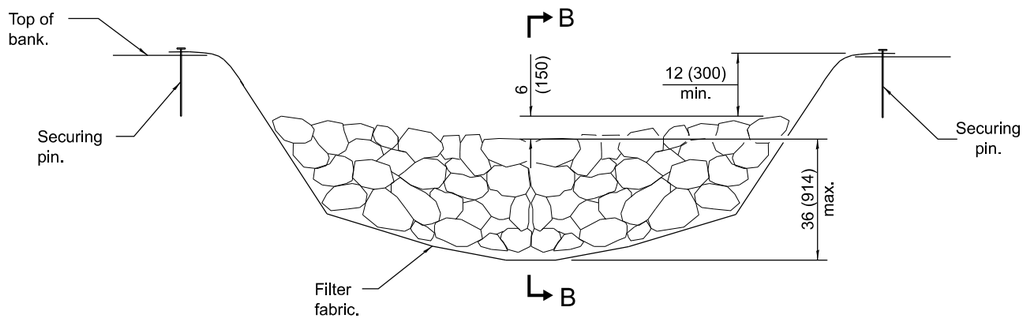
(Not applicable for J-hooks)



SILT FILTER J-HOOK PLACEMENT

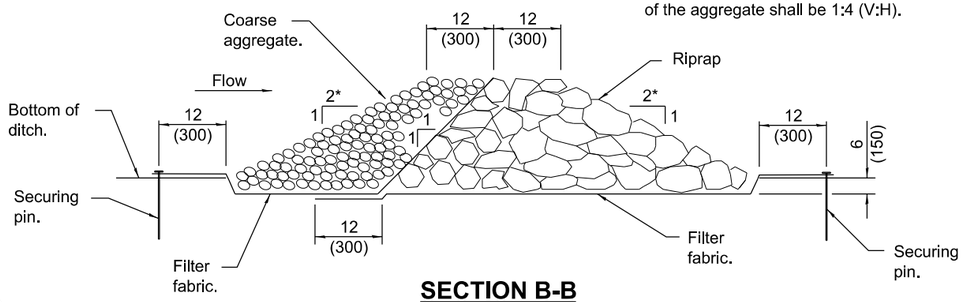


J-HOOK



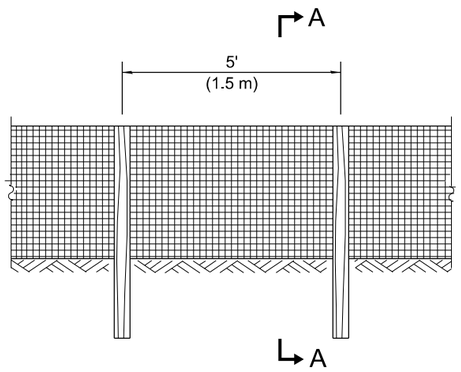
ELEVATION

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



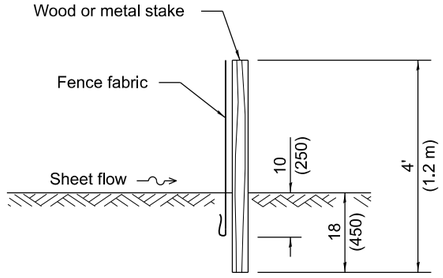
SECTION B-B

AGGREGATE DITCH CHECK

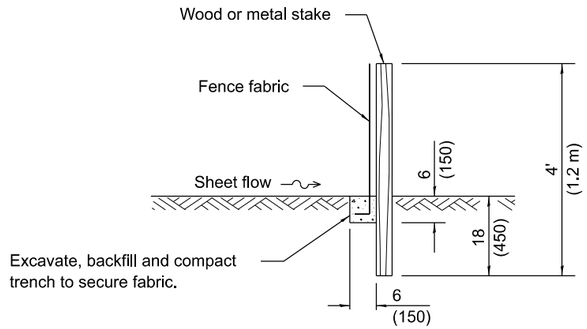


ELEVATION

SILT FILTER FENCE AS A PERIMETER EROSION BARRIER



SLICE METHOD



TRENCH METHOD

SECTION A-A

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED January 1, 2013
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

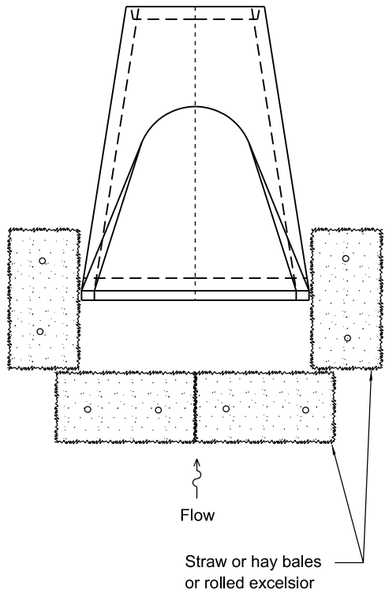
APPROVED January 1, 2013
ENGINEER OF DESIGN AND ENVIRONMENT

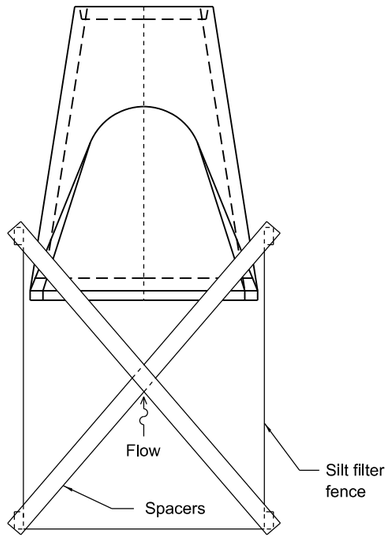
ISSUED 1-1-97

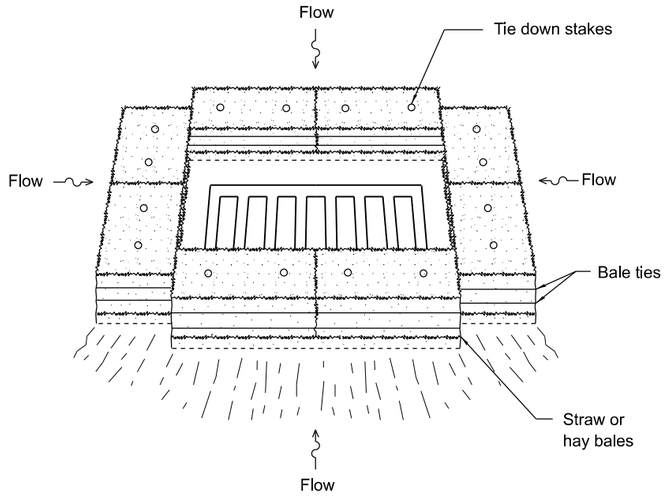
DATE	REVISIONS
1-1-13	Corrected notation for flowline (℄)
	on SEDIMENT BASIN ELEVATION
1-1-12	Omitted hay/straw perimeter barrier.
	Added SLICE METHOD to
	SECTION A-A

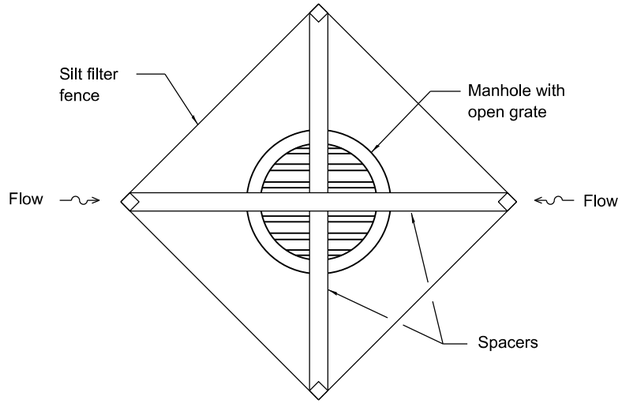
TEMPORARY EROSION CONTROL SYSTEMS

STANDARD 280001-07

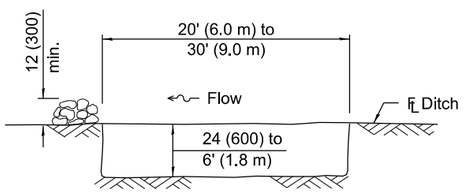






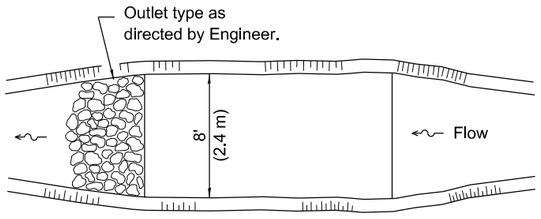


INLET AND PIPE PROTECTION



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

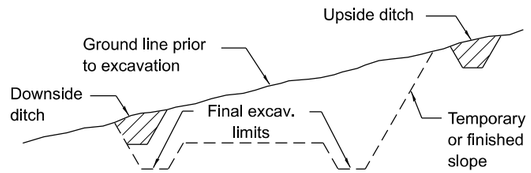
ELEVATION



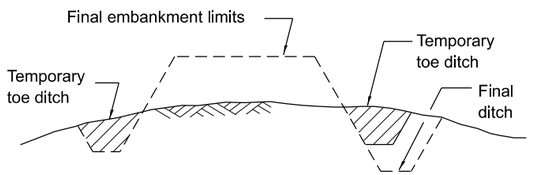
The long dimension should be parallel with the direction of the flow. Accumulated silt shall be removed anytime the basins become 75% filled.

PLAN

SEDIMENT BASIN



TYPICAL CUT CROSS-SECTION



TYPICAL FILL CROSS-SECTION

TEMPORARY DITCHES FOR CUT & FILL SECTIONS

Illinois Department of Transportation

APPROVED January 1, 2013
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

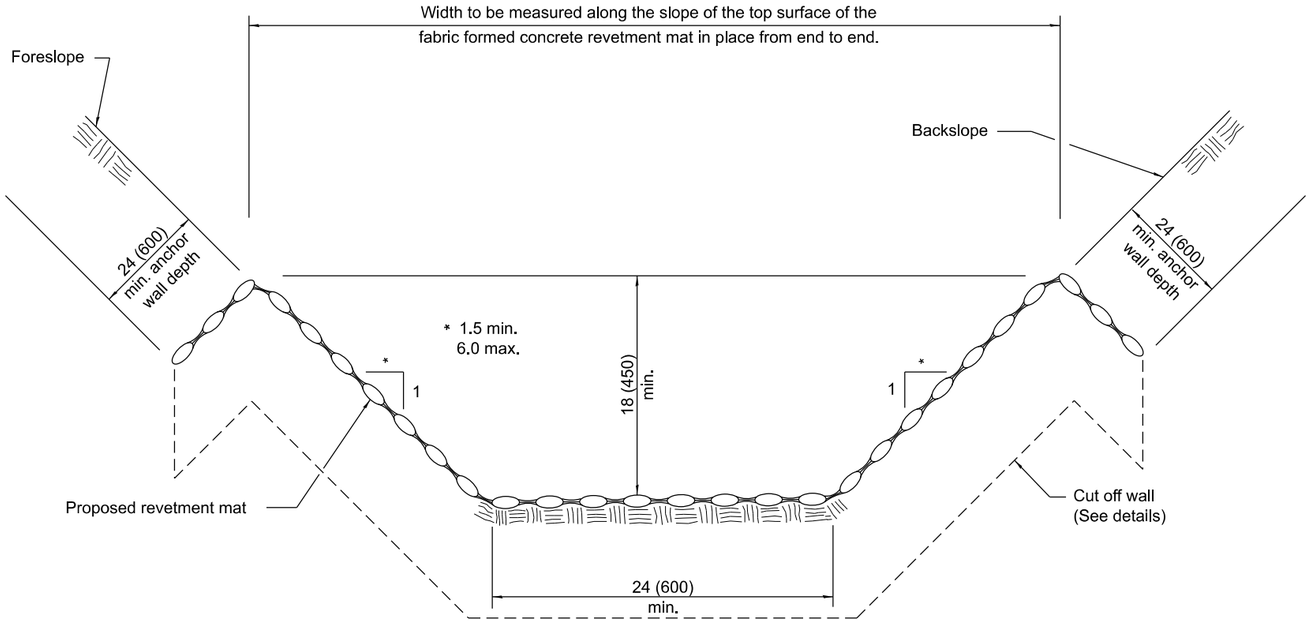
APPROVED January 1, 2013
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

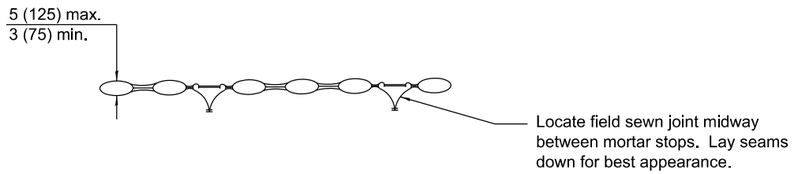
TEMPORARY EROSION CONTROL SYSTMES

(Sheet 2 of 2)

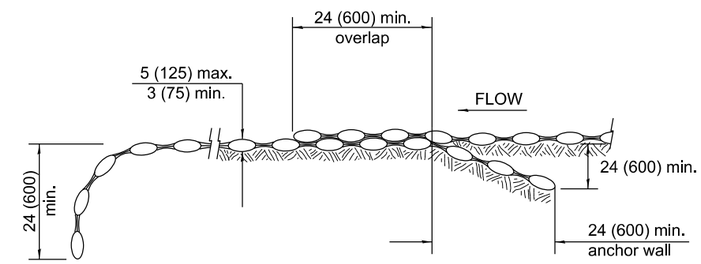
STANDARD 280001-07



TYPICAL FABRIC FORMED CONCRETE REVETMENT MAT LINED DITCH

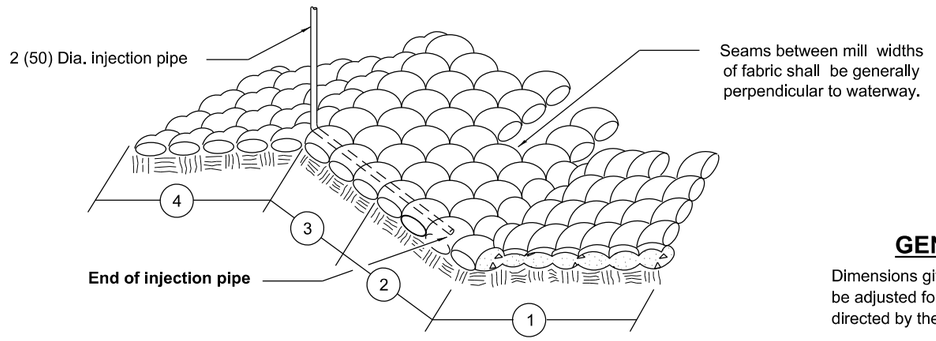


TYPICAL SECTION THRU FILTER POINT MAT



CUT OFF WALL DETAILS

TYPICAL LAP JOINTS W/ANCHOR WALL



INSTALLATION DETAILS

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

GENERAL NOTES

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

All anchor walls on 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

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ENGINEER OF POLICY AND PROCEDURES

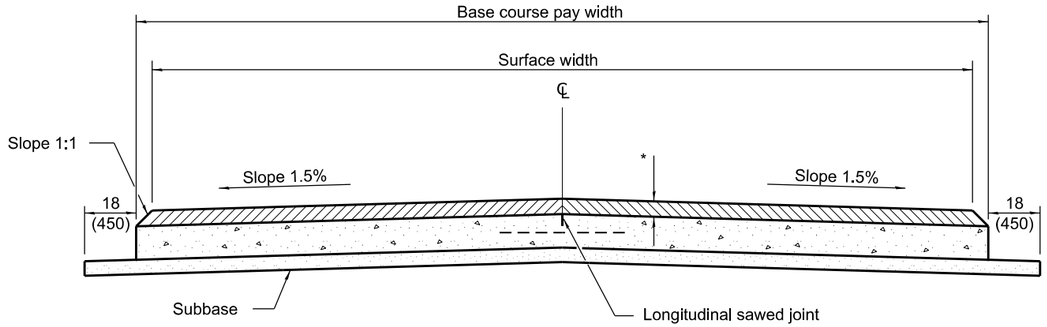
APPROVED January 1, 2008
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

FABRIC FORMED CONCRETE REVETMENT MATS

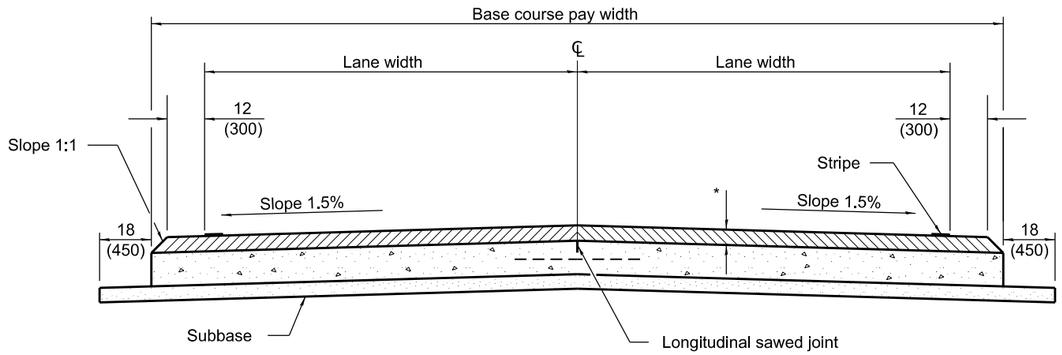
STANDARD 285001-02



SECTION A-A

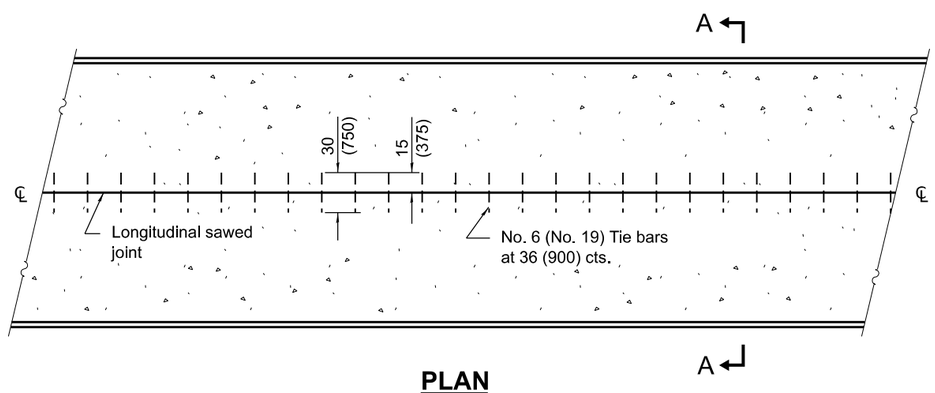
(TYPICAL 2 LANE WITH SHOULDERS)

* HMA binder and surface courses

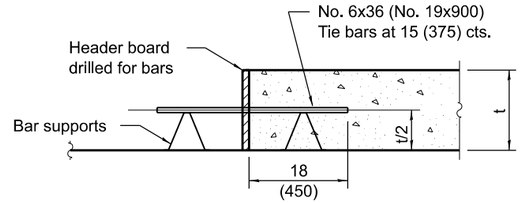


ALTERNATE SECTION A-A

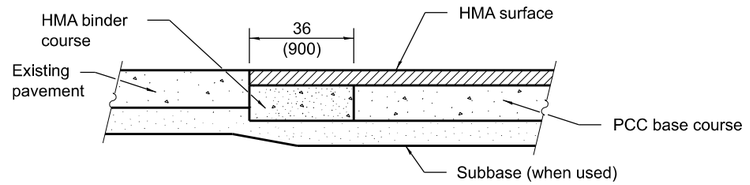
(TYPICAL 2 LANE WITH SHOULDERS)



PLAN



TRANSVERSE CONSTRUCTION JOINT



LONGITUDINAL SECTION SHOWING CONSTRUCTION ADJACENT TO EXISTING PAVEMENT

GENERAL NOTES

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

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

Illinois Department of Transportation

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Michael Brand
ENGINEER OF POLICY AND PROCEDURES

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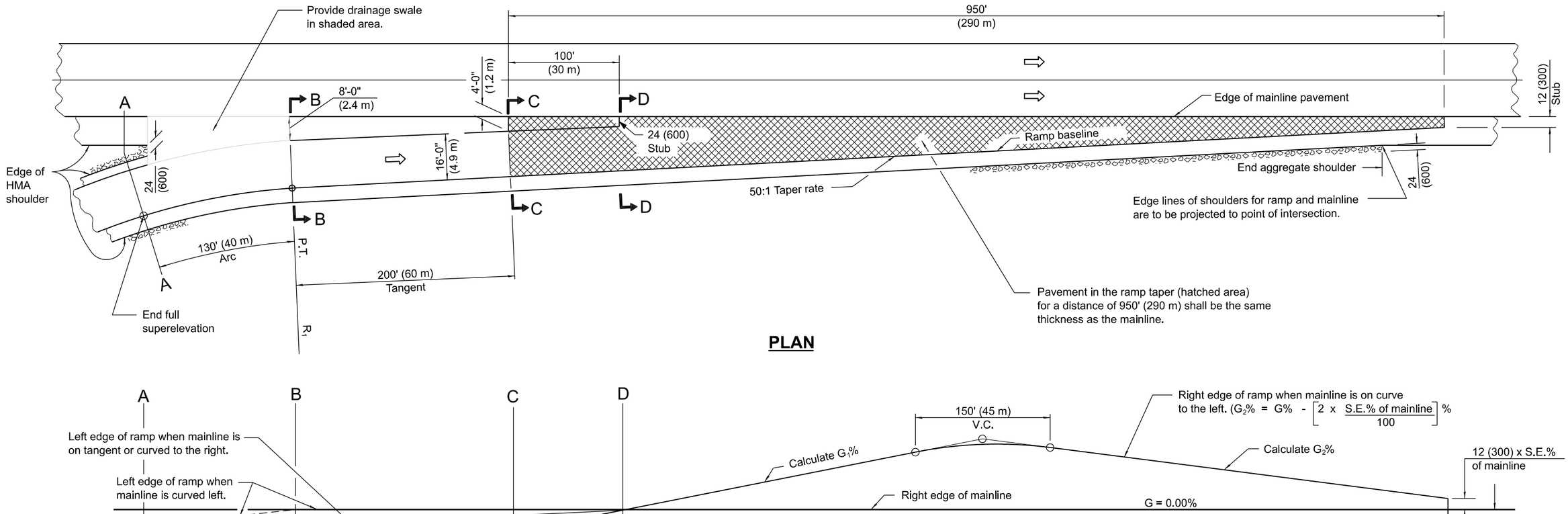
ISSUED 1-1-97

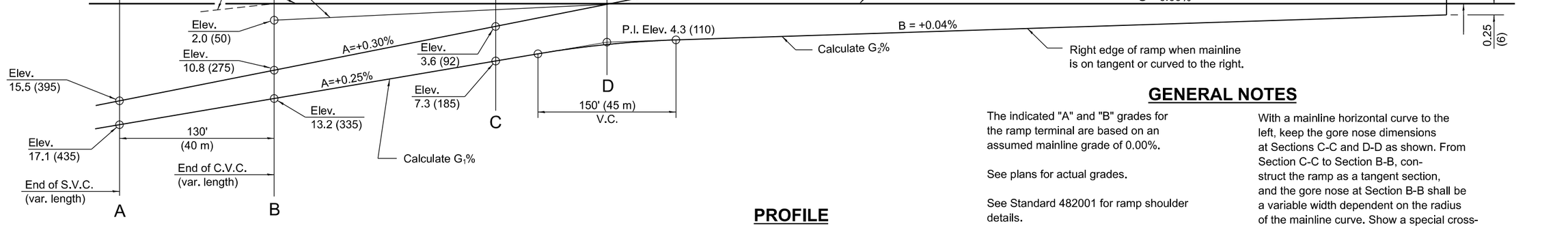
DATE	REVISIONS
1-1-18	Changed tie bar spacing
	to 36 (900) cts.
1-1-08	Switched units to English (metric).

PCC BASE COURSE WITH HMA BINDER AND SURFACE COURSES

STANDARD 353001-05



PLAN



PROFILE

GENERAL NOTES

The indicated "A" and "B" grades for the ramp terminal are based on an assumed mainline grade of 0.00%.

See plans for actual grades.

See Standard 482001 for ramp shoulder details.

Between Sections A-A and B-B (shaded area), provide a drainage swale and flush inlet to enhance drainage.

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

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

With a mainline horizontal curve to the left, keep the gore nose dimensions at Sections C-C and D-D as shown. From Section C-C to Section B-B, construct the ramp as a tangent section, and the gore nose at Section B-B shall be a variable width dependent on the radius of the mainline curve. Show a special cross-section on the plans for Section B-B.

With a mainline horizontal curve to the right, keep the gore nose dimensions at Sections D-D, C-C, and B-B as shown, and the edge of the ramp between Sections C-C and B-B shall be constructed as a compound curve tying Section C-C.

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

Illinois Department of Transportation

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Michael Brand
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

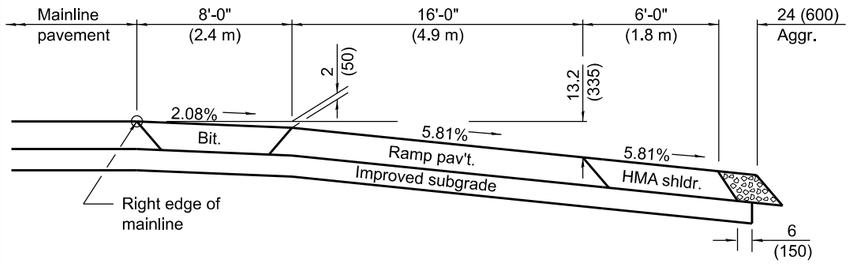
ISSUED 1-1-97

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

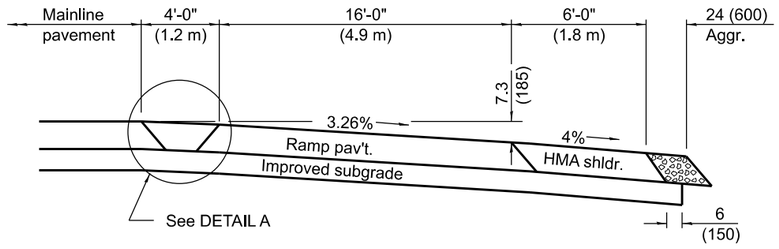
ENTRANCE RAMP TERMINAL

(FLEXIBLE RAMP PAVEMENT ADJACENT TO FLEXIBLE MAINLINE PAVEMENT) (Sheet 1 of 2)

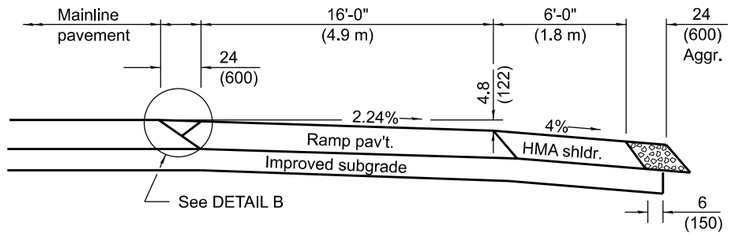
STANDARD 406001-06



SECTION B-B

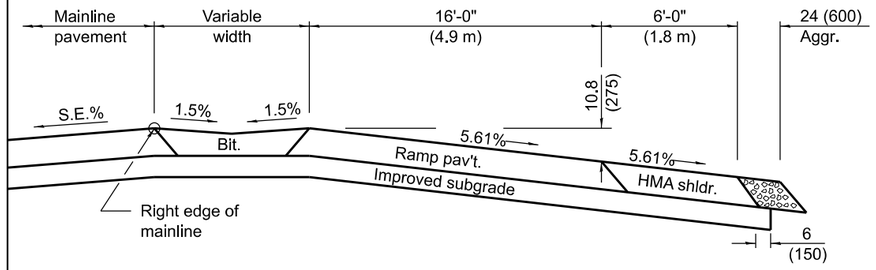


SECTION C-C

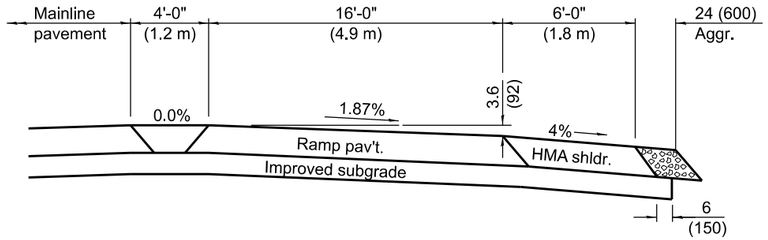


SECTION D-D

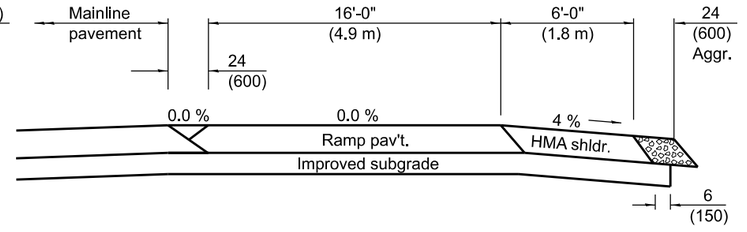
CROSS SECTIONS WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT



SECTION B-B

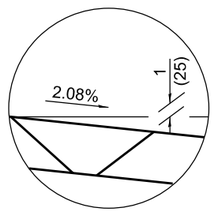


SECTION C-C

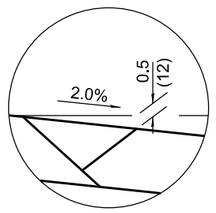


SECTION D-D

CROSS SECTIONS WHEN MAINLINE IS CURVED TO THE LEFT



DETAIL A



DETAIL B

Illinois Department of Transportation

APPROVED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

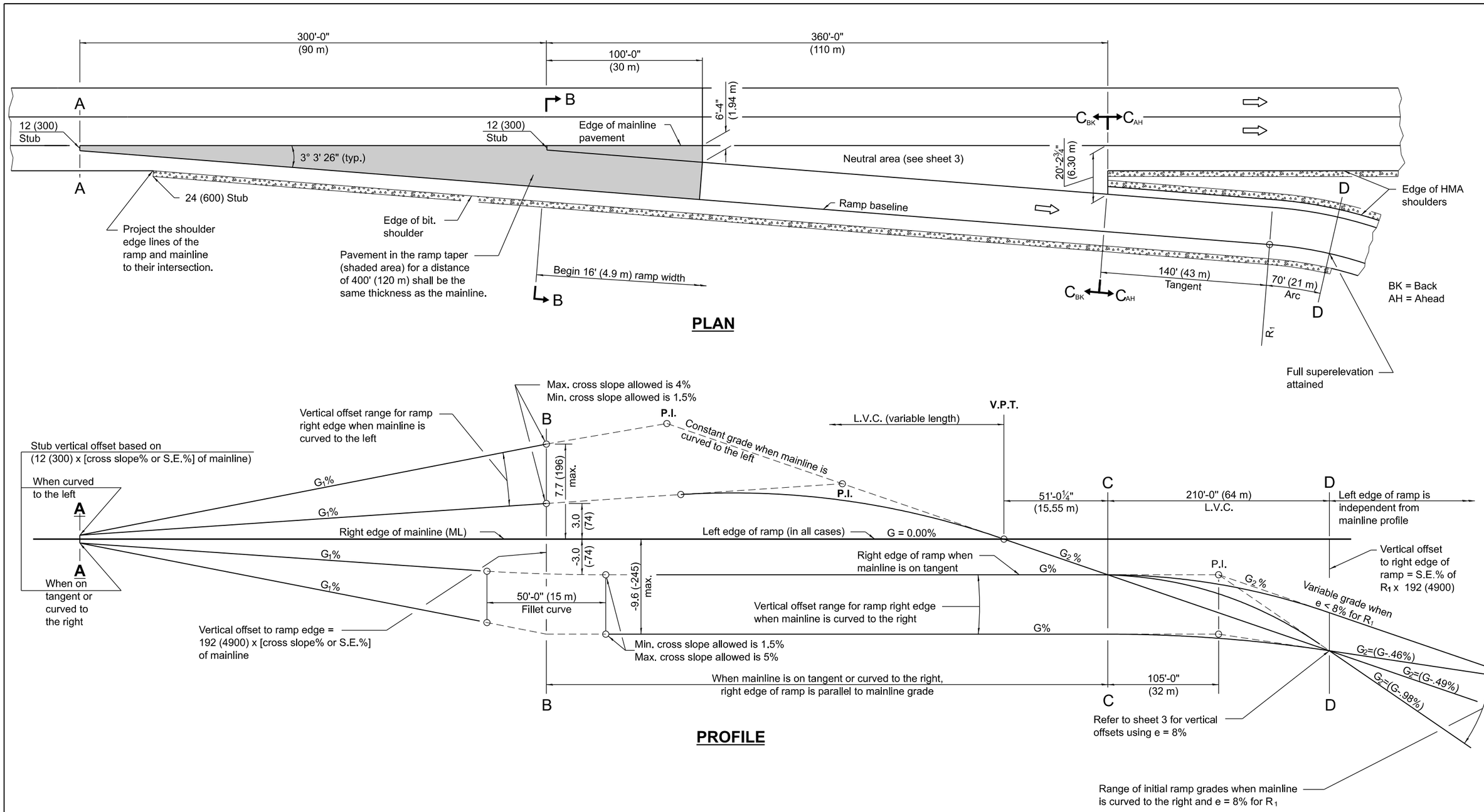
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

ENTRANCE RAMP TERMINAL

(FLEXIBLE RAMP PAVEMENT ADJACENT TO FLEXIBLE MAINLINE PAVEMENT) (Sheet 2 of 2)

STANDARD 406001-06



See Sheet 3 for GENERAL NOTES

Illinois Department of Transportation

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Michael Brand
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

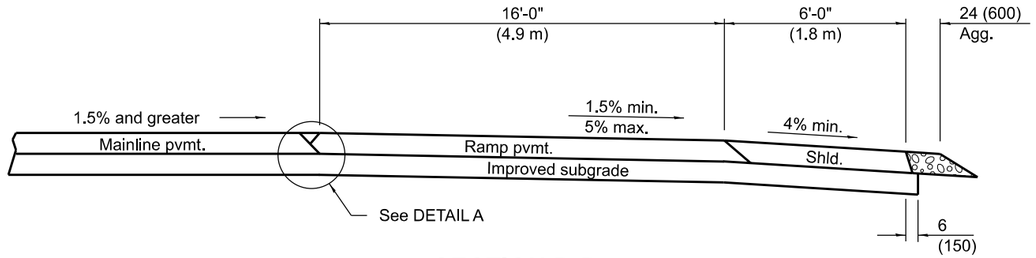
DATE	REVISIONS
1-1-15	Corrected divergence angle
	at taper. Based profile off of
	e-max instead of R1
1-1-08	Switched units to English (metric).

EXIT RAMP TERMINAL

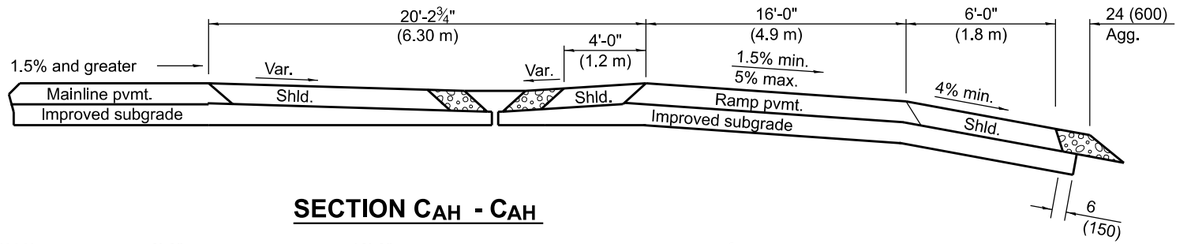
(FLEXIBLE RAMP PAVEMENT ADJACENT
TO FLEXIBLE MAINLINE PAVEMENT)

(Sheet 1 of 3)

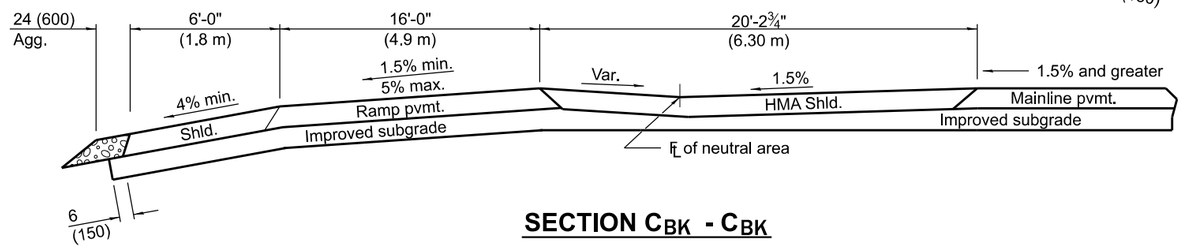
STANDARD 406101-05



SECTION B-B

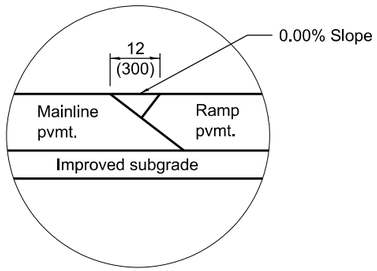


SECTION C_{AH} - C_{AH}



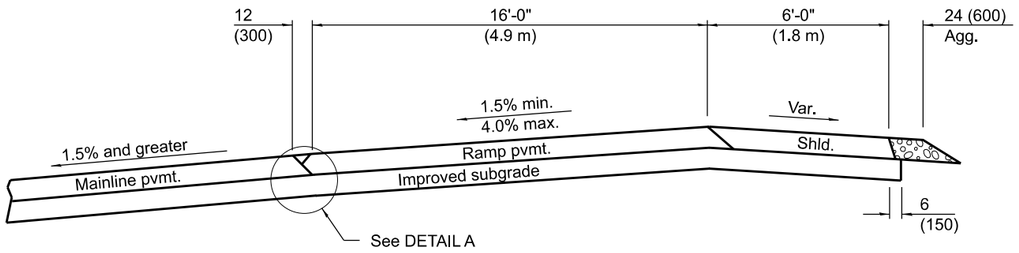
SECTION C_{BK} - C_{BK}

BK = Back
AH = Ahead

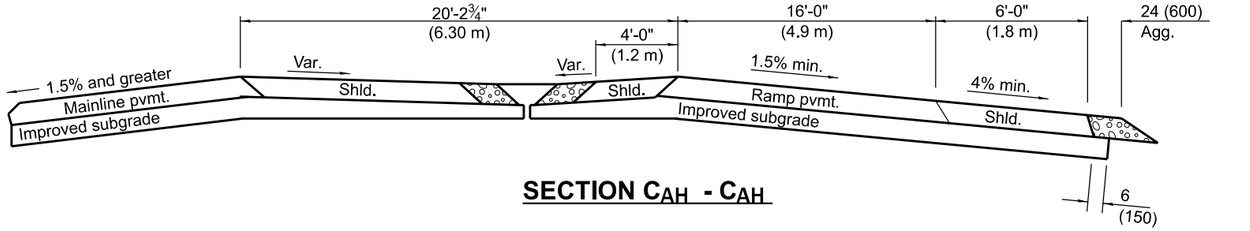


DETAIL A

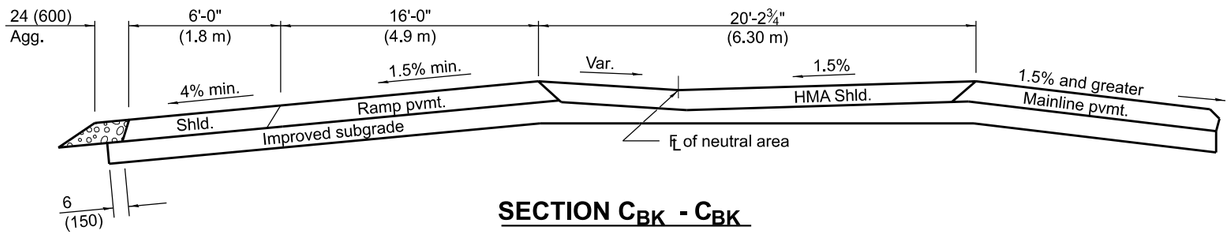
WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT



SECTION B-B



SECTION C_{AH} - C_{AH}



SECTION C_{BK} - C_{BK}

WHEN MAINLINE IS CURVED TO THE LEFT

See Sheet 3 for GENERAL NOTES

Illinois Department of Transportation

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ENGINEER OF POLICY AND PROCEDURES

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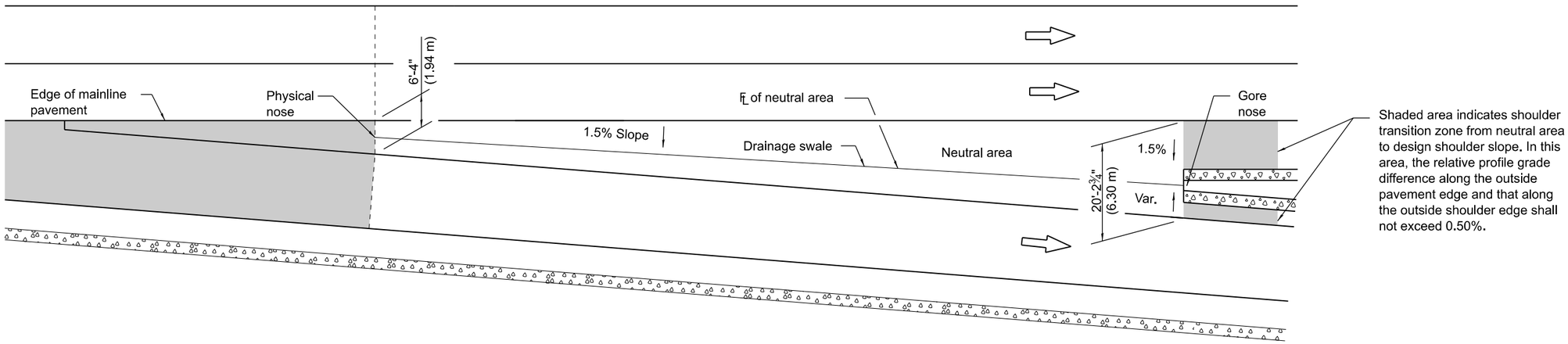
ISSUED 1-1-97

EXIT RAMP TERMINAL

(FLEXIBLE RAMP PAVEMENT ADJACENT TO FLEXIBLE MAINLINE PAVEMENT)

STANDARD 406101-05



DETAILS FOR DRAINAGE IN NEUTRAL AREA

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. % ML x 12	S.E. % ML x 12 ②
B	- 3.0	S.E. % ML x 192	S.E. % ML x 192 ②
C	- 3.0	S.E. % ML x 192	- 3.0
D	- 15.4	- 15.4	- 15.4

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.% ML x 300	S.E.% ML x 300 ②
B	- 74	S.E.% ML x 4900	S.E.% ML x 4900 ②
C	- 74	S.E. % ML x 4900	- 74
D	- 392	- 392	- 392

① Vertical offset values are calculated and based on the right edge of mainline pavement at 0.0 % grade.

② The vertical offsets of these points are above the mainline pavement and lie on an upgrade in relationship to the mainline grade.

③ S.E.=Superelevation Rate

GENERAL NOTES

The initial ramp grade (G_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 %, 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_1, construct the ramp as a 140 ft. (43 m) tangent section.

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

Illinois Department of Transportation

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ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2015
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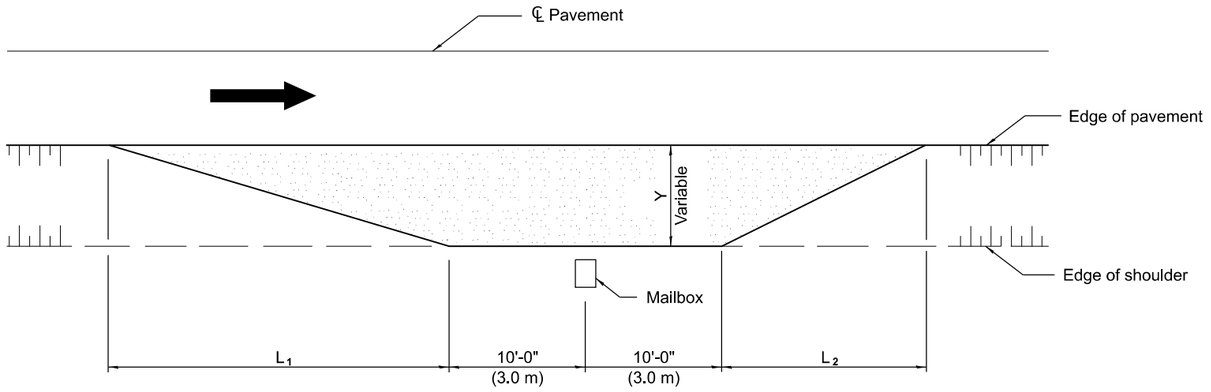
ISSUED 1-1-97

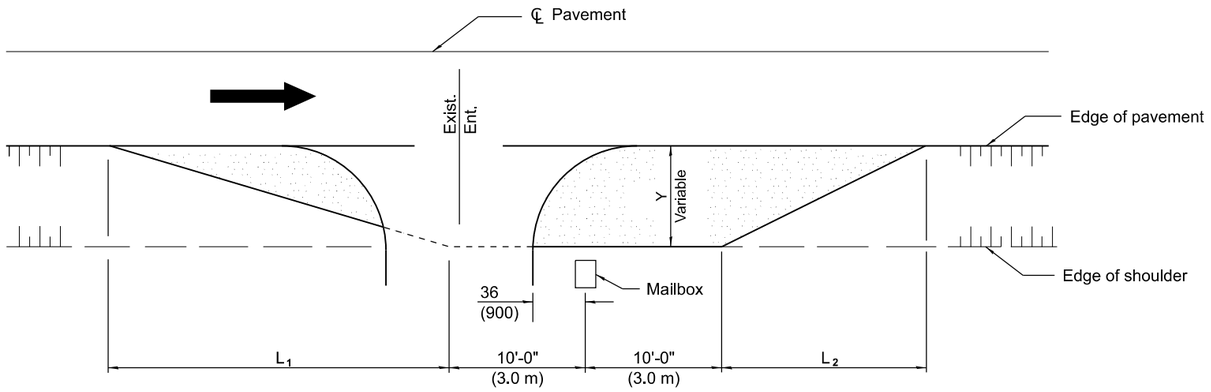
EXIT RAMP TERMINAL

(FLEXIBLE RAMP PAVEMENT ADJACENT TO FLEXIBLE MAINLINE PAVEMENT)

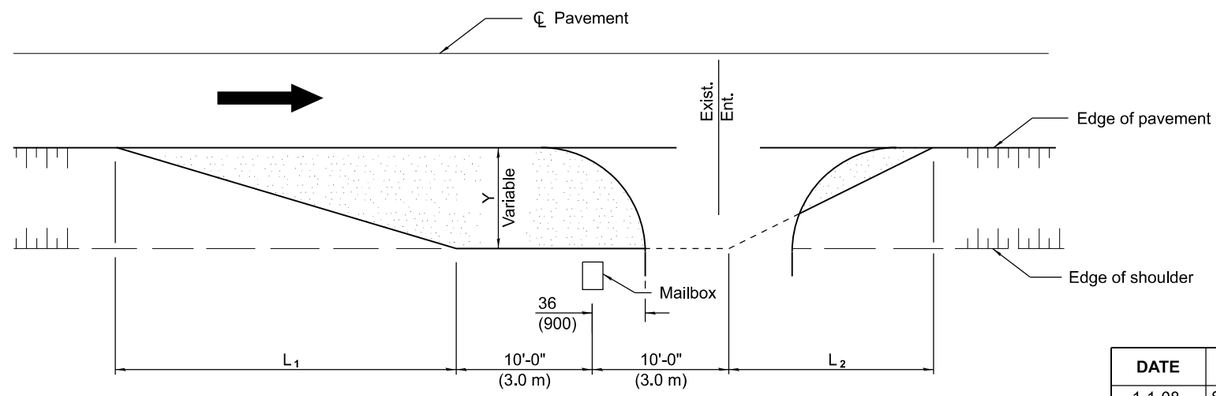
STANDARD 406101-05



TYPICAL APPLICATION



MAILBOX ON FARSIDE OF ENTRANCE



MAILBOX ON NEARSIDE OF ENTRANCE

DIMENSIONS - ft. (m)		
Width of Shoulder	4-8 (1.2-2.4)	10 (3.0)
Width of Turnout (Y)	8 (2.4)	8-10 (2.4-3.0)
L_1	32 (9.5)	32 (9.5)
L_2	20 (6.0)	20 (6.0)

GENERAL NOTES

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

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

Illinois Department of Transportation

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ENGINEER OF POLICY AND PROCEDURES

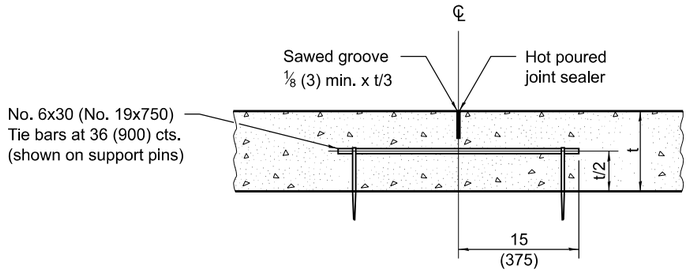
APPROVED January 1, 2008
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

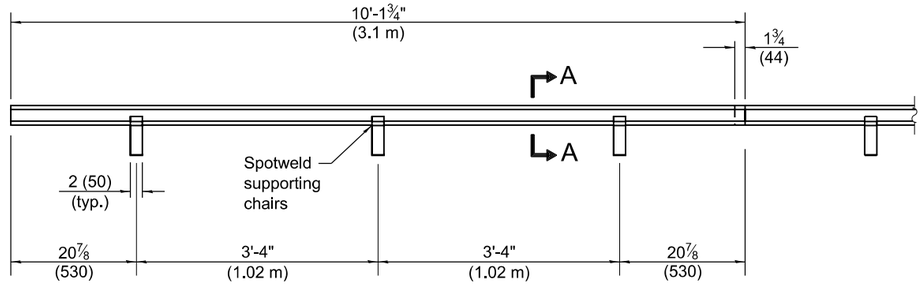
DATE	REVISIONS
1-1-08	Switched units to English (metric).
1-1-97	Renum. Standard 2171-1.
	Deleted note regarding
	Township & Dist. roads.

MAILBOX TURNOUT

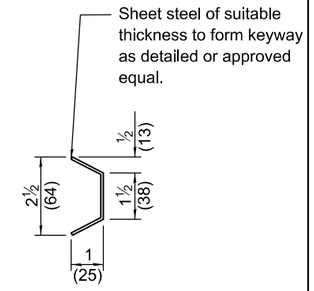
STANDARD 406201-01



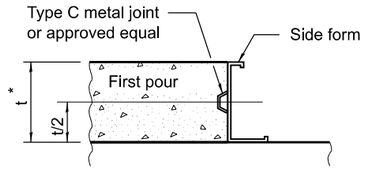
LONGITUDINAL SAWED JOINT



TYPE C METAL JOINT

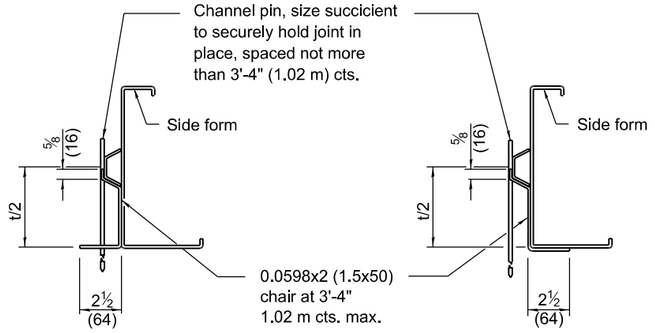


SECTION A-A



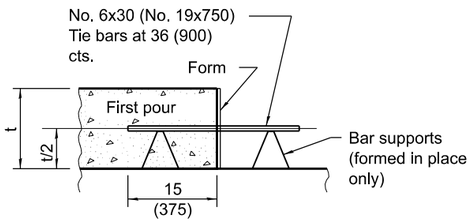
LONGITUDINAL KEYED JOINT

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



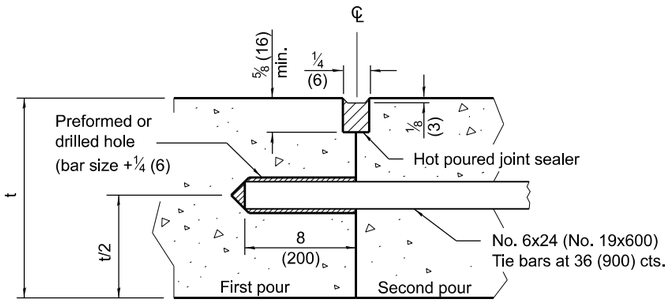
SUPPORTING CHAIR ALTERNATE

SUPPORTING CHAIR ALTERNATE



LONGITUDINAL CONSTRUCTION JOINT

(TIE BAR FORMED IN PLACE OR MECHANICALLY INSERTED)



LONGITUDINAL CONSTRUCTION JOINT

(TIE BAR GROUTED IN PLACE)

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

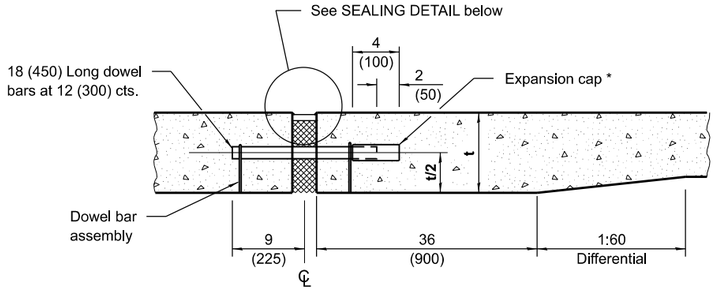
APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-22	Revised DOWEL BAR TABLE
	on Sheet 2.
1-1-18	Changed tie bar spacing
	to 36 (900) cts. Revised
	DOWEL BAR TABLE.

PAVEMENT JOINTS

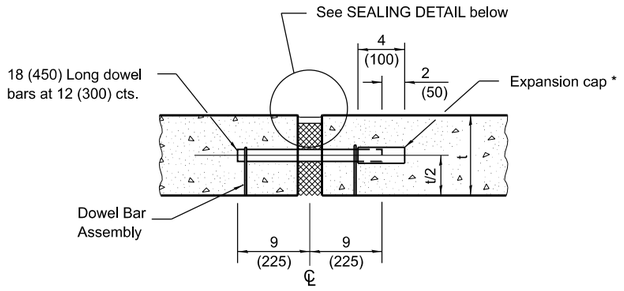
STANDARD 420001-10



TRANSVERSE EXPANSION JOINT

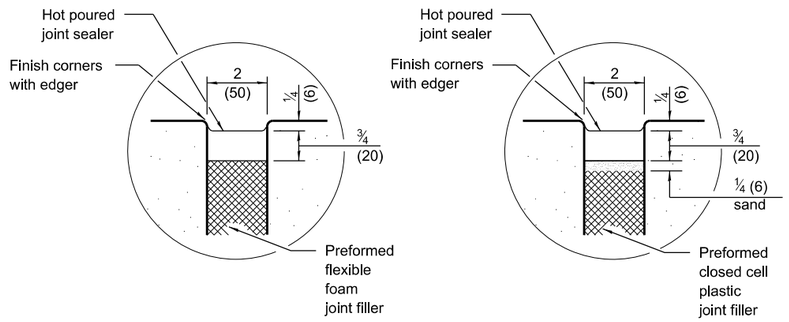
(FOR PAVEMENTS WITH UNEQUAL THICKNESS)

* 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.

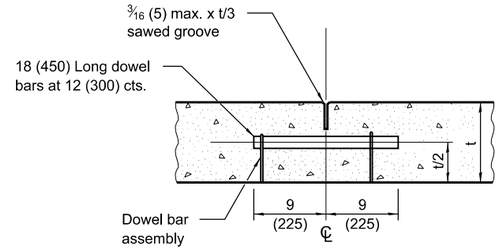


TRANSVERSE EXPANSION JOINT

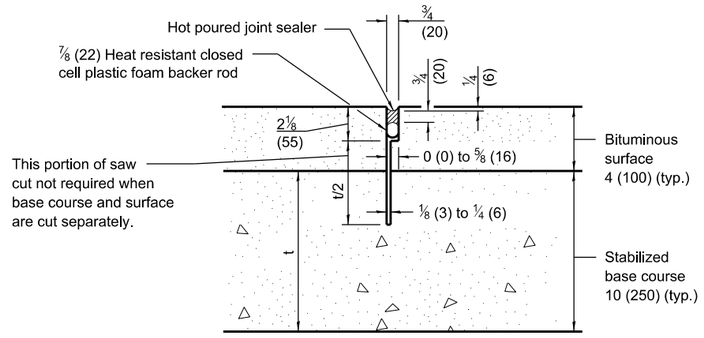
(FOR PAVEMENTS WITH EQUAL THICKNESS)



SEALING DETAIL



TRANSVERSE CONTRACTION JOINT



TRANSVERSE CONTRACTION JOINT

(FOR CAM, CFA AND LFA BASE COURSE MIXTURES)

DOWEL BAR TABLE	
PAVEMENT THICKNESS	DOWEL BAR DIAMETER
10 (250) and greater	1½ (38)
8.01 (201) thru 9.99 (249)	1¼ (32)
8 (200) and less	1 (25)

Illinois Department of Transportation

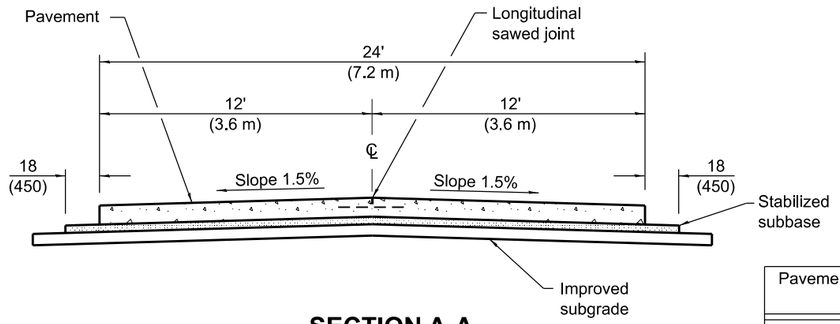
APPROVED January 1, 2022
Michael Briand
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

PAVEMENT JOINTS

STANDARD 420001-10

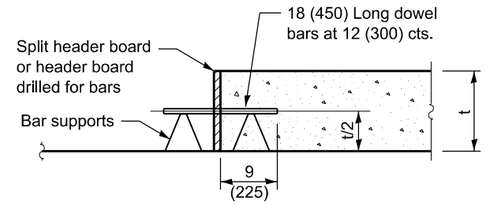


SECTION A-A

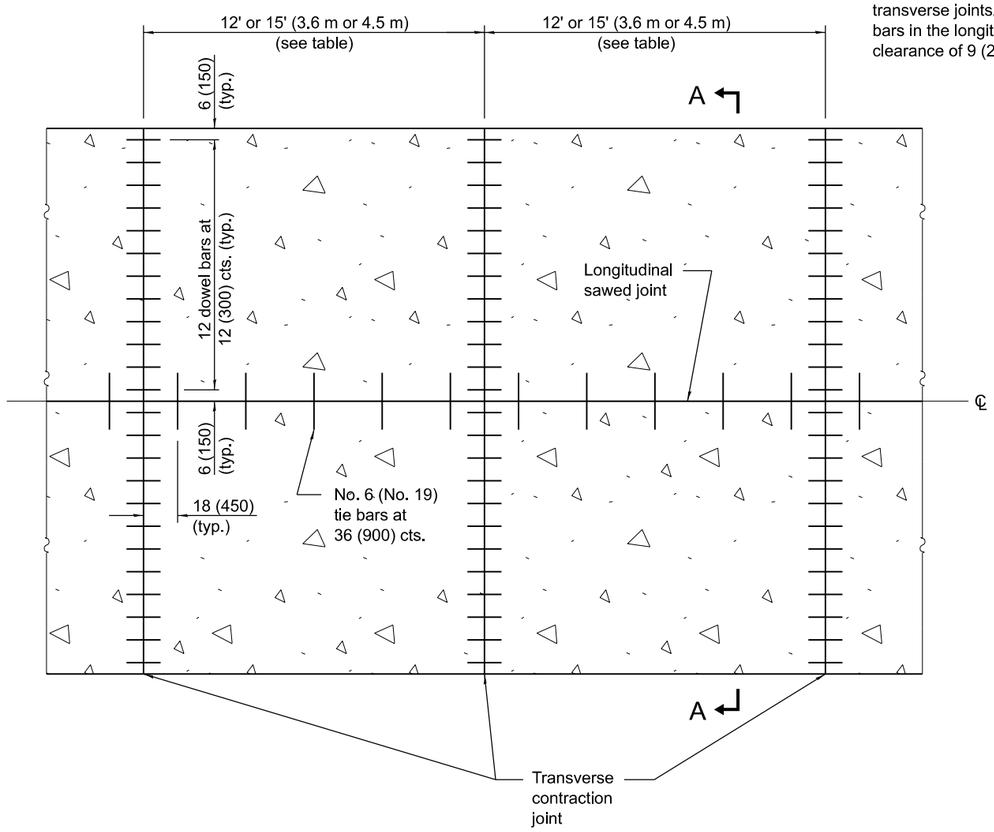
(TYPICAL 2-LANE WITH SHOULDERS)

Pavement Thickness	Spacing of Transverse Contraction Joints
Less than 10 (250)	12' (3.6 m) *
10 (250) and greater	15' (4.5 m) *

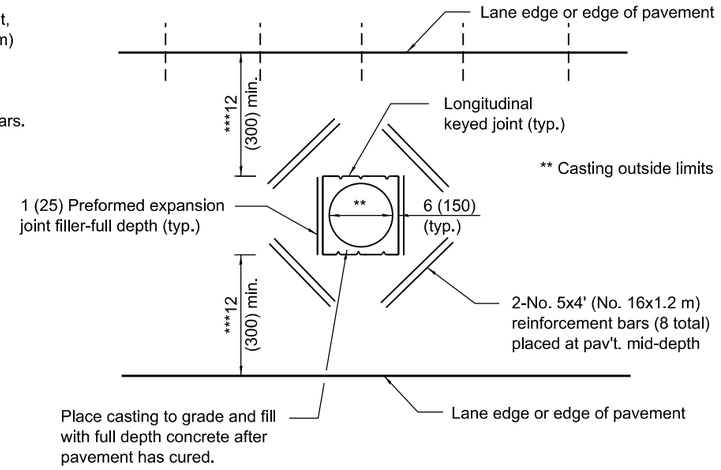
* When placed adjacent to existing PCC pavement, use a spacing between 12' (3.6 m) and 18' (5.5 m) so the joints are in prolongation with existing transverse joints. Also adjust the spacing of tie bars in the longitudinal joint(s) to maintain a clearance of 9 (225) from the end of the dowel bars.



TRANSVERSE CONSTRUCTION JOINT



PAVEMENT PLAN



*** 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

GENERAL NOTES

See Standard 420001 for details of joints not shown.

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

Illinois Department of Transportation

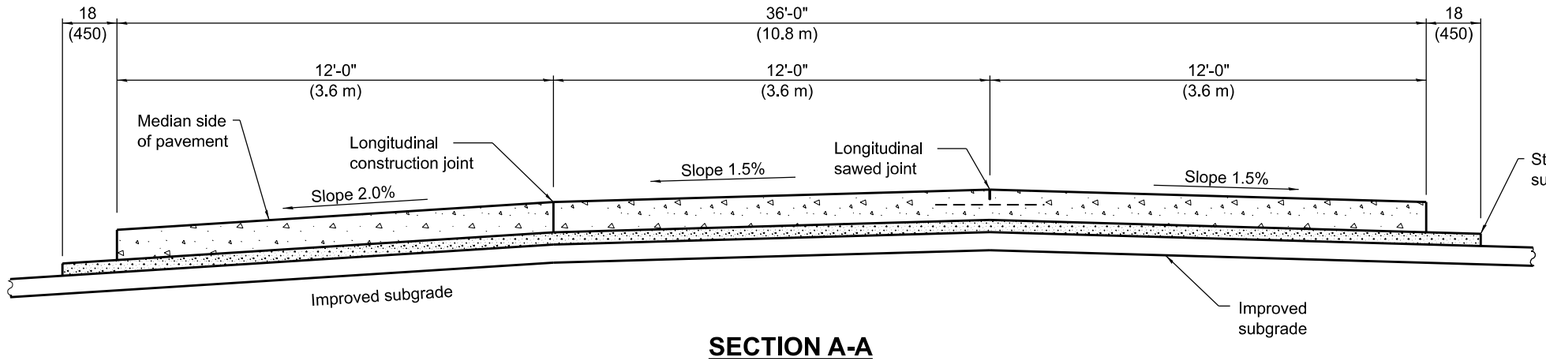
APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2022
Jeff Obr
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-22	Revised spacing of transverse
	contraction joints and header
	board callout.
1-1-18	Changed spacing of tie
	bars of 36 (900).

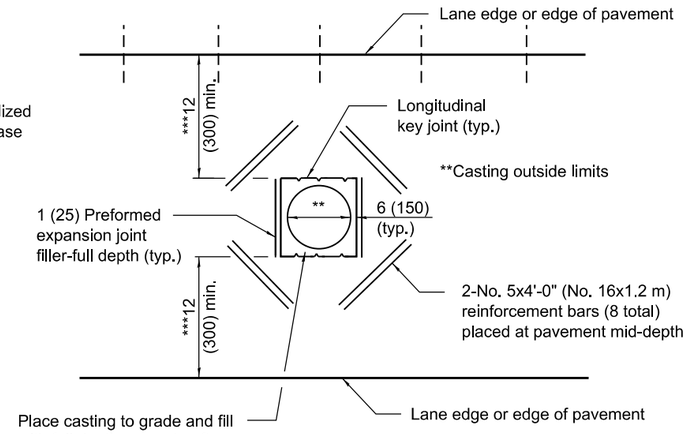
24' (7.2 m) JOINTED PCC PAVEMENT

STANDARD 420101-07



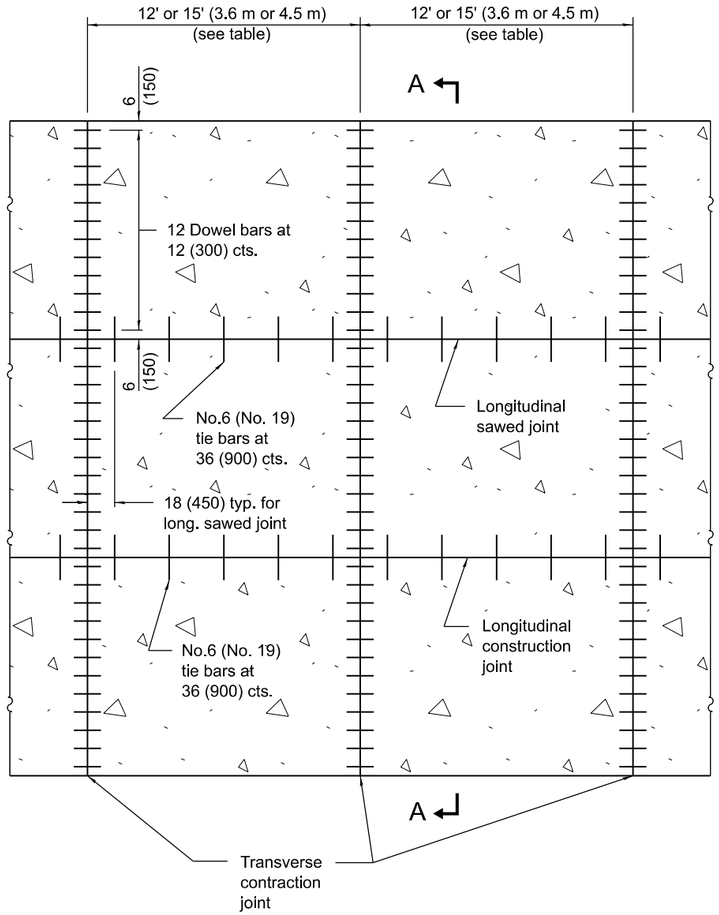
SECTION A-A

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



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

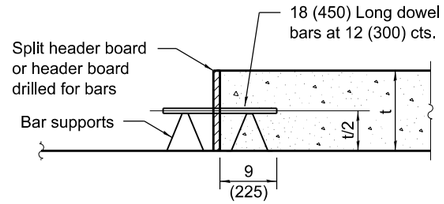
DETAIL OF ADDED REINFORCEMENT FOR PAVEMENT BLOCK-OUTS



PAVEMENT PLAN

Pavement Thickness	Spacing of Transverse Contraction Joints
Less than 10 (250)	12' (3.6 m) *
10 (250) and greater	15' (4.5 m) *

* When placed adjacent to existing PCC pavement, use a spacing between 12' (3.6 m) and 18' (5.5 m) so the joints are in prolongation with existing transverse joints. Also adjust the spacing of tie bars in the longitudinal joint(s) to maintain a clearance of 9 (225) from the end of the dowel bars.



TRANSVERSE CONSTRUCTION JOINT

GENERAL NOTES

See Standard 420001 for details of joints not shown.

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

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

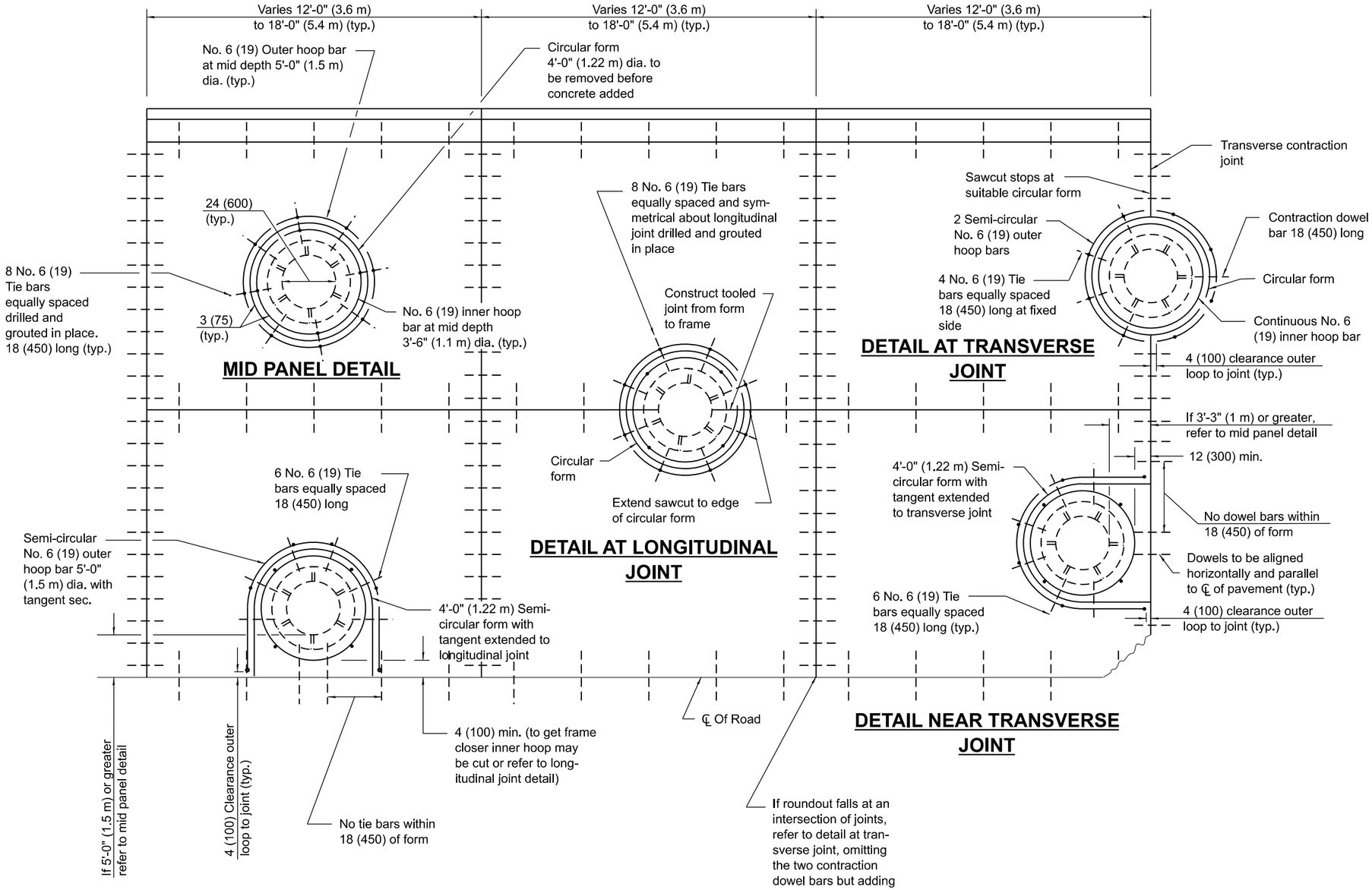
APPROVED January 1, 2022
Todd Carr
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-22	Revised spacing of transverse
	contraction joints and header
	board callout.
1-1-15	Changed spacing of tie bars
	to 36 (900).

36' (10.8 m) JOINTED PCC PAVEMENT

STANDARD 420106-07



GENERAL NOTES

Transverse joints may be moved to accommodate roundout. Edge of circular joint shall be minimum 24 (600) from transverse joint. Relocated transverse joint shall be continuous from edge of pavement to edge of pavement.

The transverse joint spacing should be adjusted to use the DETAIL NEAR TRANSVERSE JOINT. If the joint cannot be adjusted to give the 12 (300) min. offset, use the DETAIL AT TRANSVERSE JOINT and ensure the joint is centered in the structure as shown.

Circular form shall be removed prior to drill and grout of tie bars.

Drill and grout is preferred, however tie bars can be poured in place if clearance is provided to outer edge of frame. Maximum 2 (50) clearance.

Shims shall be used to adjust all frames. After adjusting mortar has cured, the shims shall be removed and the voids under the frames filled with nonshrink grout.

Hoop reinforcement shall be one piece construction having a minimum lap length of 24 (600).

All situations not shown and may require combination of details.

WHEN USING CAST IN PLACE:
Frame shall be anchored to the structure to prevent movement during the paving operation.

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

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

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

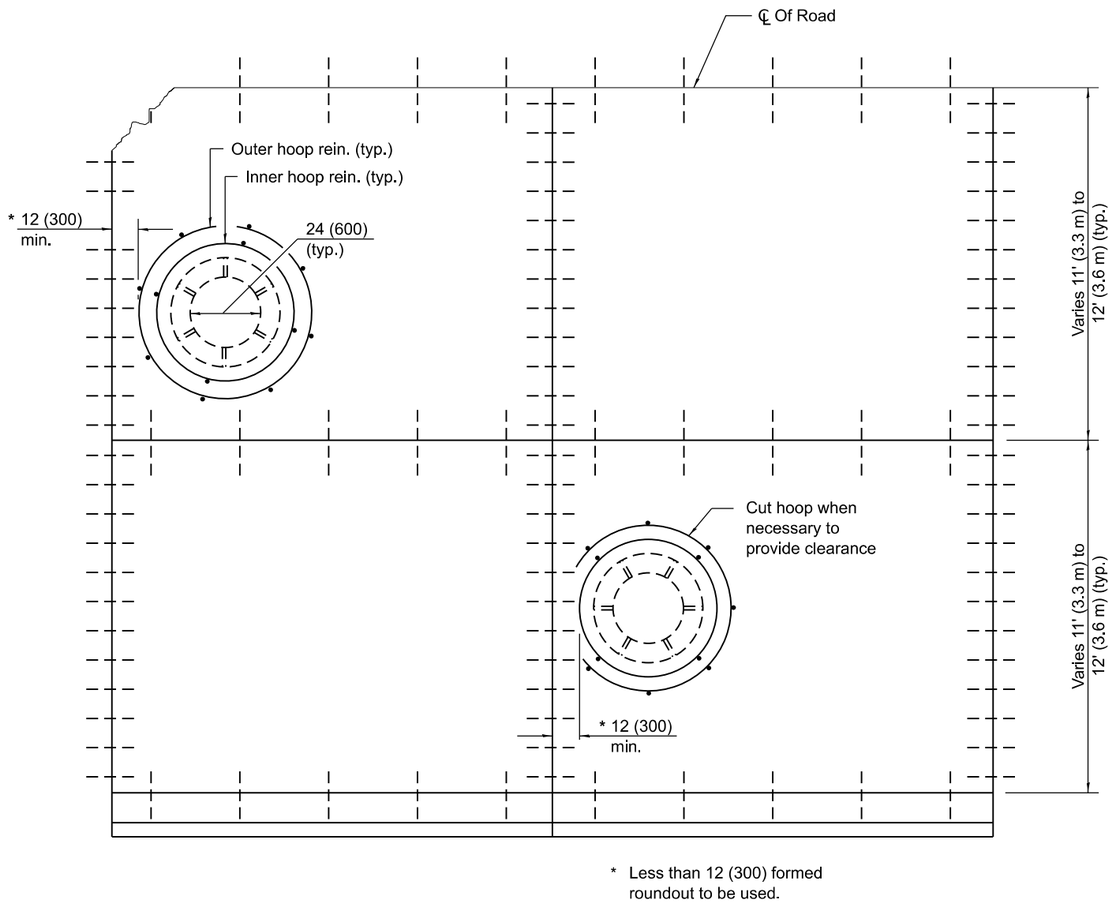
ISSUED 1-97

DATE	REVISIONS
1-1-18	Revised standard for 36 (900)
	tie bar spacing. Revised
	General Notes.
1-1-11	Corrected 'T/2' dim. on
	DETAIL OF REINFORCEMENT
	FOR PAVEMENT ROUNDOUT.

PCC PAVEMENT ROUNDOUTS

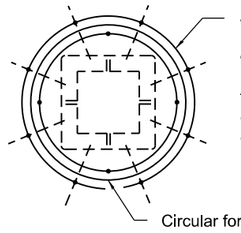
(Sheet 1 of 2)

STANDARD 420111-04



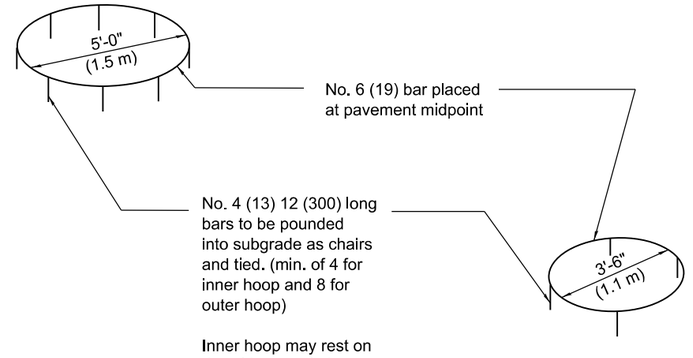
* Less than 12 (300) formed roundout to be used.

CAST IN PLACE DETAIL



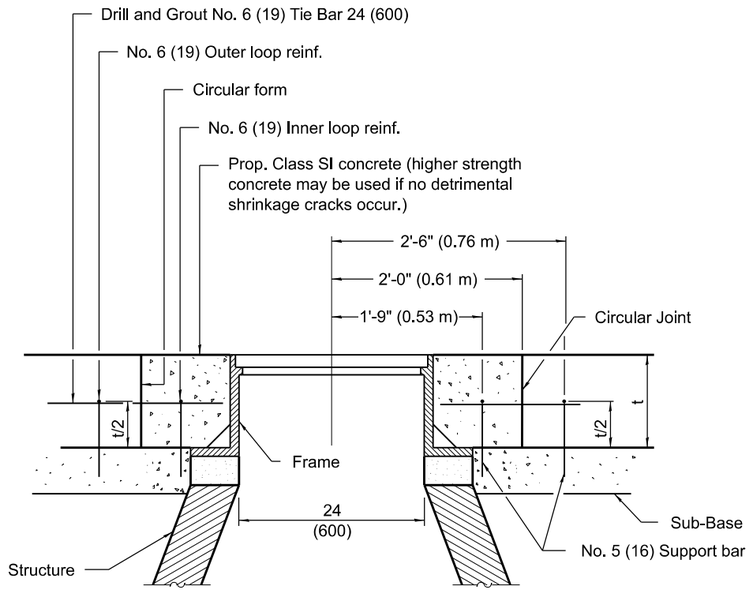
All dimensions same for the majority of circular frame & grates. For larger structures increase hoop bar and circular form diameter by 12 (300) each and add two additional equally spaced tie bars.

ROUNDOUT FOR SQUARE FRAME & GRATE AND MANHOLES



No. 4 (13) 12 (300) long bars to be pounded into subgrade as chairs and tied. (min. of 4 for inner hoop and 8 for outer hoop)

Inner hoop may rest on dowel bars or tie bars which do not interfere in the alignment.



Note:
Type 1 or Type 5 Frame and Grate may be used

DETAIL OF REINFORCEMENT FOR PAVEMENT ROUNDOUT

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

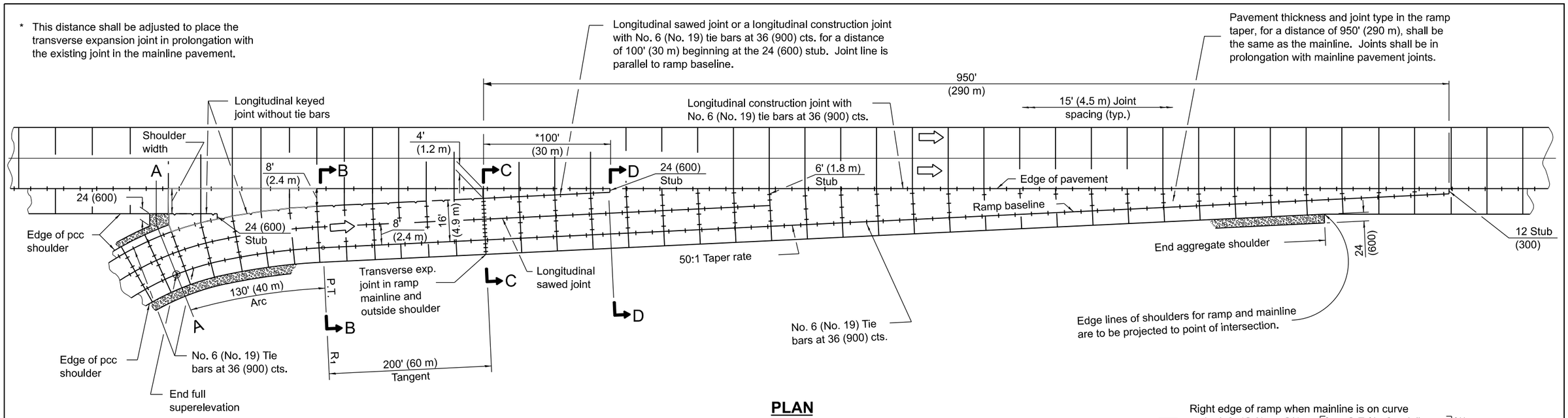
ISSUED 1-1-97

PCC PAVEMENT ROUNDOUTS

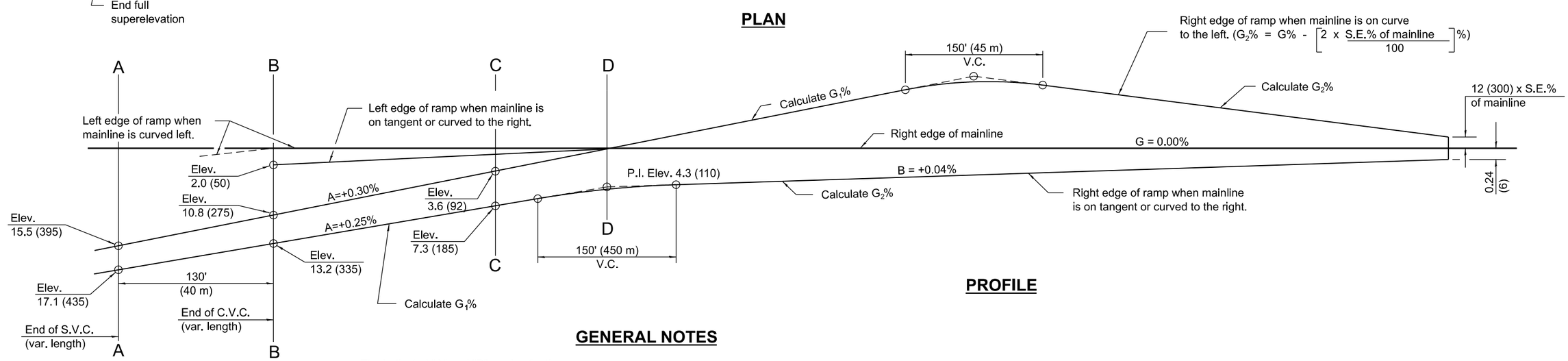
(Sheet 2 of 2)

STANDARD 420111-04

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



PLAN



PROFILE

GENERAL NOTES

The indicated "A" and "B" grades for the ramp terminal are based on an assumed mainline grade of 0.00%.

See plans for actual grades.

Pavement joints and joint spacing shall be as shown on Standards 420001, 420101 and 420106.

See Standard 483001 for ramp shoulder details.

Between Sections A-A and B-B (shaded area), provide a drainage swale and flush inlet to enhance drainage.

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

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

With a mainline horizontal curve to the left, keep the gore nose dimensions at Sections C-C and D-D as shown. From Section C-C to Section B-B, construct the ramp as a tangent section, and the gore nose at Section B-B shall be a variable width dependent on the radius of the mainline curve. Show a special cross-section on the plans for Section B-B.

With a mainline horizontal curve to the right, keep the gore nose dimensions at Sections D-D, C-C, and B-B as shown, and the edge of the ramp between Sections C-C and B-B is constructed as a compound curve tying Section C-C.

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

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

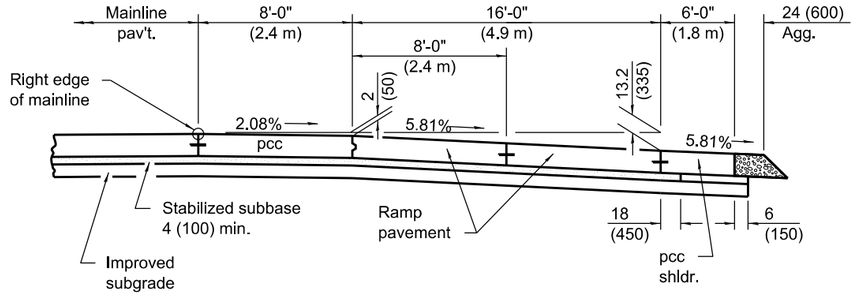
ISSUED 1-1-97

DATE	REVISIONS
1-1-22	Revised General Note for
	joints and joint spacing.
1-1-18	Changed tie bar spacing
	to 36 (900) cts.

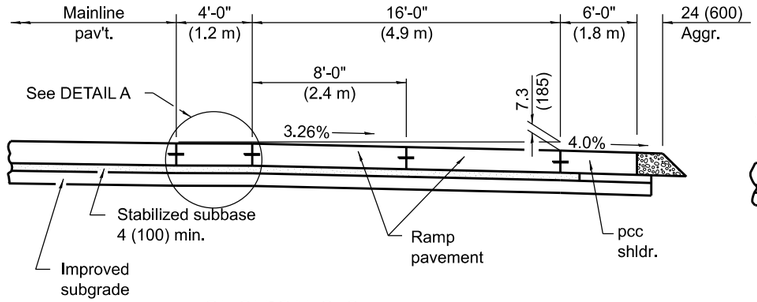
ENTRANCE RAMP TERMINAL

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

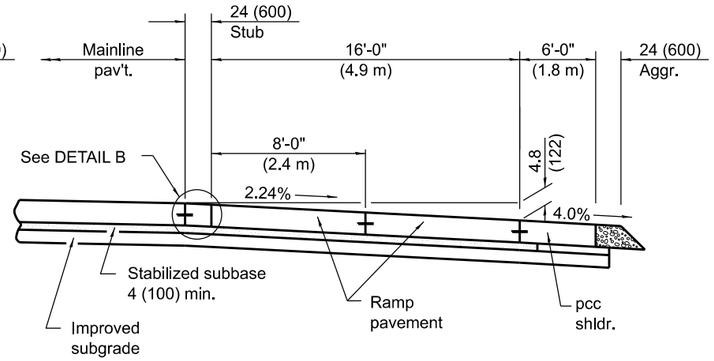
STANDARD 420201-12



SECTION B-B



SECTION C-C



SECTION D-D

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

SECTION B-B

SECTION C-C

SECTION D-D

CROSS SECTIONS WHEN MAINLINE IS CURVED TO THE LEFT

DETAIL A

DETAIL B

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

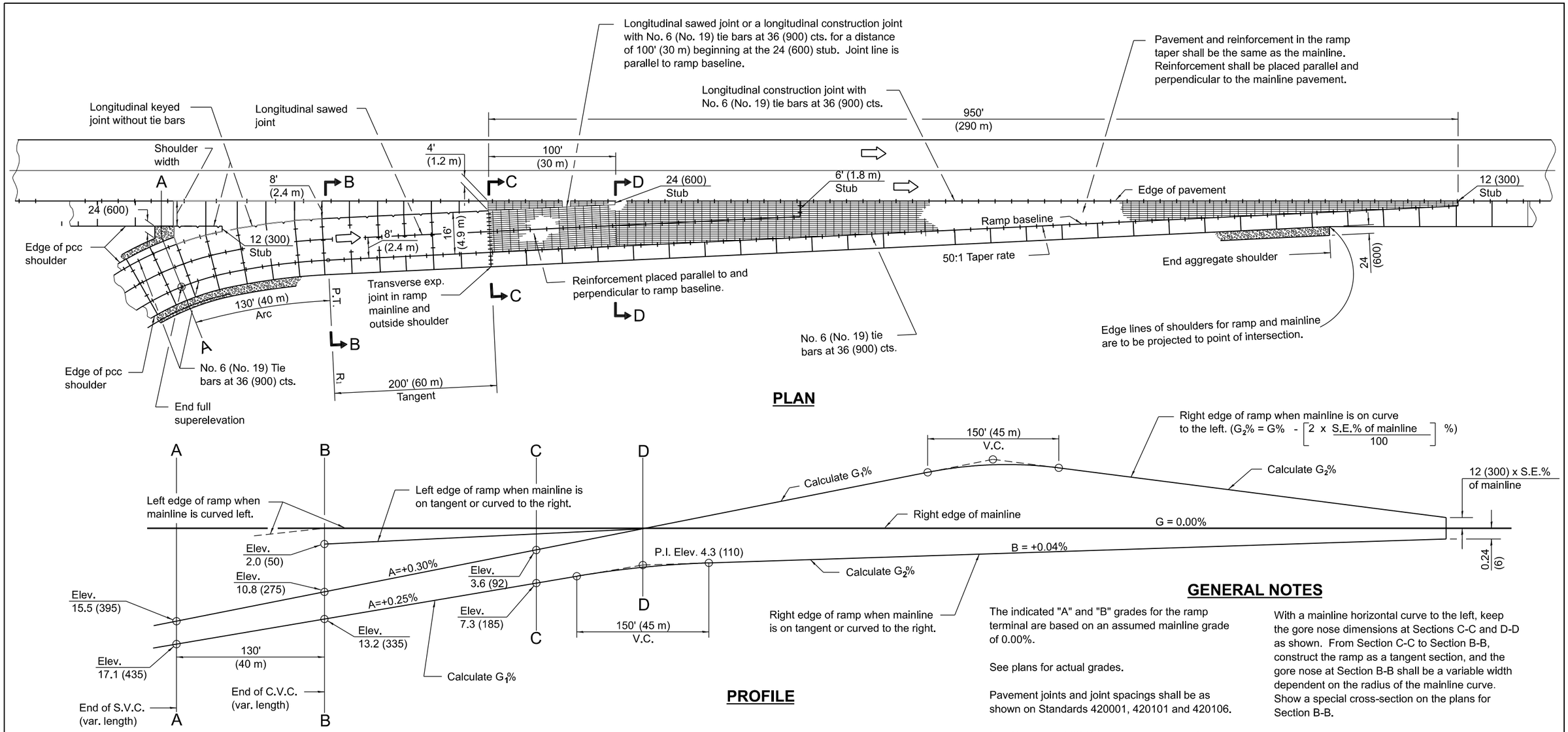
APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

ENTRANCE RAMP TERMINAL

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

STANDARD 420201-12



GENERAL NOTES

The indicated "A" and "B" grades for the ramp terminal are based on an assumed mainline grade of 0.00%.

See plans for actual grades.

Pavement joints and joint spacings shall be as shown on Standards 420001, 420101 and 420106.

See Standard 483001 for ramp shoulder details.

Between Sections A-A and B-B (shaded area), provide a drainage swale and flush inlet to enhance drainage.

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

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

With a mainline horizontal curve to the left, keep the gore nose dimensions at Sections C-C and D-D as shown. From Section C-C to Section B-B, construct the ramp as a tangent section, and the gore nose at Section B-B shall be a variable width dependent on the radius of the mainline curve. Show a special cross-section on the plans for Section B-B.

With a mainline horizontal curve to the right, keep the gore nose dimensions at Sections D-D, C-C, and B-B as shown, and the edge of the ramp between Sections C-C and B-B is constructed as a compound curve tying Section C-C.

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

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

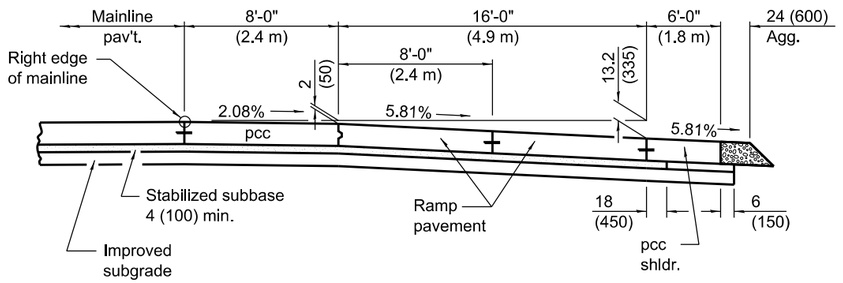
ISSUED 1-1-97

DATE	REVISIONS
1-1-22	Revised General Note for
	joints and joint spacing.
1-1-18	Changed tie bar spacing
	to 36 (900) cts.

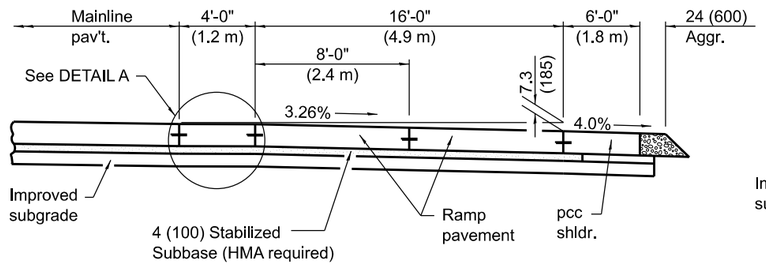
ENTRANCE RAMP TERMINAL

(JOINTED PCC RAMP PAVEMENT ADJACENT TO CRC MAINLINE PAVEMENT)

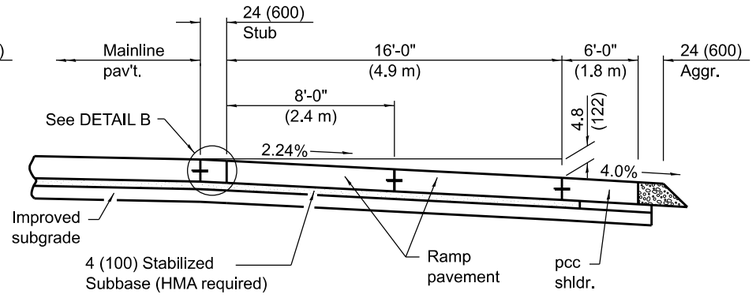
STANDARD 420206-13



SECTION B-B

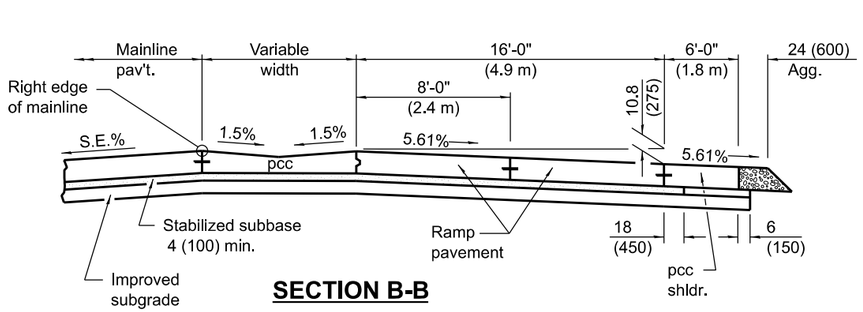


SECTION C-C

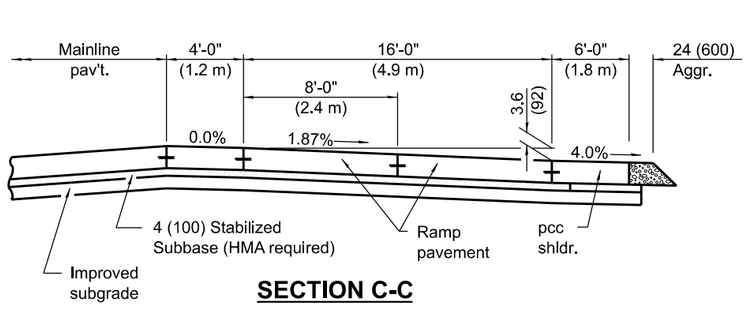


SECTION D-D

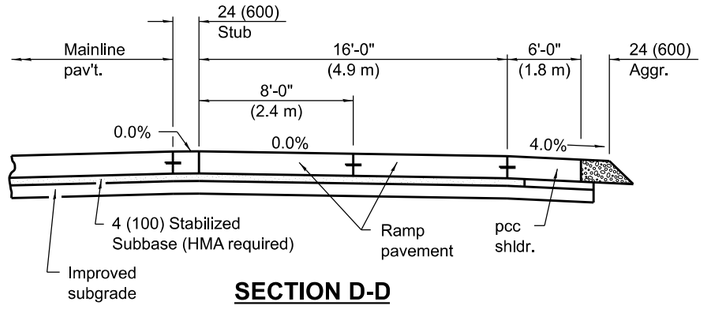
CROSS SECTIONS WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT



SECTION B-B

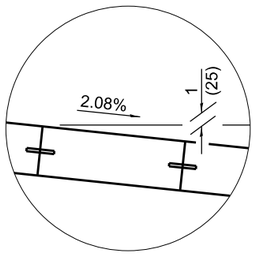


SECTION C-C

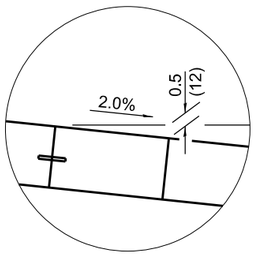


SECTION D-D

CROSS SECTIONS WHEN MAINLINE IS CURVED TO THE LEFT



DETAIL A



DETAIL B

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

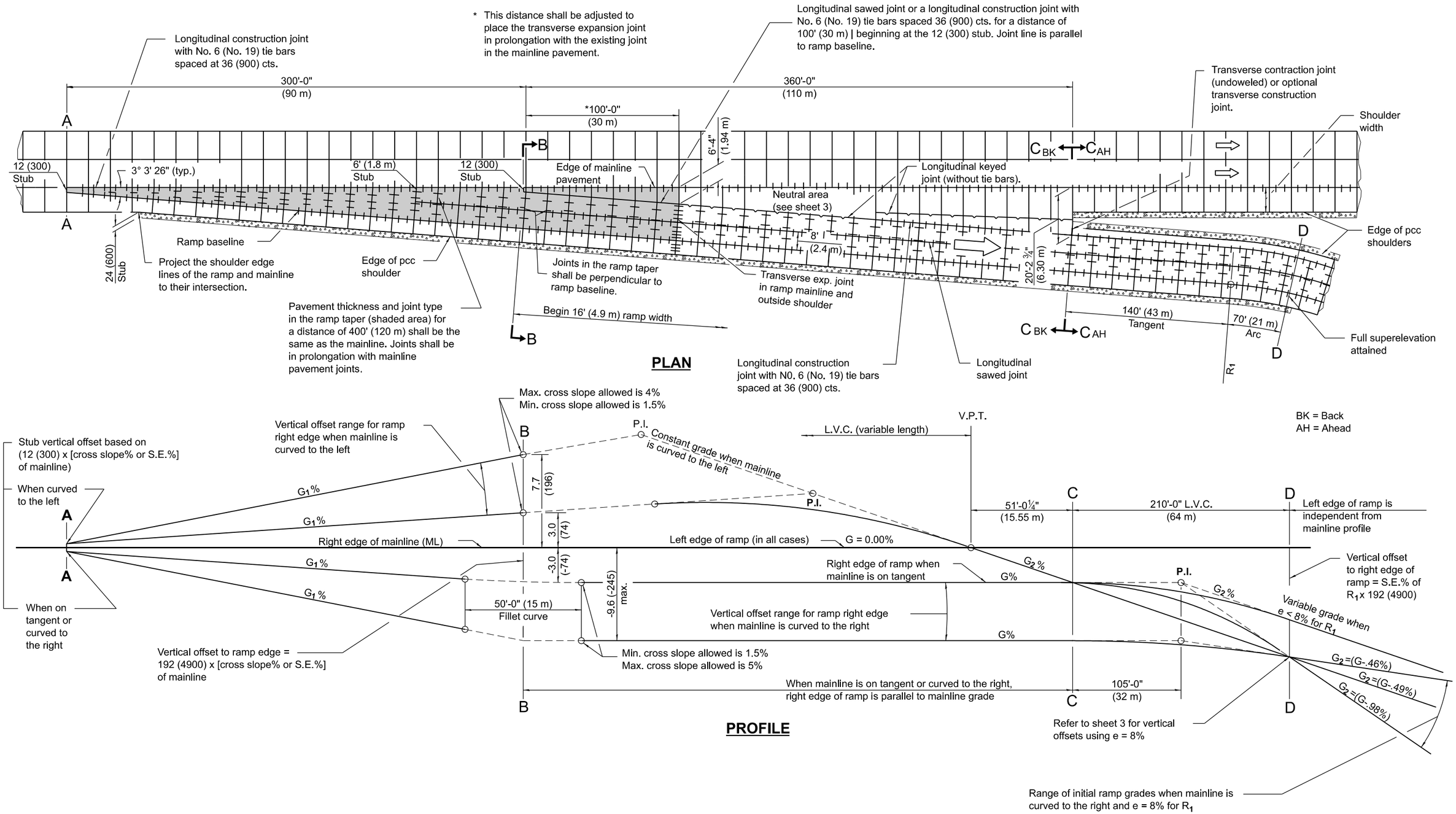
APPROVED January 1, 2022
Scott Cox
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

ENTRANCE RAMP TERMINAL

(JOINTED PCC RAMP PAVEMENT ADJACENT TO CRC MAINLINE PAVEMENT)

STANDARD 420206-13



See Sheet 3 for GENERAL NOTES

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2022
Todd Hahn
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

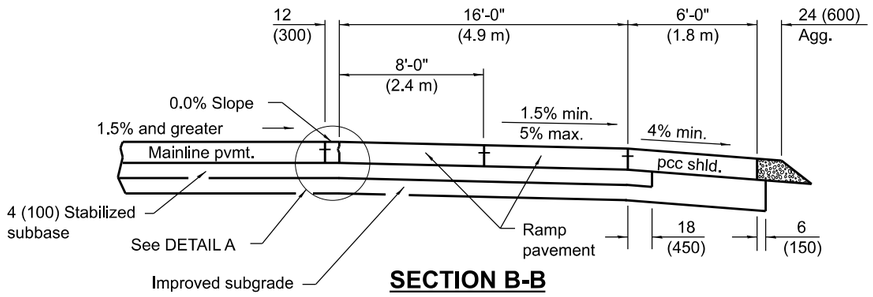
DATE	REVISIONS
1-1-22	Revised General Note for
	joints and joint spacings.
1-1-18	Changed tie bar spacing
	to 36 (900) cts.

EXIT RAMP TERMINAL

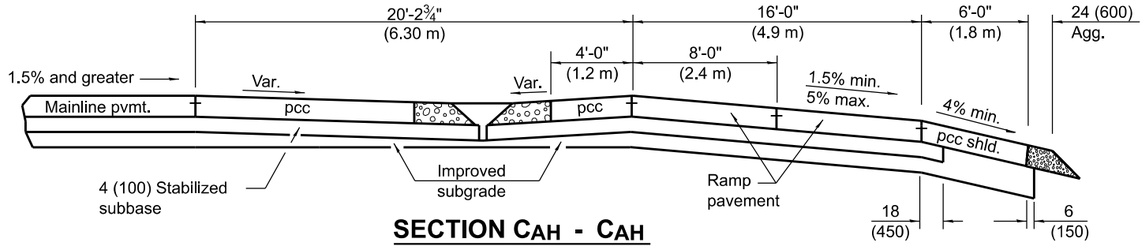
(JOINTED PCC RAMP PAVEMENT ADJACENT TO JOINTED PCC MAINLINE PAVEMENT)

(Sheet 1 of 3)

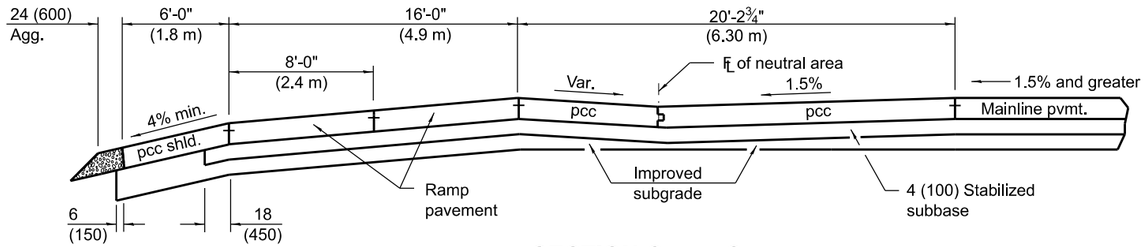
STANDARD 420301-09



SECTION B-B



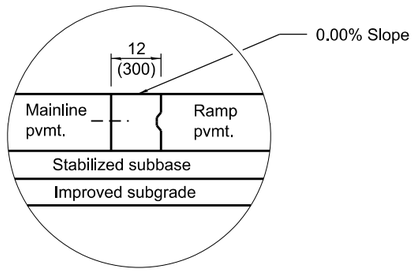
SECTION C_{AH} - C_{AH}



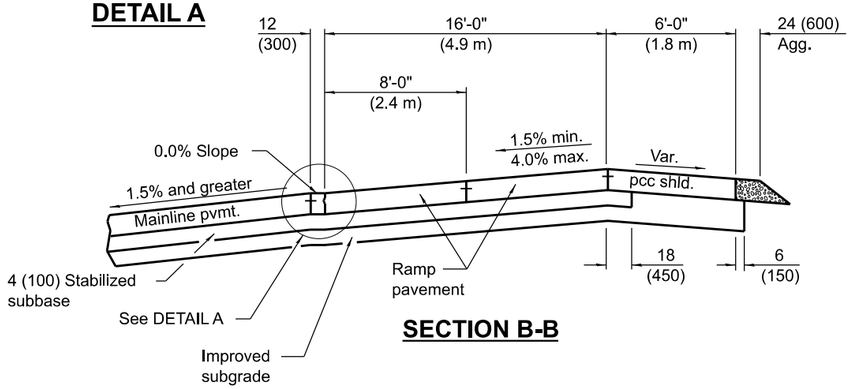
SECTION C_{BK} - C_{BK}

BK = Back
AH = Ahead

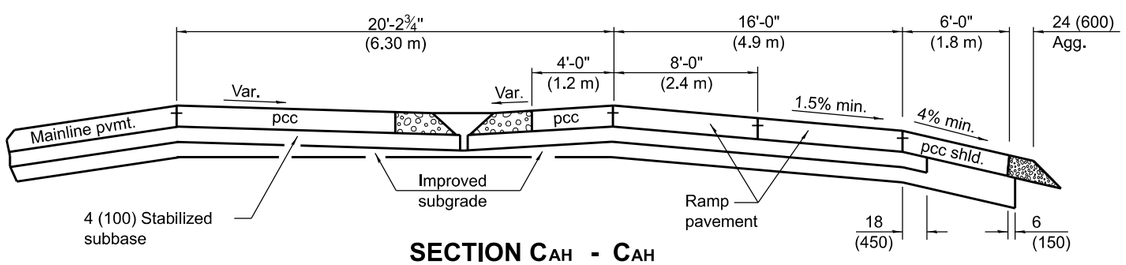
WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT



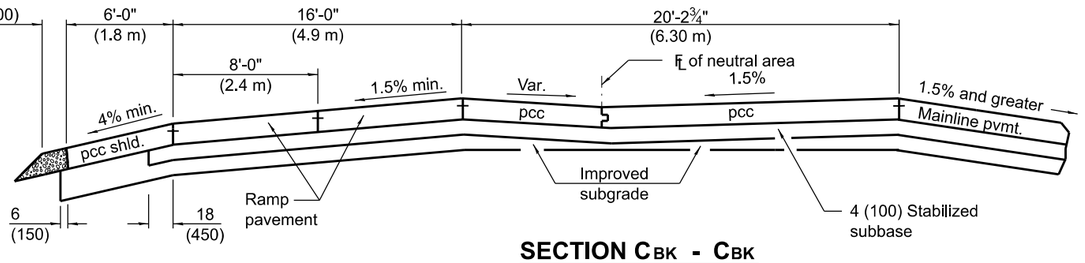
DETAIL A



SECTION B-B



SECTION C_{AH} - C_{AH}



SECTION C_{BK} - C_{BK}

WHEN MAINLINE IS CURVED TO THE LEFT

See Sheet 3 for GENERAL NOTES

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

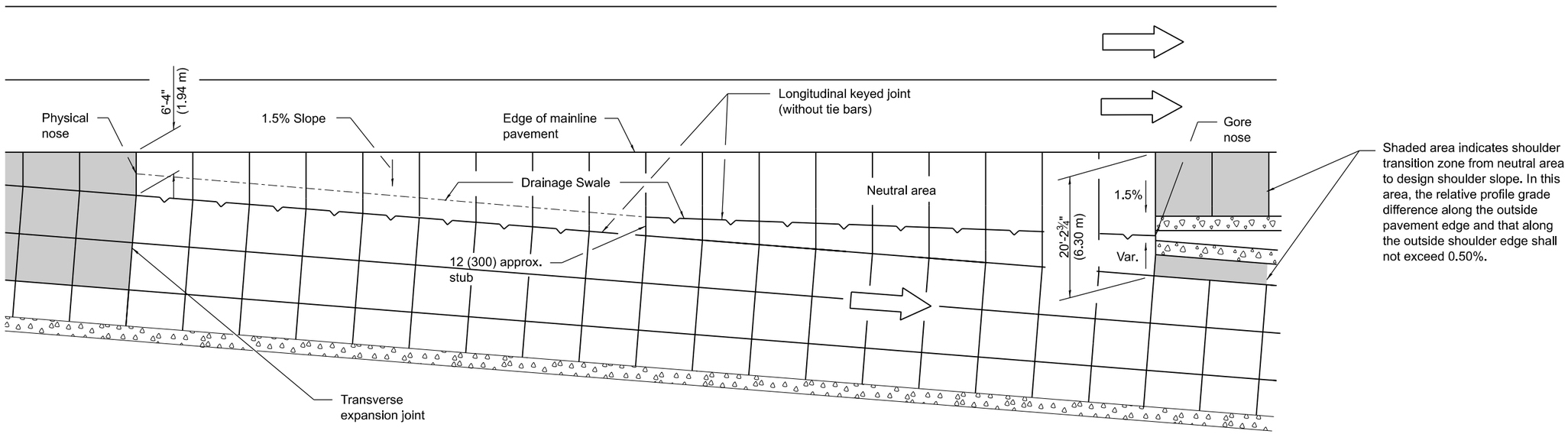
APPROVED January 1, 2022
Scott Schluter
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

EXIT RAMP TERMINAL

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

STANDARD 420301-09



DETAILS FOR DRAINAGE IN NEUTRAL AREA

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

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.% ML x 300	S.E.% ML x 300 ②
B	- 74	S.E.% ML x 4900	S.E.% ML x 4900 ②
C	- 74	S.E. % ML x 4900	- 74
D	- 392	- 392	- 392

① Vertical offset values are calculated and based on the right edge of mainline pavement at 0.0 % grade.

② The vertical offsets of these points are above the mainline pavement and lie on an upgrade in relationship to the mainline grade.

③ S.E. = Superelevation Rate

GENERAL NOTES

The initial ramp grade (G_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.

Pavement joints and joint spacings shall be as shown on Standards 420001, 420101, and 420106.

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_1, construct the ramp as a 141' (43 m) tangent section.

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

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

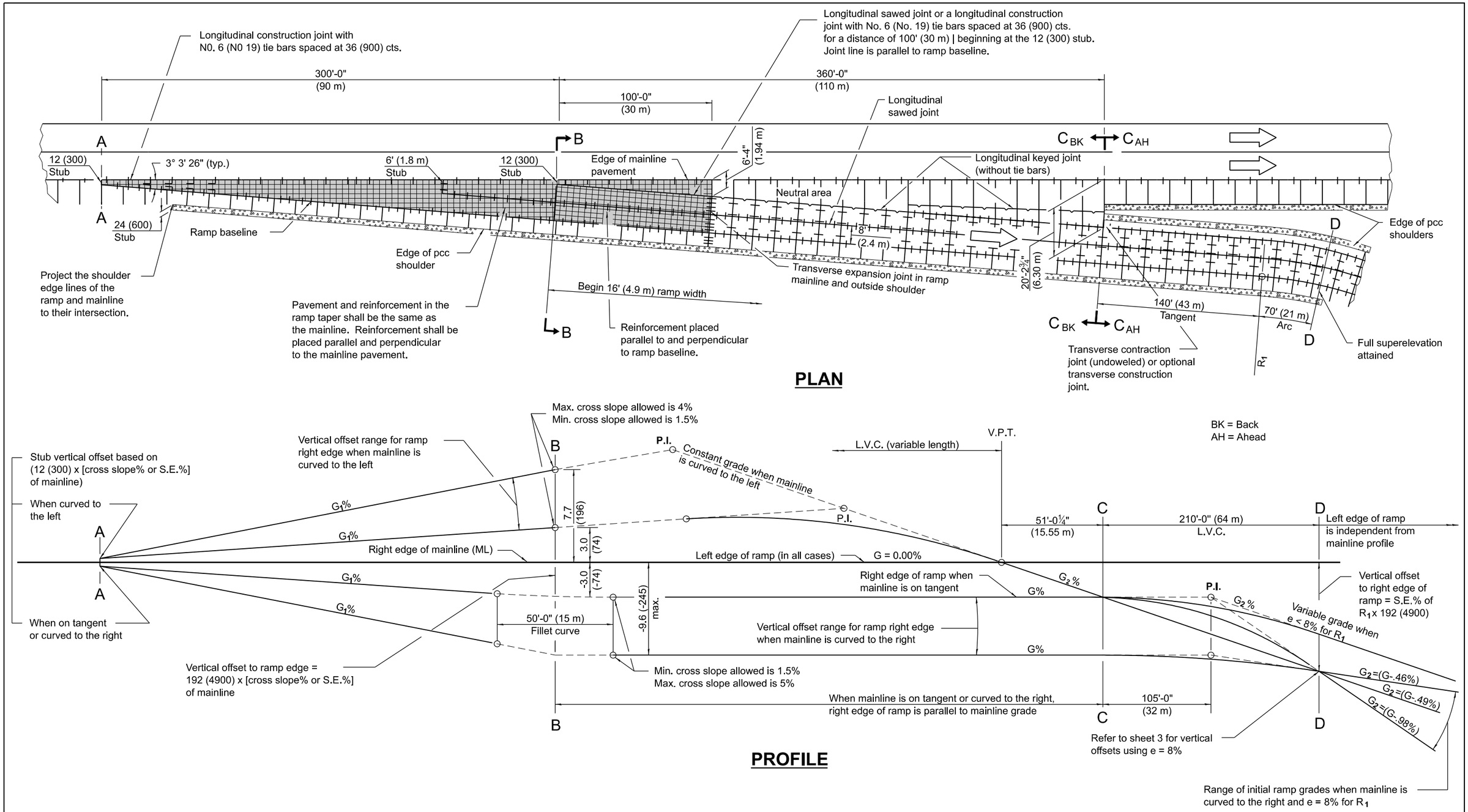
APPROVED January 1, 2022
Scott Shaw
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

EXIT RAMP TERMINAL

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

STANDARD 420301-09



See Sheet 3 for GENERAL NOTES

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

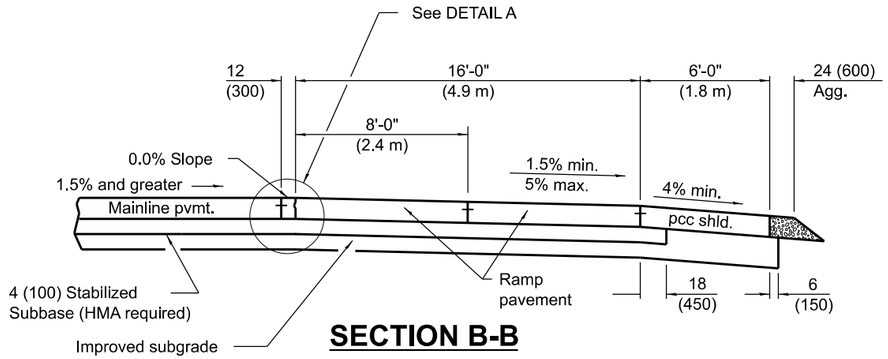
DATE	REVISIONS
1-1-22	Revised General Note for
	joints and joint spacing.
1-1-18	Changed spacing of tie bars
	to 36 (900) cts.

EXIT RAMP TERMINAL

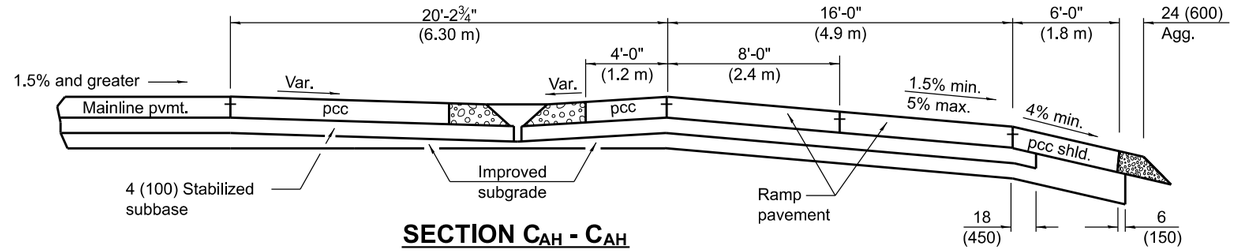
(JOINTED PCC RAMP PAVEMENT ADJACENT TO CRC MAINLINE PAVEMENT)

(Sheet 1 of 3)

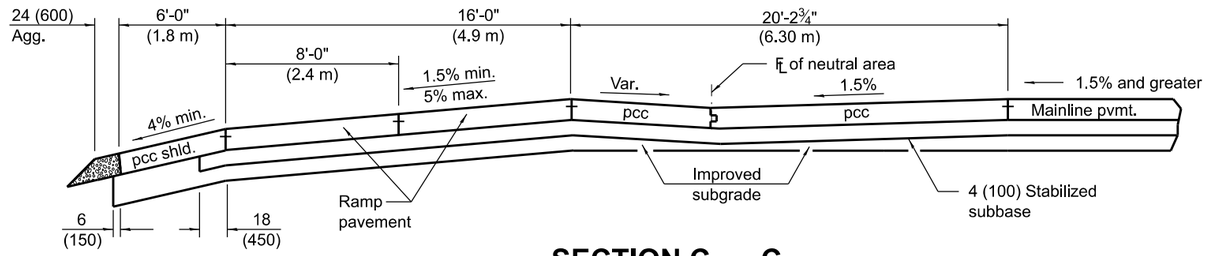
STANDARD 420306-11



SECTION B-B



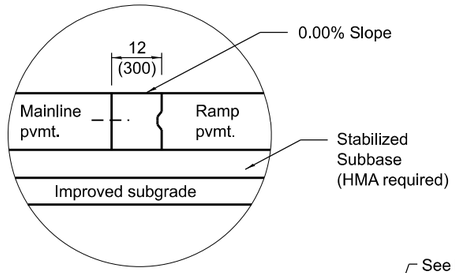
SECTION C_{AH} - C_{AH}



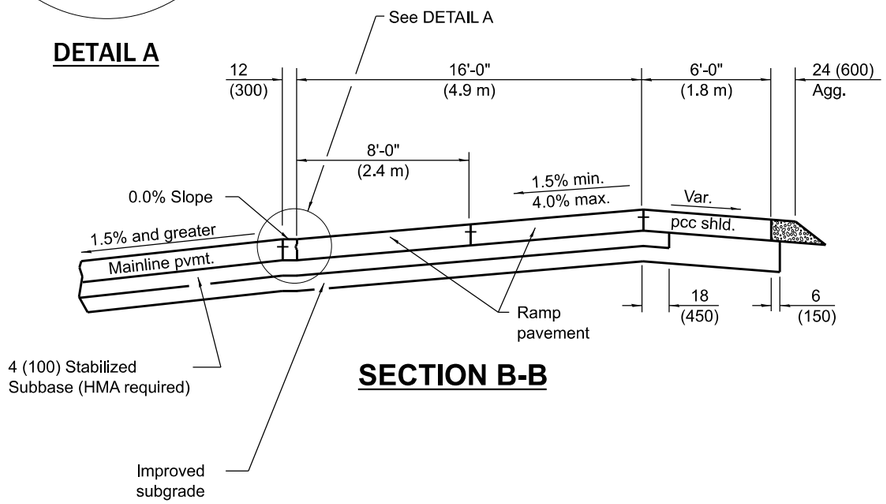
SECTION C_{BK} - C_{BK}

BK = Back
AH = Ahead

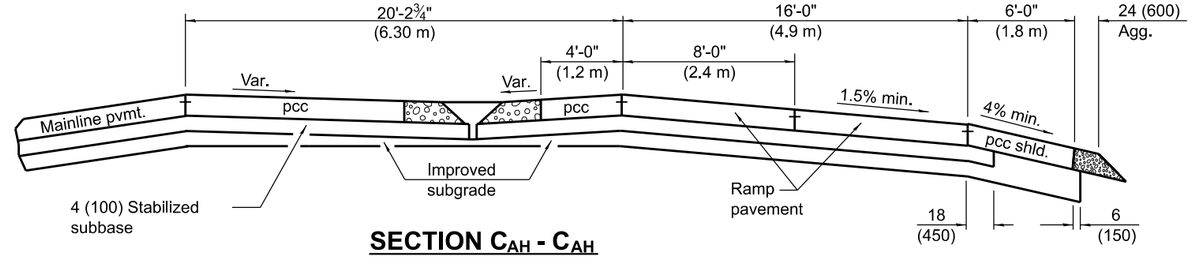
WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT



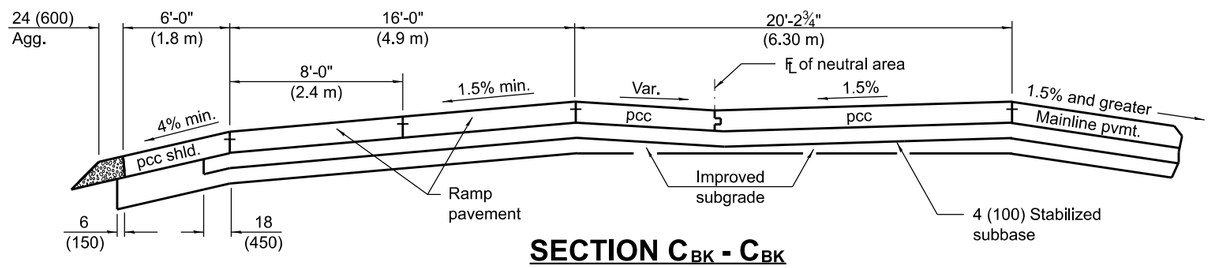
DETAIL A



SECTION B-B



SECTION C_{AH} - C_{AH}



SECTION C_{BK} - C_{BK}

WHEN MAINLINE IS CURVED TO THE LEFT

See Sheet 3 for GENERAL NOTES

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

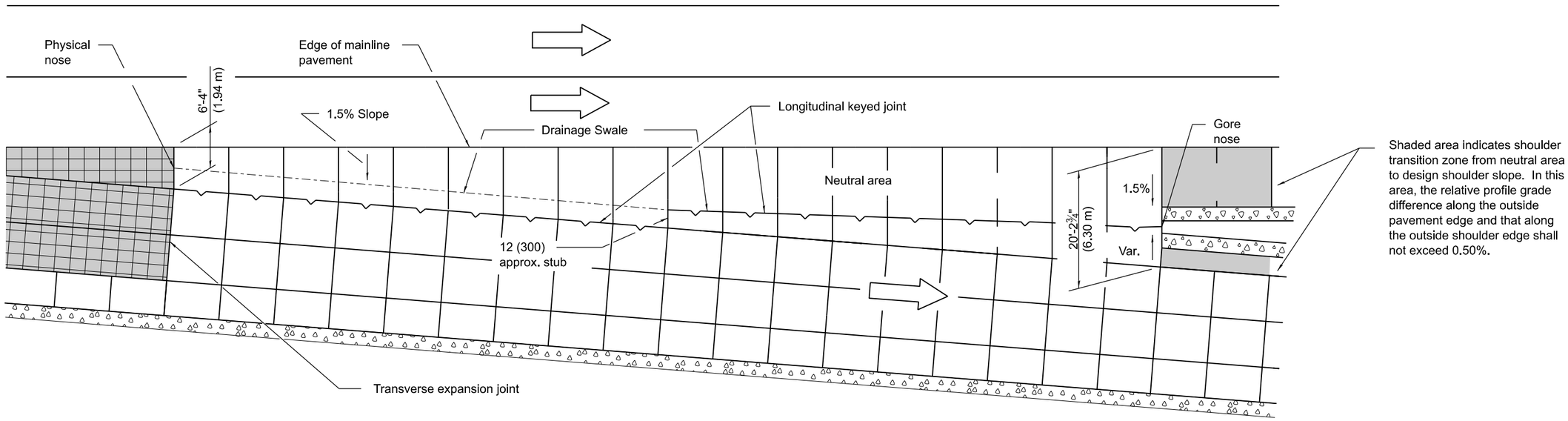
APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

EXIT RAMP TERMINAL

(JOINTED PCC RAMP PAVEMENT ADJACENT TO CRC MAINLINE PAVEMENT)

STANDARD 420306-11



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

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

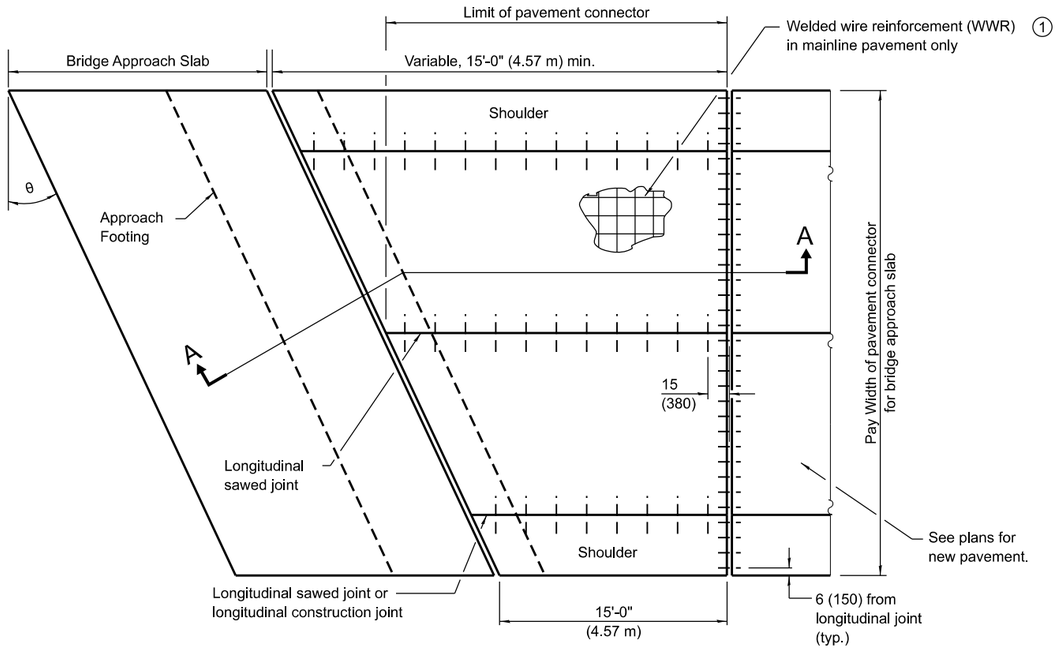
APPROVED January 1, 2022
Todd Cox
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

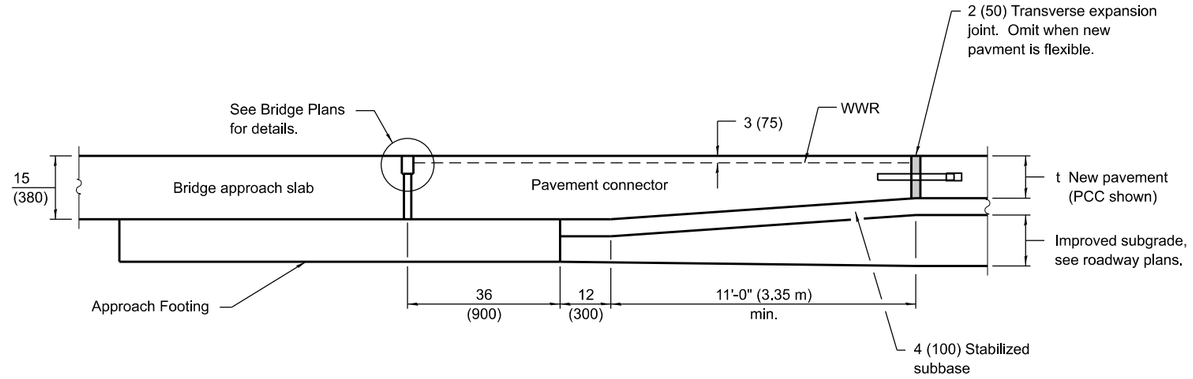
EXIT RAMP TERMINAL

(JOINTED PCC RAMP PAVEMENT ADJACENT TO CRC MAINLINE PAVEMENT)

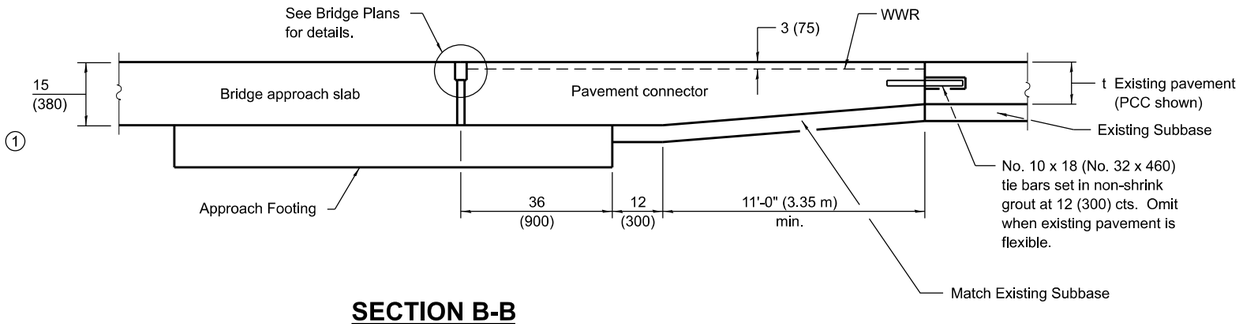
STANDARD 420306-11



PLAN
NEW CONSTRUCTION

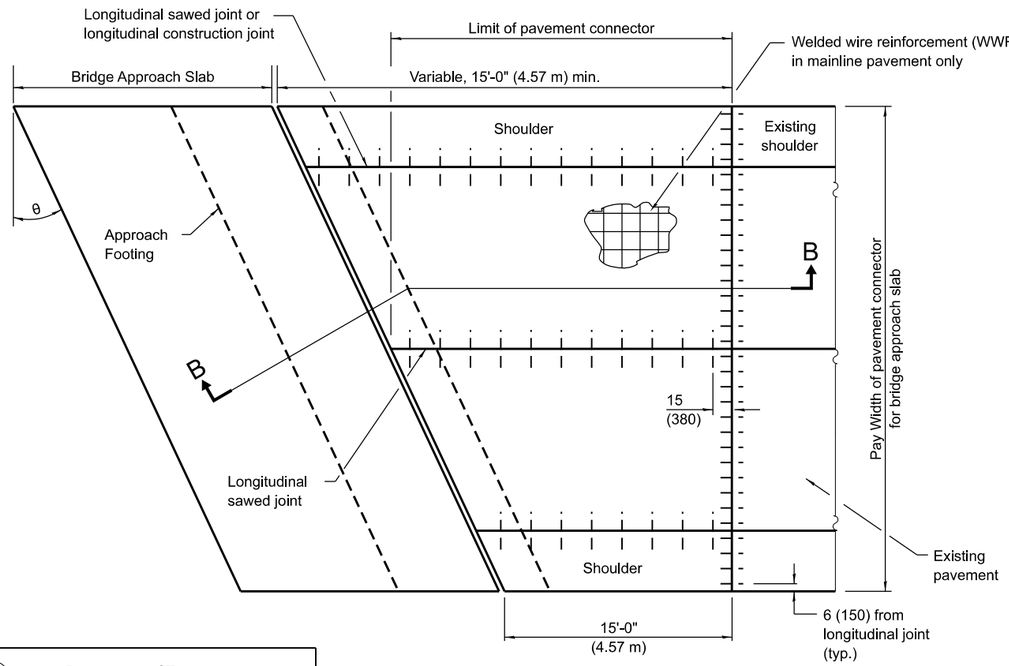


SECTION A-A



SECTION B-B

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



PLAN
EXISTING CONSTRUCTION

GENERAL NOTES

THICKNESS-"t"=Thickness of Pavement.

See Standard 420001 for pavement joint details not shown.

See Standard 610001 for shoulder inlet with curb when required.

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

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

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF POLICY AND PROCEDURES

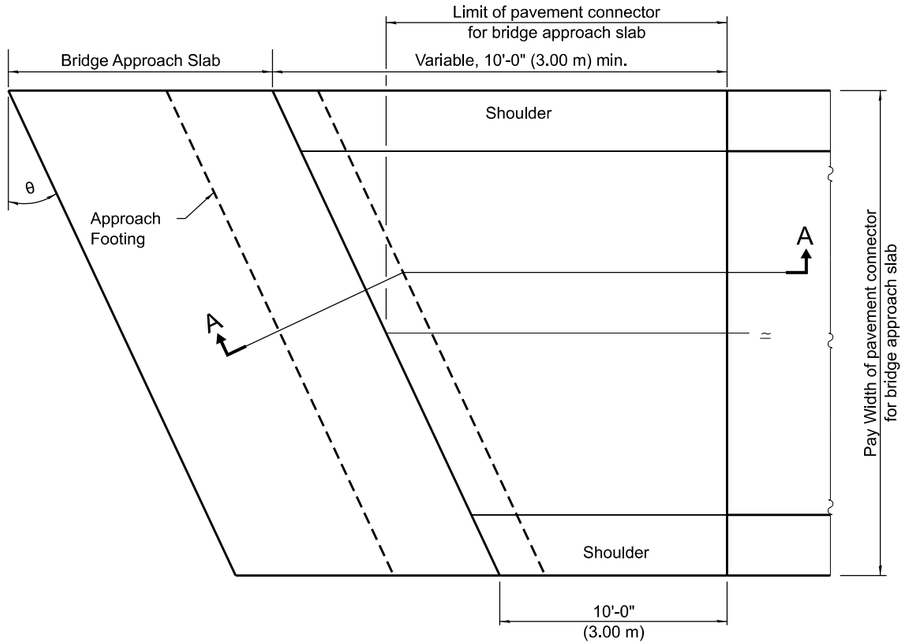
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

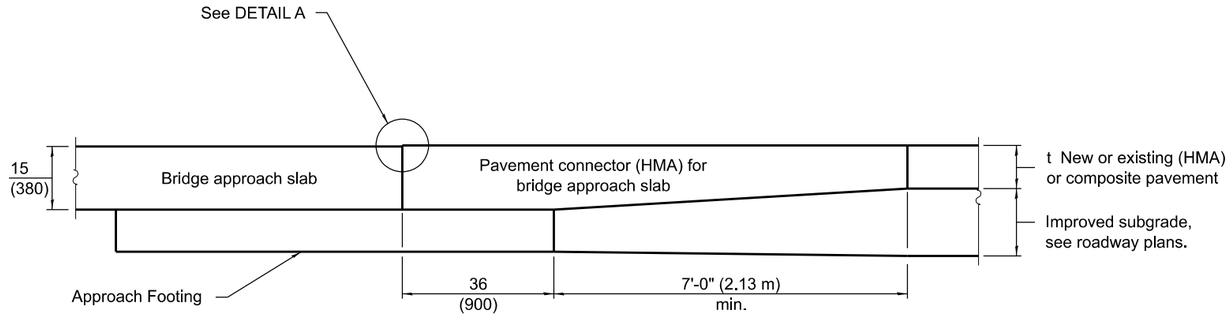
DATE	REVISIONS
1-1-19	Changed rebar in pavement
	connector to welded wire
	reinforcement.
4-1-16	Revised pavement connector
	to be rigid only. Omitted WFB
	term. joint. Renamed Std.

PAVEMENT CONNECTOR (PCC) FOR BRIDGE APPROACH SLAB

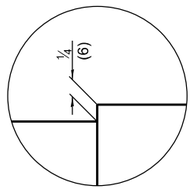
STANDARD 420401-13



PLAN
(New or existing construction)



SECTION A-A



DETAIL A

GENERAL NOTES

THICKNESS-"t"=Thickness of Pavement.

See Standard 610001 for shoulder inlet with curb when required.

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

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

Illinois Department of Transportation

APPROVED April 1, 2016
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

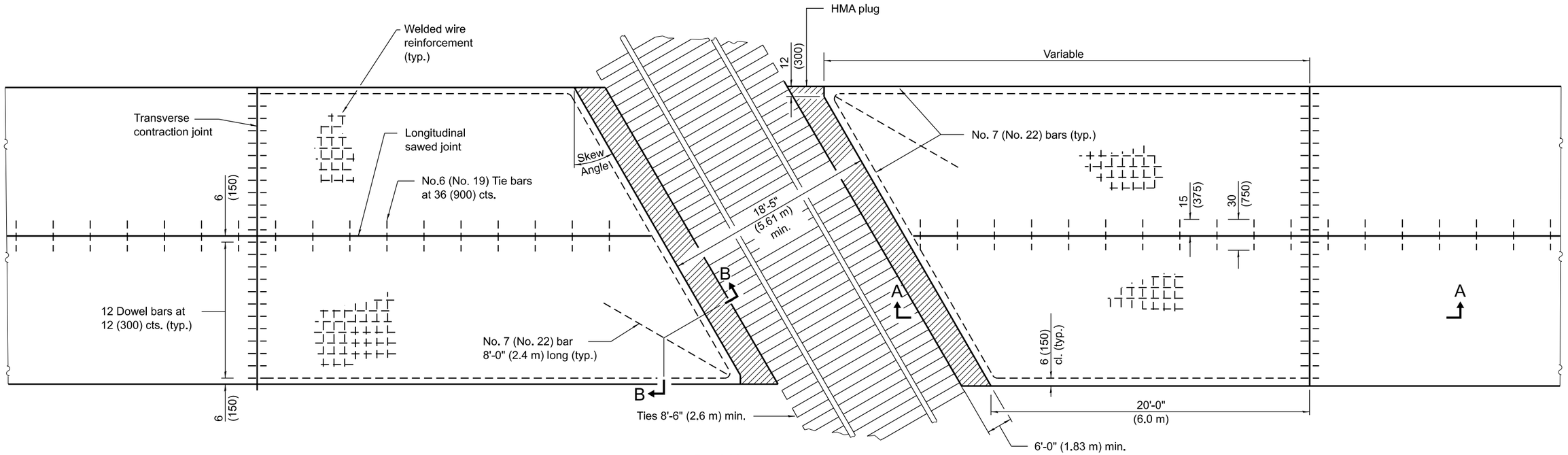
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

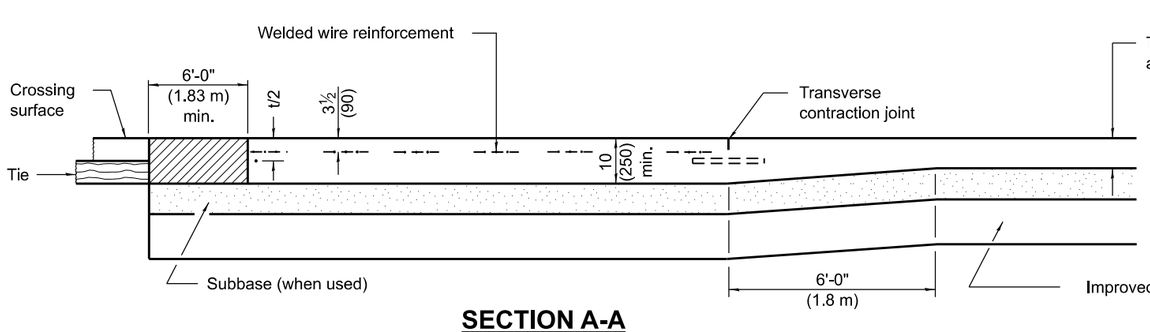
DATE	REVISIONS
4-1-16	New Standard.

PAVEMENT CONNECTOR (HMA) FOR BRIDGE APPROACH SLAB

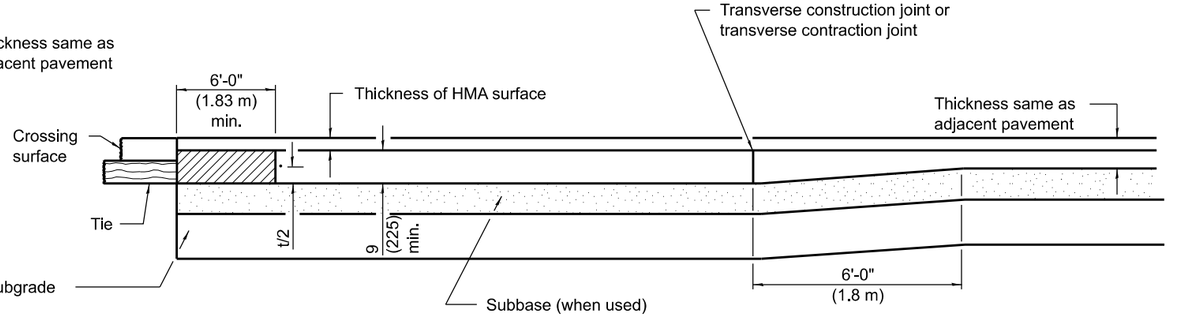
STANDARD 420406



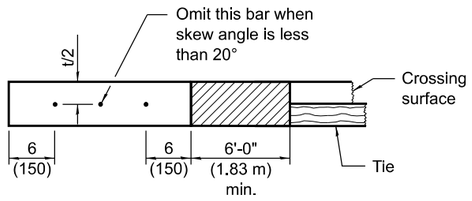
PLAN



SECTION A-A
(FOR PCC PAVEMENT)



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



SECTION B-B

GENERAL NOTES

See Standard 420001 for joint details not shown.

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

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

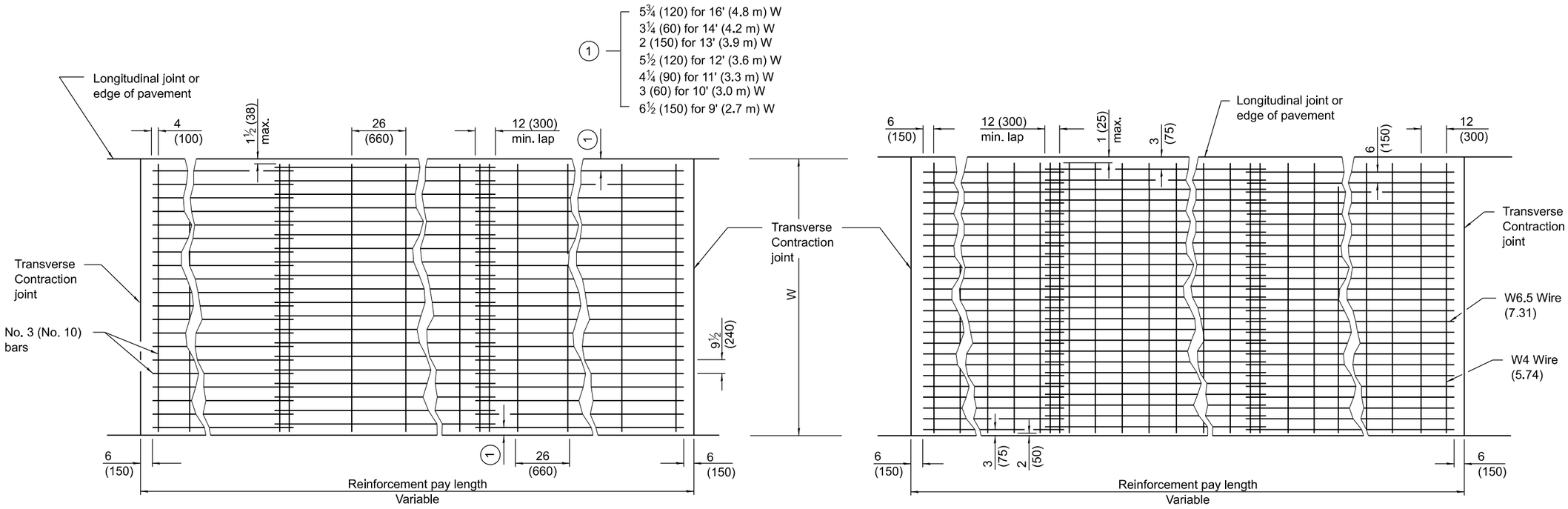
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

PCC PAVEMENT AND PCC BASE COURSE ADJACENT TO RAILROAD GRADE CROSSING

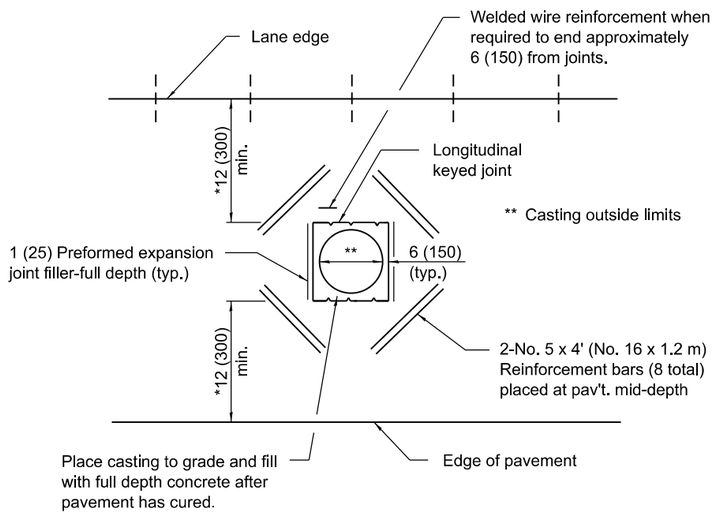
STANDARD 420501-07



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

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

TYPE B



DETAIL OF ADDED REINFORCEMENT FOR PAVEMENT BLOCKS-OUTS

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

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

TYPE A

GENERAL NOTES

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

Welded wire reinforcement which is lapped longitudinallyshall 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.

Illinois Department of Transportation

APPROVED April 1, 2016
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

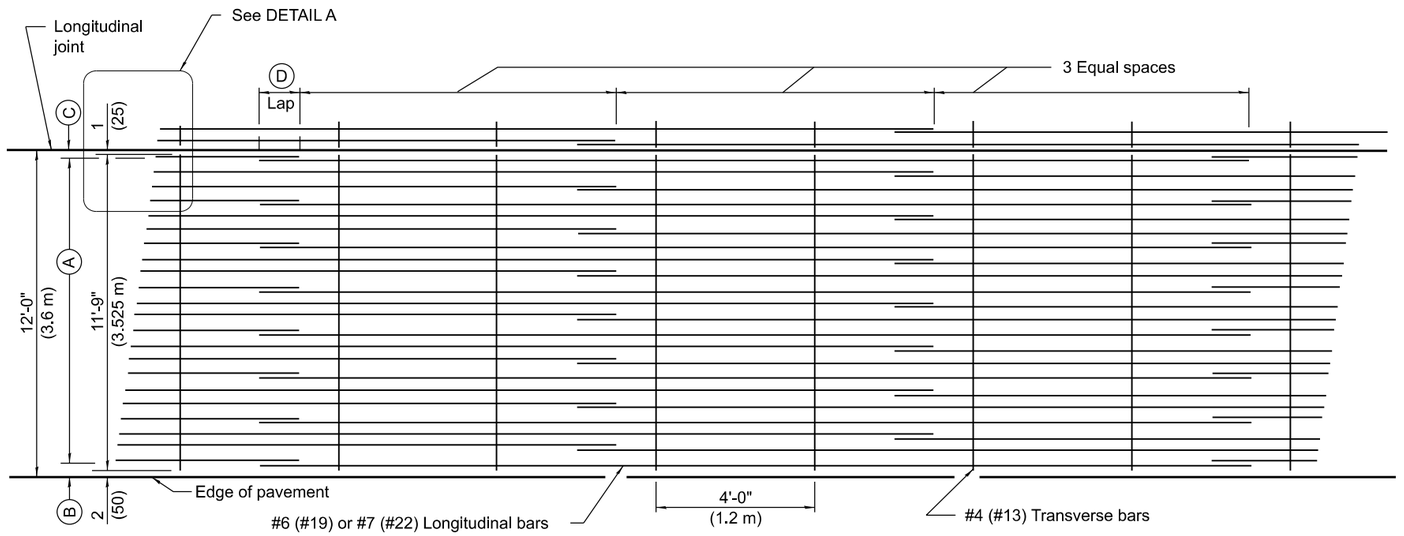
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

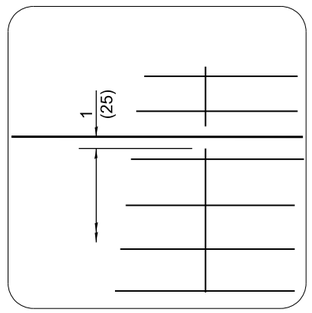
STANDARD 420701-03



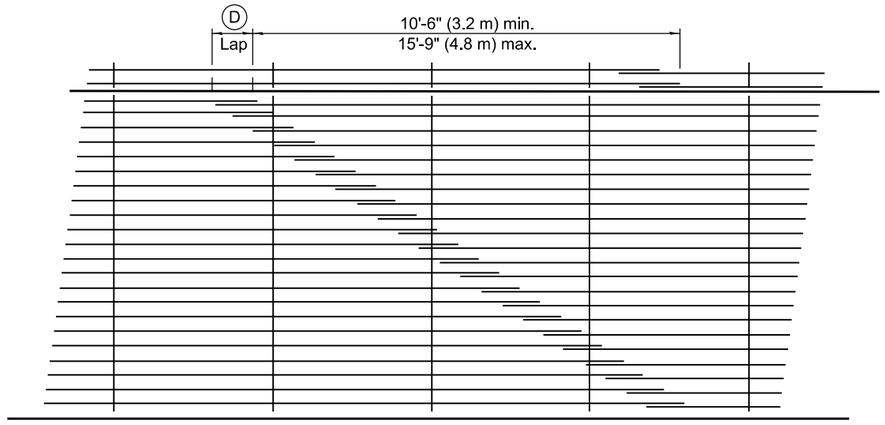
LAP DETAIL I

ENGLISH (inches)					
Bar Size	Pavement Thickness	Ⓐ (Approx. Spacing)	Ⓑ	Ⓒ	Ⓓ
#6	7¾ thru 8½	18 spaces (19 bars) @ 7⅝	3½	3	22
#6	8¾ thru 9½	20 spaces (21 bars) @ 6⅞	3½	3	22
#6	9¾ thru 10½	22 spaces (23 bars) @ 6¼	3½	3	22
#6	10¾ thru 11½	24 spaces (25 bars) @ 5¾	3½	3	22
#6	11¾ thru 12½	27 spaces (28 bars) @ 5⅛	3½	3	22
#7	9¾ thru 10½	16 spaces (17 bars) @ 8⅝	3½	3	26
#7	10¾ thru 11½	18 spaces (19 bars) @ 7⅝	3½	3	26
#7	11¾ thru 12½	19 spaces (20 bars) @ 7¼	3½	3	26
#7	12¾ thru 13½	21 spaces (22 bars) @ 6½	3½	3	26
#7	13¾ thru 14½	23 spaces (24 bars) @ 6	3½	3	26
#7	14¾ thru 15½	24 spaces (25 bars) @ 5¾	3½	3	26
#7	15¾ thru 16½	26 spaces (27 bars) @ 5¼	3½	3	26

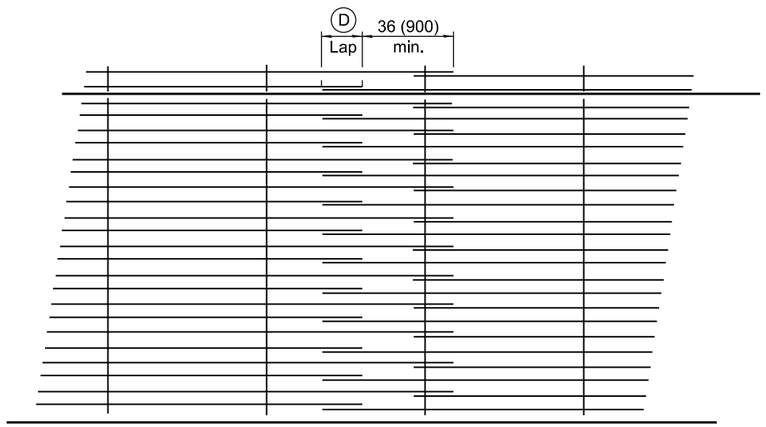
METRIC (mm)					
Bar Size	Pavement Thickness	Ⓐ (Approx. Spacing)	Ⓑ	Ⓒ	Ⓓ
#19	200 thru 220	18 spaces (19 bars) @ 191	90	75	560
#19	230 thru 250	21 spaces (22 bars) @ 163	95	80	560
#19	260 thru 280	23 spaces (24 bars) @ 149	90	80	560
#19	290 thru 310	26 spaces (27 bars) @ 132	90	75	560
#19	320 thru 340	29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



DETAIL A



LAP DETAIL II



LAP DETAIL III

GENERAL NOTES

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

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

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

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

Illinois Department of Transportation

APPROVED April 1, 2016
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

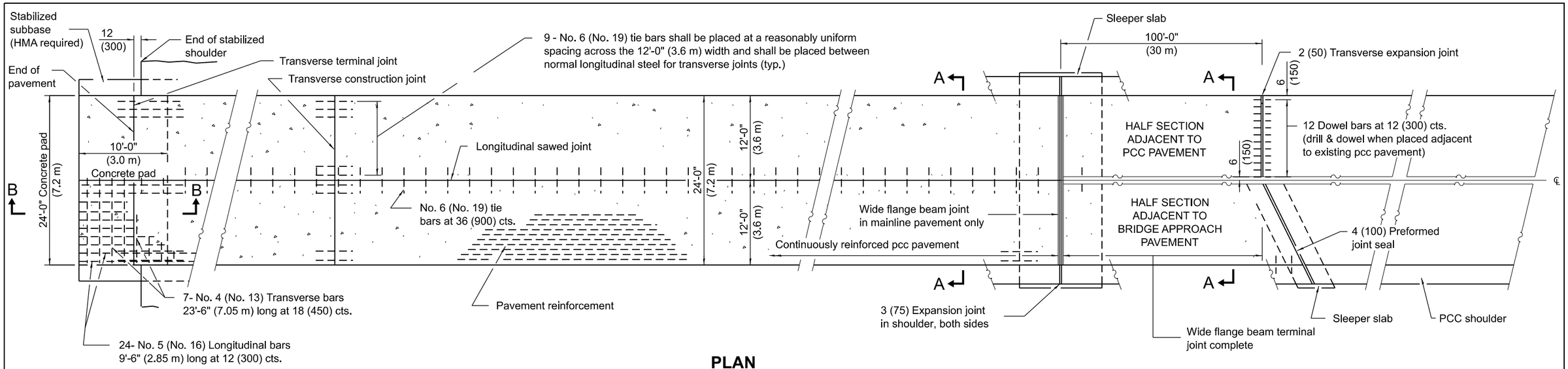
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

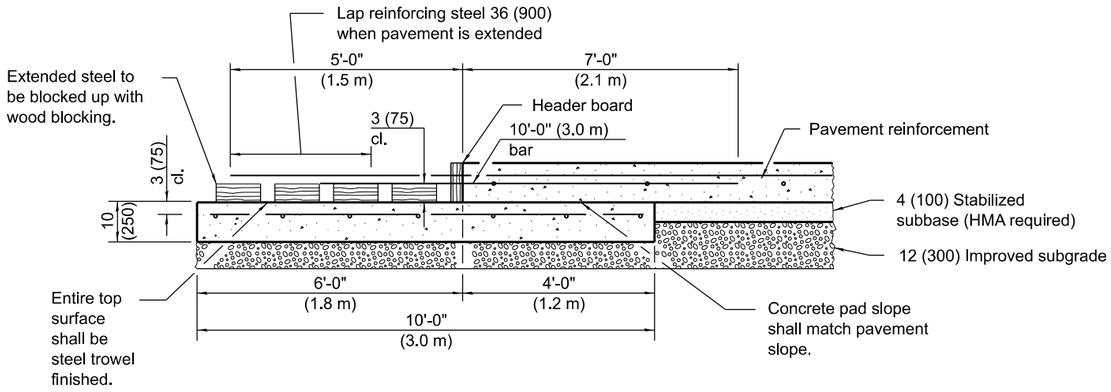
DATE	REVISIONS
4-1-16	Revised general notes with
	respect to 30' bar length.
1-1-08	Switched units to English (metric).

BAR REINFORCEMENT FOR CRC PAVEMENT

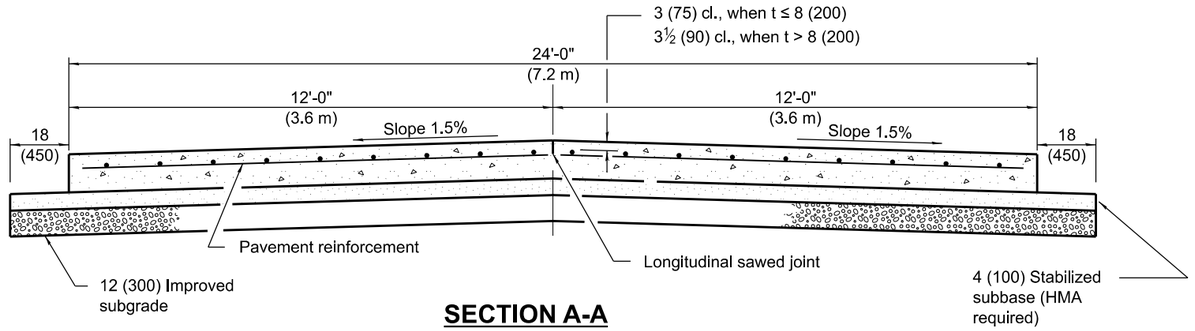
STANDARD 421001-03



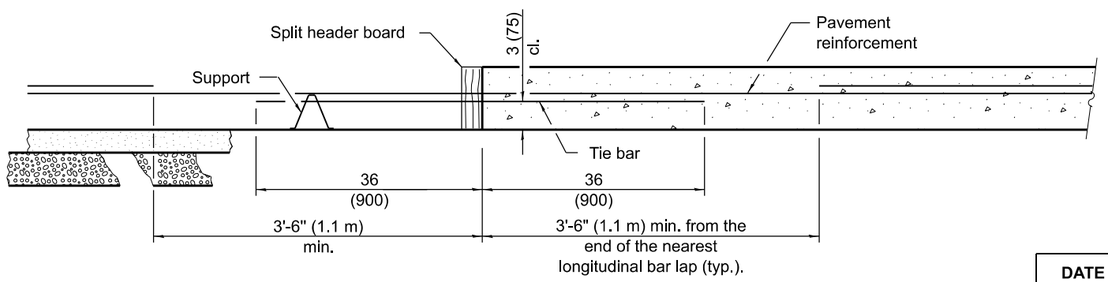
PLAN



TRANSVERSE TERMINAL JOINT
SECTION B-B



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



TRANSVERSE CONSTRUCTION JOINT

GENERAL NOTES

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

See Standards 420001 and 420401 for joint details not shown.

See Standard 421001 for details of pavement reinforcement.

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

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

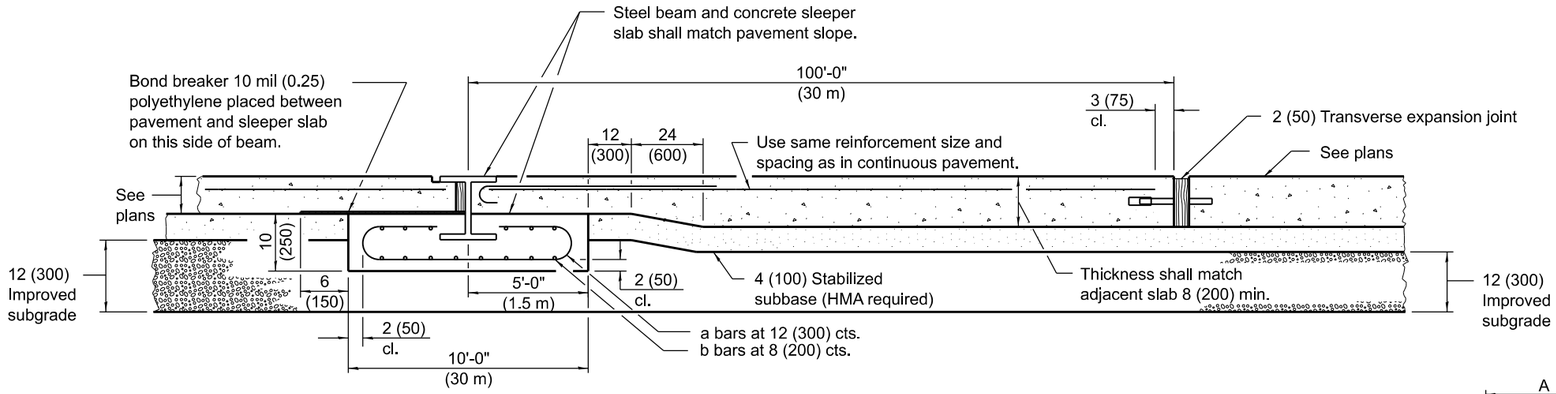
APPROVED January 1, 2018
Maureen M. Addis
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

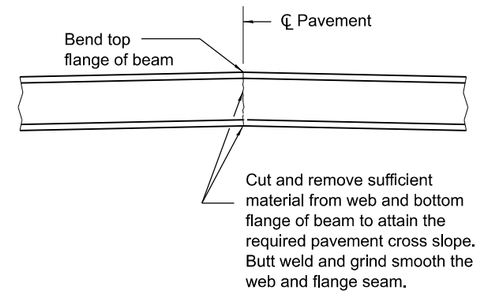
DATE	REVISIONS
1-1-18	Changed tie bar spacing
	to 36 (900) cts.
1-1-14	Added exp. jnts. in shlds. &
	omitted bars, cnst. jnt. over
	wide flange beam slpr slab.

24' (7.2 m) CRC PAVEMENT
(WITH WIDE FLANGE BEAM TERMINAL JOINT)

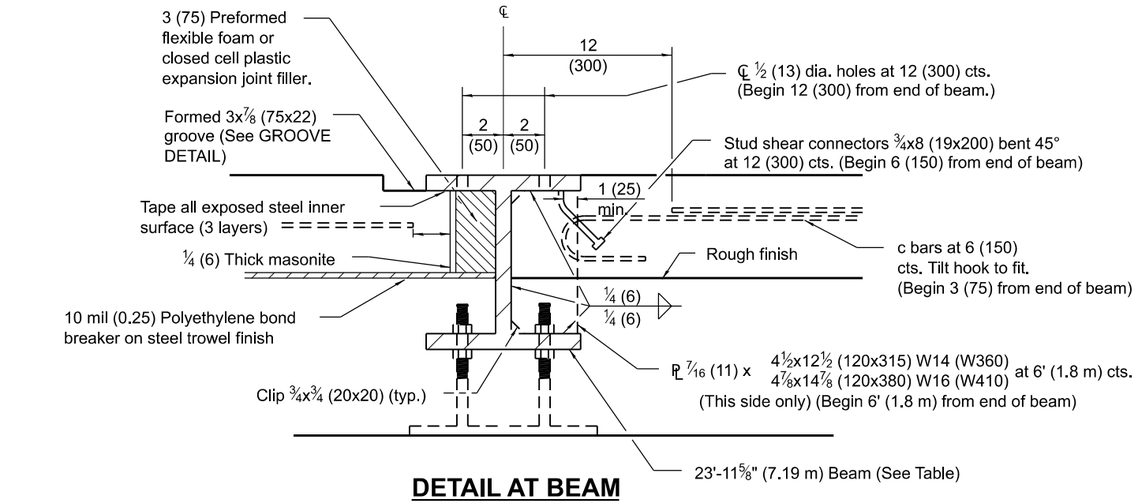
STANDARD 421101-10



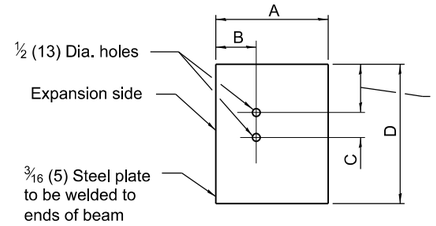
WIDE FLANGE BEAM TERMINAL JOINT



DETAIL OF CUTTING AND WELDING BEAM



DETAIL AT BEAM



END PLATE

PAVEMENT THICKNESS	<10 (250)	≥10 (250)
BEAM SIZE	W14x82 (W360x122)	W16x100 (W410x1149)
A	10⅛ (255)	10⅜ (265)
B	4⁵⁄₁₆ (110)	4⁷⁄₁₆ (115)
C	3 (75)	4 (100)
D	14¼ (360)	17 (430)

BAR a

BAR c

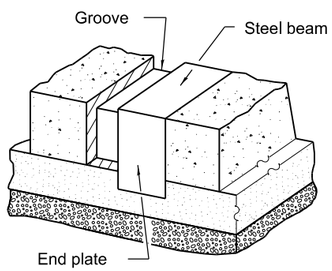
MATERIALS REQUIRED FOR ONE TRANSVERSE TERMINAL JOINT COMPLETE	
Concrete, cu. yds. (m³)	7.4 (5.4)
Reinforcement bars, lbs. (kg)	348 (160)
Pavement reinforcement, sq. yds. (m²)	13.3 (10.8)

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

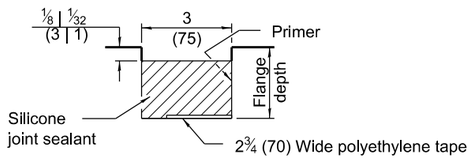
Concrete, cu. yds. (m³)	7.4 (5.4)
Reinforcement Bars, lbs. (kg)	1635 (740)
Structural Steel, lbs. (kg)	W14 (W360) 2025* (906*) W16 (W410) 2466* (1104*)

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

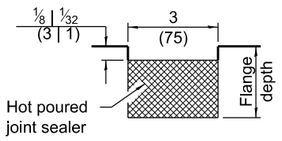
Pavement, sq. yds. (m²)	266.7 (216)
Pavement Reinforcement, sq. yds. (m²)	266.7 (216)
Stabilized Subbase, sq. yds. (m²)	285 (230.8)
Improved Subgrade, sq. yds. (m²)	300 (243)



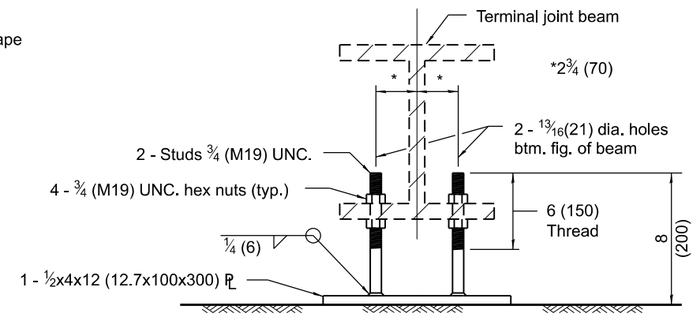
VIEW OF GROOVE AT EDGE OF PAVEMENT



GROOVE DETAIL



GROOVE DETAIL (OPTIONAL)



OPTIONAL ADJUSTABLE CHAIR

Illinois Department of Transportation

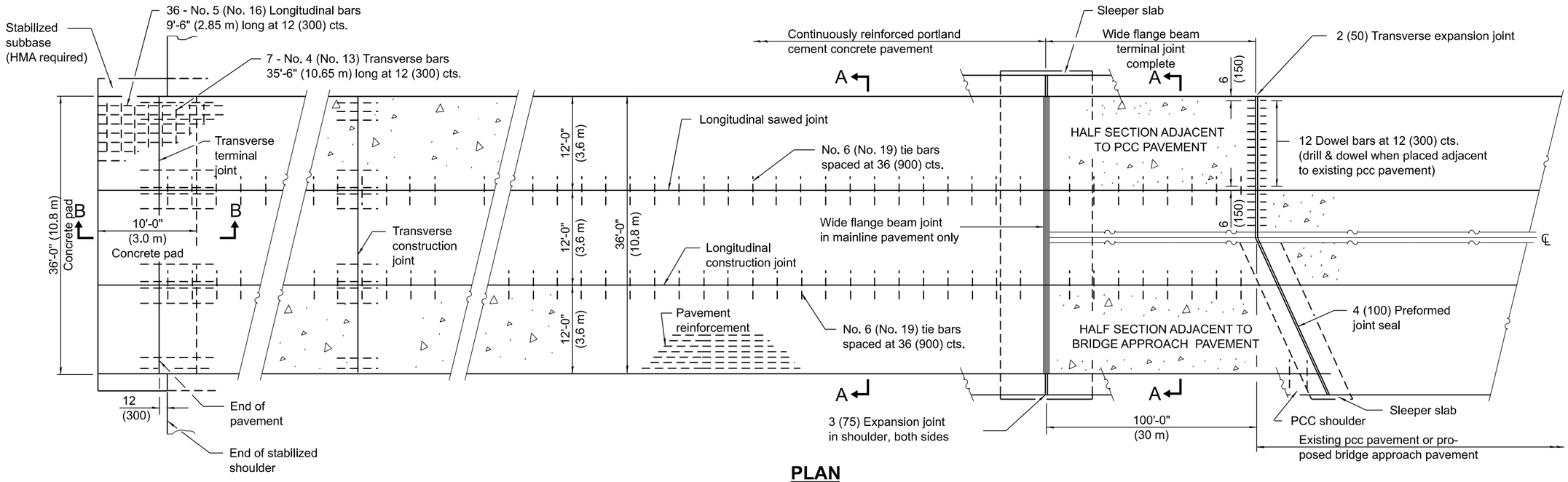
APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

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

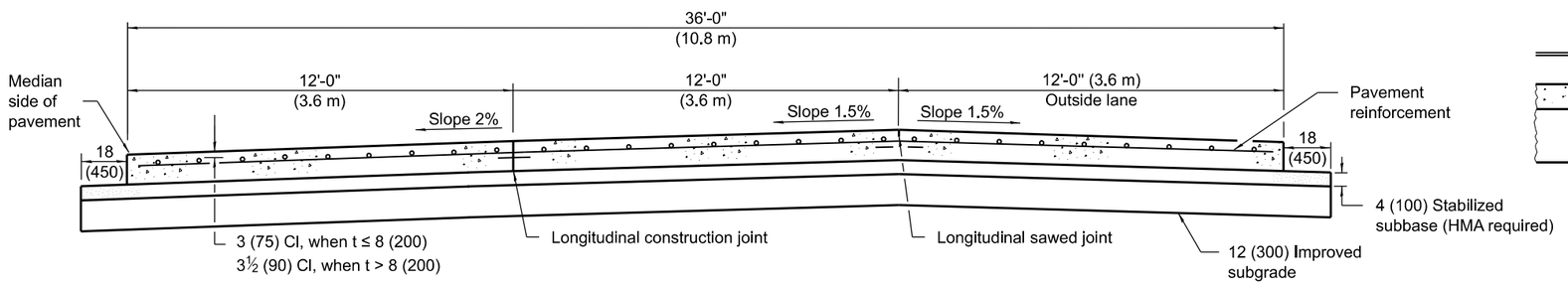
ISSUED 1-1-97

24' (7.2 m) CRC PAVEMENT
(WITH WIDE FLANGE BEAM TERMINAL JOINT)

STANDARD 421101-10

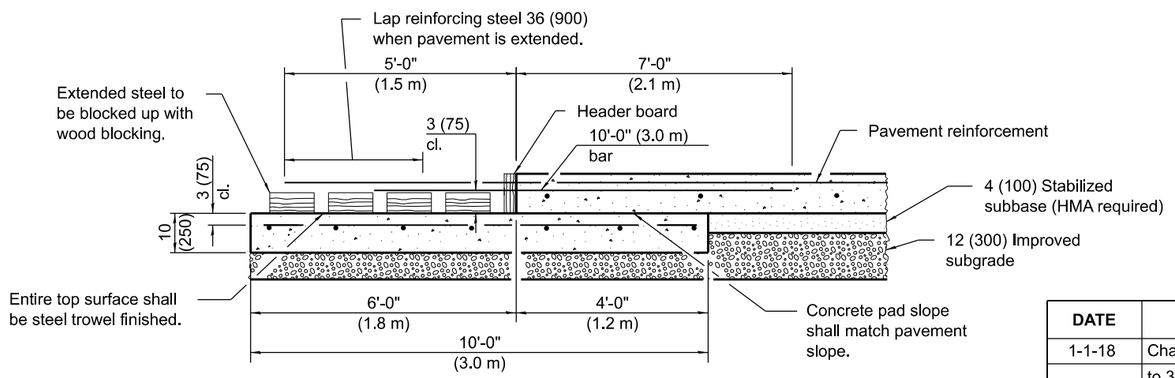


PLAN

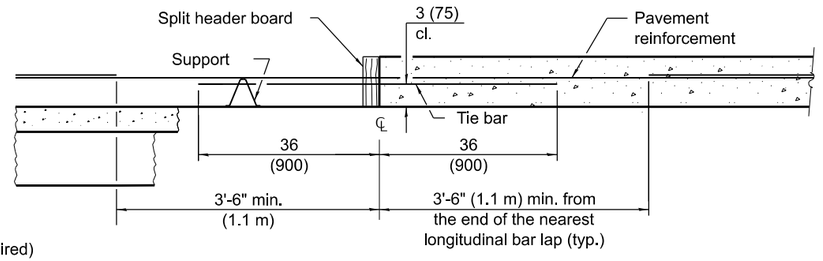


SECTION A-A

(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 Standard 420001 and 420401 for joint details not shown.

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

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

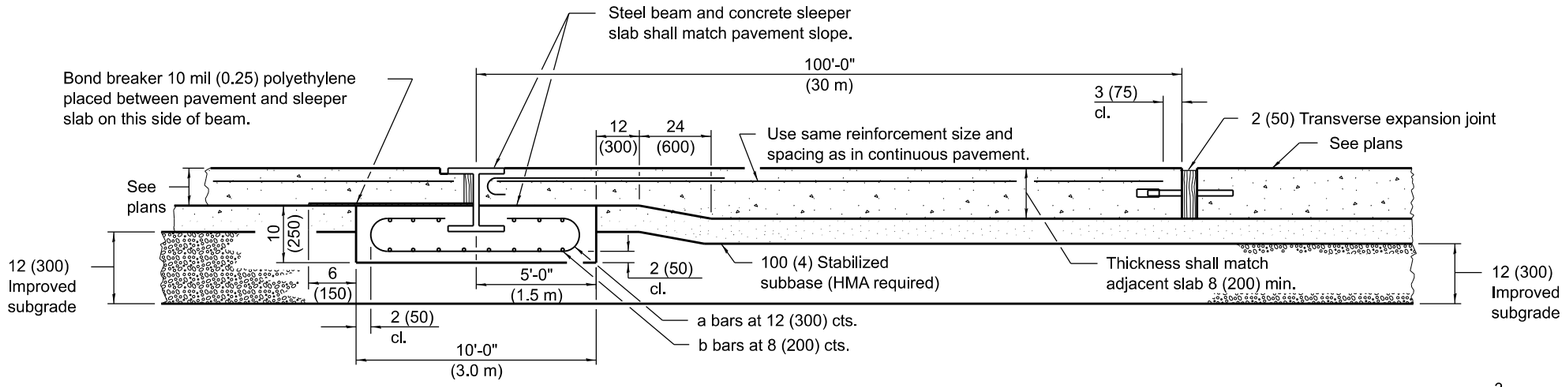
DATE	REVISIONS
1-1-18	Changed tie bar spacing
	to 36 (900) cts.
1-1-14	Added exp. jnts. in shlds. &
	omitted bars, cnst. jnt. over
	wide flange beam slpr. slab.

36' (10.8 m) CRC PAVEMENT

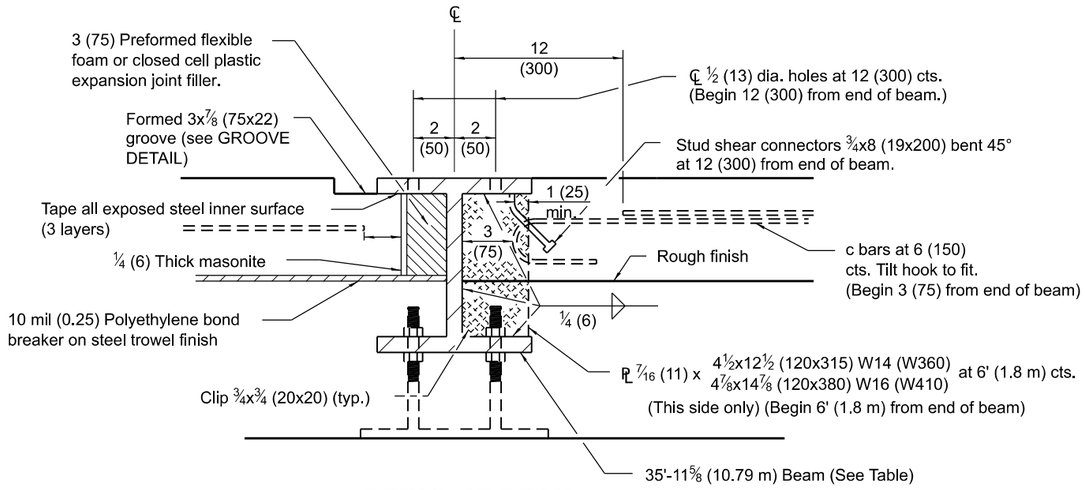
(WITH WIDE FLANGE BEAM TERMINAL JOINT)

(Sheet 1 of 2)

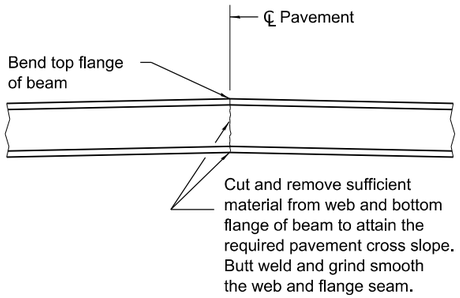
STANDARD 421106-10



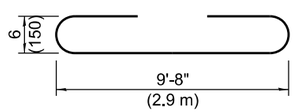
WIDE FLANGE BEAM TERMINAL JOINT



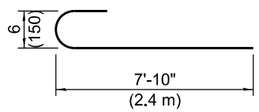
DETAIL AT BEAM



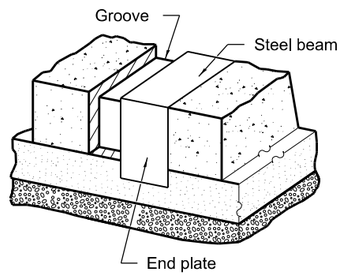
DETAIL OF CUTTING AND WELDING BEAM



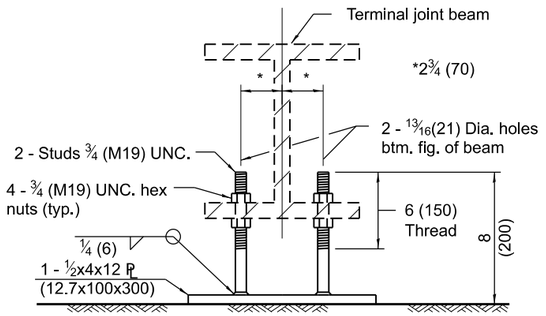
BAR a



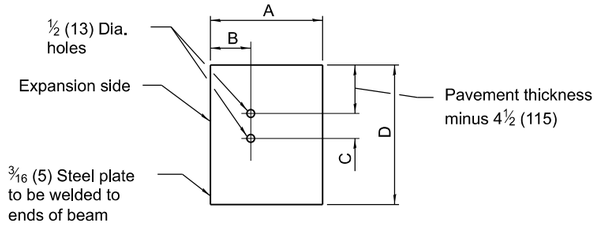
BAR c



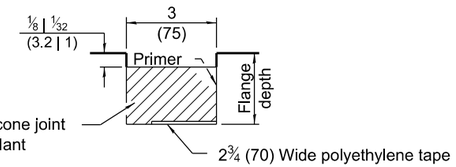
VIEW OF GROOVE AT EDGE OF PAVEMENT



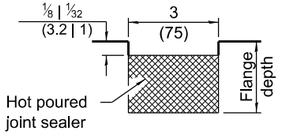
OPTIONAL ADJUSTABLE CHAIR



END PLATE



GROOVE DETAIL



GROOVE DETAIL (OPTIONAL)

PAVEMENT THICKNESS	<10 (250)	≥10 (250)
BEAM SIZE	W14X82 (W360X122)	w16x100 (W410x149)
A	10⅛ (255)	10⅜ (265)
B	4⅝ (110)	4⅞ (115)
C	3 (75)	4 (100)
D	14¼ (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)	W14 (W360)	3040 (1360)
	W16 (W410)	3710 (1655)
* Weight includes beam, end plates, stiffener plates and studs.		
Pavement, sq. yds. (m²)		400 (324)
Pavement Reinforcement, sq. yds. (m²)		400 (324)
4 (100) Stabilized Subbase, sq. yds. (m²)		411.6 (333.5)
Improved Subgrade, sq. yds. (m²)		433.3 (351)

Illinois Department of Transportation

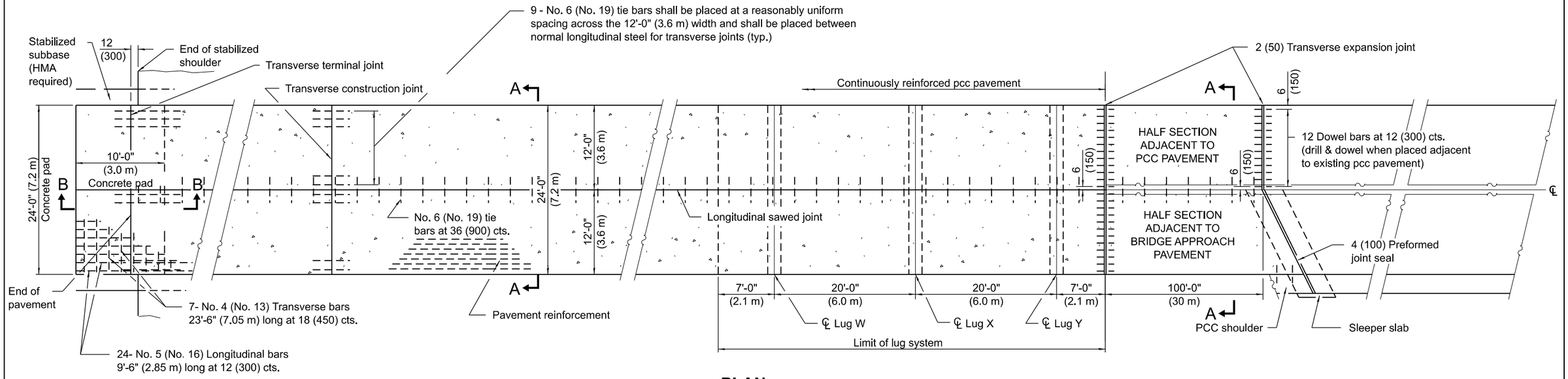
APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

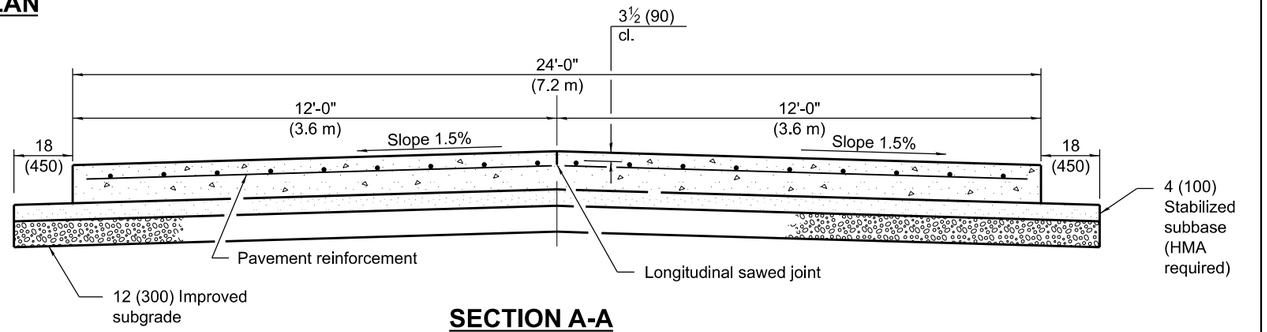
ISSUED 1-1-97

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

STANDARD 421106-10

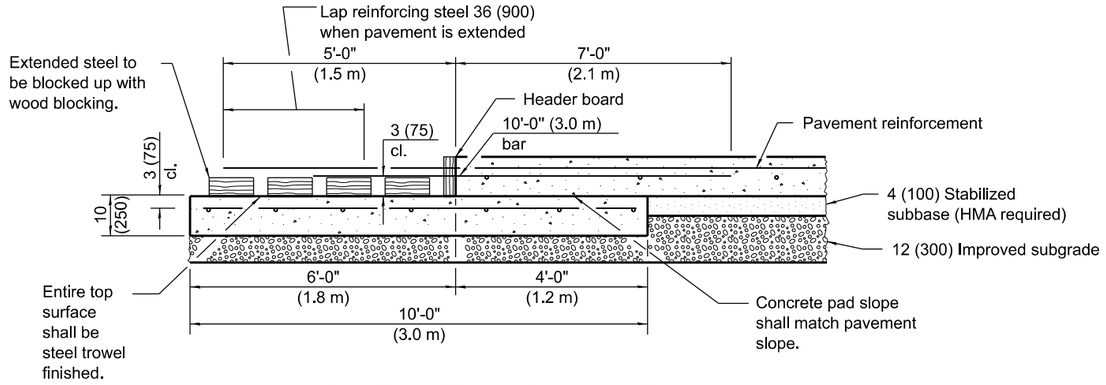


PLAN

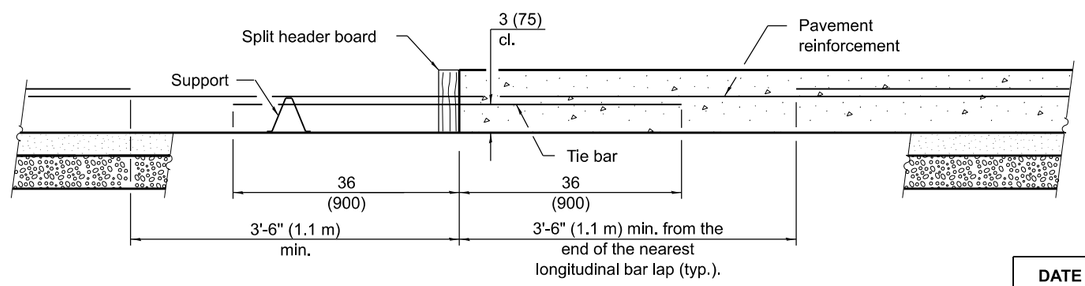


SECTION A-A

(TYPICAL 2-LANE WITH SHOULDERS)



TRANSVERSE TERMINAL JOINT
SECTION B-B



TRANSVERSE CONSTRUCTION JOINT

GENERAL NOTES

See Standard 421001 for details of pavement reinforcement.

See Standards 420001 and 420401 for joint details not shown.

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

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

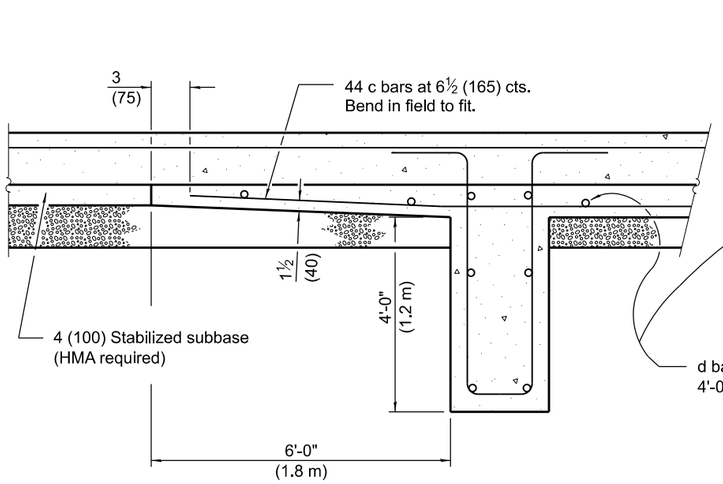
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

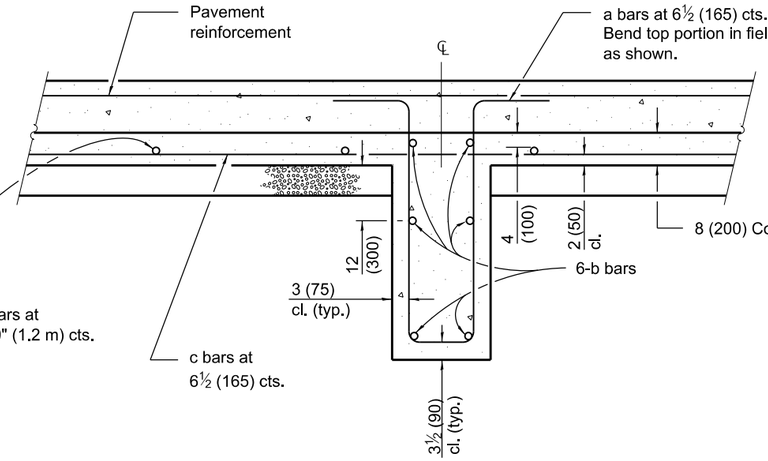
DATE	REVISIONS
1-1-18	Changed tie bar spacing
	to 36 (900) cts.
1-1-08	Switched units to English (metric).
	Revised Lug. Sys. Table

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

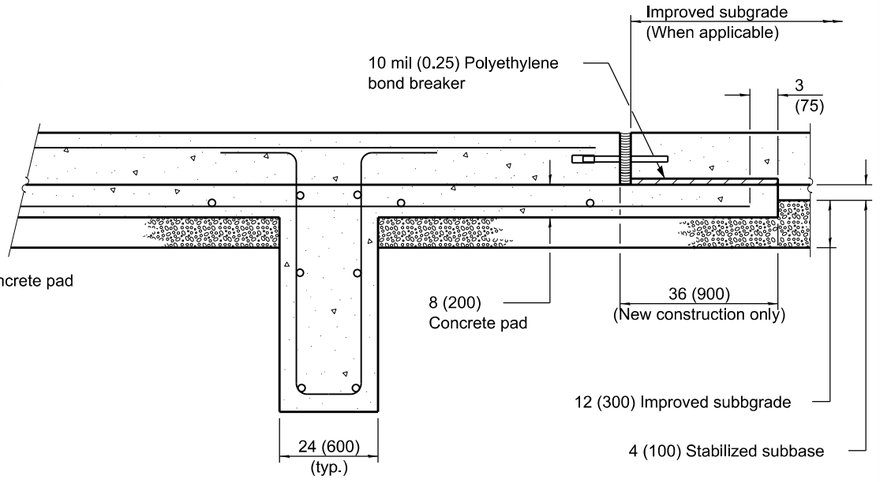
STANDARD 421201-07



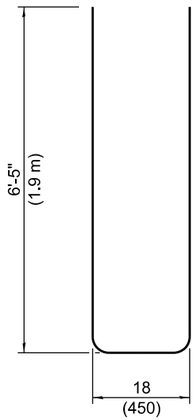
SECTION AT LUG W



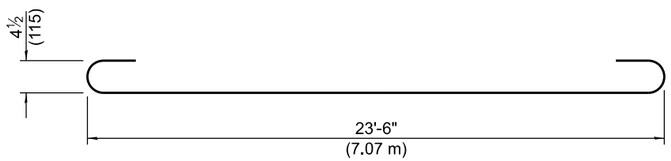
SECTION AT LUG X



SECTION AT LUG Y



BAR a



BAR b

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

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

Concrete, cu. yds. (m³)	64.0 (48.9)
Reinforcing Bars, lbs. (kg)	8372 (3800)
Concrete Pad, sq. yds. (m²)	144 (120)
Improved Subgrade, sq. yds. (m²)	162 (135)

Illinois Department of Transportation

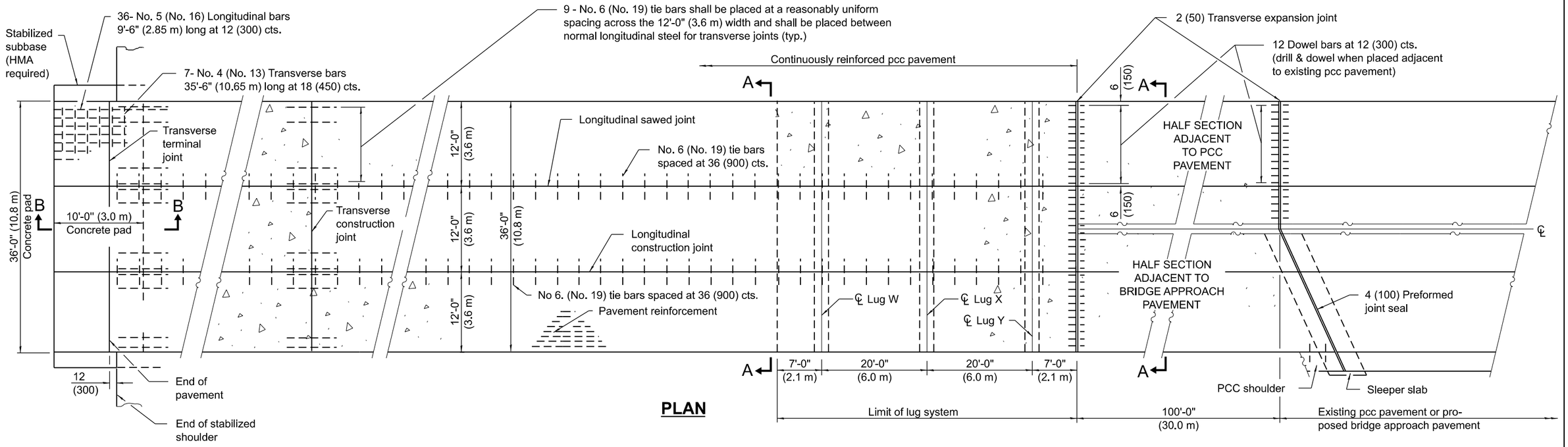
APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

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

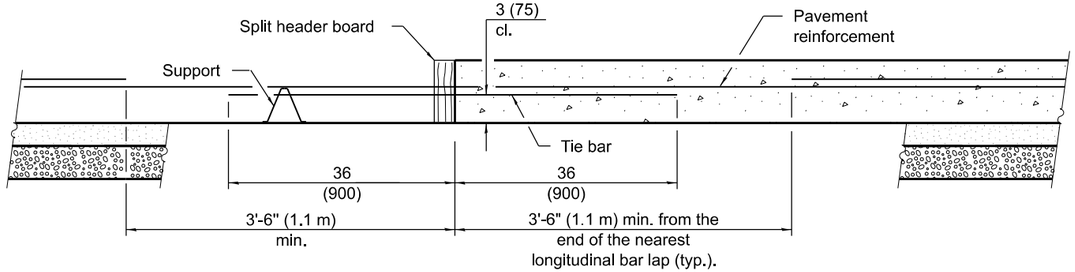
ISSUED 1-1-97

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

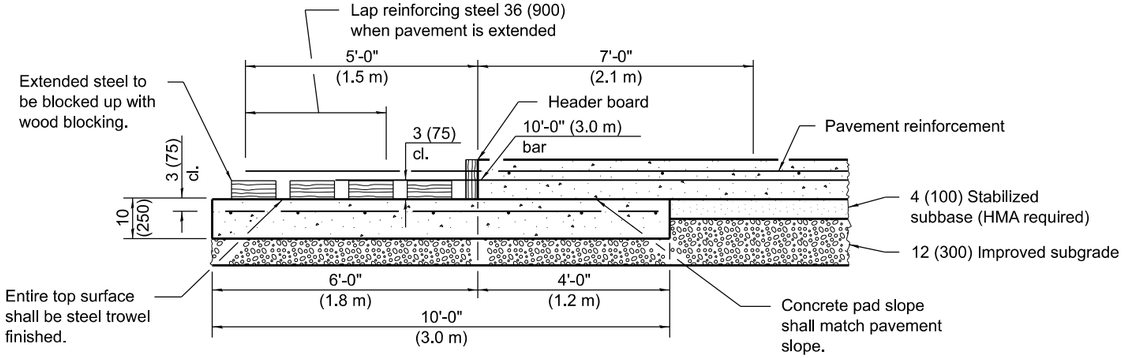
STANDARD 421201-07



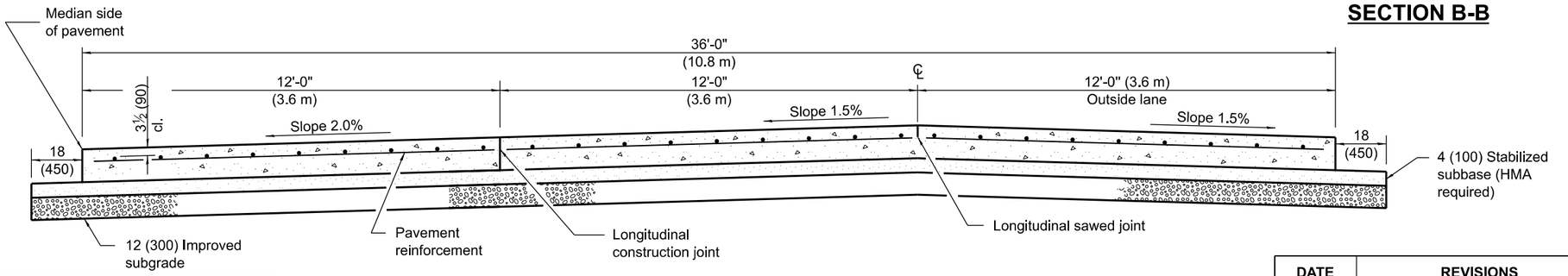
PLAN



TRANSVERSE CONSTRUCTION JOINT



TRANSVERSE TERMINAL JOINT SECTION B-B



SECTION A-A

(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.

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

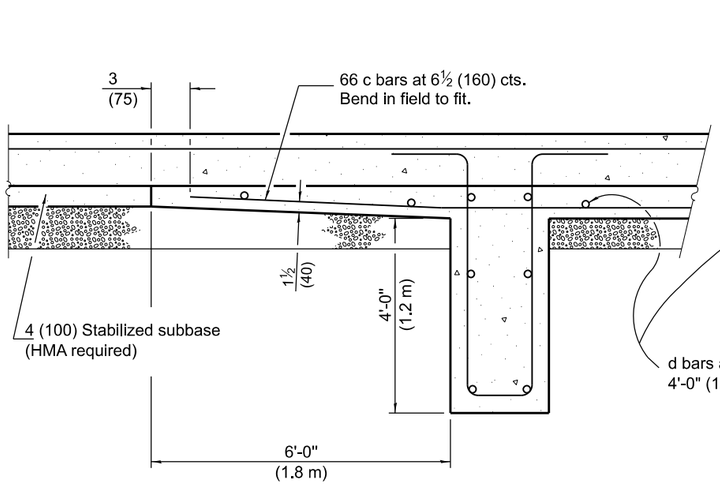
APPROVED January 1 2018
Maureen M. Addis
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

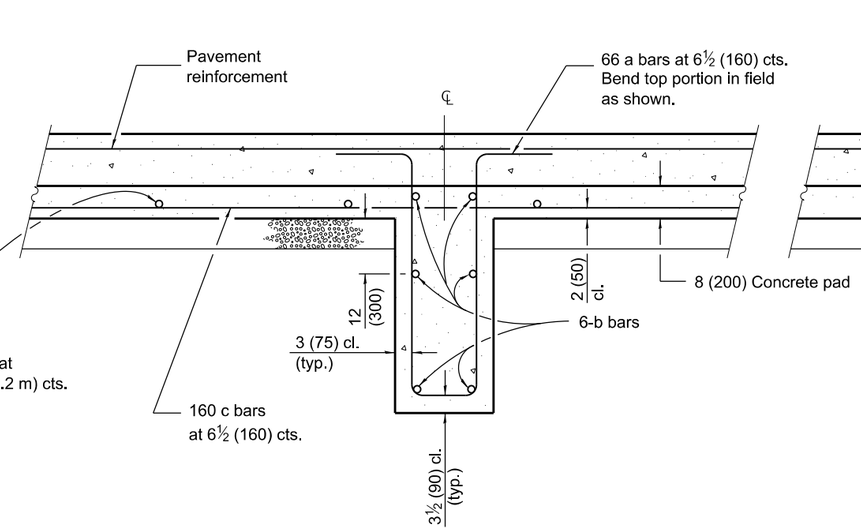
DATE	REVISIONS
1-1-18	Changed tie bar spacing
	to 36 (900).
1-1-08	Switched units to English (metric).
	Revised Lug Sys. Table.

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

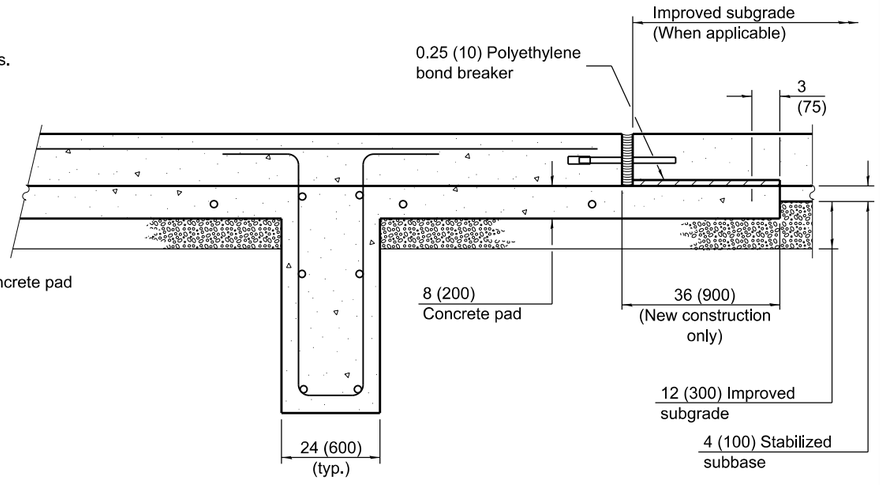
STANDARD 421206-07



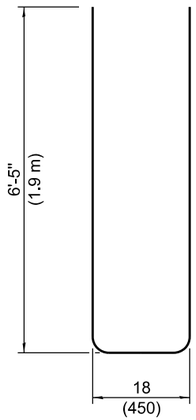
SECTION AT LUG W



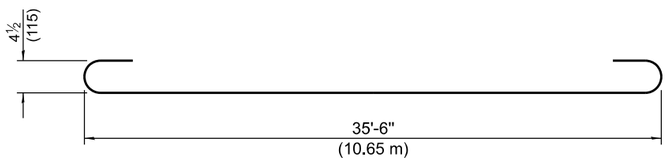
SECTION AT LUG X



SECTION AT LUG Y



BAR a



BAR b

MATERIALS REQUIRED FOR (1) ONE LUG SYSTEM

(Excluding Pavement Concrete and Pavement Reinforcement)

Bar	No.	Size	Length	Shape
a	198	No. 8 (No. 25)	14'-0" (4.25 m)	
b	18	No. 5 (No. 16)	36'-9" (11.30 m)	
c	198	No. 5 (No. 16)	20'-0" (6.10 m)	
d	42	No. 4 (No. 13)	11'-9" (3.52 m)	

Concrete, cu. yds. (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

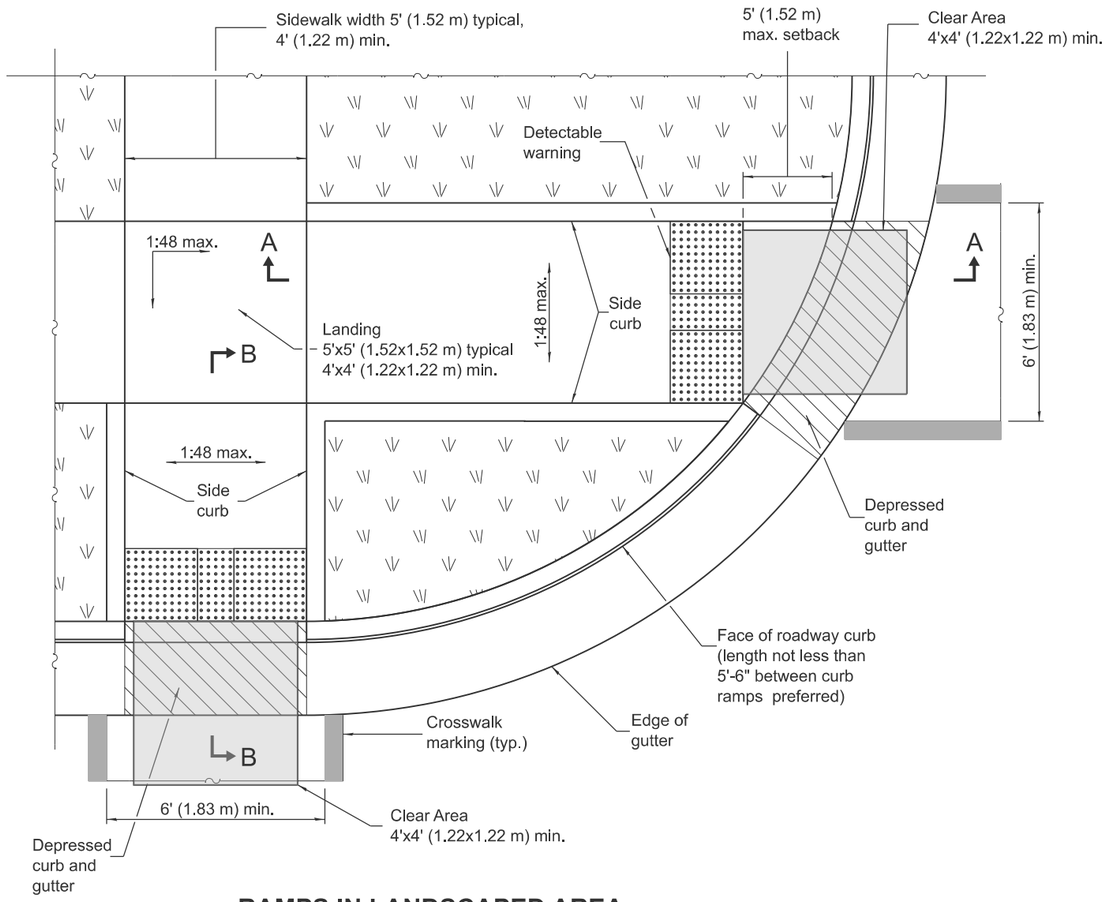
APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

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

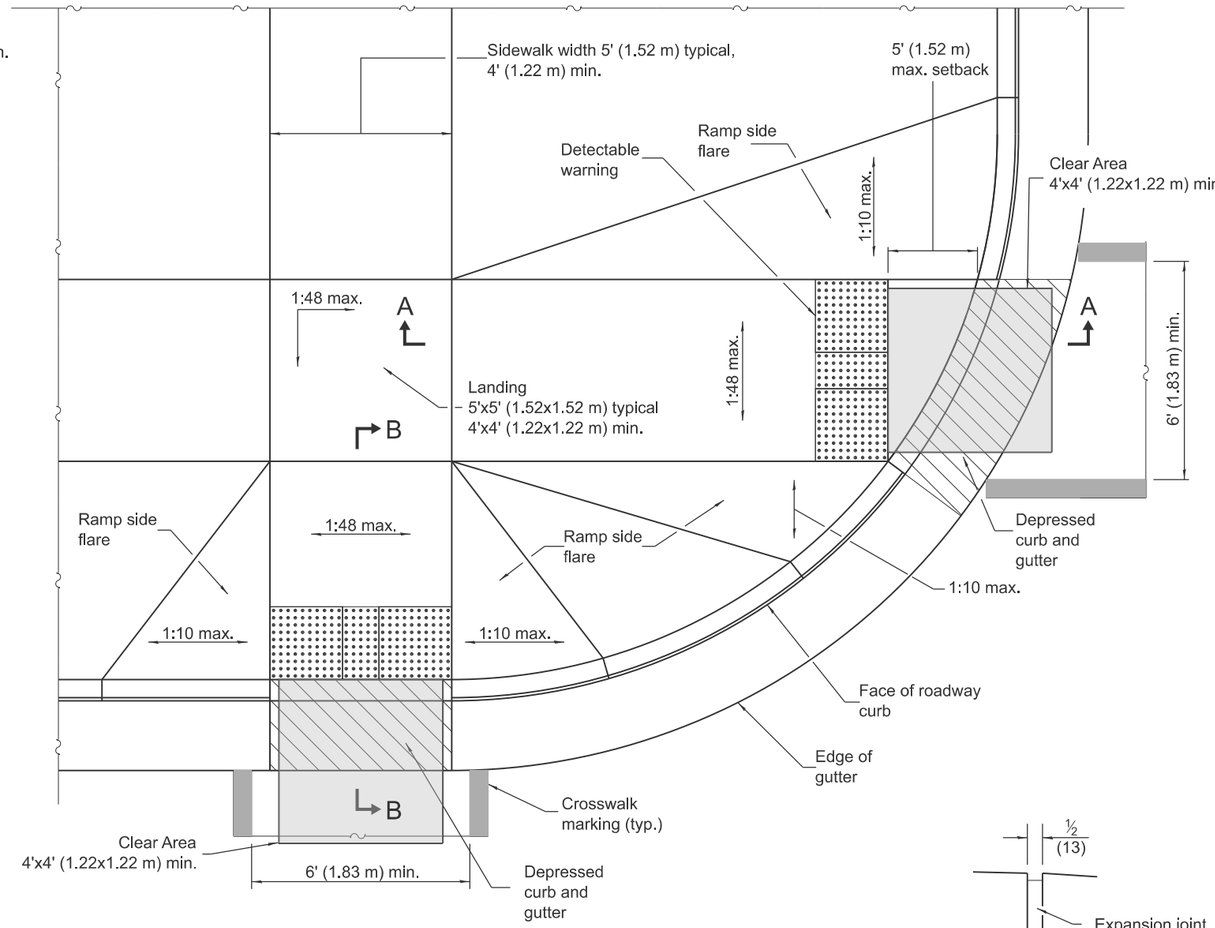
ISSUED 1-1-97

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

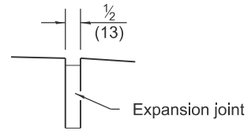
STANDARD 421206-07



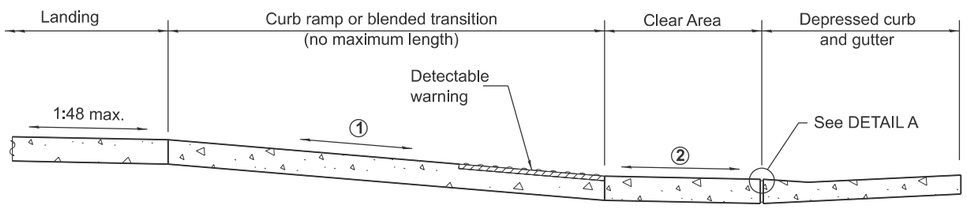
RAMPS IN LANDSCAPED AREA
SETBACK ≤ 5'



RAMPS IN PAVED AREA
SETBACK ≤ 5'



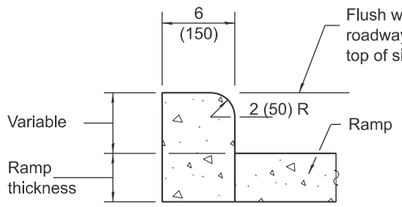
DETAIL A



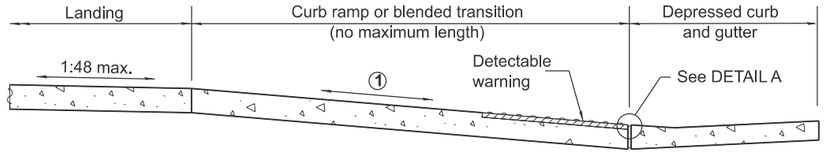
SECTION A-A

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

② Clear Area shall be located outside the travel lane inclusive of any bicycle lanes. The running slope shall be 1:20 max and the cross slope shall be:
- Signalized/Uncontrolled Intersection - 1:20
- Yield/Stop Controlled Intersection - 1:48
- Midblock - grade of the road



SIDE CURB DETAIL



SECTION B-B

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

See Sheet 2 for GENERAL NOTES.

Illinois Department of Transportation

APPROVED January 1, 2025
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

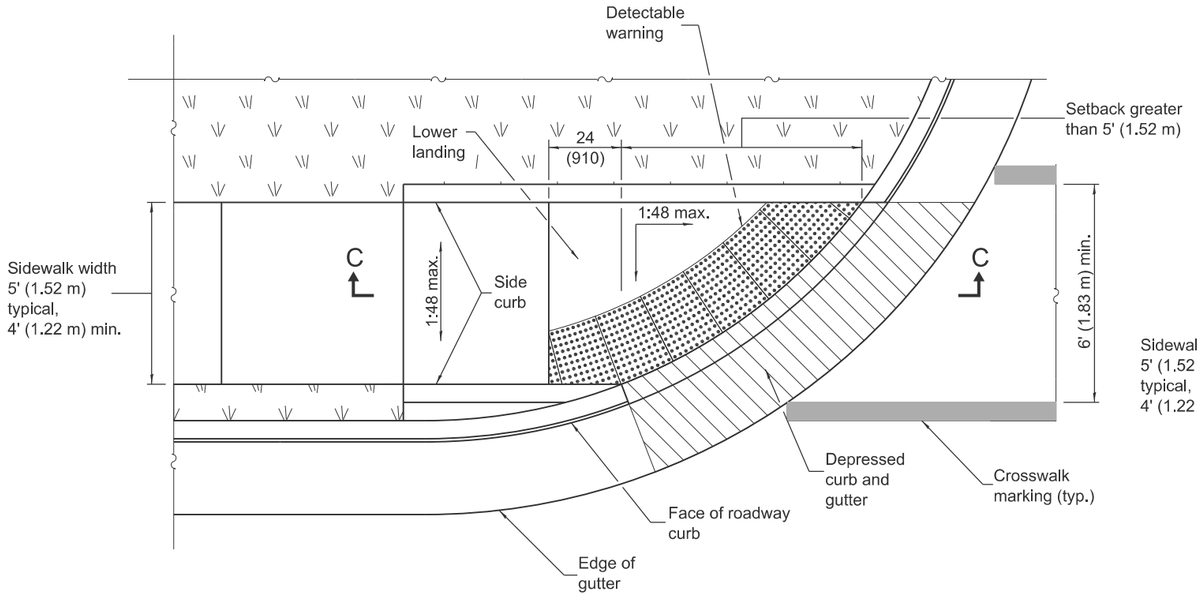
ISSUED 1-1-97

DATE	REVISIONS
1-1-25	Indicated "Clear Area" Location and
	updated cross-slopes.
1-1-19	Removed "15-foot rule", added
	"Blended transitions" and placement
	tolerances for detectable warnings.

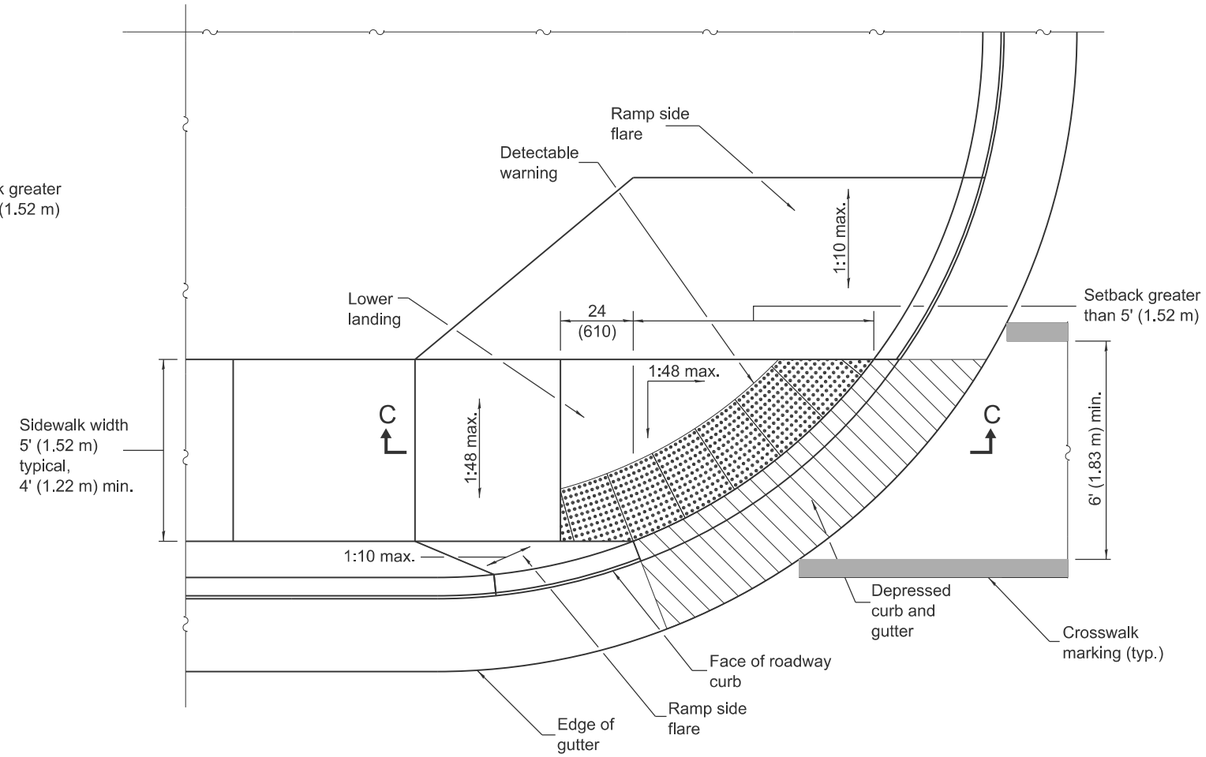
PERPENDICULAR CURB RAMPS FOR SIDEWALKS

(Sheet 1 of 2)

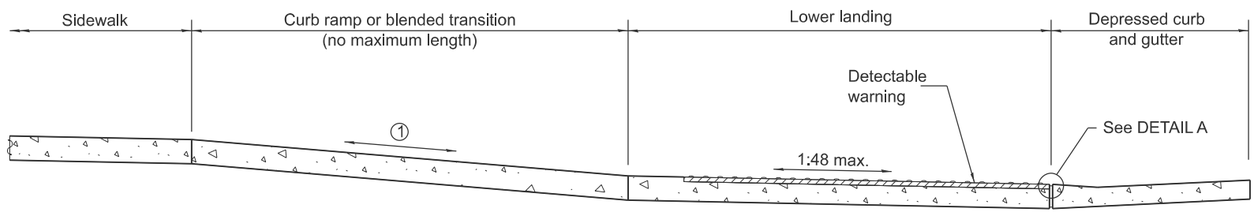
STANDARD 424001-12



RAMP IN LANDSCAPED AREA SETBACK > 5'



RAMP IN PAVED AREA SETBACK > 5'



SECTION C-C

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

GENERAL NOTES

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

Where 1:48 maximum slope is shown, 1:64 is preferred.

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

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

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

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

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

Illinois Department of Transportation

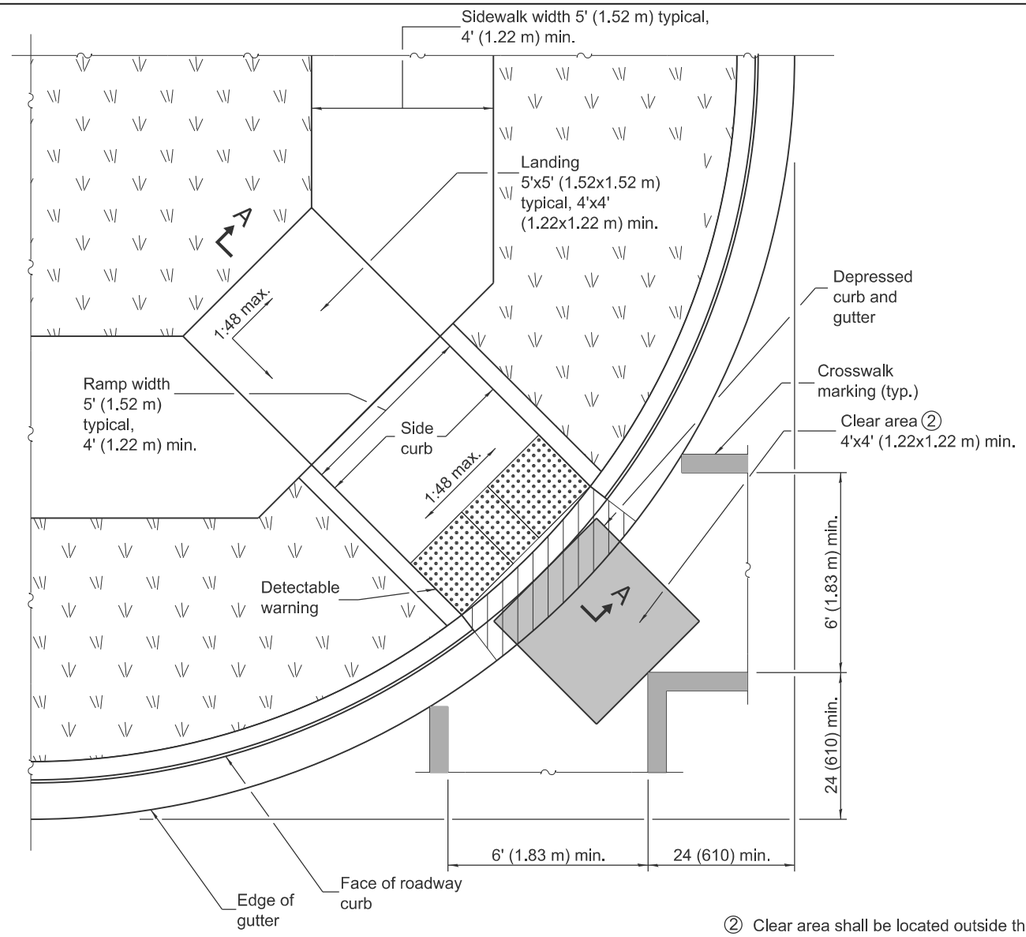
APPROVED January 1, 2025
Marshall K. Motichek
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2025
Todd Cox
ENGINEER OF DESIGN AND ENVIRONMENT

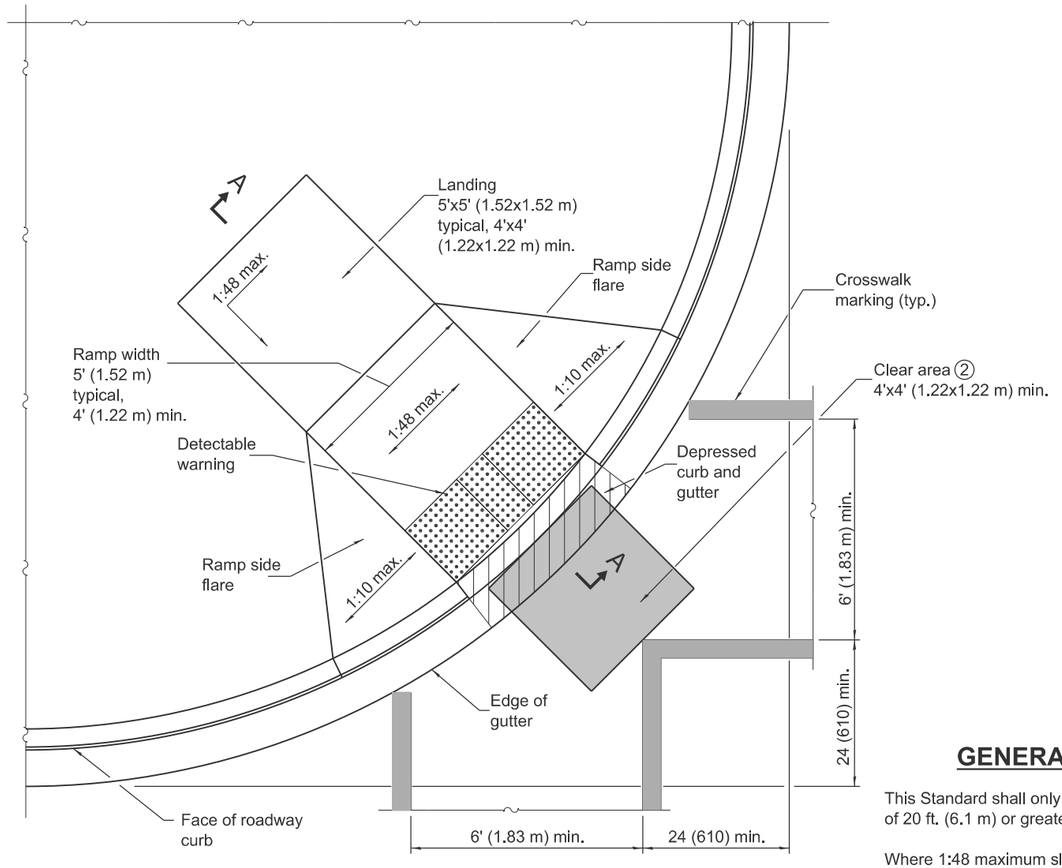
ISSUED 1-1-97

PERPENDICULAR CURB RAMPS FOR SIDEWALKS

STANDARD 424001-12



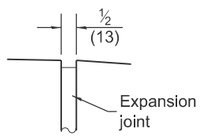
RAMP IN LANDSCAPED AREA



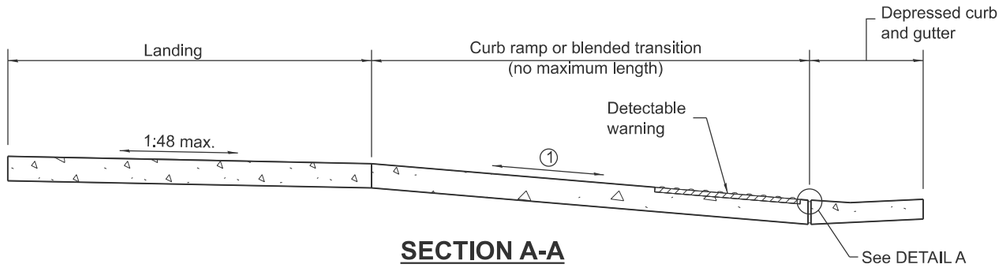
RAMP IN PAVED AREA

② Clear area shall be located outside the travel lane inclusive of any bicycle lanes. The running slope shall be 1:20 max and the cross slope shall be:

- Signalized/Uncontrolled Intersection - 1:20
- Yield/Stop Controlled Intersection - 1:48
- Midblock - grade of road

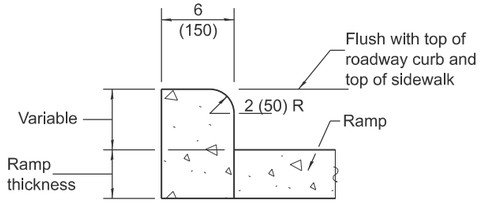


DETAIL A



SECTION A-A

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



SIDE CURB DETAIL

GENERAL NOTES

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

Where 1:48 maximum slope is shown, 1:64 is preferred.

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

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

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

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

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

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

Illinois Department of Transportation

APPROVED January 1, 2025
ENGINEER OF POLICY AND PROCEDURES

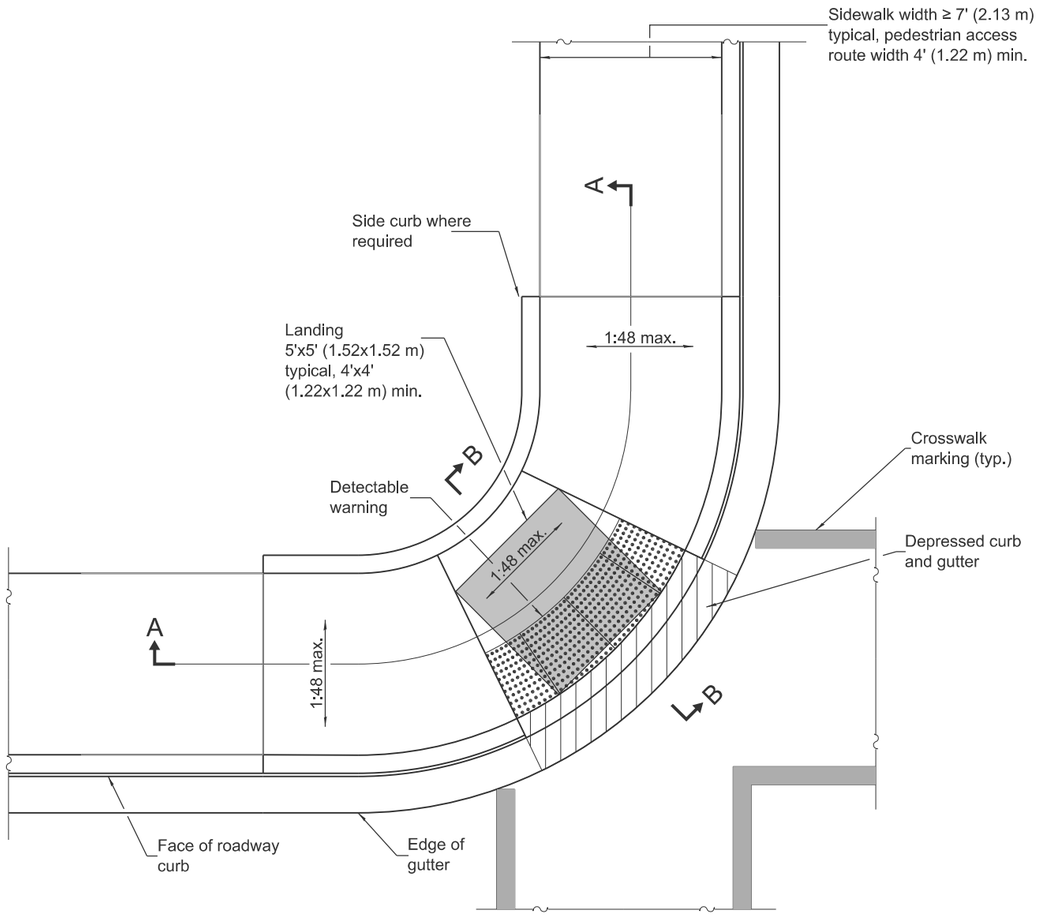
APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

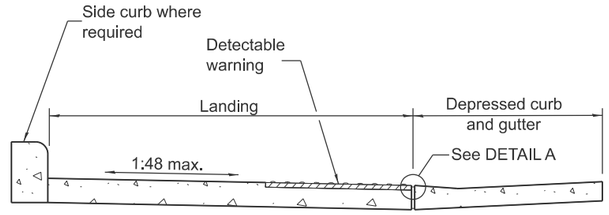
DATE	REVISIONS
1-1-25	Indicated "Clear Area" location and
	updated cross-slopes.
1-1-21	Clarified minimum crosswalk width
	and locations.

DIAGONAL CURB RAMPS FOR SIDEWALKS

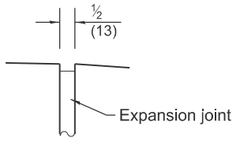
STANDARD 424006-06



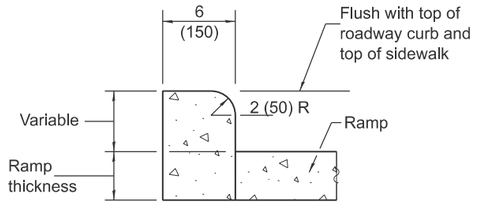
CORNER PARALLEL CURB RAMP



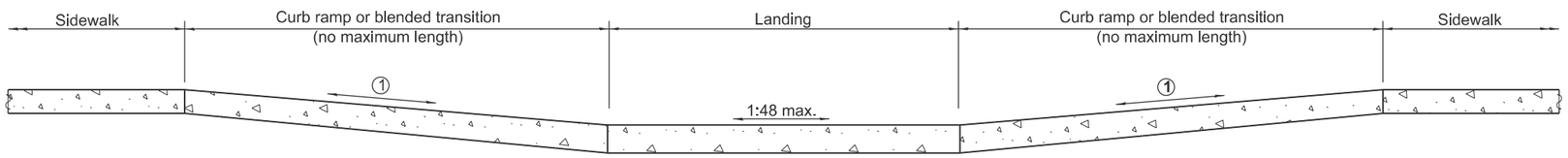
SECTION B-B



DETAIL A



SIDE CURB DETAIL



SECTION A-A

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

GENERAL NOTES

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

Where 1:48 maximum slope is shown, 1:64 is preferred.

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

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

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

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

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

Illinois Department of Transportation

APPROVED January 1, 2025
ENGINEER OF POLICY AND PROCEDURES

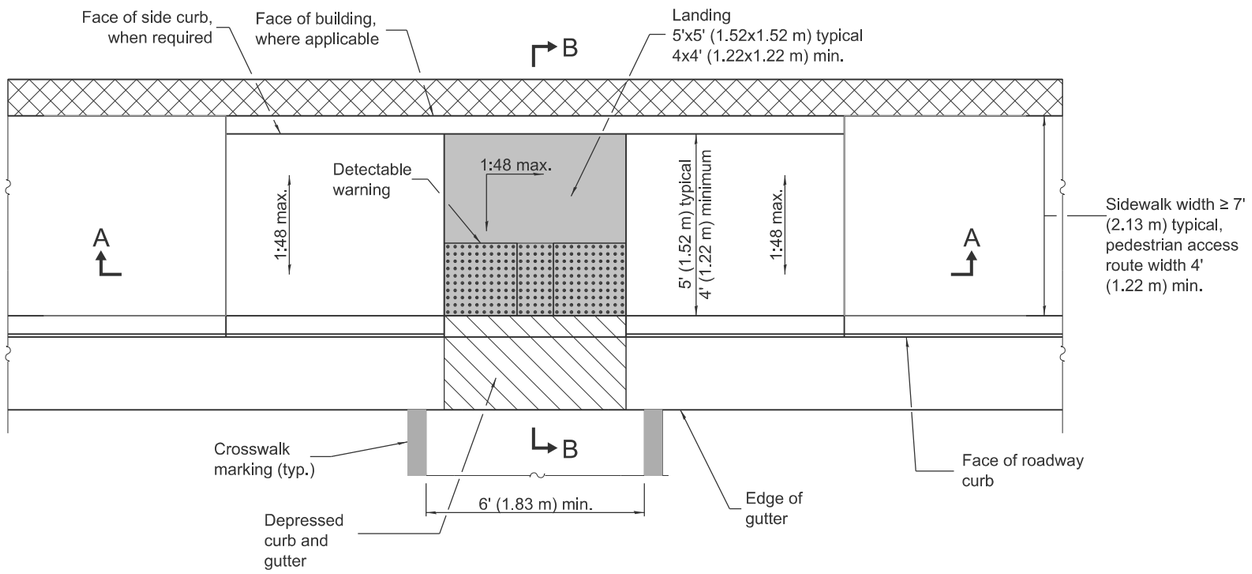
APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

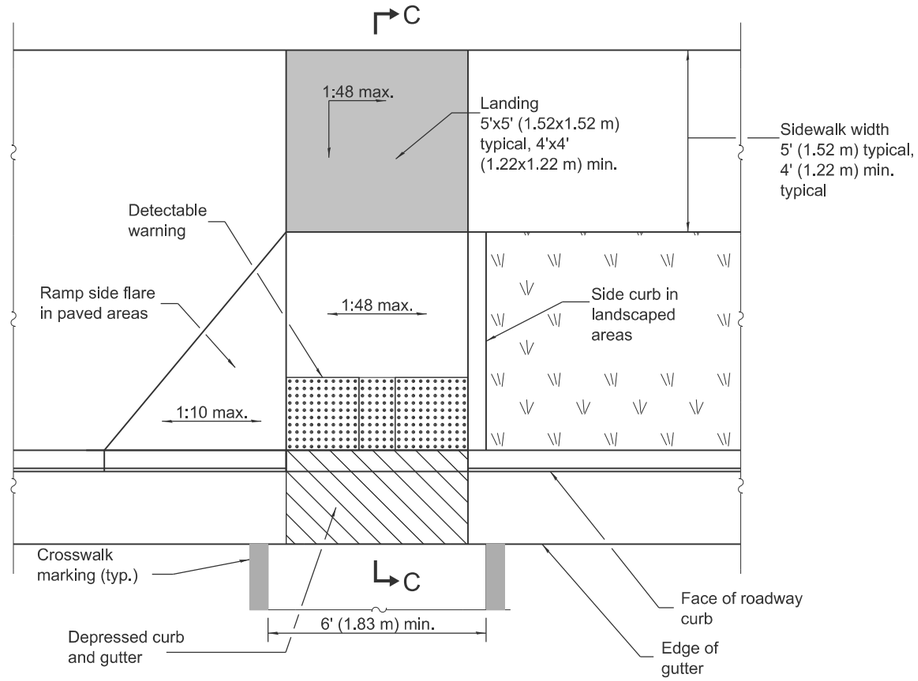
DATE	REVISIONS
1-1-25	Revised turning space with landing
	and updated cross-slope.
1-1-19	Removed upper landing, added
	blended transition and detectable
	warning tolerances.

CORNER PARALLEL CURB RAMPS FOR SIDEWALKS

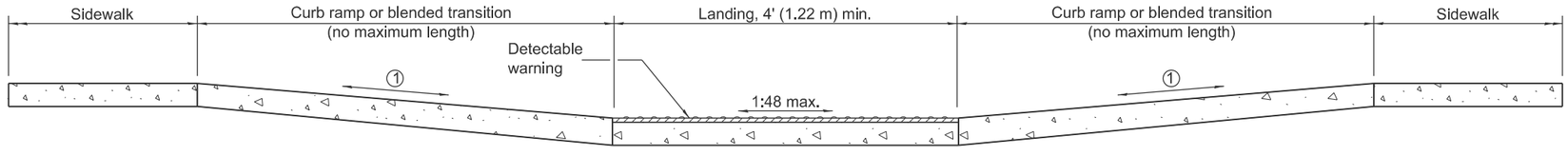
STANDARD 424011-05



PARALLEL MID-BLOCK CURB RAMP

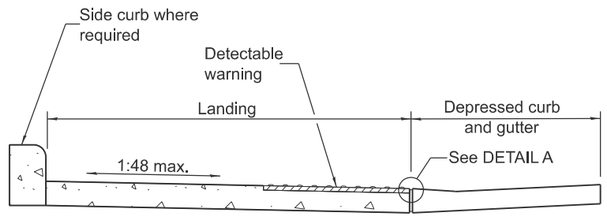


PERPENDICULAR MID-BLOCK CURB RAMP

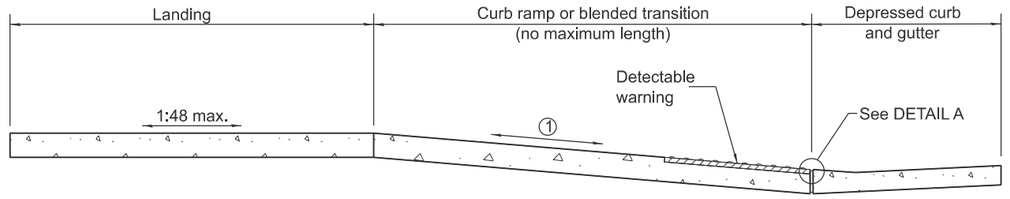


SECTION A-A

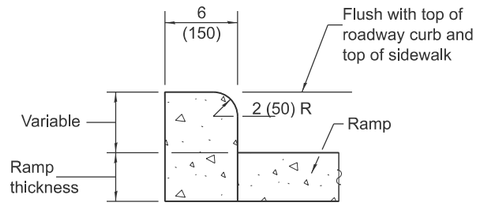
① The running slope of a curb ramp shall be 1:12 max. The running slope of a blended transition shall be 1:20 max.



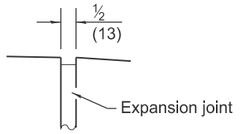
SECTION B-B



SECTION C-C



SIDE CURB DETAIL



DETAIL A

GENERAL NOTES

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

Where 1:48 maximum slope is shown, 1:64 is preferred.

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

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

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

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

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

Illinois Department of Transportation

APPROVED January 1, 2025
ENGINEER OF POLICY AND PROCEDURES

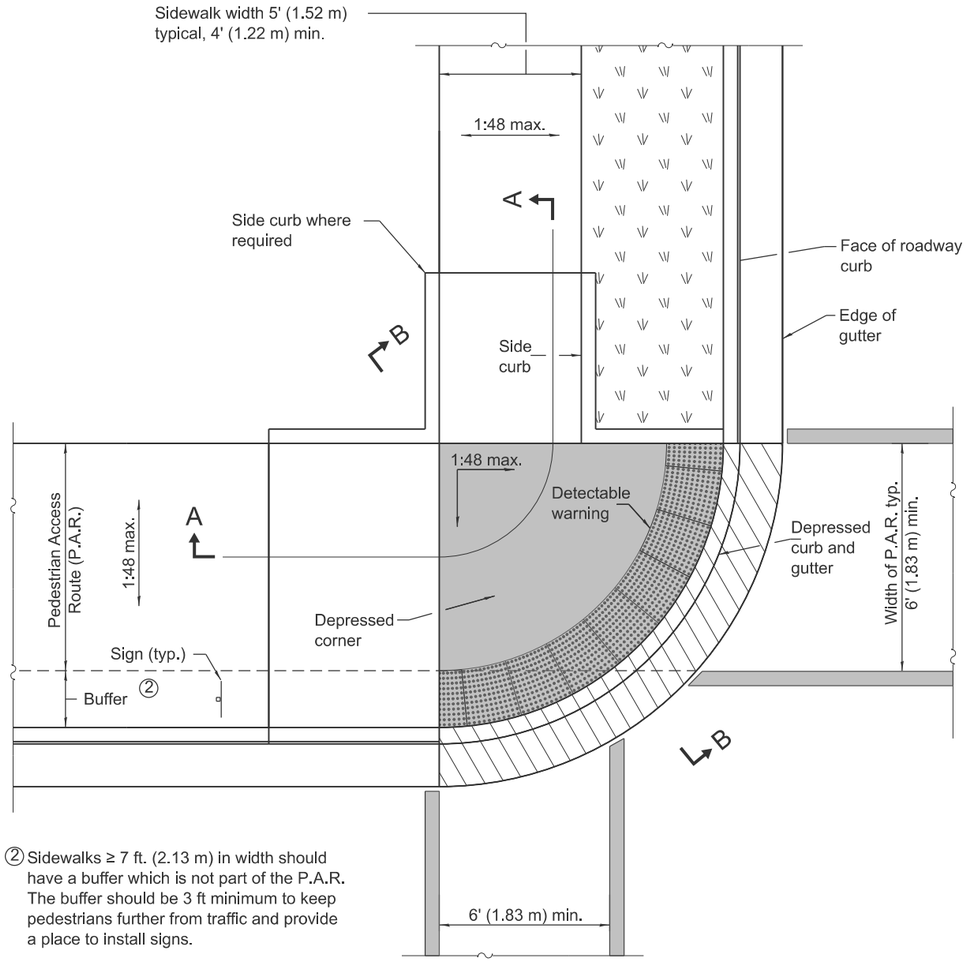
APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

DATE	REVISIONS
1-1-25	Revised turning space with landing
	and updated cross-slope.
1-1-19	Removed upper landing, added
	blended transitions and detectable
	warning tolerances.

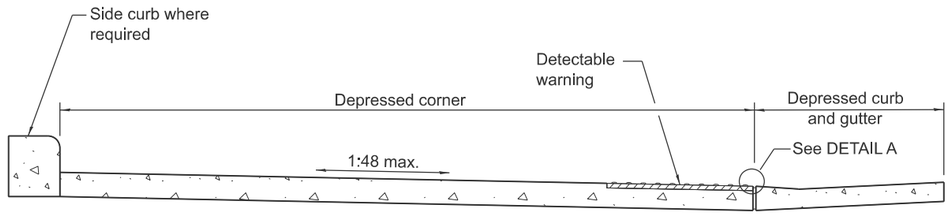
MID-BLOCK CURB RAMPS FOR SIDEWALKS

STANDARD 424016-06

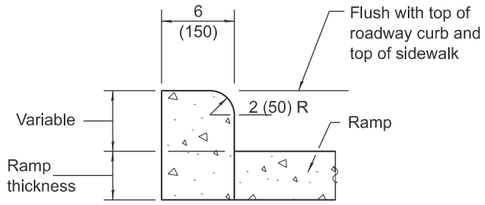


② Sidewalks ≥ 7 ft. (2.13 m) in width should have a buffer which is not part of the P.A.R. The buffer should be 3 ft minimum to keep pedestrians further from traffic and provide a place to install signs.

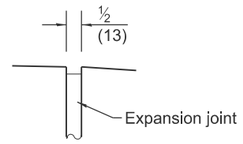
DEPRESSED CORNER



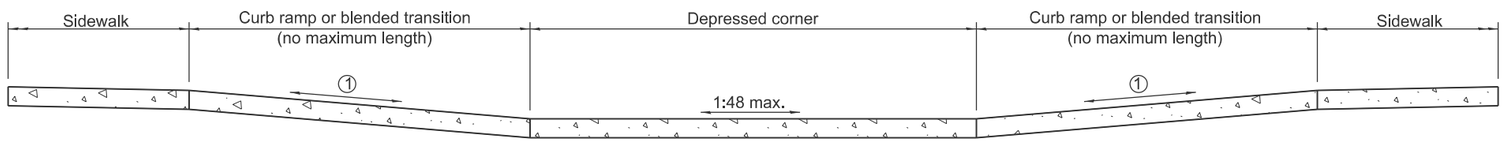
SECTION B-B



SIDE CURB DETAIL



DETAIL A



SECTION A-A

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

GENERAL NOTES

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

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

Where 1:48 maximum slope is shown, 1:64 is preferred.

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

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

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

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

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

Illinois Department of Transportation

APPROVED January 1, 2025
Marshall R. Metcalf
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2025
Todd Cox
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

DATE	REVISIONS
1-1-25	Remove min running slope from
	note 1 and updated cross-slope.
1-1-21	Added crosswalk striping and a
	"buffer" for wide sidewalks.

DEPRESSED CORNER FOR SIDEWALKS

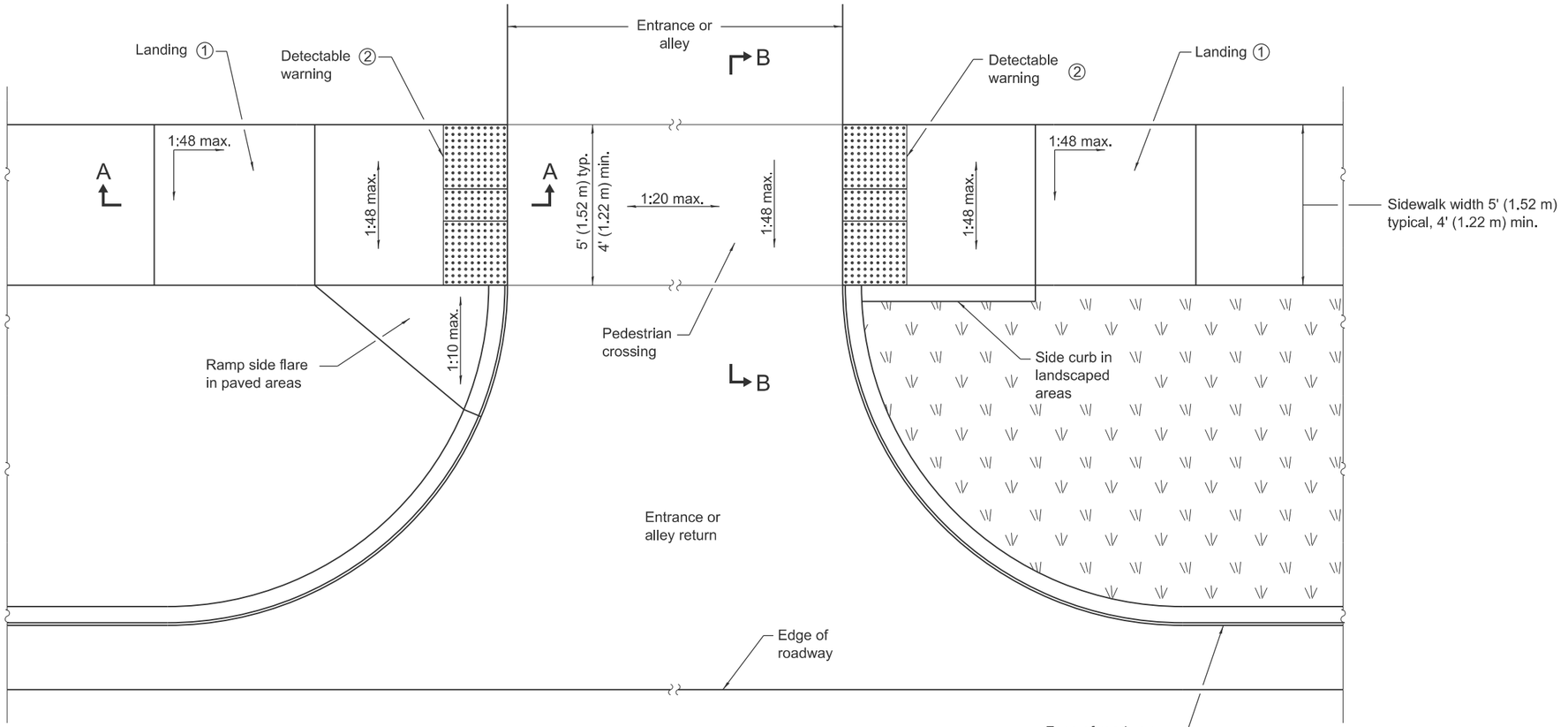
STANDARD 424021-07

① Landing not required for blended transitions, or where there is no change in direction.

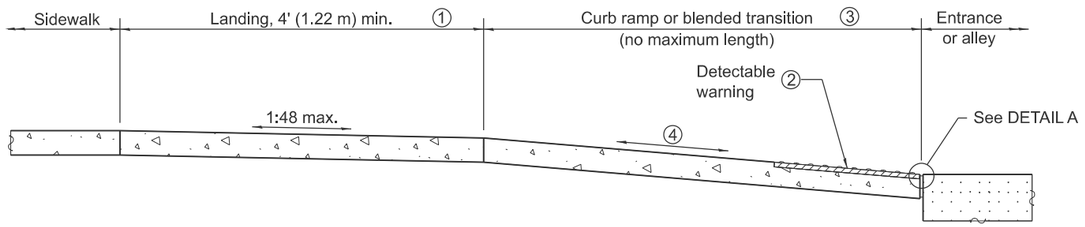
② Detectable warning shall only be installed at entrances/alleys with permanent traffic control devices (i.e. stop signs, signals).

③ Where possible, maintain the grade of the sidewalk across the entrance/ally to avoid the need for ramps and turning spaces.

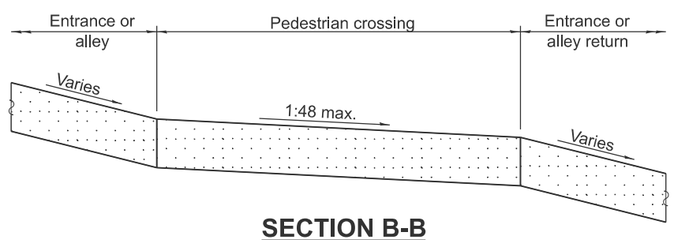
④ The running slope of a curb ramp shall be 1:12 max. The running slope of a blended transition shall be 1:20 max.



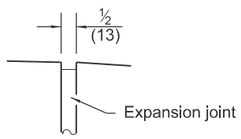
ENTRANCE / ALLEY PEDESTRIAN CROSSING



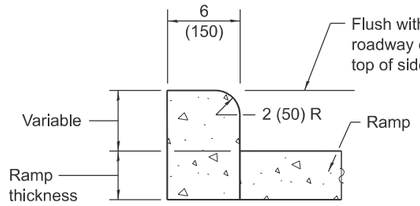
SECTION A-A



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 1:48 maximum slope is shown, 1:64 is preferred.

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

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

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

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

Illinois Department of Transportation

APPROVED January 1, 2025
ENGINEER OF POLICY AND PROCEDURES

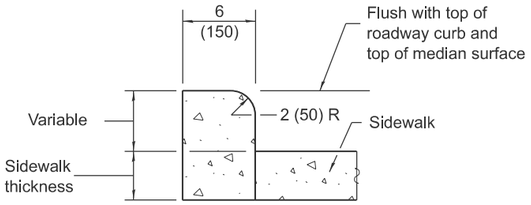
APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

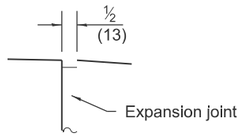
DATE	REVISIONS
1-1-25	Modified Section A-A notes and
	updated cross slopes.
1-1-19	Added blended transitions and
	placement tolerances for
	detectable warnings.

ENTRANCE / ALLEY PEDESTRIAN CROSSINGS

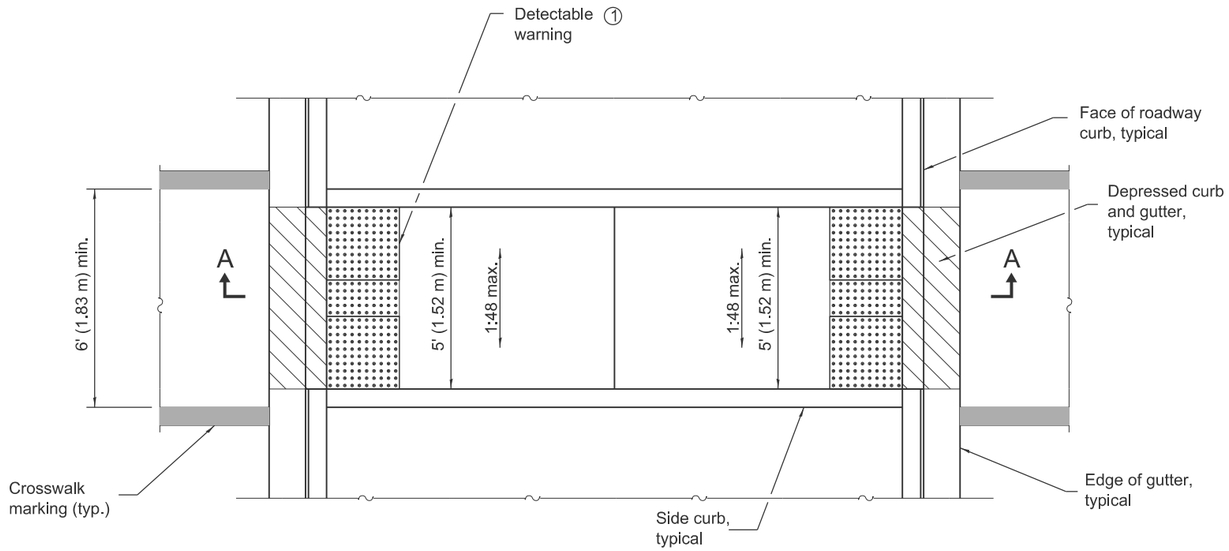
STANDARD 424026-04



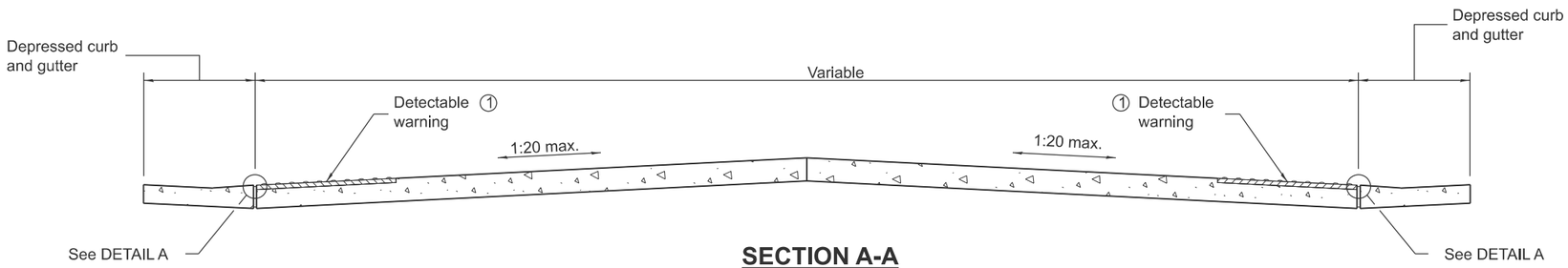
SIDE CURB DETAIL



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 1:48 maximum slope is shown, 1:64 is preferred.

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

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

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

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

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

Illinois Department of Transportation

APPROVED January 1, 2025
ENGINEER OF POLICY AND PROCEDURES

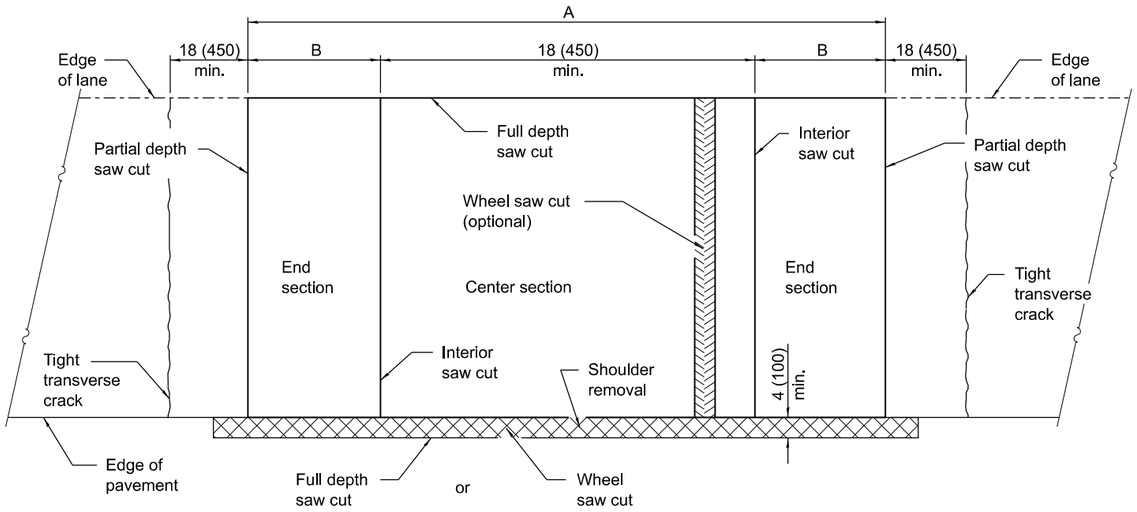
APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

DATE	REVISIONS
1-1-25	Updated cross-slope.
1-1-19	Added placement tolerances for
	detectable warnings.

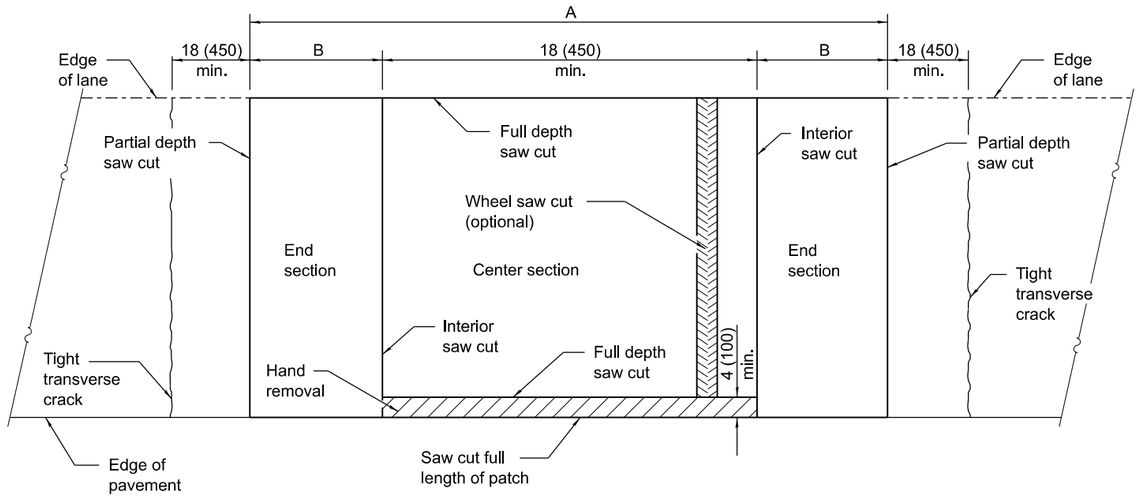
MEDIAN PEDESTRIAN CROSSINGS

STANDARD 424031-03



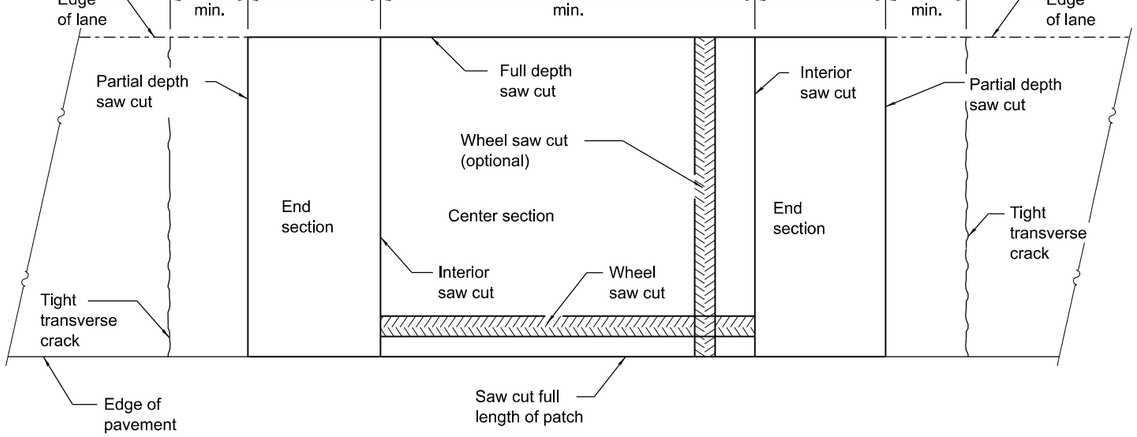
PAVEMENT SAWING DETAIL

(HMA SHOULDER)



PAVEMENT SAWING DETAIL

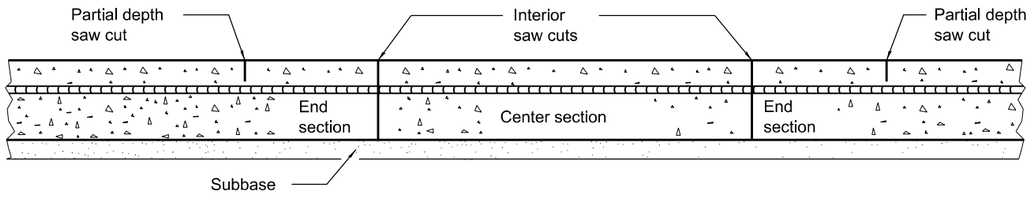
(PCC SHOULDER)



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)



SAW CUT DETAIL

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED January 1, 2008
ENGINEER OF POLICY AND PROCEDURES

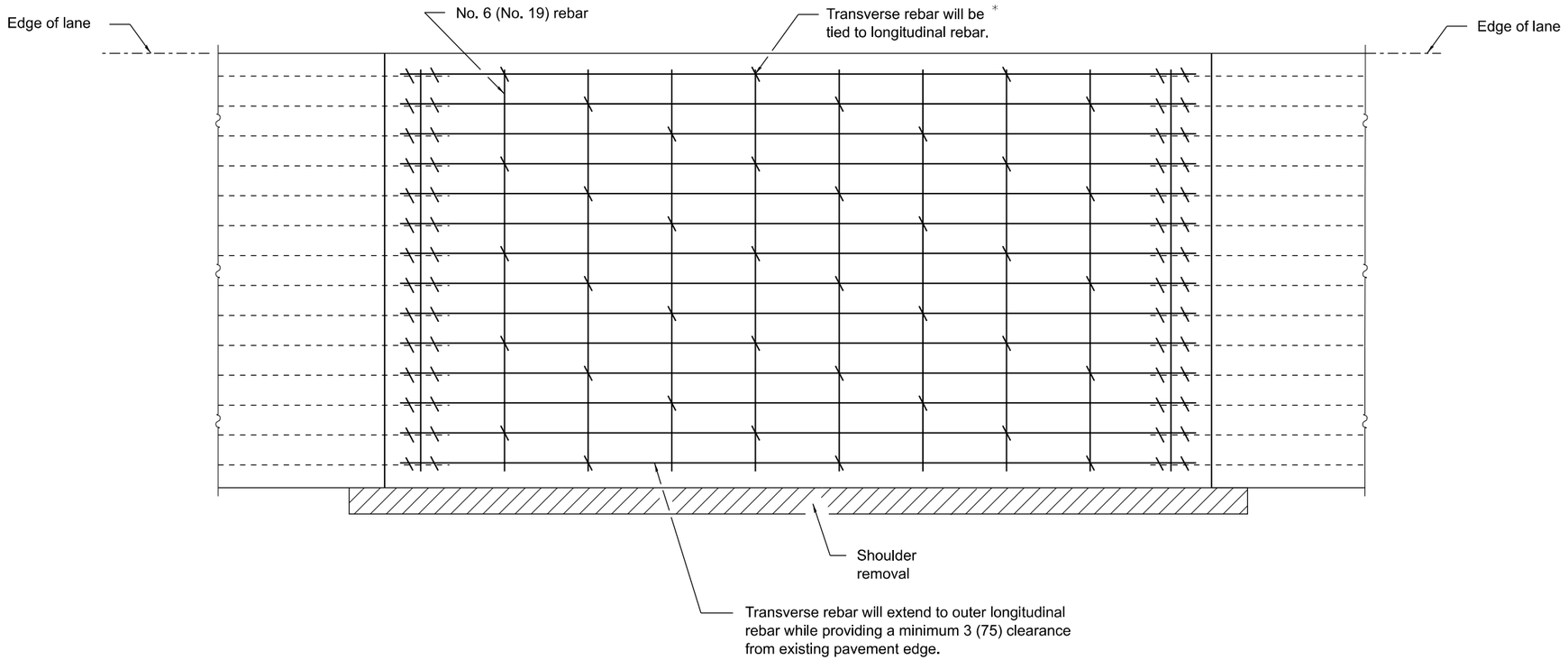
APPROVED January 1, 2008
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

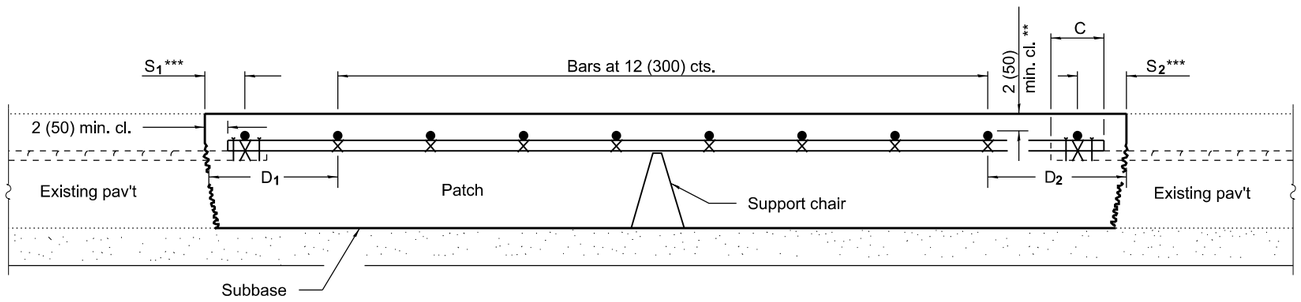
DATE	REVISIONS
1-1-08	Switched units to English (metric).
1-1-07	Revised General Notes.

CLASS A PATCHES

STANDARD 442001-04



PAVEMENT REINFORCEMENT DETAIL



PATCHING DETAIL

* Every 3rd intersection must be tied.

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

*** Variable: Where S_1 and S_2 are 2½ (65) min. and 12 (300) max. $D_1 = 2(S_1)$ and $D_2 = 2(S_2)$.

Illinois Department of Transportation

APPROVED January 1, 2008
ENGINEER OF POLICY AND PROCEDURES

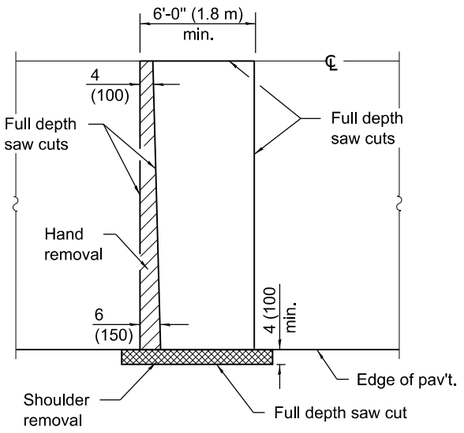
APPROVED January 1, 2008
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

CLASS A PATCHES

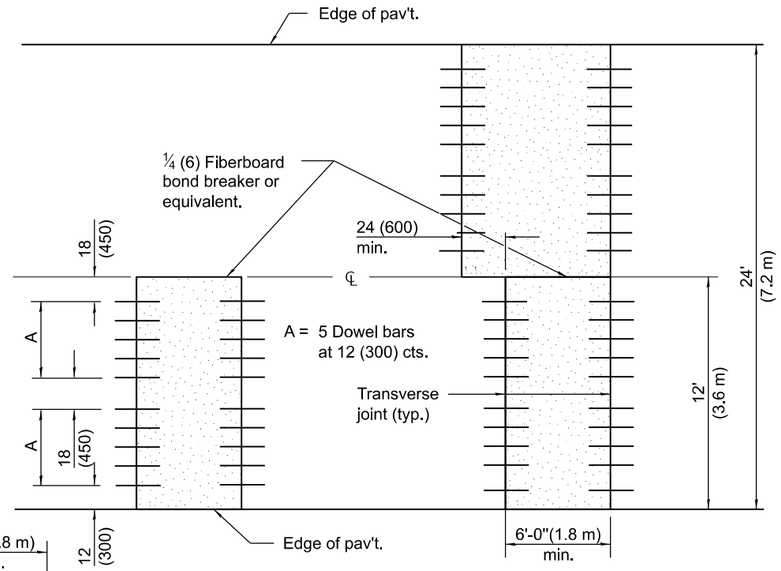
(Sheet 2 of 2)

STANDARD 442001-04

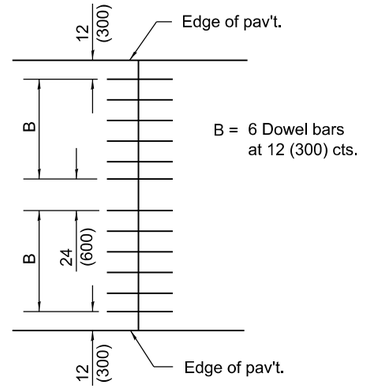


PAVEMENT SAWING DETAIL

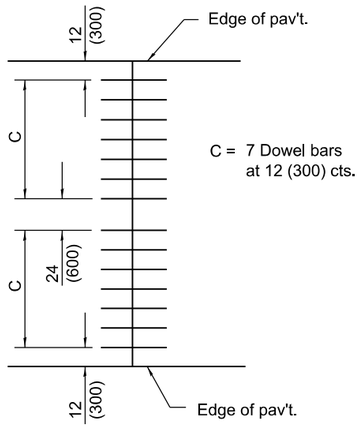
(HMA SHOULDER)



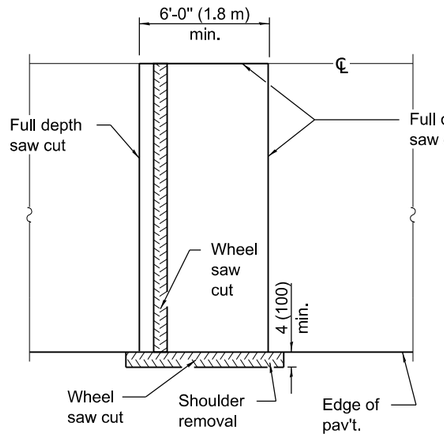
12' (3.6 m) WIDE LANES



14' (4.2 m) WIDE RAMP

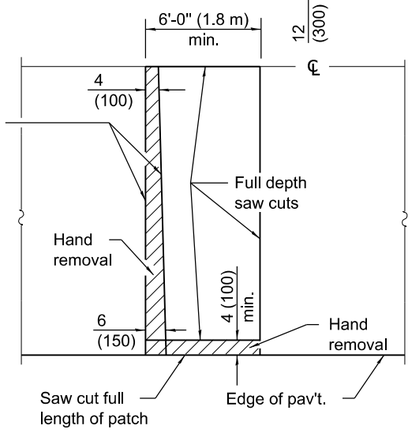


16' (4.8 m) WIDE RAMP



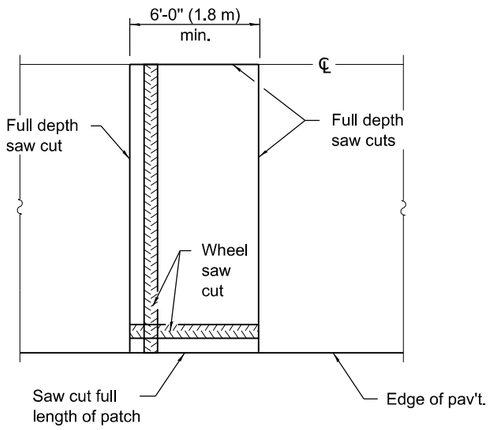
ALTERNATE SAWING DETAIL

(HMA SHOULDER)



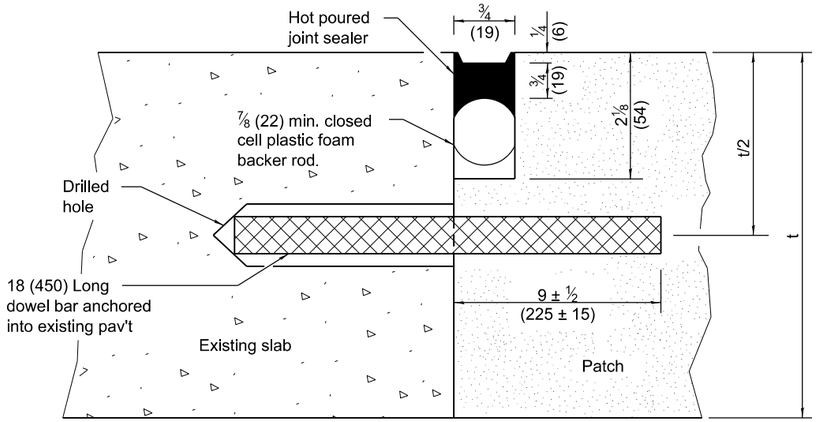
PAVEMENT SAWING DETAIL

(PCC SHOULDER)

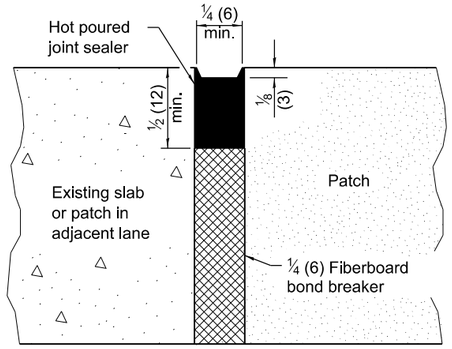


ALTERNATE SAWING DETAIL

(PCC SHOULDER)



TRANSVERSE JOINT



CENTERLINE JOINT

DOWEL BAR TABLE		
PAVEMENT THICKNESS	DOWEL BAR DIAMETER	HOLE DIAMETER
10 (250) or greater	1½ (38)	1⅝ (41)
8 (200) thru 9.99 (249)	1¼ (32)	1⅜ (35)
Less than 8 (200)	1 (25)	1⅛ (29)

GENERAL NOTES

The transverse joints for Class B patches shall align with joints or cracks in the adjacent lane whenever possible.

See Standard 420701 for details of welded wire reinforcement.

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

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

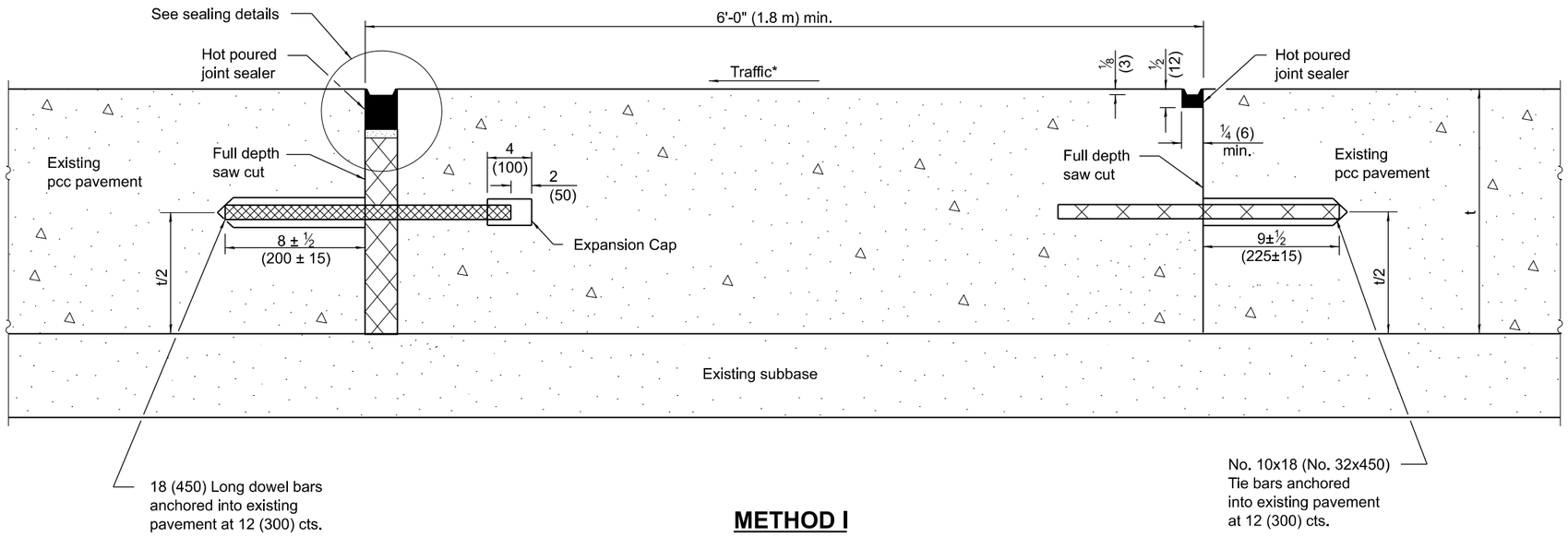
ISSUED 1-1-97

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

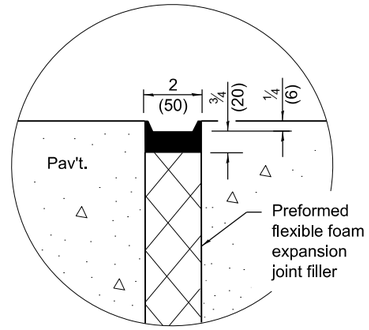
CLASS B PATCHES

(Sheet 1 of 2)

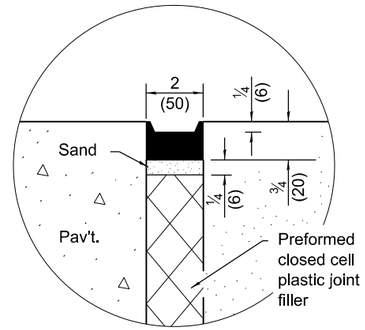
STANDARD 442101-09



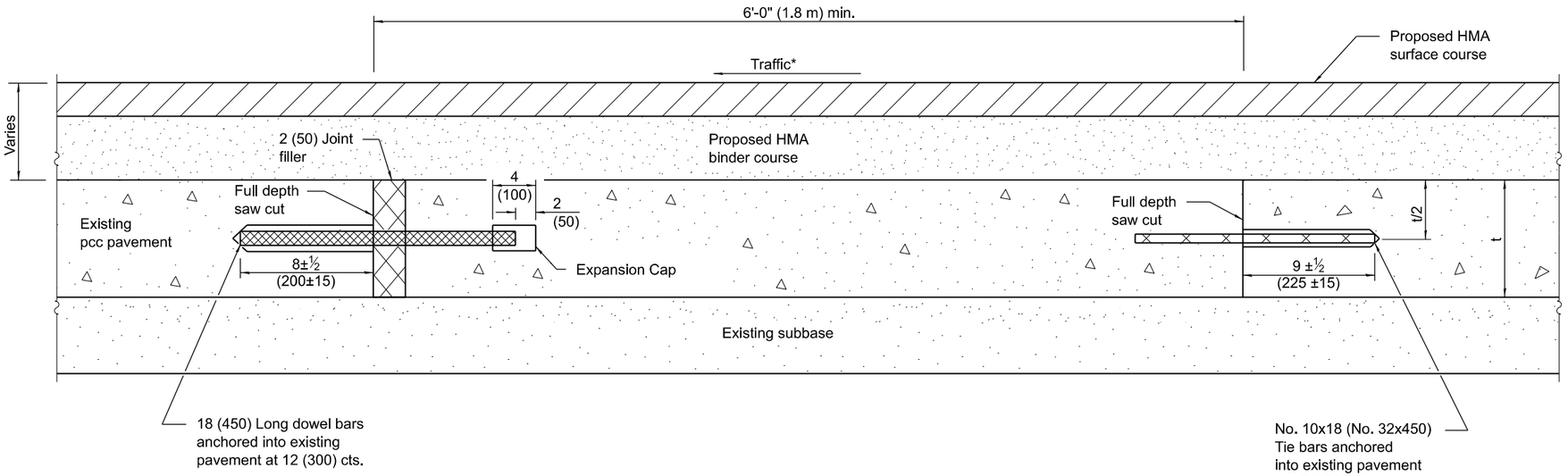
METHOD I
(Without Resurfacing)



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

APPROVED January 1, 2019
ENGINEER OF POLICY AND PROCEDURES

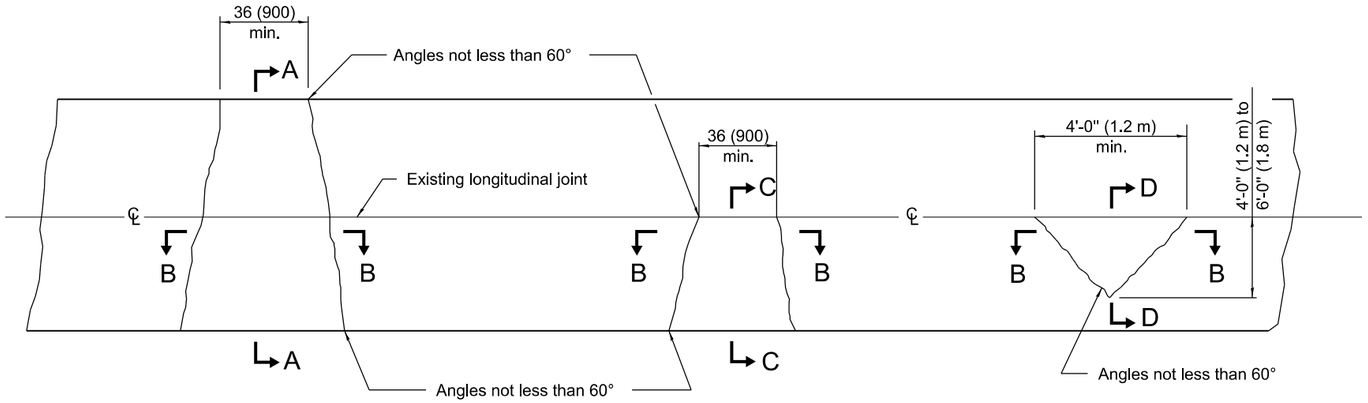
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

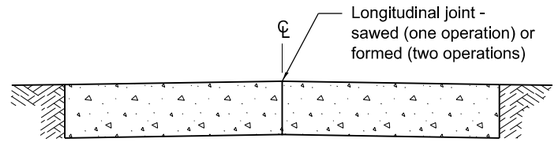
ISSUED 1-1-97

CLASS B PATCHES

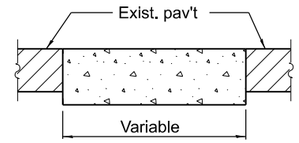
STANDARD 442101-09

CLASS C

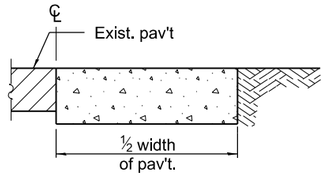




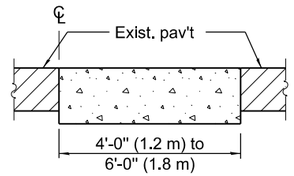
SECTION A-A



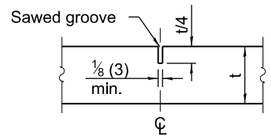
SECTION B-B



SECTION C-C



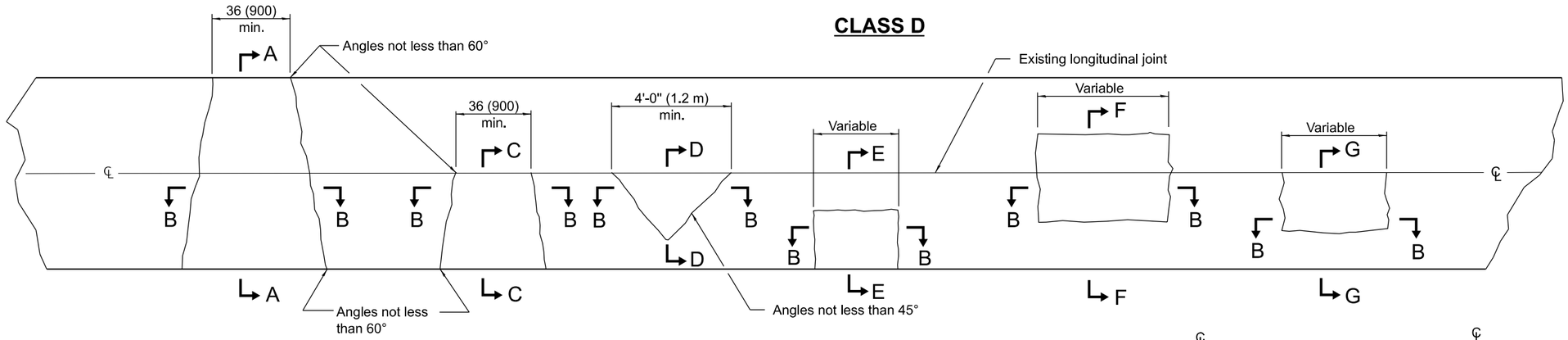
SECTION D-D

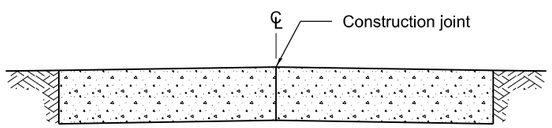


DETAIL OF SAWED CONTRACTION JOINT

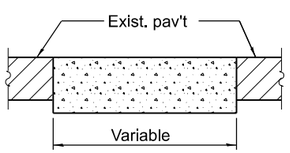
Note:
Longitudinal joints shall be as detailed on Standard 420001, except tie bars are not required for patches 20'-0" (6.0 m) or less in length.

CLASS D

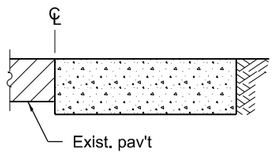




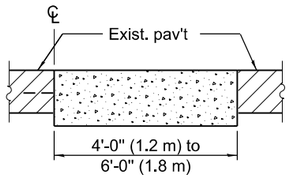
SECTION A-A
(Built in two operations)



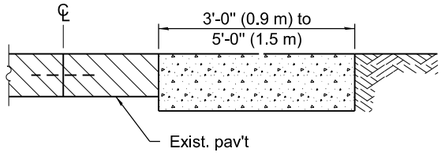
SECTION B-B



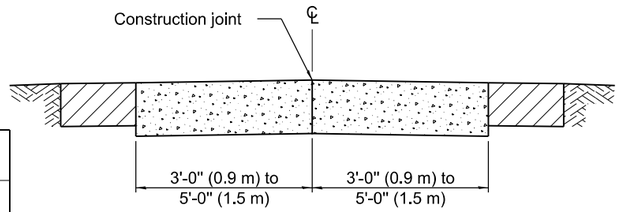
SECTION C-C



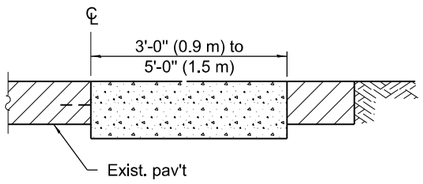
SECTION D-D



SECTION E-E



SECTION F-F
(Built in two operations)



SECTION G-G

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.

Illinois Department of Transportation

APPROVED January 1, 2008
ENGINEER OF POLICY AND PROCEDURES

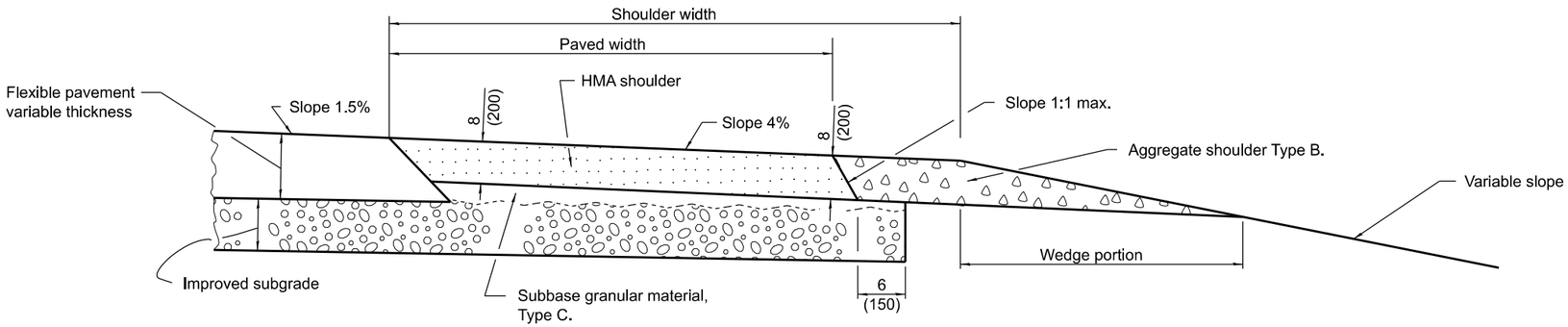
APPROVED January 1, 2008
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

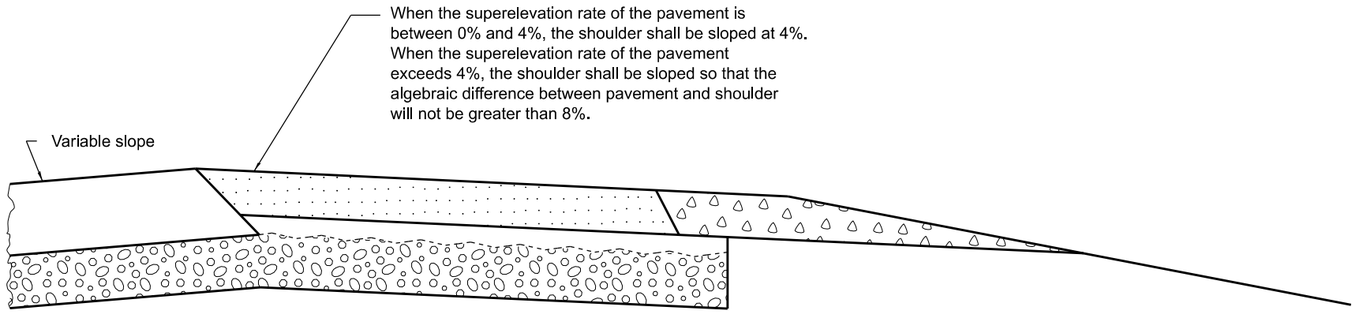
DATE	REVISIONS
1-1-08	Switched units to English (metric).
1-1-07	Revised Note for Class C patches.

CLASS C and D PATCHES

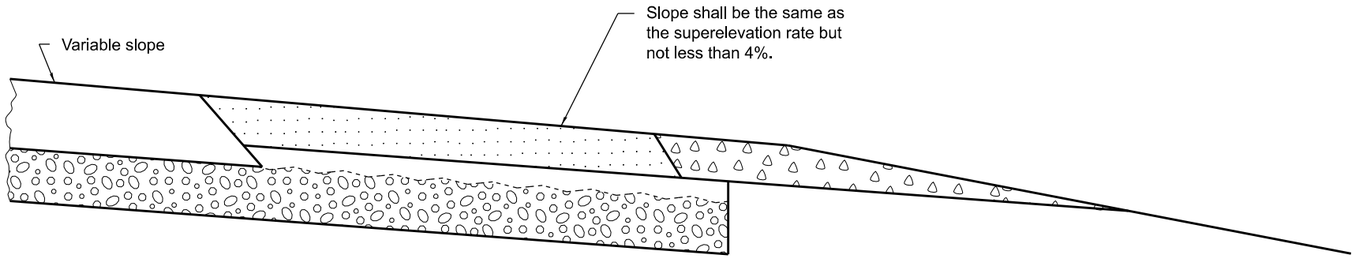
STANDARD 442201-03



SHOULDER FOR TANGENT PAVEMENT



SHOULDER FOR SUPERELEVATED PAVEMENT (OUTSIDE OF CURVE)



SHOULDER FOR SUPERELEVATED PAVEMENT (INSIDE OF CURVE)

GENERAL NOTES

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

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

Illinois Department of Transportation

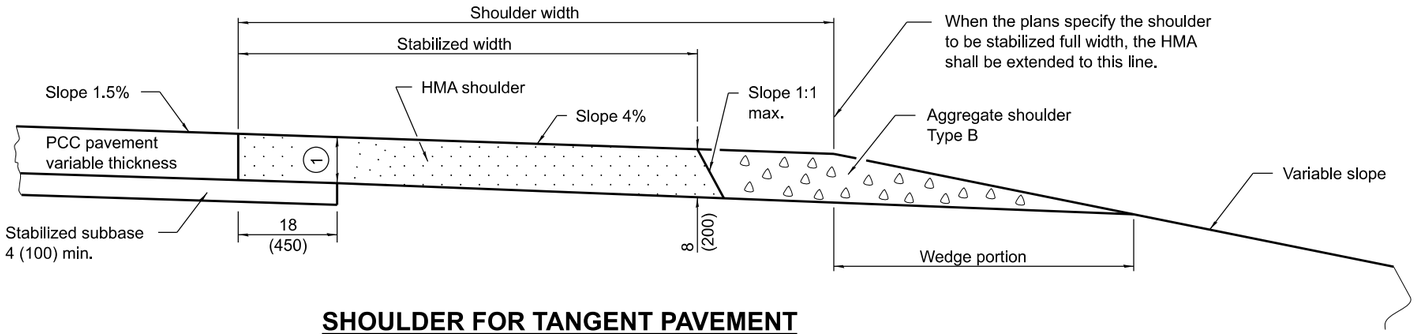
APPROVED January 1, 2008
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2008
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

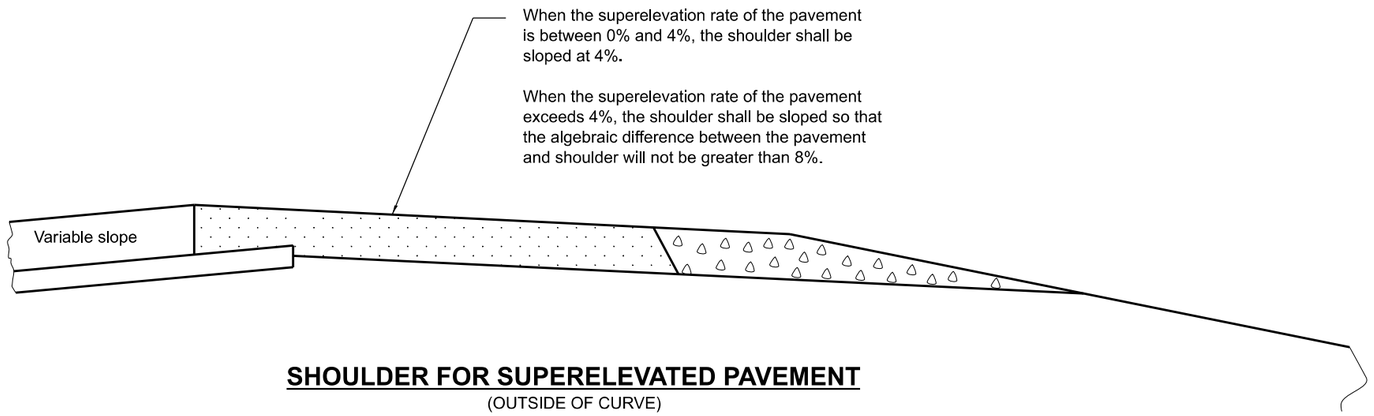
DATE	REVISIONS
1-1-08	Switched units to English (metric).
1-1-07	Switched to Hot-Mix
	Asphalt (MHA) terminology.

HMA SHOULDER ADJACENT TO FLEXIBLE PAVEMENT

STANDARD 482001-02

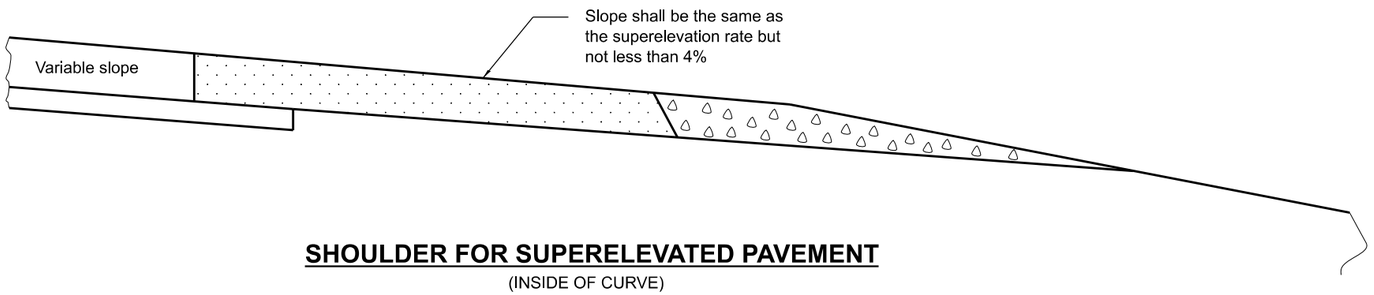


SHOULDER FOR TANGENT PAVEMENT



SHOULDER FOR SUPERELEVATED PAVEMENT

(OUTSIDE OF CURVE)



SHOULDER FOR SUPERELEVATED PAVEMENT

(INSIDE OF CURVE)

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

GENERAL NOTES

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

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

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

Illinois Department of Transportation

APPROVED January 1, 2008
ENGINEER OF POLICY AND PROCEDURES

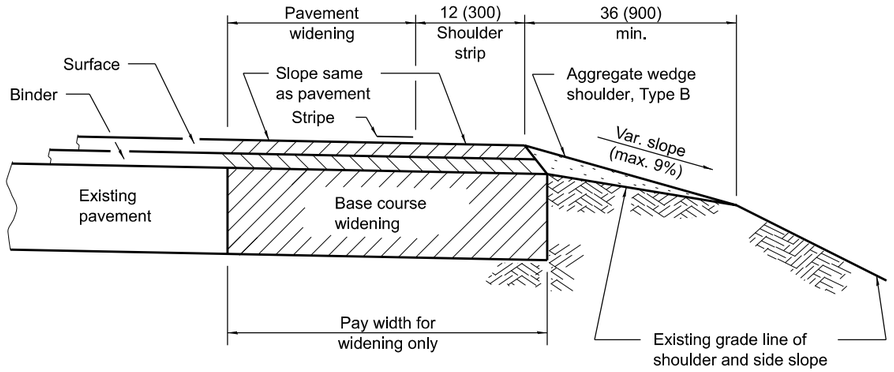
APPROVED January 1, 2008
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

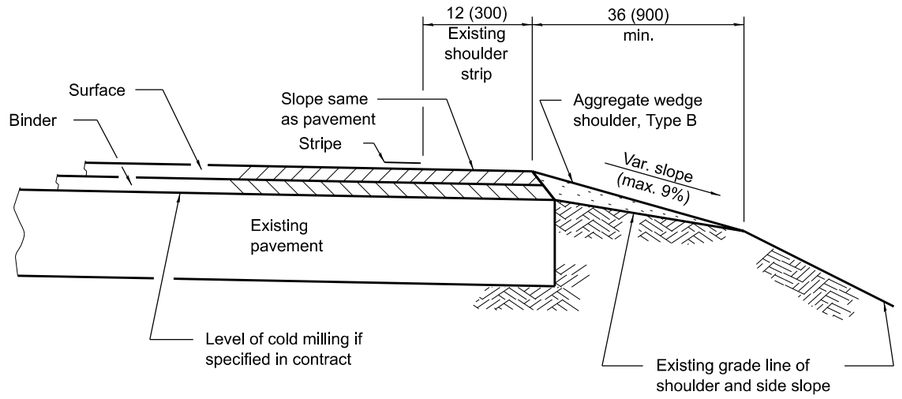
HMA SHOULDER ADJACENT TO RIGID PAVEMENT

STANDARD 482006-03



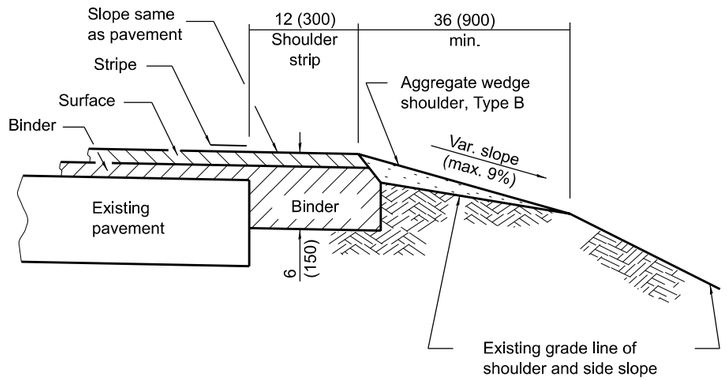
HMA SHOULDER STRIP AND AGGREGATE WEDGE WITH WIDENING

(Cross-section A)



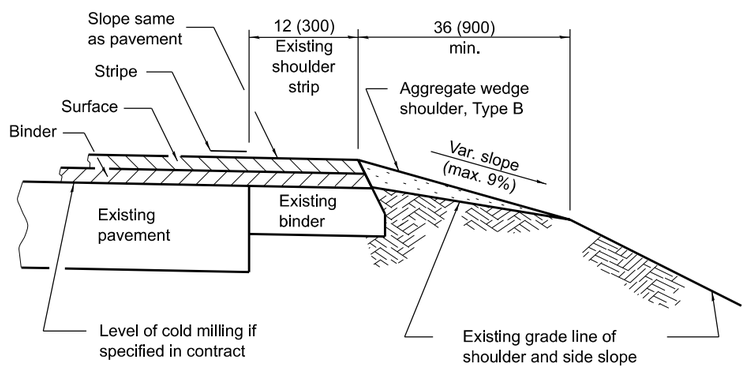
COLD MILLING AND/OR RESURFACING OF EXISTING PAVEMENT WITH SHOULDER STRIPS

(Cross-section C)



HMA SHOULDER STRIP AND AGGREGATE WEDGE WITH RESURFACING

(Cross-section B)



COLD MILLING AND/OR RESURFACING OF EXISTING PAVEMENT WITH SHOULDER STRIPS

(Cross-section D)

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

Illinois Department of Transportation

APPROVED January 1, 2008
ENGINEER OF POLICY AND PROCEDURES

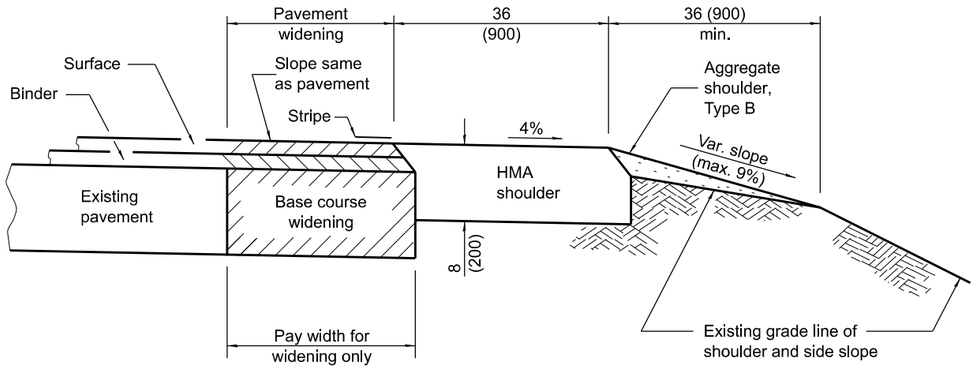
APPROVED January 1, 2008
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

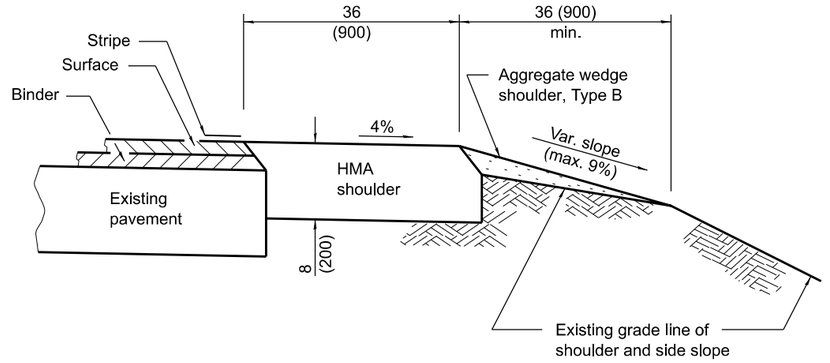
HMA SHLD. STRIPS/SHLDS. WITH RESURFACING OR WIDENING AND RESURFACING PROJECTS

STANDARD 482011-03



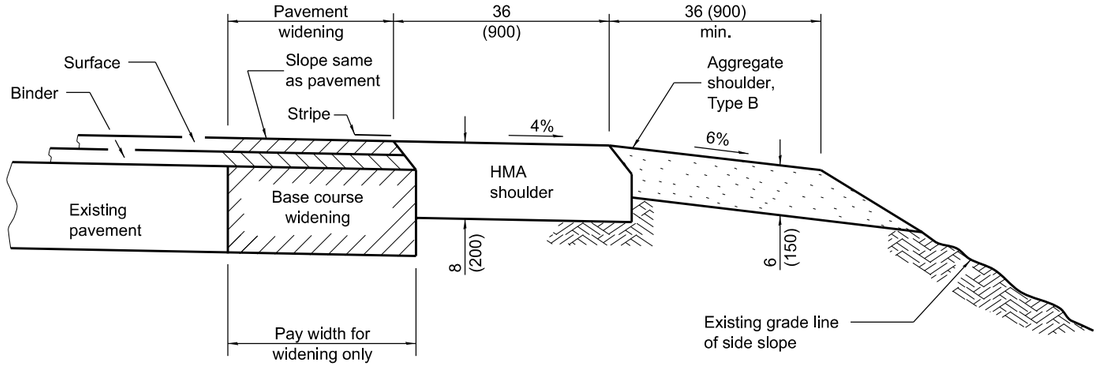
HMA SHOULDER AND AGGREGATE WEDGE WITH WIDENING

(Cross-section E)



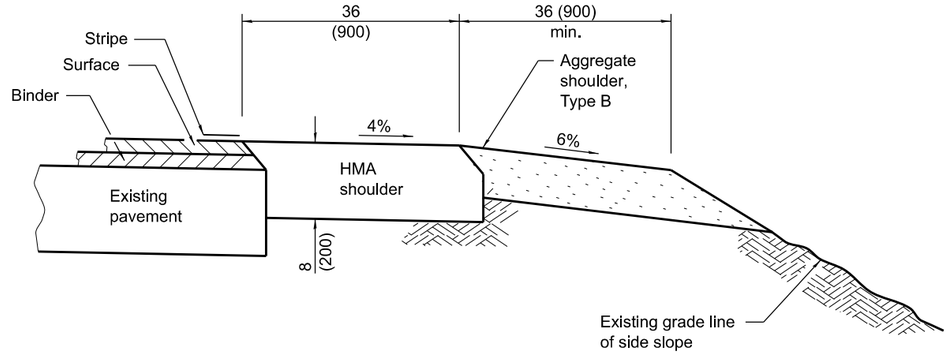
HMA SHOULDER AND AGGREGATE WEDGE WITH RESURFACING

(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

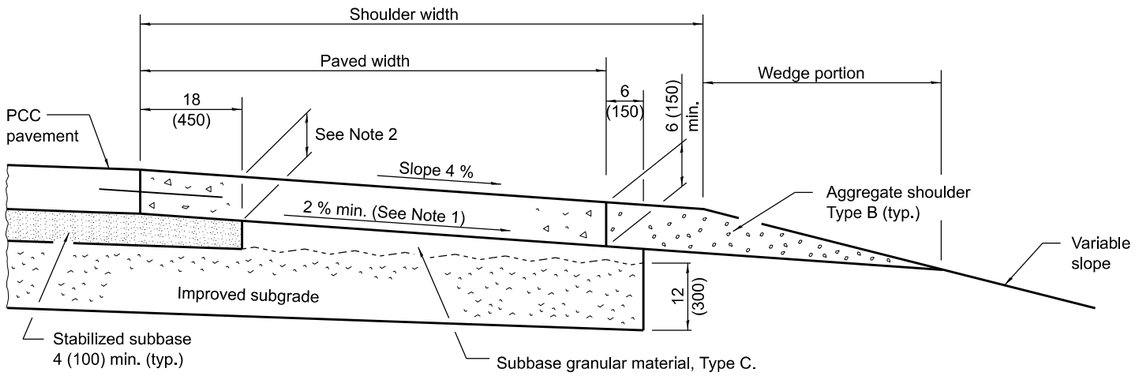
APPROVED January 1, 2008
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2008
ENGINEER OF DESIGN AND ENVIRONMENT

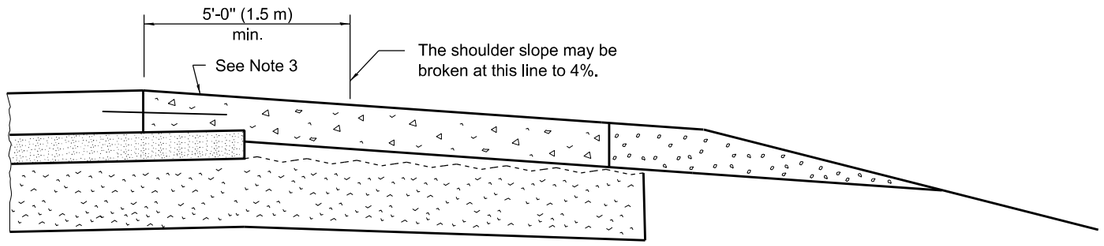
ISSUED 1-1-97

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

STANDARD 482011-03

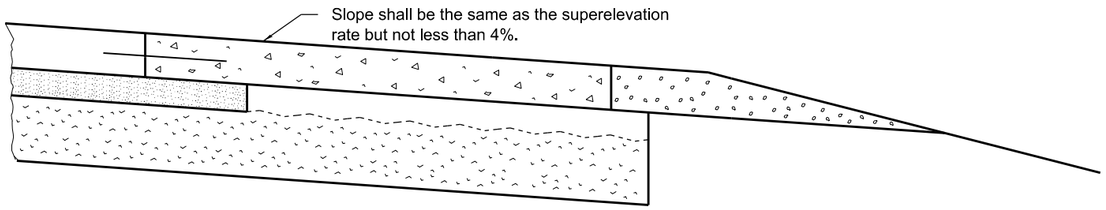


SHOULDER FOR TANGENT PAVEMENT



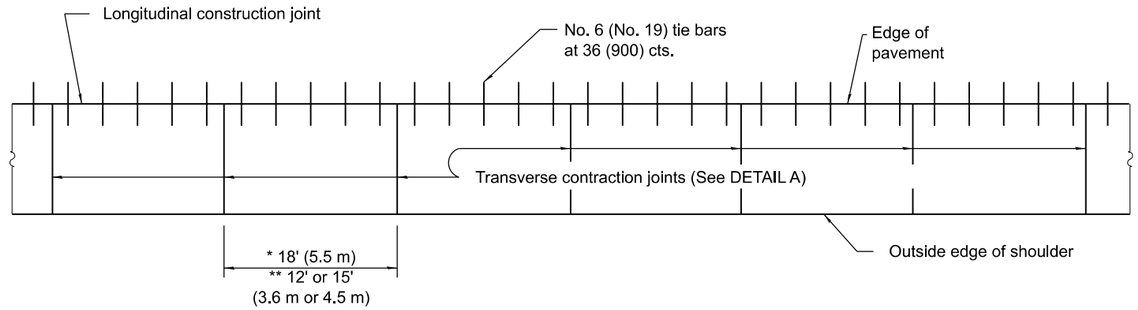
SHOULDER FOR SUPERELEVATED PAVEMENT

(Outside of curve)



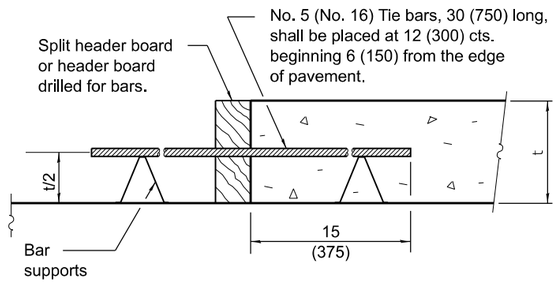
SHOULDER FOR SUPERELEVATED PAVEMENT

(Inside of curve)

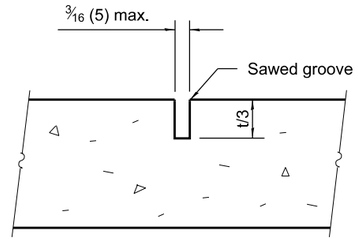


* spacing adjacent to CRC pavement
** spacing adjacent to jointed pavement to match matchline

PLAN



TRANSVERSE CONSTRUCTION JOINT



DETAIL A

TRANSVERSE CONTRACTION JOINT

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%.

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 dowel bars will not be required.

See Standard 420001 for details not shown.

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

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

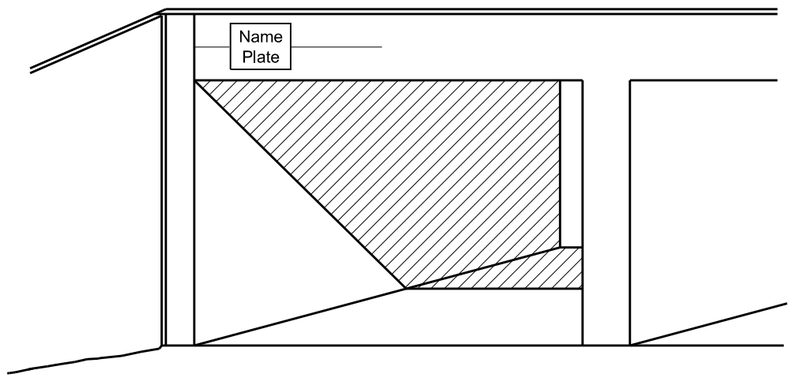
APPROVED January 1, 2022
Scott Schaefer
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-22	Revised header board callout.
	Detail A and spacing of transverse
	contraction joints.
1-1-18	Modified PLAN view. Changed tie
	bar spacing to 36 (900).

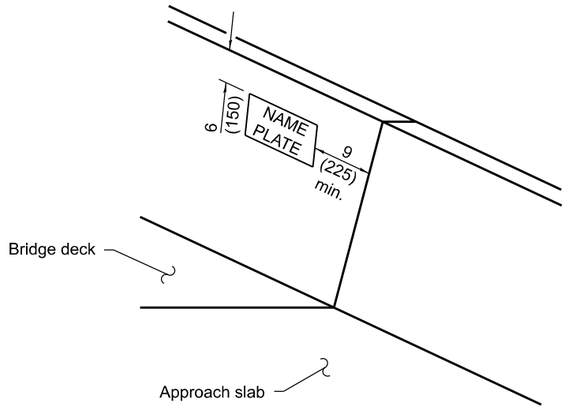
PCC SHOULDER

STANDARD 483001-06



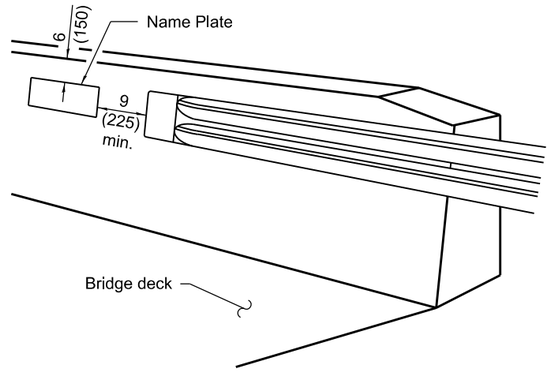
MULTI-SPAN CULVERTS

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



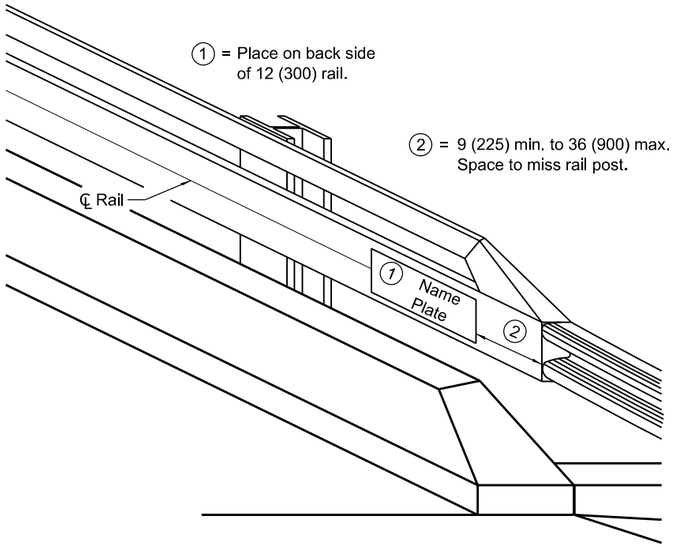
PARAPET

(Typical)

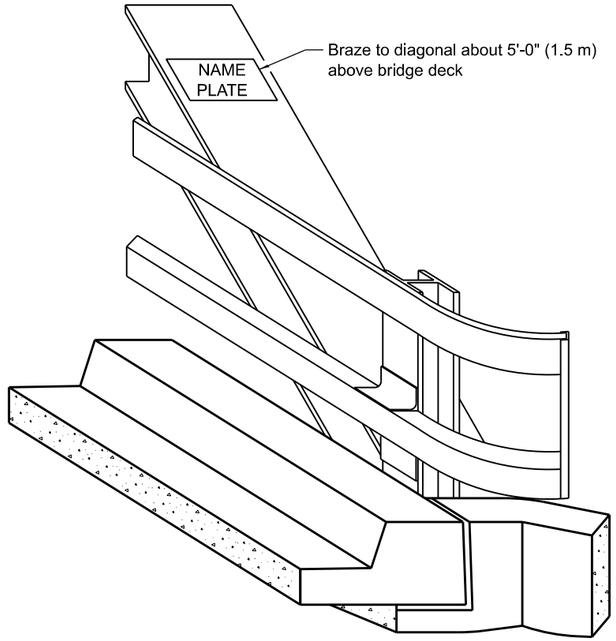


PARAPET

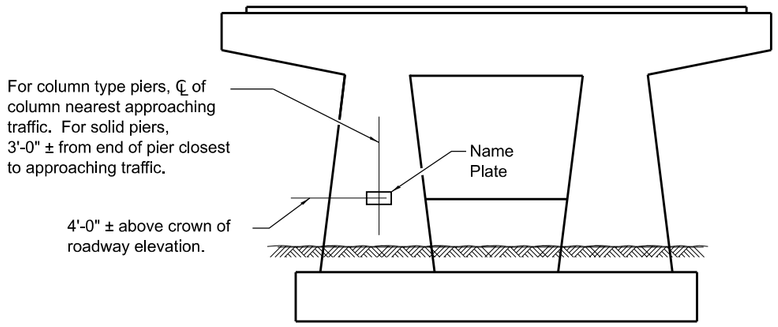
(Terminated at end of bridge)



STEEL RAILS



TRUSSES



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, 2020
ENGINEER OF BRIDGES AND STRUCTURES

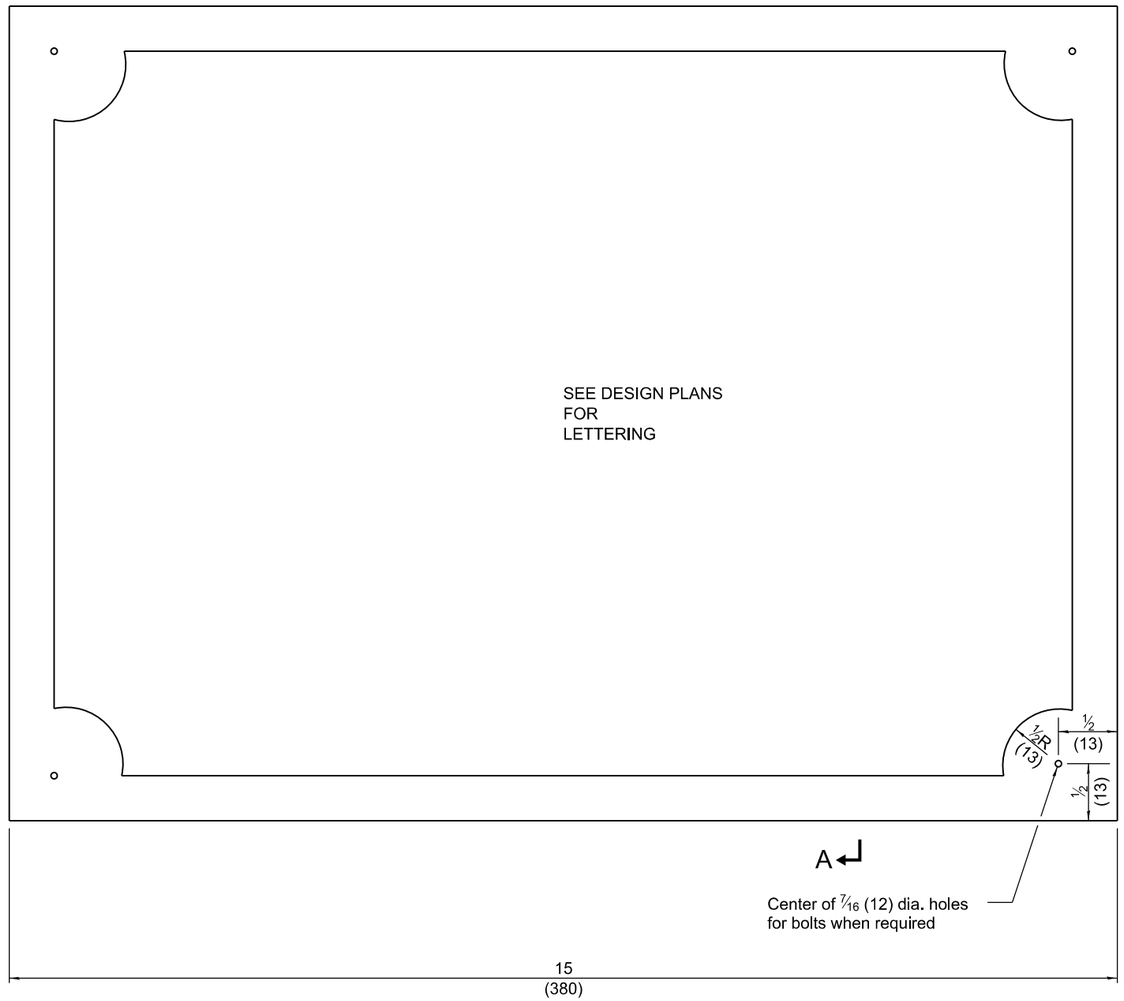
APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

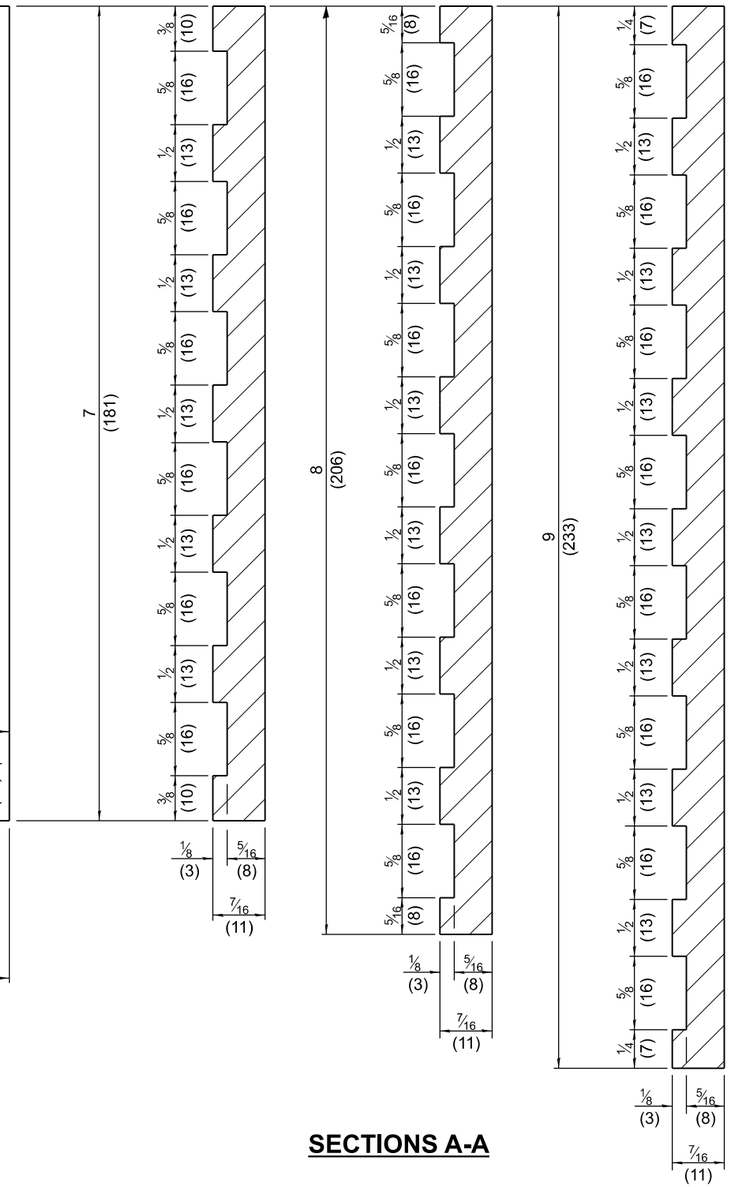
DATE	REVISIONS
1-1-20	Revised F-shape to constant slope parapet.
1-1-09	Switched units to English (metric). Added pier detail.

NAME PLATE FOR BRIDGES

STANDARD 515001-04



Lettering for



SECTIONS A-A

NOTE
Border and lettering:
Raised 1/8 (3), square cut and not tapered.

Illinois Department of Transportation

APPROVED January 1, 2020
ENGINEER OF BRIDGES AND STRUCTURES

APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

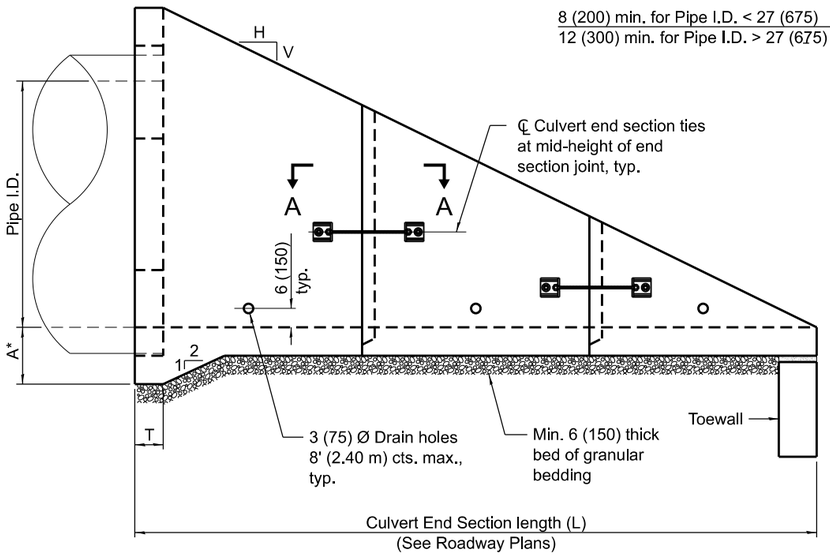
NAME PLATE FOR BRIDGES

(Sheet 2 of 2)

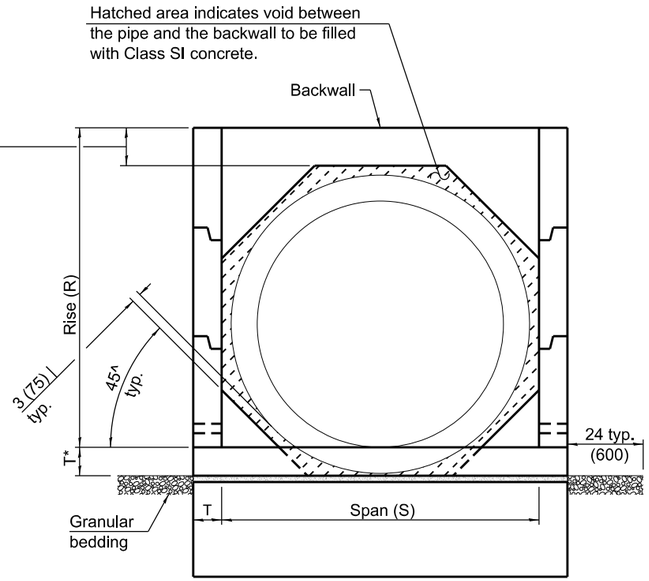
STANDARD 515001-04

PIPE CULVERT END SECTION DIMENSIONS

Pipe I.D.	A	R	S	T	L Slope of End Section 1:2	1:3	1:4	1:6
15 (375)	14 (350)	29 (737)	28 (711)	8 (200)	5'-6" (1.68 m)	7'-11" (2.42 m)	10'-4" (3.16 m)	15'-2" (4.63 m)
18 (450)	15 (375)	33 (838)	32 (813)	8 (200)	6'-2" (1.88 m)	8'-11" (2.72 m)	11'-8" (3.56 m)	17'-2" (5.24 m)
21 (525)	15 (375)	36 (914)	34 (864)	8 (200)	6'-8" (2.03 m)	9'-8" (2.95 m)	12'-8" (3.86 m)	18'-8" (5.69 m)
24 (600)	15 (375)	39 (990)	38 (970)	8 (200)	7'-2" (2.19 m)	10'-5" (3.18 m)	13'-8" (4.17 m)	20'-2" (6.15 m)
27 (675)	15 (375)	3'-10" (1.17 m)	3'-6" (1.07 m)	8 (200)	8'-4" (2.54 m)	12'-2" (3.71 m)	16'-0" (4.88 m)	23'-8" (7.21 m)
30 (750)	16 (400)	4'-2" (1.27 m)	3'-10" 1.17 m)	8 (200)	9'-0" (2.75 m)	13'-2" (4.02 m)	17'-4" (5.29 m)	25'-8" (7.83 m)
33 (825)	16 (400)	4'-5" (1.35 m)	4'-0" (1.22 m)	8 (200)	9'-6" (2.90 m)	13'-11" (4.25 m)	18'-4" (5.60 m)	27'-2" (8.29 m)
36 (900)	16 (400)	4'-8" (1.42 m)	4'-4" (1.32 m)	8 (200)	10'-0" (3.05 m)	14'-8" (4.47 m)	19'-4" (5.90 m)	28'-8" (8.74 m)
42 (1050)	17 (425)	5'-3" (1.60 m)	5'-0" (1.52 m)	8 (200)	11'-2" (3.41 m)	16'-5" (5.01 m)	21'-8" (6.61 m)	32'-2" (9.81 m)
48 (1200)	17 (425)	5'-9" (1.75 m)	5'-6" (1.68 m)	8 (200)	12'-2" (3.71 m)	17'-11" (5.46 m)	23'-8" (7.22 m)	35'-2" (10.73 m)
54 (1350)	18 (450)	6'-4" (1.93 m)	6'-2" (1.88 m)	8 (200)	13'-4" (4.07 m)	19'-8" (6.00 m)	26'-0" (7.93 m)	38'-8" (11.79 m)
60 (1500)	18 (450)	6'-10" (2.08 m)	6'-8" (2.03 m)	8 (200)	14'-4" (4.37 m)	21'-2" (6.46 m)	28'-0" (8.54 m)	41'-8" (12.71 m)
66 (1650)	19 (475)	7'-5" (2.26 m)	7'-4" (2.24 m)	8 (200)	15'-6" (4.73 m)	22'-11" (6.99 m)	30'-4" (9.26 m)	45'-2" (13.78 m)
72 (1800)	19 (475)	7'-11" (2.41 m)	7'-10" (2.39 m)	8 (200)	16'-6" (5.03 m)	24'-5" (7.45 m)	32'-4" (9.87 m)	48'-2" (14.70 m)
78 (1950)	21 (525)	8'-6" (2.59 m)	8'-6" (2.59 m)	9 (230)	17'-9" (5.41 m)	26'-3" (8.01 m)	34'-9" (10.60 m)	51'-9" (15.78 m)
84 (2100)	21 (525)	9'-0" (2.74 m)	9'-0" (2.74 m)	9 (230)	18'-9" (5.72 m)	27'-9" (8.46 m)	36'-9" (11.21 m)	54'-9" (16.70 m)

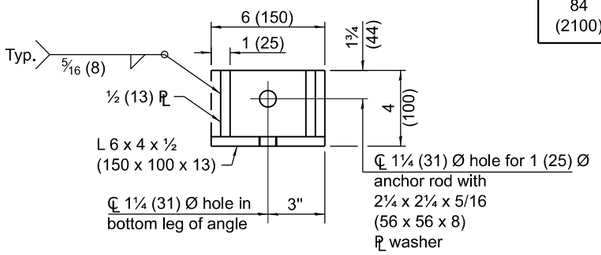


ELEVATION

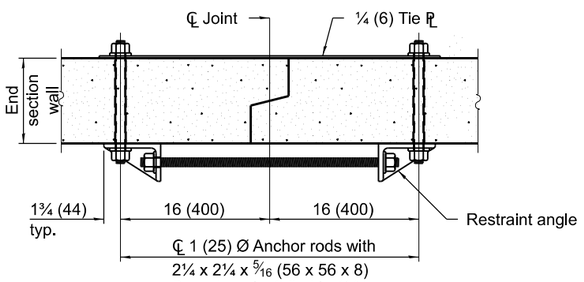


END VIEW

- This dimension shall be increased by 1½ (38) for CIP field construction. See General Notes.

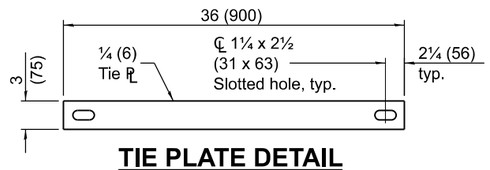


RESTRAINT ANGLE DETAIL

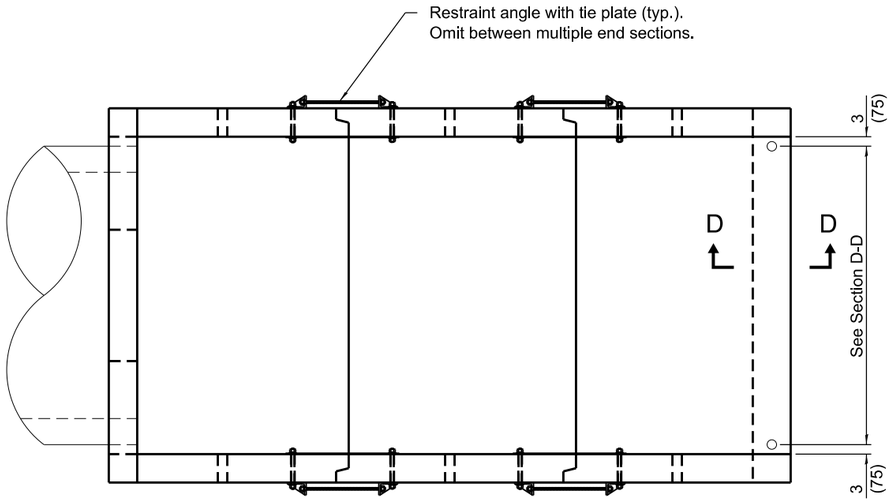


SECTION A-A

(Showing end section tie details)



TIE PLATE DETAIL



PLAN

See Sheet 2 for GENERAL NOTES

Illinois Department of Transportation

APPROVED April 15, 2016
ENGINEER OF BRIDGES AND STRUCTURES

APPROVED April 15, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

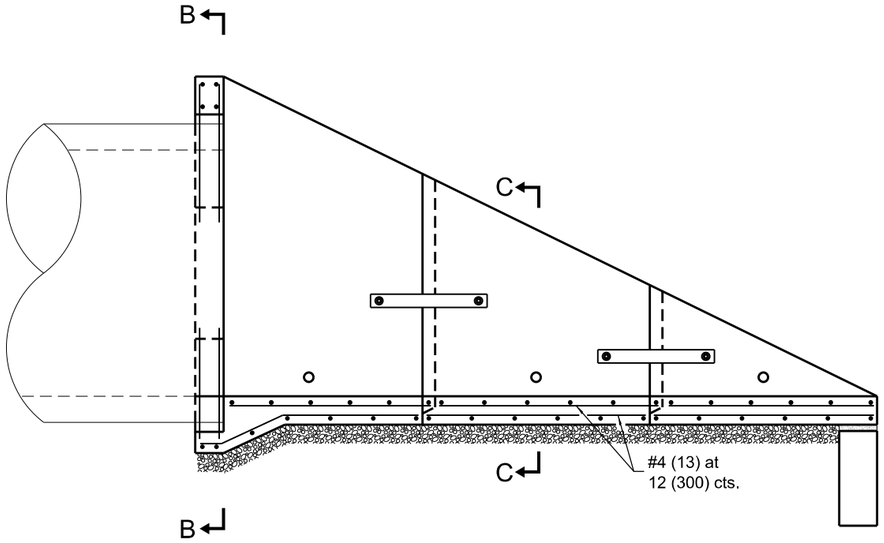
ISSUED 1-1-97

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

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

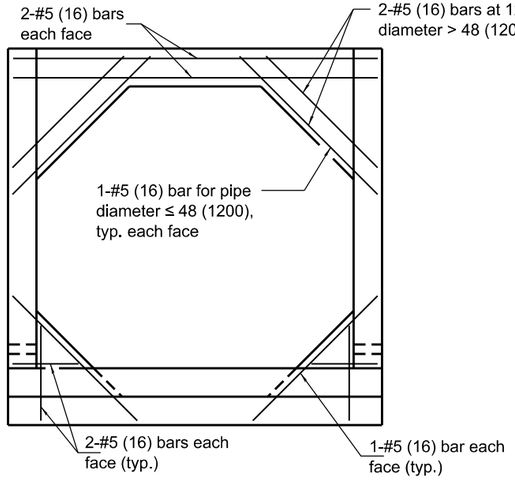
(Sheet 1 of 3)

STANDARD 542001-06



LONGITUDINAL SECTION

(Showing bottom slab and backwall reinforcement.)



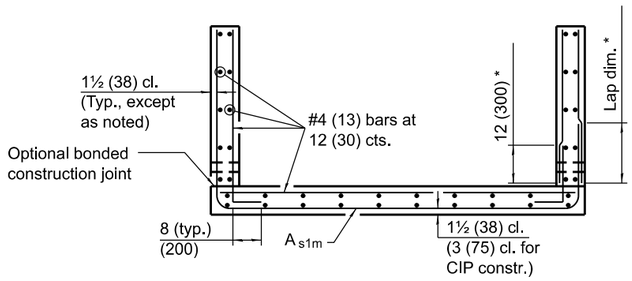
SECTION B-B

(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)

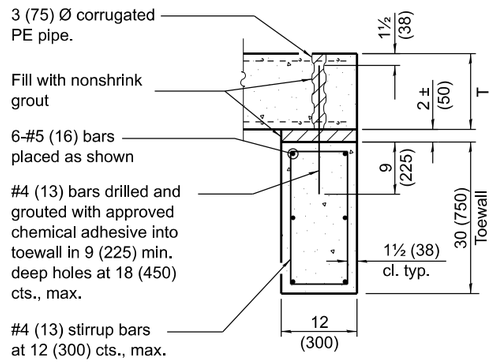
* The Contractor may use lap splices for the sidewall reinforcement at the locations shown.



SECTION C-C

REINFORCEMENT SCHEDULE

Pipe I.D.	As1m	
	Bar Size	Bar Spacing
15 (375)	4 (13)	12 (300)
18 (450)	4 (13)	12 (300)
21 (525)	4 (13)	12 (300)
24 (600)	4 (13)	12 (300)
27 (675)	4 (13)	12 (300)
30 (750)	4 (13)	12 (300)
33 (825)	4 (13)	12 (300)
36 (900)	4 (13)	12 (300)
42 (1050)	4 (13)	8 (200)
48 (1200)	4 (13)	8 (200)
54 (1350)	5 (16)	8 (200)
60 (1500)	5 (16)	8 (200)
66 (1650)	5 (16)	8 (200)
72 (1800)	6 (19)	8 (200)
78 (1950)	6 (19)	8 (200)
84 (2100)	6 (19)	8 (200)



SECTION D-D

GENERAL NOTES

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

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

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

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

2¼ x 2¼ x 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.

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

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

STANDARD 542001-06

QUANTITIES

Pipe I.D.	Concrete yd³(m³) ① Slope of End Section 1:2	1:3	1:4	1:6	Reinforcement Without Lap lbs. (kg) Slope of End Section 1:2	1:3	1:4	1:6	Reinforcement With Lap lbs. (kg) Slope of End Section 1:2	1:3	1:4	1:6
15 (375)	1.3 (1.0)	1.7 (1.3)	2.1 (1.6)	2.8 (2.1)	190 (85.2)	230 (104.1)	280 (123.3)	360 (159.2)	210 (94.9)	260 (117.6)	310 (140.3)	410 (182.9)
18 (450)	1.6 (1.2)	2.1 (1.6)	2.6 (2.0)	3.5 (2.7)	230 (104.3)	290 (131.1)	350 (158.0)	460 (207.3)	260 (114.8)	330 (146.0)	400 (177.3)	520 (234.0)
21 (525)	1.8 (1.4)	2.3 (1.8)	2.9 (2.2)	3.9 (3.0)	260 (114.5)	320 (143.3)	380 (172.2)	510 (229.9)	280 (126.5)	360 (159.7)	430 (193.0)	580 (259.5)
24 (600)	2.1 (1.6)	2.7 (2.1)	3.3 (2.5)	4.5 (3.4)	270 (121.9)	350 (155.8)	420 (189.3)	560 (251.5)	300 (133.9)	390 (172.8)	470 (211.6)	630 (282.6)
27 (675)	2.6 (2.0)	3.4 (2.6)	4.2 (3.2)	5.8 (4.4)	350 (155.5)	440 (198.5)	540 (244.4)	740 (336.3)	380 (169.6)	480 (217.8)	600 (269.6)	830 (373.2)
30 (750)	2.9 (2.2)	3.9 (3.0)	4.9 (3.7)	6.8 (5.2)	380 (169.6)	490 (219.2)	600 (271.9)	830 (374.0)	410 (184.5)	530 (240.0)	660 (299.2)	920 (413.9)
33 (825)	3.2 (2.4)	4.3 (3.3)	5.3 (4.1)	7.4 (5.7)	400 (179.7)	520 (234.9)	640 (290.3)	880 (397.6)	430 (195.2)	570 (257.2)	710 (319.0)	970 (438.9)
36 (900)	3.5 (2.7)	4.7 (3.6)	5.9 (4.5)	8.3 (6.3)	440 (197.8)	580 (262.4)	720 (323.8)	990 (449.4)	480 (214.2)	630 (286.1)	780 (354.0)	1090 (493.7)
42 (1050)	4.3 (3.3)	5.8 (4.4)	7.3 (5.6)	10.3 (7.9)	570 (256.4)	770 (346.4)	950 (429.0)	1330 (601.3)	620 (279.4)	840 (380.0)	1040 (471.6)	1470 (663.7)
48 (1200)	5.0 (3.8)	6.8 (5.2)	8.6 (6.6)	12.2 (9.3)	670 (301.1)	910 (409.9)	1140 (514.8)	1610 (728.2)	720 (325.6)	990 (445.8)	1240 (561.2)	1760 (796.8)
54 (1350)	6.0 (4.6)	8.2 (6.3)	10.3 (7.9)	14.7 (11.2)	890 (403.6)	1200 (544.5)	1530 (692.0)	2170 (985.0)	990 (448.6)	1340 (608.1)	1710 (775.8)	2440 (1108.2)
60 (1500)	6.8 (5.2)	9.3 (7.1)	11.8 (9.0)	16.8 (12.8)	1020 (461.5)	1400 (635.3)	1780 (806.8)	2530 (1149.8)	1120 (508.8)	1550 (704.5)	1980 (896.8)	2820 (1281.5)
66 (1650)	7.9 (6.0)	10.9 (8.3)	13.8 (10.6)	19.7 (15.1)	1150 (519.0)	1570 (712.4)	2010 (911.1)	2880 (1305.8)	1260 (570.2)	1730 (786.1)	2220 (1007.9)	3190 (1449.3)
72 (1800)	8.8 (6.7)	12.2 (9.3)	15.5 (11.9)	22.2 (17.0)	1520 (689.9)	2120 (962.1)	2690 (1222.5)	3880 (1761.3)	1710 (777.0)	2400 (1088.2)	3050 (1384.8)	4410 (2001.0)
78 (1950)	11.4 (8.7)	15.8 (12.1)	20.1 (15.4)	28.9 (22.1)	1750 (791.1)	2400 (1090.7)	3100 (1409.0)	4490 (2039.7)	1950 (885.5)	2700 (1223.1)	3490 (1583.9)	5060 (2298.9)
84 (2100)	12.6 (9.6)	17.4 (13.3)	22.3 (17.0)	32.1 (24.5)	1900 (862.7)	2680 (1217.4)	3430 (1558.6)	4960 (2254.4)	2120 (959.6)	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

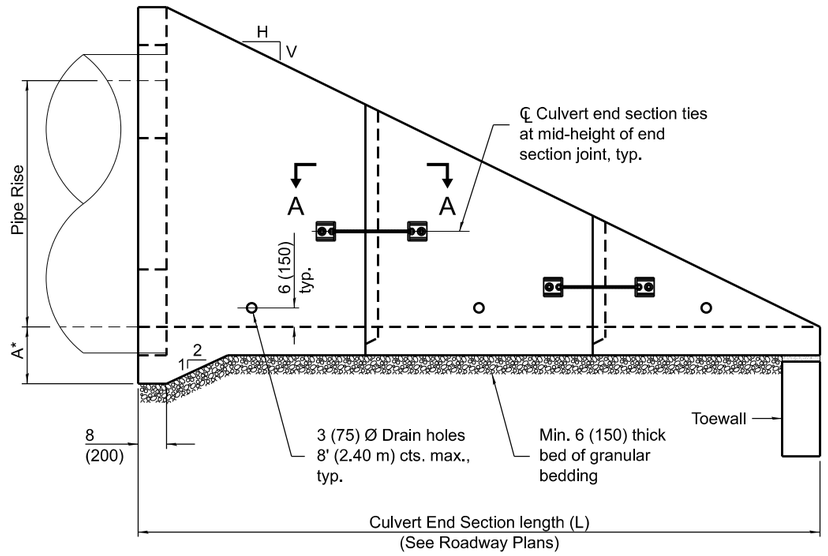
APPROVED April 15, 2016
ENGINEER OF BRIDGES AND STRUCTURES

APPROVED April 15, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

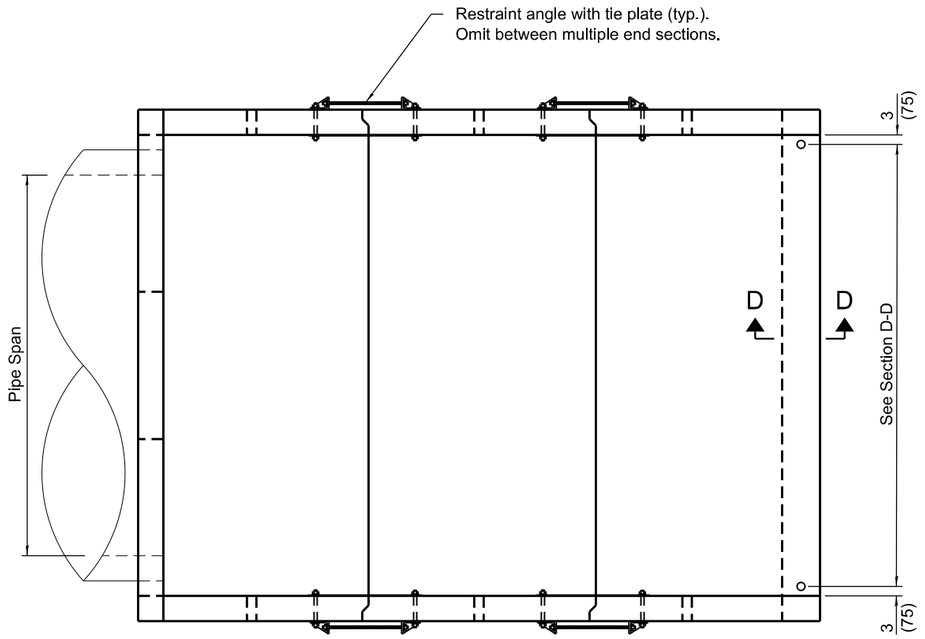
CONCRETE END SECTIONS FOR PIPE CULVERTS 15" (375 mm) THRU 84" (2100 mm) DIA.

STANDARD 542001-06

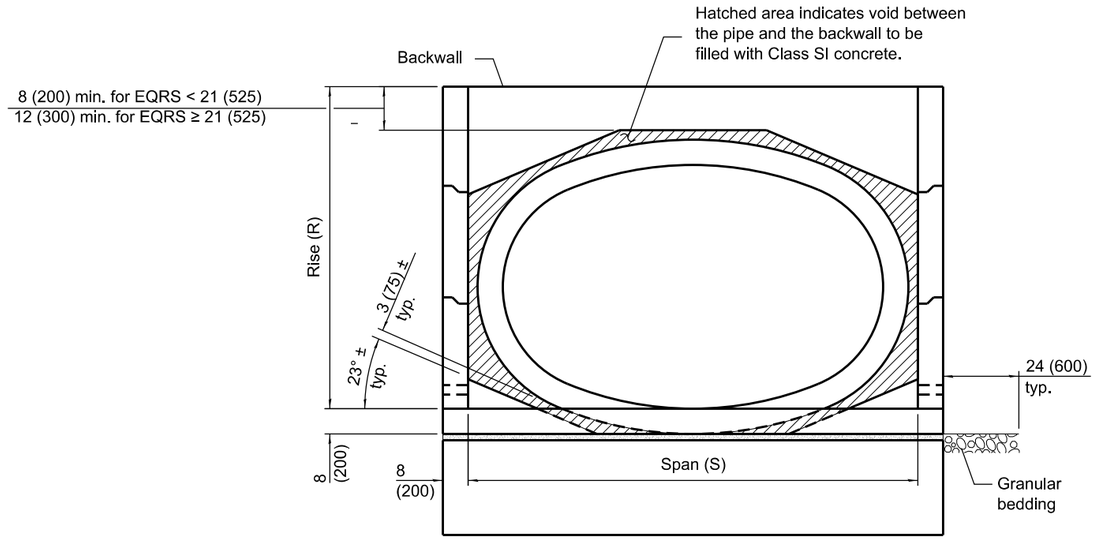


ELEVATION

* This dimension shall be increased by 1½ (38) for CIP field construction.



PLAN



END VIEW

PIPE CULVERT END SECTION DIMENSIONS

Equivalent Round Size Pipe I.D.	Pipe Span	Pipe Rise	A	R	S	L Slope of End Section 1:2	1:3	1:4	1:6
15 (375)	23 (575)	14 (350)	15 (375)	28 (711)	36 (914)	5'-4" (1.62 m)	7'-8" (2.34 m)	10'-0" (3.05 m)	14'-8" (4.47 m)
18 (450)	23 (575)	14 (350)	15 (375)	28 (711)	36 (914)	5'-4" (1.62 m)	7'-8" (2.34 m)	10'-0" (3.05 m)	14'-8" (4.47 m)
21 (525)	30 (750)	19 (475)	15 (375)	38 (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)	4'-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)	4'-6" (1.37 m)	5'-10" (1.78 m)	9'-8" (2.95 m)	14'-2" (4.32 m)	18'-8" (5.69 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.

Illinois Department of Transportation

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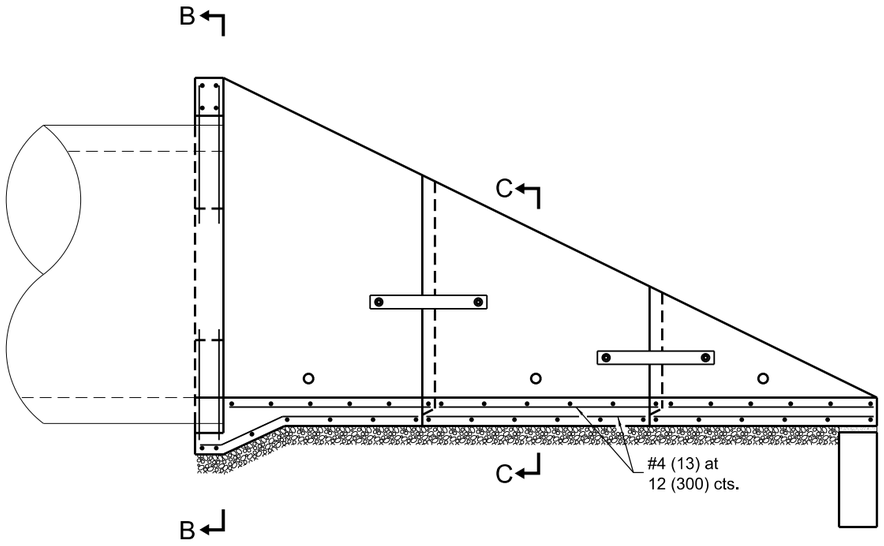
ISSUED 1-1-13

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

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

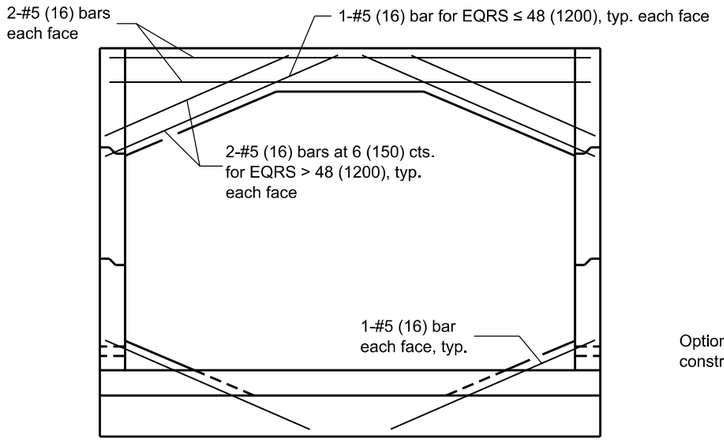
(Sheet 1 of 3)

STANDARD 542011-02



LONGITUDINAL SECTION

(Showing bottom slab and backwall reinforcement.)



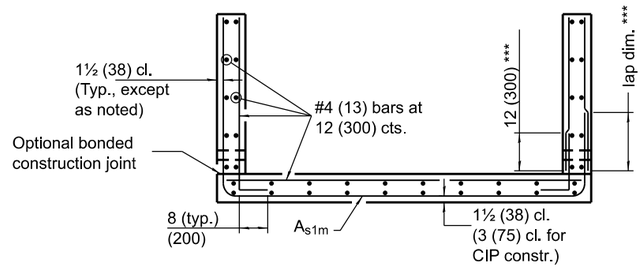
SECTION B-B

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

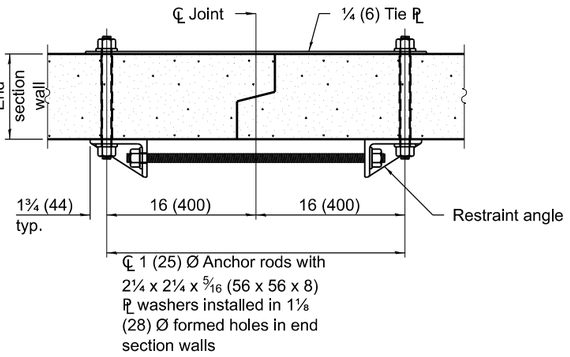
LAP DIMENSION

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

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

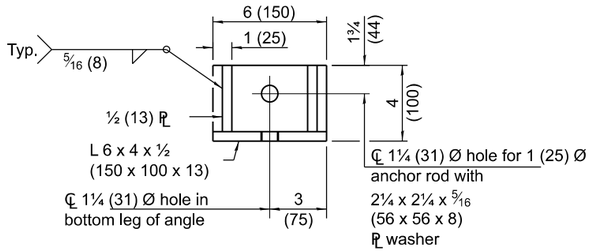


SECTION C-C

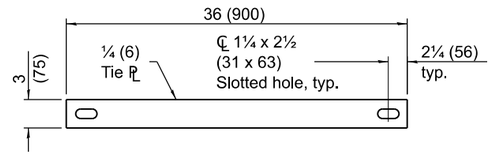


SECTION A-A

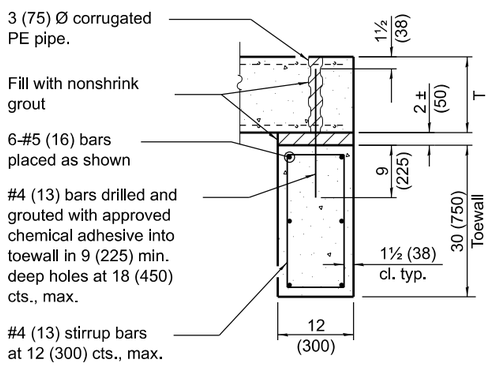
(Showing end section tie details)



RESTRAINT ANGLE DETAIL



TIE PLATE DETAIL



SECTION D-D

REINFORCEMENT SCHEDULE

Equivalent Round Size Pipe I.D.	As1m	
	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)

Illinois Department of Transportation

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

ISSUED 1-1-13

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

(Sheet 2 of 3)

STANDARD 542011-02

QUANTITIES

Equivalent Round Size Pipe I.D.	Concrete yd^3(m^3) ① Slope of End Section				Reinforcement Without Lap lbs. (kg) Slope of End Section				Reinforcement With Lap lbs. (kg) 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.

2¼ x 2¼ 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.

Illinois Department of Transportation

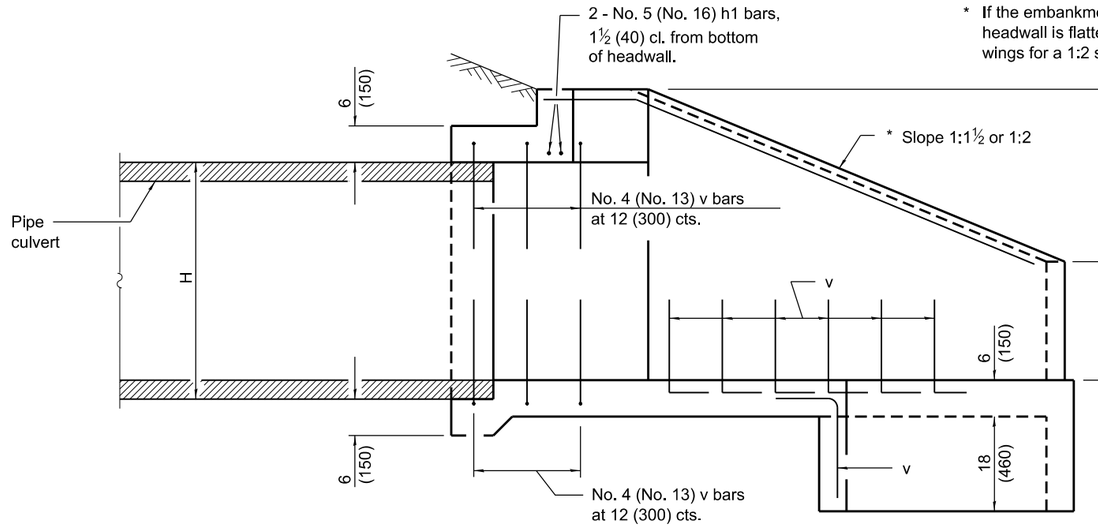
APPROVED April 15, 2016
ENGINEER OF BRIDGES AND STRUCTURES

APPROVED April 15, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

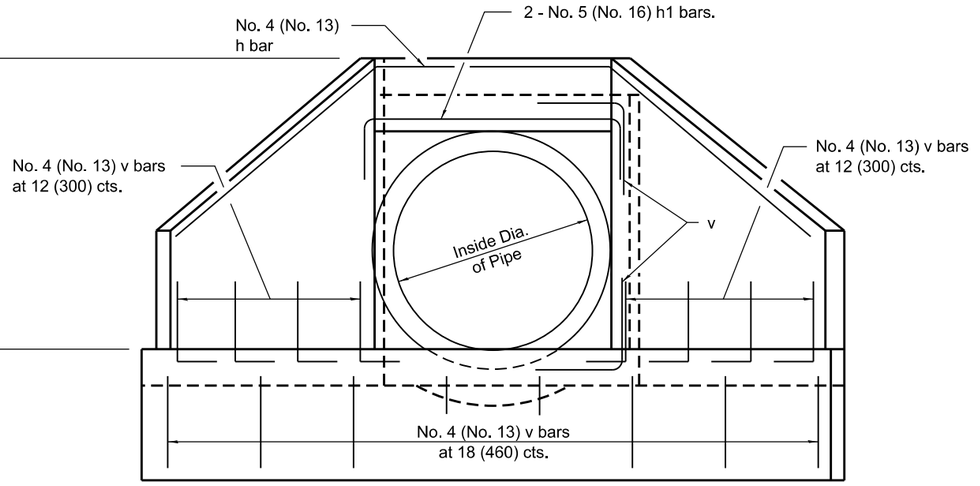
CONCRETE END SECTIONS FOR ELLIPTICAL PIPE CULVERTS 15" (375 mm) THRU 72" (1800 mm) EQUIVALENT DIAMETER

STANDARD 542011-02

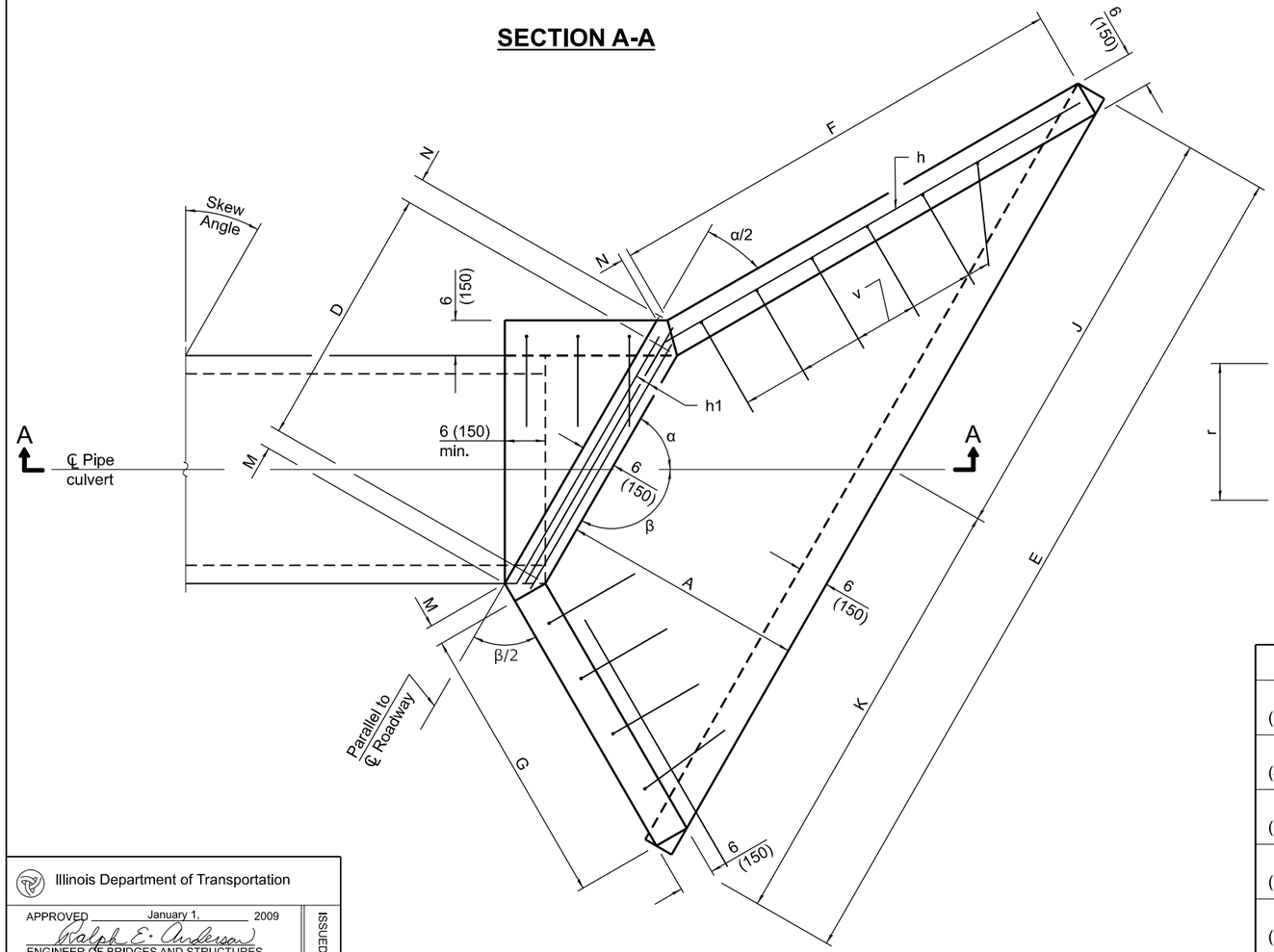


* If the embankment slope above the headwall is flatter than 1:2, provide wings for a 1:2 slope.

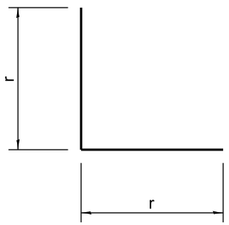
SECTION A-A



END VIEW

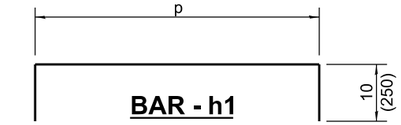


PLAN



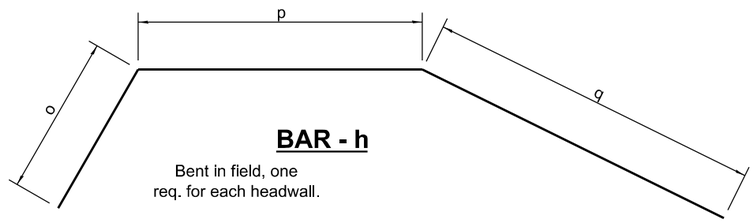
BAR - v

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



BAR - h1

Bent in field, two req. for each headwall.



BAR - h

Bent in field, one req. for each headwall.

GENERAL NOTES

Build tops of headwalls parallel to grade line.

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

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

Illinois Department of Transportation

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

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Soft converted metric reinforcement
	bars. Added h$_1$ bars.

REINFORCED CONCRETE END SECTIONS FOR PIPE CULVERTS 15" (375 mm) THRU 36" (900 mm) DIA. SKEWED WITH ROADWAY

(Sheet 1 of 5)

STANDARD 542201-02

WINGS FOR 1:1½ 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)
			A	B	C	D	E	F	G	H	J	K	M	N	α		h - bars				h1 - bars		v-bars No.	
																	o	p	q	Lgth.	p	Lgth.		
5°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	19 (485)	6'-11¾" (2.15 m)	3'-5½" (1.07 m)	38 (980)	19 (483)	3'-5¾" (1.07 m)	3'-6" (1.08 m)	2¾ (70)	2¼ (60)	85°	1.4 (1.1)	3'-6" (1.01 m)	21 (551)	3'-9" (1.09 m)	9'-0" (2.65 m)	21 (551)	3'-5" (1.04 m)	28	90 (41)
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	22 (561)	7'-2¾" (2.22 m)	3'-5½" (1.07 m)	38 (980)	22 (559)	3'-7¼" (1.11 m)	3'-7½" (1.11 m)	2¾ (70)	2¼ (60)	85°	1.6 (1.2)	3'-6" (1.03 m)	24 (626)	3'-9" (1.12 m)	9'-3" (2.78 m)	24 (626)	3'-8" (1.12 m)	28	100 (45)
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	30 (765)	8'-10¾" (2.73 m)	4'-2¼" (1.29 m)	3'-10" (1.18 m)	30 (762)	4'-5¼" (1.36 m)	4'-5½" (1.37 m)	2¾ (70)	2¼ (60)	85°	2.2 (1.7)	4'-3" (1.23 m)	32 (832)	4'-7" (1.33 m)	11'-6" (3.39 m)	32 (832)	4'-4" (1.32 m)	32	140 (63)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	3'-9" (1140)	36 (917)	10'-3" (3.12 m)	4'-9¾" (1.47 m)	4'-5" (1.35 m)	36 (914)	5'-1¼" (1.56 m)	5'-1¾" (1.56 m)	2¾ (70)	2¼ (60)	85°	2.7 (2.1)	4'-10" (1.39 m)	39 (983)	5'-2" (1.51 m)	13'-3" (3.88 m)	39 (983)	4'-11" (1.50 m)	36	180 (81)
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	3'-8¼" (1123)	11'-11" (3.63 m)	5'-6½" (1.69 m)	5'-1" (1.55 m)	3'-8" (1.119 m)	5'-11¼" (1.81 m)	5'-11¾" (1.82 m)	2¾ (70)	2¼ (60)	85°	3.3 (2.5)	5'-7" (1.6 m)	3'-11" (1.19 m)	6'-0" (1.73 m)	15'-6" (4.52 m)	3'-11" (1.19 m)	5'-7" (1.70 m)	42	240 (108)
10°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	19¼ (490)	7'-0½" (2.17 m)	3'-7½" (1.12 m)	36½ (940)	19 (483)	3'-6" (1.08 m)	3'-6½" (1.09 m)	2¾ (70)	2¼ (60)	80°	1.5 (1.2)	3'-4" (972)	22 (557)	3'-10" (1.14 m)	9'-0" (2.67 m)	22 (557)	3'-6" (1.07 m)	28	90 (41)
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	22¼ (568)	7'-3¾" (2.24 m)	3'-7½" (1.12 m)	36½ (940)	22 (559)	3'-7½" (1.11 m)	3'-8¼" (1.13 m)	2¾ (70)	2¼ (60)	80°	1.6 (1.2)	3'-4" (990)	25 (633)	3'-10" (1.17 m)	9'-3" (2.8 m)	25 (633)	3'-9" (1.14 m)	28	100 (45)
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	30½ (774)	9'-0" (2.76 m)	4'-5" (1.36 m)	3'-8½" (1.14 m)	30 (762)	4'-5¾" (1.37 m)	4'-6¼" (1.39 m)	2¾ (70)	2¼ (60)	80°	2.2 (1.7)	4'-1" (1.18 m)	33 (841)	4'-8" (1.4 m)	11'-6" (3.42 m)	33 (841)	4'-5" (1.35 m)	34	150 (68)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	3'-9" (1140)	36½ (928)	10'-4½" (3.15 m)	5'-0¾" (1.54 m)	4'-3" (1.3 m)	36 (914)	5'-1¾" (1.57 m)	5'-2½" (1.58 m)	2¾ (70)	2¼ (60)	80°	2.8 (2.1)	4'-9" (1.34 m)	39 (993)	5'-6" (1.58 m)	13'-6" (3.92 m)	39 (993)	4'-11" (1.50 m)	36	180 (81)
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	3'-8¾" (1136)	12'-0½" (3.67 m)	5'-10" (1.78 m)	4'-10¾" (1.49 m)	3'-8" (1.119 m)	6'-0" (1.83 m)	6'-0½" (1.84 m)	2¾ (70)	2¼ (60)	80°	3.5 (2.7)	5'-6" (1.54 m)	3'-11" (1.2 m)	6'-4" (1.82 m)	15'-9" (4.56 m)	3'-11" (1.2 m)	5'-7" (1.70 m)	42	240 (108)
15°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	19¾ (500)	7'-2" (2.2 m)	3'-10" (1.19 m)	35¼ (910)	19 (483)	3'-6½" (1.09 m)	3'-7½" (1.11 m)	3 (80)	2 (50)	75°	1.5 (1.2)	3'-4" (942)	22 (567)	4'-1" (1.2 m)	9'-3" (2.71 m)	22 (567)	3'-6" (1.07 m)	28	90 (41)
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	22¾ (579)	7'-5¼" (2.28 m)	3'-10" (1.19 m)	35¼ (910)	22 (559)	3'-8 " (1.13 m)	3'-9¼" (1.15 m)	3 (80)	2 (50)	75°	1.7 (1.3)	3'-4" (965)	25 (644)	4'-1" (1.23 m)	9'-6" (2.84 m)	25 (644)	3'-9" (1.14 m)	28	100 (45)
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	31 (789)	9'-2" (2.8 m)	4'-7¾" (1.43 m)	3'-6¾" (1.1 m)	30 (762)	4'-6½" (1.39 m)	4'-7½" (1.41 m)	3 (80)	2 (50)	75°	2.3 (1.8)	4'-0" (1.15 m)	34 (857)	4'-11" (1.47 m)	11'-9" (3.47 m)	34 (857)	4'-6" 1.37 m)	34	150 (68)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	3'-9" (1140)	37¼ (946)	10'-6½" (3.21 m)	5'-4" (1.63 m)	4'-1¼" (1.25 m)	36 (914)	5'-2¾" (1.59 m)	5'-3¾" (1.62 m)	3 (80)	2 (50)	75°	2.9 (2.2)	4'-8" (1.3 m)	3'-4" (1.01 m)	5'-9" (1.67 m)	13'-9" (3.98 m)	3'-4" (1.01 m)	5'-0" (1.52 m)	40	200 (90)
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	3'-9½" (1158)	12'-3¼" (3.73 m)	6'-2" (1.87 m)	4'-8¾" (1.44 m)	3'-8" (1.119 m)	6'-1" (1.85 m)	6'-2¼" (1.88 m)	3 (80)	2 (50)	75°	3.8 (2.9)	5'-3" (1.49 m)	4'-0" (1,22 m)	6'-6" (1.92 m)	15'-9" (4.63 m)	4'-0" (1.22 m)	5'-8" (1.73 m)	46	260 (117)
20°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	20¼ (514)	7'-4" (2.26 m)	4'-0¾" (1.26 m)	34¼ (880)	19 (483)	3'-7¼" (1.11 m)	3'-8¾" (1.15 m)	3 (80)	2 (50)	70°	1.6 (1.2)	39 (916)	23 (581)	4'-4" (1.27 m)	9'-6" (2.77 m)	23 (581)	3'-7" (1.09 m)	28	90 (41)
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	23½ (595)	7'-7½" (2.34 m)	4'-0¾" (1.26 m)	34¼ (880)	22 (559)	3'-9" (1.15 m)	3'-10½" (1.19 m)	3 (80)	2 (50)	70°	1.7 (1.3)	39 (938)	26 (661)	4'-4" (1.31 m)	9'-9" (2.9 m)	26 (661)	3'-10" (1.17 m)	28	100 (45)
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	32 (811)	9'-4½" (2.87 m)	4'-11¼" (1.52 m)	3'-5½" (1.07 m)	30 (762)	4'-7½" (1.42 m)	4'-9" (1.45 m)	3 (80)	2 (50)	70°	2.4 (1.8)	3'-11" (1.11 m)	35 (879)	5'-2" (1.56 m)	12'-0" (3.55 m)	35 (879)	4'-7" (1.40 m)	38	160 (72)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	3'-9" (1140)	28¼ (973)	10'-9¾" (3.29 m)	5'-8" (1.73 m)	3'-11½" (1.21 m)	36 (914)	5'-4¼" (1.63 m)	5'-5½" (1.66 m)	3 (80)	2 (50)	70°	3.1 (2.4)	4'-5" (1.26 m)	3'-5" (1.04 m)	5'-11" (1.77 m)	13'-9" (4.07 m)	3'-5" (1.04 m)	5'-1" (1.55 m)	42	210 (95)
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	3'-10¾" (1191)	12'-7" (3.86 m)	6'-6½" (1.99 m)	4'-7" (1.41 m)	3'-8" (1.119 m)	6'-2¾" (1.9 m)	6'-4¼" (1.93 m)	3 (80)	2 (50)	70°	4.0 (3.1)	5'-3" (1.45 m)	4'-1" (1.26 m)	6'-11" (2.03 m)	16'-3" (4.73 m)	4'-1" (1.26 m)	5'-9" (1.75 m)	50	280 (126)
25°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	21 (533)	7'-7" (2.33 m)	4'-4" (1.34 m)	33¼ (860)	19 (483)	3'-8½" (1.14 m)	3'-10½" (1.19 m)	3¼ (90)	1¾ (50)	65°	1.6 (1.2)	39 (893)	23 (600)	4'-7" (1.36 m)	9'-9" (2.85 m)	23 (600)	3'-7" (1.09 m)	28	90 (41)
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	24¼ (617)	7'-10¼" (2.42 m)	4'-4" (1.34 m)	33¼ (860)	22 (559)	3'-10¼" (1.19 m)	4'-0" (1.23 m)	3¼ (90)	1¾ (50)	65°	1.8 (1.4)	38 (914)	27 (683)	4'-7" (1.39 m)	10'-0" (2.99 m)	27 (683)	3'-11" (1.19 m)	32	120 (54)
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	33 (841)	9'-8½" (2.97 m)	5'-3¼" (1.62 m)	3'-4¼" (1.04 m)	30 (762)	4'-9¼" (1.46 m)	4'-11¼" (1.51 m)	3¼ (90)	1¾ (50)	65°	2.5 (1.9)	3'-10" (1.09 m)	35 (909)	5'-6" (1.66 m)	12'-3" (3.65 m)	35 (909)	4'-7" (1.40 m)	38	160 (72)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	3'-9" (1140)	3'-3¾" (1008)	11'-2" (3.4 m)	6'-0½" (1.83 m)	3'-10¼" (1.18 m)	36 (914)	5'-6" (1.68 m)	5'-8" (1.72 m)	3¼ (90)	1¾ (50)	65°	3.3 (2.5)	4'-5" (1.23 m)	3'-6" (1.08 m)	6'-4" (1.88 m)	14'-3" (4.18 m)	3'-6" (1.08 m)	5'-2" (1.58 m)	44	220 (99)
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	4'-0½" (1235)	13'-0¼" (3.96 m)	6'-11¾" (2.12 m)	4'-5¼" (1.36 m)	3'-8" (1.119 m)	6'-5¼" (1.96 m)	6'-7" (2 m)	3¼ (90)	1¾ (50)	65°	4.3 (3.3)	5'-0" (1.41 m)	4'-3" (1.3 m)	7'-3" (2.16 m)	16'-6" (4.87 m)	4'-3" (1.3 m)	5'-11" (1.80 m)	50	280 (126)
30°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	22 (558)	7'-10¾" (2.43 m)	4'-8" (1.44 m)	32¼ (830)	19 (483)	3'-10¼" (1.19 m)	4'-0½" (1.24 m)	3¼ (90)	1½ (40)	60°	1.7 (1.3)	37 (873)	24 (626)	4'-11" (1.46 m)	10'-0" (2.95 m)	24 (626)	3'-8" (1.12 m)	36	110 (50)
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	25½ (645)	8'-2¼" (2.52 m)	4'-8" (1.44 m)	32¼ (830)	22 (559)	4'-0" (1.23 m)	4'-2¼" (1.29 m)	3¼ (90)	1½ (40)	60°	1.9 (1.5)	38 (893)	28 (712)	5'-0" (1.49 m)	10'-6" (3.1 m)	28 (712)	4'-0" (1.22 m)	36	130 (59)
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	34¾ (880)	10'-1¼" (3.1 m)	5'-8" (1.74 m)	3'-3¼" (1.01 m)	30 (762)	4'-11½" (1.52 m)	5'-1¾" (1.58 m)	3¼ (90)	1½ (40)	60°	2.7 (2.1)	3'-9" (1.06 m)	37 (949)	5'-11" (1.78 m)	12'-9" (3.79 m)	37 (949)	4'-9" (1.45 m)	40	170 (77)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	3'-9" (1140)	3'-5½" (1055)	11'-7¾" (3.55 m)	6'-6" (1.98 m)	3'-9" (1.15 m)	36 (914)	5'-8¾" (1.75 m)	5'-11" (1.8 m)	3¼ (90)	1½ (40)	60°	3.5 (2.7)	4'-4" (1.2 m)	3'-8" (1.12 m)	6'-9" (2.02 m)	14'-9" (4.34 m)	3'-8" (1.12 m)	5'-4" (1.63 m)	46	230 (104)
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	4'-2¾" (1292)	13'-7" (4.13 m)	7'-6" (2.28 m)	4'-4" (1.32 m)	3'-8" (1.119 m)	6'-8½" (2.04 m)	6'-10½" (2.09 m)	3¼ (90)	1½ (40)	60°	4.6 (3.5)	5'-0" (1.37 m)	4'-5" (1.36 m)	7'-10" (2.32 m)	17'-3" (5.05 m)	4'-5" (1.36 m)	6'-1" (1.86 m)	54	300 (135)

Illinois Department of Transportation

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

APPROVED January 1, 2009
Gene E Hou
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

REINFORCED CONCRETE END SECTIONS FOR PIPE CULVERTS
15" (375 mm) THRU 36" (900 mm) DIA.
SKEWED WITH ROADWAY

STANDARD 542201-02

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)
			A	B	C	D	E	F	G	H	J	K	M	N	α		h - bars				h1 - bars		v-bars No.	
																	o	p	q	Lgth.	p	Lgth.		
35°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	23¼ (590)	8'-3¾" (2.55 m)	5'-0¾" (1.56 m)	31½ (820)	19 (483)	4'-0½" (1.24 m)	4'-3" (1.31 m)	3¾ (90)	1½ (40)	55°	1.8 (1.4)	37 (855)	26 (658)	5'-3" (1.57 m)	10'-6" (3.09 m)	26 (658)	3'-10" (1.17 m)	36	110 (50)
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	27 (682)	8'-7¼" (2.65 m)	5'-0¾" (1.56 m)	31½ (820)	22 (559)	4'-2¼" (1.29 m)	4'-5" (1.36 m)	3¾ (90)	1½ (40)	55°	2.0 (1.5)	37 (876)	29 (750)	5'-3" (1.61 m)	10'-9" (3.24 m)	29 (750)	4'-1" (1.25 m)	36	130 (59)
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	36½ (930)	10'-7¾" (3.26 m)	6'-1¾" (1.88 m)	38¼ (980)	30 (762)	5'-2½" (1.6 m)	5'-5¼" (1.66 m)	3¾ (90)	1½ (40)	55°	2.9 (2.2)	3'-8" (1.04 m)	39 (1.0 m)	6'-4" (1.92 m)	13'-3" (3.96 m)	39 (1.0 m)	4'-11" (1.50 m)	40	170 (77)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	3'-9" (1140)	3'-8" (1.116 m)	12'-3¼" (3.74 m)	7'-0½" (2.15 m)	3'-8" (1.12 m)	36 (914)	6'-0¼" (1.84 m)	6'-3" (1.9 m)	3¾ (90)	1½ (40)	55°	3.7 (2.8)	4'-2" (1.17 m)	3'-11" (1.18 m)	7'-2" (2.18 m)	15'-3" (4.54 m)	3'-11" (1.18 m)	5'-7" (1.70 m)	50	240 (108)
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	4'-5¾" (1.366 m)	14'-3¾" (4.35 m)	8'-1½" (2.47 m)	4'-2¾" (1.3 m)	3'-8" (1.119 m)	7'-0½" (2.14 m)	7'-3¼" (2.21 m)	3¾ (90)	1½ (40)	55°	4.9 (3.8)	4'-11" (1.34 m)	4'-8" (1.43 m)	8'-5" (2.51 m)	18'-0" (5.29 m)	4'-8" (1.43 m)	6'-4" (1.93 m)	56	310 (140)
40°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	24¾ (631)	8'-10" (2.71 m)	5'-6¼" (1.71 m)	31 (780)	19 (483)	4'-3½" (1.32 m)	4'-6½" (1.39 m)	3¾ (100)	1¼ (40)	50°	1.9 (1.5)	37 (840)	27 (700)	5'-8" (1.71 m)	11'-0" (3.25 m)	27 (700)	3'-11" (1.19 m)	38	120 (54)
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	28¾ (730)	9'-1¾" (2.81 m)	5'-6¼" (1.71 m)	31 (780)	22 (559)	4'-5½" (1.37 m)	4'-8¼" (1.44 m)	3¾ (100)	1¼ (40)	50°	2.2 (1.7)	36 (860)	31 (798)	5'-8" (1.76 m)	11'-3" (3.41 m)	31 (798)	4'-3" (1.30 m)	38	130 (59)
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	3'-3¼" (995)	11'-4" (3.47 m)	6'-8½" (2.08 m)	37½ (960)	30 (762)	5'-6½" (1.7 m)	5'-9½" (1.77 m)	3¾ (100)	1¼ (40)	50°	3.1 (2.4)	3'-8" (1.02 m)	3'-6" (1.07 m)	6'-10" (2.1 m)	14'-0" (4.18 m)	3'-6" (1.07 m)	5'-2" (1.58 m)	48	200 (90)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	3'-9" (1140)	3'-11" (1.193 m)	13'-0¾" (3.98 m)	7'-8¼" (2.35 m)	3'-7" (1.1 m)	36 (914)	6'-5" (1.95 m)	6'-7¾" (2.03 m)	3¾ (100)	1¼ (40)	50°	4.0 (3.1)	4'-2" (1.15 m)	4'-2" (1.26 m)	7'-11" (2.38 m)	16'-3" (4.79 m)	4'-2" (1.26 m)	5'-10" (1.78 m)	54	260 (117)
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	4'-9½" (1.461 m)	15'-3" (4.64 m)	8'-10½" (2.7 m)	4'-1¾" (1.26 m)	3'-8" (1.119 m)	7'-6" (2.28 m)	7'-9" (2.35 m)	3¾ (100)	1¼ (40)	50°	5.3 (4.1)	4'-10" (1.32 m)	5'-0" (1.53 m)	9'-2" (2.74 m)	19'-0" (5.59 m)	5'-0" (1.53 m)	6'-8" (2.03 m)	62	340 (153)
45°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	27 (683)	9'-6" (2.92 m)	6'-1¼" (1.88 m)	30¼ (780)	19 (483)	4'-7½" (1.42 m)	4'-10½" (1.5 m)	4 (100)	1¼ (30)	45°	2.1 (1.6)	36 (829)	29 (753)	6'-1" (1.89 m)	11'-6" (3.47 m)	29 (753)	4'-1" (1.25 m)	40	130 (59)
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	31 (791)	9'-10¼" (3.03 m)	6'-1¼" (1.88 m)	30¼ (780)	22 (559)	4'-9½" (1.47 m)	5'-0¾" (1.56 m)	4 (100)	1¼ (30)	45°	2.4 (1.8)	36 (847)	34 (859)	6'-2" (1.94 m)	12'-0" (3.64 m)	34 (859)	4'-6" (1.37 m)	44	150 (68)
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	3'-6½" (1.078 m)	12'-3½" (3.74 m)	7'-4¾" (2.28 m)	36¾ (950)	30 (762)	5'-11½" (1.83 m)	6'-3" (1.91 m)	4 (100)	1¼ (30)	45°	3.4 (2.6)	3'-8" (1.0 m)	3'-9" (1.15 m)	7'-7" (2.31 m)	15'-0" (4.47 m)	3'-9" (1.15 m)	5'-5" (1.65 m)	50	210 (95)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	3'-9" (1140)	4'-3" (1.293 m)	14'-1" (4.29 m)	8'-6" (2.59 m)	3'-6¼" (1.08 m)	36 (914)	6'-11" (2.1 m)	7'-2" (2.19 m)	4 (100)	1¼ (30)	45°	4.4 (3.4)	4'-2" (1.13 m)	4'-5" (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 (135)
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	5'-2¼" (1.583 m)	16'-5¼" (5.01 m)	9'-9½" (2.98 m)	4'-0¾" (1.24 m)	3'-8" (1.119 m)	8'-1" (2.46 m)	8'-4¼" (2.55 m)	4 (100)	1¼ (30)	45°	5.7 (4.4)	4'-10" (1.3 m)	5'-5" (1.65 m)	10'-0" (3.02 m)	20'-3" (5.97 m)	5'-5" (1.65 m)	7'-1" (2.16 m)	66	370 (167)
50°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	29½ (751)	10'-4½" (3.18 m)	6'-10" (2.11 m)	29¾ (770)	19 (483)	5'-0½" (1.55 m)	5'-4" (1.64 m)	4¼ (110)	1 (30)	40°	2.3 (1.8)	35 (817)	32 (822)	6'-11" (2.11 m)	12'-6" (3.75 m)	32 (822)	4'-4" (1.32 m)	46	140 (63)
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	24¼ (870)	10'-9" (3.31 m)	6'-10" (2.11 m)	29¾ (770)	22 (559)	5'-2¾" (1.61 m)	5'-6¼" (1.7 m)	4¼ (110)	1 (30)	40°	2.6 (2.0)	36 (836)	37 (939)	6'-11" (2.16 m)	13'-0" (3.94 m)	37 (939)	4'-9" (1.45 m)	46	160 (72)
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	3'-10¾" (1.185 m)	13'-4¼" (4.08 m)	8'-3½" (2.55 m)	36¼ (930)	30 (762)	6'-6¼" (2 m)	6'-10" (2.09 m)	4¼ (110)	1 (30)	40°	3.7 (2.8)	3'-7" (990)	4'-1" (1.26 m)	8'-4" (2.58 m)	16'-0" (4.83 m)	4'-1" (1.26 m)	5'-9" (1.75 m)	56	230 (104)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	3'-9" (1140)	4'-8" (1.422 m)	15'-5" (4.7 m)	9'-6" (2.9 m)	3'-5½" (1.06 m)	36 (914)	7'-6¾" (2.3 m)	7'-10¼" (2.39 m)	4¼ (110)	1 (30)	40°	4.8 (3.7)	4'-1" (1.12 m)	4'-10" (1.49 m)	9'-7" (2.94 m)	18'-6" (5.54 m)	4'-10" (1.49 m)	6'-6" (1.98 m)	66	320 (144)
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	5'-8½" (1.741 m)	18'-0¼" (5.48 m)	10'-11½" (3.34 m)	4'-0" (1.22 m)	3'-8" (1.119 m)	8'-10¼" (2.7 m)	9'-2" (2.78 m)	4¼ (110)	1 (30)	40°	6.3 (4.8)	4'-9" (1.28 m)	5'-11" (1.81 m)	11'-1" (3.38 m)	21'-9" (6.47 m)	5'-11" (1.81 m)	7'-7" (2.31 m)	74	410 (185)
55°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	33 (842)	11'-6¼" (3.54 m)	7'-9" (2.4 m)	29¼ (760)	19 (483)	5'-7¼" (1.72 m)	5'-11" (1.82 m)	4½ (110)	1 (30)	35°	2.6 (2.0)	35 (809)	36 (914)	7'-10" (2.4 m)	13'-9" (4.12 m)	36 (914)	4'-8" (1.42 m)	50	150 (68)
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	38¼ (975)	11'-11½" (3.68 m)	7'-9" (2.4 m)	29¼ (760)	22 (559)	5'-9¾" (1.79 m)	6'-1¾" (1.89 m)	4½ (110)	1 (30)	35°	2.9 (2.2)	36 (827)	3'-5" (1.05 m)	7'-10" (2.46 m)	14'-3" (4.33 m)	3'-5" (1.05 m)	5'-1" (1.55 m)	50	170 (77)
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	4'-4¼" (1.329 m)	14'-10½" (4.55 m)	9'-5" (2.9 m)	35¾ (910)	30 (762)	7'-3¼" (2.23 m)	7'-7¼" (2.32 m)	4½ (110)	1 (30)	35°	4.2 (3.2)	3'-6" (978)	4'-7" (1.4 m)	9'-5" (2.94 m)	17'-6" (5.32 m)	4'-7" (1.4 m)	6'-3" (1.91 m)	62	260 (117)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	3'-9" (1140)	5'-2¾" (1.594 m)	17'-2¼" (5.24 m)	10'-9¾" (3.3 m)	3'-5" (1.04 m)	36 (914)	8'-5¼" (2.57 m)	8'-9" (2.67 m)	4½ (110)	1 (30)	35°	5.4 (4.1)	4'-1" (1.1 m)	5'-6" (1.66 m)	10'-11" (3.33 m)	20'-6" (6.1 m)	5'-6" (1.66 m)	7'-2" (2.19 m)	74	350 (158)
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	6'-4¾" (1.951 m)	20'-1¼" (6.12 m)	12'-5¾" (3.79 m)	3'-11¼" (1.2 m)	3'-8" (1.119 m)	9'-10¾" (3.01 m)	10'-2½" (3.11 m)	4½ (110)	1 (30)	35°	7.1 (5.4)	4'-9" (1.26 m)	6'-7" (2.02 m)	12'-8" (3.84 m)	24'-0" (7.12 m)	6'-7" (2.02 m)	8'-3" (2.52 m)	86	212 (470)
60°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	38 (966)	13'-1¼" (4.03 m)	9'-0¼" (2.78 m)	29 (750)	19 (483)	6'-4½" (1.96 m)	6'-8¾" (2.07 m)	4½ (120)	0¾ (20)	30°	2.9 (2.2)	34 (802)	3'-5" (1.04 m)	9'-0" (2.78 m)	15'-3" (4.62 m)	3'-5" (1.04 m)	5'-1" (1.55 m)	54	170 (77)
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	3'-8" (1.118 m)	13'-7¼" (4.18 m)	9'-0¼" (2.78 m)	29 (750)	22 (559)	6'-7½" (2.04 m)	6'-11¾" (2.14 m)	4½ (120)	0¾ (20)	30°	3.2 (2.5)	34 (820)	3'-11" (1.19 m)	9'-0" (2.85 m)	15'-0" (4.86 m)	3'-11" (1.19 m)	5'-7" (1.70 m)	58	200 (90)
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	5'-0" (1.524 m)	16'-11¼" (5.19 m)	10'-11¼" (3.36 m)	35¼ (900)	30 (762)	8'-3½" (2.04 m)	8'-7¾" (2.65 m)	4½ (120)	0¾ (20)	30°	4.7 (3.6)	3'-6" (969)	5'-3" (1.6 m)	11'-0" (3.41 m)	19'-9" (5.98 m)	5'-3" (1.6 m)	6'-11" (2.11 m)	72	300 (135)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	3'-9" (1140)	6'-0" (1.828 m)	19'-7¼" (5.97 m)	12'-6¾" (3.83 m)	3'-4½" (1.03 m)	36 (914)	9'-7½" (2.93 m)	9'-11¾" (3.04 m)	4½ (120)	0¾ (20)	30°	6.1 (4.7)	4'-1" (1.09 m)	6'-3" (1.9 m)	12'-8" (3.87 m)	23'-0" (6.86 m)	6'-3" (1.9 m)	7'-11" (2.41 m)	82	390 (176)
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	7'-4" (2.238 m)	22'-11¼" (6.98 m)	14'-5¾" (4.41 m)	3'-10½" (1.18 m)	3'-8" (1.119 m)	11'-3½" (3.44 m)	11'-7¾" (3.54 m)	4½ (119)	0¾ (20)	30°	8.1 (6.2)	4'-7" (1.25 m)	7'-7" (2.31 m)	14'-7" (4.46 m)	26'-9" (8.02 m)	7'-7" (2.31 m)	9'-3" (2.82 m)	98	530 (239)

Illinois Department of Transportation

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

APPROVED January 1, 2009
Eric E Harm
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

REINFORCED CONCRETE END SECTIONS FOR PIPE CULVERTS
15" (375 mm) THRU 36" (900 mm) DIA.
SKEWED WITH ROADWAY

STANDARD 542201-02

WINGS FOR 1:2 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)
			A	B	C	D	E	F	G	H	J	K	M	N	α		h - bars				h1 - bars		v-bars No.	
																	o	p	q	Lgth.	p	Lgth.		
5°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	19 (485)	8'-7¾" (2.63 m)	4'-8¼" (1.42 m)	4'-3½" (1.31 m)	19 (483)	4'-3¾" (1.31 m)	4'-4" (1.32 m)	2¾ (70)	2¼ (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	110 (50)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	22 (561)	8'-10¾" (2.7 m)	4'-8¼" (1.42 m)	4'-3½" (1.31 m)	22 (559)	4'-5¼" (1.35 m)	4'-5½" (1.35 m)	2¾ (70)	2¼ (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	120 (54)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	30 (765)	10'-11" (3.31 m)	5'-8" (1.72 m)	5'-2½" (1.58 m)	30 (762)	5'-5¼" (1.65 m)	5'-5¾" (1.66 m)	2¾ (70)	2¼ (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	180 (81)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	36 (917)	12'-5" (3.78 m)	6'-5" (1.96 m)	5'-10½" (1.79 m)	36 (914)	6'-2¼" (1.89 m)	6'-2¾" (1.89 m)	2¾ (70)	2¼ (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	230 (104)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	3'-8¼" (1.123 m)	14'-5" (4.39 m)	7'-4¾" (2.25 m)	6'-9¼" (2.07 m)	3'-8" (1.119 m)	7'-2¼" (2.19 m)	7'-2¾" (2.2 m)	2¾ (70)	2¼ (60)	85°	4.5 (3.4)	7'-2" (2.12 m)	3'-11" (1.19 m)	7'-8" (2.3 m)	18'-9" (5.6 m)	3'-11" (1.19 m)	5'-7" (1.70 m)	54	300 (135)
10°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	19¼ (490)	8'-9" (2.65 m)	4'-11" 1.5 m)	4'-1½" (1.26 m)	19 (483)	4'-4" (1.32 m)	4'-5" (1.33 m)	2¾ (70)	2¼ (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	110 (50)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	22¼ (568)	9'-0" (2.73 m)	4'-11" (1.5 m)	4'-1½" (1.26 m)	22 (559)	4'-5¾" (1.36 m)	4'-6¼" (1.37 m)	2¾ (70)	2¼ (60)	80°	2.1 (1.6)	4'-4" (1.32 m)	25 (633)	5'-1" (1.55 m)	11'-6" (3.5 m)	25 (633)	3'-9" (1.14 m)	34	120 (54)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	30½ (774)	11'-0¼" (3.34 m)	5'-11½" (1.81 m)	5'-0" (1.52 m)	30 (762)	5'-5¾" (1.66 m)	5'-6½" (1.68 m)	2¾ (70)	2¼ (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	180 (81)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	36½ (928)	12'-6¾" (3.82 m)	6'-9" (2.06 m)	5'-8" (1.73 m)	36 (914)	6'-3" (1.9 m)	6'-3¾" (1.92 m)	2¾ (70)	2¼ (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	230 (104)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	3'-8¾" (1.136 m)	14'-7" (4.44 m)	7'-9¼" (2.37 m)	6'-6¼" (1.99 m)	3'-8" (1.119 m)	7'-3" (2.21 m)	7'-4" (2.23 m)	2¾ (70)	2¼ (60)	80°	4.7 (3.6)	7'-0" (2.04 m)	3'-11" (1.2 m)	8'-1" (2.42 m)	19'-0" (5.66 m)	3'-11" (1.2 m)	5'-7" (1.70 m)	54	300 (135)
15°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	19¾ (500)	8'-10¾" (2.7 m)	5'-2½" (1.58 m)	4'-0" (1.21 m)	19 (483)	4'-4¾" (1.34 m)	4'-6" (1.36 m)	3 (80)	2 (50)	75°	2.0 (1.5)	4'-3" (1.24 m)	22 (567)	5'-5" (1.6 m)	11'-6" (3.41 m)	22 (567)	3'-6" (1.07 m)	34	110 (50)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	22¾ (579)	9'-2" (2.78 m)	5'-2½" (1.58 m)	4'-0" (1.21 m)	22 (559)	4'-6½" (1.38 m)	4'-7½" (1.4 m)	3 (80)	2 (50)	75°	2.2 (1.7)	4'-3" (1.27 m)	25 (644)	5'-5" (1.64 m)	11'-9" (3.55 m)	25 (644)	3'-9" (1.14 m)	34	120 (54)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	31 (789)	11'-2¾" (3.4 m)	6'-3½" (1.91 m)	4'-10" (1.47 m)	30 (762)	5'-6¾" (1.69 m)	5'-8" (1.72 m)	3 (80)	2 (50)	75°	3.1 (2.4)	5'-2" (1.52 m)	34 (857)	6'-6" (1.95 m)	14'-6" (4.32 m)	34 (857)	4'-6" (1.37 m)	42	180 (81)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	37¼ (946)	12'-9¼" (3.89 m)	7'-1½" (2.17 m)	5'-5½" (1.67 m)	36 (914)	6'-4" (1.93 m)	6'-5¼" (1.96 m)	3 (80)	2 (50)	75°	3.9 (3.0)	5'-10" (1.72 m)	3'-4" (1.01 m)	7'-4" (2.21 m)	16'-6" (4.94 m)	3'-4" (1.01 m)	5'-0" (1.52 m)	52	250 (113)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	3'-9½ (1.158)	14'-10¼" (4.52 m)	8'-2½" (2.5 m)	6'-3½" (1.92 m)	3'-8" (1.119 m)	7'-4½" (2.25 m)	7'-5¾" (2.27 m)	3 (80)	2 (50)	75°	5.0 (3.8)	6'-9" (1.97 m)	4'-0" (1.22 m)	8'-6" (2.55 m)	19'-3" (5.74 m)	4'-0" (1.22 m)	5'-8" (1.73 m)	56	310 (140)
20°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	20¼ (514)	9'-1½" (2.77 m)	5'-6¼" (1.68 m)	3'-10½" (1.18 m)	19 (483)	4'-6" (1.37 m)	4'-7½" (1.4 m)	3 (80)	2 (50)	70°	2.1 (1.6)	4'-2" (1.21 m)	23 (581)	5'-8" (1.69 m)	11'-9" (3.48 m)	23 (581)	3'-7" (1.09 m)	36	110 (50)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	23½ (595)	9'-4½" (2.85 m)	5'-6¼" (1.68 m)	3'-10½" (1.18 m)	22 (559)	4'-7½" (1.41 m)	4'-9" (1.44 m)	3 (80)	2 (50)	70°	2.3 (1.8)	4'-2" (1.24 m)	26 (661)	5'-8" (1.73 m)	12'-0" (3.63 m)	26 (661)	3'-10" (1.17 m)	36	130 (59)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	32 (811)	11'-6¼" (3.49 m)	6'-8¼" (2.03 m)	4'-8¼" (1.42 m)	30 (762)	5'-8½" (1.73 m)	5'-9¾" (1.76 m)	3 (80)	2 (50)	70°	3.2 (2.4)	5'-0" (1.47 m)	35 (879)	6'-10" (2.07 m)	14'-9" (4.42 m)	35 (879)	4'-7" (1.40 m)	48	200 (90)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	38¼ (973)	13'-1¼" (3.99 m)	7'-6¾" (2.3 m)	5'-3½" (1.61 m)	36 (914)	6'-6" (1.98 m)	6'-7¼" (2.01 m)	3 (80)	2 (50)	70°	4.1 (3.1)	5'-9" (1.67 m)	3'-5" (1.04 m)	7'-10" (2.35 m)	17'-0" (5.05 m)	3'-5" (1.04 m)	5'-1" (1.55 m)	52	250 (113)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	3'-10¾" (1.191 m)	15'-3" (4.64 m)	8'-8½" (2.65 m)	6'-1¼" (1.86 m)	3'-8" (1.119 m)	7'-6¾" (2.3 m)	7'-8¼" (2.34 m)	3 (80)	2 (50)	70°	5.3 (4.1)	6'-6" (1.91 m)	4'-1" (1.26 m)	8'-11" (2.7 m)	19'-6" (5.87 m)	4'-1" (1.26 m)	5'-9" (1.75 m)	58	320 (144)
25°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	21 (533)	9'-5" (2.86 m)	5'-10¾" (1.79 m)	3'-9" (1.14 m)	19 (483)	4'-7½" (1.41 m)	4'-9½" (1.45 m)	3¼ (90)	1¾ (50)	65°	2.2 (1.7)	4'-1" (1.12 m)	23 (600)	6'-0" (1.8 m)	12'-0" (3.58 m)	23 (600)	3'-7" (1.09 m)	38	120 (54)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	24¼ (617)	9'-8½" (2.95 m)	5'-10¾" (1.79 m)	3'-9" (1.14 m)	22 (559)	4'-9¼" (1.45 m)	4'-11¼" (1.5 m)	3¼ (90)	1¾ (50)	65°	2.4 (1.8)	4'-0" (1.2 m)	27 (683)	6'-0" (1.85 m)	12'-3" (3.73 m)	27 (683)	3'-11" (1.19 m)	42	140 (63)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	33 (841)	11'-11" (3.61 m)	7'-1½" (2.16 m)	4'-6½" (1.38 m)	30 (762)	5'-10½" (1.78 m)	6'-0½" (1.83 m)	3¼ (90)	1¾ (50)	65°	3.4 (2.6)	4'-11" (1.43 m)	35 (909)	7'-4" (2.2 m)	15'-3" (4.55 m)	35 (909)	4'-7" (1.40 m)	48	200 (90)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	3'-3¼" (1.008 m)	13'-6¾" (4.13 m)	8'-0¾" (2.46 m)	5'-1¾" (1.57 m)	36 (914)	6'-8½" (2.04 m)	6'-10¼" (2.09 m)	3¼ (90)	1¾ (50)	65°	4.3 (3.3)	5'-6" (1.62 m)	3'-6" (1.08 m)	8'-3" (2.5 m)	17'-3" (5.2 m)	3'-6" (1.08 m)	5'-2" (1.58 m)	52	250 (113)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	4'-0½" (1.235 m)	15'-9¼" (4.8 m)	9'-3¾" (2.83 m)	5'-11¼" (1.81 m)	3'-8" (1.119 m)	7'-9¾" (2.38 m)	7'-11½" (2.42 m)	3¼ (90)	1¾ (50)	65°	5.6 (4.3)	6'-5" (1.86 m)	4'-3" (1.3 m)	9'-7" (2.88 m)	20'-3" (6.04 m)	4'-3" (1.3 m)	5'-11" (1.80 m)	60	330 (149)
30°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	22 (558)	9'-9¾" (2.98 m)	6'-4" (1.92 m)	3'-8" (1.11 m)	19 (483)	4'-9¾" (1.46 m)	5'-0" (1.52 m)	3½ (90)	1½ (40)	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	130 (59)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	25½ (645)	10'-1½" (3.07 m)	6'-4" (1.92 m)	3'-8" (1.11 m)	22 (559)	4'-11½" (1.51 m)	5'-2" (1.56 m)	3½ (90)	1½ (40)	60°	2.5 (1.9)	4'-0" (1.18 m)	28 (712)	6'-5" (1.98 m)	3.87 m (12'-9")	28 (712)	4'-0" (1.22 m)	42	150 (68)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	34¾ (880)	12'-5" (3.77 m)	7'-8" (2.32 m)	4'-5" (1.34 m)	30 (762)	6'-1½" (1.86 m)	6'-3½" (1.91 m)	3½ (90)	1½ (40)	60°	3.6 (2.8)	4'-10" (1.4 m)	37 (949)	7'-10" (2.37 m)	4.71 m (15'-9")	37 (949)	4'-9" (1.45 m)	52	210 (95)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	3'-5½" (1.055 m)	14'-1¾" (4.31 m)	8'-8" (2.64 m)	5'-0" (1.53 m)	36 (914)	6'-11¾" (2.13 m)	7'-2" (2.18 m)	3½ (90)	1½ (40)	60°	4.5 (3.4)	5'-6" (1.58 m)	3'-8" (1.12 m)	8'-10" (2.69 m)	5.39 m (18'-0")	3'-8" (1.12 m)	5'-4" (1.63 m)	56	270 (122)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	4'-2¾" (1.292 m)	16'-5½" (5.01 m)	10'-0" (3.04 m)	5'-9¼" (1.76 m)	3'-8" (1.119 m)	8'1¾" (2.48 m)	8'-3¾" (2.53 m)	3½ (90)	1½ (40)	60°	5.9 (4.5)	6'-4" (1.82 m)	4'-5" (1.36 m)	10'-3" (3.09 m)	6.26 m (21'-0")	4'-5" (1.36 m)	6'-1" (1.86 m)	66	360 (162)

Illinois Department of Transportation

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

APPROVED January 1, 2009
Eric E Harm
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

REINFORCED CONCRETE END SECTIONS FOR PIPE CULVERTS
15" (375 mm) THRU 36" (900 mm) DIA.
SKEWED WITH ROADWAY

STANDARD 542201-02

WINGS FOR 1:2 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)
															α		h - bars				h1 - bars		v-bars No.	
			A	B	C	D	E	F	G	H	J	K	M	N			o	p	q	Lgth.	p	Lgth.		
35°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	23¼ (590)	10'-4" (3.14 m)	6'-10¼" (2.08 m)	3'-6¾" (1.08 m)	19 (485)	5'-0¾" (1.54 m)	5'-3¼" (1.6 m)	¾ (90)	1½ (40)	55°	2.4 (1.8)	3'-11" (1.13 m)	26 (658)	6'-11" (2.09 m)	13'-0" (3.87 m)	26 (658)	3'-10" (1.17 m)	44	140 (63)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	27 (683)	10'-7¾" (3.23 m)	6'-10¼" (2.08 m)	3'-6¾" (1.09 m)	22 (559)	5'-2½" (1.58 m)	5'-5¼" (1.65 m)	¾ (90)	1½ (40)	55°	2.6 (2.0)	3'-11" (1.15 m)	29 (750)	6'-11" (2.14 m)	13'-3" (4.04 m)	29 (750)	4'-1" (1.25 m)	44	150 (68)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	36½ (930)	13'-1" (3.97 m)	8'-3½" (2.52 m)	4'-3¾" (1.31 m)	30 (762)	6'-5¼" (1.95 m)	6'-7¾" (2.02 m)	¾ (90)	1½ (40)	55°	3.8 (2.9)	4'-8" (1.37 m)	39 (1.0 m)	8'-4" (2.56 m)	16'-3" (4.93 m)	39 (1.0 m)	4'-11" (1.50 m)	52	220 (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)	9'-4½" (2.86 m)	4'-10½" (1.49 m)	36 (914)	7'-4¼" (2.24 m)	7'-6¾" (2.3 m)	¾ (90)	1½ (40)	55°	4.8 (3.7)	5'-4" (1.55 m)	3'-11" (1.18 m)	9'-6" (2.9 m)	18'-9" (5.64 m)	3'-11" (1.18 m)	5'-7" (1.70 m)	60	290 (131)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	4'-5¾" (1.366 m)	17'-4¼" (5.28 m)	10'-10" (3.29 m)	5'-7¾" (1.72 m)	3'-8" (1.119 m)	8'-6¾" (2.61 m)	8'-9½" (2.67 m)	¾ (90)	1½ (40)	55°	6.3 (4.8)	6'-1" (1.78 m)	4'-8" (1.43 m)	11'-0" (3.34 m)	21'-9" (6.55 m)	4'-8" (1.43 m)	6'-4" (1.93 m)	70	380 (171)
40°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	34¾ (631)	11'-0" (3.34 m)	7'-6" (2.27 m)	3'-6" (1.06 m)	19 (485)	5'-4½" (1.63 m)	5'-7½" (1.71 m)	¾ (100)	1¼ (40)	50°	2.6 (2.0)	3'-10" (1.1 m)	28 (700)	7'-7" (2.28 m)	13'-9" (4.08 m)	28 (700)	3'-11" (1.19 m)	48	150 (68)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	28¾ (730)	11'-4" (3.44 m)	7'-6" (2.27 m)	3'-6" (1.08 m)	22 (559)	5'-6½" (1.68 m)	5'-9½" (1.76 m)	¾ (100)	1¼ (40)	50°	2.8 (2.1)	3'-10" (1.13 m)	31 (798)	7'-7" (2.34 m)	14'-0" (4.26 m)	31 (798)	4'-3" (1.30 m)	48	160 (72)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	3'-3¼" (995)	13'-11¼" (4.23 m)	9'-0¾" (2.75 m)	4'-2¾" (1.28 m)	30 (762)	6'-10¼" (2.08 m)	7'-1" (2.15 m)	¾ (100)	1¼ (40)	50°	4.1 (3.1)	4'-7" (1.34 m)	3'-6" (1.07 m)	9'-2" (2.79 m)	17'-3" (5.2 m)	3'-6" (1.07 m)	5'-2" (1.58 m)	58	240 (108)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	3'-11" (1.193 m)	15'-10¾" (4.84 m)	10'-3" (3.12 m)	4'-9½" (1.46 m)	36 (914)	7'-10" (2.38 m)	8'-0¾" (2.46 m)	¾ (100)	1¼ (40)	50°	5.2 (4.0)	5'-3" (1.52 m)	4'-2" (1.26 m)	10'-4" (3.17 m)	19'-9" (5.95 m)	4'-2" (1.26 m)	5'-10" (1.78 m)	64	310 (140)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	4'-9½" (1.461 m)	18'-6" (5.63 m)	11'-10" (3.6 m)	5'-6¼" (1.68 m)	3'-8" (1.119 m)	9'-1½" (2.78 m)	9'-4½" (2.85 m)	¾ (100)	1¼ (40)	50°	6.8 (5.2)	6'-0" (1.74 m)	5'-0" (1.53 m)	12'-0" (3.65 m)	23'-0" (6.92 m)	5'-0" (1.53 m)	6'-3" (2.03 m)	78	420 (189)
45°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	27 (683)	11'-10¼" (3.6 m)	8'-3¼" (2.51 m)	3'-5¼" (1.04 m)	19 (485)	5'-9½" (1.76 m)	6'-0¾" (1.84 m)	4 (100)	1¼ (30)	45°	2.8 (2.1)	3'-9" (1.09 m)	29 (753)	8'-4" (2.51 m)	14'-6" (4.35 m)	29 (753)	4'-1" (1.25 m)	48	150 (68)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	31 (791)	12'-2½" (3.7 m)	8'-3¼" (2.51 m)	3'-5¼" (1.04 m)	22 (559)	5'-11½" (1.81 m)	6'-3" (1.89 m)	4 (100)	1¼ (30)	45°	3.1 (2.4)	3'-10" (1.11 m)	34 (859)	8'-4" (2.58 m)	15'-0" (4.55 m)	34 (859)	4'-6" (1.37 m)	52	180 (81)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	3'-6½" (1.078 m)	15'-0¼" (4.56 m)	10'-0¼" (3.03 m)	4'-1¾" (1.26 m)	30 (762)	7'-4½" (2.24 m)	7'-7¾" (2.32 m)	4 (100)	1¼ (30)	45°	4.4 (3.4)	4'-6" (1.32 m)	3'-9" (1.15 m)	10'-0" (3.08 m)	18'-3" (5.55 m)	3'-9" (1.15 m)	5'-5" (1.65 m)	60	250 (113)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	4'-3" (1.293 m)	17'-1¾" (5.23 m)	11'-4" (3.45 m)	4'-8¼" (1.43 m)	36 (914)	8'-5¼" (2.57 m)	8'-8½" (2.66 m)	4 (100)	1¼ (30)	45°	5.6 (4.3)	5'-2" (1.49 m)	4'-5" (1.36 m)	11'-5" (3.5 m)	21'-0" (6.35 m)	4'-5" (1.36 m)	6'-1" (1.86 m)	72	340 (153)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	5'-2¼" (1.583 m)	19'-11¾" (6.08 m)	13'-0¾" (3.97 m)	5'-5" (1.65 m)	3'-8" (1.119 m)	9'-10¼" (3.0 m)	10'-1½" (3.08 m)	4 (100)	1¼ (30)	45°	7.4 (5.7)	5'-11" (1.71 m)	5'-5" (1.65 m)	13'-2" (4.02 m)	24'-6" (7.39 m)	5'-5" (1.65 m)	7'-1" (2.16 m)	82	450 (203)
50°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	29½ (751)	12'-11½" (3.93 m)	9'-3" (2.81 m)	3'-4½" (1.03 m)	19 (485)	6'-4" (1.92 m)	6'-7½" (2.01 m)	4¼ (110)	1 (30)	40°	3.1 (2.4)	3'-9" (1.07 m)	32 (822)	9'-4" (2.81 m)	15'-9" (4.7 m)	32 (822)	4'-4" (1.32 m)	54	170 (77)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	34¼ (870)	13'-4¼" (4.05 m)	9'-3" (2.81 m)	3'-4½" (1.03 m)	22 (559)	6'-6¼" (1.98 m)	6'-10" (2.07 m)	4¼ (110)	1 (30)	40°	3.4 (2.6)	3'-8" (1.1 m)	37 (939)	9'-3" (2.88 m)	16'-0" (4.92 m)	37 (939)	4'-9" (1.45 m)	54	190 (86)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	3'-10¾" (1.185 m)	16'-5½" (4.99 m)	11'-2½" (3.39 m)	4'-1" (1.24 m)	30 (762)	8'-1" (2.45 m)	8'-4½" (2.54 m)	4¼ (110)	1 (30)	40°	4.8 (3.7)	4'-6" (1.3 m)	4'-1" (1.26 m)	11'-2" (3.44 m)	19'-9" (6.0 m)	4'-1" (1.26 m)	5'-9" (1.75 m)	68	280 (126)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	4'-8" (1.422 m)	18'-9½" (5.72 m)	12'-8" (3.86 m)	4'-7¼" (1.41 m)	36 (914)	9'-3" (2.82 m)	9'-6½" (2.92 m)	4¼ (110)	1 (30)	40°	6.2 (4.7)	5'-1" (1.47 m)	4'-10" (1.49 m)	12'-9" (3.91 m)	22'-9" (6.87 m)	4'-10" (1.49 m)	6'-6" (1.98 m)	78	370 (167)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	5'-8½" (1.741 m)	21'-10¾" (6.67 m)	14'-7½" (4.45 m)	5'-3¾" (1.62 m)	3'-8" (1.119 m)	10'-9½" (3.29 m)	11'-1¼" (3.38 m)	4¼ (110)	1 (30)	40°	8.1 (6.2)	5'-10" (1.69 m)	5'-11" (1.81 m)	14'-9" (4.5 m)	26'-6" (8.0 m)	5'-11" (1.81 m)	7'-7" (2.31 m)	90	490 (221)
55°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	33 (842)	14'-5" (4.38 m)	10'-6¼" (3.2 m)	3'-4" (1.01 m)	19 (485)	7'-0½" (2.14 m)	7'-4½" (2.24 m)	4½ (110)	1 (30)	35°	3.4 (2.6)	3'-8" (1.06 m)	36 (914)	10'-7" (3.18 m)	17'-3" (5.17 m)	36 (914)	4'-8" (1.42 m)	60	180 (81)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	38¼ (975)	14'-10¼" (14'-10¼")	10'-6¼" (3.2 m)	3'-4" (1.01 m)	22 (559)	7'-3¼" (2.21 m)	7'-7" (2.3 m)	4½ (110)	1 (30)	35°	3.7 (2.8)	3'-9" (1.08 m)	3'-5" (1.05 m)	10'-7" (3.27 m)	17'-9" (5.4 m)	3'-5" (1.05 m)	5'-1" (1.55 m)	60	210 (95)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	4'-4¼" (1.329 m)	14'-10¼" (5.56 m)	12'-9" (3.86 m)	4'-0¼" (1.22 m)	30 (762)	9'-0¼" (2.73 m)	9'-4" (2.83 m)	4½ (110)	1 (30)	35°	5.4 (4.1)	4'-5" (1.29 m)	4'-7" (1.4 m)	12'-9" (3.91 m)	21'-9" (6.6 m)	4'-7" (1.4 m)	6'-3" (1.91 m)	74	300 (135)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	5'-2¾" (1.594 m)	20'-11½" (6.39 m)	14'-5" (4.39 m)	4'-6½" (1.39 m)	36 (914)	10'-3¾" (3.15 m)	10'-7¾" (3.24 m)	4½ (110)	1 (30)	35°	6.9 (5.3)	5'-1" (1.45 m)	5'-6" (1.66 m)	14'-6" (4.44 m)	25'-0" (7.56 m)	5'-6" (1.66 m)	7'-2" (2.19 m)	88	420 (189)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	6'-4¾" (1.951 m)	24'-5¼" (7.44 m)	16'-7½" (5.06 m)	5'-3" (1.61 m)	3'-8" (1.119 m)	12'-0¾" (3.67 m)	12'-4¾" (3.77 m)	4½ (110)	1 (30)	35°	9.1 (7.0)	5'-10" (1.67 m)	6'-7" (2.02 m)	16'-7" (5.11 m)	29'-0" (8.8 m)	6'-7" (2.02 m)	8'-3" (2.52 m)	102	550 (248)
60°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	38 (966)	16'-5¼" (4.99 m)	12'-2¾" (3.71 m)	3'-3¼" (1.0 m)	19 (485)	8'-0½" (2.44 m)	8'-4¾" (2.55 m)	4½ (120)	0¾ (20)	30°	3.9 (3.0)	3'-8" (1.05 m)	3'-5" (1.04 m)	12'-2" (3.7 m)	19'-3" (5.79 m)	3'-5" (1.04 m)	5'-1" (1.55 m)	64	200 (90)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	3'-8" (1.118 m)	16'-11¼" (5.15 m)	12'-2¾" (3.71 m)	3'-3¼" (1.0 m)	22 (559)	8'-3½" (2.52 m)	8'-7¾" (2.63 m)	4½ (120)	0¾ (20)	30°	4.2 (3.2)	3'-8" (1.07 m)	3'-11" (1.19 m)	12'-2" (3.8 m)	19'-9" (6.06 m)	3'-11" (1.19 m)	5'-7" (1.70 m)	70	240 (108)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	5'-0" (1.524 m)	20'-11¼" (6.35 m)	14'-9¾" (4.48 m)	3'-11¾" (1.2 m)	30 (762)	10'-3½" (3.12 m)	10'-7¾" (3.23 m)	4½ (120)	0¾ (20)	30°	6.1 (4.7)	4'-5" (1.27 m)	5'-3" (1.6 m)	14'-10" (4.54 m)	24'-6" (7.41 m)	5'-3" (1.6 m)	6'-11" (2.11 m)	86	350 (158)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	6'-0" (1.828 m)	23'-11¼" (7.29 m)	16'-9" (5.1 m)	4'-5¾" (1.37 m)	36 (914)	11'-9½" (3.59 m)	12'-1¾" (3.7 m)	4½ (120)	0¾ (20)	30°	7.9 (6.0)	5'-0" (1.44 m)	6'-3" (1.9 m)	16'-9" (5.16 m)	28'-0" (8.5 m)	6'-3" (1.9 m)	7'-11" (2,41 m)	100	470 (212)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	7'-4" (2.238 m)	27'-11¼" (8.51 m)	19'-3¾" (5.88 m)	5'-2" (1.57 m)	3'-8" (1.119 m)	13'-9½" (4.2 m)	14'-1¾" (4.31 m)	4½ (120)	0¾ (20)	30°	10.4 (8.0)	5'-10" (1.65 m)	7'-7" (2.31 m)	19'-4" (5.94 m)	32'-9" (9.89 m)	7'-7" (2.31 m)	9'-3" (2.82 m)	114	620 (279)

Illinois Department of Transportation

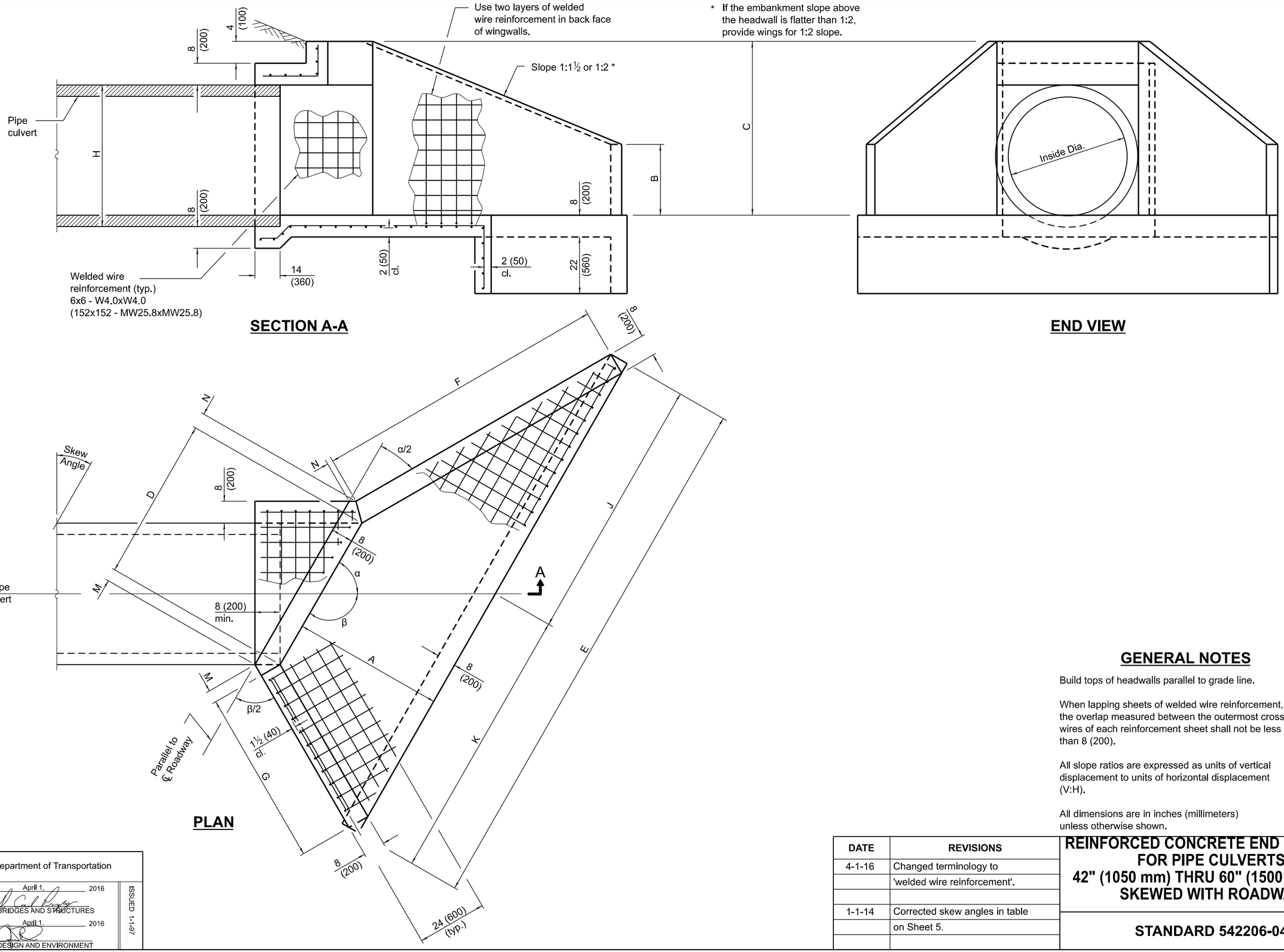
APPROVED January 1, 2009
Ralph E. Anderson
ENGINEER OF BRIDGES AND STRUCTURES

APPROVED January 1, 2009
Eric E Harm
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

REINFORCED CONCRETE END SECTIONS FOR PIPE CULVERTS
15" (375 mm) THRU 36" (900 mm) DIA.
SKEWED WITH ROADWAY

STANDARD 542201-02



SECTION A-A

END VIEW

PLAN

GENERAL NOTES

Build tops of headwalls parallel to grade line.

When lapping sheets of welded wire reinforcement, the overlap measured between the outermost cross wires of each reinforcement sheet shall not be less than 8 (200).

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

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

Illinois Department of Transportation

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

ISSUED 1-1-97

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

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

(Sheet 1 of 5)

STANDARD 542206-04

WINGS FOR 1:1½ SLOPE

Skew Angle	Nominal Pipe Dia.	Dimensions for Concrete													Concrete 2 End Secs. cu. yd. (m^3)	Welded Wire Reinforcement 2 End Secs. sq. yd. (m^2)
		A	B	C	D	E	F	G	H	J	K	M	N	α		
5°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10½" (1.49 m)	4'-3¼" (1.299 m)	13'-5" (4.09 m)	6'-0½" (1.85 m)	5'-6½" (1.69 m)	4'-3" (1.295 m)	6'-8¼" (2.04 m)	6'-8¾" (2.05 m)	3½ (90)	3 (80)	85°	6.0 (4.6)	46 (38)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	4'-10¼" (1.478 m)	14'-10" (4.48 m)	6'-8" (2.0 m)	6'-1¼" (1.83 m)	4'-10" (1.473 m)	7'-4¾" (2.23 m)	7'-5¼" (2.25 m)	3½ (90)	3 (80)	85°	7.2 (5.5)	53 (44)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11½" (1.85 m)	5'-5¼" (1.657 m)	16'-3" (5.08 m)	7'-3¼" (2.31 m)	6'-8" (2.12 m)	5'-5" (1.651 m)	8'-1¼" (2.53 m)	8'-1¾" (2.55 m)	3½ (90)	3 (80)	85°	8.4 (6.4)	65 (55)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	6'-0¼" (1.835 m)	17'-8" (5,37 m)	7'-10¾" (2.4 m)	7'-2¾" (2.2 m)	6'-0" (1.829 m)	8'-9¾" (2.68 m)	8'-10¼" (2.69 m)	3½ (90)	3 (80)	85°	9.8 (7.5)	71 (59)
10°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10½" (1.49 m)	4'-3¾" (1.314 m)	13'-6½" (4.13 m)	6'-4¼" (1.94 m)	5'-4" (1.63 m)	4'-3" (1.295 m)	6'-8¾" (2.05 m)	6'-9¾" (2.08 m)	3¾ (100)	3 (80)	80°	6.3 (4.8)	47 (39)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	4'-11" (1.495 m)	15'-0" (4.52 m)	7'-0" (2.1 m)	5'-10½" (1.77 m)	4'-10" (1.473 m)	7'-5½" (2.25 m)	7'-6½" (2.27 m)	3¾ (100)	3 (80)	80°	7.5 (5.7)	54 (45)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11½" (1.85 m)	5'-6" (1.676 m)	16'-5" (5.13 m)	7'-7¾" (2.43 m)	6'-5" (2.04 m)	5'-5" (1.651 m)	8'-2" (2.55 m)	8'-3" (2.58 m)	3¾ (100)	3 (80)	80°	8.8 (6.7)	66 (56)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	6'-1" (1.857 m)	17'-10½" (5.43 m)	8'-3½" (2.52 m)	6'-11½" (2.12 m)	6'-0" (1.829 m)	8'-10¾" (2.7 m)	8'-11¾" (2.73 m)	3¾ (100)	3 (80)	80°	10.3 (7.9)	73 (61)
15°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10½" (1.49 m)	4'-4¾" (1.34 m)	13'-9½" (4.2 m)	6'-8½" (2.05 m)	5'-1¾" (1.57 m)	4'-3" (1.295 m)	6'-10" (2.08 m)	6'-11½" (2.12 m)	4 (100)	2¾ (70)	75°	6.6 (5.0)	48 (40)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	5'-0" (1.524 m)	15'-3" (4.6 m)	7'-4¾" (2.22 m)	5'-8" (1.71 m)	4'-10" (1.473 m)	7'-6¾" (2.28 m)	7'-8¼" (2.32 m)	4 (100)	2¾ (70)	75°	7.9 (6.0)	55 (46)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11½" (1.85 m)	5'-7¼" (1.709 m)	16'-8¾" (5,22 m)	8'-1" (2.57 m)	6'-2¼" (1.97 m)	5'-5" (1.651 m)	8'-3¾" (2.59 m)	8'-5" (2.63 m)	4 (100)	2¾ (70)	75°	9.3 (7.1)	68 (57)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	6'-2½" (1.893 m)	18'-2¼" (5.53 m)	8'-9¼" (2.66 m)	6'-8¾" (2.05 m)	6'-0" (1.829 m)	9'-0½" (2.75 m)	9'-1¾" (2.78 m)	4 (100)	2¾ (70)	75°	10.8 (8.3)	75 (62)
20°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10½" (1.49 m)	4'-6¼" (1.378 m)	14'-1¾" (4,31 m)	7'-1½" (2.17 m)	4'-11¾" (1.52 m)	4'-3" (1.295 m)	7'-0" (2.13 m)	7'-1¾" (2.18 m)	4¼ (105)	2½ (70)	70°	7.0 (5.4)	49 (41)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	5'-1¾" (1.567 m)	15'-7¾" (4.72 m)	7'-10¼" (2.36 m)	5'-6" (1.65 m)	4'-10" (1.473 m)	7'-9" (2.34 m)	7'-10¾" (2.38 m)	4¼ (105)	2½ (70)	70°	8.4 (6.4)	57 (48)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11½" (1.85 m)	5'-9¼" (1.756 m)	17'-2" (5.36 m)	8'-6¾" (2.72 m)	6'-0" (1.91 m)	5'-5" (1.651 m)	8'-6" (2.65 m)	8'-8" (2.7 m)	4¼ (105)	2½ (70)	70°	9.9 (7.6)	70 (59)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	6'-4½" (1.946 m)	18-8" (5.68 m)	9'-3½" (2.83 m)	6'-6¼" (1.98 m)	6'-0" (1.829 m)	9'-3" (2.82 m)	9'-5" (2.86 m)	4¼ (105)	2½ (70)	70°	11.5 (8.8)	77 (64)
25°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10½" (1.49 m)	4'-8¼" (1.428 m)	14'-7½" (4.46 m)	7'-7¼" (2.32 m)	4'-10" (1.48 m)	4'-3" (1.295 m)	7'-2½" (2.22 m)	7'-5" (2.26 m)	4½ (110)	2¼ (60)	65°	7.4 (5.7)	51 (43)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	5'-4" (1.625 m)	16'-2¼" (4,88 m)	8'-4½" (2.52 m)	5'-4" (1.6 m)	4'-10" (1.473 m)	8'-0" (2.41 m)	8'-2¼" (2.47 m)	4½ (110)	2¼ (60)	65°	8.9 (6.8)	59 (49)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11½" (1.85 m)	5'-11¾" (1.821 m)	17'-9" (5,54 m)	9'-1¾" (2.91 m)	5'-10" (1.85 m)	5'-5" (1.651 m)	8'-9¼" (2.74 m)	8'-11¾" (2.8 m)	4½ (110)	2¼ (60)	65°	10.5 (8.0)	73 (61)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	6'-7½" (2.018 m)	19'-3¾" (5.87 m)	9'-11" (3.02 m)	6'-4" (1.92 m)	6'-0" (1.829 m)	9'-6¾" (2.90 m)	9'-9" (2.97 m)	4½ (110)	2¼ (60)	65°	12.2 (9.3)	80 (67)
30°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10½" (1.49 m)	4'-11" (1.495 m)	15'-3" (4,65 m)	8'-2" (2,49 m)	4'-8½" (1.44 m)	4'-3" (1.295 m)	7'-6" (2.29 m)	7'-9" (2,36 m)	4½ (120)	2¼ (60)	60°	7.9 (6.0)	53 (45)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	5'-7" (1.7 m)	16'-10½" (5.1 m)	9'-0" (2.7 m)	5'-2¼" (1.56 m)	4'-10" (1.473 m)	8'-3¾" (2.51 m)	8'-6¾" (2.59 m)	4½ (120)	2¼ (60)	60°	9.5 (7.3)	62 (52)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11½" (1.85 m)	6'-3" (1.906 m)	18'-6¼" (5.79 m)	9'-10" (3.12 m)	5'-8" (1.8 m)	5'-5" (1.651 m)	9'-1¾" (2.85 m)	9'-4½" (2.92 m)	4½ (120)	2¼ (60)	60°	11.2 (8.6)	77 (64)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	6'-11¼" (2.111 m)	20'-2" (6.13 m)	10'-8" (3.24 m)	6'-2" (1.87 m)	6'-0" (1.829 m)	9'-11½" (3.03 m)	10'-2½" (3.1 m)	4½ (120)	2¼ (60)	60°	13.1 (10.0)	84 (70)

Illinois Department of Transportation

APPROVED April 1, 2016
ENGINEER OF BRIDGES AND STRUCTURES

APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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 1:1½ SLOPE

Skew Angle	Nominal Pipe Dia.	Dimensions for Concrete													Concrete 2 End Secs. cu. yd. (m^3)	Welded Wire Reinforcement 2 End Secs. sq. yd. (m^2)
		A	B	C	D	E	F	G	H	J	K	M	N	α		
35°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10½" (1.49 m)	5'-2¼" (1.58 m)	16'-0¾" (4.59 m)	8'-10" (2.71 m)	4'-7¼" (1.41 m)	4'-3" (1.295 m)	7'-10¾" (2.4 m)	8'-2" (2.49 m)	4¾ (120)	2 (50)	55°	8.5 (6.5)	56 (47)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	5'-10¾" (1.798 m)	17'-9½" (5.36 m)	9'-9" (2.93 m)	5'-1" (1.53 m)	4'-10" (1.473 m)	8'-9" (2.64 m)	9'-0½" (2.73 m)	4¾ (120)	2 (50)	55°	10.2 (7.8)	66 (55)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11½" (1.85 m)	6'-7¼" (2.015 m)	19'-6¼" (6.1 m)	10'-7¾" (3.38 m)	5'-6½" (1.76 m)	5'-5" (1.651 m)	9'-7½" (3.01 m)	9'-10¾" (3.09 m)	4¾ (120)	2 (50)	55°	12.0 (9.2)	81 (68)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	7'-4" (2.232 m)	21'-3" (6.46 m)	11'-6½" (3.51 m)	6'-0¼" (1.83 m)	6'-0" (1.829 m)	10'-5¾" (3.19 m)	10'-9¼" (3.27 m)	4¾ (120)	2 (50)	55°	14.1 (10.8)	89 (74)
40°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10½" (1.49 m)	5'-6½" (1.69 m)	17'-1¼" (5.21 m)	9'-8" (2.95 m)	4'-6" (1.38 m)	4'-3" (1.295 m)	8'-4¾" (2.56 m)	8'-8½" (2.65 m)	5 (130)	1¾ (50)	50°	9.1 (7.0)	60 (50)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	6'-3¾" (1.922 m)	18'-11¼" (5.72 m)	10'-7¾" (3.2 m)	4'-11½" (1.49 m)	4'-10" (1.473 m)	9'-3¾" (2.81 m)	9'-7½" (2.91 m)	5 (130)	1¾ (50)	50°	11.0 (8.4)	70 (58)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11½" (1.85 m)	7'-0¾" (2.155 m)	20'-9½" (6.5 m)	11'-7½" (3.69 m)	5'-5" (1.72 m)	5'-5" (1.651 m)	10'-2¾" (3.2 m)	10'-6¾" (3.3 m)	5 (130)	1¾ (50)	50°	13.0 (9.9)	86 (72)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	7'-10" (2.387 m)	22'-7¾" (6.89 m)	12'-7½" (3.84 m)	6'-0" (1.79 m)	6'-0" (1.829 m)	11'-2" (3.4 m)	11'-5¾" (3.49 m)	5 (130)	1¾ (50)	50°	15.2 (11.6)	95 (79)
45°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10½" (1.49 m)	6'-0" (1.831 m)	18'-5¼" (5.62 m)	10'-8" (3.26 m)	4'-5" (1.35 m)	4'-3" (1.295 m)	9'-0½" (2.76 m)	9'-4¾" (2.86 m)	5¼ (140)	1½ (40)	45°	10.0 (7.6)	65 (54)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	6'-10" (2.083 m)	20'-5¼" (6.17 m)	11'-9" (3.53 m)	4'-10½" (1.46 m)	4'-10" (1.473 m)	10'-0½" (3.03 m)	10'-4¾" (3.14 m)	5¼ (140)	1½ (40)	45°	12.0 (9.2)	75 (63)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11½" (1.85 m)	7'-8" (2.334 m)	22'-5¼" (7.01 m)	12'-10¼" (4.08 m)	5'-3¾" (1.69 m)	5'-5" (1.651 m)	11'-0½" (3.45 m)	11'-4¾" (3.56 m)	5¼ (140)	1½ (40)	45°	14.2 (10.9)	93 (78)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	8'-5¾" (2.586 m)	24'-5¼" (7.43 m)	13'-11¼" (4.24 m)	5'-9¼" (1.76 m)	6'-0" (1.829 m)	12'-0½" (3.66 m)	12'-4¾" (3.77 m)	5¼ (140)	1½ (40)	45°	16.7 (12.8)	103 (86)
50°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10½" (1.49 m)	6'-7¼" (2.014 m)	20'-2" (6.15 m)	11'-11¼" (3.64 m)	4'-4¼" (1.33 m)	4'-3" (1.295 m)	9'-10½" (3.01 m)	10'-3½" (3.14 m)	5½ (140)	1½ (40)	40°	11.0 (8.4)	71 (59)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	7'-6¼" (2.291 m)	22'-4½" (6.75 m)	13'-2" (3.95 m)	4'-9½" (1.44 m)	4'-10" (1.473 m)	10'-11¾" (3.31 m)	11'-4¾" (3.44 m)	5½ (140)	1½ (40)	40°	13.3 (10.2)	82 (69)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11½" (1.85 m)	8'-5" (2.568 m)	24'-7" (7.68 m)	14'-4½" (4.56 m)	5'-2¾" (1.66 m)	5'-5" (1.651 m)	12'-1" (3.78 m)	12'-6" (3.9 m)	5½ (140)	1½ (40)	40°	15.8 (12.1)	102 (85)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	9'-4" (2.845 m)	26'-9¼" (8.15 m)	15'-7¼" (4.72 m)	5'-8" (1.73 m)	6'-0" (1.829 m)	13'-2¼" (4.02 m)	13'-7" (4.13 m)	5½ (140)	1½ (40)	40°	18.5 (14.1)	112 (94)
55°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10½" (1.49 m)	7'-5" (2.257 m)	22'-5¾" (6.85 m)	13'-7" (4.14 m)	4'-3½" (1.31 m)	4'-3" (1.295 m)	11'-0¼" (3.36 m)	11'-5½" (3.49 m)	5¾ (150)	1¼ (30)	35°	12.3 (9.4)	79 (66)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	8'-5" (2.568 m)	24'-11½" (7.53 m)	14'-11½" (4.49 m)	4'-8½" (1.42 m)	4'-10" (1.473 m)	12'-3" (3.7 m)	12'-8½" (3.83 m)	5¾ (150)	1¼ (30)	35°	14.9 (11.4)	92 (77)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11½" (1.85 m)	9'-5¼" (2.878 m)	27'-5" (8.57 m)	16'-4¼" (5.19 m)	5'-1¾" (1.64 m)	5'-5" (1.651 m)	13'-6" (4.22 m)	13'-11" (4.35 m)	5¾ (150)	1¼ (30)	35°	17.7 (13.5)	113 (95)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	10'-5½" (3.188 m)	29'-10¾" (9.09 m)	17'-8¾" (5.39 m)	5'-7" (1.7 m)	6'-0" (1.829 m)	14'-8¾" (4.48 m)	15'-2" (4.61 m)	5¾ (150)	1¼ (30)	35°	20.8 (15.9)	125 (104)
60°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10½" (1.49 m)	8'-6" (2.59 m)	25'-7¾" (7.82 m)	15'-9¼" (4.81 m)	4'-2¾" (1.29 m)	4'-3" (1.295 m)	12'-7" (3.84 m)	13'-0¾" (3.98 m)	6¼ (160)	1 (30)	30°	14.1 (10.8)	89 (75)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	9'-8" (2.946 m)	28'-5¾" (8.59 m)	17'-4¾" (5.22 m)	4'-8" (1.4 m)	4'-10" (1.473 m)	14'-0" (4.22 m)	14'-5¾" (4.37 m)	6¼ (160)	1 (30)	30°	17.0 (13.0)	104 (87)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11½" (1.85 m)	10'-10" (3.302 m)	31'-3¾" (9.79 m)	19'-0" (6.03 m)	5'-1" (1.62 m)	5'-5" (1.651 m)	15'-5" (4.82 m)	15'-10¾" (4.97 m)	6¼ (160)	1 (30)	30°	20.3 (15.5)	129 (108)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	12'-0" (3.658 m)	34'-1¾" (10.39 m)	20'-7¼" (6.26 m)	5'-6¼" (1.68 m)	6'-0" (1.829 m)	16'-10" (5.12 m)	17'-3¾" (5.27 m)	6¼ (160)	1 (30)	30°	23.8 (18.2)	142 (119)

Illinois Department of Transportation

APPROVED April 1, 2016
ENGINEER OF BRIDGES AND STRUCTURES

APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

STANDARD 542206-04

WINGS FOR 1:2 SLOPE

Skew Angle	Nominal Pipe Dia.	Dimensions for Concrete													Concrete 2 End Secs. cu. yd. (m^3)	Welded Wire Reinforcement 2 End Secs. sq. yd. (m^2)
		A	B	C	D	E	F	G	H	J	K	M	N	α		
5°	42 (1050)	5'-5" (1.66 m)	26 (660)	4'-10½" (1.49 m)	4'-3¼" (1.299 m)	16'-1" (4.29 m)	8'-0¼" (2.46 m)	7'-4¼" (2.26 m)	4'-3" (1.295 m)	8'-0¼" (2.45 m)	8'-0¾" (2.47 m)	3½ (90)	3 (80)	85°	8.0 (6.1)	61 (51)
	48 (1200)	6'-0" (1.8 m)	29 (740)	5'-5" (1.64 m)	4'-10¼" (1.478 m)	17'-10" (5.38 m)	8'-10½" (2.67 m)	8'-1¾" (2.44 m)	1.473 m (4'-10")	8'-10¾" (2.68 m)	8'-11¼" (2.7 m)	3½ (90)	3 (80)	85°	9.6 (7.3)	71 (59)
	54 (1350)	6'-7" (2.08 m)	32 (810)	5'-11½" (1.85 m)	5'-5¼" (1.657 m)	19'-7" (6.12 m)	9'-9" (3.08 m)	8'-11¼" (2.82 m)	1.651 m (5'-5")	9'-9¼" (3.05 m)	9'-9¾" (3.07 m)	3½ (90)	3 (80)	85°	11.3 (8.6)	88 (74)
	60 (1500)	7'-2" (2.16 m)	35 (890)	6'-6" (1.97 m)	6'-0¼" (1.835 m)	21'-4¼" (6.46 m)	10'-7¼" (3.2 m)	9'-8¾" (2.93 m)	1.829 m (6'-0")	10'-8" (3.22 m)	10'-8¼" (3.24 m)	3½ (90)	3 (80)	85°	13.2 (10.1)	96 (80)
10°	42 (1050)	5'-5" (1.66 m)	26 (660)	4'-10½" (1.49 m)	4'-3¾" (1.314 m)	16'-3" (4.97 m)	8'-5" (2.59 m)	7'-0¾" (2.17 m)	1.295 m (4'-3")	8'-1" (2.47 m)	8'-2" (2.5 m)	3¾ (100)	3 (80)	80°	8.3 (6.3)	62 (52)
	48 (1200)	6'-0" (1.8 m)	29 (740)	5'-5" (1.64 m)	4'-11" (1.495 m)	18'-0½" (5.43 m)	9'-4" (2.8 m)	7'-10" (2.35 m)	1.473 m (4'-10")	8'-11¾" (2.71 m)	9'-0¾" (2.73 m)	3¾ (100)	3 (80)	80°	9.9 (7.6)	72 (60)
	54 (1350)	6'-7" (2.08 m)	32 (810)	5'-11½" (1.85 m)	5'-6" (1.676 m)	19'-9¾" (6.19 m)	10'-3" (3.24 m)	8'-7¼" (2.72 m)	1.651 m (5'-5")	9'-10½" (3.08 m)	9'-11¼" (3.11 m)	3¾ (100)	3 (80)	80°	11.7 (8.9)	90 (75)
	60 (1500)	7'-2" (2.16 m)	35 (890)	6'-6" (1.97 m)	6'-1" (1.857 m)	21'-7" (6.53 m)	11'-1¾" (3.36 m)	9'-4¼" (2.82 m)	1.829 m (6'-0")	10'-9" (3.25 m)	10'-10" (3.28 m)	3¾ (100)	3 (80)	80°	13.7 (10.5)	98 (82)
15°	42 (1050)	5'-5" (1.66 m)	26 (660)	4'-10½" (1.49 m)	4'-4¾" (1.34 m)	16'-6½" (5.06 m)	8'-10¾" (2.73 m)	6'-10" (2.1 m)	1.295 m (4'-3")	8'-2½" (2.51 m)	8'-4" (2.55 m)	4 (100)	2¾ (70)	75°	8.6 (6.6)	64 (53)
	48 (1200)	6'-0" (1.8 m)	29 (740)	5'-5" (1.64 m)	5'-0" (1.524 m)	18'-4½" (5.54 m)	9'-10¼" (2.96 m)	7'-6¾" (2.27 m)	1.473 m (4'-10")	9'-1½" (2.75 m)	9'-3" (2.79 m)	4 (100)	2¾ (70)	75°	10.4 (8.0)	74 (62)
	54 (1350)	6'-7" (2.08 m)	32 (810)	5'-11½" (1.85 m)	5'-7¼" (1.709 m)	20'-2" (6.3 m)	10'-9¾" (3.42 m)	8'-3½" (2.63 m)	1.651 m (5'-5")	10'-0¼" (3.13 m)	10'-1¾" (3.17 m)	4 (100)	2¾ (70)	75°	12.3 (9.4)	92 (77)
	60 (1500)	7'-2" (2.16 m)	35 (890)	6'-6" (1.97 m)	6'-2½" (1.893 m)	21'-11¾" (6.65 m)	11'-9¼" (3.55 m)	9'-0½" (2.73 m)	1.829 m (6'-0")	10'-11¼" (3.31 m)	11'-0½" (3.34 m)	4 (100)	2¾ (70)	75°	14.3 (10.9)	100 (84)
20°	42 (1050)	5'-5" (1.66 m)	26 (660)	4'-10½" (1.49 m)	4'-6¼" (1.378 m)	16'-11¾" (5.19 m)	9'-5¼" (2.9 m)	6'-7¼" (2.03 m)	1.295 m (4'-3")	8'-5" (2.57 m)	8'-6¾" (2.62 m)	4¼ (110)	2½ (70)	70°	9.0 (6.9)	66 (55)
	48 (1200)	6'-0" (1.8 m)	29 (740)	5'-5" (1.64 m)	5'-1¾" (1.567 m)	18'-10" (5.68 m)	10'-5½" (3.14 m)	7'-4" (2.2 m)	1.473 m (4'-10")	9'-4" (2.81 m)	9'-6" (2.86 m)	4¼ (110)	2½ (70)	70°	10.9 (8.3)	76 (64)
	54 (1350)	6'-7" (2.08 m)	32 (810)	5'-11½" (1.85 m)	5'-9¼" (1.756 m)	20'-8½" (6.47 m)	11'-5¾" (3.63 m)	8'-0½" (2.54 m)	1.651 m (5'-5")	10'-3¼" (3.21 m)	10'-5¼" (3.26 m)	4¼ (110)	2½ (70)	70°	12.9 (9.9)	94 (79)
	60 (1500)	7'-2" (2.16 m)	35 (890)	6'-6" (1.97 m)	6'-4½" (1.946 m)	22'-6¾" (6.83 m)	12'-6" (3.77 m)	8'-9" (2.64 m)	1.829 m (6'-0")	11'-2½" (3.39 m)	11'-4¼" (3.44 m)	4¼ (110)	2½ (70)	70°	15.1 (11.5)	103 (86)
25°	42 (1050)	5'-5" (1.66 m)	26 (660)	4'-10½" (1.49 m)	4'-8¼" (1.428 m)	17'-6¾" (5.37 m)	10'-1" (3.09 m)	6'-5" (1.64 m)	1.295 m (4'-3")	8'-8¼" (2.65 m)	8'-10½" (2.72 m)	4½ (110)	2¼ (60)	65°	9.5 (7.3)	65 (55)
	48 (1200)	6'-0" (1.8 m)	29 (740)	5'-5" (1.64 m)	5'-4" (1.625 m)	19'-6" (5.88 m)	11'-2' (3.35 m)	7'-1¼" (2.14 m)	1.473 m (4'-10")	9'-7¾" (2.91 m)	9'-10¼" (2.97 m)	4½ (110)	2¼ (60)	65°	11.5 (8.8)	79 (66)
	54 (1350)	6'-7" (2.08 m)	32 (810)	5'-11½" (1.85 m)	5'-11¾" (1.821 m)	21'-5" (6.69 m)	12'-3" (3.87 m)	7'-9¾" (2.47 m)	1.651 m (5'-5")	10'-7¼" (3.31 m)	10'-9¾" (3.37 m)	4½ (110)	2¼ (60)	65°	13.6 (10.4)	98 (82)
	60 (1500)	7'-2" (2.16 m)	35 (890)	6'-6" (1.97 m)	6'-7½" (2.018 m)	23'-4¼" (7.06 m)	13'-4" (4.02 m)	8'-6" (2.56 m)	1.829 m (6'-0")	11'-7" (3.5 m)	11'-9¼" (3.56 m)	4½ (110)	2¼ (60)	65°	15.9 (12.2)	107 (90)
30°	42 (1050)	5'-5" (1.66 m)	26 (660)	4'-10½" (1.49 m)	4'-11" (1.495 m)	18'-4" (5.61 m)	10'-10" (3.32 m)	6'-3" (1.92 m)	1.295 m (4'-3")	9'-0½" (2.77 m)	9'-3½" (2.84 m)	4½ (120)	2¼ (60)	60°	10.1 (7.7)	71 (59)
	48 (1200)	6'-0" (1.8 m)	29 (740)	5'-5" (1.64 m)	5'-7" (1.7 m)	20'-4¼" (6.13 m)	12'-0" (3.6 m)	6'-11¼" (2.08 m)	1.473 m (4'-10")	10'-0¾" (3.03 m)	10'-3½" (3.1 m)	4½ (120)	2¼ (60)	60°	12.2 (9.3)	82 (69)
	54 (1350)	6'-7" (2.08 m)	32 (810)	5'-11½" (1.85 m)	6'-3" (1.906 m)	22'-4½" (6.99 m)	13'-2" (4.16 m)	7'-7¼" (2.41 m)	1.651 m (5'-5")	11'-0¾" (3.46 m)	11'-3¾" (3.53 m)	4½ (120)	2¼ (60)	60°	14.4 (11.0)	102 (86)
	60 (1500)	7'-2" (2.16 m)	35 (890)	6'-6" (1.97 m)	6'-11¼" (2.111 m)	24'-4¾" (7.38 m)	14'-4" (4.32 m)	8'-3¼" (2.45 m)	1.829 m (6'-0")	12'-1" (3.65 m)	12'-3¾" (3.73 m)	4½ (120)	2¼ (60)	60°	16.9 (12.9)	112 (93)

Illinois Department of Transportation

APPROVED April 1, 2016
ENGINEER OF BRIDGES AND STRUCTURES

APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

WINGS FOR 1:2 SLOPE

Skew Angle	Nominal Pipe Dia.	Dimensions for Concrete													Concrete 2 End Secs. cu. yd. (m^3)	Welded Wire Reinforcement 2 End Secs. sq. yd. (m^2)
		A	B	C	D	E	F	G	H	J	K	M	N	α		
35°	42 (1050)	5'-5" (1.66 m)	26 (660)	4'-10½" (1.49 m)	5'-2¼" (1.58 m)	19'-3¾" (5.91 m)	11'-8¾" (3.6 m)	6'-1¼" (1.87 m)	4'-3" (1.295 m)	9'-6¼" (2.91 m)	9'-9½" (3.0 m)	4¾ (120)	2 (50)	55°	10.8 (8.3)	75 (63)
	48 (1200)	6'-0" (1.80 m)	29 (740)	5'-5" (1.64 m)	5'-10¾" (1.798 m)	21'-5½" (6.47 m)	13'-0" (3.9 m)	6'-9¼" (2.03 m)	4'-10" (1.473 m)	10'-7" (3.91 m)	10'-10½" (3.28 m)	4¾ (120)	2 (50)	55°	13.0 (9.9)	87 (73)
	54 (1350)	6'-7" (2.08 m)	32 (810)	5'-11½" (1.85 m)	6'-7¼" (2.015 m)	23'-7" (7.37 m)	14'-3" (4.51 m)	7'-5" (2.35 m)	5'-5" (1.651 m)	11'-7¾" (3.64 m)	11'-11¼" (3.73 m)	4¾ (120)	2 (50)	55°	15.4 (11.8)	108 (90)
	60 (1500)	7'-2" (2.16 m)	35 (890)	6'-6" (1.97 m)	7'-4" (2.232 m)	25'-8¾" (7.78 m)	15'-6¼" (4.68 m)	8'-1" (2.44 m)	6'-0" (1.829 m)	12'-8¾" (3.85 m)	13'-0" (3.93 m)	4¾ (120)	2 (50)	55°	18.1 (13.8)	118 (99)
40°	42 (1050)	5'-5" (1.66 m)	26 (660)	4'-10½" (1.49 m)	5'-6½" (1.69 m)	20'-7" (6.29 m)	12'-9¾" (3.93 m)	5'-11¾" (1.84 m)	4'-3" (1.295 m)	10'-1½" (3.1 m)	10'-5½" (3.19 m)	5 (130)	1¾ (50)	50°	11.6 (8.9)	80 (67)
	48 (1200)	6'-0" (1.80 m)	29 (740)	5'-5" (1.64 m)	6'-3¾" (1.922 m)	22'-10¼" (6.89 m)	14'-2¼" (4.26 m)	6'-7½" (1.99 m)	4'-10" (1.473 m)	11'-3¼" (3.4 m)	11'-7" (3.49 m)	5 (130)	1¾ (50)	50°	14.0 (10.7)	93 (77)
	54 (1350)	6'-7" (2.08 m)	32 (810)	5'-11½" (1.85 m)	7'-0¾" (2.155 m)	25'-1¾" (7.86 m)	15'-7" (4.93 m)	7'-3¼" (2.3 m)	5'-5" (1.651 m)	12'-5" (3.88 m)	12'-8¾" (3.98 m)	5 (130)	1¾ (50)	50°	16.7 (12.8)	115 (96)
	60 (1500)	7'-2" (2.16 m)	35 (890)	6'-6" (1.97 m)	7'-10" (2.387 m)	27'-5¼" (8.3 m)	16'-11½" (5.11 m)	7'-11" (2.39 m)	6'-0" (1.829 m)	13'-6¾" (4.1 m)	13'-10½" (4.2 m)	5 (130)	1¾ (50)	50°	19.5 (14.9)	126 (105)
45°	42 (1050)	5'-5" (1.66 m)	26 (660)	4'-10½" (1.49 m)	6'-0" (1.831 m)	22'-2½" (6.79 m)	14'-1¾" (4.34 m)	5'-10¼" (1.8 m)	4'-3" (1.295 m)	10'-11" (3.34 m)	11'-3½" (3.45 m)	5¼ (140)	1½ (40)	45°	12.6 (9.6)	86 (72)
	48 (1200)	6'-0" (1.80 m)	29 (740)	5'-5" (1.64 m)	6'-10" (2.083 m)	24'-8¼" (7.44 m)	15'-8¼" (4.7 m)	6'-6" (1.95 m)	4'-10" (1.473 m)	12'-2" (3.67 m)	12'-6¼" (3.77 m)	5¼ (140)	1½ (40)	45°	15.2 (12.0)	100 (83)
	54 (1350)	6'-7" (2.08 m)	32 (810)	5'-11½" (1.85 m)	7'-8" (2.334 m)	27'-1¾" (8.48 m)	17'-2½" (5.44 m)	7'-1½" (2.25 m)	5'-5" (1.651 m)	13'-4¾" (4.19 m)	13'-9" (4.29 m)	5¼ (140)	1½ (40)	45°	18.2 (13.9)	124 (104)
	60 (1500)	7'-2" (2.16 m)	35 (890)	6'-6" (1.97 m)	8'-5¾" (2.586 m)	29'-7½" (8.96 m)	18'-8¾" (5.65 m)	7'-9" (2.34 m)	6'-0" (1.829 m)	14'-7½" (4.43 m)	15'-0" (4.53 m)	5¼ (140)	1½ (40)	45°	21.3 (16.3)	136 (114)
50°	42 (1050)	5'-5" (1.66 m)	26 (660)	4'-10½" (1.49 m)	6'-7¼" (2.014 m)	24'-3¾" (7.44 m)	15'-10" (4.86 m)	5'-9¼" (1.77 m)	4'-3" (1.295 m)	11'-11½" (3.66 m)	12'-4¼" (3.78 m)	5½ (150)	1½ (40)	40°	13.9 (10.6)	94 (78)
	48 (1200)	6'-0" (1.80 m)	29 (740)	5'-5" (1.64 m)	7'-6¼" (2.291 m)	27'-0½" (8.15 m)	17'-6½" (5.27 m)	6'-4½" (1.92 m)	4'-10" (1.473 m)	13'-3¾" (4.02 m)	13'-8¾" (4.13 m)	5½ (150)	1½ (40)	40°	16.8 (12.8)	109 (91)
	54 (1350)	6'-7" (2.08 m)	32 (810)	5'-11½" (1.85 m)	8'-5" (2.568 m)	29'-9¼" (9.3 m)	19'-3" (6.09 m)	7'-0" (2.21 m)	5'-5" (1.651 m)	14'-8¼" (4.59 m)	15'-1" (4.71 m)	5½ (150)	1½ (40)	40°	20.0 (15.3)	135 (113)
	60 (1500)	7'-2" (2.16 m)	35 (890)	6'-6" (1.97 m)	9'-4" (2.845 m)	32'-5¾" (9.82 m)	20'-11½" (6.32 m)	7'-7½" (2.3 m)	6'-0" (1.829 m)	16'-0½" (4.86 m)	16'-5¼" (4.97 m)	5½ (150)	1½ (40)	40°	23.5 (18.0)	148 (124)
55°	42 (1050)	5'-5" (1.66 m)	26 (660)	4'-10½" (1.49 m)	7'-5" (2.257 m)	27'-1½" (8.3 m)	18'-0¼" (5.52 m)	5'-8¼" (1.74 m)	4'-3" (1.295 m)	13'-4¼" (4.08 m)	13'-9¼" (4.22 m)	5¾ (150)	1¼ (30)	35°	15.5 (11.9)	104 (87)
	48 (1200)	6'-0" (1.80 m)	29 (740)	5'-5" (1.64 m)	8'-5" (2.568 m)	30'-2¼" (9.1 m)	19'-11½" (5.99 m)	6'-3½" (1.89 m)	4'-10" (1.473 m)	14'-10½" (4.48 m)	15'-3¾" (4.62 m)	5¾ (150)	1¼ (30)	35°	18.8 (14.4)	121 (101)
	54 (1350)	6'-7" (2.08 m)	32 (810)	5'-11½" (1.85 m)	9'-5¼" (2.878 m)	33'-2¾" (10.39 m)	21'-10¾" (6.92 m)	6'-10¾" (2.18 m)	5'-5" (1.651 m)	16'-4¾" (5.13 m)	16'-10" (5.26 m)	5¾ (150)	1¼ (30)	35°	22.4 (17.1)	150 (125)
	60 (1500)	7'-2" (2.16 m)	35 (890)	6'-6" (1.97 m)	10'-5½" (3.188 m)	36'-3½" (10.97 m)	23'-10" (7.18 m)	7'-6¼" (2.27 m)	6'-0" (1.829 m)	17'-11¼" (5.42 m)	18'-4¼" (5.55 m)	5¾ (150)	1¼ (30)	35°	26.4 (20.2)	165 (138)
60°	42 (1050)	5'-5" (1.66 m)	26 (660)	4'-10½" (1.49 m)	8'-6" (2.59 m)	30'-11¾" (9.48 m)	20'-11¼" (6.42 m)	5'-7¼" (1.72 m)	4'-3" (1.295 m)	15'-3" (4.67 m)	15'-8¾" (4.81 m)	6¼ (160)	1 (30)	30°	17.7 (13.5)	118 (98)
	48 (1200)	6'-0" (1.80 m)	29 (740)	5'-5" (1.64 m)	9'-8" (2.946 m)	34'-5¾" (10.39 m)	23'-2¼" (6.96 m)	6'-2½" (1.87 m)	4'-10" (1.473 m)	17'-0" (5.12 m)	17'-5¾" (5.27 m)	6¼ (160)	1 (30)	30°	21.5 (16.4)	137 (115)
	54 (1350)	6'-7" (2.08 m)	32 (810)	5'-11½" (1.85 m)	10'-10" (3.302 m)	37'-11¾" (11.87 m)	25'-5¼" (8.04 m)	6'-9¾" (2.16 m)	5'-5" (1.651 m)	18'-9" (5.86 m)	19'-2¾" (6.01 m)	6¼ (160)	1 (30)	30°	25.7 (19.6)	170 (142)
	60 (1500)	7'-2" (2.16 m)	35 (890)	6'-6" (1.97 m)	12'-0" (3.658 m)	41'-5¾" (12.55 m)	27'-8¼" (8.35 m)	7'-5" (2.24 m)	6'-0" (1.829 m)	20'-6" (6.2 m)	20'-11¾" (6.35 m)	6¼ (160)	1 (30)	30°	30.2 (23.1)	187 (157)

Illinois Department of Transportation

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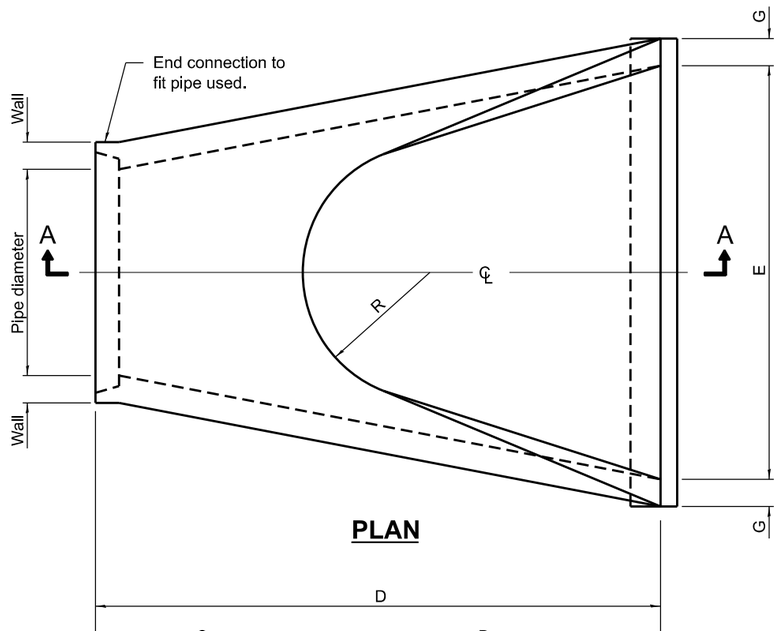
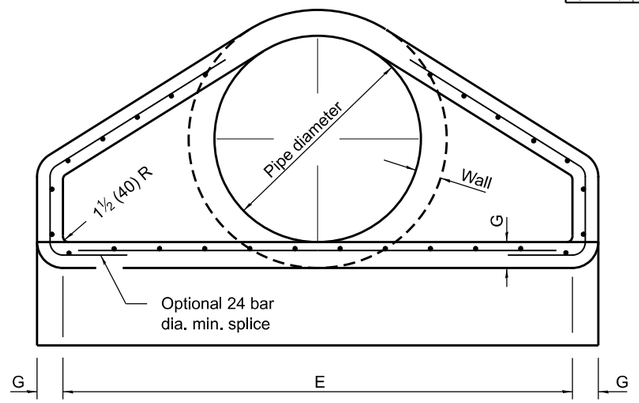
REINFORCED CONCRETE END SECTIONS FOR PIPE CULVERTS
42" (1050 mm) THRU 60" (1500 mm) DIA.
SKEWED WITH ROADWAY
(Sheet 5 of 5)

STANDARD 542206-04



SECTION A-A



END VIEW

PIPE DIA.	APPROX. QTY. lbs. (kg)	WALL	A	B	C	D	E	G	R	APPROX. SLOPE
12 (300)	530 (240)	2 (51)	4 (102)	24 (610)	4'-0⅞" (1.241 m)	6'-0⅞" (1.851 m)	24 (610)	2 (51)	9 (229)	1:2.4
15 (375)	740 (335)	2¼ (57)	6 (152)	27 (686)	3'-10" (1.168 m)	6'-1" (1.854 m)	30 (762)	2¼ (57)	11 (280)	1:2.4
18 (450)	990 (450)	2½ (64)	9 (229)	27 (686)	3'-10" (1.168 m)	6'-1" (1.854 m)	36 (914)	2½ (64)	12 (305)	1:2.4
21 (525)	1280 (580)	2¾ (70)	9 (229)	35 (889)	38 (965)	6'-1" (1.854 m)	3'-6" (1.067 m)	2¾ (70)	13 (330)	1:2.4
24 (600)	1520 (690)	3 (76)	9½ (241)	3'-7½" (1.105 m)	30 (762)	6'-1½" (1.867 m)	4'-0" (1.219 m)	3 (76)	14 (356)	1:2.5
27 (675)	1930 (875)	3¼ (83)	10½ (267)	4'-0" (1.219 m)	25½ (648)	6'-1½" (1.867 m)	4'-6" (1.372 m)	3¼ (83)	14½ (368)	1:2.4
30 (750)	2190 (995)	3½ (89)	12 (305)	4'-6" (1.375 m)	19¾ (502)	6'-1¾" (1.874 m)	5'-0" (1.524 m)	3½ (89)	15 (381)	1:2.5
33 (825)	3200 (1450)	3¾ (95)	13½ (343)	4'-10½" (1.486 m)	39¼ (997)	8'-1¾" (2.483 m)	5'-6" (1.676 m)	3¾ (95)	17½ (445)	1:2.5
36 (900)	4100 (1860)	4 (102)	15 (381)	5'-3" (1.6 m)	34¾ (883)	8'-1¾" (2.483 m)	6'-0" (1.829 m)	4 (102)	20 (508)	1:2.5
42 (1050)	5380 (2440)	4½ (114)	21 (533)	5'-3" (1.6 m)	35 (889)	8'-2" (2.489 m)	6'-6" (1.981 m)	4½ (114)	22 (559)	1:2.5
48 (1200)	6550 (2970)	5 (127)	24 (610)	6'-0" (1.829 m)	26 (660)	8'-2" (2.489 m)	7'-0" (2.134 m)	5 (127)	22 (559)	1:2.5
54 (1350)	8240 (3740)	5½ (140)	27 (686)	5'-5" (1.651 m)	35 (889)	8'-4" (2.54 m)	7'-6" (2.286 m)	5½ (140)	24 (610)	1:2.0
60 (1500)	8730 (3960)	6 (152)	35 (889)	5'-0" (1.524 m)	39 (991)	8'-3" (2.515 m)	8'-0" (2.438 m)	5 (127)	*	1:1.9
66 (1650)	10710 (4860)	6½ (165)	30 (762)	6'-0" (1.829 m)	27 (686)	8'-3" (2.515 m)	8'-6" (2.591 m)	5½ (140)	*	1:1.7
72 (1800)	12520 (5680)	7 (178)	36 (914)	6'-6" (1.981 m)	21 (533)	8'-3" (2.514 m)	9'-0" (2.743 m)	6 (152	*	1:1.8
78 (1950)	14770 (6700)	7½ (191)	36 (914)	7'-6" (2.286 m)	21 (533)	9'-3" (2.819 m)	9'-6" (2.896 m)	6½ (165)	*	1:1.8
84 (2100)	18160 (8240)	8 (203)	36 (914)	7'-6½" (2.299 m)	21 (533)	9'-3½" (2.832 m)	10'-0" (3.048 m)	6½ (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.

Illinois Department of Transportation

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

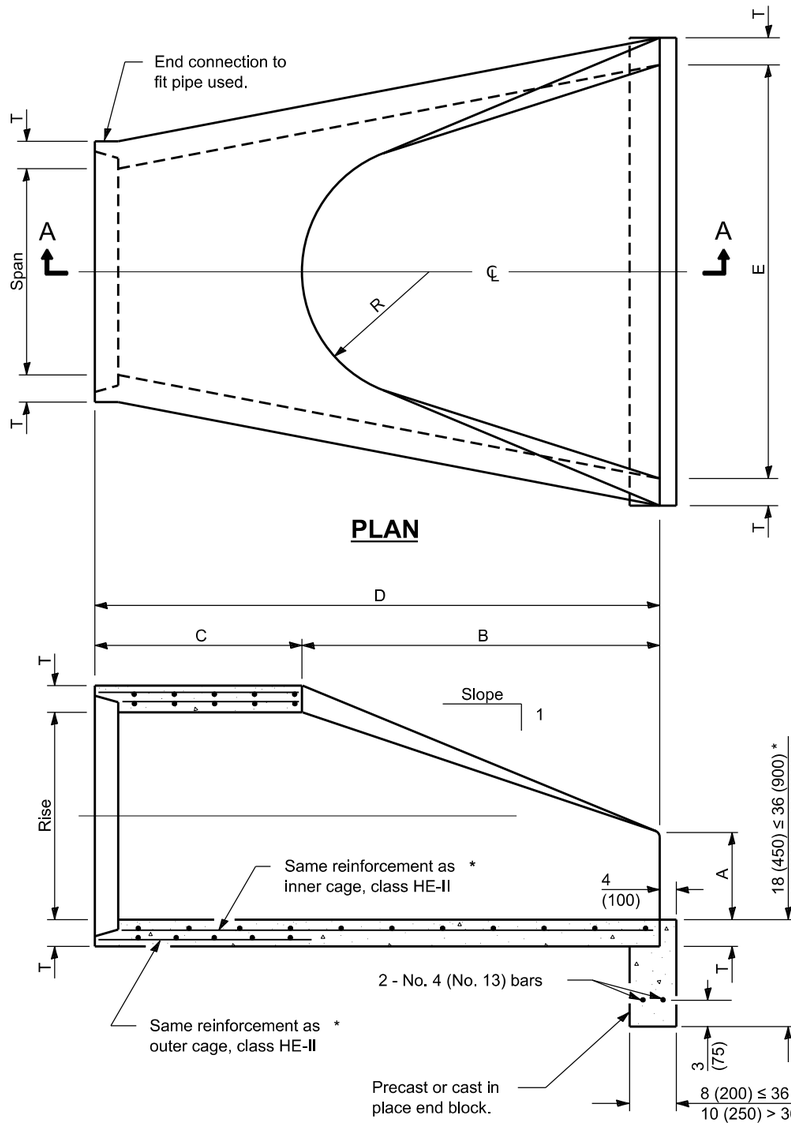
APPROVED January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

PRECAST REINFORCED CONCRETE FLARED END SECTION

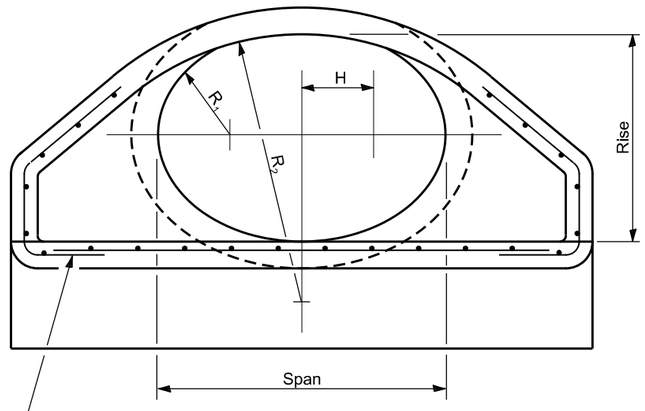
STANDARD 542301-03



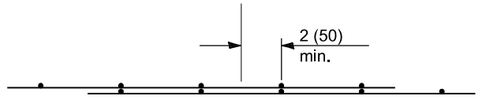
* Refers to the equivalent pipe diameter.

SECTION A-A

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)	2¾ (70)	8 (203)	27 (686)	3'-9" (1.143 m)	6'-0" (1.829 m)	36 (914)	5⅜ (137)	6 (152)	6 (152)	20 (508)	1:3.1
30 (762)	19 (483)	24 (600)	3¼ (83)	8½ (216)	39 (991)	33 (838)	6'-0" (1.829 m)	4'-0" (1.219 m)	6⅞ (175)	7 (178)	8¼ (210)	26¼ (667)	1:2.8
34 (864)	22 (559)	27 (675)	3½ (89)	9 (229)	4'-0" (1.219 m)	24 (610)	6'-0" (1.829 m)	4'-6" (1.372 m)	7¾ (197)	8 (203)	9¼ (235)	29¼ (743)	1:2.9
38 (965)	24 (610)	30 (750)	3½ (95)	9½ (241)	4'-6" (1.372 m)	18 (475)	6'-0" (1.829 m)	5'-0" (1.524 m)	8⅝ (219)	9 (229)	10¼ (260)	32¾ (832)	1:2.9
45 (1143)	29 (737)	36 (900)	4½ (114)	11¼ (286)	5'-0" (1.524 m)	36 (914)	8'-0" (2.438 m)	6'-0" (1.829 m)	10½ (267)	12 (305)	12¼ (311)	39¼ (997)	1:2.7
53 (1346)	34 (864)	42 (1050)	5 (127)	15¾ (400)	5'-0" (1.524 m)	36 (914)	8'-0" (2.438 m)	6'-6" (1.981 m)	12⅛ (308)	13 (330)	14½ (368)	3'-10" (1.168 m)	1:2.6
60 (1524)	38 (965)	48 (1200)	5½ (140)	21 (533)	5'-0" (1.524 m)	36 (914)	8'-0" (2.438 m)	7'-0" (2.134 m)	13½ (343)	14 (356)	16½ (419)	4'-3½" (1.308 m)	1:2.7
68 (1727)	43 (1092)	54 (1350)	6 (152)	26 (660)	5'-0" (1.524 m)	36 (914)	8'-0" (2.438 m)	7'-6" (2.286 m)	15¼ (387)	16 (406)	18¾ (476)	4'-10½" (1.486 m)	1:2.6
76 (1930)	48 (1219)	60 (1500)	6½ (165)	31 (787)	5'-0" (1.524 m)	36 (914)	8'-0" (2.438 m)	8'-0" (2.439 m)	17 (432)	18 (457)	20¾ (527)	5'-5" (1.651 m)	1:2.6



END VIEW



OPTIONAL WELDED WIRE REINFORCEMENT LAP

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED April 1, 2016
ENGINEER OF BRIDGES AND STRUCTURES

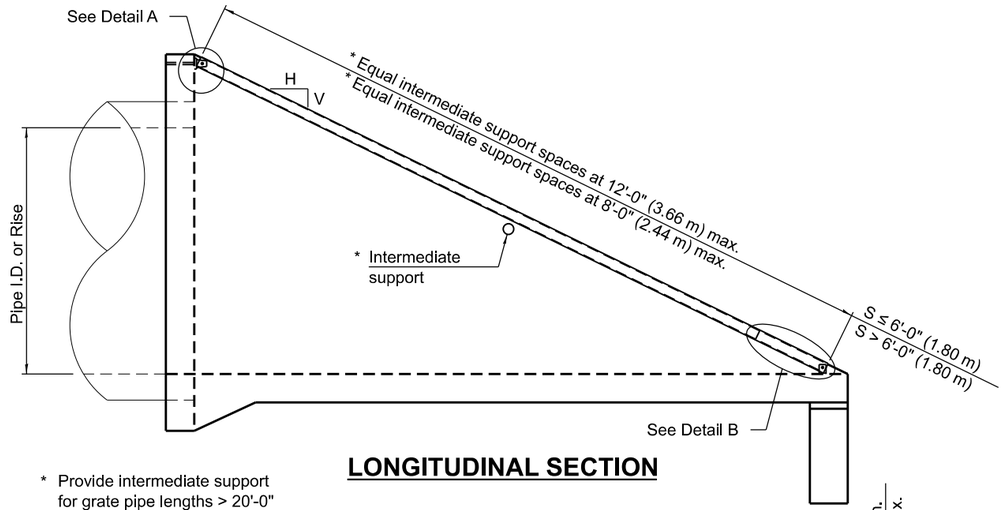
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

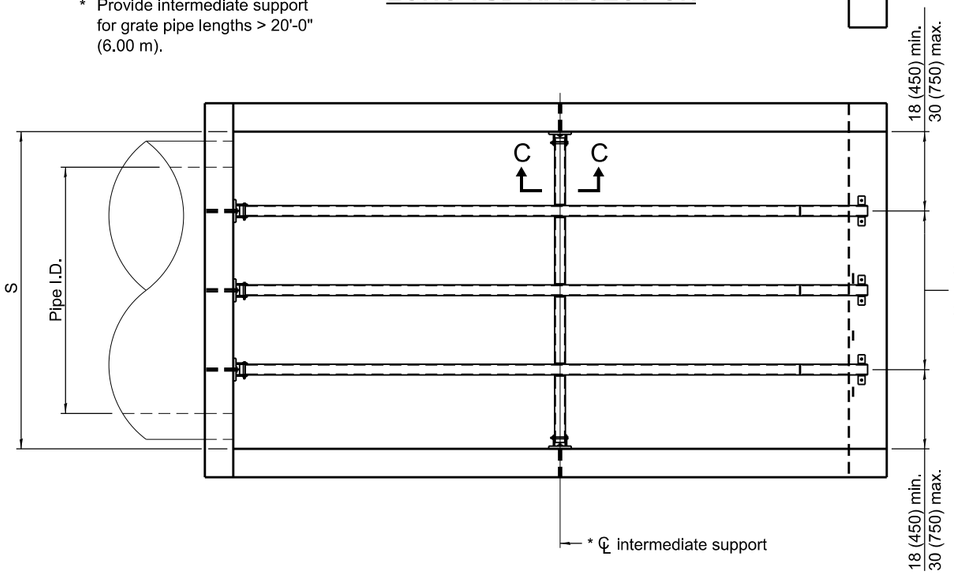
PRECAST REINFORCED CONCRETE ELLIPTICAL FLARED END SECTION

STANDARD 542306-03

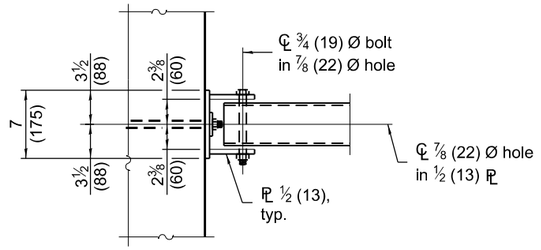


LONGITUDINAL SECTION

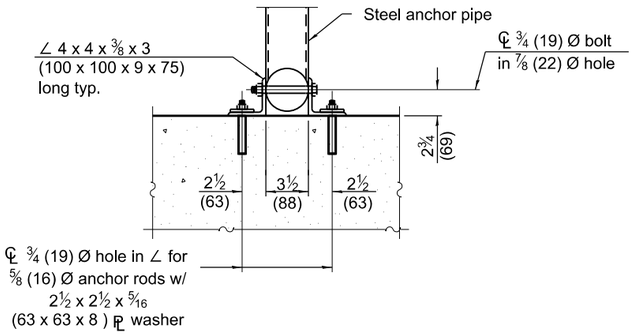
* Provide intermediate support for grate pipe lengths > 20'-0" (6.00 m).



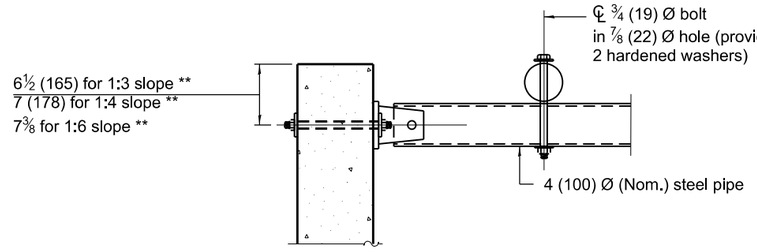
PLAN VIEW



VIEW A-A

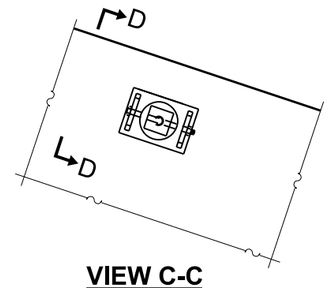


SECTION B-B



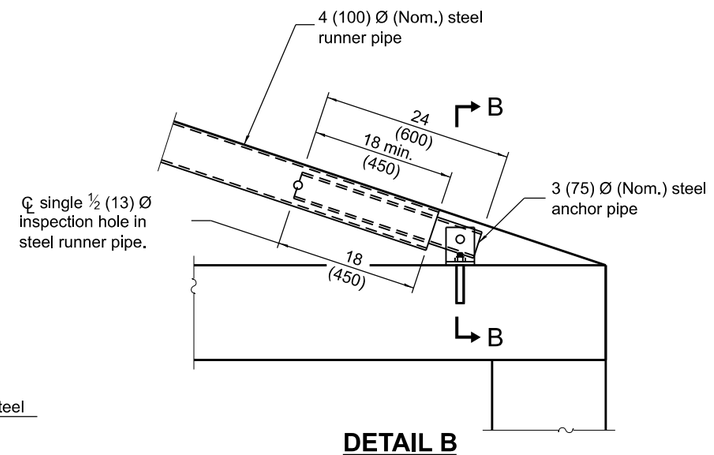
SECTION D-D

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

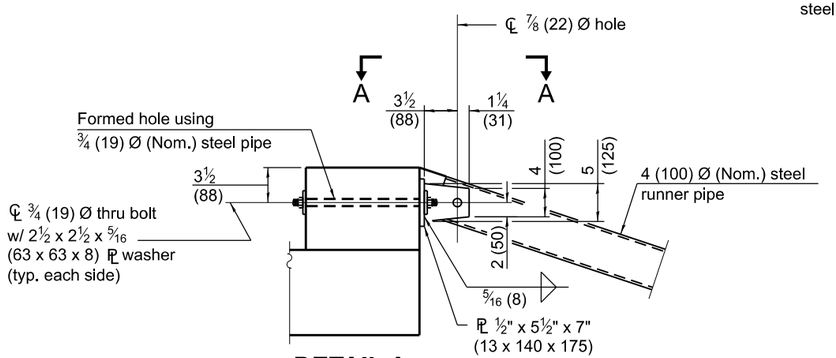


VIEW C-C

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



DETAIL B



DETAIL A

GENERAL NOTES

This standard shall only be used on concrete end sections not skewed more than ± 15 degrees with roadway.

The minimum distance from the center of a hole to the free edge of a structural shape or plate shall be 1½ (38) unless noted otherwise.

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

Illinois Department of Transportation

APPROVED January 1, 2018
ENGINEER OF BRIDGES AND STRUCTURES

APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-18	Corrected value in elliptical
	pipe table. Renamed standard.
4-1-16	Corrected typo.

TRAVERSABLE PIPE GRATE FOR CONCRETE END SECTIONS

(Sheet 1 of 2)

STANDARD 542311-07

PIPE-GRATE SCHEDULE FOR PIPE CULVERT END SECTIONS

Pipe I.D.	Slope of End Section								
	1:3			1:4			1:6		
	Main Pipe No. / Length	Int. Support No. / Length	Total Length of Pipe	Main Pipe No. / Length	Int. support No. / Length	Total Length of Pipe	Main Pipe No. / Length	Int. Support No. / Length	Total Length of Pipe
27 (675)	1 @ 9'-8" 1 @ (2.95 m)	N/A	9'-8" (2.95 m)	1 @ 12'-11" 1 @ (3.94 m)	N/A	12'-11" (3.94 m)	1 @ 19'-7" 1 @ (5.97 m)	N/A	19'-7" (5.97 m)
30 (750)	1 @ 11'-4" 1 @ (3.43 m)	N/A	11'-4" (3.43 m)	1 @ 14'-10" 1 @ (4.52 m)	N/A	14'-10" (4.52 m)	1 @ 21'-10" 1 @ (6.65 m)	1 @ 3'-6 1 @ 1.07 m)	25'-4" (7.72 m)
33 (825)	1 @ 12'-1" 1 @ (3.68 m)	N/A	12'-1" (3.68 m)	1 @ 15'-10" 1 @ (4.83 m)	N/A	15'-10" (4.83 m)	1 @ 23'-5" 1 @ (7.14 m)	1 @ 3'-7" 1 @ (1.09 m)	27'-0" (8.23 m)
36 (900)	1 @ 12'-10" 1 @ (3.91 m)	N/A	12'-10" (3.91 m)	1 @ 16'-10" 1 @ (5.13 m)	N/A	16'-10" (5.13 m)	1 @ 24'-11" 1 @ (7.59 m)	2 @ 3'-11" 2 @ (1.19 m)	32'-9" (9.97 m)
42 (1050)	2 @ 14'-9" 2 @ (4.50 m)	N/A	29'-6" (9.00 m)	2 @ 19'-3" 2 @ (5.87 m)	N/A	38'-6" (11.74 m)	2 @ 28'-6" 2 @ (8.69 m)	2 @ 4'-7" 2 @ (1.40 m)	66'-2" (20.18 m)
48 (1200)	2 @ 16'-4" 2 @ (4.98 m)	N/A	32'-8" (9.96 m)	2 @ 21'-4" 2 @ (6.50 m)	1 @ 5'-1" 1 @ (1.55 m)	47'-9" (14.55 m)	2 @ 31'-6" 2 @ (9.60 m)	2 @ 5'-1" 2 @ (1.55 m)	73'-2" (22.30 m)
54 (1350)	2 @ 18'-2" 2 @ (5.54 m)	N/A	36'-4" (11.08 m)	2 @ 23'-9" 2 @ (7.24 m)	2 @ 5'-9" 2 @ (1.75 m)	59'-0" (16.23 m)	2 @ 35'-1 2 @ (10.69 m)	4 @ 5'-9" 4 @ (1.75 m)	93'-2" (28.38 m)
60 (1500)	2 @ 19'-9" 2 @ (6.02 m)	N/A	39'-6" (12.04 m)	2 @ 25'-10" 2 @ (7.87 m)	3 @ 6'-3" 3 @ (1.91 m)	70'-5" (21.47 m)	2 @ 38'-1" 2 @ (11.61 m)	4 @ 6'-3" 4 @ (1.91 m)	101'-2" (30.86 m)
66 (1650)	2 @ 21'-7" 2 @ (6.58 m)	2 @ 6'-11" 2 @ (2.11 m)	57'-0" (17.38 m)	2 @ 28'-2" 2 @ (8.59 m)	3 @ 6'-11" 3 @ (2.11 m)	77'-1" (23.51 m)	2 @ 41'-11" 2 @ (12.78 m)	5 @ 6'-11" 5 @ (2.11 m)	127'-5" (36.11 m)
72 (1800)	3 @ 23'-2" 3 @ (7.06 m)	2 @ 7'-5" 2 @ (2.26 m)	84'-4" (25.70 m)	3 @ 30'-3" 3 @ (9.22 m)	3 @ 7'-5" 3 @ (2.26 m)	113'-0" (34.44 m)	3 @ 44'-8" 3 @ (13.61 m)	5 @ 7'-5" 5 @ (2.26 m)	171'-1" (52.13 m)
78 (1950)	3 @ 25'-0" 3 @ (7.62 m)	3 @ 8'-1" 3 @ (2.46 m)	99'-3" (30.24 m)	3 @ 32'-8" 3 @ (9.96 m)	4 @ 8'-1" 4 @ (2.46 m)	130'-4" (39.72 m)	3 @ 48'-3" 3 @ (14.71 m)	6 @ 8'-1" 6 @ (2.46 m)	193'-3" (58.89 m)
84 (2100)	3 @ 26'-7" 3 @ (8.10 m)	3 @ 8'-7" 3 @ (2.62 m)	105'-6" (32.16 m)	3 @ 34'-9" 3 @ (10.59 m)	4 @ 8'-7" 4 @ (2.62 m)	138'-7" (42.25 m)	3 @ 51'-3" 3 @ (15.62 m)	6 @ 8'-7" 6 @ (2.62 m)	206'-3" (62.58 m)

PIPE-GRATE SCHEDULE FOR ELLIPTICAL PIPE CULVERT END SECTIONS

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

Illinois Department of Transportation

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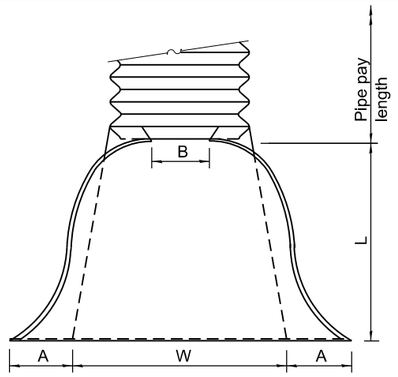
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

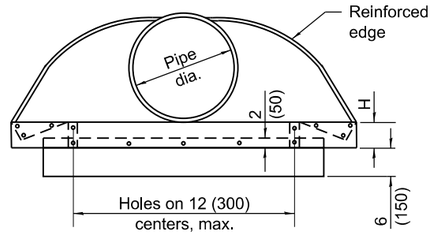
TRAVERSABLE PIPE GRATE FOR CONCRETE END SECTIONS

STANDARD 542311-07

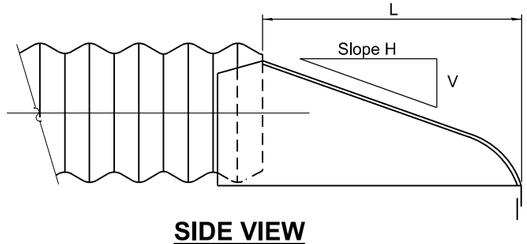
PIPE DIA.	THICK-NESS	DIMENSIONS A	B	H	L	W	SLOPE (Approx.) (V:H)	BODY
		1± (25)	(max.)	1± (25)	1½± (38)	2± (50)		
12 (300)	0.064 (1.63)	6 (150)	6 (150)	6 (150)	21 (535)	24 (610)	1:2½	1 Pc.
15 (375)	0.064 (1.63)	7 (180)	8 (205)	6 (150)	26 (660)	30 (760)	1:2½	1 Pc.
18 (450)	0.064 (1.63)	8 (205)	10 (255)	6 (150)	31 (785)	36 (915)	1:2½	1 Pc.
21 (525)	0.064 (1.63)	9 (230)	12 (305)	6 (150)	36 (915)	42 (1.065 m)	1:2½	1 Pc.
24 (600)	0.064 (1.63)	10 (255)	13 (330)	6 (150)	41 (1.040 m)	48 (1.220 m)	1:2½	1 Pc.
30 (750)	0.079 (2.01)	12 (305)	16 (405)	8 (205)	51 (1.295 m)	60 (1.525 m)	1:2½	1 Pc.
36 (900)	0.079 (2.01)	14 (355)	19 (480)	9 (230)	60 (1.525 m)	72 (1.830 m)	1:2½	2 Pc.
42 (1050)	0.109 (2.77)	16 (405)	22 (560)	11 (280)	69 (1.750 m)	84 (2.135 m)	1:2½	2 Pc.
48 (1200)	0.109 (2.77)	18 (455)	27 (685)	12 (305)	78 (1.980 m)	90 (2.285 m)	1:2¼	2 Pc.
54 (1350)	0.109 (2.77)	18 (455)	30 (760)	12 (305)	84 (2.135 m)	102 (2.590 m)	1:2	2 Pc.
60 (1500)	0.109 (2.77)	18 (455)	33 (840)	12 (305)	87 (2.210 m)	114 (2.895 m)	1:1¾	3 Pc.
66 (1650)	0.109 (2.77)	18 (455)	36 (915)	12 (305)	87 (2.210 m)	120 (3.050 m)	1:1½	3 Pc.
72 (1800)	0.109 (2.77)	18 (455)	39 (990)	12 (305)	87 (2.210 m)	126 (3.200 m)	1:1⅓	3 Pc.
78 (1950)	0.109 (2.77)	18 (455)	42 (1.065 m)	12 (305)	87 (2.210 m)	132 (3.355 m)	1:1¼	3 Pc.
84 (2250)	0.109 (2.77)	18 (455)	45 (1.145 m)	12 (305)	87 (2.210 m)	138 (3.505 m)	1:1⅙	3 Pc.



PLAN



END VIEW



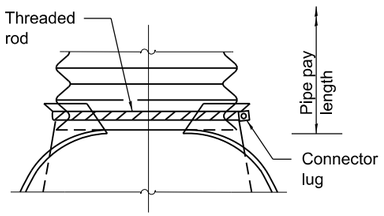
SIDE VIEW

END SECTION

NOTES

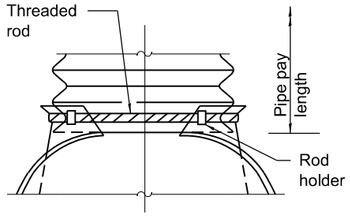
For 60 (1500) thru 84 (2250) sizes, reinforced edges shall be supplemented with stiffener angles. The angles shall be 2 x 2 x ¼(51 x 51 x 6.4) for 60 (1500) thru 72 (1800) diameter and 2½ x 2½ x ¼ (64 x 64 x 6.4) for 78 (1950) thru 84 (2250) diameter. The angles shall be attached by ⅜ (M10) rivets or bolts.

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



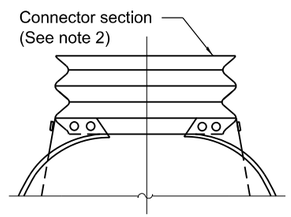
TYPE 1

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



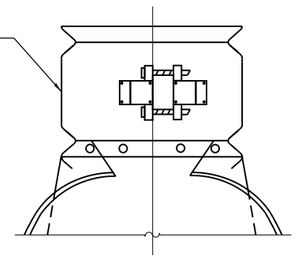
TYPE 2

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



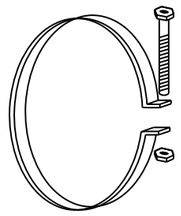
TYPE 3

(See Note 2)



TYPE 4

(See Note 3)



1 (25) wide, 0.109 (2.77) thick strap with standard ½ x 6 (M12x150) band bolt and nut.

ALTERNATE STRAP CONNECTOR

(For Type 1 only)

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 2⅔ (68) pitch x ½ (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 2⅔ x ½ (68 x 13) dimple, hugger, or annular band of 3 x 1 (75 x 25). 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.

Illinois Department of Transportation

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ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

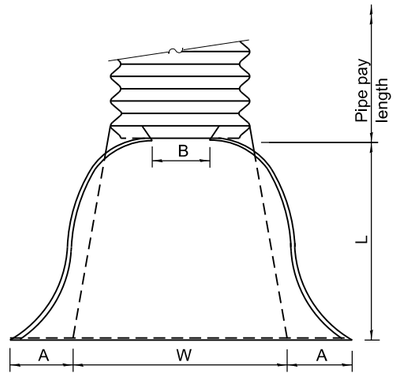
DATE	REVISIONS
1-1-21	Revised THICKNESS values
	in table.
1-1-18	Renamed standard.

METAL FLARED END SECTION FOR PIPE CULVERTS

CONNECTIONS OF END SECTIONS

STANDARD 542401-04

PIPE ARCH DIMENSIONS		THICK-NESS	DIMENSIONS					SLOPE (Approx.) (V:H)	BODY
			A	B	H	L	W		
SPAN	RISE		1± (25)	(max.)	1± (25)	1½± (38)	2± (50)		
17 (432)	13 (330)	0.064 (1.63)	7 (180)	9 (230)	6 (150)	19 (485)	30 (760)	1:2½	1 Pc.
21 (533)	15 (381)	0.064 (1.63)	7 (180)	10 (255)	6 (150)	23 (585)	36 (915)	1:2½	1 Pc.
24 (610)	18 (457)	0.064 (1.63)	8 (205)	12 (305)	6 (150)	28 (710)	42 (1.065 m)	1:2½	1 Pc.
28 (711)	20 (508)	0.064 (1.63)	9 (230)	14 (355)	6 (150)	32 (815)	48 (1.220 m)	1:2½	1 Pc.
35 (889)	24 (610)	0.079 (2.01)	10 (255)	16 (405)	6 (150)	39 (990)	60 (1.525 m)	1:2½	1 Pc.
42 (1067)	29 (737)	0.079 (2.01)	12 (305)	18 (460)	8 (205)	53 (1.170 m)	75 (1.905 m)	1:2½	1 Pc.
49 (1245)	33 (838)	0.109 (2.77)	13 (330)	21 (535)	9 (230)	46 (1.345 m)	85 (2.160 m)	1:2½	2 Pc.
57 (1448)	38 (965)	0.109 (2.77)	18 (460)	26 (660)	12 (305)	63 (1.600 m)	90 (2.285 m)	1:2½	2 Pc.
64 (1626)	43 (1092)	0.109 (2.77)	18 (460)	30 (760)	12 (305)	70 (1.780 m)	102 (2.590 m)	1:2¼	2 Pc.
71 (1803)	47 (1194)	0.109 (2.77)	18 (460)	33 (840)	12 (305)	77 (1.955 m)	114 (2.895 m)	1:2¼	3 Pc.
77 (1956)	52 (1321)	0.109 (2.77)	18 (460)	36 (915)	12 (305)	77 (1.955 m)	126 (3.200 m)	1:2	3 Pc.
83 (2108)	57 (1448)	0.109 (2.77)	18 (460)	39 (990)	12 (305)	77 (1.955 m)	138 (3.505 m)	1:2	3 Pc.



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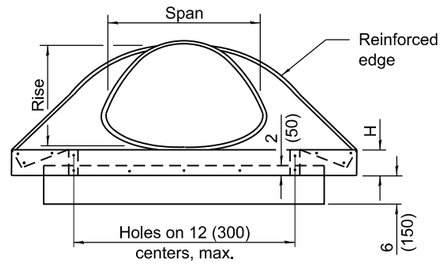
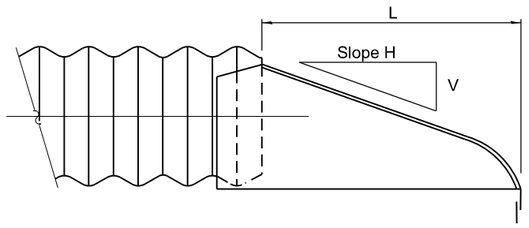


END VIEW



SIDE VIEW

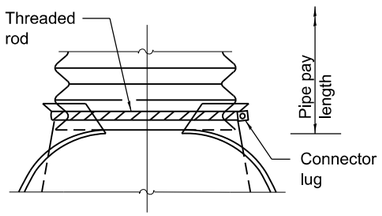
END SECTION

NOTES

For the 77x52 (1956x1321) and 83x57 (2108x1448) sizes, reinforced edges shall be supplemented with 2x2x¼ (51x51x6.4) stiffener angles. The angles shall be attached by ⅜ (M10) rivets or bolts.

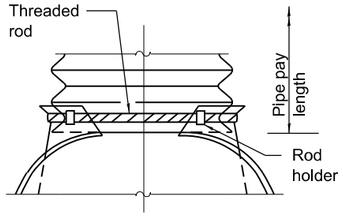
Angle reinforcement shall be placed under the center panel seams on the 77x52 (1956x1321) and 83x57 (2108x1448) sizes.

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



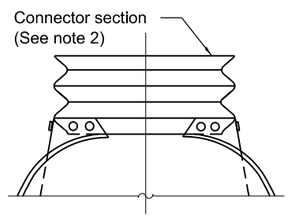
TYPE 1

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



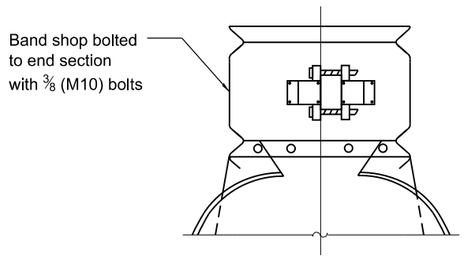
TYPE 2

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



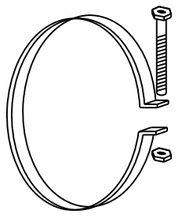
TYPE 3

(See Note 2)



TYPE 4

(See Note 3)



1 (25) wide, 0.109 (2.77) thick strap with standard ½x6 (M12x150) band bolt and nut.

ALTERNATE STRAP CONNECTOR

(For Type 1 only)

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.

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

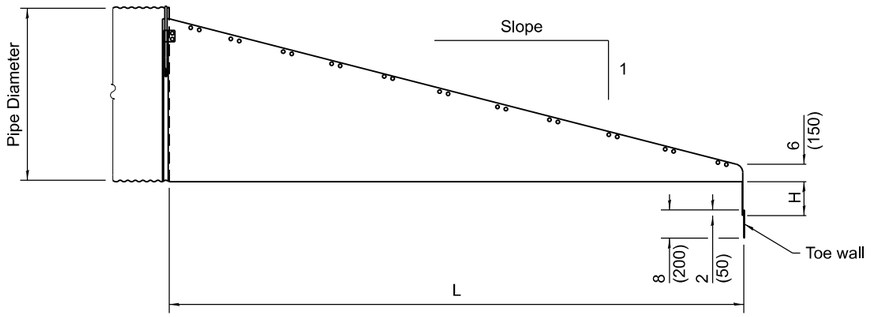
ISSUED 1-1-97

CONNECTIONS OF END SECTIONS

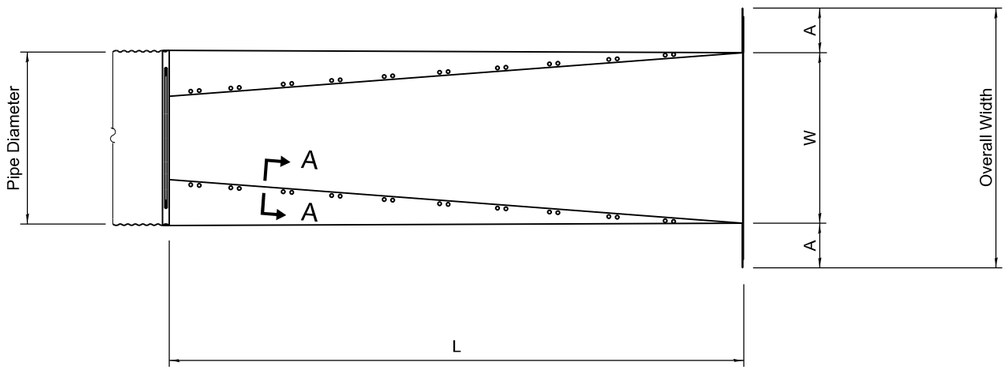
DATE	REVISIONS
1-1-21	Revised THICKNESS values
	in table.
1-1-18	Renamed standard.

METAL FLARED END SECTION FOR PIPE ARCHES

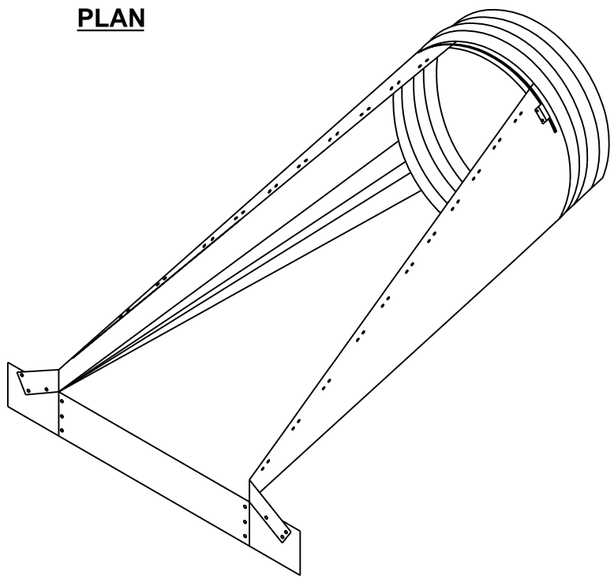
STANDARD 542406-04



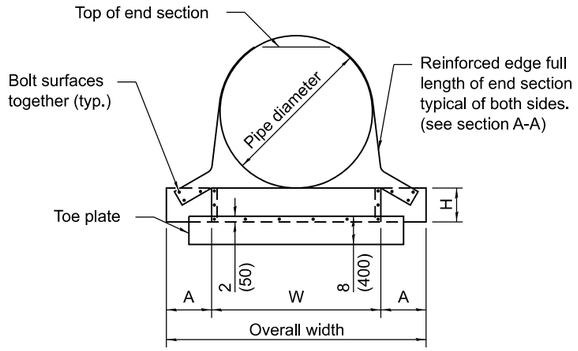
ELEVATION



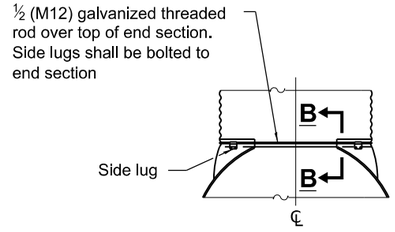
PLAN



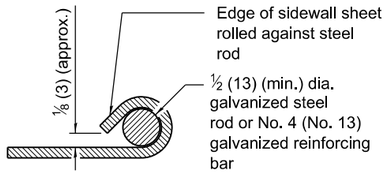
END SECTION PERSPECTIVE VIEW



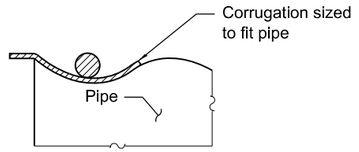
END VIEW



CONNECTIONS OF END SECTION



SECTION A-A



SECTION B-B

METAL END SECTIONS FOR ROUND PIPE CULVERT

PIPE DIA.	METAL THICK. (min.)	DIMENSIONS					
		A	H	W	OVERALL WIDTH	L	
						SLOPE 1:4	SLOPE 1:6
15 (375)	0.064 (1.63)	8 (200)	6 (150)	21 (525)	37 (950)	20 (500)	30 (750)
18 (450)	0.064 (1.63)	8 (200)	6 (150)	24 (600)	40 (1000)	32 (800)	48 (1200)
21 (525)	0.064 (1.63)	8 (200)	6 (150)	27 (700)	43 (1100)	44 (1100)	60 (1500)
24 (600)	0.064 (1.63)	8 (200)	6 (150)	30 (750)	46 (1150)	55 (1400)	83 (2100)
30 (750)	0.109 (2.77)	12 (300)	9 (230)	36 (900)	60 (1500)	79 (2000)	118 (3000)
36 (900)	0.109 (2.77)	12 (300)	9 (230)	42 (1050)	66 (1650)	102 (2600)	154 (3900)
42 (1050)	0.109 (2.77)	16 (400)	12 (300)	48 (1200)	80 (2000)	126 (3200)	189 (4800)
48 (1200)	0.109 (2.77)	16 (400)	12 (300)	54 (1350)	86 (2150)	150 (3800)	224 (5700)
54 (1350)	0.109 (2.77)	16 (400)	12 (300)	60 (1500)	92 (2300)	173 (4400)	260 (6600)
60 (1500)	0.109 (2.77)	16 (400)	12 (300)	66 (1650)	98 (2450)	197 (5000)	295 (7500)

GENERAL NOTES

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

Provide traversable pipe grate when specified.

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

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

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

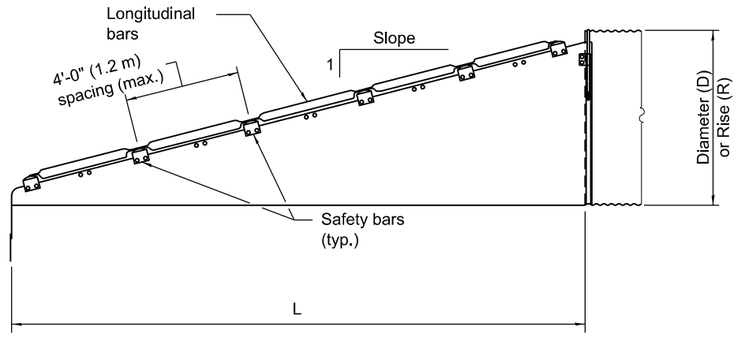
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18

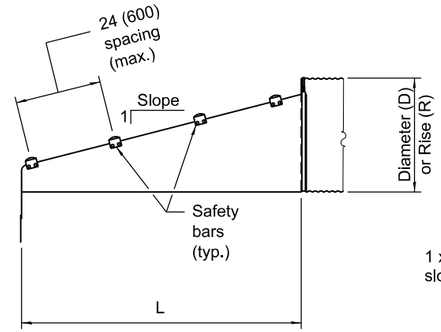
DATE	REVISIONS
1-1-18	New Standard.

SLOPED METAL END SECTIONS FOR PIPE CULVERTS 15" (375 mm) THRU 60" (1500 mm) DIA.

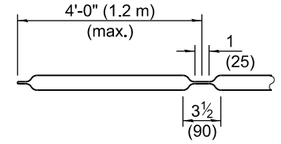
STANDARD 542411



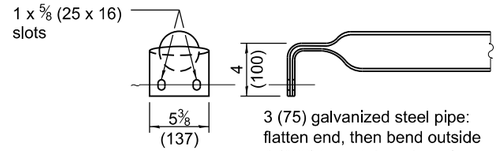
CROSS DRAINAGE END SECTION - ELEVATION



PARALLEL DRAINAGE END SECTION - ELEVATION



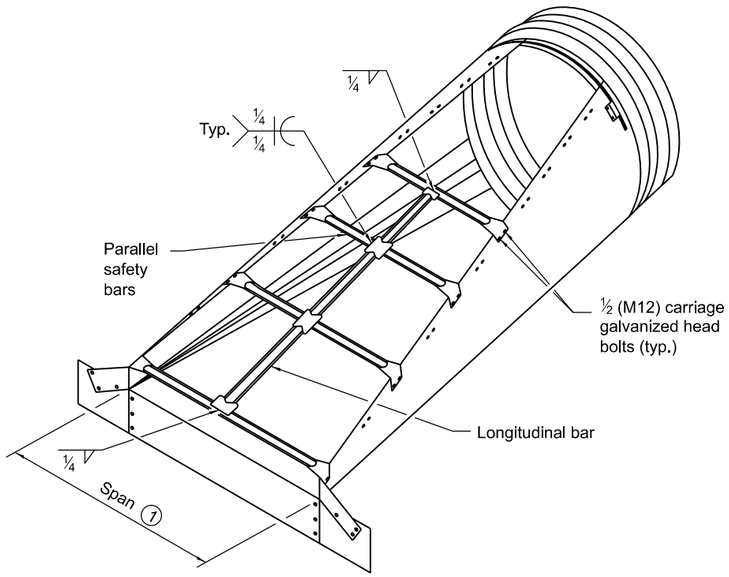
LONGITUDINAL DRAINAGE BAR



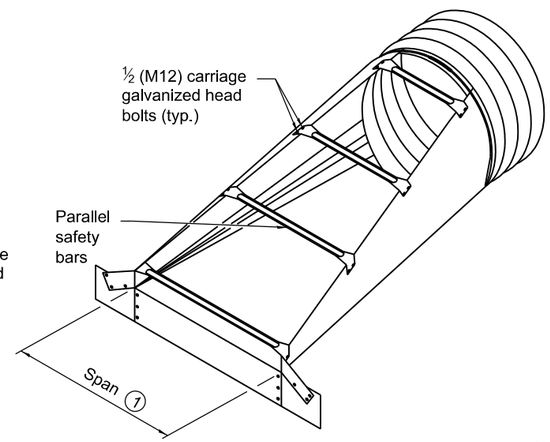
3 (75) galvanized steel pipe: flatten end, then bend outside 4 (100) to match end section sides.

PARALLEL BARS

SAFETY BAR DETAILS

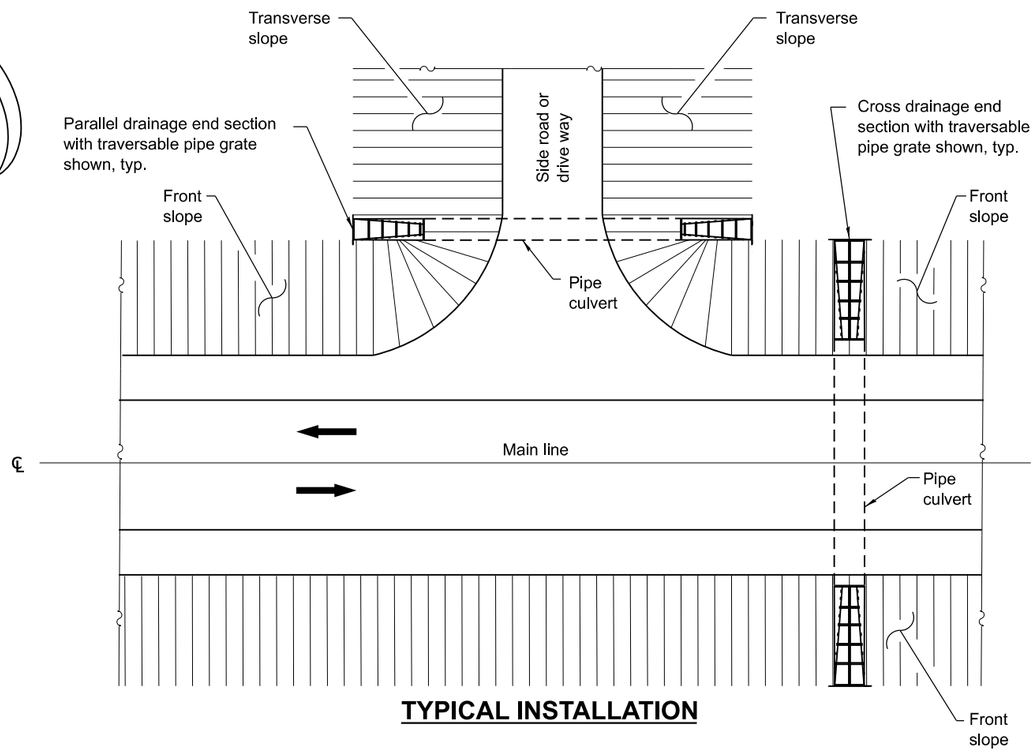


CROSS DRAINAGE END SECTION



PARALLEL DRAINAGE END SECTION

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



TYPICAL INSTALLATION

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

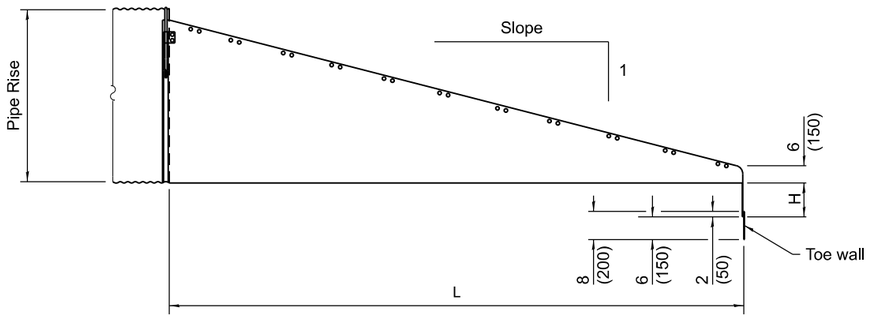
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18

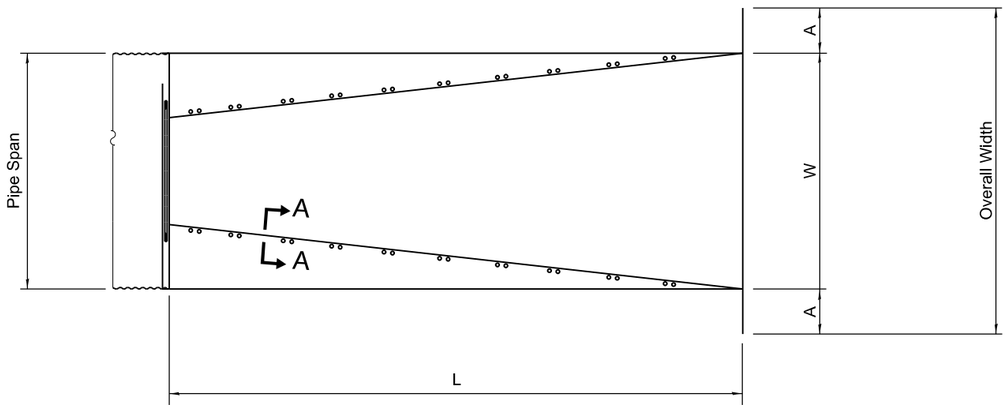
SLOPED METAL END SECTIONS FOR PIPE CULVERTS 15" (375 mm) THRU 60" (1500 mm) DIA.

(Sheet 2 of 2)

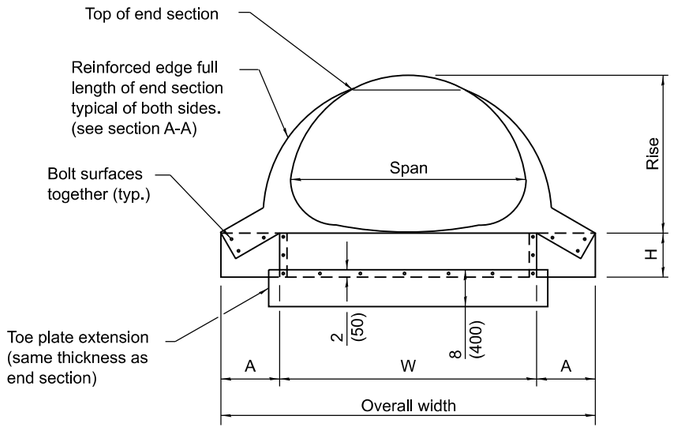
STANDARD 542411



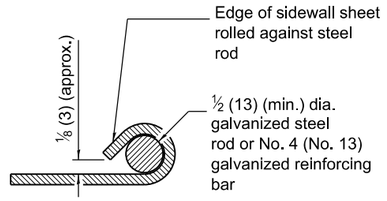
ELEVATION



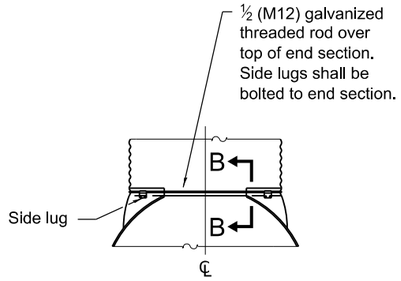
PLAN



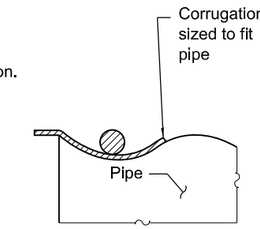
END VIEW



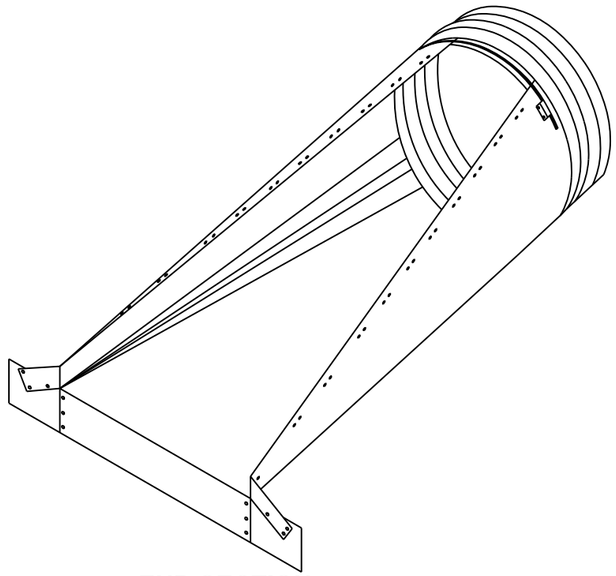
SECTION A-A



CONNECTIONS OF END SECTION



SECTION B-B



END SECTION PERSPECTIVE VIEW

METAL END SECTIONS FOR PIPE ARCH CULVERT

PIPE EQUIV. ROUND DIA.	METAL THICK. (min.)	DIMENSIONS											
						CORRIGATION 2⅔ x ½				CORRIGATION 3 x 1 OR 5 x 1			
		A	H	W	OVERALL WIDTH	SPAN	RISE	L		SPAN	RISE	L	
								SLOPE 1:4	SLOPE 1:6			SLOPE 1:4	SLOPE 1:6
15 (375)	0.064 (1.63)	8 (200)	6 (150)	23 (585)	39 (1000)	17 (430)	13 (330)	12 (300)	18 (460)	———	———	———	———
18 (450)	0.064 (1.63)	8 (200)	6 (150)	27 (700)	43 (1100)	21 (530)	15 (380)	20 (500)	30 (750)	———	———	———	———
21 (525)	0.064 (1.63)	8 (200)	6 (150)	30 (750)	46 (1150)	24 (610)	18 (460)	32 (810)	48 (1220)	———	———	———	———
24 (600)	0.064 (1.63)	8 (200)	6 (150)	33 (830)	49 (1250)	28 (700)	20 (500)	40 (1000)	60 (1500)	———	———	———	———
30 (750)	0.109 (2.77)	12 (300)	9 (225)	40 (1025)	64 (1625)	35 (870)	24 (630)	55 (1400)	83 (2100)	———	———	———	———
36 (900)	0.109 (2.77)	12 (300)	9 (225)	47 (1200)	71 (1800)	42 (1060)	29 (740)	75 (1900)	112 (2850)	———	———	———	———
42 (1050)	0.109 (2.77)	16 (400)	12 (300)	54 (1375)	86 (2175)	49 (1240)	33 (840)	90 (2300)	136 (3450)	———	———	———	———
48 (1200)	0.109 (2.77)	16 (400)	12 (300)	62 (1575)	94 (2375)	57 (1440)	38 (970)	110 (2800)	165 (4200)	53 (1340)	41 (1050)	124 (3150)	186 (4720)
54 (1350)	0.109 (2.77)	16 (400)	12 (300)	69 (1750)	101 (2550)	64 (1620)	43 (1100)	130 (3300)	195 (4950)	60 (1520)	46 (1170)	144 (3660)	216 (5490)
60 (1500)	0.109 (2.77)	16 (400)	12 (300)	76 (1925)	107 (2725)	71 (1800)	47 (1200)	146 (3700)	218 (5550)	66 (1670)	51 (1300)	164 (4170)	246 (6250)
66 (1650)	0.109 (2.77)	16 (400)	12 (300)	79 (2000)	111 (2800)	77 (1950)	52 (1320)	180 (4600)	270 (6850)	73 (1850)	55 (1400)	180 (4580)	270 (6860)
72 (1800)	0.109 (2.77)	16 (400)	12 (300)	88 (2225)	120 (3025)	83 (2100)	57 (1450)	185 (4700)	278 (7050)	81 (2050)	59 (1500)	196 (4980)	294 (7470)

GENERAL NOTES

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

Provide traversable pipe grate when specified.

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

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

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

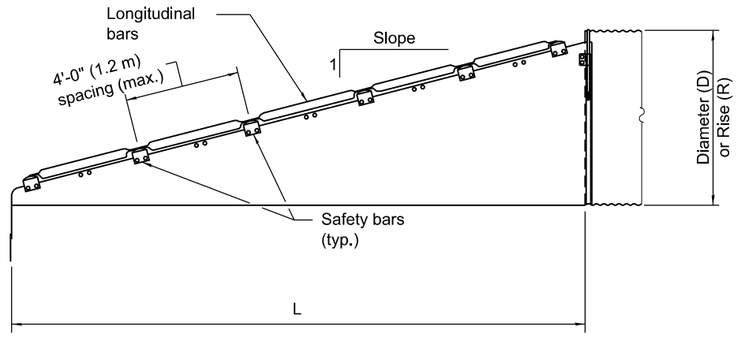
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18

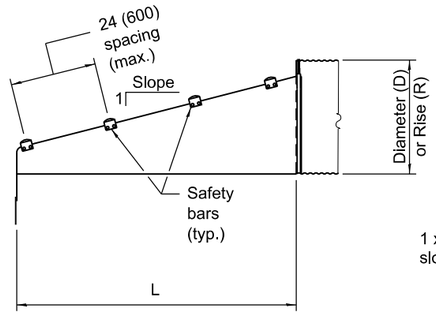
DATE	REVISIONS
1-1-18	New Standard.

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

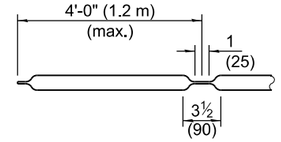
STANDARD 542416



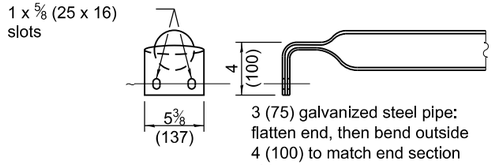
CROSS DRAINAGE END SECTION - ELEVATION



PARALLEL DRAINAGE END SECTION - ELEVATION



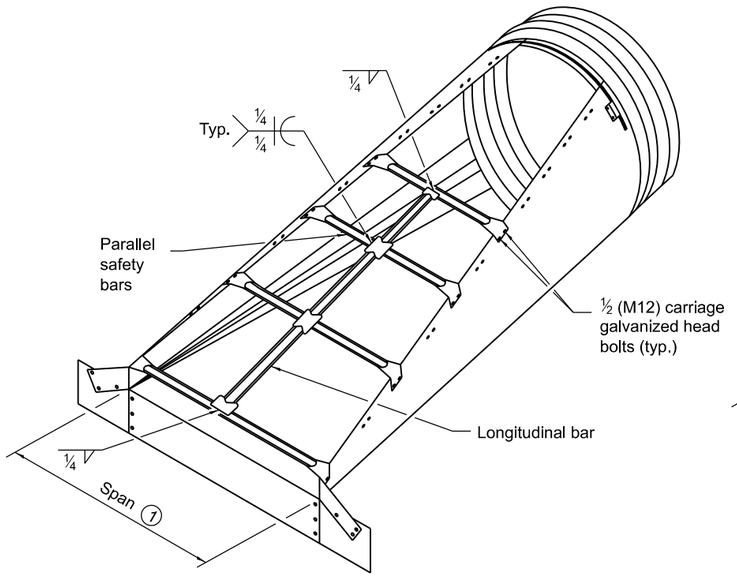
LONGITUDINAL DRAINAGE BAR



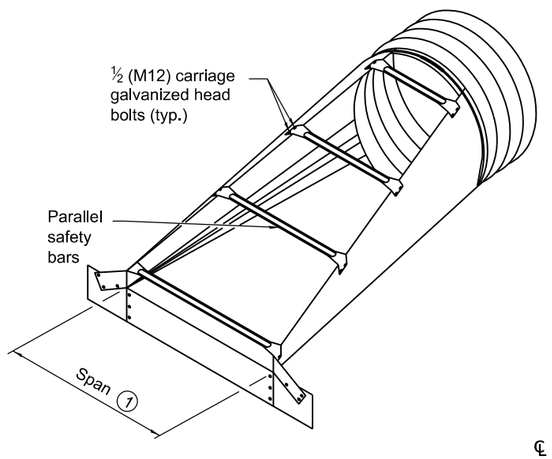
3 (75) galvanized steel pipe: flatten end, then bend outside 4 (100) to match end section sides.

PARALLEL BARS

SAFETY BAR DETAILS

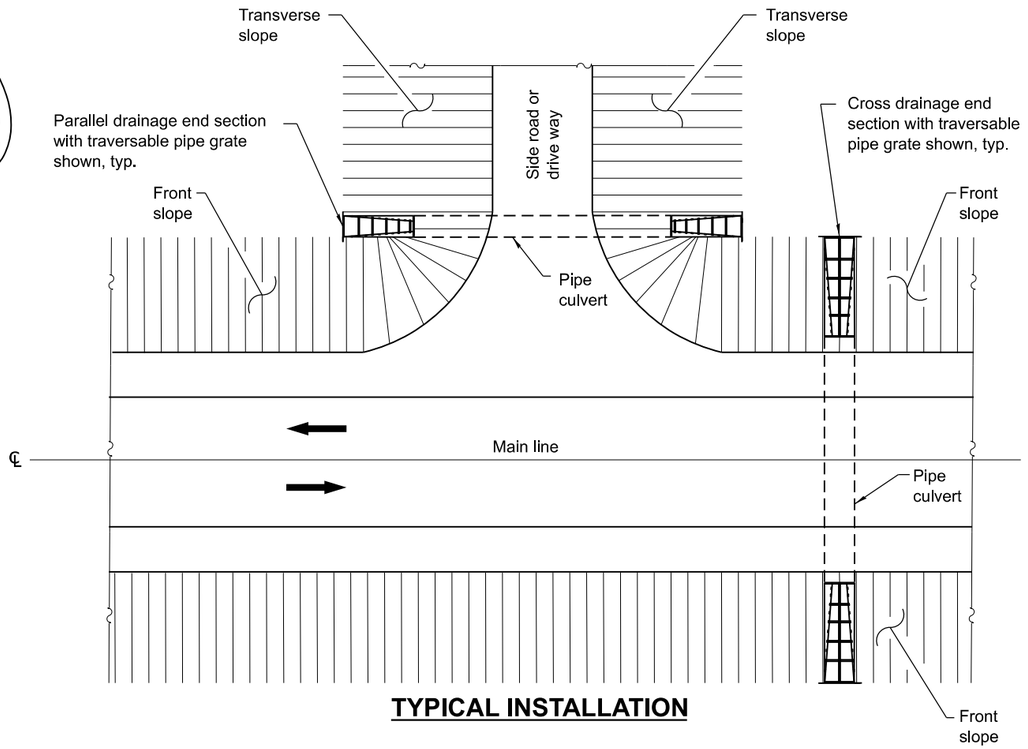


CROSS DRAINAGE END SECTION



PARALLEL DRAINAGE END SECTION

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



TYPICAL INSTALLATION

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

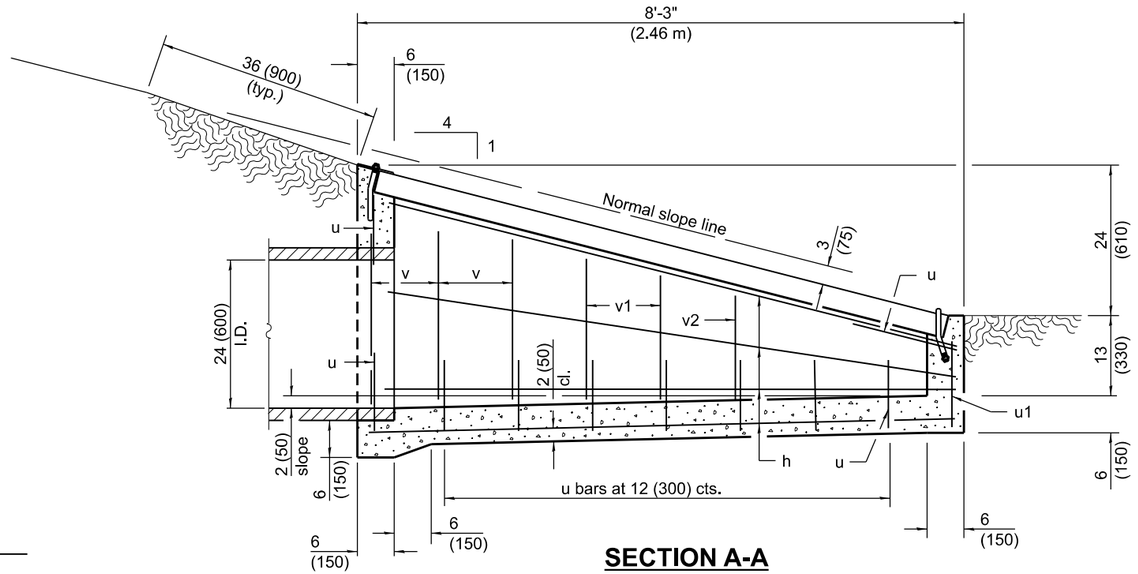
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18

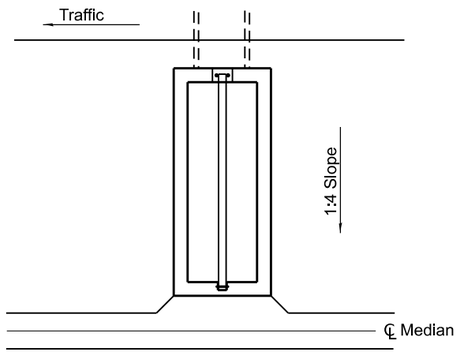
SLOPED METAL END SECTIONS FOR PIPE ARCH CULVERTS 15" (375 mm) THRU 72" (1800 mm) EQUIVALENT DIA.

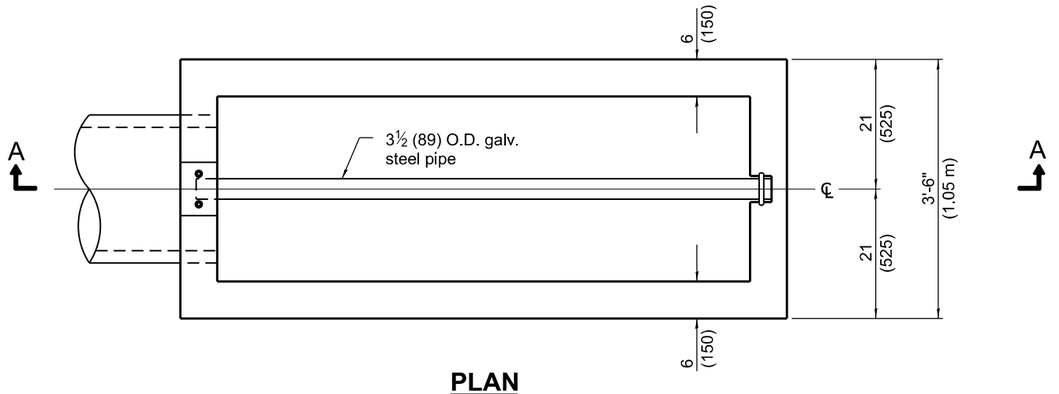
(Sheet 2 of 2)

STANDARD 542416

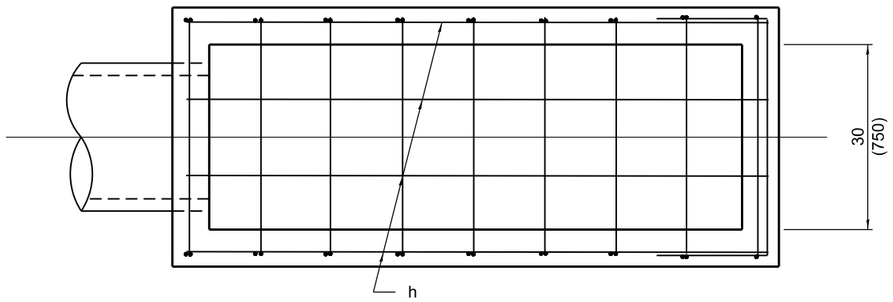


SECTION A-A

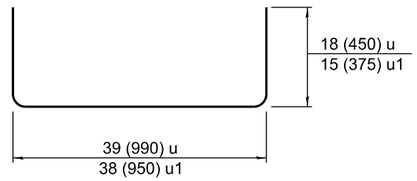




PLAN



PLAN OF REINFORCEMENT



Bars u & u1

Material required for one inlet box

Bar	Qty.	Size	Length
h	10	No. 4 (No. 13)	7'-9" (2.35 m)
u	10	No. 4 (No. 13)	6'-3" (1.90 m)
u1	1	No. 4 (No. 13)	5'-8" (1.70 m)
v	6	No. 4 (No. 13)	30 (760)
v1	4	No. 4 (No. 13)	24 (610)
v2	2	No. 4 (No. 13)	18 (460)
Galv. Steel Pipe		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)

Traffic →

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

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

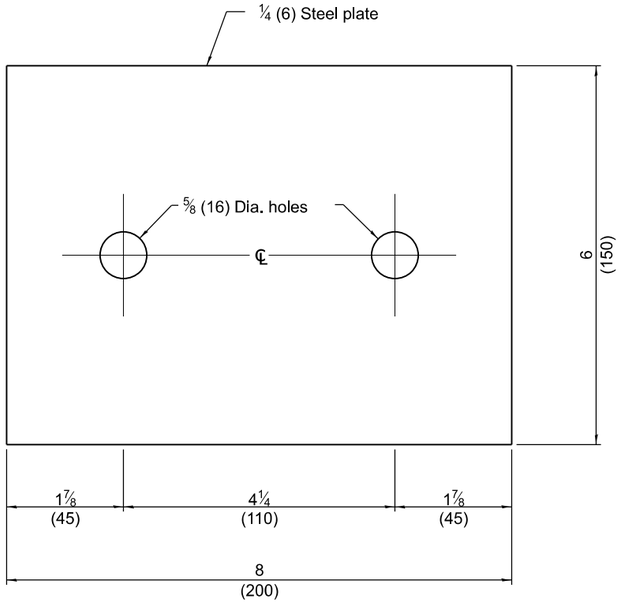
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

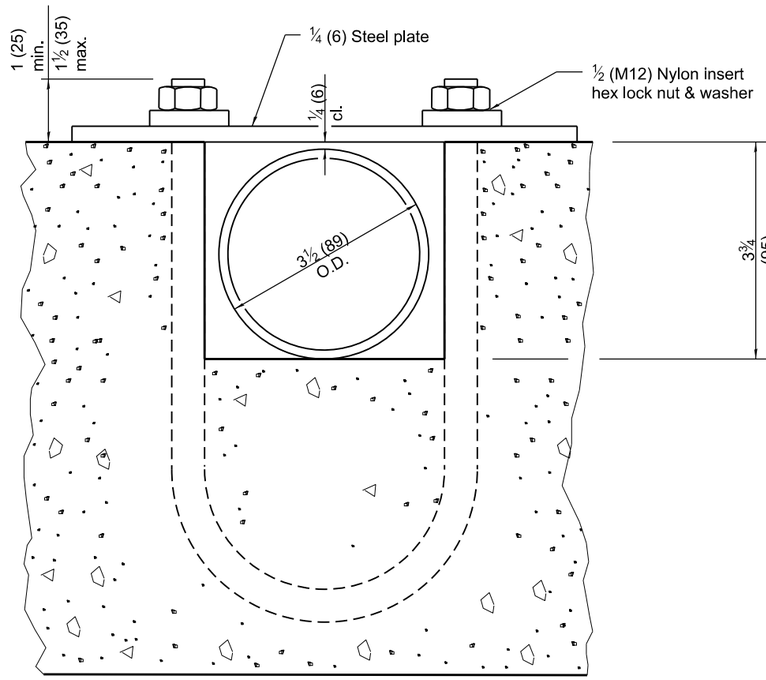
INLET BOX TYPE 24 (600) A

STANDARD 542501-02

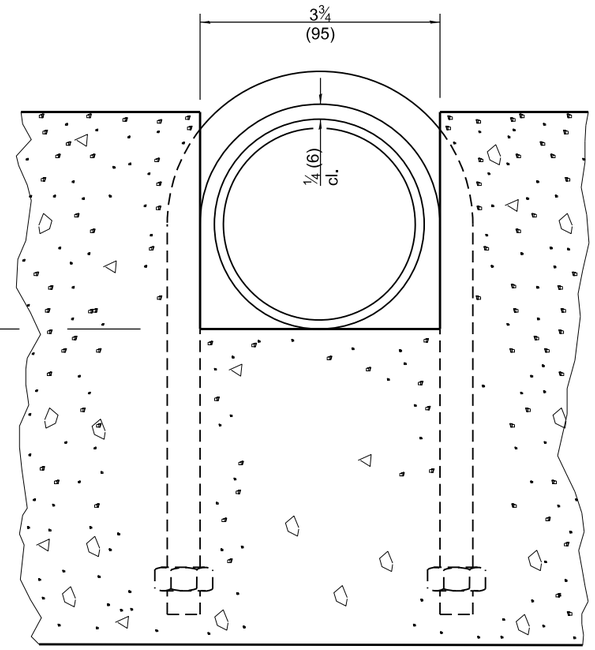


TOP ANCHOR PLATE

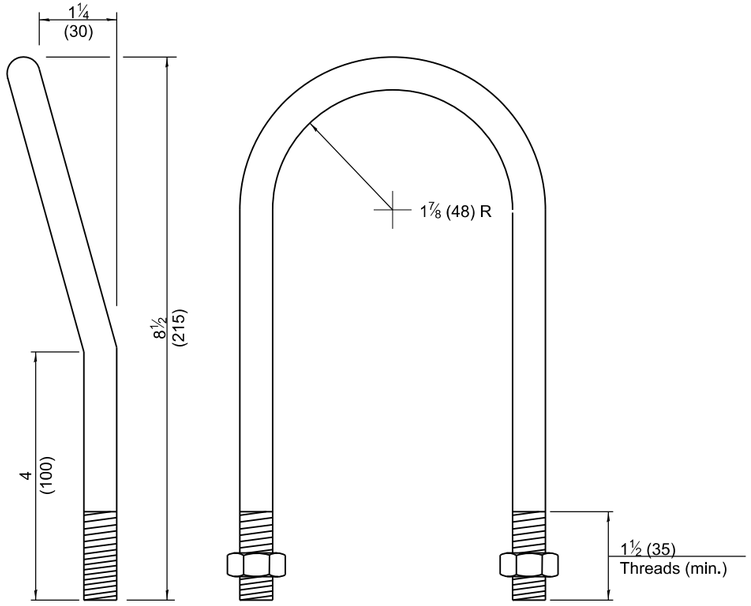
(1 - required)



SECTION B-B

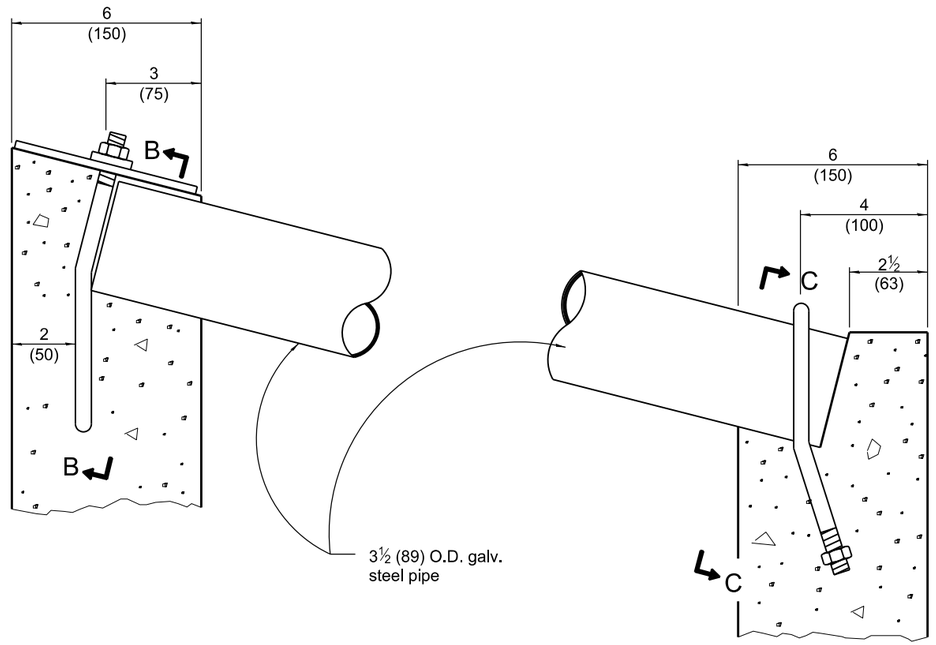


SECTION C-C



1/2 (M12) U BOLT

(2 - required)



DETAIL AT BLOCKOUTS

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

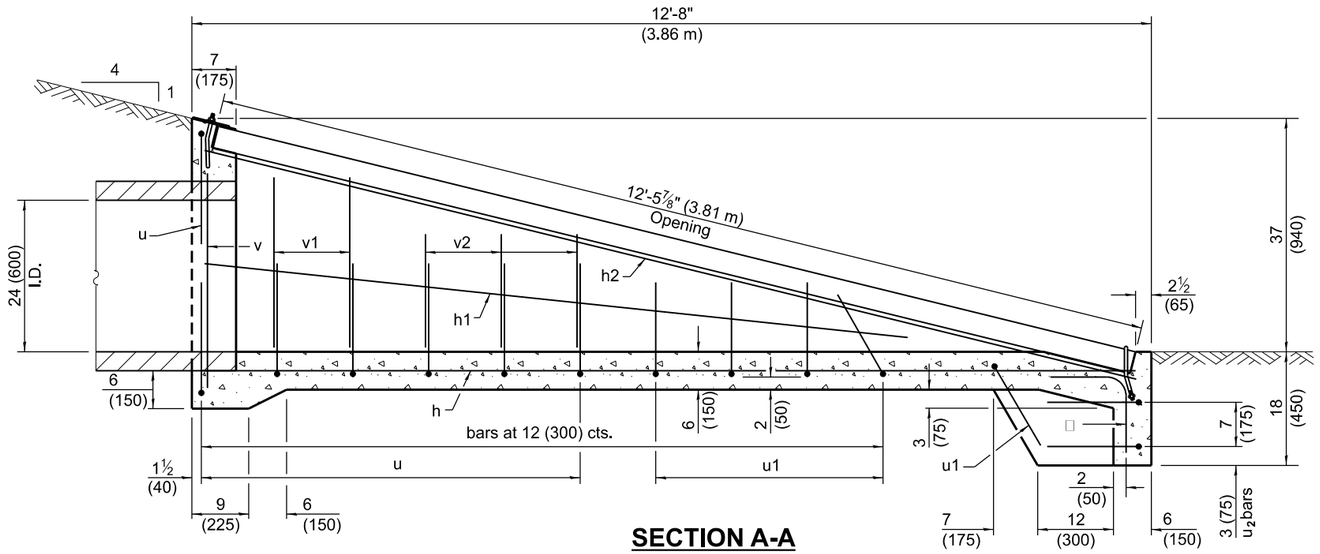
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

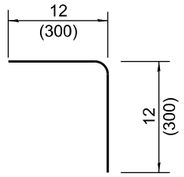
INLET BOX
TYPE 24 (600) A

(Sheet 2 of 2)

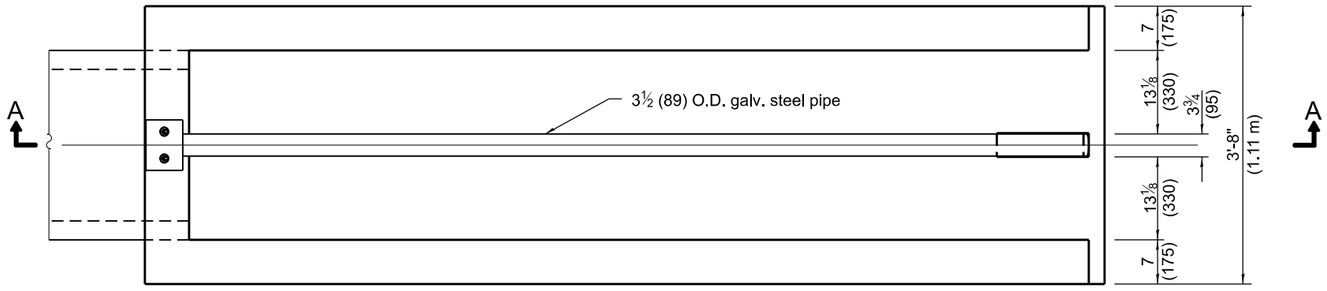
STANDARD 542501-02



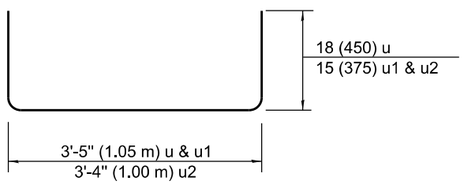
SECTION A-A



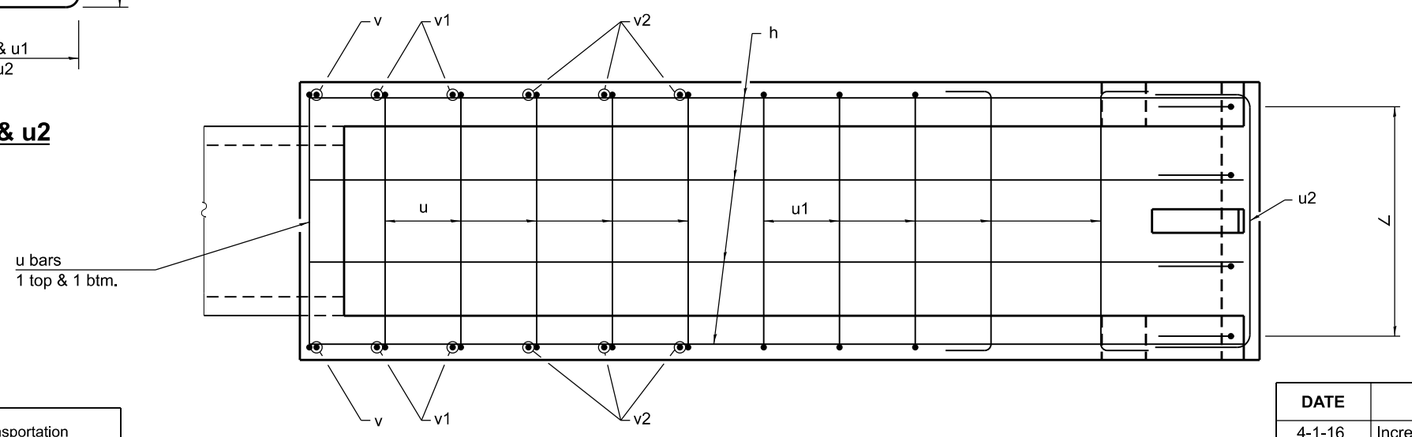
Bar ∠



PLAN



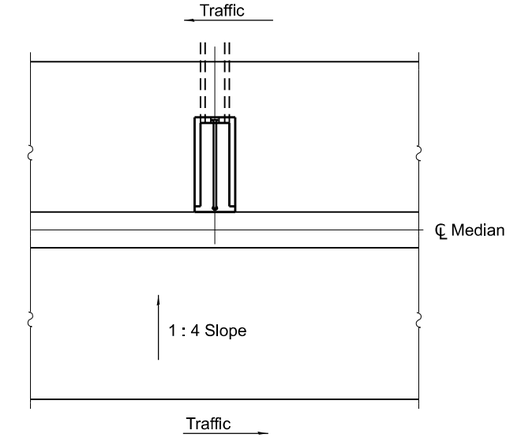
Bars u, u1 & u2



PLAN OF REINFORCEMENT

Material required for one inlet box

Bar	Qty.	Size	Length
h	4	No. 4 (No. 13)	12'-4" (3.76 m)
h1	2	No. 4 (No. 13)	9'-4" (2.84 m)
h2	2	No. 4 (No. 13)	12'-8" (3.86 m)
∠	4	No. 4 (No. 13)	2'-0" (0.60 m)
u	7	No. 4 (No. 13)	6'-5" (1.95 m)
u1	5	No. 4 (No. 13)	5'-11" (1.80 m)
u2	2	No. 4 (No. 13)	5'-10" (1.75 m)
v	2	No. 4 (No. 13)	34 (864)
v1	4	No. 4 (No. 13)	27 (680)
v2	6	No. 4 (No. 13)	18 (460)
Concrete		cu. yds. (m)	1.9 (1.5)
Reinf. Bars		lbs. (kg)	141 (64.0)
Galv. Steel Pipe		3½ (89) O.D.	12'-5⅝" (3.80 m)



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

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED April 1, 2016
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

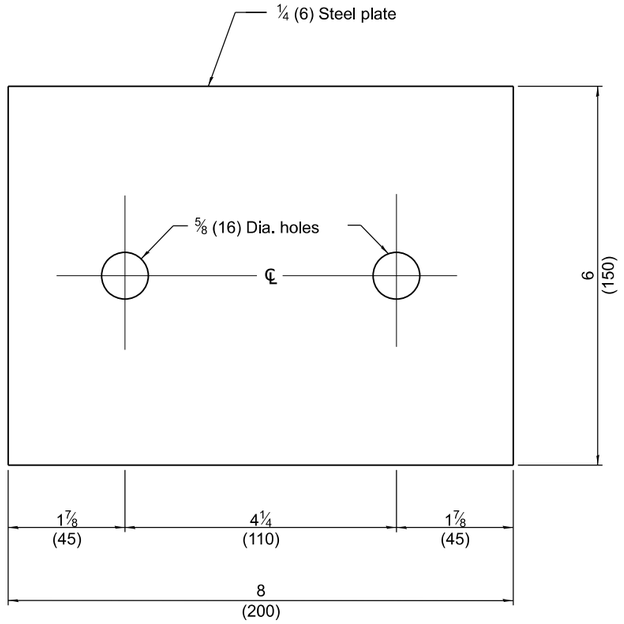
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

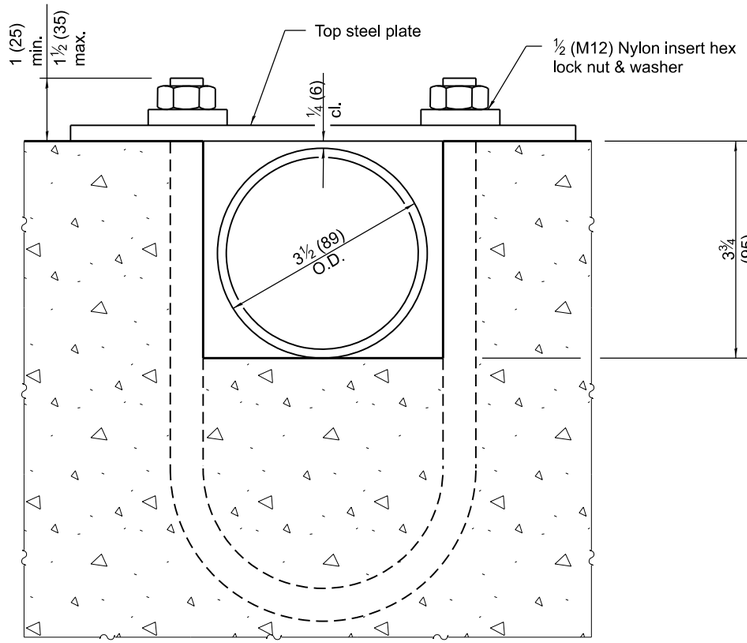
DATE	REVISIONS
4-1-16	Increased length of inlet box to
	provide clearance for top u-bolt.
1-1-09	Switched units to English (metric).

INLET BOX TYPE 24 (600) B

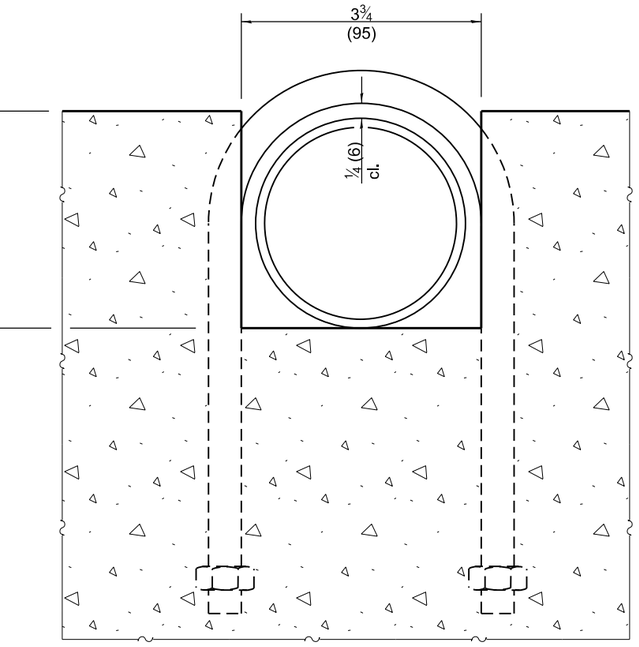
STANDARD 542506-03



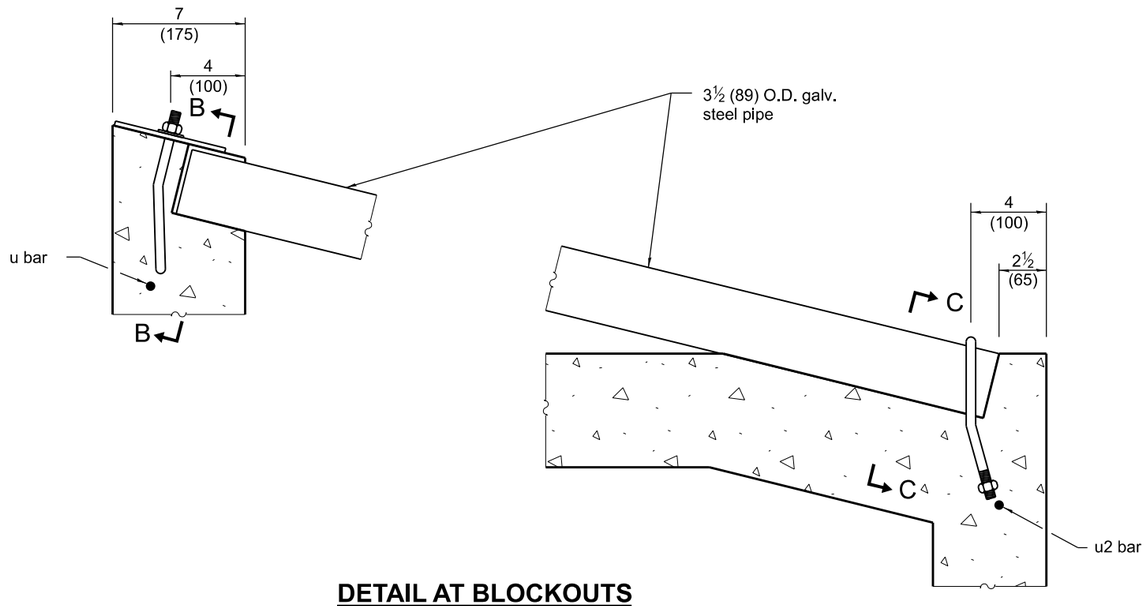
TOP ANCHOR PLATE
(1 - required)



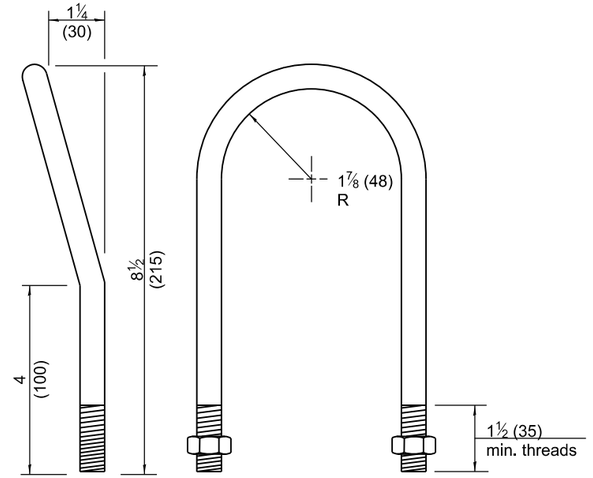
SECTION B-B



SECTION C-C



DETAIL AT BLOCKOUTS



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

Illinois Department of Transportation

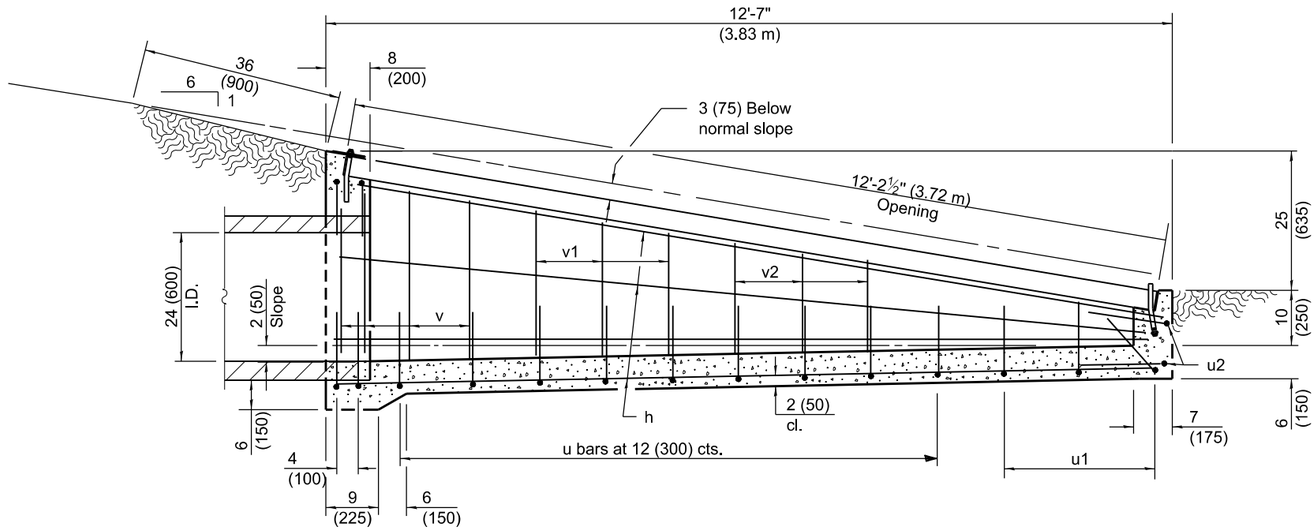
APPROVED April 1, 2016
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

INLET BOX
TYPE 24 (600) B

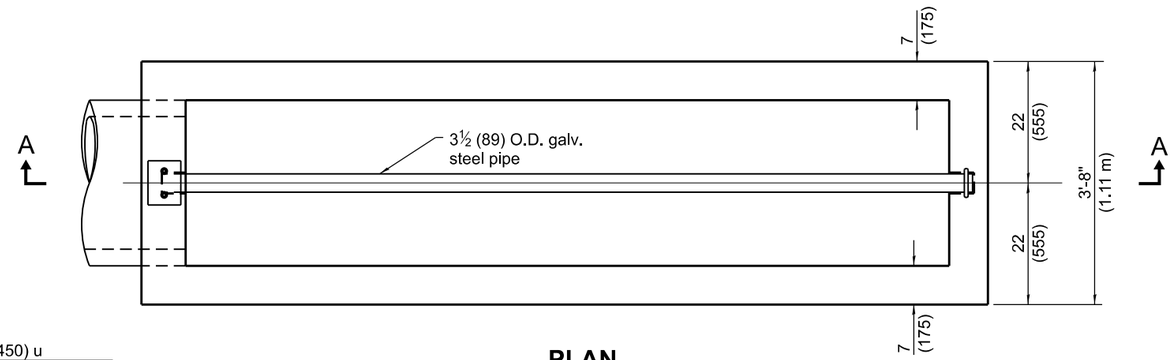
STANDARD 542506-03



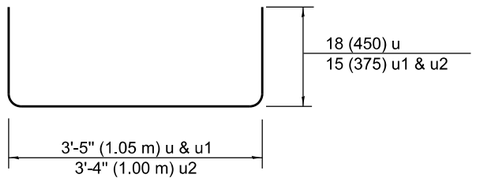
SECTION A-A

Material required for one inlet box

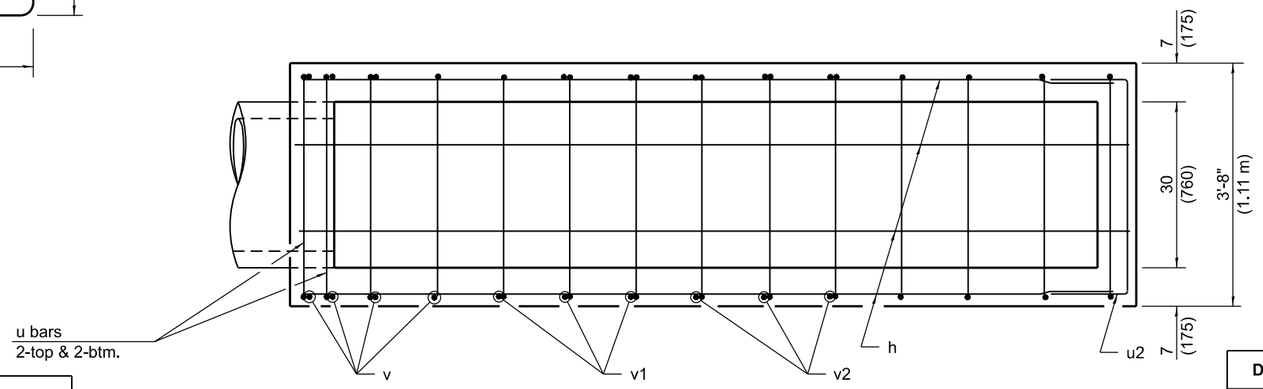
Bar	Qty.	Size	Length
h	10	No. 4 (No. 13)	12'-0" (3.65 m)
u	13	No. 4 (No. 13)	6'-5" (1.95 m)
u1	3	No. 4 (No. 13)	5'-11" (1.80 m)
u2	2	No. 4 (No. 13)	5'-10" (1.75 m)
v	8	No. 4 (No. 13)	30 (760)
v1	6	No. 4 (No. 13)	24 (610)
v2	6	No. 4 (No. 13)	18 (460)
Concrete		cu. yds. (m^3)	1.9 (1.45)
Reinf. Bars		lbs. (kg)	83 (183)
Galv. Steel Pipe		3½ (89) O.D.	12'-2¼" (3.71 m)



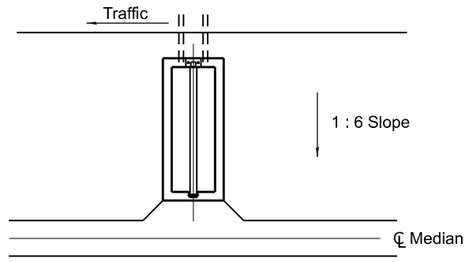
PLAN



Bars u, u1 & u2



PLAN OF REINFORCEMENT



Traffic

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

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

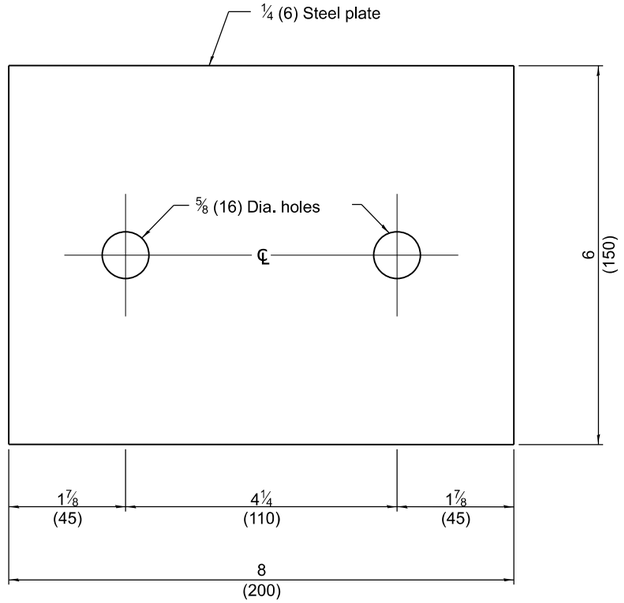
ISSUED 1-1-97

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

INLET BOX TYPE 24 (600) C

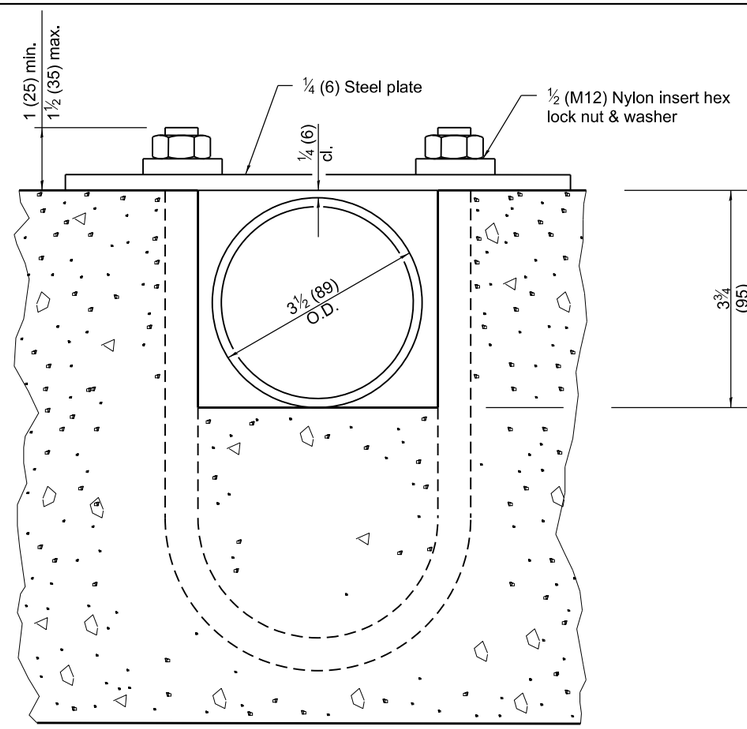
(Sheet 1 of 2)

STANDARD 542511-02

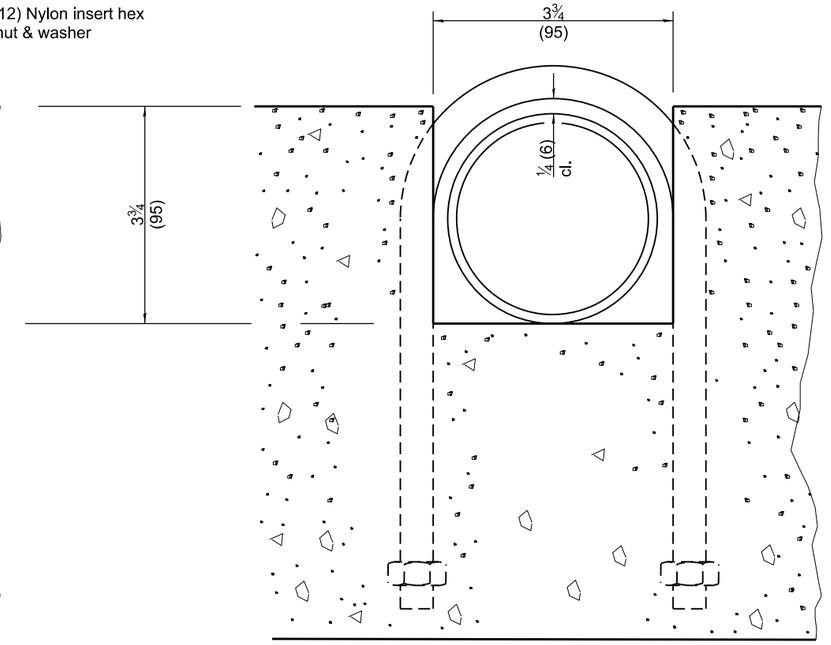


TOP ANCHOR PLATE

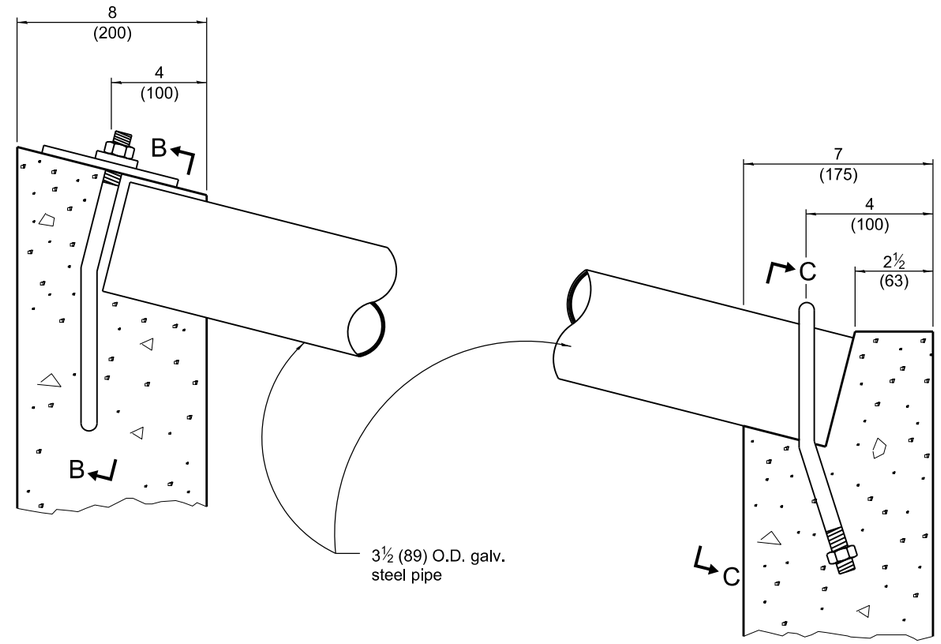
(1 - required)



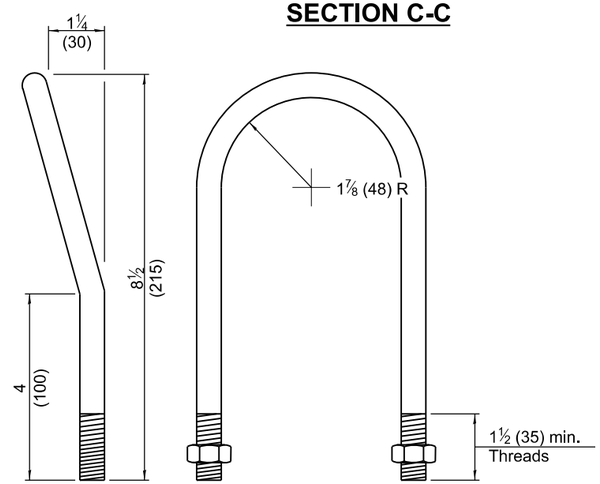
SECTION B-B



SECTION C-C



DETAIL AT BLOCKOUTS



1/2 (M12) U BOLT

(2 - required)

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

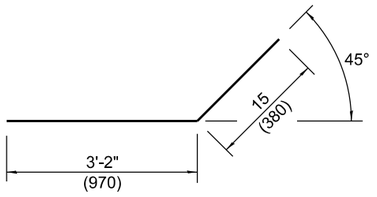
ISSUED 1-1-97

INLET BOX
TYPE 24 (600) C

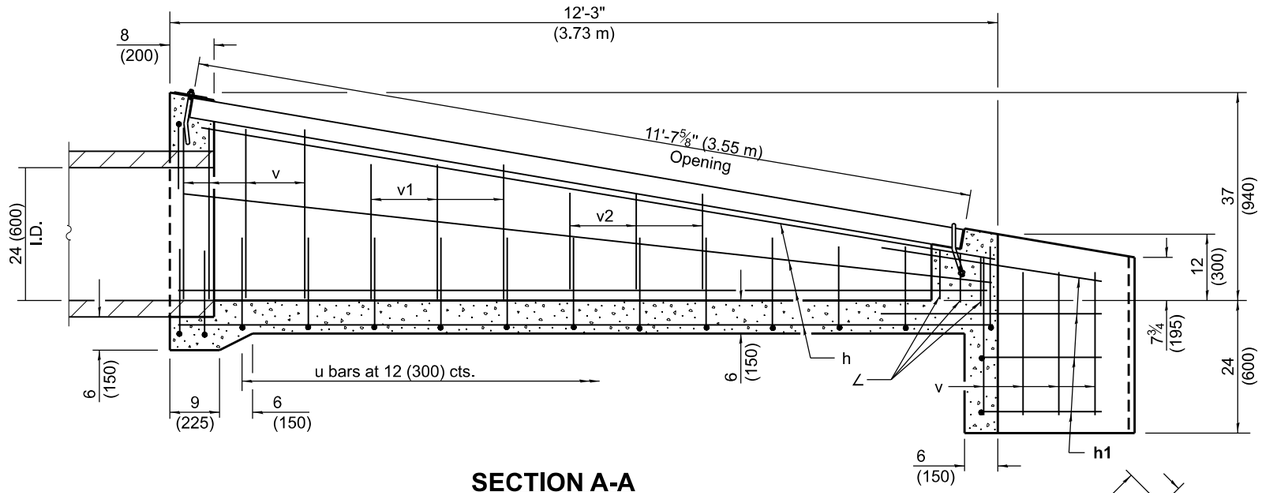
STANDARD 542511-02

Material required for one inlet box

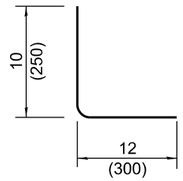
Bar	Qty.	Size	Length
h	10	No. 4 (No. 13)	12'-0" (3.66 m)
h1	8	No. 4 (No. 13)	4'-5" (1.35 m)
∠	3	No. 4 (No. 13)	22 (550)
u	14	No. 4 (No. 13)	6'-5" (1.94 m)
u1	2	No. 4 (No. 13)	7'-5" (2.24 m)
v	16	No. 4 (No. 13)	30 (760)
v1	6	No. 4 (No. 13)	24 (610)
v2	8	No. 4 (No. 13)	18 (460)
Concrete		cu. yds. (m^3)	2.2 (1.68)
Reinf. Bars		lbs. (kg)	220 (99.8)
Galv. Steel Pipe		3½ (89) O.D.	11'-7⅜" (3.55 m)



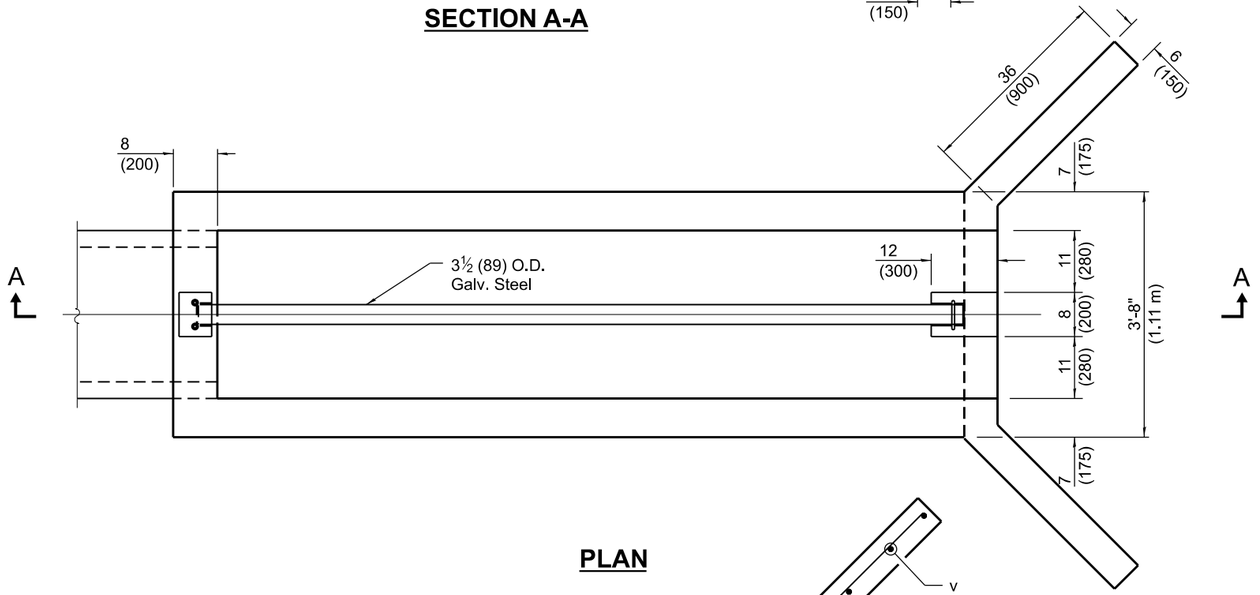
Bar h1



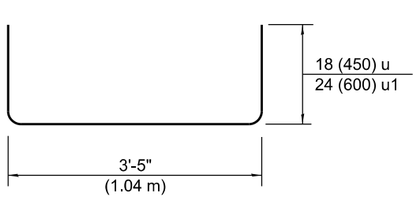
SECTION A-A



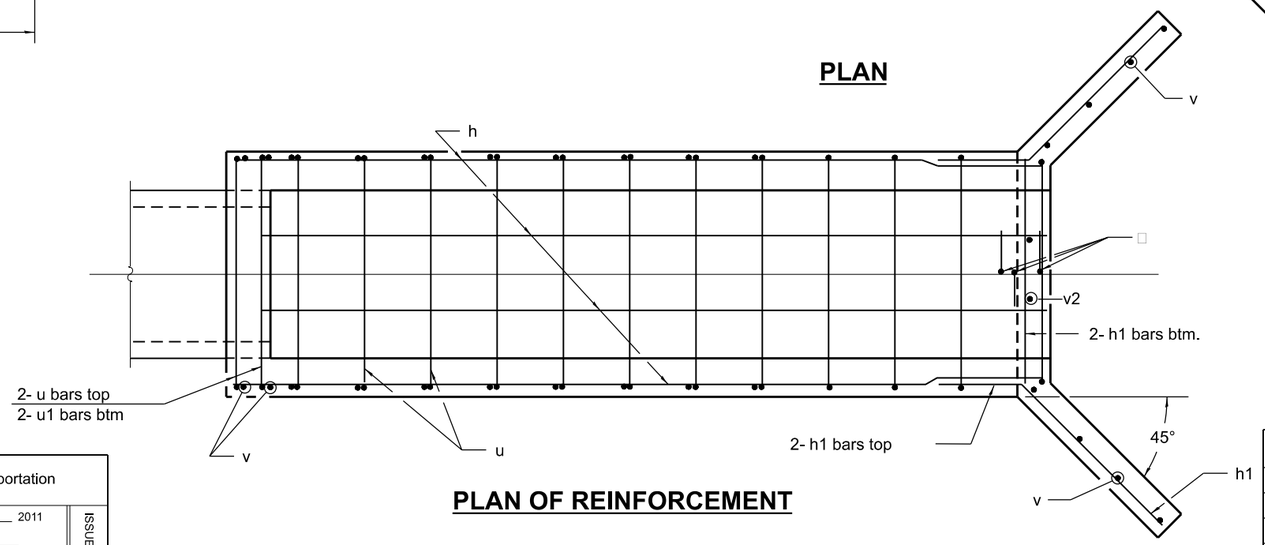
Bar ∠



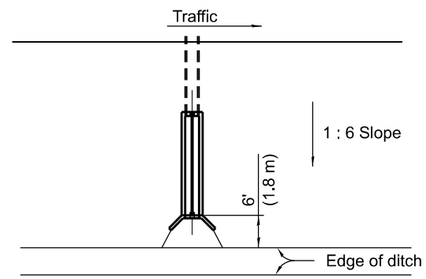
PLAN



Bar u & u1



PLAN OF REINFORCEMENT



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

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED January 1, 2011
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

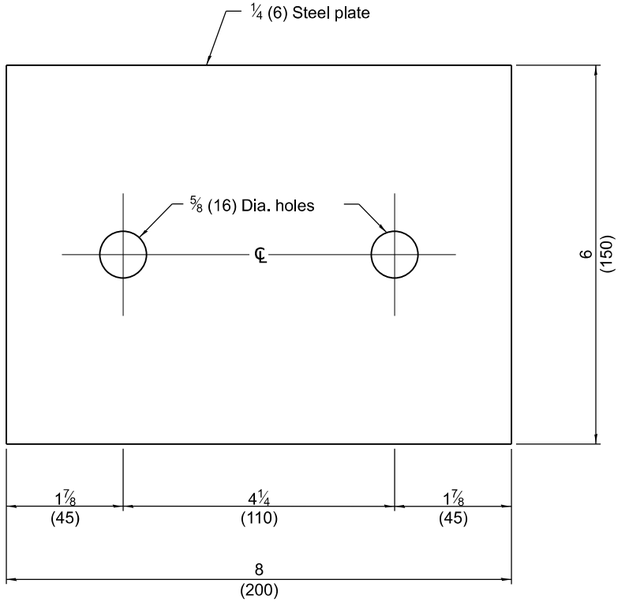
APPROVED January 1, 2011
Scott E. Stitt
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

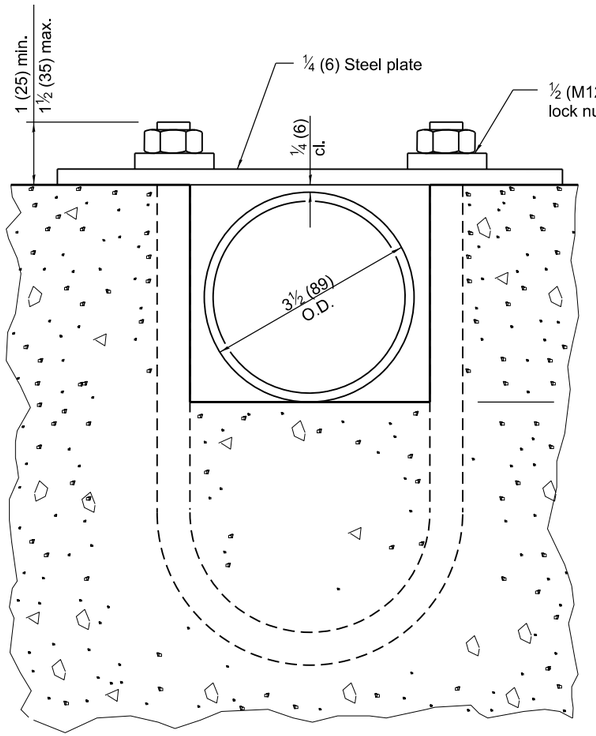
DATE	REVISIONS
1-1-11	Corrected two bars in weir to 'v2'.
1-1-09	Switched units to English (metric).

INLET BOX TYPE 24 (600) D

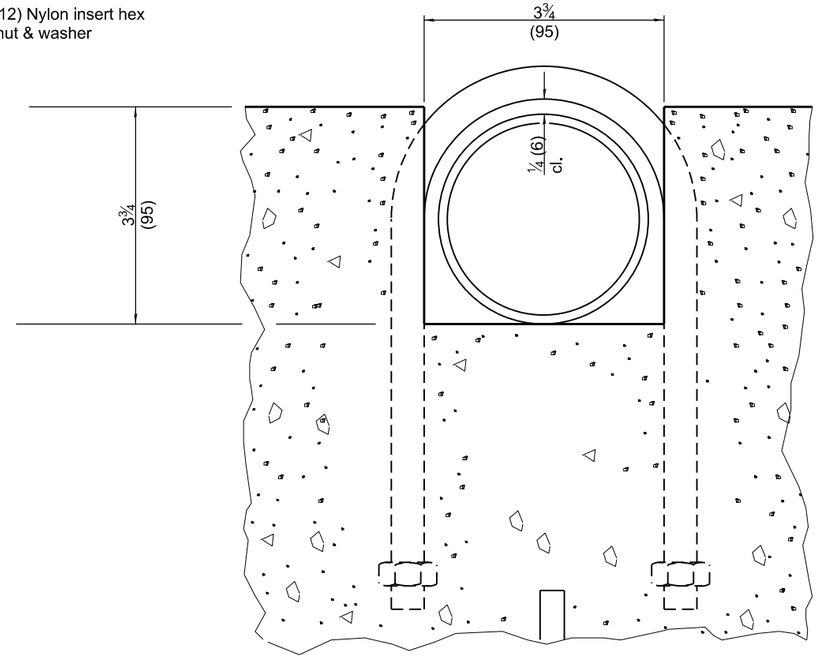
STANDARD 542516-03



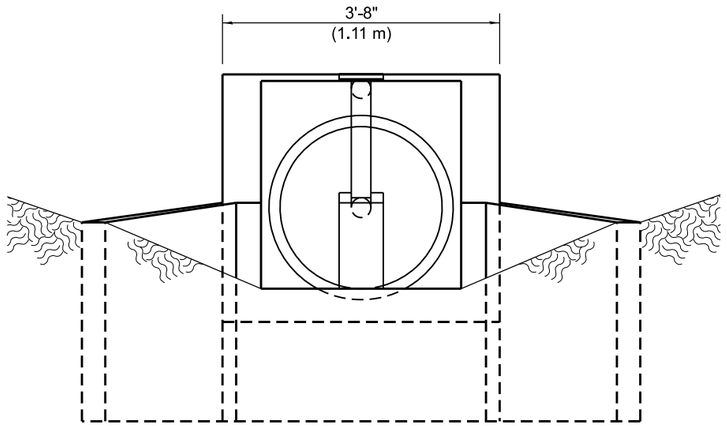
TOP ANCHOR PLATE
(1-required)



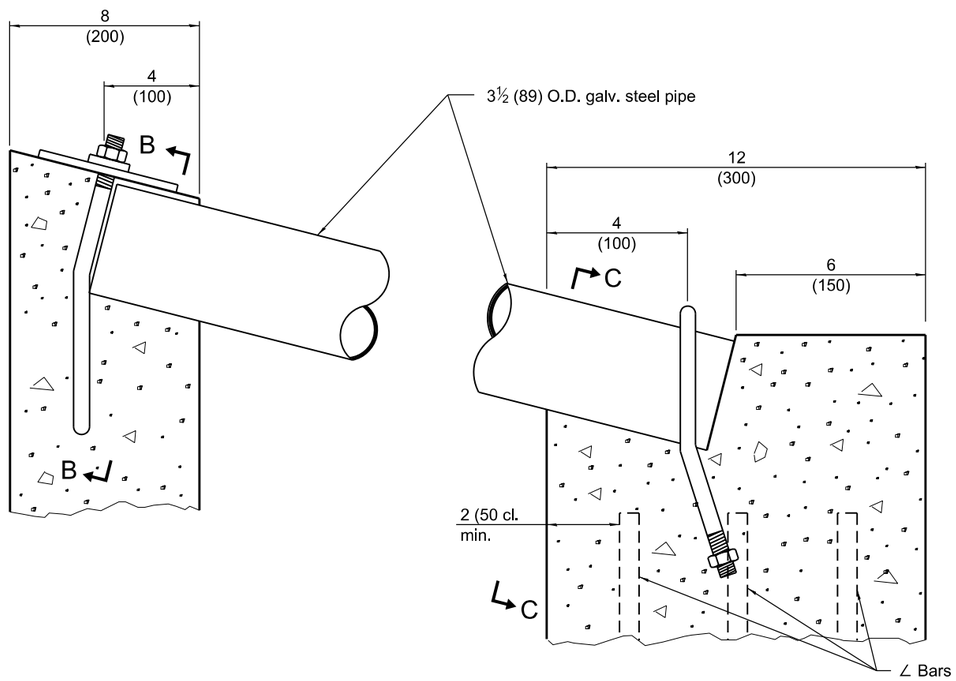
SECTION B-B



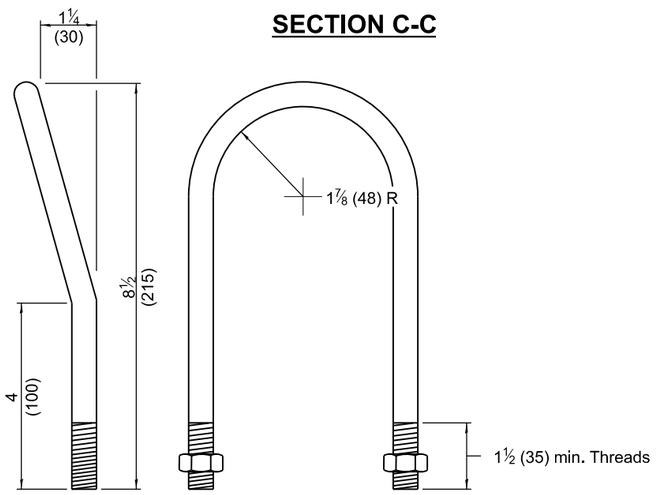
SECTION C-C



END VIEW



DETAIL AT BLOCKOUTS



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

Illinois Department of Transportation

APPROVED January 1, 2011
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

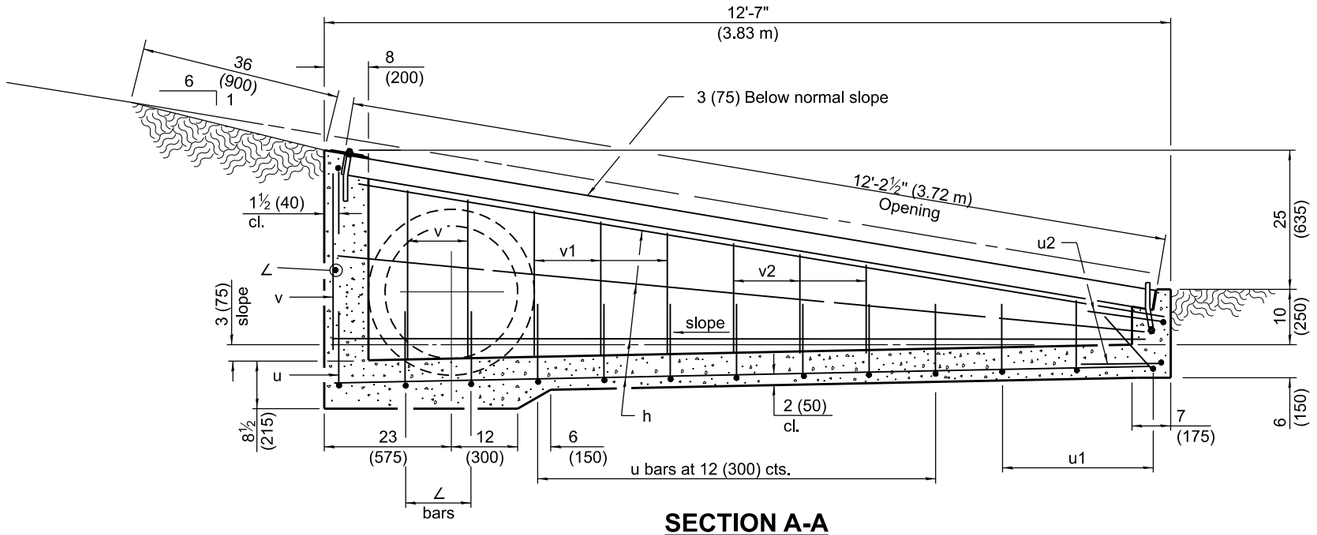
APPROVED January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

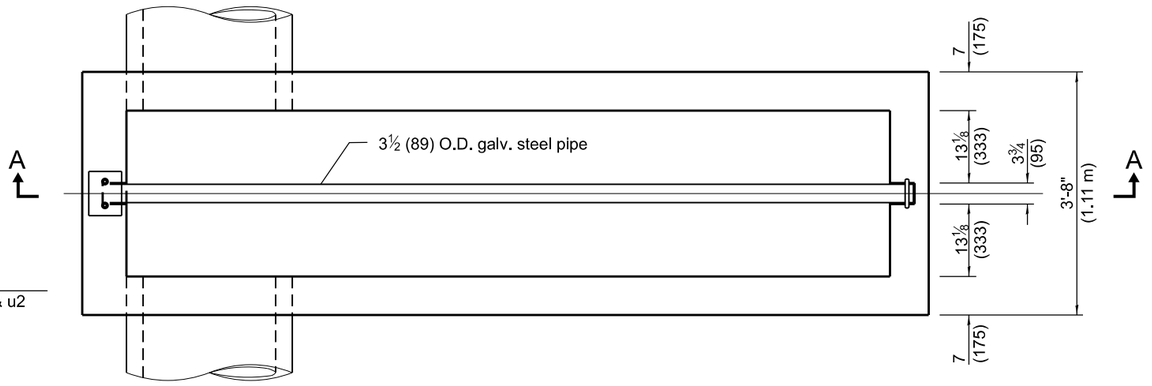
INLET BOX
TYPE 24 (600) D

(Sheet 2 of 2)

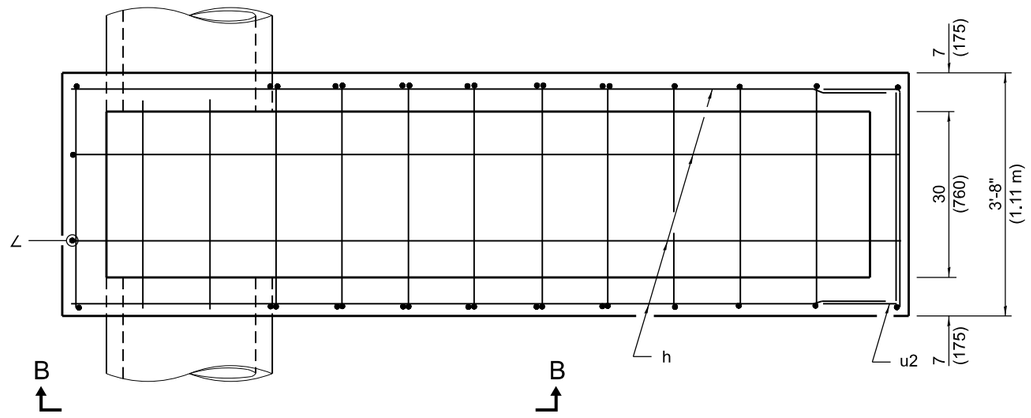
STANDARD 542516-03



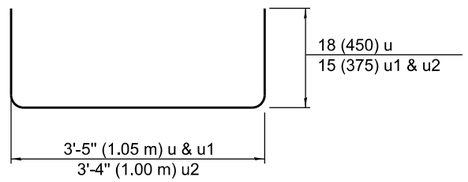
SECTION A-A



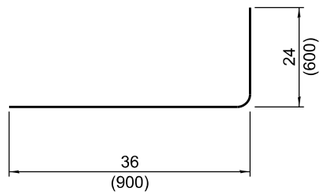
PLAN



PLAN OF REINFORCEMENT



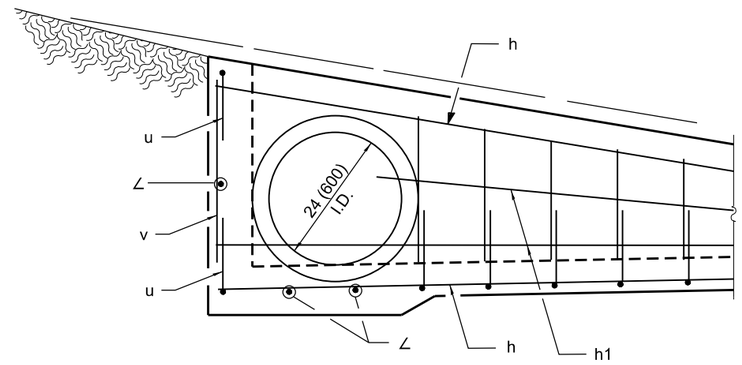
Bars u, u1 & u2



Bar ∠

Material required for one inlet box

Bar	Qty.	Size	Length
h	8	No. 4 (No. 13)	12'-0" (3.66 m)
h1	2	No. 4 (No. 13)	9'-0" (2.75 m)
∠	5	No. 4 (No. 13)	5'-0" (1.50 m)
u	9	No. 4 (No. 13)	6'-5" (1.95 m)
u1	3	No. 4 (No. 13)	5'-11" (1.80 m)
u2	2	No. 4 (No. 13)	5'-10" (1.75 m)
v	6	No. 4 (No. 13)	30 (760)
v1	6	No. 4 (No. 13)	24 (610)
v2	6	No. 4 (No. 13)	18 (460)
Concrete		cu. yds. (m^3)	2.0 (1.5)
Reinforcement Bars		lbs. (kg)	175 (79.4)
Galv. Steel Pipe		3½ (89) O.D.	12'-2¼" (3.71 m)



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.

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

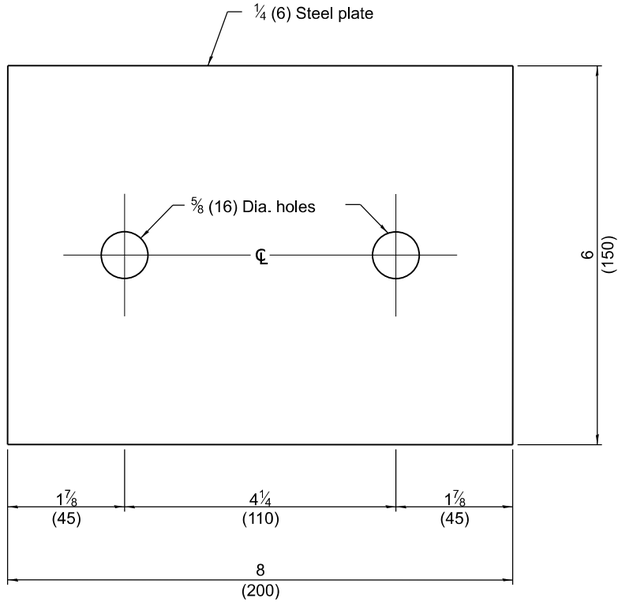
ISSUED 1-1-97

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

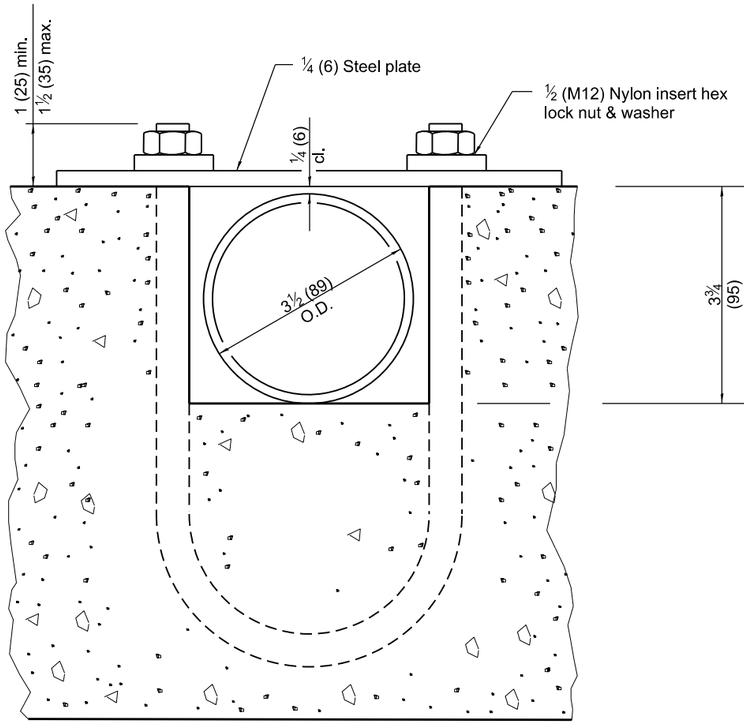
INLET BOX TYPE 24 (600) E

(Sheet 1 of 2)

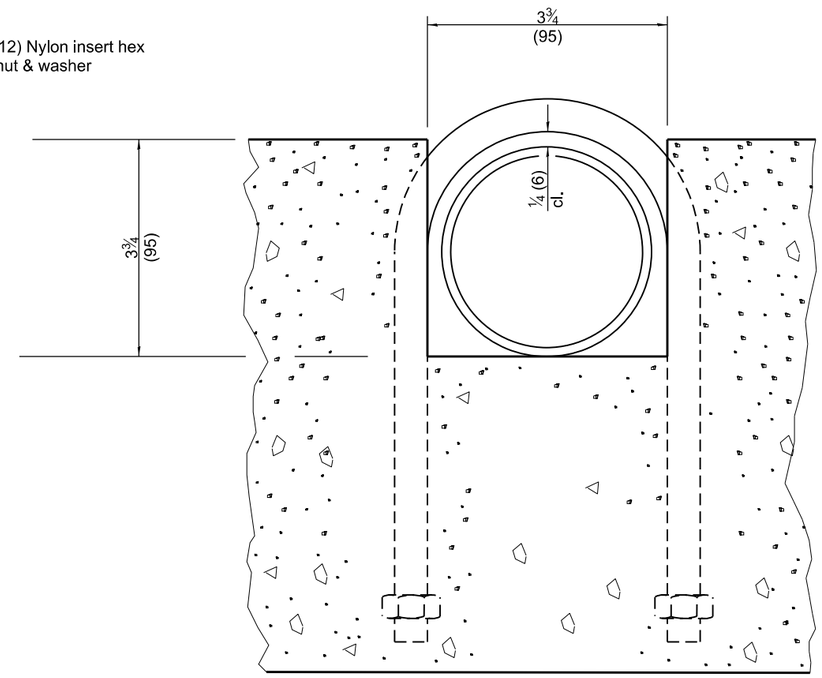
STANDARD 542521-02



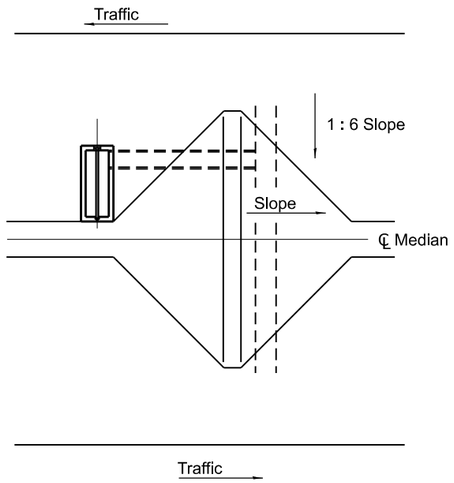
TOP ANCHOR PLATE
(1 - required)



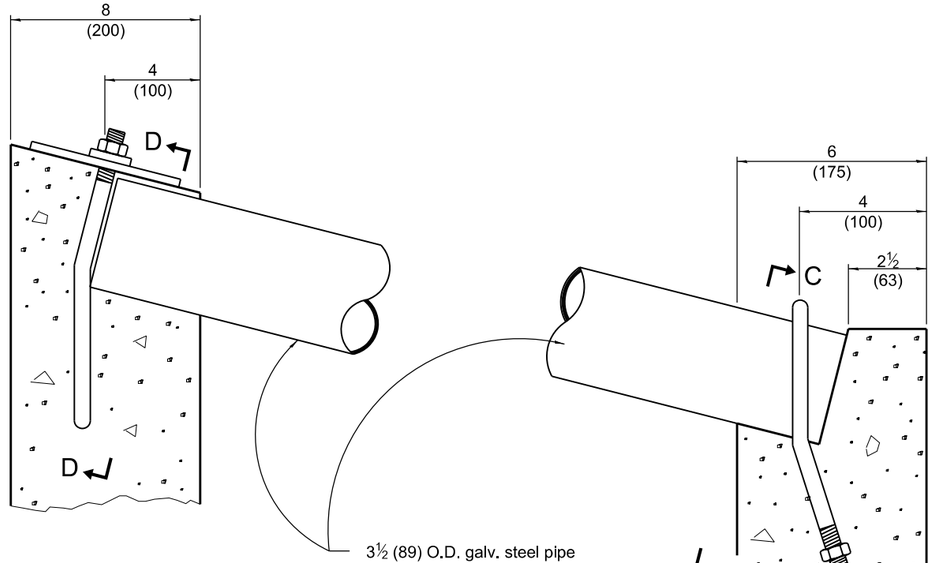
SECTION D-D



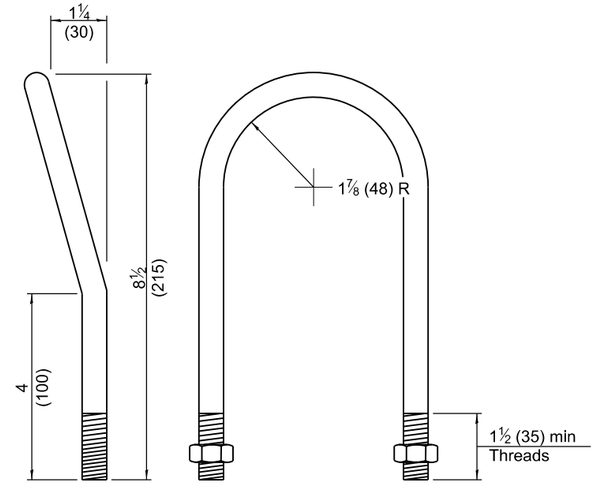
SECTION C-C



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



DETAIL AT BLOCKOUTS



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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

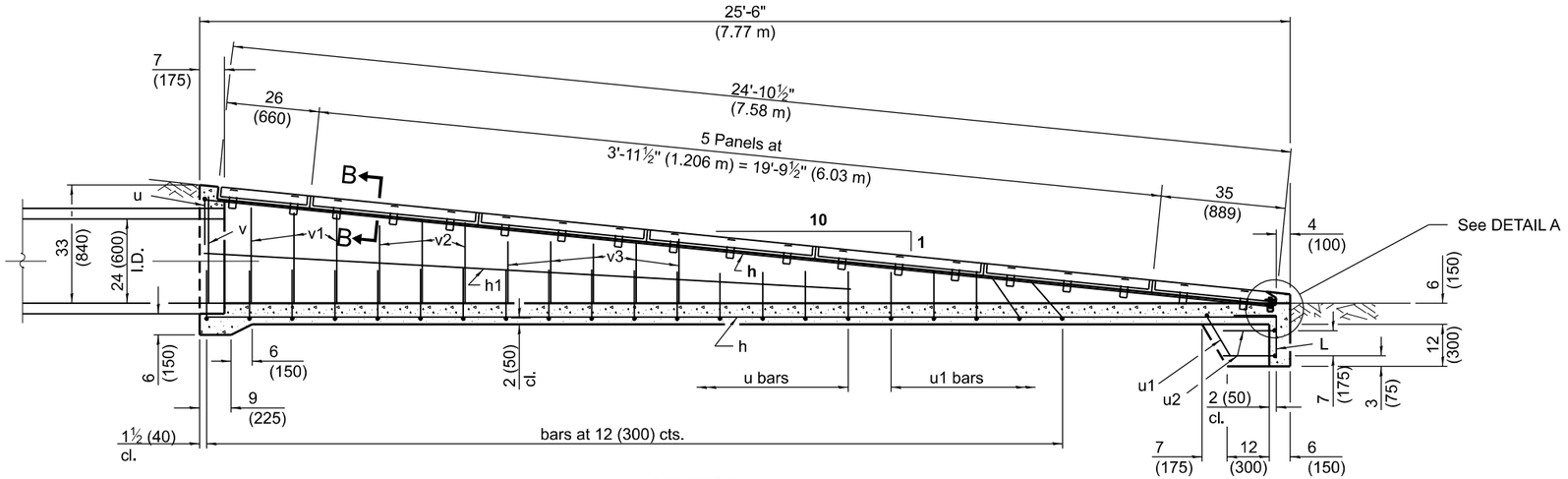
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

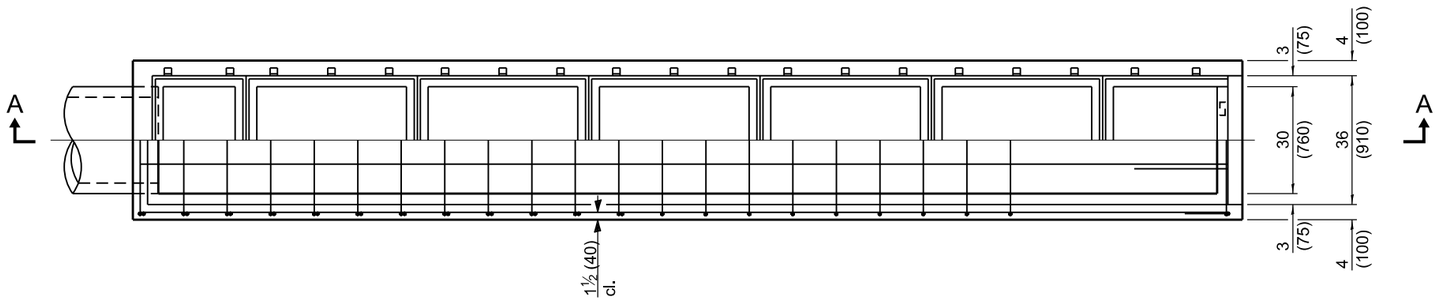
INLET BOX
TYPE 24 (600) E

(Sheet 2 of 2)

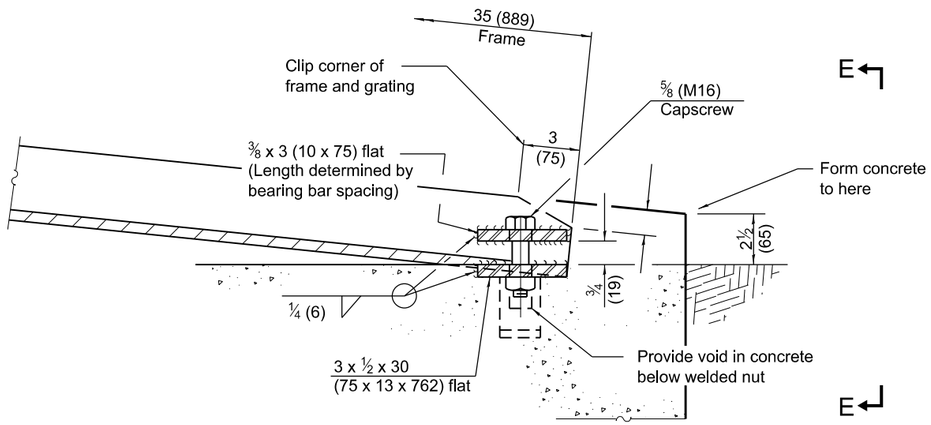
STANDARD 542521-02



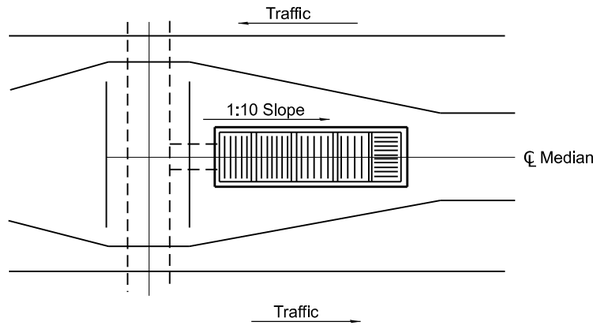
SECTION A-A



PLAN



DETAIL A



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

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.

Illinois Department of Transportation

APPROVED January 1, 2011
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

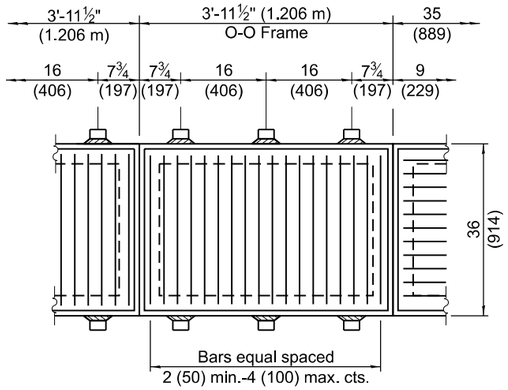
APPROVED January 1, 2011
Scott Eschbach
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

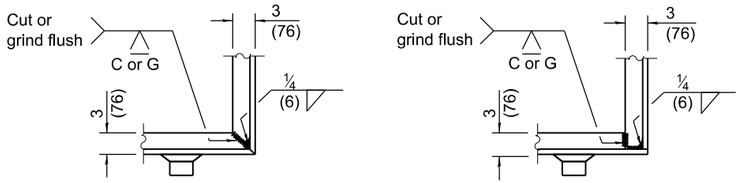
DATE	REVISIONS
1-1-11	Corrected weld symbols on Sheet 2.
1-1-09	Switched units to English (metric).
	Revised General Notes.

INLET BOX
TYPE 24 (600) F

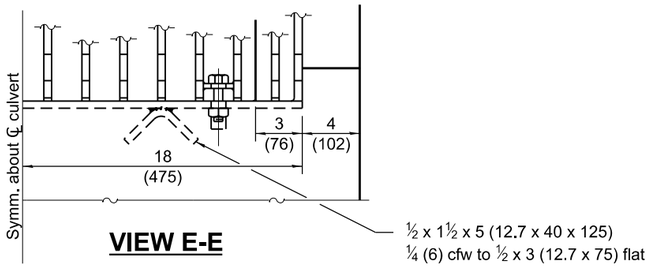
STANDARD 542526-03



TYPICAL STEEL GRATING



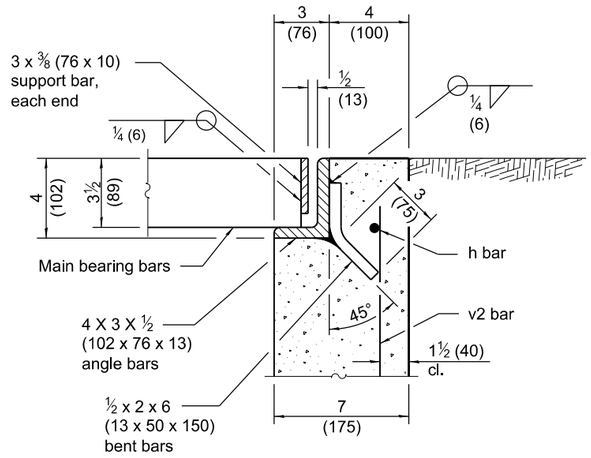
TYPICAL CORNER OF STEEL GRATING FRAME



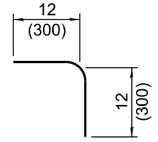
VIEW E-E

Material Required for One Inlet Box

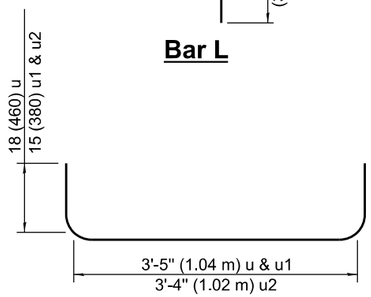
Bar	No.	Size	Length
h	6	No. 4 (No. 13)	25'-0" (7.62 m)
h1	2	No. 4 (No. 13)	11'-0" (3.35 m)
L	4	No. 4 (No. 13)	24 (600)
u	17	No. 4 (No. 13)	6'-5" (1.96 m)
u1	6	No. 4 (No. 13)	5'-11" (1.80 m)
u2	2	No. 4 (No. 13)	5'-10" (1.78 m)
v	2	No. 4 (No. 13)	30 (760)
v1	6	No. 4 (No. 13)	27 (690)
v2	6	No. 4 (No. 13)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



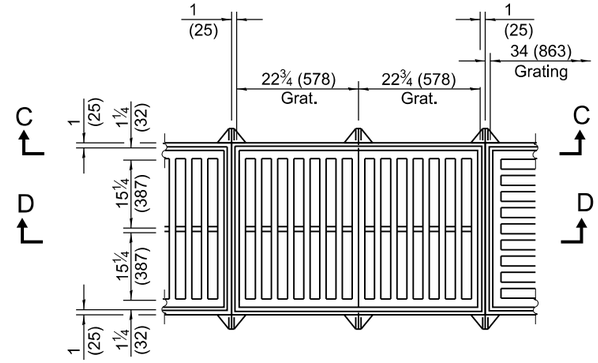
SECTION B-B



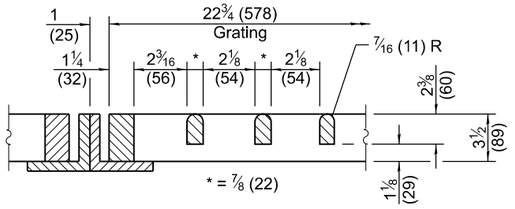
Bar L



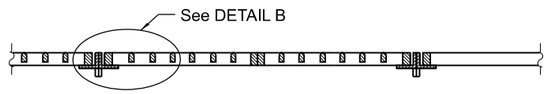
BARS u, u1 & u2



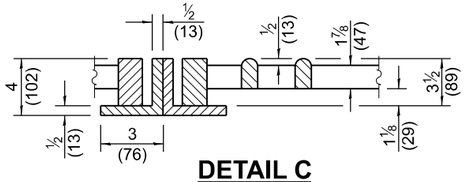
TYPICAL CAST GRATING



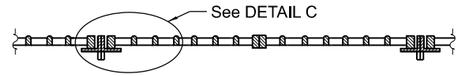
DETAIL B



SECTION C-C



DETAIL C



SECTION D-D

Illinois Department of Transportation

APPROVED January 1, 2011
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

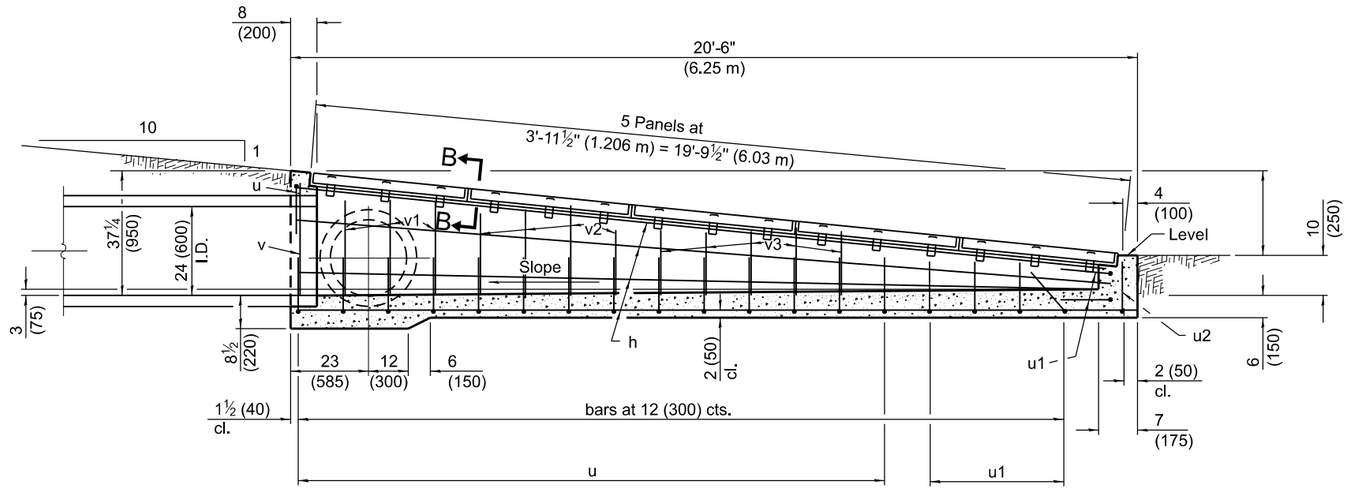
APPROVED January 1, 2011
Scott E. Stitt
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

INLET BOX TYPE 24 (600) F

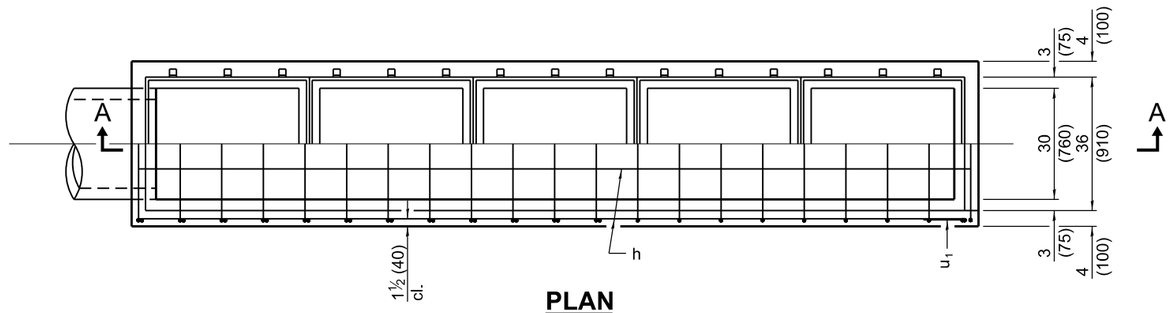
(Sheet 2 of 2)

STANDARD 542526-03

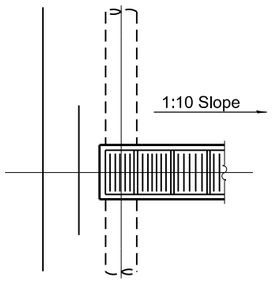


SECTION A-A

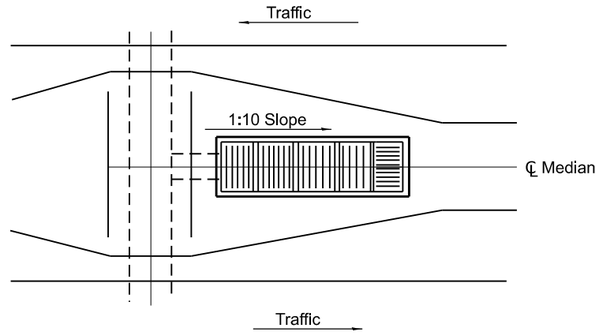
NOTE:
Culvert pipe may exit from the side (or sides) by changing reinforcement bars in that area and in the headwall end of box.



PLAN



Detail showing exit from side (or sides)



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

Illinois Department of Transportation

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Michael Brand
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT

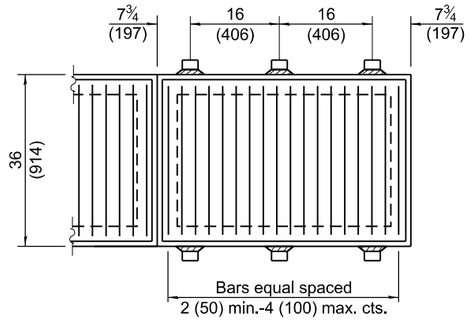
ISSUED 1-1-97

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

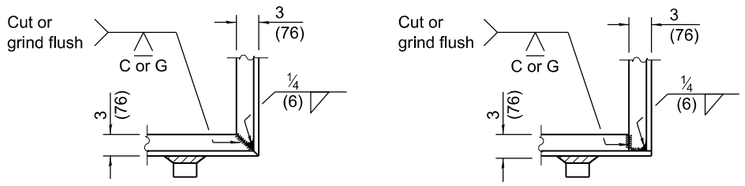
INLET BOX
TYPE 24 (600) G

(Sheet 1 of 2)

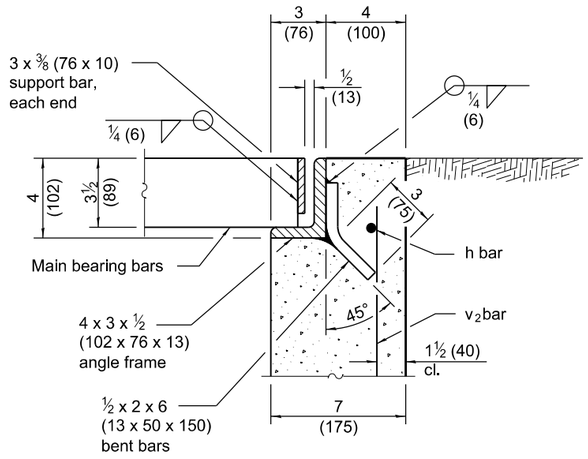
STANDARD 542531-04



TYPICAL STEEL GRATING



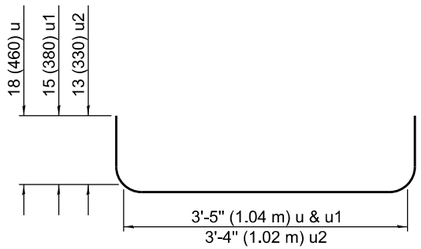
TYPICAL CORNER OF STEEL GRATING FRAME



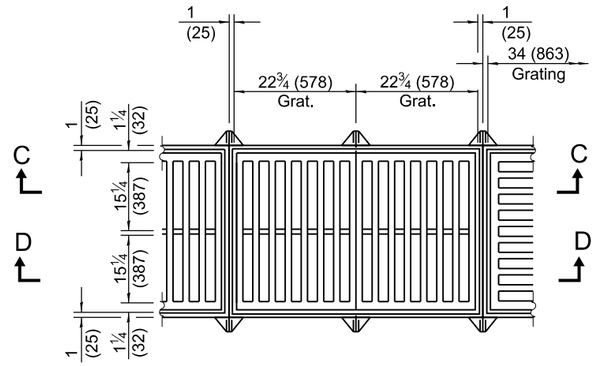
SECTION B-B

Material Required for One Inlet Box

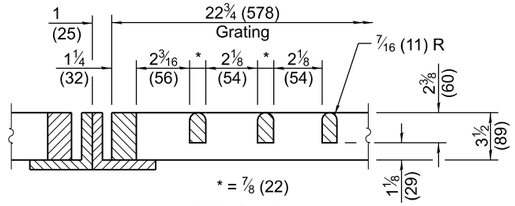
Bar	No.	Size	Length
h	10	No. 4 (No. 13)	20'-0" (6.10 m)
u	17	No. 4 (No. 13)	6'-5" (1.96 m)
u1	6	No. 4 (No. 13)	5'-11" (1.80 m)
u2	1	No. 4 (No. 13)	5'-6" (1.68 m)
v	2	No. 4 (No. 13)	33 (840)
v1	6	No. 4 (No. 13)	30 (760)
v2	10	No. 4 (No. 13)	24 (610)
v3	10	No. 4 (No. 13)	18 (460)
Concrete		cu. yds. (m^3)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



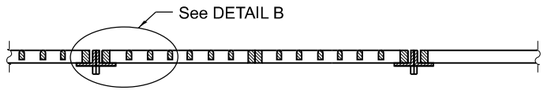
BARS u, u1 & u2



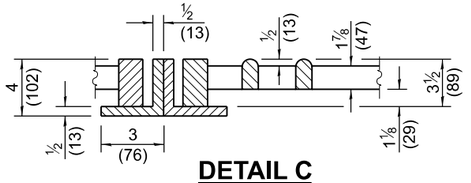
TYPICAL CAST GRATING



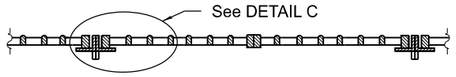
DETAIL B



SECTION C-C



DETAIL C



SECTION D-D

Illinois Department of Transportation

APPROVED January 1, 2011
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

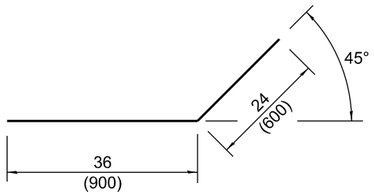
APPROVED January 1, 2011
Scott Stitt
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

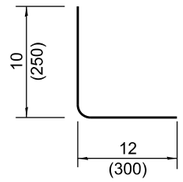
INLET BOX TYPE 24 (600) G

(Sheet 2 of 2)

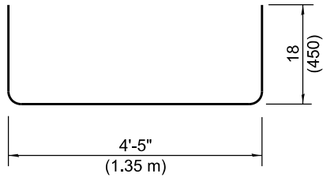
STANDARD 542531-04



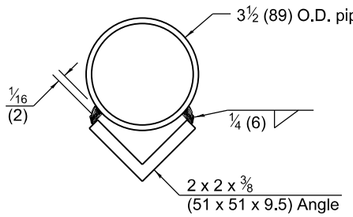
Bar h2



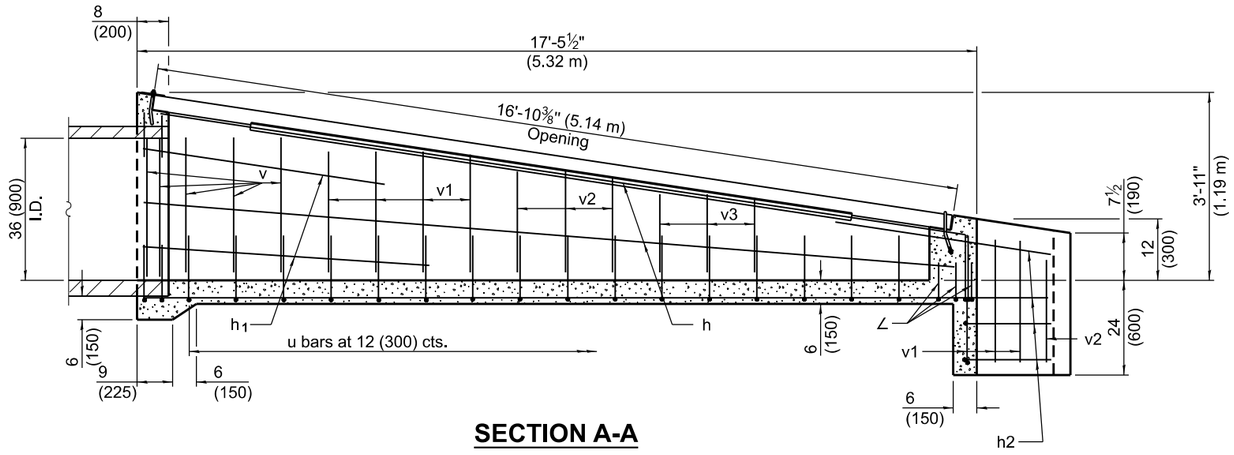
Bar ∠



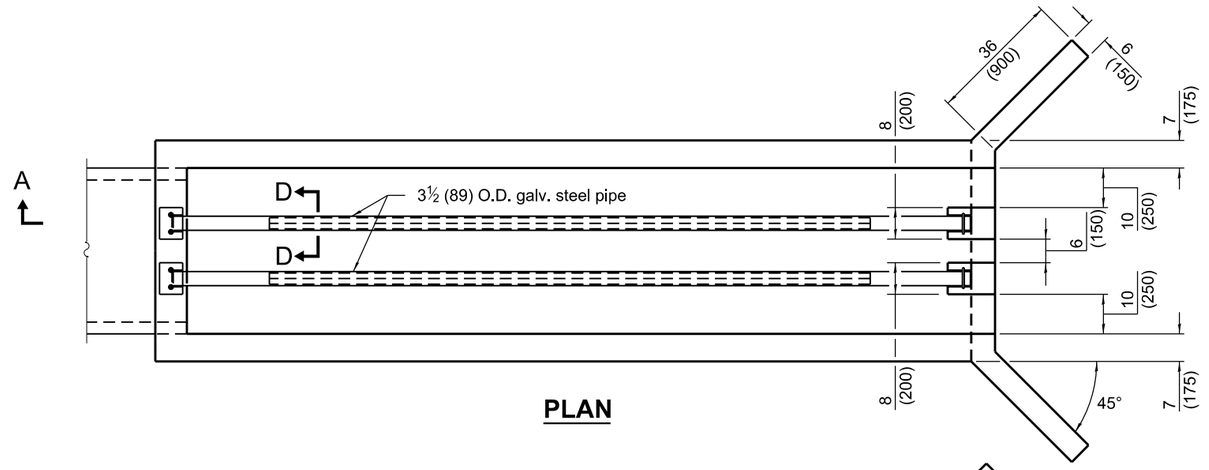
Bar u



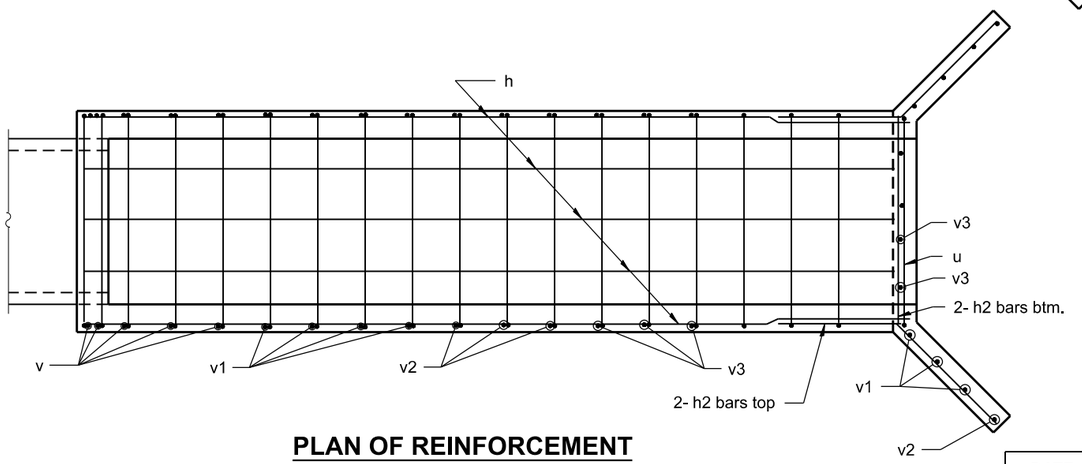
SECTION D-D



SECTION A-A



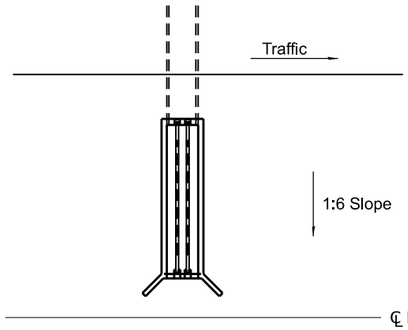
PLAN



PLAN OF REINFORCEMENT

Material required for one inlet box

Bar	Qty.	Size	Length
h	9	No. 4 (No. 13)	17'-0" (5.18 m)
h1	4	No. 4 (No. 13)	6'-3" (1.90 m)
h2	8	No. 4 (No. 13)	5'-0" (1.50 m)
∠	6	No. 4 (No. 13)	22 (550)
u	21	No. 4 (No. 13)	7'-5" (2.25 m)
v	10	No. 4 (No. 13)	36 (910)
v1	14	No. 4 (No. 13)	30 (760)
v2	8	No. 4 (No. 13)	24 (610)
v3	10	No. 4 (No. 13)	18 (460)
Concrete		cu. yds. (m^3)	3.9 (3.0)
Reinf. Bars		lbs. (kg)	319 (145)
Galv. Steel Pipe		3½ (89) O.D.	2 at 16'-10⅛" (5.15 m)
Galv. Steel Angle		2x2x⅜ (51x51x9.5)	2 at 12'-10" (3.90 m)



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

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED January 1, 2010
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2010
ENGINEER OF DESIGN AND ENVIRONMENT

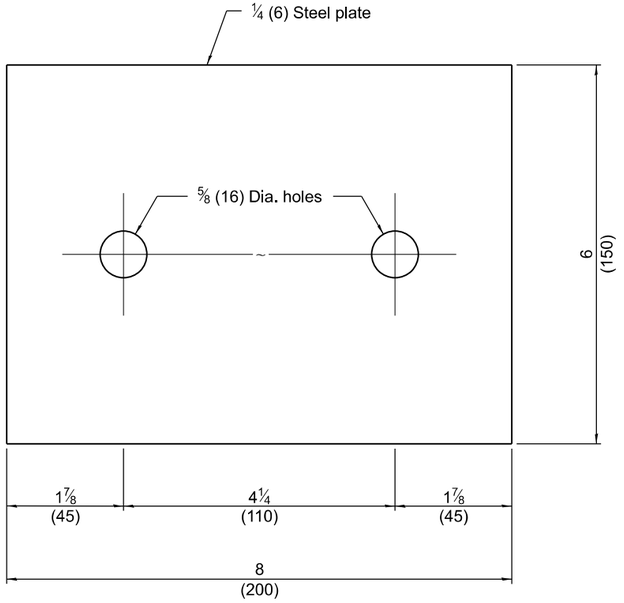
ISSUED 1-1-97

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

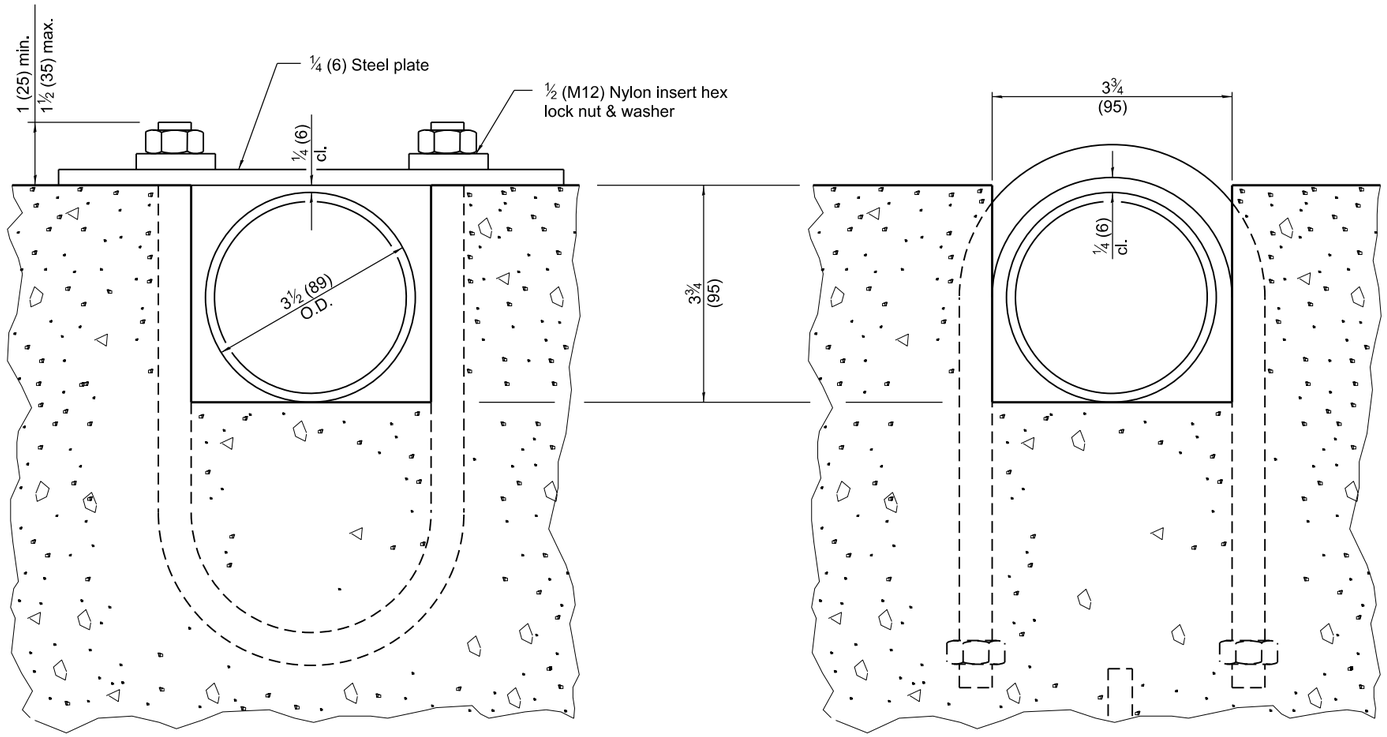
INLET BOX TYPE 36 (900) A

(Sheet 1 of 2)

STANDARD 542536-03

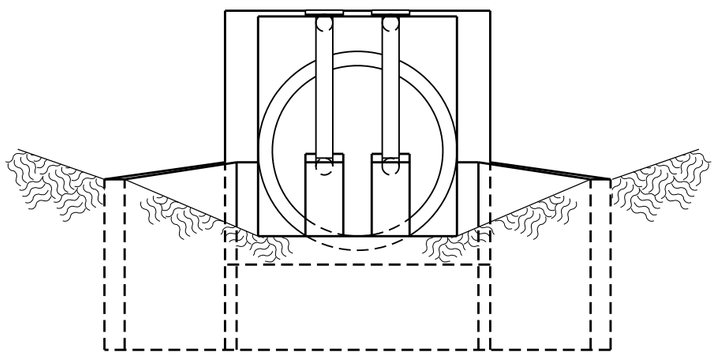


TOP ANCHOR PLATE
(2 - required)

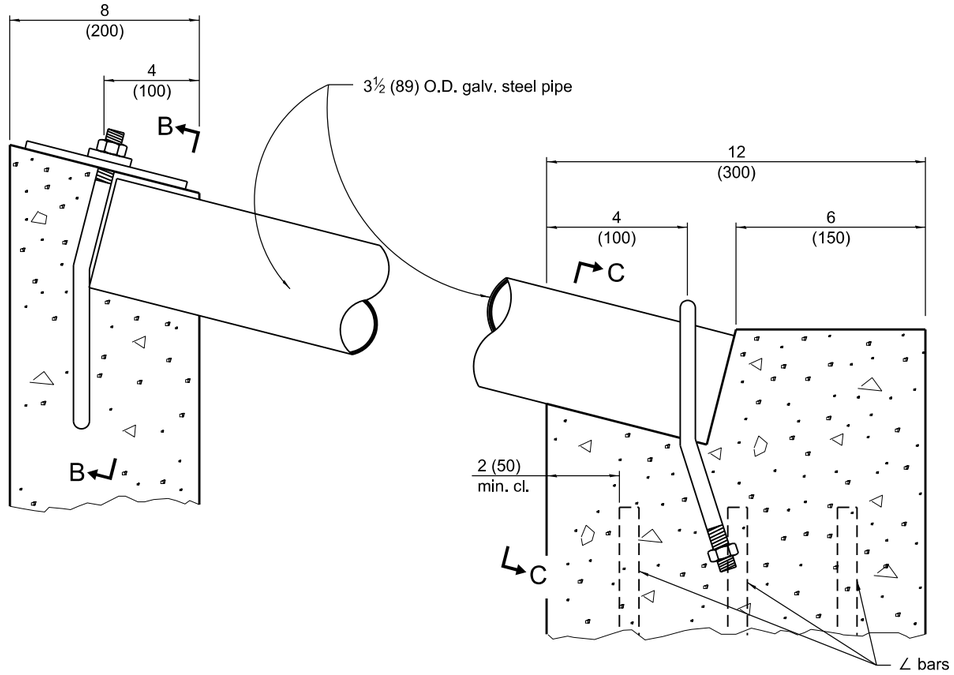


SECTION B-B

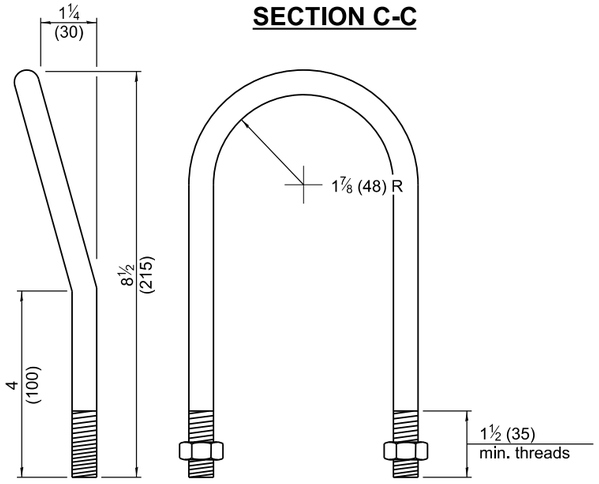
SECTION C-C



END VIEW



DETAIL AT BLOCKOUTS



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

Illinois Department of Transportation

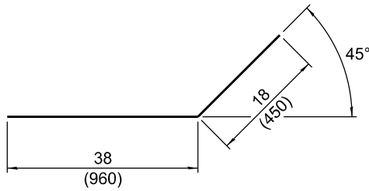
APPROVED January 1, 2010
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2010
ENGINEER OF DESIGN AND ENVIRONMENT

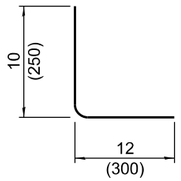
ISSUED 1-1-97

INLET BOX
TYPE 36 (900) A

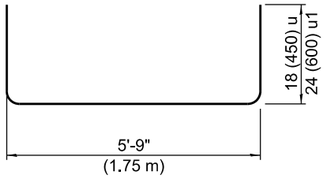
STANDARD 542536-03



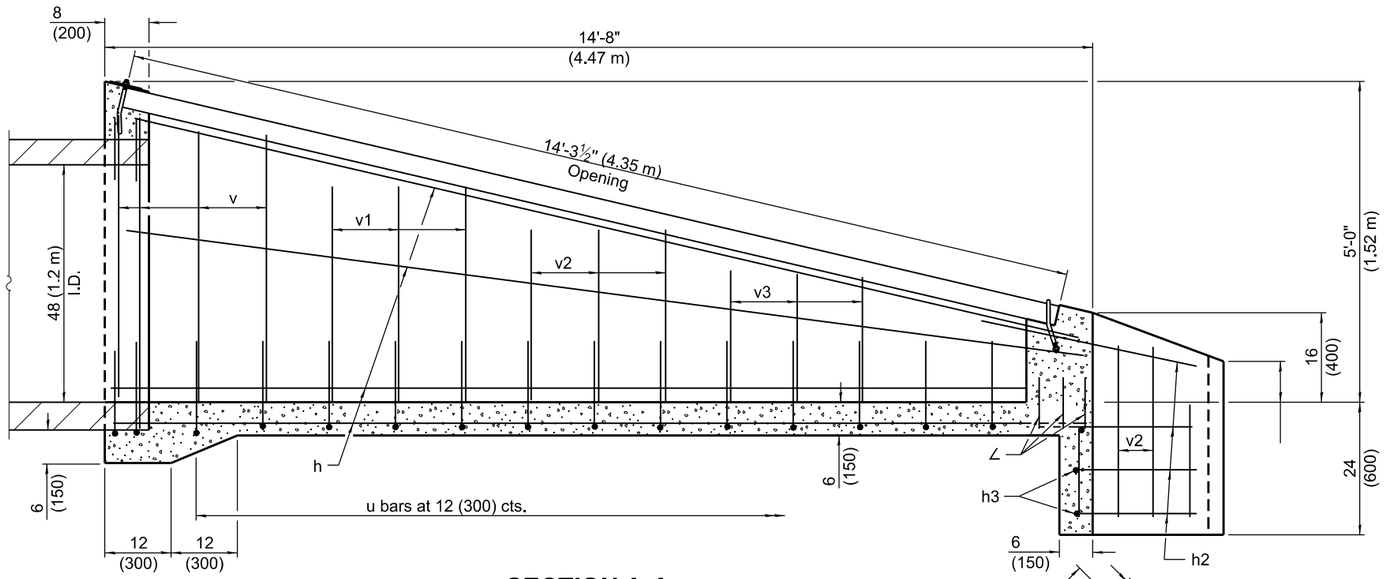
Bar h2



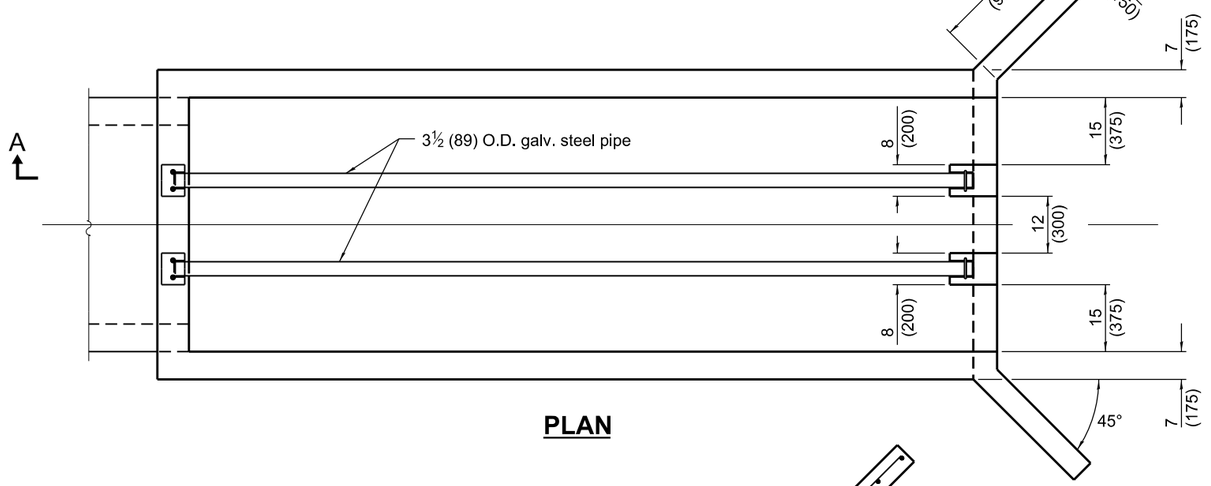
Bar ∠



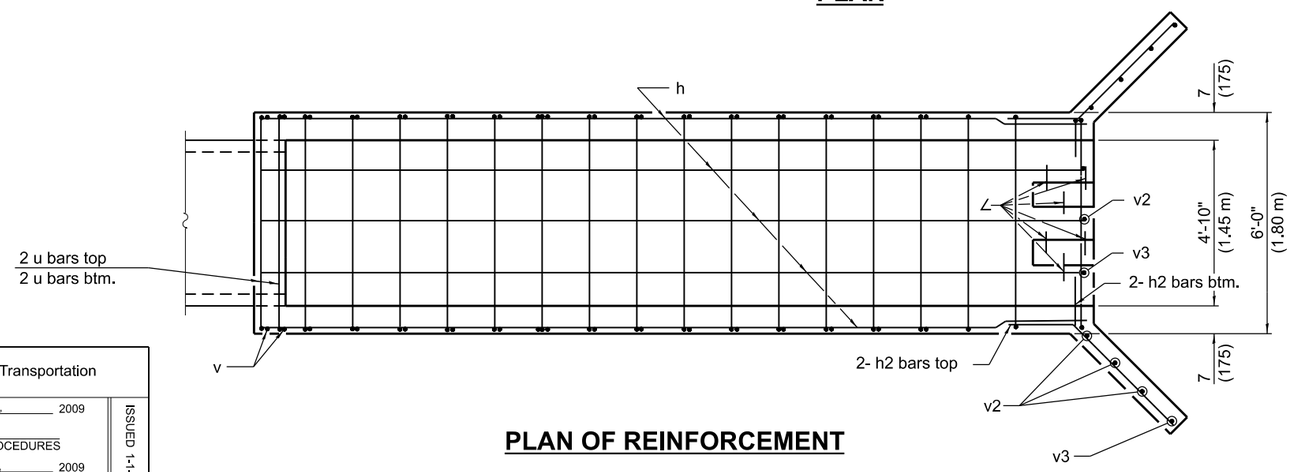
Bar u & u1



SECTION A-A



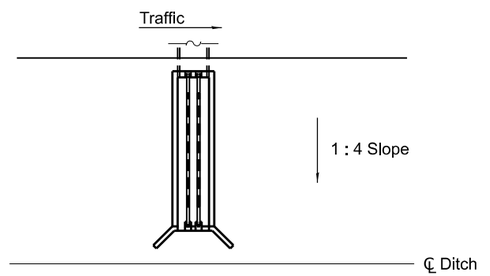
PLAN



PLAN OF REINFORCEMENT

Material required for one inlet box

Bar	Qty.	Size	Length
h	11	No. 4 (No. 13)	14'-5" (4.40 m)
h2	8	No. 4 (No. 13)	4'-8" (1.40 m)
h3	2	No. 4 (No. 13)	5'-6" (1.70 m)
∠	6	No. 4 (No. 13)	22 (550)
u	16	No. 4 (No. 13)	8'-9" (2.67 m)
u1	2	No. 4 (No. 13)	9'-9" (2.97 m)
v	8	No. 4 (No. 13)	4'-3" (1.30 m)
v1	6	No. 4 (No. 13)	3'-6" (1.07 m)
v2	13	No. 4 (No. 13)	33 (840)
v3	10	No. 4 (No. 13)	21 (530)
Concrete		cu. yds. (m³)	5.0 (3.80)
Reinf. Bars		lbs. (kg)	324 (147)
Galv. Steel Pipe		3½ (89) O.D.	2 at 14'-3¼" (4.35 m)



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

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

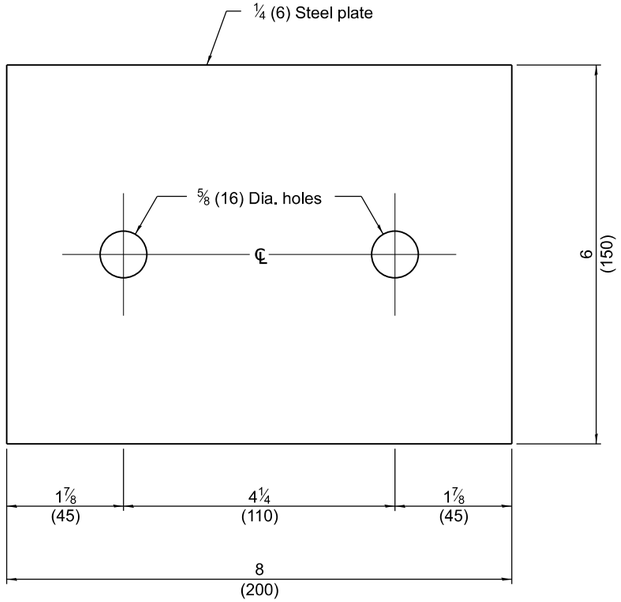
ISSUED 1-1-97

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

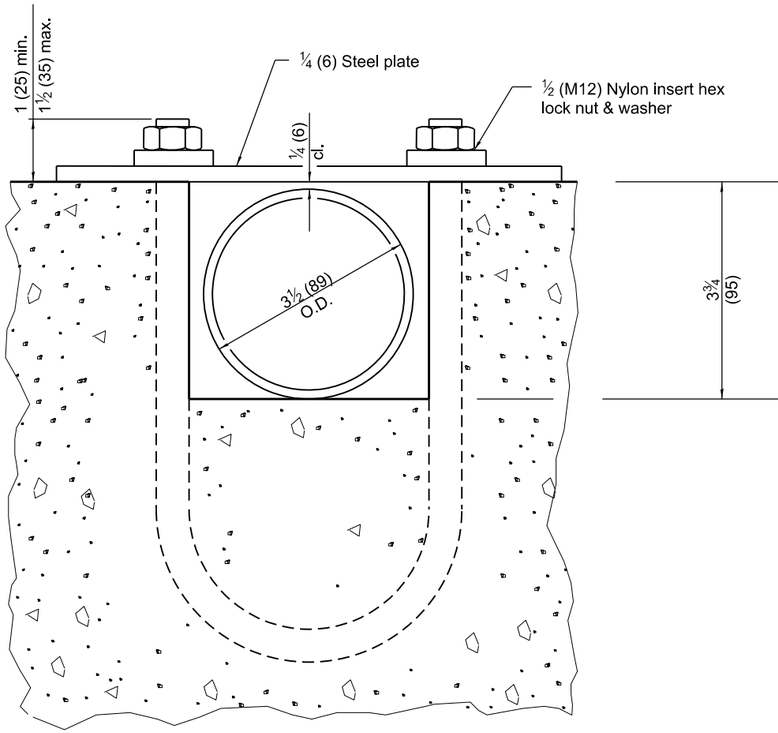
INLET BOX TYPE 48 (1200) A

(Sheet 1 of 2)

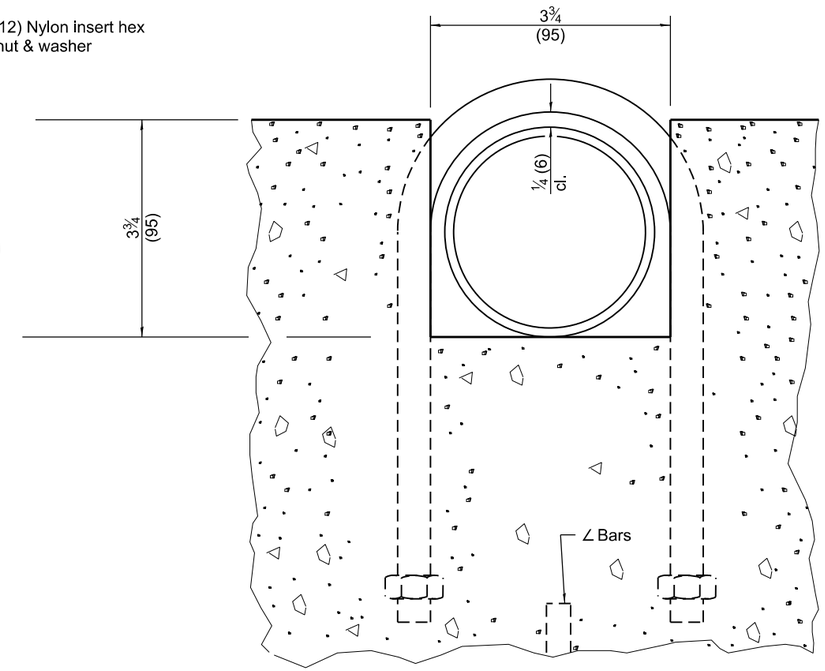
STANDARD 542541-02



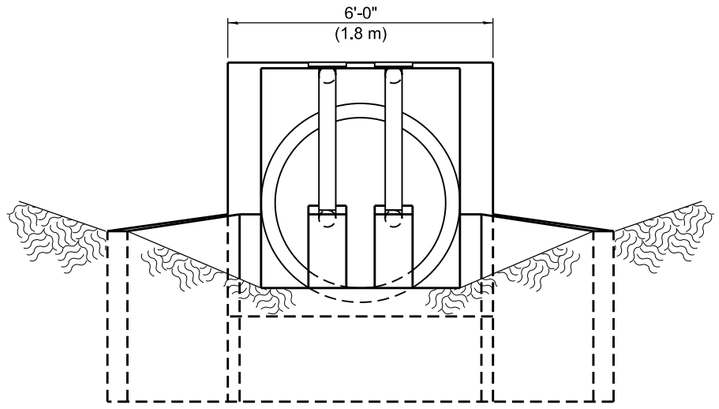
TOP ANCHOR PLATE
(2 - required)



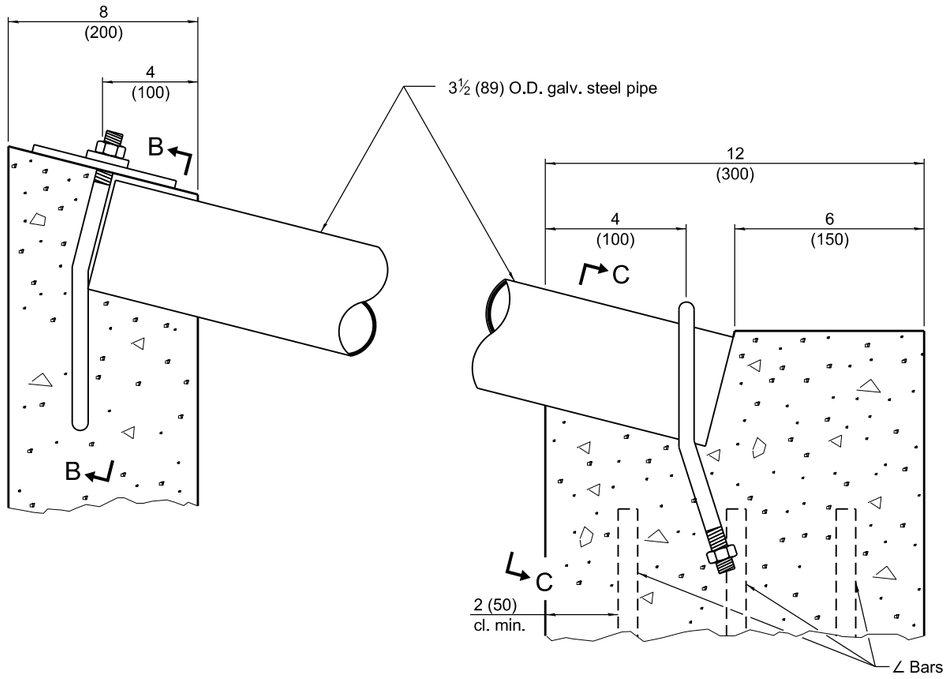
SECTION B-B



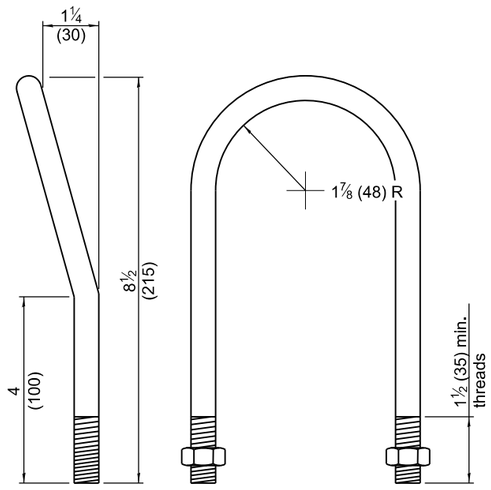
SECTION C-C



END VIEW



DETAIL AT BLOCKOUTS



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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

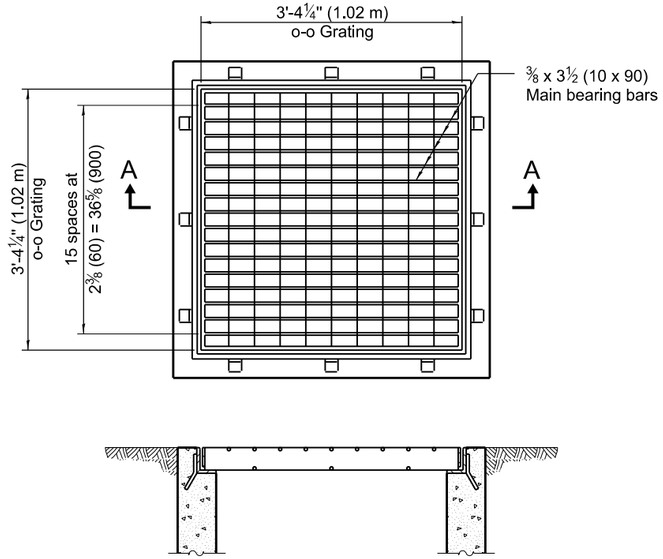
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

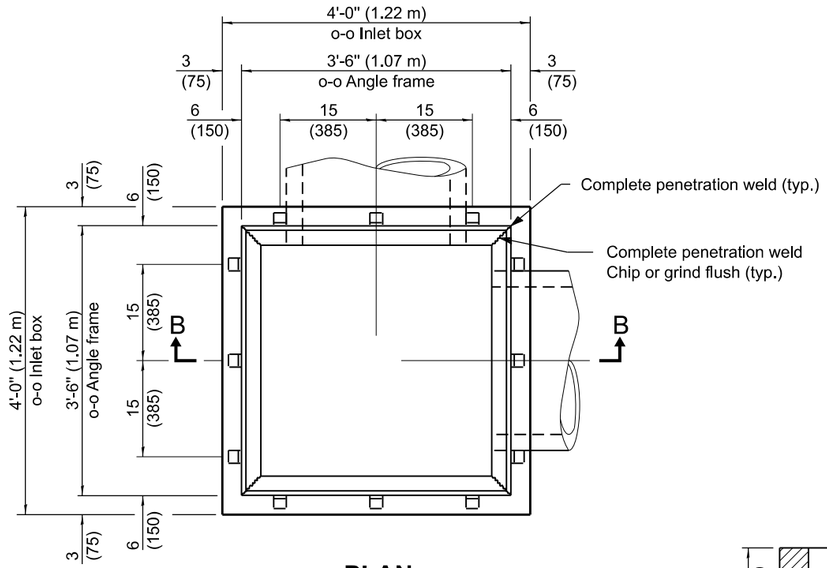
INLET BOX
TYPE 48 (1200) A

(Sheet 2 of 2)

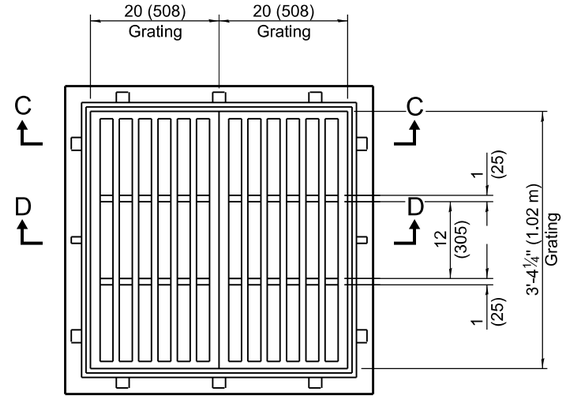
STANDARD 542541-02

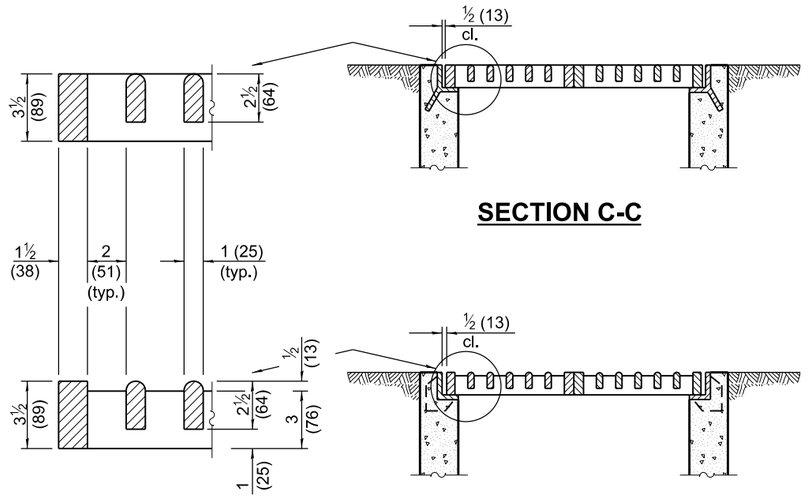


SECTION A-A



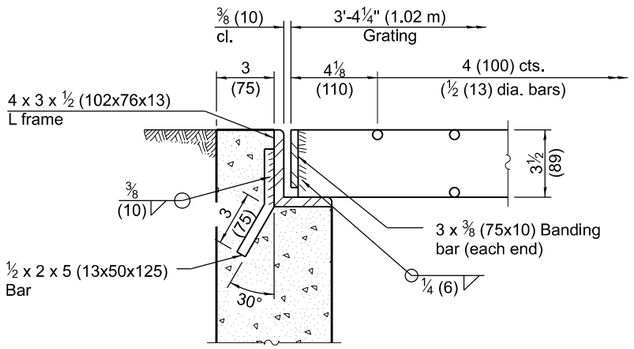
PLAN
(Grating omitted for clarity)



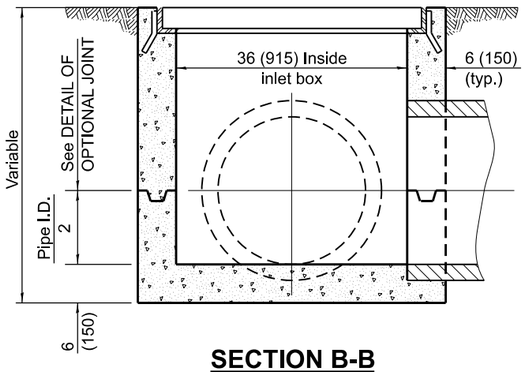


SECTION C-C

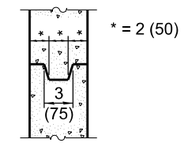
SECTION D-D
CAST FRAME & GRATE



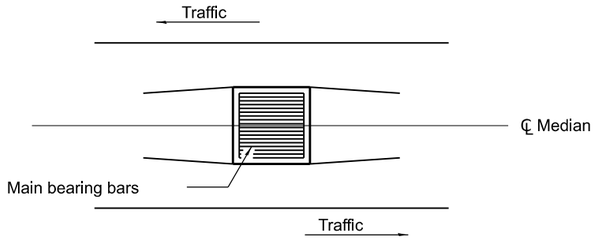
STEEL FRAME & GRATE



SECTION B-B



DETAIL of OPTIONAL JOINT



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

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

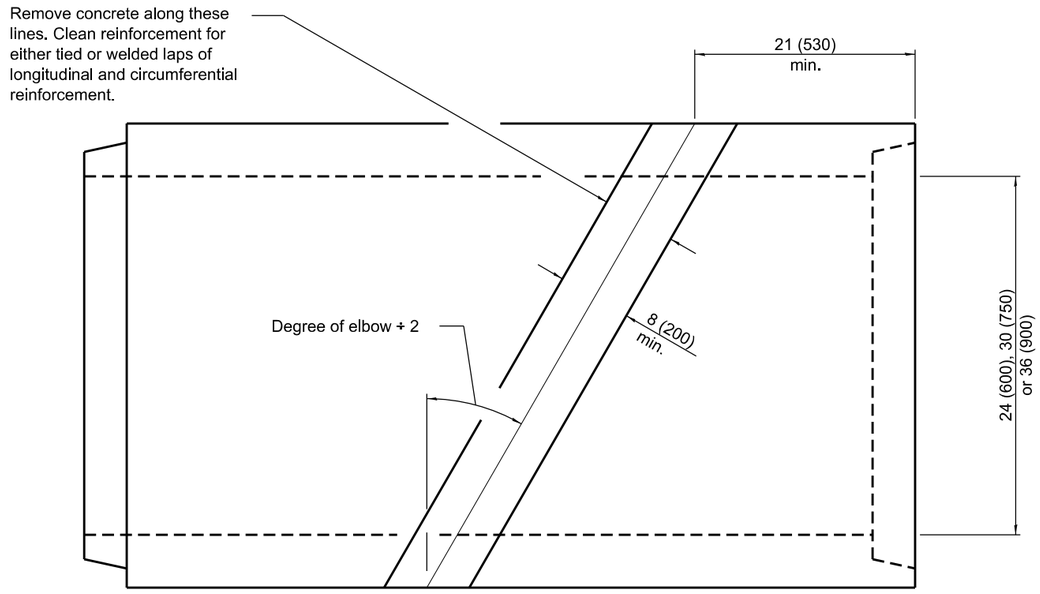
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

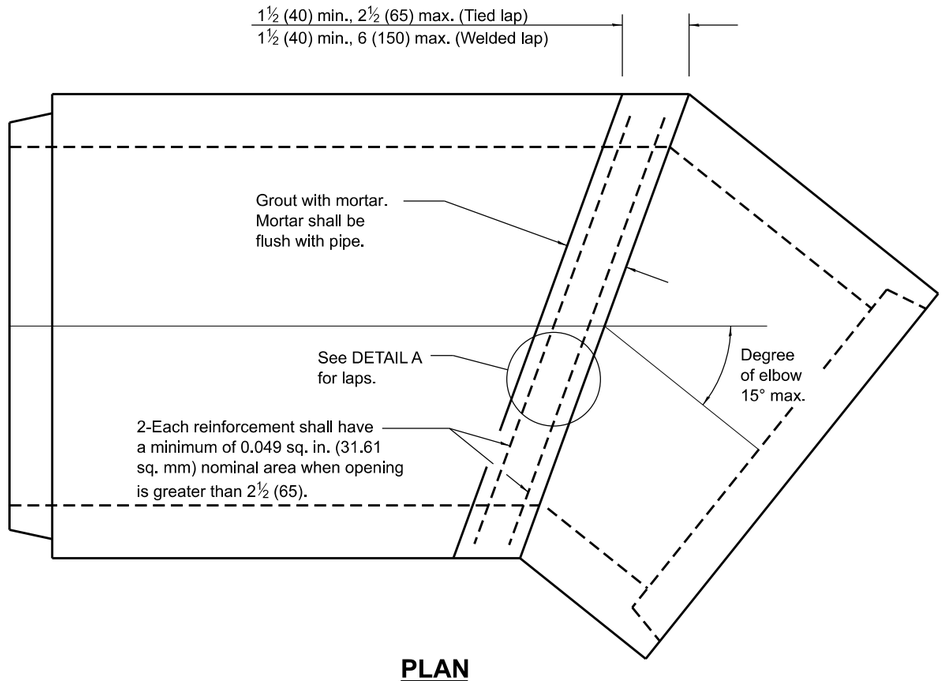
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2240-6.

FLUSH INLET BOX FOR MEDIAN

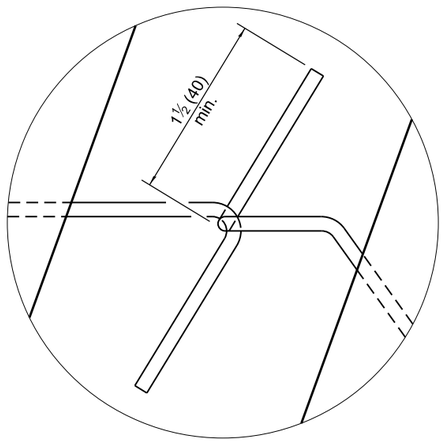
STANDARD 542546-01



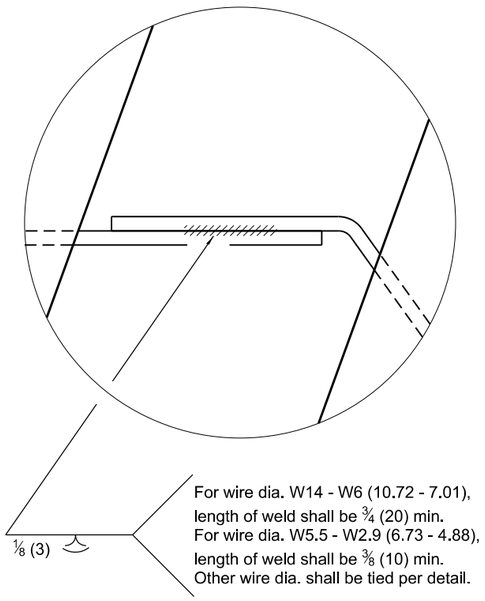
PLAN
(Reinforced concrete pipe)



PLAN
(Reinforced concrete pipe elbow)

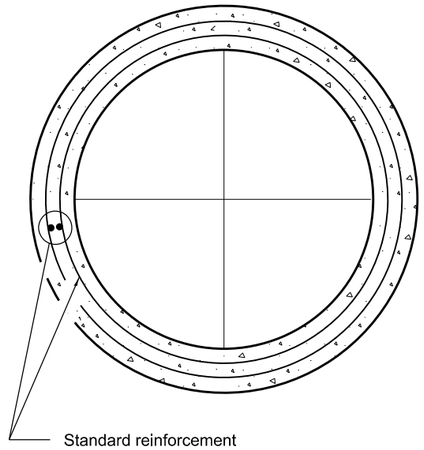


TIED LAP



WELDED LAP

DETAIL A



TRANSVERSE SECTION

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

Illinois Department of Transportation

APPROVED January 1, 2011
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

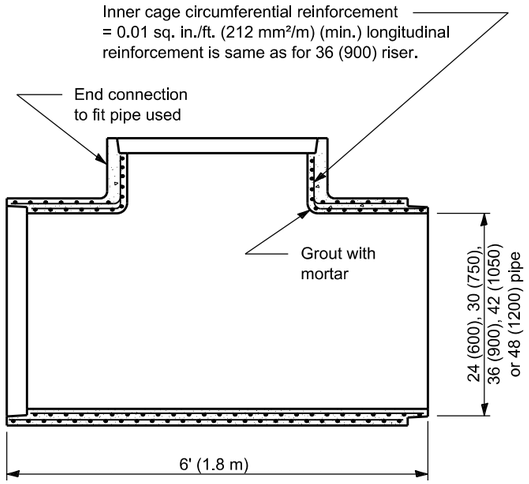
APPROVED January 1, 2011
Scott Bush
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

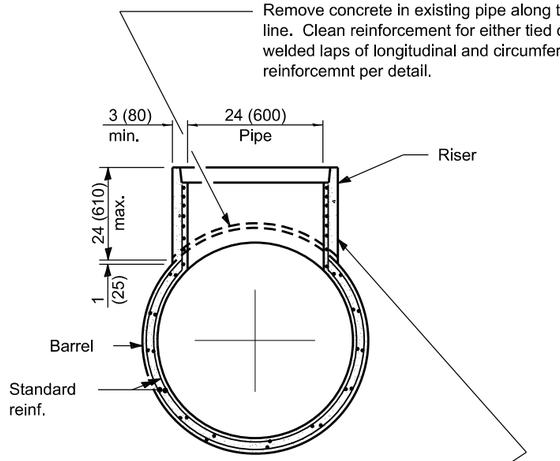
REINFORCED CONCRETE PIPE ELBOW 24", 30", OR 36" (600 mm, 750 mm, OR 900 mm)

STANDARD 542601-03

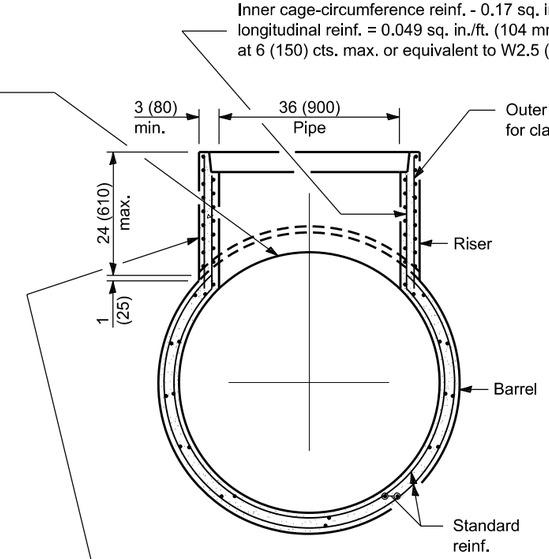


LONGITUDINAL SECTION

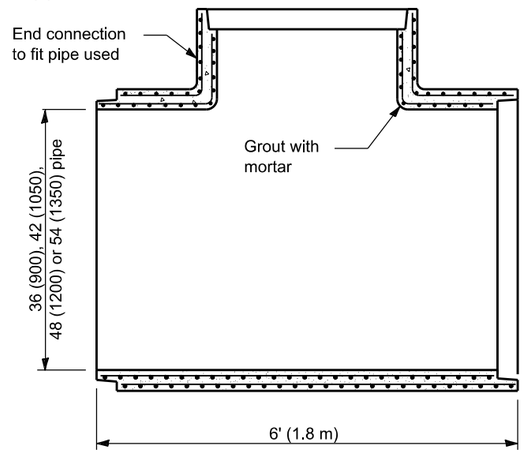
For wire W12 thru W2 (10.008 thru 7.188),
length of weld shall be ¾ (20) min.
For wire W5.5 thru W2.5 (6.655 thru 4.496),
length of weld shall be ⅜ (10) min.
Other wire gauges shall be tied per detail.



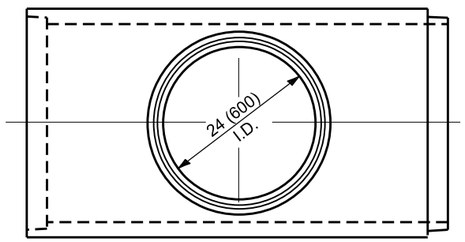
TRANSVERSE SECTION



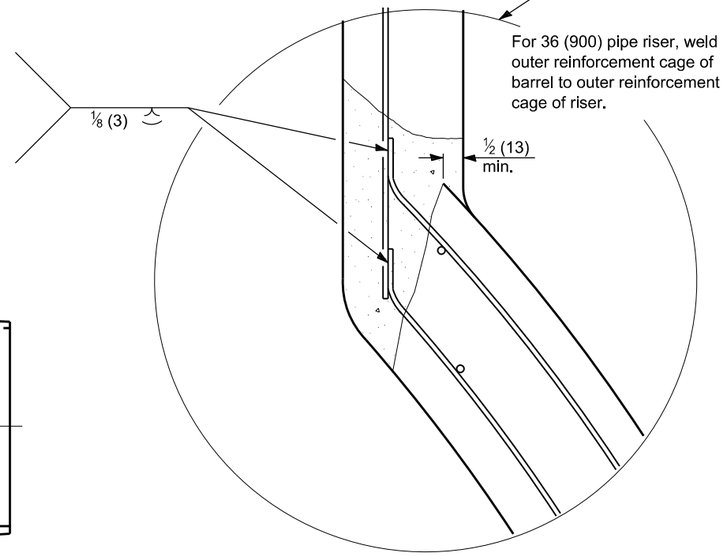
TRANSVERSE SECTION



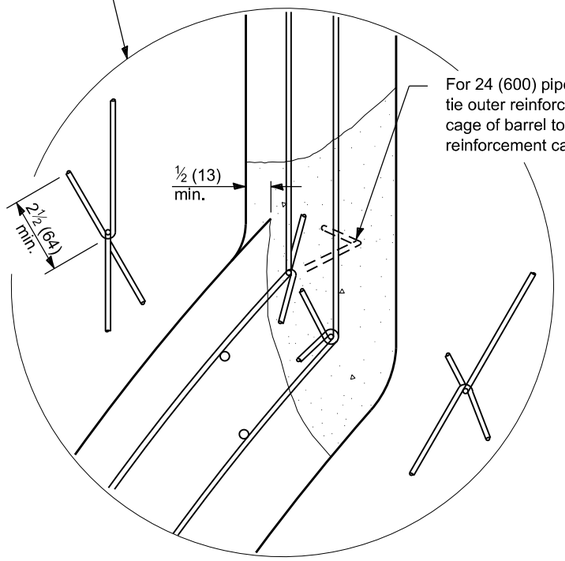
LONGITUDINAL SECTION



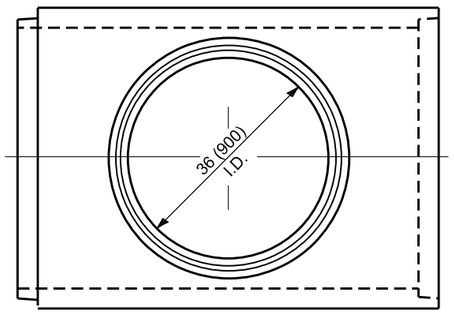
PLAN
TEE WITH 24 (600) RISER



WELDED LAP



TIED LAP



PLAN
TEE WITH 36 (900) RISER

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

Illinois Department of Transportation

APPROVED January 1, 2011
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

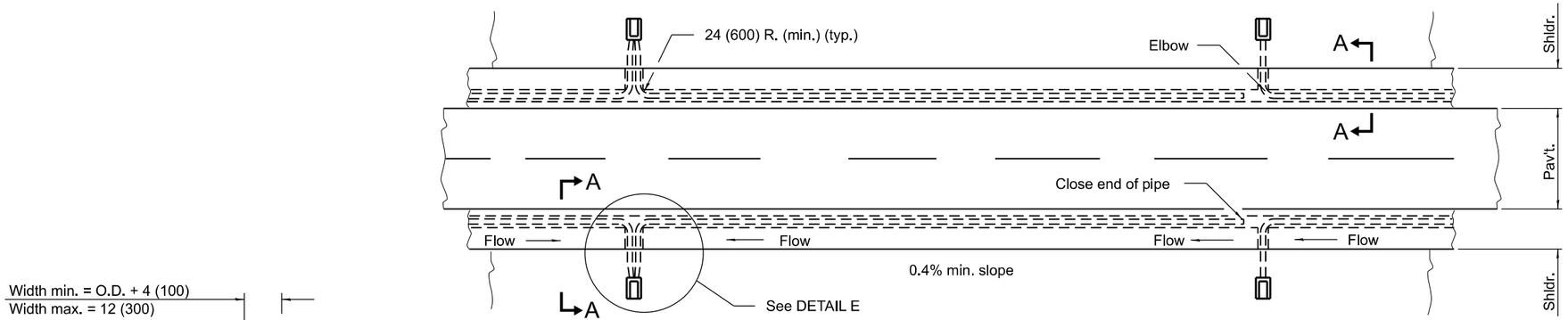
APPROVED January 1, 2011
Scott E. Schaffer
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

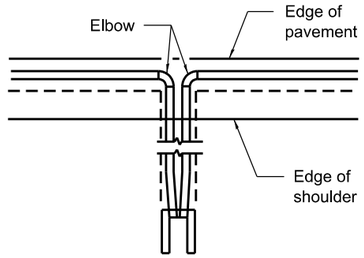
DATE	REVISIONS
1-1-11	Corrected weld symbol
	on Welded Lap detail.
1-1-09	Switched units to English (metric).

REINFORCED CONCRETE PIPE TEE

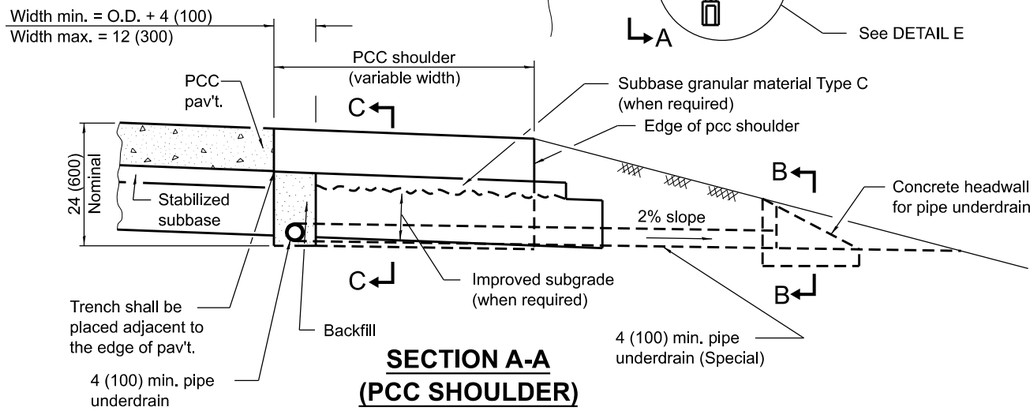
STANDARD 542606-02



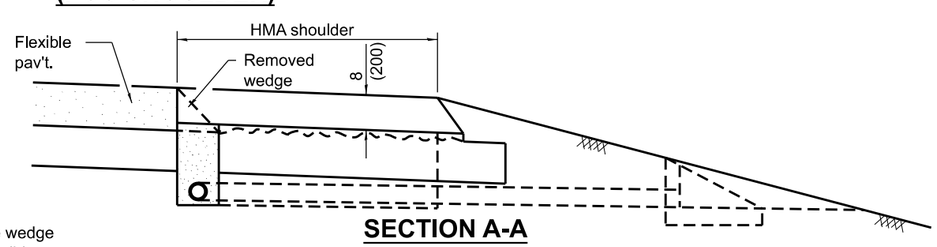
PLAN



DETAIL E

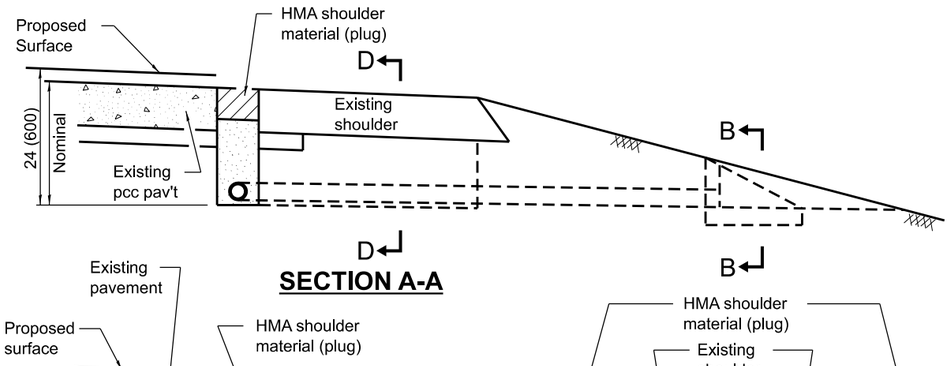


SECTION A-A (PCC SHOULDER)

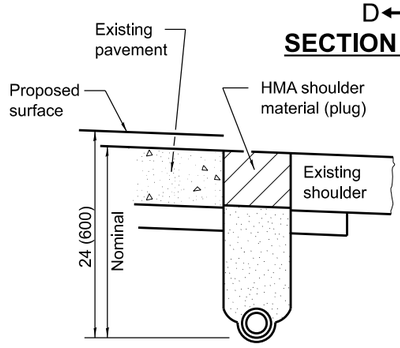


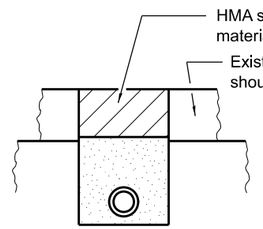
SECTION A-A (HMA SHOULDER)

(Dimensions and notes not shown shall be as shown in the above Section A-A)

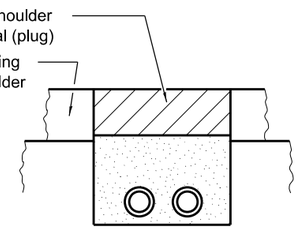


SECTION A-A



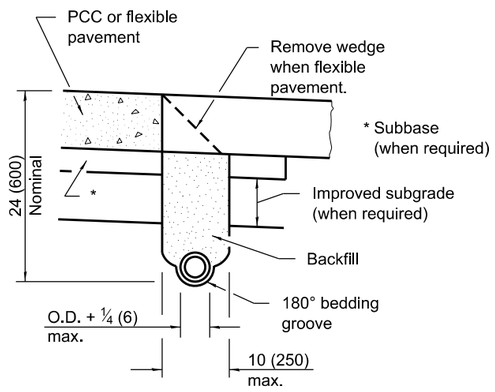


SECTION D-D

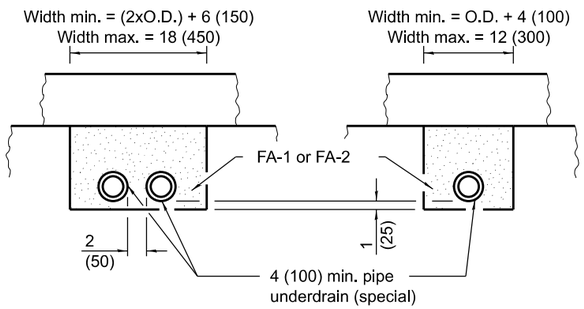


SECTION D-D
(Sag Locations)

TRENCH FOR CORRUGATED POLYETHYLENE TUBING ALTERNATE



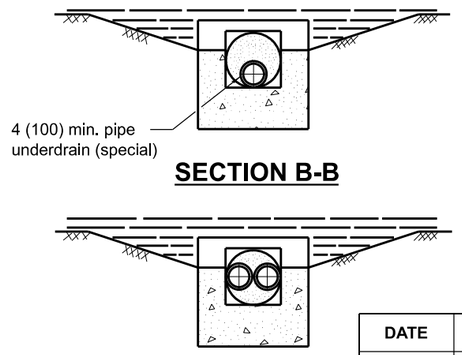
TRENCH FOR CORRUGATED POLYETHYLENE TUBING ALTERNATE



SECTION C-C
(Sag locations)

SECTION C-C

NEW CONSTRUCTION



SECTION B-B

SECTION B-B
(Sag locations)

EXISTING CONSTRUCTION

(Except as noted or shown, dimensions and notes specified for Existing Construction are the same as those of New Construction)

GENERAL NOTES

See Standard 601101 for details of concrete headwall.

See Standards 482001, 482006 and 483001 for details of shoulders not shown.

The 24 (600) radius on the drainage fitting is only a minimum. Larger radii meeting the approval of the Engineer may be substituted.

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

Illinois Department of Transportation

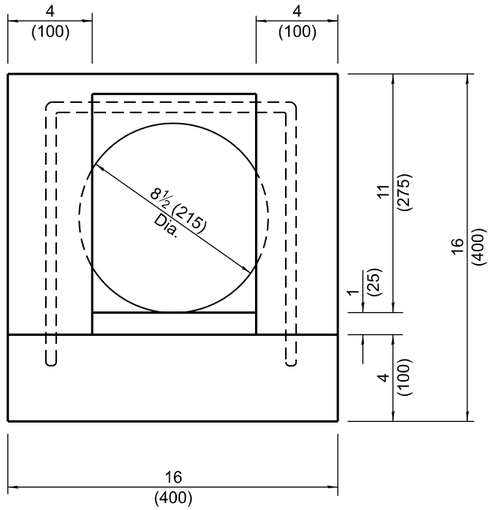
APPROVED April 1, 2016
Michael Brand
ENGINEER OF POLICY AND PROCEDURES
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

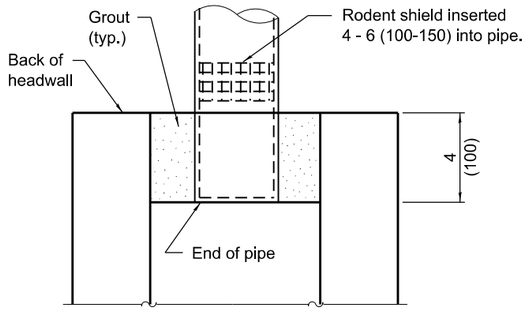
DATE	REVISIONS
4-1-16	Renamed standard. Omitted
	drainage mat option.
1-1-11	Added 'PCC' and 'HMA' to
	SECTION A-A titles on Sheet 2.

PIPE UNDERDRAINS

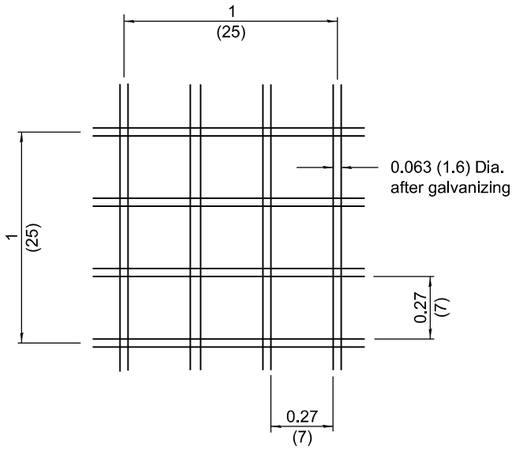
STANDARD 601001-05



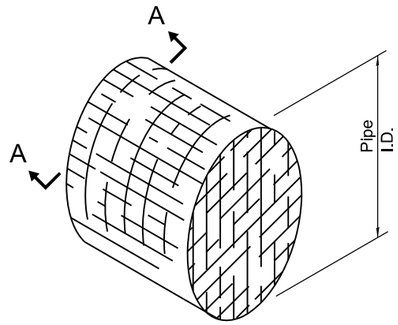
FRONT VIEW



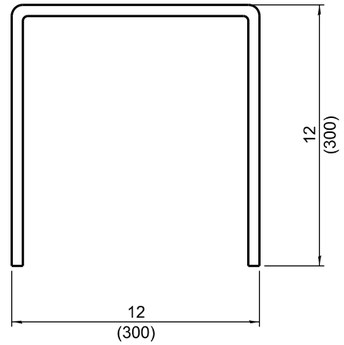
RODENT SHIELD PLACEMENT



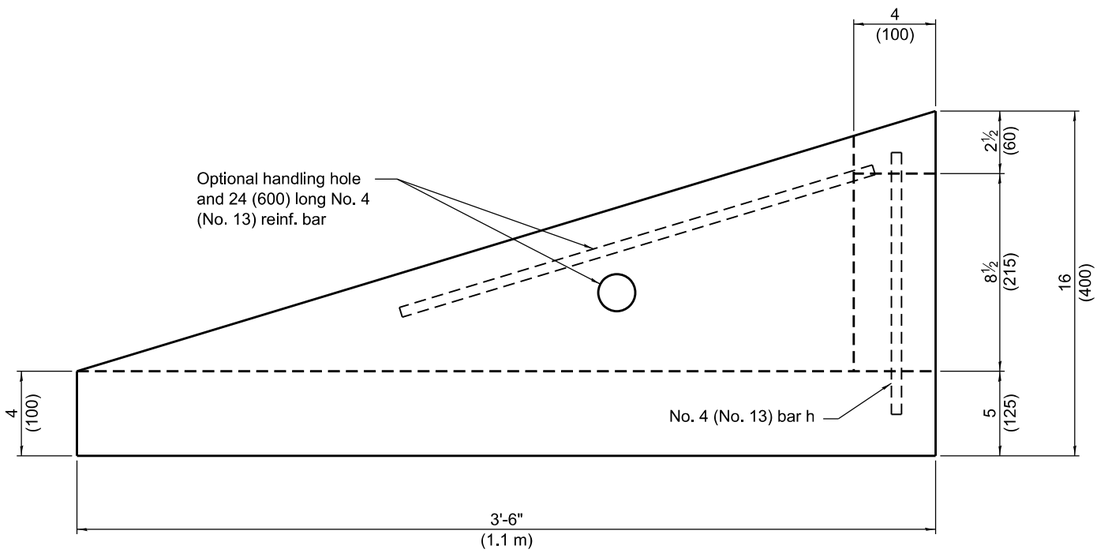
SECTION A-A



DETAIL OF RODENT SHIELD



BAR h



SIDE VIEW

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED April 1, 2016
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

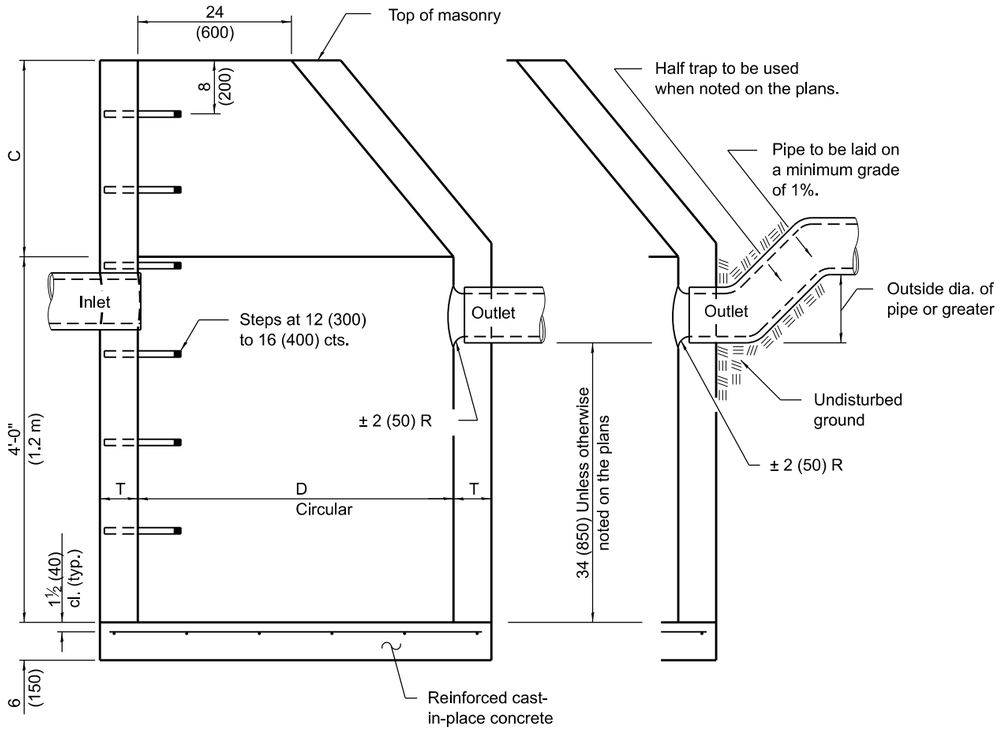
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

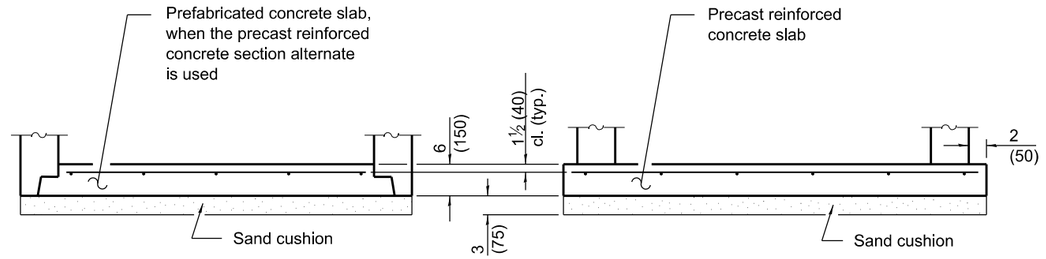
CONCRETE HEADWALL FOR PIPE UNDERDRAINS

STANDARD 601101-02



ELEVATION
(Standard Outlet)

ELEVATION
(Half Trap)



ALTERNATE BOTTOM SLAB

ALTERNATE MATERIALS FOR WALLS	D	C*	T (min.)
Concrete Masonry Unit	4'-0" (1.2 m) 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.

Illinois Department of Transportation

APPROVED January 1, 2011
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

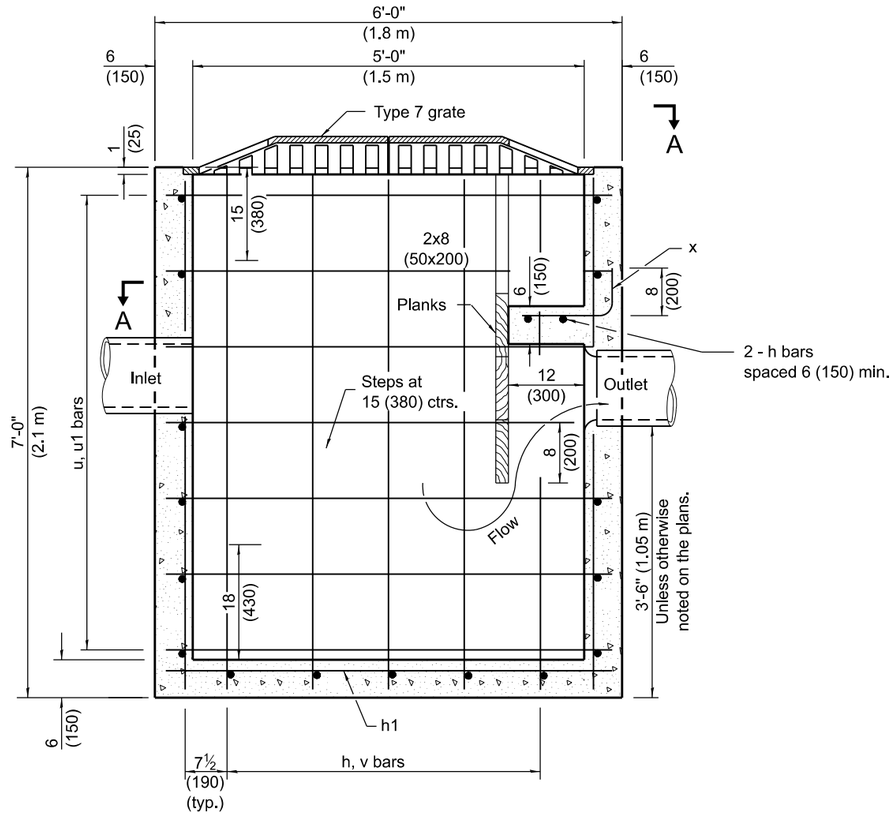
APPROVED January 1, 2011
Scott Bush
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

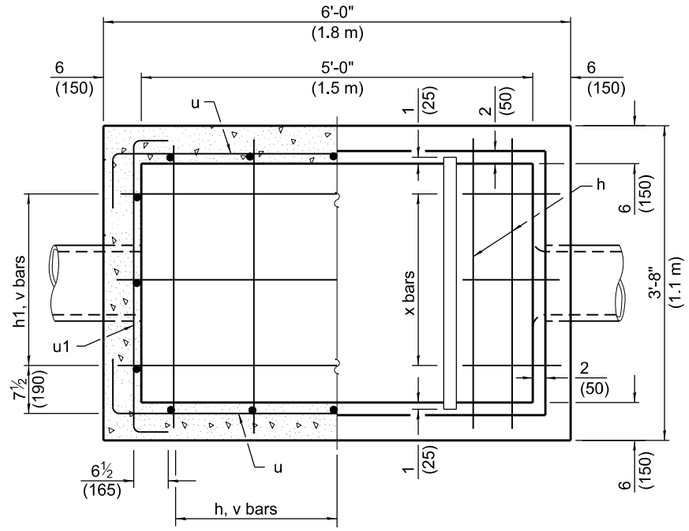
DATE	REVISIONS
1-1-11	Added 'Outside' to half trap note.
	Detail rein. in slabs. Revised
	general notes.
1-1-09	Switched units to English (metric).

CATCH BASIN TYPE A

STANDARD 602001-02



ELEVATION



SECTION A-A

(Grating removed to show plan of baffles.)

MATERIALS REQUIRED FOR ONE (1) TYPE B CATCH BASIN

Bar	Qty.	Size	Shape	Length
h	7	No. 4 (No. 13)	———	3'-5" (1.02 m)
h1	3	No. 4 (No. 13)	———	5'-9" (1.72 m)
u	14	No. 4 (No. 13)	⌊———⌋	7'-0" (2.10 m)
u1	14	No. 4 (No. 13)	⌊———⌋	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. (m³)	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).

GENERAL NOTES

See Standard 602701 for details of steps.

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

Illinois Department of Transportation

APPROVED January 1, 2013
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

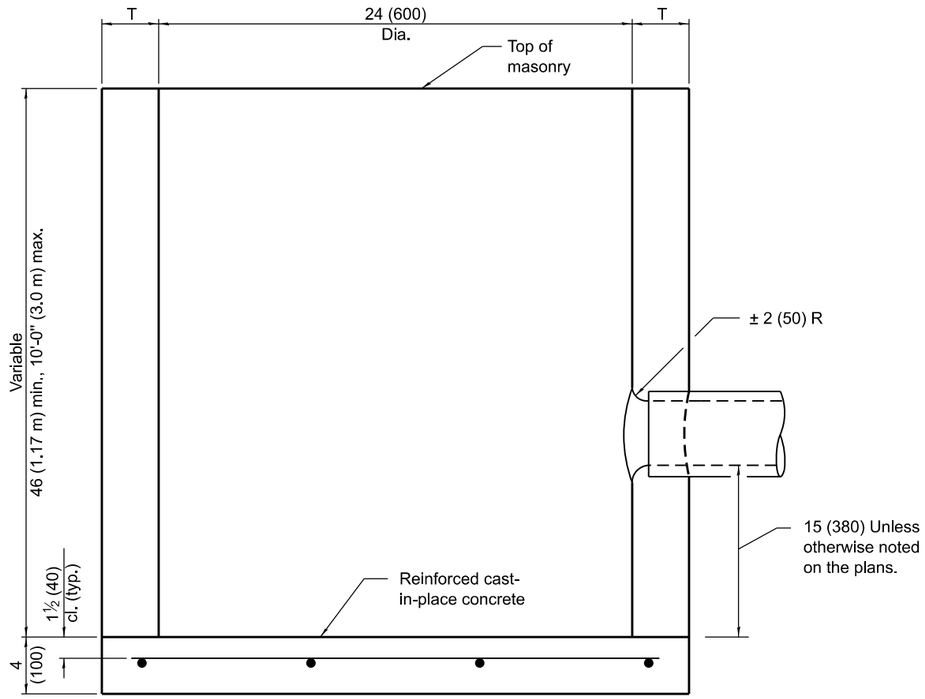
APPROVED January 1, 2013
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

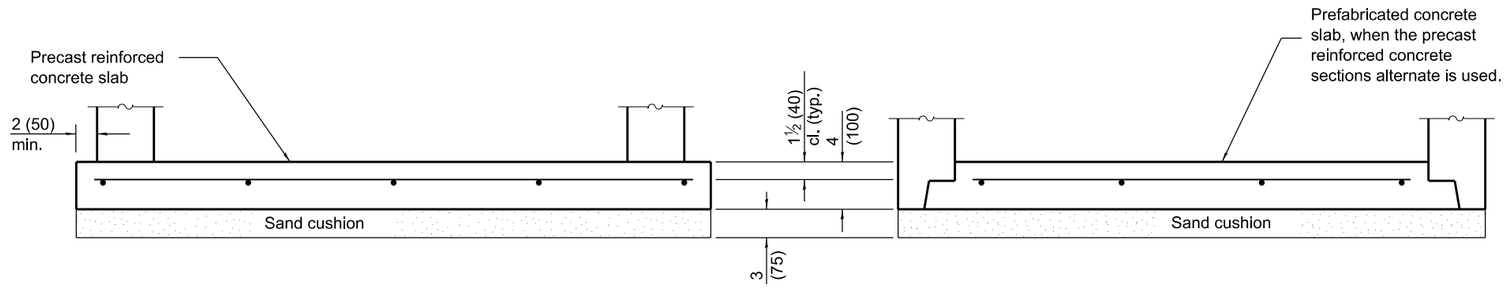
DATE	REVISIONS
1-1-13	Revised and relocated steps.
1-1-11	Added additional bar identification.

CATCH BASIN TYPE B

STANDARD 602006-04



ELEVATION



ALTERNATE BOTTOM SLAB

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

GENERAL NOTES

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

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

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

Illinois Department of Transportation

APPROVED January 1, 2011
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

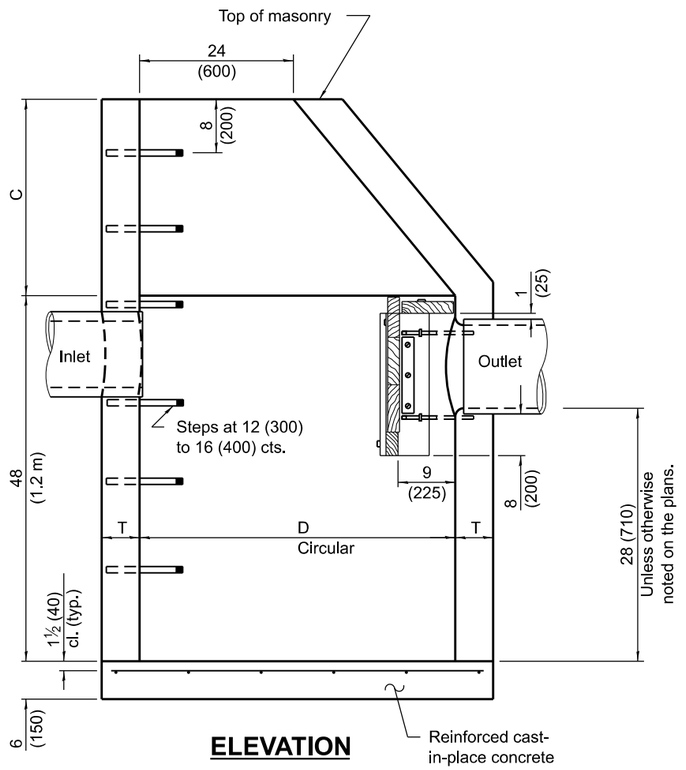
APPROVED January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

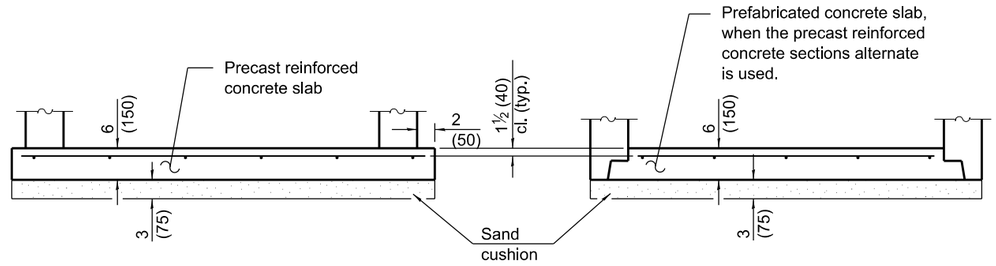
DATE	REVISIONS
1-1-11	Detailed rein. in slabs. Added
	max limit to height. Added
	general notes.
1-1-09	Switched units to English (metric).

CATCH BASIN TYPE C

STANDARD 602011-02



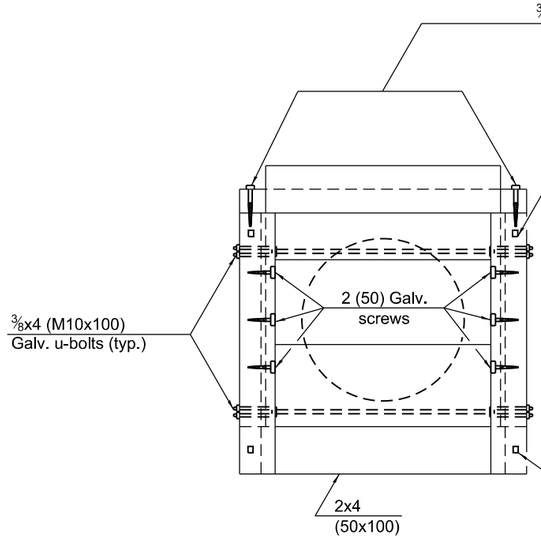
ELEVATION



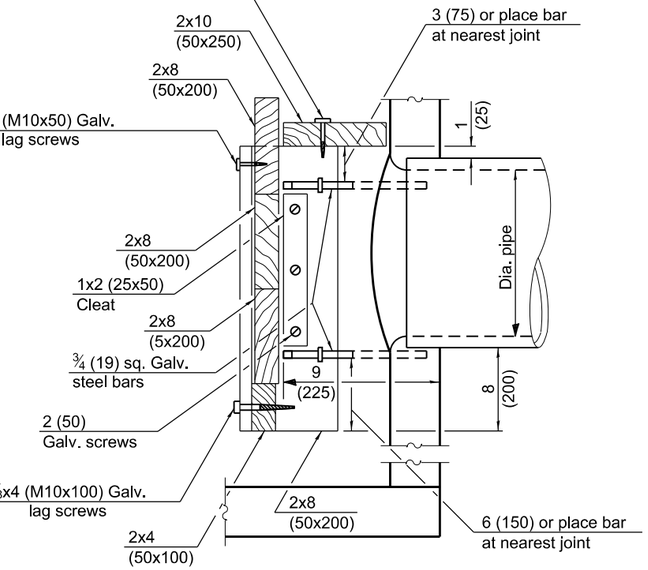
ALTERNATE BOTTOM SLAB

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

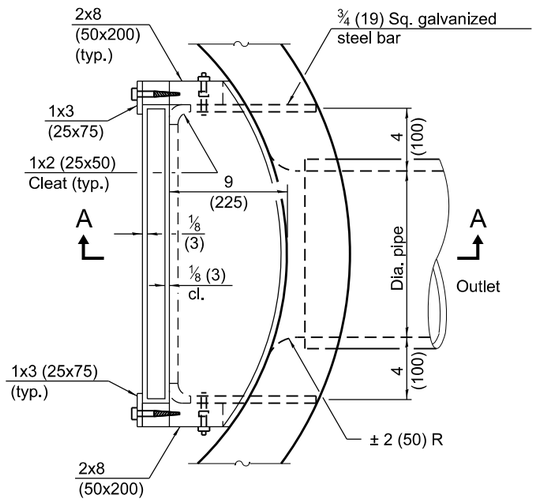
* For precast reinforced concrete sections, dimension "C" may vary from the dimension given to plus 6 (150).



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.

Illinois Department of Transportation

APPROVED January 1, 2011
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

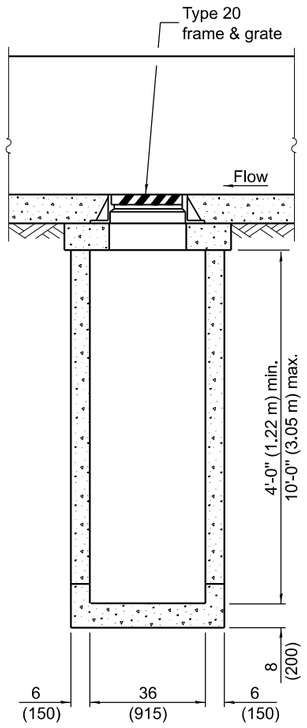
APPROVED January 1, 2011
Scott Bush
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

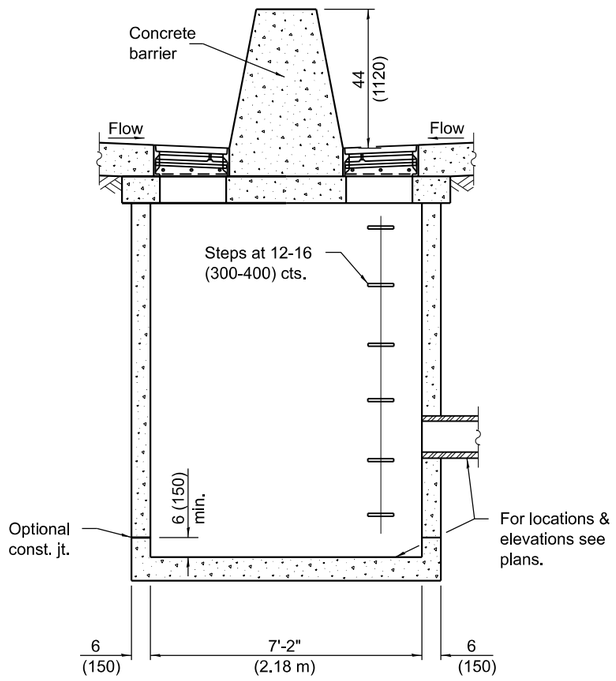
DATE	REVISIONS
1-1-11	Detailed reinforcement in slabs.
	Revised general notes.
1-1-09	Switched units to English (metric).

CATCH BASIN TYPE D

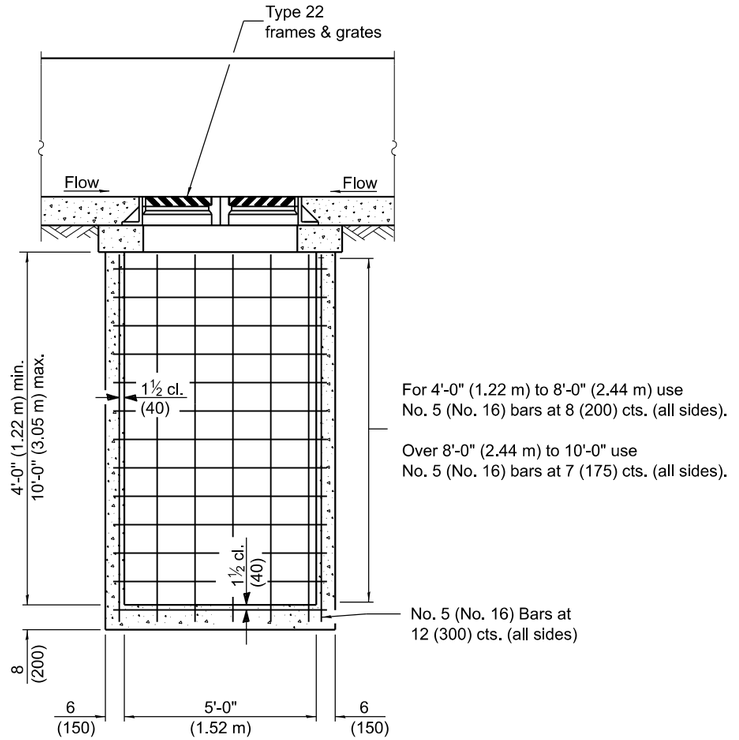
STANDARD 602016-02



FRONT ELEVATION - TYPE 4



SIDE ELEVATION - TYPE 4 & 5



FRONT ELEVATION - TYPE 5

GENERAL NOTES

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

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

See Standard 602701 for details of steps.

Exposed edges shall be beveled ¾ (19).

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

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

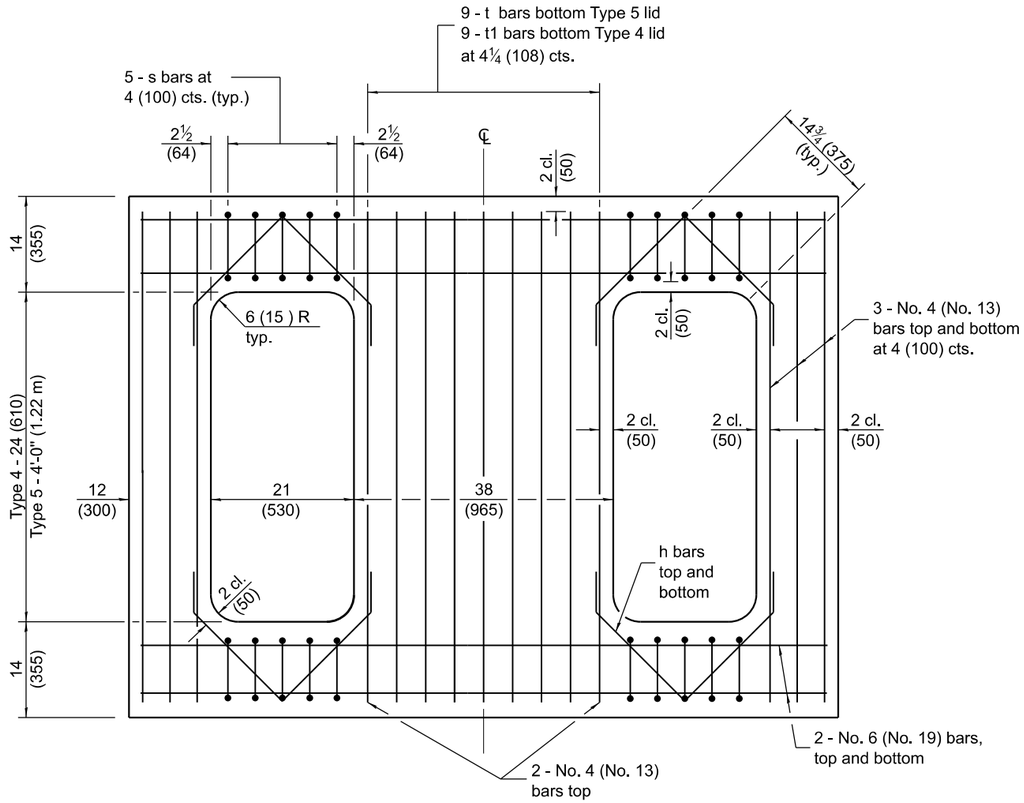
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

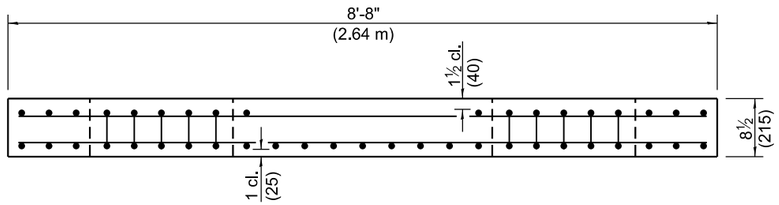
ISSUED 4-1-04

DATE	REVISIONS
1-1-21	Revised openings in lid to fit
	the 36 (915) wide of the revised
	concrete median barrier.
1-1-19	Deleted Type 6 and revised
	Types 4 and 5 to fit with 44 (1120)
	height, constant slope barrier.

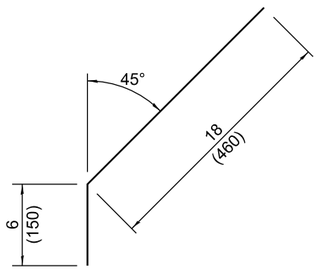
DRAINAGE STRUCTURES TYPES 4 & 5

STANDARD 602106-03

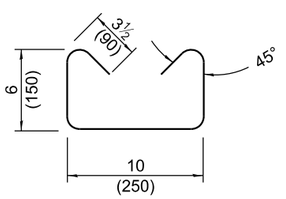




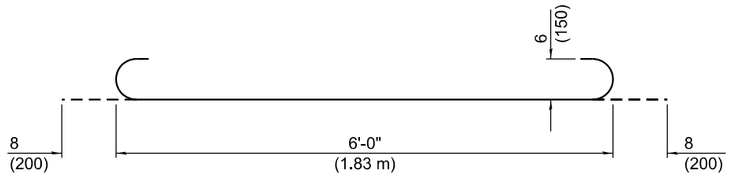
REINFORCED LID - TYPE 4 & 5



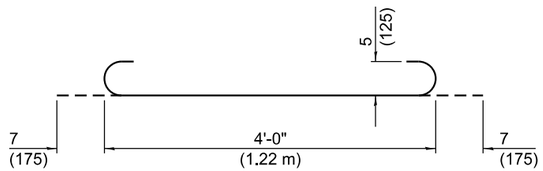
No. 4 (No. 13) Bar h



No. 3 (No. 10) Bar s



No. 6 (No. 19) Bar t



No. 5 (No. 16) Bar t_1

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

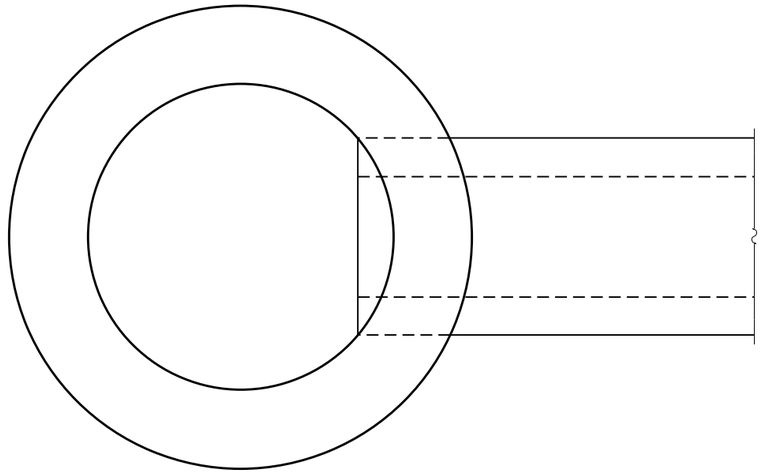
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-04

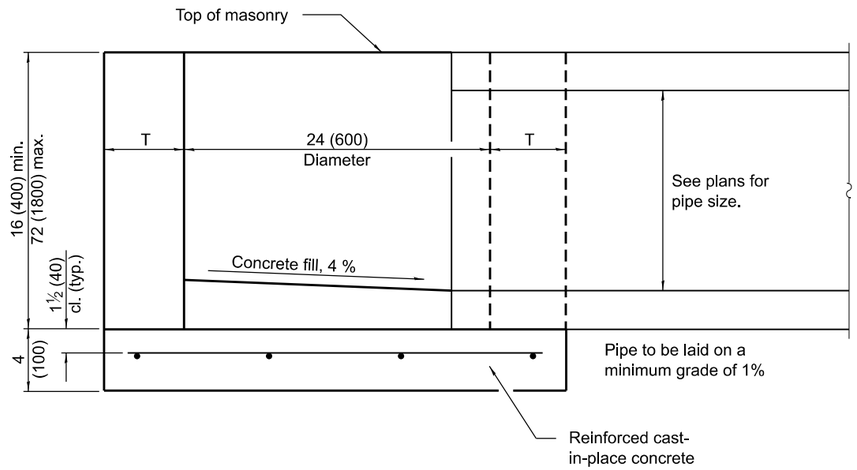
DRAINAGE STRUCTURES TYPES 4 & 5

(Sheet 2 of 2)

STANDARD 602106-03

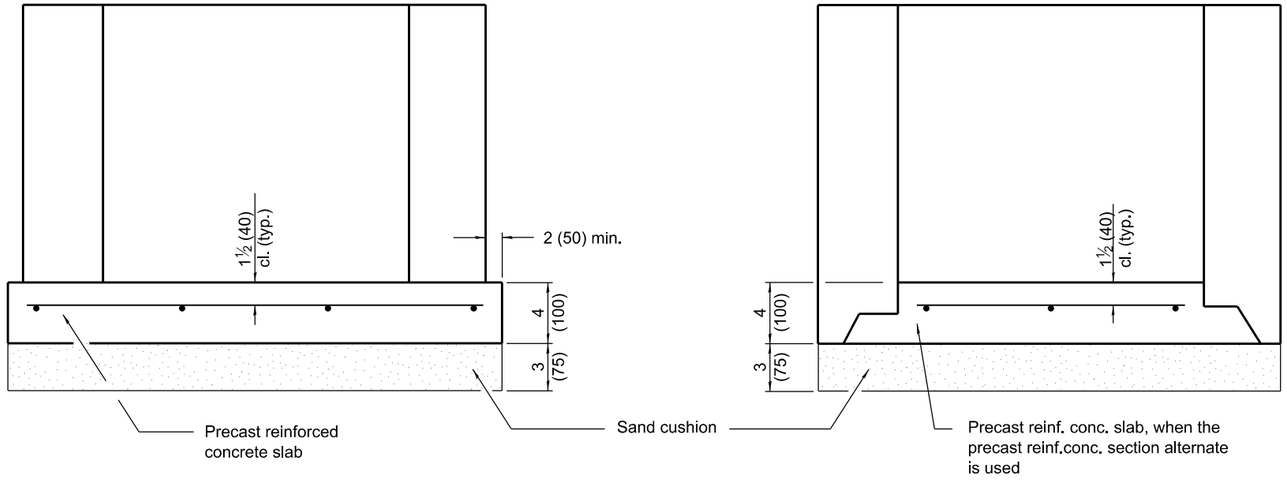


PLAN



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.

Illinois Department of Transportation

APPROVED January 1, 2014
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

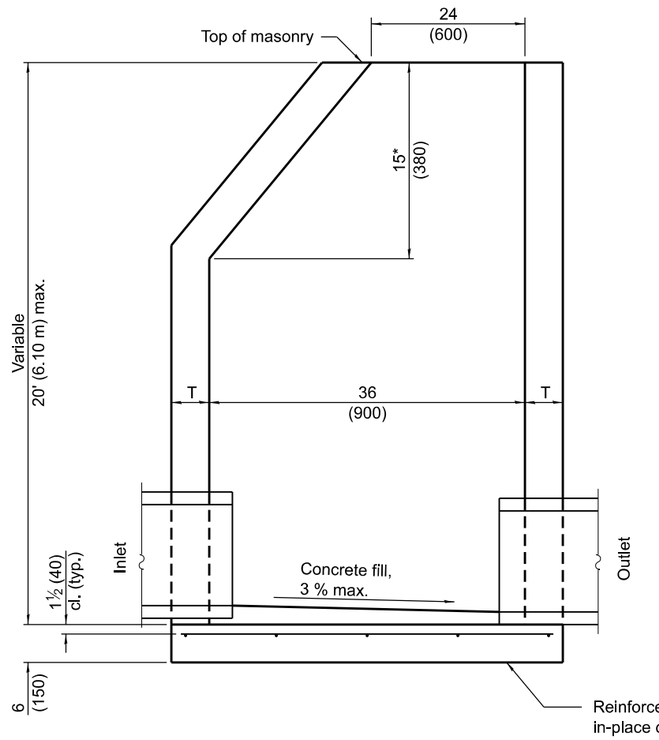
ISSUED 1-1-97

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

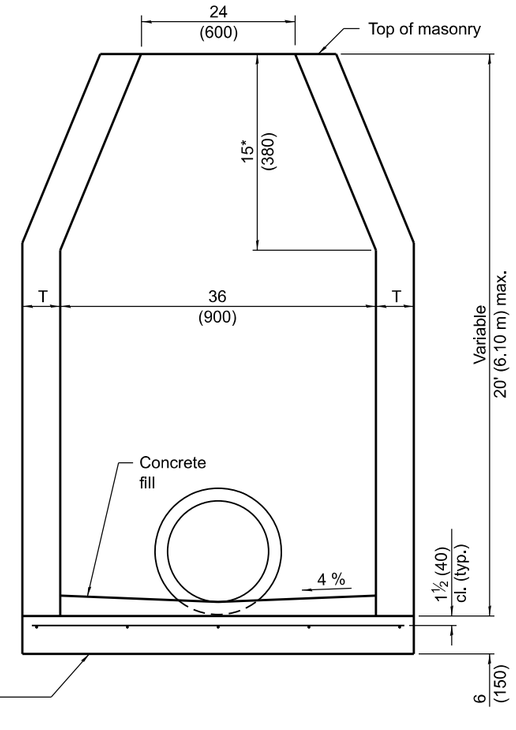
INLET - TYPE A

STANDARD 602301-04

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

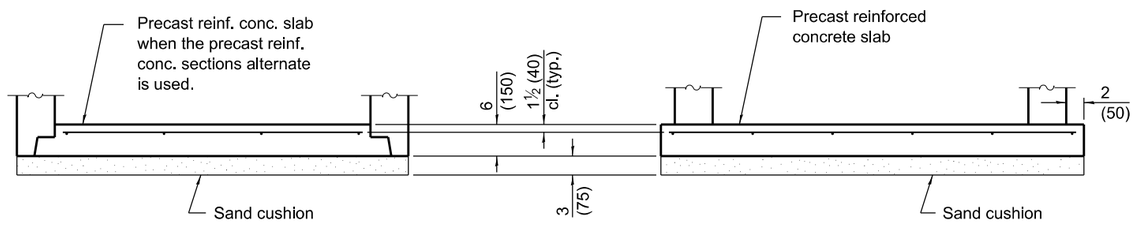


ELEVATION - ECCENTRIC



ELEVATION - CONCENTRIC

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



ALTERNATE BOTTOM SLAB

GENERAL NOTES

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

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

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

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

Illinois Department of Transportation

APPROVED January 1, 2011
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

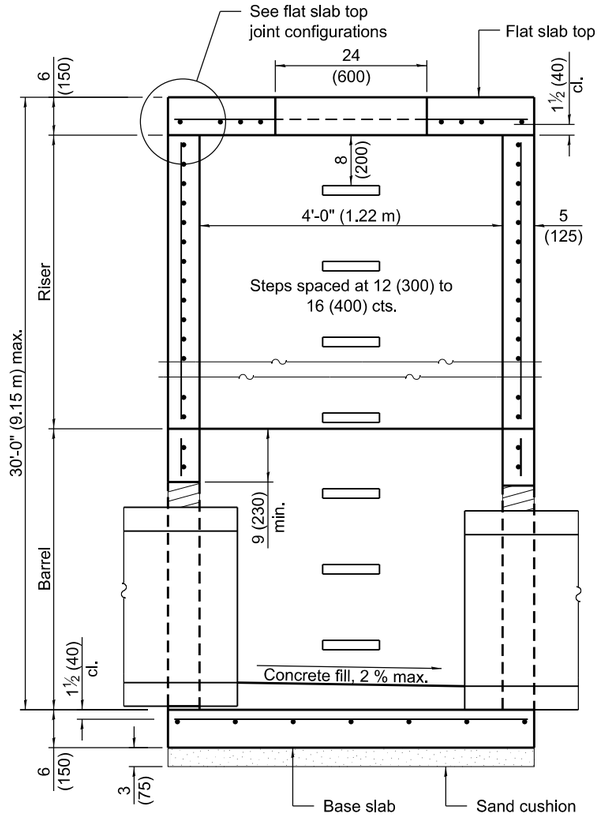
APPROVED January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

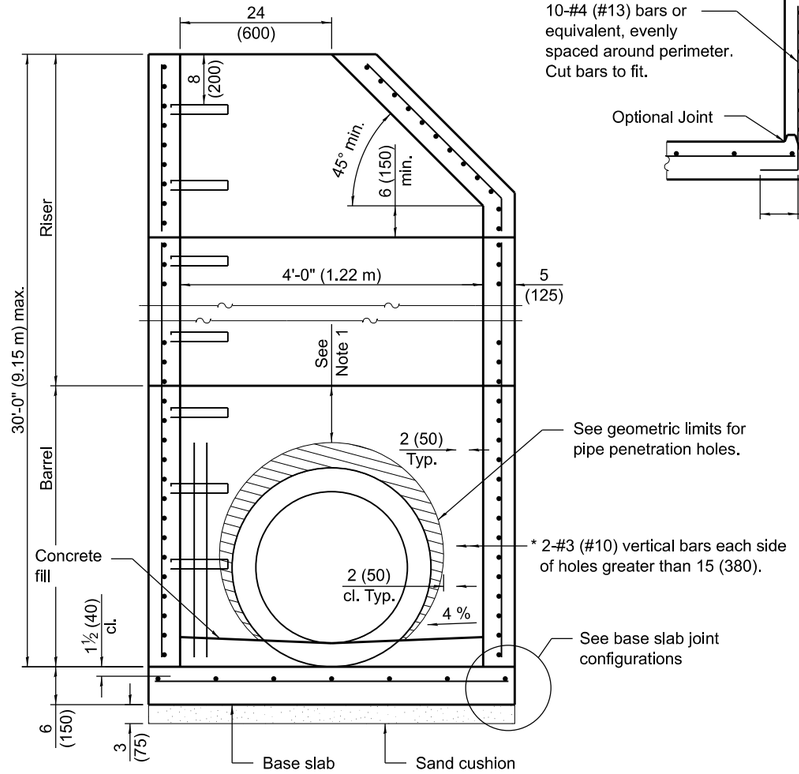
INLET - TYPE B

STANDARD 602306-03



SECTION PARALLEL TO PIPE

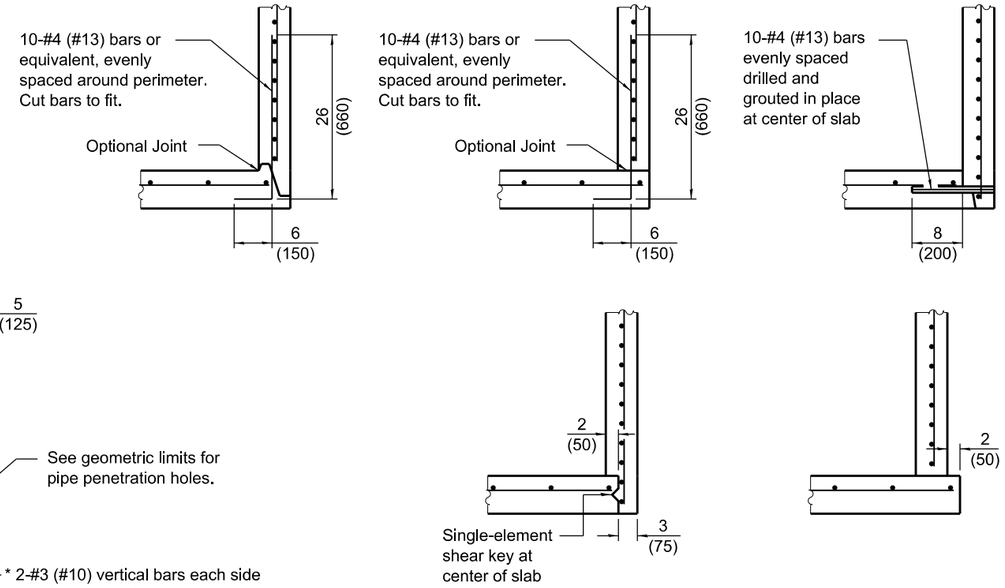
(Without conical top riser)



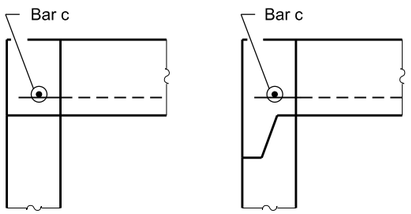
SECTION PERPENDICULAR TO PIPE

(With conical top riser)

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



BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS

(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

Note 1: A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 24 (600).

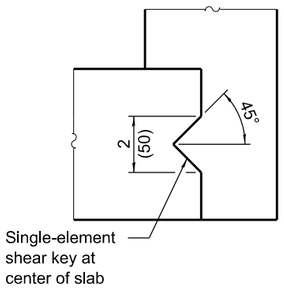
Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

Note 3: A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.

Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



SHEAR KEY GEOMETRY

(Reinforcement not shown for clarity)

GENERAL NOTES

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

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

See Standard 602701 for details of manhole steps.

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

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

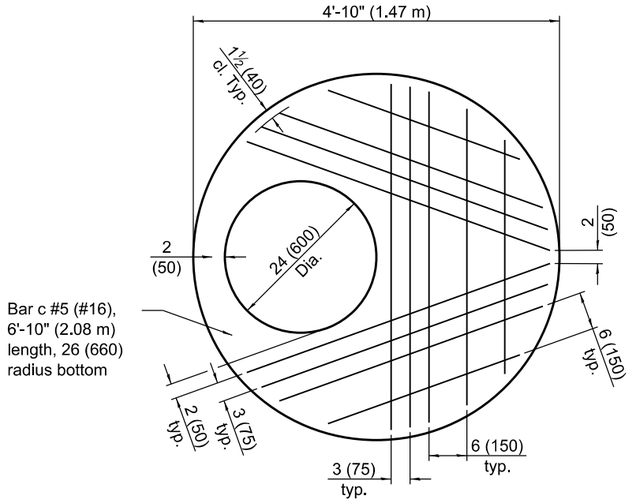
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-21	Revised Note 1 and lift hole
	general note.
3-1-19	Moved wall reinforcement from
	inside face to middle.

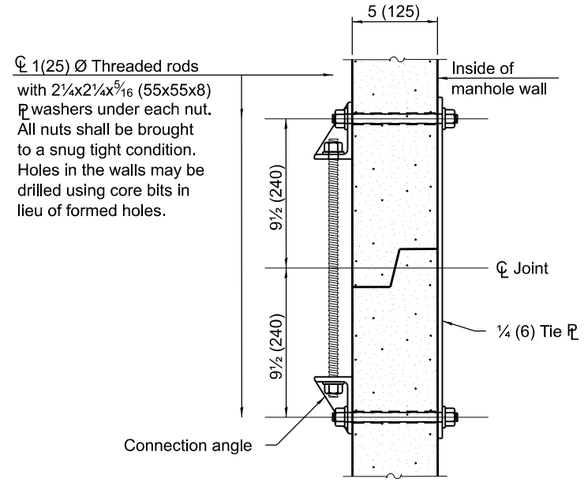
PRECAST MANHOLE TYPE A 4' (1.22 m) DIAMETER

STANDARD 602401-07

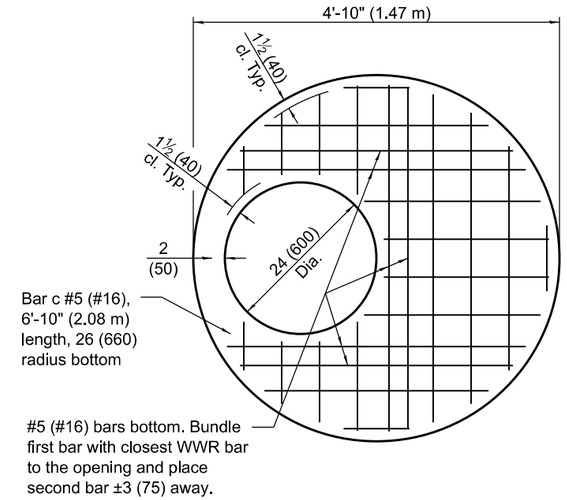


PLAN - FLAT SLAB TOP

(Showing layout of reinforcement bars and c bars)

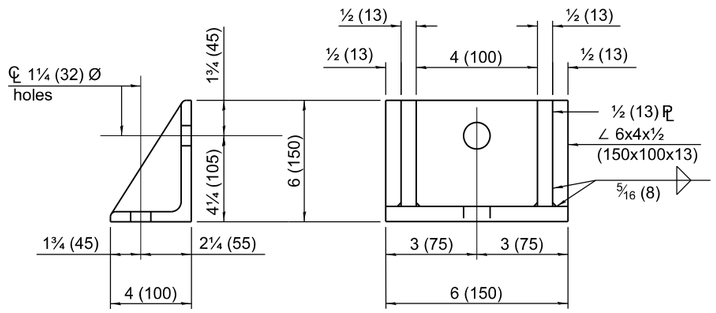


JOINT SPLICE

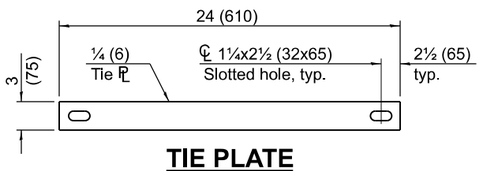


PLAN - FLAT SLAB TOP

(Showing layout of welded wire reinforcement and c bars)



CONNECTION ANGLE



TIE PLATE

FLAT SLAB TOP REINFORCEMENT

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

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

WALL REINFORCEMENT

Location	Orientation	WWR or Rebar	
		A_s(min.)	Spacing (max.)
Riser	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)
Barrel	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
	Vertical	0.16 sq. in./ft. (339 sq. mm/m)	4 (100)

BASE SLAB REINFORCEMENT

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

Illinois Department of Transportation

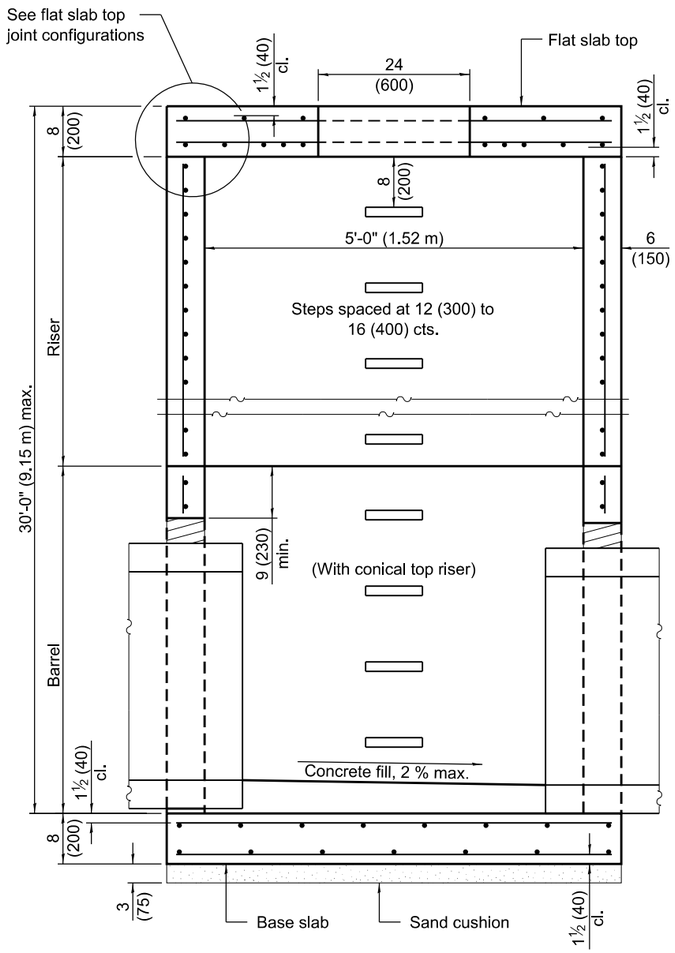
APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

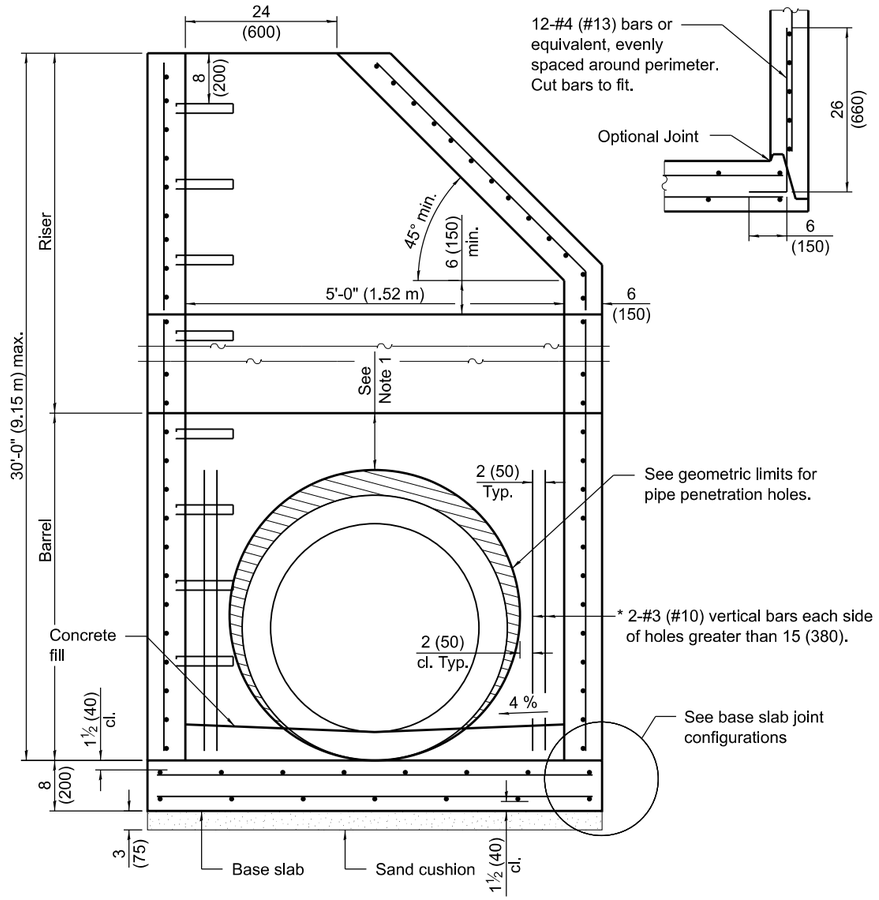
PRECAST MANHOLE TYPE A 4' (1.22 m) DIAMETER

STANDARD 602401-07



SECTION PARALLEL TO PIPE

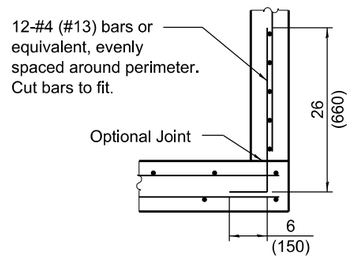
(Without conical top riser)

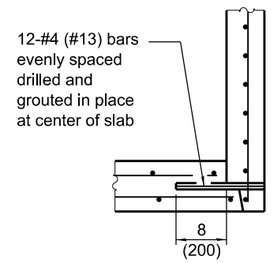


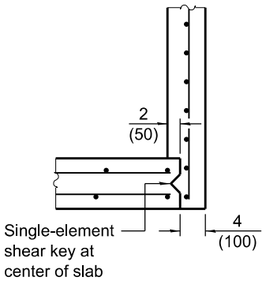
SECTION PERPENDICULAR TO PIPE

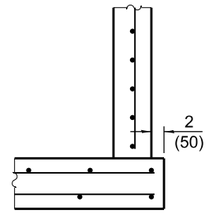
(With conical top riser)

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

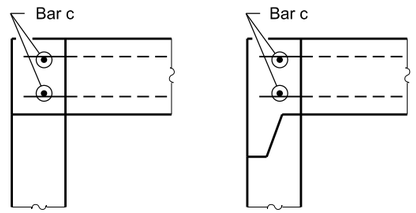








BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS

(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

Note 1: A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 32 (810).

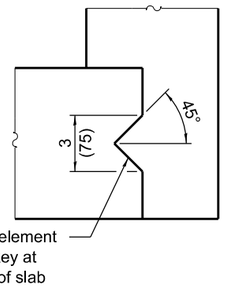
Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

Note 3: A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.

Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



SHEAR KEY GEOMETRY

(Reinforcement not shown for clarity)

GENERAL NOTES

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

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

See Standard 602701 for details of manhole steps.

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

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

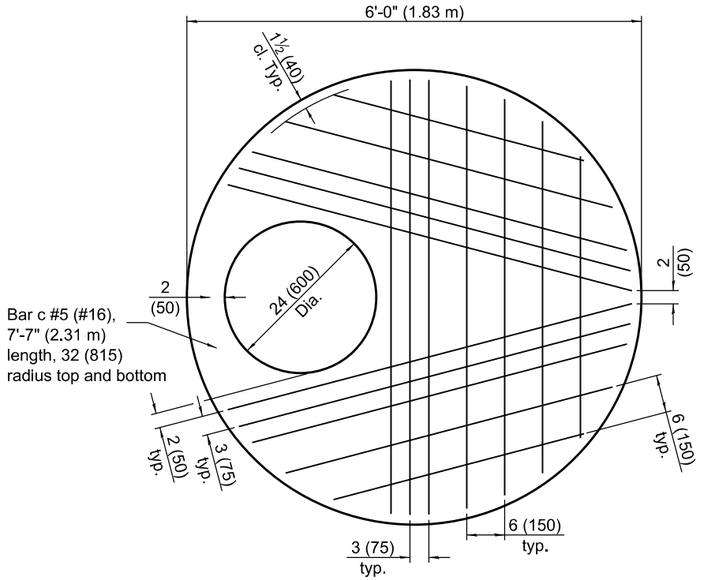
ISSUED 1-1-18

DATE	REVISIONS
1-1-21	Revised Note 1 and lifting hole
	general note.
3-1-19	Moved wall reinforcement from
	inside face to middle.

PRECAST MANHOLE TYPE A 5' (1.52 m) DIAMETER

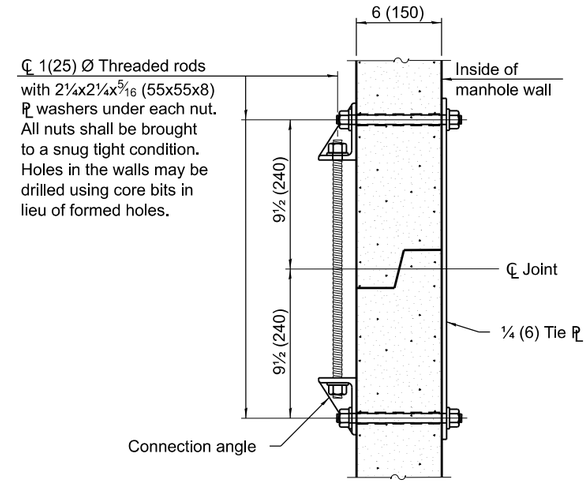
(Sheet 1 of 2)

STANDARD 602402-03



PLAN - FLAT SLAB TOP

(Showing layout of bottom reinforcement bars and c bars)



JOINT SPLICE

FLAT SLAB TOP REINFORCEMENT

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

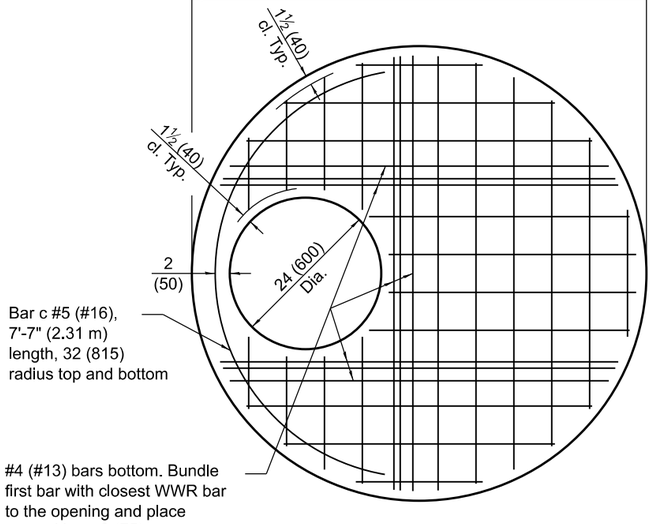
** Only one layer of WWR permitted to avoid congestion.

WALL REINFORCEMENT

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

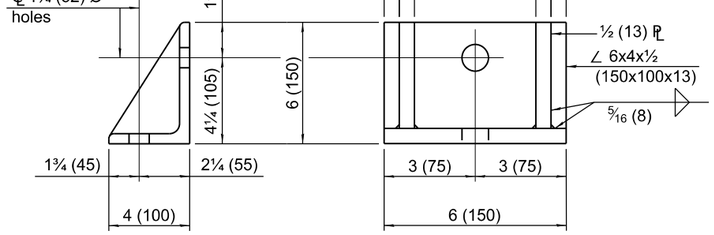
BASE SLAB REINFORCEMENT

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

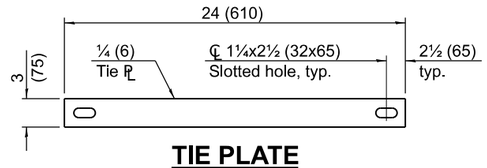


PLAN - FLAT SLAB TOP

(Showing layout of welded wire reinforcement and c bars)



CONNECTION ANGLE



TIE PLATE

Illinois Department of Transportation

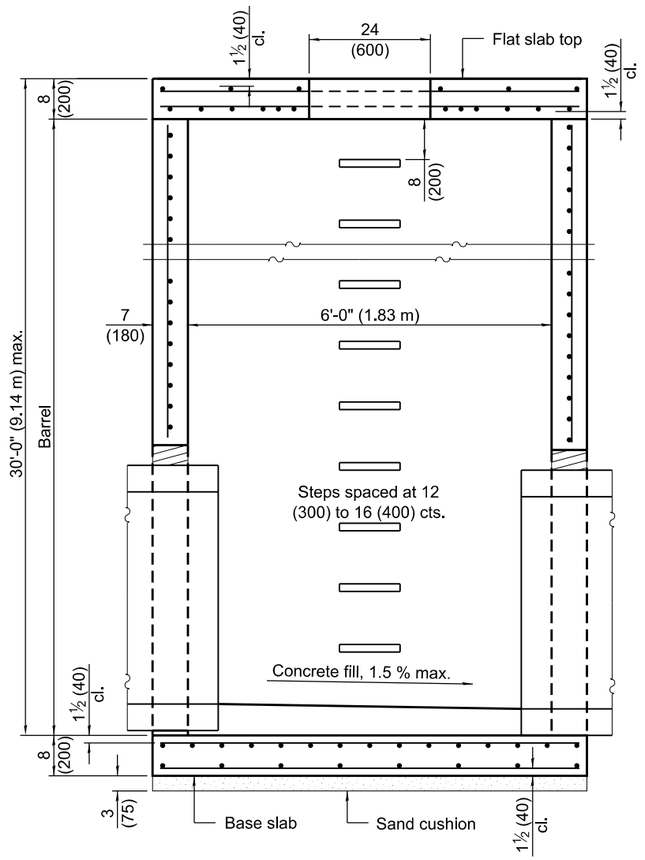
APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

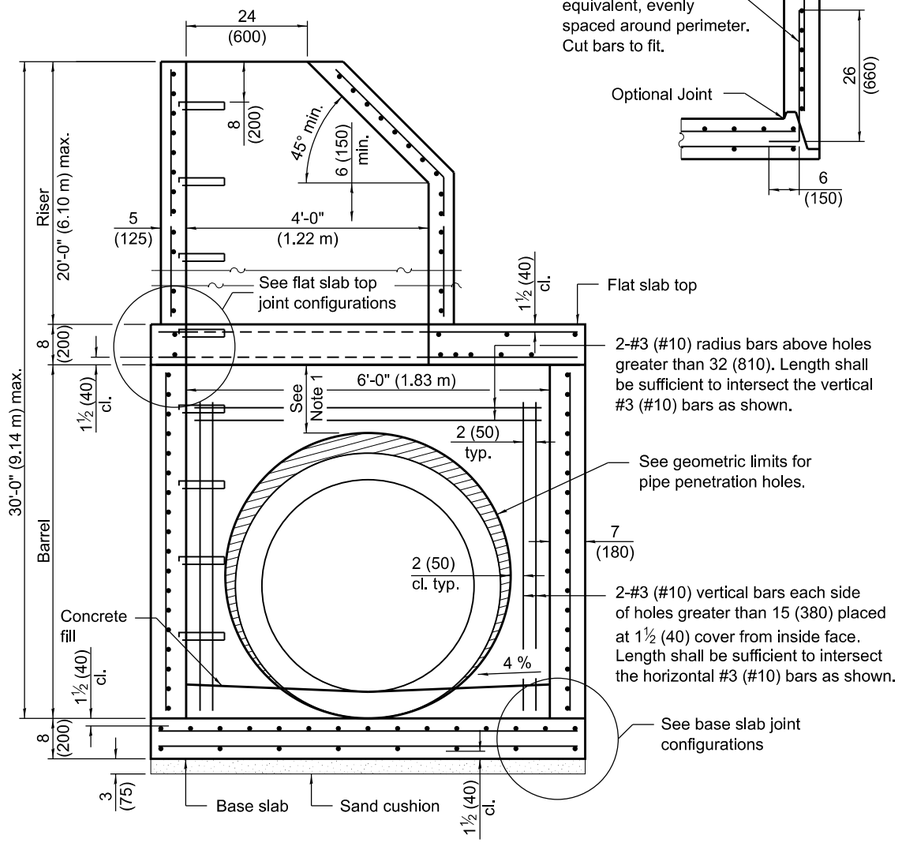
ISSUED 1-1-18

PRECAST MANHOLE TYPE A 5' (1.52 m) DIAMETER

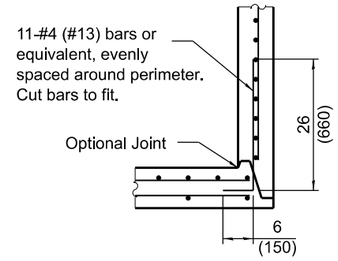
STANDARD 602402-03

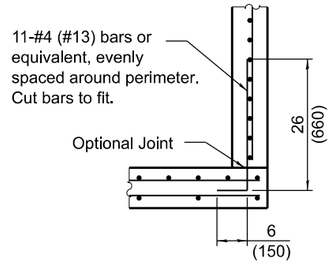


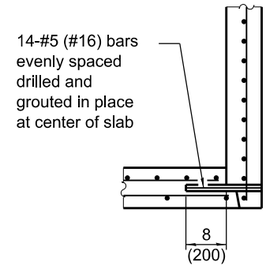
SECTION PARALLEL TO PIPE
(Without conical top riser)

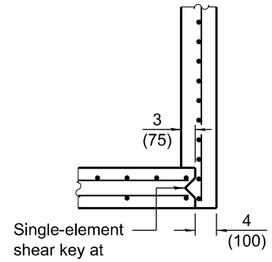


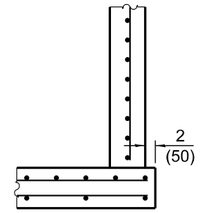
SECTION PERPENDICULAR TO PIPE
(With conical top riser)



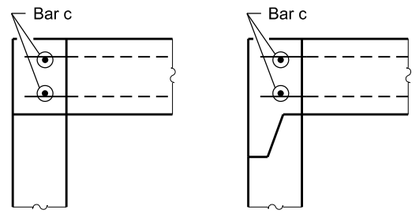








BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

Note 1: A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 32 (810).

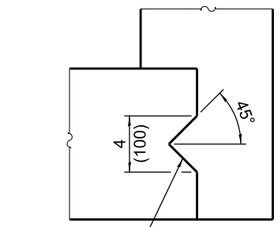
Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

Note 3: A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.

Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



SHEAR KEY GEOMETRY
(Reinforcement not shown for clarity)

GENERAL NOTES

Pipe holes shall be formed to facilitate proper placement of hole reinforcement.

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

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

See Standard 602701 for details of manhole steps.

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

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

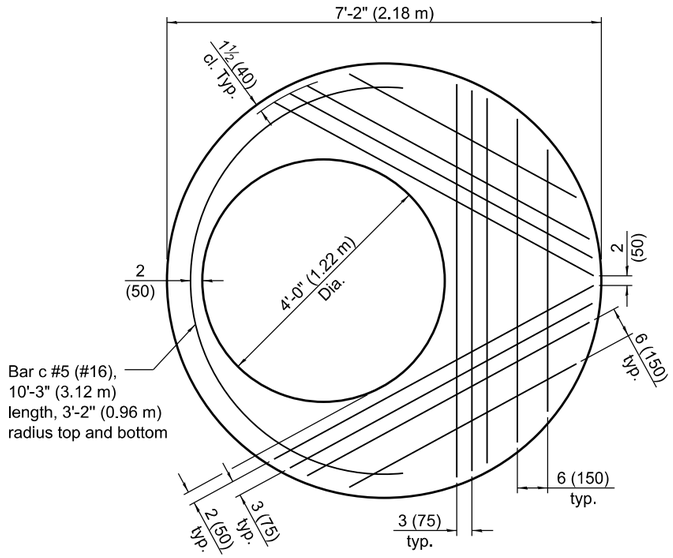
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

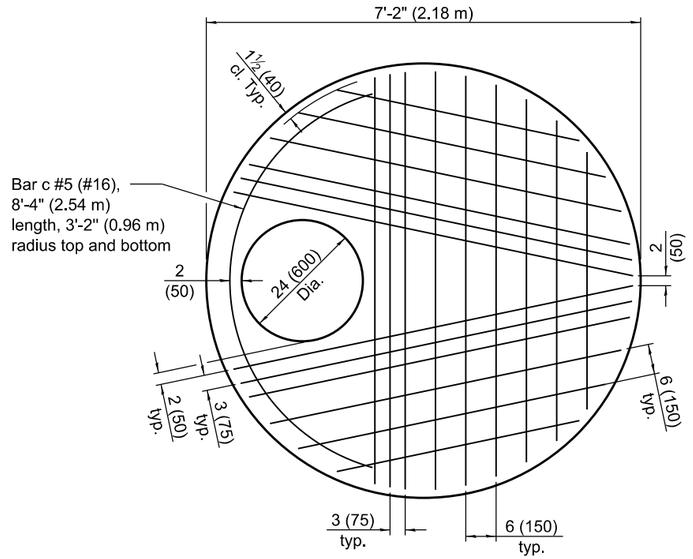
ISSUED 1-1-97

DATE	REVISIONS
1-1-21	Revised Note 1, Note 2, and
	lifting hole general note.
3-1-19	Moved wall reinforcement from
	inside face to middle.

PRECAST MANHOLE TYPE A 6' (1.83 m) DIAMETER

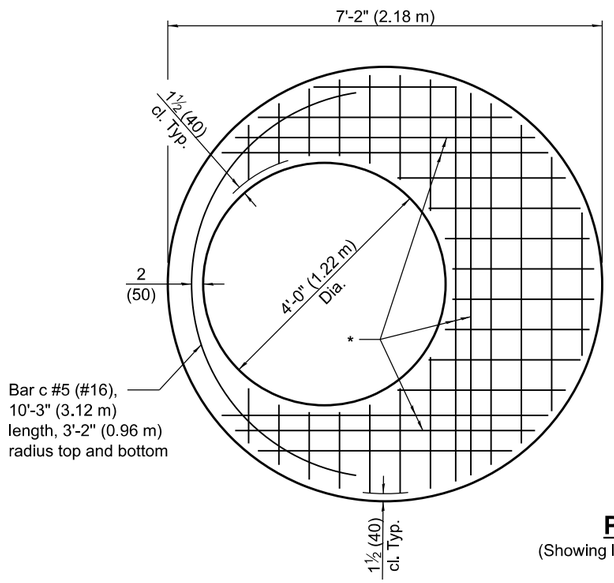
STANDARD 602406-11

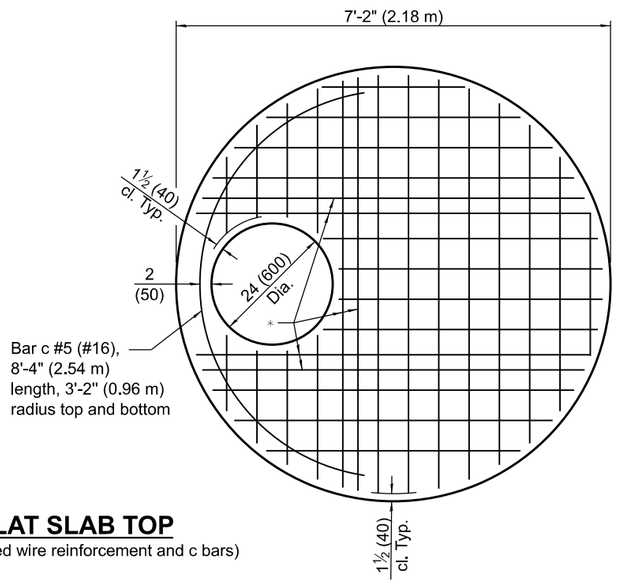




PLAN - FLAT SLAB TOP

(Showing layout of bottom reinforcement bars and c bars)





PLAN - FLAT SLAB TOP

(Showing layout of welded wire reinforcement and c bars)

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

Illinois Department of Transportation

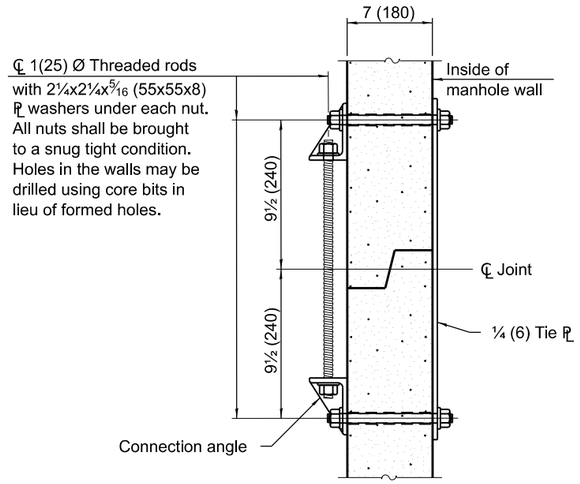
APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

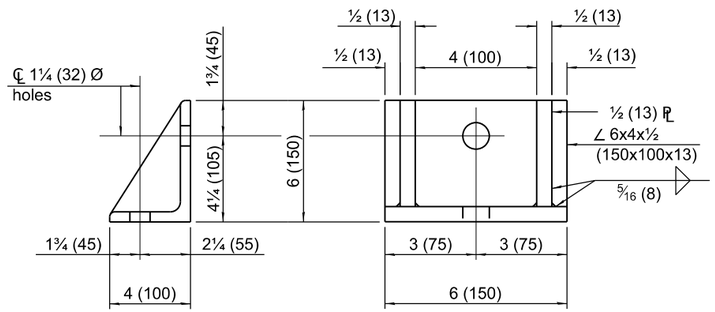
ISSUED 1-1-97

PRECAST MANHOLE TYPE A 6' (1.83 m) DIAMETER

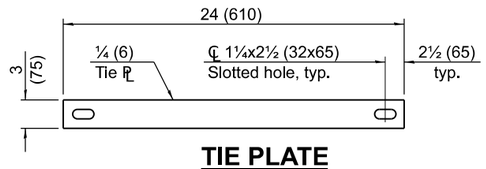
STANDARD 602406-11



JOINT SPLICE



CONNECTION ANGLE



TIE PLATE

FLAT SLAB TOP REINFORCEMENT

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

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

WALL REINFORCEMENT

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

BASE SLAB REINFORCEMENT

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

Illinois Department of Transportation

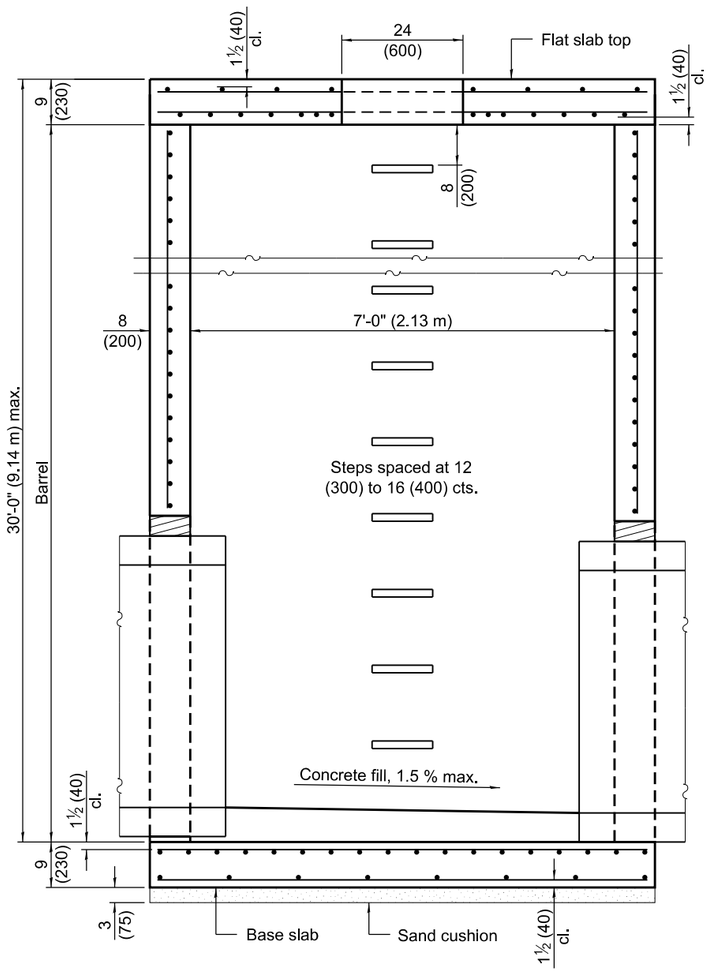
APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

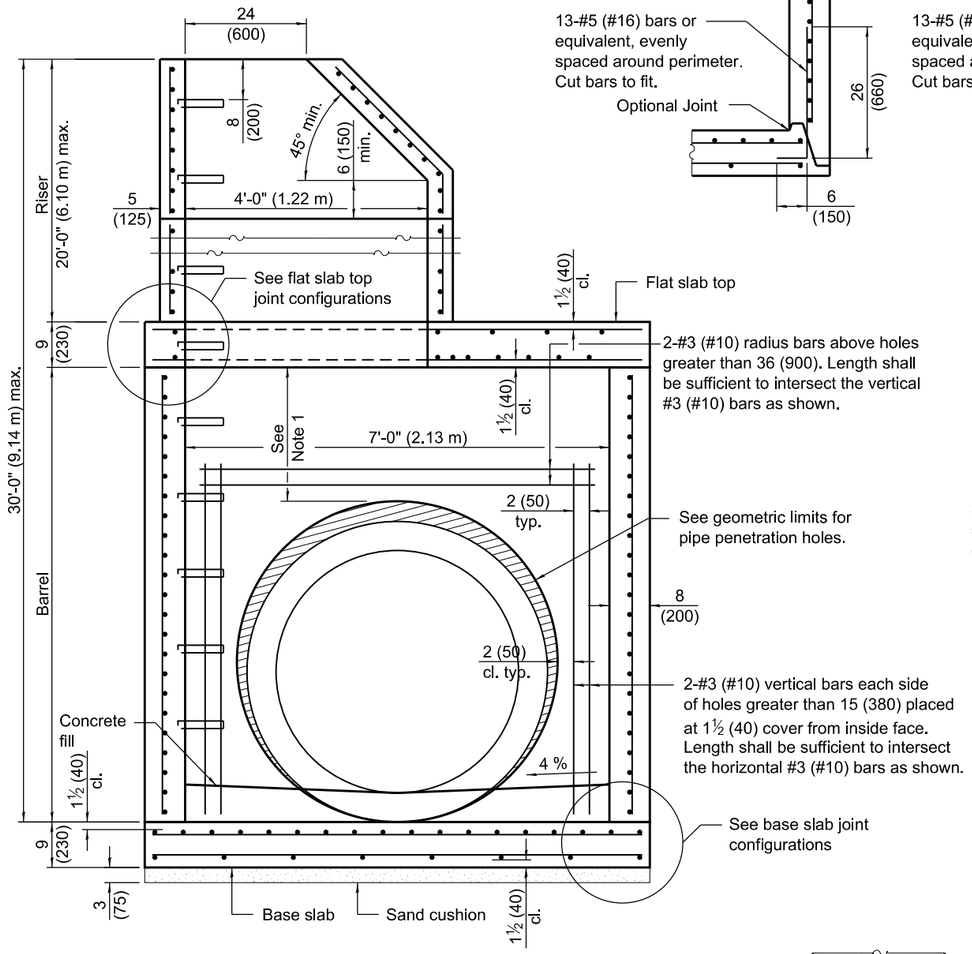
PRECAST MANHOLE TYPE A 6' (1.83 m) DIAMETER

STANDARD 602406-11



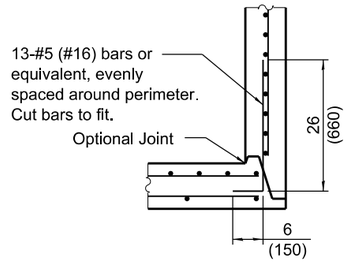
SECTION PARALLEL TO PIPE

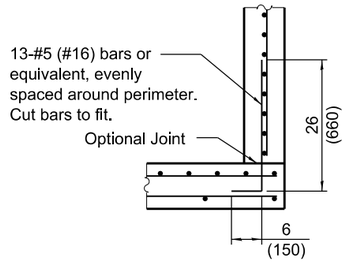
(Without conical top riser)

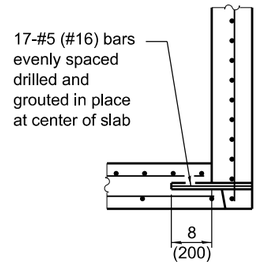


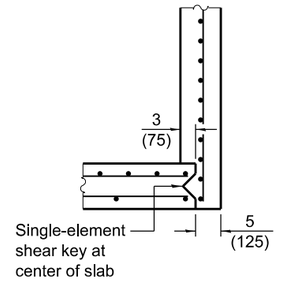
SECTION PERPENDICULAR TO PIPE

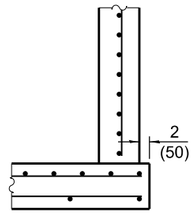
(With conical top riser)



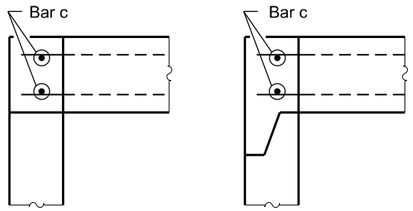








BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS

(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

Note 1: A minimum of 12 (300) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 36 (900).

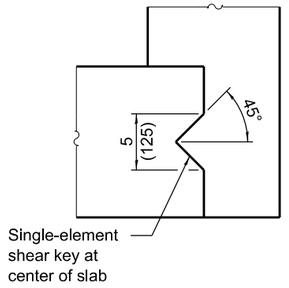
Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

Note 3: A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.

Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



SHEAR KEY GEOMETRY

(Reinforcement not shown for clarity)

GENERAL NOTES

Pipe holes shall be formed to facilitate proper placement of hole reinforcement.

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

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

See Standard 602701 for details of manhole steps.

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

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

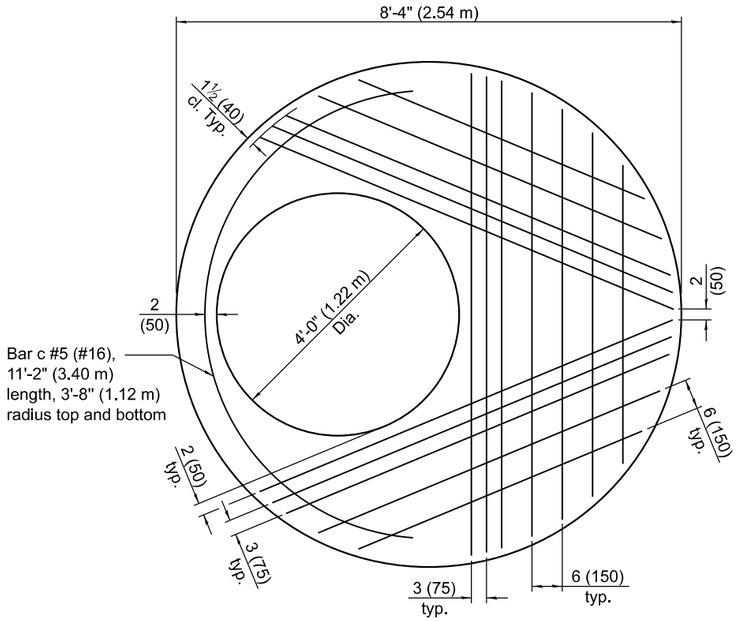
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

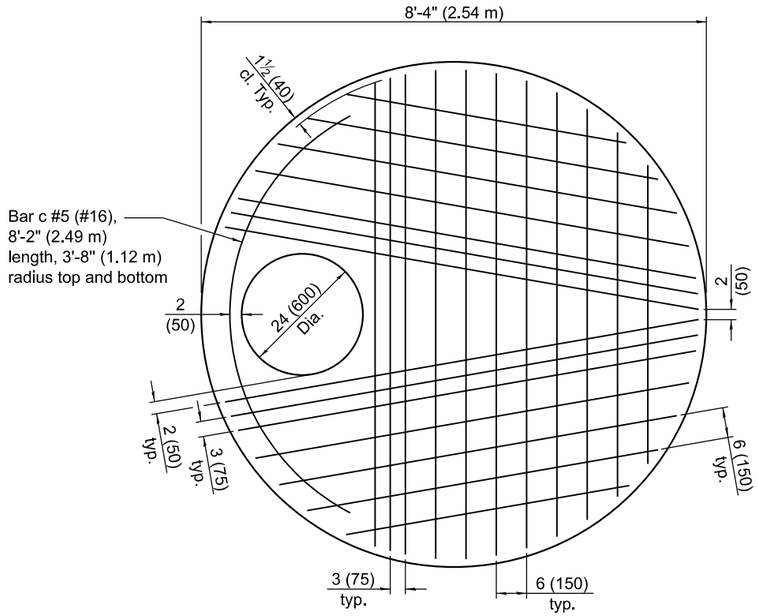
ISSUED 4-1-06

DATE	REVISIONS
1-1-21	Revised Note 1 and lifting hole
	general note.
3-1-19	Moved wall reinforcement from
	inside face to middle.

PRECAST MANHOLE TYPE A 7' (2.13 m) DIAMETER

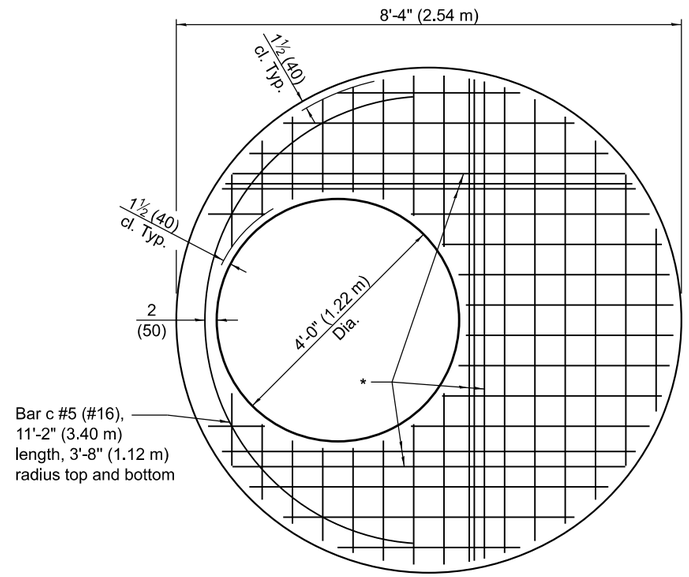
STANDARD 602411-09

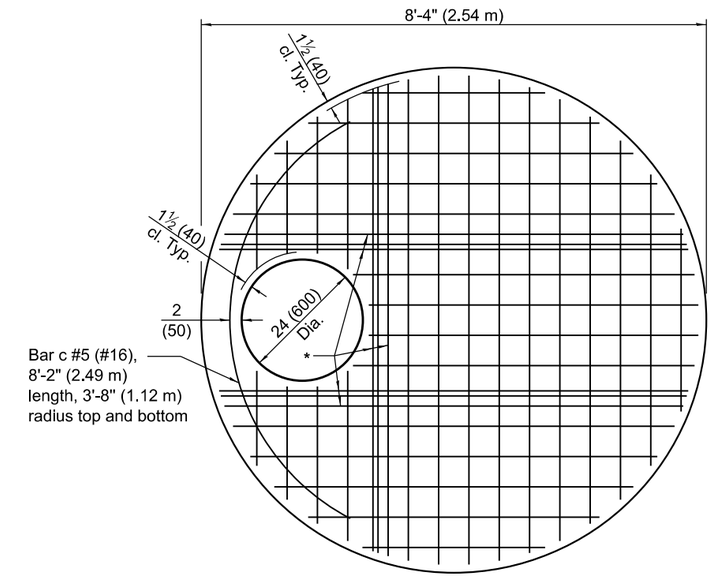




PLAN - FLAT SLAB TOP

(Showing layout of bottom reinforcement bars and c bars)





PLAN - FLAT SLAB TOP

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

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

Illinois Department of Transportation

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ENGINEER OF POLICY AND PROCEDURES

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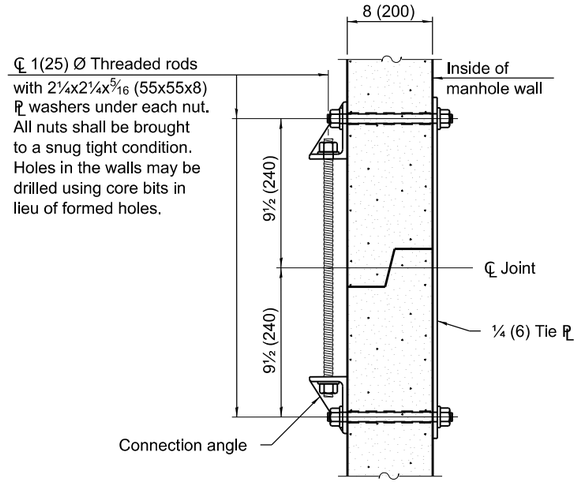
ENGINEER OF DESIGN AND ENVIRONMENT

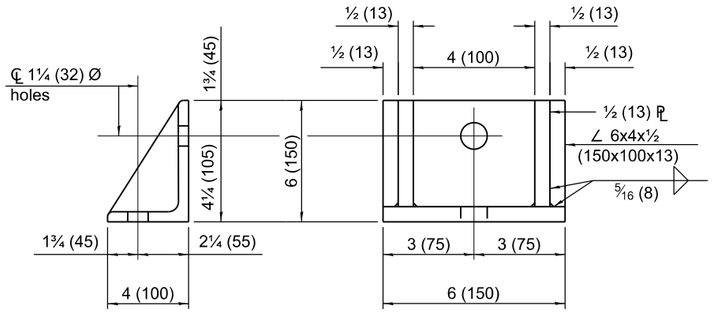
ISSUED 4-1-06

PRECAST MANHOLE TYPE A
7' (2.13 m) DIAMETER

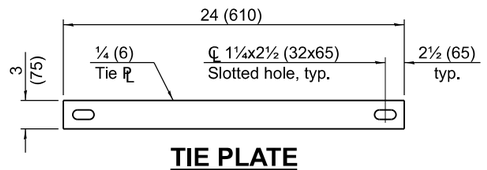
STANDARD 602411-09



JOINT SPLICE



CONNECTION ANGLE



TIE PLATE

FLAT SLAB TOP REINFORCEMENT

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

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

WALL REINFORCEMENT

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

BASE SLAB REINFORCEMENT

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

Illinois Department of Transportation

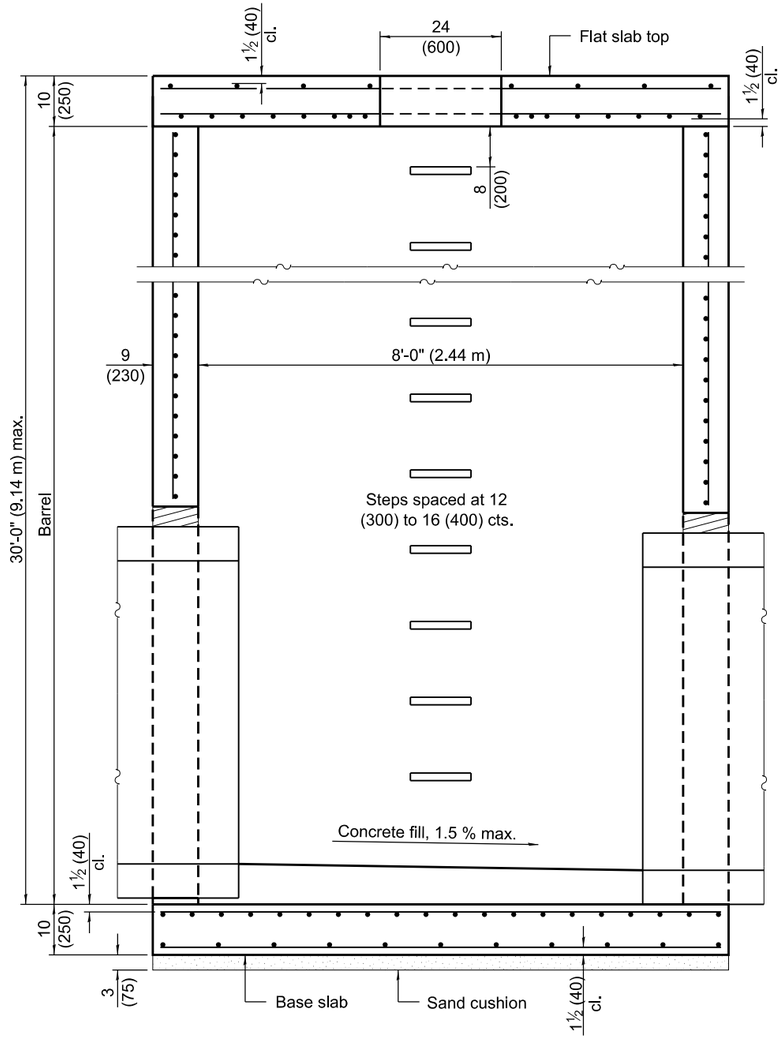
APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

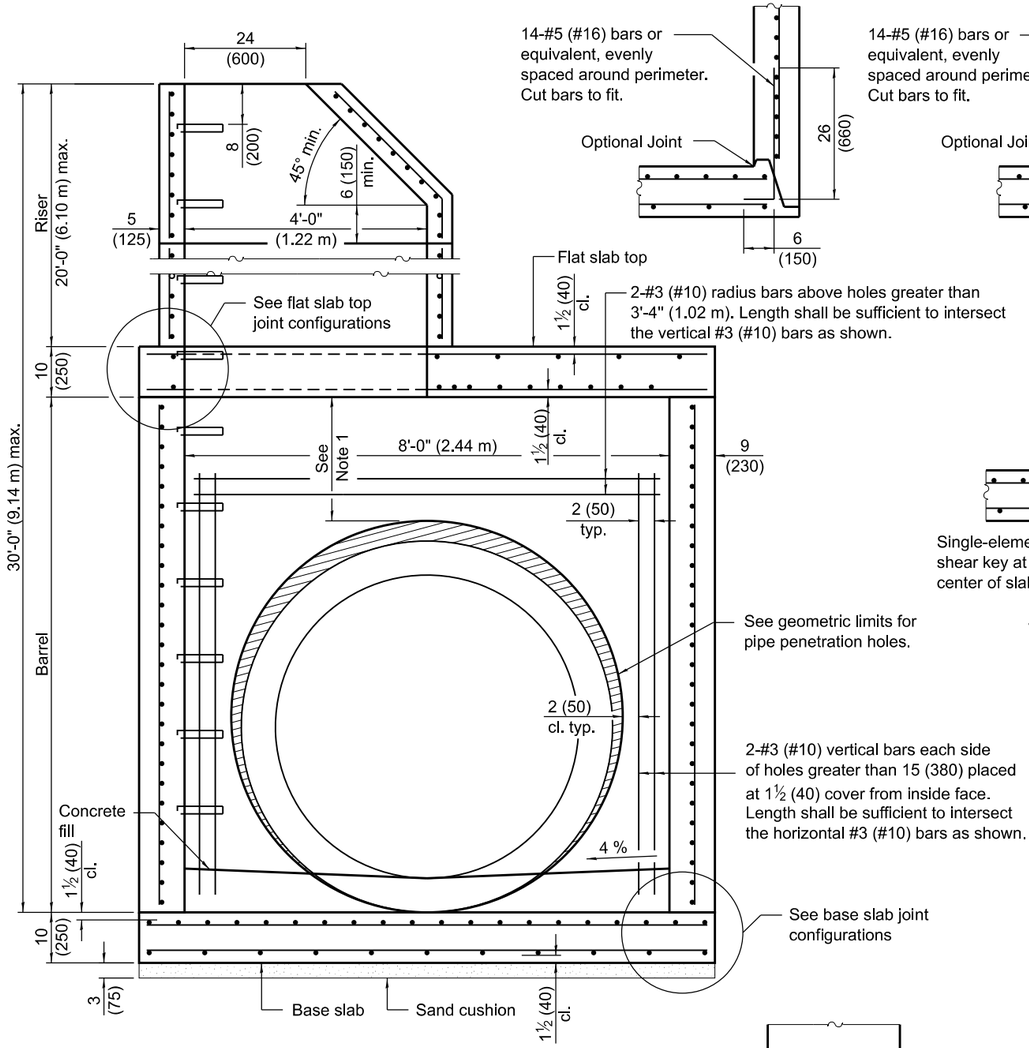
ISSUED 4-1-06

PRECAST MANHOLE TYPE A 7' (2.13 m) DIAMETER

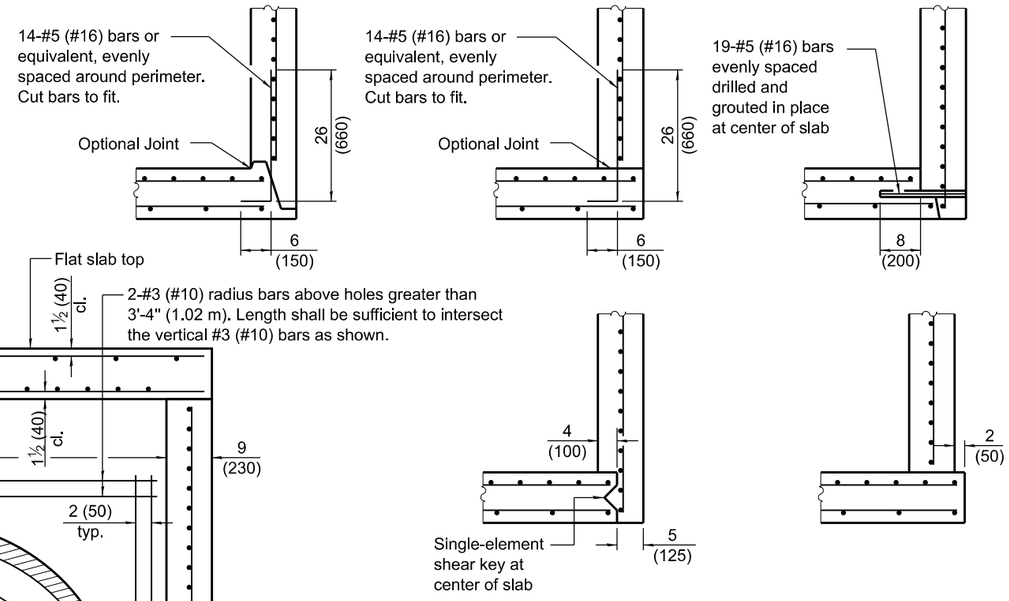
STANDARD 602411-09



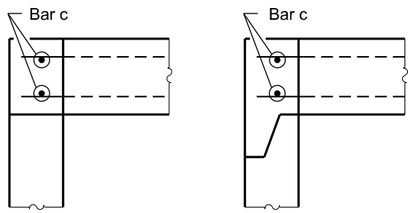
SECTION PARALLEL TO PIPE
(Without conical top riser)



SECTION PERPENDICULAR TO PIPE
(With conical top riser)



BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

Note 1: A minimum of 12 (300) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 3'-4" (1.02 m).

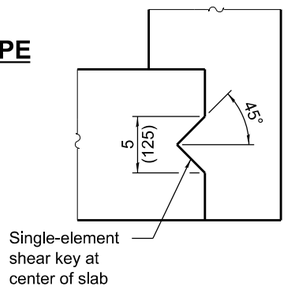
Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

Note 3: A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.

Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



SHEAR KEY GEOMETRY
(Reinforcement not shown for clarity)

GENERAL NOTES

Pipe holes shall be formed to facilitate proper placement of hole reinforcement.

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

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

See Standard 602701 for details of manhole steps.

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

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

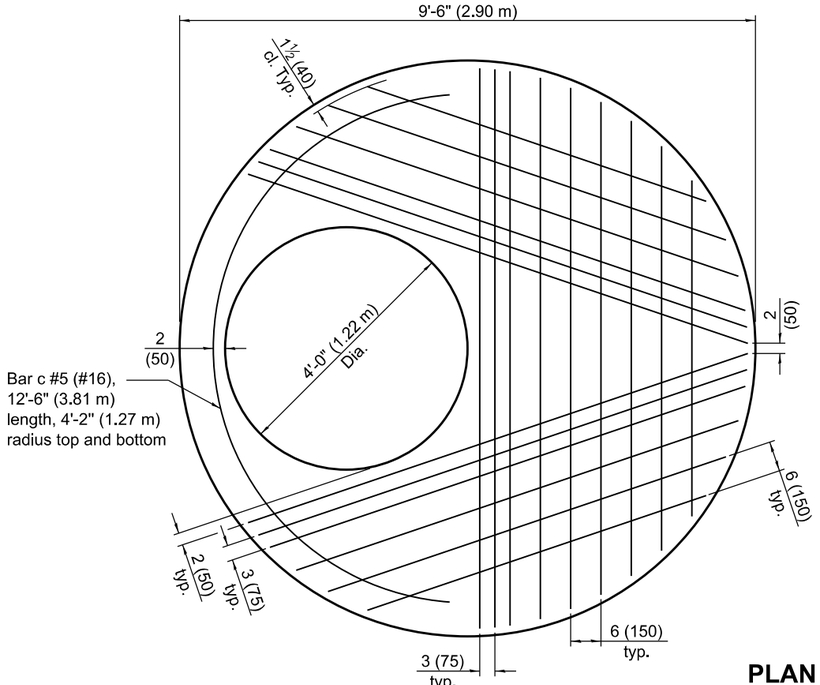
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

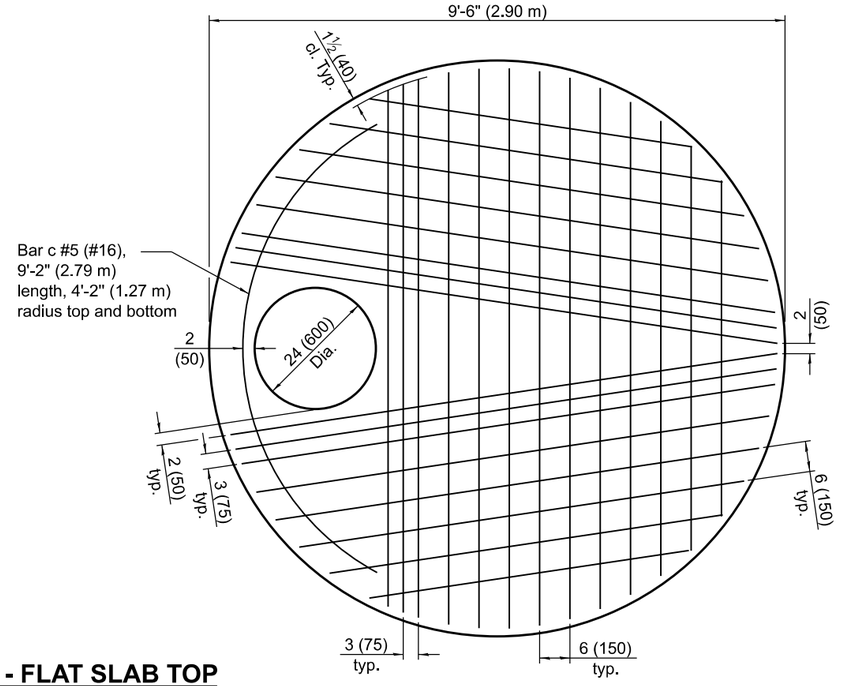
ISSUED 4-1-06

DATE	REVISIONS
1-1-21	Revised Note 1 and lifting hole
	general note.
3-1-19	Moved wall reinforcement from
	inside face to middle.

PRECAST MANHOLE TYPE A 8' (2.44 m) DIAMETER

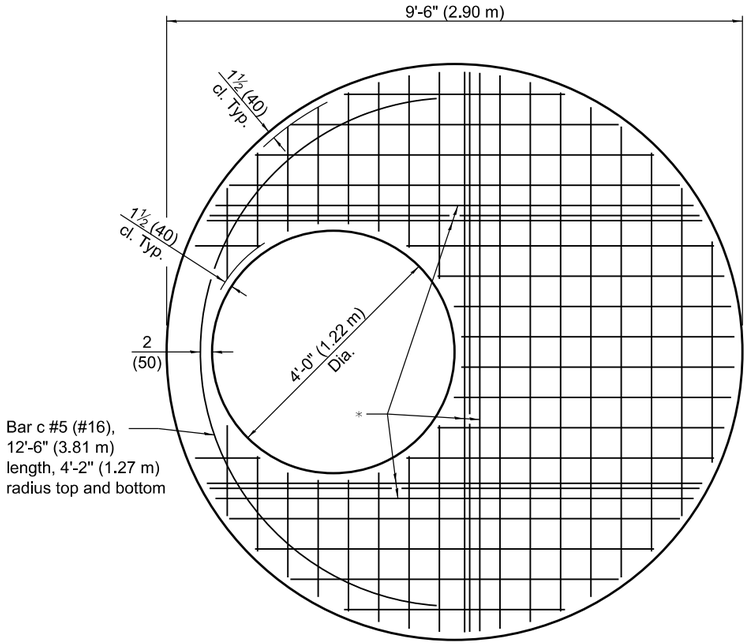
STANDARD 602416-09

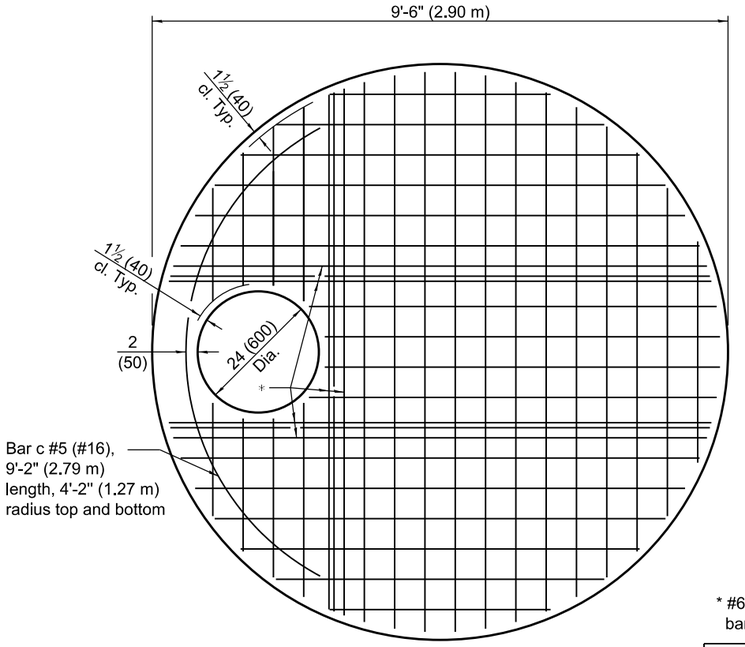




PLAN - FLAT SLAB TOP

(Showing layout of bottom reinforcement bars and c bars)





PLAN - FLAT SLAB TOP

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

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

Illinois Department of Transportation

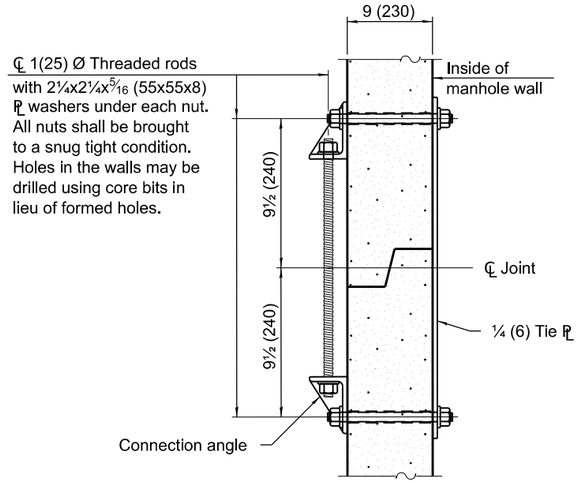
APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

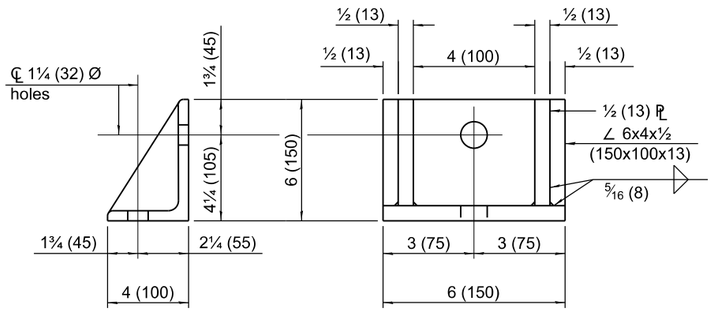
ISSUED 4-1-06

PRECAST MANHOLE TYPE A 8' (2.44 m) DIAMETER

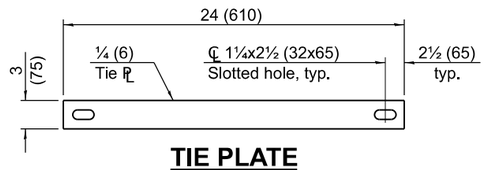
STANDARD 602416-09



JOINT SPLICE



CONNECTION ANGLE



TIE PLATE

FLAT SLAB TOP REINFORCEMENT

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

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

WALL REINFORCEMENT

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

BASE SLAB REINFORCEMENT

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

Illinois Department of Transportation

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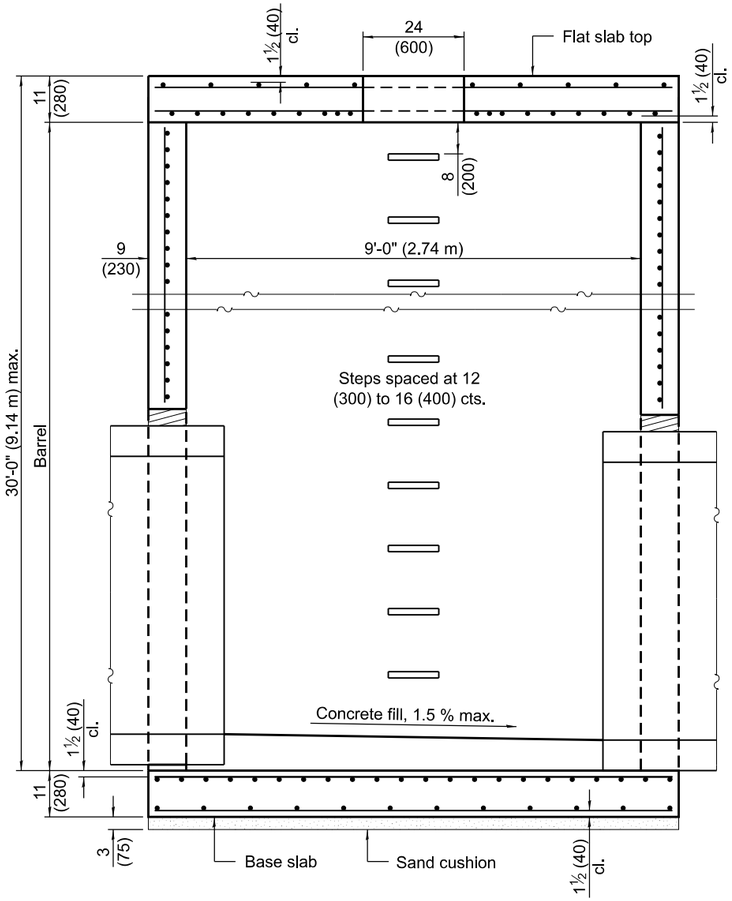
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

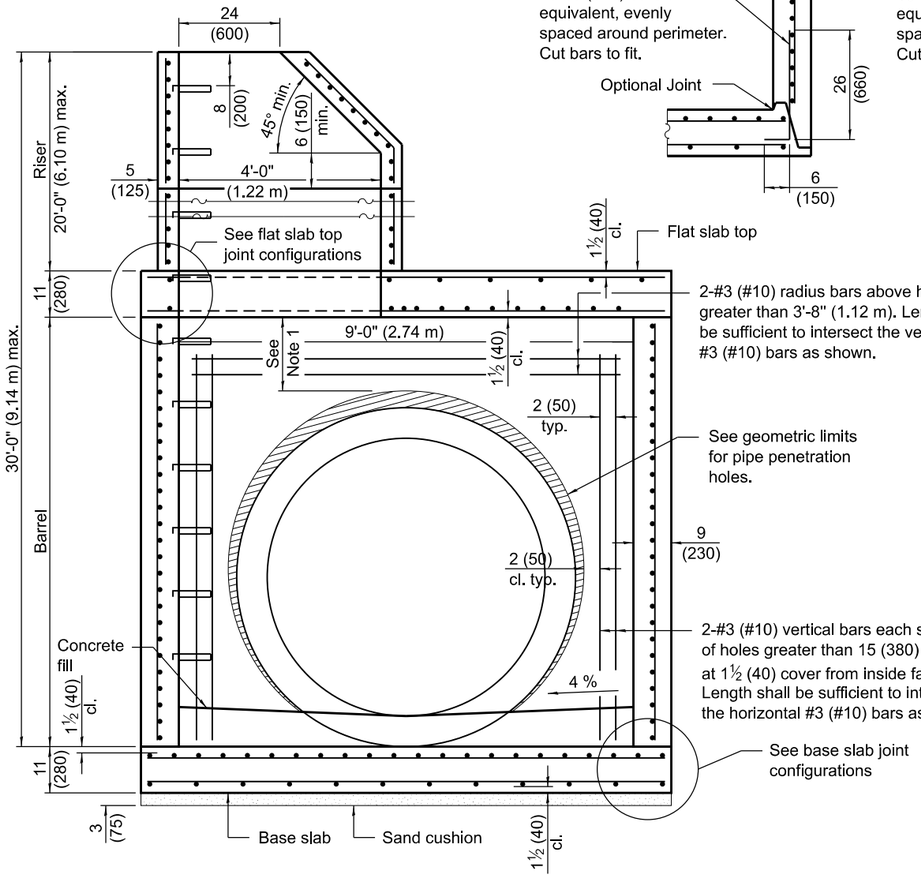
ISSUED 4-1-06

PRECAST MANHOLE TYPE A 8' (2.44 m) DIAMETER

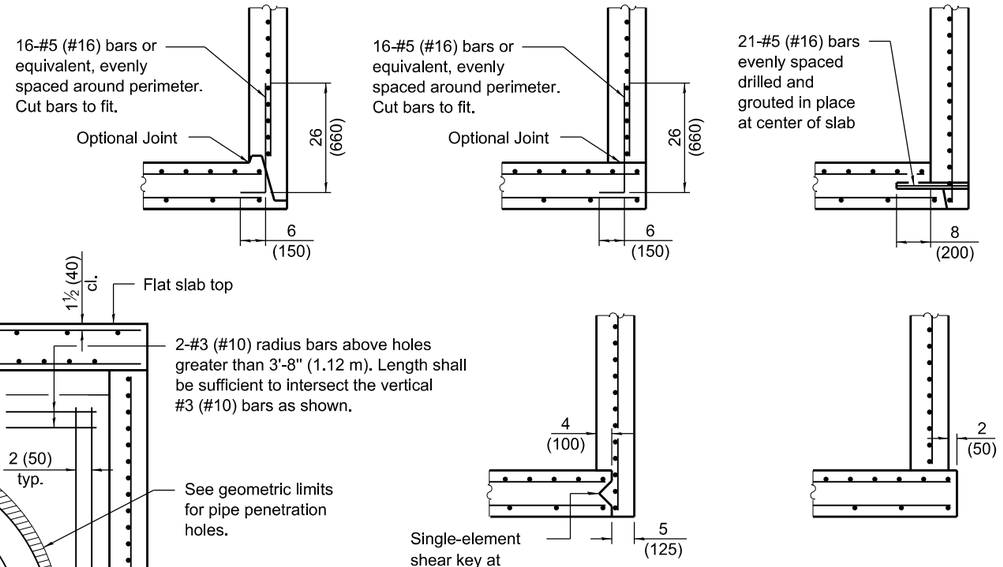
STANDARD 602416-09



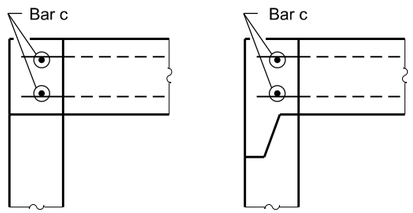
SECTION PARALLEL TO PIPE
(Without conical top riser)



SECTION PERPENDICULAR TO PIPE
(With conical top riser)



BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

Note 1: A minimum of 12 (300) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 3'-8" (1.12 m).

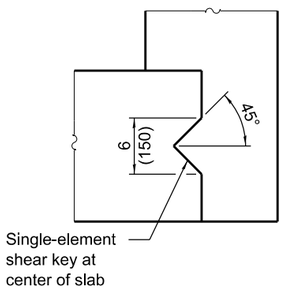
Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

Note 3: A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.

Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



SHEAR KEY GEOMETRY
(Reinforcement not shown for clarity)

GENERAL NOTES

Pipe holes shall be formed to facilitate proper placement of hole reinforcement.

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

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

See Standard 602701 for details of manhole steps.

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

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

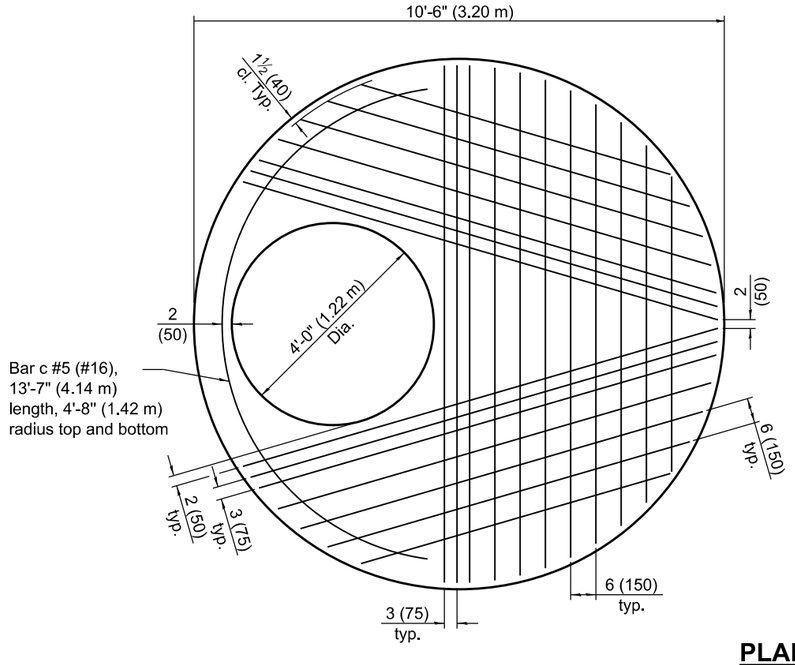
ISSUED 4-1-06

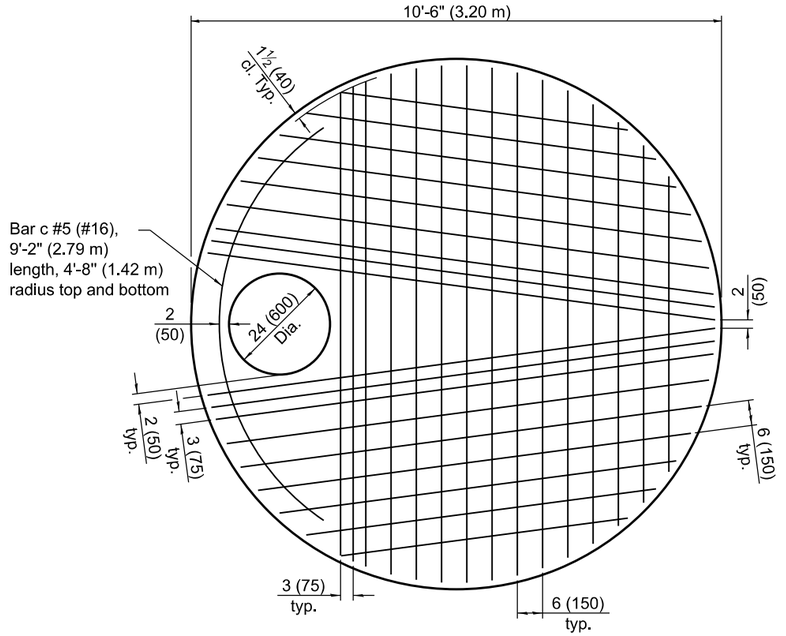
DATE	REVISIONS
1-1-21	Revised Note 1 and lifting hole
	general note.
3-1-19	Moved wall reinforcement from
	inside face to middle.

PRECAST MANHOLE TYPE A
9' (2.74 m) DIAMETER

(Sheet 1 of 3)

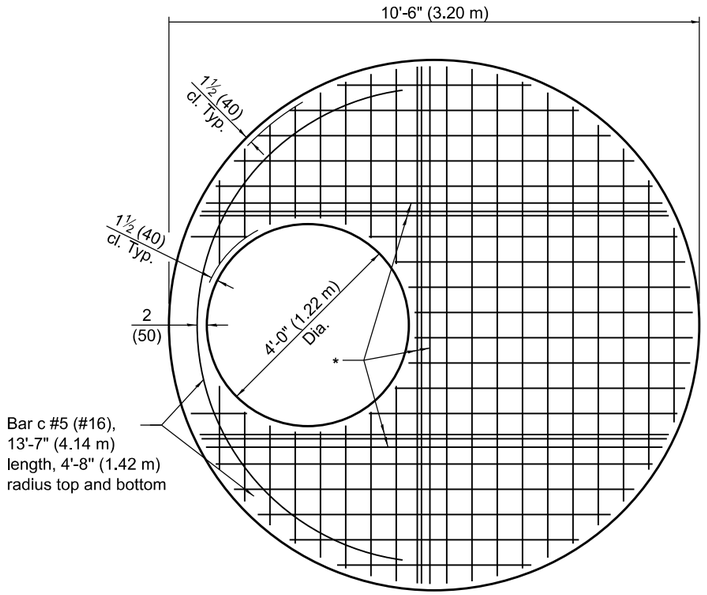
STANDARD 602421-09

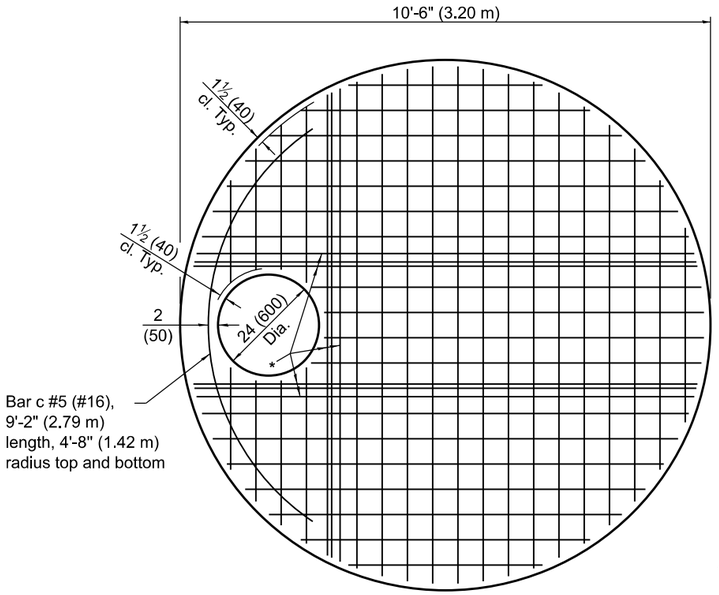




PLAN - FLAT SLAB TOP

(Showing layout of bottom reinforcement bars and c bars)





PLAN - FLAT SLAB TOP

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

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

Illinois Department of Transportation

APPROVED January 1, 2021
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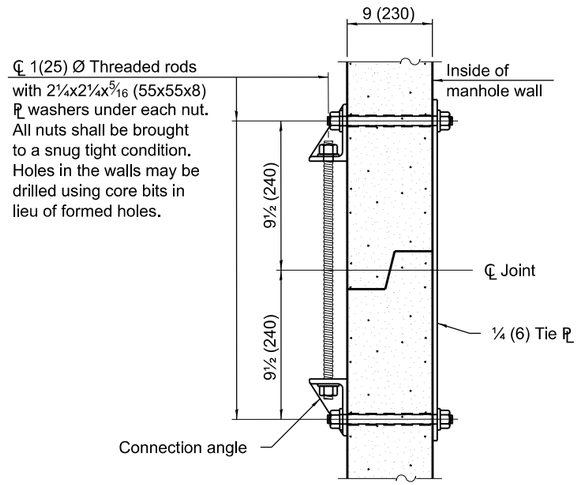
ENGINEER OF DESIGN AND ENVIRONMENT

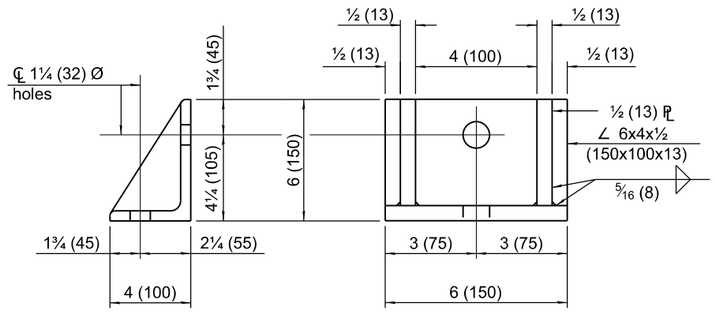
ISSUED 4-1-06

PRECAST MANHOLE TYPE A
9' (2.74 m) DIAMETER

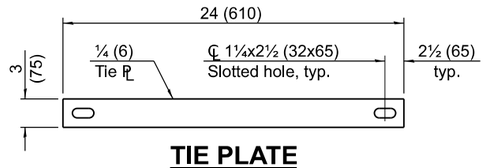
STANDARD 602421-09



JOINT SPLICE



CONNECTION ANGLE



TIE PLATE

FLAT SLAB TOP REINFORCEMENT

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

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

WALL REINFORCEMENT

Location	Orientation	WWR or Rebar	
		A_s (min.)	Spacing (max.)
4 ft. (1.22 m) Ø Riser	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)
9 ft. (2.74 m) Ø Barrel	Circumferential	0.27 sq. in./ft. (572 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)

BASE SLAB REINFORCEMENT

Location	Riser Height (RH)/ Total Height (TH)	WWR or Rebar (each direction)	
		A_s (min.)	Spacing (max.)
Top Mat	RH ≤ 10 ft. (3.05 m) & TH ≤ 20 ft. (6.10 m)	0.44 sq. in./ft. (931 sq. mm/m)	6 (150)
	RH > 10 ft. (3.05 m) or TH > 20 ft. (6.10 m)	0.72 sq. in./ft. (1524 sq. mm/m)	6 (150)
Bottom Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)

Illinois Department of Transportation

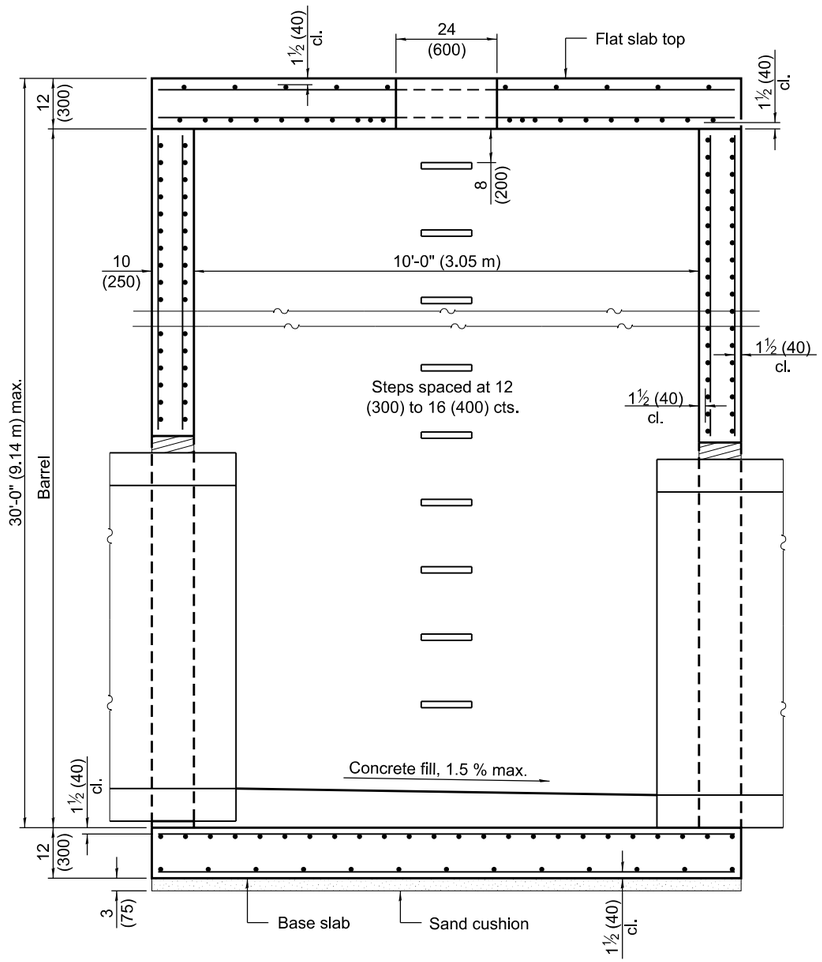
APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

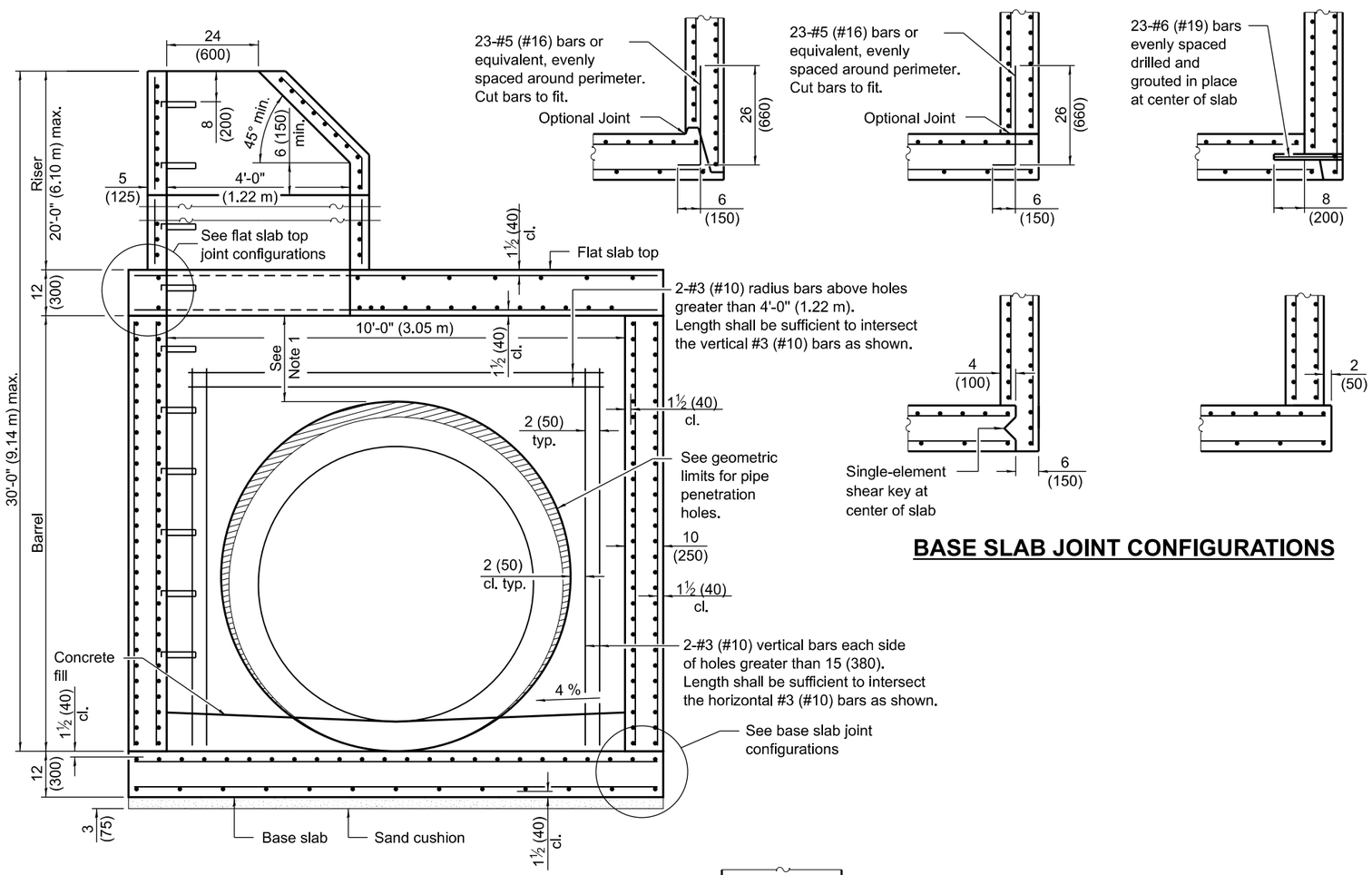
ISSUED 4-1-06

PRECAST MANHOLE TYPE A 9' (2.74 m) DIAMETER

STANDARD 602421-09

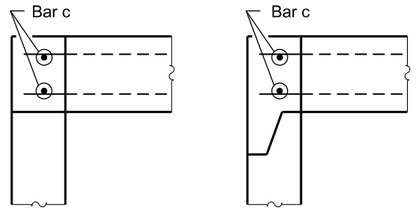


SECTION PARALLEL TO PIPE
(Without conical top riser)



SECTION PERPENDICULAR TO PIPE
(With conical top riser)

BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

Note 1: A minimum of 12 (300) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 4'-0" (1.22 m).

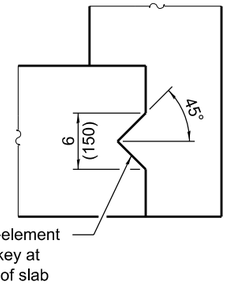
Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

Note 3: A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.

Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



SHEAR KEY GEOMETRY
(Reinforcement not shown for clarity)

GENERAL NOTES

Pipe holes shall be formed to facilitate proper placement of hole reinforcement.

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

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

See Standard 602701 for details of manhole steps.

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

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

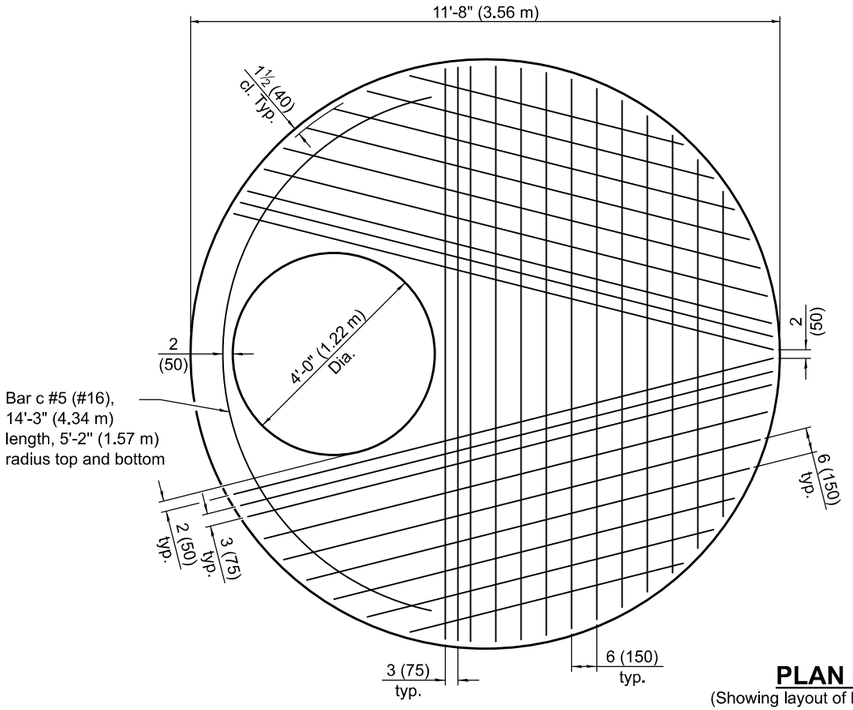
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

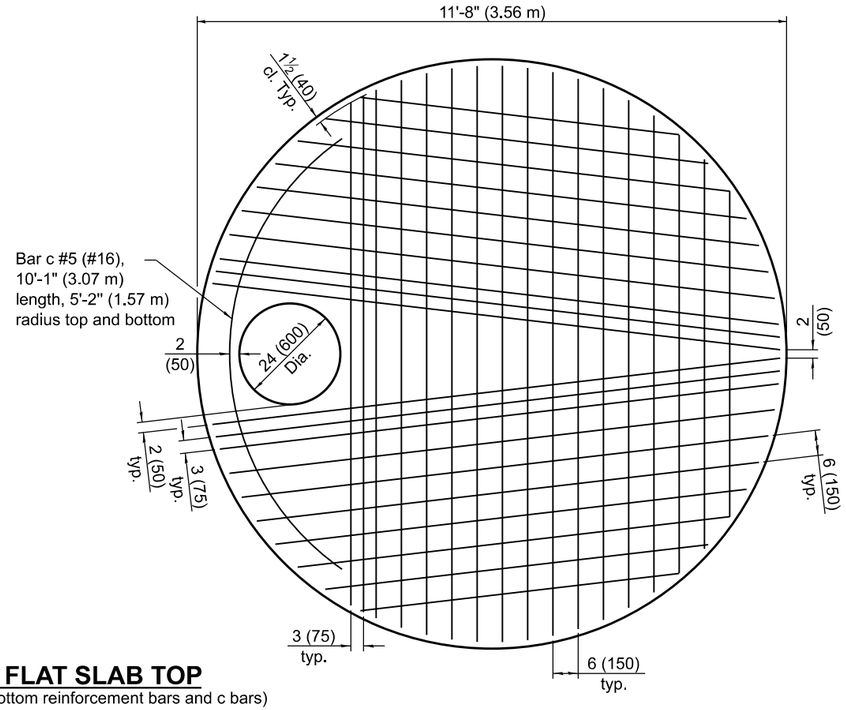
ISSUED 1-1-18

DATE	REVISIONS
1-1-21	Revised Note 1.
3-1-19	Moved wall reinforcement of
	4'-0" (1.22 m) riser from inside
	face to middle.

PRECAST MANHOLE TYPE A 10' (3.05 m) DIAMETER

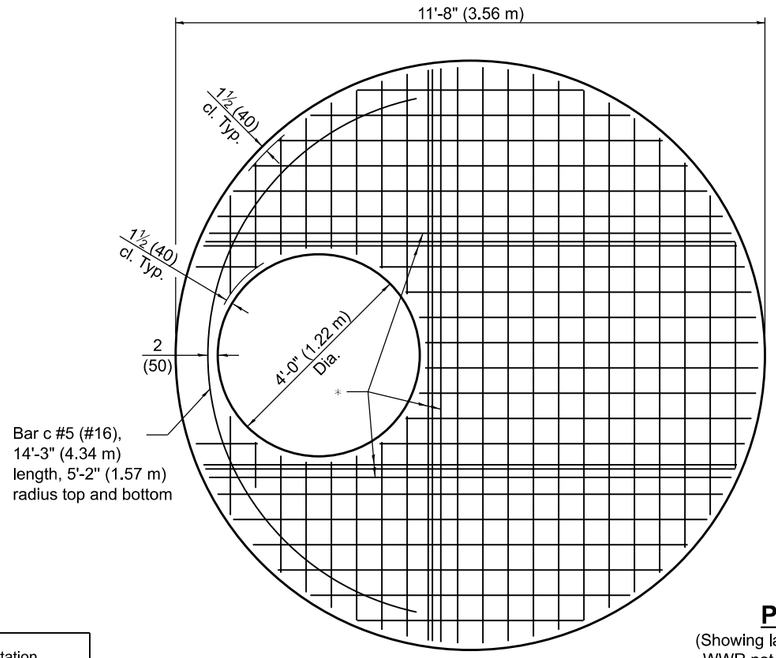
STANDARD 602426-03

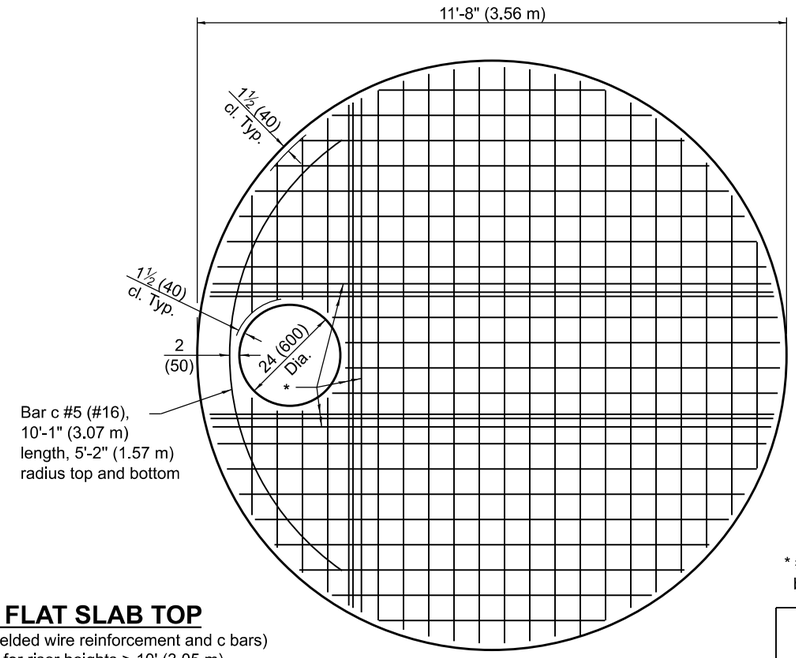




PLAN - FLAT SLAB TOP

(Showing layout of bottom reinforcement bars and c bars)





PLAN - FLAT SLAB TOP

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

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

Illinois Department of Transportation

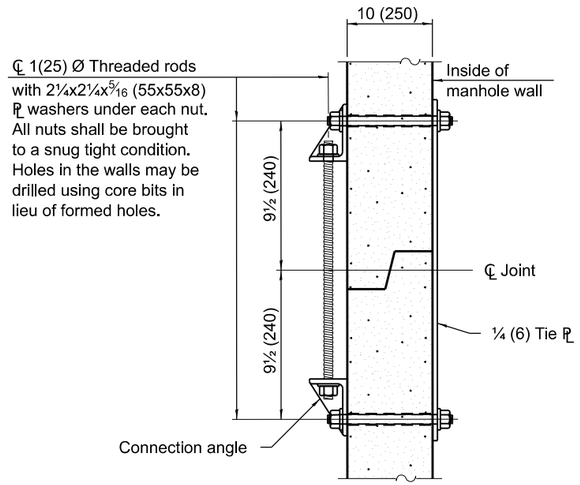
APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

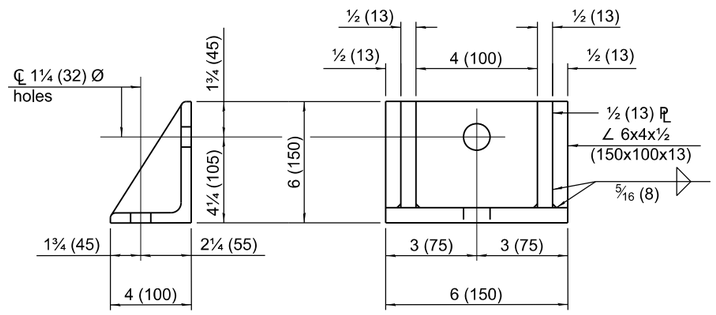
ISSUED 1-1-18

PRECAST MANHOLE TYPE A 10' (3.05 m) DIAMETER

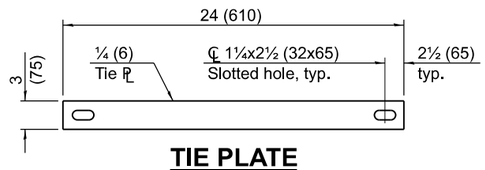
STANDARD 602426-03



JOINT SPLICE



CONNECTION ANGLE



TIE PLATE

FLAT SLAB TOP REINFORCEMENT

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

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

WALL REINFORCEMENT

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

BASE SLAB REINFORCEMENT

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

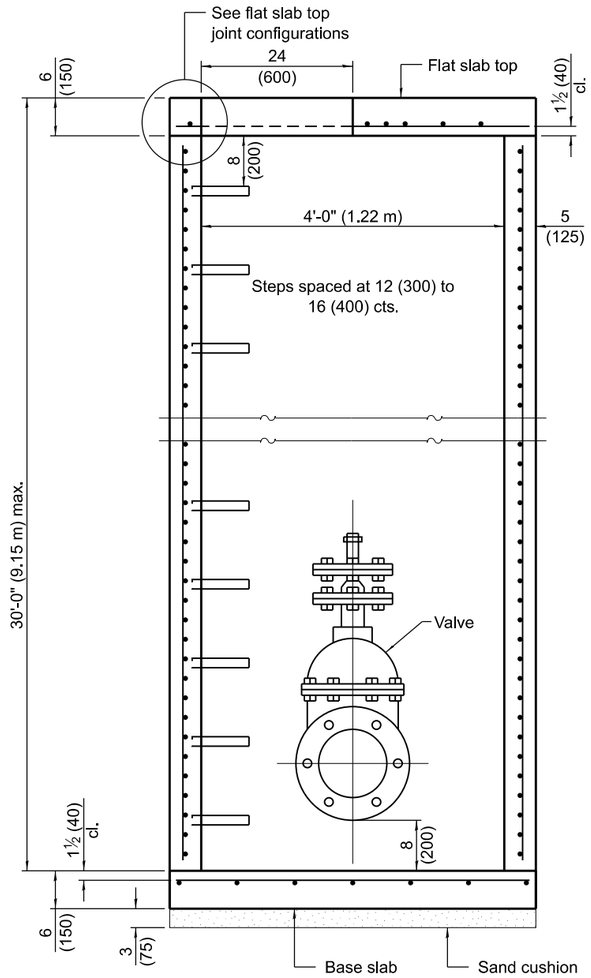
Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

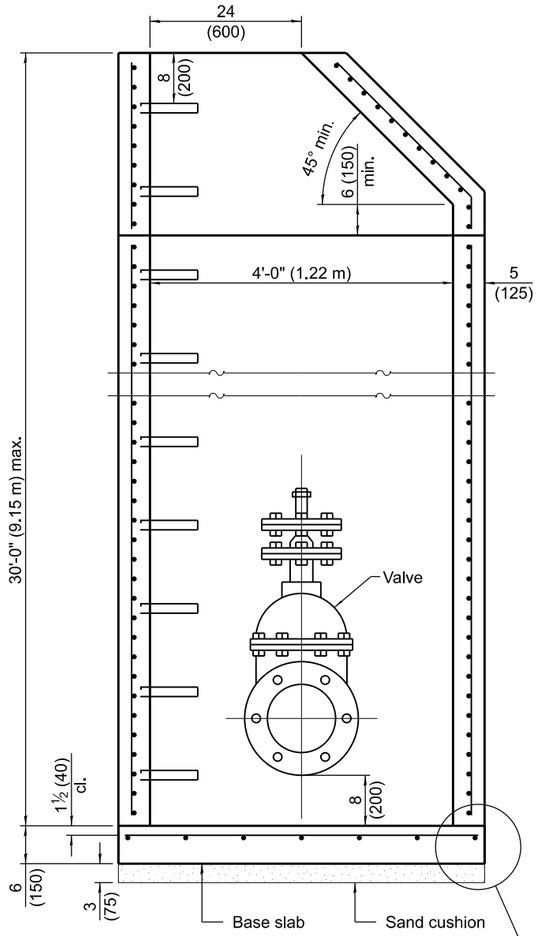
ISSUED 1-1-18

PRECAST MANHOLE TYPE A 10' (3.05 m) DIAMETER

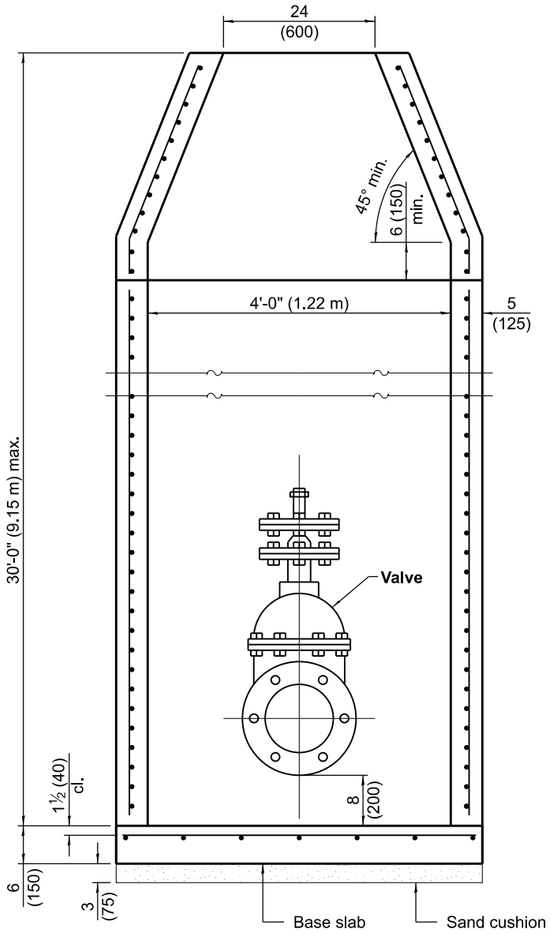
STANDARD 602426-03



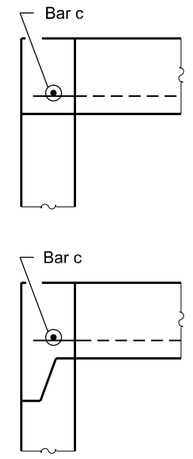
SECTION THRU VALVE VAULT
(Without conical top)



SECTION THRU VALVE VAULT
(With conical top)



SECTION THRU VALVE VAULT
(With concentric conical top)



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GENERAL NOTES

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

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

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

See Standard 602701 for details of manhole steps.

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

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

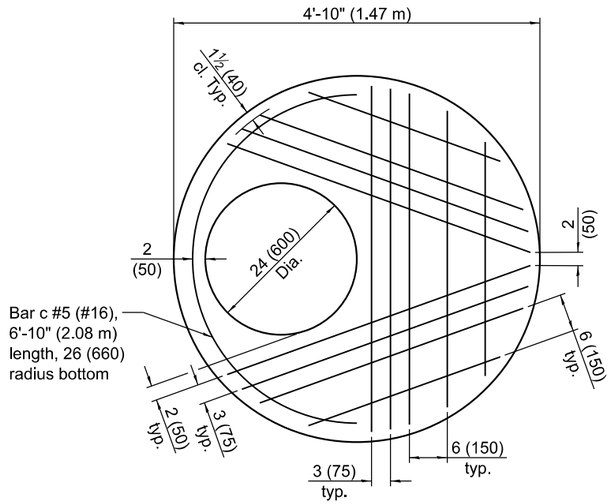
ISSUED 1-1-97

DATE	REVISIONS
1-1-21	Revised lifting hole general note.
3-1-19	Moved wall reinforcement from
	inside face to middle.

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

(Sheet 1 of 2)

STANDARD 602501-06



PLAN - FLAT SLAB TOP

(Showing layout of reinforcement bars and c bars)

FLAT SLAB TOP REINFORCEMENT

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

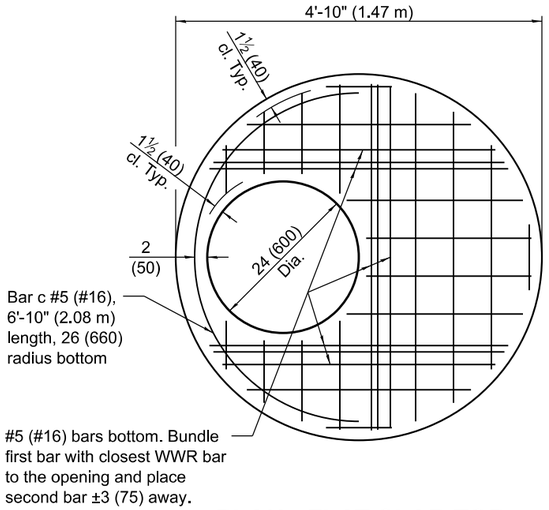
* Only one layer of WWR permitted to avoid congestion.

WALL REINFORCEMENT

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

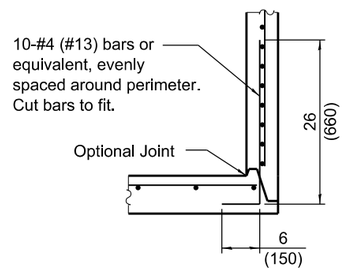
BASE SLAB REINFORCEMENT

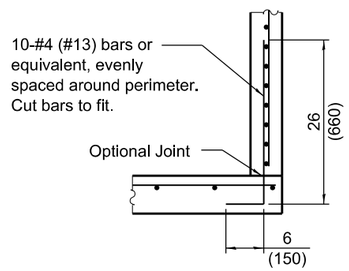
Location	Total Height	WWR or Rebar (each direction)	
		A_s (min.)	Spacing (max.)
Top Mat	≤ 20 ft. (6.10 m)	0.24 sq. in./ft. (508 sq. mm/m)	10 (250)
	> 20 ft. (6.10 m)	0.24 sq. in./ft. (508 sq. mm/m)	10 (250)

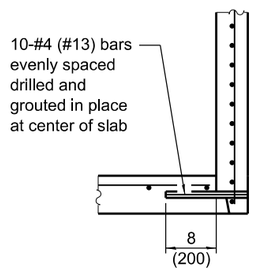


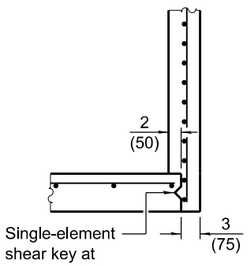
PLAN - FLAT SLAB TOP

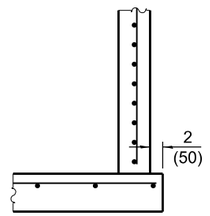
(Showing layout of welded wire reinforcement and c bars)



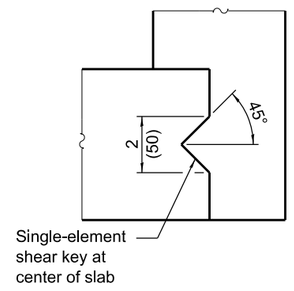








BASE SLAB JOINT CONFIGURATIONS



SHEAR KEY GEOMETRY

(Reinforcement not shown for clarity)

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

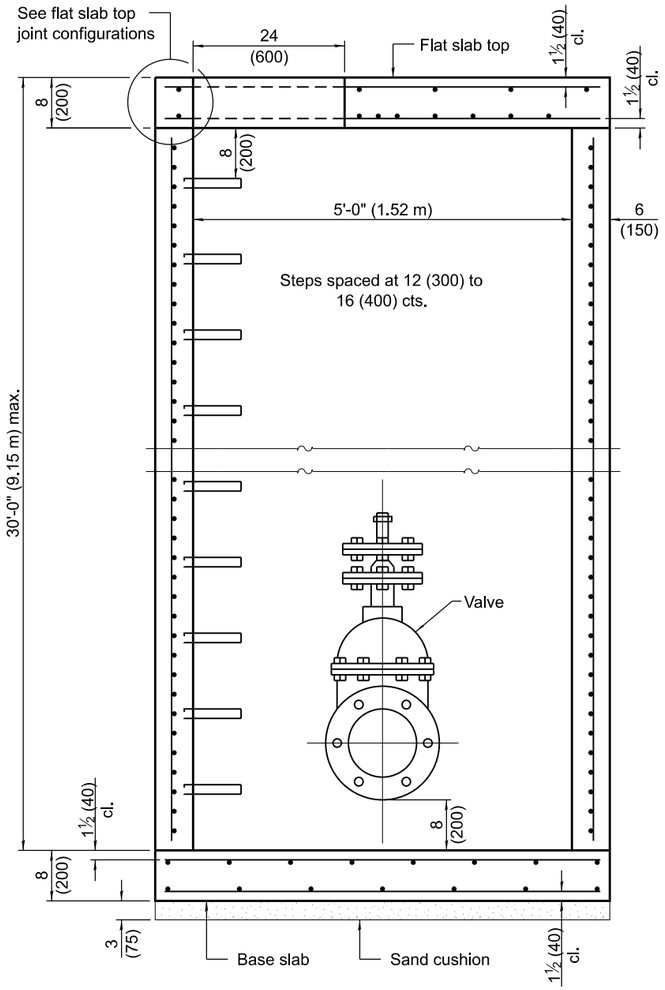
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

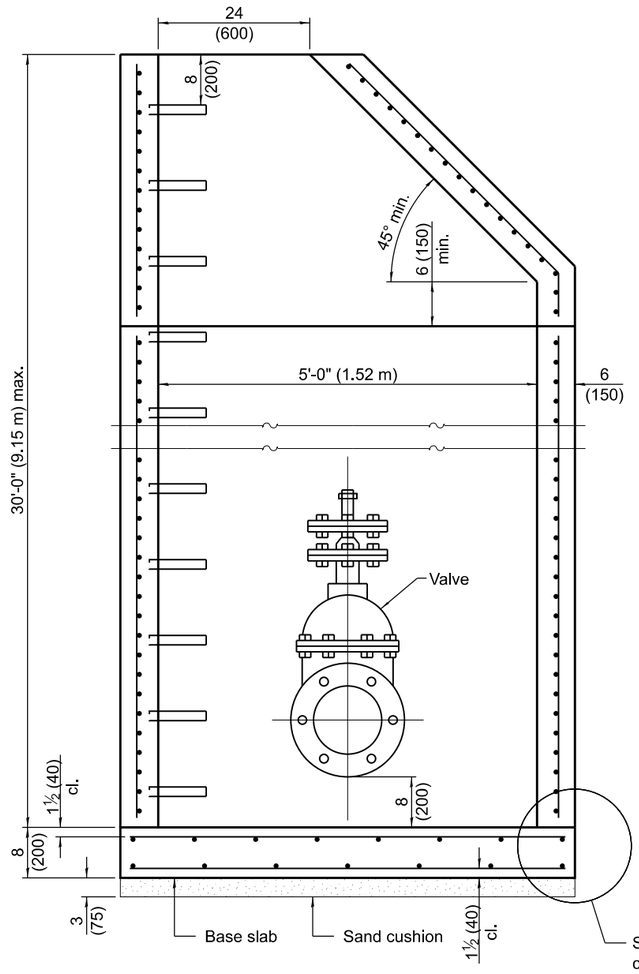
PRECAST VALVE VAULT TYPE A 4' (1.22 m) DIAMETER

(Sheet 2 of 2)

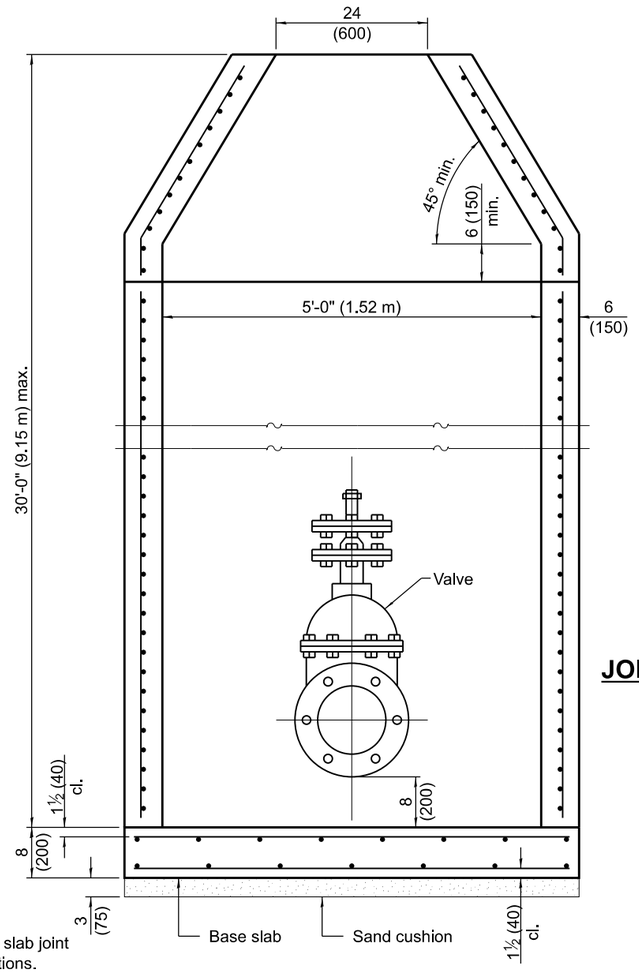
STANDARD 602501-06



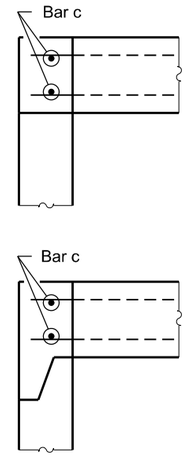
SECTION THRU VALVE VAULT
(Without conical top)



SECTION THRU VALVE VAULT
(With conical top)



SECTION THRU VALVE VAULT
(With concentric conical top)



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GENERAL NOTES

Use this standard for water mains ≥ 10 (250).

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

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

See Standard 602701 for details of manhole steps.

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

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

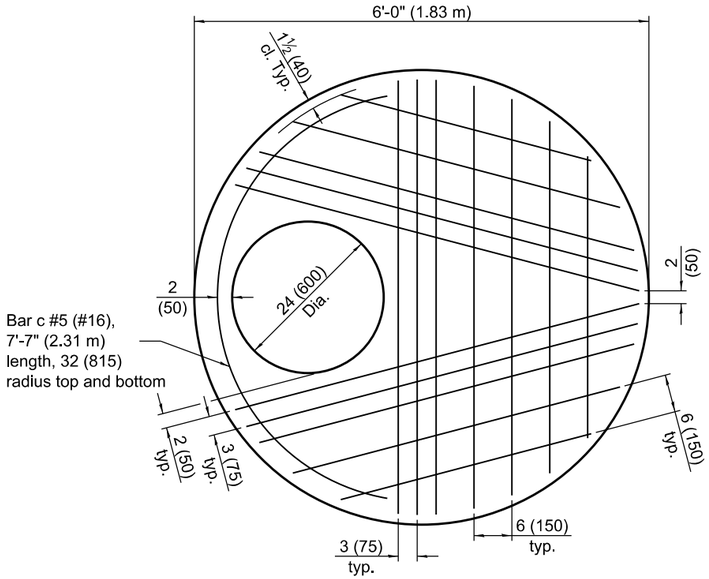
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18

DATE	REVISIONS
1-1-21	Revised lifting hole general note.
3-1-19	Moved wall reinforcement from
	inside face to middle.

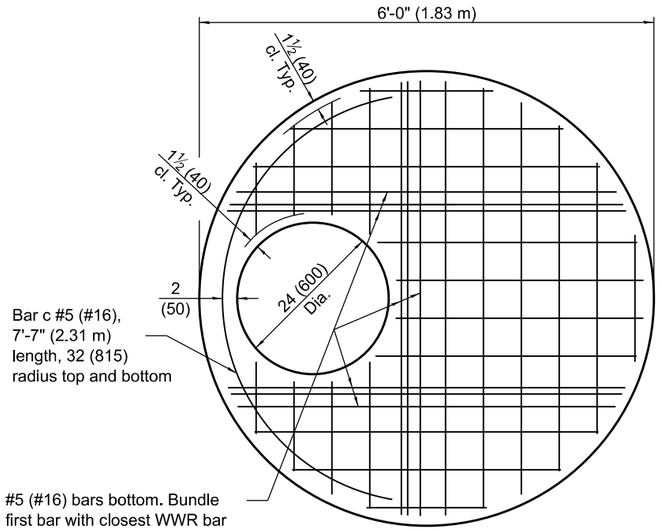
PRECAST VALVE VAULT TYPE A 5' (1.52 m) DIAMETER

STANDARD 602506-03



PLAN - FLAT SLAB TOP

(Showing layout of bottom reinforcement bars and c bars)



PLAN - FLAT SLAB TOP

(Showing layout of welded wire reinforcement and c bars)

FLAT SLAB TOP REINFORCEMENT

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

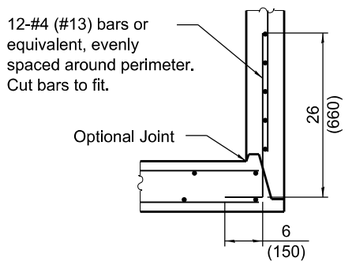
* Only one layer of WWR permitted to avoid congestion.

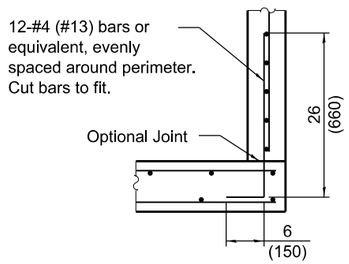
WALL REINFORCEMENT

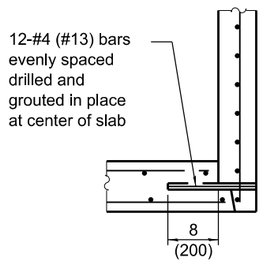
Orientation	WWR or Rebar	
	A_s(min.)	Spacing (max.)
Circumferential	0.15 sq. in./ft. (318 sq. mm/m)	6 (150)
Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)

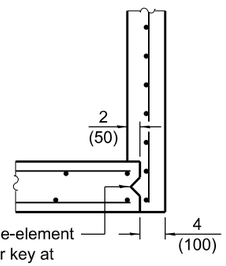
BASE SLAB REINFORCEMENT

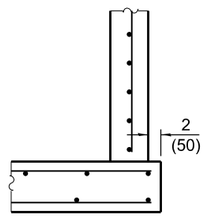
Location	Total Height	WWR or Rebar (each direction)	
		A_s(min.)	Spacing (max.)
Top Mat	≤ 20 ft. (6.10 m)	0.24 sq. in./ft. (508 sq. mm/m)	10 (250)
	> 20 ft. (6.10 m)	0.28 sq. in./ft. (593 sq. mm/m)	8 (200)
Bottom Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)



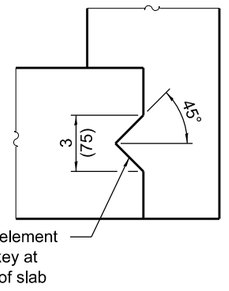








BASE SLAB JOINT CONFIGURATIONS



SHEAR KEY GEOMETRY

(Reinforcement not shown for clarity)

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

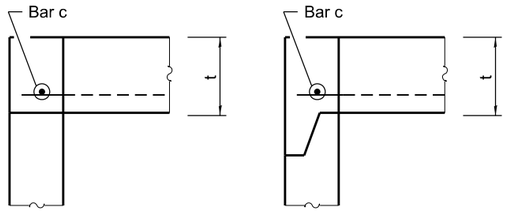
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18

PRECAST VALVE VAULT TYPE A 5' (1.52 m) DIAMETER

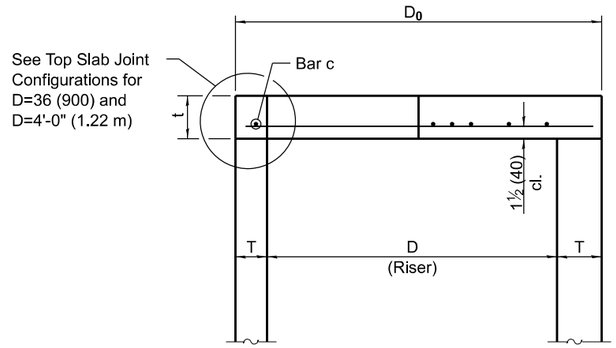
(Sheet 2 of 2)

STANDARD 602506-03

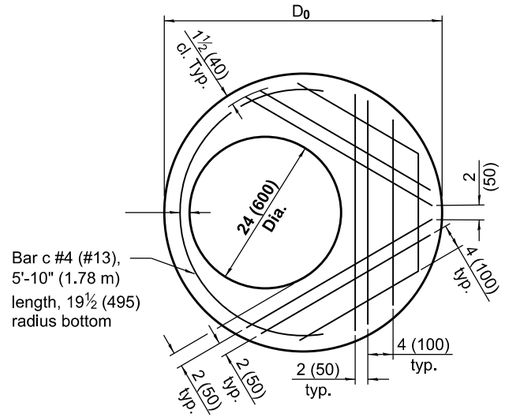


FLAT SLAB TOP JOINT CONFIGURATIONS FOR D = 36 (900) AND D = 4'-0" (1.22 m)

(Shown at access hole)

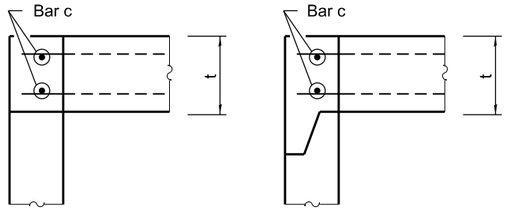


SECTION THRU FLAT SLAB TOP FOR D = 36 (900) AND D = 4'-0" (1.22 m)



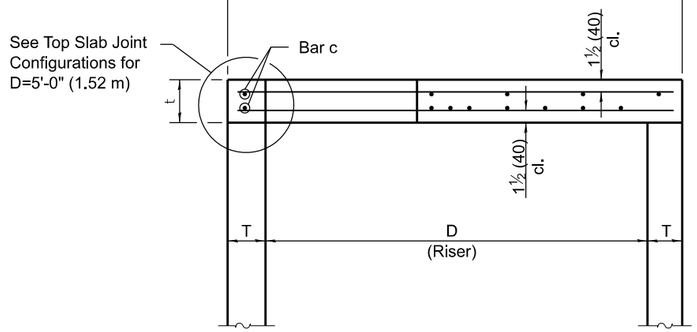
PLAN - FLAT SLAB TOP FOR D = 36 (900)

(Showing layout of reinforcement bars and c bars)

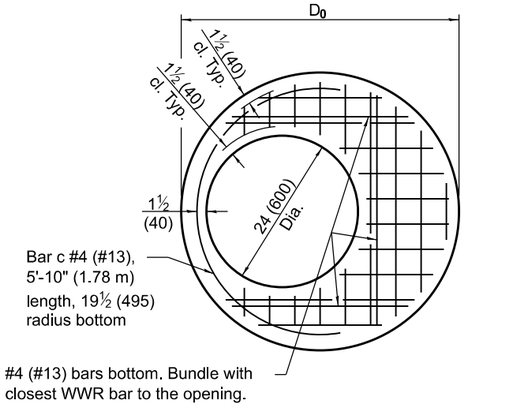


FLAT SLAB TOP JOINT CONFIGURATIONS D = 5'-0" (1.52 m)

(Shown at access hole)



SECTION THRU FLAT SLAB TOP FOR D = 5'-0" (1.52 m)



PLAN - FLAT SLAB TOP FOR D = 36 (900)

(Showing layout of welded wire reinforcement and c bars)

TABLE

D	T	D_0 (min.)	t
36 (900)	See applicable Standards	D + 2T	6 (150)
4'-0" (1.2 m)			6 (150)
5'-0" (1.5 m)			8 (200)

GENERAL NOTES

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

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

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

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

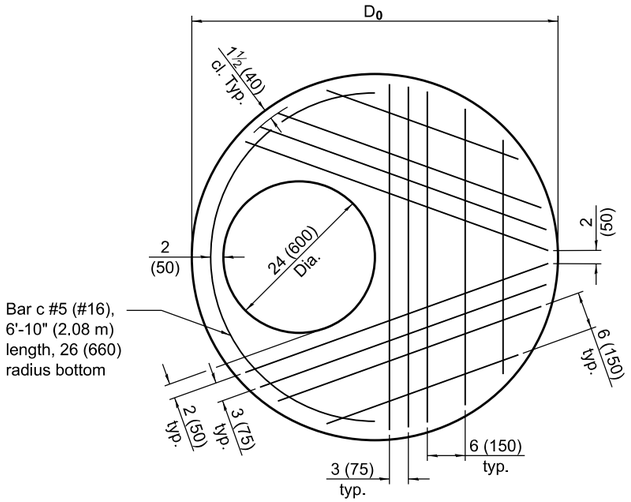
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-19	Expanded / refined reinforcement
	options.
1-1-18	Revised for compliance with LRFD.

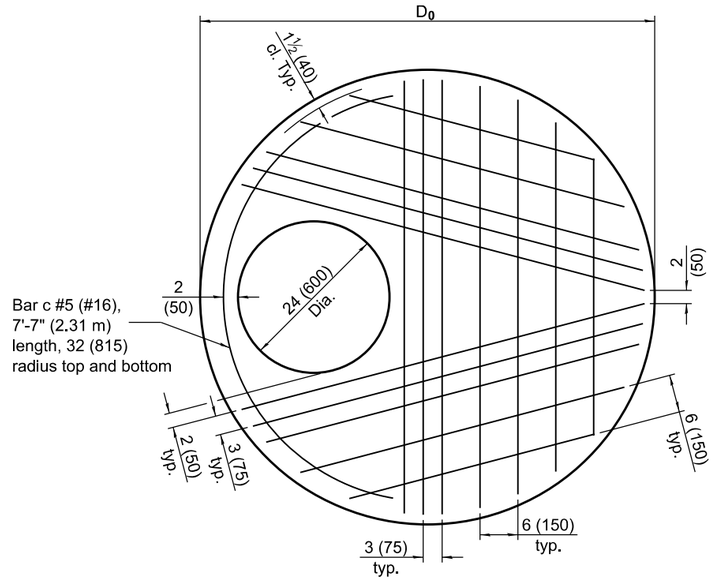
PRECAST REINFORCED CONCRETE FLAT SLAB TOP

STANDARD 602601-06



PLAN - FLAT SLAB TOP FOR D = 4'-0" (1.22 m)

(Showing layout of reinforcement bars and c bars)



PLAN - FLAT SLAB TOP FOR D = 5'-0" (1.52 m)

(Showing layout of bottom reinforcement bars and c bars)

FLAT SLAB TOP REINFORCEMENT FOR D = 36 (900)

Location	WWR (each direction)		Rebar		
	A_s (min.)	Spacing (max.)	A_s (min.)	Spacing (max.)	Bar Size
Bottom Mat	* 0.60 sq. in./ft. (1270 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#4 (#13)

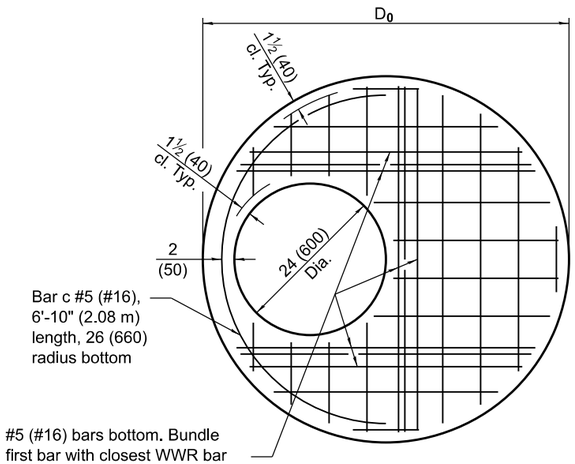
FLAT SLAB TOP REINFORCEMENT FOR D = 4'-0" (1.22 m)

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

FLAT SLAB TOP REINFORCEMENT FOR D = 5'-0" (1.52 m)

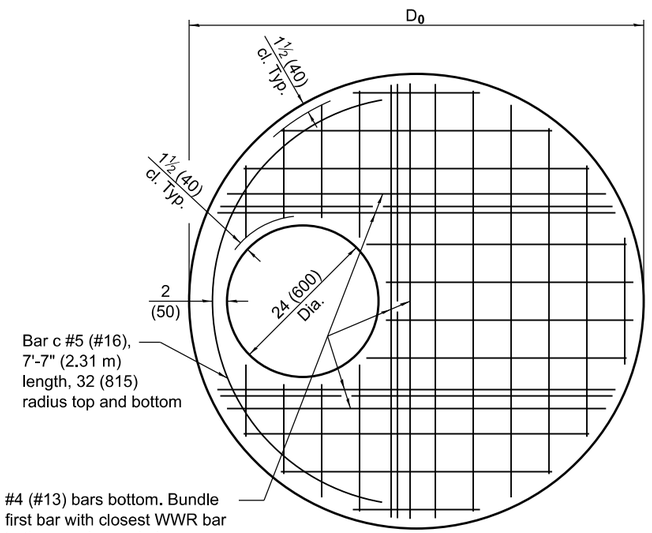
Location	WWR (each direction)		Rebar (each direction except as noted)		
	A_s (min.)	Spacing (max.)	A_s (min.)	Spacing (max.)	Bar Size
Top Mat	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	#3 or #4 (#10) (#13)
Bottom Mat	* 0.40 sq. in./ft. (847 sq. mm/m)	6 (150)	See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

* Only one layer of WWR permitted to avoid congestion.



PLAN - FLAT SLAB TOP FOR D = 4'-0" (1.22 m)

(Showing layout of welded wire reinforcement and c bars)



PLAN - FLAT SLAB TOP FOR D = 5'-0" (1.52 m)

(Showing layout of welded wire reinforcement and c bars)

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

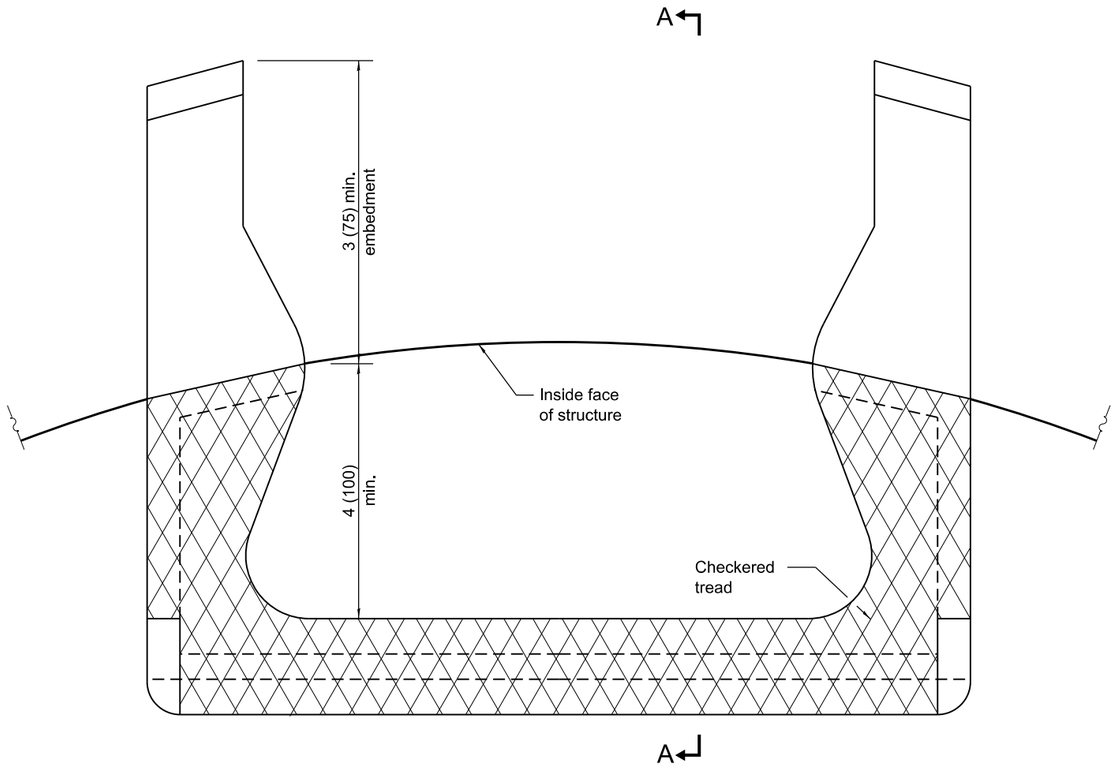
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

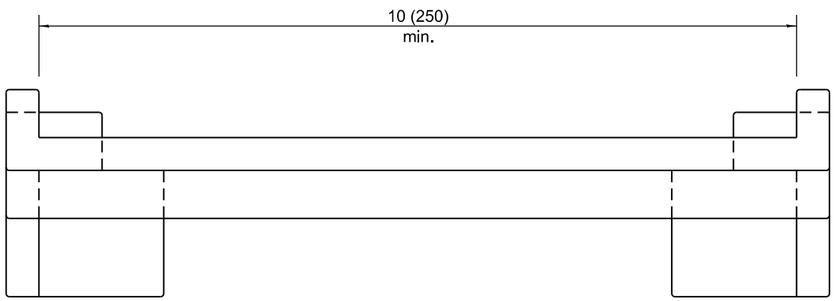
PRECAST REINFORCED CONCRETE FLAT SLAB TOP

STANDARD 602601-06

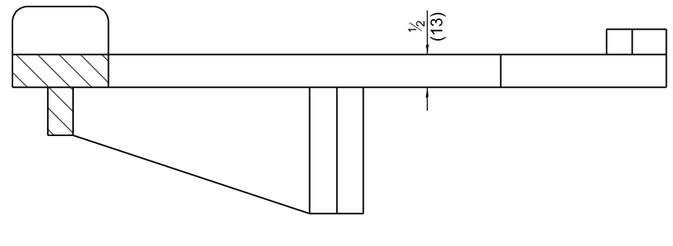
CAST IRON STEPS



PLAN VIEW



ELEVATION VIEW



SECTION A-A

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

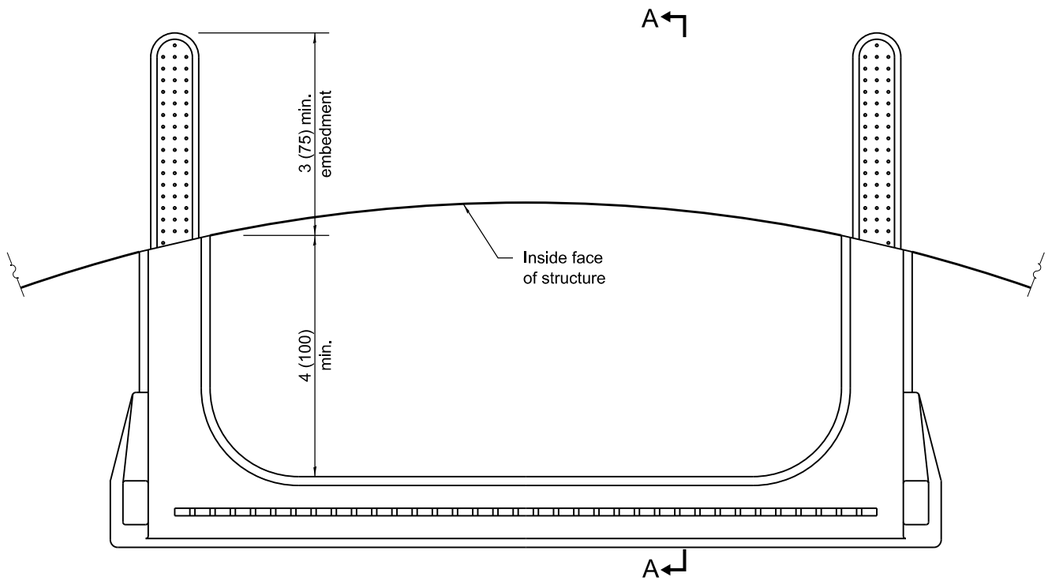
ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to English (metric).
4-1-06	Revised title, drawings, and added
	plastic steps on sheet 2.

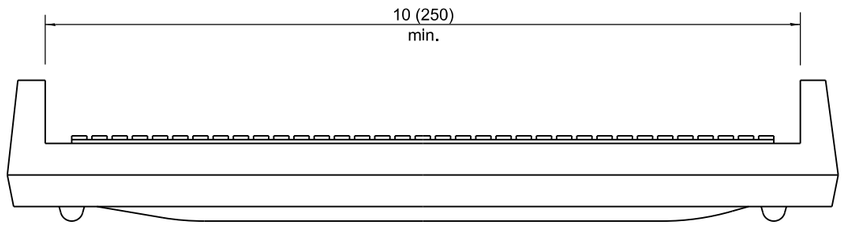
MANHOLE STEPS

(Sheet 1 of 2)

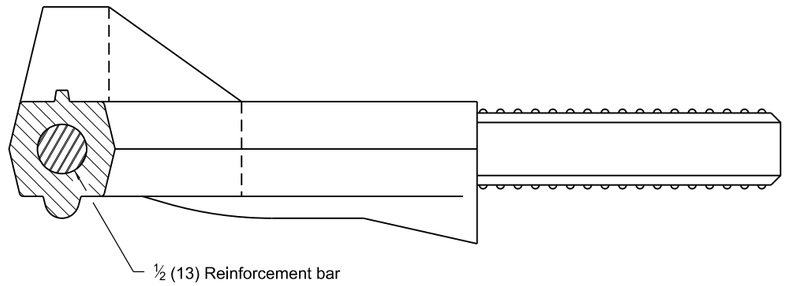
STANDARD 602701-02



PLAN VIEW



ELEVATION VIEW



SECTION A-A

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

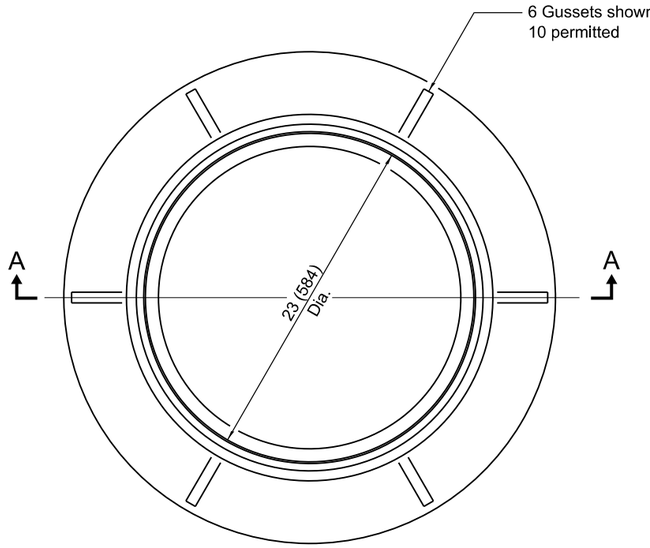
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

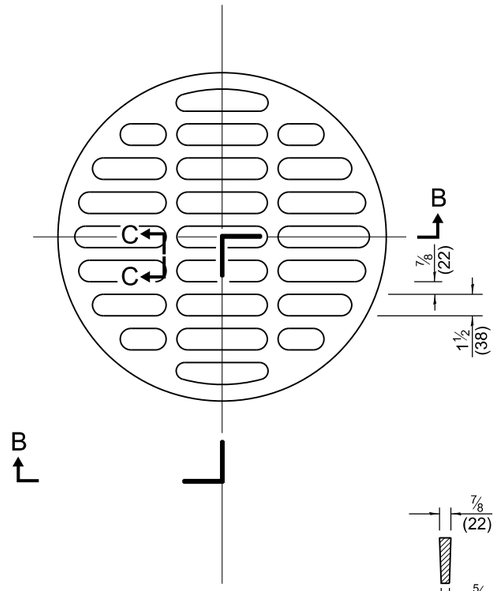
MANHOLE STEPS

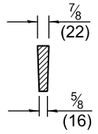
(Sheet 2 of 2)

STANDARD 602701-02

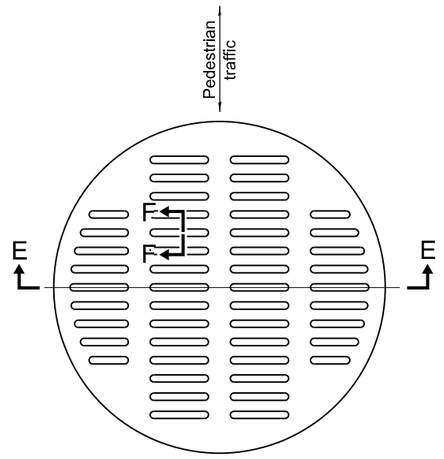


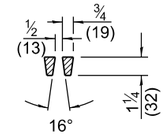
CAST FRAME



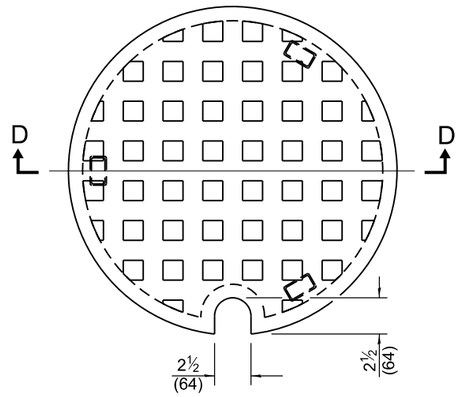


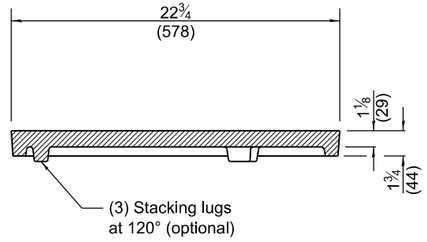
SECTION C-C





SECTION F-F

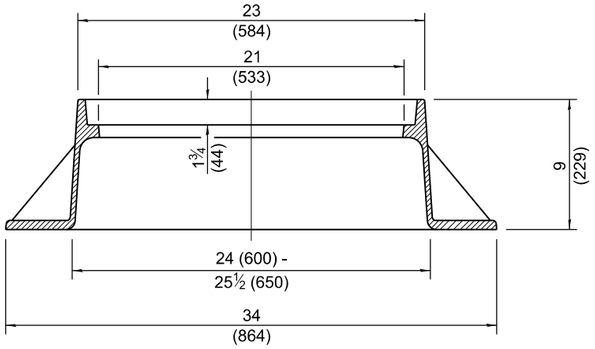




SECTION D-D

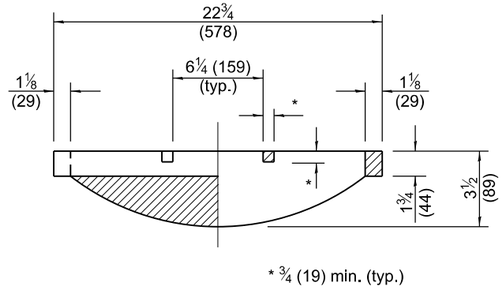
CAST CLOSED LID

Gray Iron Lid



SECTION A-A

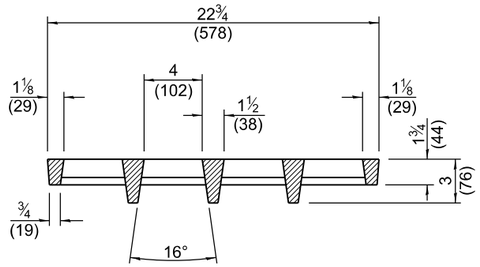
Gray Iron



* ¾ (19) min. (typ.)

SECTION B-B

CAST OPEN LID



SECTION E-E

ADA COMPLIANT CAST OPEN LID

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

Illinois Department of Transportation

APPROVED January 1, 2020
ENGINEER OF POLICY AND PROCEDURES

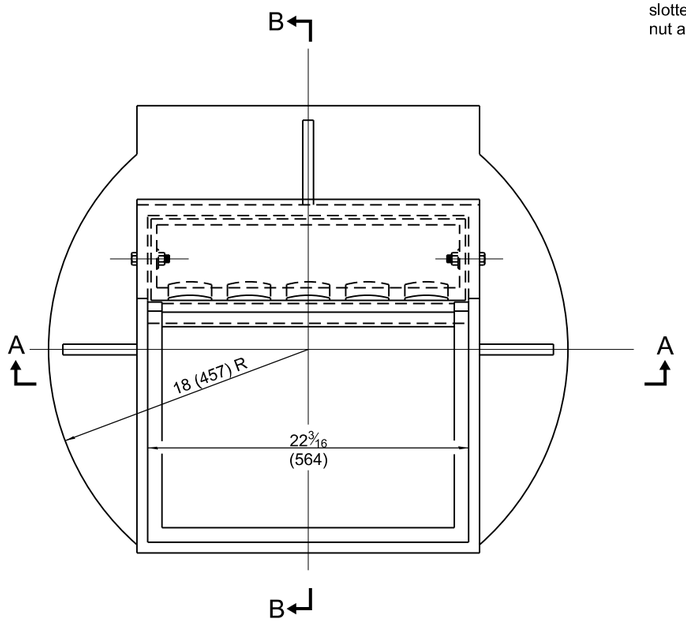
APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

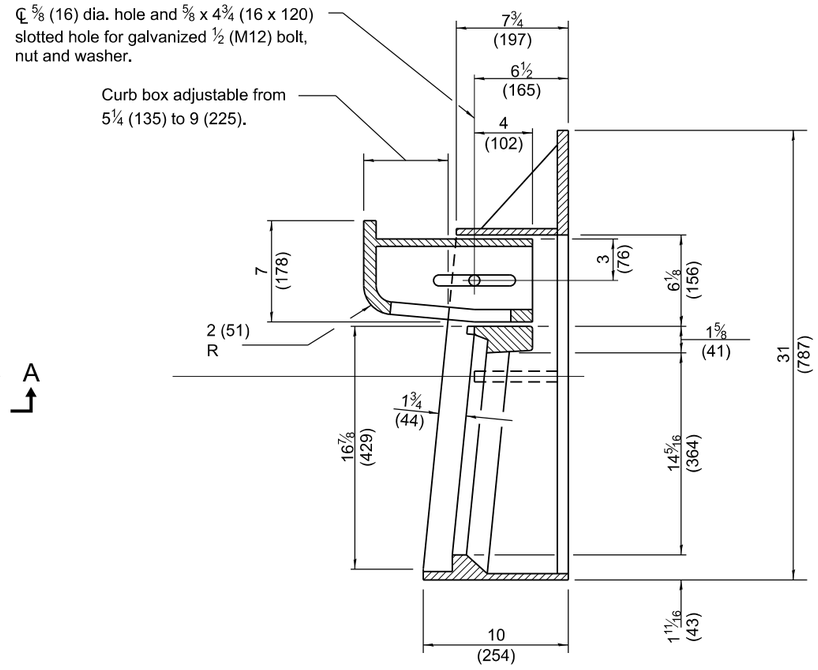
DATE	REVISIONS
1-1-20	Revised dimension in Section B-B
	of cast open lid.
1-1-15	Revised dimensioning of frame.
	Added ADA compliant open lid.

FRAME AND LIDS TYPE 1

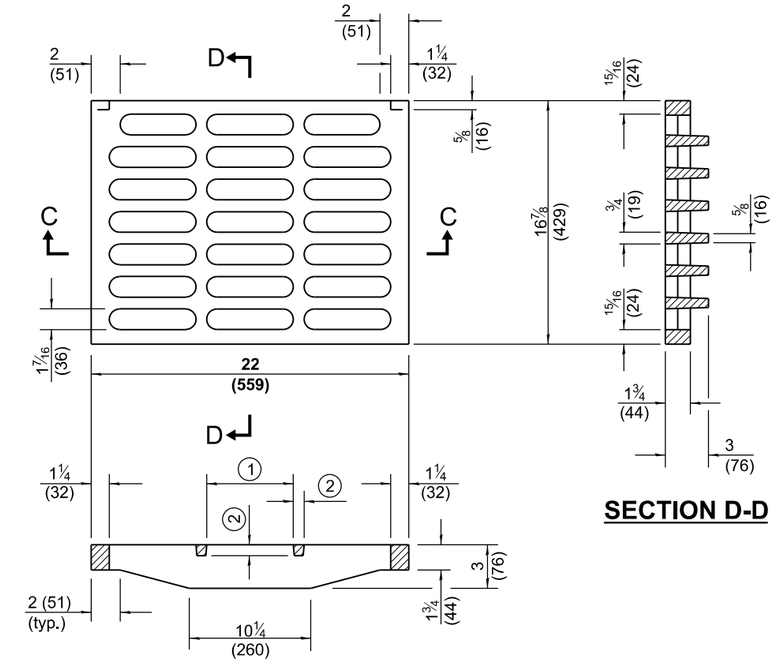
STANDARD 604001-05



CAST FRAME



SECTION B-B



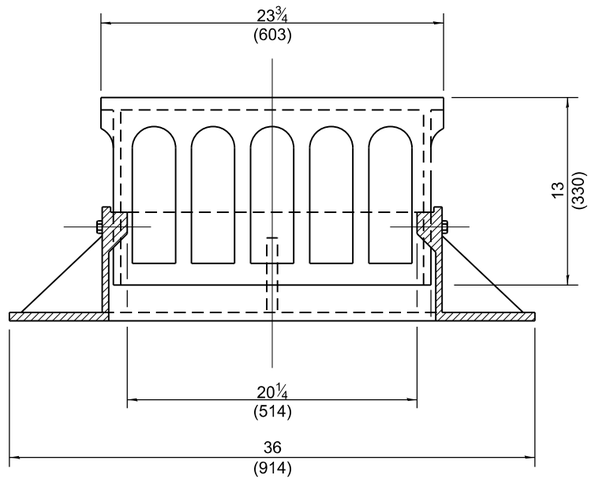
SECTION D-D

SECTION C-C

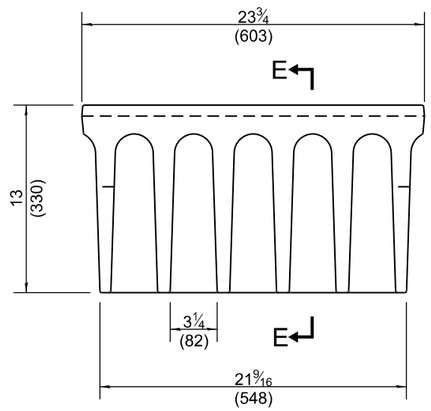
(1) = 6 (152) typ.

(2) = 3/4 (19) typ.

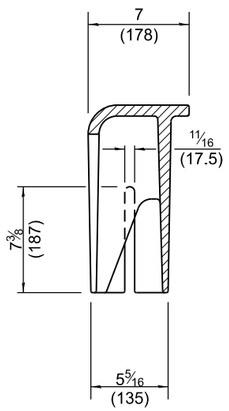
CAST GRATE



SECTION A-A



ALTERNATE CURB BOX



SECTION E-E

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

Illinois Department of Transportation

APPROVED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

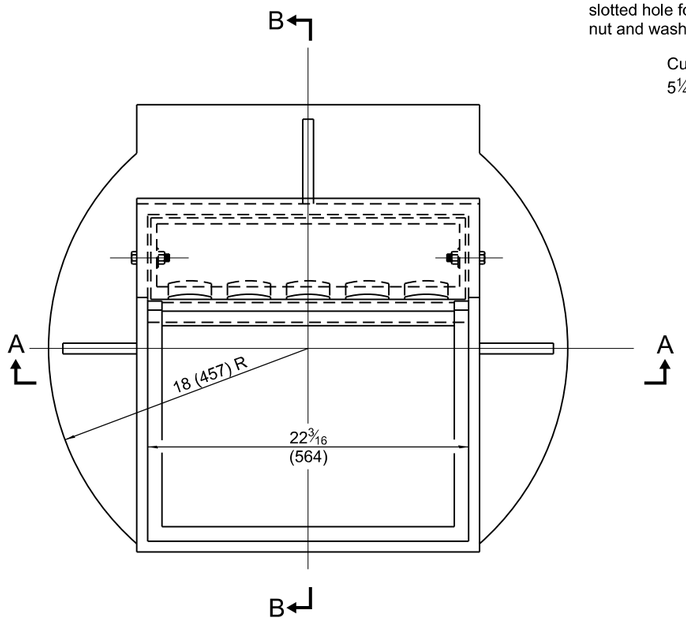
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

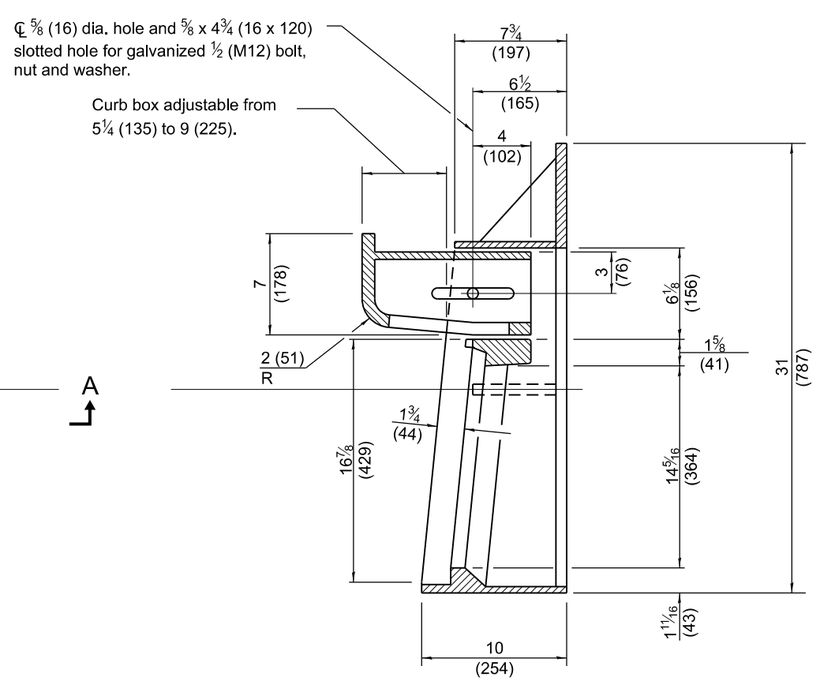
DATE	REVISIONS
1-1-15	Revised dimensions of frame
	and alternate curb box.
1-1-09	Switched units to English (metric).

FRAME AND GRATE TYPE 3

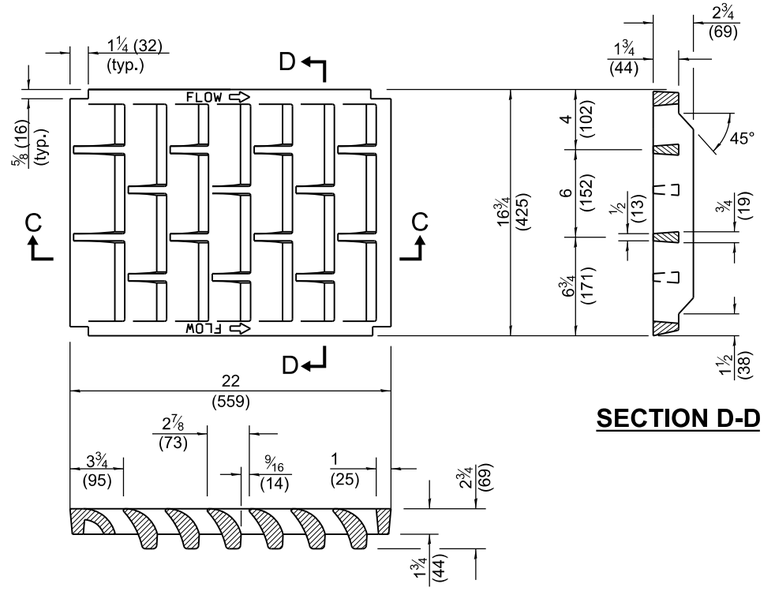
STANDARD 604006-05



CAST FRAME



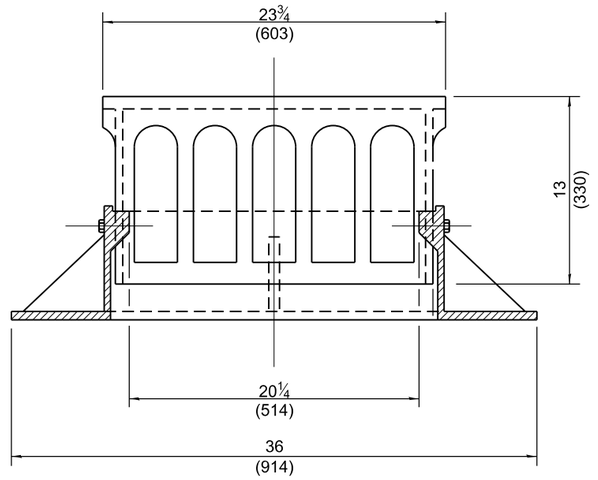
SECTION B-B



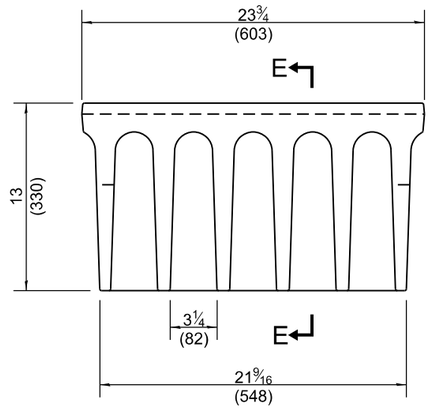
SECTION D-D

SECTION C-C

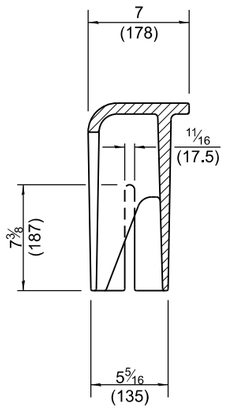
CAST GRATE



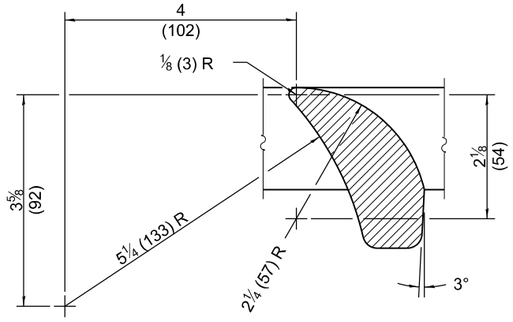
SECTION A-A



ALTERNATE CURB BOX



SECTION E-E



VANE DETAIL

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

DATE	REVISIONS
1-1-15	Revised dimensions of frame
	and alternate curb box.
1-1-09	Switched units to English (metric).

FRAME AND GRATE TYPE 3V

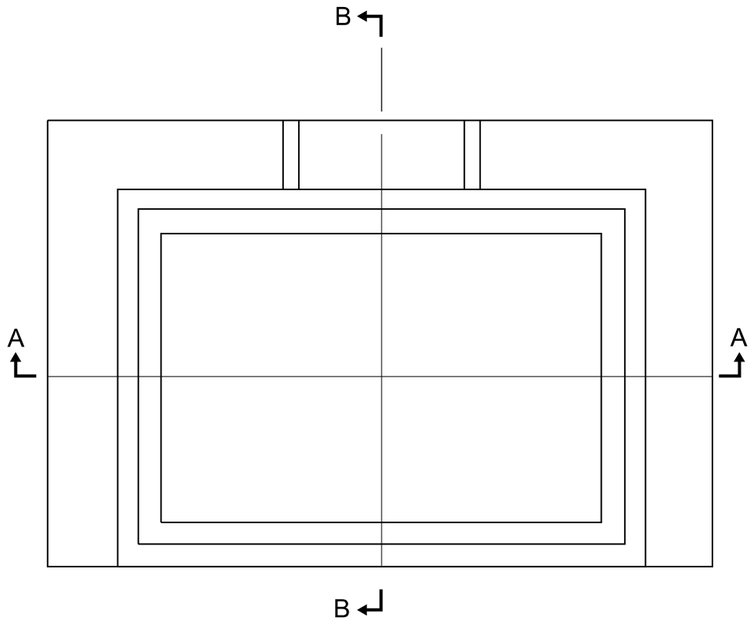
STANDARD 604011-05

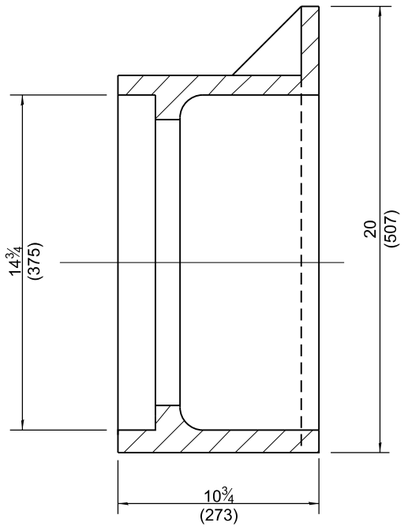
Illinois Department of Transportation

APPROVED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

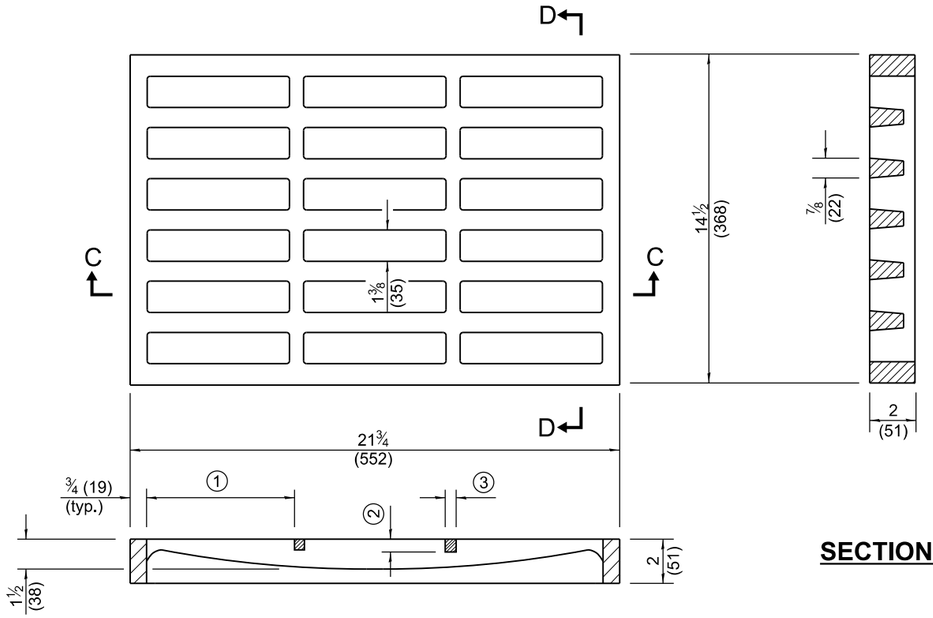
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97





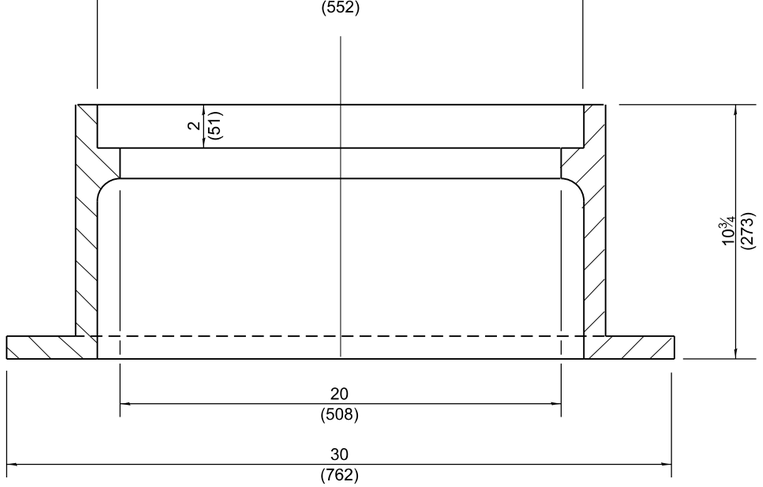
SECTION B-B



SECTION D-D

SECTION C-C

① = 6¼ (159) (typ.)
② = ¾ (19) (typ.)
③ = ⅝ (16) (typ.)



SECTION A-A

CAST FRAME

CAST GRATE

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

Illinois Department of Transportation

APPROVED April 1, 2016
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

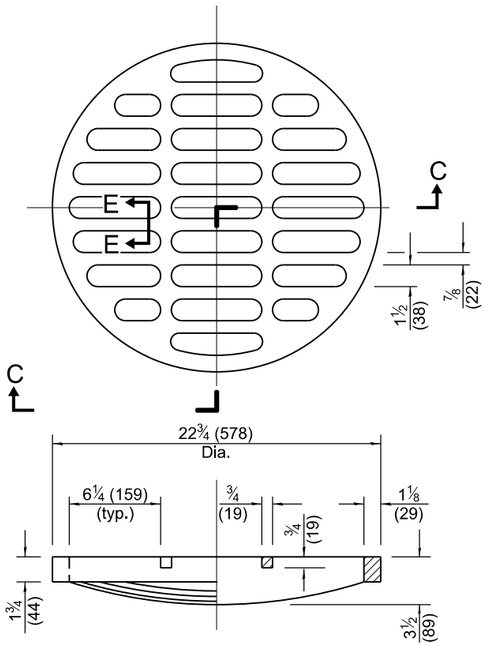
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
4-1-16	Corrected dimension on
	SECTION A-A.
1-1-15	Revised dimensions of frame
	and grate.

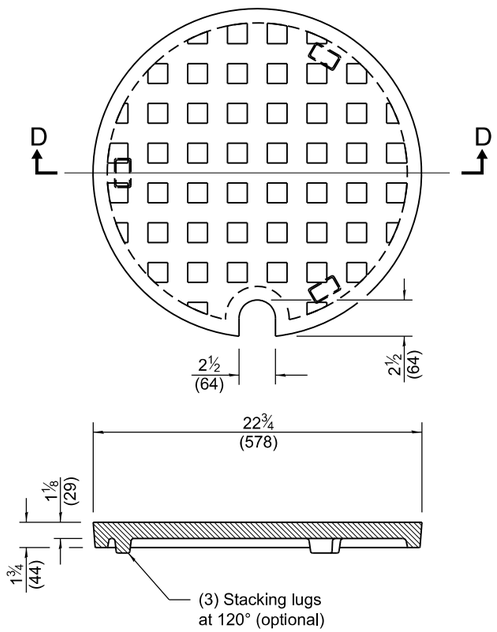
FRAME AND GRATE TYPE 4

STANDARD 604016-04



SECTION C-C

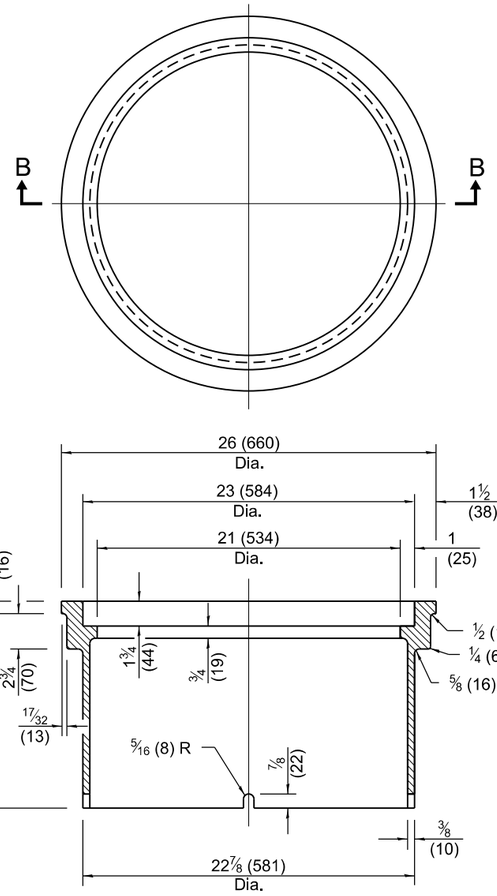
CAST OPEN LID



SECTION D-D

CAST CLOSED LID

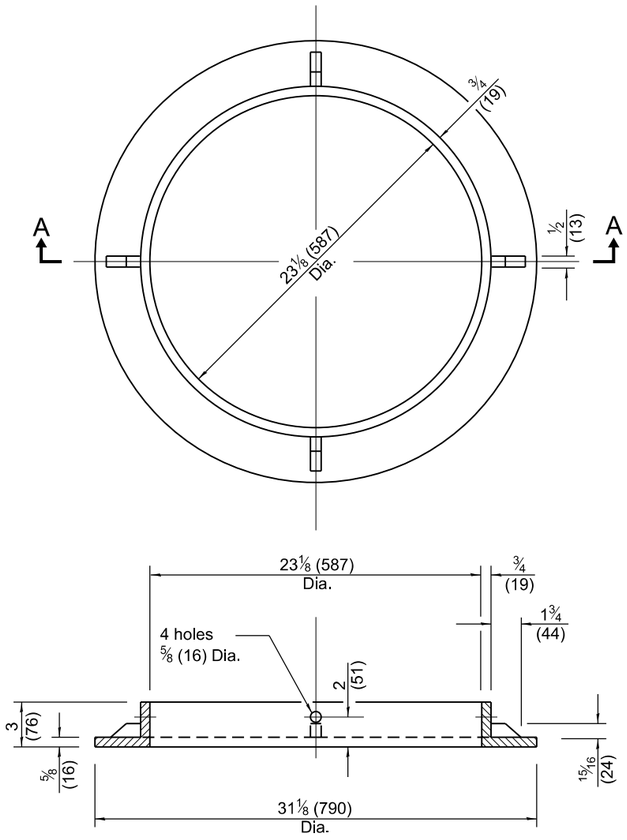
Gray Iron



SECTION B-B

CAST FRAME

Gray Iron

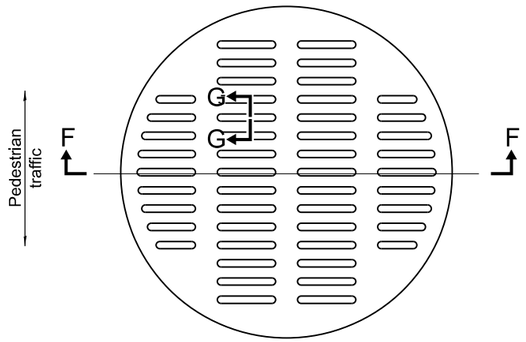


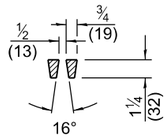
SECTION A-A

CAST BASE

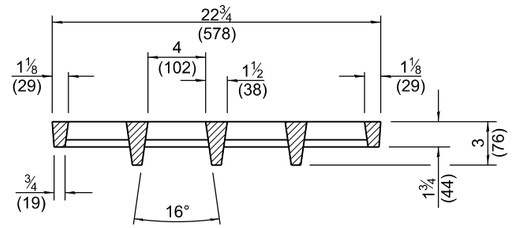
Gray Iron

SECTION E-E



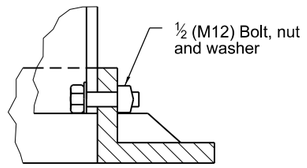


SECTION G-G



SECTION F-F

ADA COMPLIANT CAST OPEN LID



DETAIL OF BOLTING FRAME TO BASE

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

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED January 1, 2020
ENGINEER OF POLICY AND PROCEDURES

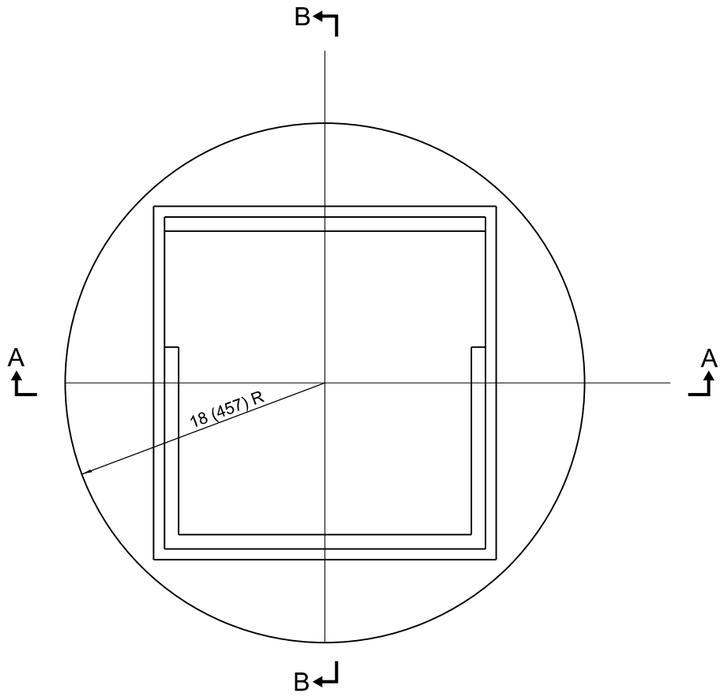
APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

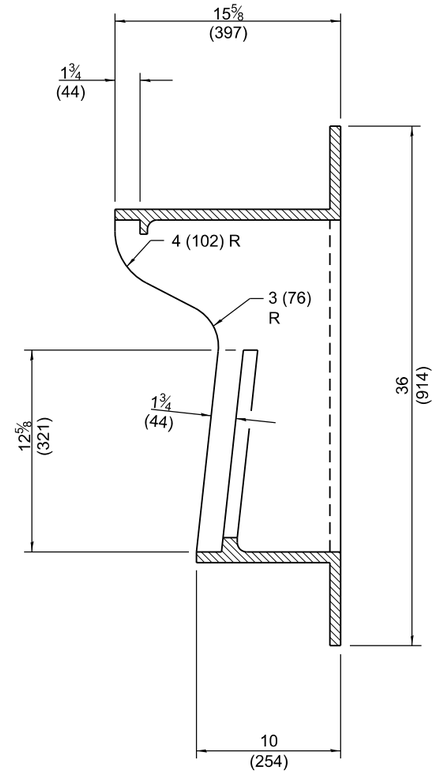
ISSUED 1-1-97

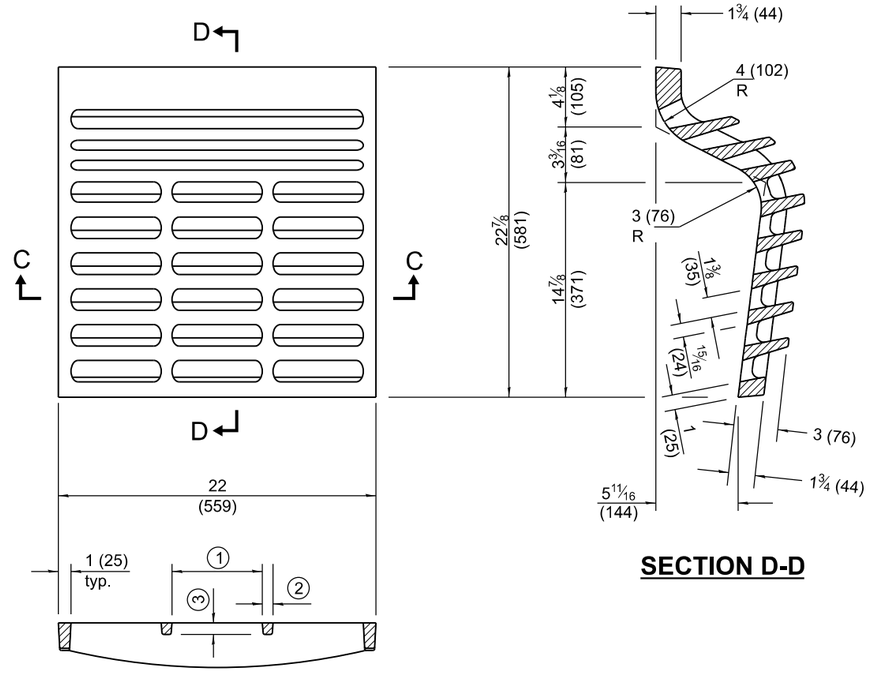
DATE	REVISIONS
1-1-20	Revised dimension location in
	Section A-A.
1-1-15	Added ADA compliant open lid.

BASE, FRAME AND LIDS TYPE 5

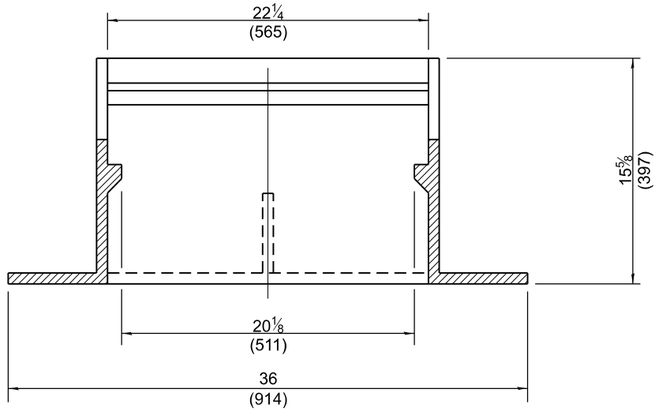
STANDARD 604021-04







SECTION D-D



SECTION A-A

SECTION B-B

SECTION C-C

① = 6¼ (159) max. (typ.)
② = ¾ (19) min. (typ.)
③ = 3⁄16 (21) min. (typ.)

CAST FRAME

CAST GRATE

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

Illinois Department of Transportation

APPROVED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

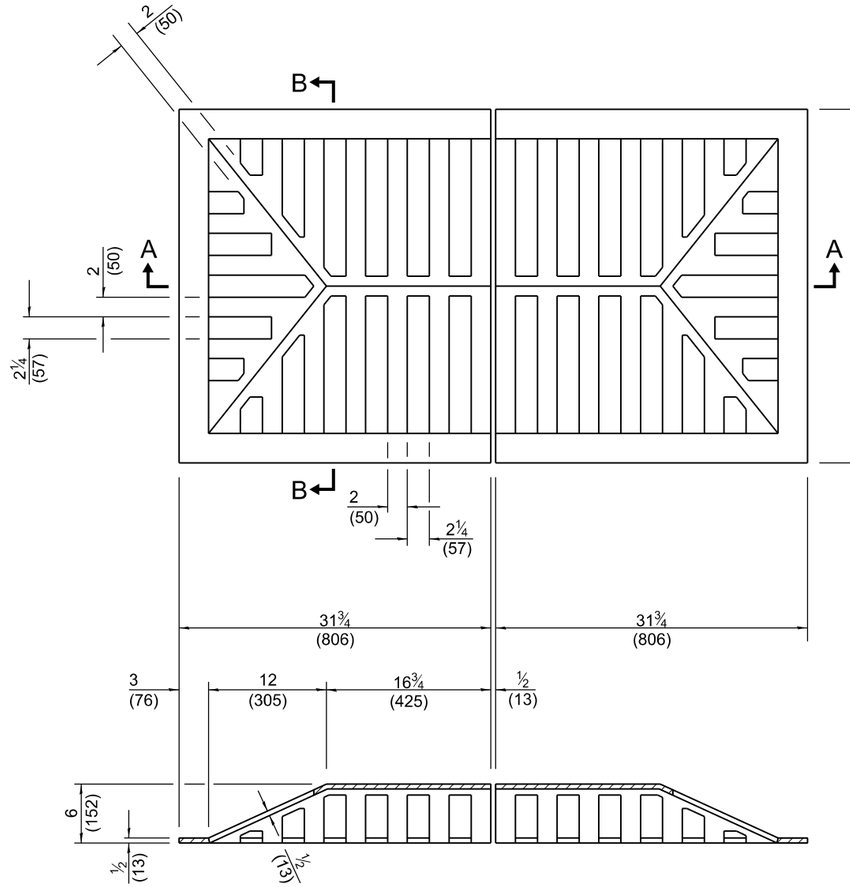
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

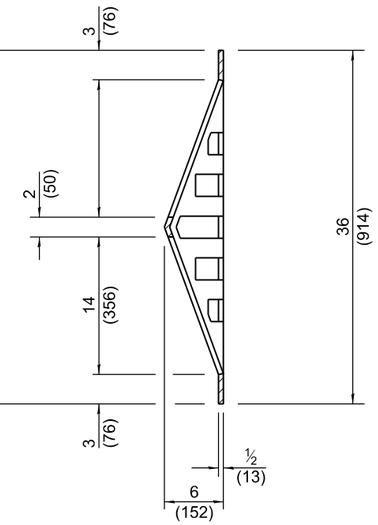
DATE	REVISIONS
1-1-15	Revised dimensions of frame
	and grate.
1-1-09	Switched units to English (metric).

FRAME AND GRATE TYPE 6

STANDARD 604026-03



SECTION A-A



SECTION B-B

CAST GRATE

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

Illinois Department of Transportation

APPROVED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

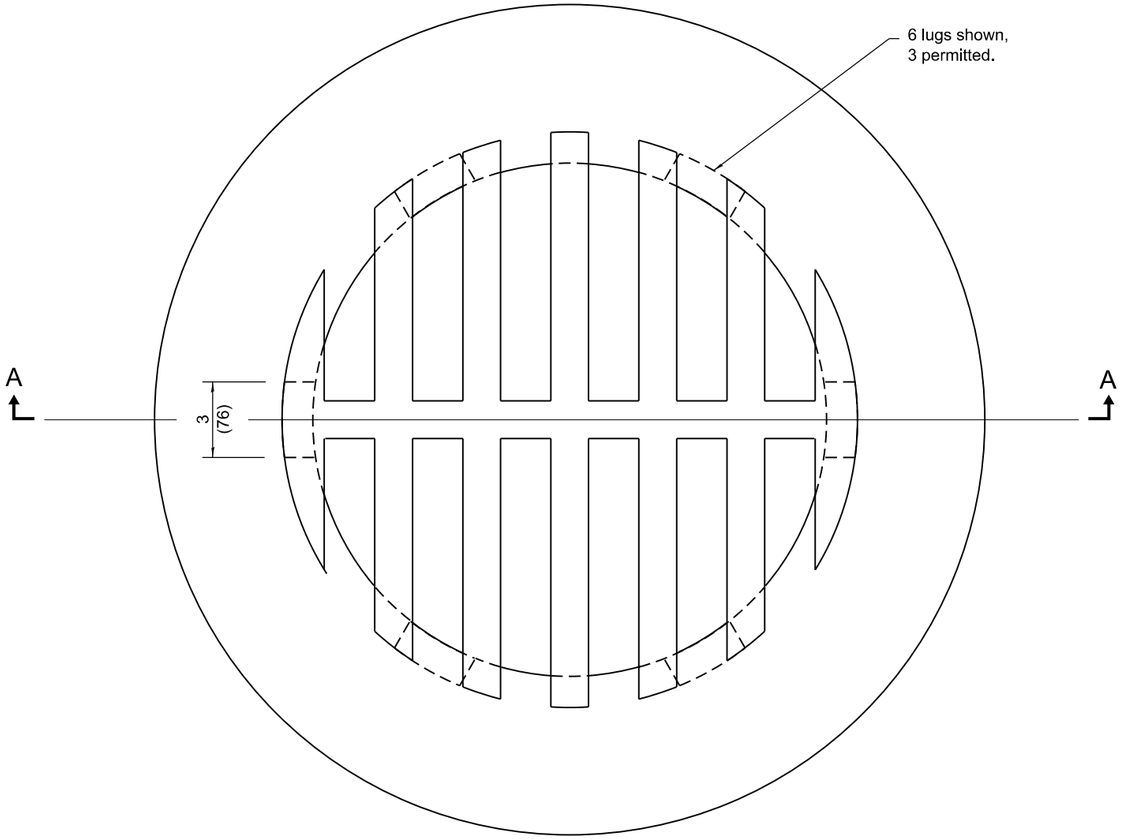
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

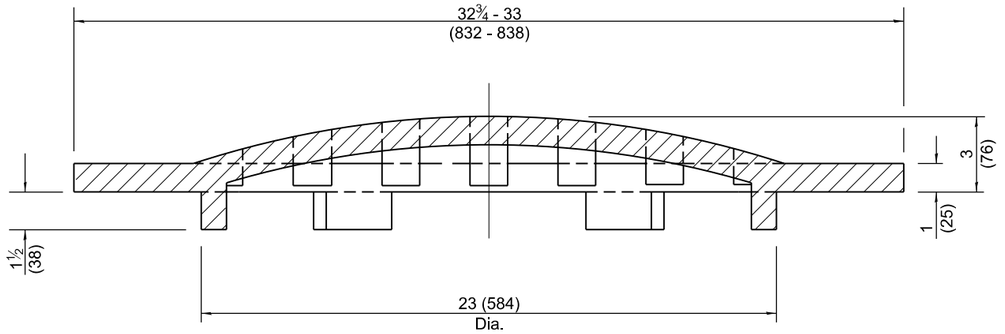
DATE	REVISIONS
1-1-15	Revised grate thickness.
1-1-09	Switched units to English (metric).

GRATE TYPE 7

STANDARD 604031-03



CAST GRATE



SECTION A-A

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

Illinois Department of Transportation

APPROVED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

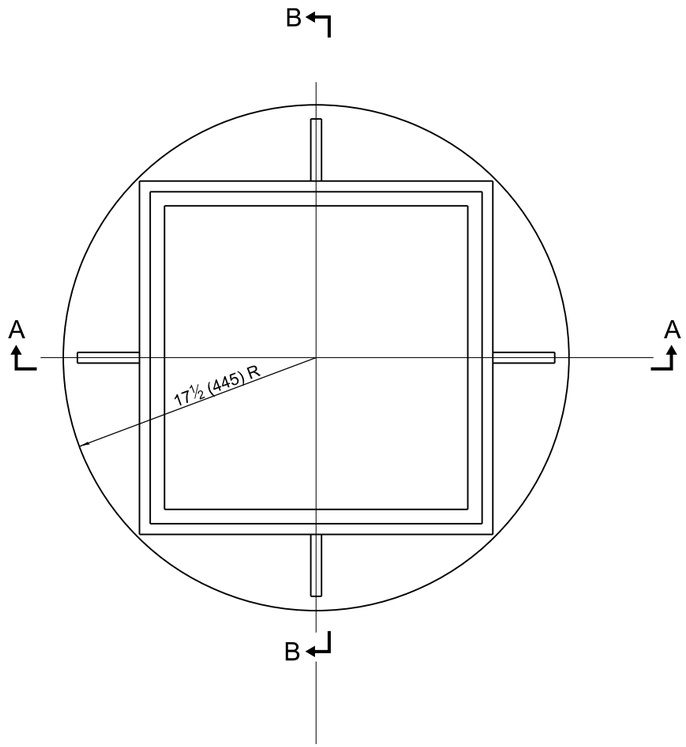
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

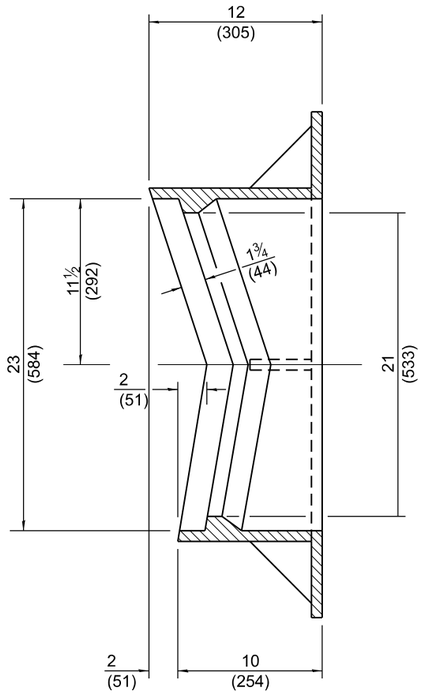
ISSUED 1-1-97

DATE	REVISIONS
1-1-15	Revised dimensions.
1-1-09	Switched units to English (metric).

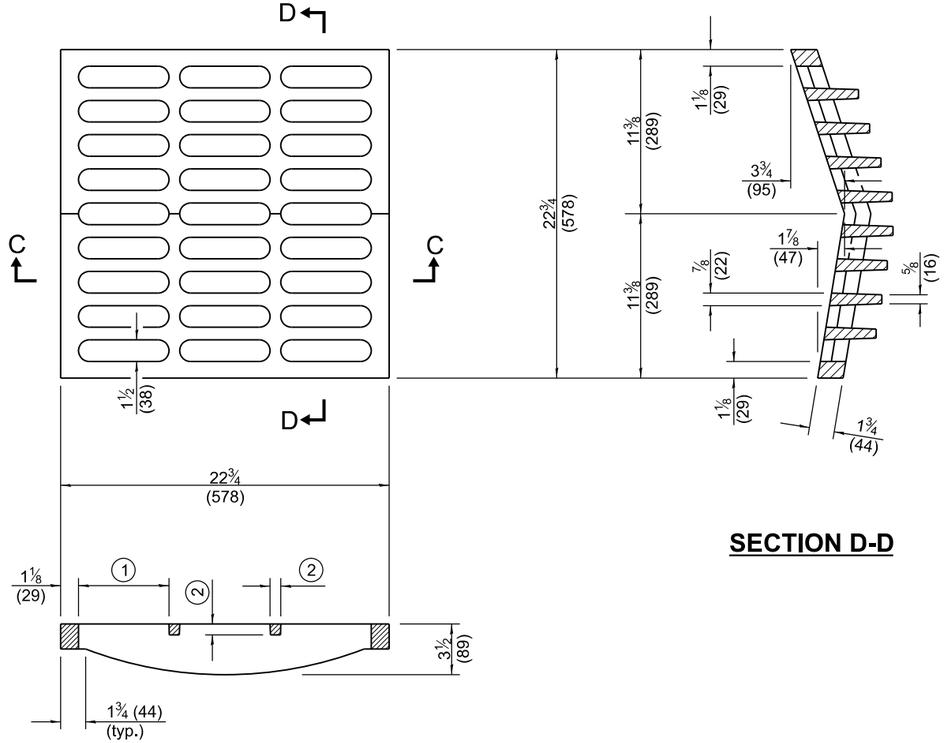
GRATE TYPE 8

STANDARD 604036-03

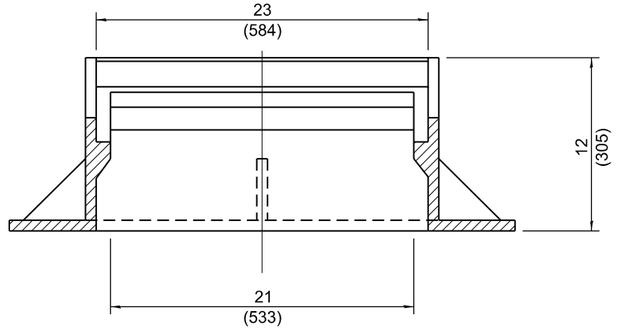




SECTION B-B



SECTION D-D



SECTION A-A

SECTION C-C

(1) = 6¼ (159) max. (typ.)
(2) = ¾ (19) min. (typ.)

CAST GRATE

CAST FRAME

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

Illinois Department of Transportation

APPROVED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

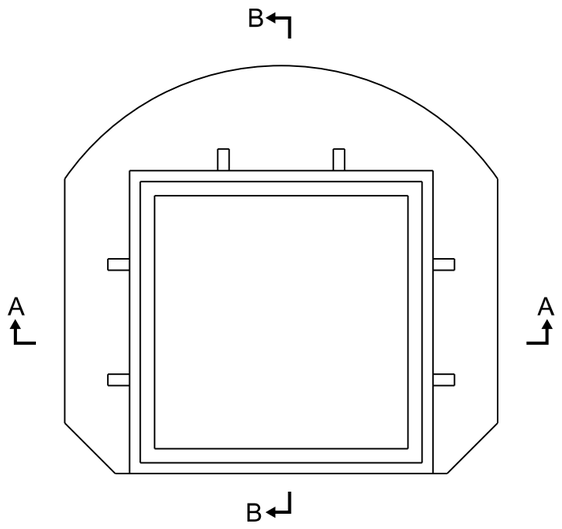
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

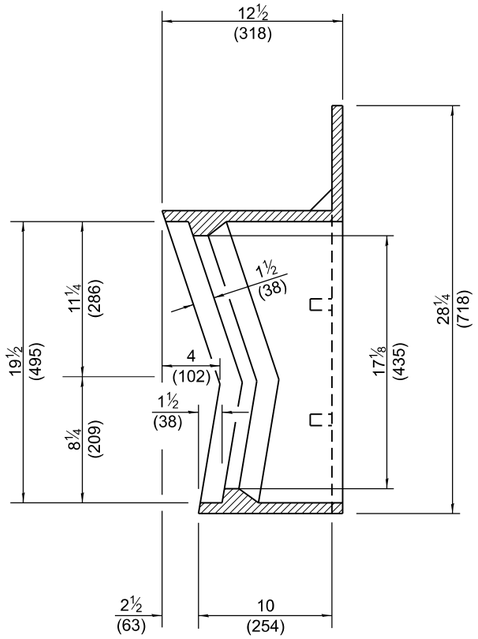
ISSUED 1-1-97

DATE	REVISIONS
1-1-15	Revised dimensions of frame.
1-1-09	Switched units to English (metric).

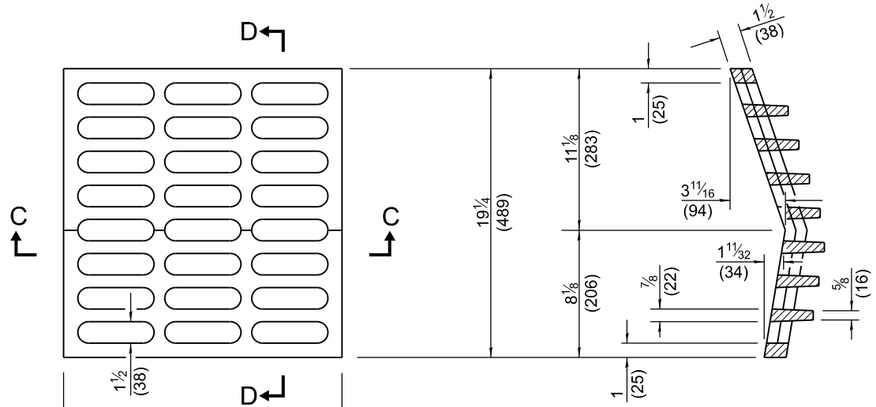
FRAME AND GRATE TYPE 9

STANDARD 604041-03

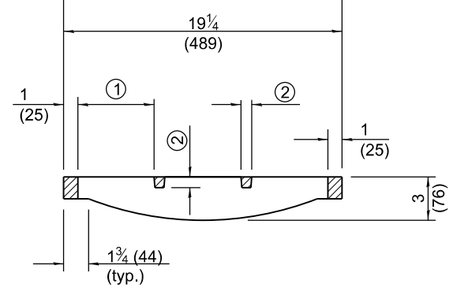




SECTION B-B

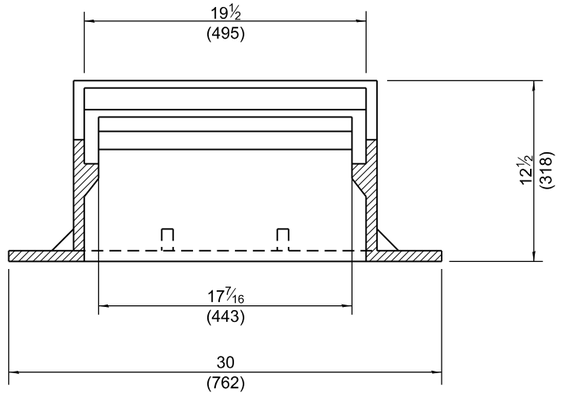


SECTION D-D



SECTION C-C

① = 6¼ (159) max. (typ.)
② = ¾ (19) min. (typ.)



SECTION A-A

CAST GRATE

CAST FRAME

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

Illinois Department of Transportation

APPROVED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

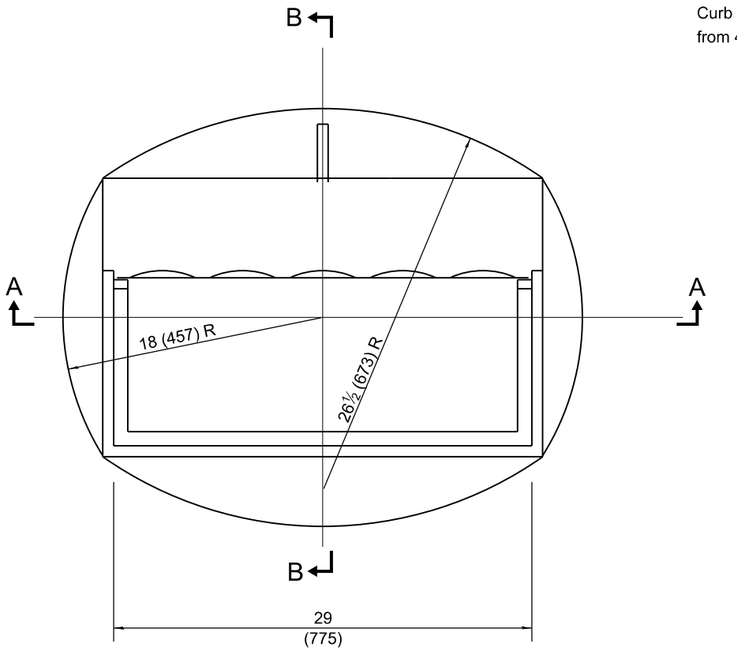
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

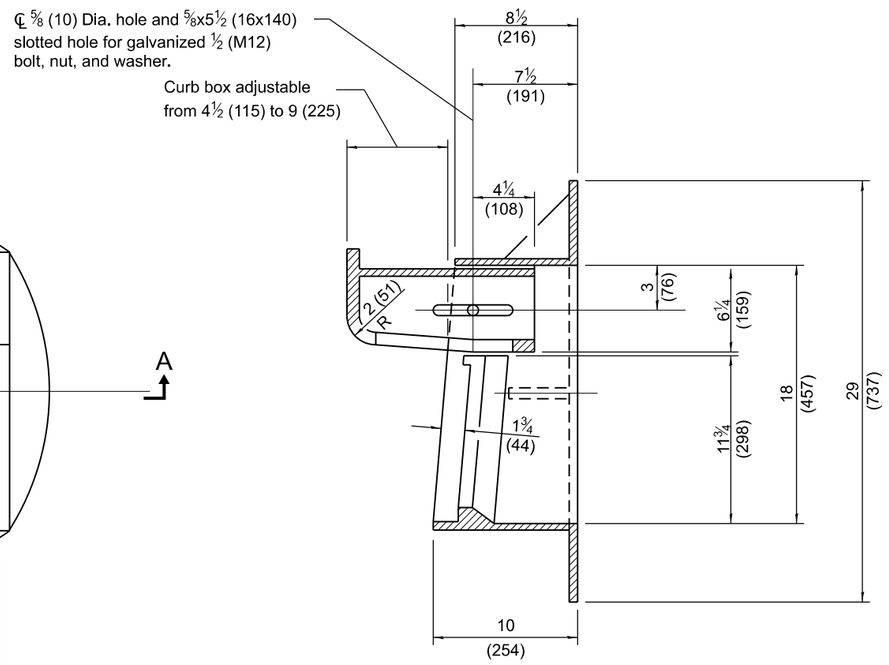
DATE	REVISIONS
1-1-15	Revised dimensions of frame.
1-1-09	Switched units to English (metric).

FRAME AND GRATE TYPE 10

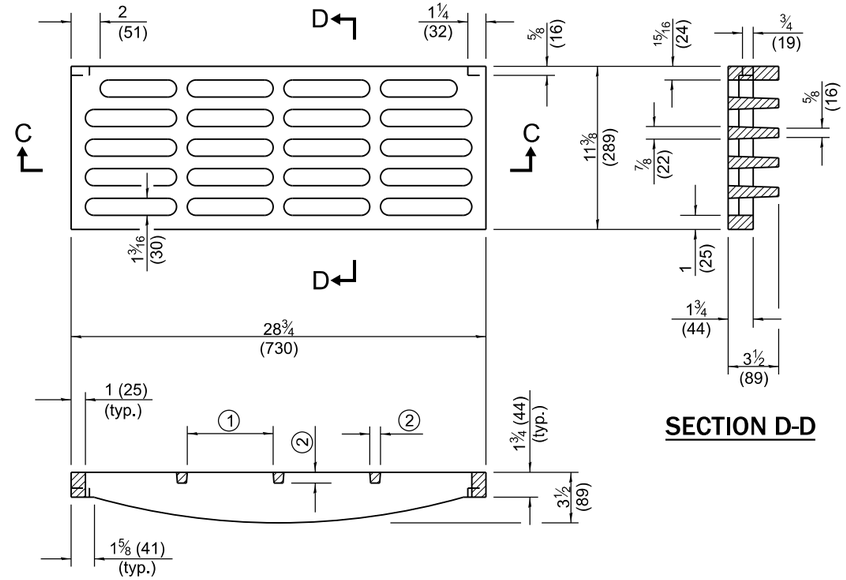
STANDARD 604046-03



CAST FRAME



SECTION B-B



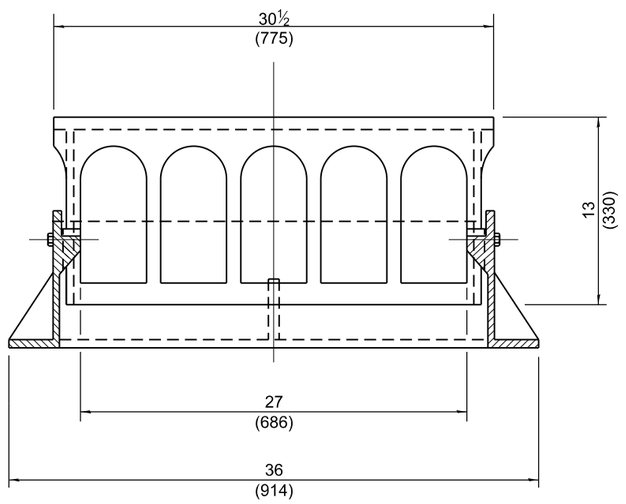
SECTION D-D

SECTION C-C

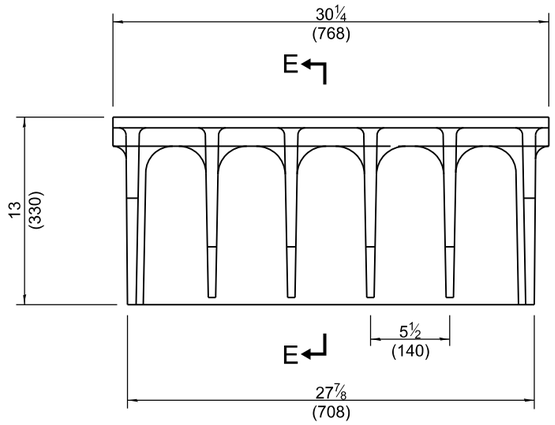
① = 6¼ (159) max. (typ.)

② = ¾ (19) min. (typ.)

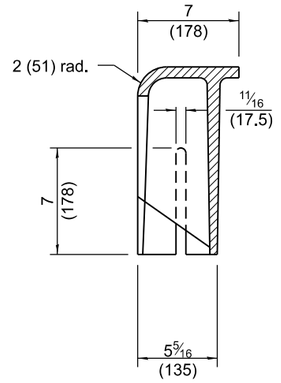
CAST GRATE



SECTION A-A



ALTERNATE CURB BOX



SECTION E-E

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

Illinois Department of Transportation

APPROVED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

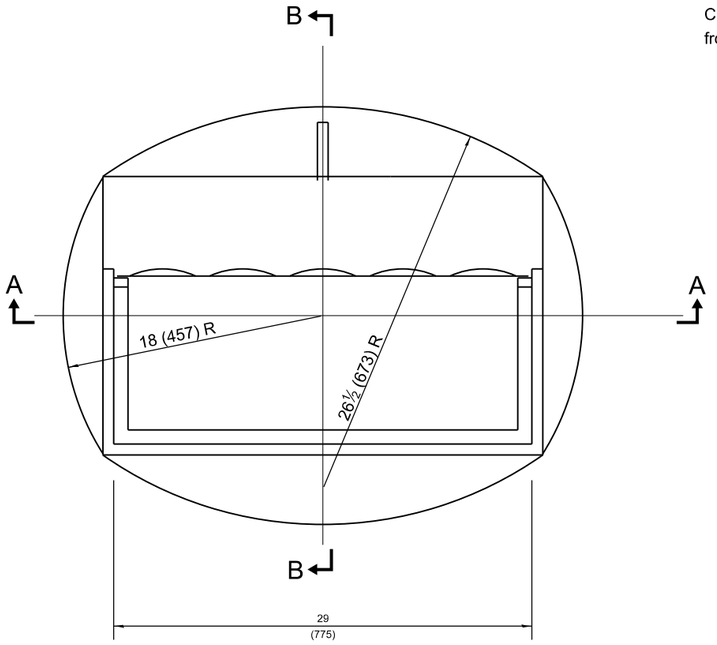
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

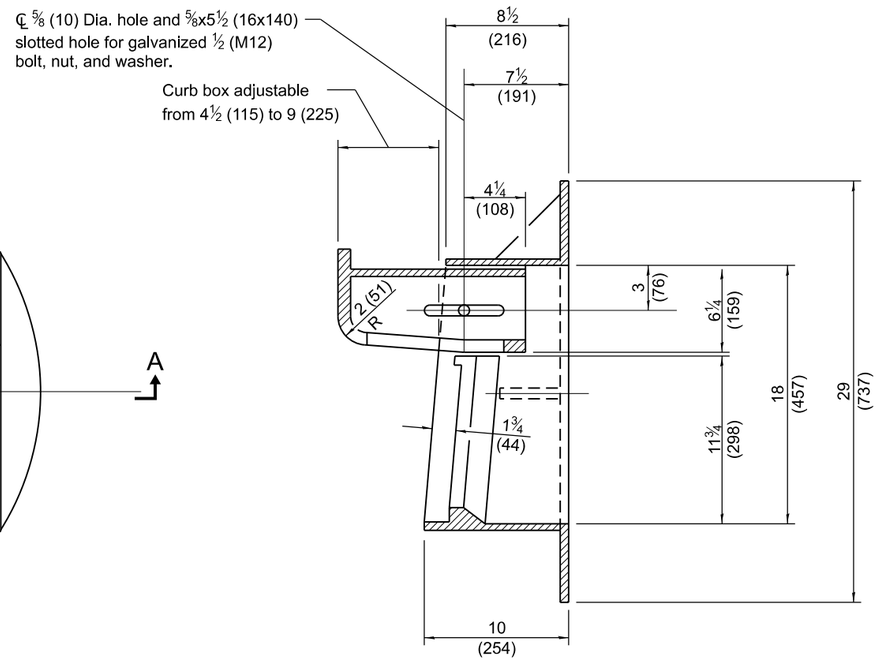
DATE	REVISIONS
1-1-15	Revised dimensions of frame
	and alternate curb box.
4-1-09	Switched units to English (metric).

FRAME AND GRATE TYPE 11

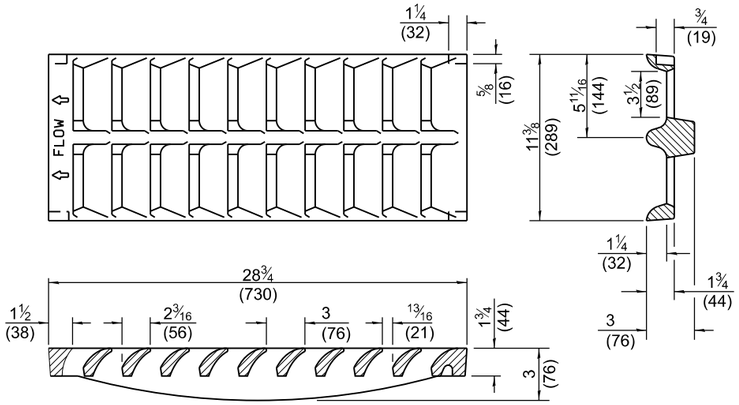
STANDARD 604051-04



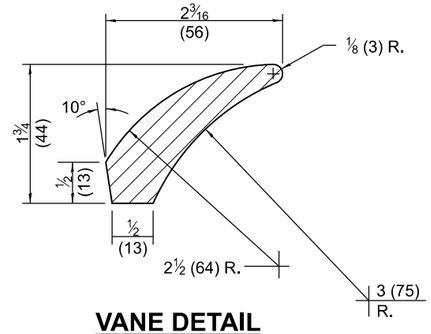
CAST FRAME



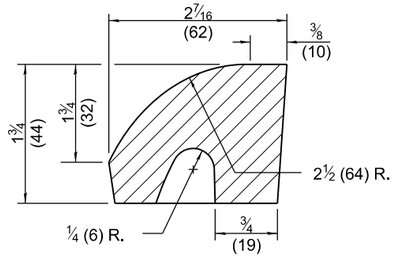
SECTION B-B



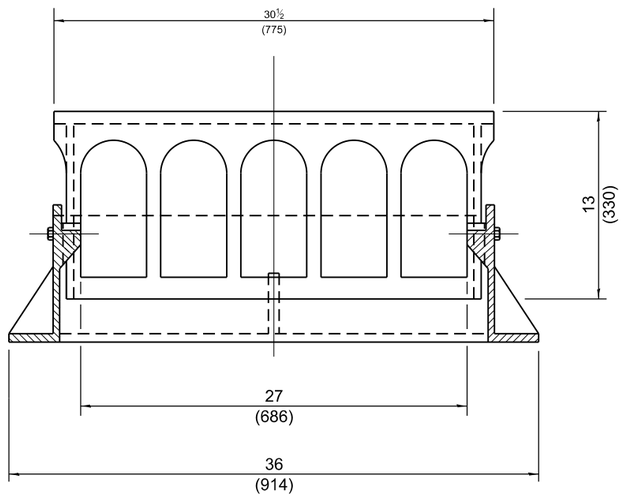
CAST GRATE



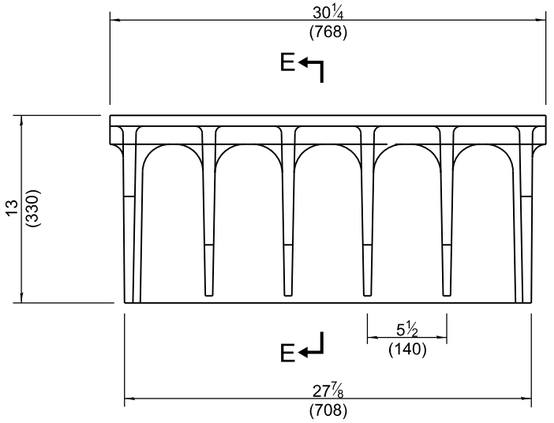
VANE DETAIL



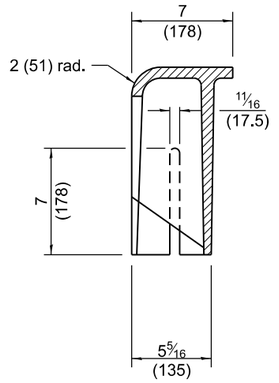
FRONT VANE DETAIL



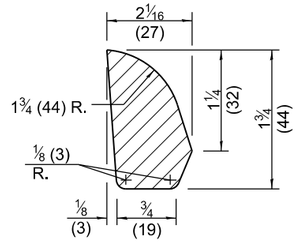
SECTION A-A



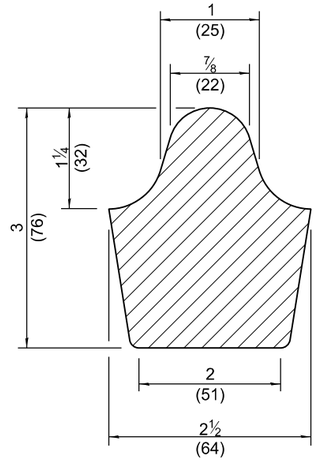
ALTERNATE CURB BOX



SECTION E-E



SIDE RIB DETAIL



MIDDLE RIB DETAIL

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

Illinois Department of Transportation

APPROVED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

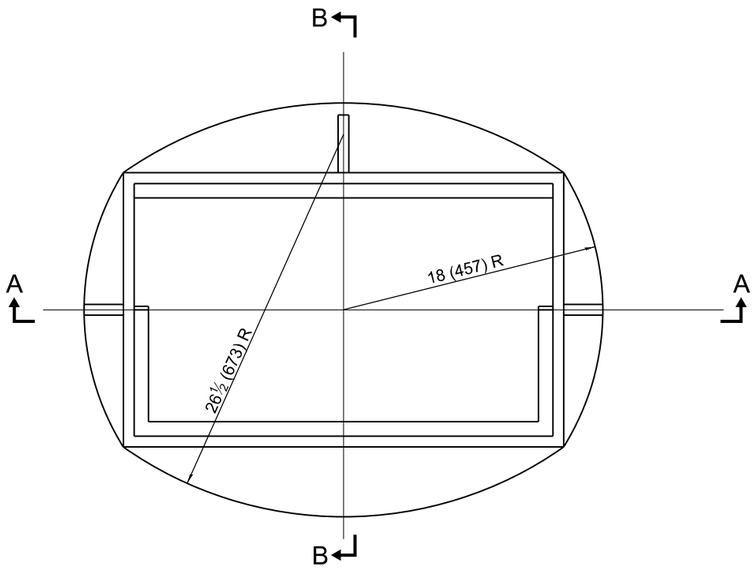
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

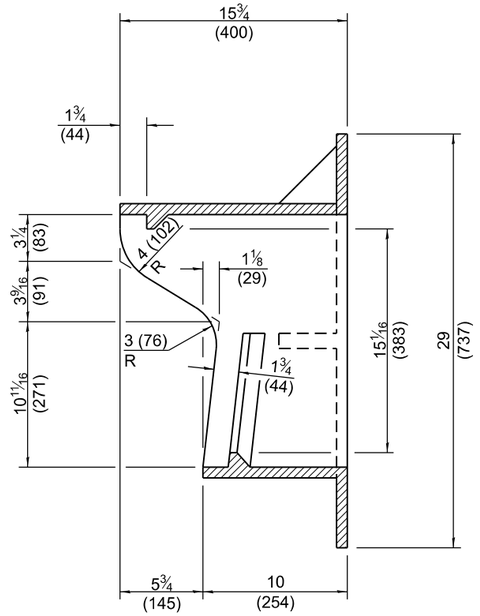
ISSUED 1-1-97

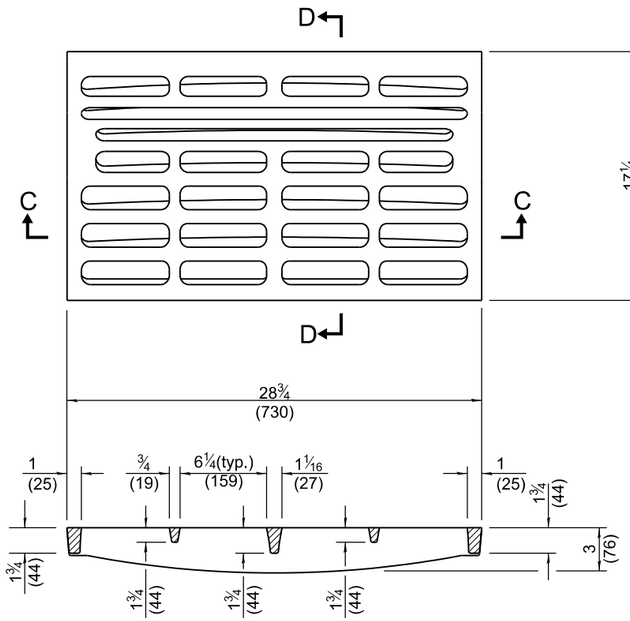
DATE	REVISIONS
1-1-15	Revised dimensions of frame
	and alternate curb box.
1-1-09	Switched units to English (metric).

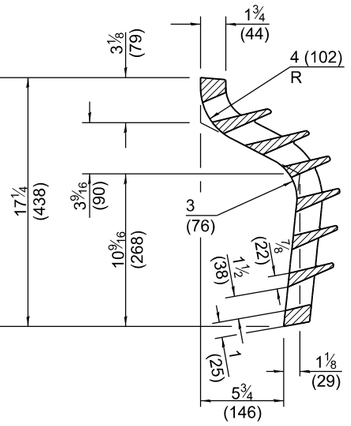
FRAME AND GRATE TYPE 11V

STANDARD 604056-04

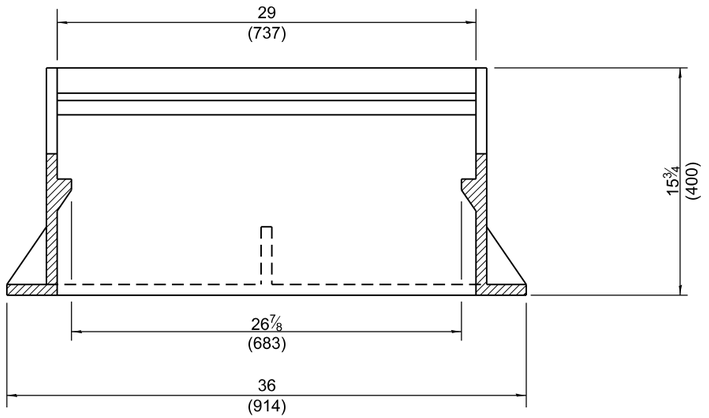








SECTION D-D



SECTION A-A

SECTION B-B

SECTION C-C

CAST GRATE

CAST FRAME

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

Illinois Department of Transportation

APPROVED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

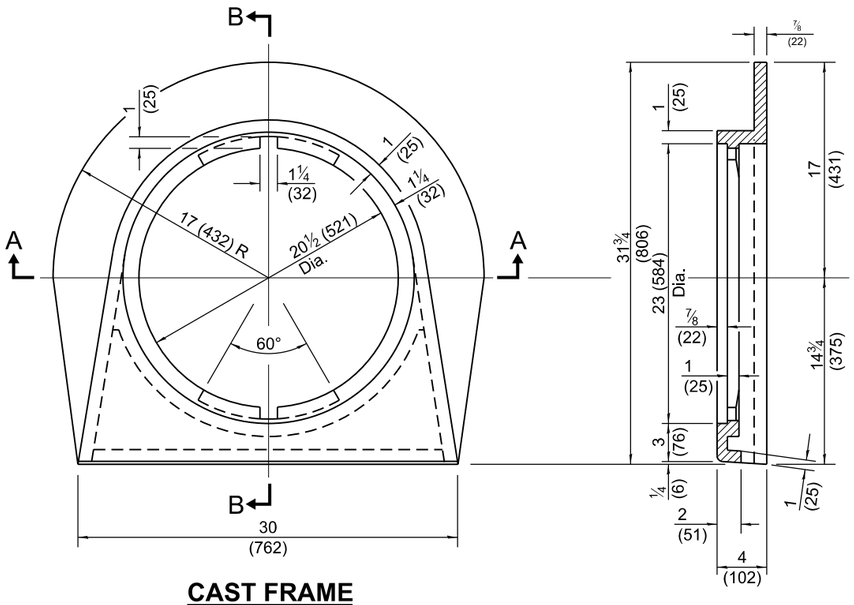
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-15	Revised dimensions of frame
	and grate.
1-1-09	Swtiched units to English (metric).

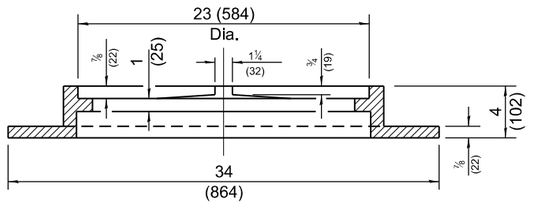
FRAME AND GRATE TYPE 12

STANDARD 604061-03

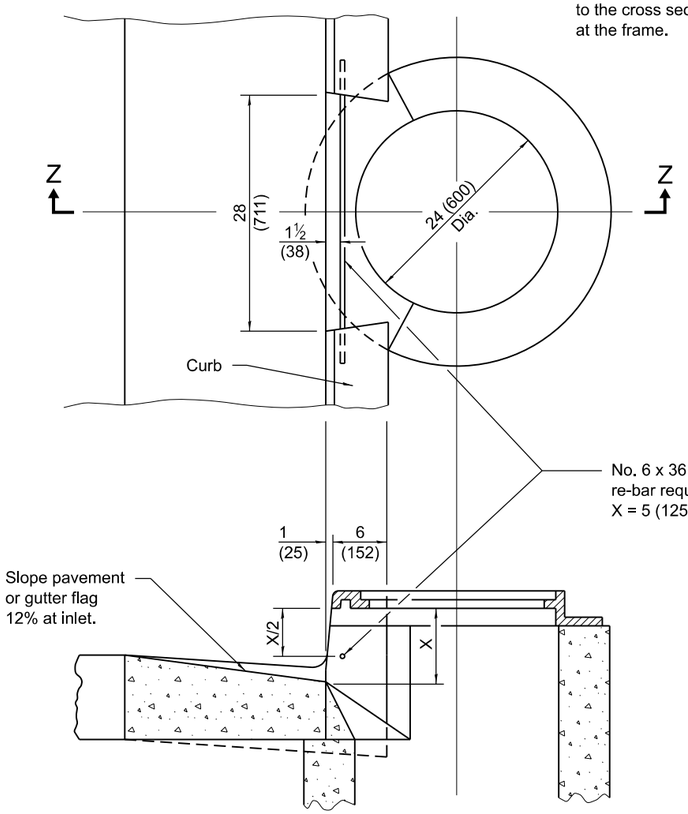


CAST FRAME
(GRAY IRON)

SECTION B-B



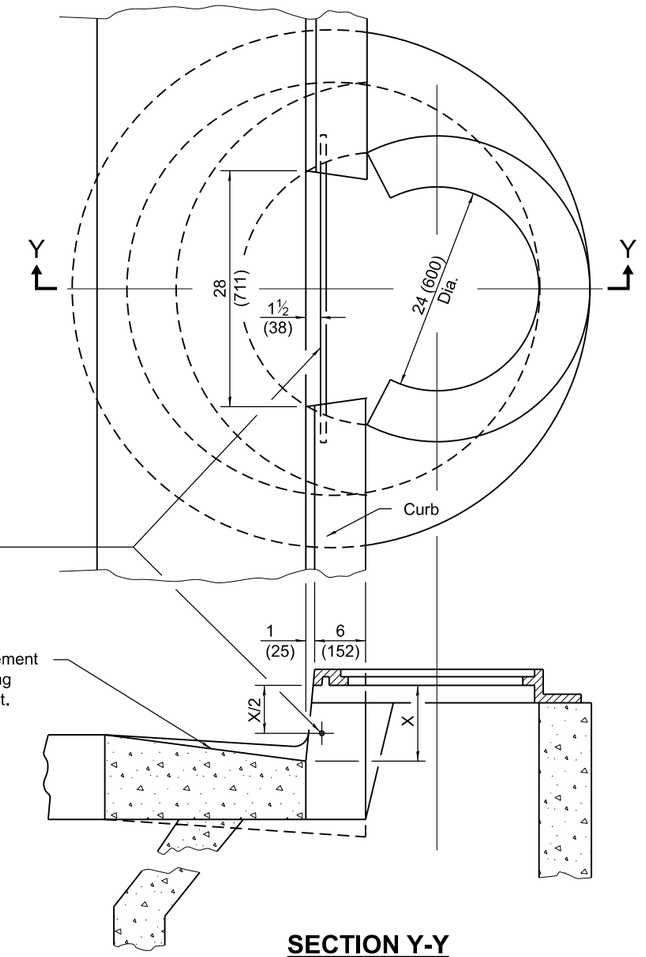
SECTION A-A



SECTION Z-Z
(WITH FRAME)

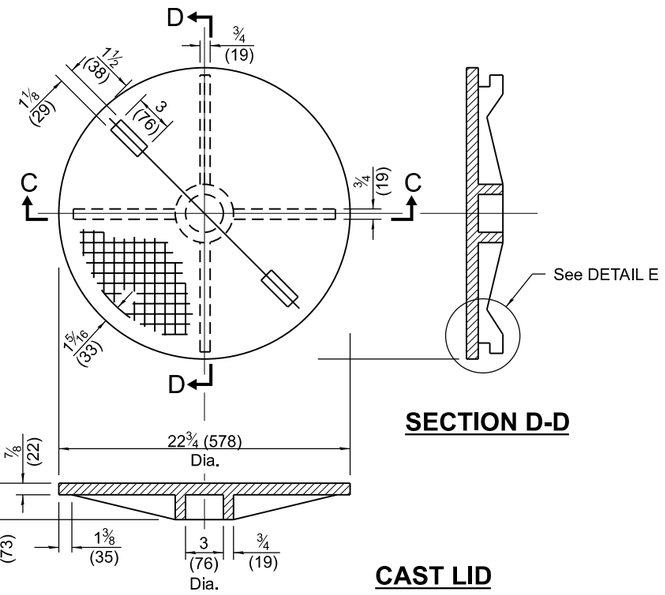
CASE II

NOTE:
Warp sloping face of curbs in a distance of 5' (1.5 m) to the cross section shown at the frame.



SECTION Y-Y
(WITH FRAME)

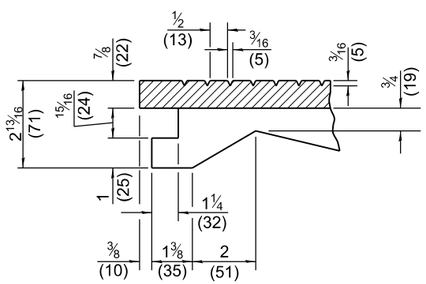
CASE I



SECTION D-D

CAST LID

SECTION C-C



DETAIL E

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

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-04	Removed weights.

FRAME AND LID TYPE 15

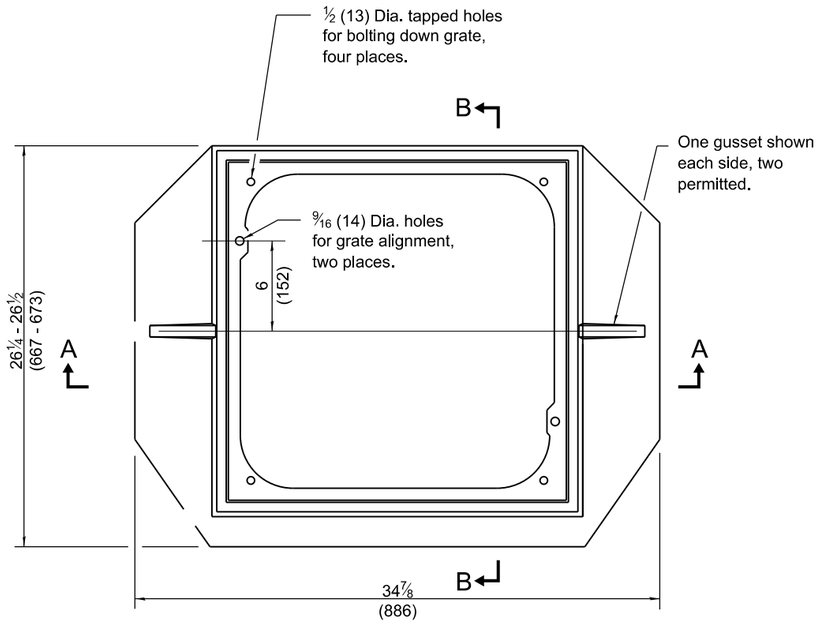
STANDARD 604066-02

Illinois Department of Transportation

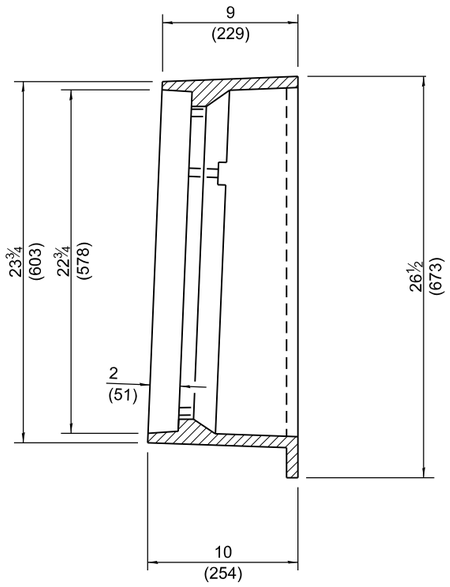
APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

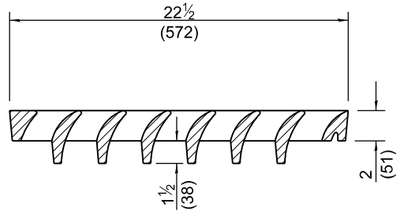
ISSUED 1-1-97



PLAN

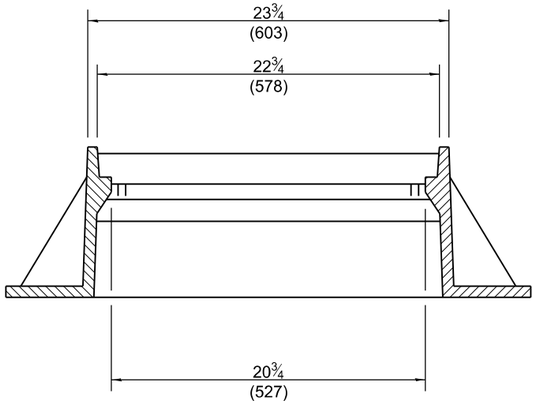


SECTION B-B

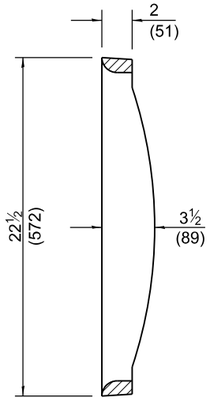


SECTION C-C

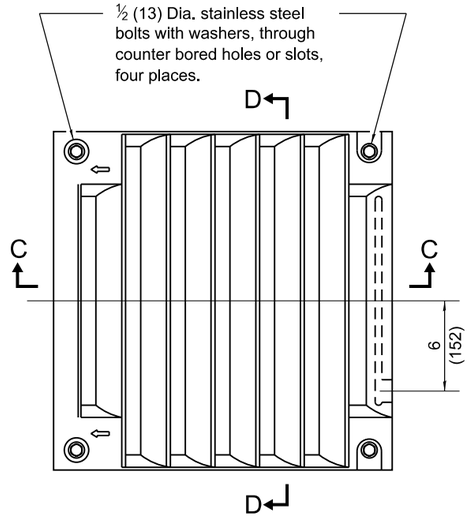
CAST FRAME



SECTION A-A



SECTION D-D



CAST GRATE

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

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

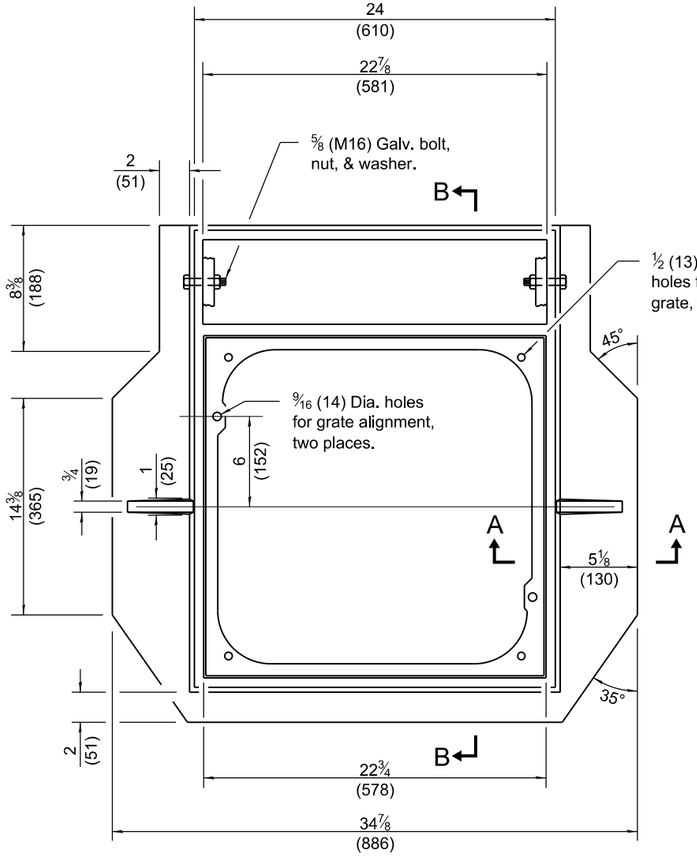
APPROVED January 1, 2022
Scott Schaefer
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

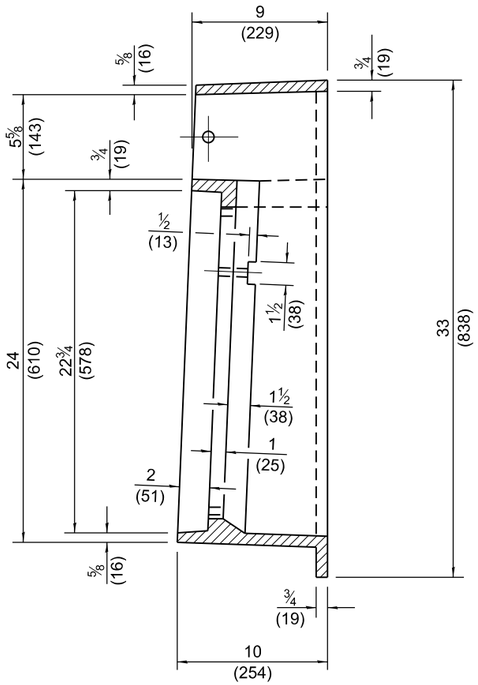
DATE	REVISIONS
1-1-22	Removed slots in frame which
	held the "safety bar".
1-1-21	Removed "safety bar" from frame.

FRAME AND GRATE TYPE 20

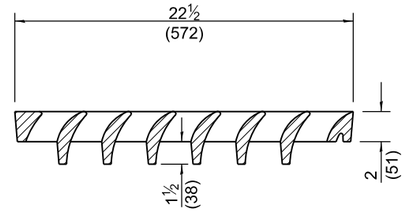
STANDARD 604071-07



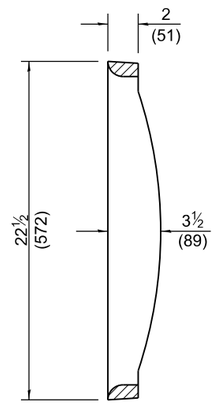
PLAN



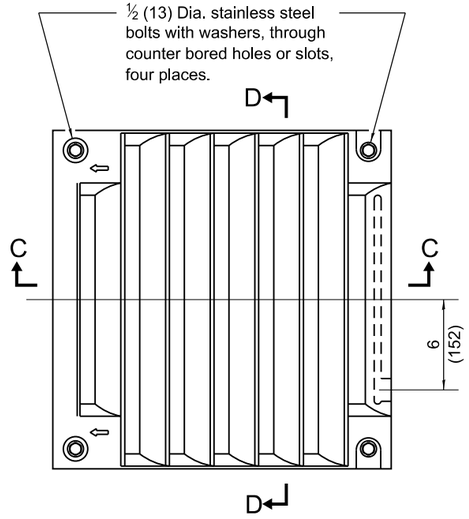
SECTION B-B



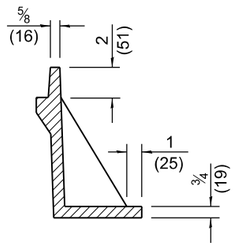
SECTION C-C



SECTION D-D

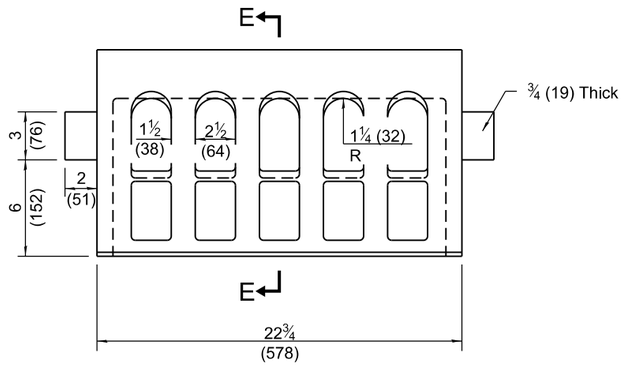


CAST GRATE

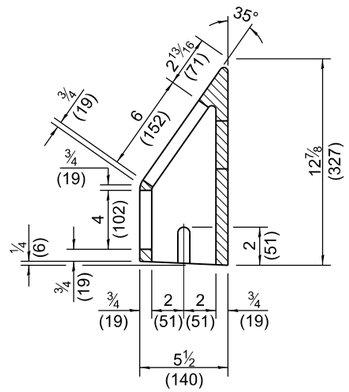


SECTION A-A

CAST FRAME



CURB BOX



SECTION E-E

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

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

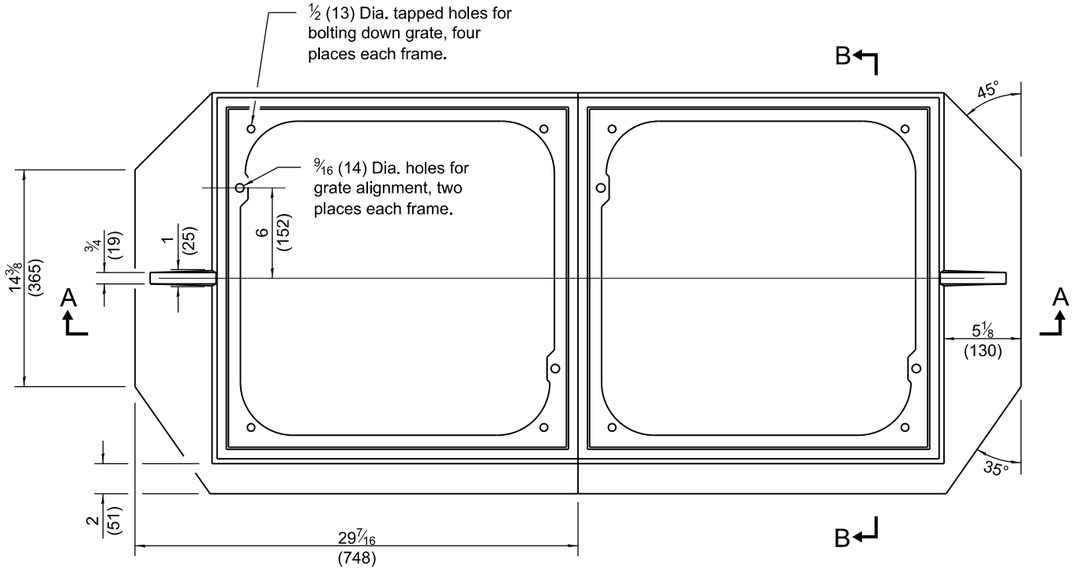
APPROVED January 1, 2022
Todd Coe
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

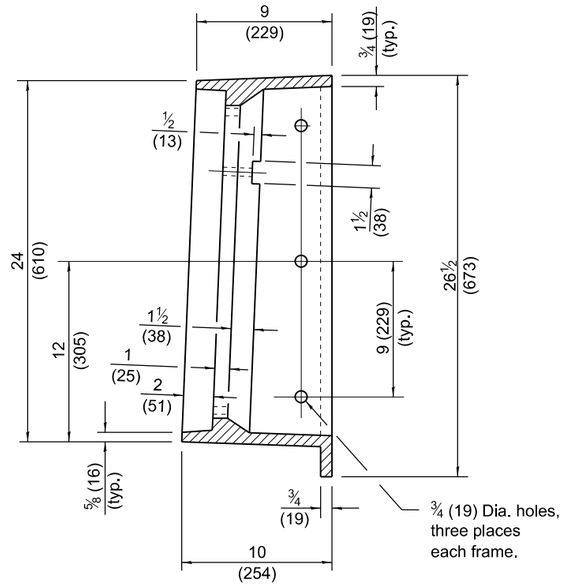
DATE	REVISIONS
1-1-22	Removed slots in frame which
	held the "safety bar".
1-1-21	Removed "safety bar" from frame.

FRAME AND GRATE TYPE 21

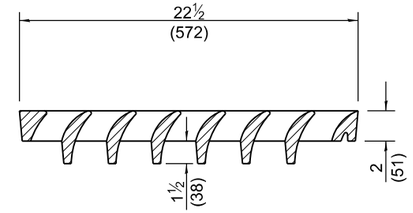
STANDARD 604076-06



PLAN

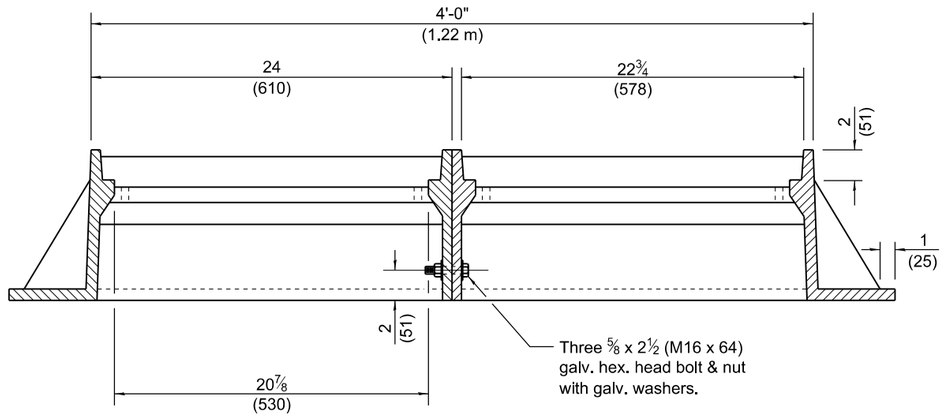


SECTION B-B

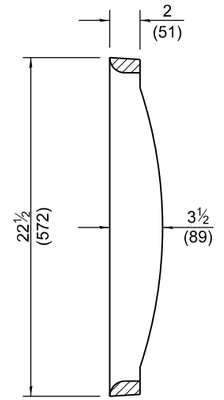


SECTION C-C

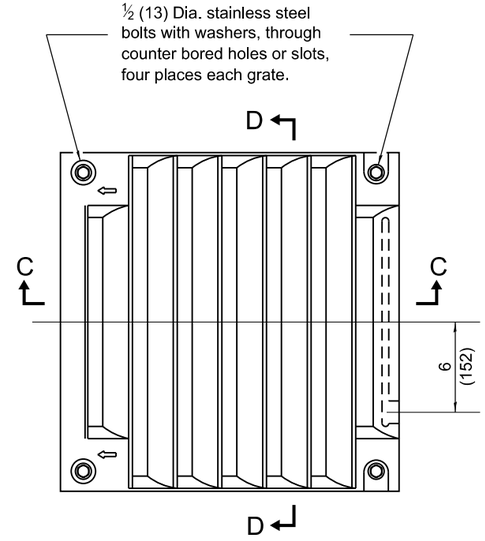
CAST FRAME



SECTION A-A



SECTION D-D



CAST GRATE

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

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

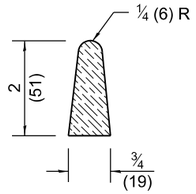
APPROVED January 1, 2022
Todd Carr
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

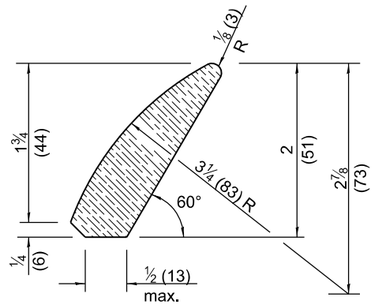
DATE	REVISIONS
1-1-22	Removed slots in frame which
	held the "safety bar".
1-1-21	Removed "safety bar" from frame.

FRAMES AND GRATES TYPE 22

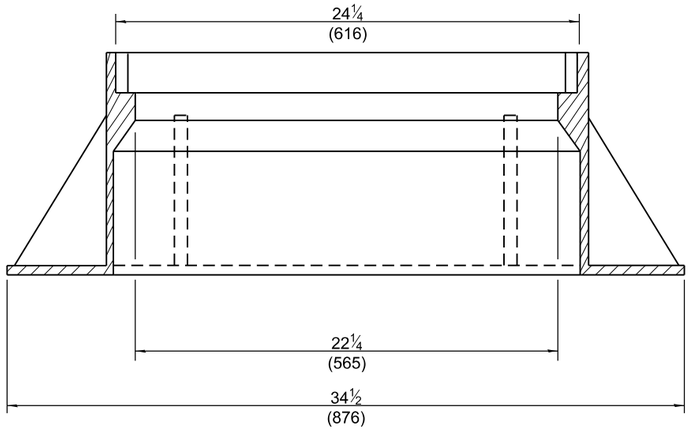
STANDARD 604081-06



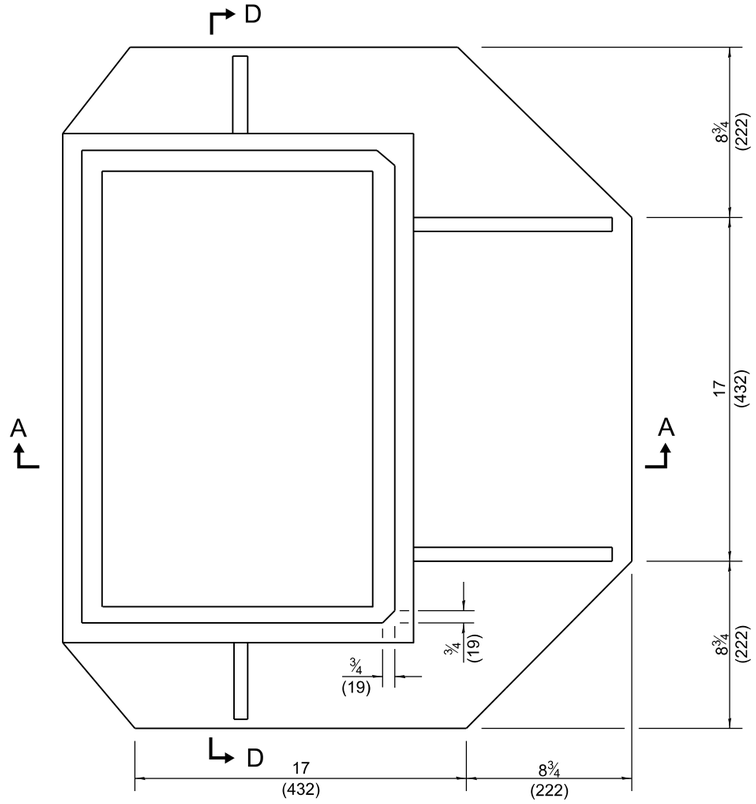
DETAIL A



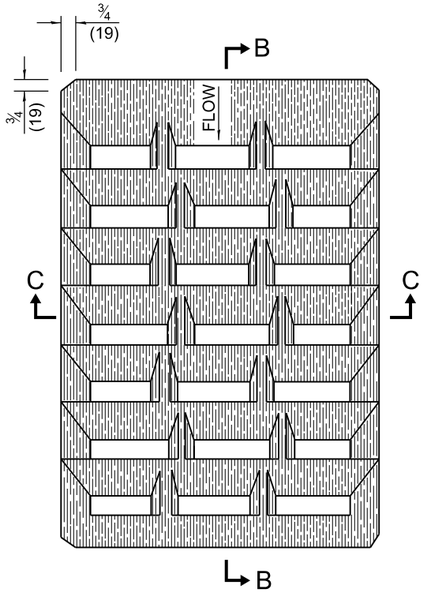
DETAIL B



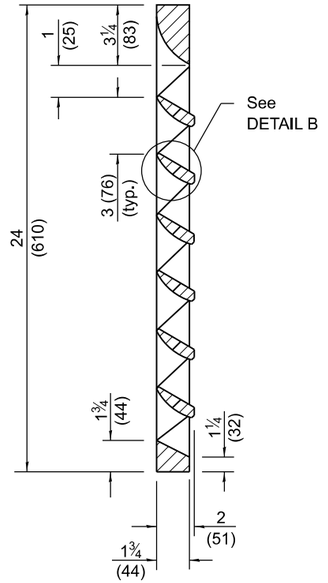
SECTION D-D



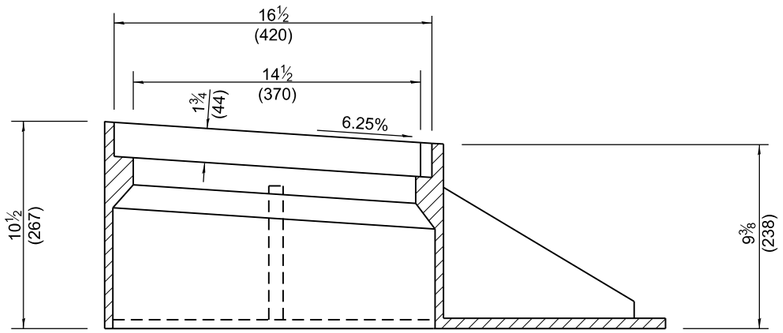
PLAN - FRAME



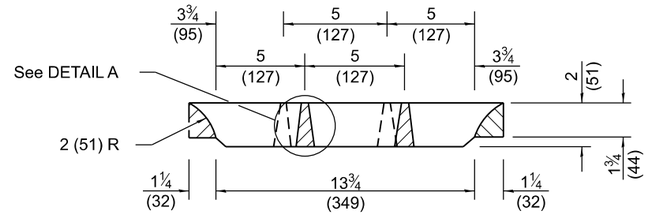
GRATE



SECTION B-B



SECTION A-A



SECTION C-C

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

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

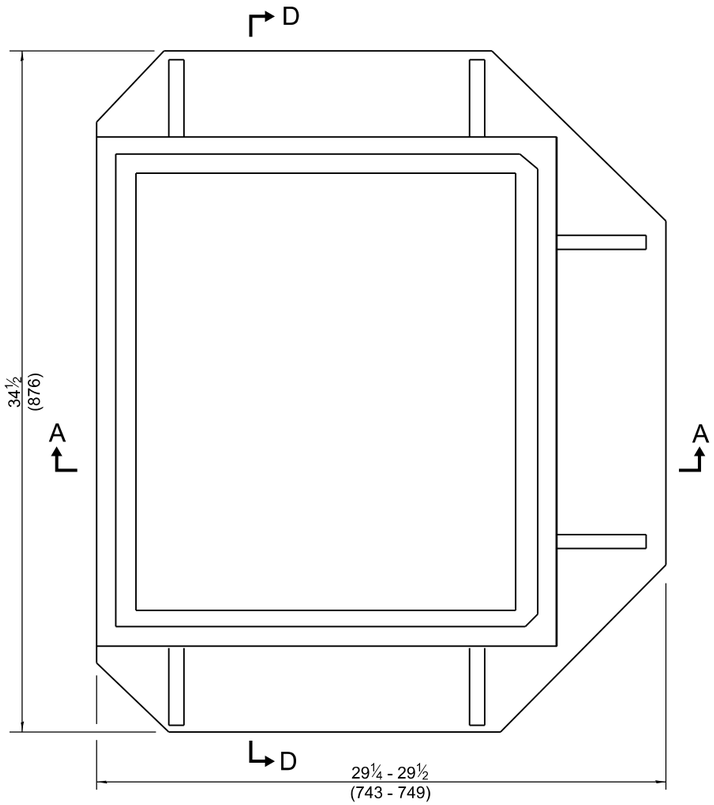
APPROVED January 1, 2022
Scott Cole
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

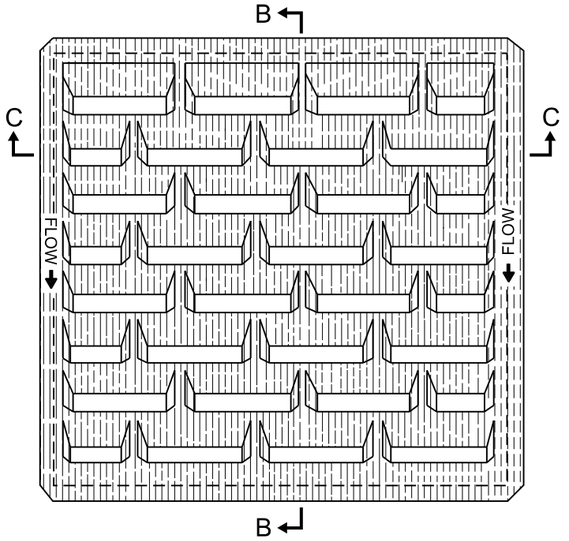
DATE	REVISIONS
1-1-22	Removed slots in frame which
	held the "safety bars".
1-1-21	Removed "safety bars" from frame.

FRAME AND GRATE TYPE 23

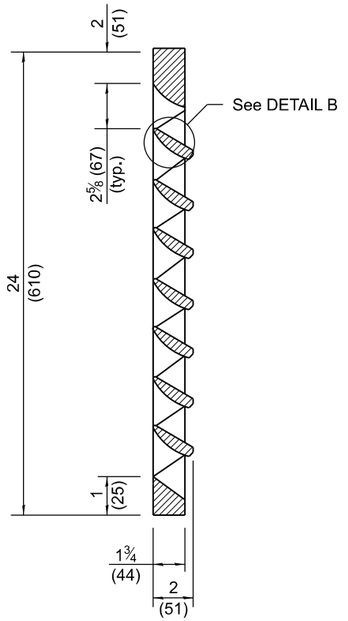
STANDARD 604086-05



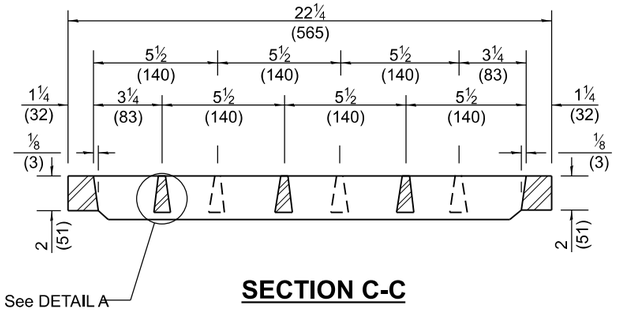
PLAN - FRAME



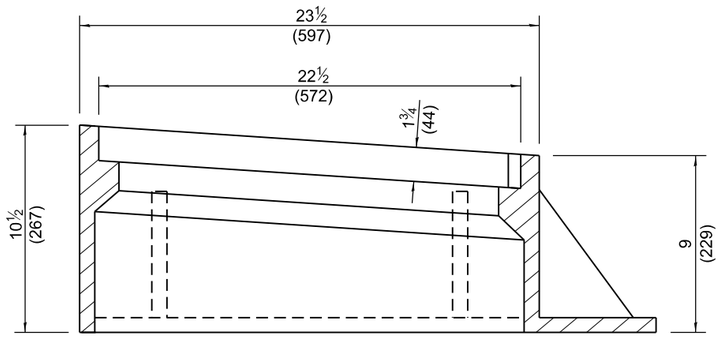
GRATE



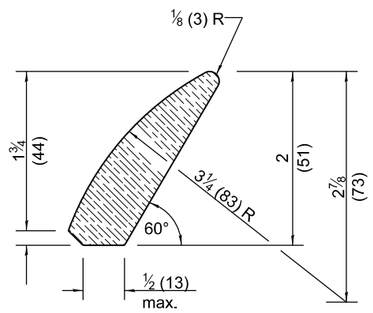
SECTION B-B



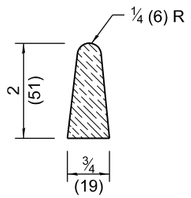
SECTION C-C



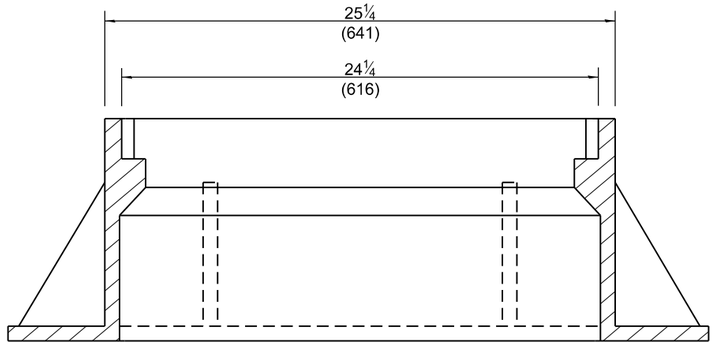
SECTION A-A



DETAIL B



DETAIL A



SECTION D-D

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

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

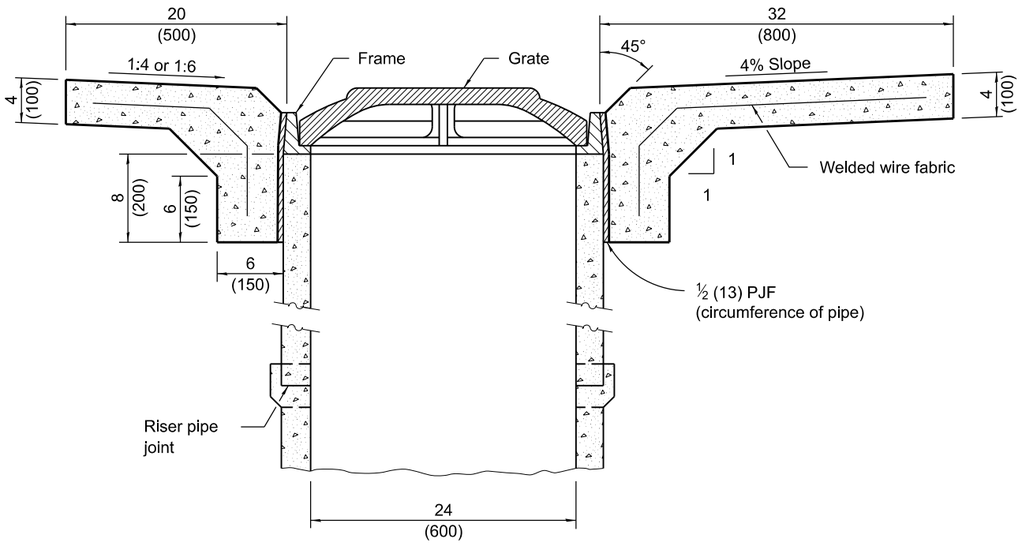
APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

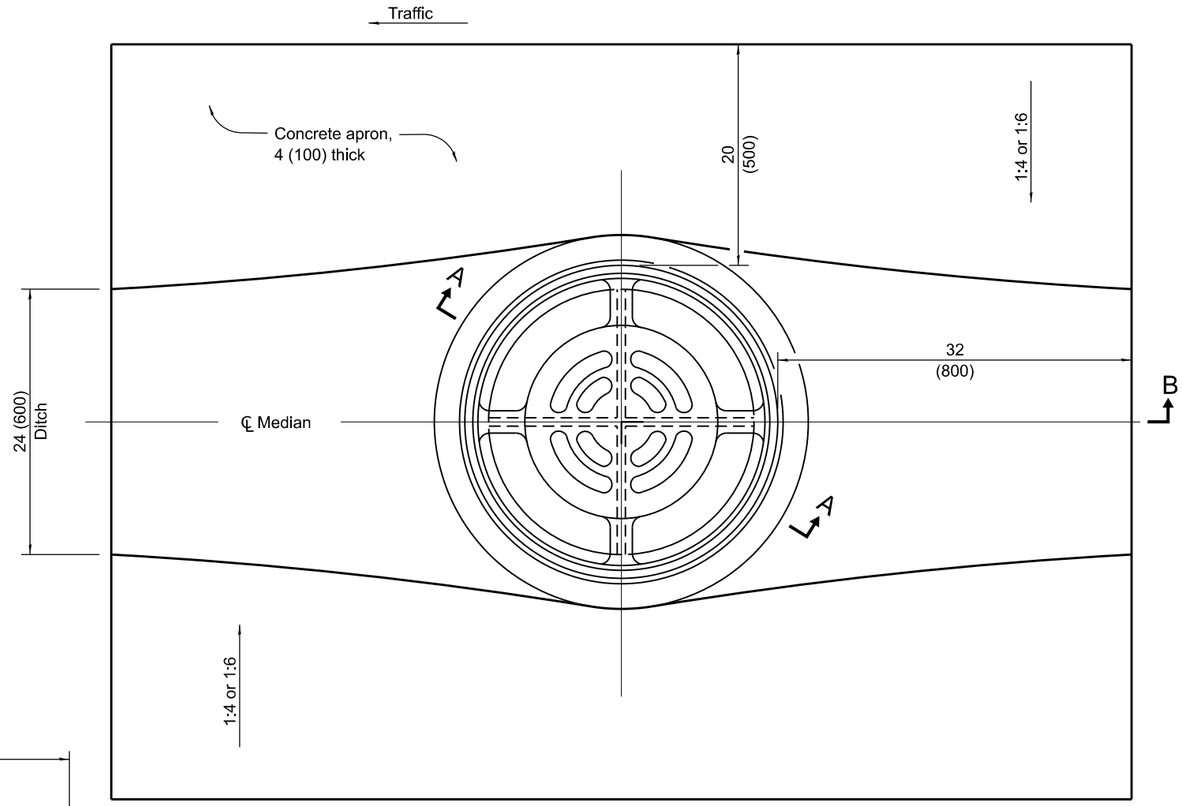
DATE	REVISIONS
1-1-22	Removed slots in frame which
	held the "safety bar".
1-1-21	Removed "safety bar" from frame.

FRAME AND GRATE TYPE 24

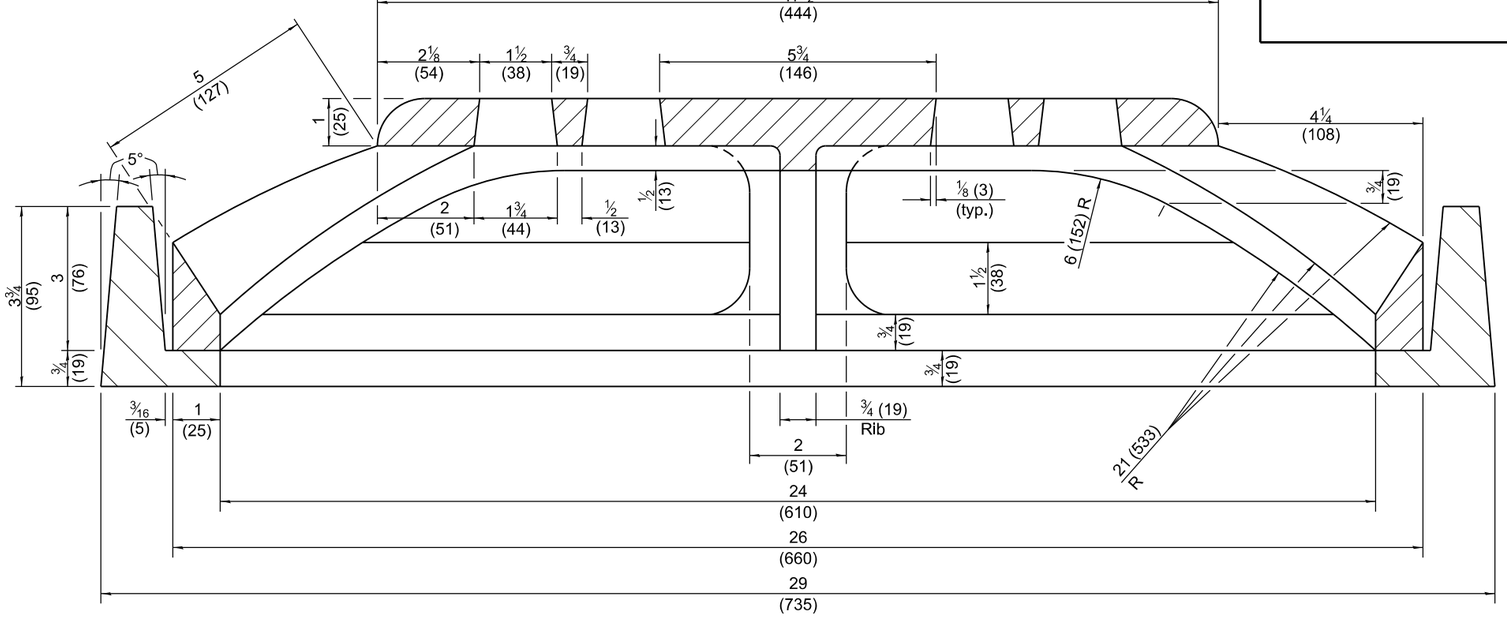
STANDARD 604091-05



SECTION B-B



LOCATION SKETCH - PLAN



SECTION A-A

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

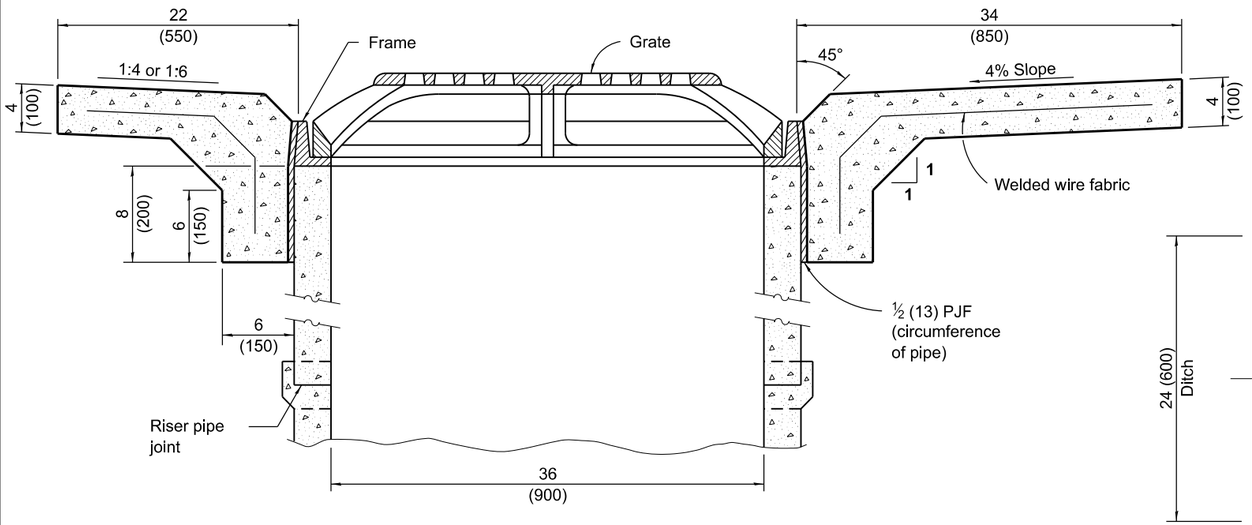
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

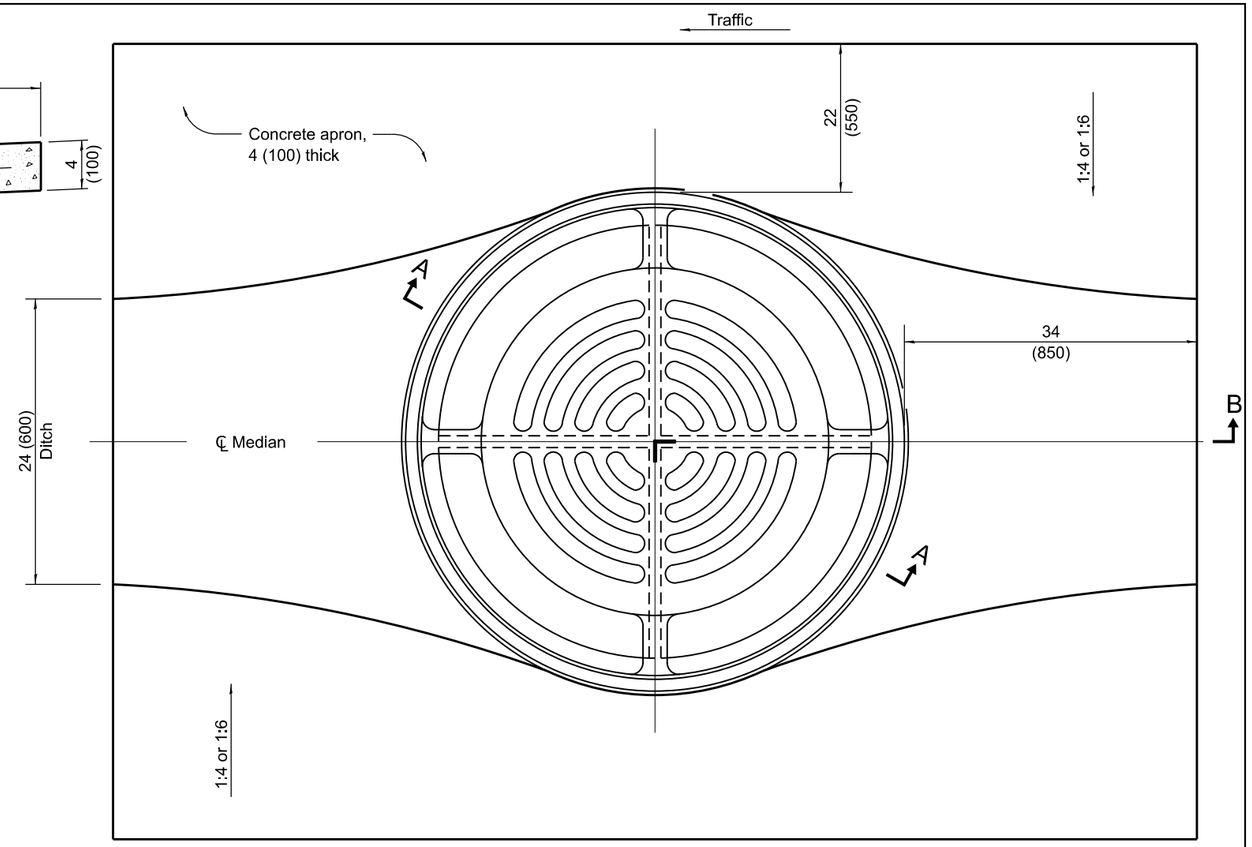
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2250-3.

MEDIAN INLET for 24" (600 mm) REINFORCED CONCRETE PIPE

STANDARD 604101-01

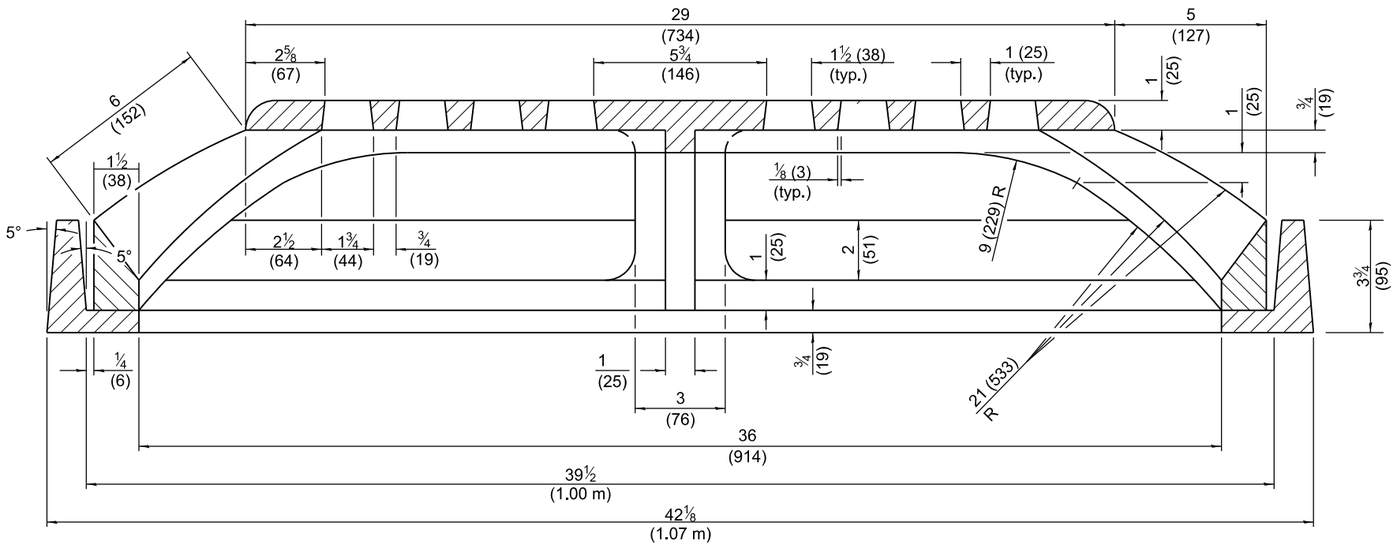


SECTION B-B



B

LOCATION SKETCH - PLAN



SECTION A-A

Traffic

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

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

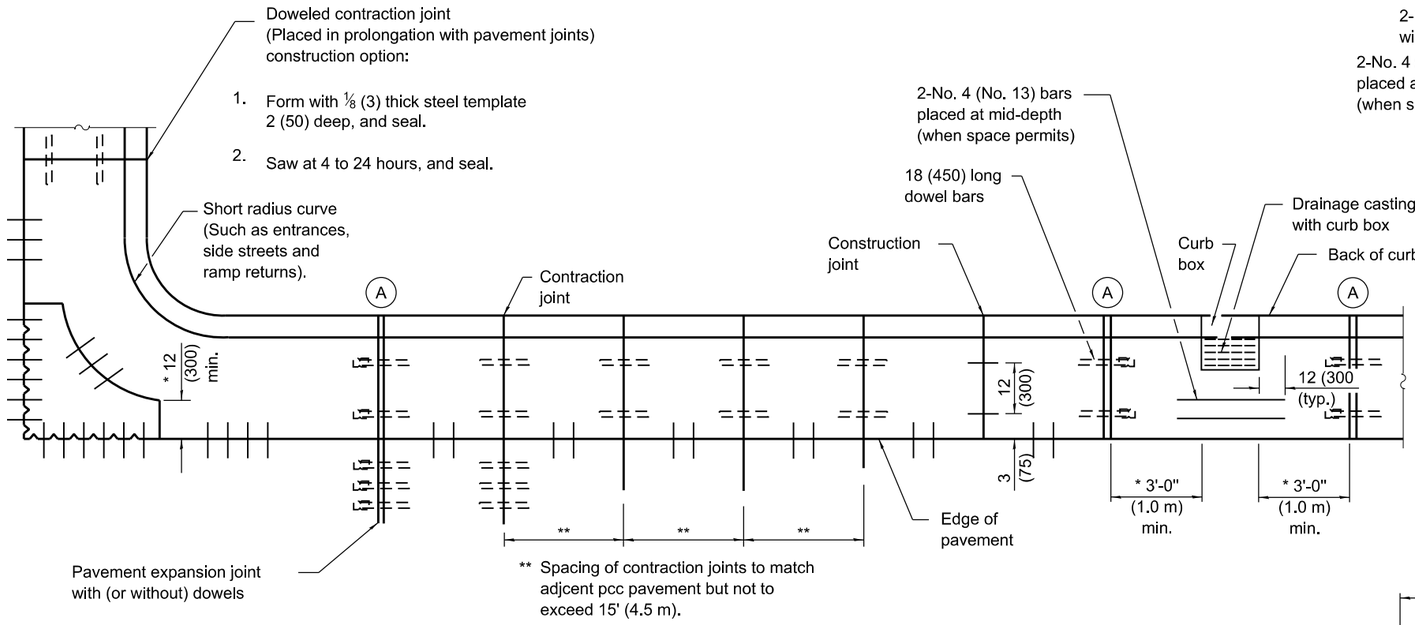
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

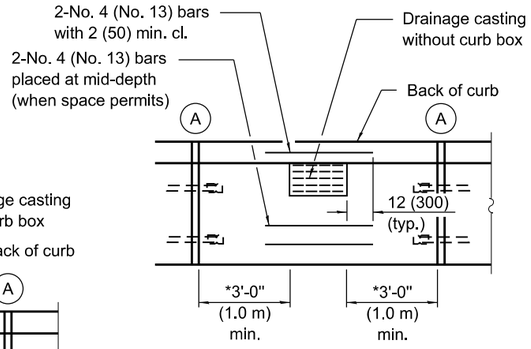
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2251-2.

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

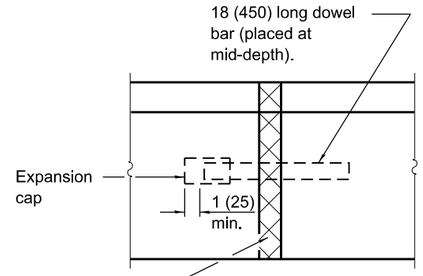
STANDARD 604106-01



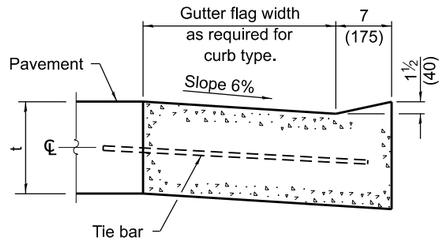
PLAN
ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE



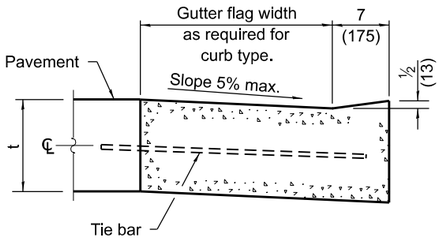
* This dimension shall be adjusted to align with joint on the adjacent pavement



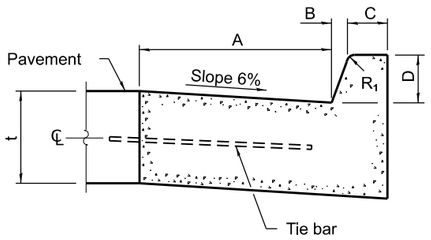
DETAIL Ⓐ
EXPANSION JOINT



DEPRESSED CURB (TYPICAL)



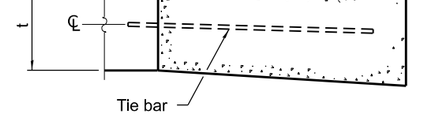
DEPRESSED CURB ADJACENT TO CURB RAMP ACCESSIBLE TO THE DISABLED



BARRIER CURB

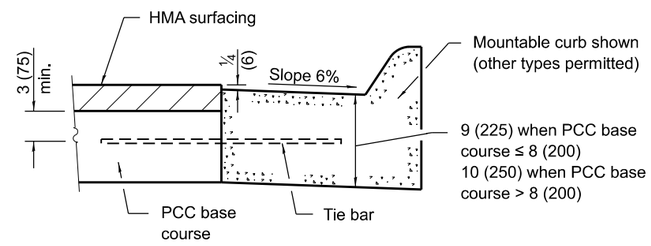
TABLE OF DIMENSIONS BARRIER CURB					
TYPE	A	B	C	D	R_1
B-6.06 * (B-15.15)	6 (150)	1 (25)	6 (150)	6 (150)	1 (25)
B-6.12 (B-15.3)	12 (300)	1 (25)	6 (150)	6 (150)	1 (25)
B-6.18 (B-15.45)	18 (450)	1 (25)	6 (150)	6 (150)	1 (25)
B-6.24 (B-15.60)	24 (600)	1 (25)	6 (150)	6 (150)	1 (25)
B-9.12 (B-22.30)	12 (300)	2 (50)	5 (125)	9 (225)	1 (25)
B-9.18 (B-22.45)	18 (450)	2 (50)	5 (125)	9 (225)	1 (25)
B-9.24 (B-22.60)	24 (600)	2 (50)	5 (125)	9 (225)	1 (25)

* For corner islands only.

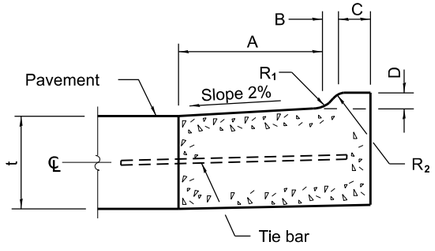


MOUNTABLE CURB

TABLE OF DIMENSIONS MOUNTABLE CURB						
TYPE	A	B	C	D	R_1	R_2
M-2.06 (M-5.15)	6 (150)	2 (50)	4 (100)	2 (50)	3 (75)	2 (50)
M-2.12 (M-5.30)	12 (300)	2 (50)	4 (100)	2 (50)	3 (75)	2 (50)
M-4.06 (M-10.15)	6 (150)	4 (100)	3 (75)	4 (100)	3 (75)	NA
M-4.12 (M-10.30)	12 (300)	4 (100)	3 (75)	4 (100)	3 (75)	NA
M-4.18 (M-10.45)	18 (450)	4 (100)	3 (75)	4 (100)	3 (75)	NA
M-4.24 (M-10.60)	24 (600)	4 (100)	3 (75)	4 (100)	3 (75)	NA
M-6.06 (M-15.15)	6 (150)	6 (150)	2 (50)	6 (150)	2 (50)	NA
M-6.12 (M-15.30)	12 (300)	6 (150)	2 (50)	6 (150)	2 (50)	NA
M-6.18 (M-15.45)	18 (450)	6 (150)	2 (50)	6 (150)	2 (50)	NA
M-6.24 (M-15.60)	24 (600)	6 (150)	2 (50)	6 (150)	2 (50)	NA



ADJACENT TO PCC BASE COURSE WITH HMA SURFACING



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

GENERAL NOTES

The bottom slope of combination curb and gutter constructed adjacent to pcc pavement shall be the same slope as the subbase or 6% when subbase is omitted.

t = Thickness of pavement.

Longitudinal joint tie bars shall be No. 6 (No. 19) at 36 (900) centers in accordance with details for longitudinal construction joint shown on Standard 420001.

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

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

See Standard 606301 for details of corner islands.

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

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2022
Scott Schaefer
ENGINEER OF DESIGN AND ENVIRONMENT

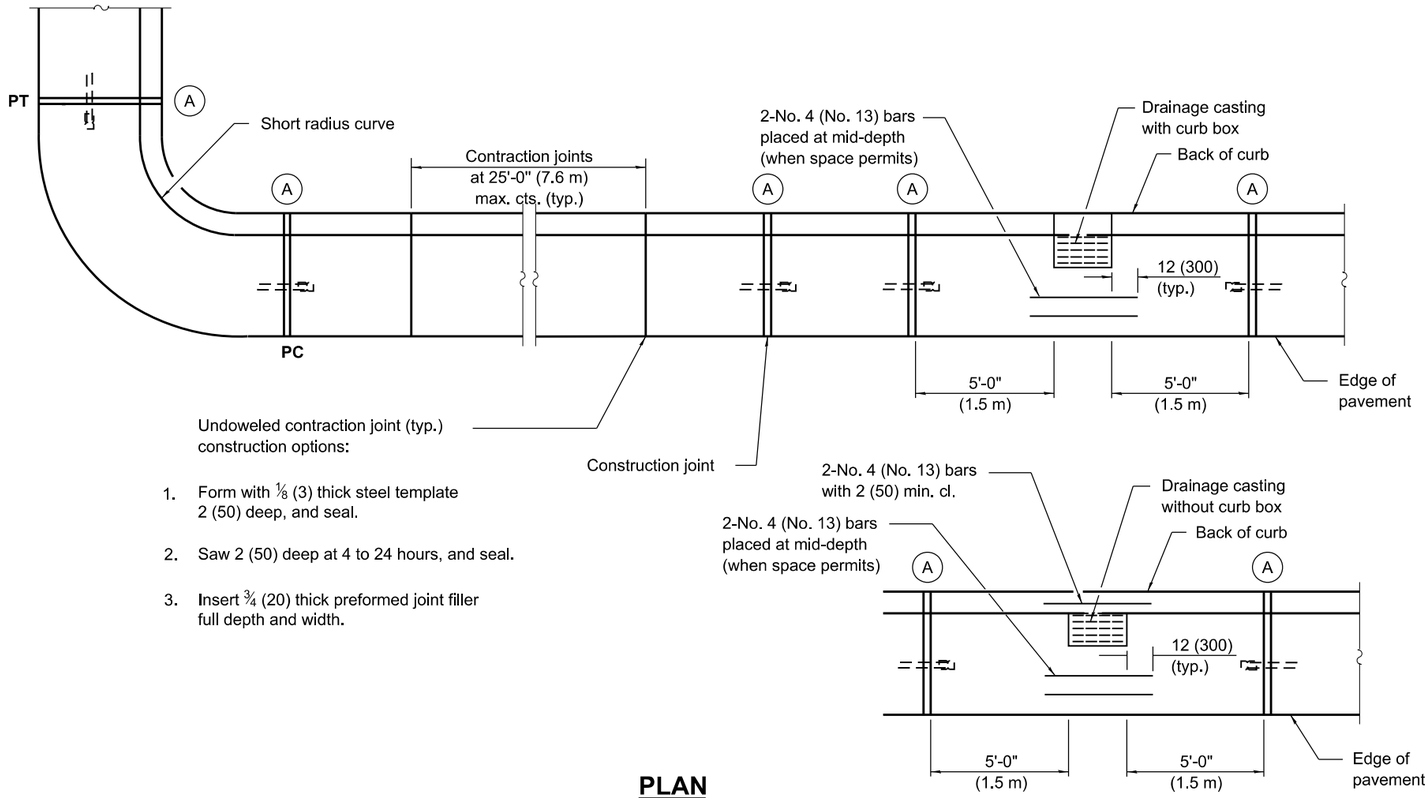
ISSUED 1-1-97

DATE	REVISIONS
1-1-22	Revised contract joint spacing
	adjacent to pcc pavement.
1-1-18	Revised General Note for tie bar
	spacing to 36 (900) cts.

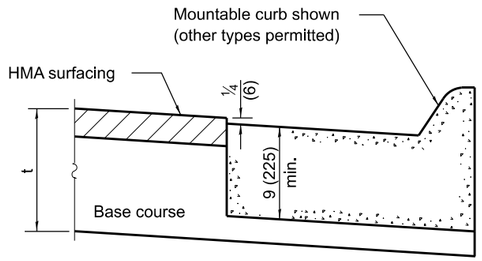
CONCRETE CURB TYPE B AND COMBINATION CONCRETE CURB AND GUTTER

(Sheet 1 of 2)

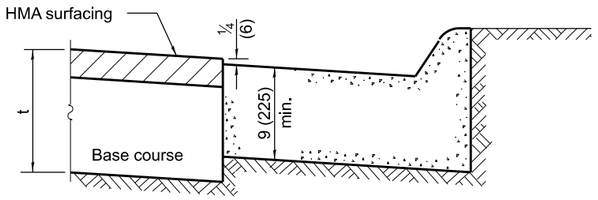
STANDARD 606001-08



PLAN

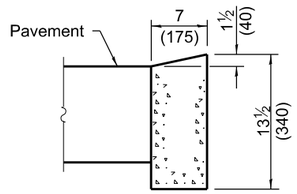


ON DISTURBED SUBGRADE

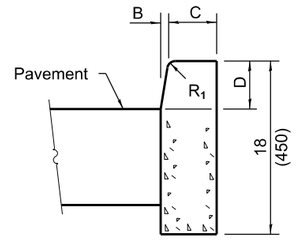


ON UNDISTURBED SUBGRADE

ADJACENT TO FLEXIBLE PAVEMENT

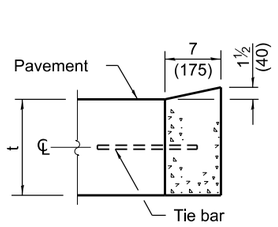


DEPRESSED CURB

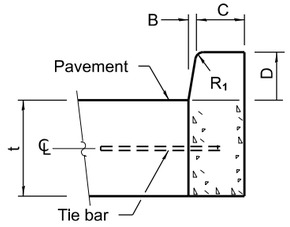


BARRIER CURB

ADJACENT TO FLEXIBLE PAVEMENT



DEPRESSED CURB



BARRIER CURB

ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE

CONCRETE CURB TYPE B

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

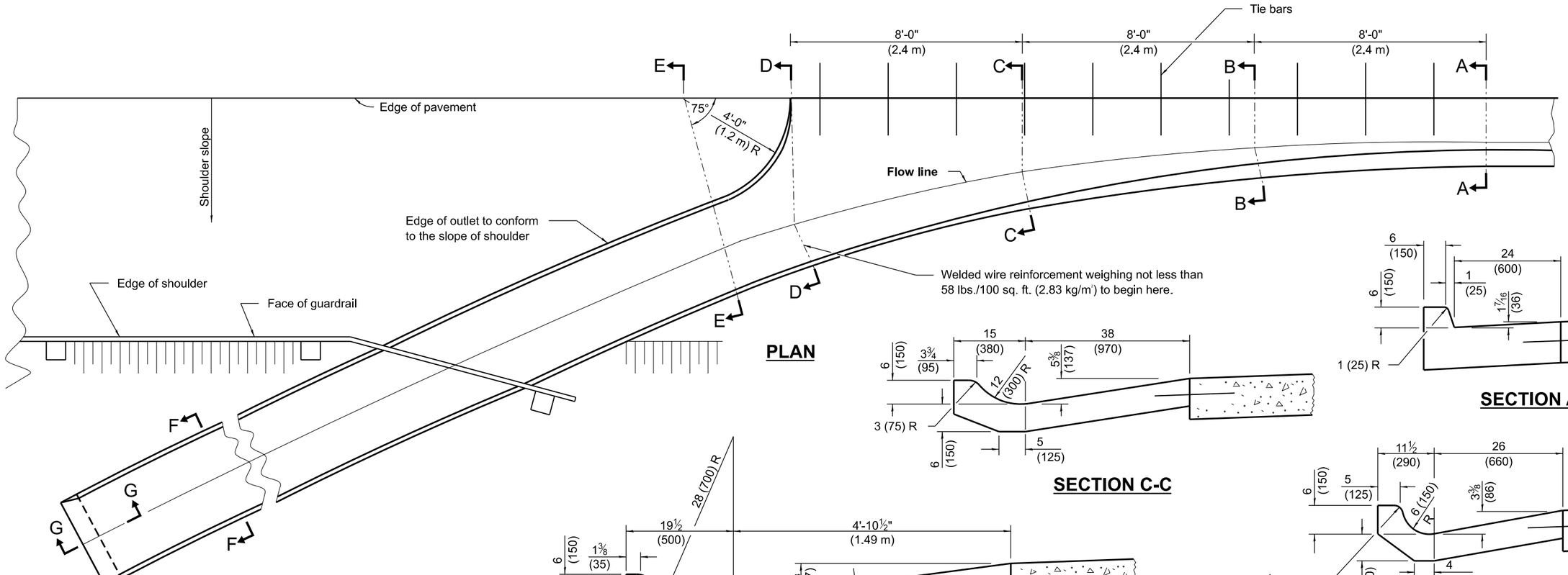
APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

CONCRETE CURB TYPE B AND COMBINATION CONCRETE CURB AND GUTTER

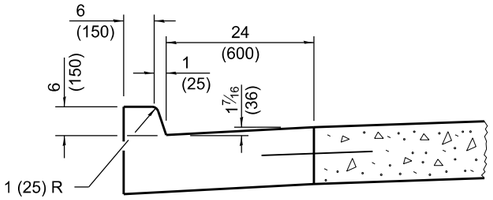
(Sheet 2 of 2)

STANDARD 606001-08

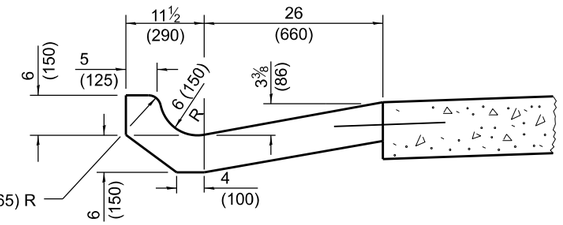


PLAN

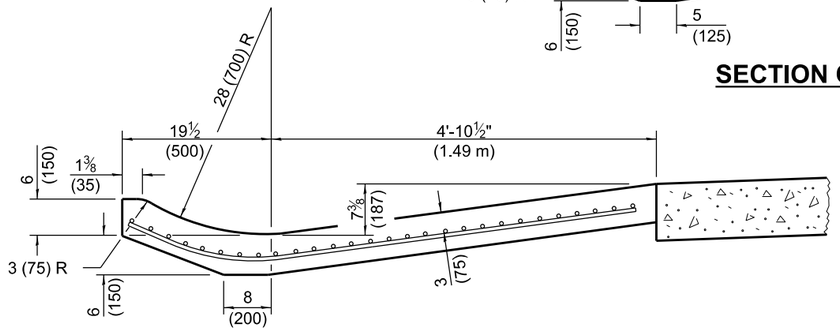
SECTION C-C



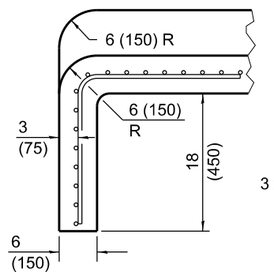
SECTION A-A



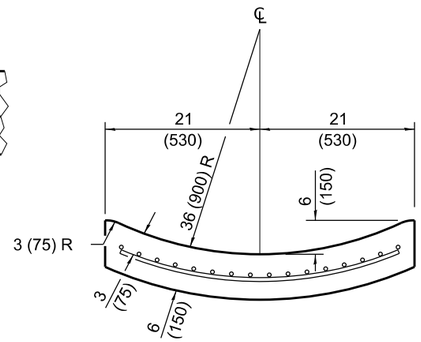
SECTION B-B



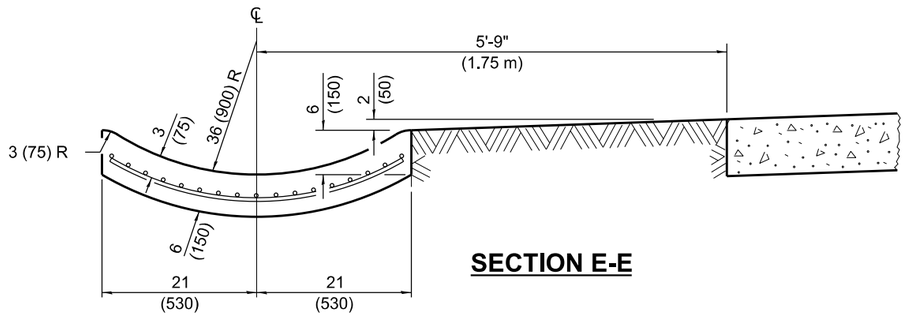
SECTION D-D



SECTION G-G



SECTION F-F



SECTION E-E

GENERAL NOTES

Tie bars shall be No. 6 (No. 19) at 36 (900) centers unless otherwise shown.

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

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

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

QUANTITIES

For Section A-A to E-E and curtain wall =

2.38 cu. yds. (1.82 m³) concrete for 9 (225) pav't.
2.41 cu. yds. (1.84 m³) concrete for 10 (250) pav't.

For Section F-F =

0.069 cu. yds. (0.17 m³) concrete per ft. (m)

STANDARD OUTLET

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

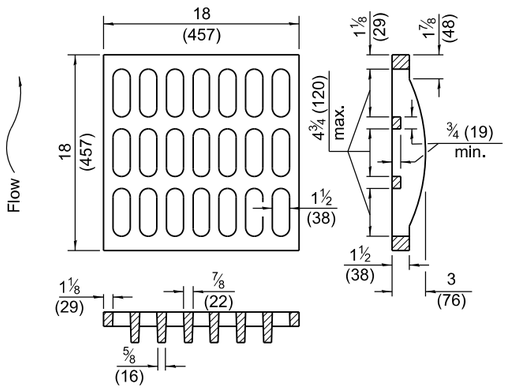
APPROVED January 1, 2018
Maureen M. Addis
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

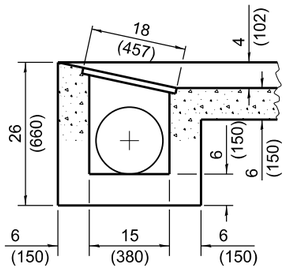
DATE	REVISIONS
1-1-18	Revised General Notes for tie bar
	spacing to 36 (900) cts.
4-1-16	Changed terminology to
	'welded wire reinforcement'.

OUTLETS FOR CONCRETE CURB AND GUTTER TYPE B-6.24 (B-15.60)

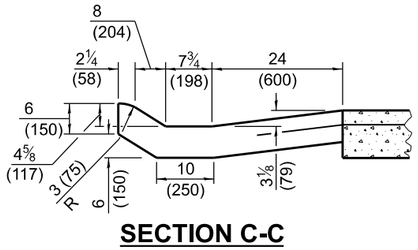
STANDARD 606006-04



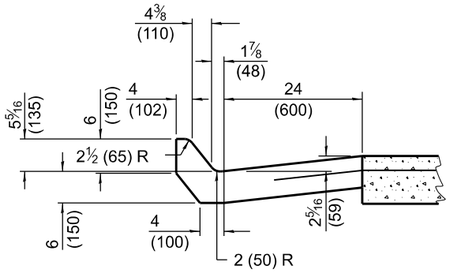
GRATE TYPE A



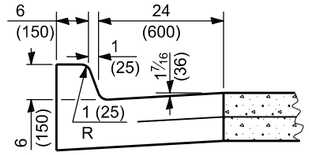
SECTION E-E



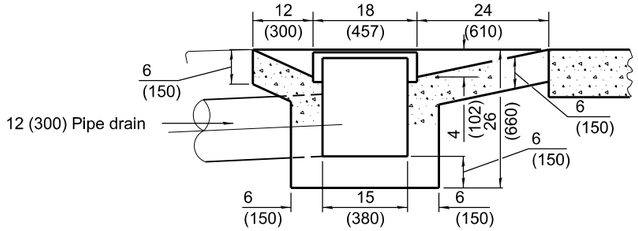
SECTION C-C



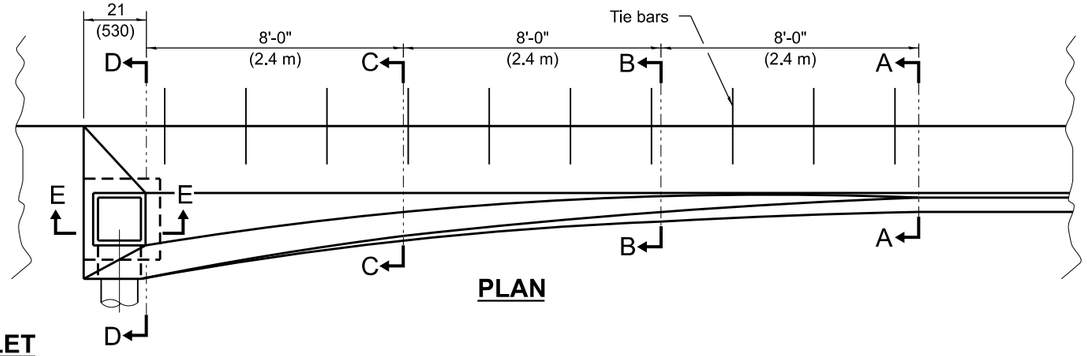
SECTION B-B



SECTION A-A



SECTION D-D



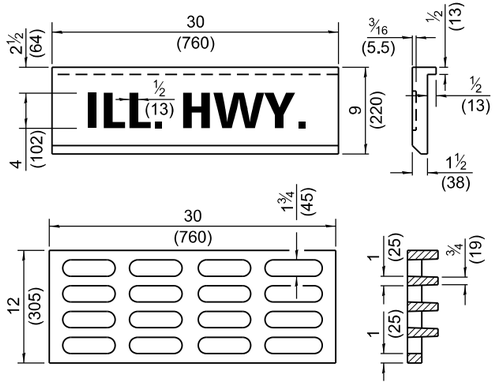
PLAN

TYPE 1 OUTLET

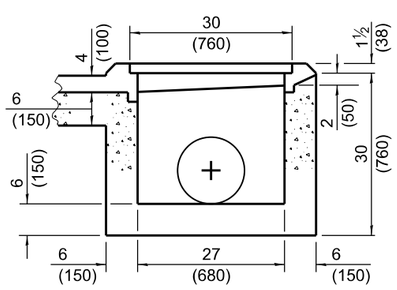
QUANTITIES

1.98 cu. yds. (1.51 m³) concrete for 9 (225) pav't.

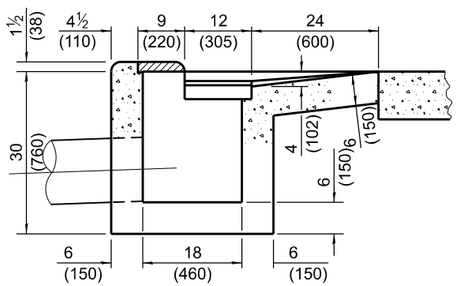
2.01 cu. yds. (1.54 m³) concrete for 10 (250) pav't.



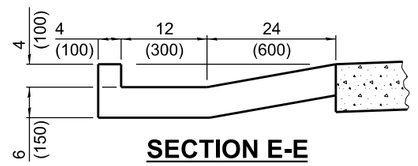
GRATE AND COVER TYPE 2B



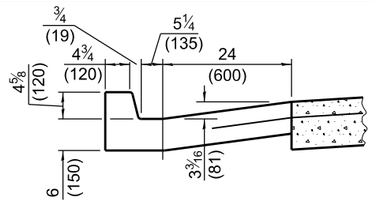
SECTION F-F



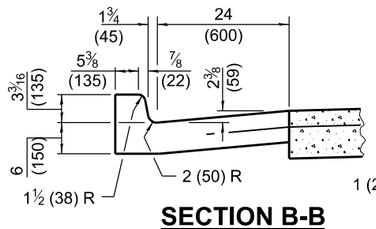
SECTION D-D



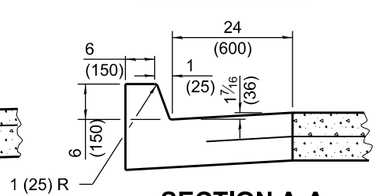
SECTION E-E



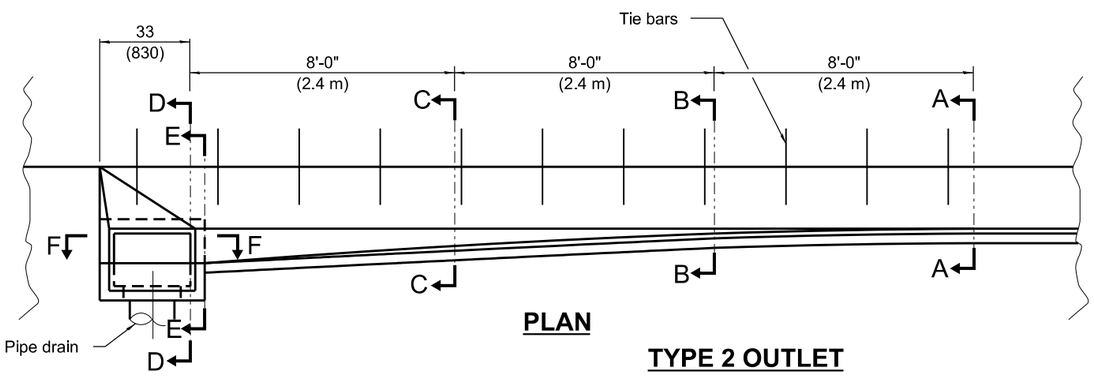
SECTION C-C



SECTION B-B



SECTION A-A



PLAN

TYPE 2 OUTLET

QUANTITIES

2.07 cu. yds. (1.58 m³) concrete for 9 (225) pav't.

2.07 cu. yds. (1.60 m³) concrete for 10 (250) pav't.

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

Illinois Department of Transportation

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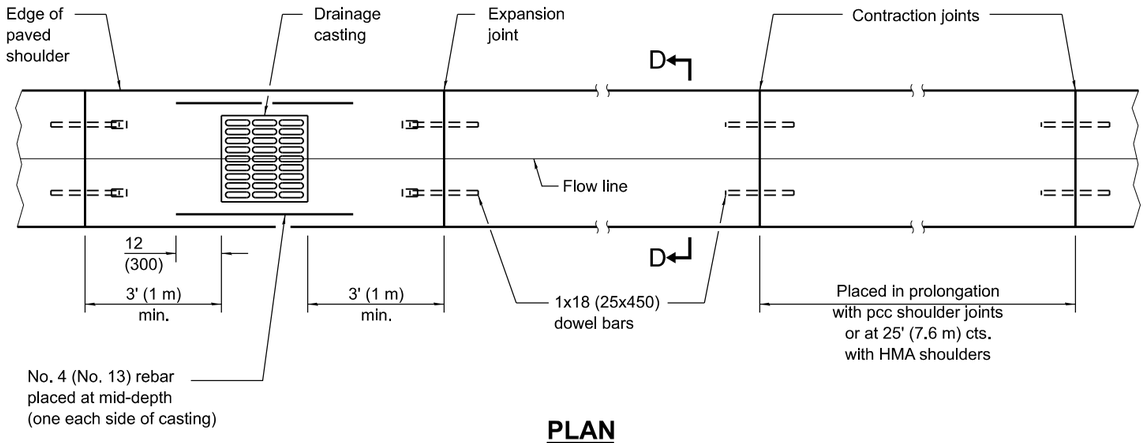
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

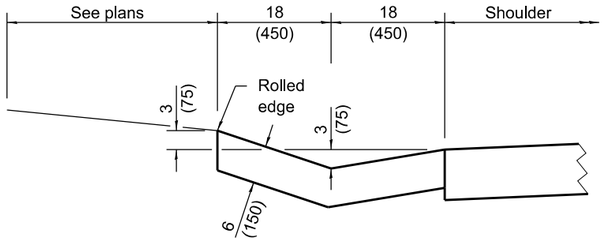
ISSUED 1-1-97

OUTLETS FOR CONCRETE CURB AND GUTTER TYPE B-6.24 (B-15.60)

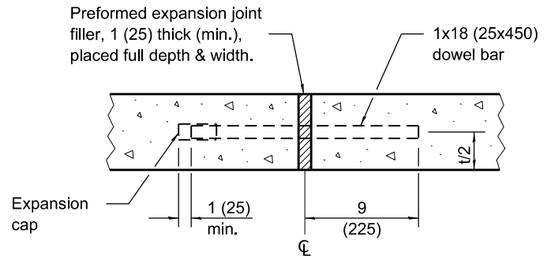
STANDARD 606006-04



PLAN

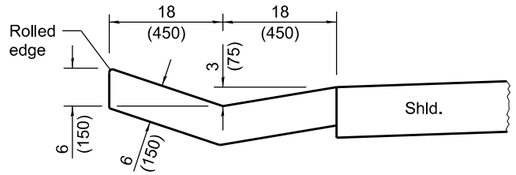


SECTION D-D

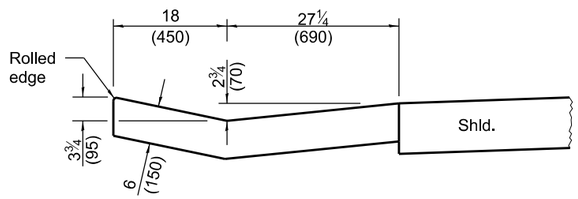


EXPANSION JOINT

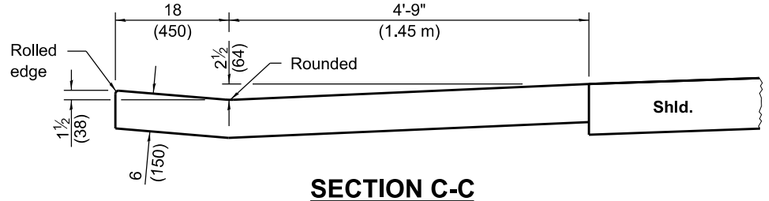
TYPE A GUTTER



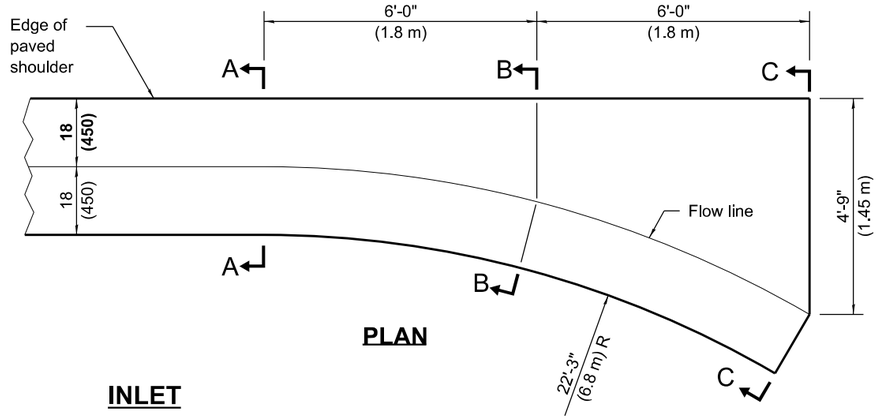
SECTION A-A



SECTION B-B



SECTION C-C



PLAN

INLET

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.

Illinois Department of Transportation

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Michael Brand
ENGINEER OF POLICY AND PROCEDURES

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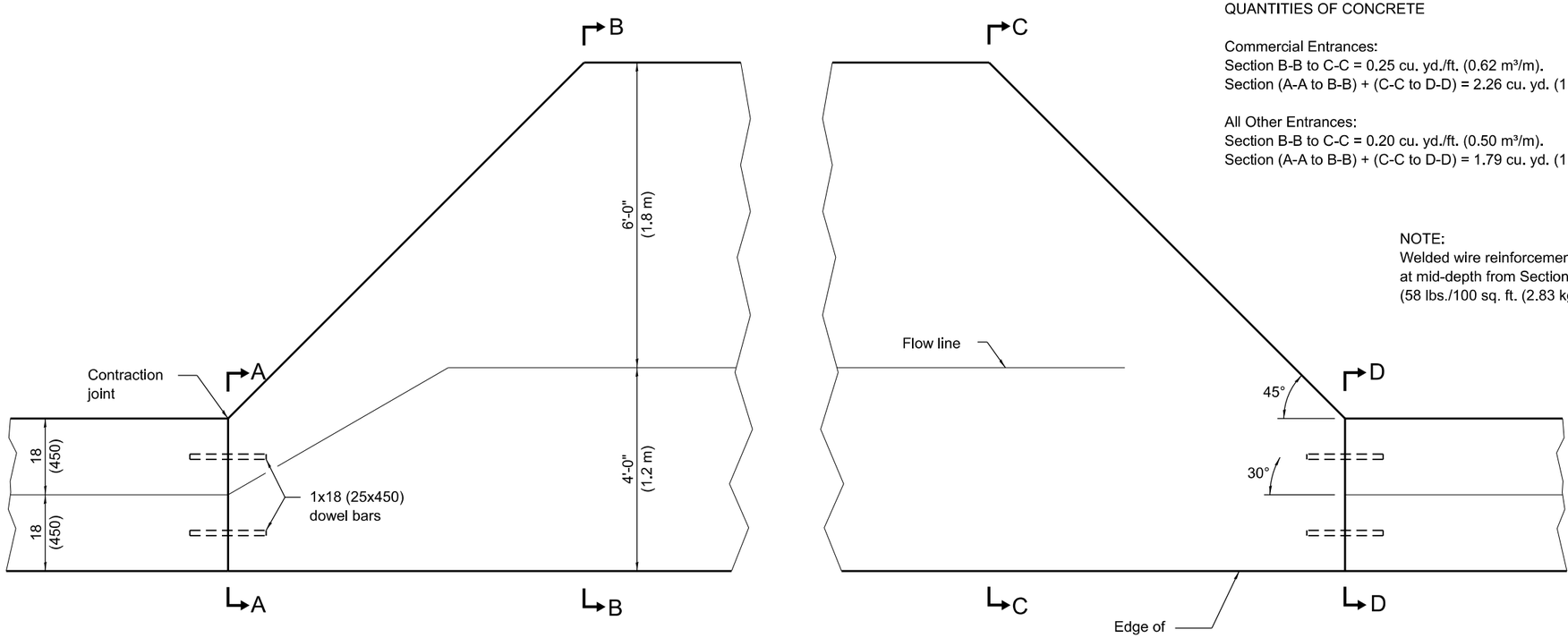
ISSUED 1-1-97

DATE	REVISIONS
4-1-16	Changed terminology to
	'welded wire reinforcement'.
1-1-09	Switched units to English (metric).
	Changed radii, adjusted quantities.

TYPE A GUTTER (INLET, OUTLET & ENTRANCE)

STANDARD 606101-05



PLAN

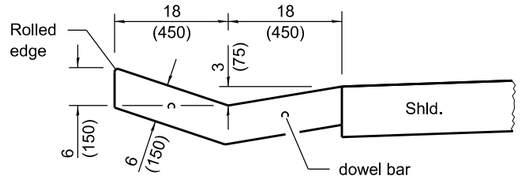
QUANTITIES OF CONCRETE

Commercial Entrances:
Section B-B to C-C = 0.25 cu. yd./ft. (0.62 m³/m).
Section (A-A to B-B) + (C-C to D-D) = 2.26 cu. yd. (1.73 m³).

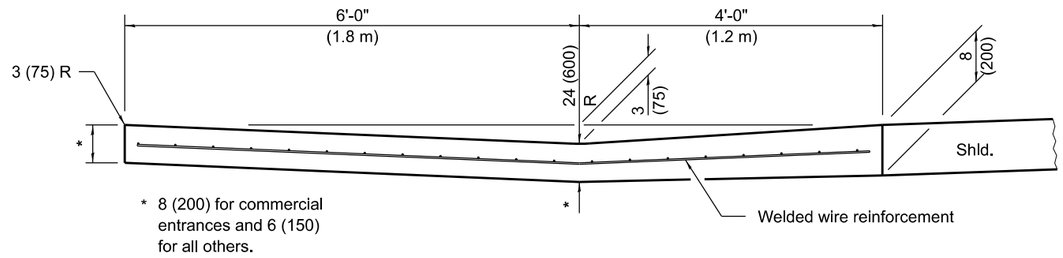
All Other Entrances:
Section B-B to C-C = 0.20 cu. yd./ft. (0.50 m³/m).
Section (A-A to B-B) + (C-C to D-D) = 1.79 cu. yd. (1.37 m³).

NOTE:
Welded wire reinforcement shall be installed at mid-depth from Section A-A to D-D.
(58 lbs./100 sq. ft. (2.83 kg/m²))

ENTRANCE



SECTIONS A-A & D-D



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

SECTIONS B-B & C-C

Illinois Department of Transportation

APPROVED April 1, 2016
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ENGINEER OF POLICY AND PROCEDURES

APPROVED April 1, 2016
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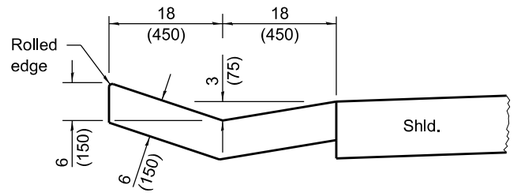
ISSUED 1-1-97

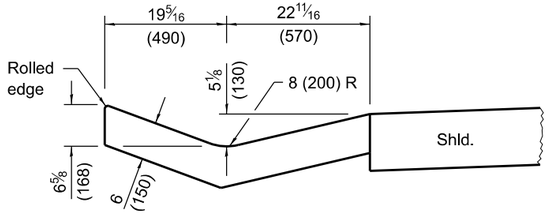
TYPE A GUTTER (INLET, OUTLET & ENTRANCE)

(Sheet 2 of 3)

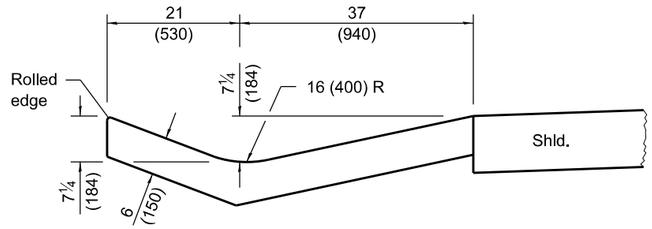
STANDARD 606101-05



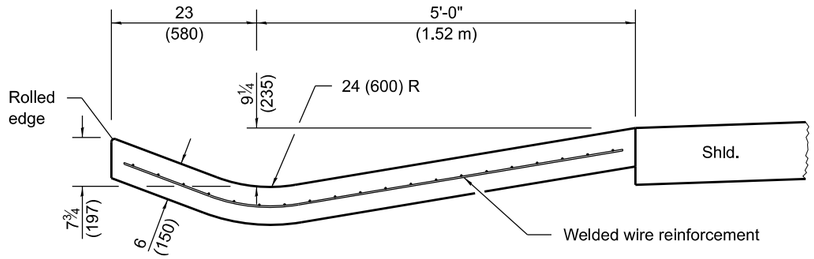
SECTION A-A



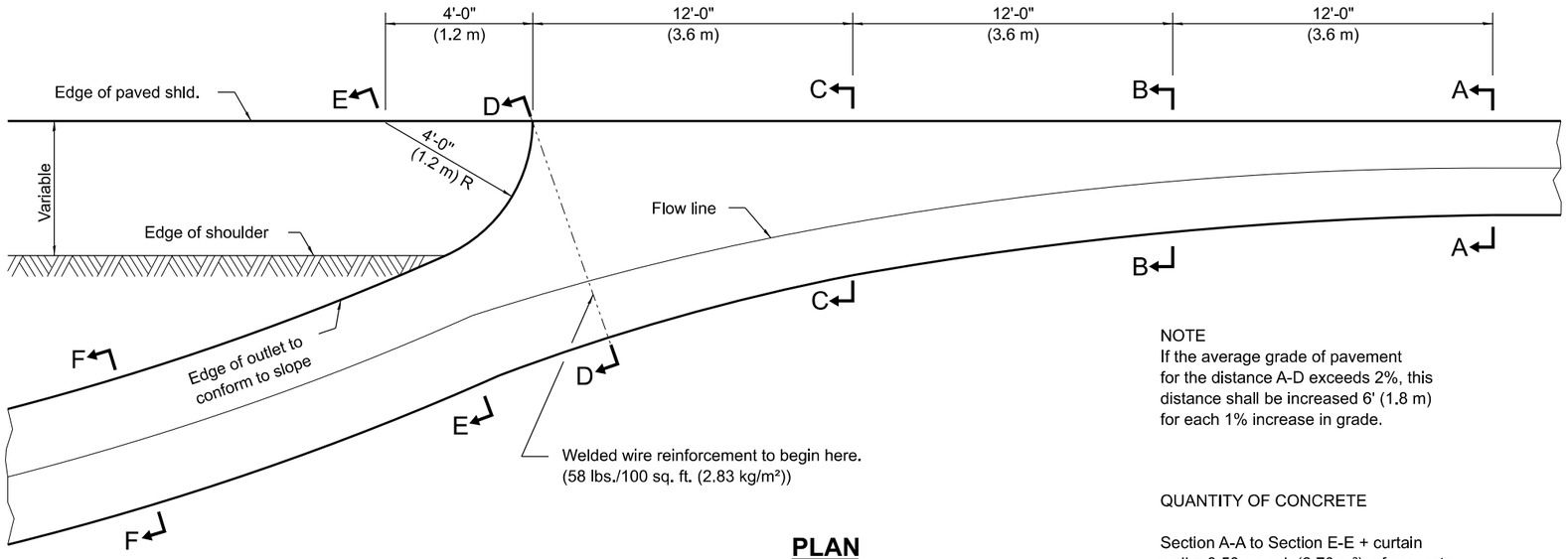
SECTION B-B



SECTION C-C



SECTION D-D



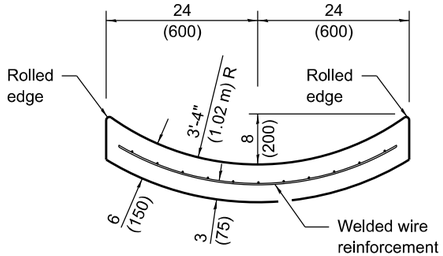
PLAN

OUTLET

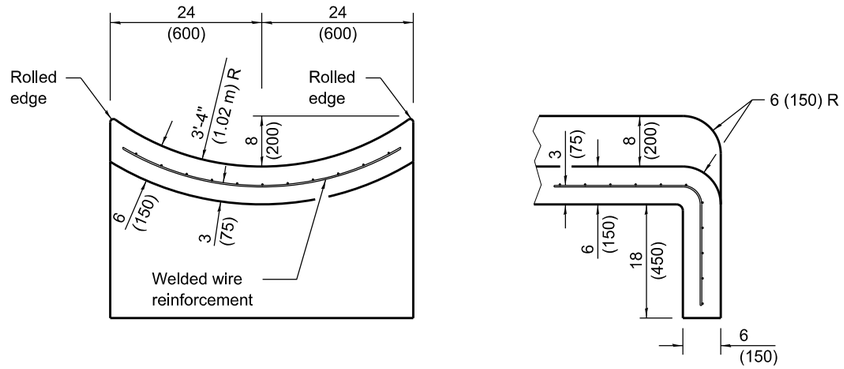
NOTE
If the average grade of pavement for the distance A-D exceeds 2%, this distance shall be increased 6' (1.8 m) for each 1% increase in grade.

QUANTITY OF CONCRETE

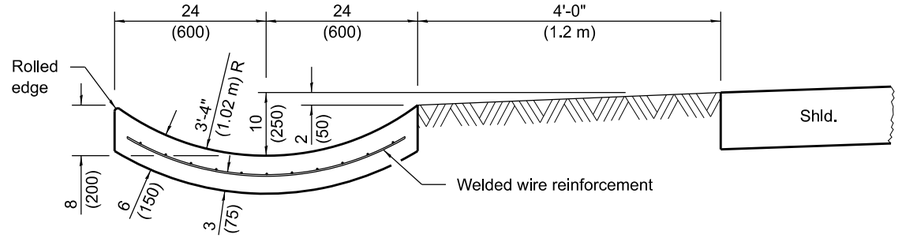
Section A-A to Section E-E + curtain wall = 3.53 cu. yd. (2.70 m³) of concrete.
Section F-F = 0.079 cu. yd./ft. (0.2 m³/m).



SECTION F-F



SECTIONS AT END OF OUTLET



SECTION E-E

Illinois Department of Transportation

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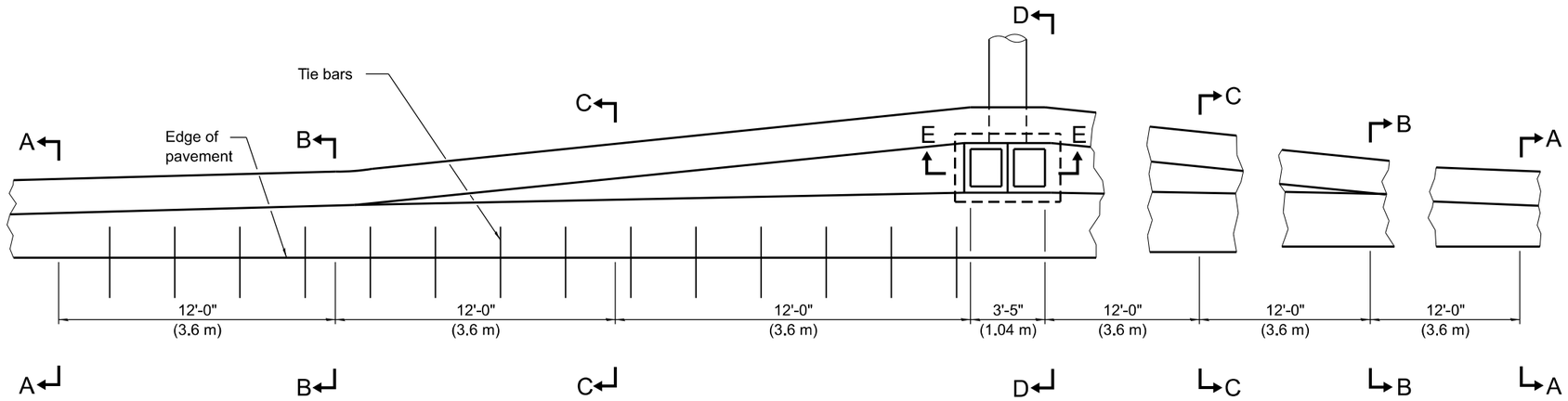
ENGINEER OF POLICY AND PROCEDURES
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

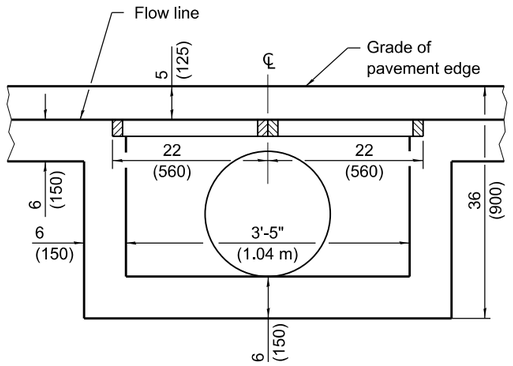
TYPE A GUTTER (INLET, OUTLET & ENTRANCE)

(Sheet 3 of 3)

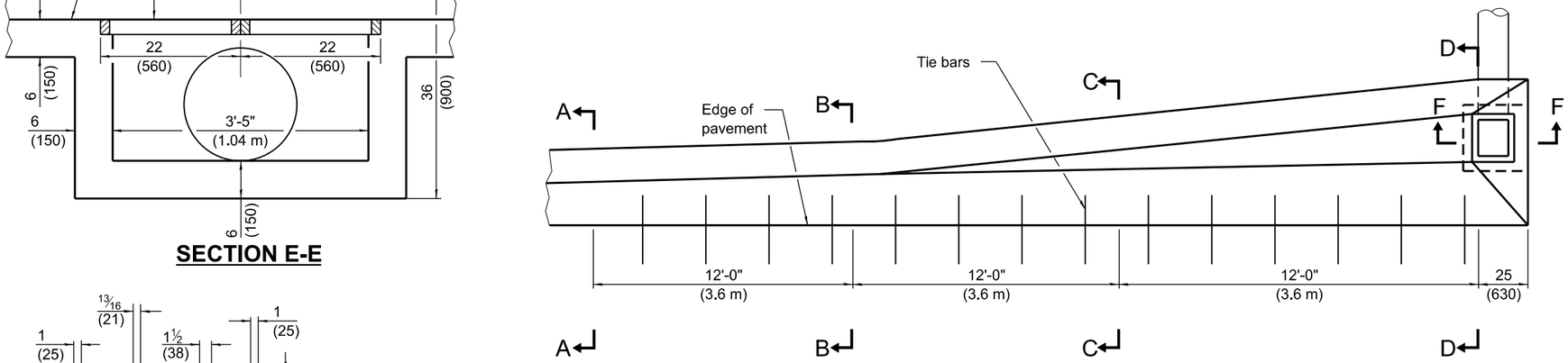
STANDARD 606101-05



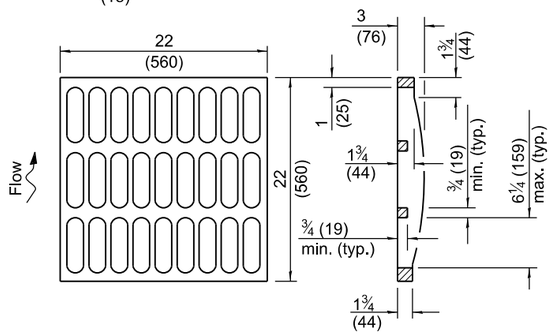
PLAN-DOUBLE OUTLET



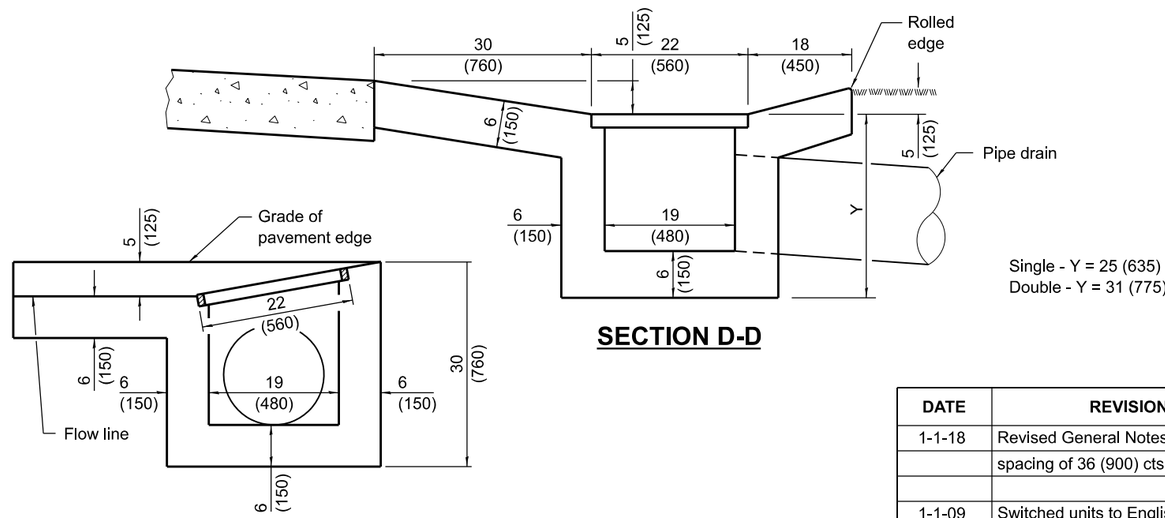
SECTION E-E



PLAN-SINGLE OUTLET



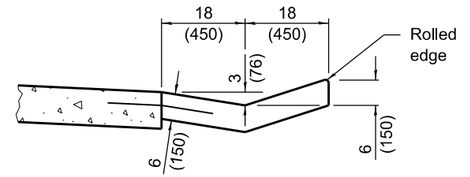
GRATE TYPE A



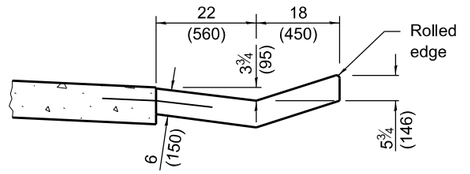
Single - Y = 25 (635)
Double - Y = 31 (775)

SECTION D-D

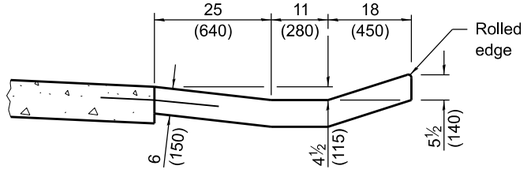
SECTION F-F



SECTION A-A



SECTION B-B



SECTION C-C

QUANTITIES

Material	Single	Double
Concrete - cu. yd. (m³)	3.3 (2.5)	6.5 (5)
Cast Iron Grate - Ea.	1	2
Pipe Drain - Dia. in. (mm)	15 (375)	18 (450)

GENERAL NOTES

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

Tie bars shall be No. 6 (No. 19) at 36 (900) centers unless otherwise shown.

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

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

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

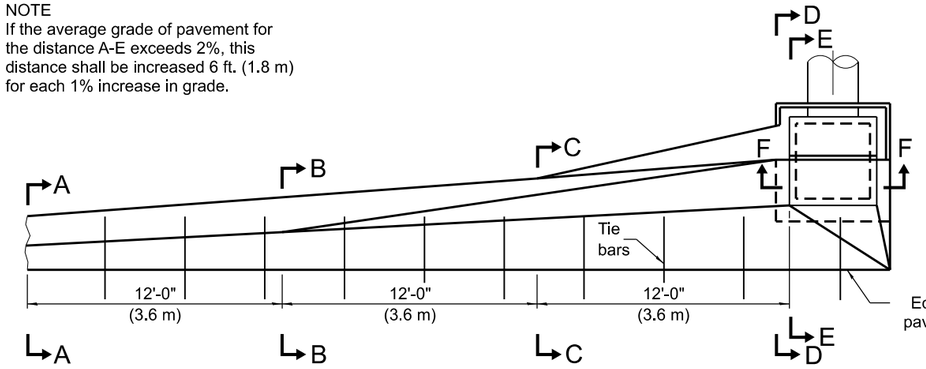
ISSUED 1-1-97

DATE	REVISIONS
1-1-18	Revised General Notes for tie bar
	spacing of 36 (900) cts.
1-1-09	Switched units to English (metric).

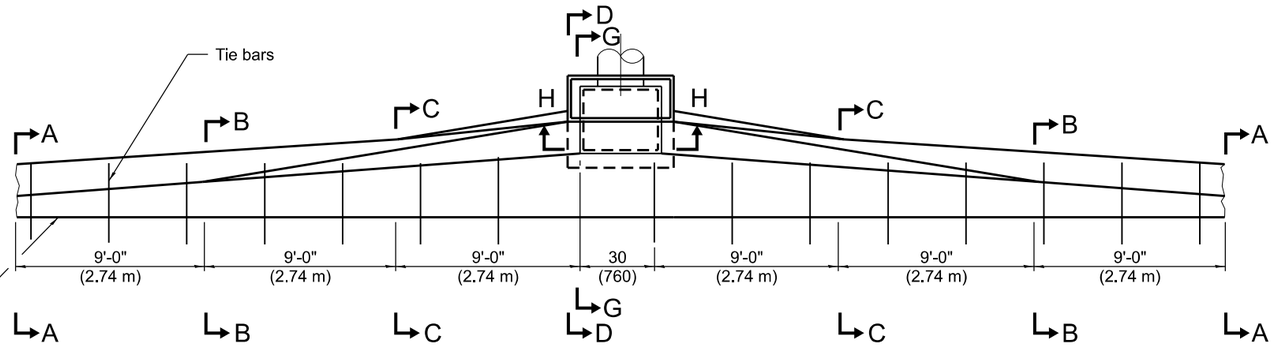
OUTLET TYPE 1 FOR TYPE A GUTTER

STANDARD 606106-05

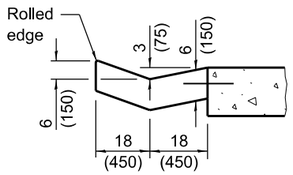
NOTE
If the average grade of pavement for the distance A-E exceeds 2%, this distance shall be increased 6 ft. (1.8 m) for each 1% increase in grade.



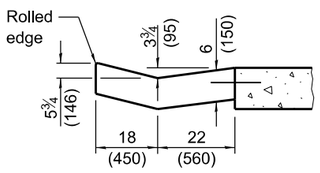
PLAN - SINGLE OUTLET



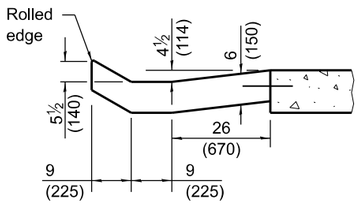
PLAN - DOUBLE OUTLET



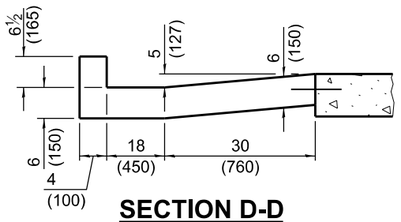
SECTION A-A



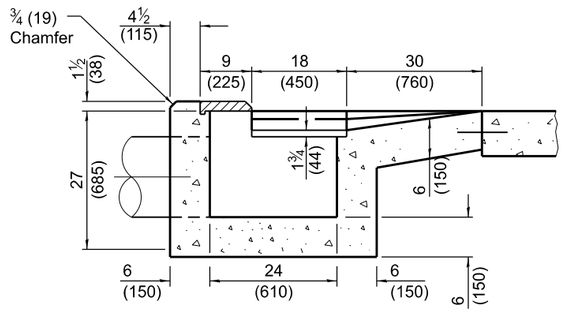
SECTION B-B



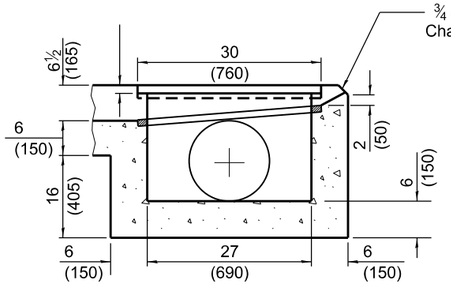
SECTION C-C



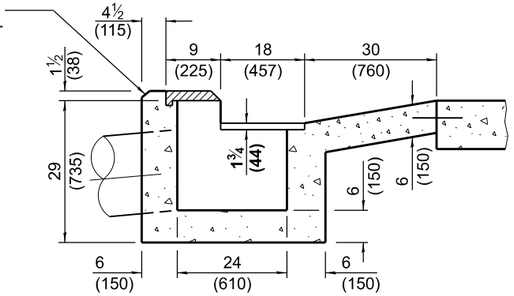
SECTION D-D



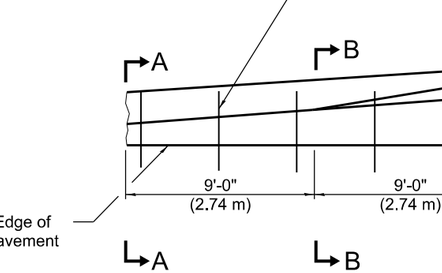
SECTION E-E



SECTION F-F



SECTION G-G

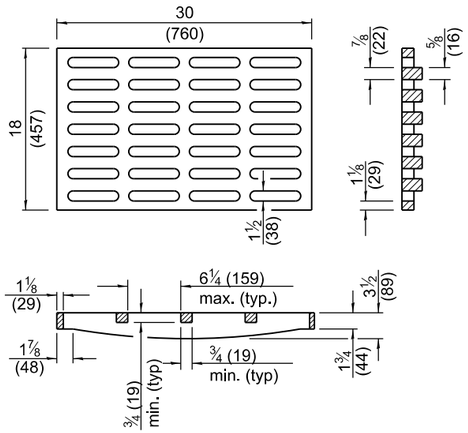


SECTION H-H

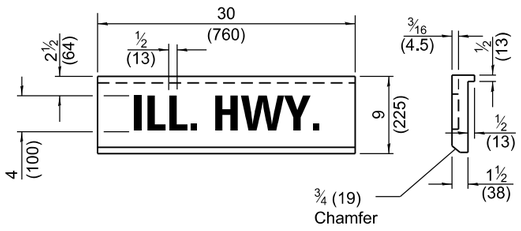
QUANTITIES

Material	Single	Double
Concrete - cu. yd. (m^3)	3.07 (2.35)	4.33 (3.31)
Cast Iron Grate - Ea.	1	1
Cast Iron Cover - Ea.	1	1
Pipe Drain - Dia. in. (mm)	15 (375)	18 (450)

Flow



GRATE AND COVER TYPE 2A



GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

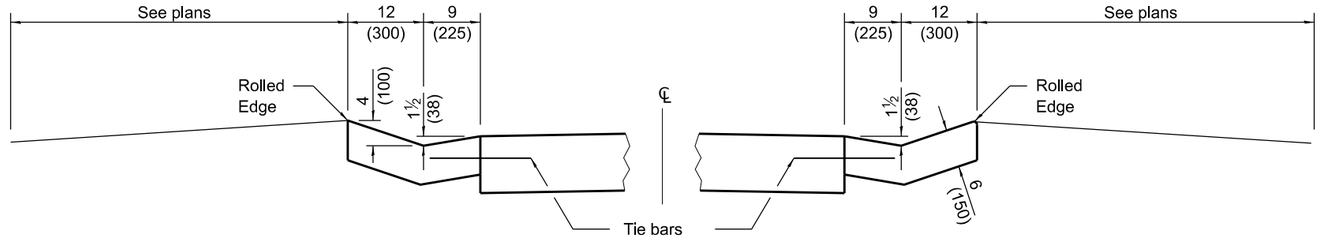
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

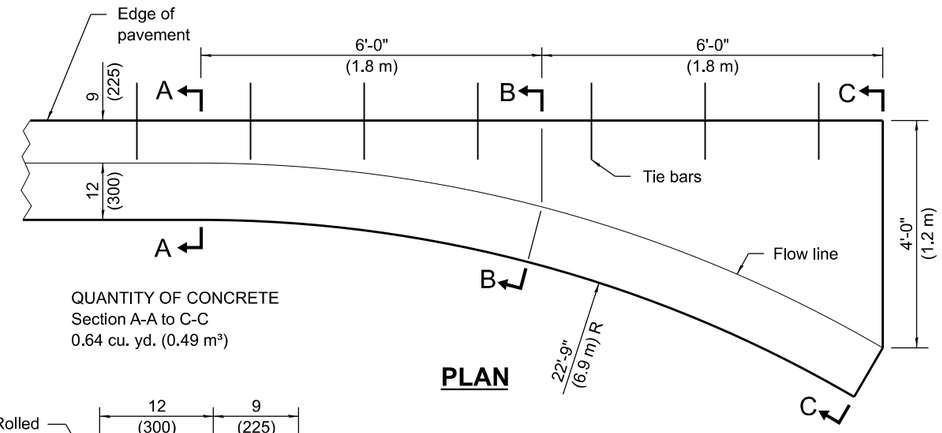
ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Removed weight of grate and cover.

OUTLETS TYPE 2 FOR TYPE A GUTTER

STANDARD 606111-03

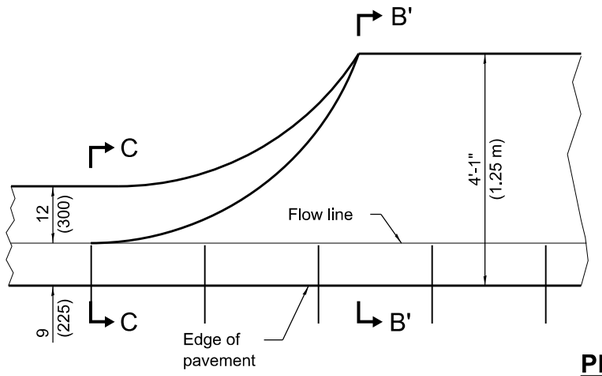


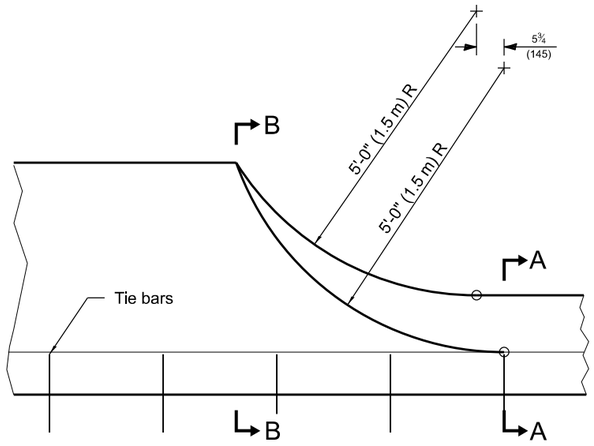


QUANTITY OF CONCRETE
Section A-A to C-C
0.64 cu. yd. (0.49 m³)

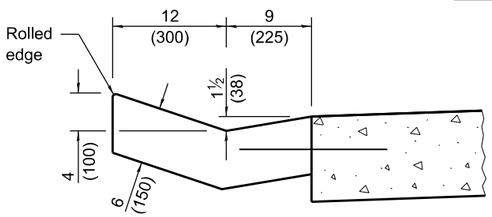
PLAN

TYPE B GUTTER

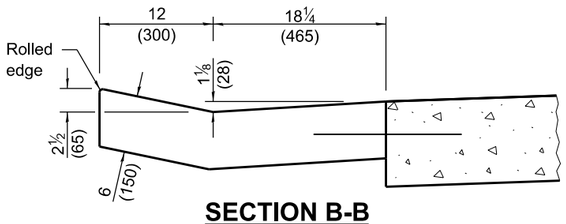




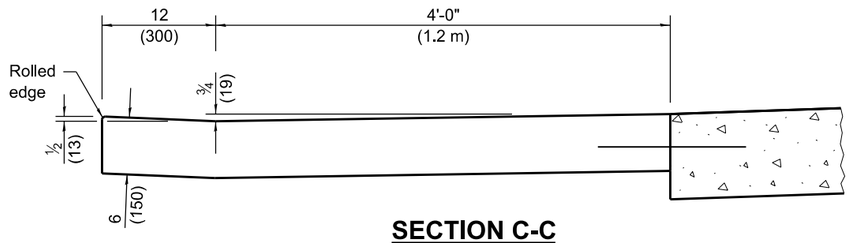
PLAN



SECTION A-A

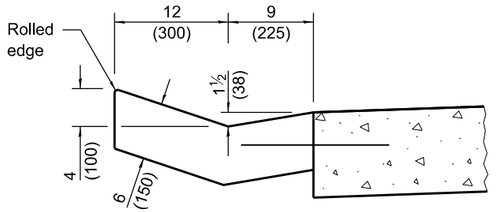


SECTION B-B

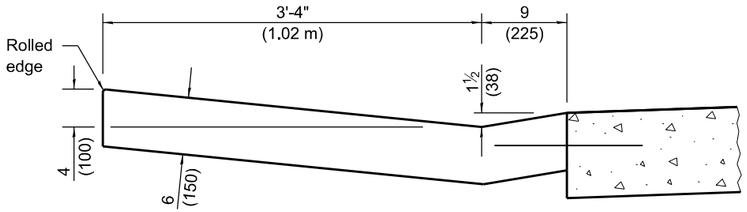


SECTION C-C

INLET



SECTIONS A-A & C-C



SECTIONS B-B & B'-B'

ENTRANCE

QUANTITY OF CONCRETE
Section B'-B' to B-B = 0.076 cu. yd./ft. (0.19 m³/m)
Section (C-C to B'-B') + (B-B to A-A) = 0.44 cu. yd. (0.34 m³)

GENERAL NOTES

Gutter, gutter inlet, gutter outlet and gutter entrance shall be tied to the pavement in accordance with details for longitudinal construction joint shown on Standard 420001.

Two 1-1/4 x 18 (32 x 450) dowel bars shall be installed in all joints when the gutter is constructed adjacent to flexible pavement.

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

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

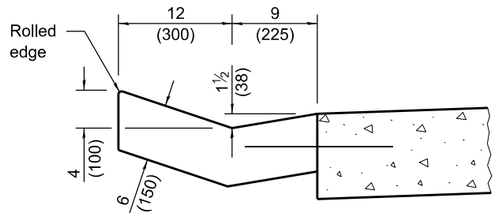
APPROVED January 1, 2018
Maureen M. Butler
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

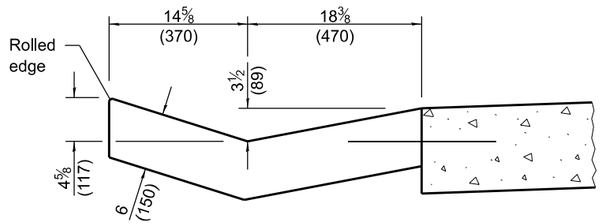
DATE	REVISIONS
1-1-18	Deleted first General Note to avoid
	conflict with second General Note.
4-1-16	Changed terminology to
	'welded wire reinforcement'.

TYPE B GUTTER (INLET, OUTLET & ENTRANCE)

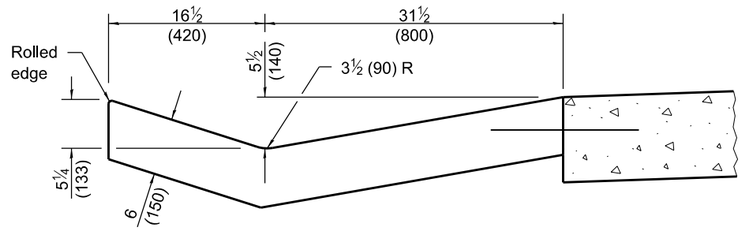
STANDARD 606201-04



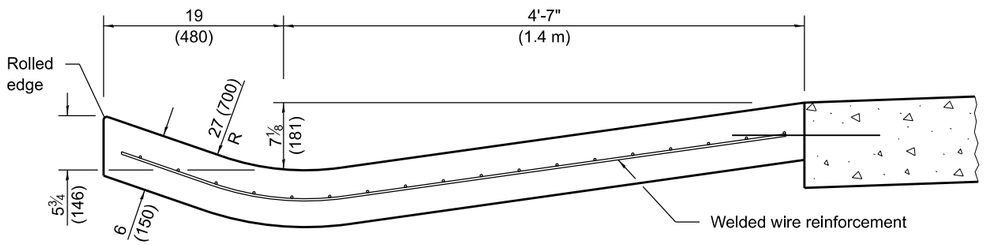
SECTION A-A



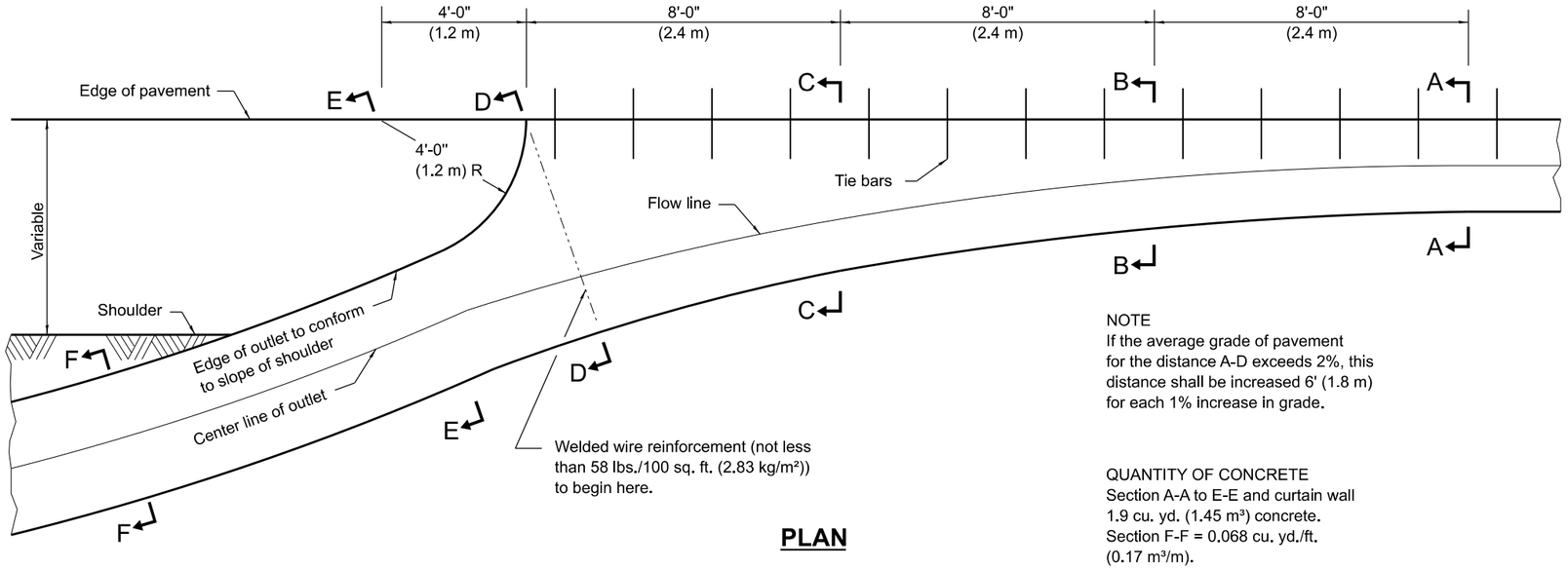
SECTION B-B



SECTION C-C



SECTION D-D

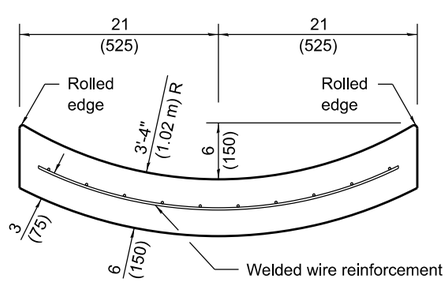


PLAN

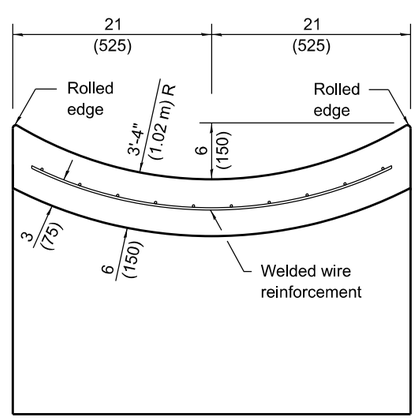
NOTE
If the average grade of pavement for the distance A-D exceeds 2%, this distance shall be increased 6' (1.8 m) for each 1% increase in grade.

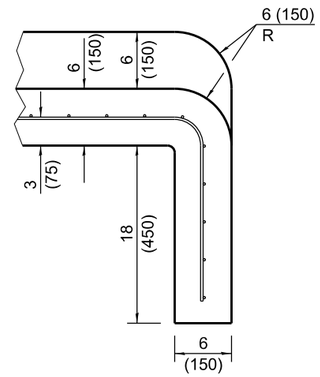
QUANTITY OF CONCRETE
Section A-A to E-E and curtain wall 1.9 cu. yd. (1.45 m³) concrete.
Section F-F = 0.068 cu. yd./ft. (0.17 m³/m).

OUTLET

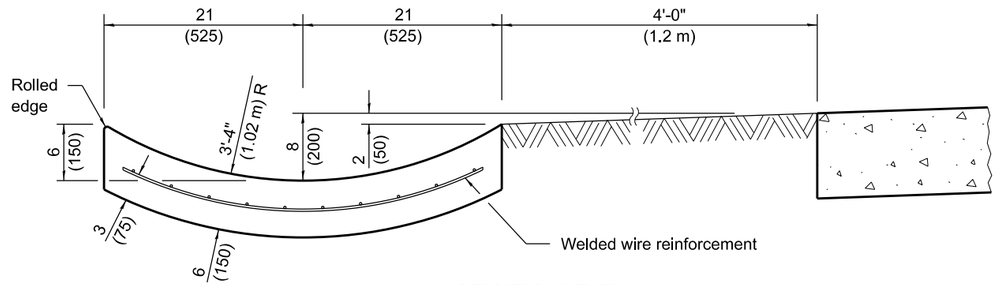


SECTION F-F





SECTIONS AT END OF OUTLET



SECTION E-E

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

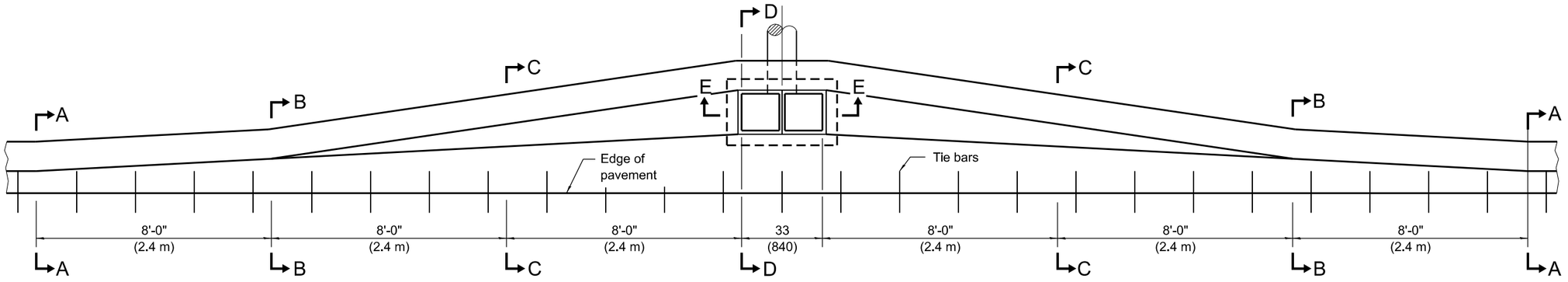
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

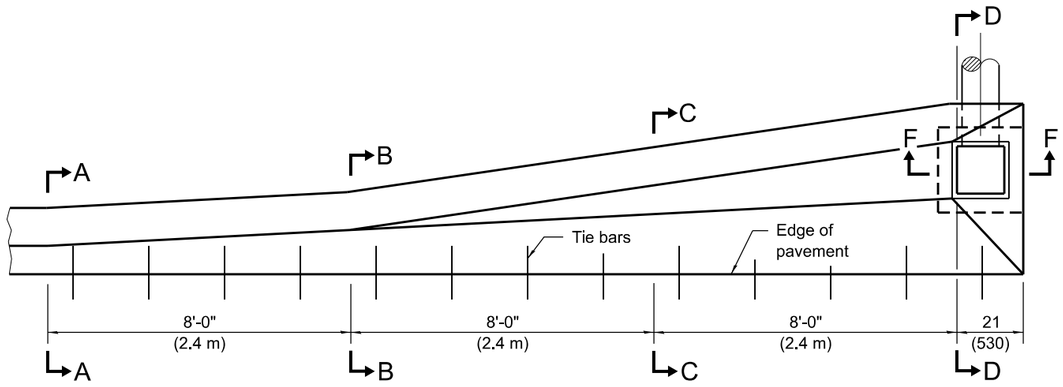
TYPE B GUTTER (INLET, OUTLET & ENTRANCE)

(Sheet 2 of 2)

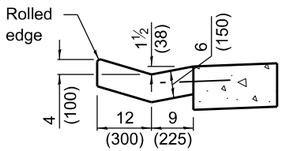
STANDARD 606201-04



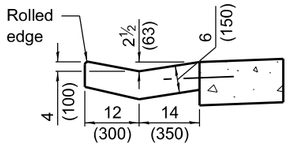
PLAN - DOUBLE OUTLET



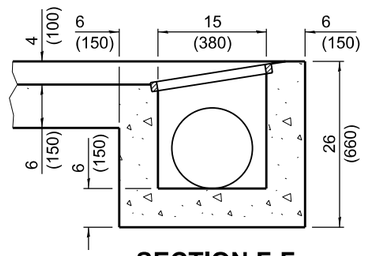
PLAN - SINGLE OUTLET



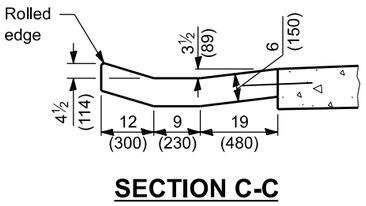
SECTION A-A



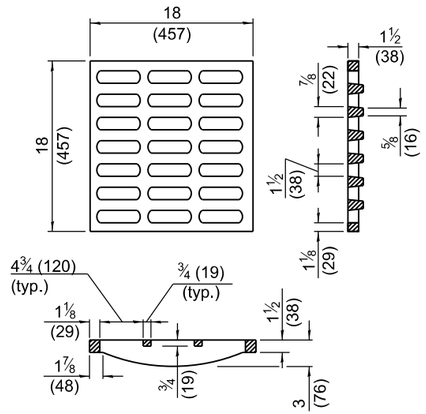
SECTION B-B



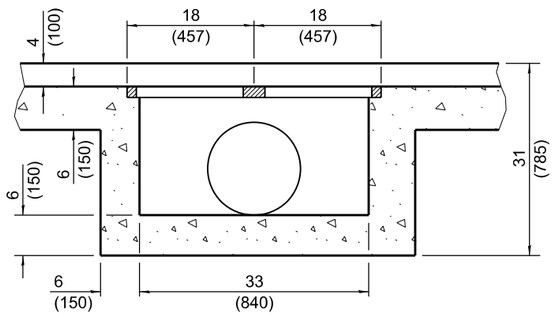
SECTION F-F



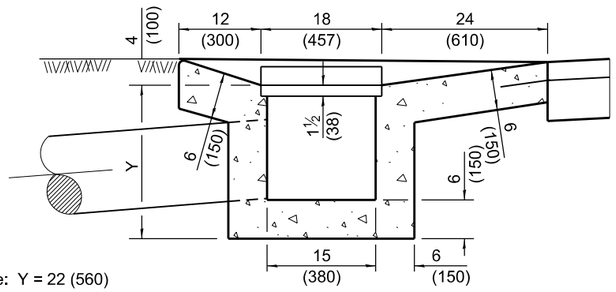
SECTION C-C



GRATE TYPE B



SECTION E-E



SECTION D-D

Single: Y = 22 (560)
Double: Y = 27 (685)

QUANTITIES

Material	Single	Double
Concrete - cu. yd. (m^3)	1.7 (1.3)	3.1 (2.4)
Cast Iron Grate - Ea.	1	2
Pipe Drain - Dia. in (mm)	12 (300)	15 (375)

GENERAL NOTES

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

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

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

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

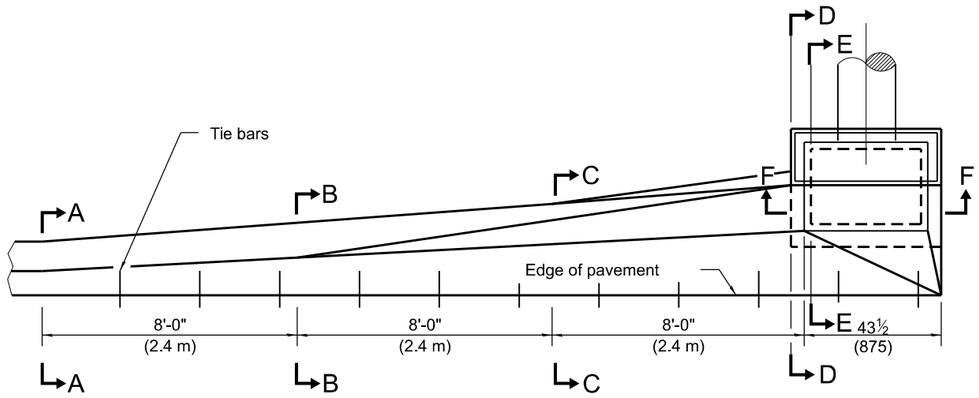
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

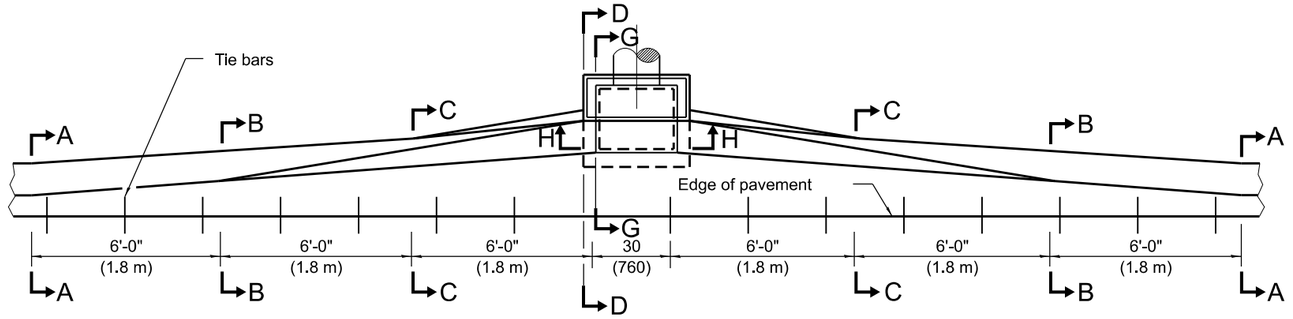
DATE	REVISIONS
1-1-18	Deleted second General Note to
	avoid conflict with first General Note.
1-1-09	Switched units to English (metric).

OUTLET TYPE 1 FOR TYPE B GUTTER

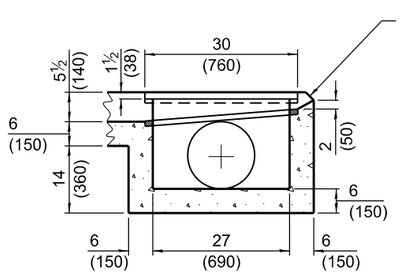
STANDARD 606206-04



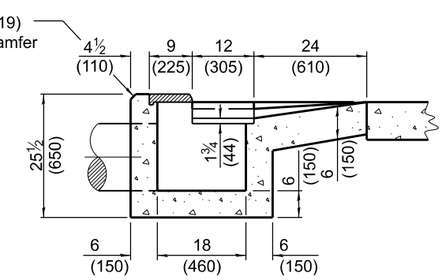
PLAN - SINGLE OUTLET



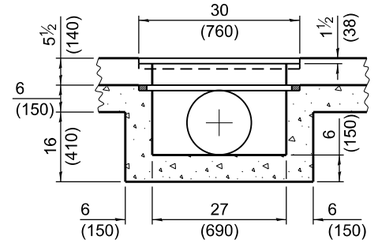
PLAN - DOUBLE OUTLET



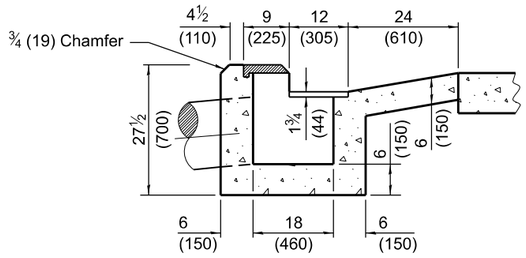
SECTION F-F



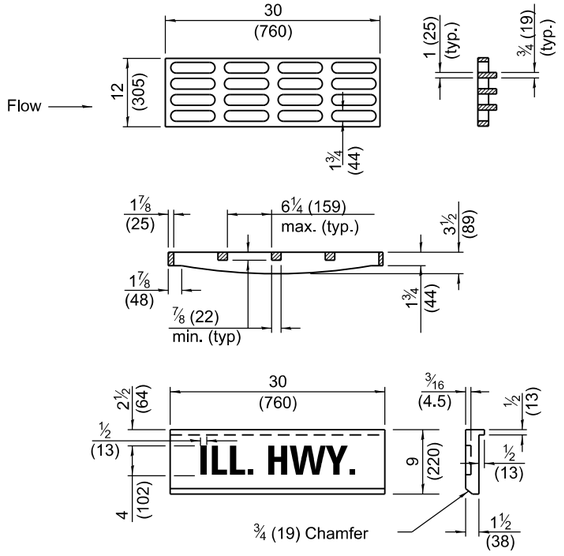
SECTION E-E



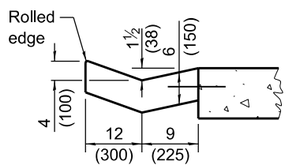
SECTION H-H



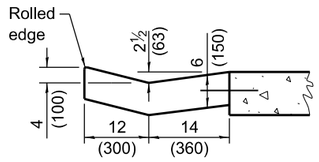
SECTION G-G



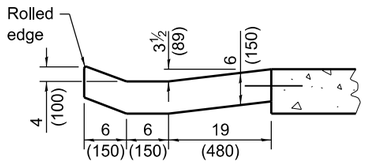
GRATE AND COVER TYPE 2B



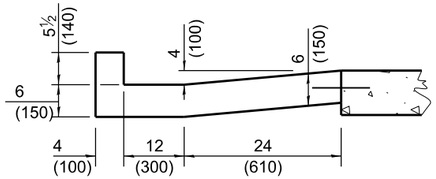
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

QUANTITIES

Material	Single	Double
Concrete - cu. yd. (m³)	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.

Illinois Department of Transportation

APPROVED January 1, 2018
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

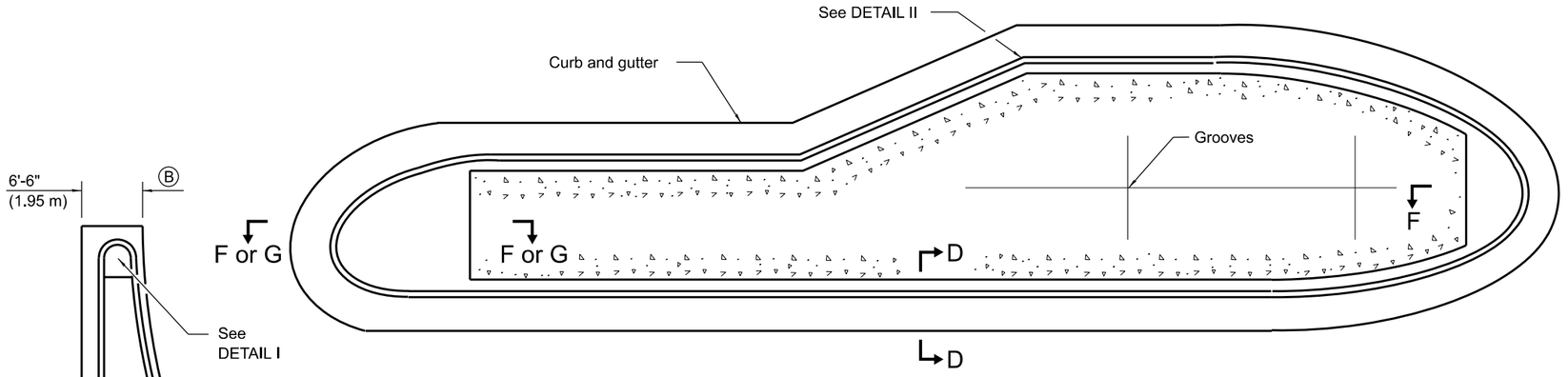
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-18	Revised tie bar notes to be consistent
	with other gutter Highway Standards.
1-1-09	Switched units to English (metric).

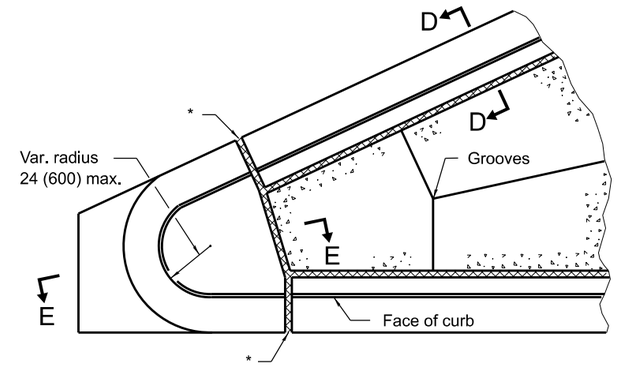
OUTLETS TYPE 2 FOR TYPE B GUTTER

STANDARD 606211-04

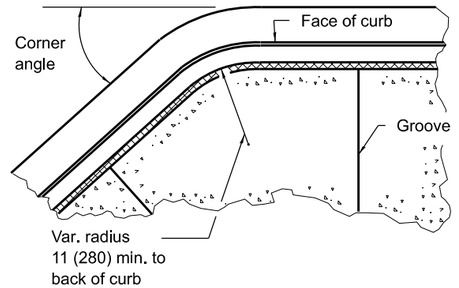


TYPICAL PLAN OF MEDIAN ISLAND

(SEE SHEET 2 FOR DETAILS OF RAMPED NOSES)

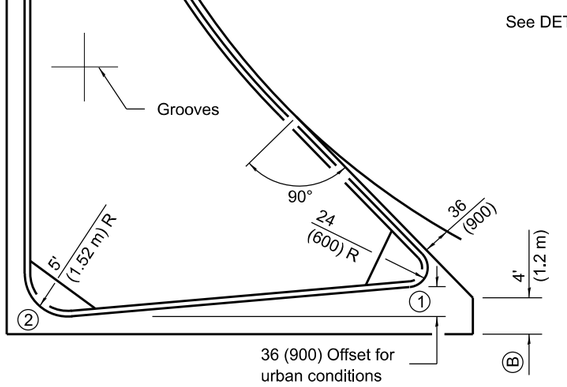


DETAIL I



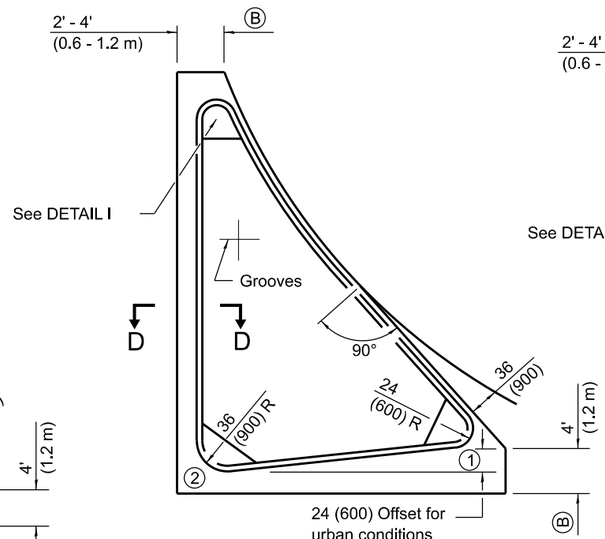
DETAIL II

Typical detail when corner angle is less than 90° and for other corners with radius greater than 24 (600).



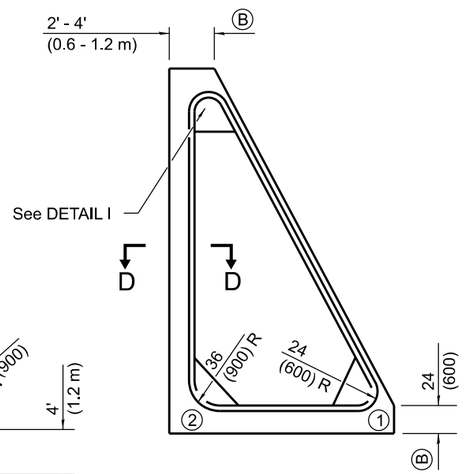
LARGE ISLAND

(FREE FLOW DESIGN)



INTERMEDIATE ISLAND

(FOR RIGHT TURN LANE DESIGN)



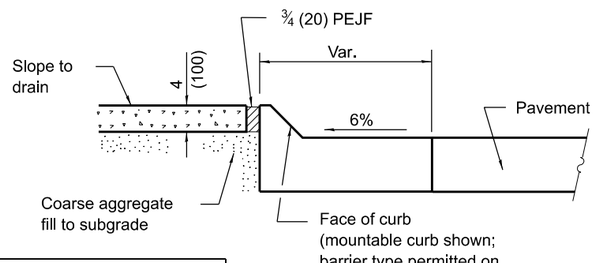
SMALL ISLAND

TYPICAL PLANS OF CORNER ISLANDS

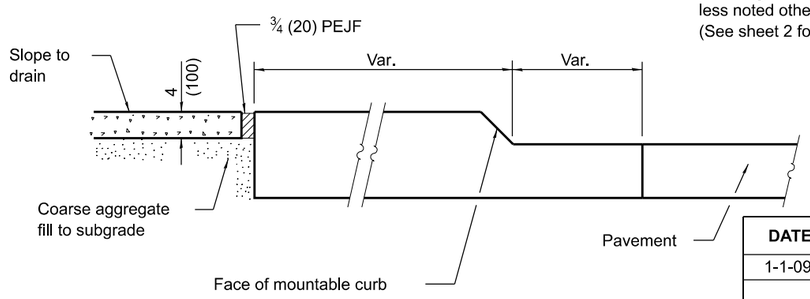
(SEE SHEET 2 FOR DETAILS OF RAMPED NOSES)

NOTE:
The blockouts Ⓑ for the islands shall be extended so that the termination will line up with proposed or existing pavement joint.

Noses 1 and 2 shall be ramped unless noted otherwise on the plans. (See sheet 2 for length)



SECTION D-D



SECTION E-E

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.

See Standard 420001 and 606001 for details not shown.

* ¾ (20) PEJF conforming to the full cross section of the curb, gutter and median surface.

X = PCC base course plus HMA thickness.

t = Pavement or pcc base course thickness.

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

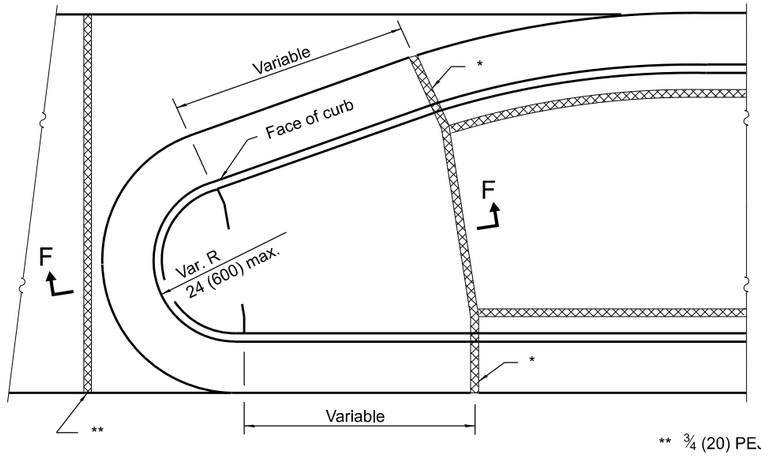
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

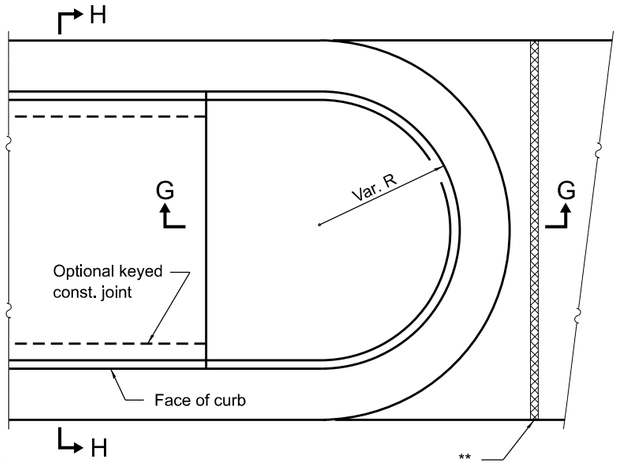
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Switched to Hot-Mix Asphalt (HMA)
	terminology.

PC CONCRETE ISLANDS AND MEDIANS

STANDARD 606301-04



TYPE P MEDIAN SURFACE



SOLID MEDIAN

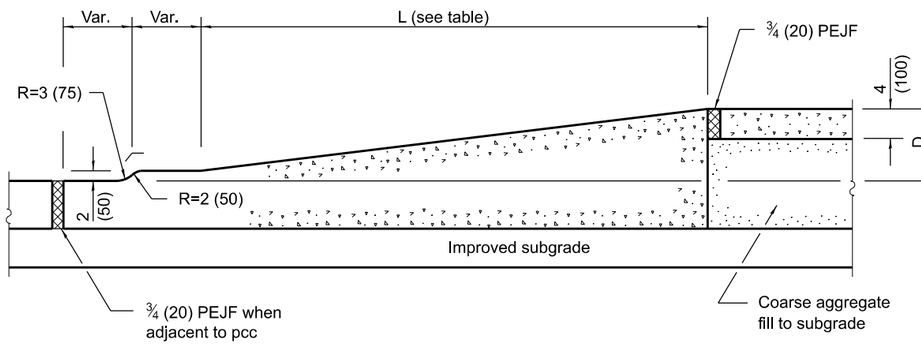
** ¾ (20) PEJF between rigid pavement and median end. Align with joint in adjacent pavement.

TABLE OF DIMENSIONS					
TYPE SB MEDIANS					
TYPE	A	B	C	D	R_1
SB-6.06 (SB-15.15)	6 (150)	1 (25)	6 (150)	6 (150)	1 (25)
SB-6.12 (SB-15.30	12 (300)	1 (25)	6 (150)	6 (150)	1 (25)
SB-6.18 (SB-15.45)	18 (450)	1 (25)	6 (150)	6 (150)	1 (25)
SB-6.24 (SB-15.60)	24 (600)	1 (25)	6 (150)	6 (150)	1 (25)
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)

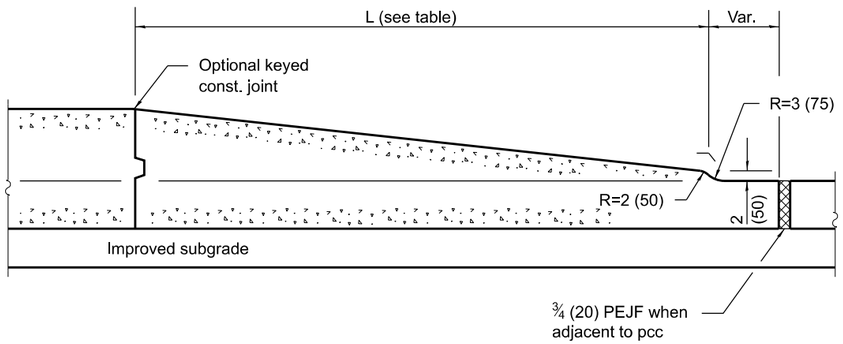
TABLE OF DIMENSIONS					
TYPE M AND SM MEDIANS					
TYPE	A	B	C	D	R_1
M-2.06 (M-5.15)	6 (150)	2 (50)	4 (100)	2 (50)	2 (50)
M-2.12 (M-5.30)	12 (300)	2 (50)	4 (100)	2 (50)	2 (50)
SM-4.06 (SM-10.15)	6 (150)	4 (100)	3 (75)	4 (100)	3 (75)
SM-4.12 (SM-10.30)	12 (300)	4 (100)	3 (75)	4 (100)	3 (75)
SM-4.18 (SM-10.45)	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)

PLAN

(RAMPED NOSES)

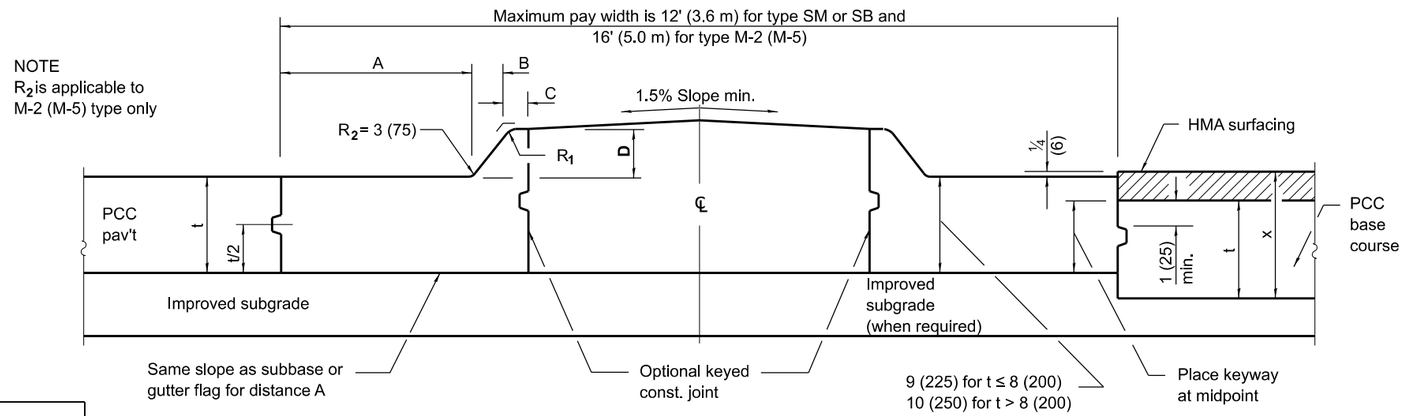


SECTION F-F



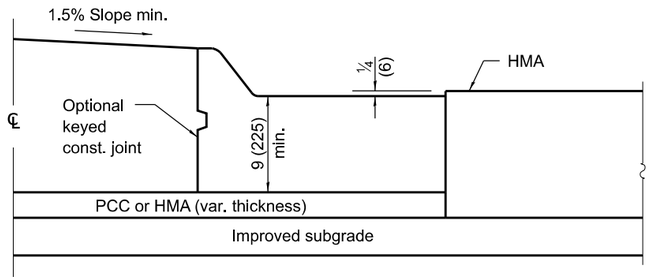
SECTION G-G

TABLE OF RAMPED NOSE LENGTHS	
TYPE OF NOSE	L
Median	6' (1.8 m)
Small Island	24 (600)
Intermediate Island	4' (1.2 m)
Large Island	6' (1.8 m)



HALF SECTION FOR PCC PAVEMENT

HALF SECTION FOR PCC BASE COURSE



HALF SECTION FOR FLEXIBLE PAVEMENT

SECTION H-H

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

Illinois Department of Transportation

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ENGINEER OF POLICY AND PROCEDURES

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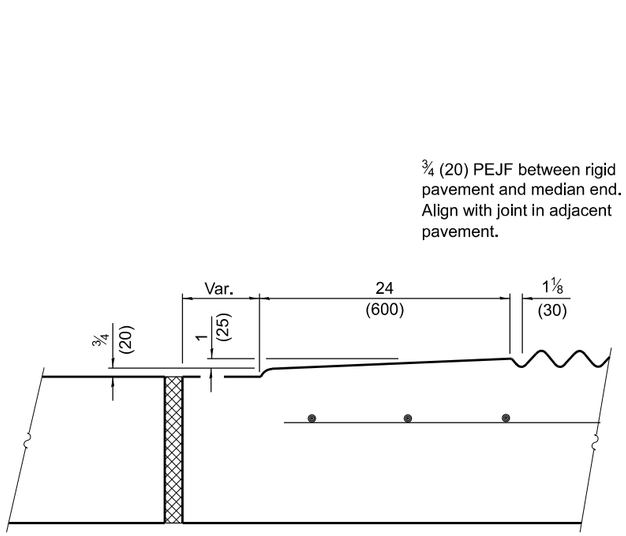
ISSUED 1-1-97

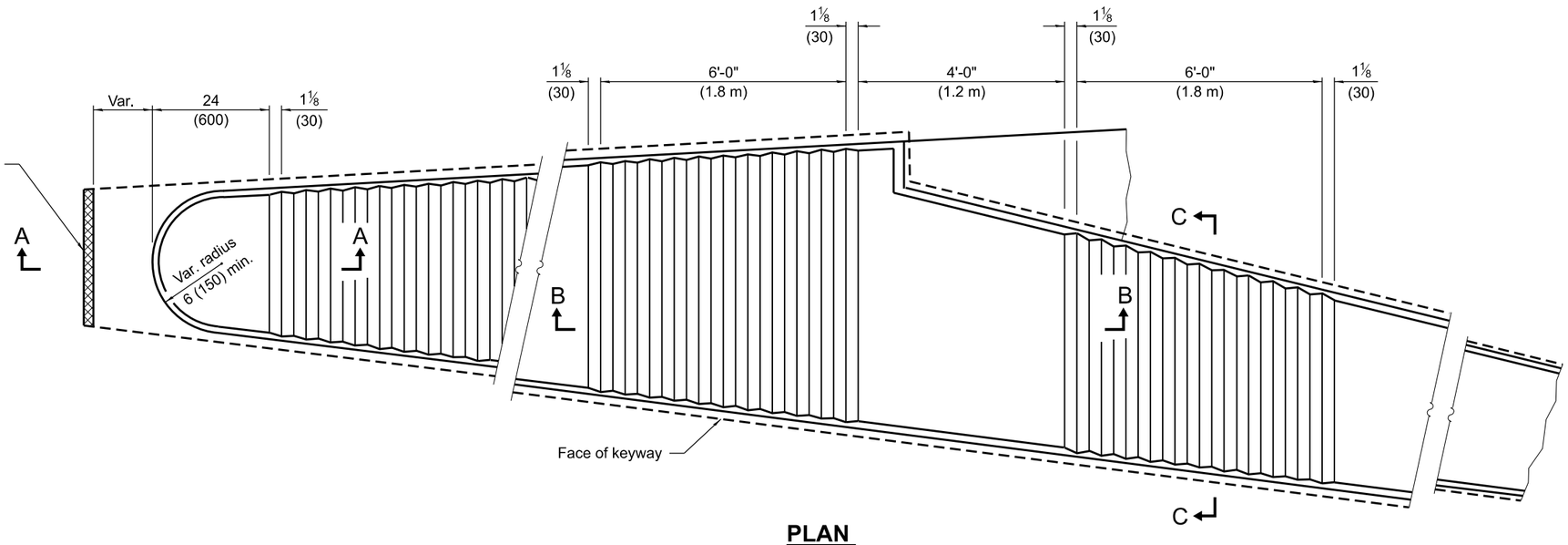
PC CONCRETE ISLANDS AND MEDIANS

(Sheet 2 of 2)

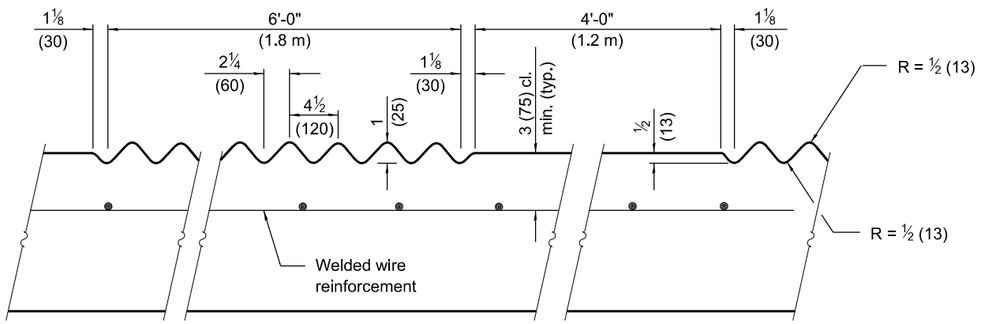
STANDARD 606301-04



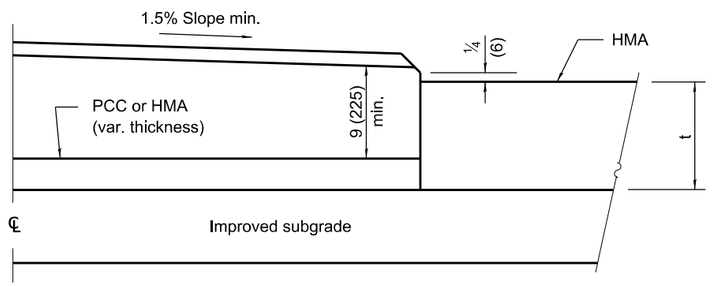
SECTION A-A



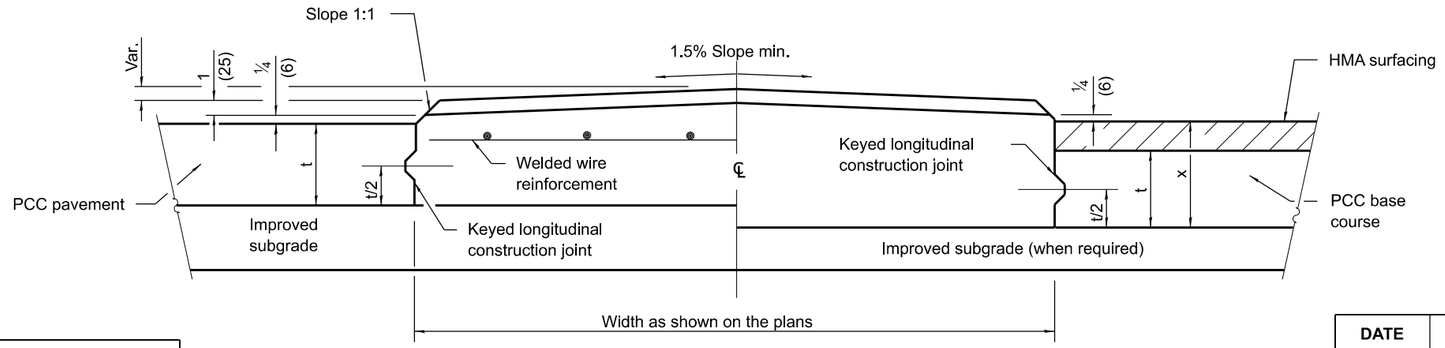
PLAN



SECTION B-B



HALF SECTION FOR FLEXIBLE PAVEMENT
SECTION C-C



HALF SECTION FOR PCC PAVEMENT

SECTION C-C

HALF SECTION FOR PCC BASE COURSE

GENERAL NOTES

PEJF = Preformed expansion joint filler.

Median layout and radii shall be as shown on the plans.

Keyed longitudinal construction joints shall be constructed without tie bars.

X = PCC base course plus HMA thickness.

t = Pavement or pcc base course thickness.

Welded wire reinforcement required for medians built contiguous to reinforced pcc pavement only.

See Standards 420001 and 420701 for details not shown.

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

Illinois Department of Transportation

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ENGINEER OF POLICY AND PROCEDURES

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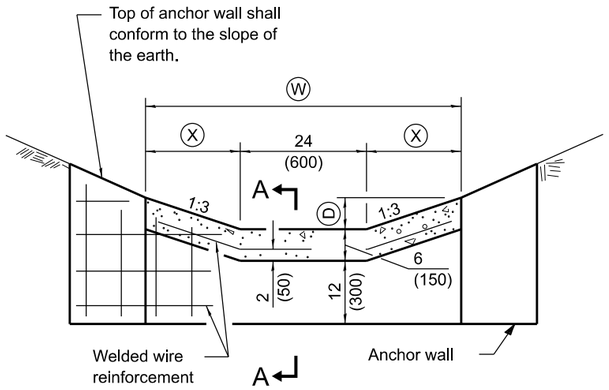
DATE	REVISIONS
4-1-16	Changed terminology to
	'welded wire reinforcement'.
1-1-09	Switched units to English (metric).

CORRUGATED PC CONCRETE MEDIANS

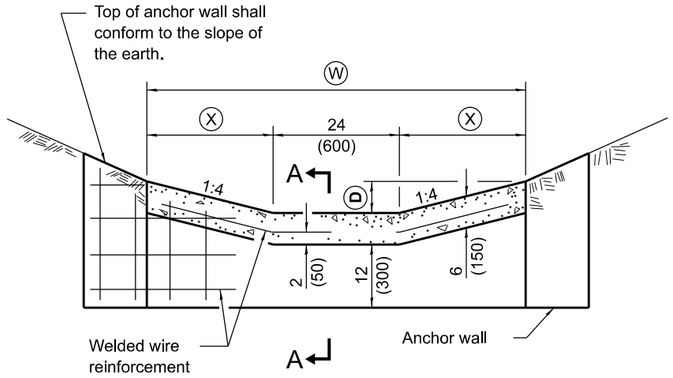
STANDARD 606306-04



ELEVATION

TABLE FOR PAVED DITCH TYPE A

TYPE	D	W	X	Flow Area sq. ft. (m²)	Conc. Area sq. yd. (m²)
A-15	6 (150)	5'-0" (1.5 m)	18 (450)	1.75 (0.175)	0.278 (0.225)
A-22	9 (225)	6'-6" (1.95 m)	27 (675)	3.19 (0.287)	0.361 (0.293)
A-30	12 (300)	8'-0" (2.4 m)	36 (900)	5.00 (0.450)	0.444 (0.360)
A-37	15 (375)	9'-6" (2.85 m)	3'-9" (1.12 m)	7.19 (0.645)	0.528 (0.426)
A-45	18 (450)	11'-0" (3.3 m)	4'-6" (1.35 m)	9.75 (0.877)	0.611 (0.495)
A-52	21 (525)	12'-6" (3.75 m)	5'-3" (1.58 m)	12.69 (1.144)	0.694 (0.564)
A-60	24 (600)	14'-0" (4.2 m)	6'-0" (1.8 m)	16.00 (1.440)	0.778 (0.630)

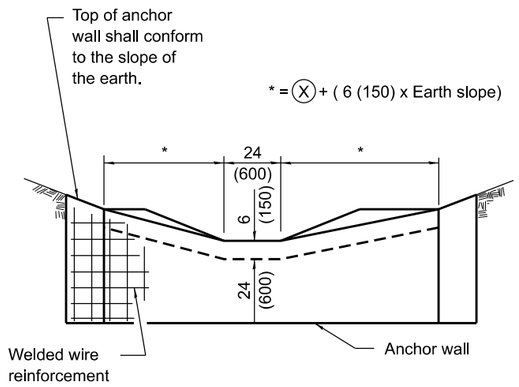


ELEVATION

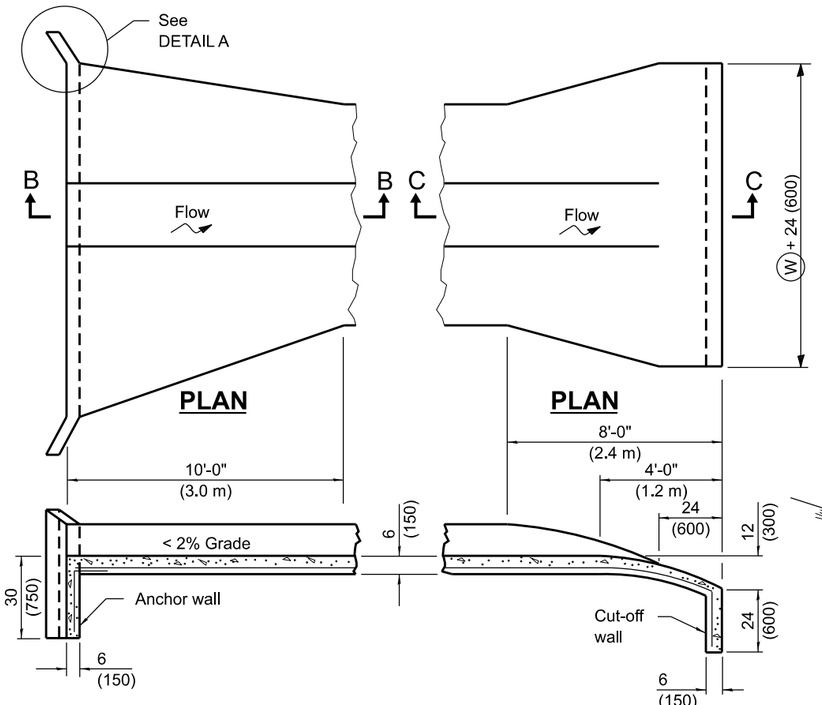
TABLE FOR PAVED DITCH TYPE B

TYPE	D	W	X	Flow Area sq. ft. (m²)	Conc. Area sq. yd. (m²)
B-15	6 (150)	6'-0" (1.8 m)	24 (600)	2.00 (0.180)	0.333 (0.270)
B-22	9 (225)	8'-0" (2.4 m)	36 (900)	3.75 (0.337)	0.444 (0.360)
B-30	12 (300)	10'-0" (3.0 m)	4'-0" (1.2 m)	6.00 (0.540)	0.555 (0.450)
B-37	15 (375)	12'-0" (3.6 m)	5'-0" (1.5 m)	8.75 (0.787)	0.667 (0.540)
B-45	18 (450)	14'-0" (4.2 m)	6'-0" (1.8 m)	12.00 (1.080)	0.778 (0.630)
B-52	21 (525)	16'-0" (4.8 m)	7'-0" (2.1 m)	15.75 (1.417)	0.889 (0.720)
B-60	24 (600)	18'-0" (5.4 m)	8'-0" (2.4 m)	20.00 (1.800)	1.000 (0.810)

PAVED DITCH TYPE A



ELEVATION



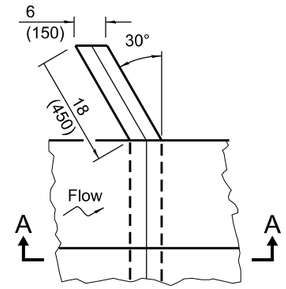
PLAN

SECTION B-B

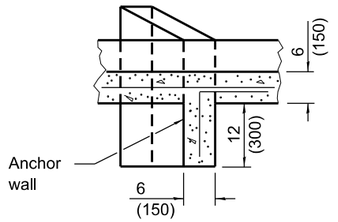
PLAN

SECTION C-C

PAVED DITCH TYPE B

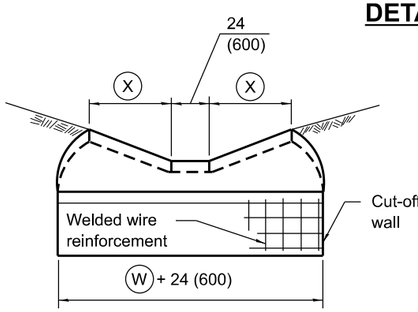


DETAIL A



SECTION A-A

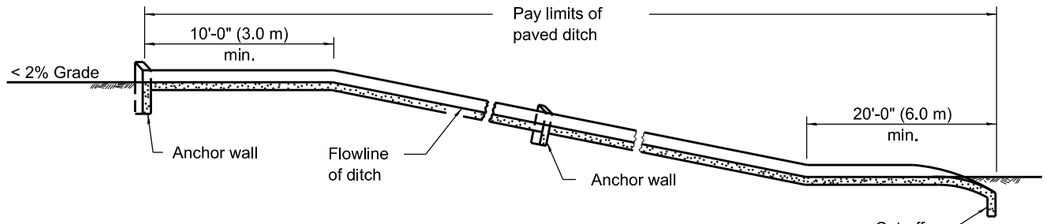
DETAIL OF ANCHOR WALL



ELEVATION

DETAIL OF UPSTREAM END

DETAIL OF DOWNSTREAM END



LOCATION AND LIMITS OF PAVED DITCH

GENERAL NOTES

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

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

Illinois Department of Transportation

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Michael Brand
ENGINEER OF POLICY AND PROCEDURES

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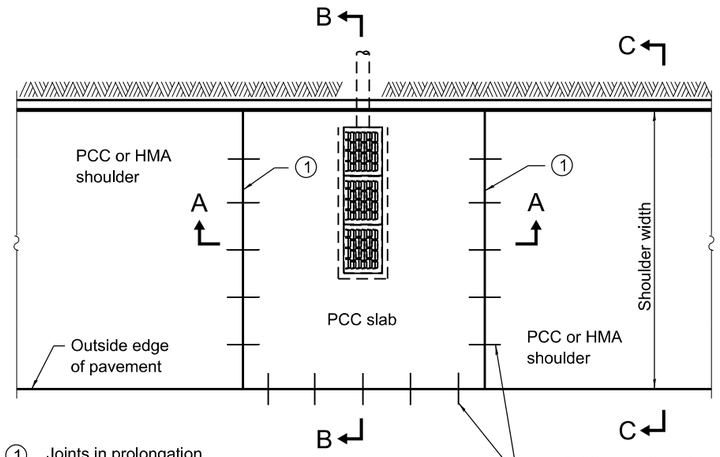
ISSUED 1-1-97

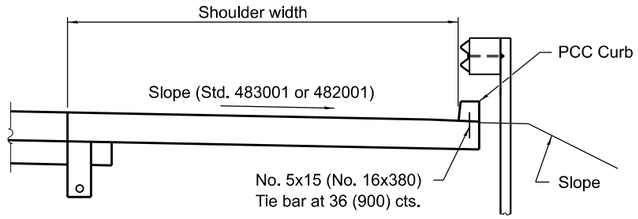
DATE	REVISIONS
4-1-16	Changed terminology to
	'welded wire reinforcement'.
1-1-09	Switched units to English (metric).

PAVED DITCH

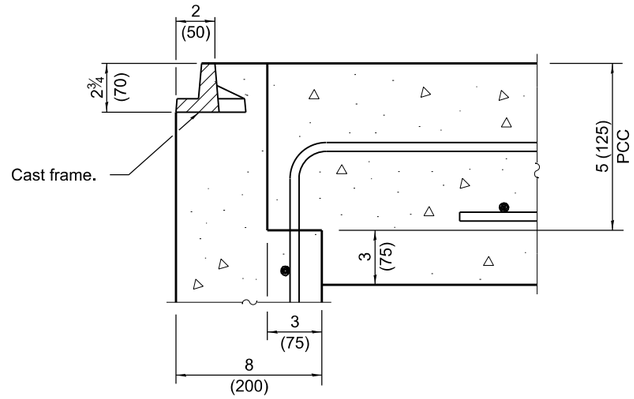
STANDARD 606401-02



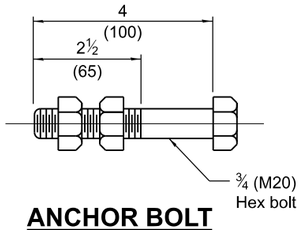
PLAN



SECTION C-C

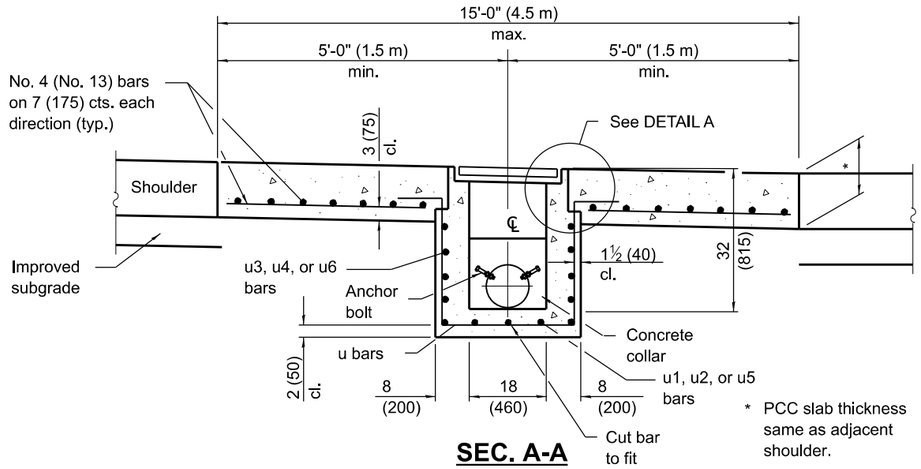


DETAIL A

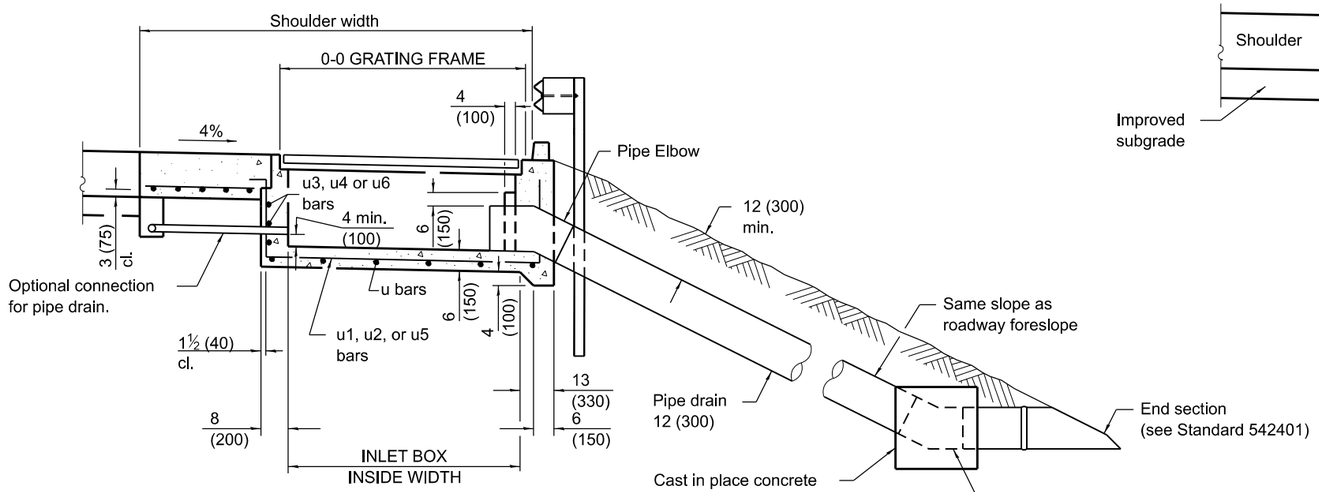


ANCHOR BOLT

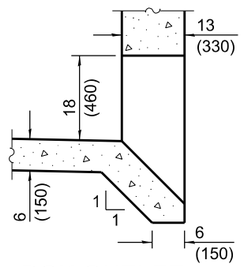
(Used to tie pipe to concrete collar)



SEC. A-A



SECTION B-B



BOX OUTLET WHEN PRECAST

GENERAL NOTES

See Standard 420001 for joint details not shown.

See Standard 630001 for details of guardrail not shown.

All exposed edges of the inlet, except the upper perimeter, shall be beveled ¾ (20).

For placement of drainage elements on existing construction with existing rigid pavement, substitute expansion anchor ties for tie bars. For nonrigid pavements or monolithic construction of PCC slab and shoulder, omit tie bars.

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

INLET TYPE	SHOULDER WIDTH	O-O GRATING FRAME	INLET BOX INSIDE WIDTH	INLET BOX INSIDE LENGTH
Type E	8' (2.4 m)	4'-4" (1.325 m)	3'-11" (1.195 m)	18 (460)
Type F	10' (3.0 m)	6'-5" (1.960 m)	6'-0" (1.830 m)	18 (460)
Type G	5' (1.5 m) or less	27 (690)	22 (560)	18 (460)

Illinois Department of Transportation

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ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

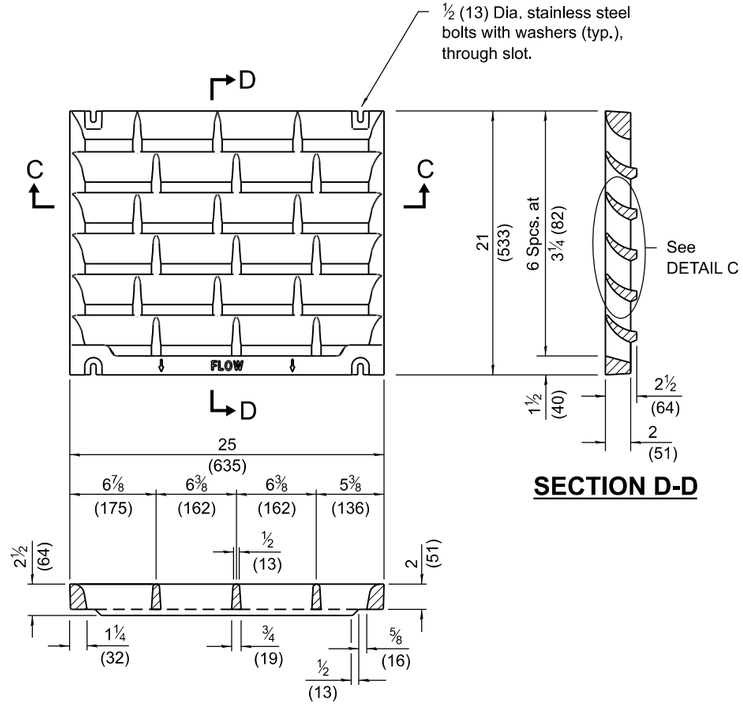
ISSUED 1-1-97

DATE	REVISIONS
1-1-21	Revised Section B-B, precast
	box outlet, anchor bolts, rebar and
	curb details. Added pipe elbows
	and WWR note.
1-1-18	Changed tie bar spacing to
	36 (900) cts.

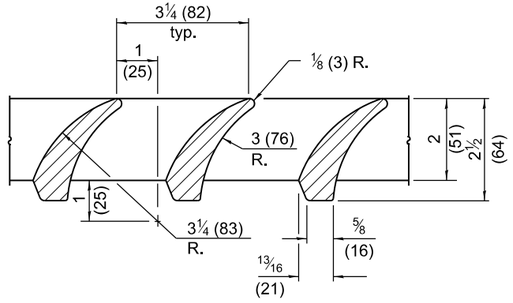
SHOULDER INLET WITH CURB

(Sheet 1 of 2)

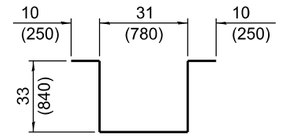
STANDARD 610001-09



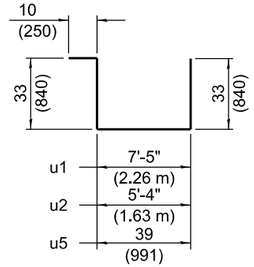
SECTION C-C



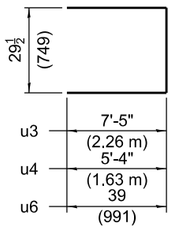
DETAIL C



BAR u



BARS u1, u2, & u5



BARS u3, u4 & u6

INLET BOX

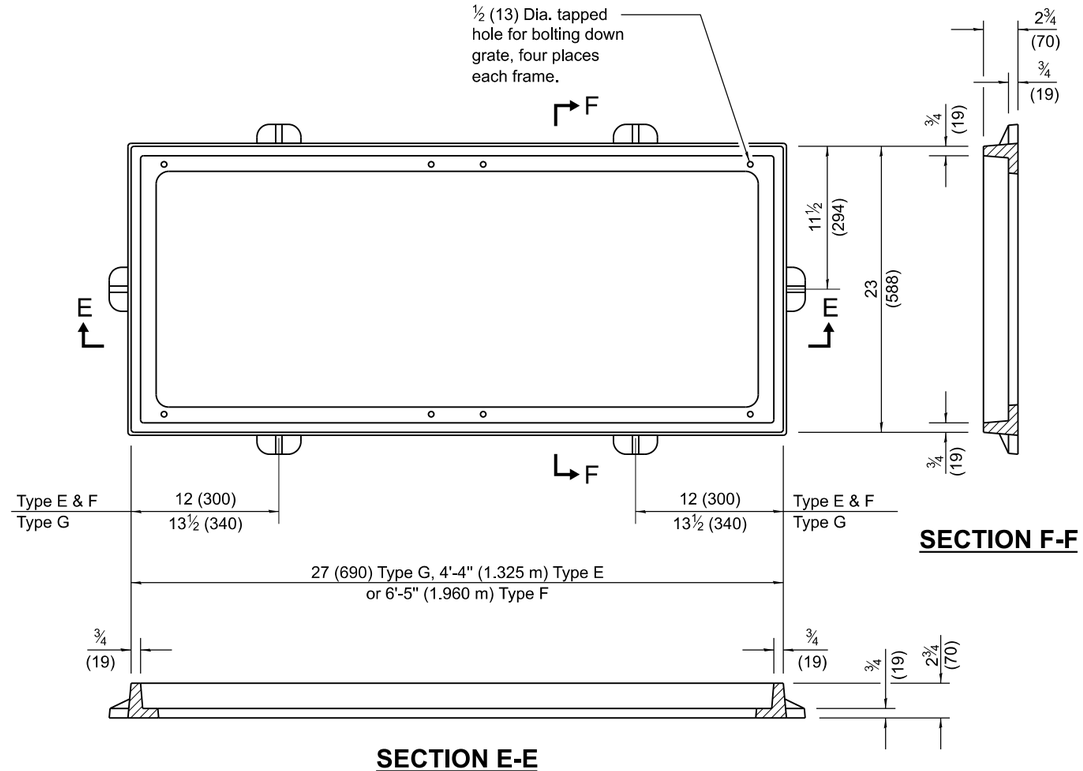
REQUIRED MATERIAL			
TYPE F			
Bar	Qty.	Size	Length
u	8	No. 4 (No.13)	9'-9" (2.96 m)
u1	3	No. 4 (No.13)	13'-9" (4.19 m)
u3	4	No. 4 (No.13)	17'-3½" (5.27 m)
Concrete		cu. yds. (m^3)	1.7 (1.3)
Reinf. bars		lbs. (kg)	126 (57.2)
Grating		sq. ft. (m^2)	10.9 (1.02)
TYPE E			
Bar	Qty.	Size	Length
u	6	No. 4 (No.13)	9'-9" (2.96 m)
u2	3	No. 4 (No.13)	11'-8" (3.56 m)
u4	4	No. 4 (No.13)	13'-1½" (4.00 m)
Concrete		cu. yds. (m^3)	1.3 (1.0)
Reinf. bars		lbs. (kg)	98 (44.5)
Grating		sq. ft. (m^2)	7.3 (0.68)
TYPE G			
Bar	Qty.	Size	Length
u	4	No. 4 (No.13)	9'-9" (2.69 m)
u5	3	No. 4 (No.13)	9'-7" (2.92 m)
u6	4	No. 4 (No.13)	8'-11½" (2.73 m)
Concrete		cu. yds. (m^3)	0.5 (0.4)
Reinf. bars		lbs. (kg)	70 (31.8)
Grating		sq. ft. (m^2)	3.6 (0.34)

NOTES

Welded wire reinforcement (WWR) may be used in lieu of reinforcement bars. Only one layer of WWR is permitted to avoid congestion.

DETAIL OF CAST GRATE

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



SECTION F-F

SECTION E-E

DETAIL OF CAST FRAME

(Type E shown)

Illinois Department of Transportation

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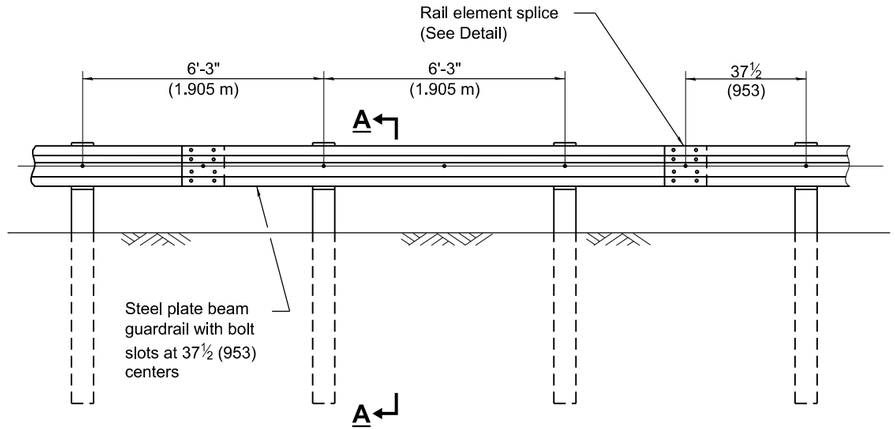
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

SHOULDER INLET WITH CURB

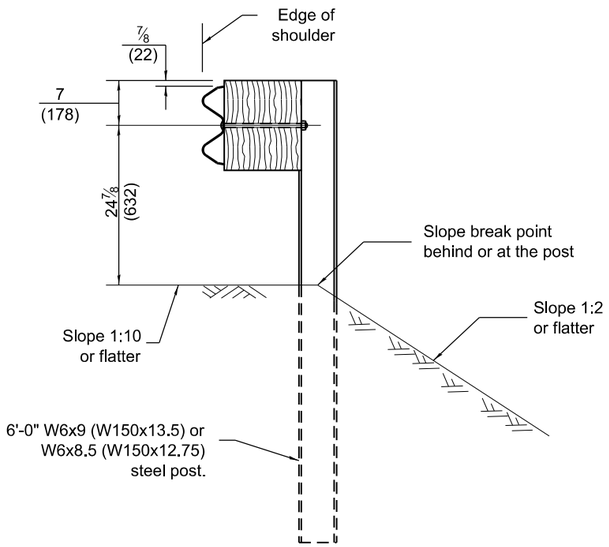
STANDARD 610001-09



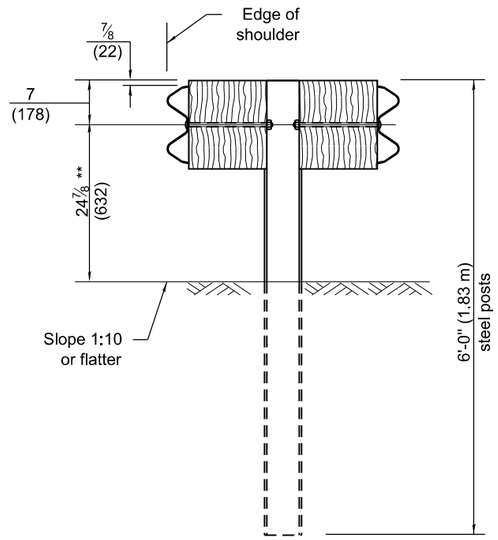
ELEVATION

TYPE A

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

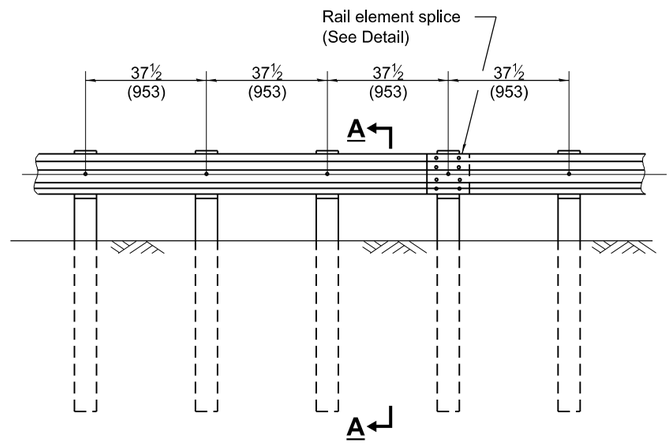


SECTION A-A



SECTION B-B

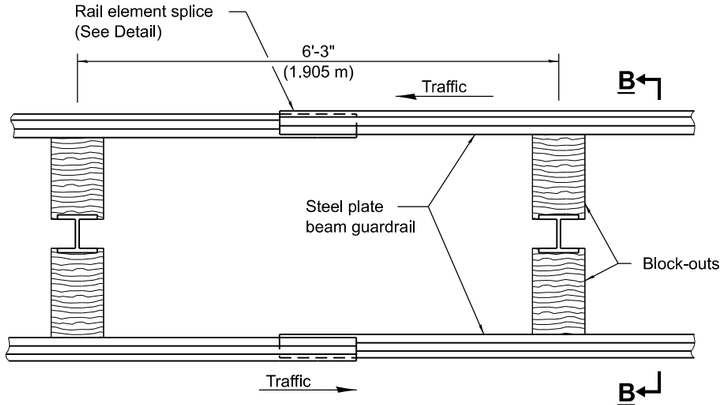
** When connecting Type D guardrail to an impact attenuator, adjust this dimension to match over a distance of 25'-0" (7.62 m) from point of connection if necessary.



ELEVATION

TYPE B

37½ (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.

Illinois Department of Transportation

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ENGINEER OF POLICY AND PROCEDURES

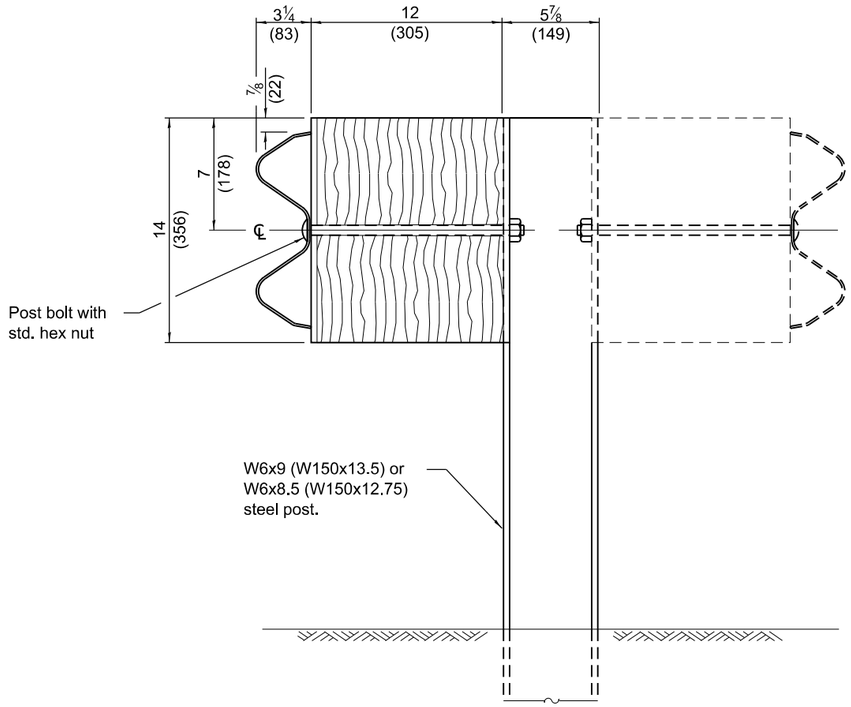
APPROVED January 1, 2024
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

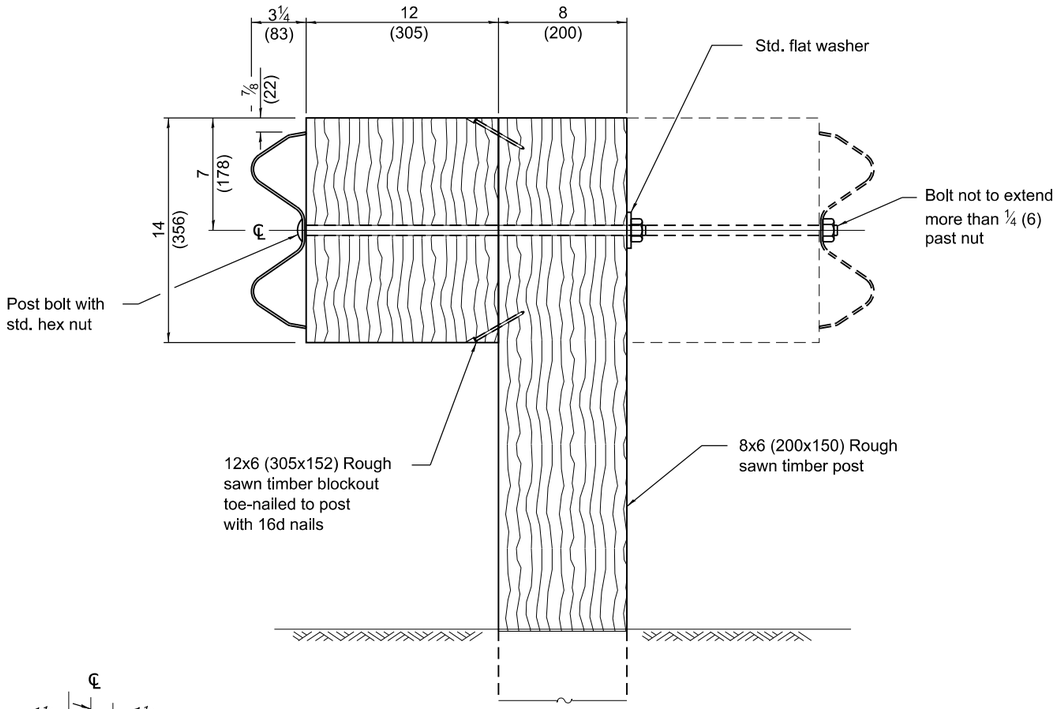
DATE	REVISIONS
1-1-24	Revised Section A-A to allow 6' posts
	at or behind the slope break point.
1-1-18	Revised steel post to have four
	holes in each flange.

STEEL PLATE BEAM GUARDRAIL

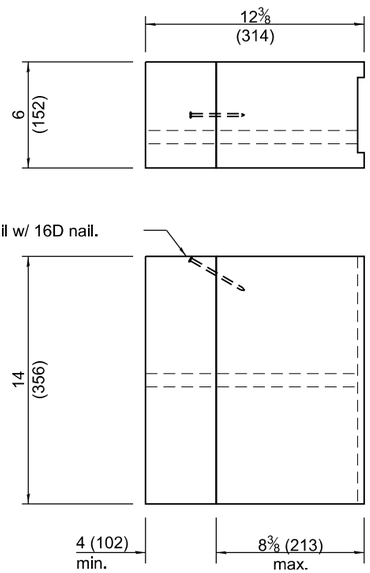
STANDARD 630001-13



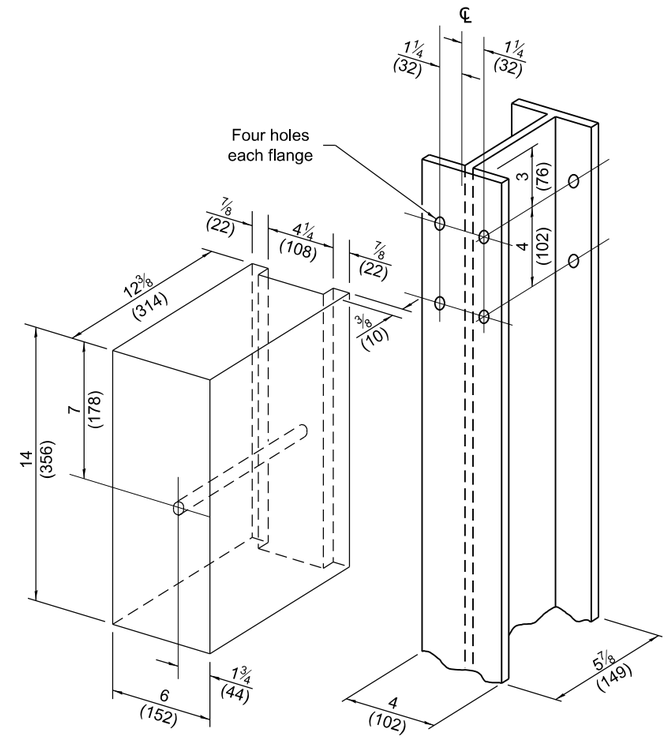
STEEL POST CONSTRUCTION



WOOD POST CONSTRUCTION

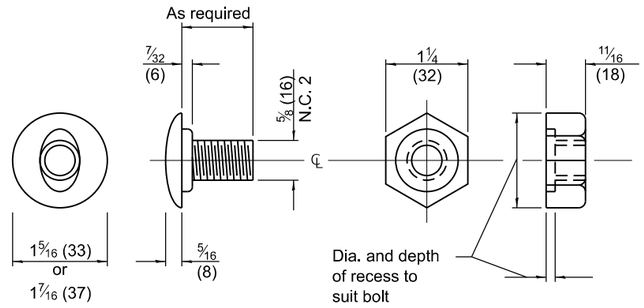


TWO-PIECE WOOD BLOCKOUT OPTION



Note:
All holes ¾ (20) dia.

WOOD BLOCK-OUT AND STEEL POST DETAILS



POST OR SPLICE BOLT & NUT

Illinois Department of Transportation

APPROVED January 1, 2024
ENGINEER OF POLICY AND PROCEDURES

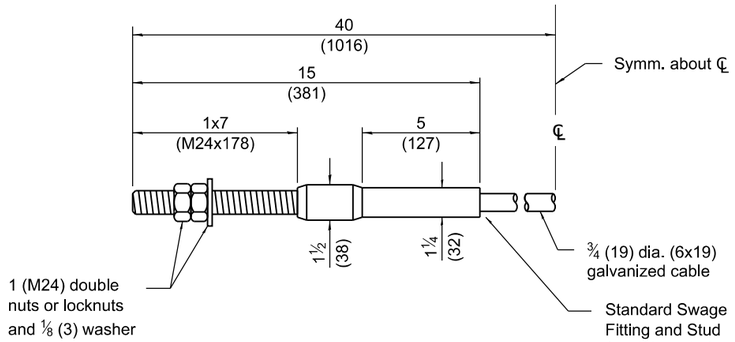
APPROVED January 1, 2024
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

STEEL PLATE BEAM GUARDRAIL

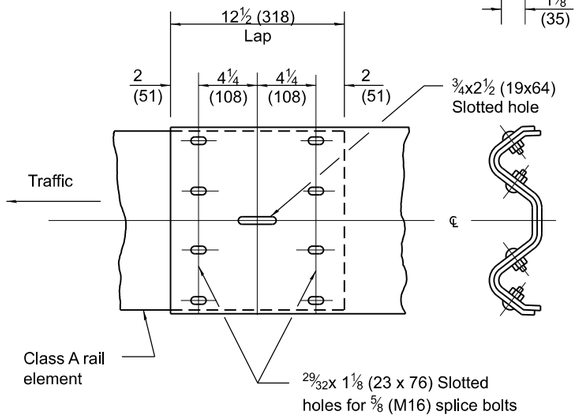
(Sheet 2 of 4)

STANDARD 630001-13

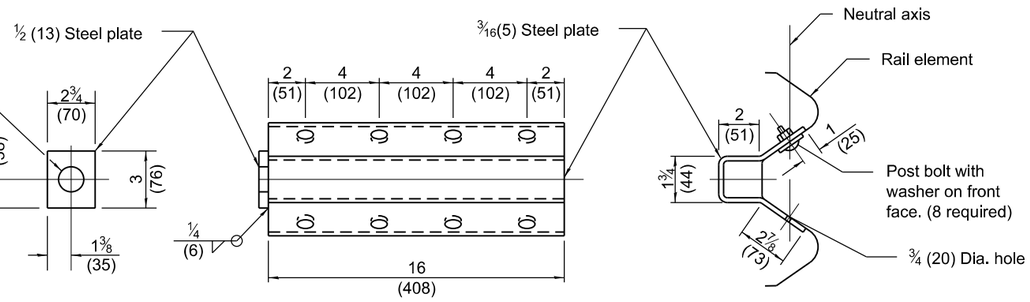


CABLE ASSEMBLY

(42,800 lbs. (190 kN) min. breaking strength)
Tighten to taut tension.

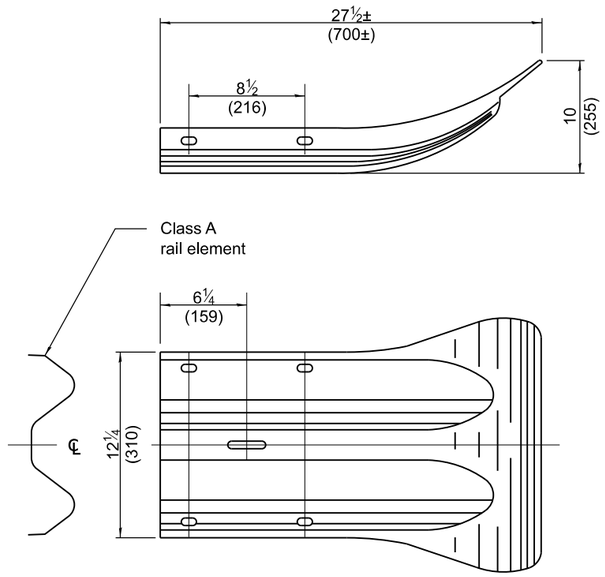


RAIL ELEMENT SPLICE

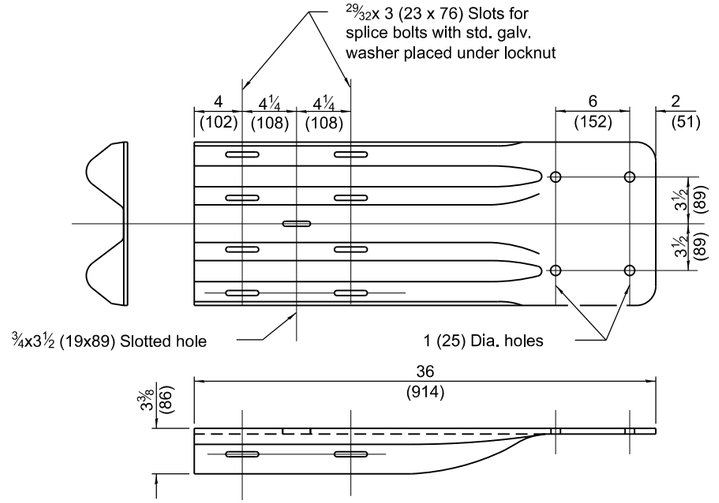


NOTE
Anchor plate T shall be used to attach cable assembly to guardrail when required on traffic barrier terminals.

ANCHOR PLATE T DETAILS



END SECTION

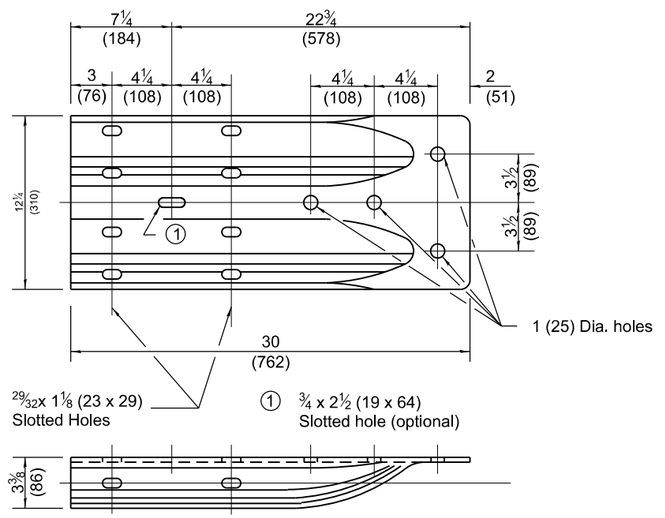


NOTE
When end shoe is attached to a bridge parapet which has an expansion joint, the bolts shall be provided with a locknut or double nut and shall be tightened only to a point that will allow guardrail movement.

The standard end shoe shall be attached to the concrete with pre-drilled or self-drilling anchor bolts. The anchor cone shall be set flush with the surface of the concrete.

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

END SHOE



ALTERNATE END SHOE

Illinois Department of Transportation

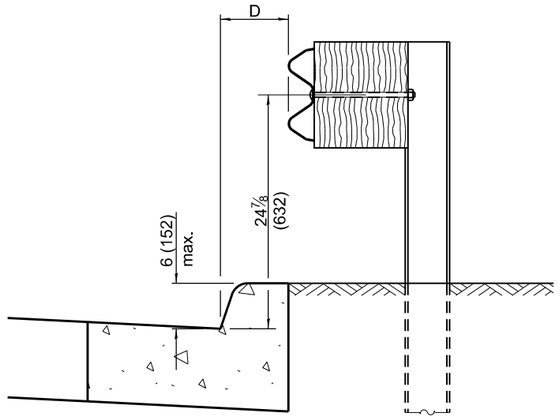
APPROVED January 1, 2024
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2024
ENGINEER OF DESIGN AND ENVIRONMENT

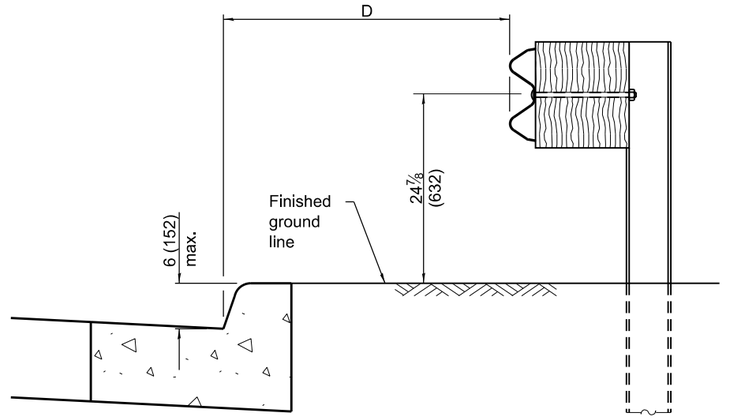
ISSUED 1-1-97

STEEL PLATE BEAM GUARDRAIL

STANDARD 630001-13



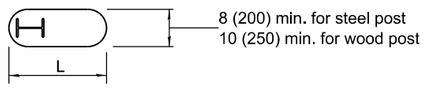
0 ≤ D < 6 (150 m)



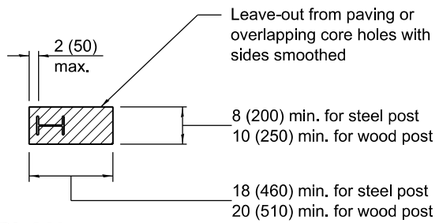
4'-0" (1.2 m) ≤ D ≤ 12'-0" (3.7 m)

GUARDRAIL PLACED BEHIND CURB

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

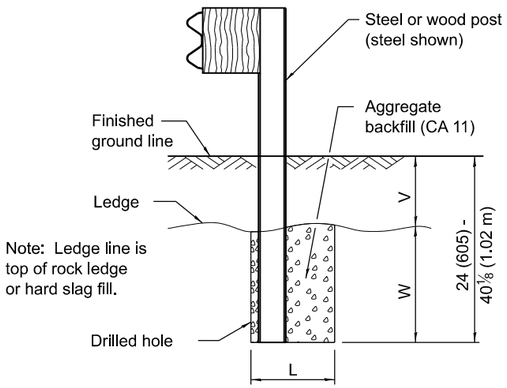


PLAN

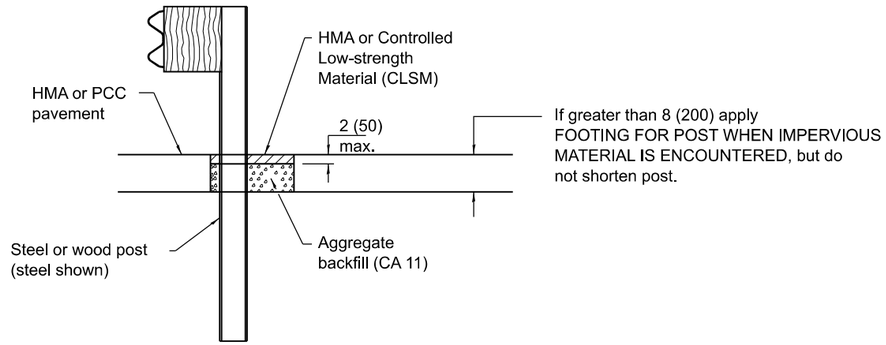


PLAN

V	W	L	
		Steel Post	Wood Post
0 - 6 (0 - 152)	24 (610)	21 (530)	23 (580)
> 6 - 18 (> 152 - 458)	18 (458)	14½ (368)	16½ (419)
> 18 - 31 (> 458 - 787)	12 (305)	8 (203)	10 (250)
> 31 - 40⅛ (> 787 - 1.02 m)	12 - 0 (305 - 0)	8 (203)	10 (250)



ELEVATION



ELEVATION

FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED

LEAVE-OUT FOR POST WHEN PAVED MATERIAL IS ENCOUNTERED

Illinois Department of Transportation

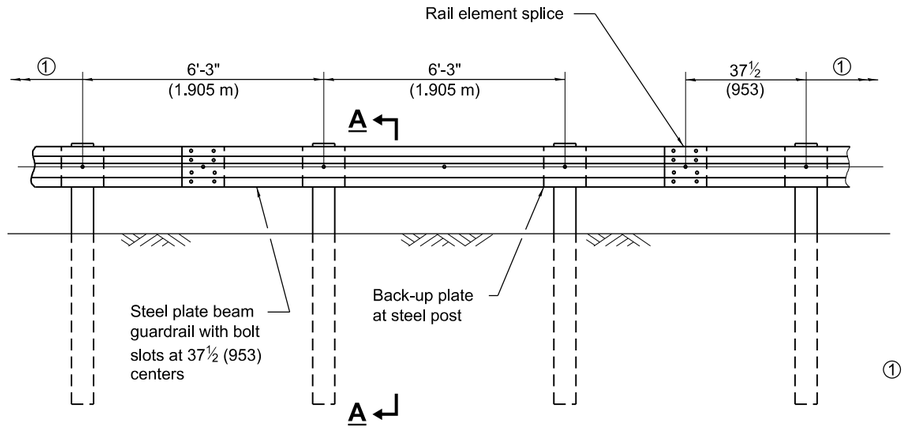
APPROVED January 1, 2024
Marshall R. Metcalf
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2024
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

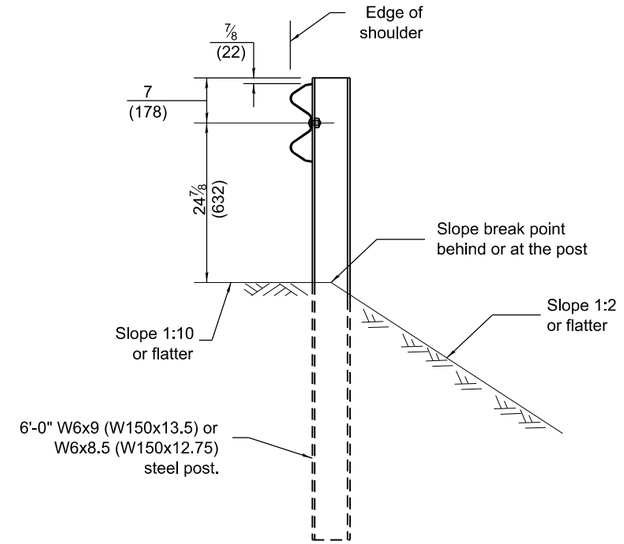
STEEL PLATE BEAM GUARDRAIL

STANDARD 630001-13

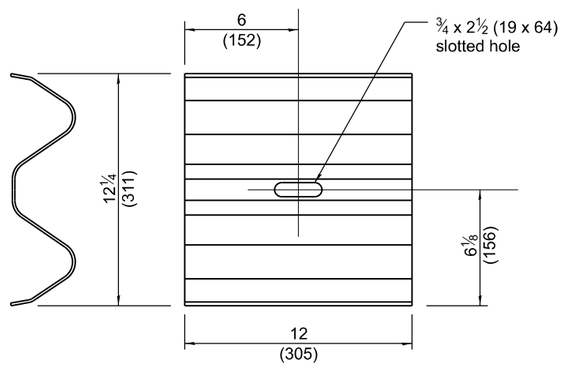


ELEVATION

① When connecting to long-span guardrail over culvert, the next post may be the third (farthest from culvert) CRT wood post (See Standard 630106).



SECTION A-A



BACK-UP PLATE

GENERAL NOTES

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

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

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

Illinois Department of Transportation

APPROVED January 1, 2024
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2024
ENGINEER OF DESIGN AND ENVIRONMENT

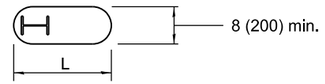
ISSUED 1-1-17

DATE	REVISIONS
1-1-24	Revised Detail at Post and
	Section A-A to allow 6' posts at or
	behind the slope break post.
1-1-17	New Standard.

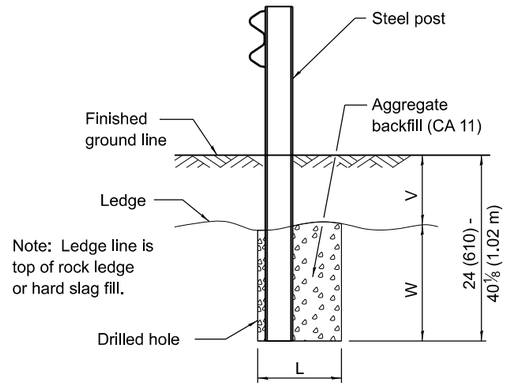
NON-BLOCKED STEEL PLATE BEAM GUARDRAIL

STANDARD 630006-01

V	W	L
0 - 6 (0 - 152)	24 (610)	21 (530)
> 6 - 18 (> 152 - 458)	18 (458)	14½ (368)
> 18 - 31 (> 458 - 787)	12 (305)	8 (203)
> 31 - 40⅛ (> 787 - 1.02 m)	12 - 0 (305 - 0)	8 (203)

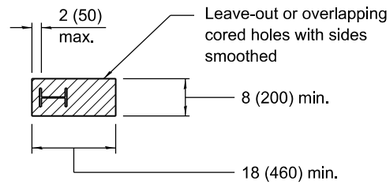


PLAN

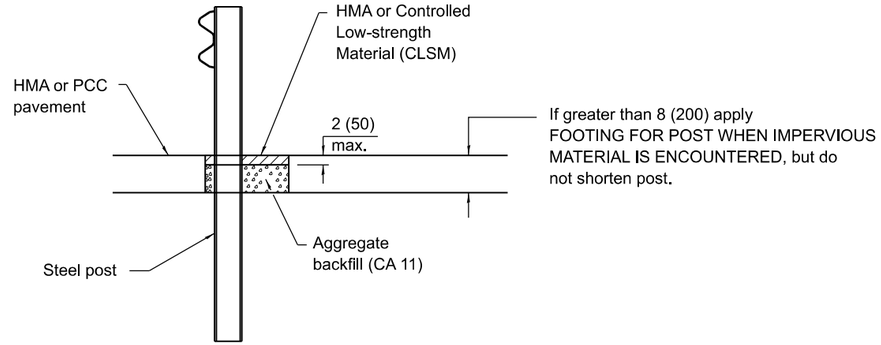


ELEVATION

FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED



PLAN



ELEVATION

LEAVE-OUT FOR POST WHEN PAVED MATERIAL IS ENCOUNTERED

Illinois Department of Transportation

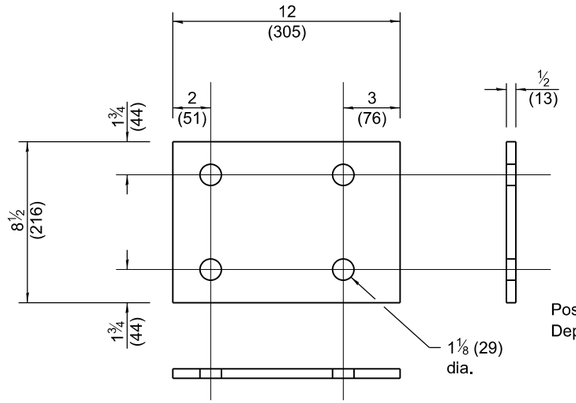
APPROVED January 1, 2024
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2024
ENGINEER OF DESIGN AND ENVIRONMENT

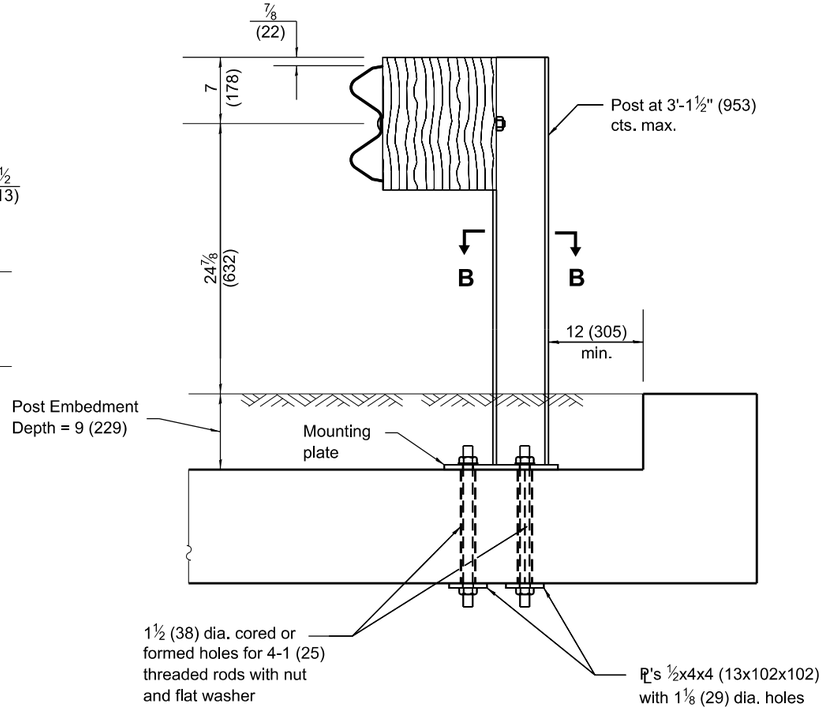
ISSUED 1-1-17

NON-BLOCKED STEEL PLATE BEAM GUARDRAIL

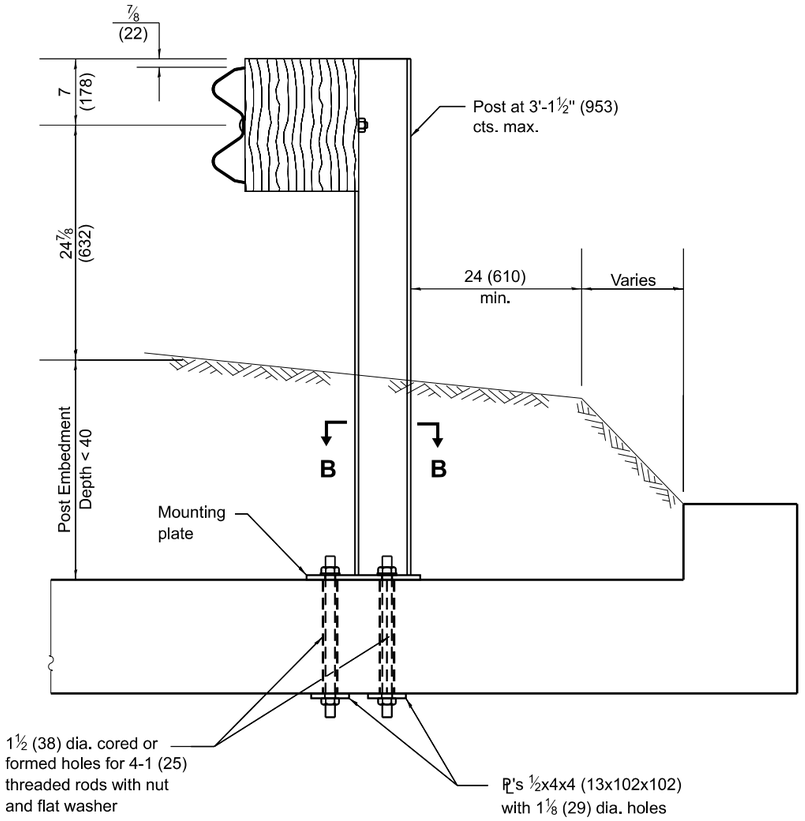
STANDARD 630006-01



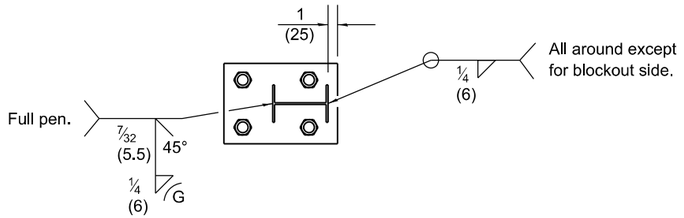
MOUNTING PLATE



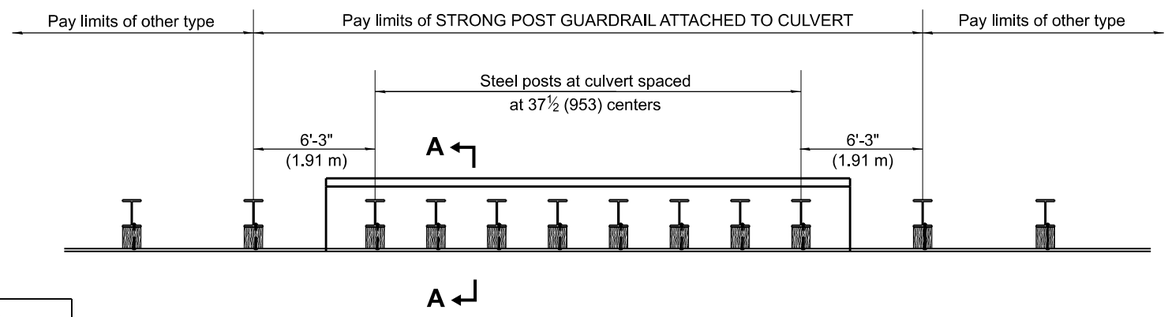
SECTION A-A
(LEVEL TERRAIN)



SECTION A-A
(FILL SLOPE)



SECTION B-B



PLAN VIEW

GENERAL NOTES

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

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

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

Illinois Department of Transportation

APPROVED January 1, 2024
ENGINEER OF POLICY AND PROCEDURES

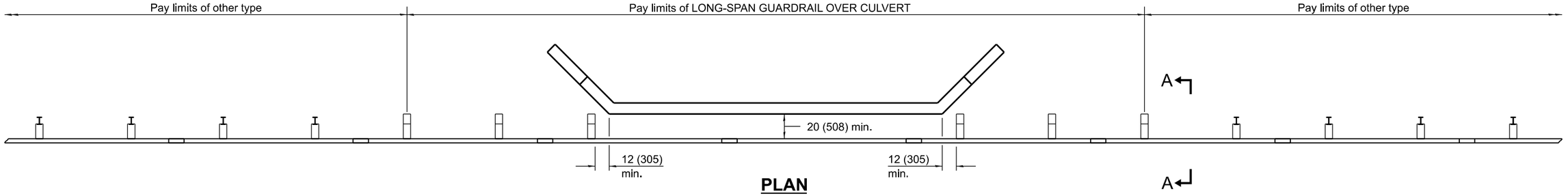
APPROVED January 1, 2024
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

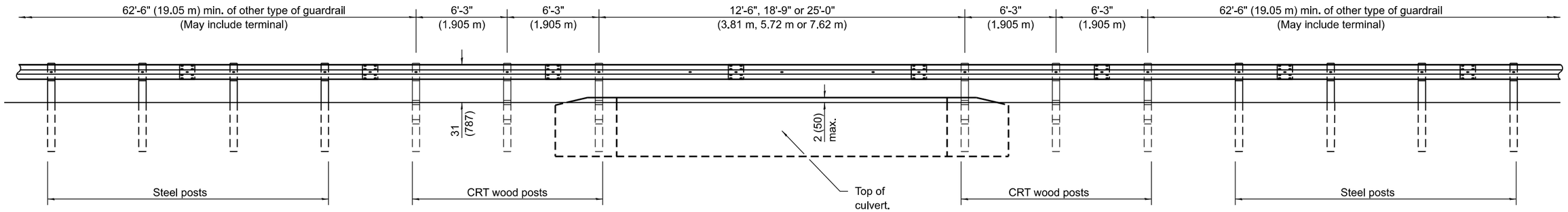
DATE	REVISIONS
1-1-24	Revised fill slope deatil. Added level
	terrain detail and pay limits plan view.
1-1-17	Omitted all cases but MNT. ON SLAB.
	Renamed standard. Added mounting
	plate detail.

STRONG POST GUARDRAIL ATTACHED TO CULVERT

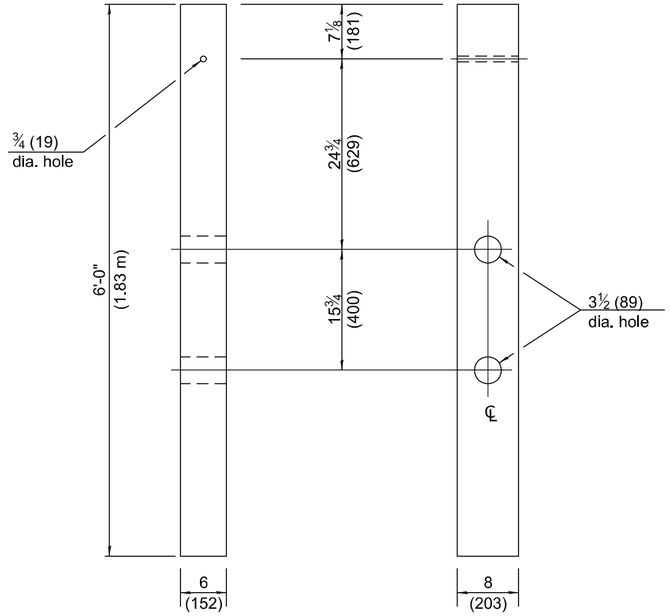
STANDARD 630101-11



PLAN



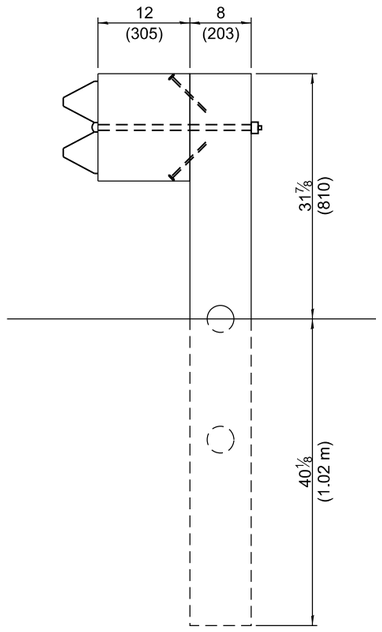
ELEVATION



FRONT

SIDE

CRT WOOD POST



SECTION A-A

GENERAL NOTES

See Standard 630001 for details of guardrail not shown.

Blockouts shown at steel posts shall be omitted when NON-BLOCKED STEEL PLATE BEAM GUARDRAIL is specified. See Standard 630006 for details not shown.

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

Illinois Department of Transportation

APPROVED January 1, 2017
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

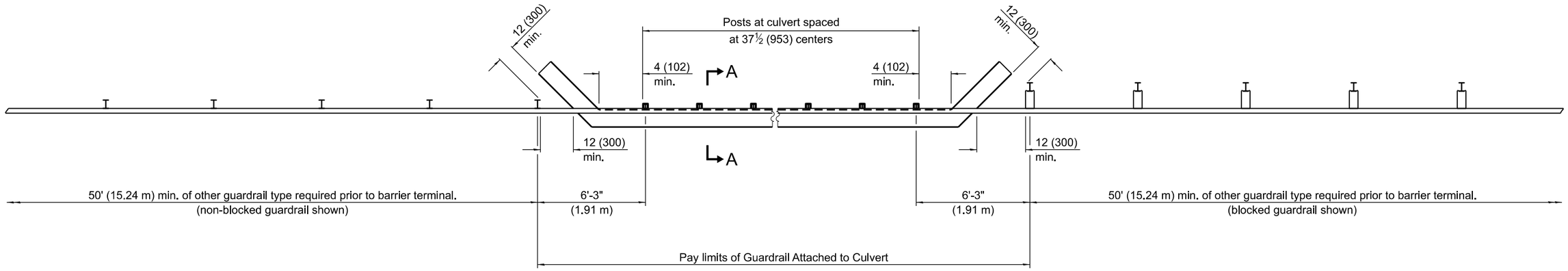
APPROVED January 1, 2017
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-11

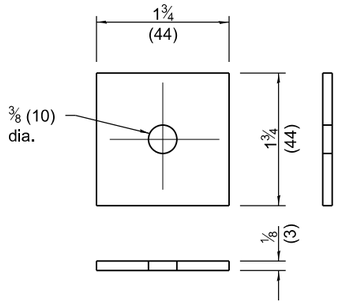
DATE	REVISIONS
1-1-17	Revised general notes for
	non-blocked guardrail option.
	Revised pay limits.
1-1-13	Added min. dim. from guardrail to
	headwall. Added dim. to Section A-A.

LONG-SPAN GUARDRAIL OVER CULVERT

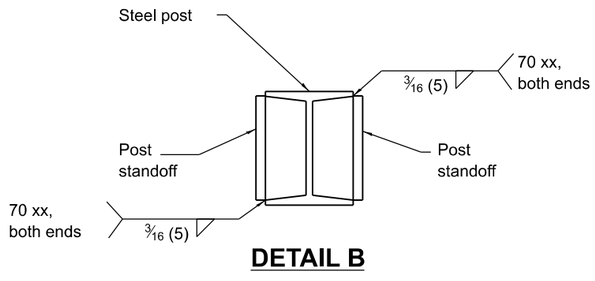
STANDARD 630106-02



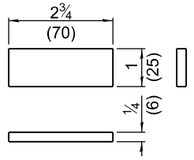
PLAN



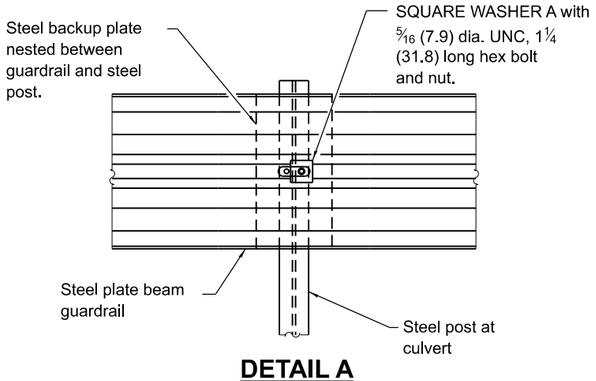
SQUARE WASHER A



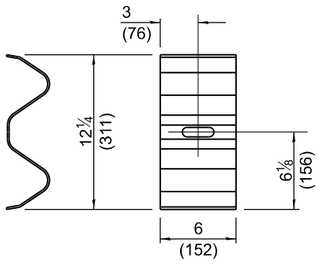
DETAIL B



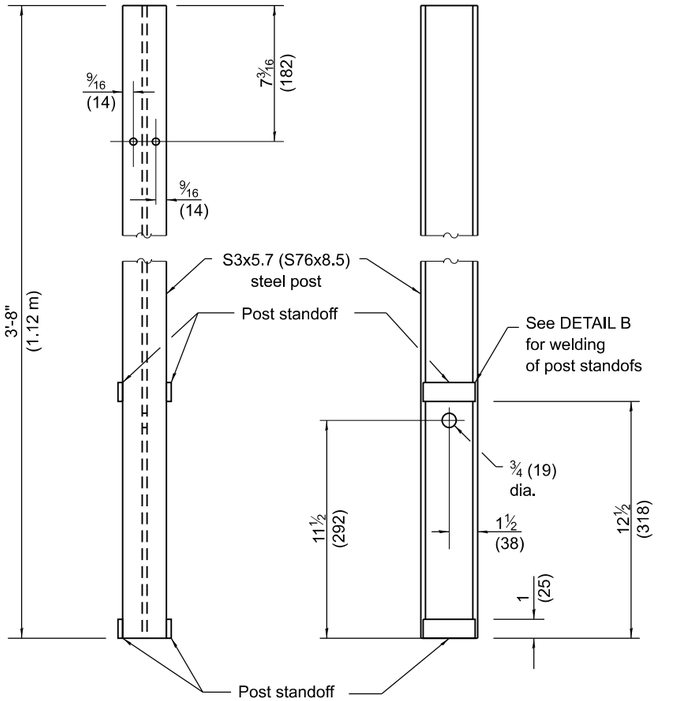
POST STANDOFF



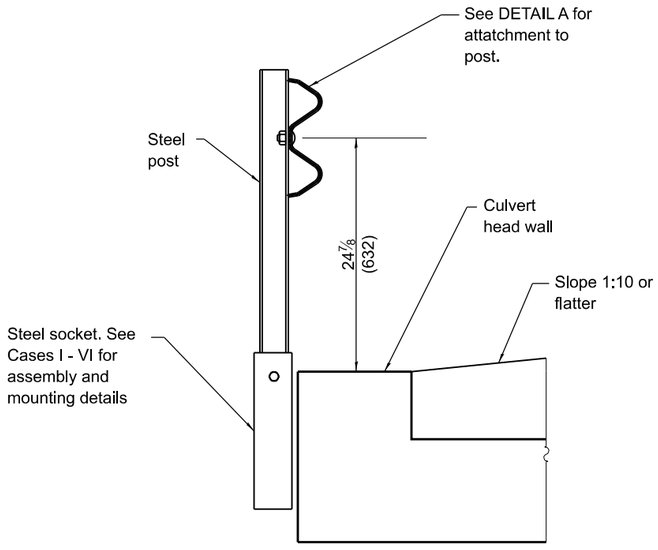
DETAIL A



BACKUP PLATE



STEEL POST



SECTION A-A

GENERAL NOTES

See Standard 630001 for details of guardrail not shown.

See Standard 630006 for details of non-blocked guardrail not shown.

All threaded rods and bolts shall be installed with heavy hex nuts and standard washers unless noted otherwise.

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

Illinois Department of Transportation

APPROVED January 1, 2020
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

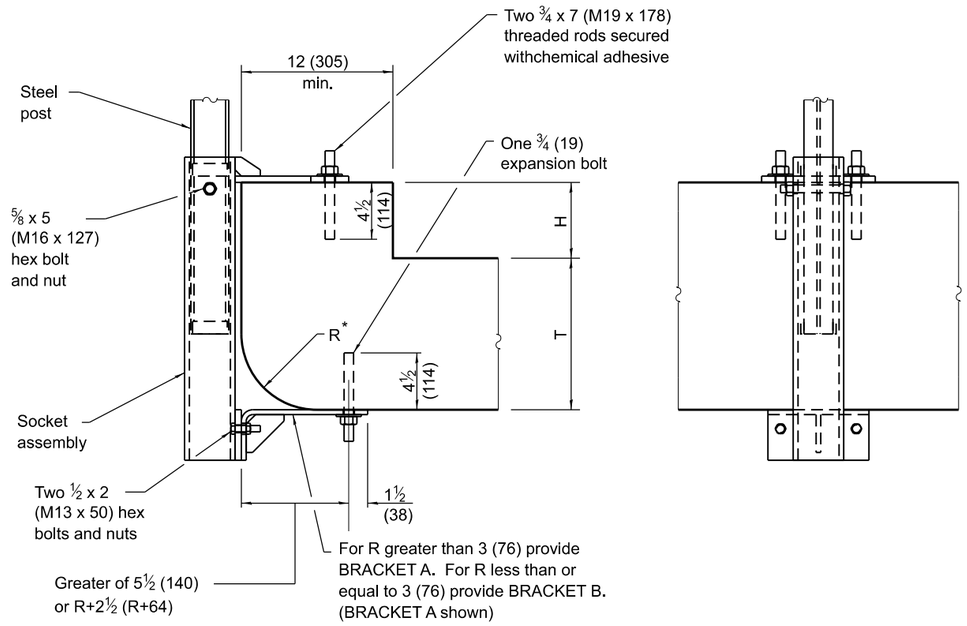
ISSUED 1-1-17

DATE	REVISIONS
1-1-20	Revised HHS to HHS in Top View
	on sheets 2-5.
1-1-17	New Standard.

WEAK POST GUARDRAIL ATTACHED TO CULVERT

(Sheet 1 of 6)

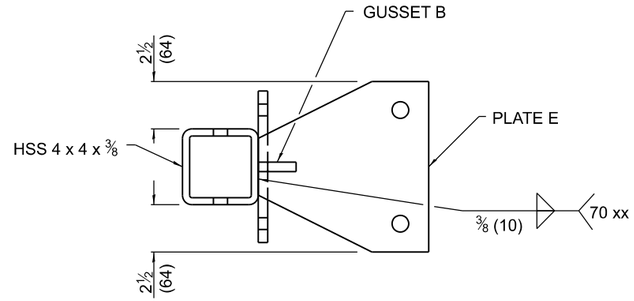
STANDARD 630111-01



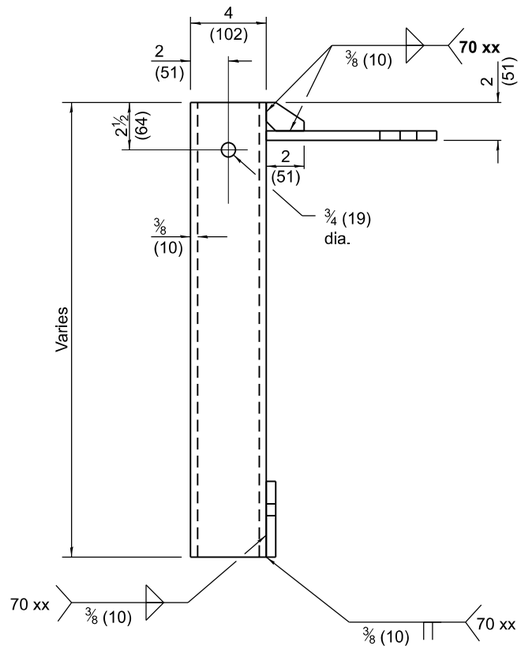
* R varies between 0 to 6 (152)

CROSS SECTION **ELEVATION**

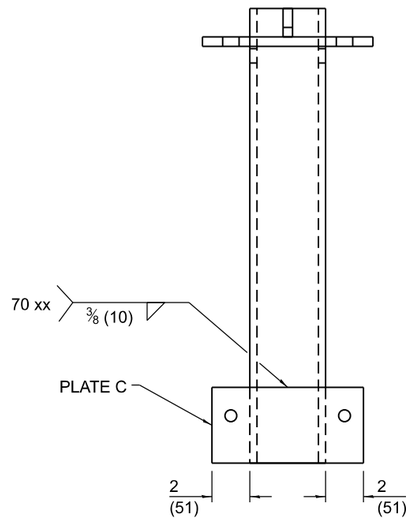
CASE I, (H+T-R) < 18 (457), TOP MOUNT



TOP VIEW



SIDE VIEW



FRONT VIEW

SOCKET ASSEMBLY FOR CASE I

Illinois Department of Transportation

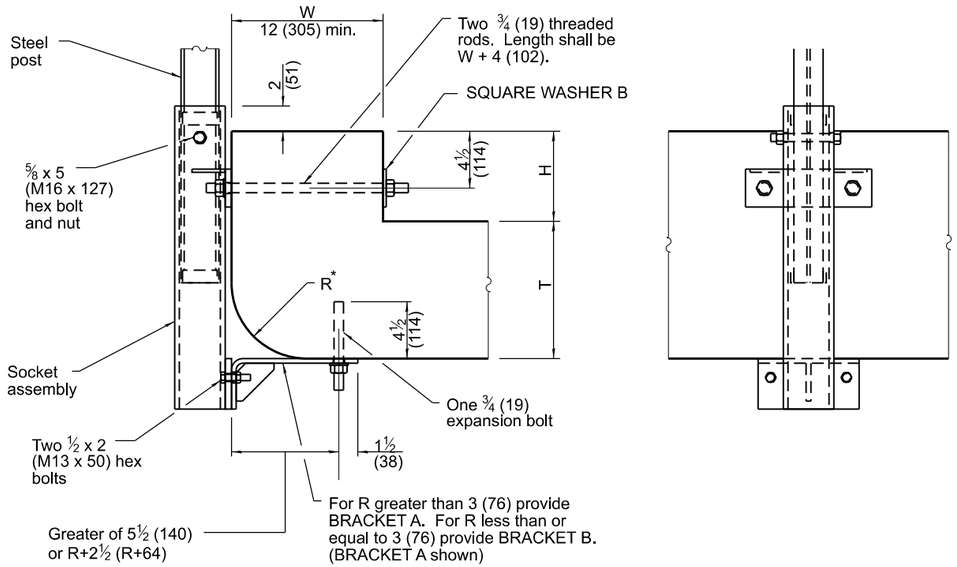
APPROVED January 1, 2020
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17

WEAK POST GUARDRAIL ATTACHED TO CULVERT

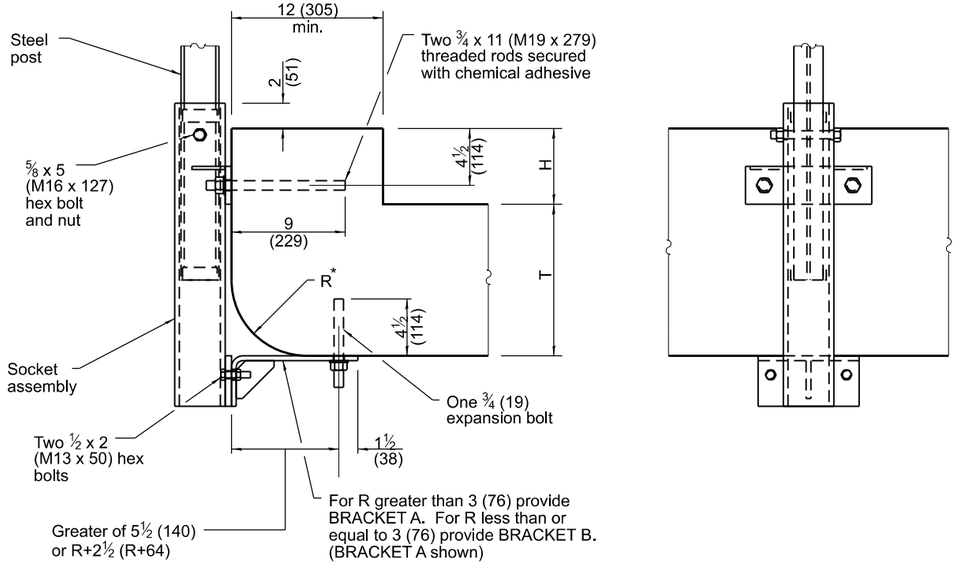
STANDARD 630111-01



* R varies between 0 to 6 (152)

CROSS SECTION **ELEVATION**

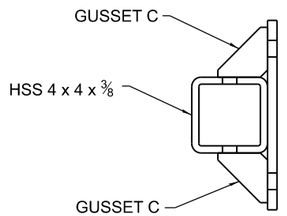
CASE II, (H+T-R) < 18 (457), SIDE-MOUNT THROUGH-BOLT



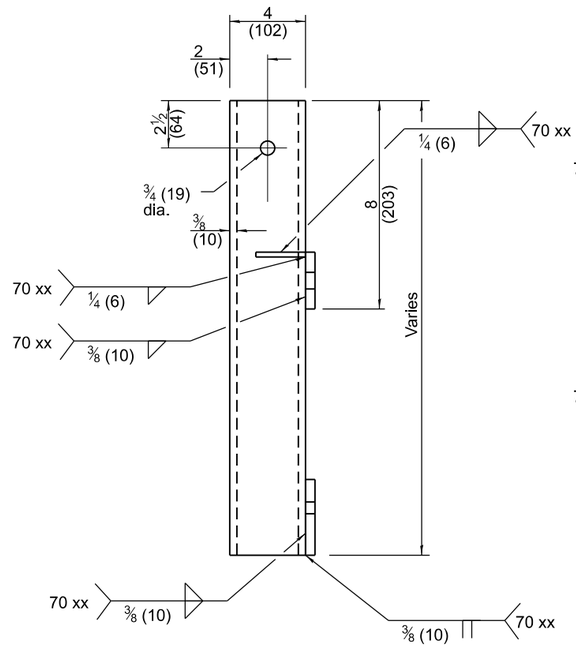
* R varies between 0 to 6 (152)

CROSS SECTION **ELEVATION**

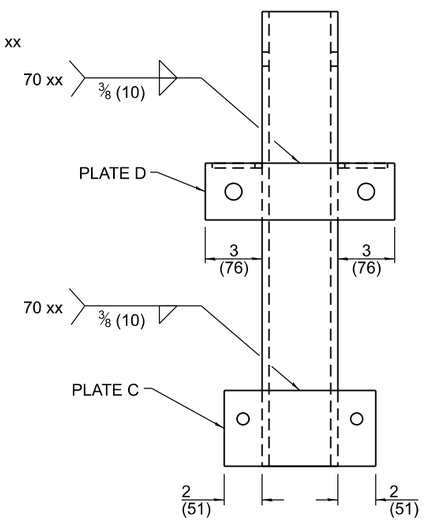
CASE III, (H+T-R) < 18 (457), SIDE-MOUNT ANCHORED



TOP VIEW



SIDE VIEW



FRONT VIEW

SOCKET ASSEMBLY FOR CASES II & III

Illinois Department of Transportation

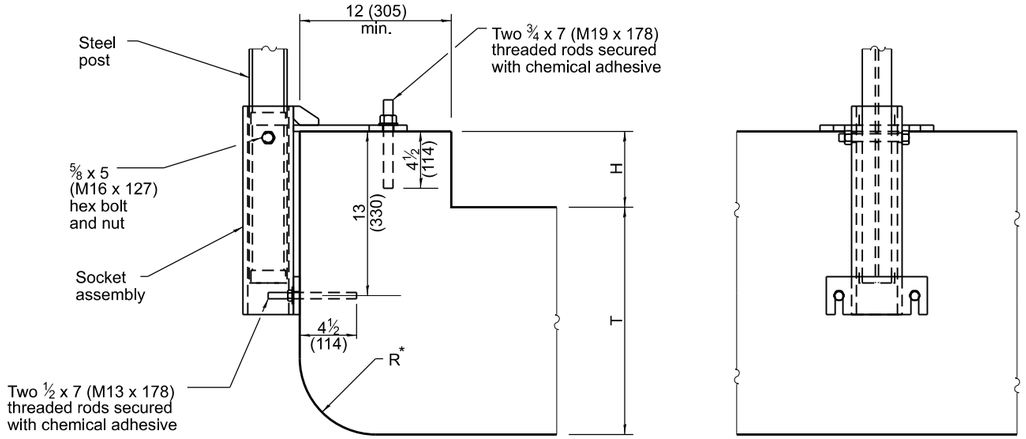
APPROVED January 1, 2020
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17

WEAK POST GUARDRAIL ATTACHED TO CULVERT

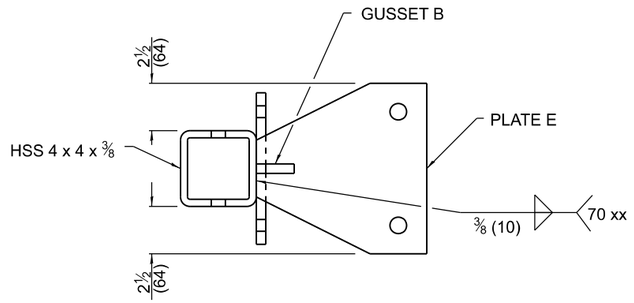
STANDARD 630111-01



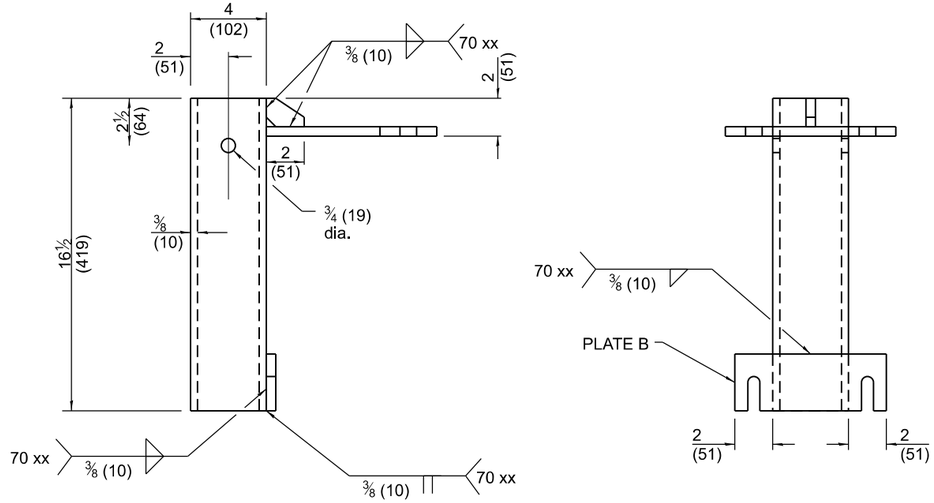
* R varies between 0 to 6 (152)

CROSS SECTION **ELEVATION**

CASE IV, (H+T-R) ≥ 18 (457), TOP MOUNT



TOP VIEW



SIDE VIEW

FRONT VIEW

SOCKET ASSEMBLY
FOR CASE IV

Illinois Department of Transportation

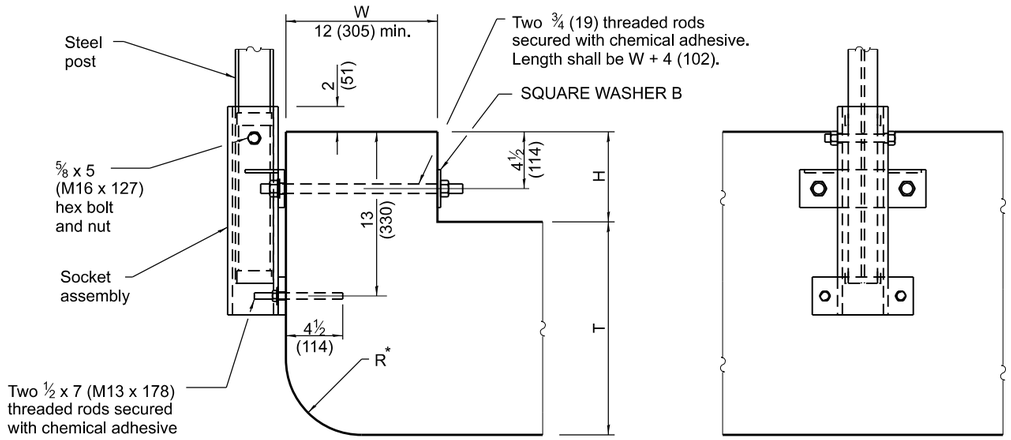
APPROVED January 1, 2020
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17

WEAK POST GUARDRAIL ATTACHED TO CULVERT

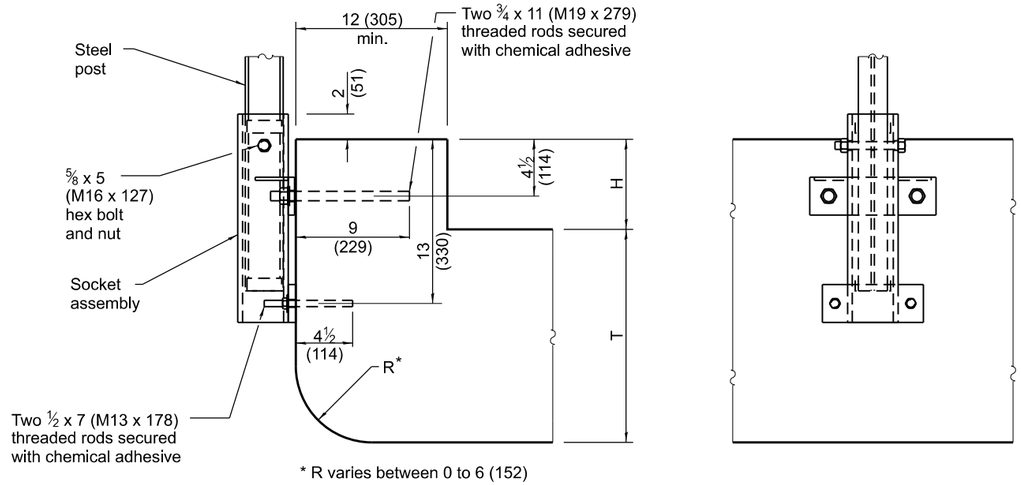
STANDARD 630111-01



* R varies between 0 to 6 (152)

CROSS SECTION **ELEVATION**

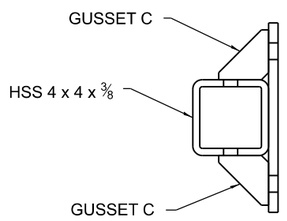
CASE V, (H+T-R) > 18 (457), SIDE-MOUNT, THROUGH-BOLT



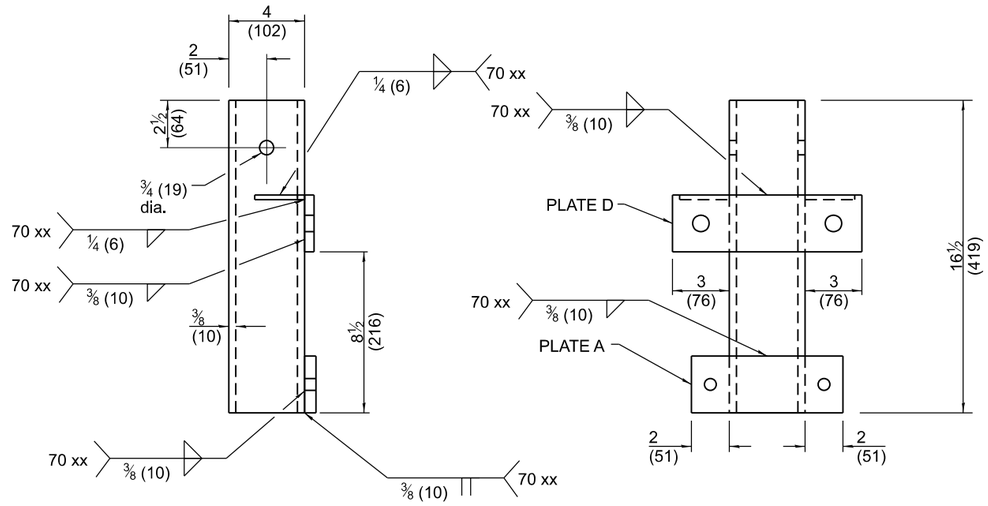
* R varies between 0 to 6 (152)

CROSS SECTION **ELEVATION**

CASE VI, (H+T-R) ≥ 18 (457), SIDE-MOUNT ANCHORED



TOP VIEW



SIDE VIEW **FRONT VIEW**

SOCKET ASSEMBLY FOR CASES V & VI

Illinois Department of Transportation

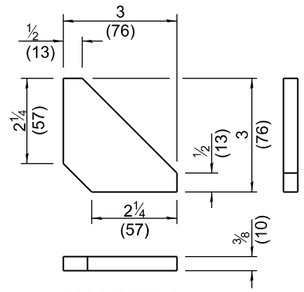
APPROVED January 1, 2020
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

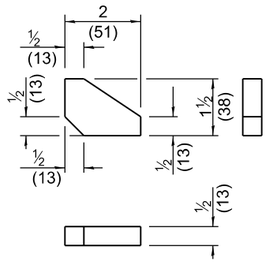
ISSUED 1-1-17

WEAK POST GUARDRAIL ATTACHED TO CULVERT

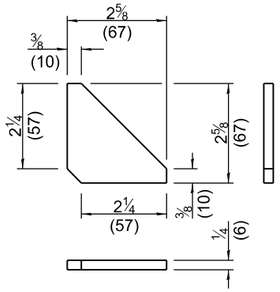
STANDARD 630111-01



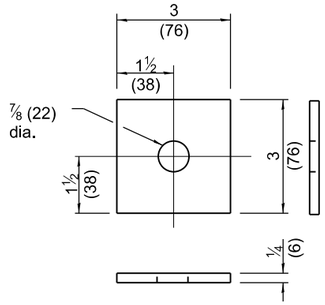
GUSSET A



GUSSET B



GUSSET C



SQUARE WASHER B

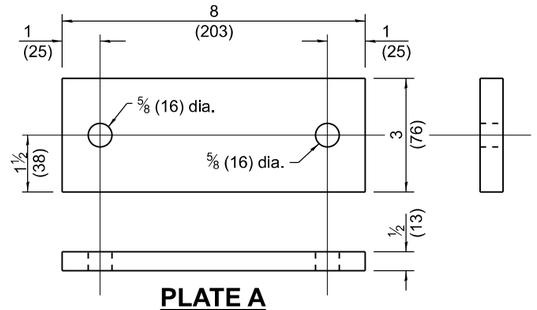


PLATE A

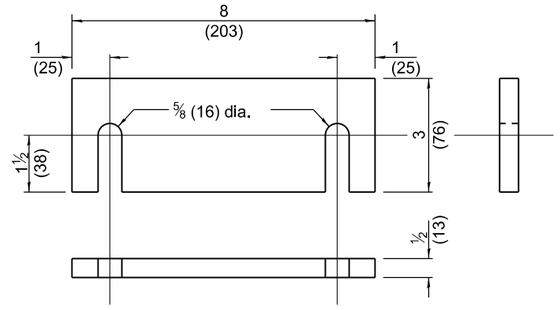


PLATE B

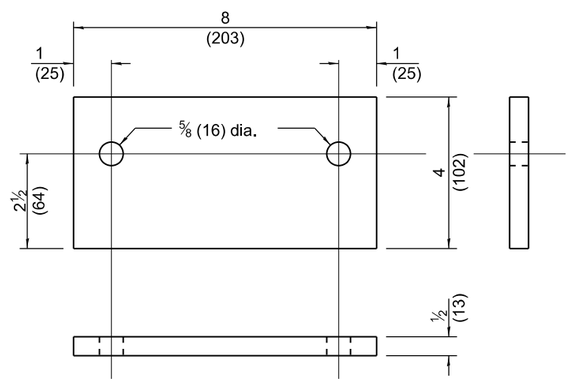


PLATE C

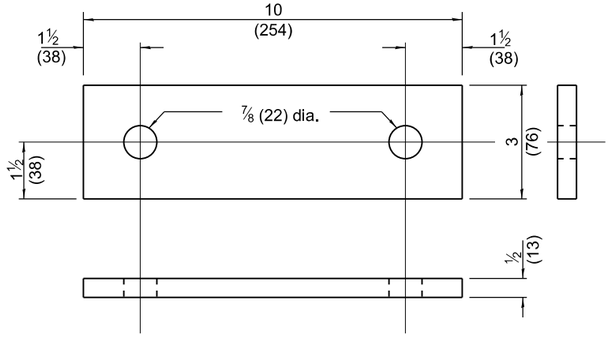
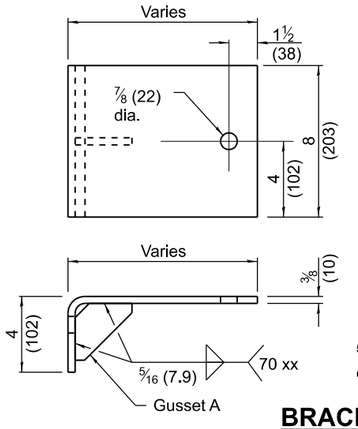
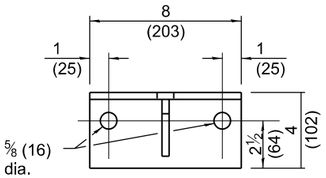
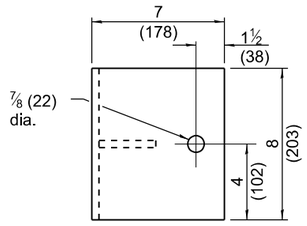


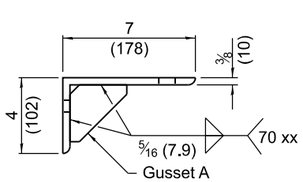
PLATE D

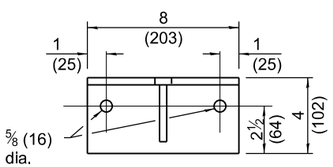




BRACKET A







BRACKET B

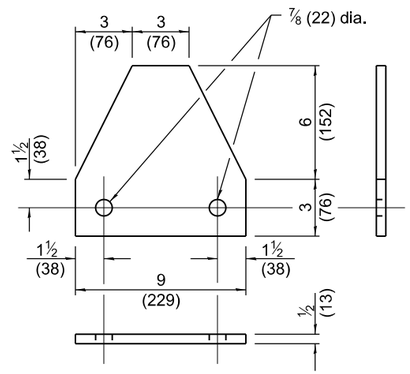


PLATE E

Illinois Department of Transportation

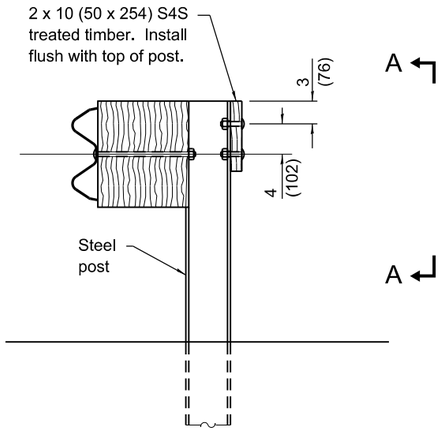
APPROVED January 1, 2020
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

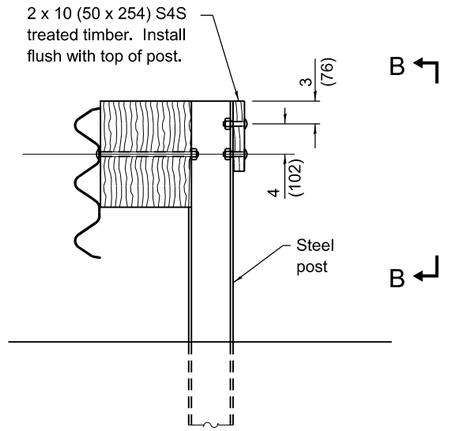
ISSUED 1-1-17

WEAK POST GUARDRAIL ATTACHED TO CULVERT

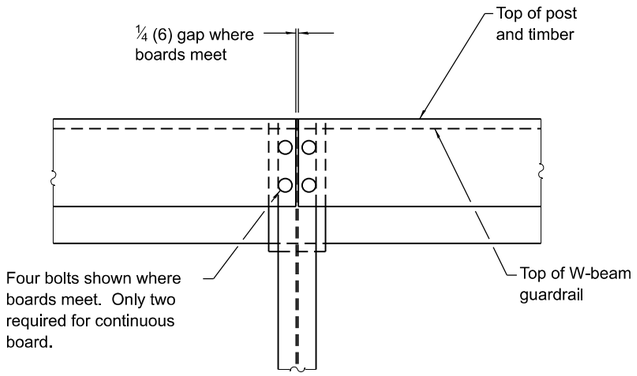
STANDARD 630111-01



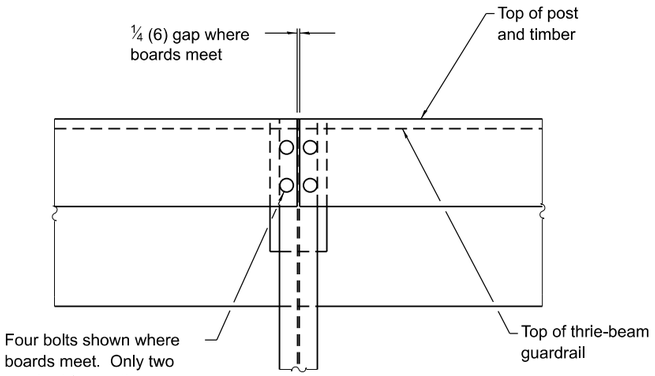
ELEVATION WITH W-BEAM GUARDRAIL



ELEVATION WITH THRIE-BEAM GUARDRAIL



VIEW A-A



VIEW B-B

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED January 1, 2017
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

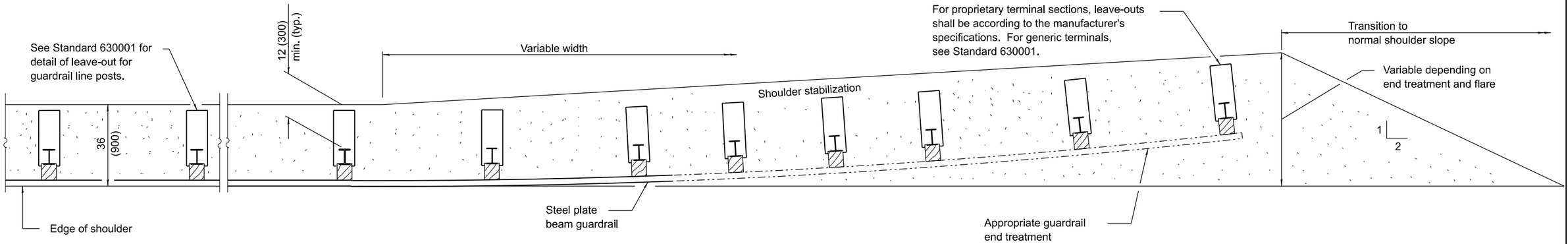
APPROVED January 1, 2017
Maureen M Beck
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17

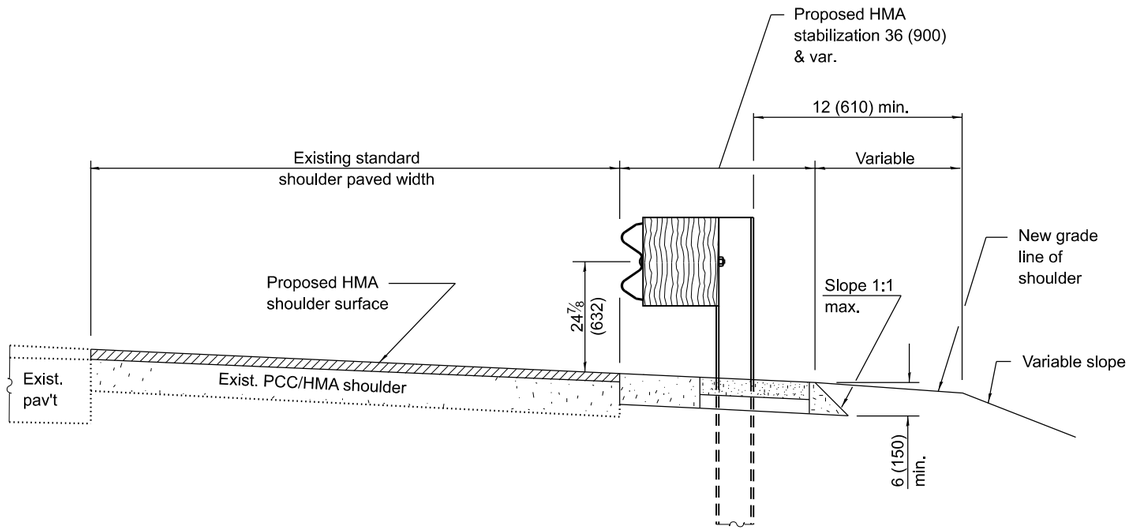
DATE	REVISIONS
1-1-17	New Standard.

BACK SIDE PROTECTION OF GUARDRAIL

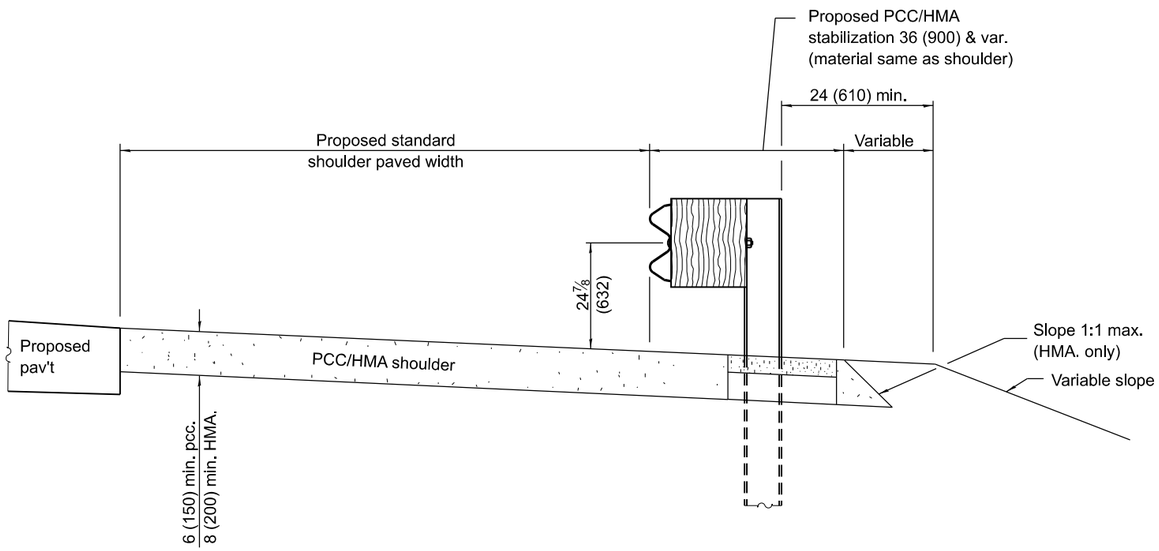
STANDARD 630116



PLAN



RESURFACING



NEW CONSTRUCTION

GENERAL NOTES

See Standard 482001, 482006, 483001 and 630001 for details not shown.

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

Illinois Department of Transportation

APPROVED January 1, 2017
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

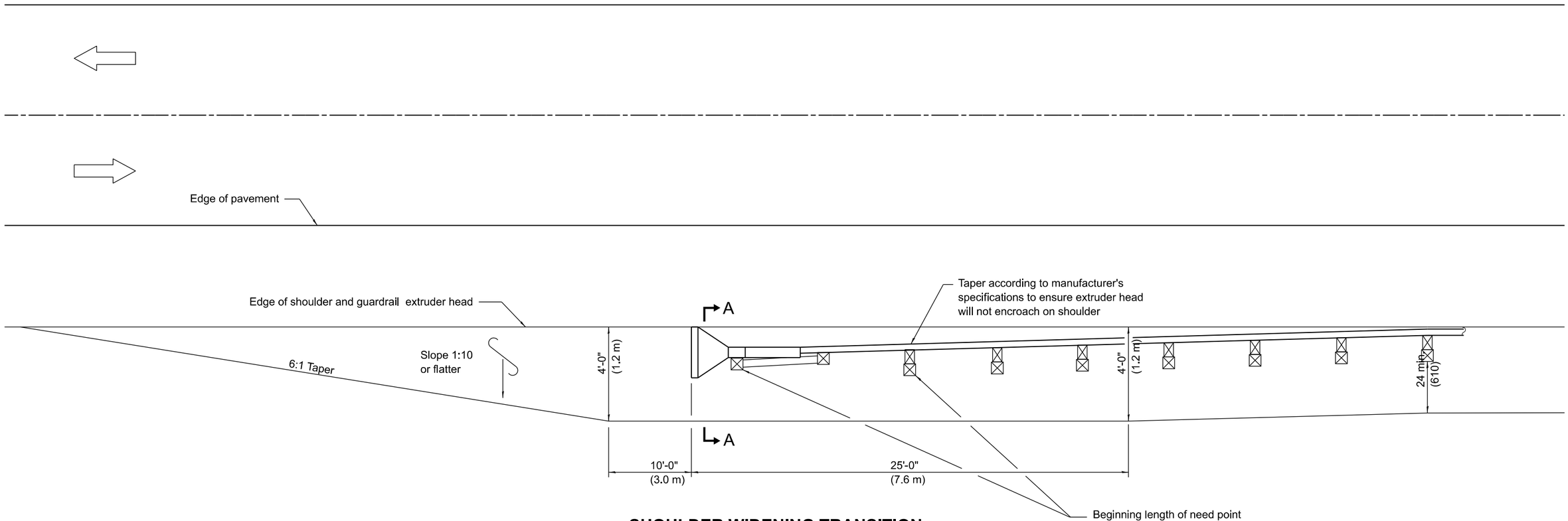
APPROVED January 1, 2017
Maureen M. Addis
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

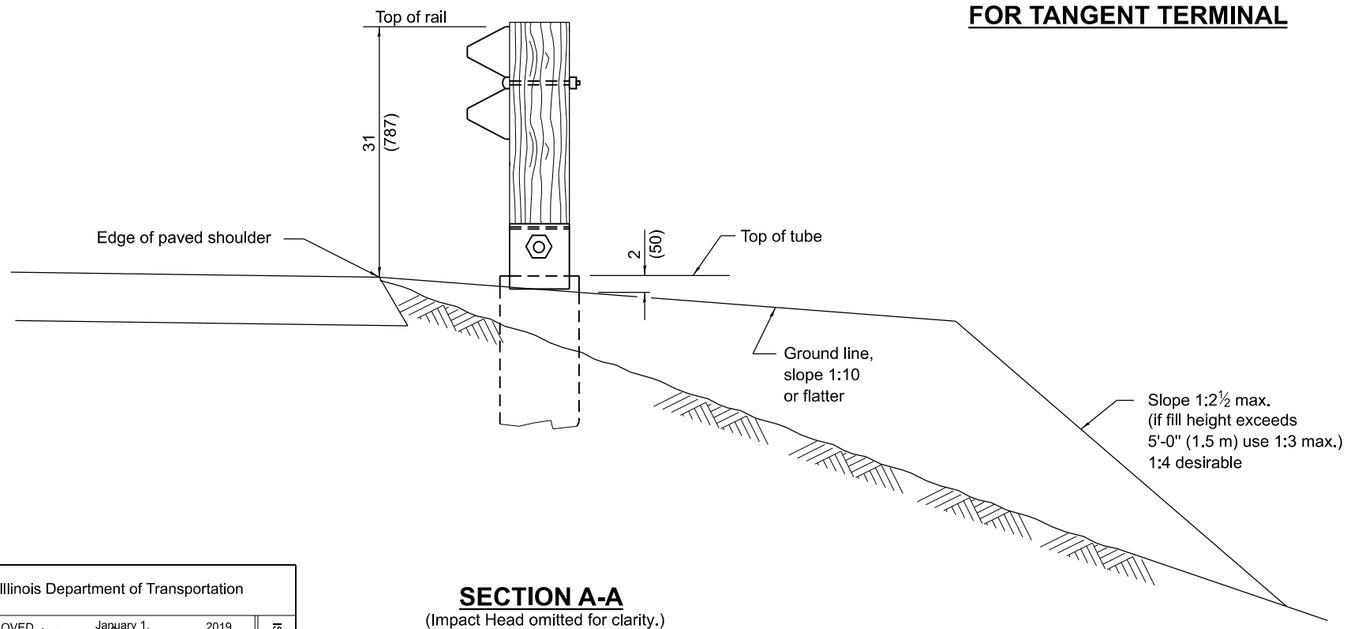
DATE	REVISIONS
1-1-17	Revised leave-outs, moved
	dimensions to Standard 630001.
1-1-09	Switched units to English (metric).

PCC / HMA STABILIZATION AT STEEL PLATE BEAM GUARDRAIL

STANDARD 630201-07



SHOULDER WIDENING TRANSITION FOR TANGENT TERMINAL



SECTION A-A

(Impact Head omitted for clarity.)

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF POLICY AND PROCEDURES

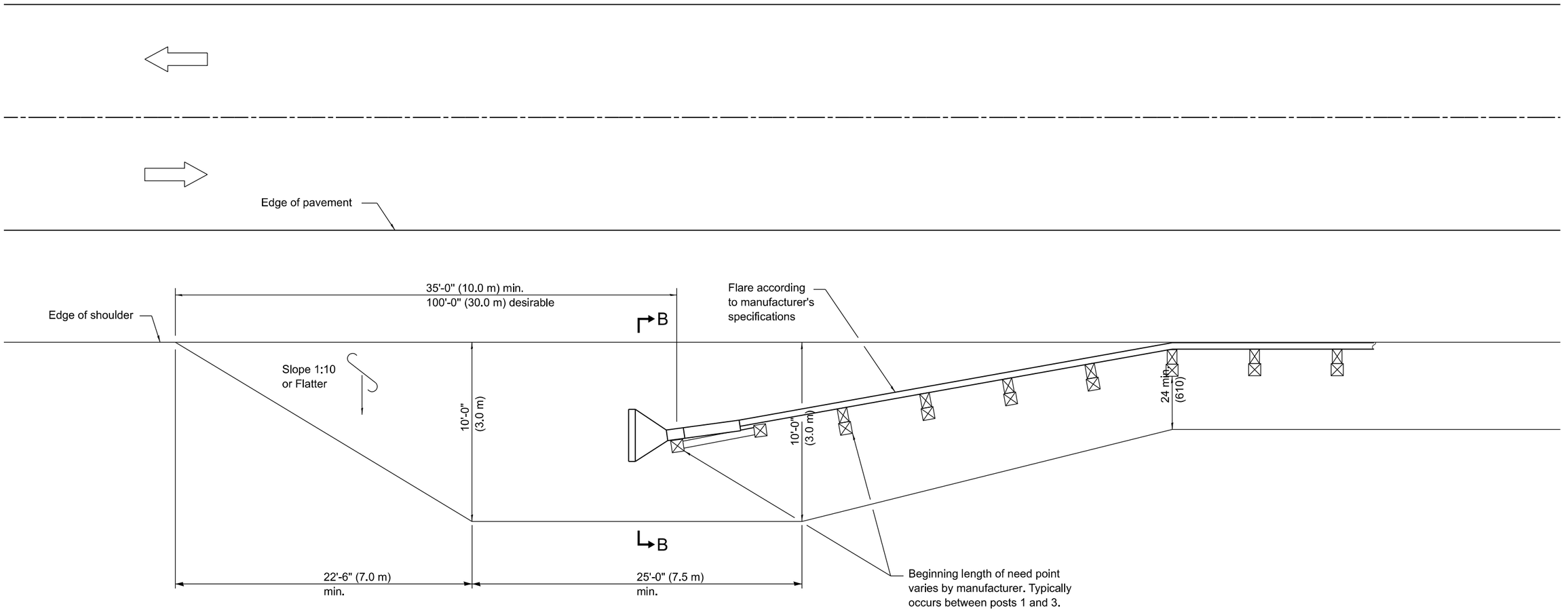
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-00

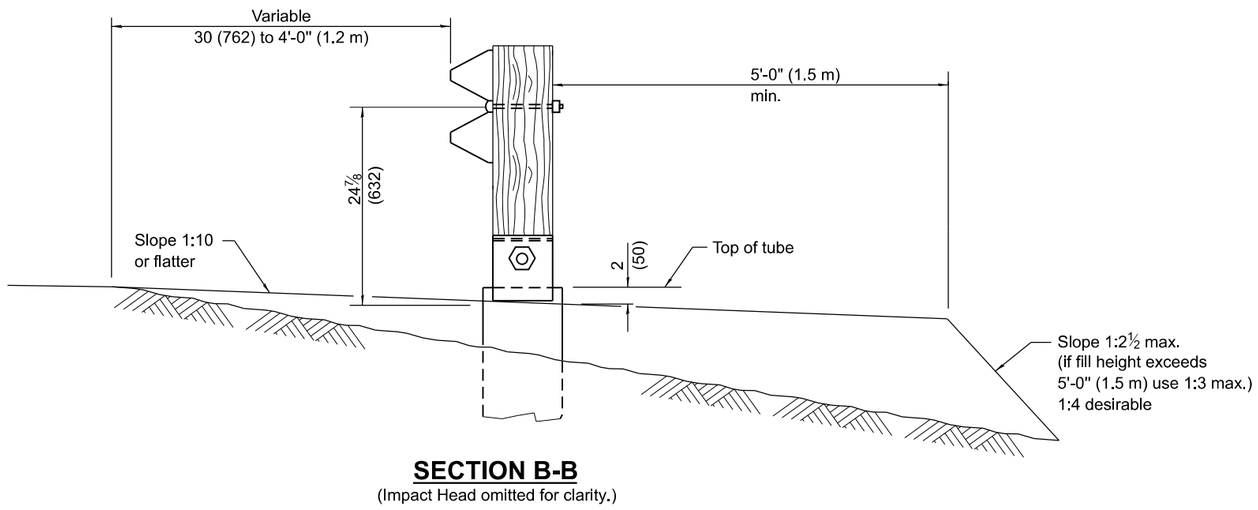
DATE	REVISIONS
1-1-19	Removed pay limits. Revised notes
	regarding the taper/flare and
	length of need point.
1-1-18	Omitted posts from 'Pay limits of
	other type'.

SHOULDER WIDENING FOR TYPE 1 (SPECIAL) GUARDRAIL TERMINALS

STANDARD 630301-09



SHOULDER WIDENING TRANSITION FOR FLARED TERMINAL



SECTION B-B

(Impact Head omitted for clarity.)

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF POLICY AND PROCEDURES

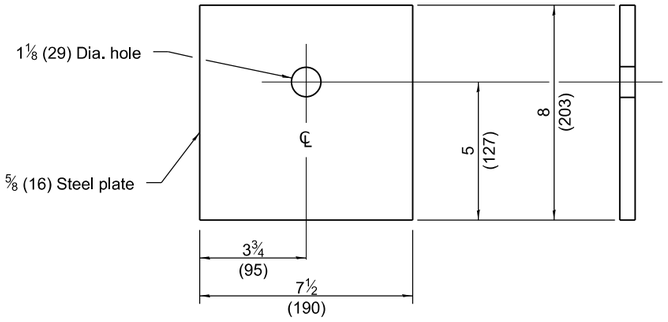
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-00

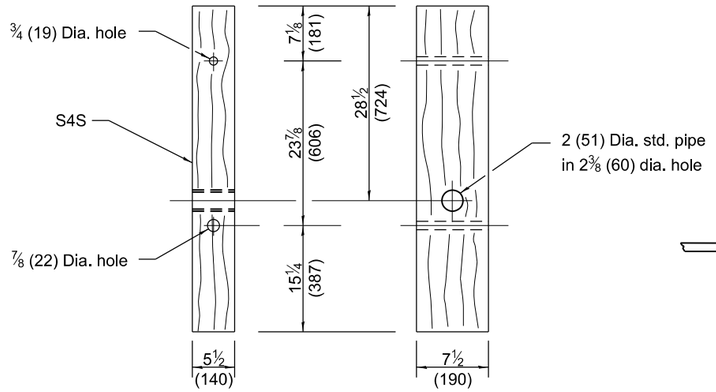
SHOULDER WIDENING FOR TYPE 1 (SPECIAL) GUARDRAIL TERMINALS

(Sheet 2 of 2)

STANDARD 630301-09



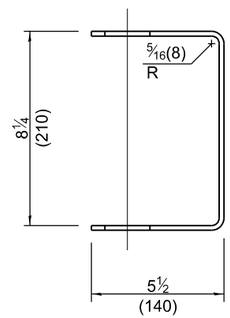
BEARING PLATE K



FRONT

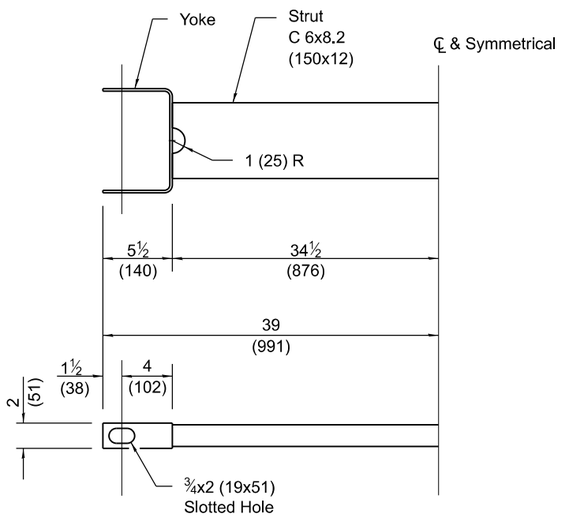
SIDE

WOOD POST

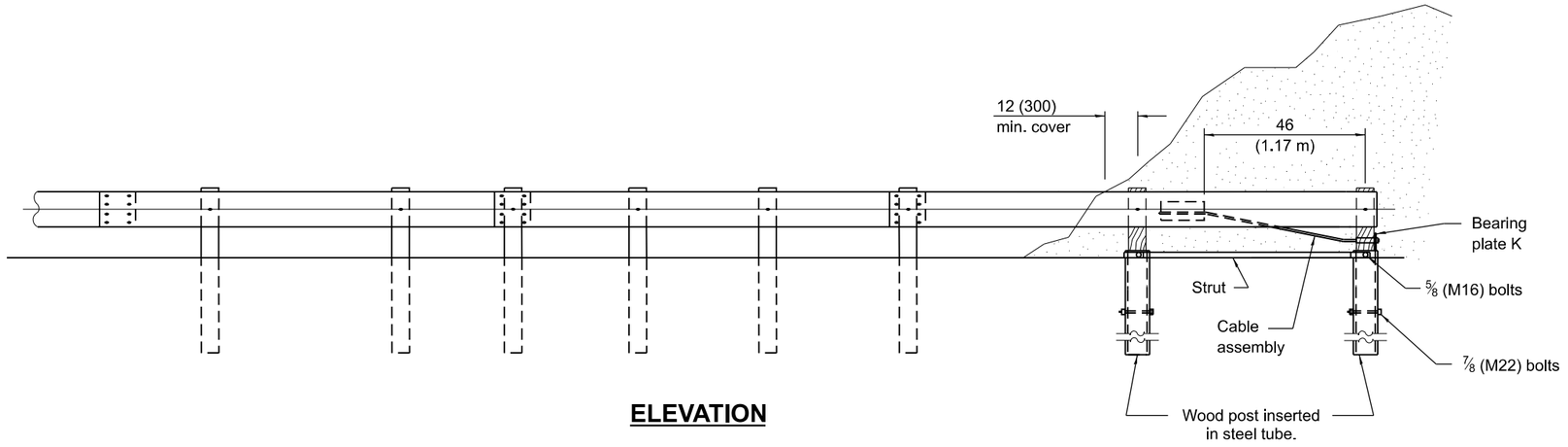


YOKE

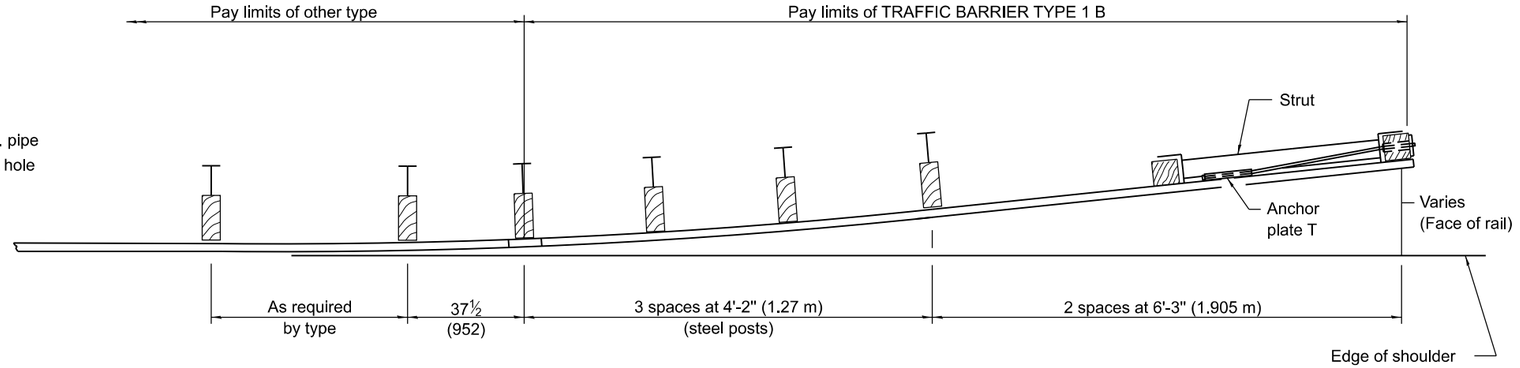
⅜ (5) thick steel



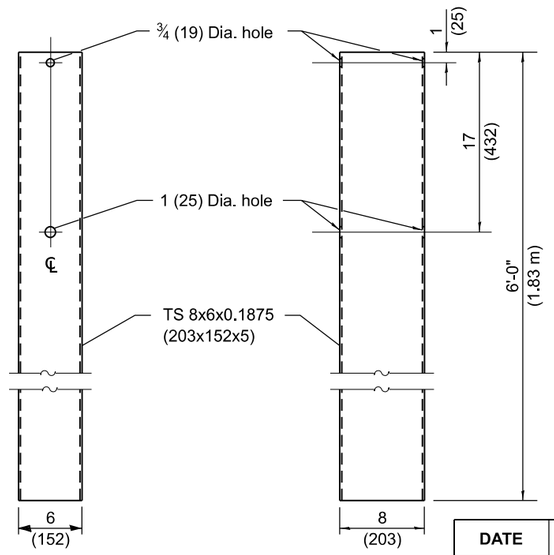
CABLE STRUT



ELEVATION



PLAN



FRONT

SIDE

STEEL TUBE

GENERAL NOTES

See Standard 630001 for details of guardrail not shown.

The bearing plate K shall be held in position by two eight penny nails driven into the post and bent over the top of the plate.

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

Illinois Department of Transportation

APPROVED January 1, 2011
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

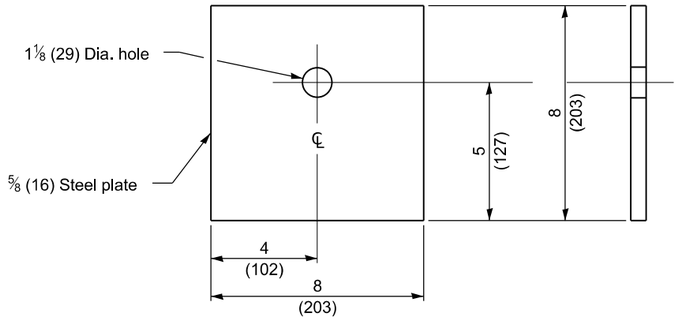
APPROVED January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

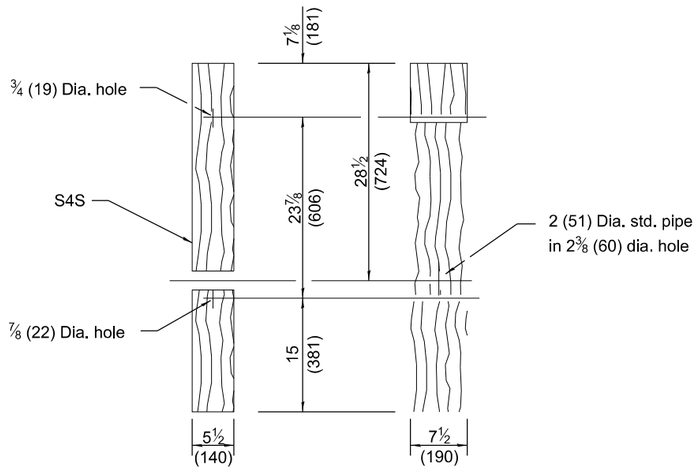
DATE	REVISIONS
1-1-11	Revised steel tube length
	to 6'-0" (1.83 m).
1-1-10	Increased steel tube length, corrected
	hole locations in tube.

TRAFFIC BARRIER TERMINAL, TYPE 1B

STANDARD 631006-08



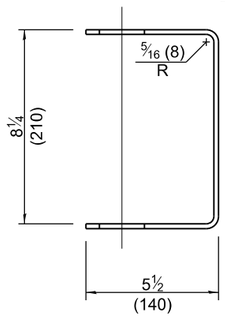
BEARING PLATE K



FRONT

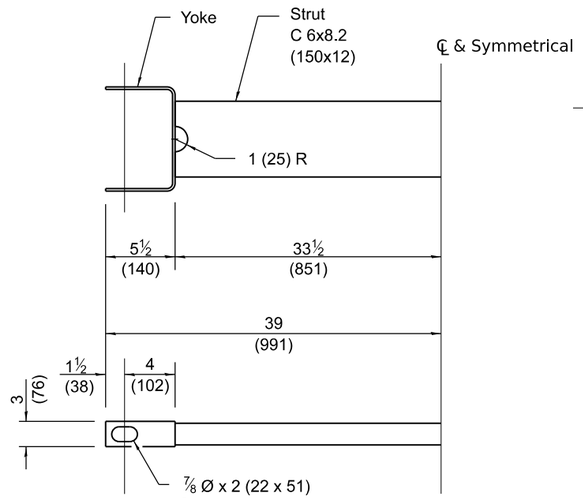
SIDE

WOOD POST

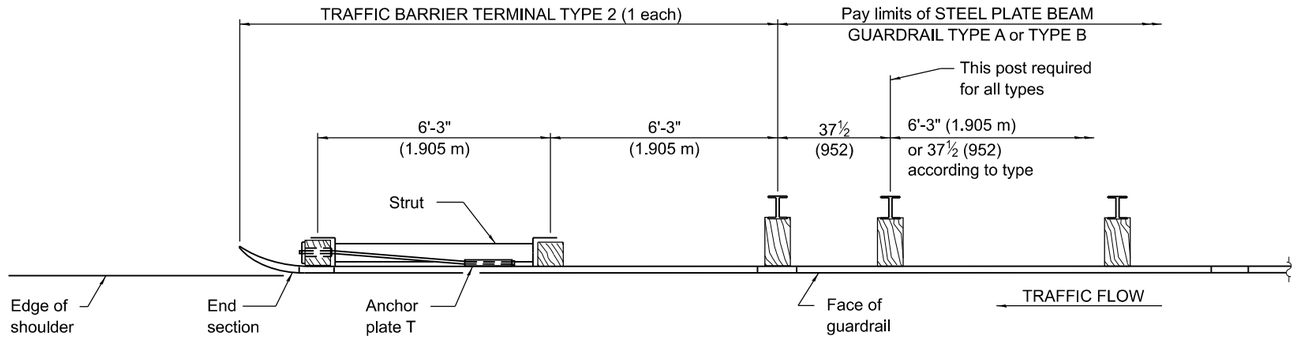


YOKE

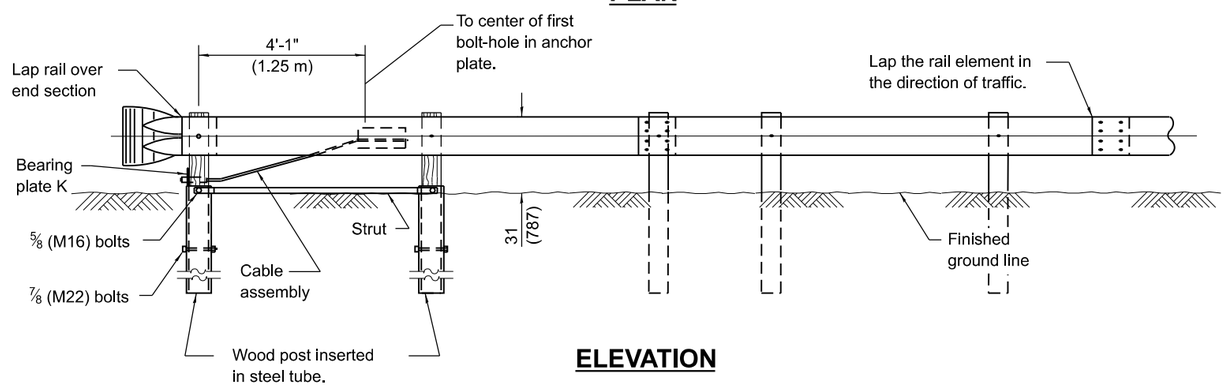
⅜16 (5) thick steel



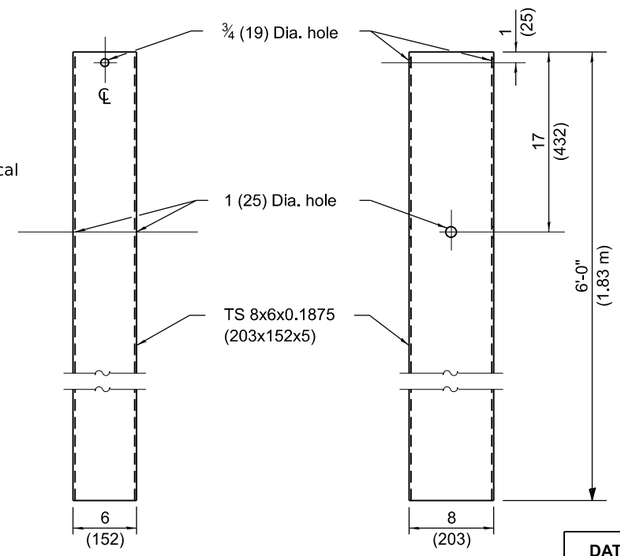
CABLE STRUT



PLAN



ELEVATION



FRONT

SIDE

STEEL TUBE

GENERAL NOTES

See Standard 630001 for details of guardrail not shown.

The bearing plate K shall be held in position by two eight penny nails driven into the post and bent over the top of the plate.

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

Illinois Department of Transportation

APPROVED January 1, 2017
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

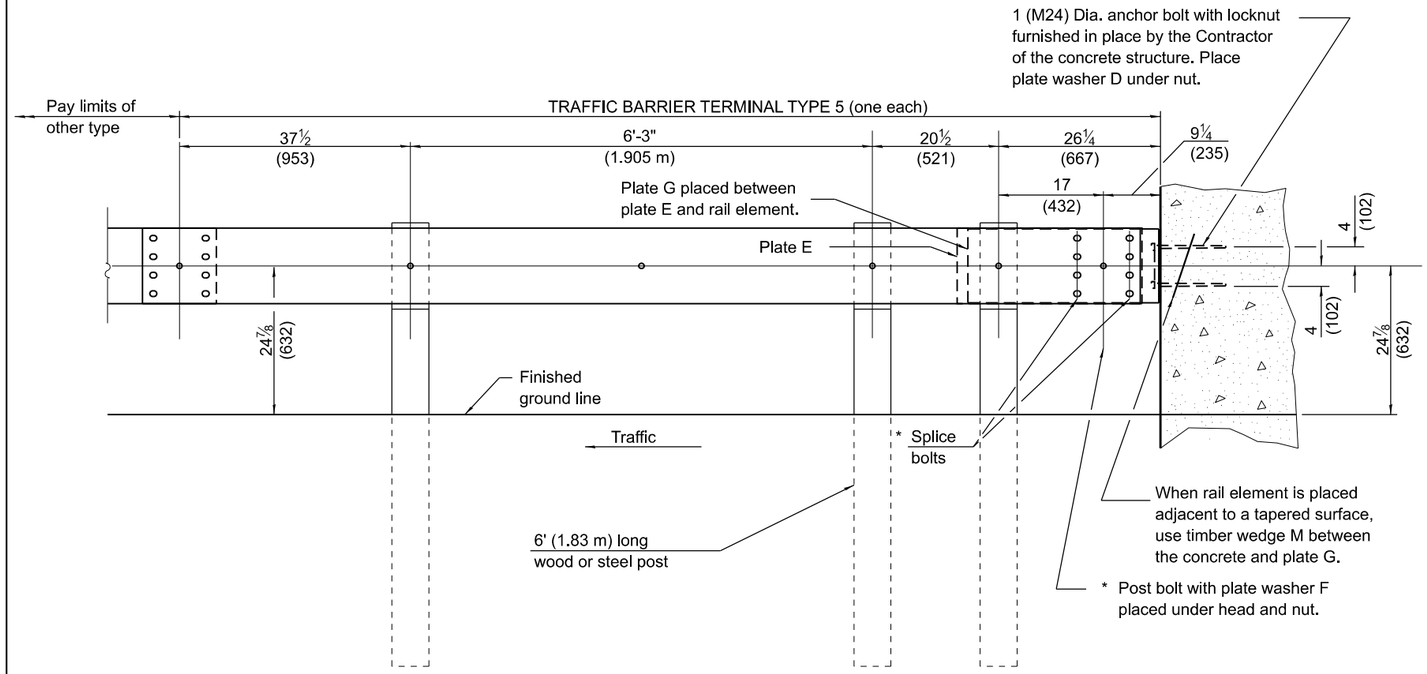
APPROVED January 1, 2017
Maureen M. Bede
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-17	Revised wood post length and
	hole spacing.
1-1-13	Corrected metric dimension for
	BEARING PLATE K. Changed
	pipe dia. in wood post.

TRAFFIC BARRIER TERMINAL, TYPE 2

STANDARD 631011-10



TYPE 5 - CONCRETE BRIDGE PARAPET

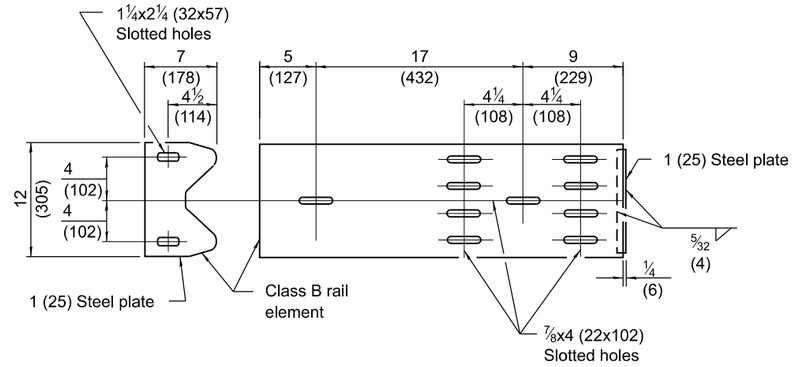
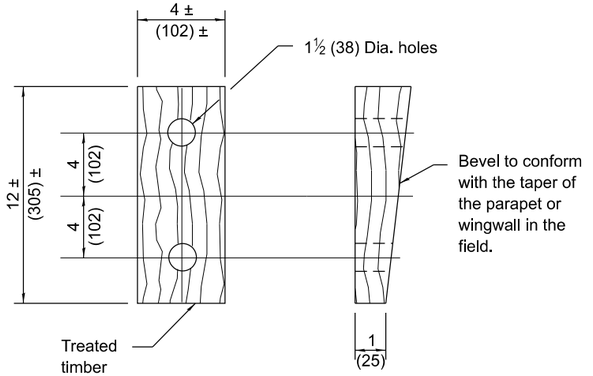


PLATE G



WEDGE M

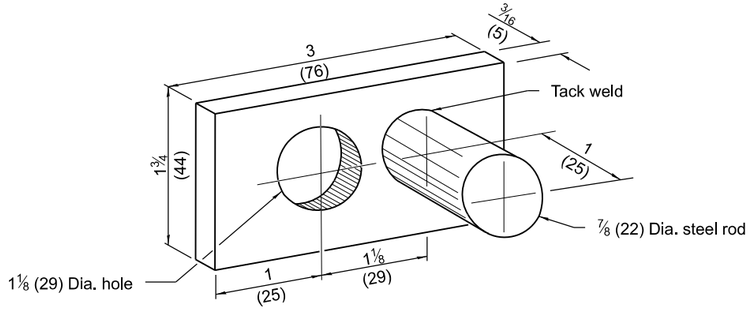
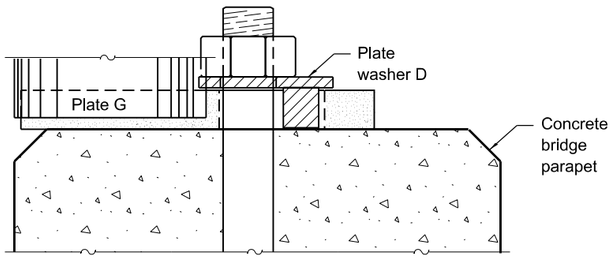


PLATE WASHER D



PLACEMENT OF PLATE WASHER D
(PLAN)

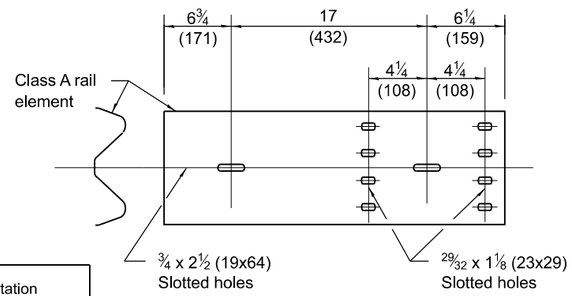


PLATE E

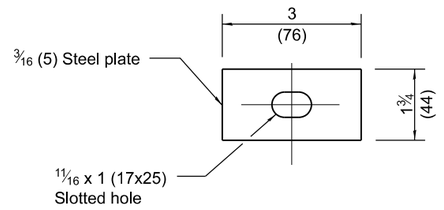


PLATE WASHER F

GENERAL NOTES

Install plate washer D so the 1 (25) projection fills the remainder of the slotted holes in the 1 (25) end plate on plate G after the 1 (M24) dia. bolts are in place.

* When an expansion joint exists below the connector, bolts shall be provided with a locknut or double nuts and shall be tightened only to a point that will allow plate G to be free to move.

See Standard 630001 for details of guardrail not shown.

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

Illinois Department of Transportation

APPROVED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

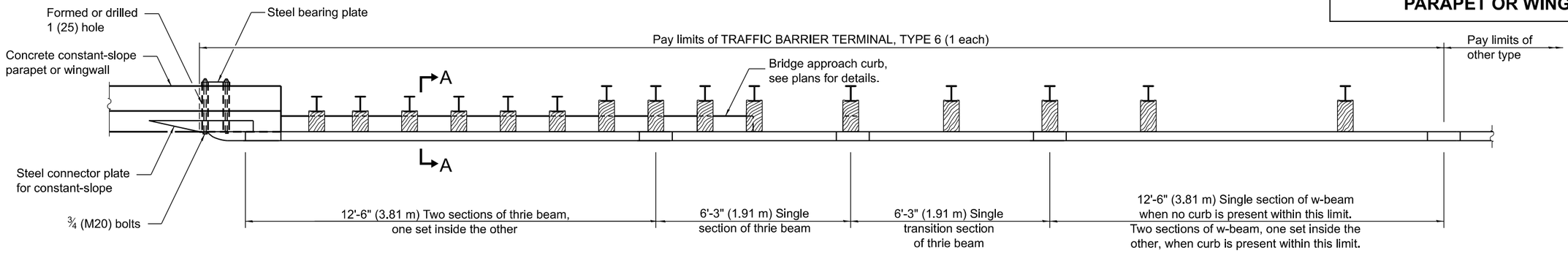
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

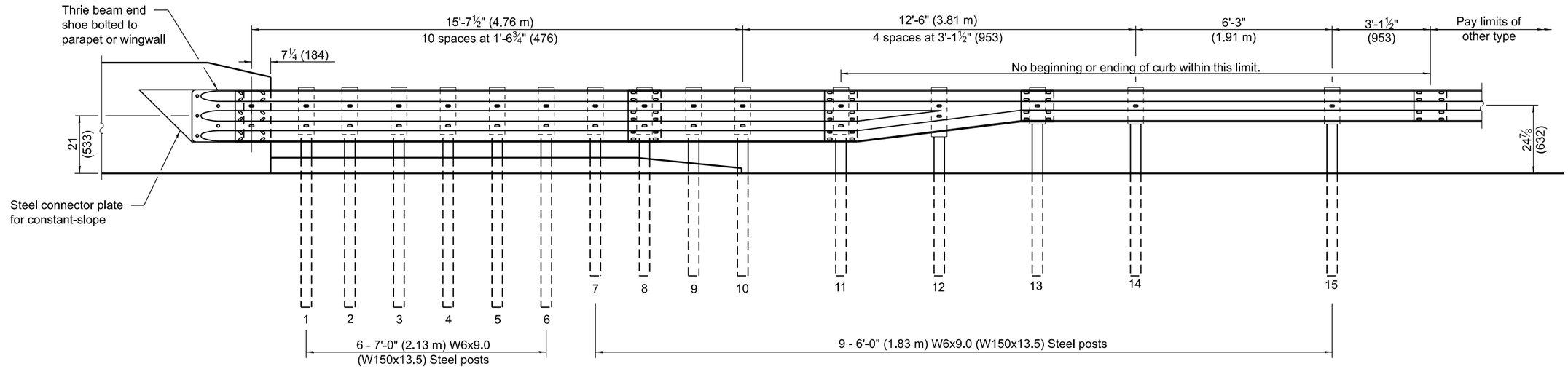
DATE	REVISIONS
1-1-15	Revised post spacing dimensions
	on elevation.
1-1-09	Switched units to English (metric).

TRAFFIC BARRIER TERMINAL, TYPE 5

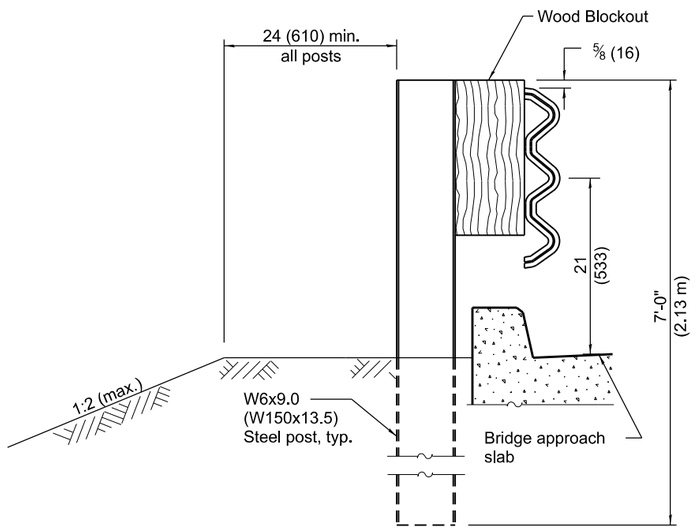
STANDARD 631026-06



PLAN



ELEVATION



SECTION A-A

GENERAL NOTES

See Standard 630001 for details of guardrail not shown.

Thrie beam rail shall be bolted to block-out at all posts.

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

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

Illinois Department of Transportation

APPROVED January 1, 2023
ENGINEER OF SAFETY PROG. AND ENGINEERING

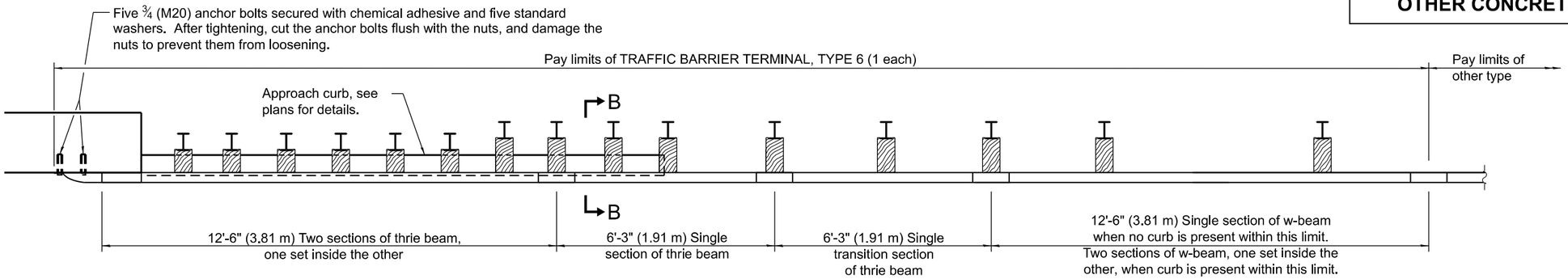
APPROVED January 1, 2023
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

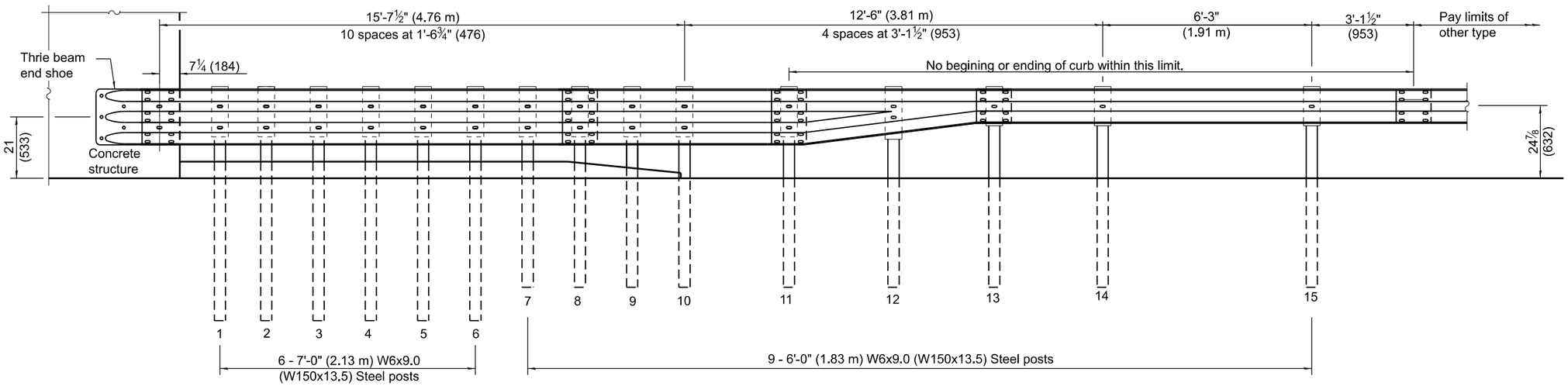
DATE	REVISIONS
1-1-23	Removed two posts, revised
	blockouts, and removed notes
	on sheet 4.
1-1-21	Added Detail A and revised plate
	dimensions on sheet 4.

TRAFFIC BARRIER TERMINAL, TYPE 6

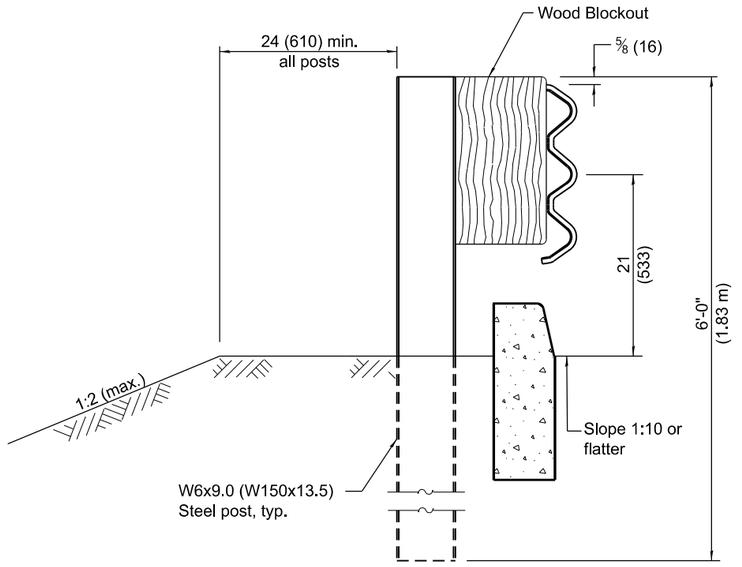
STANDARD 631031-18



PLAN



ELEVATION



SECTION B-B

Illinois Department of Transportation

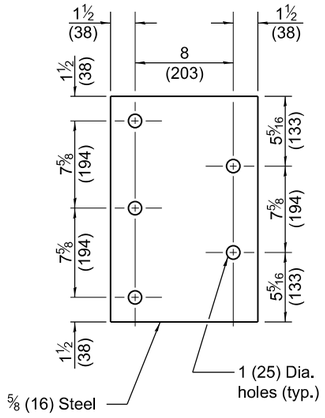
APPROVED January 1, 2023
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2023
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

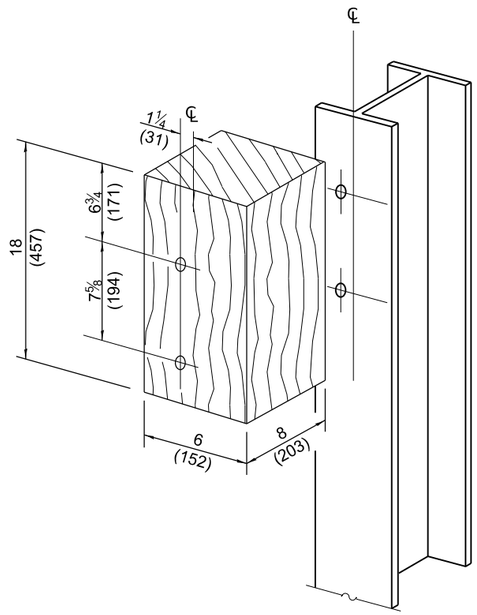
TRAFFIC BARRIER TERMINAL, TYPE 6

STANDARD 631031-18

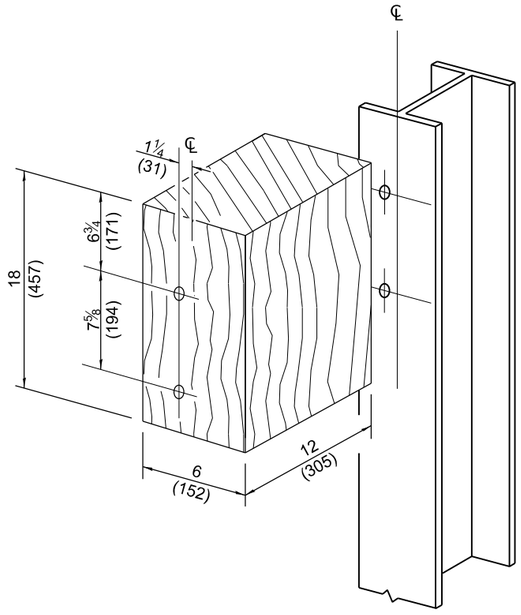


STEEL BEARING PLATE FOR F-SHAPE PARAPET

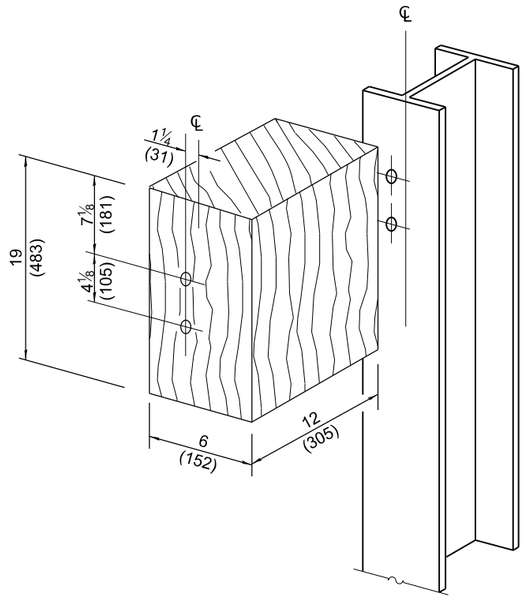
(5 each individual 5x5x⅝ (125x125x16) steel plates with centered 1 (25) holes may be substituted for the plate shown.)



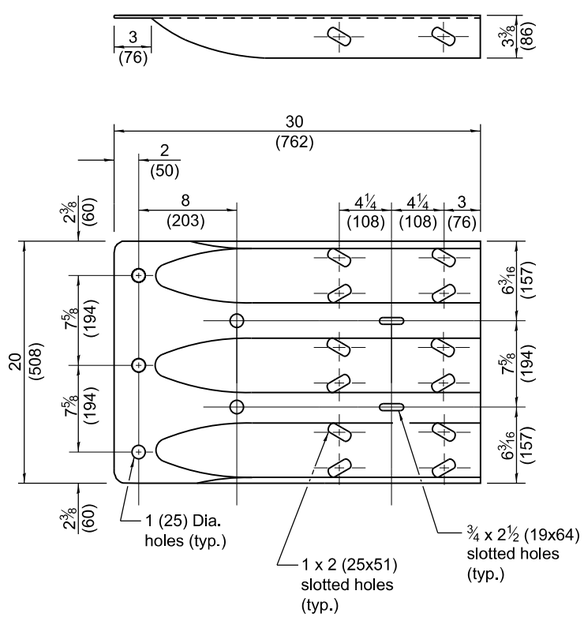
POSTS 1-6 WOOD BLOCKOUT DETAIL



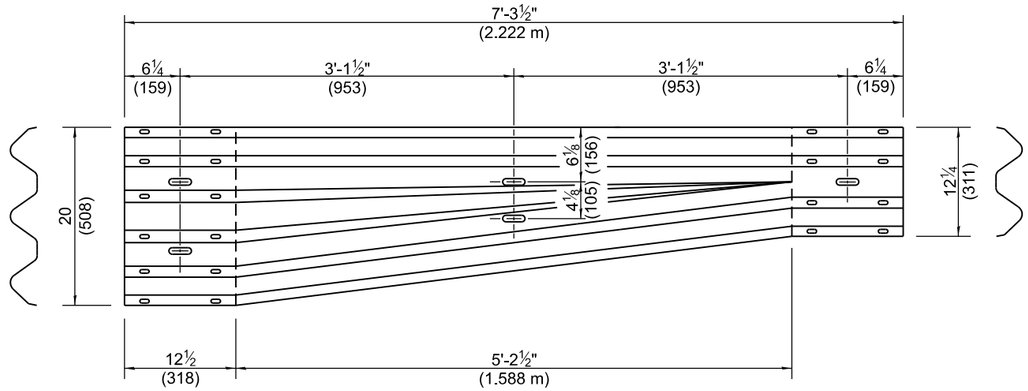
POSTS 7-11 WOOD BLOCKOUT DETAIL



POST 12 WOOD BLOCKOUT DETAIL



THRIE BEAM END SHOE DETAIL



TRANSITION SECTION

(10 gauge (3.4) rail element)

Illinois Department of Transportation

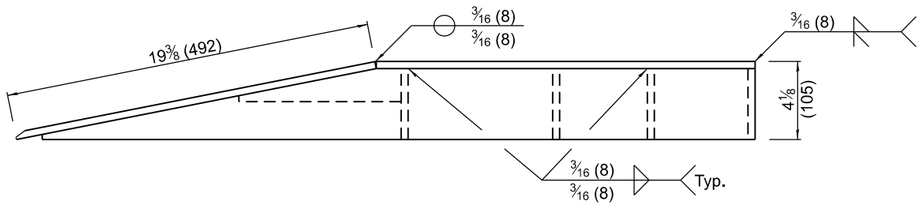
APPROVED January 1, 2023
ENGINEER OF SAFETY PROG. AND ENGINEERING

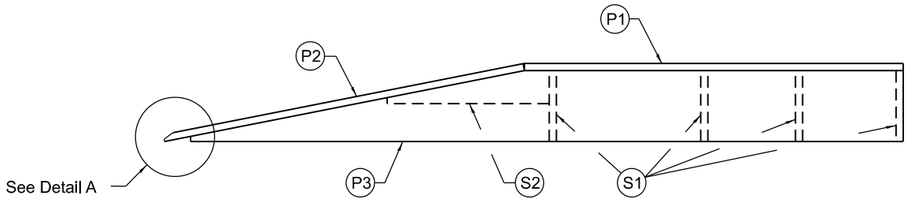
APPROVED January 1, 2023
ENGINEER OF DESIGN AND ENVIRONMENT

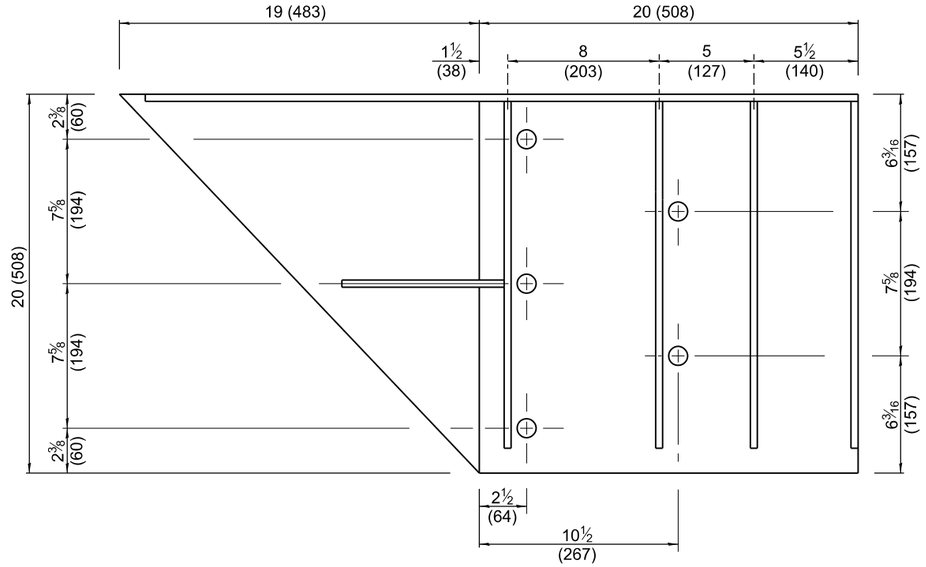
ISSUED 1-1-97

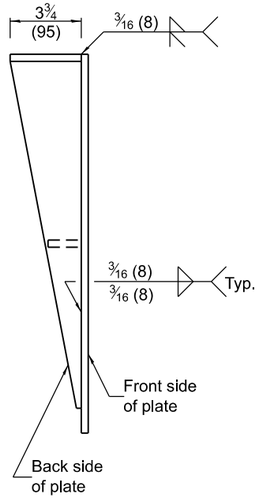
TRAFFIC BARRIER TERMINAL, TYPE 6

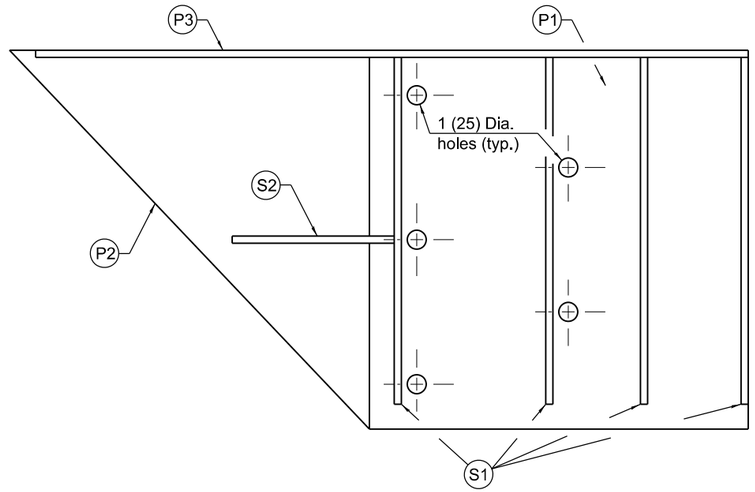
STANDARD 631031-18

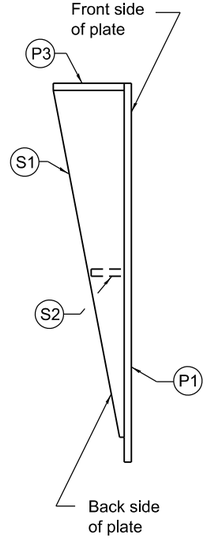










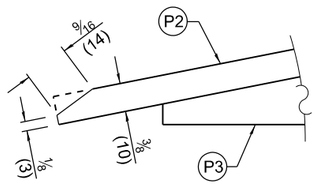


WELDING INSTRUCTION

(Back side of plate shown)

PLATE AND STIFFENER IDENTIFICATION

(Back side of plate shown)



DETAIL A

(Bevel front corner of plate P2
as shown for handling purposes.)

CONNECTOR PLATE DIMENSION (PER ASSEMBLY)				
PLATE	QUANTITY	SHAPE	SIZE A x B x C x D x E	THICKNESS
P1	1	A B	20 x 20 (508 x 508)	⅜ (10)
P2	1	A C B	19⅜ x 20 x 27 13/16 (492 x 508 x 706)	⅜ (10)
P3	1	D E A B C	20 x ¾ x 37⅝ x ¼ x 17 15/16 (508 x 95 x 956 x 6 x 456)	⅜ (10)
S1	4	D A B C	18 5/16 x ¼ x 18⅝ x ¾ (465 x 6 x 473 x 95)	⅜ (10)
S2	1	D E A B C	1 5/16 x 1¾ x 8 1/16 x ⅜ x 6⅞ (33 x 44 x 205 x 10 x 175)	⅜ (10)

Illinois Department of Transportation

APPROVED January 1, 2023
ENGINEER OF SAFETY PROG. AND ENGINEERING

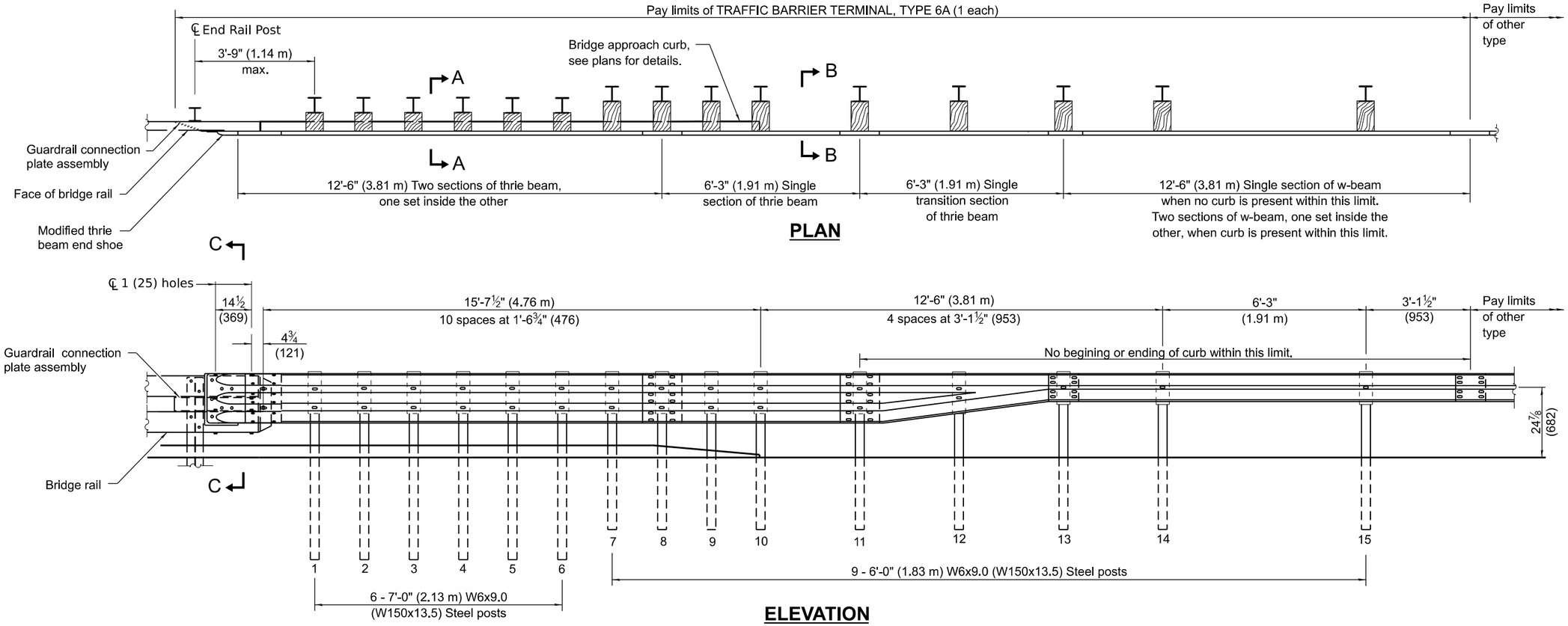
APPROVED January 1, 2023
ENGINEER OF DESIGN AND ENVIRONMENT

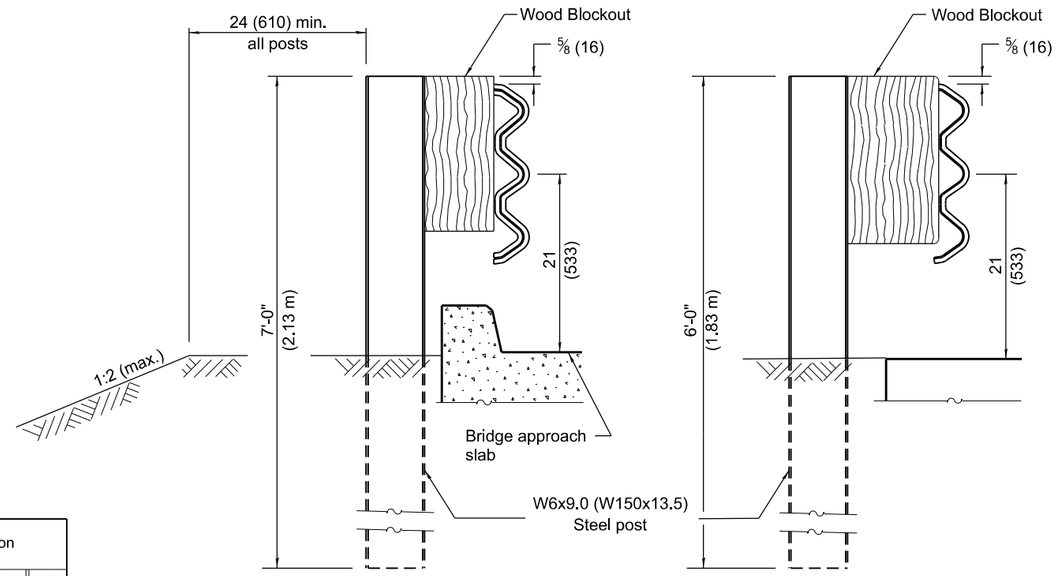
ISSUED 1-1-97

STEEL CONNECTOR PLATE FOR CONSTANT SLOPE PARAPET

TRAFFIC BARRIER TERMINAL, TYPE 6

STANDARD 631031-18





GENERAL NOTES

This standard shows attachment to side mounted bridge rail, Type SMX. Side mounted bridge rail, Type SM is similar.

See Standard 630001 for details of guardrail not shown.

Thrie beam rail shall be bolted to block-out at all posts.

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

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

Illinois Department of Transportation

APPROVED January 1, 2023
ENGINEER OF SAFETY PROG. AND ENGINEERING

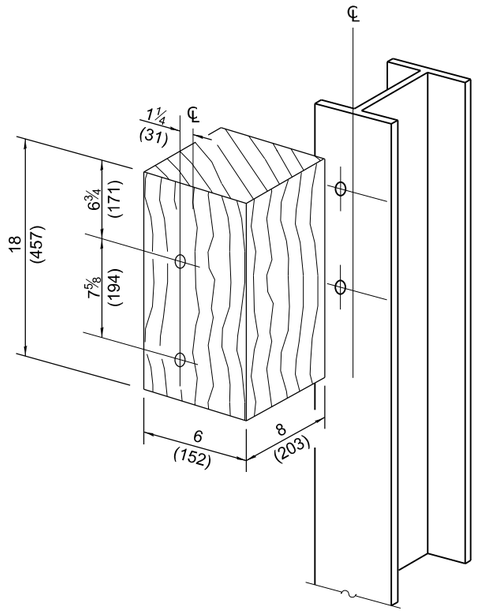
APPROVED January 1, 2023
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-03

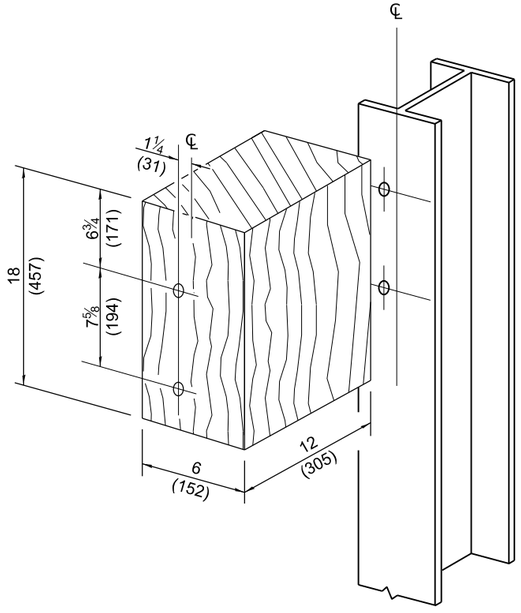
DATE	REVISIONS
1-1-23	Updated bridge rail connection to
	match the new Type SMX. Revised
	post spacing, blockouts, and details
	to match other TBTs.
1-1-17	Revised length of thrie beam. Revised
	length of posts.

TRAFFIC BARRIER TERMINAL, TYPE 6A

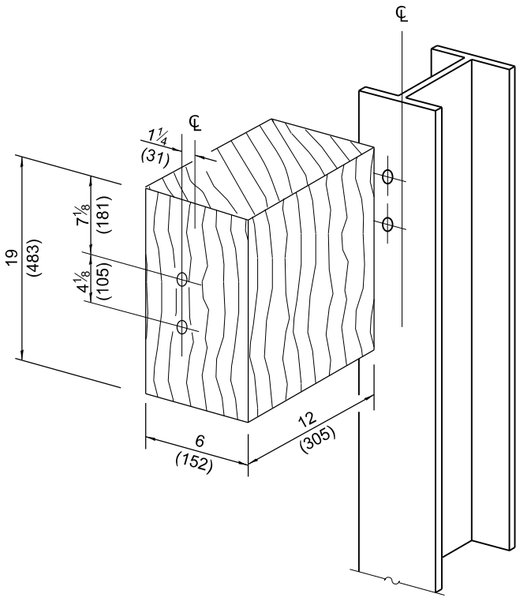
STANDARD 631032-10



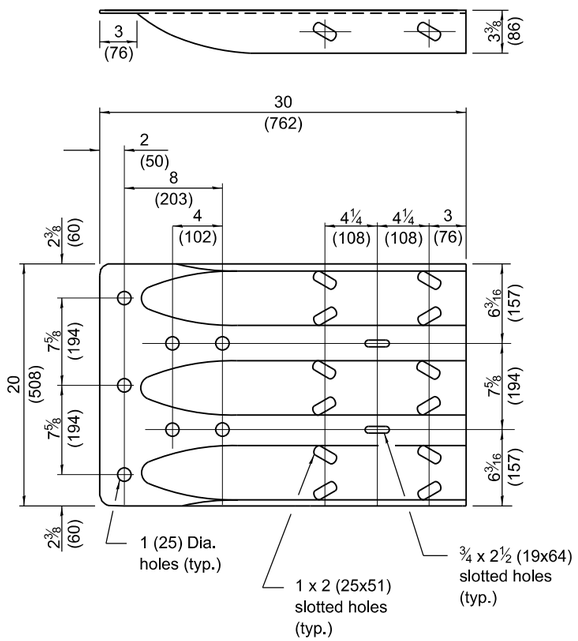
POSTS 1-6 WOOD BLOCKOUT DETAIL



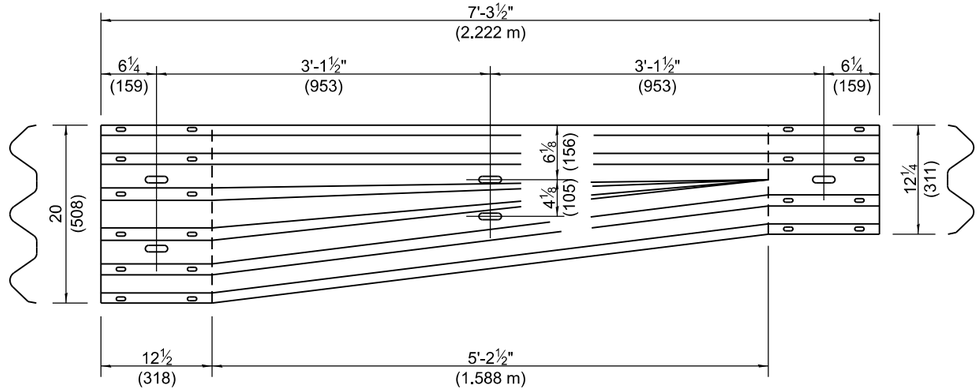
POSTS 7-11 WOOD BLOCKOUT DETAIL



POST 12 WOOD BLOCKOUT DETAIL



MODIFIED THRIE BEAM END SHOE DETAIL



TRANSITION SECTION

(10 gauge (3.4) rail element)

Illinois Department of Transportation

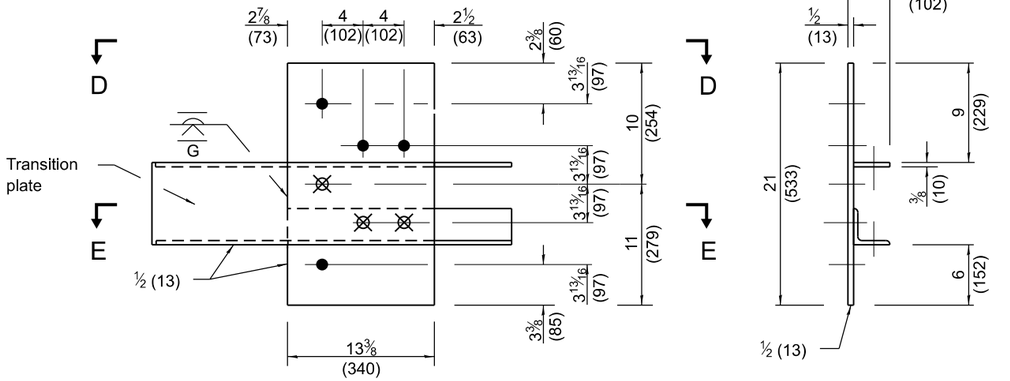
APPROVED January 1, 2023
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2023
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-03

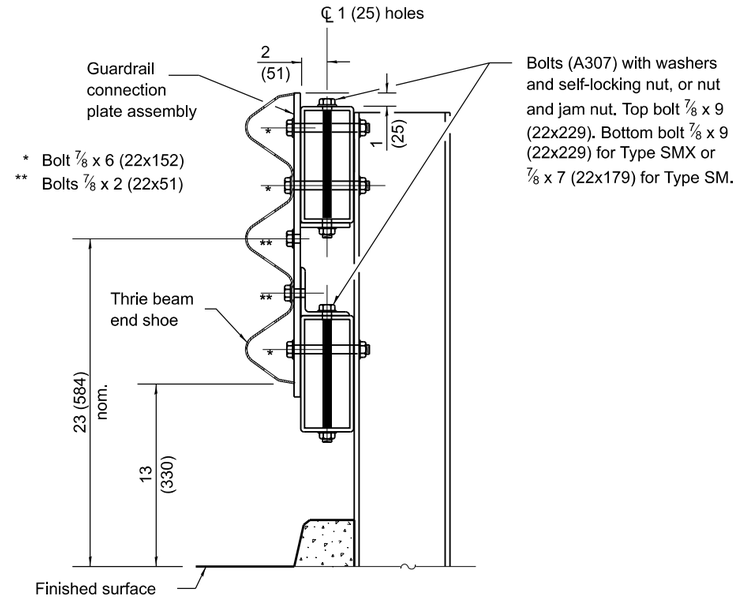
TRAFFIC BARRIER TERMINAL, TYPE 6A

STANDARD 631032-10



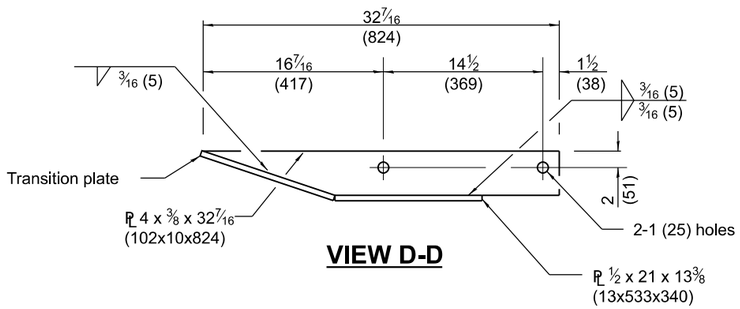
LEGEND

- ● 1 (25) dia. hole for ⅞ (22) dia. H.S. bolt with washer and nut.
- ⊠ Drill and tap hole for ⅞ (22) dia. H.S. bolt.

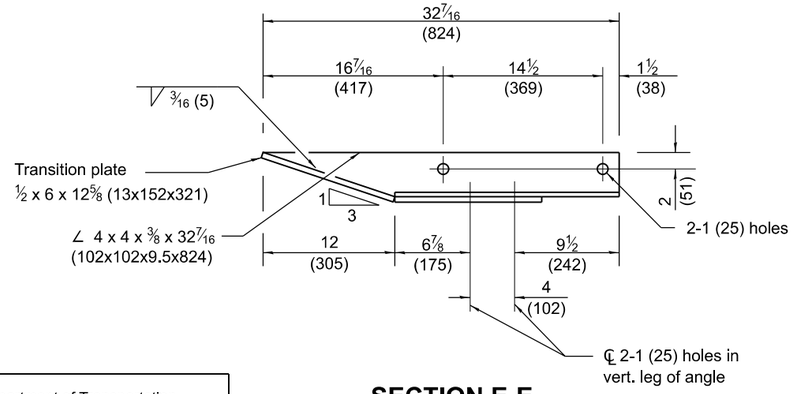


GUARDRAIL CONNECTION PLATE ASSEMBLY DETAILS

(Mirror for opposite end)



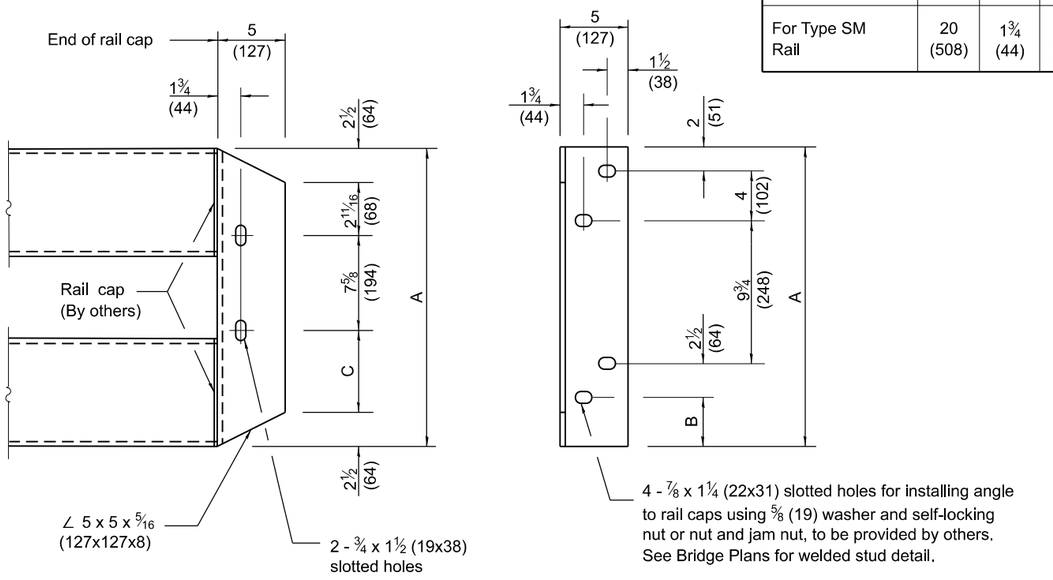
VIEW D-D



SECTION E-E

SECTION C-C

Dimensions	A	B	C
For Type SMX Rail	22 (560)	3¾ (95)	6 11/16 (170)
For Type SM Rail	20 (508)	1¾ (44)	4 11/16 (119)



TRANSITION ANGLE

(Mirror for opposite end.)

Illinois Department of Transportation

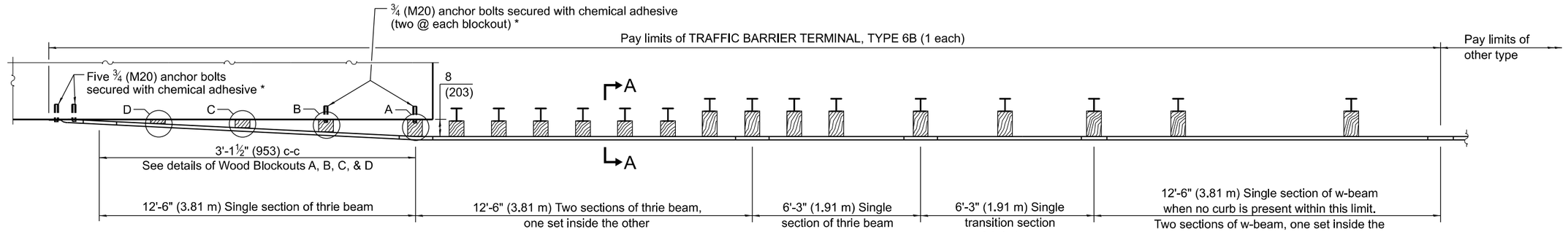
APPROVED January 1, 2023
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2023
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-03

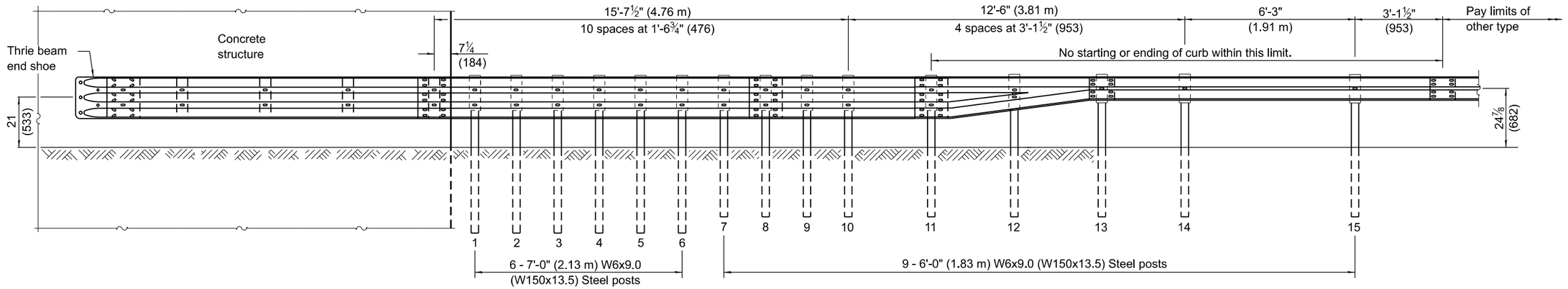
TRAFFIC BARRIER TERMINAL, TYPE 6A

STANDARD 631032-10

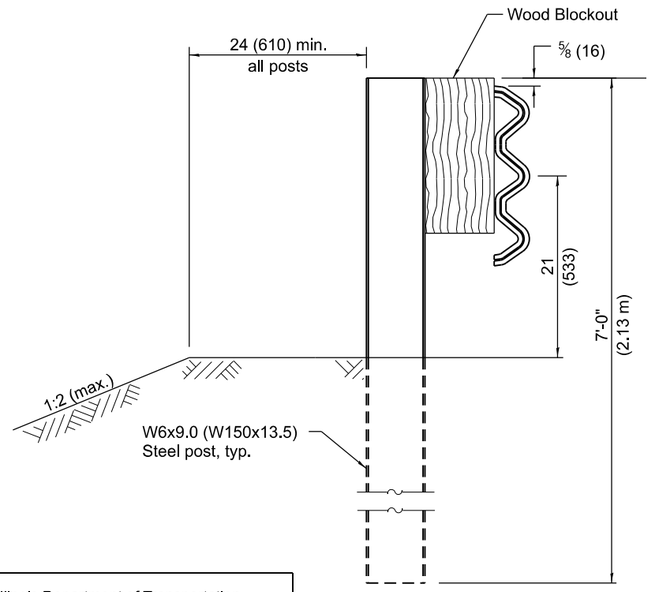


* With standard washers. After tightening, cut the anchor bolts flush with the nuts and damage the nuts to prevent them from loosening.

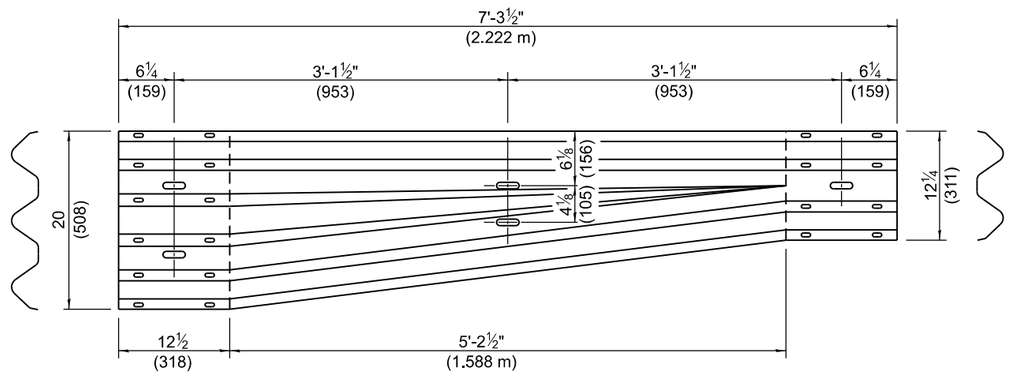
PLAN



ELEVATION



SECTION A-A



TRANSITION SECTION

(10 guage (3.4) rail element)

GENERAL NOTES

See Standard 630001 for details of guardrail not shown.

Thrie beam rail shall be bolted to block-out at all posts.

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

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

Illinois Department of Transportation

APPROVED January 1, 2023
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2023
ENGINEER OF DESIGN AND ENVIRONMENT

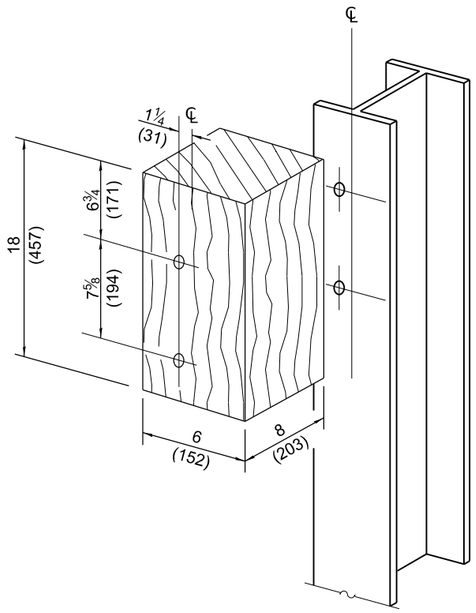
ISSUED 1-1-03

DATE	REVISIONS
1-1-23	Removed two posts and revised
	blockouts to be consistent with
	other TBTs.
1-1-20	Added two posts and revised
	length of posts.

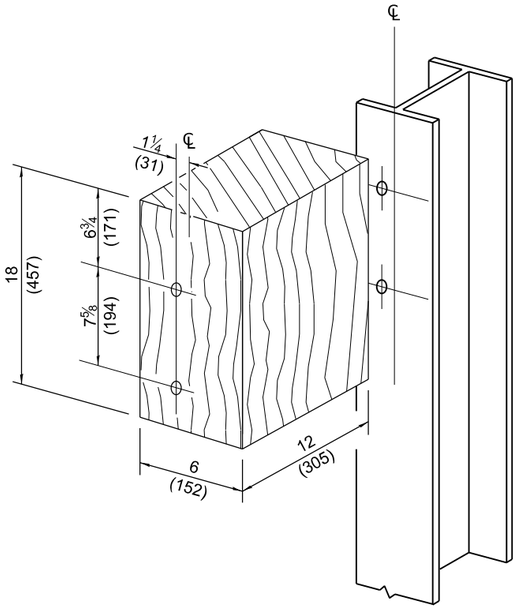
TRAFFIC BARRIER TERMINAL, TYPE 6B

(Sheet 1 of 2)

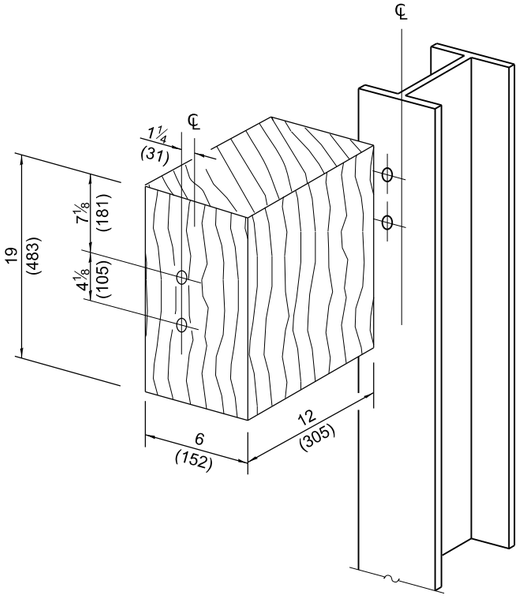
STANDARD 631033-09



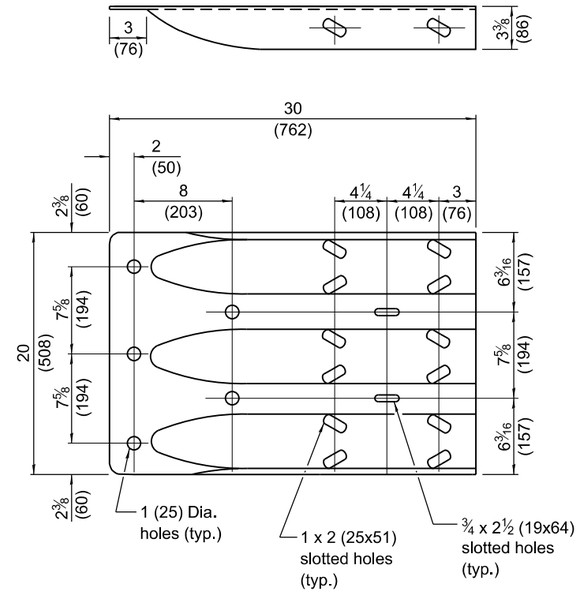
POSTS 1-6 WOOD BLOCKOUT DETAIL



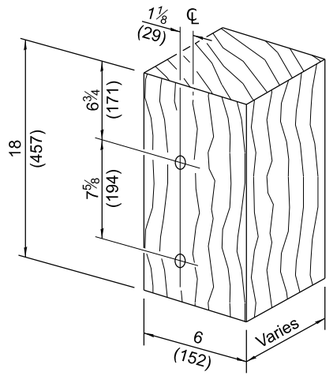
POSTS 7-11 WOOD BLOCKOUT DETAIL



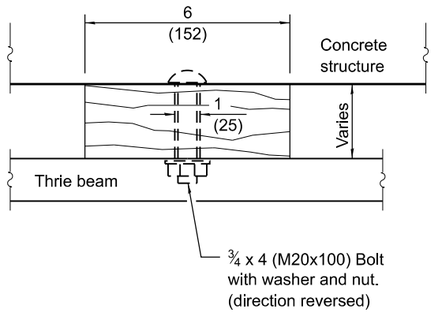
POSTS 12 WOOD BLOCKOUT DETAIL



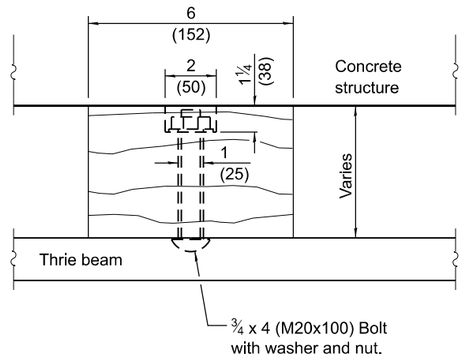
THRIE BEAM END SHOE DETAIL



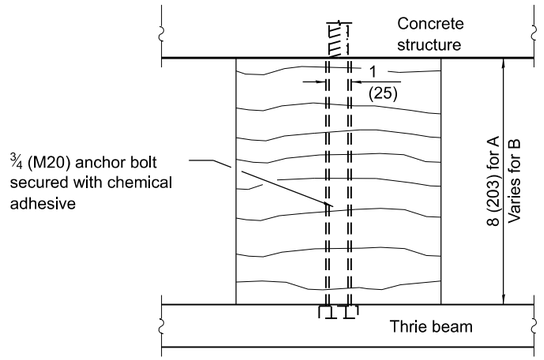
MODIFIED THICKNESS DETAIL
WOOD BLOCKOUTS A, B, C, & D



WOOD BLOCKOUT D



WOOD BLOCKOUT C



WOOD BLOCKOUT A & B

Illinois Department of Transportation

APPROVED January 1, 2023
ENGINEER OF SAFETY PROG. AND ENGINEERING

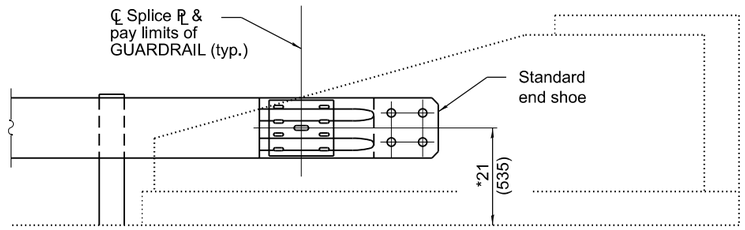
APPROVED January 1, 2023
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-03

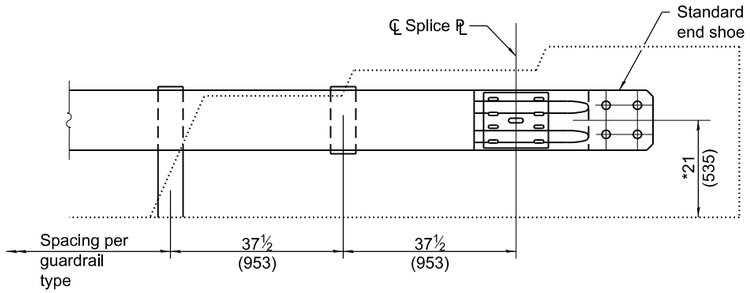
TRAFFIC BARRIER TERMINAL, TYPE 6B

(Sheet 2 of 2)

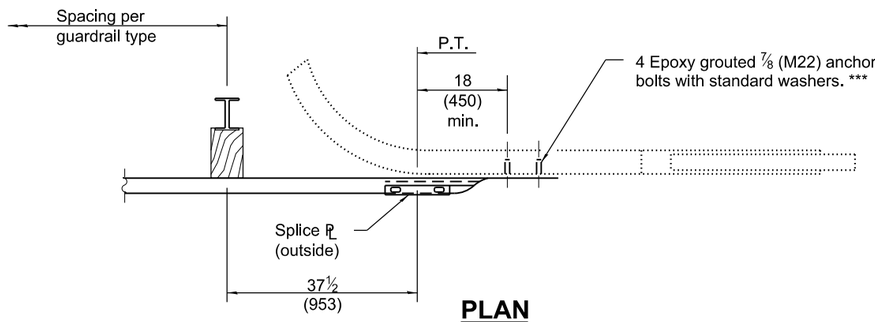
STANDARD 631033-09



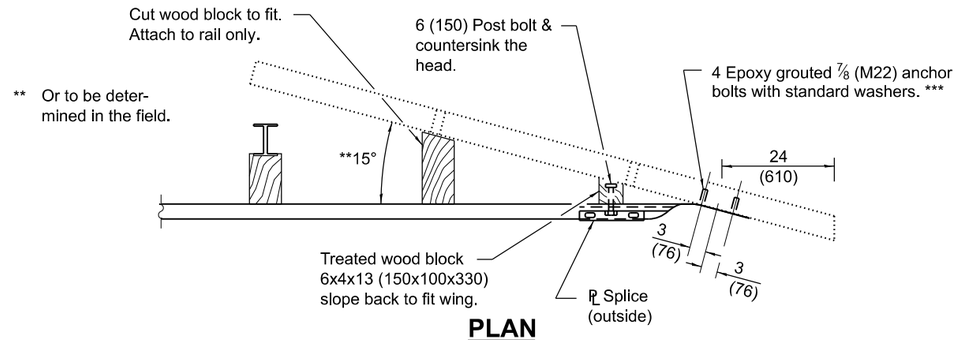
ELEVATION



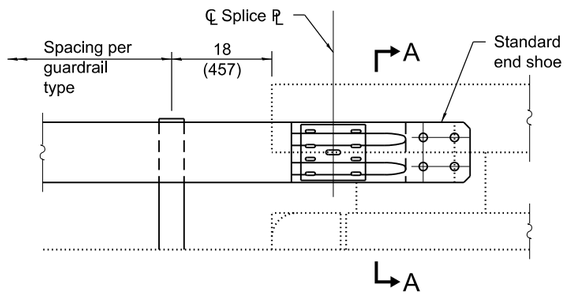
ELEVATION



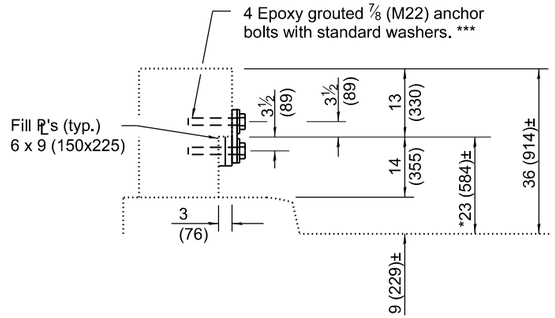
PLAN
CURVED WING



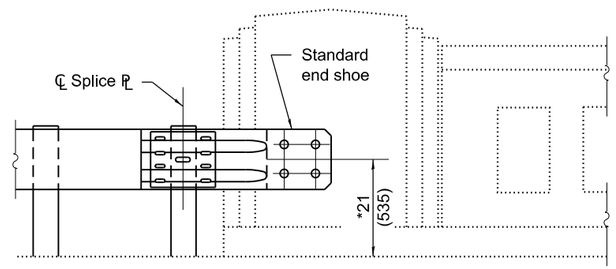
PLAN
FLARED WING



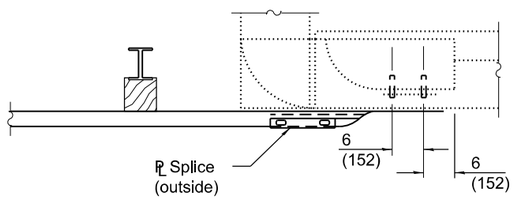
ELEVATION



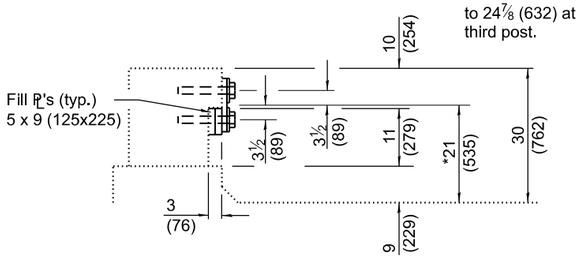
SECTION A-A
(HIGH RAIL)



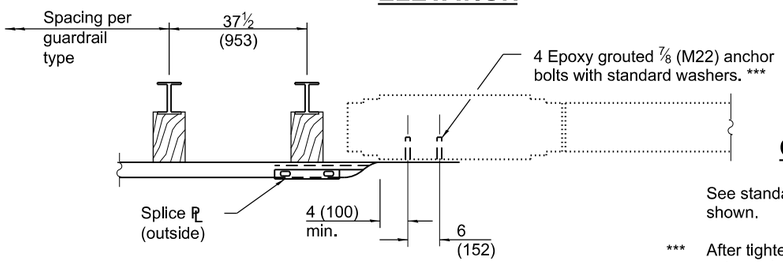
ELEVATION



PLAN



SECTION A-A
(LOW RAIL)



PLAN
CONCRETE HANDRAIL

GENERAL NOTES

See standard 630001 or details of guardrail not shown.

*** After tightening, cut the anchor bolts flush with nuts, and damage the bolt head to prevent it from loosening.

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

REINFORCED CONCRETE HANDRAIL

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

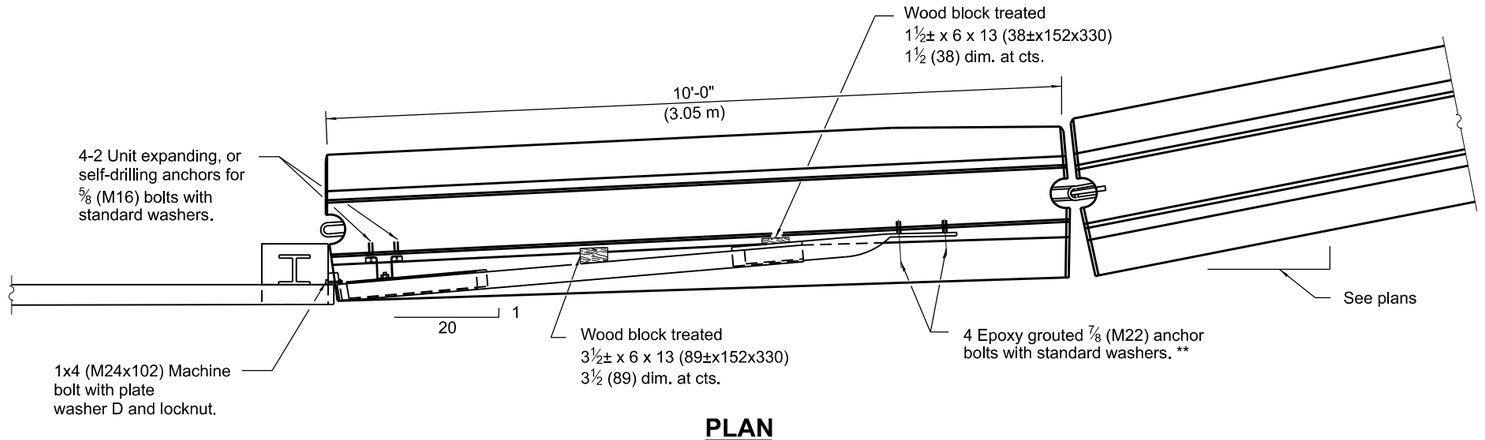
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

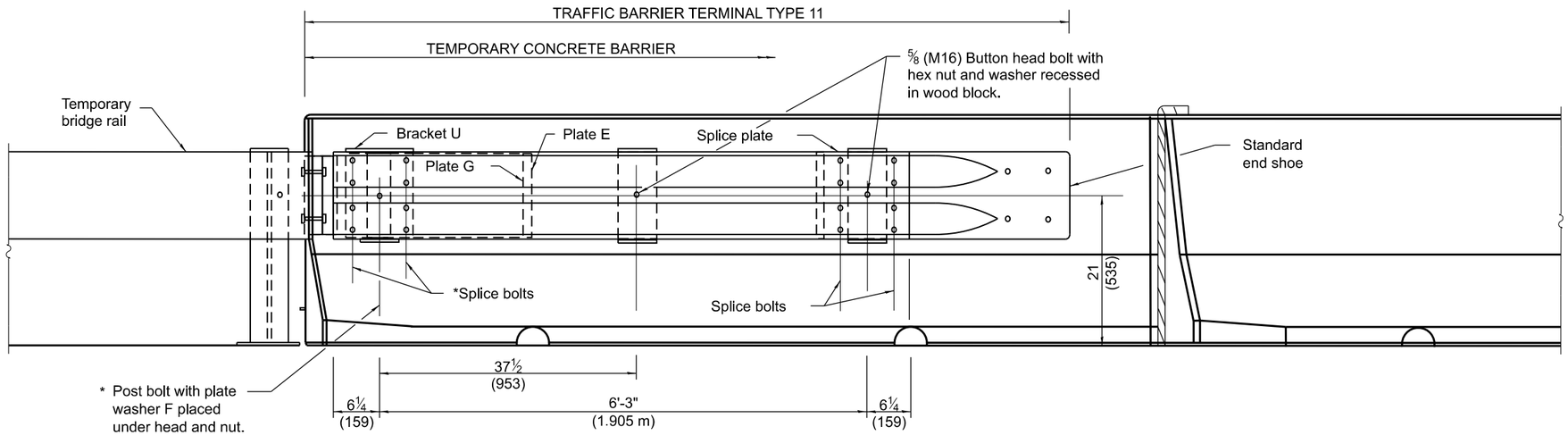
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Changes adopted to implement the
	Midwest Guardrail System.

TRAFFIC BARRIER TERMINAL, TYPE 10

STANDARD 631046-04



PLAN



ELEVATION

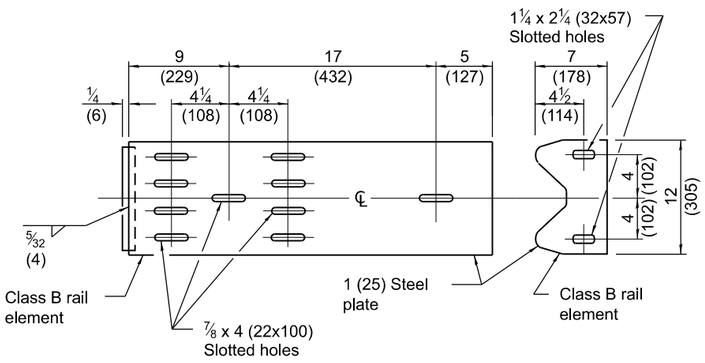


PLATE G

(Place between the rail element and Plate E)

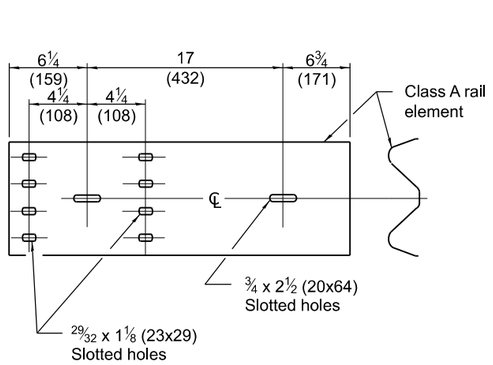
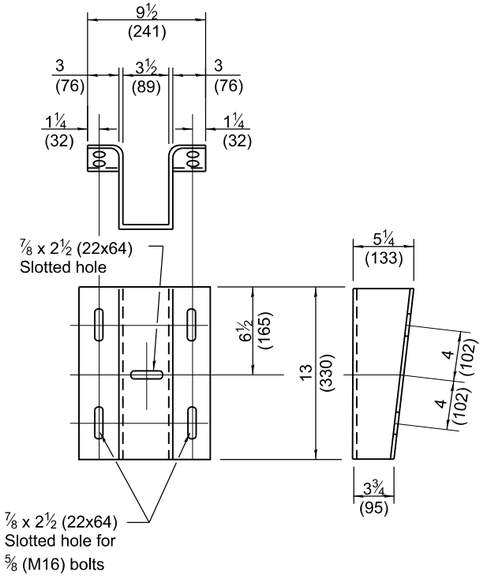


PLATE E



BRACKET U

(¼ (6) Thick steel plate
or rectangular tubing
with flange welded on.)

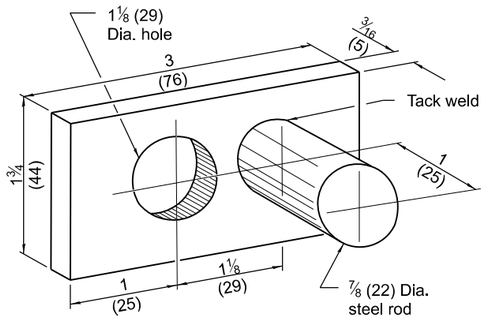


PLATE WASHER D

GENERAL NOTES

For details of guardrail not shown, see Standard 630001.

Install the face of the guardrail flush with the face of the temporary bridge rail. Install plate washer D so that the 1 (25) projection fills the remainder of the slotted holes in the 1 (25) end plate on plate G after the 1 (M24) diameter bolts are in place.

* Bolts shall be provided with a lock nut or double nut and shall be tightened only to a point that will allow plate G to be free to move.

** After tightening, cut the anchor bolts flush with nuts, and damage the bolt head to prevent them from loosening.

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

Illinois Department of Transportation

APPROVED January 1, 2011
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

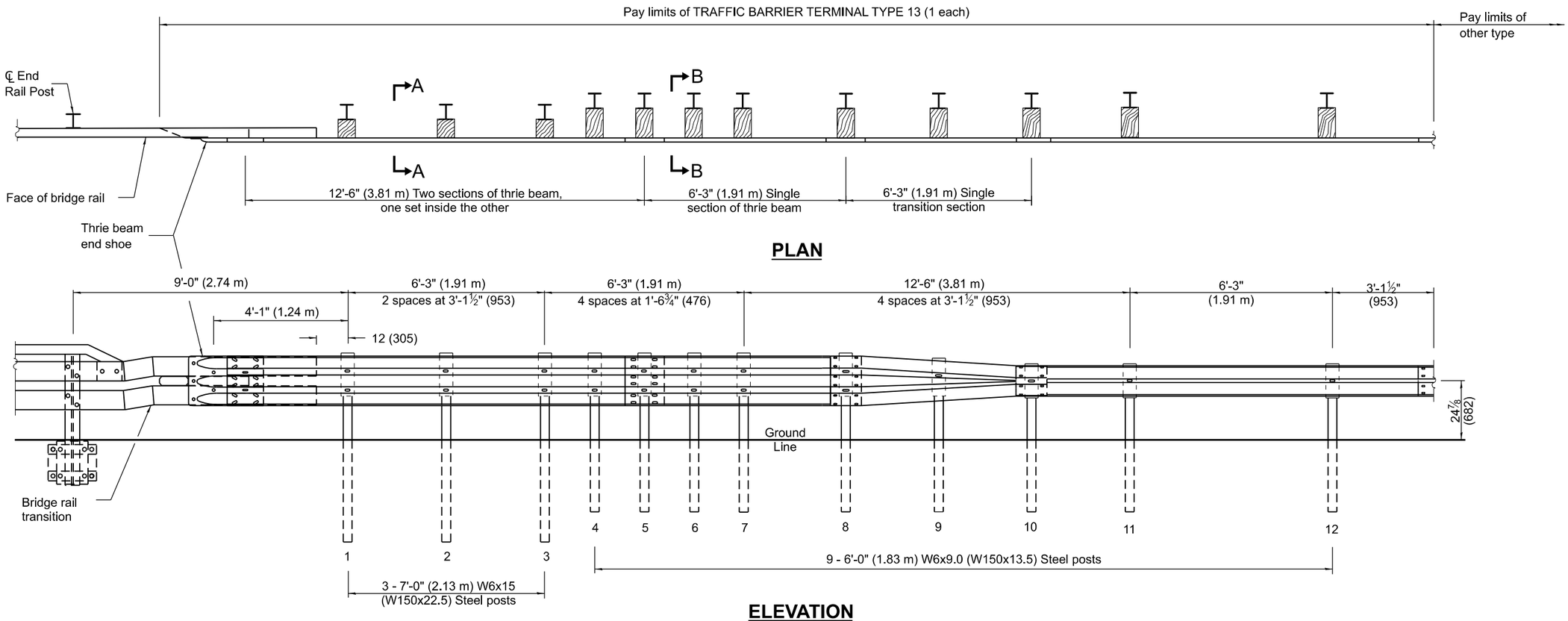
APPROVED January 1, 2011
Scott Bob
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

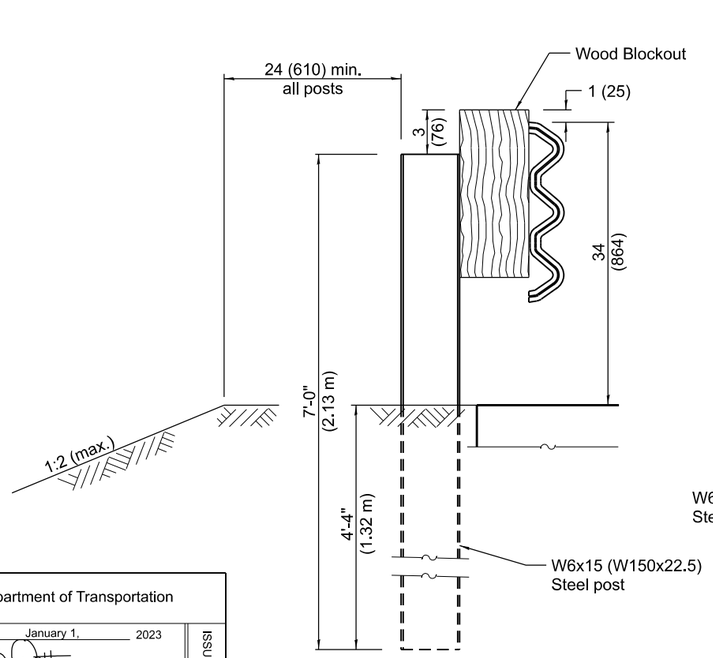
TRAFFIC BARRIER TERMINAL, TYPE 11

STANDARD 631051-03



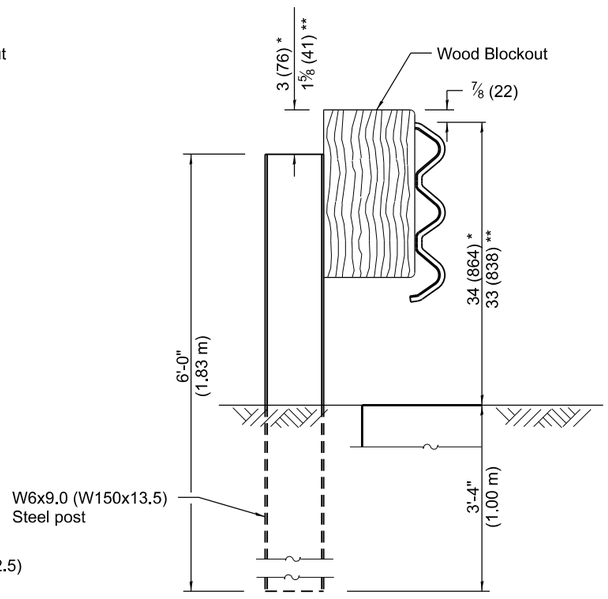
PLAN

ELEVATION



SECTION A-A

Posts 1-3



SECTION B-B

* Posts 4-8
** Post 9

GENERAL NOTES

This standard shows attachment to side mounted bridge railing, Type IL-OH.

See Standard 630001 for details of guardrail not shown.

Thrie beam rail shall be bolted to block-out at all posts.

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

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

Illinois Department of Transportation

APPROVED January 1, 2023
ENGINEER OF SAFETY PROG. AND ENGINEERING

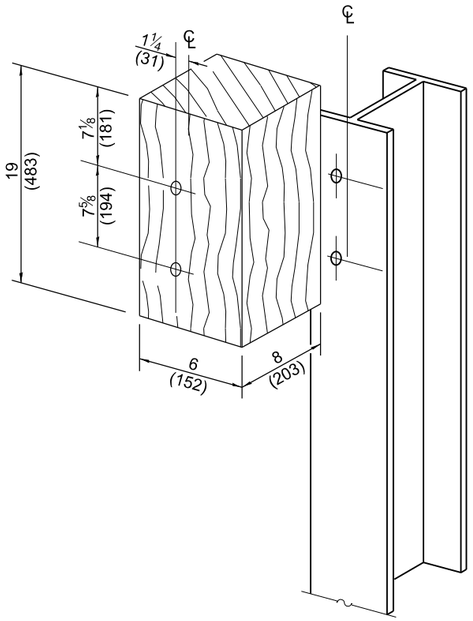
APPROVED January 1, 2023
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-22

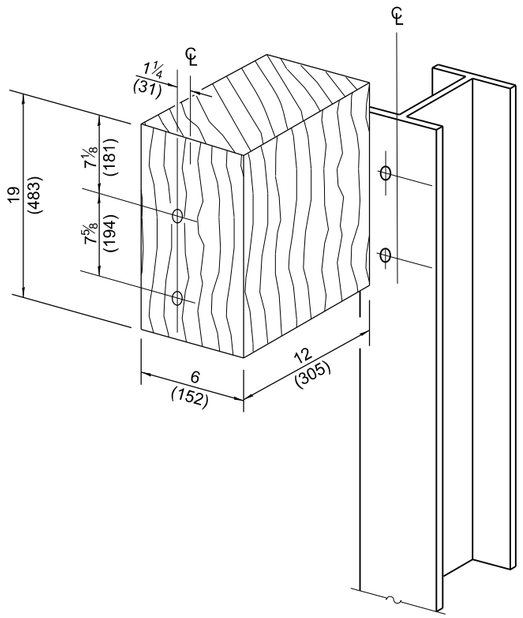
DATE	REVISIONS
1-1-23	Revised pay limits to end at splice.
1-1-22	New Standard.

TRAFFIC BARRIER TERMINAL, TYPE 13

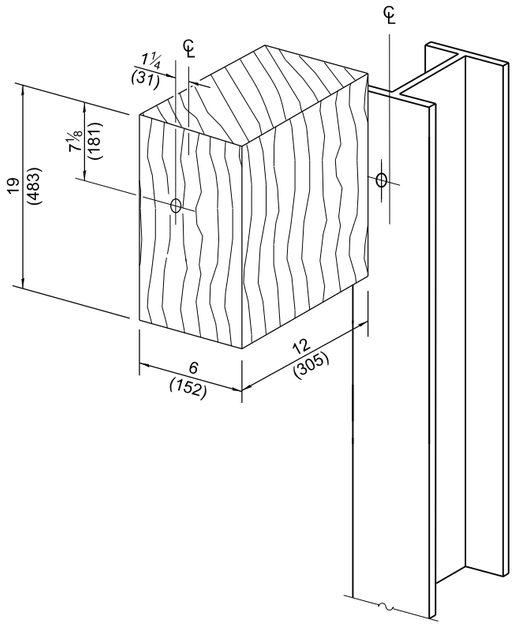
STANDARD 631061-01



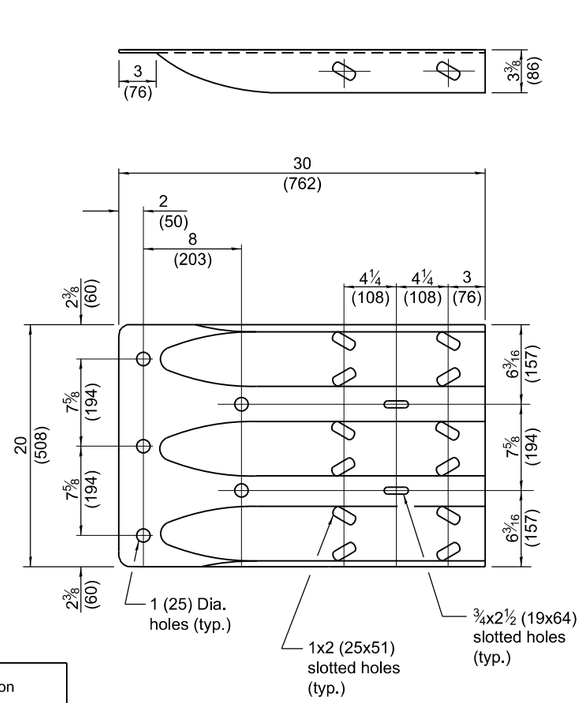
POSTS 1-3 WOOD BLOCKOUT DETAIL



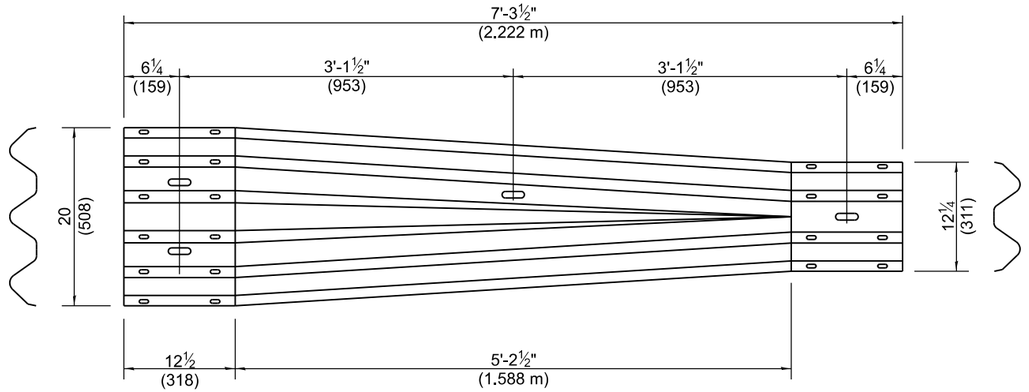
POSTS 4-8 WOOD BLOCKOUT DETAIL



POST 9 WOOD BLOCKOUT DETAIL



THRIE BEAM END SHOE DETAIL



TRANSITION SECTION

(10 gauge (3.4) rail element)

Illinois Department of Transportation

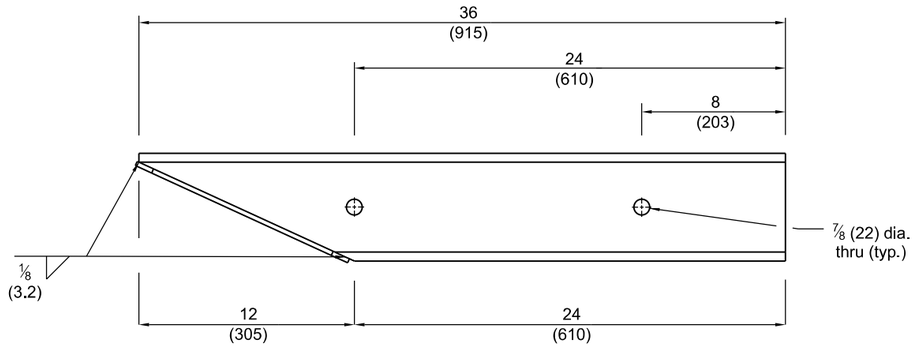
APPROVED January 1, 2023
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2023
ENGINEER OF DESIGN AND ENVIRONMENT

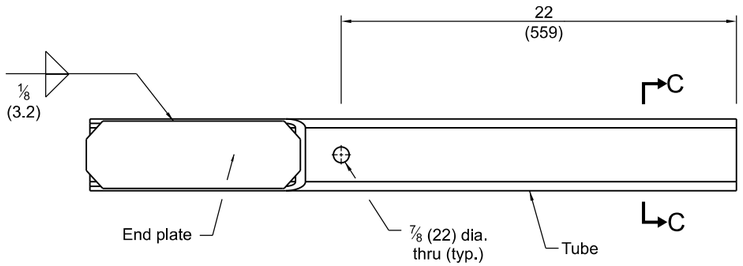
ISSUED 1-1-22

TRAFFIC BARRIER TERMINAL, TYPE 13

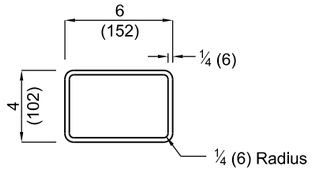
STANDARD 631061-01



PLAN



ELEVATION



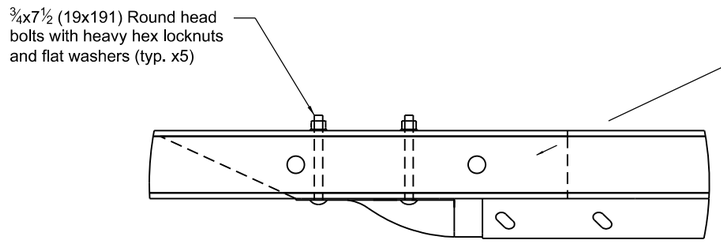
SECTION C-C

ELEVATION

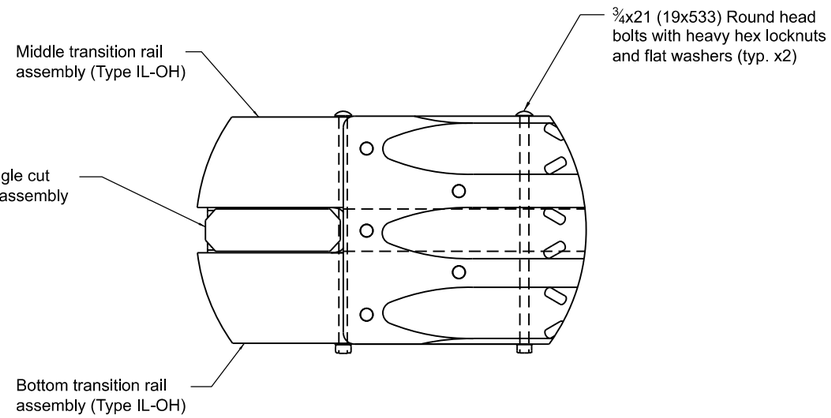
PLAN

ANGLE CUT TUBE ASSEMBLY - END PLATE

ANGLE CUT TUBE ASSEMBLY



PLAN



ELEVATION

BRIDGE RAIL CONNECTION DETAIL

Illinois Department of Transportation

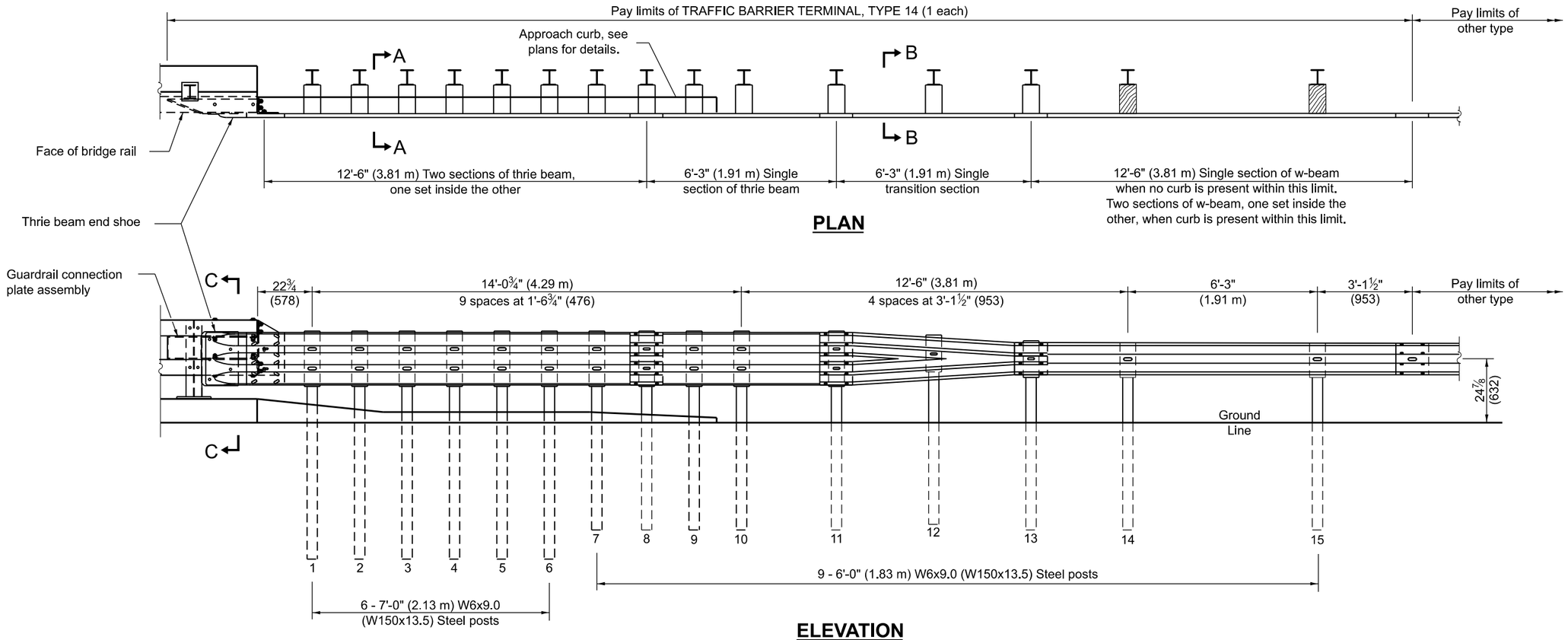
APPROVED January 1, 2023
ENGINEER OF SAFETY PROG. AND ENGINEERING

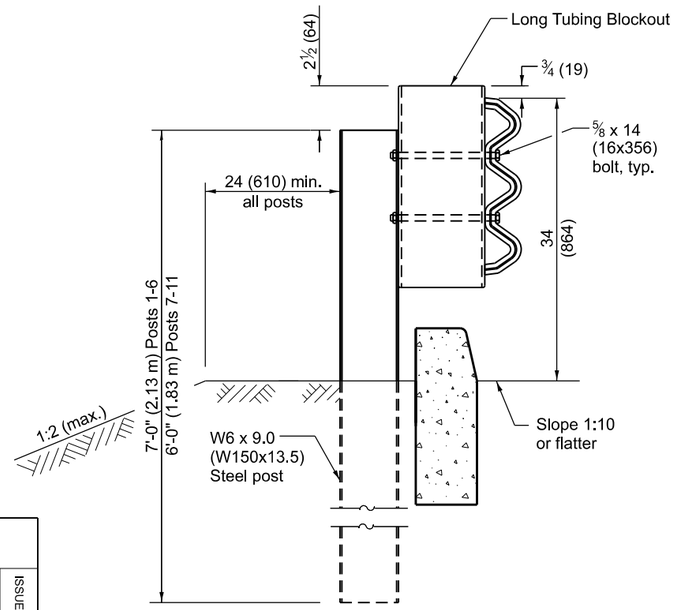
APPROVED January 1, 2023
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-22

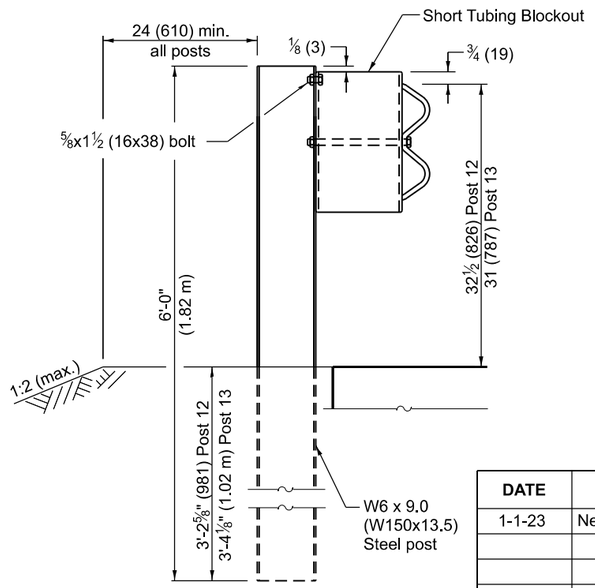
TRAFFIC BARRIER TERMINAL, TYPE 13

STANDARD 631061-01





SECTION A-A
Posts 1-11



SECTION B-B
Posts 12-13

GENERAL NOTES

This standard shows attachment to curb mounted bridge rail, Type CO-10.

See Standard 630001 for details of guardrail not shown.

Blockouts for posts 1-13 shall be HSS 12x6x¼ (305x150x6) or solid wood of the same dimensions.

Thrie beam rail shall be bolted to block-out at all posts.

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

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

Illinois Department of Transportation

APPROVED January 1, 2023
ENGINEER OF SAFETY PROG. AND ENGINEERING

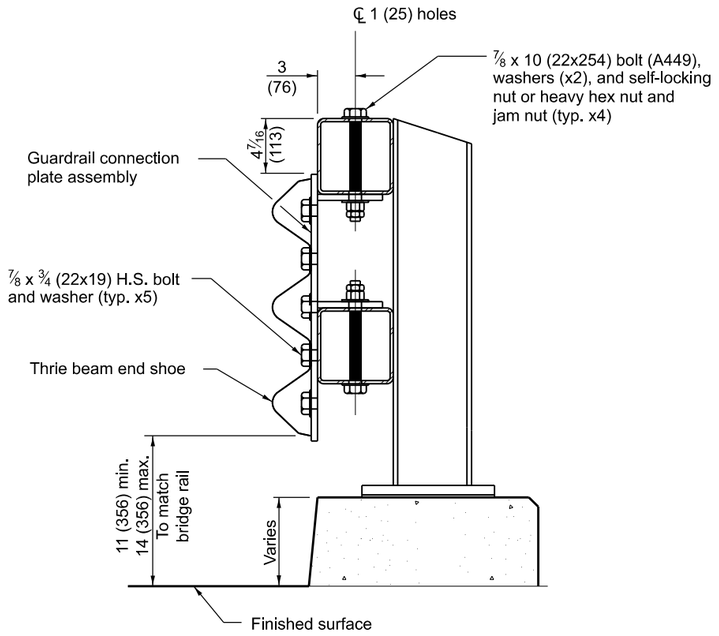
APPROVED January 1, 2023
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-23

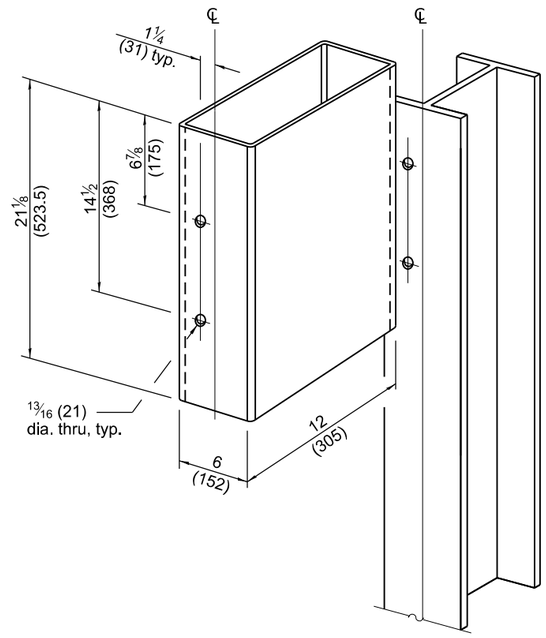
DATE	REVISIONS
1-1-23	New Standard.

TRAFFIC BARRIER TERMINAL, TYPE 14

STANDARD 631066

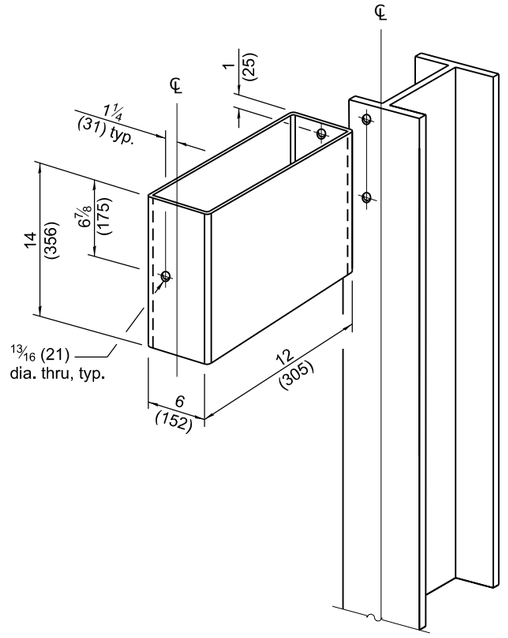


SECTION C-C



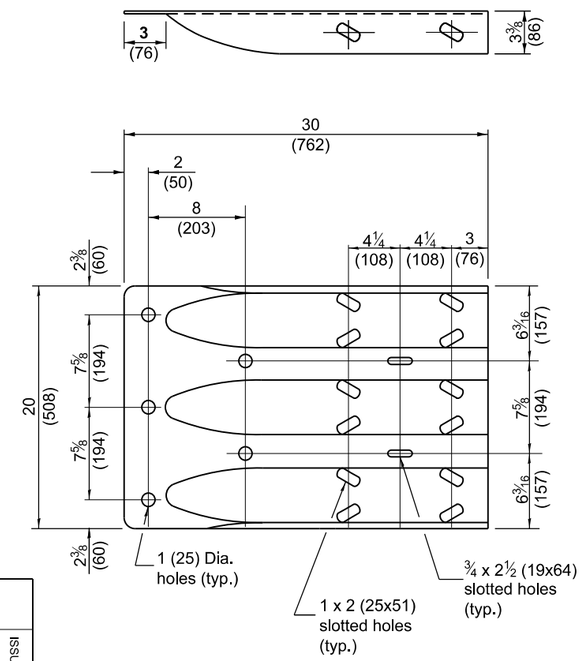
LONG TUBING BLOCKOUT DETAIL

Posts 1-11

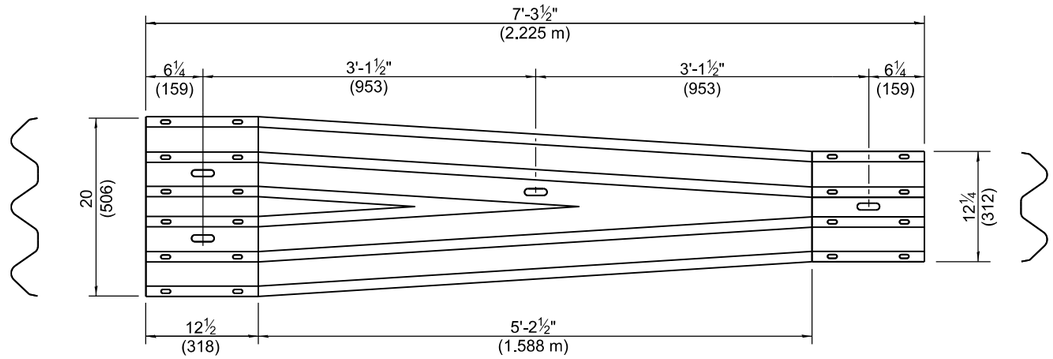


SHORT TUBING BLOCKOUT DETAIL

Posts 12-13



THRIE BEAM END SHOE DETAIL



TRANSITION SECTION

(10 gauge (3.4) rail element)

Illinois Department of Transportation

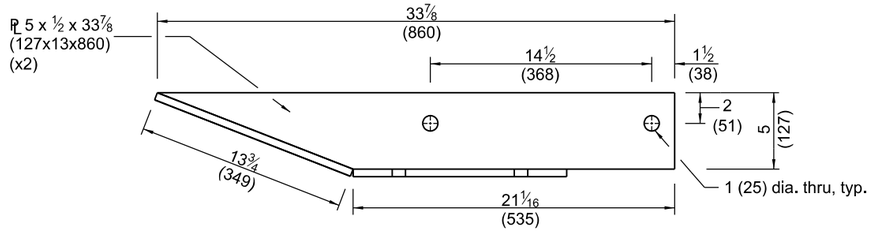
APPROVED January 1, 2023
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2023
ENGINEER OF DESIGN AND ENVIRONMENT

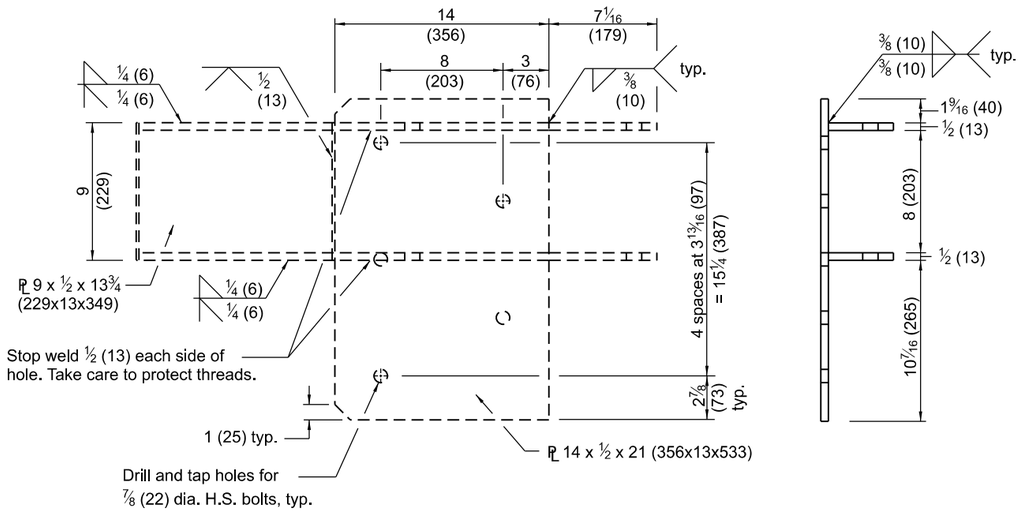
ISSUED 1-1-23

TRAFFIC BARRIER TERMINAL, TYPE 14

STANDARD 631066



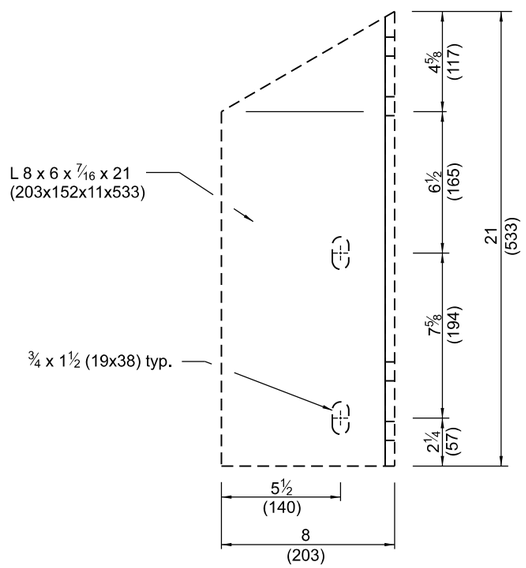
PLAN

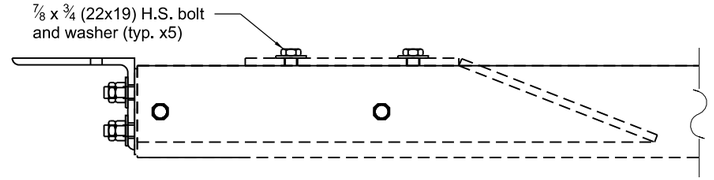


ELEVATION

GUARDRAIL CONNECTION PLATE ASSEMBLY DETAIL

Front View (Mirror for opposite end)





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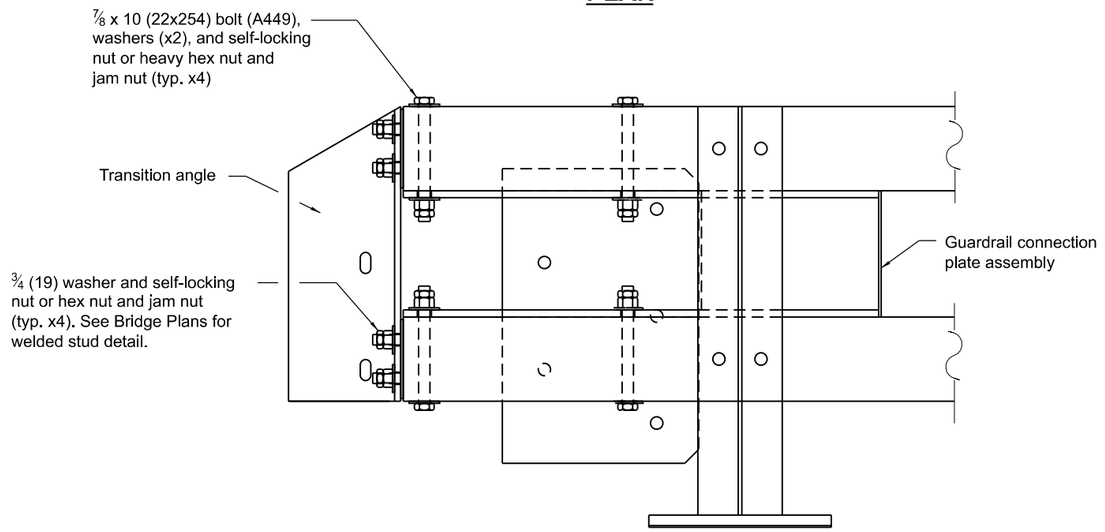
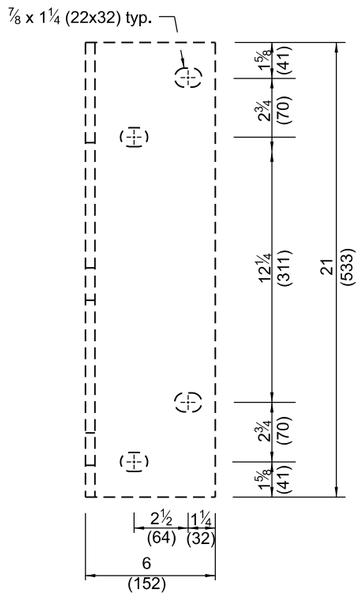


ELEVATION

BRIDGE RAIL CONNECTION DETAIL

Back View (Thrie beam end shoe not shown for clarity)



TRANSITION ANGLE

(Mirror for opposite end)

Illinois Department of Transportation

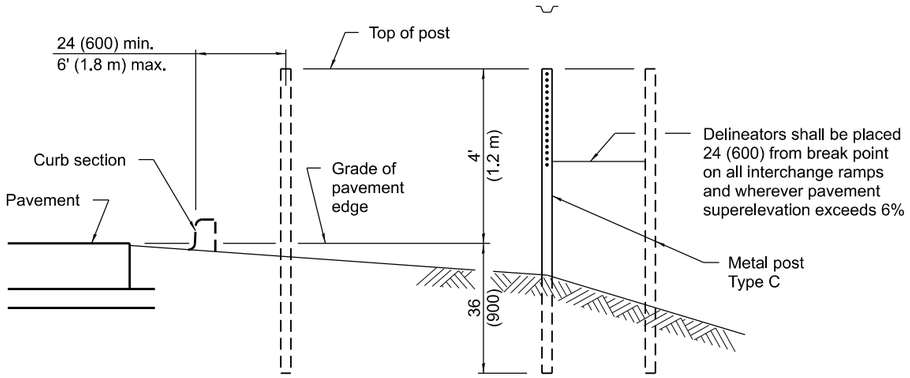
APPROVED January 1, 2023
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2023
ENGINEER OF DESIGN AND ENVIRONMENT

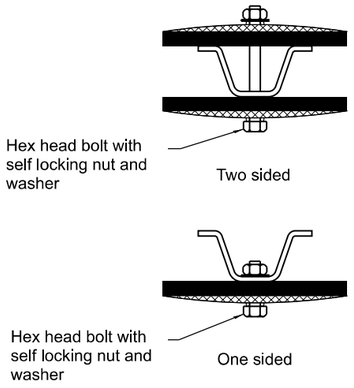
ISSUED 1-1-23

TRAFFIC BARRIER TERMINAL, TYPE 14

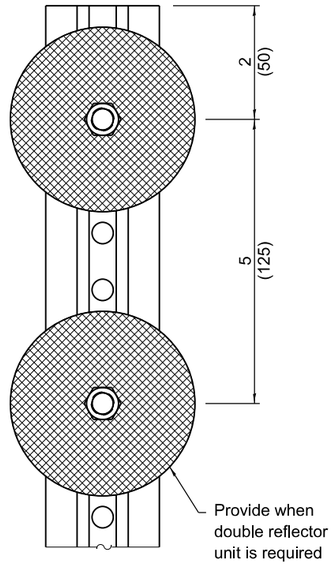
STANDARD 631066



SECTIONAL VIEW

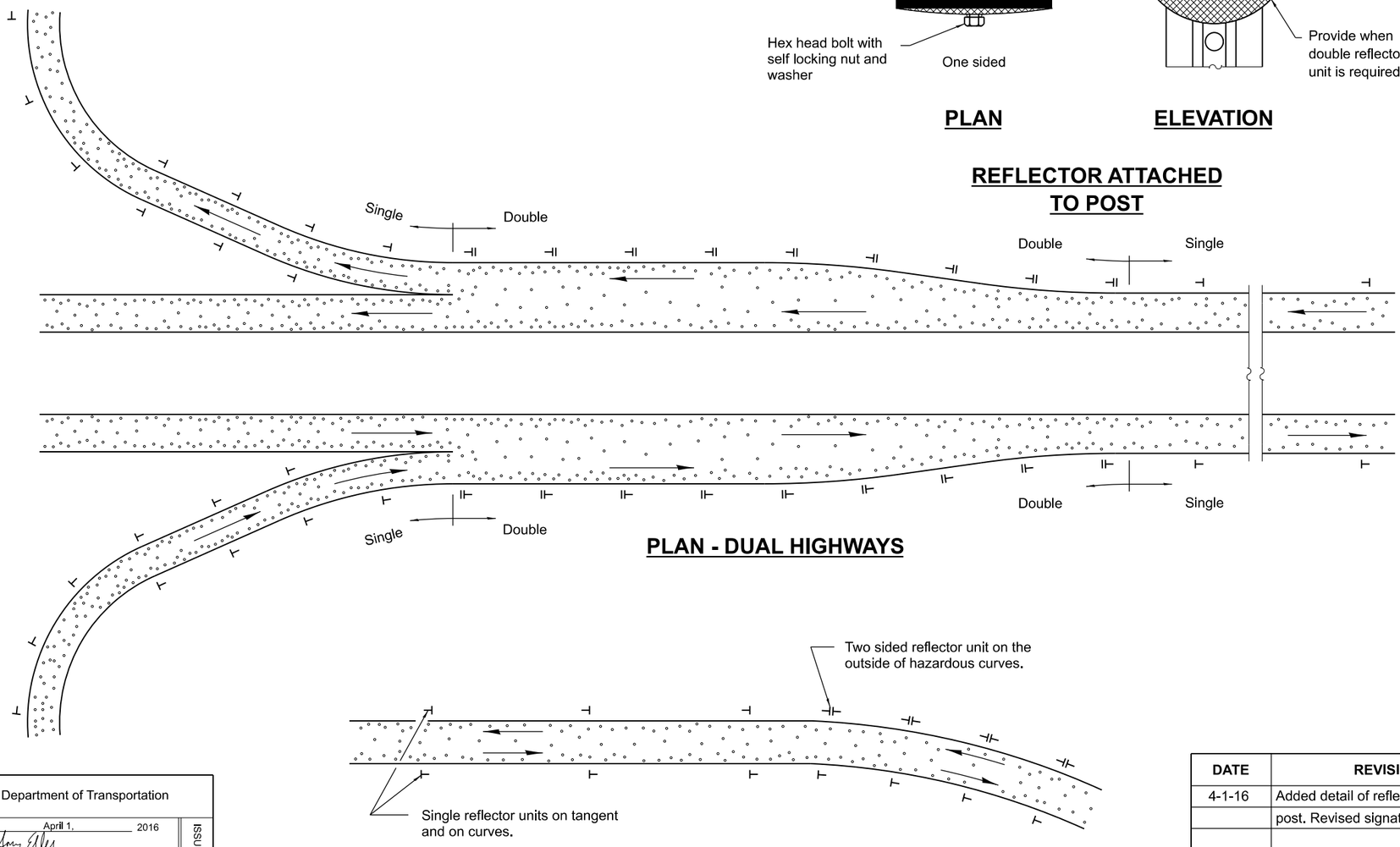


PLAN



ELEVATION

REFLECTOR ATTACHED TO POST



PLAN - DUAL HIGHWAYS

PLAN - TWO-WAY ROADWAYS

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	20	40	65	125
(30)	(5)	(10)	(20)	(40)
100 - 174	30	60	90	180
(30 - 54)	(10)	(20)	(25)	(55)
175 - 224	35	70	110	200
(55 - 69)	(10)	(20)	(35)	(60)
225 - 274	40	85	125	200
(70 - 84)	(10)	(25)	(40)	(60)
275 - 349	50	95	145	200
(85 - 104)	(15)	(30)	(45)	(60)
350 - 449	55	110	170	200
(105 - 134)	(15)	(35)	(50)	(60)
450 - 549	65	125	190	200
(135 - 164)	(20)	(40)	(60)	(60)
550 - 649	70	140	200	200
(165 - 199)	(20)	(45)	(60)	(60)
650 - 749	75	150	200	200
(200 - 229)	(25)	(45)	(60)	(60)
750 - 849	80	165	200	200
(230 - 259)	(25)	(50)	(60)	(60)
850 - 949	85	175	200	200
(260 - 289)	(25)	(55)	(60)	(60)
950 - 1049	90	185	200	200
(290 - 319)	(25)	(55)	(60)	(60)
1050 - 1299	100	200	200	200
(320 - 394)	(30)	(60)	(60)	(60)
1300 - 1999	125	200	200	300
(395 - 609)	(40)	(60)	(60)	(90)
2000 - 2999	150	200	200	300
(610 - 914)	(45)	(60)	(60)	(90)
3000 - 3999	175	200	300	300
(915 - 1219)	(55)	(60)	(90)	(90)
4000 or greater	400	400	400	400
(1220)	(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 720011 for details of metal post.

Double reflector units shall be used on the outside of all acceleration and deceleration lanes. Single reflector units shall be used on ramps. Delineators shall be used on outside of all curved sections of ramps.

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

Illinois Department of Transportation

APPROVED April 1, 2016
ENGINEER OF OPERATIONS

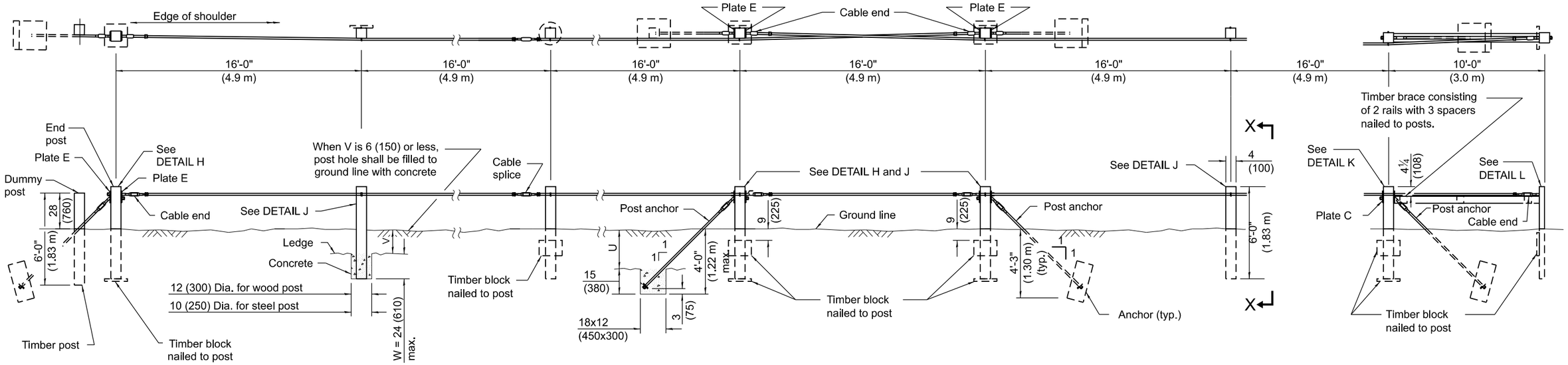
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

DELINEATORS

STANDARD 635001-02



END ANCHOR ARRANGEMENT

TYPICAL FOOTINGS FOR POST AND ANCHOR WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED

INTERMEDIATE ANCHOR ARRANGEMENT

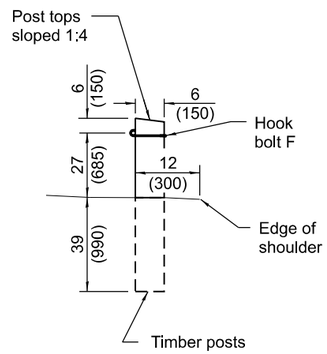
DEAD END ANCHOR ARRANGEMENT

NOTES

V + W shall not exceed 39 (990). When V is 0 to 15 (380), W = 24 (610), and posts shall be shortened as required. When V exceeds 15 (380), W shall be shortened correspondingly.

T = 15 (380) when U is 33 (840) or less. When U exceeds 33 (840) the impervious material shall be removed and the standard anchor shall be used.

Timber blocks shall be nailed to each wood post on the concave side of curve for curves having a radius of less than 600' (180 m).



VIEW X-X

Typical Wood Materials	
Item	Size
Post	4x4x6'-0" (100x150x1.83 m)
Block	2x12x18 (50x300x450)
Rail	2x6 (50x150)
Spacer	2x6x6 (50x150x150)

GENERAL NOTES

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

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

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

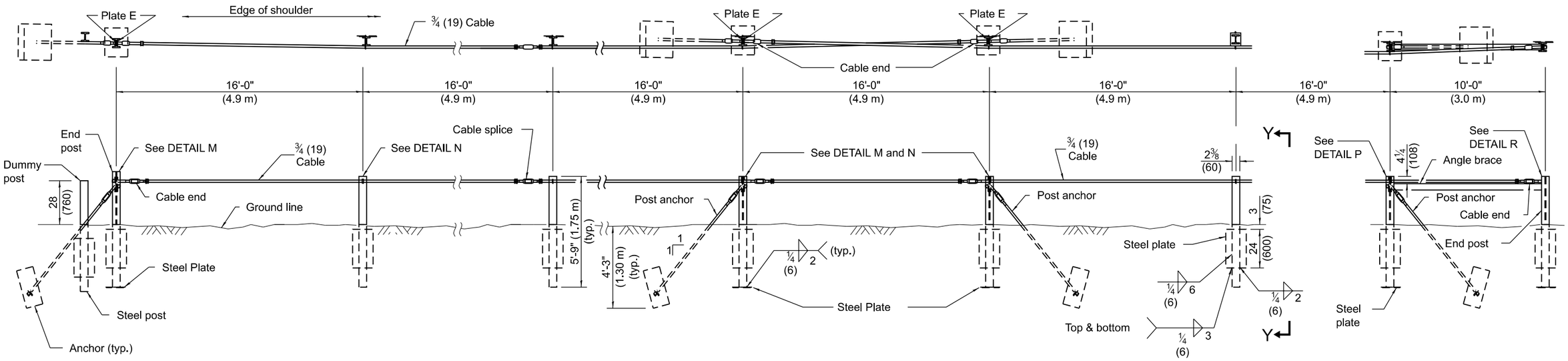
ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to English (metric).
	Omitted precast deadman
	and general note.
1-1-05	Corrected note on Post Anchor
	detail on sheet 3 of 3.

CABLE ROAD GUARD SINGLE STRAND

(Sheet 1 of 3)

STANDARD 636001-02

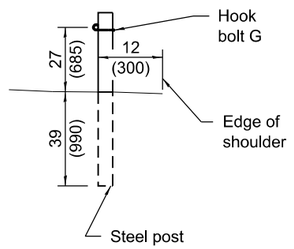


END ANCHOR ARRANGEMENT

INTERMEDIATE ANCHOR ARRANGEMENT

DEAD END ANCHOR ARRANGEMENT

TYPICAL STEEL MATERIALS	
Item	Size
Post	S3x5.7x5'-9" (S75x8.5x1.75 m)
Bottom Plate	¼x8x8 (6x200x200)
Side Plate	¼x8x24 (6x200x600)
Brace	L 4x3x⅜ (L 102x76x9.5)



VIEW Y-Y

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

CABLE ROAD GUARD SINGLE STRAND

STANDARD 636001-02

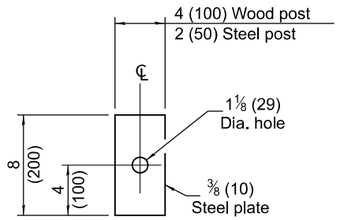


PLATE C

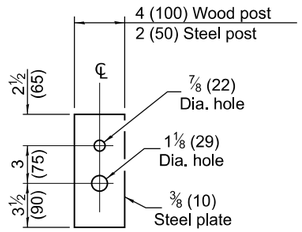
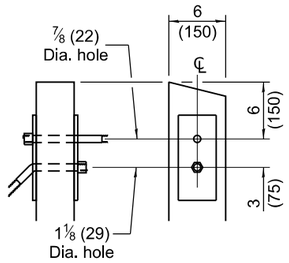
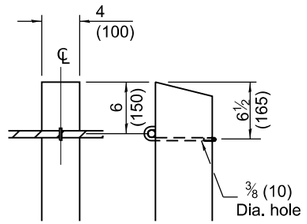


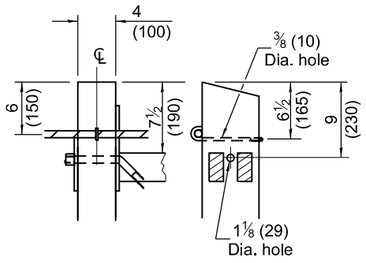
PLATE E



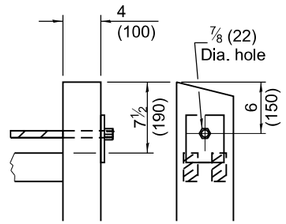
DETAIL H



DETAIL J



DETAIL K



DETAIL L

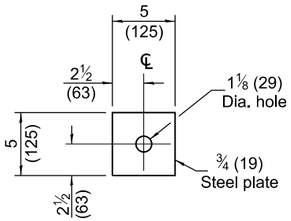


PLATE B

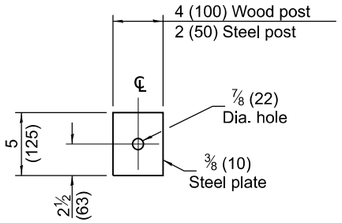
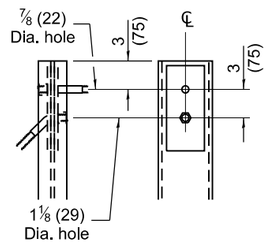
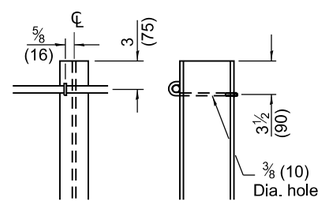


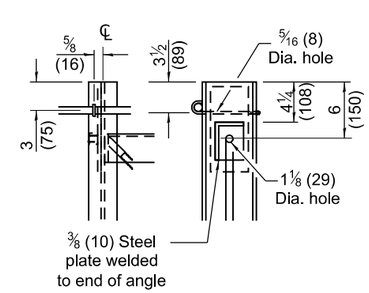
PLATE D



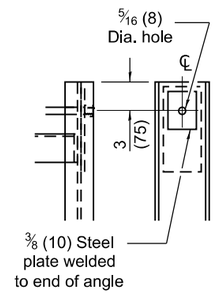
DETAIL M



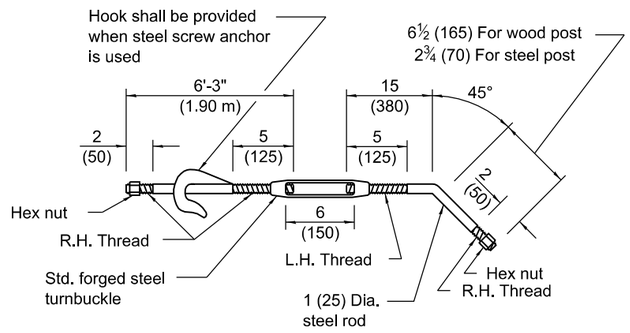
DETAIL N



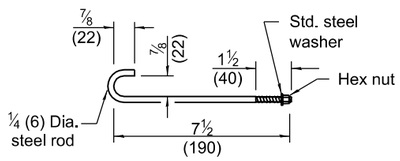
DETAIL P



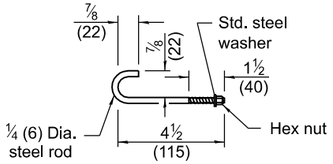
DETAIL R



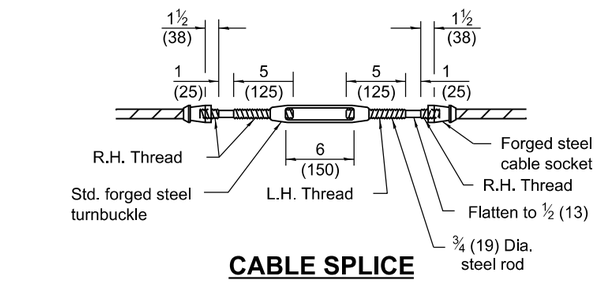
POST ANCHOR



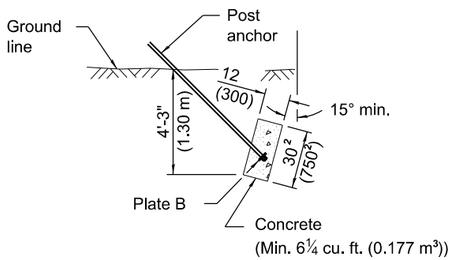
HOOK BOLT F



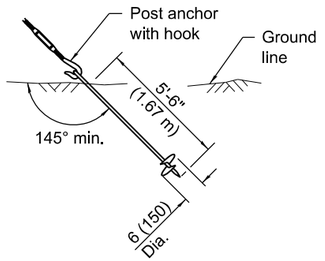
HOOK BOLT G



CABLE SPLICE

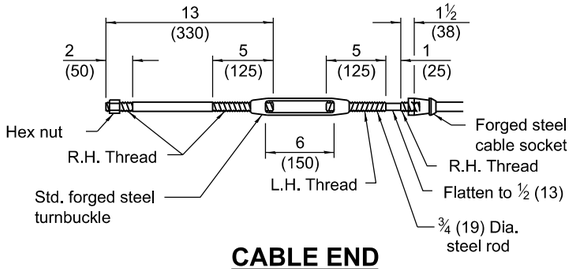


CAST IN PLACE DEADMAN



STEEL SCREW

ALTERNATE - ANCHORS



CABLE END

Illinois Department of Transportation

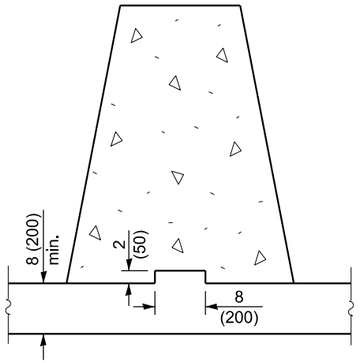
APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

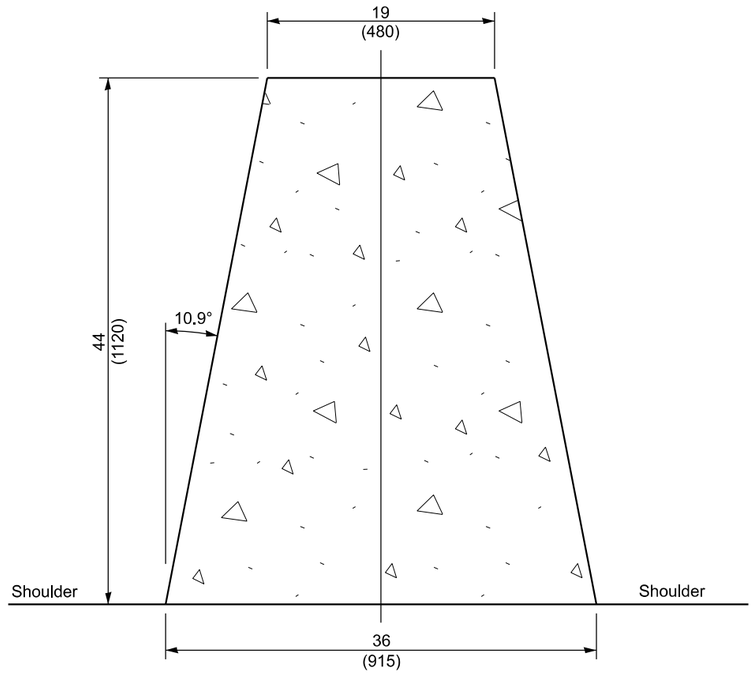
ISSUED 1-1-97

CABLE ROAD GUARD SINGLE STRAND

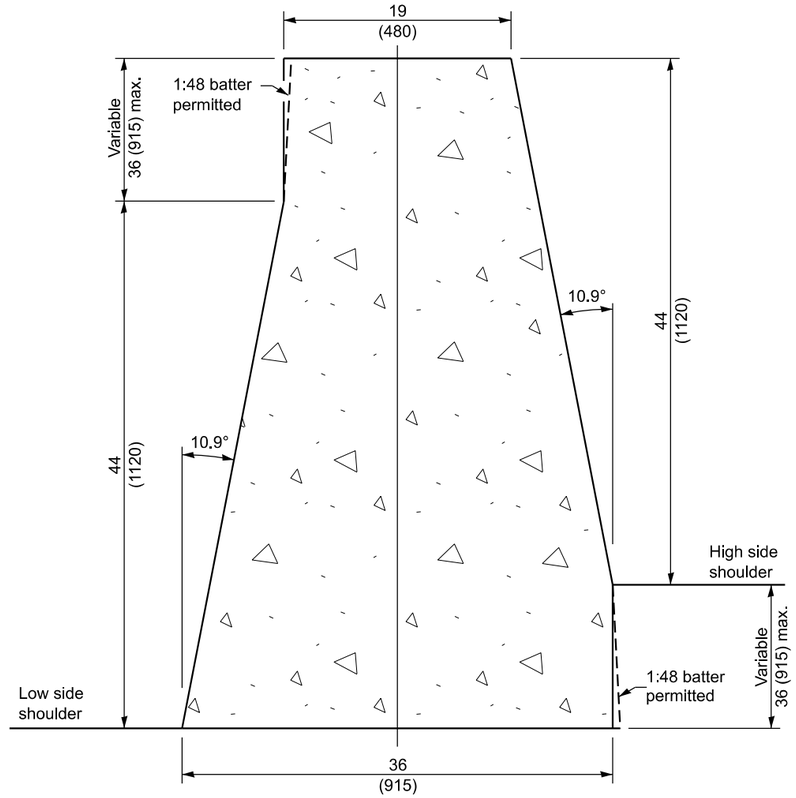
STANDARD 636001-02



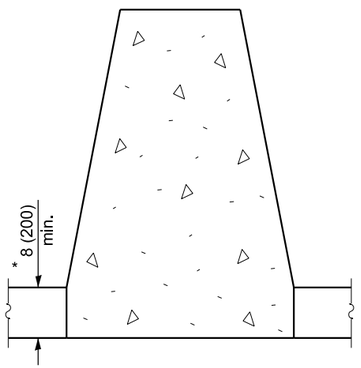
NEW PCC BASE w/ KEYWAY



TYPICAL CROSS-SECTION

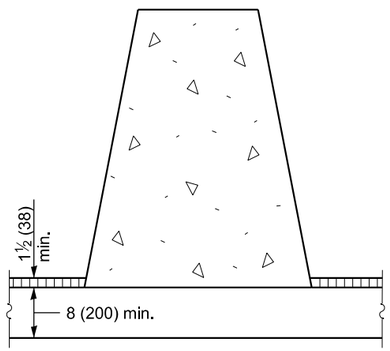


VARIABLE CROSS-SECTION

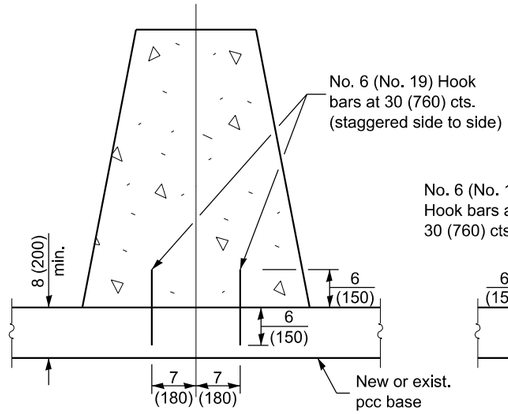


NEW MONOLITHIC PCC BASE

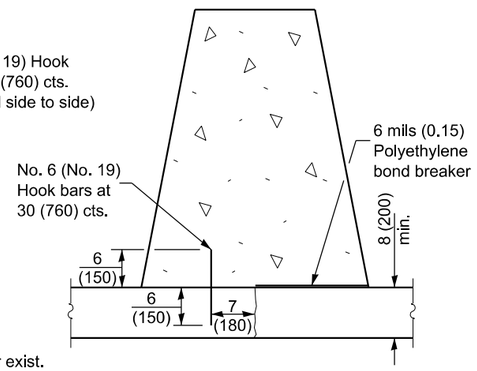
* This dimension shall be 10 (250) min. when the barrier is confined by earth.



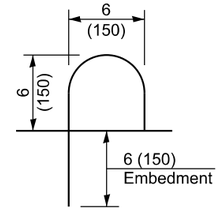
NEW OR EXISTING HMA / PCC BASE w/ HMA OVERLAY CONFINEMENT



NEW OR EXISTING PCC BASE w/ HOOK BARS



EXISTING PCC BASE WITH LONGITUDINAL JOINT



HOOK BAR DETAIL (Side View)

GENERAL NOTES

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

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

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

FIVE ANCHORING METHODS

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

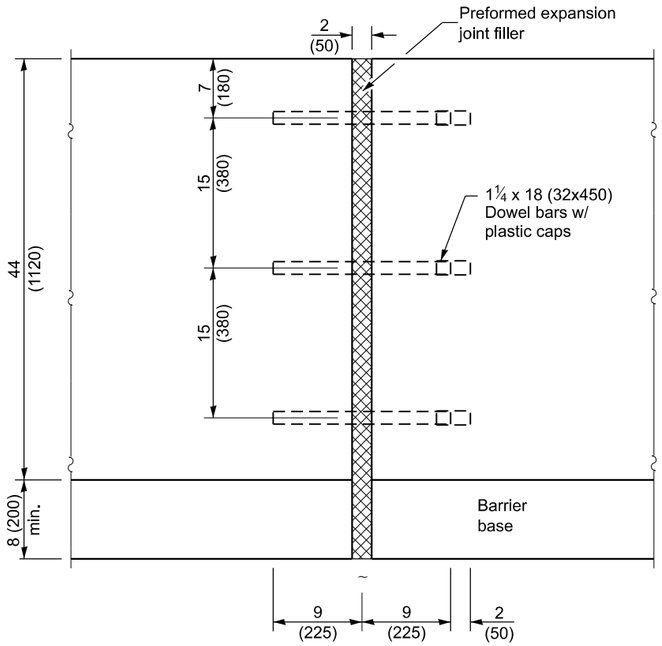
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

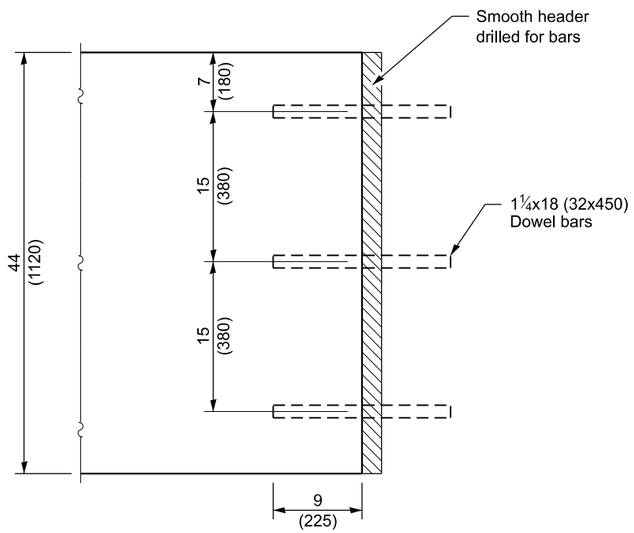
DATE	REVISIONS
1-1-21	Revised Typical and Variable
	Cross-Sections. Added keyway
	anchor method and hook bars.
1-1-19	Revised from F-shape to constant
	slope, increased height, and renamed
	standard.

CONCRETE BARRIER, DOUBLE FACE, 44 in. (1120 mm) HEIGHT

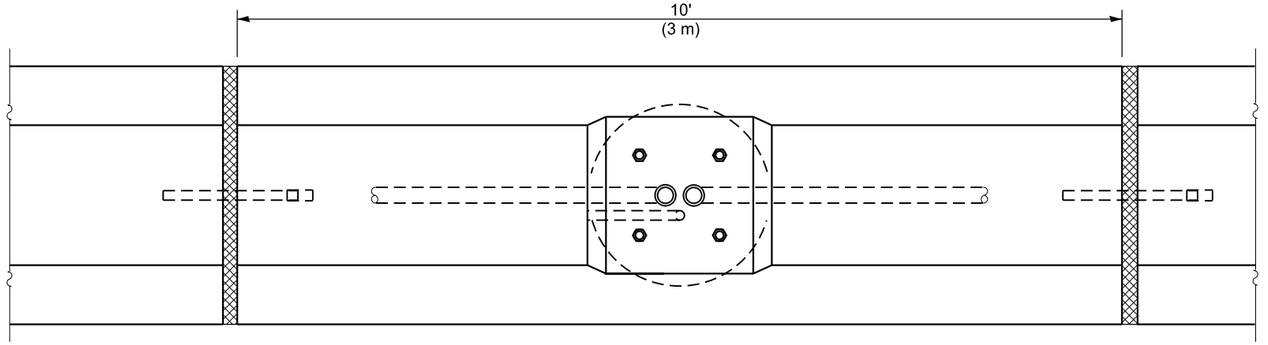
STANDARD 637006-05



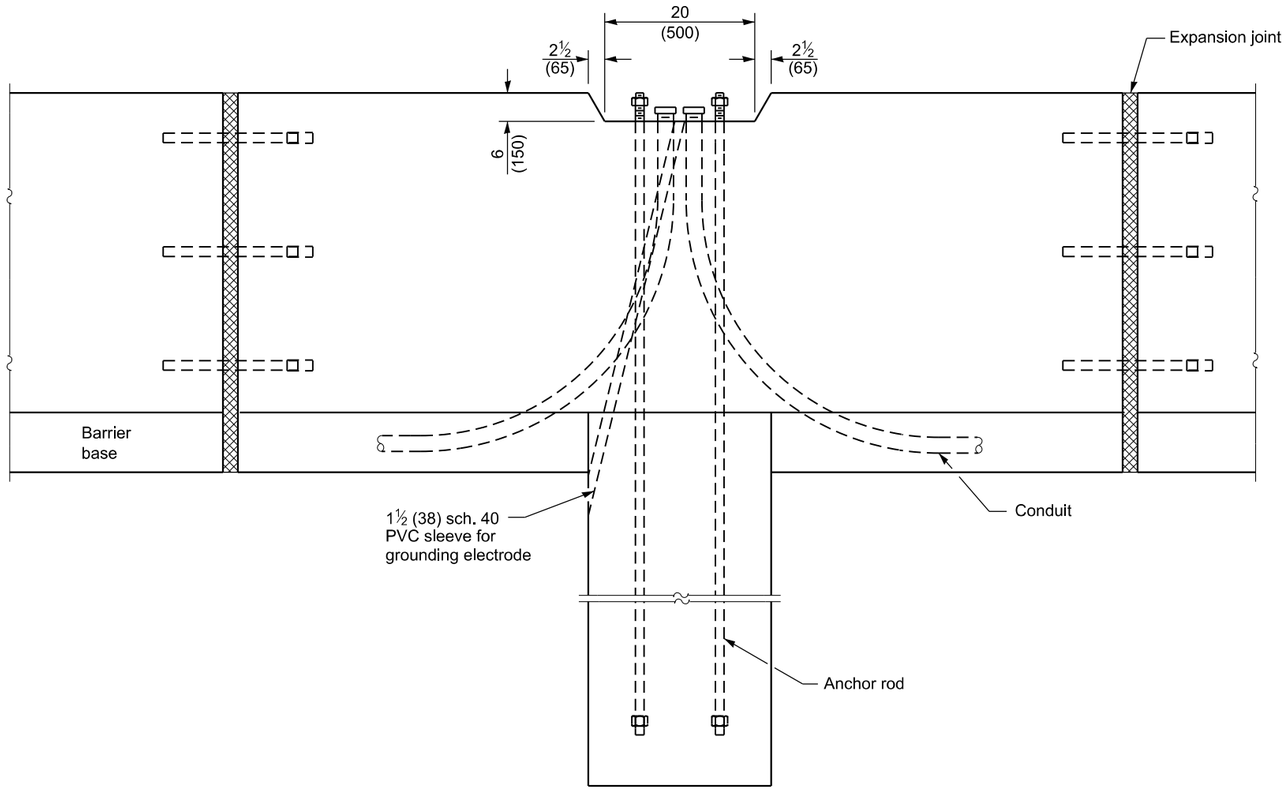
EXPANSION JOINT



CONSTRUCTION JOINT



PLAN AT LIGHTING FOUNDATION



ELEVATION AT LIGHTING FOUNDATION

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

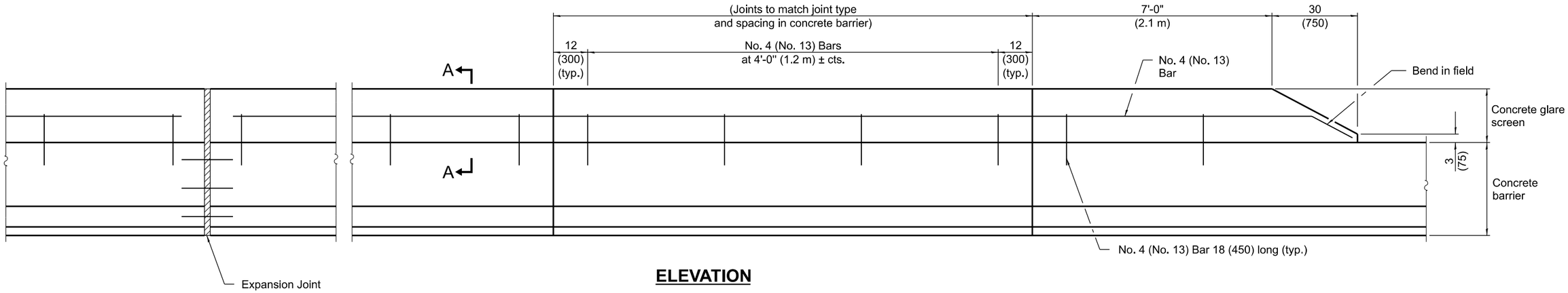
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

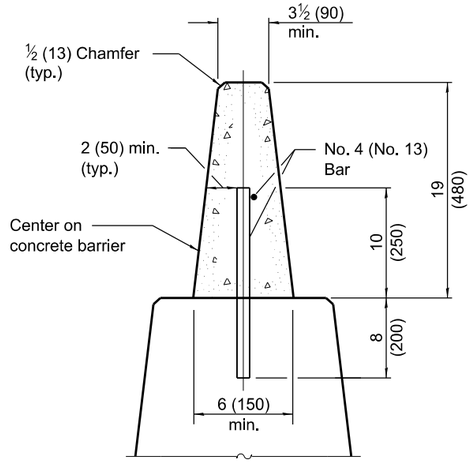
CONCRETE BARRIER, DOUBLE FACE, 44 in. (1120 mm) HEIGHT

(Sheet 2 of 2)

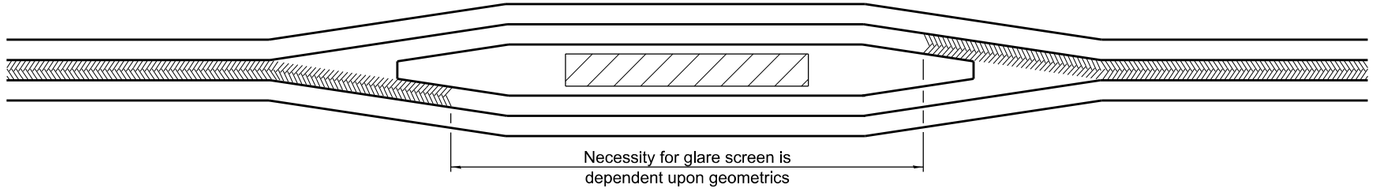
STANDARD 637006-05



ELEVATION



SECTION A-A



TYPICAL APPLICATION AT MEDIAN OBSTRUCTIONS

Glare Screen

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

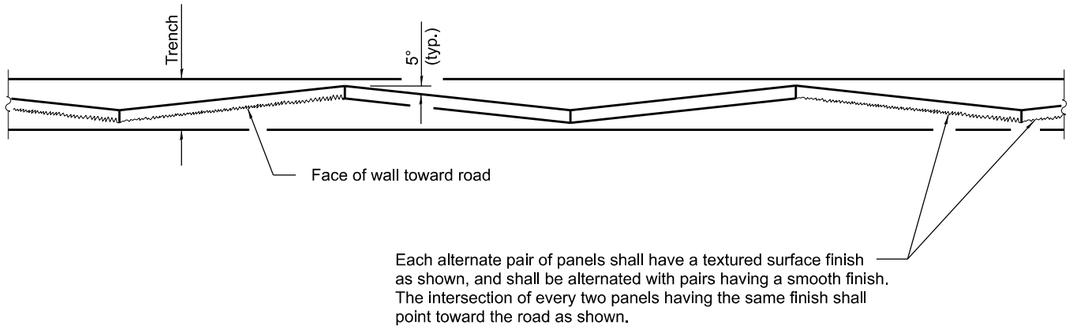
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-04	Revised for F-shape barrier.

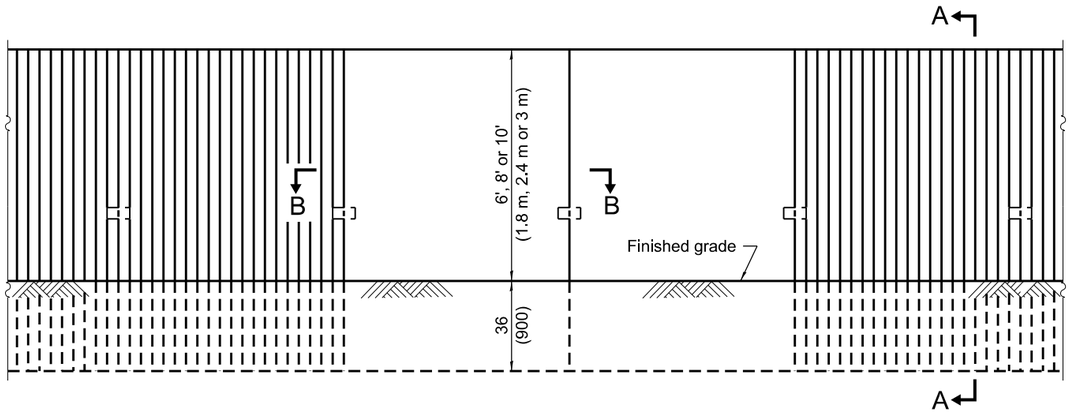
CONCRETE GLARE SCREEN

STANDARD 638101-02

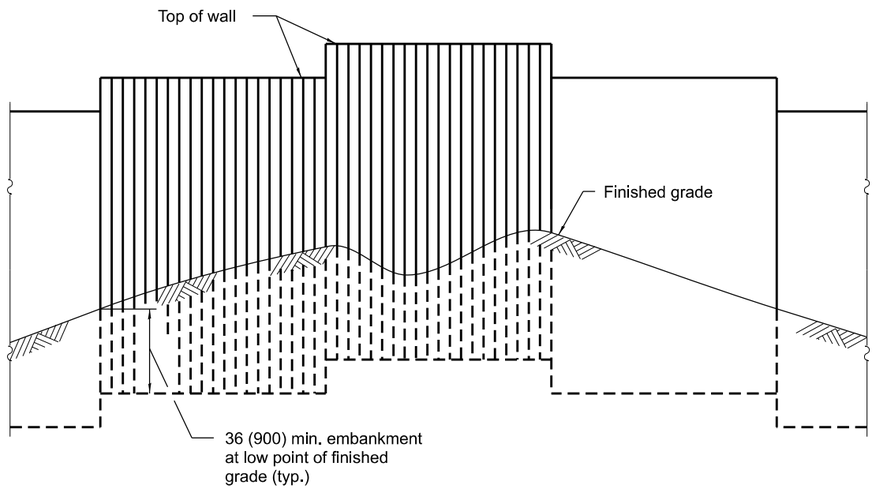


Each alternate pair of panels shall have a textured surface finish as shown, and shall be alternated with pairs having a smooth finish. The intersection of every two panels having the same finish shall point toward the road as shown.

PLAN

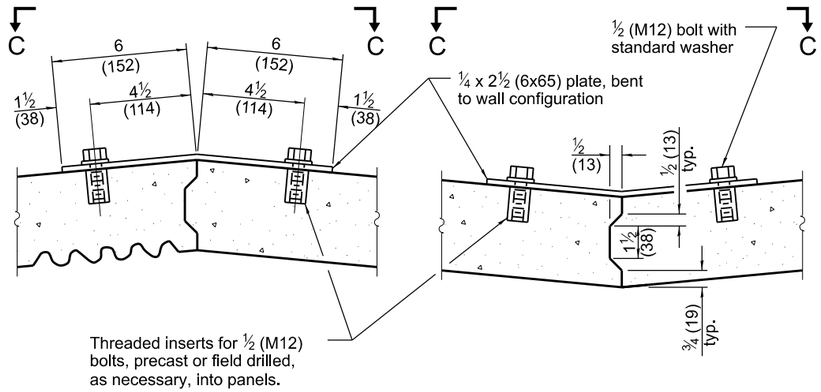


ELEVATION



ELEVATION

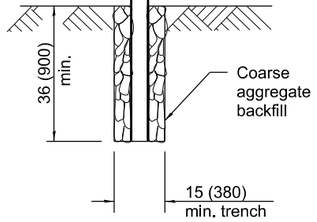
(Showing installation of wall in irregular ground)



Showing typical metal band connector dimensions

Showing typical shear key dimensions

SECTION B-B



SECTION A-A

GENERAL NOTES

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

ALLOWABLE STRESSES:

Concrete:	f'c = 3,500 psi (24 MPa)
	f'ci = 2,250 psi (15 MPa)
Prestressing Steel:	f's = 270,000 psi (1860 MPa)
	fsi = 189,000 psi (1300 MPa)
Reinforcing Steel:	f'y = 40,000 psi min. (270 MPa)
Structural Steel:	fs = 20,000 psi (138 MPa)
Minimum allowable soil bearing pressure:	= 1.25 tsf (120 kPa)

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
Gary L. Hans
ENGINEER OF DESIGN AND ENVIRONMENT

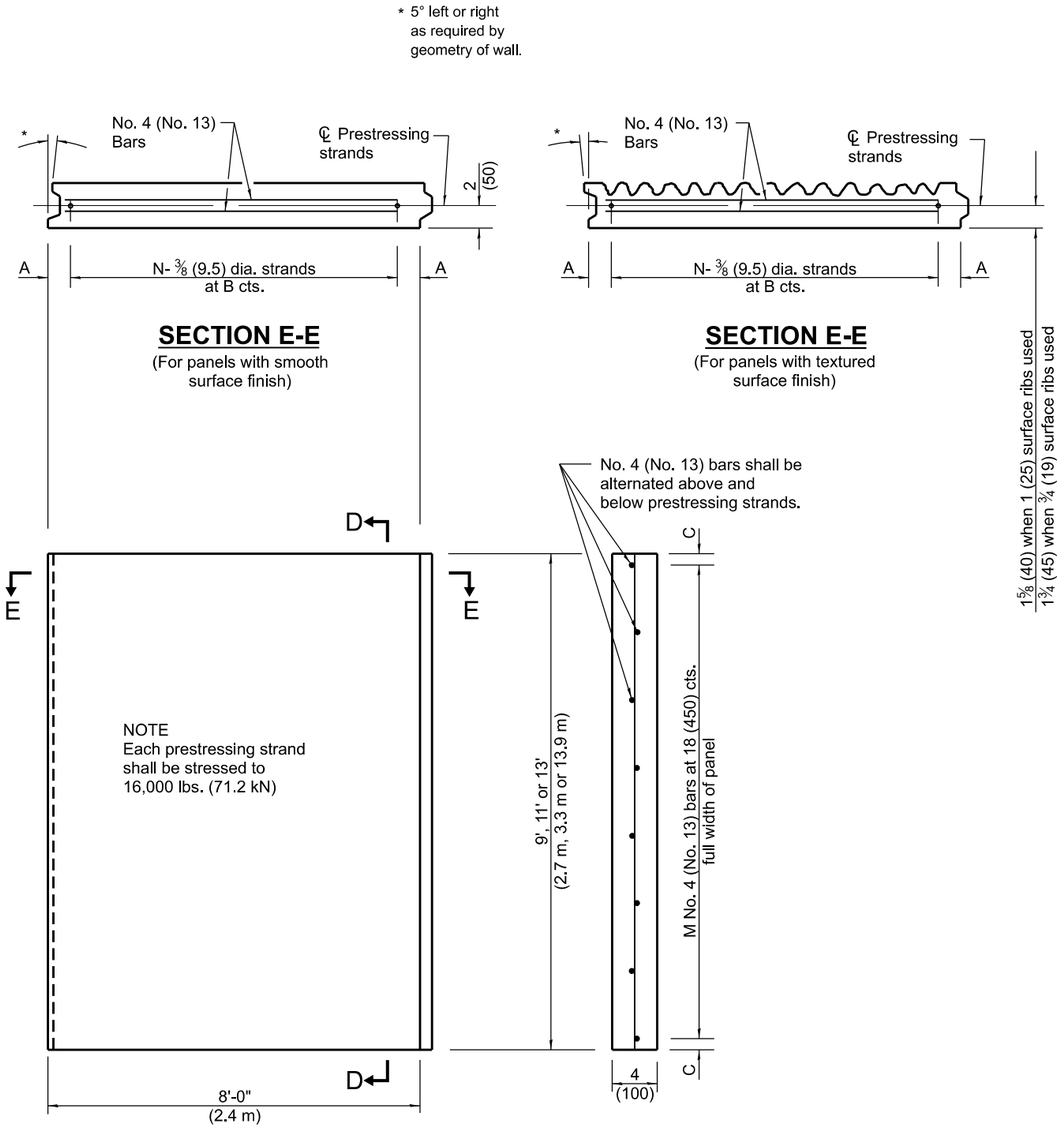
ISSUED 1-1-97

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

SIGHT SCREEN PRECAST PRESTRESSED CONCRETE PANEL WALL

(Sheet 1 of 2)

STANDARD 639001-02

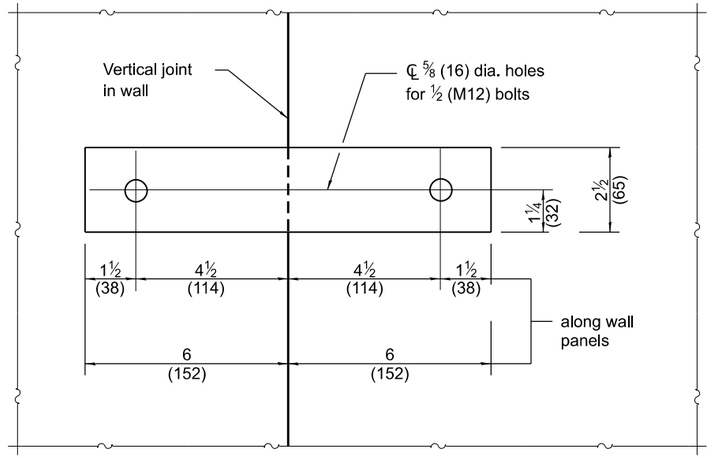


SECTION E-E
(For panels with smooth surface finish)

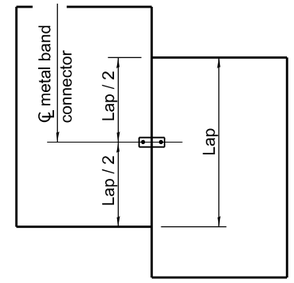
SECTION E-E
(For panels with textured surface finish)

ELEVATION

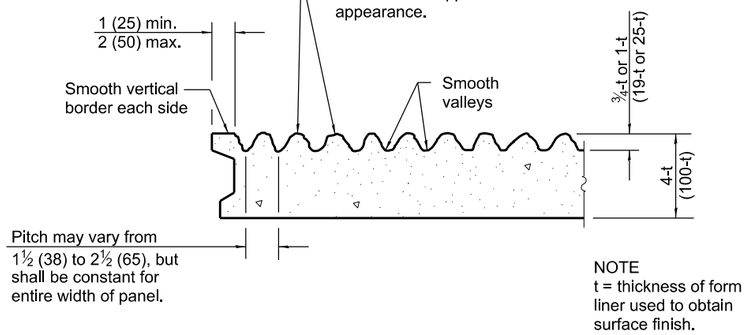
SEC. D-D



SECTION C-C



PANEL ELEVATION
(Showing location of metal band connector)



TEXTURED SURFACE FINISH DETAIL

STRAND and REINFORCEMENT LAYOUT

Nominal Panel Size	A	N	B	C	M
8'-0" x 9'-0" (2.4 m x 2.7 m)	6 (150)	8	12 (300)	9 (225)	6
8'-0" x 11'-0" (2.4 m x 3.3 m)	3 (75)	11	9 (225)	3 (75)	8
8'-0" x 13'-0" (2.4 m x 3.9 m)	3 (75)	16	6 (150)	6 (150)	9

Illinois Department of Transportation

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Ralph E. Anderson
ENGINEER OF BRIDGES AND STRUCTURES

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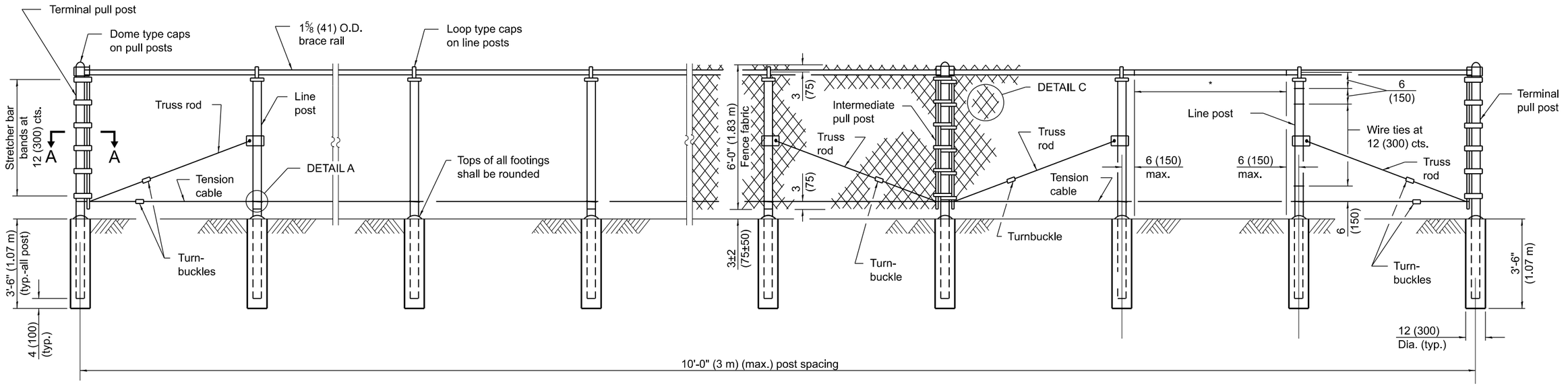
ISSUED 1-1-97

SIGHT SCREEN PRECAST PRESTRESSED CONCRETE PANEL WALL

(Sheet 2 of 2)

STANDARD 639001-02



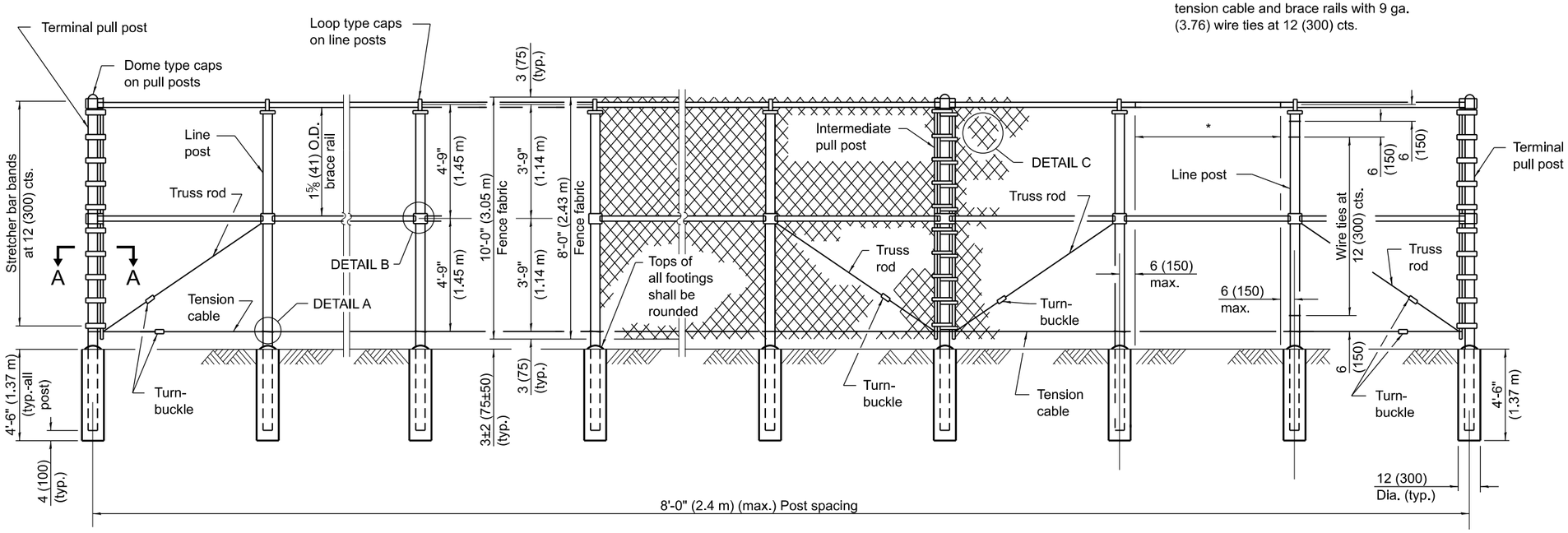
ELEVATION - 6' (1.83 m) FENCE

(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.



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

(Looking toward highway)

GENERAL NOTES

Loading for wind 80 mph (130 km/h) with 30% gust factor. Minimum allowable soil pressure = 1.25 tsf (120 kPa).

Tension cable shall be provided with one turn buckle between each pair of pull posts.

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

Illinois Department of Transportation

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

APPROVED January 1, 2009
Gregg E. Hanson
ENGINEER OF DESIGN AND ENVIRONMENT

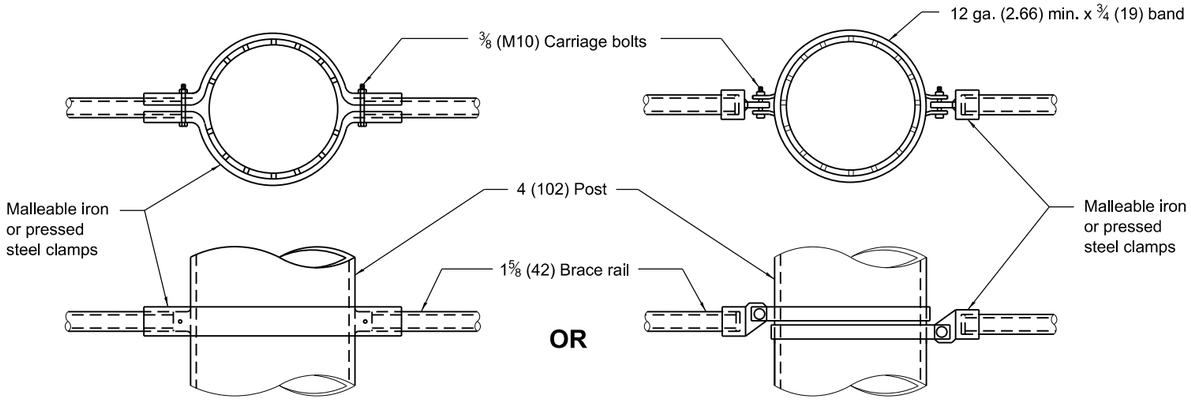
ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to English (metric).
	Revised General Notes.
1-1-97	Renum. Standard 2365-6.

SIGHT SCREEN CHAIN LINK FENCE

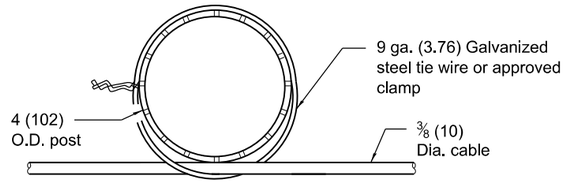
(Sheet 1 of 2)

STANDARD 640001-01

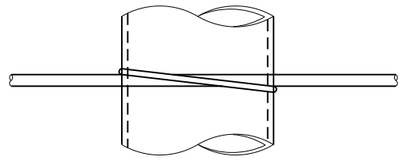


DETAIL B

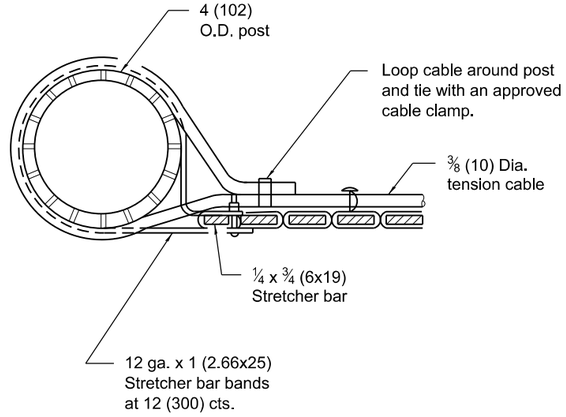
(Showing typical method of attaching middle brace rails to posts.)



PLAN

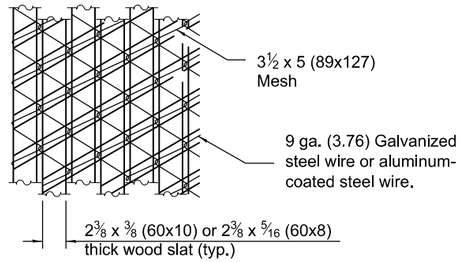


DETAIL A



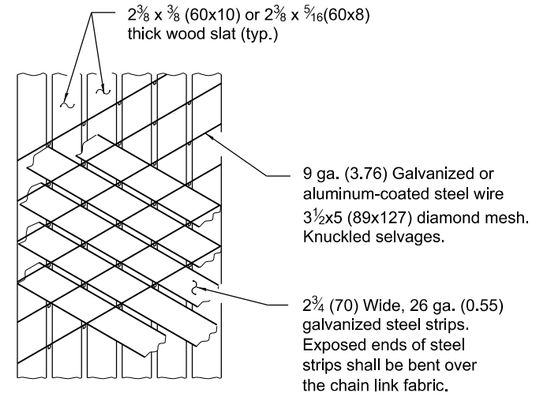
SECTION A-A

(Showing method of fastening bottom tension cable and fence fabric to pull posts.)



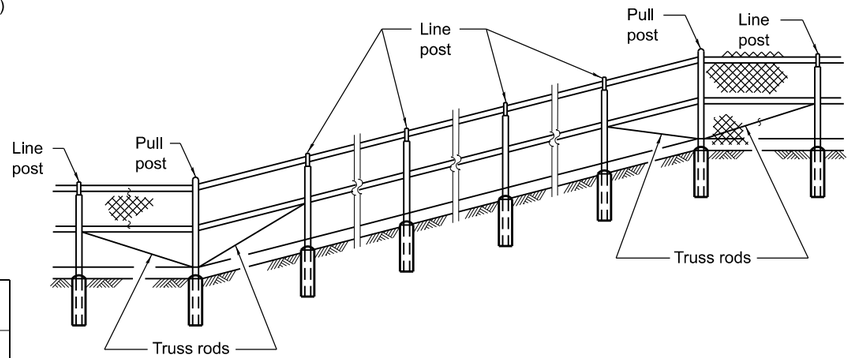
DETAIL OF FABRIC

(Looking from highway)

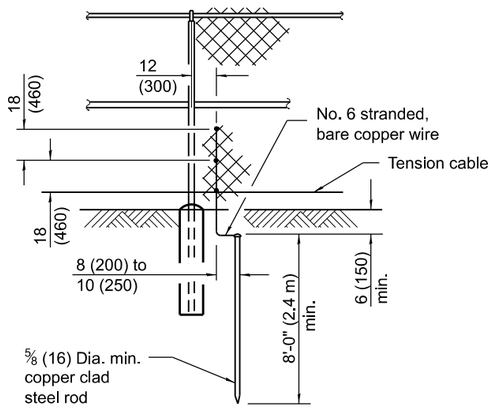


DETAIL C

(Looking toward highway)



FENCE INSTALLATION ON SLOPES



PROTECTIVE ELECTRICAL GROUND

Illinois Department of Transportation

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

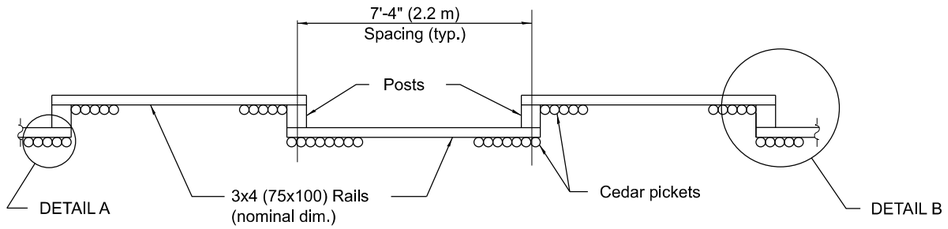
APPROVED January 1, 2009
Gary L. Hans
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

SIGHT SCREEN CHAIN LINK FENCE

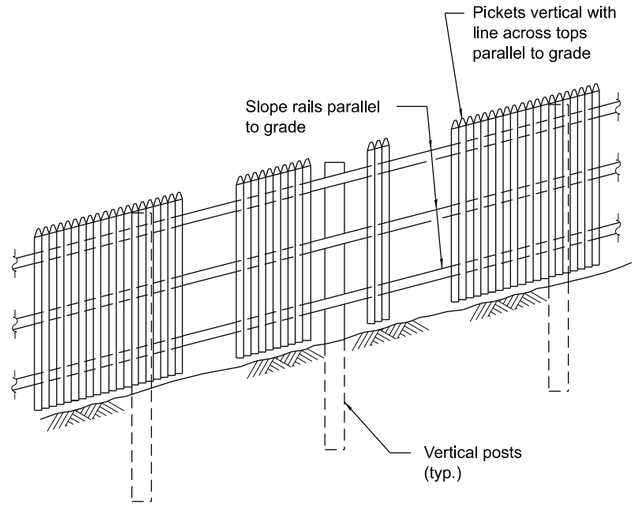
(Sheet 2 of 2)

STANDARD 640001-01

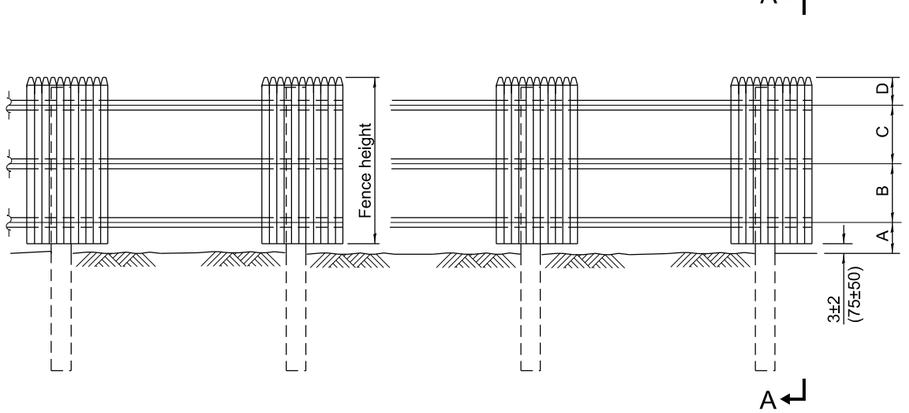


PLAN
(Facing highway)

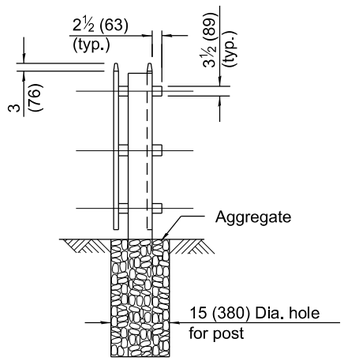
	FENCE HEIGHT	
	6'-0" (1.8 m)	8'-0" (2.4 m)
Post Size (nominal dim.)	6x8 (150x200)	8x8 (200x200)
Post Length	10'-0" (3.0 m)	14'-0" (4.3 m)
Post Embedment	4'-0" (1.2 m)	6'-0" (1.8 m)
A	15 (380)	18 (460)
B	24 (600)	33 (870)
C	24 (600)	33 (870)
D	12 (300)	15 (380)



ELEVATION
(Showing treatment with sloping ground)

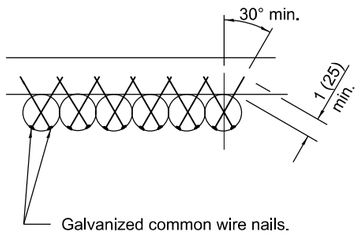


ELEVATION

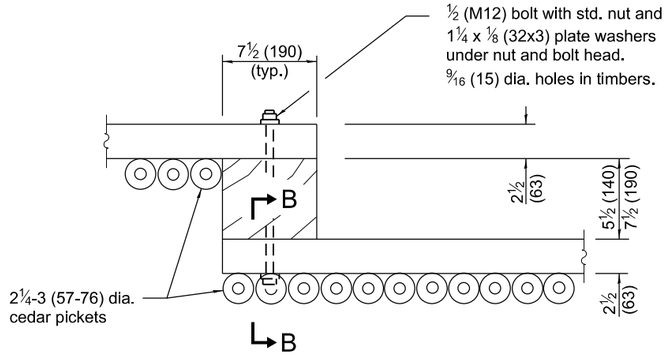


SEC. A-A

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



DETAIL A
(Showing typical picket to rail attachment)



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

GENERAL NOTES

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

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

Illinois Department of Transportation

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

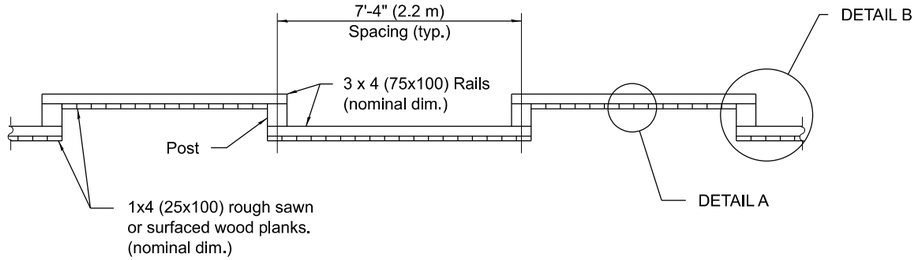
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to English (metric).
	Changed Sec. B-B to Detail B.
1-1-97	Renum. Standard 2367-3.
	Deleted DN Symbol.

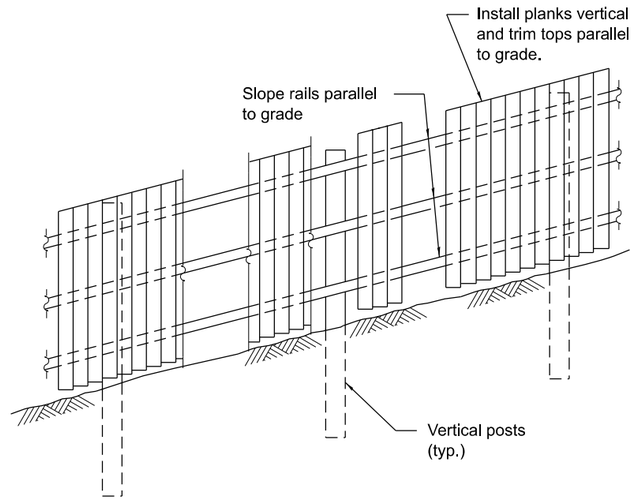
SIGHT SCREEN CEDAR STOCKADE FENCE TYPE S

STANDARD 641001-01

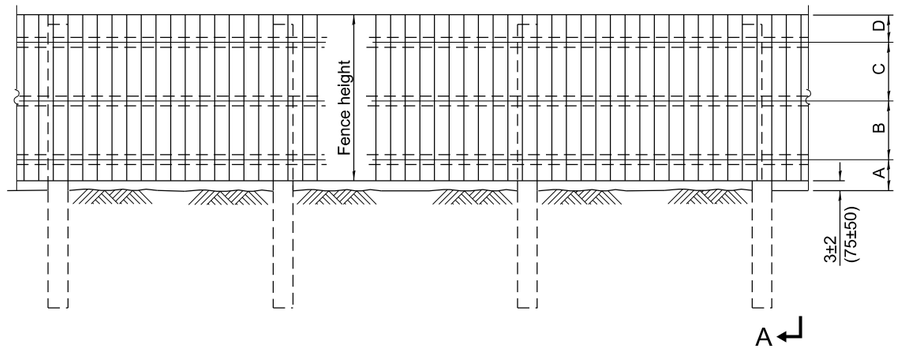


PLAN
(Facing highway)

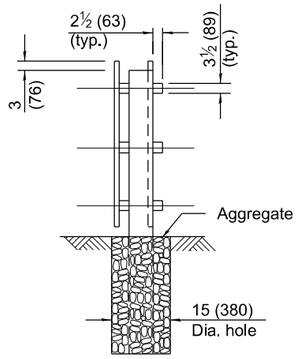
	FENCE HEIGHT	
	6'-0" (1.8 m)	8'-0" (2.4 m)
Post Size (nominal dim.)	6x8 (150x200)	8x8 (200x200)
Post Length	10'-0" (3.0 m)	14'-0" (4.3 m)
Post Embedment	4'-0" (1.2 m)	6'-0" (1.8 m)
A	15 (380)	18 (460)
B	24 (600)	33 (870)
C	24 (600)	33 (870)
D	12 (300)	15 (380)



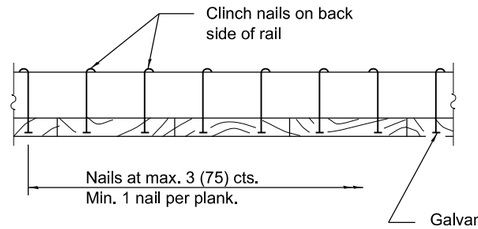
ELEVATION
(Showing treatment with sloping ground)



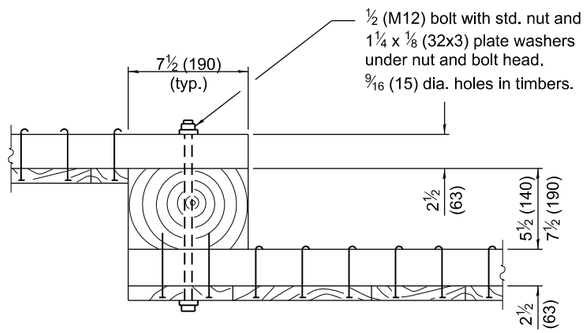
ELEVATION



SEC. A-A



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



DETAIL B
(Showing typical panel to
post connection details)

GENERAL NOTES

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

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

Illinois Department of Transportation

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

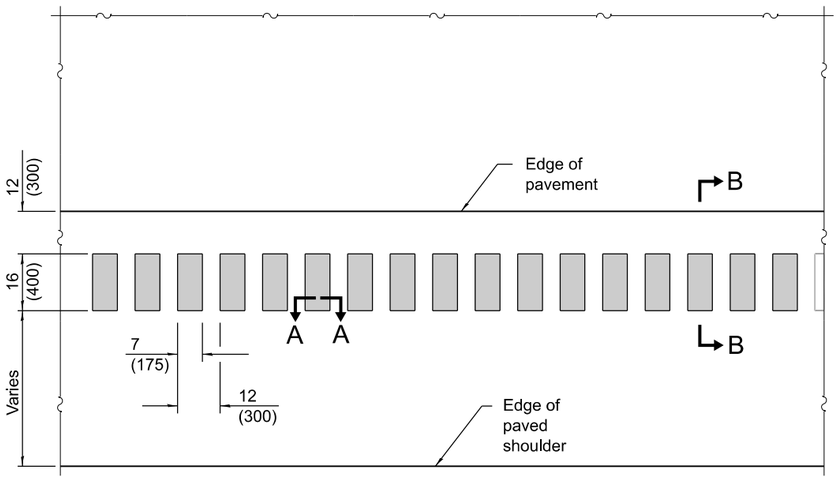
APPROVED January 1, 2009
Gary L. Hans
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

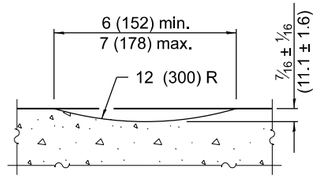
DATE	REVISIONS
1-1-09	Switchd units to English (metric).
	Changed Section B-B to Detail B.
1-1-97	Renum. Standard 2367-3.
	Deleted DN Symbol.

SIGHT SCREEN WOOD PLANK FENCE TYPE P

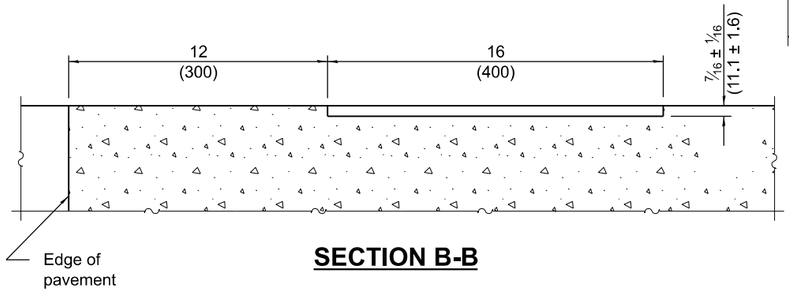
STANDARD 641006-01



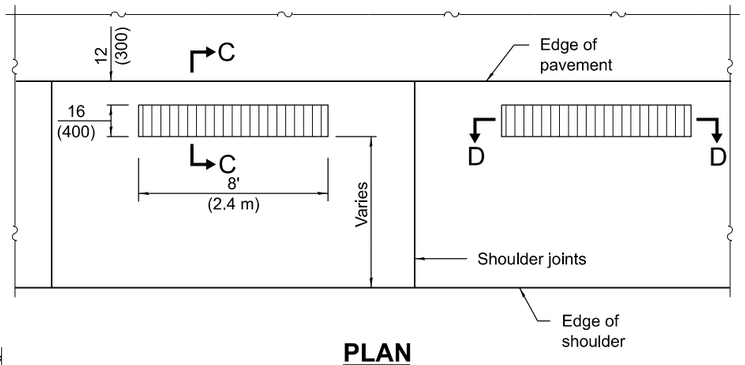
PLAN



SECTION A-A

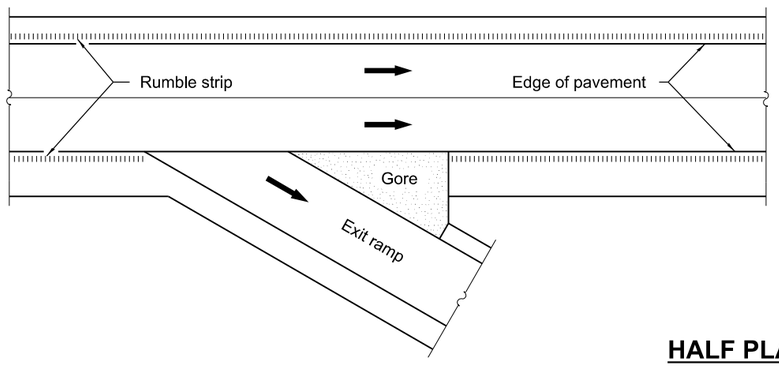


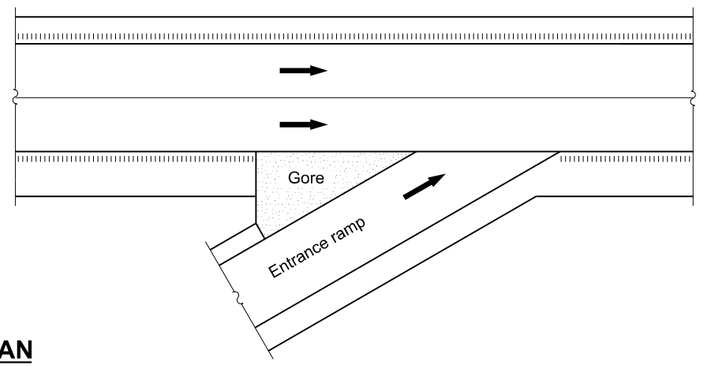
SECTION B-B



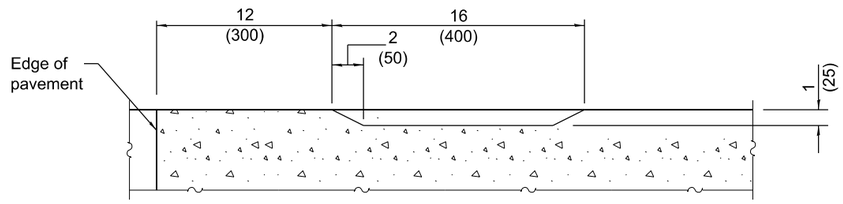
PLAN

(Formed Alternate for PCC Shoulders)
Center rumblestrips between the shoulder joints.

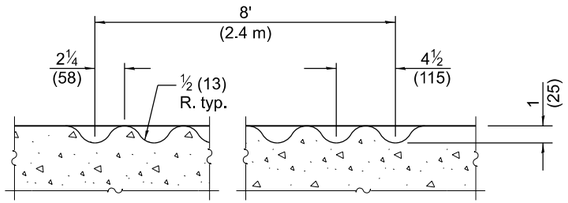




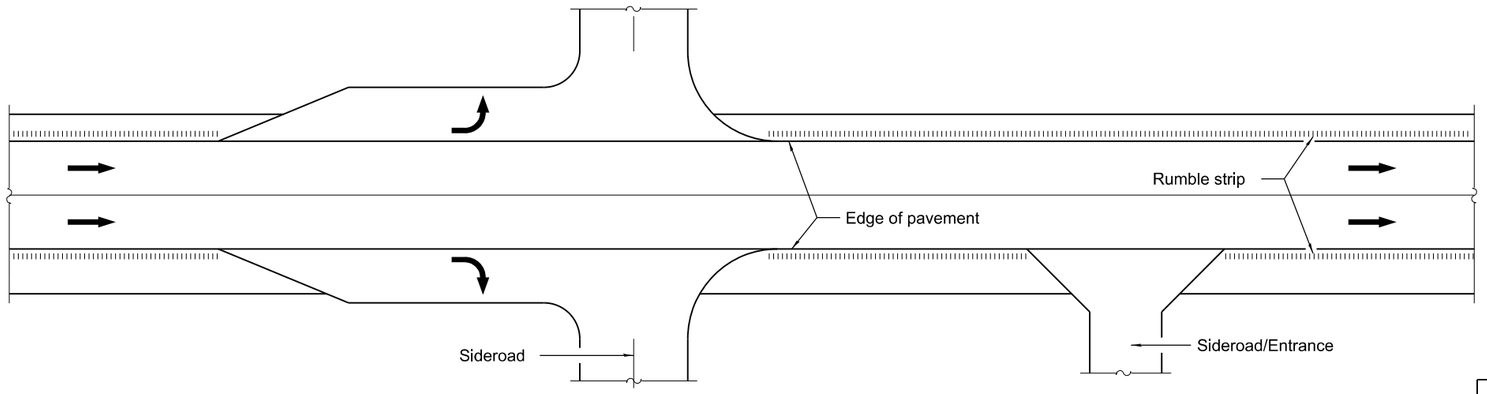
HALF PLAN
TYPICAL APPLICATION AT AN INTERCHANGE



SECTION C-C



SECTION D-D



HALF PLAN
TYPICAL APPLICATION AT AN INTERSECTION OR ENTRANCE

GENERAL NOTES

On Portland cement concrete shoulders, no shoulder rumble strip shall be located closer than 6 (150) to a transverse joint.

Omit shoulder rumble strips across structures.

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

Illinois Department of Transportation

APPROVED January 1, 2022
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

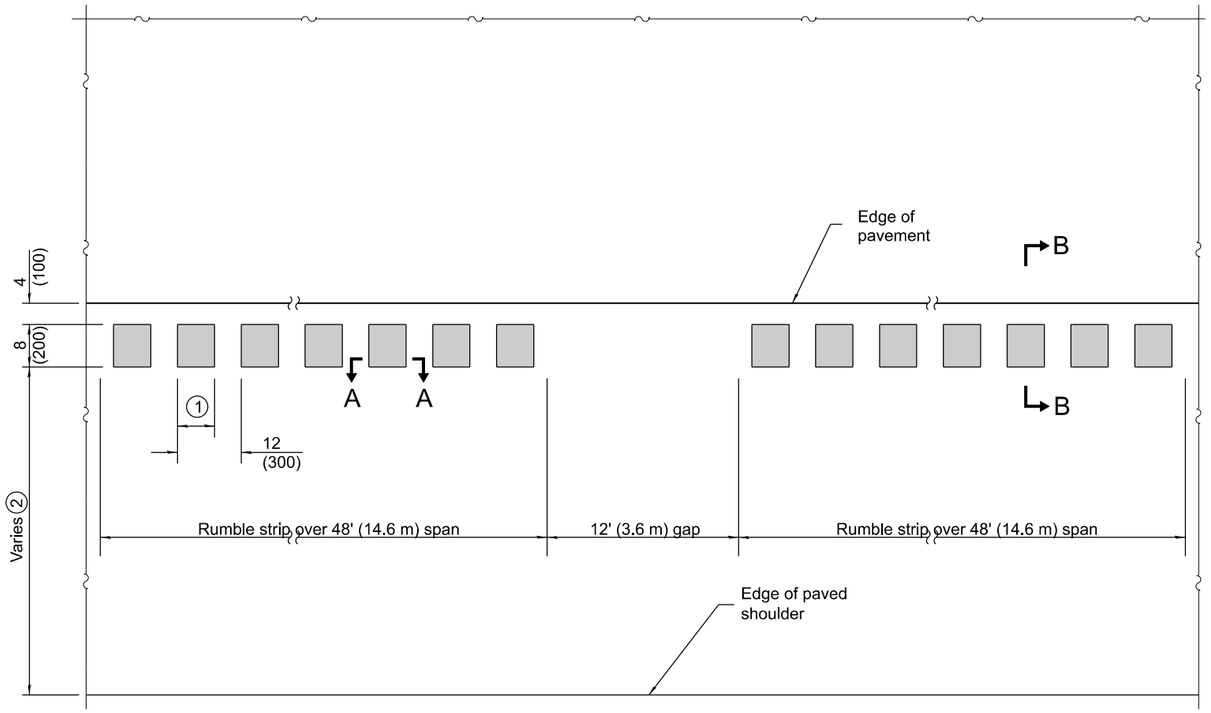
APPROVED January 1, 2022
Todd Acre
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-03

DATE	REVISIONS
1-1-22	Revised location of rumbles relative
	to the shoulder joints in Plan View.
1-1-12	Changed formed rumble strip to
	16 (400) wide. Rev'd milled strip.
	Renamed Standard.

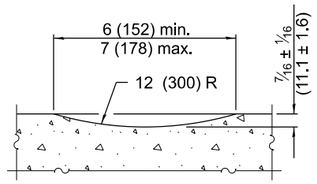
SHOULDER RUMBLE STRIPS, 16 in.

STANDARD 642001-03

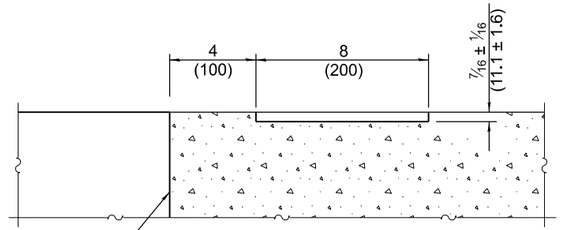


PLAN

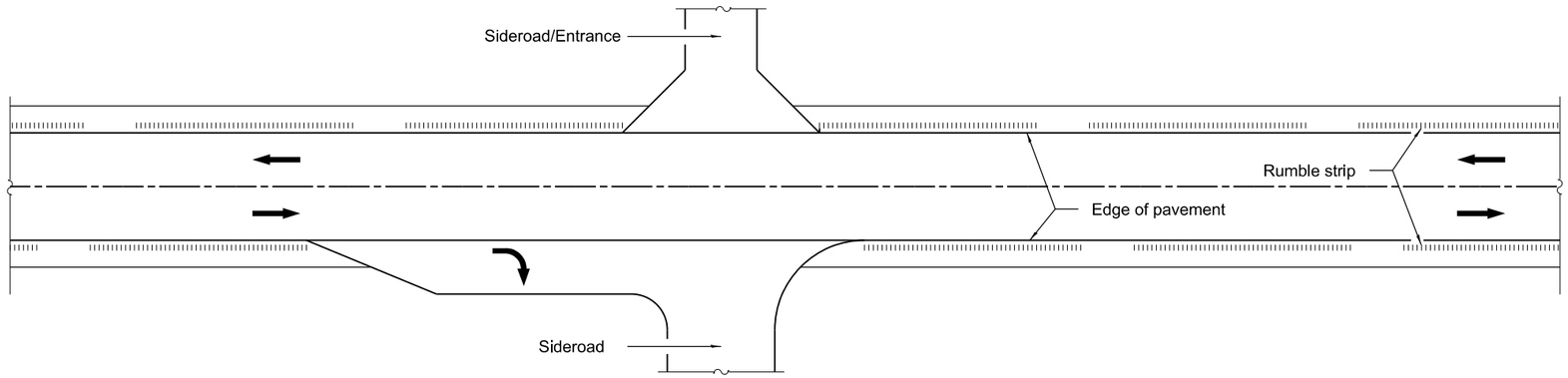
1. See Section A-A.
2. 4' (1.2 m) preferred, 3' (900) minimum where the paved shoulder is considered a bicycle accommodation.



SECTION A-A



SECTION B-B



TYPICAL APPLICATION AT AN INTERSECTION OR ENTRANCE

GENERAL NOTES

Omit shoulder rumble strips across structures and at mailbox turnouts.

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

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF POLICY AND PROCEDURES

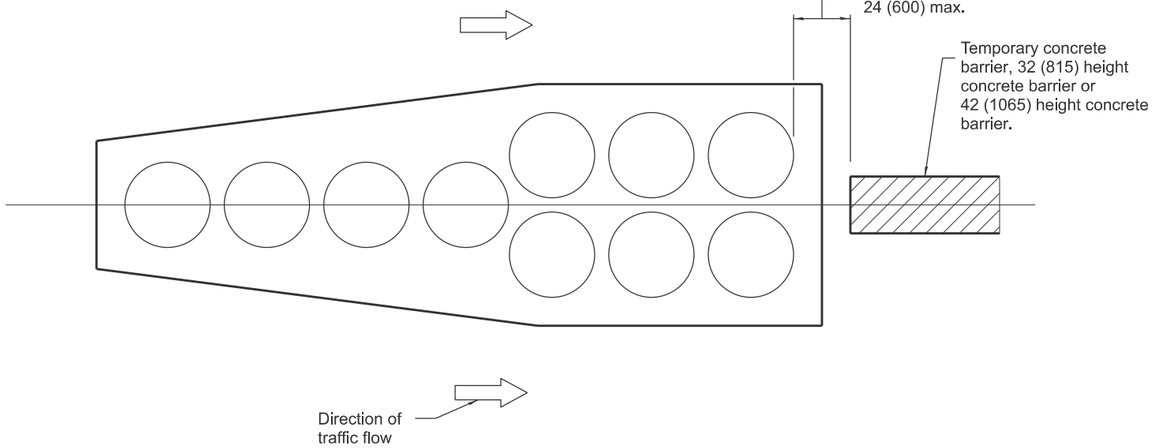
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

DATE	REVISIONS
1-1-21	Added minimum width of paved shoulder for bicycle accommodations.
1-1-12	New Standard.

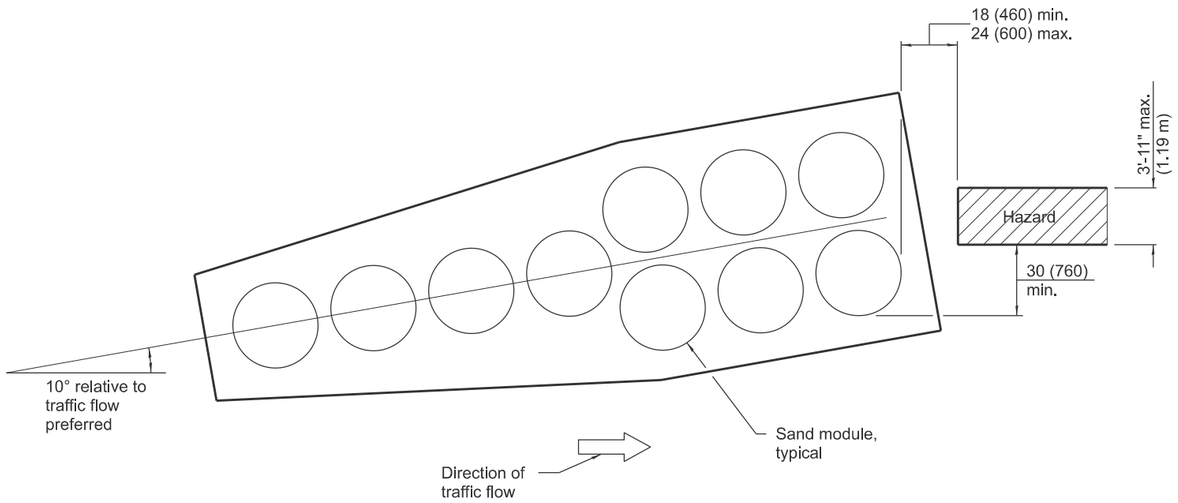
SHOULDER RUMBLE STRIPS, 8 in.

STANDARD 642006-01



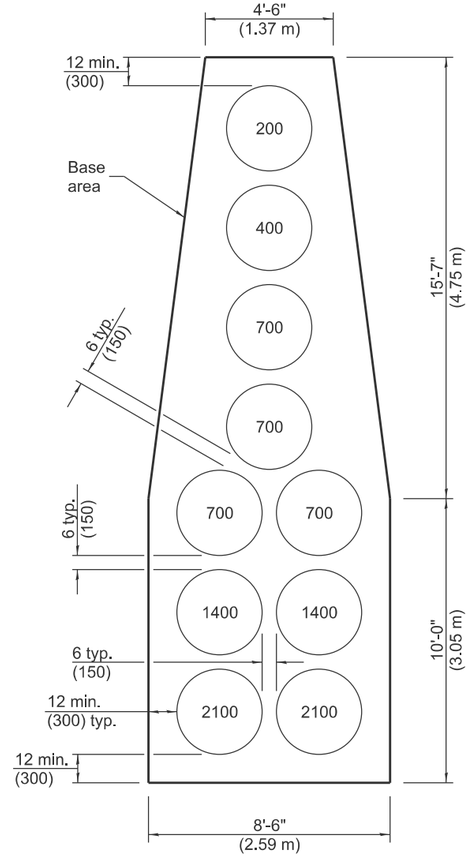
GORE INSTALLATION

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



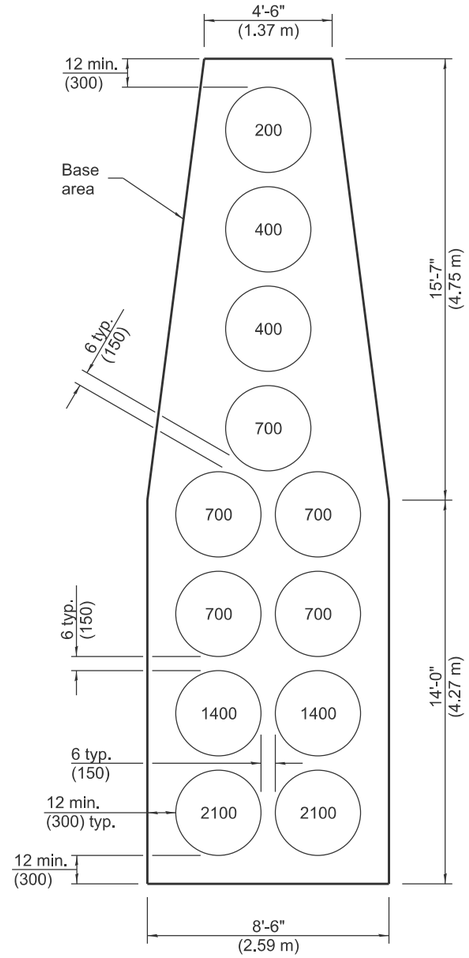
ROADSIDE INSTALLATION

(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.

Inserts are required for weights 200, 400, and 700 lbs.

Illinois Department of Transportation

APPROVED January 1, 2025
ENGINEER OF POLICY AND PROCEDURES

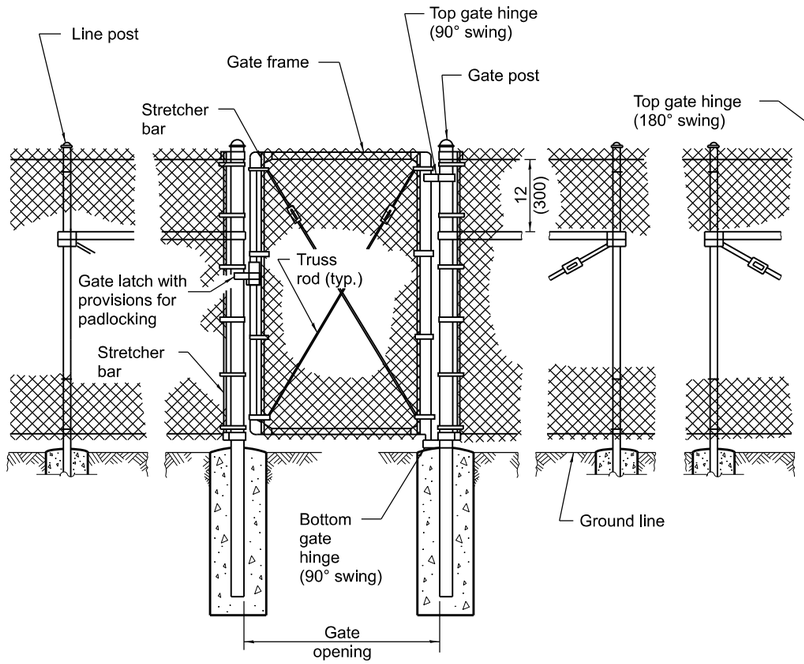
APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

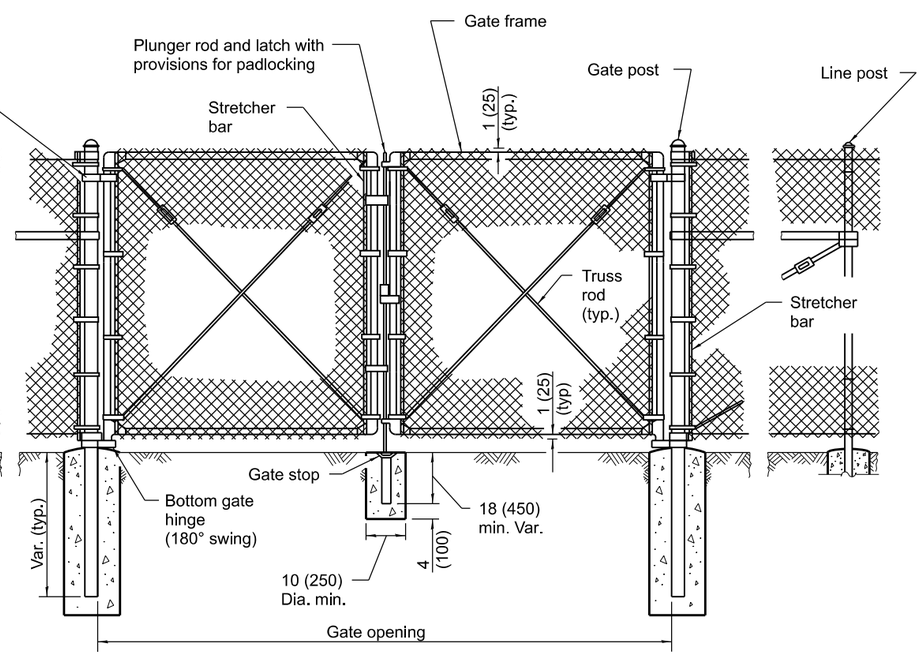
DATE	REVISIONS
1-1-25	Revised TL 3 array and weights
1-1-14	Revised distance from barrels
	to hazard.

SAND MODULE IMPACT ATTENUATORS

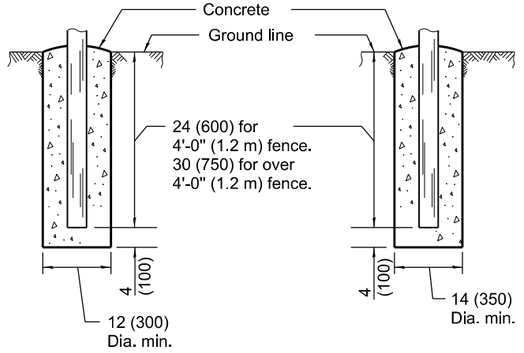
STANDARD 643001-03



PEDESTRIAN GATE

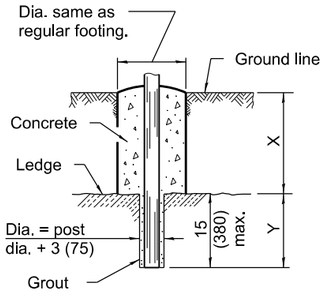


VEHICLE GATE



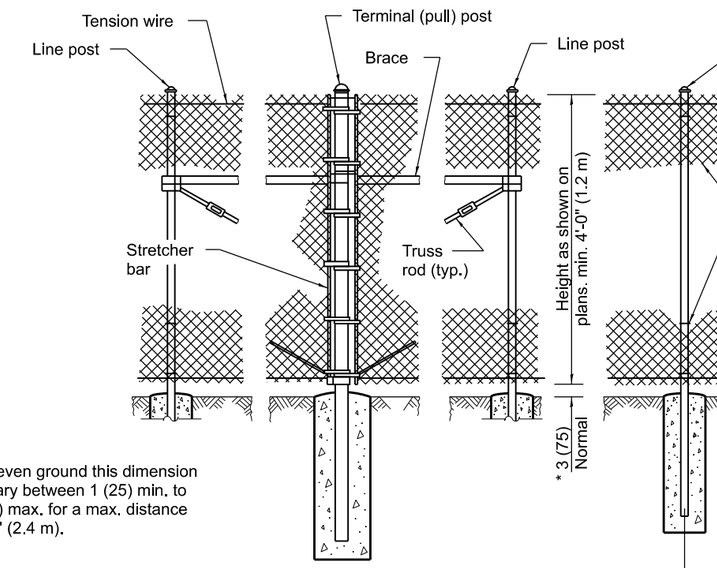
FOOTING FOR LINE POST

FOOTING FOR GATE & TERMINAL POST



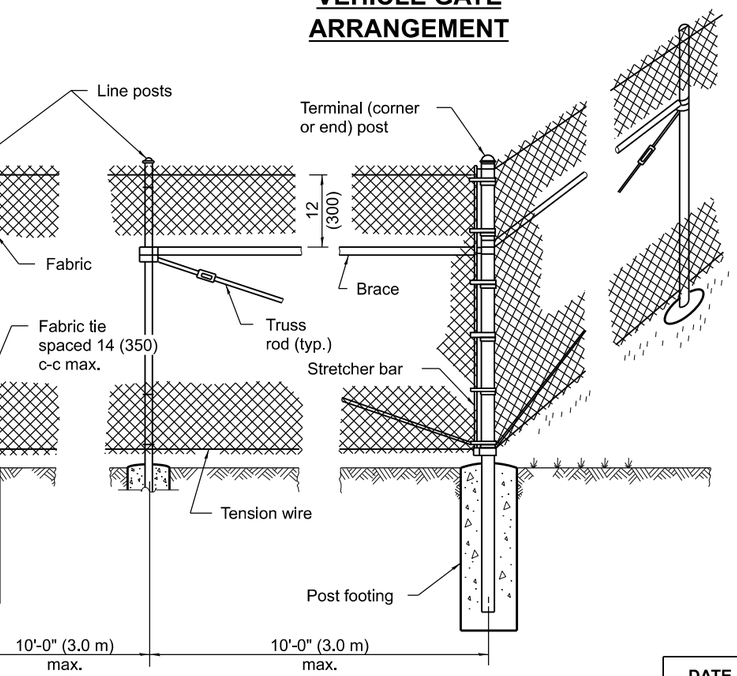
FOOTING FOR POST IN ROCK LEDGE

PEDESTRIAN 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).

VEHICLE GATE ARRANGEMENT



PULL POST ARRANGEMENT

LINE POST ARRANGEMENT

CORNER OR END POST ARRANGEMENT

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

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

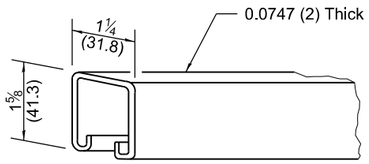
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

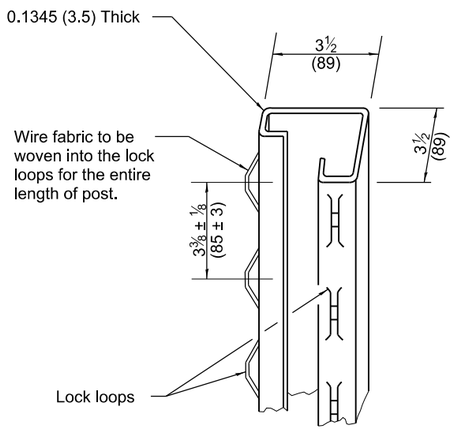
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-99	Rev. "pans" to "plans" in
	LINE POST ARRANGEMENT.

CHAIN LINK FENCE

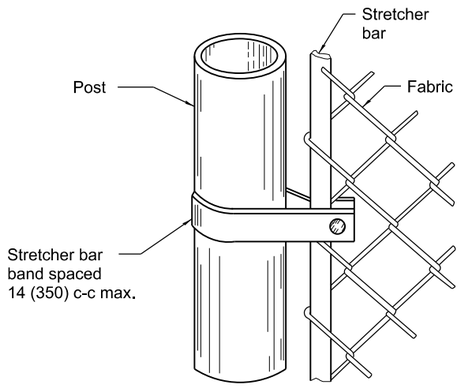
STANDARD 664001-02



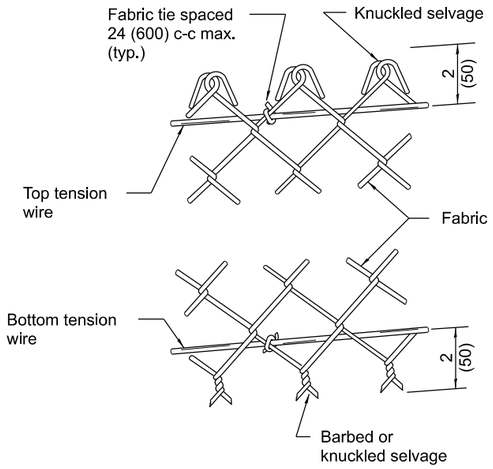
ROLL FORMED SECTION OF BRACE



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)
⊏	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 3½x3½ (89.0x89.0)	See detail
Sq. Tubing 2½x2½ (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 1⅝x1¼ (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)	Size (O.D.)	kg/m (lbs./ft.)
Up to 4 (1.2)	Up to 8 (2.5)	2.375 (60.3)	3.65 (5.43)	2½ (63.5)	4.32 (6.43)	2.375 (60.3)	3.11 (4.63)
Over 4 (1.2) to 8 (2.5)	Over 8 (2.5) to 16 (5.0)	2.875 (73.0)	5.79 (8.62)	3 (76.2)	5.78 (8.60)	2.875 (73.0)	4.64 (6.91)
Over 8 (2.5) to 12 (3.6)	Over 16 (5.0) to 24 (7.4)	3.5 (89.0)	7.58 (11.28)	3 (76.2)	8.80 (13.10)	3.5 (89)	5.707 (8.49)

* The 3½ x 3½ (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

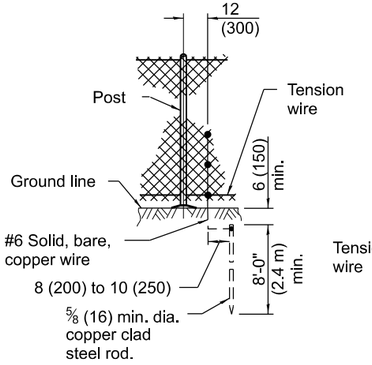
APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

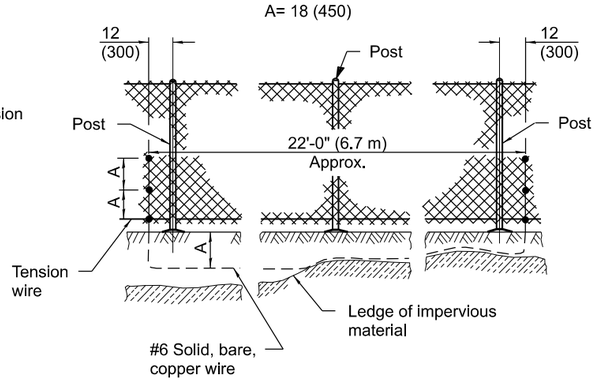
ISSUED 1-1-97

CHAIN LINK FENCE

STANDARD 664001-02

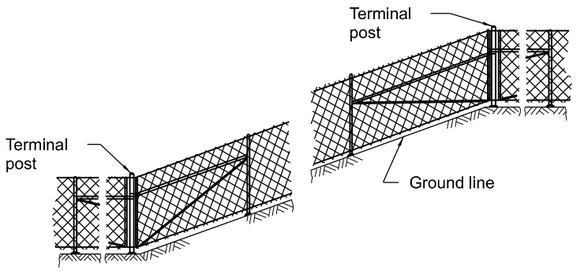


STANDARD GROUND

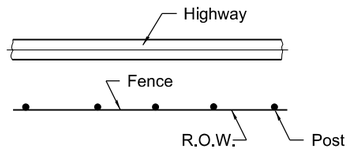


COUNTERPOISE GROUND (ALTERNATE)

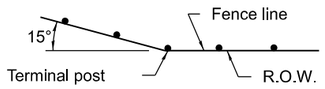
PROTECTIVE ELECTRICAL GROUNDS



INSTALLATION ON SLOPES



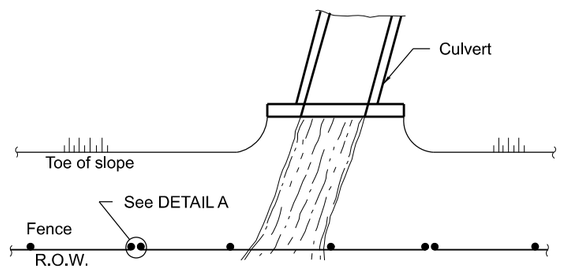
PLAN



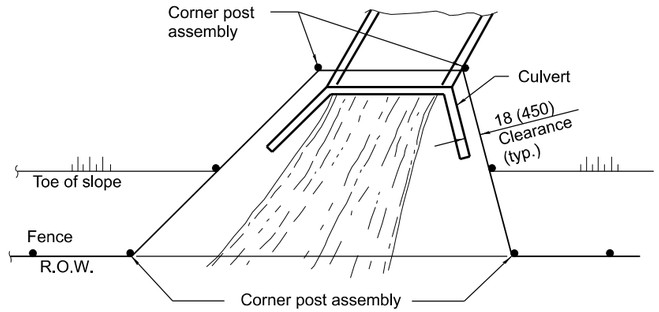
When fence line has a change in direction of 15° or more, a terminal post shall be placed as shown above.

Where angle is less than 15° and existing conditions require a terminal post, they shall be placed as directed by the Engineer.

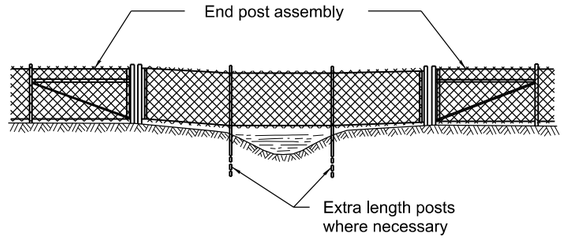
INSTALLATION AT CORNERS



PLAN AT STREAM CROSSING

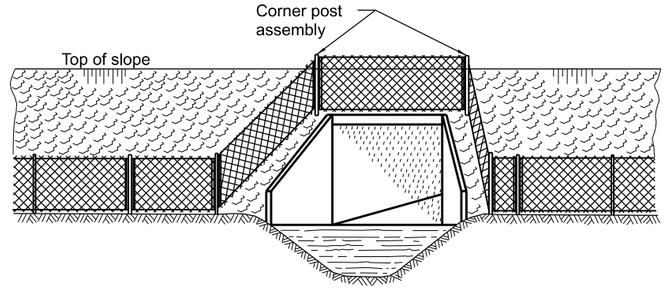


PLAN AT HEADWALL



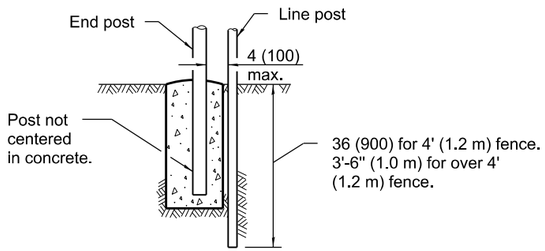
The chain link fabric shall be replaced by barbed wire strands at 12 (300) maximum centers between the double posts shown on DETAIL A when shown on the plans.

ELEVATION INSTALLATION OVER STREAM



When the width of the culvert makes it necessary to anchor a post to the top of the culvert, a cast iron shoe or other device approved by the Engineer shall be used.

ELEVATION INSTALLATION AROUND HEADWALL



DETAIL A

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

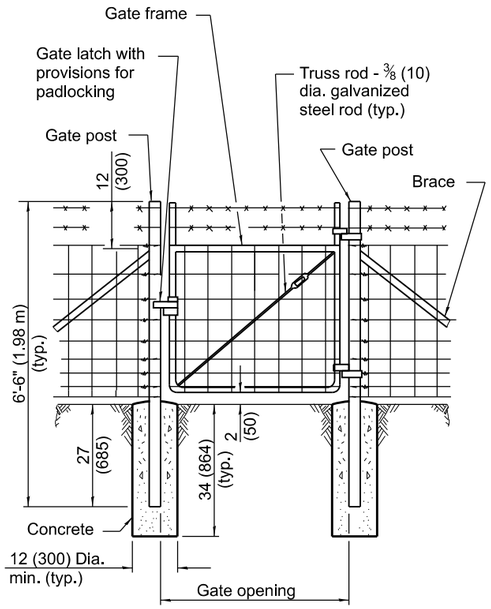
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

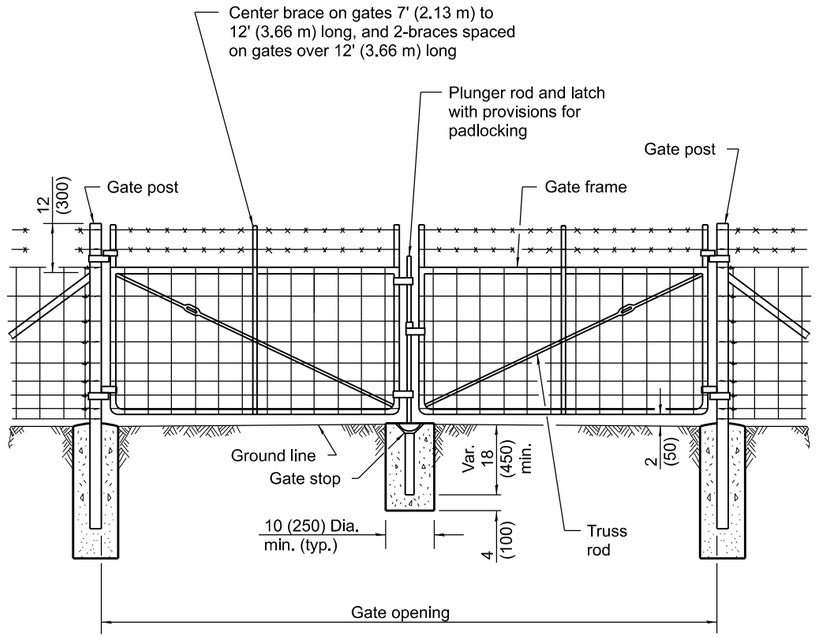
CHAIN LINK FENCE

STANDARD 664001-02

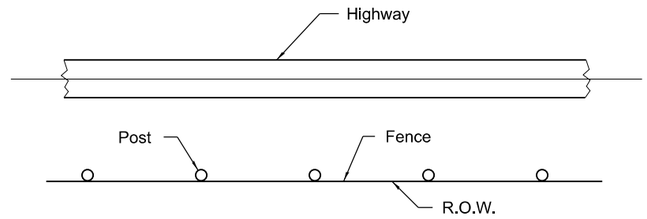
FENCE USING METAL POSTS



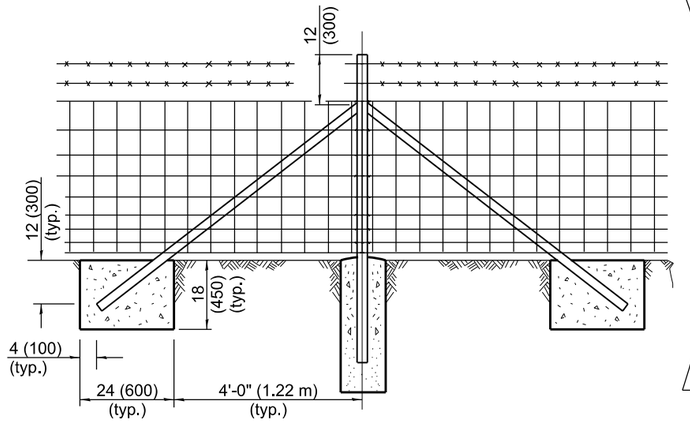
SINGLE GATE



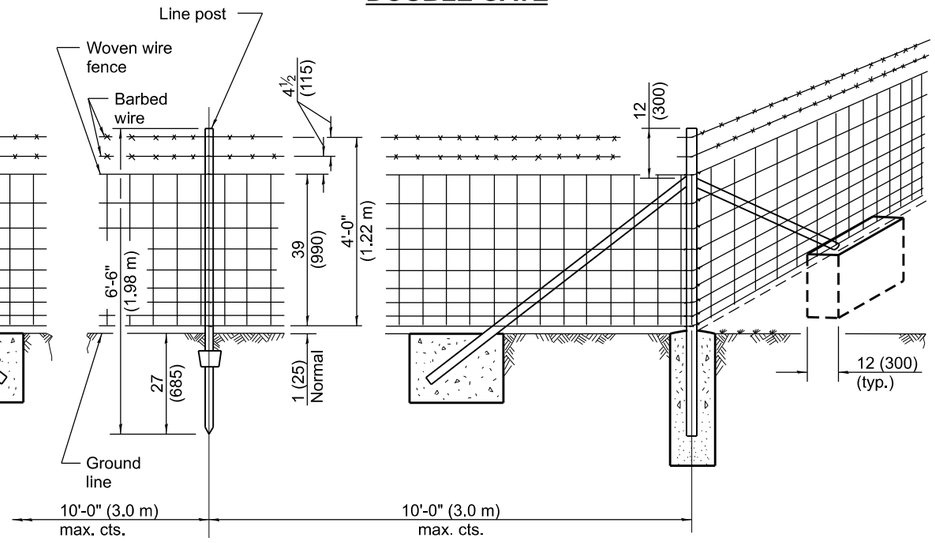
DOUBLE GATE



PLAN



PULL POST



LINE POST

CORNER OR END POST

NOTES

Barbed wires shall be tied to each post. Top and bottom wires of woven fence shall be tied to each post. Tie every other wire between, alternating on successive posts.

Barbed wires and line wires of woven fence shall be be fastened to the corner, end, pull, and gate posts by wrapping the wires around the post and tying back on itself with not less than 3 twists tightly wrapped.

GENERAL NOTES

Pull posts shall be placed at the locations determined by the Engineer. They shall be placed at 660' (200 m) intervals between posts to which the ends of the fabric and barbed wires are fastened or midway between such posts when the distance is less than 1320' (400 m) and greater than 660' (200 m).

Bracing for gate posts shall be the same type used for end posts.

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

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

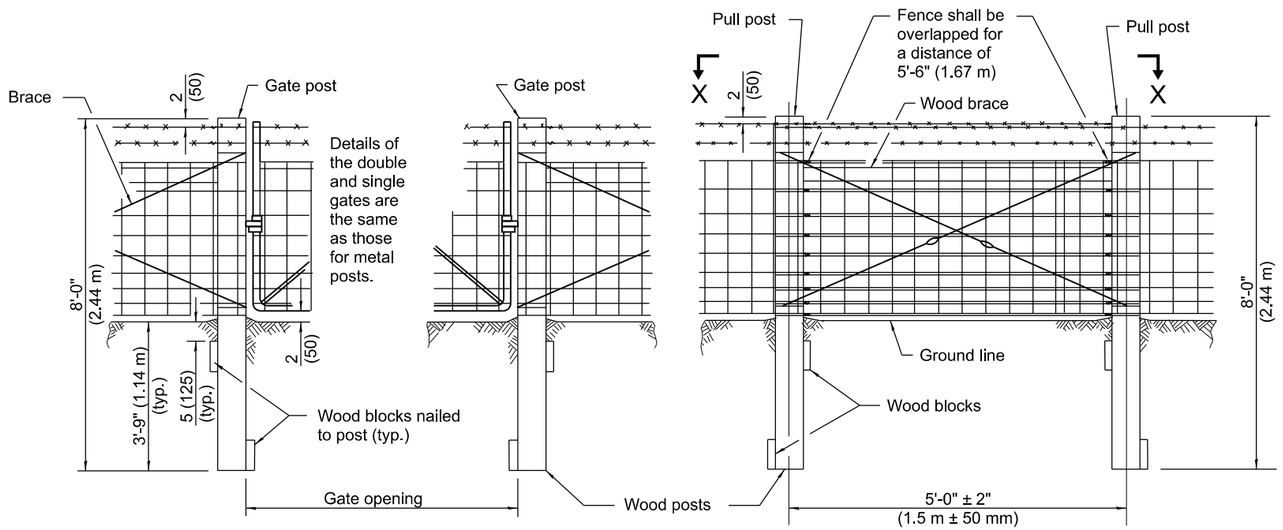
ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-02	Corrected dimensions on
	sheet 3 and 4.

WOVEN WIRE FENCE

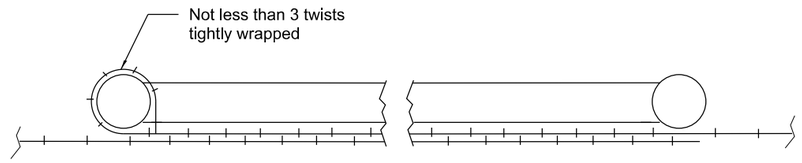
STANDARD 665001-02

FENCE USING WOOD POSTS

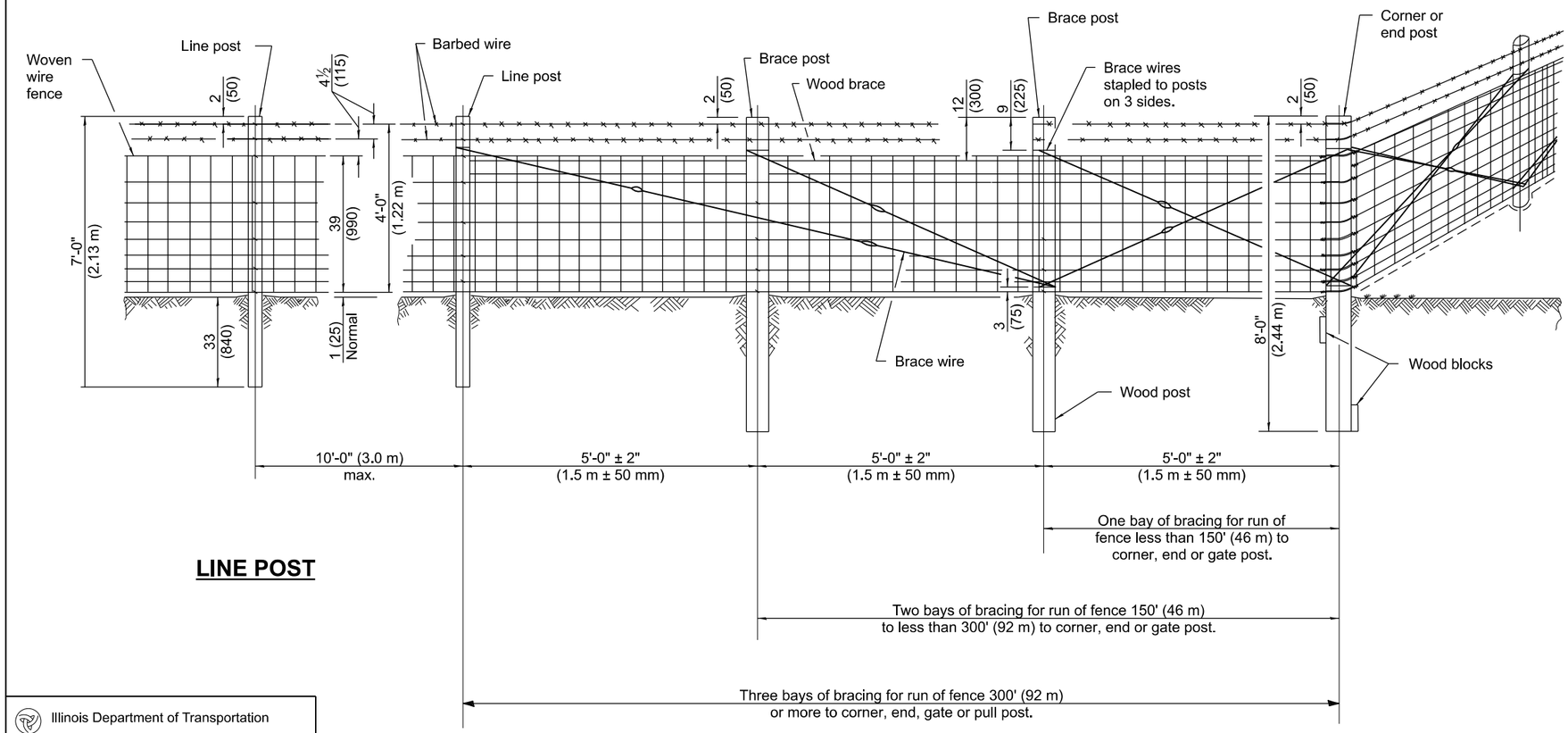


SINGLE OR DOUBLE GATE

PULL POST



SECTION X-X



LINE POST

CORNER OR END POST

NOTES

Barbed wires shall be stapled to each post. Top and bottom wire of woven fence shall be stapled to each post. Staple every other wire between, alternating on successive posts.

Metal line posts may be used in lieu of wood line posts.

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

WOVEN WIRE FENCE

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 2½x2½x¼ (64x64x6.4) H, I, U, structural shapes	3.65 (5.43) 3.11 (4.63) 3.09 (4.60) 4.32 (6.43) 4.1 (6.10) 4.1 (6.10) min.	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 2½x2½x¼ (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)
Type A: Pipe 2.375 (60.3) O.D. Type B: Pipe 2.375 (60.3) O.D. Type C: Pipe 2.375 (60.3) O.D. Tubing 2.5 (63.5) Sq. Angle 2½x2½x¼ (64x64x6.4) H, I, U, structural shapes	3.65 (5.43) 3.11 (4.63) 3.09 (4.60) 4.32 (6.43) 4.1 (6.10) 4.1 (6.10) min.	2.875 (73.0) O.D. 2.875 (73.0) O.D. 2.875 (73.0) O.D. 3 (76.2) Sq. 3x3x5/16 (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. 3½x3½x3/8 (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

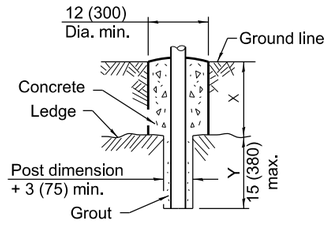
APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

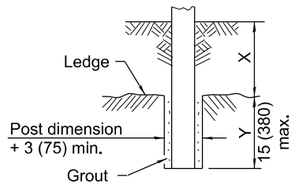
ISSUED 1-1-97

WOVEN WIRE FENCE

STANDARD 665001-02



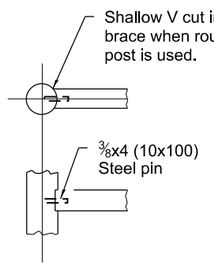
METAL POST

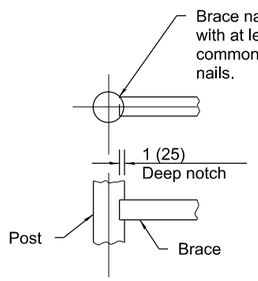


WOOD POST

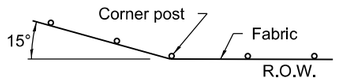
NOTE
X + Y shall not exceed 27 (685), 33 (840), or 3'-9" (1.14 m) as applicable. When X is 0 to 12 (300), 18 (450), or 30 (760), Y = 15 (380), and the post shall be shortened as required. When X exceeds 12 (300), 18 (450), or 30 (760), Y shall be decreased correspondingly.

FOOTING FOR POSTS WHEN ROCK LEDGE IS ENCOUNTERED



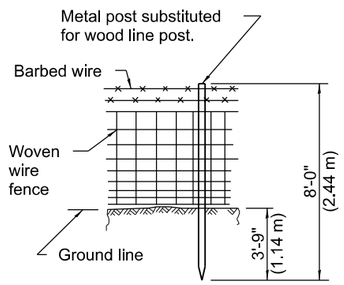


ALTERNATE DETAILS FOR FASTENING WOOD BRACE TO WOOD POST

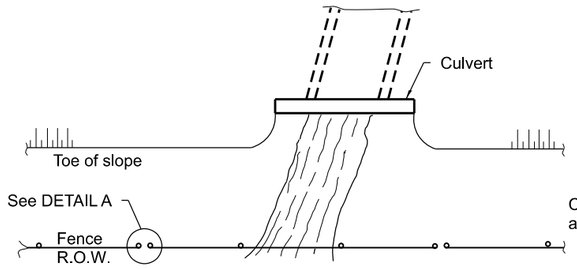


NOTE
Where fence line has a change in direction of 15° of more, a corner post with bracing as required shall be placed as shown above. Where angle is less than 15° and existing conditions require a corner post, they shall be placed as directed by the Engineer.

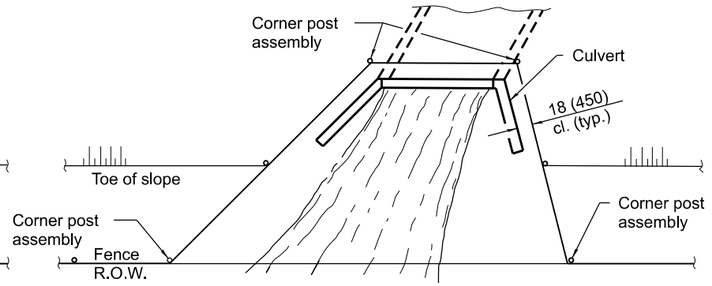
INSTALLATION AT CORNERS



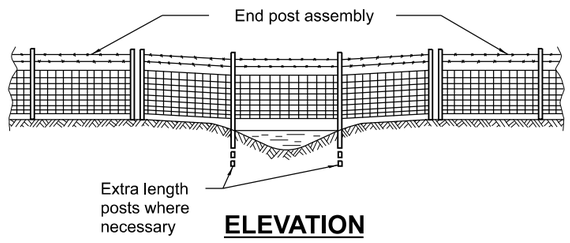
PROTECTIVE ELECTRICAL GROUNDING FOR WOOD POST FENCE INSTALLATION



PLAN AT STREAM CROSSING



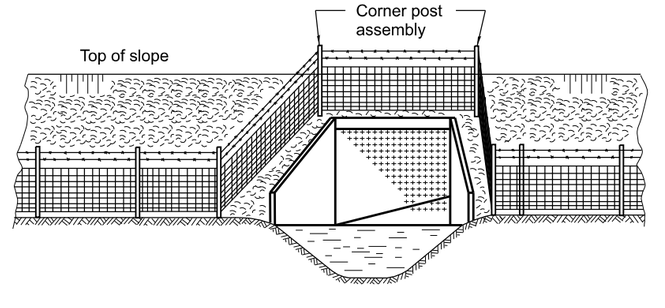
PLAN AT HEADWALL



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.

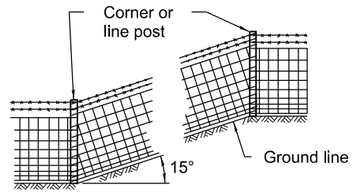
INSTALLATION OVER STREAM



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.

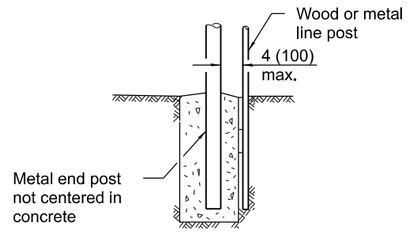
INSTALLATION AROUND HEADWALL



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



DETAIL A

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

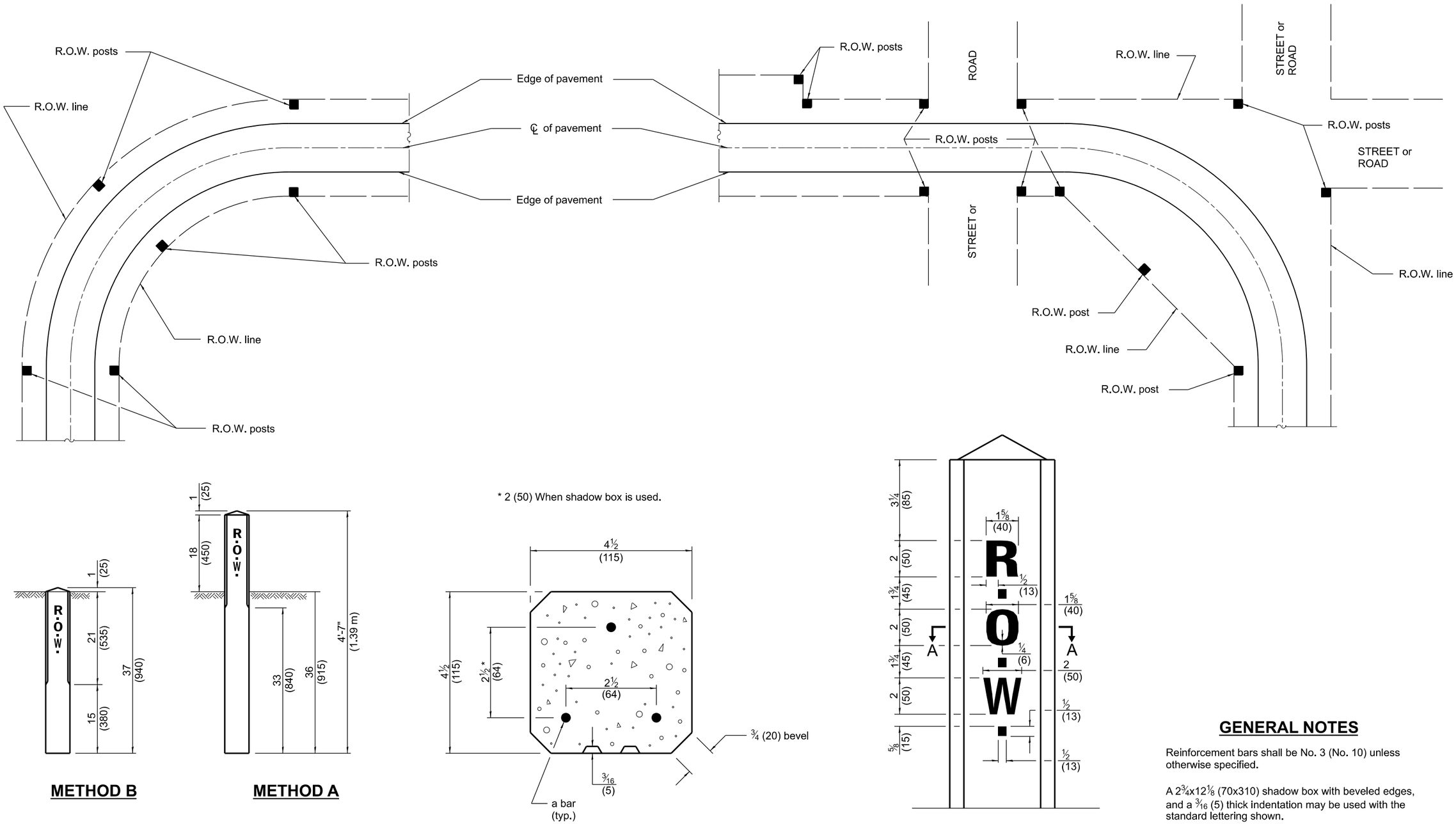
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

WOVEN WIRE FENCE

(Sheet 4 of 4)

STANDARD 665001-02



METHOD B

METHOD A

* 2 (50) When shadow box is used.

SECTION A-A

GENERAL NOTES

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

A 2¾x12⅛ (70x310) shadow box with beveled edges, and a 3/16 (5) thick indentation may be used with the standard lettering shown.

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

METHOD A	4'-0" (1.2 m)
METHOD B	30 (750)

a BAR

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

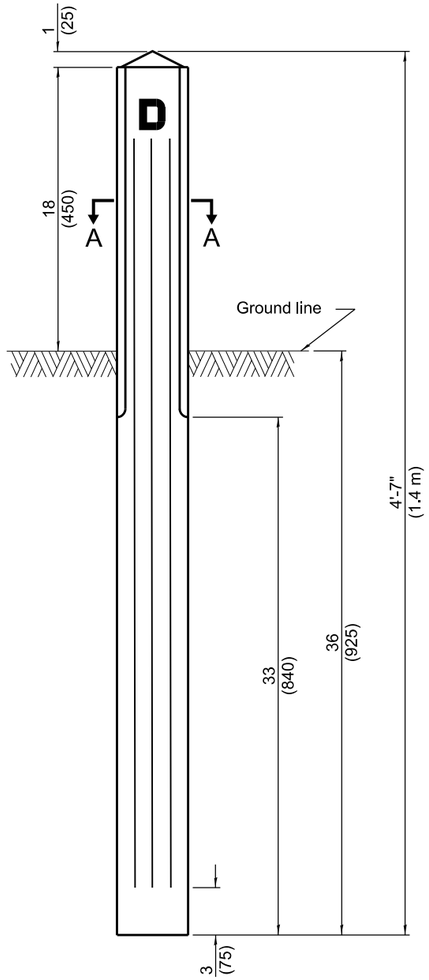
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

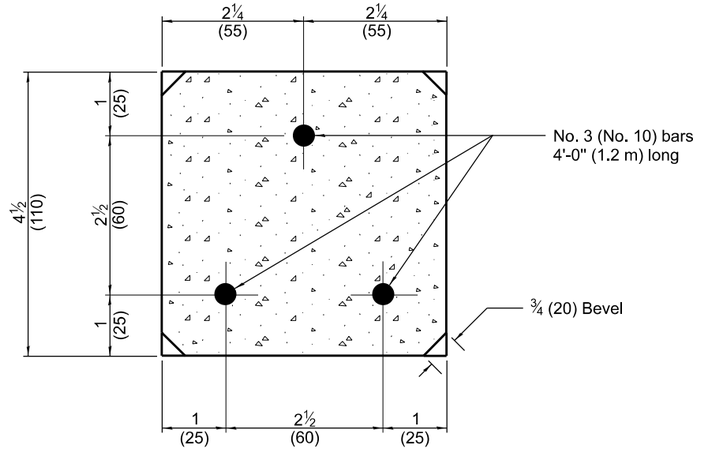
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 1744-6.

RIGHT OF WAY MARKERS

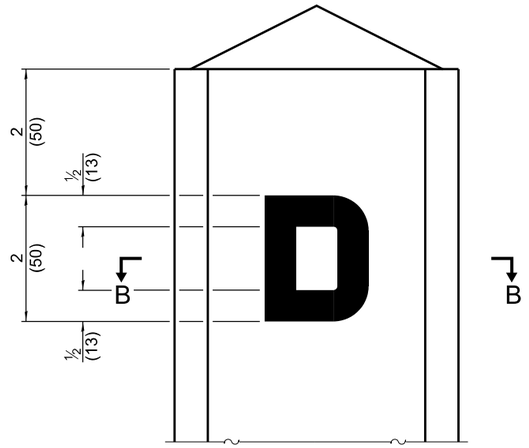
STANDARD 666001-01



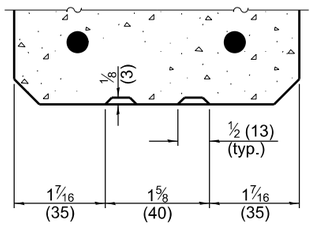
FRONT ELEVATION



SECTION A-A



DETAIL OF LETTER



SECTION B-B

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

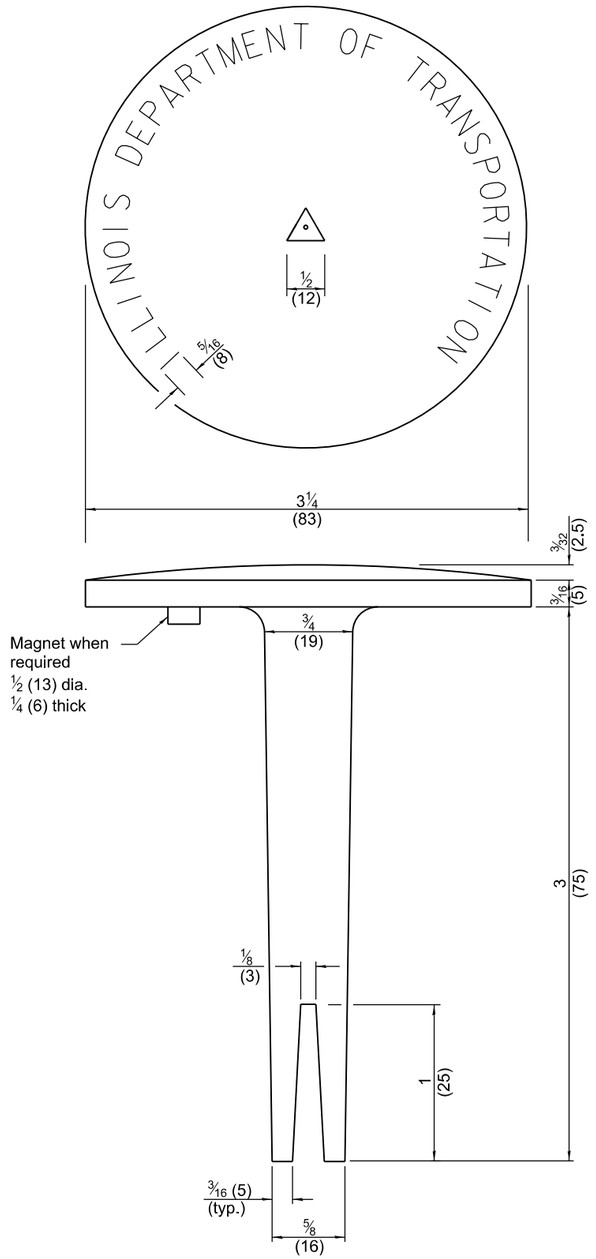
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

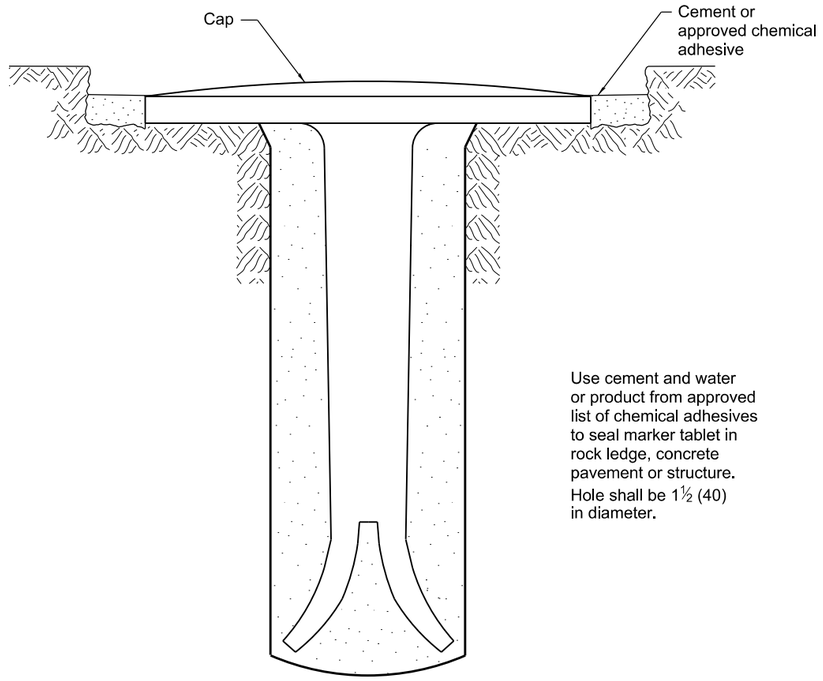
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 1999-4.

DRAINAGE MARKERS

STANDARD 667001-01



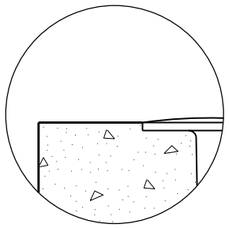
ALUMINUM TABLET



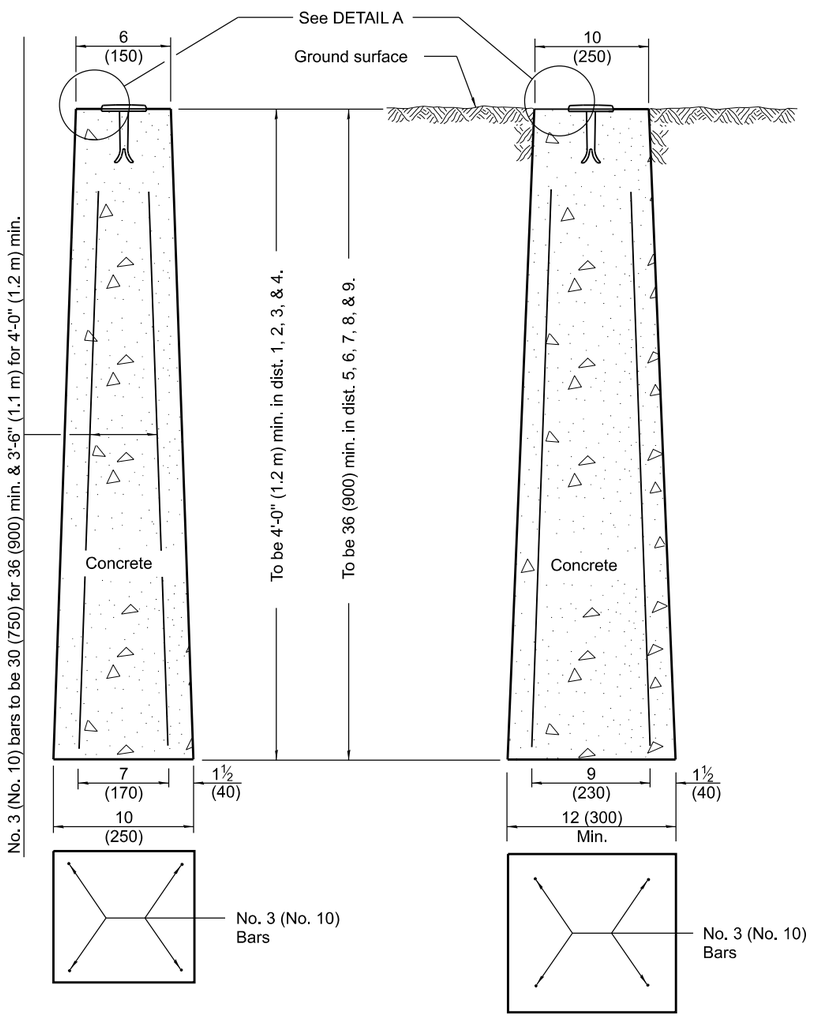
Use cement and water or product from approved list of chemical adhesives to seal marker tablet in rock ledge, concrete pavement or structure.
Hole shall be 1½ (40) in diameter.

Tablet constructed in rock ledge or concrete.

TYPE I



DETAIL A



PRECAST MARKER

CAST-IN-PLACE MARKER

TYPE II

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

Illinois Department of Transportation

APPROVED January 1, 2012
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

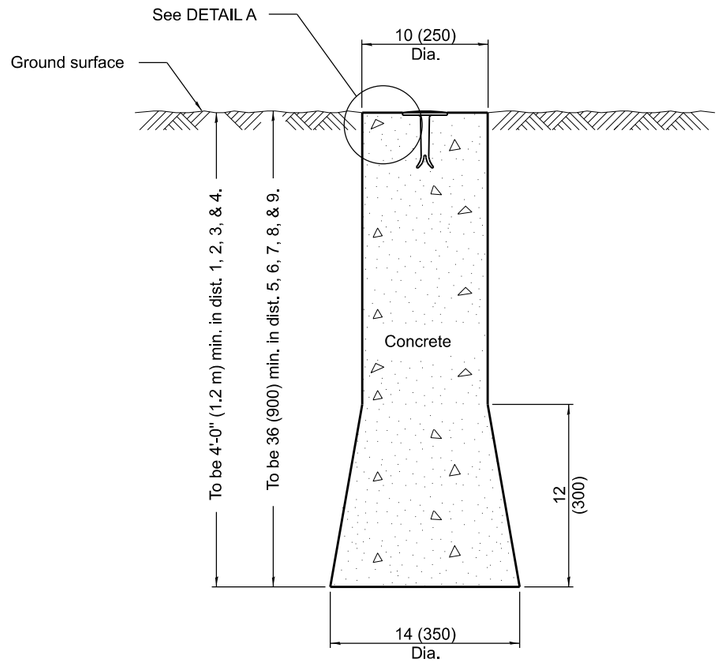
APPROVED January 1, 2012
Scott Bush
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

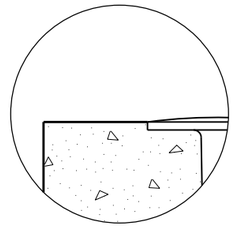
DATE	REVISIONS
1-1-12	Changed 'epoxy' references to
	'chemical adhesives'.
1-1-09	Switched units to English (metric).

PERMANENT SURVEY MARKERS

STANDARD 667101-02



ELEVATION



DETAIL A

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

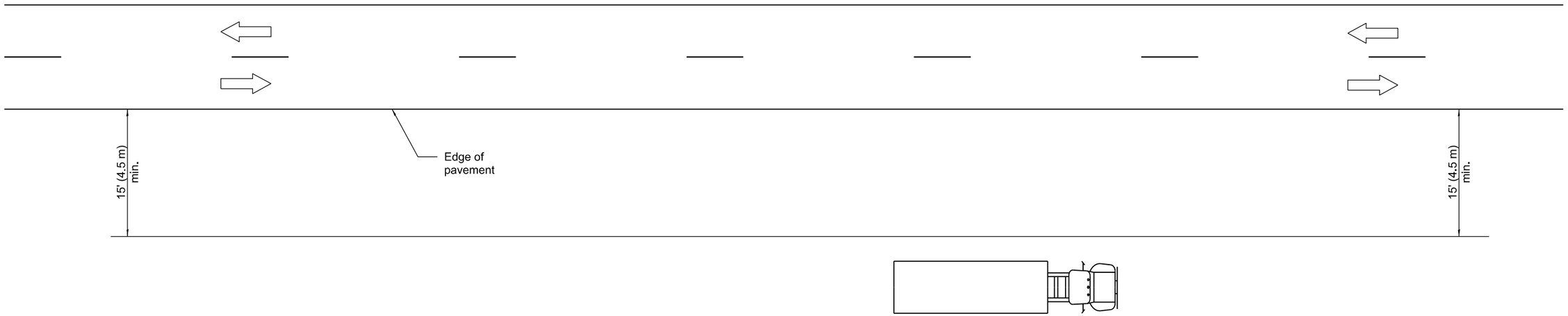
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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



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
ENGINEER OF OPERATIONS

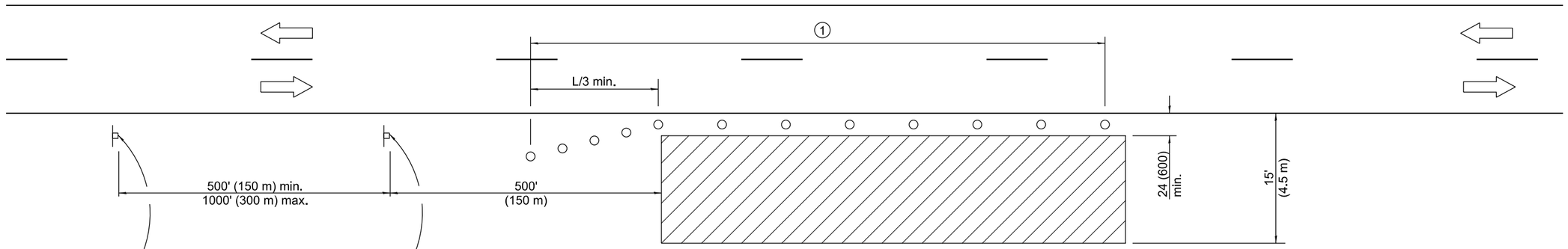
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-05	Revised title and notes.

OFF-RD OPERATIONS, 2L, 2W, MORE THAN 15' (4.5 m) AWAY

STANDARD 701001-02



For contract construction projects

W20-I103(0)-48

W21-1(0)-48

For maintenance and utility projects

W20-1(0)-48

TYPICAL APPLICATIONS

Utility operations
Culvert extensions
Side slope changes
Guardrail installation and maintenance
Delineator installation
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) from the edge of pavement.

Calculate L as follows:

SPEED LIMIT	FORMULAS	
	English	(Metric)
40 mph (70 km/h) or less:	$L=\frac{WS^2}{60}$	$L=\frac{WS^2}{150}$
45 mph (80 km/h) or greater:	L=(W)(S)	L=0.65(W)(S)

W = Width of offset in feet (meters).

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

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

Illinois Department of Transportation

APPROVED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

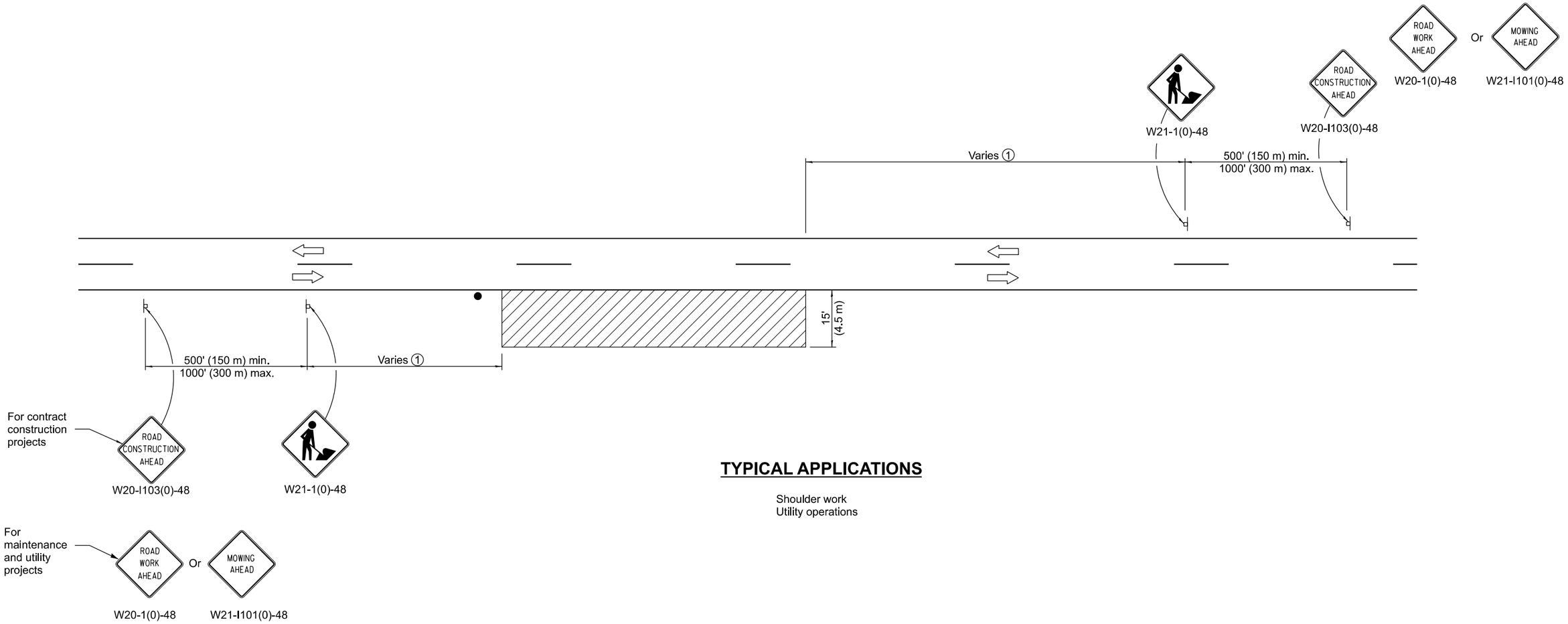
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

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.

OFF-RD OPERATIONS, 2L, 2W, 15' (4.5 m) TO 24" (600 mm) FROM PAVEMENT EDGE

STANDARD 701006-05



TYPICAL APPLICATIONS

Shoulder work
Utility operations

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 4 miles (6.4 km) whichever is less.

SYMBOLS

Work area

Sign

Flagger with traffic control sign when required

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.

Illinois Department of Transportation

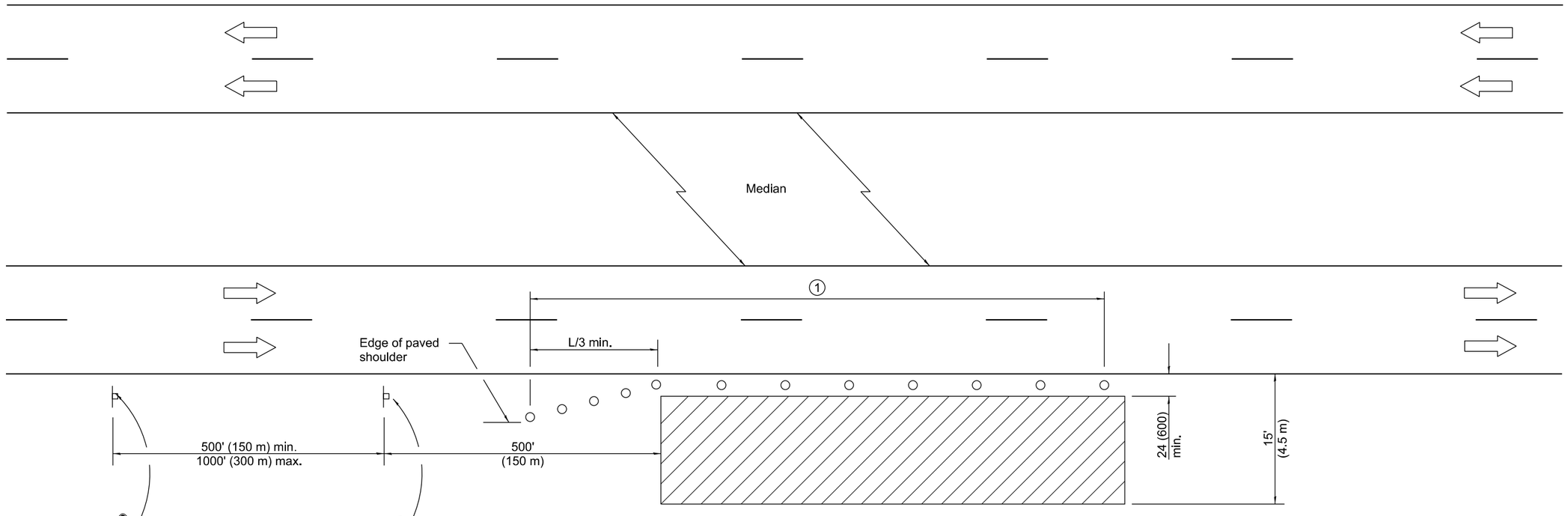
APPROVED January 1, 2014
ENGINEER OF SAFETY ENGINEERING
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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



For contract construction projects

W20-I103(0)-48

W21-1(0)-48

For maintenance and utility projects

W20-1(0)-48

TYPICAL APPLICATIONS

Utility operations
Culvert extensions
Side slope changes
Guardrail installation and maintenance
Delineator installation
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) from the edge of pavement.

Calculate L as follows:

SPEED LIMIT	FORMULAS	
	English	(Metric)
40 mph (70 km/h) or less:	$L=\frac{WS^2}{60}$	$L=\frac{WS^2}{150}$
45 mph (80 km/h) or greater:	L=(W)(S)	L=0.65(W)(S)

W = Width of offset in feet (meters).

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

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

Illinois Department of Transportation

APPROVED January 1, 2016
ENGINEER OF SAFETY ENGINEERING

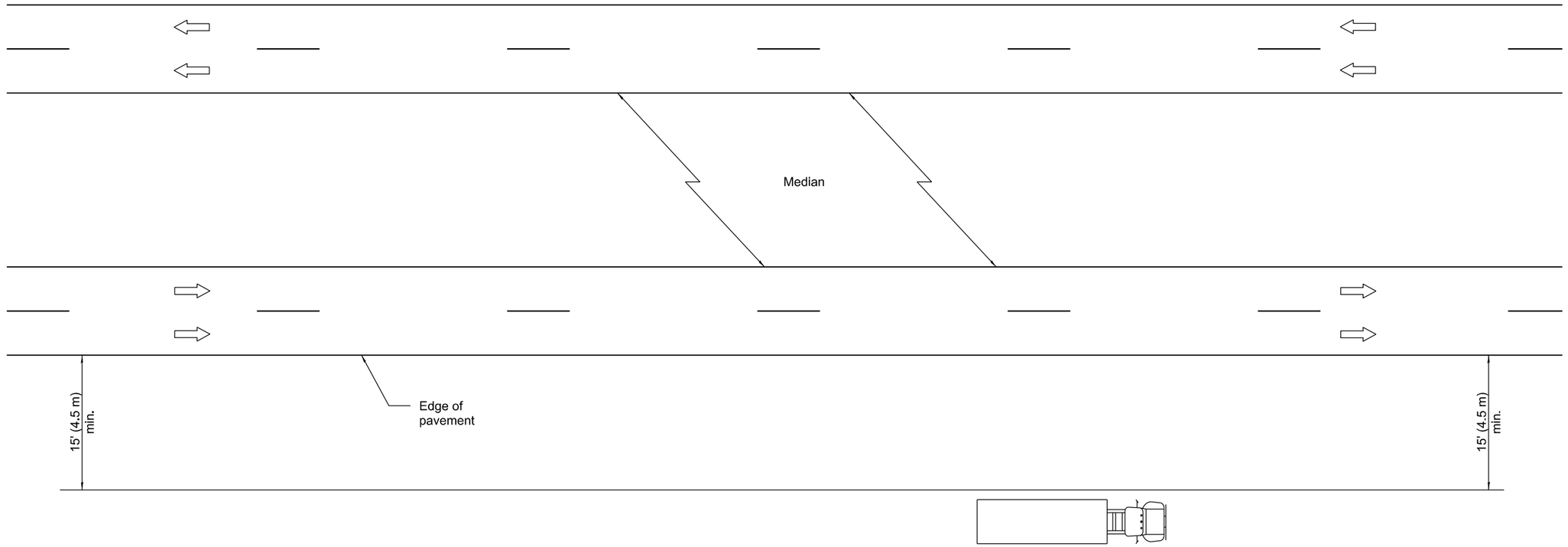
APPROVED January 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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



TYPICAL APPLICATIONS

Landscaping work
Utility work
Fencing contracts

GENERAL NOTES

This Standard is used where at all times all vehicles, equipment, workers or their activities are more than 15' (4.5 m) from the edge of pavement.

When the work operation requires that two or more work vehicles cross the 15' (4.5 m) clear zone in any one hour, traffic control shall be according to Standard 701101.

This Standard also applies to work performed in the median more than 15' (4.5 m) from either pavement.

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

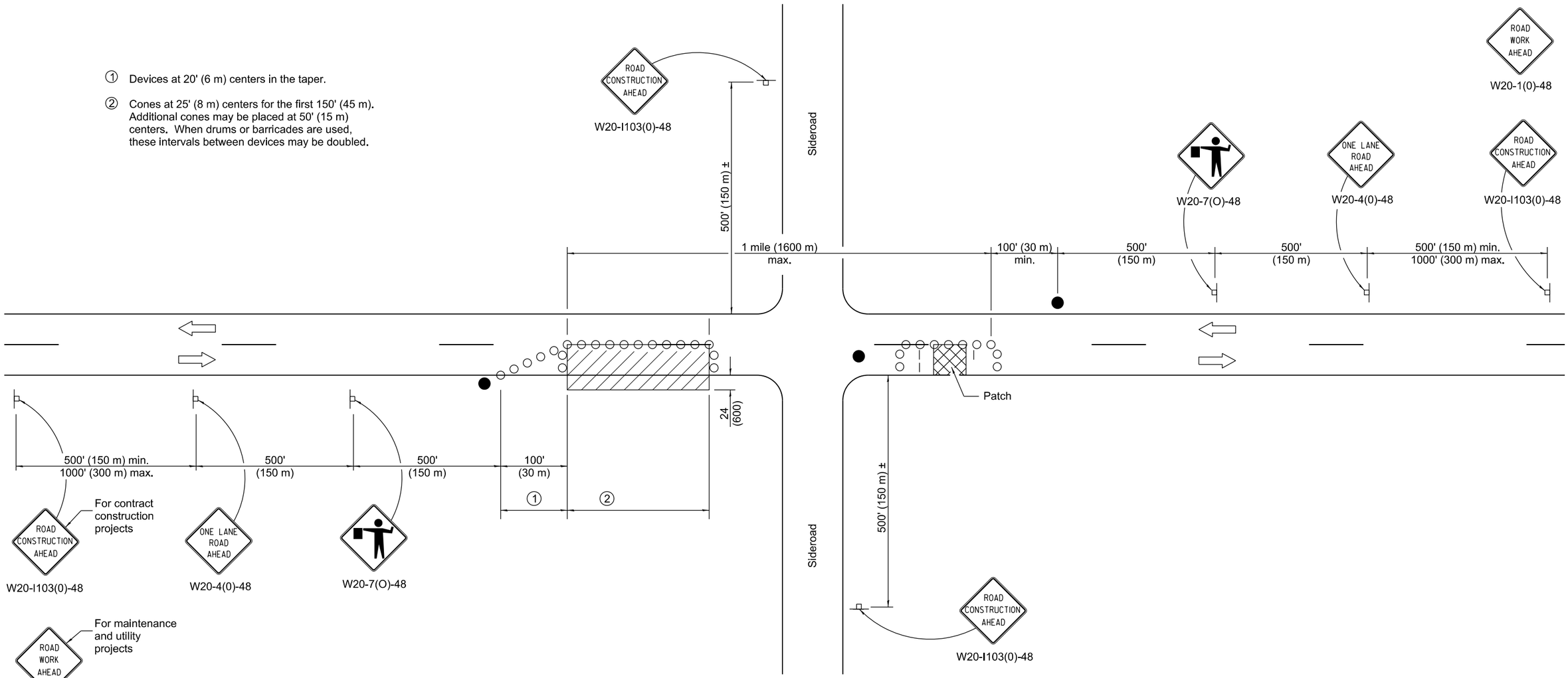
DATE	REVISIONS
1-1-05	Switched units to English (metric).
	Revised title.
1-1-97	Renum. Standard 2313-6.

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

STANDARD 701106-02

① Devices at 20' (6 m) centers in the taper.

② Cones at 25' (8 m) centers for the first 150' (45 m). Additional cones may be placed at 50' (15 m) centers. When drums or barricades are used, these intervals between devices may be doubled.



TYPICAL APPLICATIONS

Isolated patching
Utility operations
Storm sewer
Culverts
Cable placement

SYMBOLS

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

GENERAL NOTES

This Standard is used where at any time, any vehicles, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) outside the edge of pavement for daylight operation.

When the distance between successive work areas exceeds 2000' (600 m), additional warning signs, flaggers, and taper shall be placed as shown.

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

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFTEY PROG. AND ENGINEERING

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

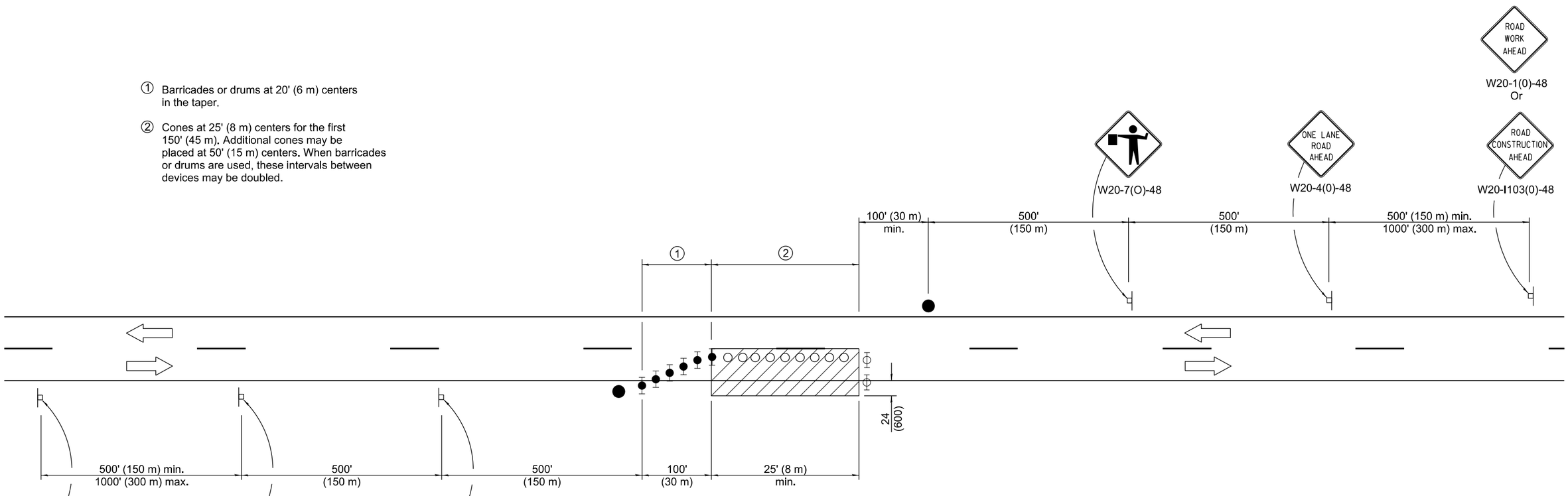
DATE	REVISIONS
1-1-19	Revised device spacing in taper.
1-1-11	Revised flagger sign.

LANE CLOSURE, 2L 2W, DAY ONLY, FOR SPEEDS ≥ 45 MPH

STANDARD 701201-05

① Barricades or drums at 20' (6 m) centers in the taper.

② Cones at 25' (8 m) centers for the first 150' (45 m). Additional cones may be placed at 50' (15 m) centers. When barricades or drums are used, these intervals between devices may be doubled.



TYPICAL APPLICATIONS

Isolated patch
Installation of drainage structure
Utility operations

SYMBOLS

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

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) from the edge of pavement for nighttime operation.

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

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

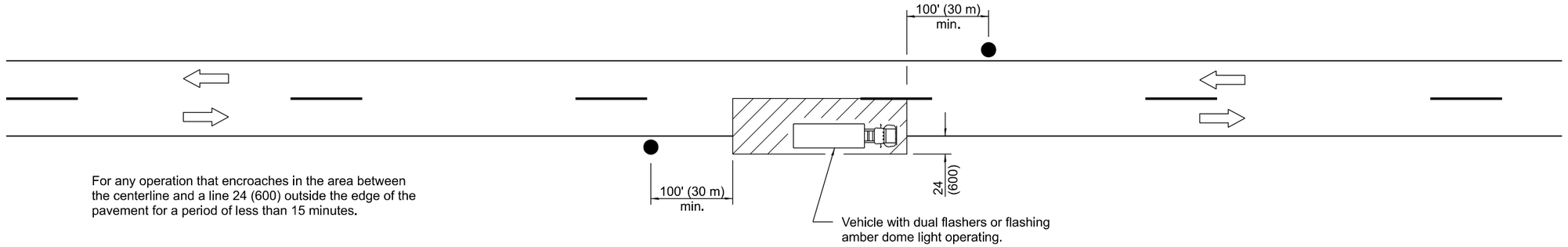
ISSUED 1-1-97

DATE	REVISIONS
1-1-19	Revised device spacing in taper
	and added cones as an option.
1-1-18	Omitted steady burning lights
	in tangent.

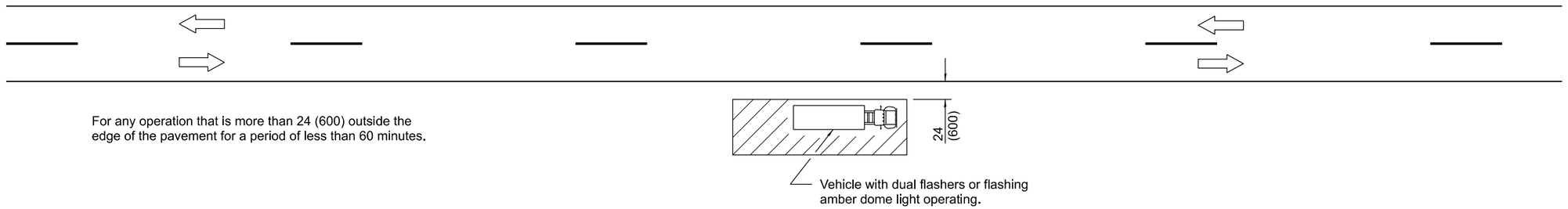
LANE CLOSURE, 2L, 2W NIGHT ONLY, FOR SPEEDS ≥ 45 MPH

STANDARD 701206-05

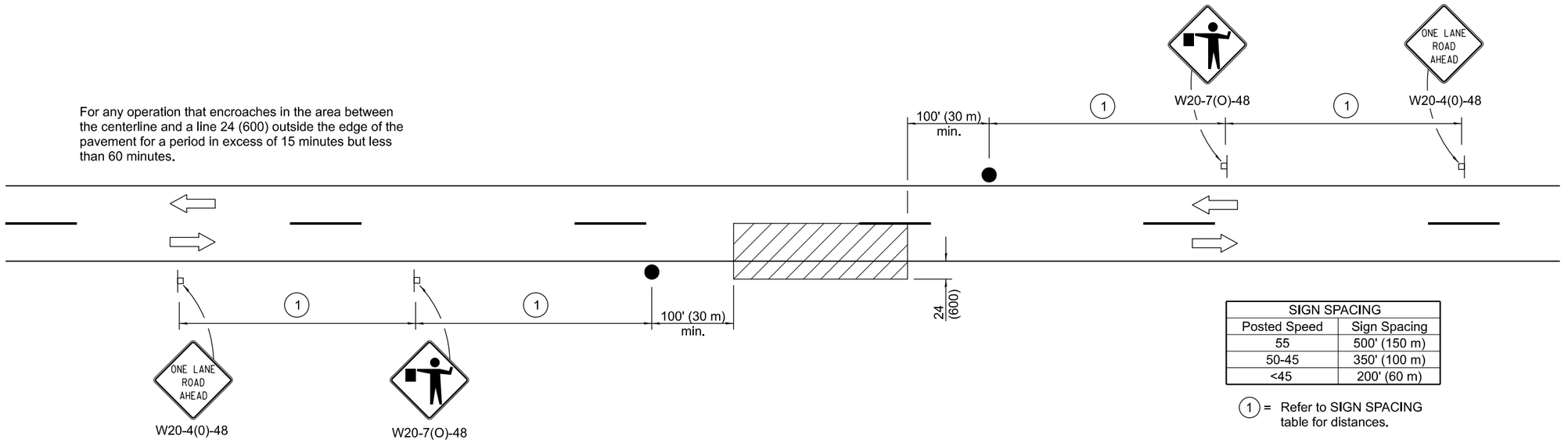
For any operation that encroaches in the area between the centerline and a line 24 (600) outside the edge of the pavement for a period of less than 15 minutes.



For any operation that is more than 24 (600) outside the edge of the pavement for a period of less than 60 minutes.



For any operation that encroaches in the area between the centerline and a line 24 (600) outside the edge of the pavement for a period in excess of 15 minutes but less than 60 minutes.



SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

(1) = Refer to SIGN SPACING table for distances.

TYPICAL APPLICATIONS

Marking patches
Field survey
String line
Utility operations
Cleaning up debris on pavement

SYMBOLS

Work area

Sign on portable or permanent support

Flagger with traffic control sign

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

Illinois Department of Transportation

APPROVED January 1, 2011
ENGINEER OF SAFETY ENGINEERING

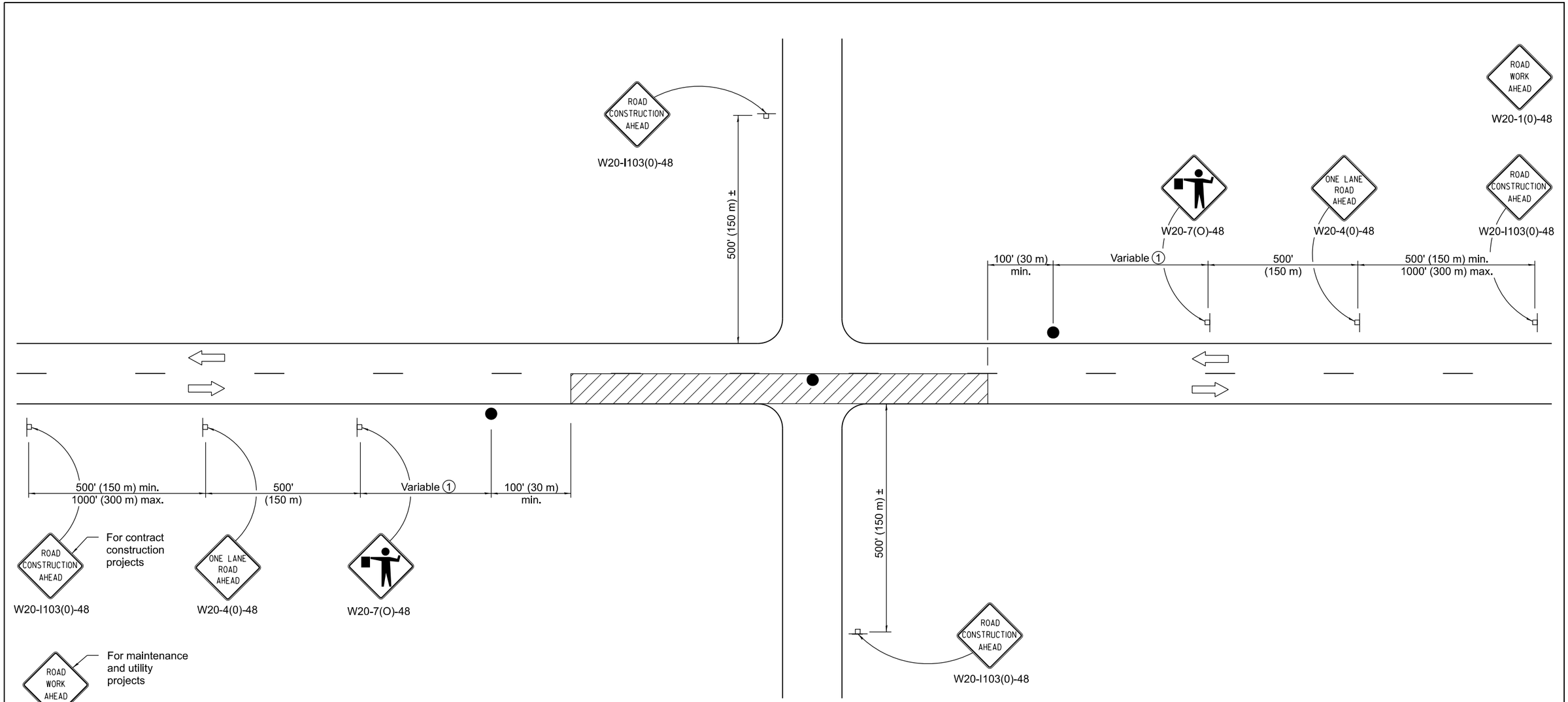
APPROVED January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-11	Revised flagger sign.
1-1-09	Switched units to English (metric).

LANE CLOSURE, 2L, 2W, SHORT TIME OPERATIONS

STANDARD 701301-04



TYPICAL APPLICATIONS

Bituminous resurfacing
Milling operations
Utility operations
Shoulder operations

SYMBOLS

Work area

Sign on portable or permanent support

Flagger with traffic control sign

① Minimum distance is 200' (60 m). Maximum distance to be determined by the Engineer but should not exceed 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 ½ mph (1 km/h) and less than 4 mph (6 km/h).

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

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

Illinois Department of Transportation

APPROVED January 1, 2018
ENGINEER OF SAFETY PROG. AND ENGINEERING

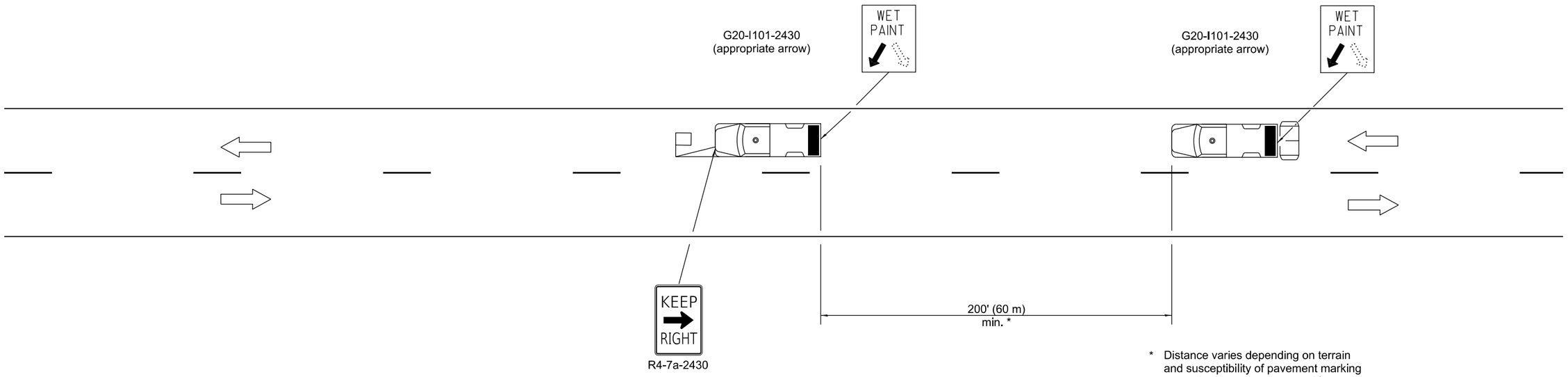
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-18	Revised lower speed limit for operation to ½ mph.
1-1-11	Revised flagger sign.

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

STANDARD 701306-04



* Distance varies depending on terrain and susceptibility of pavement marking or crack sealant to wheel tracking.

TYPICAL APPLICATIONS

Landscaping work
Utility work
Pavement marking
Weed spraying
Roadometer measurements
Debris cleanup
Crack pouring

SYMBOLS

Arrow board (Hazard Mode only)

Truck with headlights, emergency flashers and flashing amber light. (visible from all directions)

18 x 18 (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

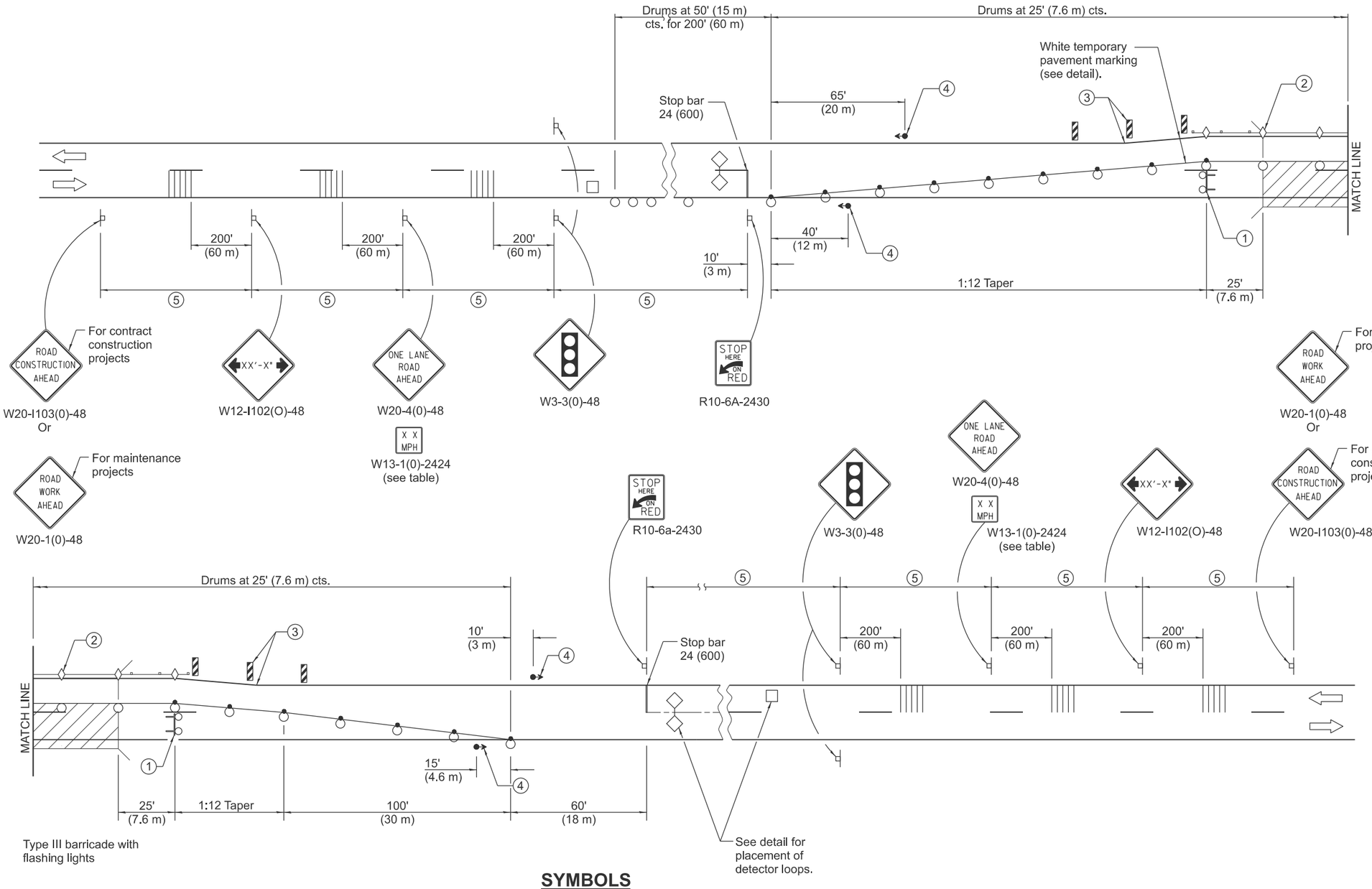
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to English (metric).
	Omitted Pass With Care sign.
1-1-00	Eliminated speed restrictions
	in Standard title.

LANE CLOSURE 2L, 2W MOVING OPERATIONS- DAY ONLY

STANDARD 701311-03



1. Type III barricade to be placed when no work is being performed.
2. Guardrail/barrier wall reflectors at 25' (7.6 m) cts. See Standards 704001 & 782006.
3. Vertical panels at 25' (7.6 m) cts. throughout lane shift. These devices may be omitted when the guardrail, w/markers, extends to at least this point on the taper.
4. The edge of the post mounted signal head shall be between 24 (610) and 6' (1.8 m) from edge of shoulder.
5.

SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Work area
- Sign
- Traffic signal
- Detector loops
- Type III barricade with flashing lights
- Drum with steady burn bi-directional light
- Temporary rumble strip (when specified)
- Crystal, bidirectional guardrail/barrier wall reflector
- Double vertical panel (see detail)
- Drum

Illinois Department of Transportation

APPROVED January 1, 2025
ENGINEER OF SAFETY PROG. AND ENGINEERING
APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

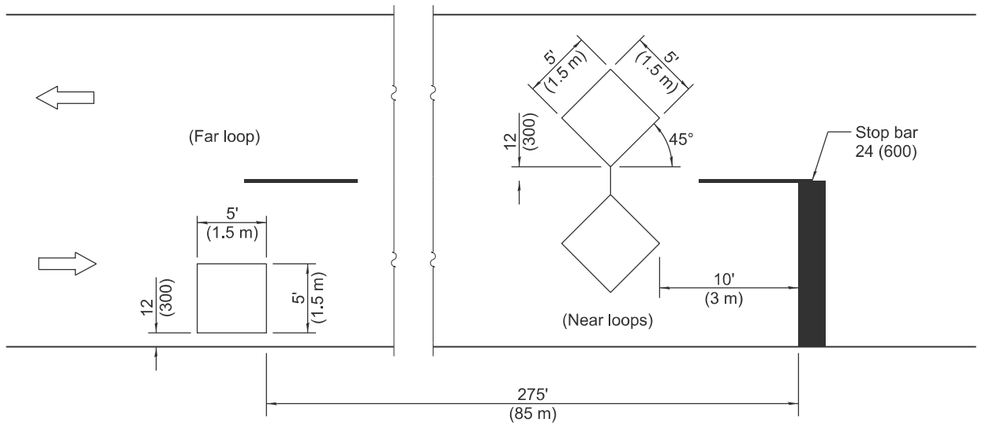
See Sheet 2 for GENERAL NOTES.

DATE	REVISIONS
1-1-25	Added SIGN SPACING table to
	revise distances per posted speed.
1-1-20	Revised from F-shape to constant
	slope parapet.

LANE CLOSURE, 2L, 2W, BRIDGE REPAIR, FOR SPEEDS ≥ 45 MPH

(Sheet 1 of 2)

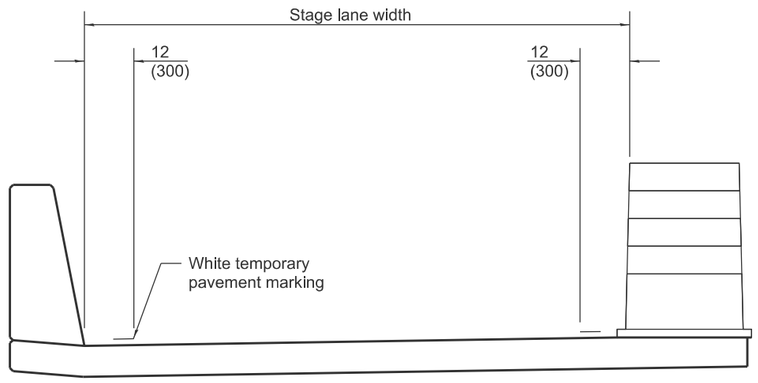
STANDARD 701316-14



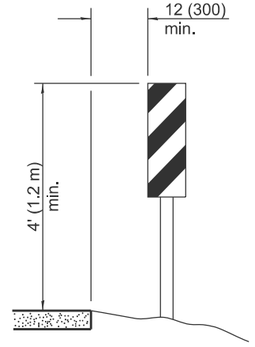
DETECTOR LOOPS

TRAFFIC SIGNAL SEQUENCE						
PHASE	A			B		
INTERVAL	1	2	3	4	5	6
NORTHBOUND OR EASTBOUND	G	Y	R	R	R	R
SOUTHBOUND OR WESTBOUND	R	R	R	G	Y	R

ADVISORY SPEED LIMIT	
NORMAL POSTED SPEED	ADVISORY SPEED
55 - 45 mph	40 mph
40 mph	35 mph
35 - 30 mph	30 mph



TEMPORARY PAVEMENT MARKING



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.

Illinois Department of Transportation

APPROVED January 1, 2025
ENGINEER OF SAFETY PROG. AND ENGINEERING

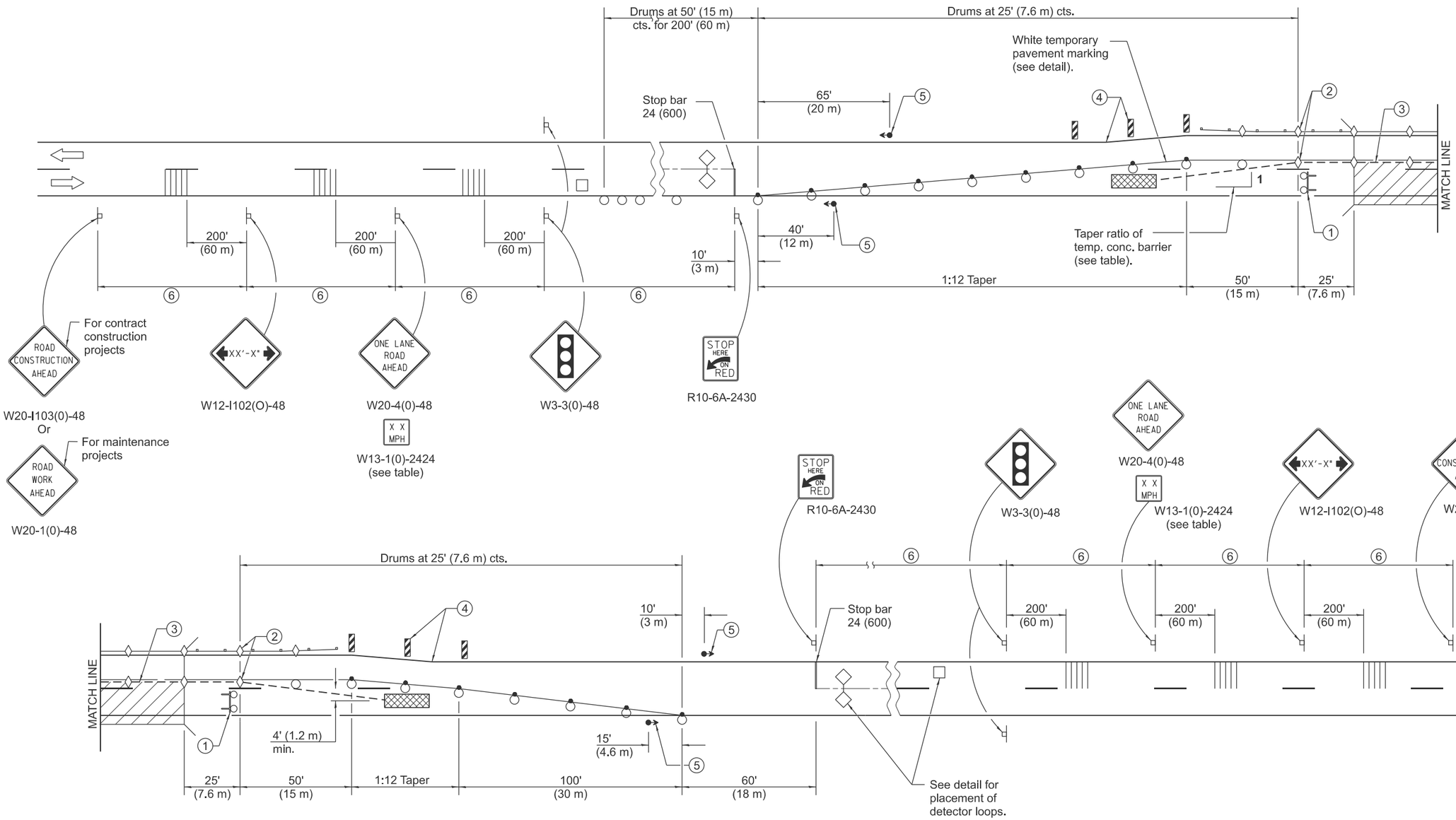
APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

LANE CLOSURE, 2L, 2W, BRIDGE REPAIR, FOR SPEEDS ≥ 45 MPH

(Sheet 2 of 2)

STANDARD 701316-14



1. Type III barricade to be placed when no work is being performed.
2. Guardrail/barrier wall reflectors at 25' (7.6 m) cts. See Standards 704001 & 782006.
3. When temp. bridge rail is specified, it shall be connected to the temp. conc. barrier using a traffic barrier terminal Type 11.
4. Vertical panels at 25' (7.6 m) cts. throughout lane shift. These devices may be omitted when the guardrail, w/markers, extends to at least this point on the taper.
5. The edge of the post mounted signal head shall be between 24 (610) and 6' (1.8 m) from edge of shoulder.

⑥

SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Work area
- Sign
- Type III barricade with flashing lights
- Traffic signal
- Detector loops
- Impact attenuator
- Drum with steady burning bi-directional light
- Temporary concrete barrier
- Temporary rumble strip (when specified)
- Double vertical panel (see detail)
- Crystal, bidirectional guardrail/barrier wall reflector
- Drum

Illinois Department of Transportation

APPROVED January 1, 2025
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

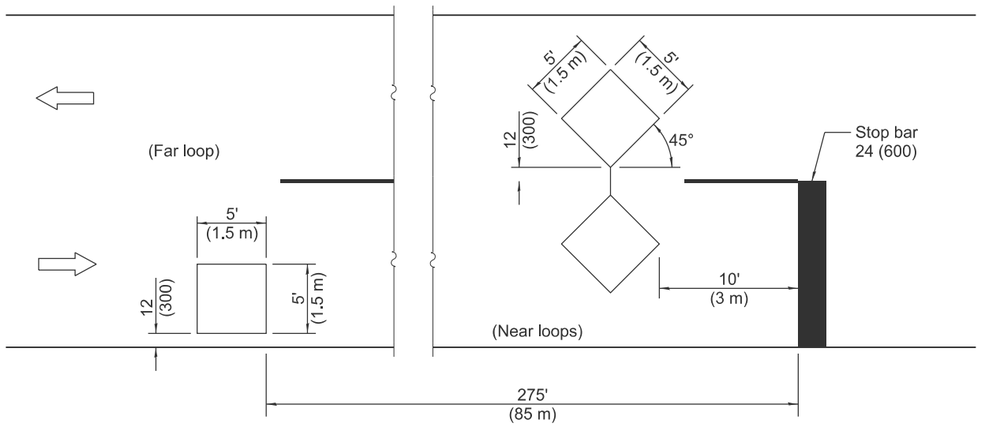
See Sheet 2 for GENERAL NOTES

DATE	REVISIONS
1-1-25	Added SIGN SPACING table to
	revise distances per posted speed.
1-1-20	Revised from F-shape to constant
	slope parapet.

LANE CLOSURE, 2L, 2W, BRIDGE REPAIR WITH BARRIER

(Sheet 1 of 2)

STANDARD 701321-19

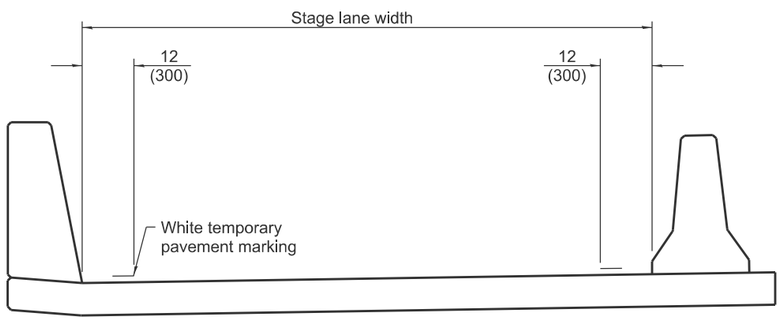


DETECTOR LOOPS

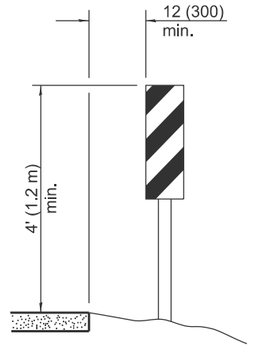
TRAFFIC SIGNAL SEQUENCE						
PHASE	A			B		
INTERVAL	1	2	3	4	5	6
NORTHBOUND OR EASTBOUND	G	Y	R	R	R	R
SOUTHBOUND OR WESTBOUND	R	R	R	G	Y	R

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



TEMPORARY PAVEMENT MARKING



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.

Illinois Department of Transportation

APPROVED January 1, 2025
ENGINEER OF SAFETY PROG. AND ENGINEERING

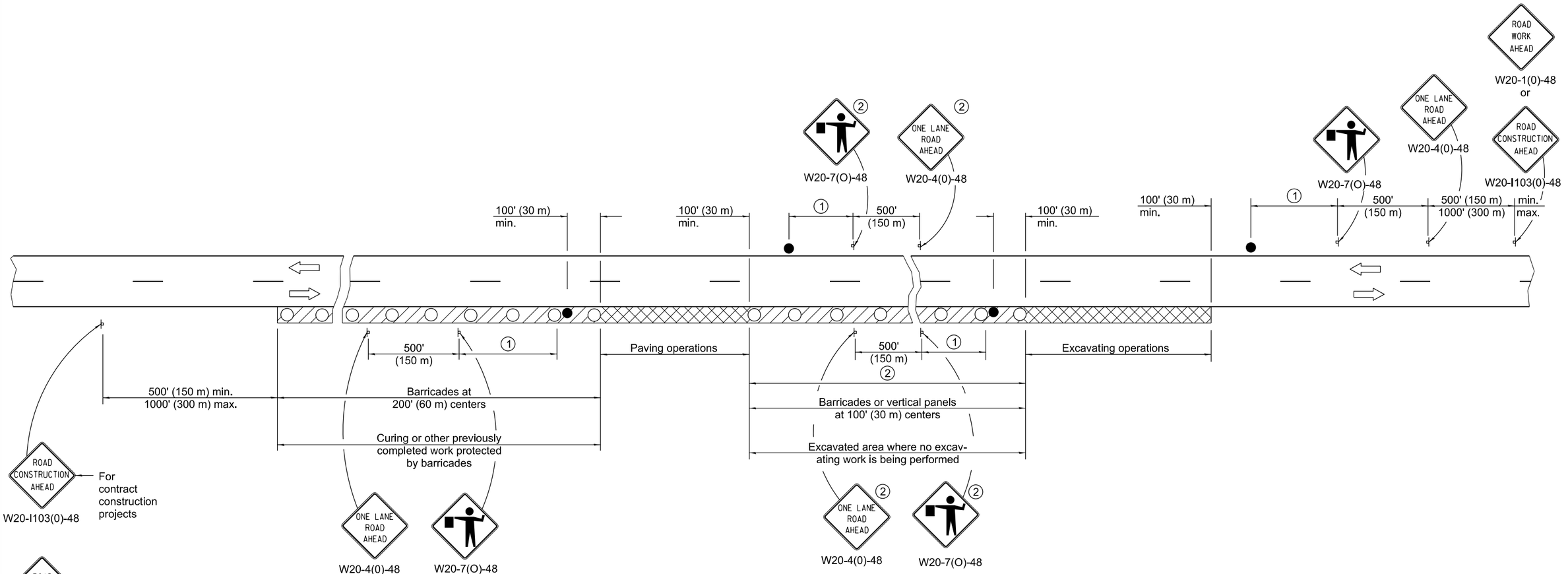
APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

LANE CLOSURE, 2L, 2W, BRIDGE REPAIR WITH BARRIER

(Sheet 2 of 2)

STANDARD 701321-19



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 ½ 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
ENGINEER OF SAFETY ENGINEERING

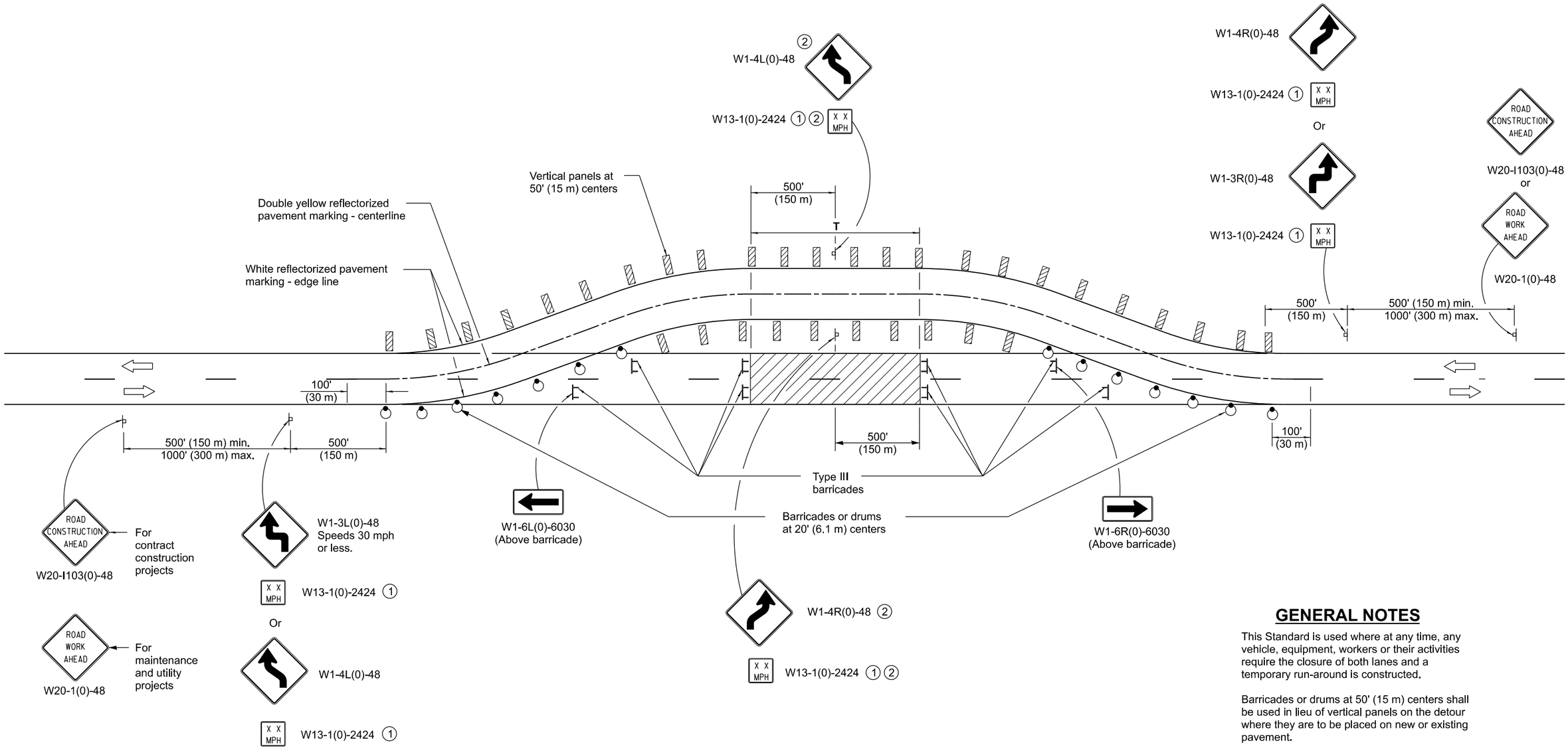
APPROVED January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

LANE CLOSURE, 2L, 2W, PAVEMENT WIDENING FOR SPEEDS ≥ 45 MPH

STANDARD 701326-04



TYPICAL APPLICATIONS

Bridge construction
Culvert construction

SYMBOLS

- Work area
- Sign
- Barricade or drum with steady burn bi-directional light
- Double vertical panel
- Type III barricade

1. The advisory speed to be shown below the reverse curve (turn) signs shall be determined at the site and approved by the Engineer.
2. These signs are not required when T is less than 500' (150 m).

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 January 1, 2018
ENGINEER OF SAFETY PROG. AND ENGINEERING

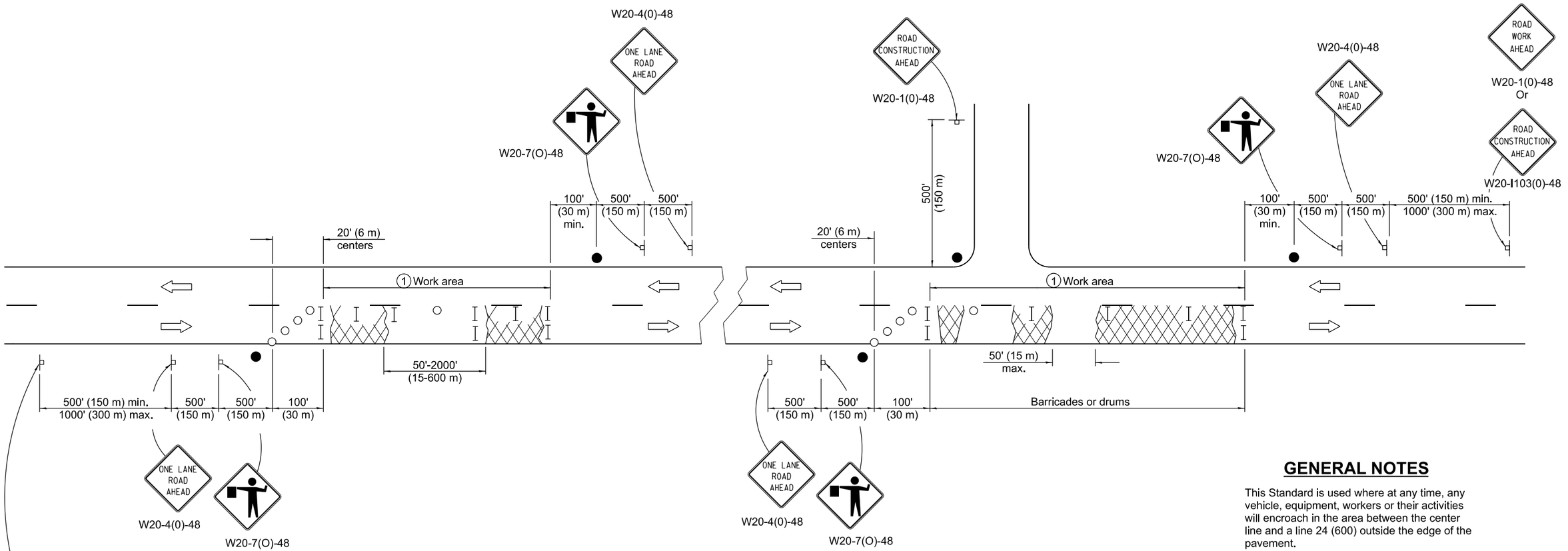
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-18	Changed lights on drums to
	bi-directional.
1-1-11	Changed vertical panel to
	double vertical panel.

LANE CLOSURE, 2L, 2W, WITH RUN-AROUND, FOR SPEEDS ≥ 45 MPH

STANDARD 701331-05



1 ½ mile (800 m) maximum

SYMBOLS

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

TYPICAL APPLICATIONS

Patching

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) outside the edge of the pavement.

Two flaggers shall be required for each separate lane closure. The flagger shall be a minimum of 200' (60 m) and a maximum of ½ day's operation beyond the flagger sign. When the distance between succes- sive patches exceeds 2000' (600 m), additional flaggers, warning signs, and tapers shall be placed as shown.

Barricades/drums shall be placed at intervals not greater than 100' (30 m) or cones shall be placed at intervals not greater than 50' (15 m) centers throughout the work zone. When the spacing between open holes is greater than 50' (15 m), two barricades/drums shall be placed in front of each open hole and one on the backside close to the centerline. When the open hole is greater than 10' (3 m) parallel to the centerline, one barricade/drum shall be placed in each hole. For large holes, barricades/drums shall be placed at 50' (16 m) centers.

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

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

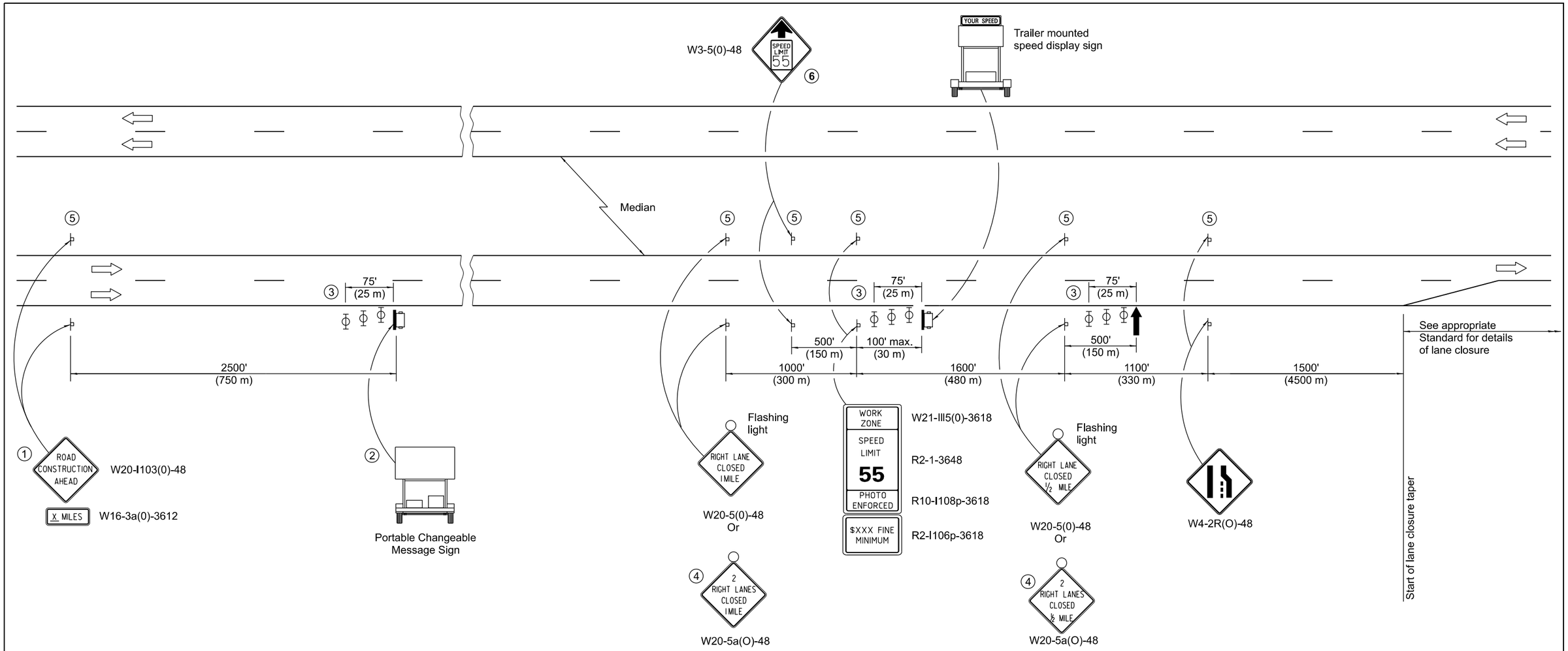
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-19	Revised device spacing in taper.
1-1-11	Revised flagger sign.

LANE CLOSURE, 2L, 2W, WORK AREAS IN SERIES FOR SPEEDS ≥ 45 MPH

STANDARD 701336-07



SYMBOLS

- Arrow board
- Trailer mounted sign
- Sign
- Type II barricade, drum, or vertical barricade with monodirectional flashing light

1. The Road Construction Ahead sign shall be located 3 to 5 miles in advance of the project limits.
2. The message 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"
3. Three, Type II barricades, drums, or vertical barricades at 25' (8 m) centers.
4. This sign shall be used when 2 lanes are closed.
5. This sign shall be omitted when median width is less than 10' (3 m).
6. 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 sign 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, 2024
ENGINEER OF SAFETY PROG. AND ENGINEERING

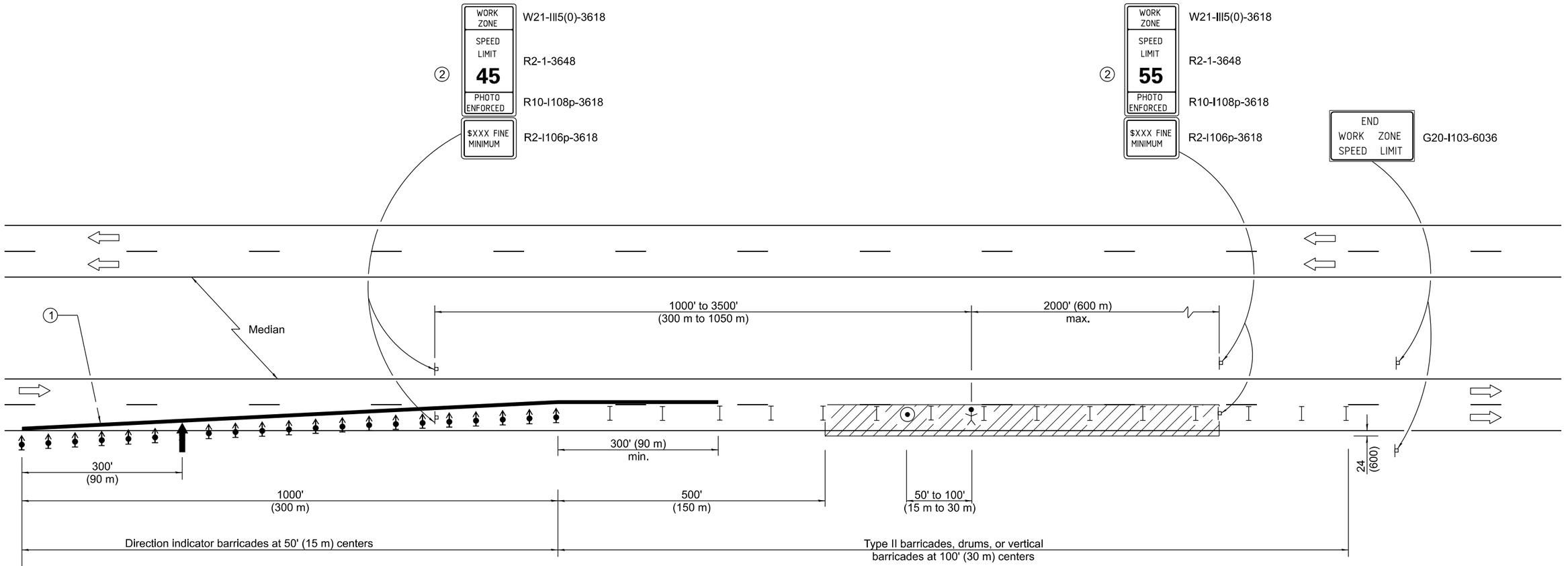
APPROVED January 1, 2024
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-04

DATE	REVISIONS
1-1-24	Moved flashing light from the side
	to top center of lane closed signs.
1-1-22	Corrected work zone speed limit
	sign number.

APPROACH TO LANE CLOSURE, FREEWAY/EXPRESSWAY

STANDARD 701400-12



SYMBOLS

- Arrow board
- Work area
- Worker
- Sign
- Direction indicator barricade with steady burn monodirectional light
- Type II barricade, drum, or vertical barricade
- Spotter

① Reflectorized temporary pavement marking tape shall be placed throughout the taper and for 300' (90 m) along-side the work area when the closure time is greater than fourteen days. The edge line shall be white for right lane closure and yellow for left lane closures.

② Work Zone speed limit signs shall be moved as necessary to maintain the required spacing between the signs and the workers in each separate work activity. Work Zone Speed Limit 55 Photo Enforced sign shall be omitted when the work area dictates placement of the sign array within 500' (150 m) of the End Work Zone Speed Limit Sign.

GENERAL NOTES

This Standard is used where at any time any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 24 (600) of the edge of pavement.

This Standard must always be used in combination with Standard 701400.

This Standard also applies when work is being performed in the left lane. Under these conditions, the setup would be a mirror image to what is shown.

A check barricade shall be placed in the middle of the closed lane and at the shoulder at 1000' (300 m) centers.

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

Illinois Department of Transportation

APPROVED January 1, 2022
ENGINEER OF SAFETY PROG. AND ENGINEERING

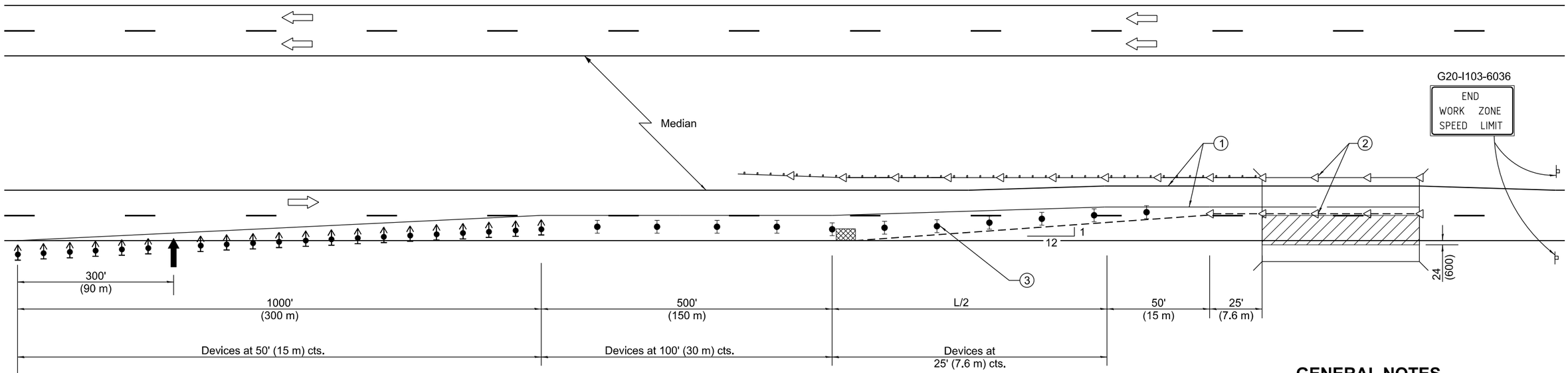
APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-22	Corrected work zone speed limit
	sign numbers.
1-1-19	Replaced flagger with spotter.

LANE CLOSURE, FREEWAY/EXPRESSWAY

STANDARD 701401-13



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 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	FORMULAS	
	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 January 1, 2017
ENGINEER OF SAFETY PROG. AND ENGINEERING

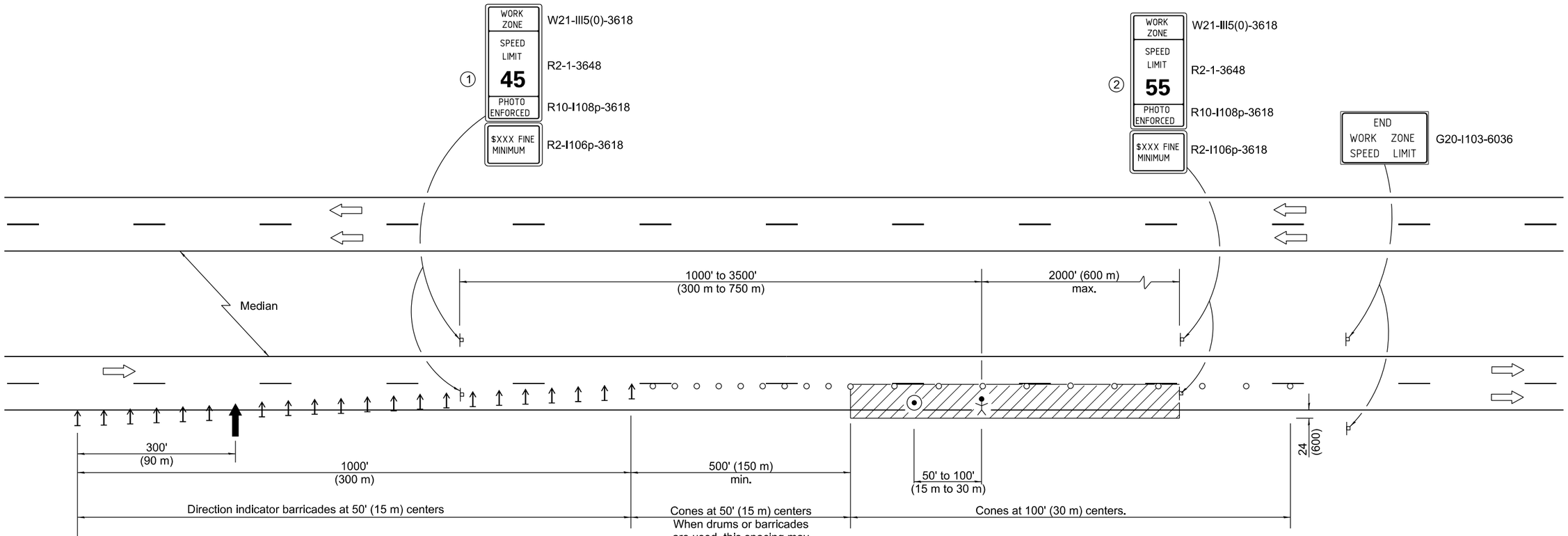
APPROVED January 1, 2017
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-00

DATE	REVISIONS
1-1-17	Revised END WORK ZONE SPEED
	LIMIT sign from orange to white
	background.
4-1-16	Added reference to Standards
	704001 and 782006 in note (2).

LANE CLOSURE FREEWAY/EXPRESSWAY WITH BARRIER

STANDARD 701402-12



TYPICAL APPLICATIONS

Pavement patch
Utility operations
Bituminous resurfacing

SYMBOLS

- Arrow board
- Work area
- Worker
- Sign
- Direction indicator barricade
- Cone, drum or barricade
- Spotter

(1) Work zone speed limit signs shall be moved as necessary to maintain the required spacing between the signs and the workers in each separate work activity.

(2) Work Zone Speed Limit 55 Photo Enforced sign shall be omitted when the work area dictates placement of the sign array within 500' (150 m) of the End Work Zone Speed Limit sign.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 24 (600) of the edge of pavement for daylight operation.

This Standard must always be used in combination with Standard 701400.

This Standard also applies when work is being performed in the left lane. Under these conditions, the set up would be a mirror image to what is shown.

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

Illinois Department of Transportation

APPROVED January 1, 2022
ENGINEER OF SAFETY PROG. AND ENGINEERING

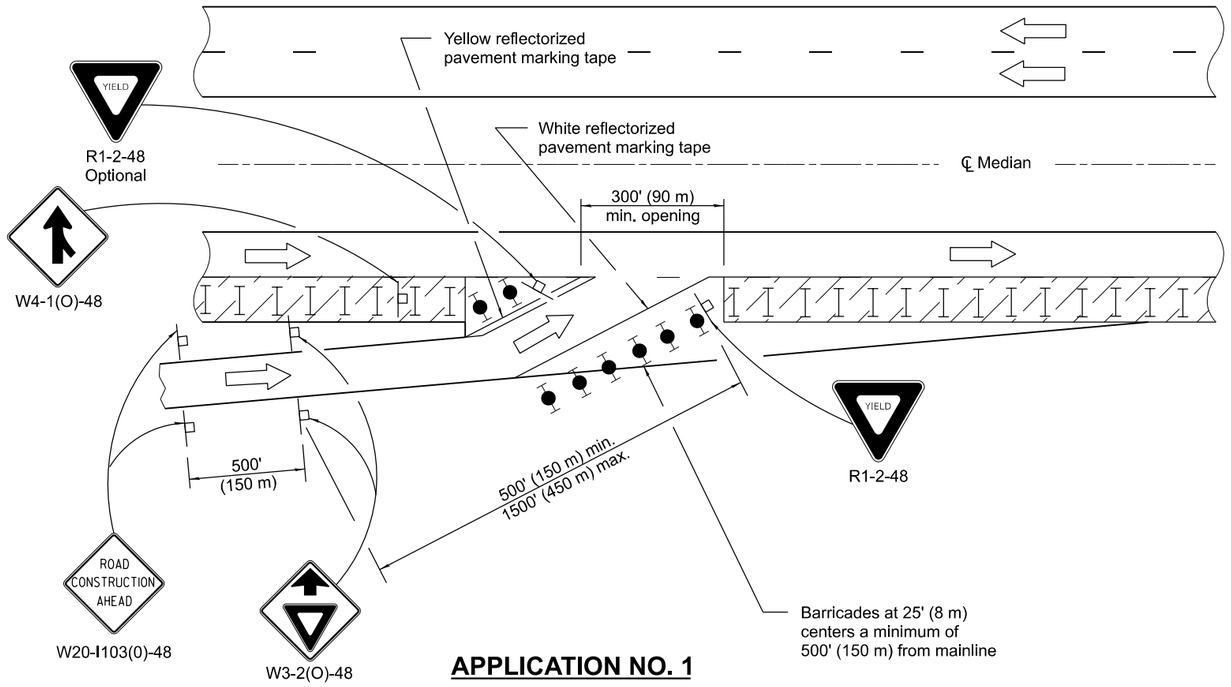
APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-22	Corrected work zone speed limit
	sign numbers.
1-1-19	Replaced flagger with spotter.

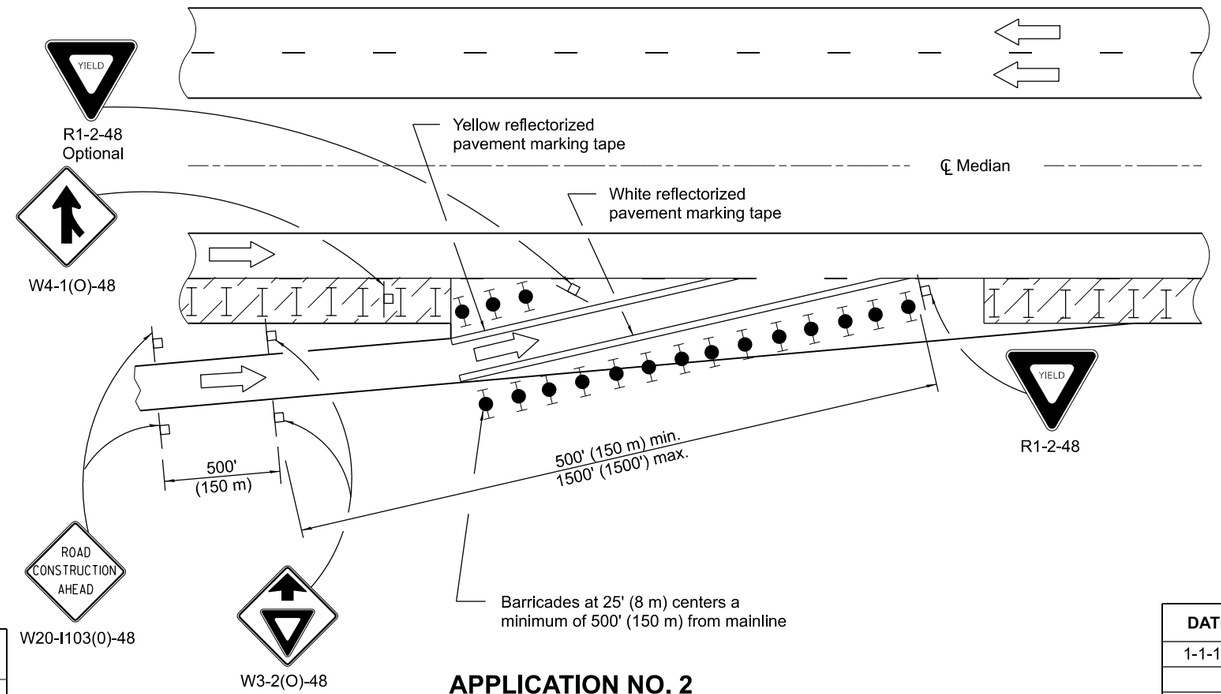
LANE CLOSURE, FREEWAY/EXPRESSWAY, DAY OPERATIONS ONLY

STANDARD 701406-13



APPLICATION NO. 1

Application No. 1 depicts a modified entrance ramp. This method shall be utilized whenever existing entrance tapers cannot be retained due to the close proximity of the work zone. The entrance location may be shifted, with the approval of the Engineer, to perform work in the entrance area. Application No. 2 shall be put into effect as soon as possible.



APPLICATION NO. 2

Application No. 2 depicts a shortening of the normal entrance ramp. This method shall be used whenever the existing geometrics can be retained. Consideration should be given to the entering motorists' line of sight, through, between, or over the delineation devices.

SYMBOLS

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

Illinois Department of Transportation

APPROVED January 1, 2015
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

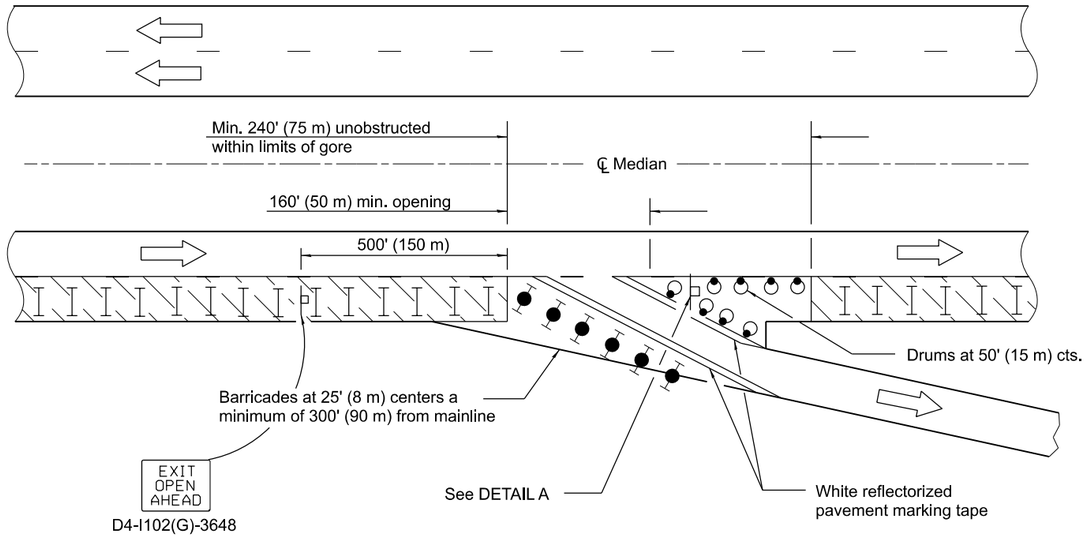
ISSUED 1-1-97

DATE	REVISIONS
1-1-15	Revised gen. notes to limit App's 1
	and 3 to five days, omit pvt. tape
	for ≤ 5 days.
1-1-12	Revised merge sign to agree with
	MUTCD. Dimensioned EXIT OPEN
	AHEAD sign.

LANE CLOSURE, MULTILANE, AT ENTRANCE OR EXIT RAMP, FOR SPEEDS ≥ 45 MPH

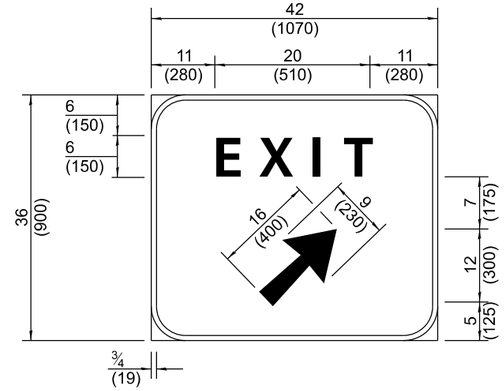
(Sheet 1 of 2)

STANDARD 701411-09



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.

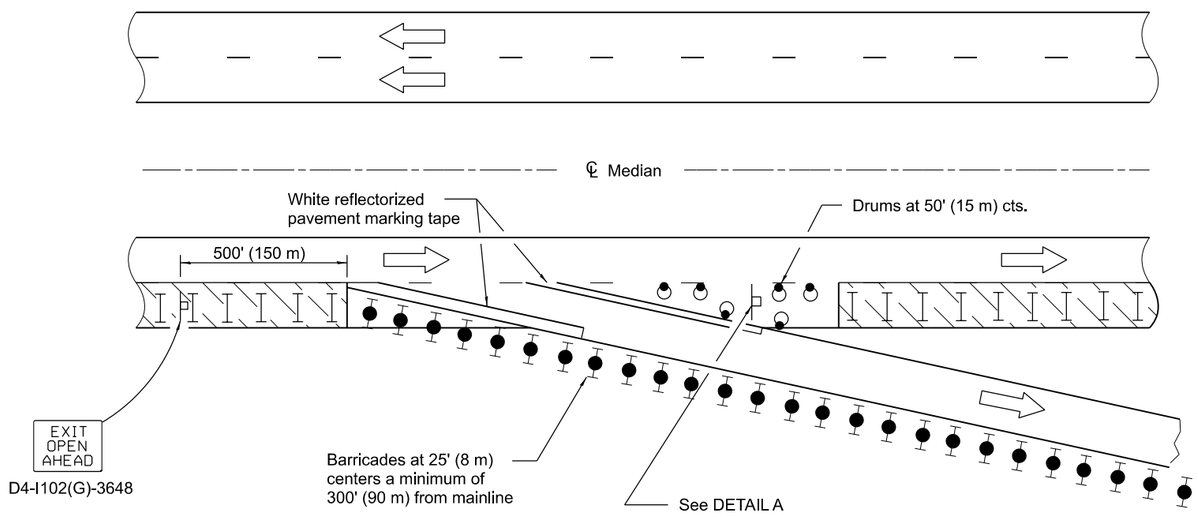


Background - Green
Border and legend - White
"D" size letters

EXIT SIGN - SPECIAL

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.

Illinois Department of Transportation

APPROVED January 1, 2015
ENGINEER OF SAFETY PROG. AND ENGINEERING

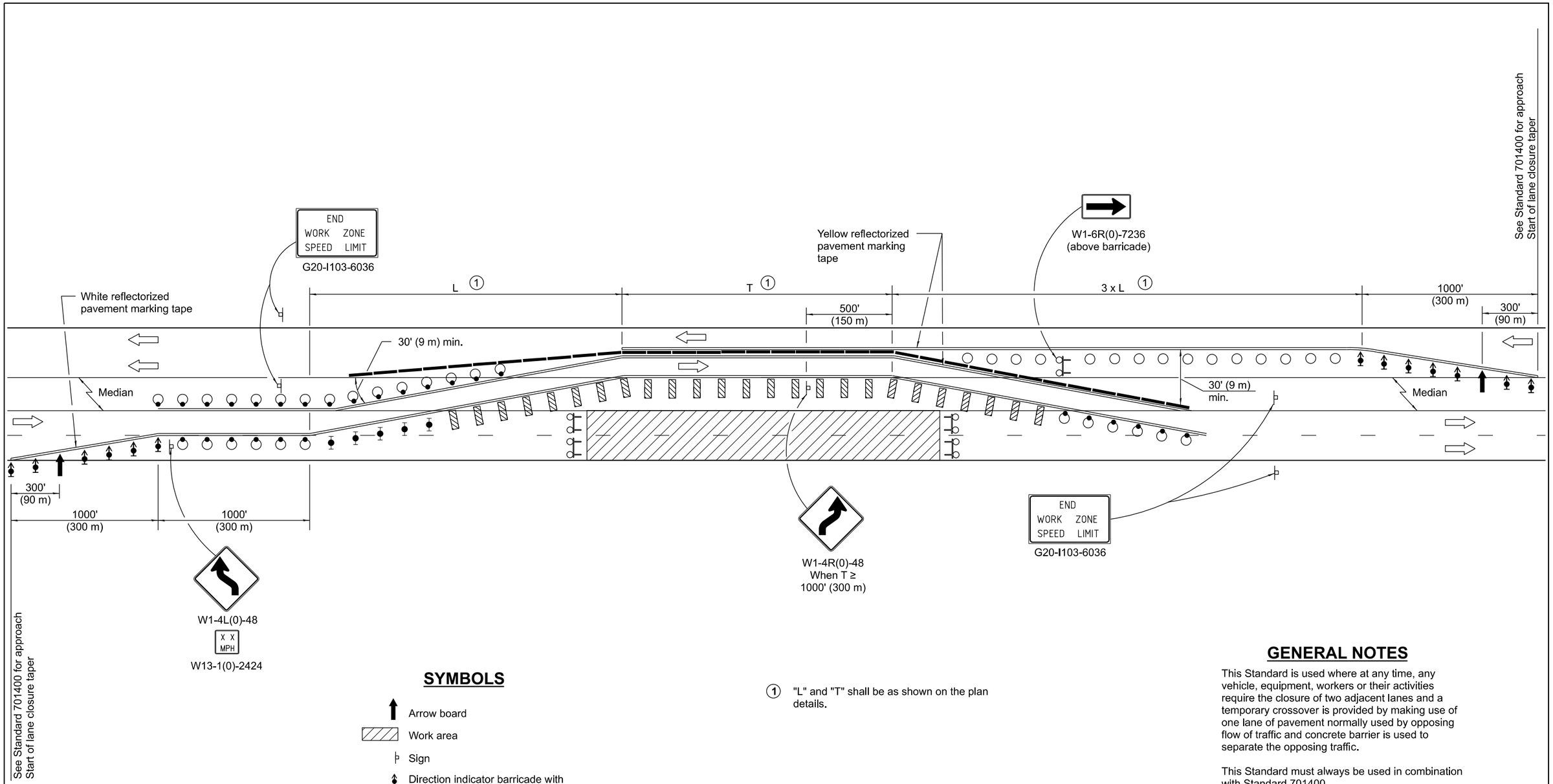
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

LANE CLOSURE, MULTILANE, AT ENTRANCE OR EXIT RAMP, FOR SPEEDS ≥ 45 MPH

(Sheet 2 of 2)

STANDARD 701411-09



SYMBOLS

- Arrow board
- Work area
- Sign
- Direction indicator barricade with steady burn monodirectional light
- Type II barricade with steady burn monodirectional light
- Drum with steady burn monodirectional light
- Vertical Panel
- Type III barricade with flashing lights
- Temporary concrete barrier
- Drum

(1) "L" and "T" shall be as shown on the plan details.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities require the closure of two adjacent lanes and a temporary crossover is provided by making use of one lane of pavement normally used by opposing flow of traffic and concrete barrier is used to separate the opposing traffic.

This Standard must always be used in combination with Standard 701400.

All barricades, drums, and vertical panels shall be at 50 ft. (15 m) centers.

Temporay concrete barrier shall be according to Standard 704001.

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

Illinois Department of Transportation

APPROVED January 1, 2018
ENGINEER OF SAFETY PROG. AND ENGINEERING

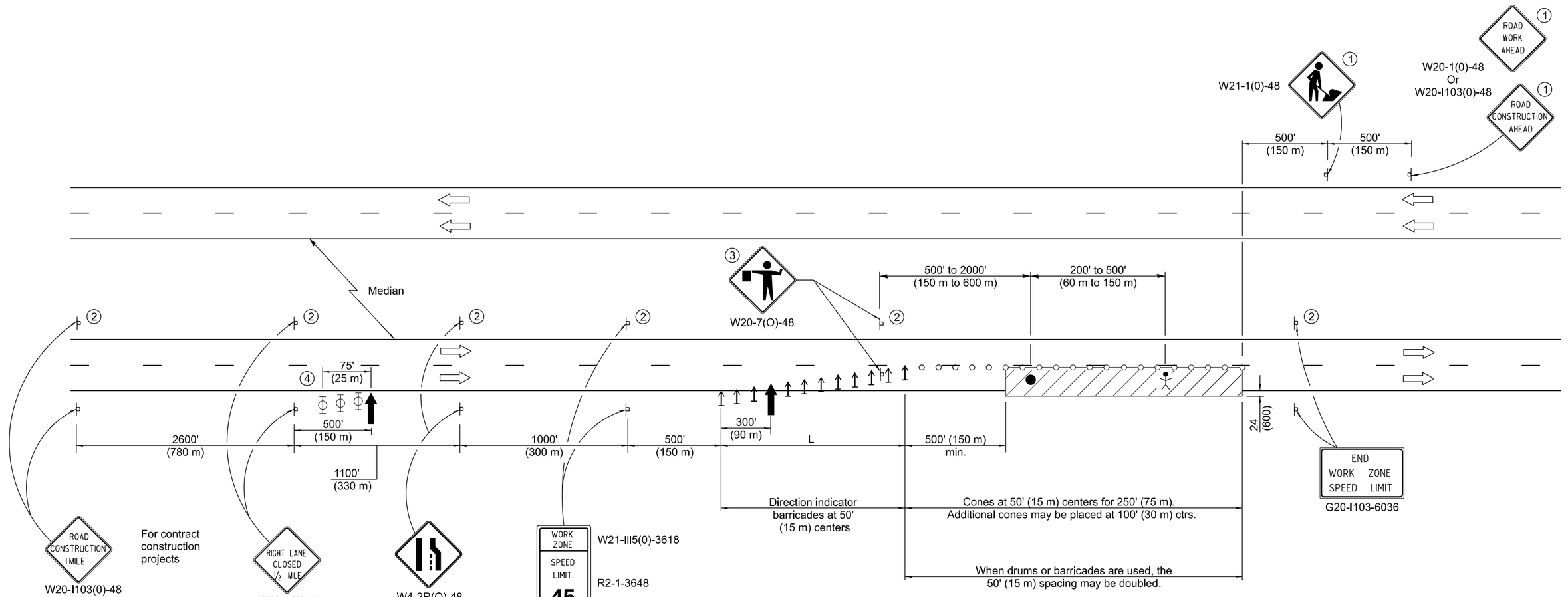
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-18	Omitted lights on drums for
	the '3 x L' tangents.
1-1-17	Revised END WORK ZONE SPEED
	LIMIT sign from orange to white
	background.

LANE CLOSURE, FREEWAY/EXPRESSWAY, WITH CROSSOVER AND BARRIER

STANDARD 701416-11



L = lane width X taper ratio	
Normal Posted Speed	Taper Ratio
mph	
55	55/1
45	45/1

TYPICAL APPLICATIONS

Pavement patch
Utility operations
Bituminous resurfacing

SYMBOLS

- Arrow board
- Work area
- Sign
- Direction indicator barricade
- Cone, drum or barricade
- Flagger with traffic control sign
- Worker
- Type II barricade, drum, or vertical barricade with monodirectional flashing light

1. Undivided roadway only with left lane closure in opposite direction.
2. Omitted when median is less than 10' (3 m).
3. FLAGGER signs shall be moved as necessary to maintain the required spacing between the sign and each separate work activity.
4. Three Type II barricades, drums, or vertical barricades at 25' (8 m) centers.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 24 (600) of the edge of pavement.

This Standard also applies when work is being performed in the left lane. Under these conditions, LEFT LANE CLOSED signs shall be substituted for RIGHT LANE CLOSED signs. On undivided highways, signs shall be added in the opposite direction as shown.

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

Illinois Department of Transportation

APPROVED January 1, 2017
ENGINEER OF SAFETY PROG. AND ENGINEERING

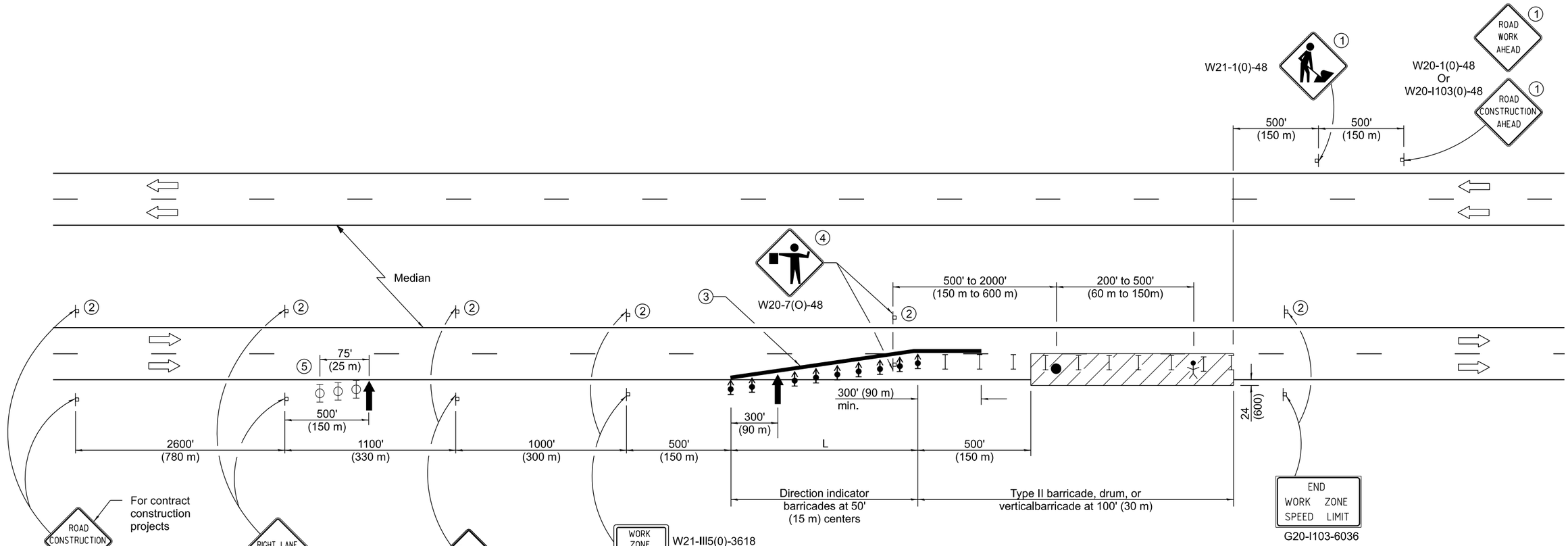
APPROVED January 1, 2017
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-04

DATE	REVISIONS
1-1-17	Revised END WORK ZONE SPEED
	LIMIT sign. Changed device spacing
	at first arrow board.
1-1-15	Revised END WORK ZONE SPEED
	LIMIT sign dimensions.

LANE CLOSURE, MULTILANE, DAY OPERATIONS ONLY, FOR SPEEDS ≥ 45 MPH TO 55 MPH

STANDARD 701421-08



L = lane width X taper ratio	
Normal Posted Speed	Taper Ratio
mph	
55	55/1
45	45/1

SYMBOLS

- Arrow board
- Work area
- Sign
- Direction indicator barricade with steady burn monodirectional light
- Type II barricade, drum, or vertical barricade
- Flagger with traffic control sign
- Worker
- Type II barricade, drum, or vertical barricade with monodirectional flashing light

(1) Undivided roadway only with left lane closure in opposite direction.

(2) Omitted when median is less than 10' (3 m).

(3) Reflectorized temporary pavement marking tape shall be placed throughout the taper and for 300' (90 m) along-side the work area where the closure time is greater than fourteen days. The edge line shall be white for right lane closures and yellow for left lane closures.

(4) FLAGGER signs shall be moved as necessary to maintain the required spacing between the sign and each separate work activity.

(5) Three Type II barricades, drums, or vertical barricades at 25' (8 m) centers.

GENERAL NOTES

This standard is used where at any time any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 24 (600) of the edge of pavement for daylight operation exceeding one day.

This standard also applies when work is being performed in the left lane. Under these conditions LEFT LANE CLOSED signs shall be substituted for RIGHT LANE CLOSED signs. On undivided highways, signs shall be added in the opposite direction as shown.

A check barricade shall be placed in the middle of the closed lane and at the shoulder at 1000' (300 m) centers.

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

Illinois Department of Transportation

APPROVED January 1, 2018
ENGINEER OF SAFETY PROG. AND ENGINEERING

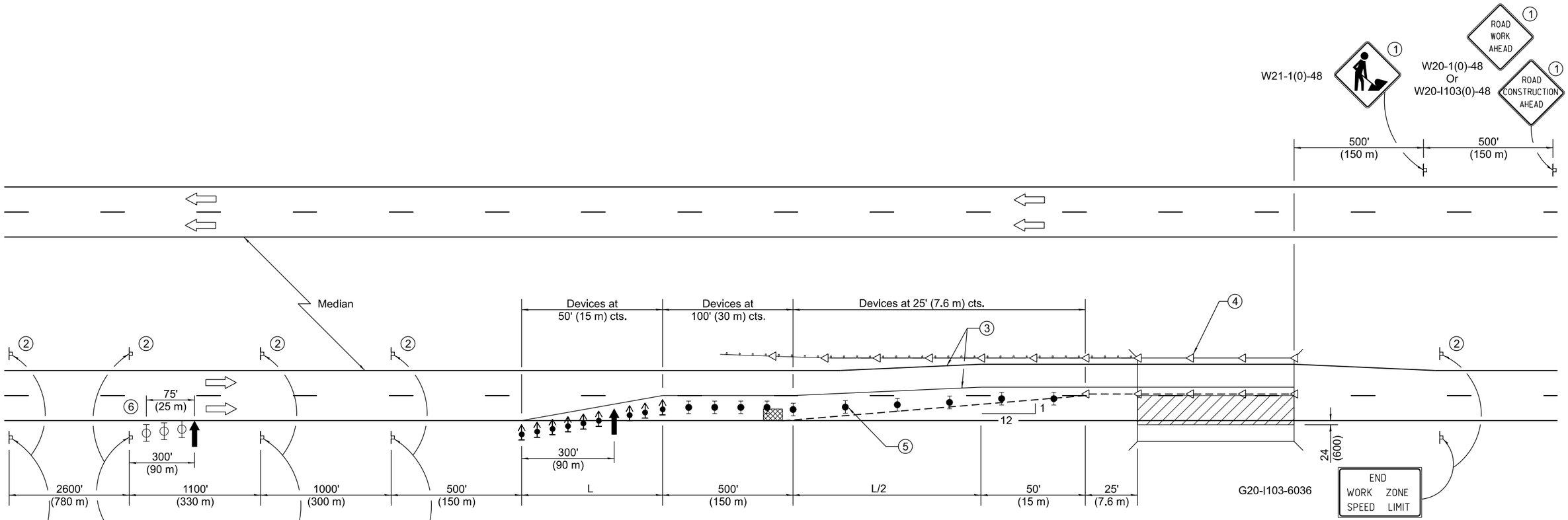
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

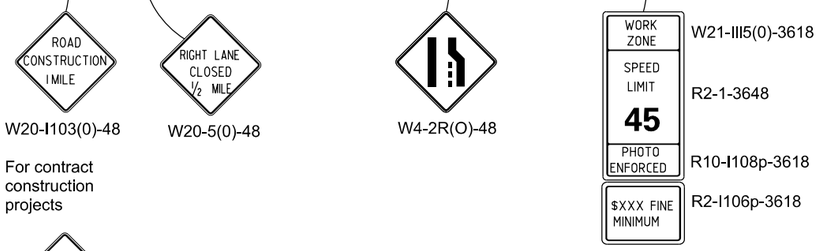
ISSUED 4-1-04

DATE	REVISIONS
1-1-18	Omitted lights in tangent.
1-1-17	Revised END WORK ZONE SPEED
	LIMIT sign. Changed device spacing
	at first arrow board.

LANE CLOSURE, MULTILANE, FOR SPEEDS ≥ 45 MPH TO 55 MPH

STANDARD 701422-10





W20-I103(0)-48

W20-5(0)-48

W4-2R(O)-48

W21-III5(0)-3618

R2-1-3648

R10-I108p-3618

R2-I106p-3618

W20-1(0)-48

For contract construction projects

For maintenance and utility projects

SYMBOLS

- Arrow board
- Work area
- Sign
- Direction indicator barricade with steady burn monodirectional light
- Type II barricade, drum, or vertical barricade with steady burn monodirectional light
- Temporary concrete barrier
- Monodirectional guardrail/barrier wall reflector
- Impact attenuator
- Type II barricade, drum, or vertical barricade with monodirectional flashing light

(1) Undivided roadway only with left lane closure in opposite direction.

(2) Sign in median may be omitted when median is less than 10' (3 m).

(3) Temporary pavement marking tape shall be placed throughout the taper and along-side the work area. The right edge line shall be white and the left edge line shall be yellow.

(4) Guardrail/barrier wall reflectors at 25' (7.6 m). Markers on right shall be crystal and markers on left shall be amber. See Standards 704001 and 782006.

(5) Verticle barricades shall not be used in lane shift taper.

(6) Three Type II barricades, drums, or vertical barricades at 25' (8 m) centers.

GENERAL NOTES

This standard is used where at any time any vehicle, equipment, workers or their activities will encroach on the pavement or on the shoulder within 24 (600) of the edge of pavement for daylight operation exceeding one day and where temporary concrete barrier is utilized.

When work is being performed in the left lane, the set up would be a mirror image to what is shown.

Calculate L as follows:

NORMAL POSTED SPEED	FORMULAS English	(Metric)
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 January 1, 2017
ENGINEER OF SAFETY PROG. AND ENGINEERING

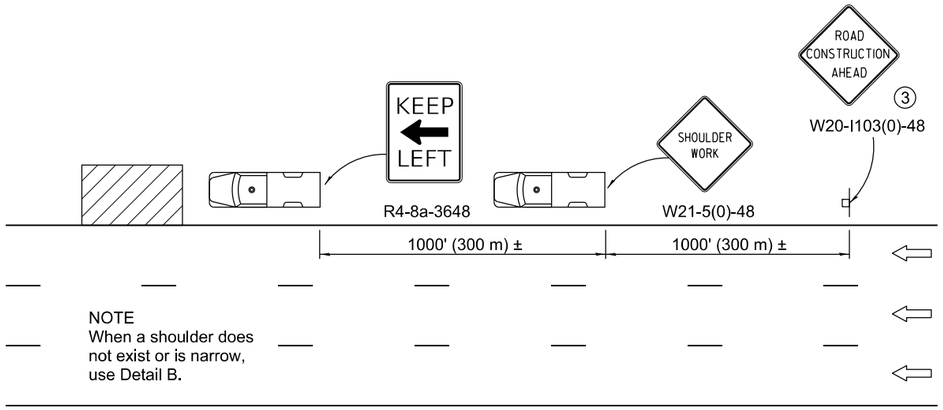
APPROVED January 1, 2017
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-00

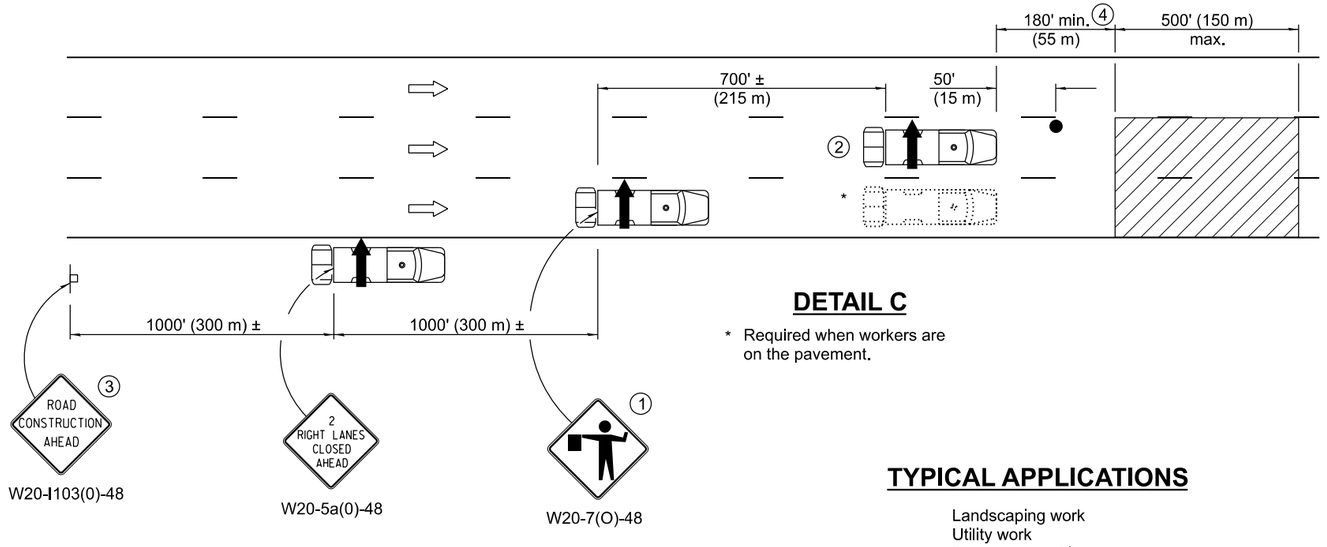
DATE	REVISIONS
1-1-17	Revised END WORK ZONE SPEED
	LIMIT sign. Changed device spacing
	at first arrow board.
4-1-16	Corrected reference to standard
	in note (4).

LANE CLOSURE, MULTILANE, WITH BARRIER, FOR SPEEDS ≥ 45 MPH TO 55 MPH

STANDARD 701423-10



DETAIL A

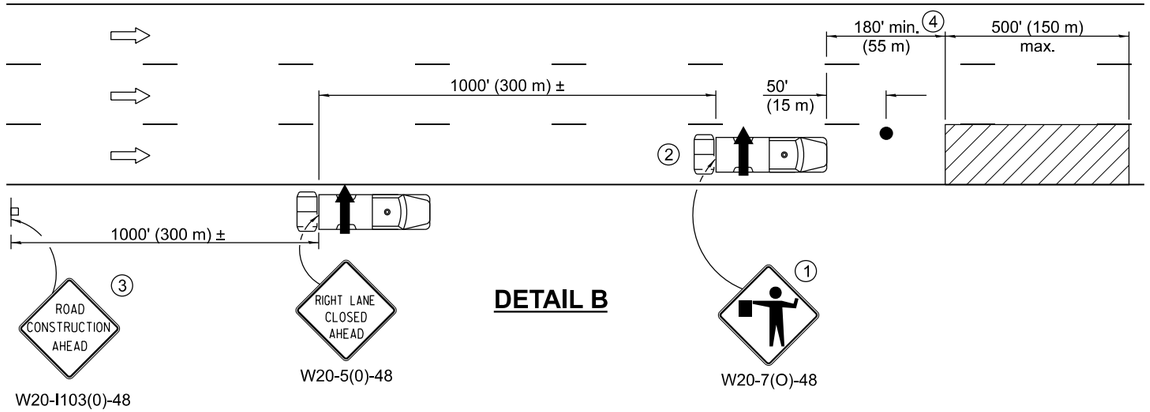


DETAIL C

* Required when workers are on the pavement.

TYPICAL APPLICATIONS

Landscaping work
Utility work
Pavement marking
Weed spraying
Roadometer measurements
Debris cleanup
Crack pouring



DETAIL B

SYMBOLS

- Arrow board
- Work area
- Truck with flashing amber light
- Truck/Trailer mounted attenuator
- Flagger with traffic control sign
- Sign

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-I101-2430
(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.

Illinois Department of Transportation

APPROVED January 1, 2017
ENGINEER OF SAFETY PROG. AND ENGINEERING

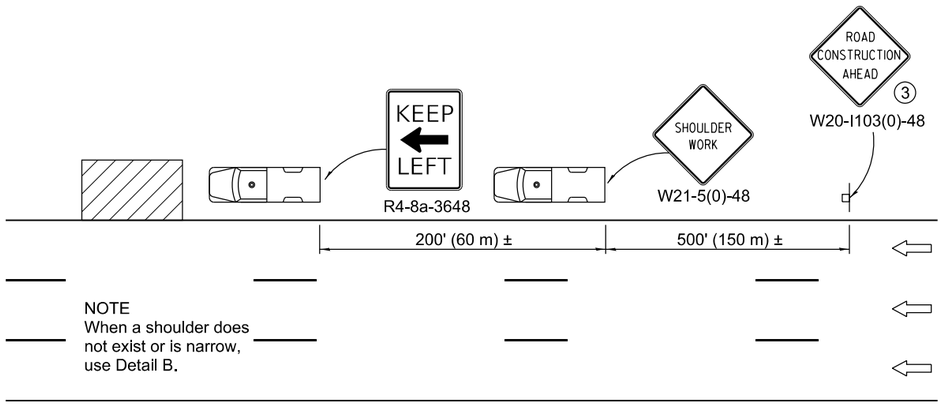
APPROVED January 1, 2017
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

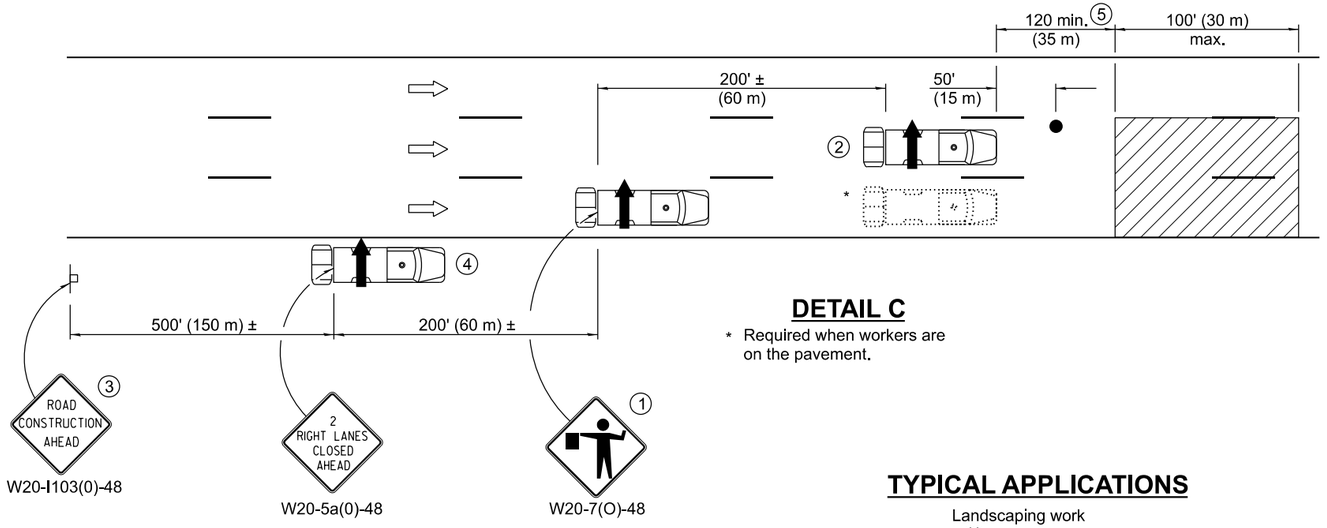
DATE	REVISIONS
1-1-17	Revised 'NOTE' on DETAIL A to
	use DETAIL B in lieu of DETAIL C.
4-1-16	Added trailer option for attenuator
	symbol. Added note ④. Revised
	general notes.

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

STANDARD 701426-09



DETAIL A

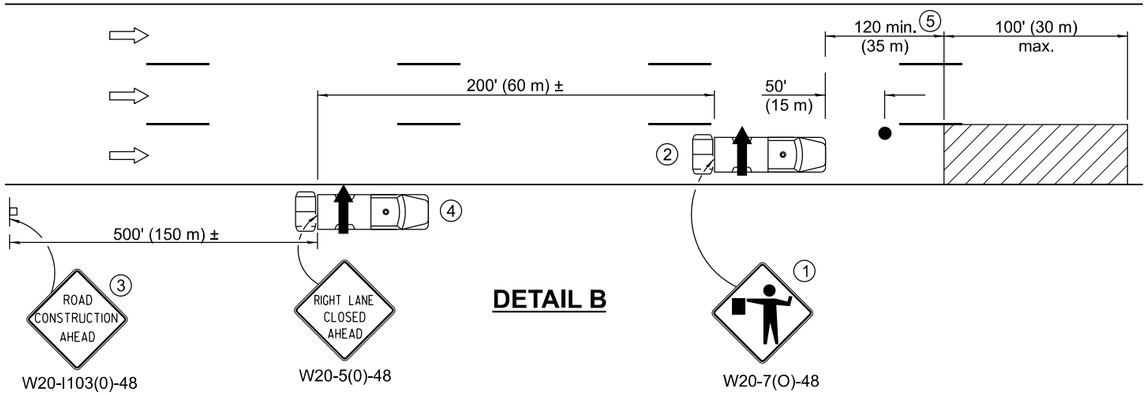


DETAIL C

* Required when workers are on the pavement.

TYPICAL APPLICATIONS

Landscaping work
Utility work
Pavement marking
Weed spraying
Roadometer measurements
Debris cleanup
Crack pouring



DETAIL B

① Flaggers are required when workers are on the pavement.

② For striping operations only. See sign arrow detail on this standard.

③ For stationary operations which are on the roadway or shoulder, greater than 15 minutes and up to 1 hour.

④ Omit truck, attenuator and arrow board when no shoulder exists due to curb and gutter.

⑤ The distance between the work and the lead truck may vary according to terrain or paint/crack sealing time.

G20-I101-2430
(appropriate arrow)
② (when striping only)

SYMBOLS

Arrow board

Work area

Truck with flashing amber light

Truck/Trailer mounted attenuator

Flagger with traffic control sign

Sign

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.

Illinois Department of Transportation

APPROVED January 1, 2017
ENGINEER OF SAFETY PROG. AND ENGINEERING

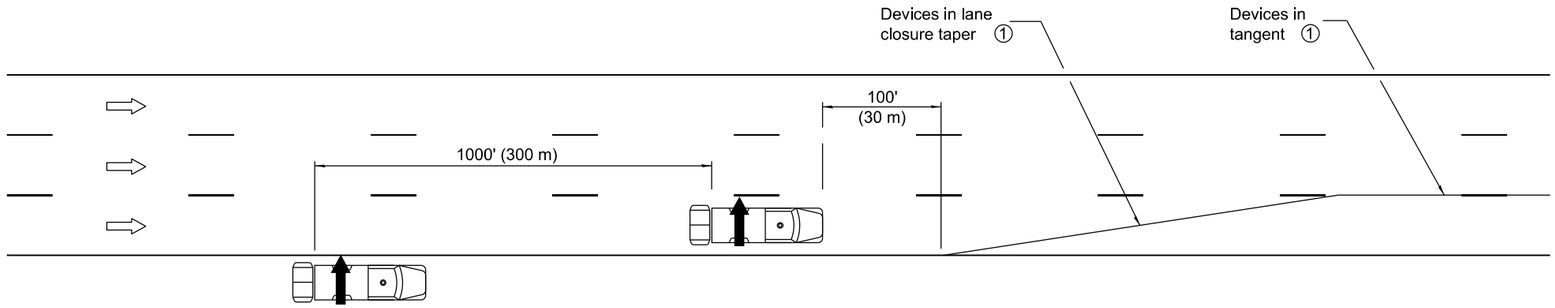
APPROVED January 1, 2017
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-11

DATE	REVISIONS
1-1-17	Revised 'NOTE' on DETAIL A to use
	DETAIL B in lieu of DETAIL C.
4-1-16	Revised general notes. Added note
	⑤ Revised distance between work
	and lead truck.

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

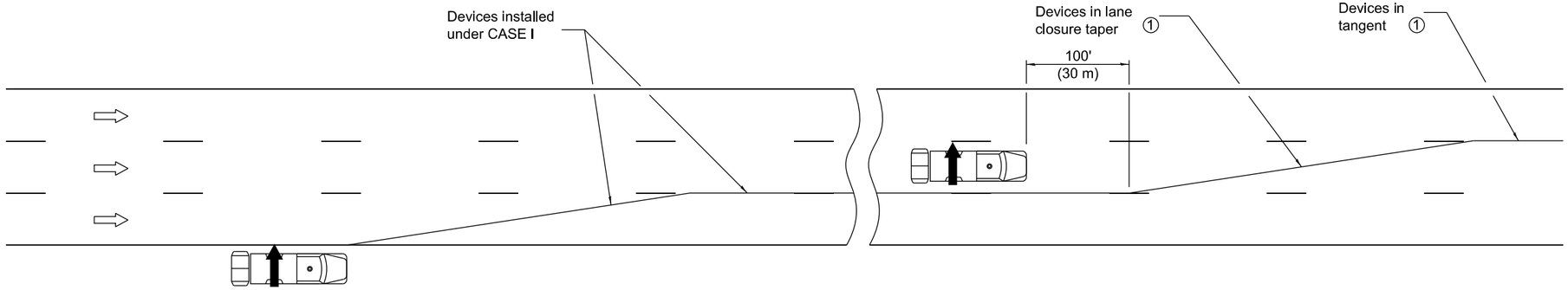
STANDARD 701427-05



① See plans or appropriate Standard for delineating devices, spacing and length of taper/tangent.

CASE I

CASE I depicts the setup of delineating devices for a single outside lane closure.



CASE II

CASE II depicts the setup of delineating devices for a two lane closure. The single lane closure device setup as depicted in CASE I shall be performed prior to the setup for the second lane closure.

SYMBOLS

Arrow board

Truck with flashing amber light

Truck/Trailer mounted attenuator

GENERAL NOTES

This Standard is used for setup and removal of lane closures on freeways/expressways having ADT greater than 25,000.

Trucks with arrow boards and truck-mounted-attenuators shall be in place as shown for the setup and removal of the lane closure taper(s) and the first 100' (30 m) of channelizing devices in the tangent(s).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions arrow board indications shall be directed to the right.

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

Illinois Department of Transportation

APPROVED January 1, 2016
ENGINEER OF SAFETY ENGINEERING

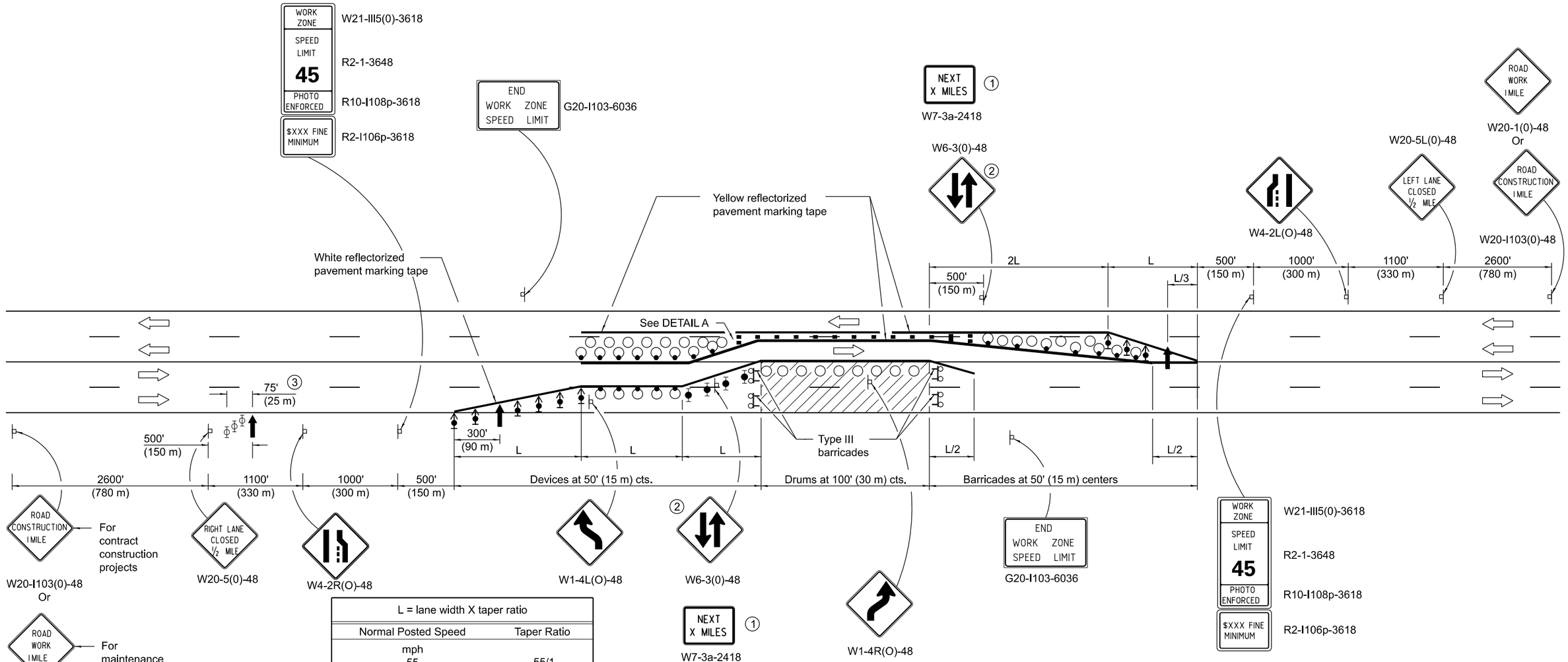
APPROVED January 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

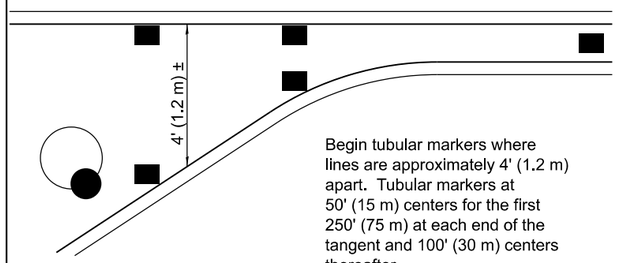
DATE	REVISIONS
4-1-16	Added trailer option for
	attenuator symbol.
1-1-14	New Standard.

TRAFFIC CONTROL SETUP AND REMOVAL FREEWAY/EXPRESSWAY

STANDARD 701428-01



L = lane width X taper ratio	
Normal Posted Speed	Taper Ratio
mph	
55	55/1
45	45/1



Begin tubular markers where lines are approximately 4' (1.2 m) apart. Tubular markers at 50' (15 m) centers for the first 250' (75 m) at each end of the tangent and 100' (30 m) centers thereafter.

DETAIL A

SYMBOLS

- Arrow board
- Work area
- Sign
- Drum with steady burn monodirectional light
- Direction indicator barricade with steady burn monodirectional light
- Type II barricade with steady burn monodirectional light
- Type II barricade, drum or vertical barricade with monodirectional flashing light
- Tubular marker
- Type III barricade with flashing monodirectional lights
- Drum

(1) Shall be repeated every 1 mile (1.6 km).

(2) Shall be repeated every 1 mile (1.6 km) in each direction in the tangent section unless concrete barrier is used.

(3) Three Type II barricades, drums or vertical barricades at 25' (8 m) centers.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities require the closure of two adjacent lanes and a temporary crossover is provided by making use of one lane of pavement normally used by opposing flow of traffic and flexible delineators are used to separate the opposing traffic.

Cones may be substituted for flexible delineators during daytime operations at half the spacing.

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

Illinois Department of Transportation

APPROVED January 1, 2018
ENGINEER OF SAFETY PROG. AND ENGINEERING

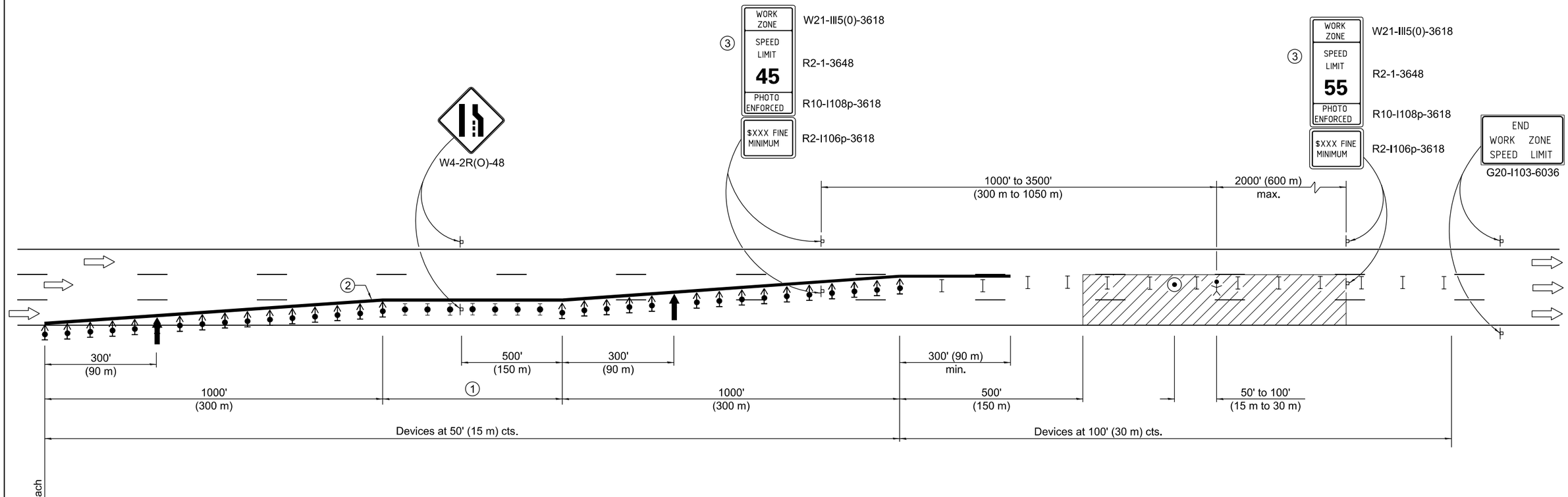
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-18	Omitted lights on drums in tangent for
	westbound traffic and at work area.
1-1-17	Replaced W18-I100 plaque with
	W7-3a plaque. Changed flexible
	delineator to tubular marker.

LANE CLOSURE, MULTILANE, UNDIV. WITH CROSSOVER, FOR SPEEDS ≥ 45 MPH TO 55 MPH

STANDARD 701431-13



SYMBOLS

- Arrow board
- Work area
- Worker
- Sign
- Direction indicator barricade with steady burn monodirectional light
- Type II barricade, drum, or vertical barricade with steady burn monodirectional light
- Spotter
- Type II barricade, drum, or vertical barricade

(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 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.

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF SAFETY PROG. AND ENGINEERING

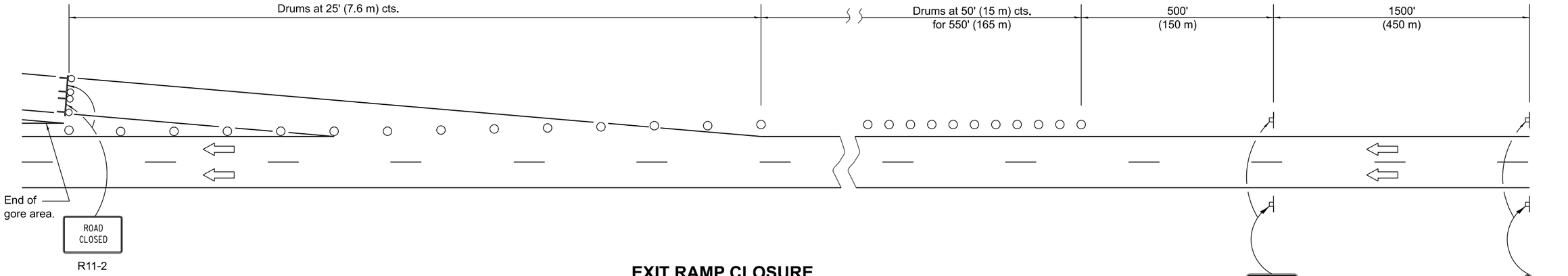
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-05

DATE	REVISIONS
1-1-21	Corrected symbol for type II barricade
	with steady burn monodirectional light
	and altered device spacing callout.
1-1-20	Replaced flagger with spotter.

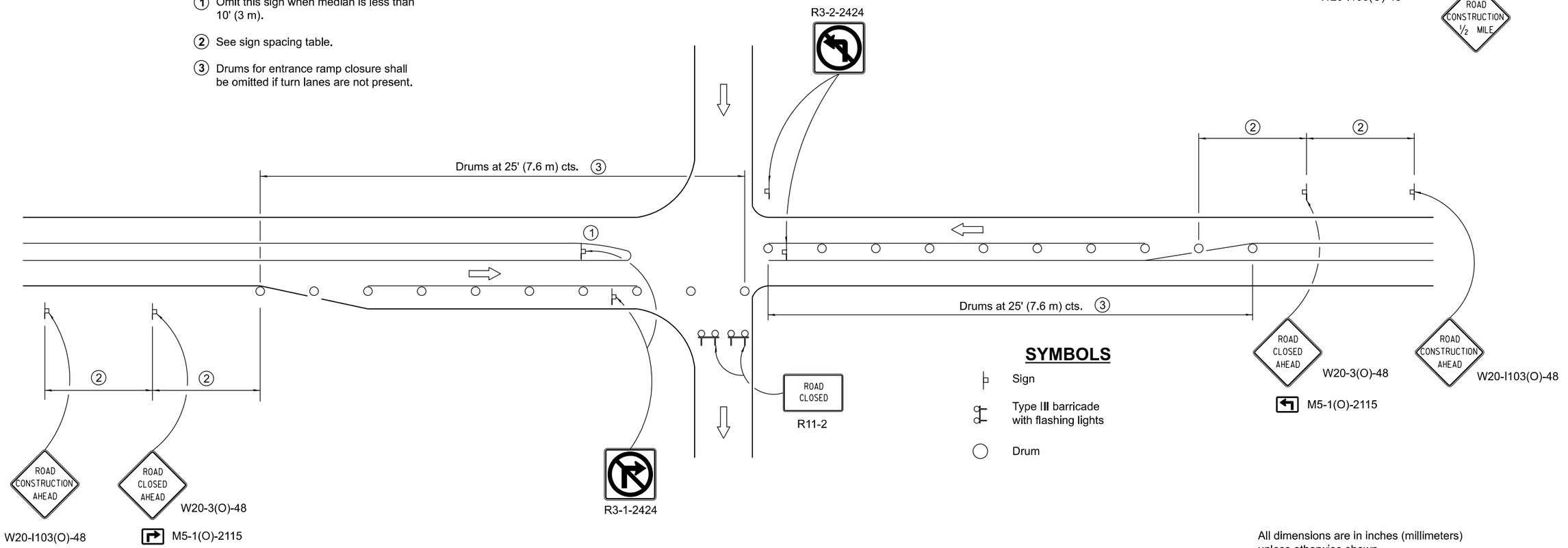
TWO LANE CLOSURE, FREEWAY/EXPRESSWAY

STANDARD 701446-11



EXIT RAMP CLOSURE

1. Omit this sign when median is less than 10' (3 m).
2. See sign spacing table.
3. Drums for entrance ramp closure shall be omitted if turn lanes are not present.



SYMBOLS

- Sign
- Type III barricade with flashing lights
- Drum

ENTRANCE RAMP CLOSURE

SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50 - 45	350' (100 m)
< 45	200' (60 m)

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

Illinois Department of Transportation

APPROVED January 1, 2018
ENGINEER OF SAFETY PROG. AND ENGINEERING

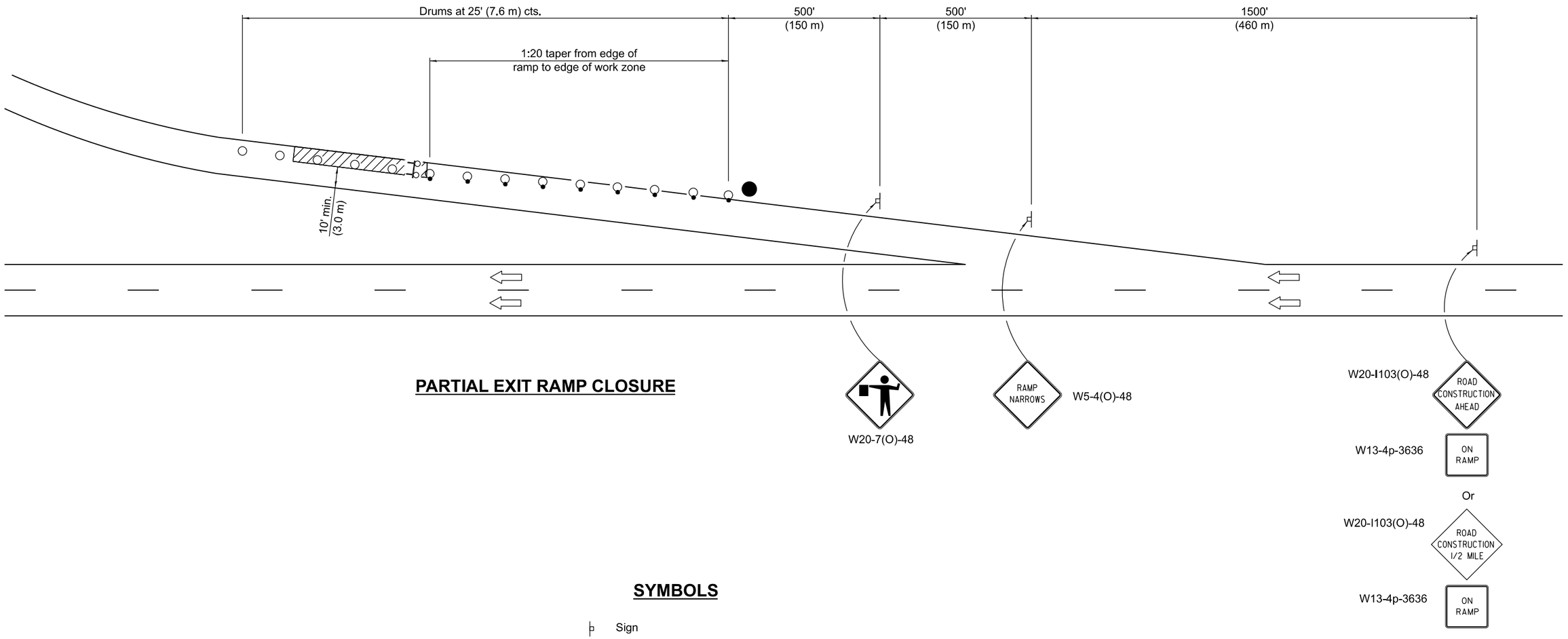
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-09

DATE	REVISIONS
1-1-18	Omitted lights from drums.
1-1-17	Added flashing lights to
	Type III barricade.

RAMP CLOSURE FREEWAY/EXPRESSWAY

STANDARD 701451-05



PARTIAL EXIT RAMP CLOSURE

SYMBOLS

- Sign
- Type III barricade with flashing lights
- Drum with steady burning light
- Work area
- Flagger with traffic control sign
- Drum

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

Illinois Department of Transportation

APPROVED January 1, 2018
ENGINEER OF SAFETY PROG. AND ENGINEERING

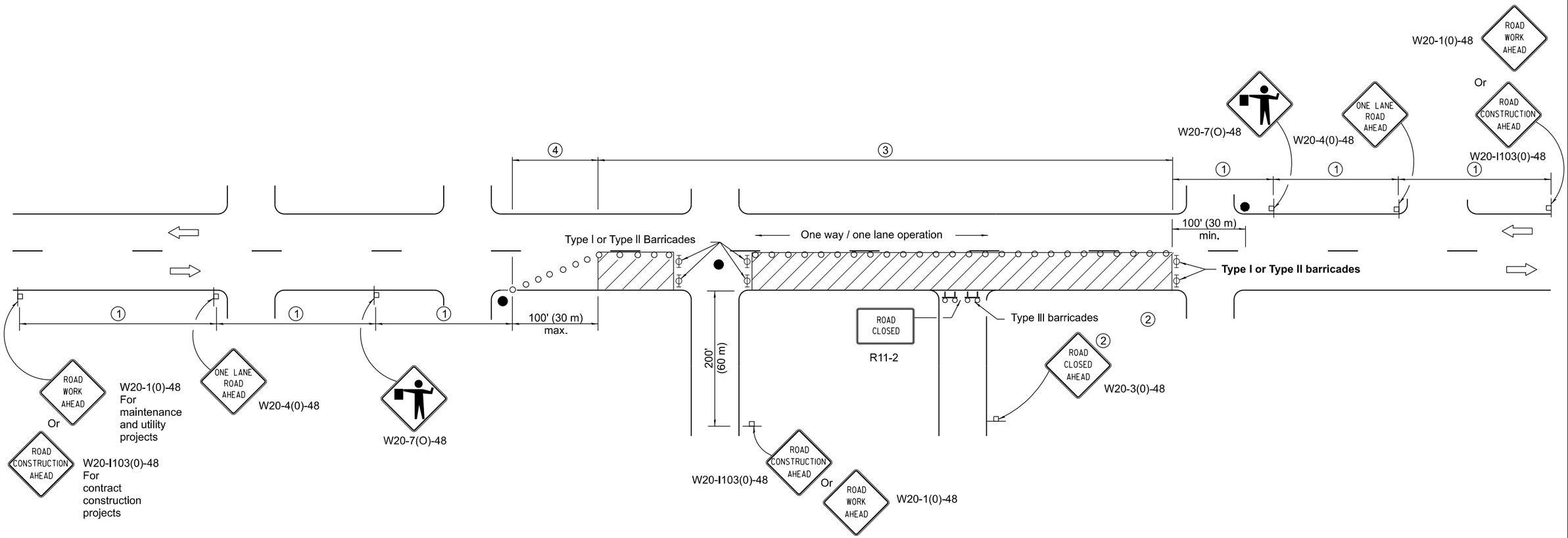
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-09

DATE	REVISIONS
1-1-18	Omitted lights on drums
	in tangent.
1-1-17	Added flashing lights to Type III
	barricade.

PARTIAL EXIT RAMP CLOSURE, FREEWAY/EXPRESSWAY

STANDARD 701456-05



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

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of one traffic lane in an urban area.

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

Illinois Department of Transportation

APPROVED January 1, 2011
ENGINEER OF SAFETY ENGINEERING

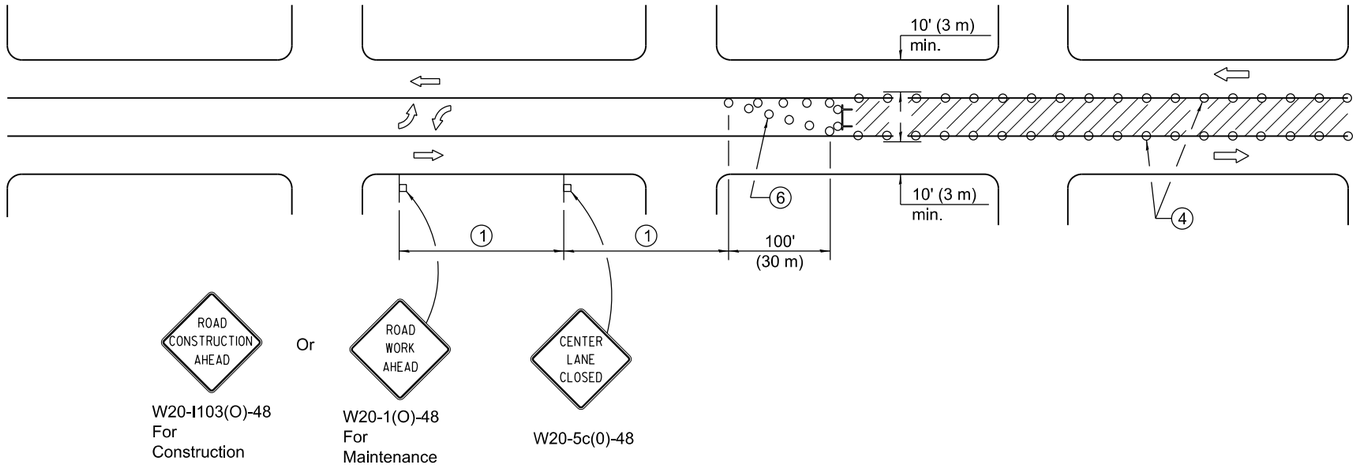
APPROVED January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

URBAN LANE CLOSURE, 2L, 2W, UNDIVIDED

STANDARD 701501-06



CASE I

(Signs required for both directions)

SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Work area
- Barricade or drum with flashing light
- Flagger with traffic control sign
- Cone, drum or barricade
- Sign on portable or permanent support
- Type III barricade with flashing lights

1. Refer to SIGN SPACING TABLE for distances.
2. Required for speeds > 40 mph (70 km/h).
3. Required if work exceeds 500' (164 m) or 1 block.
4. Cones at 25' (8 m) centers for 250' (75 m) on approach. Additional cones may be placed at 50' (15 m) centers. When drums or type I or II barricades are used, the interval between devices may be doubled.
5. For approved sideroad closures.
6. Cones, drums or barricades at 20' (6 m) centers in taper.
7. Use flagger sign only when flagger is present.

GENERAL NOTES

This Standard is used to close one lane of an urban, two lane, two way roadway with a bidirectional turn lane.

Case I applies when no workers are present. When workers are present, two lanes shall be closed and traffic control shall be according to Standard 701501.

Calculate L as follows:

SPEED LIMIT	FORMULAS	
	English	(Metric)
40 mph (70 km/h) or less:	$L=\frac{WS^2}{60}$	$L=\frac{WS^2}{150}$
45 mph (80 km/h) or greater:	L=(W)(S)	L=0.65(W)(S)

W = Width of offset in feet (meters).

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

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

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

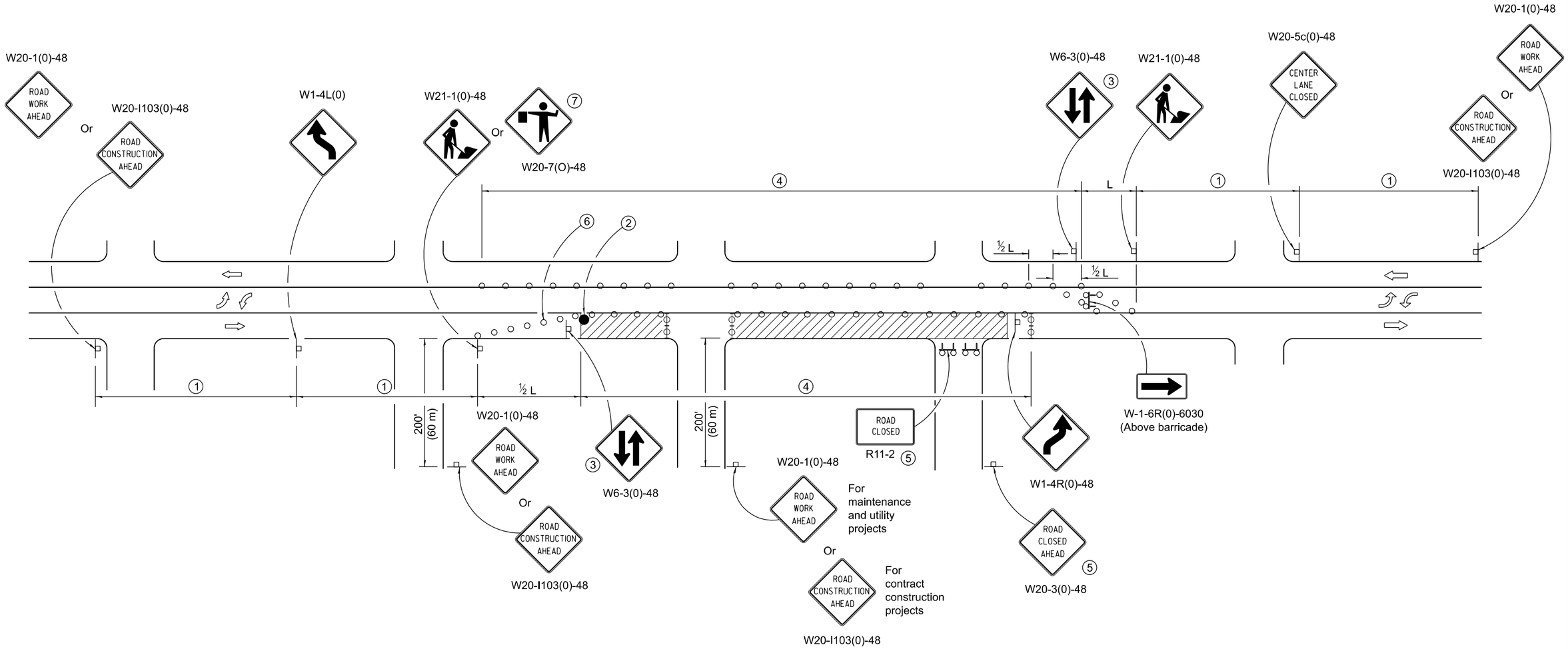
ISSUED 1-1-01

DATE	REVISIONS
1-1-19	Revised to allow cones at night.
1-1-18	Corrected sign number for TWO WAY
	TRAFFIC sign for CASE II.

URBAN LANE CLOSURE, 2L, 2W, WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 1 of 2)

STANDARD 701502-09



CASE II

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

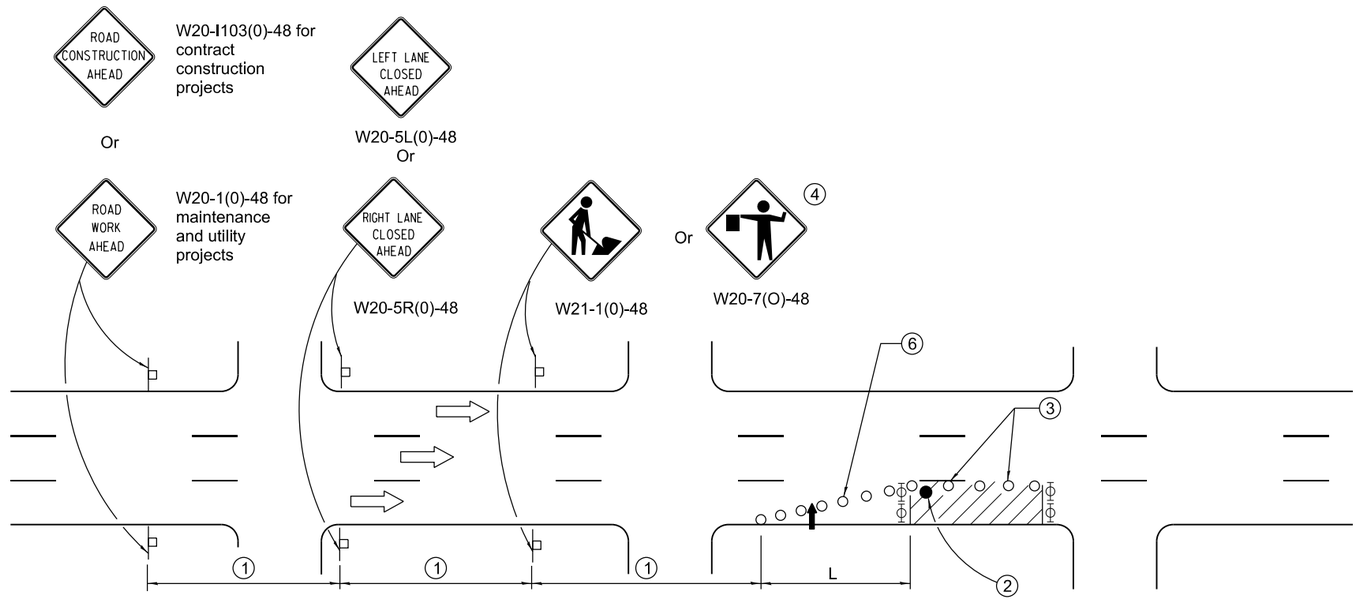
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-01

URBAN LANE CLOSURE, 2L, 2W, WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 2 of 2)

STANDARD 701502-09



SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Arrow board
- Cone, drum or barricade
- Sign on portable or permanent support
- Work area
- Barricade or drum with flashing light
- Type III barricade with flashing lights
- Flagger with traffic control sign.

1. Refer to SIGN SPACING TABLE for distances.
2. Required for speeds > 40 MPH
3. Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.
4. Use flagger sign only when flagger is present.
5. For approved sideroad closures.
6. Cones, drums or barricades at 20' (6 m) in taper.

GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement during shoulder operations or where construction requires lane closures in urban areas.

Calculate L as follows:

SPEED LIMIT

	FORMULAS	
	English	(Metric)
40 mph (70 km/h) or less:	$L=\frac{WS^2}{60}$	$L=\frac{WS^2}{150}$
45 mph (80 km/h) or greater:	L=(W)(S)	L=0.65(W)(S)

W = Width of offset in feet (meters).

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

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

Illinois Department of Transportation

APPROVED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

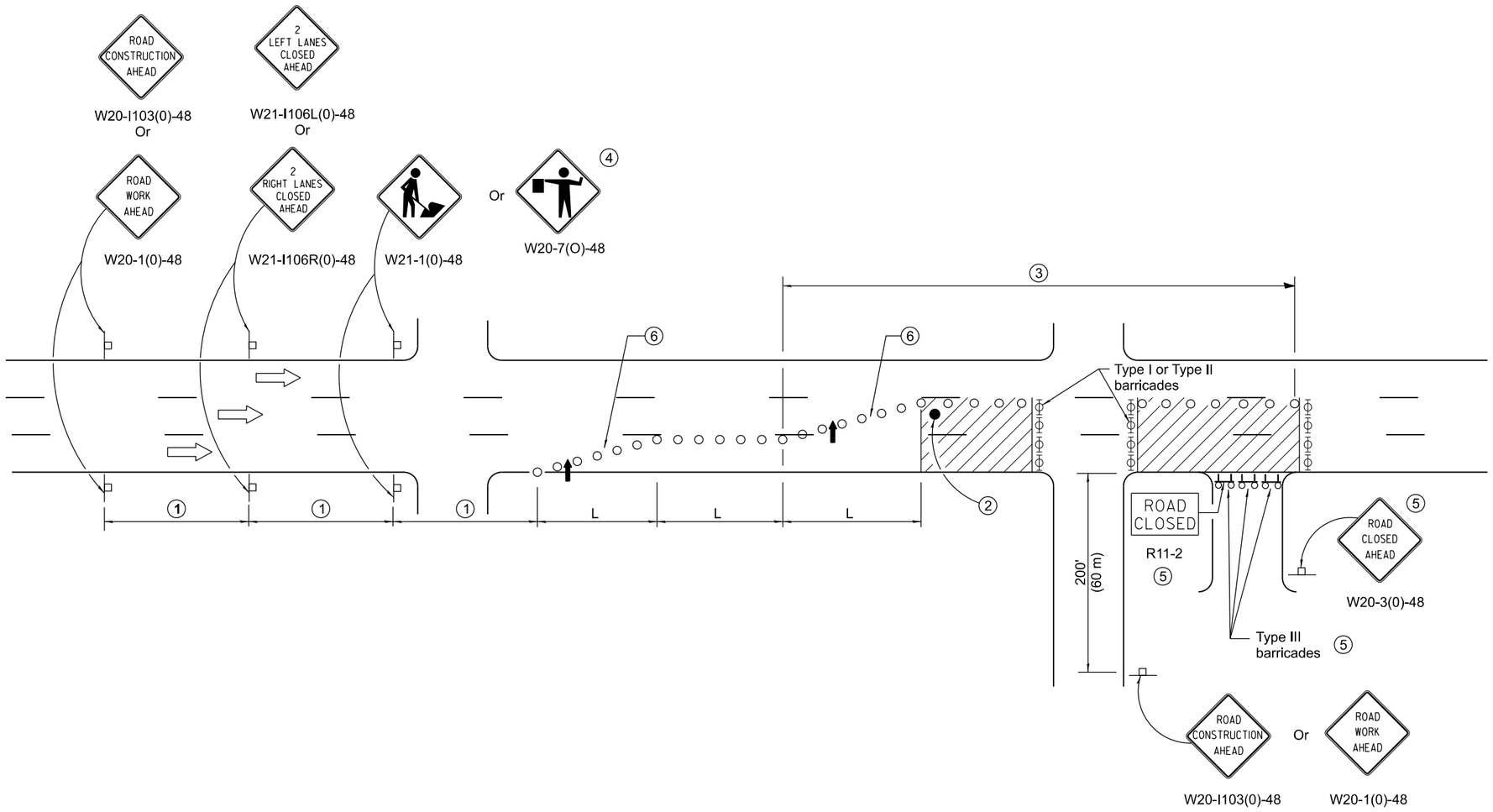
ISSUED 1-1-97

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

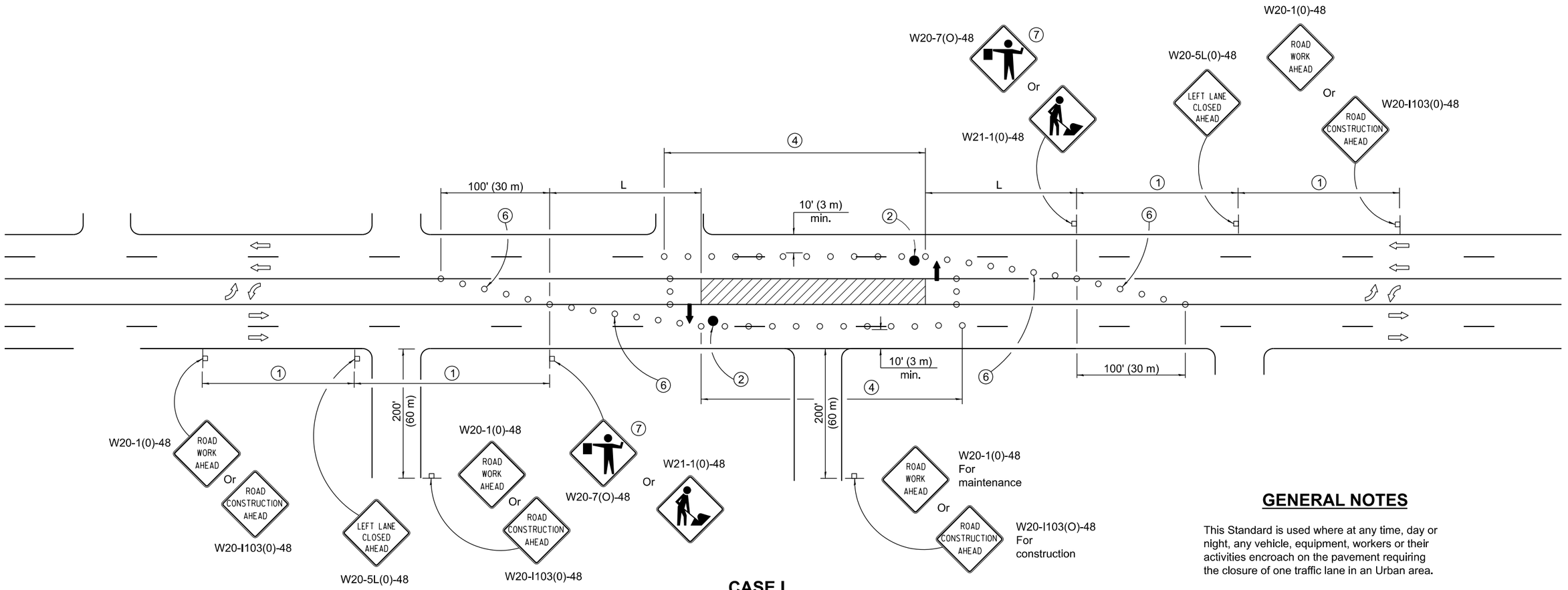
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

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) on approach. Additional cones may be placed at 50' (15 m) centers. When drums or type I or II barricades are used, the interval between devices may be doubled.
5. For approved sideroad closures.
6. Cones, drums or barricades at 20' (6 m) centers in taper.
7. Use flagger sign only when flagger is present.

SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Arrow board
- Work area
- Barricade or drum with steady burning mondirectional light
- Flagger with traffic control sign
- Cone, drum or barricade
- Sign on portable or permanent support
- Type III barricade with flashing lights

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	FORMULAS (Metric)
40 mph (70 km/h) or less:	$L=\frac{WS^2}{60}$	$L=\frac{WS^2}{150}$
45 mph (80 km/h) or greater:	L=(W)(S)	L=0.65(W)(S)

W = Width of offset in feet (meters).

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

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

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

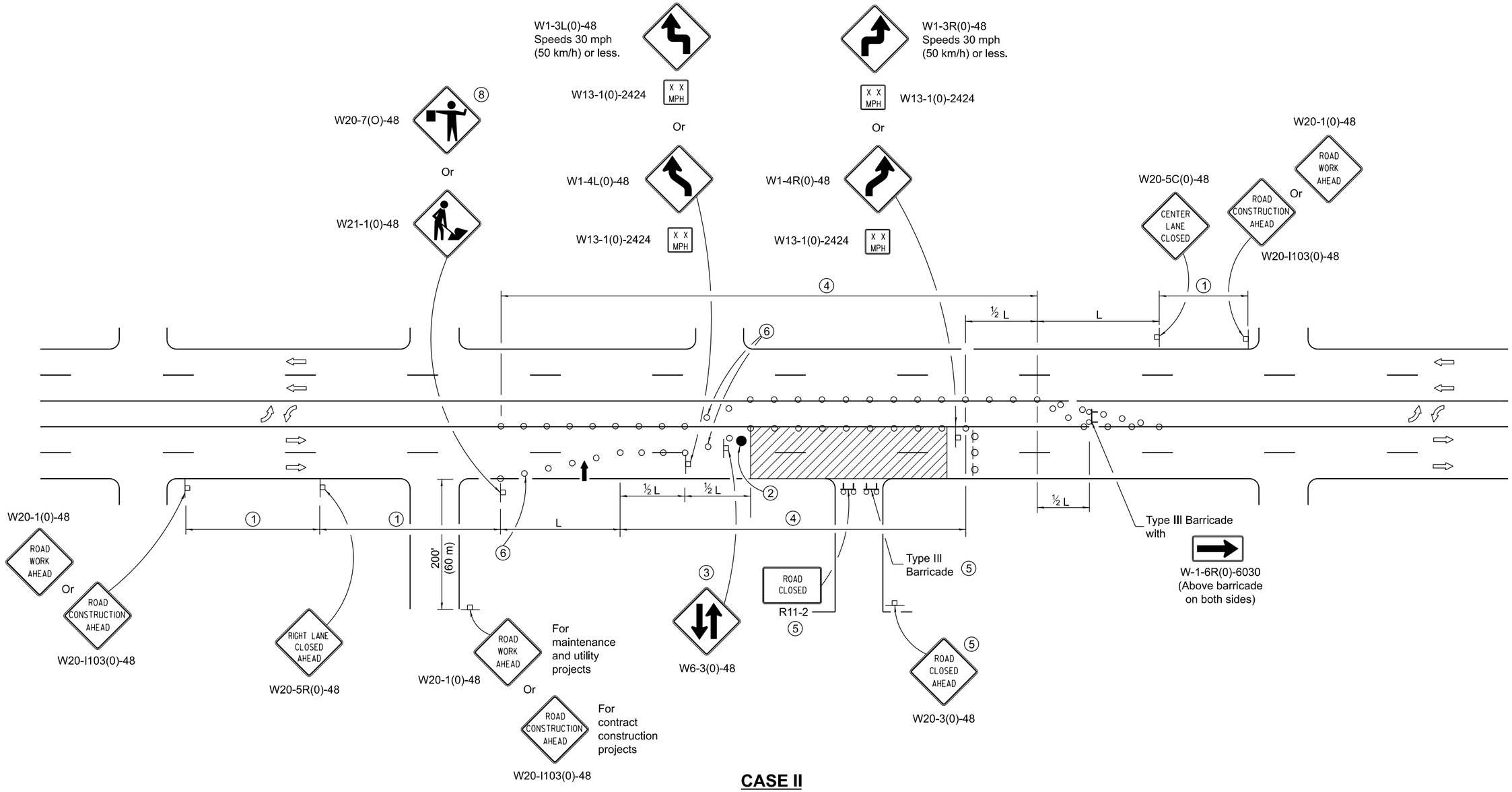
ISSUED 1-1-13

DATE	REVISIONS
1-1-19	Revised to allow cones at night.
1-1-18	Moved arrow boards into closed
	lanes for CASE I.

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 1 of 4)

STANDARD 701602-10



CASE II

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

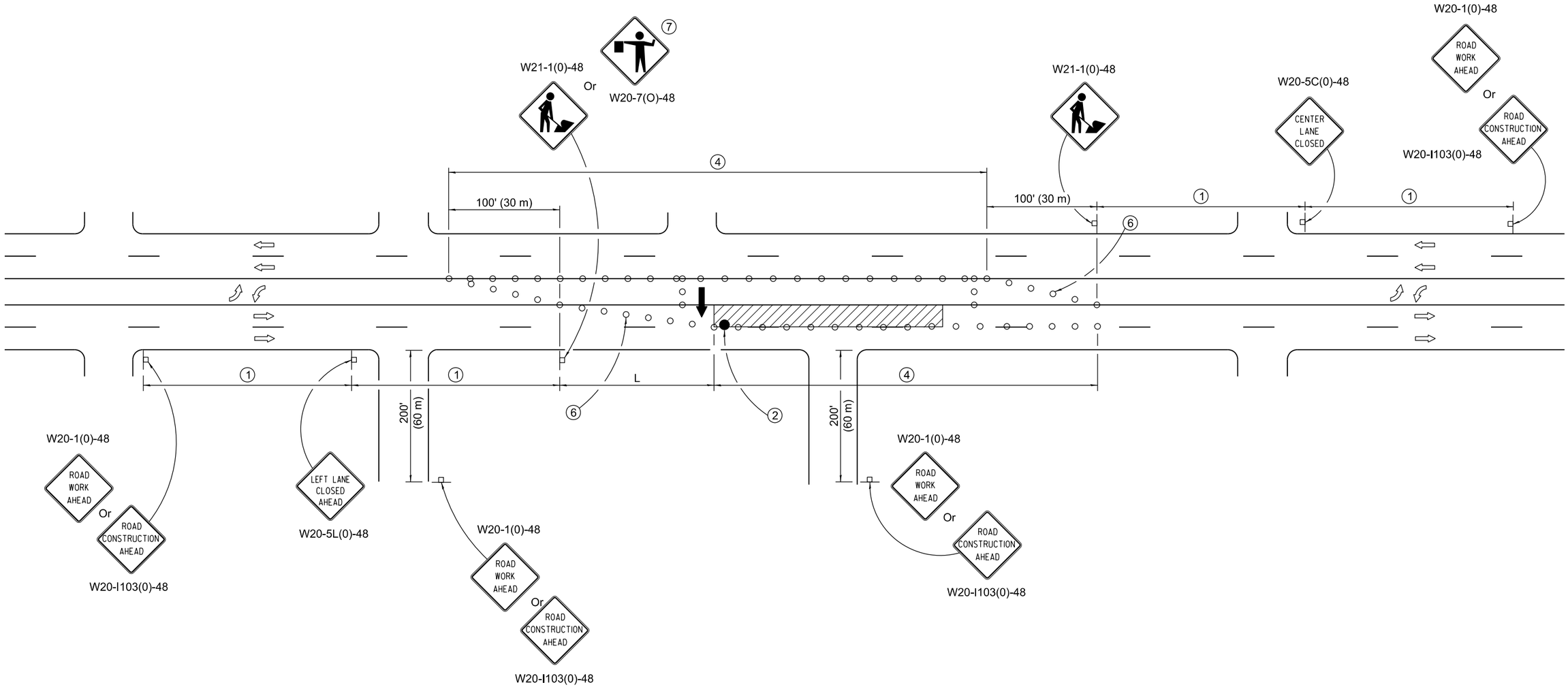
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 2 of 4)

STANDARD 701602-10



CASE III

Illinois Department of Transportation

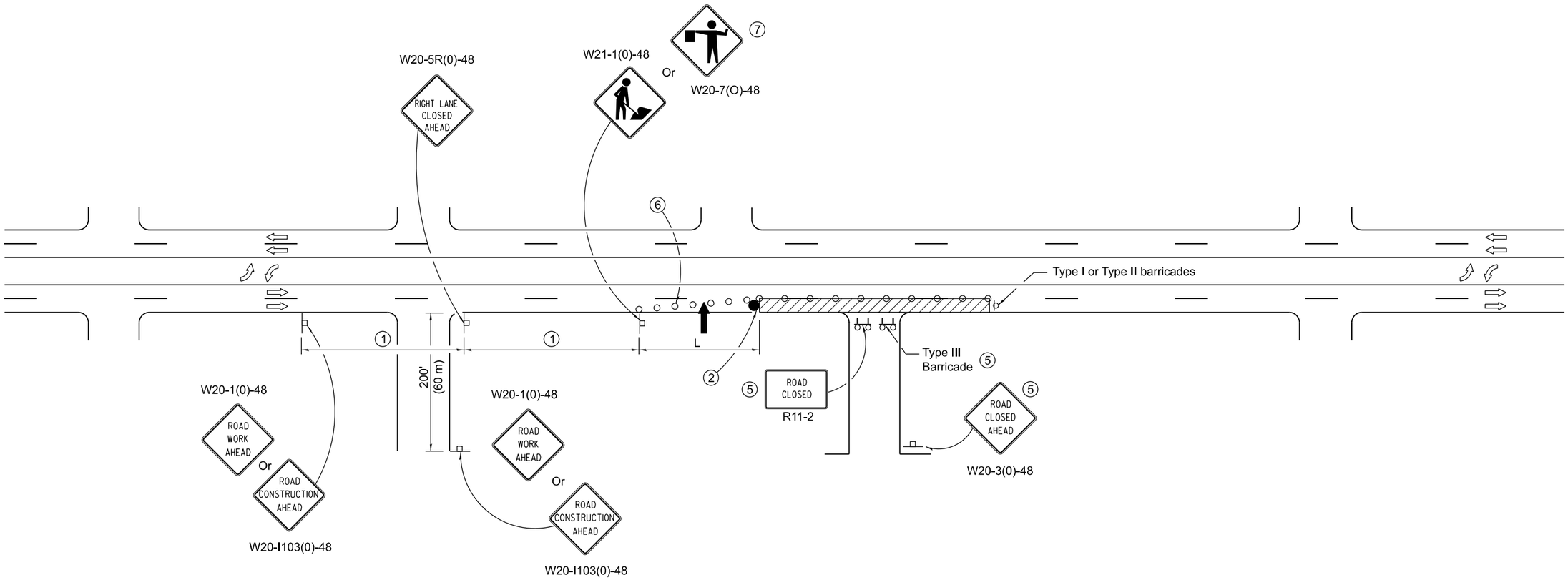
APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

STANDARD 701602-10



CASE IV

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

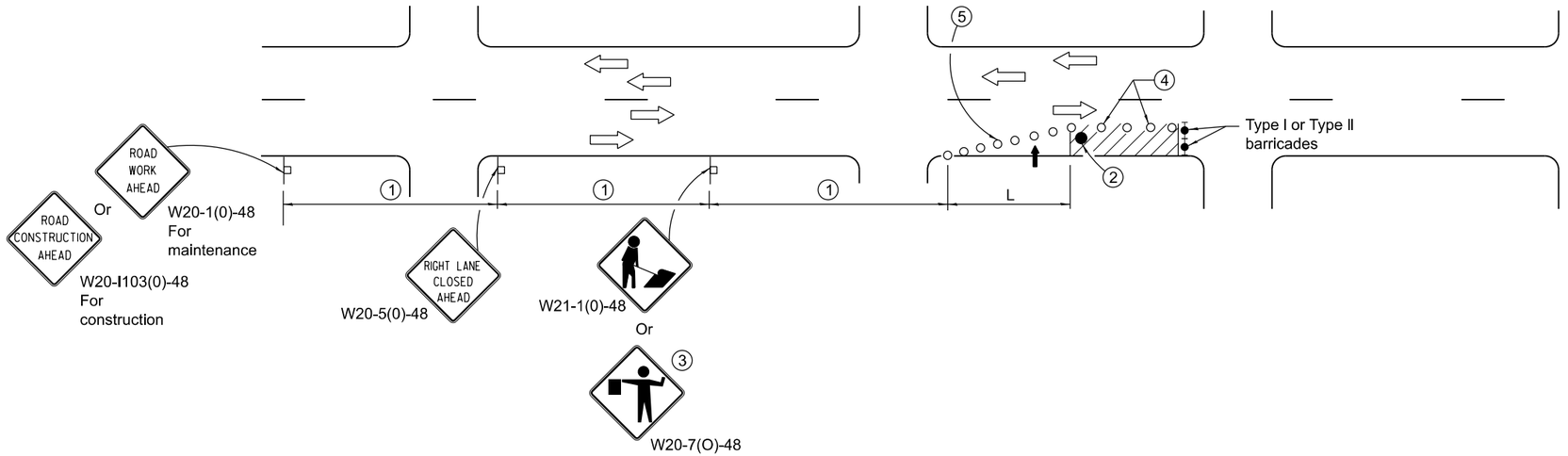
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 4 of 4)

STANDARD 701602-10



SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Arrow board
- Cone, drum or barricade
- Sign on portable or permanent support
- Work area
- Barricade or drum with flashing light
- Flagger with traffic control sign.

1. Refer to SIGN SPACING TABLE for distances.
2. Required for speeds > 40 mph.
3. Use flagger sign only when flagger is present.
4. Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.
5. Cones, drums or barricades at 20' (6 m) centers in taper.

GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of one traffic lane in an Urban area.

Calculate L as follows:

SPEED LIMIT

FORMULAS

	English	(Metric)
40 mph (70 km/h) or less:	$L=\frac{WS^2}{60}$	$L=\frac{WS^2}{150}$
45 mph (80 km/h) or greater:	L=(W)(S)	L=0.65(W)(S)

W = Width of offset in feet (meters).

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

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

Illinois Department of Transportation

APPROVED January 1, 2015
ENGINEER OF SAFETY ENGINEERING

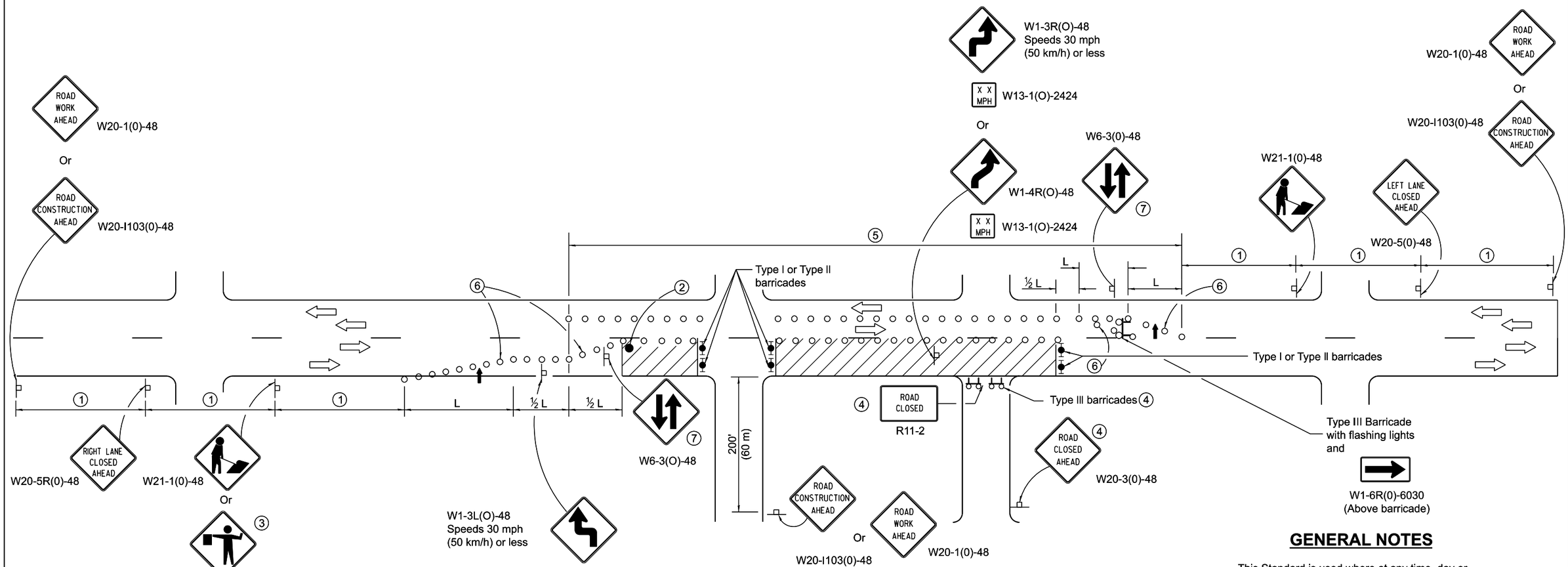
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

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



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. Use flagger sign only when flagger is present.
4. For approved sideroad closures.
5. Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.
6. Cones, drums or barricades at 20' (6 m) centers in taper.
7. Repeat every 1 mile (1.6 km).

GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of more than one traffic lane in an Urban area.

Calculate L as follows:

SPEED LIMIT

	FORMULAS	
	English	(Metric)
40 mph (70 km/h) or less:	$L=\frac{WS^2}{60}$	$L=\frac{WS^2}{150}$
45 mph (80 km/h) or greater:	L=(W)(S)	L=0.65(W)(S)

W = Width of offset in feet (meters).

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

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

Illinois Department of Transportation

APPROVED January 1, 2016
ENGINEER OF SAFETY ENGINEERING

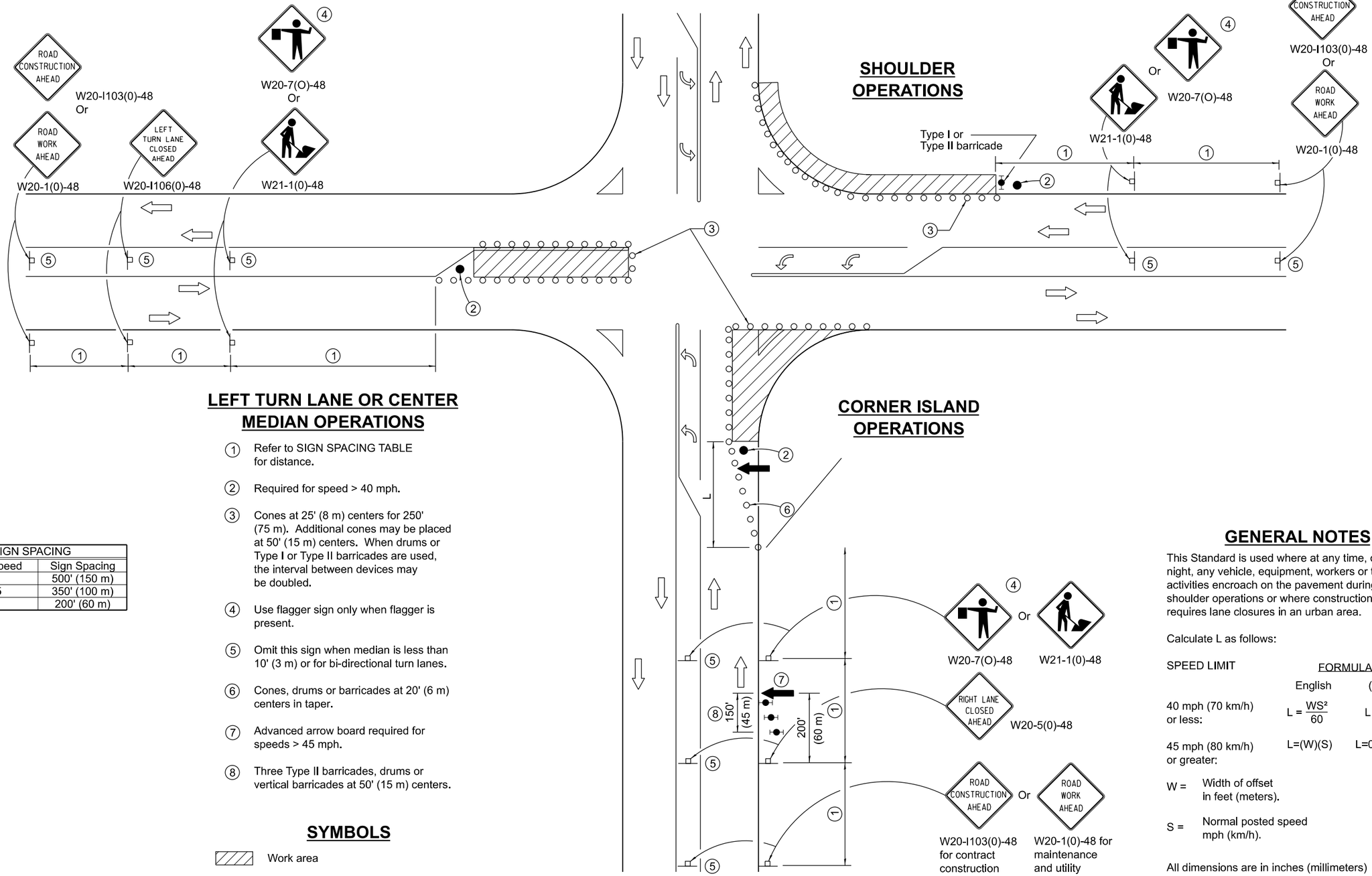
APPROVED January 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-15

DATE	REVISIONS
4-1-16	Moved first reverse curve/turn
	sign to middle of tangent.
1-1-15	New Standard.

URBAN HALF ROAD CLOSURE, MULTILANE, 2W WITH MOUNTABLE MEDIAN

STANDARD 701611-01



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

GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement during shoulder operations or where construction requires lane closures in an urban area.

Calculate L as follows:

SPEED LIMIT	FORMULAS	
	English	(Metric)
40 mph (70 km/h) or less:	$L = \frac{WS^2}{60}$	$L = \frac{WS^2}{150}$
45 mph (80 km/h) or greater:	L=(W)(S)	L=0.65(W)(S)

W = Width of offset in feet (meters).

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

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

Illinois Department of Transportation

APPROVED April 1, 2016
ENGINEER OF SAFETY ENGINEERING

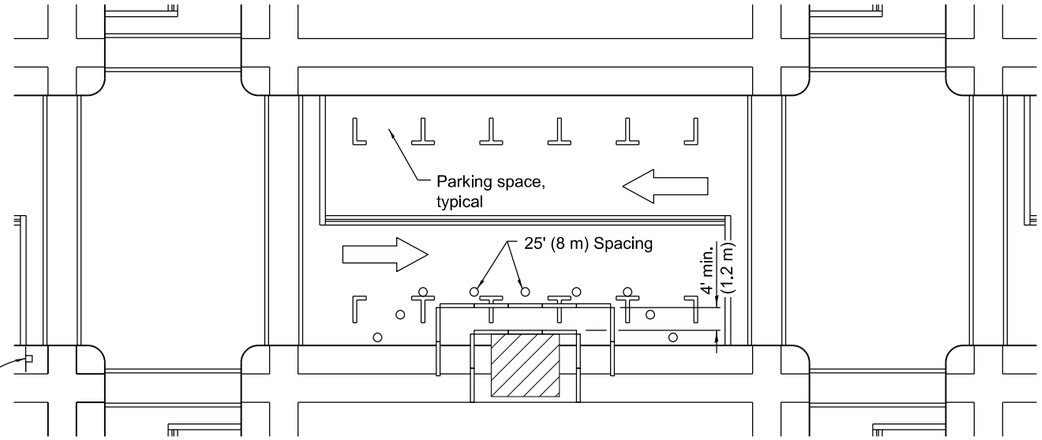
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
4-1-16	Corrected sign number for LEFT
	TURN LANE CLOSED AHEAD.
1-1-14	Added devices at arrow board
	upstream from taper. Revised
	workers sign number.

URBAN LANE CLOSURE, MULTILANE INTERSECTION

STANDARD 701701-10



① ROAD CONSTRUCTION AHEAD

W20-I103(0)-48 for contract construction projects

Or

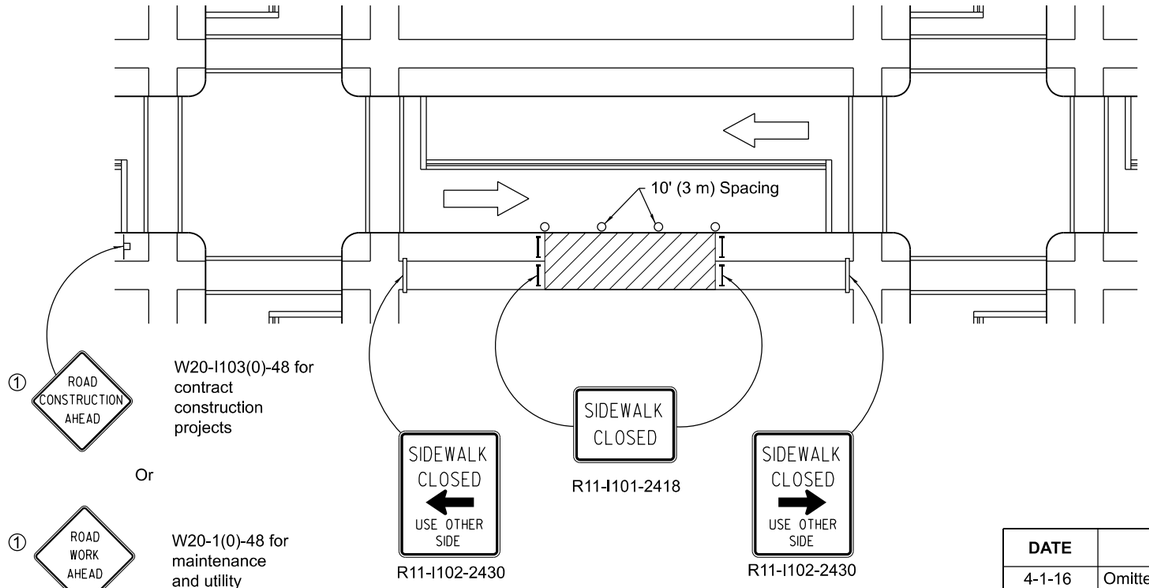
① ROAD WORK AHEAD

W20-1(0)-48 for maintenance and utility projects

SIDEWALK DIVERSION

SYMBOLS

- Work area
- Sign on portable or permanent support
- Barricade or drum
- Cone, drum or barricade
- Type III barricade
- Detectable pedestrian channelizing barricade



① ROAD CONSTRUCTION AHEAD

W20-I103(0)-48 for contract construction projects

Or

① ROAD WORK AHEAD

W20-1(0)-48 for maintenance and utility projects

R11-I101-2418

R11-I102-2430

R11-I102-2430

SIDEWALK CLOSURE

① Omit whenever duplicated by road work traffic control.

GENERAL NOTES

This Standard is used where, at any time, pedestrian traffic must be rerouted due to work being performed.

This Standard must be used in conjunction with other Traffic Control & Protection Standards when roadway traffic is affected.

Temporary facilities shall be detectable and accessible.

The temporary pedestrian facilities shall be provided on the same side of the closed facilities whenever possible.

The SIDEWALK CLOSED / USE OTHER SIDE sign shall be placed at the nearest crosswalk or intersection to each end of the closure. Where the closure occurs at a corner, the signs shall be erected on the corners across the street from the closure. The SIDEWALK CLOSED signs shall be used at the ends of the actual closures.

Type III barricades and R11-2-4830 signs shall be positioned as shown in "ROAD CLOSED TO ALL TRAFFIC" detail on Standard 701901.

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

Illinois Department of Transportation

APPROVED January 1, 2016
ENGINEER OF SAFETY ENGINEERING

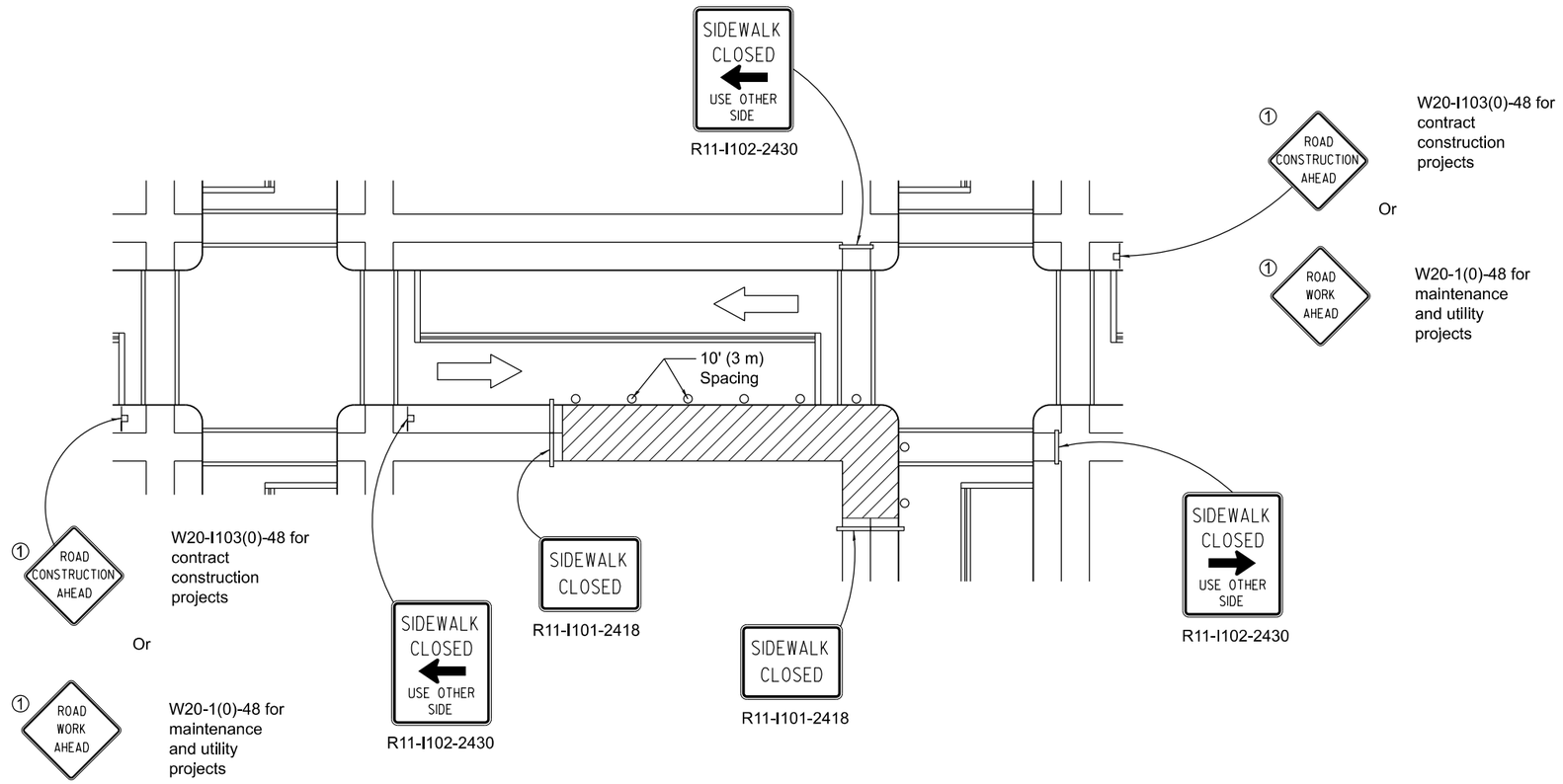
APPROVED January 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

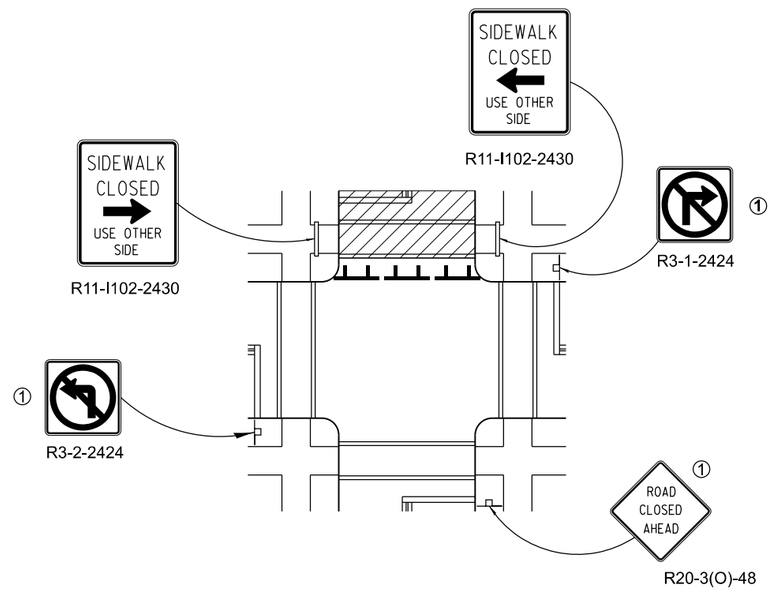
DATE	REVISIONS
4-1-16	Omitted orange safety fence from
	standard as this is covered in
	the standard spec.
1-1-12	Added SIDEWALK DIVERSION.
	Modified appearance of plan views.
	Renamed Standard.

SIDEWALK, CORNER OR CROSSWALK CLOSURE

STANDARD 701801-06



CORNER CLOSURE



CROSSWALK CLOSURE

Illinois Department of Transportation

APPROVED January 1, 2016
ENGINEER OF SAFETY ENGINEERING

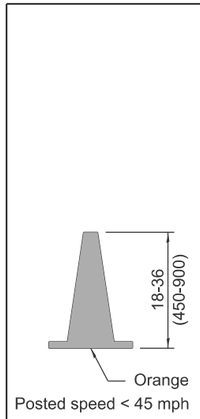
APPROVED January 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

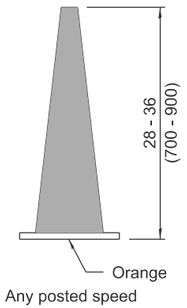
ISSUED 1-1-97

SIDEWALK, CORNER OR CROSSWALK CLOSURE

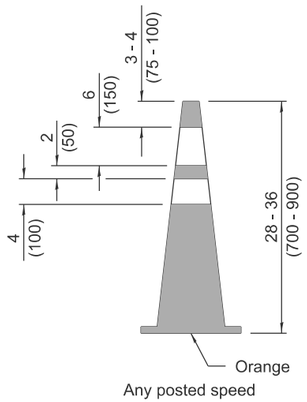
(Sheet 2 of 2)

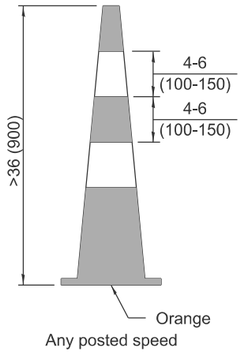
STANDARD 701801-06





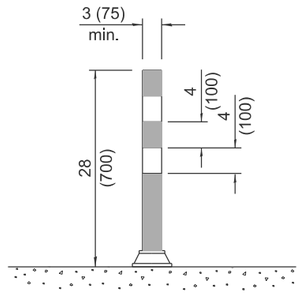
DAYTIME USE



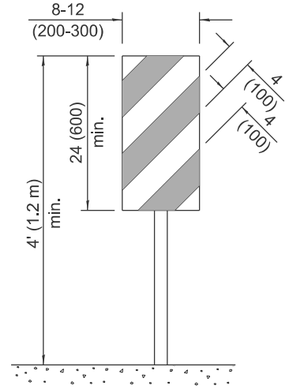


DAY OR NIGHTTIME USE

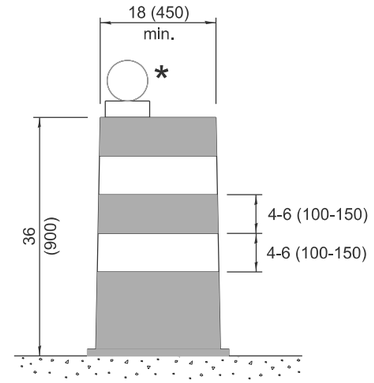
CONES



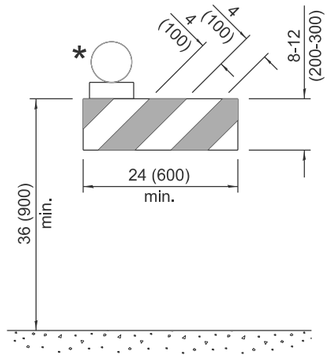
TUBULAR MARKER



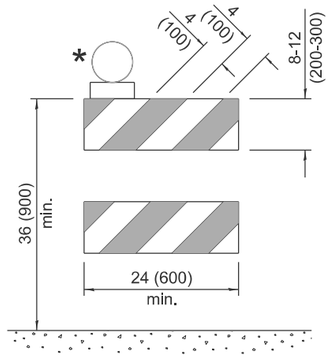
VERTICAL PANEL
POST MOUNTED



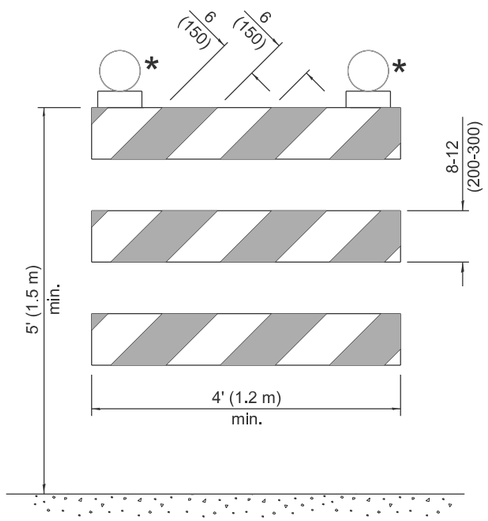
DRUM



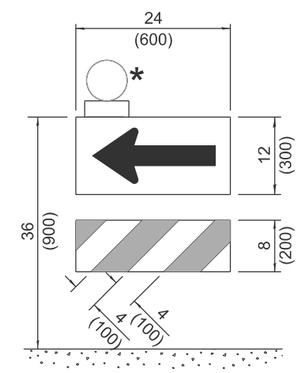
TYPE I BARRICADE



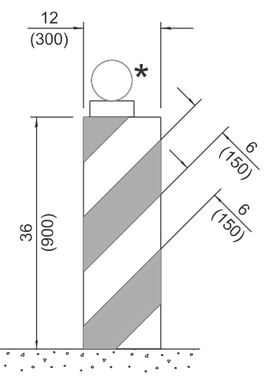
TYPE II BARRICADE



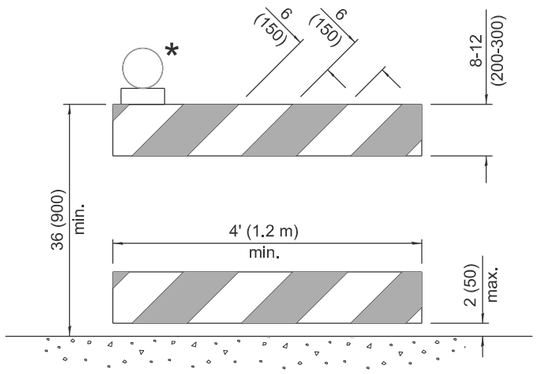
TYPE III BARRICADE



DIRECTION INDICATOR BARRICADE



VERTICAL BARRICADE



DETECTABLE PEDESTRIAN CHANNELIZING BARRICADE

* Warning lights (if required)

GENERAL NOTES

All heights shown shall be measured above the pavement surface.

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

Illinois Department of Transportation

APPROVED January 1, 2025
ENGINEER OF SAFETY PROG. AND ENGINEERING

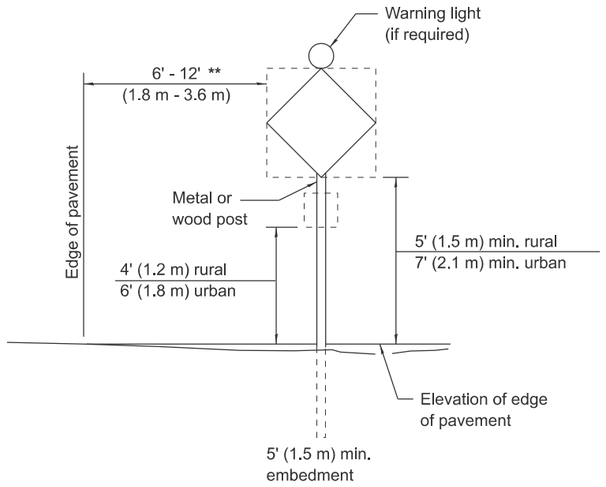
APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

DATE	REVISIONS
1-1-25	Updated Temporary Rumble
	Strip Detail (sht. 3).
1-1-24	Revised Type III Barricade notes
	(sht. 3) & moved warning light on
	post mounted signs to top center.

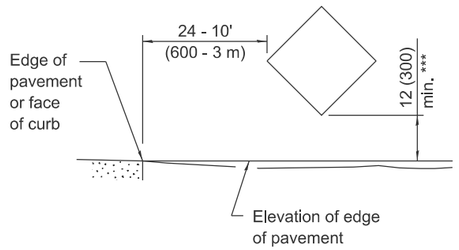
TRAFFIC CONTROL DEVICES

STANDARD 701901-10



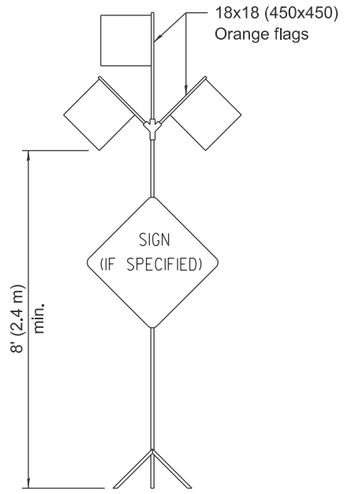
POST MOUNTED SIGNS

** When curb or paved shoulder are present this dimension shall be 24 (600) to the face of curb or 6' (1.8 m) to the outside edge of the paved shoulder.



SIGNS ON TEMPORARY SUPPORTS

*** When work operations exceed four days, this dimension shall be 5' (1.5 m) min. If located behind other devices, the height shall be sufficient to be seen completely above the devices.



HIGH LEVEL WARNING DEVICE

G20-I104(0)-6036

G20-I105(0)-6024

This signing is required for all projects 2 miles (3200 m) or more in length.

ROAD CONSTRUCTION NEXT X MILES sign shall be placed 500' (150 m) in advance of project limits.

END CONSTRUCTION sign shall be erected at the end of the job unless another job is within 2 miles (3200 m).

Dual sign displays shall be utilized on multi-lane highways.

WORK LIMIT SIGNING

W21-III5(0)-3618

R2-1-3648

R10-I108p-3618 ****

R2-I106p-3618

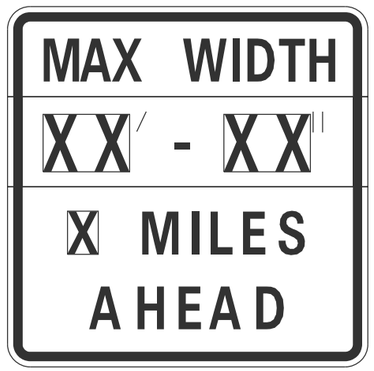
Sign assembly as shown on Standards or as allowed by District Operations.

G20-I103-6036

This sign shall be used when the above sign assembly is used.

HIGHWAY CONSTRUCTION SPEED ZONE SIGNS

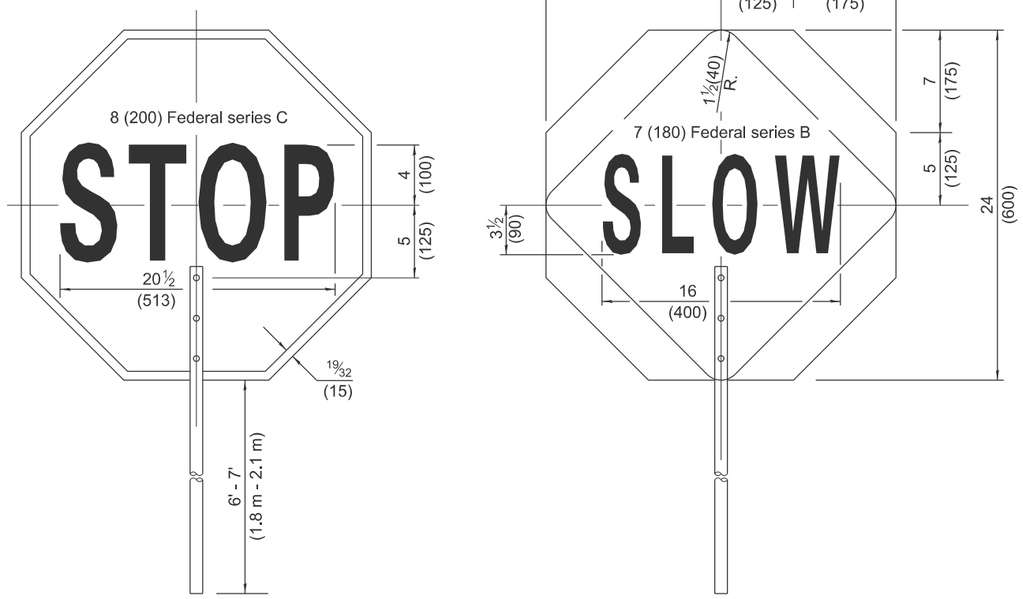
**** R10-I108p shall only be used along roadways under the juristiction of the State.



W12-I103-4848

WIDTH RESTRICTION SIGN

XX'-XX" width and X miles are variable.



FRONT SIDE

REVERSE SIDE

FLAGGER TRAFFIC CONTROL SIGN

Illinois Department of Transportation

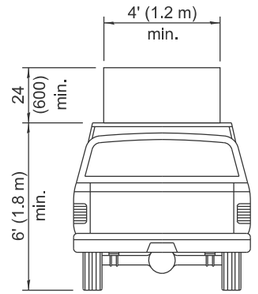
APPROVED January 1, 2025
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

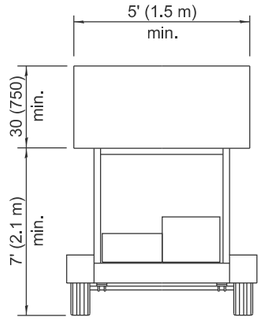
ISSUED 1-1-13

TRAFFIC CONTROL DEVICES

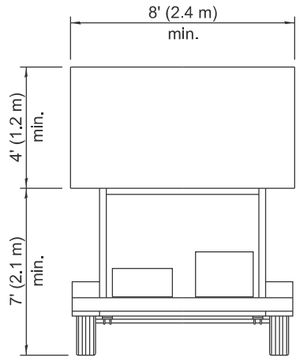
STANDARD 701901-10



TYPE A
ROOF
MOUNTED

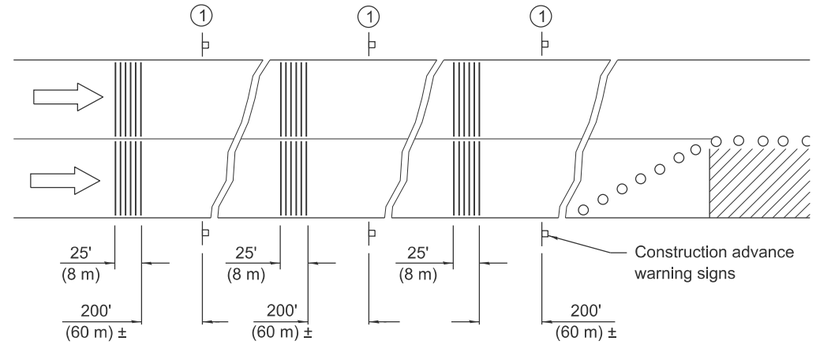


TYPE B
ROOF OR TRAILER
MOUNTED

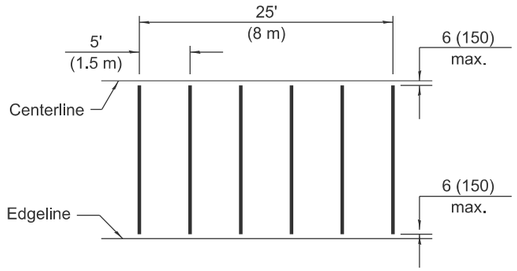


TYPE C
TRAILER
MOUNTED

ARROW BOARDS

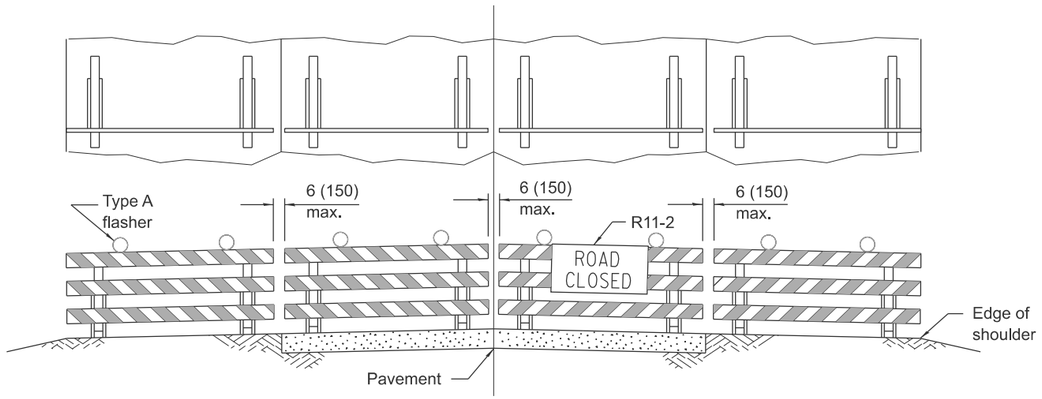


(1) This sign shall be omitted when median width is less than 10' (3 m).



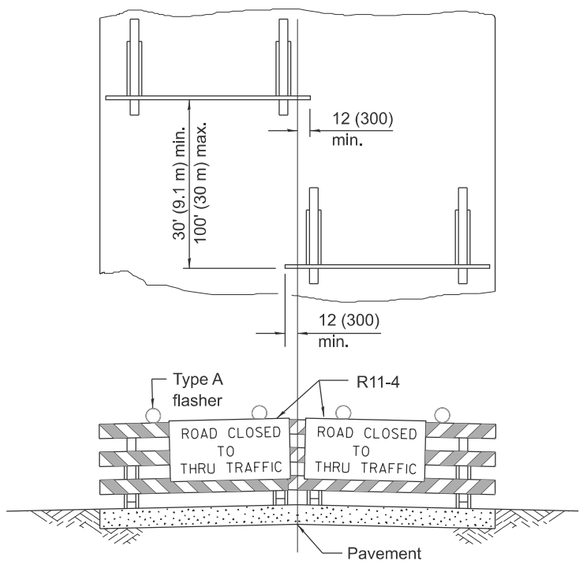
TYPICAL INSTALLATION

TEMPORARY RUMBLE STRIPS



ROAD CLOSED TO ALL TRAFFIC

Reflectorized striping may be omitted on the back side of the barricades.



ROAD CLOSED TO THRU TRAFFIC

Reflectorized striping shall appear on both sides of the barricades.

TYPICAL APPLICATIONS OF TYPE III BARRICADES CLOSING A ROAD

If a Type III barricade with an attached sign panel which meets NCHRP 350 or MASH is not available, the sign may be mounted on an NCHRP 350 or MASH temporary sign support directly in front of the barricade.

Illinois Department of Transportation

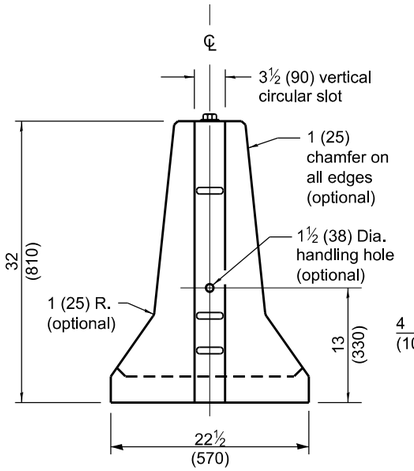
APPROVED January 1, 2025
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

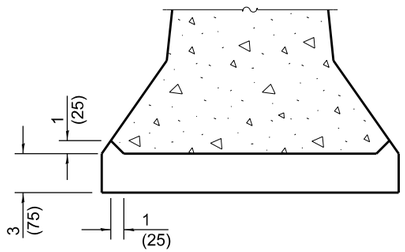
ISSUED 1-1-13

TRAFFIC CONTROL DEVICES

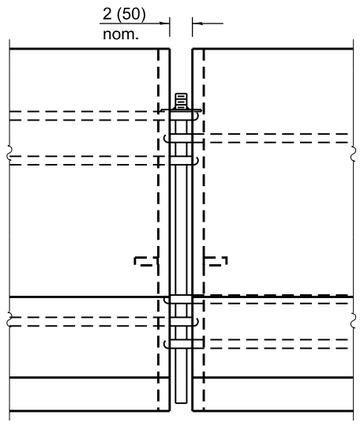
STANDARD 701901-10



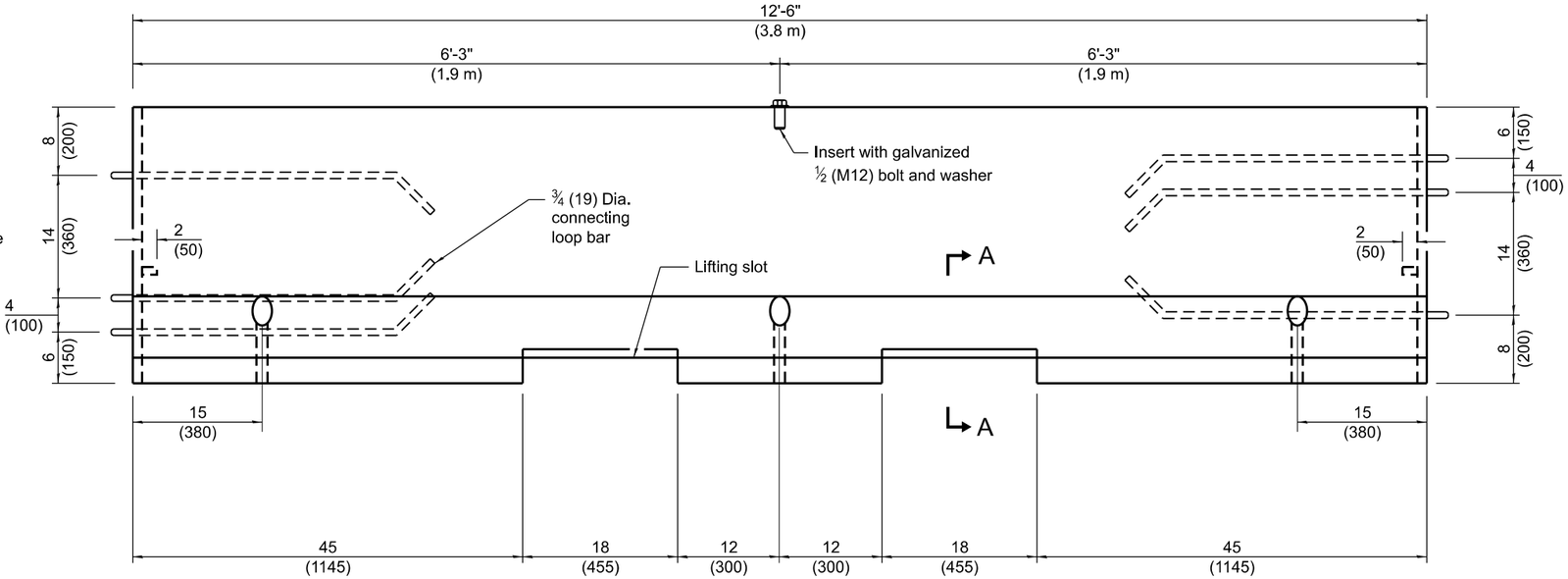
END VIEW
(Showing lifting slot)



SECTION A-A LIFTING SLOT

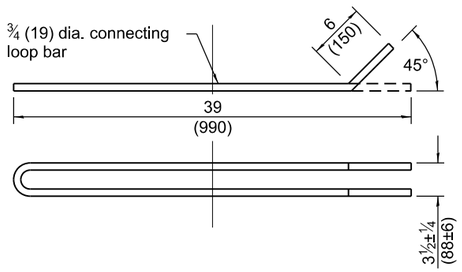


CONNECTING DETAIL

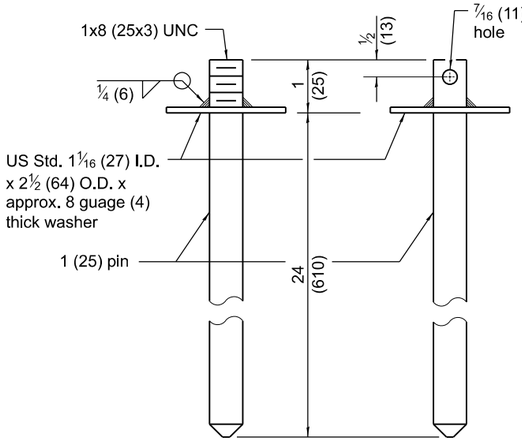


ELEVATION
(Showing connecting loop bars and vertical panel bolt/insert)

PLAN

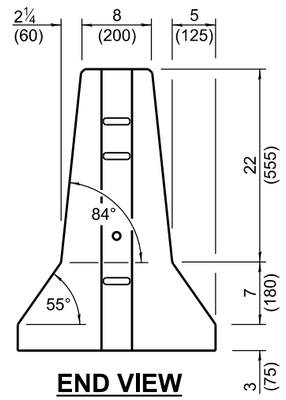


CONNECTING LOOP BAR

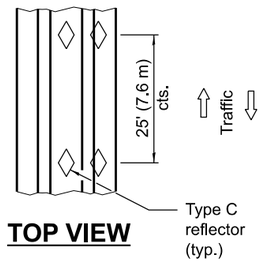


CONNECTING AND ANCHOR PINS
(End may be beveled ¼ (6) max.)

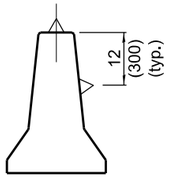
F SHAPE DESIGN



END VIEW



TOP VIEW



BARRIER WALL REFLECTORS

GENERAL NOTES

Each F shape barrier shall be clearly marked with "ILLINOIS F SHAPE", the Producer's mark and the date of manufacture. The markings shall be indented on the barrier or painted thereon with waterproof paint/ink.

The insert for the ½ (M12) bolt shall be capable of 3,000 lb (13 kN) pull-out strength.

When barrier separates opposing flows of traffic markers shall be on both sides of barrier.

See Standard 782006 for dimensions of Type C reflector.

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

Illinois Department of Transportation

APPROVED January 1, 2016
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

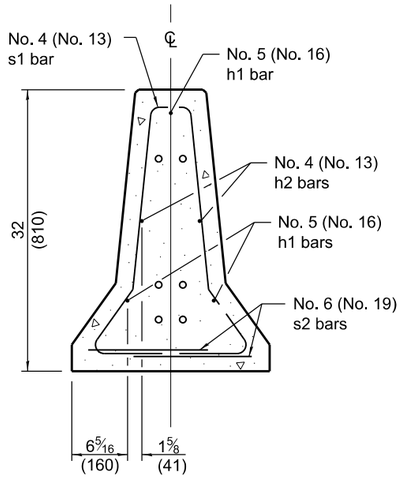
ISSUED 10-1-02

DATE	REVISIONS
4-1-16	Rev. opt. chamfer on all edges to
	1 (25). Reference to Std. 635011
	now 782006.
1-1-12	Omitted 'ALTERNATE' from
	connecting and anchoring pins detail.

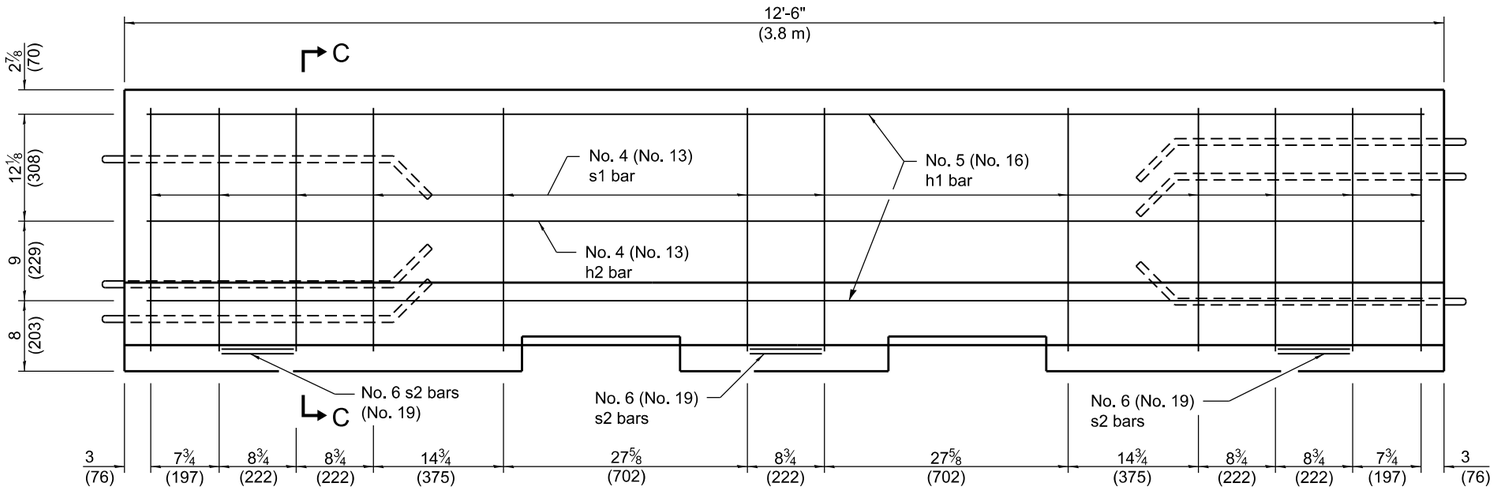
TEMPORARY CONCRETE BARRIER

STANDARD 704001-08

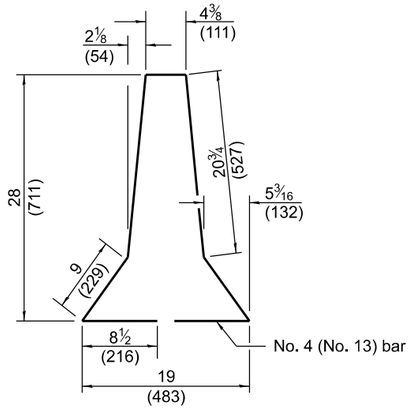
F SHAPE DESIGN



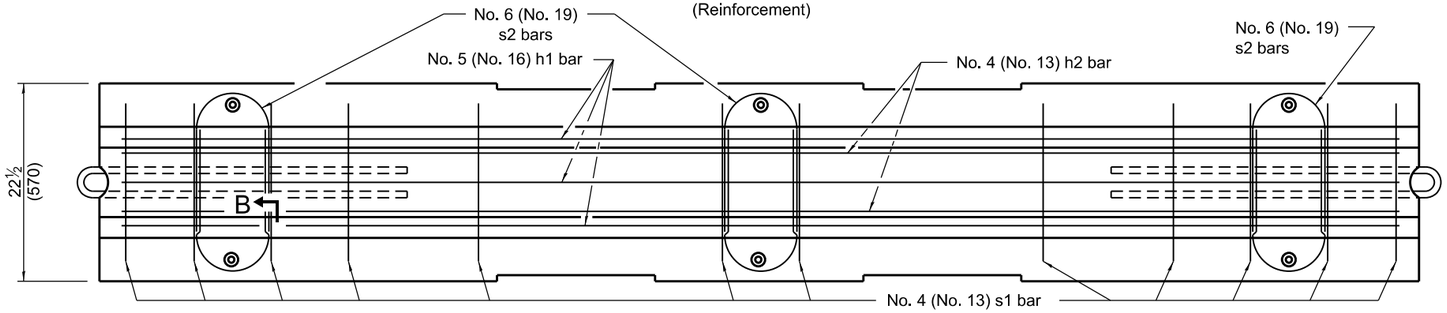
SECTION C-C



ELEVATION
(Reinforcement)



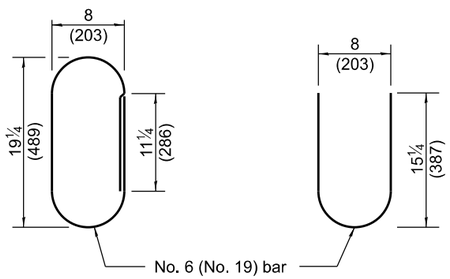
s1 BAR



PLAN

ALTERNATE s1 BAR

SECTION B-B
ANCHORING DETAIL



ALTERNATE s2 BARS

Illinois Department of Transportation

APPROVED January 1, 2016
Michael Brand
ENGINEER OF POLICY AND PROCEDURES

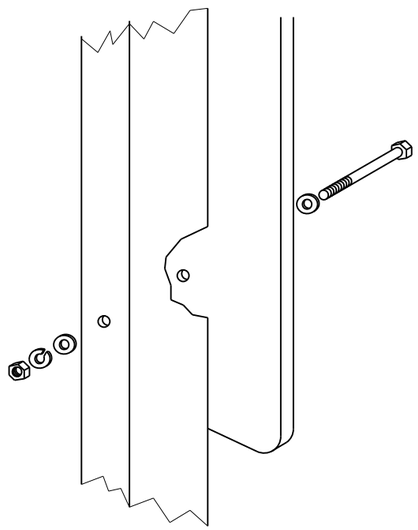
APPROVED January 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 10-1-02

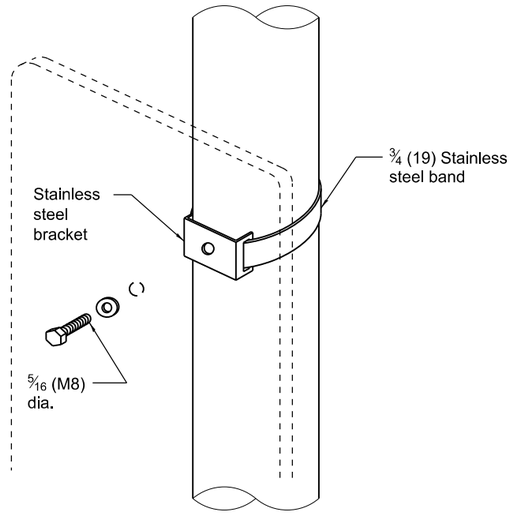
TEMPORARY CONCRETE BARRIER

(Sheet 2 of 2)

STANDARD 704001-08

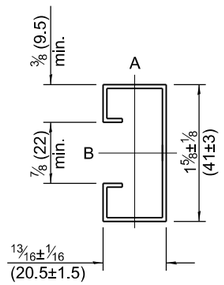


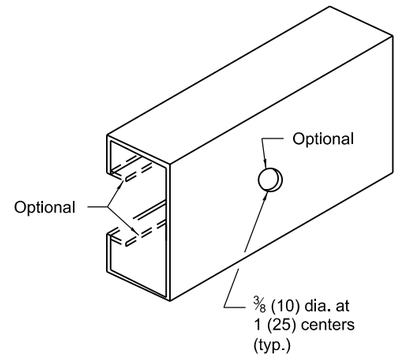
Sign panel 36 (900) wide or less



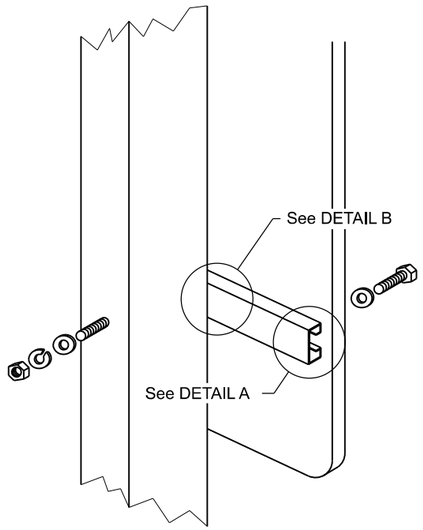
Sign panel 36 (900) wide or less

Section modulus (minimum)	Axis A	Axis B
Steel	0.050 in.³ (819 mm³)	0.105 in.³ (1720 mm³)
Aluminum	0.150 in.³ (2458 mm³)	0.315 in.³ (5162 mm³)



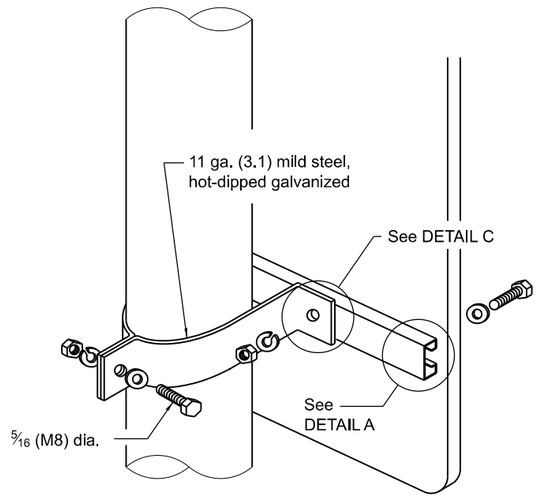


SUPPORTING CHANNEL DETAILS



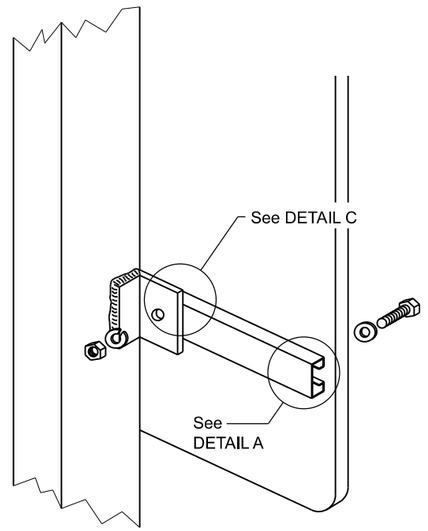
Sign panel over 36 (900) wide

WOOD OR TELESCOPING STEEL POSTS



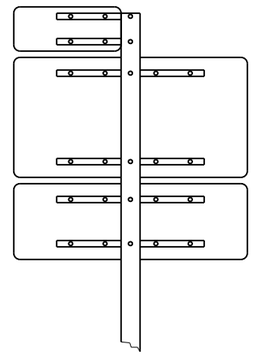
Sign panel over 36 (900) wide

LIGHT OR SIGNAL STANDARDS

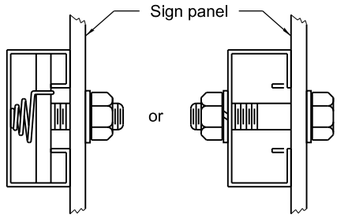


BREAKAWAY STEEL TUBING POSTS

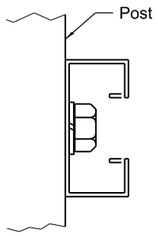
(All sign panel sizes)



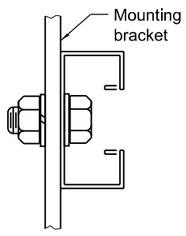
ROUTE MARKER ASSEMBLY



DETAIL A



DETAIL B



DETAIL C

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

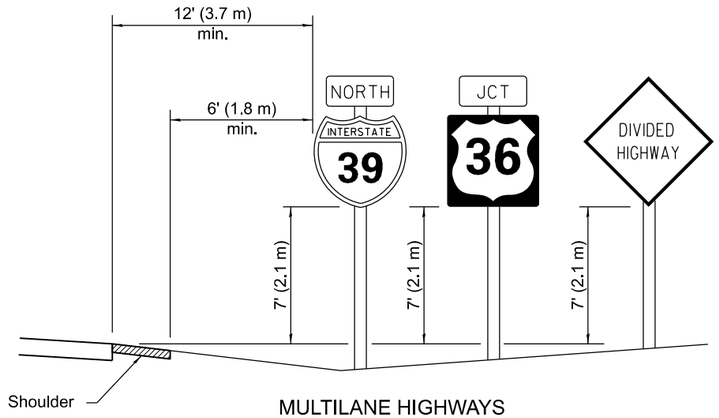
ISSUED 1-1-97

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

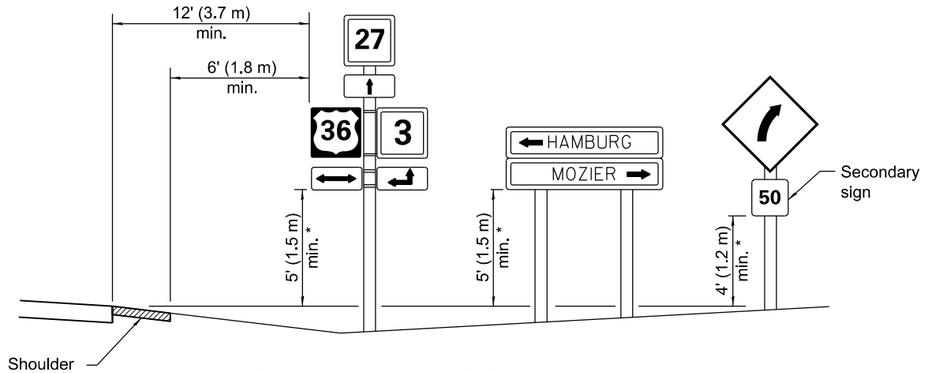
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2319-6.

SIGN PANEL MOUNTING DETAILS

STANDARD 720001-01

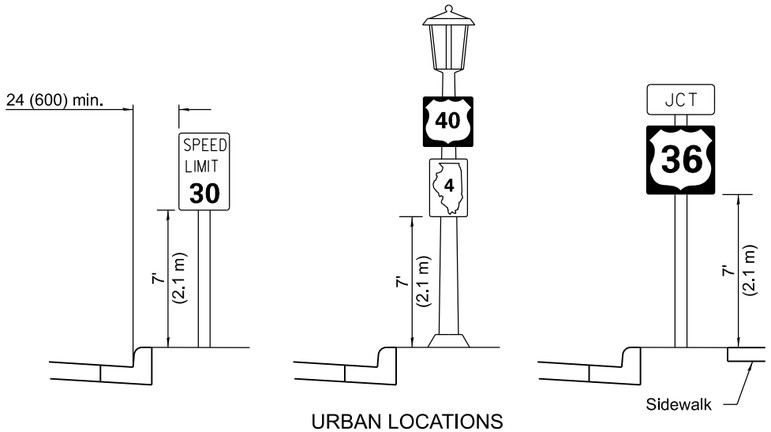


MULTILANE HIGHWAYS



* 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).

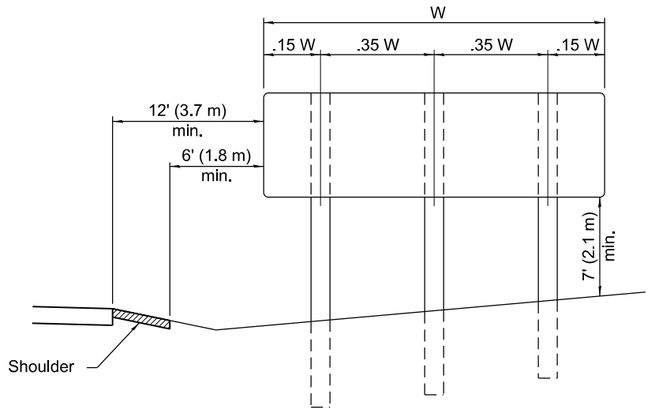
TWO LANE RURAL HIGHWAYS

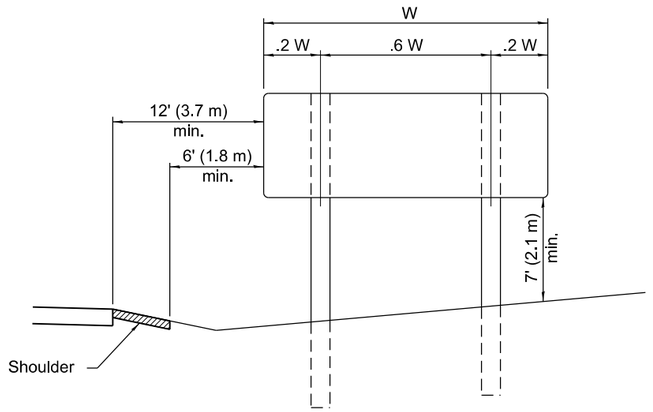


URBAN LOCATIONS

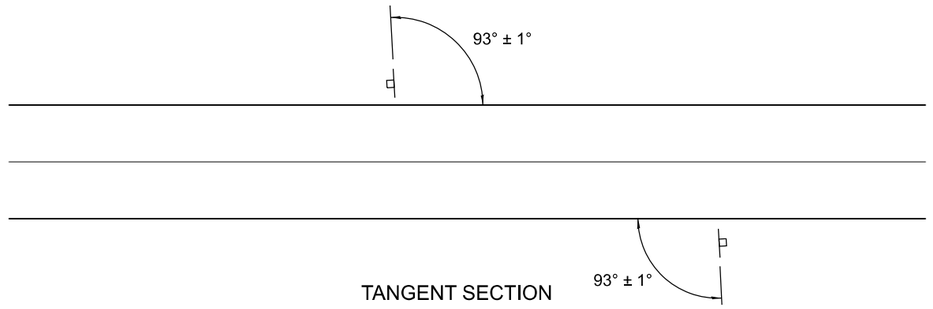
TYPICAL INSTALLATIONS

Signs in any area shall be erected to a uniform height above the edge of the pavement.

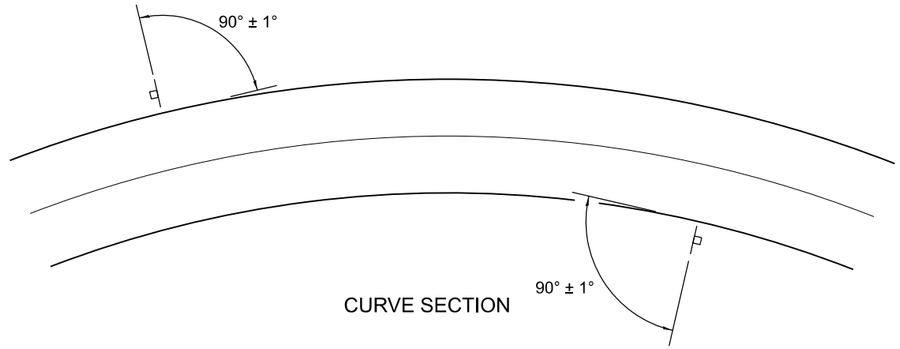




POST SPACING FOR NON-FREEWAY SIGN PANELS



TANGENT SECTION



CURVE SECTION

GROUND MOUNT SIGN POSITIONING

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

DATE	REVISIONS
1-1-14	Added shoulder and slopes. Changed sign distances from roadway and shoulder.
1-1-12	Revised sign elevation for multilane highways. Revised sign elevation and distance to curb for rural location.

SIGN PANEL ERECTION DETAILS

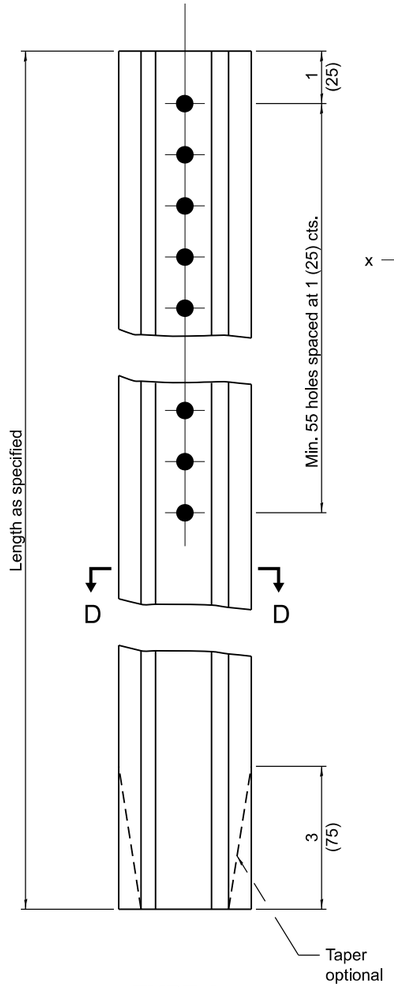
STANDARD 720006-04

Illinois Department of Transportation

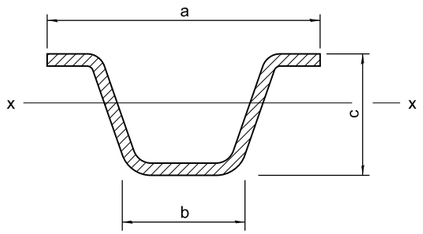
APPROVED January 1, 2014
ENGINEER OF OPERATIONS

APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

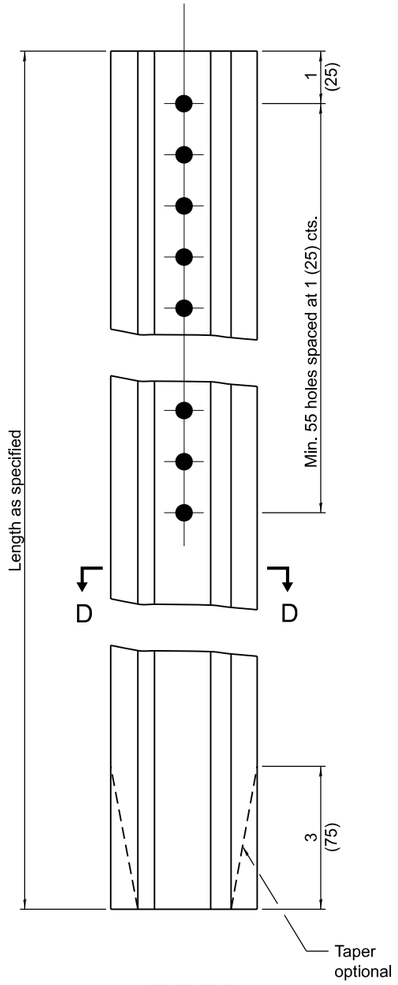
ISSUED 1-1-97



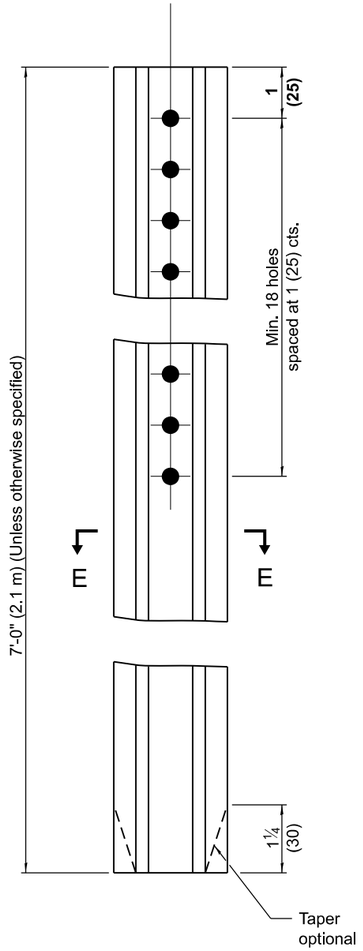
TYPE A



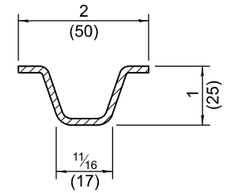
SECTION D-D



TYPE B



TYPE C



SECTION E-E

Steel - 1.12 lbs./ft. (1.67 kg/m)

		a	b	c	Sx-x in.³ (mm³)	lbs./ft. (kg/m)
TYPE A	Steel	3 1/16 (78)	1 1/4 (32)	1 7/16 (37)	0.223 (3,654)	2.00 (2.98)
	Aluminum	3 1/2 (89)	1 5/8 (41)	1 7/8 (48)	0.435 (7,128)	0.90 (1.34)
TYPE B	Steel	3 3/16 (81)	1 1/4 (32)	1 1/2 (38)	0.341 (5,588)	3.00 (4.46)
	Aluminum	4 5/8 (118)	2 1/4 (57)	2 3/8 (60)	0.888 (14,552)	1.30 (1.93)

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.

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

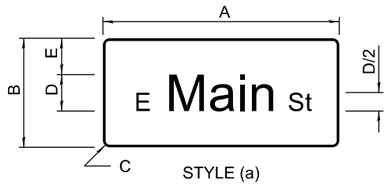
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2350-4.

METAL POSTS FOR SIGNS, MARKERS & DELINEATORS

STANDARD 720011-01



STYLE (a)

STYLE (b)

STYLE (c)

STYLE (d)

STYLE (e)

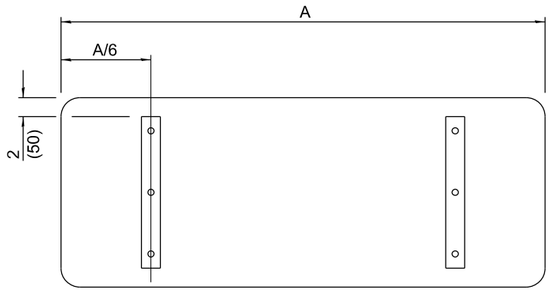
When road classification only is on the second line, it should not be abbreviated.

STYLE (f)

TYPICAL SIGN STYLES

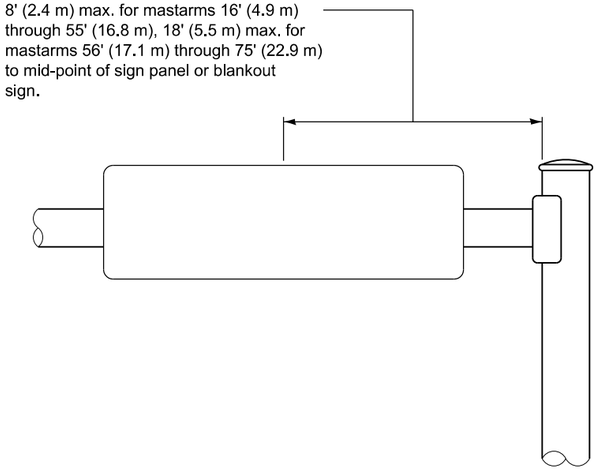
SIGN STYLE		DIMENSIONS							LETTER SIZE UC/LC PRIMARY			BORDER
		A	B	C	D	E	F	G	H	1	2	*	
a,b,d	Var.		12 (300)	1½ (40)	6 (150)	3 (75)	- -	- -	- -	6/4½ (150/115)	- -	- -	⅜ (10)
	Var.		18 (450)	1½ (40)	8 (200)	5 (125)	- -	- -	- -	8/6 (200/150)	- -	- -	⅝ (15)
	Var.		24 (600)	1½ (40)	10 (250)	7 (175)	- -	- -	- -	10/7½ (250/190)	- -	- -	⅝ (15)
	Var.		30 (750)	1⅞ (45)	12 (300)	9 (225)	- -	- -	- -	12/9 (400/300)	- -	- -	¾ (20)
c,e	Var.		24 (600)	1½ (40)	6 (150)	- -	- -	5½ (140)	4 (100)	6/4½ (150/115)	- -	3 (75)	⅝ (15)
	Var.		30 (750)	1⅞ (45)	8 (200)	- -	- -	7 (175)	4½ (115)	8/6 (200/150)	- -	4 (100)	¾ (20)
	Var.		36 (900)	2¼ (60)	10 (250)	- -	- -	7½ (190)	6 (150)	10/7½ (250/190)	- -	5 (125)	¾ (20)
	Var.		42 (1050)	3 (75)	12 (300)	- -	- -	8½ (215)	7 (175)	12/9 (400/300)	- -	6 (150)	1 (25)
f	Var.		24 (600)	1½ (40)	6 (150)	4 (100)	4 (100)	- -	- -	6/4½ (150/115)	6/4½ (150/115)	- -	⅝ (15)
	Var.		30 (750)	1⅞ (45)	8 (200)	4½ (115)	5 (125)	- -	- -	8/6 (200/150)	8/6 (200/150)	- -	¾ (20)
	Var.		42 (1050)	3 (75)	10 (250)	7½ (190)	7 (175)	- -	- -	10/7½ (250/190)	10/7½ (250/190)	- -	1 (25)
	Var.		48 (1200)	3 (75)	12 (300)	7½ (190)	8 (200)	- -	- -	12/9 (400/300)	12/9 (400/300)	- -	1 (25)

* Supplemental Messages



SUPPORTING CHANNELS

8' (2.4 m) max. for mastarms 16' (4.9 m) through 55' (16.8 m), 18' (5.5 m) max. for mastarms 56' (17.1 m) through 75' (22.9 m) to mid-point of sign panel or blankout sign.



MOUNTING LOCATION

GENERAL NOTES

All signs shall have a white reflectorized legend and border on a green reflectorized background.

The sign panels shall be mounted as shown on Standard 720001 or as specified in the plans.

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

Illinois Department of Transportation

APPROVED January 1, 2018
ENGINEER OF OPERATIONS

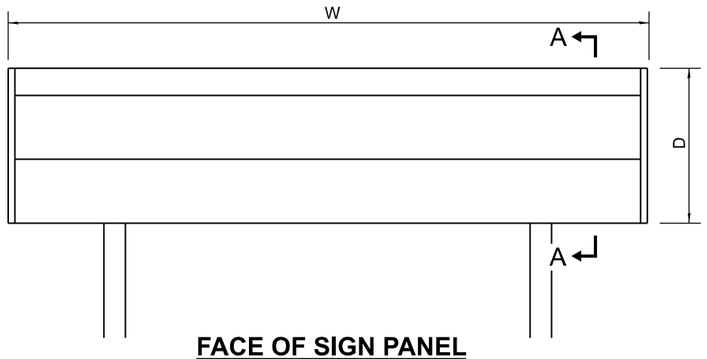
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

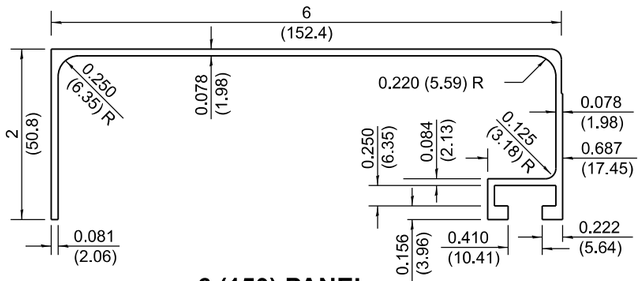
DATE	REVISIONS
1-1-18	Revised MOUNTING LOCATION
	detail.
1-1-12	Revised table and lettering to
	upper/lower case per current MUTCD.

MAST ARM MOUNTED STREET NAME SIGNS

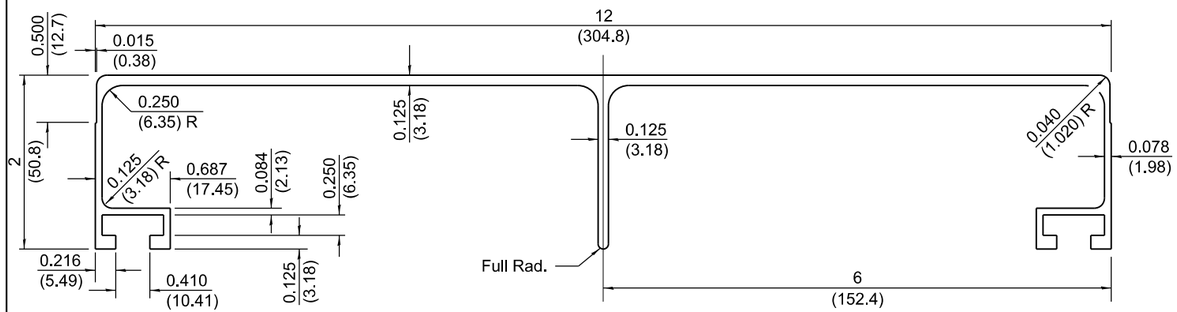
STANDARD 720016-04



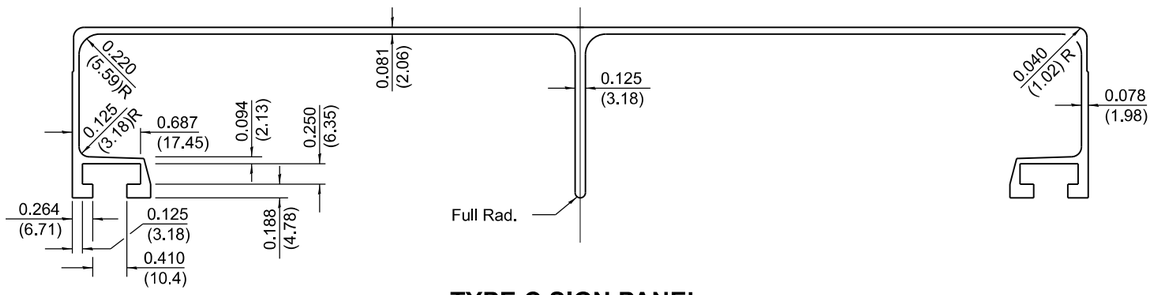
FACE OF SIGN PANEL



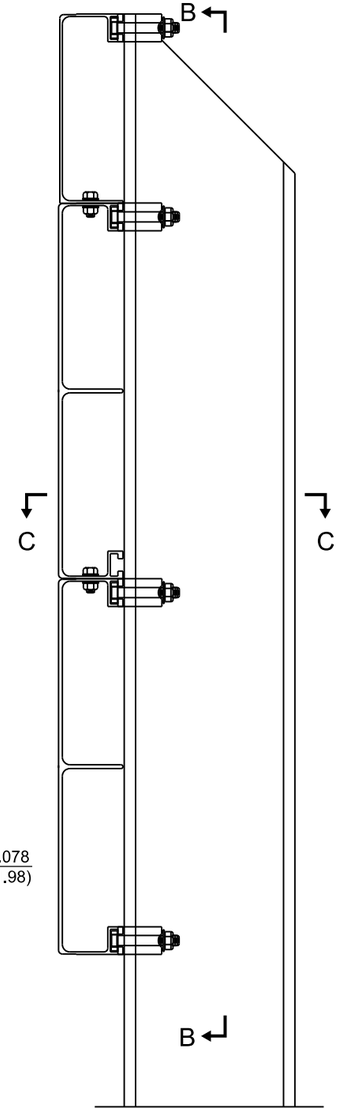
6 (150) PANEL



TYPE B SIGN PANEL



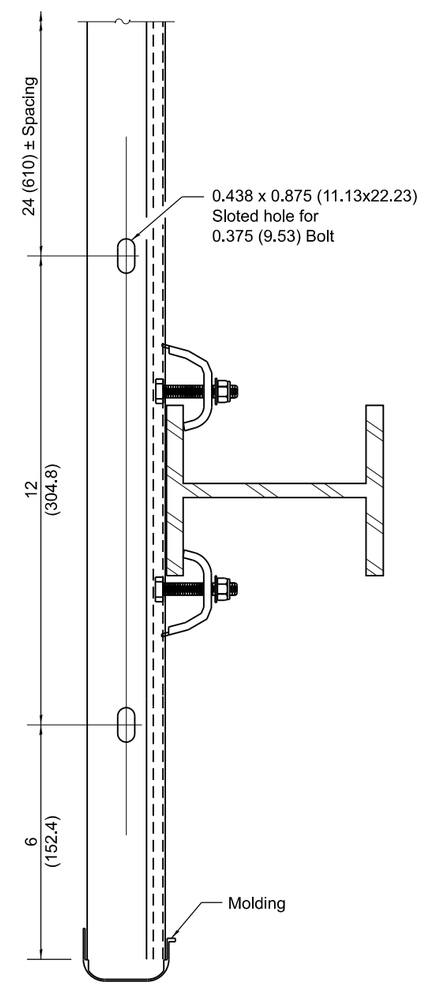
TYPE C SIGN PANEL



SECTION A-A

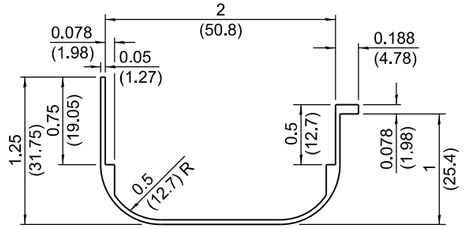
SECTION B-B

(Provide two post clips top and bottom. Alternate at interior panel joints on ground-mounted signs, and provide two clips at all panel joints on over-head mounted signs.)



SECTION C-C

(w/o panel bolts)



SIGN MOLDING

(Color shall match sign face material. To be riveted to sign panel at 24 (600) O.C.)

Illinois Department of Transportation

APPROVED January 1, 2022
ENGINEER OF OPERATIONS

APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

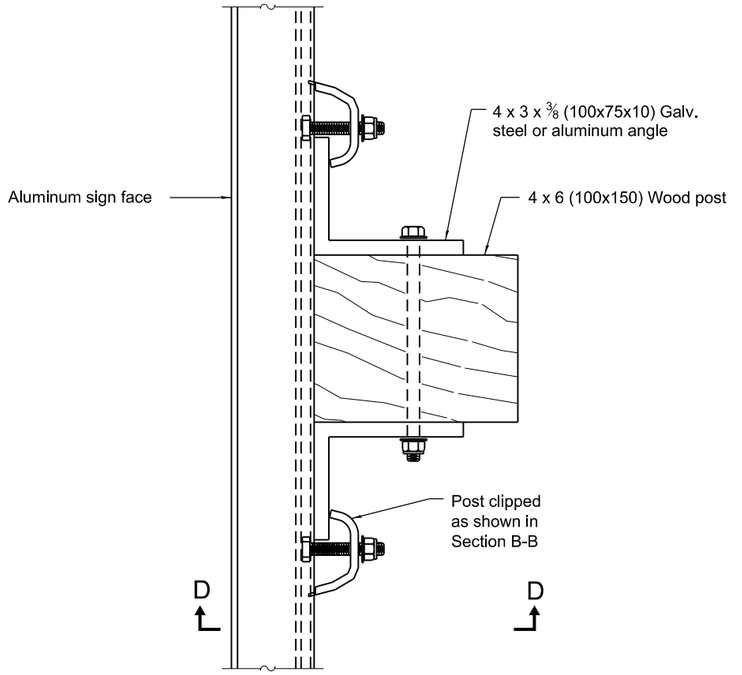
ISSUED 1-1-00

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

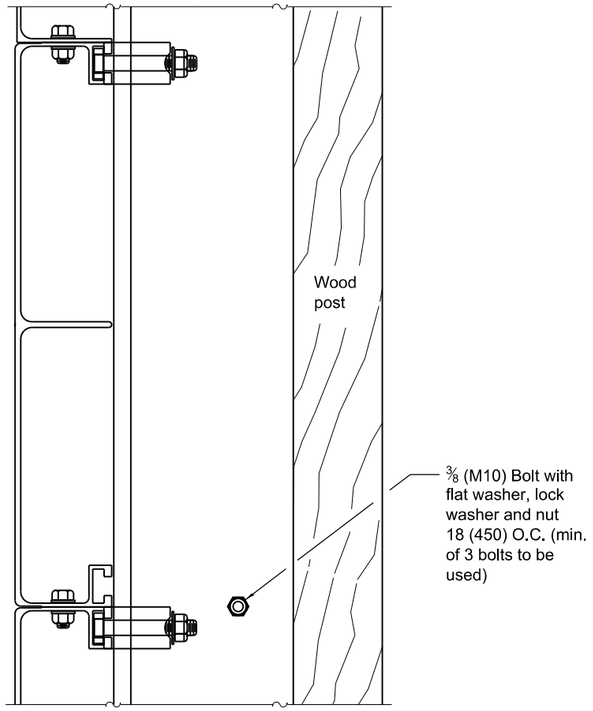
DATE	REVISIONS
1-1-22	Removed stainless steel clip option
	and minor typos.
1-1-09	Added aluminum clip. Switch units
	to English (metric).

SIGN PANELS EXTRUDED ALUMINUM TYPE

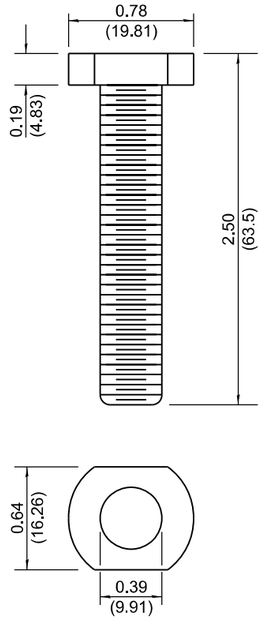
STANDARD 720021-03

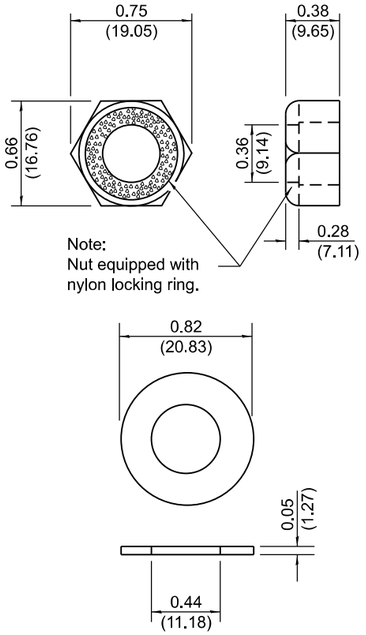


SIGN PANEL ATTACHMENT TO WOOD POST

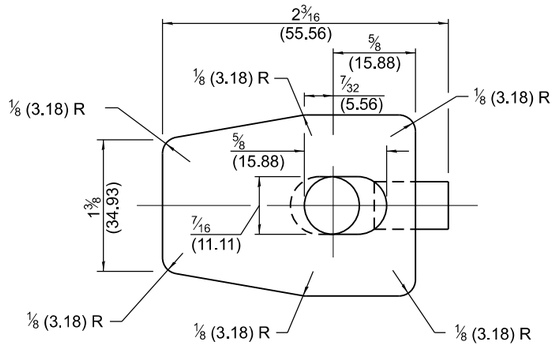


SECTION D-D

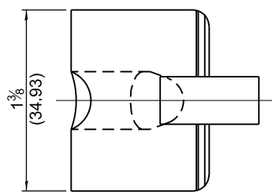




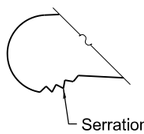
ALUMINUM CLIP NUT, BOLT AND WASHER ASSEMBLY



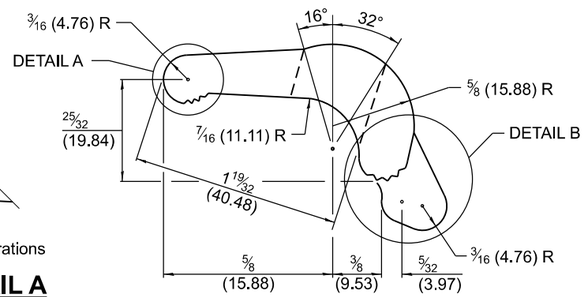
PLAN VIEW



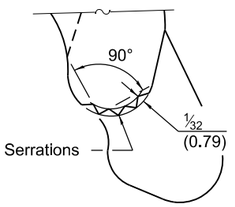
END VIEW



DETAIL A
(Enlarged view of serrations)



ELEVATION VIEW



DETAIL B
(Enlarged detail of serrations)

ALUMINUM CLIP

Illinois Department of Transportation

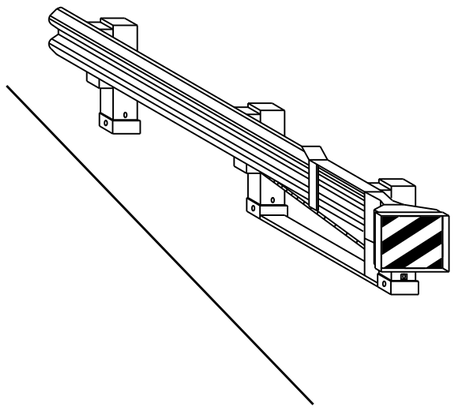
APPROVED January 1, 2022
ENGINEER OF OPERATIONS

APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

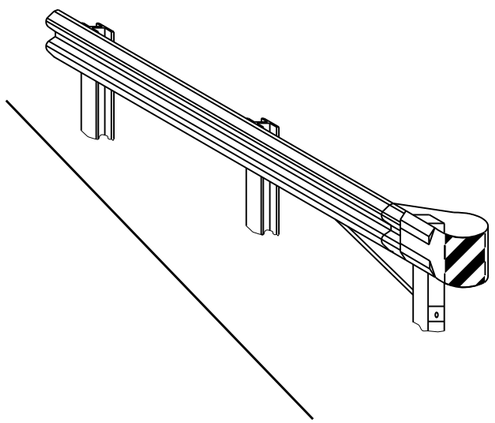
ISSUED 1-1-00

SIGN PANELS EXTRUDED ALUMINUM TYPE

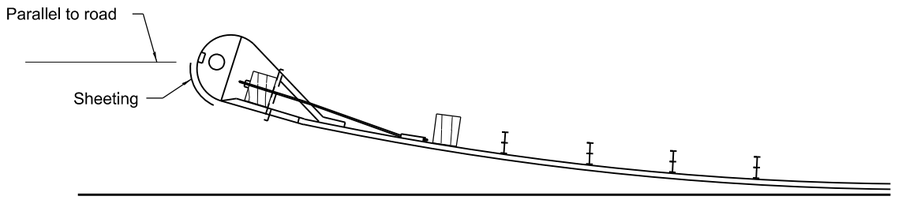
STANDARD 720021-03



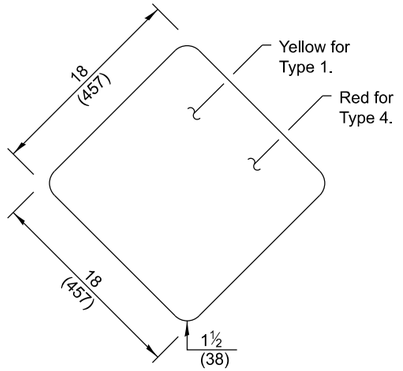
CASE I



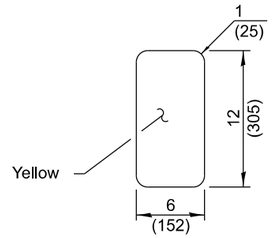
CASE II



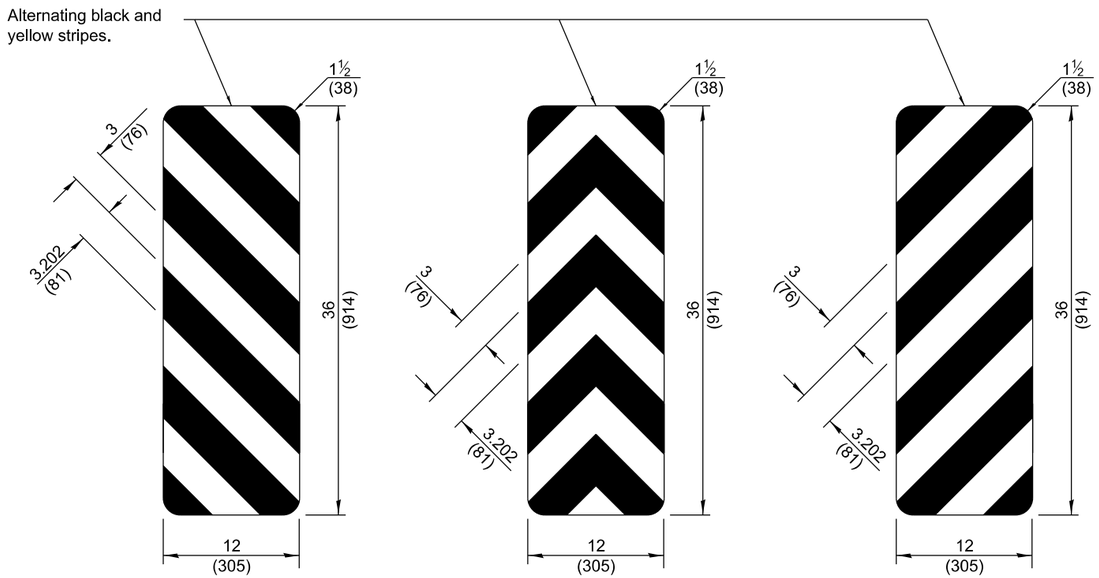
SHEETING POSITION: CASE II



TYPE 1 OR TYPE 4

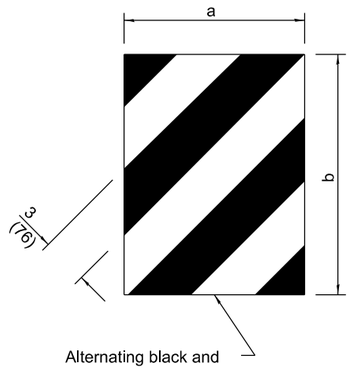


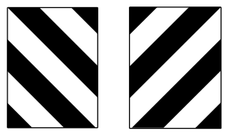
TYPE 2



TYPE 3

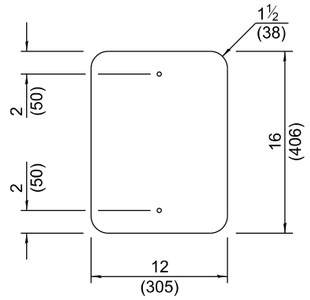
OBJECT MARKER DETAILS





DIMENSION	CASE I	CASE II
a	*	18 (450)
b	*	16 (406)

DIRECT APPLIED



POST MOUNTED

GENERAL NOTES

See detail on Standard 729001 for mounting markers to posts.

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

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.

Illinois Department of Transportation

APPROVED January 1, 2017
ENGINEER OF OPERATIONS

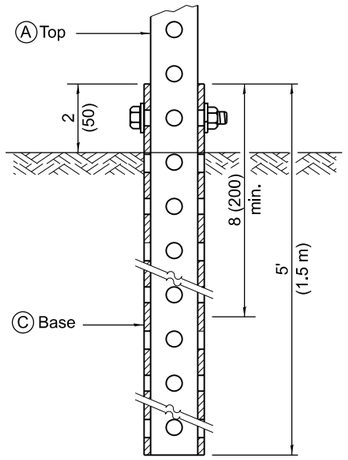
APPROVED January 1, 2017
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-16

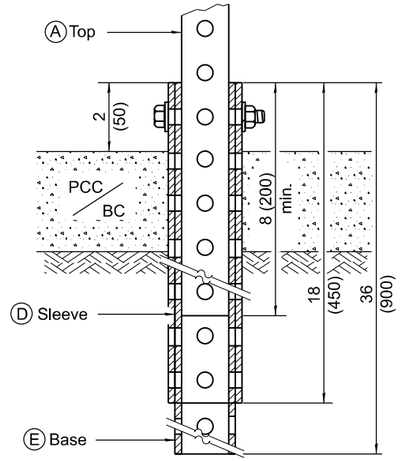
DATE	REVISIONS
1-1-17	Omitted minimum reflective area
	requirement for terminal marker.
4-1-16	Renumbered standard from 635006.

OBJECT AND TERMINAL MARKERS

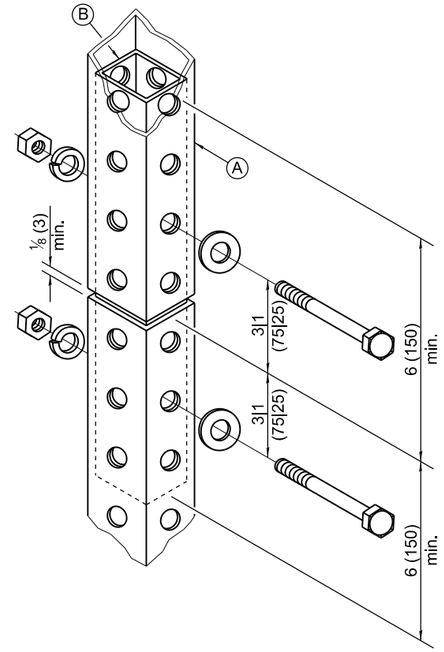
STANDARD 725001-01



GROUND MOUNT DETAIL



PAVEMENT MOUNT DETAIL



SPLICE DETAIL

Ⓐ	2 x 2 x var. (51 x 51 var.)
Ⓑ	1¾ x 1¾ x 12 (44 x 44 x 300)
Ⓒ	2¼ x 2¼ x 60 (57 x 57 x 1500)
Ⓓ	2½ x 2½ x 18 (64 x 64 x 450)
Ⓔ	2¼ x 2¼ x 36 (57 x 57 x 900)

GENERAL NOTES

All bolts ⅜ (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

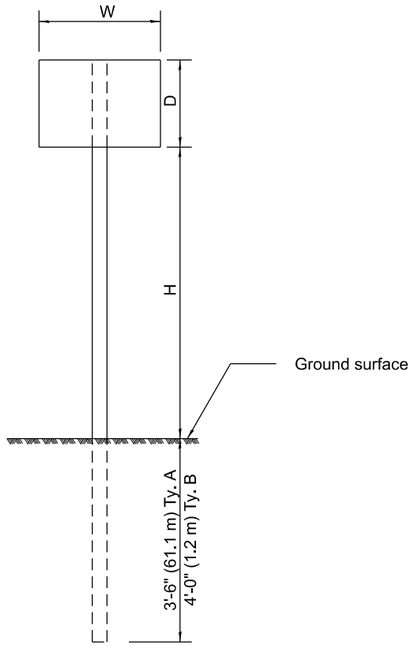
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-07

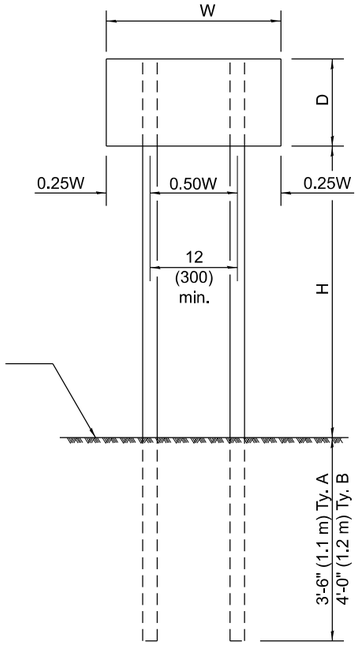
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	New Standard. Used to be part
	of Standard 72006.

TELESCOPING STEEL SIGN SUPPORT

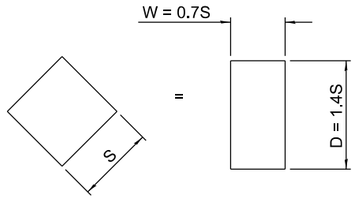
STANDARD 728001-01



ONE POST INSTALLATION

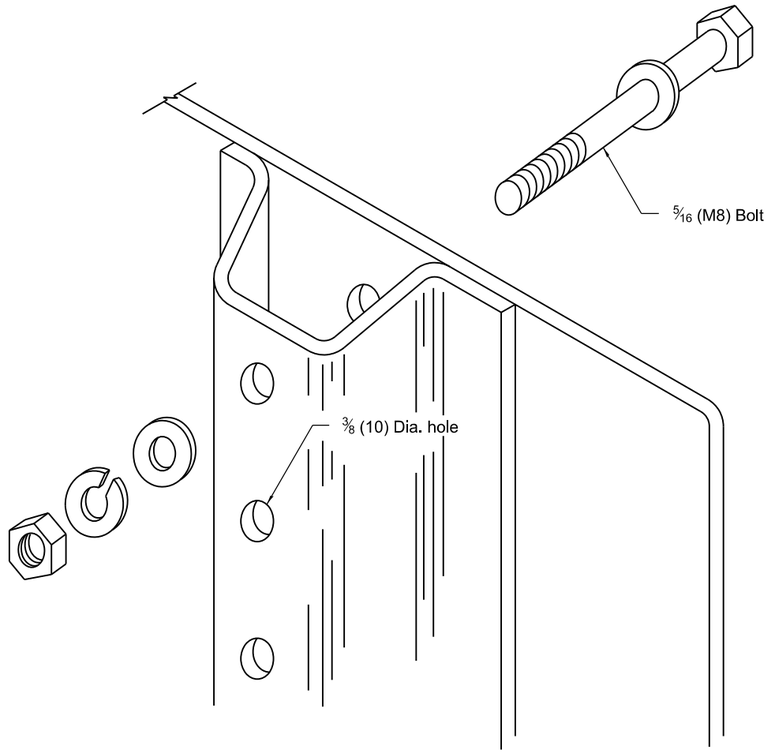


TWO POST INSTALLATION



For diamond shaped sign with side S as shown, use required post size for a sign with W = 0.7S and D = 1.4S.

SIGN DEPTH (D)	H	NO. AND TYPE OF POST FOR SIGN WIDTH (W)				
		12 (300)	18 (450)	24 (600)	30 (750)	36 (900)
18 (450)	5'-0" (1.5 m)	A	A	A	A	A
	5'-6" (1.7 m)	A	A	A	A	A
	6'-0" (1.8 m)	A	A	A	A	B
	6'-6" (2.0 m)	A	A	A	A	B
	7'-0" (2.1 m)	A	A	A	A	B
	7'-6" (2.3 m)	A	A	A	A	B
	8'-0" (2.4 m)	A	A	A	A	B
	8'-6" (2.6 m)	A	A	A	B	B
	9'-0" (2.7 m)	A	A	A	B	B
24 (600)	5'-0" (1.5 m)	A	A	A	A	B
	5'-6" (1.7 m)	A	A	A	A	B
	6'-0" (1.8 m)	A	A	A	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, Luminaires and Traffic Signals.

LOADING: for 60 mph (95 km/h) wind velocity with 30% gust factor, normal to sign.

SOIL PRESSURE: Minimum allowable soil pressure 1.25 tsf (120 kPa).

See Standard 720011 for details of Types A and B posts.

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF POLICY AND PROCEDURES

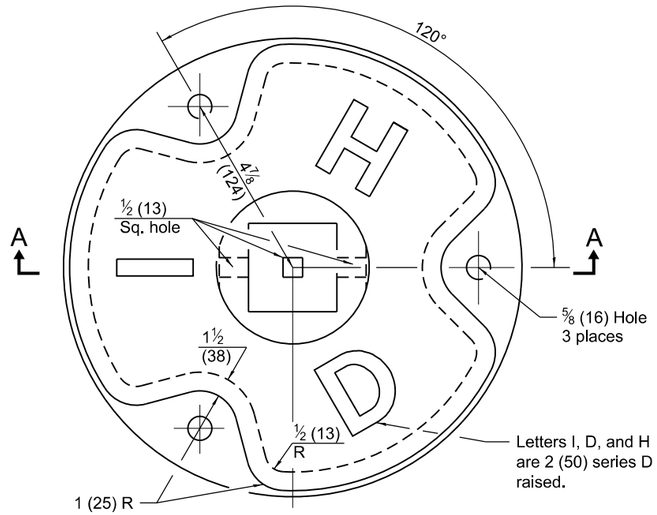
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

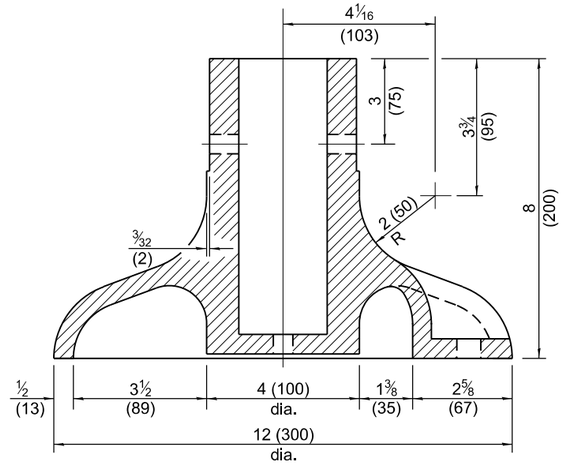
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2363-2.

APPLICATIONS OF TYPES A & B METAL POSTS (FOR SIGNS & MARKERS)

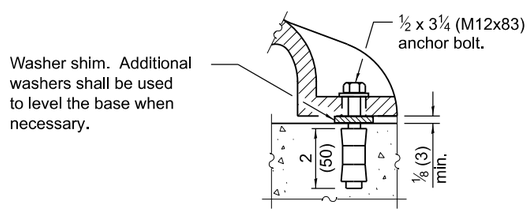
STANDARD 729001-01



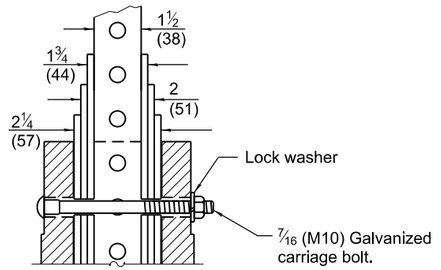
PLAN



SECTION A-A



ANCHOR BOLT DETAIL



POST ASSEMBLY DETAIL

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

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	New Standard. Used to be part of
	Standard 720006.

BASE FOR TELESCOPING STEEL SIGN SUPPORT

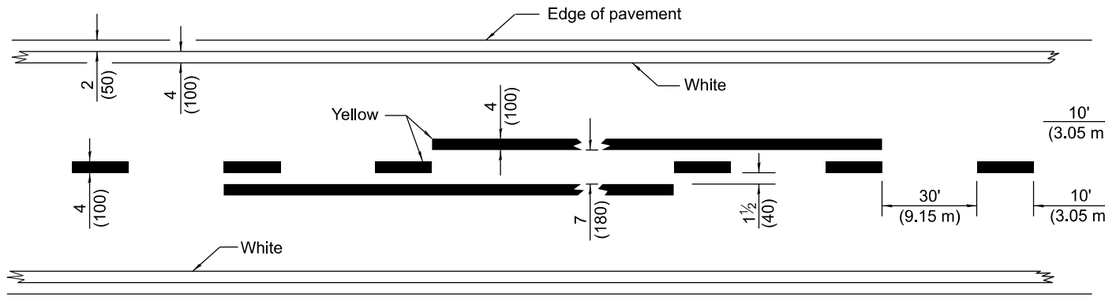
STANDARD 731001-01

Illinois Department of Transportation

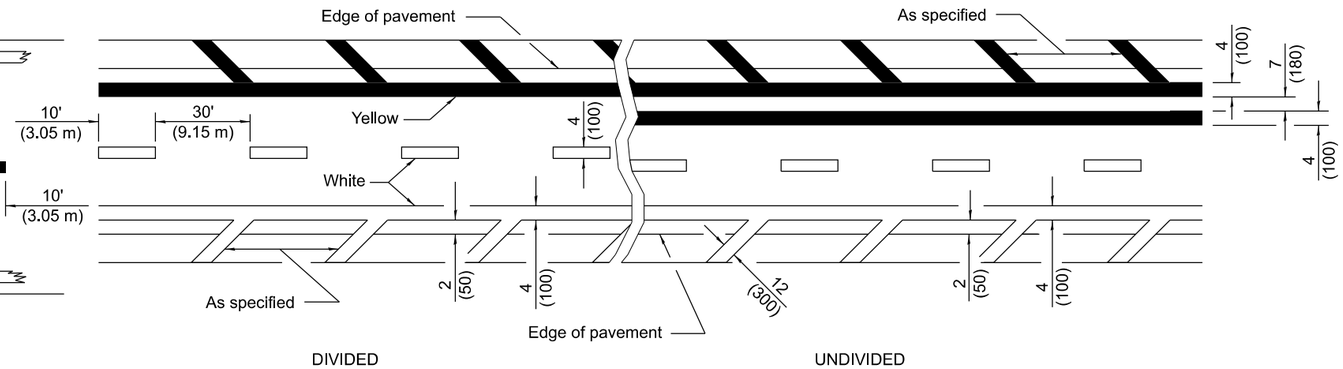
APPROVED January 1, 2009
ENGINEER OF OPERATIONS

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-07

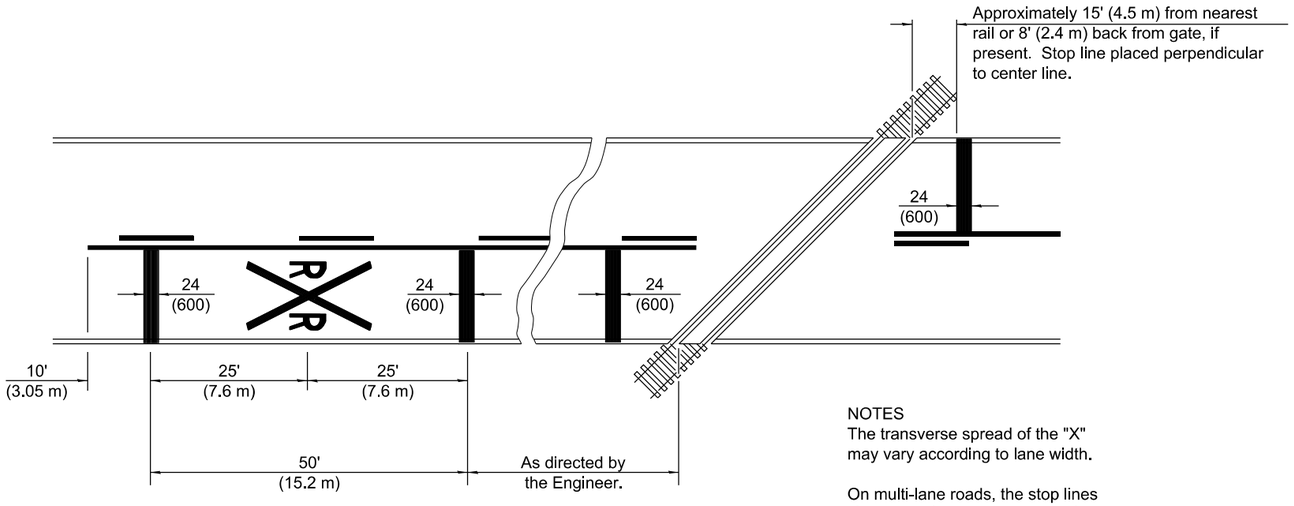


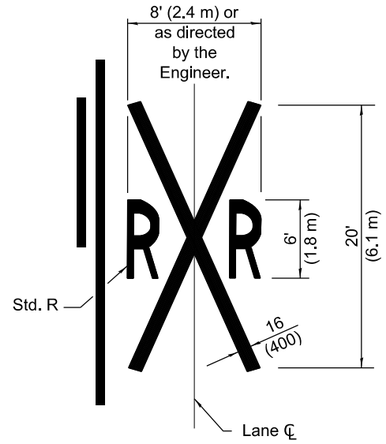
2 LANE



MULTI LANE

LANE AND EDGE LINES





NOTES
The transverse spread of the "X" may vary according to lane width.

On multi-lane roads, the stop lines shall extend across all approach lanes and separate RXR symbols shall be placed adjacent to each other in each lane.

When the pavement marking symbol is used, a portion of the symbol should be located directly adjacent to the Advance Warning Sign (W10-1) as placed by Table 2C-4, Condition B of the MUTCD.

PAVEMENT MARKINGS AT RAILROAD-HIGHWAY GRADE CROSSING

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

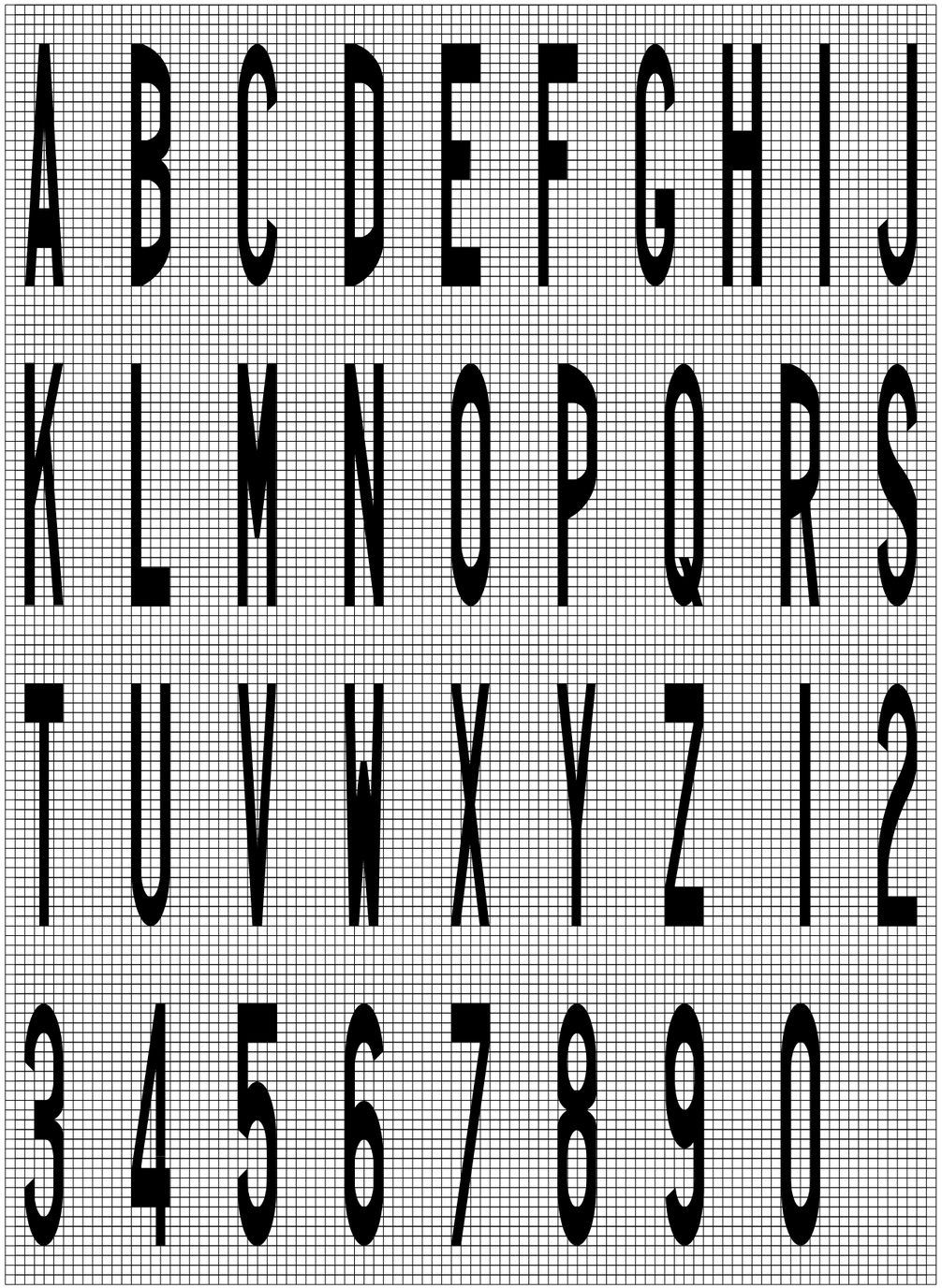
ISSUED 1-1-97

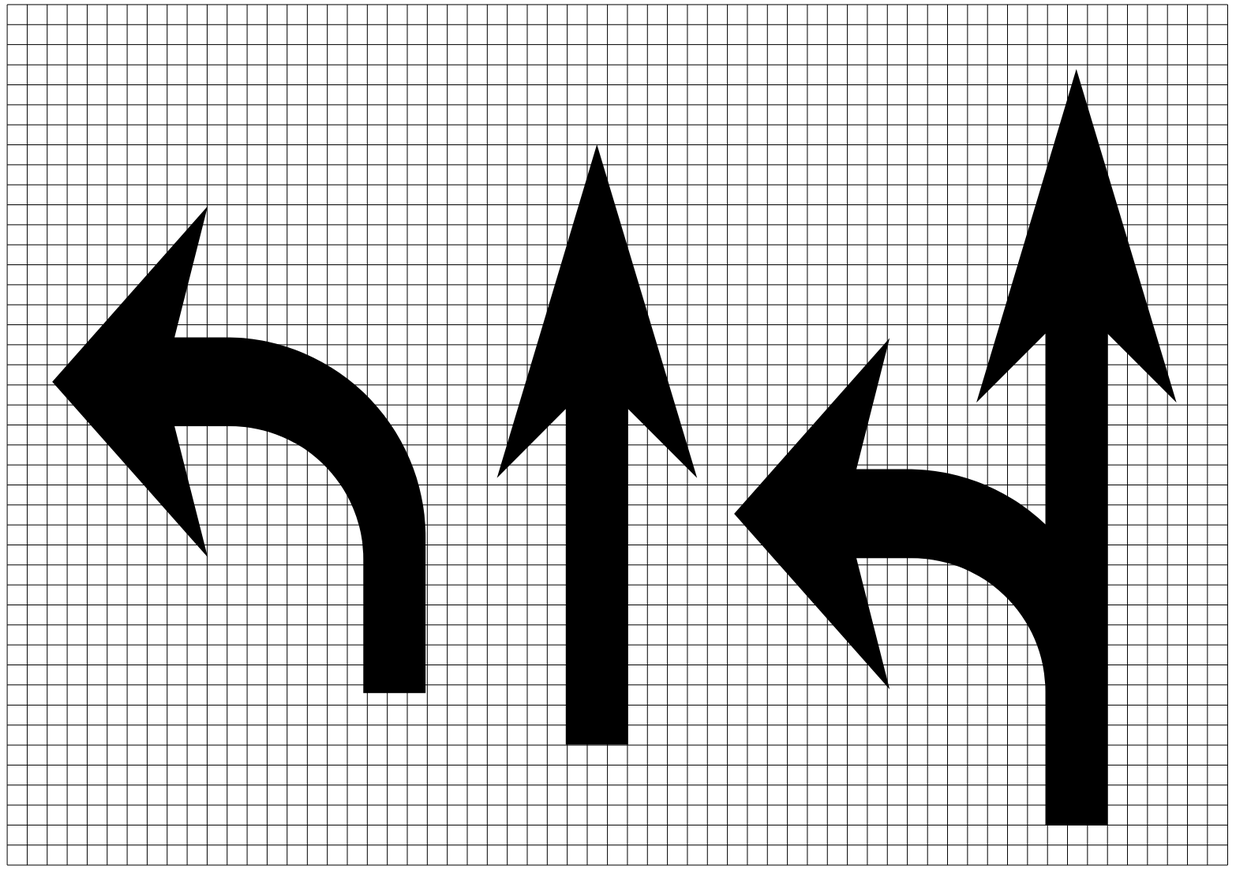
DATE	REVISIONS
1-1-15	Added symbols. Revised bike symbol.
	Revised note for stop line at
	RR crossing.
1-1-14	Added bike symbol. Renamed 'LANE
	DROP ARROW' detail to 'LANE-
	REDUCTION ARROW'.

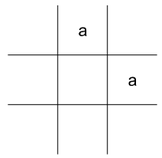
TYPICAL PAVEMENT MARKINGS

(Sheet 1 of 3)

STANDARD 780001-05







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

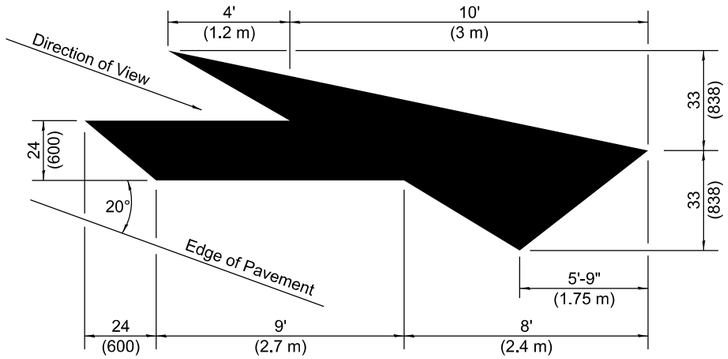
APPROVED January 1, 2015
ENGINEER OF OPERATIONS

APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

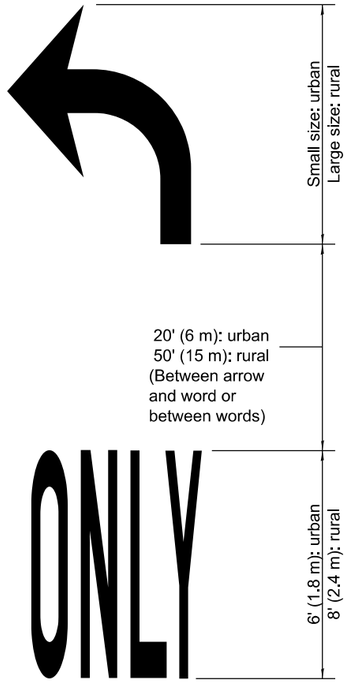
TYPICAL PAVEMENT MARKINGS

STANDARD 780001-05

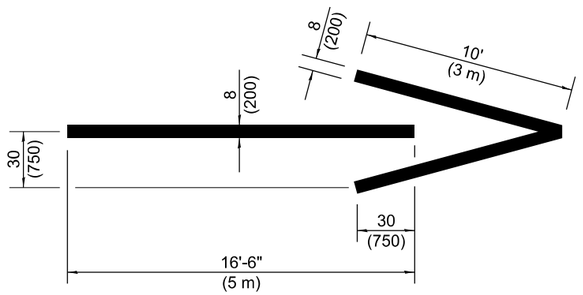


LANE-REDUCTION ARROW

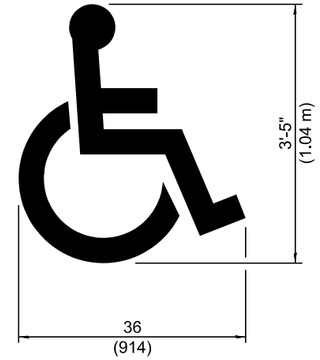
Right lane-reduction arrow shown.
Use mirror image for left lane.



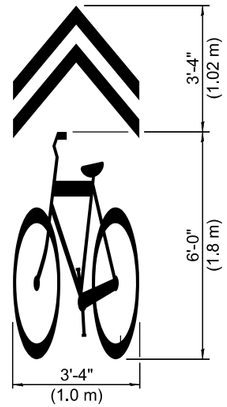
WORD AND ARROW LAYOUT



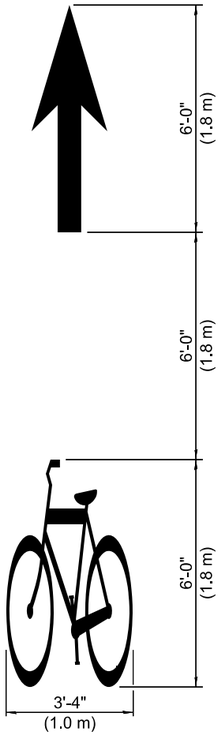
WRONG WAY ARROW



INTERNATIONAL SYMBOL OF ACCESSIBILITY



SHARED LANE SYMBOL



BIKE SYMBOL

(Arrow is optional.)

Illinois Department of Transportation

APPROVED January 1, 2015
ENGINEER OF OPERATIONS

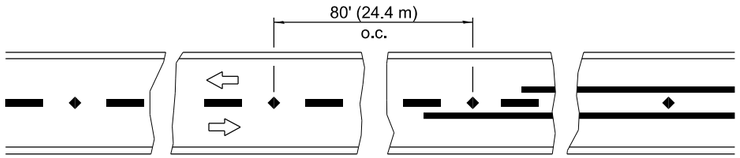
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

TYPICAL PAVEMENT MARKINGS

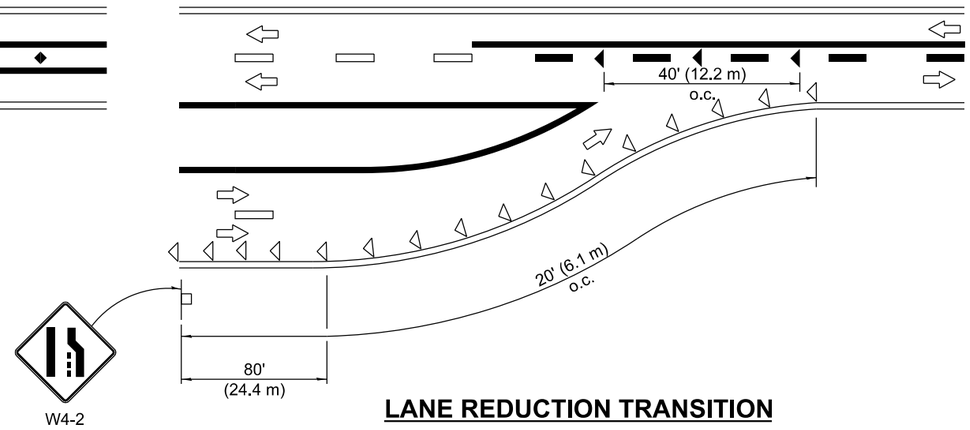
(Sheet 3 of 3)

STANDARD 780001-05

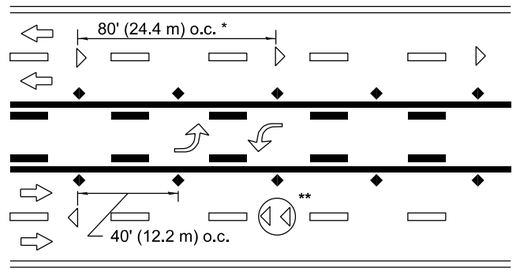


Reduce to 40' (12.2 m) o.c. on curves with posted or advisory speeds of 45 mph (70 km/h) or less.

TWO-LANE / TWO-WAY

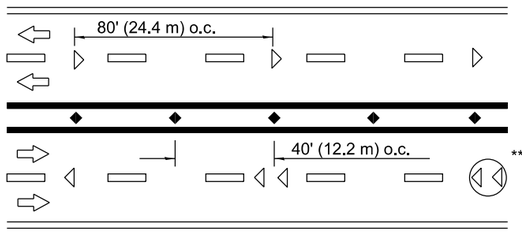


LANE REDUCTION TRANSITION



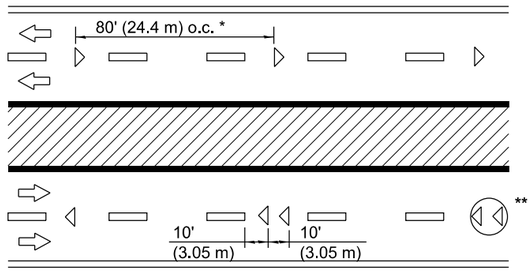
*,** See MULTI LANE DIVIDED detail for lane marker notes.

TWO-WAY LEFT TURN



*,** See MULTI LANE DIVIDED detail for lane marker notes.

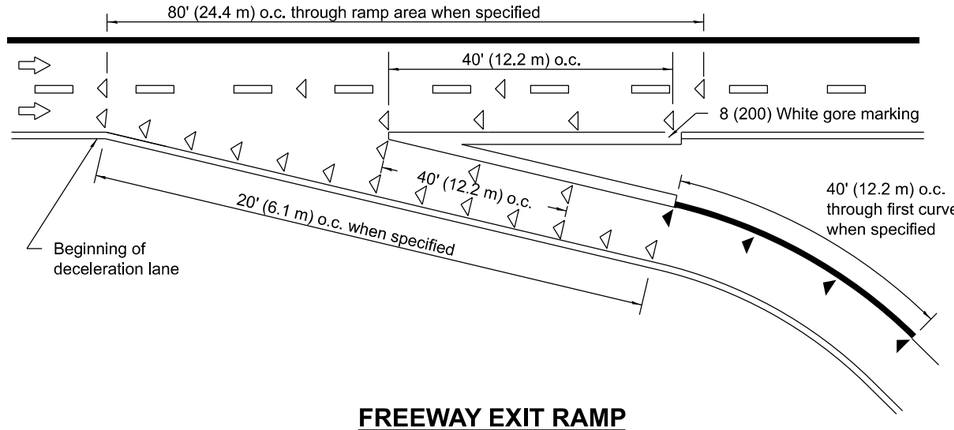
MULTI-LANE UNDIVIDED



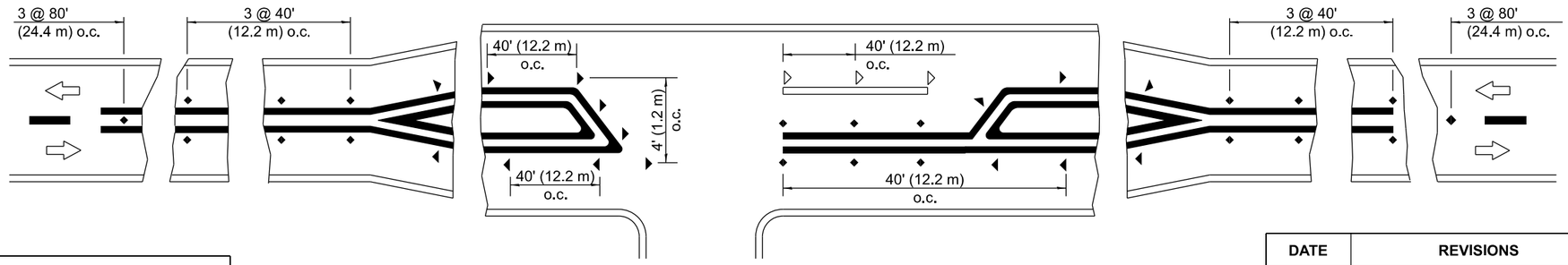
* Reduce to 40' (12.2 m) o.c. on curves where advisory speeds are 10 mph (15 km/h) lower than posted speeds.

** Where double lane line markers are specified, they shall be spaced as shown.

MULTI-LANE DIVIDED



FREEWAY EXIT RAMP



RURAL LEFT TURN

SYMBOLS

- Yellow stripe
- White stripe
- One-way amber marker
- One-way crystal marker
- Two-way amber marker

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

Illinois Department of Transportation

APPROVED April 1, 2016
ENGINEER OF OPERATIONS

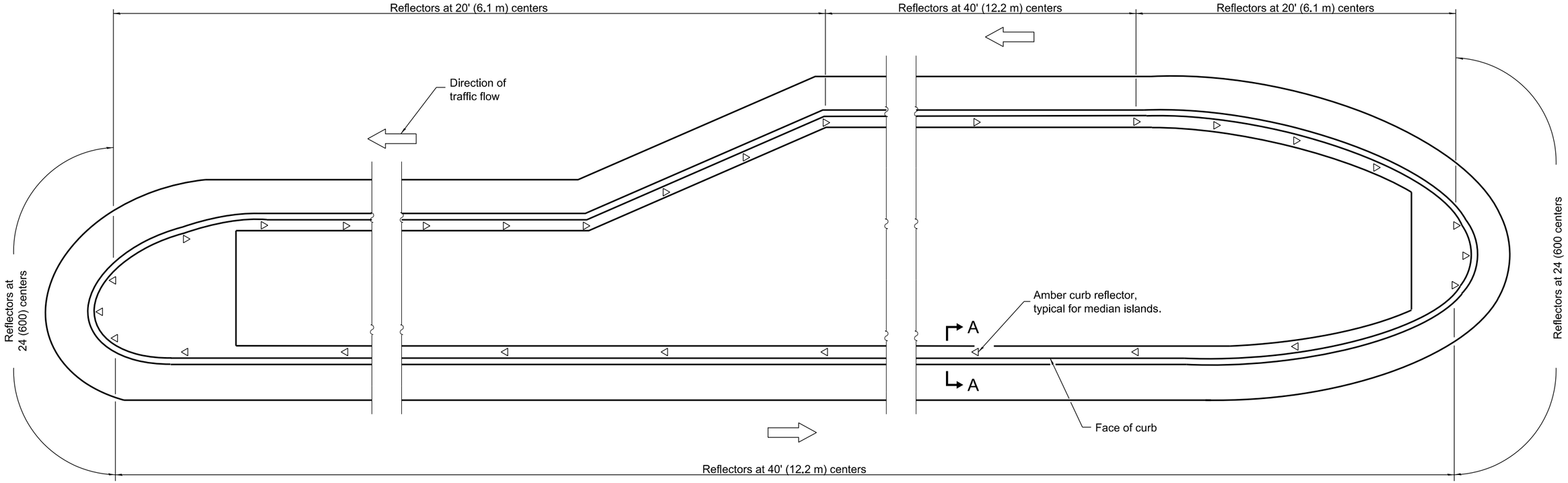
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

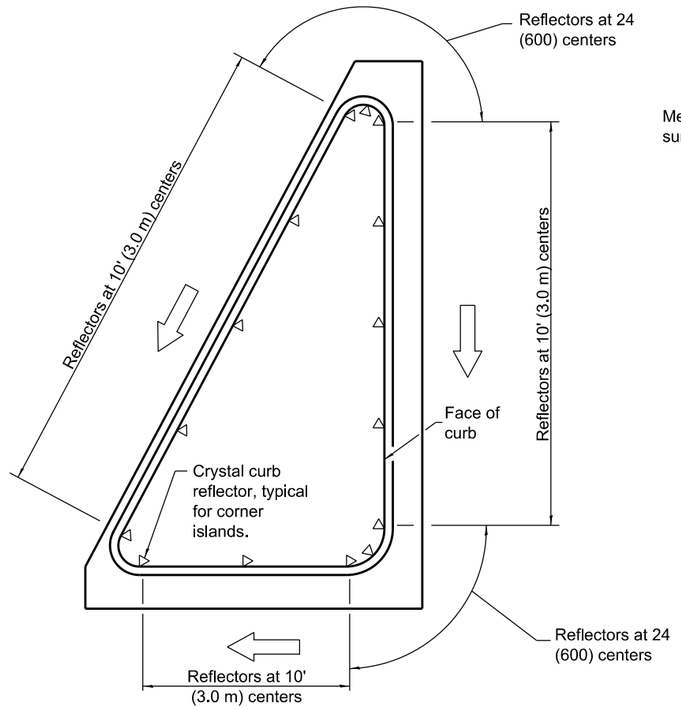
DATE	REVISIONS
4-1-16	Revised LANE ENDS sign W4-2
	to agree with current MUTCD.
1-1-09	Switched units to English (metric).

TYPICAL APPLICATIONS RAISED REFLECTIVE PAVEMENT MARKERS

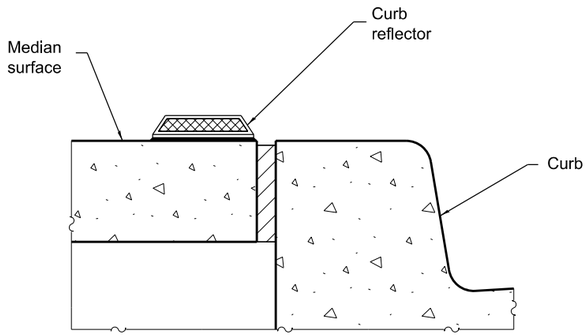
STANDARD 781001-04



MEDIAN ISLAND



CORNER ISLAND



SECTION A-A

(Similar for corner islands.)

GENERAL NOTES

Curb reflectors shall be monodirectional and oriented with the reflective face toward approaching traffic.

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

Illinois Department of Transportation

APPROVED April 1, 2016
ENGINEER OF OPERATIONS

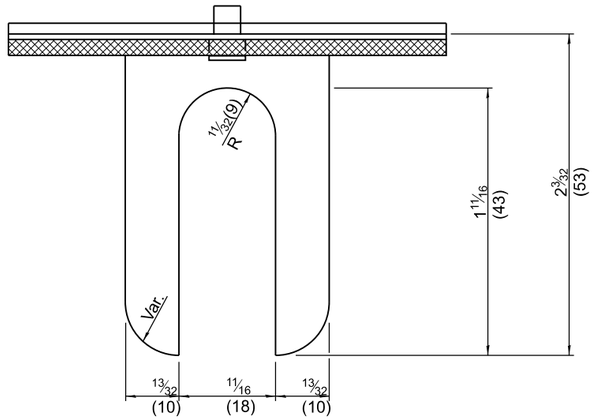
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

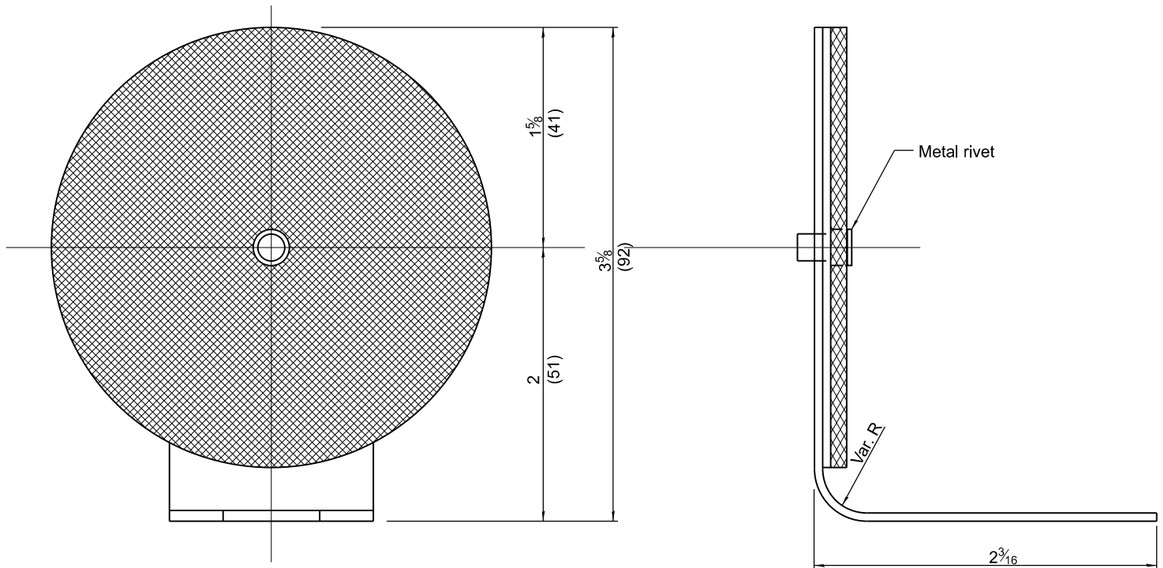
ISSUED 1-1-97

DATE	REVISIONS
4-1-16	Revised title and removed
	work 'prismatic'.
1-1-12	New Standard.

CURB REFLECTORS

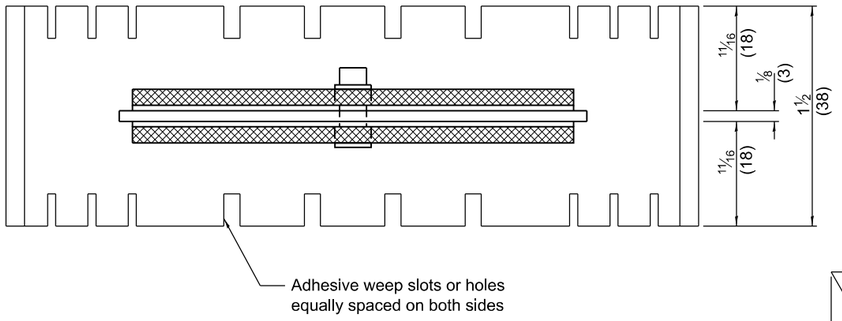
STANDARD 782001-01

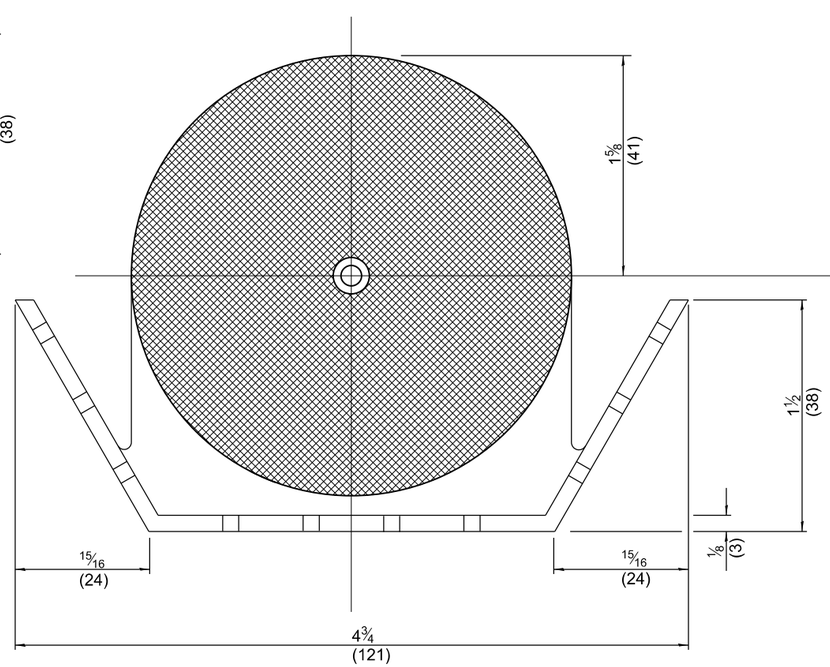


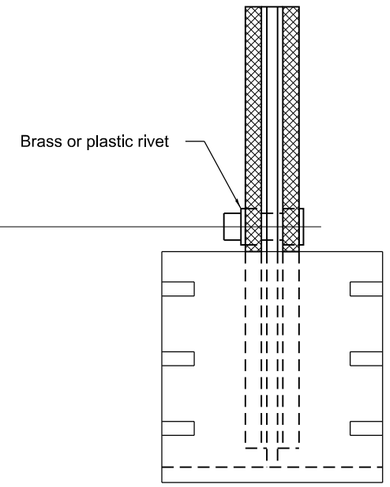


REFLECTOR TYPE A

(monodirectional shown)







REFLECTOR TYPE B

(bidirectional shown)

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

Illinois Department of Transportation

APPROVED January 1, 2020
ENGINEER OF OPERATIONS

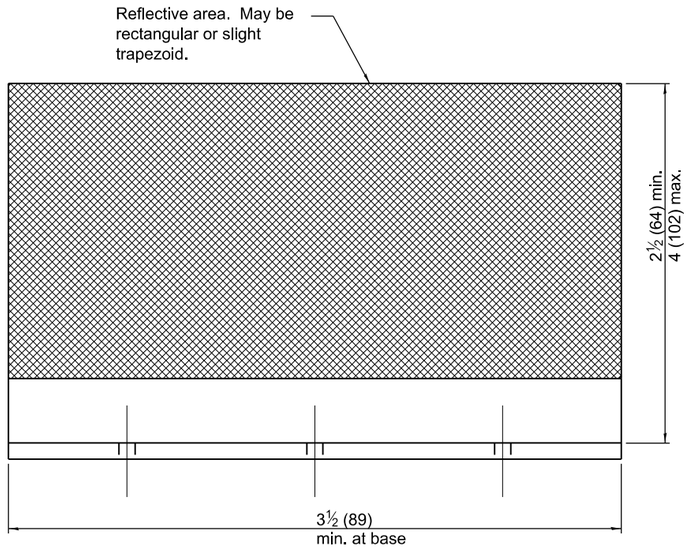
APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

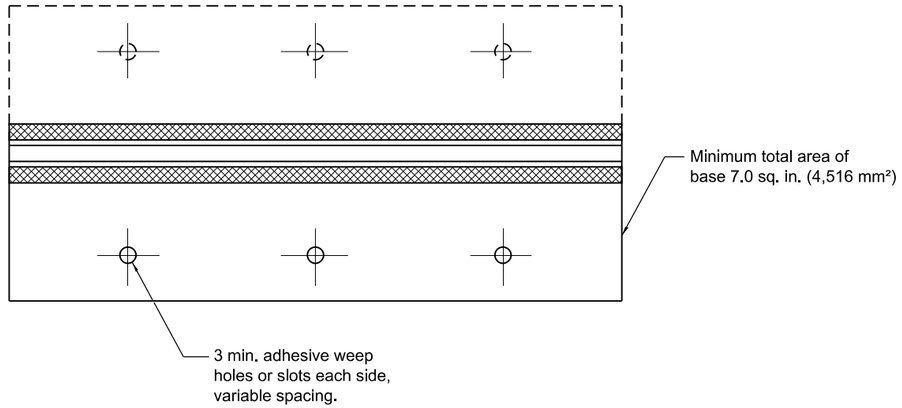
ISSUED 1-1-00

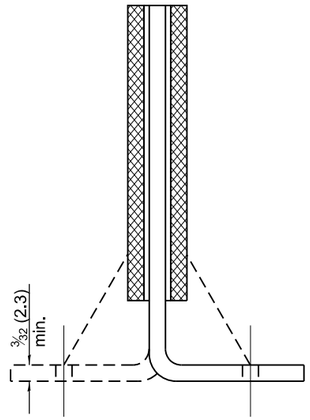
DATE	REVISIONS
1-1-20	Revised from F-shape to constant
	slope parapet, revised note 3 on
	sheet 3, and fix typo.
4-1-16	Added reflector spacing detail.
	Moved TERMINAL MARKER to
	std. 725001.

GUARDRAIL AND BARRIER WALL REFLECTOR MOUNTING DETAILS

STANDARD 782006-01

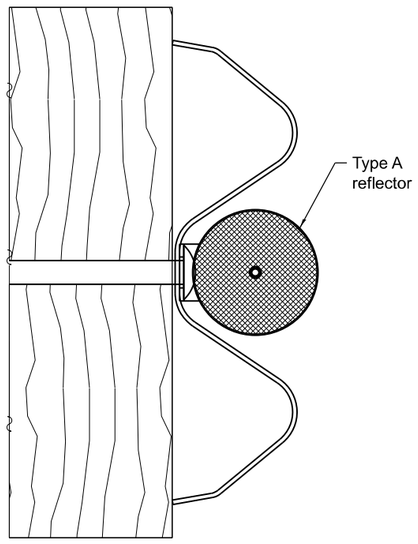


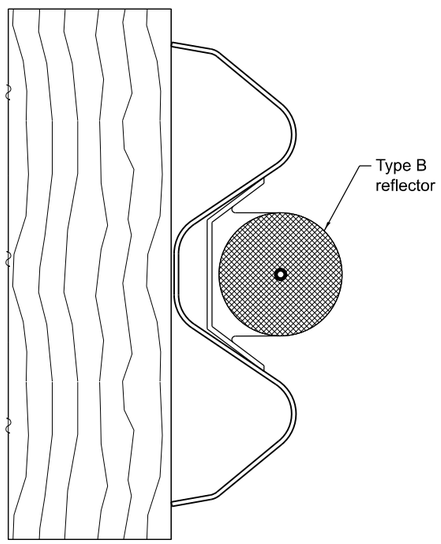




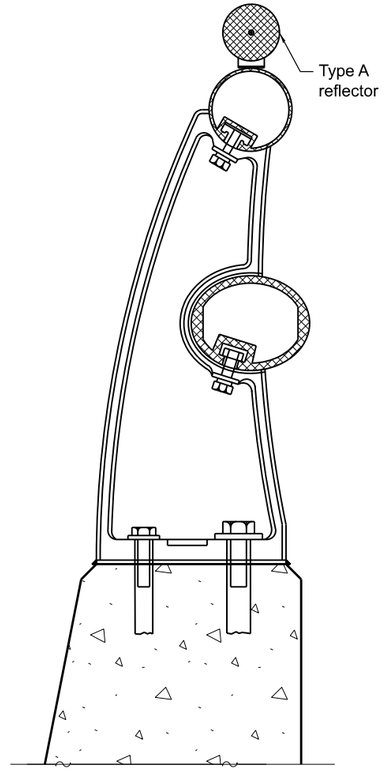
Cross section may be "T" or "L" shaped and may have side supports at ends.

REFLECTOR TYPE C

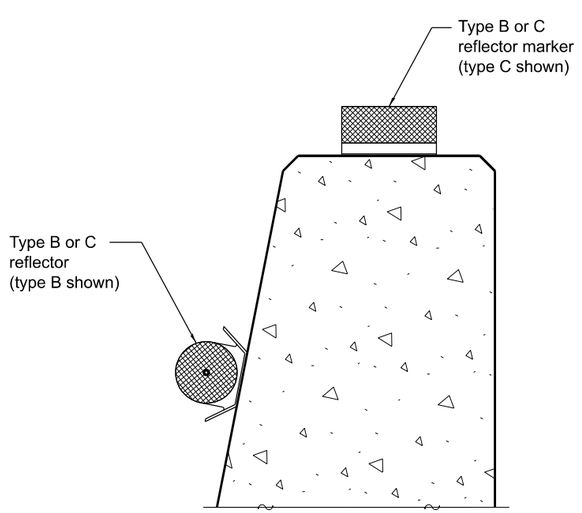




TYPICAL MOUNTING DETAIL FOR GUARDRAIL REFLECTOR



TYPICAL MOUNTING DETAIL FOR BRIDGE RAIL REFLECTOR



TYPICAL MOUNTING DETAIL FOR BARRIER WALL REFLECTOR

Illinois Department of Transportation

APPROVED January 1, 2020
ENGINEER OF OPERATIONS

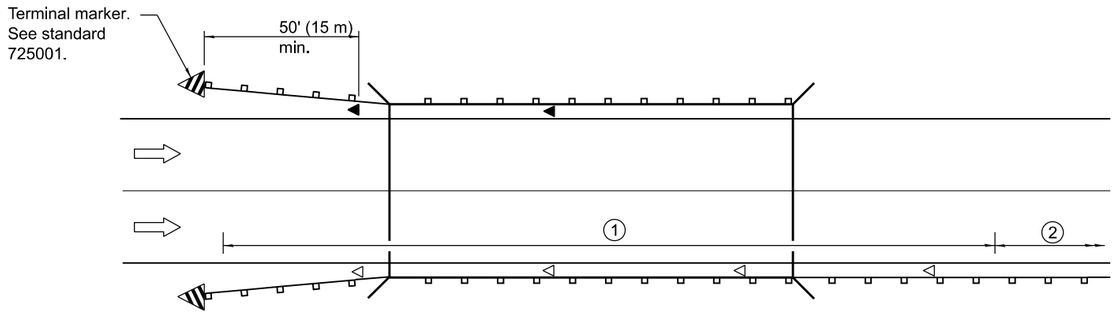
APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-00

GUARDRAIL AND BARRIER WALL REFLECTOR MOUNTING DETAILS

(Sheet 2 of 3)

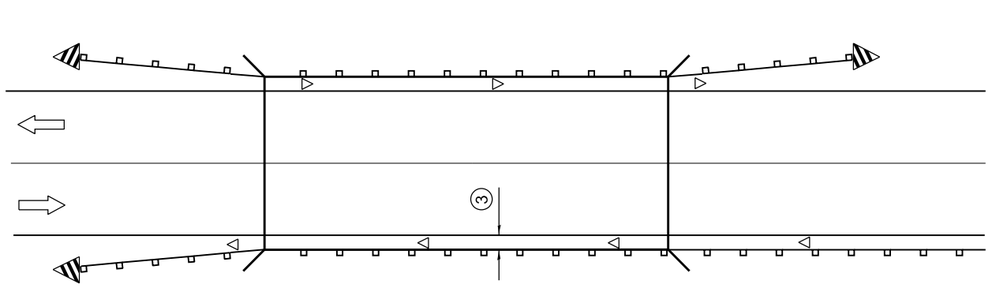
STANDARD 782006-01



1 Spacing 80 ft. (24 m) max. for first 400 ft. (122 m) or curve spacing shown in Standard 635001, whichever is less (min. 4 reflectors regardless of length).

2 After 400 ft. (122 m), transition to normal delineator spacing shown in Standard 635001, and continue as required.

ONE-WAY TRAFFIC



3 Where the shoulder width is reduced to less than 24 (610), use bidirectional crystal/crystal in lieu of monodirectional crystal.

◁ Monodirectional crystal

◀ Monodirectional amber

TWO-WAY TRAFFIC

GUARDRAIL / BARRIER WALL REFLECTOR PLACEMENT DETAIL

Illinois Department of Transportation

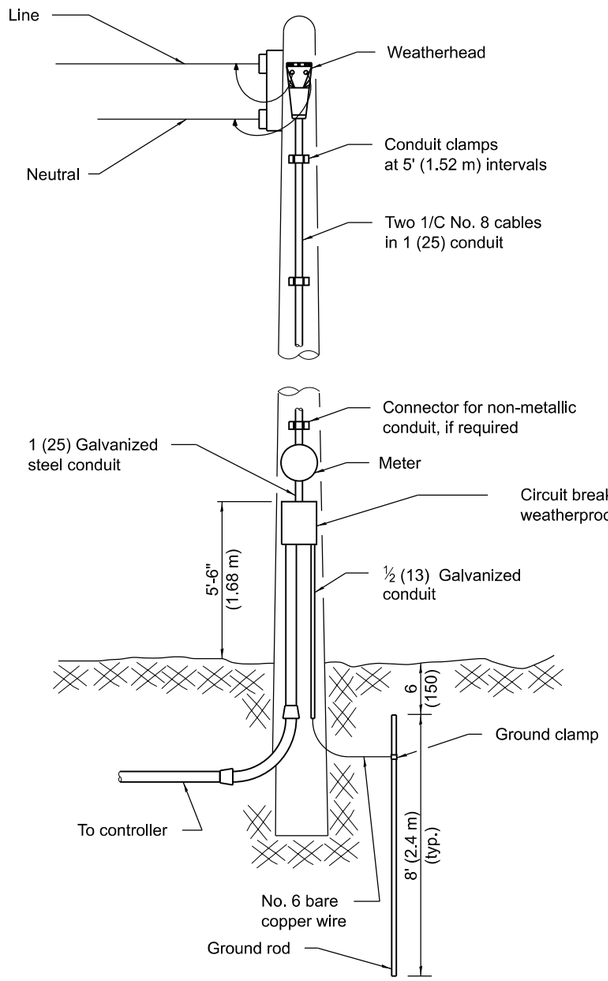
APPROVED January 1, 2020
ENGINEER OF OPERATIONS

APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

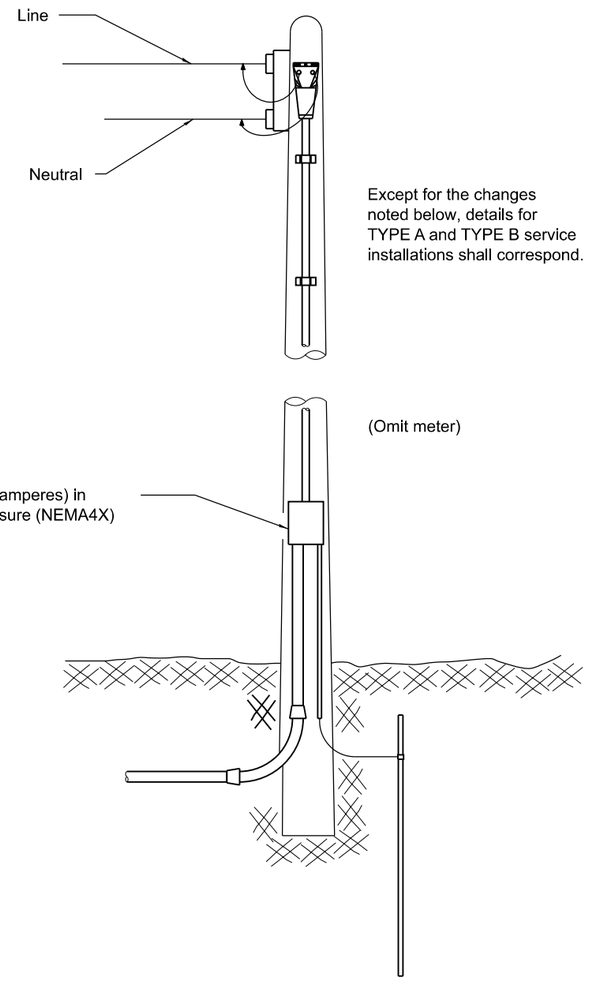
ISSUED 1-1-00

GUARDRAIL AND BARRIER WALL REFLECTOR MOUNTING DETAILS

STANDARD 782006-01

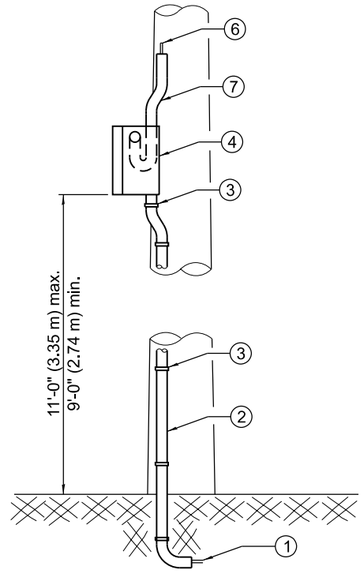


TYPE A



TYPE B

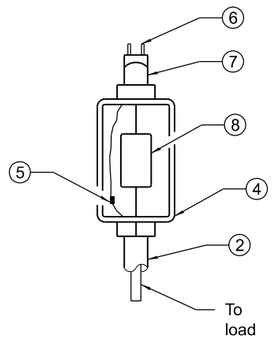
Except for the changes noted below, details for TYPE A and TYPE B service installations shall correspond.

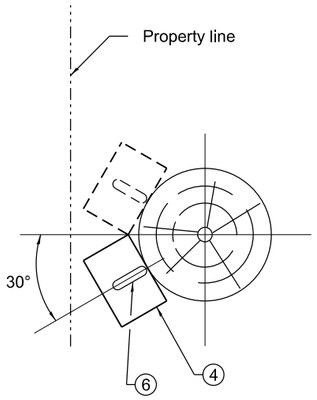


The following equipment is to be furnished and installed on the TYPE C installation.

1. Cable in conduit (electric cable, No. 6, 2/C except where otherwise specified)
2. Galvanized steel conduit 1¼ (32) with bend
3. Galvanized conduit clamps
4. Aluminum weatherproof box with gasketed cover. Weatherproof box shall be installed facing the adjacent property line. (See diagram for alternate installation.)
5. Ground stud for neutral connection
6. Service cables
7. Offset weatherproof fitting
8. Circuit breaker

TYPE C





ALTERNATE INSTALLATION

(Installation when weatherproof box cannot be installed facing the adjacent property line.)

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

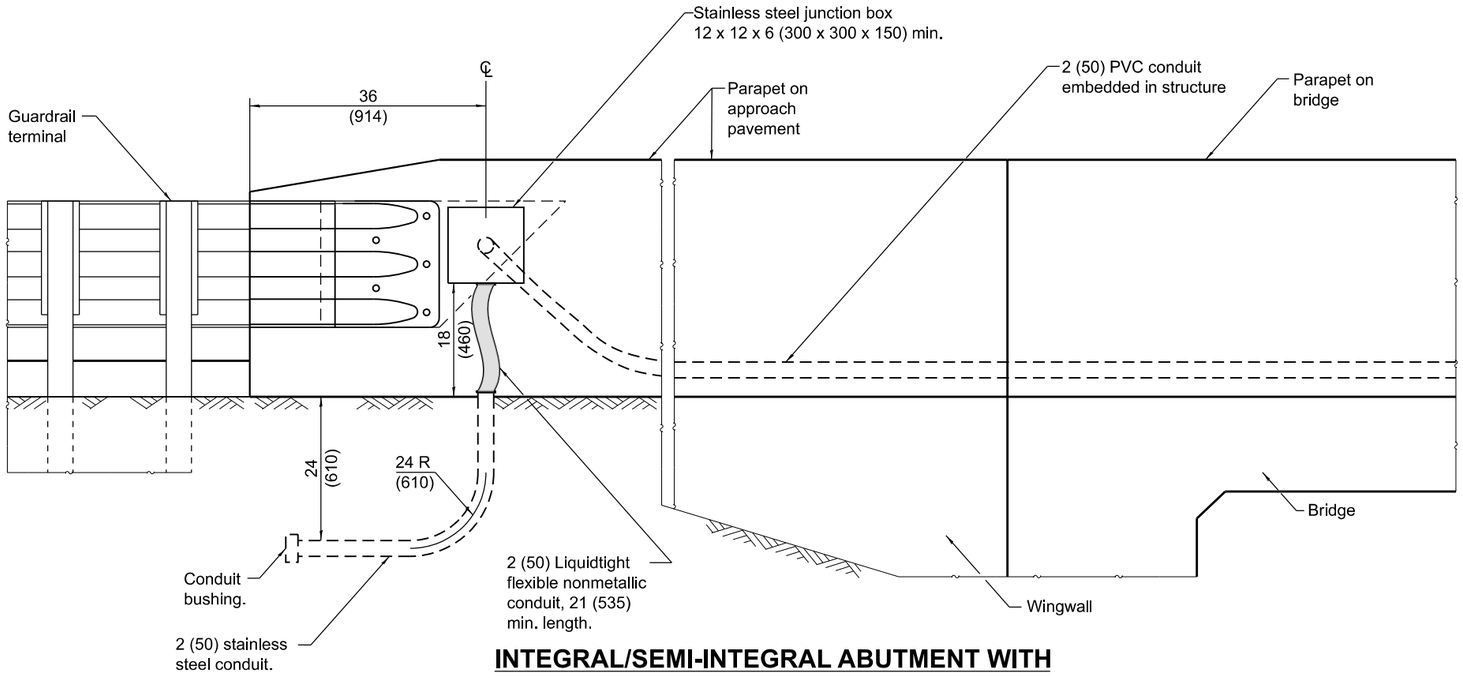
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

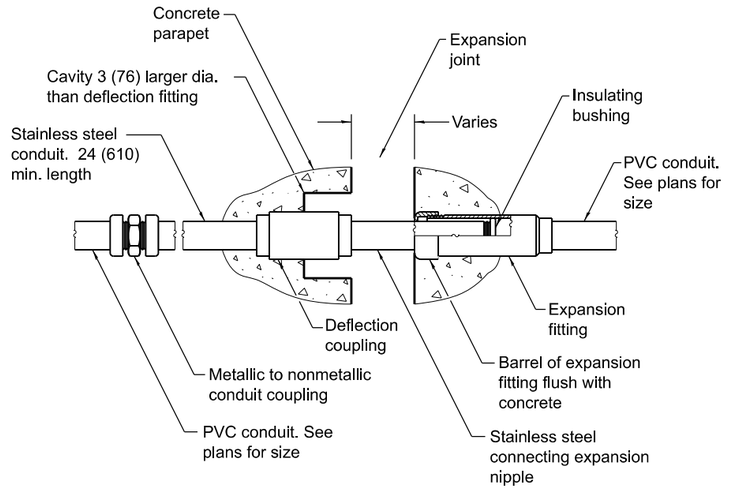
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-02	Renum. Standard 2373-1.

ELECTRICAL SERVICE INSTALLATION DETAILS

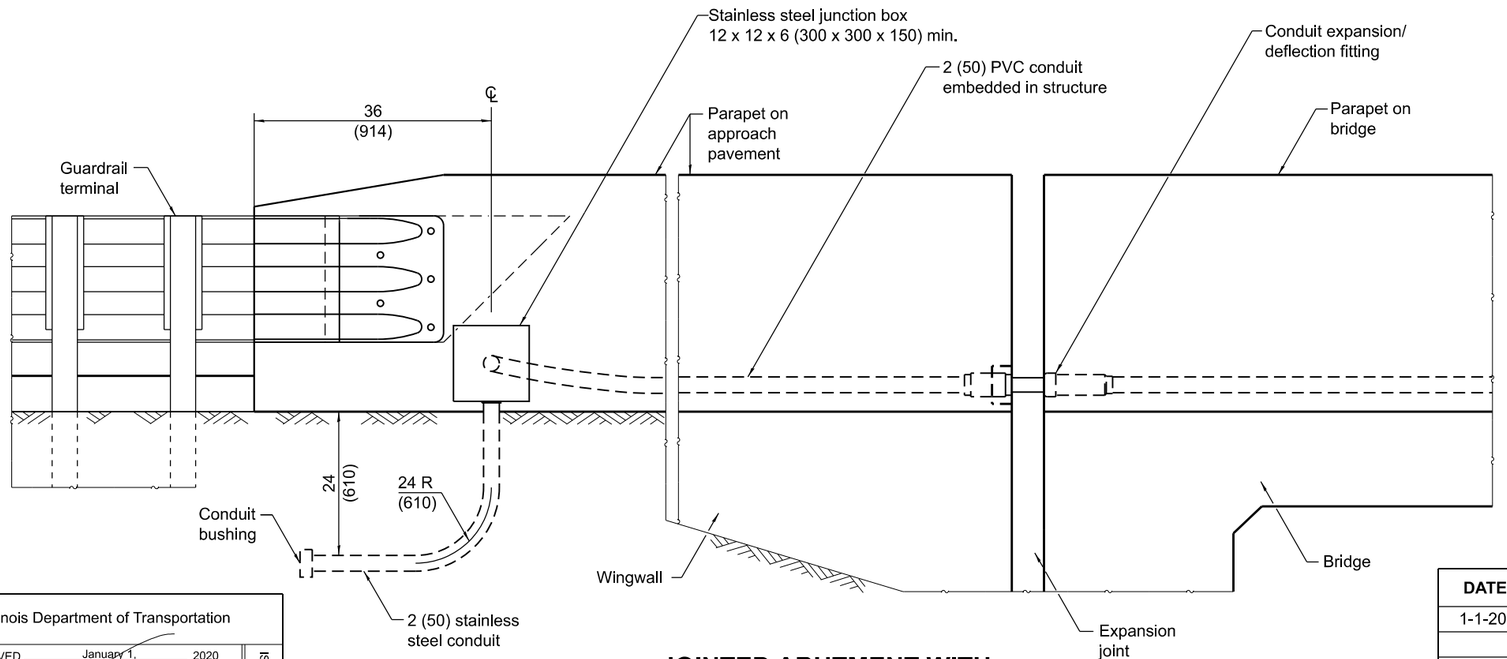
STANDARD 805001-01



INTEGRAL/SEMI-INTEGRAL ABUTMENT WITH PARAPET ON APPROACH PAVEMENT



COMBINATION EXPANSION/ DEFLECTION FITTING



JOINTED ABUTMENT WITH PARAPET ON APPROACH PAVEMENT

GENERAL NOTES

The barrel in the expansion fitting shall be fully embedded in the concrete on one side of the expansion joint. One half the length of the deflection fitting shall be embedded in the concrete on the other side of the expansion joint.

The Contractor shall install combination expansion deflection fittings at all bridge expansion joints.

With the approval of the Engineer, the Contractor may substitute two 12 x 12 x 6 (300 x 300 x 150) min. stainless steel junction boxes attached to back of wall and connected with liquidtight flexible nonmetallic conduit for all expansion joints.

See Standard 631031 for details of steel connector plate for constant slope parapet.

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

Illinois Department of Transportation

APPROVED January 1, 2020
ELECTRICAL AND MECHANICAL UNIT CHIEF

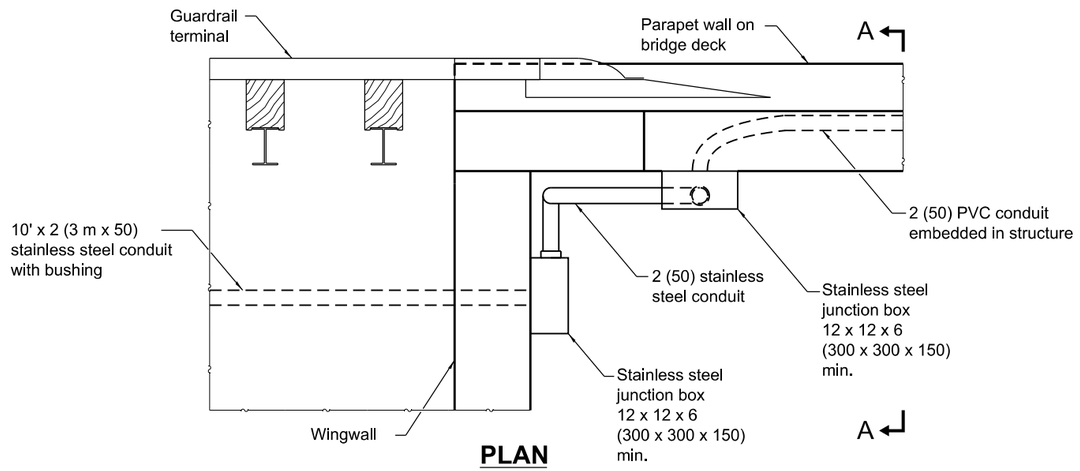
APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-15

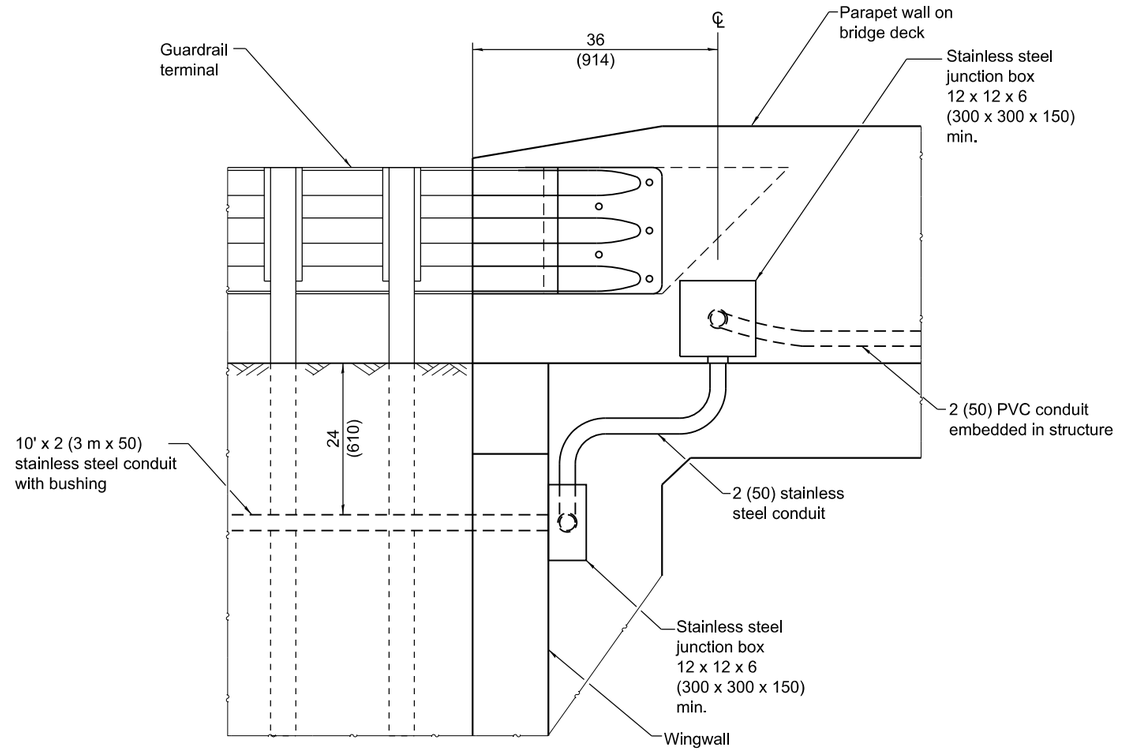
DATE	REVISIONS
1-1-20	Revised from F-shape to constant
	slop parapet, added general note for
	steel connector plate, revised
	standard name, and fixed typo.
1-1-15	New Standard

RACEWAYS EMBEDDED IN STRUCTURE

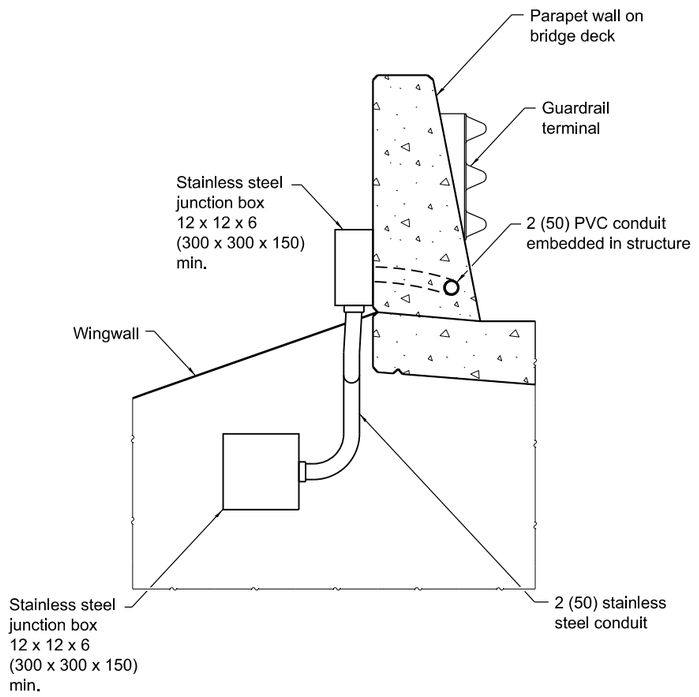
STANDARD 812001-01



PLAN



ELEVATION



VIEW A-A

Illinois Department of Transportation

APPROVED January 1, 2020
ME Seppelt
ELECTRICAL AND MECHANICAL UNIT CHIEF

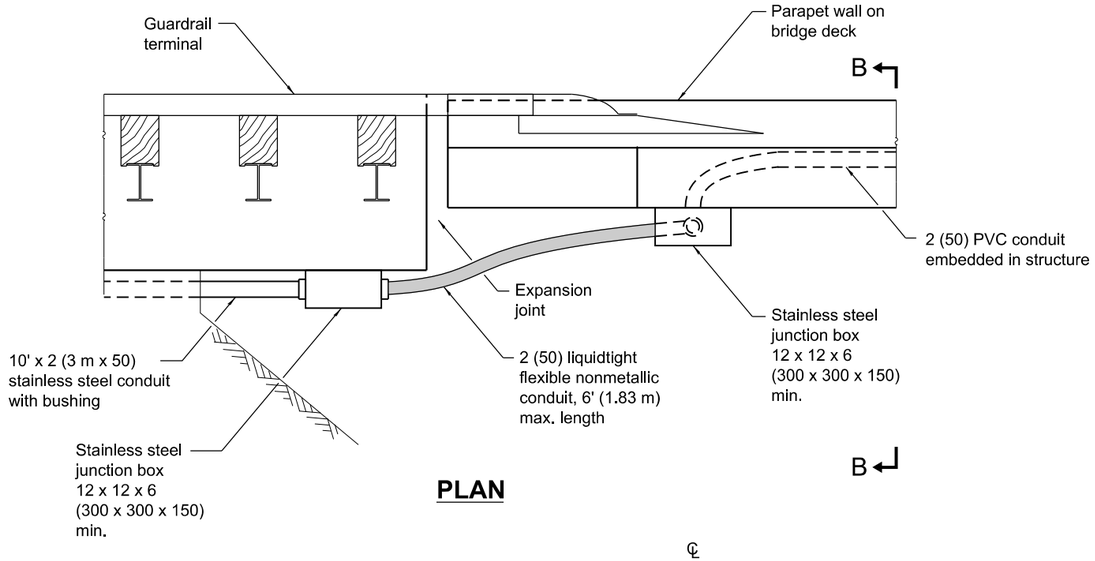
APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-15

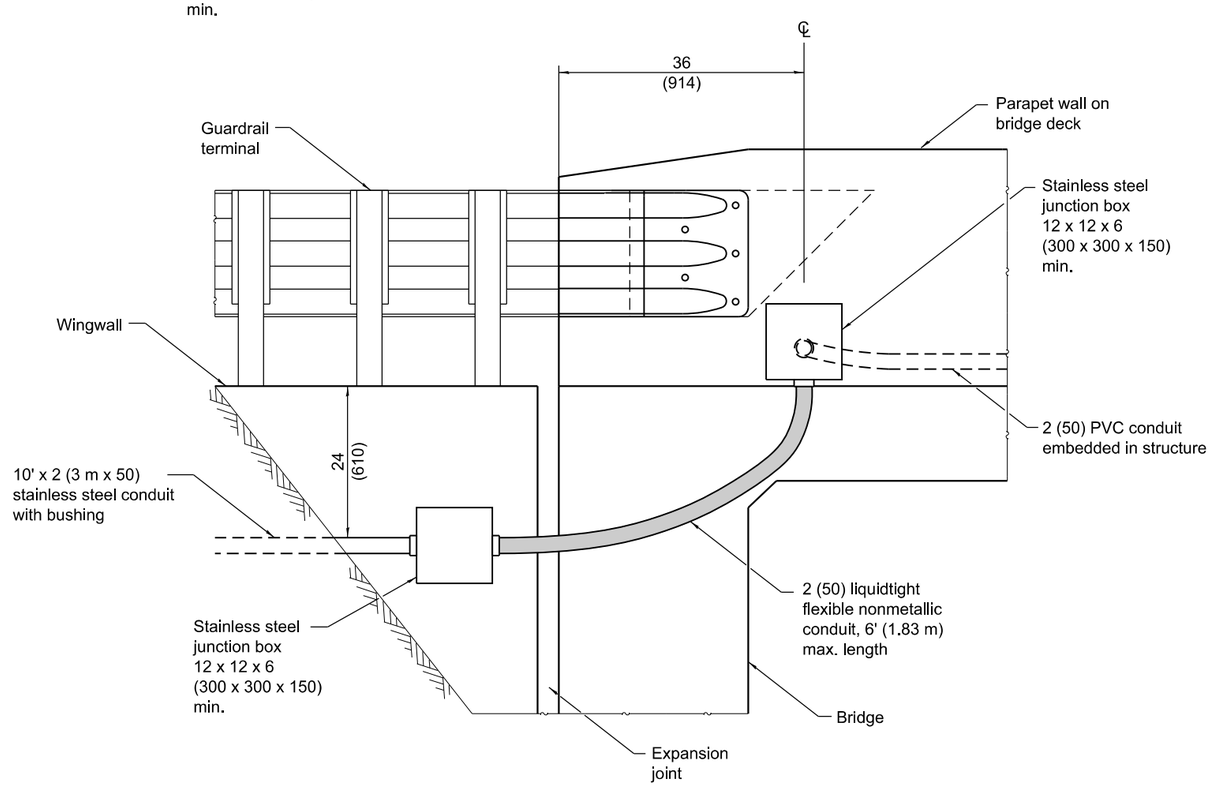
INTEGRAL/SEMI-INTEGRAL ABUTMENT WITH PARAPET ENDING ON BRIDGE DECK

RACEWAYS EMBEDDED IN STRUCTURE

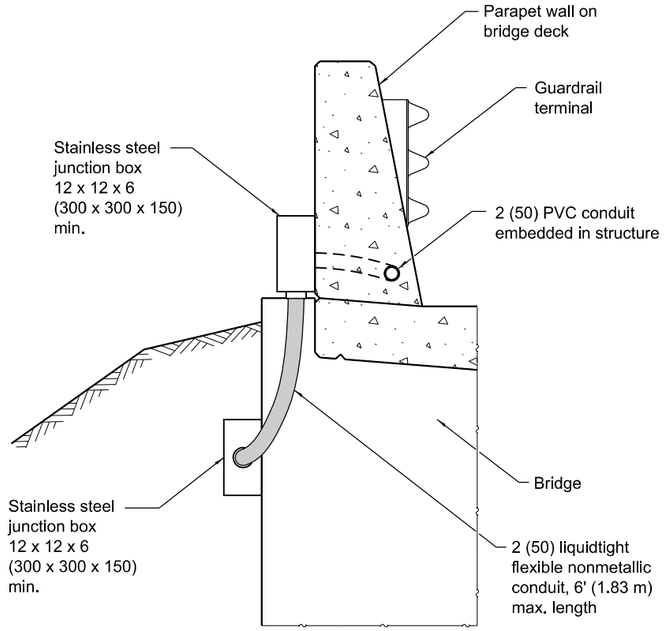
STANDARD 812001-01



PLAN



ELEVATION



VIEW B-B

Illinois Department of Transportation

APPROVED January 1, 2020
ELECTRICAL AND MECHANICAL UNIT CHIEF

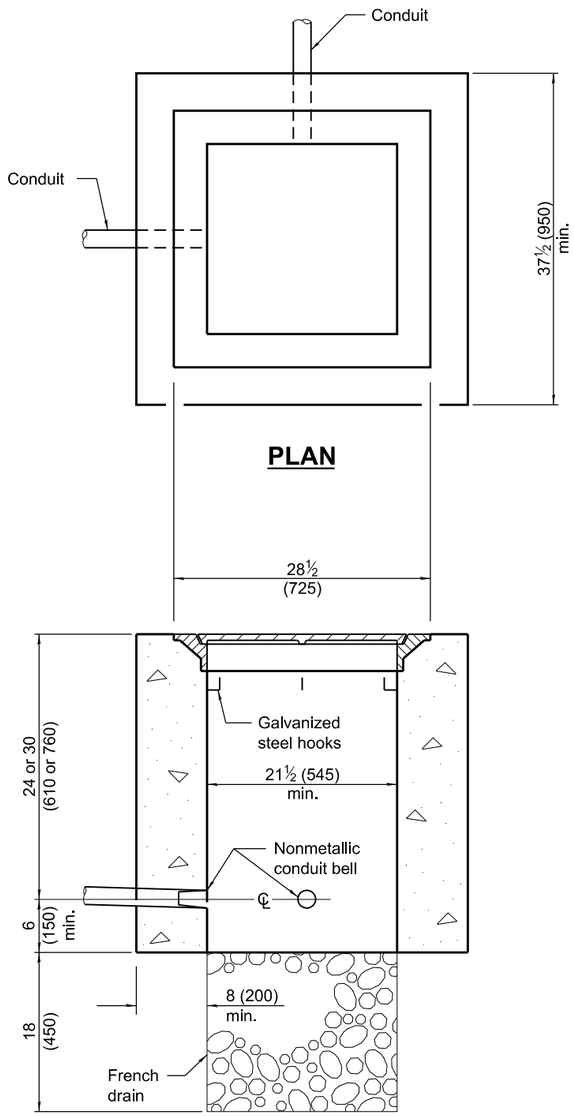
APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-15

JOINTED ABUTMENT WITH PARAPET ENDING ON BRIDGE DECK

RACEWAYS EMBEDDED IN STRUCTURE

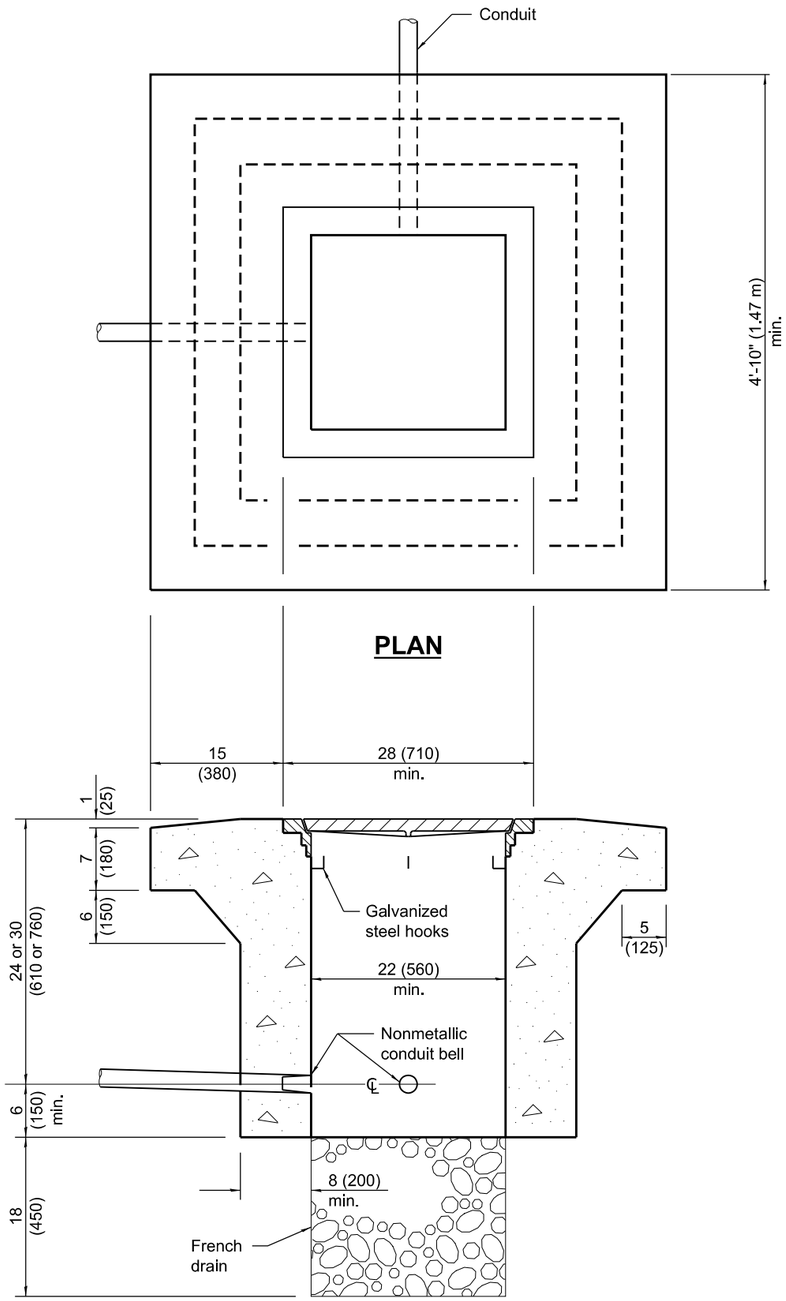
STANDARD 812001-01



PLAN

ELEVATION

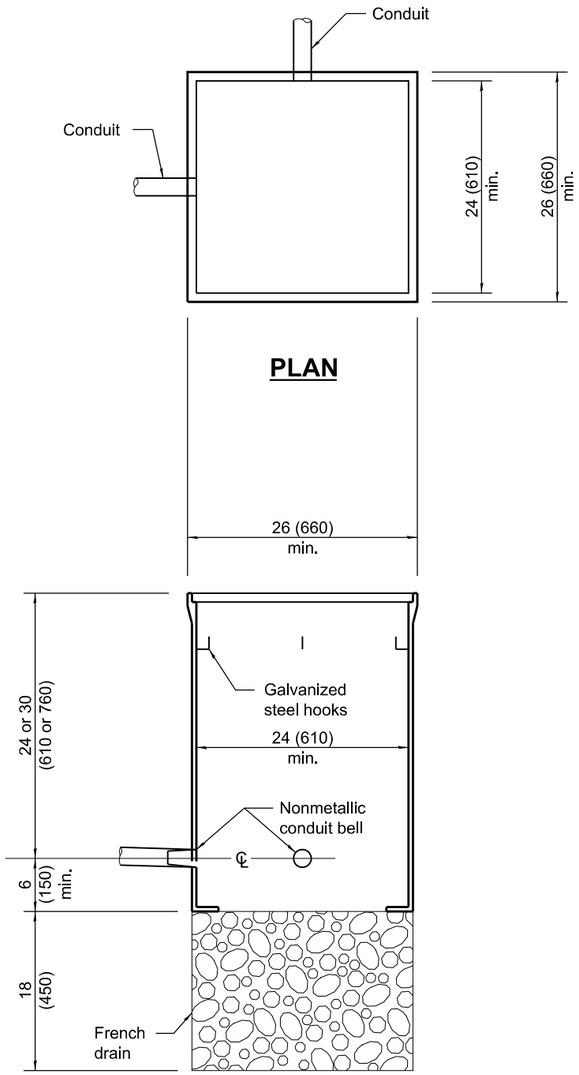
PORTLAND CEMENT CONCRETE



PLAN

ELEVATION

PORTLAND CEMENT CONCRETE HEAVY DUTY



PLAN

ELEVATION

COMPOSITE CONCRETE

QUANTITIES

Depth	Concrete yd³ (m³) Handhole	Concrete yd³ (m³) Heavy Duty Handhole
30 (762)	0.61 (0.47)	0.98 (0.75)
36 (914)	0.73 (0.56)	1.10 (0.84)

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

Illinois Department of Transportation

APPROVED January 1, 2015
ENGINEER OF OPERATIONS

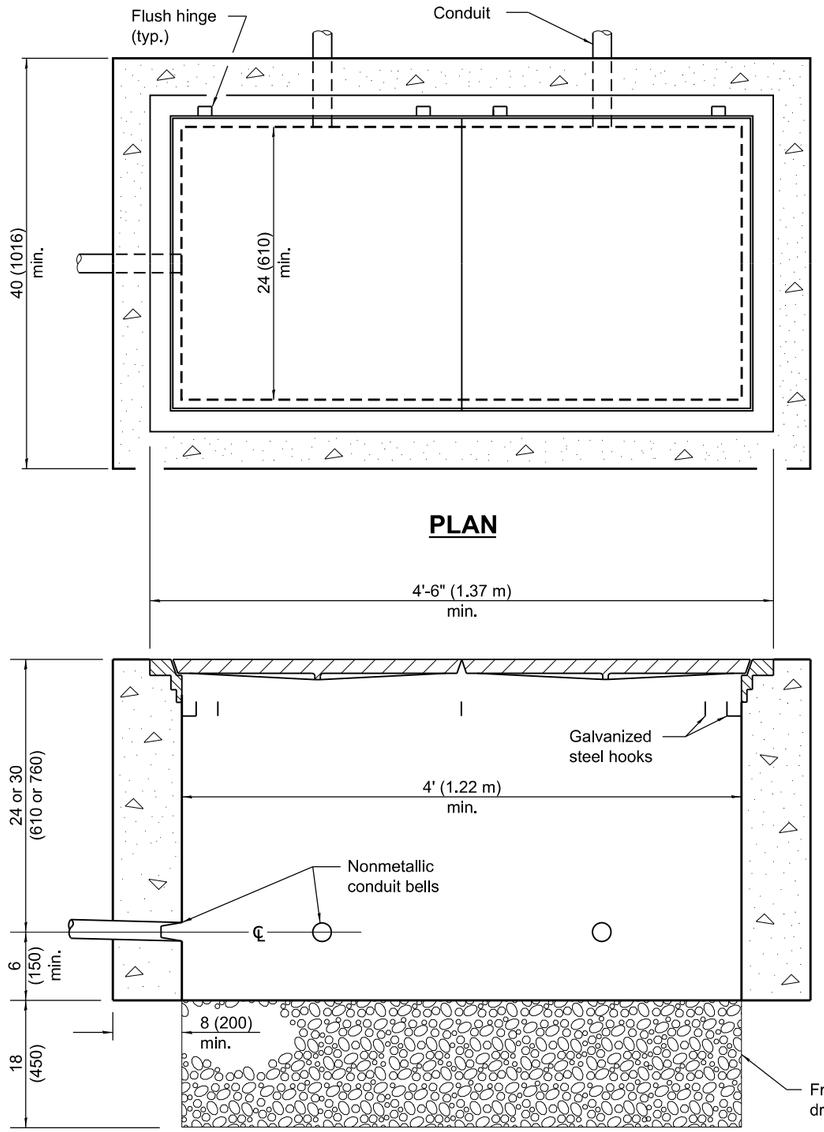
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-15	Corrected dimension on heavy
	duty handhole. Added concrete
	quantities table.
1-1-09	Switched units to English (metric).

HANDHOLES

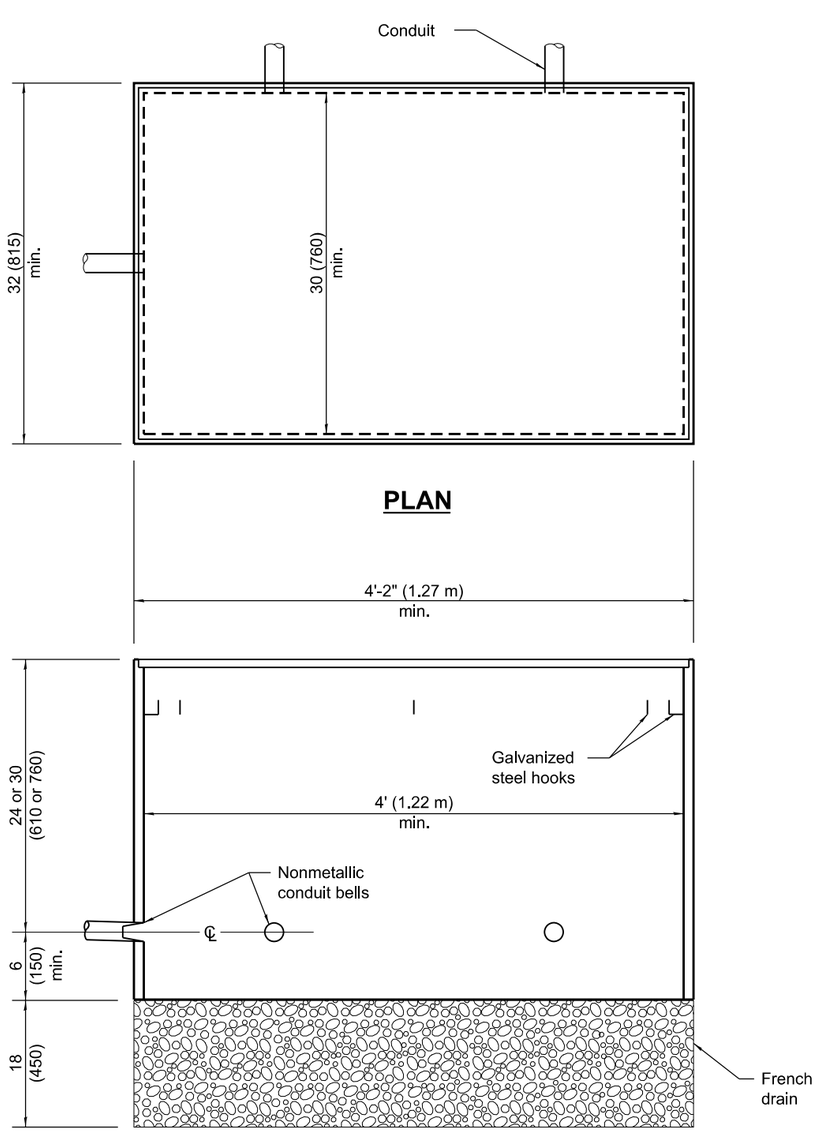
STANDARD 814001-03



PLAN

ELEVATION

PORTLAND CEMENT CONCRETE



PLAN

ELEVATION

COMPOSITE CONCRETE

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

Illinois Department of Transportation

APPROVED January 1, 2021
ENGINEER OF OPERATIONS

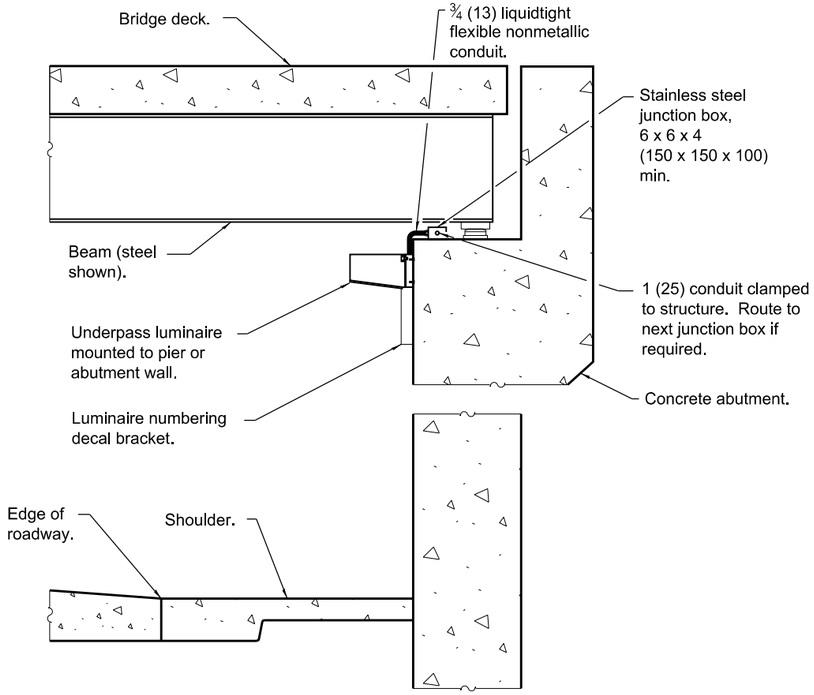
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

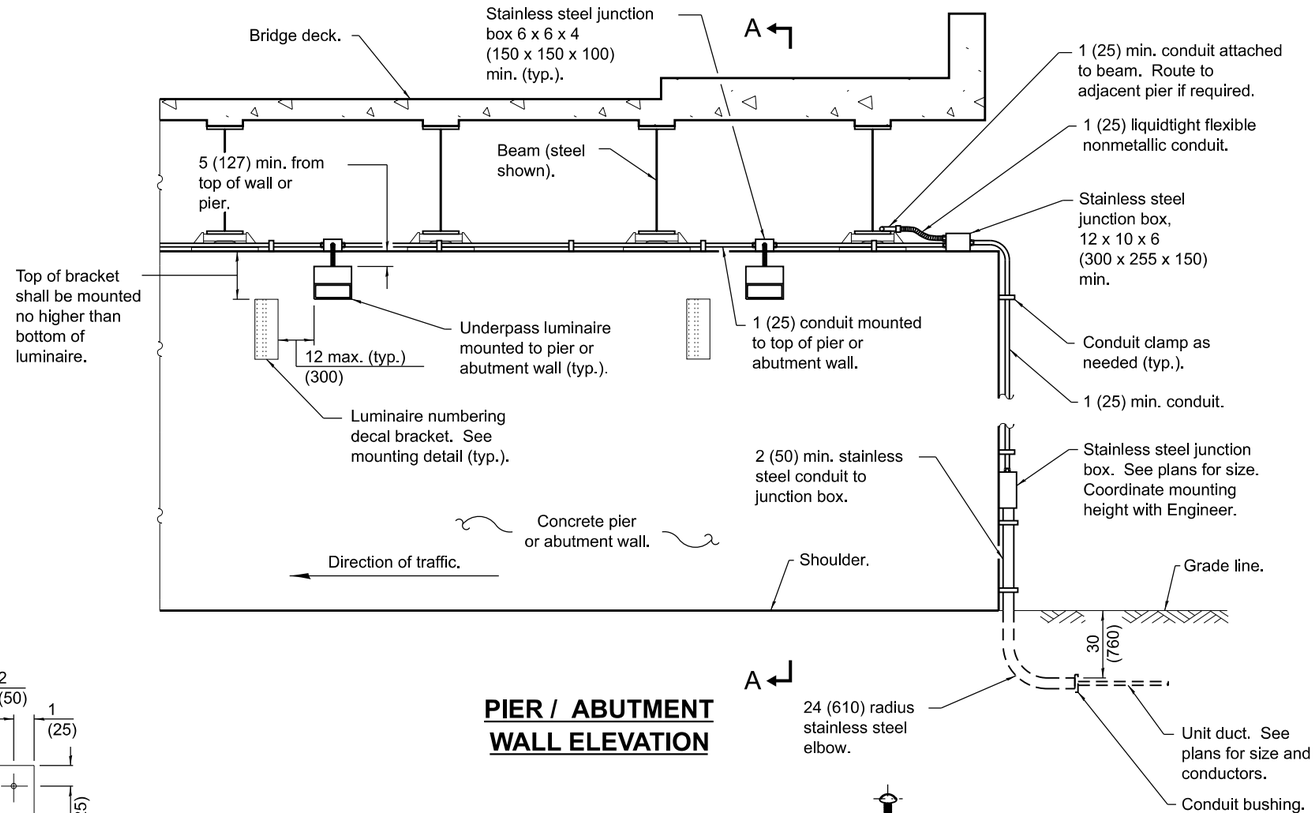
DATE	REVISIONS
1-1-21	Corrected dimension in Portland
	Cement Concrete plan view.
1-1-09	Switched units to English (metric).

DOUBLE HANDHOLES

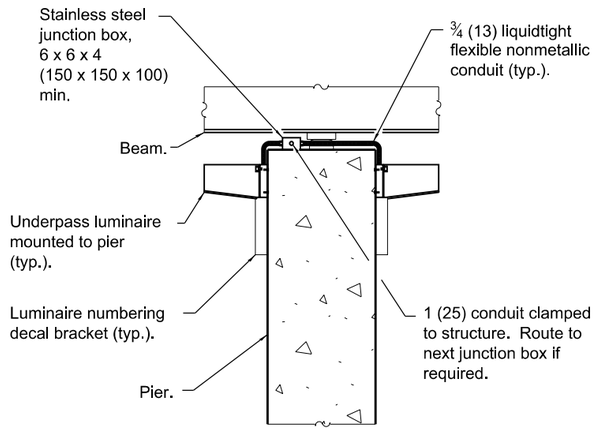
STANDARD 814006-03



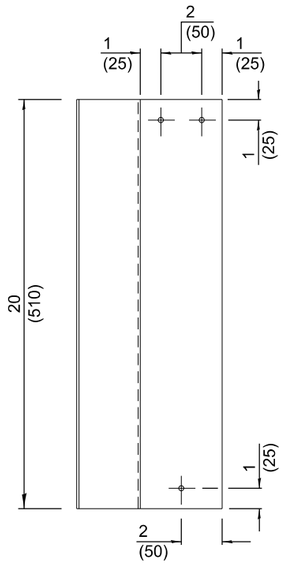
SECTION A-A



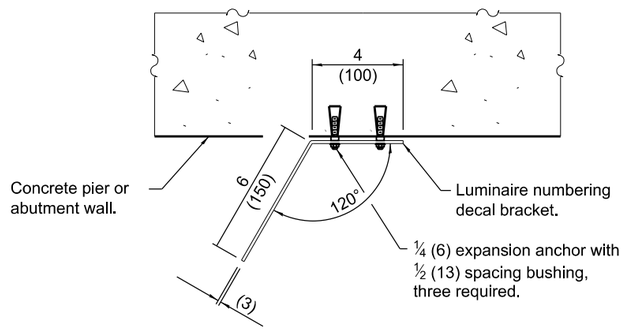
PIER / ABUTMENT WALL ELEVATION



CENTER PIER DETAIL



ELEVATION



TOP VIEW

CONDUIT CLAMP

CONDUIT BEAM 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.

LUMINAIRE NUMBERING DECAL BRACKET MOUNTING DETAIL

Illinois Department of Transportation

APPROVED April 1, 2016
ENGINEER OF PRELIMINARY ENGINEERING

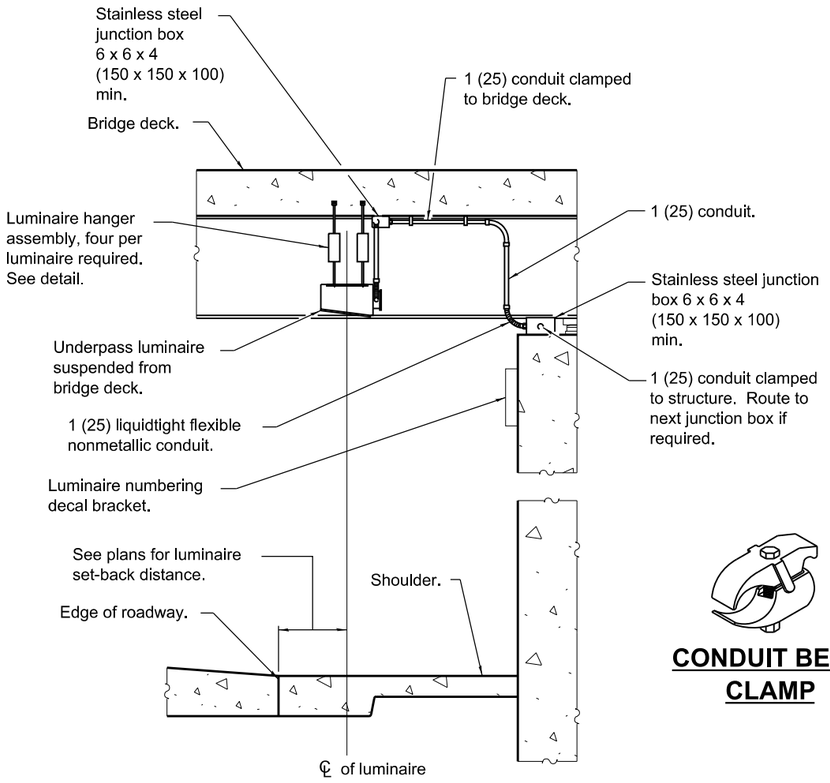
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-16

DATE	REVISIONS
4-1-16	New Standard.

UNDERPASS LIGHTING WALL MOUNT

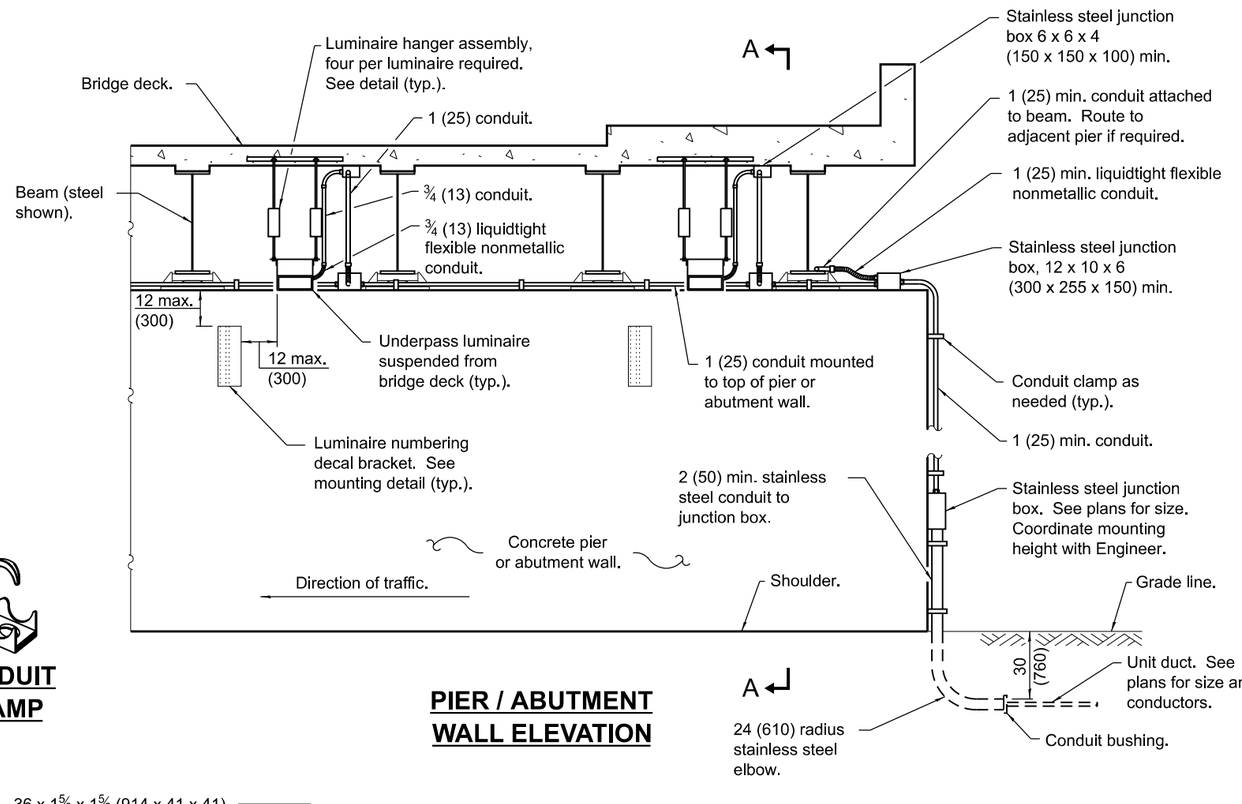
STANDARD 821001



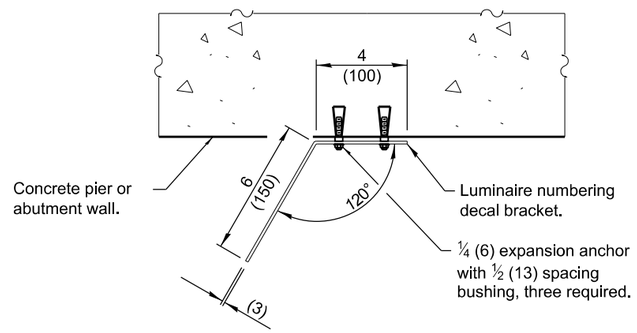
SECTION A-A

CONDUIT BEAM CLAMP

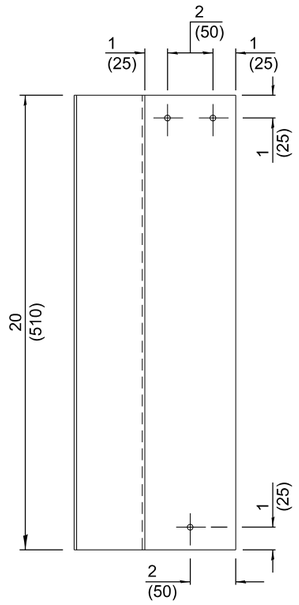
CONDUIT CLAMP



PIER / ABUTMENT WALL ELEVATION

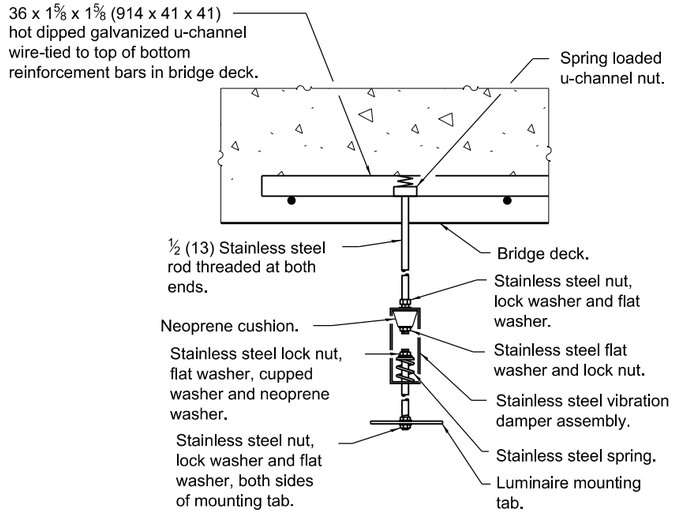


TOP VIEW



ELEVATION

LUMINAIRE NUMBERING DECAL BRACKET MOUNTING DETAIL



LUMINAIRE HANGER ASSEMBLY DETAIL

GENERAL NOTES

See plans for underpass luminaire locations.

Underpass luminaires shall be centered between beams unless otherwise directed by the Engineer.

Optics of underpass luminaires shall be installed 1 (25) above the bottom of the beams with no parts of the luminaire or attached conduit below the beams.

Rigid conduit may be used in lieu of flexible conduit.

Stainless steel conduit shall be used beneath any openings in the bridge deck.

Branch circuits to luminaires shown routed from underground. Branch circuits may also be routed from bridge parapet above.

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

Illinois Department of Transportation

APPROVED April 1, 2016
ENGINEER OF PRELIMINARY ENGINEERING

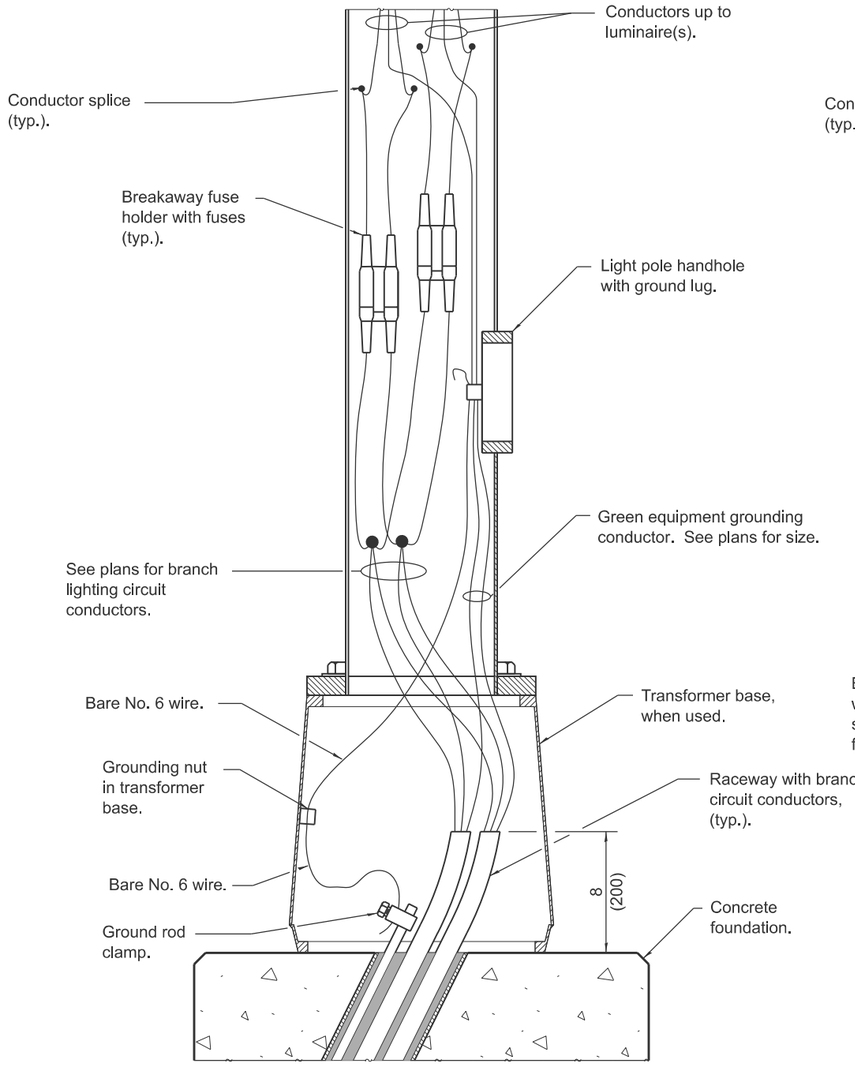
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-16

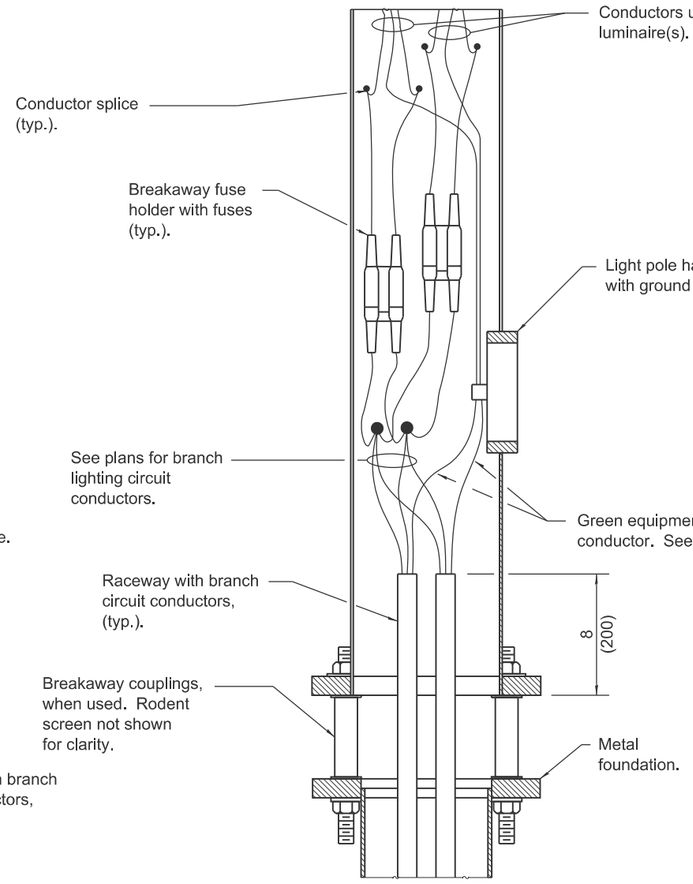
DATE	REVISIONS
4-1-16	New Standard.

UNDERPASS LIGHTING SUSPENDED

STANDARD 821006



ELEVATION AT POLE BASE WITH CONCRETE FOUNDATION



ELEVATION AT POLE BASE WITH METAL FOUNDATION

(Rodent screen not shown)

GENERAL NOTES

Wiring for twin luminaire installation shown. Omit one fuse holder 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 handole.

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.

Illinois Department of Transportation

APPROVED January 1, 2025
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

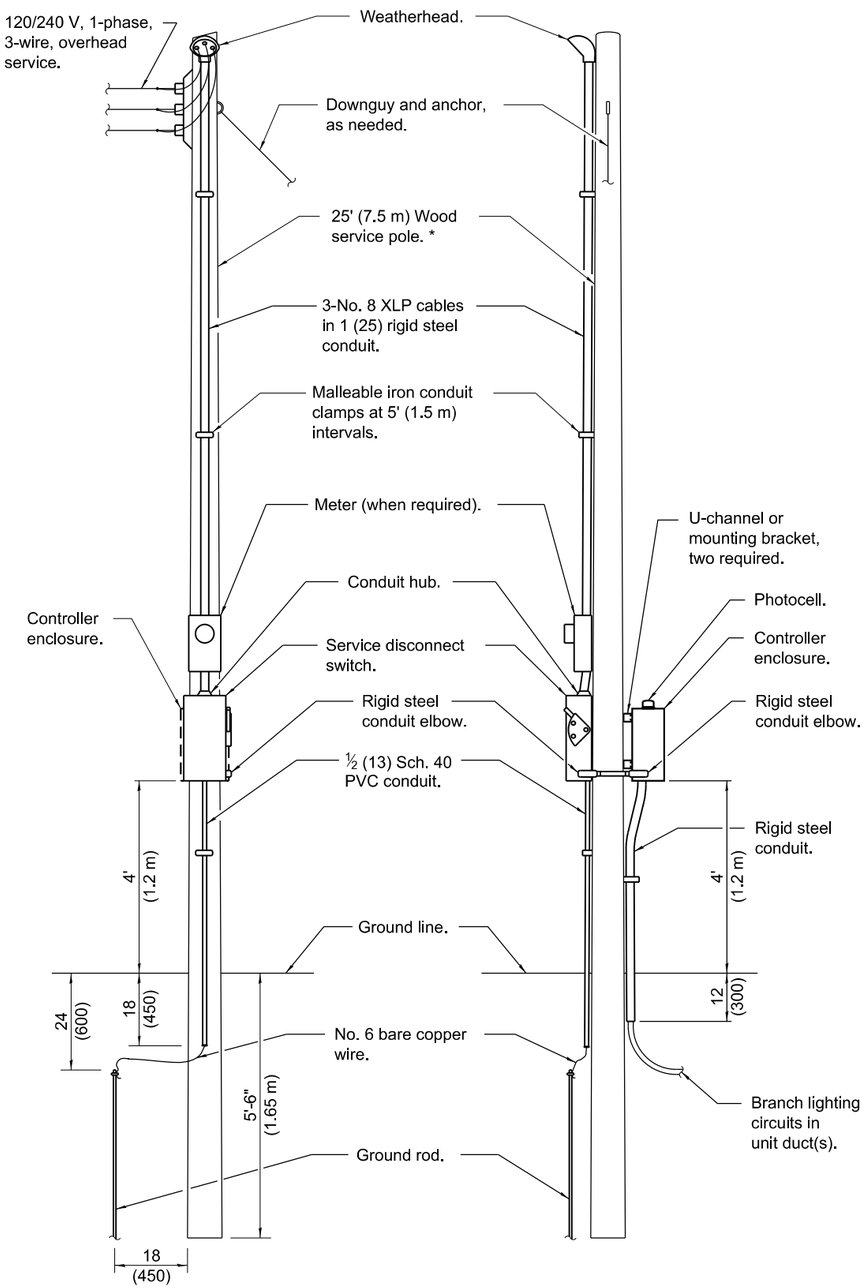
ISSUED 1-1-14

DATE	REVISIONS
1-1-25	Omitted the surge protective device
	in the light pole.
1-1-17	Renamed Standard

LUMINAIRE WIRING IN POLE

STANDARD 821101-03

30 AMP

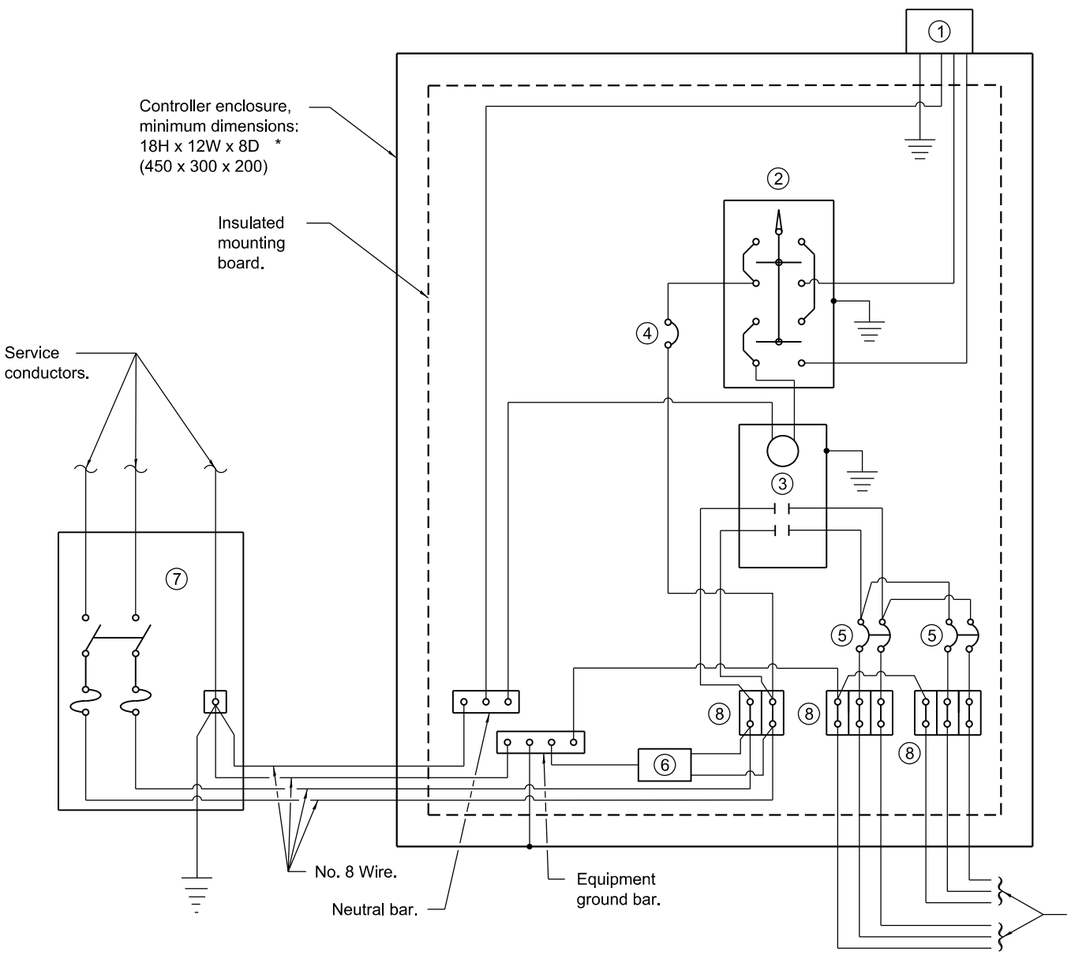


FRONT **SIDE**

ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

* Size larger as needed.



CONTROL SCHEMATIC

1. Photocell with integral surge arrester.
2. HAND-OFF-AUTO selector switch.
3. 60 amp, electrically held contactor.
4. 15 amp, 1-pole circuit breaker.
5. 20 amp, 2-pole circuit breaker.
6. Surge arrester.
7. Service disconnect switch - 2-pole, 3-wire, 30 amp, fused at 30 amp, solid neutral in NEMA 4X enclosure having lockable external handle.
8. Terminal block sized for conductors as shown on plans.

* Size larger as needed.

GENERAL NOTES

Provide 12 x 9 x 1 (305x225x25) watertight pouch mounted inside controller door with as-built plans and schematics.

Provide engraved nameplate on front of enclosure reading "LIGHTING".

Enclosure shall be mounted to pole with pole-bands and lag-bolts.

Work pad not shown.

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

Illinois Department of Transportation

APPROVED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

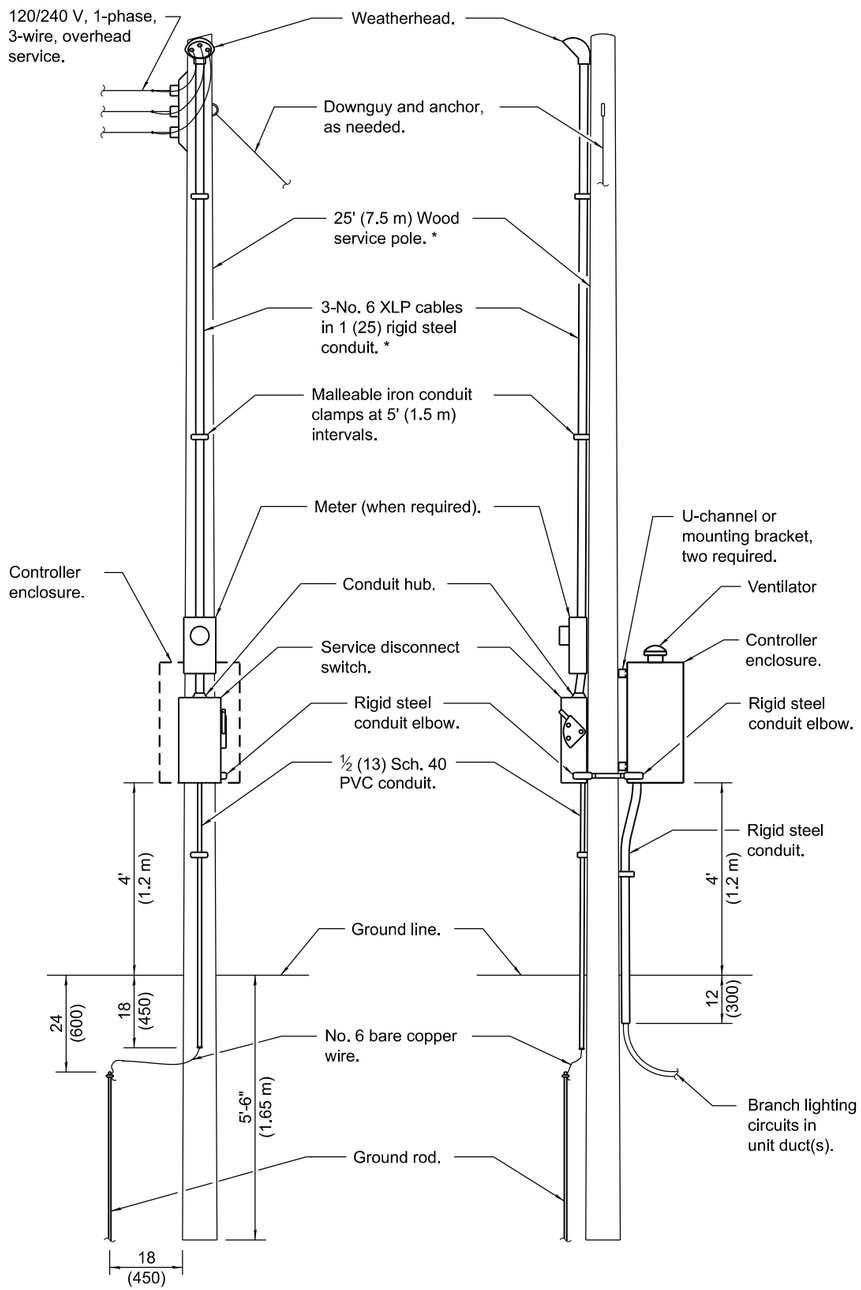
ISSUED 1-1-10

DATE	REVISIONS
1-1-19	Replaced ** note with new note
	regarding consulting utility company
	stsandards for installation.
4-1-16	Corrected connection at terminal
	block.

LIGHTING CONTROLLER POLE MOUNTED, 240V

STANDARD 825001-04

60 AMP

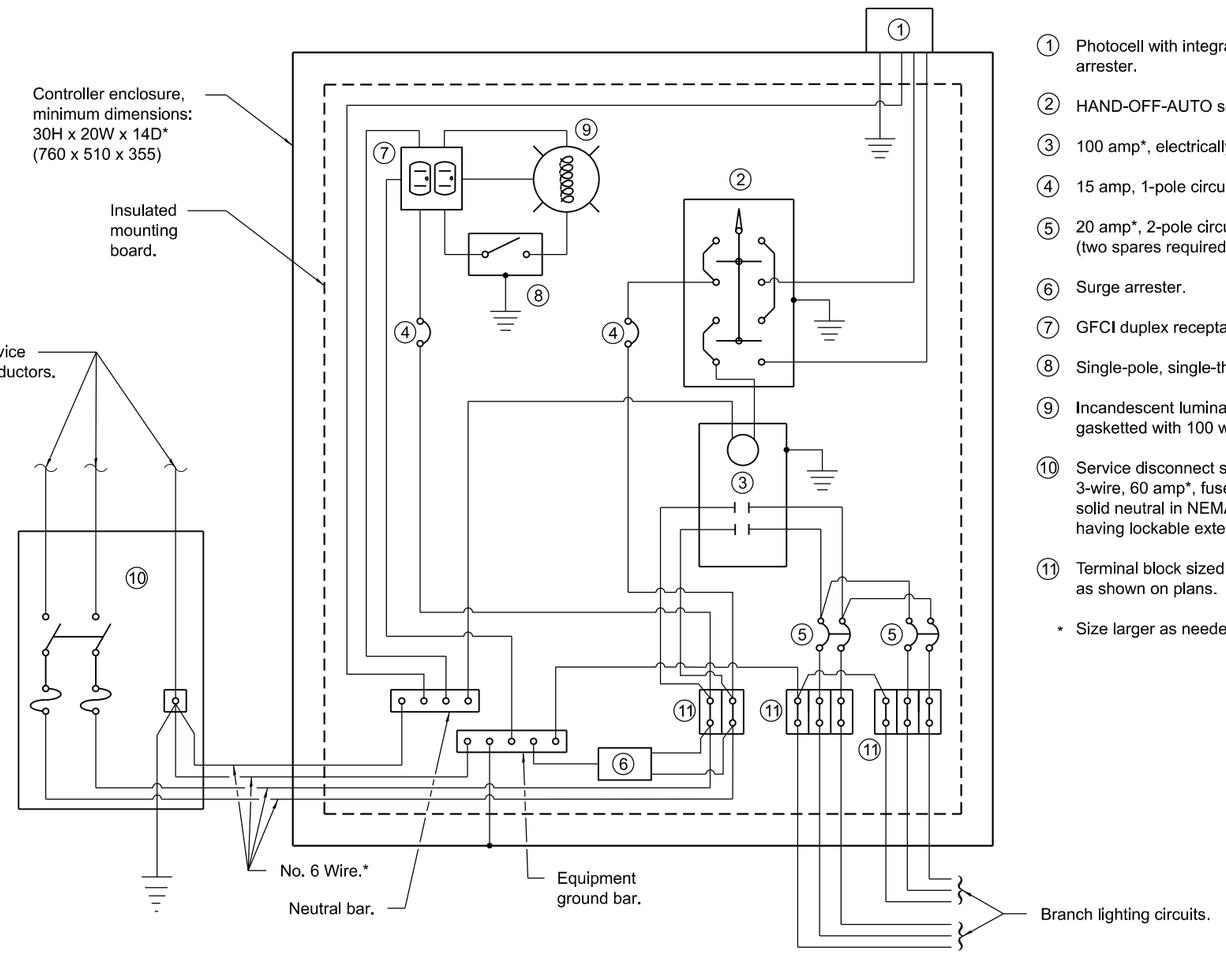


FRONT **SIDE**

ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

* Size larger as needed.



CONTROL SCHEMATIC

① Photocell with integral surge arrester.

② HAND-OFF-AUTO selector switch.

③ 100 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 gasketted 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 Terminal block sized for conductors as shown on plans.

* Size larger as needed.

Illinois Department of Transportation

APPROVED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

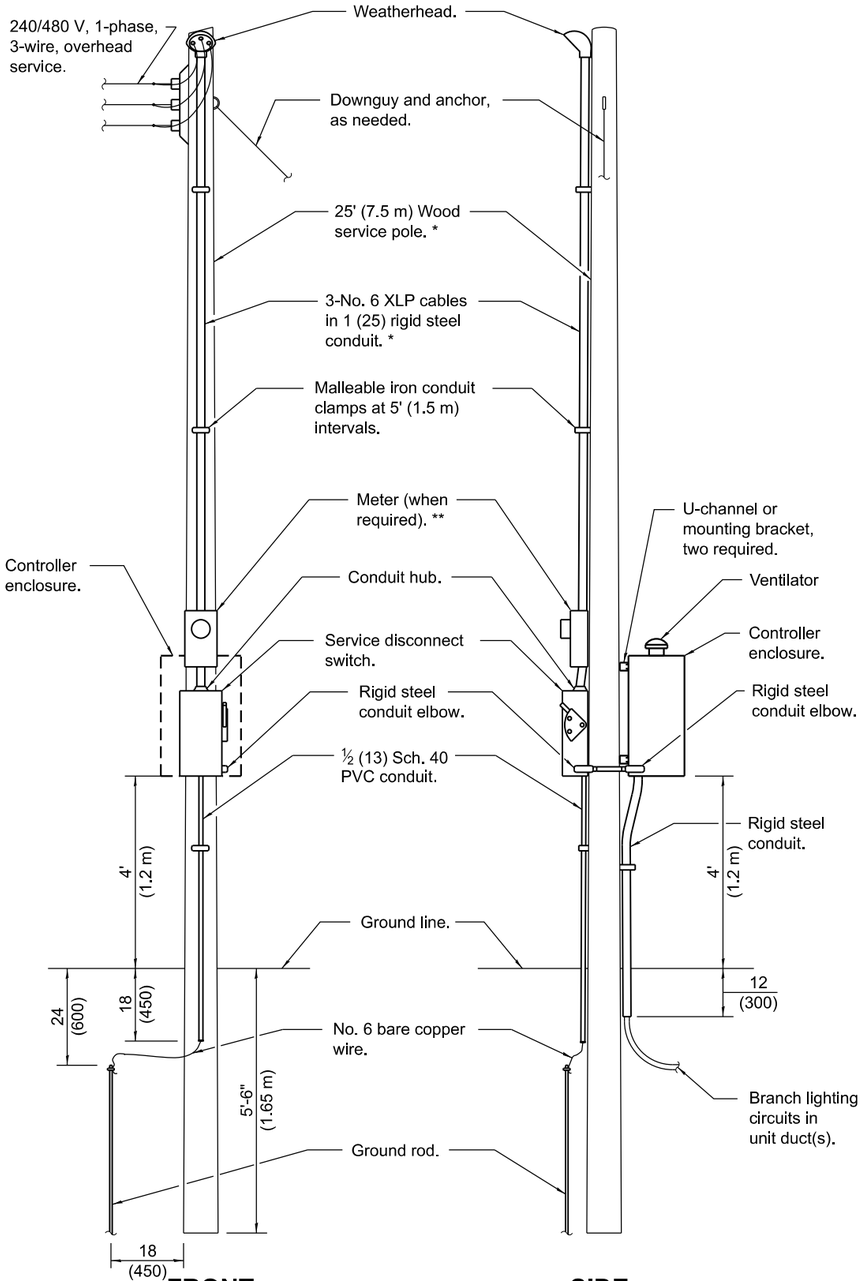
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-10

LIGHTING CONTROLLER POLE MOUNTED, 240V

(Sheet 2 of 2)

STANDARD 825001-04



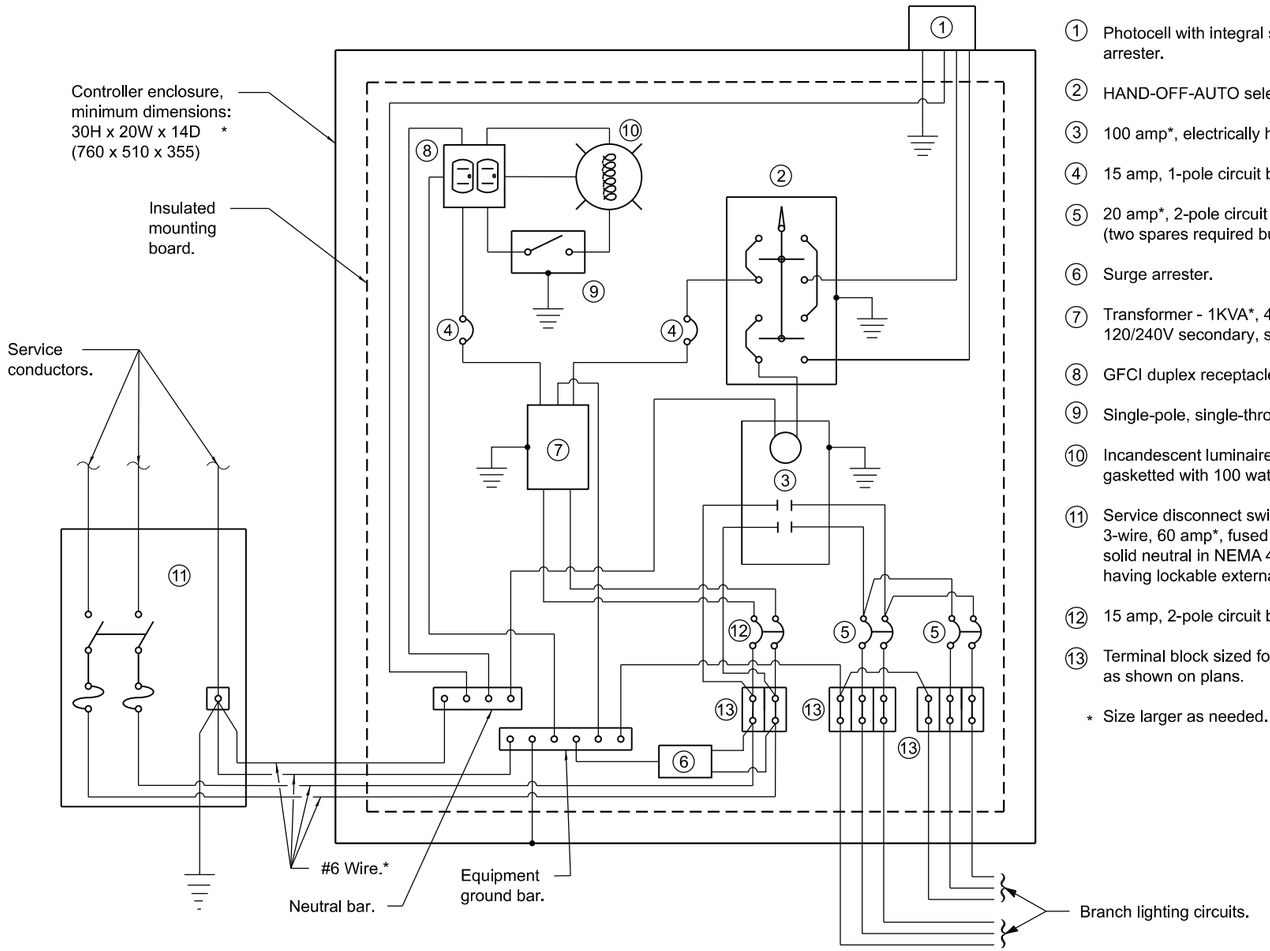
FRONT **SIDE**

ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utilitycompany standards for exact requirements.)

* Size larger as needed.

** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.



CONTROL SCHEMATIC

1. Photocell with integral surge arrester.
2. HAND-OFF-AUTO selector switch.
3. 100 amp*, electrically held contactor.
4. 15 amp, 1-pole circuit breaker.
5. 20 amp*, 2-pole circuit breaker (two spares required but not shown).
6. Surge arrester.
7. Transformer - 1KVA*, 480V primary, 120/240V secondary, single-phase, 60Hz.
8. GFCI duplex receptacle.
9. Single-pole, single-throw switch.
10. Incandescent luminaire, enclosed and gasketted with 100 watt lamp.
11. Service disconnect switch - 2-pole, 3-wire, 60 amp*, fused at 60 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
12. 15 amp, 2-pole circuit breaker.
13. Terminal block sized for conductors as shown on plans.

* Size larger as needed.

GENERAL NOTES

Provide 12 x 9 x 1 (305x225x25) watertight pouch mounted inside controller door with as-built plans and schematics.

Provide engraved nameplate on front of enclosure reading "LIGHTING".

Enclosure shall be mounted to pole with pole-bands and lag-bolts.

Work pad not shown.

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

Illinois Department of Transportation

APPROVED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

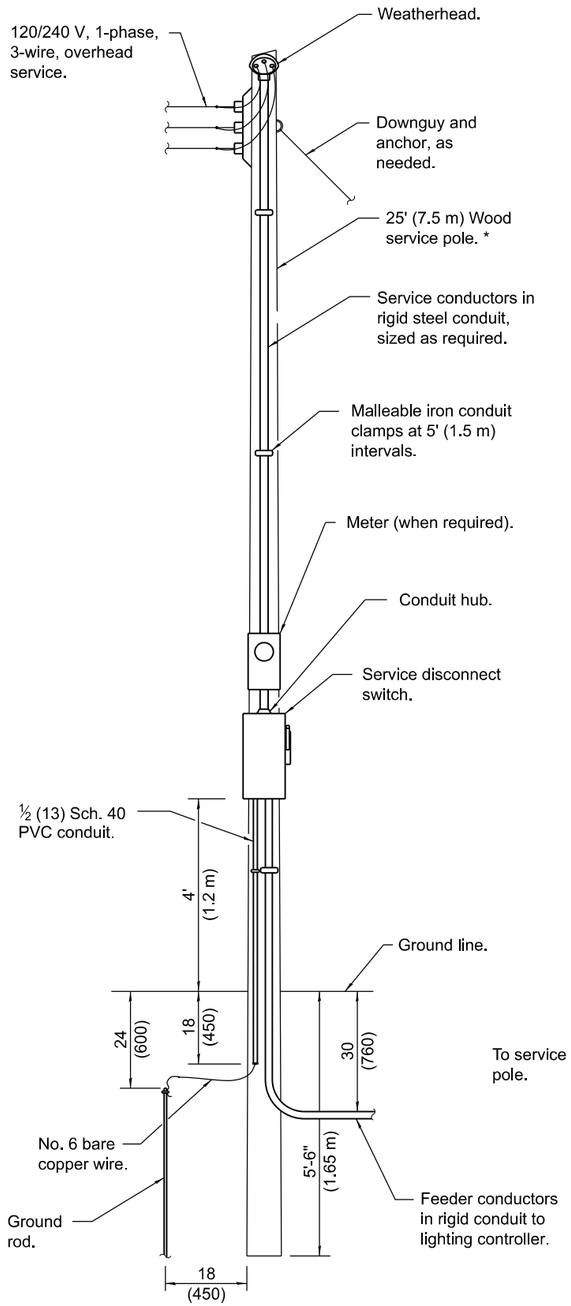
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-10

DATE	REVISIONS
1-1-19	Replaced ** note with new note
	regarding utility company standards.
	Made *** the ** note.
1-1-15	Added note (13).

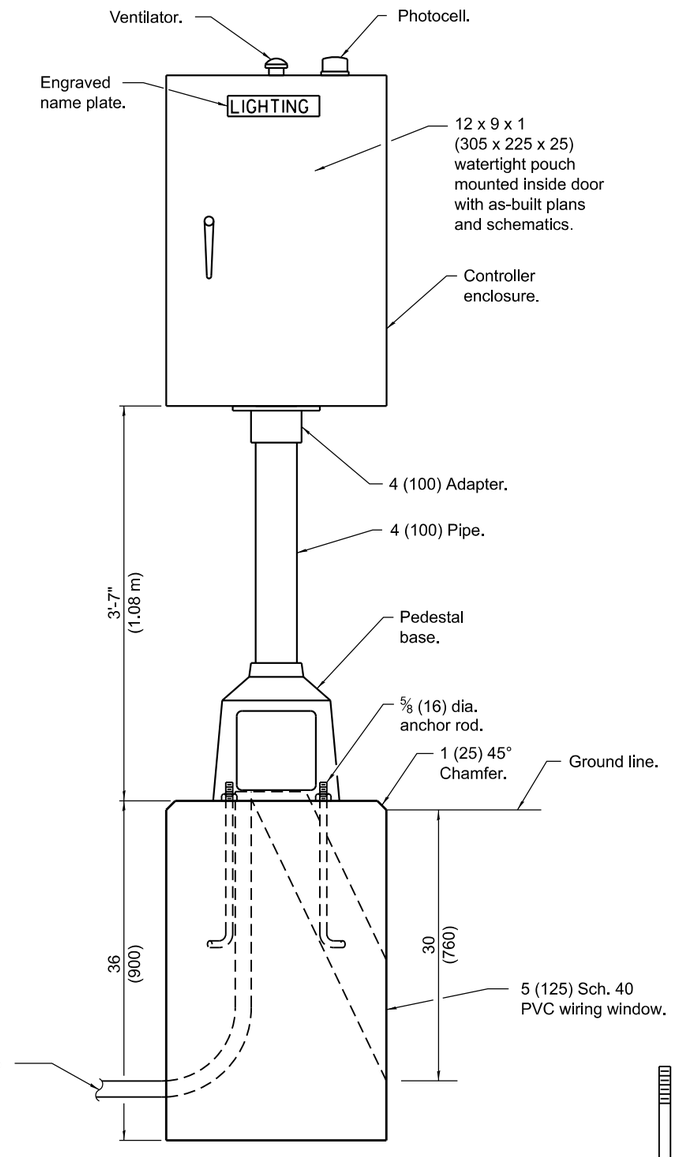
LIGHTING CONTROLLER POLE MOUNTED, 480V

STANDARD 825006-03

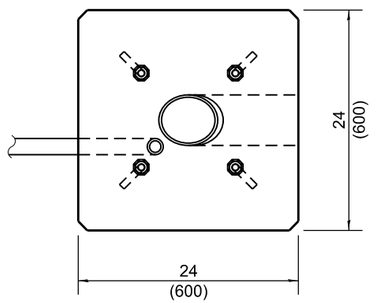


ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)
* Size larger as needed.

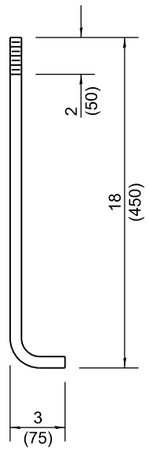


LIGHTING CONTROLLER

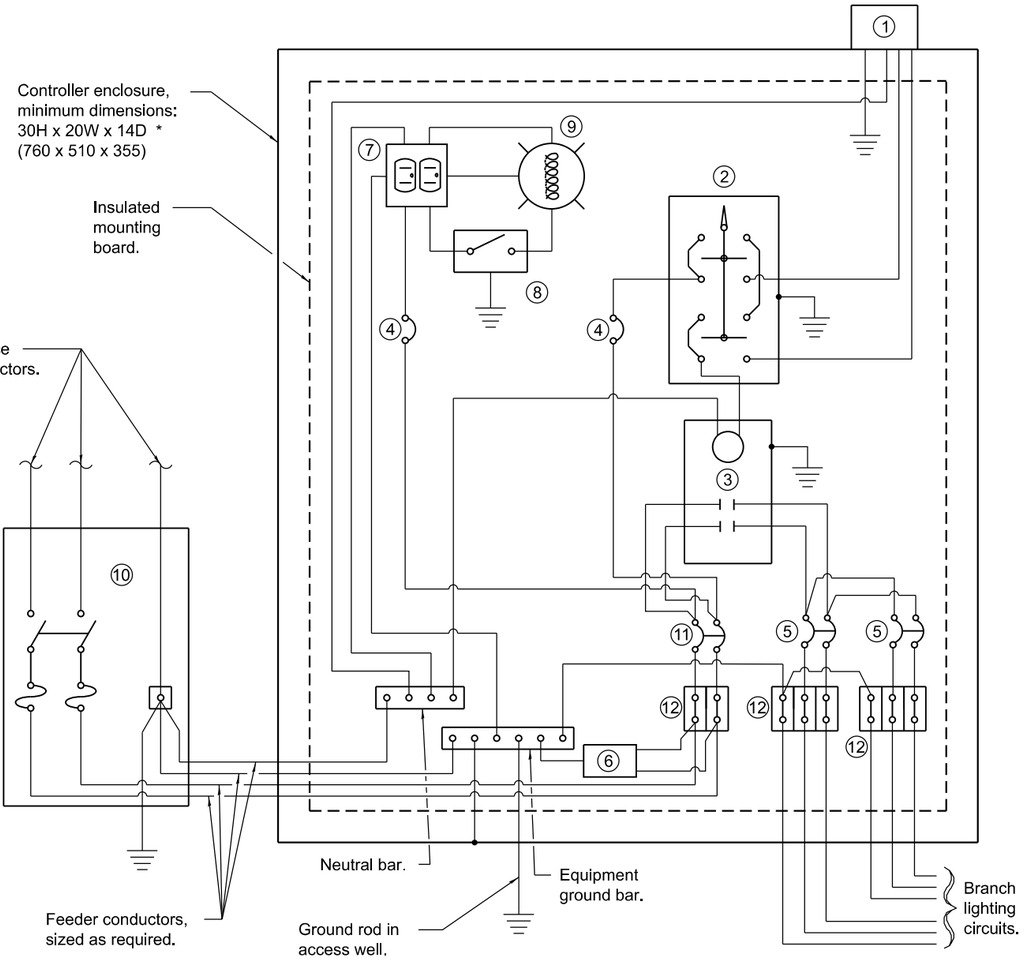


FOUNDATION (PLAN)

(Work pad not shown.)



ANCHOR ROD DETAIL



CONTROL SCHEMATIC

① Photocell with integral surge arrester.
② HAND-OFF-AUTO selector switch.
③ 100 amp*, electrically held contactor.
④ 15 amp, 1-pole circuit breaker.
⑤ 20 amp*, 2-pole circuit breaker (two spares required but not shown).
⑥ Surge arrester.
⑦ GFCI duplex receptacle.
⑧ Single-pole, single-throw switch.
⑨ Incandescent luminaire, enclosed and gasketted with 100 watt lamp.
⑩ Service disconnect switch - 2-pole, 3-wire, 60 amp*, fused at 60 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
⑪ 60 amp*, 2-pole circuit breaker.
⑫ Terminal block sized for conductors as shown on plans.

* Size larger as needed.

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

Illinois Department of Transportation

APPROVED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

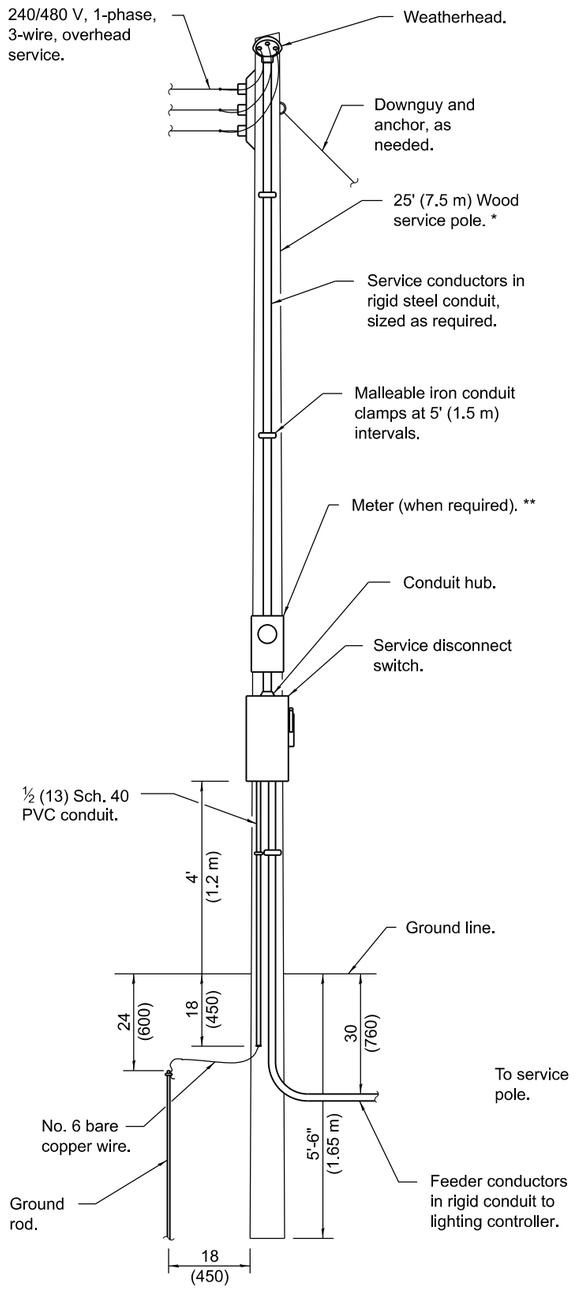
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-10

DATE	REVISIONS
1-1-19	Replaced ** note with new note
	regarding consulting utility company
	standards for installation.
1-1-15	Added note ⑫.

LIGHTING CONTROLLER PEDESTAL MOUNTED, 240V

STANDARD 825011-04

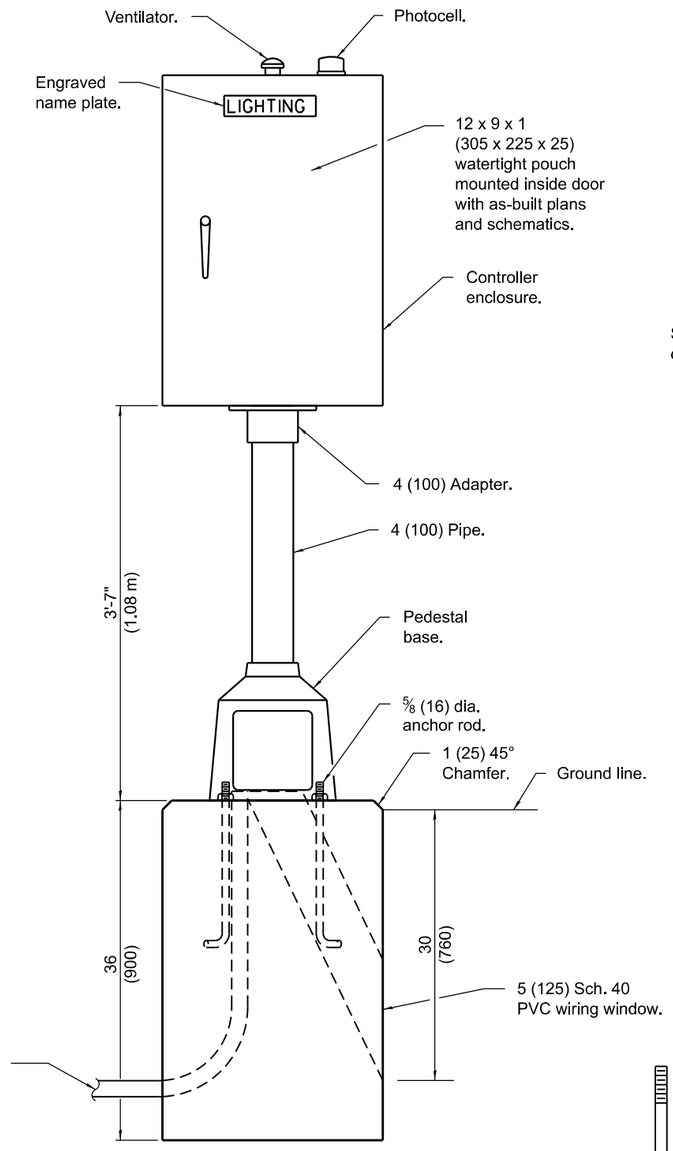


ELECTRIC SERVICE INSTALLATION

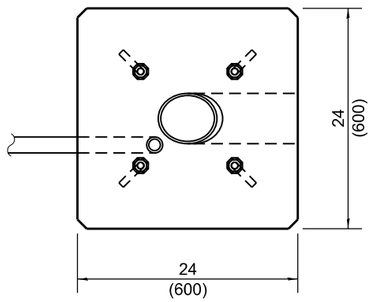
(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

* Size larger as needed.

** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

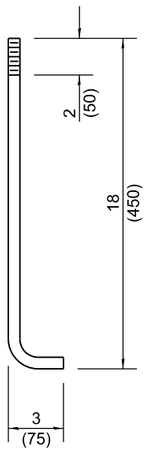


LIGHTING CONTROLLER

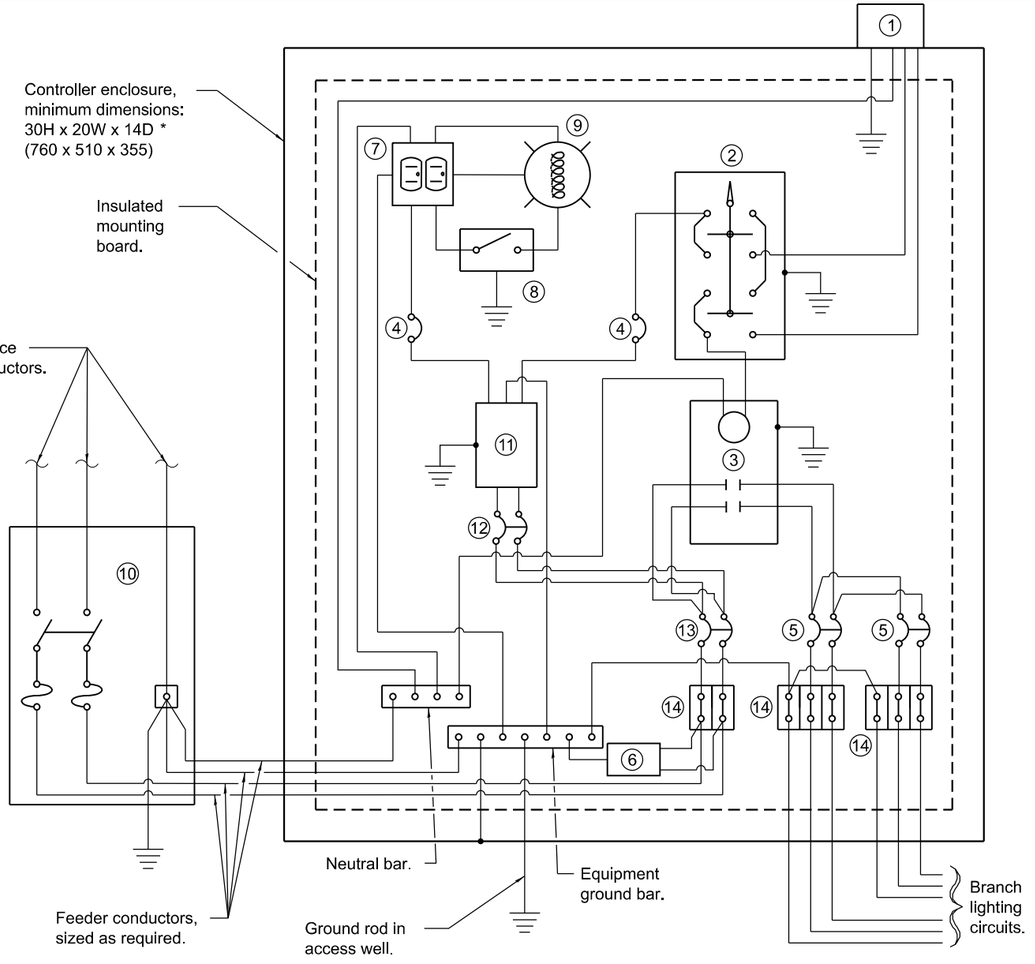


FOUNDATION (PLAN)

(Work pad not shown.)



ANCHOR ROD DETAIL



CONTROL SCHEMATIC

① Photocell with integral surge arrester.

② HAND-OFF-AUTO selector switch.

③ 100 amp*, electrically held contactor.

④ 15 amp, 1-pole circuit breaker.

⑤ 20 amp*, 2-pole circuit breaker (two spares required but not shown).

⑥ Surge arrester.

⑦ GFCI duplex receptacle.

⑧ Single-pole, single-throw switch.

⑨ Incandescent luminaire, enclosed and gasketted with 100 watt lamp.

⑩ Service disconnect switch - 2-pole, 3-wire, 60 amp*, fused at 60 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.

⑪ Transformer - 1KVA*, 480V primary, 120/240V secondary, single-phase, 60Hz.

⑫ 15 amp, 2-pole circuit breaker.

⑬ 60 amp*, 2-pole circuit breaker.

⑭ Terminal block sized for conductors as shown on plans.

* Size larger as needed.

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

Illinois Department of Transportation

APPROVED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

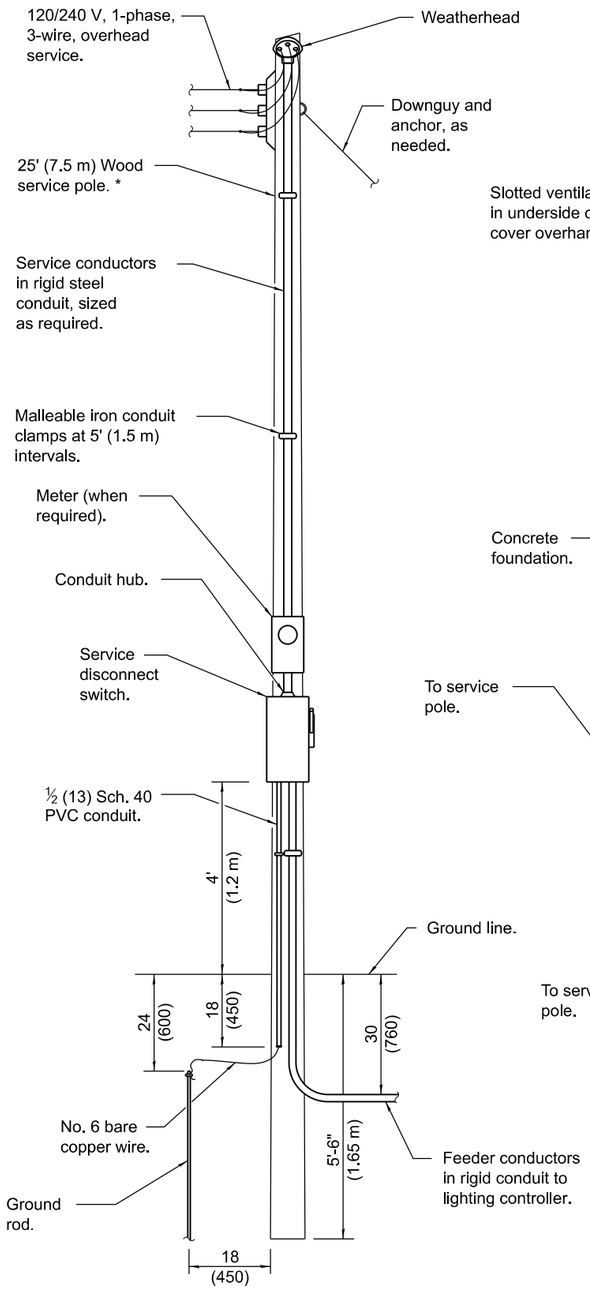
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-10

DATE	REVISIONS
1-1-19	Replaced ** note with new note
	regarding utility company standards.
	Made *** the ** note.
1-1-15	Added note ⑭.

LIGHTING CONTROLLER PEDESTAL MOUNTED, 480V

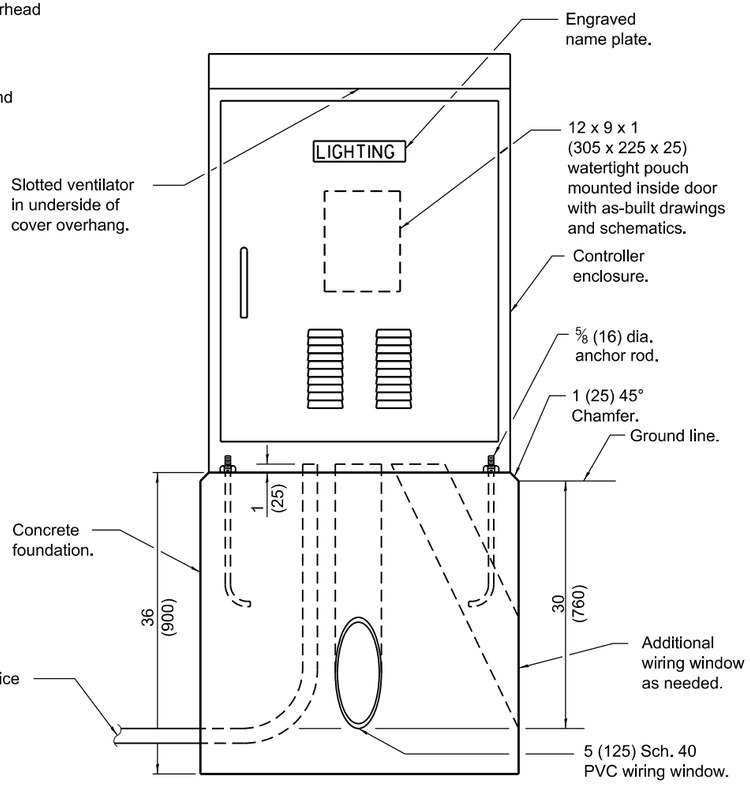
STANDARD 825016-04



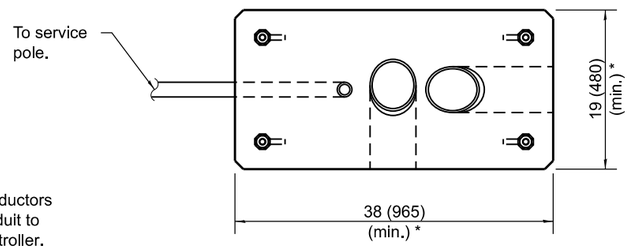
ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

* Size larger as needed.

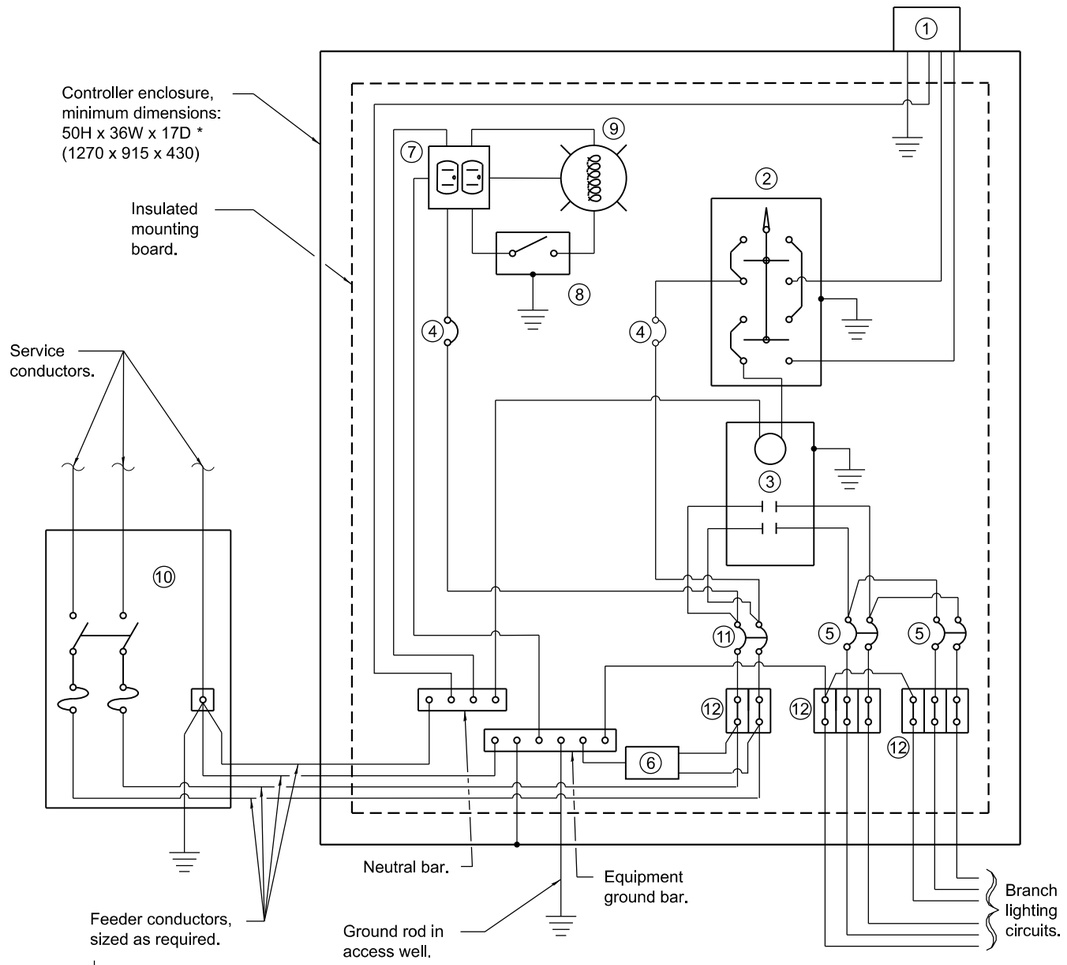


LIGHTING CONTROLLER



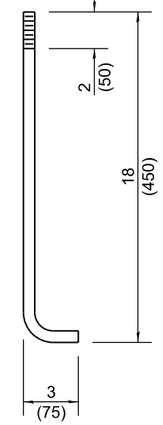
FOUNDATION (PLAN)

(Work pad not shown.)



CONTROL SCHEMATIC

1. Photocell with integral surge arrester.
2. HAND-OFF-AUTO selector switch.
3. 100 amp*, electrically held contactor.
4. 15 amp, 1-pole circuit breaker.
5. 20 amp*, 2-pole circuit breaker (two spares required but not shown).
6. Surge arrester.
7. GFCI duplex receptacle.
8. Single-pole, single-throw switch.
9. Incandescent luminaire, enclosed and gasketted with 100 watt lamp.
10. Service disconnect switch - 2-pole, 3-wire, 100 amp*, fused at 100 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
11. 100 amp*, 2-pole circuit breaker.
12. Terminal block sized for conductors as shown on plans.



ANCHOR ROD DETAIL

* Size larger as needed.

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

DATE	REVISIONS
1-1-19	Replaced ** note with new note
	regarding consulting utility company
	standards for installation.
1-1-15	Added note (12).

LIGHTING CONTROLLER BASE MOUNTED, 240V

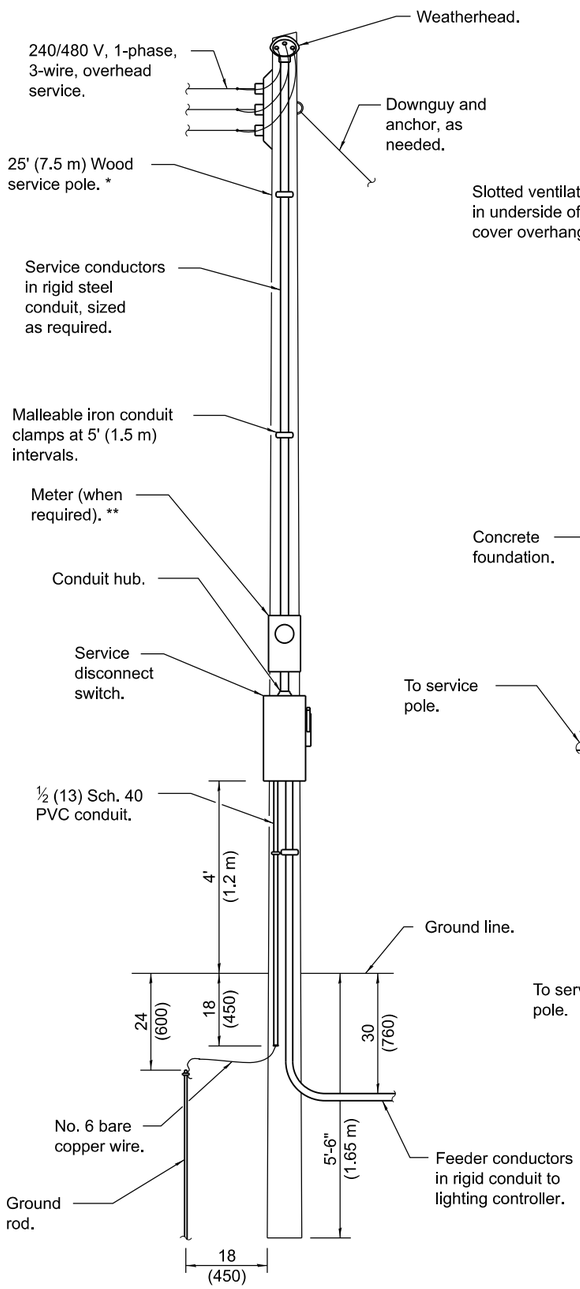
STANDARD 825021-04

Illinois Department of Transportation

APPROVED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-10

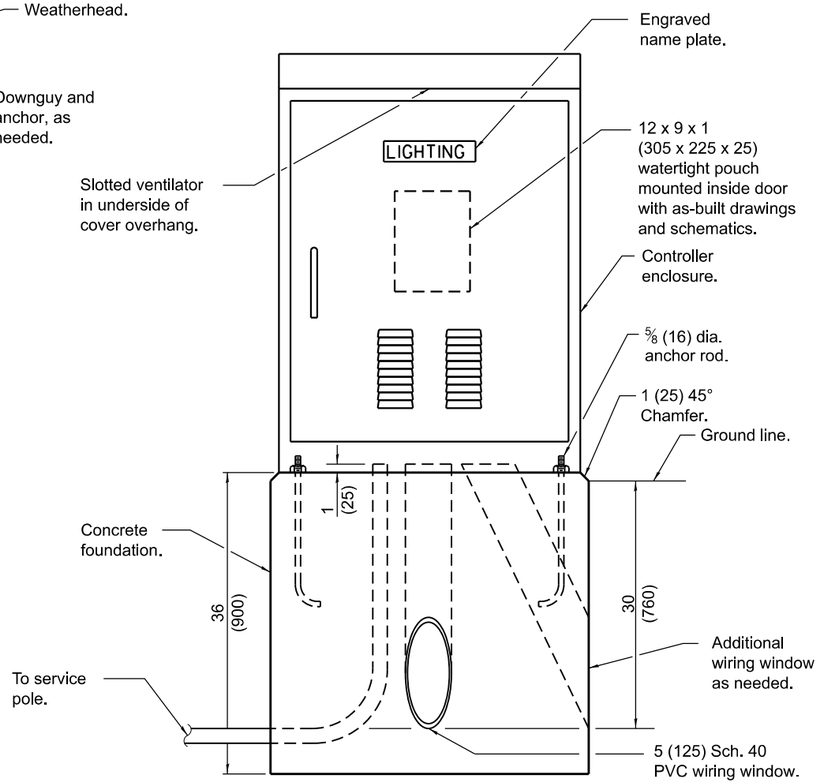


ELECTRIC SERVICE INSTALLATION

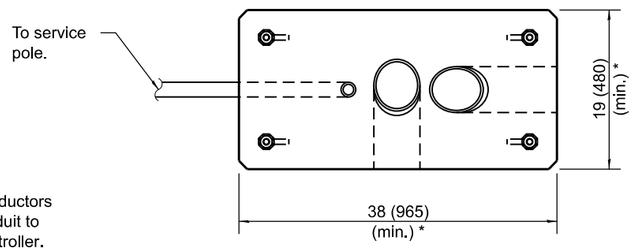
(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

* Size larger as needed.

** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

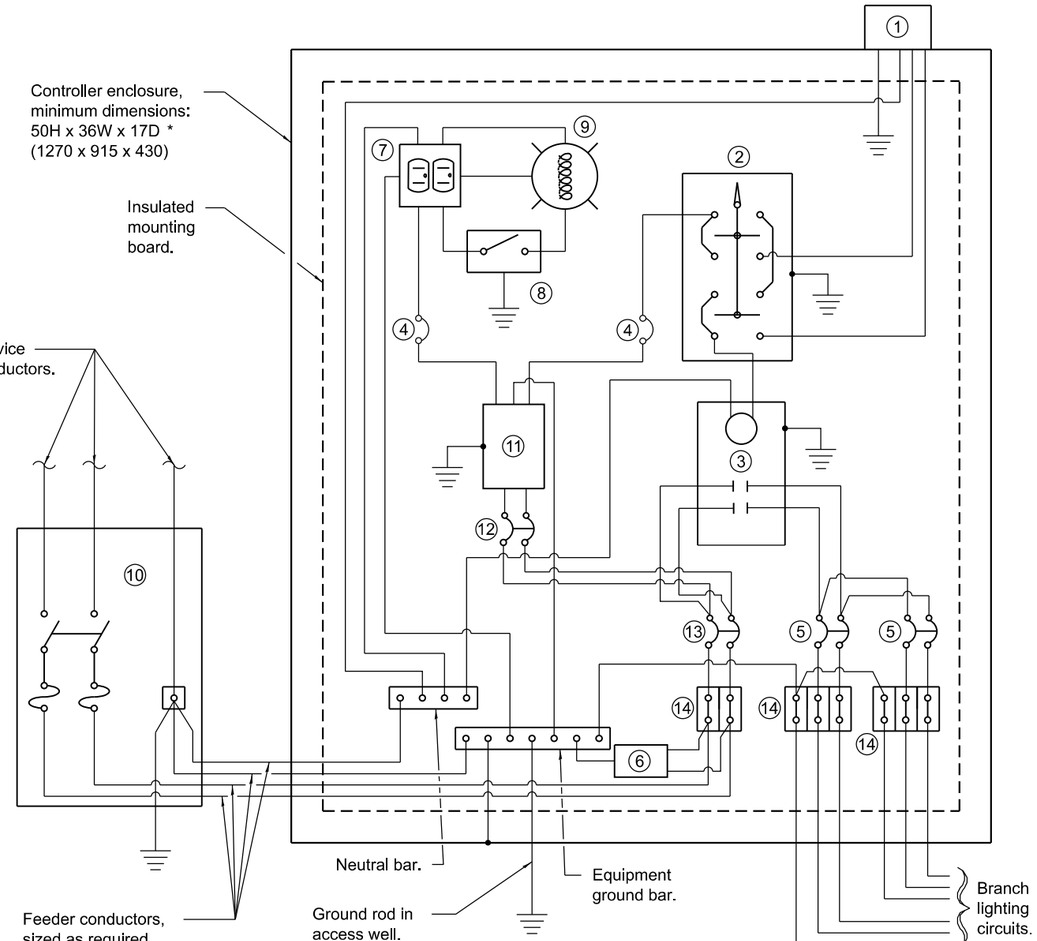


LIGHTING CONTROLLER



FOUNDATION (PLAN)

(Work pad not shown.)

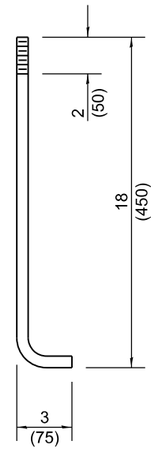


CONTROL SCHEMATIC

1. Photocell with integral surge arrester.
2. HAND-OFF-AUTO selector switch.
3. 100 amp*, electrically held contactor.
4. 15 amp, 1-pole circuit breaker.
5. 20 amp*, 2-pole circuit breaker (two spares required but not shown).
6. Surge arrester.
7. GFCI duplex receptacle.
8. Single-pole, single-throw switch.
9. Incandescent luminaire, enclosed and gasketted with 100 watt lamp.
10. Service disconnect switch - 2-pole, 3-wire, 100 amp*, fused at 100 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
11. Transformer - 1KVA*, 480V primary, 120/240V secondary, single-phase, 60Hz.
12. 15 amp, 2-pole circuit breaker.
13. 100 amp*, 2-pole circuit breaker.
14. Terminal block sized for conductors as shown on plans.

* Size larger as needed.

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



ANCHOR ROD DETAIL

Illinois Department of Transportation

APPROVED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

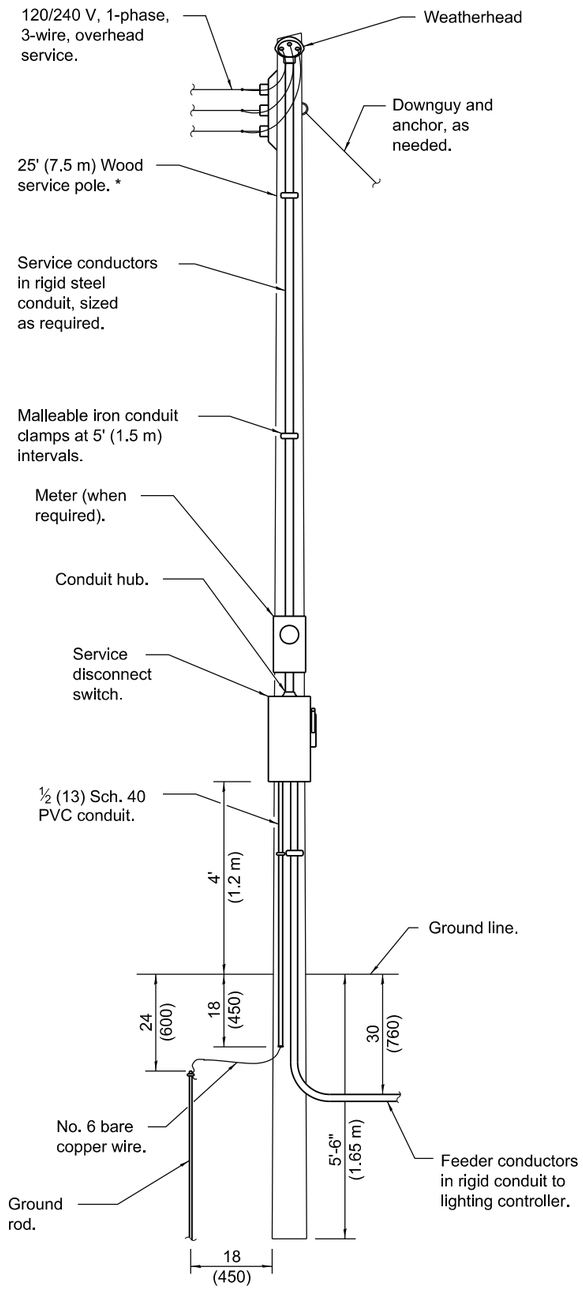
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-10

DATE	REVISIONS
1-1-19	Replaced ** note with new note
	regarding utility company standards.
	Made *** the ** note.
1-1-15	Added note (14).

LIGHTING CONTROLLER BASE MOUNTED, 480V

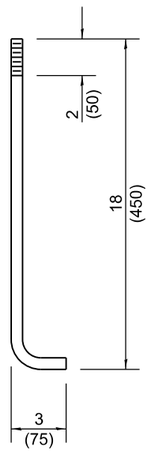
STANDARD 825026-04



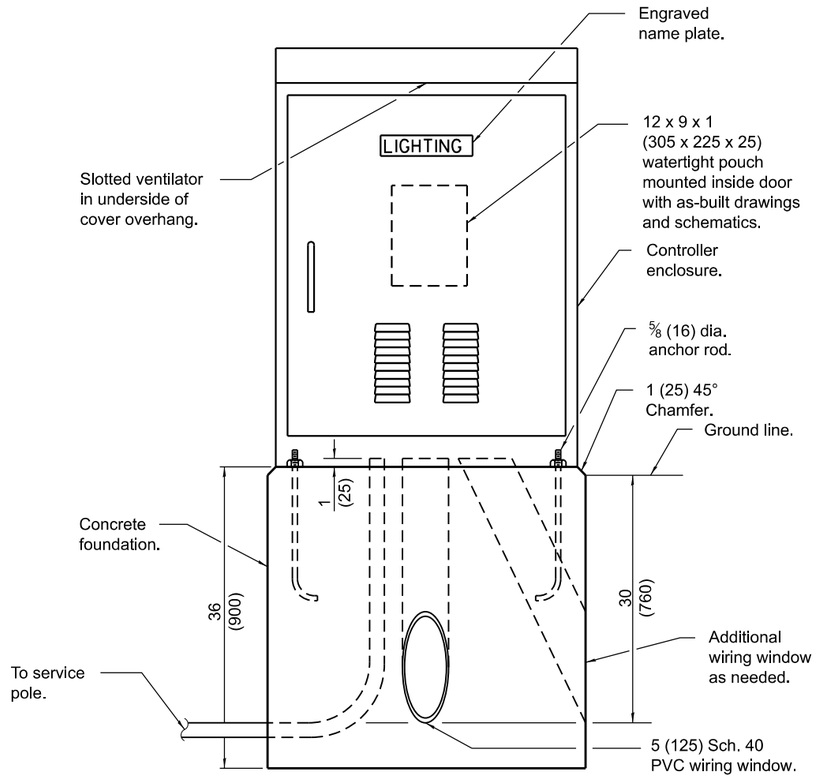
ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

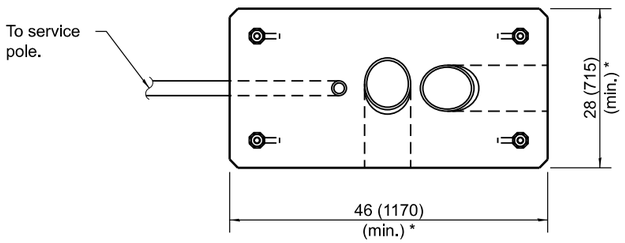
* Size larger as needed.



ANCHOR ROD DETAIL



LIGHTING CONTROLLER



FOUNDATION (PLAN)

(Work pad not shown.)

* Size larger as needed.

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

Illinois Department of Transportation

APPROVED January 1, 2022
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

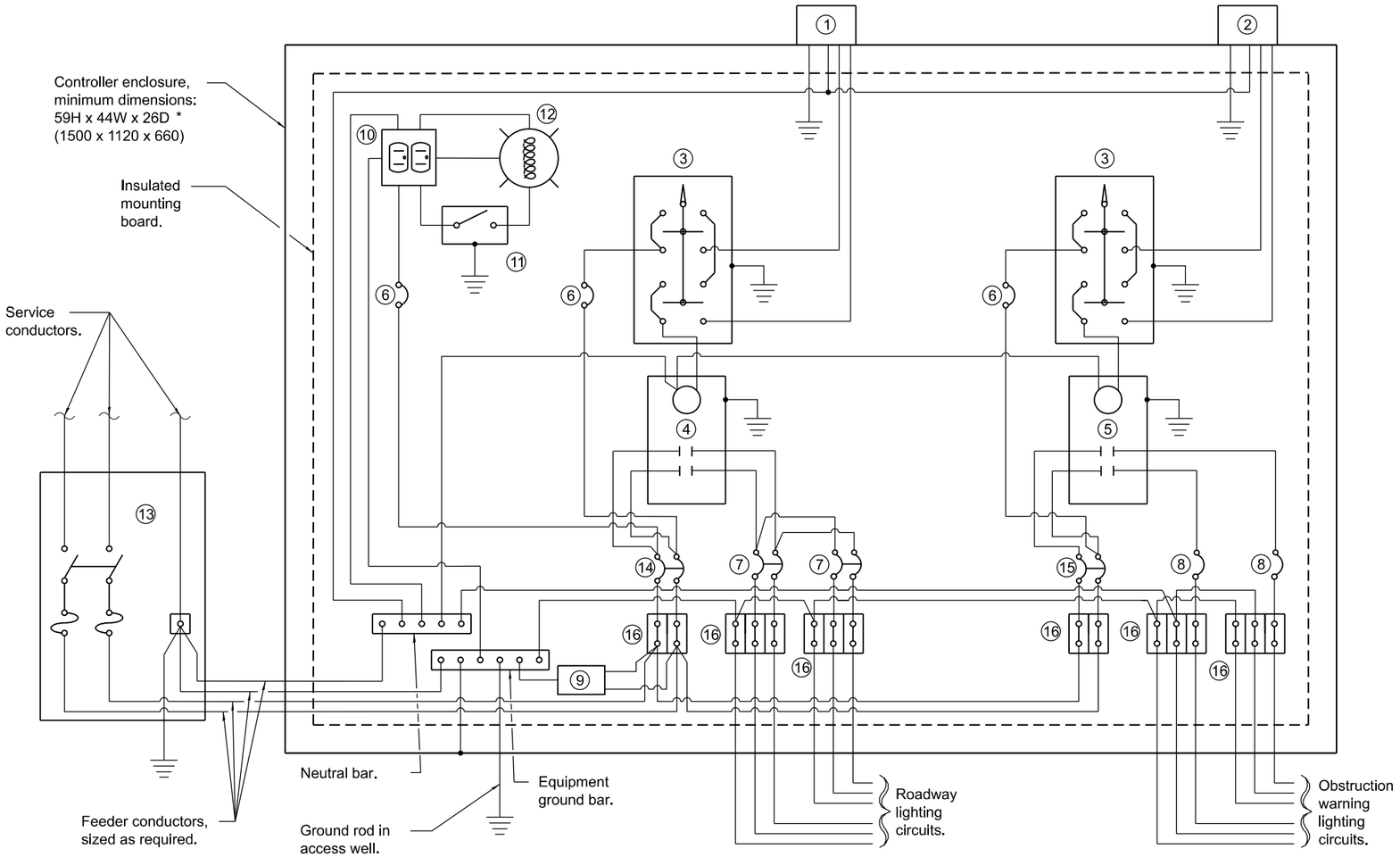
ISSUED 1-1-12

DATE	REVISIONS
1-1-22	Replaced "Navigation" with
	"Obstruction Warning" in std. title,
	note (2) and Control Schematic.
1-1-19	Replaced ** note with new note
	regarding consulting utility company
	standards for installation.

OBSTRUCTION WARNING LIGHTING CONTROLLER, 240V

(Sheet 1 of 2)

STANDARD 826001-03



1. Photocell with integral surge arrester for roadway lighting.
2. Photocell with integral surge arrester for obstruction warning lighting.
3. HAND-OFF-AUTO selector switch.
4. 100 amp*, electrically held contactor.
5. 60 amp*, electrically held contactor.
6. 15 amp, 1-pole circuit breaker.
7. 20 amp*, 2-pole circuit breaker (two spares required but not shown).
8. 20 amp*, single-pole circuit breaker (two shown, quantity as required).
9. Surge arrester.
10. GFCI duplex receptacle.
11. Single-pole, single-throw switch.
12. Incandescent luminaire, enclosed and gasketted with 100 watt lamp.
13. Service disconnect switch - 2-pole, 3-wire, 100 amp*, fused at 100 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
14. 60 amp*, 2-pole circuit breaker.
15. 30 amp*, 2-pole circuit breaker.
16. Terminal block sized for conductors as shown on plans.

* Size larger as needed.

CONTROL SCHEMATIC

Illinois Department of Transportation

APPROVED January 1, 2022
ELECTRICAL AND MECHANICAL UNIT CHIEF

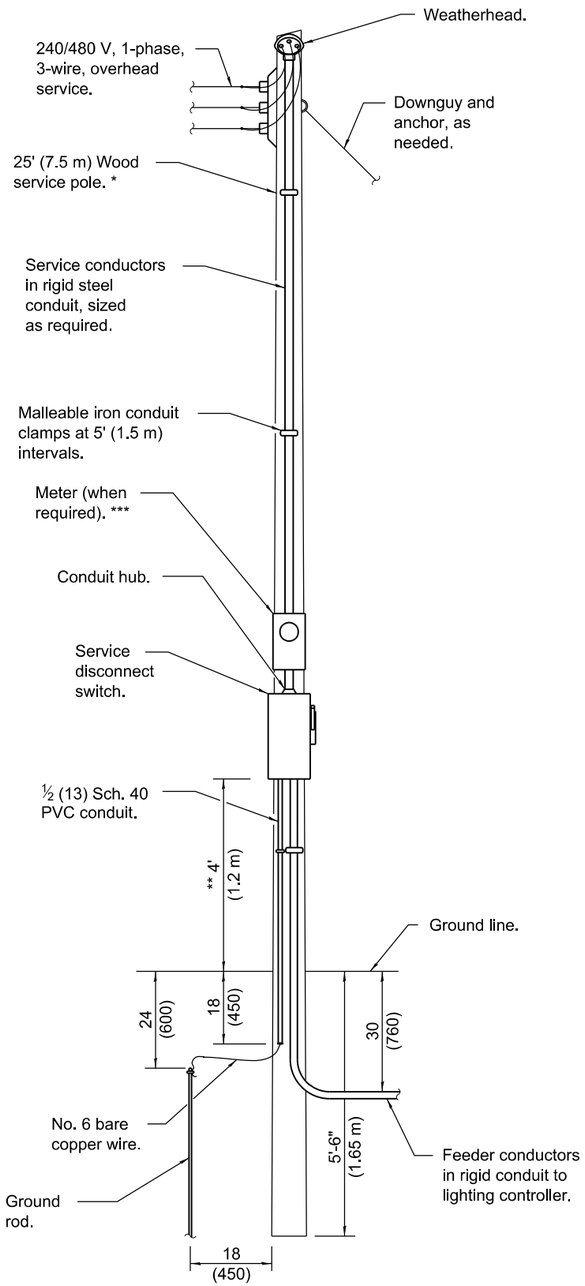
APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

OBSTRUCTION WARNING LIGHTING CONTROLLER, 240V

(Sheet 2 of 2)

STANDARD 826001-03

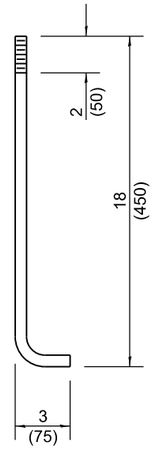


ELECTRIC SERVICE INSTALLATION

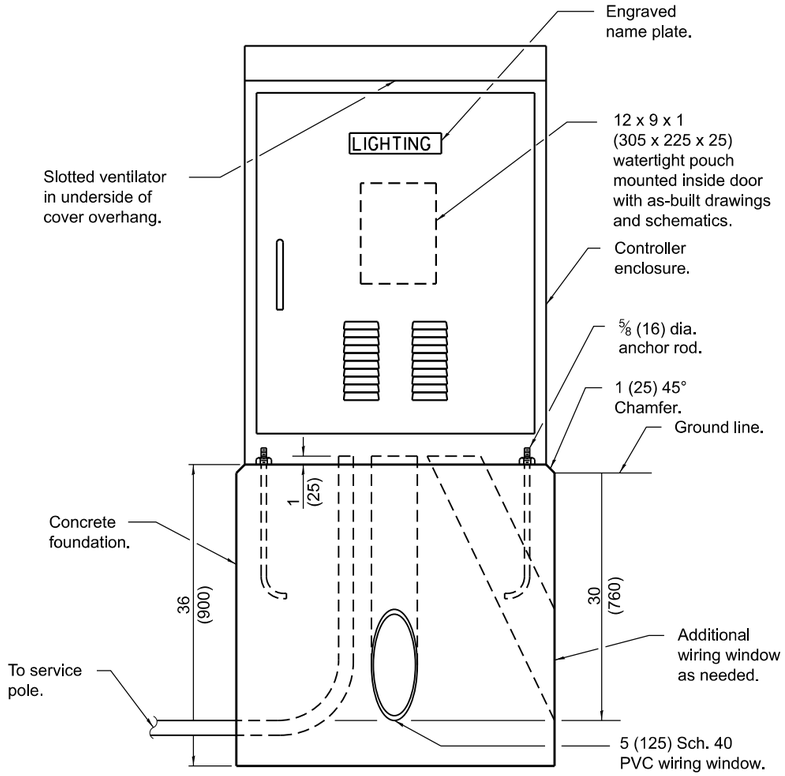
(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

* Size larger as needed.

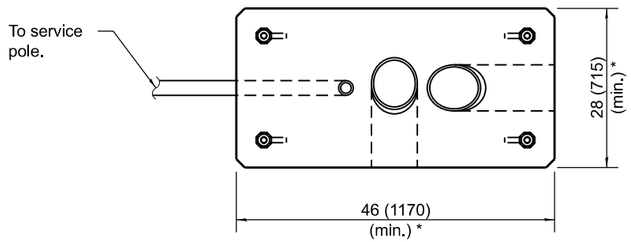
** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.



ANCHOR ROD DETAIL



LIGHTING CONTROLLER



FOUNDATION (PLAN)

(Work pad not shown.)

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

Illinois Department of Transportation

APPROVED January 1, 2022
Bernard Sutton
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2022
Todd Hahn
ENGINEER OF DESIGN AND ENVIRONMENT

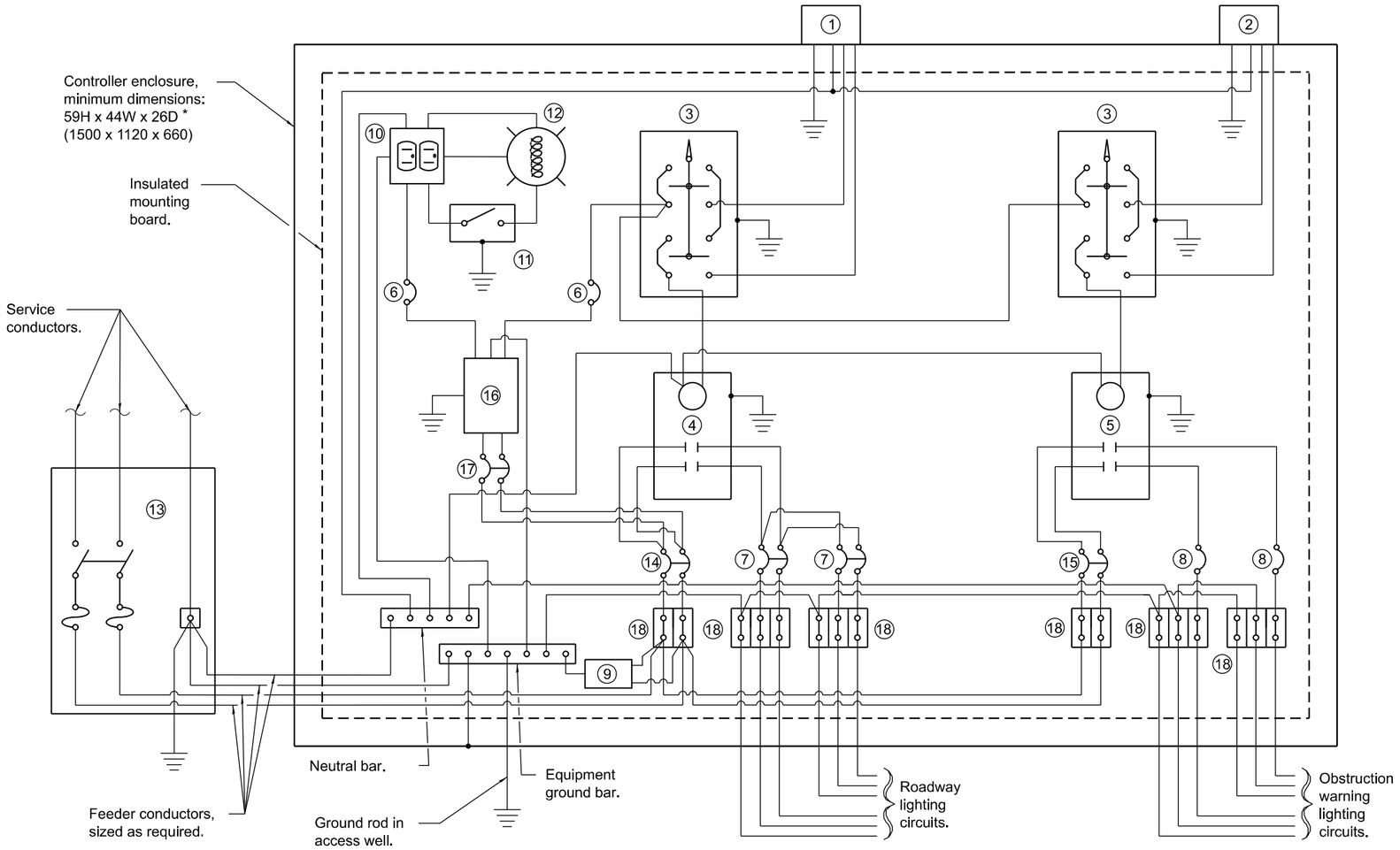
ISSUED 1-1-12

DATE	REVISIONS
1-1-22	Replaced "Navigation" with
	"Obstruction Warning" in std. title,
	note (2) and Control Schematic.
1-1-19	Replaced ** note with new note
	regarding utility company standards.
	Made *** the ** note.

OBSTRUCTION WARNING LIGHTING CONTROLLER, 480V

(Sheet 1 of 2)

STANDARD 826006-03



1. Photocell with integral surge arrester for roadway lighting.
2. Photocell with integral surge arrester for obstruction warning lighting.
3. HAND-OFF-AUTO selector switch.
4. 100 amp*, electrically held contactor.
5. 60 amp*, electrically held contactor.
6. 15 amp, 1-pole circuit breaker.
7. 20 amp*, 2-pole circuit breaker (two spares required but not shown).
8. 20 amp*, single-pole circuit breaker (two shown, quantity as required).
9. Surge arrester.
10. GFCI duplex receptacle.
11. Single-pole, single-throw switch.
12. Incandescent luminaire, enclosed and gasketted with 100 watt lamp.
13. Service disconnect switch - 2-pole, 3-wire, 100 amp*, fused at 100 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
14. 60 amp*, 2-pole circuit breaker.
15. 30 amp*, 2-pole circuit breaker.
16. Transformer - 1 KVA*, 480V primary, 120/240V secondary, single phase, 60 Hz.
17. 15 amp, 2-pole circuit breaker.
18. Terminal block sized for conductors as shown on plans.

* Size larger as needed.

CONTROL SCHEMATIC

Illinois Department of Transportation

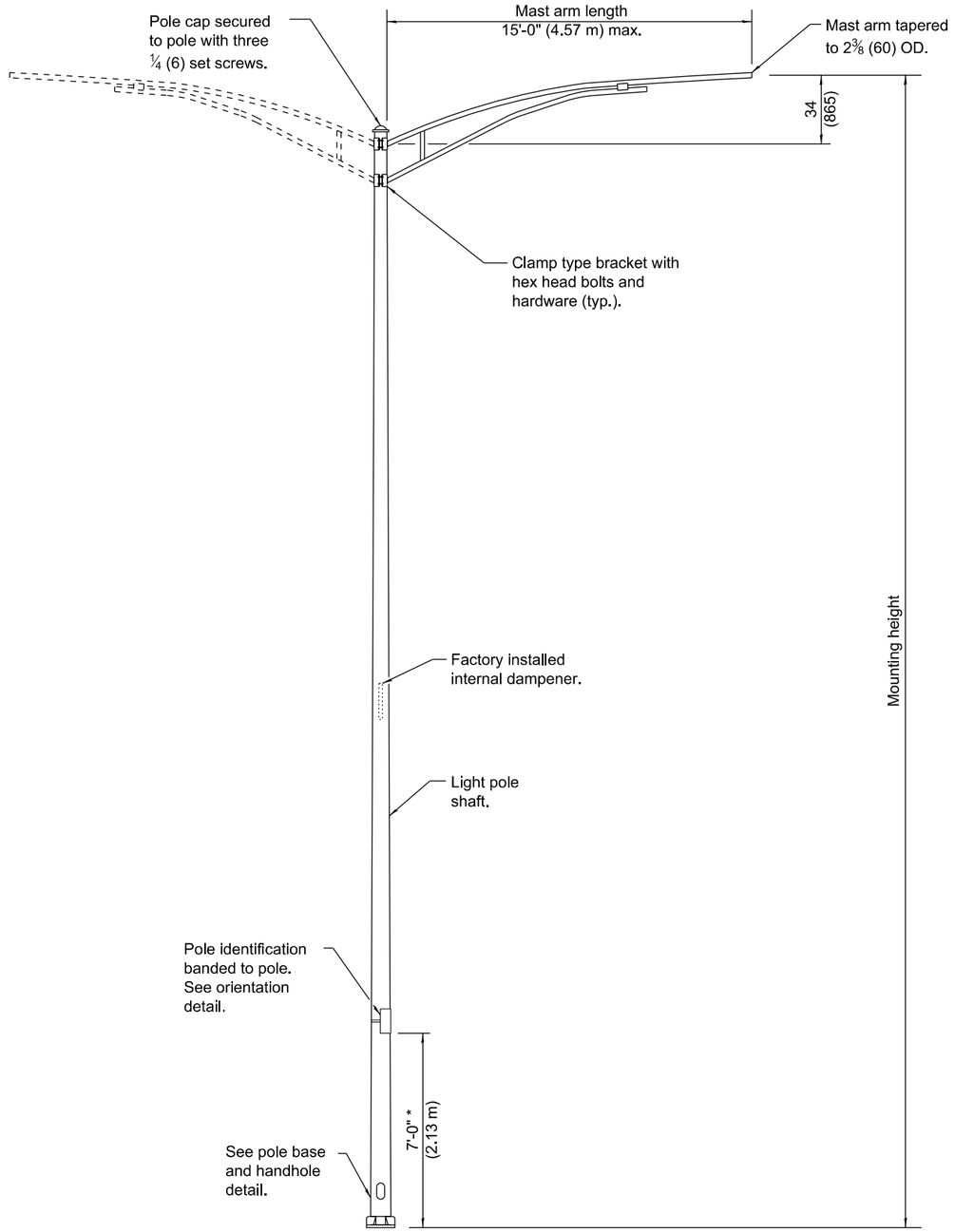
APPROVED January 1, 2022
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

OBSTRUCTION WARNING LIGHTING CONTROLLER, 480V

STANDARD 826006-03



MAST ARM LIGHT POLE

(Single or twin mount)

* Unless directed otherwise by the Engineer.

POLE		
MOUNTING HEIGHT	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
35' (10.7 m) or less	8 tapered to 4½ (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	11½ (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.

Illinois Department of Transportation

APPROVED January 1, 2015
ENGINEER OF PRELIMINARY ENGINEERING

APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

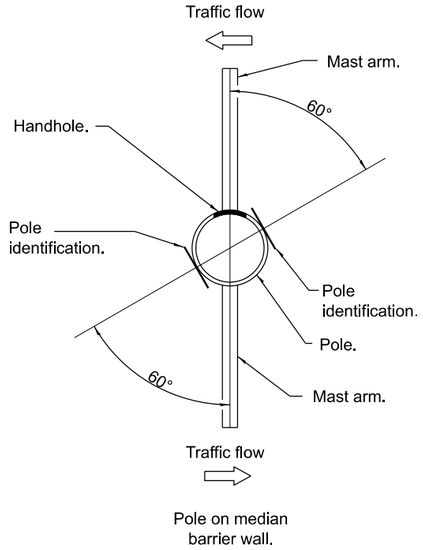
ISSUED 1-1-12

DATE	REVISIONS
1-1-15	Revised note on HANDHOLE DETAIL.
1-1-14	Added pole mounted on bridge
	parapet. Modified attachment
	of screen.

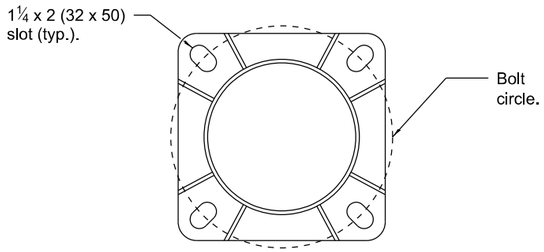
LIGHT POLE ALUMINUM MAST ARM

(Sheet 1 of 2)

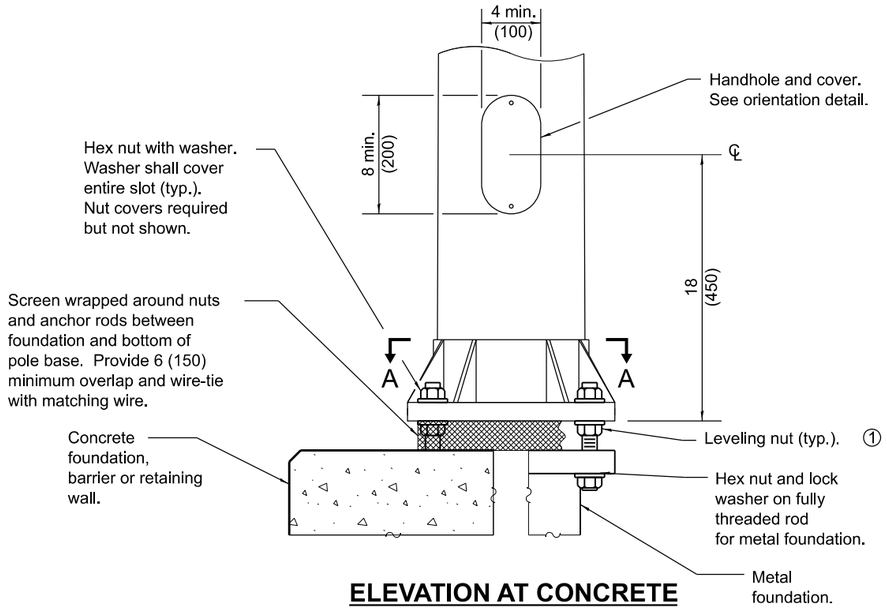
STANDARD 830001-03



Pole on median barrier wall.

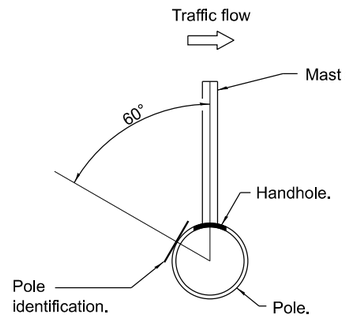


SECTION A-A
(Bolts not shown)

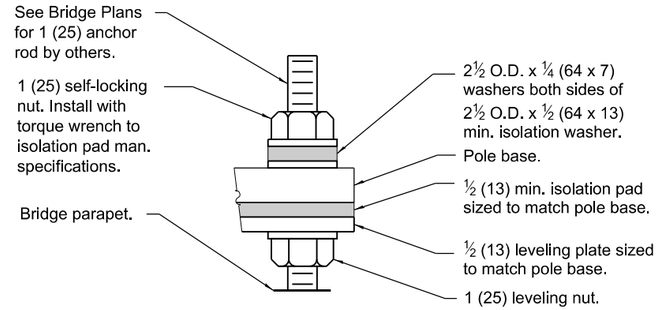


ELEVATION AT CONCRETE FOUNDATION, METAL FOUNDATION OR RETAINING WALL

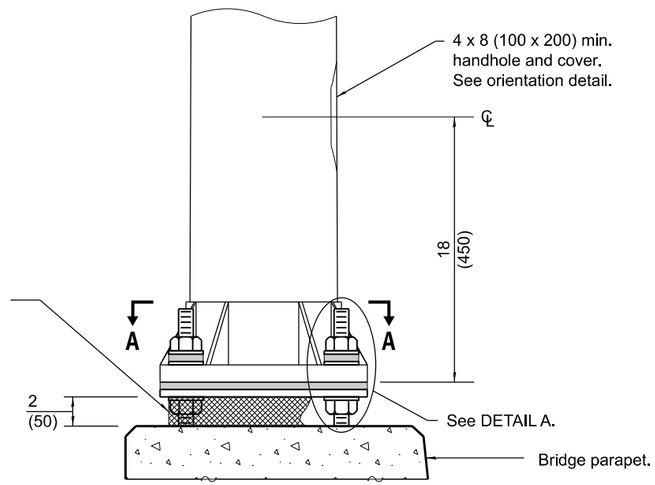
① Omit leveling nuts when breakaway devices are required.



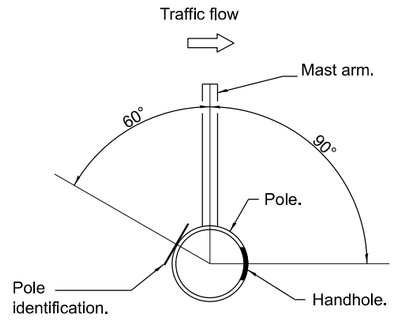
Pole on barrier wall, retaining wall or parapet.



DETAIL A

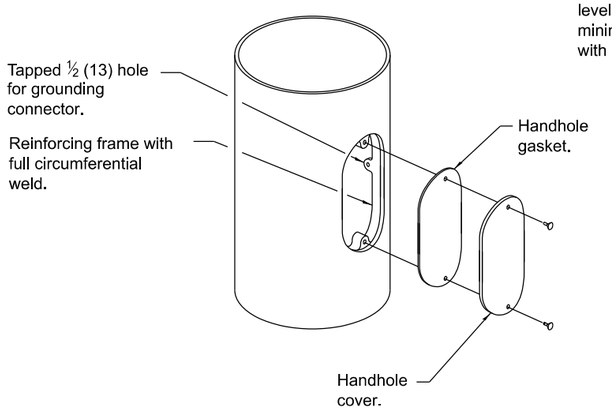


ELEVATION AT BRIDGE PARAPET



Pole on ground mounted foundation.

HANDHOLE / IDENTIFICATION ORIENTATION DETAIL



HANDHOLE DETAIL

POLE BASE DETAILS

Illinois Department of Transportation

APPROVED January 1, 2015
ENGINEER OF PRELIMINARY ENGINEERING

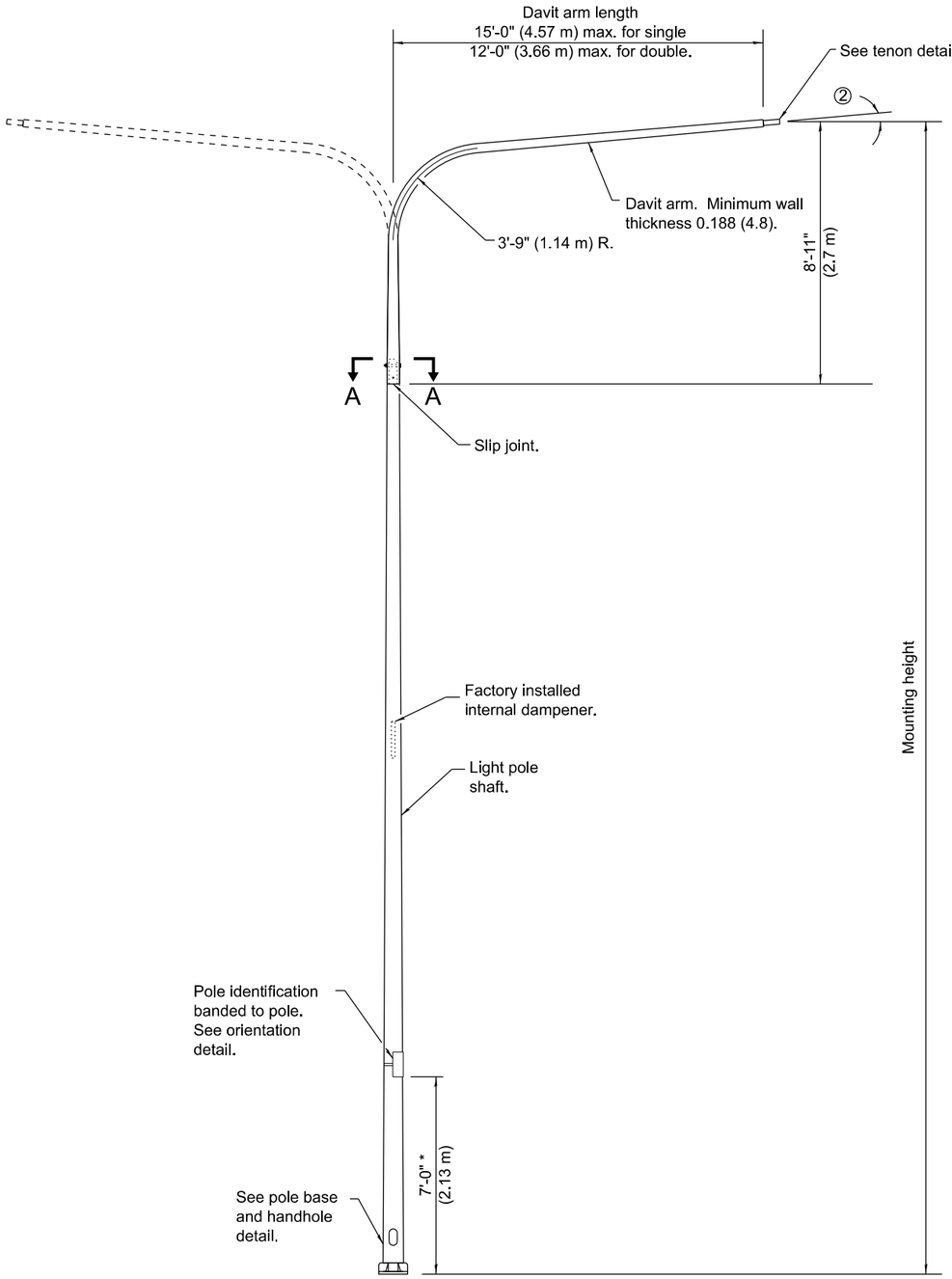
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

LIGHT POLE ALUMINUM MAST ARM

(Sheet 2 of 2)

STANDARD 830001-03

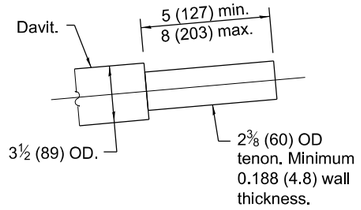


DAVIT LIGHT POLE

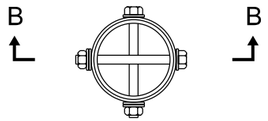
(Single or twin mount)

* Unless directed otherwise by the Engineer.

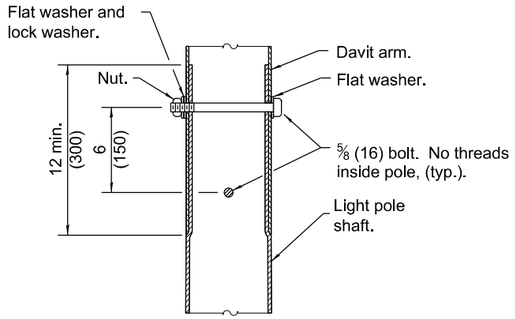
POLE BASE	
MOUNTING HEIGHT	BOLT CIRCLE DIAMETER
35' (10.7 m) or less	11½ (290)
Greater than 35' (10.7 m) to 50' (15.2 m)	15 (380)



TENON DETAIL



SECTION A-A



SECTION B-B

POLE LOWER SHAFT			
MOUNTING HEIGHT	LOWER SHAFT LENGTH ①	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
30' (9.1 m)	21'-1" (6.4 m)	8 tapered to 6 (200 to 114)	0.25 (6)
35' (10.7 m)	26'-1" (7.9 m)	8 tapered to 6 (200 to 114)	0.25 (6)
40' (12.2 m)	31'-1" (9.5 m)	10 tapered to 6 (250 to 150)	0.25 (6)
45' (13.7 m)	36'-1" (11.0 m)	10 tapered to 6 (250 to 150)	0.25 (6)
50' (15.2 m)	41'-1" (12.5 m)	10 tapered to 6 (250 to 150)	0.312 (8)

① Lower shaft length shall be from the bottom of the pole base to the bottom of the slip joint.

② 5° max. for unloaded pole, 1.5° max. for loaded pole.

GENERAL NOTES

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Voids in light pole base shall be sealed to prevent rodent entry.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

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

Illinois Department of Transportation

APPROVED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

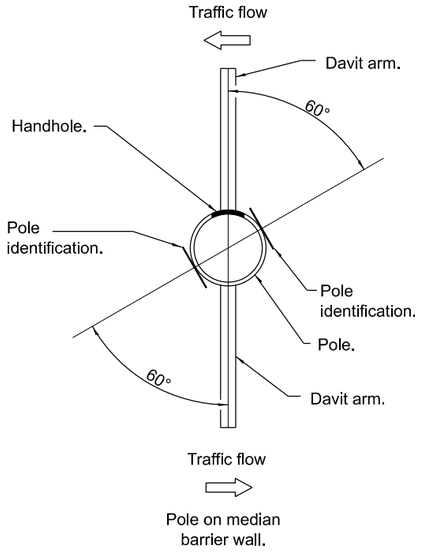
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

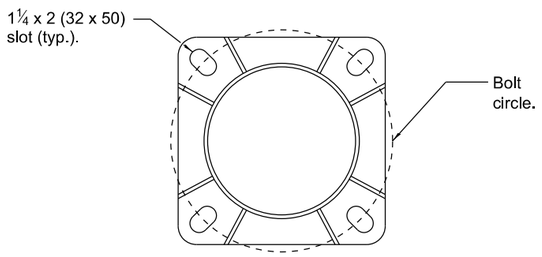
DATE	REVISIONS
1-1-19	Revised standard to comply with
	the 2013 version of AASHTO.
1-1-17	Added notes ③ and ④.

LIGHT POLE ALUMINUM DAVIT ARM

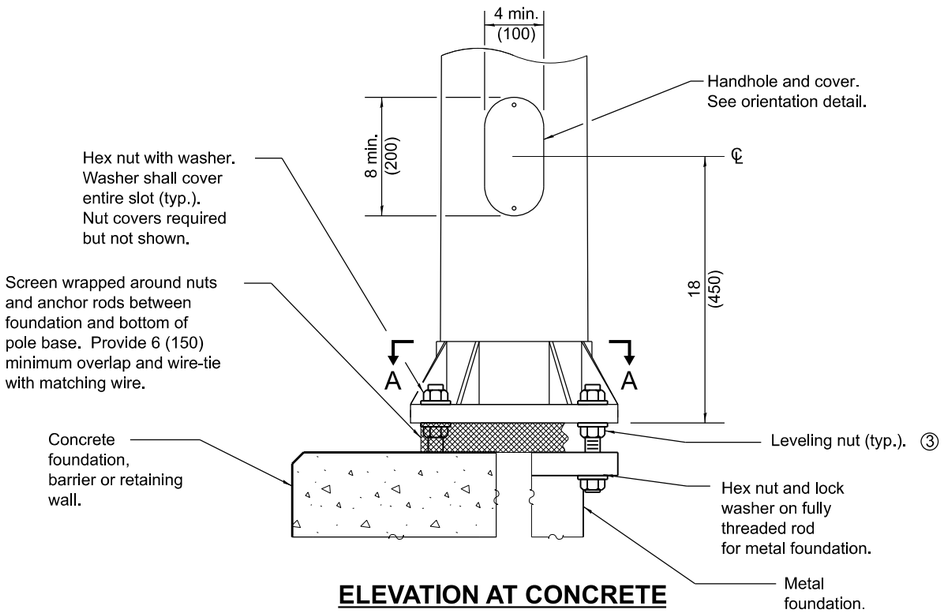
STANDARD 830006-05



Pole on median barrier wall.

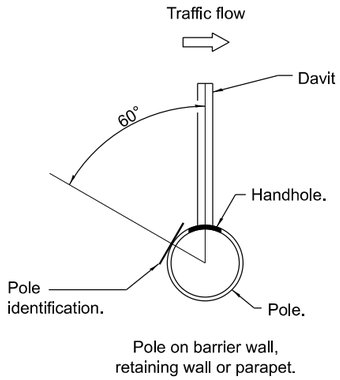


SECTION A-A
(Bolts not shown)

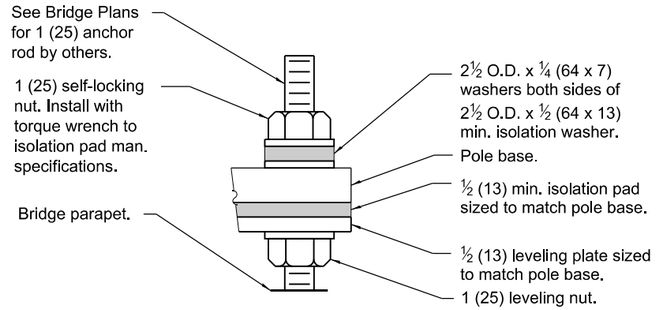


ELEVATION AT CONCRETE FOUNDATION, METAL FOUNDATION OR RETAINING WALL

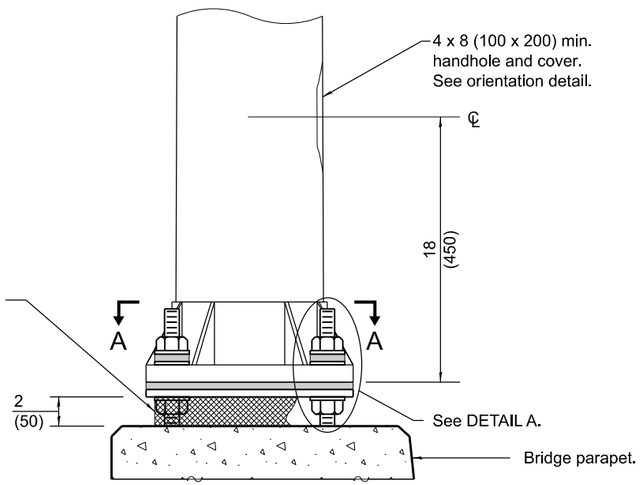
③ Omit leveling nuts when breakaway devices are required.



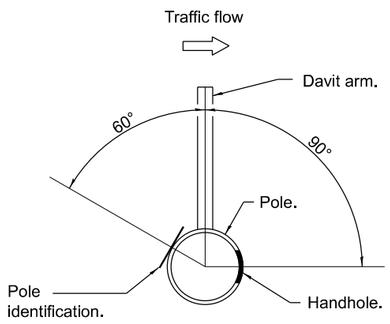
Pole on barrier wall, retaining wall or parapet.



DETAIL A

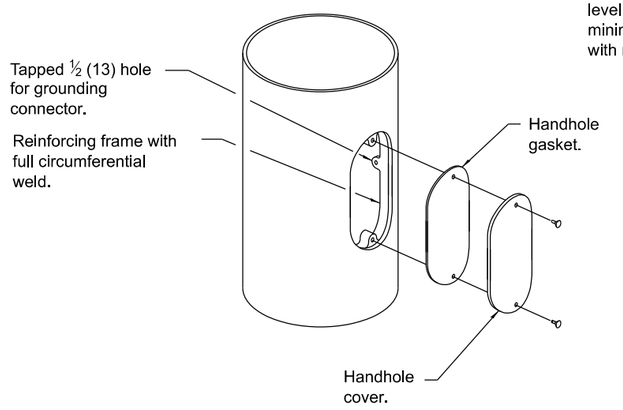


ELEVATION AT BRIDGE PARAPET



Pole on ground mounted foundation.

HANDHOLE / IDENTIFICATION ORIENTATION DETAIL



HANDHOLE DETAIL

POLE BASE DETAILS

Illinois Department of Transportation

APPROVED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

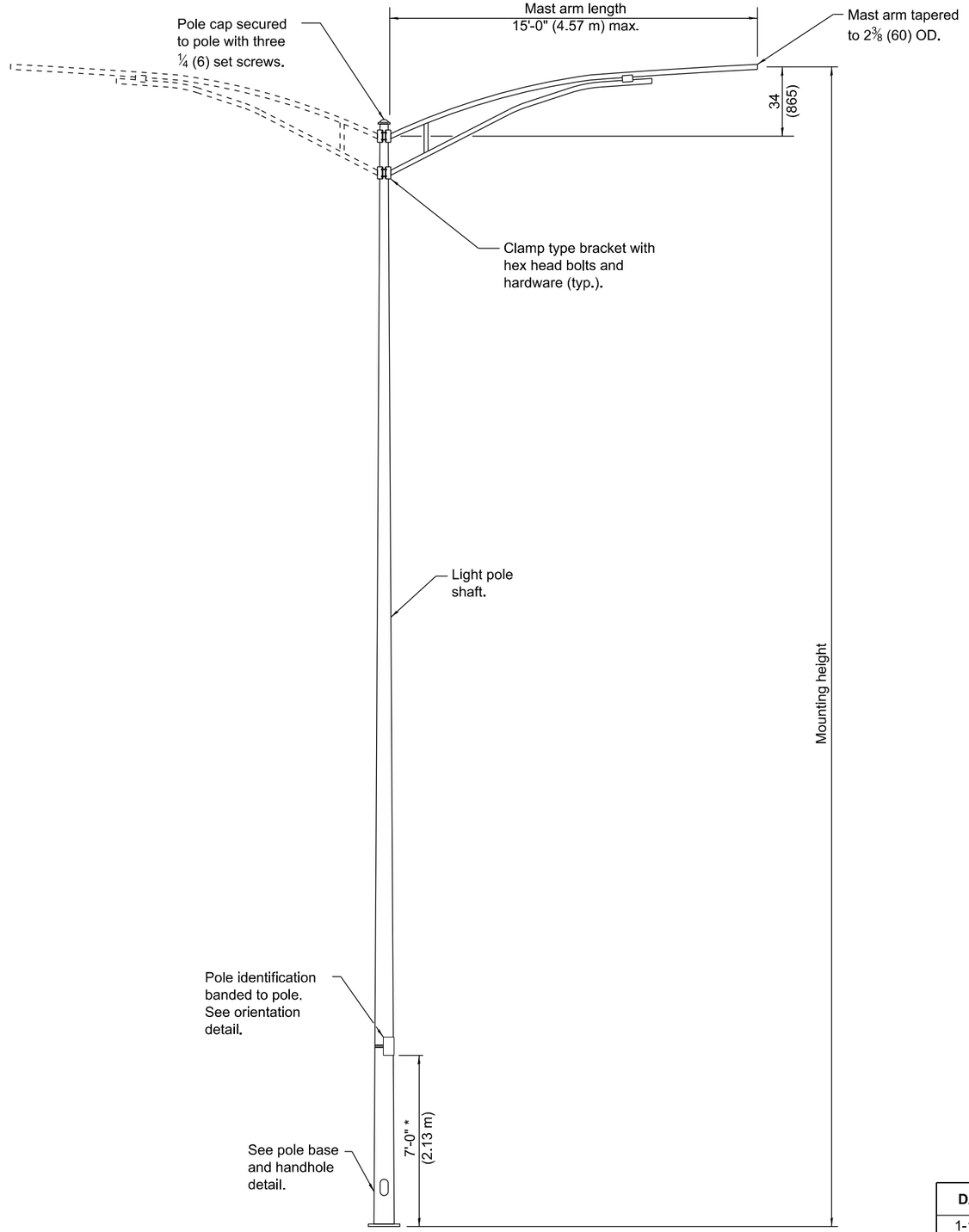
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

LIGHT POLE ALUMINUM DAVIT ARM

(Sheet 2 of 2)

STANDARD 830006-05



MAST ARM
LIGHT POLE
(Single or twin mount)
* Unless directed otherwise by the Engineer.

POLE		
MOUNTING HEIGHT	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
35' (10.7 m) or less	8 tapered to 4 (200 to 100)	10 guage
Greater than 35' (10.7 m) to 50' (15.2 m)	10 tapered to 4 (250 to 100)	7 guage

BASE PLATE		
MOUNTING HEIGHT	BOLT CIRCLE DIAMETER	BASE PLATE THICKNESS
35' (10.7 m) or less	11½ (290)	1 (25)
Greater than 35' (10.7 m) to 50' (15.2 m)	15 (380)	1¼ (32)

GENERAL NOTES

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

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

Illinois Department of Transportation

APPROVED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

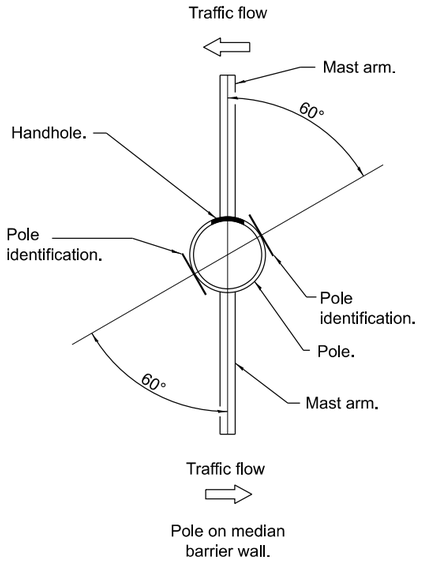
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

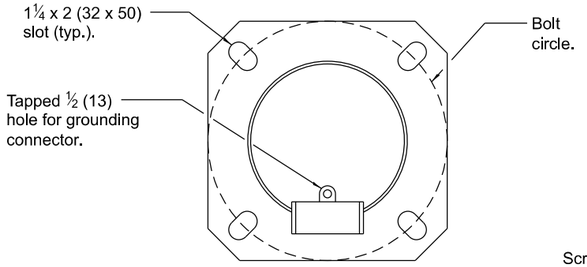
DATE	REVISIONS
1-1-19	Revised POLE and BASE POLE
	tables.
1-1-14	Added pole mounted on bridge
	parapet. Modified attachment
	of screen.

LIGHT POLE
STEEL MAST ARM

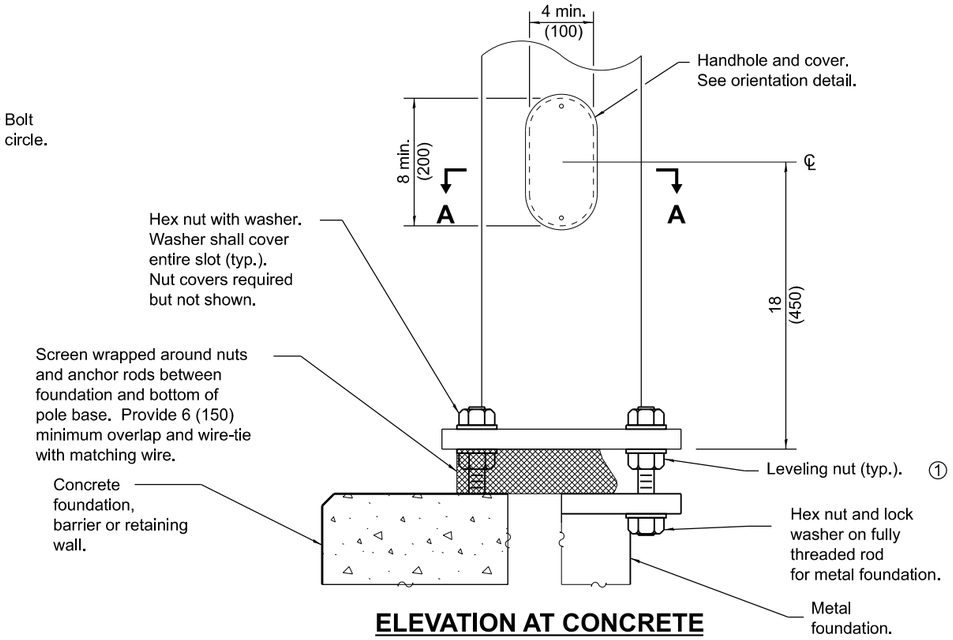
STANDARD 830011-03



Pole on median barrier wall.

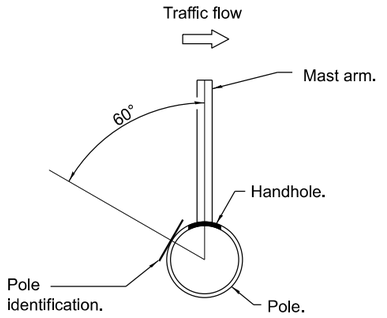


SECTION A-A
(Bolts not shown)

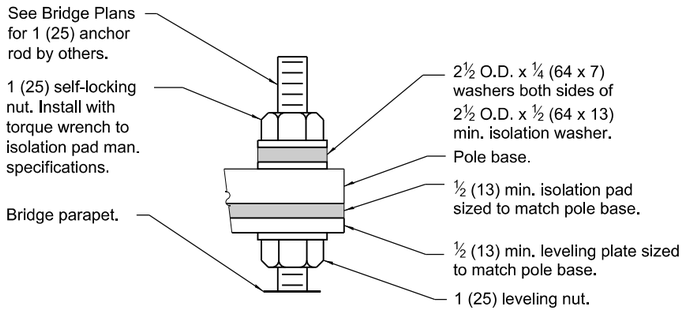


ELEVATION AT CONCRETE FOUNDATION, METAL FOUNDATION OR RETAINING WALL

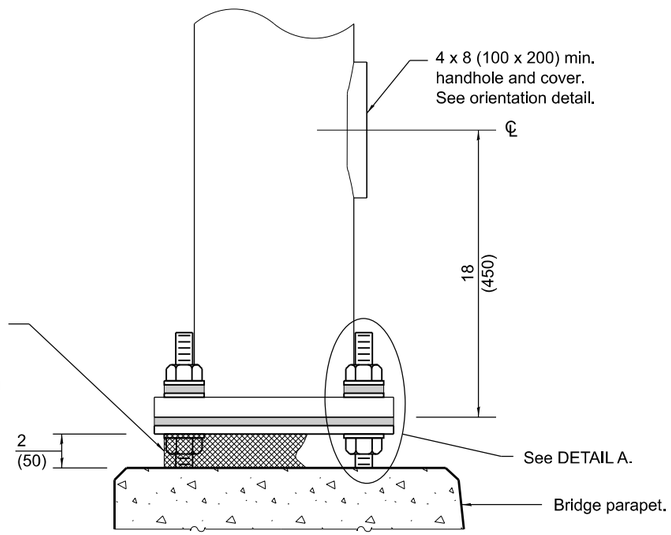
① Omit leveling nuts when breakaway devices are required.



Pole on barrier wall, retaining wall or parapet.

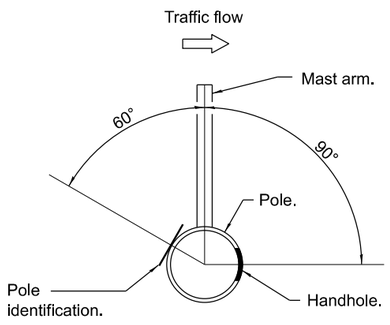


DETAIL A



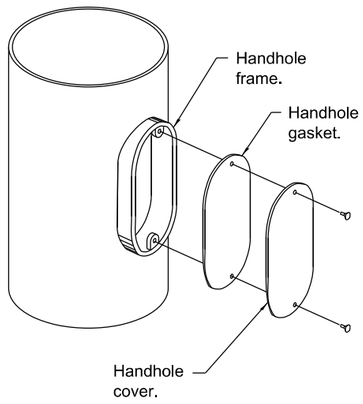
ELEVATION AT BRIDGE PARAPET

POLE BASE DETAILS



Pole on ground mounted foundation.

HANDHOLE / IDENTIFICATION ORIENTATION DETAIL



HANDHOLE DETAIL

Illinois Department of Transportation

APPROVED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

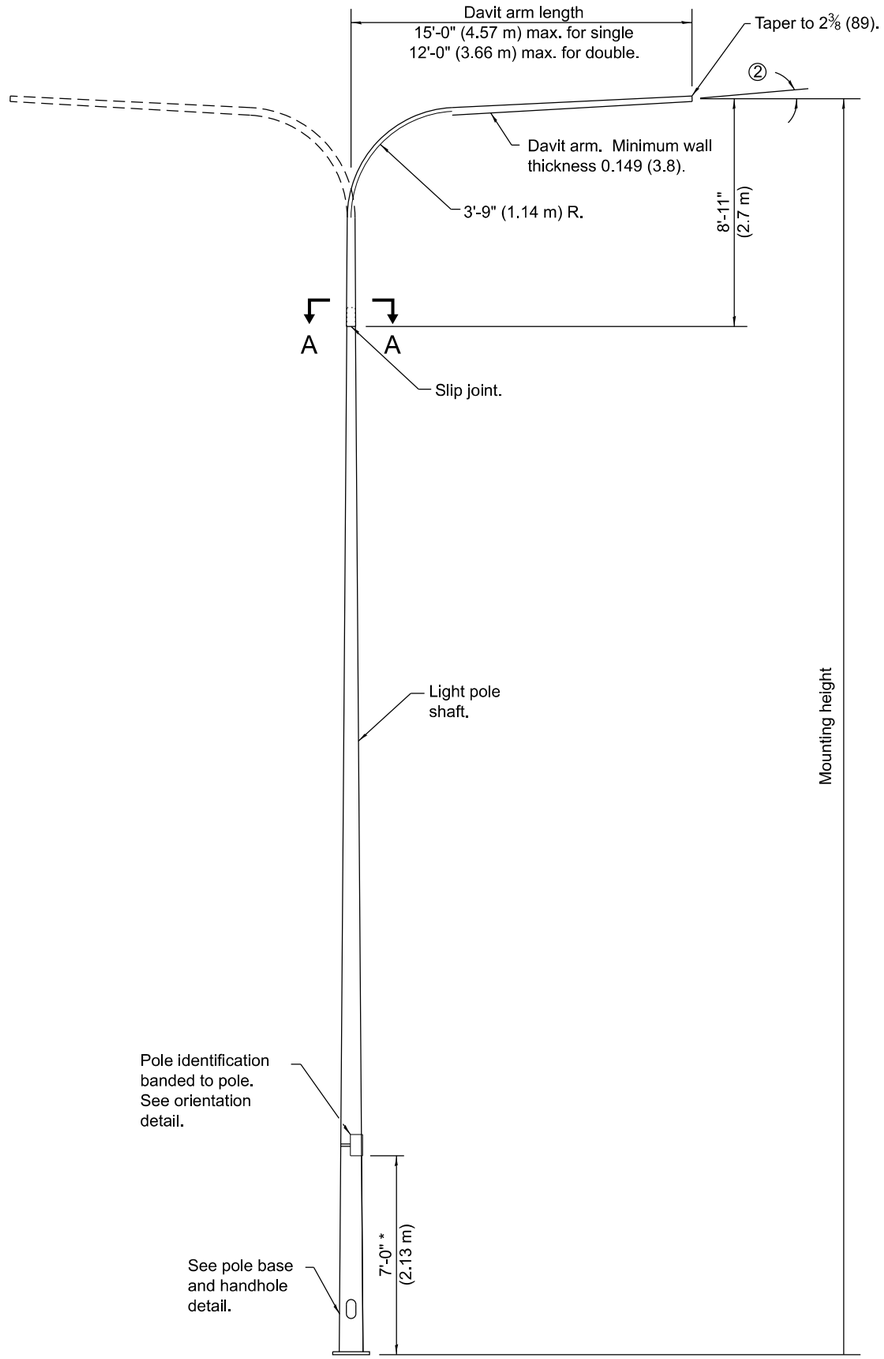
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

LIGHT POLE STEEL MAST ARM

(Sheet 2 of 2)

STANDARD 830011-03



DAVIT LIGHT POLE

(Single or twin mount)

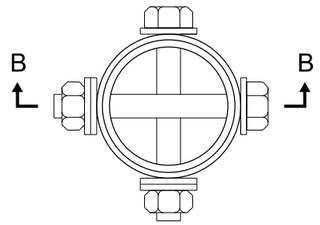
* Unless directed otherwise by the Engineer.

BASE PLATE		
MOUNTING HEIGHT	BOLT CIRCLE DIAMETER	BASE PLATE THICKNESS
35' (10.7 m) or less	11½ (290)	1 (25)
Greater than 35' (10.7 m) to 50' (15.2 m)	15 (380)	1¼ (32)

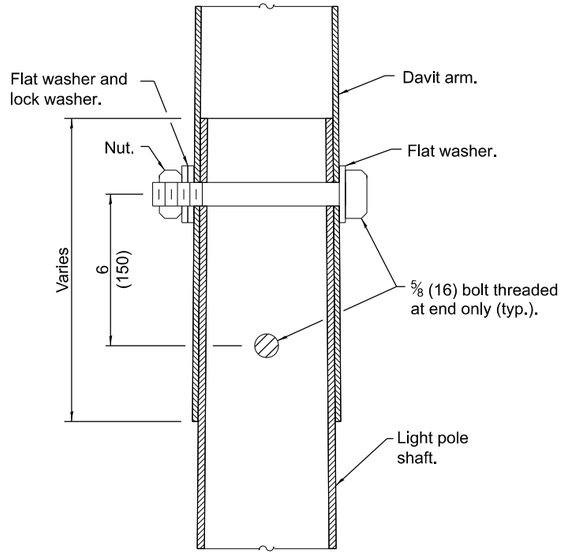
POLE LOWER SHAFT			
MOUNTING HEIGHT	LOWER SHAFT LENGTH ①	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
30' (9.1 m)	21'-1" (6.4 m)	8 tapered to 6 (200 to 114)	10 gauge
35' (10.7 m)	26'-1" (7.9 m)	8 tapered to 6 (200 to 114)	10 gauge
40' (12.2 m)	31'-1" (9.5 m)	10 tapered to 6 (250 to 150)	7 gauge
45' (13.7 m)	36'-1" (11.0 m)	10 tapered to 6 (250 to 150)	7 gauge
50' (15.2 m)	41'-1" (12.5 m)	10 tapered to 6 (250 to 150)	7 gauge

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



SECTION B-B

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.

Illinois Department of Transportation

APPROVED January 1, 2019
ME Seppelt
ELECTRICAL AND MECHANICAL UNIT CHIEF

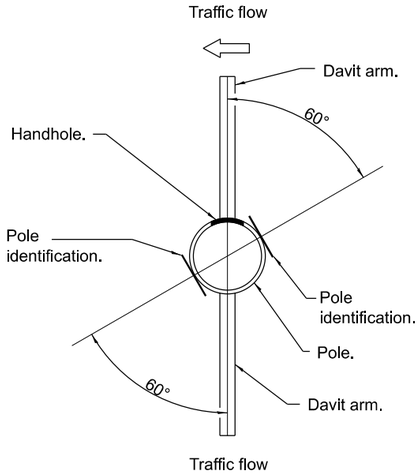
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

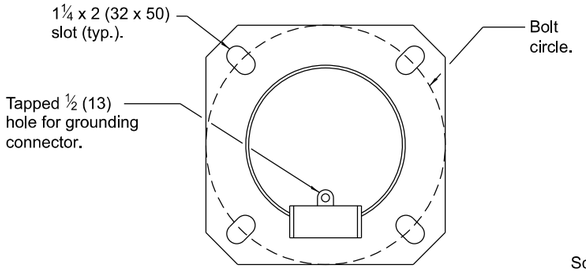
DATE	REVISIONS
1-1-19	Revised BASE PLATE table.
1-1-14	Added pole mounted on bridge
	parapet. Modified attachment
	of screen.

LIGHT POLE STEEL DAVIT ARM

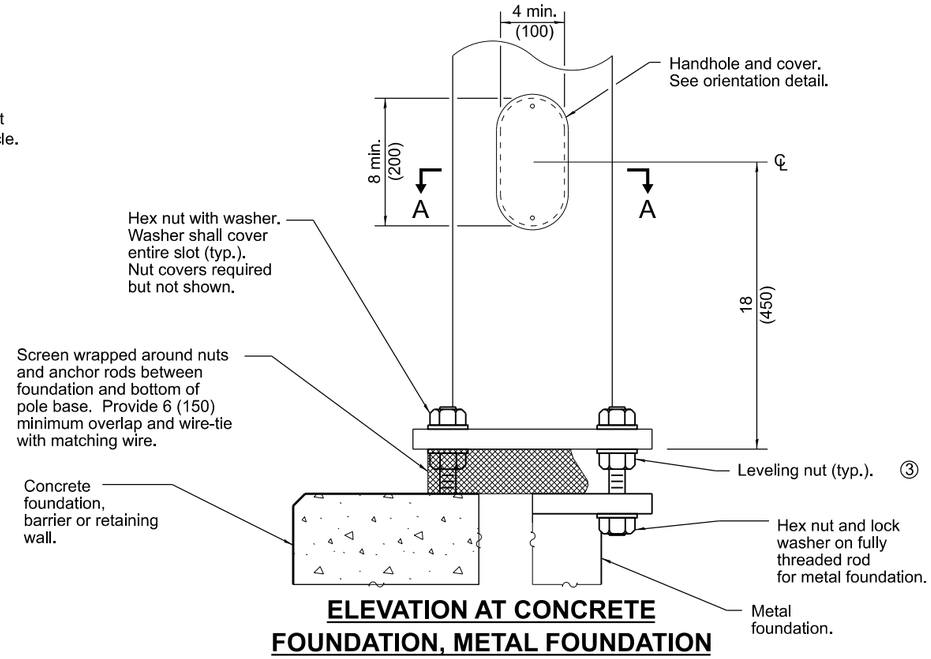
STANDARD 830016-03



Pole on median barrier wall.

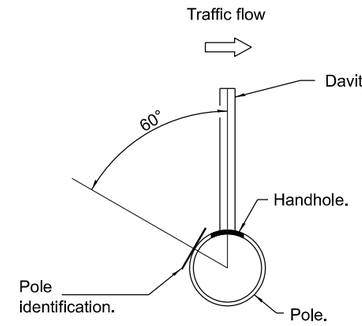


SECTION A-A
(Bolts not shown)

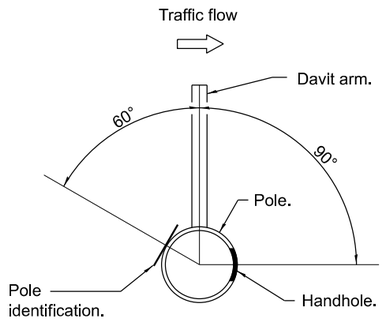


ELEVATION AT CONCRETE FOUNDATION, METAL FOUNDATION OR RETAINING WALL

③ Omit leveling nuts when breakaway devices are required.

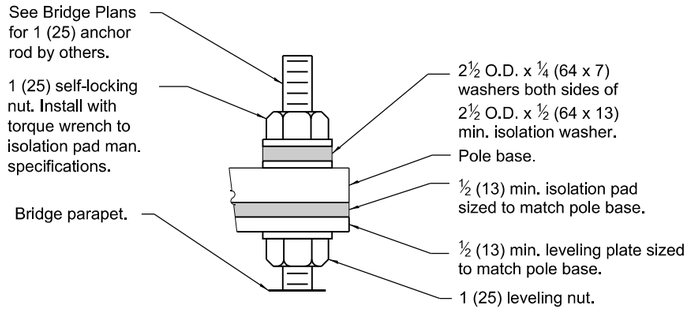


Pole on barrier wall, retaining wall or parapet.

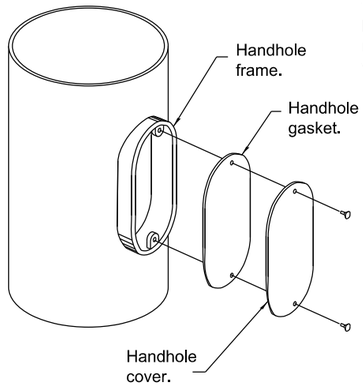


Pole on ground mounted foundation.

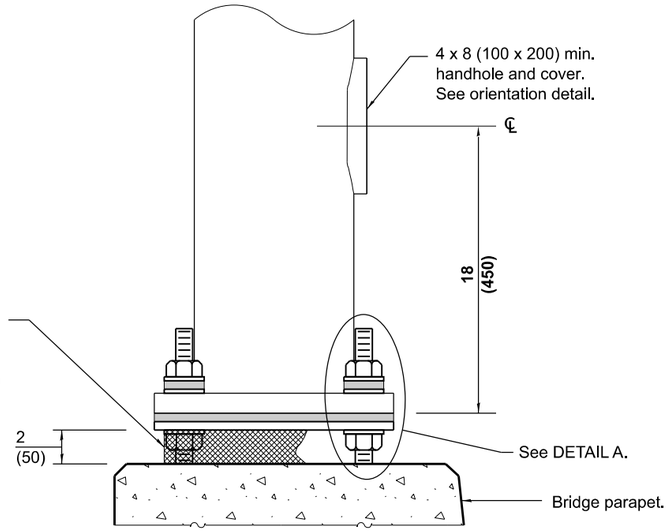
HANDHOLE / IDENTIFICATION ORIENTATION DETAIL



DETAIL A



HANDHOLE DETAIL



ELEVATION AT BRIDGE PARAPET

POLE BASE DETAILS

Illinois Department of Transportation

APPROVED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

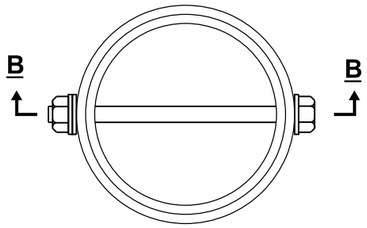
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

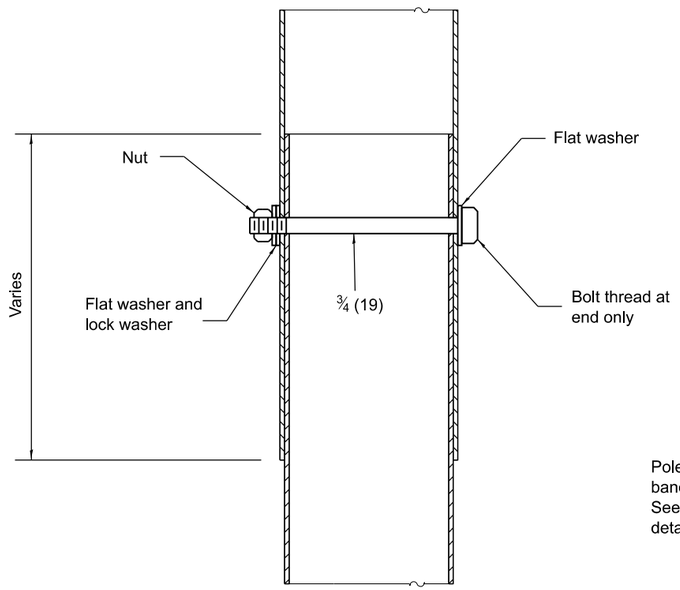
LIGHT POLE
STEEL DAVIT ARM

(Sheet 2 of 2)

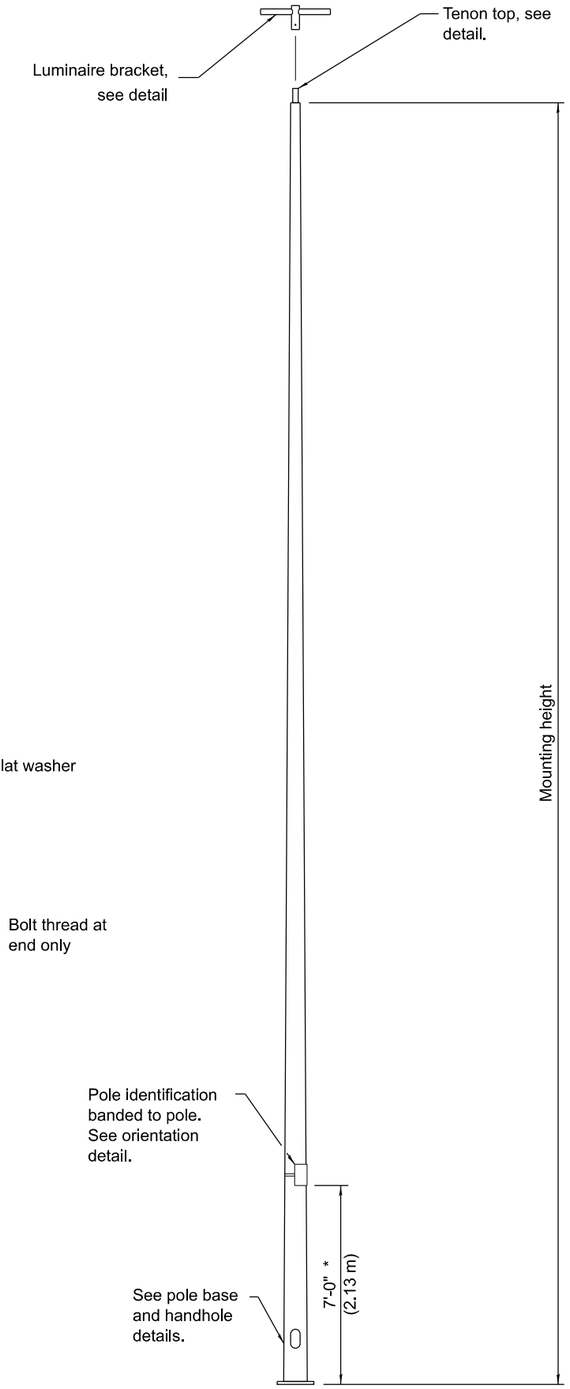
STANDARD 830016-03



SECTION A-A



SECTION B-B



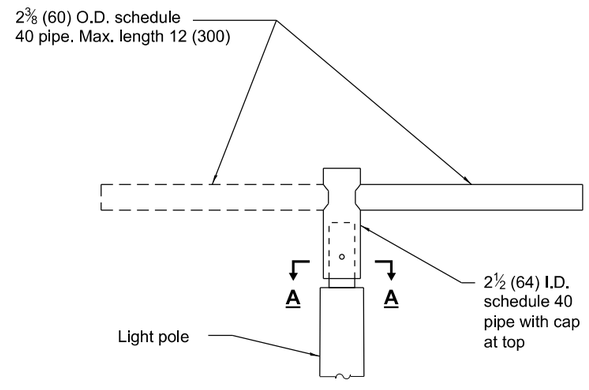
TENON TOP LIGHT POLE

(Single or twin mount)

* Unless directed otherwise by the Engineer

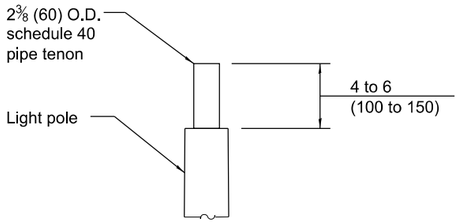
BASE PLATE		
MOUNTING HEIGHT	BOLT CIRCLE DIAMETER	BASE PLATE THICKNESS
35' (10.7 m) or less	11½ (290)	1 (25)
Greater than 35' (10.7 m) to 50' (15.2 m)	15 (380)	1¼ (32)

LIGHT POLE		
MOUNTING HEIGHT	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
35' (10.7 m) or less	8 tapered to 4 (200 to 100)	10 guage
Greater than 35' (10.7 m) to 50' (15.2 m)	10 tapered to 4 (250 to 100)	7 guage



LUMINAIRE BRACKET DETAIL

(Single or Twin Arm)



TENON DETAIL

GENERAL NOTES

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

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

Illinois Department of Transportation

APPROVED January 1, 2024
Bernard Smithin
ELECTRICAL AND MECHANICAL UNIT CHIEF

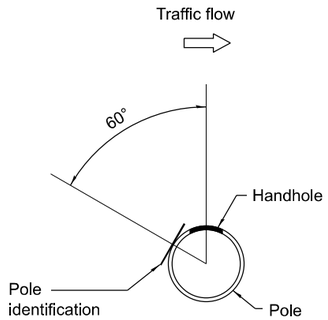
APPROVED January 1, 2024
ENGINEER OF DESIGN AND ENVIRONMENT

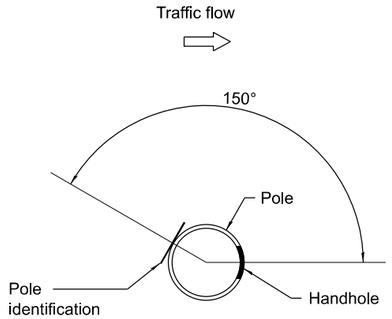
ISSUED 1-1-12

DATE	REVISIONS
1-1-24	Replaced 'bullhorn' bracket with
	horizontal bracket.
1-1-19	Revised BASE PLATE and
	LIGHT POLE tables.

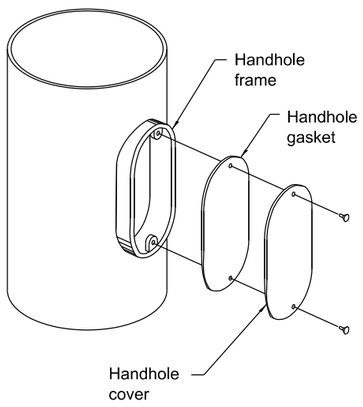
LIGHT POLE STEEL TENON TOP

STANDARD 830021-04

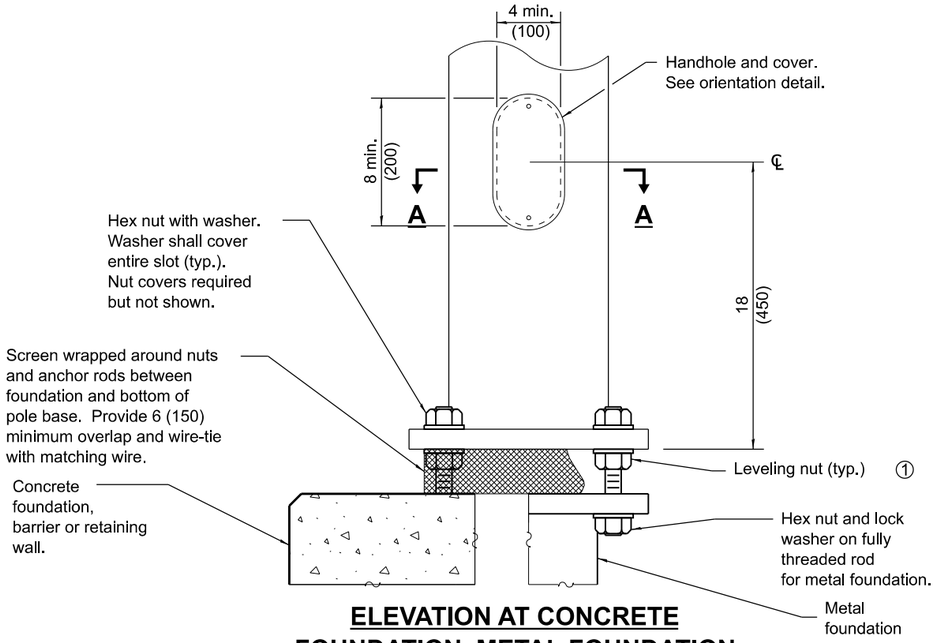




HANDHOLE / IDENTIFICATION ORIENTATION DETAIL

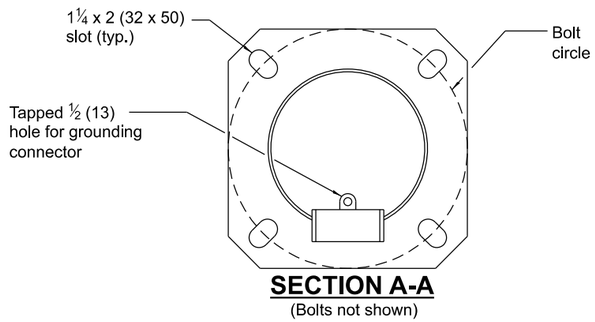


HANDHOLE DETAIL



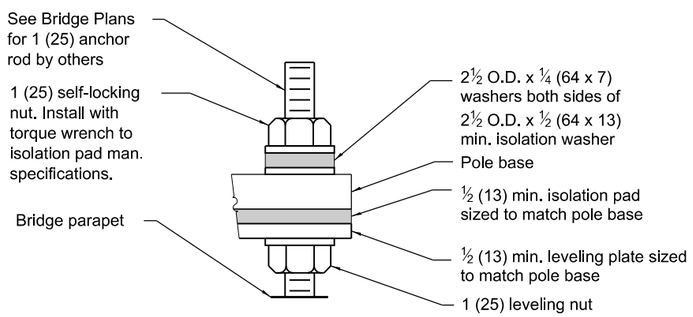
ELEVATION AT CONCRETE FOUNDATION, METAL FOUNDATION OR RETAINING WALL

① Omit leveling nuts when breakaway devices are required.

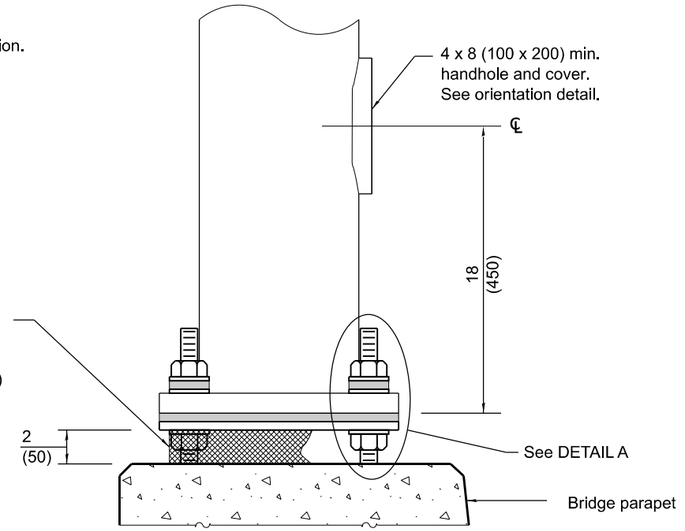


SECTION A-A

(Bolts not shown)



DETAIL A



ELEVATION AT BRIDGE PARAPET

POLE BASE DETAILS

Illinois Department of Transportation

APPROVED January 1, 2024
ELECTRICAL AND MECHANICAL UNIT CHIEF

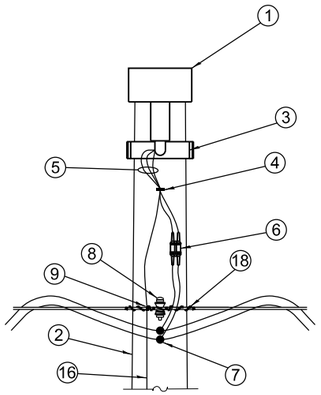
APPROVED January 1, 2024
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

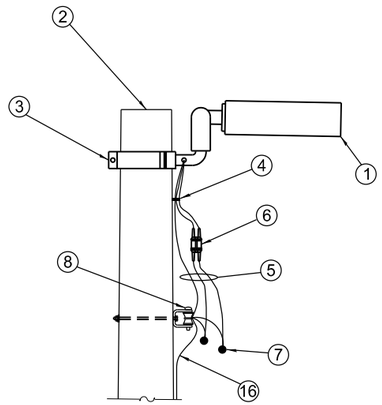
LIGHT POLE STEEL TENON TOP

(Sheet 2 of 2)

STANDARD 830021-04



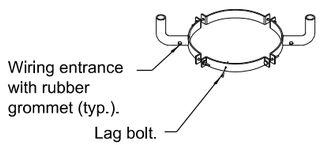
FACING VIEW



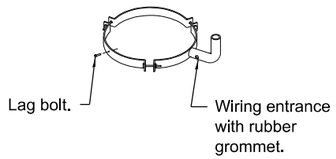
SIDE VIEW

LUMINAIRE MOUNTING DETAILS

43' - 44' (13.1 m - 13.4 m) mounting height unless noted otherwise on plans.

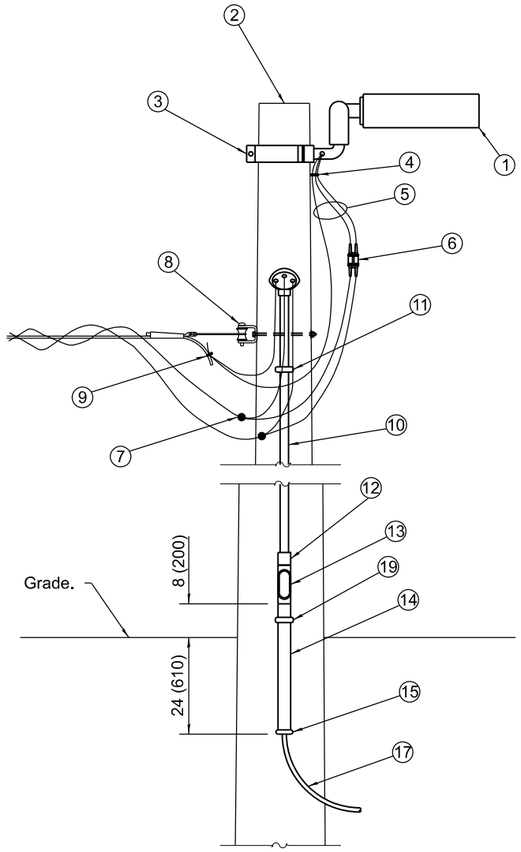


TWIN

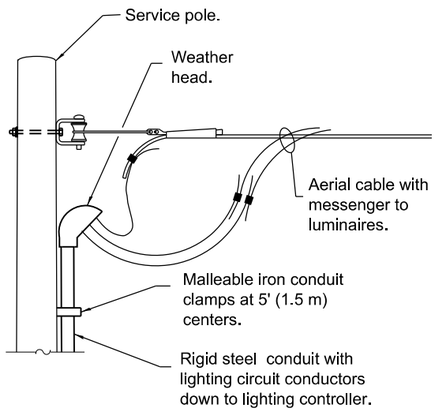


SINGLE

MOUNTING BRACKET DETAILS



LIGHT POLE WITH CIRCUIT ROUTED UNDERGROUND



LIGHTING CIRCUIT AT SERVICE/CONTROLLER

See standard 825001 for service installation.

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" condulet, 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" condulet.

* 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, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

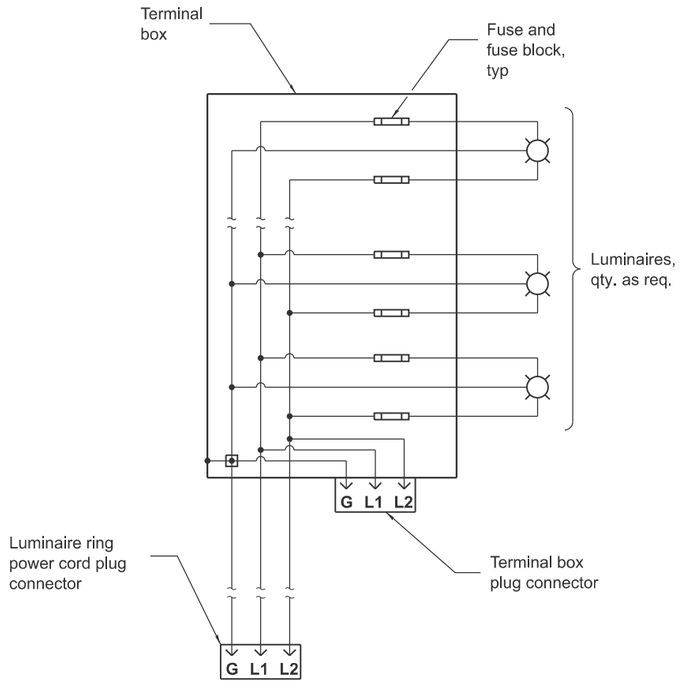
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

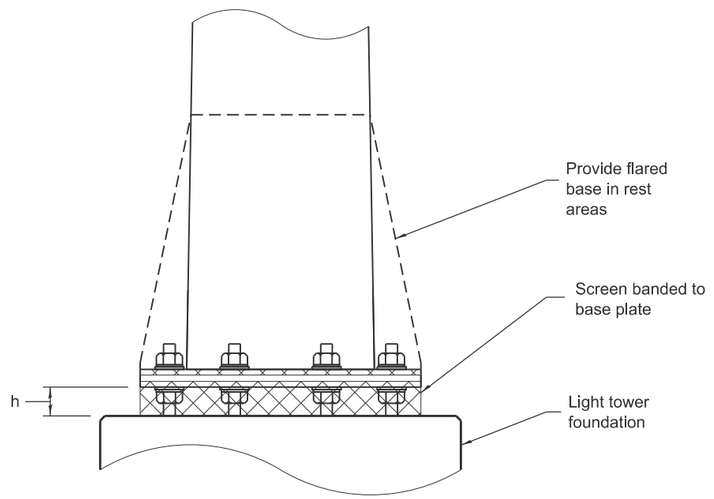
DATE	REVISIONS
1-1-19	Revised Luminaire to be horizontal.
1-1-13	New Standard.

TEMPORARY ROADWAY LIGHTING

STANDARD 830026-01

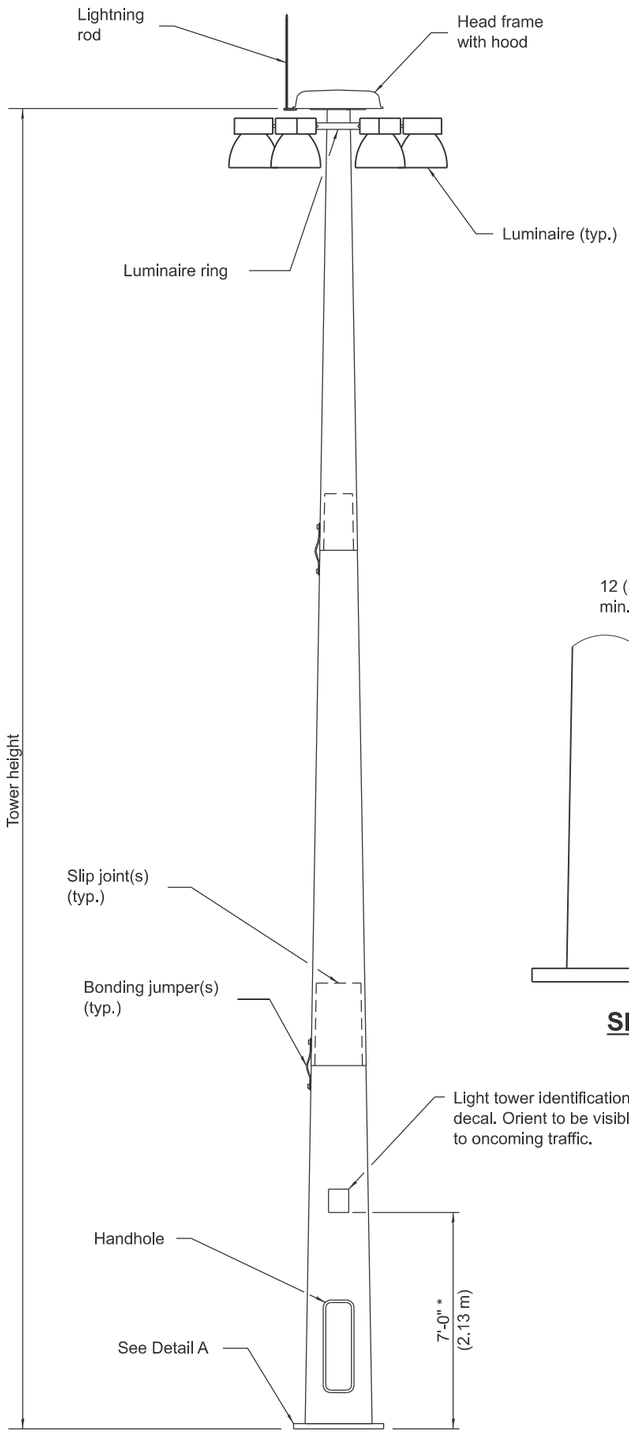


LUMINAIRE RING WIRING DIAGRAM

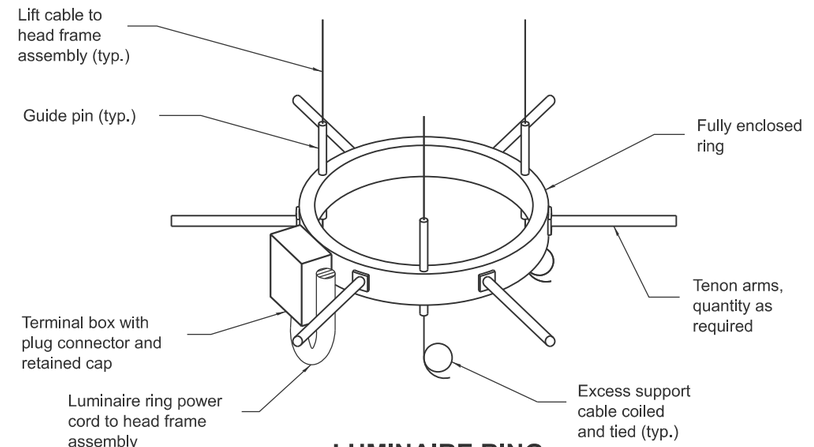


DETAIL A

h = Anchor rod dia. + leveling nut and washer thickness

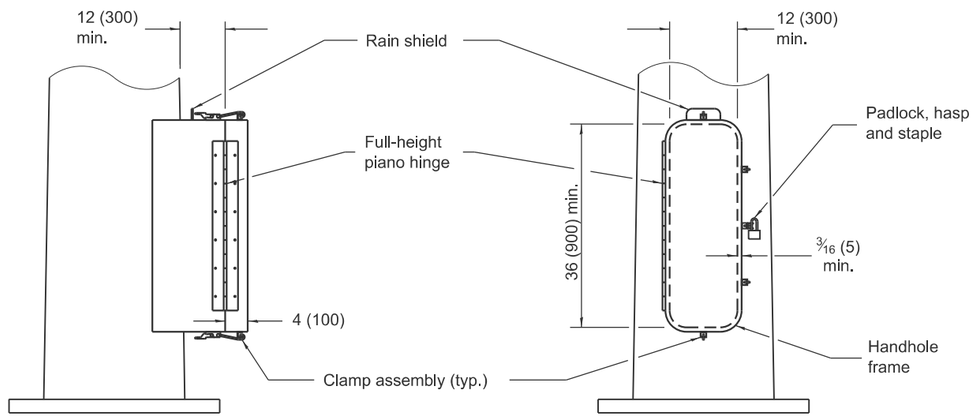


LIGHT TOWER



LUMINAIRE RING

(Two or three lift cable system permitted, three lift cable type shown.)



SIDE

FRONT

HANDHOLE

GENERAL NOTES

See Standard 837001 for High Mast Tower Foundation and grounding electrode.

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

Illinois Department of Transportation

APPROVED January 1, 2025
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

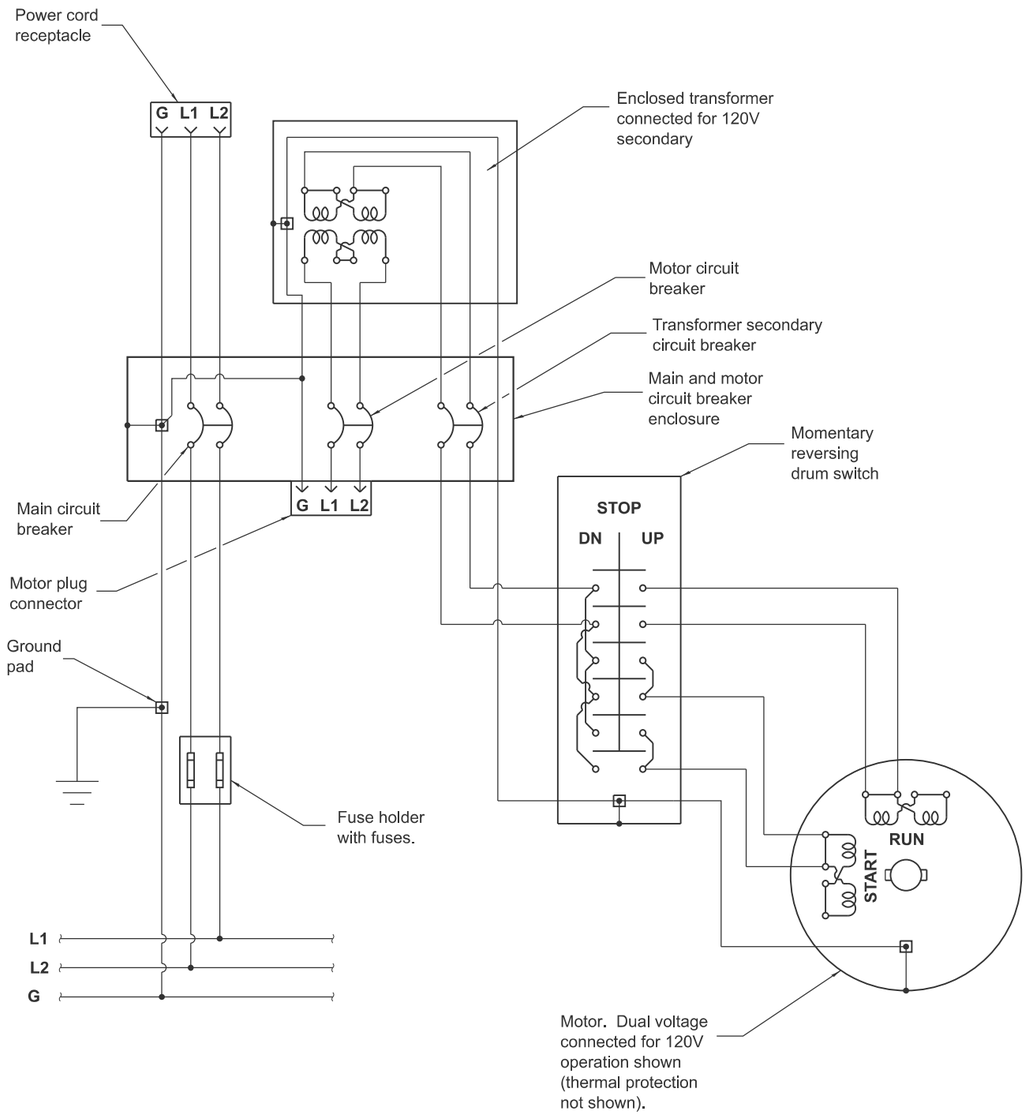
ISSUED 1-1-11

DATE	REVISIONS
1-1-25	Omitted the surge protective device
	in the base of the light tower.
1-1-24	Omitted option for horizontal or
	multi-mount of luminaires.

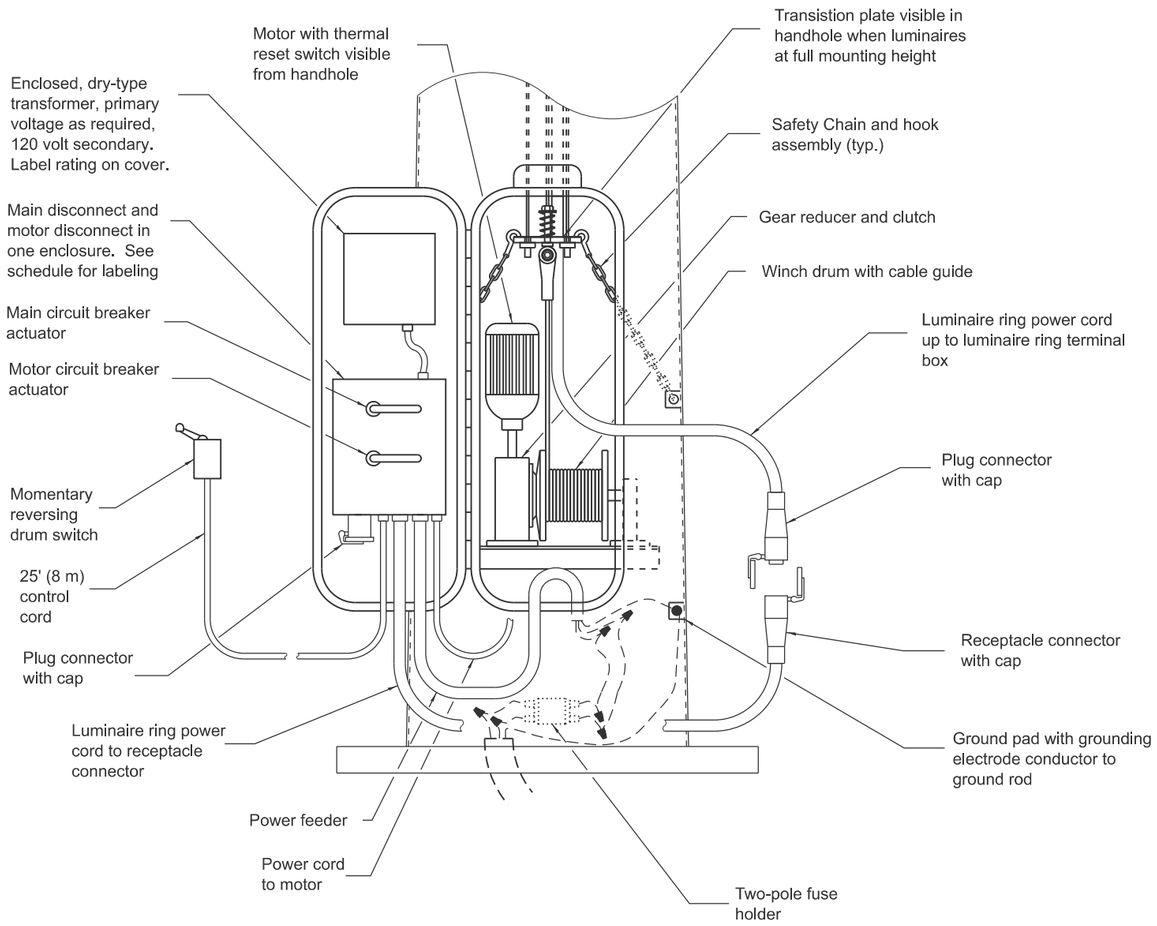
LIGHT TOWER

(Sheet 1 of 2)

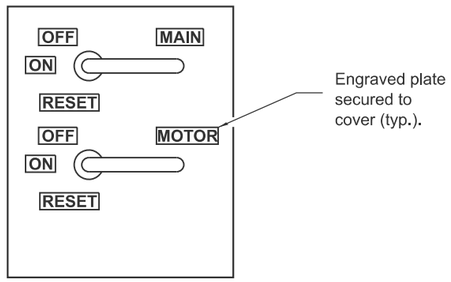
STANDARD 835001-03



LOWERING SYSTEM WIRING DIAGRAM



LOWERING AND SUPPORT MECHANISM



DISCONNECT SCHEDULE

Illinois Department of Transportation

APPROVED January 1, 2025
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-11

LIGHT TOWER

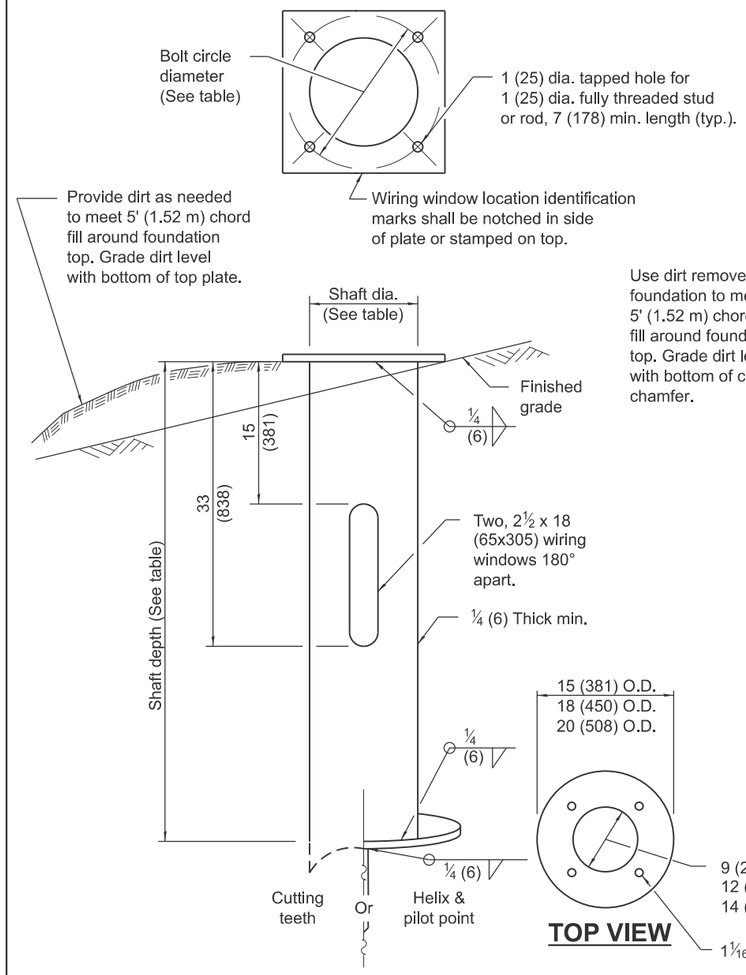
(Sheet 2 of 2)

STANDARD 835001-03

		METAL FOUNDATION			CONCRETE FOUNDATION		
LIGHT POLE MOUNTING HEIGHT	BOLT CIRCLE DIAMETER	SHAFT DIAMETER	SHAFT DEPTH	TOP PLATE (min)	SHAFT DIAMETER	SHAFT DEPTH	ANCHOR ROD LENGTH
≤30' (9.1 m)	11½ (292)	8⅝ (220)	6' (1.83 m)	12 x 12 x 1 (300 x 300 x 25)	24 (610)	5'-0" (1.52 m)	4'-9" (1.45 m)
31'-35' (9.4 m - 10.7 m)	11½ (292)	8⅝ (220)	6' (1.83 m)	12 x 12 x 1 (300 x 300 x 25)	24 (610)	5'-6" (1.67 m)	5'-3" (1.60 m)
36'-40' (10.9 m - 12.2 m)	15 (381) ②	8⅝ (220)	6' (1.83 m) ①	15 x 15 x 1¼ (375 x 375 x 31)	30 (762)	6'-0" (1.83 m)	5'-9" (1.75 m)
41'-45' (12.5 m - 13.7 m)	15 (381) ②	8⅝ (220)	6' (1.83 m) ①	15 x 15 x 1¼ (375 x 375 x 31)	30 (762)	6'-6" (1.98 m)	6'-3" (1.90 m)
46'-50' (14.0 m - 15.2 m)	15 (381) ②	8⅝ (220)	8' (2.44 m)	15 x 15 x 1¼ (375 x 375 x 31)	30 (762)	7'-0" (2.13 m)	6'-9" (2.00 m)

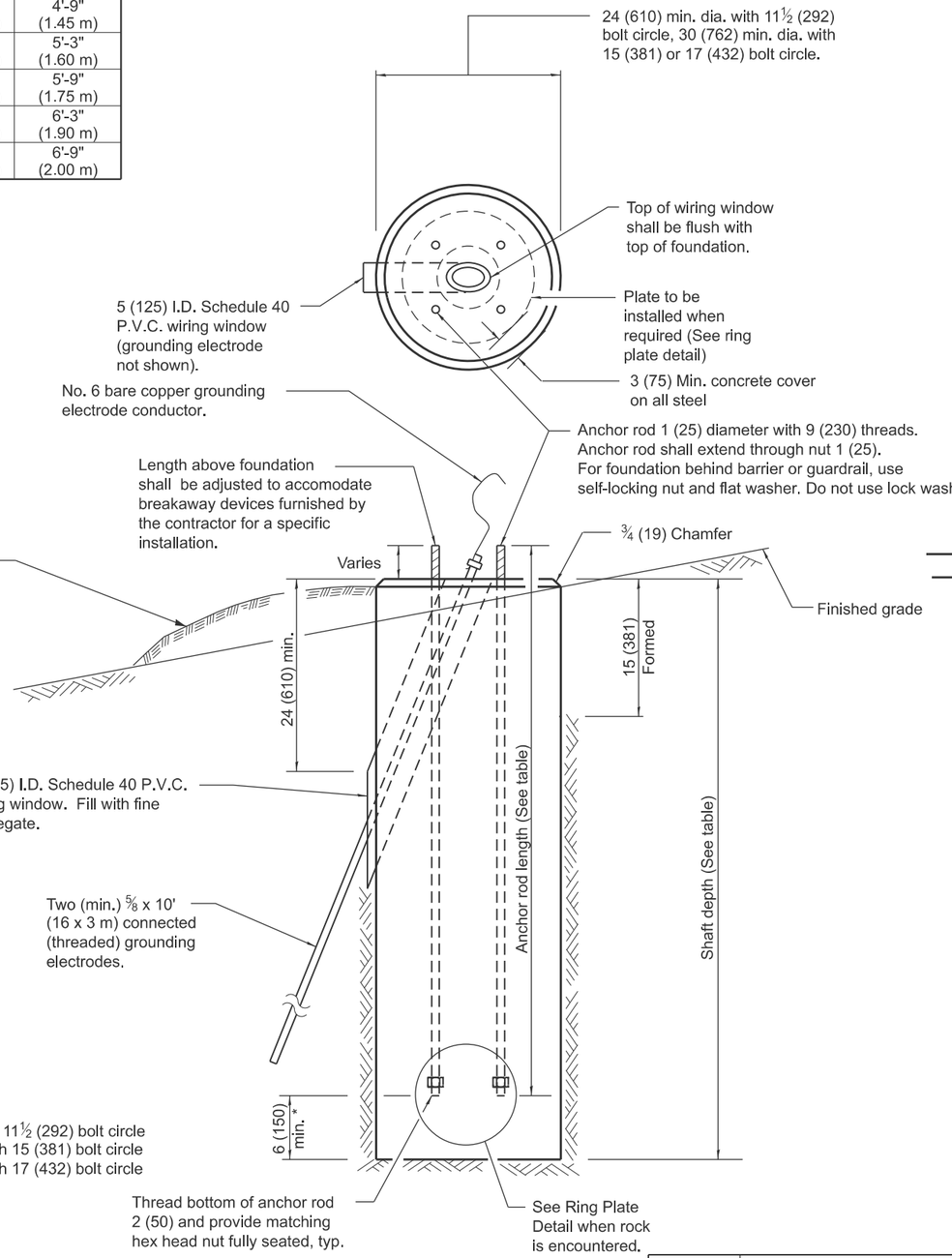
① 8⅝ x 8'-0" (220 x 2.44 m) for twin luminaires.

② Bolt circle diam. shall be 17 (430) when a transformer base is used.



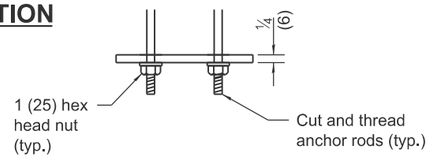
TOP VIEW

METAL FOUNDATION

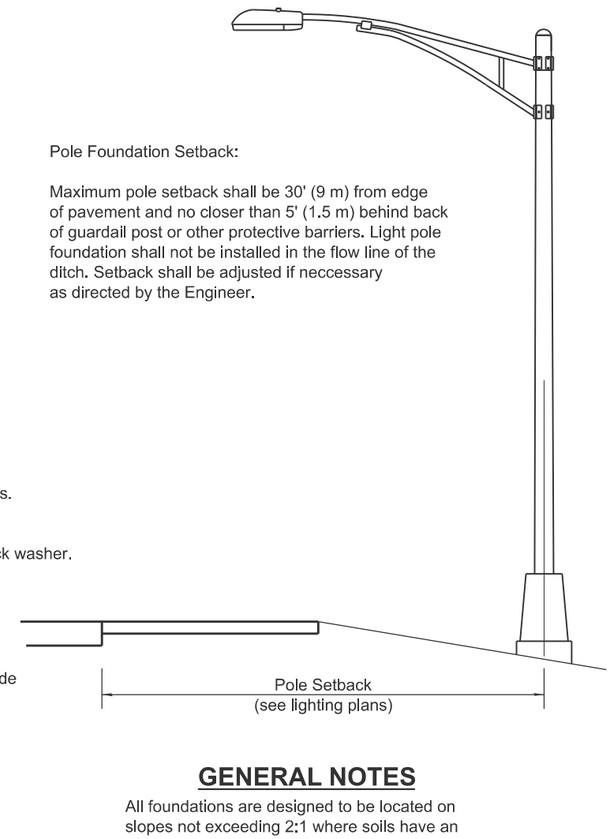


* If the required anchor rod length above top of foundation is less than 3 (75), anchor rods may be lowered below 6 (150).

CONCRETE FOUNDATION



RING PLATE DETAIL



Pole Foundation Setback:

Maximum pole setback shall be 30' (9 m) from edge of pavement and no closer than 5' (1.5 m) behind back of guardail post or other protective barriers. Light pole foundation shall not be installed in the flow line of the ditch. Setback shall be adjusted if necessary as directed by the Engineer.

GENERAL NOTES

All foundations are designed to be located on slopes not exceeding 2:1 where soils have an unconfined compressive strength of at least 1.0 TSF. The Contractor shall verify the soil strength during drilling for concrete foundations or by monitoring installation resistance of metal foundations and notify the Engineer if other conditions are encountered.

When rock is encountered the foundation depth may be reduced 6 (150) for every 12 (300) of embedment in rock. The minimum foundation depth shall be 4'-6" (1.37 m) with cut anchor rods 6 (150) above bottom of excavated hole. See ring plate detail.

Anchor rods shall be increased in diameter as needed for 50' (15.2 m) mounting height or above. The Contractor shall match the breakaway device size or slotted hole size in the pole base plate to accomodate larger rod sizes.

Transformer bases shall not be used on metal foundations.

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

Illinois Department of Transportation

APPROVED January 1, 2025
Bernard Griffin
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2025
ENGINEER OF DESIGN AND ENVIRONMENT

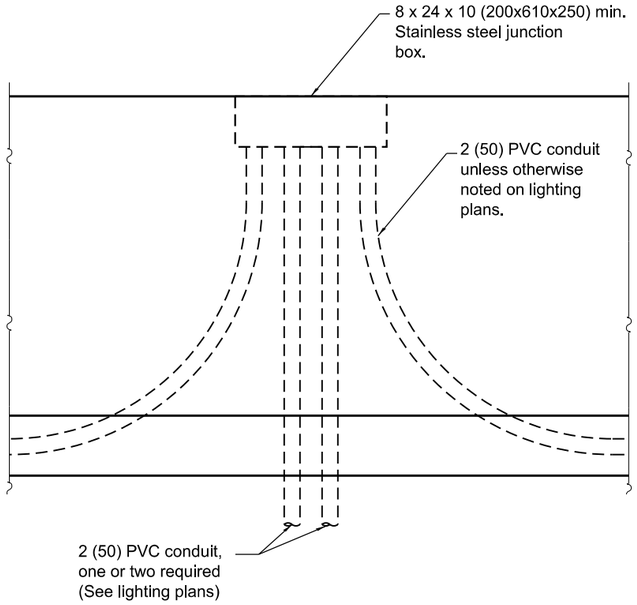
ISSUED 1-1-10

DATE	REVISIONS
1-1-25	Revised pole location setback
	to agree with the BDE Manual.
1-1-19	Omitted multimount luminaire to
	agree with BDE Manual.

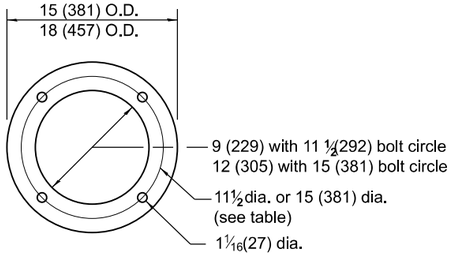
LIGHT POLE FOUNDATION

STANDARD 836001-05

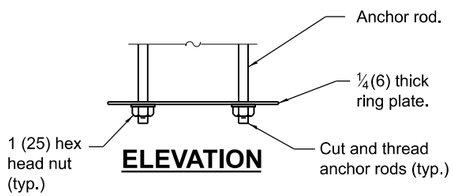
FOUNDATION TABLE				
LIGHT POLE MOUNTING HEIGHT	SHAFT DIAMETER	SHAFT DEPTH	ANCHOR ROD LENGTH	ANCHOR ROD CIRCLE DIA.
≤30' (9.1 m)	24 (610)	36 (914)	6'-2" (1.88 m)	11½ (292)
31'-35' (9.4 m - 10.7 m)	24 (610)	3'-6" (1.06 m)	6'-8" (2.03 m)	11½ (292)
36'-40' (10.9 m - 12.2 m)	30 (762)	4'-0" (1.22 m)	7'-2" (2.18 m)	15 (381)
41'-45' (12.5 m - 13.7 m)	30 (762)	4'-6" (1.37 m)	7'-8" (2.34 m)	15 (381)
46'-50' (14.0 m - 15.2 m)	30 (762)	5'-0" (1.52 m)	8'-2" (2.49 m)	15 (381)



JUNCTION BOX ELEVATION

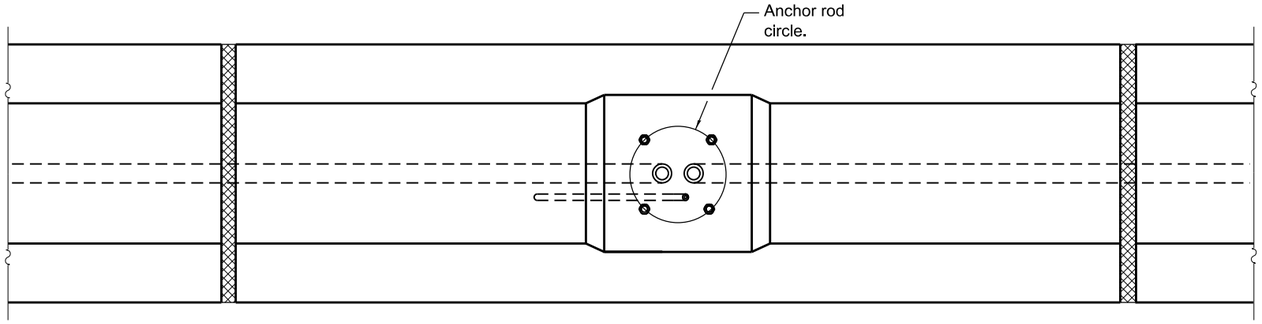


PLAN

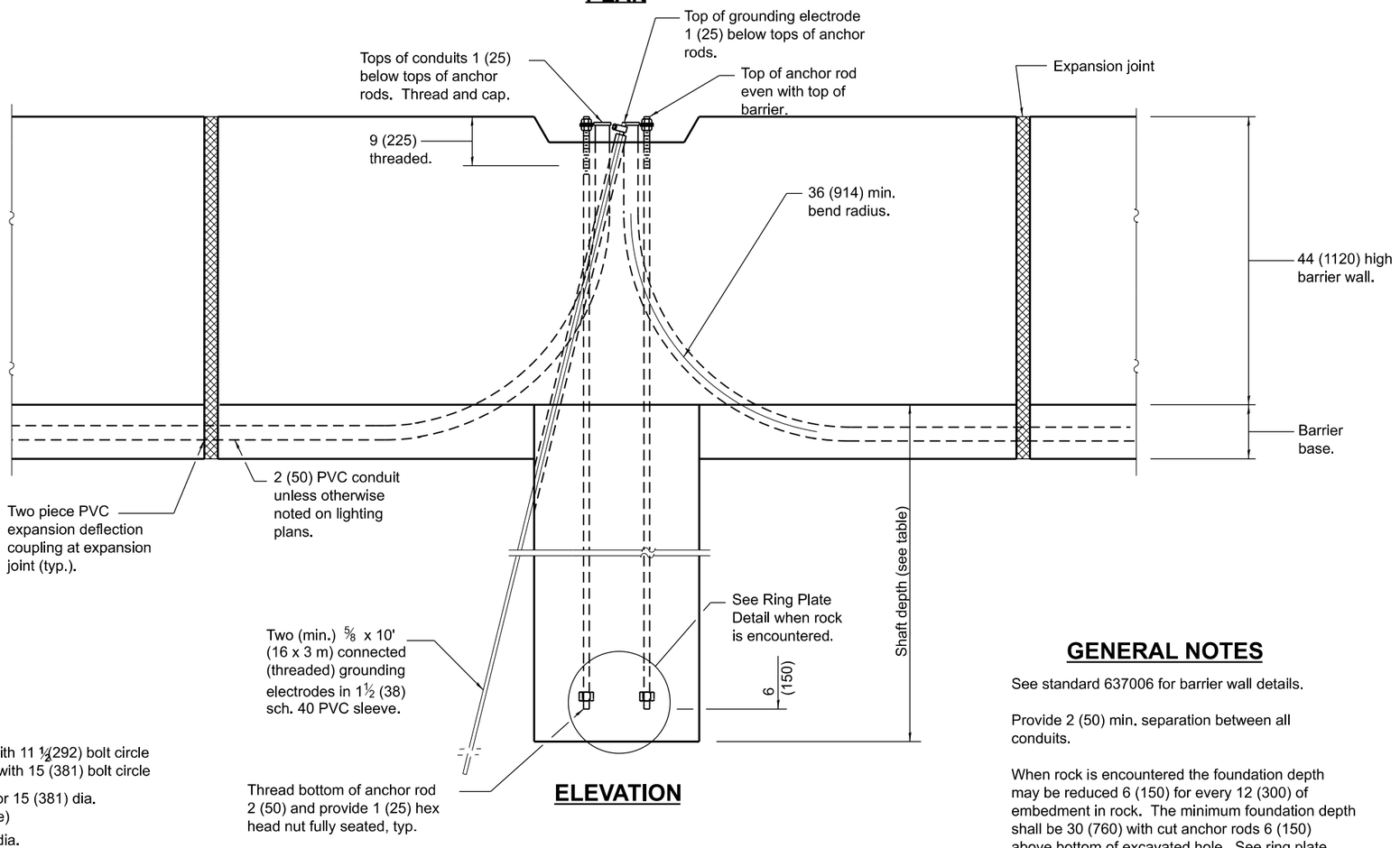


ELEVATION

RING PLATE DETAIL



PLAN



ELEVATION

LIGHT POLE FOUNDATION

GENERAL NOTES

See standard 637006 for barrier wall details.

Provide 2 (50) min. separation between all conduits.

When rock is encountered the foundation depth may be reduced 6 (150) for every 12 (300) of embedment in rock. The minimum foundation depth shall be 30 (760) with cut anchor rods 6 (150) above bottom of excavated hole. See ring plate detail.

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

Illinois Department of Transportation

APPROVED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

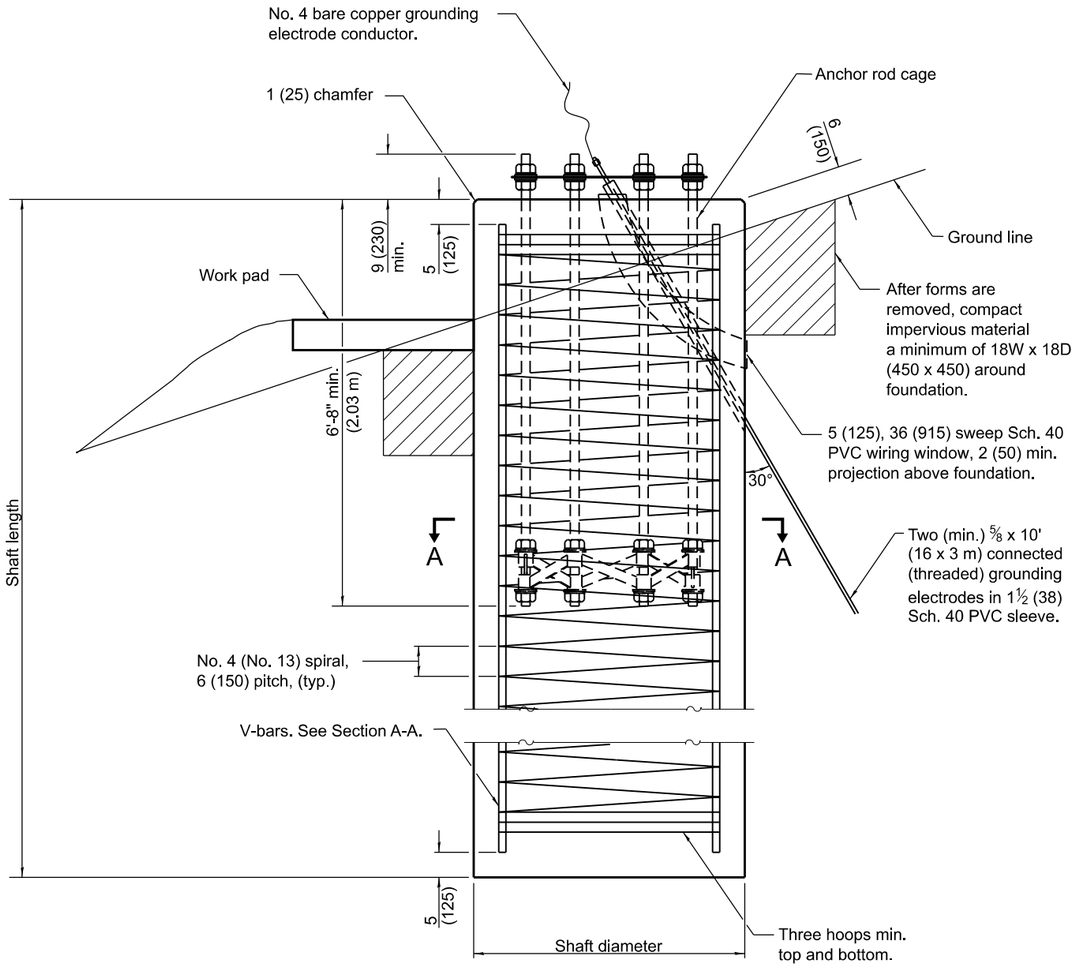
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

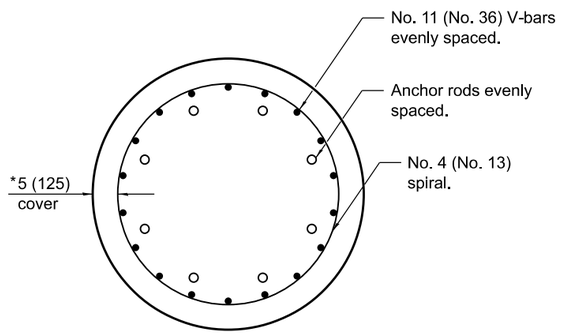
DATE	REVISIONS
1-1-19	Revised standard for new constant
	slope median berrier.
	Renamed standard.
1-1-14	Modified grounding method. Revised
	general notes.

LIGHT POLE FOUNDATION WITH 44 IN (1120 mm) CONCRETE BARRIER

STANDARD 836011-02



FOUNDATION ELEVATION



SECTION A-A

* See Rod and Reinforcement Table.

SHAFT LENGTH TABLE											
SOIL CONSISTENCY		AVERAGE STRENGTH	LIGHT TOWER HEIGHT								
		Qu in tsf (Qu in kPa)	80' (24 m)	90' (27 m)	100' (30 m)	110' (34 m)	120' (37 m)	130' (40 m)	140' (43 m)	150' (46 m)	160' (49 m)
Cohesive	SOFT	< 0.5 (< 50)	20'-6" (6.2 m)	21'-6" (6.5 m)	22'-6" (6.9 m)	24'-0" (7.2 m)	25'-0" (7.6 m)	26'-6" (8.0 m)	27'-6" (8.3 m)	28'-6" (8.7 m)	30'-0" (9.1 m)
	MEDIUM	0.5 to 1 (50 to 100)	17'-0" (5.1 m)	17'-6" (5.3 m)	18'-6" (5.6 m)	19'-0" (5.8 m)	20'-6" (6.2 m)	21'-6" (6.4 m)	22'-0" (6.7 m)	23'-6" (7.0 m)	24'-0" (7.3 m)
	STIFF	1 to 2 (100 to 200)	14'-6" (4.4 m)	15'-0" (4.5 m)	15'-6" (4.7 m)	16'-0" (4.8 m)	17'-6" (5.2 m)	18'-0" (5.4 m)	18'-6" (5.5 m)	19'-6" (5.9 m)	20'-0" (6.1 m)
	VERY STIFF	2 to 4 (200 to 400)	13'-0" (3.8 m)	13'-0" (3.9 m)	13'-6" (4.1 m)	14'-0" (4.2 m)	15'-0" (4.5 m)	15'-6" (4.6 m)	16'-0" (4.7 m)	17'-0" (5.1 m)	17'-6" (5.2 m)
	HARD	> 4 (> 400)	11'-6" (3.5 m)	12'-0" (3.5 m)	12'-0" 3.6 m)	12'-6" (3.7 m)	13'-6" (4.0 m)	13'-6" (4.1 m)	14'-0" (4.2 m)	15'-0" (4.5 m)	15'-6" (4.6 m)
		N in BLOWS/FT. (N in BLOWS/0.3m)									
Granular	VERY LOOSE	< 5 (< 5)	16'-6" (5.0 m)	17'-6" (5.2 m)	18'-0" (5.4 m)	18'-6" (5.6 m)	19'-0" (5.8 m)	20'-0" (6.0 m)	20'-6" (6.2 m)	21'-0" (6.3 m)	21'-6" (6.5 m)
	LOOSE	5 to 10 (5 to 10)	15'-0" (4.6 m)	16'-0" (4.8 m)	16'-6" (4.9 m)	17'-0" (5.1 m)	17'-6" (5.3 m)	18'-0" (5.5 m)	18'-6" (5.6 m)	19'-0" (5.7 m)	19'-6" (5.9 m)
	MEDIUM	10 to 25 (10 to 25)	14'-6" (4.4 m)	15'-0" (4.5 m)	15'-6" (4.7 m)	16'-0" (4.9 m)	16'-6" (5.0 m)	17'-0" (5.2 m)	17'-6" (5.3 m)	18'-0" (5.5 m)	18'-6" (5.6 m)
	DENSE	25 to 50 (25 to 50)	14'-0" (4.1 m)	14'-6" (4.3 m)	15'-0" (4.5 m)	15'-6" (4.6 m)	15'-6" (4.7 m)	16'-6" (4.9 m)	16'-6" (5.0 m)	17'-0" (5.2 m)	17'-6" (5.3 m)
	VERY DENSE	> 50 (> 50)	13'-0" (3.9 m)	13'-6" (4.1 m)	14'-0" (4.2 m)	14'-6" (4.4 m)	15'-0" (4.5 m)	15'-6" (4.7 m)	16'-0" (4.8 m)	16'-6" (4.9 m)	17'-0" (5.1 m)

See Sheet 2 for GENERAL NOTES.

Illinois Department of Transportation

APPROVED January 1, 2020
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-10

DATE	REVISIONS
1-1-20	Revised min. anchor rod diameters.
1-1-15	Added 6'-8" min. anchor rod
	embedment in foundation.

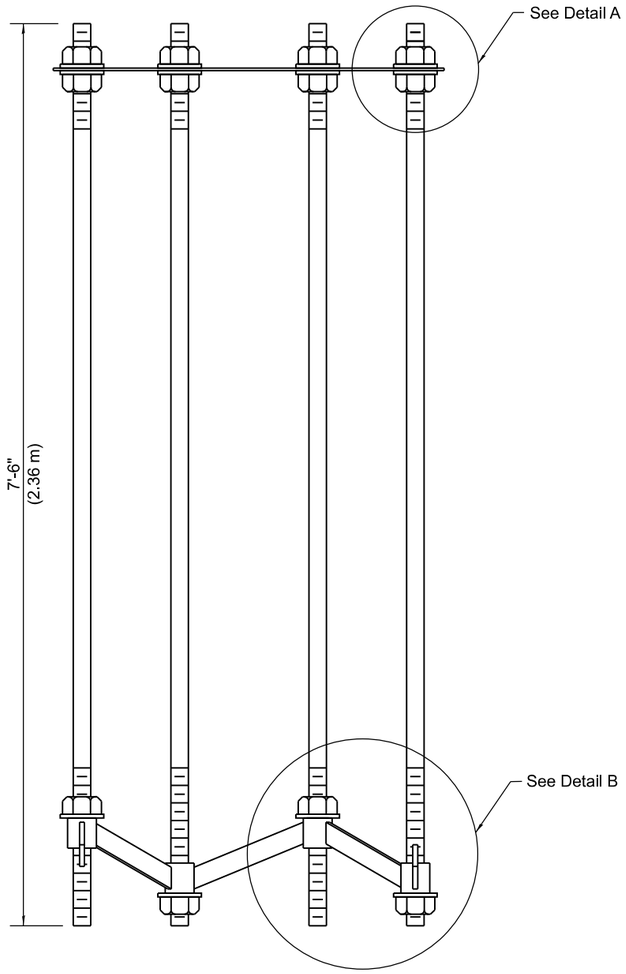
LIGHT TOWER FOUNDATION

(Sheet 1 of 2)

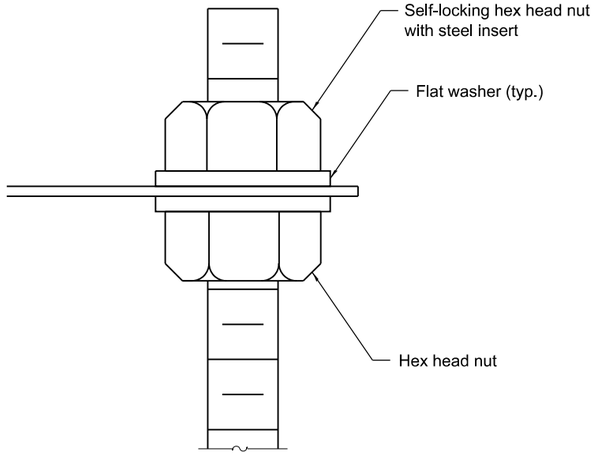
STANDARD 837001-05

ROD AND REINFORCEMENT TABLE					
TOWER HEIGHT	ANCHOR ROD DIAM. (MIN)	ROD CIRCLE DIAM. (MIN)	TOWER BASE DIAM. (MIN)	DRILLED SHAFT DIAM. (1)	V BAR QTY.
80' (25 m)	1½ (38)	30 (760)	24 (610)	4'-0" (1.2 m)	14
90' (27 m)	1¾ (44)	30 (760)	24 (610)	4'-0" (1.2 m)	14
100' (30 m)	1¾ (44)	30 (760)	24 (610)	4'-0" (1.2 m)	14
110' (34 m)	2 (51)	30 (760)	24 (610)	4'-0" (1.2 m)	14
120' (37 m)	2 (51)	36 (915)	26 (660)	4'-6" (1.4 m)	18
130' (40 m)	2¼ (57)	36 (915)	28 (710)	4'-6" (1.4 m)	18
140' (43 m)	2¼ (57)	36 (915)	28 (710)	4'-6" (1.4 m)	18
150' (46 m)	2¼ (57)	38 (965)	30 (760)	5'-0" (1.5 m)	22
160' (49 m)	2½ (64)	38 (965)	32 (810)	5'-0" (1.5 m)	22

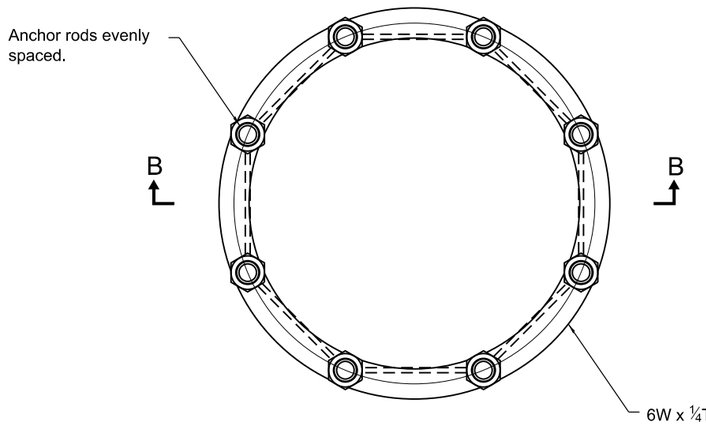
(1) Diameter based on a 5 (125) conc. cover. The min. cover shall be 3 (75) in dry shaft excavation and 4 (100) in a wet hole. When rock is encountered a 5 (125) cover against soil and a 2 (50) cover against rock shall be required.



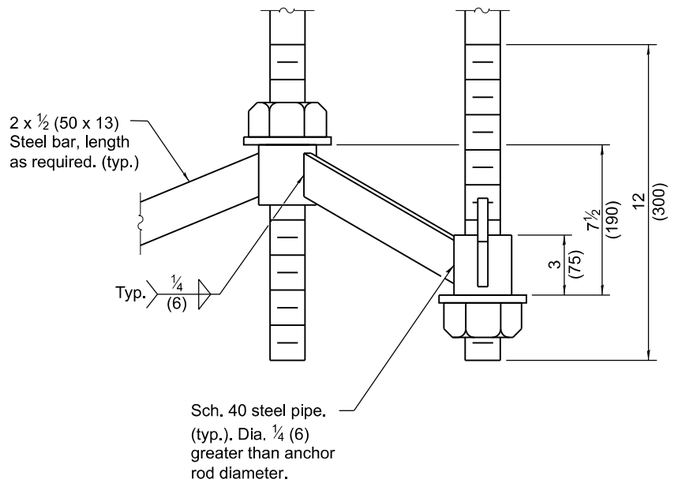
SECTION B-B



DETAIL A



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.

Illinois Department of Transportation

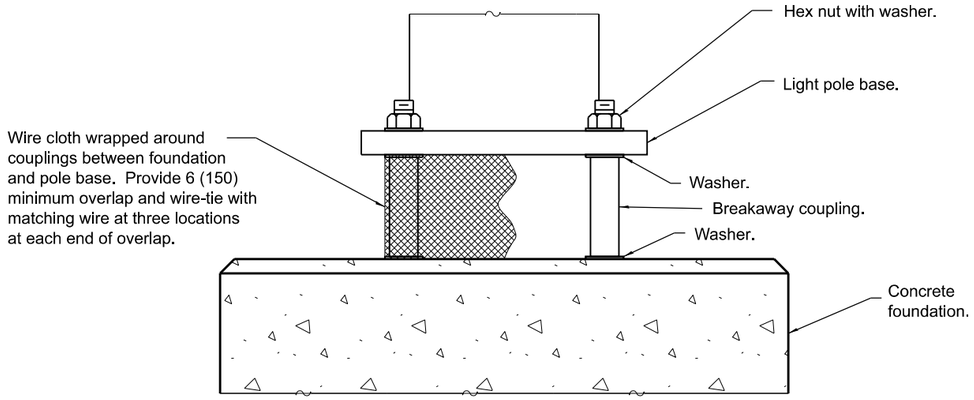
APPROVED January 1, 2020
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-10

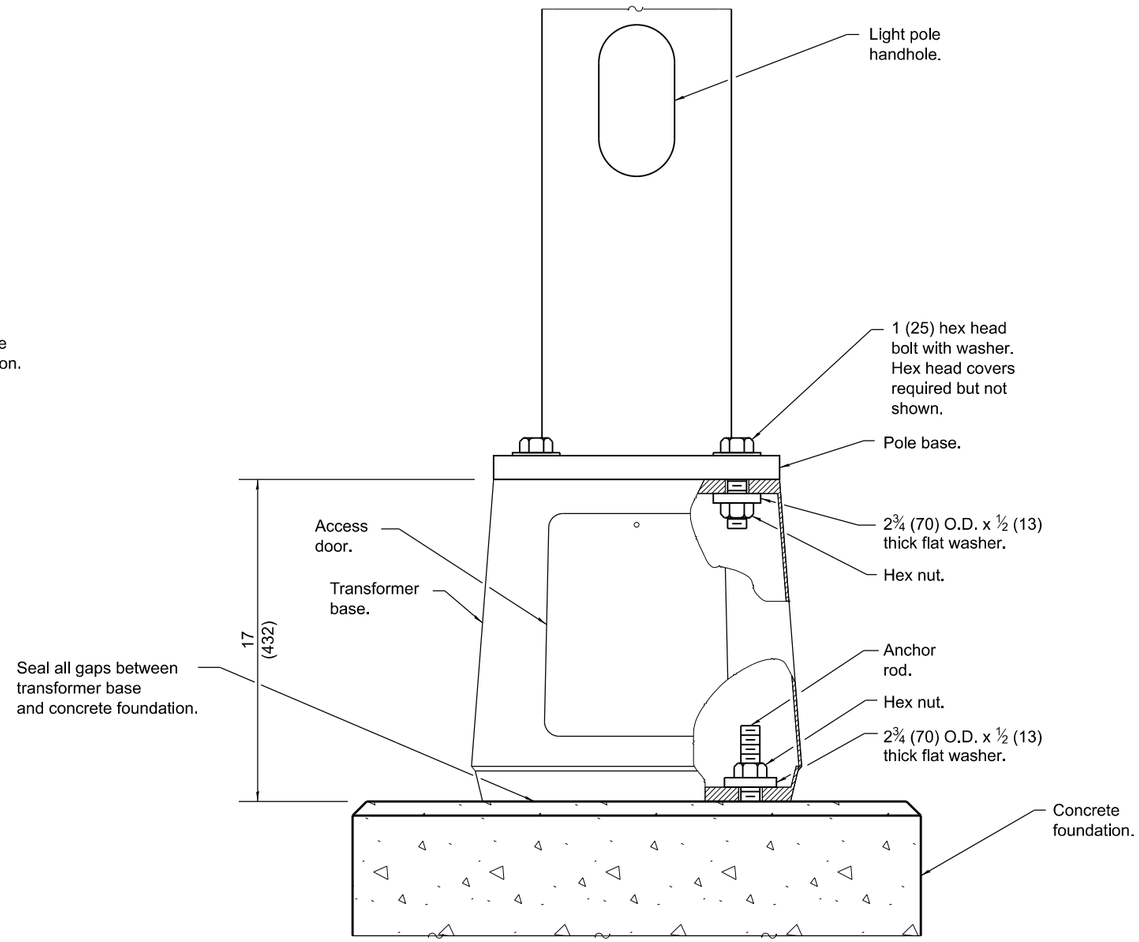
LIGHT TOWER FOUNDATION

STANDARD 837001-05



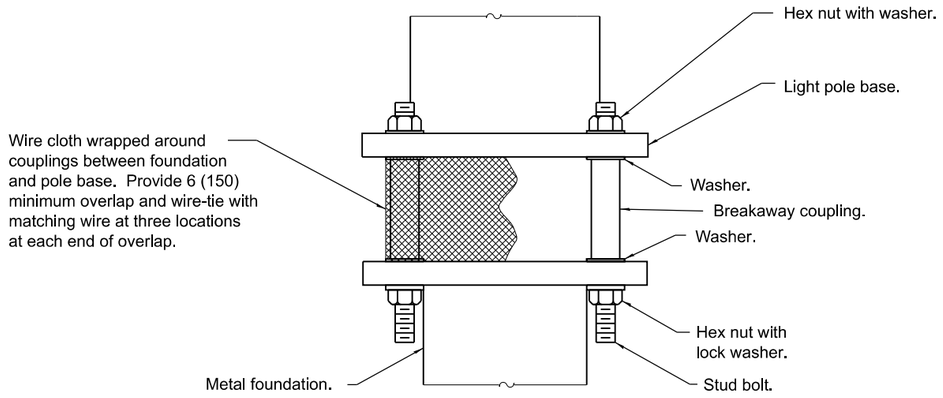
BREAKAWAY COUPLINGS ON CONCRETE FOUNDATION FOR STEEL LIGHT POLE

(Provide pole base skirt around wire cloth when required.)



BREAKAWAY TRANSFORMER BASE FOR STEEL OR ALUMINUM POLE

(Steel pole shown)



BREAKAWAY COUPLINGS ON METAL FOUNDATION FOR STEEL POLE

(Provide pole base skirt around wire cloth when required.)

See Sheet 2 for GENERAL NOTES.

Illinois Department of Transportation

APPROVED January 1, 2018
ENGINEER OF PRELIMINARY ENGINEERING

APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

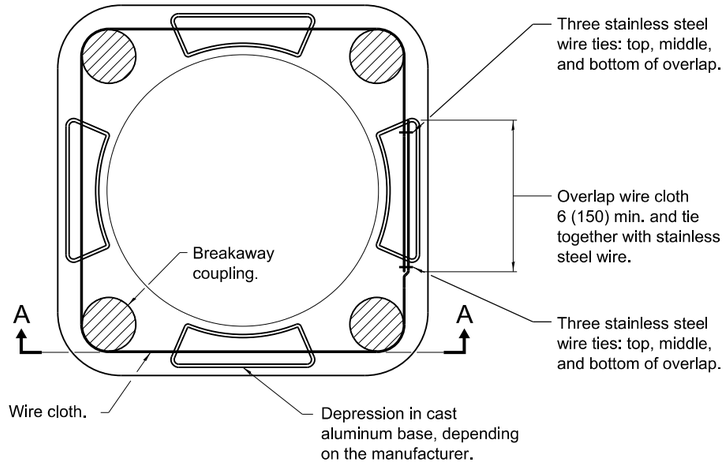
ISSUED 1-1-12

DATE	REVISIONS
1-1-18	Revised to show rodent shield
	installation for aluminum poles.
1-1-14	New Standard.

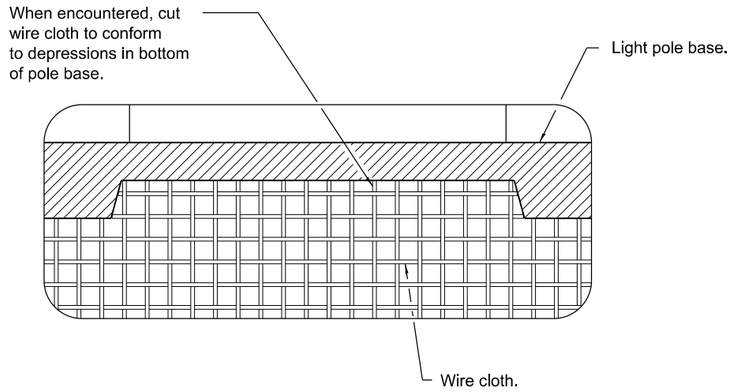
BREAKAWAY DEVICES

(Sheet 1 of 2)

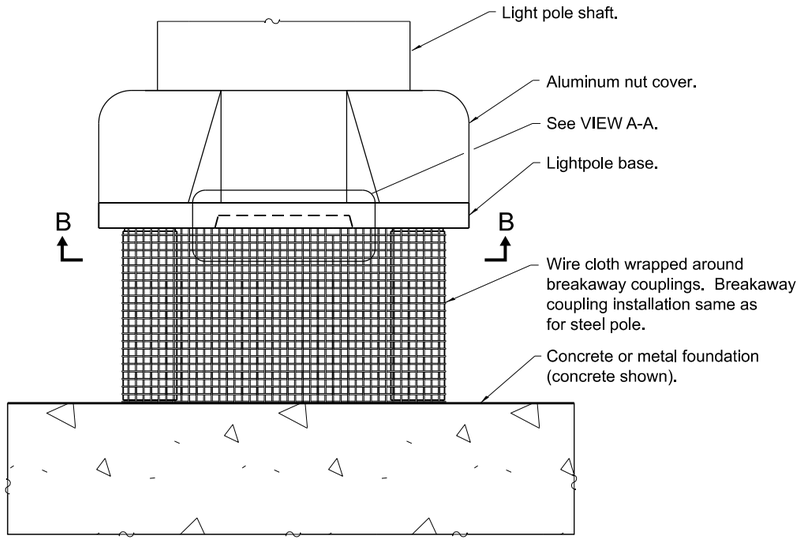
STANDARD 838001-01



VIEW B-B



VIEW A-A



BREAKAWAY COUPLINGS FOR ALUMINUM POLES

(Provide pole base skirt around wire cloth when required.)

GENERAL NOTES

See light pole standard for details not shown.

Use largest transformer base bolt circle possible.

Transformer bases shall not be installed on metal foundations.

Washers on top of pole base shall cover the entire bolt slot.

See Standard 836001 for Light Pole Foundation.

Wire cloth shall be stainless steel, have a maximum opening of ¼ (6), and have a minimum wire size of AWG No. 16 (1.6).

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

Illinois Department of Transportation

APPROVED January 1, 2018
ENGINEER OF PRELIMINARY ENGINEERING

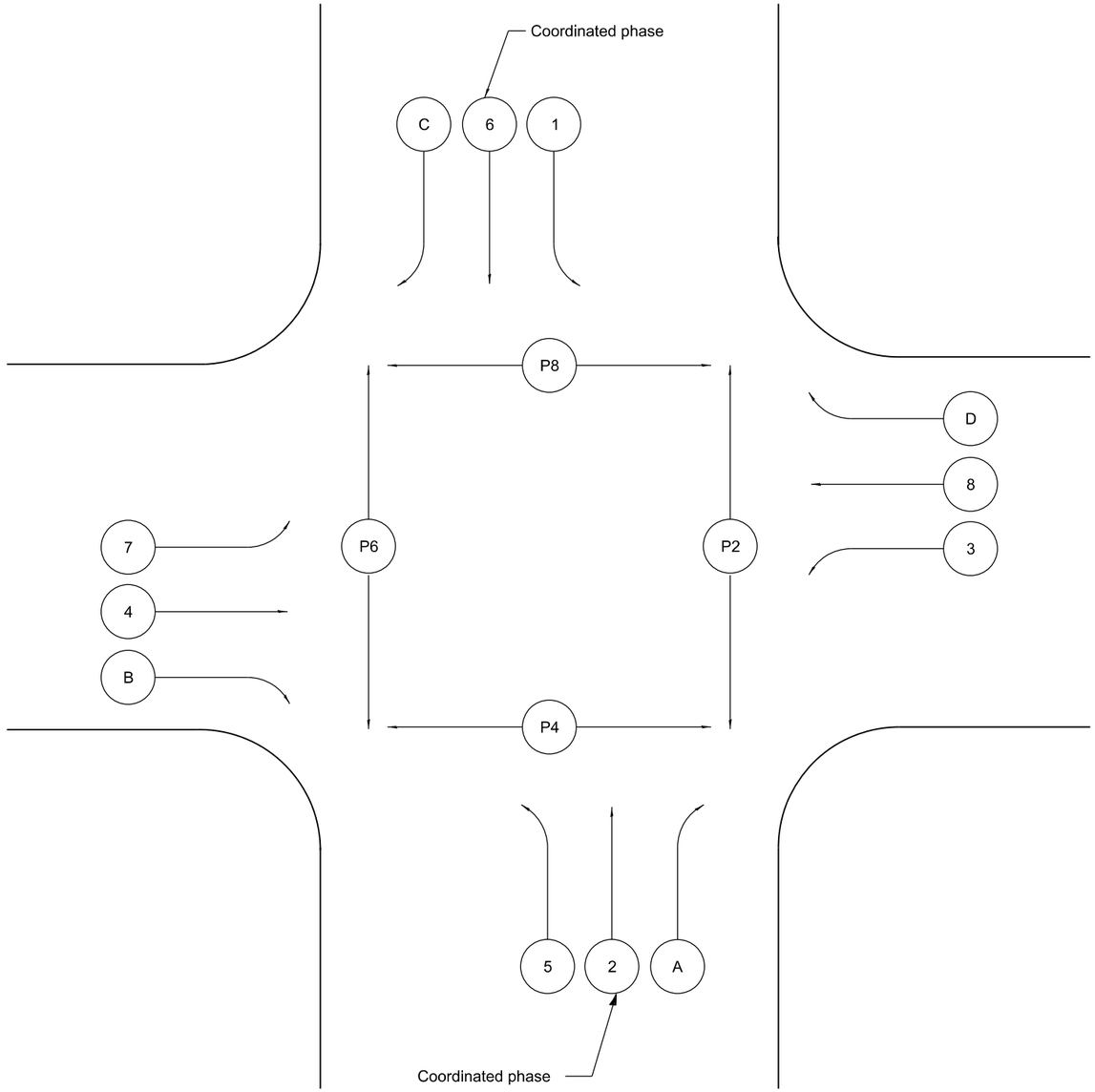
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

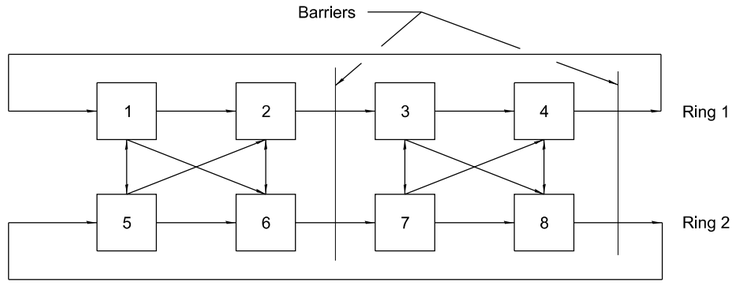
BREAKAWAY DEVICES

(Sheet 2 of 2)

STANDARD 838001-01



STANDARD PHASE DESIGNATION DIAGRAM (NEMA)



NEMA EIGHT PHASE DUAL RING ACTUATED CONFIGURATION

LEGEND

(X), [X]	Vehicular phase no. x
(PX)	Pedestrian phase no. x
(A), (B), (C), (D)	Right turn overlaps where:
(A) = (2) + (3)	
(B) = (4) + (5)	
(C) = (6) + (7)	
(D) = (8) + (1)	
NEMA	National Electrical Manufacturers Association

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

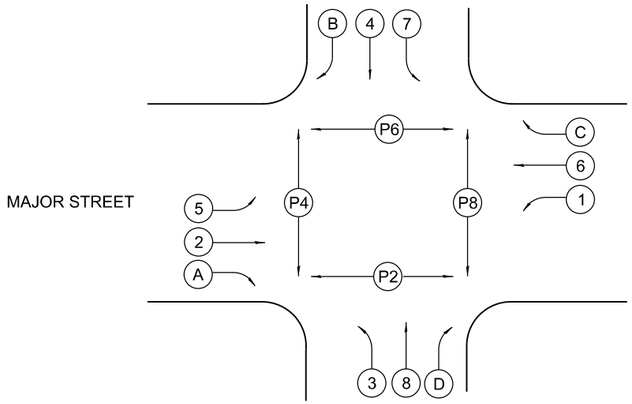
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

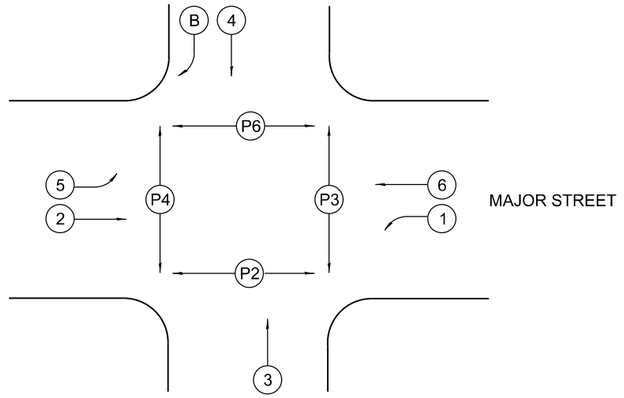
ISSUED 1-1-97

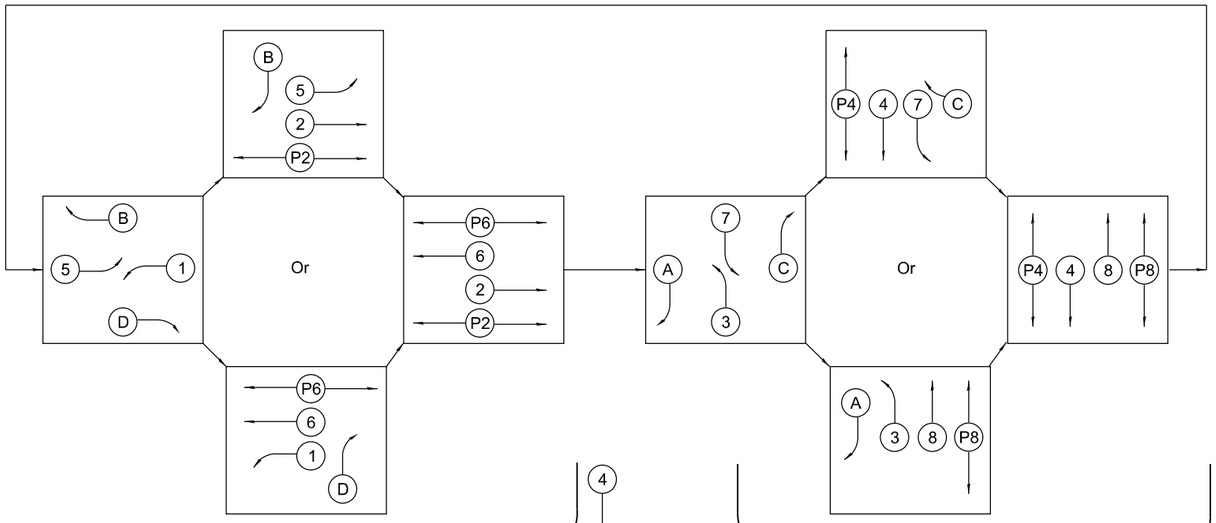
DATE	REVISIONS
1-1-09	Omitted note regarding units of length.
1-1-97	Renum. Standard 2393-2.

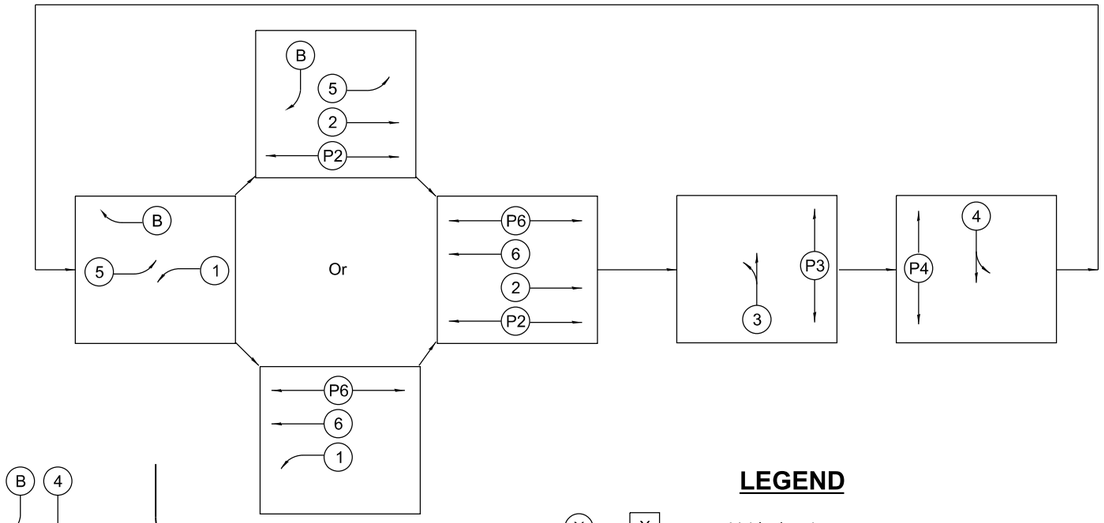
STANDARD PHASE DESIGNATION DIAGRAMS AND PHASE SEQUENCES

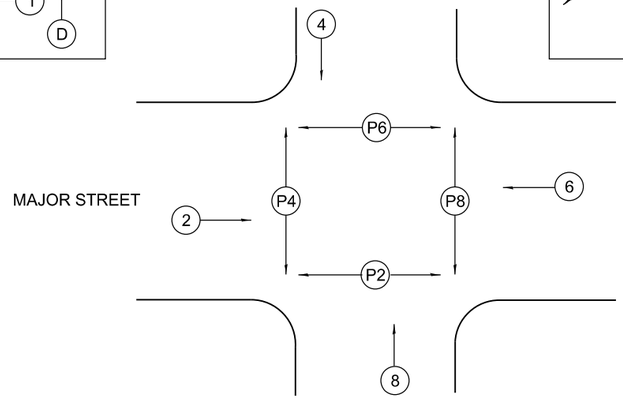
STANDARD 857001-01

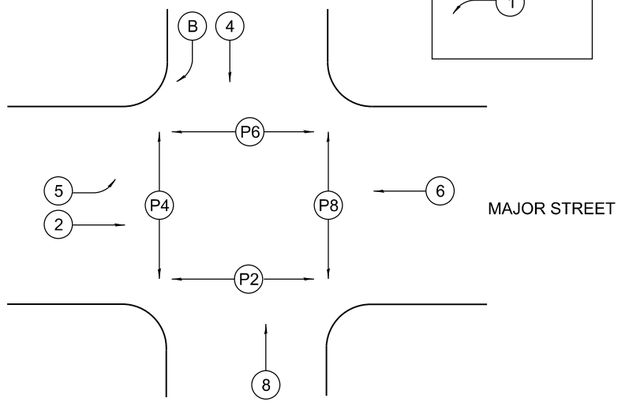


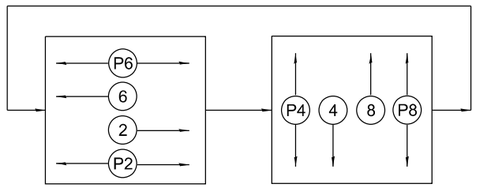


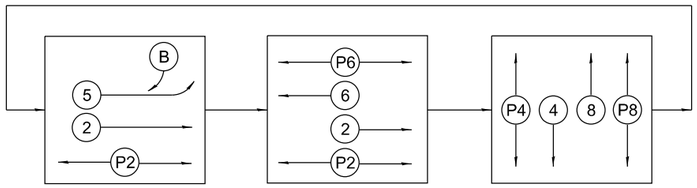












LEGEND

(X), [X]	Vehicular phase no. x
(PX)	Pedestrian phase no. x
(A), (B), (C), (D)	Right turn overlaps where:
(A) = (2) + (3)	
(B) = (4) + (5)	
(C) = (6) + (7)	
(D) = (8) + (1)	
NEMA	National Electrical Manufacturers Association

PHASE DESIGNATION DIAGRAMS AND CORRESPONDING PHASE SEQUENCES

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

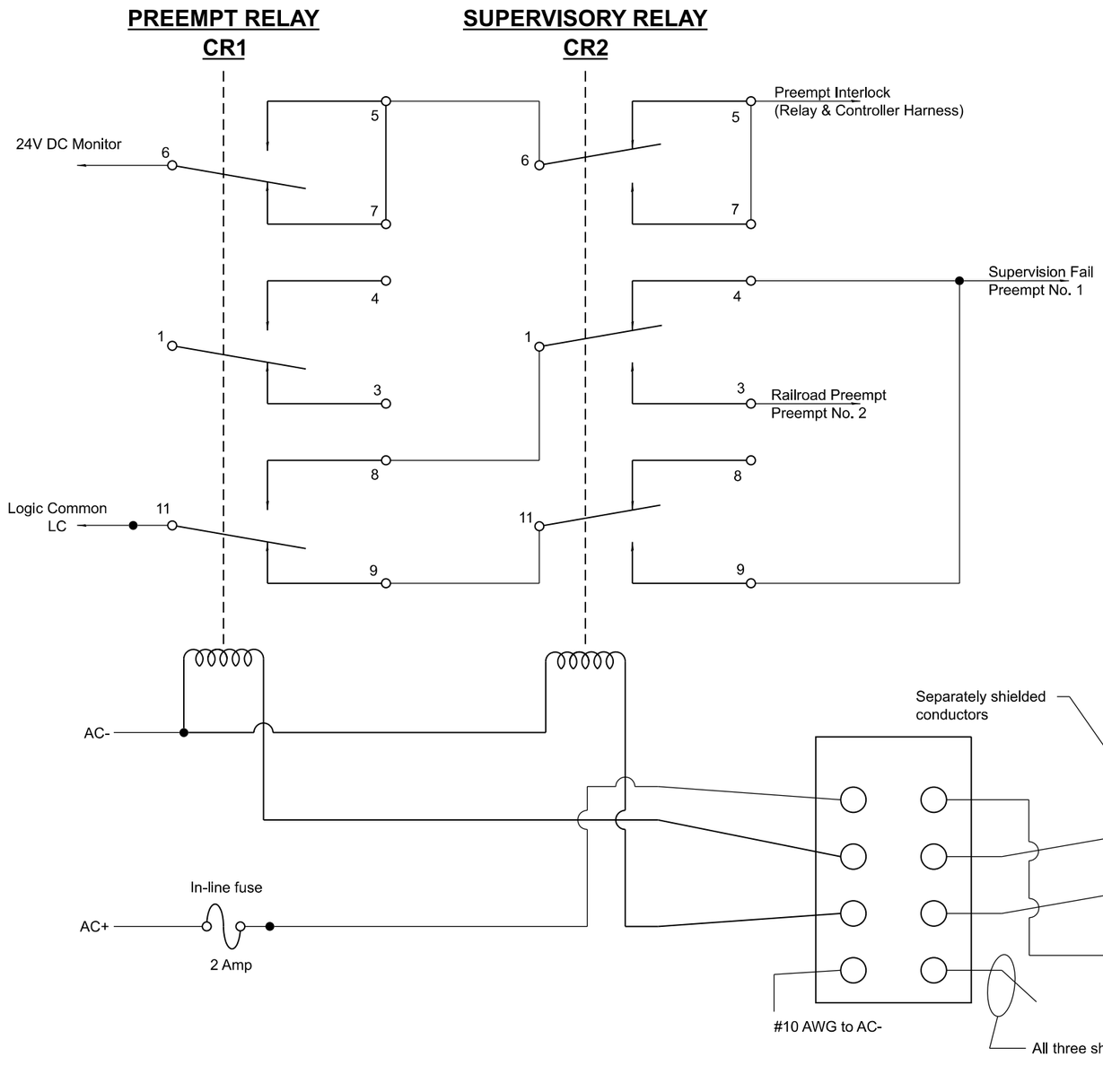
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

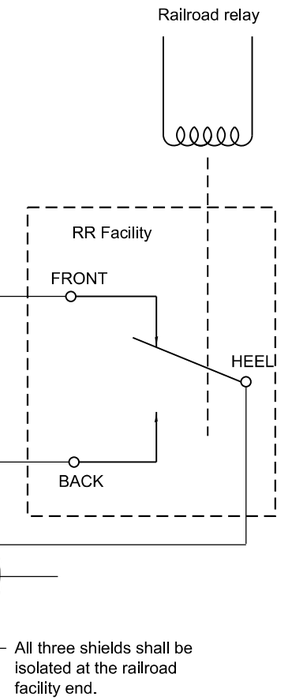
ISSUED 1-1-97

STANDARD PHASE DESIGNATION DIAGRAMS AND PHASE SEQUENCES

(Sheet 2 of 2)

STANDARD 857001-01





RELAYS IN NON-PREEMPT STATE - RAILROAD AND PREEMPT RELAYS ENERGIZED

GENERAL NOTES

CR1 and CR2 are 120VAC 3PDT Relays.

Supervision Fail is Preempt No. 1, causing traffic signal controller to implement all-red flash following track clearance phase.

Railroad Preempt is Preempt No. 2, causing traffic signal controller to implement railroad preemption routine following 1 second delay.

Preempt No. 1 and Preempt No. 2 shall have priority over all other preempts. The railroad preemption routine shall abbreviate each and all active pedestrian phases by immediately entering into flashing DON'T WALK and timing concurrently with the associated vehicle yellow change interval.

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

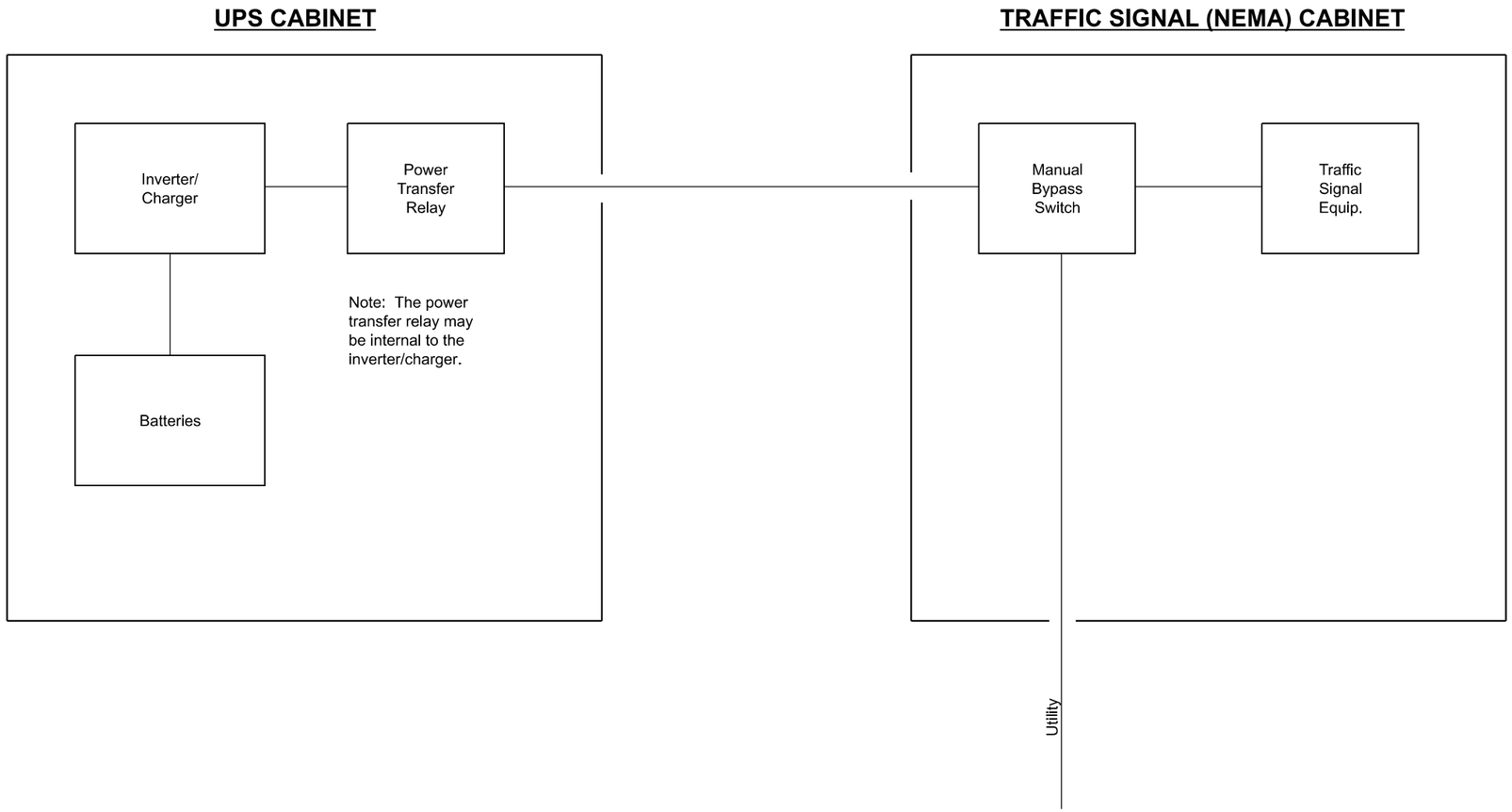
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-04

DATE	REVISIONS
1-1-09	Omitted note regarding units of length.
1-1-04	New Standard.

SUPERVISED RAILROAD INTERCONNECT CIRCUIT

STANDARD 857006-01



SINGLE LINE BLOCK DIAGRAM

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

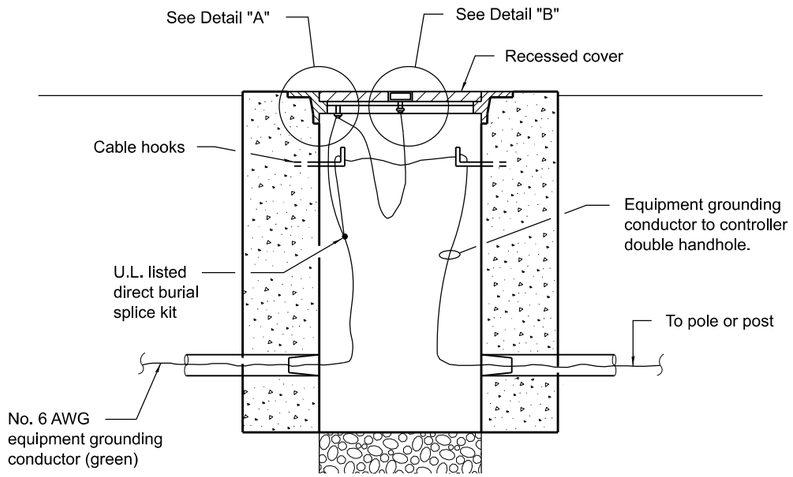
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-06

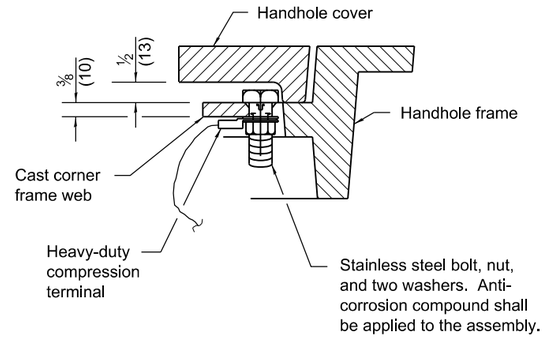
DATE	REVISIONS
1-1-09	Omitted note regarding units of length.
4-1-06	New Standard.

UNINTERRUPTABLE POWER SUPPLY (UPS)

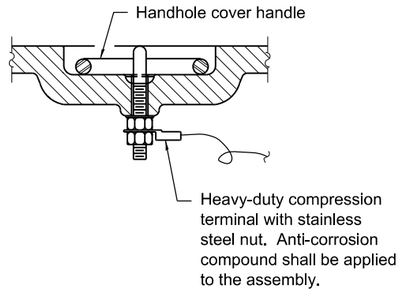
STANDARD 862001-01



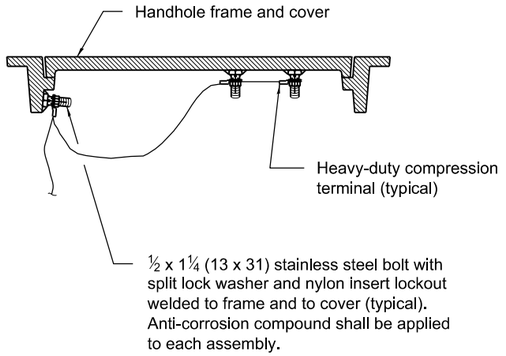
BONDING A HANDHOLE COVER & FRAME



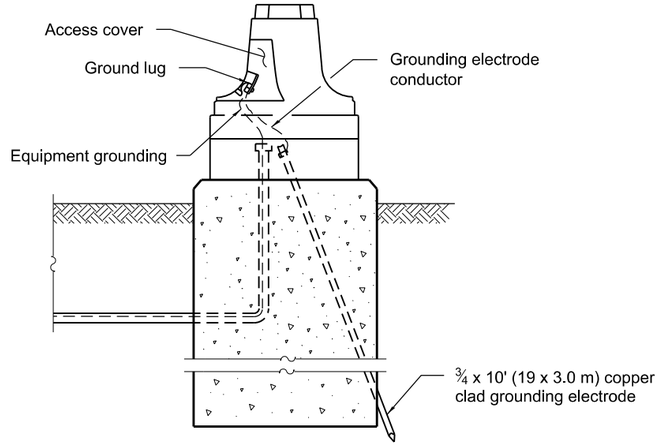
DETAIL "A"



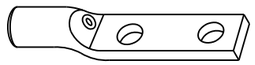
DETAIL "B"



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

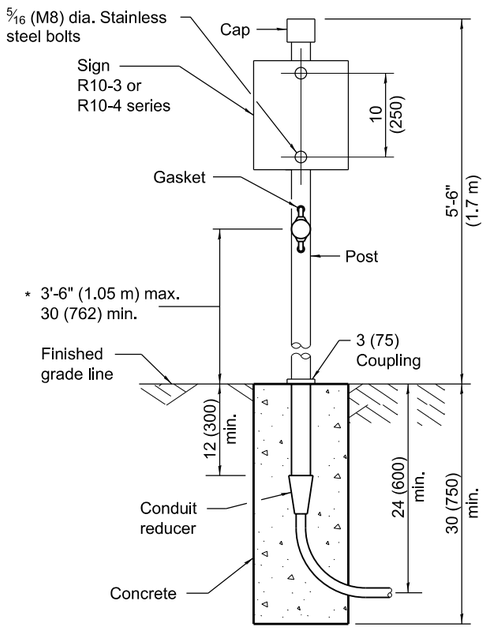
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-06

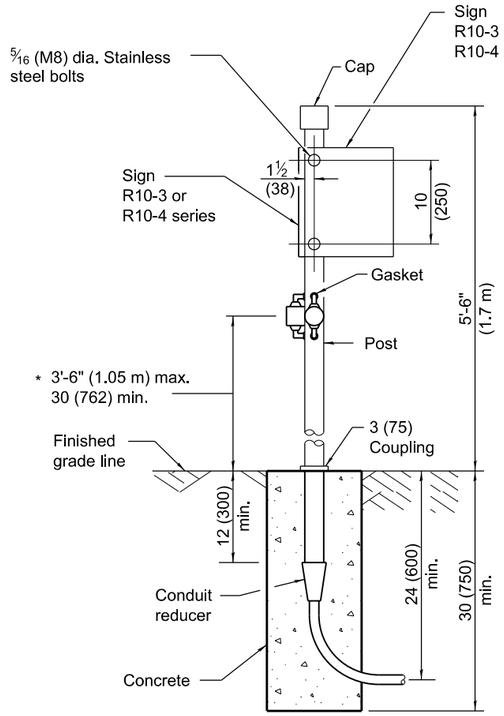
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Revised terminology.

TRAFFIC SIGNAL GROUNDING & BONDING

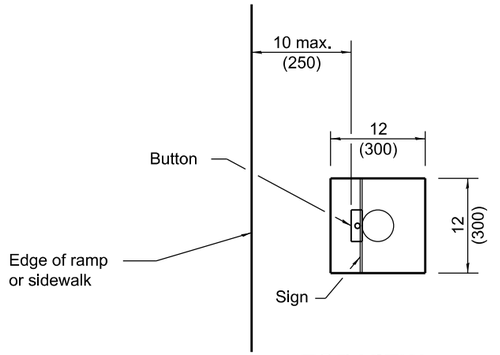
STANDARD 873001-02



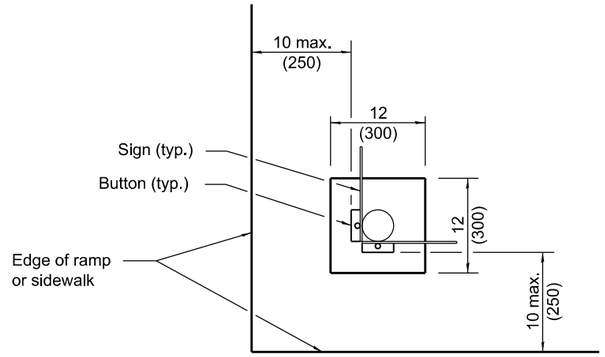
PEDESTRIAN ONE PUSH BUTTON POST



PEDESTRIAN TWO PUSH BUTTON POST



TOP VIEW
TYPICAL ONE BUTTON



TOP VIEW
TYPICAL TWO BUTTONS

* 36 (914) prefered

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

Illinois Department of Transportation

APPROVED April 1, 2016
ENGINEER OF OPERATIONS

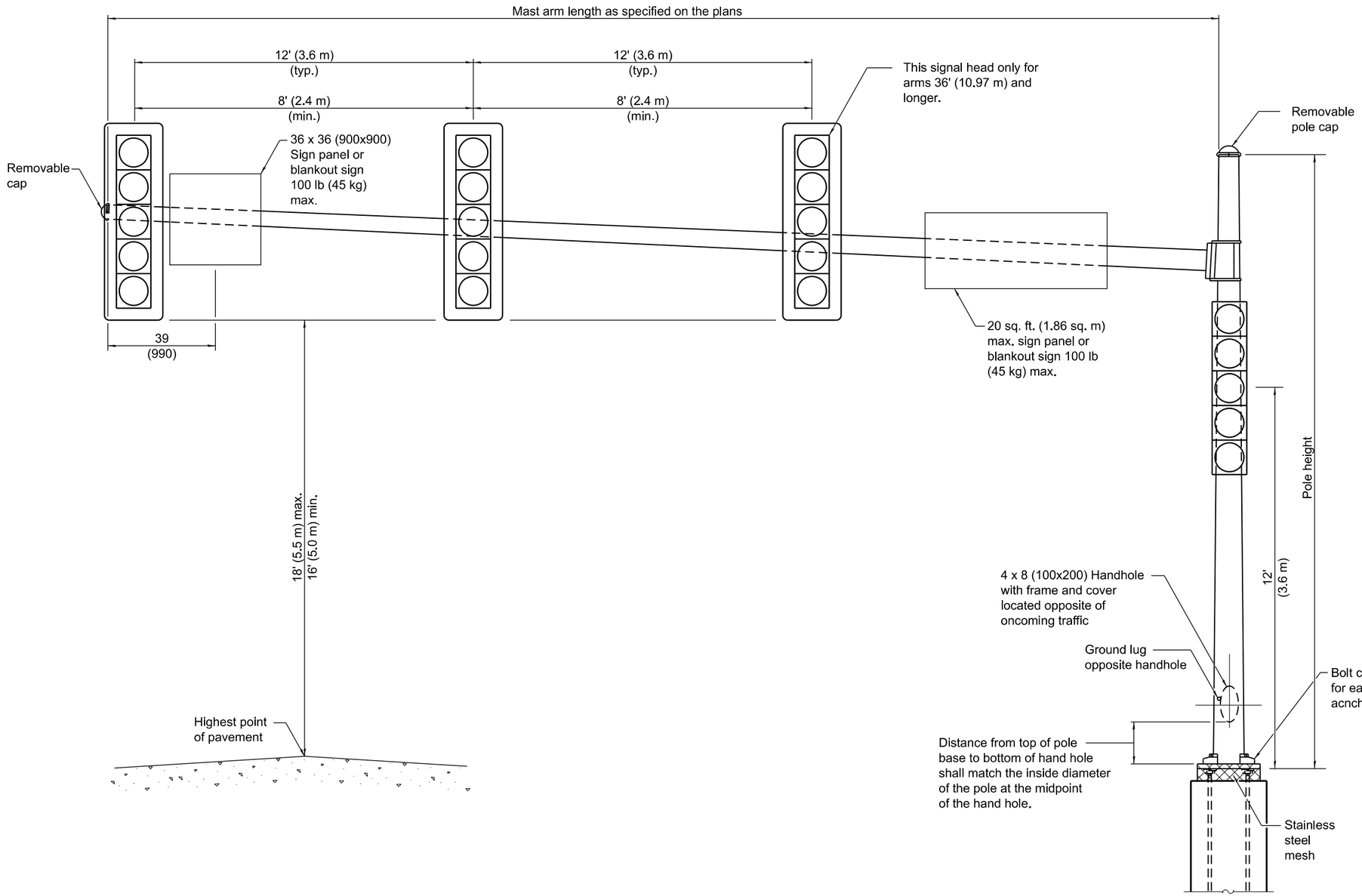
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

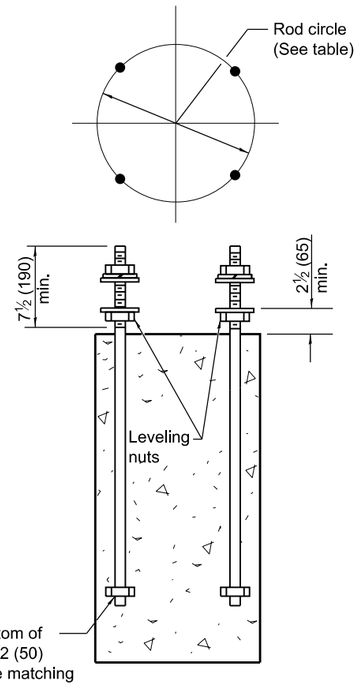
ISSUED 1-1-07

DATE	REVISIONS
4-1-16	Revised sign numbers for consitency
	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

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
16' thru 40' (4.87 m thru 12.20 m)	18 (450)	1¾ x 7' (44 x 2.10 m)
42' thru 55' (12.80 m thru 16.80 m)	21 (535)	1¾ x 7' (44 x 2.10 m)

GENERAL NOTES

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panel or blankout sign closest to pole.

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

Illinois Department of Transportation

APPROVED January 1, 2020
ENGINEER OF OPERATIONS

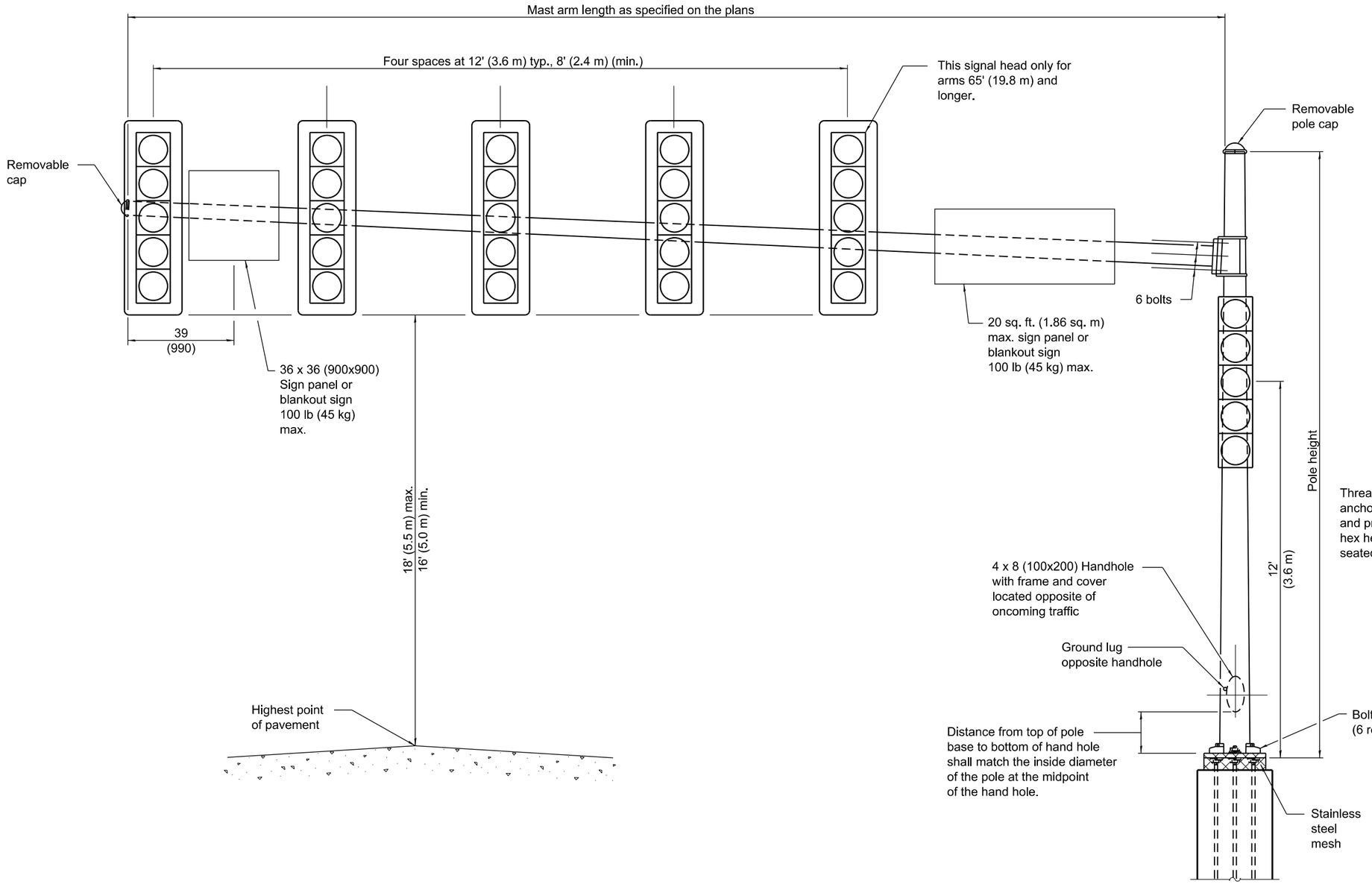
APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

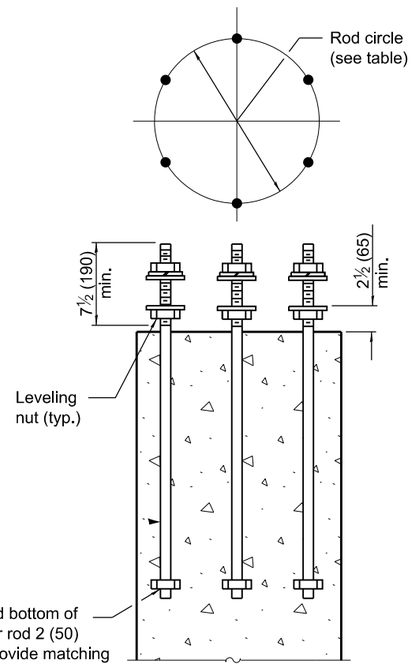
ISSUED 1-1-02

DATE	REVISIONS
1-1-20	Revised mast arm length.
1-1-18	Revised table for LRFD reqs. Revised
	GEN. NOTES for sign location.
	Replaced rod hooks with nuts.

STEEL MAST ARM ASSEMBLY AND POLE 16' THROUGH 55'

STANDARD 877001-08





ANCHOR ROD DETAIL

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
56' thru 64' (17.07 m thru 19.51 m)	24 (610)	1¾ x 7' (44 x 2.10 m)
65' thru 75' (19.81 m thru 22.86 m)	27 (685)	2 x 7'-6" (51 x 2.29 m)

GENERAL NOTES

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lbs. (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panel or blankout sign closest to pole.

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

Illinois Department of Transportation

APPROVED January 1, 2018
ENGINEER OF OPERATIONS

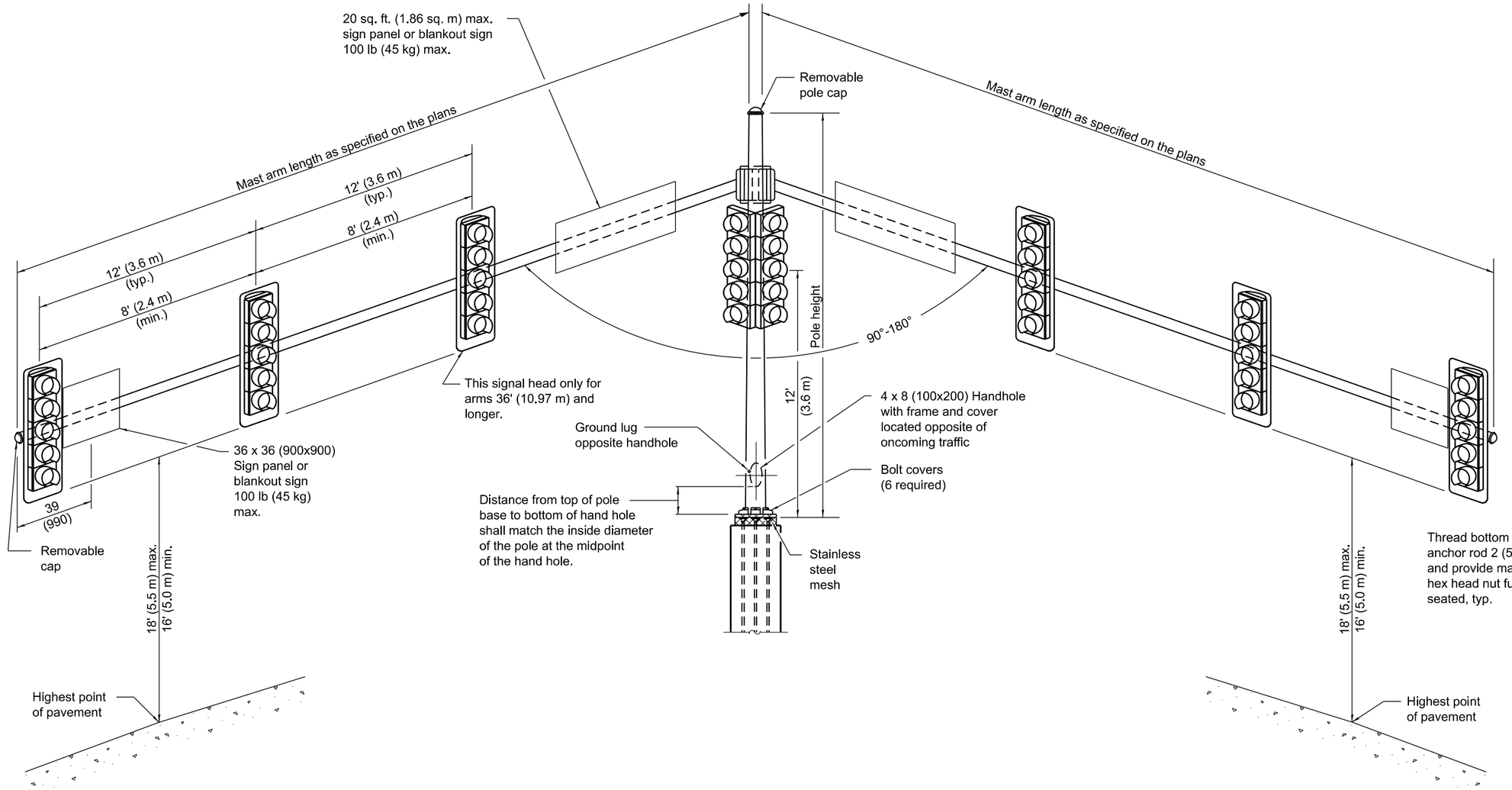
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

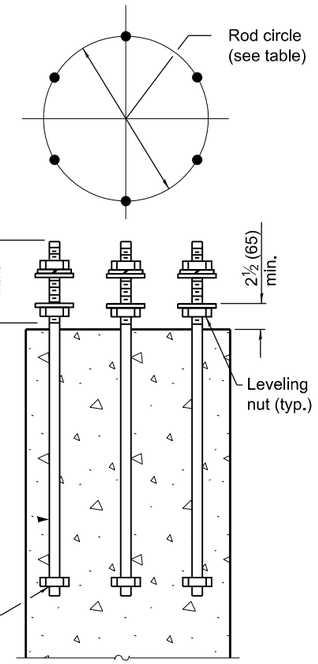
ISSUED 1-1-08

DATE	REVISIONS
1-1-18	Rev. hand hole loc. Rev. Gen. Notes
	for sign loc. Replaced rod hooks
	with nuts.
4-1-16	Changed sign panel to 36x36 and
	100 lb max.

STEEL MAST ARM ASSEMBLY AND POLE 56' THROUGH 75'

STANDARD 877002-04





ANCHOR ROD DETAIL

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
16' thru 30' (4.87 m thru 9.14 m)	18 (450)	1¾ x 7' (44 x 2.10 m)
32' thru 50' (9.75 m thru 15.24 m)	21 (535)	2 x 7'-6" (51 x 2.29 m)

GENERAL NOTES

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panels or blankout signs closest to pole.

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

Illinois Department of Transportation

APPROVED January 1, 2018
ENGINEER OF OPERATIONS

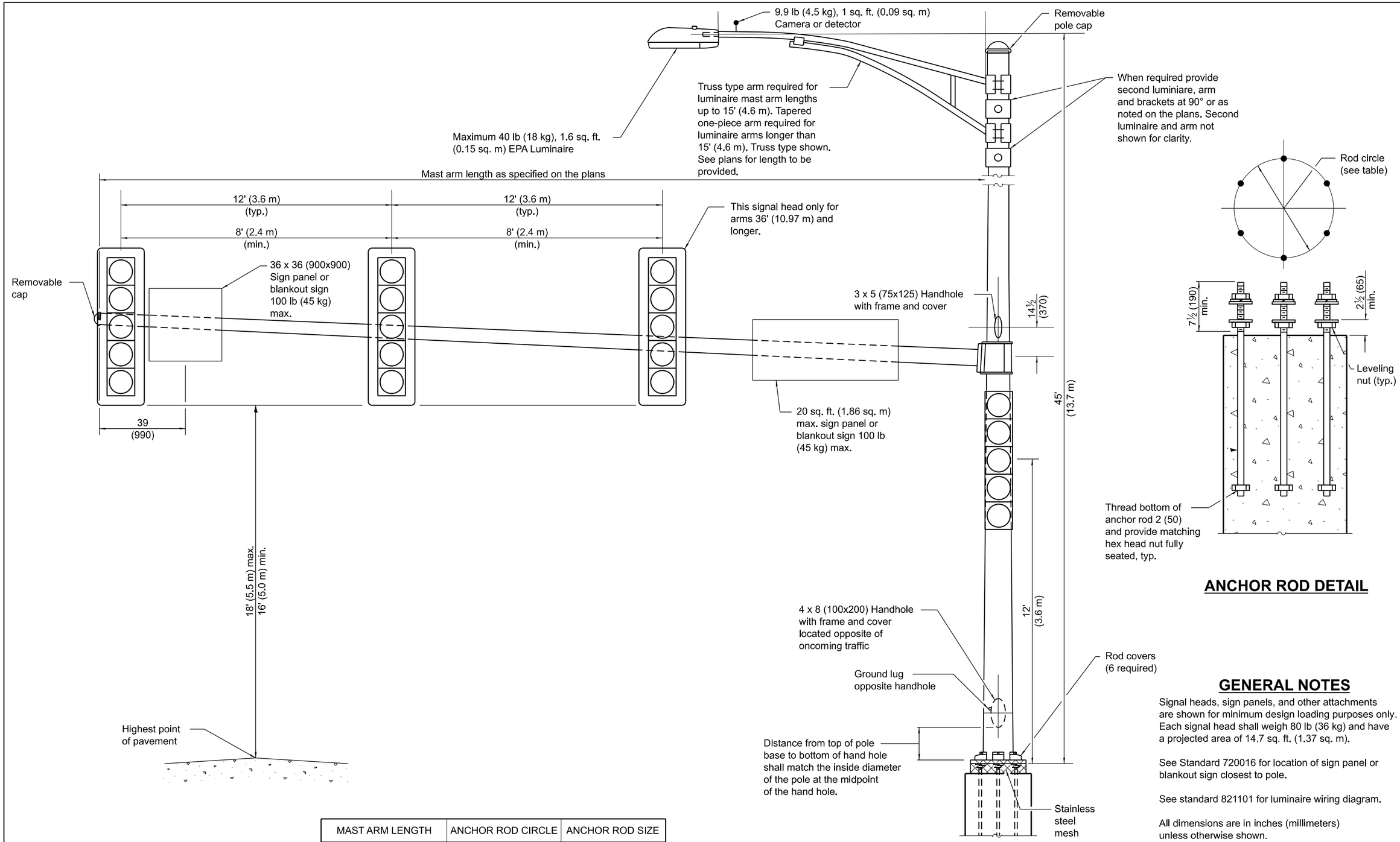
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

DATE	REVISIONS
1-1-18	Revised for LRFD reqs. Revised GEN.
	NOTES for sign location. Revised
	ANCHOR ROD DETAIL.
4-1-16	Changed sign panel to 36x36. Added
	max weight of 100 lb. Modified
	dim. to outer signal.

STEEL MAST ARM ASSEMBLY AND POLE WITH DUAL MAST ARMS

STANDARD 877006-06



ANCHOR ROD DETAIL

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
16' thru 35' (4.87 m thru 10.67 m)	18 (450)	1¾ x 7' (44 x 2.10 m)
36' thru 55' (10.97 m thru 16.80 m)	21 (535)	1¾ x 7' (44 x 2.10 m)

GENERAL NOTES

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panel or blankout sign closest to pole.

See standard 821101 for luminaire wiring diagram.

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

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF OPERATIONS

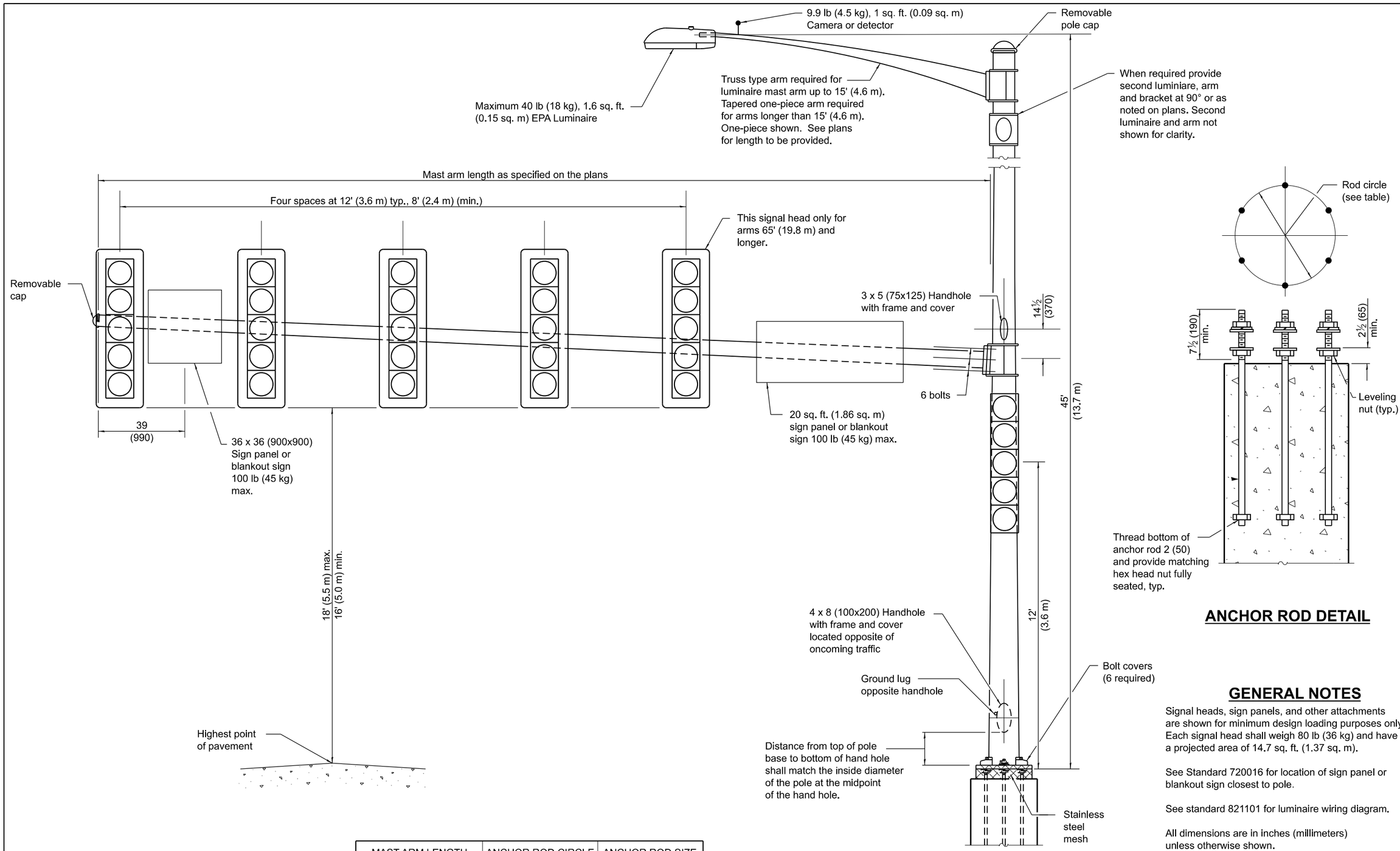
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

DATE	REVISIONS
1-1-19	Remove tenon top info. Rev.
	luminaire arm info. Rev. second
	luminaire info.
1-1-18	Revised for LRFD reqs. Revised
	GEN. NOTES for sign location.
	Revised ANCHOR ROD DETAIL.

STEEL COMB. MAST ARM ASSEMBLY AND POLE 16' THROUGH 55'

STANDARD 877011-10



ANCHOR ROD DETAIL

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
56' thru 64' (17.07 m thru 19.51 m)	24 (610)	1¾ x 7' (44 x 2.10 m)
65' thru 75' (19.81 m thru 22.86 m)	27 (685)	2 x 7'-6" (51 x 2.29 m)

GENERAL NOTES

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panel or blankout sign closest to pole.

See standard 821101 for luminaire wiring diagram.

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

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF OPERATIONS

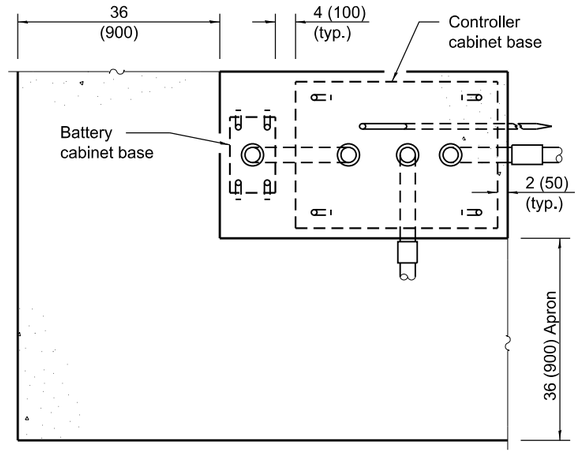
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-08

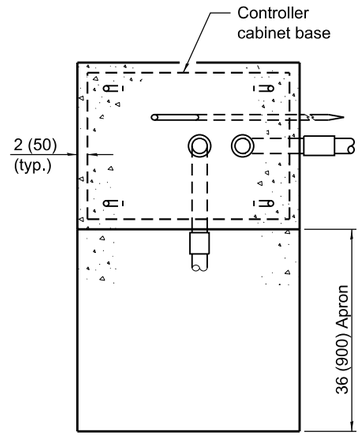
DATE	REVISIONS
1-1-19	Remove tenon top info. Rev.
	luminaire arm info. Rev. second
	luminaire info.
1-1-18	Rev. hand hole location. Rev. Gen.
	Notes for sign location. Replaced
	rod hooks with nuts.

STEEL COMB. MAST ARM ASSEMBLY AND POLE 56' THROUGH 75'

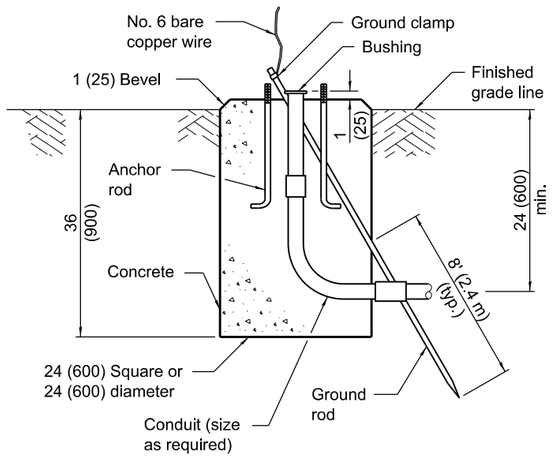
STANDARD 877012-07



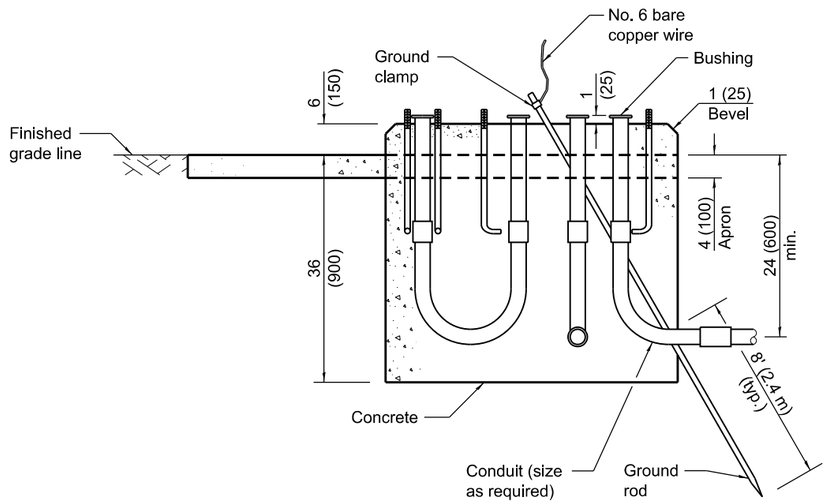
TOP VIEW



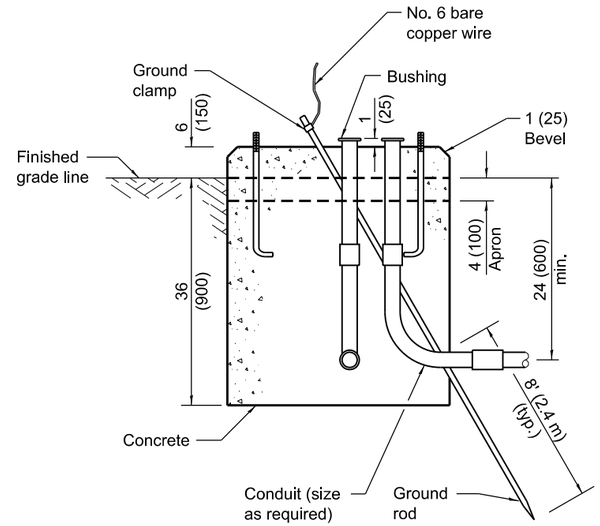
TOP VIEW



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, 2021
ENGINEER OF OPERATIONS

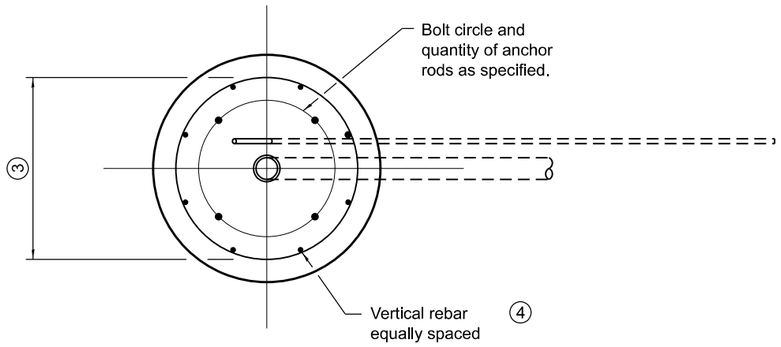
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

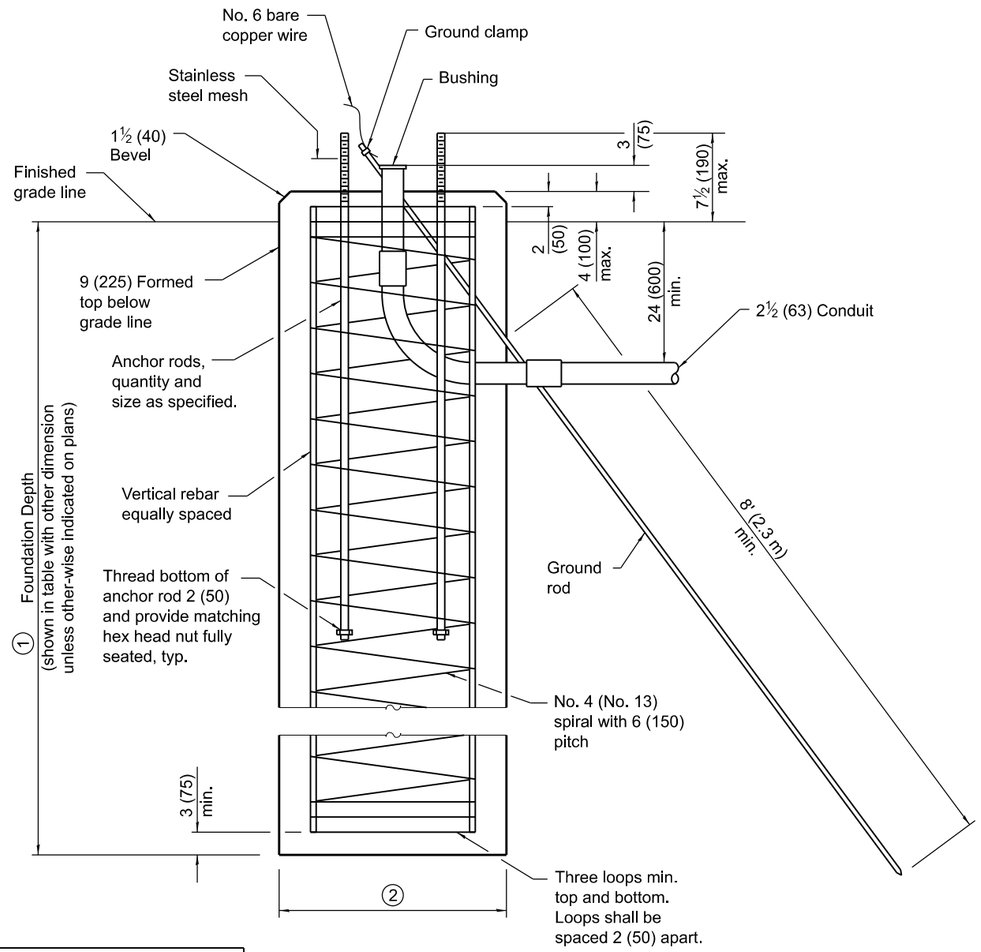
DATE	REVISIONS
1-1-21	Revised anchor rod end in
	Type E detail.
1-1-15	Revised TYPE E detail.

CONCRETE FOUNDATION DETAILS

STANDARD 878001-11



TOP VIEW



TYPE E

Mast Arm Length	① Foundation Depth *	② Foundation Diameter	③ Spiral Diameter	④ Quantity of Rebars	Size of Rebars
Less than 30' (9.1 m)	10'-0" (3.0 m)	30 (750)	24 (600)	8	6 (19)
Greater than or equal to 30' (9.1 m) and less than 40' (12.2 m)	13'-6" (4.1 m)	30 (750)	24 (600)	8	6 (19)
	11'-0" (3.4 m)	36 (900)	30 (750)	12	7 (22)
Greater than or equal to 40' (12.2 m) and less than 50' (15.2 m)	13'-0" (4.0 m)	36 (900)	30 (750)	12	7 (22)
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 (Qu) > 1.0 tsf (100 kpa). This strength shall be verified by boring data prior to construction or with testing by the Engineer during foundation drilling. The Bureau of Bridges & Structures should be contacted for a revised design if other conditions are encountered.

Illinois Department of Transportation

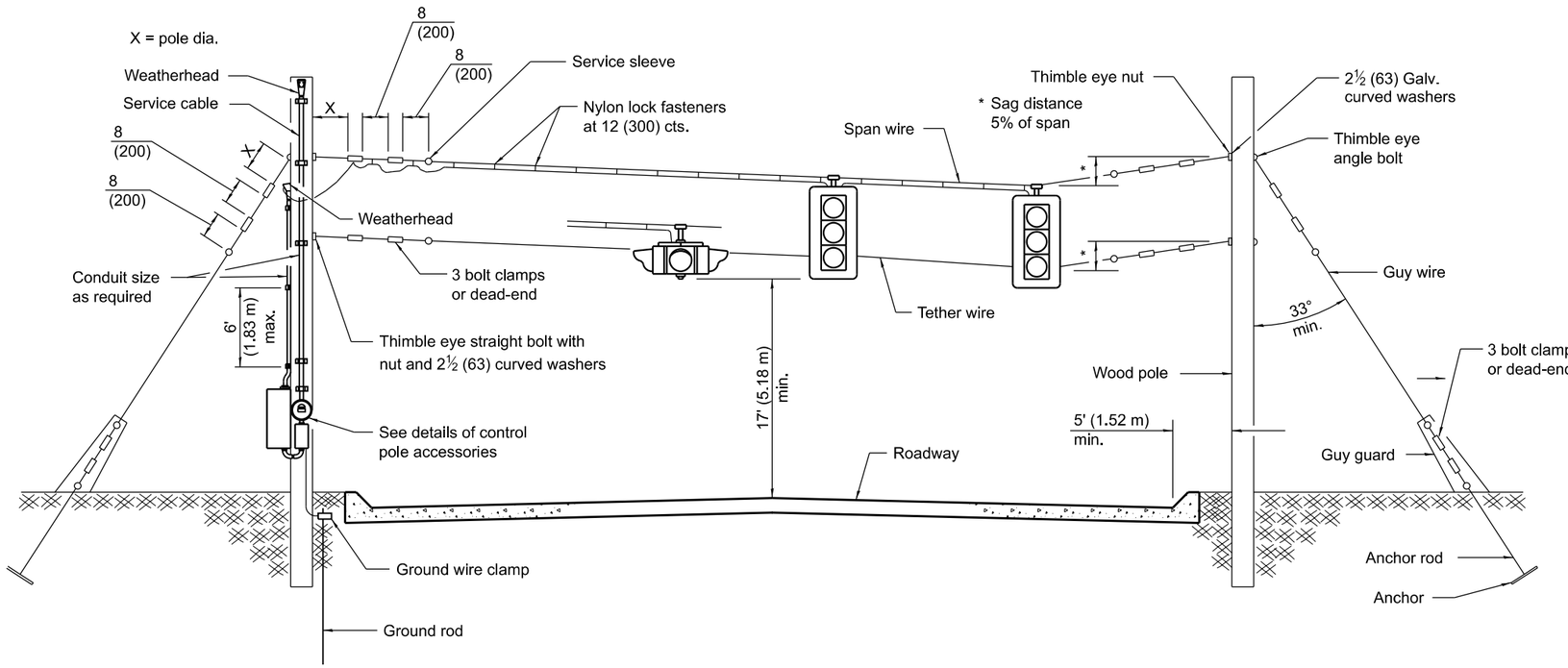
APPROVED January 1, 2021
ENGINEER OF OPERATIONS

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

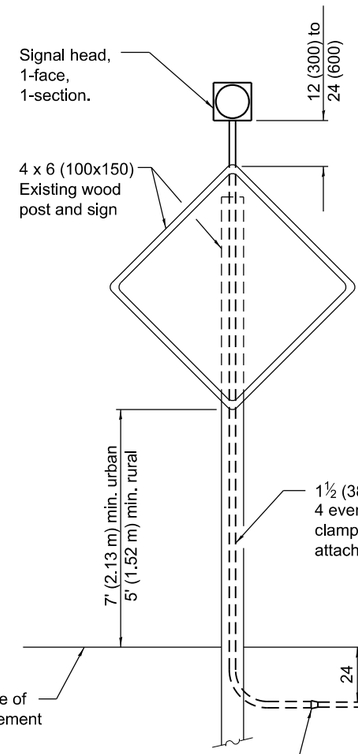
ISSUED 1-1-02

CONCRETE FOUNDATION DETAILS

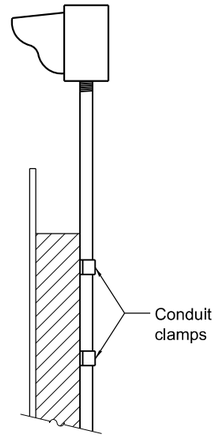
STANDARD 878001-11



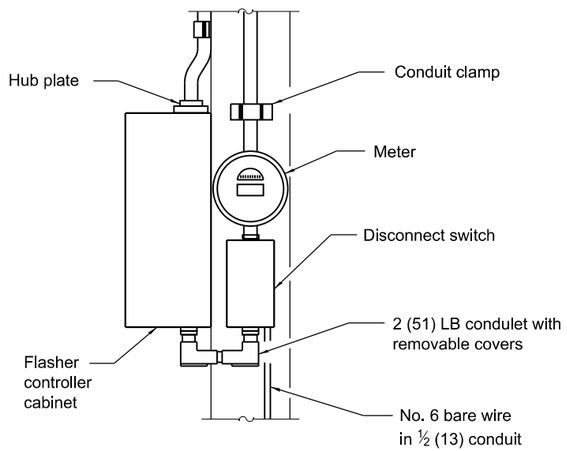
SPAN WIRE MOUNTED SIGNALS AND FLASHING BEACON



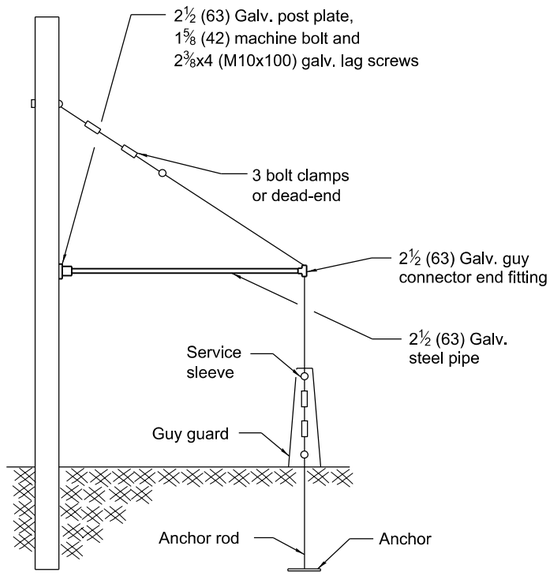
POST MOUNTED FLASHING BEACON



MOUNTING DETAIL



CONTROL POLE DETAIL



SIDEWALK GUY DETAIL

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

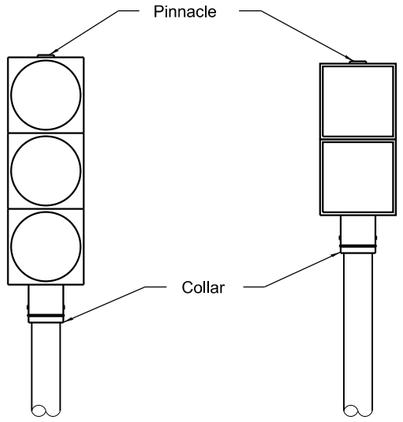
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-02	Renum. Standard 84001.

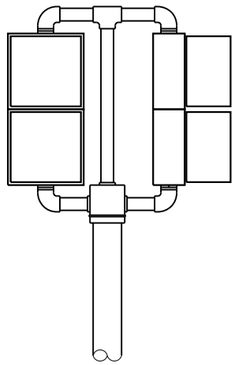
SPAN WIRE MOUNTED SIGNALS AND FLASHING BEACON INSTALLATION

STANDARD 880001-01



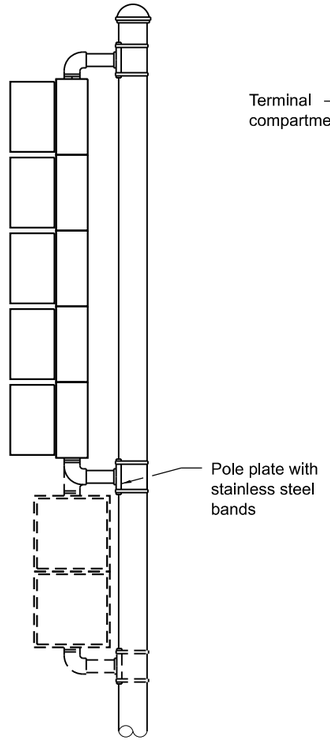
POST MOUNTED TRAFFIC SIGNAL HEAD

ONE WAY



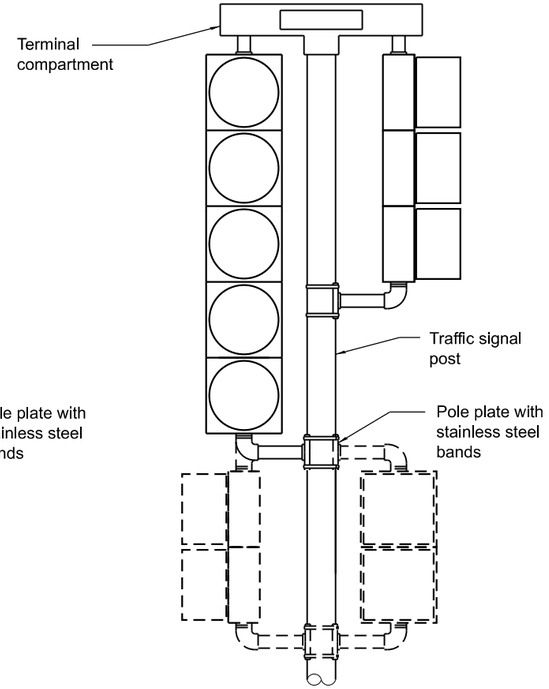
POST MOUNTED PEDESTRIAN SIGNAL HEAD

ONE WAY



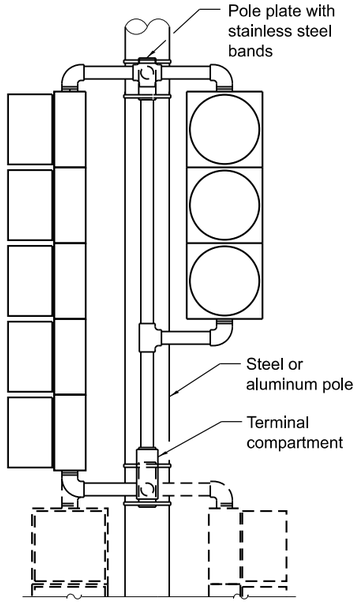
POST MOUNTED PEDESTRIAN SIGNAL HEAD

TWO WAY



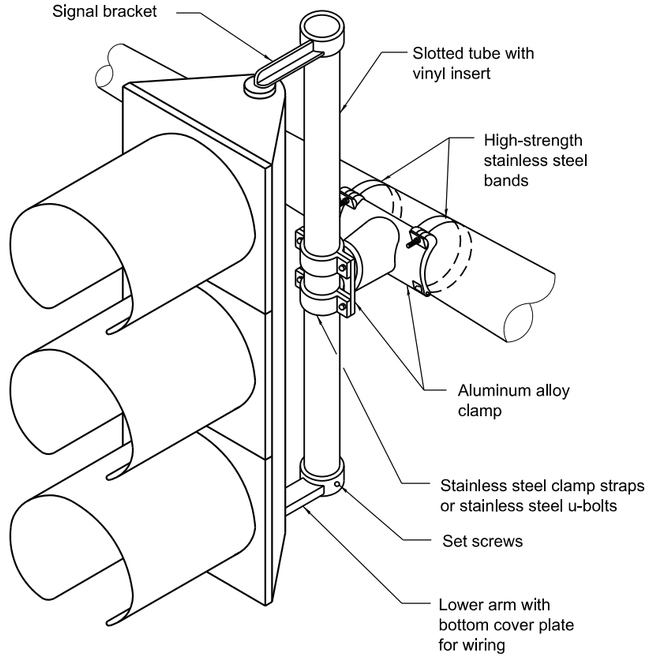
BRACKET MOUNTED TRAFFIC SIGNAL HEAD

ONE WAY



BRACKET MOUNTED TRAFFIC SIGNAL HEAD

TWO WAY



STEEL MAST ARM MOUNTING

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

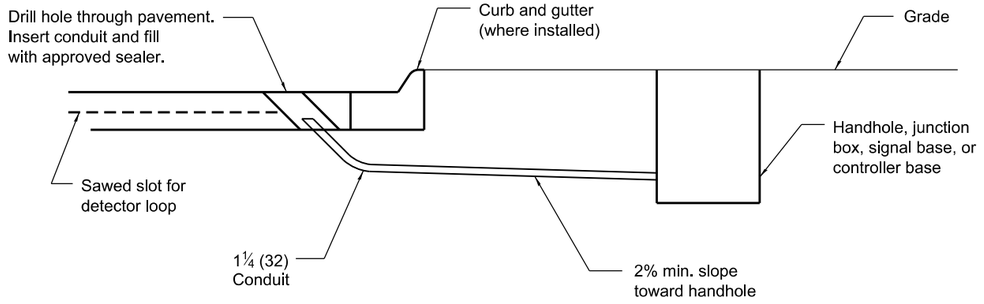
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

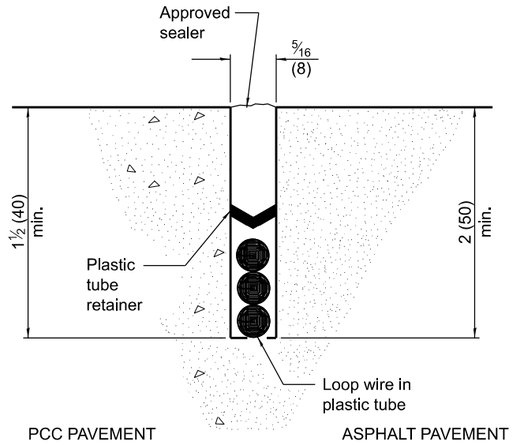
DATE	REVISIONS
1-1-09	Omitted note regarding units
	of length.
1-1-02	Renum. Standard 840006.

TRAFFIC SIGNAL MOUNTING DETAILS

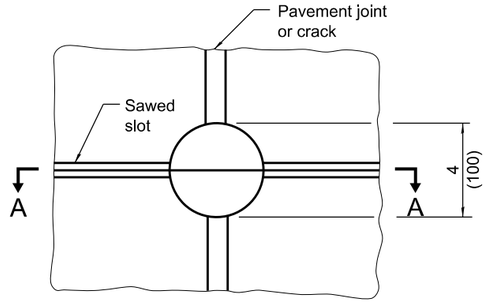
STANDARD 880006-01



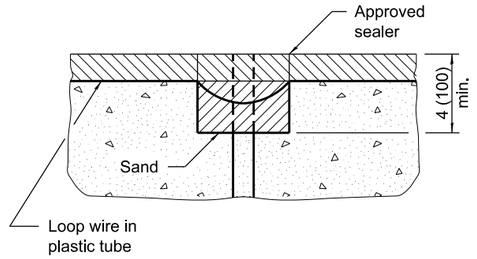
DETECTOR LOOP LEAD-IN



DETECTOR LOOP INSTALLATION



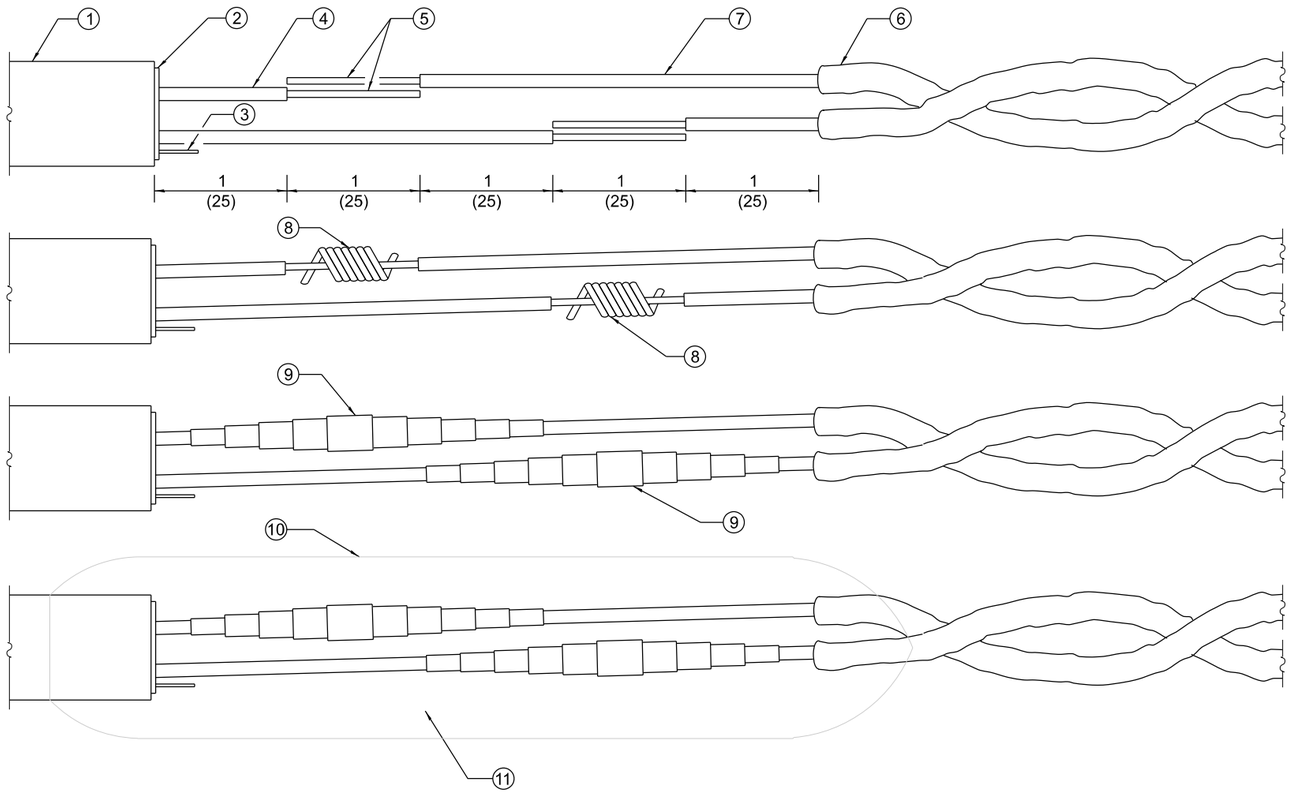
PLAN



SECTION A-A

NOTE
Loop wire shall follow saw cut to bottom, forming slack section at joint.

DETECTOR LOOP AT PAVEMENT JOINT OR PAVEMENT CRACK



LOOP WIRE AND LEAD-IN CABLE SPLICE

① = Lead-in cable (single pair or multipair)
② = Lead-in cable shield
③ = Lead-in cable shield drain-wire
④ = Lead-in cable insulated conductor
⑤ = Bare conductor
⑥ = Loop wire in tube
⑦ = Loop wire insulated conductor
⑧ = Twisted and resin soldered conductor
⑨ = Electrical tape insulated spice
⑩ = Rigid mold
⑪ = Waterproof and dielectric resin

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

Illinois Department of Transportation

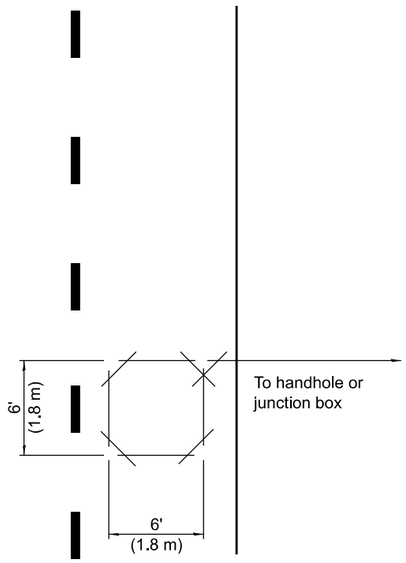
APPROVED January 1, 2009
ENGINEER OF OPERATIONS
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

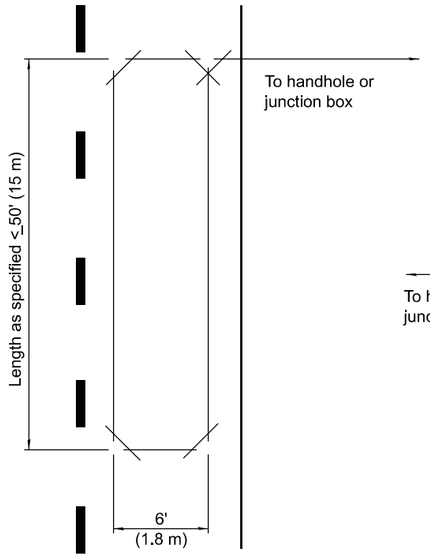
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-02	Renum. Standard 846001.

DETECTOR LOOP INSTALLATIONS

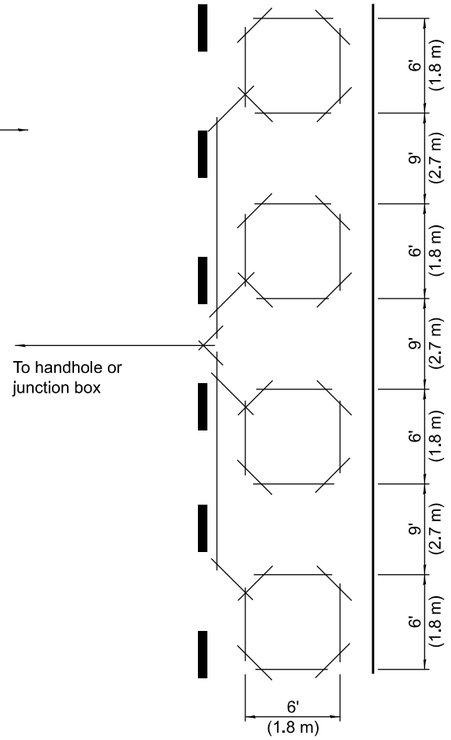
STANDARD 886001-01



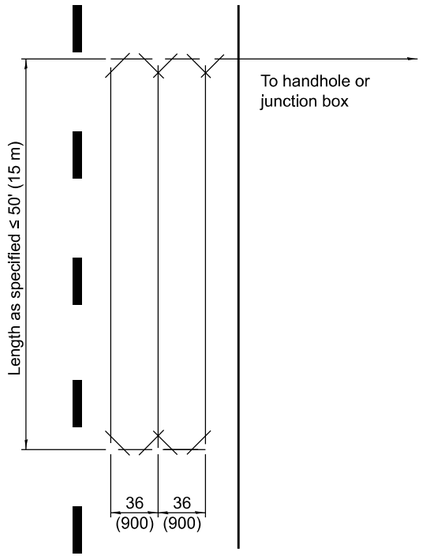
FOR POINT DETECTION
SHORT LOOP



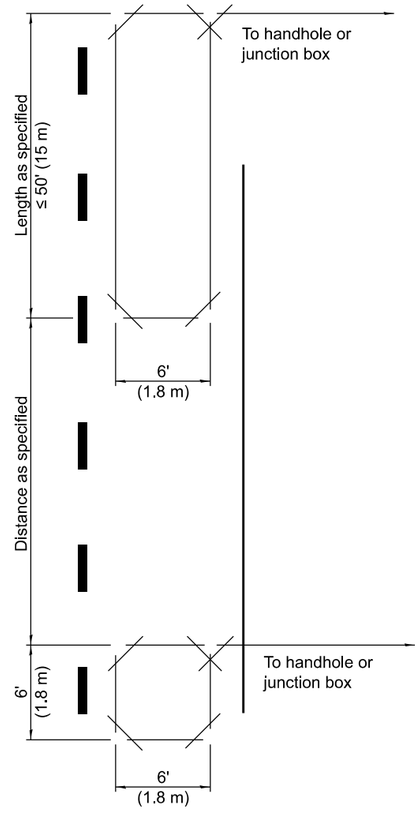
FOR PRESENCE DETECTION
LONG LOOP



FOR PRESENCE DETECTION
MULTIPLE LOOP IN SERIES

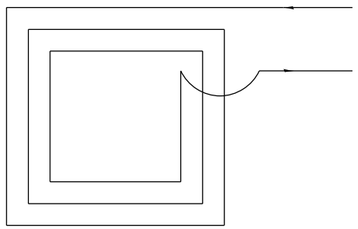


FOR PRESENCE DETECTION
QUADRUPOLE LOOP

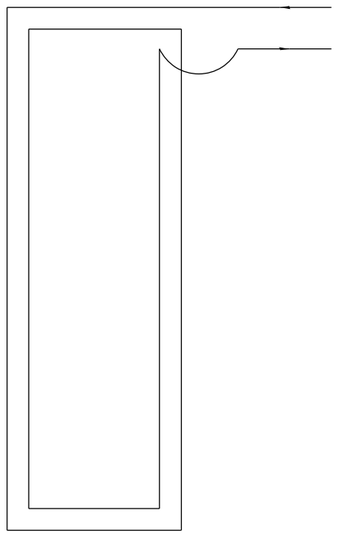


FOR EXTENDED-CALL DETECTION

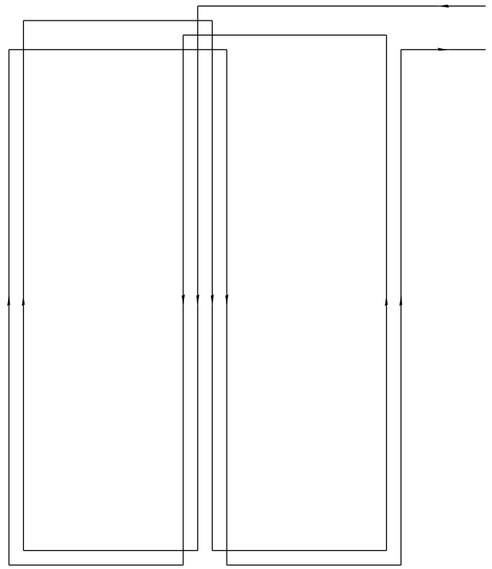
SLOT PLAN



SHORT LOOP



LONG LOOP



QUADRUPOLE LOOP

WIRING DIAGRAM

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

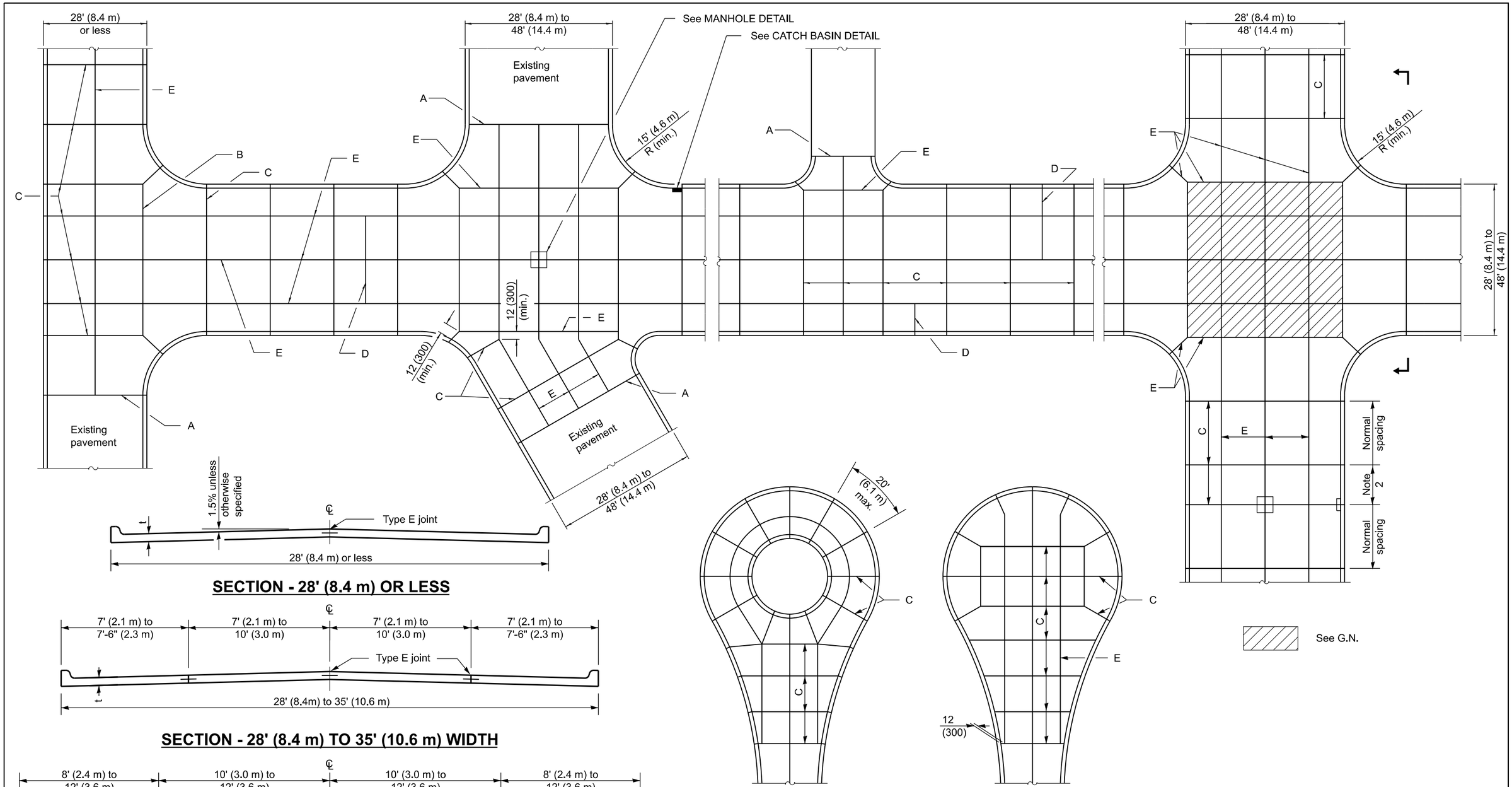
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-02	Renum. Standard 846006.

TYPICAL LAYOUTS FOR DETECTION LOOPS

STANDARD 886006-01



t = See typical cross section on plans for thickness

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

Illinois Department of Transportation

APPROVED January 1, 2022
ENGINEER OF LOCAL ROADS AND STREETS

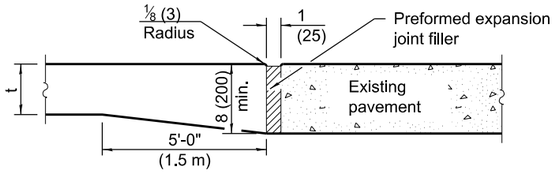
APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

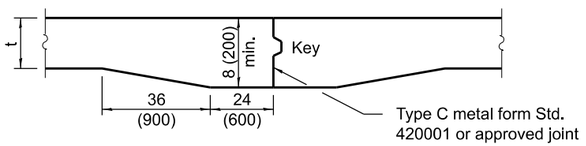
DATE	REVISIONS
1-1-22	Revised spacing of trasverse
	joints in General Notes.
1-1-18	Changed No. 6 (No. 19) bars to
	No. 5 (No. 16) bars.

PCC PAVEMENT SPECIAL (NONREINFORCED)

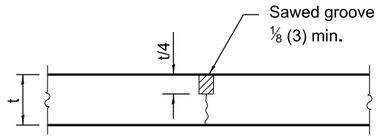
STANDARD B.L.R. 10-8



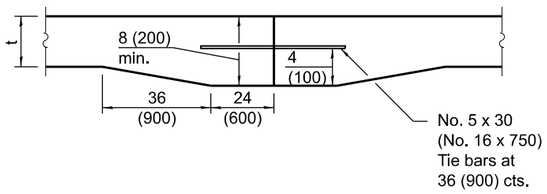
TYPE A
EXPANSION JOINT



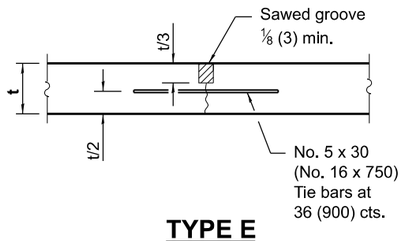
TYPE B
KEYED JOINT



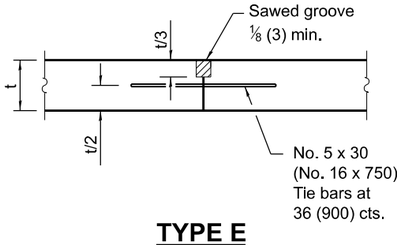
TYPE C
SAWED TRANSVERSE JOINT



TYPE D
TIED TRANSVERSE CONSTRUCTION JOINT



TYPE E
SAWED LONGITUDINAL JOINT



TYPE E
LONGITUDINAL CONSTRUCTION JOINT

GENERAL NOTES

All catch basins shall be separated from the pavement and curb by boxing out as shown in the detail. Manhole castings within the pavement limits shall be boxed in a like manner except when telescoping type castings are used.

When a joint falls within 5 ft. (1.5 m) of or contacts basins, manholes, or other structures, shorten one or more panels either side of opening to permit joint to fall at the corners of the box out.

When specified, roundouts as shown on Standard 420111 shall be used in lieu of the manhole detail shown herein except No. 5 (No. 16) bars shall be used in lieu of No. 6 (No. 19) bars.

All transverse joints must extend through curbs and be continuous across pavement, except tied transverse construction joints. Expansion joints will be required as shown on the plans.

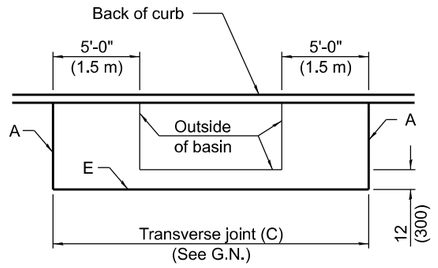
When specified, the pavement structure thickness at intersections shall be increased. This requirement generally will occur when the design traffic through the intersection exceeds the typical design of the pavement structure either side of the intersection.

Joints shall be sawed to a depth of 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.

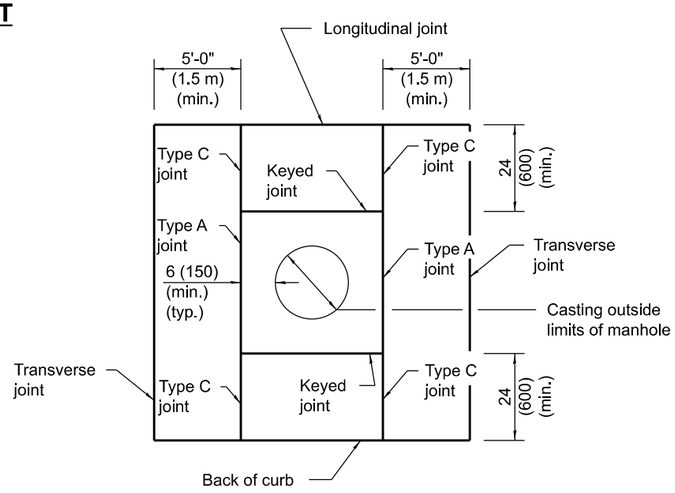
This alternate construction is at the Contractor's option and shall be constructed in accordance with Section 606 of the Standard Specifications. The combination concrete curb and gutter shall be measured in place and the area computed in sq yd (sq m). This work will be paid for at the contract unit price per sq yd (sq m) for portland cement concrete pavement special with integral curb of the thickness specified.

Transverse joint spacing shall not exceed 12' (3.6 m) for pavements less than 10 (250) thick or 15' (4.5 m) for pavements 10 (250) thick and greater.

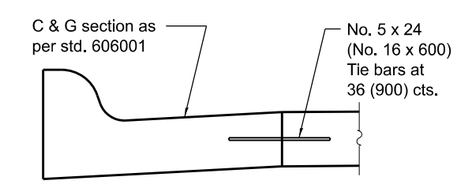
Construct TYPE D tied transverse construction joint when construction joint does not fall at a TYPE C sawed transverse joint.



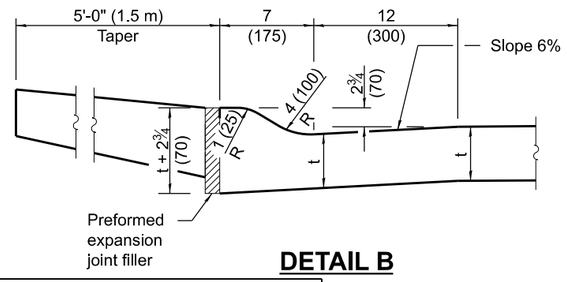
CATCH BASIN DETAIL



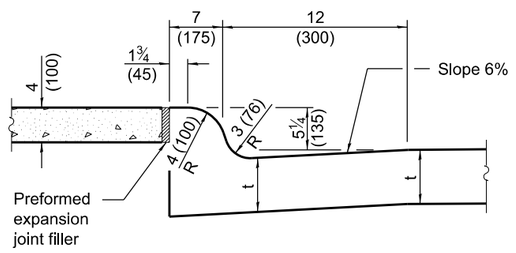
MANHOLE DETAIL
Showing Joint types



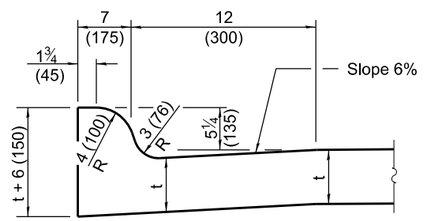
COMB. CURB & GUTTER DETAIL
Alt. const. see G.N.



DETAIL B



DETAIL A



INTEGRAL CURB
See DETAIL A for crosswalks
and DETAIL B for driveways.

Illinois Department of Transportation

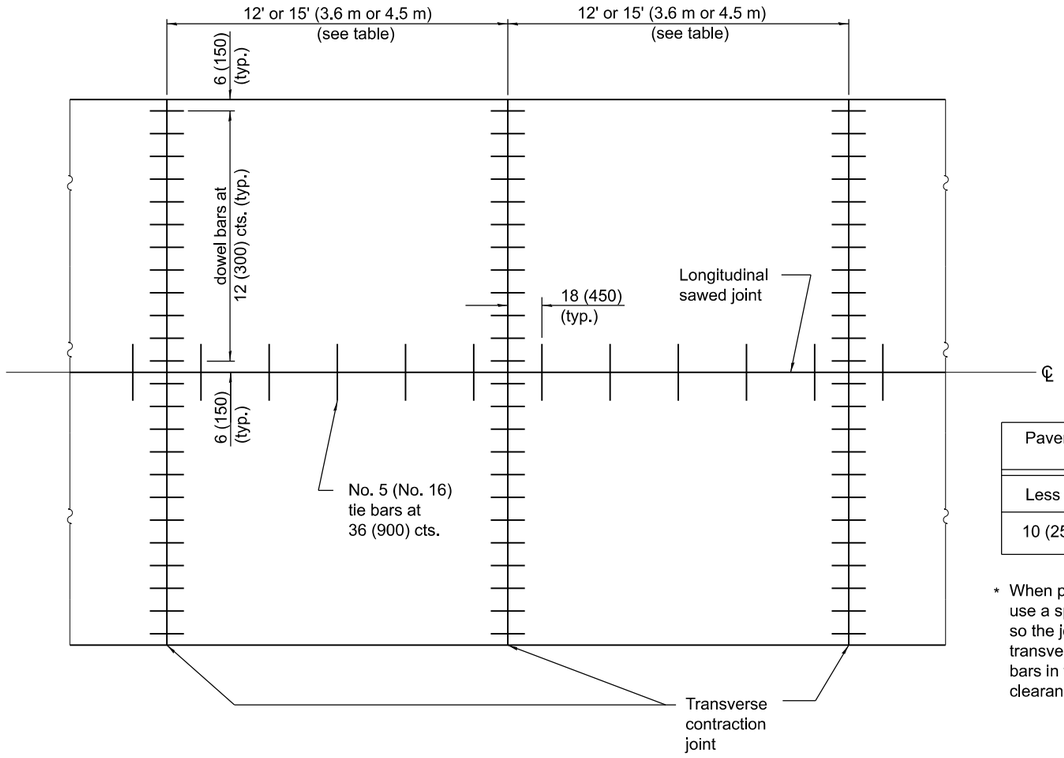
APPROVED January 1, 2022
ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

PCC PAVEMENT SPECIAL (NONREINFORCED)

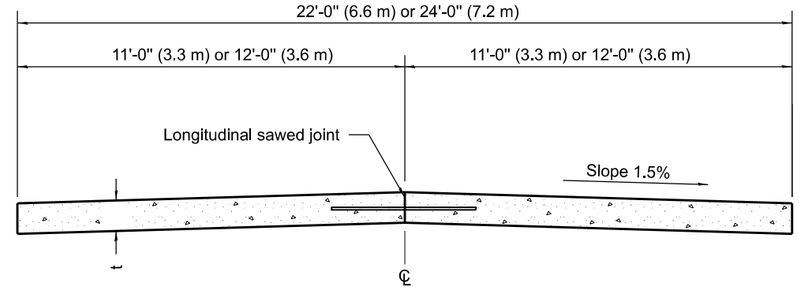
STANDARD B.L.R. 10-8



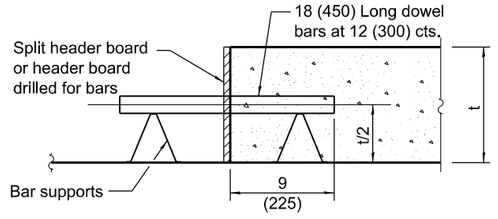
PLAN OF PAVEMENT

Pavement Thickness	Spacing of Transverse Contraction Joints
Less than 10 (250)	12' (3.6 m) *
10 (250) and greater	15' (4.5 m) *

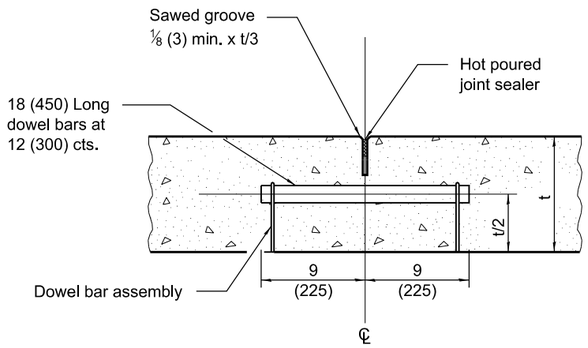
* When placed adjacent to existing PCC pavement, use a spacing between 12' (3.6 m) and 18' (5.5 m) so the joints are in prolongation with existing transverse joints. Also adjust the spacing of tie bars in the longitudinal joint(s) to maintain a clearance of 9 (225) from the end of the dowel bars.



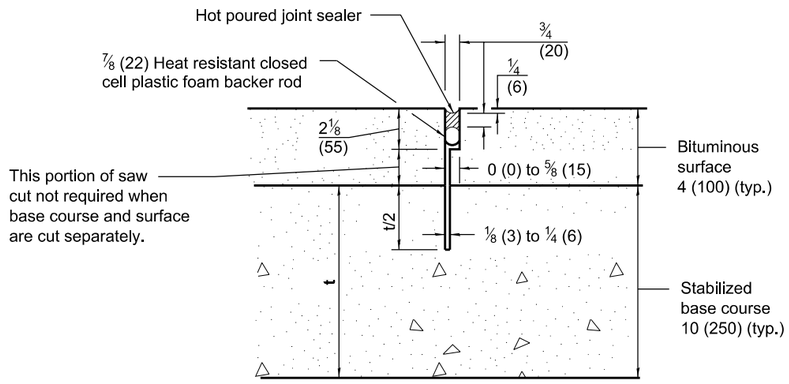
CROSS SECTION OF PAVEMENT



TRANSVERSE CONSTRUCTION JOINT



TRANSVERSE CONTRACTION JOINT



TRANSVERSE CONTRACTION JOINT

(For CAM, CFA and LFA Base Course Mixtures)

GENERAL NOTES

See Standard 420001 for details of Transverse Expansion Joints, Longitudinal Sawed Joints and Longitudinal Construction Joints.

Dowel bars are only required for Class I, **II**, or III Roads and Streets having pavement thickness of 7 (175) or greater.

t = Pavement thickness (See Typical Cross Section)

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

DOWEL BAR TABLE

PAVEMENT THICKNESS	DOWEL BAR DIAMETER
10 (250) and greater	1½ (38)
8.01 (201) to 9.99 (249)	1¼ (32)
8 (200) and less	1 (25)

Illinois Department of Transportation

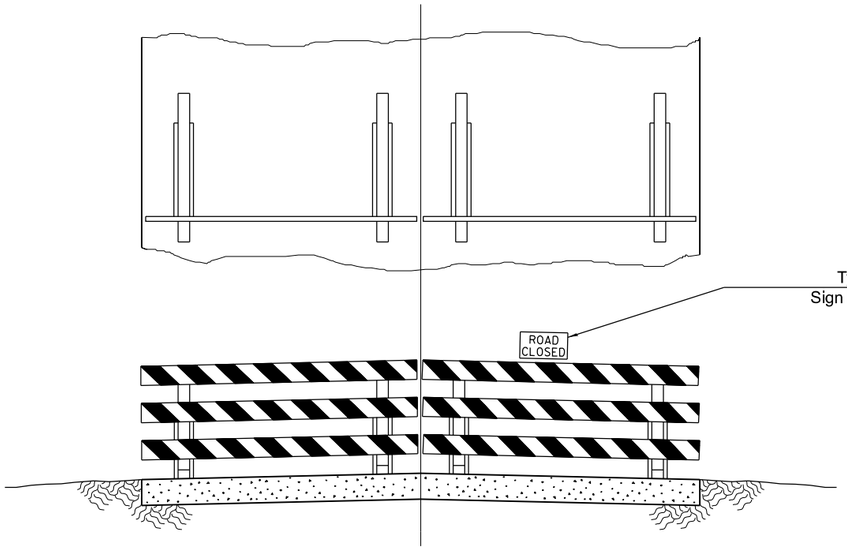
APPROVED January 1, 2022
ENGINEER OF LOCAL ROADS AND STREETS
APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-22	Revised spacing of transverse
	contraction joints, dowel bar table
	and header board callout.
1-1-18	Revised dowel and tie bar sizes.
	Increased tie bar spacing. Eliminated
	skewed joint.

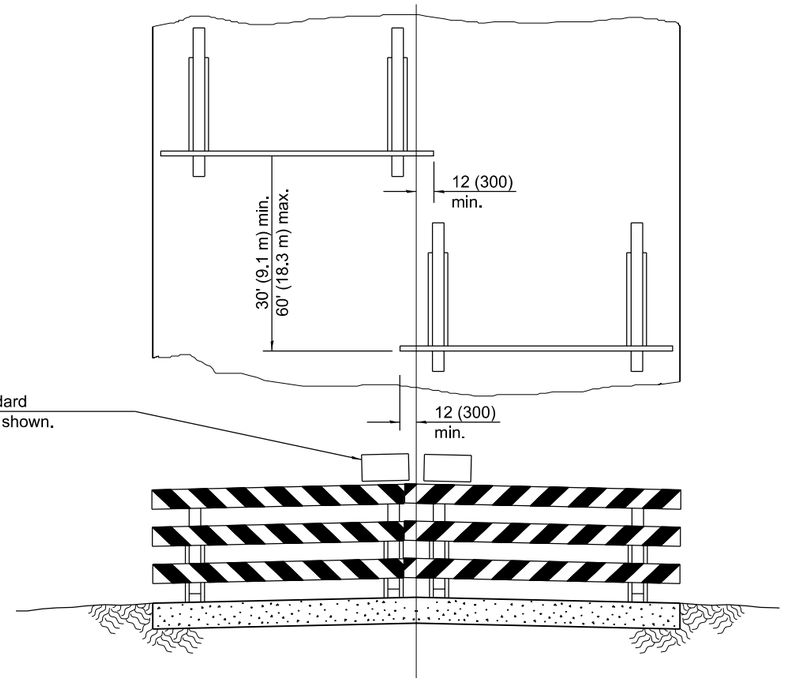
PORTLAND CEMENT CONCRETE PAVEMENT (NONREINFORCED)

STANDARD B.L.R. 14-13

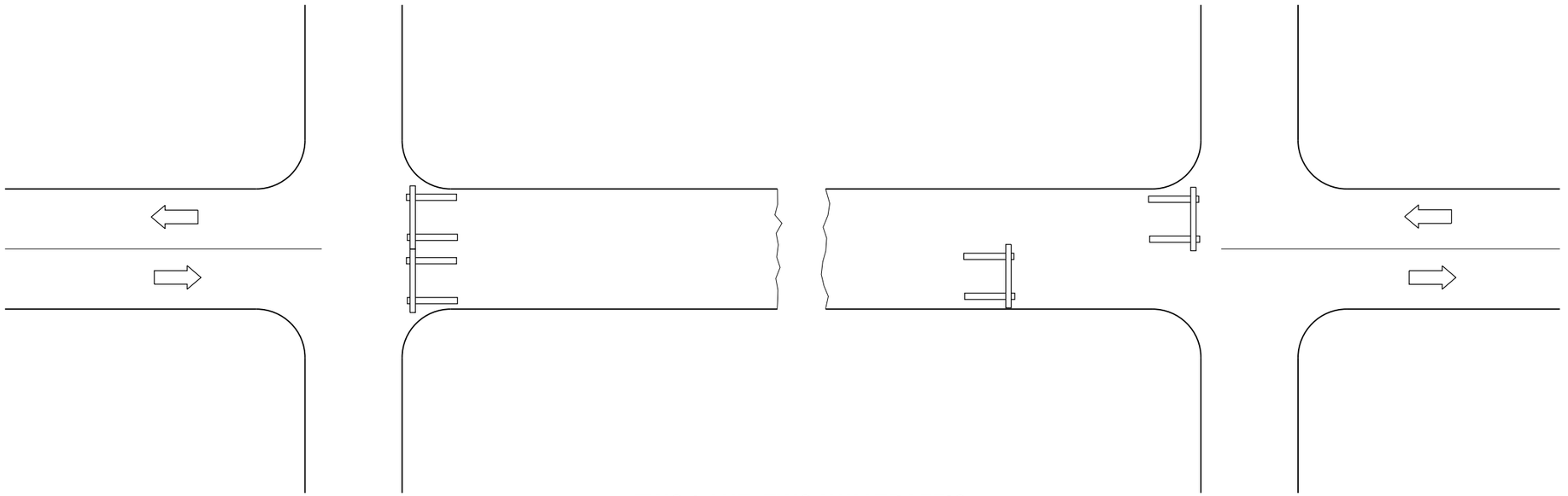


Resident traffic and day labor force's equipment to use road shoulder for passing barricade.

Type III Barricades with Standard
Sign R11-2 or R11-4 mounted as shown.



Use when shoulders are too narrow for passage of traffic.



TWO-LANE, TWO-WAY TRAFFIC, RURAL OPERATIONS EXCEEDING ONE DAYLIGHT PERIOD

GENERAL NOTES

Type III barricades to be width of pavement only.

Reflectorized striping shall appear on both sides of barricades. Barricades shall be positioned so that stripes slope downward toward the side on which traffic is to pass.

Although not shown, advance warning signs with minimum dimensions of 36x36 (900x900) and black legends on orange reflectorized backgrounds shall be utilized where needed.

This case is for use on rural local roads where the local authority considers this protection to be appropriate for the specific job conditions.

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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF LOCAL ROADS AND STREETS

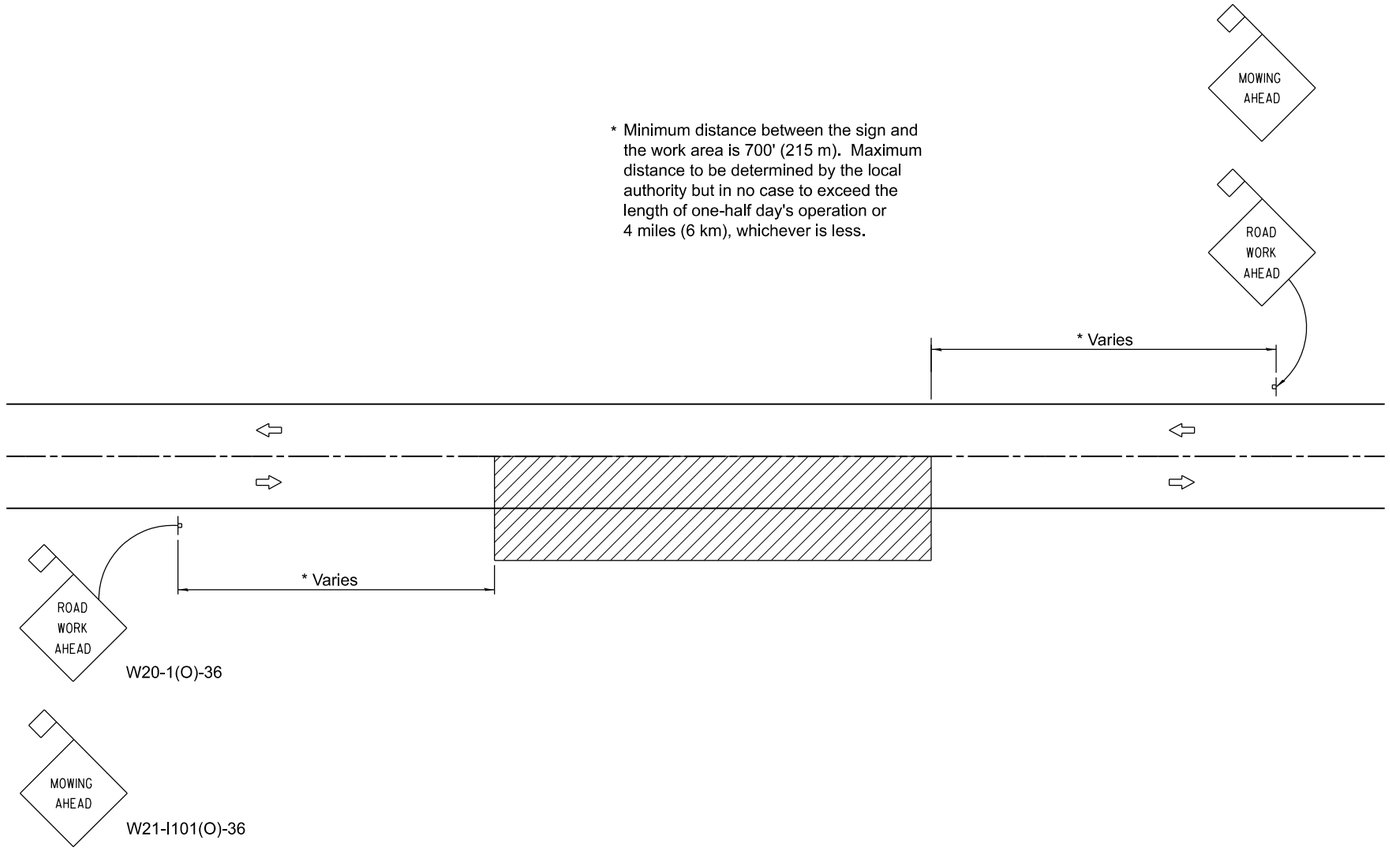
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-98	Rev. "R-11-1" to "R11-4". Rev. 4th
	General Note.

TRAFFIC CONTROL DEVICES - DAY LABOR CONSTRUCTION

STANDARD B.L.R. 17-4



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 acitvities are restricted at all times to one side of the pavment.

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
James K Klein
ENGINEER OF LOCAL ROADS AND STREETS

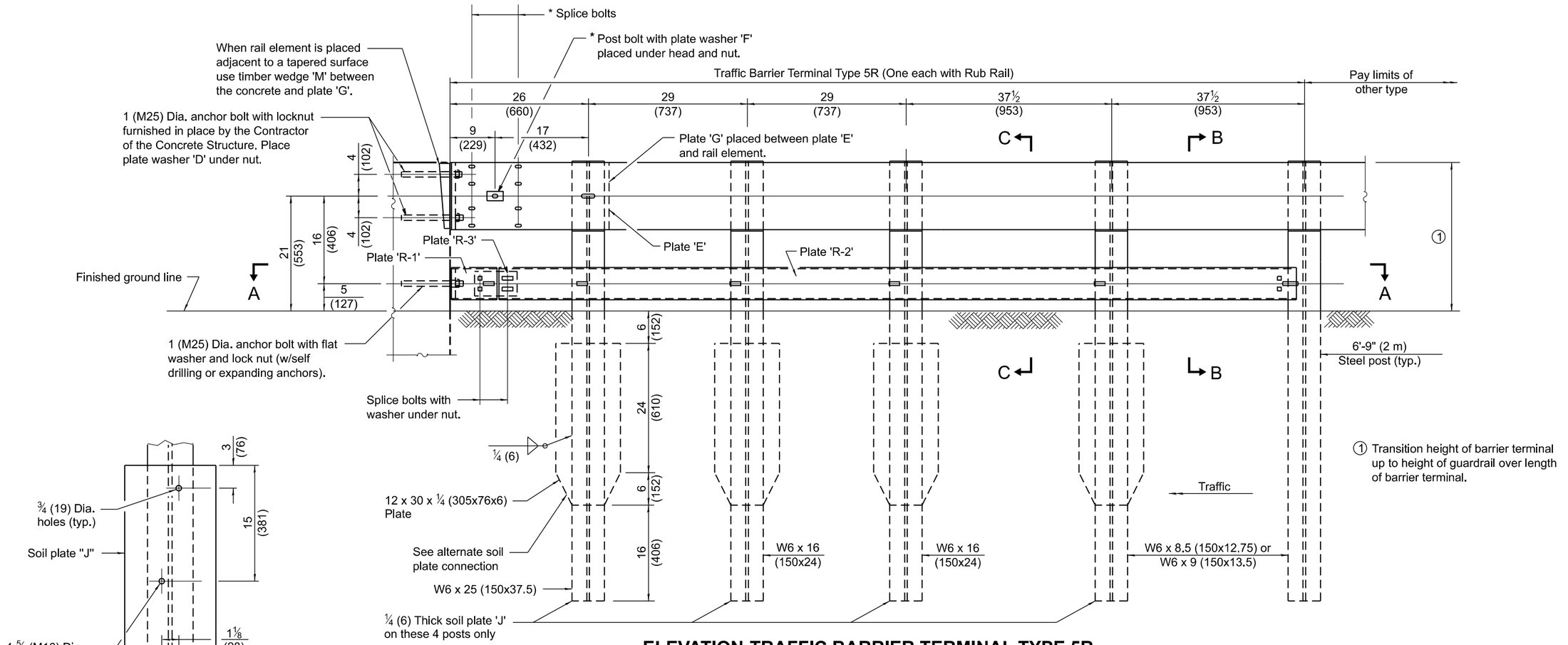
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

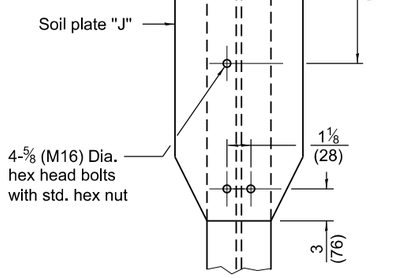
DATE	REVISIONS
1-1-15	Corrected RWA sign number.
1-1-09	Switched units to English (metric).
	Moved one General Note.

TRAFFIC CONTROL DEVICES- DAY LABOR MAINTENANCE

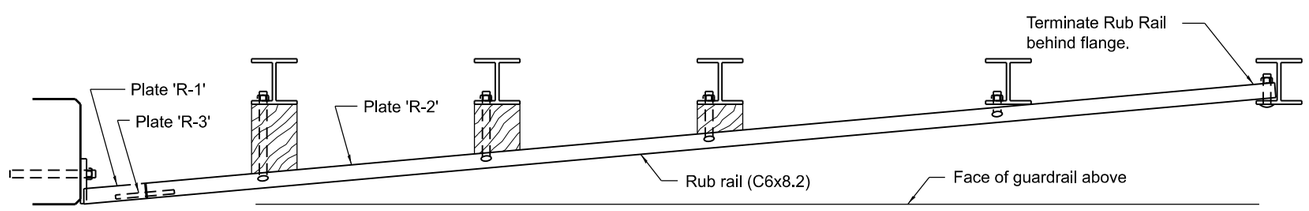
STANDARD B.L.R. 18-6



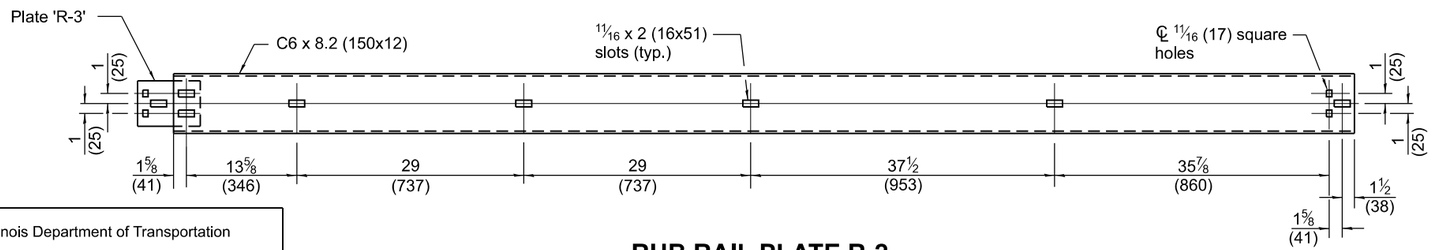
ELEVATION-TRAFFIC BARRIER TERMINAL TYPE 5R



ALTERNATE SOIL PLATE CONNECTION



SECTION A-A



RUB RAIL PLATE R-2

GENERAL NOTES

See Standard B.L.R. 26 for details of guardrail not shown.

Install the face of the guardrail flush with the face of the parapet. Install plate washer "D" so that the 1 (25) projection fills the remainder of the slotted holes in the 1 (25) end plate on plate "G" afterthe 1 (25) bolts are in place.

* When an expantion joint exists below the connector, bolts shall be provided with locknut or double nut and shall be tightened only to a point that will allow plate G to be free to move.

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

Illinois Department of Transportation

APPROVED January 1, 2012
ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

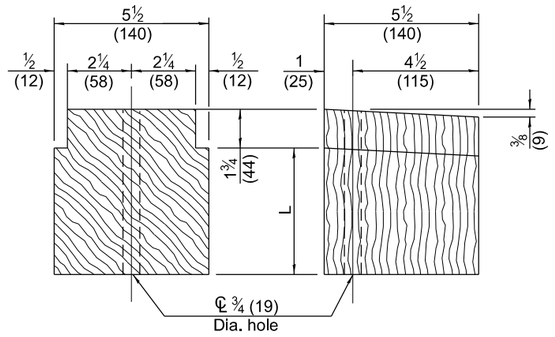
ISSUED 1-1-97

DATE	REVISIONS
1-1-12	Revised barrier terminal height
	per note ①.
1-1-09	Switched units to English (metric).

TRAFFIC BARRIER TERMINAL - TYPE 5R

(Sheet 1 of 2)

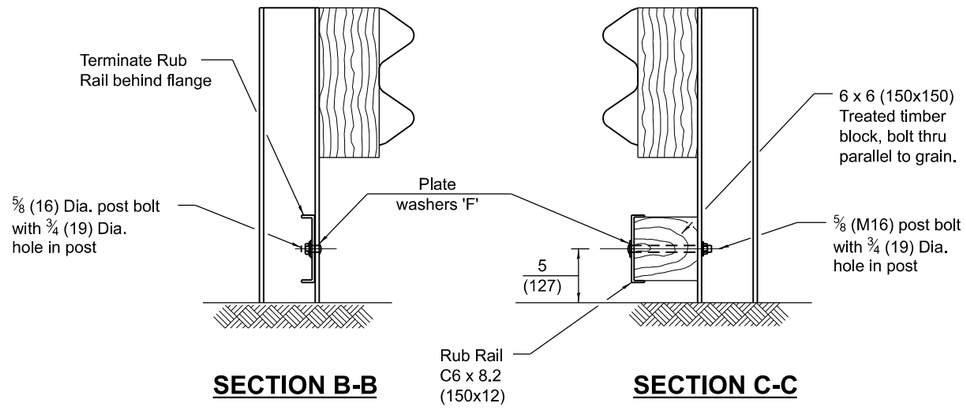
STANDARD B.L.R. 20-7



** L
7⅜ (187)
5⅝ (143)
3⅞ (98)

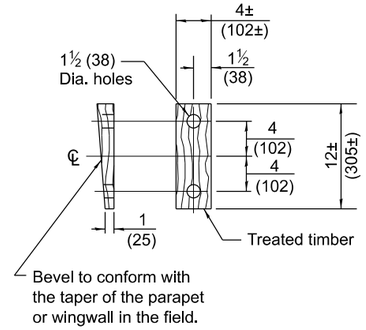
TREATED TIMBER BLOCKING

**** Approximate Lengths Field Verify**

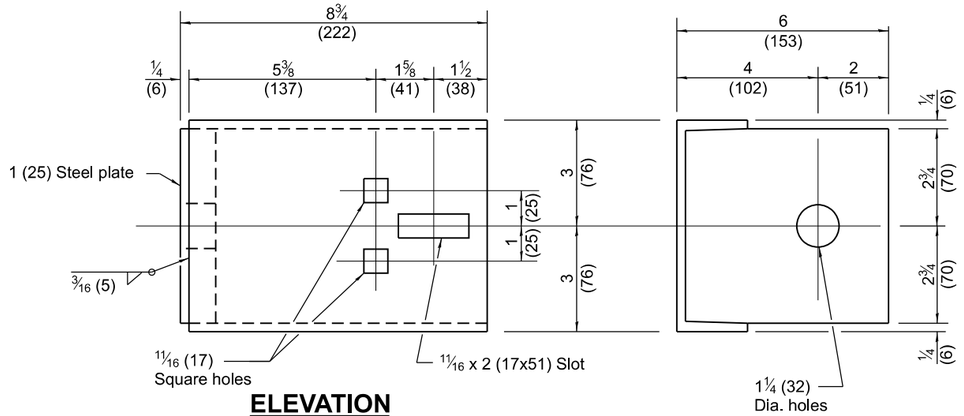


SECTION B-B

SECTION C-C

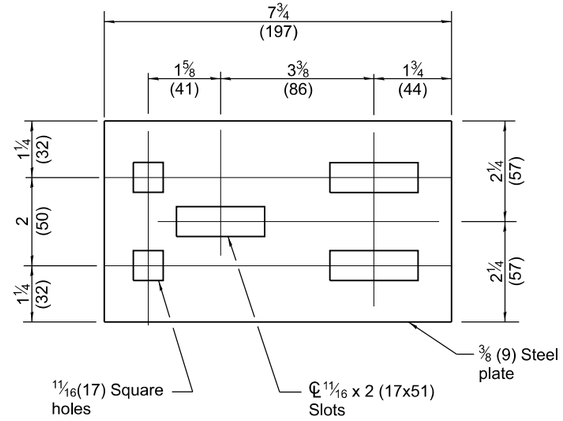


WEDGE M



ELEVATION

END VIEW



SPLICE PLATE 'R-3'

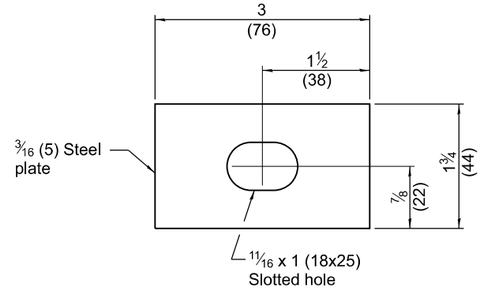


PLATE WASHER F

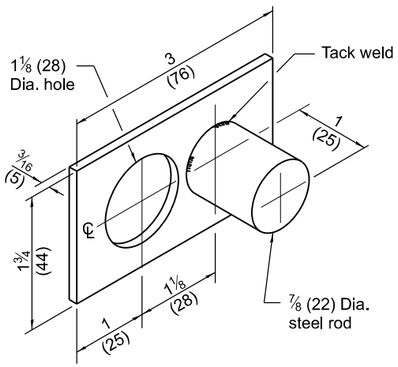
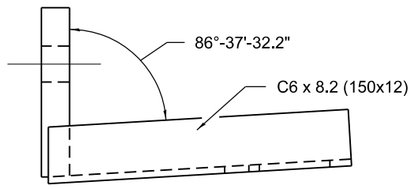


PLATE WASHER D



PLAN

RUB RAIL PLATE R-1

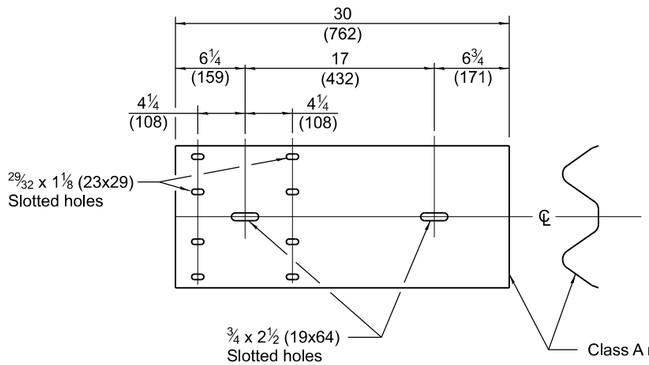


PLATE E

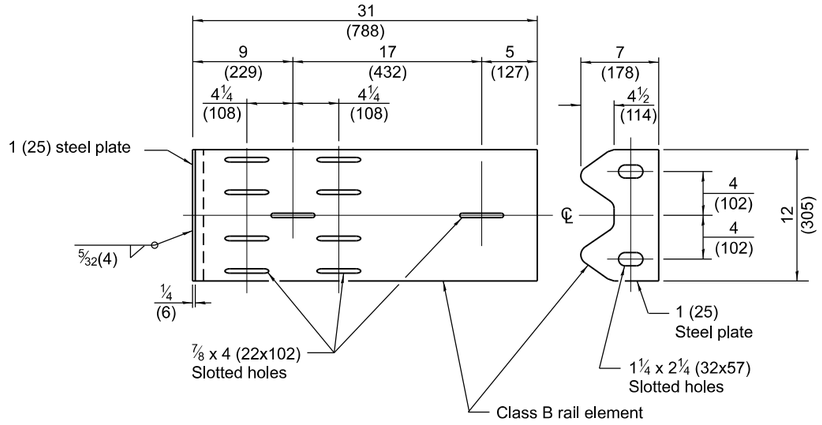


PLATE G

Illinois Department of Transportation

APPROVED January 1, 2012
ENGINEER OF LOCAL ROADS AND STREETS

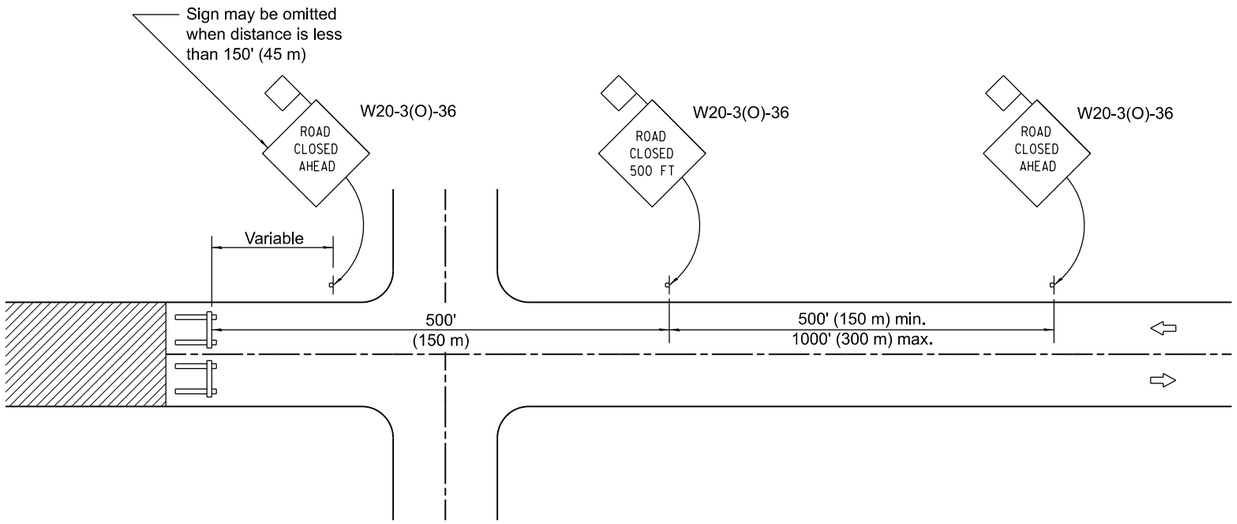
APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

TRAFFIC BARRIER TERMINAL - TYPE 5R

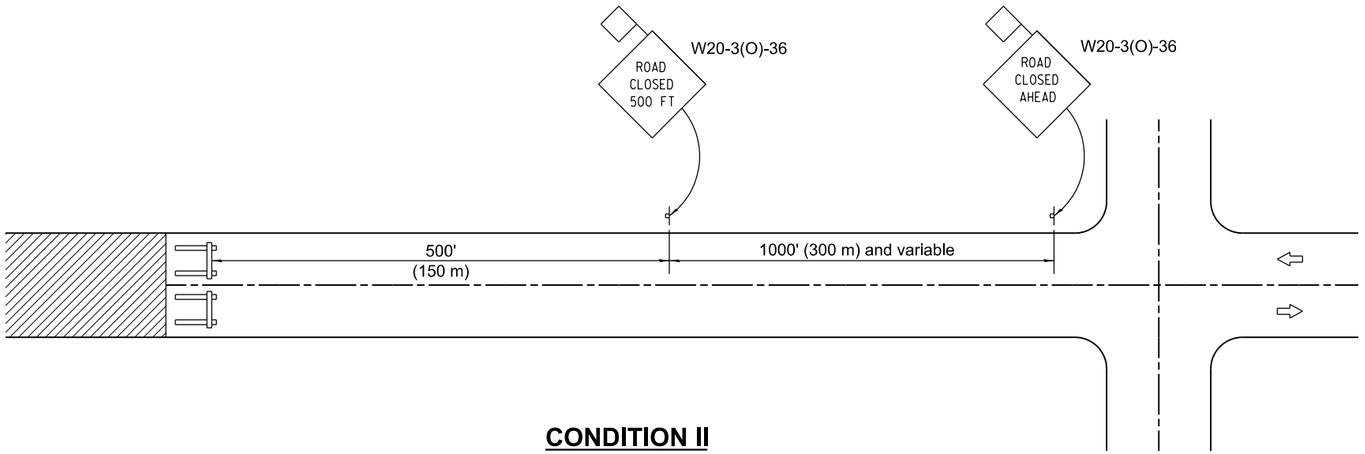
(Sheet 2 of 2)

STANDARD B.L.R. 20-7



CONDITION I

When distance from closure to crossroad is less than 1500' (450 m)



CONDITION II

When distance from closure to crossroad is greater than 1500' (450 m)

SYMBOLS

Work area

Type III Barricade

Sign with 18 x 18 (450x450) min. orange flag attached

GENERAL NOTES

Type III Barricades and R11-2-4830 signs shall be positioned as shown in "Road Closed To All Traffic" detail on Highway Standard 701901.

Two Type A Low Intensity Flashing Lights shall be used on each approach in advance of the work area during hours of darkness. One light shall be installed above the barricades and the other above the first advance warning sign.

All warning signs shall have minimum dimensions of 36 x 36 (900 x 900) and have a black legend on an orange reflectorized background.

When fluorescent signs are used, orange flags are not required.

Longitudinal dimensions may be adjusted to fit field conditions.

When the distance between the barricade and the intersection is between 1500' (450 m) and 2000' (600 m), the advance sign shall be placed at the intersection. When the distance between the barricade and the intersection is over 2000' (600 m), an additional sign shall be placed at the intersection. The additional sign shall give the distance to the barricade in miles or fractions of a mile.

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

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

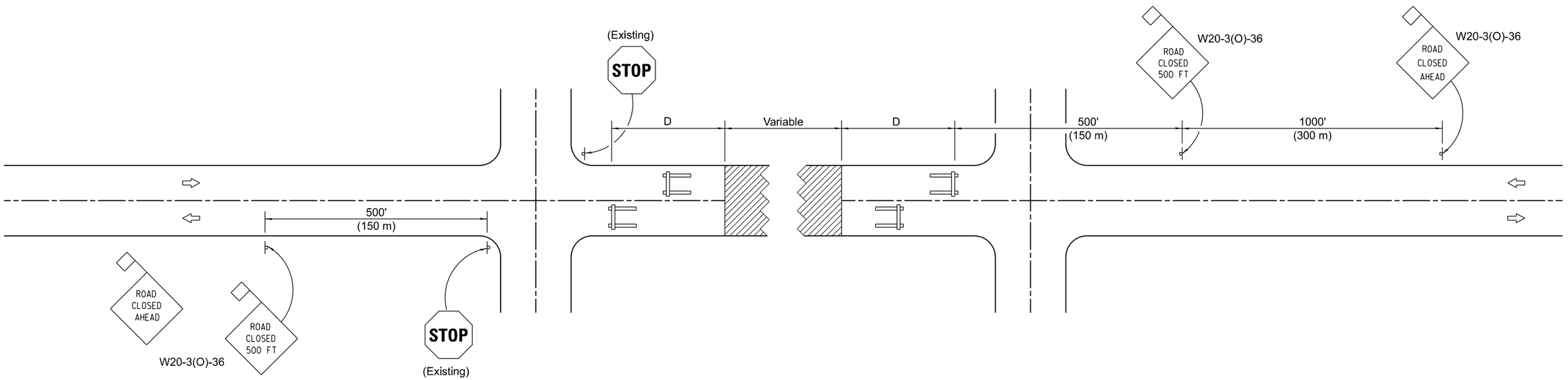
DATE	REVISIONS
1-1-12	Omitted two notes from
	GENERAL NOTES.
1-1-09	Switched units to English (metric).

TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS

STANDARD B.L.R. 21-9

CONDITION I
APPROACH TRAFFIC STOPPED

CONDITION II
APPROACH TRAFFIC DOES NOT STOP



SYMBOLS

Work area

Type III Barricade

Sign with 18 x 18 (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
ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

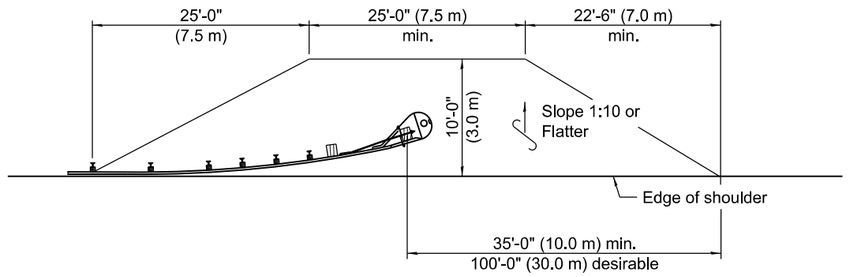
DATE	REVISIONS
1-1-12	Omitted two notes from GENERAL
	NOTES.
1-1-09	Revised General Notes and switched
	units to English (metric).

TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL HIGHWAYS

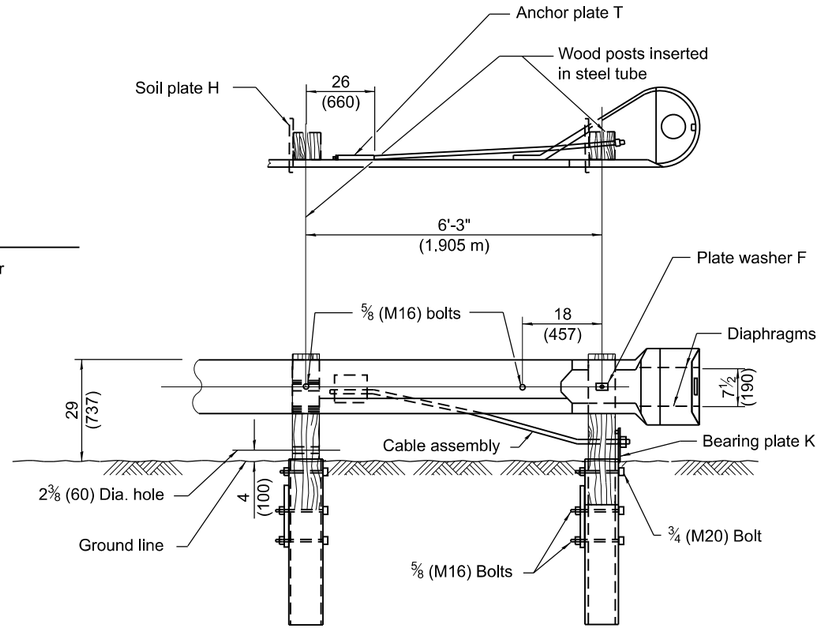
(TWO-LANE TWO WAY RURAL TRAFFIC)
(ROAD CLOSED TO THRU TRAFFIC)

STANDARD B.L.R. 22-7

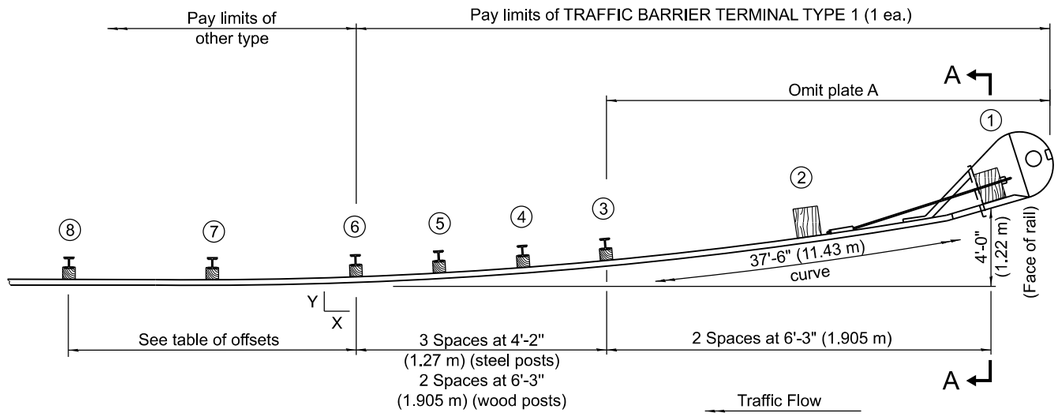
OFFSETS TO FACE OF RAIL		
Post	X ft (m)	Y ft (m)
①	37.22 (11.345)	4.0 (1.22)
②	31.09 (9.475)	2.79 (0.850)
③	24.92 (7.595)	1.79 (0.545)
④	20.79 (6.335)	1.25 (0.380)
⑤	16.64 (5.070)	0.80 (0.245)
⑥	12.49 (3.805)	0.45 (0.135)
⑦	6.25 (1.905)	0.11 (0.035)
⑧	0.00 (0.00)	0.00 (0.00)



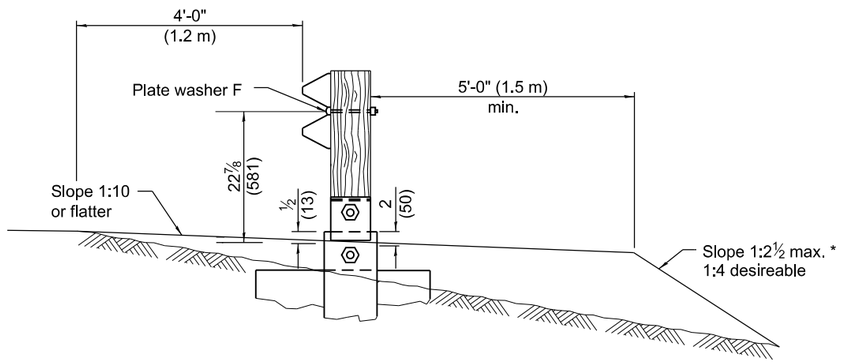
SHOULDER WIDENING TRANSITION



WOOD BREAKAWAY POSTS
TUBULAR STEEL FOUNDATIONS



PLAN



SECTION A-A

* If fill height exceeds 5'-0" (1.5 m) use 1:3 max.

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.

Illinois Department of Transportation

APPROVED January 1, 2012
ENGINEER OF LOCAL ROADS AND STREETS

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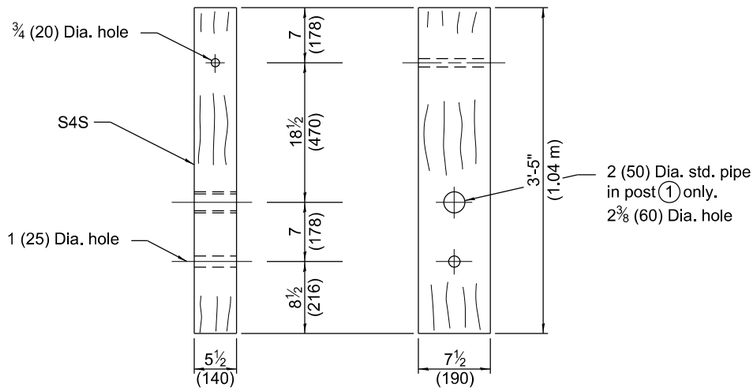
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-08

DATE	REVISIONS
1-1-12	Revised barrier terminal height
	and wood breakaway post.
1-1-09	Switched units to English (metric).

TRAFFIC BARRIER TERMINAL TYPE 1

STANDARD B.L.R. 23-4



WOOD BREAKAWAY POST
(2 ea.)

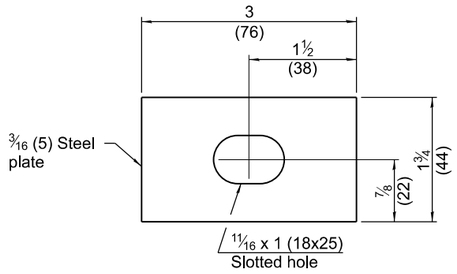
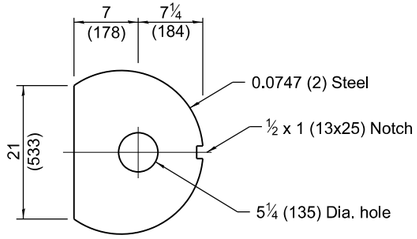
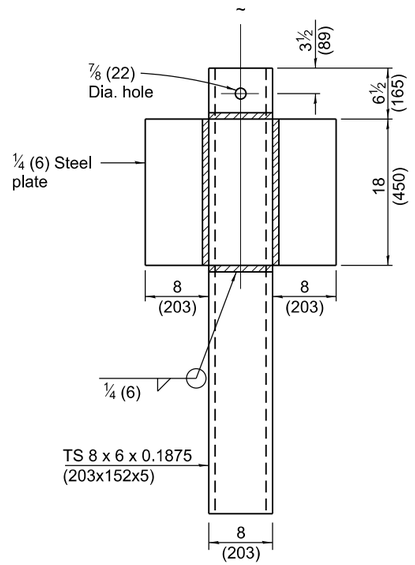


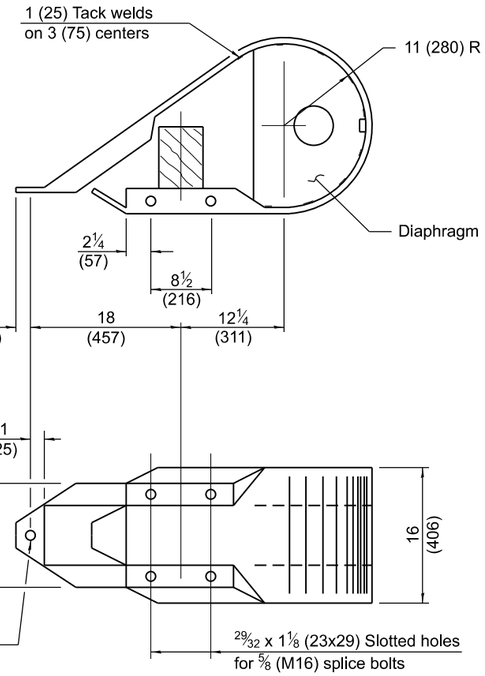
PLATE WASHER F
(1 ea.)



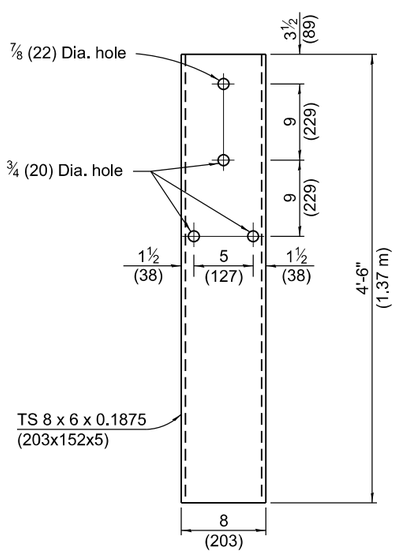
DIAPHRAGM
(2 ea.)



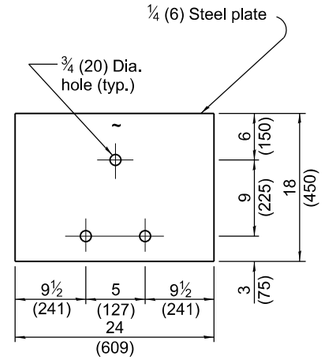
ALTERNATE SOIL PLATE CONNECTION



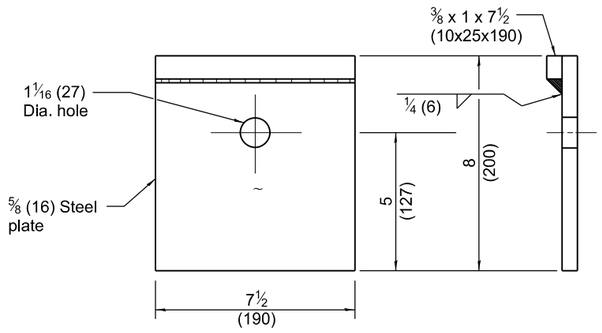
NOSE
(1 ea.)



STEEL TUBE
(2 ea.)



SOIL PLATE H
(2 ea.)



BEARING PLATE K
(1 ea.)

Illinois Department of Transportation

APPROVED January 1, 2012
ENGINEER OF LOCAL ROADS AND STREETS

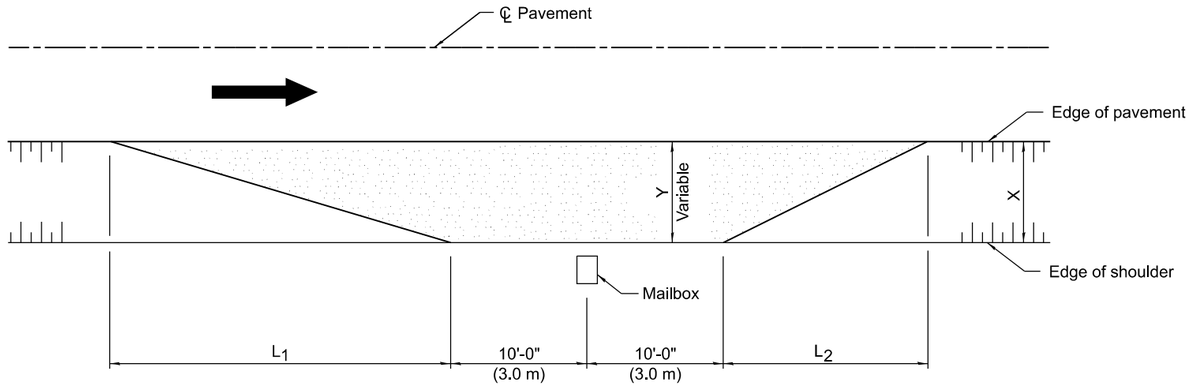
APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-06

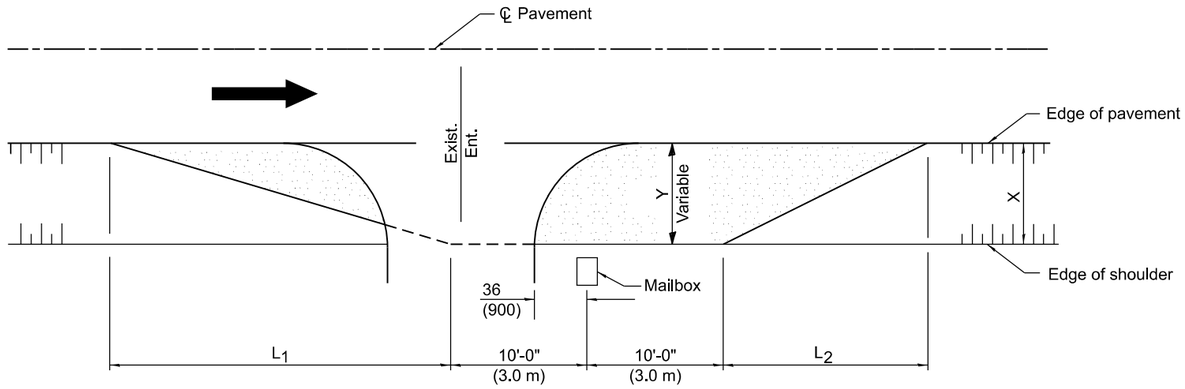
TRAFFIC BARRIER TERMINAL TYPE 1

(Sheet 2 of 2)

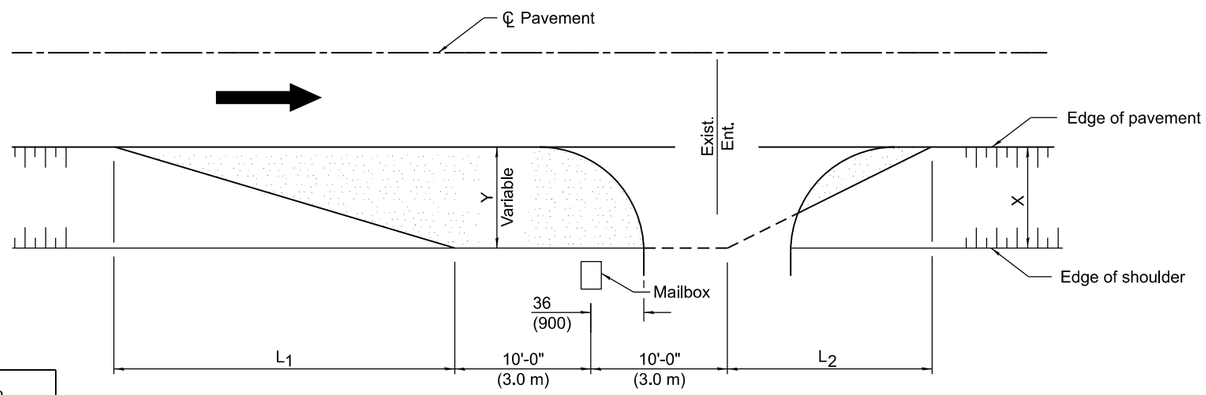
STANDARD B.L.R. 23-4



TYPICAL APPLICATION



MAILBOX ON FARSIDE OF ENTRANCE



MAILBOX ON NEARSIDE OF ENTRANCE

DIMENSIONS - ft. (m)						
Width of Shoulder (X)	12 (3.6)	10 (3.0)	8 (2.4)	6 (1.8)	5 (1.5)	4 (1.2)
Width of Turnout (Y)	8 (2.4)	8 (2.4)	6 (1.8)	4 (1.2)	4 (1.2)	4 (1.2)
L_1	30 (9.0)	30 (9.0)	23 (6.9)	15 (4.5)	15 (4.5)	15 (4.5)
L_2	20 (6.0)	20 (6.0)	15 (4.5)	10 (3.0)	10 (3.0)	10 (3.0)

Note:
Dimensions for Township and District Roads may vary from the above dimensions.

GENERAL NOTES

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

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

Illinois Department of Transportation

APPROVED January 1, 2009
Charles J. Ingersoll
ENGINEER OF LOCAL ROADS AND STREETS

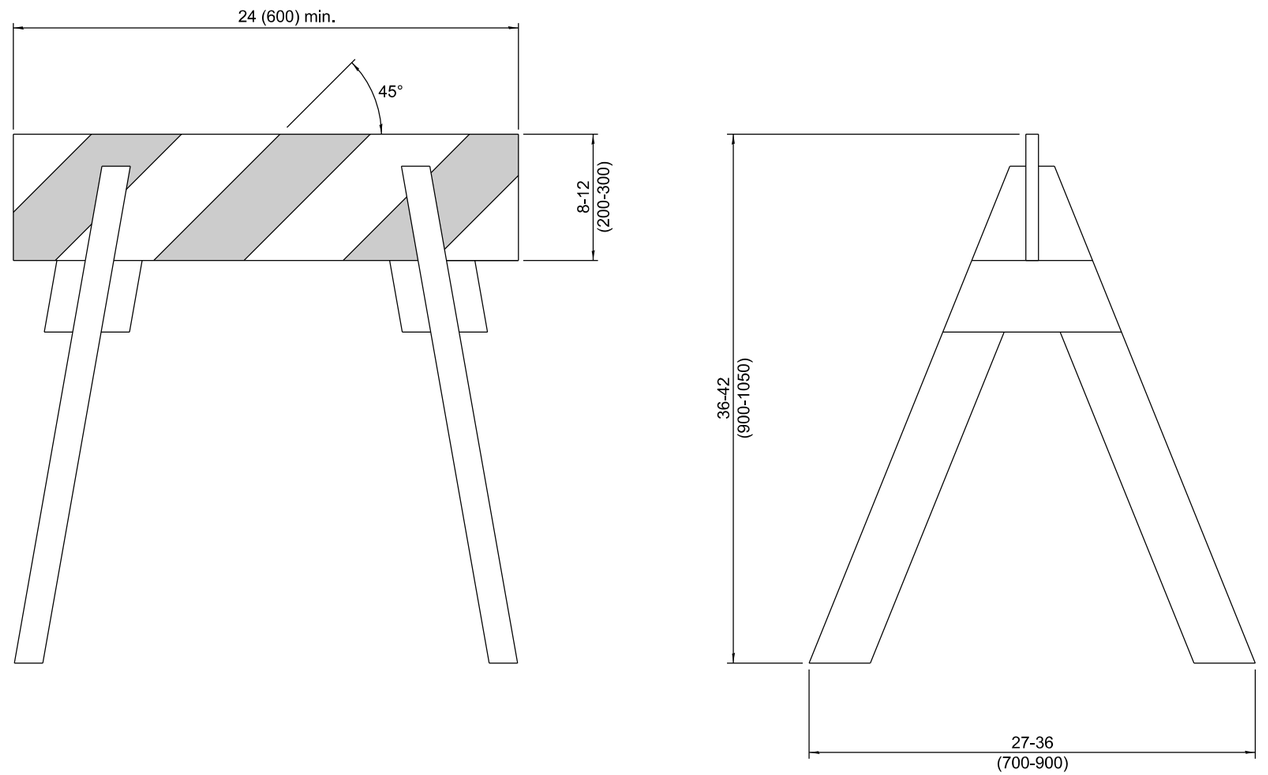
APPROVED January 1, 2009
Eric E. Harm
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-99	Add width of shoulder X.

MAILBOX TURNOUT FOR LOCAL ROADS

STANDARD B.L.R. 24-2



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

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF LOCAL ROADS AND STREETS

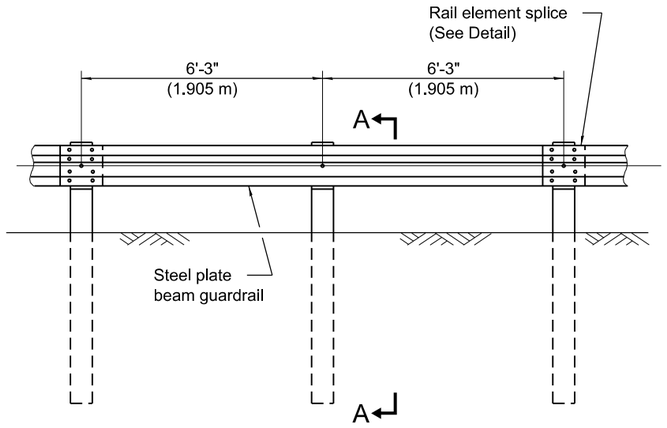
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-03

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-03	New standard from 702001-02.

TYPE 1A BARRICADE FOR NON-NHS ROUTES

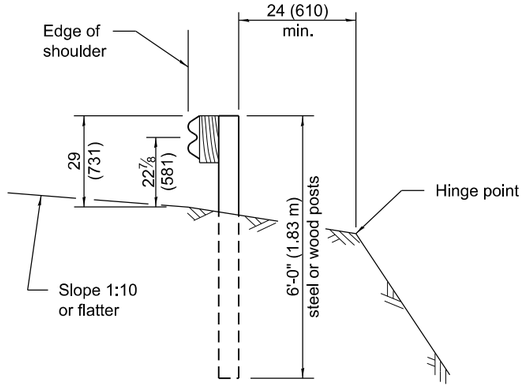
STANDARD B.L.R. 25-1



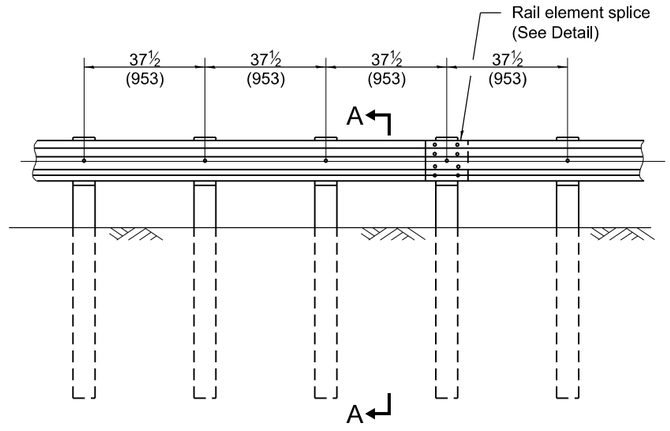
ELEVATION

TYPE A

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



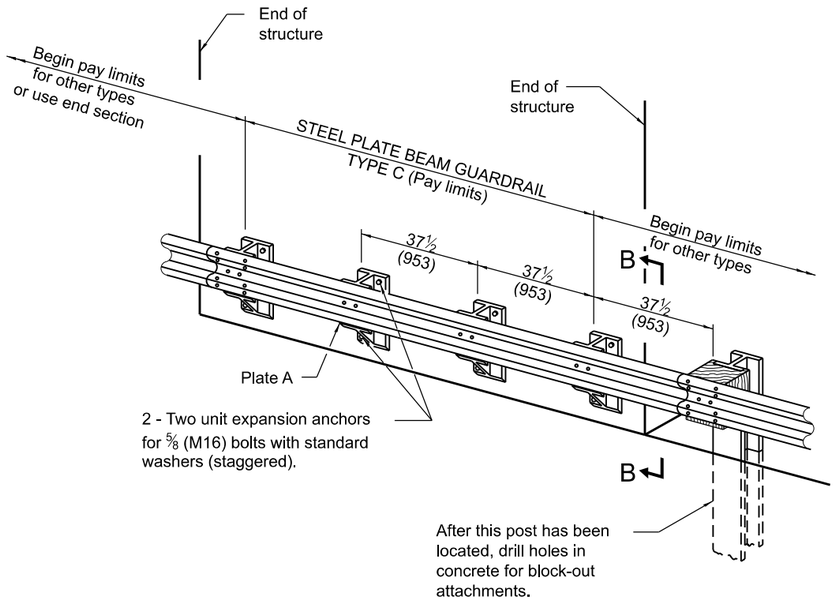
SECTION A-A



ELEVATION

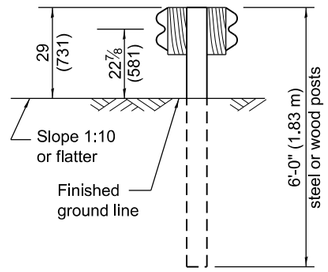
TYPE B

37½ (953) Closed post spacing

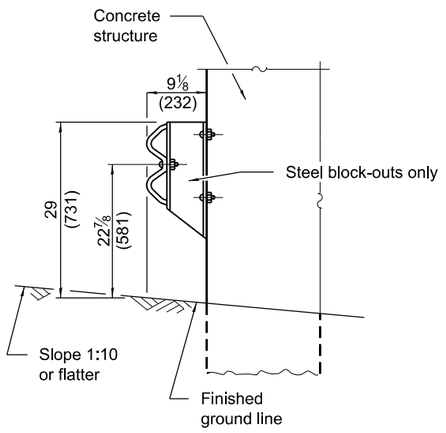


TYPE C

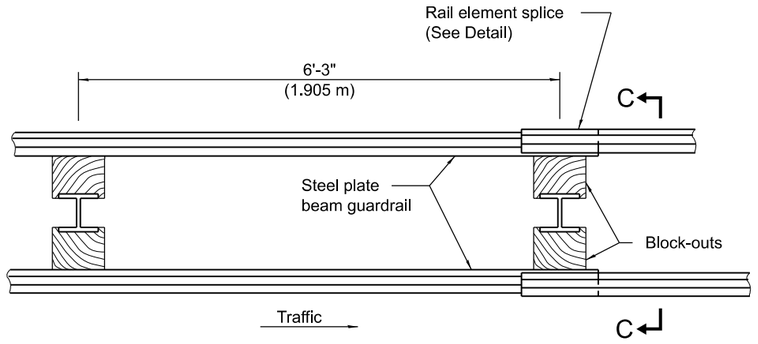
37½ (953) Block-out spacing



SECTION C-C



SECTION B-B



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.

Illinois Department of Transportation

APPROVED January 1, 2012
ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

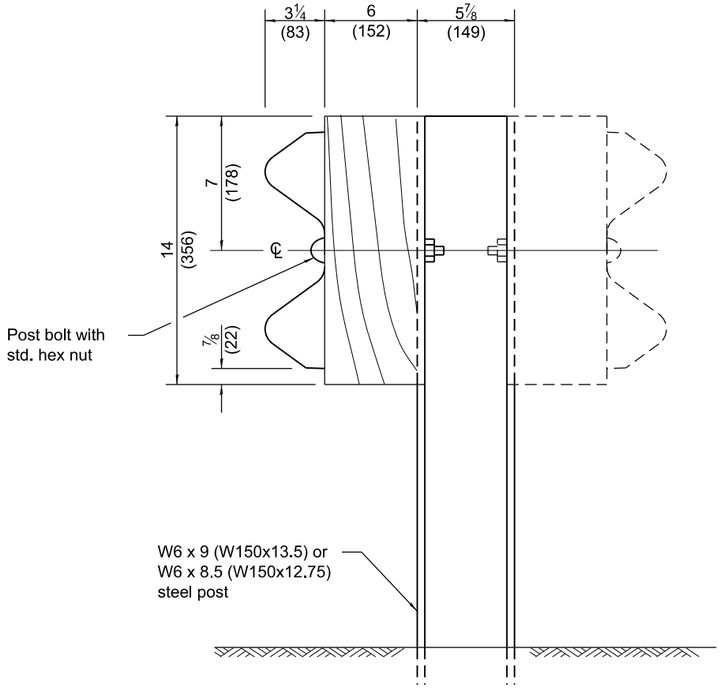
ISSUED 1-1-08

DATE	REVISIONS
1-1-12	Revised guardrail height. Modfied
	table on sht. 4. Renamed standard.
1-1-10	Changed post length from 6'-9" to
	6'-0". Modified table on sht. 4.

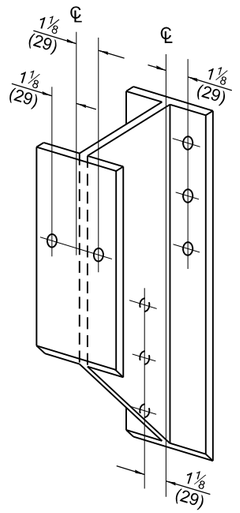
STEEL PLATE BEAM GUARDRAIL 29" (731 mm) HEIGHT

(Sheet 1 of 4)

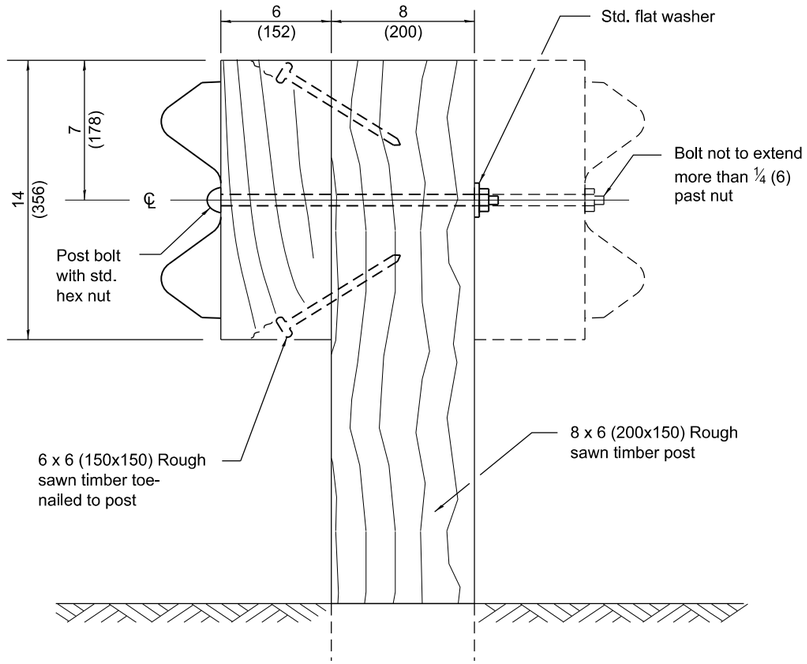
STANDARD B.L.R. 26-3



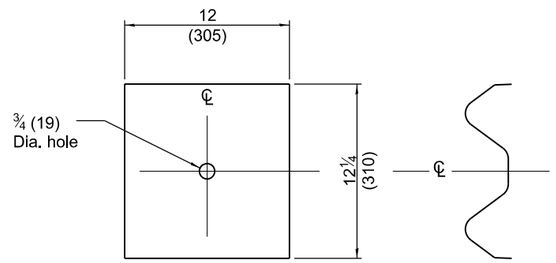
STEEL POST CONSTRUCTION



STEEL BLOCK-OUT DETAIL

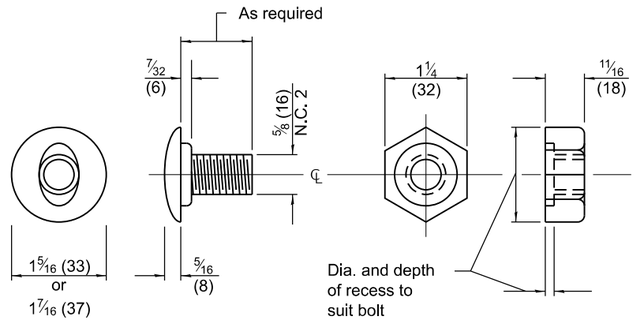


WOOD POST CONSTRUCTION



NOTE
Plate A shall be placed between rail element and block-out at non-splice mounting points only when steel block-outs are used.

PLATE A



POST OR SPLICE BOLT & NUT

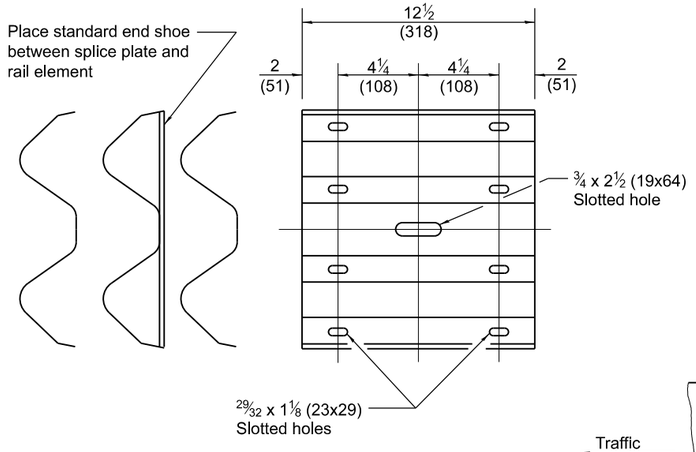
Illinois Department of Transportation

APPROVED January 1, 2012
ENGINEER OF LOCAL ROADS AND STREETS
APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

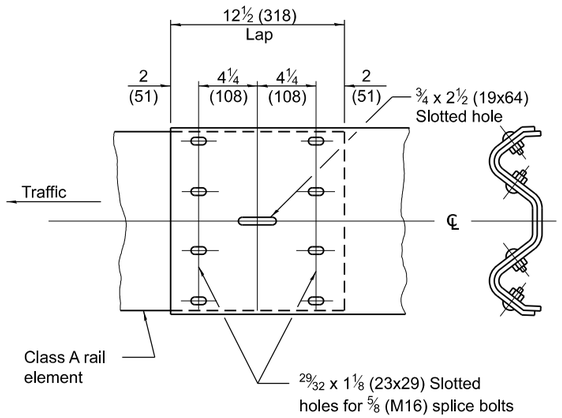
ISSUED 1-1-08

STEEL PLATE BEAM GUARDRAIL 29" (731 mm) HEIGHT

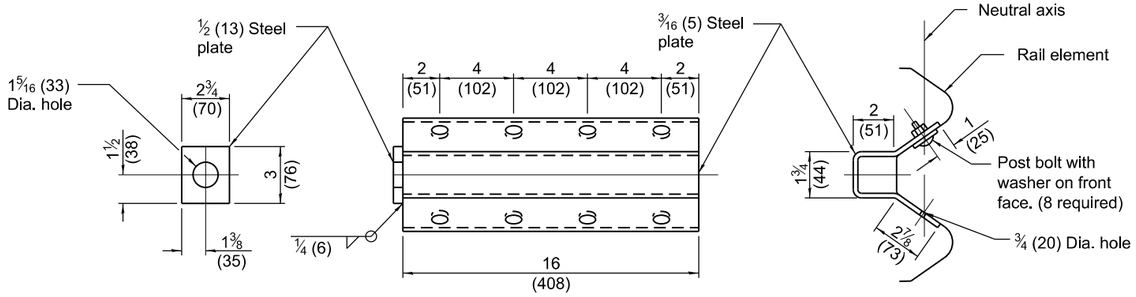
STANDARD B.L.R. 26-3



SPLICE PLATE

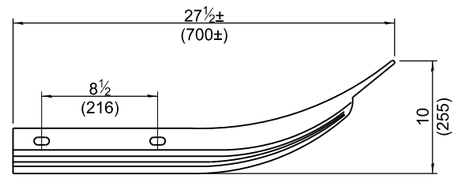


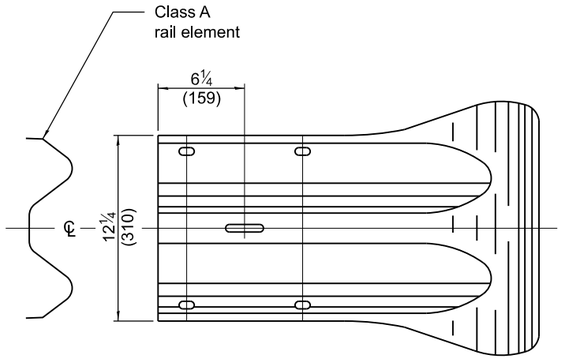
RAIL ELEMENT SPLICE



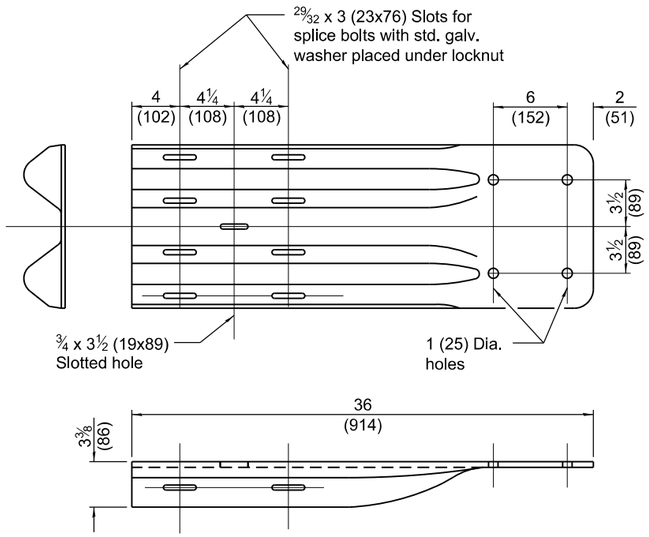
NOTE
Anchor plate T shall be used to attach cable assembly to guardrail when required on traffic barrier terminals.

ANCHOR PLATE T DETAILS





END SECTION

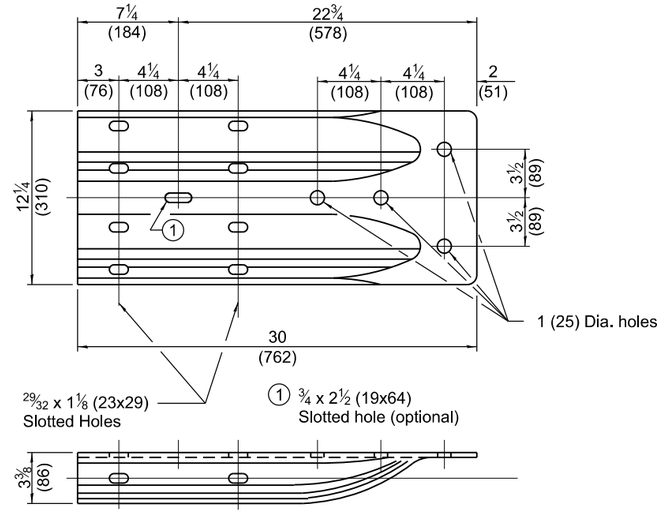


NOTE
When end shoe is attached to a bridge parapet which has an expansion joint, the bolts shall be provided with a locknut or double nut and shall be tightened only to a point that will allow guardrail movement.

The standard end shoe shall be attached to the concrete with pre-drilled or self-drilling anchor bolts. The anchor cone shall be set flush with the surface of the concrete.

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

END SHOE



ALTERNATE END SHOE

Illinois Department of Transportation

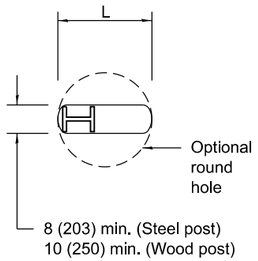
APPROVED January 1, 2012
ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

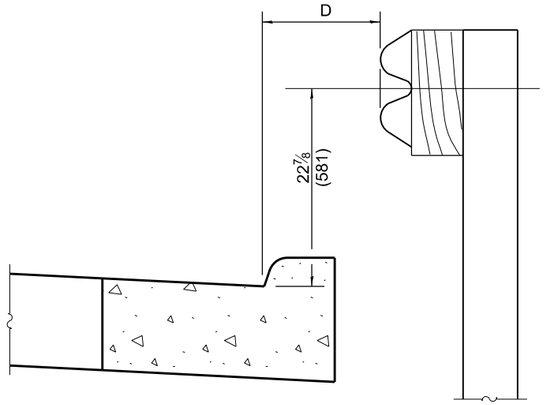
ISSUED 1-1-08

STEEL PLATE BEAM GUARDRAIL 29" (731 mm) HEIGHT

STANDARD B.L.R. 26-3



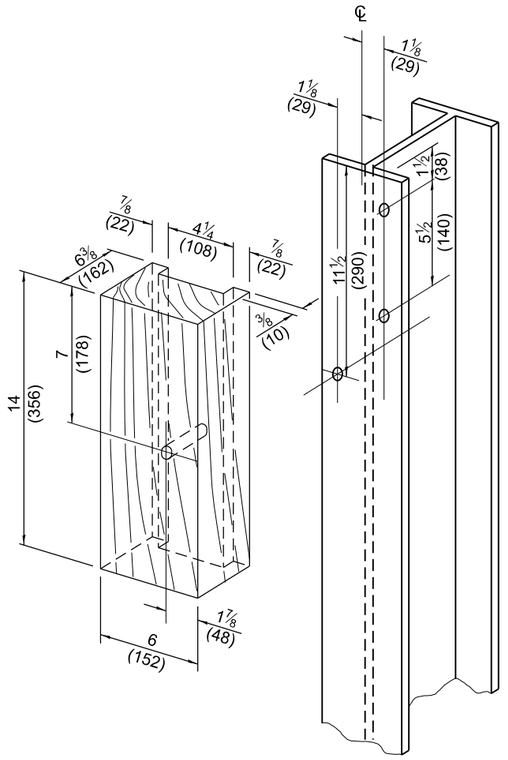
PLAN



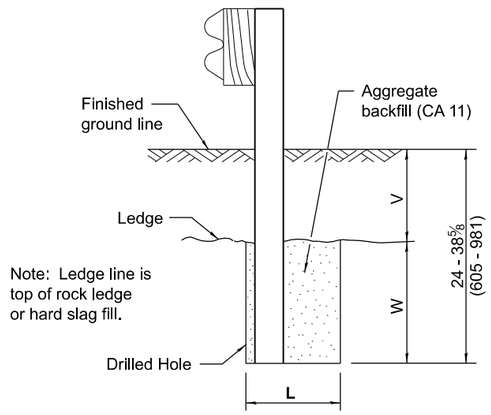
Note:
If it is necessary for D to be more than 12 (300) and less than 10'-0" (3.0 m) Type M-2 (M-5) curb and gutter (Std. 606001) shall be used in front of and in advance of the guardrail.

GUARDRAIL PLACED BEHIND CURB

(D = O desirable to 12 (300) maximum)



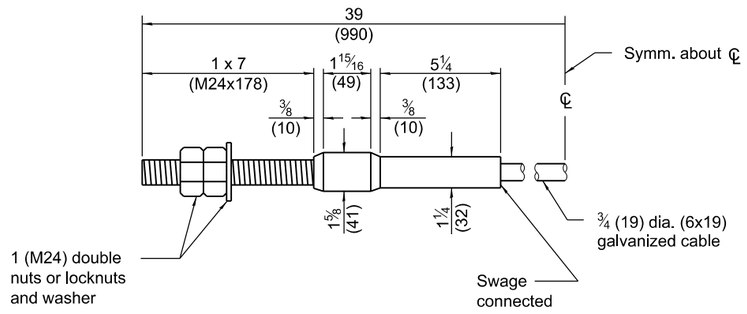
WOOD BLOCK-OUT AND STEEL POST DETAILS



ELEVATION

FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED

V	W	L	
		Steel Post	Wood Post
0 - 16⅛ (0 - 410)	24 (610)	21 (530)	23 (580)
>16⅛ - 28⅛ (>410 - 714)	12 (305)	8 (203)	10 (250)
>28⅛ - 38⅝ (>714 - 981)	12 - 0 (305 - 0)	8 (203)	10 (250)



CABLE ASSEMBLY

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

Illinois Department of Transportation

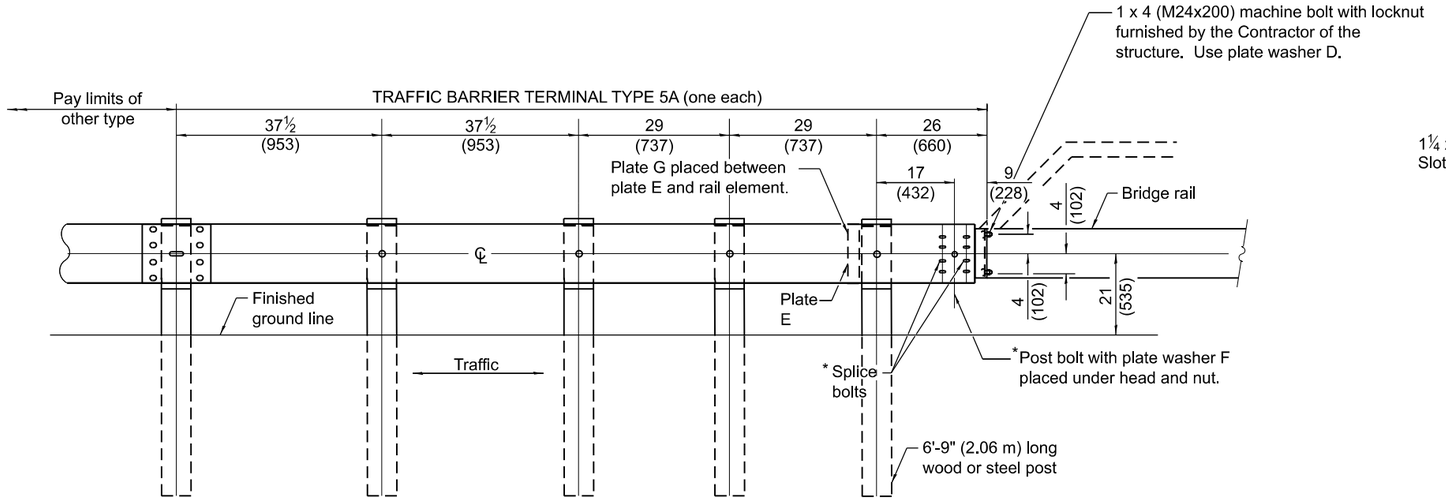
APPROVED January 1, 2012
Darrell Lewis
ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2012
Scott Sossong
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-08

STEEL PLATE BEAM GUARDRAIL 29" (731 mm) HEIGHT

STANDARD B.L.R. 26-3



TYPE 5A - STEEL BRIDGE RAIL

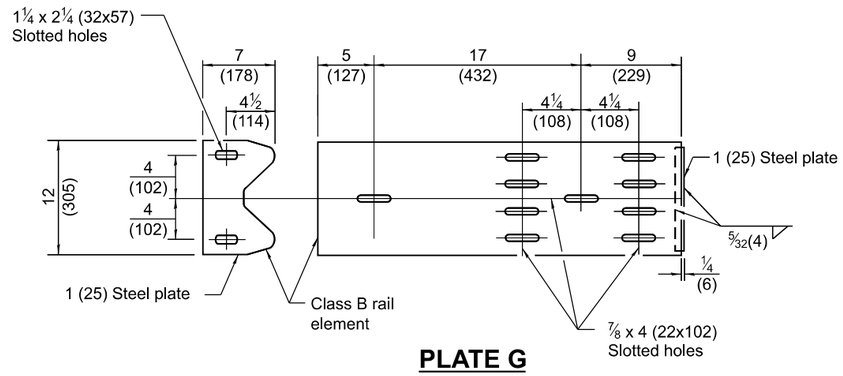


PLATE G

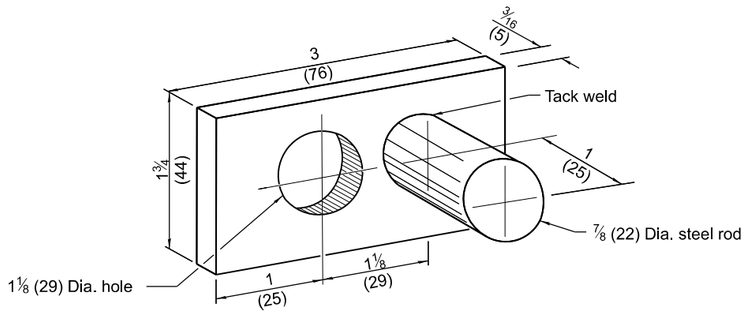
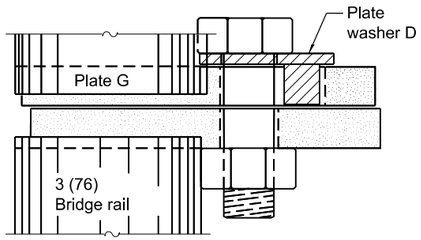
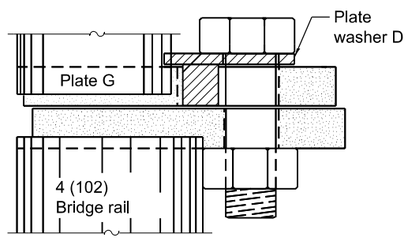


PLATE WASHER D





PLACEMENT OF PLATE WASHER D
(PLAN)

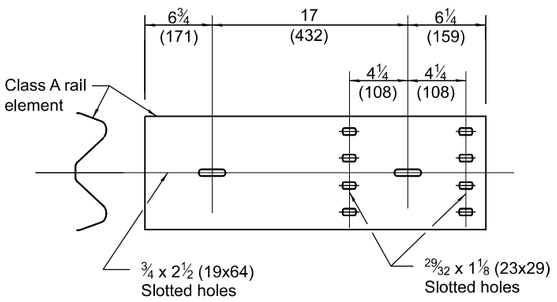


PLATE E

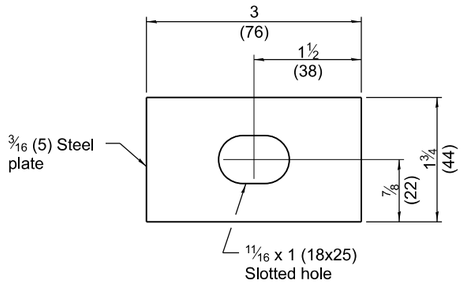


PLATE WASHER F

GENERAL NOTES

See Standard B.L.R. 26 for details of guardrail not shown.

Install plate washer D so the 1 (25) projection fills the remainder of the slotted holes in the 1 (25) end plate on plate G after the 1 (M24) dia. bolts are in place.

When an expansion joint exists below the connector, bolts shall be provided with a locknut or double nuts and shall be tightened only to a point that will allow plate G to be free to move.

The face of the guardrail shall be installed flush with the face of the bridge rail.

When this terminal is used with Standard 630001, the guardrail shall transition down to the height of the terminal.

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

Illinois Department of Transportation

APPROVED January 1, 2009
Charles J. Ingersoll
ENGINEER OF LOCAL ROADS AND STREETS

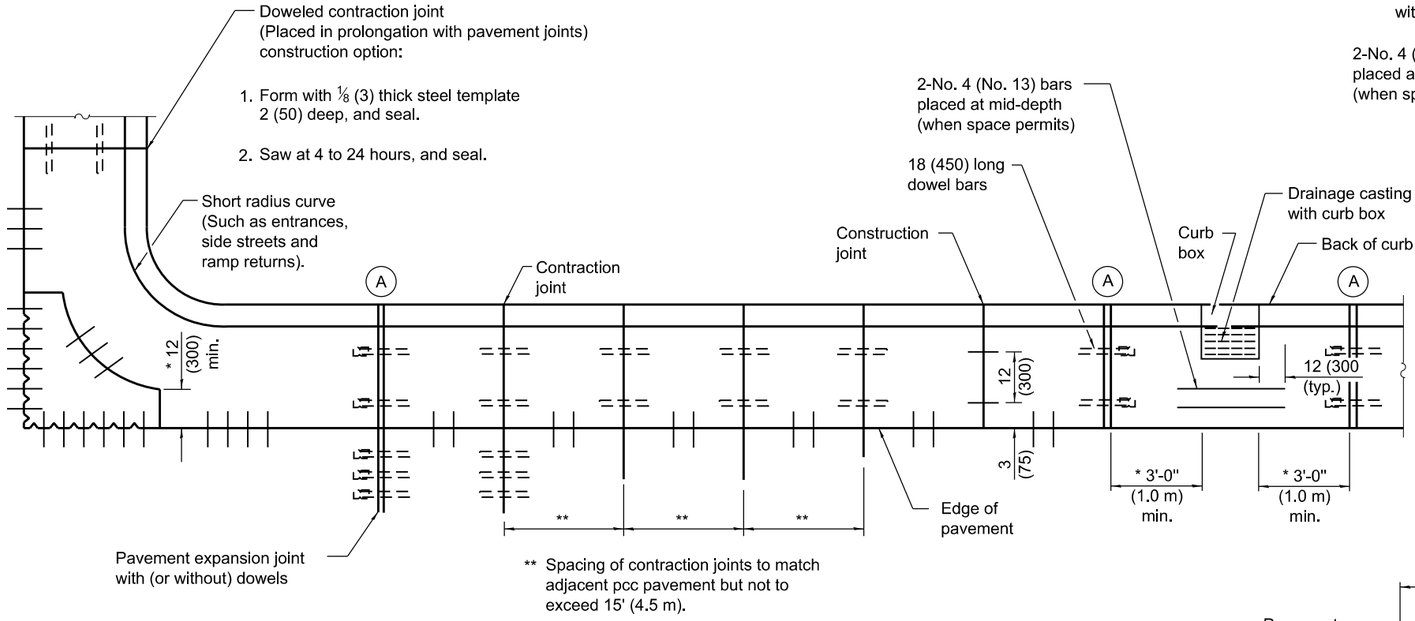
APPROVED January 1, 2009
Eric E. Harm
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-08

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-08	New Standard. Was part of Std.
	631026 prior to January 1, 2007.

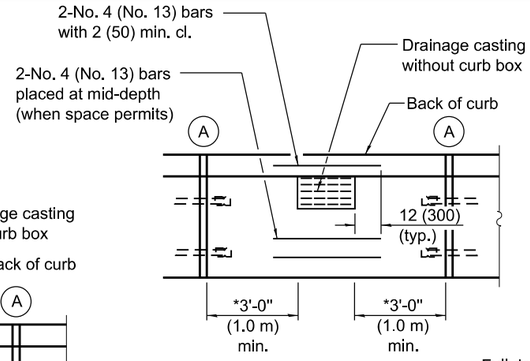
TRAFFIC BARRIER TERMINAL TYPE 5A

STANDARD B.L.R. 27-1

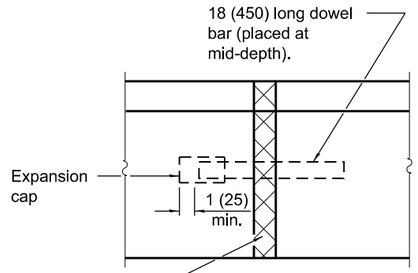


** Spacing of contraction joints to match adjacent pcc pavement but not to exceed 15' (4.5 m).

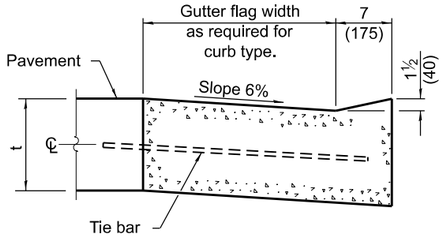
PLAN
ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE



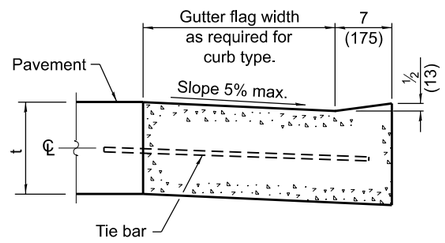
* This dimension shall be adjusted to align with joint on the adjacent pavement



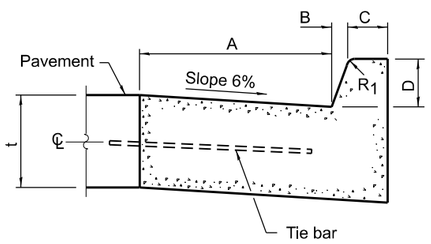
DETAIL Ⓐ
EXPANSION JOINT



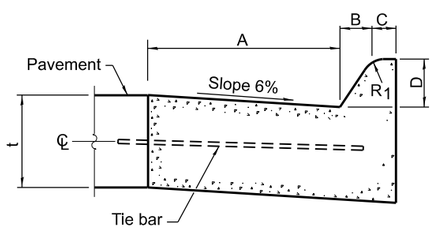
DEPRESSED CURB (TYPICAL)



DEPRESSED CURB ADJACENT TO CURB RAMP ACCESSIBLE TO THE DISABLED



BARRIER CURB

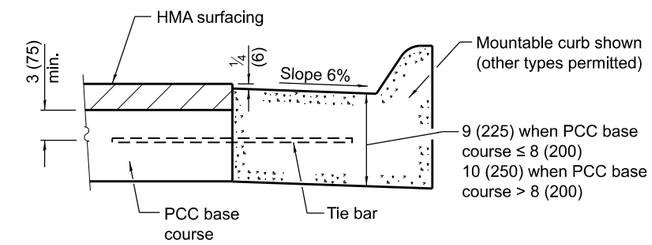


MOUNTABLE CURB

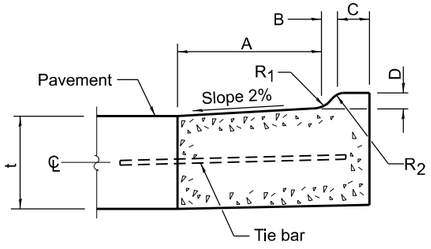
TABLE OF DIMENSIONS BARRIER CURB					
TYPE	A	B	C	D	R_1
B-6.06 * (B-15.15)	6 (150)	1 (25)	6 (150)	6 (150)	1 (25)
B-6.12 (B-15.3)	12 (300)	1 (25)	6 (150)	6 (150)	1 (25)
B-6.18 (B-15.45)	18 (450)	1 (25)	6 (150)	6 (150)	1 (25)
B-6.24 (B-15.60)	24 (600)	1 (25)	6 (150)	6 (150)	1 (25)
B-9.12 (B-22.30)	12 (300)	2 (50)	5 (125)	9 (225)	1 (25)
B-9.18 (B-22.45)	18 (450)	2 (50)	5 (125)	9 (225)	1 (25)
B-9.24 (B-22.60)	24 (600)	2 (50)	5 (125)	9 (225)	1 (25)

* For corner islands only.

TABLE OF DIMENSIONS MOUNTABLE CURB						
TYPE	A	B	C	D	R_1	R_2
M-2.06 (M-5.15)	6 (150)	2 (50)	4 (100)	2 (50)	3 (75)	2 (50)
M-2.12 (M-5.30)	12 (300)	2 (50)	4 (100)	2 (50)	3 (75)	2 (50)
M-4.06 (M-10.15)	6 (150)	4 (100)	3 (75)	4 (100)	3 (75)	NA
M-4.12 (M-10.30)	12 (300)	4 (100)	3 (75)	4 (100)	3 (75)	NA
M-4.18 (M-10.45)	18 (450)	4 (100)	3 (75)	4 (100)	3 (75)	NA
M-4.24 (M-10.60)	24 (600)	4 (100)	3 (75)	4 (100)	3 (75)	NA
M-6.06 (M-15.15)	6 (150)	6 (150)	2 (50)	6 (150)	2 (50)	NA
M-6.12 (M-15.30)	12 (300)	6 (150)	2 (50)	6 (150)	2 (50)	NA
M-6.18 (M-15.45)	18 (450)	6 (150)	2 (50)	6 (150)	2 (50)	NA
M-6.24 (M-15.60)	24 (600)	6 (150)	2 (50)	6 (150)	2 (50)	NA



ADJACENT TO PCC BASE COURSE WITH HMA SURFACING



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

DOWEL BAR TABLE

PAVEMENT THICKNESS	DOWEL BAR DIAMETER
10 (250) and greater	1½ (38)
8.01 (201) to 9.99 (249)	1¼ (32)
8 (200) and less	1 (25)

GENERAL NOTES

The bottom slope of combination curb and gutter constructed adjacent to pcc pavement shall be the same slope as the subbase or 6% when subbase is omitted.

t = Pavement thickness.

Longitudinal joint tie bars shall be No. 5 (No. 16) at 24 (600) centers in accordance with details for longitudinal construction joint shown on Standard 420001.

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

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

See Standard 606301 for details of corner islands except reference to Standard 606001 does not apply.

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

Illinois Department of Transportation

APPROVED January 1, 2022
ENGINEER OF LOCAL ROADS AND STREETS
APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

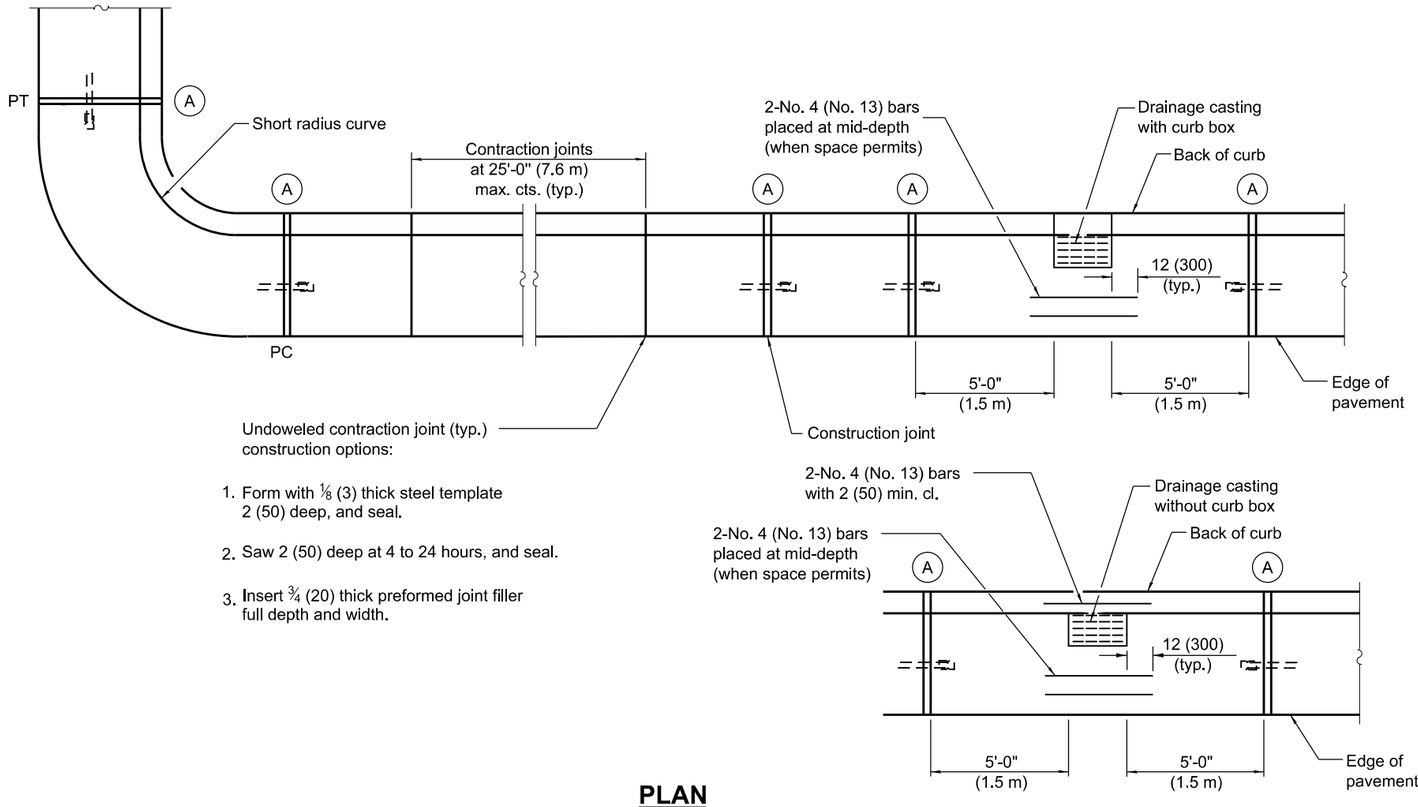
ISSUED 1-1-18

DATE	REVISIONS
1-1-22	Revised contraction joint spacing
	adjacent to PCC pvmt. and DOWEL
	BAR TABLE.
1-1-18	New Standard.

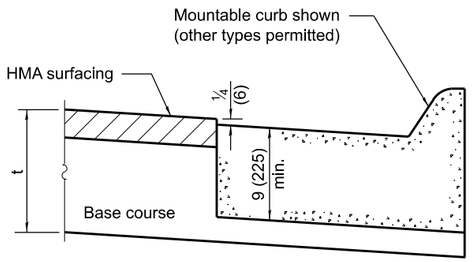
CONCRETE CURB TYPE B AND COMBINATION CONCRETE CURB AND GUTTER

(Sheet 1 of 2)

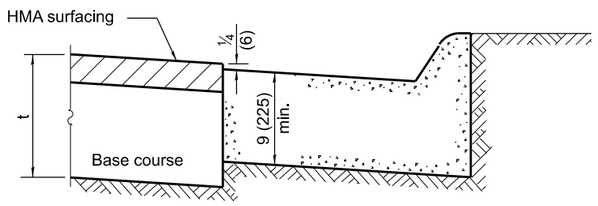
STANDARD B.L.R. 28-1



PLAN

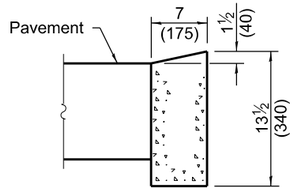


ON DISTURBED SUBGRADE

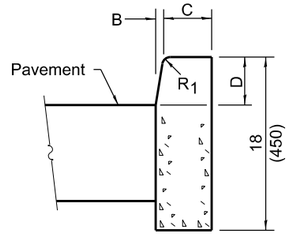


ON UNDISTURBED SUBGRADE

ADJACENT TO FLEXIBLE PAVEMENT

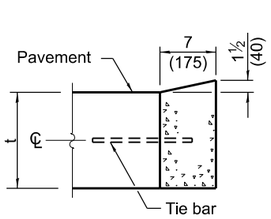


DEPRESSED CURB

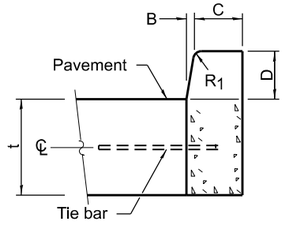


BARRIER CURB

ADJACENT TO FLEXIBLE PAVEMENT



DEPRESSED CURB



BARRIER CURB

ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE

CONCRETE CURB TYPE B

Illinois Department of Transportation

APPROVED January 1, 2022
ENGINEER OF LOCAL ROADS AND STREETS
APPROVED January 1, 2022
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18

CONCRETE CURB TYPE B AND COMBINATION CONCRETE CURB AND GUTTER

(Sheet 2 of 2)

STANDARD B.L.R. 28-1