



# Illinois Department of Transportation

## Memorandum

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To: Highway Standards Users  
From: Jack A. Elston  
Subject: Revision #224  
Date: September 4, 2020

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Revision #224 of the Highway Standards, effective January 1, 2021, is now available on the department's website.

The revisions are as follows:

<u>Removed</u>	<u>Inserted</u>	<u>Remarks</u>
Division 000 Index January 1, 2020	Division 000 Index January 1, 2020	Updated.
000001-07	000001-08	Updated fonts, abbreviations and symbols.
Division 200 Index January 1, 2020	Division 200 Index January 1, 2020	Updated.
Division 300 Index January 1, 2020	Division 300 Index January 1, 2020	Updated.
Division 400 Index January 1, 2020	Division 400 Index January 1, 2020	Updated.
424006-04	424006-05	Clarified minimum crosswalk width and locations.
424021-05	424021-06	Added crosswalk striping and a "buffer" for wide sidewalks.
Division 500 Index January 1, 2020	Division 500 Index January 1, 2020	Updated.
542401-03	542401-04	Revised THICKNESS values in table.
542406-03	542406-04	Revised THICKNESS values in table.

<u>Removed</u>	<u>Inserted</u>	<u>Remarks</u>
Division 600 Index January 1, 2020	Division 600 Index January 1, 2021	Updated.
602106-02	602106-03	Revised openings in lid to fit the 36 (915) width of the revised concrete median barrier.
602401-06	602401-07	Revised Note 1 and lifting hole general note.
602402-02	602402-03	Revised Note 1 and lifting hole general note..
602406-10	602406-11	Revised Note 1, Note 2 and lifting hole general note..
602411-08	602411-09	Revised Note 1 and lifting hole general note.
602416-08	602416-09	Revised Note 1 and lifting hole general note.
602421-08	602421-09	Revised Note 1 and lifting hole general note.
602426-02	602426-03	Revised Note 1.
602501-05	602501-06	Revised lifting hole general note.
602506-02	602506-03	Revised lifting hole general note.
604071-05	604071-06	Removed "safety bar" from frame.
604076-04	604076-05	Removed "safety bar" from frame.
604081-04	604081-05	Removed "safety bar" from frame.
604086-03	604086-04	Removed "safety bar" from frame.
604091-03	604091-04	Removed "safety bar" from frame.
610001-08	610001-09	Revised Section B-B, precast box outlet, anchor bolts, rebar and curb details. Added pipe elbows and WWR note.

<u>Removed</u>	<u>Inserted</u>	<u>Remarks</u>
631031-16	631031-17	Added Detail A and revised plate dimensions on sheet 4.
637006-04	637006-05	Revised Typical and Variable Cross-Sections. Added keyway anchor method and hook bars.
642006	642006-01	Added minimum width of paved shoulder for bicycle accommodations.
Division 700 Index January 1, 2020	Division 700 Index January 1, 2021	Updated.
701400-09	701400-10	Removed Work Zone Public Information sign and its note. Revised stationary sign gen. note.
701446-10	701446-11	Corrected symbol for type II barricade with steady burn monodirectional light and altered device spacing callout.
Division 800 Index January 1, 2020	Division 800 Index January 1, 2021	Updated.
814006-02	814006-03	Corrected dimension in Portland Cement Concrete Plan view.
878001-10	878001-11	Revised anchor rod end in Type E detail.
Standards by Subject/Title January 1, 2020	Standards by Subject/Title January 1, 2021	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.

January 1, 2021



**Standards by Division**

**DIVISION 200 EARTHWORK, LANDSCAPING, and EROSION CONTROL**

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**STD. NO. TITLE**

**EARTHWORK**

202001-01 Earth Median Ditch Check

**EROSION CONTROL**

280001-07 Temporary Erosion Control Systems

285001-02 Fabric Formed Concrete Revetment Mats

January 1, 2021



**Standards by Division**

**DIVISION 300 SUBGRADES, SUBBASES, and BASE COURSES**

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**STD. NO. TITLE**

**BASE COURSE**

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



## Standards by Division

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**DIVISION 400 SURFACE COURSES, PAVEMENTS, REHABILITATION, AND SHOULDERS**


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

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

**PORTLAND CEMENT CONCRETE PAVEMENTS AND SIDEWALKS**

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

**PAVEMENT REHABILITATION**

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

**SHOULDERS**

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



## Standards by Division

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**DIVISION 500 BRIDGES and CULVERTS**


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



## Standards by Division

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**DIVISION 600 INCIDENTAL CONSTRUCTION**


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<b>STD. NO.</b>	<b>TITLE</b>
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601001-05	Pipe Underdrains
601101-02	Concrete Headwall for Pipe Underdrain
602001-02	Catch Basin, Type A
602006-04	Catch Basin, Type B
602011-02	Catch Basin, Type C
602016-02	Catch Basin, Type D
602106-03	Drainage Structures, Types 4 & 5
602301-04	Inlet, Type A
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
602416-09	Precast Manhole, Type A, 8' (2.44 m) Diameter
602421-09	Precast Manhole, Type A, 9' (2.74 m) Diameter
602426-03	Precast Manhole, Type A, 10' (3.05 m) Diameter
602501-06	Precast Valve Vault, Type A, 4' (1.22 m) Diameter
602506-03	Precast Valve Vault, Type A, 5' (1.52 m) Diameter
602601-06	Precast Reinforced Concrete Flat Slab Top
602701-02	Manhole Steps
604001-05	Frame and Lids, Type 1
604006-05	Frame and Grate, Type 3
604011-05	Frame and Grate, Type 3V
604016-04	Frame and Grate, Type 4
604021-04	Base, Frame and Lids, Type 5
604026-03	Frame and Grate, Type 6
604031-03	Grate, Type 7
604036-03	Grate, Type 8
604041-03	Frame and Grate, Type 9
604046-03	Frame and Grate, Type 10
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604076-05	Frame and Grate, Type 21
604081-05	Frames and Grates, Type 22
604086-04	Frame and Grate, Type 23
604091-04	Frame and Grate, Type 24



604101-01	Median Inlet for 24" (600 mm) Reinforced Concrete Pipe
604106-01	Median Inlet for 36" (900 mm) Reinforced Concrete Pipe
606001-07	Concrete Curb Type B and Combination Concrete Curb and Gutter
606006-04	Outlet for Concrete Curb and Gutter, Type B-6.24 (B-15.60)
606101-05	Type A Gutter (Inlet, Outlet, and Entrance)
606106-05	Outlet, Type I for Type A Gutter
606111-03	Outlets, Type 2 for Type A Gutter
606201-04	Type B Gutter (Inlet, Outlet, and Entrance)
606206-04	Outlet, Type 1 for Type B Gutter
606211-04	Outlets, Type 2 for Type B Gutter
606301-04	PC Concrete Islands And Medians
606306-04	Corrugated PC Concrete Medians
606401-02	Paved Ditch
610001-09	Shoulder Inlet With Curb

### **SAFETY RELATED ITEMS**

630001-12	Steel Plate Beam Guardrail
630006	Non-blocked Steel Plate Beam Guardrail
630101-10	Strong Post Guardrail Attached to Culvert
630106-02	Long-Span Guardrail Over Culvert
630111-01	Weak Post Guardrail Attached to Culvert
630116	Back Side Protection of Guardrail
630201-07	PCC/HMA Stabilization at Steel Plate Beam Guardrail
630301-09	Shoulder Widening for Type 1 (Special) Guardrail Terminals
631006-08	Traffic Barrier Terminal, Type 1B
631011-10	Traffic Barrier Terminal, Type 2
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631031-17	Traffic Barrier Terminal, Type 6
631032-09	Traffic Barrier Terminal, Type 6A
631033-08	Traffic Barrier Terminal, Type 6B
631046-04	Traffic Barrier Terminal, Type 10
631051-03	Traffic Barrier Terminal, Type 11
635001-02	Delineators
636001-02	Cable Road Guard Single Strand
637006-05	Concrete Barrier Double Face, 44 in. (1120 mm) Height
638101-02	Concrete Glare Screen
639001-02	Sight Screen Precast Prestressed Concrete Panel Wall
640001-01	Sight Screen Chain Link Fence
641001-01	Sight Screen Cedar Stockade Fence Type S
641006-01	Sight Screen Wood Plank Fence Type P
642001-02	Shoulder Rumble Strips, 16 in.
642006-01	Shoulder Rumble Strips, 8 in.
643001-02	Sand Module Impact Attenuators

### **OTHER ITEMS**

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



## Standards by Division

**DIVISION 700 WORK ZONE TRAFFIC CONTROL AND PROTECTION,  
SIGNING, AND PAVEMENT MARKING**


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<b>STD. NO.</b>	<b>TITLE</b>
<b>WORK ZONE TRAFFIC CONTROL AND PROTECTION</b>	
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701006-05	Off-Road Operations, 2L, 2W, 15' (4.5 m) to 24" (600 mm) From Pavement Edge
701011-04	Off-Road Moving Operations, 2L, 2W, Day Only
701101-05	Off-Road Operations, Multilane, 15' (4.5 m) to 24" (600 mm) From Pavement Edge
701106-02	Off-Road Operations, Multilane, More Than 15' (4.5 m) Away
701201-05	Lane Closure, 2L, 2W, Day Only, for Speeds $\geq$ 45 MPH
701206-05	Lane Closure, 2L, 2W, Night Only, for Speeds $\geq$ 45 MPH
701301-04	Lane Closure, 2L, 2W, Short Time Operations
701306-04	Lane Closure, 2L, 2W, Slow Moving Operations Day Only, for Speeds $\geq$ 45 MPH
701311-03	Lane Closure, 2L, 2W, Moving Operations - Day Only
701316-13	Lane Closure, 2L, 2W, Bridge Repair, for Speeds $\geq$ 45 MPH
701321-18	Lane Closure, 2L, 2W, Bridge Repair with Barrier
701326-04	Lane Closure, 2L, 2W, Pavement Widening, for Speeds $\geq$ 45 MPH
701331-05	Lane Closure, 2L, 2W, With Run-Around, for Speeds $\geq$ 45 MPH
701336-07	Lane Closure, 2L, 2W, Work Areas in Series, for Speeds $\geq$ 45 MPH
701400-10	Approach to Lane Closure, Freeway/Expressway
701401-12	Lane Closure, Freeway/Expressway
701402-12	Lane Closure, Freeway/Expressway, with Barrier
701406-12	Lane Closure, Freeway/Expressway, Day Operations Only
701411-09	Lane Closure, Multilane, at Entrance or Exit Ramp, for Speeds $\geq$ 45 MPH
701416-11	Lane Closure, Freeway/Expressway, with Crossover and Barrier
701421-08	Lane Closure, Multilane, Day Operations Only, for Speeds $\geq$ 45 MPH to 55 MPH
701422-10	Lane Closure, Multilane, for Speeds $\geq$ 45 MPH to 55 MPH
701423-10	Lane Closure, Multilane, with Barrier, for Speeds $\geq$ 45 MPH to 55 MPH
701426-09	Lane Closure, Multilane, Intermittent or Moving Operation, for Speeds $\geq$ 45 MPH
701427-05	Lane Closure, Multilane, Intermittent or Moving Operation, for Speeds $\leq$ 40 MPH
701428-01	Traffic Control, Setup and Removal, Freeway/Expressway
701431-13	Lane Closure, Multilane, Undivided with Crossover, for Speeds $\geq$ 45 MPH to 55 MPH
701446-11	Two Lane Closure, Freeway/Expressway
701451-05	Ramp Closure Freeway/Expressway
701456-05	Partial Exit Ramp Closure Freeway/Expressway
701501-06	Urban Lane Closure, 2L, 2W, Undivided
701502-09	Urban Lane Closure, 2L, 2W, with Bidirectional Left Turn Lane
701601-09	Urban Lane Closure, Multilane, 1W or 2W with Nontraversable Median
701602-10	Urban Lane Closure, Multilane, 2W with Bidirectional Left Turn Lane
701606-10	Urban Single Lane Closure, Multilane, 2W with Mountable Median
701611-01	Urban Half Road Closure, Multilane, 2W with Mountable Median
701701-10	Urban Lane Closure, Multilane Intersection

701801-06 Sidewalk, Corner or Crosswalk Closure  
701901-08 Traffic Control Devices  
704001-08 Temporary Concrete Barrier

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720001-01 Sign Panel Mounting Details  
720006-04 Sign Panel Erection Details  
720011-01 Metal Posts for Signs, Markers and Delineators  
720016-04 Mast Arm Mounted Street Name Signs  
720021-02 Sign Panels, Extruded Aluminum Type  
725001-01 Object and Terminal Markers  
728001-01 Telescoping Steel Sign Support  
729001-01 Applications of Types A and B Metal Posts (For Signs & Markers)  
731001-01 Base for Telescoping Steel Sign Support

**PAVEMENT MARKING**

780001-05 Typical Pavement Markings  
781001-04 Typical Applications Raised Reflective Pavement Markers  
782001-01 Curb Reflectors  
782006-01 Guardrail and Barrier Wall Reflector Mounting Details



## Standards by Division

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**DIVISION 800 ELECTRICAL**


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**STD. NO. TITLE****GENERAL ELECTRICAL REQUIREMENTS**

805001-01 Electrical Service Installation Details

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812001-01 Raceways Embedded in Structure

814001-03 Handholes

814006-03 Double Handholes

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821001 Underpass Lighting Wall Mount

821006 Underpass Lighting Suspended

821101-02 Luminaire Wiring in Pole

**LIGHTING – CONTROLLERS**

825001-04 Lighting Controller, Pole Mounted, 240V

825006-03 Lighting Controller, Pole Mounted, 480V

825011-04 Lighting Controller, Pedestal Mounted, 240V

825016-04 Lighting Controller, Pedestal Mounted, 480V

825021-04 Lighting Controller, Base Mounted, 240V

825026-04 Lighting Controller, Base Mounted, 480V

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830001-03 Light Pole Aluminum Mast Arm

830006-05 Light Pole Aluminum Davit Arm

830011-03 Light Pole Steel Mast Arm

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830021-03 Light Pole Steel Tenon Top

830026-01 Temporary Roadway Lighting

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835001-01 Light Tower

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877011-10 Steel Combination Mast Arm Assembly and Pole 16' Through 55'

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878001-11 Concrete Foundation Details

**TRAFFIC SIGNALS - SIGNAL HEADS**

880001-01 Span Wire Mounted Signals and Flashing Beacon Installation

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886006-01 Typical Layout for Detection Loops

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**Standards by Division**

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000001-08	Standard Symbols, Abbreviations and Patterns
001001-02	Areas of Reinforcement Bars
001006	Decimal of an Inch and of a Foot

**Standards by Division****DIVISION BLR LOCAL ROADS**

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<b>STD. NO.</b>	<b>TITLE</b>
BLR 10-7	PCC Pavement Special
BLR 14-12	Portland Cement Concrete Pavement (Nonreinforced)
BLR 17-4	Traffic Control Devices - Day Labor Construction
BLR 18-6	Traffic Control Devices - Day Labor Maintenance
BLR 20-7	Traffic Barrier Terminal - Type 5R
BLR 21-9	Typical Application of Traffic Control Devices for Construction on Rural Local Highways
BLR 22-7	Typ. Appl. of T.C.D. for Rural Loc. Hwys. (2-Lane 2 Way Rural Traff.) (Rd. Closed to Thru Traff.)
BLR 23-4	Traffic Barrier Terminal Type 1
BLR 24-2	Mailbox Turnout for Local Roads
BLR 25-1	Type 1A Barricade for Non-NHS Routes
BLR 26-3	Steel Plate Beam Guardrail 29 in. (731 mm) Height
BLR 27-1	Traffic Barrier Terminal Type 5A
BLR 28	Concrete Curb Type B and Combination Concrete Curb and Gutter



<u>SUBJECT/TITLE</u>	<u>STD. NO.</u>
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## F

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Lighting Controller, Pedestal Mounted, 240V .....	825011
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**M**

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     Type 1, for Type A Gutter .....606106  
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     Type 2, for Type A Gutter .....606111  
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## S

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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


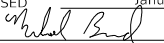
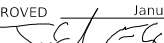
Sight Screen, Concrete Panel Wall, Precast Prestressed .....	639001
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Sight Screen, Wood Fence, Wood Plank .....	641006
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Tee, Concrete Pipe .....	542606
Traffic Barrier Terminal:	
Type 1 .....	BLR-23
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Type 2 .....	631011
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Traffic Control:	
Devices .....	701901
Devices:	
Type 1A Barricade for Non-NHS Routes .....	BLR 25
Day Labor Construction .....	BLR 17
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Typical Application of, for Construction on Rural Local Highways (Two-Lane Two Way Rural Traffic) (Road Closed to Thru Traffic) .....	BLR 22
Lane Closure, 2L, 2W:	
Bridge Repair, for Speeds $\geq$ 45 MPH.....	701316
Bridge Repair with Barrier.....	701321
Day Only, for Speeds $\geq$ 45 MPH.....	701201
Moving Operations - Day Only.....	701311
Night Only, for Speeds $\geq$ 45 MPH.....	701206
Pavement Widening, for Speeds $\geq$ 45 MPH.....	701326
Short Time Operations .....	701301
Slow Moving Operations Day Only, for Speeds $\geq$ 45 MPH.....	701306
With Run-Around, for Speeds $\geq$ 45 MPH .....	701331
Work Areas in Series, for Speeds $\geq$ 45 MPH .....	701336
Lane Closure, Freeway/Expressway .....	701401
Lane Closure, Freeway/Expressway:	
Approach to .....	701400
Day Operations Only .....	701406
Sidewalk, Corner or Crosswalk Closure.....	701801

Two Lane Closure .....	701446
with Barrier .....	701402
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Lane Closure, Multilane:	
at Entrance or Exit Ramp, for Speeds $\geq$ 45 MPH .....	701411
Day Operations Only, for Speeds $\geq$ 45 MPH to 55 MPH .....	701421
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Intermittent or Moving Operation, for Speeds $\geq$ 45 MPH .....	701426
Intermittent or Moving Operation, for Speeds $\leq$ 40 MPH .....	701427
Undivided With Crossover, for Speeds $\geq$ 45 MPH to 55 MPH .....	701431
with Barrier, for Speeds $\geq$ 45 MPH to 55 MPH .....	701423
Lane Closure, Urban:	
2L, 2W, Undivided .....	701501
2L, 2W, with Bidirectional Left Turn Lane .....	701502
Multilane, 1W or 2W with Nontraversable Median .....	701601
Multilane, 2W with Bidirectional Left Turn Lane .....	701602
Multilane, Single Lane Closure, 2W with Mountable Median .....	701606
Multilane, Half Road, Closure, 2W with Mountable Median .....	701611
Multilane Intersection .....	701701
Off-Road Operations:	
2L 2W, 15 ft. (4.5 m) to 24 in. (600 mm) From Pavement Edge .....	701006
2L 2W, More Than 15 ft. (4.5 m) Away .....	701001
Moving, 2L 2W, Day Only .....	701011
Multilane, 15 ft. (4.5 m) to 24 in. (600 mm) From Pavement Edge .....	701101
Multilane, More Than 15 ft. (4.5 m) Away .....	701106
Setup and Removal, Freeway/Expressway .....	701428
Traffic Signal Grounding & Bonding .....	873001
Traffic Signal Mounting Details, Post and Bracket Mounted .....	880006
Traffic Signal Mounting Details, Span Wire Mounted and Flashing Beacon .....	880001
U-Z	
Uninterruptable Power Supply (UPS) .....	862001
Valve Vault, Precast, Type A, 4 ft. (1.22 m) Diameter .....	602501
Valve Vault, Precast, Type A, 5 ft. (1.52 m) Diameter .....	602506

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

 Illinois Department of Transportation	
PASSED <u>January 1, 2021</u>  ENGINEER OF POLICY AND PROCEDURES	ISSUED 1-1-97
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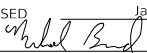
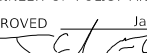
DATE	REVISIONS
1-1-21	Updated fonts, abbreviations and symbols.
1-1-19	Added new symbols.

**STANDARD SYMBOLS,  
ABBREVIATIONS  
AND PATTERNS**

(Sheet 1 of 9)

**STANDARD 000001-08**

<u>ADJUSTMENT ITEMS</u>		<u>EX</u>	<u>PR</u>	<u>ALIGNMENT ITEMS</u>		<u>EX</u>	<u>PR</u>	<u>DRAINAGE ITEMS</u>		<u>EX</u>	<u>PR</u>
Structure To Be Adjusted			ADJ	Baseline	_____	_____		Channel or Stream Line	-----	-----	
Structure To Be Cleaned			C	Centerline	-----	-----		Culvert Line	-----	-----	
Main Structure To Be Filled			FM	Centerline Break Circle	o	o		Grading & Shaping Ditches	-----	-----	
Structure To Be Filled			F	Baseline Symbol	BL	BL		Drainage Boundary Line	////	////	
Structure To Be Filled Special			FSP	Centerline Symbol	CL	CL		Paved Ditch	=====	=====	
Structure To Be Removed			R	PI Indicator	Δ	Δ		Aggregate Ditch	=====	=====	
Structure To Be Reconstructed			REC	Point Indicator	o	o		Pipe Underdrain	=====	=====	
Structure To Be Reconstructed Special			RSP	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=		Storm Sewer	=====	=====	
Frame and Grate To Be Adjusted			A	<u>BOUNDARIES ITEMS</u>		<u>EX</u>	<u>PR</u>	Flowline	FL	FL	
Frame and Lid To Be Adjusted			A	Dashed Property Line	-----	-----		Ditch Check	◆	◆	
Domestic Service Box To Be Adjusted			A	Solid Property/Lot Line	_____	_____		Headwall	-	∩	
Valve Vault To Be Adjusted			A	Section/Grant Line	-----	-----		Inlet	□	■	
Special Adjustment			SP	Quarter Section Line	-----	-----		Manhole	⊙	⊙	
Item To Be Abandoned			AB	Quarter/Quarter Section Line	-----	-----		Summit	↔	↔	
Item To Be Moved			M	County/Township Line	-----	-----		Roadway Ditch Flow	~→	~→	
Item To Be Relocated			REL	State Line	-----	-----		Swale	→	→	
Pavement Removal and Replacement				Chiseled Square Found	□	□		Catch Basin	○	●	
				Iron Pipe Found	○	●		Culvert End Section	◁	◁	
				Iron Pipe Set	●	●		Water Surface Indicator	▽	▽	
				Survey Marker	◐	◐		Riprap	▒	▒	
				Property Line Symbol	PL	PL		<u>HYDRAULICS ITEMS</u>		<u>EX</u>	<u>PR</u>
				Same Ownership Symbol (Half Size)	↗	↗		Overflow	↪	↪	
				Northwest Quarter Corner (Half Size)	⊙	⊙		Sheet Flow	→	→	
				Section Corner (Half Size)	⊙	⊙		Hydrant Outlet	→	→	
				Southeast Quarter Corner (Half Size)	⊙	⊙		<b>STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS</b> (Sheet 2 of 9) <b>STANDARD 000001-08</b>			


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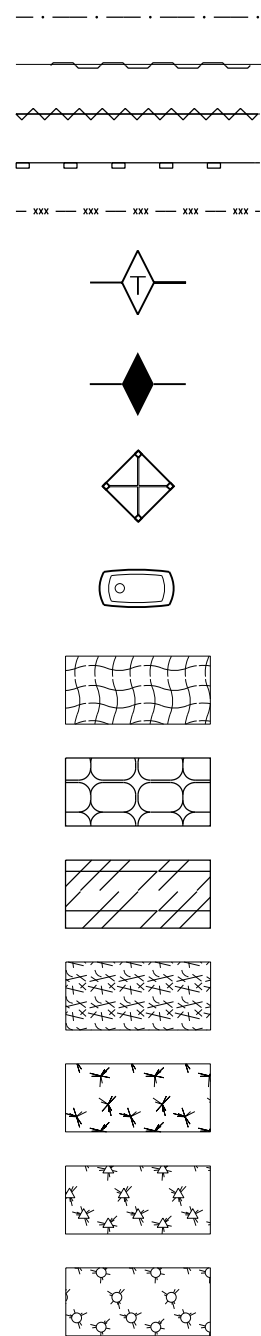


**EROSION & SEDIMENT CONTROL ITEMS**

**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

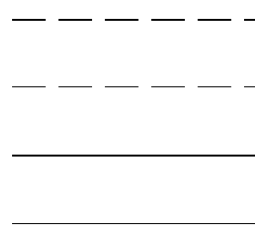


**CONTOUR ITEMS**

**EX**

**PR**

- Approx. Index Line
- Approx. Intermediate Line
- Index Contour
- Intermediate Contour

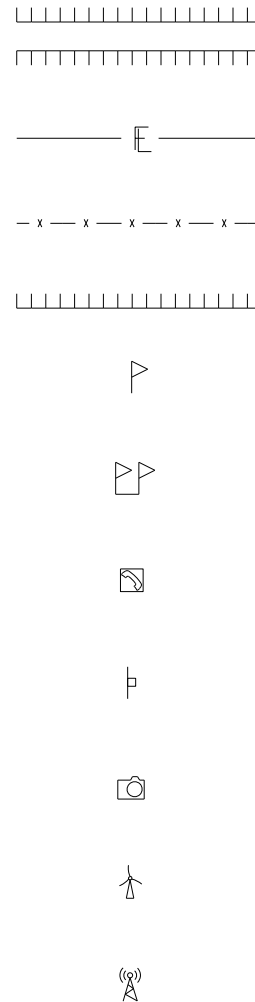


**NON-HIGHWAY IMPROVEMENT ITEMS**

**EX**

**PR**

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



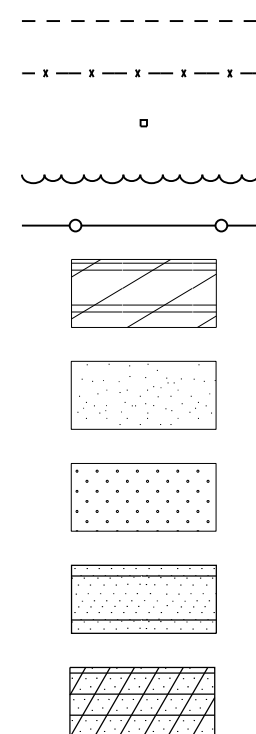
\*Intelligent Transportation Systems

**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

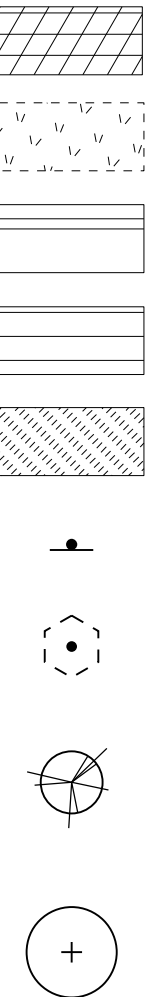


**EXISTING LANDSCAPING ITEMS (contd.)**

**EX**

**PR**

- Seeding Class 5
- Seeding Class 7
- Seedlings Type 1
- Seedlings Type 2
- Sodding
- Mowstake w/Sign
- Tree Trunk Protection
- Evergreen Tree
- Shade Tree

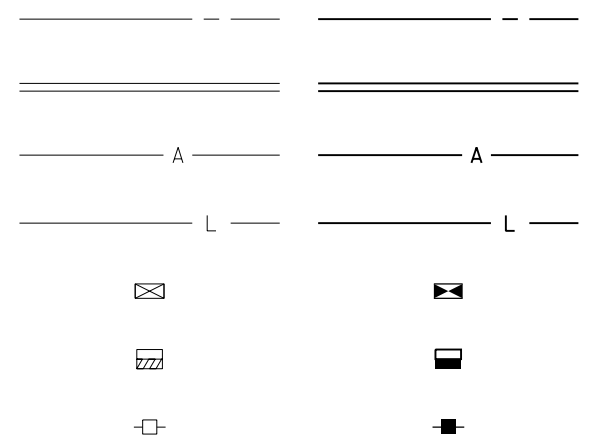


**LIGHTING**

**EX**

**PR**

- Duct
- Conduit
- Electrical Aerial Cable
- Electrical Buried Cable
- Controller
- Underpass Luminaire
- Power Pole



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**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

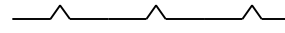


**PAVEMENT (MISC.)**

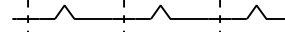
**EX**

**PR**

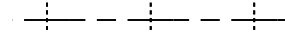
Keyed Long. Joint



Keyed Long. Joint w/Tie Bars



Sawed Long. Joint w/Tie Bars



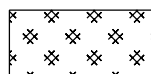
Bituminous Shoulder



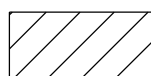
Bituminous Taper



Stabilized Driveway



Widening



**PAVEMENT MARKINGS**

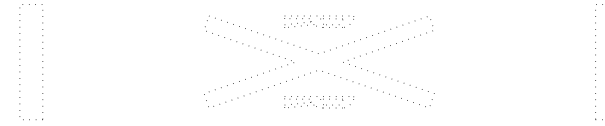
**EX**

**PR**

Handicap Symbol



RR Crossing



Raised Marker Amber 1 Way



Raised Marker Amber 2 Way



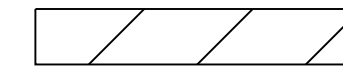
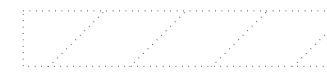
Raised Marker Crystal 1 Way



Two Way Turn Left



Shoulder Diag. Pattern



Skip-Dash White



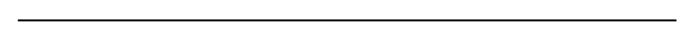
Skip-Dash Yellow



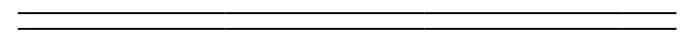
Stop Line



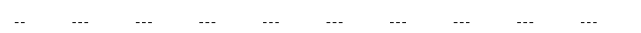
Solid Line



Double Centerline



Dotted Lines



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**STANDARD 000001-08**

**PAVEMENT MARKINGS**  
**(contd.)**

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

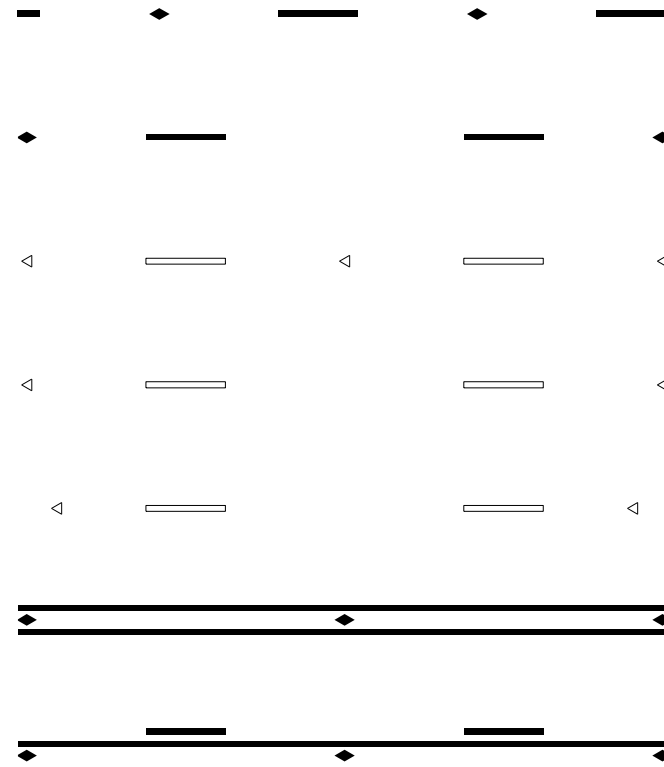
Urban Left Turn Only

Urban Right Turn Only

Urban Thru Only

**EX**

**PR**



ONLY  
ONLY  
ONLY



**RAILROAD ITEMS**

**EX**

**PR**

Abandoned Railroad



Railroad



Railroad Point



Control Box



Crossing Gate



Flashing Signal



Railroad Cant. Mast Arm



Crossbuck

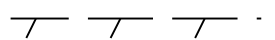


**REMOVAL ITEMS**

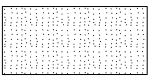
**EX**

**PR**

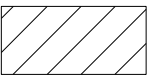
Removal Tic



Bituminous Removal



Hatch Pattern



Tree Removal Single



**RIGHT OF WAY ITEMS**

**EX**

**PR**

Future ROW Corner Monument



ROW Marker



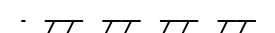
ROW Line



Easement



Temporary Easement



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ABBREVIATIONS  
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**STANDARD 000001-08**

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Urban LT & RT Turn Arrow

Urban Thru Arrow

**PAVEMENT MARKINGS**  
**(contd.)**

**EX**

**PR**

Urban U-Turn



Urban Combined U-Turn



Rural Combination Left



Rural Combination Right



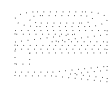
Rural Left Turn Arrow



Rural Right Turn Arrow



Rural Left Turn Only



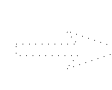
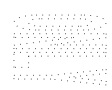
**ONLY ONLY ONLY**



Rural Right Turn Only



Rural Thru Only



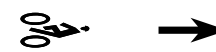
Rural Thru Arrow



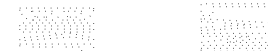
Rural Lt & Rt Turn Arrow



Bike Lane Symbol



Bike Lane Text



Bike Path Shared



Bike Shared Roadway



Lane Drop Symbol



Wrong Way Arrow



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**STANDARD SYMBOLS,  
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**RIGHT OF WAY ITEMS  
(contd.)**

	<u>EX</u>	<u>PR</u>
Access Control Line	—	— AC —
Access Control Line & ROW	— AC —	— AC —
Access Control Line & ROW with Fence	— x — AC —	— x — AC — x —
Excess ROW Line		— XS —

**ROADWAY PLAN  
ITEMS**

	<u>EX</u>	<u>PR</u>
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)		
Match Line		STA. 45+00
Slope Limit Line	---	
Typical Cross-Section Line	---	---

**ROADWAY PROFILES**

	<u>EX</u>	<u>PR</u>
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**

	<u>EX</u>	<u>PR</u>
Cone, Drum or Barricade		○
Barricade Type II		
Barricade Type III		TT
Barricade With Edge Line		
Flashing Light Sign		○
Panels I		
Panels II		
Direction of Traffic		➔
Sign Flag (Half Size)		◇

**SIGNING ITEMS  
(contd.)**

	<u>EX</u>	<u>PR</u>
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)		
Left Lane Closed Ahead W20-5L(O) (Half Size)		
Right Lane Closed Ahead W20-5R(O) (Half Size)		
Road Closed Ahead W20-3(O) (Half Size)		
Road Construction Ahead W20-1(O) (Half Size)		
Single Lane Ahead (Half Size)		
Transition Left W4-2L (Half Size)		
Transition Right W4-2R (Half Size)		

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**STANDARD SYMBOLS,  
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(Sheet 7 of 9)

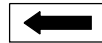
**STANDARD 000001-08**

**SIGNING ITEMS**  
**(contd.)**

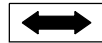
**EX**

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



One Way Left R6-1L  
(Half Size)



One Way Right R6-1R  
(Half Size)



Left Turn Lane R3-I100L  
(Half Size)



Keep Left R4-7AL  
(Half Size)



Keep Left R4-7BL  
(Half Size)



Keep Right R4-7AR  
(Half Size)



Keep Right R4-7BR  
(Half Size)



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



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



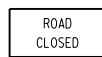
No Left Turn R3-2  
(Half Size)



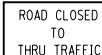
No Right Turn R3-1  
(Half Size)



Road Closed R11-2  
(Half Size)



Road Closed Thru Traffic R11-2  
(Half Size)

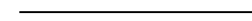


**STRUCTURES ITEMS**

**EX**

**PR**

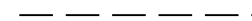
Box Culvert Barrel



Box Culvert Headwall



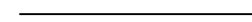
Bridge Pier



Bridge



Retaining Wall



Temporary Sheet Piling



**TRAFFIC SHEET**  
**ITEMS**

**EX**

**PR**

Cable Number



Left Turn Green



Left Turn Yellow



Signal Backplate



Signal Section 8" (200 mm)



Signal Section 12" (300 mm)



Walk/Don't Walk Letters



Walk/Don't Walk Symbols



**TRAFFIC SIGNAL**  
**ITEMS**

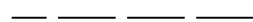
**EX**

**PR**

Galv. Steel Conduit



Underground Cable



Detector Loop Line



Detector Loop Large



Detector Loop Small



Detector Loop Quadrapole



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**STANDARD SYMBOLS,  
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**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



**UNDERGROUND UTILITY ITEMS**

**EX**

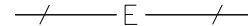
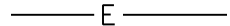
**PR**

**ABANDONED**

Cable TV



Electric Cable



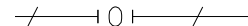
Fiber Optic



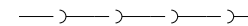
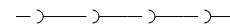
Gas Pipe



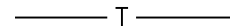
Oil Pipe



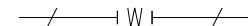
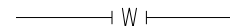
Sanitary Sewer



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



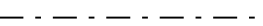
Evergreen Tree



Stump



Orchard/Nursery Line



Vegetation Line



Woods & Bush Line

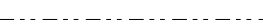


**WATER FEATURE ITEMS**

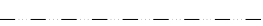
**EX**

**PR**

Stream or Drainage Ditch



Waters Edge



Water Surface Indicator



Water Point



Disappearing Ditch



Marsh



Marsh/Swamp Boundary



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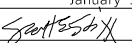
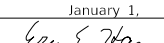
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**STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS**

(Sheet 9 of 9)

**STANDARD 000001-08**

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

 Illinois Department of Transportation  
 PASSED January 1, 2009  
  
 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			
$\frac{1}{64}$	0.0052	$\frac{1}{16}$	$\frac{1}{64}$	0.171875	$2\frac{1}{16}$	$\frac{1}{32}$	0.3385	$4\frac{1}{16}$	$\frac{3}{64}$	0.5052	$6\frac{1}{16}$	$\frac{4}{64}$	0.671875	$8\frac{1}{16}$	$\frac{27}{32}$	0.8385	$10\frac{1}{16}$
	0.0104	$\frac{1}{8}$		0.1771	$2\frac{1}{8}$		0.34375	$4\frac{1}{8}$		0.5104	$6\frac{1}{8}$		0.6771	$8\frac{1}{8}$		0.84375	$10\frac{1}{8}$
	0.015625	$\frac{3}{16}$		0.1823	$2\frac{3}{16}$		0.3490	$4\frac{3}{16}$		0.515625	$6\frac{3}{16}$		0.6823	$8\frac{3}{16}$		0.8490	$10\frac{3}{16}$
	0.0208	$\frac{1}{4}$		0.1875	$2\frac{1}{4}$		0.3542	$4\frac{1}{4}$		0.5208	$6\frac{1}{4}$		0.6875	$8\frac{1}{4}$		0.8542	$10\frac{1}{4}$
$\frac{1}{32}$	0.0260	$\frac{5}{16}$	$\frac{1}{32}$	0.1927	$2\frac{5}{16}$	$\frac{2}{64}$	0.359375	$4\frac{5}{16}$	$\frac{17}{32}$	0.5260	$6\frac{5}{16}$	$\frac{45}{64}$	0.6927	$8\frac{5}{16}$	$\frac{55}{64}$	0.859375	$10\frac{5}{16}$
	0.03125	$\frac{3}{8}$		0.1979	$2\frac{3}{8}$		0.3646	$4\frac{3}{8}$		0.53125	$6\frac{3}{8}$		0.6979	$8\frac{3}{8}$		0.8646	$10\frac{3}{8}$
	0.0365	$\frac{7}{16}$		0.203125	$2\frac{7}{16}$		0.3698	$4\frac{7}{16}$		0.5365	$6\frac{7}{16}$		0.703125	$8\frac{7}{16}$		0.8698	$10\frac{7}{16}$
	0.0417	$\frac{1}{2}$		0.2083	$2\frac{1}{2}$		0.3750	$4\frac{1}{2}$		0.5417	$6\frac{1}{2}$		0.7083	$8\frac{1}{2}$		0.8750	$10\frac{1}{2}$
$\frac{3}{64}$	0.046875	$\frac{9}{16}$	$\frac{1}{32}$	0.2135	$2\frac{9}{16}$	$\frac{25}{64}$	0.3802	$4\frac{9}{16}$	$\frac{35}{64}$	0.546875	$6\frac{9}{16}$	$\frac{23}{32}$	0.7135	$8\frac{9}{16}$	$\frac{57}{64}$	0.8802	$10\frac{9}{16}$
	0.0521	$\frac{3}{8}$		0.21875	$2\frac{3}{8}$		0.3854	$4\frac{3}{8}$		0.5521	$6\frac{3}{8}$		0.71875	$8\frac{3}{8}$		0.8854	$10\frac{3}{8}$
	0.0573	$\frac{11}{16}$		0.2240	$2\frac{11}{16}$		0.390625	$4\frac{11}{16}$		0.5573	$6\frac{11}{16}$		0.7240	$8\frac{11}{16}$		0.890625	$10\frac{11}{16}$
	0.0625	$\frac{3}{4}$		0.2292	$2\frac{3}{4}$		0.3958	$4\frac{3}{4}$		0.5625	$6\frac{3}{4}$		0.7292	$8\frac{3}{4}$		0.8958	$10\frac{3}{4}$
$\frac{1}{16}$	0.0677	$\frac{13}{16}$	$\frac{15}{64}$	0.234375	$2\frac{13}{16}$	$\frac{13}{32}$	0.4010	$4\frac{13}{16}$	$\frac{9}{16}$	0.5677	$6\frac{13}{16}$	$\frac{47}{64}$	0.734375	$8\frac{13}{16}$	$\frac{29}{32}$	0.9010	$10\frac{13}{16}$
	0.0729	$\frac{7}{8}$		0.2396	$2\frac{7}{8}$		0.40625	$4\frac{7}{8}$		0.5729	$6\frac{7}{8}$		0.7396	$8\frac{7}{8}$		0.90625	$10\frac{7}{8}$
	0.078125	$\frac{15}{16}$		0.2448	$2\frac{15}{16}$		0.4115	$4\frac{15}{16}$		0.578125	$6\frac{15}{16}$		0.7448	$8\frac{15}{16}$		0.9115	$10\frac{15}{16}$
	0.0833	1		0.2500	3		0.4167	5		0.5833	7		0.7500	9		0.9167	11
$\frac{3}{32}$	0.0885	$\frac{17}{16}$	$\frac{17}{64}$	0.2552	$3\frac{17}{16}$	$\frac{27}{64}$	0.421875	$5\frac{17}{16}$	$\frac{19}{32}$	0.5885	$7\frac{17}{16}$	$\frac{49}{64}$	0.7552	$9\frac{17}{16}$	$\frac{59}{64}$	0.921875	$11\frac{17}{16}$
	0.09375	$\frac{1}{8}$		0.2604	$3\frac{1}{8}$		0.4271	$5\frac{1}{8}$		0.59375	$7\frac{1}{8}$		0.7604	$9\frac{1}{8}$		0.9271	$11\frac{1}{8}$
	0.0990	$\frac{3}{16}$		0.265625	$3\frac{3}{16}$		0.4323	$5\frac{3}{16}$		0.5990	$7\frac{3}{16}$		0.765625	$9\frac{3}{16}$		0.9323	$11\frac{3}{16}$
	0.1042	$\frac{1}{4}$		0.2708	$3\frac{1}{4}$		0.4375	$5\frac{1}{4}$		0.6042	$7\frac{1}{4}$		0.7708	$9\frac{1}{4}$		0.9375	$11\frac{1}{4}$
$\frac{7}{64}$	0.109375	$\frac{5}{16}$	$\frac{9}{32}$	0.2760	$3\frac{5}{16}$	$\frac{7}{16}$	0.4427	$5\frac{5}{16}$	$\frac{39}{64}$	0.609375	$7\frac{5}{16}$	$\frac{25}{32}$	0.7760	$9\frac{5}{16}$	$\frac{15}{16}$	0.9427	$11\frac{5}{16}$
	0.1146	$\frac{3}{8}$		0.28125	$3\frac{3}{8}$		0.4479	$5\frac{3}{8}$		0.6146	$7\frac{3}{8}$		0.78125	$9\frac{3}{8}$		0.9479	$11\frac{3}{8}$
	0.1198	$\frac{7}{16}$		0.2865	$3\frac{7}{16}$		0.453125	$5\frac{7}{16}$		0.6198	$7\frac{7}{16}$		0.7865	$9\frac{7}{16}$		0.953125	$11\frac{7}{16}$
	0.1250	$\frac{1}{2}$		0.2917	$3\frac{1}{2}$		0.4583	$5\frac{1}{2}$		0.6250	$7\frac{1}{2}$		0.7917	$9\frac{1}{2}$		0.9583	$11\frac{1}{2}$
$\frac{1}{8}$	0.1302	$\frac{19}{16}$	$\frac{19}{64}$	0.296875	$3\frac{19}{16}$	$\frac{29}{64}$	0.4635	$5\frac{19}{16}$	$\frac{5}{8}$	0.6302	$7\frac{19}{16}$	$\frac{51}{64}$	0.796875	$9\frac{19}{16}$	$\frac{61}{64}$	0.9635	$11\frac{19}{16}$
	0.1354	$\frac{1}{8}$		0.3021	$3\frac{1}{8}$		0.46875	$5\frac{1}{8}$		0.6354	$7\frac{1}{8}$		0.8021	$9\frac{1}{8}$		0.96875	$11\frac{1}{8}$
	0.140625	$\frac{3}{16}$		0.3073	$3\frac{3}{16}$		0.4740	$5\frac{3}{16}$		0.640625	$7\frac{3}{16}$		0.8073	$9\frac{3}{16}$		0.9740	$11\frac{3}{16}$
	0.1458	$\frac{1}{4}$		0.3125	$3\frac{1}{4}$		0.4792	$5\frac{1}{4}$		0.6458	$7\frac{1}{4}$		0.8125	$9\frac{1}{4}$		0.9792	$11\frac{1}{4}$
$\frac{5}{64}$	0.1510	$\frac{11}{16}$	$\frac{5}{64}$	0.3177	$3\frac{11}{16}$	$\frac{31}{64}$	0.484375	$5\frac{11}{16}$	$\frac{41}{64}$	0.6510	$7\frac{11}{16}$	$\frac{13}{16}$	0.8177	$9\frac{11}{16}$	$\frac{31}{32}$	0.984375	$11\frac{11}{16}$
	0.15625	$\frac{3}{8}$		0.3229	$3\frac{3}{8}$		0.4896	$5\frac{3}{8}$		0.65625	$7\frac{3}{8}$		0.8229	$9\frac{3}{8}$		0.9896	$11\frac{3}{8}$
	0.1615	$\frac{7}{16}$		0.328125	$3\frac{7}{16}$		0.4948	$5\frac{7}{16}$		0.6615	$7\frac{7}{16}$		0.828125	$9\frac{7}{16}$		0.9948	$11\frac{7}{16}$
	0.1667	2		0.3333	4		0.5000	6		0.6667	8		0.8333	10		0.9167	12

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

DATE	REVISIONS
1-1-97	New Standard.

## DECIMAL OF AN INCH AND OF A FOOT

STANDARD 001006

Illinois Department of Transportation

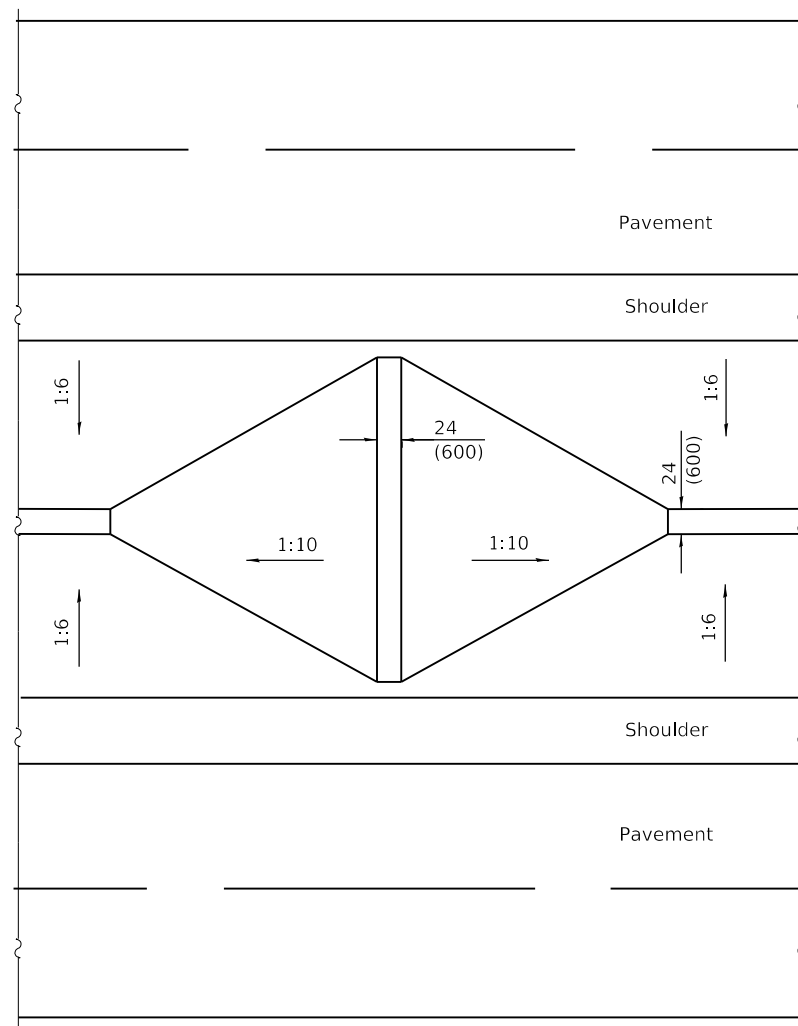
PASSED January 1, 1997

ENGINEER OF POLICY AND PROCEDURES

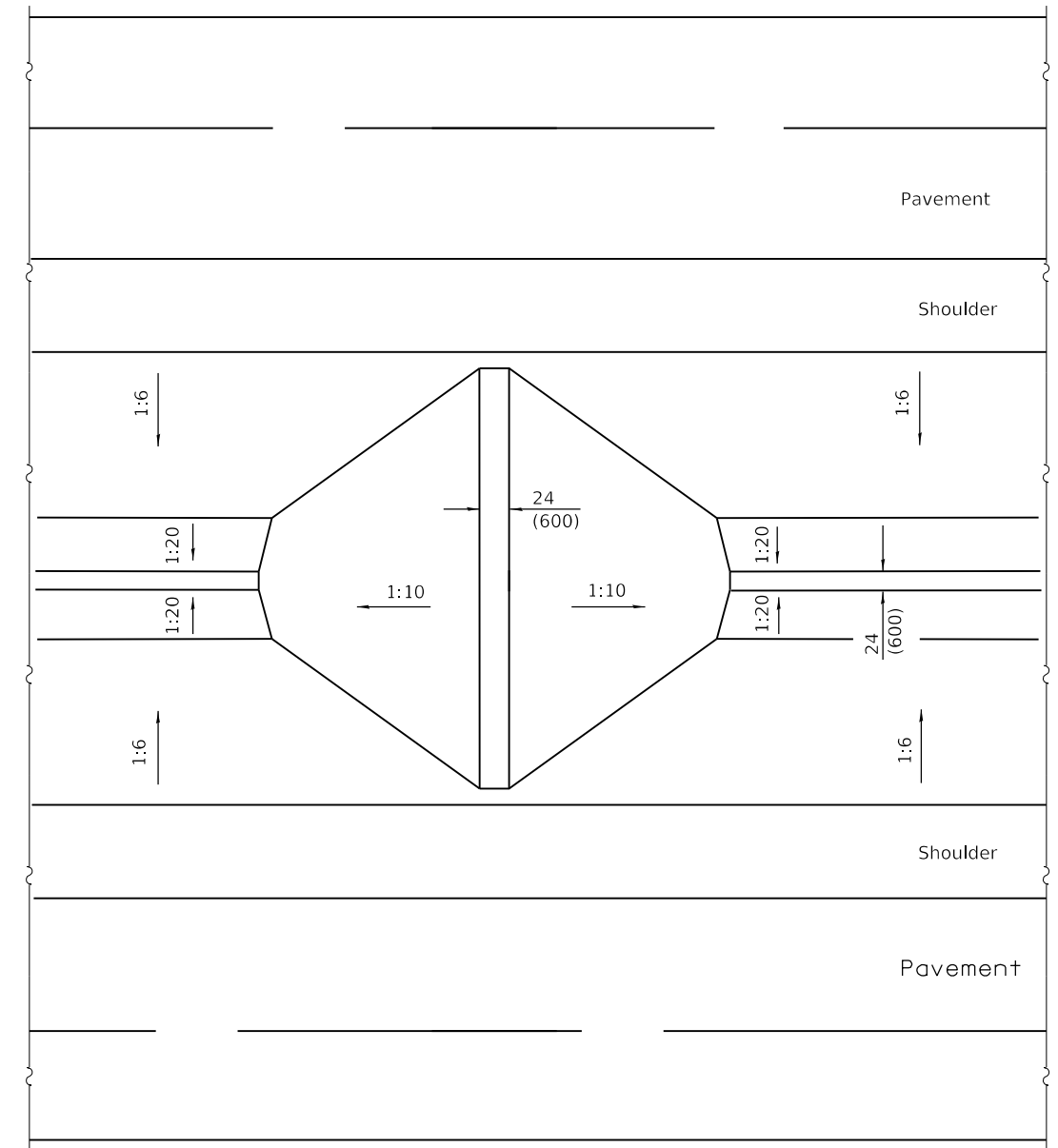
APPROVED January 1, 1997

ENGINEER OF DESIGN AND ENVIRONMENT

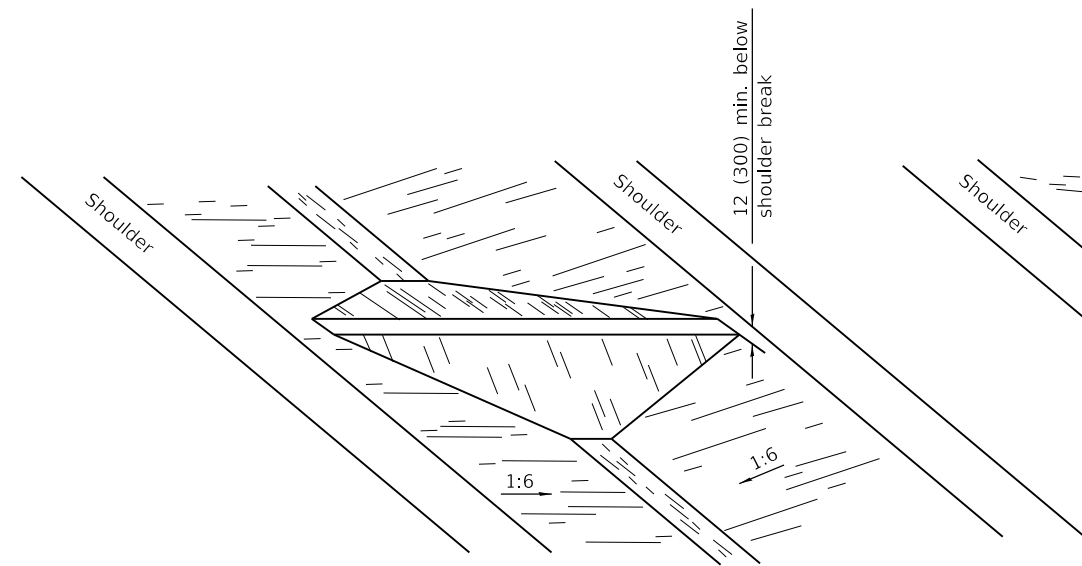
ISSUED 1-1-97



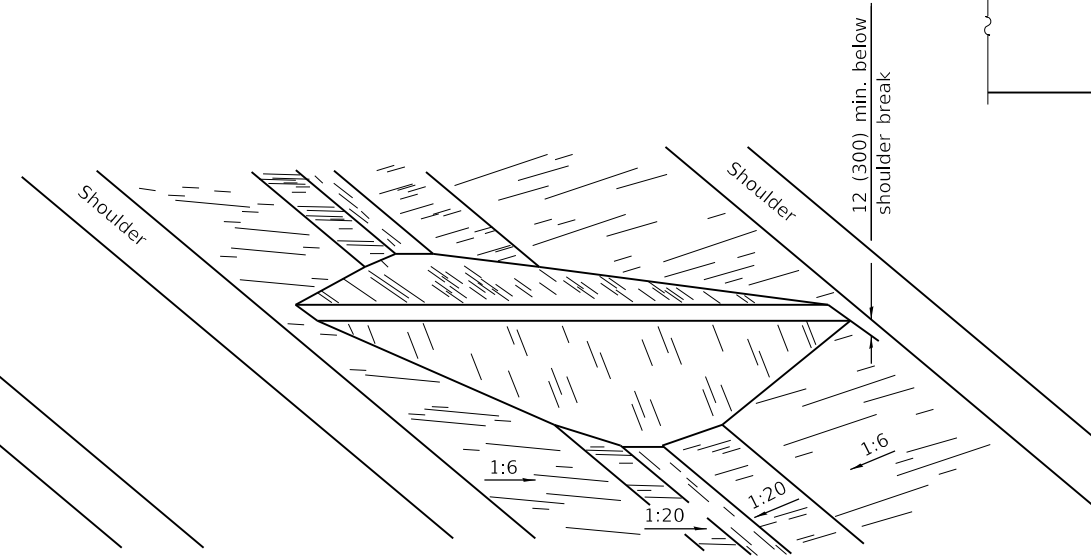
**DITCH CHECK FOR NARROW MEDIAN**



**DITCH CHECK FOR WIDE MEDIAN**



**VIEW OF NARROW MEDIAN**



**VIEW OF WIDE MEDIAN**

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

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

Illinois Department of Transportation

PASSED January 1, 2008  
*Scott Smith*  
 ENGINEER OF POLICY AND PROCEDURES

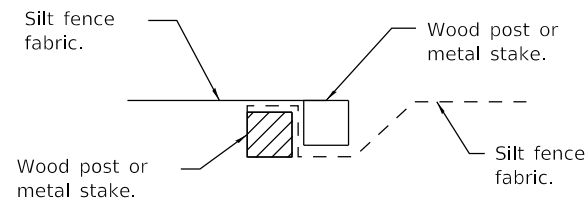
APPROVED January 1, 2008  
*Lee E. Han*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

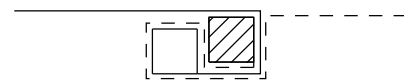
**EARTH MEDIAN  
 DITCH CHECK**

**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**

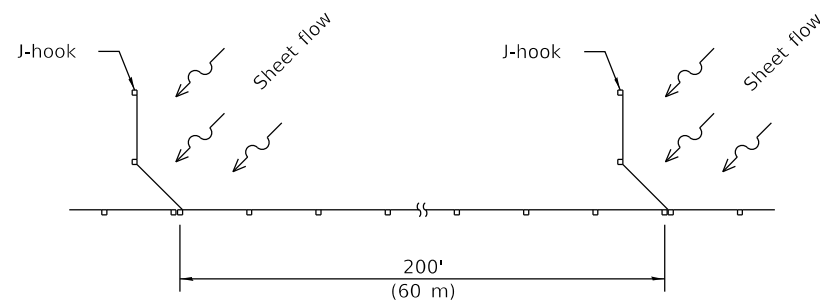


Rotate posts (stakes) together 180° clockwise and drive both posts (stakes) 18 (450) into ground.

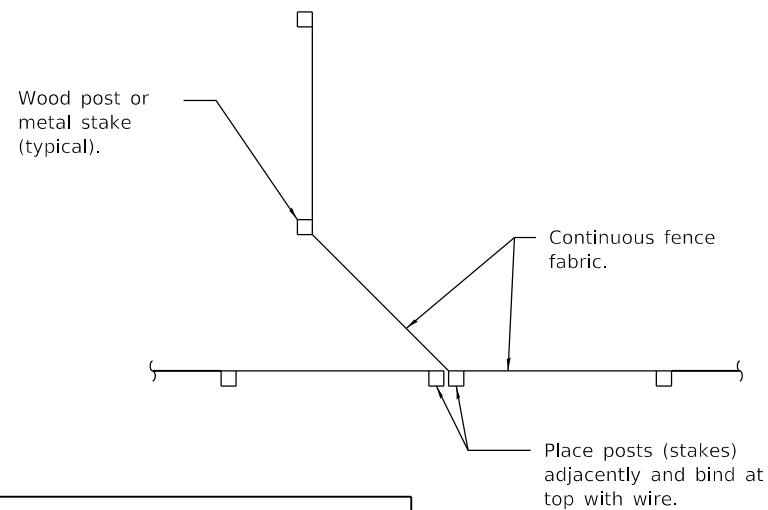
**STEP 2**

**ATTACHING TWO SILT FILTER FENCES**

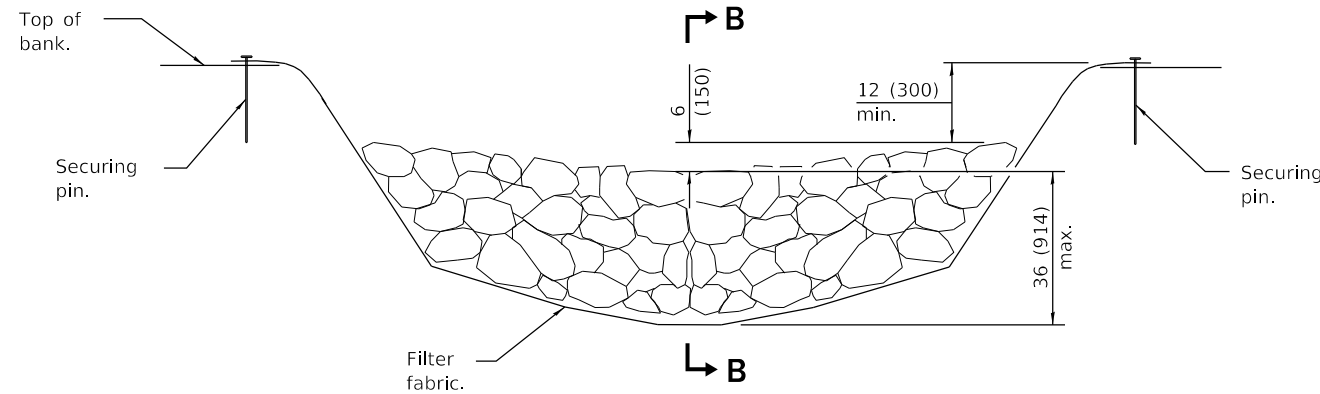
(Not applicable for J-hooks)



**SILT FILTER J-HOOK PLACEMENT**

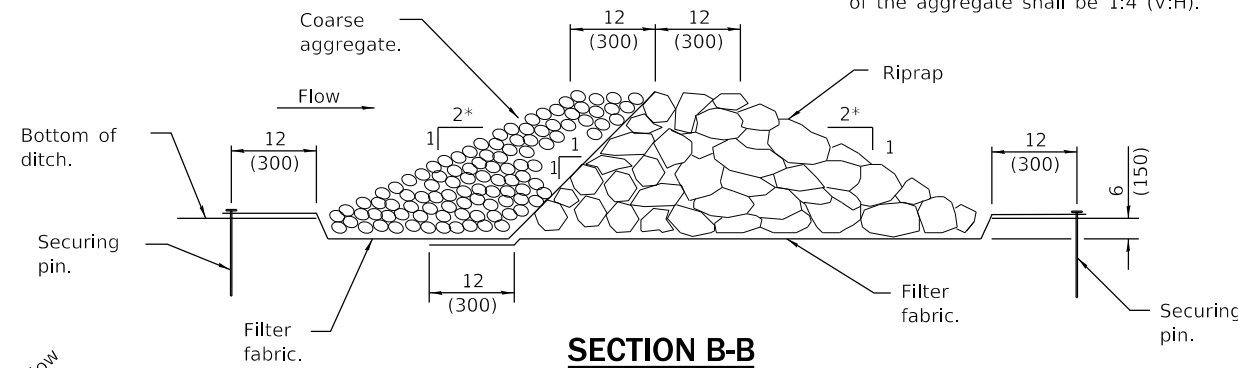


**J-HOOK**



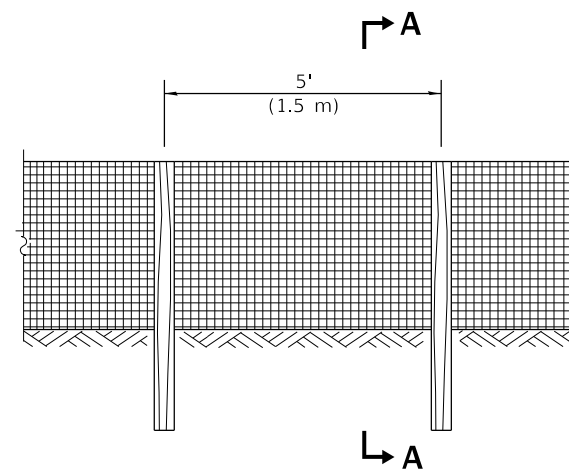
**ELEVATION**

\* 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).



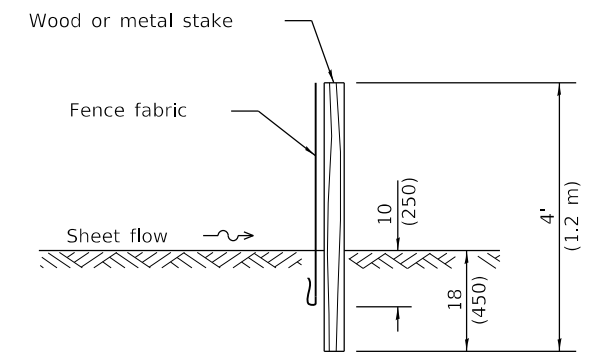
**SECTION B-B**

**AGGREGATE DITCH CHECK**

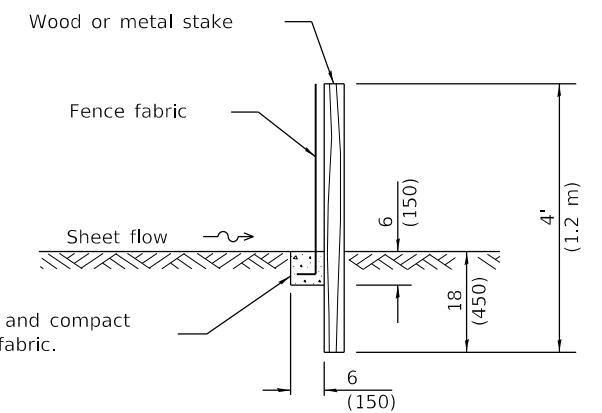


**ELEVATION**

**SILT FILTER FENCE AS A PERIMETER EROSION BARRIER**



**SLICE METHOD**



**TRENCH METHOD**

**SECTION A-A**

Excavate, backfill and compact trench to secure fabric.

**GENERAL NOTES**

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

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

Illinois Department of Transportation

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

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

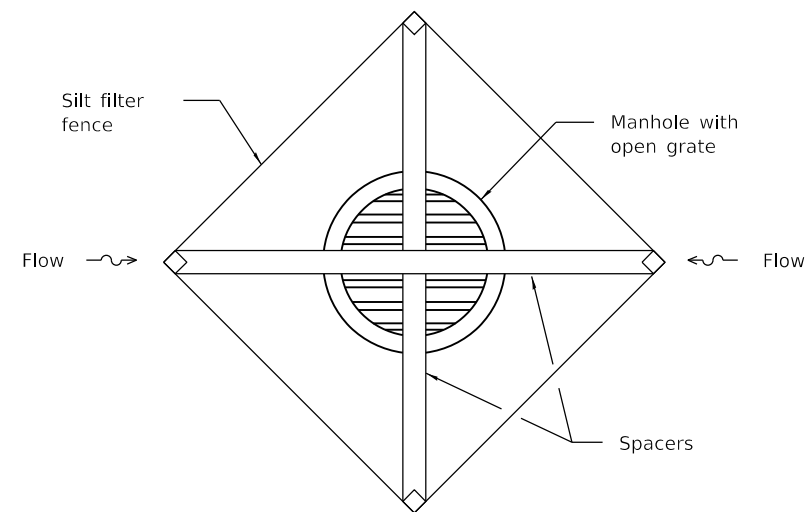
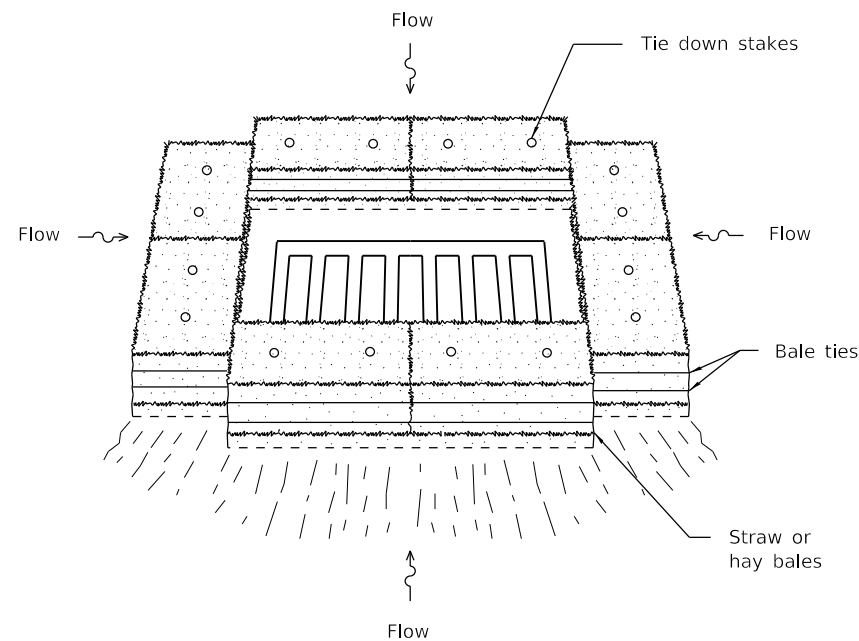
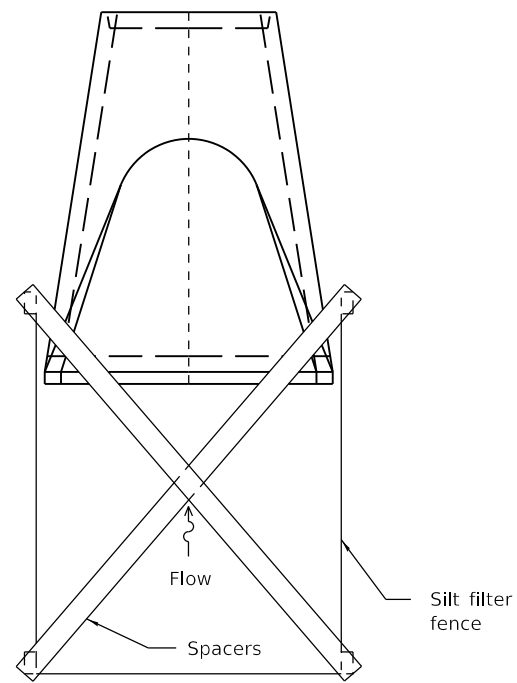
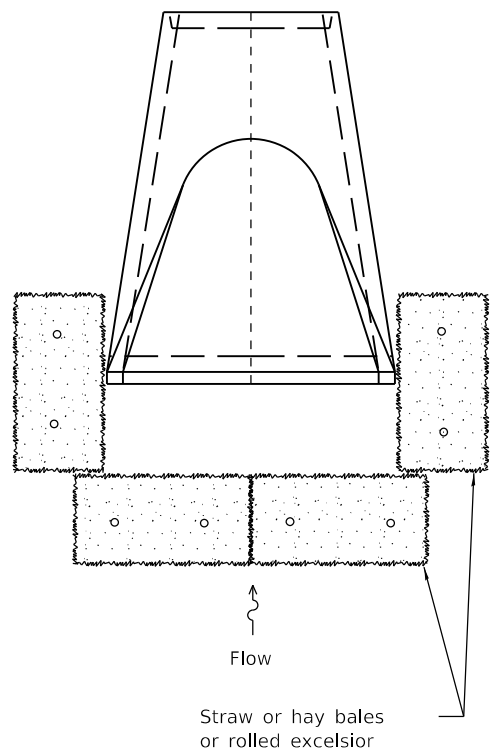
ISSUED 1-1-97

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

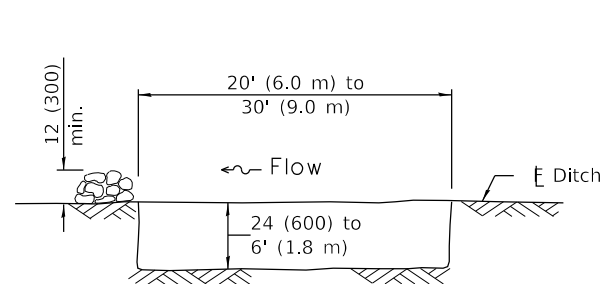
**TEMPORARY EROSION CONTROL SYSTEMS**

(Sheet 1 of 2)

**STANDARD 280001-07**

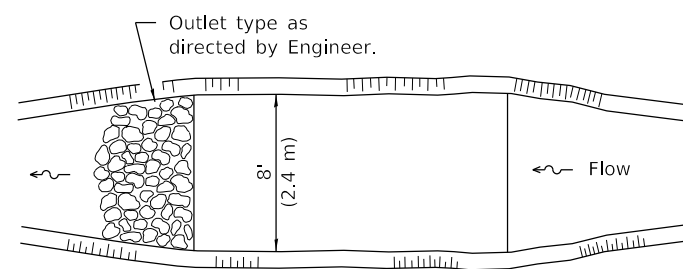


**INLET AND PIPE PROTECTION**



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

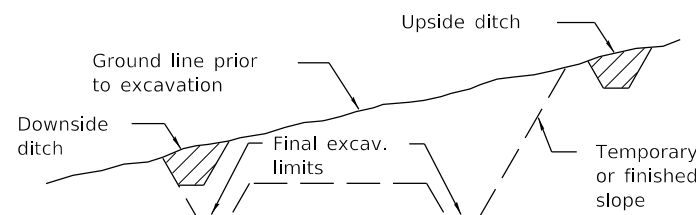
**ELEVATION**



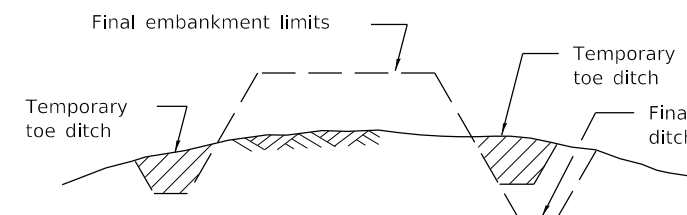
The long dimension should be parallel with the direction of the flow. Accumulated silt shall be removed anytime the basins become 75% filled.

**PLAN**

**SEDIMENT BASIN**



**TYPICAL CUT CROSS-SECTION**



**TYPICAL FILL CROSS-SECTION**

**TEMPORARY DITCHES FOR CUT & FILL SECTIONS**

Illinois Department of Transportation

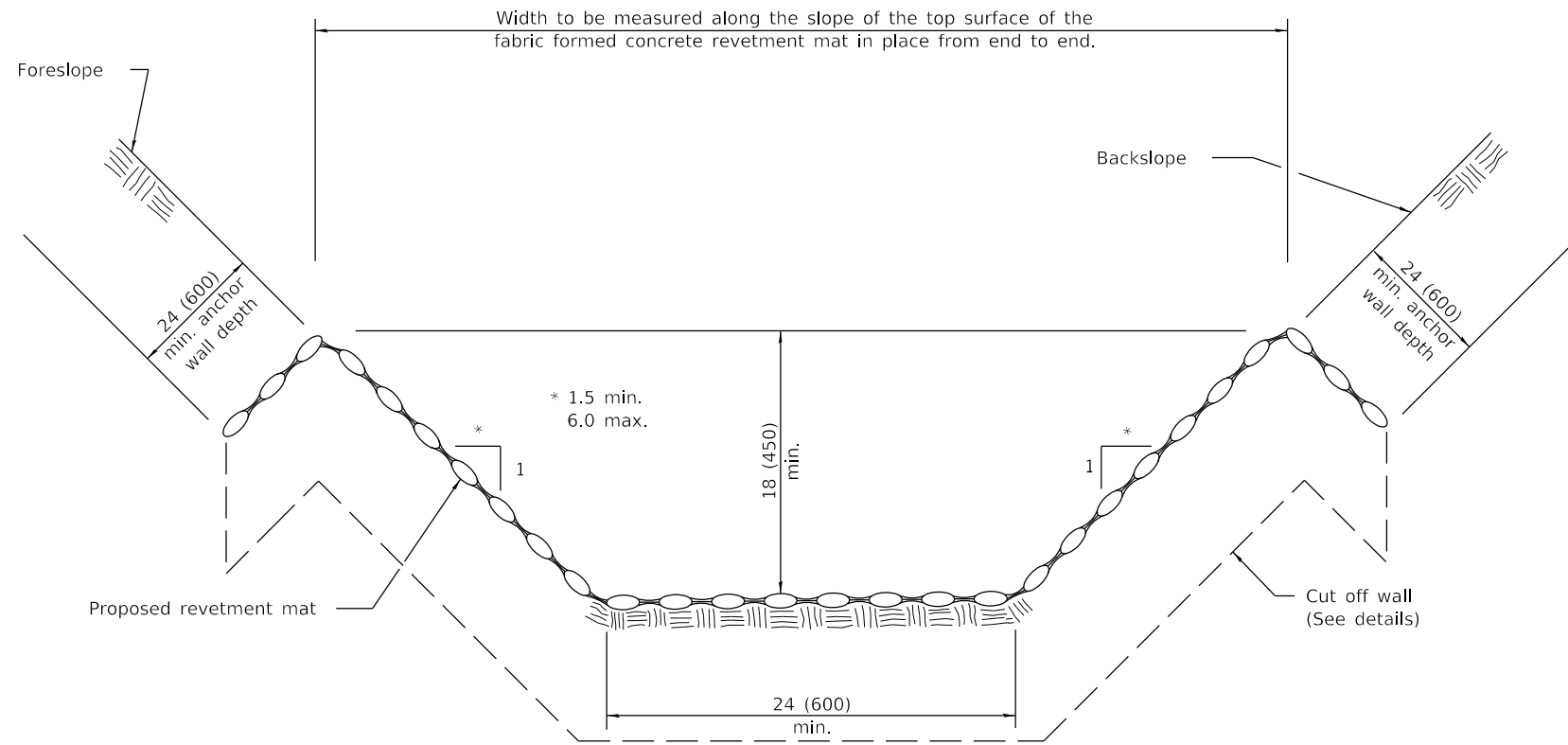
PASSED January 1, 2013  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

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

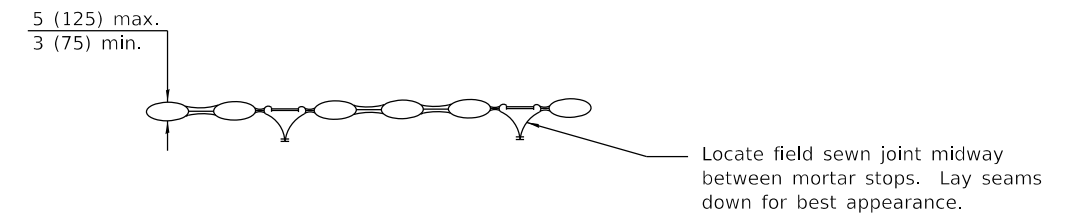
ISSUED 1-1-97

**TEMPORARY EROSION CONTROL SYSTEMS**  
 (Sheet 2 of 2)

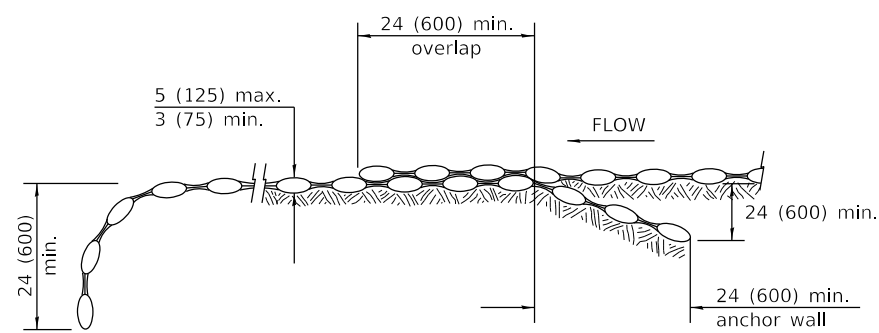
**STANDARD 280001-07**



**TYPICAL FABRIC FORMED CONCRETE REVETMENT MAT LINED DITCH**

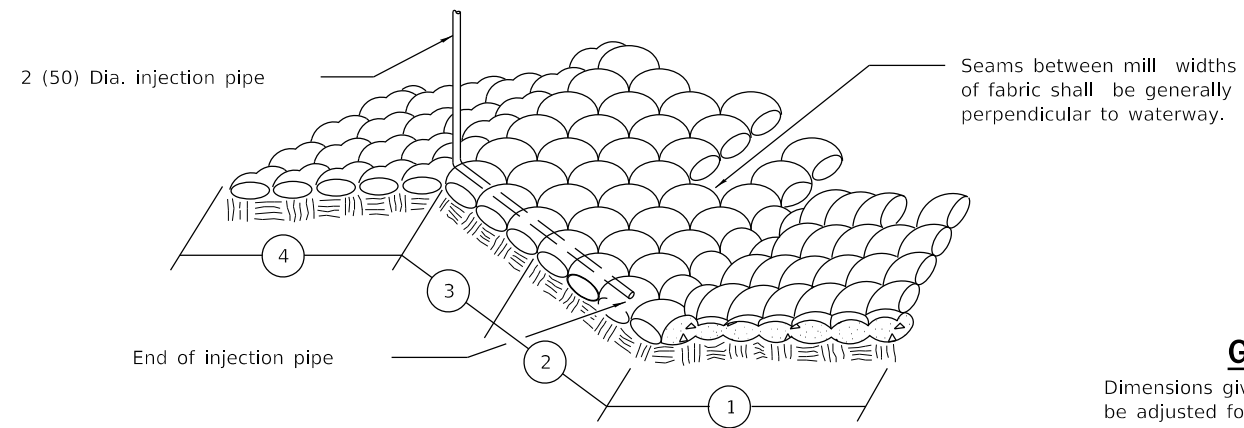


**TYPICAL SECTION THRU FILTER POINT MAT**



**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

PASSED January 1, 2008

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2008

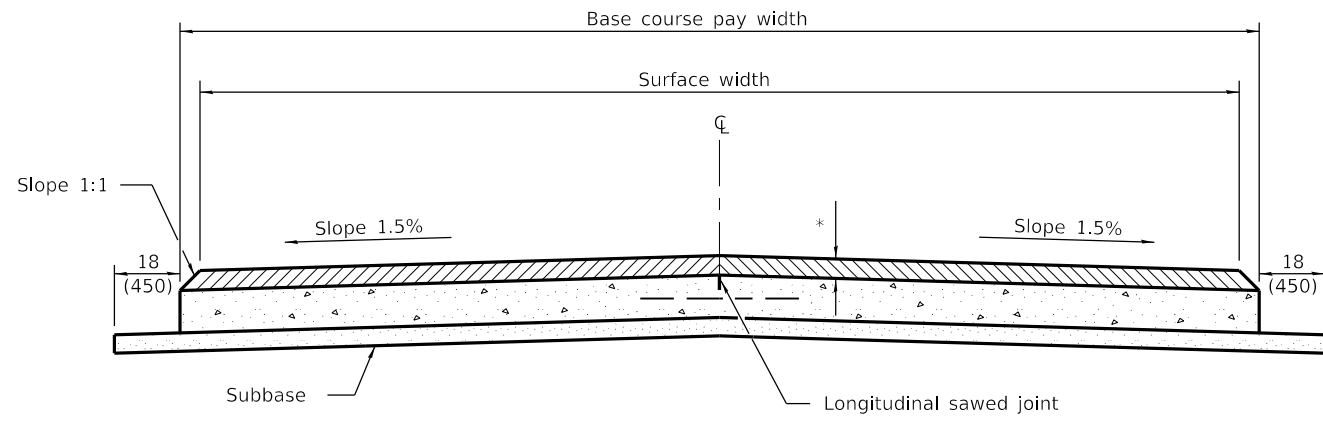
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

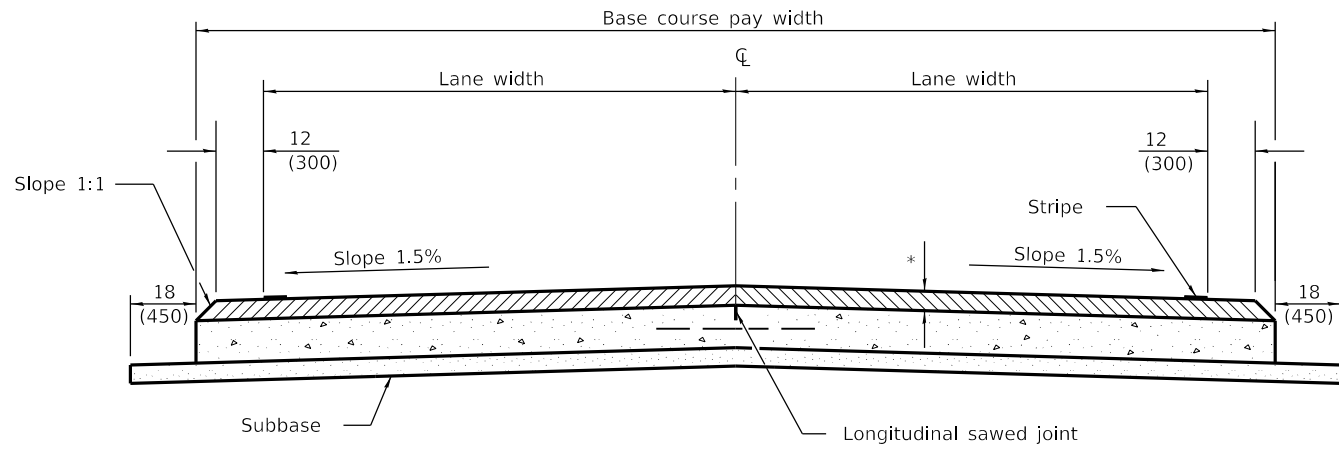
**FABRIC FORMED CONCRETE REVETMENT MATS**

**STANDARD 285001-02**

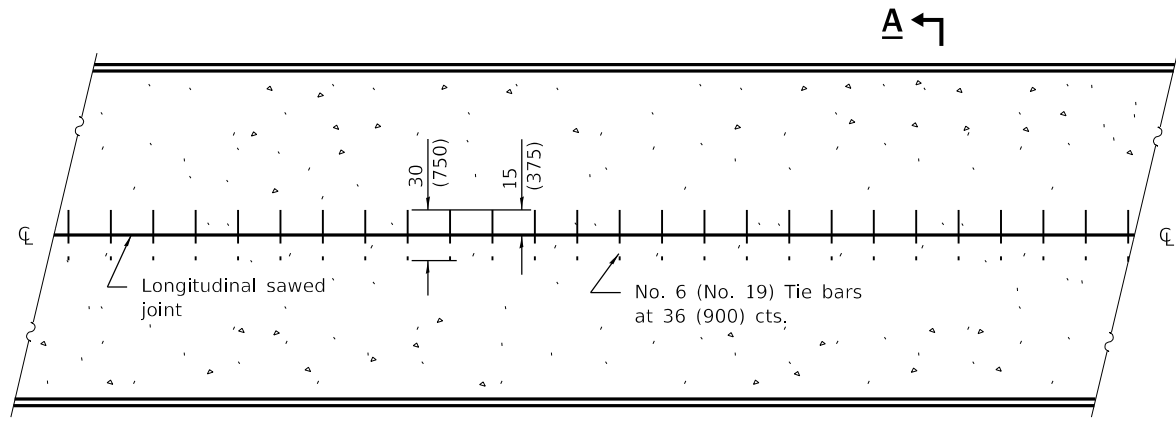


**SECTION A-A**  
(TYPICAL 2 LANE WITH SHOULDERS)

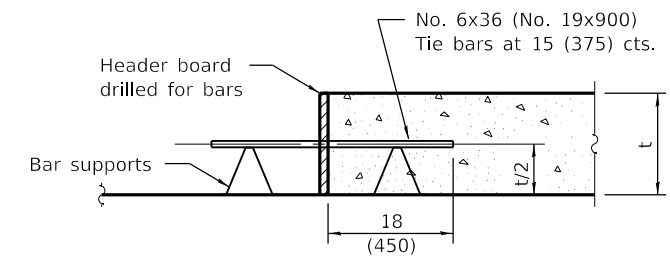
\* HMA binder and surface courses



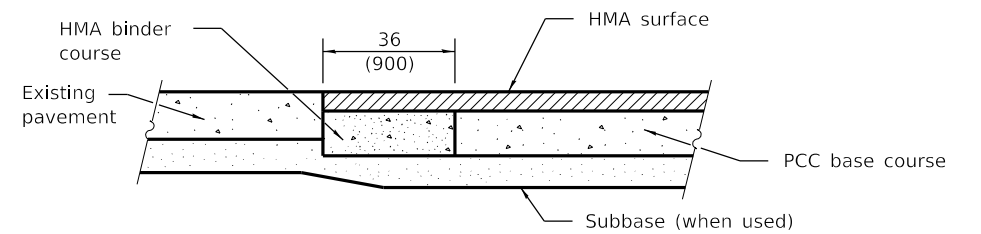
**ALTERNATE SECTION A-A**  
(TYPICAL 2 LANE WITH SHOULDERS)



**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.

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**

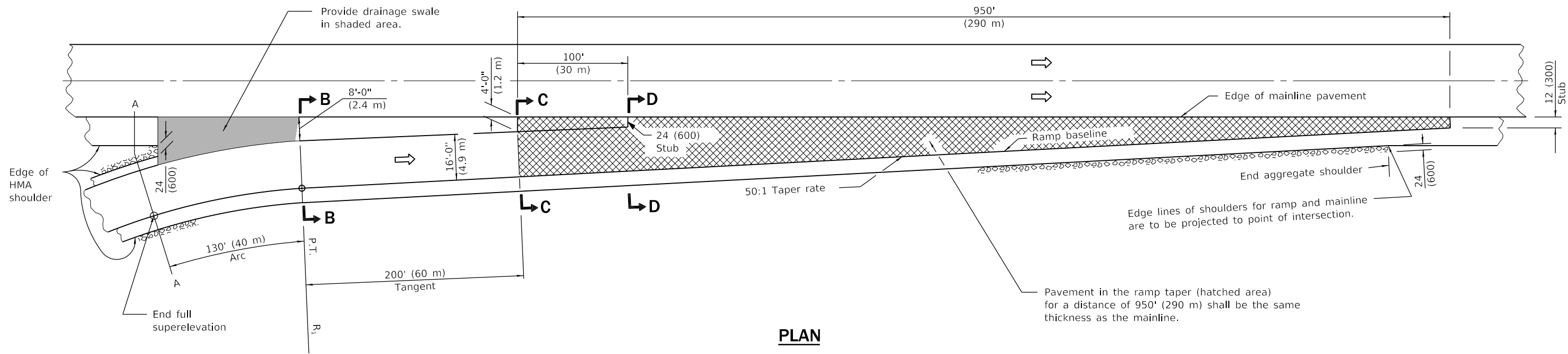
**STANDARD 353001-05**

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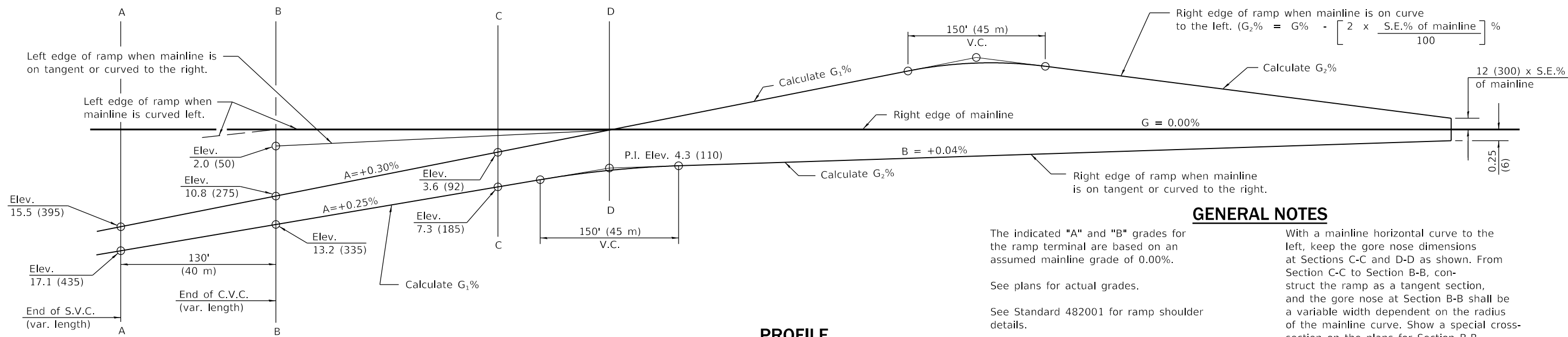
PASSED January 1, 2018  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018  
*Maureen M. Beck*  
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**PLAN**



**PROFILE**

**GENERAL NOTES**

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

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

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*Michael Beard*  
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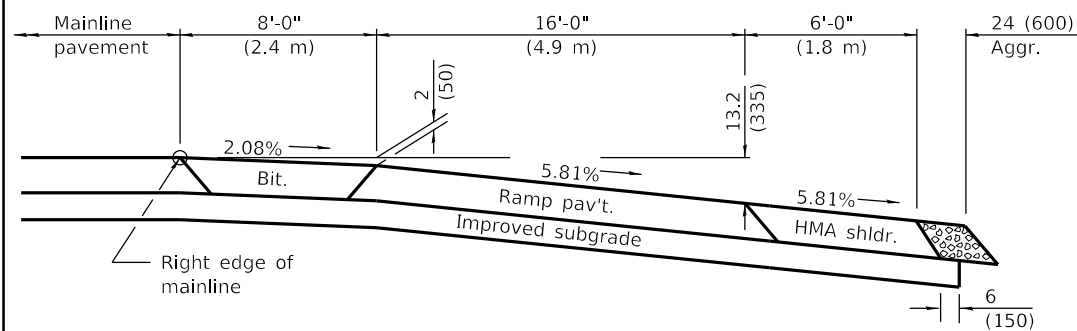
ISSUED 1-1-97

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

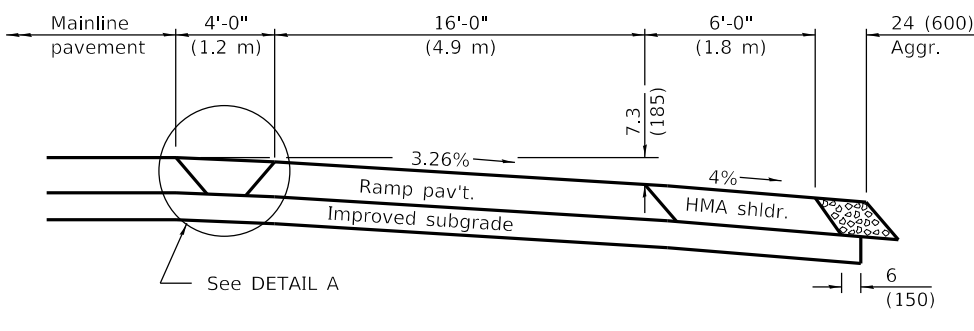
**ENTRANCE RAMP TERMINAL**  
 (FLEXIBLE RAMP PAVEMENT ADJACENT TO FLEXIBLE MAINLINE PAVEMENT)

(Sheet 1 of 2)

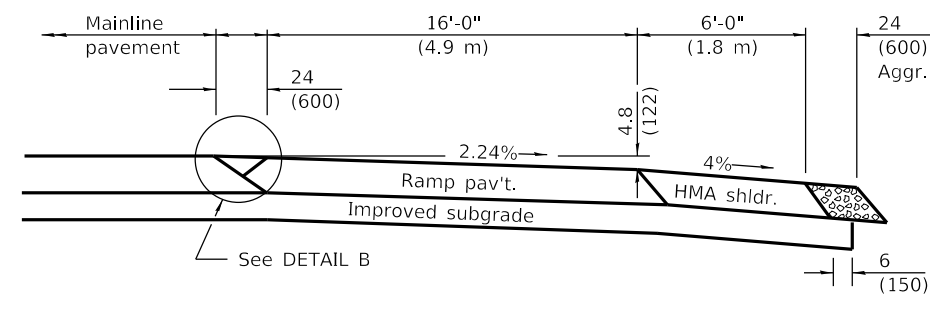
**STANDARD 406001-06**



**SECTION B-B**

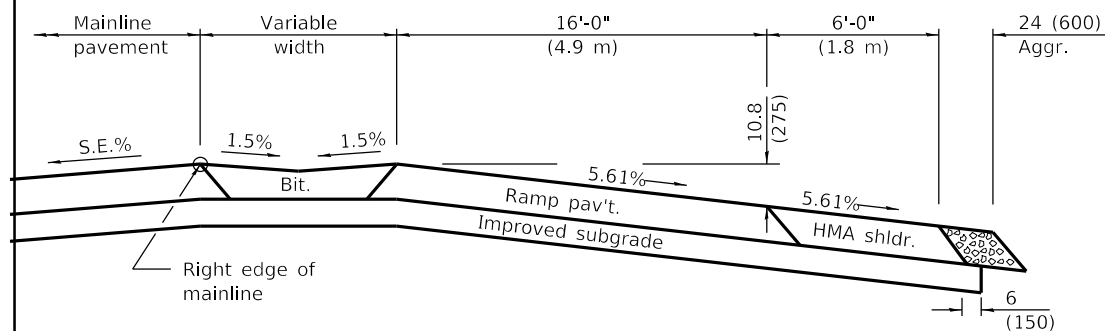


**SECTION C-C**

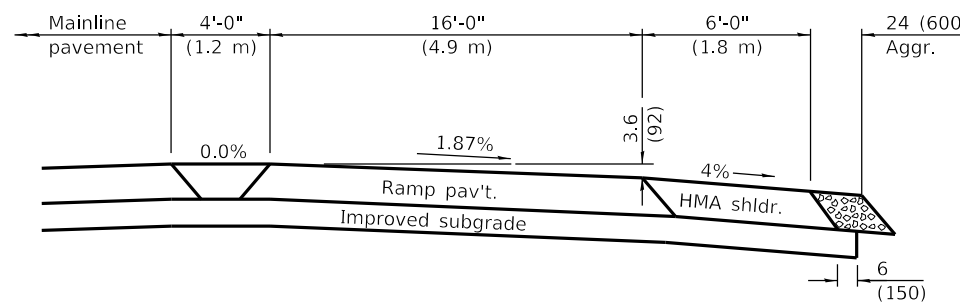


**SECTION D-D**

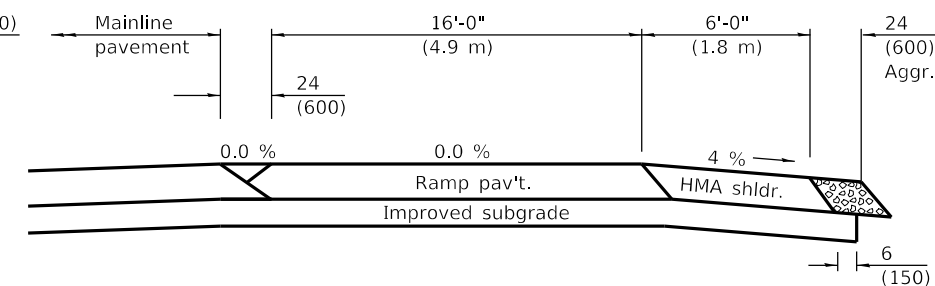
**CROSS SECTIONS WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT**



**SECTION B-B**

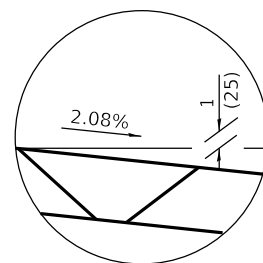


**SECTION C-C**

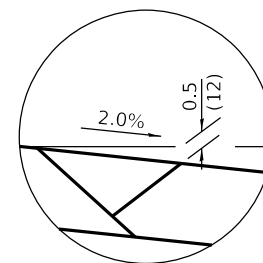


**SECTION D-D**

**CROSS SECTIONS WHEN MAINLINE IS CURVED TO THE LEFT**



**DETAIL A**

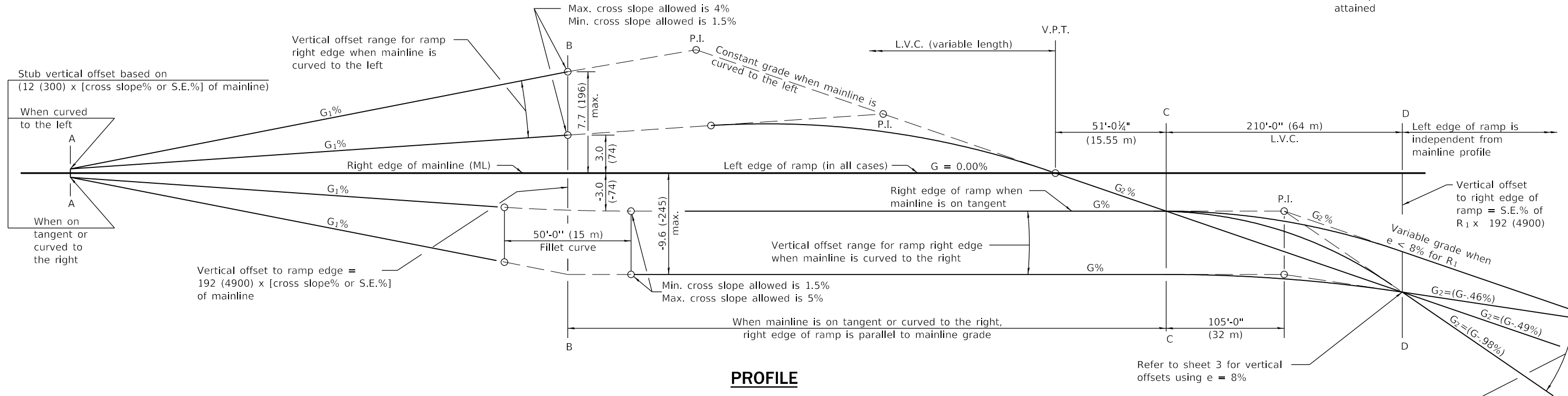
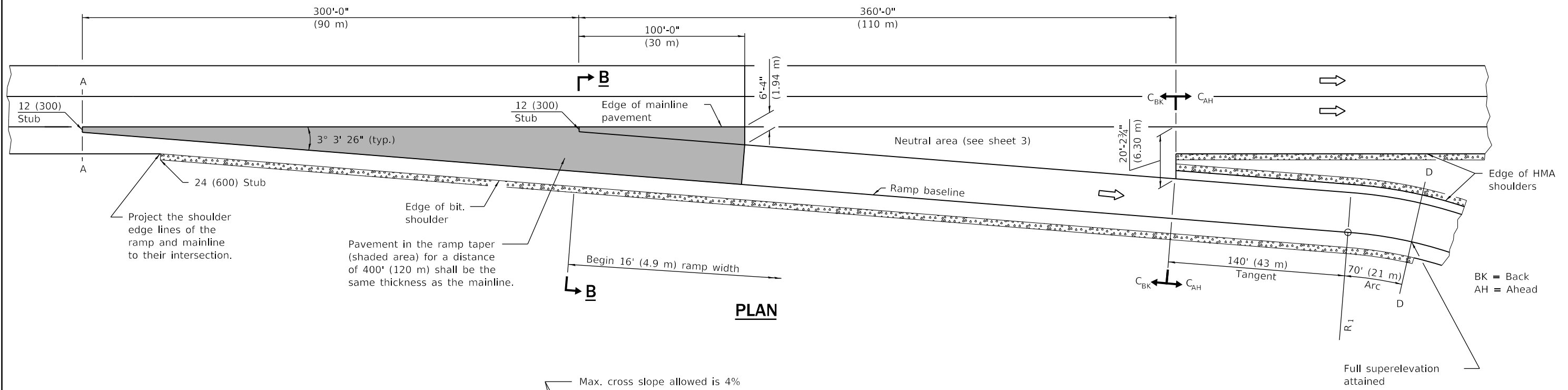


**DETAIL B**

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 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

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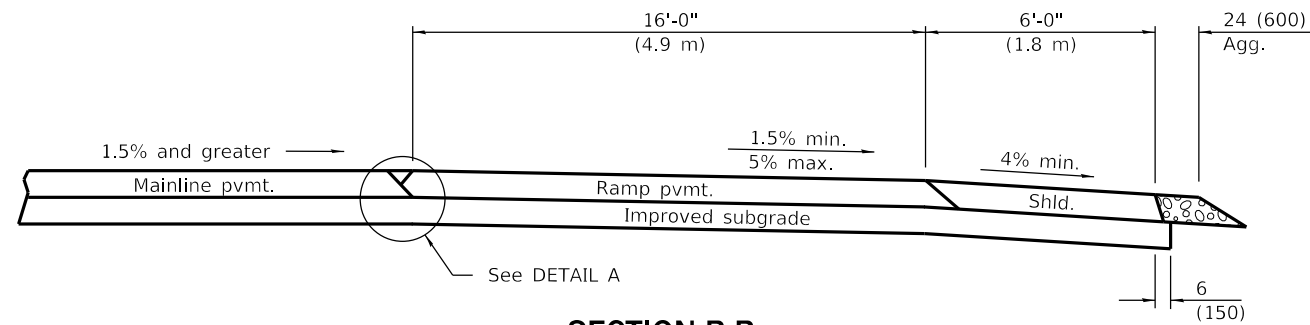
ISSUED 1-1-97

APPROVED January 1, 2015  
*[Signature]*  
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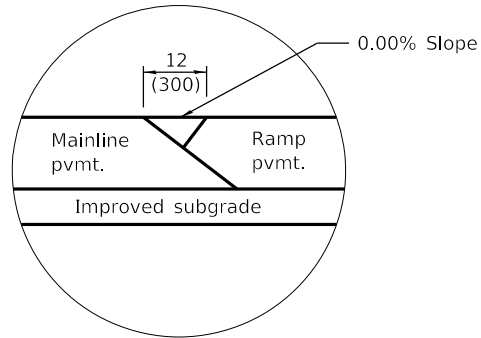
DATE	REVISIONS
1-1-15	Corrected divergence angle at taper. Based profile off of e-max instead of R <sub>1</sub> .
1-1-08	Switched units to English (metric).

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

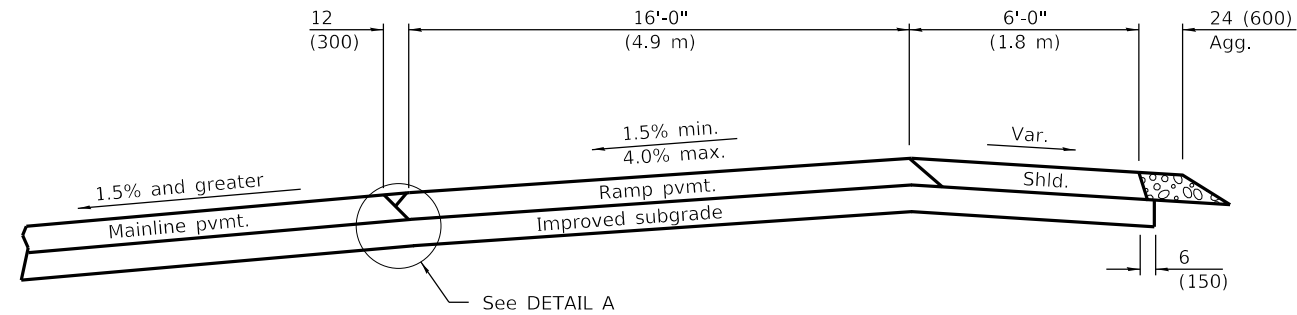
**STANDARD 406101-05**



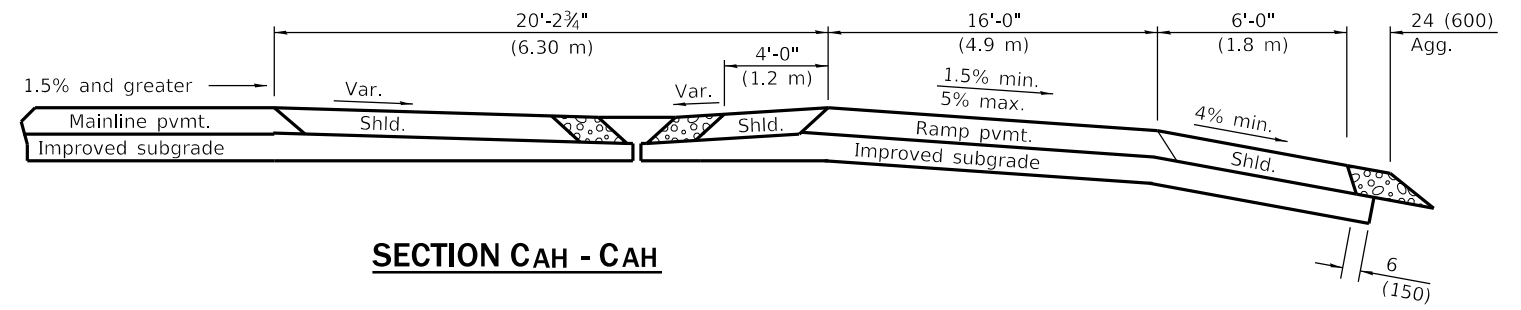
**SECTION B-B**



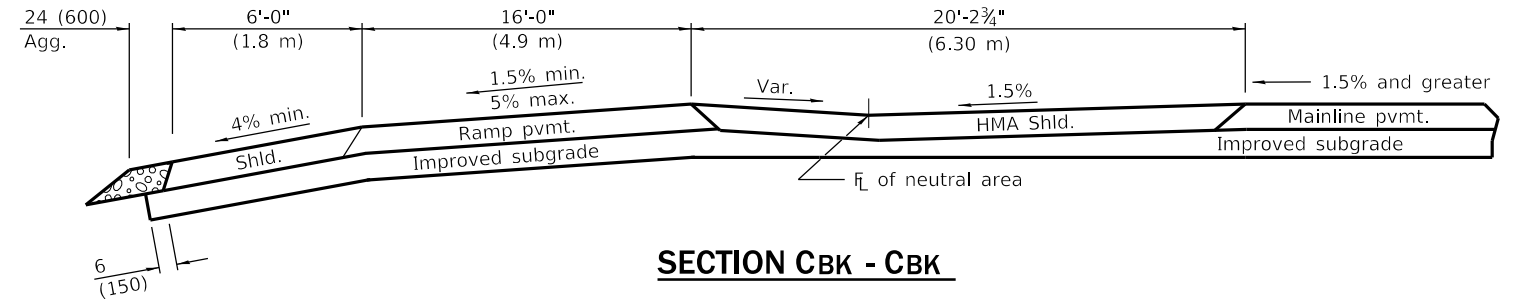
**DETAIL A**



**SECTION B-B**



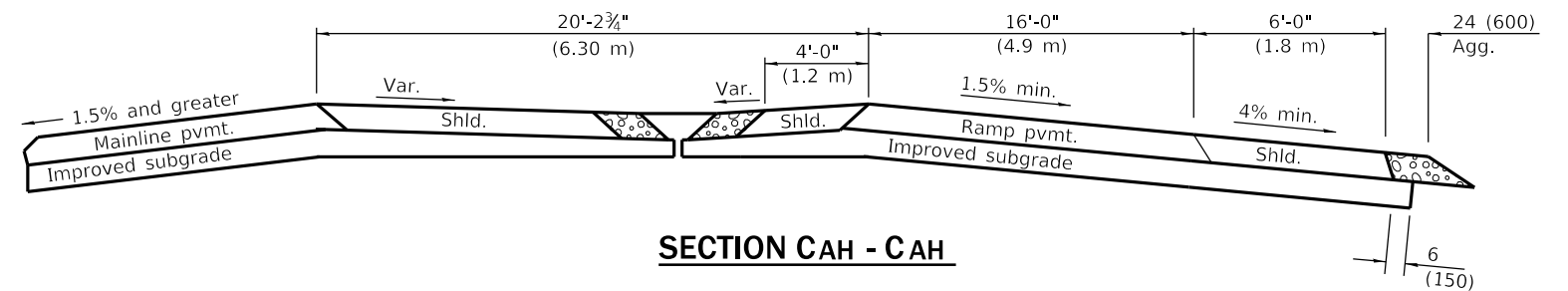
**SECTION CAH - CAH**



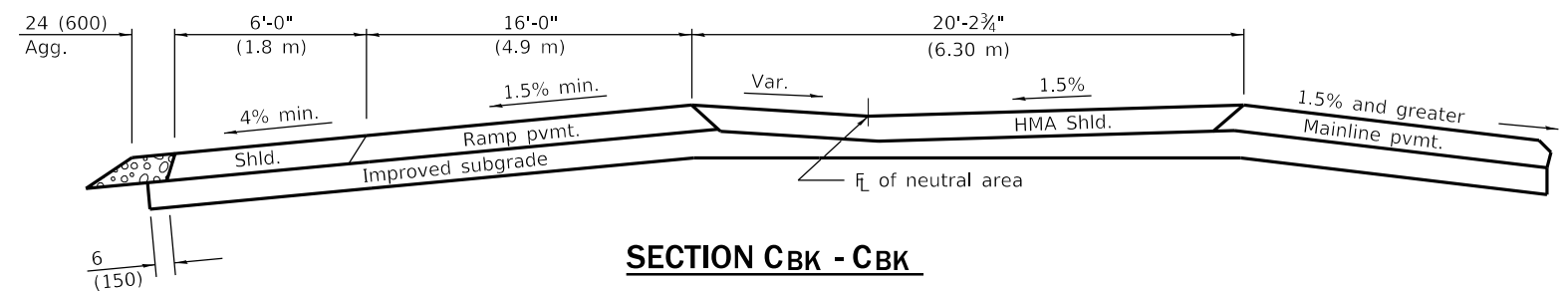
**SECTION CBK - CBK**

BK = Back  
AH = Ahead

**WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT**



**SECTION CAH - CAH**



**SECTION CBK - CBK**

**WHEN MAINLINE IS CURVED TO THE LEFT**

See Sheet 3 for GENERAL NOTES

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*Michael Beard*  
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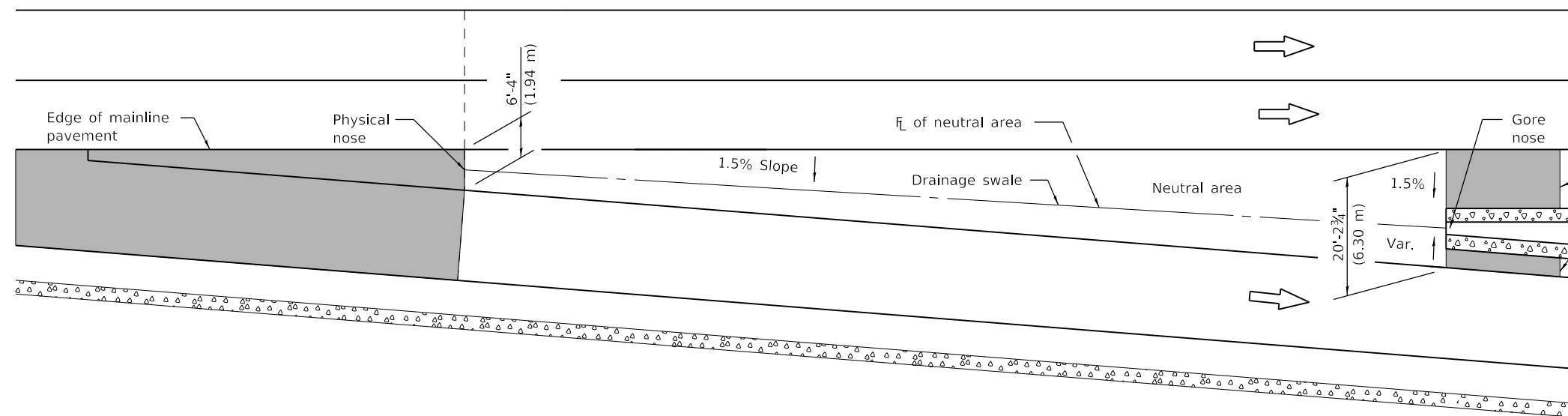
APPROVED January 1, 2015  
*[Signature]*  
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**EXIT RAMP TERMINAL**  
 (FLEXIBLE RAMP PAVEMENT ADJACENT  
 TO FLEXIBLE MAINLINE PAVEMENT)

(Sheet 2 of 3)

**STANDARD 406101-05**



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

### DETAILS FOR DRAINAGE IN NEUTRAL AREA

### GENERAL NOTES

The initial ramp grade (G<sub>2</sub>) 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<sub>1</sub>, construct the ramp as a 140 ft. (43 m) tangent section.

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

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

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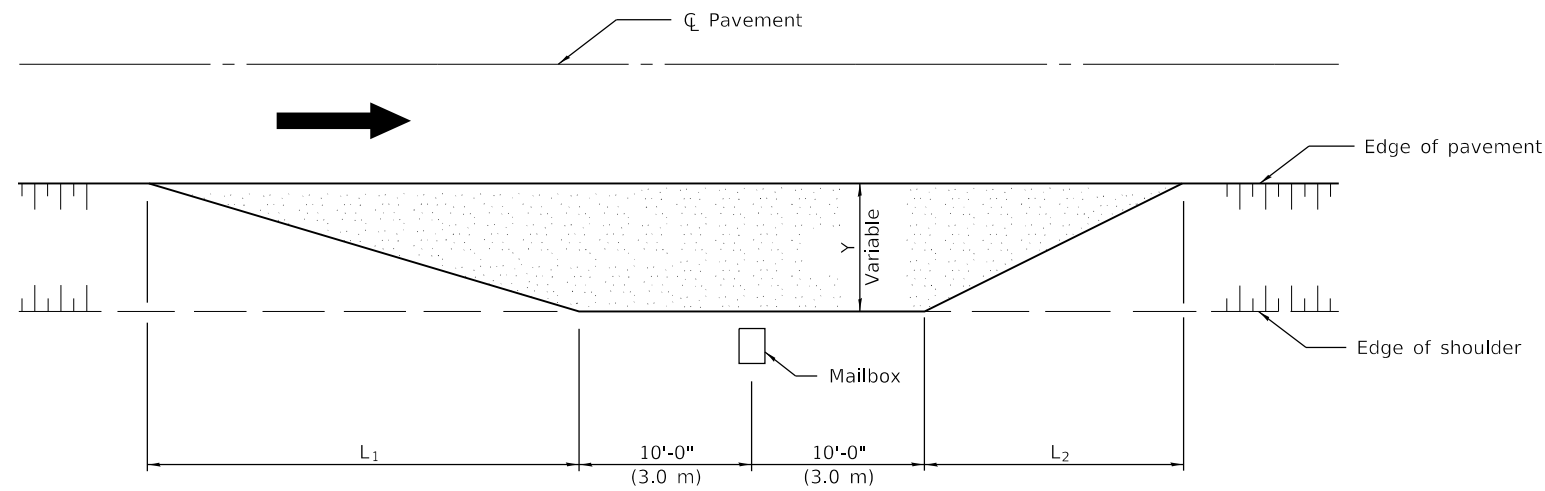
PASSED January 1, 2015  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2015  
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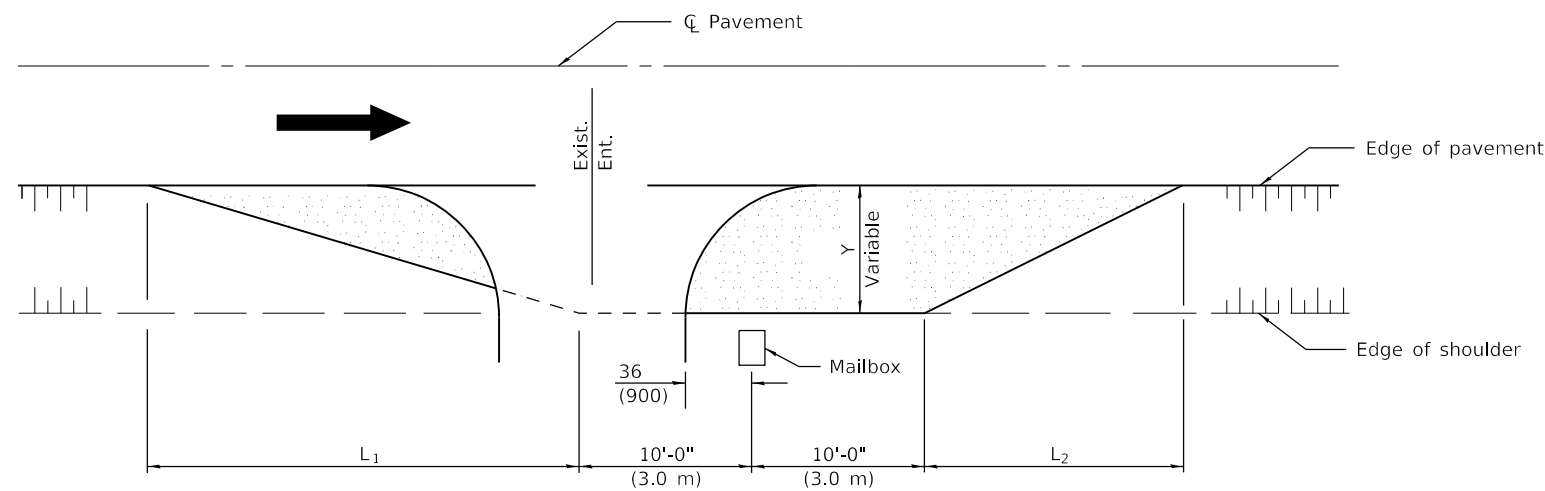
ISSUED 1-1-97

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

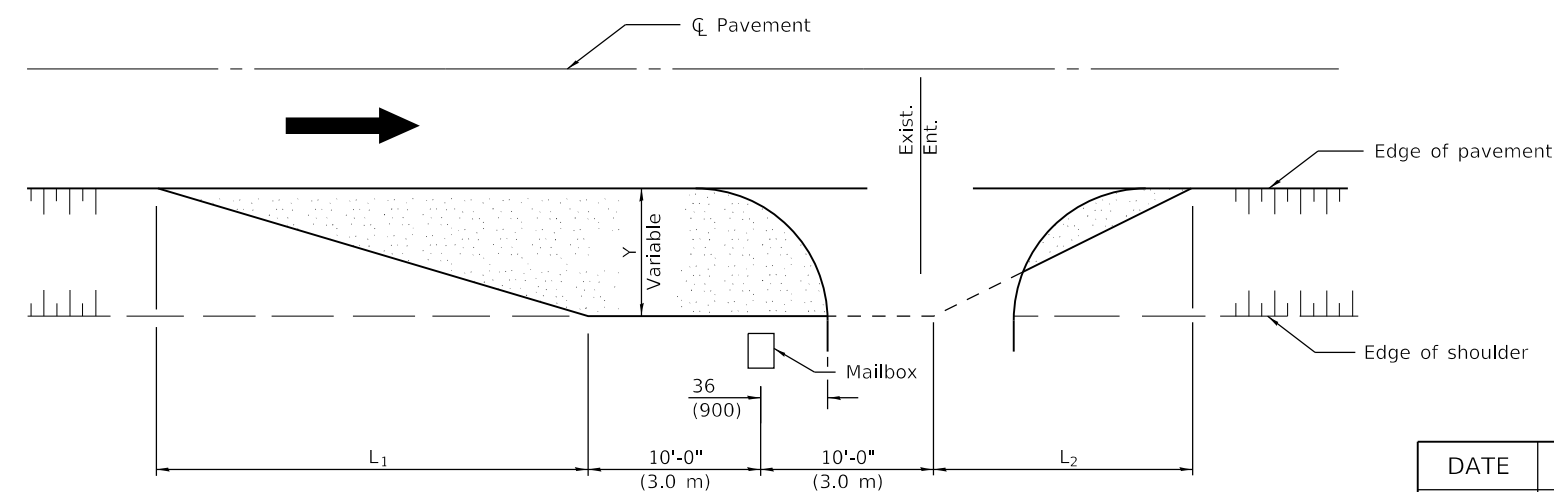
**STANDARD 406101-05**



**TYPICAL APPLICATION**



**MAILBOX ON FAR SIDE OF ENTRANCE**



**MAILBOX ON NEAR SIDE OF ENTRANCE**

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

**GENERAL NOTES**

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

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

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

**MAILBOX TURNOUT**

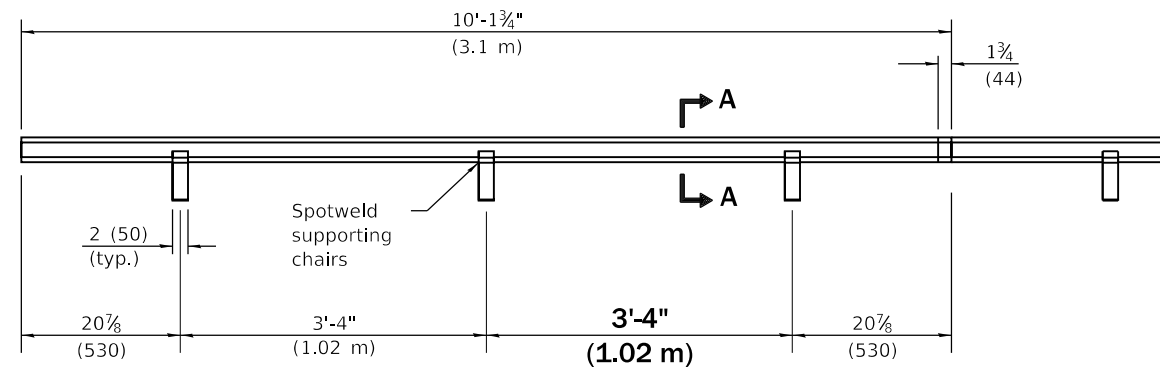
**STANDARD 406201-01**

Illinois Department of Transportation

PASSED January 1, 2008  
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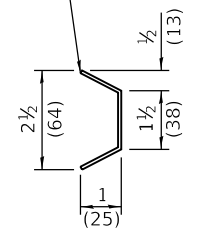
APPROVED January 1, 2008  
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 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

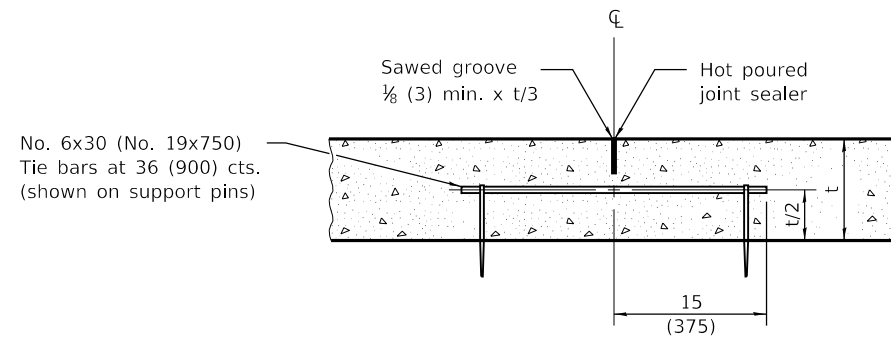


**TYPE C METAL JOINT**

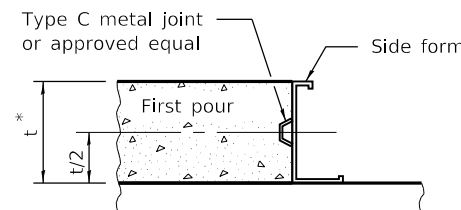
Sheet steel of suitable thickness to form keyway as detailed or approved equal.



**SECTION A-A**

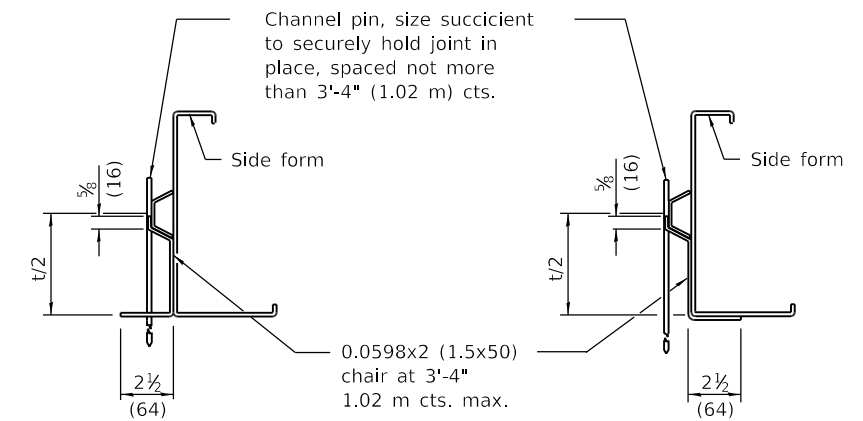


**LONGITUDINAL SAWED JOINT**



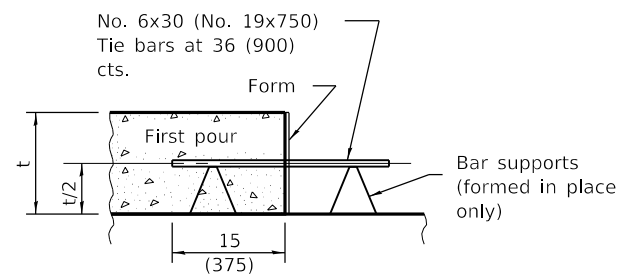
**LONGITUDINAL KEYED JOINT**

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

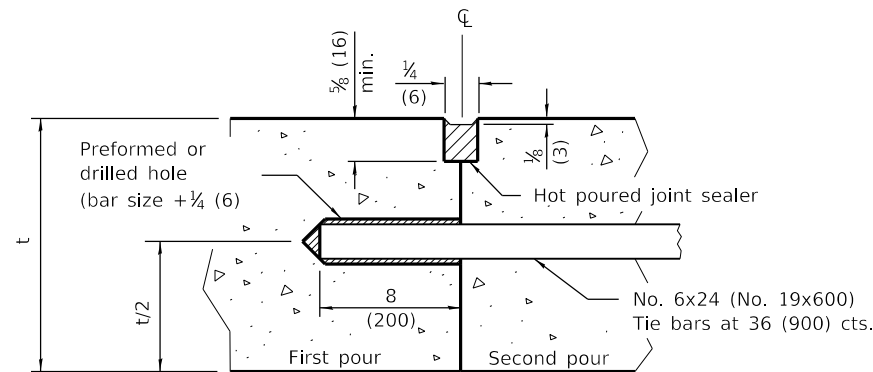


**SUPPORTING CHAIR ALTERNATE**

**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.

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

APPROVED January 1, 2018  
*Marcus M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

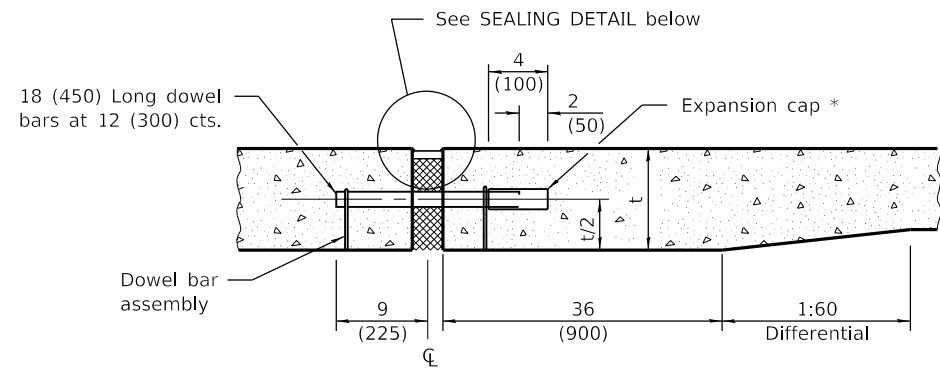
ISSUED 1-1-97

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

**PAVEMENT JOINTS**

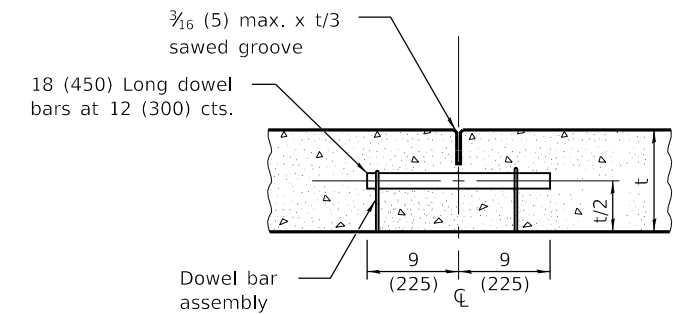
(Sheet 1 of 2)

**STANDARD 420001-09**

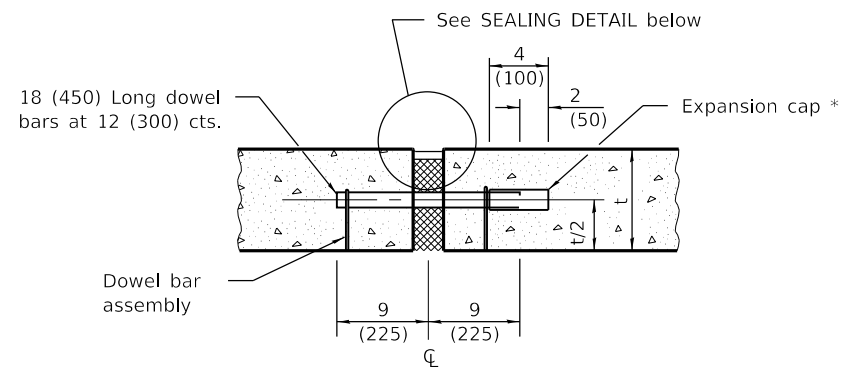


**TRANSVERSE EXPANSION JOINT**  
(FOR PAVEMENTS WITH UNEQUAL THICKNESS)

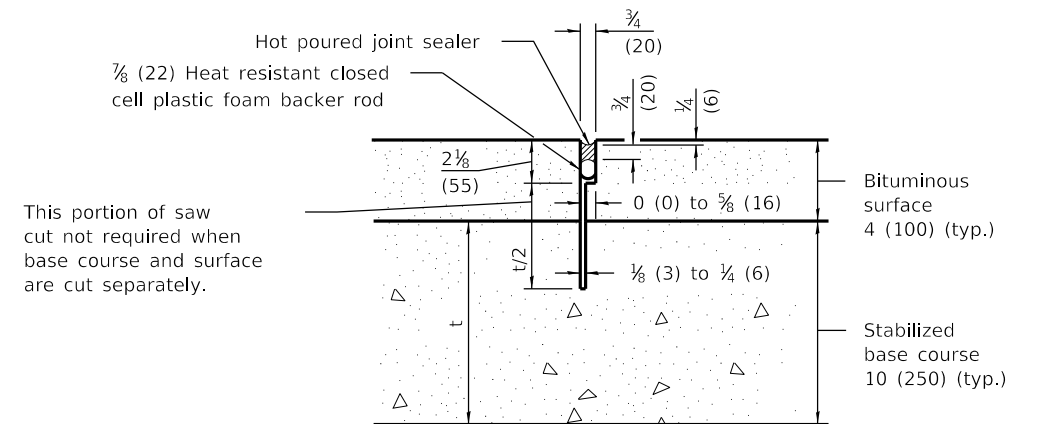
\* Expansion caps shall be installed on the exposed end of each dowel bar once the header has been removed and the joint filler material has been installed.



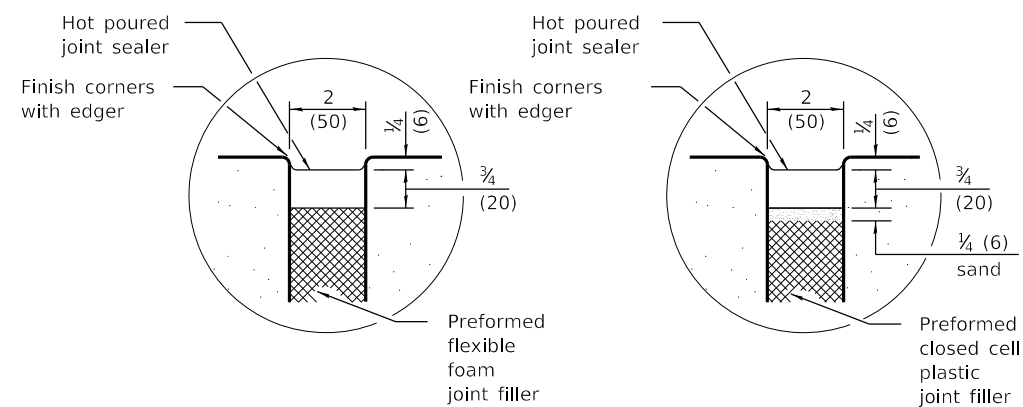
**TRANSVERSE CONTRACTION JOINT**



**TRANSVERSE EXPANSION JOINT**  
(FOR PAVEMENTS WITH EQUAL THICKNESS)

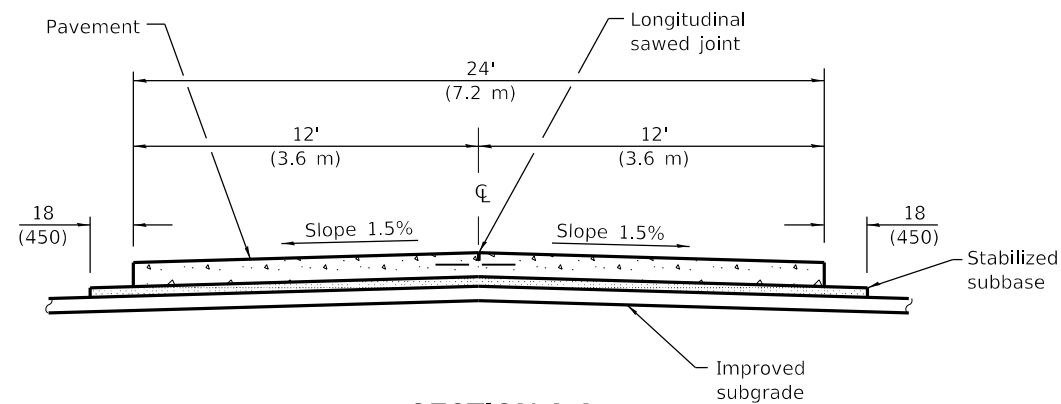


**TRANSVERSE CONTRACTION JOINT**  
(FOR CAM, CFA AND LFA BASE COURSE MIXTURES)

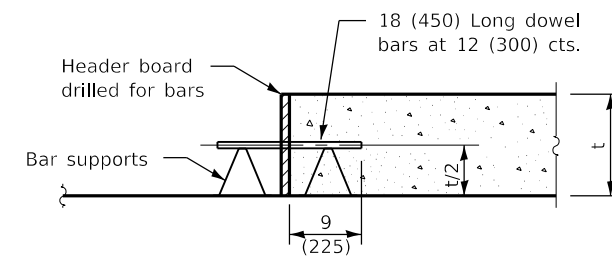


**SEALING DETAIL**

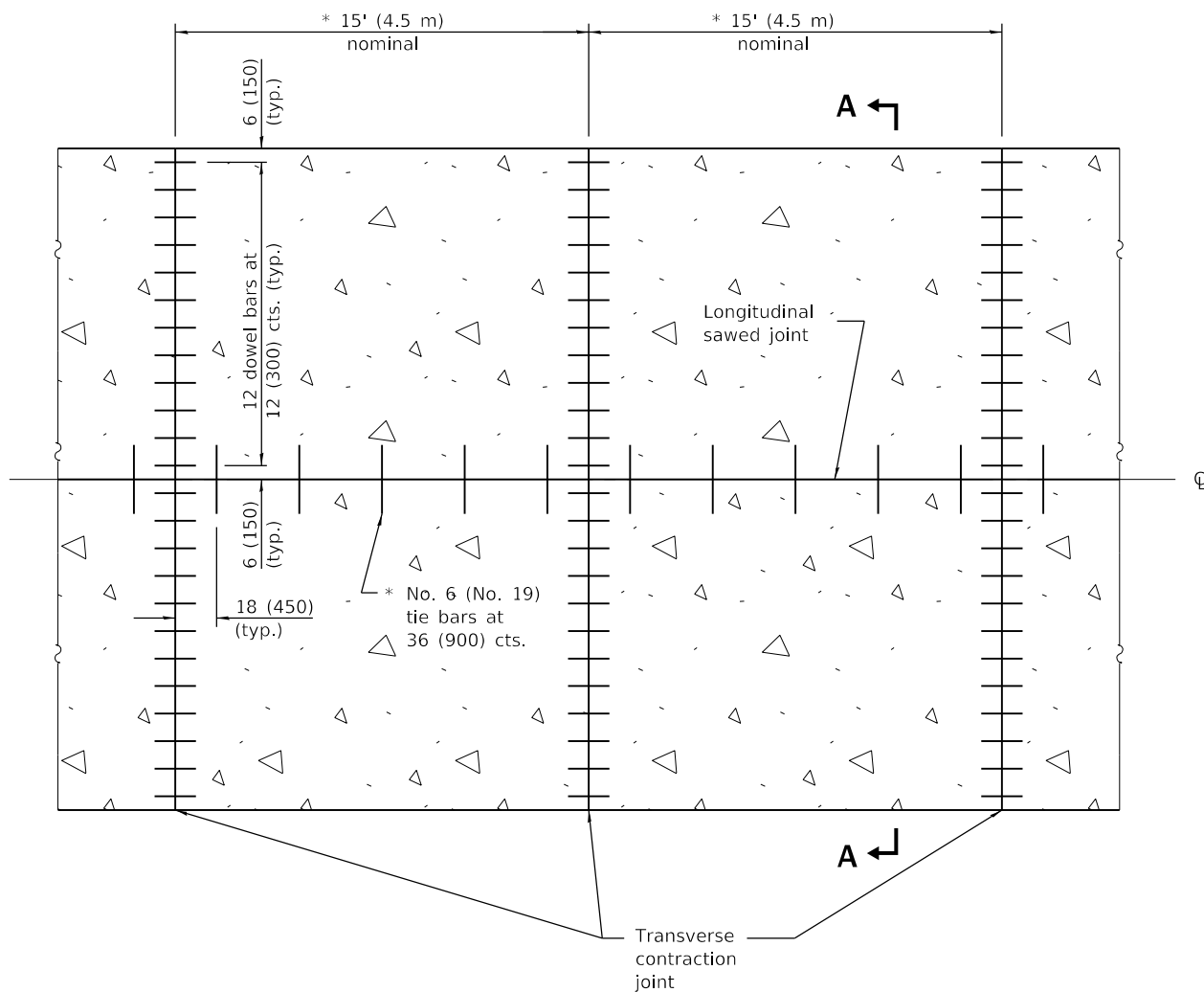
DOWEL BAR TABLE	
PAVEMENT THICKNESS	DOWEL BAR DIAMETER
10 (250) or greater	1 1/2 (38)
8 (200) thru 9.99 (249)	1 1/4 (32)
Less than 8 (200)	1 (25)



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

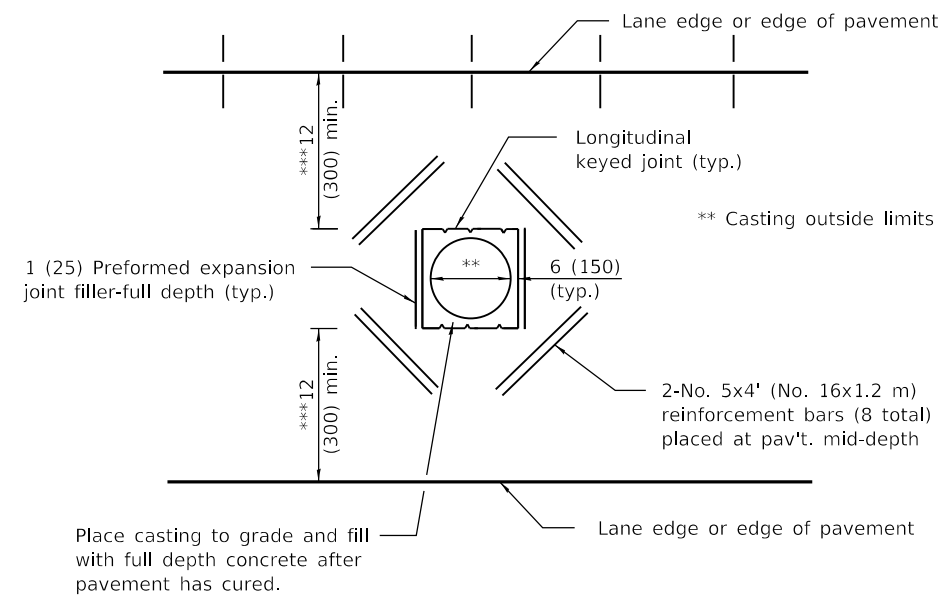


**TRANSVERSE CONSTRUCTION JOINT**



**PAVEMENT PLAN**

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



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

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

**GENERAL NOTES**

See Standard 420001 for details of joints not shown.

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

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

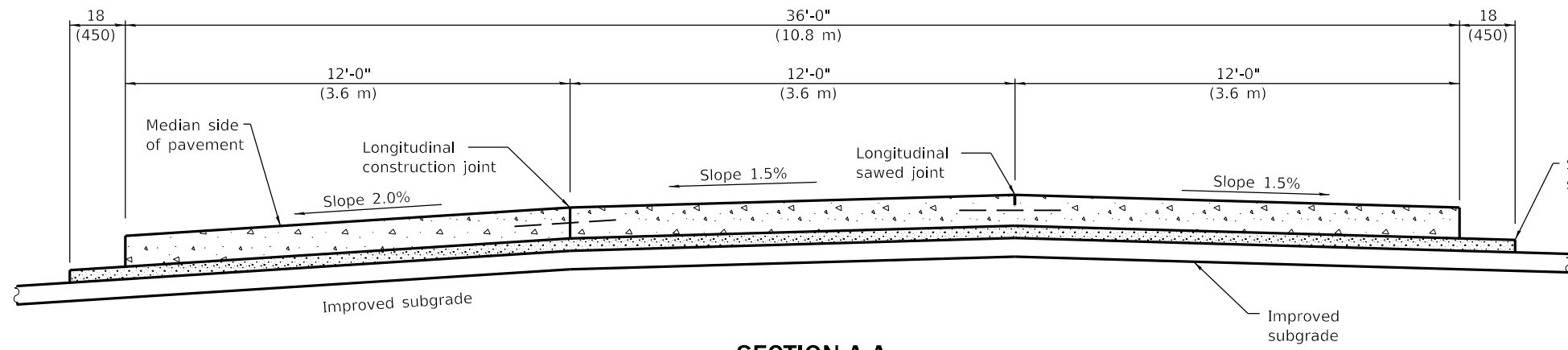
APPROVED January 1, 2018  
*Maureen M. Adams*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

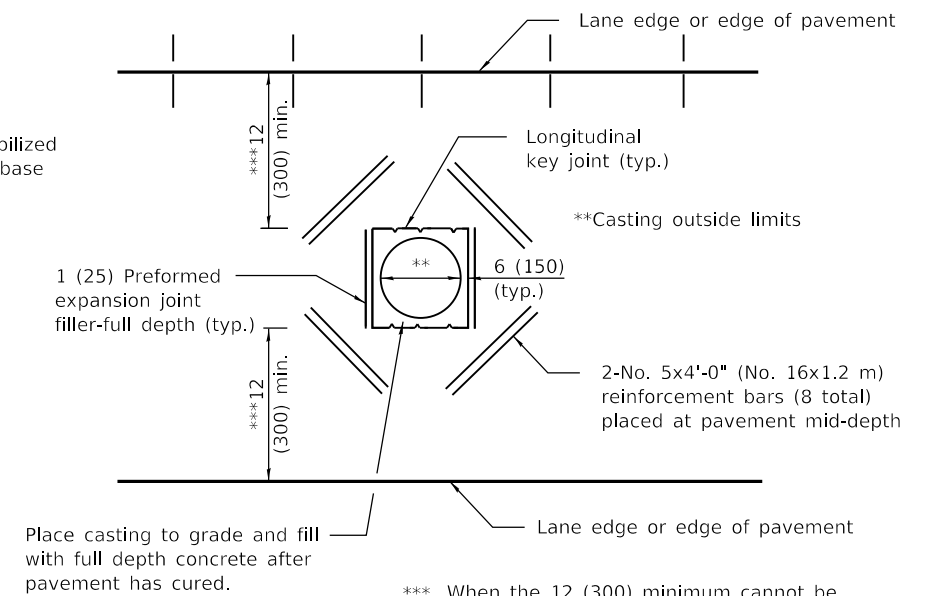
DATE	REVISIONS
1-1-18	Changed spacing of tie bars to 36 (900).
1-1-15	Added dimension of tie bars from transverse contraction joints

**24' (7.2 m) JOINTED PCC PAVEMENT**

**STANDARD 420101-06**

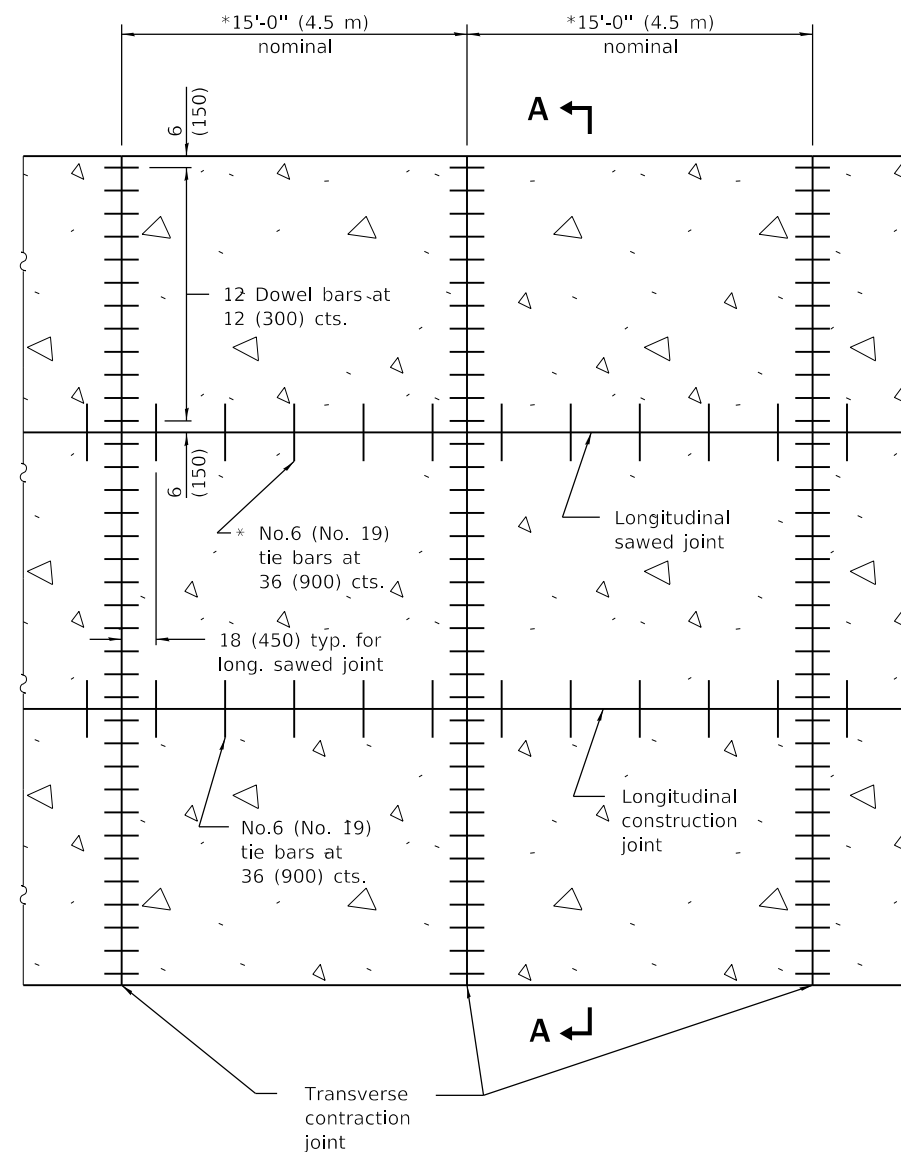


**SECTION A-A**  
(TYPICAL 3-LANE, 1-WAY WITH SHOULDERS)

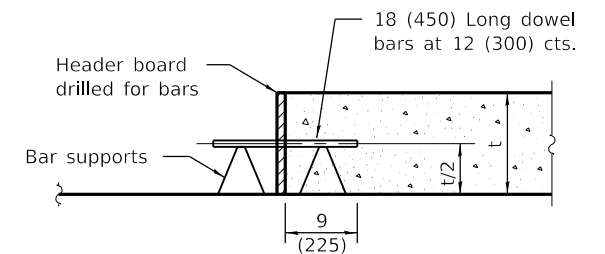


\*\*\* When the 12 (300) minimum cannot be achieved, the transverse joints shall be extended to either the longitudinal joint or edge of pavement.

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



**PAVEMENT PLAN**



**TRANSVERSE CONSTRUCTION JOINT**

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

**GENERAL NOTES**

See Standard 420001 for details of joints not shown.

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

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

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

**STANDARD 420106-06**

Illinois Department of Transportation

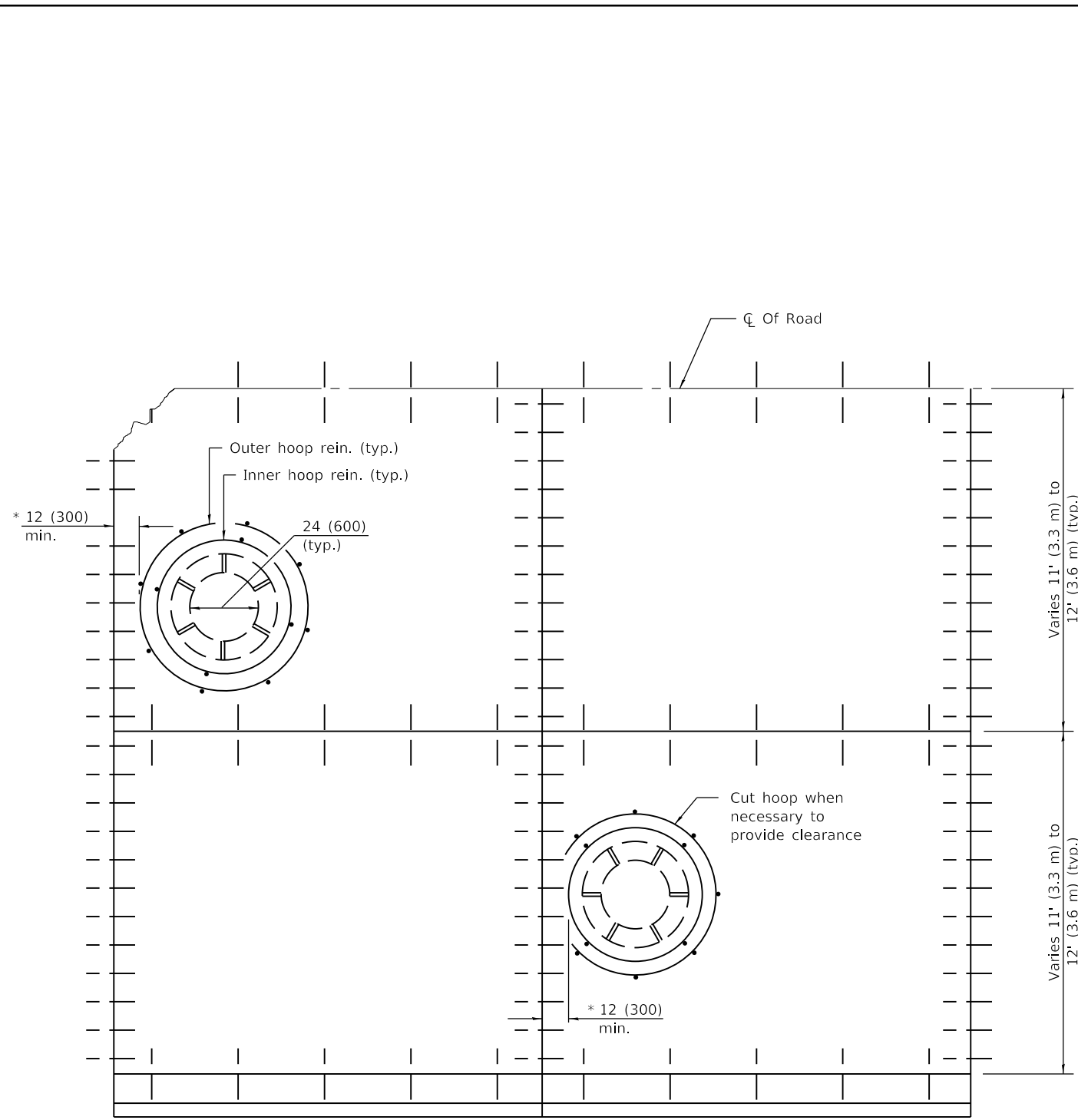
PASSED January 1, 2018  
*Michael Beard*  
ENGINEER OF POLICY AND PROCEDURES

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

ISSUED 1-1-97

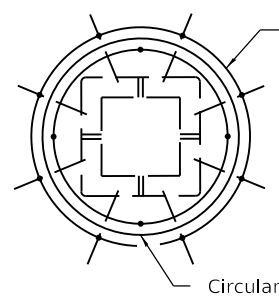






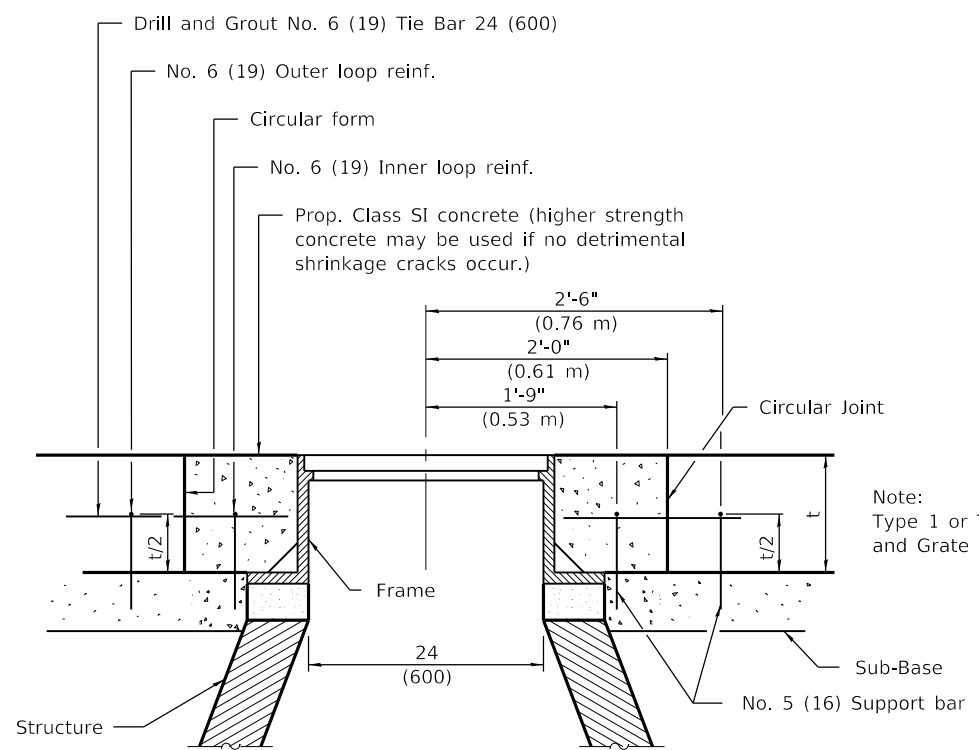
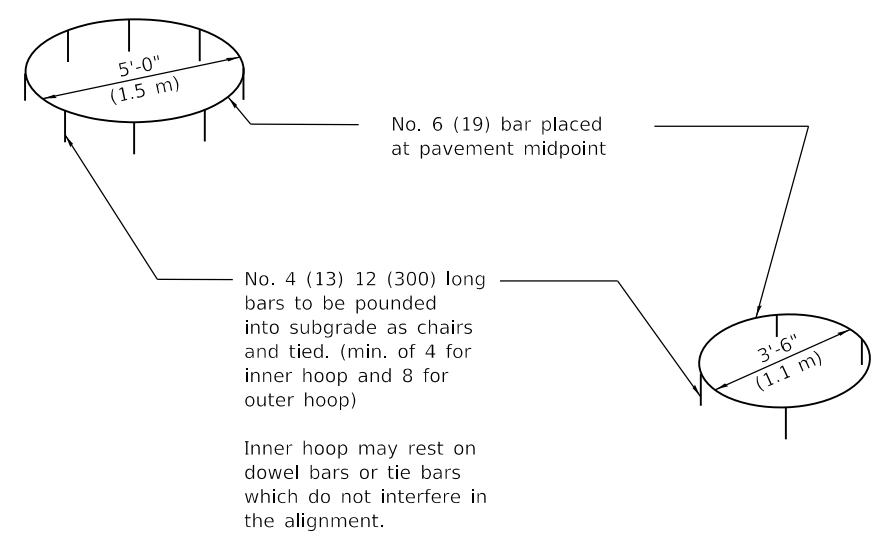
**CAST IN PLACE DETAIL**

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



**ROUNDOUT FOR SQUARE FRAME & GRATE AND MANHOLES**

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.



**DETAIL OF REINFORCEMENT FOR PAVEMENT ROUNDOUT**

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

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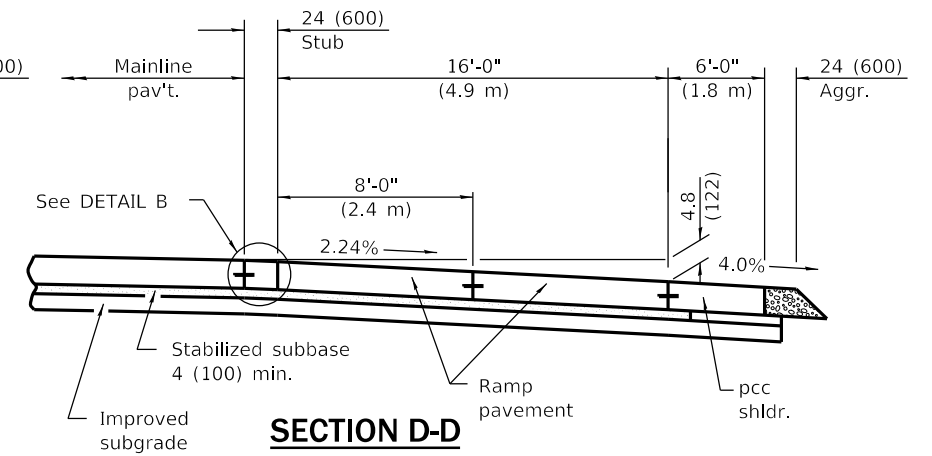
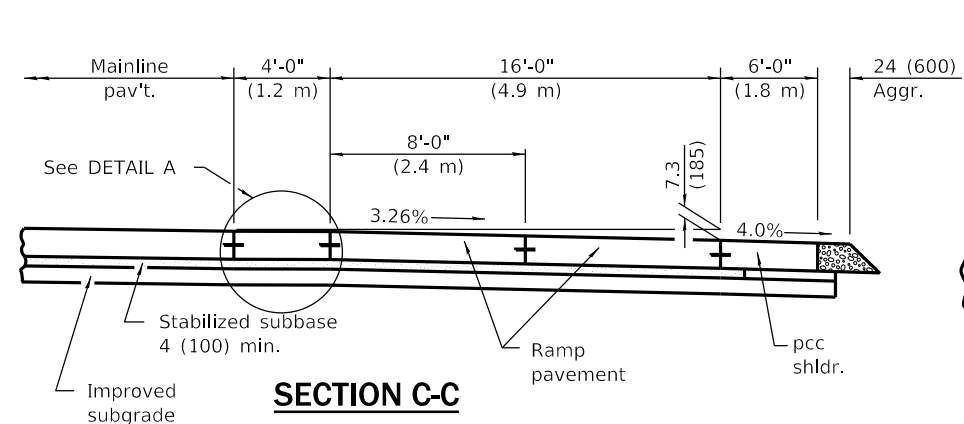
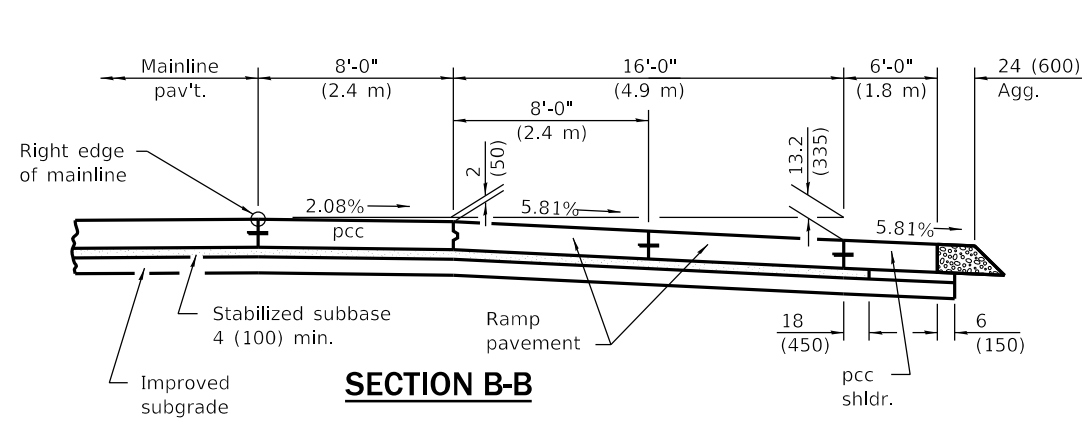
APPROVED January 1, 2018  
*Maureen M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

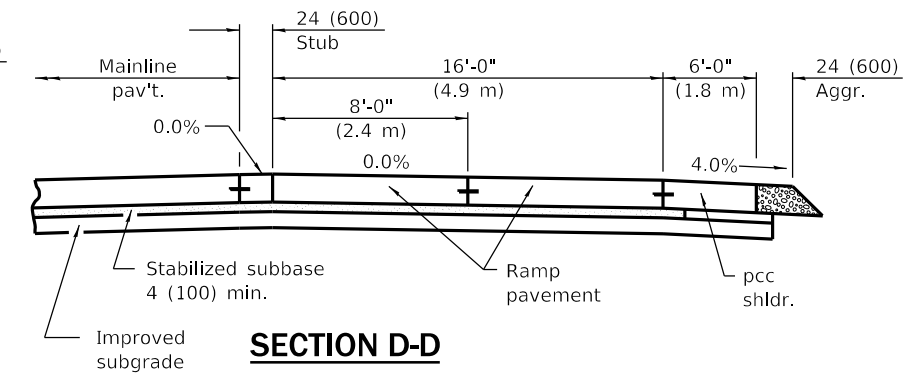
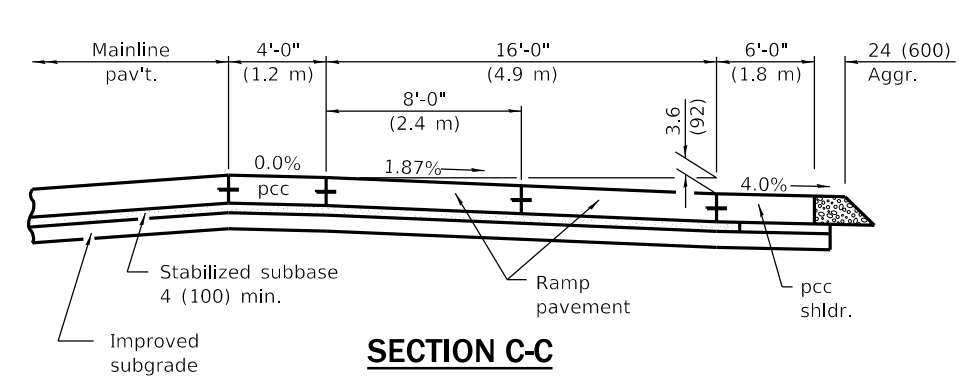
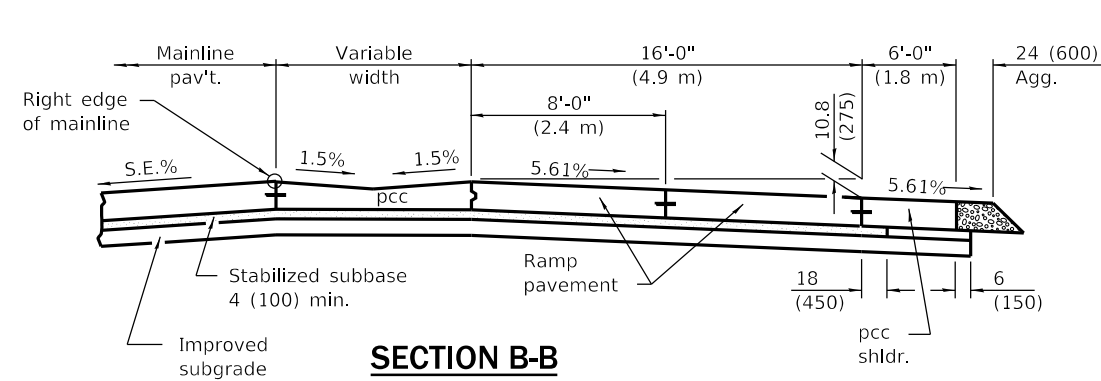
**PCC PAVEMENT ROUNDOUTS**  
 (Sheet 2 of 2)

**STANDARD 420111-04**

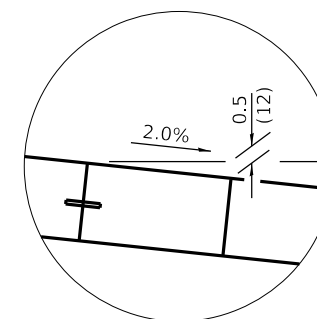
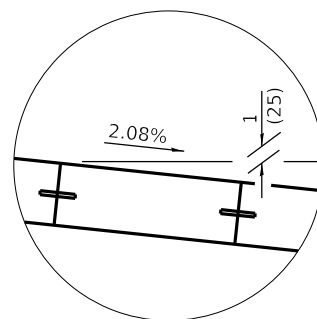




**CROSS SECTIONS WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT**



**CROSS SECTIONS WHEN MAINLINE IS CURVED TO THE LEFT**



**DETAIL A**

**DETAIL B**

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*Michael Beard*  
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APPROVED January 1, 2018  
*Marcus M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

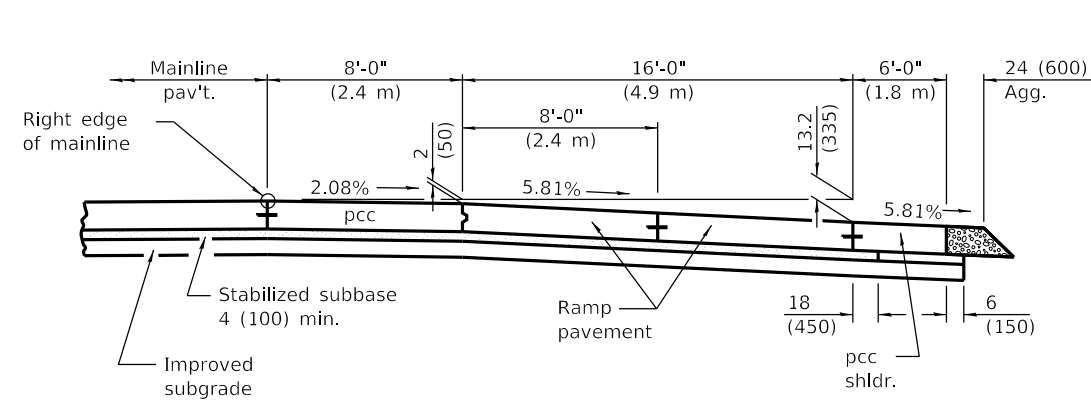
ISSUED 1-1-97

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

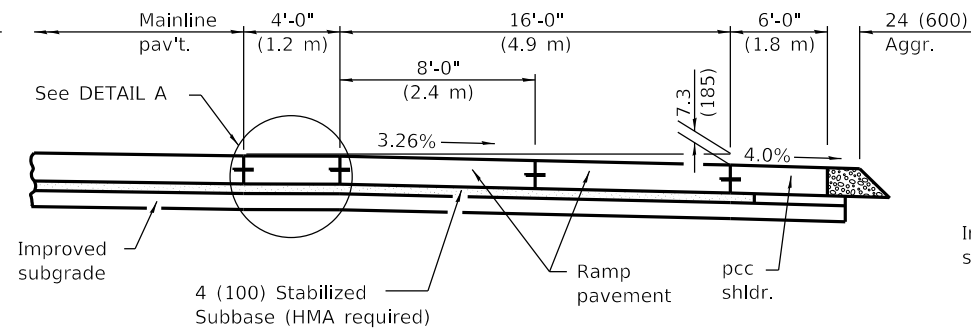
(Sheet 2 of 2)

**STANDARD 420201-11**

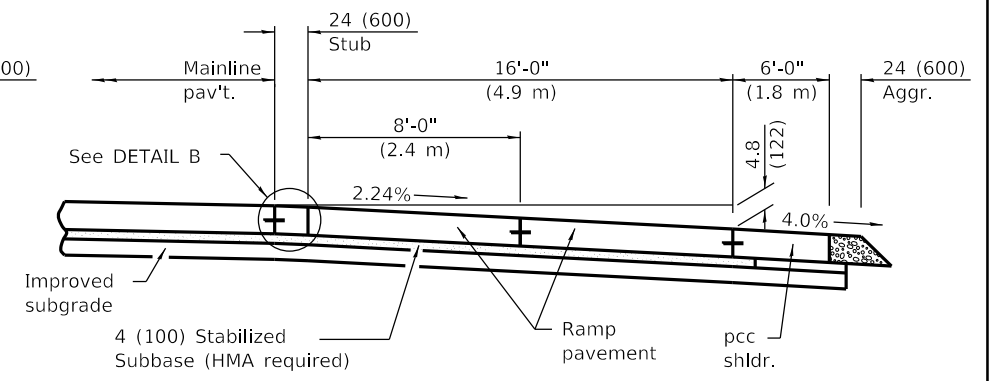




**SECTION B-B**

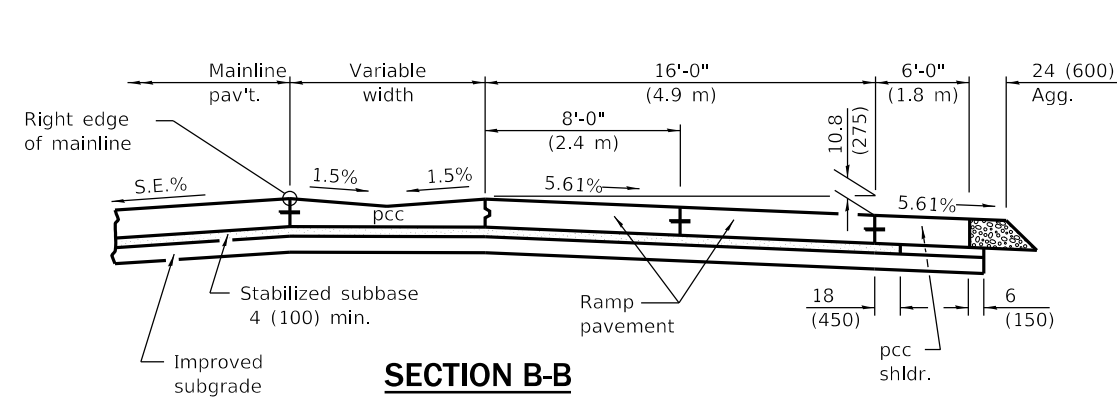


**SECTION C-C**

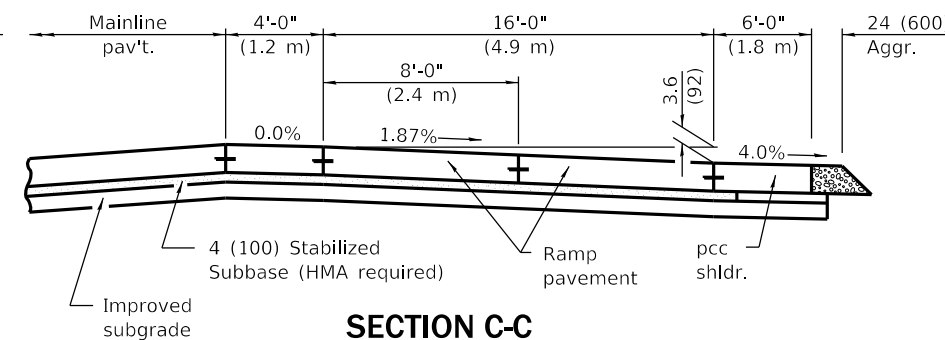


**SECTION D-D**

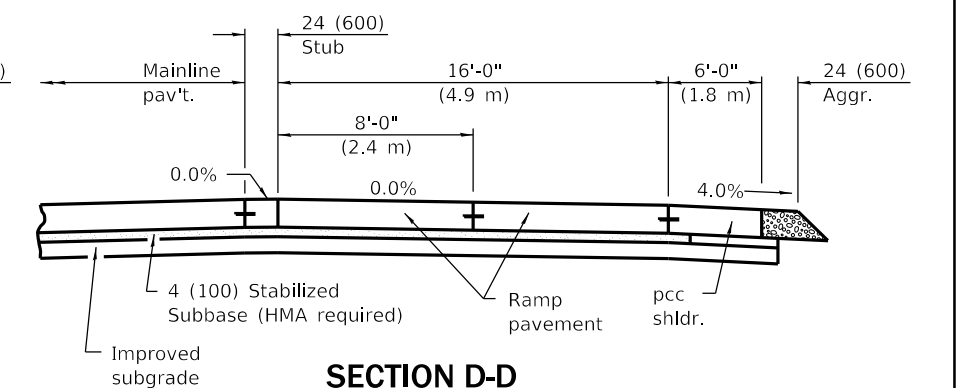
**CROSS SECTIONS WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT**



**SECTION B-B**

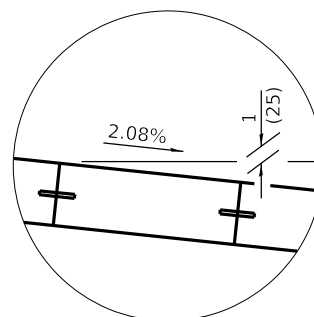


**SECTION C-C**

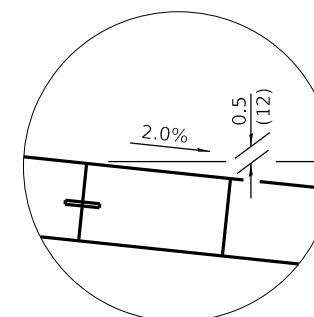


**SECTION D-D**

**CROSS SECTIONS WHEN MAINLINE IS CURVED TO THE LEFT**



**DETAIL A**



**DETAIL B**

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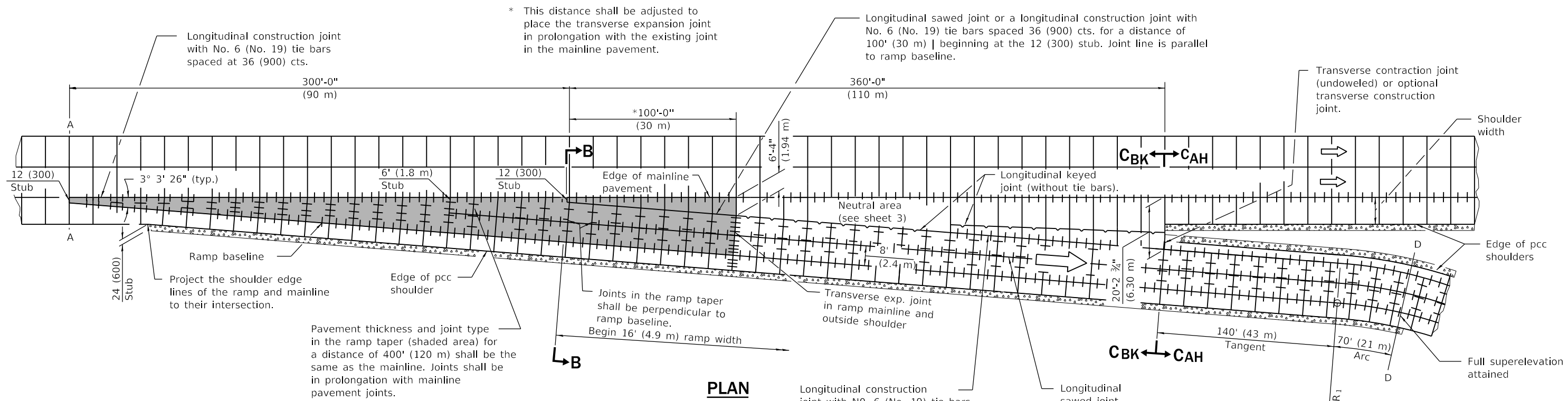
APPROVED January 1, 2018  
*Marcus M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

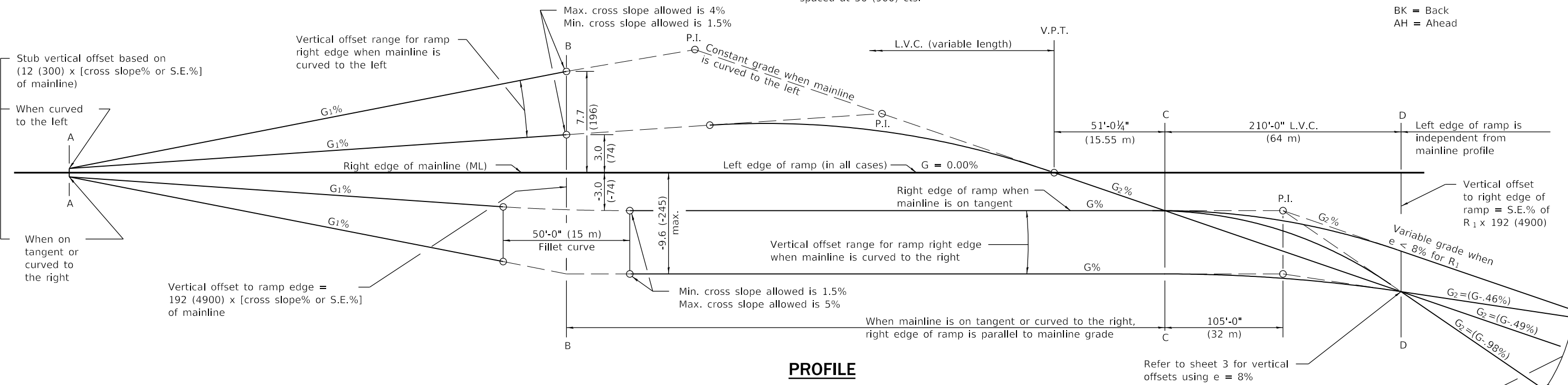
**ENTRANCE RAMP TERMINAL**  
 (JOINTED PCC RAMP PAVEMENT  
 ADJACENT TO CRC MAINLINE PAVEMENT)

(Sheet 2 of 2)

**STANDARD 420206-12**



**PLAN**



**PROFILE**

Illinois Department of Transportation

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

APPROVED January 1, 2018  
Maurice M. Adams  
ENGINEER OF DESIGN AND ENVIRONMENT

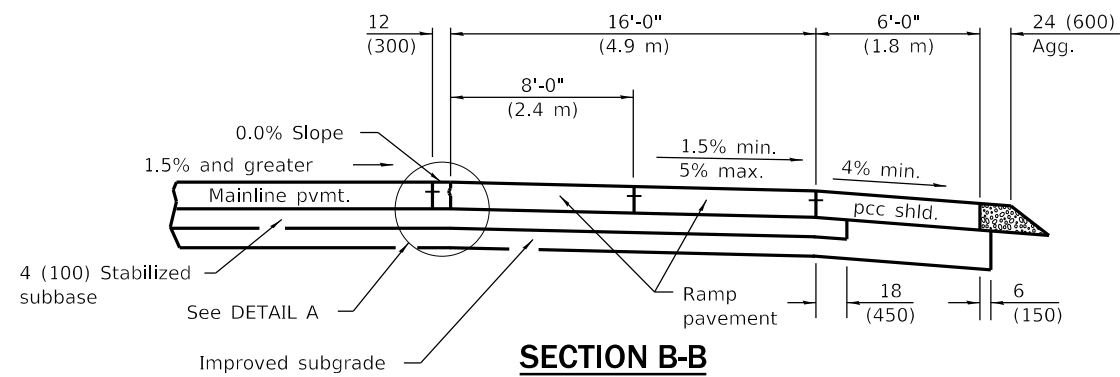
ISSUED 1-1-97

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

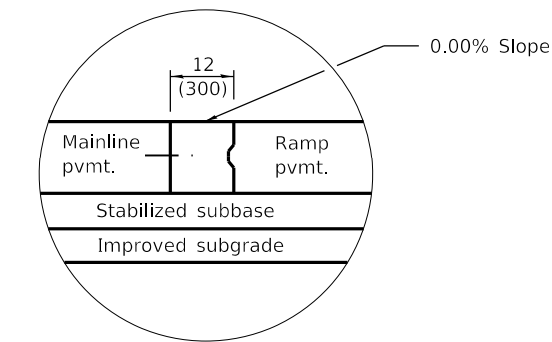
**EXIT RAMP TERMINAL**  
(JOINTED PCC RAMP PAVEMENT  
ADJACENT TO JOINTED PCC MAINLINE PAVEMENT)

(Sheet 1 of 3)

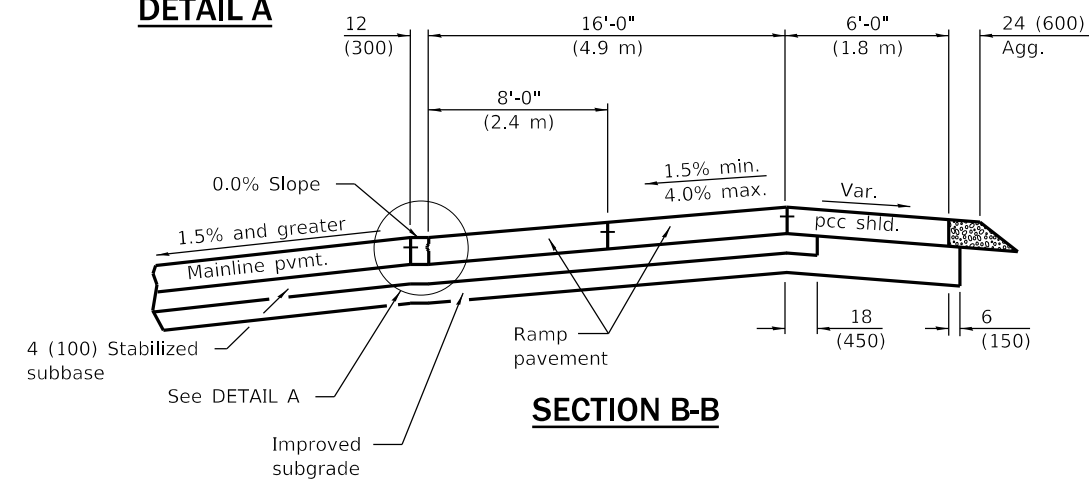
**STANDARD 420301-08**



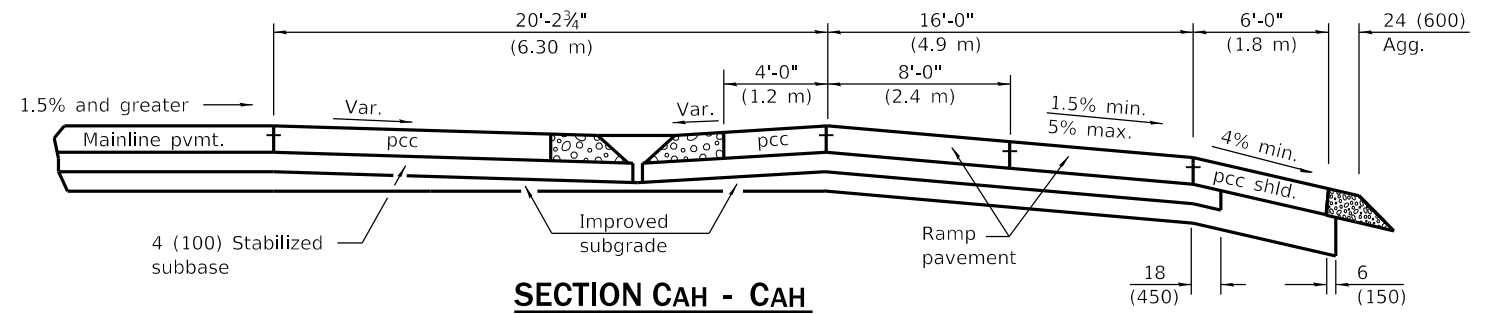
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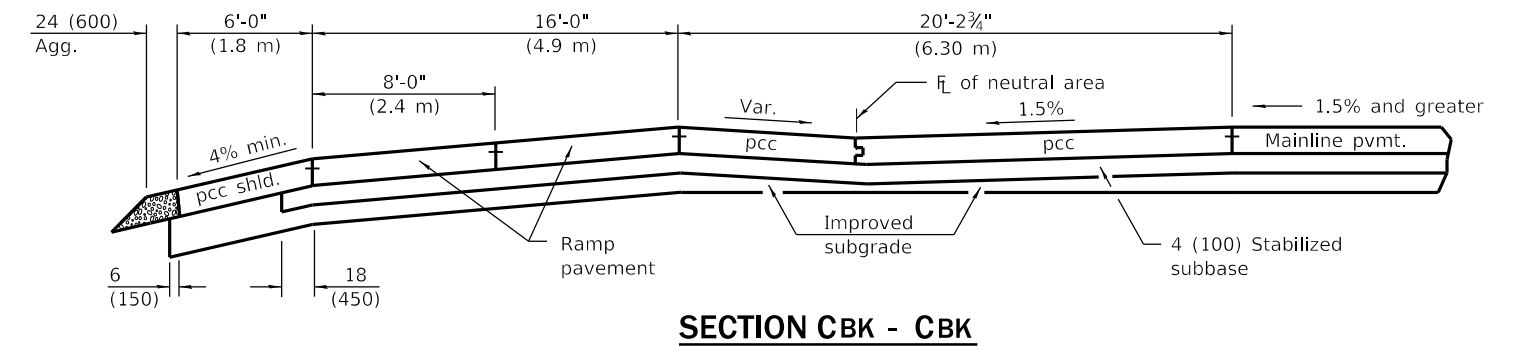
**DETAIL A**



**SECTION B-B**



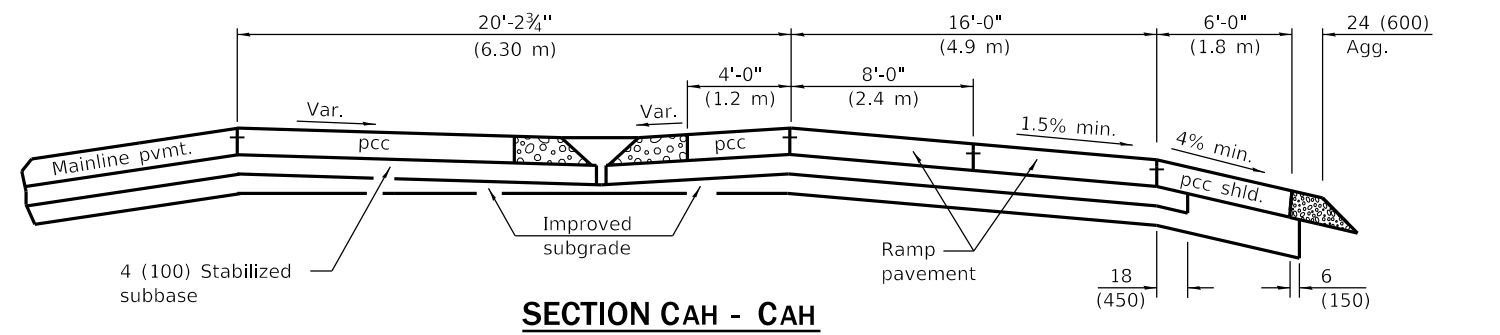
**SECTION CAH - CAH**



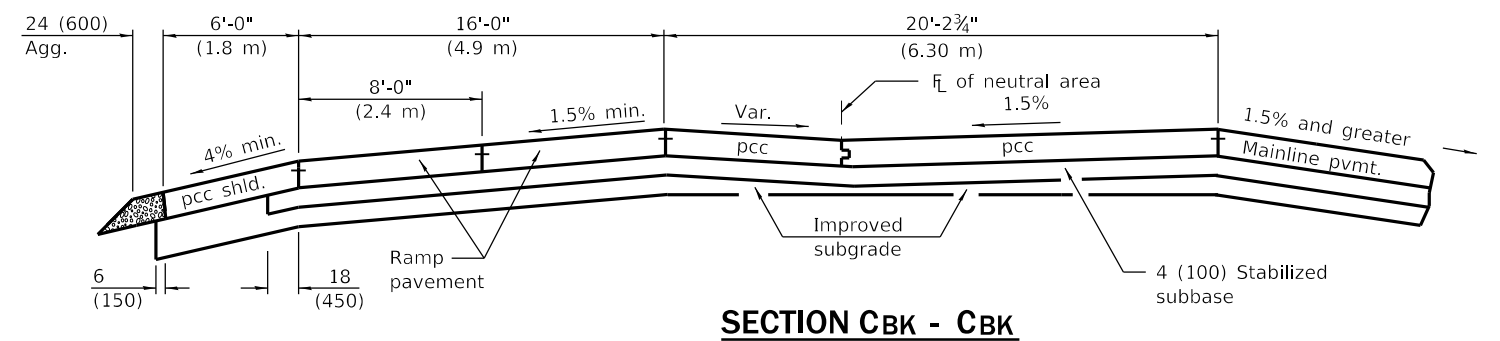
**SECTION CBK - CBK**

BK = Back  
AH = Ahead

**WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT**



**SECTION CAH - CAH**



**SECTION CBK - CBK**

See Sheet 3 for GENERAL NOTES

**WHEN MAINLINE IS CURVED TO THE LEFT**

Illinois Department of Transportation

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

APPROVED January 1, 2018  
*Marcus M. Adams*  
 ENGINEER OF DESIGN AND ENVIRONMENT

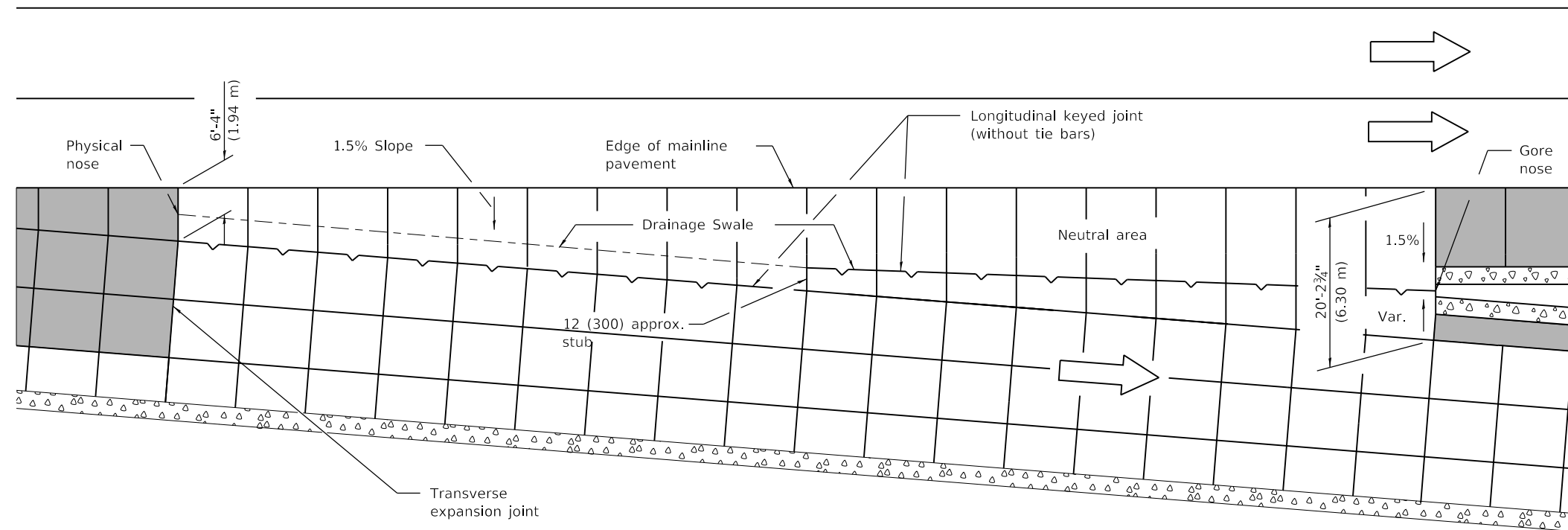
ISSUED 1-1-97

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

(Sheet 2 of 3)

**STANDARD 420301-08**





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

### DETAILS FOR DRAINAGE IN NEUTRAL AREA

### GENERAL NOTES

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

See plans for actual grades.

All pavement joints shall be detailed as shown on Standards 420001 and 483001.

See Standard 483001 for ramp shoulder details.

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

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

Where an exit ramp terminal is proposed adjacent to a mainline horizontal curve, construct the edge of the terminal by using offset widths, and for the terminal segment downstream from Section C-C to R, construct the ramp as a 141' (43 m) tangent section.

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

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

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*Michael Beard*  
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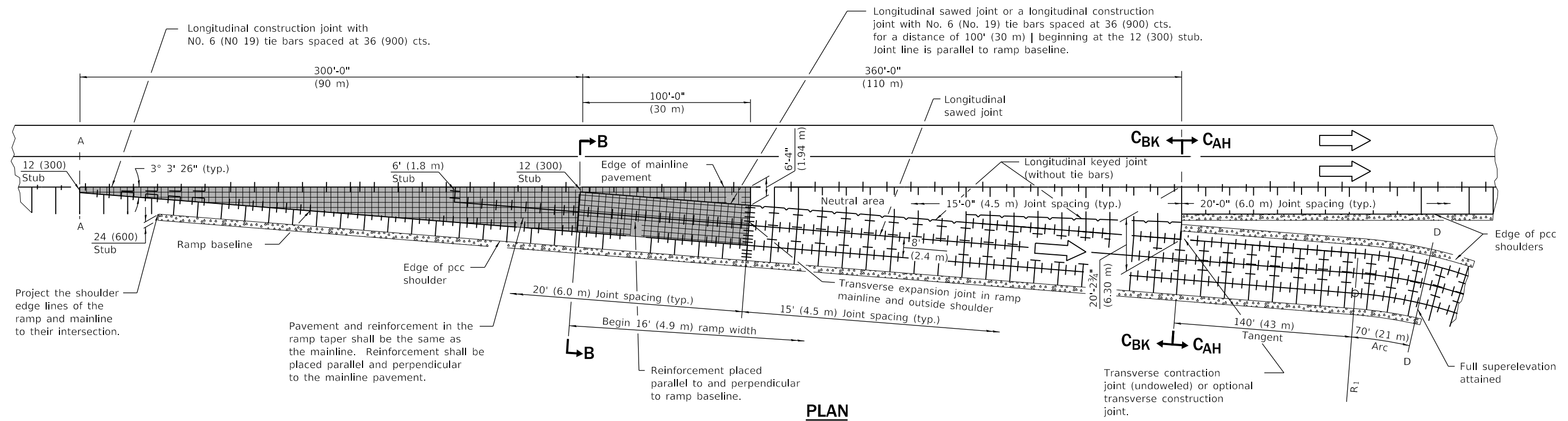
APPROVED January 1, 2018  
*Marcus M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

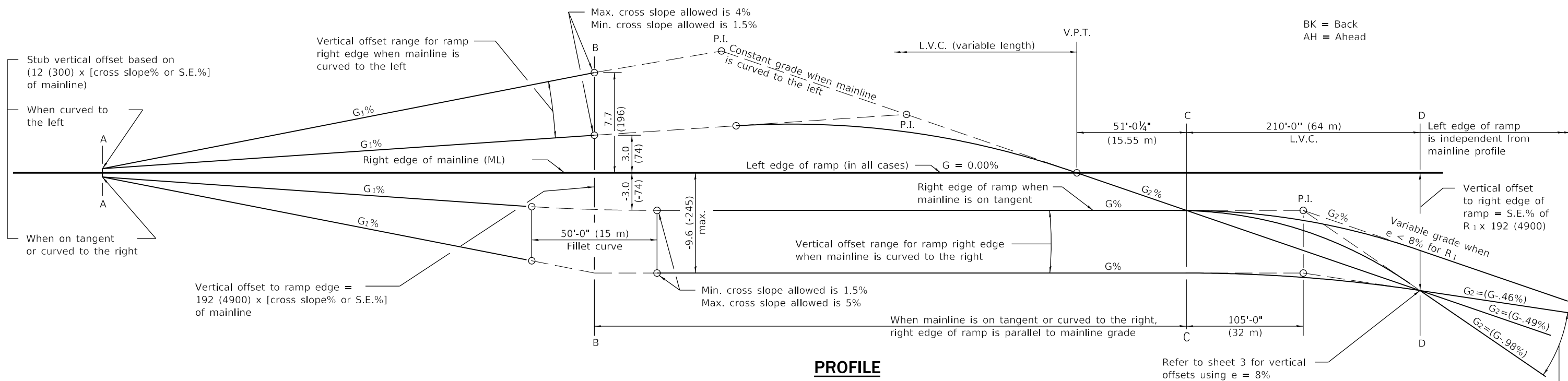
**EXIT RAMP TERMINAL**  
 (JOINTED PCC RAMP PAVEMENT  
 ADJACENT TO JOINTED PCC MAINLINE PAVEMENT)

(Sheet 3 of 3)

**STANDARD 420301-08**



**PLAN**



**PROFILE**

See Sheet 3 for GENERAL NOTES

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

APPROVED January 1, 2018  
*Marcus M. Adams*  
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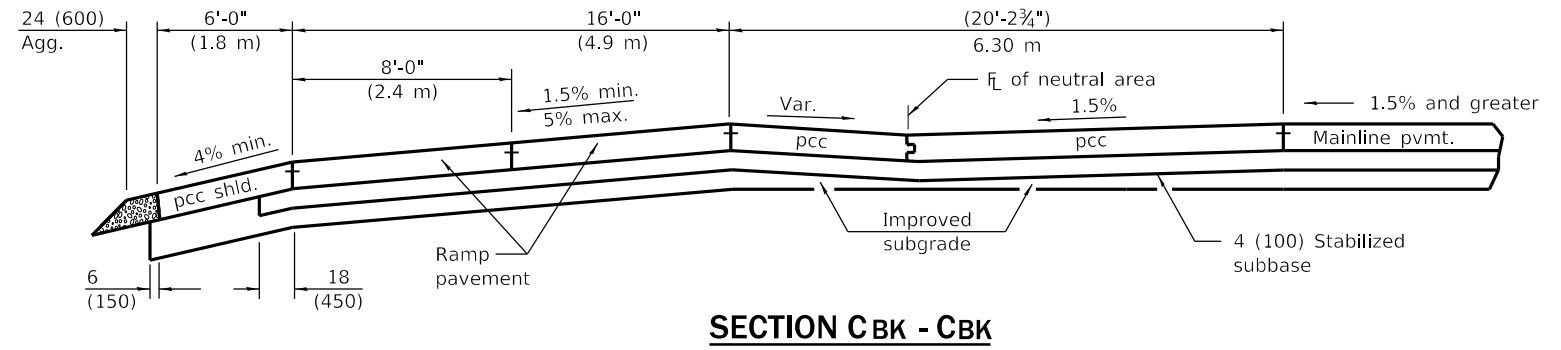
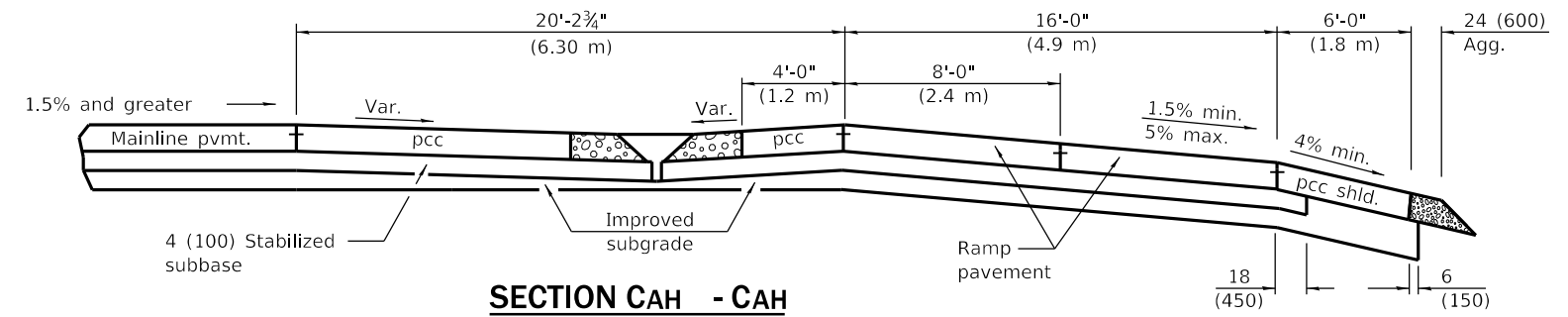
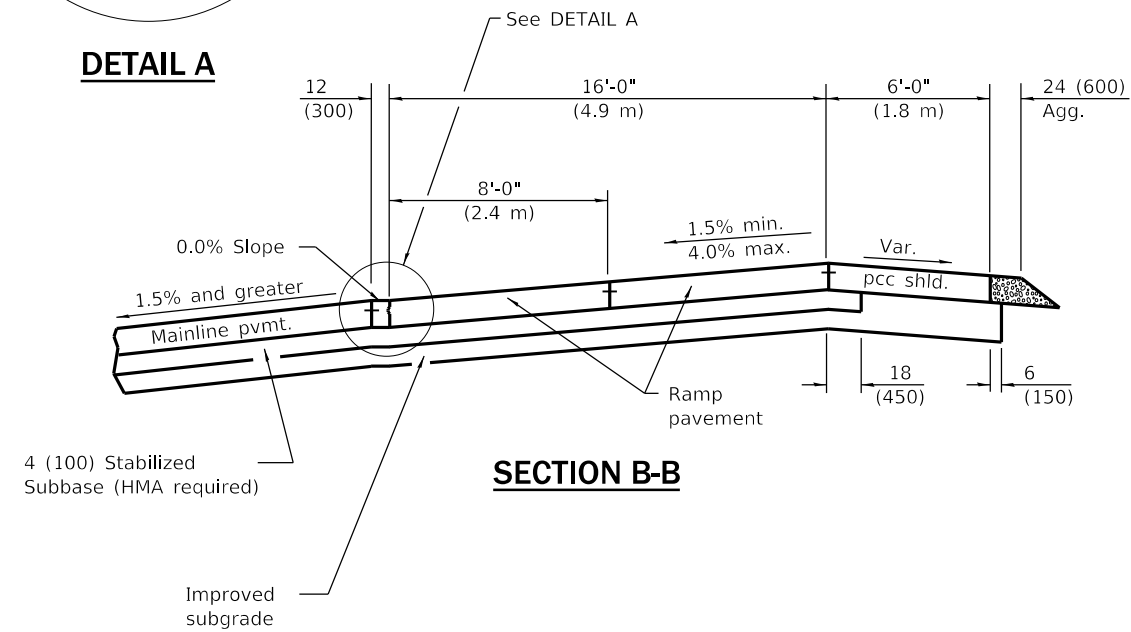
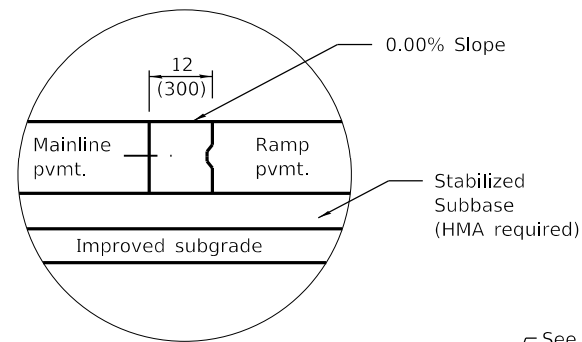
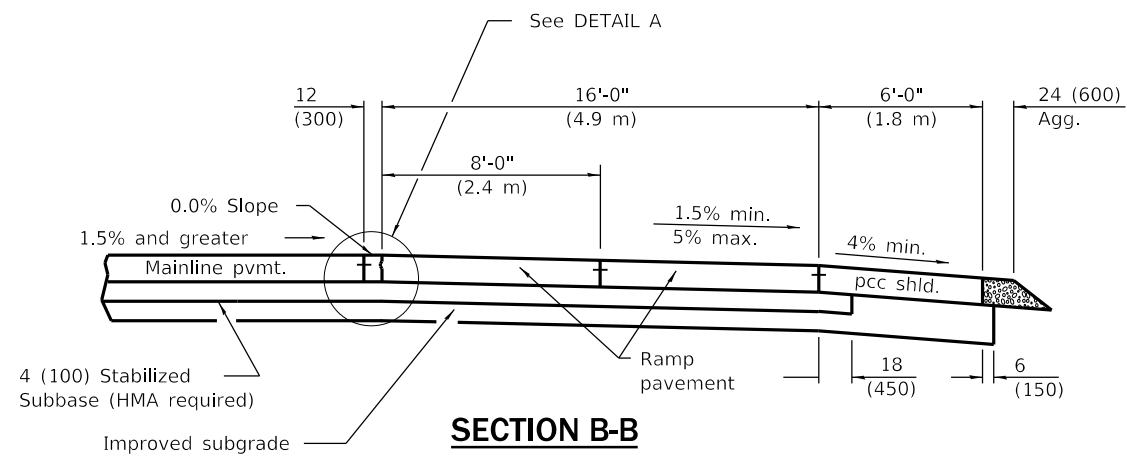
ISSUED 1-1-97

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

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

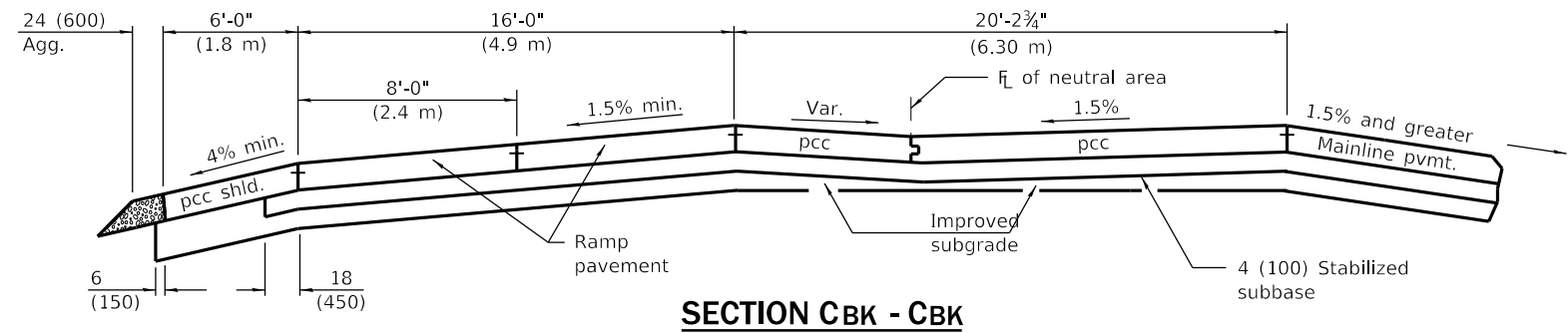
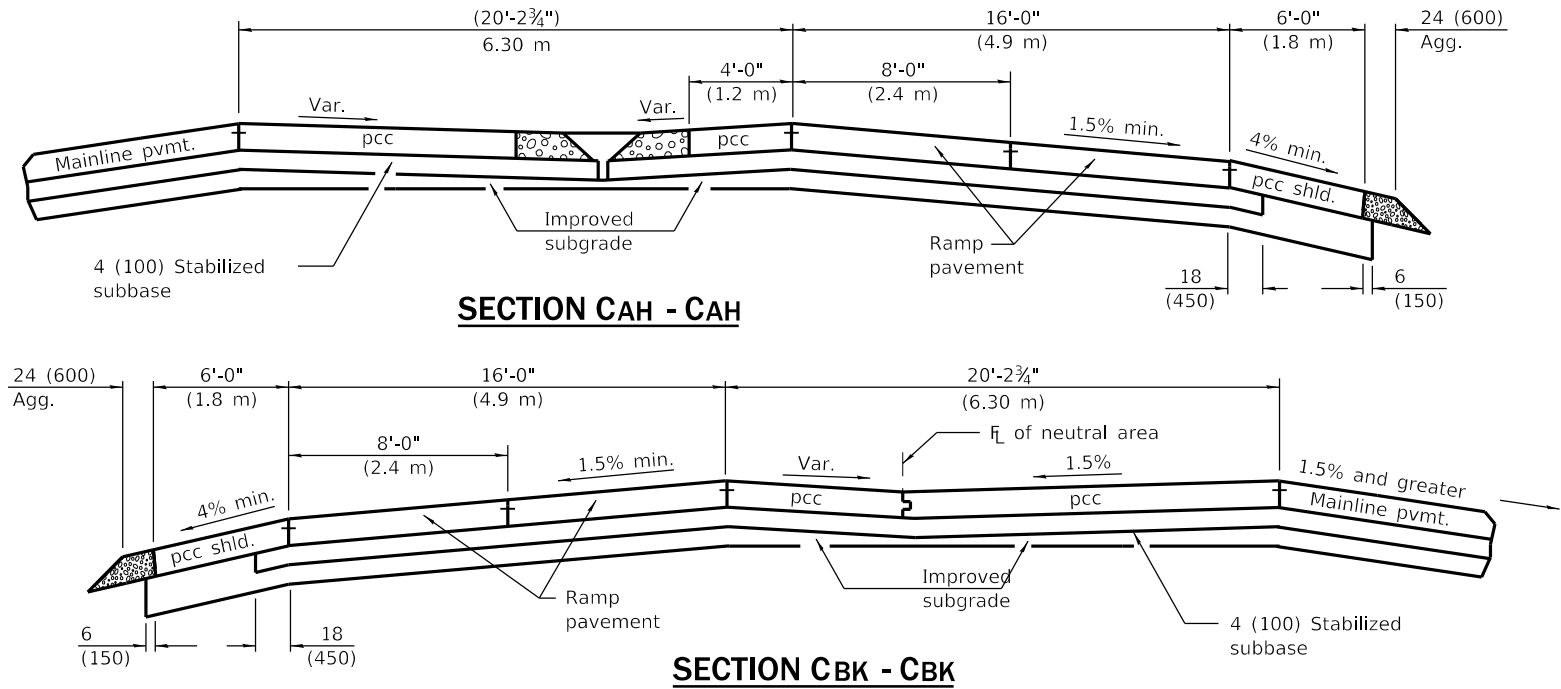
(Sheet 1 of 3)

**STANDARD 420306-10**



BK = Back  
AH = Ahead

**WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT**



See Sheet 3 for GENERAL NOTES

**WHEN MAINLINE IS CURVED TO THE LEFT**

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

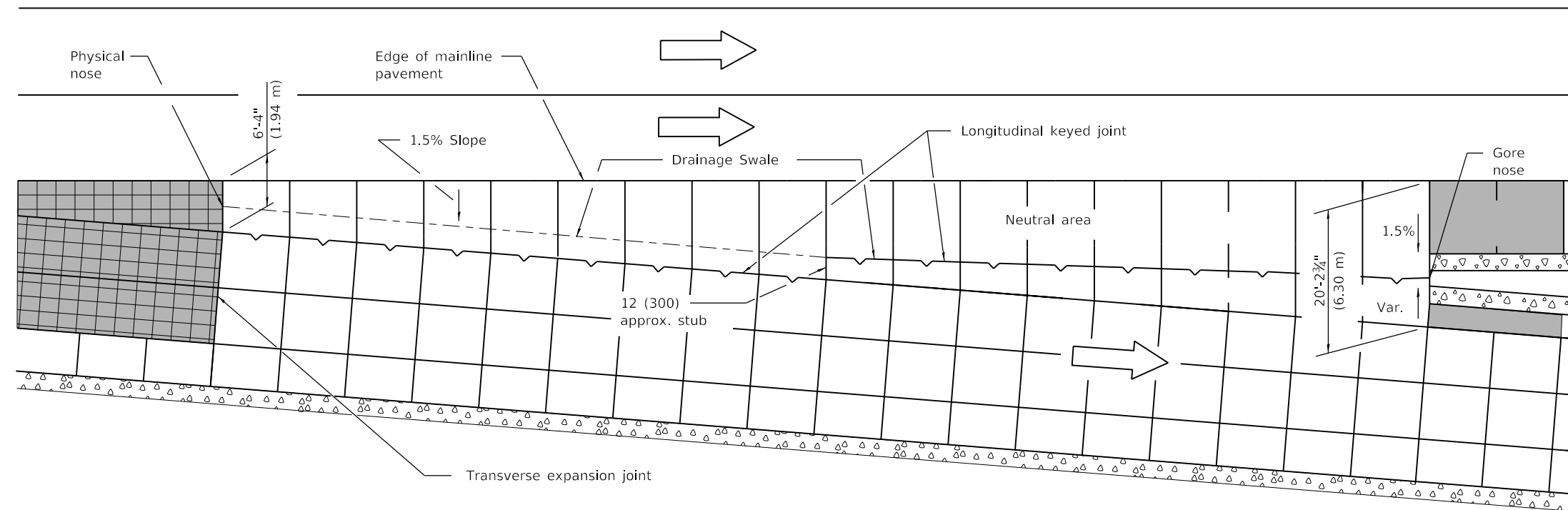
APPROVED January 1, 2018  
*Marcus M. Beck*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

(Sheet 2 of 3)

**STANDARD 420306-10**



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

### DETAILS FOR DRAINAGE IN NEUTRAL AREA

### GENERAL NOTES

The initial ramp grade ( $G_2$ ) is based on the line generated through the PI that is 105' (32 m) past Section C-C and the point created by the vertical offset at Section D-D.

See plans for actual grades.

All pavement joints shall be detailed as shown on Standards 420001 and 483001. See Standard 483001 for ramp shoulder details.

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

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

Where an exit ramp terminal is proposed adjacent to a mainline horizontal curve, construct the edge of the terminal by using offset widths, and for the terminal segment downstream from Section C-C to  $R_1$ , construct the ramp as a 141' (43 m) tangent section.

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

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

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*Michael Beard*  
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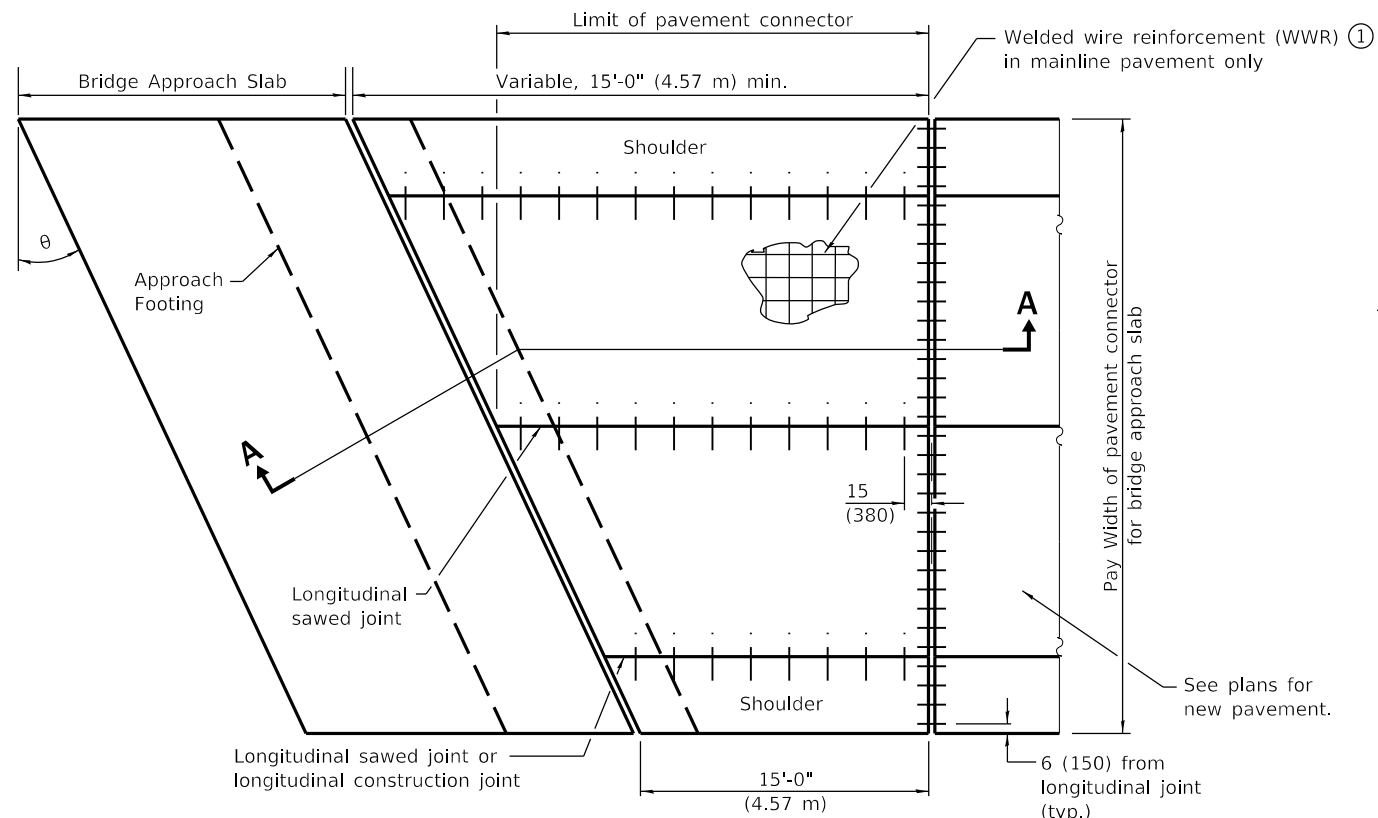
APPROVED January 1, 2018  
*Marcus M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

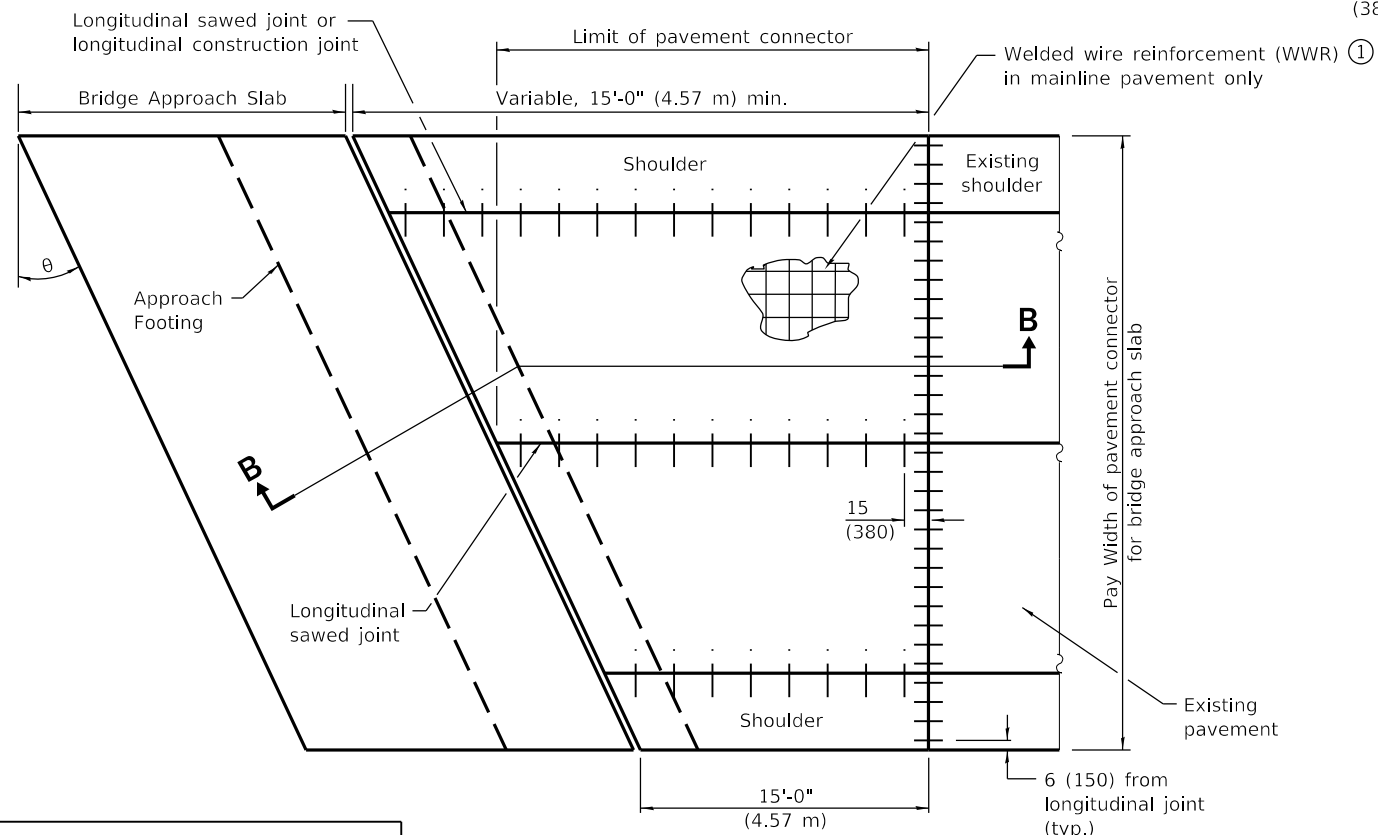
**EXIT RAMP TERMINAL**  
 (JOINTED PCC RAMP PAVEMENT  
 ADJACENT TO CRC MAINLINE PAVEMENT)

(Sheet 3 of 3)

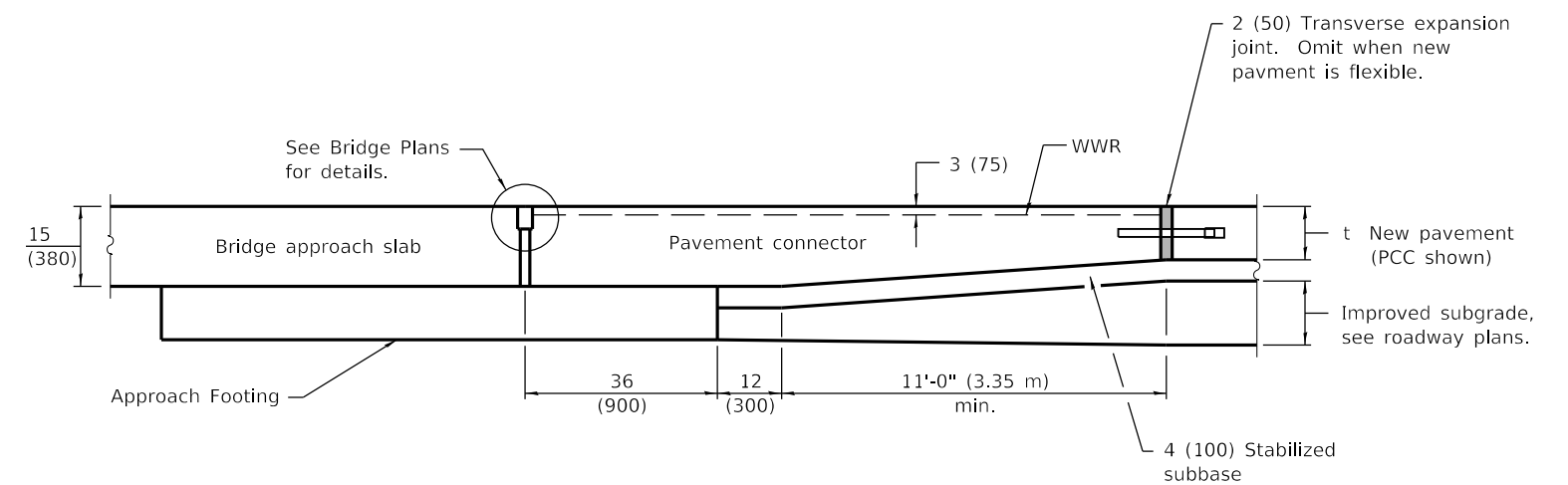
**STANDARD 420306-10**



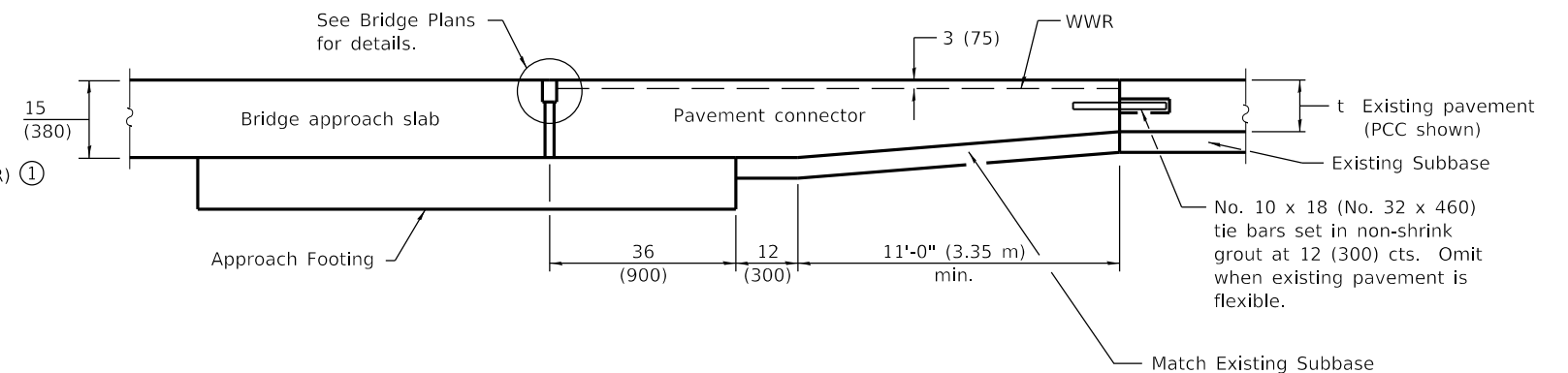
**PLAN  
NEW CONSTRUCTION**



**PLAN  
EXISTING CONSTRUCTION**



**SECTION A-A**



**SECTION B-B**

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

**GENERAL NOTES**

- THICKNESS-*t*=Thickness of Pavement.
- See Standard 420001 for pavement joint details not shown.
- See Standard 610001 for shoulder inlet with curb when required.
- See plans for details of bridge approach slab, approach footing and joint treatment.
- All dimensions are in inches (millimeters) unless otherwise shown.

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

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

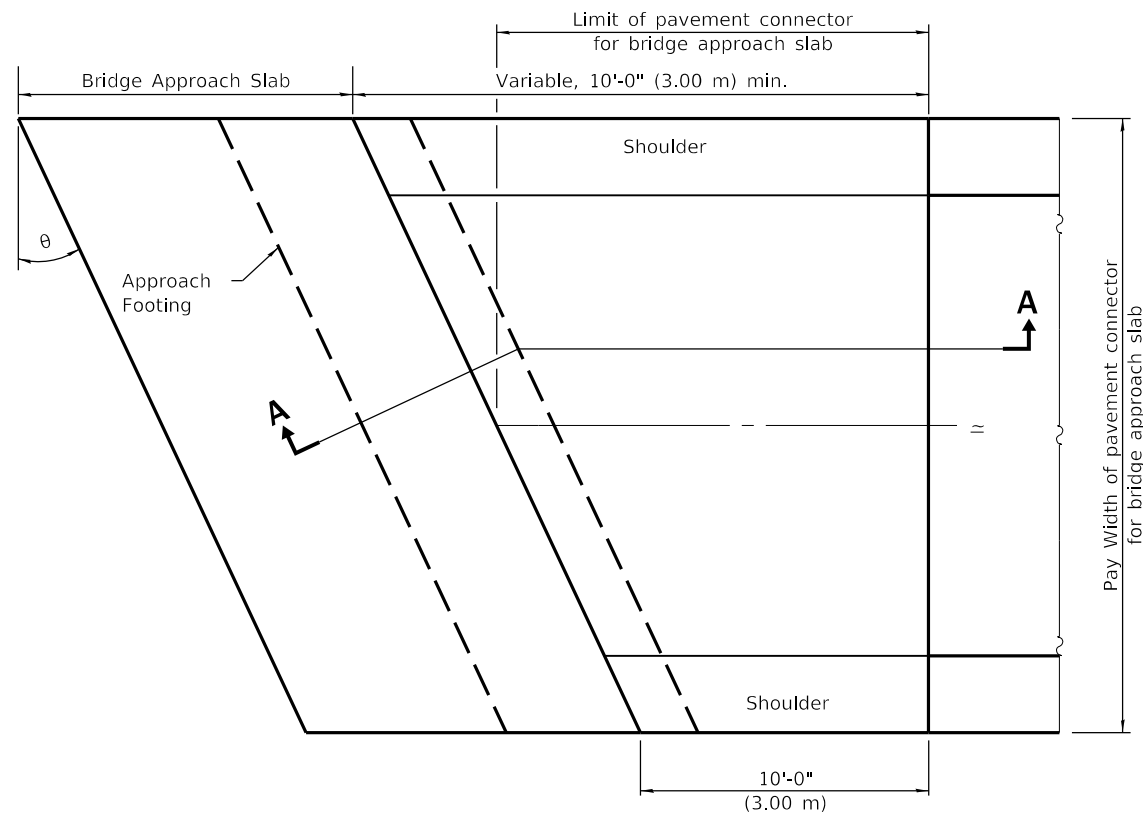
**STANDARD 420401-13**

Illinois Department of Transportation

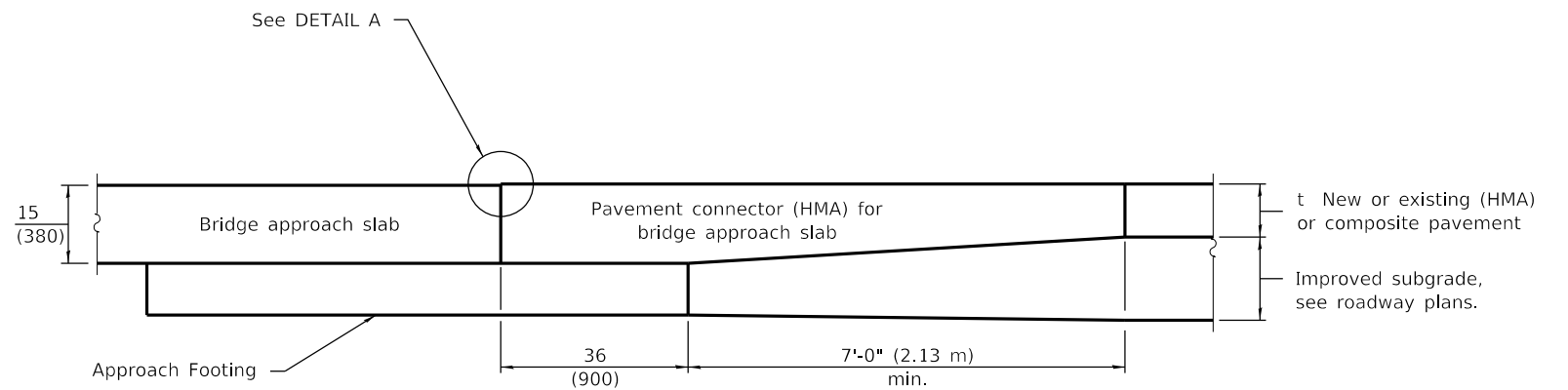
PASSED January 1 2019  
*Michael Bond*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1 2019  
*John E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

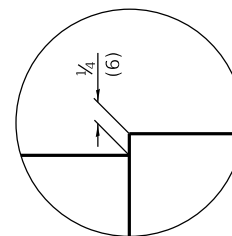
ISSUED 1-1-97



**PLAN**  
(New or existing construction)



**SECTION A-A**



**DETAIL A**

**GENERAL NOTES**

THICKNESS-*t*=Thickness of Pavement.

See Standard 610001 for shoulder inlet with curb when required.

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

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

DATE	REVISIONS
4-1-16	New standard.

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

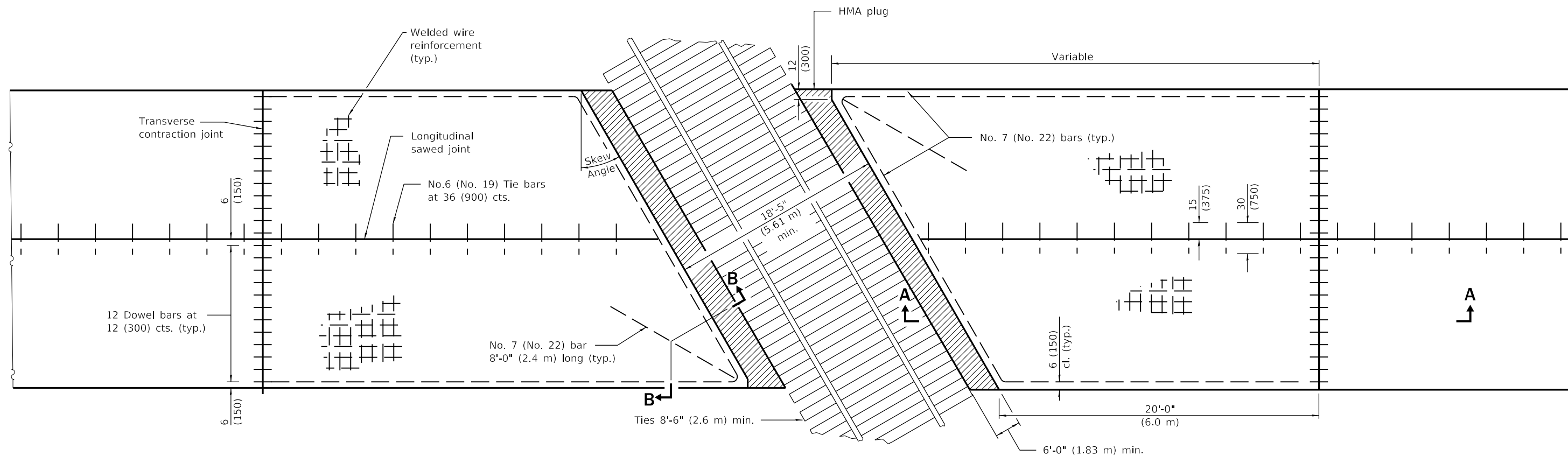
**STANDARD 420406**

Illinois Department of Transportation

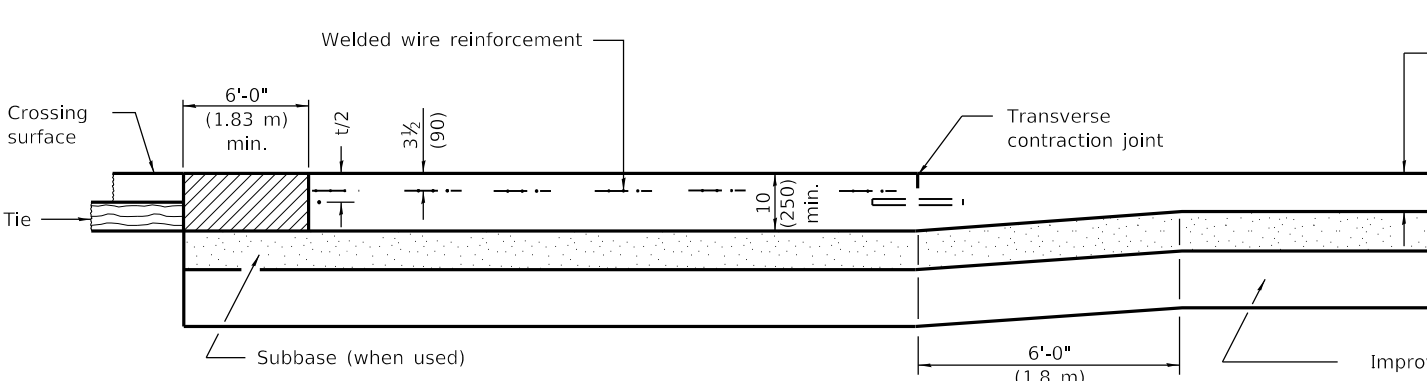
PASSED April 1, 2016  
*Michael Beard*  
ENGINEER OF POLICY AND PROCEDURES

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

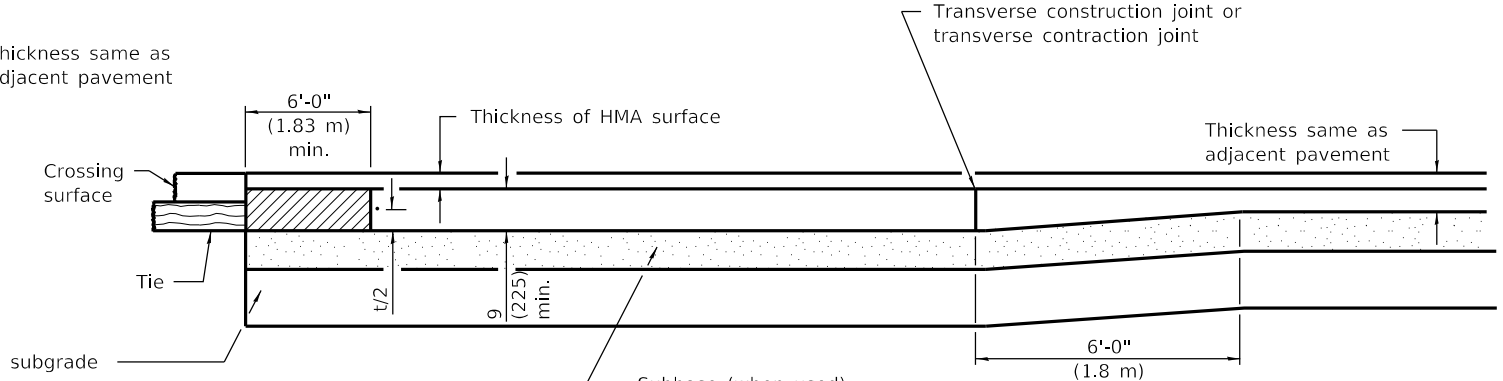
ISSUED 1-1-97



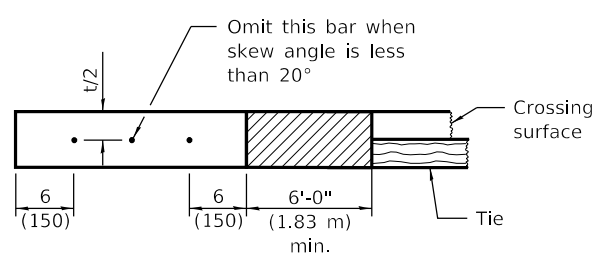
**PLAN**



**SECTION A-A**  
(FOR PCC PAVEMENT)



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



**SECTION B-B**

**GENERAL NOTES**

See Standard 420001 for joint details not shown.  
All dimensions are in inches (millimeters) unless otherwise shown.

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

**PCC PAVEMENT AND PCC BASE COURSE ADJACENT TO RAILROAD GRADE CROSSING**

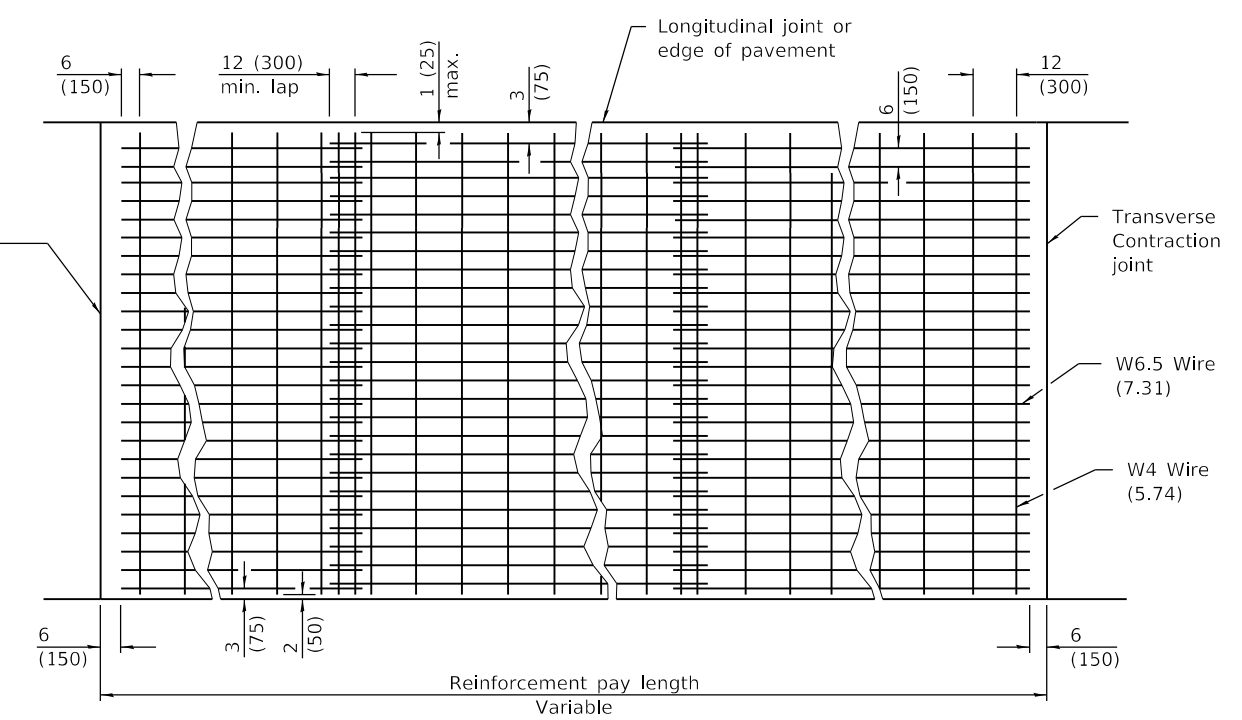
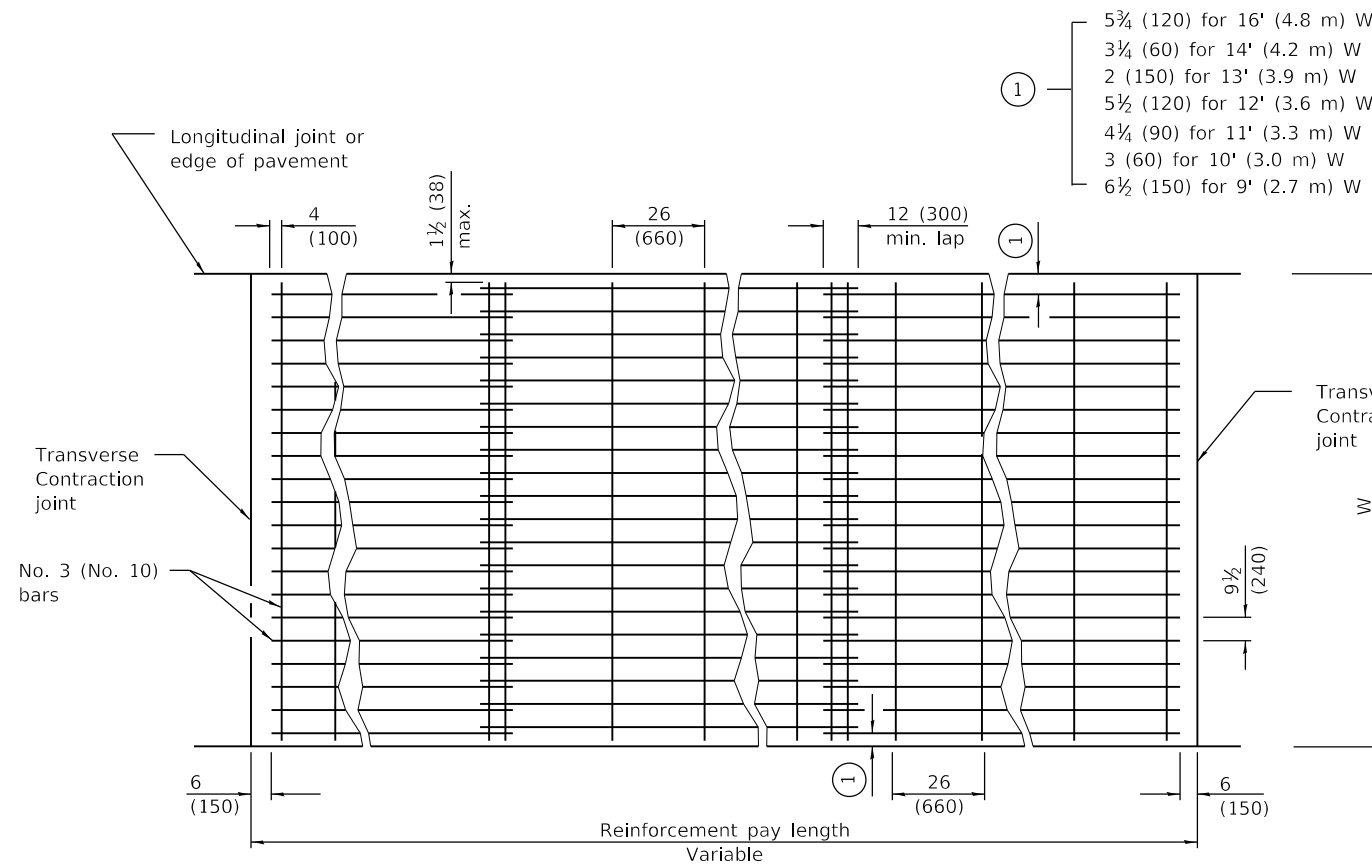
**STANDARD 420501-07**

Illinois Department of Transportation

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

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

ISSUED 1-1-97



Approximately 63 lbs./100 sq. ft. (3.07 kg/m<sup>2</sup>)

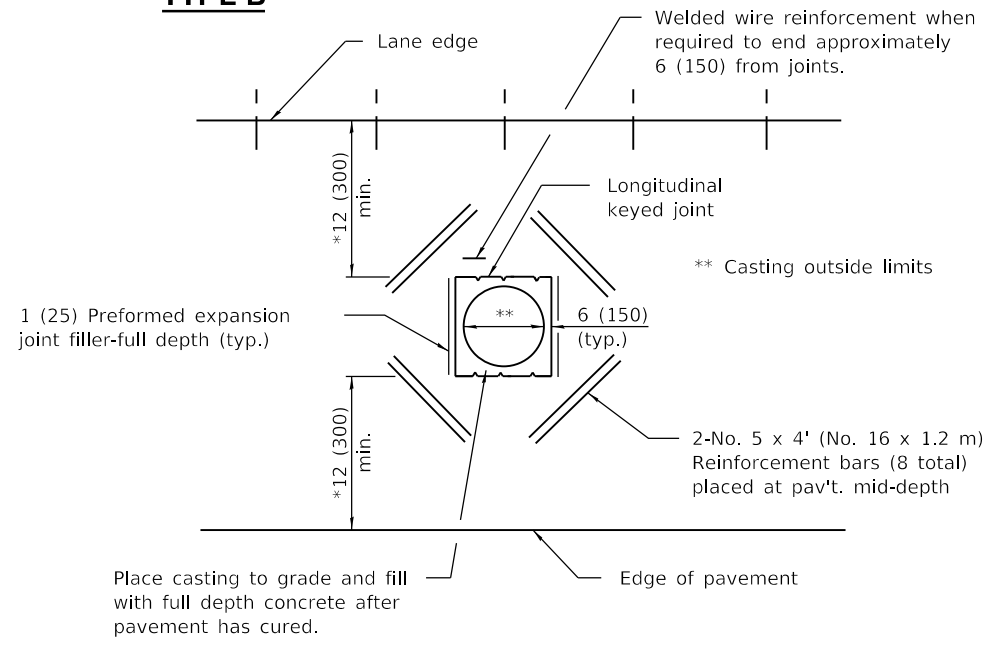
Approximately 63 lbs./100 sq. ft. (3.07 kg/m<sup>2</sup>)

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

**TYPE B**

**TYPE A**

\* 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**  
 Pavement block-outs shall be at least 24 (600) from contraction joints.  
 Welded wire reinforcement which is lapped longitudinally shall have a minimum lap of 6 (150).  
 Welded wire reinforcement may be positioned with the transverse wires on top or bottom of the longitudinal wires.  
 All dimensions are in inches (millimeters) unless otherwise shown.

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

**PAVEMENT WELDED WIRE REINFORCEMENT**

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**STANDARD 420701-03**

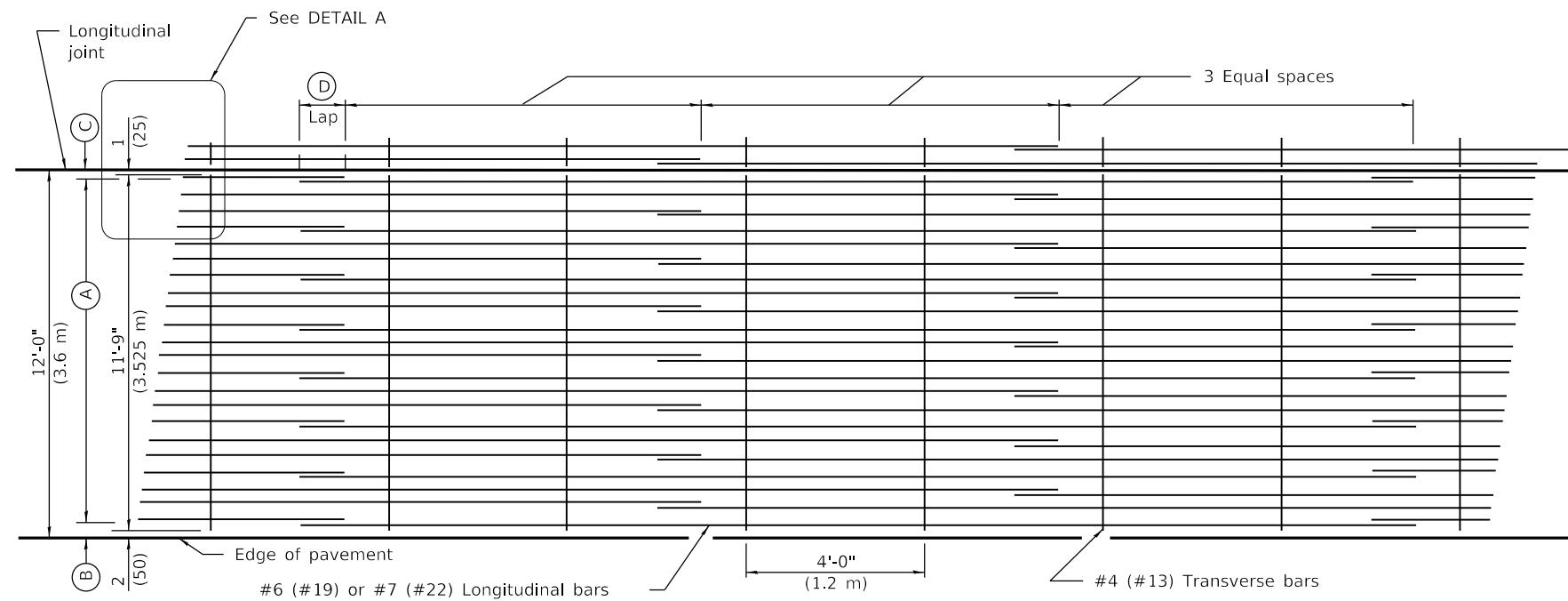
Illinois Department of Transportation

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

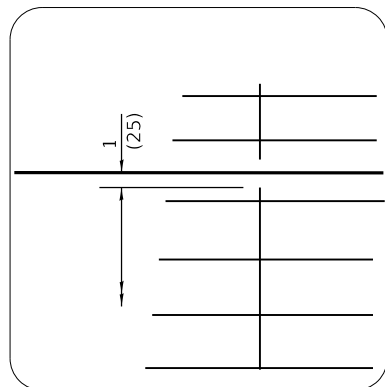
APPROVED April 1, 2016  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

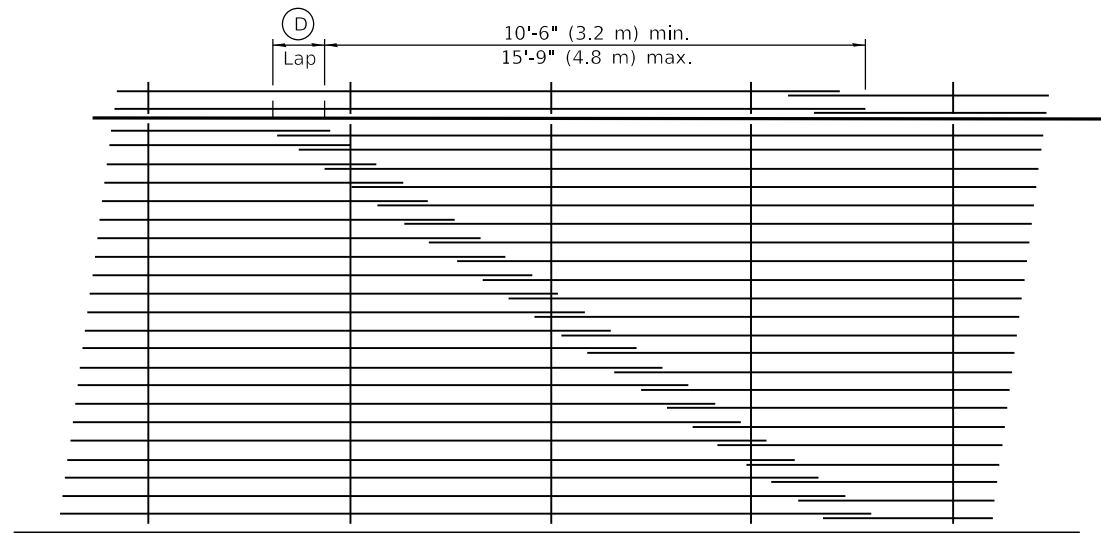




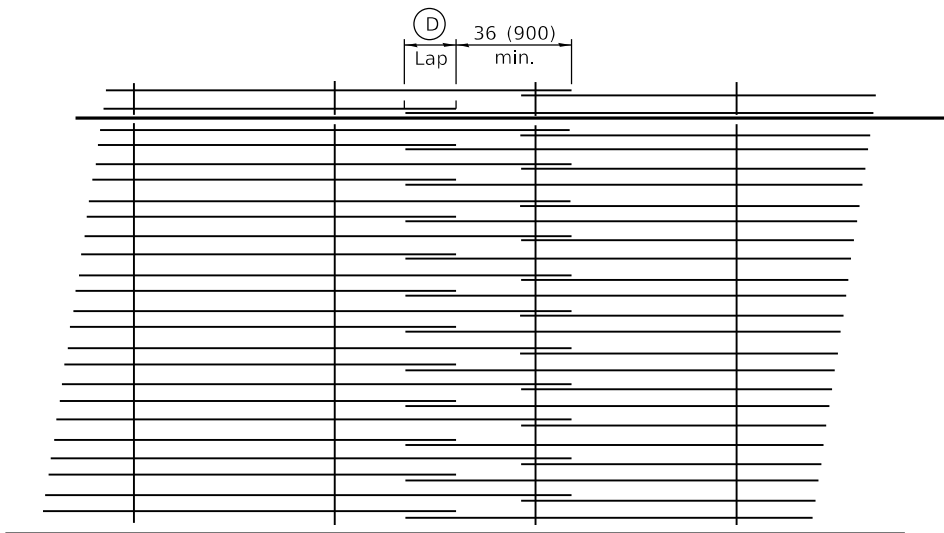
**LAP DETAIL I**



**DETAIL A**



**LAP DETAIL II**



**LAP DETAIL III**

ENGLISH (inches)					
Bar Size	Pavement Thickness	(A) (Approx. Spacing)	(B)	(C)	(D)
#6	7¼ thru 8½	18 spaces (19 bars) @ 7½	3½	3	22
#6	8¾ thru 9½	20 spaces (21 bars) @ 6¾	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) @ 5½	3½	3	22
#7	9¾ thru 10½	16 spaces (17 bars) @ 8½	3½	3	26
#7	10¾ thru 11½	18 spaces (19 bars) @ 7½	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	(A) (Approx. Spacing)	(B)	(C)	(D)
#19	200 thru 220	18 spaces (19 bars) @ 191	90	75	560
#19	230 thru 250	21 spaces (22 bars) @ 163	95	80	560
#19	260 thru 280	23 spaces (24 bars) @ 149	90	80	560
#19	290 thru 310	26 spaces (27 bars) @ 132	90	75	560
#19	320 thru 340	29 spaces (30 bars) @ 118	95	80	560
#22	230 thru 250	15 spaces (16 bars) @ 229	90	75	660
#22	260 thru 280	17 spaces (18 bars) @ 202	90	75	660
#22	290 thru 310	19 spaces (20 bars) @ 181	90	70	660
#22	320 thru 340	21 spaces (22 bars) @ 163	95	80	660
#22	350 thru 370	23 spaces (24 bars) @ 149	90	80	660
#22	380 thru 400	25 spaces (26 bars) @ 137	95	80	660
#22	410 thru 430	27 spaces (28 bars) @ 127	90	80	660

**GENERAL NOTES**

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

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

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

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

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

**BAR REINFORCEMENT FOR CRC PAVEMENT**

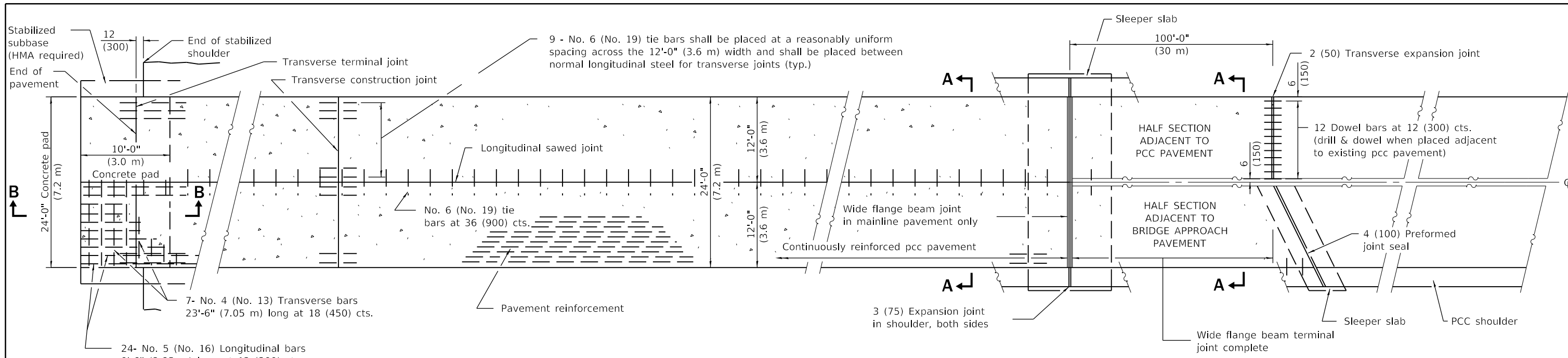
**STANDARD 421001-03**

Illinois Department of Transportation

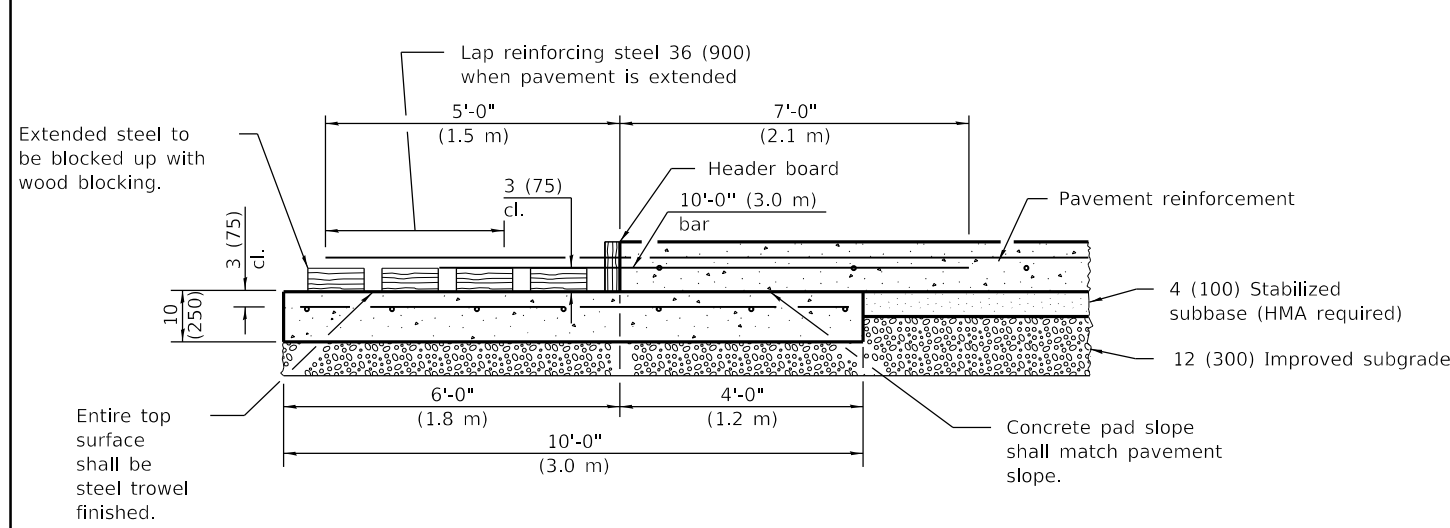
PASSED April 1, 2016  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

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

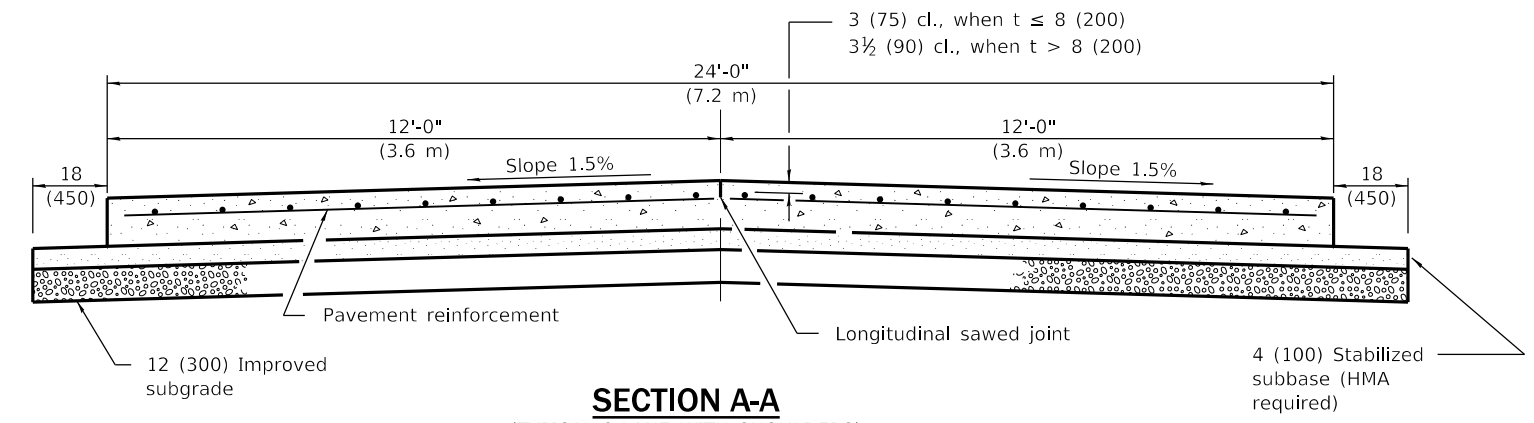
ISSUED 1-1-97



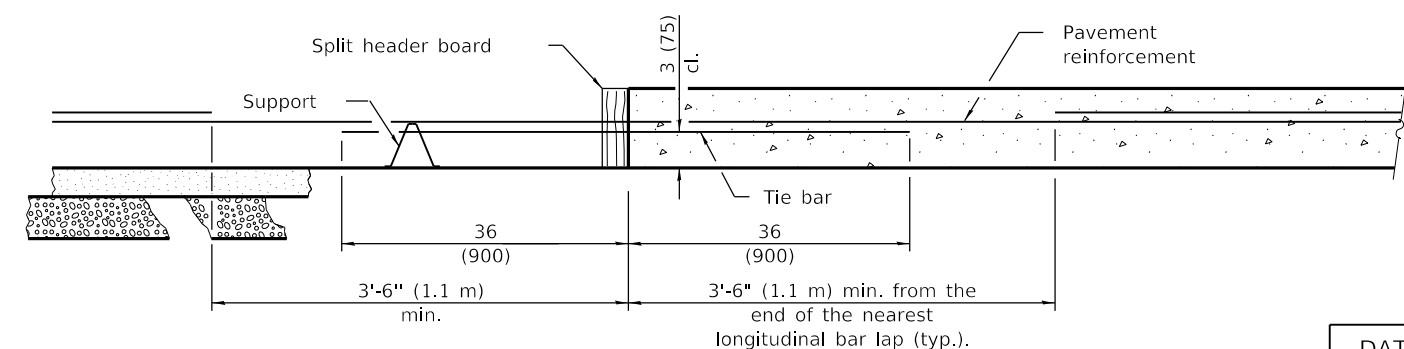
**PLAN**



**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

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

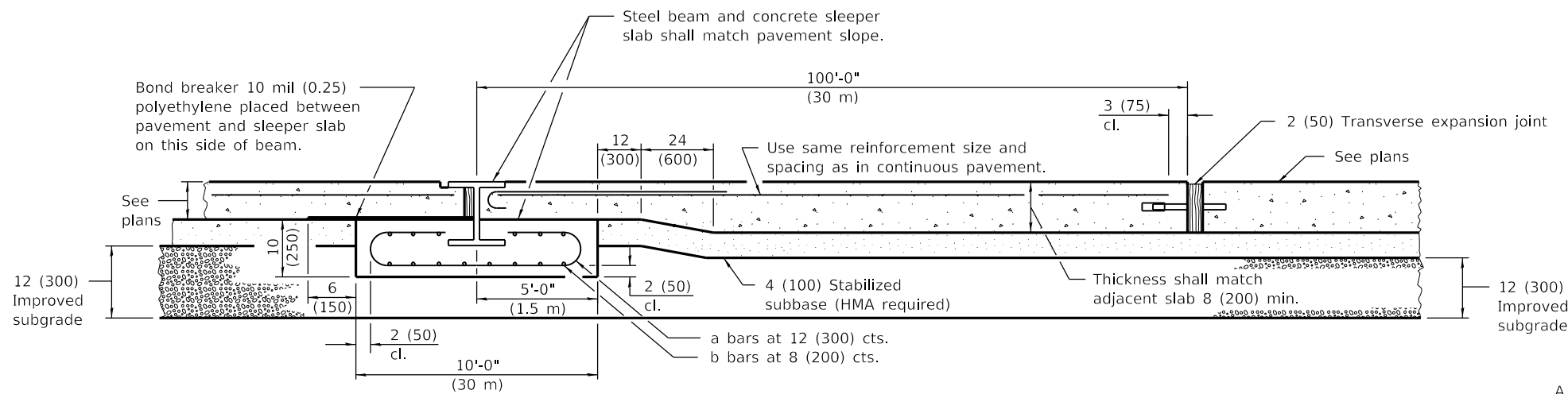
APPROVED January 1, 2018  
*Marcus M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

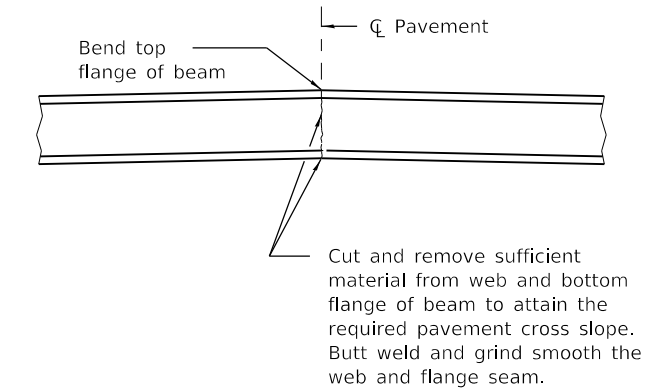
DATE	REVISIONS
1-1-18	Changed tie bar spacing to 36 (900) cts.
1-1-14	Added exp. jnts. in shlds. & omitted bars, cnst. jnt. over wide flange beam slpr slab.

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

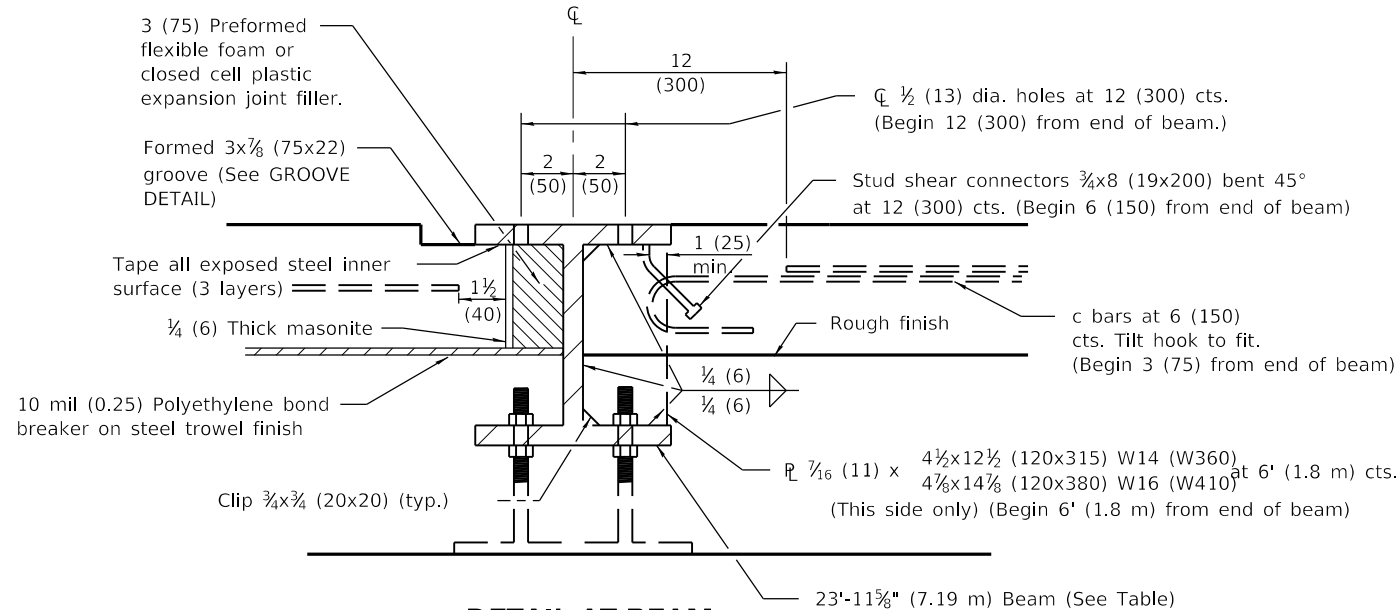
**STANDARD 421101-10**



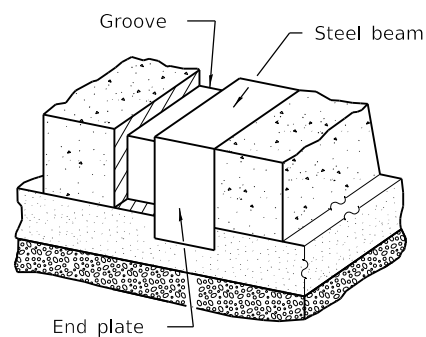
**WIDE FLANGE BEAM TERMINAL JOINT**



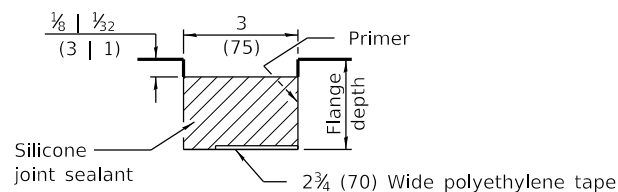
**DETAIL OF CUTTING AND WELDING BEAM**



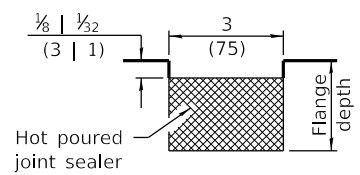
**DETAIL AT BEAM**



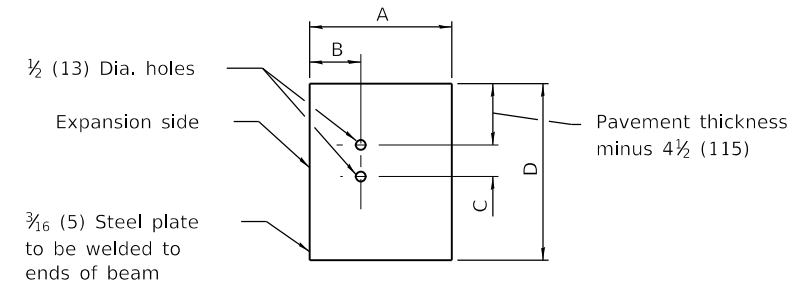
**VIEW OF GROOVE AT EDGE OF PAVEMENT**



**GROOVE DETAIL**

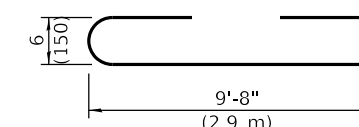


**GROOVE DETAIL (OPTIONAL)**

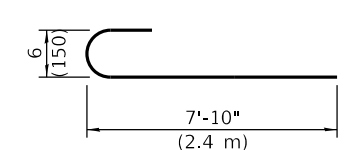


**END PLATE**

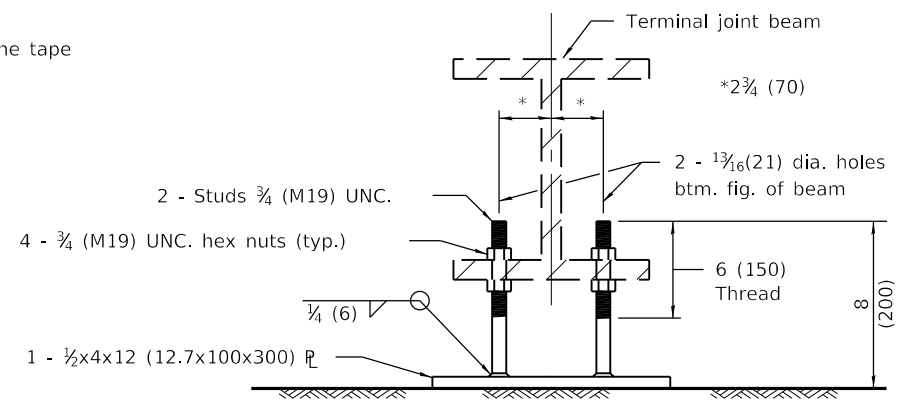
PAVEMENT THICKNESS	<10 (250)	≥10 (250)
BEAM SIZE	W14x82 (W360x122)	W16x100 (W410x1149)
A	10 5/8 (255)	10 5/8 (265)
B	4 5/16 (110)	4 7/16 (115)
C	3 (75)	4 (100)
D	14 1/4 (360)	17 (430)



**BAR a**



**BAR c**



**OPTIONAL ADJUSTABLE CHAIR**

MATERIALS REQUIRED FOR ONE TRANSVERSE TERMINAL JOINT COMPLETE

Concrete, cu. yds. (m <sup>3</sup> )	7.4 (5.4)
Reinforcement bars, lbs. (kg)	348 (160)
Pavement reinforcement, sq. yds. (m <sup>2</sup> )	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. (m <sup>3</sup> )	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. (m <sup>2</sup> )	266.7 (216)
Pavement Reinforcement, sq. yds. (m <sup>2</sup> )	266.7 (216)
Stabilized Subbase, sq. yds. (m <sup>2</sup> )	285 (230.8)
Improved Subgrade, sq. yds. (m <sup>2</sup> )	300 (243)

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

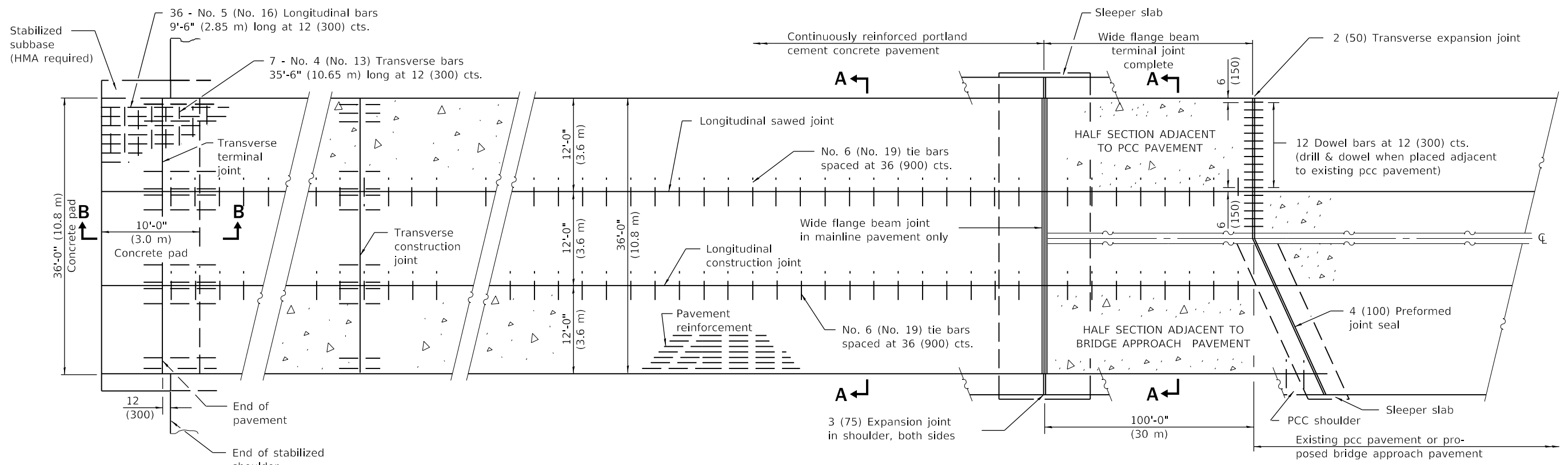
**STANDARD 421101-10**

Illinois Department of Transportation

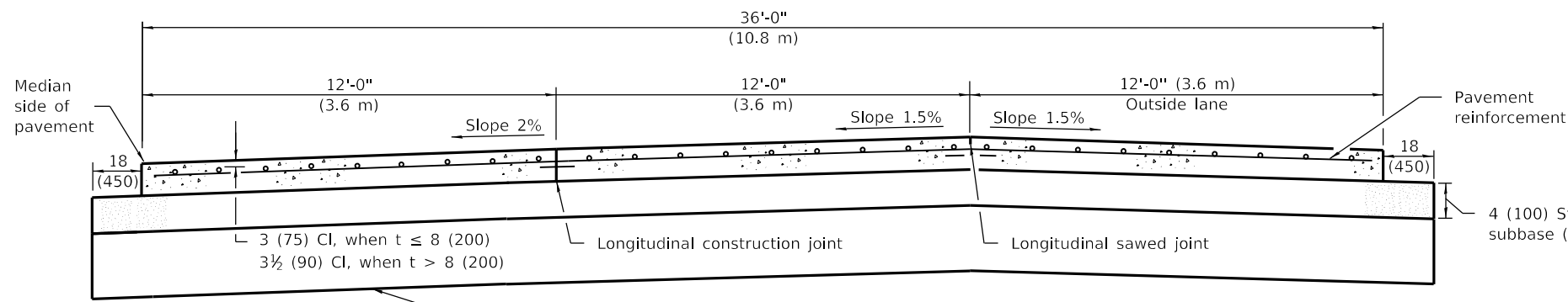
PASSED January 1, 2018  
*Michael Brand*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018  
*Marcus M. Beck*  
ENGINEER OF DESIGN AND ENVIRONMENT

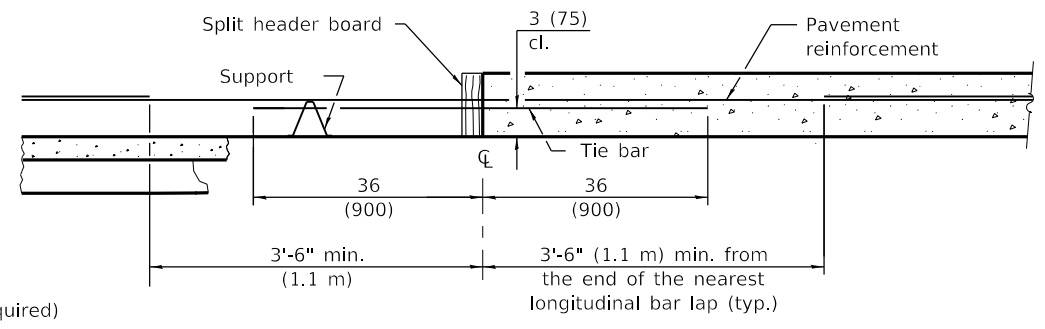
ISSUED 1-1-97



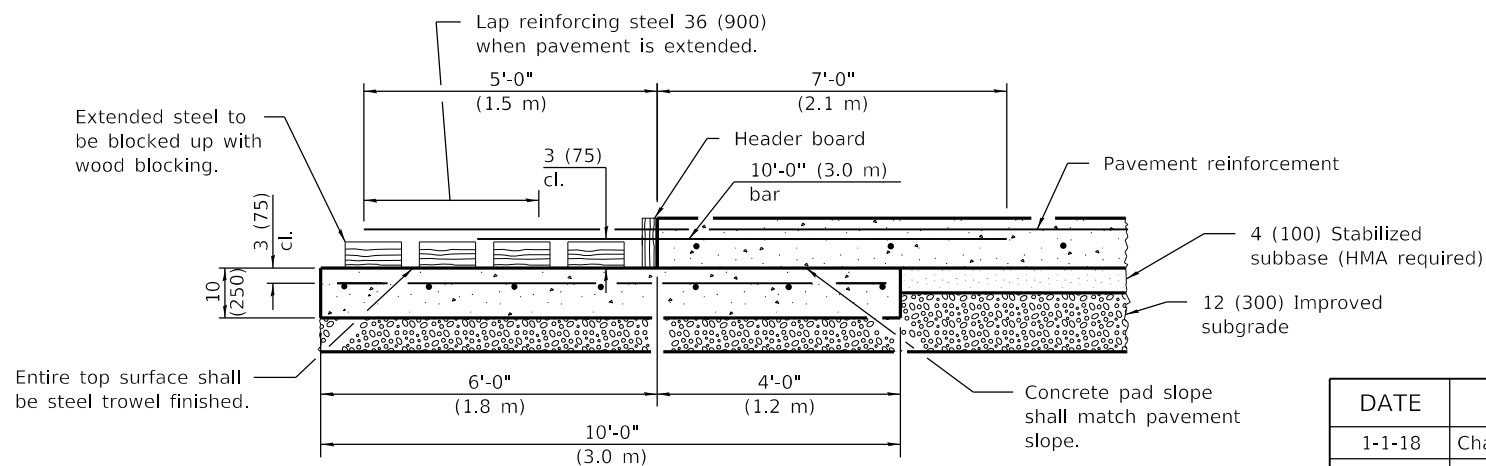
**PLAN**



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



**TRANSVERSE CONSTRUCTION JOINT**



**TRANSVERSE TERMINAL JOINT**  
**SECTION B-B**

**GENERAL NOTES**

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

See Standard 421001 for details of pavement reinforcement.  
See Standards 420001 and 420401 for joint details not shown.

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

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)

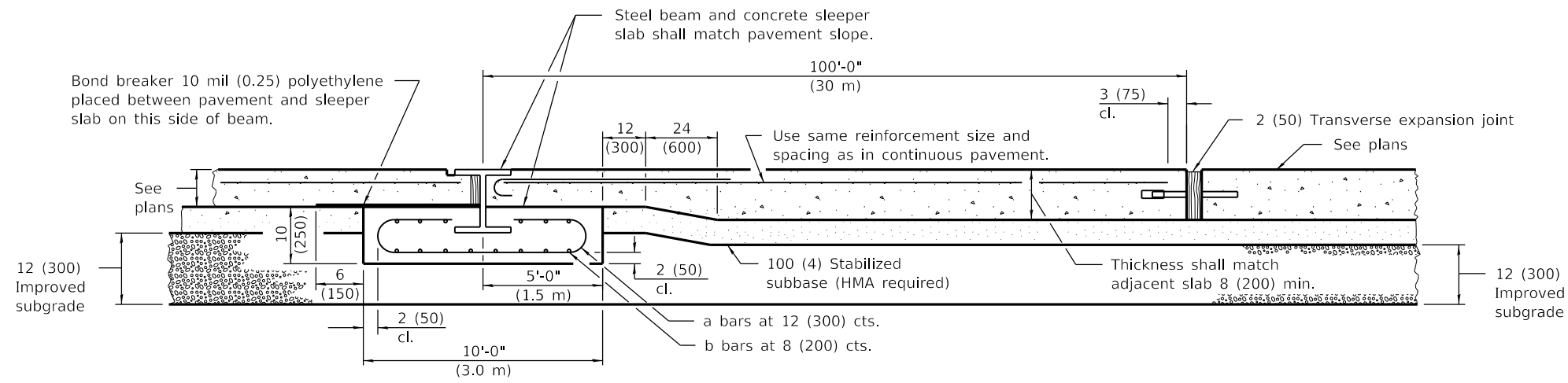
**STANDARD 421106-10**

Illinois Department of Transportation

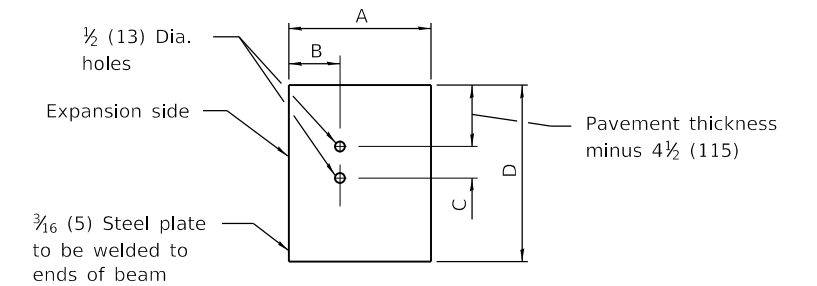
PASSED January 1, 2018  
*Michael Beard*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018  
*Marcus M. Beck*  
ENGINEER OF DESIGN AND ENVIRONMENT

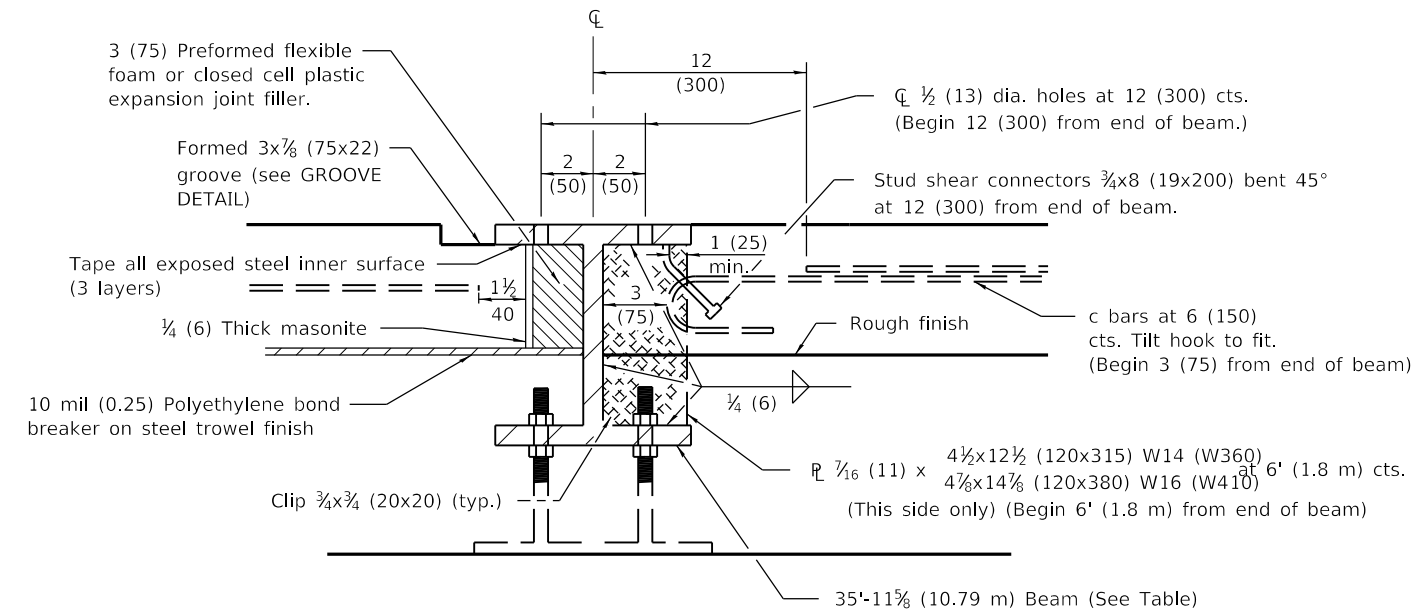
ISSUED 1-1-97



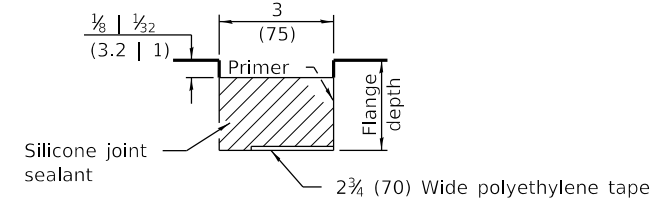
**WIDE FLANGE BEAM TERMINAL JOINT**



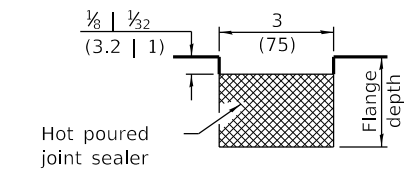
**END PLATE**



**DETAIL AT BEAM**



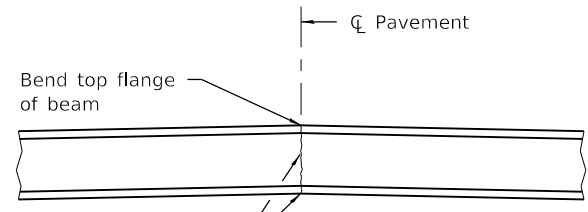
**GROOVE DETAIL**



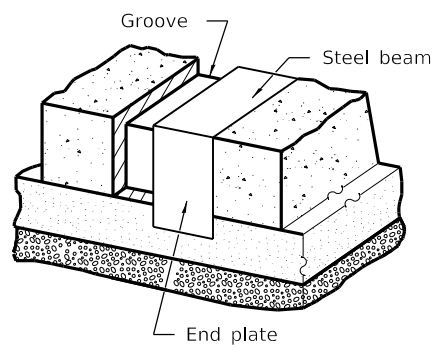
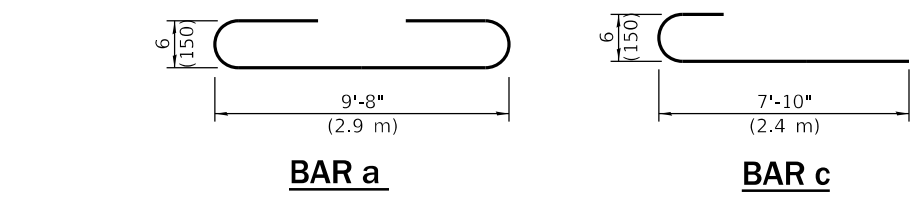
**GROOVE DETAIL (OPTIONAL)**

PAVEMENT THICKNESS	<10 (250)	≥10 (250)
BEAM SIZE	W14X82 (W360X122)	w16x100 (W410x149)
A	10 1/8 (255)	10 3/8 (265)
B	4 3/16 (110)	4 1/16 (115)
C	3 (75)	4 (100)
D	14 1/4 (360)	17 (430)

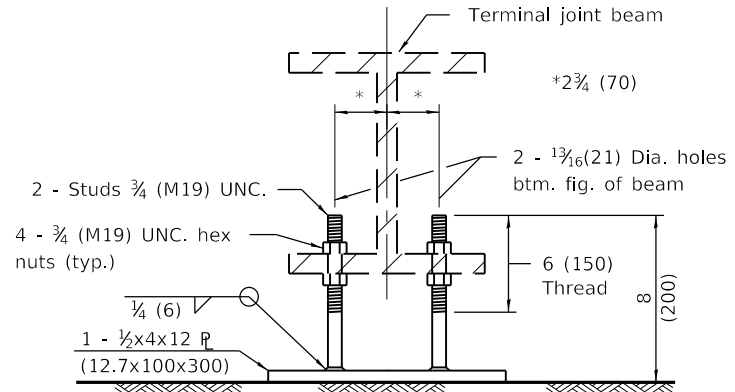
MATERIALS REQUIRED FOR ONE TRANSVERSE TERMINAL JOINT COMPLETE	
Concrete, cu. yds. (m³)	11.1 (8.1)
Reinforcement bars, lbs. (kg)	523 (235)
Pavement reinforcement, sq. yds. (m²)	20 (16.2)



**DETAIL OF CUTTING AND WELDING BEAM**



**VIEW OF GROOVE AT EDGE OF PAVEMENT**



**OPTIONAL ADJUSTABLE CHAIR**

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)

**36' (10.8 m)**  
**CRC PAVEMENT**  
 (WITH WIDE FLANGE BEAM TERMINAL JOINT)  
 (Sheet 2 of 2)

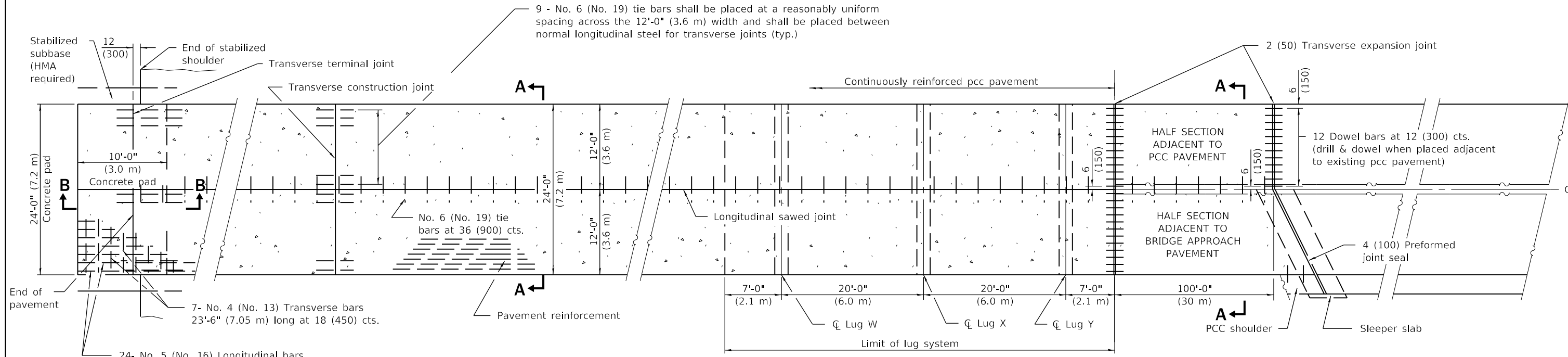
**STANDARD 421106-10**

Illinois Department of Transportation

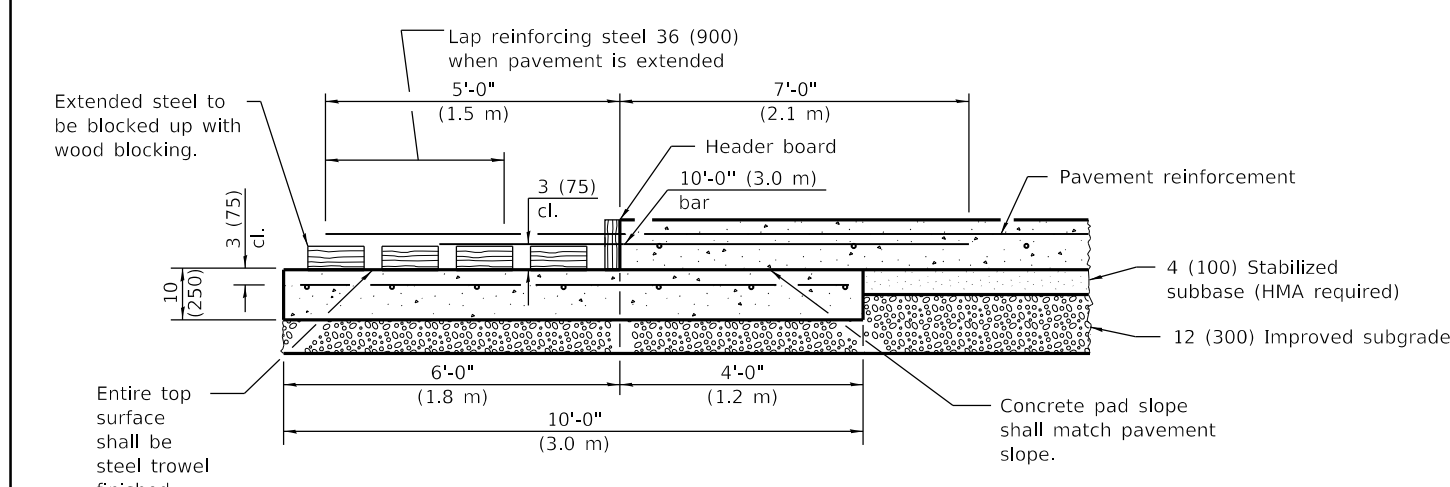
PASSED January 1, 2018  
 Michael Brand  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018  
 Matthew M. Adams  
 ENGINEER OF DESIGN AND ENVIRONMENT

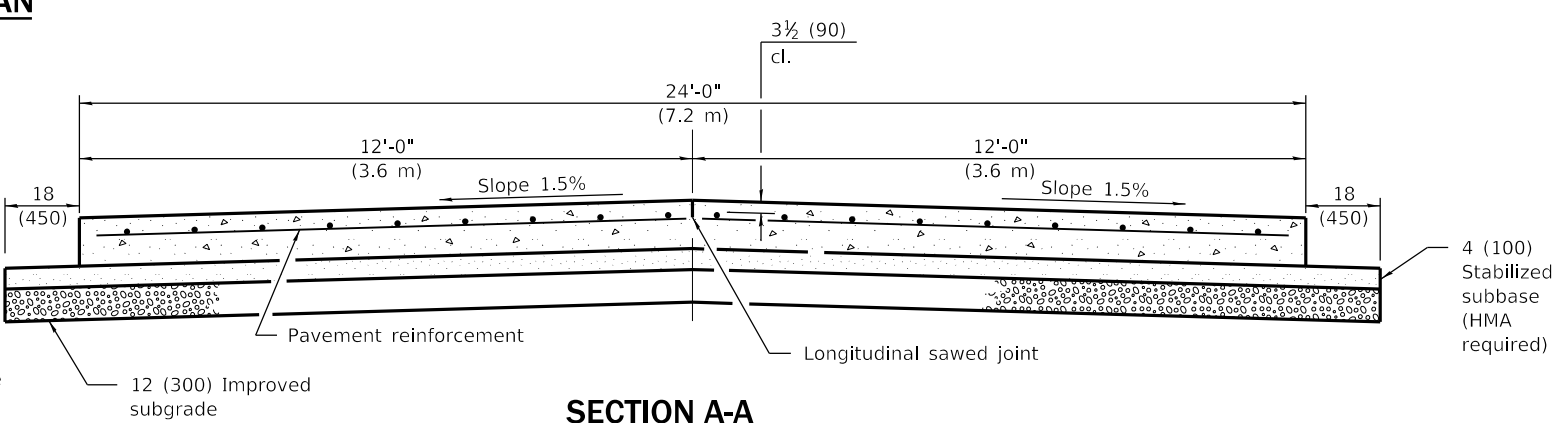
ISSUED 1-1-97



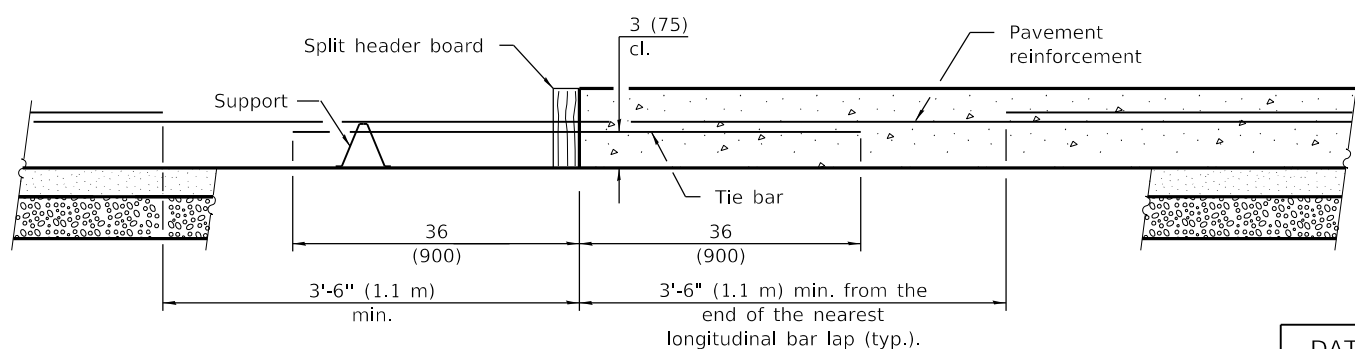
**PLAN**



**TRANSVERSE TERMINAL JOINT SECTION B-B**



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



**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.

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)  
(Sheet 1 of 2)

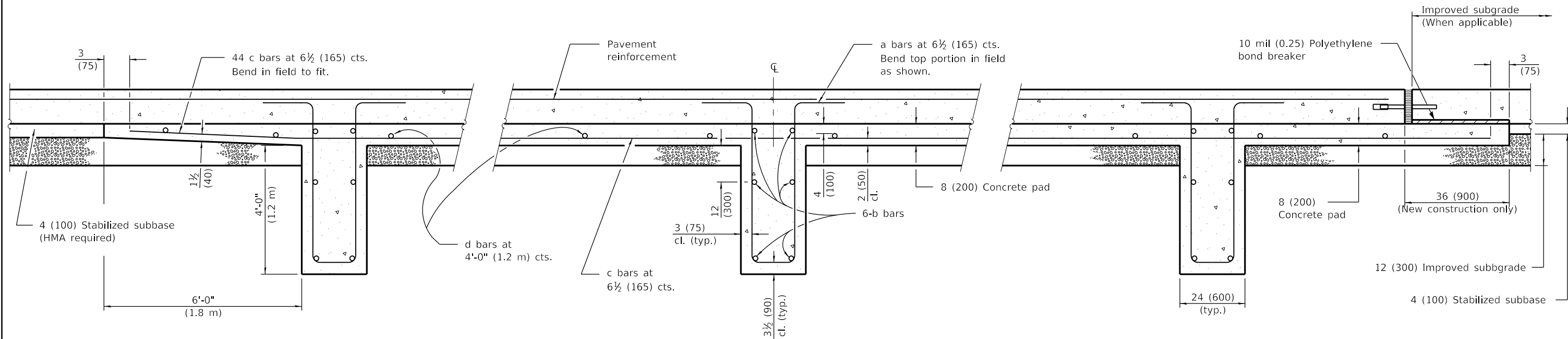
**STANDARD 421201-07**

Illinois Department of Transportation

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

APPROVED January 1, 2018  
*Marcus M. Beck*  
ENGINEER OF DESIGN AND ENVIRONMENT

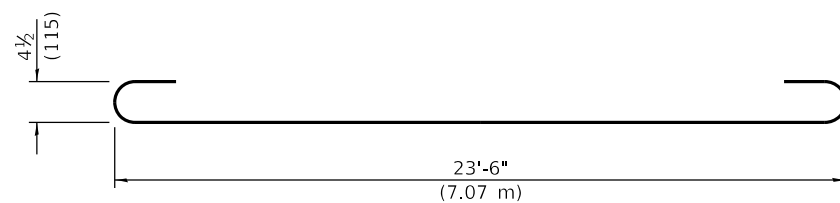
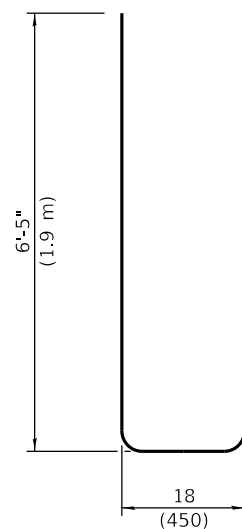
ISSUED 1-1-97



**SECTION AT LUG W**

**SECTION AT LUG X**

**SECTION AT LUG Y**



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

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

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

Illinois Department of Transportation

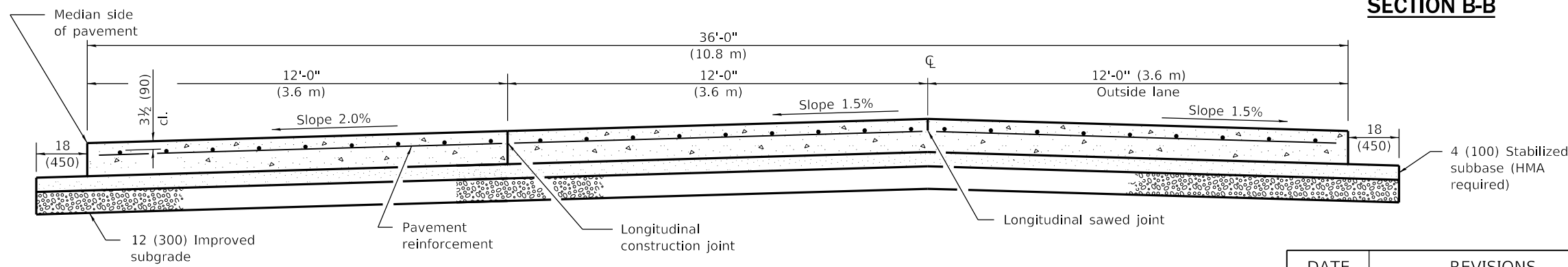
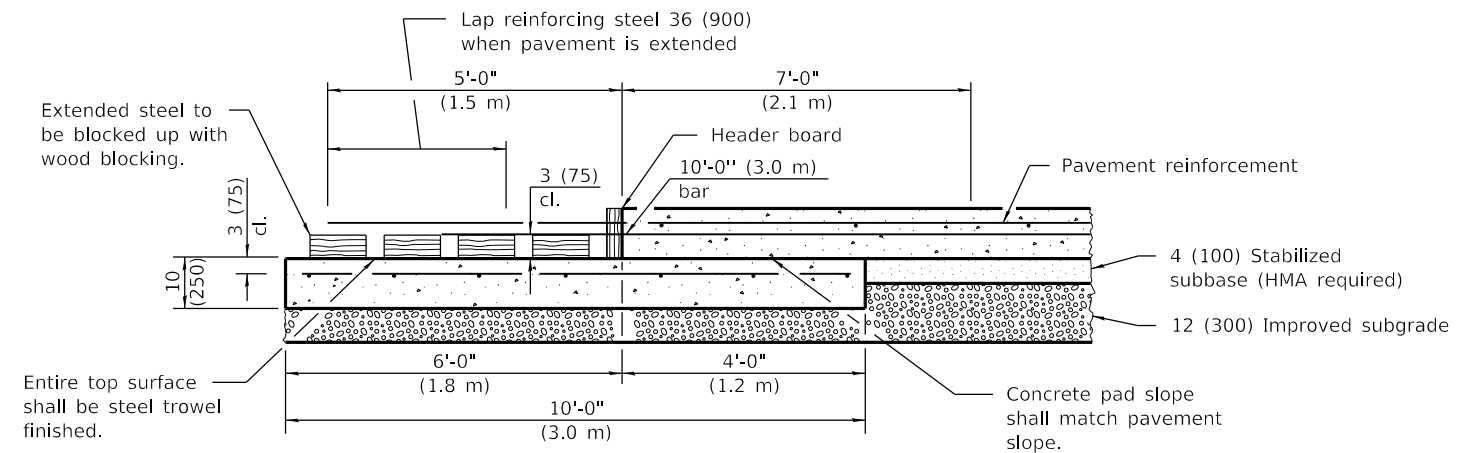
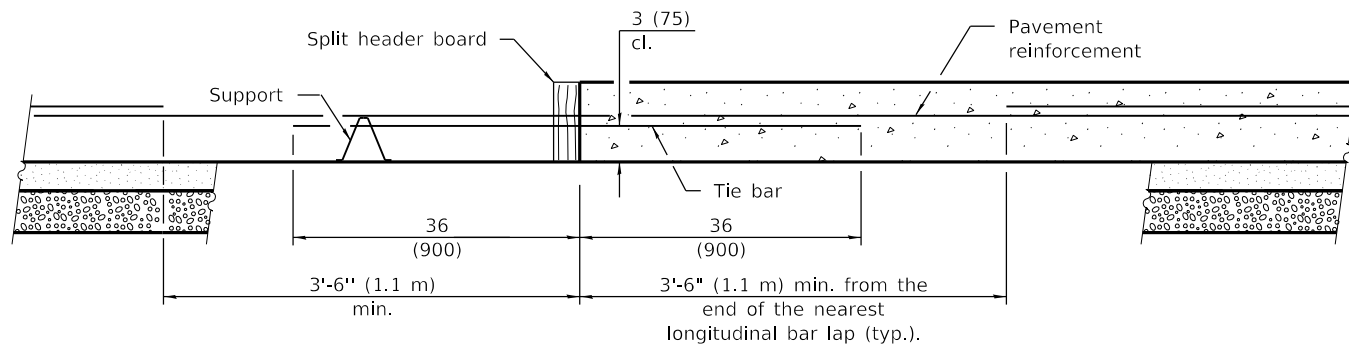
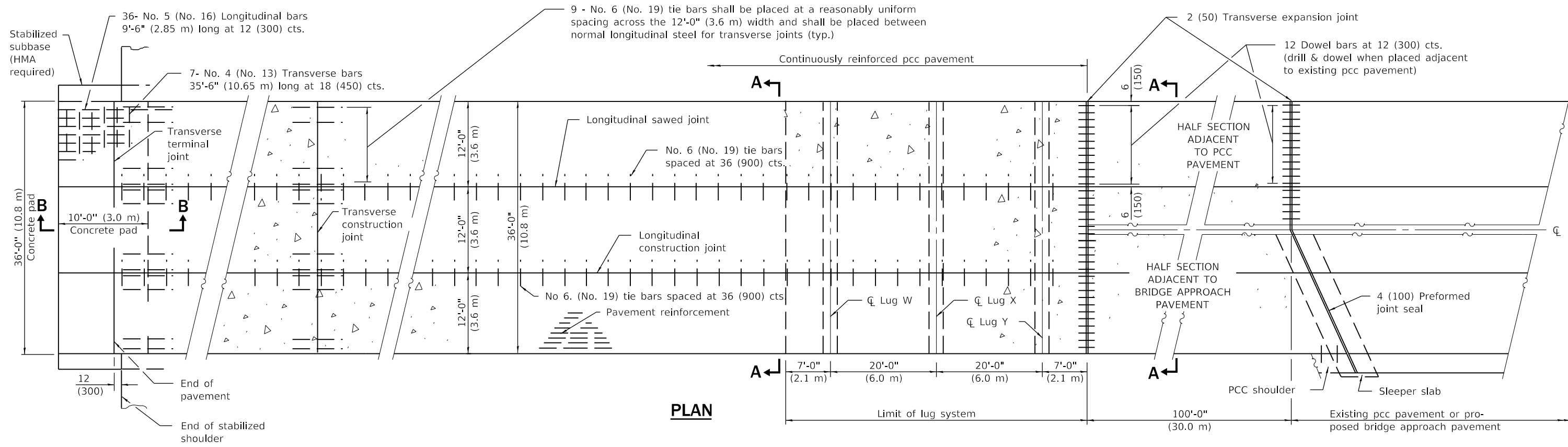
PASSED January 1, 2018  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

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

ISSUED 1-1-97

**24' (7.2 m)**  
**CRC PAVEMENT**  
 (WITH LUG SYSTEM) (Sheet 2 of 2)

**STANDARD 421201-07**



**GENERAL NOTES**

See Standard 421001 for details of pavement reinforcement.

See Standards 420001 and 420401 for joint details not shown.

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

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

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

(Sheet 1 of 2)

**STANDARD 421206-07**

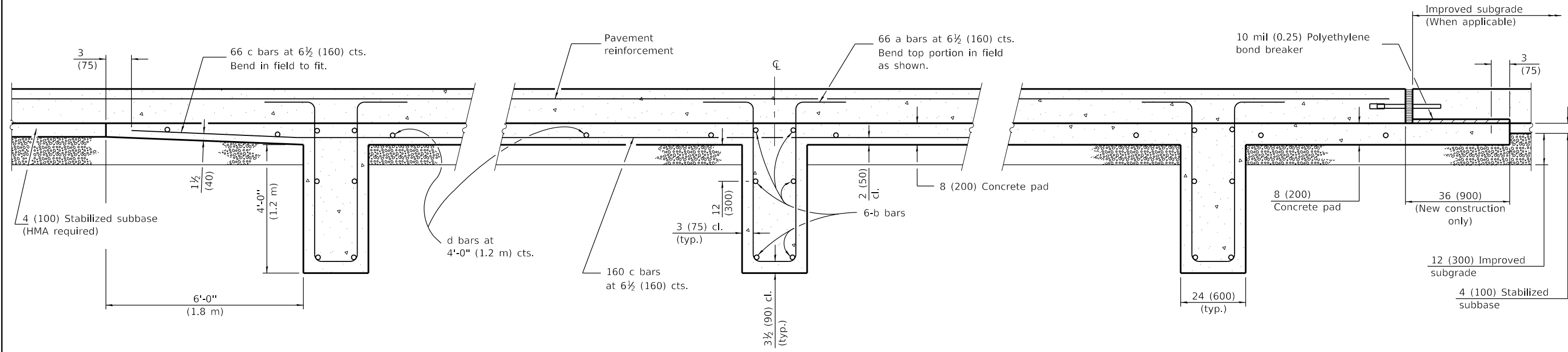
Illinois Department of Transportation

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

APPROVED January 1, 2018  
*Marcus M. Beck*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

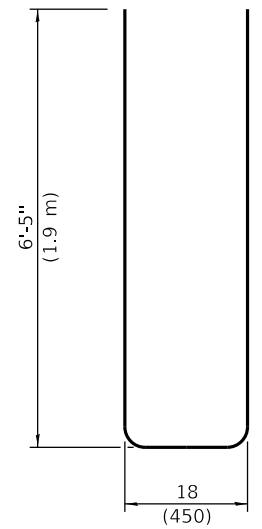




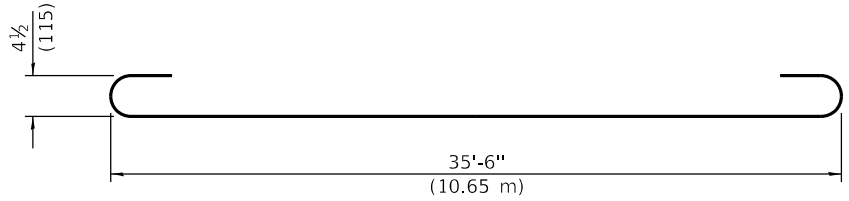
**SECTION AT LUG W**

**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)	

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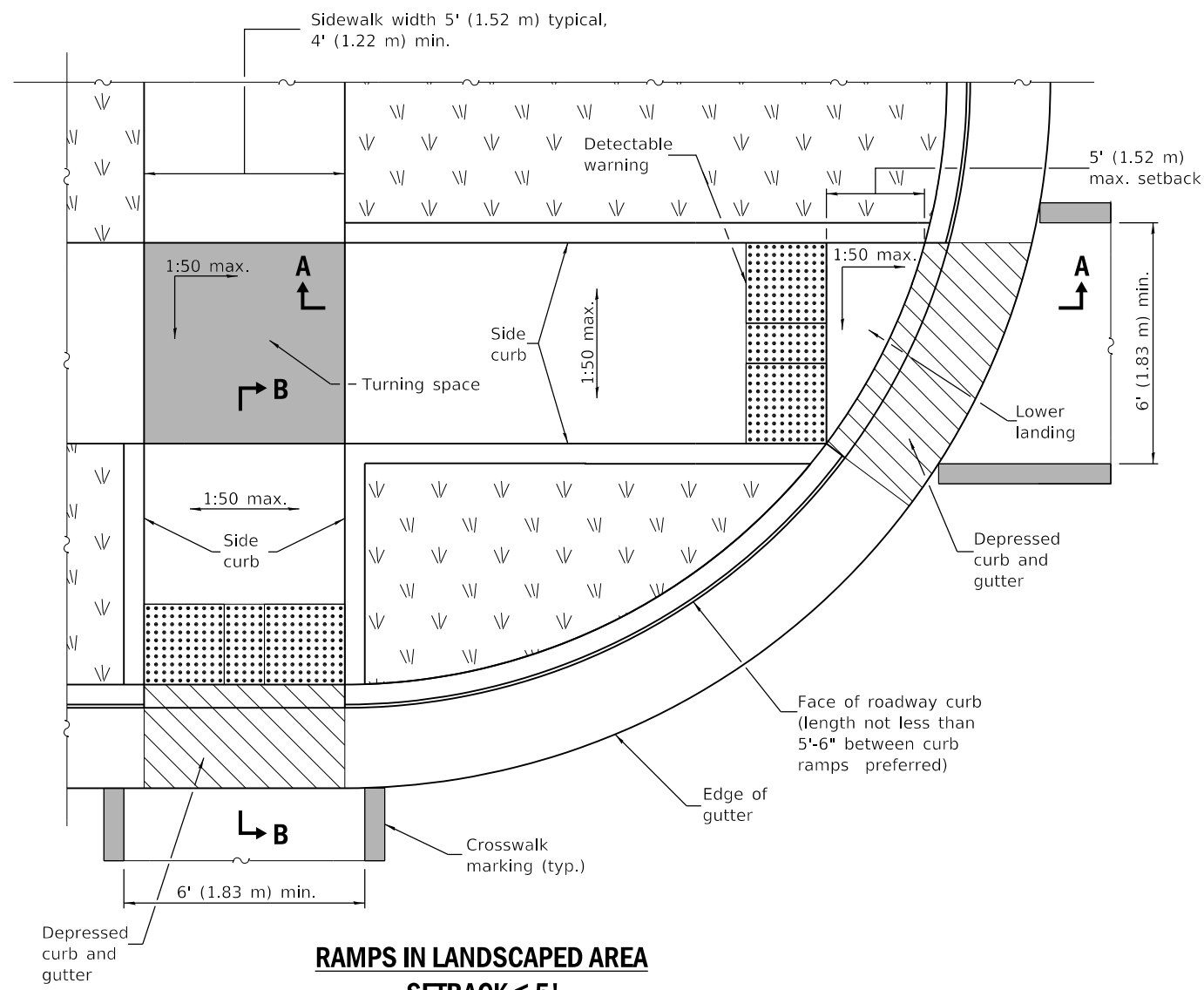
PASSED January 1, 2018  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

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

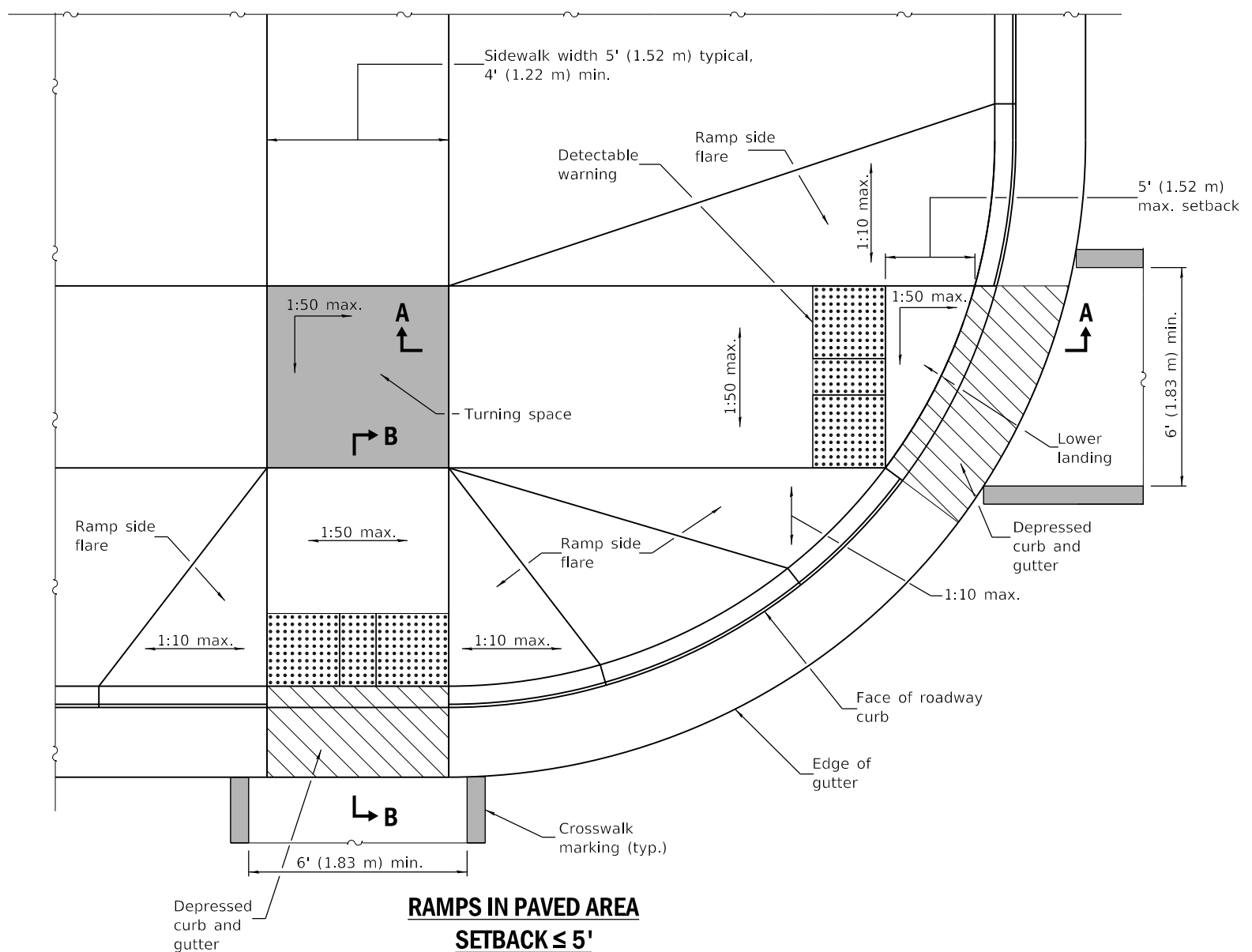
ISSUED 1-1-97

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

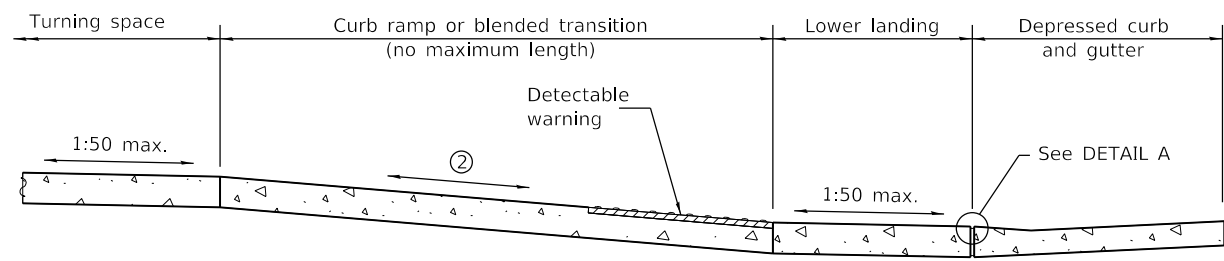
**STANDARD 421206-07**



**RAMPS IN LANDSCAPED AREA  
SETBACK ≤ 5'**

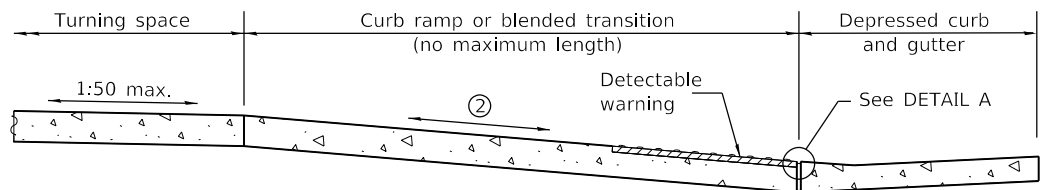


**RAMPS IN PAVED AREA  
SETBACK ≤ 5'**



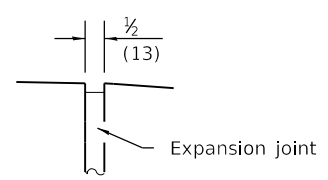
**SECTION A-A**

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

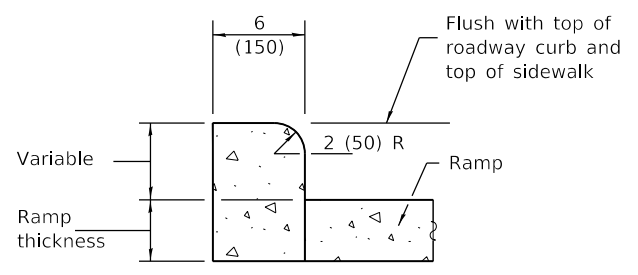


**SECTION B-B**

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



**DETAIL A**



**SIDE CURB DETAIL**

See Sheet 2 for GENERAL NOTES.

Illinois Department of Transportation

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

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

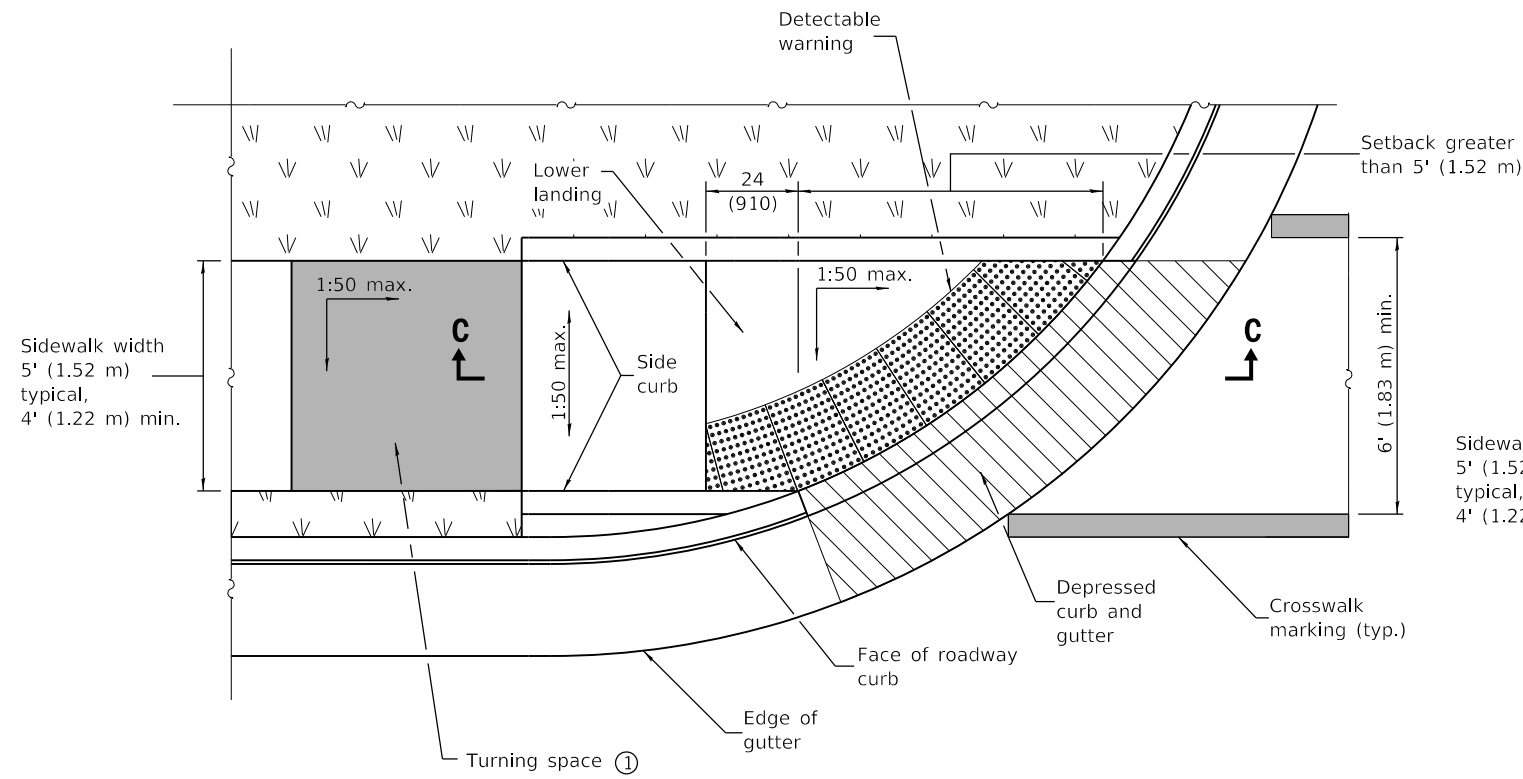
ISSUED 1-1-97

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

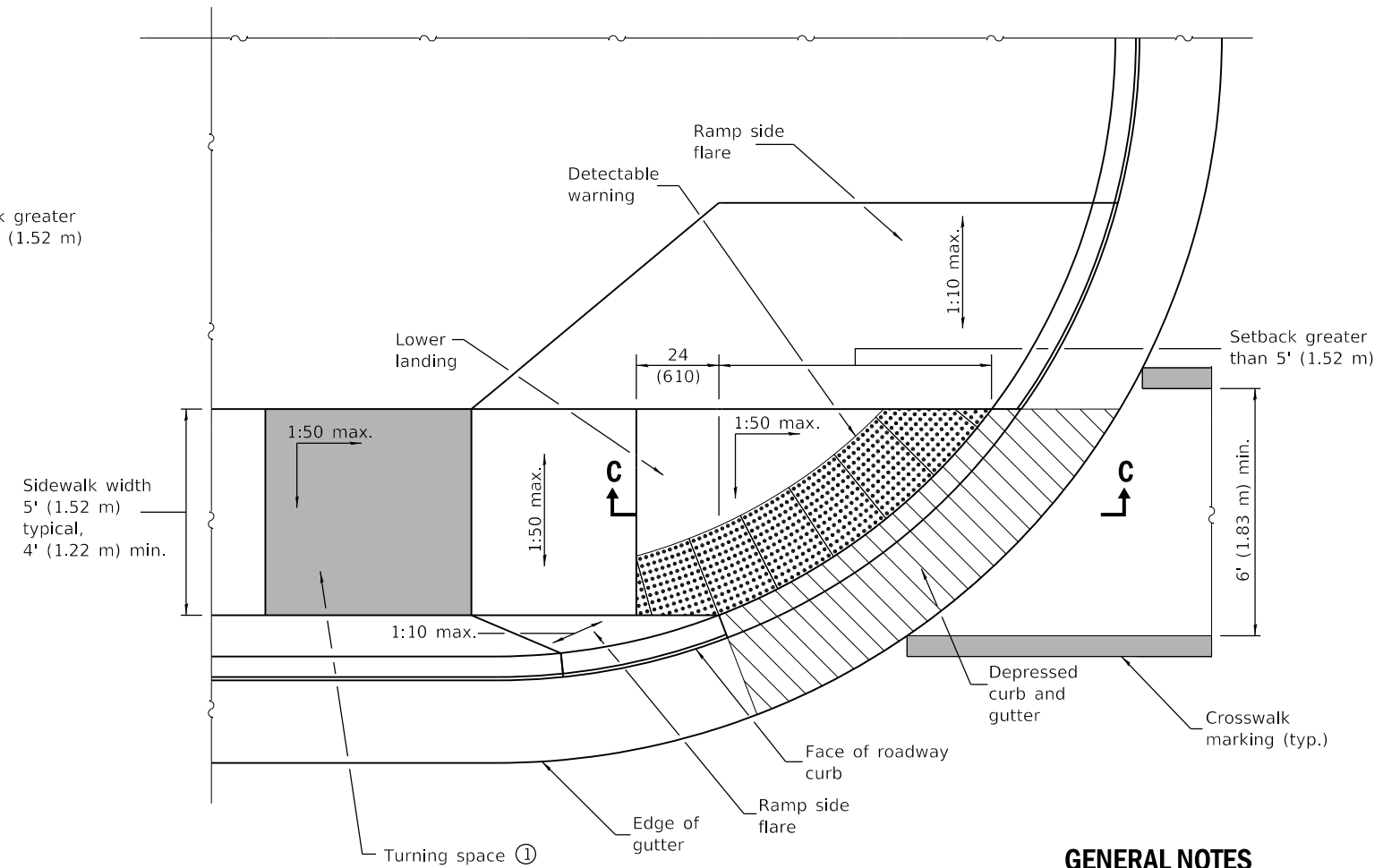
**PERPENDICULAR CURB RAMPS  
FOR SIDEWALKS**

(Sheet 1 of 2)

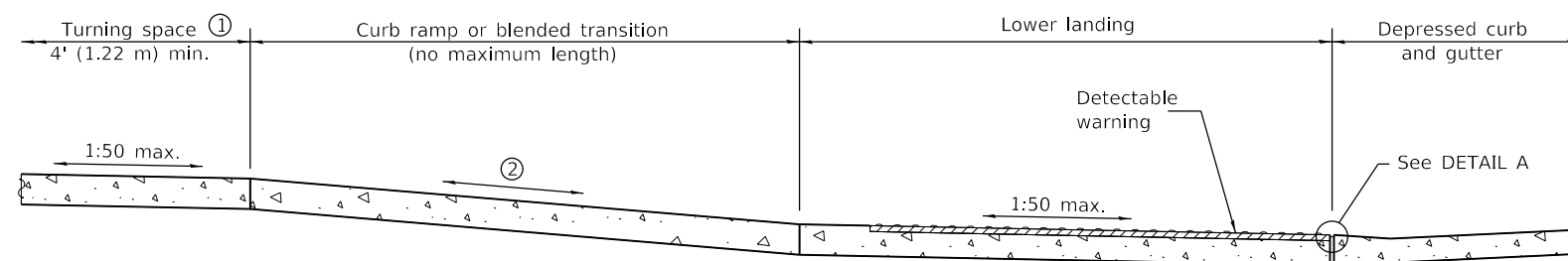
**STANDARD 424001-11**



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



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



**SECTION C-C**

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

**GENERAL NOTES**

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

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

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

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

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

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

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

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

**PERPENDICULAR CURB RAMPS  
FOR SIDEWALKS**

(Sheet 2 of 2)

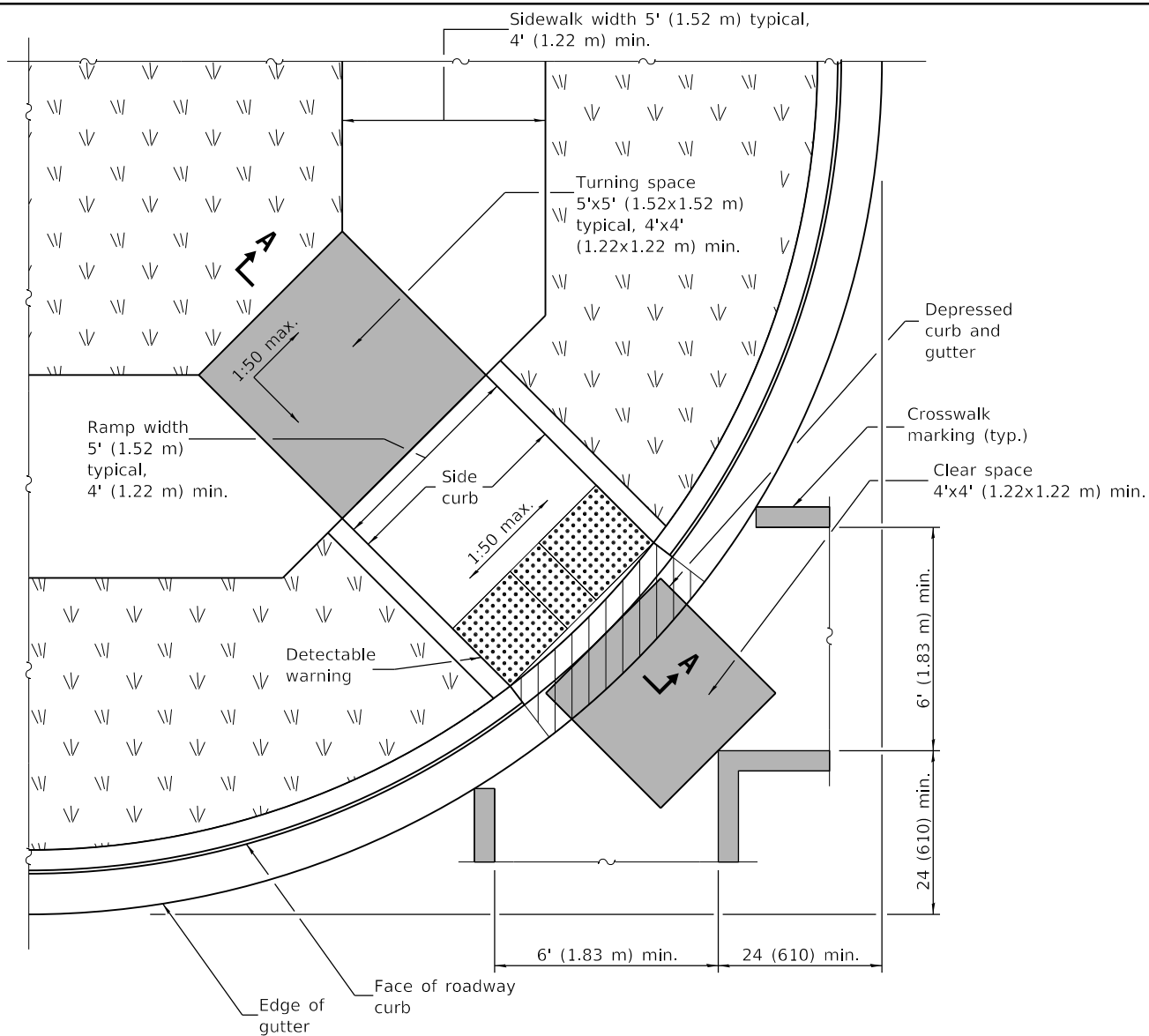
**STANDARD 424001-11**

Illinois Department of Transportation

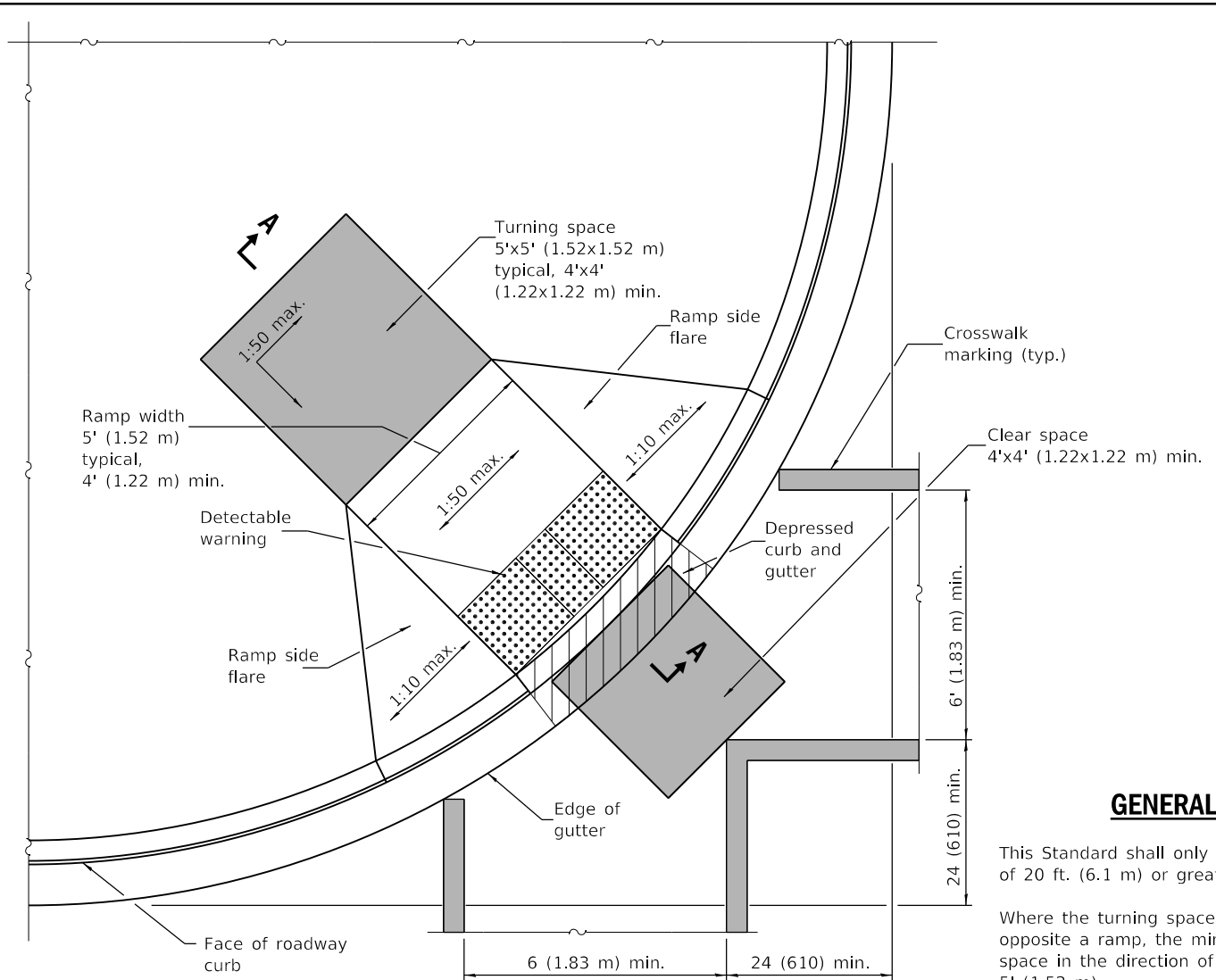
PASSED January 1, 2019  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES

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

ISSUED 1-1-97



**RAMP IN LANDSCAPED AREA**



**RAMP IN PAVED AREA**

**GENERAL NOTES**

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

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

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

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

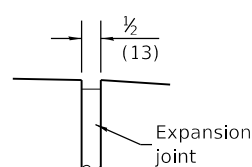
**Side Border** - Detectable warnings should extend the full width of the walking surface (excluding flared sides) but a border along each side up to 2 in. (50 mm) in width is allowed.

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

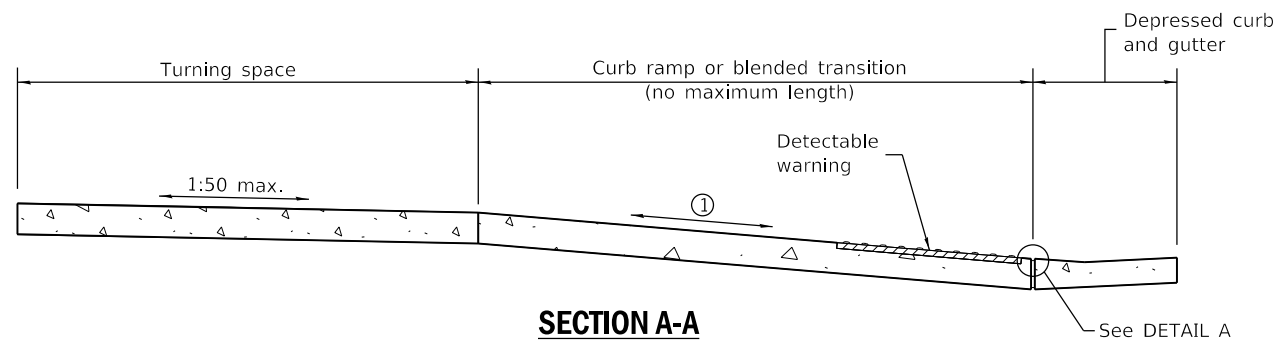
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

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

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

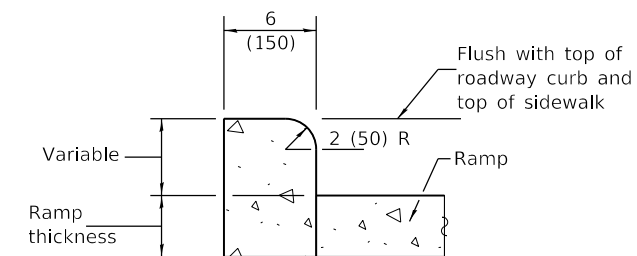


**DETAIL A**



**SECTION A-A**

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



**SIDE CURB DETAIL**

DATE	REVISIONS
1-1-21	Clarified minimum crosswalk width and locations.
1-1-19	Removed "15-foot rule", added "blended transitions" and placement tolerances for detectable warnings.

**DIAGONAL CURB RAMPS FOR SIDEWALKS**

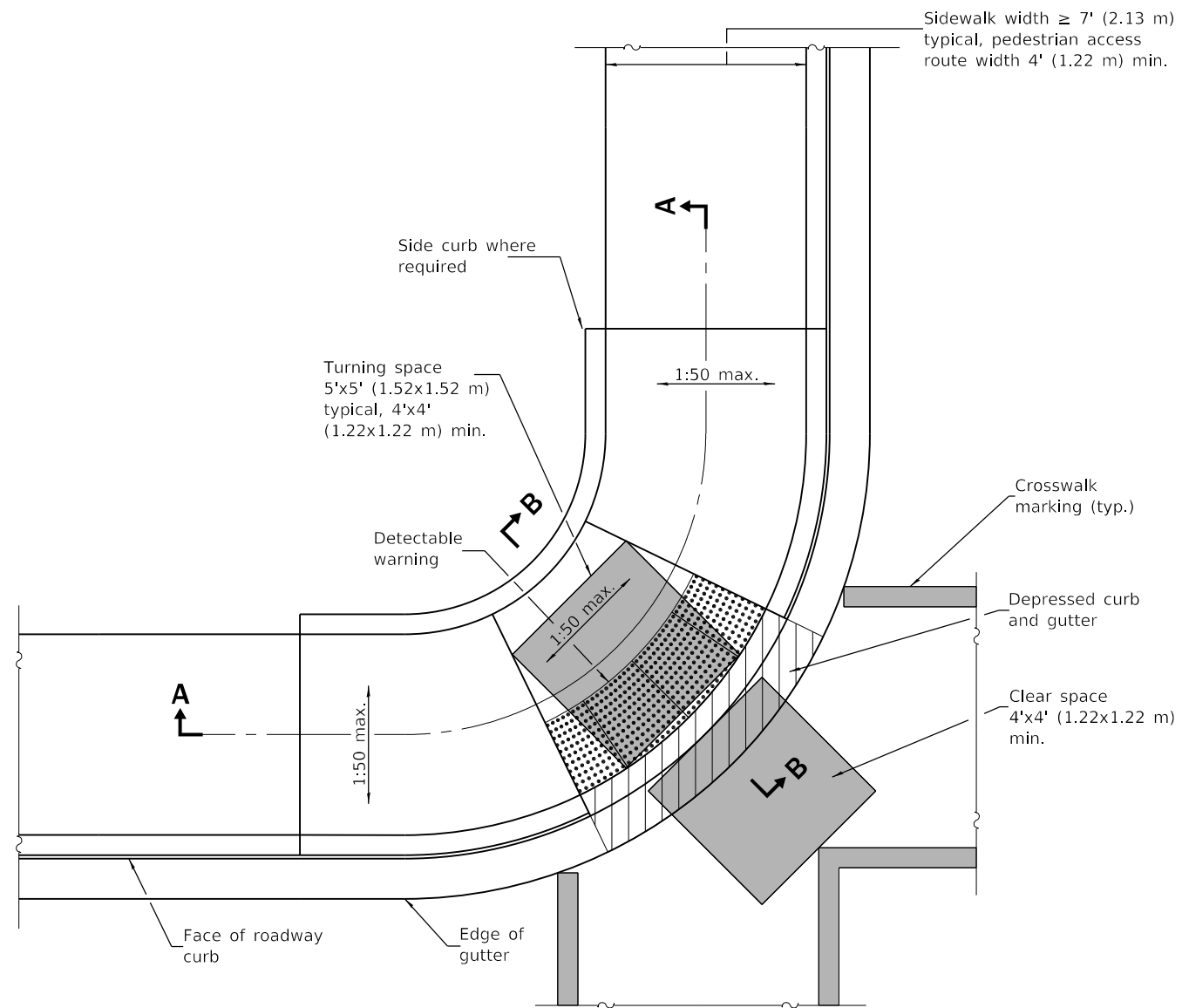
**STANDARD 424006-05**

Illinois Department of Transportation

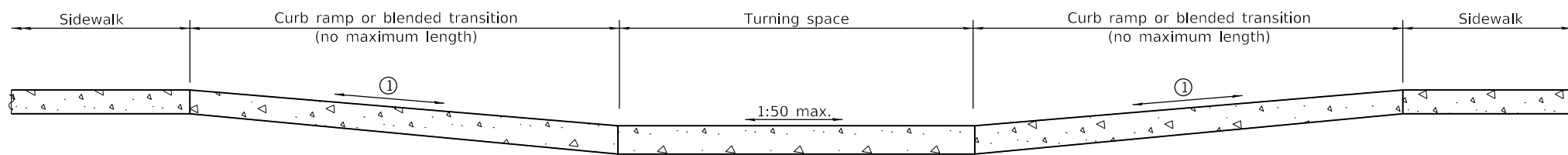
PASSED January 1, 2021  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
*John E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

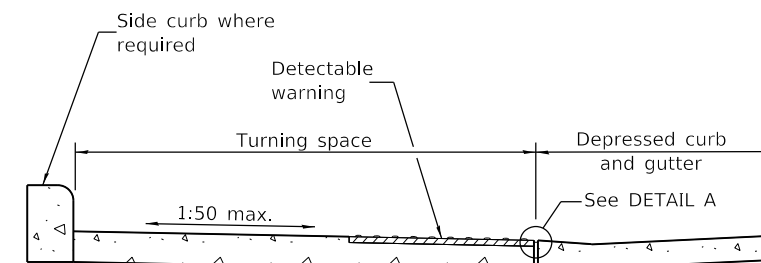


**CORNER PARALLEL CURB RAMP**

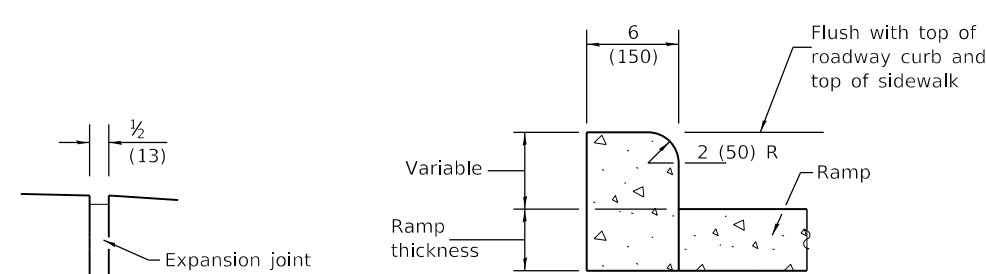


**SECTION A-A**

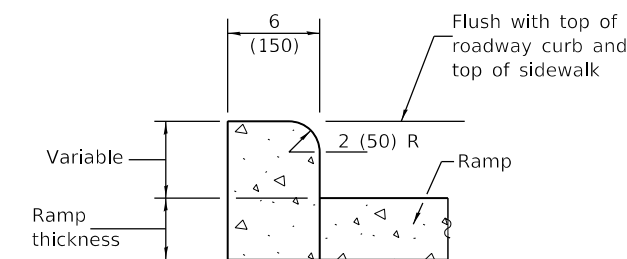
① The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.



**SECTION B-B**



**DETAIL A**



**SIDE CURB DETAIL**

**GENERAL NOTES**

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

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

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

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

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

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

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

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

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

**CORNER PARALLEL CURB RAMPS FOR SIDEWALKS**

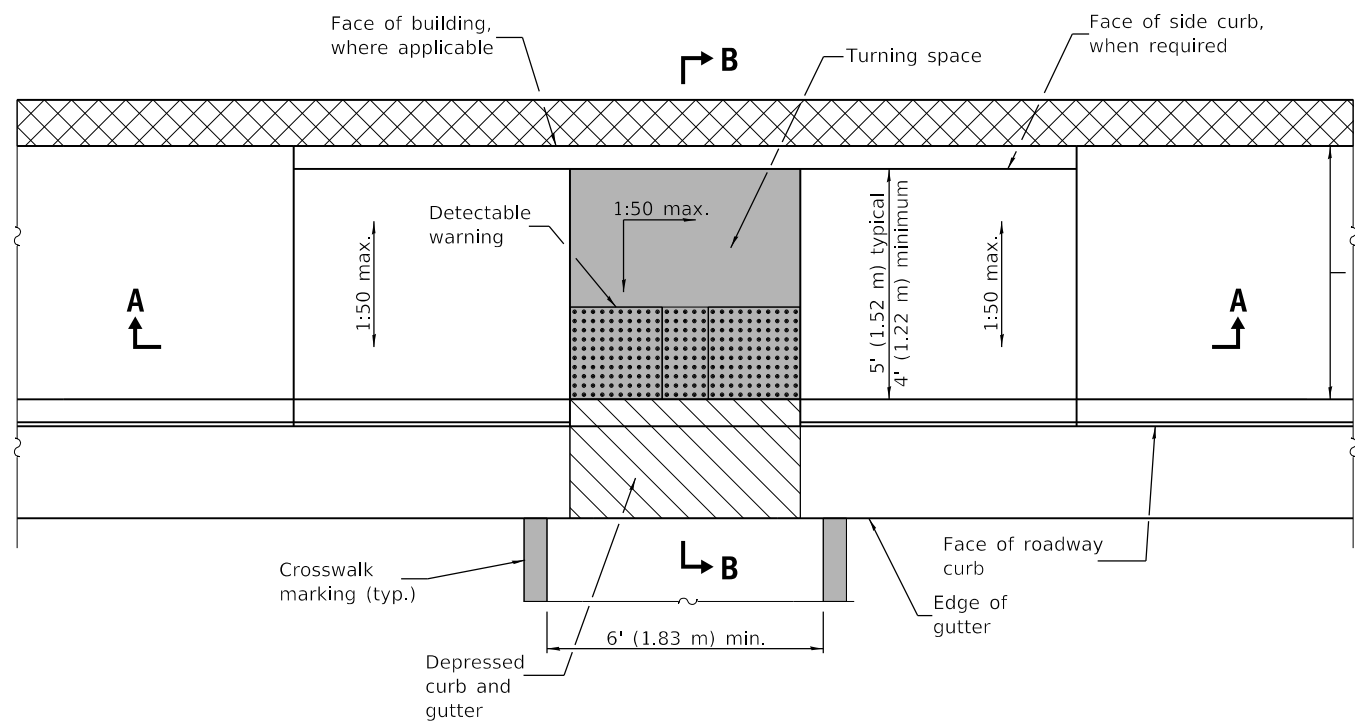
**STANDARD 424011-04**

Illinois Department of Transportation

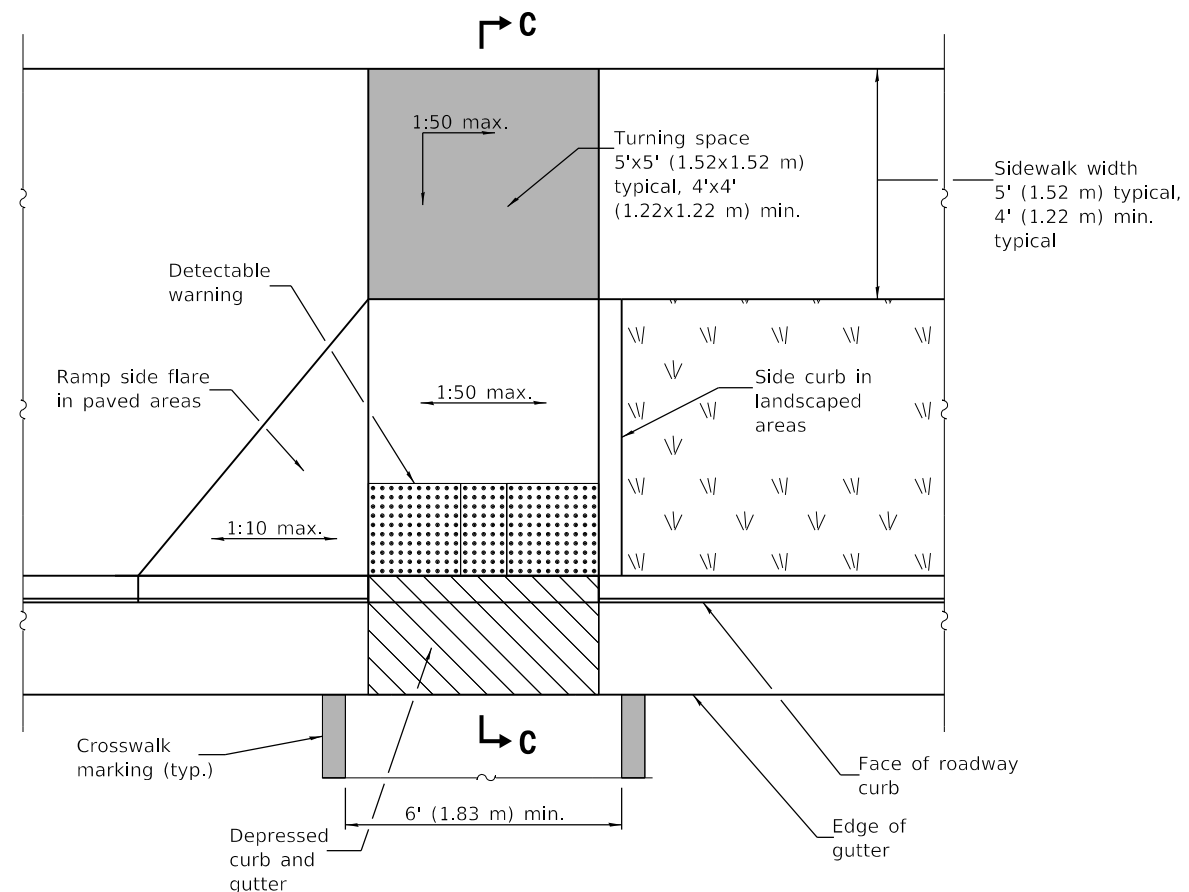
PASSED January 1, 2019  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES

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

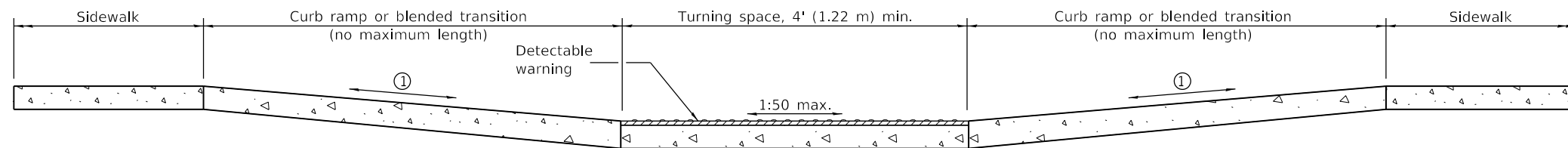
ISSUED 1-1-12



**PARALLEL MID-BLOCK CURB RAMP**

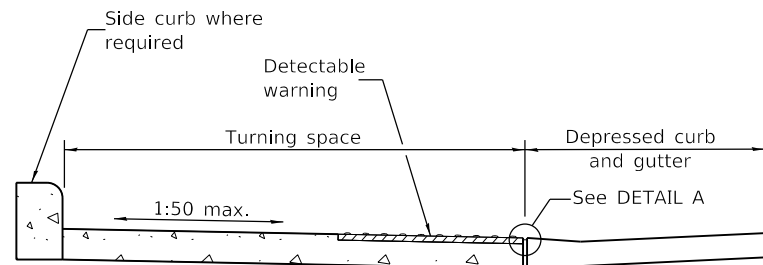


**PERPENDICULAR MID-BLOCK CURB RAMP**

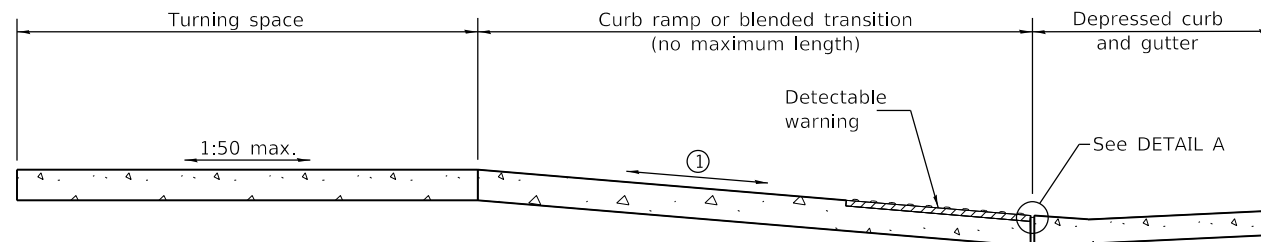


**SECTION A-A**

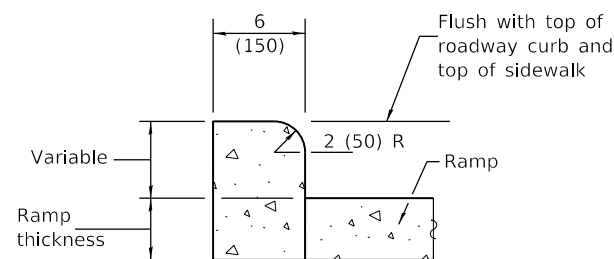
① The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.



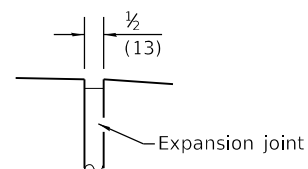
**SECTION B-B**



**SECTION C-C**



**SIDE CURB DETAIL**



**DETAIL A**

**GENERAL NOTES**

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

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

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

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

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

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

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

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

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

**MID-BLOCK CURB RAMPS FOR SIDEWALKS**

**STANDARD 424016-05**

Illinois Department of Transportation

PASSED January 1, 2019

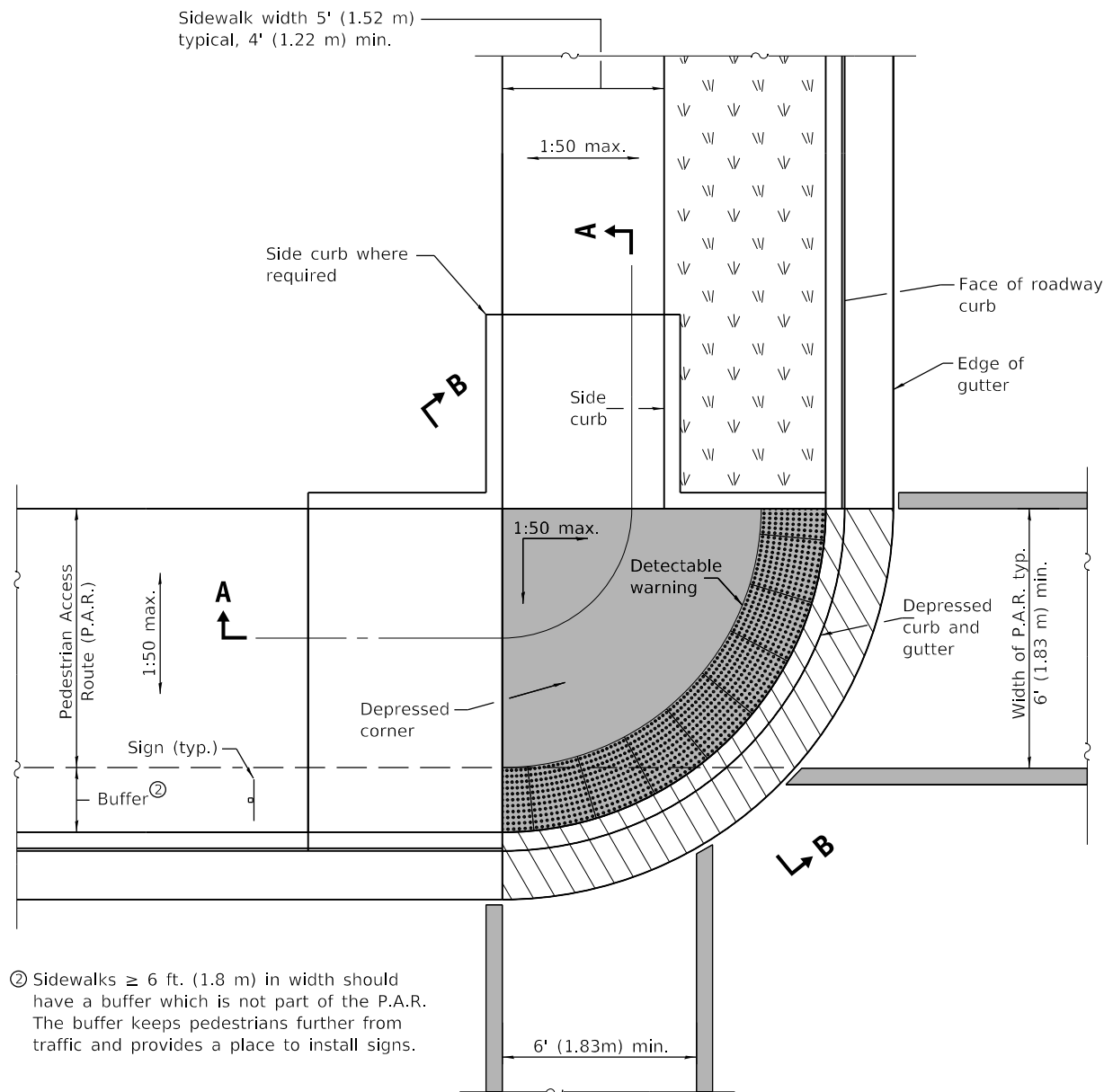
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2019

ENGINEER OF DESIGN AND ENVIRONMENT

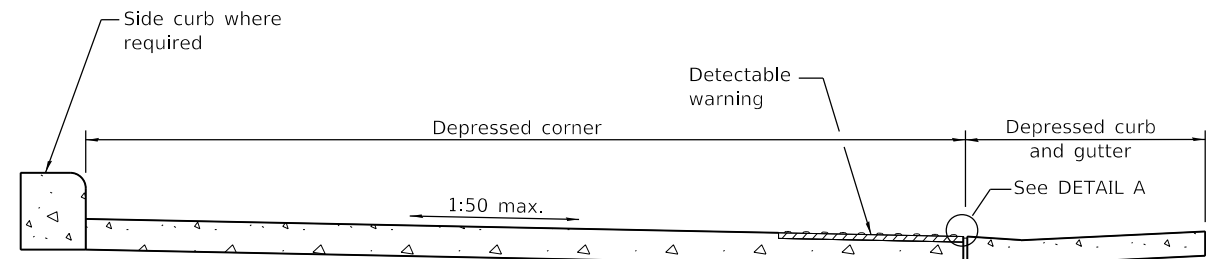
ISSUED 1-1-12

Sidewalk width 5' (1.52 m) typical, 4' (1.22 m) min.

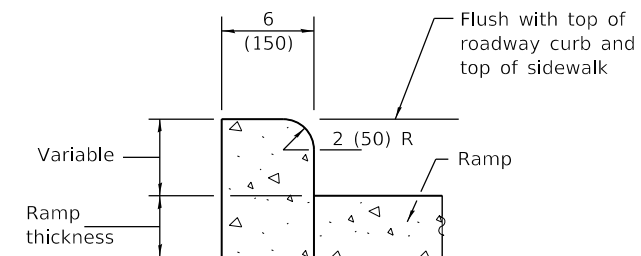


② Sidewalks  $\geq$  6 ft. (1.8 m) in width should have a buffer which is not part of the P.A.R. The buffer keeps pedestrians further from traffic and provides a place to install signs.

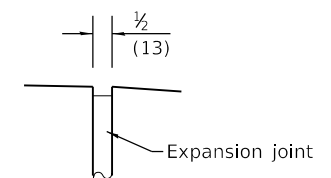
**DEPRESSED CORNER**



**SECTION B-B**



**SIDE CURB DETAIL**



**DETAIL A**

**GENERAL NOTES**

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

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

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

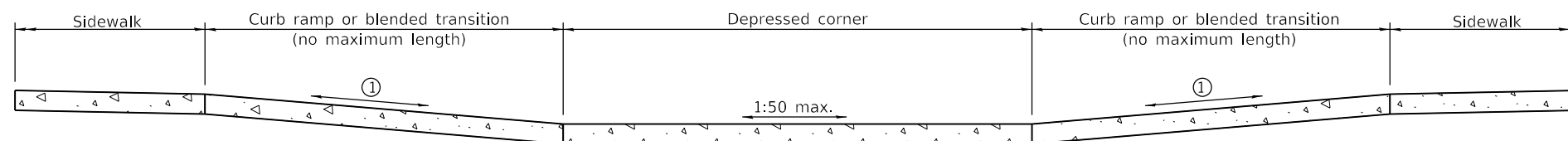
Detectable warnings are shown in their ideal tolerances but the following placement tolerances are allowed.

**Side Border** - Detectable warnings should extend the full width of the walking surface (excluding flared 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.



**SECTION A-A**

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

Illinois Department of Transportation

PASSED January 1, 2021  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

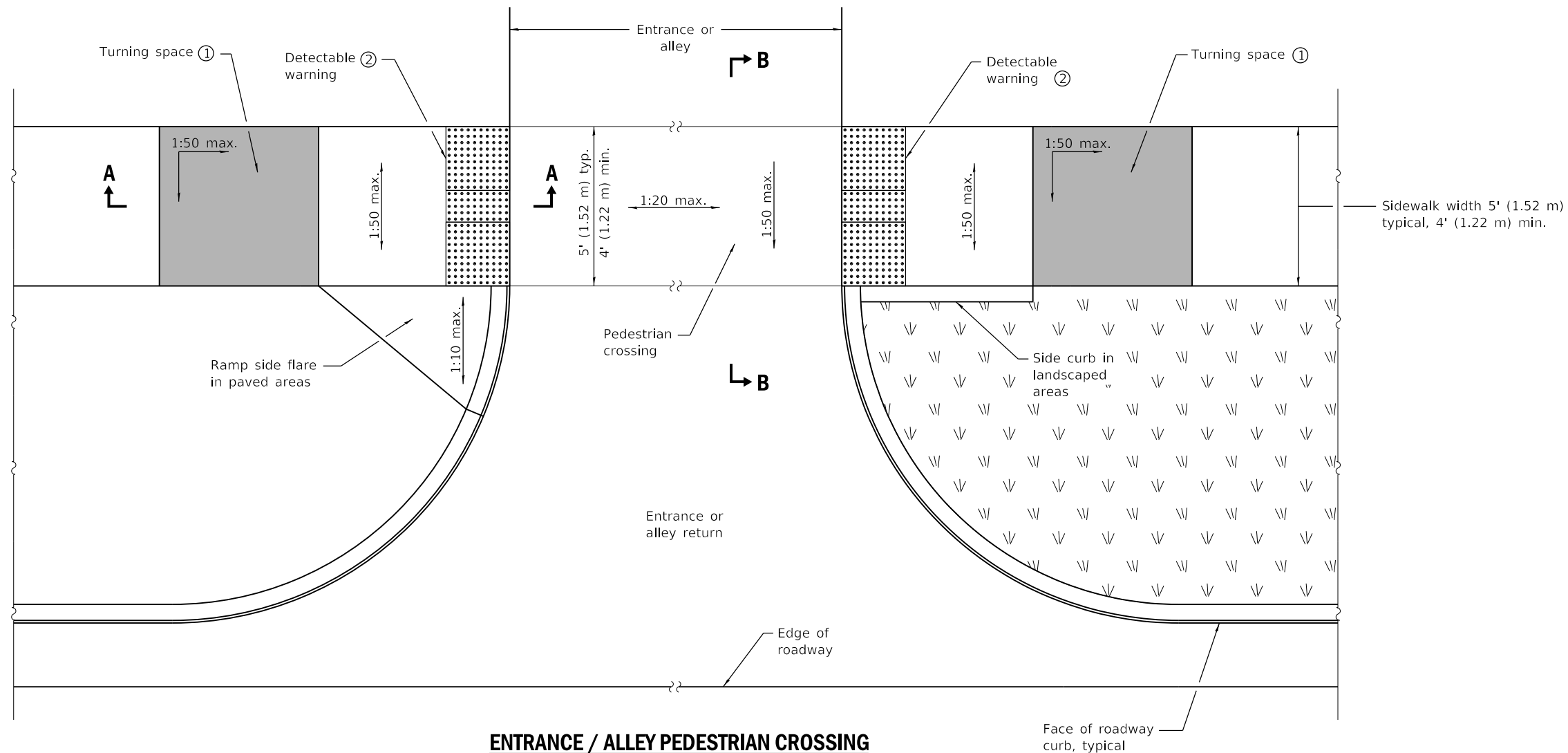
ISSUED 1-1-12

DATE	REVISIONS
1-1-21	Added crosswalk striping and a "buffer" for wide sidewalks.
1-1-19	Removed upper landings, added blended transition and detectable warning tolerances.

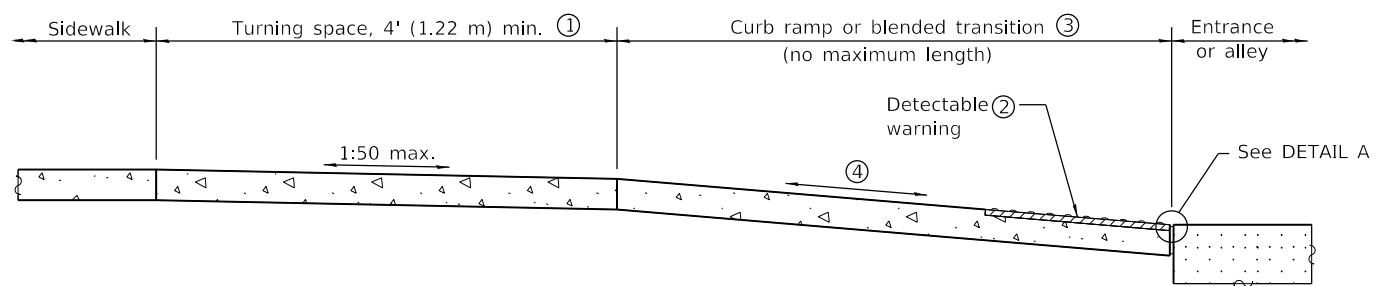
**DEPRESSED CORNER FOR SIDEWALKS**

**STANDARD 424021-06**

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

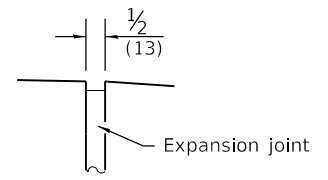


**ENTRANCE / ALLEY PEDESTRIAN CROSSING**

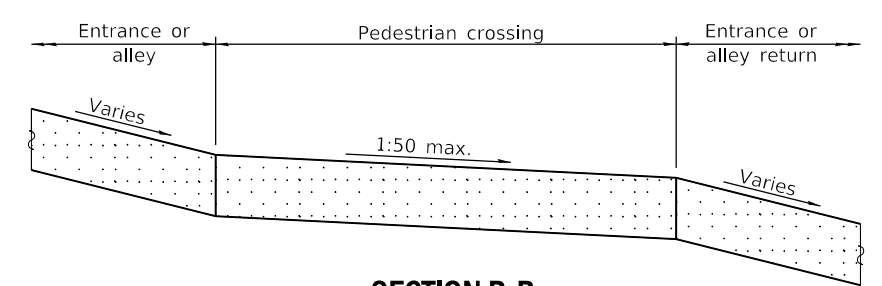


**SECTION A-A**

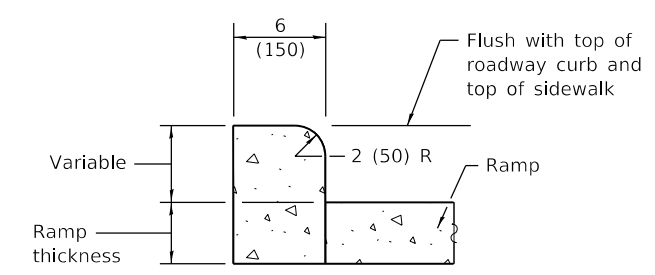
- ① Turning space not required for blended transitions.
- ④ The running slope of a curb ramp shall be 1:20 min and 1:12 max. The running slope of a blended transition shall be 1:20 max.



**DETAIL A**



**SECTION B-B**



**SIDE CURB DETAIL**

**GENERAL NOTES**

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).  
 Where 1:50 maximum slope is shown, 1:64 is preferred.  
 Detectable warnings are shown in their ideal locations but the following placement tolerances are allowed.  
Side Border - Detectable warnings should extend the full width of the walking surface (excluding flared sides) but a border along each side up to 2 in. (50 mm) in width is allowed.  
Curb Set-Back - Detectable warnings located at the back of curb should closely align with the curb but a gap up to 6 in. (150 mm) behind the curb is allowed.  
 All dimensions are in inches (millimeters) unless otherwise shown.

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

**ENTRANCE / ALLEY PEDESTRIAN CROSSINGS**

**STANDARD 424026-03**

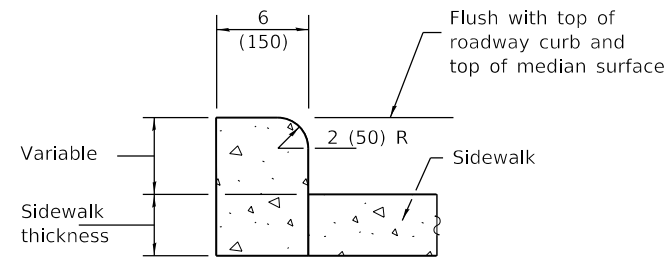
Illinois Department of Transportation

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

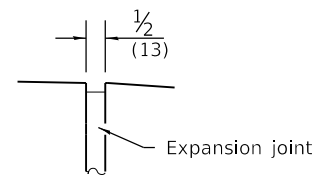
APPROVED January 1, 2019  
*Joe E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

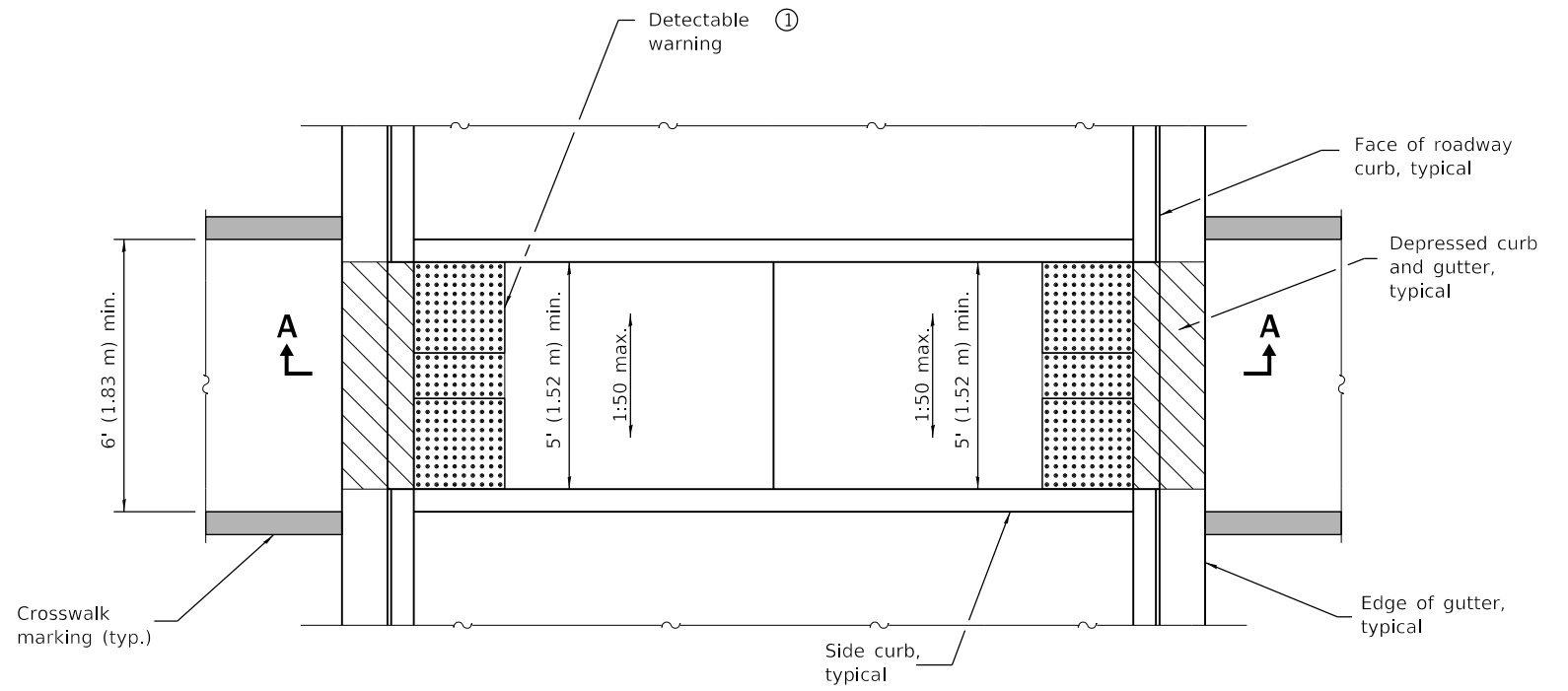




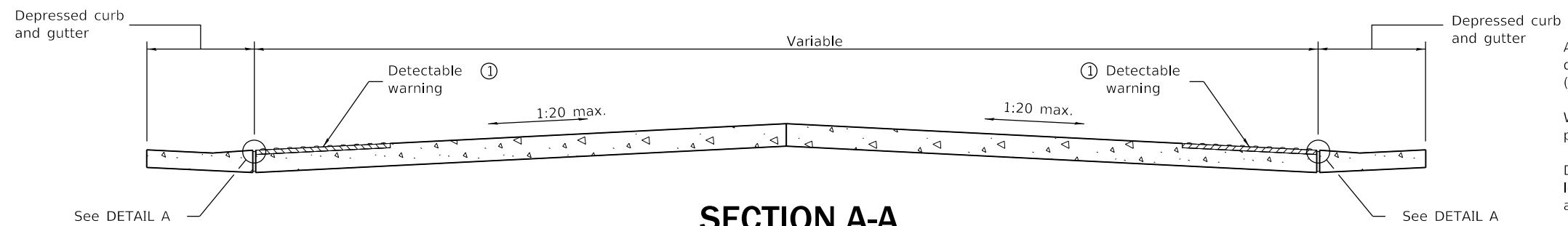
**SIDE CURB DETAIL**



**DETAIL A**



**MEDIAN PEDESTRIAN CROSSING**



**SECTION A-A**

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

**GENERAL NOTES**

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

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

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

Side Border - Detectable warnings should extend the full width of the walking surface (excluding flared 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.

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

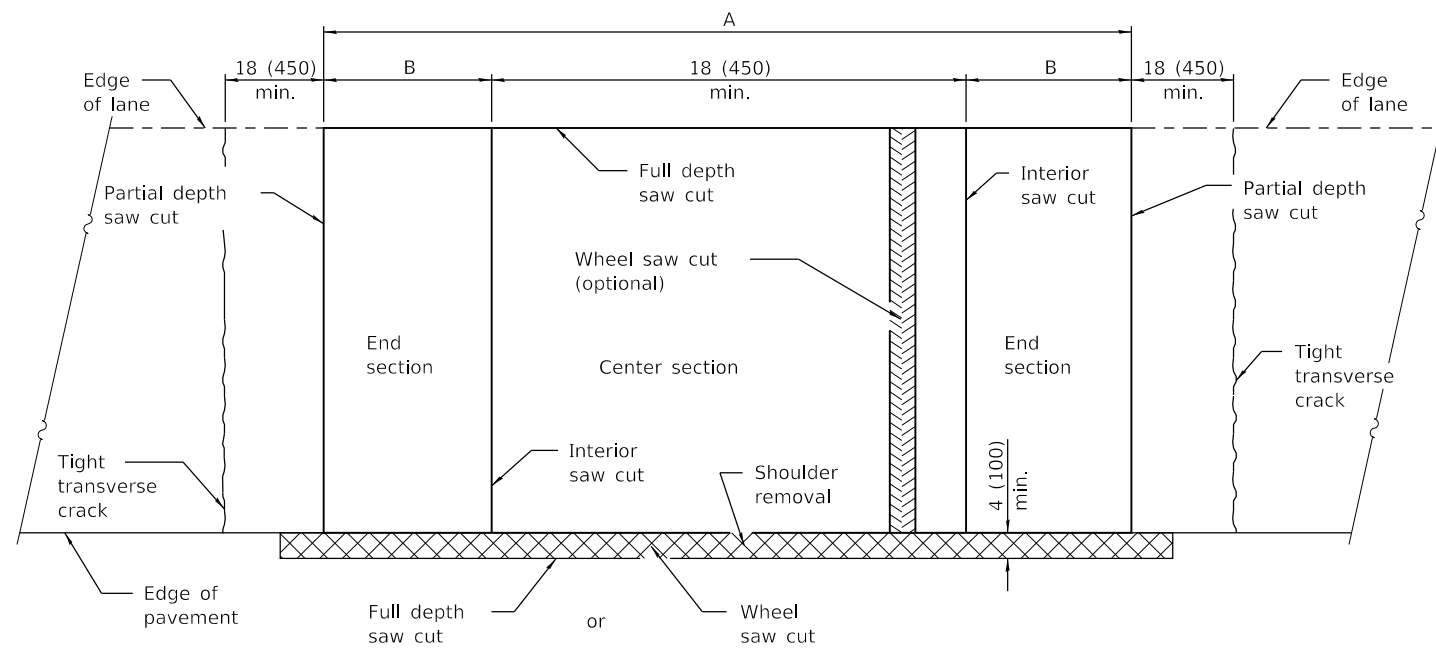
APPROVED January 1, 2019  
*John E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

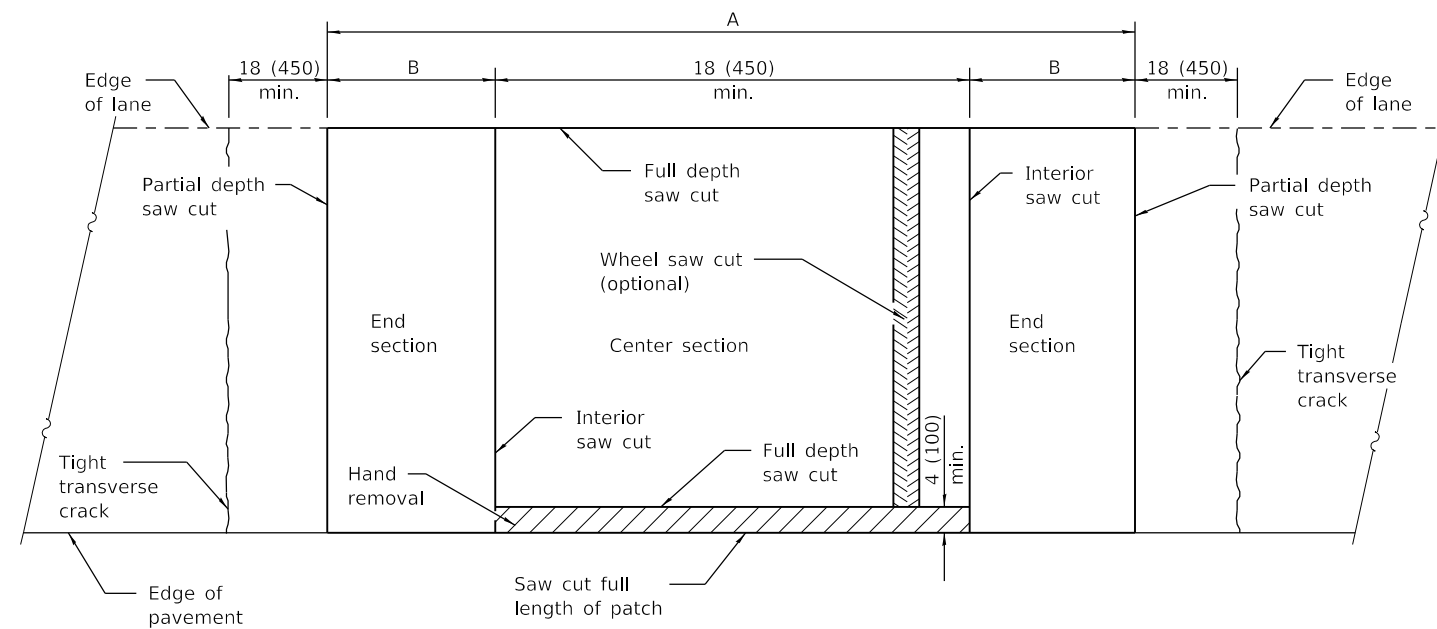
DATE	REVISIONS
1-1-19	Added placement tolerances for detectable warnings.
1-1-12	Widened crosswalk to 6' (1.83 m) min. inside dimension.
	Revised General Notes.

**MEDIAN PEDESTRIAN CROSSINGS**

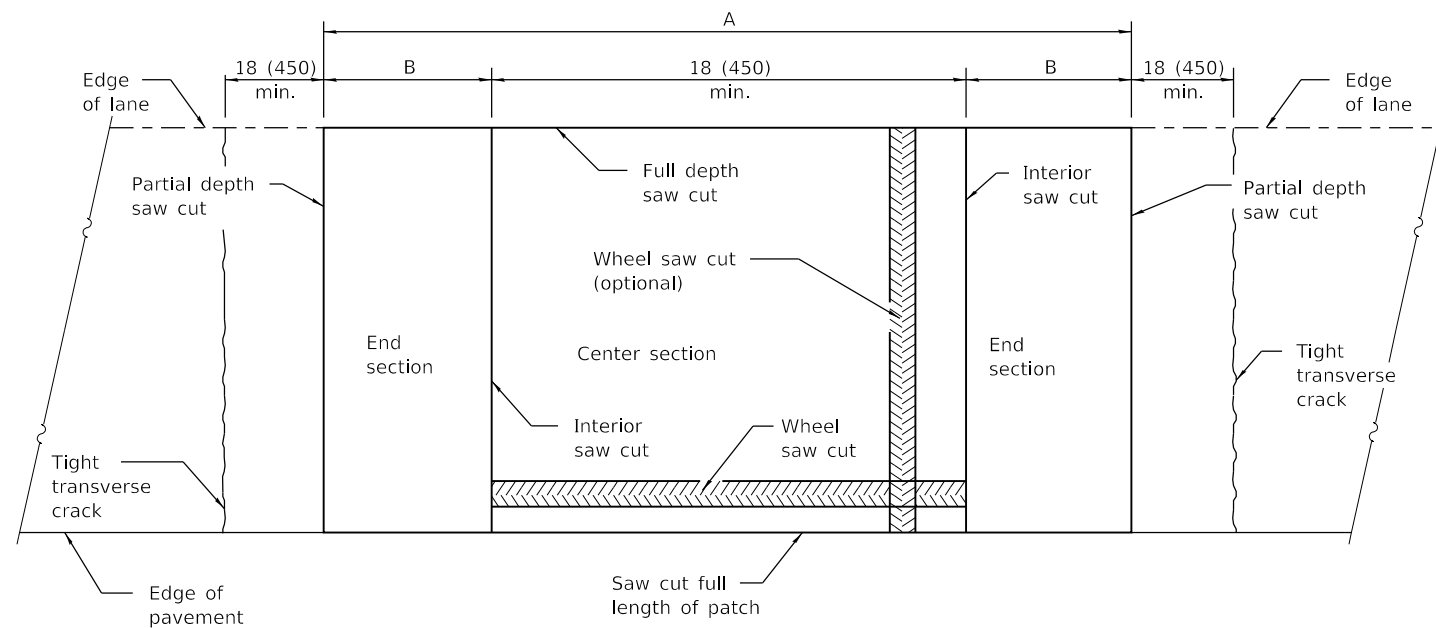
**STANDARD 424031-02**



**PAVEMENT SAWING DETAIL**  
(HMA SHOULDER)

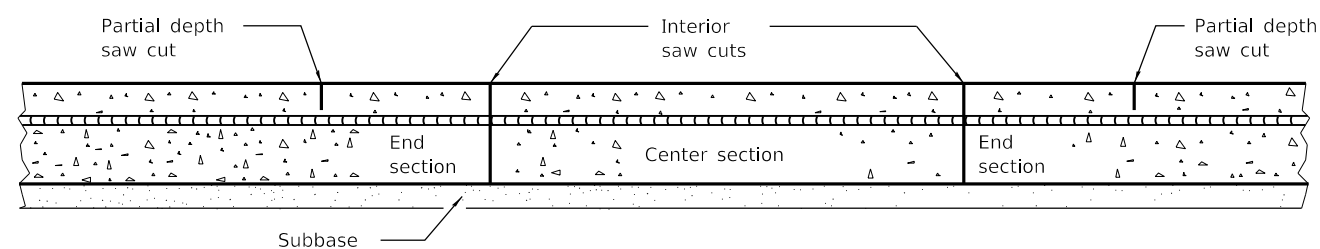


**PAVEMENT SAWING DETAIL**  
(PCC SHOULDER)



**ALTERNATE SAWING DETAIL**  
(PCC SHOULDER)

EXISTING REINFORCEMENT BARS	A (min.)	B (min.)	C (min.)
No. 5 (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.

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

**CLASS A PATCHES**

(Sheet 1 of 2)

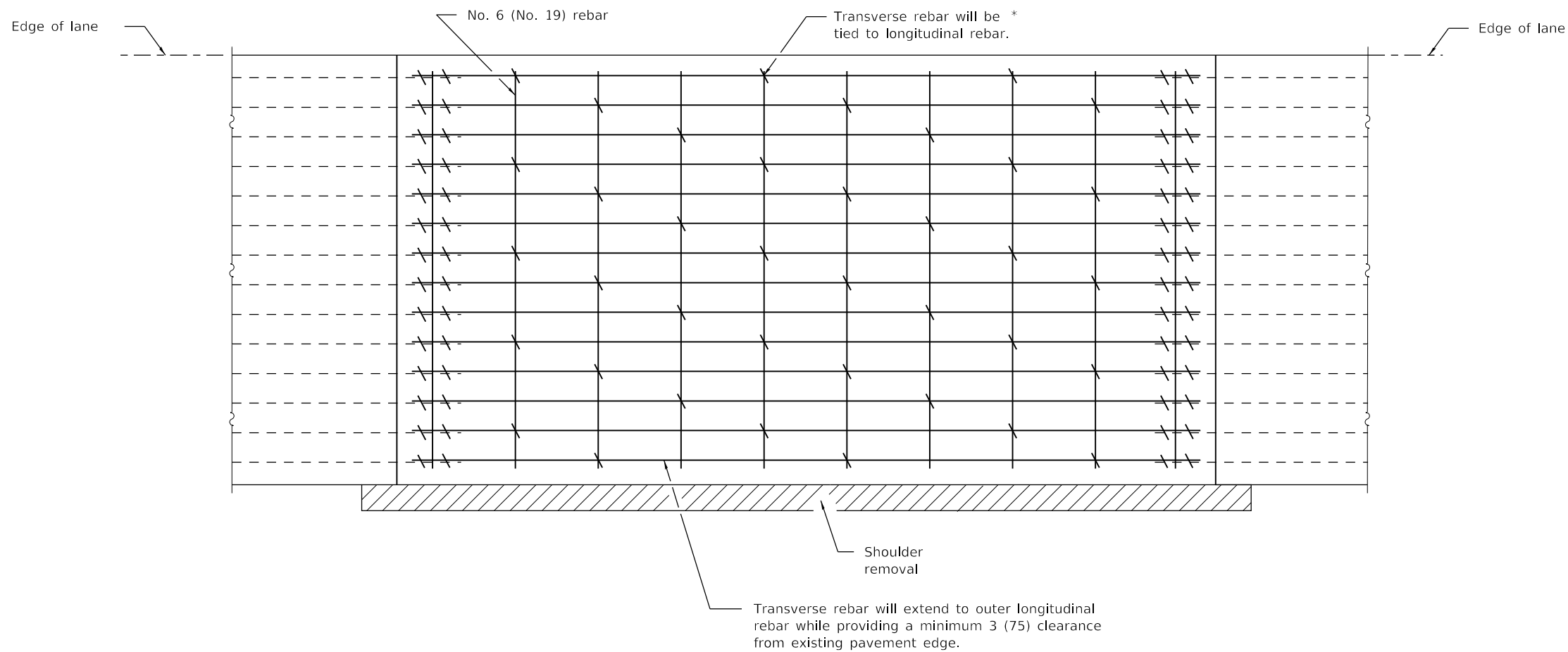
**STANDARD 442001-04**

Illinois Department of Transportation

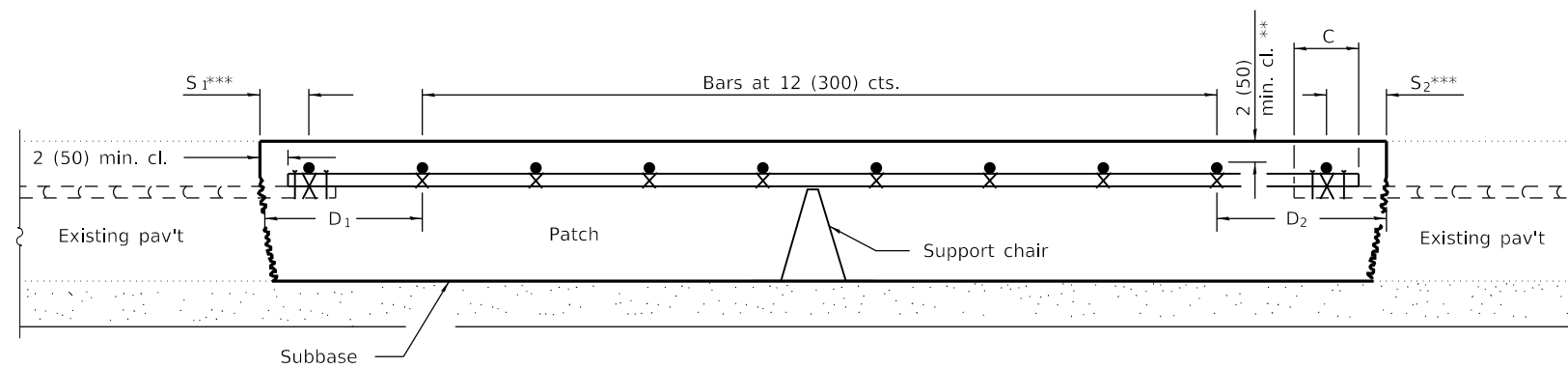
PASSED January 1, 2008  
*[Signature]*  
ENGINEER OF POLICY AND PROCEDURES

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

ISSUED 1-1-97



**PAVEMENT REINFORCEMENT DETAIL**



**PATCHING DETAIL**

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

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PASSED January 1, 2008

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2008

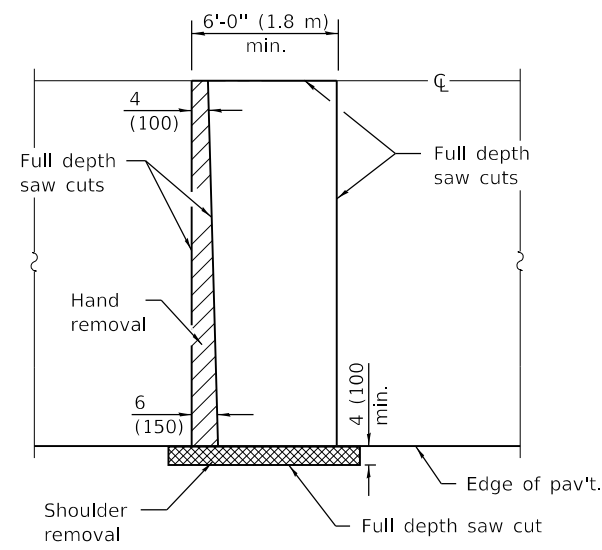
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

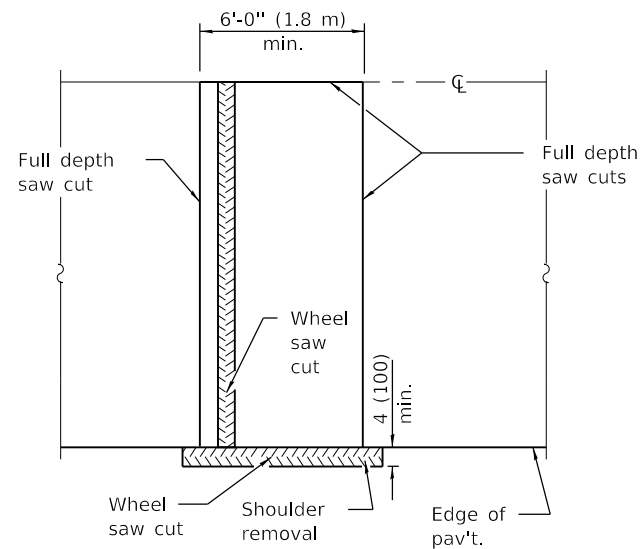
**CLASS A PATCHES**

(Sheet 2 of 2)

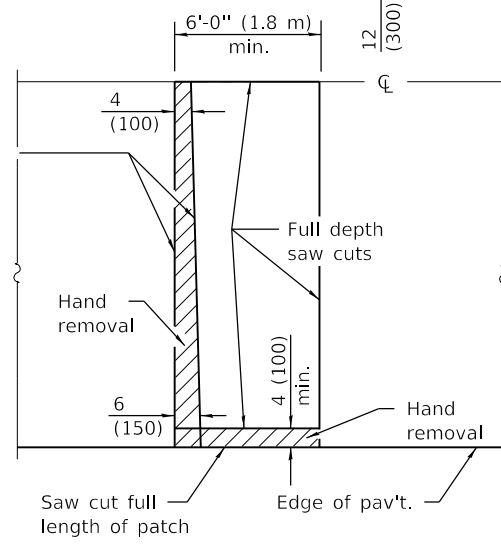
**STANDARD 442001-04**



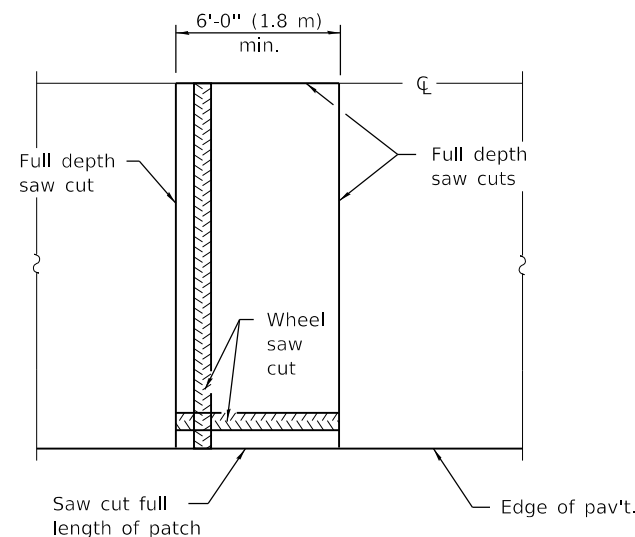
**PAVEMENT SAWING DETAIL**  
(HMA SHOULDER)



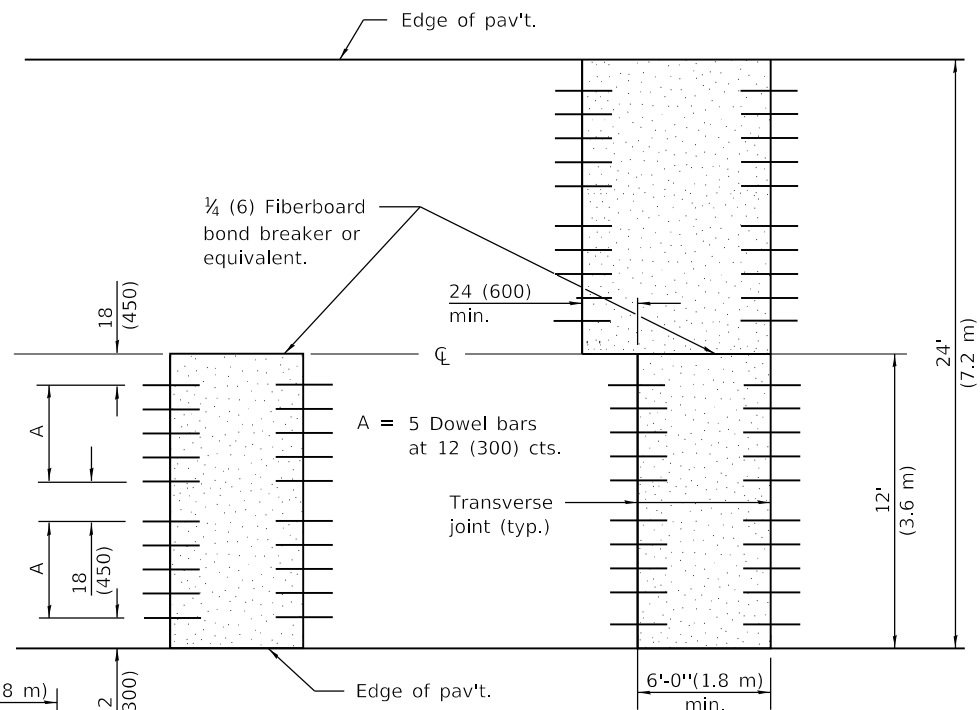
**ALTERNATE SAWING DETAIL**  
(HMA SHOULDER)



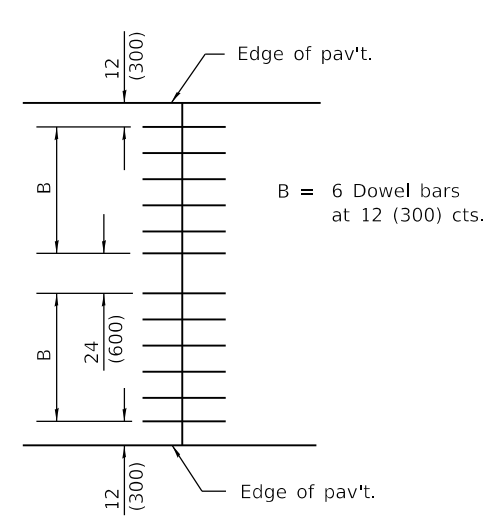
**PAVEMENT SAWING DETAIL**  
(PCC SHOULDER)



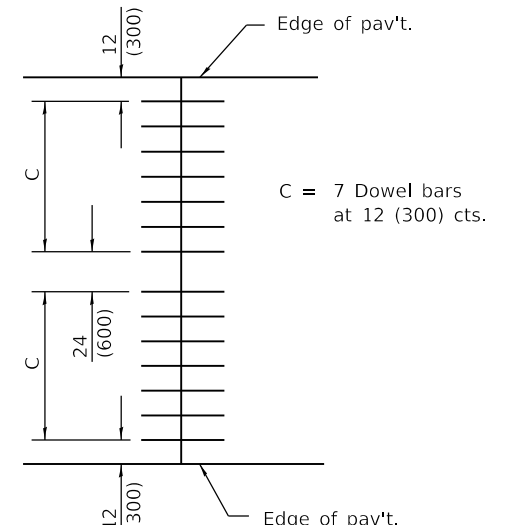
**ALTERNATE SAWING DETAIL**  
(PCC SHOULDER)



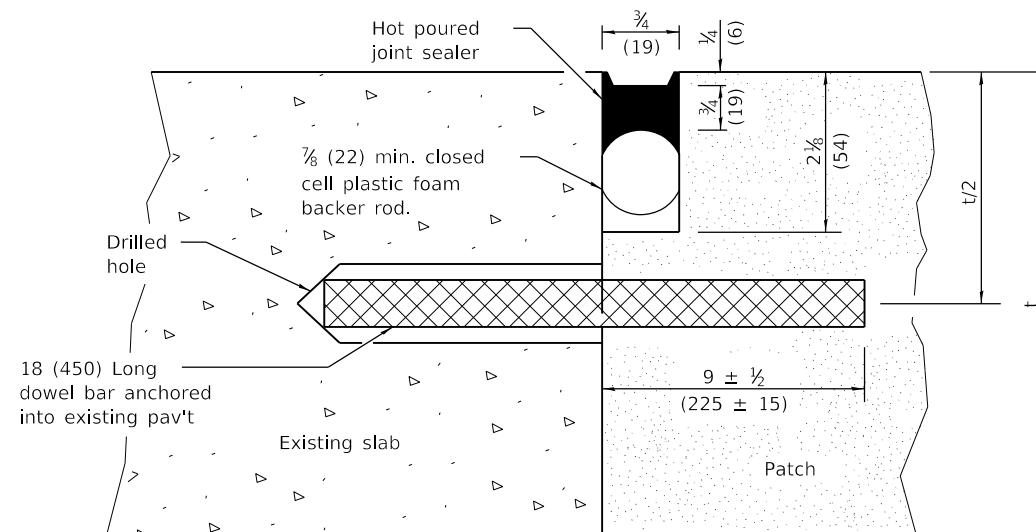
**12' (3.6 m) WIDE LANES**



**14' (4.2 m) WIDE RAMP**

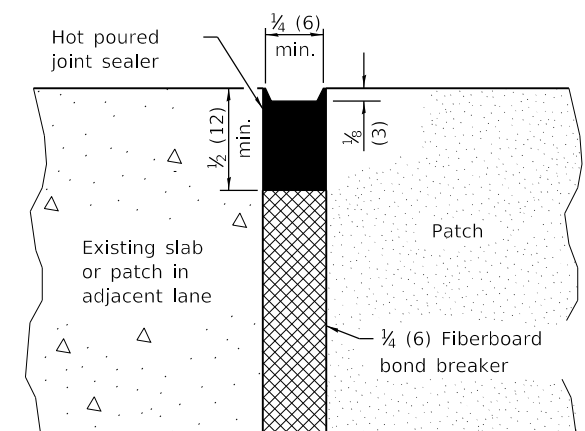


**16' (4.8 m) WIDE RAMP**



**TRANSVERSE JOINT**

DOWEL BAR TABLE		
PAVEMENT THICKNESS	DOWEL BAR DIAMETER	HOLE DIAMETER
10 (250) or greater	1½ (38)	1¾ (41)
8 (200) thru 9.99 (249)	1¼ (32)	1⅝ (35)
Less than 8 (200)	1 (25)	1⅝ (29)



**CENTERLINE JOINT**

**GENERAL NOTES**

The transverse joints for Class B patches shall align with joints or cracks in the adjacent lane whenever possible.  
See Standard 420701 for details of welded wire reinforcement.

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

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

**CLASS B PATCHES**

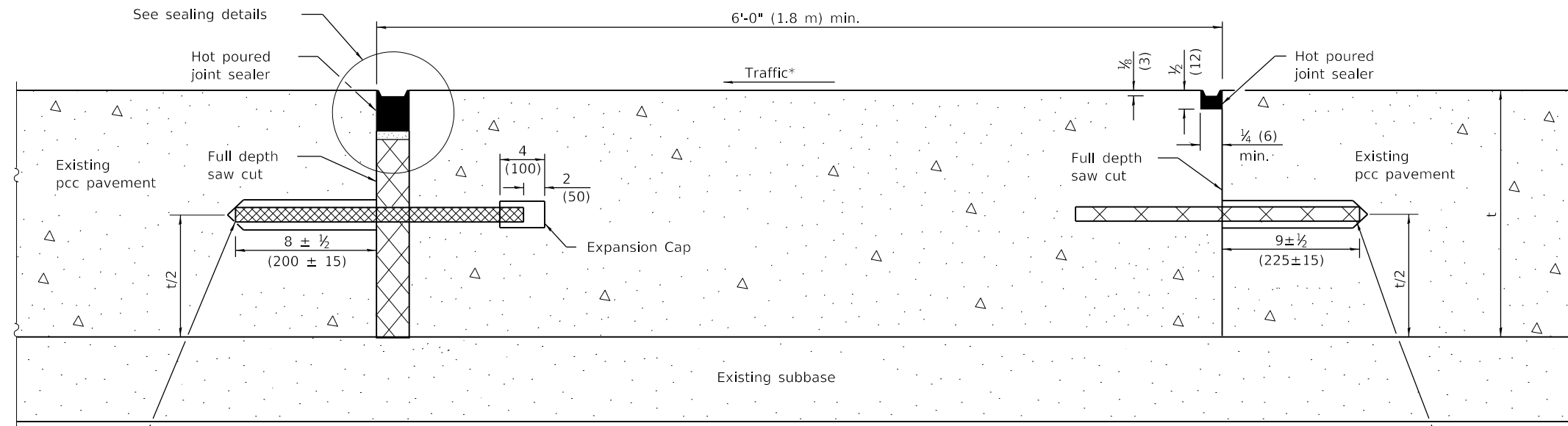
(Sheet 1 of 2)

**STANDARD 442101-09**

Illinois Department of Transportation  
 PASSED January 1, 2019  
 ENGINEER OF POLICY AND PROCEDURES  
 APPROVED January 1, 2019  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-19

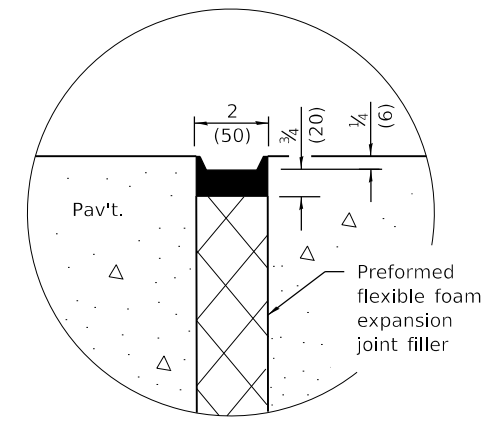
**TRANSVERSE EXPANSION JOINTS**



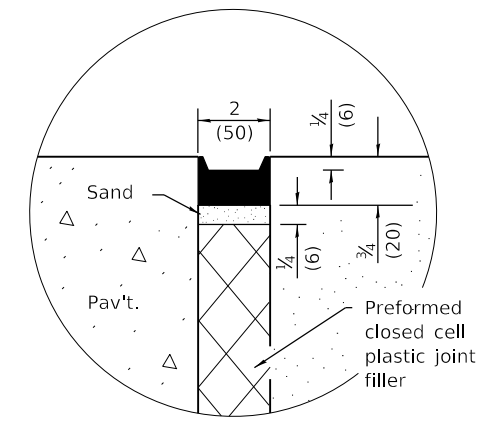
18 (450) Long dowel bars anchored into existing pavement at 12 (300) cts.

**METHOD I**  
(Without Resurfacing)

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



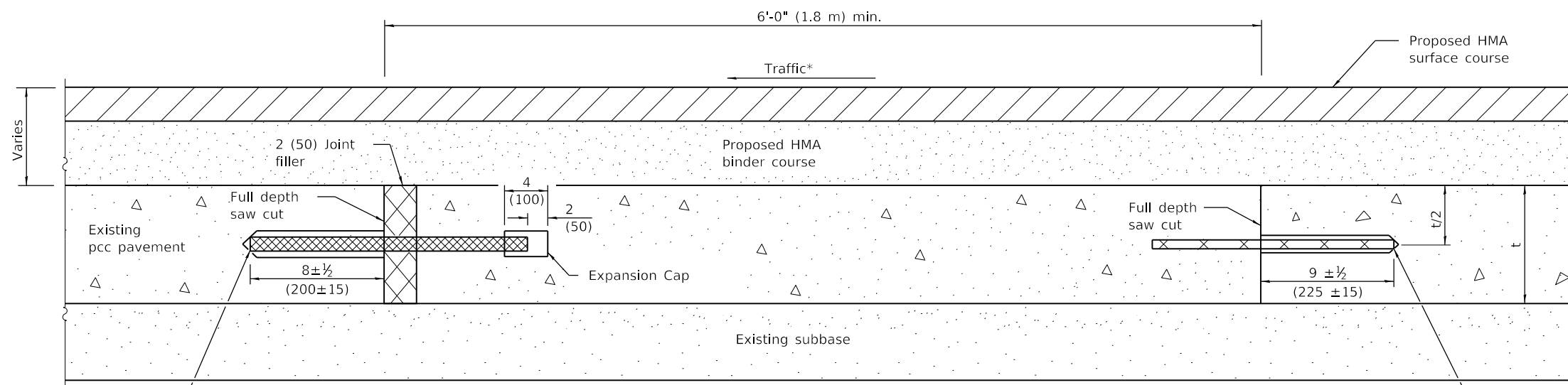
**SEALING DETAIL**



**SEALING DETAIL**

**NOTE**

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



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

**METHOD II**  
(With Resurfacing)

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

Illinois Department of Transportation

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

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

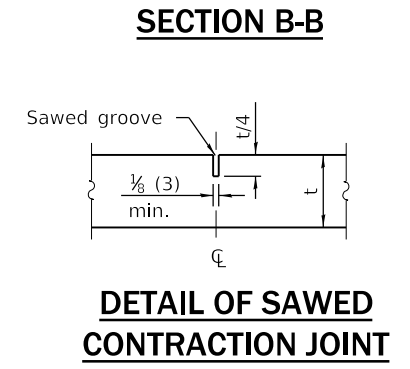
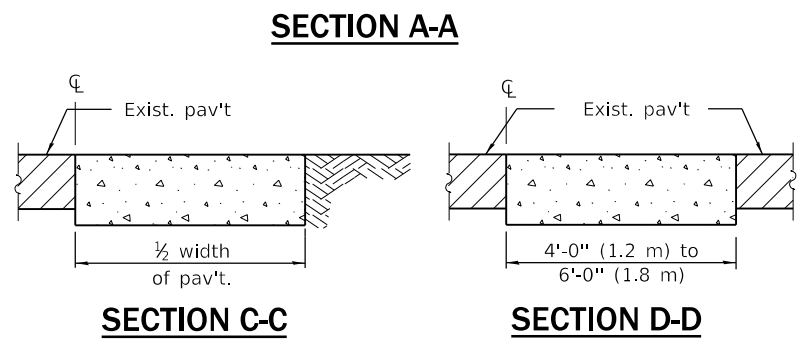
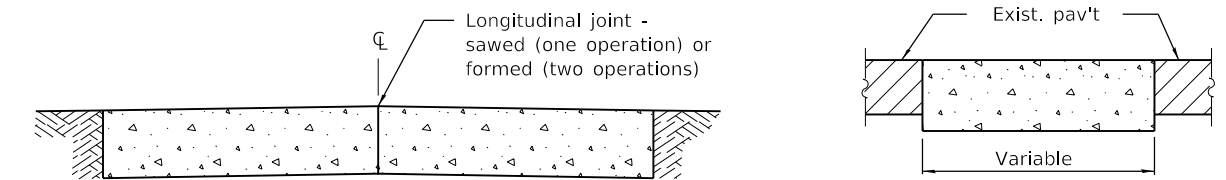
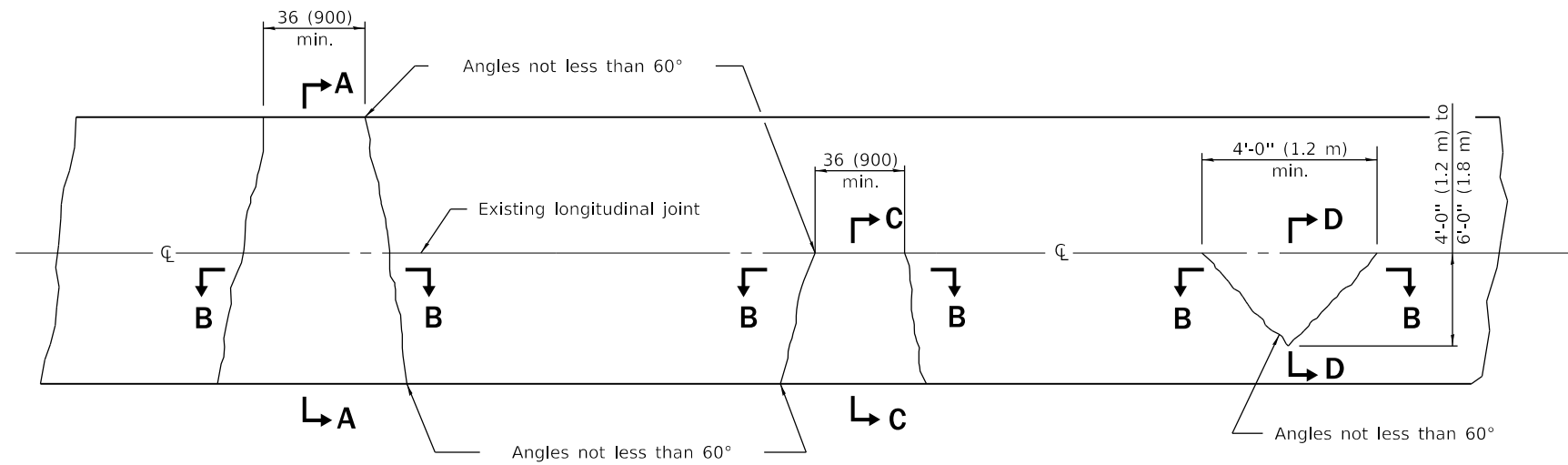
ISSUED 1-1-97

**CLASS B PATCHES**

(Sheet 2 of 2)

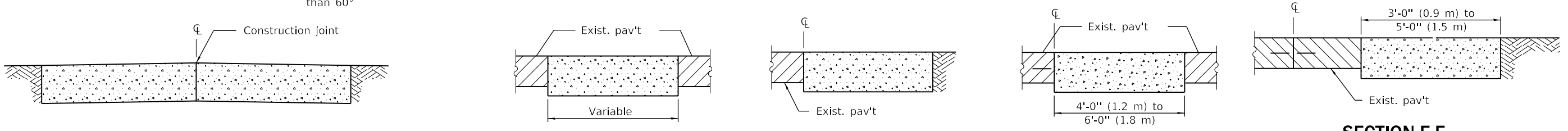
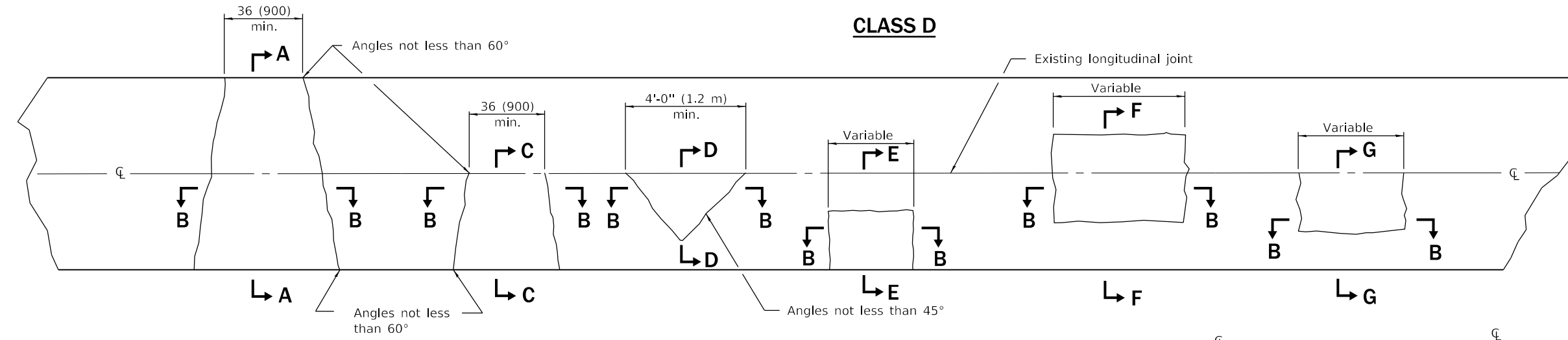
**STANDARD 442101-09**

**CLASS C**



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**



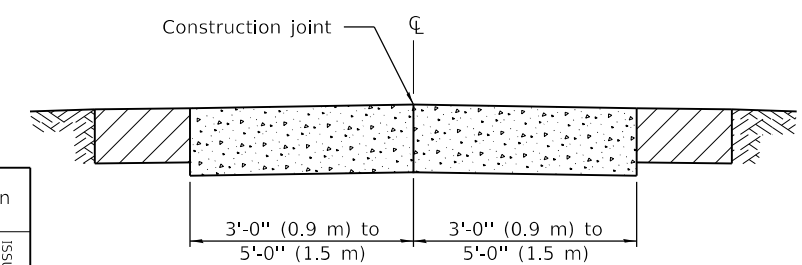
**SECTION A-A**  
(Built in two operations)

**SECTION B-B**

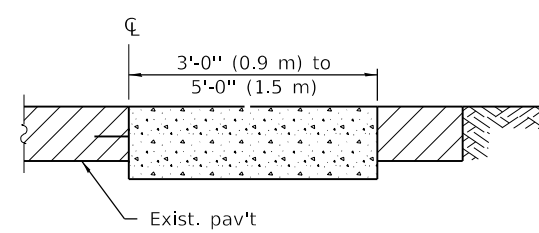
**SECTION C-C**

**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.

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

**CLASS C and D PATCHES**

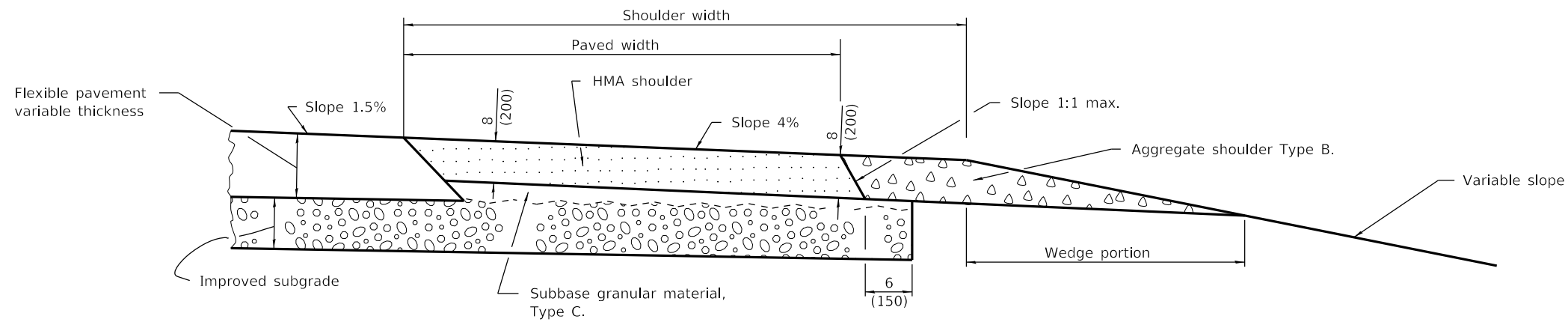
**STANDARD 442201-03**

Illinois Department of Transportation

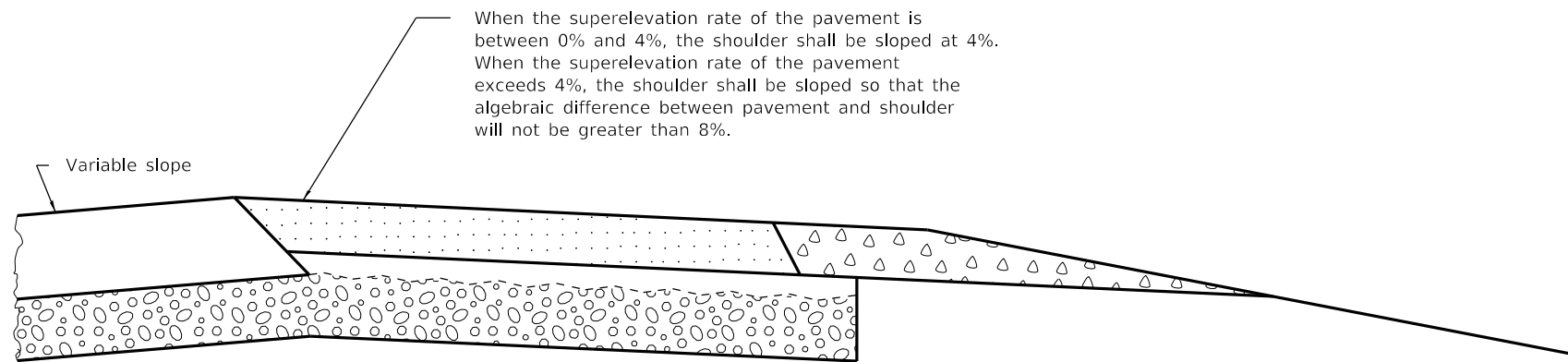
PASSED January 1, 2008  
*Scott Smith*  
ENGINEER OF POLICY AND PROCEDURES

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

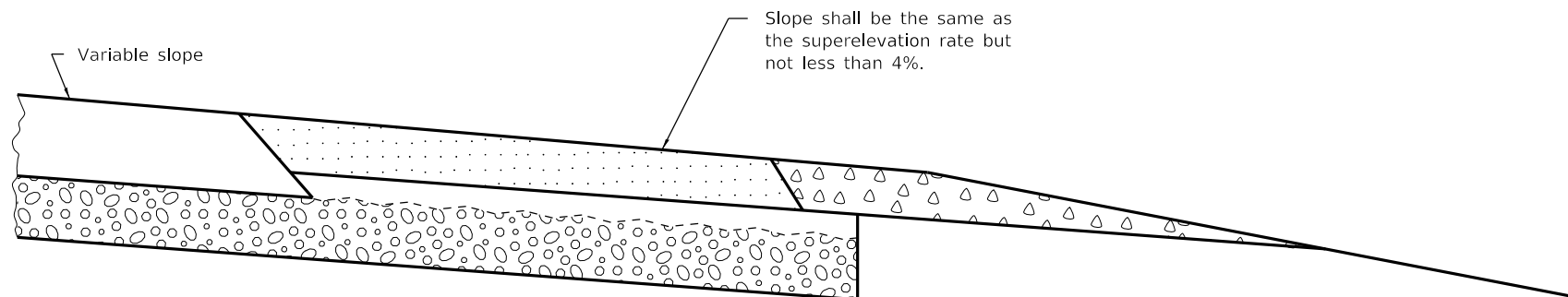
ISSUED 1-1-97



**SHOULDER FOR TANGENT PAVEMENT**



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



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

**GENERAL NOTES**

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

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

Illinois Department of Transportation

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

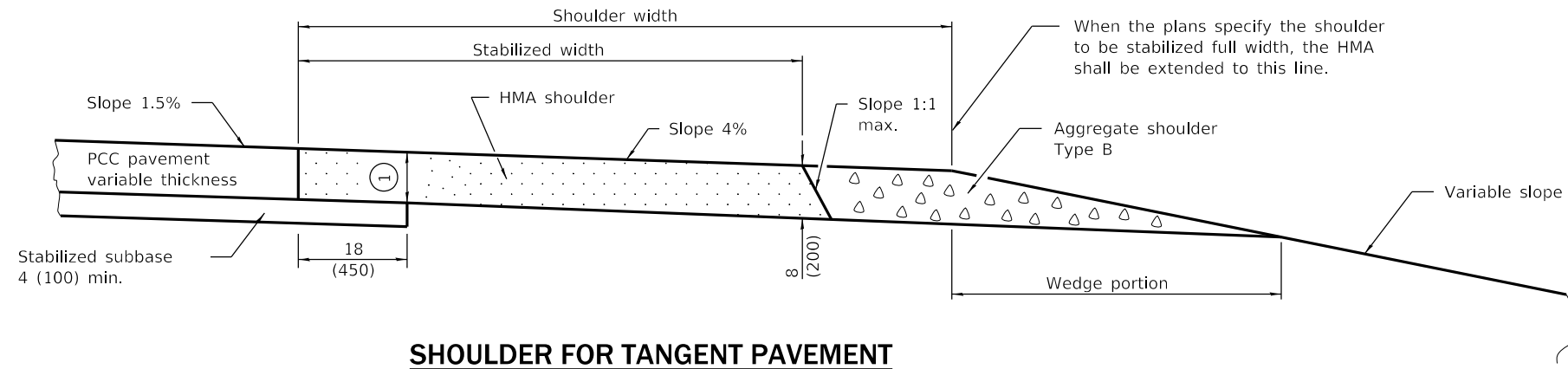
APPROVED January 1, 2008  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

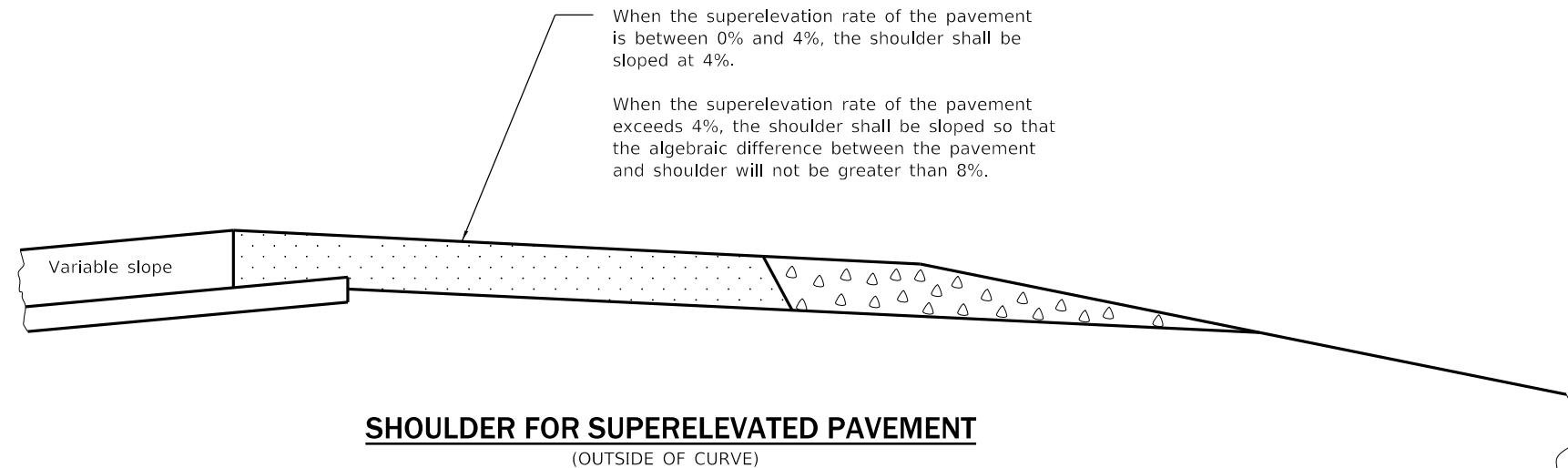
DATE	REVISIONS
1-1-08	Switched units to English (metric).
1-1-07	Switched to Hot-Mix Asphalt (HMA) terminology.

**HMA SHOULDER ADJACENT TO FLEXIBLE PAVEMENT**

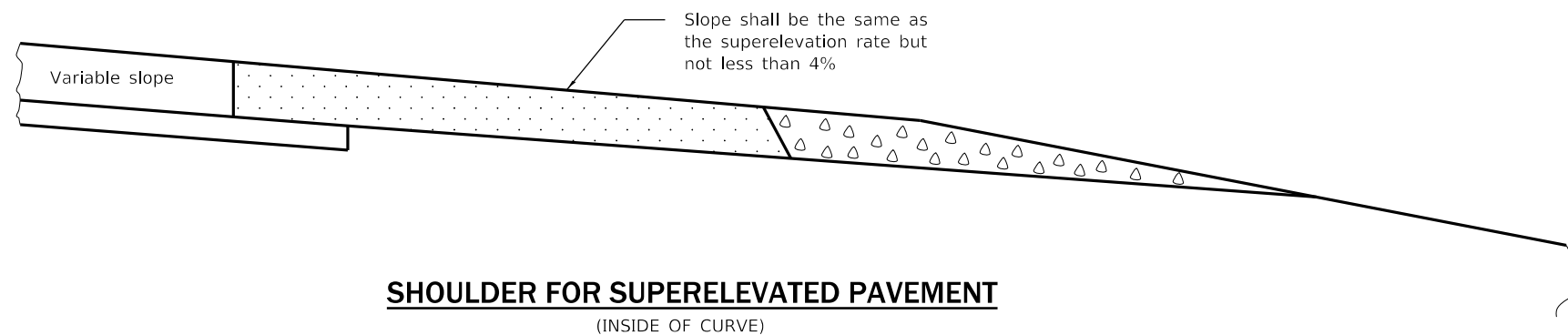
**STANDARD 482001-02**



**SHOULDER FOR TANGENT PAVEMENT**



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



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

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

**GENERAL NOTES**

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

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

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

Illinois Department of Transportation

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

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

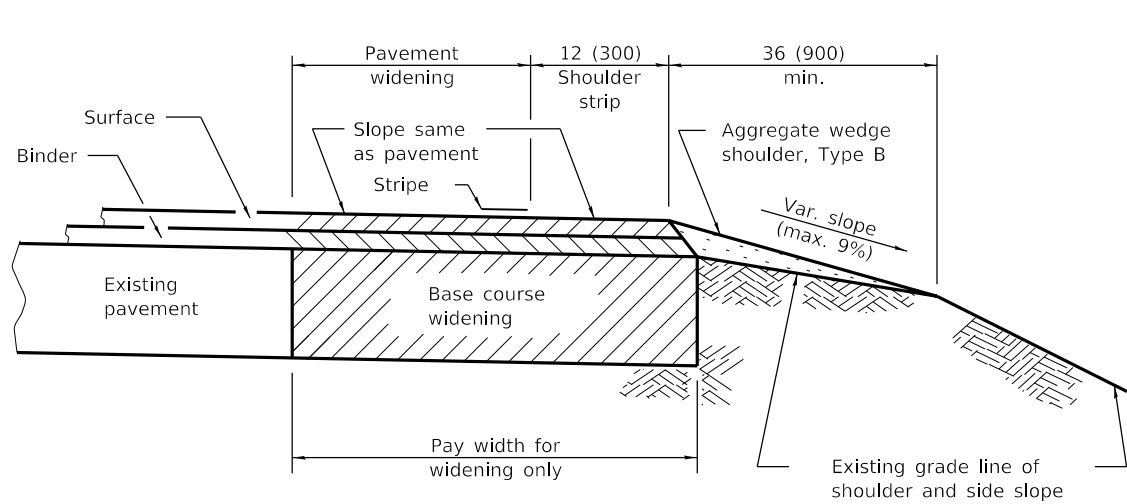
ISSUED 1-1-97

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

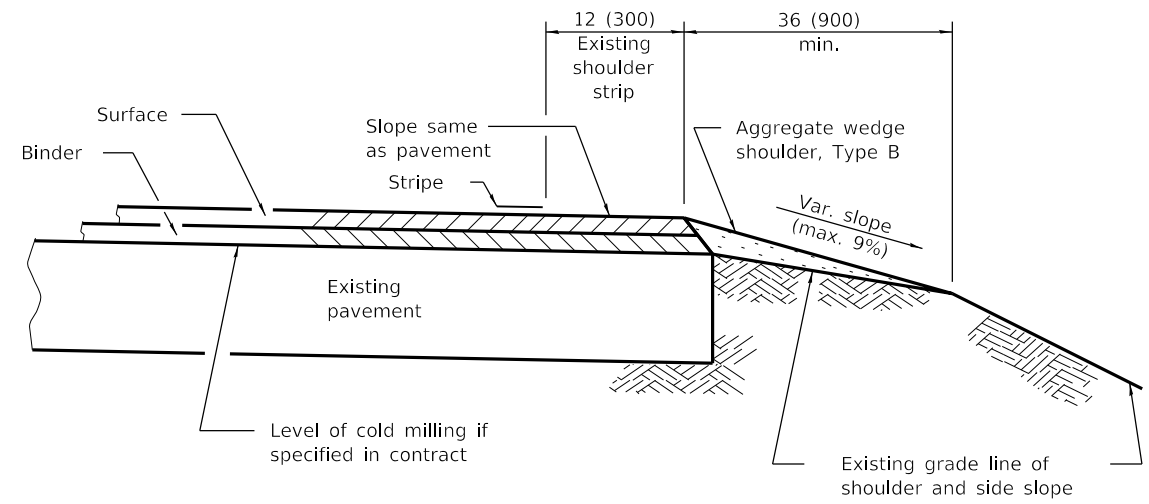
**HMA SHOULDER ADJACENT TO RIGID PAVEMENT**

**STANDARD 482006-03**

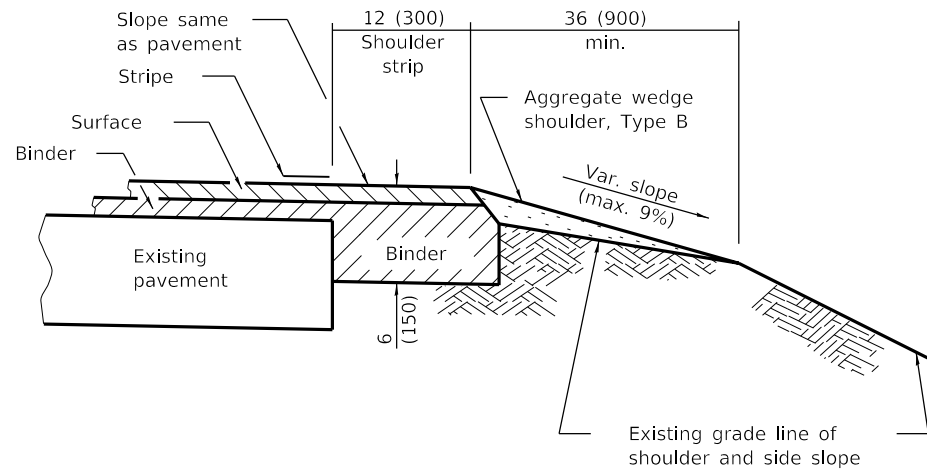




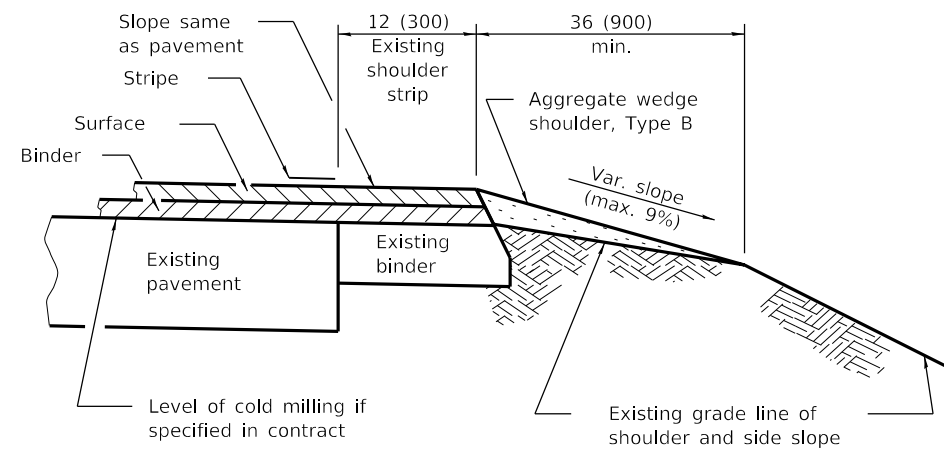
**HMA SHOULDER STRIP AND  
AGGREGATE WEDGE WITH WIDENING**  
(Cross-section A)



**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

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

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

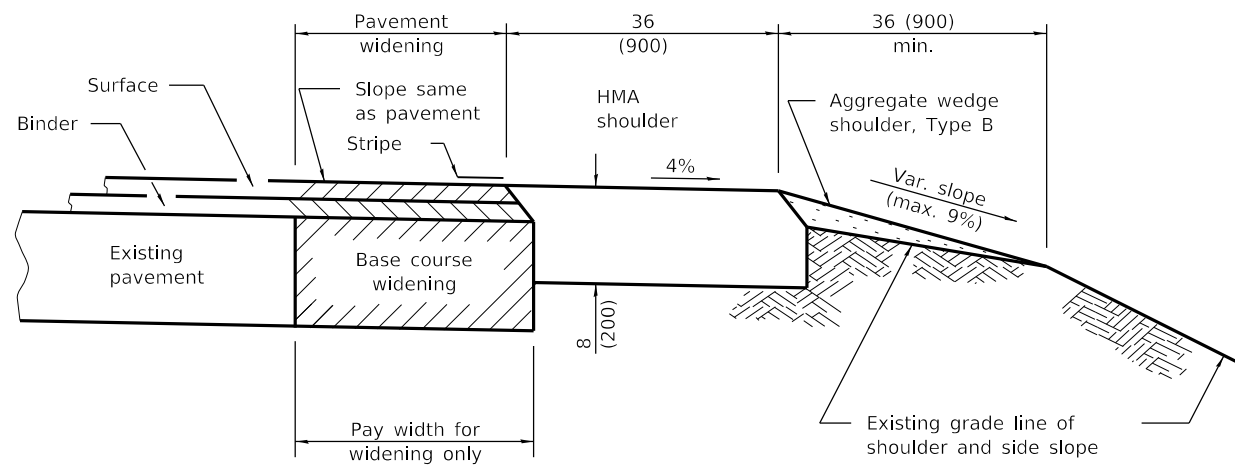
ISSUED 1-1-97

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**

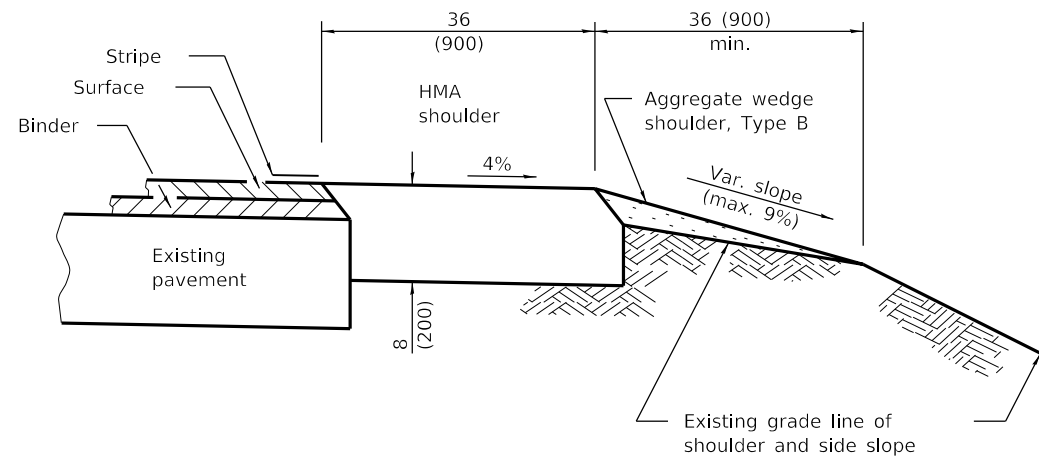
(Sheet 1 of 2)

**STANDARD 482011-03**



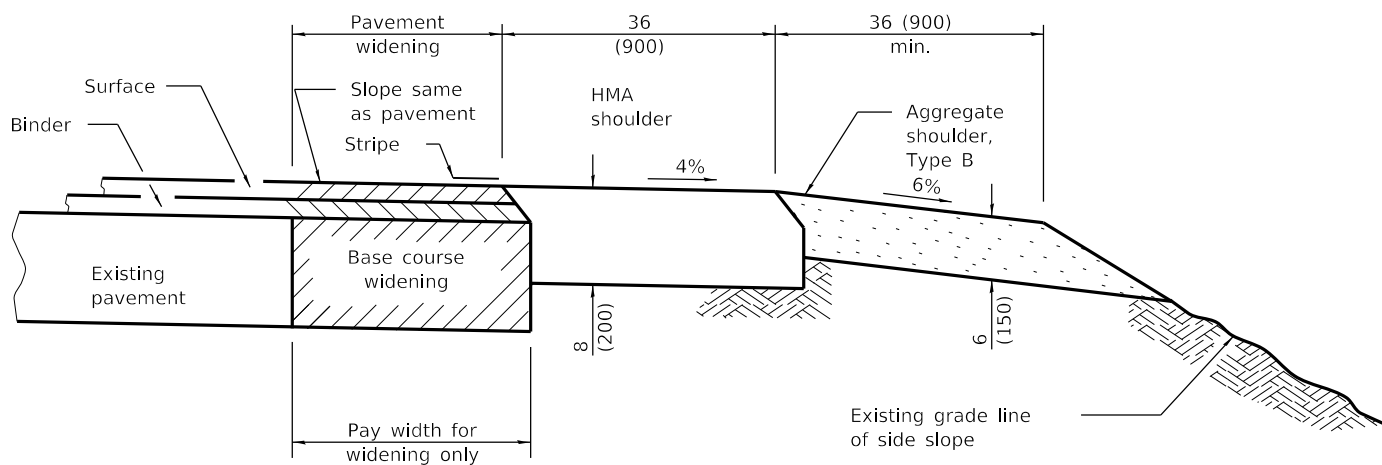
**HMA SHOULDER AND AGGREGATE WEDGE WITH WIDENING**

(Cross-section E)



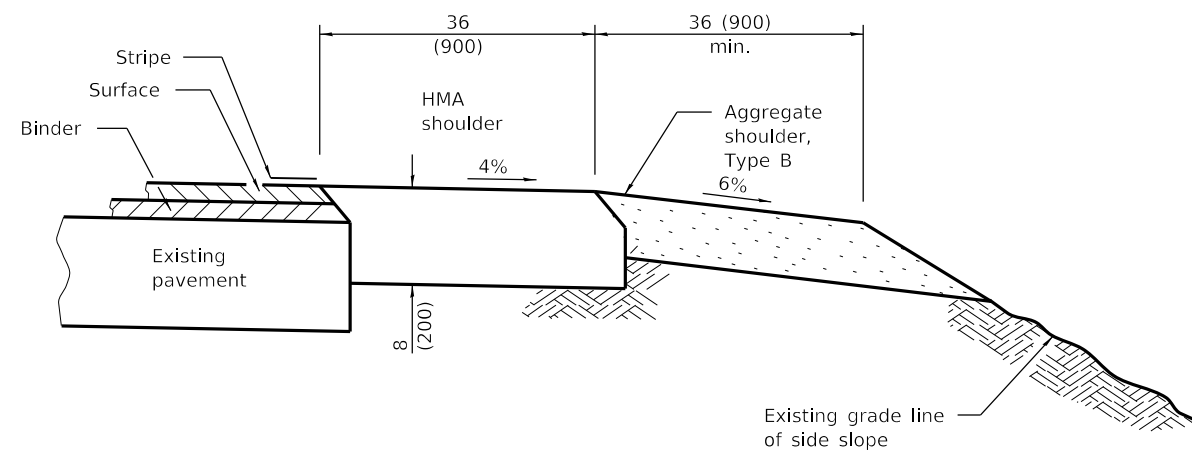
**HMA SHOULDER AND AGGREGATE WEDGE WITH RESURFACING**

(Cross-section G)



**HMA AND AGGREGATE SHOULDERS WITH WIDENING**

(Cross-section F)



**HMA AND AGGREGATE SHOULDERS WITH RESURFACING**

(Cross-section H)

Illinois Department of Transportation

PASSED January 1, 2008

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2008

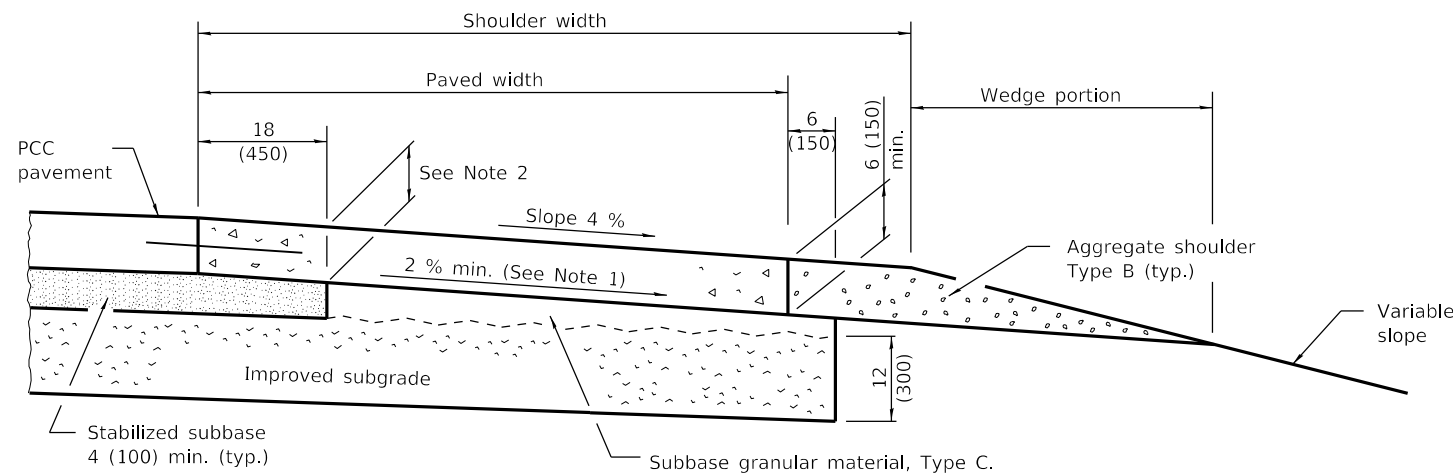
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

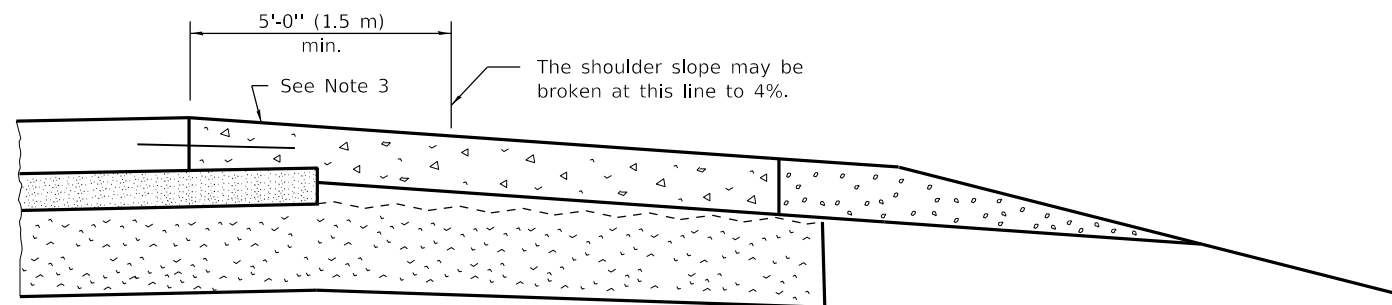
**HMA SHLD. STRIPS/SHLDS. WITH RESURFACING OR WIDENING AND RESURFACING PROJECTS**

(Sheet 2 of 2)

**STANDARD 482011-03**

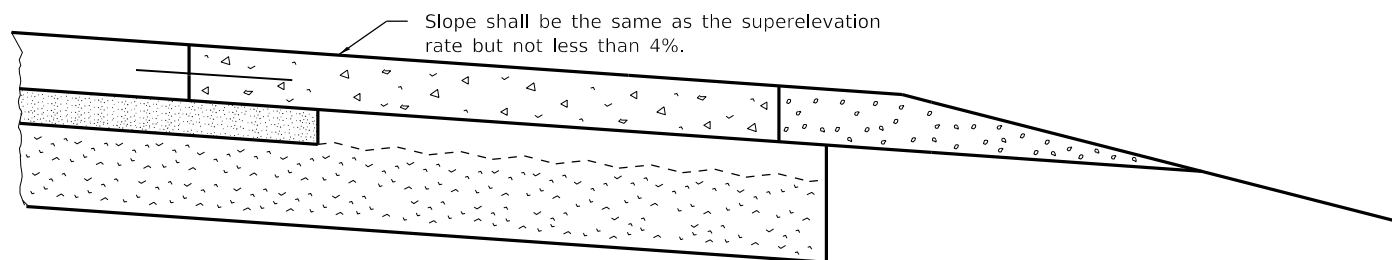


**SHOULDER FOR TANGENT PAVEMENT**



**SHOULDER FOR SUPERELEVATED PAVEMENT**

(Outside of curve)

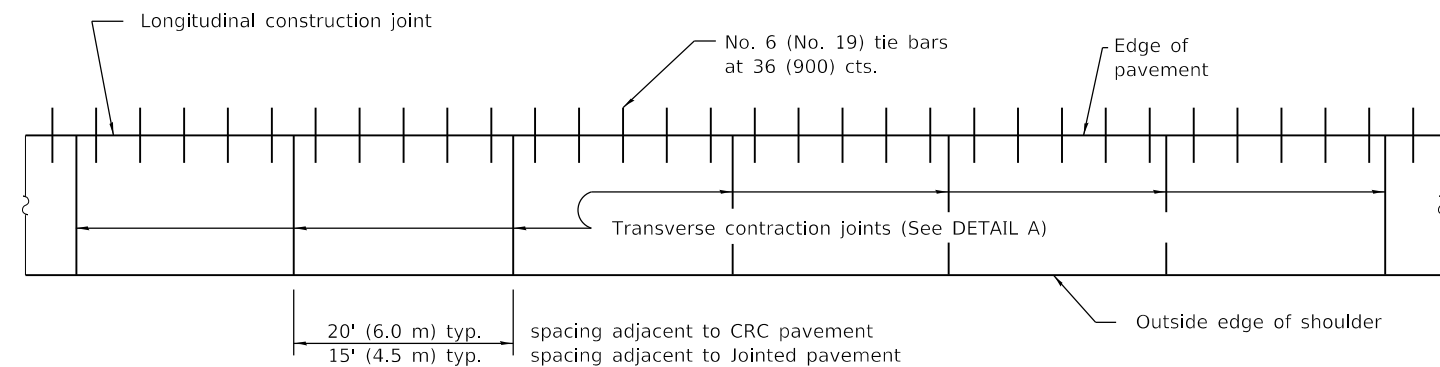


**SHOULDER FOR SUPERELEVATED PAVEMENT**

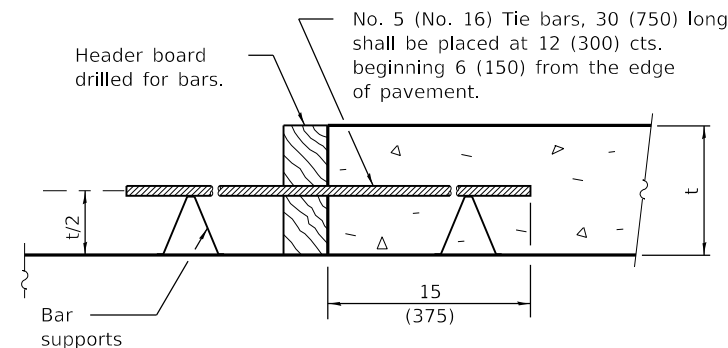
(Inside of curve)

**NOTES**

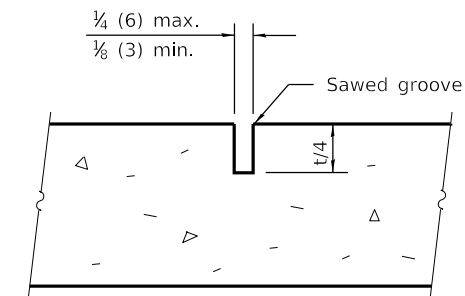
- Note 1: Does not apply when sub-surface drains are installed.
- Note 2: When the subbase is not removed, this thickness will vary with the thickness of pavement, extended length of subbase, and the slope of pavement. When this thickness is less than 6 (150), the paved shoulder shall be stepped down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



**PLAN**



**TRANSVERSE CONSTRUCTION JOINT**



**DETAIL A**

**TRANSVERSE CONTRACTION JOINT**

**GENERAL NOTES**

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

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

See Standard 420001 for details not shown.

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

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

**PCC SHOULDER**

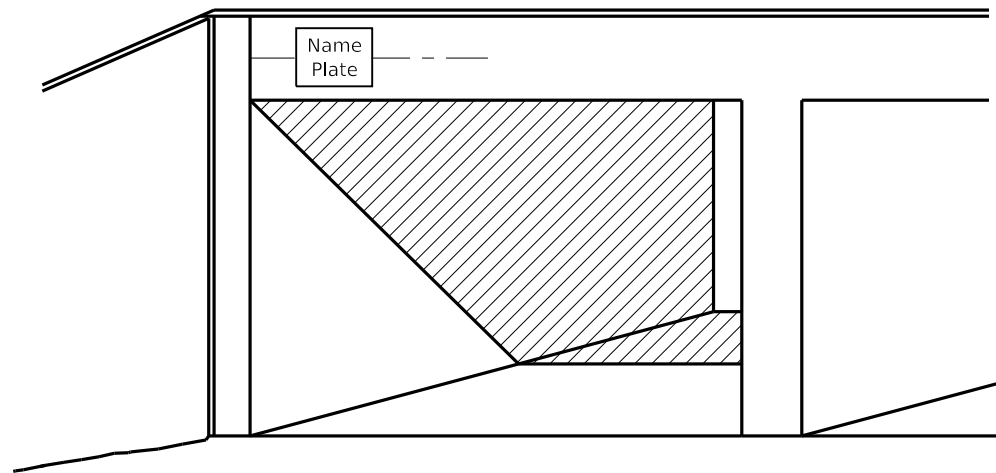
**STANDARD 483001-05**

Illinois Department of Transportation

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

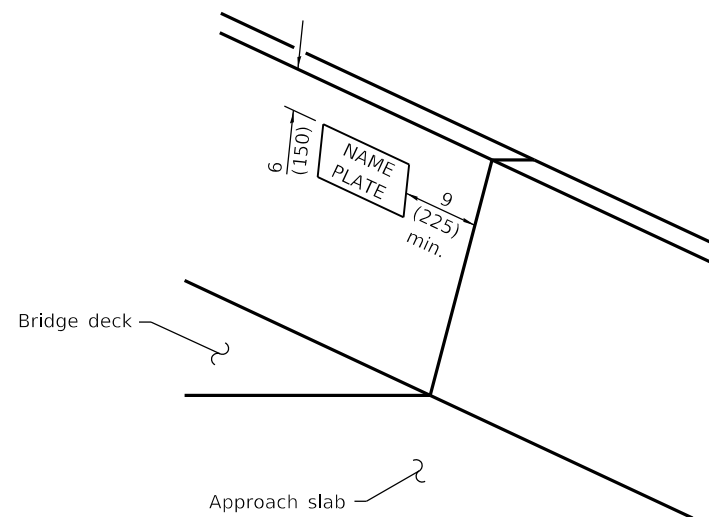
APPROVED January 1, 2018  
*Marcus M. Adams*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

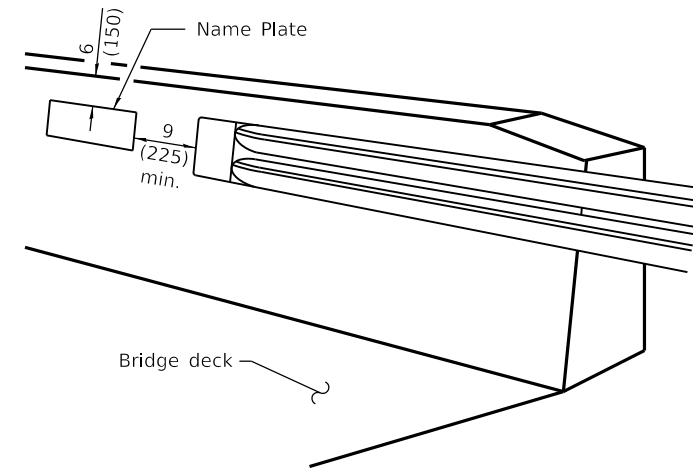


**MULTI-SPAN CULVERTS**

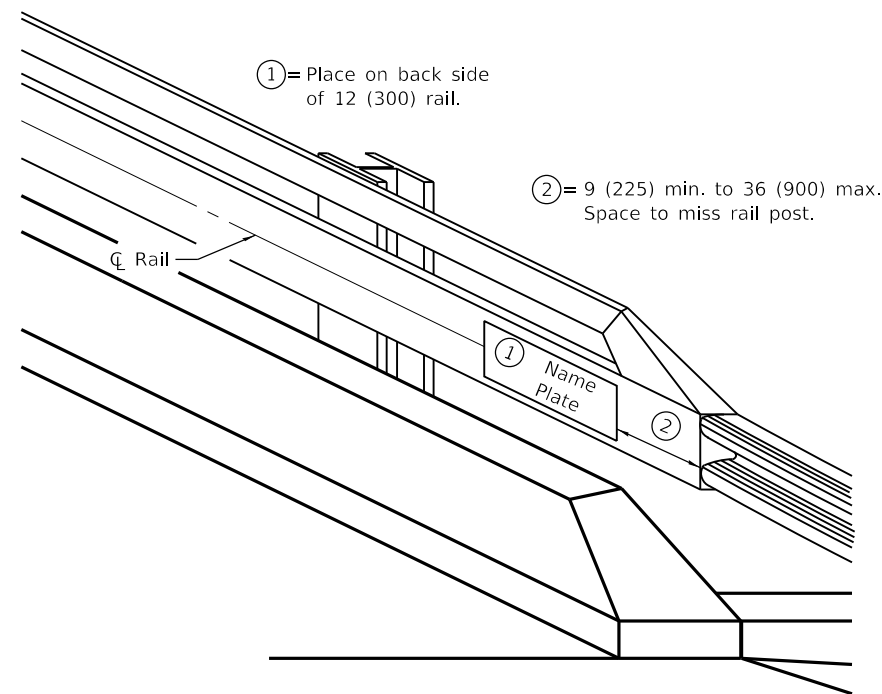
(Unless otherwise noted on the plans, name plates are not required for structures less than 20' (6.1 m) in length)



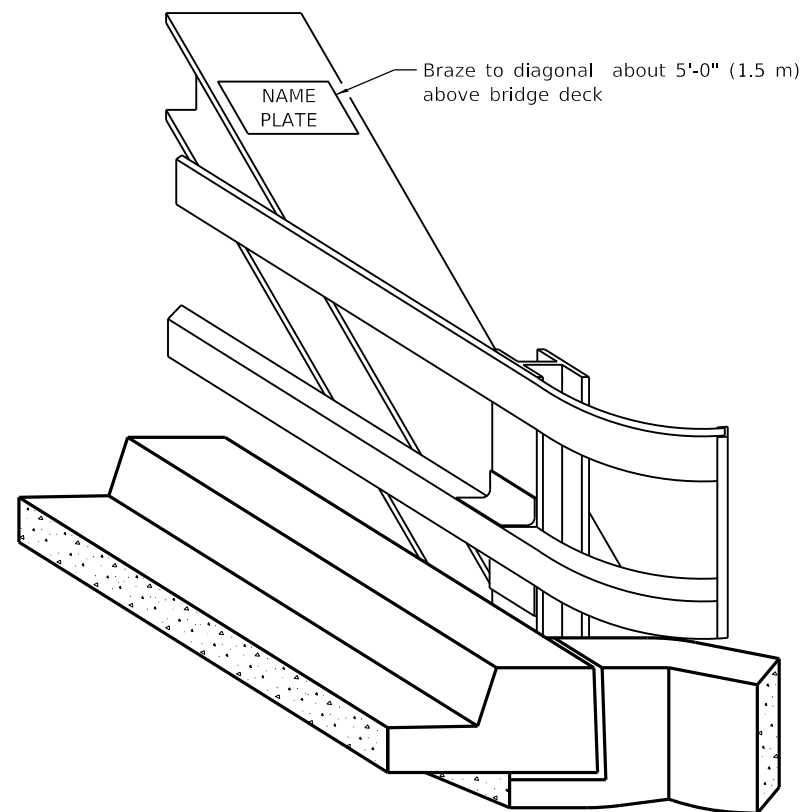
**PARAPET**  
(Typical)



**PARAPET**  
(Terminated at end of bridge)



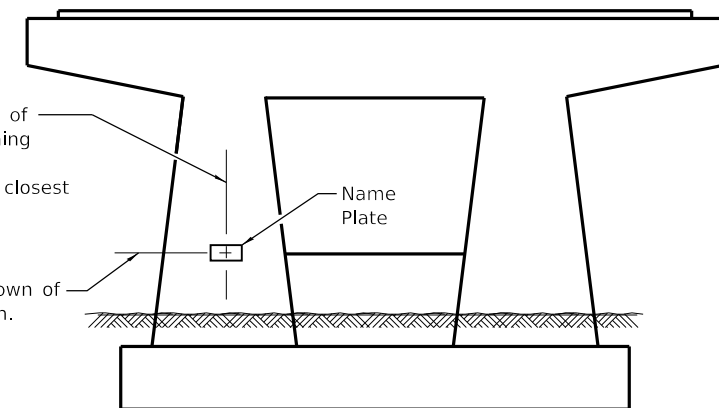
**STEEL RAILS**



**TRUSSES**

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

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



**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

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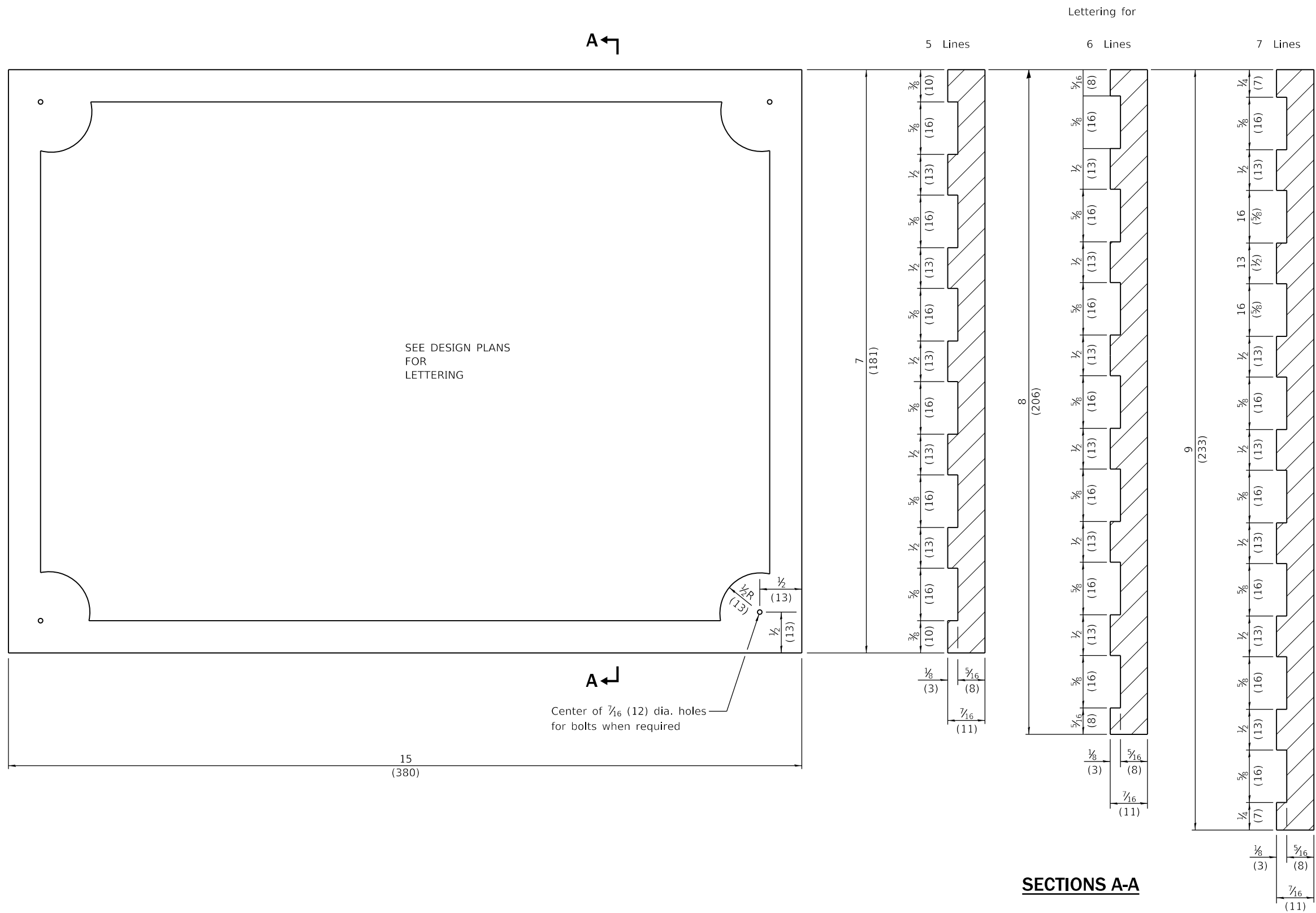
ISSUED 1-1-97

DATE	REVISIONS
1-1-20	Revised F-shape to constant slope parapet.
1-1-09	Switched units to English (metric). Added pier detail.
1-1-02	Removed Placing: note on sht. 2. Added braze note on sht. 1.

**NAME PLATE FOR BRIDGES**

(Sheet 1 of 2)

**STANDARD 515001-04**



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

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APPROVED January 1, 2020

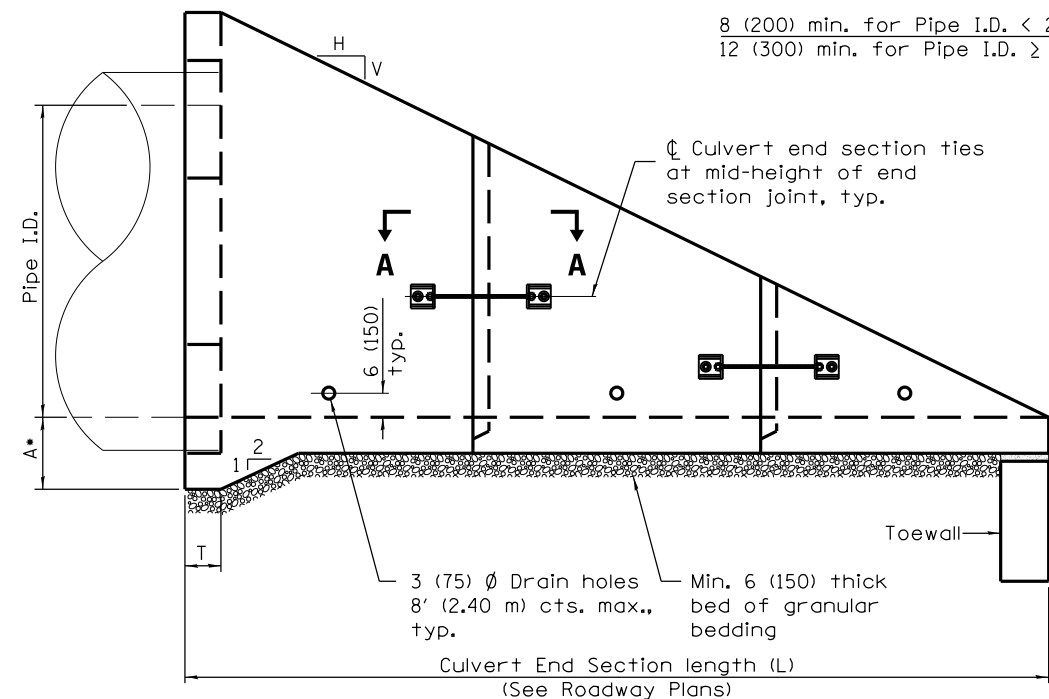
ENGINEER OF DESIGN AND ENVIRONMENT

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**NAME PLATE  
 FOR BRIDGES**

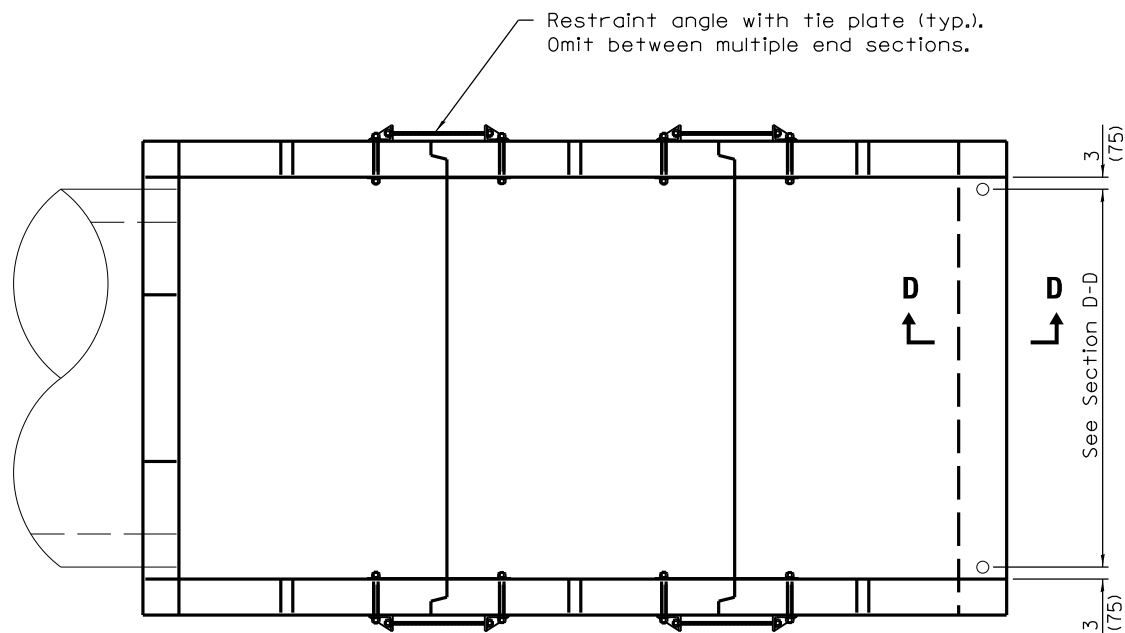
(Sheet 2 of 2)

**STANDARD 515001-04**

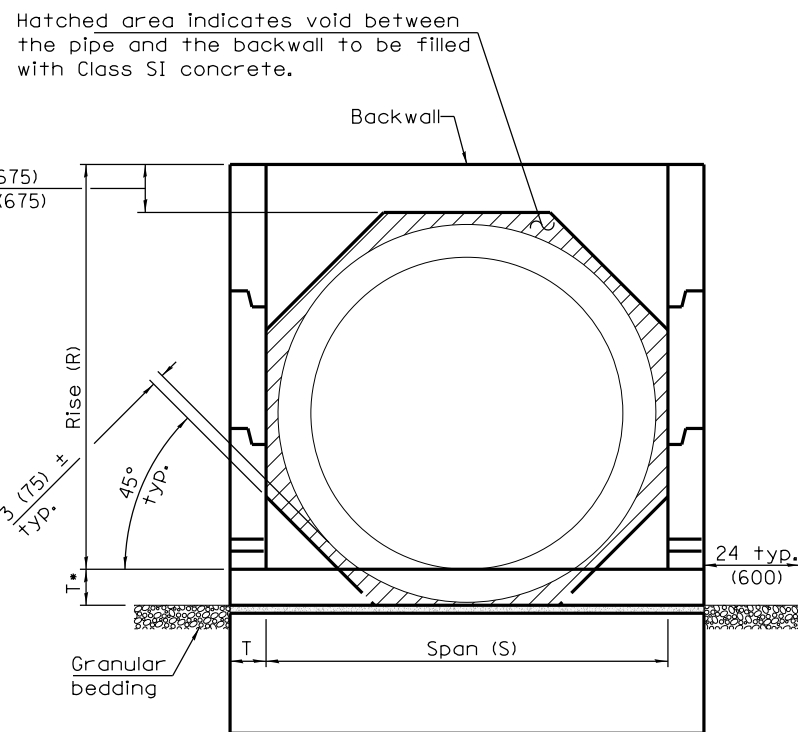


**ELEVATION**

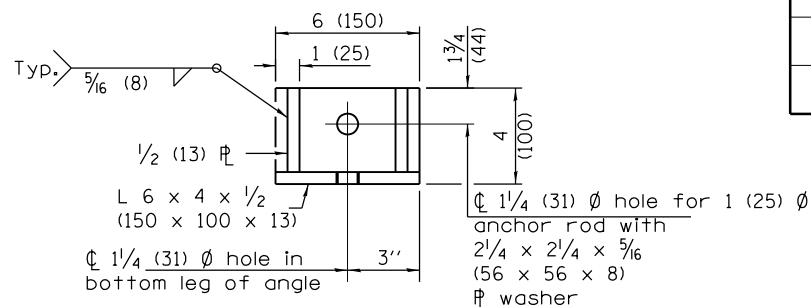
- This dimension shall be increased by 1/2 (38) for CIP field construction. See General Notes.



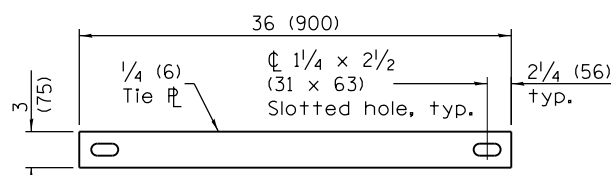
**PLAN**



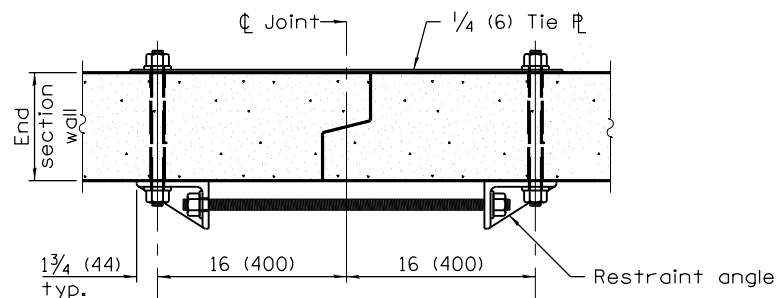
**END VIEW**



**RESTRAINT ANGLE DETAIL**



**TIE PLATE DETAIL**



∅ 1 (25) ∅ Anchor rods with 2 1/4 x 2 1/4 x 5/16 (56 x 56 x 8) ∅ washers installed in 1/8 (28) ∅ formed holes in end section walls

**SECTION A-A**  
(Showing end section tie details)

**PIPE CULVERT END SECTION DIMENSIONS**

Pipe I.D.	A	R	S	T	L			
					Slope of End Section			
					1:2	1:3	1:4	1:6
15 (375)	14 (350)	29 (737)	28 (711)	8 (200)	5'-6" (1.68 m)	7'-11" (2.42 m)	10'-4" (3.16 m)	15'-2" (4.63 m)
18 (450)	15 (375)	33 (838)	32 (813)	8 (200)	6'-2" (1.88 m)	8'-11" (2.72 m)	11'-8" (3.56 m)	17'-2" (5.24 m)
21 (525)	15 (375)	36 (914)	34 (864)	8 (200)	6'-8" (2.03 m)	9'-8" (2.95 m)	12'-8" (3.86 m)	18'-8" (5.69 m)
24 (600)	15 (375)	39 (990)	38 (970)	8 (200)	7'-2" (2.19 m)	10'-5" (3.18 m)	13'-8" (4.17 m)	20'-2" (6.15 m)
27 (675)	15 (375)	3'-10" (1.17 m)	3'-6" (1.07 m)	8 (200)	8'-4" (2.54 m)	12'-2" (3.71 m)	16'-0" (4.88 m)	23'-8" (7.21 m)
30 (750)	16 (400)	4'-2" (1.27 m)	3'-10" (1.17 m)	8 (200)	9'-0" (2.75 m)	13'-2" (4.02 m)	17'-4" (5.29 m)	25'-8" (7.83 m)
33 (825)	16 (400)	4'-5" (1.35 m)	4'-0" (1.22 m)	8 (200)	9'-6" (2.90 m)	13'-11" (4.25 m)	18'-4" (5.60 m)	27'-2" (8.29 m)
36 (900)	16 (400)	4'-8" (1.42 m)	4'-4" (1.32 m)	8 (200)	10'-0" (3.05 m)	14'-8" (4.47 m)	19'-4" (5.90 m)	28'-8" (8.74 m)
42 (1050)	17 (425)	5'-3" (1.60 m)	5'-0" (1.52 m)	8 (200)	11'-2" (3.41 m)	16'-5" (5.01 m)	21'-8" (6.61 m)	32'-2" (9.81 m)
48 (1200)	17 (425)	5'-9" (1.75 m)	5'-6" (1.68 m)	8 (200)	12'-2" (3.71 m)	17'-11" (5.46 m)	23'-8" (7.22 m)	35'-2" (10.73 m)
54 (1350)	18 (450)	6'-4" (1.93 m)	6'-2" (1.88 m)	8 (200)	13'-4" (4.07 m)	19'-8" (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)

**GENERAL NOTES**

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

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

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

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

2 1/4 x 2 1/4 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.

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

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

(Sheet 1 of 3)

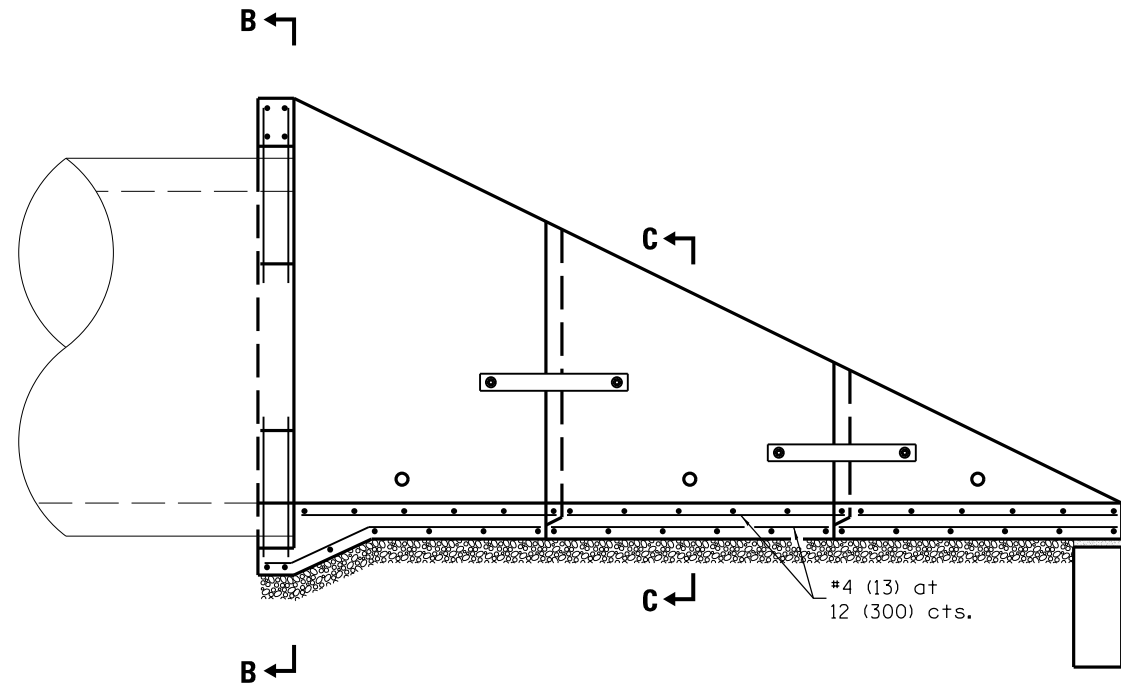
**STANDARD 542001-06**

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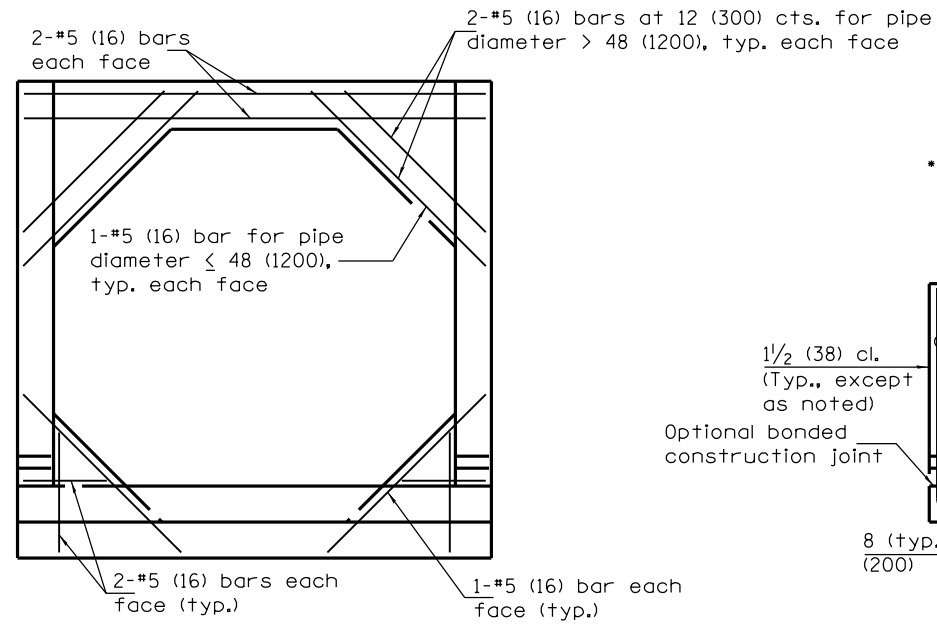
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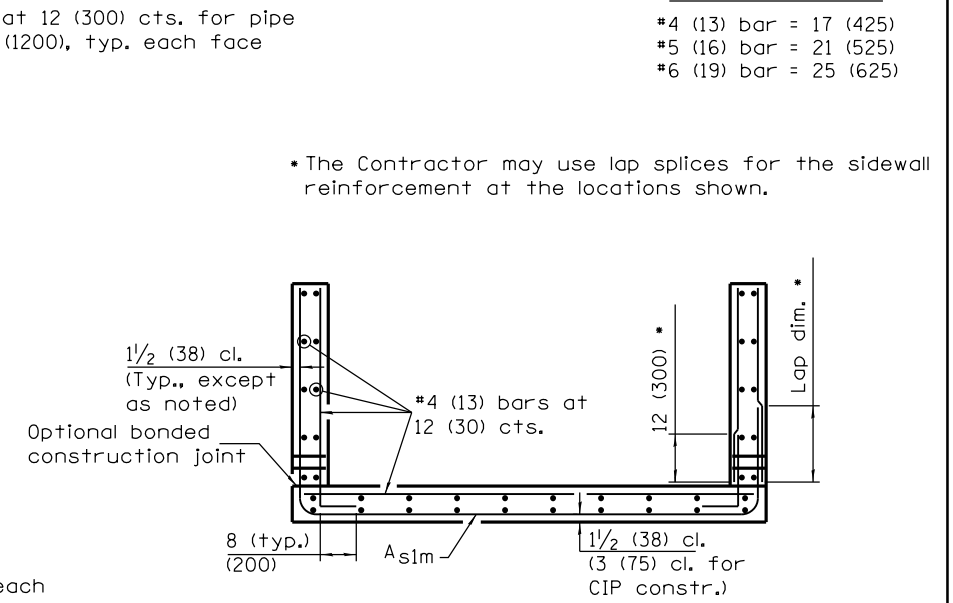
ISSUED 1-1-97



**LONGITUDINAL SECTION**  
(Showing bottom slab and backwall reinforcement.)



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



**SECTION C-C**

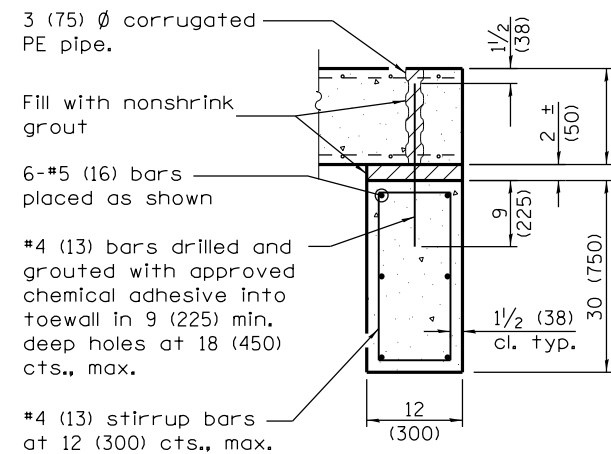
**LAP DIMENSION**

- #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.

**REINFORCEMENT SCHEDULE**

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



**SECTION D-D**

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

(Sheet 2 of 3)

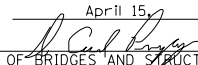
**STANDARD 542001-06**

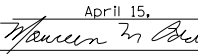
**QUANTITIES**

Pipe I.D.	Concrete yd <sup>3</sup> (m <sup>3</sup> ) ①				Reinforcement Without Lap lbs. (kg)				Reinforcement With Lap lbs (kg)			
	Slope of End Section				Slope of End Section				Slope of End Section			
	1:2	1:3	1:4	1:6	1:2	1:3	1:4	1:6	1:2	1:3	1:4	1:6
15 (375)	1.3 (1.0)	1.7 (1.3)	2.1 (1.6)	2.8 (2.1)	190 (85.2)	230 (104.1)	280 (123.3)	360 (159.2)	210 (94.9)	260 (117.6)	310 (140.3)	410 (182.9)
18 (450)	1.6 (1.2)	2.1 (1.6)	2.6 (2.0)	3.5 (2.7)	230 (104.3)	290 (131.1)	350 (158.0)	460 (207.3)	260 (114.8)	330 (146.0)	400 (177.3)	520 (234.0)
21 (525)	1.8 (1.4)	2.3 (1.8)	2.9 (2.2)	3.9 (3.0)	260 (114.5)	320 (143.3)	380 (172.2)	510 (229.9)	280 (126.5)	360 (159.7)	430 (193.0)	580 (259.5)
24 (600)	2.1 (1.6)	2.7 (2.1)	3.3 (2.5)	4.5 (3.4)	270 (121.9)	350 (155.8)	420 (189.3)	560 (251.5)	300 (133.9)	390 (172.8)	470 (211.6)	630 (282.6)
27 (675)	2.6 (2.0)	3.4 (2.6)	4.2 (3.2)	5.8 (4.4)	350 (155.5)	440 (198.5)	540 (244.4)	740 (336.3)	380 (169.6)	480 (217.8)	600 (269.6)	830 (373.2)
30 (750)	2.9 (2.2)	3.9 (3.0)	4.9 (3.7)	6.8 (5.2)	380 (169.6)	490 (219.2)	600 (271.9)	830 (374.0)	410 (184.5)	530 (240.0)	660 (299.2)	920 (413.9)
33 (825)	3.2 (2.4)	4.3 (3.3)	5.3 (4.1)	7.4 (5.7)	400 (179.7)	520 (234.9)	640 (290.3)	880 (397.6)	430 (195.2)	570 (257.2)	710 (319.0)	970 (438.9)
36 (900)	3.5 (2.7)	4.7 (3.6)	5.9 (4.5)	8.3 (6.3)	440 (197.8)	580 (262.4)	720 (323.8)	990 (449.4)	480 (214.2)	630 (286.1)	780 (354.0)	1090 (493.7)
42 (1050)	4.3 (3.3)	5.8 (4.4)	7.3 (5.6)	10.3 (7.9)	570 (256.4)	770 (346.4)	950 (429.0)	1330 (601.3)	620 (279.4)	840 (380.0)	1040 (471.6)	1470 (663.7)
48 (1200)	5.0 (3.8)	6.8 (5.2)	8.6 (6.6)	12.2 (9.3)	670 (301.1)	910 (409.9)	1140 (514.8)	1610 (728.2)	720 (325.6)	990 (445.8)	1240 (561.2)	1760 (796.8)
54 (1350)	6.0 (4.6)	8.2 (6.3)	10.3 (7.9)	14.7 (11.2)	890 (403.6)	1200 (544.5)	1530 (692.0)	2170 (985.0)	990 (448.6)	1340 (608.1)	1710 (775.8)	2440 (1108.2)
60 (1500)	6.8 (5.2)	9.3 (7.1)	11.8 (9.0)	16.8 (12.8)	1020 (461.5)	1400 (635.3)	1780 (806.8)	2530 (1149.8)	1120 (508.8)	1550 (704.5)	1980 (896.8)	2820 (1281.5)
66 (1650)	7.9 (6.0)	10.9 (8.3)	13.8 (10.6)	19.7 (15.1)	1150 (519.0)	1570 (712.4)	2010 (911.1)	2880 (1305.8)	1260 (570.2)	1730 (786.1)	2220 (1007.9)	3190 (1449.3)
72 (1800)	8.8 (6.7)	12.2 (9.3)	15.5 (11.9)	22.2 (17.0)	1520 (689.9)	2120 (962.1)	2690 (1222.5)	3880 (1761.3)	1710 (777.0)	2400 (1088.2)	3050 (1384.8)	4410 (2001.0)
78 (1950)	11.4 (8.7)	15.8 (12.1)	20.1 (15.4)	28.9 (22.1)	1750 (791.1)	2400 (1090.7)	3100 (1409.0)	4490 (2039.7)	1950 (885.5)	2700 (1223.1)	3490 (1583.9)	5060 (2298.9)
84 (2100)	12.6 (9.6)	17.4 (13.3)	22.3 (17.0)	32.1 (24.5)	1900 (862.7)	2680 (1217.4)	3430 (1558.6)	4960 (2254.4)	2120 (959.6)	3000 (1359.6)	3840 (1743.2)	5560 (2526.8)

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

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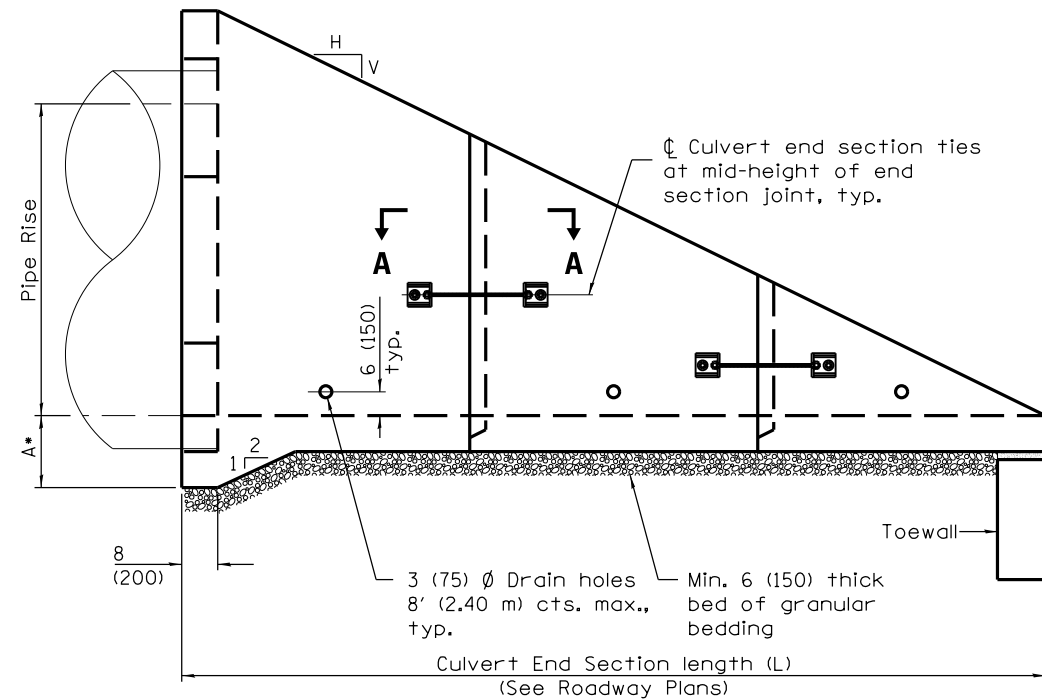
ISSUED 1-1-97

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

(Sheet 3 of 3)

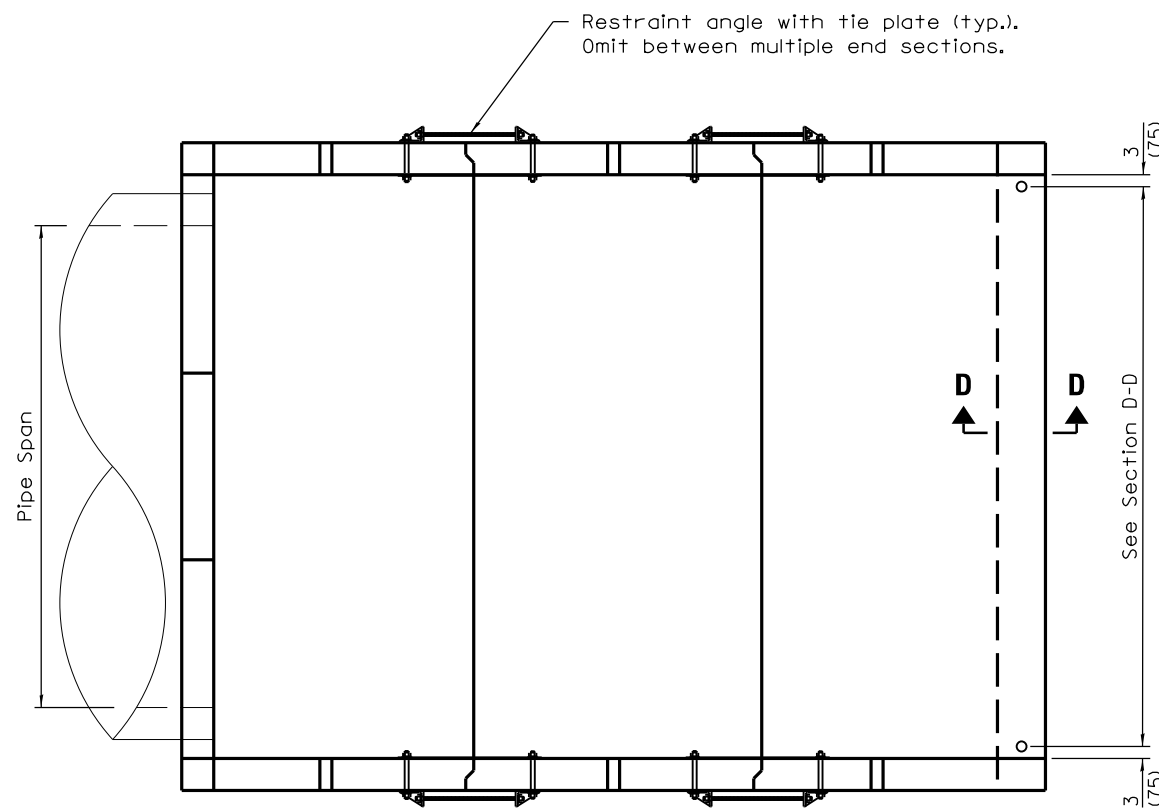
**STANDARD 542001-06**





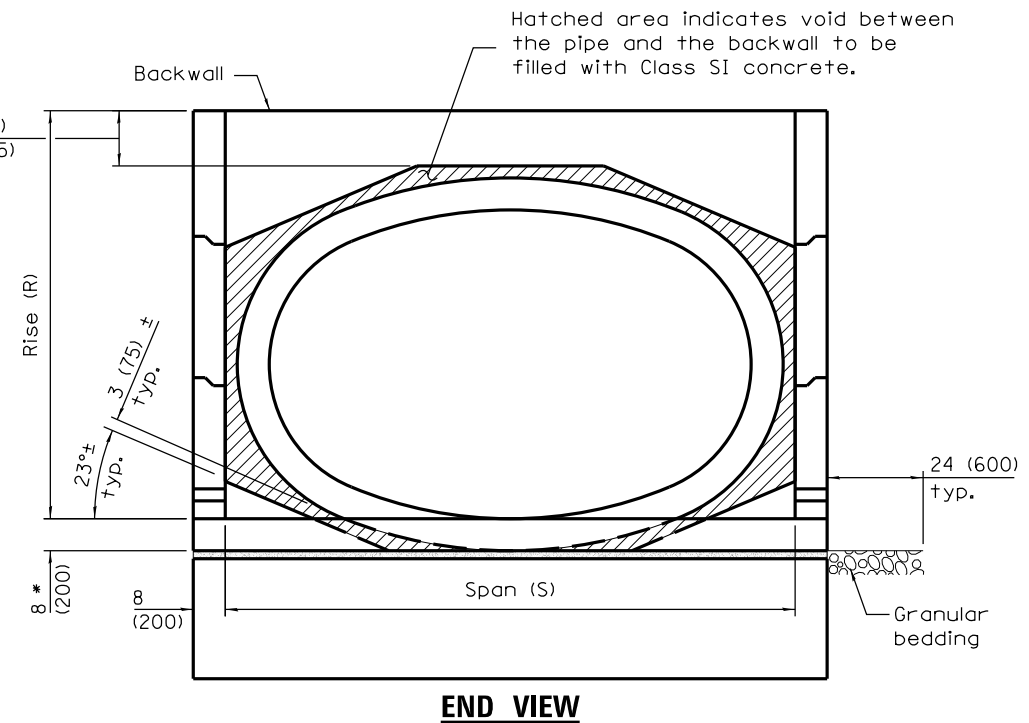
**ELEVATION**

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



**PLAN**

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



**END VIEW**

**PIPE CULVERT END SECTION DIMENSIONS**

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

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)

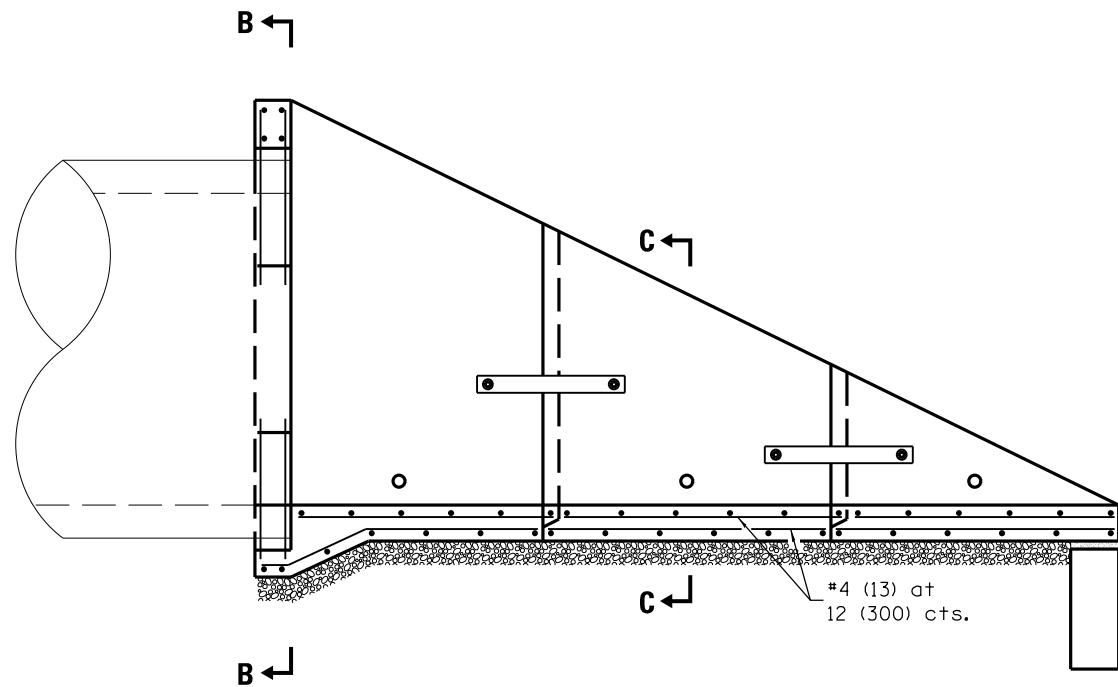
**STANDARD 542011-02**

Illinois Department of Transportation

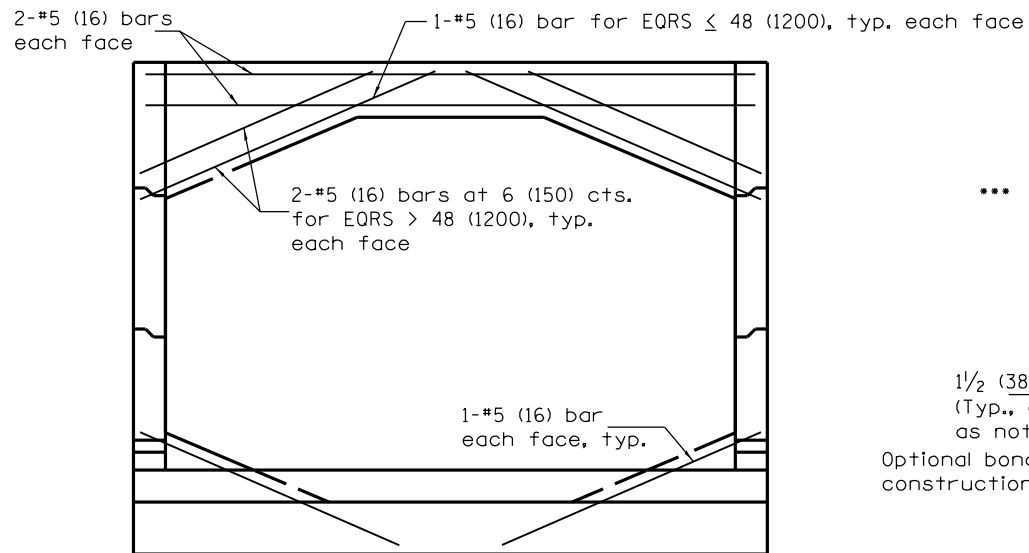
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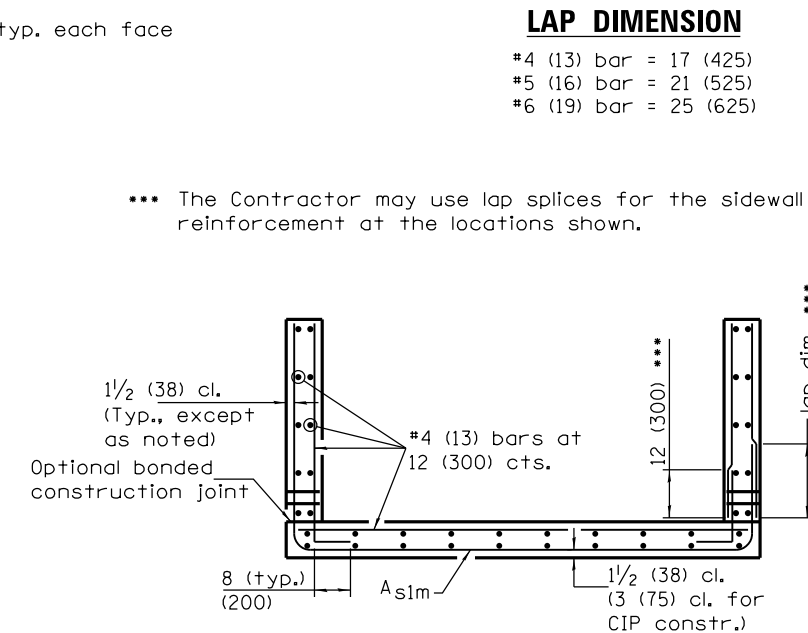
ISSUED 1-1-13



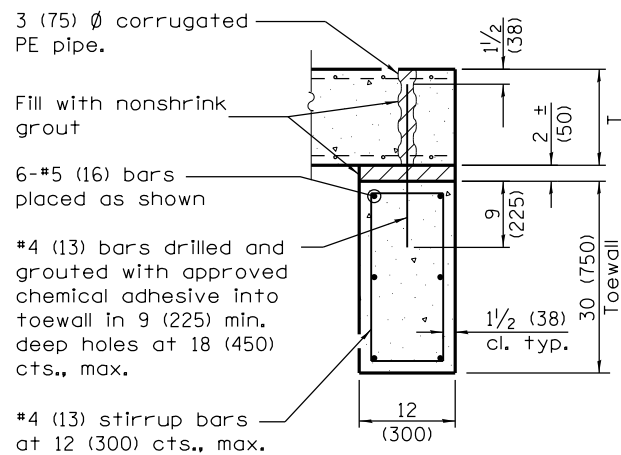
**LONGITUDINAL SECTION**  
(Showing bottom slab and backwall reinforcement.)



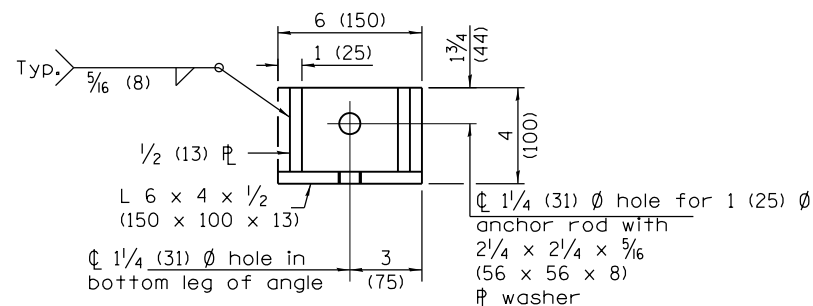
**SECTION B-B**  
(Showing backwall reinforcement only.)  
(Pipe omitted for clarity.)



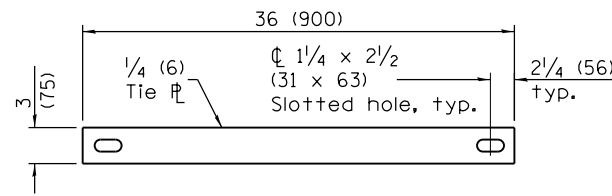
**SECTION C-C**



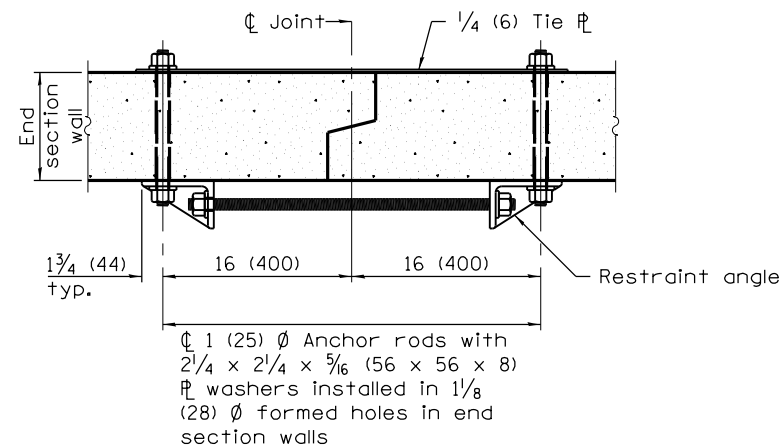
**SECTION D-D**



**RESTRAINT ANGLE DETAIL**



**TIE PLATE DETAIL**



**SECTION A-A**  
(Showing end section tie details)

**REINFORCEMENT SCHEDULE**

Equivalent Round Size Pipe I.D.	A <sub>s1m</sub>	
	Bar Size	Bar Spacing
15 (375)	4 (13)	12 (300)
18 (450)	4 (13)	12 (300)
21 (525)	4 (13)	12 (300)
24 (600)	4 (13)	12 (300)
27 (700)	4 (13)	12 (300)
30 (750)	4 (13)	12 (300)
36 (900)	4 (13)	12 (300)
42 (1050)	4 (13)	12 (300)
48 (1200)	4 (13)	8 (200)
54 (1350)	4 (13)	8 (200)
60 (1500)	4 (13)	8 (200)
66 (1650)	5 (16)	8 (200)
72 (1800)	5 (16)	8 (200)

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

(Sheet 2 of 3)

**STANDARD 542011-02**

Illinois Department of Transportation

APPROVED April 15, 2016  
*[Signature]*  
 ENGINEER OF BRIDGES AND STRUCTURES

APPROVED April 15, 2016  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

**QUANTITIES**

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

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

**GENERAL NOTES**

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

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

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

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

2/4 x 2/4 x 5/16 (56 x 56 x 8) plate washers shall be provided under each nut required for the anchor rods. Holes in the walls for the culvert tie assembly may be drilled using core bits in lieu of formed holes.

See Standard 542311 for end sections having traversable pipe grate.


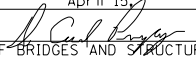
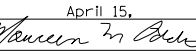
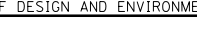
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

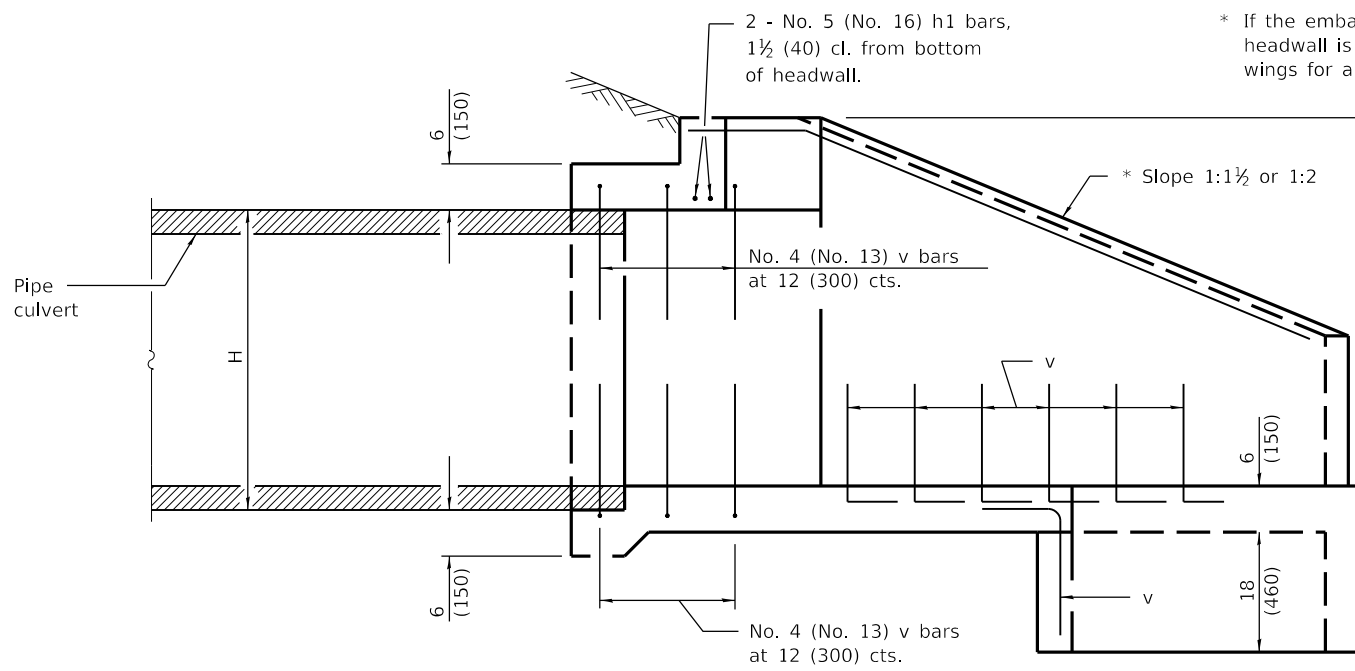
All dimensions are in inches (millimeters) unless otherwise shown.

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

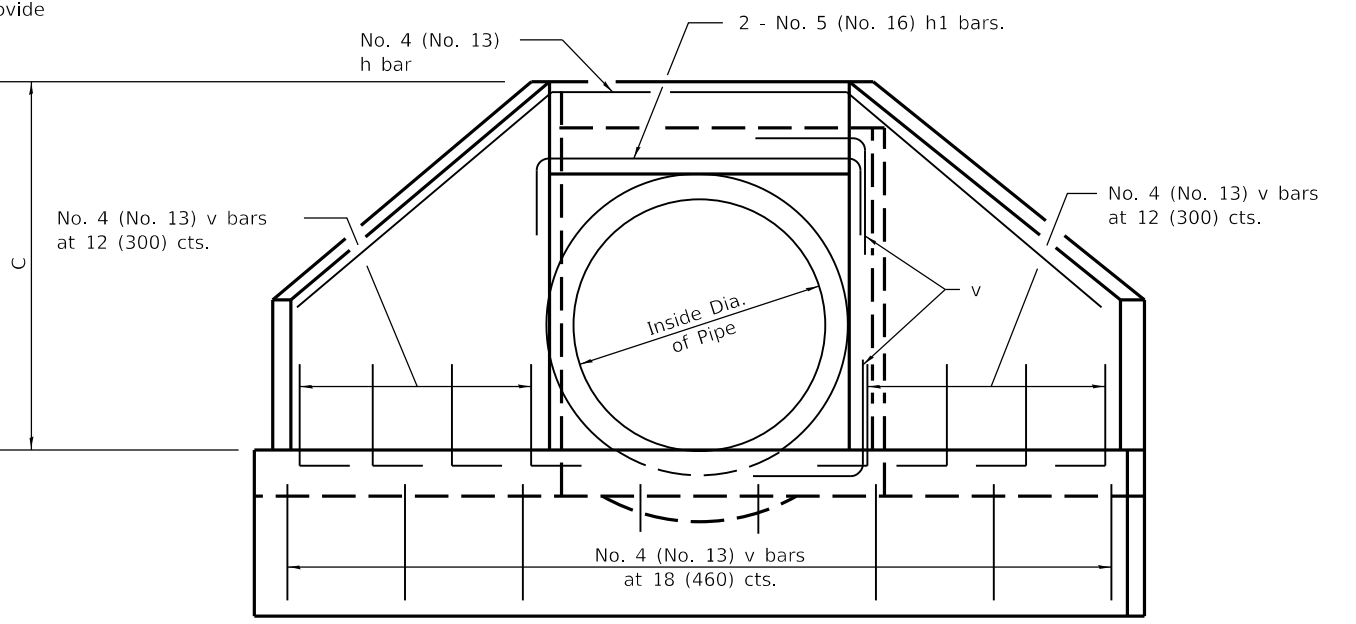
(Sheet 3 of 3)

**STANDARD 542011-02**

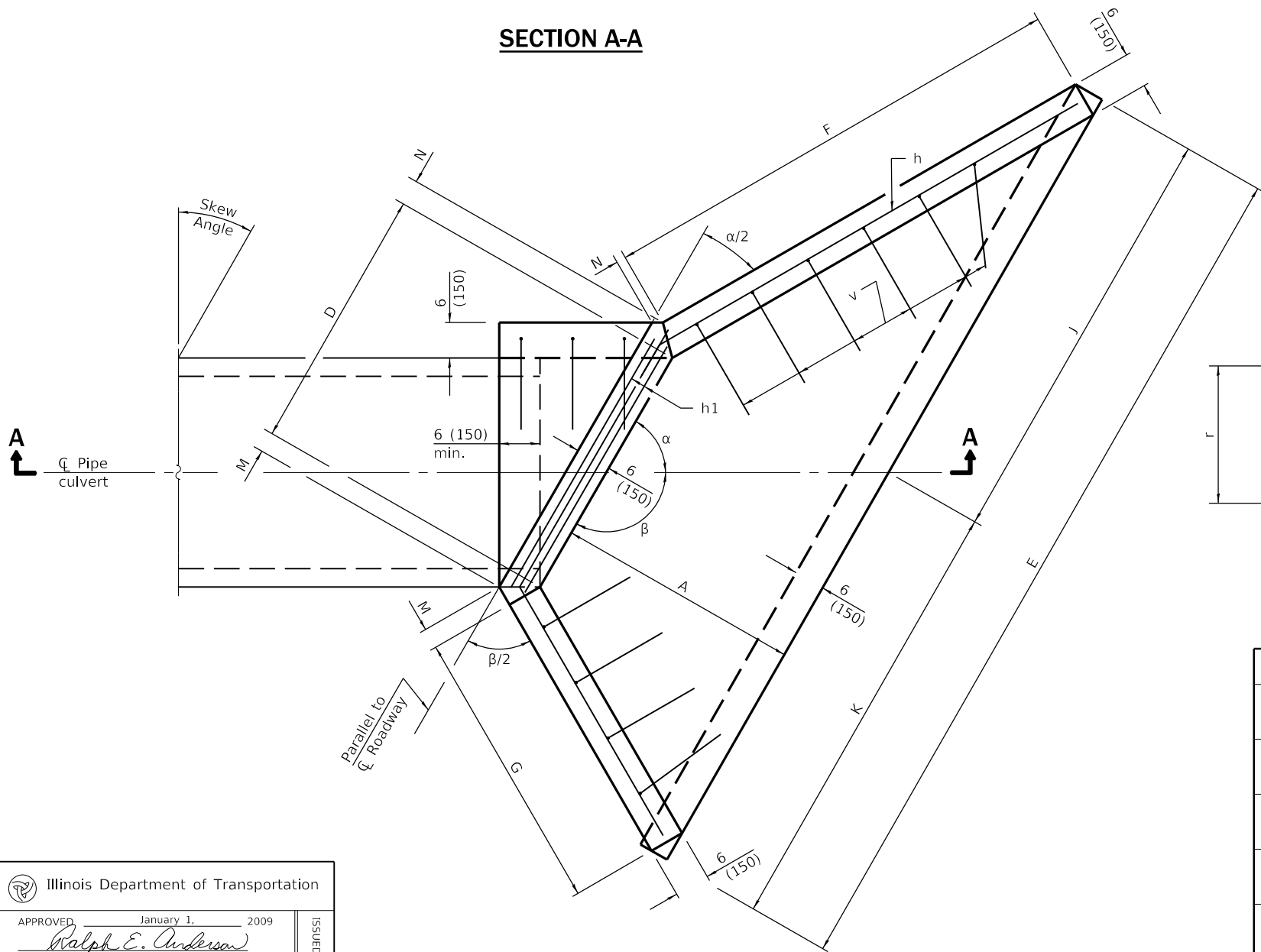
 Illinois Department of Transportation	ISSUED 1-1-13
APPROVED <u>April 15, 2016</u>  ENGINEER OF BRIDGES AND STRUCTURES	
APPROVED <u>April 15, 2016</u>  ENGINEER OF DESIGN AND ENVIRONMENT	
APPROVED <u>April 15, 2016</u>  ENGINEER OF DESIGN AND ENVIRONMENT	



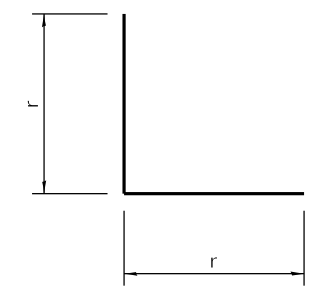
**SECTION A-A**



**END VIEW**

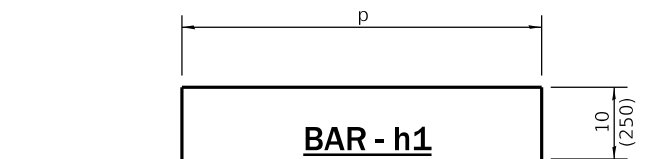


**PLAN**



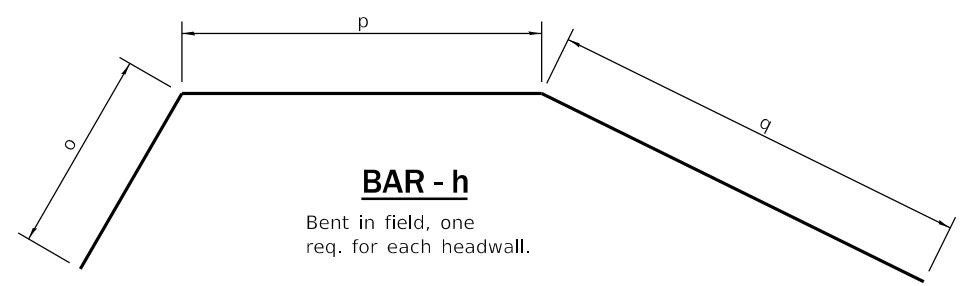
**BAR - v**

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.

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

Illinois Department of Transportation


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

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

ISSUED 1-1-97

## 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'-11¼" (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)	39 (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'-1½" (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'-8½" (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)
	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)
10°	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)	39 (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'-8½" (1136)	12'-0½" (3.67 m)	5'-10" (1.78 m)	4'-10¼" (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)
	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	19¼ (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'-6" (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)	22¼ (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)	39 (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'-3¼" (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)	
15°	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)	39 (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'-10¼" (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)
	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)
20°	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	33 (841)	9'-8½" (2.97 m)	5'-3¾" (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)	39 (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'-0½" (3.96 m)	6'-11¼" (2.12 m)	4'-5½" (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)
	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'-10½" (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)	34¼ (880)	10'-1¼" (3.1 m)	5'-8" (1.74 m)	3'-3¾" (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)	39 (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  
*Lee E. Han*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97


**REINFORCED CONCRETE END SECTIONS  
 FOR PIPE CULVERTS  
 15" (375 mm) THRU 36" (**

## 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 (50)	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 (59)	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)	37 (1.04 m)	39 (1.0 m)	6'-4" (1.92 m)	13'-3" (3.96 m)	39 (1.0 m)	4'-11" (1.50 m)	40 (77)	170 (77)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	31 (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 (108)	240 (108)
	DS 36-1½ (DS 900-1½)	36 (900)	39 (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 (140)	310 (140)
	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	24¼ (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 (54)	120 (54)
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	28¼ (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 (59)	130 (59)
40°	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	3'-3½" (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 (90)	200 (90)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (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'-1" (2.38 m)	16'-3" (4.79 m)	4'-2" (1.26 m)	5'-10" (1.78 m)	54 (117)	260 (117)
	DS 36-1½ (DS 900-1½)	36 (900)	39 (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 (153)	340 (153)
	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)	30¾ (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 (59)	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)	30¾ (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 (68)	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 (95)	210 (95)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	4'-3" (1.293 m)	14'-1" (4.29 m)	8'-6" (2.59 m)	3'-6½" (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 (135)	300 (135)
DS 36-1½ (DS 900-1½)	36 (900)	39 (1140)	22 (560)	4'-4" (1320)	5'-2¼" (1.583 m)	16'-5½" (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 (167)	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 (63)	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'-2¼" (1.61 m)	5'-6½" (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 (72)	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)	36¾ (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 (104)	230 (104)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	4'-8" (1.422 m)	15'-5" (4.7 m)	9'-6" (2.9 m)	3'-5½" (1.06 m)	36 (914)	7'-6¼" (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 (144)	320 (144)
	DS 36-1½ (DS 900-1½)	36 (900)	39 (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 (185)	410 (185)
	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	33 (842)	11'-6½" (3.54 m)	7'-9" (2.4 m)	29¾ (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 (68)	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)	29¾ (760)	22 (559)	5'-9¾" (1.79 m)	6'-1¾" (1.89 m)	4½ (110)	1 (30)	35°	2.9 (2.2)	36 (827)	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 (77)	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 (117)	260 (117)	
60°	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	5'-2¾" (1.594 m)	17'-2½" (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 (158)	350 (158)
	DS 36-1½ (DS 900-1½)	36 (900)	39 (1140)	22 (560)	4'-4" (1320)	6'-4¾" (1.951 m)	20'-1½" (6.12 m)	12'-5¾" (3.79 m)	3'-11¼" (1.2 m)	3'-8" (1.119 m)	9'-10½" (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 (470)	212 (470)
	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'-8¼" (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 (77)	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 (90)	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)	35¾ (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 (135)	300 (135)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	6'-0" (1.828 m)	19'-7½" (5.97 m)	12'-6¾" (3.83 m)	3'-4½" (1.03 m)	36 (914)	9'-7½" (2.93 m)	9'-11¼" (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 (176)	390 (176)
	DS 36-1½ (DS 900-1½)	36 (900)	39 (1140)	22 (560)	4'-4" (1320)	7'-4" (2.238 m)	22'-11½" (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 (239)	

## WINGS FOR 1:2 SLOPE

Skew Angle	Design No.	Nominal Pipe Dia.	DIMENSIONS FOR CONCRETE													Concrete 2 End Sections yd <sup>3</sup> (m <sup>3</sup> )	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)	551 (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)	832 (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'-2½" (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)	983 (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'-8½" (1.123 m)	14'-5" (4.39 m)	7'-4¾" (2.25 m)	6'-9½" (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)
	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)
10°	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'-0½" (3.34 m)	5'-1½" (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'-8½" (1.136 m)	14'-7" (4.44 m)	7'-9¼" (2.37 m)	6'-6½" (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)
	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	19¼ (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)	22¼ (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)
15°	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" (1.72 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'-5¼" (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)
	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'-8½" (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)
20°	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'-6¼" (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'-10¼" (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)
	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	21 (533)	9'-5" (2.86 m)	5'-10¼" (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'-3½" (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)
30°	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)
	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)	34¼ (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'-11¼" (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'-9½" (1.76 m)	3'-8" (1.119 m)	8'1¼" (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  
*Lee E. Han*

## WINGS FOR 1:2 SLOPE


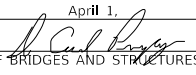
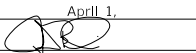
Skew Angle	Design No.	Nominal Pipe Dia.	DIMENSIONS FOR CONCRETE													Concrete 2 End Sections yd <sup>3</sup> (m <sup>3</sup> )	Reinf. Bars - 2 End Sections						Bars for 2 End Sections lbs. (kg)		
			A	B	C	D	E	F	G	H	J	K	M	N	α		h - bars			h1 - bars		v-bars No.			
																	o	p	q	Lgth.	p			Lgth.	
35°	DS 15-2 (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)	3¾ (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)	3¾ (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)	3'-11" (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)	3¾ (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)	3¾ (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)	18'-9" (5.64 m)	3'-11" (1.18 m)	3'-11" (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'-5½" (1.366 m)	17'-4½" (5.28 m)	10'-10" (3.29 m)	5'-7¾" (1.72 m)	3'-8" (1.119 m)	8'-6¾" (2.61 m)	8'-9¾" (2.67 m)	3¾ (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)	
	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)	3¾ (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)	
40°	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)	3¾ (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'-3½" (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)	3¾ (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)	3¾ (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)	19'-9" (5.95 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'-6½" (1.68 m)	3'-8" (1.119 m)	9'-1½" (2.78 m)	9'-4½" (2.85 m)	3¾ (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)	
	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'-5¾" (1.04 m)	19 (485)	5'-9½" (1.76 m)	6'-0¾" (1.84 m)	4 (100)	1¼ (30)	45°	2.8 (2.1)	5'-3" (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'-5½" (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)	
45°	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'-8½" (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'-2½" (1.583 m)	19'-11¼" (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)	
	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'-4½" (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'-4" (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)	
50°	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'-10¼" (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)	
	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" (4.56 m)	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'-4½" (1.329 m)	14'-10¼" (5.56 m)	12'-9" (3.86 m)	3'-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'-2½" (1.594 m)	20'-11¼" (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)	
60°	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'-5½" (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)	
	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	38 (966)	16'-5½" (4.99 m)	12'-2¾" (3.71 m)	3'-3¾" (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'-3¾" (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'-9¼" (4.48 m)	3'-11¼" (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'-1¼" (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							





### WINGS FOR 1:1 1/2 SLOPE

Skew Angle	Nominal Pipe Dia.	Dimensions for Concrete													Concrete 2 End Secs. cu. yd. (m <sup>3</sup> )	Welded Wire Reinforcement 2 End Secs. sq. yd. (m <sup>2</sup> )
		A	B	C	D	E	F	G	H	J	K	M	N	α		
5°	42 (1050)	4'-1"	26 (660)	4'-10 1/2"	4'-3 1/4"	13'-5"	6'-0 1/2"	5'-6 1/2"	4'-3"	6'-8 1/4"	6'-8 3/4"	3 1/2 (90)	3 (80)	85°	6.0 (4.6)	46 (38)
	48 (1200)	4'-6"	29 (740)	5'-5"	4'-10 1/4"	14'-10"	6'-8"	6'-1 1/4"	4'-10"	7'-4 3/4"	7'-5 1/4"	3 1/2 (90)	3 (80)	85°	7.2 (5.5)	53 (44)
	54 (1350)	4'-11"	32 (810)	5'-11 1/2"	5'-5 1/4"	16'-3"	7'-3 1/4"	6'-8"	5'-5"	8'-1 1/4"	8'-1 1/4"	3 1/2 (90)	3 (80)	85°	8.4 (6.4)	65 (55)
	60 (1500)	5'-4"	35 (890)	6'-6"	6'-0 1/4"	17'-8"	7'-10 3/4"	7'-2 3/4"	6'-0"	8'-9 3/4"	8'-10 1/4"	3 1/2 (90)	3 (80)	85°	9.8 (7.5)	71 (59)
10°	42 (1050)	4'-1"	26 (660)	4'-10 1/2"	4'-3 3/4"	13'-6 1/2"	6'-4 1/4"	5'-4"	4'-3"	6'-8 3/4"	6'-9 3/4"	3 3/4 (100)	3 (80)	80°	6.3 (4.8)	47 (39)
	48 (1200)	4'-6"	29 (740)	5'-5"	4'-11"	15'-0"	7'-0"	5'-10 1/2"	4'-10"	7'-5 1/2"	7'-6 1/2"	3 3/4 (100)	3 (80)	80°	7.5 (5.7)	54 (45)
	54 (1350)	4'-11"	32 (810)	5'-11 1/2"	5'-6"	16'-5"	7'-7 3/4"	6'-5"	5'-5"	8'-2"	8'-3"	3 3/4 (100)	3 (80)	80°	8.8 (6.7)	66 (56)
	60 (1500)	5'-4"	35 (890)	6'-6"	6'-1"	17'-10 1/2"	8'-3 1/2"	6'-11 1/2"	6'-0"	8'-10 3/4"	8'-11 3/4"	3 3/4 (100)	3 (80)	80°	10.3 (7.9)	73 (61)
15°	42 (1050)	4'-1"	26 (660)	4'-10 1/2"	4'-4 3/4"	13'-9 1/2"	6'-8 1/2"	5'-1 3/4"	4'-3"	6'-10"	6'-11 1/2"	4 (100)	2 1/4 (70)	75°	6.6 (5.0)	48 (40)
	48 (1200)	4'-6"	29 (740)	5'-5"	5'-0"	15'-3"	7'-4 3/4"	5'-8"	4'-10"	7'-6 3/4"	7'-8 1/4"	4 (100)	2 3/4 (70)	75°	7.9 (6.0)	55 (46)
	54 (1350)	4'-11"	32 (810)	5'-11 1/2"	5'-7 1/4"	16'-8 3/4"	8'-1"	6'-2 1/4"	5'-5"	8'-3 3/4"	8'-5"	4 (100)	2 3/4 (70)	75°	9.3 (7.1)	68 (57)
	60 (1500)	5'-4"	35 (890)	6'-6"	6'-2 1/2"	18'-2 1/4"	8'-9 1/4"	6'-8 3/4"	6'-0"	9'-0 1/2"	9'-1 1/4"	4 (100)	2 3/4 (70)	75°	10.8 (8.3)	75 (62)
20°	42 (1050)	4'-1"	26 (660)	4'-10 1/2"	4'-6 1/4"	14'-1 1/4"	7'-1 1/2"	4'-11 3/4"	4'-3"	7'-0"	7'-1 3/4"	4 1/4 (105)	2 1/2 (70)	70°	7.0 (5.4)	49 (41)
	48 (1200)	4'-6"	29 (740)	5'-5"	5'-1 3/4"	15'-7 3/4"	7'-10 1/4"	5'-6"	4'-10"	7'-9"	7'-10 3/4"	4 1/4 (105)	2 1/2 (70)	70°	8.4 (6.4)	57 (48)
	54 (1350)	4'-11"	32 (810)	5'-11 1/2"	5'-9 1/4"	17'-2"	8'-6 3/4"	6'-0"	5'-5"	8'-6"	8'-8"	4 1/4 (105)	2 1/2 (70)	70°	9.9 (7.6)	70 (59)
	60 (1500)	5'-4"	35 (890)	6'-6"	6'-4 1/2"	18-8"	9'-3 1/2"	6'-6 1/4"	6'-0"	9'-3"	9'-5"	4 1/4 (105)	2 1/2 (70)	70°	11.5 (8.8)	77 (64)
25°	42 (1050)	4'-1"	26 (660)	4'-10 1/2"	4'-8 1/4"	14'-7 1/2"	7'-7 1/4"	4'-10"	4'-3"	7'-2 1/2"	7'-5"	4 1/2 (110)	2 1/4 (60)	65°	7.4 (5.7)	51 (43)
	48 (1200)	4'-6"	29 (740)	5'-5"	5'-4"	16'-2 1/4"	8'-4 1/2"	5'-4"	4'-10"	8'-0"	8'-2 1/4"	4 1/2 (110)	2 1/4 (60)	65°	8.9 (6.8)	59 (49)
	54 (1350)	4'-11"	32 (810)	5'-11 1/2"	5'-11 3/4"	17'-9"	9'-1 3/4"	5'-10"	5'-5"	8'-9 1/4"	8'-11 3/4"	4 1/2 (110)	2 1/4 (60)	65°	10.5 (8.0)	73 (61)
	60 (1500)	5'-4"	35 (890)	6'-6"	6'-7 1/2"	19'-3 3/4"	9'-11"	6'-4"	6'-0"	9'-6 3/4"	9'-9"	4 1/2 (110)	2 1/4 (60)	65°	12.2 (9.3)	80 (67)
30°	42 (1050)	4'-1"	26 (660)	4'-10 1/2"	4'-11"	15'-3"	8'-2"	4'-8 1/2"	4'-3"	7'-6"	7'-9"	4 1/2 (120)	2 1/4 (60)	60°	7.9 (6.0)	53 (45)
	48 (1200)	4'-6"	29 (740)	5'-5"	5'-7"	16'-10 1/2"	9'-0"	5'-2 1/2"	4'-10"	8'-3 3/4"	8'-6 3/4"	4 1/2 (120)	2 1/4 (60)	60°	9.5 (7.3)	62 (52)
	54 (1350)	4'-11"	32 (810)	5'-11 1/2"	6'-3"	18'-6 1/4"	9'-10"	5'-8"	5'-5"	9'-1 3/4"	9'-4 1/2"	4 1/2 (120)	2 1/4 (60)	60°	11.2 (8.6)	77 (64)
	60 (1500)	5'-4"	35 (890)	6'-6"	6'-11 1/4"	20'-2"	10'-8"	6'-2"	6'-0"	9'-11 1/2"	10'-2 1/2"	4 1/2 (120)	2 1/4 (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 1:2 SLOPE**

Skew Angle	Nominal Pipe Dia.	Dimensions for Concrete													Concrete 2 End Secs. cu. yd. (m <sup>3</sup> )	Welded Wire Reinforcement 2 End Secs. sq. yd. (m <sup>2</sup> )
		A	B	C	D	E	F	G	H	J	K	M	N	α		
5°	42 (1050)	5'-5"	26 (660)	4'-10½"	4'-3¼"	16'-1"	8'-0¼"	7'-4¼"	4'-3"	8'-0¼"	8'-0¼"	3½	3	85°	8.0 (6.1)	61 (51)
	48 (1200)	6'-0"	29 (740)	5'-5"	4'-10¼"	17'-10"	8'-10½"	8'-1¾"	1.473 m (4'-10")	8'-10¾"	8'-11¼"	3½	3	85°	9.6 (7.3)	71 (59)
	54 (1350)	6'-7"	32 (810)	5'-11½"	5'-5¼"	19'-7"	9'-9"	8'-11¼"	1.651 m (5'-5")	9'-9¼"	9'-9¾"	3½	3	85°	11.3 (8.6)	88 (74)
	60 (1500)	7'-2"	35 (890)	6'-6"	6'-0¼"	21'-4¼"	10'-7¼"	9'-8¾"	1.829 m (6'-0")	10'-8"	10'-8¼"	3½	3	85°	13.2 (10.1)	96 (80)
10°	42 (1050)	5'-5"	26 (660)	4'-10½"	4'-3¾"	16'-3"	8'-5"	7'-0¾"	1.295 m (4'-3")	8'-1"	8'-2"	3¾	3	80°	8.3 (6.3)	62 (52)
	48 (1200)	6'-0"	29 (740)	5'-5"	4'-11"	18'-0½"	9'-4"	7'-10"	1.473 m (4'-10")	8'-11¼"	9'-0¾"	3¾	3	80°	9.9 (7.6)	72 (60)
	54 (1350)	6'-7"	32 (810)	5'-11½"	5'-6"	19'-9¾"	10'-3"	8'-7½"	1.651 m (5'-5")	9'-10½"	9'-11¼"	3¾	3	80°	11.7 (8.9)	90 (75)
	60 (1500)	7'-2"	35 (890)	6'-6"	6'-1"	21'-7"	11'-1¾"	9'-4½"	1.829 m (6'-0")	10'-9"	10'-10"	3¾	3	80°	13.7 (10.5)	98 (82)
15°	42 (1050)	5'-5"	26 (660)	4'-10½"	4'-4¾"	16'-6½"	8'-10¾"	6'-10"	1.295 m (4'-3")	8'-2½"	8'-4"	4	2¾	75°	8.6 (6.6)	64 (53)
	48 (1200)	6'-0"	29 (740)	5'-5"	5'-0"	18'-4½"	9'-10¼"	7'-6¾"	1.473 m (4'-10")	9'-1½"	9'-3"	4	2¾	75°	10.4 (8.0)	74 (62)
	54 (1350)	6'-7"	32 (810)	5'-11½"	5'-7¼"	20'-2"	10'-9¾"	8'-3½"	1.651 m (5'-5")	10'-0¼"	10'-1¾"	4	2¾	75°	12.3 (9.4)	92 (77)
	60 (1500)	7'-2"	35 (890)	6'-6"	6'-2½"	21'-11¾"	11'-9¼"	9'-0½"	1.829 m (6'-0")	10'-11¼"	11'-0½"	4	2¾	75°	14.3 (10.9)	100 (84)
20°	42 (1050)	5'-5"	26 (660)	4'-10½"	4'-6½"	16'-11¾"	9'-5½"	6'-7¼"	1.295 m (4'-3")	8'-5"	8'-6¾"	4¼	2½	70°	9.0 (6.9)	66 (55)
	48 (1200)	6'-0"	29 (740)	5'-5"	5'-1¾"	18'-10"	10'-5½"	7'-4"	1.473 m (4'-10")	9'-4"	9'-6"	4¼	2½	70°	10.9 (8.3)	76 (64)
	54 (1350)	6'-7"	32 (810)	5'-11½"	5'-9¼"	20'-8½"	11'-5¾"	8'-0½"	1.651 m (5'-5")	10'-3¼"	10'-5¼"	4¼	2½	70°	12.9 (9.9)	94 (79)
	60 (1500)	7'-2"	35 (890)	6'-6"	6'-4½"	22'-6¾"	12'-6"	8'-9"	1.829 m (6'-0")	11'-2½"	11'-4¼"	4¼	2½	70°	15.1 (11.5)	103 (86)
25°	42 (1050)	5'-5"	26 (660)	4'-10½"	4'-8¾"	17'-6¾"	10'-1"	6'-5"	1.295 m (4'-3")	8'-8½"	8'-10½"	4½	2¼	65°	9.5 (7.3)	65 (55)
	48 (1200)	6'-0"	29 (740)	5'-5"	5'-4"	19'-6"	11'-2"	7'-1¼"	1.473 m (4'-10")	9'-7¾"	9'-10¼"	4½	2¼	65°	11.5 (8.8)	79 (66)
	54 (1350)	6'-7"	32 (810)	5'-11½"	5'-11¾"	21'-5"	12'-3"	7'-9¾"	1.651 m (5'-5")	10'-7¼"	10'-9¾"	4½	2¼	65°	13.6 (10.4)	98 (82)
	60 (1500)	7'-2"	35 (890)	6'-6"	6'-7½"	23'-4¼"	13'-4"	8'-6"	1.829 m (6'-0")	11'-7"	11'-9¼"	4½	2¼	65°	15.9 (12.2)	107 (90)
30°	42 (1050)	5'-5"	26 (660)	4'-10½"	4'-11"	18'-4"	10'-10"	6'-3"	1.295 m (4'-3")	9'-0½"	9'-3½"	4½	2¼	60°	10.1 (7.7)	71 (59)
	48 (1200)	6'-0"	29 (740)	5'-5"	5'-7"	20'-4¼"	12'-0"	6'-11¼"	1.473 m (4'-10")	10'-0¾"	10'-3½"	4½	2¼	60°	12.2 (9.3)	82 (69)
	54 (1350)	6'-7"	32 (810)	5'-11½"	6'-3"	22'-4½"	13'-2"	7'-7¼"	1.651 m (5'-5")	11'-0¾"	11'-3¾"	4½	2¼	60°	14.4 (11.0)	102 (86)
	60 (1500)	7'-2"	35 (890)	6'-6"	6'-11¼"	24'-4¾"	14'-4"	8'-3¾"	1.829 m (6'-0")	12'-1"	12'-3¾"	4½	2¼	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**

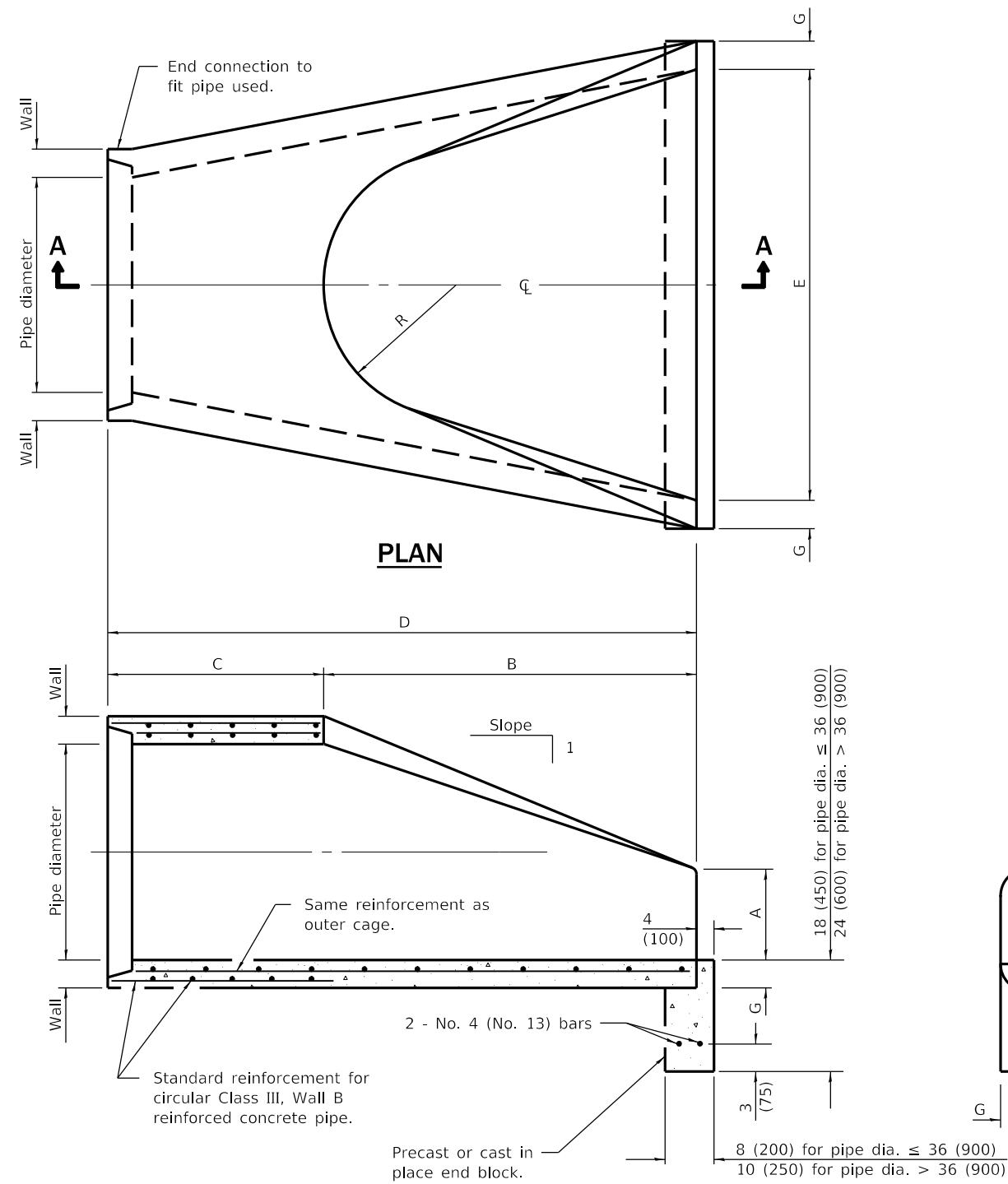
### WINGS FOR 1:1 1/2 SLOPE

Skew Angle	Nominal Pipe Dia.	Dimensions for Concrete														Concrete 2 End Secs. cu. yd. (m <sup>3</sup> )	Welded Wire Reinforcement 2 End Secs. sq. yd. (m <sup>2</sup> )
		A	B	C	D	E	F	G	H	J	K	M	N	α			
35°	42 (1050)	5'-5"	26	4'-10½"	5'-2¼"	19'-3¾"	11'-8¾"	6'-1½"	4'-3"	9'-6¼"	9'-9½"	4¾	2	55°	10.8 (8.3)	75 (63)	
	48 (1200)	6'-0"	29	5'-5"	5'-10¾"	21'-5½"	13'-0"	6'-9½"	4'-10"	10'-7"	10'-10½"	4¾	2	55°	13.0 (9.9)	87 (73)	
	54 (1350)	6'-7"	32	5'-11½"	6'-7¼"	23'-7"	14'-3"	7'-5"	5'-5"	11'-7¾"	11'-11¼"	4¾	2	55°	15.4 (11.8)	108 (90)	
	60 (1500)	7'-2"	35	6'-6"	7'-4"	25'-8¾"	15'-6¼"	8'-1"	6'-0"	12'-8¾"	13'-0"	4¾	2	55°	18.1 (13.8)	118 (99)	
40°	42 (1050)	5'-5"	26	4'-10½"	5'-6½"	20'-7"	12'-9¾"	5'-11¾"	4'-3"	10'-1½"	10'-5½"	5	1¾	50°	11.6 (8.9)	80 (67)	
	48 (1200)	6'-0"	29	5'-5"	6'-3¾"	22'-10¼"	14'-2¼"	6'-7½"	4'-10"	11'-3¼"	11'-7"	5	1¾	50°	14.0 (10.7)	93 (77)	
	54 (1350)	6'-7"	32	5'-11½"	7'-0¾"	25'-1¾"	15'-7"	7'-3½"	5'-5"	12'-5"	12'-8¾"	5	1¾	50°	16.7 (12.8)	115 (96)	
	60 (1500)	7'-2"	35	6'-6"	7'-10"	27'-5¼"	16'-11½"	7'-11"	6'-0"	13'-6¾"	13'-10½"	5	1¾	50°	19.5 (14.9)	126 (105)	
45°	42 (1050)	5'-5"	26	4'-10½"	6'-0"	22'-2½"	14'-1¾"	5'-10¼"	4'-3"	10'-11"	11'-3½"	5¼	1½	45°	12.6 (9.6)	86 (72)	
	48 (1200)	6'-0"	29	5'-5"	6'-10"	24'-8¼"	15'-8¼"	6'-6"	4'-10"	12'-2"	12'-6¼"	5¼	1½	45°	15.2 (12.0)	100 (83)	
	54 (1350)	6'-7"	32	5'-11½"	7'-8"	27'-1¾"	17'-2½"	7'-1½"	5'-5"	13'-4¾"	13'-9"	5¼	1½	45°	18.2 (13.9)	124 (104)	
	60 (1500)	7'-2"	35	6'-6"	8'-5¾"	29'-7½"	18'-8¾"	7'-9"	6'-0"	14'-7½"	15'-0"	5¼	1½	45°	21.3 (16.3)	136 (114)	
50°	42 (1050)	5'-5"	26	4'-10½"	6'-7¼"	24'-3¾"	15'-10"	5'-9¼"	4'-3"	11'-11½"	12'-4¼"	5½	1½	40°	13.9 (10.6)	94 (78)	
	48 (1200)	6'-0"	29	5'-5"	7'-6¼"	27'-0½"	17'-6½"	6'-4½"	4'-10"	13'-3¾"	13'-8¾"	5½	1½	40°	16.8 (12.8)	109 (91)	
	54 (1350)	6'-7"	32	5'-11½"	8'-5"	29'-9¼"	19'-3"	7'-0"	5'-5"	14'-8¼"	15'-1"	5½	1½	40°	20.0 (15.3)	135 (113)	
	60 (1500)	7'-2"	35	6'-6"	9'-4"	32'-5¼"	20'-11½"	7'-7½"	6'-0"	16'-0½"	16'-5¼"	5½	1½	40°	23.5 (18.0)	148 (124)	
55°	42 (1050)	5'-5"	26	4'-10½"	7'-5"	27'-1½"	18'-0¼"	5'-8¼"	4'-3"	13'-4¼"	13'-9¼"	5¾	1¼	35°	15.5 (11.9)	104 (87)	
	48 (1200)	6'-0"	29	5'-5"	8'-5"	30'-2¼"	19'-11½"	6'-3½"	4'-10"	14'-10½"	15'-3¾"	5¾	1¼	35°	18.8 (14.4)	121 (101)	
	54 (1350)	6'-7"	32	5'-11½"	9'-5½"	33'-2¾"	21'-10¾"	6'-10¾"	5'-5"	16'-4¾"	16'-10"	5¾	1¼	35°	22.4 (17.1)	150 (125)	
	60 (1500)	7'-2"	35	6'-6"	10'-5½"	36'-3½"	23'-10"	7'-6¼"	6'-0"	17'-11¼"	18'-4¼"	5¾	1¼	35°	26.4 (20.2)	165 (138)	
60°	42 (1050)	5'-5"	26	4'-10½"	8'-6"	30'-11¾"	20'-11¼"	5'-7¼"	4'-3"	15'-3"	15'-8¾"	6¼	1	30°	17.7 (13.5)	118 (98)	
	48 (1200)	6'-0"	29	5'-5"	9'-8"	34'-5¾"	23'-2¼"	6'-2½"	4'-10"	17'-0"	17'-5¾"	6¼	1	30°	21.5 (16.4)	137 (115)	
	54 (1350)	6'-7"	32	5'-11½"	10'-10"	37'-11¾"	25'-5¼"	6'-9¾"	5'-5"	18'-9"	19'-2¾"	6¼	1	30°	25.7 (19.6)	170 (142)	
	60 (1500)	7'-2"	35	6'-6"	12'-0"	41'-5¾"	27'-8¼"	7'-5"	6'-0"	20'-6"	20'-11¾"	6¼	1	30°	30.2 (23.1)	187 (157)	

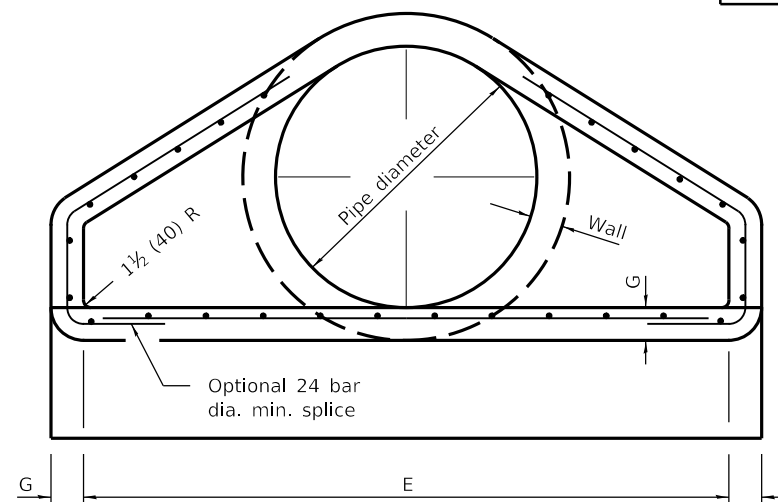
Illinois Department of Transportation  
 APPROVED                      April 1, 2016  
 ENGINEER OF BRIDGES AND STRUCTURES  
 APPROVED                      April 1, 2016  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

**REINFORCED CONCRETE END SECTIONS  
 FOR PIPE CULVERTS  
 42" (1050 mm) THRU 60" (1500 mm) DIA.  
 SKEWED WITH ROADWAY**  
 (Sheet 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'-0 7/8" (1.241 m)	6'-0 7/8" (1.851 m)	24 (610)	2 (51)	9 (229)	1:2.4
15 (375)	740 (335)	2 1/4 (57)	6 (152)	27 (686)	3'-10" (1.168 m)	6'-1" (1.854 m)	30 (762)	2 1/4 (57)	11 (280)	1:2.4
18 (450)	990 (450)	2 1/2 (64)	9 (229)	27 (686)	3'-10" (1.168 m)	6'-1" (1.854 m)	36 (914)	2 1/2 (64)	12 (305)	1:2.4
21 (525)	1280 (580)	2 3/4 (70)	9 (229)	35 (889)	38 (965)	6'-1" (1.854 m)	3'-6" (1.067 m)	2 3/4 (70)	13 (330)	1:2.4
24 (600)	1520 (690)	3 (76)	9 1/2 (241)	3'-7 1/2" (1.105 m)	30 (762)	6'-1 1/2" (1.867 m)	4'-0" (1.219 m)	3 (76)	14 (356)	1:2.5
27 (675)	1930 (875)	3 1/4 (83)	10 1/2 (267)	4'-0" (1.219 m)	25 1/2 (648)	6'-1 1/2" (1.867 m)	4'-6" (1.372 m)	3 1/4 (83)	14 1/2 (368)	1:2.4
30 (750)	2190 (995)	3 1/2 (89)	12 (305)	4'-6" (1.375 m)	19 3/4 (502)	6'-1 3/4" (1.874 m)	5'-0" (1.524 m)	3 1/2 (89)	15 (381)	1:2.5
33 (825)	3200 (1450)	3 3/4 (95)	13 1/2 (343)	4'-10 1/2" (1.486 m)	39 1/4 (997)	8'-1 3/4" (2.483 m)	5'-6" (1.676 m)	3 3/4 (95)	17 1/2 (445)	1:2.5
36 (900)	4100 (1860)	4 (102)	15 (381)	5'-3" (1.6 m)	34 3/4 (883)	8'-1 3/4" (2.483 m)	6'-0" (1.829 m)	4 (102)	20 (508)	1:2.5
42 (1050)	5380 (2440)	4 1/2 (114)	21 (533)	5'-3" (1.6 m)	35 (889)	8'-2" (2.489 m)	6'-6" (1.981 m)	4 1/2 (114)	22 (559)	1:2.5
48 (1200)	6550 (2970)	5 (127)	24 (610)	6'-0" (1.829 m)	26 (660)	8'-2" (2.489 m)	7'-0" (2.134 m)	5 (127)	22 (559)	1:2.5
54 (1350)	8240 (3740)	5 1/2 (140)	27 (686)	5'-5" (1.651 m)	35 (889)	8'-4" (2.54 m)	7'-6" (2.286 m)	5 1/2 (140)	24 (610)	1:2.0
60 (1500)	8730 (3960)	6 (152)	35 (889)	5'-0" (1.524 m)	39 (991)	8'-3" (2.515 m)	8'-0" (2.438 m)	5 (127)	*	1:1.9
66 (1650)	10710 (4860)	6 1/2 (165)	30 (762)	6'-0" (1.829 m)	27 (686)	8'-3" (2.515 m)	8'-6" (2.591 m)	5 1/2 (140)	*	1:1.7
72 (1800)	12520 (5680)	7 (178)	36 (914)	6'-6" (1.981 m)	21 (533)	8'-3" (2.514 m)	9'-0" (2.743 m)	6 (152)	*	1:1.8
78 (1950)	14770 (6700)	7 1/2 (191)	36 (914)	7'-6" (2.286 m)	21 (533)	9'-3" (2.819 m)	9'-6" (2.896 m)	6 1/2 (165)	*	1:1.8
84 (2100)	18160 (8240)	8 (203)	36 (914)	7'-6 1/2" (2.299 m)	21 (533)	9'-3 1/2" (2.832 m)	10'-0" (3.048 m)	6 1/2 (165)	*	1:1.6

\* Radius as furnished by manufacturer

**GENERAL NOTES**

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

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

Illinois Department of Transportation

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

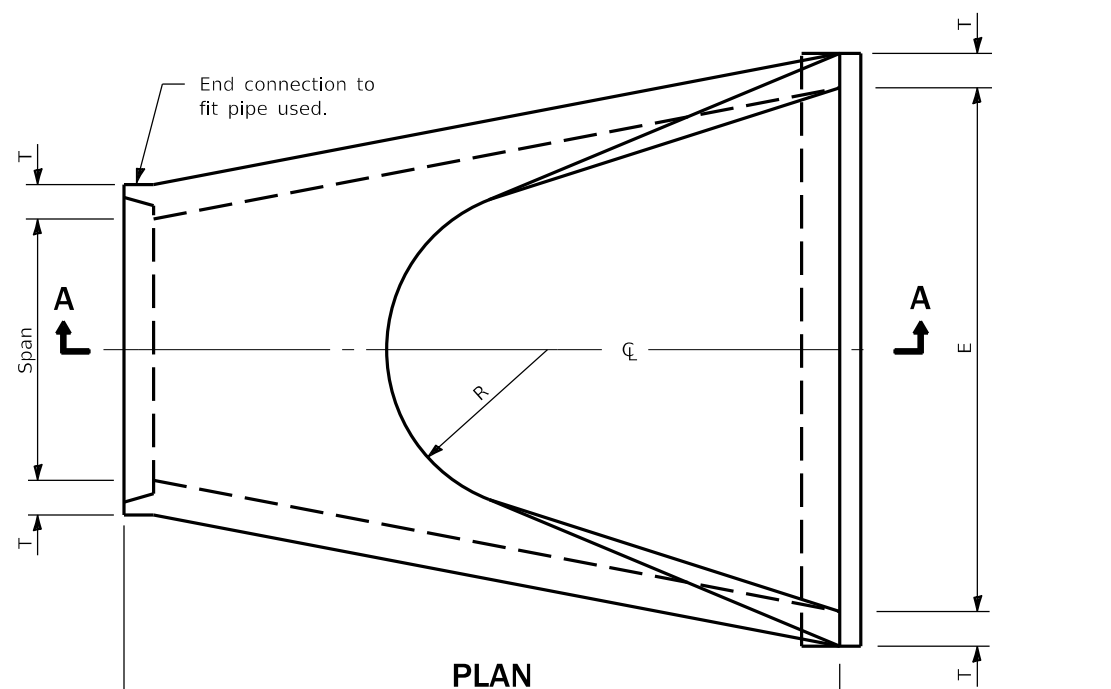
APPROVED January 1, 2011  
*Scott Schick*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

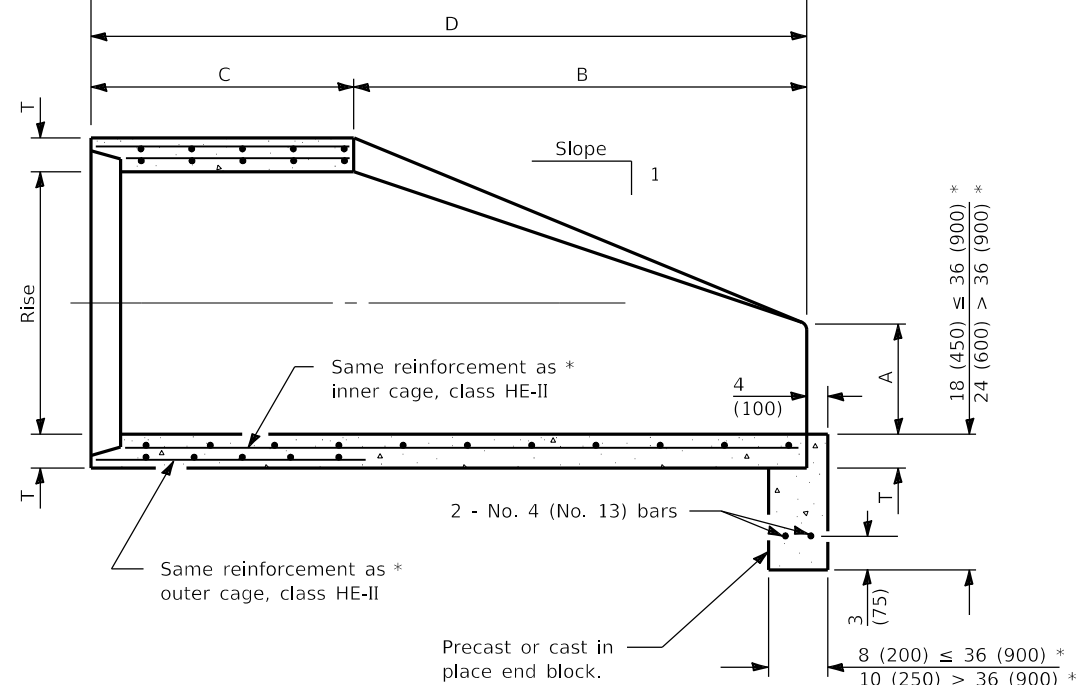
DATE	REVISIONS
1-1-11	Clarified ref. to pipe dia. on Section A-A. Changed 'inner' to 'outer' cage ref.
1-1-09	Switched units to English (metric).

**PRECAST REINFORCED CONCRETE FLARED END SECTION**

**STANDARD 542301-03**



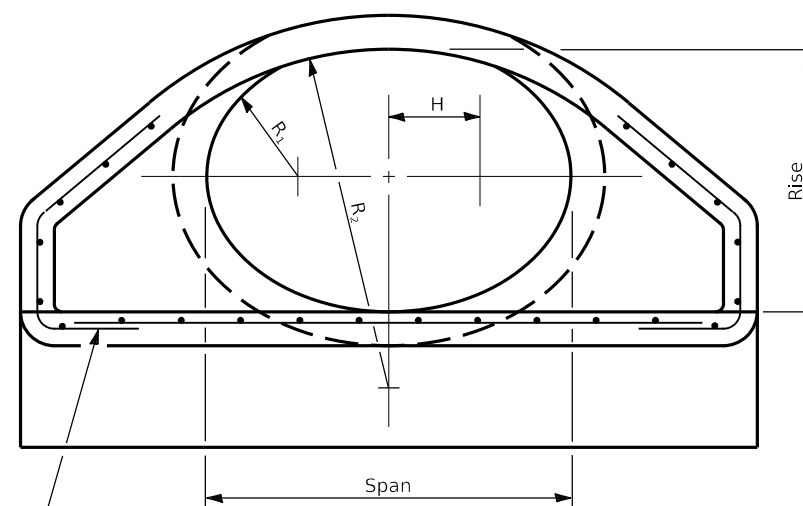
**PLAN**



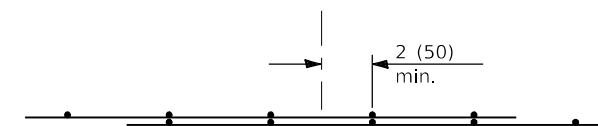
**SECTION A-A**

\* Refers to the equivalent pipe diameter.

SPAN	RISE	EQUIV. DIA.	WALL T	A	B	C	D	E	H	R	R <sub>1</sub>	R <sub>2</sub>	APPROX. SLOPE
23 (584)	14 (356)	18 (450)	2 3/4 (70)	8 (203)	27 (686)	3'-9" (1.143 m)	6'-0" (1.829 m)	36 (914)	5 3/8 (137)	6 (152)	6 (152)	20 (508)	1:3.1
30 (762)	19 (483)	24 (600)	3 1/4 (83)	8 1/2 (216)	39 (991)	33 (838)	6'-0" (1.829 m)	4'-0" (1.219 m)	6 7/8 (175)	7 (178)	8 1/4 (210)	26 1/4 (667)	1:2.8
34 (864)	22 (559)	27 (675)	3 1/2 (89)	9 (229)	4'-0" (1.219 m)	24 (610)	6'-0" (1.829 m)	4'-6" (1.372 m)	7 3/4 (197)	8 (203)	9 1/4 (235)	29 1/4 (743)	1:2.9
38 (965)	24 (610)	30 (750)	3 1/2 (95)	9 1/2 (241)	4'-6" (1.372 m)	18 (475)	6'-0" (1.829 m)	5'-0" (1.524 m)	8 5/8 (219)	9 (229)	10 1/4 (260)	32 3/4 (832)	1:2.9
45 (1143)	29 (737)	36 (900)	4 1/2 (114)	11 1/4 (286)	5'-0" (1.524 m)	36 (914)	8'-0" (2.438 m)	6'-0" (1.829 m)	10 1/2 (267)	12 (305)	12 1/4 (311)	39 1/4 (997)	1:2.7
53 (1346)	34 (864)	42 (1050)	5 (127)	15 3/4 (400)	5'-0" (1.524 m)	36 (914)	8'-0" (2.438 m)	6'-6" (1.981 m)	12 1/2 (308)	13 (330)	14 1/2 (368)	3'-10" (1.168 m)	1:2.6
60 (1524)	38 (965)	48 (1200)	5 1/2 (140)	21 (533)	5'-0" (1.524 m)	36 (914)	8'-0" (2.438 m)	7'-0" (2.134 m)	13 1/2 (343)	14 (356)	16 1/2 (419)	4'-3 1/2" (1.308 m)	1:2.7
68 (1727)	43 (1092)	54 (1350)	6 (152)	26 (660)	5'-0" (1.524 m)	36 (914)	8'-0" (2.438 m)	7'-6" (2.286 m)	15 1/4 (387)	16 (406)	18 3/4 (476)	4'-10 1/2" (1.486 m)	1:2.6
76 (1930)	48 (1219)	60 (1500)	6 1/2 (165)	31 (787)	5'-0" (1.524 m)	36 (914)	8'-0" (2.438 m)	8'-0" (2.439 m)	17 (432)	18 (457)	20 3/4 (527)	5'-5" (1.651 m)	1:2.6



**END VIEW**



**OPTIONAL WELDED WIRE REINFORCEMENT LAP**

**GENERAL NOTES**

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

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

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

**PRECAST REINFORCED CONCRETE ELLIPTICAL FLARED END SECTION**

**STANDARD 542306-03**

Illinois Department of Transportation

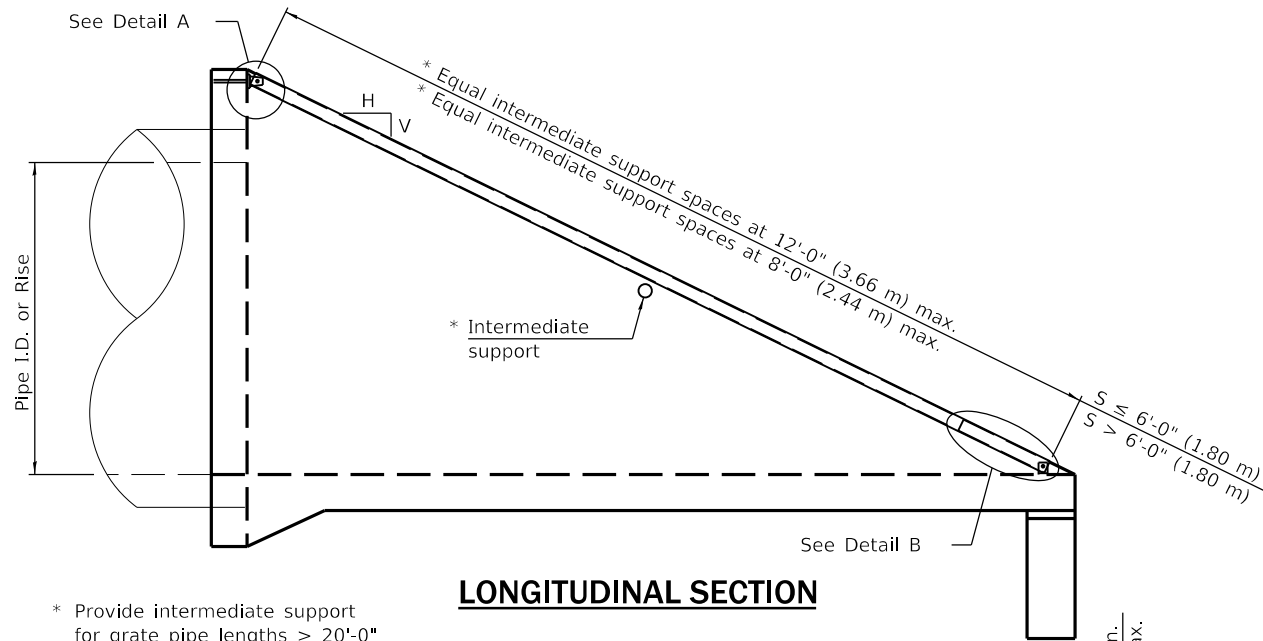
APPROVED April 1, 2016

ENGINEER OF BRIDGES AND STRUCTURES

APPROVED April 1, 2016

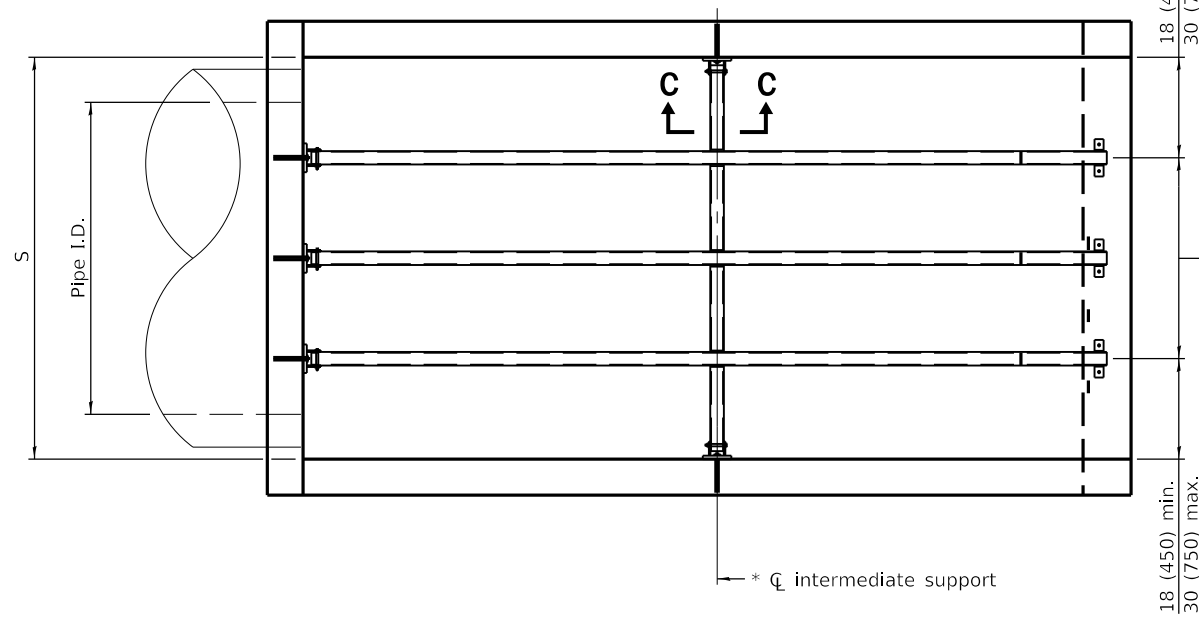
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



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

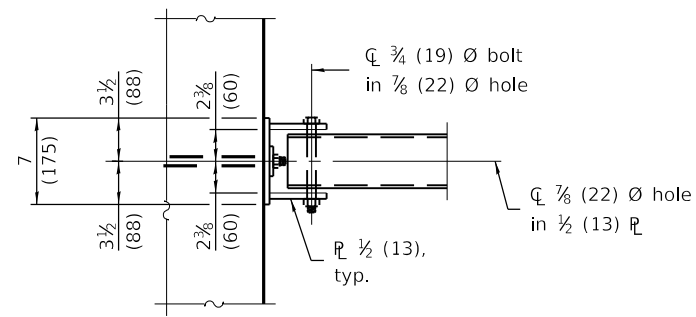
**LONGITUDINAL SECTION**



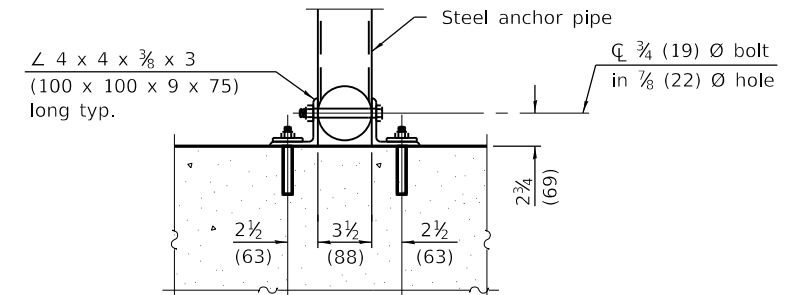
**PLAN VIEW**

Steel pipes at  
18 (450) cts. min.  
30 (750) cts. max.

6 1/2 (165) for 1:3 slope \*\*  
7 (178) for 1:4 slope \*\*  
7 3/8 for 1:6 slope \*\*

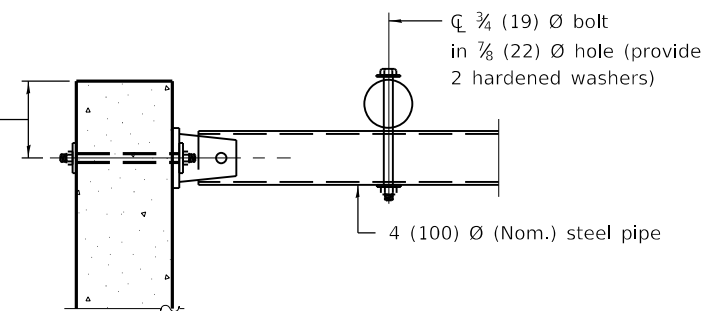


**VIEW A-A**



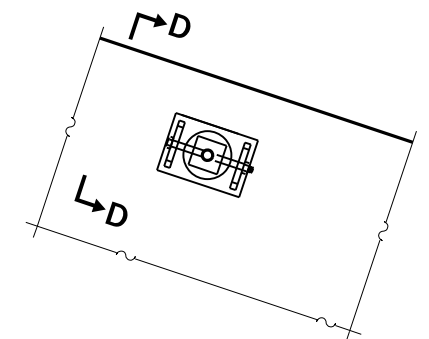
C 3/4 (19) Ø hole in L for  
3/8 (16) Ø anchor rods w/  
2 1/2 x 2 1/2 x 3/16  
(63 x 63 x 8) R washer

**SECTION B-B**

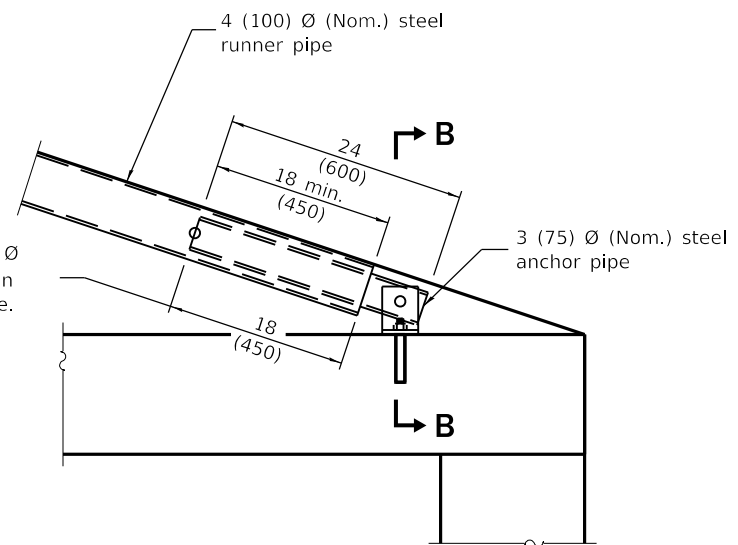


**SECTION D-D**

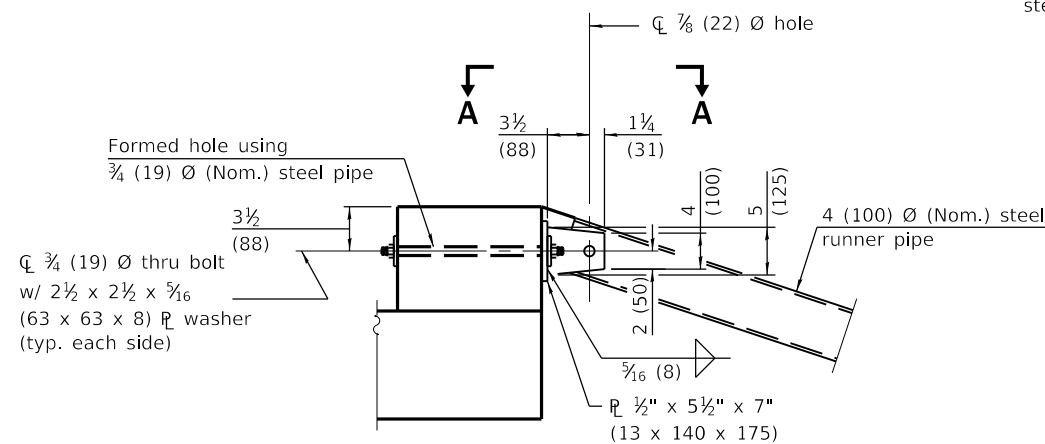
\*\* Measured perpendicular to top of culvert wall. In addition, formed hole shall be located a minimum of 6 (150) measured horizontally from any vertical joints necessary for construction of the culvert end section.



**VIEW C-C**



**DETAIL B**



**DETAIL A**

**GENERAL NOTES**

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

The minimum distance from the center of a hole to the free edge of a structural shape or plate shall be 1 1/2 (38) unless noted otherwise.

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

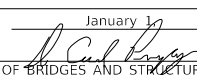
DATE	REVISIONS
1-1-18	Corrected value in elliptical pipe table. Renamed standard.
4-1-16	Corrected typo.

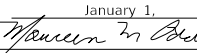
**TRAVERSABLE PIPE GRATE FOR CONCRETE END SECTIONS**

(Sheet 1 of 2)

**STANDARD 542311-07**

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



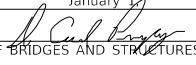
**PIPE-GRATE SCHEDULE FOR PIPE CULVERT END SECTIONS**

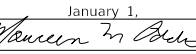
Pipe I.D.	Slope of End Section								
	1:3			1:4			1:6		
	Main Pipe No. / Length	Int. Support No. / Length	Total Length of Pipe	Main Pipe No. / Length	Int. support No. / Length	Total Length of Pipe	Main Pipe No. / Length	Int. Support No. / Length	Total Length of Pipe
27 (675)	1 @ 9'-8" 1 @ (2.95 m)	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

APPROVED January 1, 2018  
  
 ENGINEER OF BRIDGES AND STRUCTURES

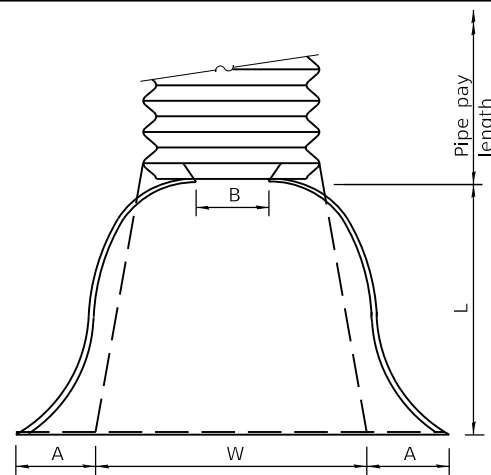
APPROVED January 1, 2018  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

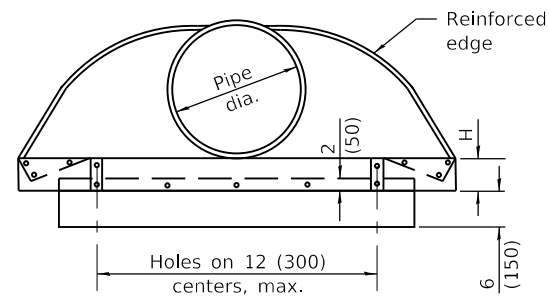
**TRAVERSABLE PIPE GRATE  
FOR CONCRETE END  
SECTIONS** (Sheet 2 of 2)

**STANDARD 542311-07**

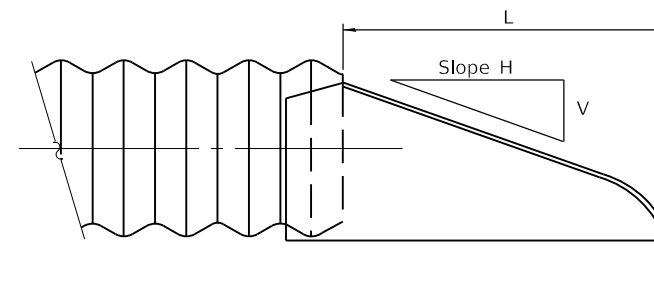
PIPE DIA.	THICKNESS	DIMENSIONS					SLOPE (Approx.) (V:H)	BODY
		A	B	H	L	W		
12 (300)	0.064 (1.63)	1± (25)	6 (150)	6 (150)	1± (25)	1½± (38)	2± (50)	1 Pc.
15 (375)	0.064 (1.63)	7 (180)	8 (205)	6 (150)	26 (660)	30 (760)	1:2½	1 Pc.
18 (450)	0.064 (1.63)	8 (205)	10 (255)	6 (150)	31 (785)	36 (915)	1:2½	1 Pc.
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)	1:1⅓	3 Pc.



**PLAN**



**END VIEW**



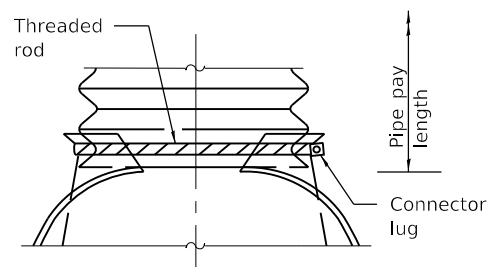
**SIDE VIEW**

**END SECTION**

**NOTES**

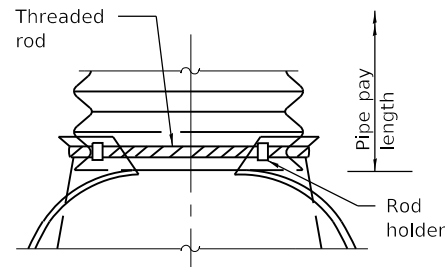
For 60 (1500) thru 84 (2250) sizes, reinforced edges shall be supplemented with stiffener angles. The angles shall be 2x2x¼(51x51x6.4) for 60 (1500) thru 72 (1800) diameter and 2½x2½x¼ (64x64x6.4) for 78 (1950) thru 84 (2250) diameter. The angles shall be attached by ⅝ (M10) rivets or bolts.

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



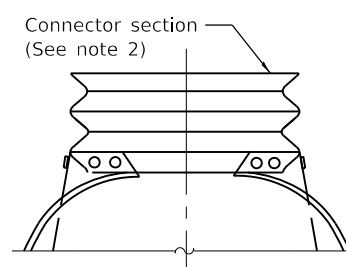
**TYPE 1**

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



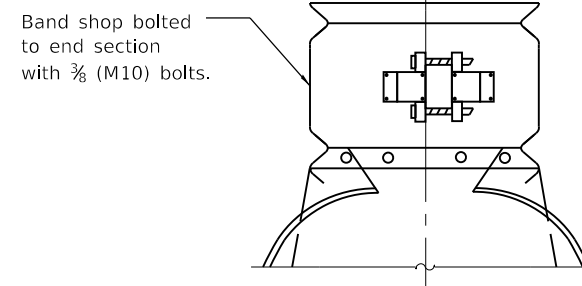
**TYPE 2**

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



**TYPE 3**

(See Note 2)



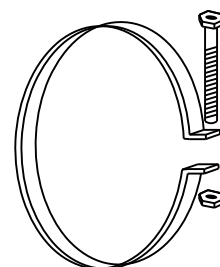
**TYPE 4**

(See Note 3)

**NOTES**

- Types 1 and 2 for pipes with annular ends only.
- Type 3 connection may be used for all pipe sizes and includes 12 (300) of the pipe length. The connector section shall be attached to the end section by rivets or bolts and shall be the same metal thickness as the end section. Stub shall be either 2⅔ (68) pitch x ½ (13) depth or 3 (75) pitch x 1 (25) depth annular corrugated pipe.
- Type 4 connection can be used for all pipe sizes. Coupler shall be 2⅔ x ½ (68x13) dimple, hugger, or annular band of 3x1 (75x25). The dimple, hugger, or annular band may be used with corrugated metal pipes having annular ends. For corrugated metal pipes having helical ends, only the dimple band will be allowed.

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



**ALTERNATE STRAP CONNECTOR**

(For Type 1 only)

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

**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 CULVERTS**

**STANDARD 542401-04**

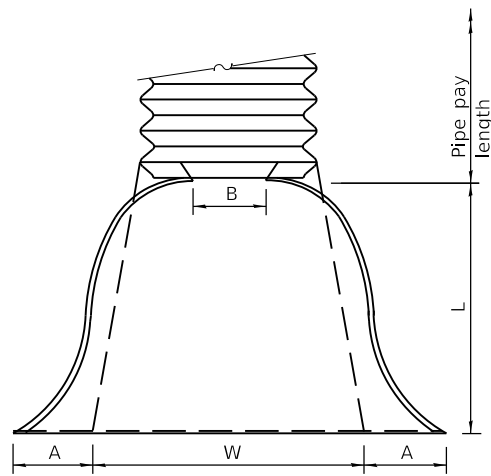
Illinois Department of Transportation

PASSED January 1, 2021  
  
 ENGINEER OF POLICY AND PROCEDURES

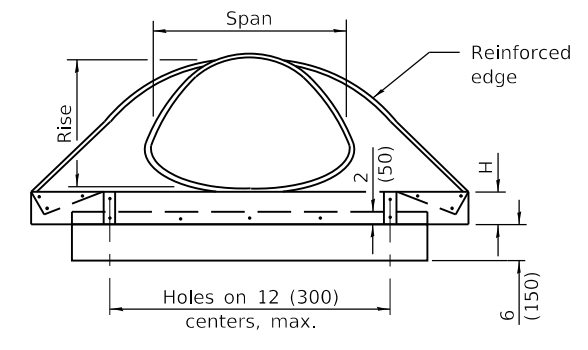
APPROVED January 1, 2021  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

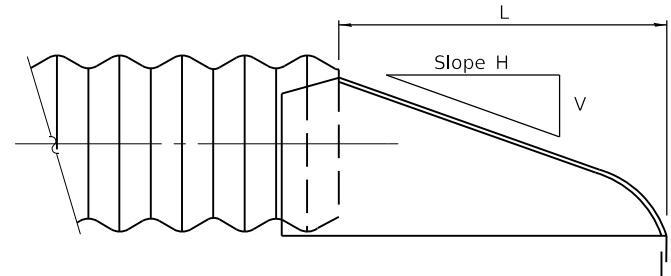
PIPE ARCH DIMENSIONS		THICKNESS	DIMENSIONS					SLOPE (Approx.) (V:H)	BODY
SPAN	RISE		A	B	H	L	W		
17 (432)	13 (330)	0.064 (1.63)	7 (180)	9 (230)	6 (150)	19 (485)	30 (760)	1:2½	1 Pc.
21 (533)	15 (381)	0.064 (1.63)	7 (180)	10 (255)	6 (150)	23 (585)	36 (915)	1:2½	1 Pc.
24 (610)	18 (457)	0.064 (1.63)	8 (205)	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 (1,170 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.



**PLAN**



**END VIEW**



**SIDE VIEW**

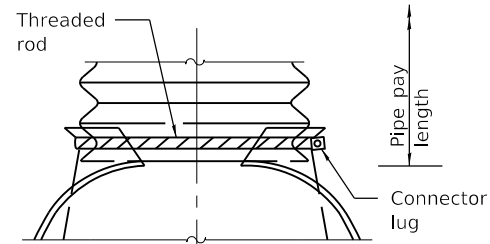
**END SECTION**

**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.

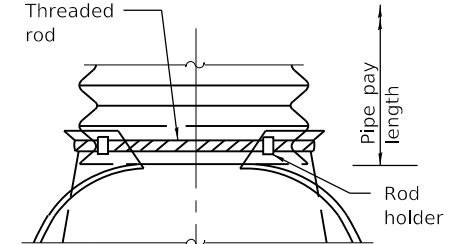
Angle reinforcement shall be placed under the center panel seams on the 77x52 (1956x1321) and 83x57 (2108x1448) sizes.

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



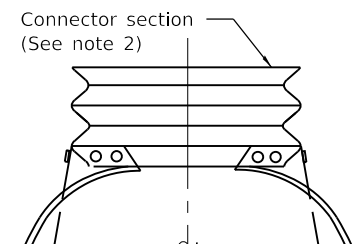
**TYPE 1**

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



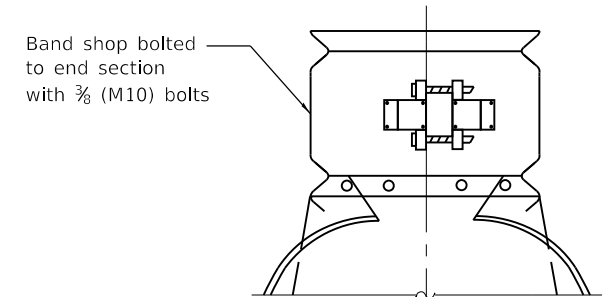
**TYPE 2**

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



**TYPE 3**

(See Note 2)



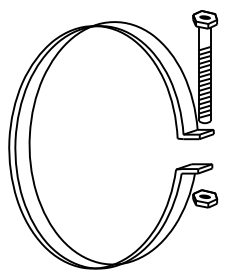
**TYPE 4**

(See Note 3)

**NOTES**

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

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



**ALTERNATE STRAP CONNECTOR**

(For Type 1 only)

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

**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**

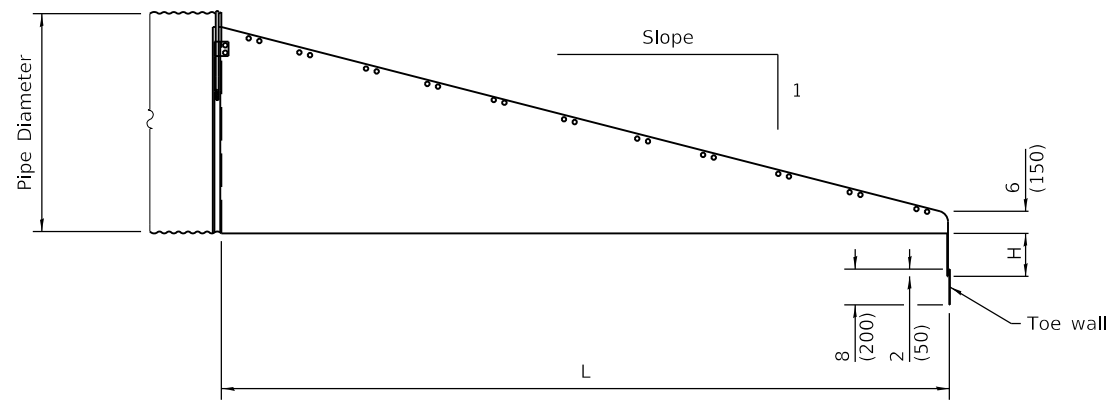
**STANDARD 542406-04**

Illinois Department of Transportation

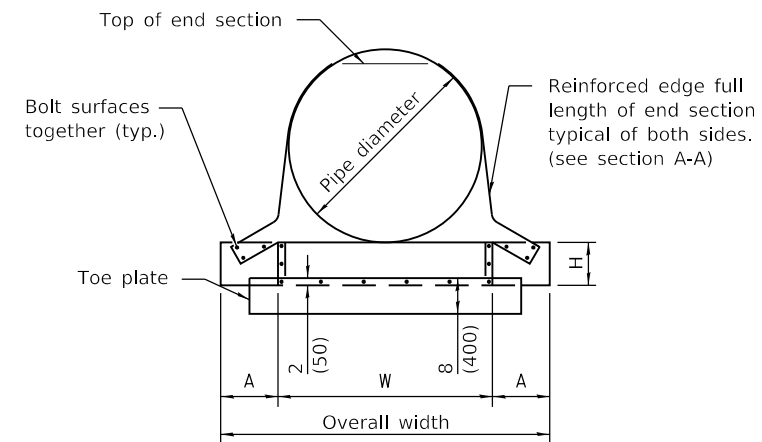
PASSED January 1, 2021  
  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

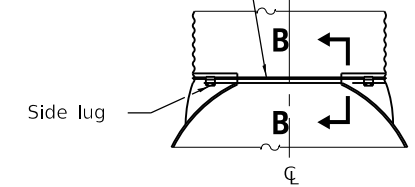


**ELEVATION**

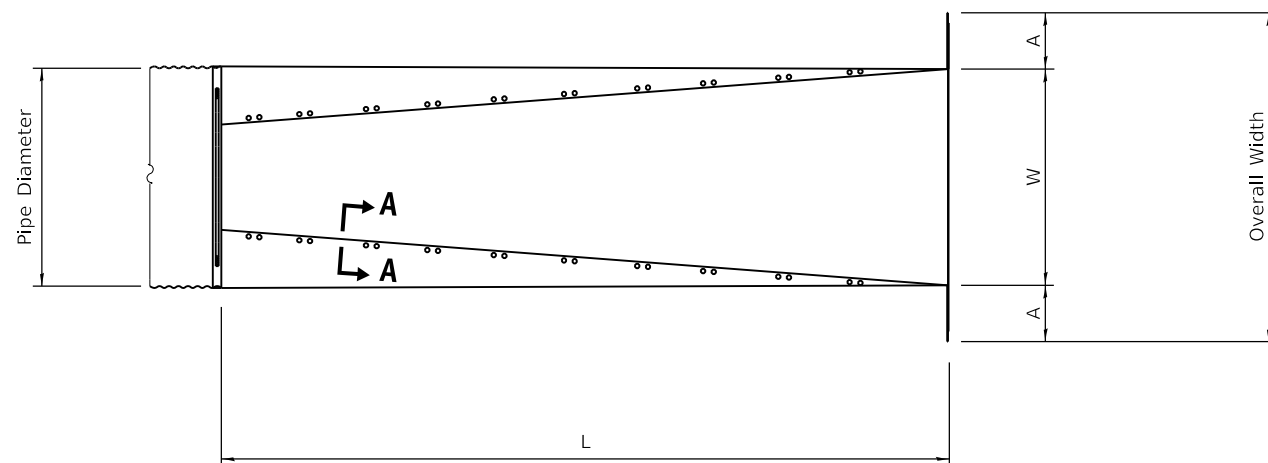


**END VIEW**

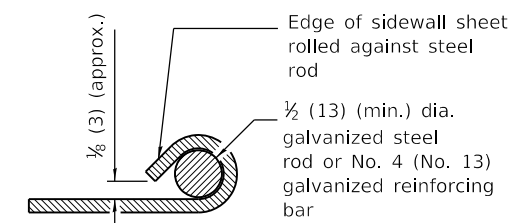
½ (M12) galvanized threaded rod over top of end section. Side lugs shall be bolted to end section



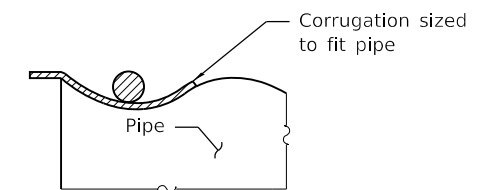
**CONNECTIONS OF END SECTION**



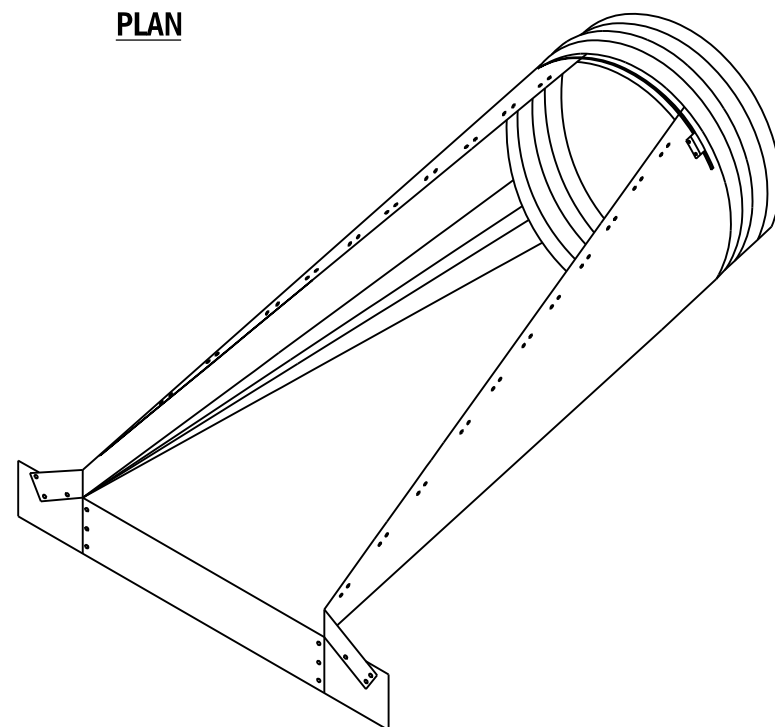
**PLAN**



**SECTION A-A**



**SECTION B-B**



**END SECTION  
PERSPECTIVE VIEW**

**METAL END SECTIONS FOR ROUND PIPE CULVERT**

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

**GENERAL NOTES**

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

Provide traversable pipe grate when specified.

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

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

DATE	REVISIONS
1-1-18	New standard.

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

(Sheet 1 of 2)

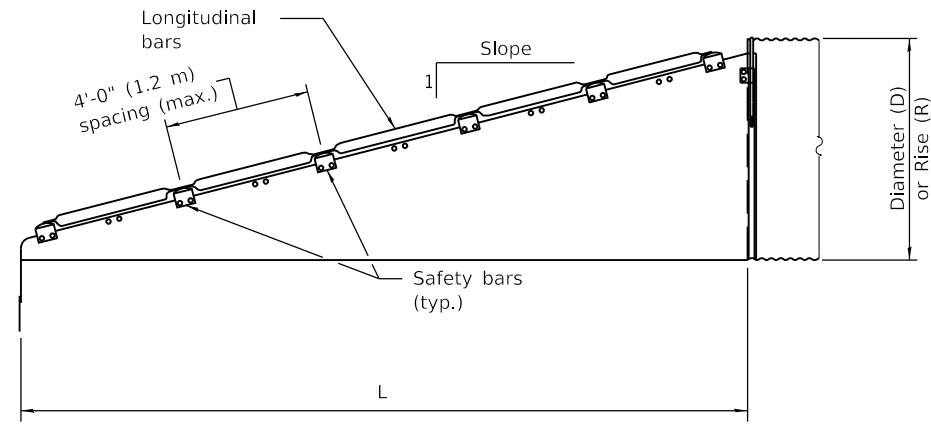
**STANDARD 542411**

Illinois Department of Transportation

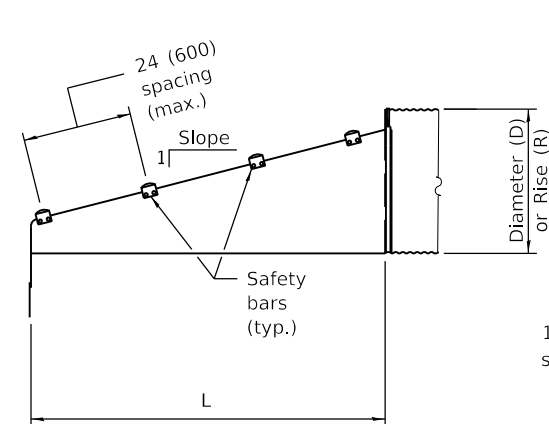
PASSED January 1, 2018  
*Michael Beard*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018  
*Marcus M. Adams*  
ENGINEER OF DESIGN AND ENVIRONMENT

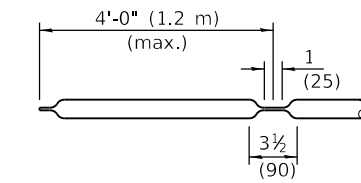
ISSUED 1-1-18



**CROSS DRAINAGE  
END SECTION - ELEVATION**

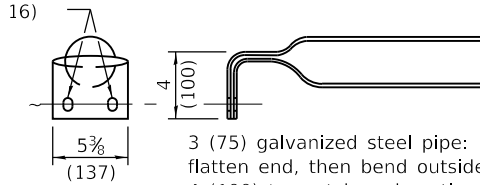


**PARALLEL DRAINAGE  
END SECTION - ELEVATION**



**LONGITUDINAL DRAINAGE BAR**

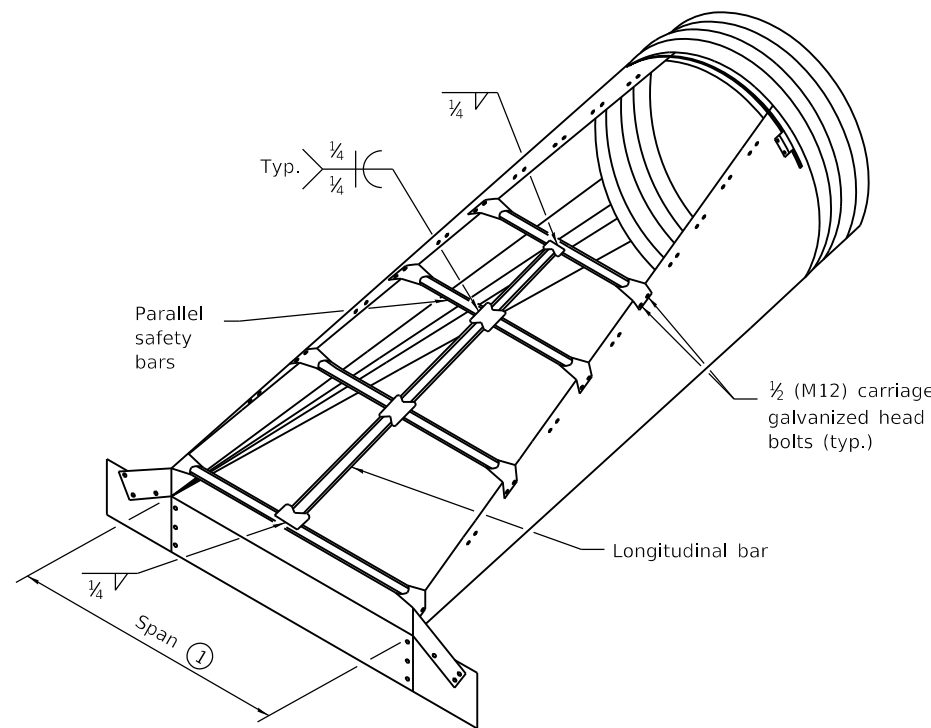
1 x 5/8 (25 x 16) slots



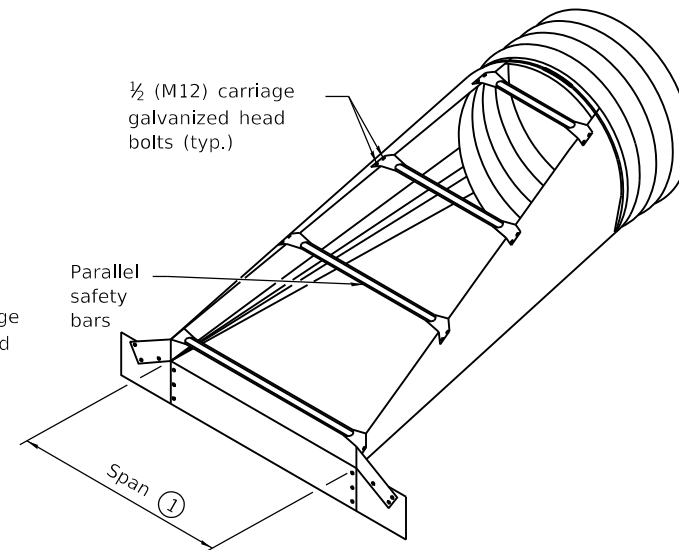
3 (75) galvanized steel pipe: flatten end, then bend outside 4 (100) to match end section sides.

**PARALLEL BARS**

**SAFETY BAR DETAILS**

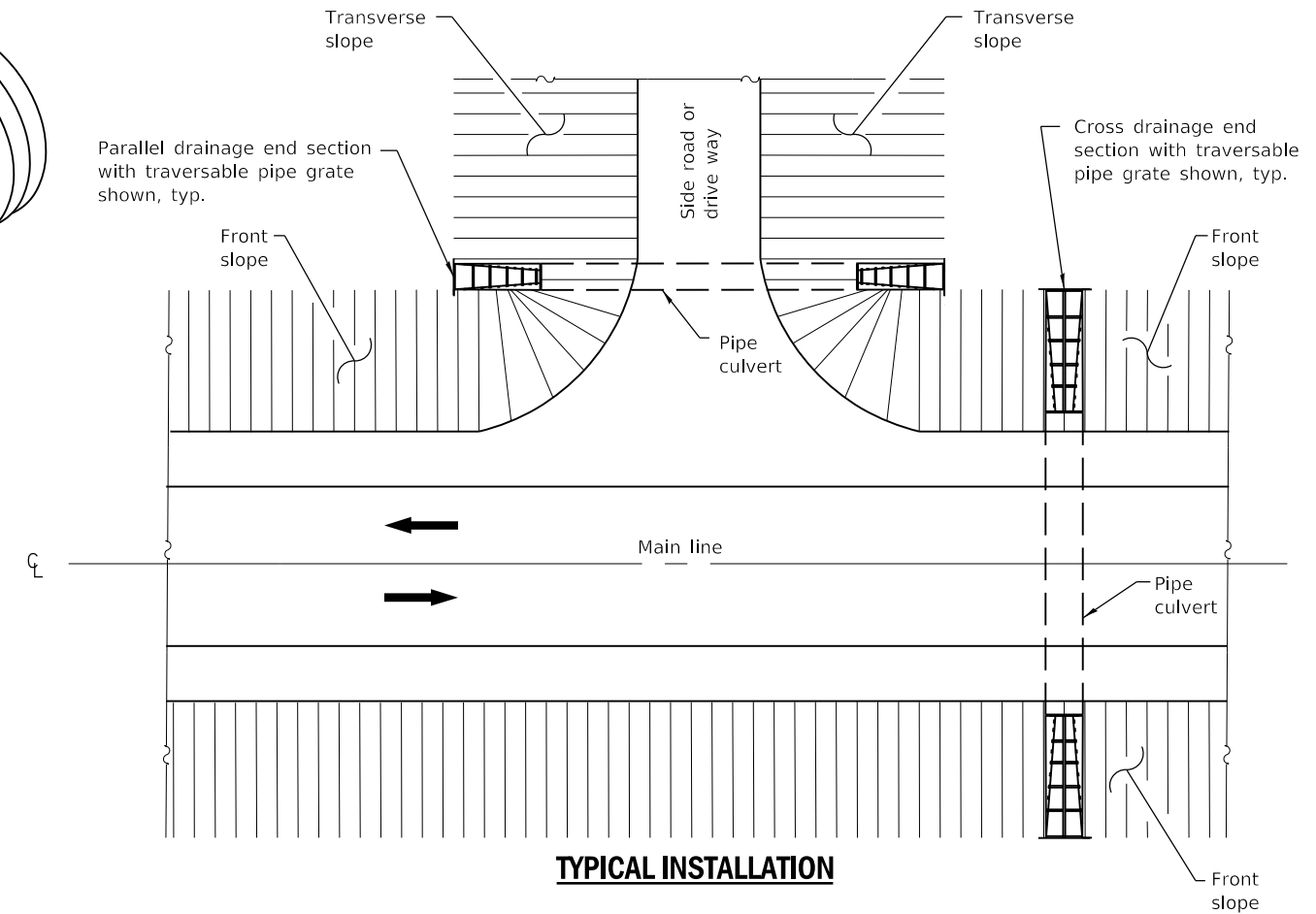


**CROSS DRAINAGE END SECTION**



**PARALLEL DRAINAGE  
END SECTION**

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

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

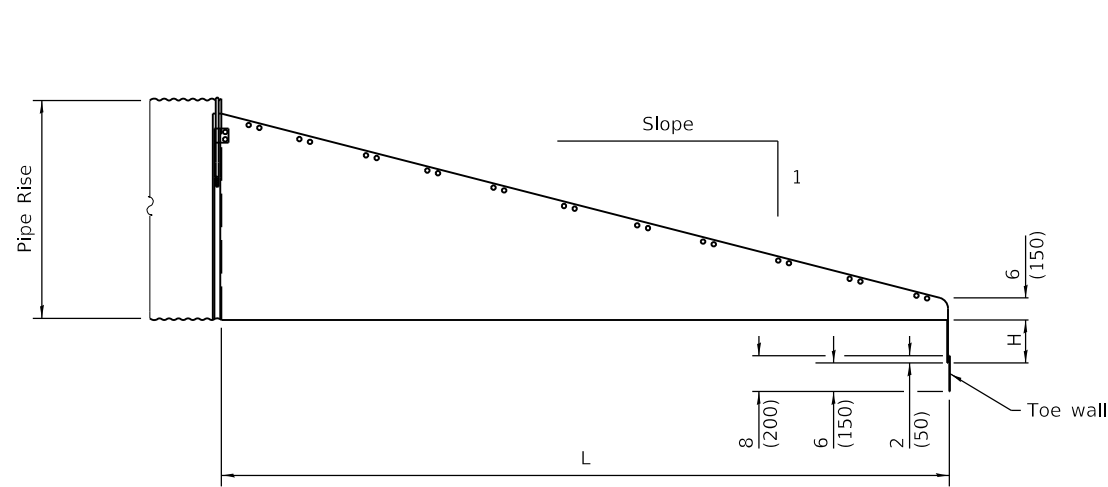
APPROVED January 1, 2018  
*Marcus M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18

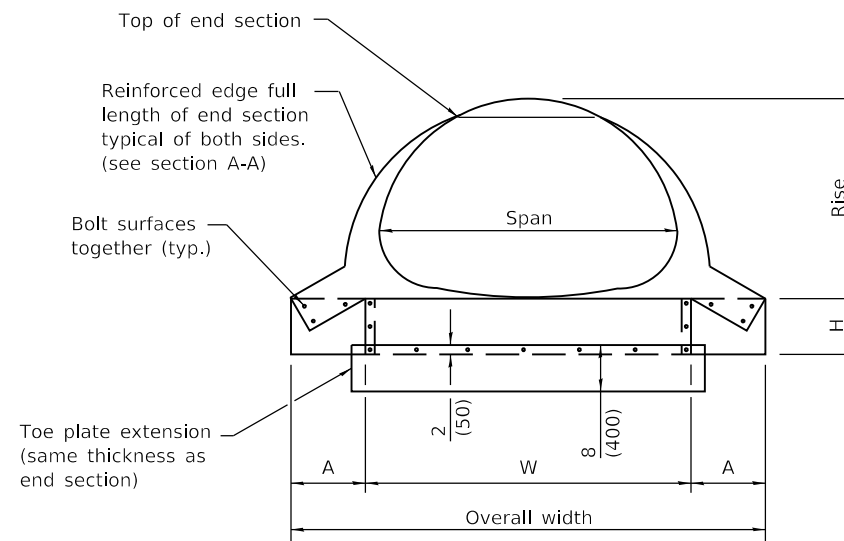
**SLOPED METAL END SECTIONS  
FOR PIPE CULVERTS 15" (375 mm)  
THRU 60" (1500 mm) DIA.**

(Sheet 2 of 2)

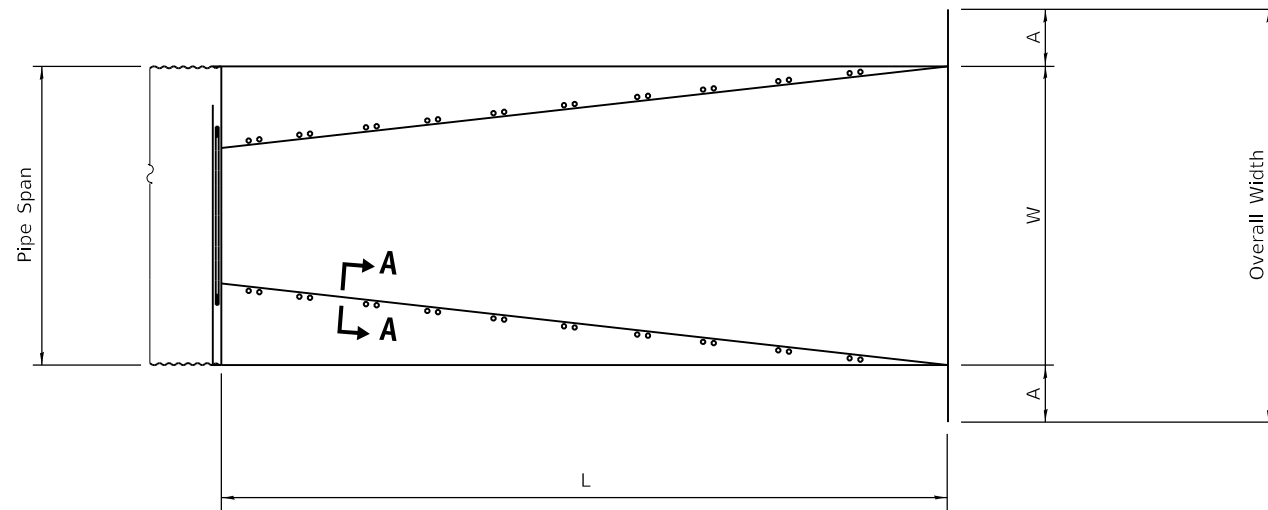
**STANDARD 542411**



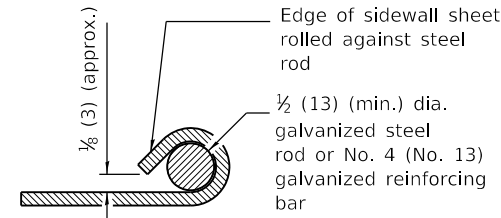
**ELEVATION**



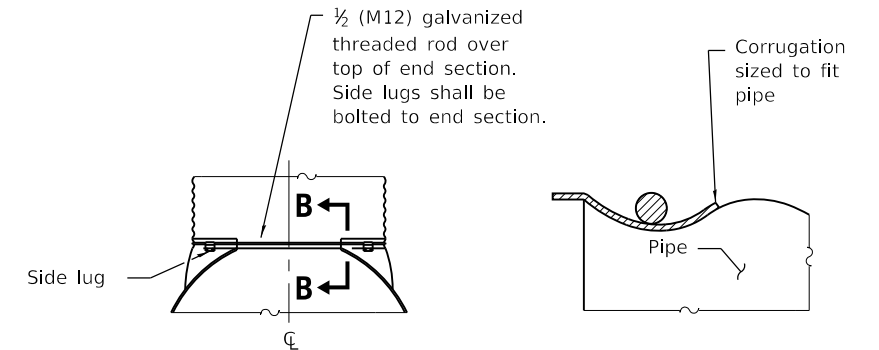
**END VIEW**



**PLAN**

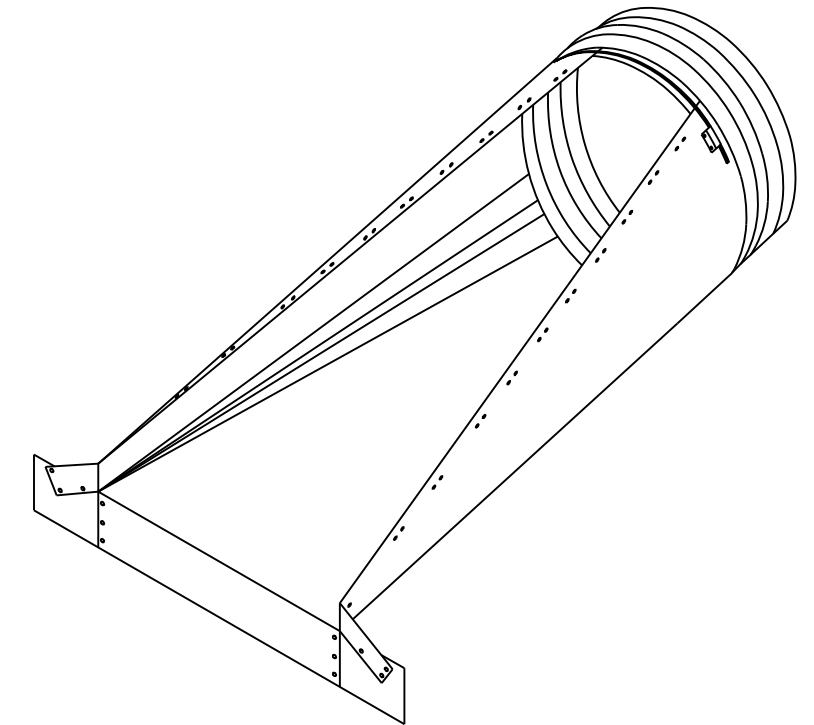


**SECTION A-A**



**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											
		A	H	W	OVERALL WIDTH	CORRIGATION 2 1/2 x 1/2				CORRIGATION 3 x 1 OR 5 x 1			
						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.

DATE	REVISIONS
1-1-18	New standard.

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

(Sheet 1 of 2)

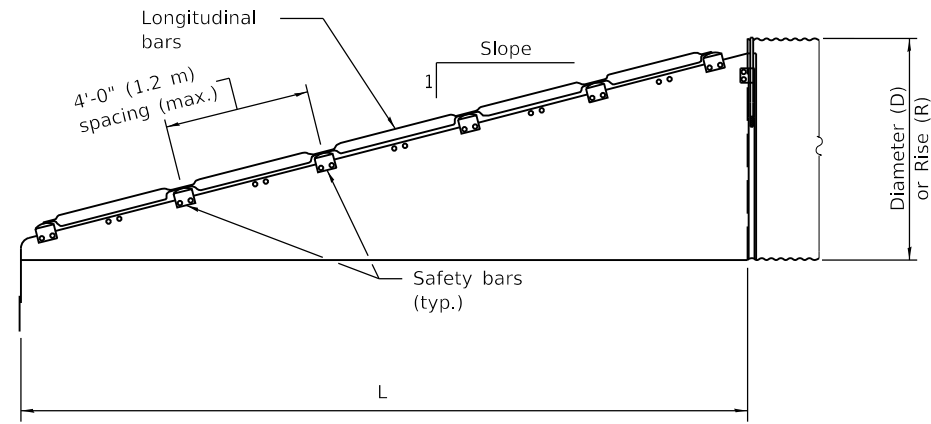
**STANDARD 542416**

Illinois Department of Transportation

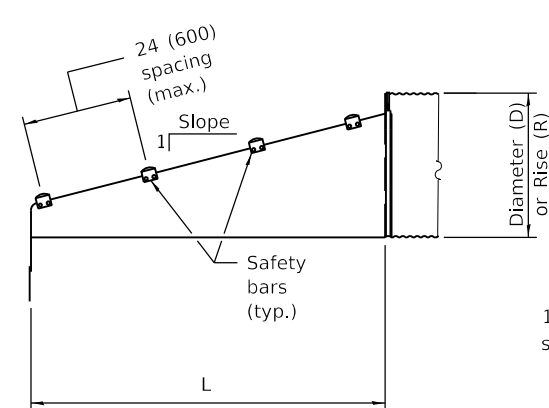
PASSED January 1, 2018  
*Michael Brand*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018  
*Marcus M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

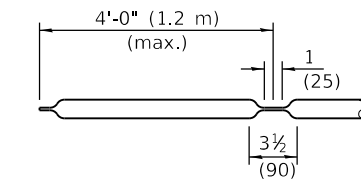
ISSUED 1-1-18



**CROSS DRAINAGE  
END SECTION - ELEVATION**

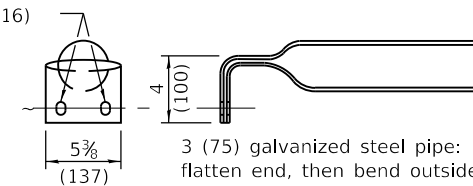


**PARALLEL DRAINAGE  
END SECTION - ELEVATION**



**LONGITUDINAL DRAINAGE BAR**

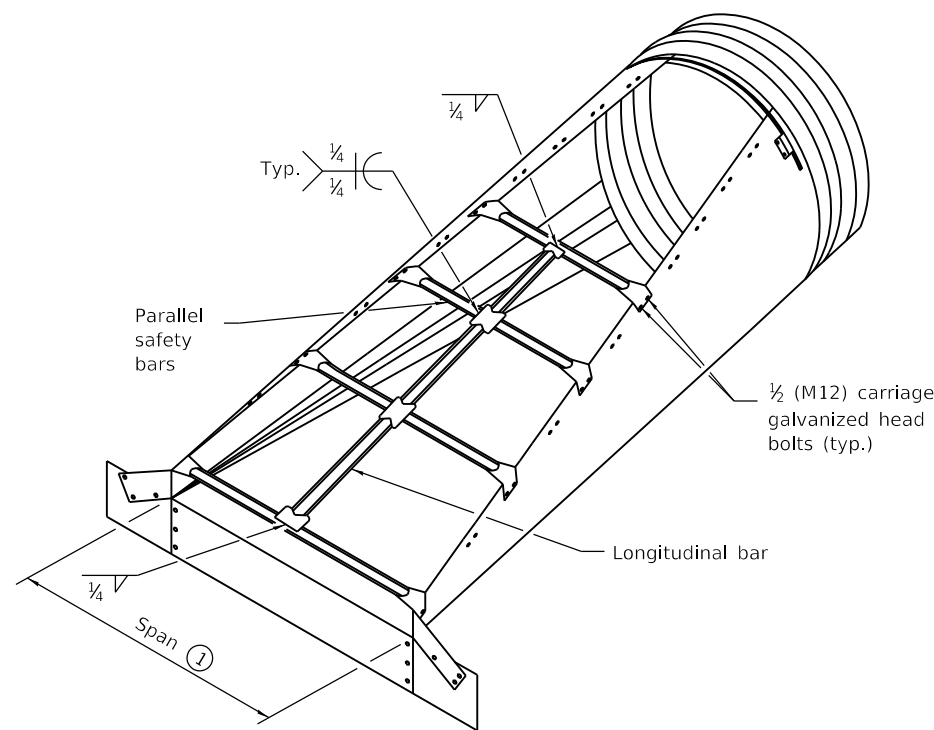
1 x 5/8 (25 x 16) slots



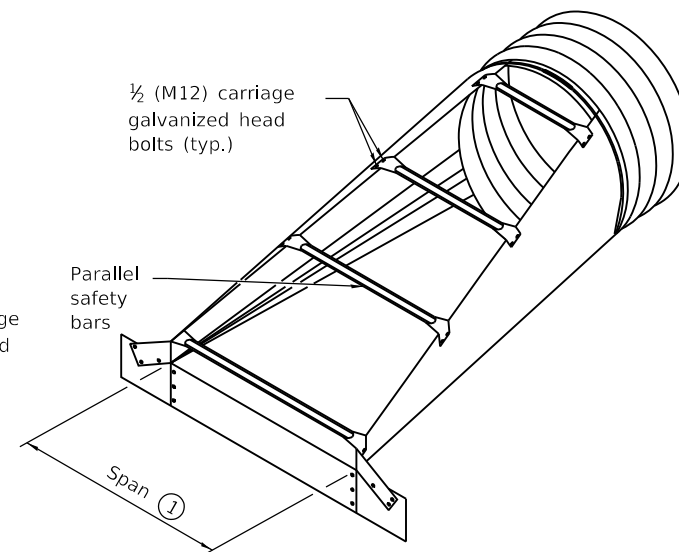
3 (75) galvanized steel pipe: flatten end, then bend outside 4 (100) to match end section sides.

**PARALLEL BARS**

**SAFETY BAR DETAILS**

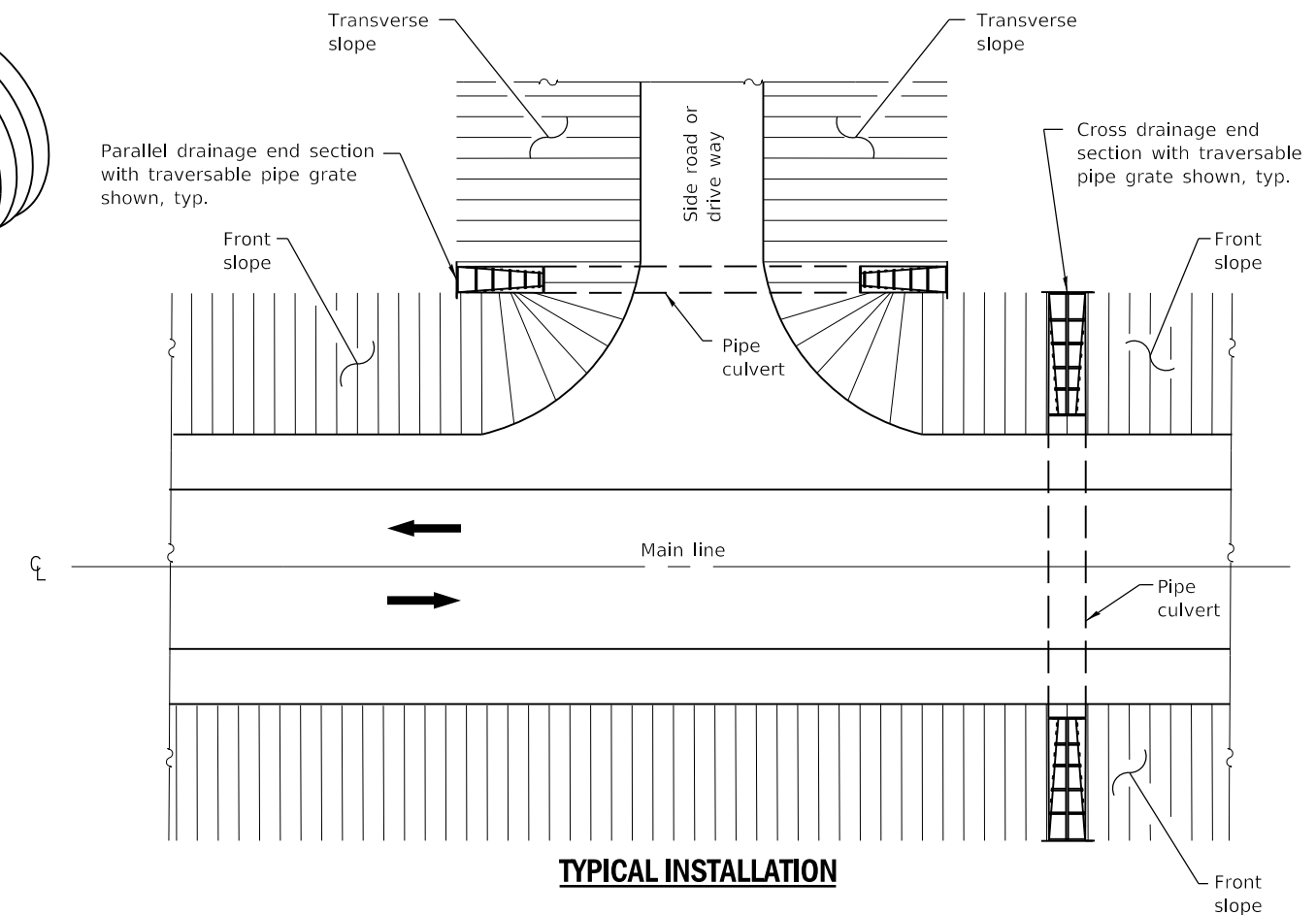


**CROSS DRAINAGE END SECTION**



**PARALLEL DRAINAGE  
END SECTION**

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

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

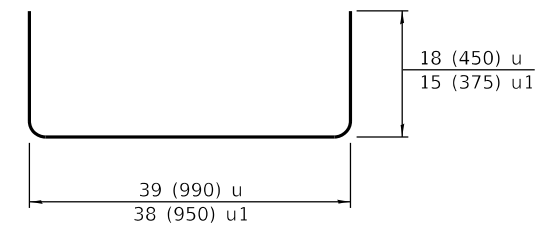
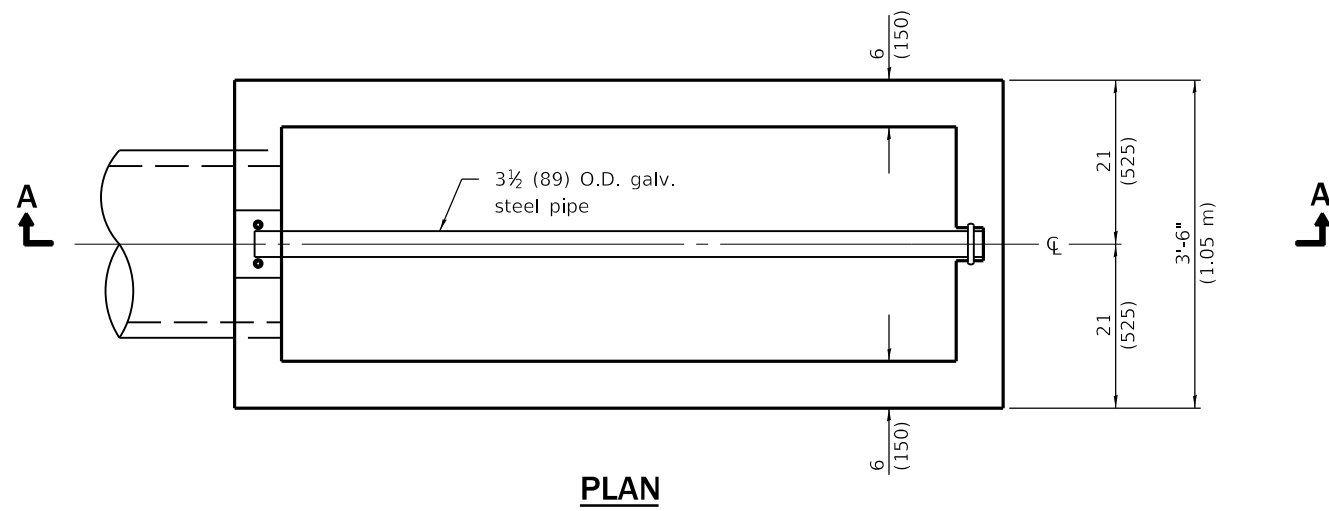
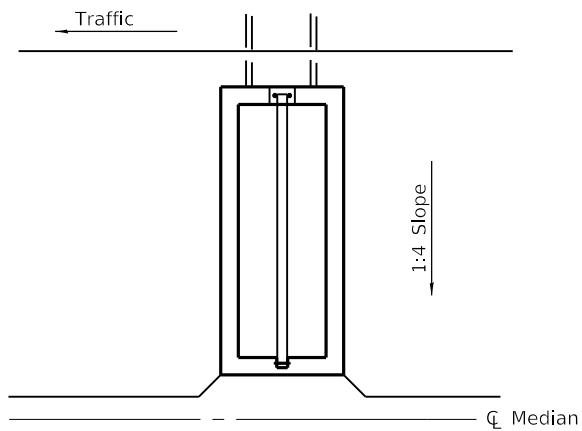
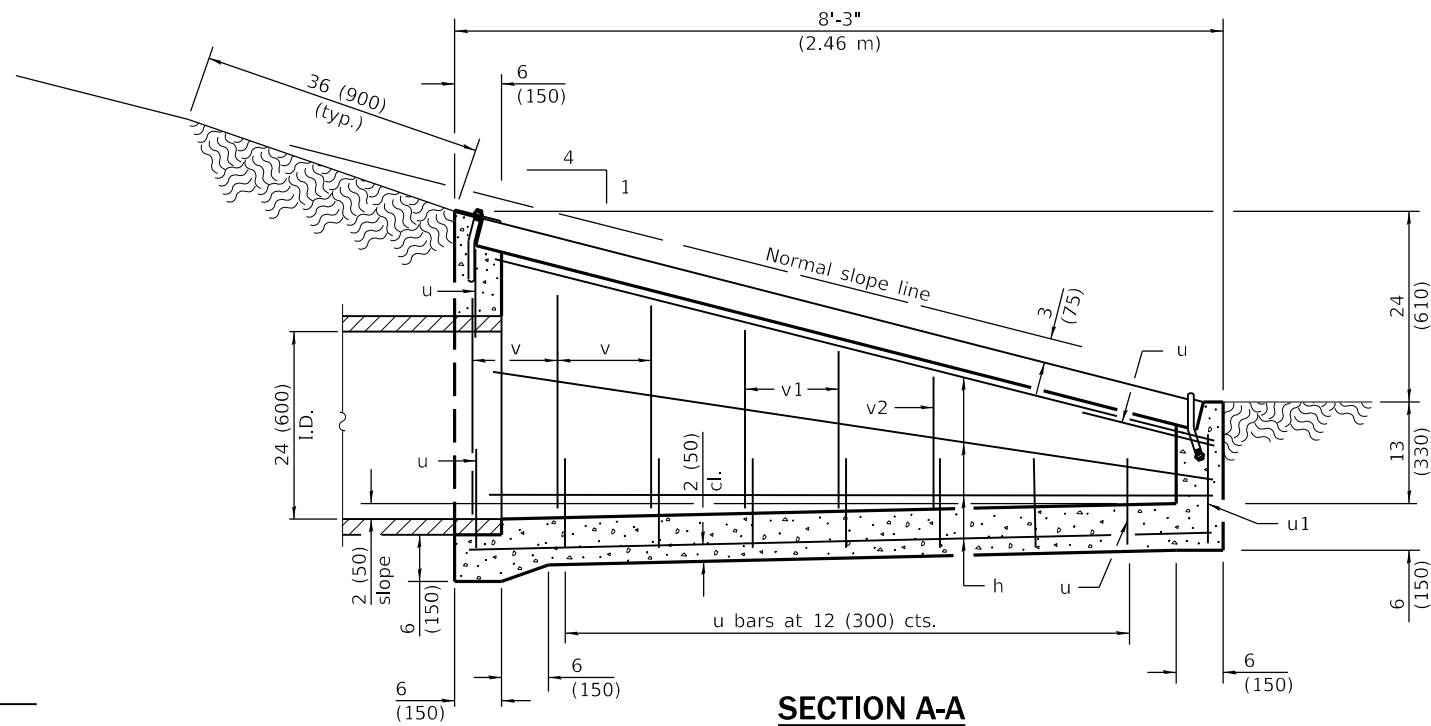
APPROVED January 1, 2018  
*Marcus M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18

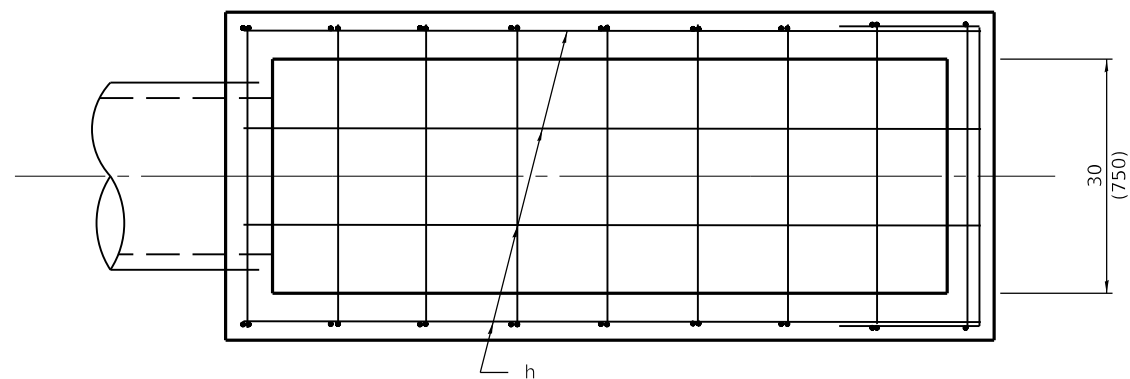
**SLOPED METAL END SECTIONS FOR PIPE  
ARCH CULVERTS 15" (375 mm) THRU  
72" (1800 mm) EQUIVALENT DIA.**

(Sheet 2 of 2)

**STANDARD 542416**



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



Material required for one inlet box

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

**Bars u & u1**

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

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

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

(Sheet 1 of 2)

**STANDARD 542501-02**

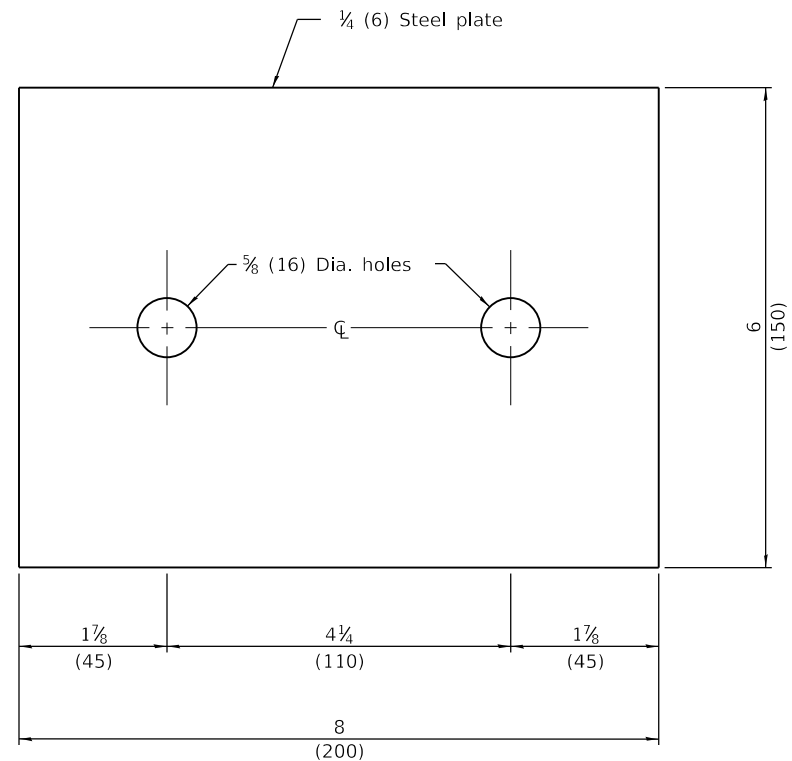
Illinois Department of Transportation

PASSED January 1, 2009  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009  
 ENGINEER OF DESIGN AND ENVIRONMENT

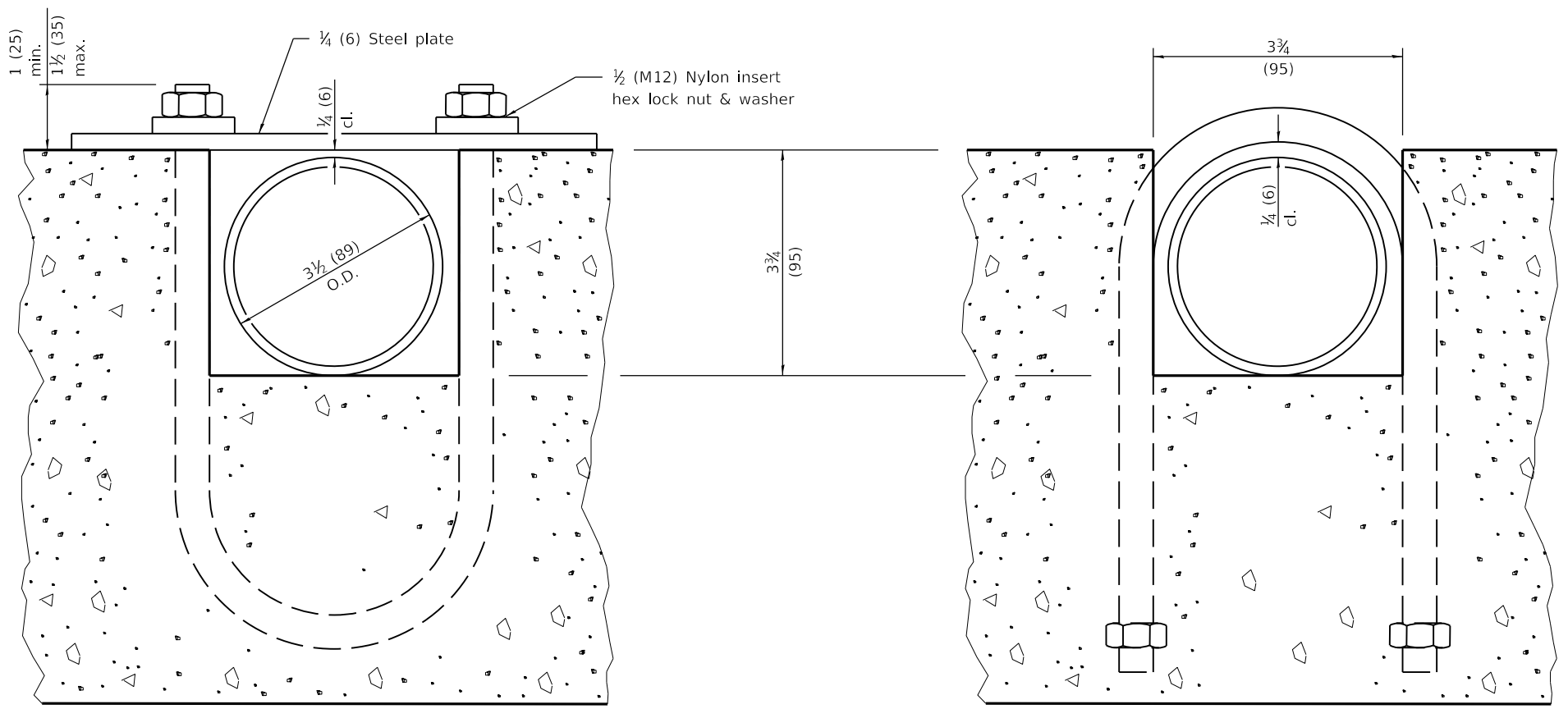
ISSUED 1-1-09





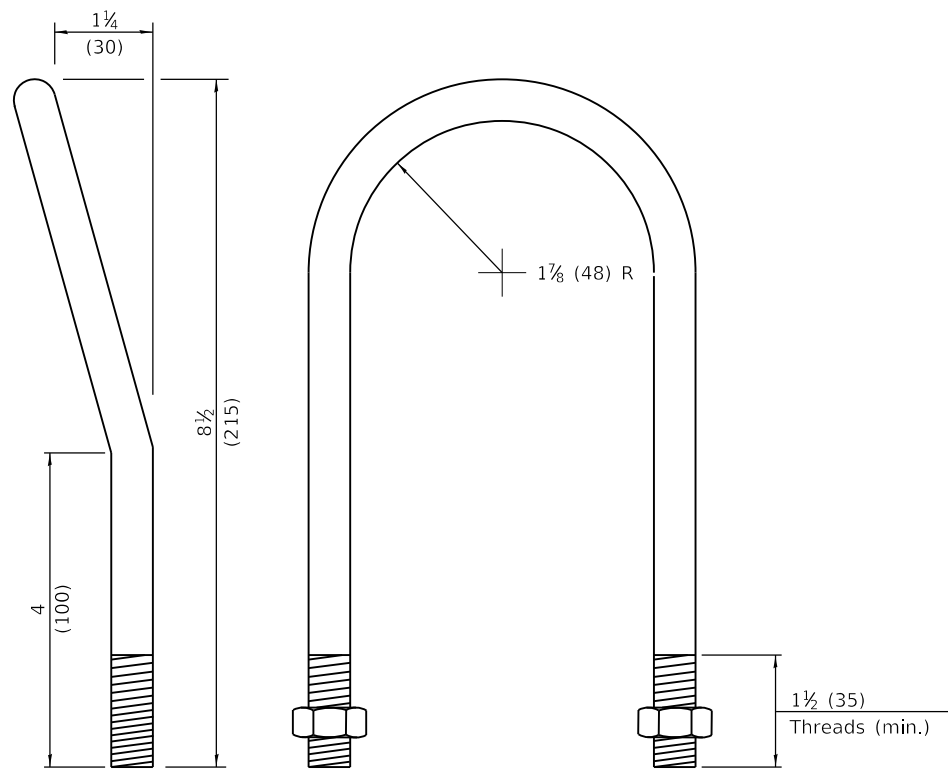
**TOP ANCHOR PLATE**

(1 - required)



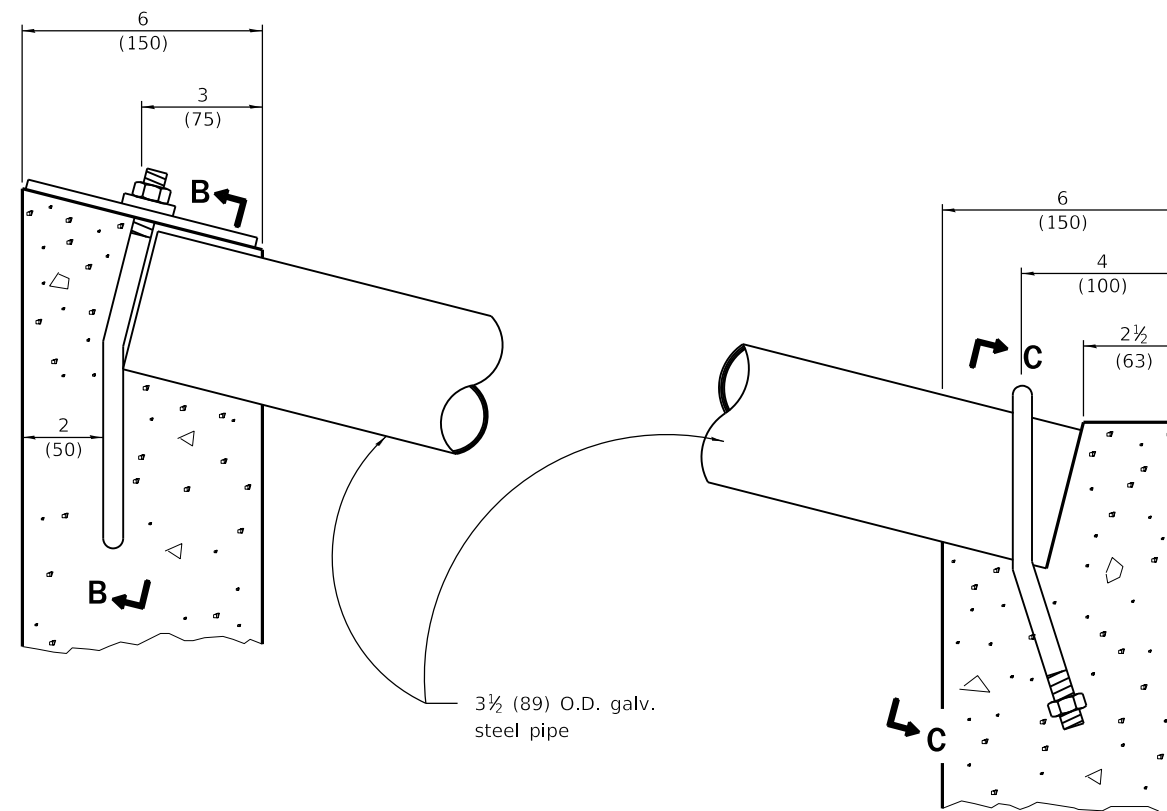
**SECTION B-B**

**SECTION C-C**



**1/2 (M12) U BOLT**

(2 - required)



**DETAIL AT BLOCKOUTS**

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

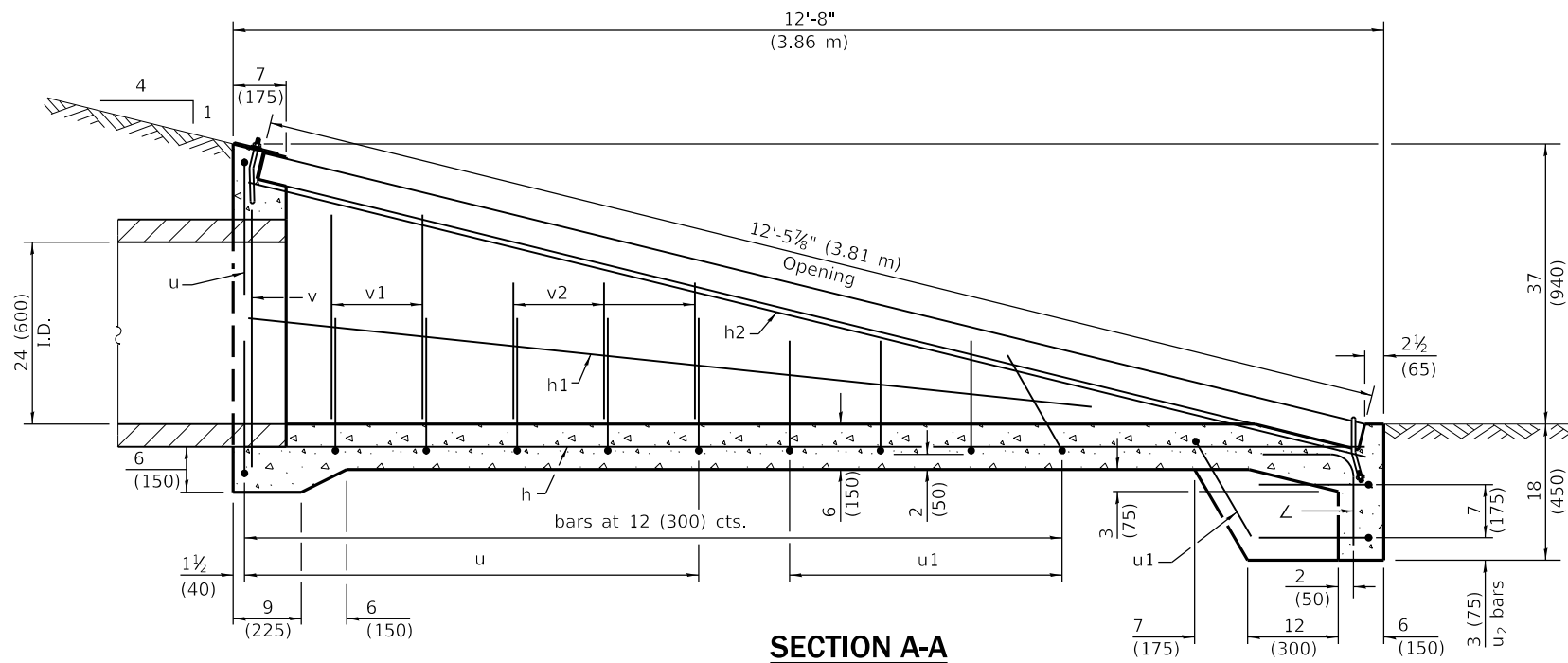
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

(Sheet 2 of 2)

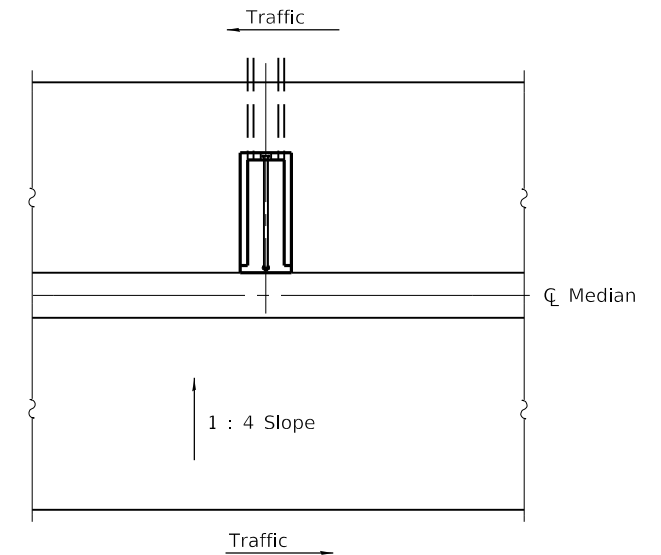
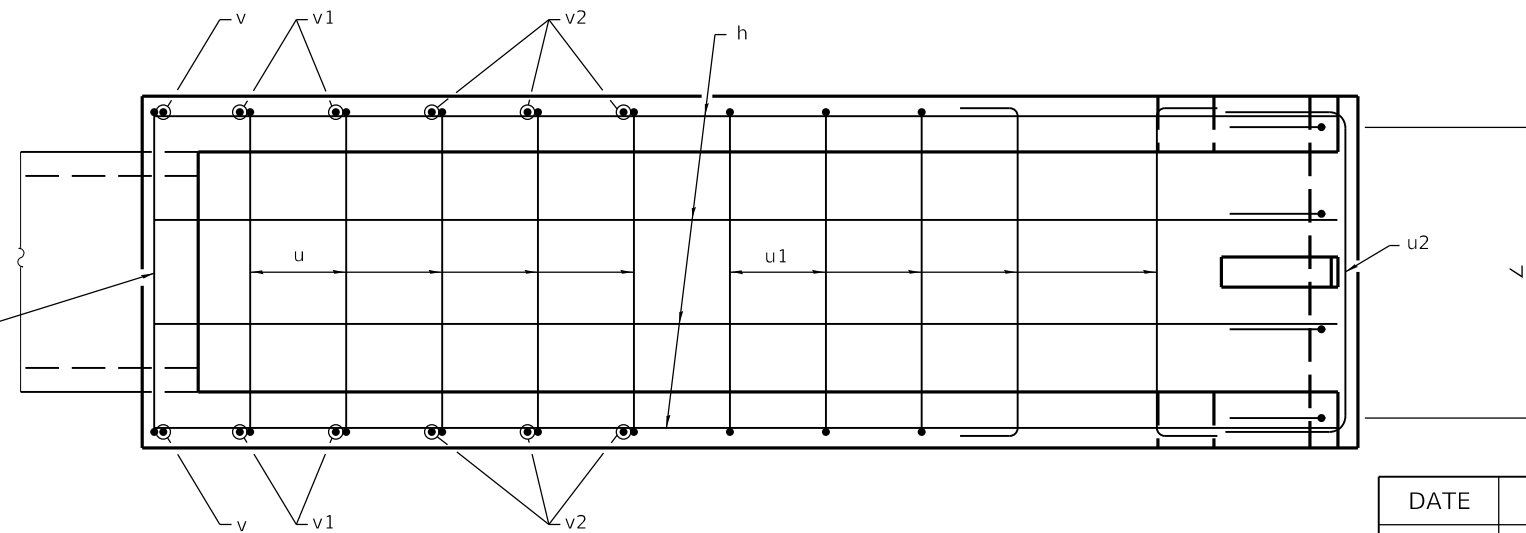
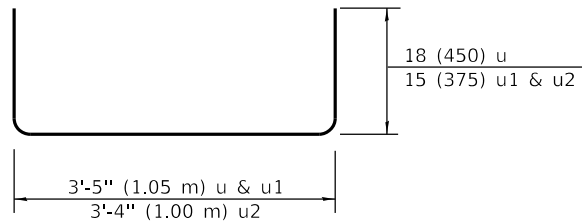
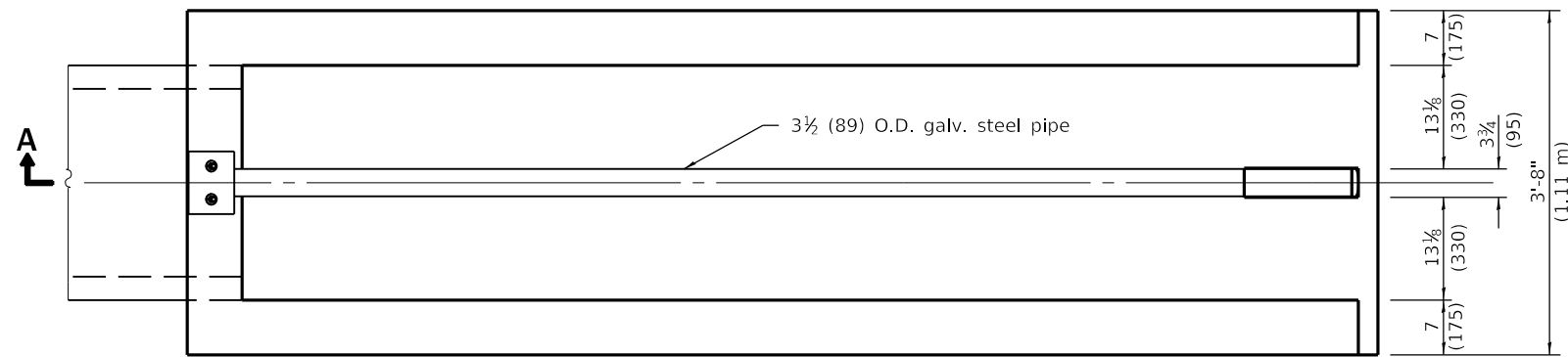
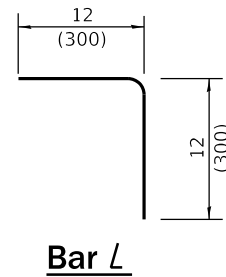
**STANDARD 542501-02**



**SECTION A-A**

Material required for one inlet box

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



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

**GENERAL NOTES**

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

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

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

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

(Sheet 1 of 2)

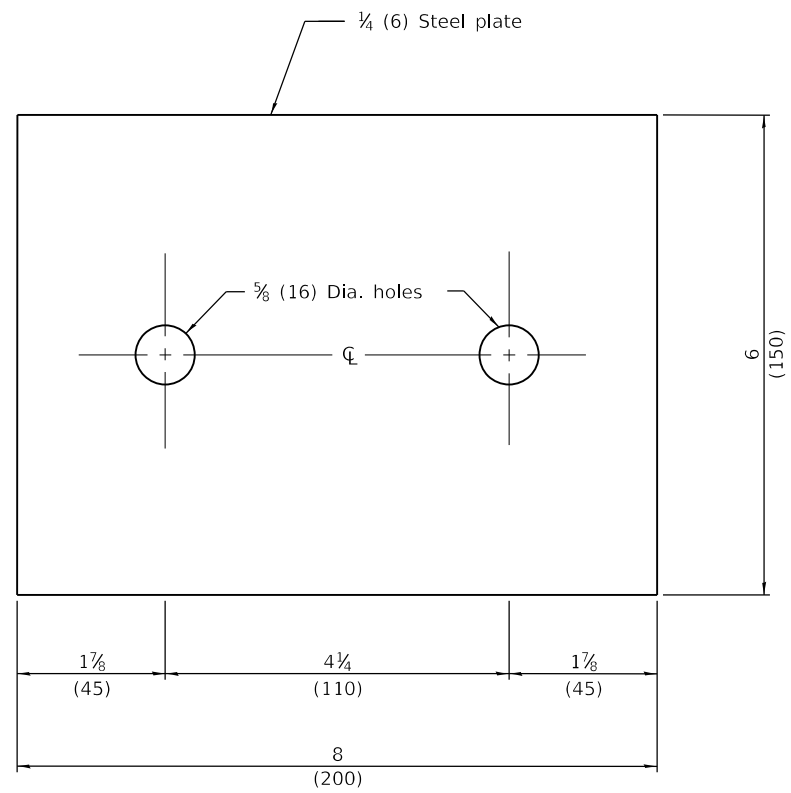
**STANDARD 542506-03**

Illinois Department of Transportation

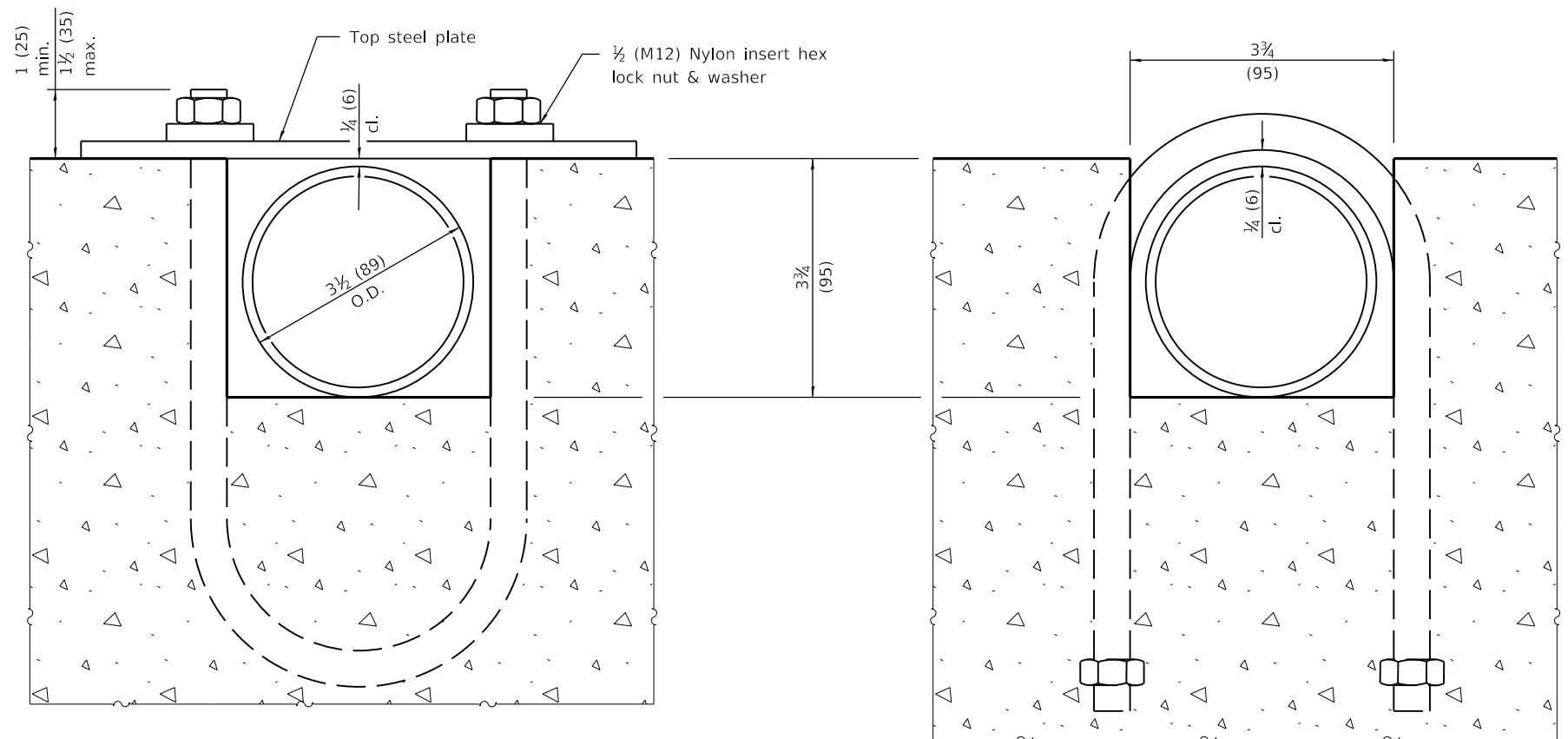
PASSED Michael Beard April 1, 2016  
ENGINEER OF POLICY AND PROCEDURES

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

ISSUED 1-1-09

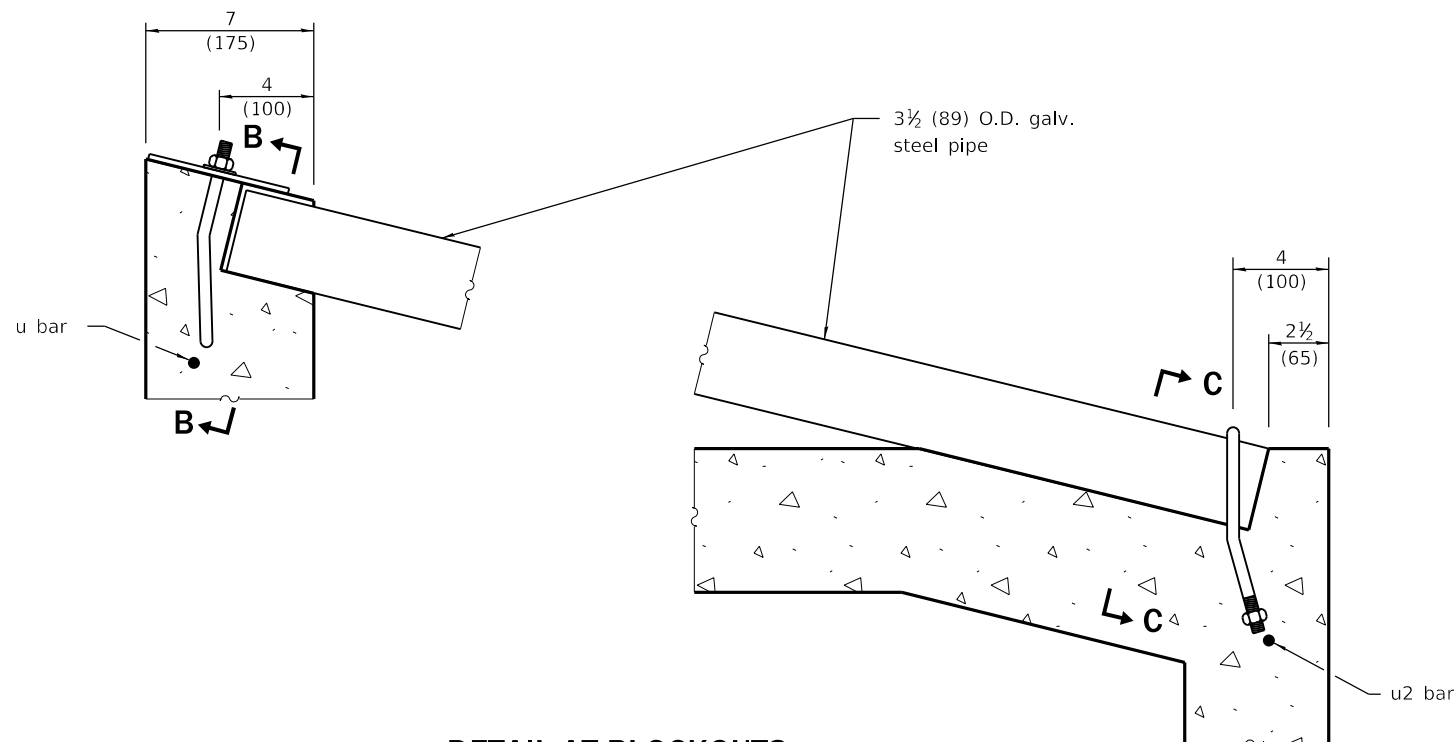


**TOP ANCHOR PLATE**  
(1 - required)

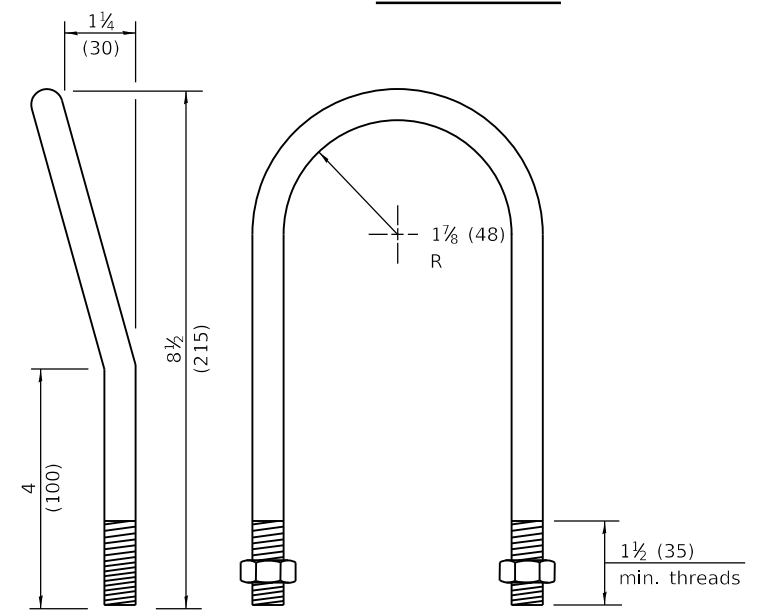


**SECTION B-B**

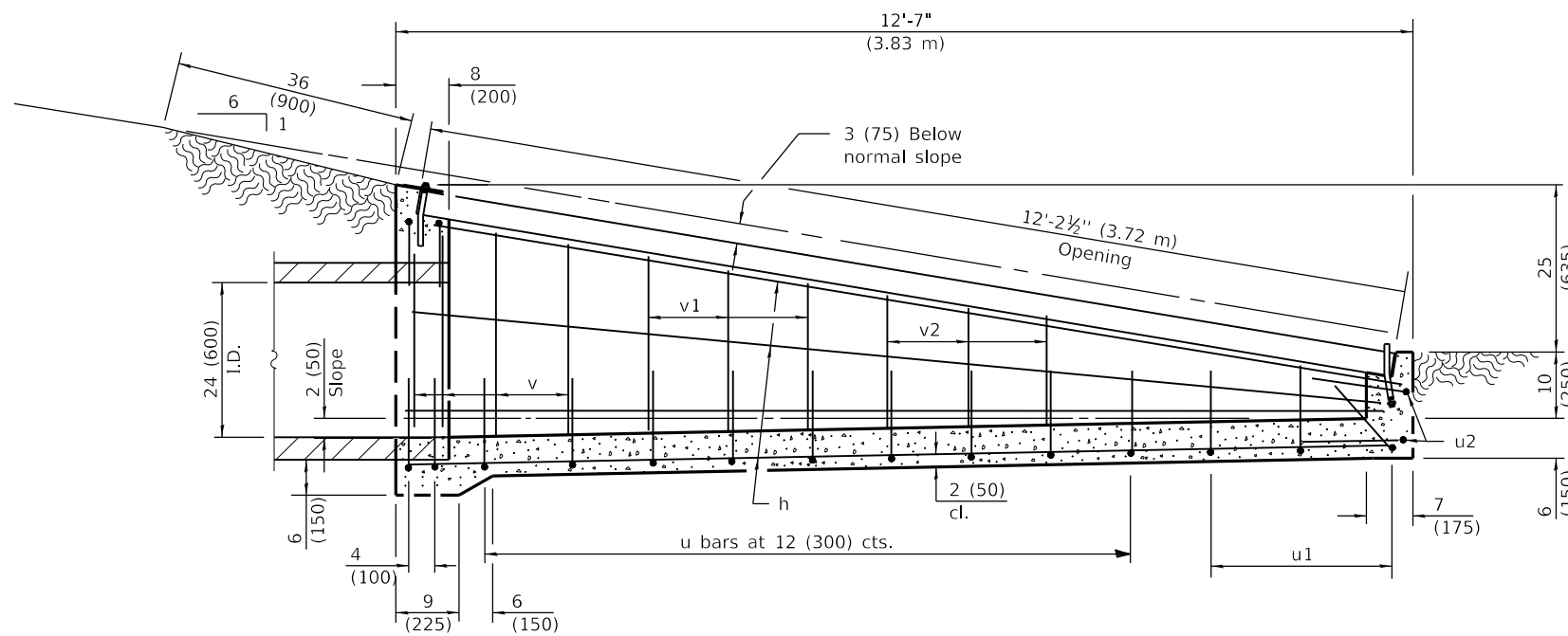
**SECTION C-C**



**DETAIL AT BLOCKOUTS**



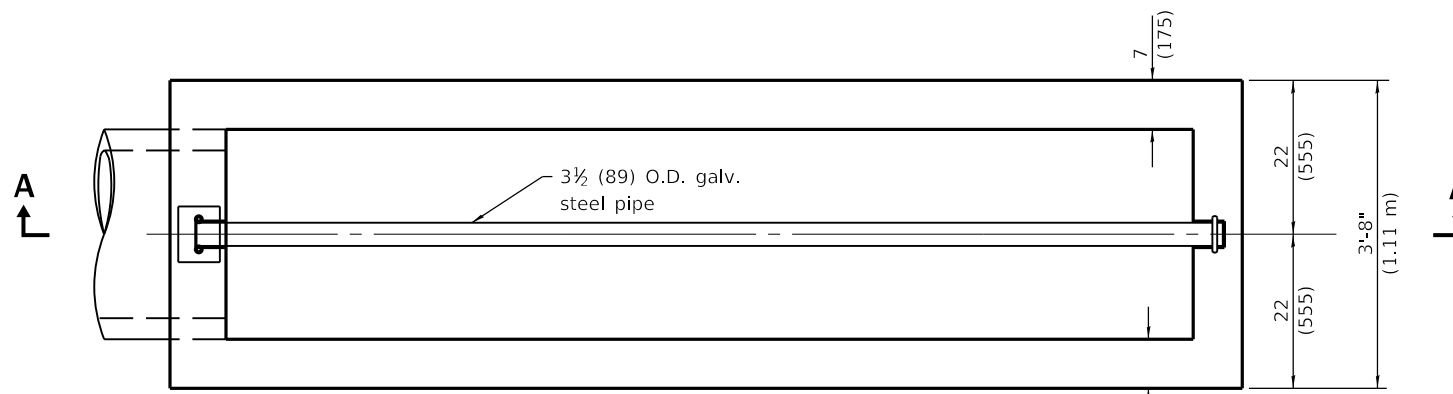
**1/2 (M12) U BOLT**  
(2 - required)



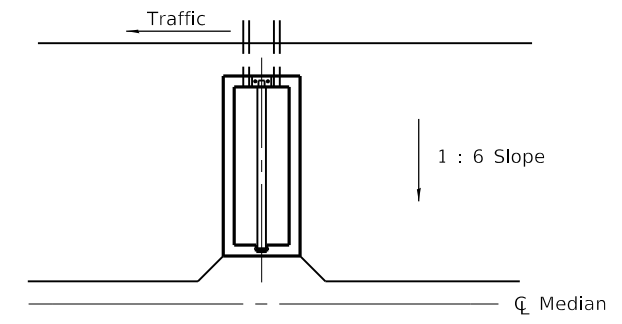
**SECTION A-A**

Material required for one inlet box

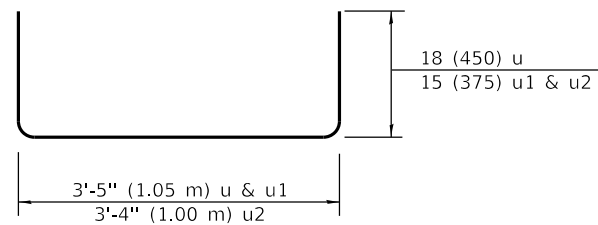
Bar	Qty.	Size	Length
h	10	No. 4 (No. 13)	12'-0" (3.65 m)
u	13	No. 4 (No. 13)	6'-5" (1.95 m)
u1	3	No. 4 (No. 13)	5'-11" (1.80 m)
u2	2	No. 4 (No. 13)	5'-10" (1.75 m)
v	8	No. 4 (No. 13)	30 (760)
v1	6	No. 4 (No. 13)	24 (610)
v2	6	No. 4 (No. 13)	18 (460)
Concrete		cu. yds. (m <sup>3</sup> )	1.9 (1.45)
Reinf.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



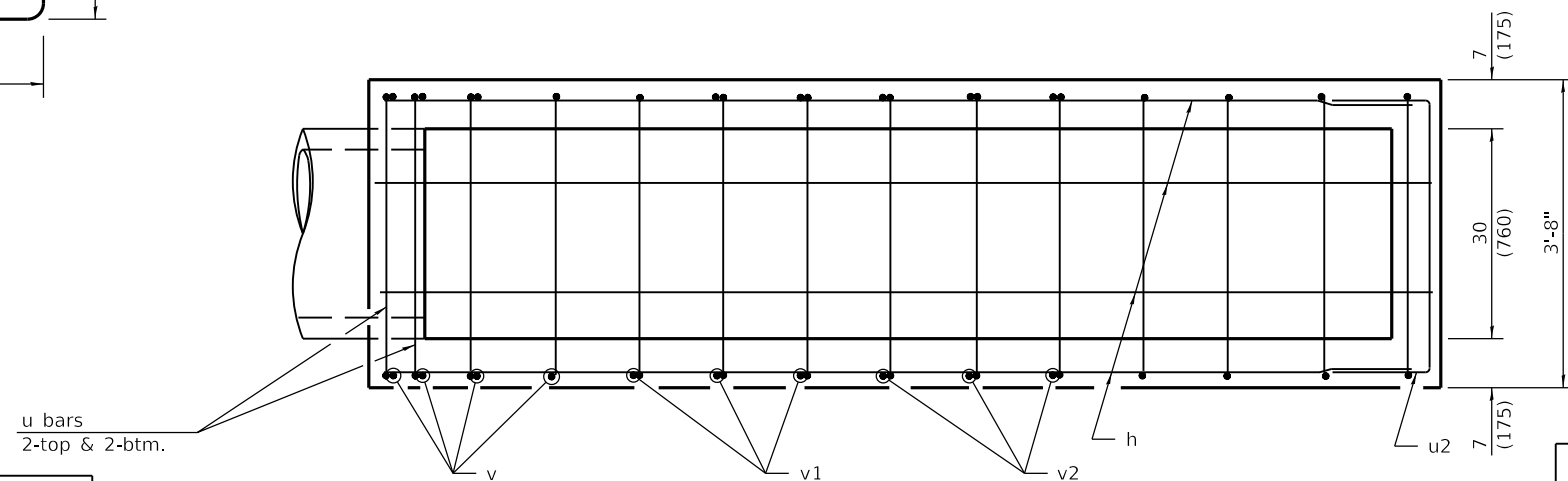
**PLAN**



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



**Bars u, u1 & u2**



**PLAN OF REINFORCEMENT**

**GENERAL NOTES**

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

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

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

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

(Sheet 1 of 2)

**STANDARD 542511-02**

Illinois Department of Transportation

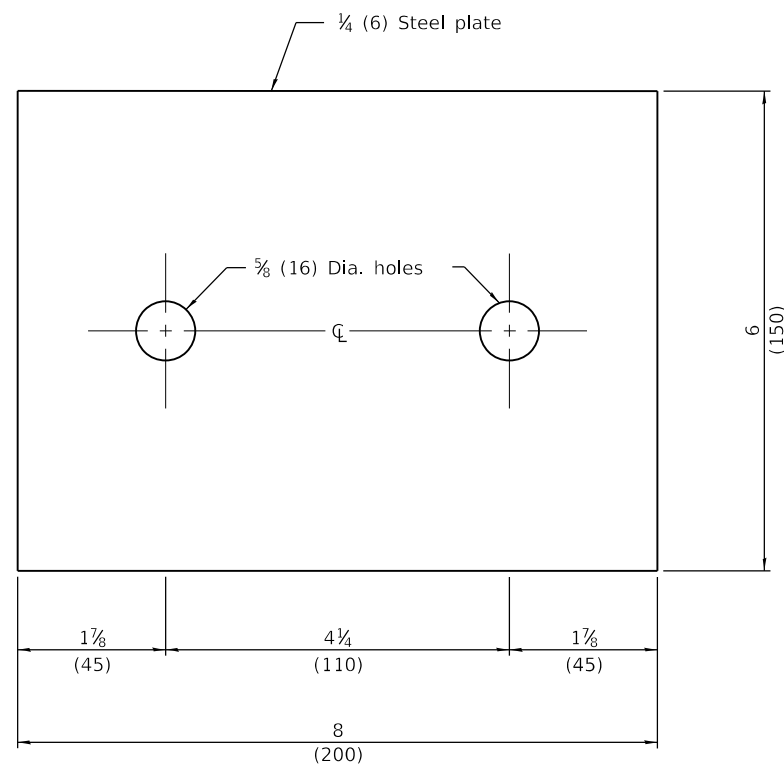
PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

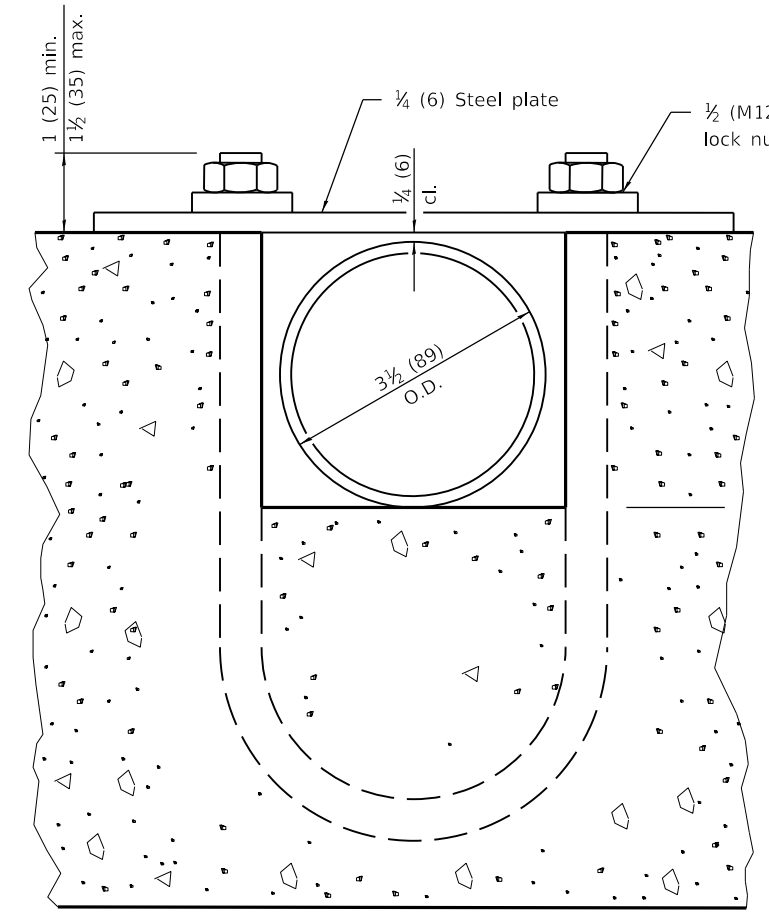
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

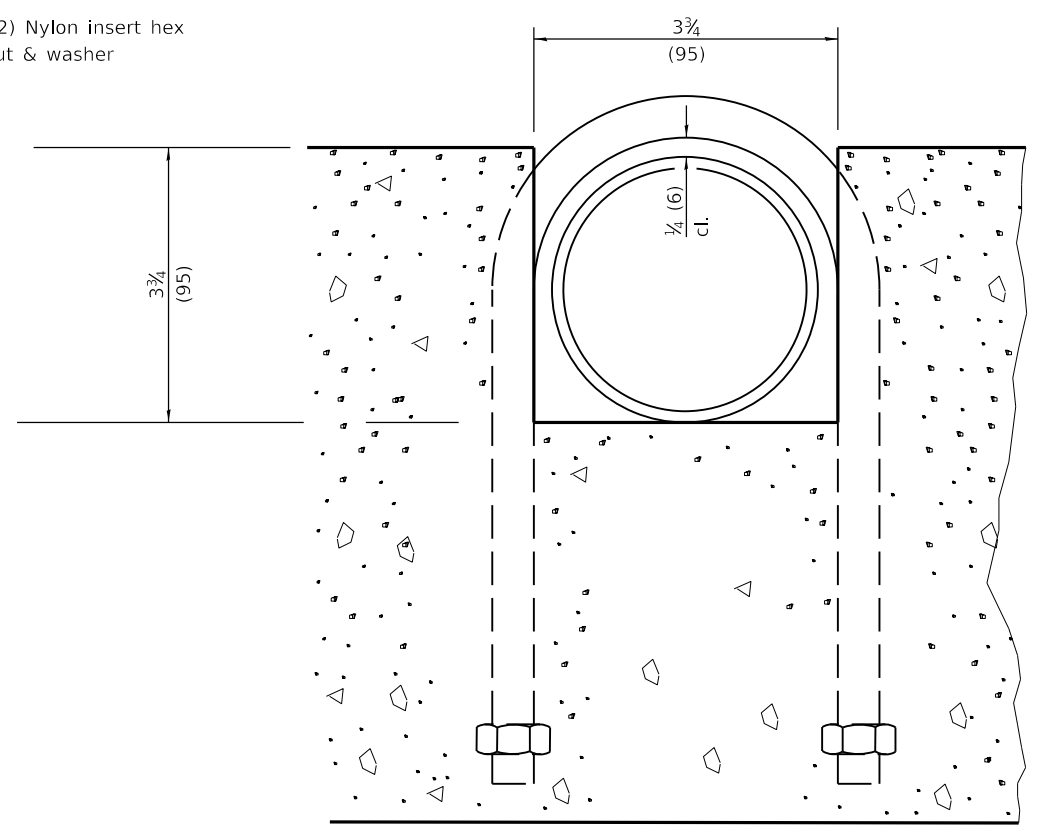
ISSUED 1-1-07



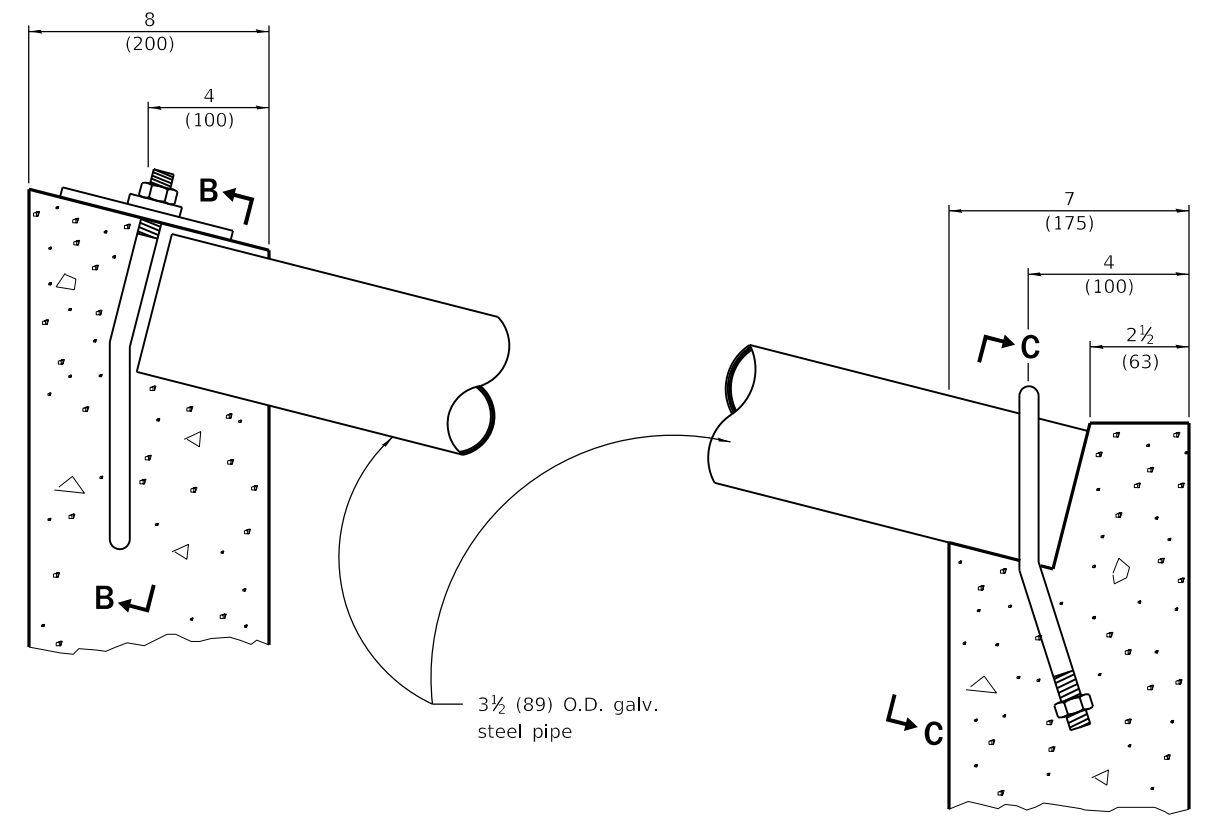
**TOP ANCHOR PLATE**  
(1 - required)



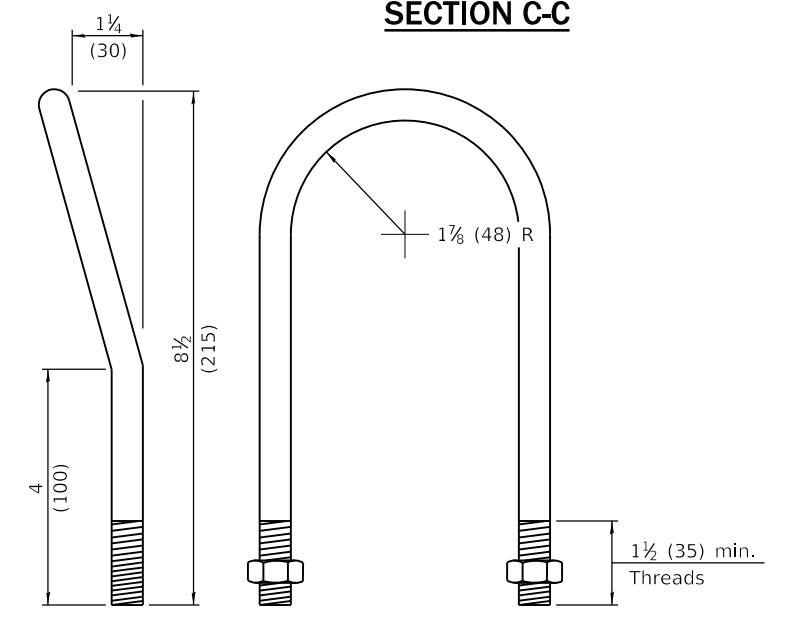
**SECTION B-B**



**SECTION C-C**



**DETAIL AT BLOCKOUTS**

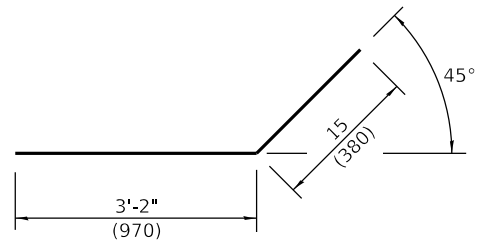


**1/2 (M12) U BOLT**  
(2 - required)

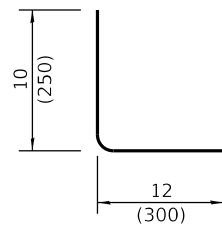
Illinois Department of Transportation  
 PASSED January 1, 2009  
 ENGINEER OF POLICY AND PROCEDURES  
 APPROVED January 1, 2009  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

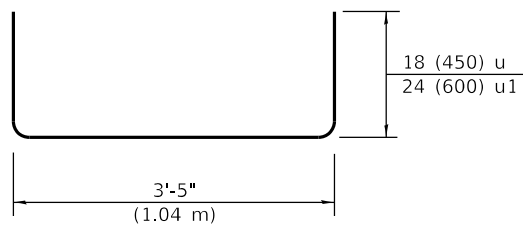
**INLET BOX**  
**TYPE 24 (600) C**  
 (Sheet 2 of 2)  
**STANDARD 542511-02**



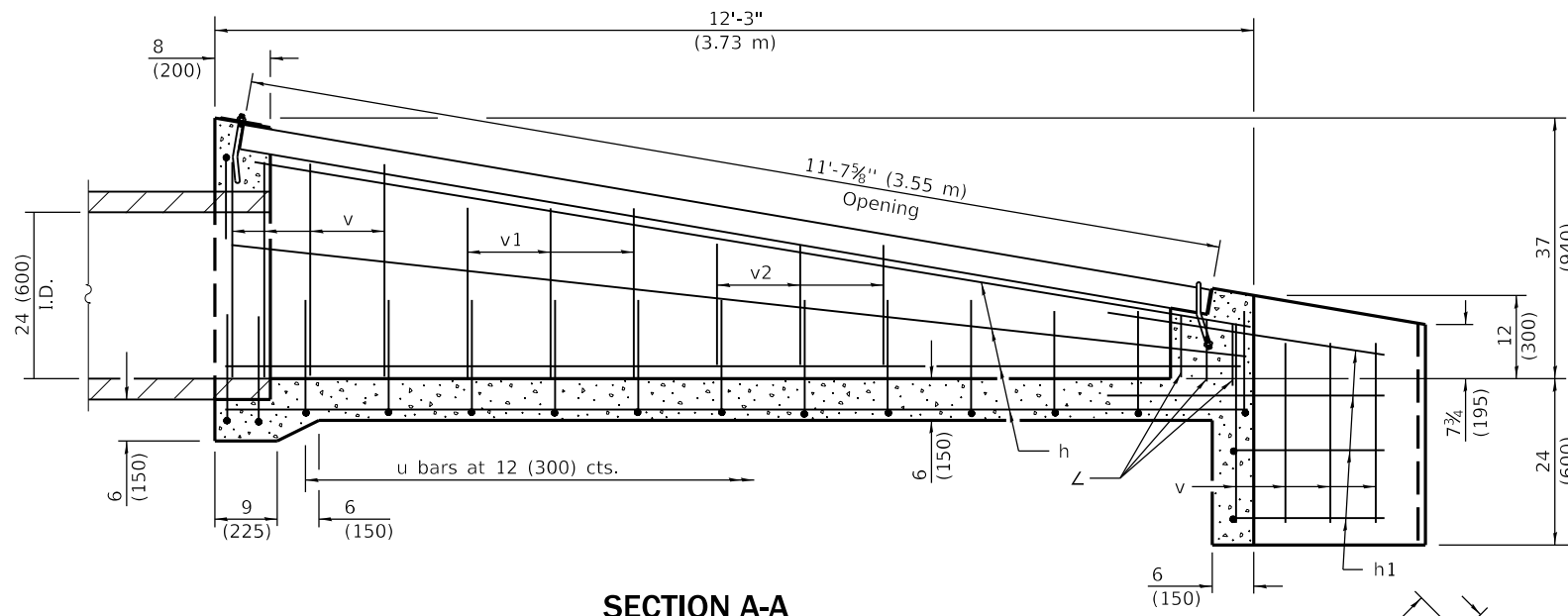
**Bar h1**



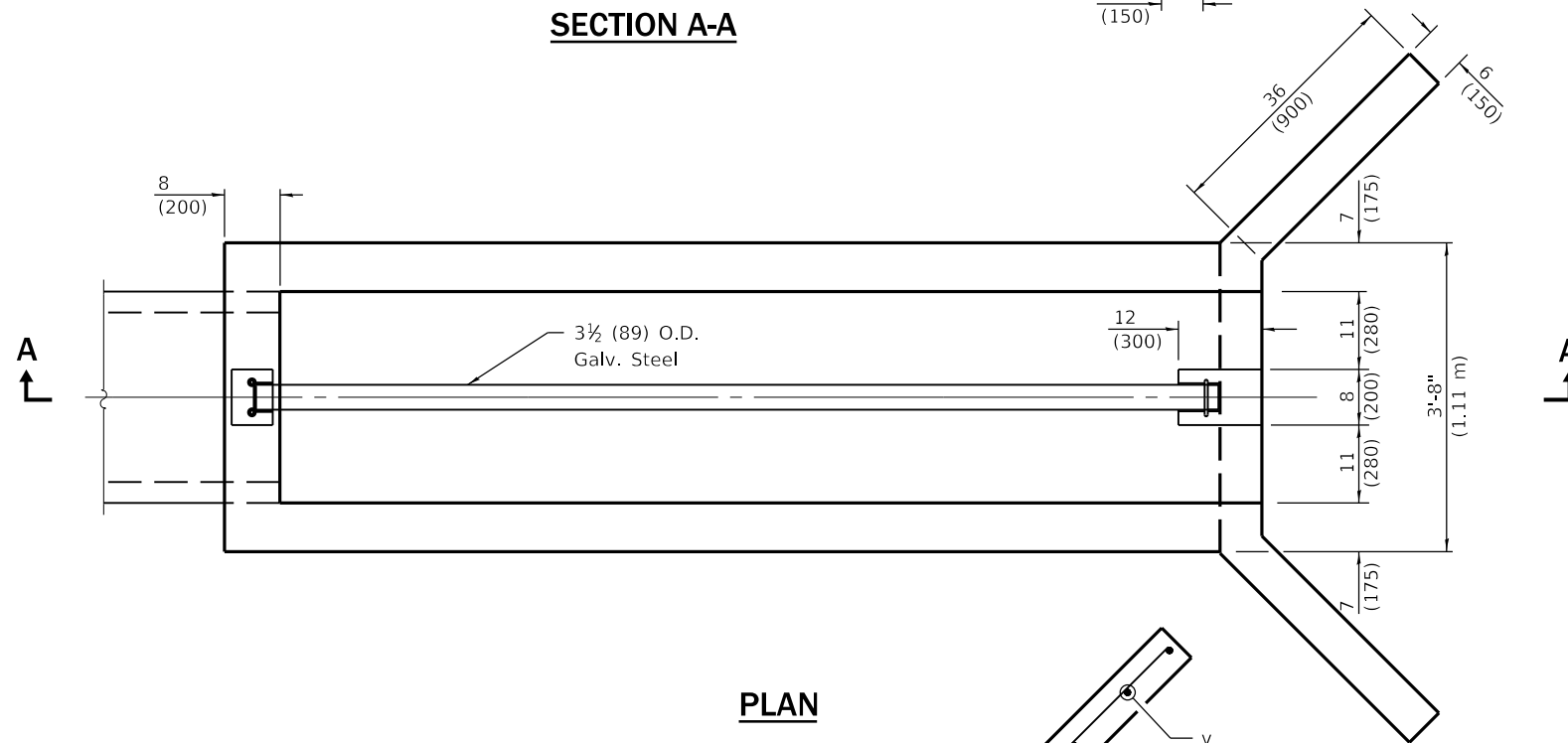
**Bar L**



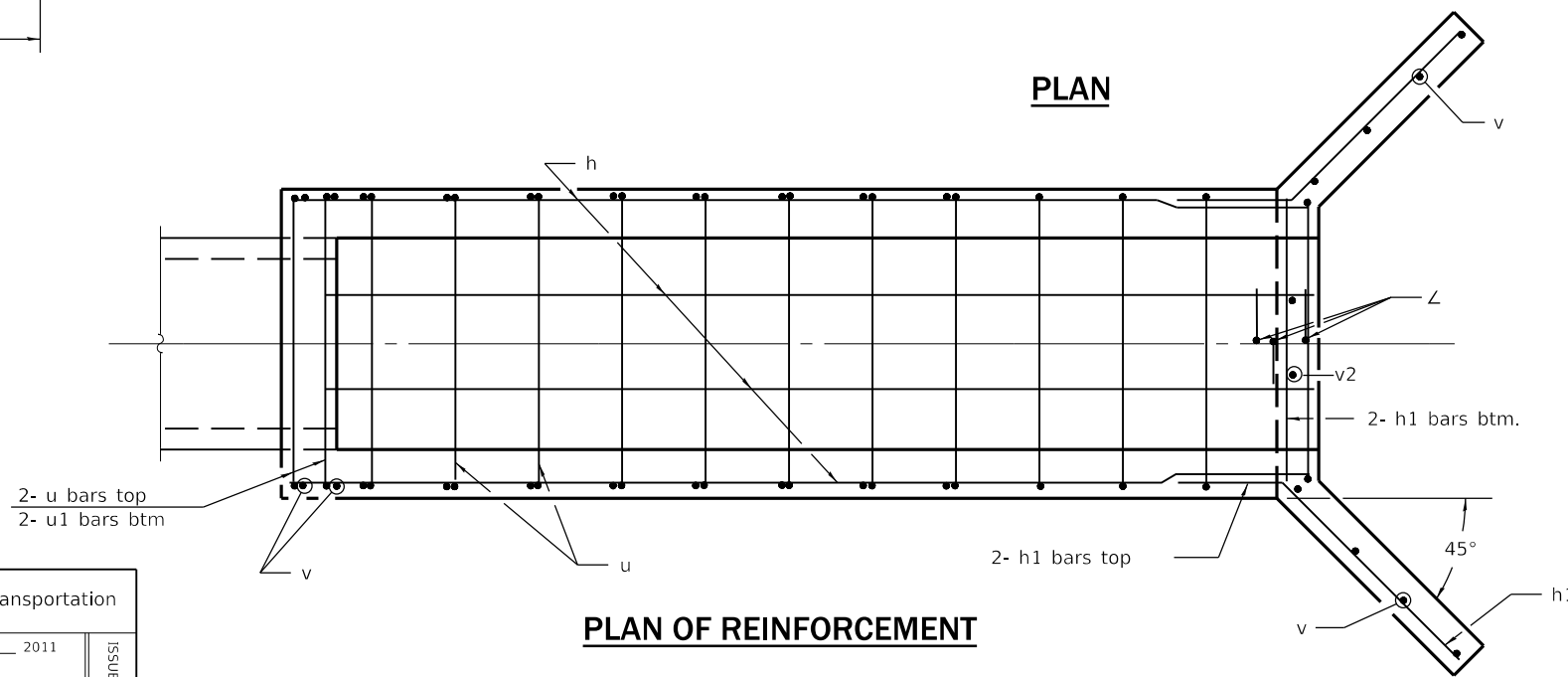
**Bar u & u1**



**SECTION A-A**



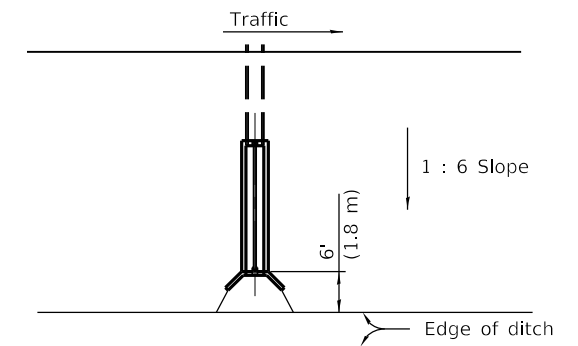
**PLAN**



**PLAN OF REINFORCEMENT**

Material required for one inlet box

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



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

**GENERAL NOTES**

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

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

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

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

(Sheet 1 of 2)

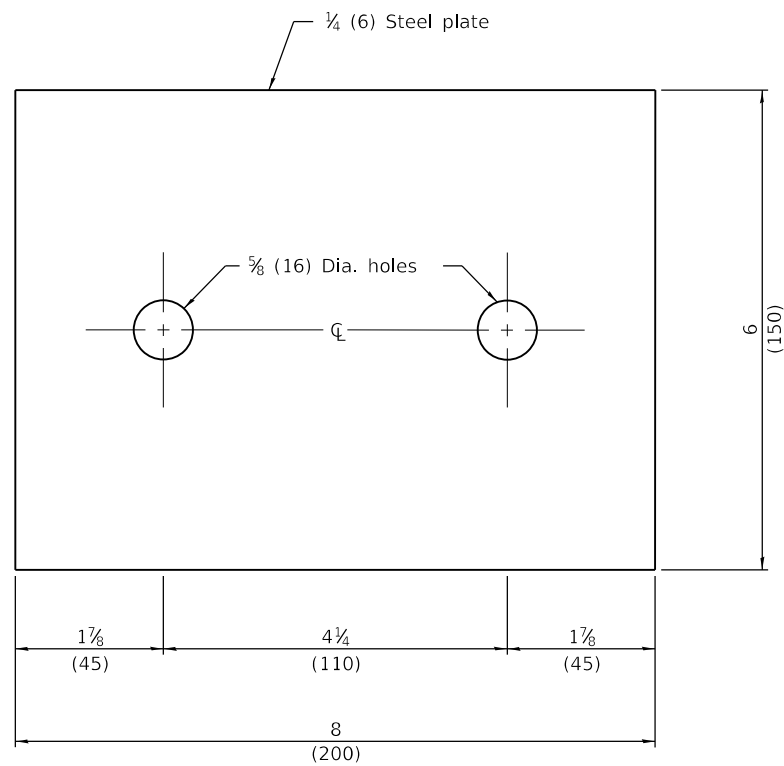
**STANDARD 542516-03**

Illinois Department of Transportation

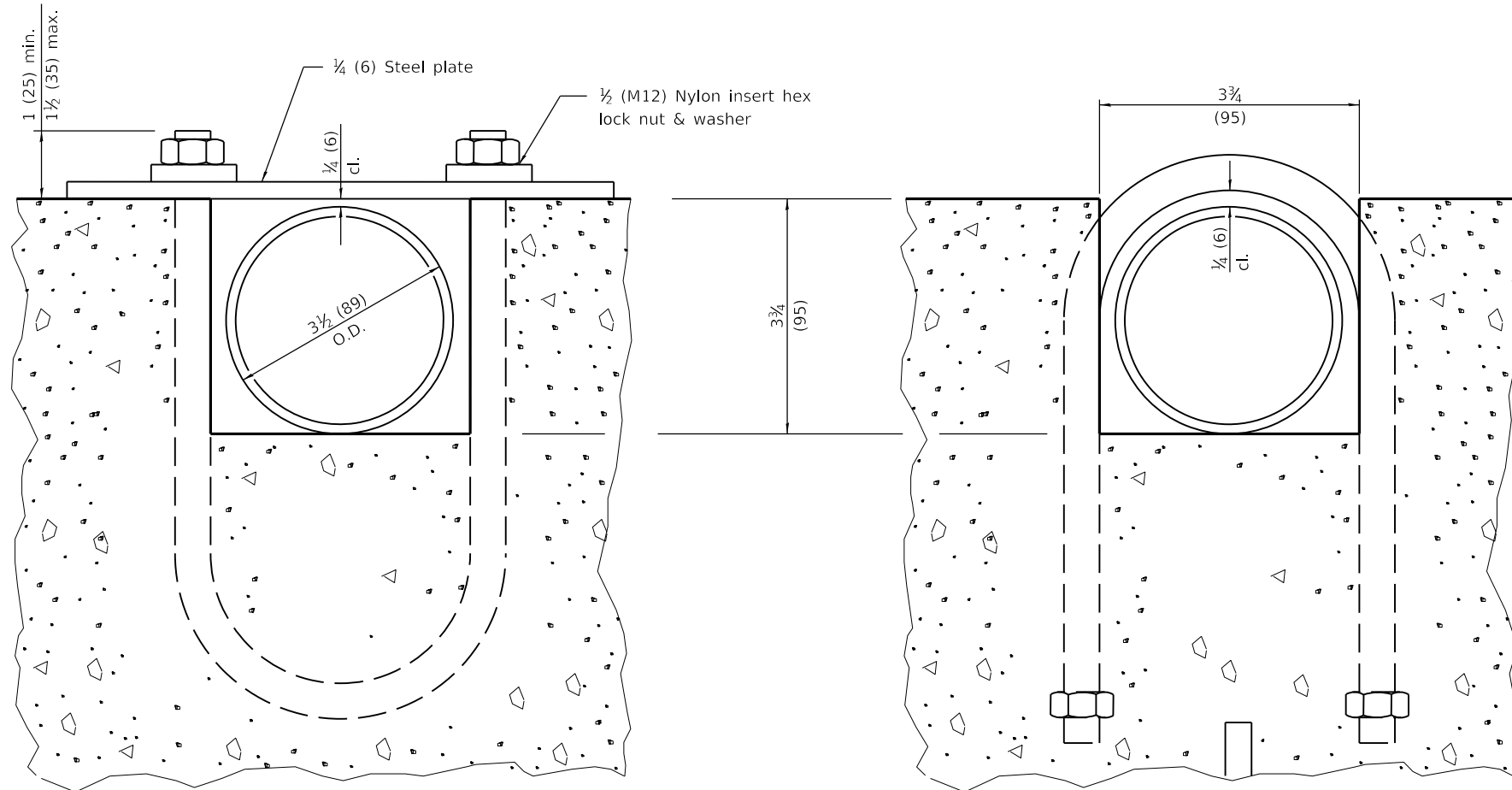
PASSED January 1, 2011  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2011  
*Scott Schick*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

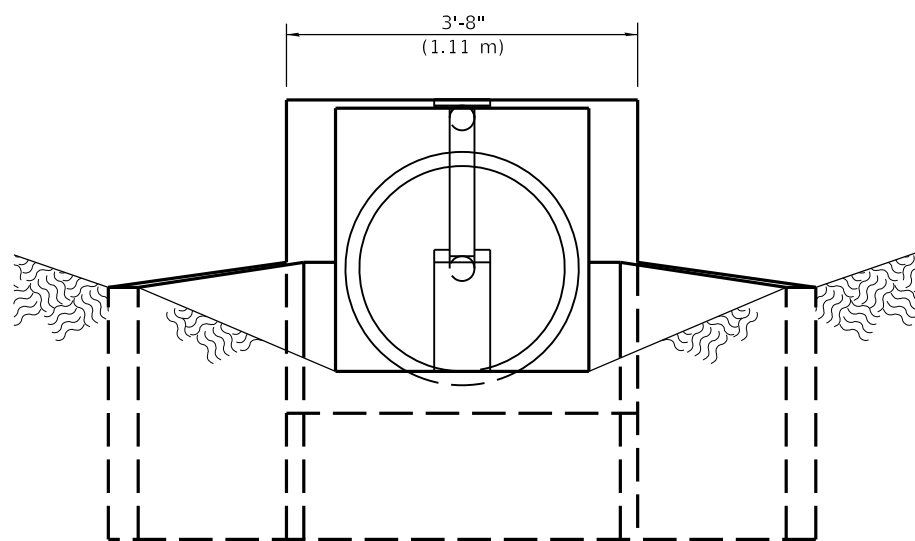


**TOP ANCHOR PLATE**  
(1-required)

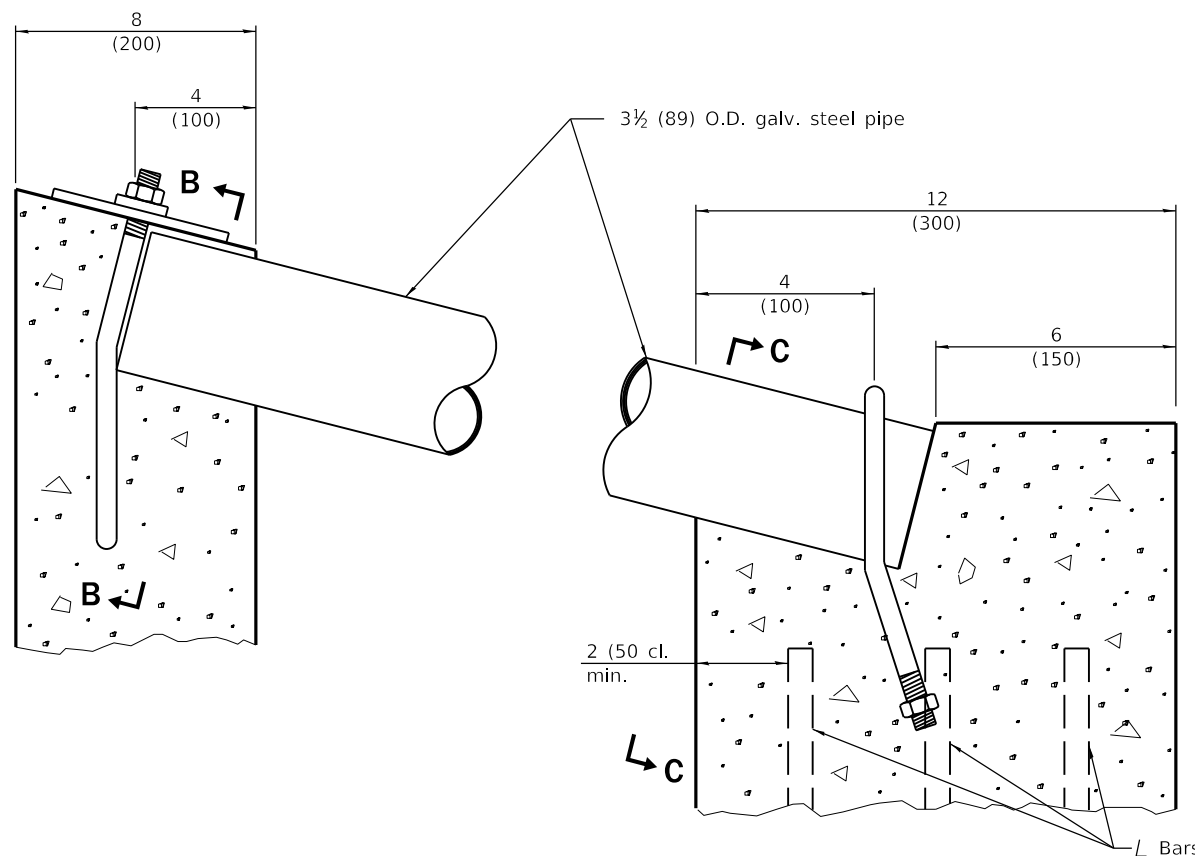


**SECTION B-B**

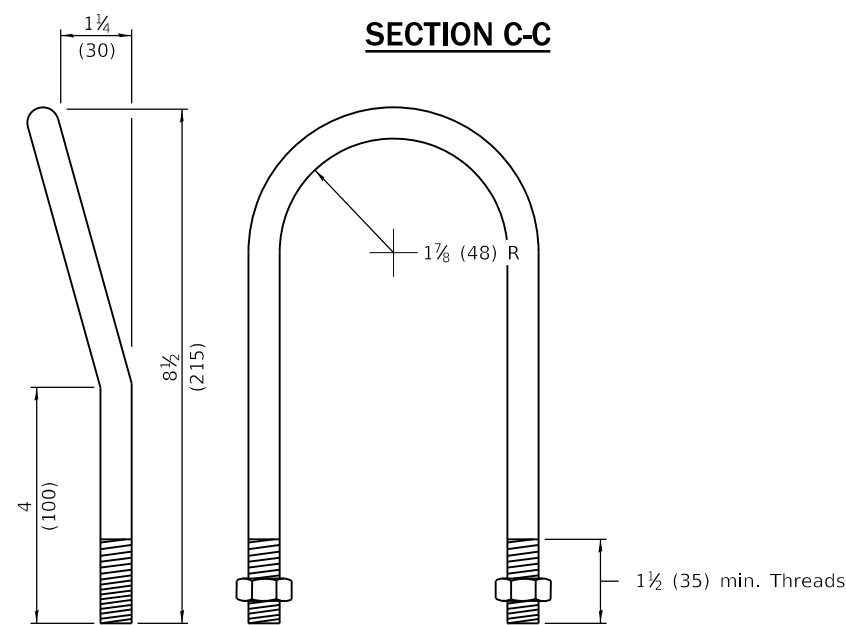
**SECTION C-C**



**END VIEW**



**DETAIL AT BLOCKOUTS**



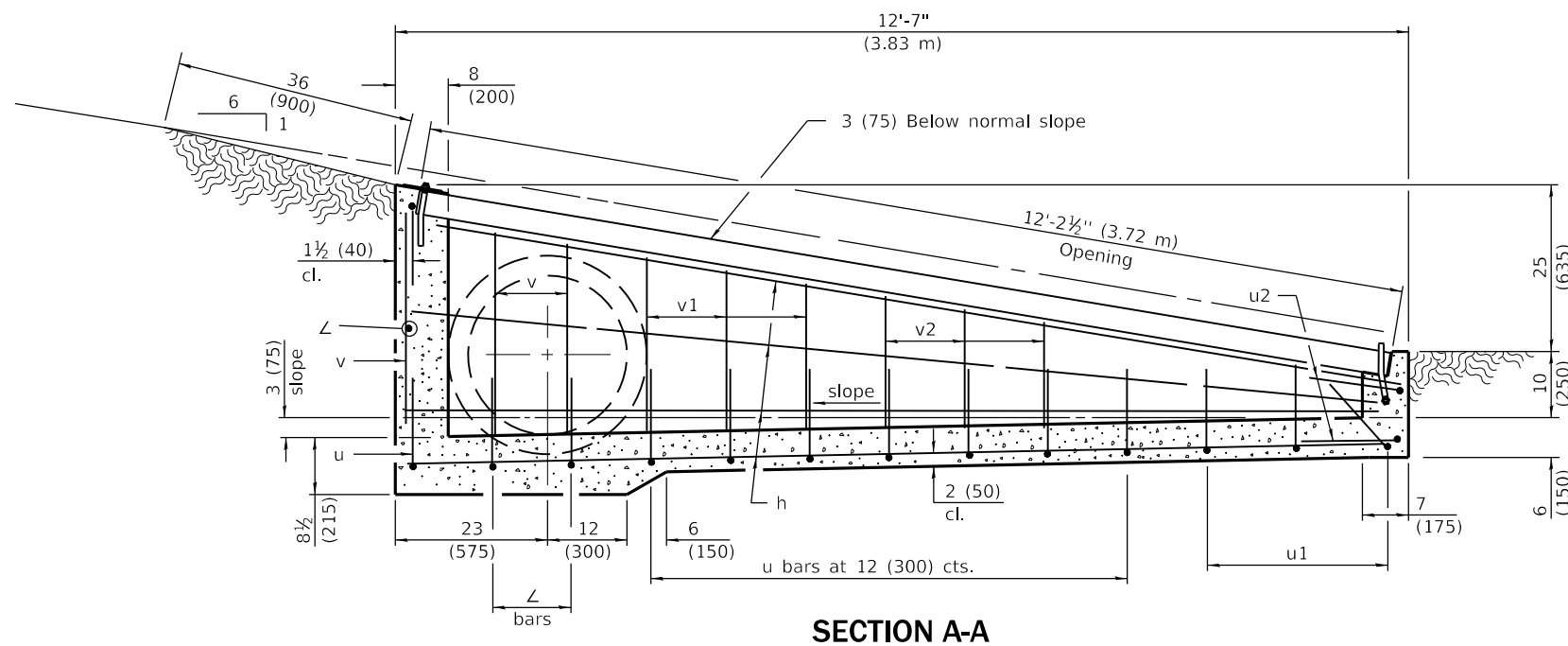
**1/2 (M12) U BOLT**  
(2-required)

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

(Sheet 2 of 2)

**STANDARD 542516-03**

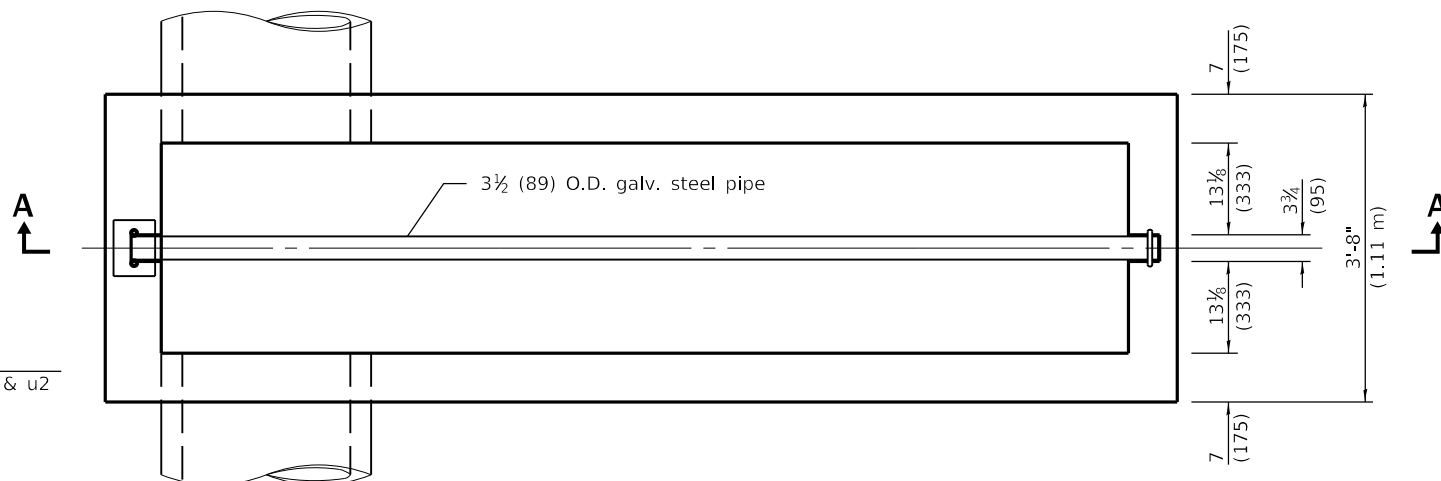
	Illinois Department of Transportation	
	PASSED	January 1, 2011
	ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2011	ISSUED 1-1-97
ENGINEER OF DESIGN AND ENVIRONMENT		



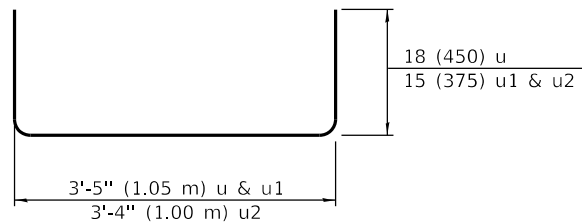
**SECTION A-A**

Material required for one inlet box

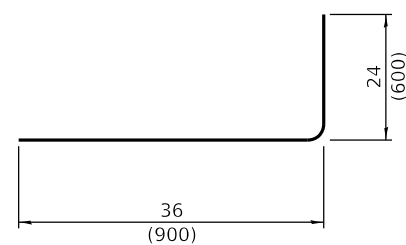
Bar	Qty.	Size	Length
h	8	No. 4 (No. 13)	12'-0" (3.66 m)
h1	2	No. 4 (No. 13)	9'-0" (2.75 m)
L	5	No. 4 (No. 13)	5'-0" (1.50 m)
u	9	No. 4 (No. 13)	6'-5" (1.95 m)
u1	3	No. 4 (No. 13)	5'-11" (1.80 m)
u2	2	No. 4 (No. 13)	5'-10" (1.75 m)
v	6	No. 4 (No. 13)	30 (760)
v1	6	No. 4 (No. 13)	24 (610)
v2	6	No. 4 (No.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



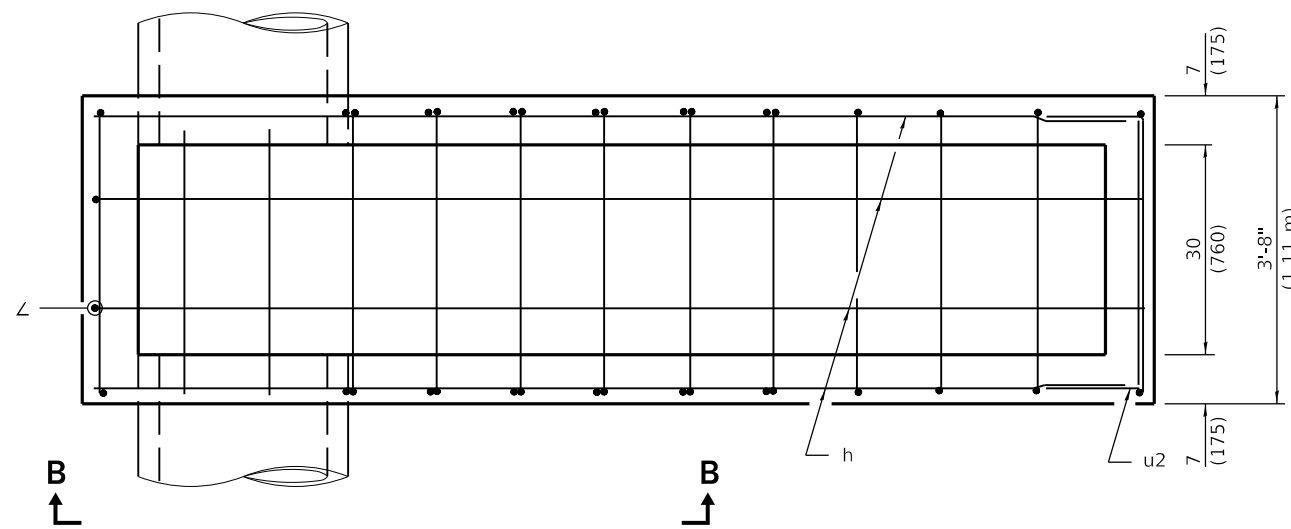
**PLAN**



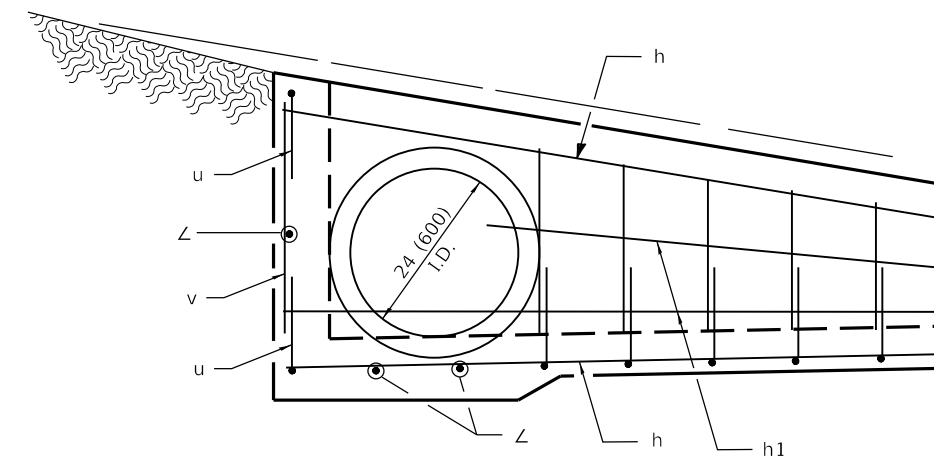
**Bars u, u1 & u2**



**Bar L**



**PLAN OF REINFORCEMENT**



**SECTION B-B**

**GENERAL NOTES**

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

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

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

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

(Sheet 1 of 2)

**STANDARD 542521-02**

Illinois Department of Transportation

PASSED January 1, 2009

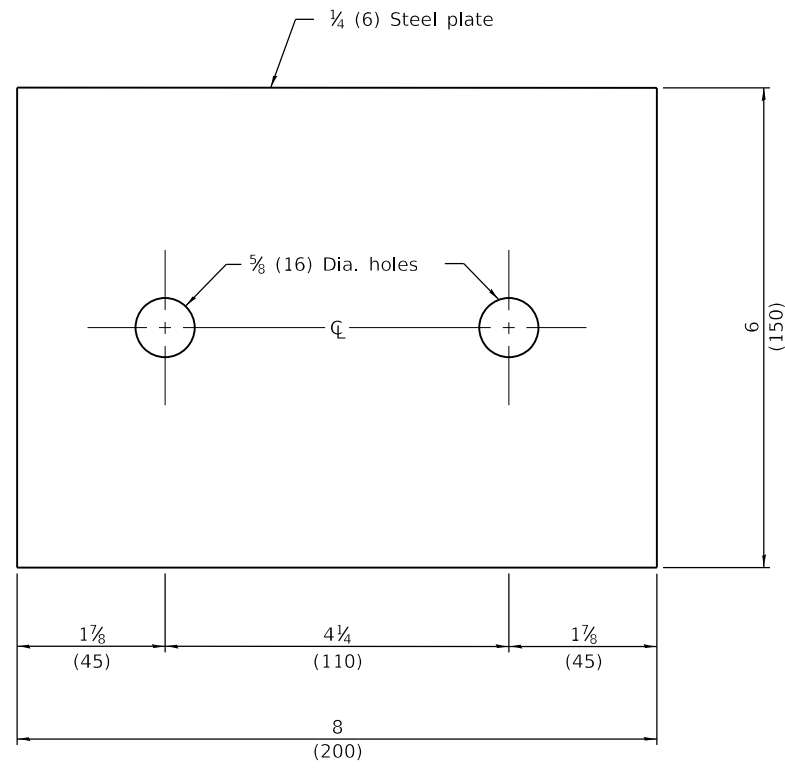
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

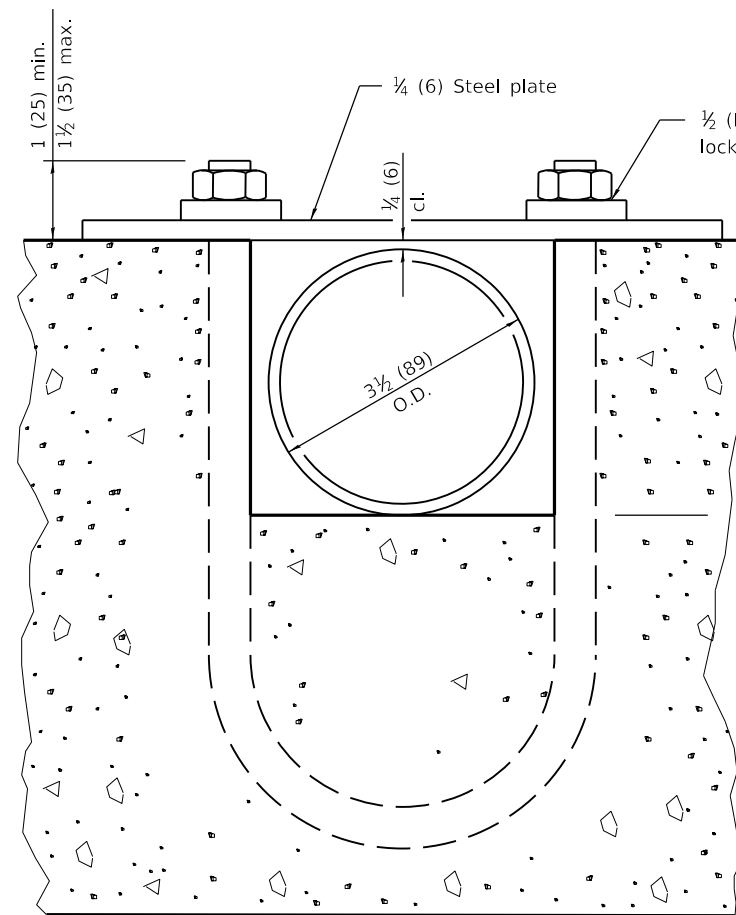
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 46-T-1-03/05

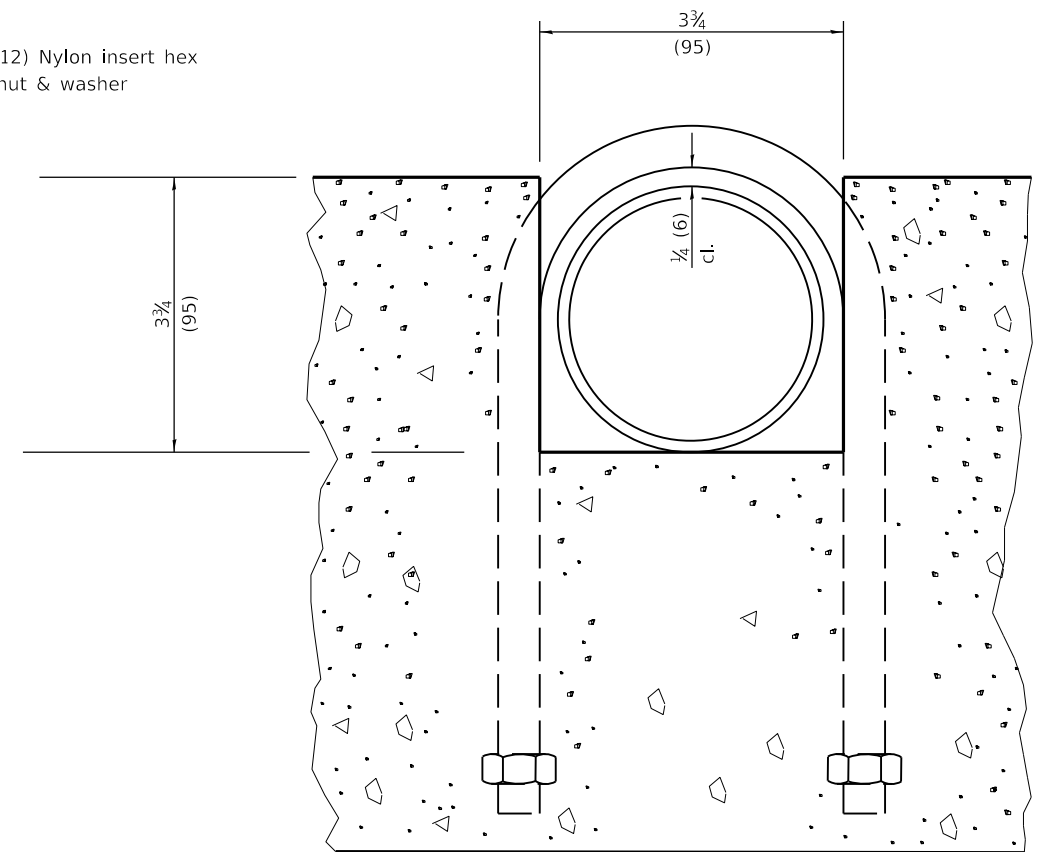




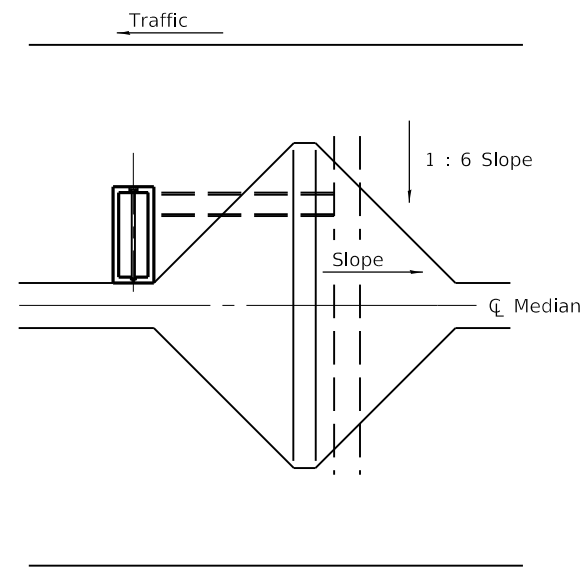
**TOP ANCHOR PLATE**  
(1 - required)



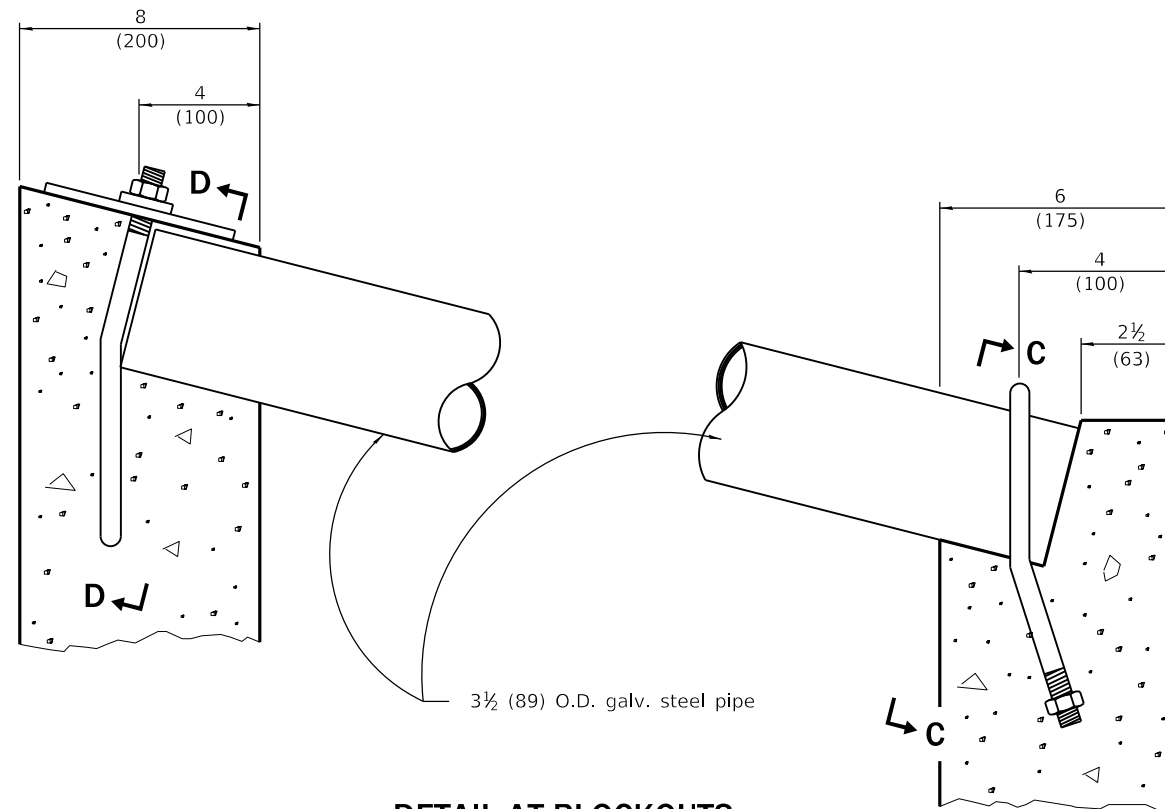
**SECTION D-D**



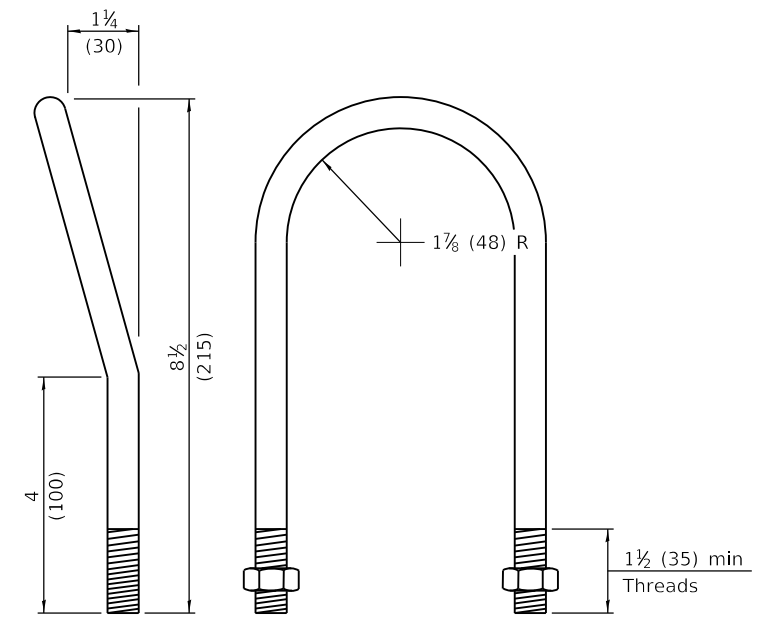
**SECTION C-C**



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



**DETAIL AT BLOCKOUTS**



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

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

(Sheet 2 of 2)

**STANDARD 542521-02**

Illinois Department of Transportation

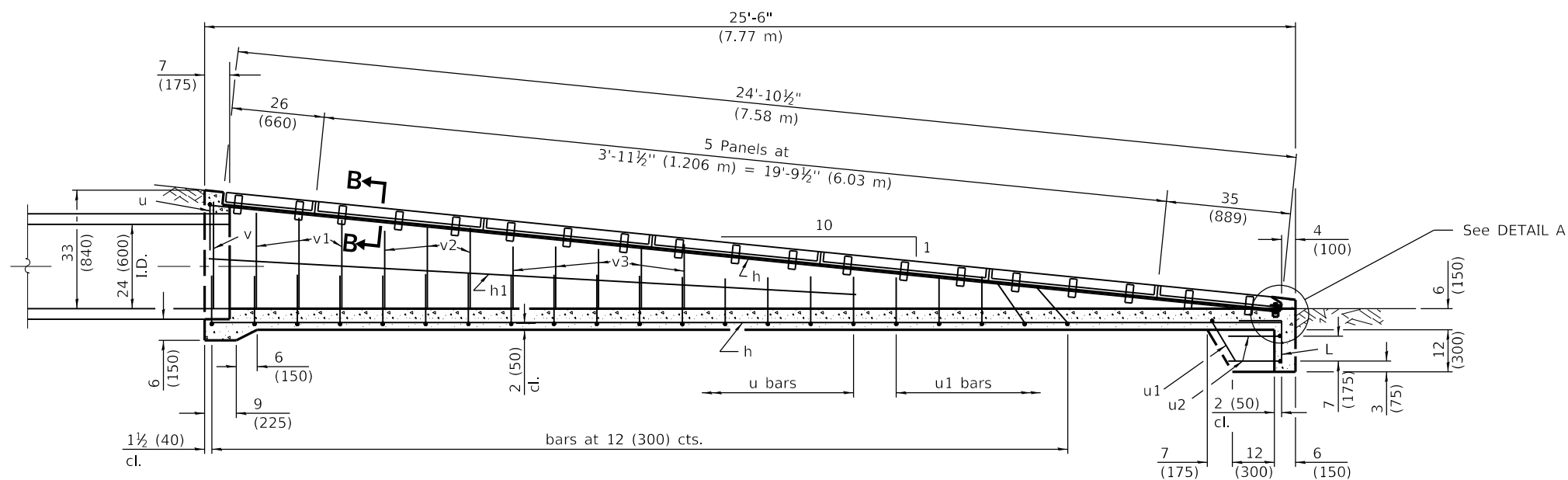
PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

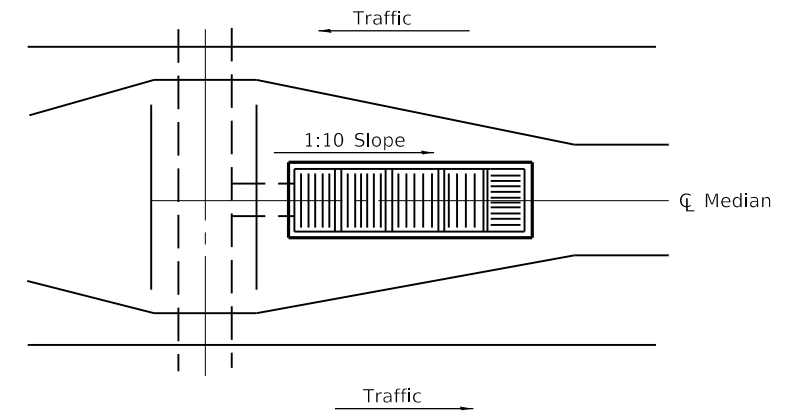
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

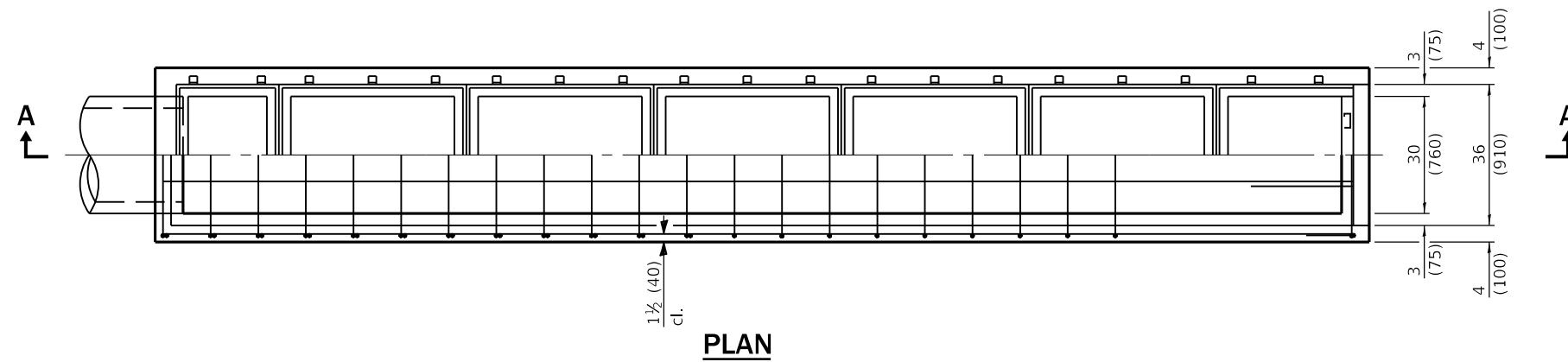
ISSUED 1-1-97



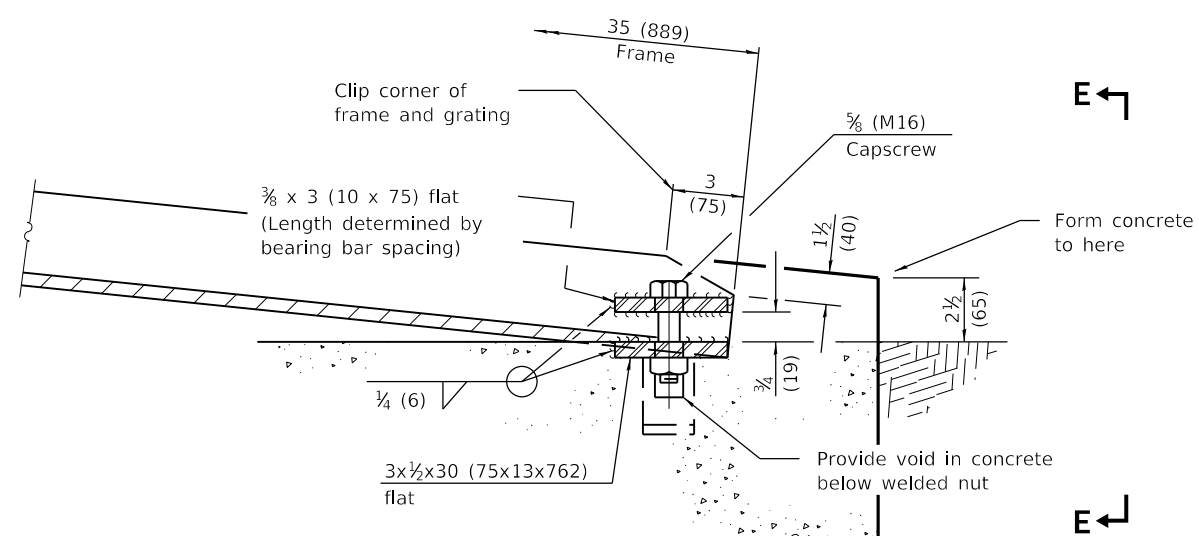
**SECTION A-A**



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



**PLAN**



**DETAIL A**

**GENERAL NOTES**

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

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

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

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

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

(Sheet 1 of 2)

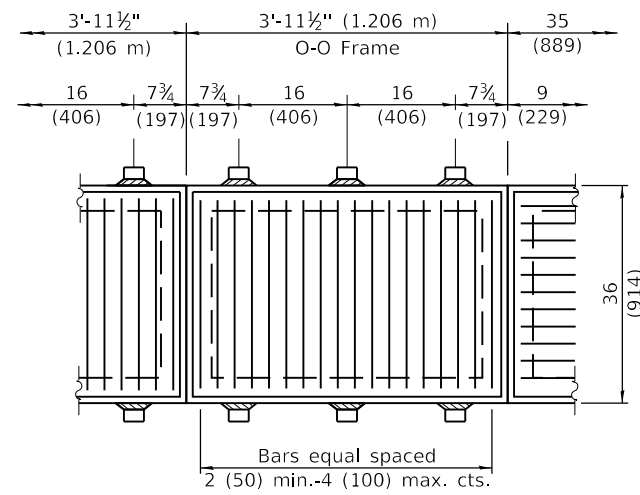
**STANDARD 542526-03**

Illinois Department of Transportation

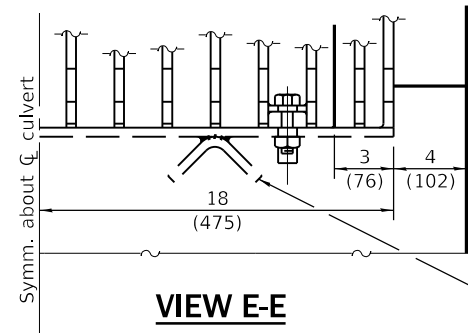
PASSED January 1, 2011  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2011  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97  
 76-T



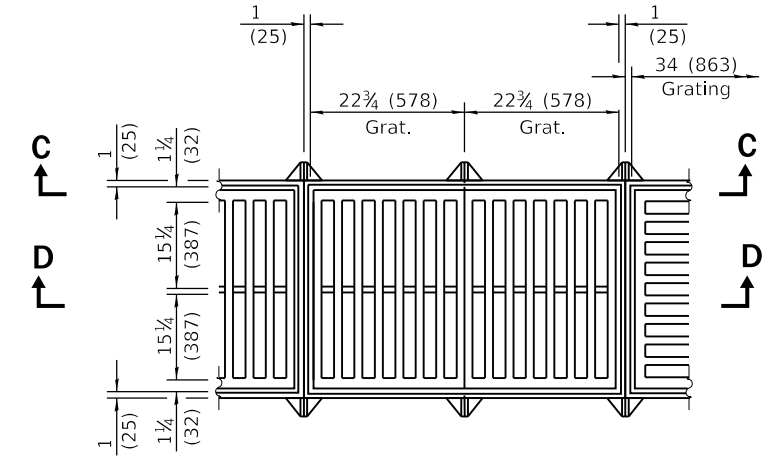
**TYPICAL STEEL GRATING**



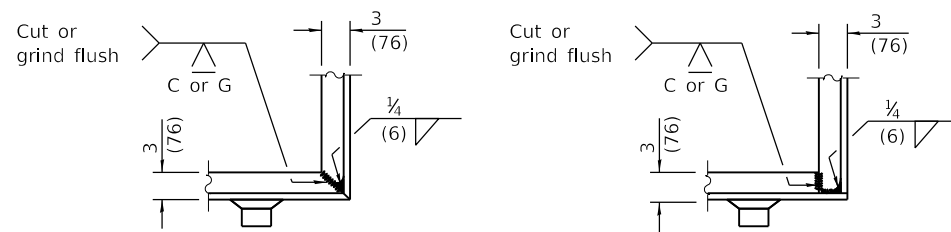
1/2 x 1 1/2 x 5 (12.7 x 40 x 125)  
1/4 (6) cfw to 1/2 x 3 (12.7 x 75) flat

Material Required for One Inlet Box

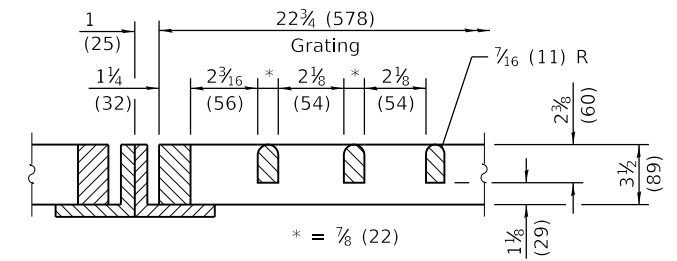
Bar	No.	Size	Length
h	6	No. 4 (No. 13)	25'-0" (7.62 m)
h1	2	No. 4 (No. 13)	11'-0" (3.35 m)
L	4	No. 4 (No. 13)	24 (600)
u	17	No. 4 (No. 13)	6'-5" (1.96 m)
u1	6	No. 4 (No. 13)	5'-11" (1.80 m)
u2	2	No. 4 (No. 13)	5'-10" (1.78 m)
v	2	No. 4 (No. 13)	30 (760)
v1	6	No. 4 (No. 13)	27 (690)
v2	6	No. 4 (No. 13)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



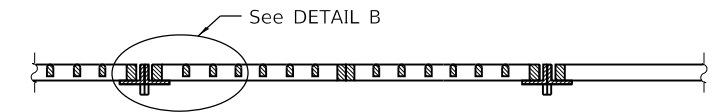
**TYPICAL CAST GRATING**



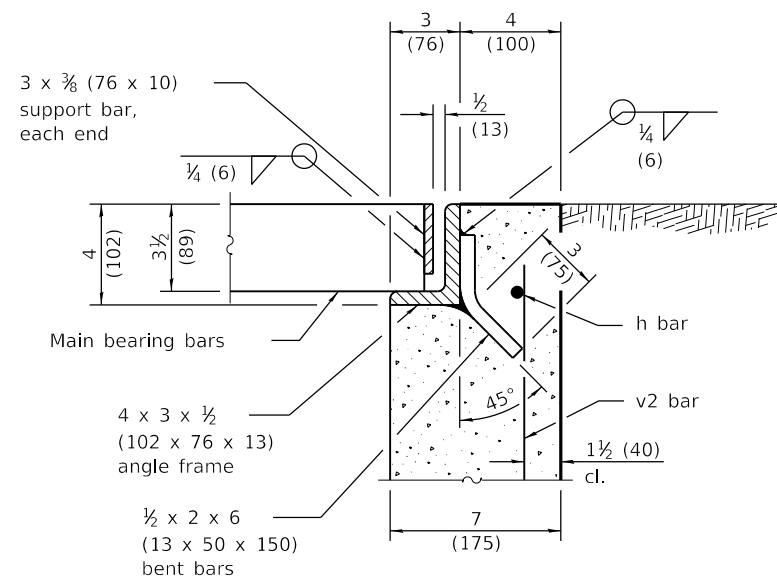
**TYPICAL CORNER OF STEEL GRATING FRAME**



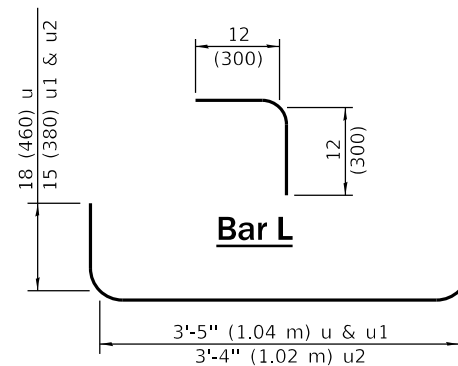
**DETAIL B**



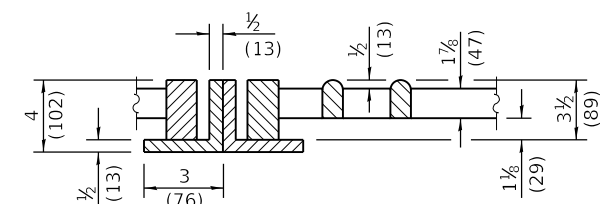
**SECTION C-C**



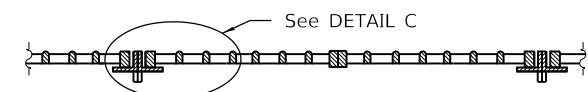
**SECTION B-B**



**BARS u, u1 & u2**



**DETAIL C**



**SECTION D-D**

Illinois Department of Transportation

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

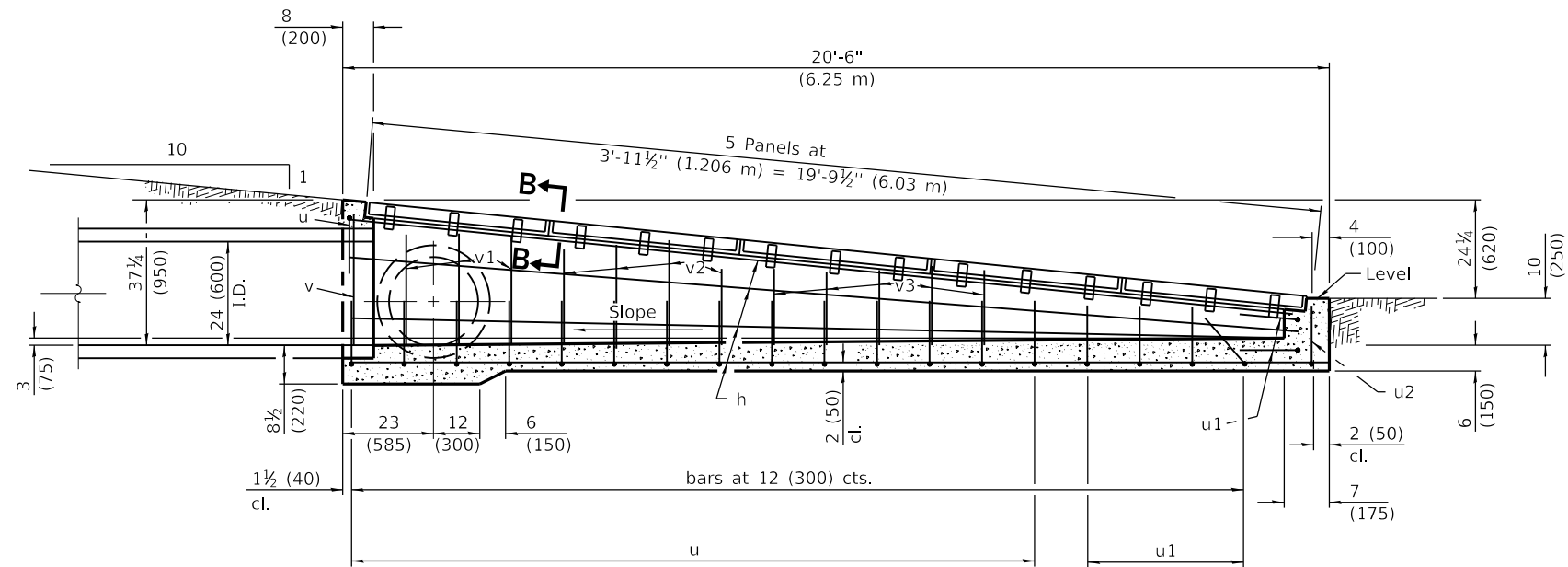
APPROVED January 1, 2011  
Santosh  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

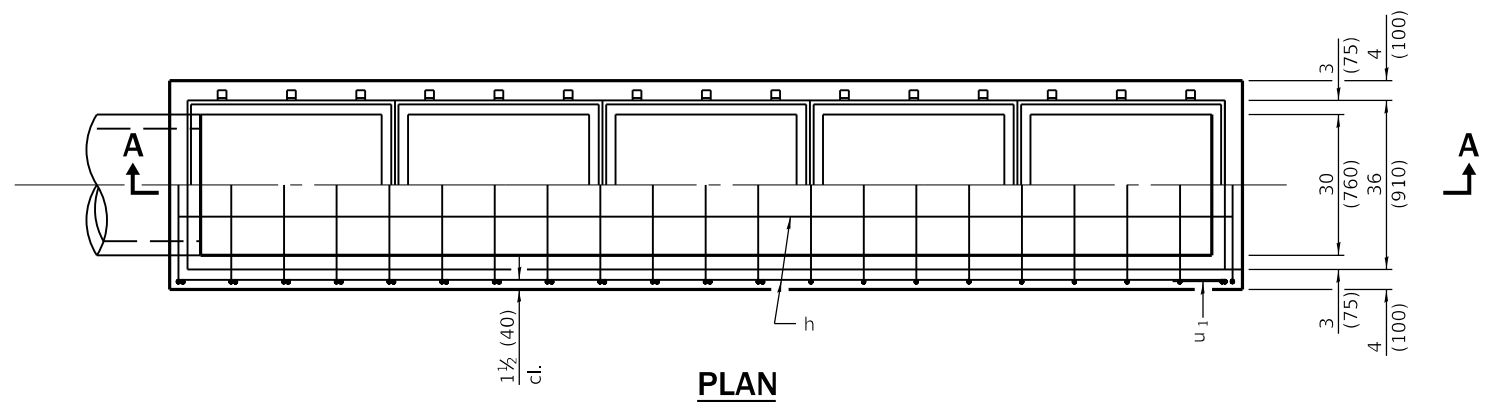
(Sheet 2 of 2)

**STANDARD 542526-03**

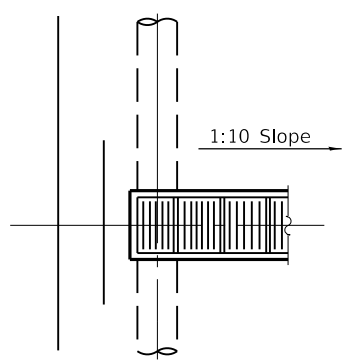


**SECTION A-A**

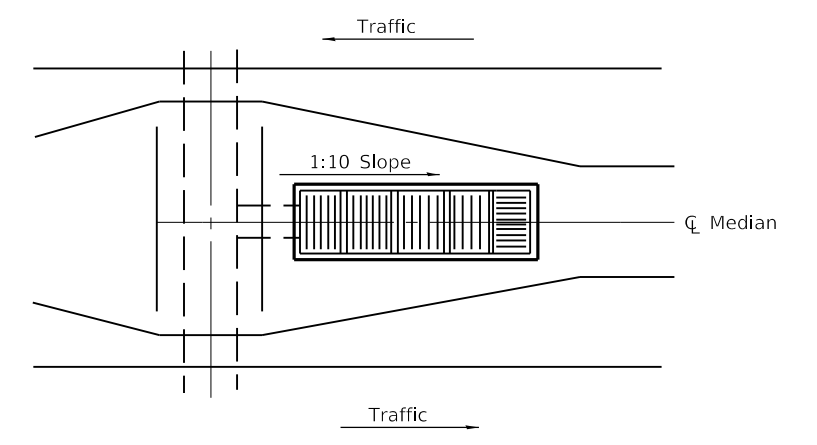
NOTE:  
Culvert pipe may exit from the side (or sides) by changing reinforcement bars in that area and in the headwall end of box.



**PLAN**



Detail showing exit from side (or sides)



Sketch showing location and direction of main bearing bars in relation to  $\text{C Median}$  (showing exit from end)

**GENERAL NOTES**

If field conditions will permit, bottom of inlet box shall have 2 (50) slope.  
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).  
All dimensions are in inches (millimeters) unless otherwise shown.

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

**INLET BOX  
TYPE 24 (600) G**  
(Sheet 1 of 2)

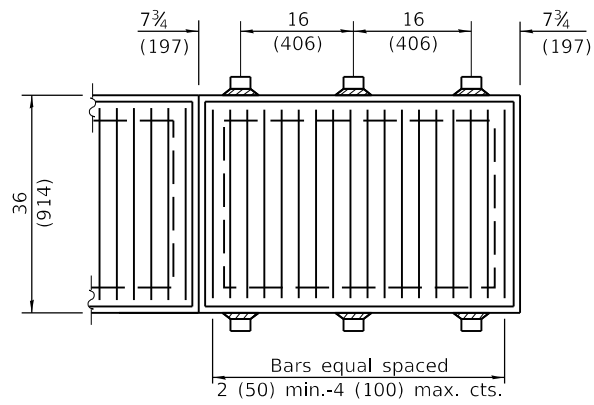
**STANDARD 542531-04**

Illinois Department of Transportation

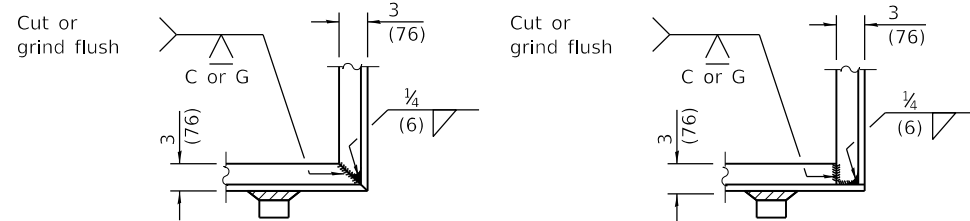
PASSED January 1, 2011  
*Michael Beard*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2011  
*Scott Schick*  
ENGINEER OF DESIGN AND ENVIRONMENT

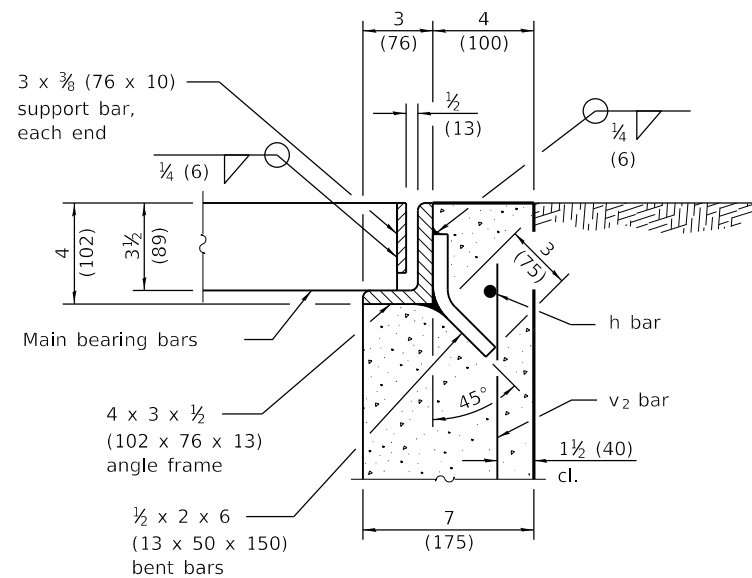
ISSUED 1-1-97



**TYPICAL STEEL GRATING**



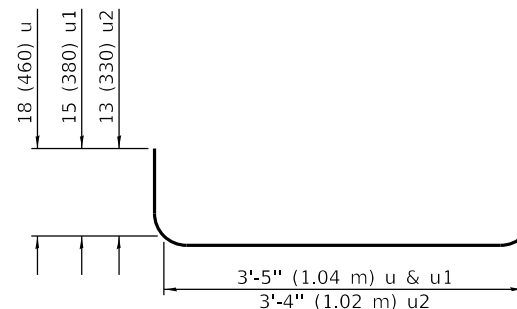
**TYPICAL CORNER OF STEEL GRATING FRAME**



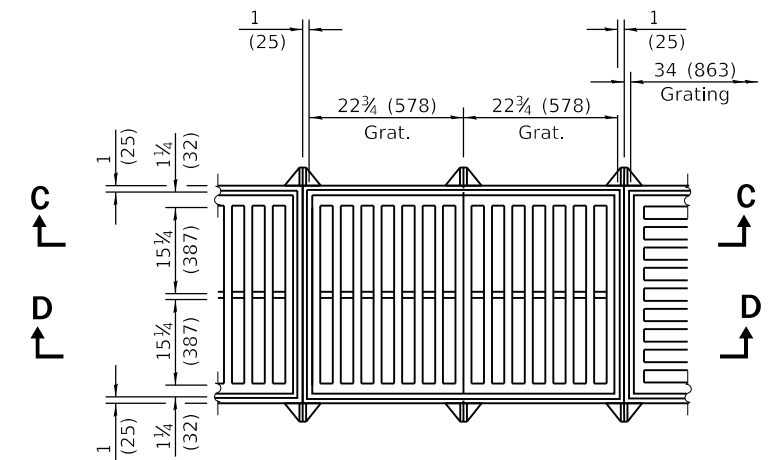
**SECTION B-B**

Material Required for One Inlet Box

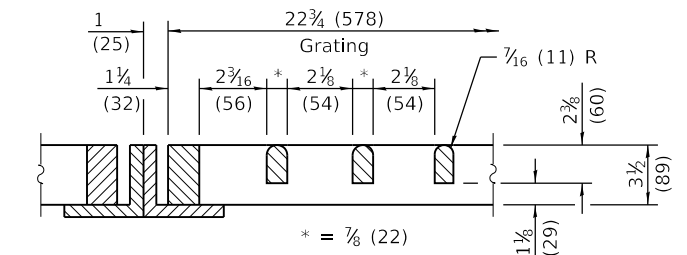
Bar	No.	Size	Length
h	10	No. 4 (No. 13)	20'-0" (6.10 m)
u	17	No. 4 (No. 13)	6'-5" (1.96 m)
u1	6	No. 4 (No. 13)	5'-11" (1.80 m)
u2	1	No. 4 (No. 13)	5'-6" (1.68 m)
v	2	No. 4 (No. 13)	33 (840)
v1	6	No. 4 (No. 13)	30 (760)
v2	10	No. 4 (No. 13)	24 (610)
v3	10	No. 4 (No. 13)	18 (460)
Concrete		cu. yds. (m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



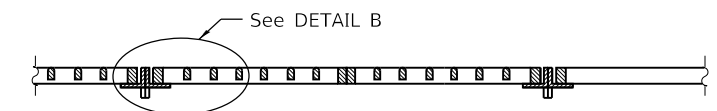
**BARS u, u1 & u2**



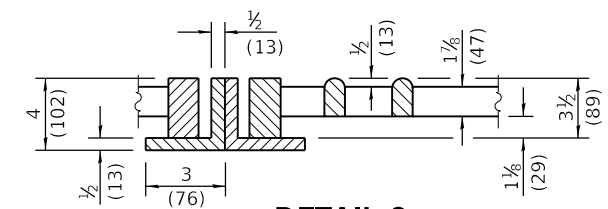
**TYPICAL CAST GRATING**



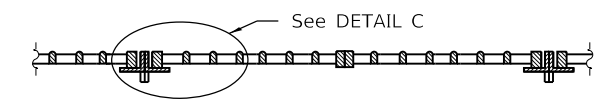
**DETAIL B**



**SECTION C-C**



**DETAIL C**



**SECTION D-D**

Illinois Department of Transportation

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

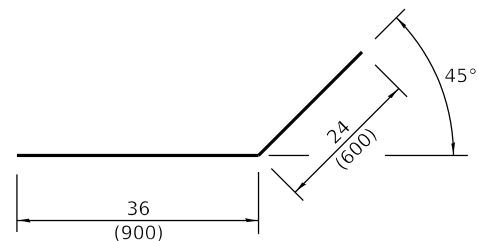
APPROVED January 1, 2011  
*Scott Schick*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

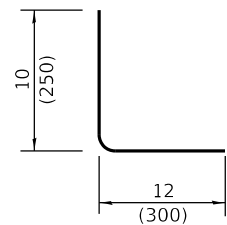
**INLET BOX  
TYPE 24 (600) G**

(Sheet 2 of 2)

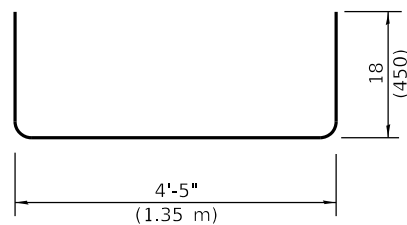
**STANDARD 542531-04**



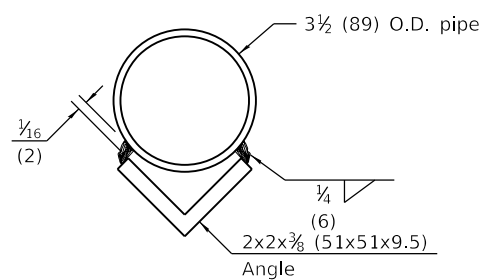
**Bar h2**



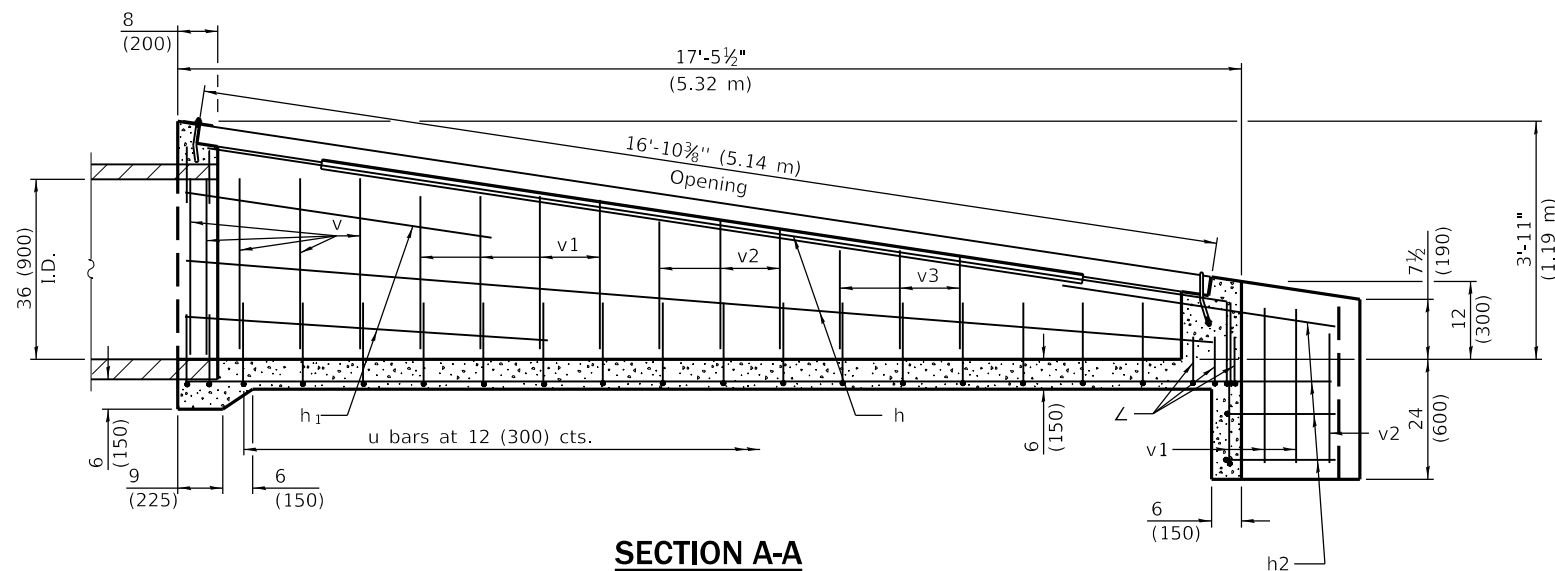
**Bar L**



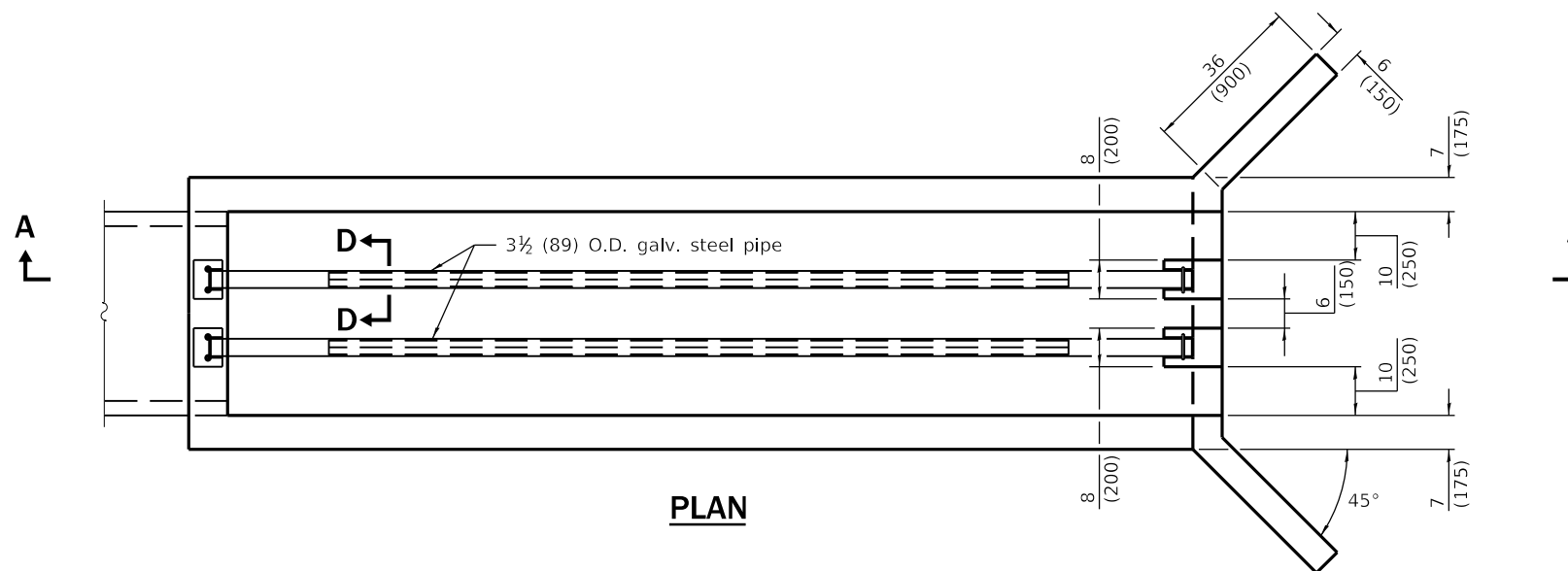
**Bar u**



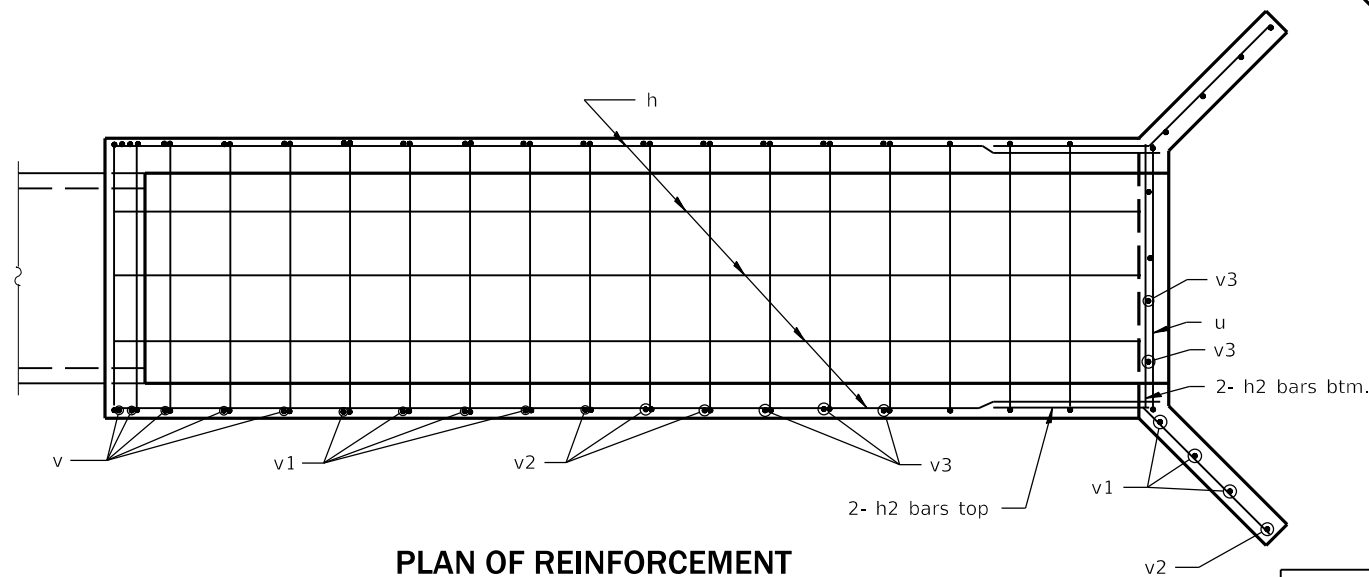
**SECTION D-D**



**SECTION A-A**



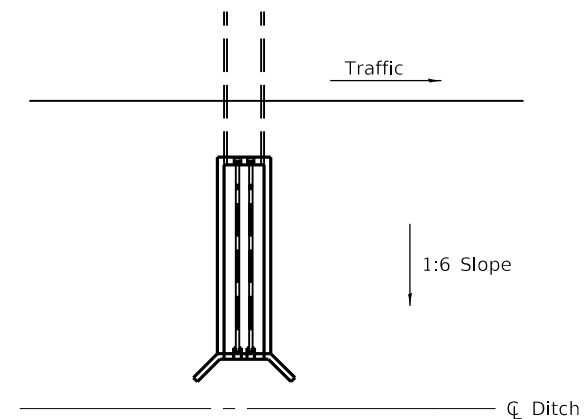
**PLAN**



**PLAN OF REINFORCEMENT**

Material required for one inlet box

Bar	Qty.	Size	Length
h	9	No. 4 (No. 13)	17'-0" (5.18 m)
h1	4	No. 4 (No. 13)	6'-3" (1.90 m)
h2	8	No. 4 (No. 13)	5'-0" (1.50 m)
L	6	No. 4 (No. 13)	22 (550)
u	21	No. 4 (No. 13)	7'-5" (2.25 m)
v	10	No. 4 (No. 13)	36 (910)
v1	14	No. 4 (No. 13)	30 (760)
v2	8	No. 4 (No. 13)	24 (610)
v3	10	No. 4 (No. 13)	18 (460)
Concrete	cu. yds. (m <sup>3</sup> )		3.9 (3.0)
Reinf. Bars	lbs. (kg)		319 (145)
Galv. Steel Pipe	3 1/2 (89) O.D.	2 at 16'-10 3/8" (5.15 m)	
Galv. Steel Angle	2x2x3/8 (51x51x9.5)	2 at 12'-10" (3.90 m)	



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

**GENERAL NOTES**

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

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

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

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

(Sheet 1 of 2)

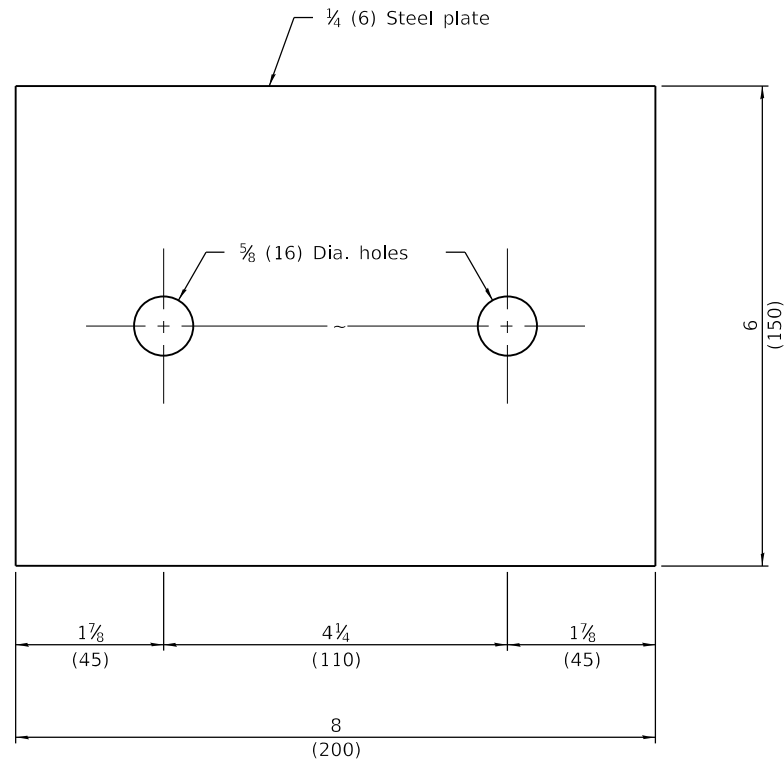
**STANDARD 542536-03**

Illinois Department of Transportation

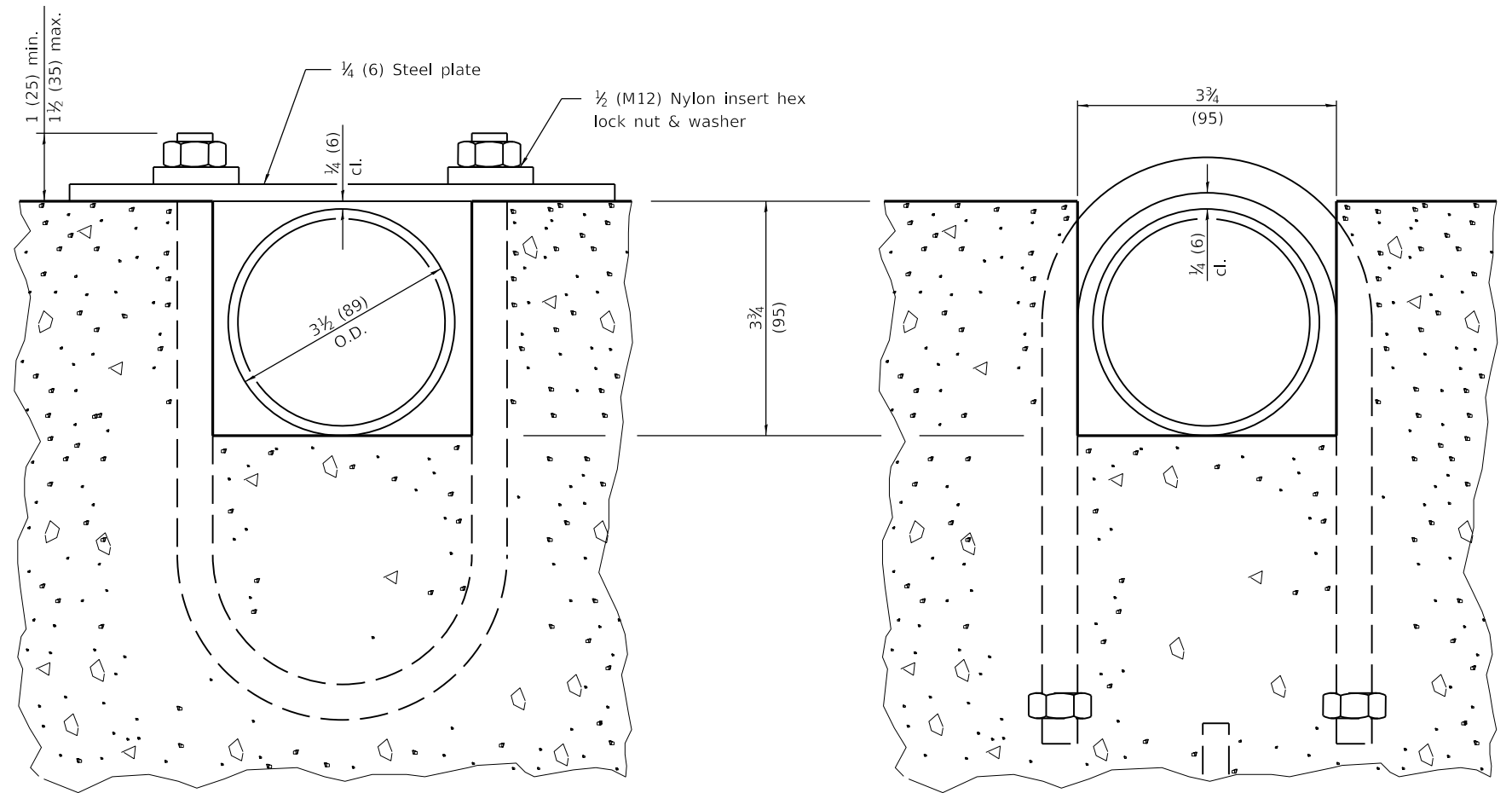
PASSED January 1, 2010  
*[Signature]*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2010  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

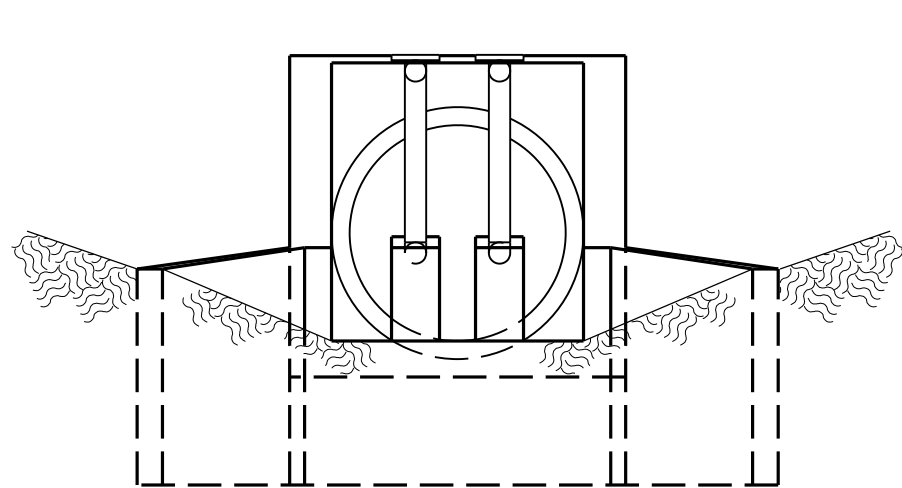


**TOP ANCHOR PLATE**  
(2 - required)

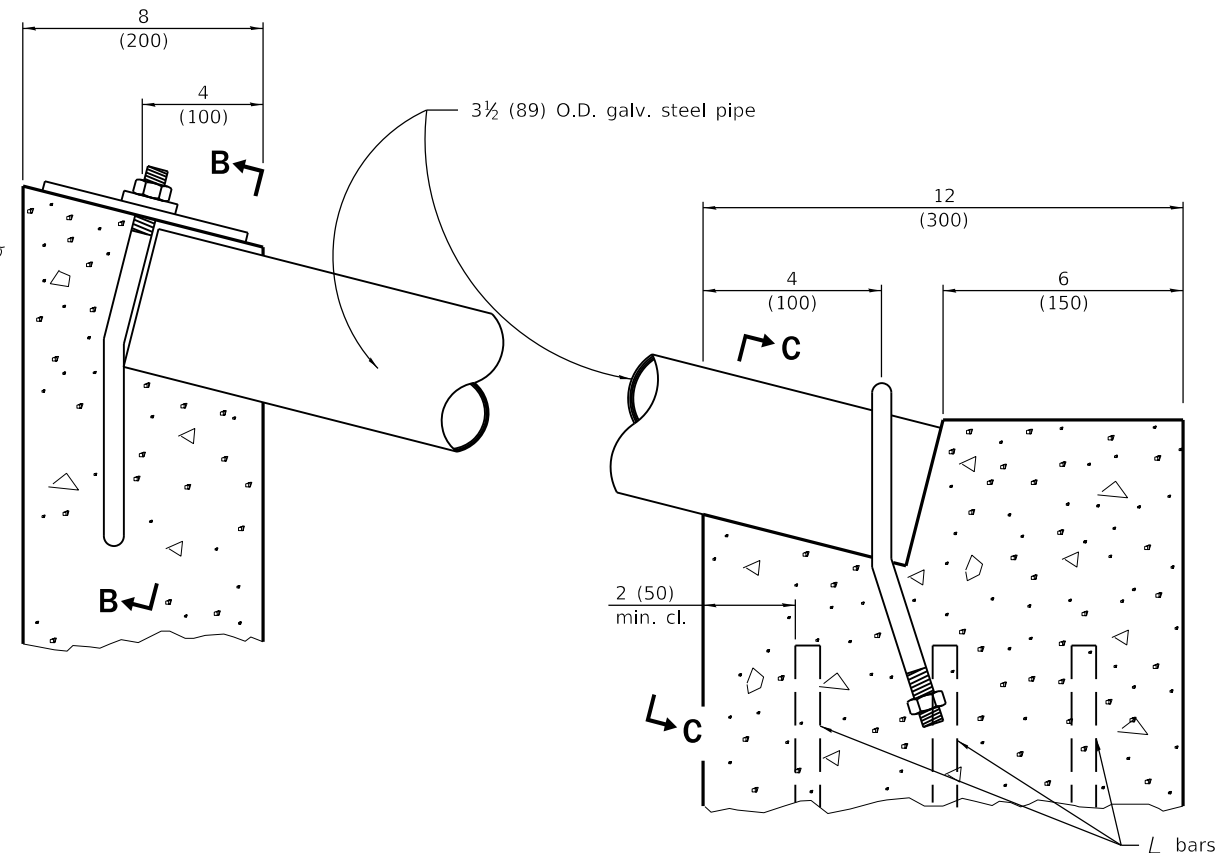


**SECTION B-B**

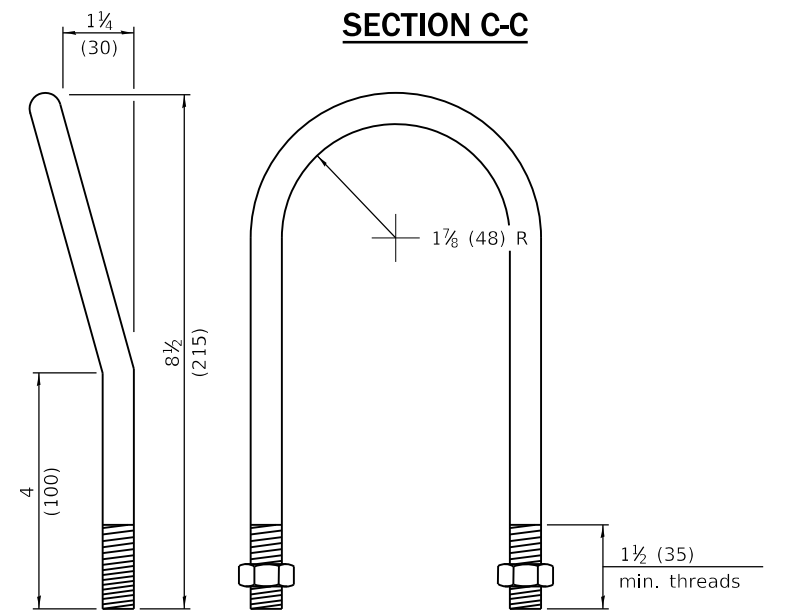
**SECTION C-C**



**END VIEW**



**DETAIL AT BLOCKOUTS**



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

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

(Sheet 2 of 2)

**STANDARD 542536-03**

Illinois Department of Transportation

PASSED January 1, 2010

ENGINEER OF POLICY AND PROCEDURES

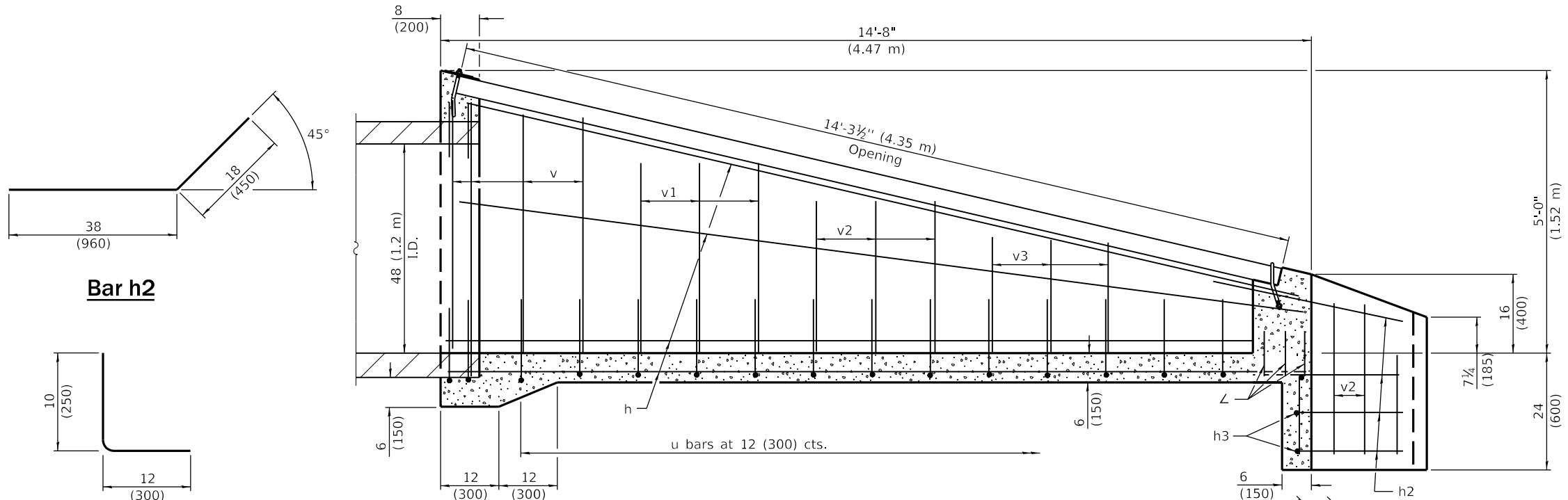
APPROVED January 1, 2010

ENGINEER OF DESIGN AND ENVIRONMENT

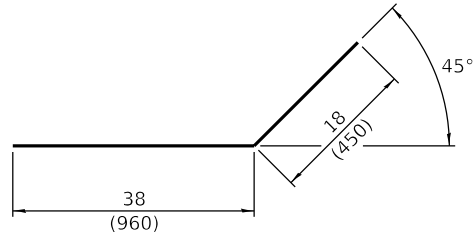
ISSUED 1-1-97

Material required for one inlet box

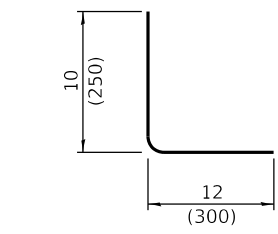
Bar	Qty.	Size	Length
h	11	No. 4 (No. 13)	14'-5" (4.40 m)
h2	8	No. 4 (No. 13)	4'-8" (1.40 m)
h3	2	No. 4 (No. 13)	5'-6" (1.70 m)
L	6	No. 4 (No. 13)	22 (550)
u	16	No. 4 (No. 13)	8'-9" (2.67 m)
u1	2	No. 4 (No. 13)	9'-9" (2.97 m)
v	8	No. 4 (No. 13)	4'-3" (1.30 m)
v1	6	No. 4 (No. 13)	3'-6" (1.07 m)
v2	13	No.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



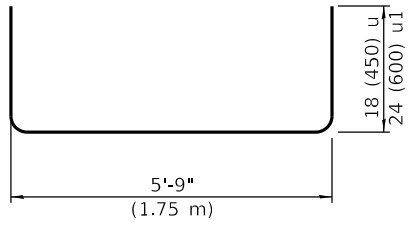
**SECTION A-A**



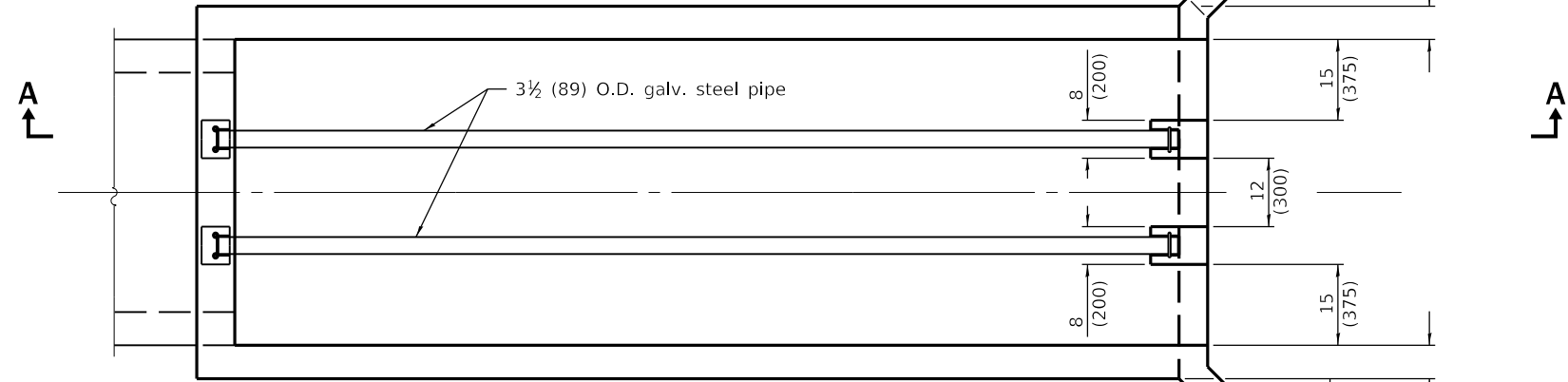
**Bar h2**



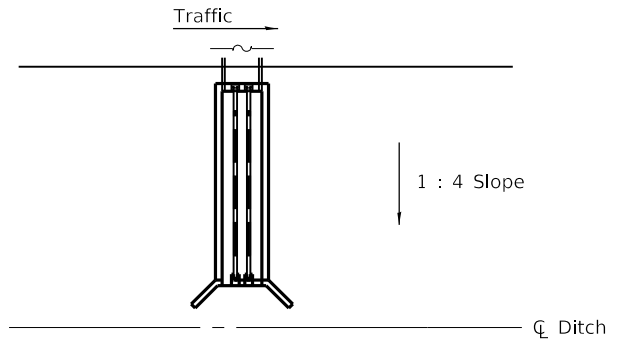
**Bar L**



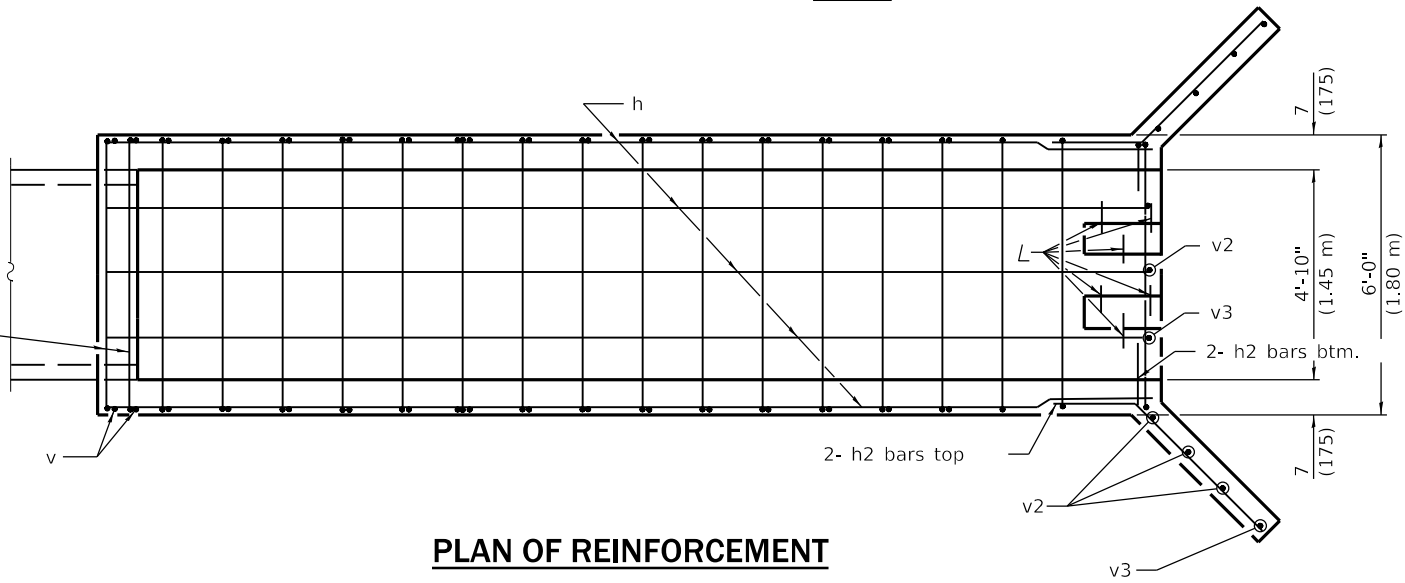
**Bar u & u1**



**PLAN**



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



**PLAN OF REINFORCEMENT**

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

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

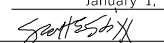
All dimensions are in inches (millimeters) unless otherwise shown.

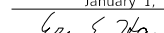
**INLET BOX  
TYPE 48 (1200) A**

(Sheet 1 of 2)

**STANDARD 542541-02**

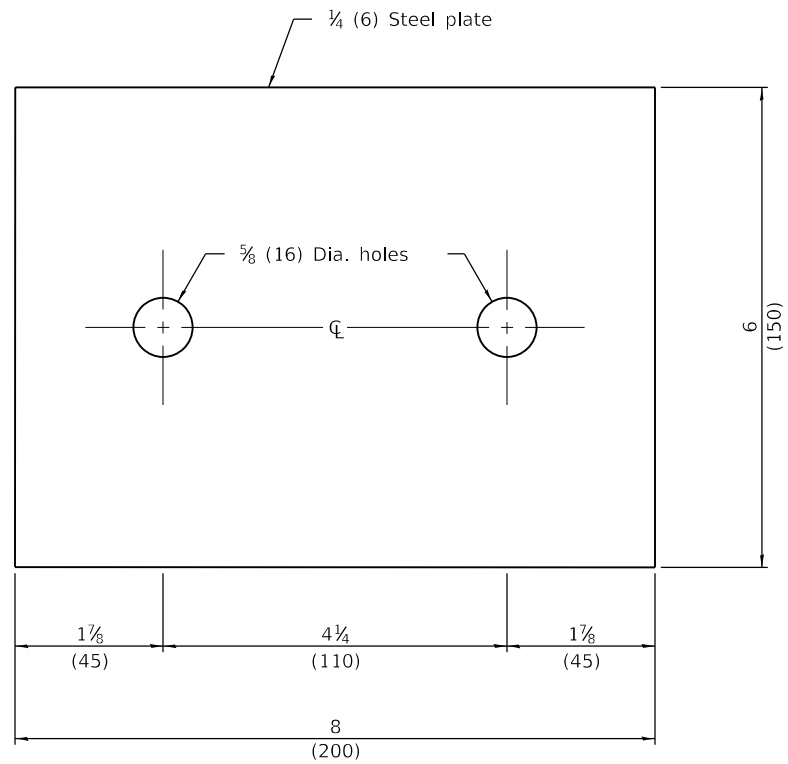
Illinois Department of Transportation

PASSED January 1, 2009  
  
 ENGINEER OF POLICY AND PROCEDURES

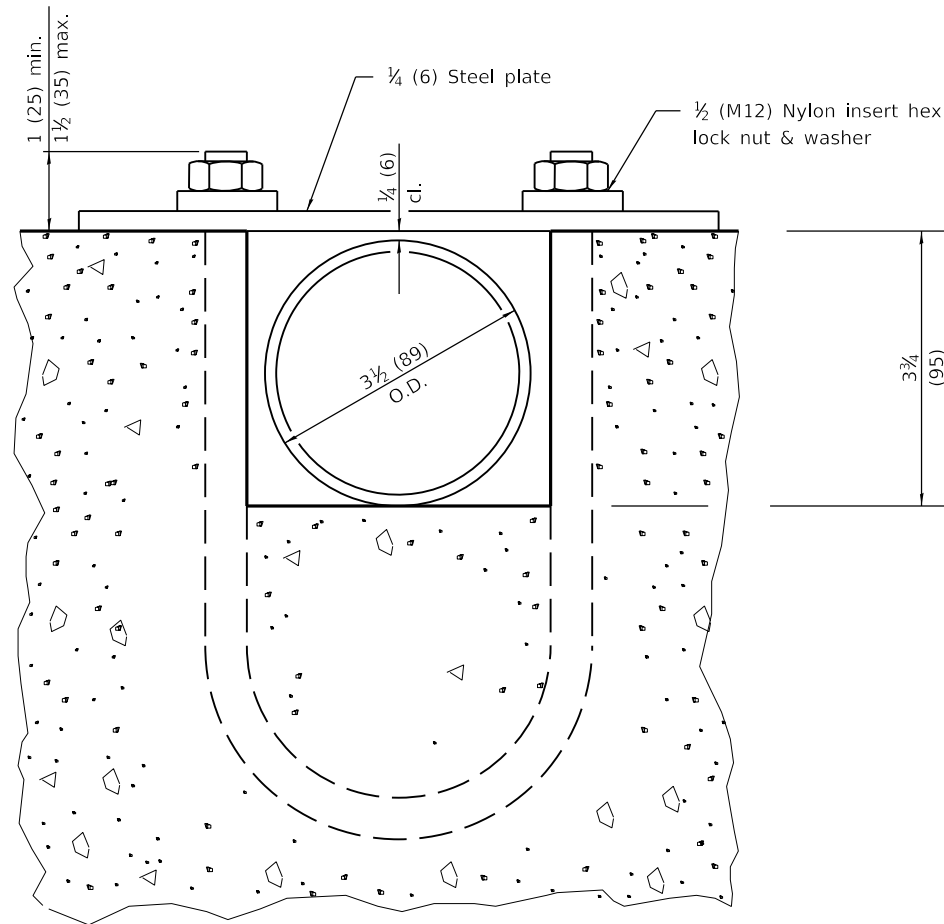
APPROVED January 1, 2009  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

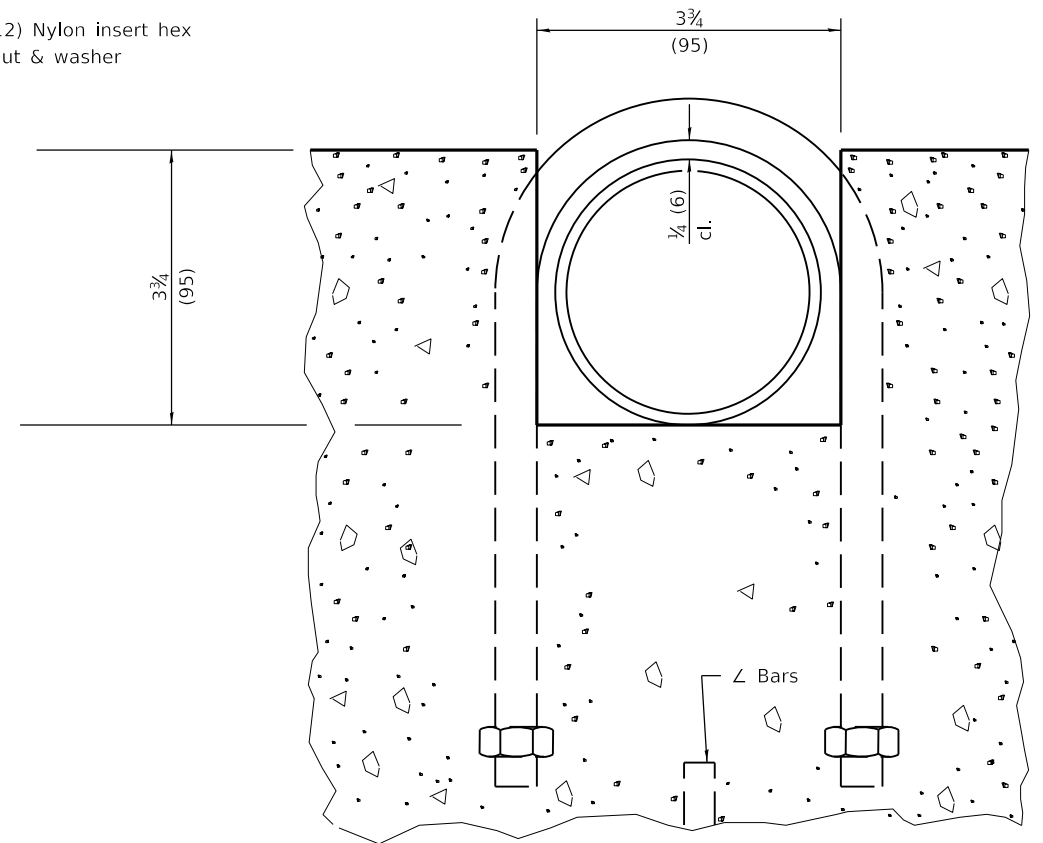




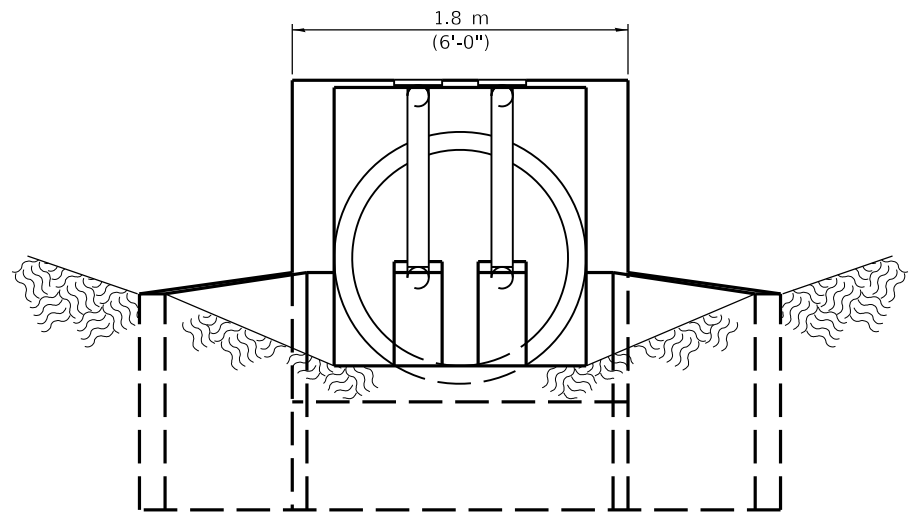
**TOP ANCHOR PLATE**  
(2 - required)



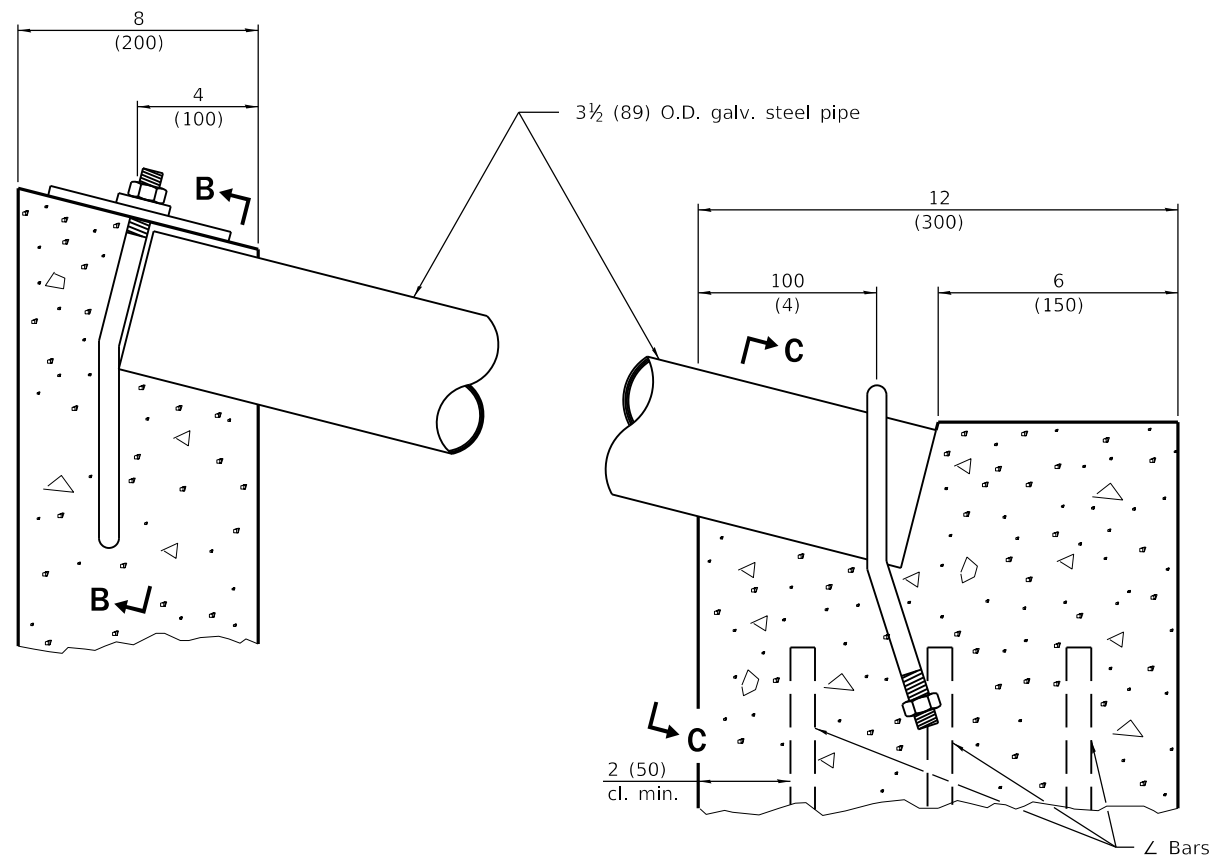
**SECTION B-B**



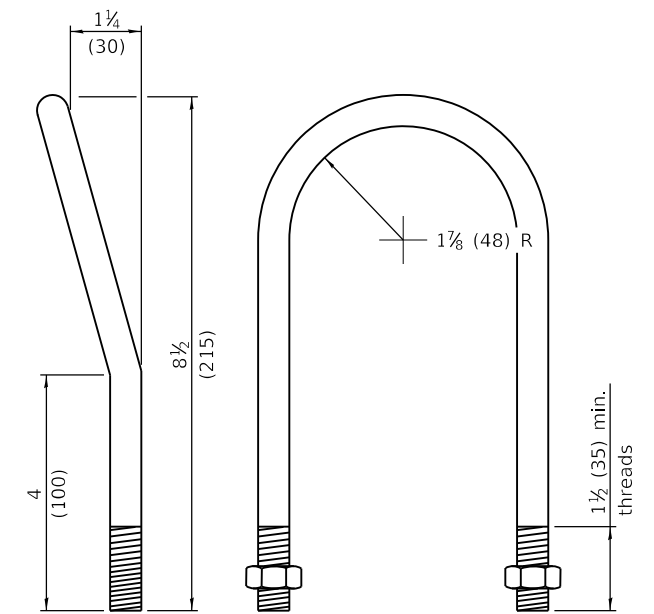
**SECTION C-C**



**END VIEW**



**DETAIL AT BLOCKOUTS**



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

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

(Sheet 2 of 2)

**STANDARD 542541-02**

Illinois Department of Transportation

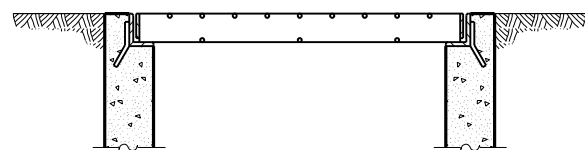
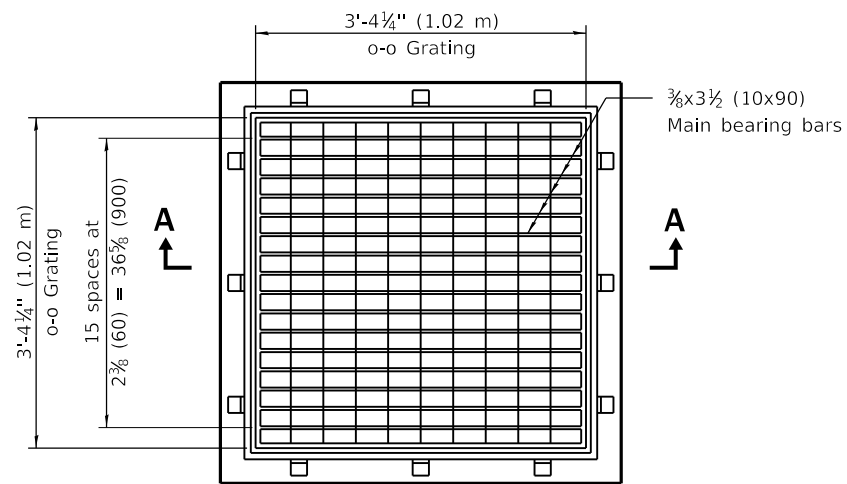
PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

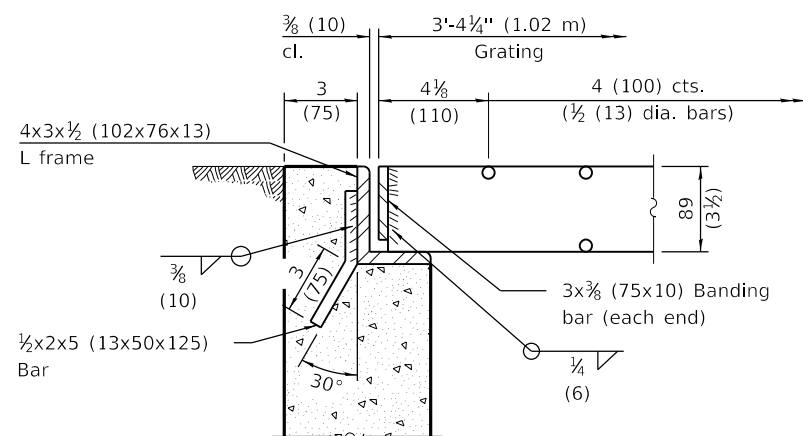
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

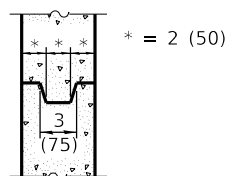
ISSUED 1-1-97



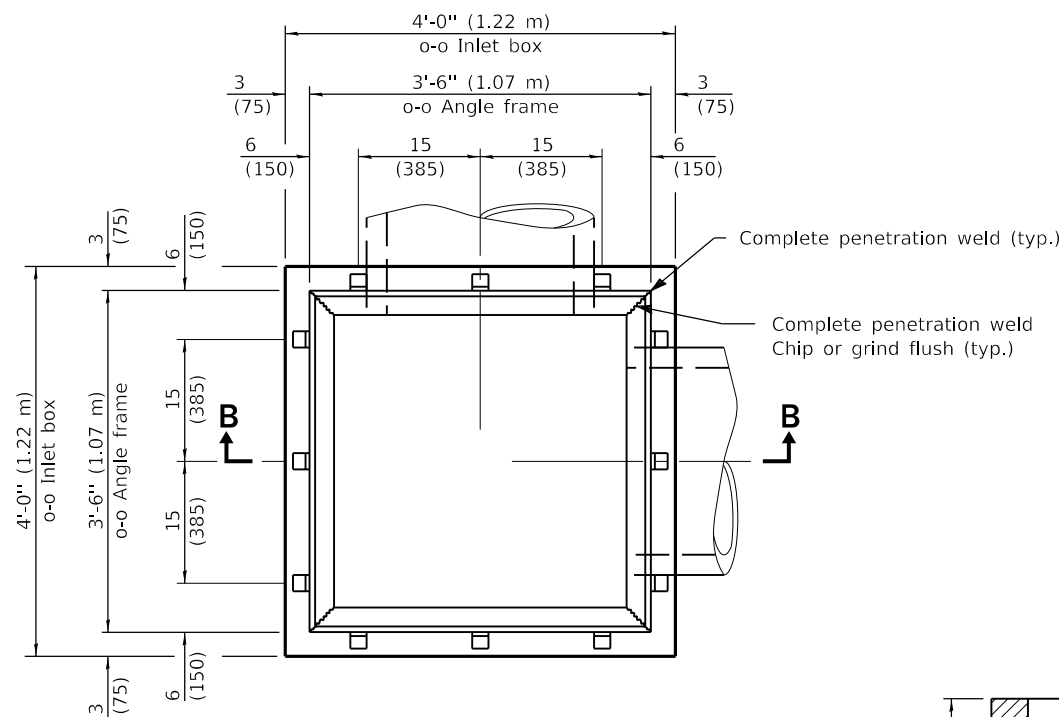
**SECTION A-A**



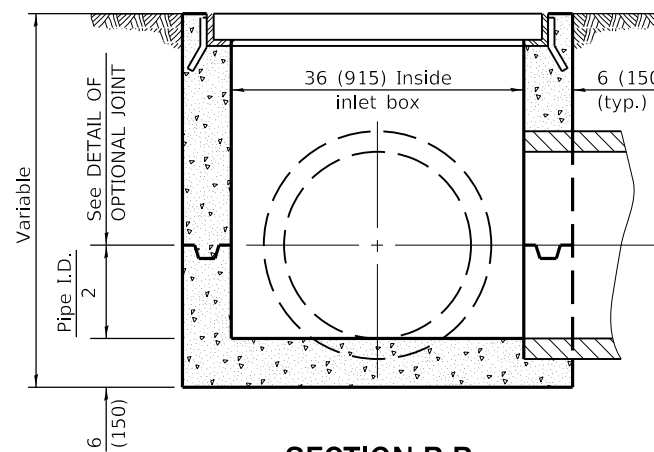
**STEEL FRAME & GRATE**



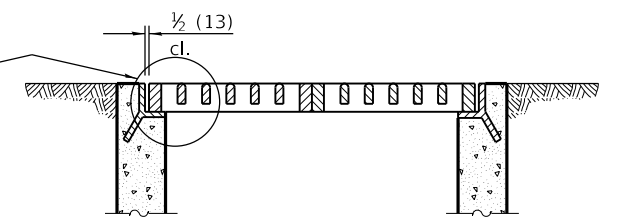
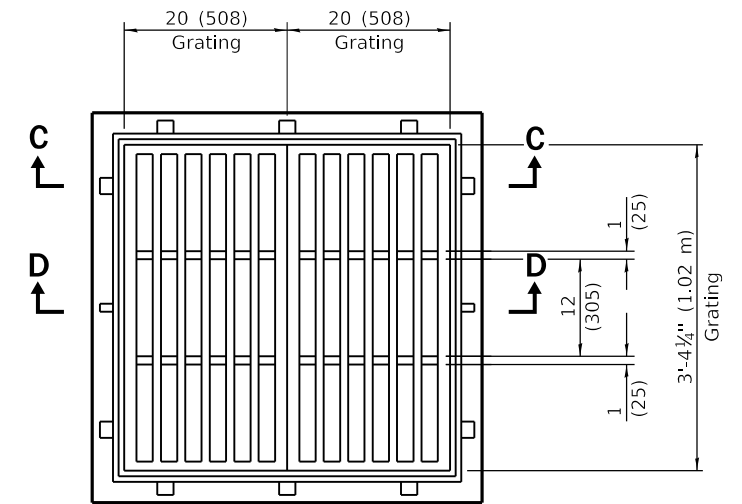
**DETAIL of OPTIONAL JOINT**



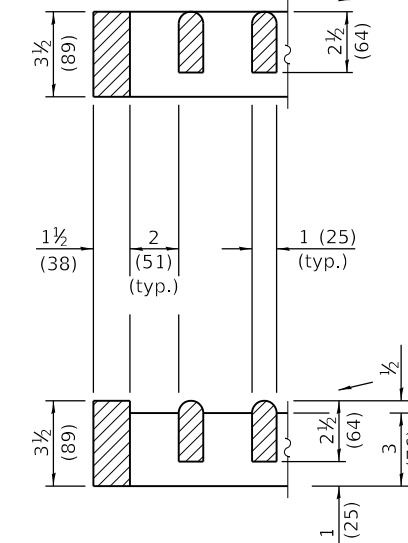
**PLAN**  
(Grating omitted for clarity)



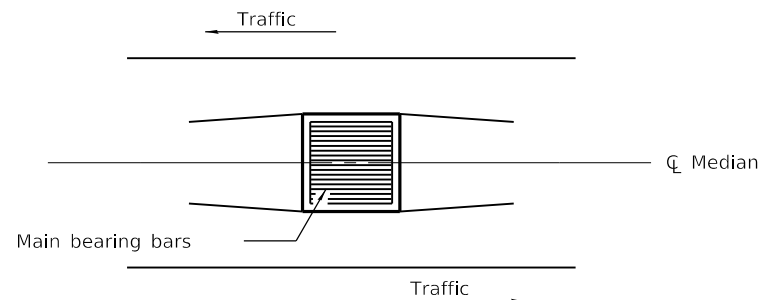
**SECTION B-B**



**SECTION C-C**



**SECTION D-D  
CAST FRAME & GRATE**



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

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

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**

Illinois Department of Transportation

PASSED January 1, 2009

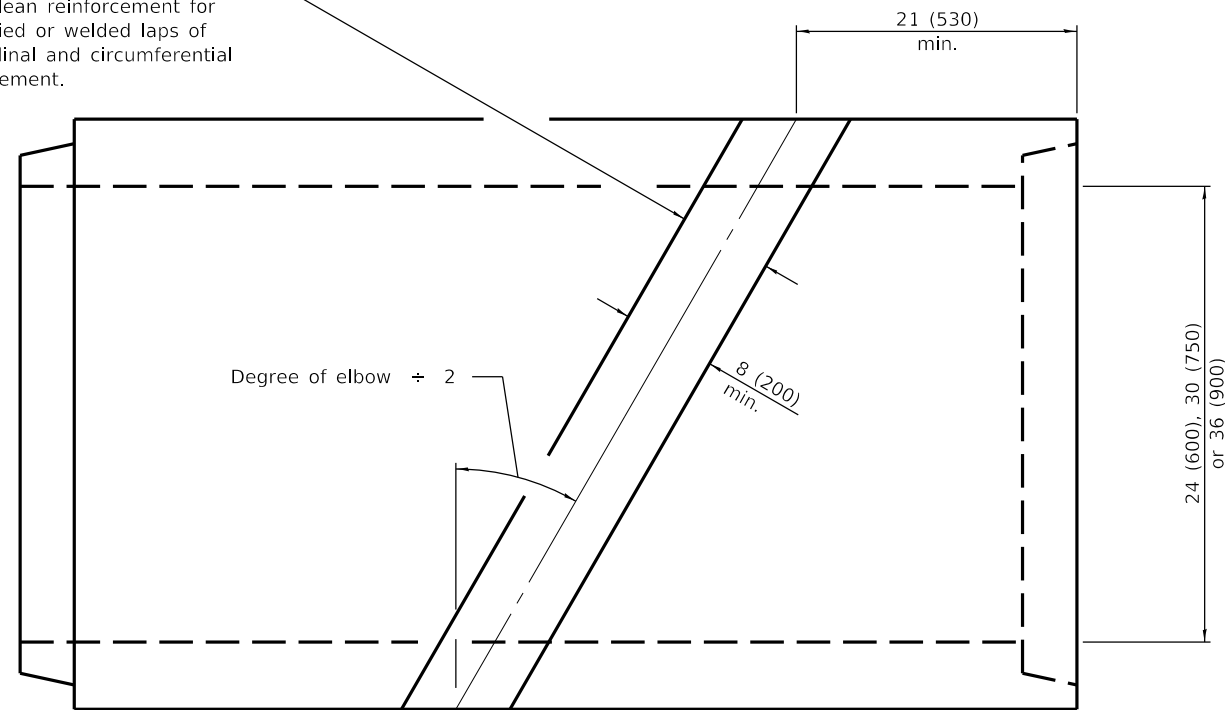
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

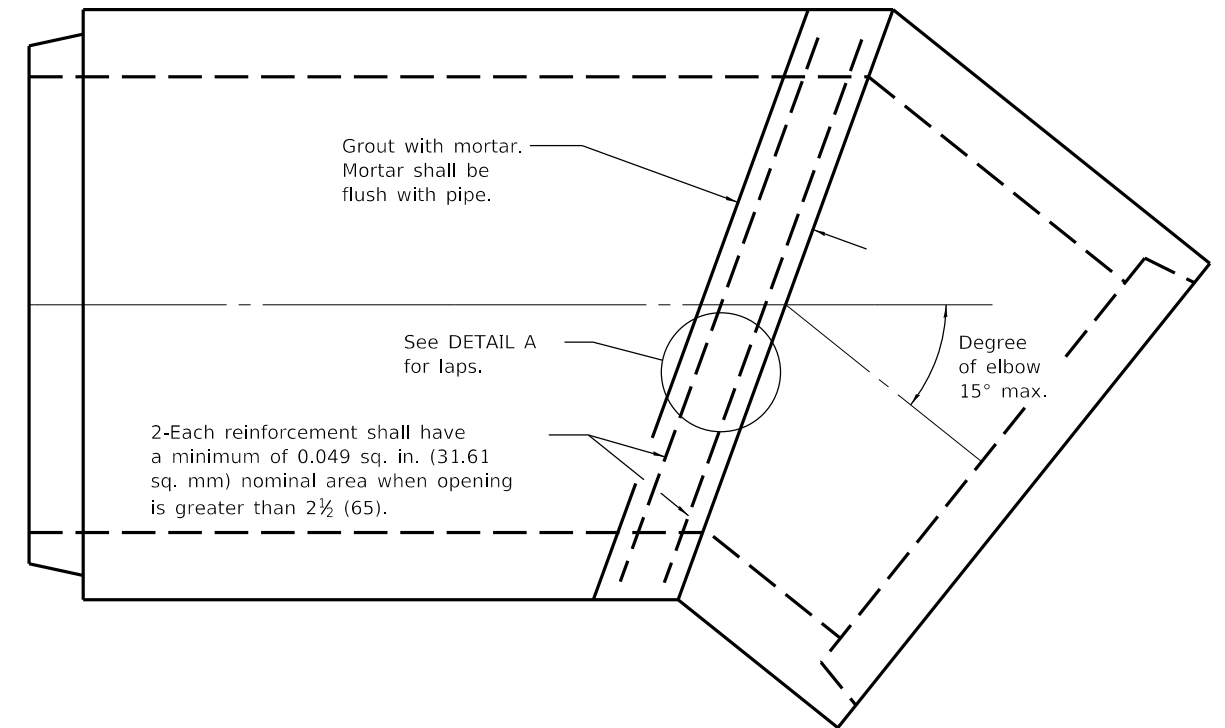
ISSUED 1-1-97

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

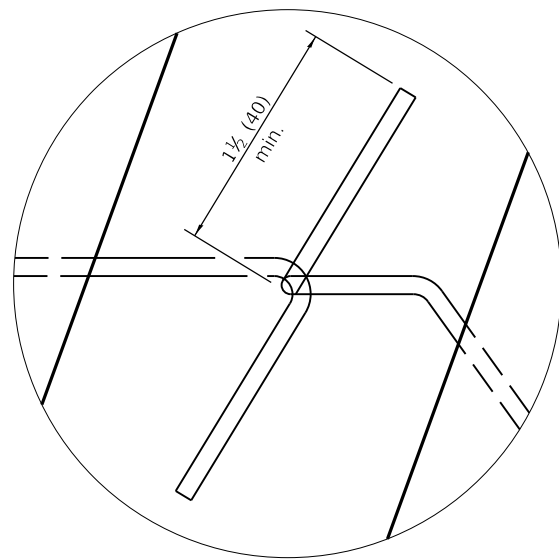


**PLAN**  
(Reinforced concrete pipe)

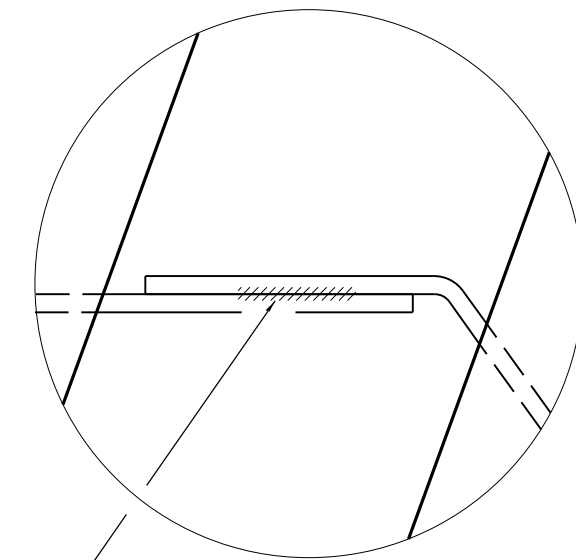
1½ (40) min., 2½ (65) max. (Tied lap)  
1½ (40) min., 6 (150) max. (Welded lap)



**PLAN**  
(Reinforced concrete pipe elbow)

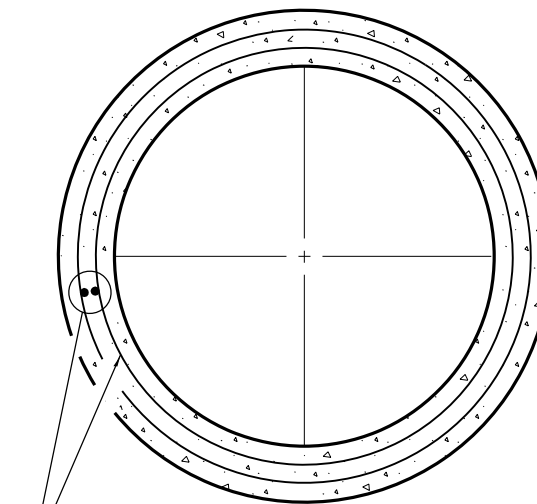


**TIED LAP**



¾ (20) min.  
For wire dia. W14 - W6 (10.72 - 7.01), length of weld shall be ¾ (20) min.  
For wire dia. W5.5 - W2.9 (6.73 - 4.88), length of weld shall be ¾ (10) min.  
Other wire dia. shall be tied per detail.

**WELDED LAP**



**TRANSVERSE SECTION**

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

**DETAIL A**

Illinois Department of Transportation

PASSED January 1, 2011  
*Michael Brand*  
ENGINEER OF POLICY AND PROCEDURES

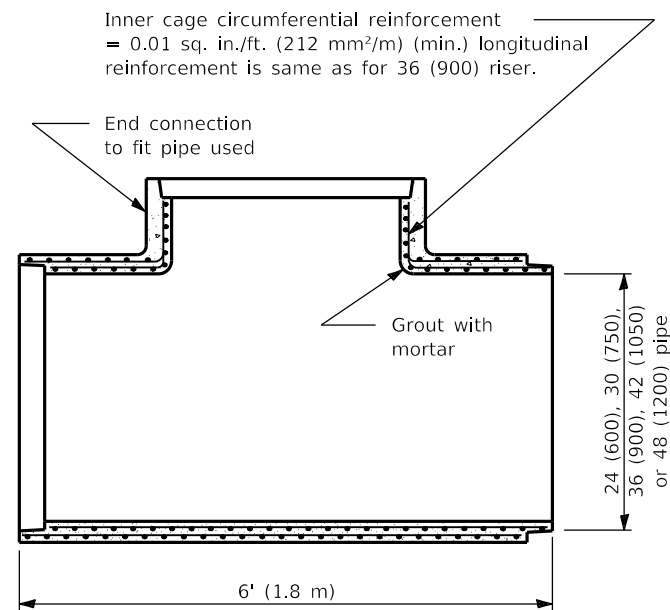
APPROVED January 1, 2011  
*Scott S. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

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.

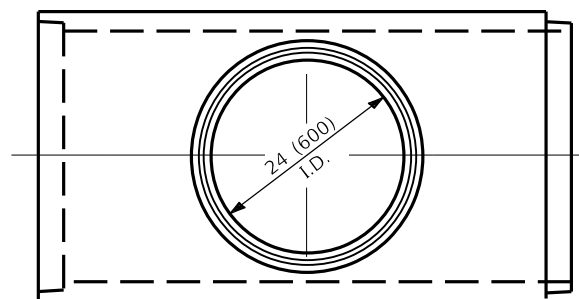
**REINFORCED CONCRETE PIPE  
ELBOW 24", 30" OR 36"  
(600 mm, 750 mm OR 900 mm)**

**STANDARD 542601-03**

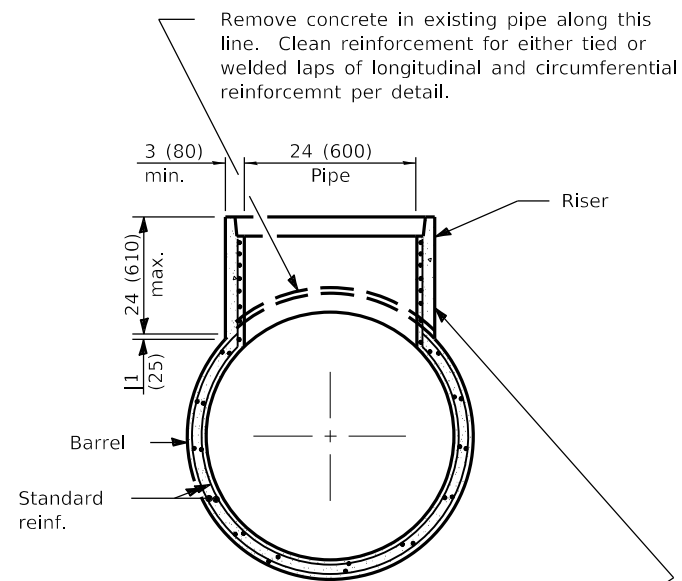


**LONGITUDINAL SECTION**

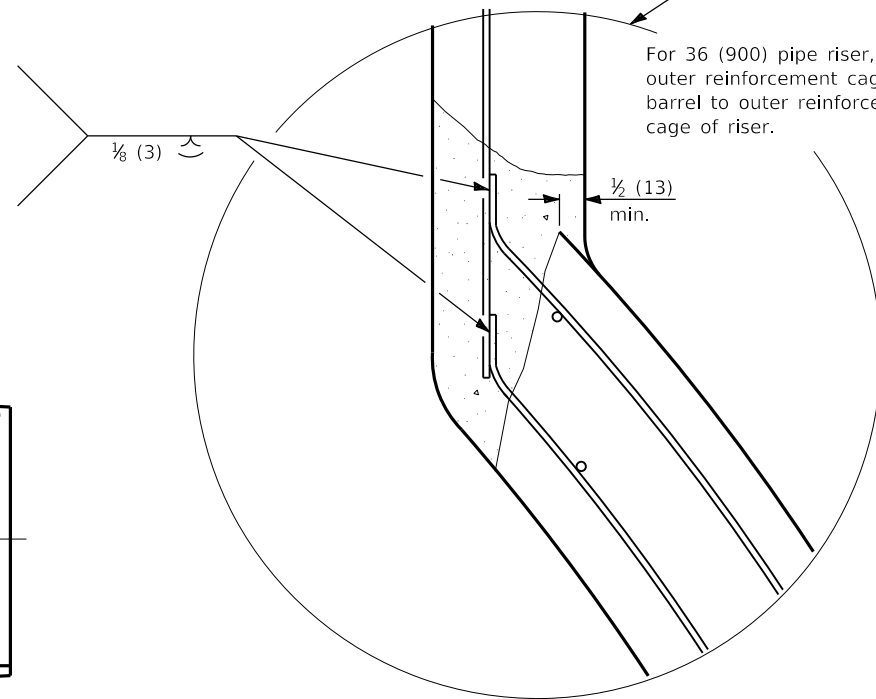
For wire W12 thru W2 (10.008 thru 7.188), length of weld shall be  $\frac{3}{4}$  (20) min.  
 For wire W5.5 thru W2.5 (6.655 thru 4.496), length of weld shall be  $\frac{5}{8}$  (10) min.  
 Other wire gauges shall be tied per detail.



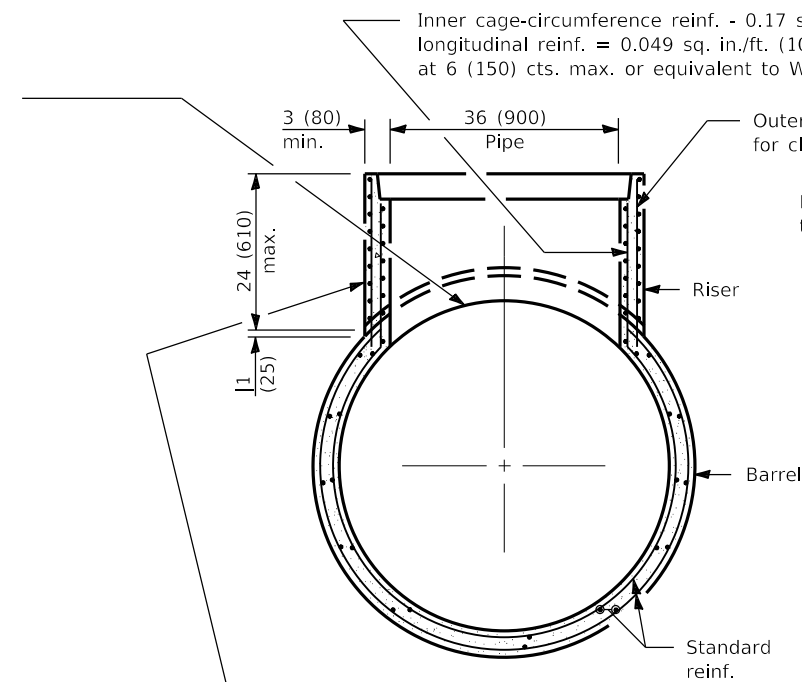
**PLAN  
TEE WITH 24 (600) RISER**



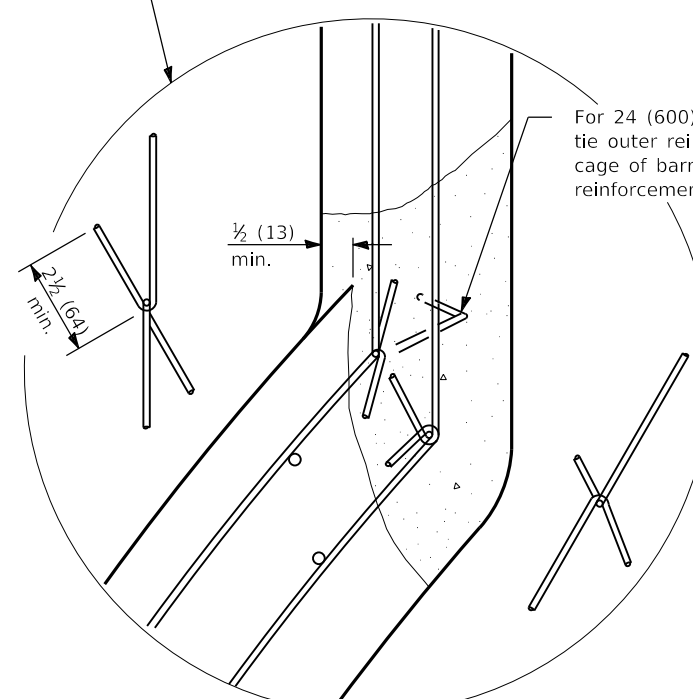
**TRANSVERSE SECTION**



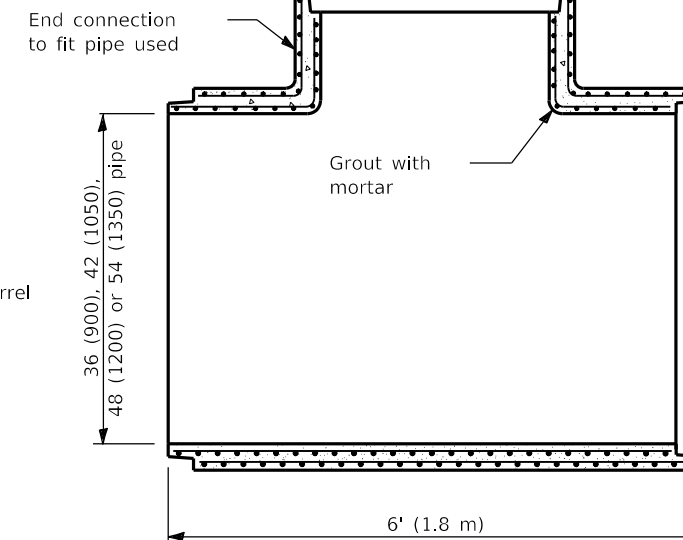
**WELDED LAP**



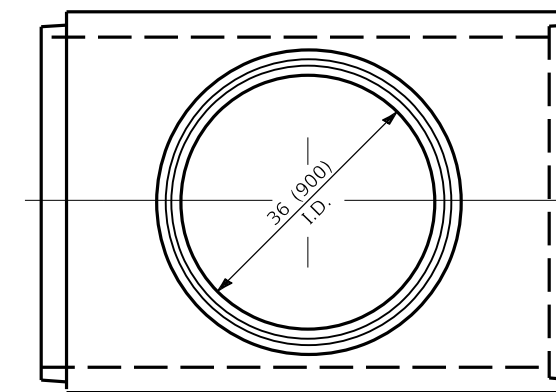
**TRANSVERSE SECTION**



**TIED LAP**



**LONGITUDINAL SECTION**



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

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

Illinois Department of Transportation

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

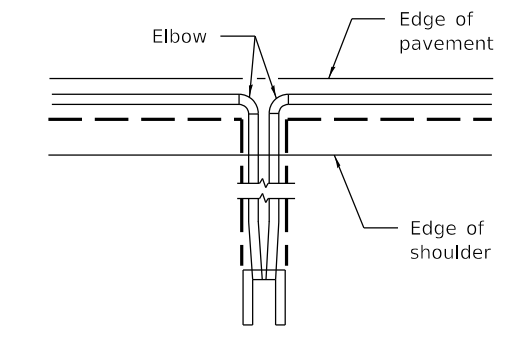
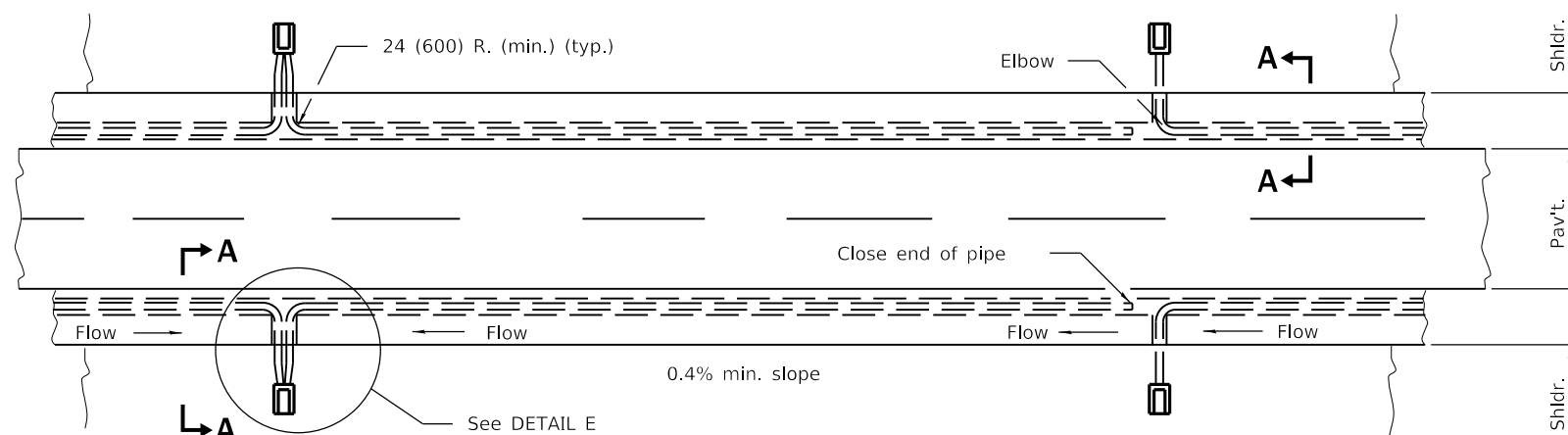
APPROVED January 1, 2011  
*Scott Schick*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

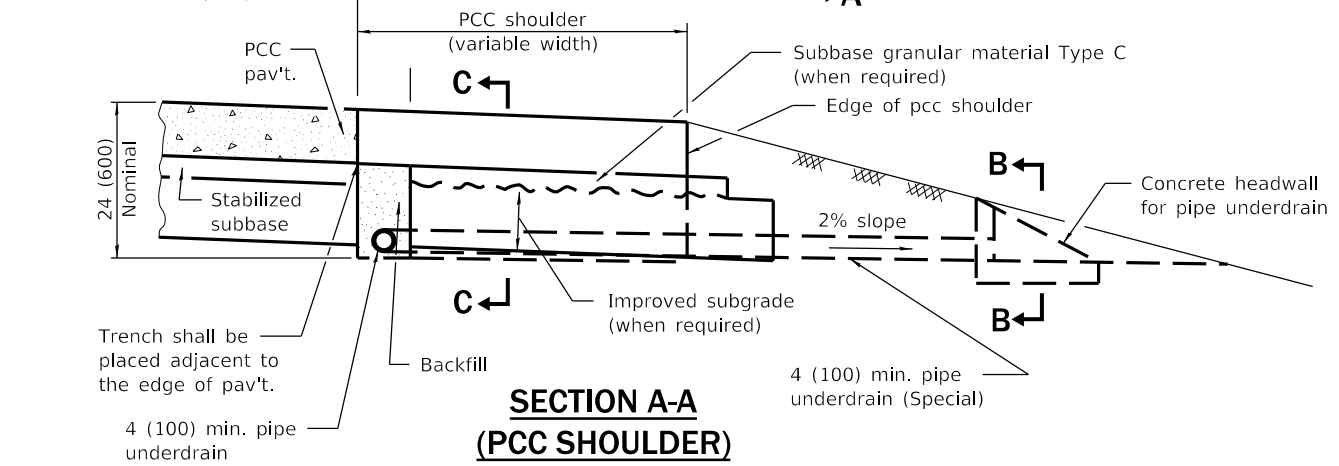
**REINFORCED CONCRETE  
PIPE TEE**

**STANDARD 542606-02**



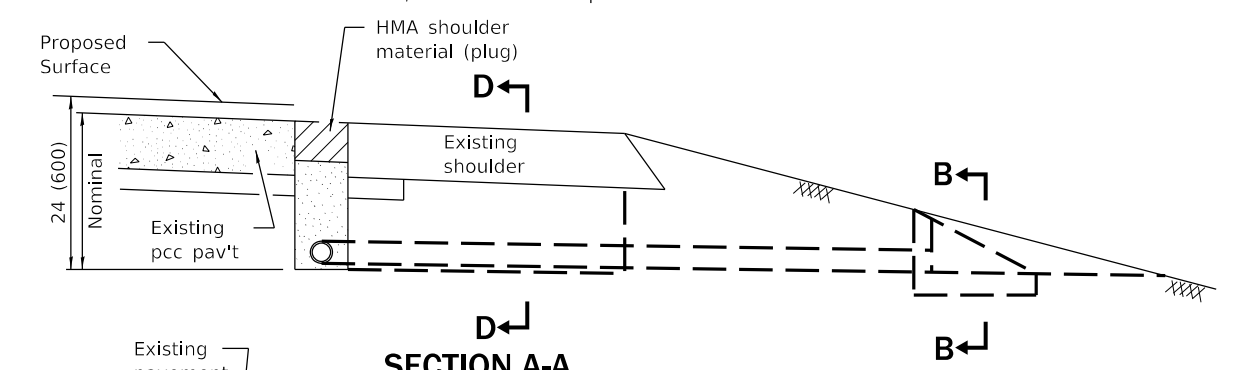
**DETAIL E**

Width min. = O.D. + 4 (100)  
Width max. = 12 (300)

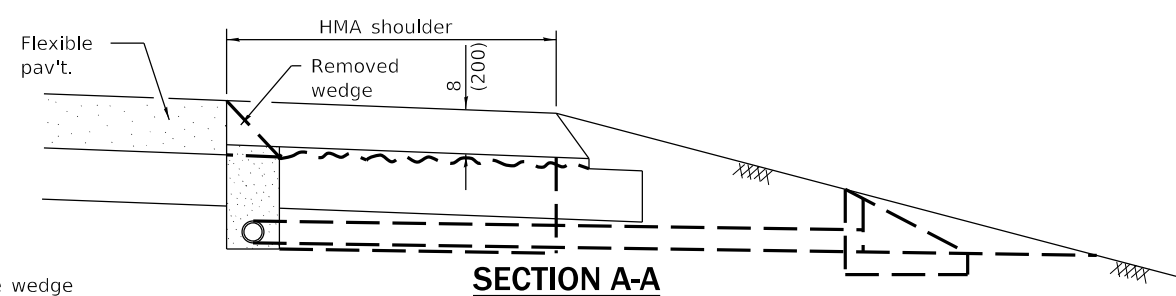


**SECTION A-A  
(PCC SHOULDER)**

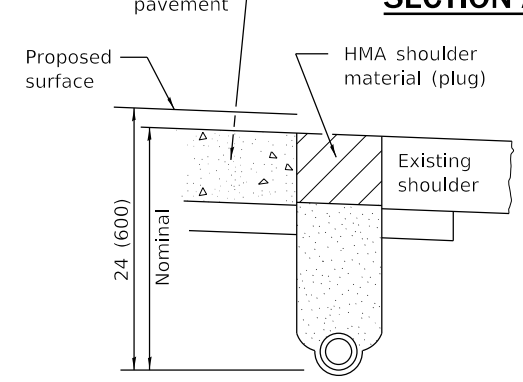
**PLAN**



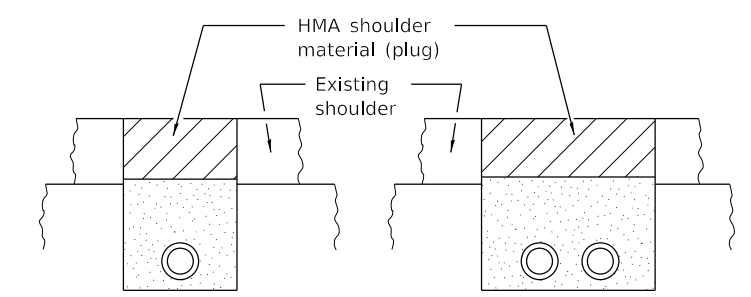
**SECTION A-A**



**SECTION A-A  
(HMA SHOULDER)**

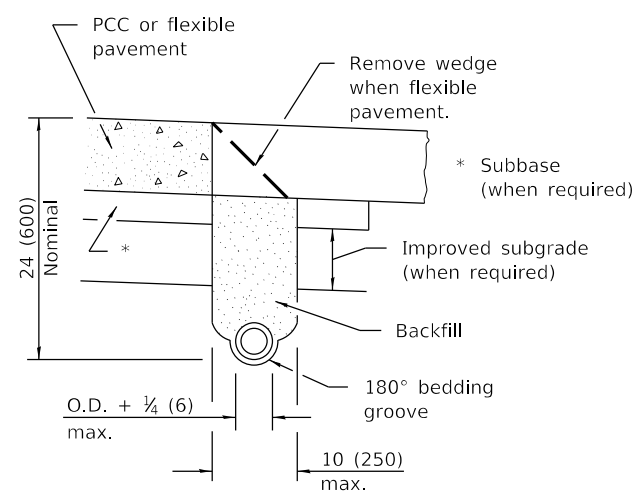


**SECTION D-D**



**SECTION D-D  
(Sag Locations)**

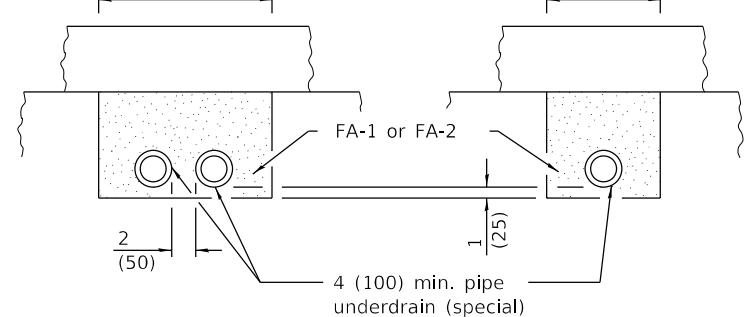
**TRENCH FOR CORRUGATED POLYETHYLENE TUBING ALTERNATE**



**TRENCH FOR CORRUGATED POLYETHYLENE TUBING ALTERNATE**

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

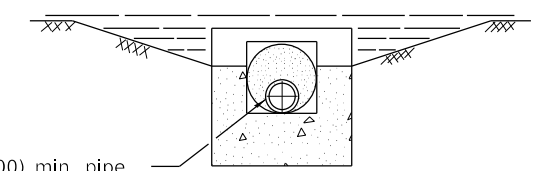
Width min. =  $(2 \times \text{O.D.}) + 6$  (150)  
Width max. = 18 (450)



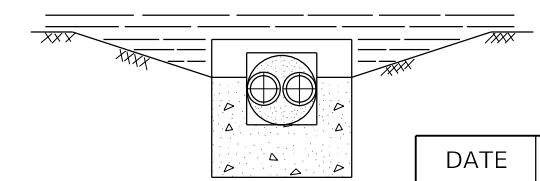
**SECTION C-C  
(Sag Locations)**

**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.

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**

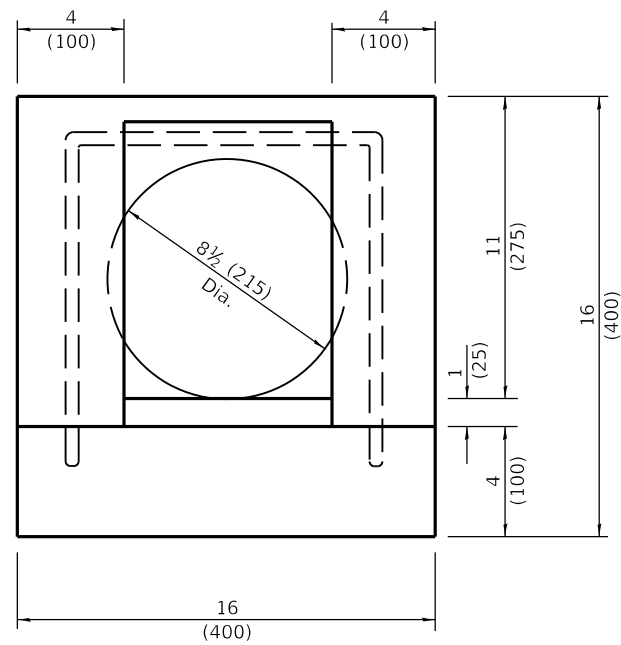
**STANDARD 601001-05**

Illinois Department of Transportation

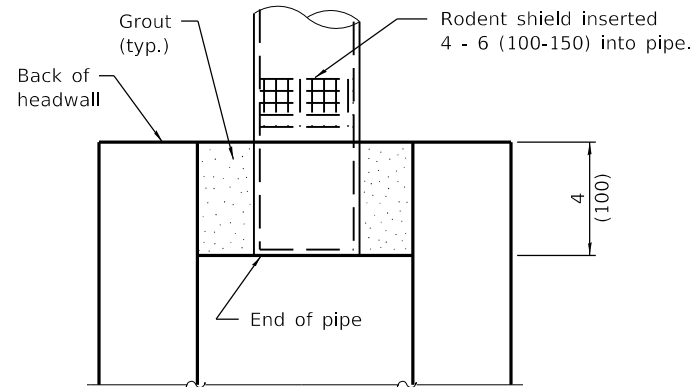
PASSED April 1, 2016  
*Michael Beard*  
ENGINEER OF POLICY AND PROCEDURES

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

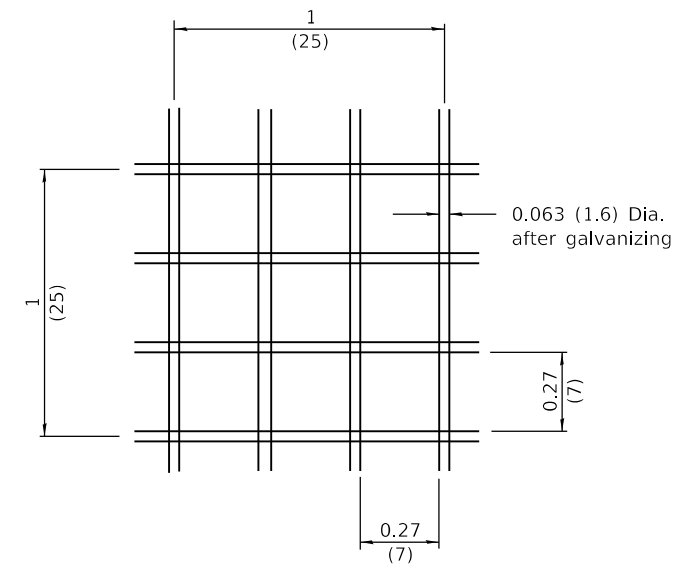
ISSUED 1-1-97



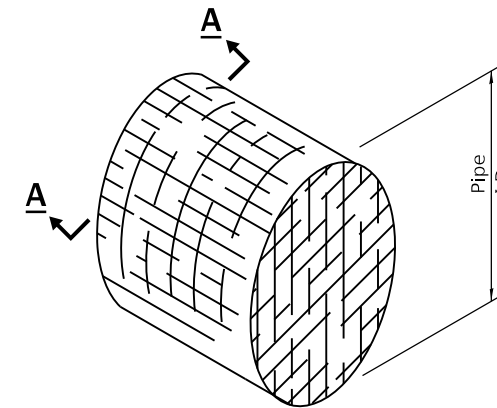
**FRONT VIEW**



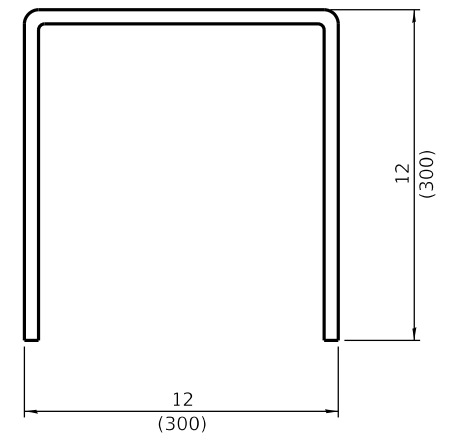
**RODENT SHIELD PLACEMENT**



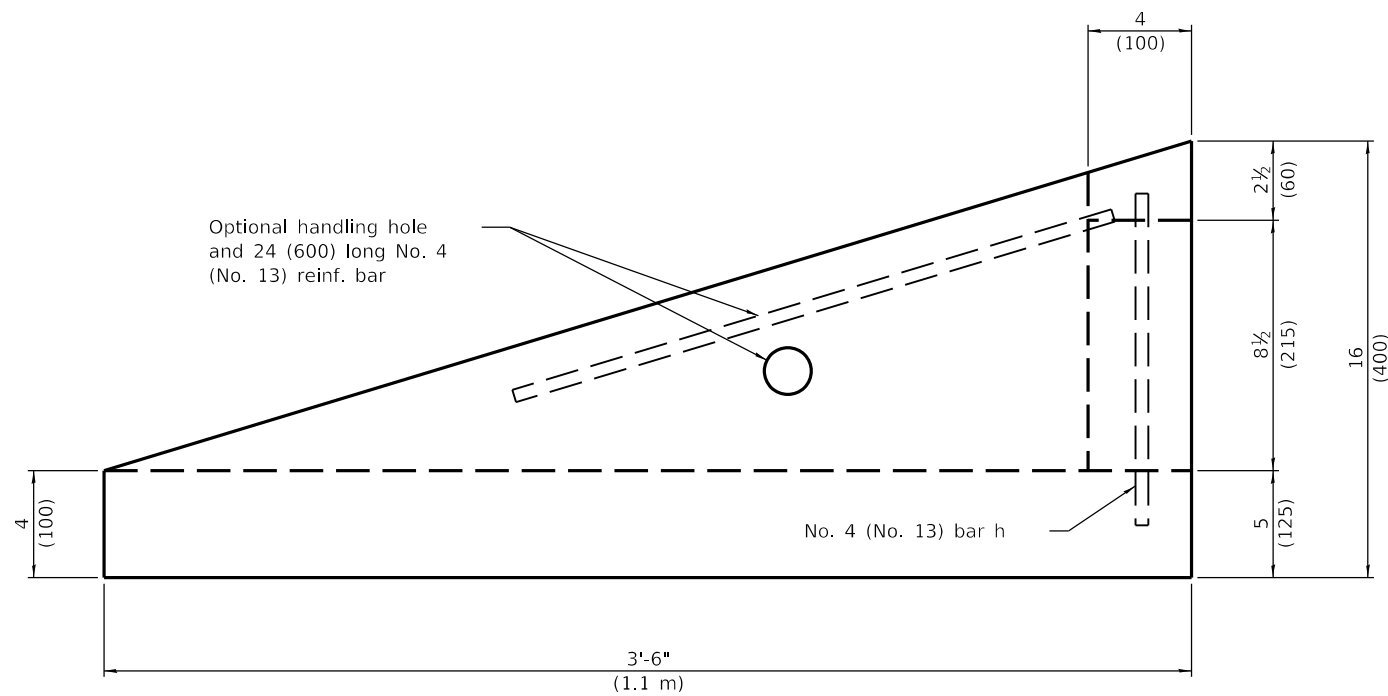
**SECTION A-A**



**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.

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**

Illinois Department of Transportation

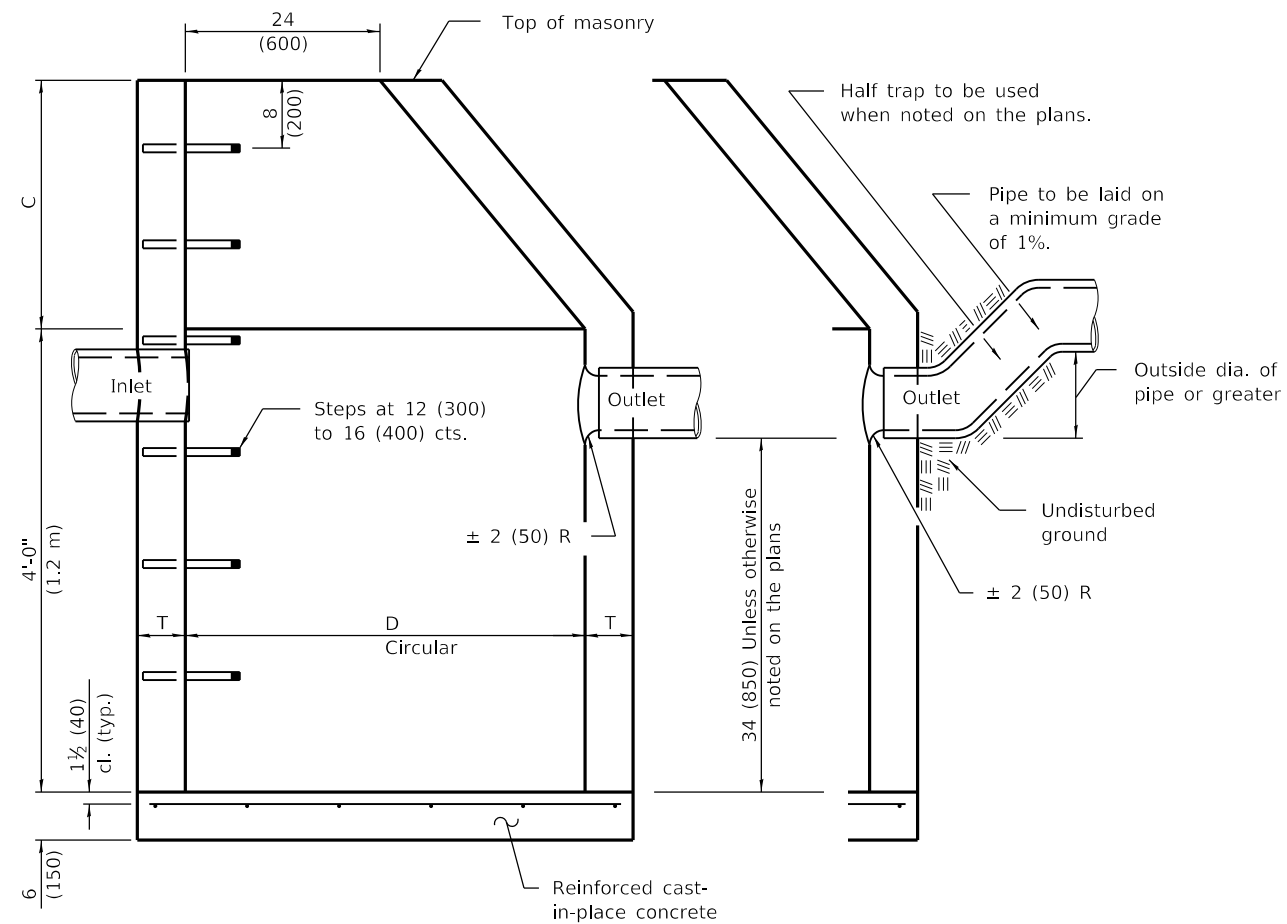
PASSED April 1, 2016

*Michael Beard*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED April 1, 2016

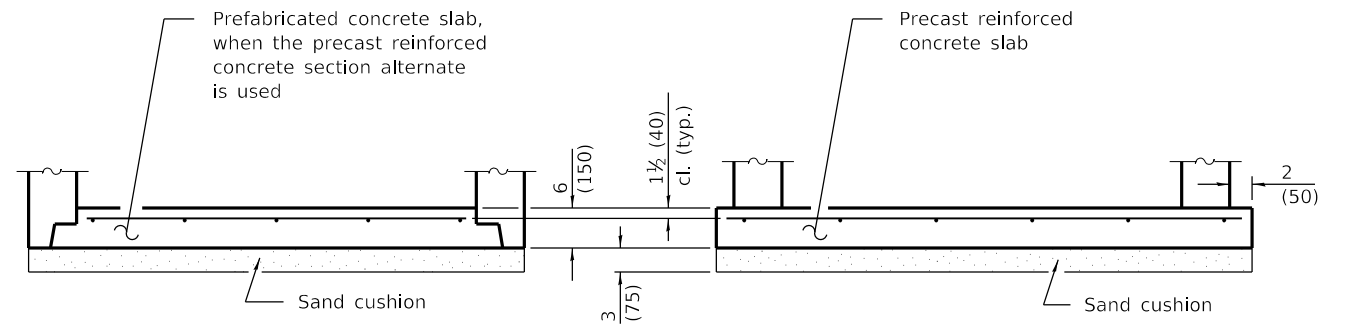
*[Signature]*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



**ELEVATION**  
(Standard Outlet)

**ELEVATION**  
(Half Trap)



**ALTERNATE BOTTOM SLAB**

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

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

**GENERAL NOTES**

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

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

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

See Standard 602701 for details of steps.

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

Illinois Department of Transportation

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

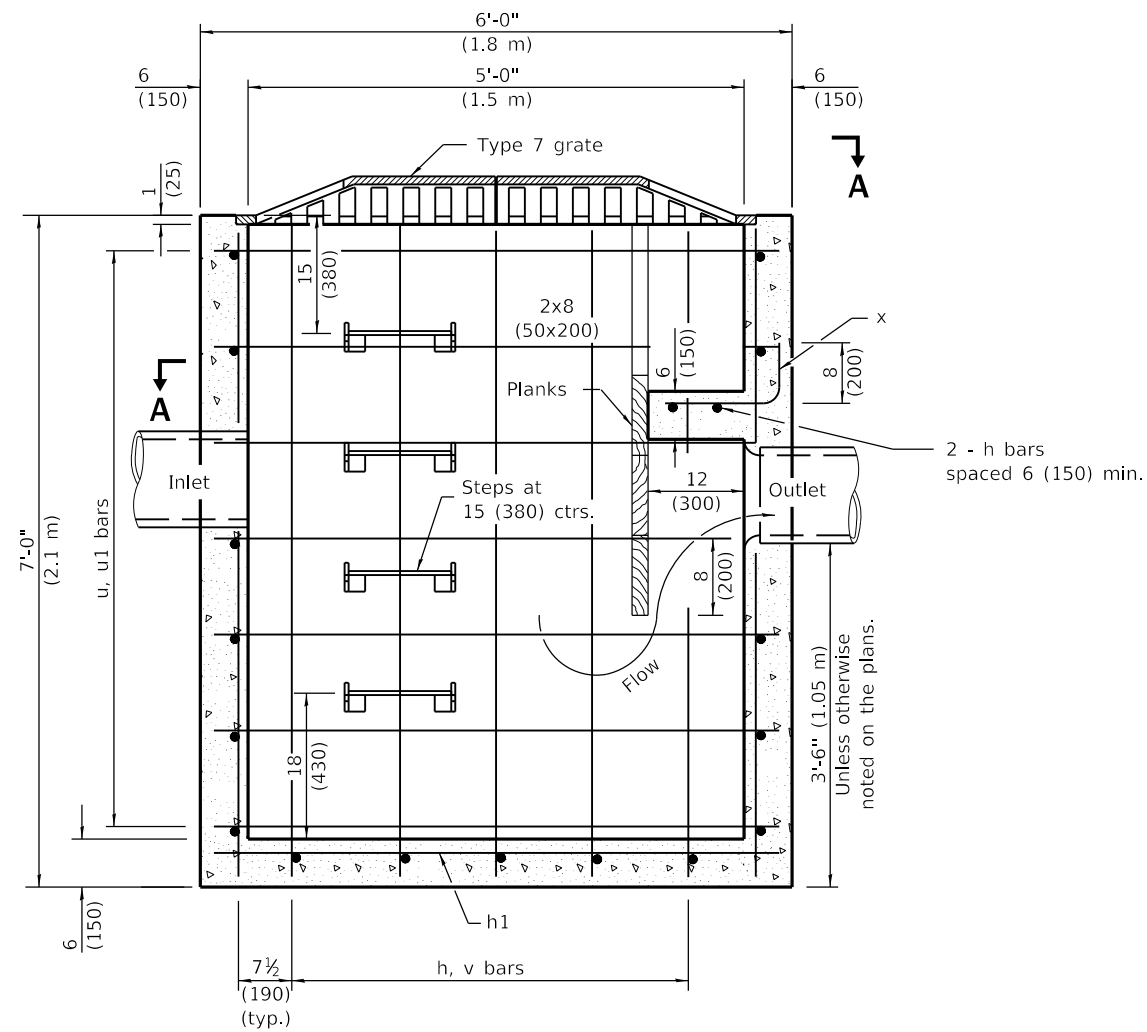
APPROVED January 1, 2011  
*Scott Schick*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

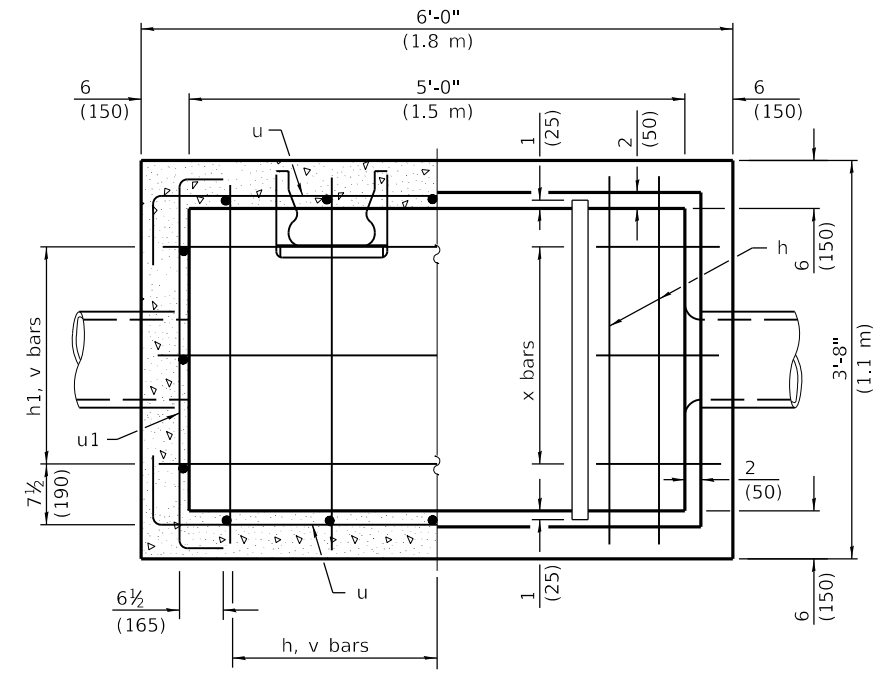
DATE	REVISIONS
1-1-11	Added 'Outside' to half trap note. Detail rein. in slabs.
	Revised general notes.
1-1-09	Switched units to English (metric).

**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. (m <sup>3</sup> )	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.

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

**CATCH BASIN  
TYPE B**

**STANDARD 602006-04**

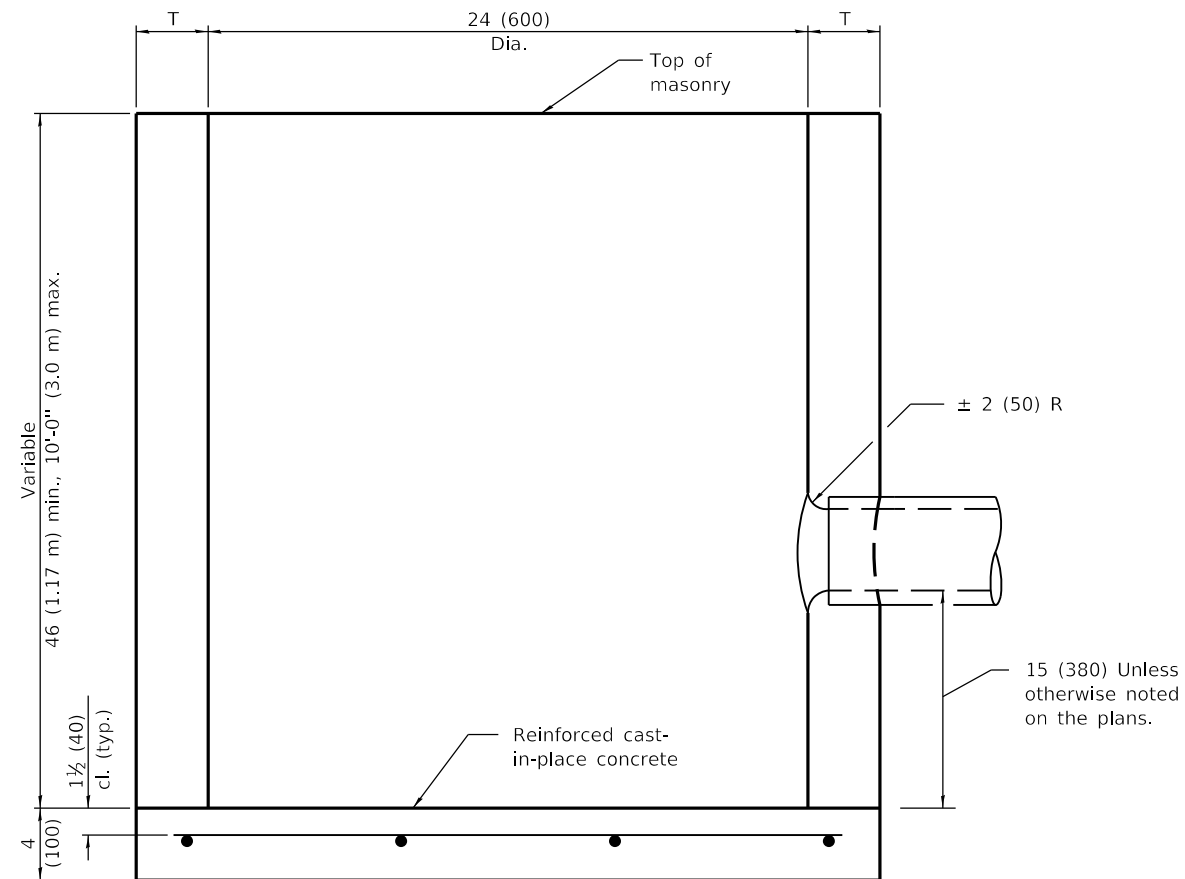
Illinois Department of Transportation

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

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

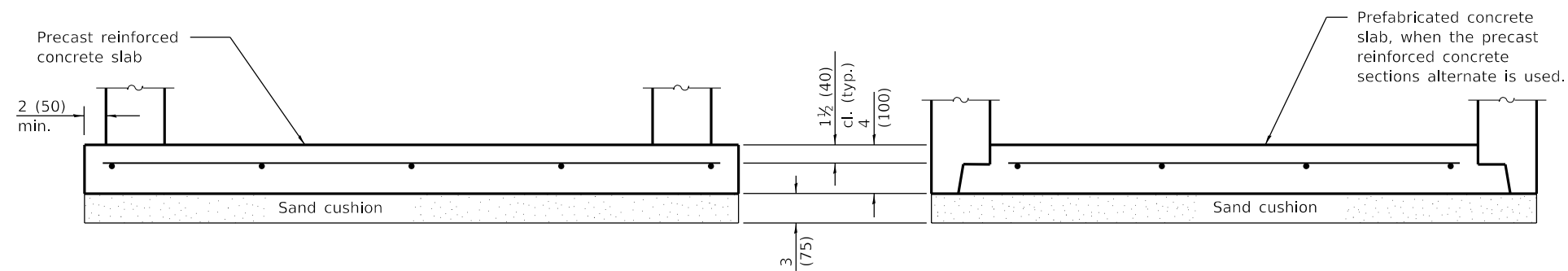
ISSUED 1-1-97





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)

**ELEVATION**



**ALTERNATE BOTTOM SLAB**

**GENERAL NOTES**

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

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

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

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

**CATCH BASIN TYPE C**

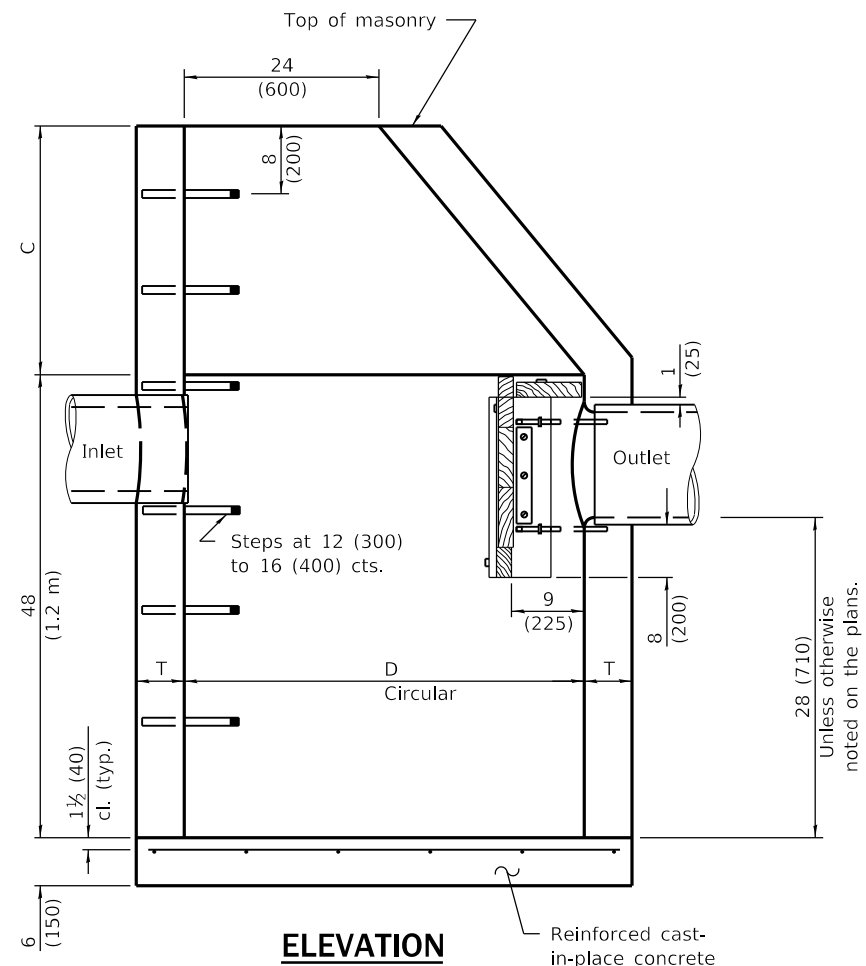
**STANDARD 602011-02**

Illinois Department of Transportation

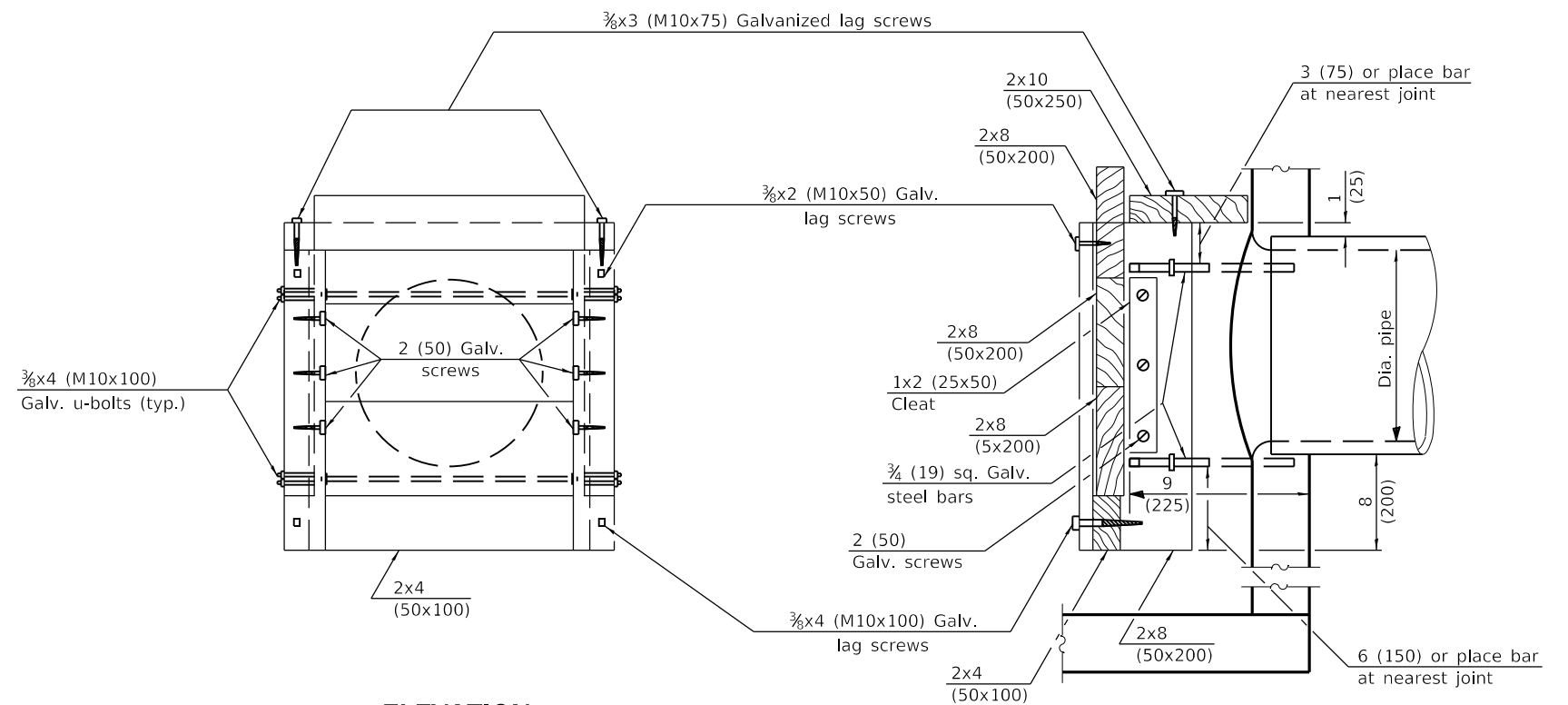
PASSED January 1, 2011  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2011  
*Scott Schick*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

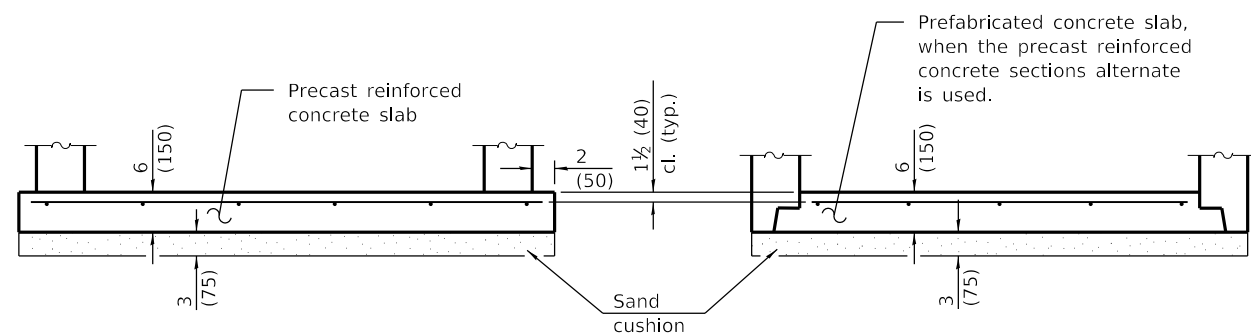


**ELEVATION**

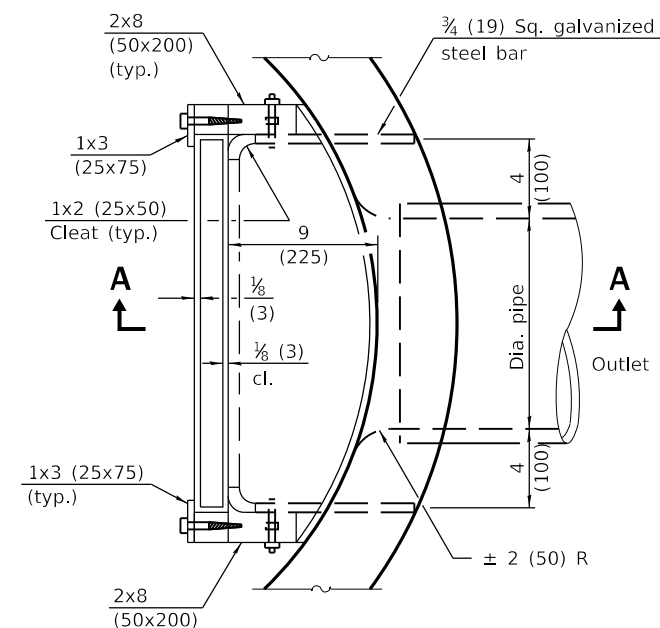


**ELEVATION**

**SECTION A-A**



**ALTERNATE BOTTOM SLAB**



**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.

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).

Illinois Department of Transportation

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

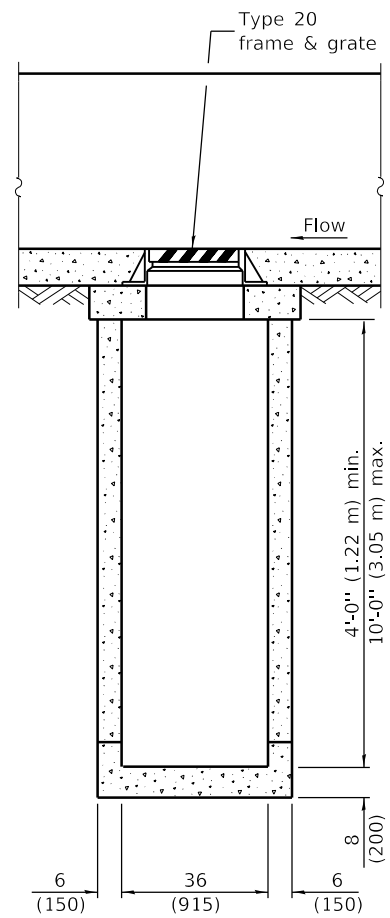
APPROVED January 1, 2011  
*Scott Schick*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

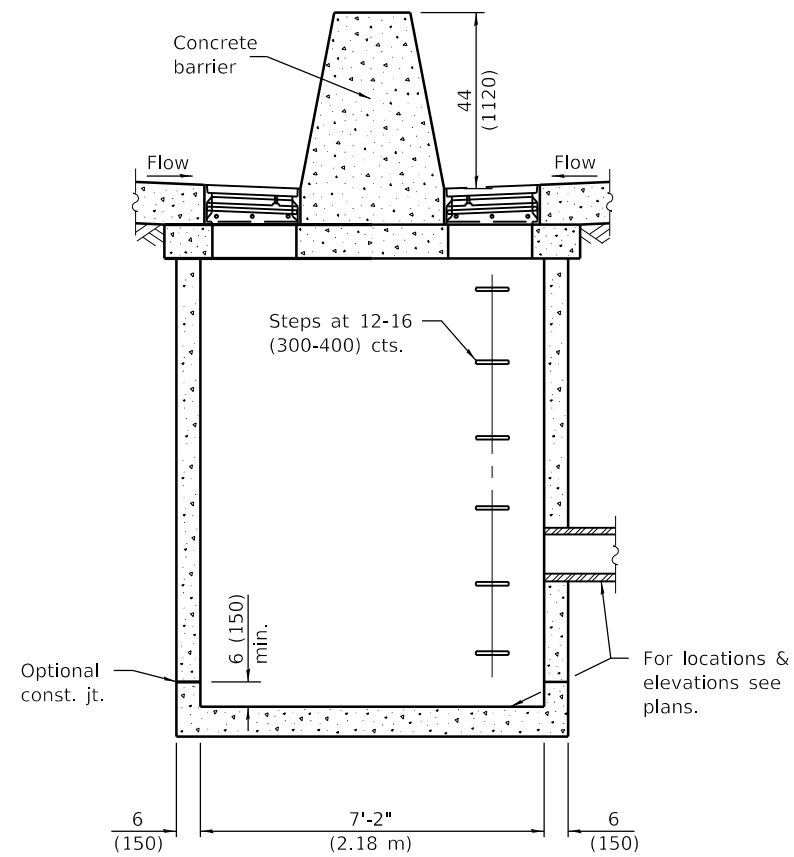
DATE	REVISIONS
1-1-11	Detailed reinforcement in slabs. Revised general notes.
1-1-09	Switched units to English (metric).

**CATCH BASIN  
TYPE D**

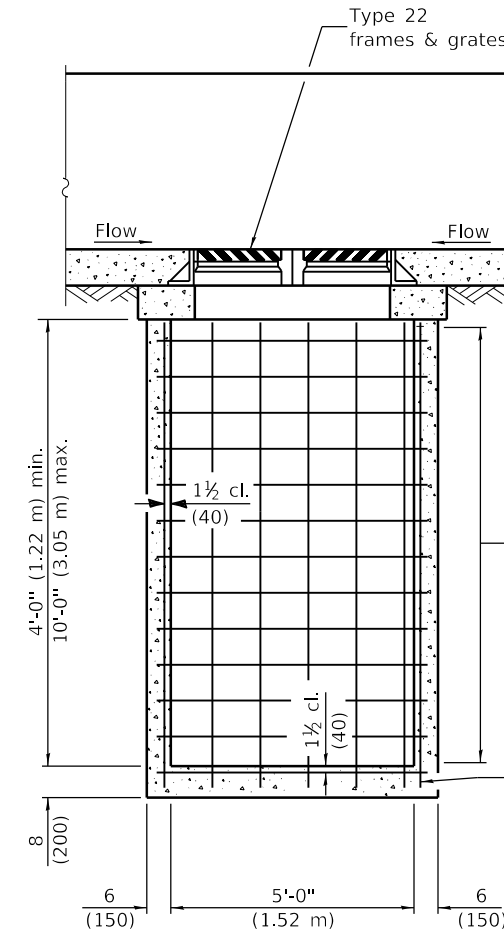
**STANDARD 602016-02**



**FRONT ELEVATION - TYPE 4**



**SIDE ELEVATION - TYPE 4 & 5**



**FRONT ELEVATION - TYPE 5**

For 4'-0" (1.22 m) to 8'-0" (2.44 m) use No. 5 (No. 16) bars at 8 (200) cts. (all sides).  
Over 8'-0" (2.44 m) to 10'-0" use No. 5 (No. 16) bars at 7 (175) cts. (all sides).

No. 5 (No. 16) Bars at 12 (300) cts. (all sides)

**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 3/4 (19).

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

Illinois Department of Transportation

PASSED January 1, 2021  
*Michael Bond*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
*Joseph E. G...*  
ENGINEER OF DESIGN AND ENVIRONMENT

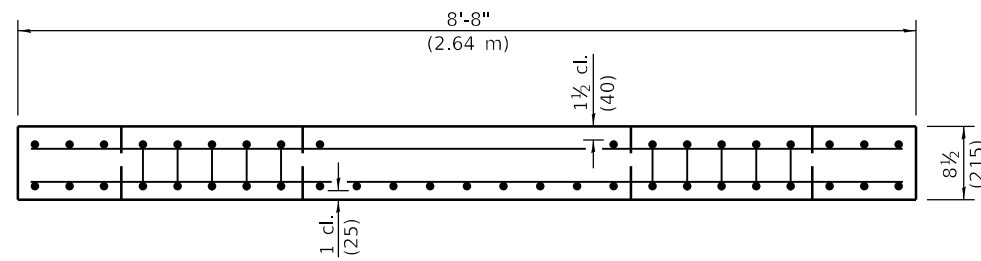
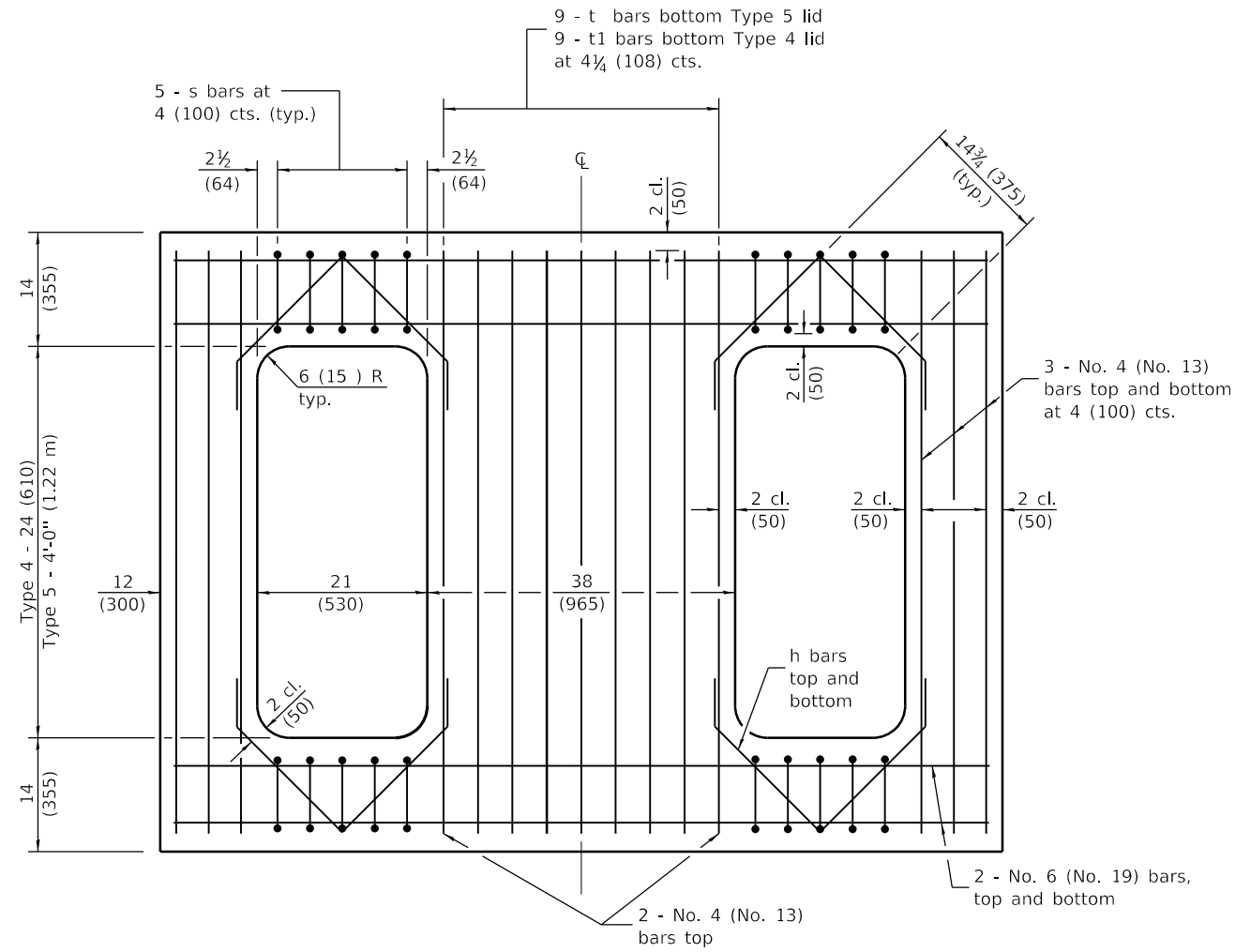
ISSUED 4-1-04

DATE	REVISIONS
1-1-21	Revised openings in lid to fit the 36 (915) width 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.

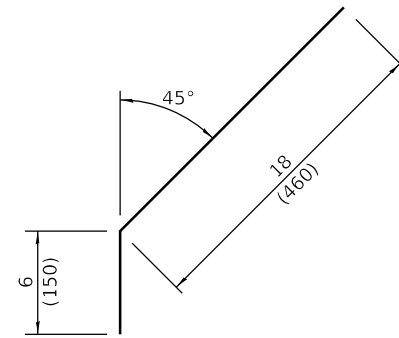
**DRAINAGE STRUCTURES  
TYPES 4 & 5**

(Sheet 1 of 2)

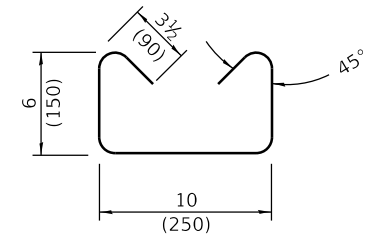
**STANDARD 602106-03**



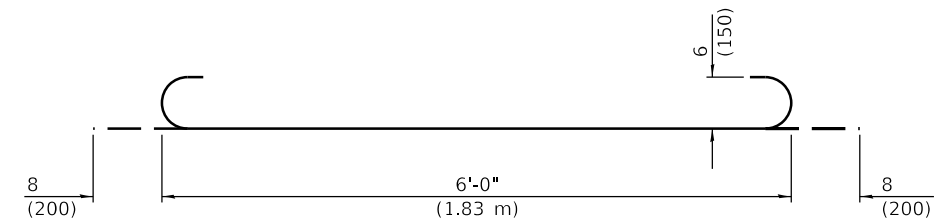
**REINFORCED LID - TYPE 4 & 5**



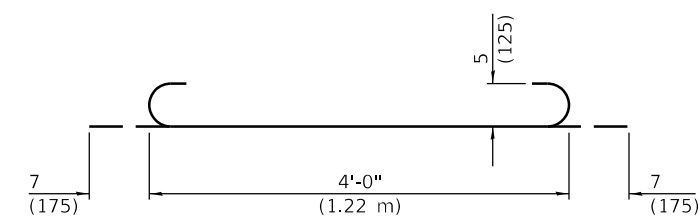
**No. 4 (No. 13) Bar h**



**No. 3 (No. 10) Bar s**



**No. 6 (No. 19) Bar t**



**No. 5 (No. 16) Bar t1**

Illinois Department of Transportation

PASSED January 1, 2021  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
*J. E. EG*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-04

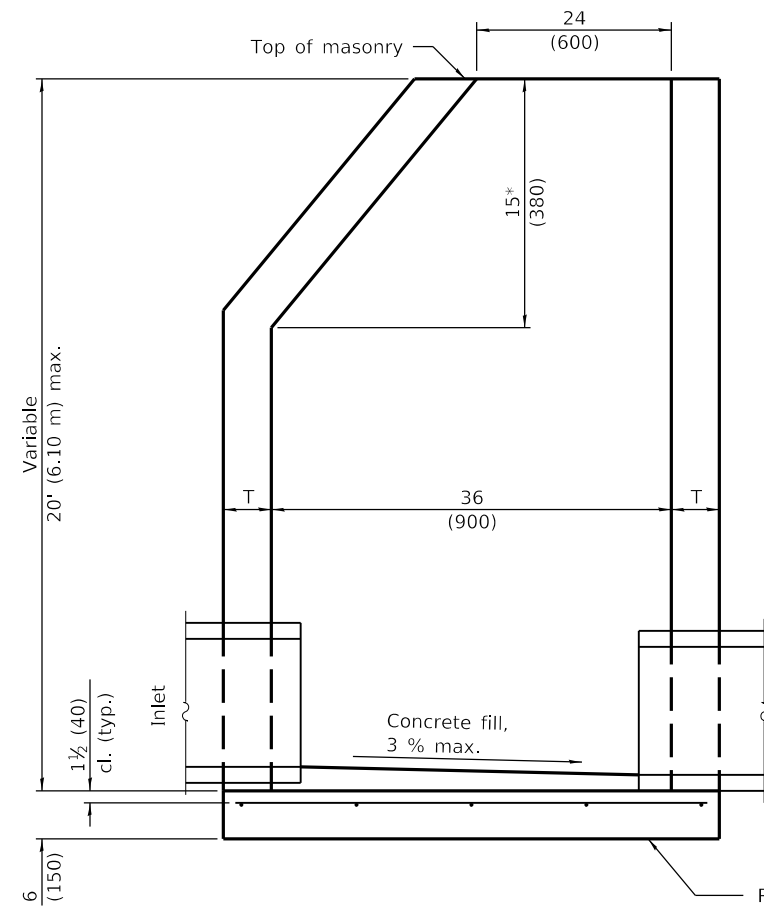
**DRAINAGE STRUCTURES  
 TYPES 4 & 5**

(Sheet 2 of 2)

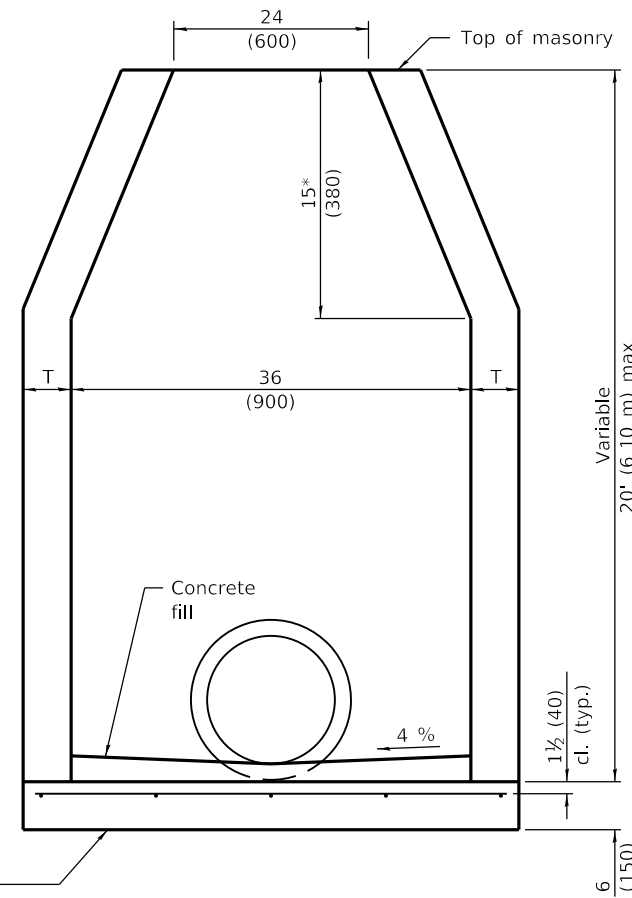
**STANDARD 602106-03**



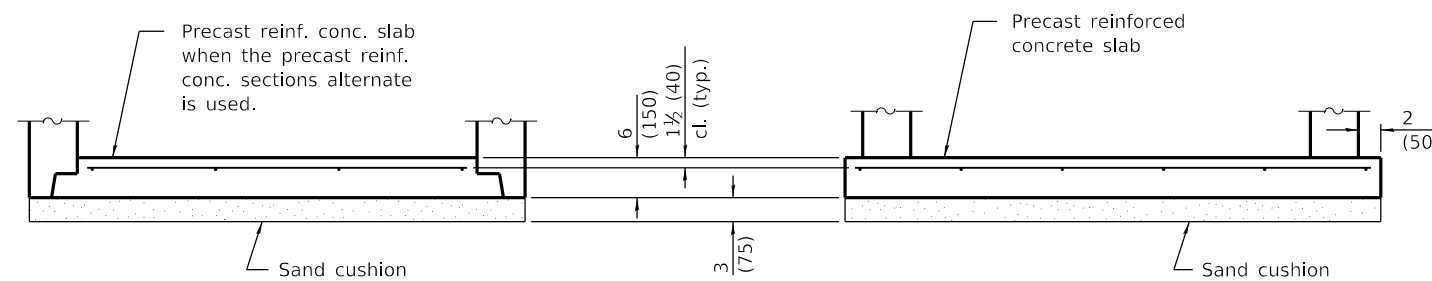
\* For precast reinforced concrete sections, this dimension may vary from the dimension given to plus 6 (150).



**ELEVATION - ECCENTRIC**



**ELEVATION - CONCENTRIC**



**ALTERNATE BOTTOM SLAB**

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)

**GENERAL NOTES**

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

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

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

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

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

**INLET - TYPE B**

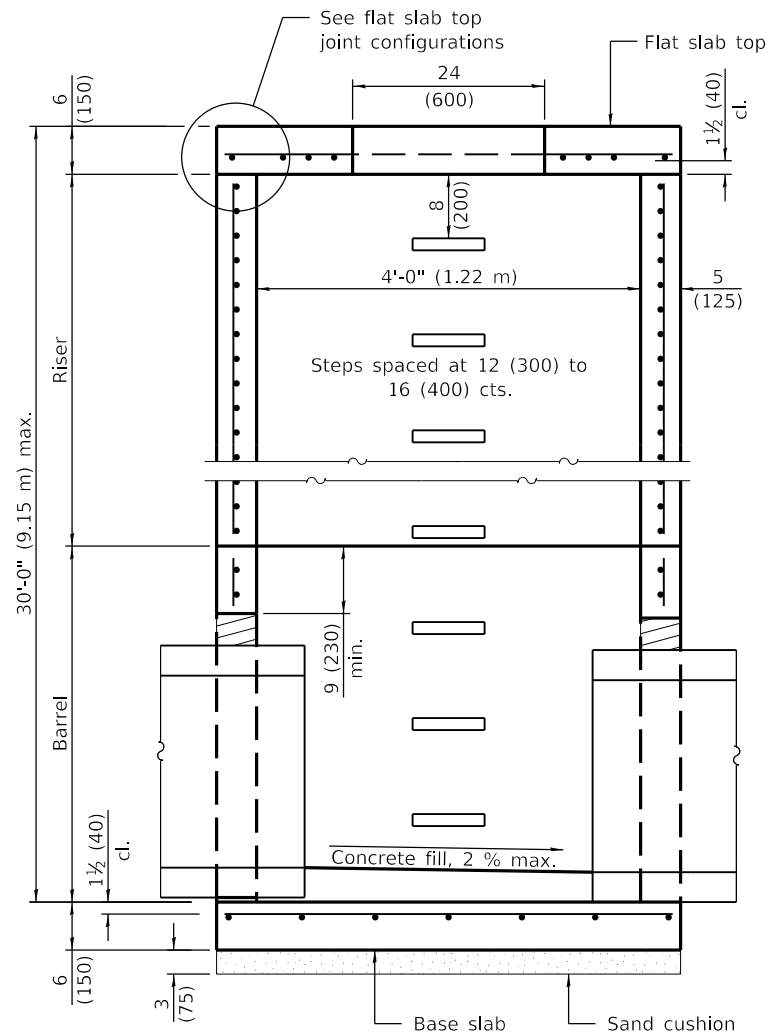
**STANDARD 602306-03**

Illinois Department of Transportation

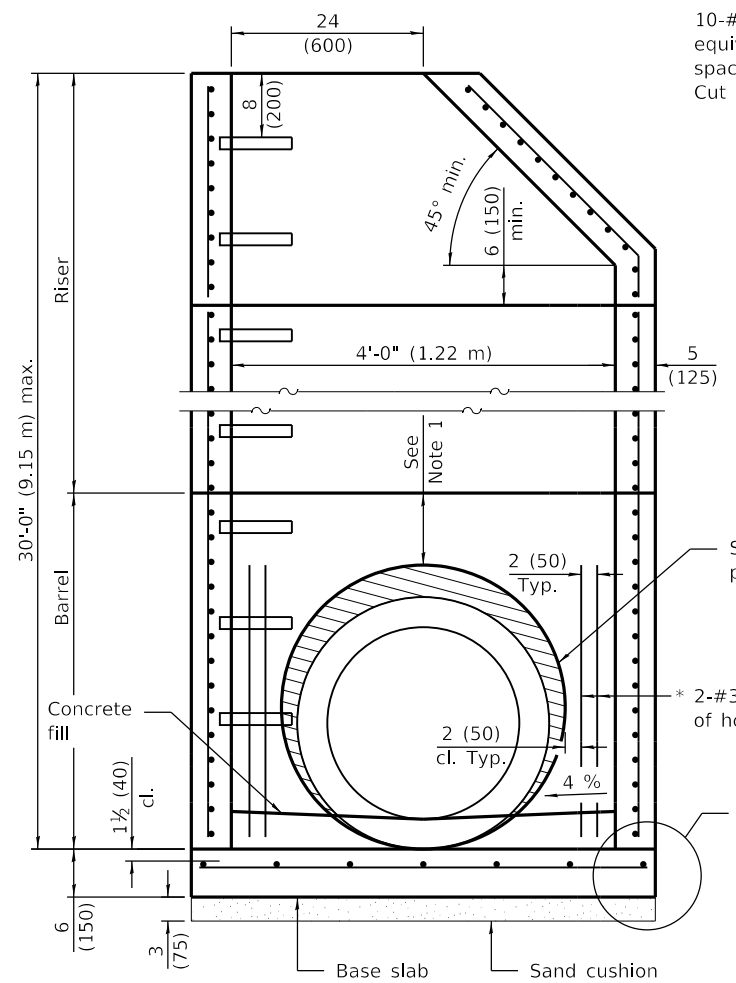
PASSED January 1, 2011  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2011  
*Scott Schick*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



**SECTION PARALLEL TO PIPE**  
(Without conical top riser)

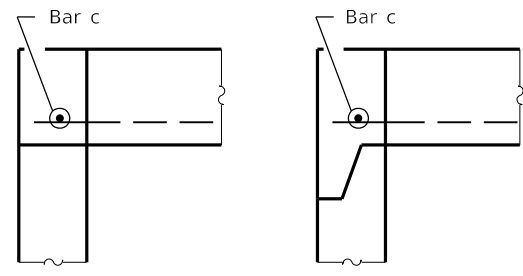


**SECTION PERPENDICULAR TO PIPE**  
(With conical top riser)

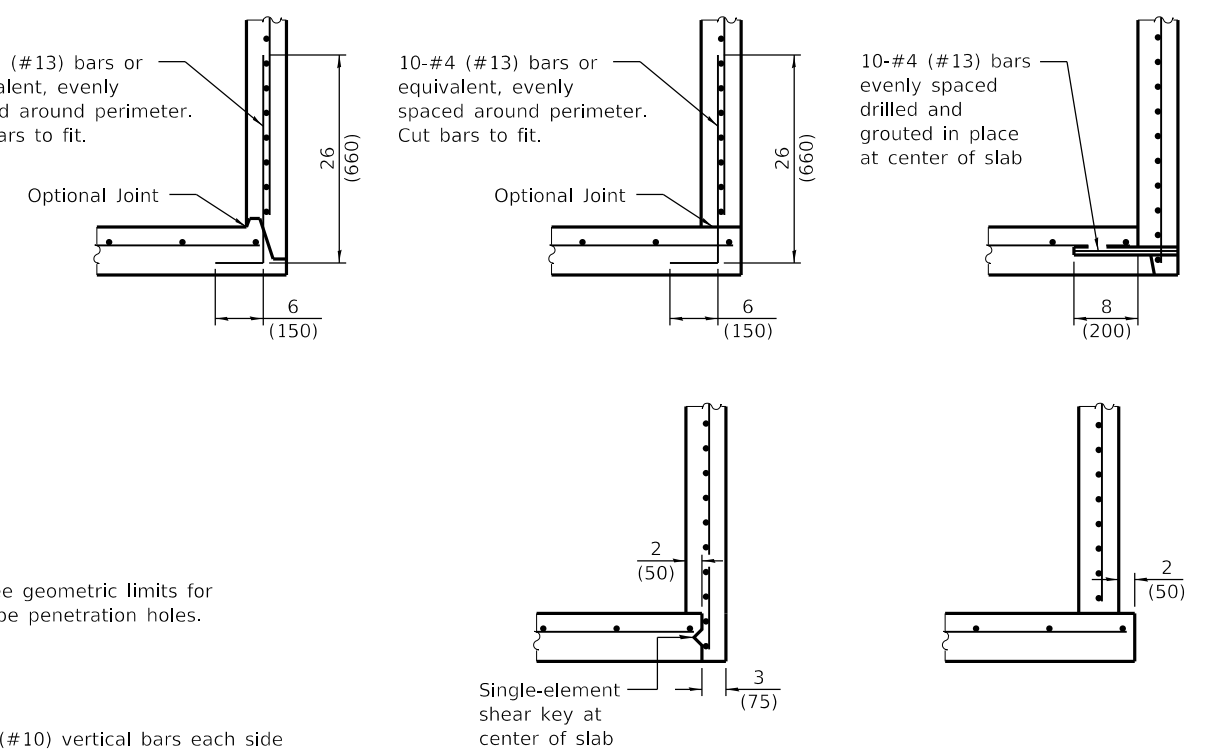
\* As an alternate, the barrel wall reinforcement may be reduced to riser wall reinforcement with #3 (#10) bars placed around the pipe penetration holes as shown. This option may be utilized when the pipe penetration holes are formed as opposed to cored.

**GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES**

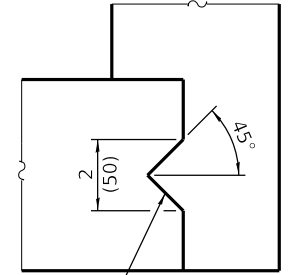
- Note 1: A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 24 (600).
- Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).
- Note 3: A maximum of 60 percent of the inside 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.



**FLAT SLAB TOP JOINT CONFIGURATIONS**  
(Shown at access hole)



**BASE SLAB JOINT CONFIGURATIONS**



Single-element shear key at center of slab

**SHEAR KEY GEOMETRY**  
(Reinforcement not shown for clarity)

**GENERAL NOTES**

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

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**  
**4' (1.22 m) DIAMETER**  
(Sheet 1 of 2)

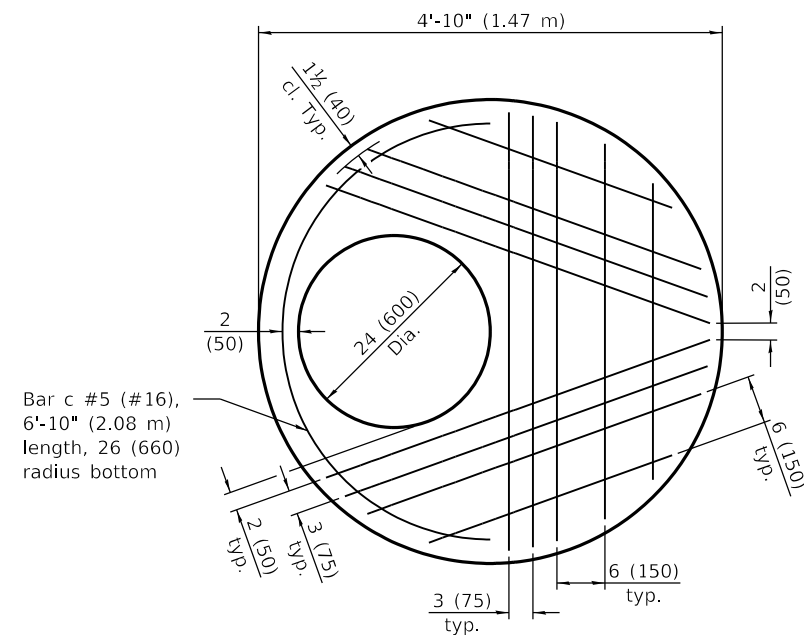
**STANDARD 602401-07**

Illinois Department of Transportation

PASSED January 1, 2021  
  
 ENGINEER OF POLICY AND PROCEDURES

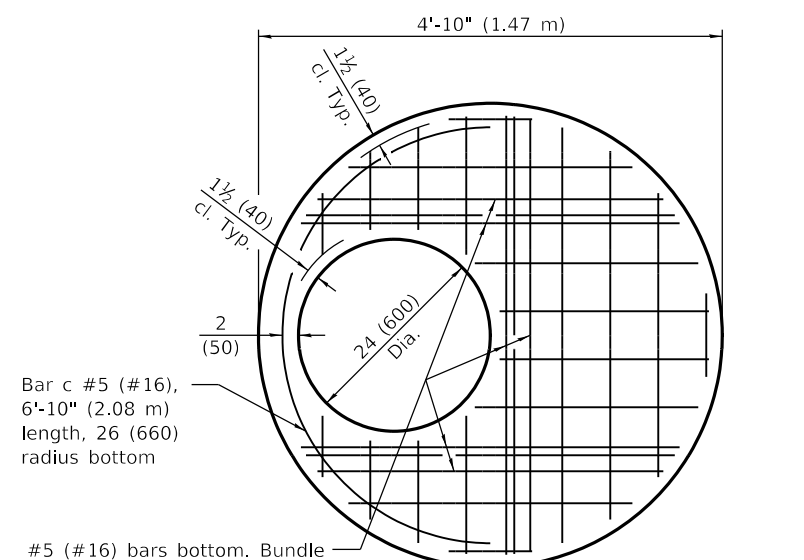
APPROVED January 1, 2021  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



**PLAN - FLAT SLAB TOP**

(Showing layout of reinforcement bars and c bars)

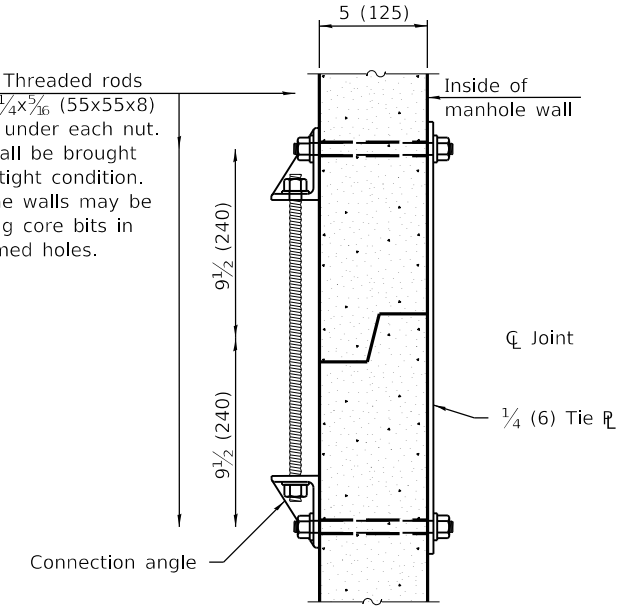


**PLAN - FLAT SLAB TOP**

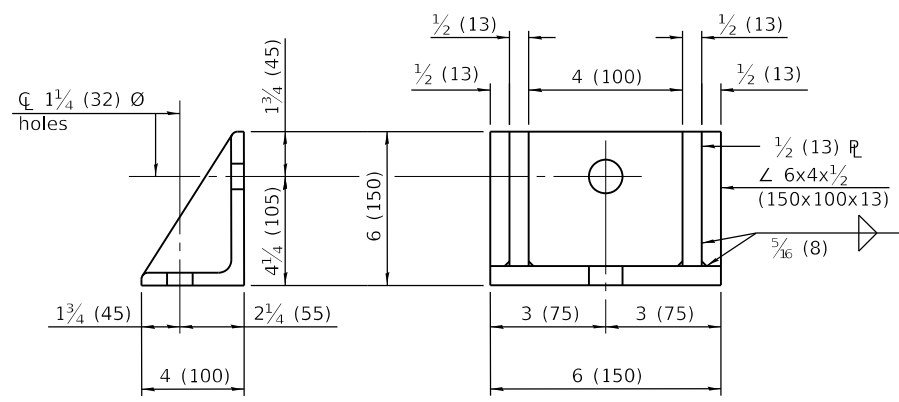
(Showing layout of welded wire reinforcement and c bars)

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

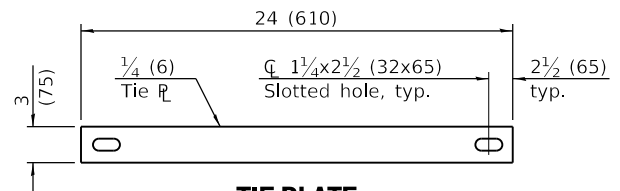
$\varnothing$  1(25)  $\varnothing$  Threaded rods with  $2\frac{1}{4} \times 2\frac{1}{4} \times \frac{5}{16}$  (55x55x8)  $\varnothing$  washers under each nut. All nuts shall be brought to a snug tight condition. Holes in the walls may be drilled using core bits in lieu of formed holes.



**JOINT SPLICE**



**CONNECTION ANGLE**



**TIE PLATE**

**FLAT SLAB TOP REINFORCEMENT**

Location	WWR (each direction)		Rebar		
	A <sub>s</sub> (min.)	Spacing (max.)	A <sub>s</sub> (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 <sub>s</sub> (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 <sub>s</sub> (min.)	Spacing (max.)
Top Mat	$\leq$ 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

PASSED January 1, 2021  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES

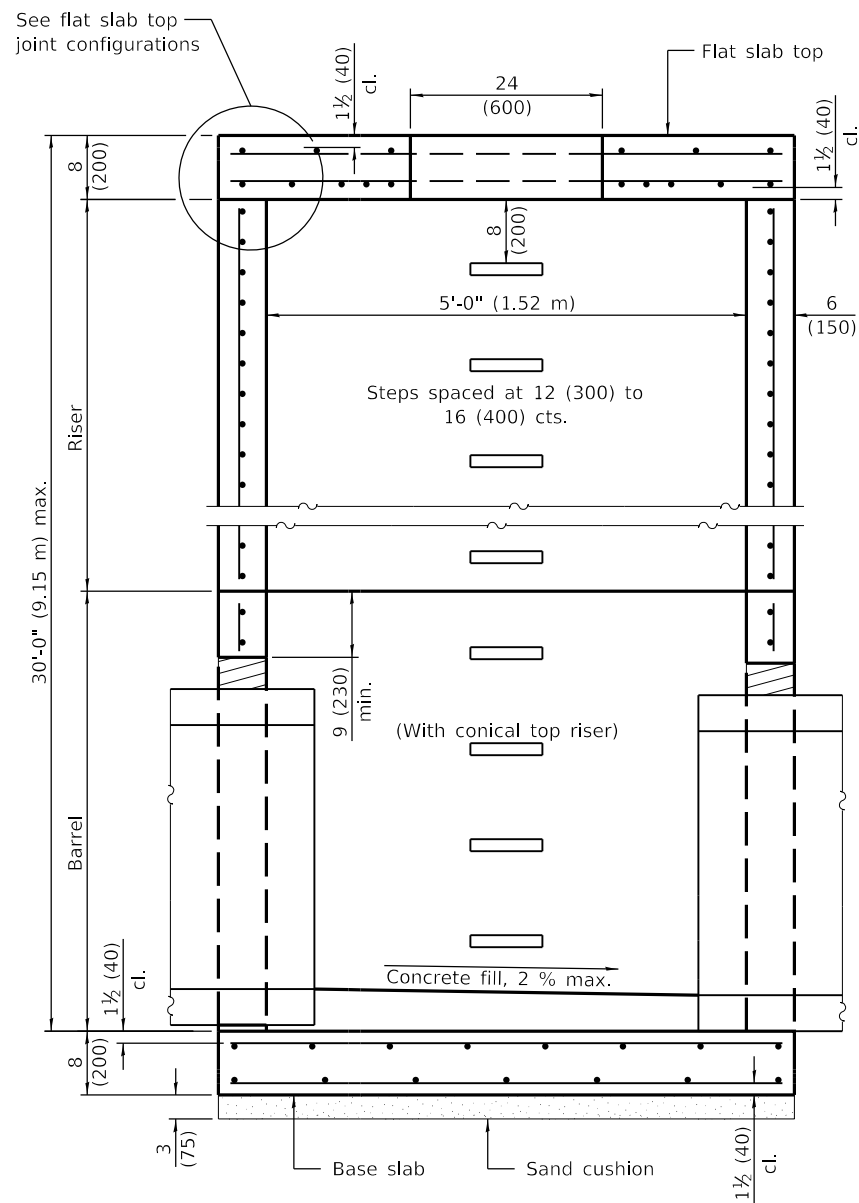
APPROVED January 1, 2021  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

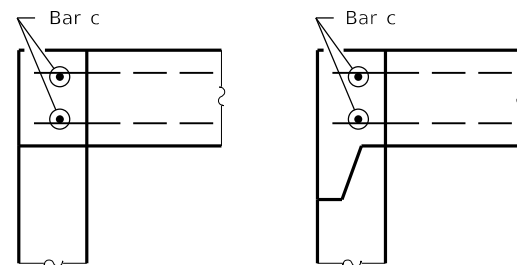
**PRECAST MANHOLE TYPE A**  
**4' (1.22 m) DIAMETER**  
 (Sheet 2 of 2)

**STANDARD 602401-07**

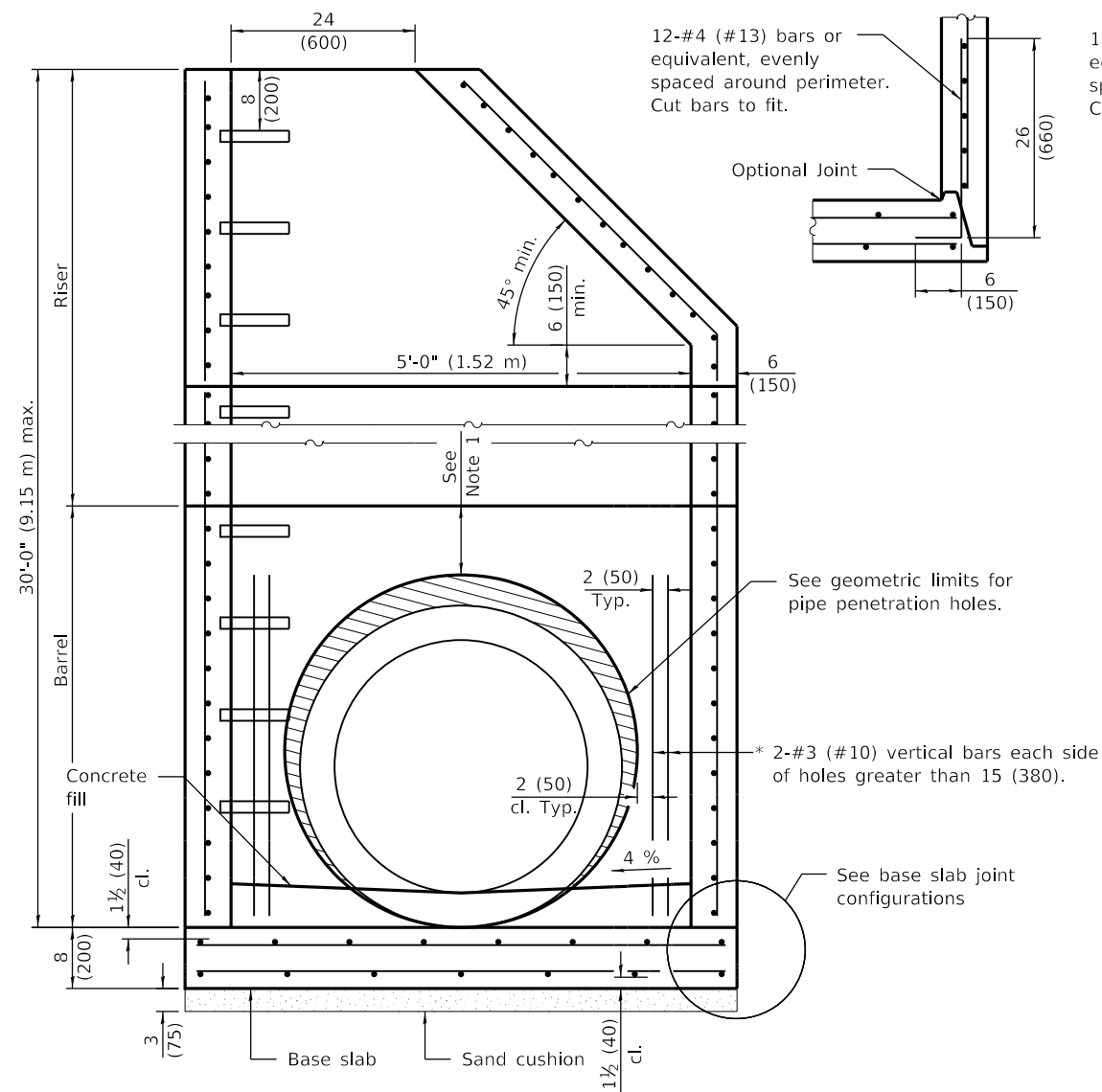




**SECTION PARALLEL TO PIPE**  
(Without conical top riser)



**FLAT SLAB TOP JOINT CONFIGURATIONS**  
(Shown at access hole)

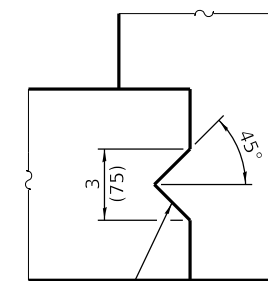


**SECTION PERPENDICULAR TO PIPE**  
(With conical top riser)

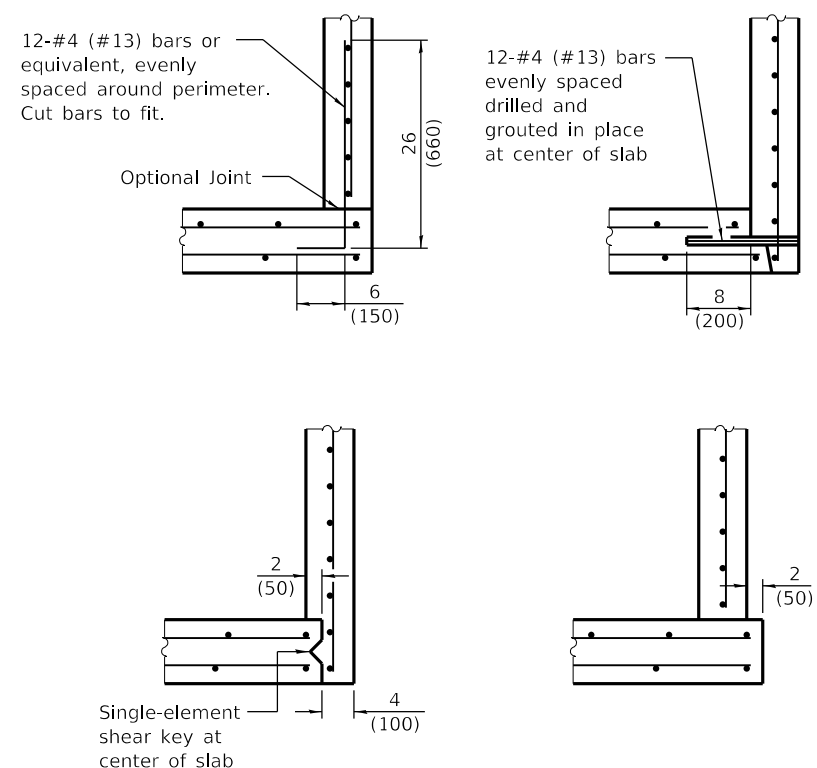
\* As an alternate, the barrel wall reinforcement may be reduced to riser wall reinforcement with #3 (#10) bars placed around the pipe penetration holes as shown. This option may be utilized when the pipe penetration holes are formed as opposed to cored.

**GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES**

- 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.



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



**BASE SLAB JOINT CONFIGURATIONS**

**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.

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)

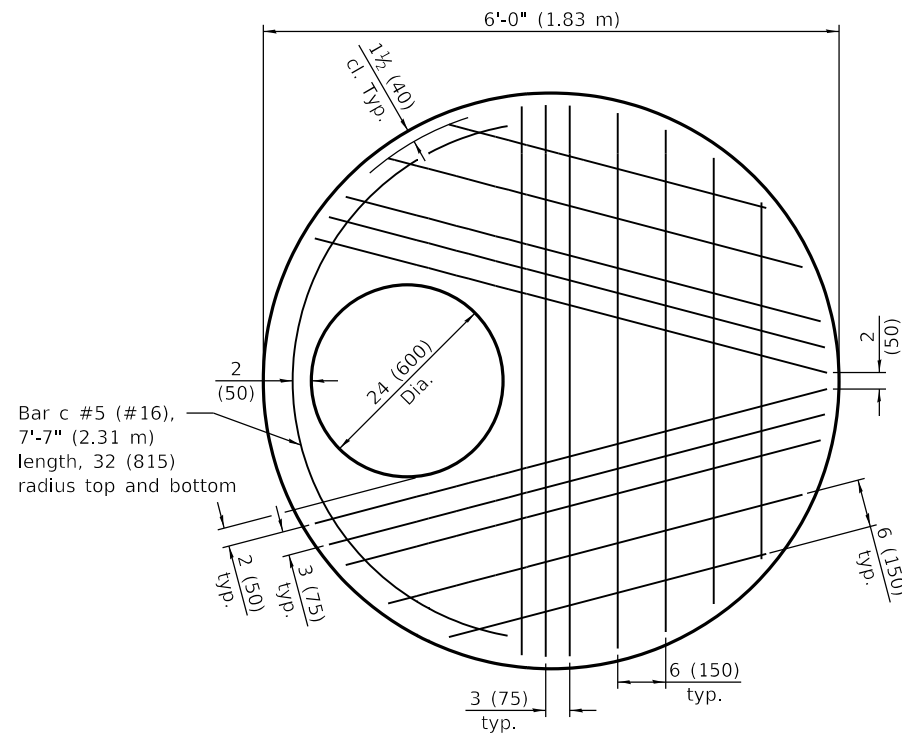
**STANDARD 602402-03**

Illinois Department of Transportation

PASSED January 1, 2021  
Michael Bond  
ENGINEER OF POLICY AND PROCEDURES

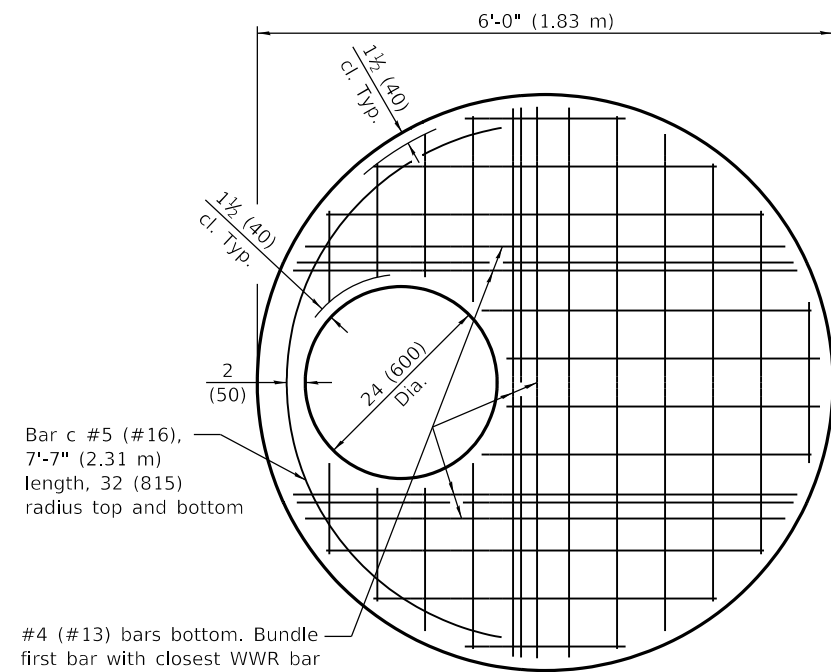
APPROVED January 1, 2021  
S. E. C. E.  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUES  
81-1-1



**PLAN - FLAT SLAB TOP**

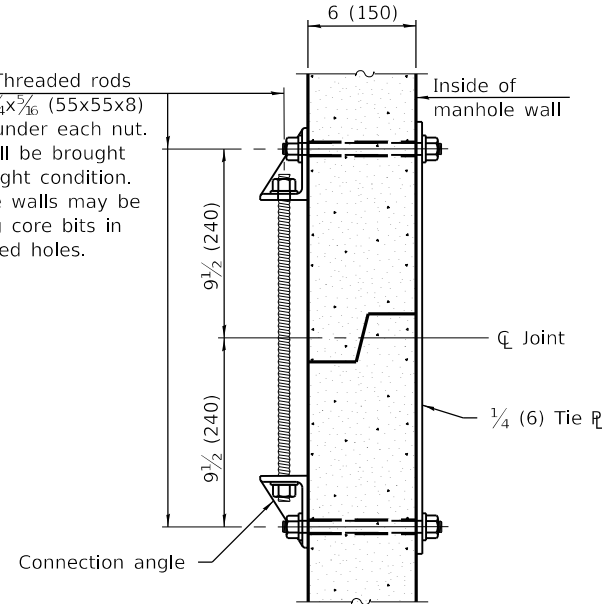
(Showing layout of bottom reinforcement bars and c bars)



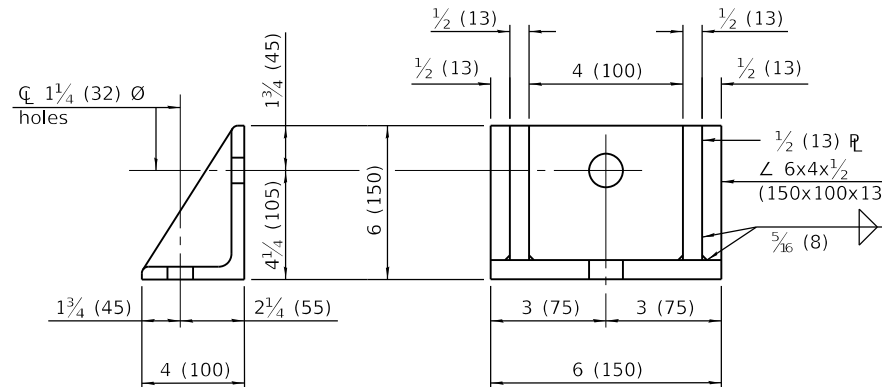
**PLAN - FLAT SLAB TOP**

(Showing layout of welded wire reinforcement and c bars)

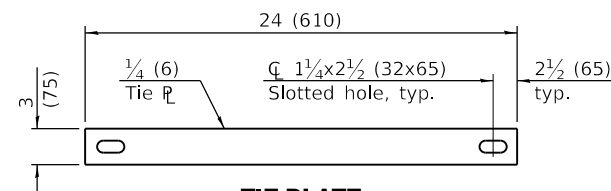
1(25)  $\varnothing$  Threaded rods with  $2\frac{1}{4} \times 2\frac{1}{4} \times \frac{5}{16}$  (55x55x8)  $\varnothing$  washers under each nut. All nuts shall be brought to a snug tight condition. Holes in the walls may be drilled using core bits in lieu of formed holes.



**JOINT SPLICE**



**CONNECTION ANGLE**



**TIE PLATE**

**FLAT SLAB TOP REINFORCEMENT**

Location	WWR (each direction)		Rebar (each direction except as noted)		
	A <sub>s</sub> (min.)	Spacing (max.)	A <sub>s</sub> (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 <sub>s</sub> (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 <sub>s</sub> (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)

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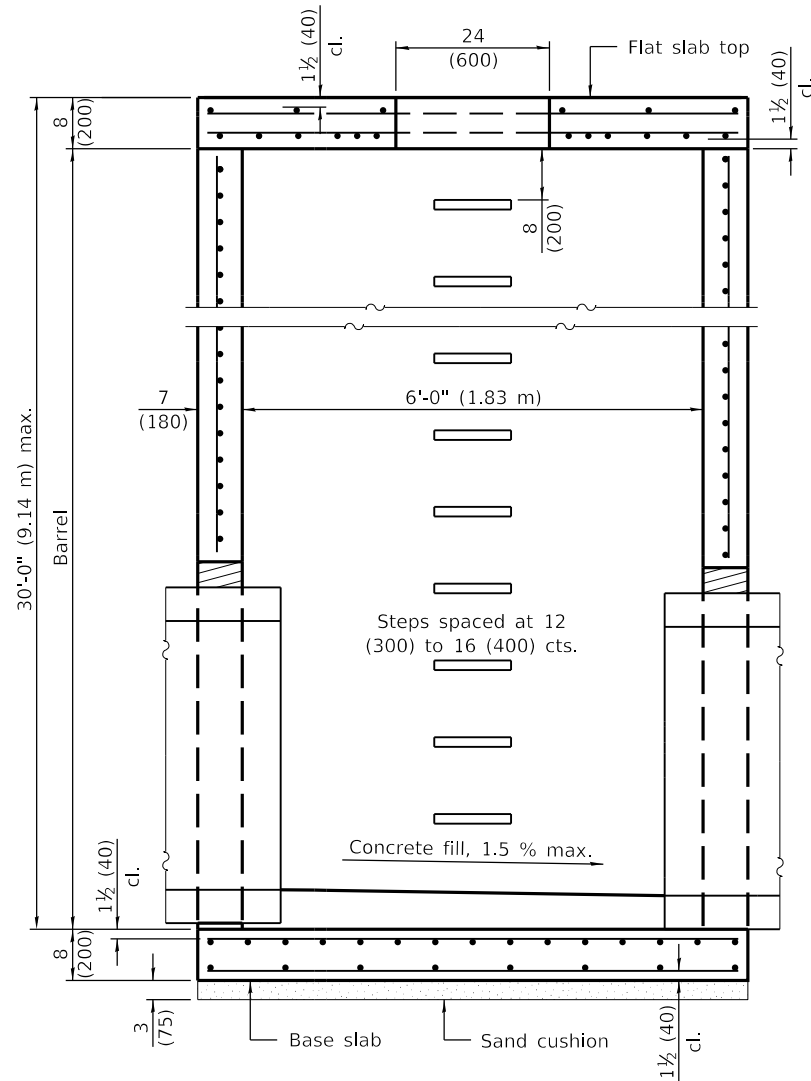
PASSED January 1, 2021  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
*J. E. C.*  
 ENGINEER OF DESIGN AND ENVIRONMENT

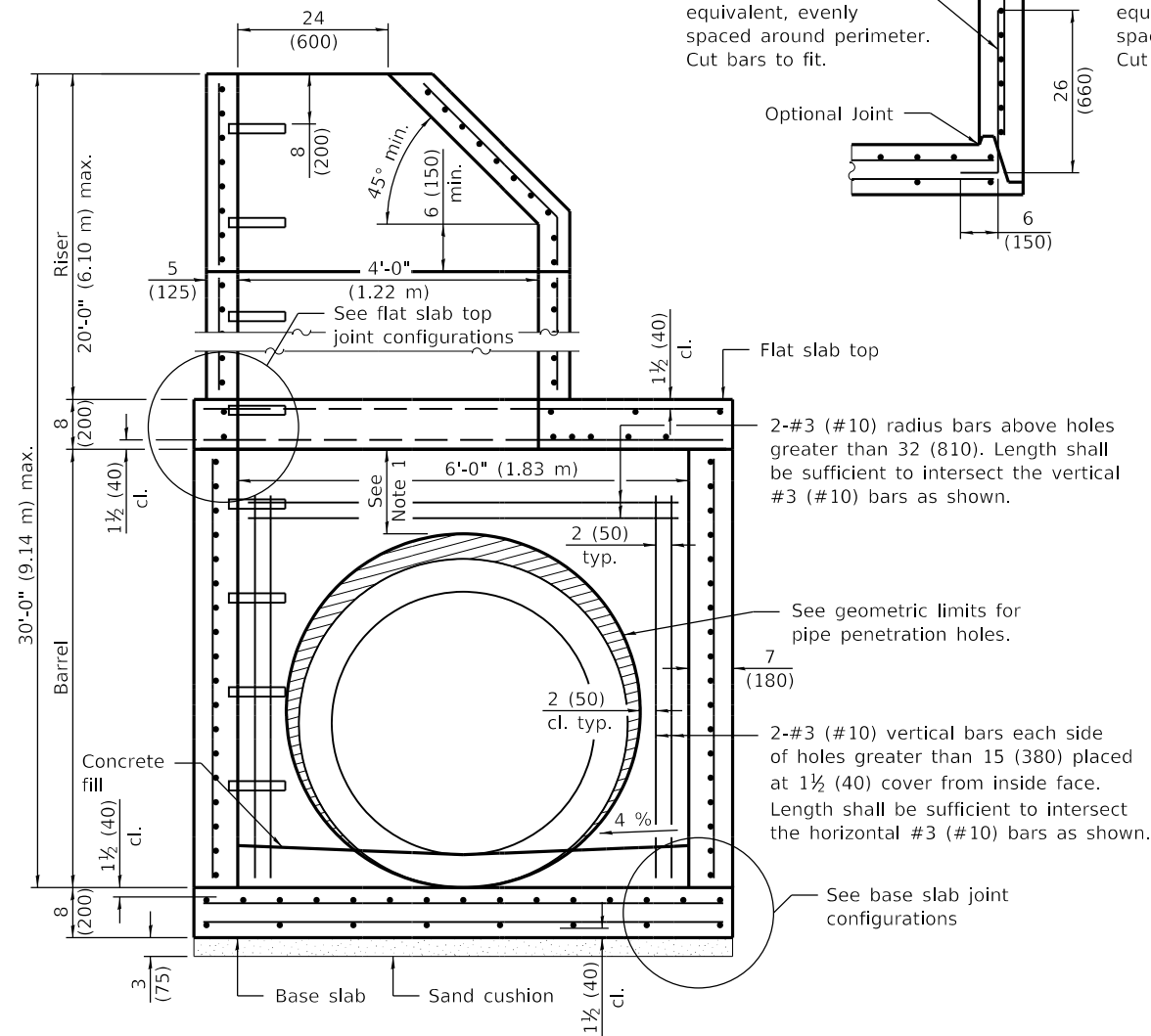
ISSUED 1-1-18

**PRECAST MANHOLE TYPE A**  
**5' (1.52 m) DIAMETER**  
 (Sheet 2 of 2)

**STANDARD 602402-03**



**SECTION PARALLEL TO PIPE**  
(Without conical top riser)

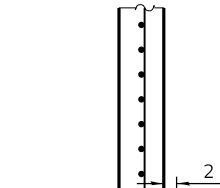
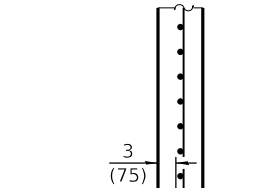
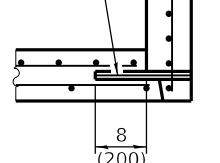
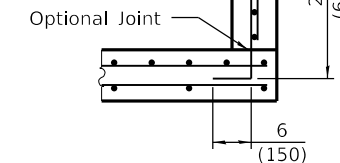
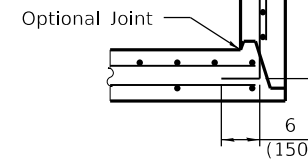


**SECTION PERPENDICULAR TO PIPE**  
(With conical top riser)

11-#4 (#13) bars or equivalent, evenly spaced around perimeter. Cut bars to fit.

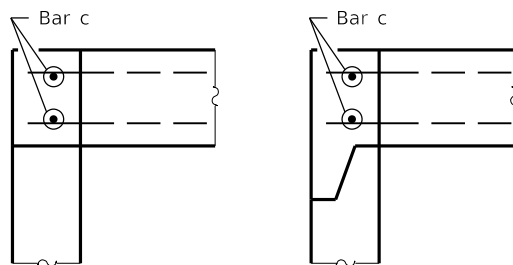
11-#4 (#13) bars or equivalent, evenly spaced around perimeter. Cut bars to fit.

14-#5 (#16) bars evenly spaced drilled and grouted in place at center of slab



Single-element shear key at center of slab

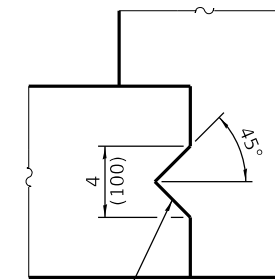
**BASE SLAB JOINT CONFIGURATIONS**



**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.



Single-element shear key at center of slab

**SHEAR KEY GEOMETRY**

(Reinforcement not shown for clarity)

**GENERAL NOTES**

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

DATE	REVISIONS
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**

(Sheet 1 of 3)

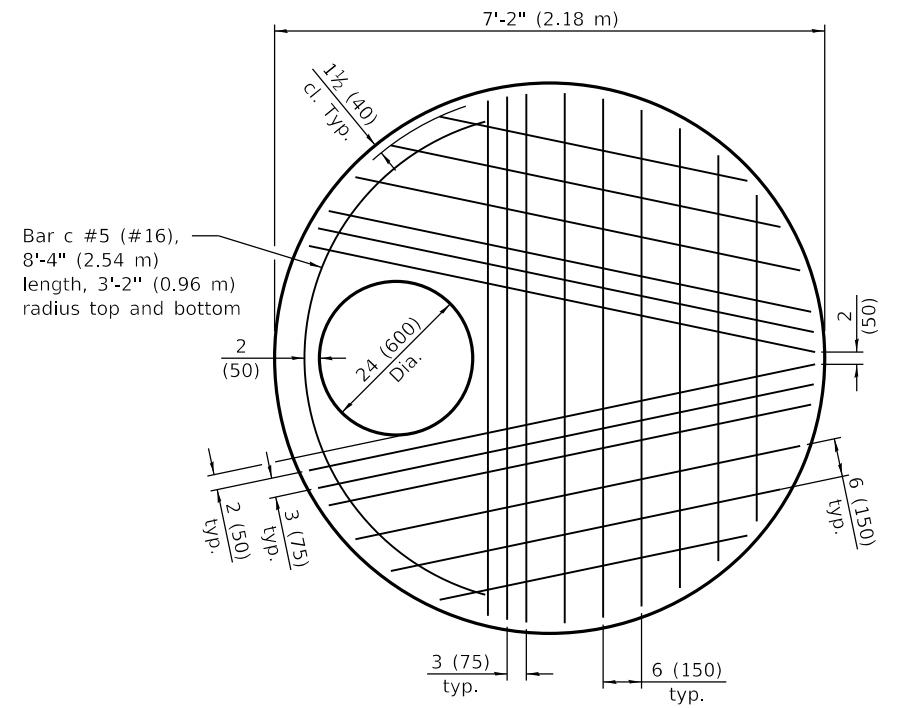
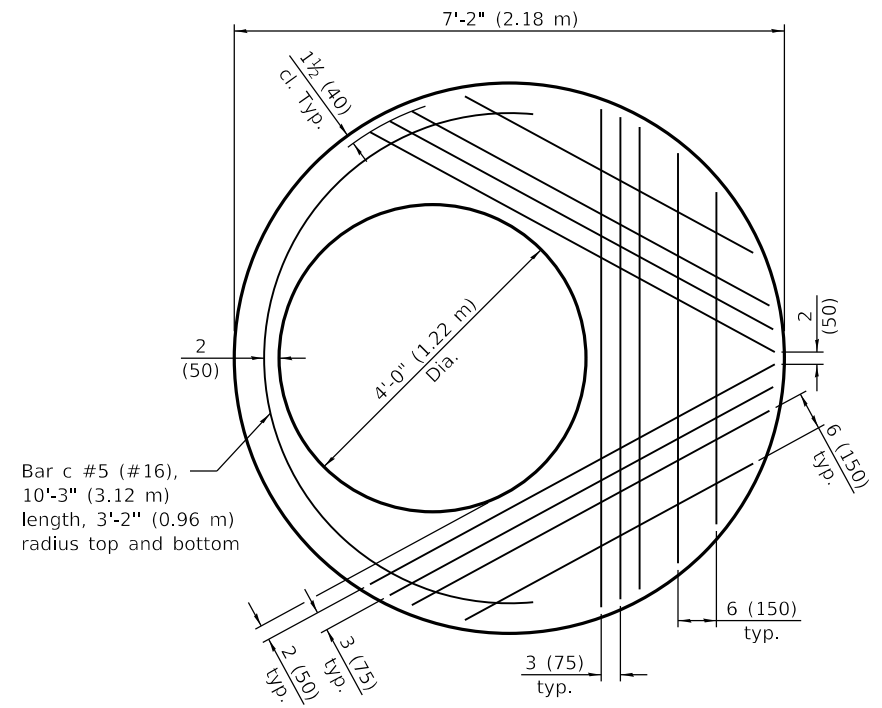
**STANDARD 602406-11**

Illinois Department of Transportation

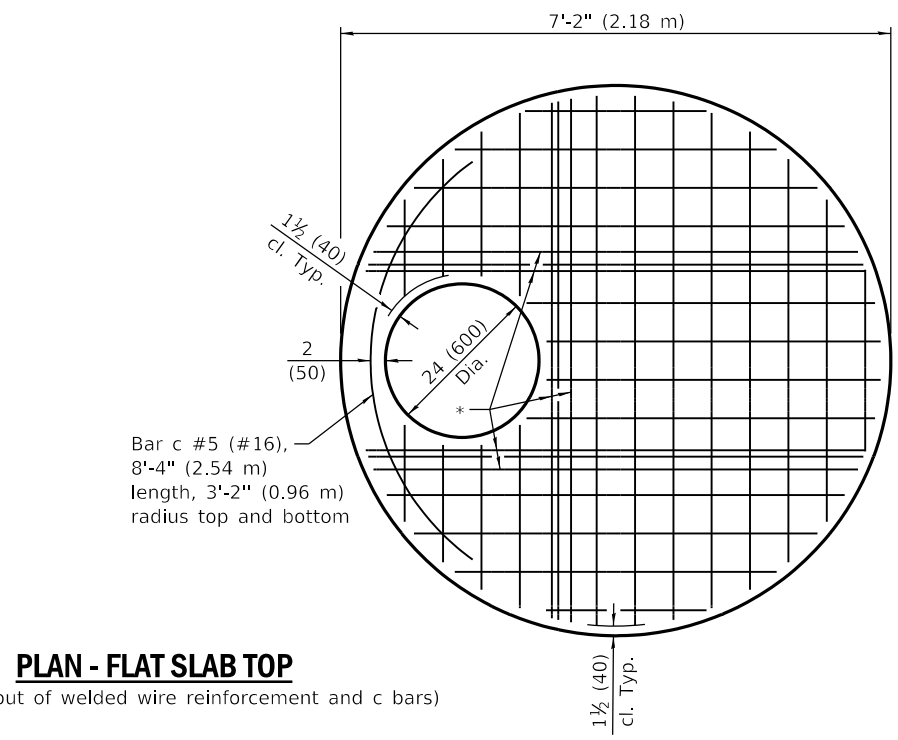
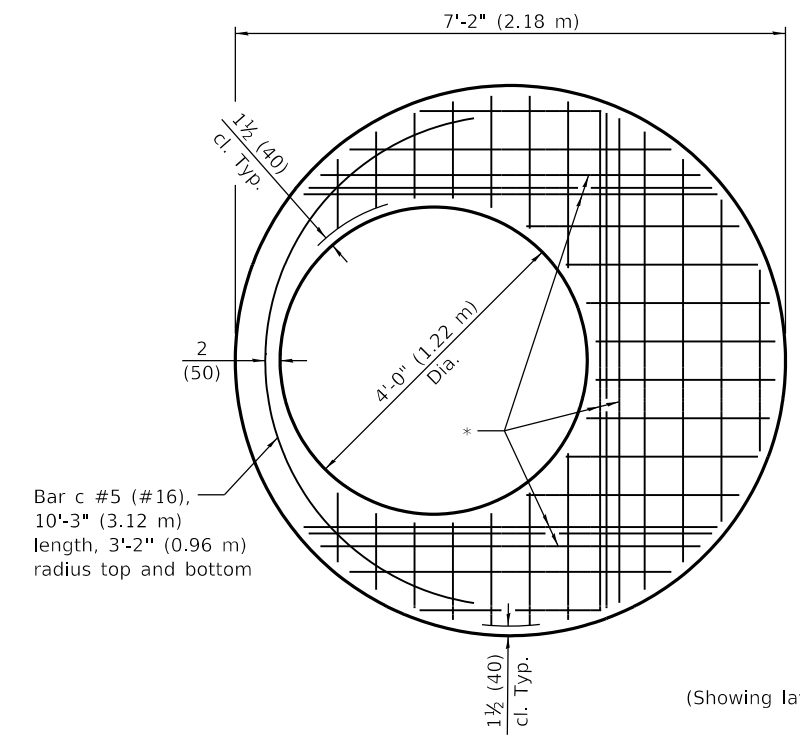
PASSED January 1, 2021  
*Michael Bond*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
*J. E. C.*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-21



**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

PASSED January 1, 2021  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES

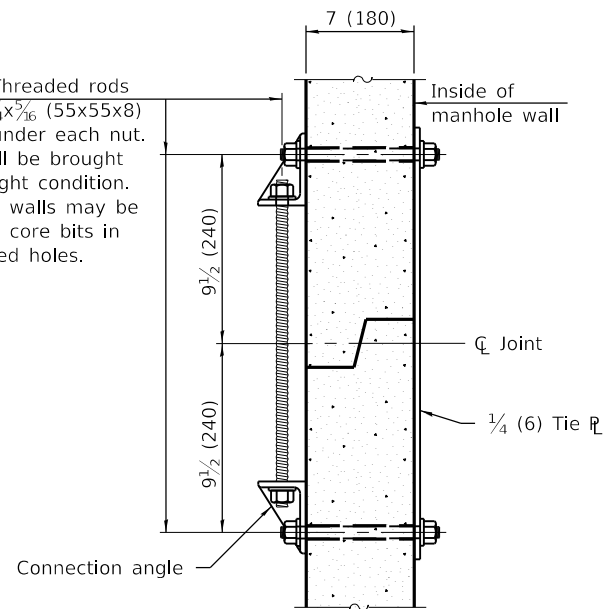
APPROVED January 1, 2021  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

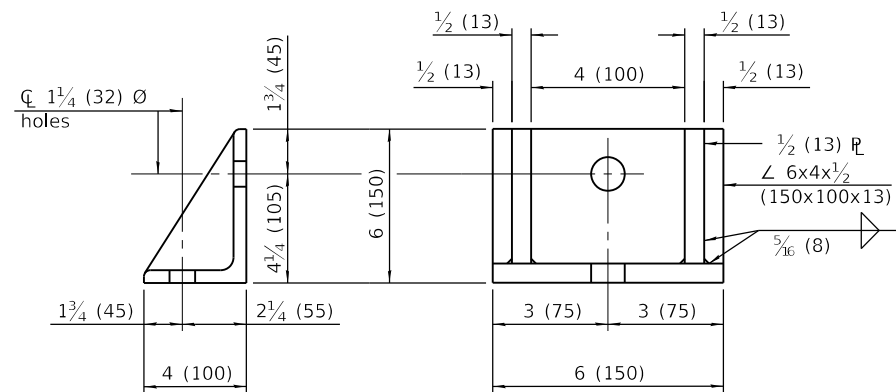
**PRECAST MANHOLE TYPE A**  
**6' (1.83 m) DIAMETER**  
 (Sheet 2 of 3)

**STANDARD 602406-11**

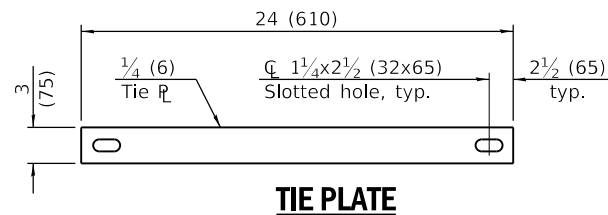
$\varnothing$  1(25)  $\varnothing$  Threaded rods with  $2\frac{1}{4} \times 2\frac{1}{4} \times \frac{3}{16}$  (55x55x8)  $\varnothing$  washers under each nut. All nuts shall be brought to a snug tight condition. Holes in the walls may be drilled using core bits in lieu of formed holes.



**JOINT SPLICE**



**CONNECTION ANGLE**



**TIE PLATE**

**FLAT SLAB TOP REINFORCEMENT**

Location	Riser Height (RH)	WWR (each direction)		Rebar (each direction except as noted)		
		A <sub>s</sub> (min.)	Spacing (max.)	A <sub>s</sub> (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)

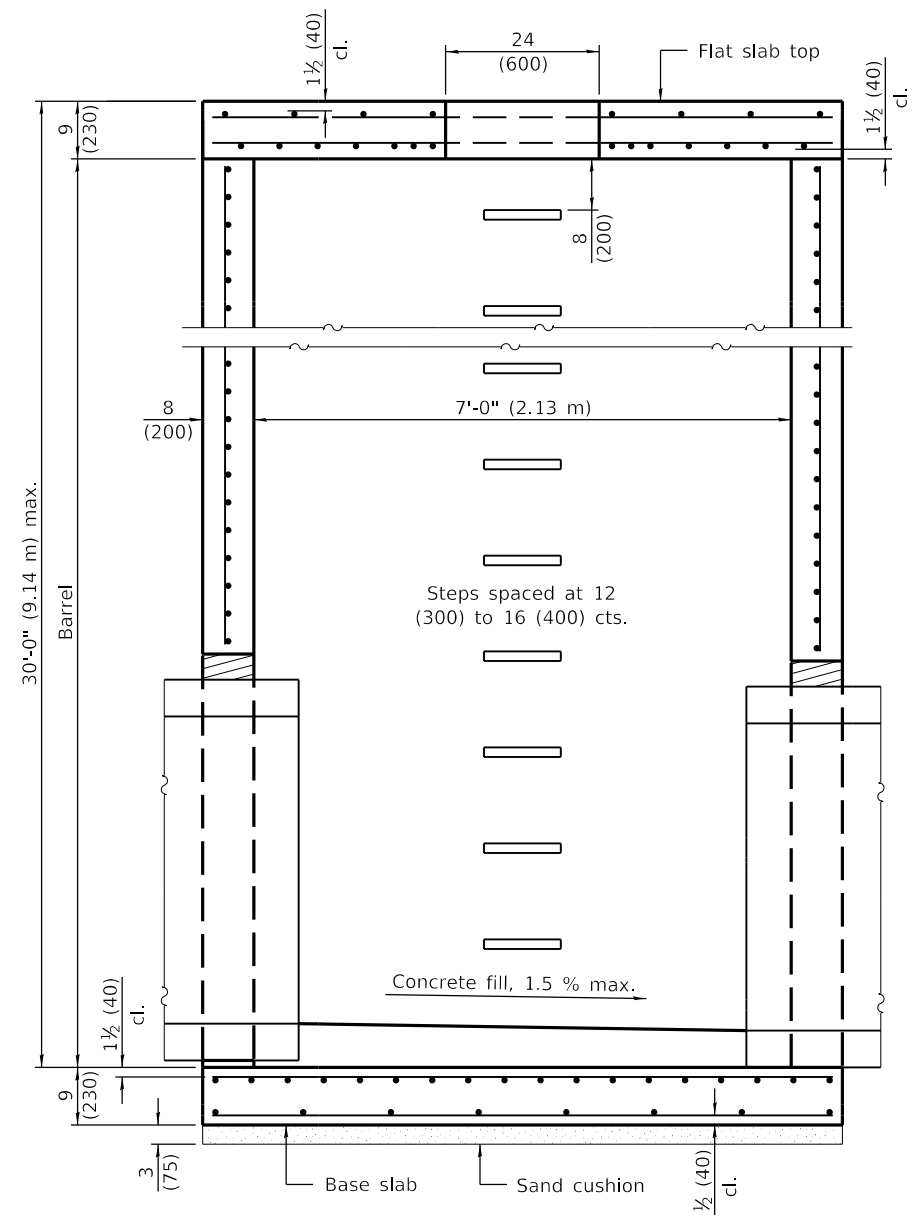
\*\* Only one layer of WWR permitted to avoid congestion.

**WALL REINFORCEMENT**

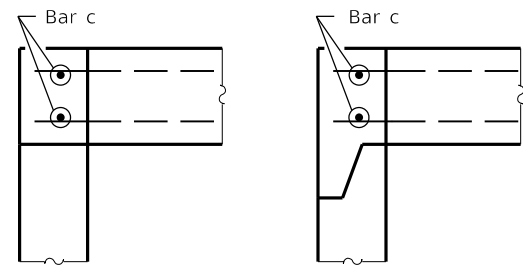
Location	Orientation	WWR or Rebar	
		A <sub>s</sub> (min.)	Spacing (max.)
4 ft. (1.22 m) $\varnothing$ Riser	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)
6 ft. (1.83 m) $\varnothing$ Barrel	Circumferential	0.18 sq. in./ft. (381 sq. mm/m)	6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

**BASE SLAB REINFORCEMENT**

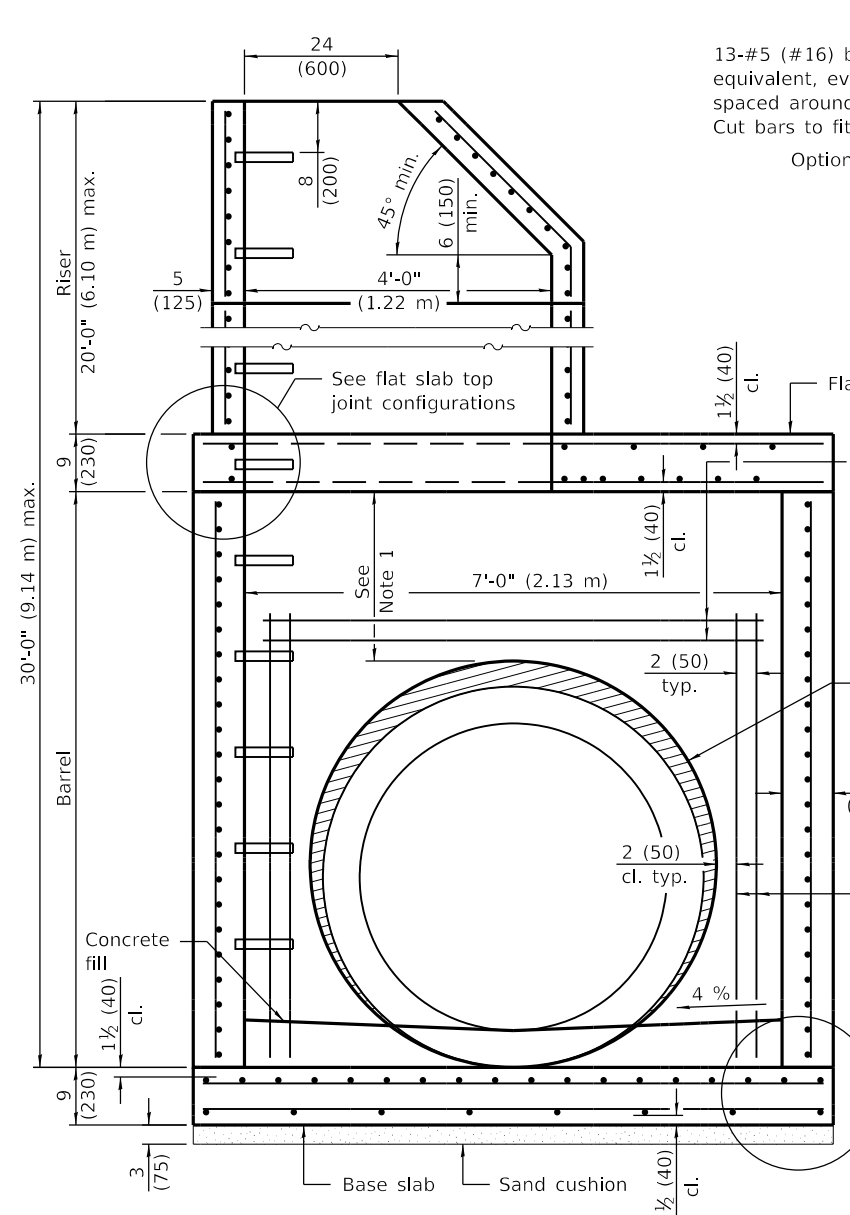
Location	Riser Height (RH)/ Total Height (TH)	WWR or Rebar (each direction)	
		A <sub>s</sub> (min.)	Spacing (max.)
Top Mat	RH ≤ 10 ft. (3.05 m) & TH ≤ 20 ft. (6.10 m)	0.28 sq. in./ft. (593 sq. mm/m)	6 (150)
	RH > 10 ft. (3.05 m) or TH > 20 ft. (6.10 m)	0.40 sq. in./ft. (847 sq. mm/m)	6 (150)
Bottom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



**SECTION PARALLEL TO PIPE**  
(Without conical top riser)



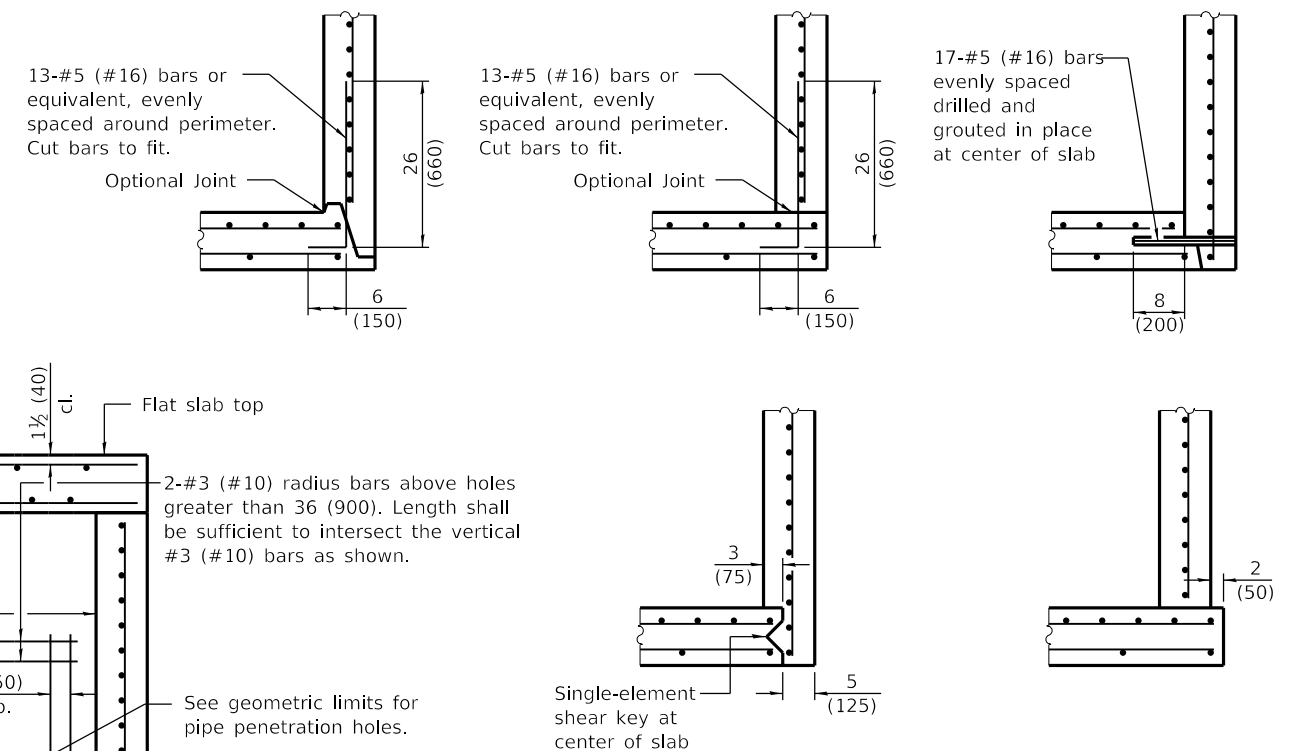
**FLAT SLAB TOP JOINT CONFIGURATIONS**  
(Shown at access hole)



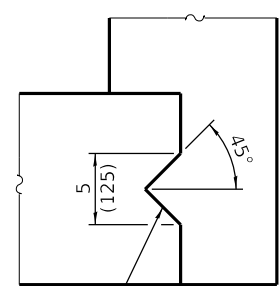
**SECTION PERPENDICULAR TO PIPE**  
(With conical top riser)

**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.



**BASE SLAB JOINT CONFIGURATIONS**



**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

PASSED January 1, 2021  
  
 ENGINEER OF POLICY AND PROCEDURES

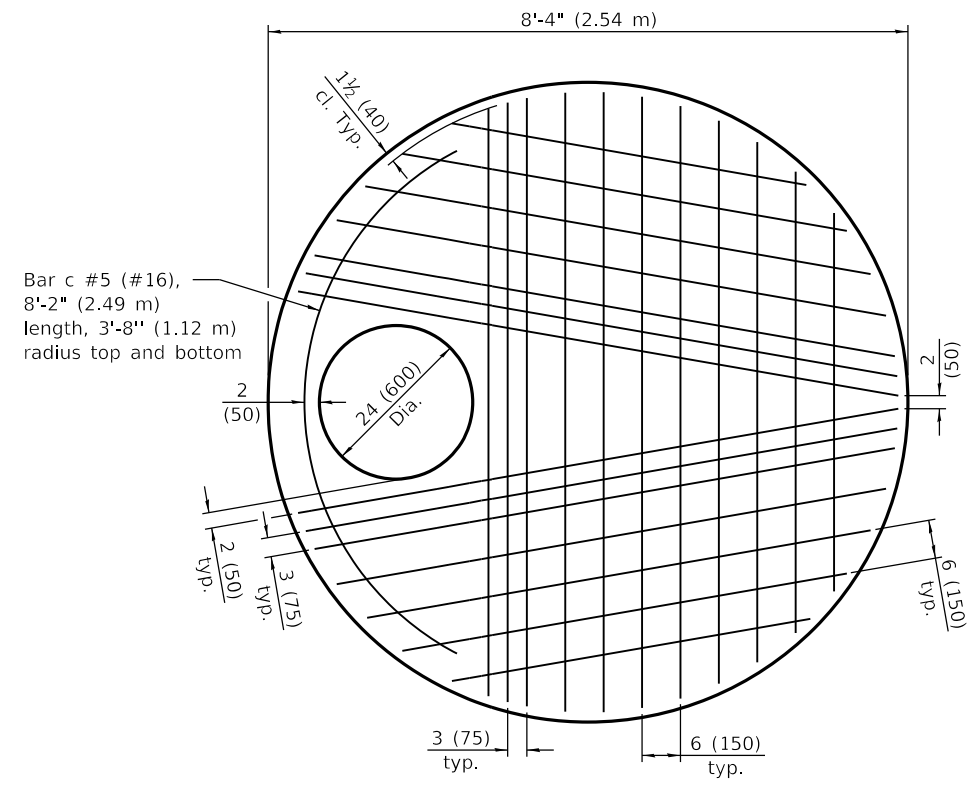
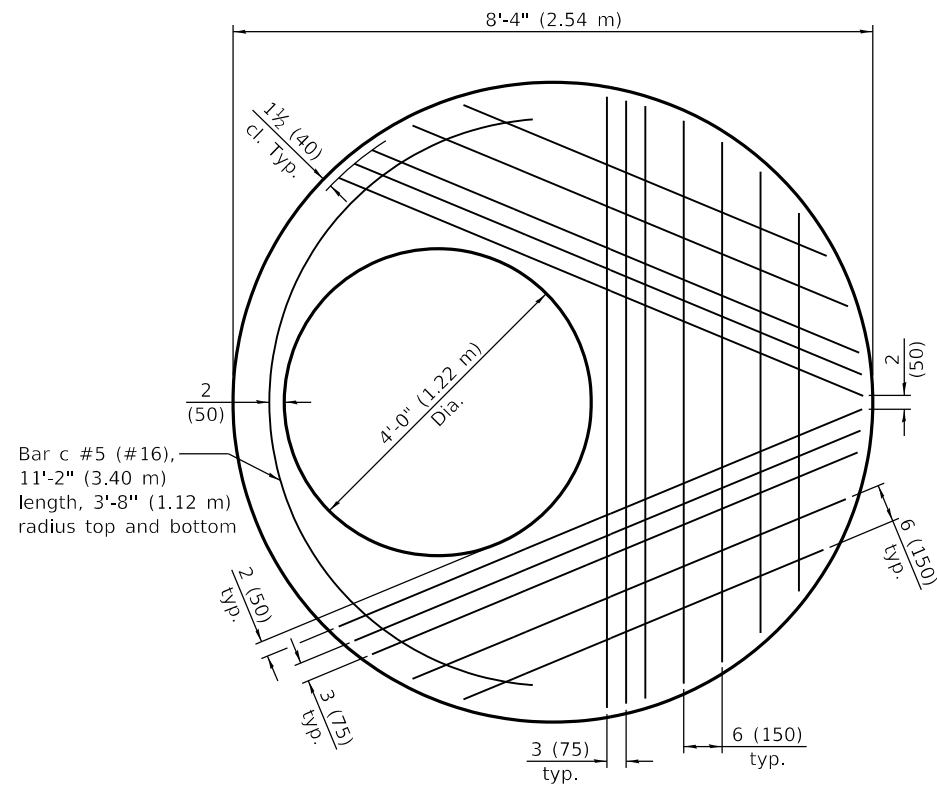
APPROVED January 1, 2021  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

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.

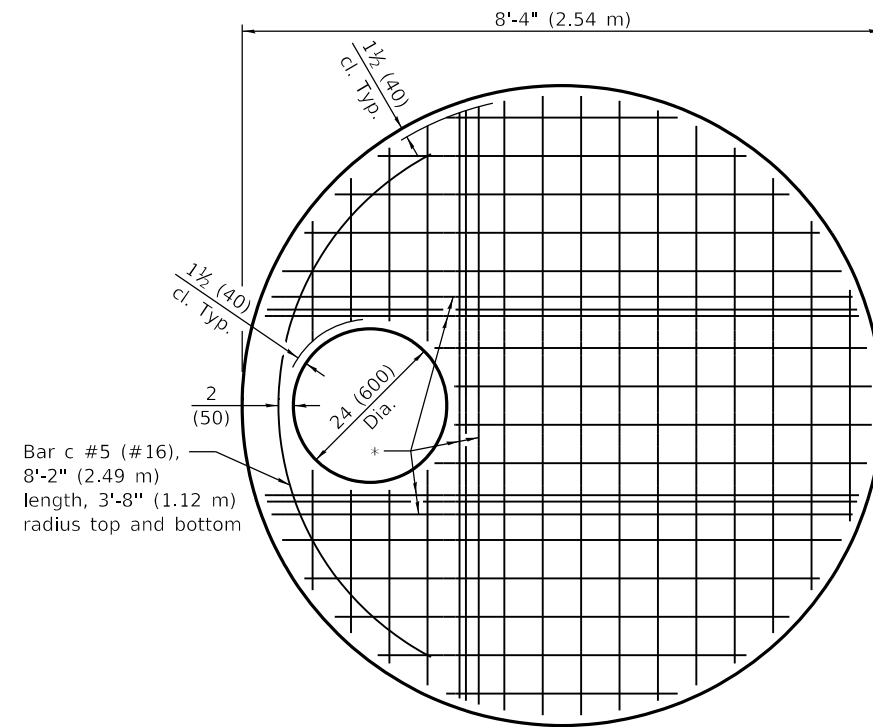
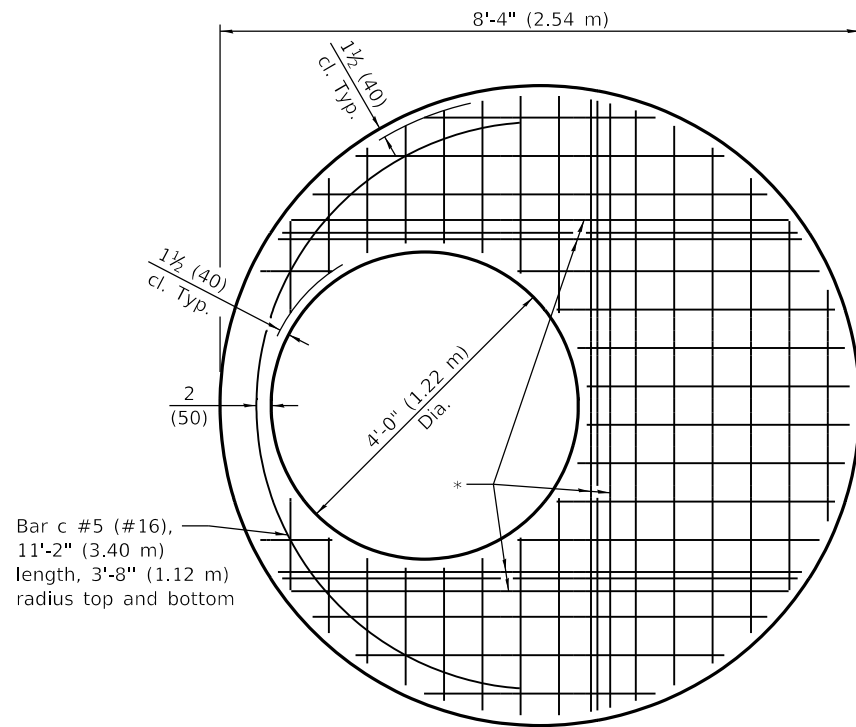
**PRECAST MANHOLE TYPE A**  
**7' (2.13 m) DIAMETER**  
 (Sheet 1 of 3)

**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

PASSED January 1, 2021  
  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

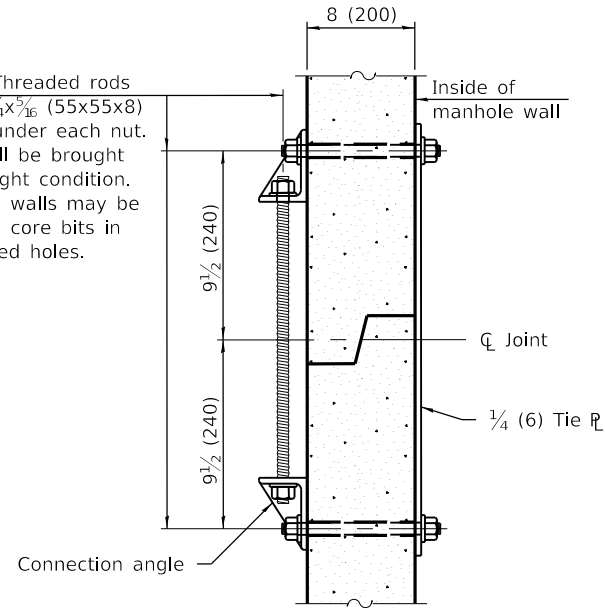
ISSUED 4-1-06

**PRECAST MANHOLE TYPE A**  
**7' (2.13 m) DIAMETER**

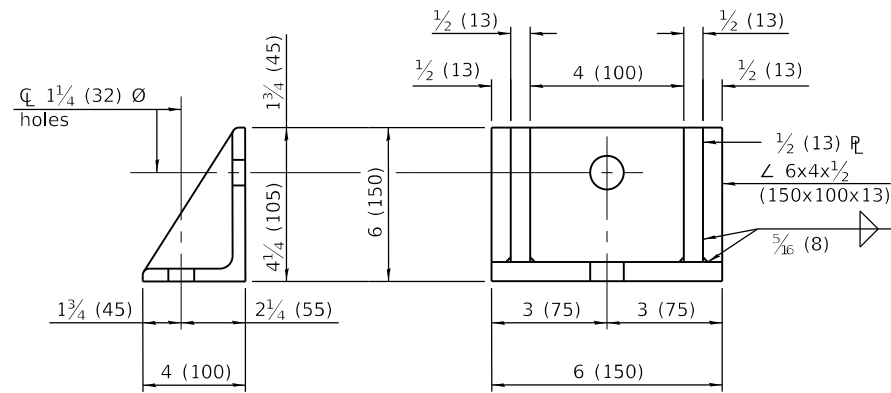
(Sheet 2 of 3)

**STANDARD 602411-09**

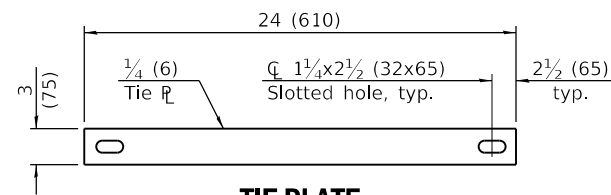
1(25)  $\varnothing$  Threaded rods with  $2\frac{1}{4} \times 2\frac{1}{4} \times \frac{5}{16}$  (55x55x8)  $\varnothing$  washers under each nut. All nuts shall be brought to a snug tight condition. Holes in the walls may be drilled using core bits in lieu of formed holes.



**JOINT SPLICE**



**CONNECTION ANGLE**



**TIE PLATE**

**FLAT SLAB TOP REINFORCEMENT**

Location	Riser Height (RH)	WWR (each direction)		Rebar (each direction except as noted)		
		A <sub>s</sub> (min.)	Spacing (max.)	A <sub>s</sub> (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.

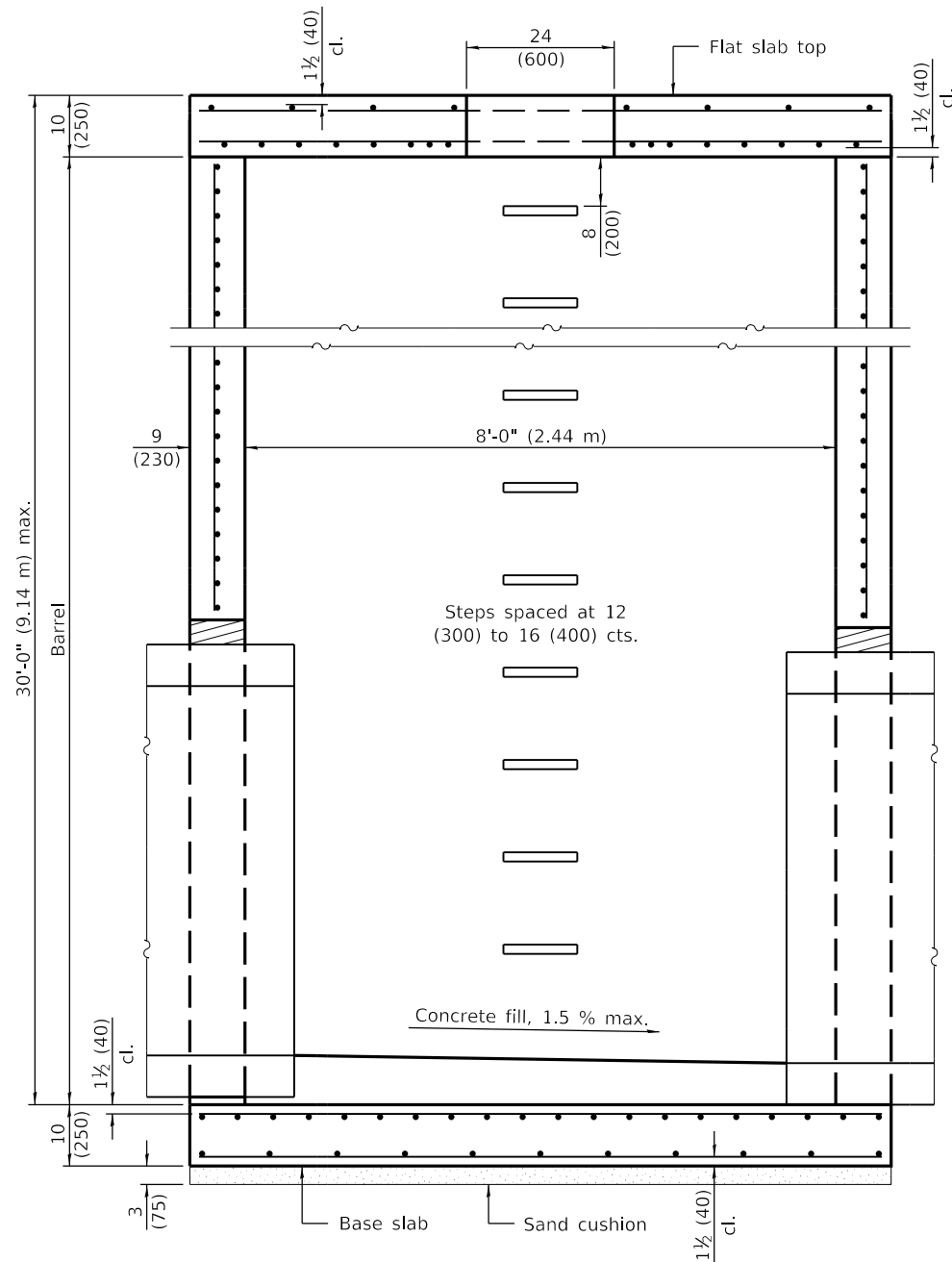
**WALL REINFORCEMENT**

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

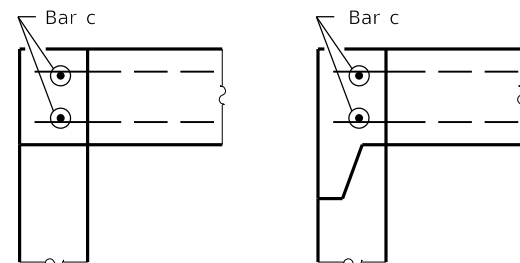
**BASE SLAB REINFORCEMENT**

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

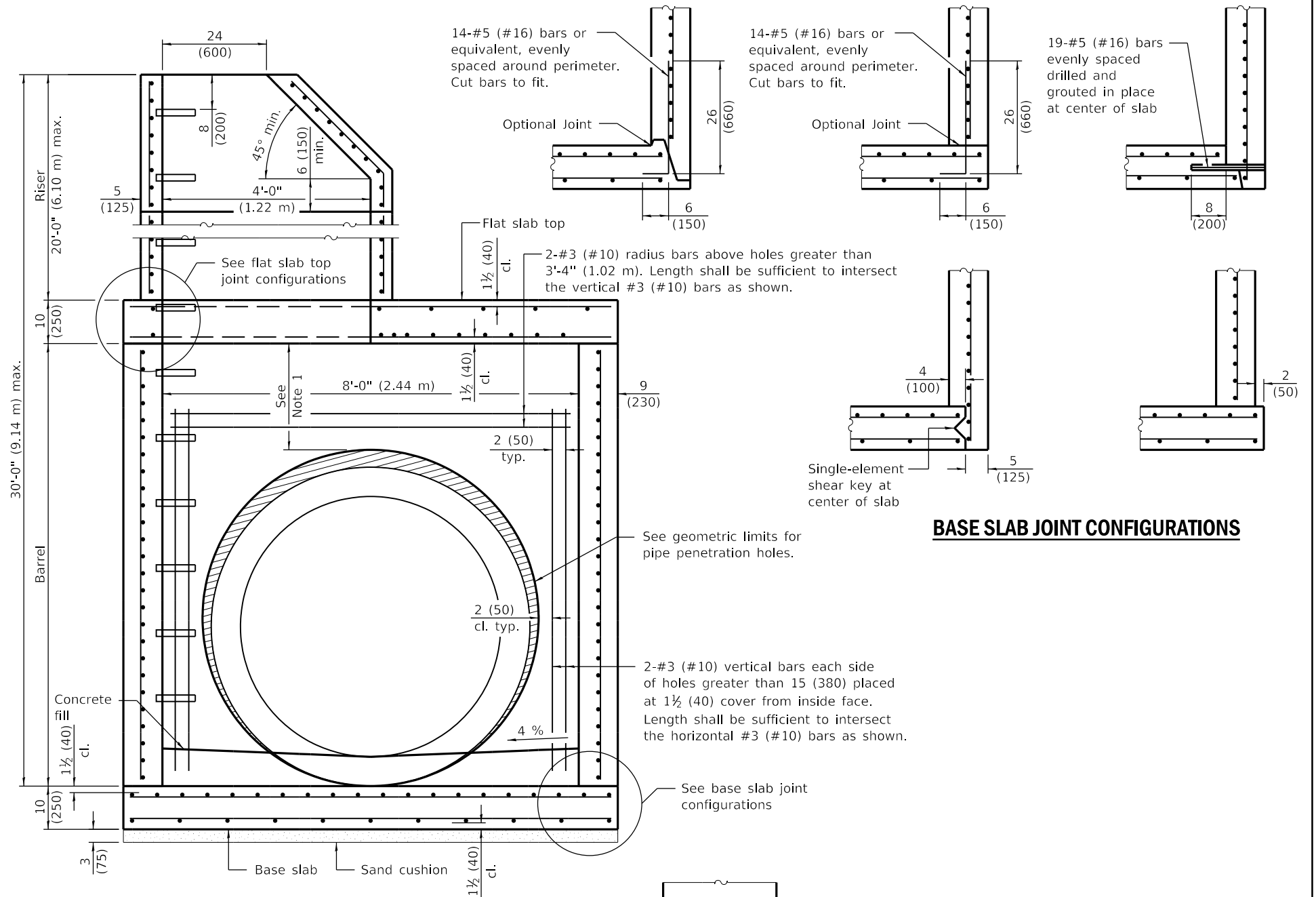




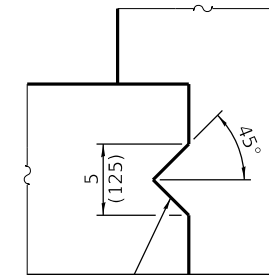
**SECTION PARALLEL TO PIPE**  
(Without conical top riser)



**FLAT SLAB TOP JOINT CONFIGURATIONS**  
(Shown at access hole)



**SECTION PERPENDICULAR TO PIPE**  
(With conical top riser)



Single-element shear key at center of slab

**SHEAR KEY GEOMETRY**

(Reinforcement not shown for clarity)

**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.

**BASE SLAB JOINT CONFIGURATIONS**

**GENERAL NOTES**

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

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**

(Sheet 1 of 3)

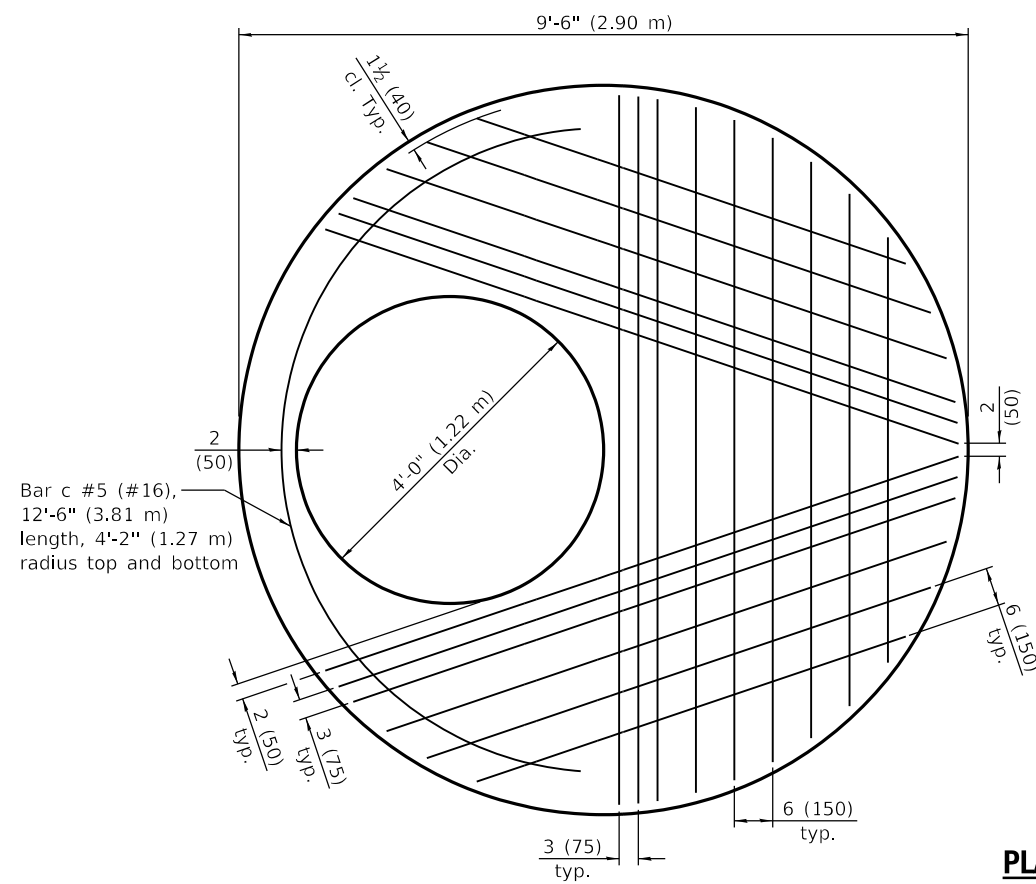
**STANDARD 602416-09**

Illinois Department of Transportation

PASSED January 1, 2021  
*Michael Bond*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
*J. E. [Signature]*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-06

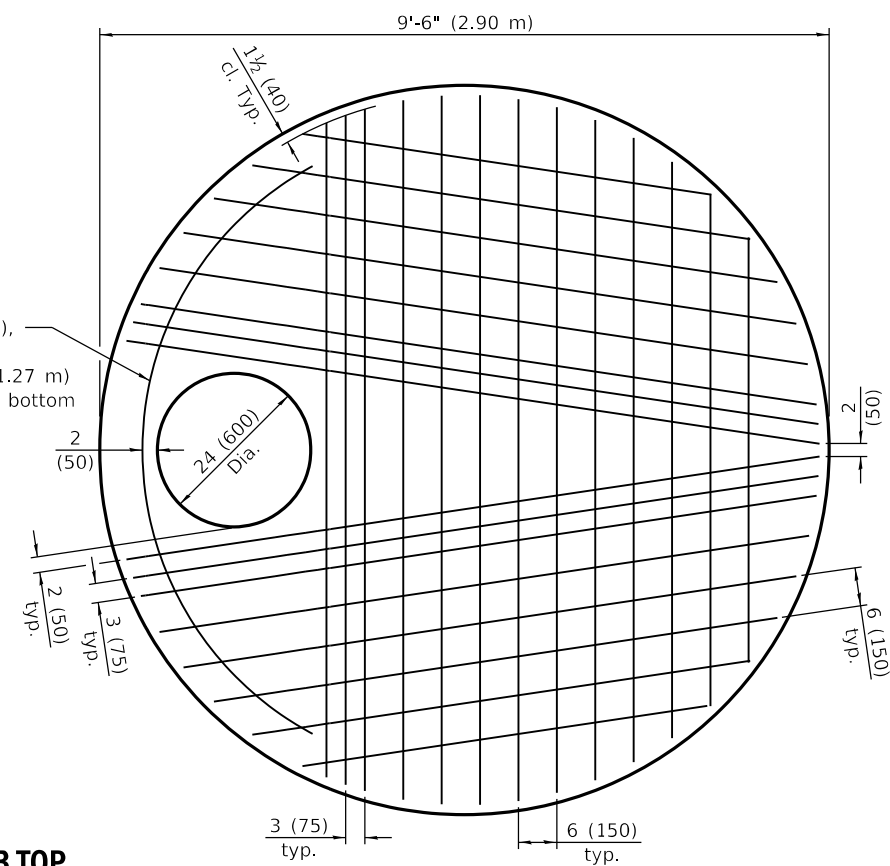


**PLAN - FLAT SLAB TOP**

(Showing layout of bottom reinforcement bars and c bars)

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

Bar c #5 (#16),  
12'-6" (3.81 m)  
length, 4'-2" (1.27 m)  
radius top and bottom

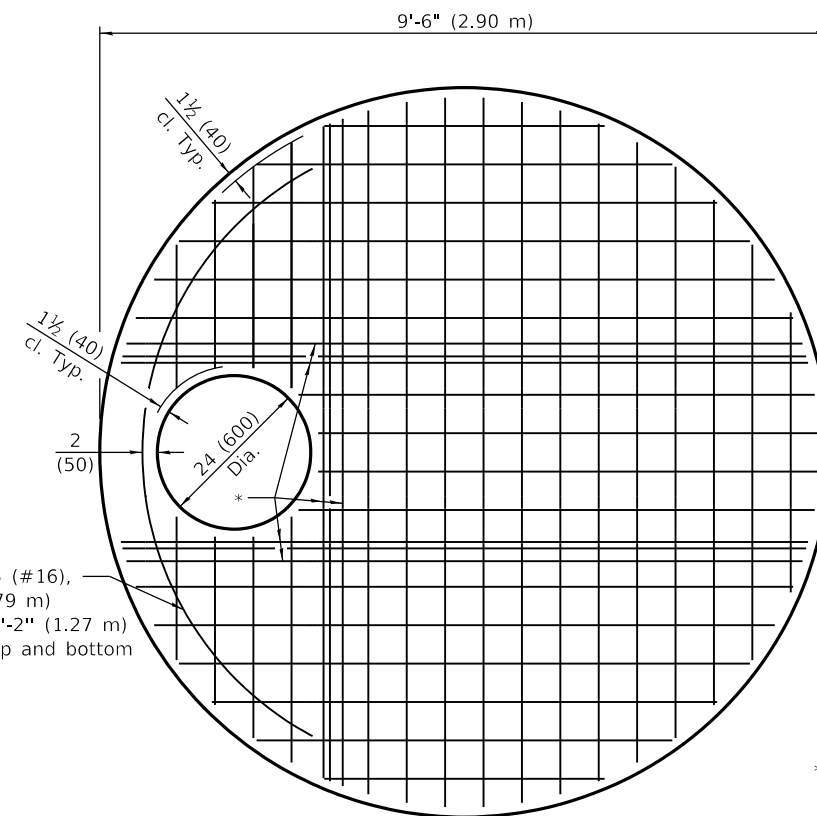
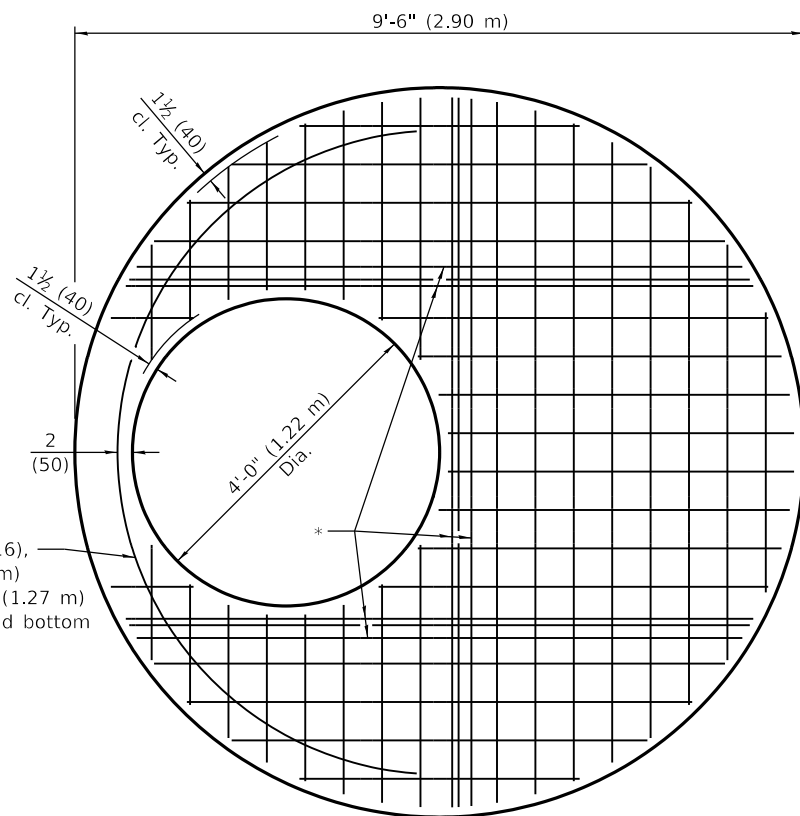


**PLAN - FLAT SLAB TOP**

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

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

Bar c #5 (#16),  
12'-6" (3.81 m)  
length, 4'-2" (1.27 m)  
radius top and bottom



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

Illinois Department of Transportation

PASSED January 1, 2021  
*Michael Bond*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
*J. E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

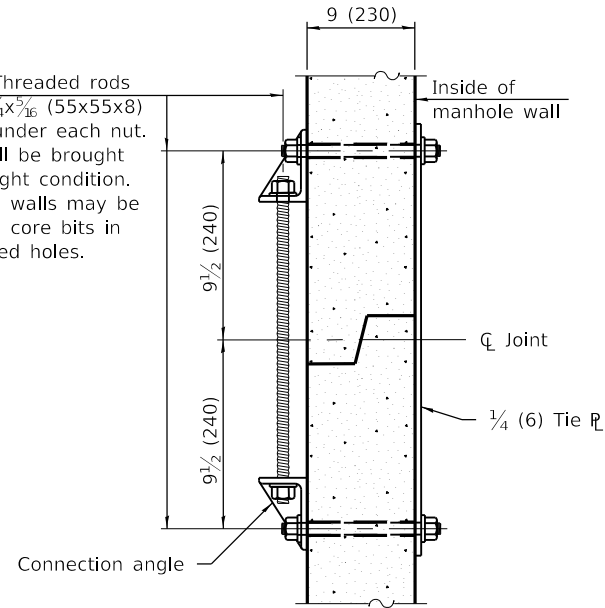
ISSUED 4-1-06

**PRECAST MANHOLE TYPE A**  
**8' (2.44 m) DIAMETER**

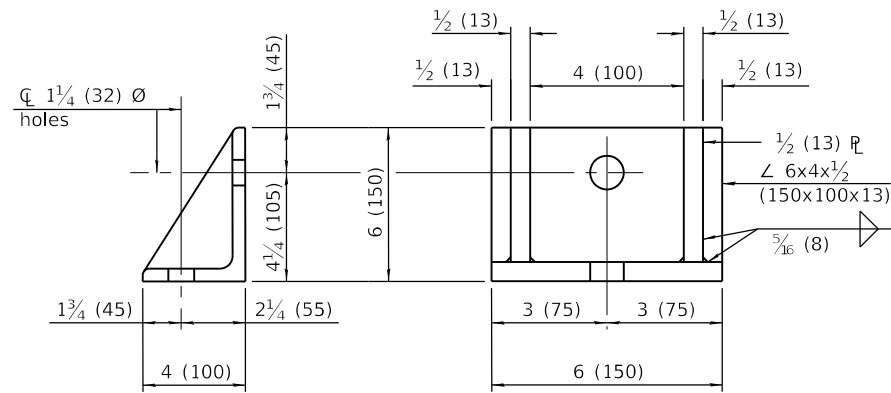
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**STANDARD 602416-09**

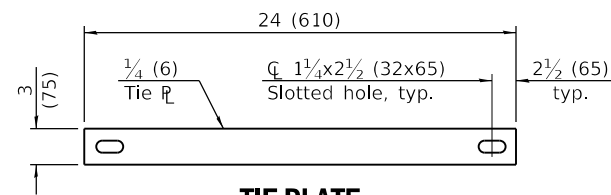
$\varnothing$  1(25)  $\varnothing$  Threaded rods  
 with  $2\frac{1}{4} \times 2\frac{1}{4} \times \frac{5}{16}$  (55x55x8)  
 $\varnothing$  washers under each nut.  
 All nuts shall be brought  
 to a snug tight condition.  
 Holes in the walls may be  
 drilled using core bits in  
 lieu of formed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



**JOINT SPLICE**



**CONNECTION ANGLE**



**TIE PLATE**

**FLAT SLAB TOP REINFORCEMENT**

Location	Riser Height (RH)	WWR (each direction)		Rebar (each direction except as noted)		
		A <sub>s</sub> (min.)	Spacing (max.)	A <sub>s</sub> (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 <sub>s</sub> (min.)	Spacing (max.)
4 ft. (1.22 m) $\varnothing$ Riser	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)
8 ft. (2.44 m) $\varnothing$ Barrel	Circumferential	0.24 sq. in./ft. (508 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)

**BASE SLAB REINFORCEMENT**

Location	Riser Height (RH)/ Total Height (TH)	WWR or Rebar (each direction)	
		A <sub>s</sub> (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)

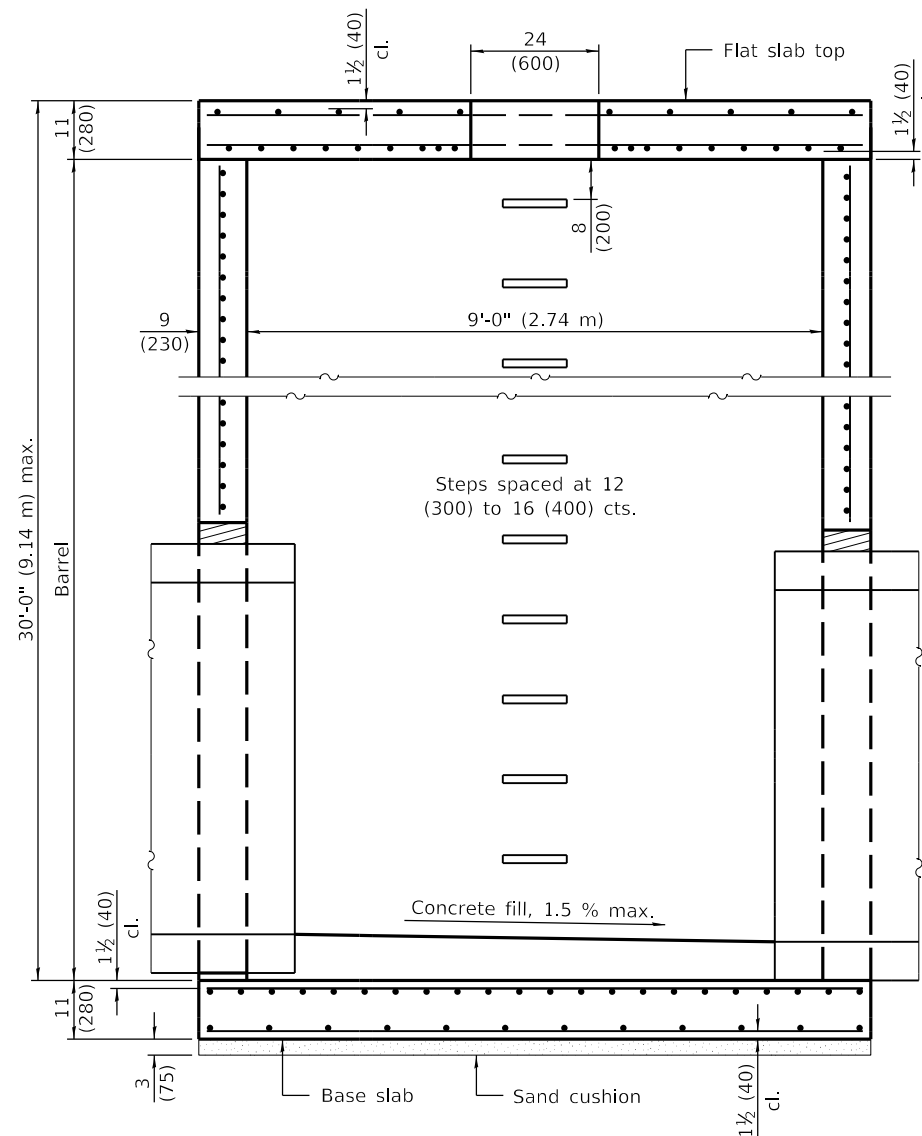
Illinois Department of Transportation  
 PASSED January 1, 2021  
 [Signature]  
 ENGINEER OF POLICY AND PROCEDURES  
 APPROVED January 1, 2021  
 [Signature]  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-06

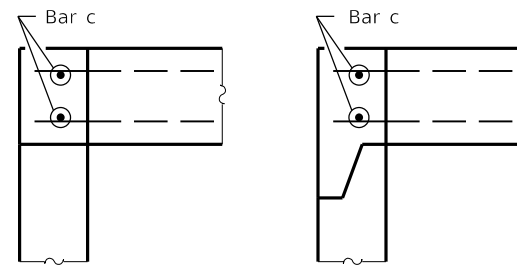
**PRECAST MANHOLE TYPE A  
8' (2.44 m) DIAMETER**

(Sheet 3 of 3)

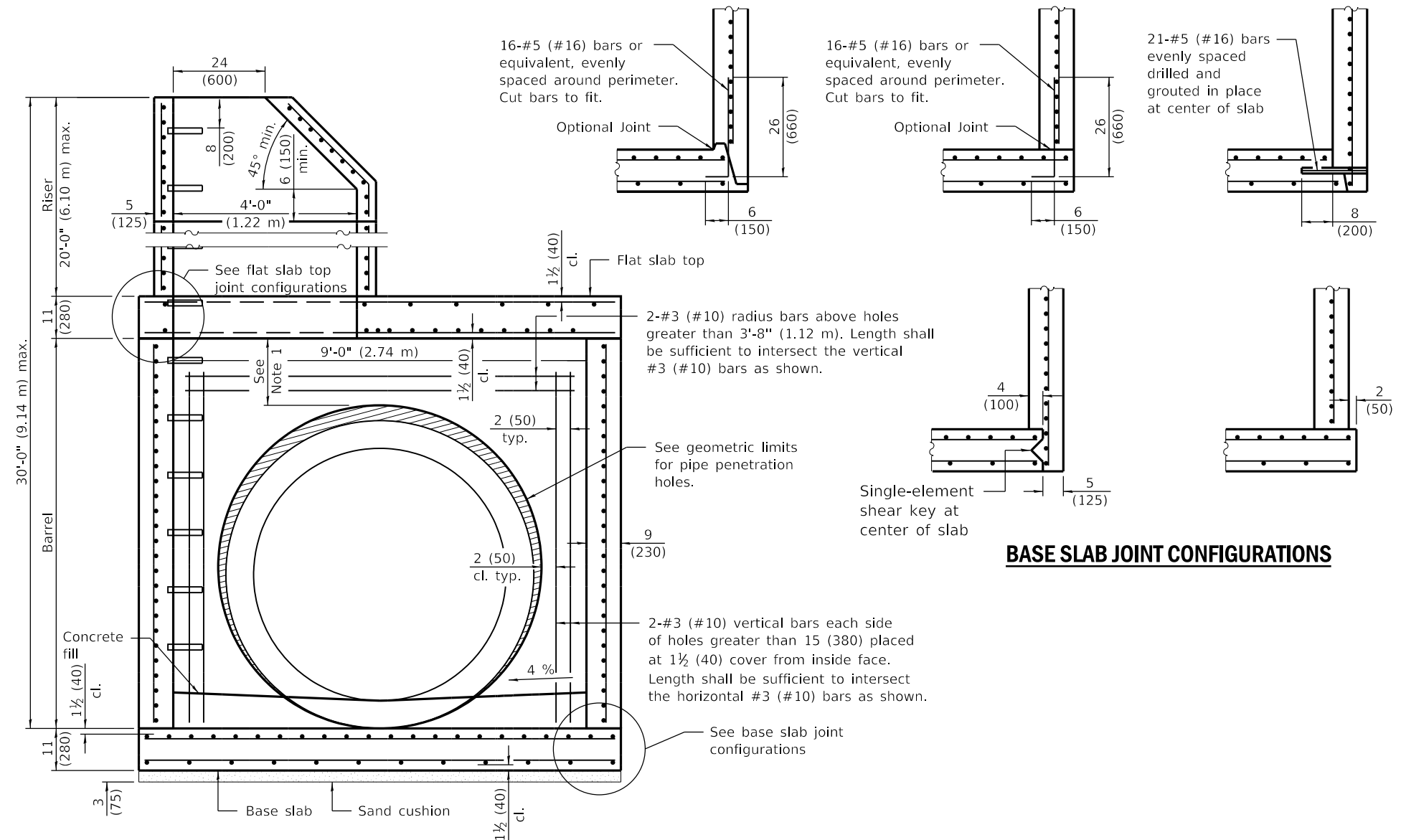
**STANDARD 602416-09**



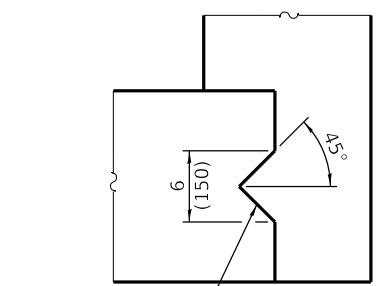
**SECTION PARALLEL TO PIPE**  
(Without conical top riser)



**FLAT SLAB TOP JOINT CONFIGURATIONS**  
(Shown at access hole)



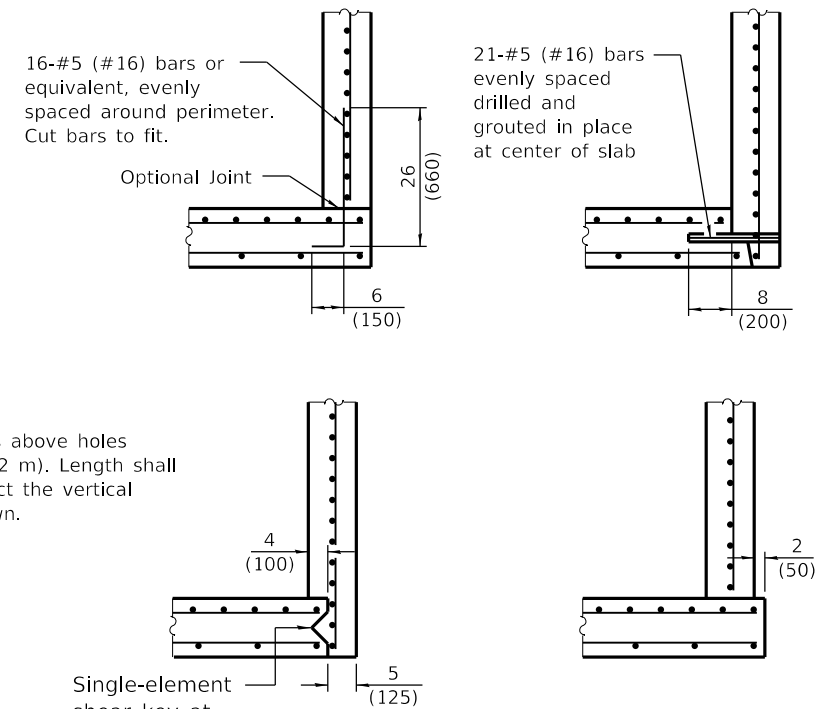
**SECTION PERPENDICULAR TO PIPE**  
(With conical top riser)



Single-element shear key at center of slab

**SHEAR KEY GEOMETRY**  
(Reinforcement not shown for clarity)

**BASE SLAB JOINT CONFIGURATIONS**



**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.

**GENERAL NOTES**

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

DATE	REVISIONS
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)

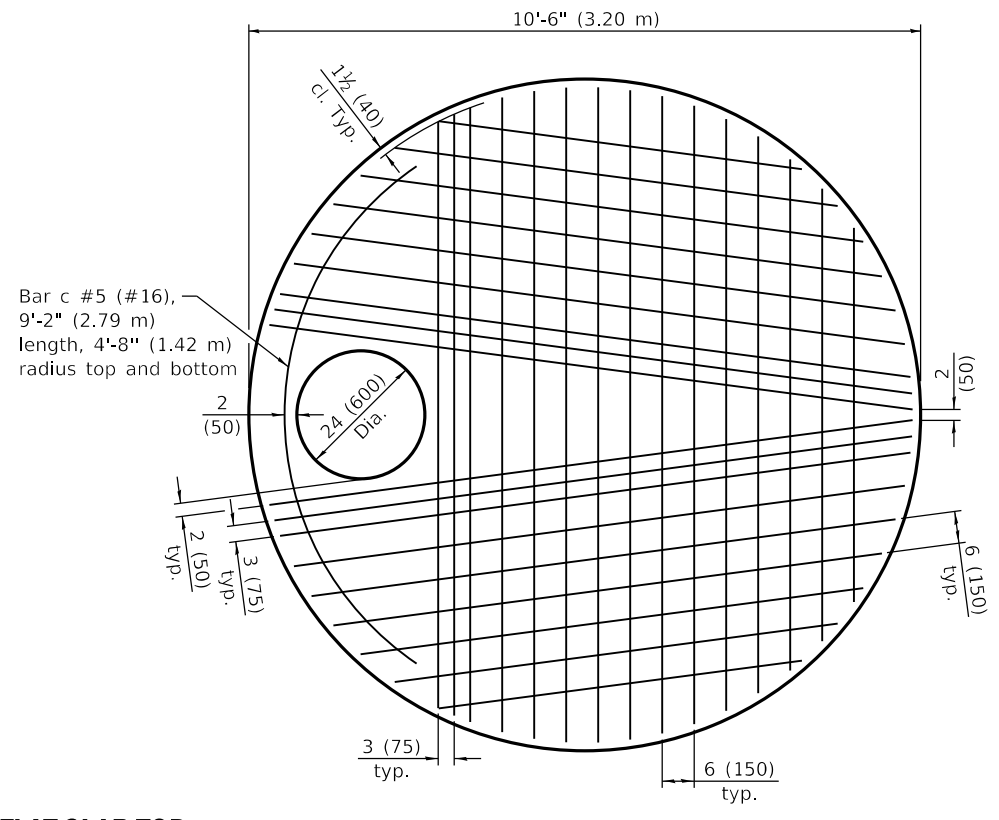
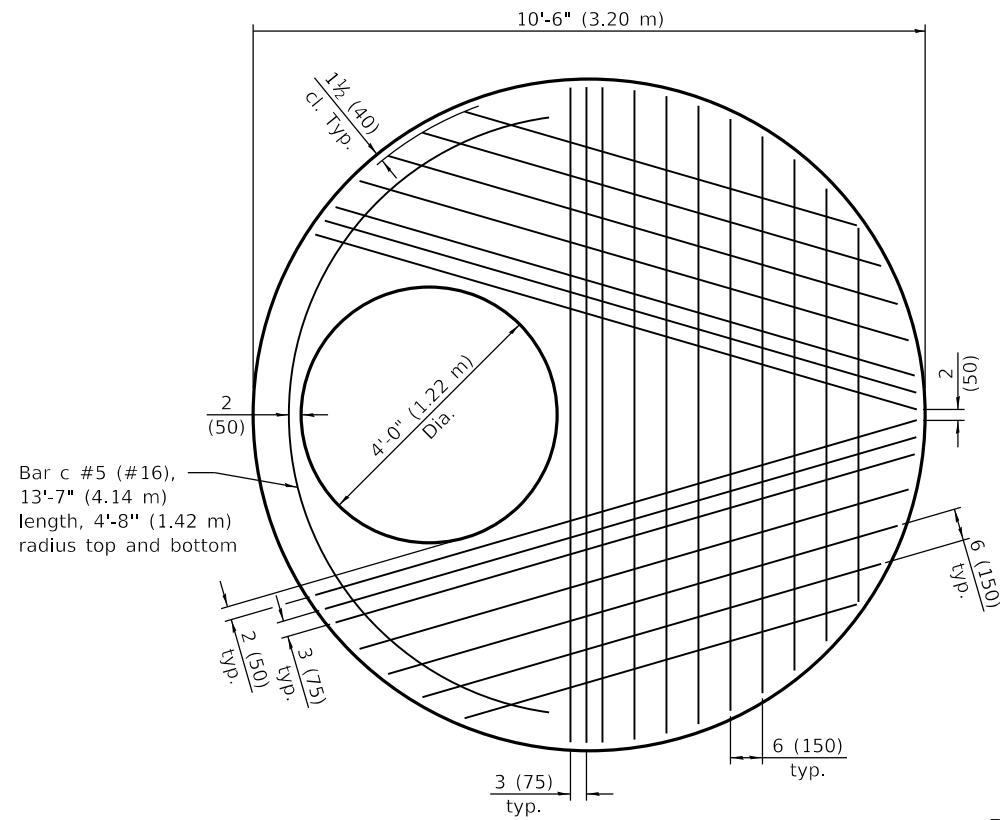
**STANDARD 602421-09**

Illinois Department of Transportation

PASSED January 1, 2021  
*Michael Bond*  
ENGINEER OF POLICY AND PROCEDURES

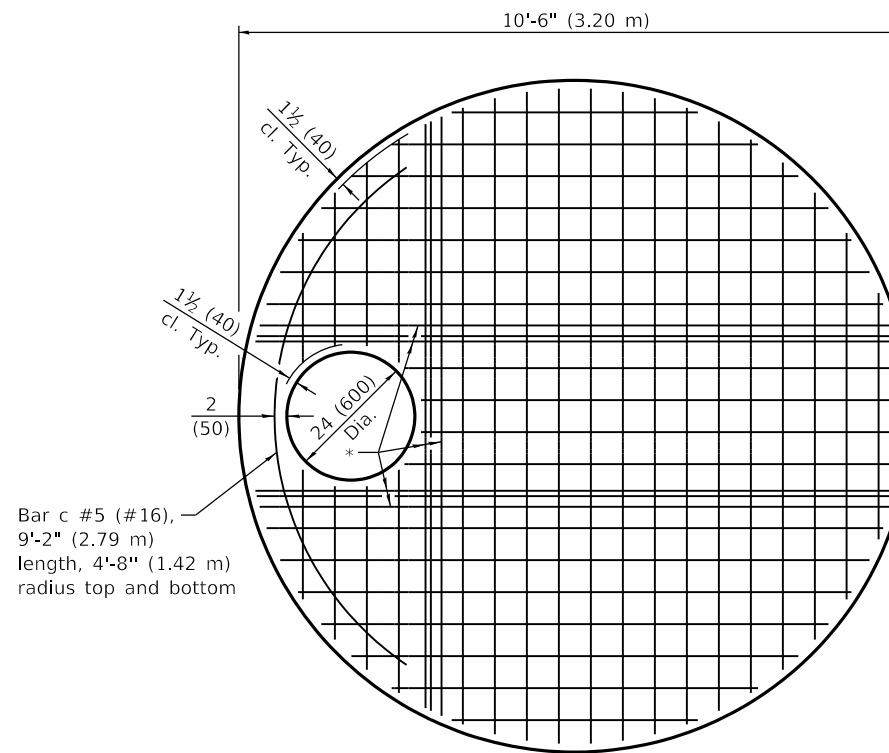
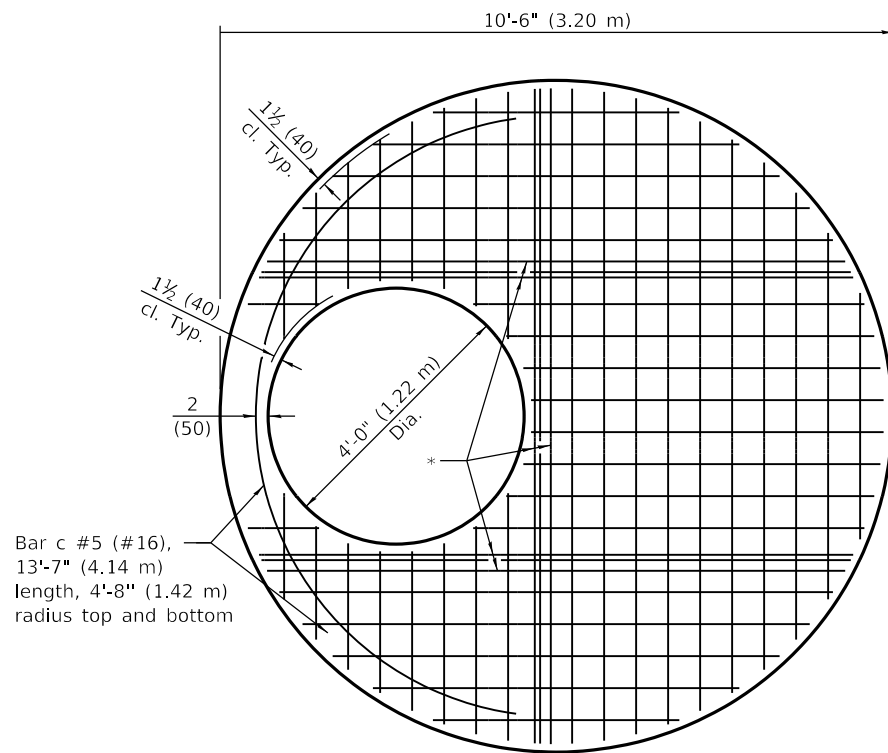
APPROVED January 1, 2021  
*J. E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-06



**PLAN - FLAT SLAB TOP**

(Showing layout of bottom reinforcement bars and c bars)



**PLAN - FLAT SLAB TOP**

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

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

Illinois Department of Transportation

PASSED January 1, 2021  
  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

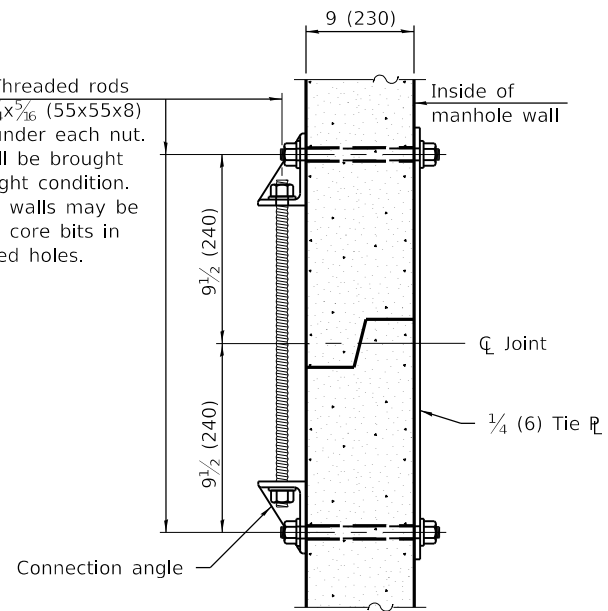
ISSUED 4-1-06

**PRECAST MANHOLE TYPE A**  
**9' (2.74 m) DIAMETER**

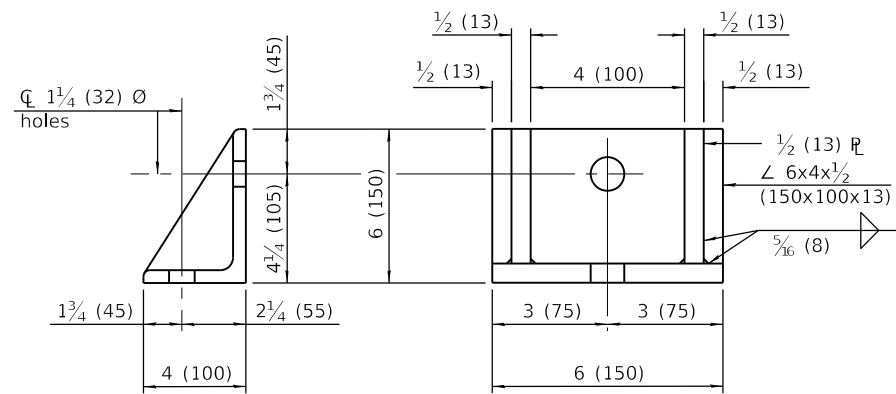
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**STANDARD 602421-09**

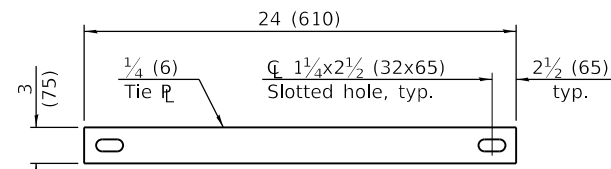
$\varnothing$  1(25)  $\varnothing$  Threaded rods with  $2\frac{1}{4} \times 2\frac{1}{4} \times \frac{5}{16}$  (55x55x8)  $\varnothing$  washers under each nut. All nuts shall be brought to a snug tight condition. Holes in the walls may be drilled using core bits in lieu of formed holes.



**JOINT SPLICE**



**CONNECTION ANGLE**



**TIE PLATE**

**FLAT SLAB TOP REINFORCEMENT**

Location	Riser Height (RH)	WWR (each direction)		Rebar (each direction except as noted)		
		$A_s$ (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 $\leq$ 10 ft. (3.05 m)	** 0.88 sq. in./ft. (1863 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#6 (#19)
	RH > 10 ft. (3.05 m)	WWR not permitted				#8 (#25)

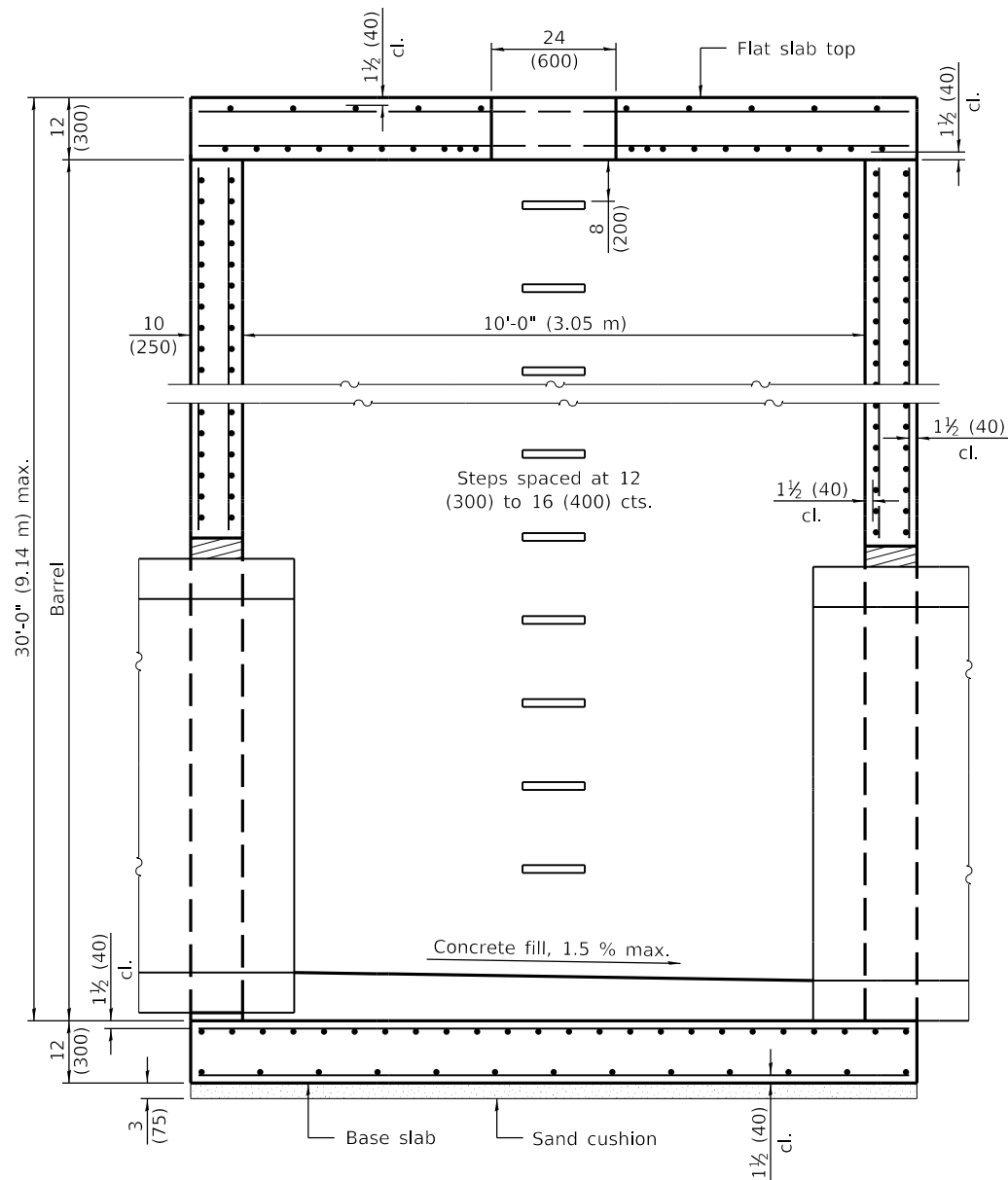
\*\* Only one layer of WWR permitted to avoid congestion.

**WALL REINFORCEMENT**

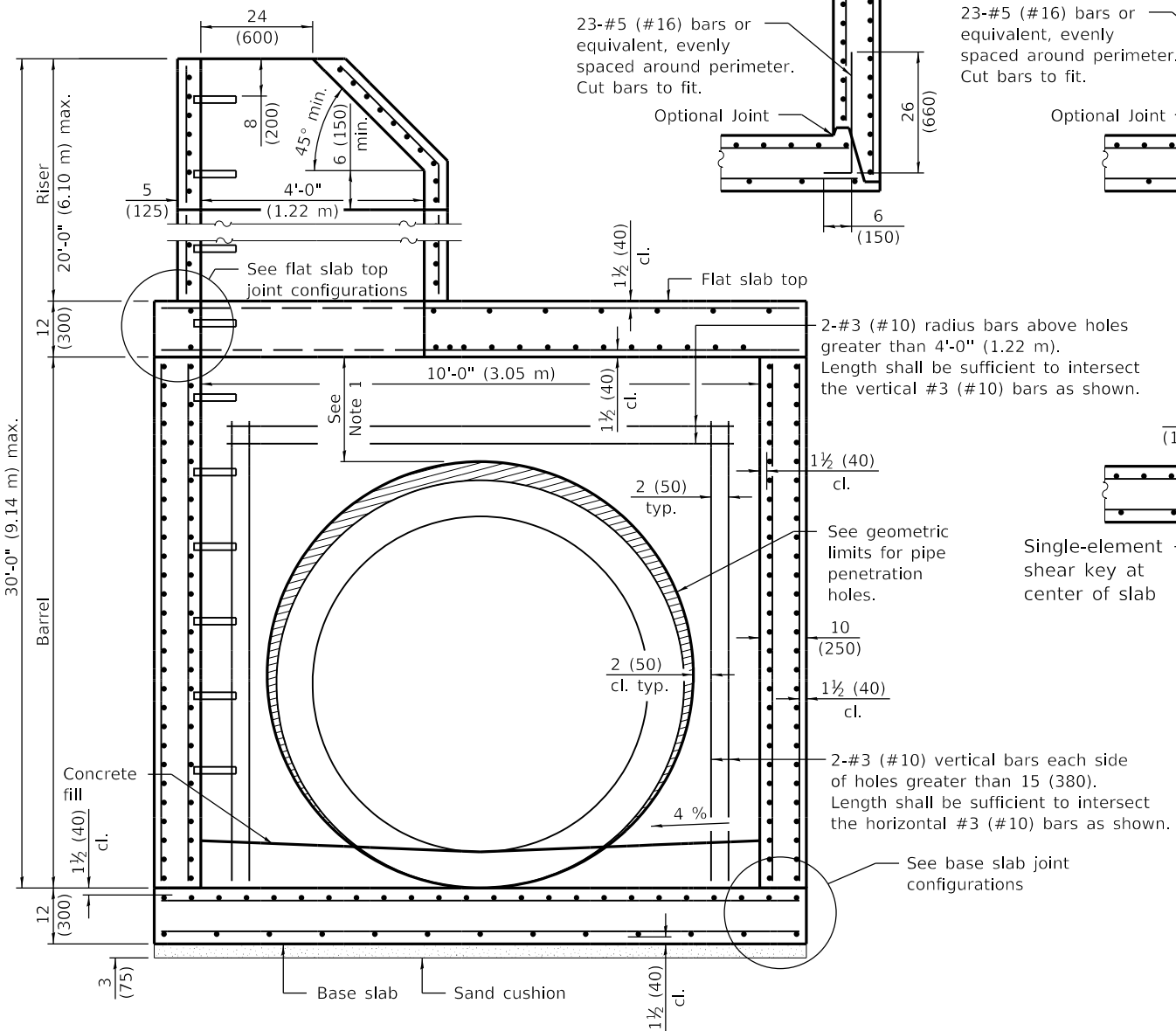
Location	Orientation	WWR or Rebar	
		$A_s$ (min.)	Spacing (max.)
4 ft. (1.22 m) $\varnothing$ Riser	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)
9 ft. (2.74 m) $\varnothing$ Barrel	Circumferential	0.27 sq. in./ft. (572 sq. mm/m)	6 (150)
	Vertical	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 $\leq$ 10 ft. (3.05 m) & TH $\leq$ 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)

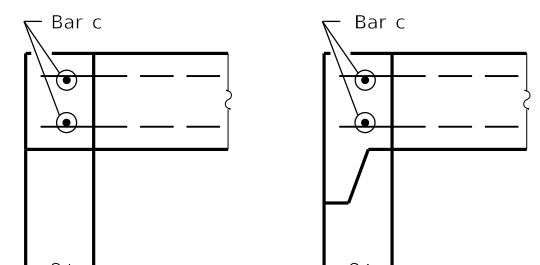
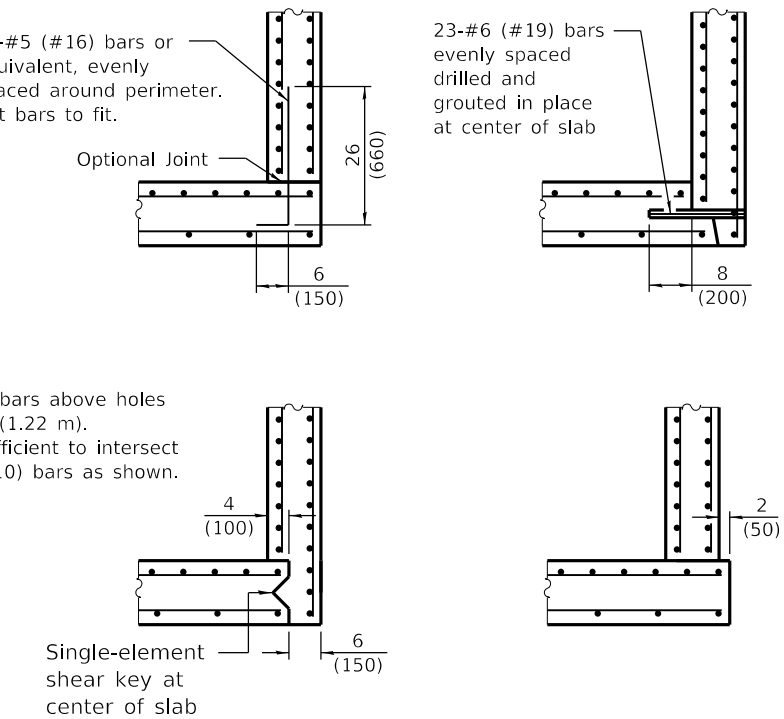


**SECTION PARALLEL TO PIPE**  
(Without conical top riser)



**SECTION PERPENDICULAR TO PIPE**  
(With conical top riser)

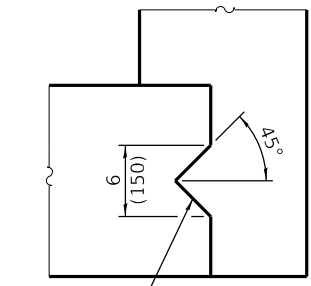
**BASE SLAB JOINT CONFIGURATIONS**



**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.

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**  
(Sheet 1 of 3)

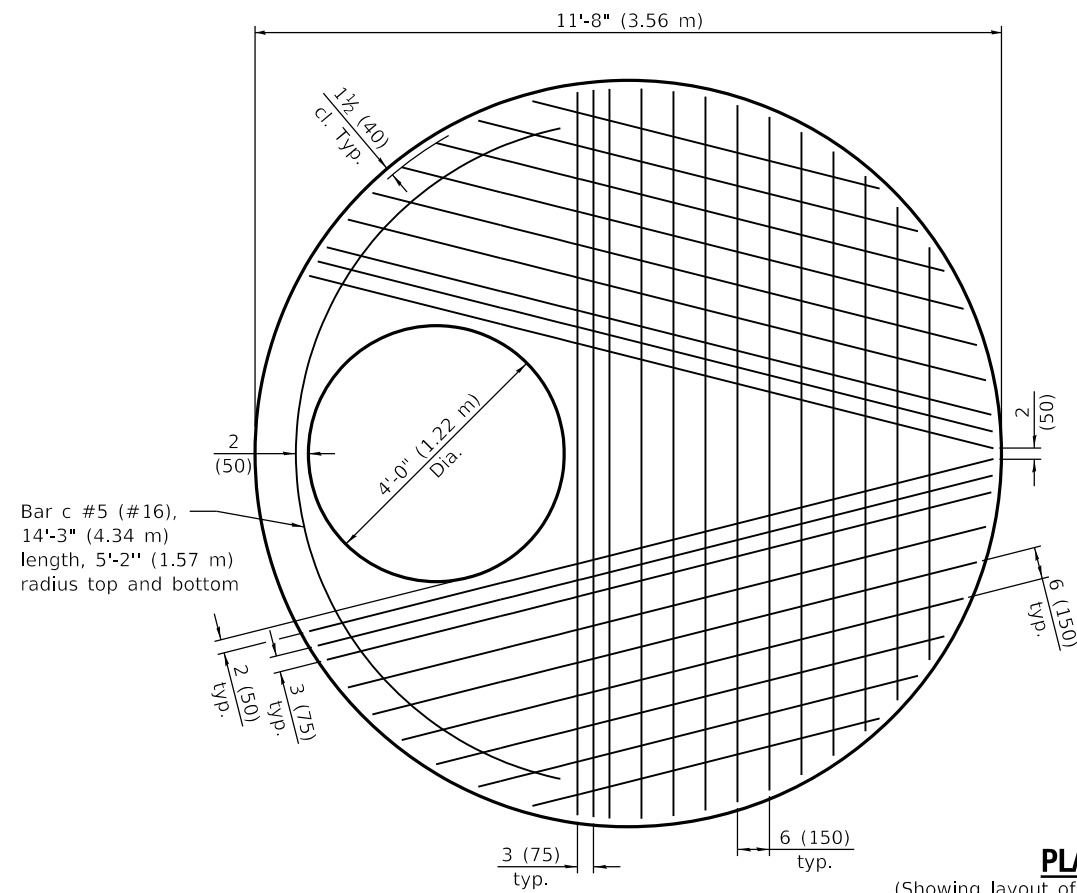
**STANDARD 602426-03**

Illinois Department of Transportation

PASSED January 1, 2021  
*Michael Bond*  
ENGINEER OF POLICY AND PROCEDURES

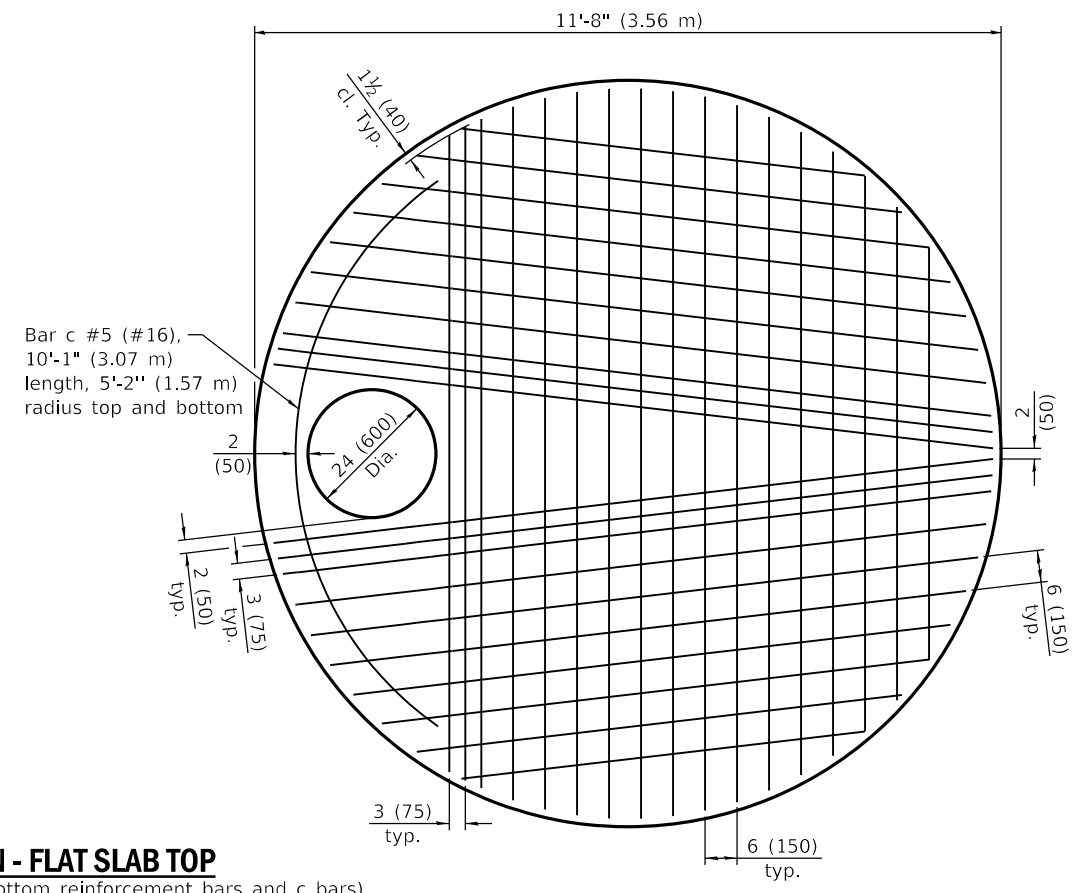
APPROVED January 1, 2021  
*J. E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

81-1-1 03/05/01



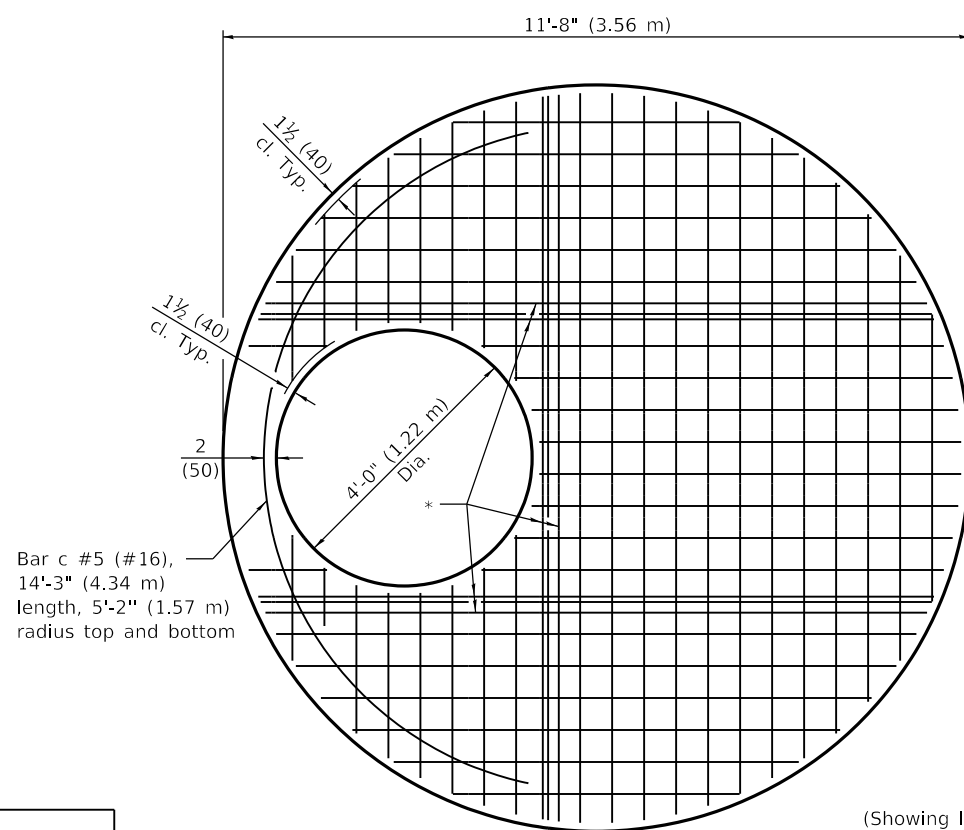
**PLAN - FLAT SLAB TOP**

(Showing layout of bottom reinforcement bars and c bars)



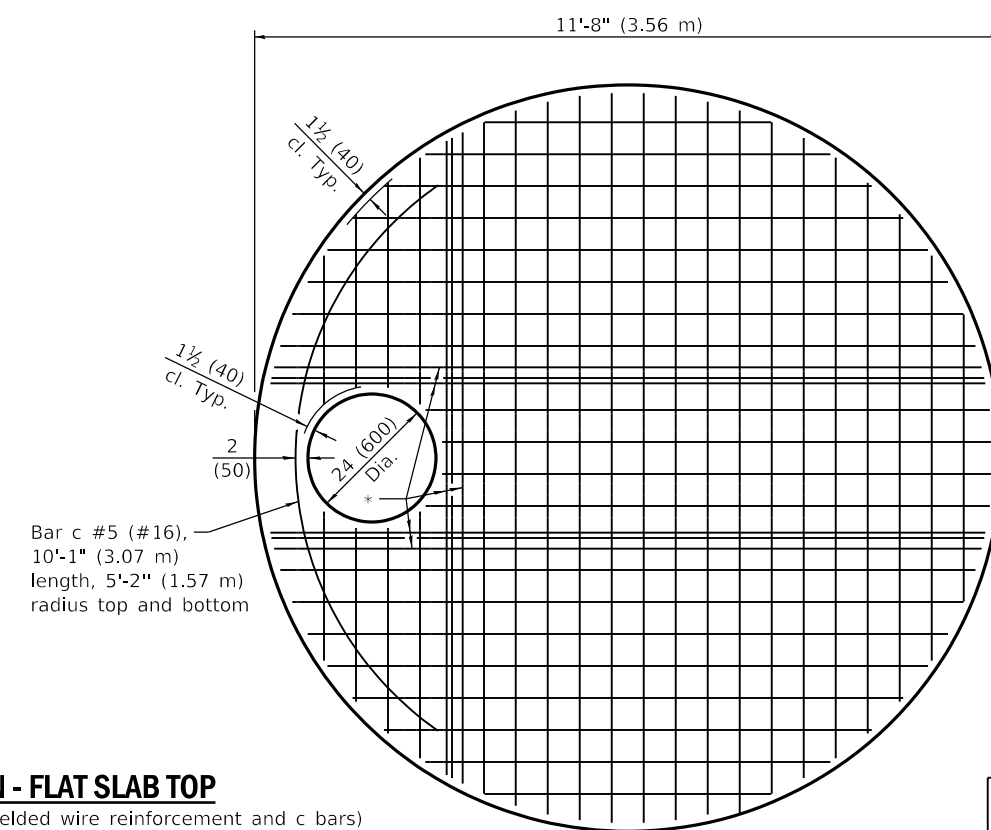
**PLAN - FLAT SLAB TOP**

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



**PLAN - FLAT SLAB TOP**

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



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

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PASSED January 1, 2021  
*Michael Bond*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
*J. E. C. G.*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18

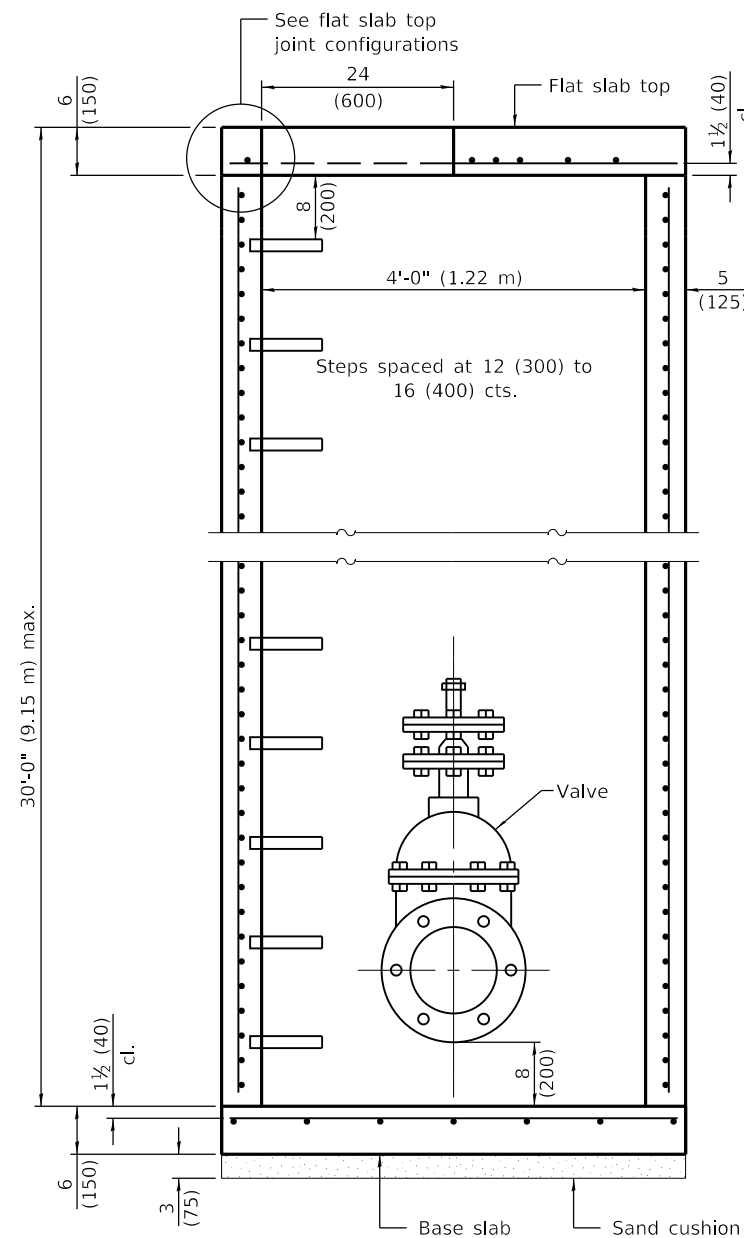
**PRECAST MANHOLE TYPE A  
10' (3.05 m) DIAMETER**

(Sheet 2 of 3)

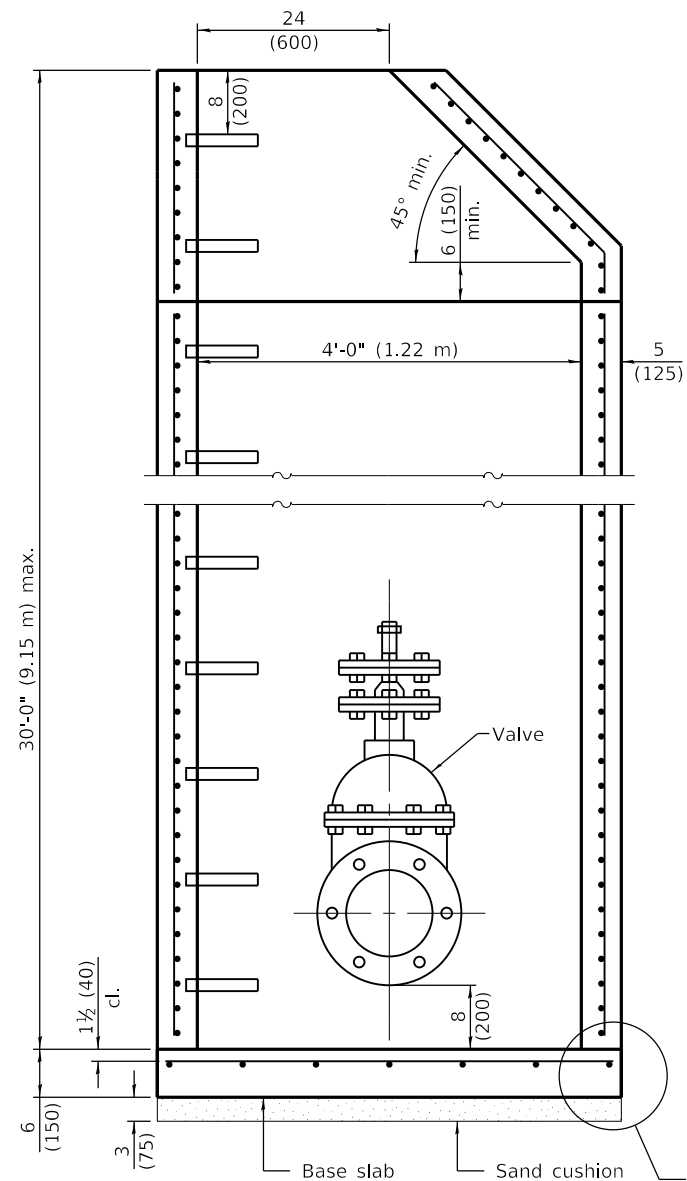
**STANDARD 602426-03**



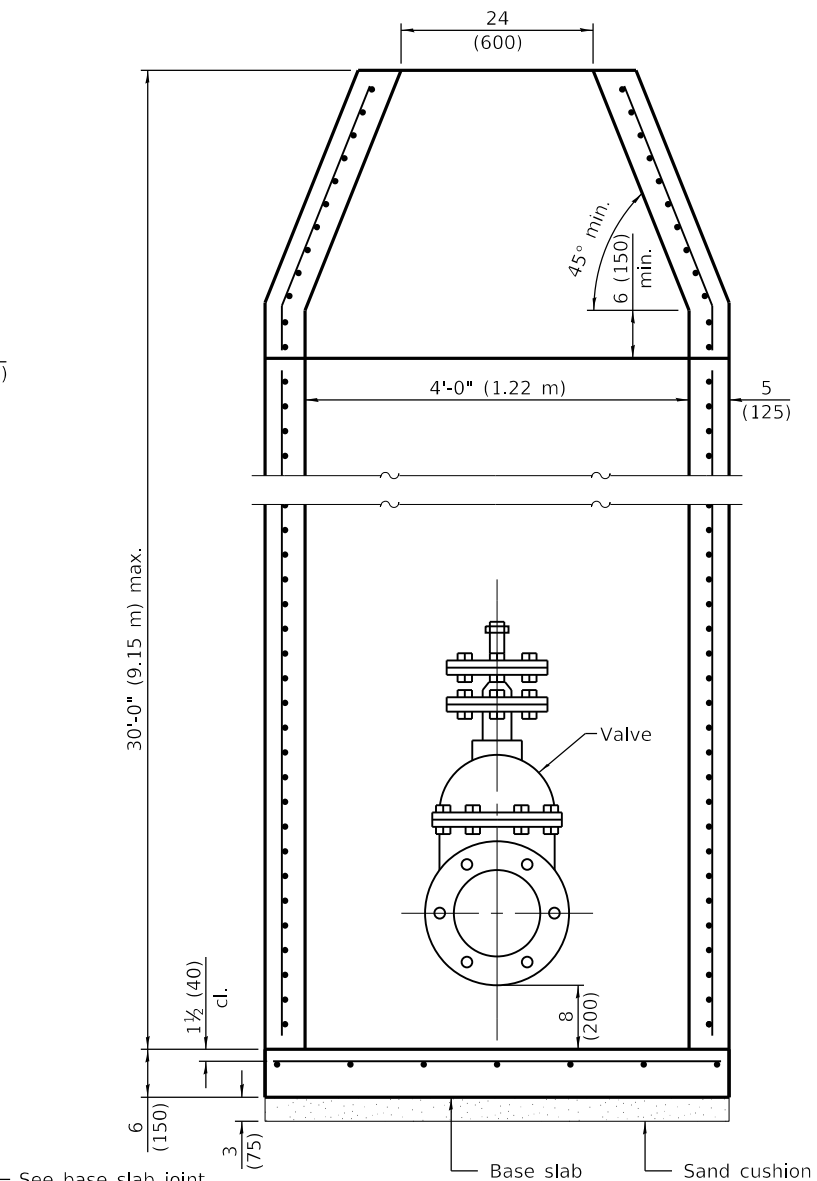




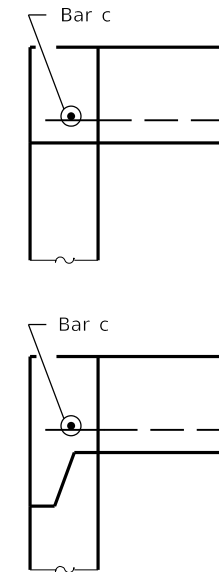
**SECTION THRU VALVE VAULT**  
(Without conical top)



**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  $\leq$  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.

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)

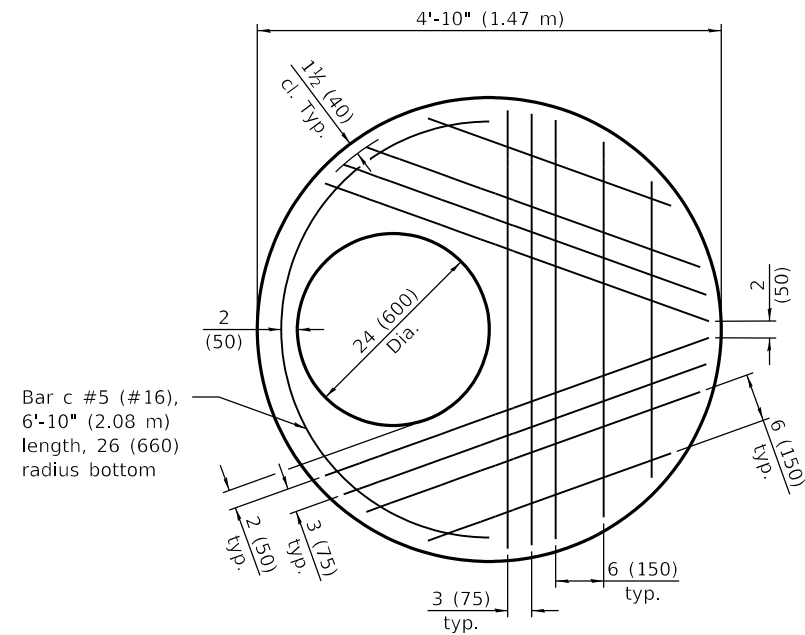
**STANDARD 602501-06**

Illinois Department of Transportation

PASSED January 1, 2021  
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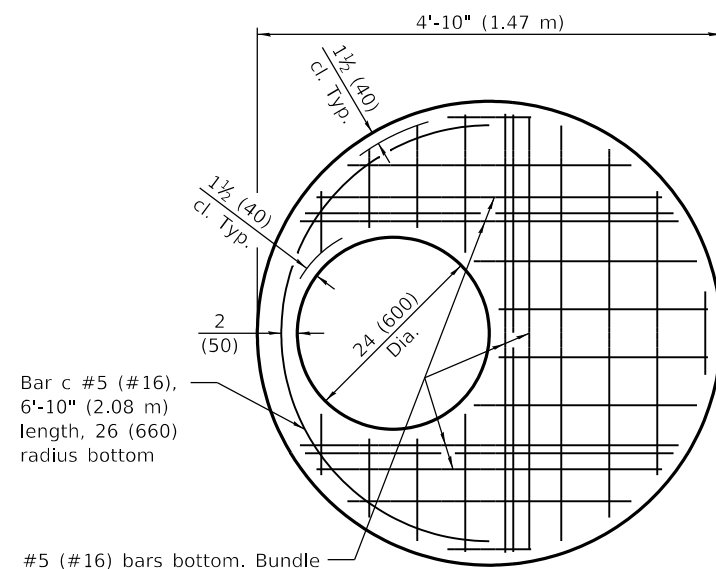
APPROVED January 1, 2021  
*J. E. ...*  
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**PLAN - FLAT SLAB TOP**

(Showing layout of reinforcement bars and c bars)



**PLAN - FLAT SLAB TOP**

(Showing layout of welded wire reinforcement and c bars)

**FLAT SLAB TOP REINFORCEMENT**

Location	WWR (each direction)		Rebar		
	A <sub>s</sub> (min.)	Spacing (max.)	A <sub>s</sub> (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)

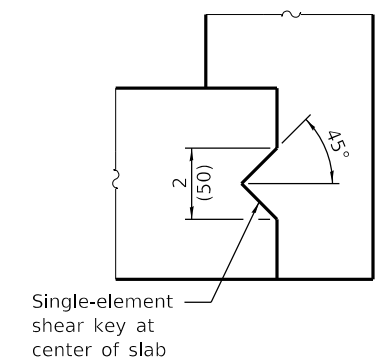
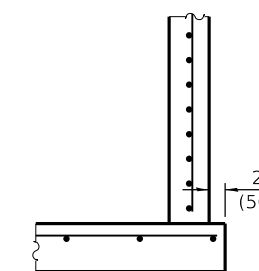
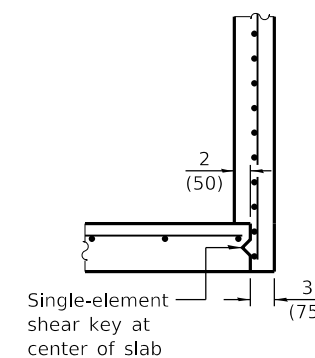
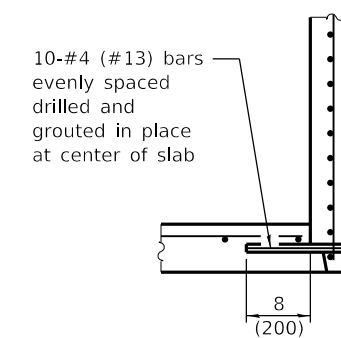
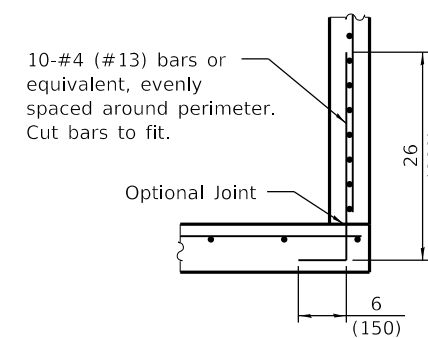
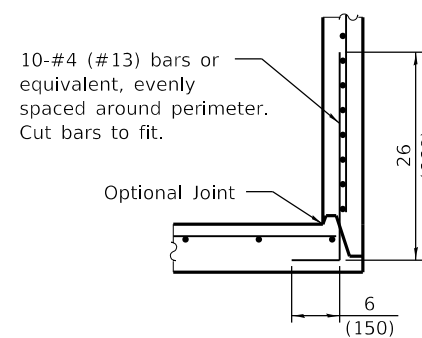
\* Only one layer of WWR permitted to avoid congestion.

**WALL REINFORCEMENT**

Orientation	WWR or Rebar	
	A <sub>s</sub> (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 <sub>s</sub> (min.)	Spacing (max.)
Top Mat	≤ 20 ft. (6.10 m)	0.24 sq. in./ft. (508 sq. mm/m)	10 (250)
	> 20 ft. (6.10 m)	0.24 sq. in./ft. (508 sq. mm/m)	10 (250)



Single-element shear key at center of slab

**SHEAR KEY GEOMETRY**  
(Reinforcement not shown for clarity)

**BASE SLAB JOINT CONFIGURATIONS**

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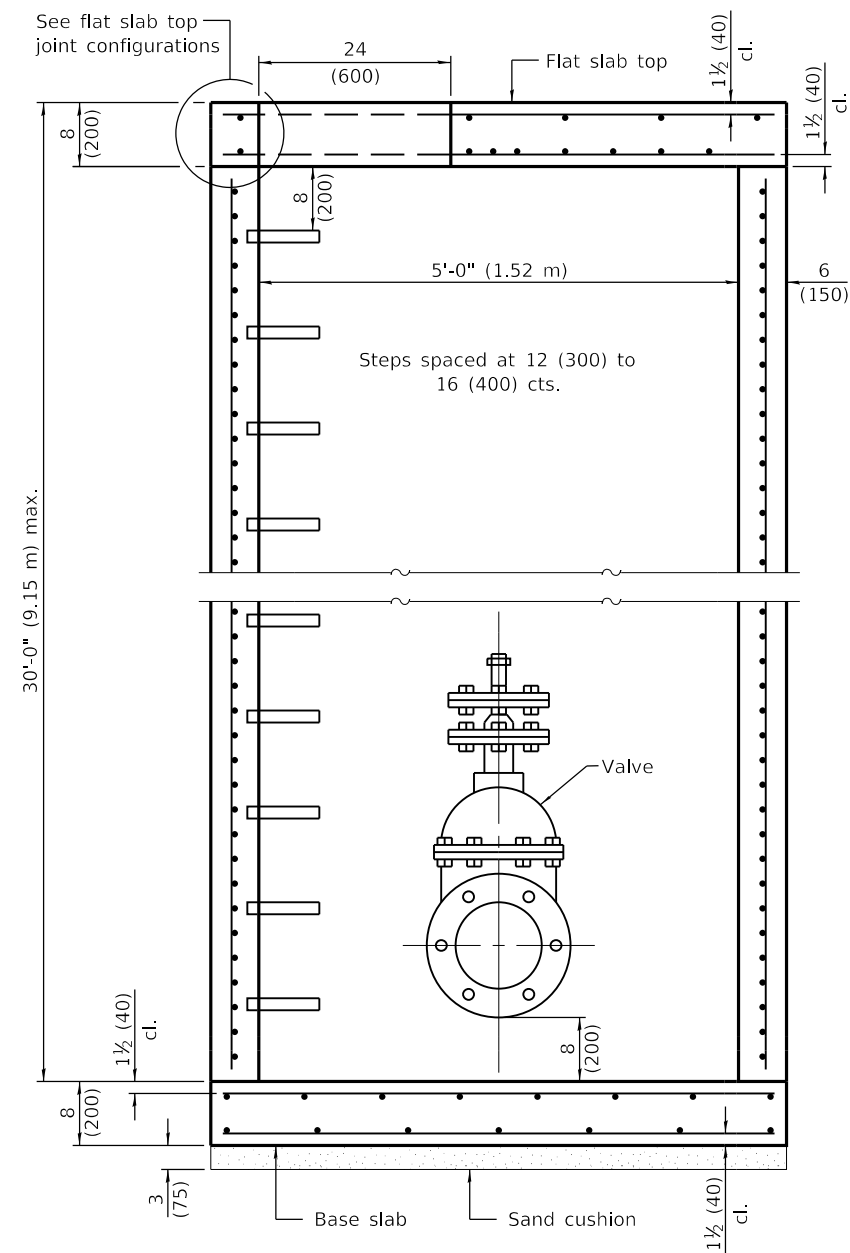
APPROVED January 1, 2021  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

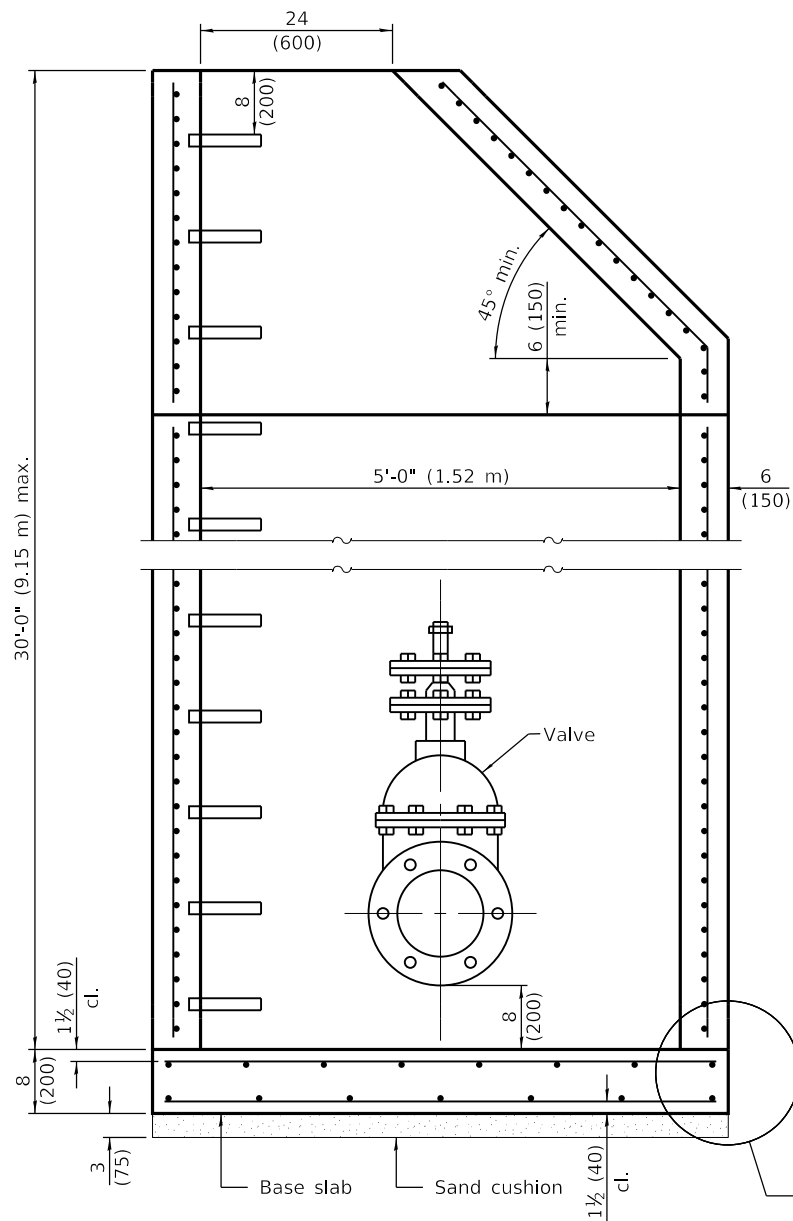
**PRECAST VALVE VAULT TYPE A**  
**4' (1.22 m) DIAMETER**

(Sheet 2 of 2)

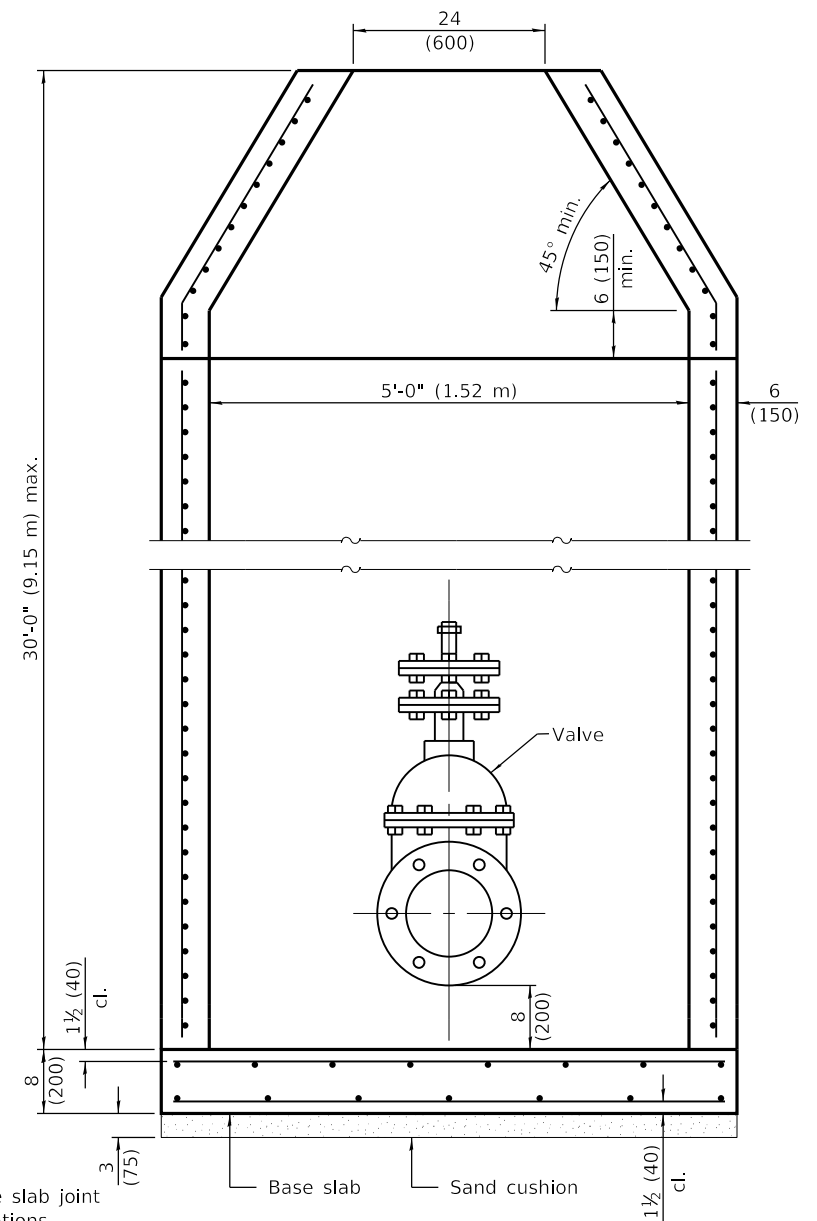
**STANDARD 602501-06**



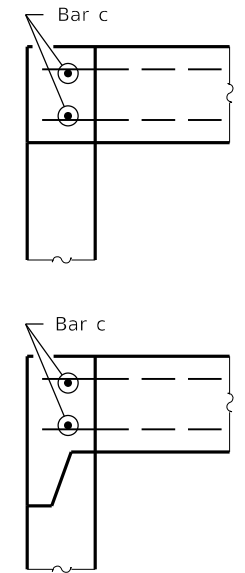
**SECTION THRU VALVE VAULT**  
(Without conical top)



**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  $\geq 10$  (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.

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**

(Sheet 1 of 2)

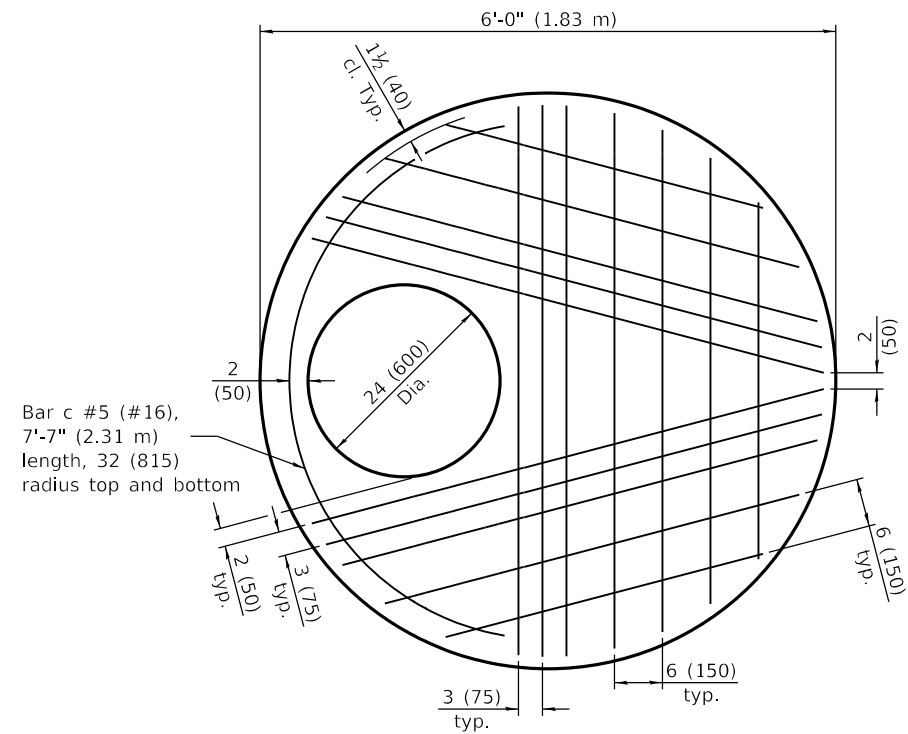
**STANDARD 602506-03**

Illinois Department of Transportation

PASSED January 1, 2021  
*Michael Bond*  
ENGINEER OF POLICY AND PROCEDURES

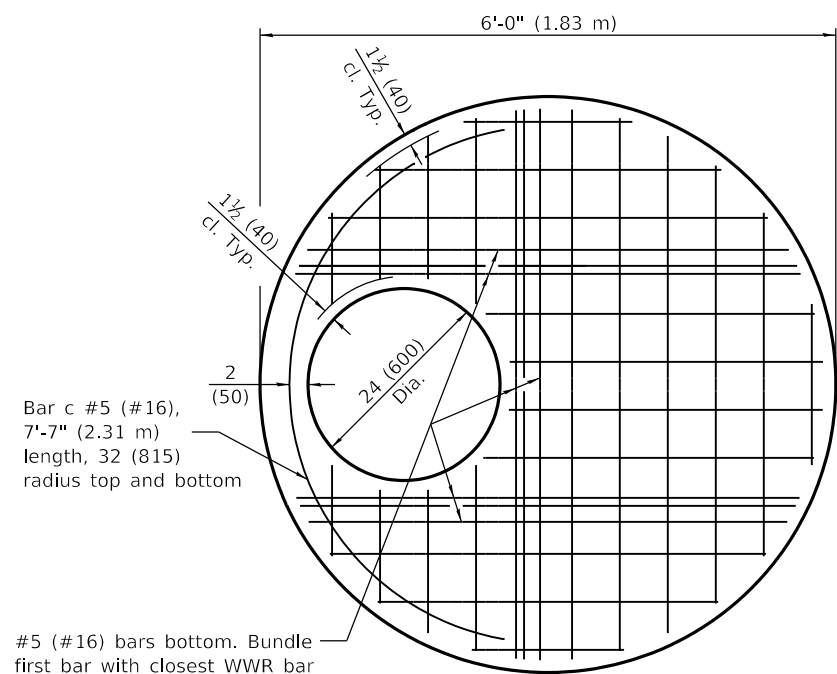
APPROVED January 1, 2021  
*J. E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18



**PLAN - FLAT SLAB TOP**

(Showing layout of bottom reinforcement bars and c bars)



**PLAN - FLAT SLAB TOP**

(Showing layout of welded wire reinforcement and c bars)

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

**FLAT SLAB TOP REINFORCEMENT**

Location	WWR (each direction)		Rebar (each direction except as noted)		
	A <sub>s</sub> (min.)	Spacing (max.)	A <sub>s</sub> (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)

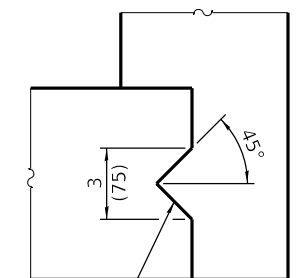
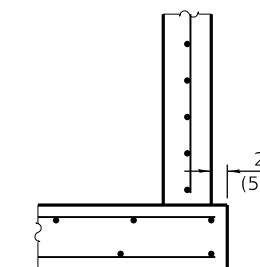
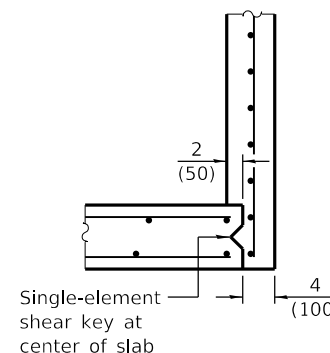
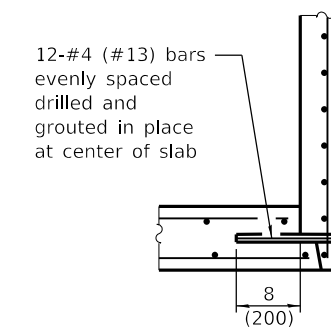
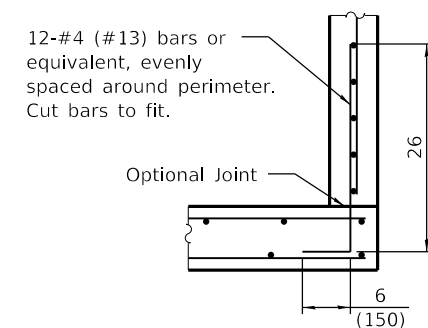
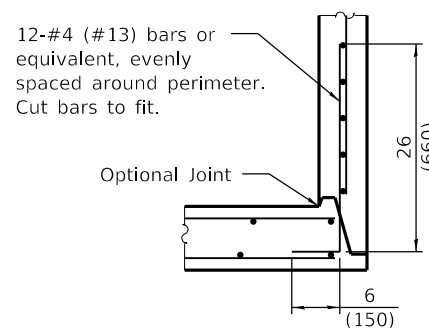
\* Only one layer of WWR permitted to avoid congestion.

**WALL REINFORCEMENT**

Orientation	WWR or Rebar	
	A <sub>s</sub> (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 <sub>s</sub> (min.)	Spacing (max.)
Top Mat	≤ 20 ft. (6.10 m)	0.24 sq. in./ft. (508 sq. mm/m)	10 (250)
	> 20 ft. (6.10 m)	0.28 sq. in./ft. (593 sq. mm/m)	8 (200)
Bottom Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)



Single-element shear key at center of slab

**SHEAR KEY GEOMETRY**  
(Reinforcement not shown for clarity)

**BASE SLAB JOINT CONFIGURATIONS**

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

(Sheet 2 of 2)

**STANDARD 602506-03**

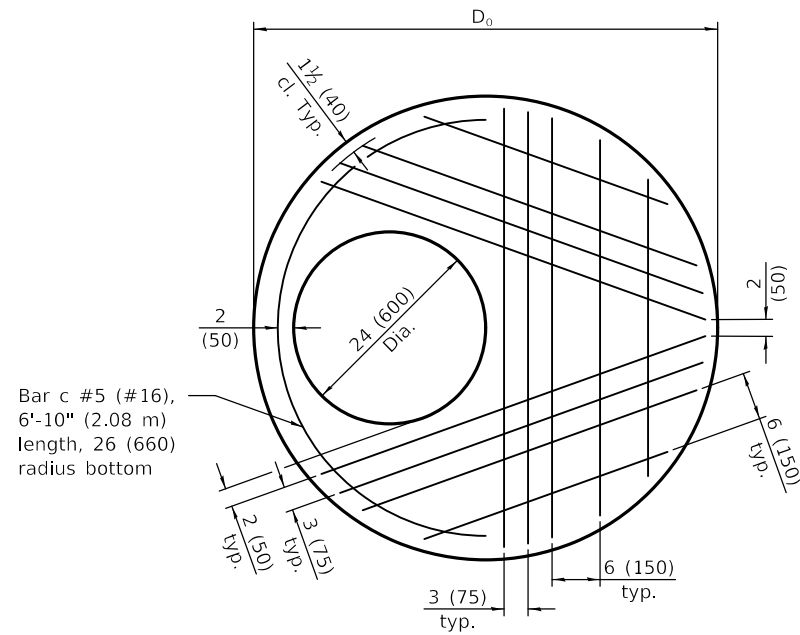
Illinois Department of Transportation

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 ENGINEER OF POLICY AND PROCEDURES

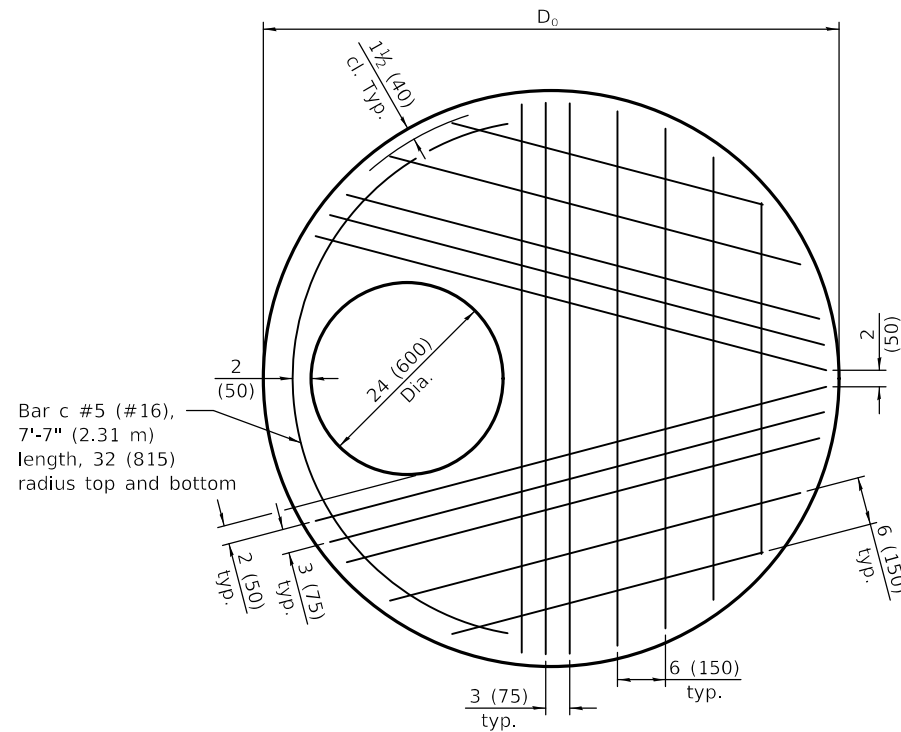
APPROVED January 1, 2021  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18





**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 <sub>s</sub> (min.)	Spacing (max.)	A <sub>s</sub> (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)

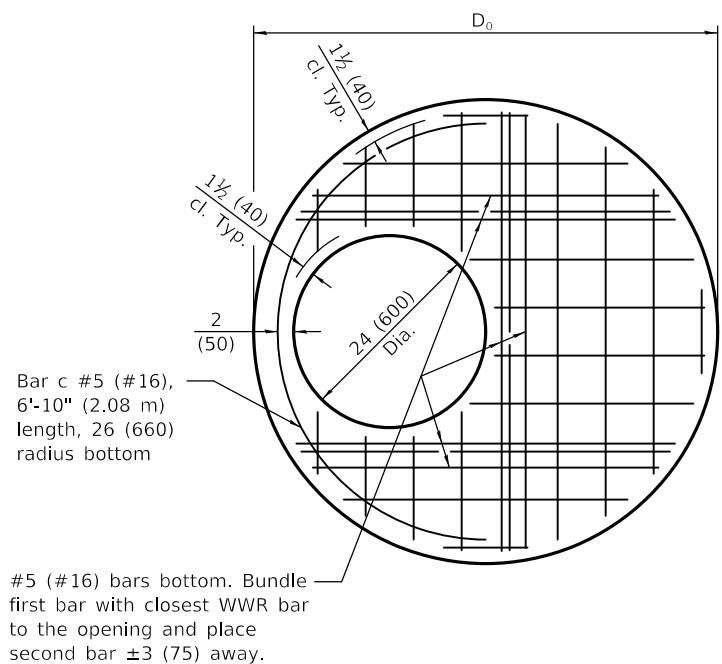
**FLAT SLAB TOP REINFORCEMENT FOR D = 4'-0" (1.22 m)**

Location	WWR (each direction)		Rebar		
	A <sub>s</sub> (min.)	Spacing (max.)	A <sub>s</sub> (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)

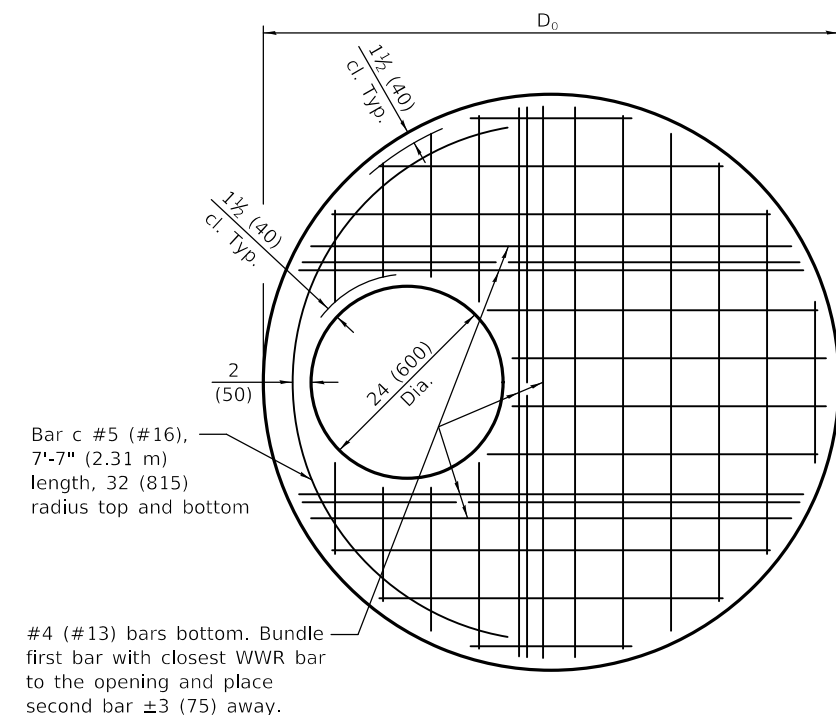
**FLAT SLAB TOP REINFORCEMENT FOR D = 5'-0" (1.52 m)**

Location	WWR (each direction)		Rebar (each direction except as noted)		
	A <sub>s</sub> (min.)	Spacing (max.)	A <sub>s</sub> (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

PASSED January 1, 2019  
  
 ENGINEER OF POLICY AND PROCEDURES

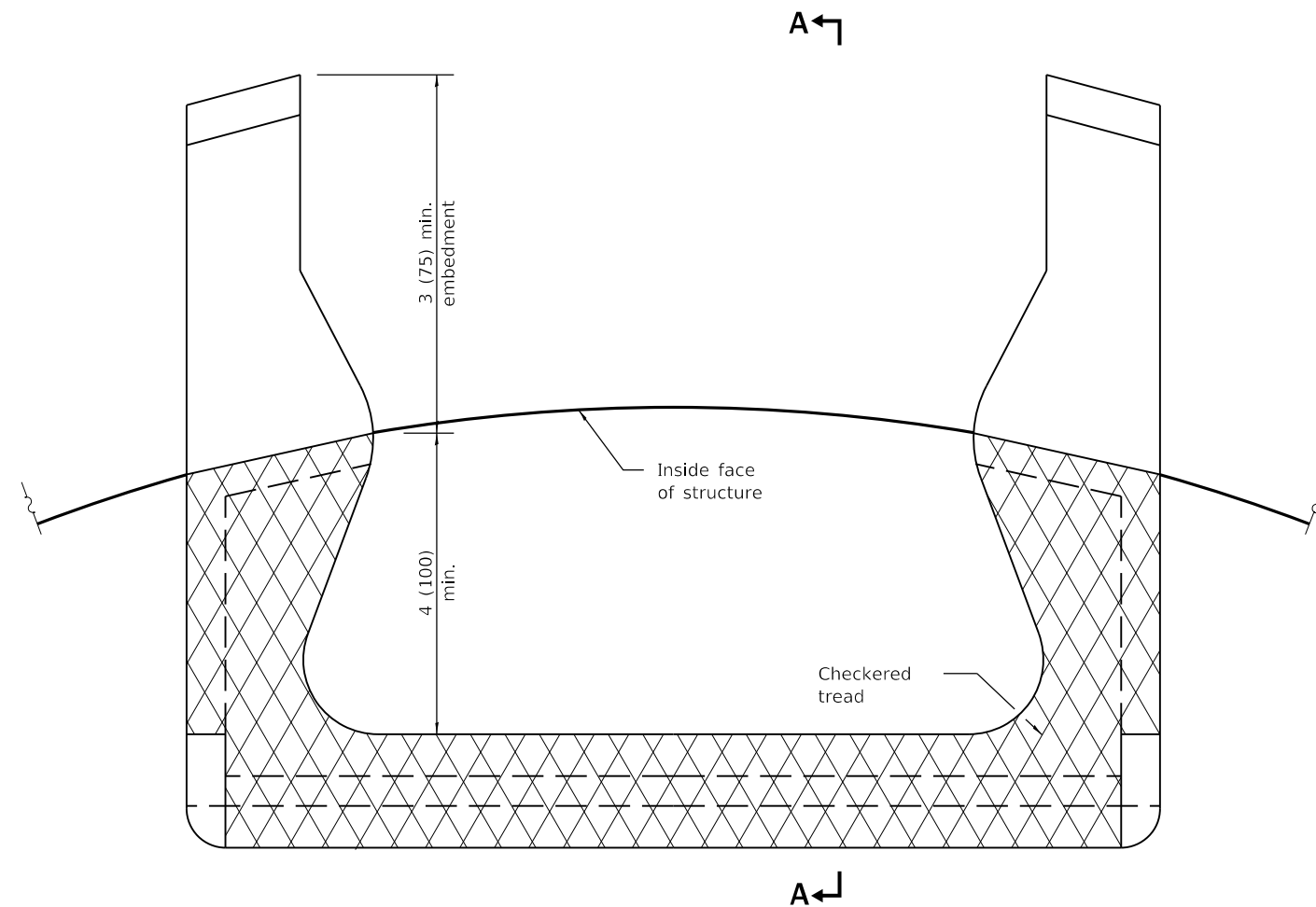
APPROVED January 1, 2019  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

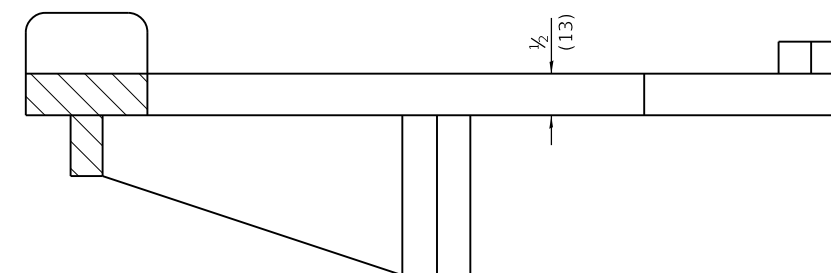
**PRECAST REINFORCED  
CONCRETE FLAT SLAB TOP**

(Sheet 2 of 2)

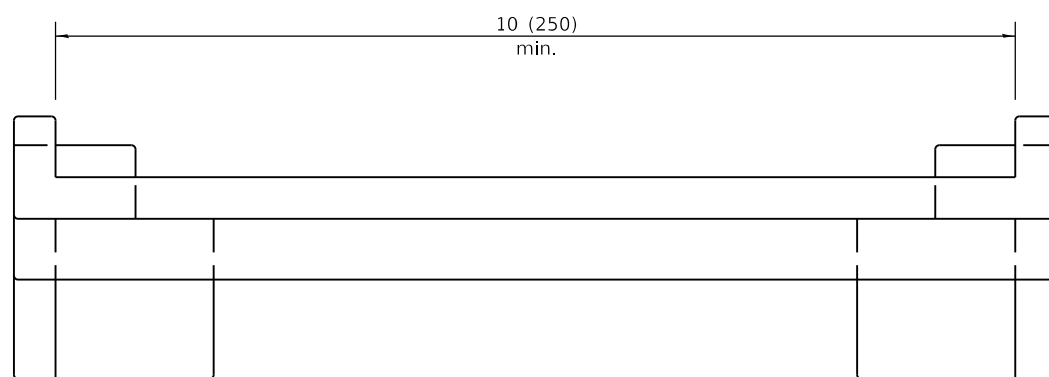
**STANDARD 602601-06**



**PLAN VIEW**




**SECTION A-A**



**ELEVATION VIEW**

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


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

ISSUED 1-1-97

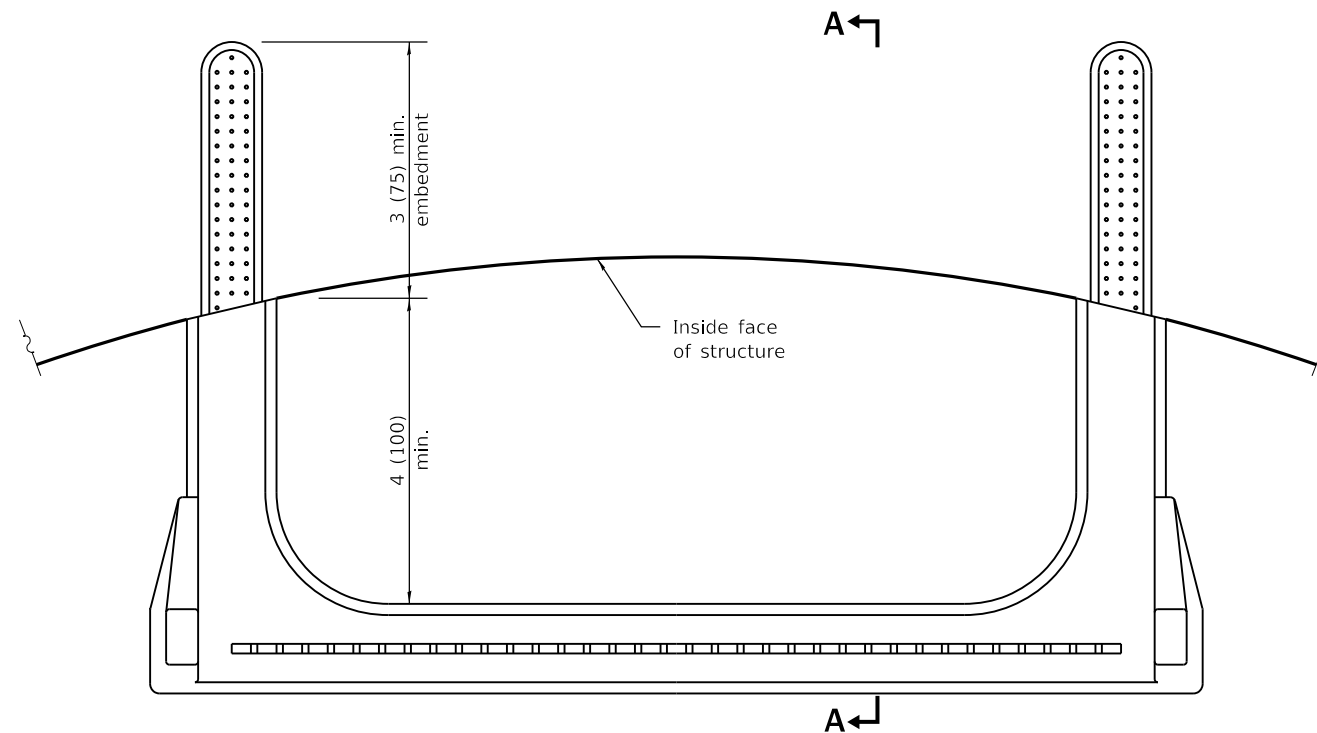
DATE	REVISIONS
1-1-09	Switched units to English (metric).
4-1-06	Revised title, drawings, and added plastic steps on sheet 2.

**MANHOLE STEPS**

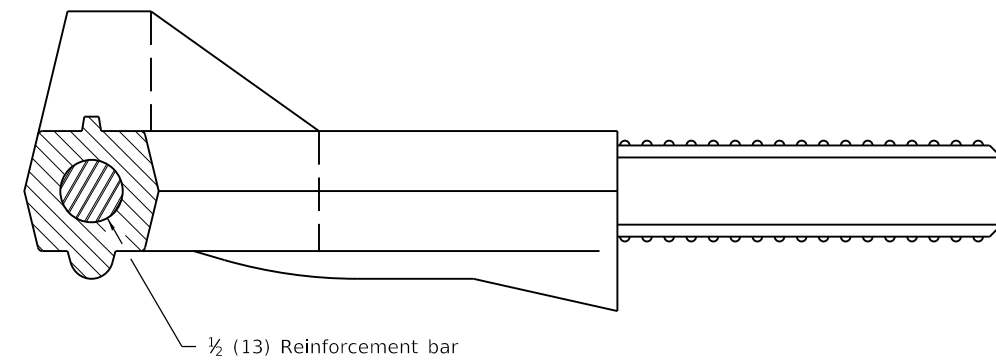
(Sheet 1 of 2)

**STANDARD 602701-02**

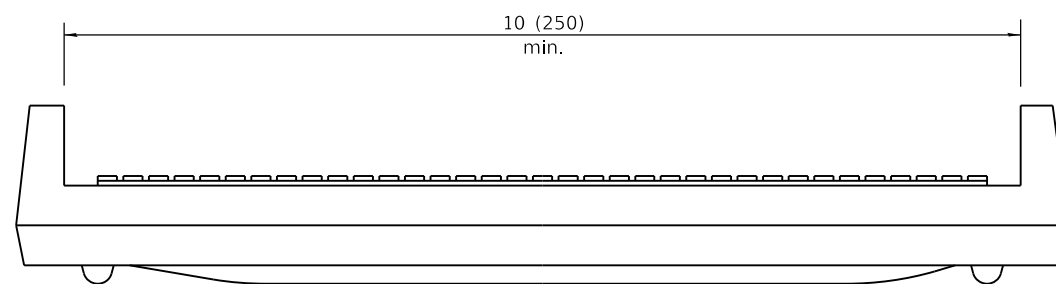




**PLAN VIEW**



**SECTION A-A**



**ELEVATION VIEW**

Illinois Department of Transportation

PASSED January 1, 2009

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APPROVED January 1, 2009

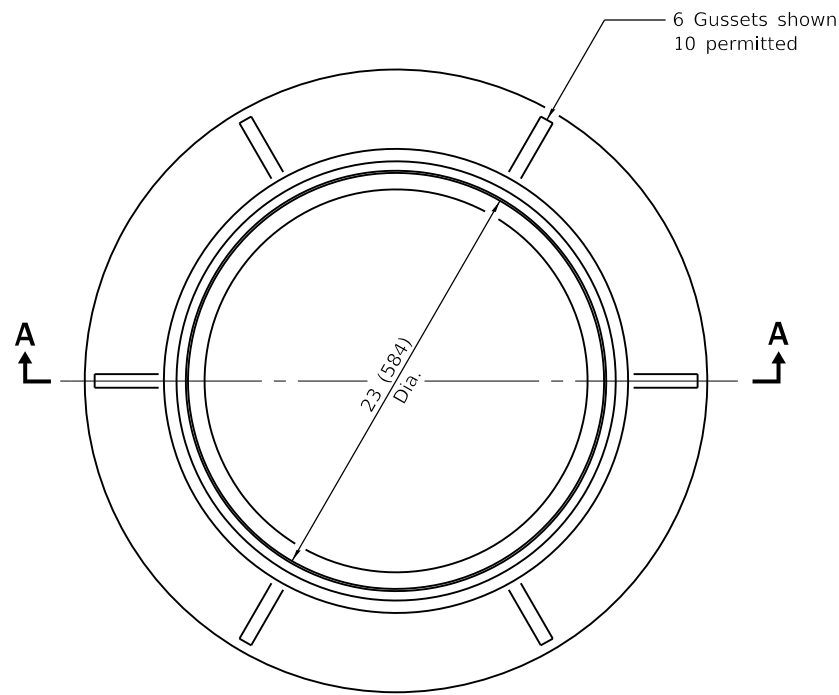
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

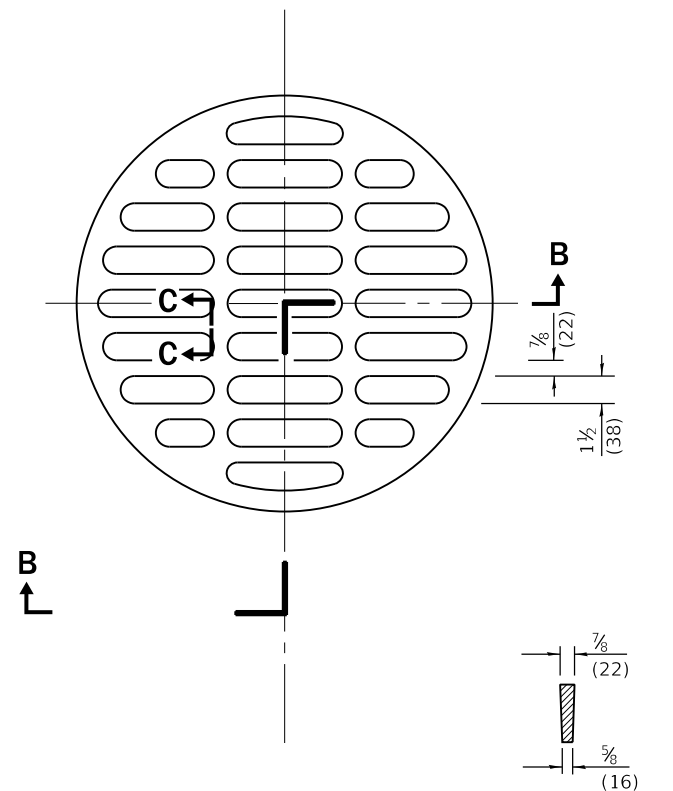
**MANHOLE STEPS**

(Sheet 2 of 2)

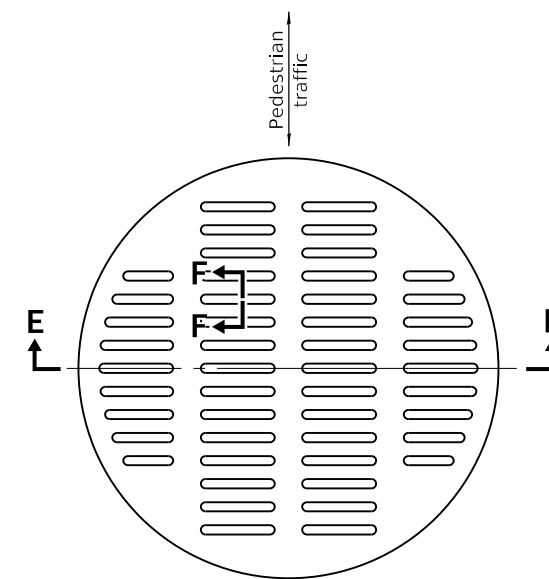
**STANDARD 602701-02**



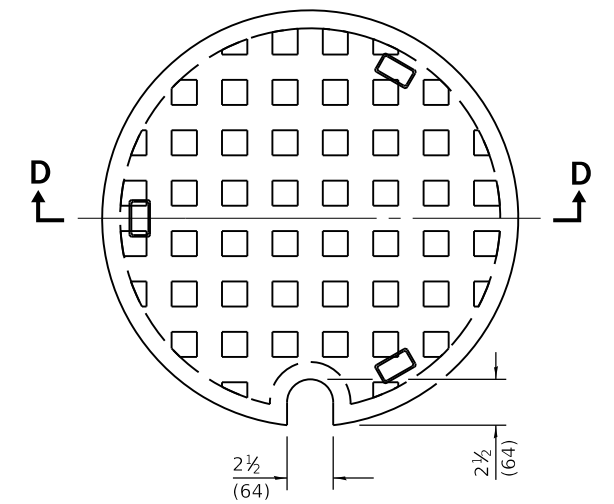
**CAST FRAME**



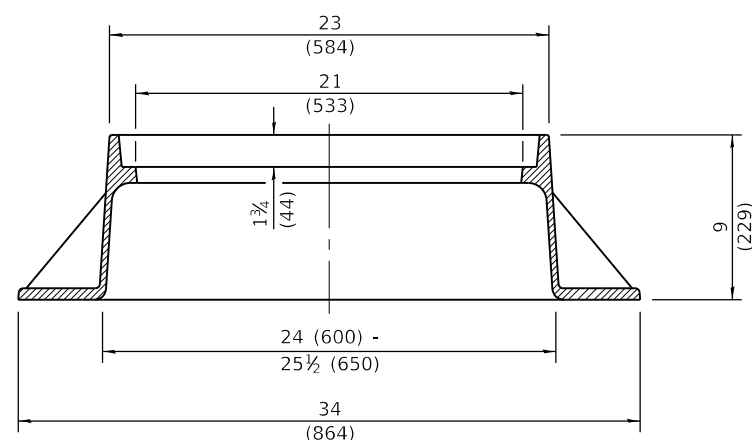
**SECTION C-C**



**SECTION F-F**

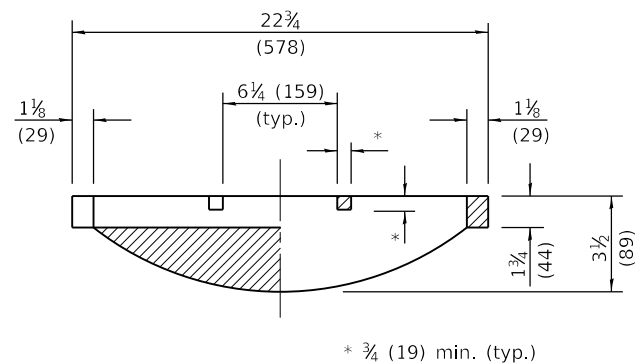


**SECTION D-D**



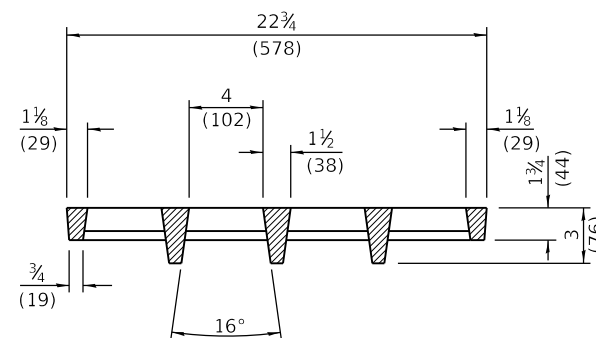
**SECTION A-A**

Gray Iron



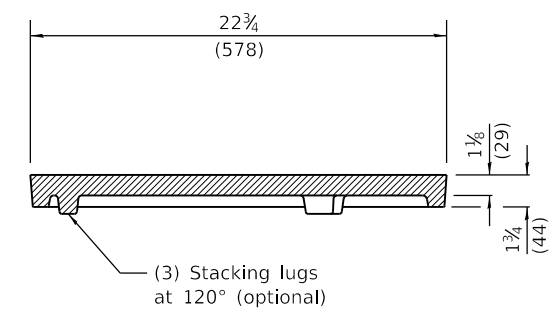
**SECTION B-B**

**CAST OPEN LID**



**SECTION E-E**

**ADA COMPLIANT  
CAST OPEN LID**



**CAST CLOSED LID**

Gray Iron Lid

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

Illinois Department of Transportation

PASSED January 1, 2020  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES

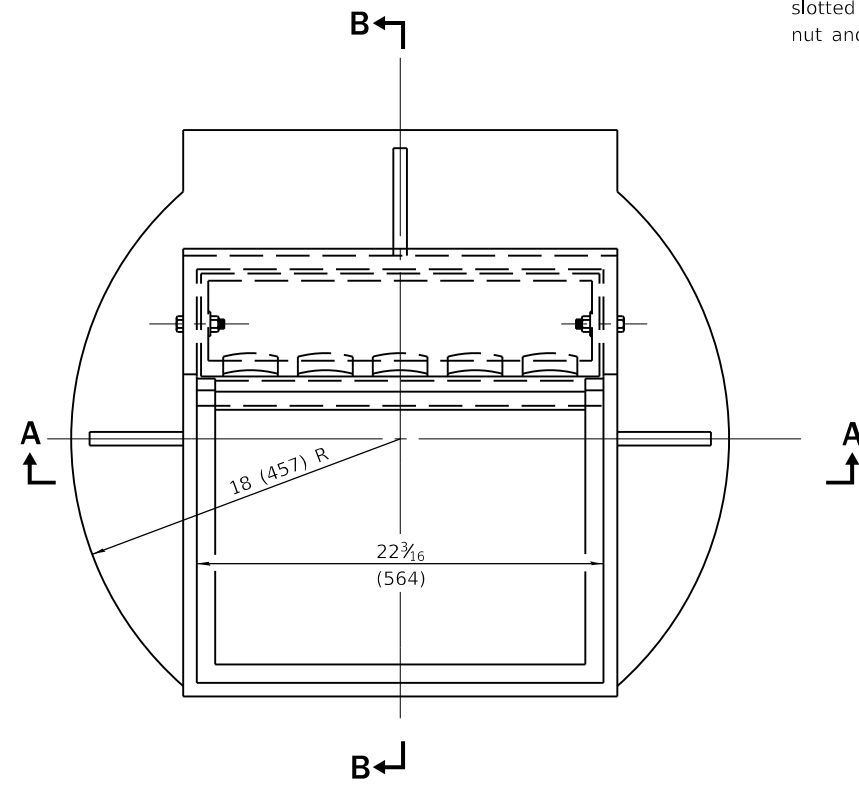
APPROVED January 1, 2020  
*J. S. E. E.*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

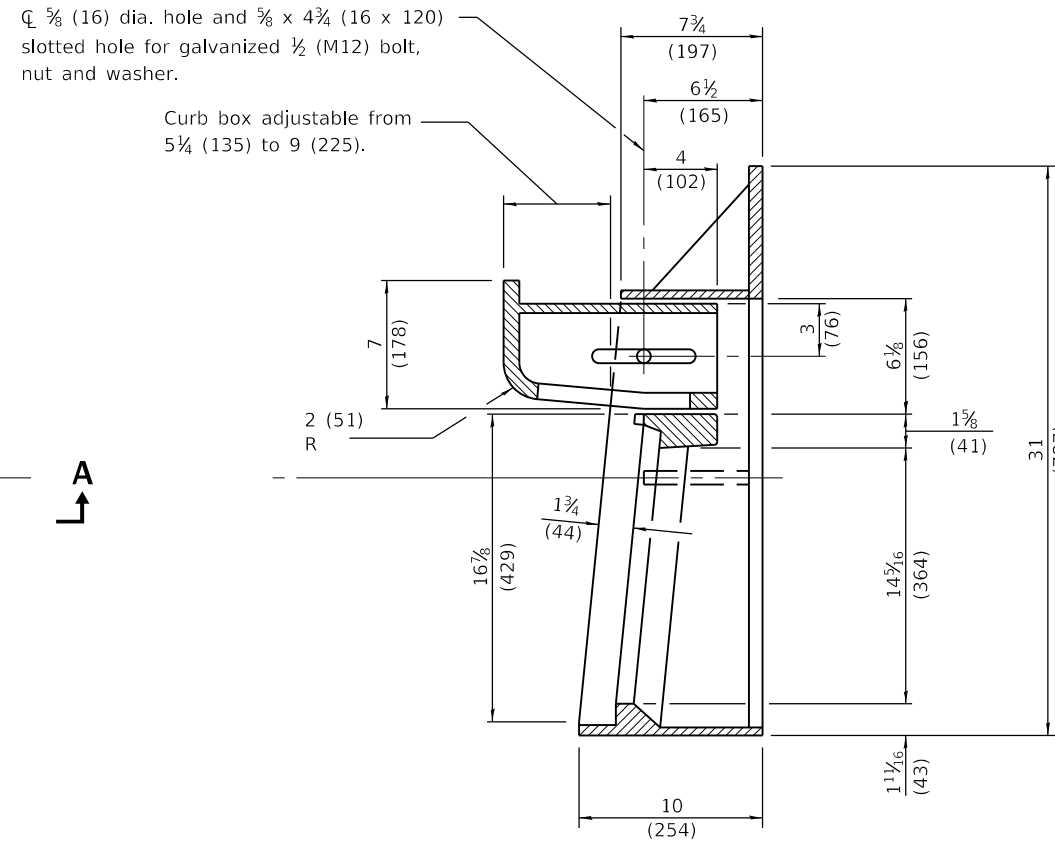
DATE	REVISIONS
1-1-20	Revised dimension in Section B-B of cast open lid.
1-1-15	Revised dimensioning of frame. Added ADA compliant open lid.
1-1-09	Switched units to English (metric).

**FRAME AND LIDS  
TYPE 1**

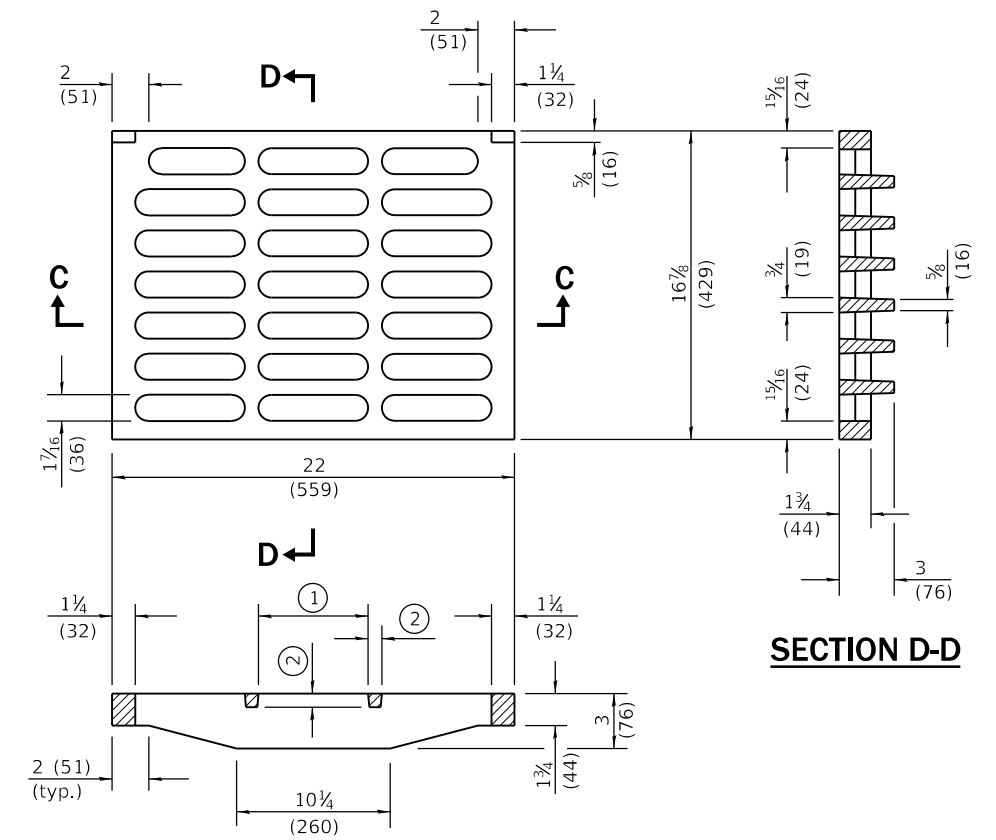
**STANDARD 604001-05**



**CAST FRAME**



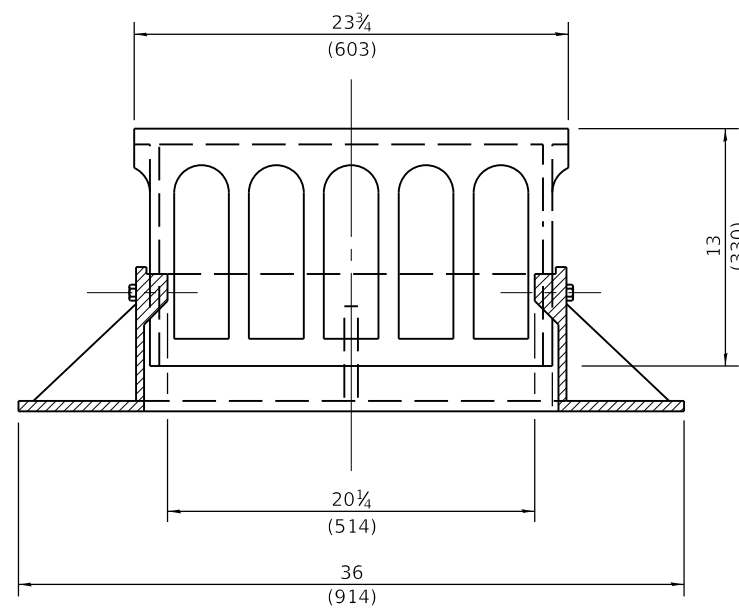
**SECTION B-B**



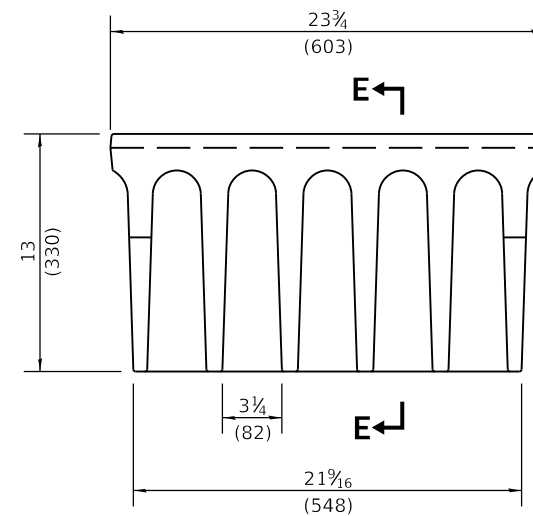
**SECTION C-C**

- ① = 6 (152) typ.
- ② =  $\frac{3}{4}$  (19) typ.

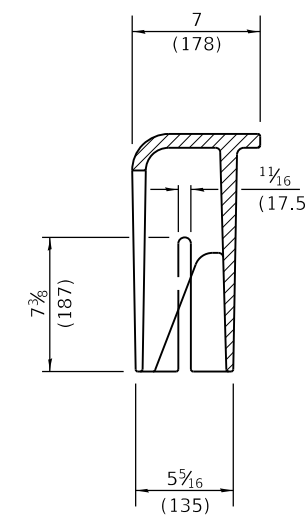
**CAST GRATE**



**SECTION A-A**



**ALTERNATE CURB BOX**



**SECTION E-E**

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

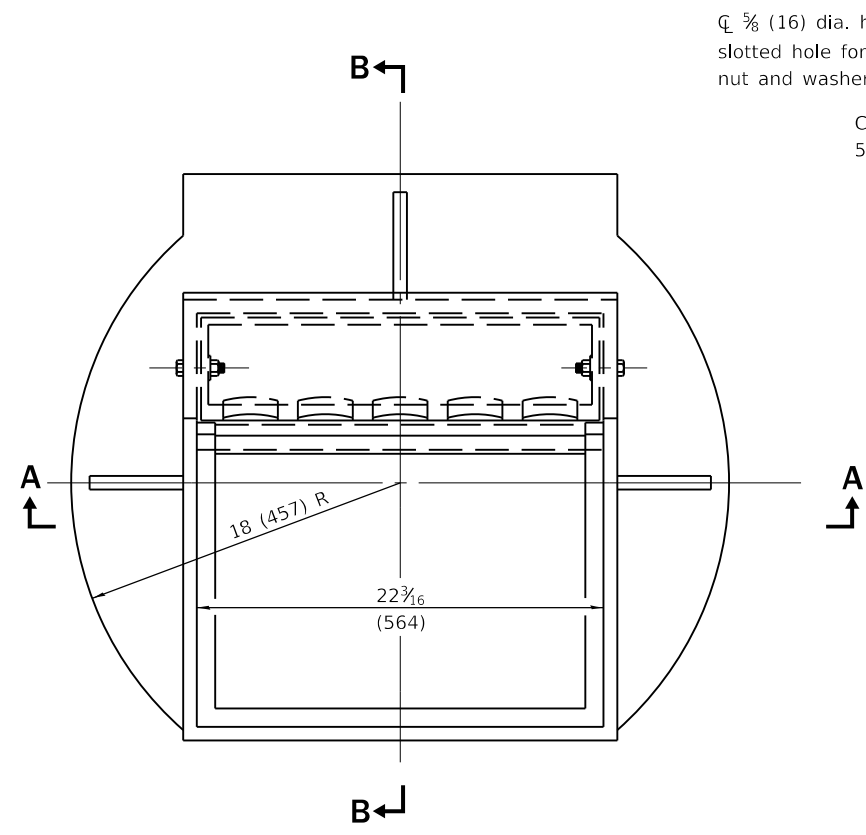
Illinois Department of Transportation  
 PASSED January 1, 2015  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES  
 APPROVED January 1, 2015  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

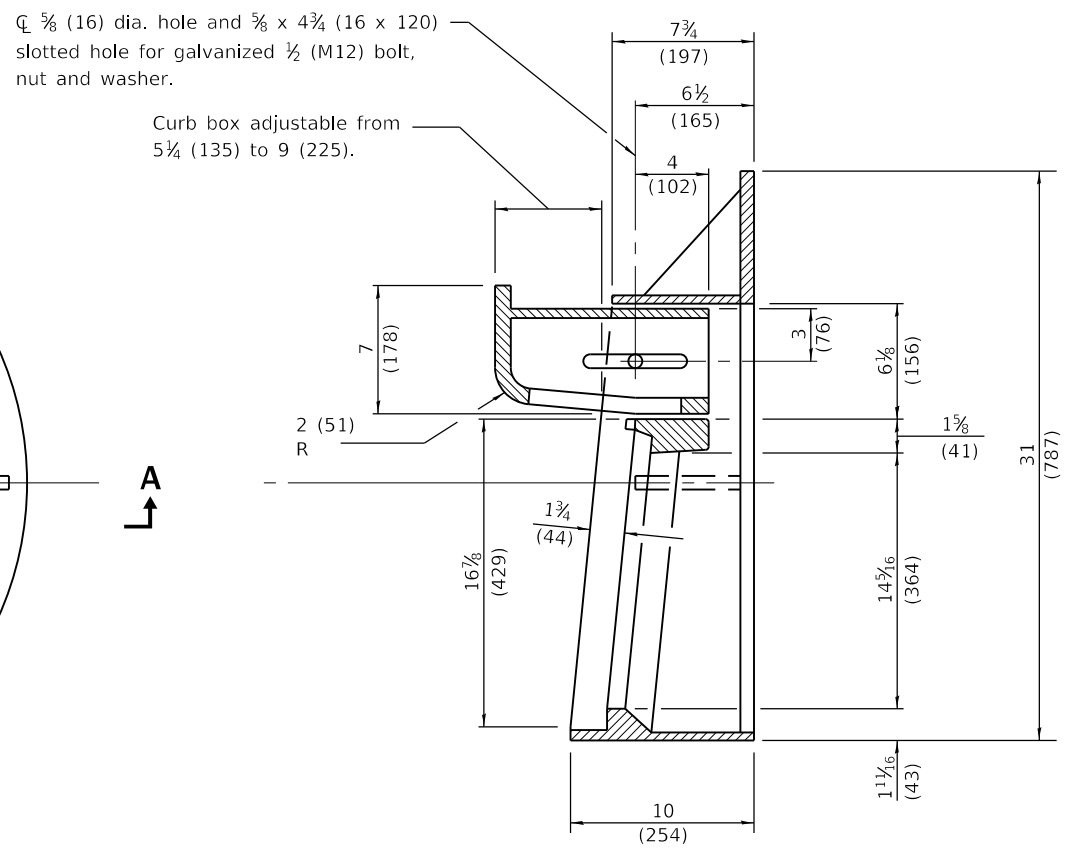
DATE	REVISIONS
1-1-15	Revised dimenstions of frame and alternate curb box.
1-1-09	Switched units to English (metric).

**FRAME AND GRATE  
TYPE 3**

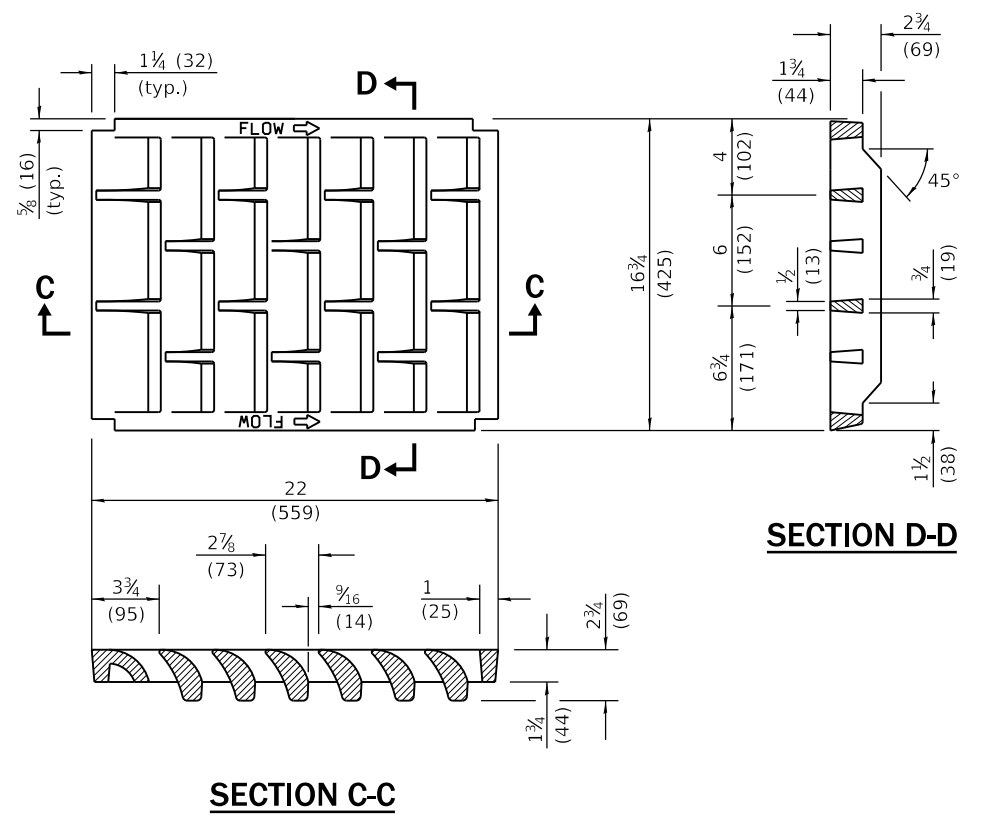
**STANDARD 604006-05**



**CAST FRAME**



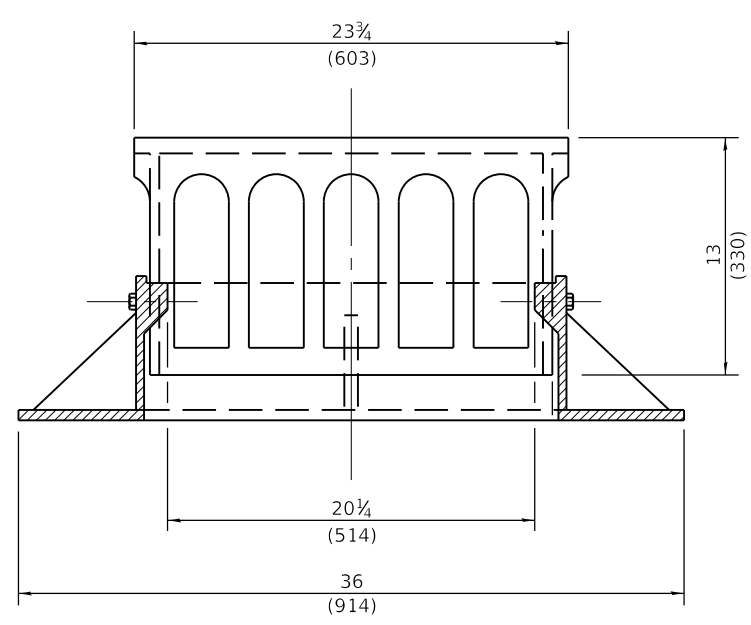
**SECTION B-B**



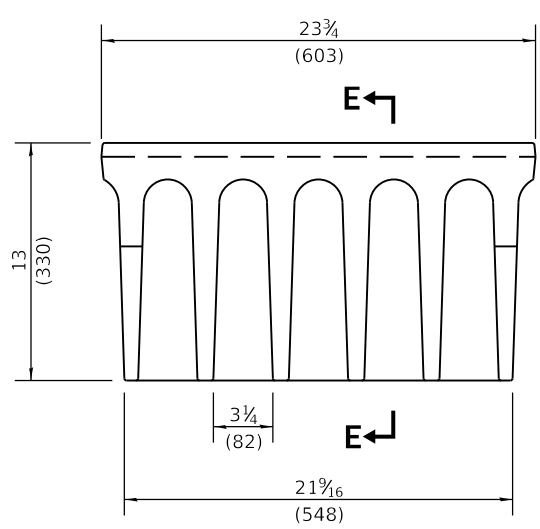
**SECTION C-C**

**SECTION D-D**

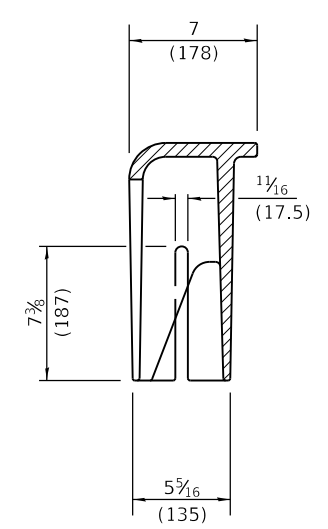
**CAST GRATE**



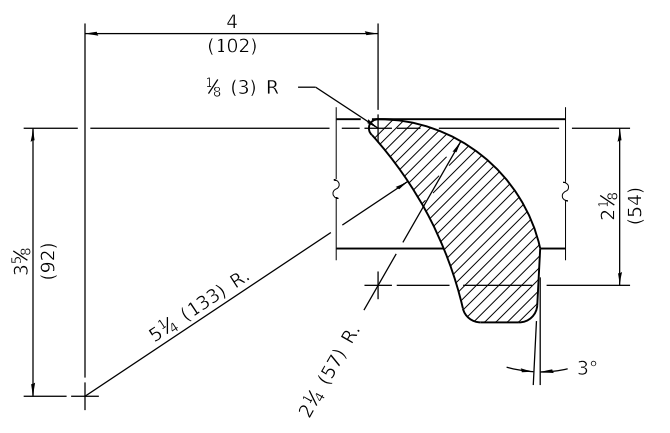
**SECTION A-A**



**ALTERNATE CURB BOX**



**SECTION E-E**



**VANE DETAIL**

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

Illinois Department of Transportation

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

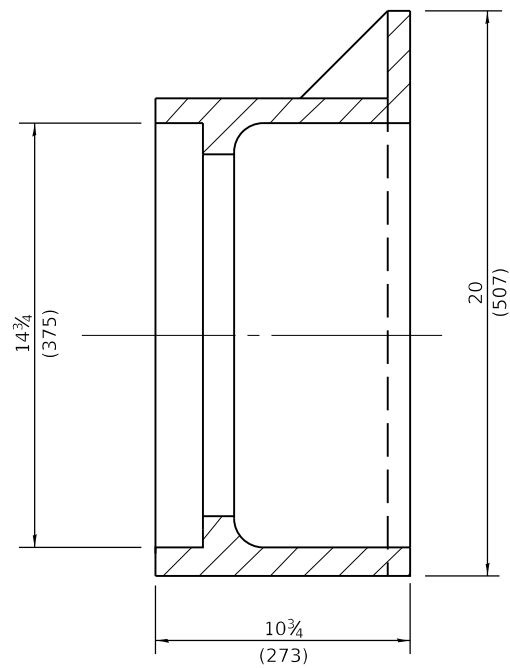
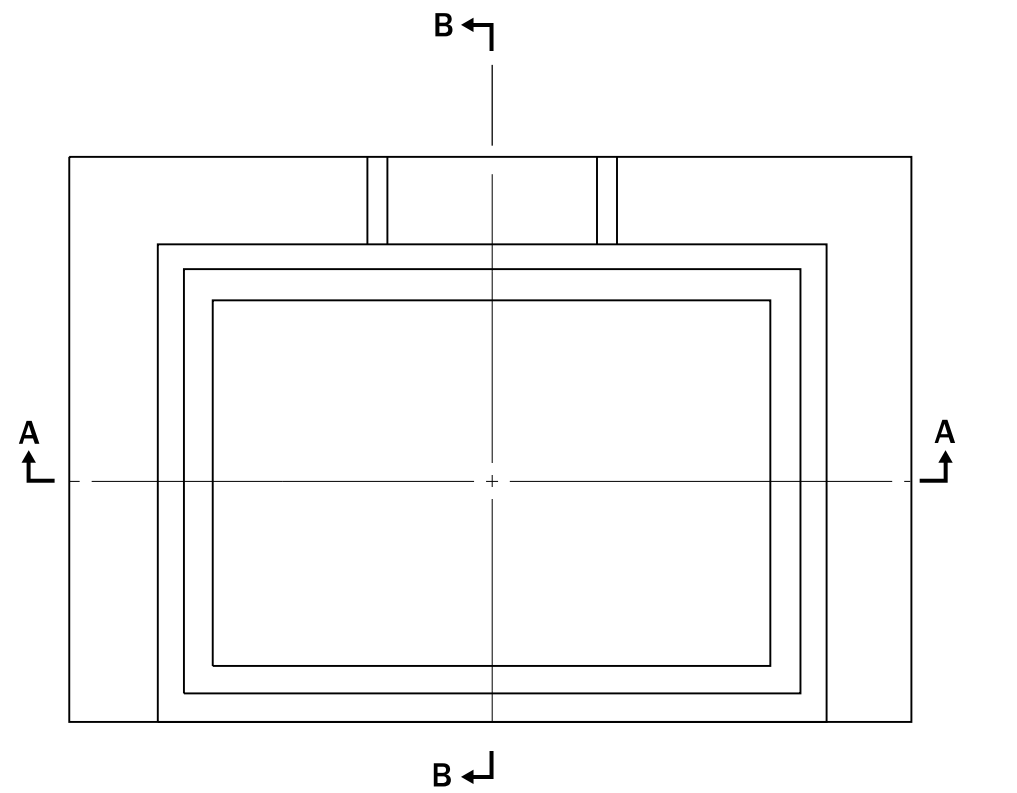
APPROVED January 1, 2015  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

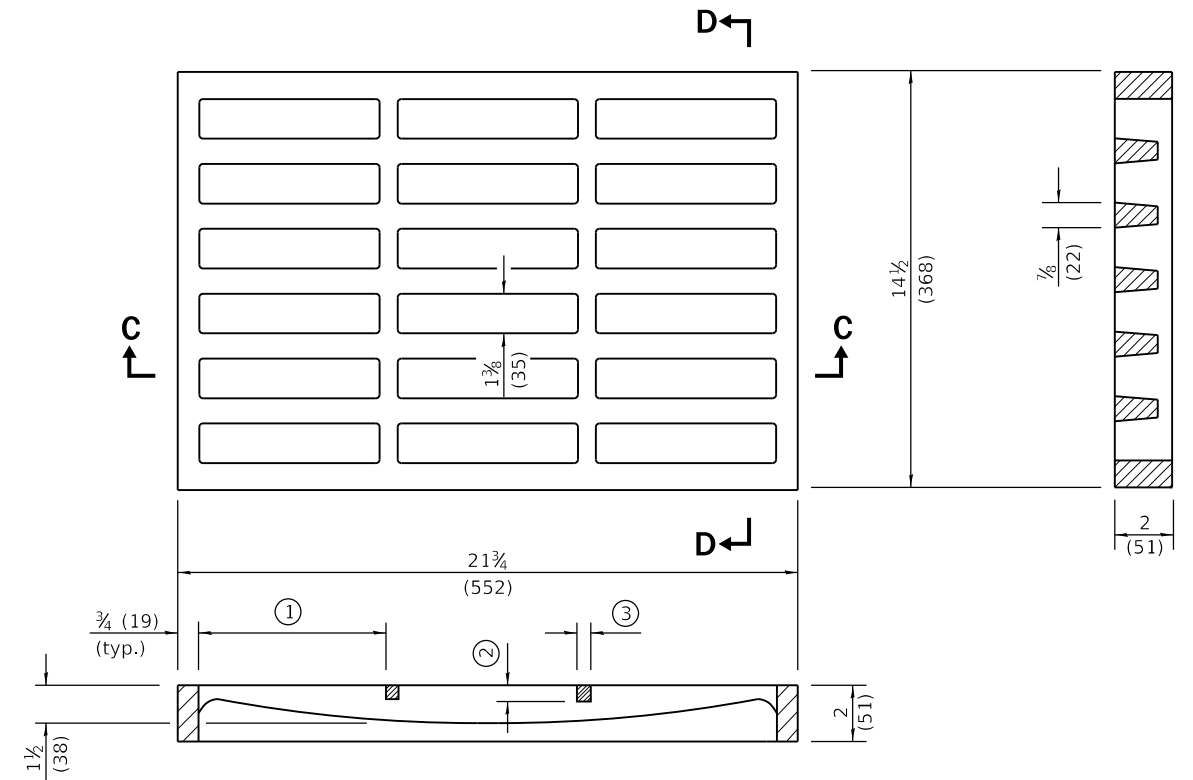
DATE	REVISIONS
1-1-15	Revised dimensions of frame and alternate curb box.
1-1-09	Switched units to English (metric).

**FRAME AND GRATE  
TYPE 3V**

**STANDARD 604011-05**



**SECTION B-B**

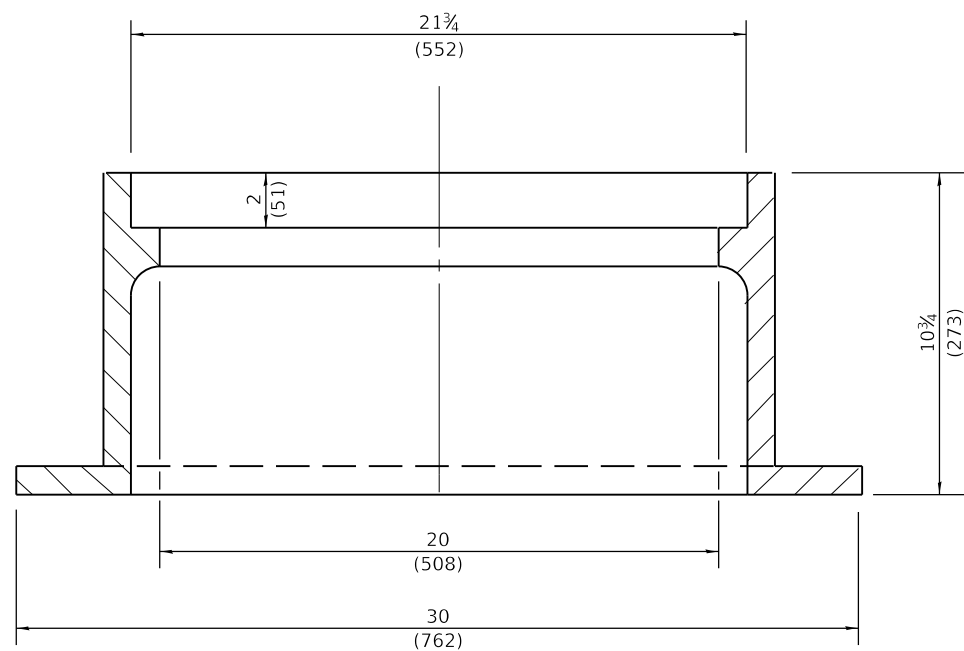


**SECTION C-C**

**SECTION D-D**

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

**CAST GRATE**



**SECTION A-A**

**CAST FRAME**

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

Illinois Department of Transportation

PASSED April 1, 2016

*Michael Beard*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED April 1, 2016

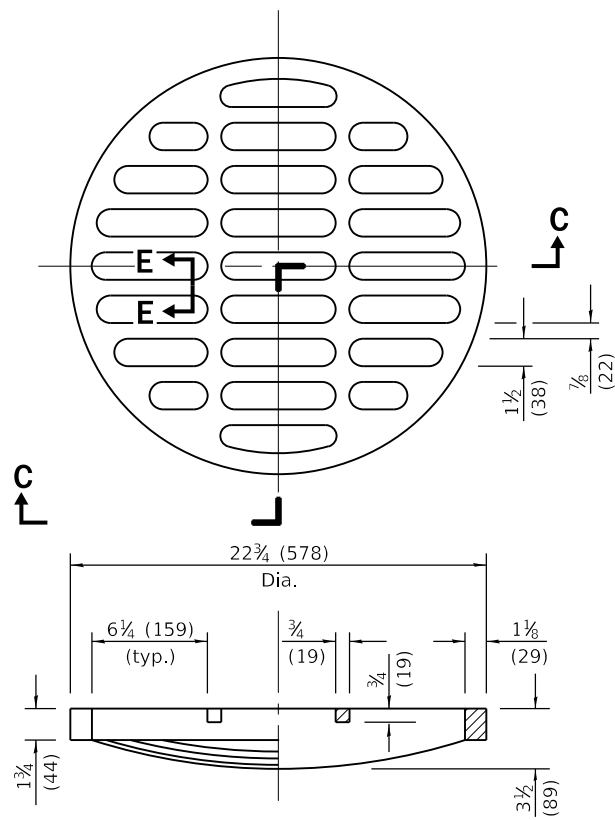
*[Signature]*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

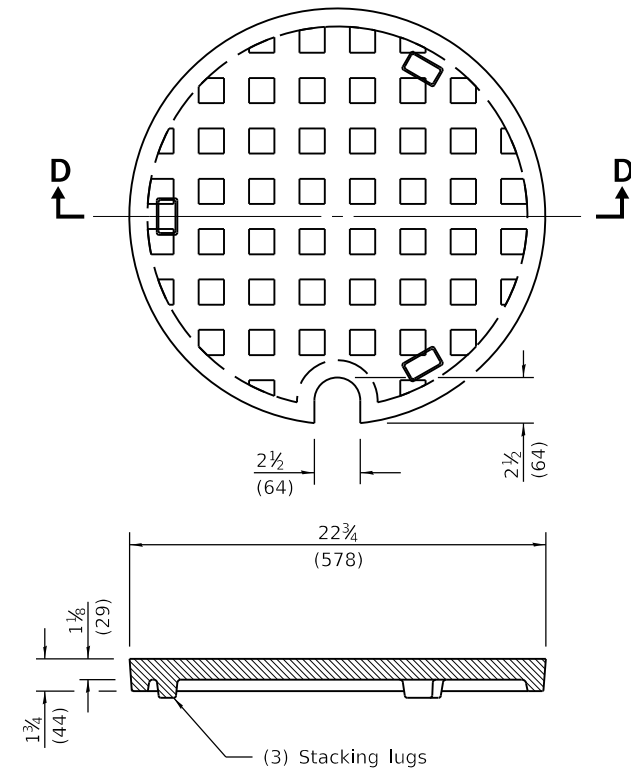
DATE	REVISIONS
4-1-16	Corrected dimension on SECTION A-A.
1-1-15	Revised dimensions of frame and grate.

**FRAME AND GRATE  
TYPE 4**

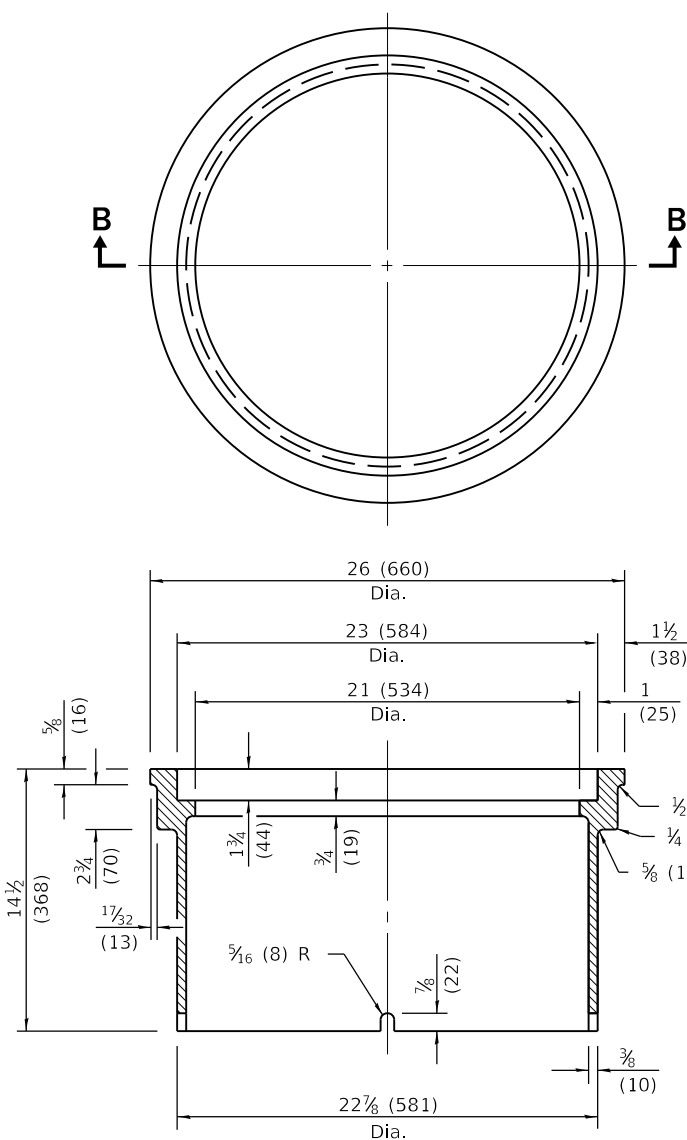
**STANDARD 604016-04**



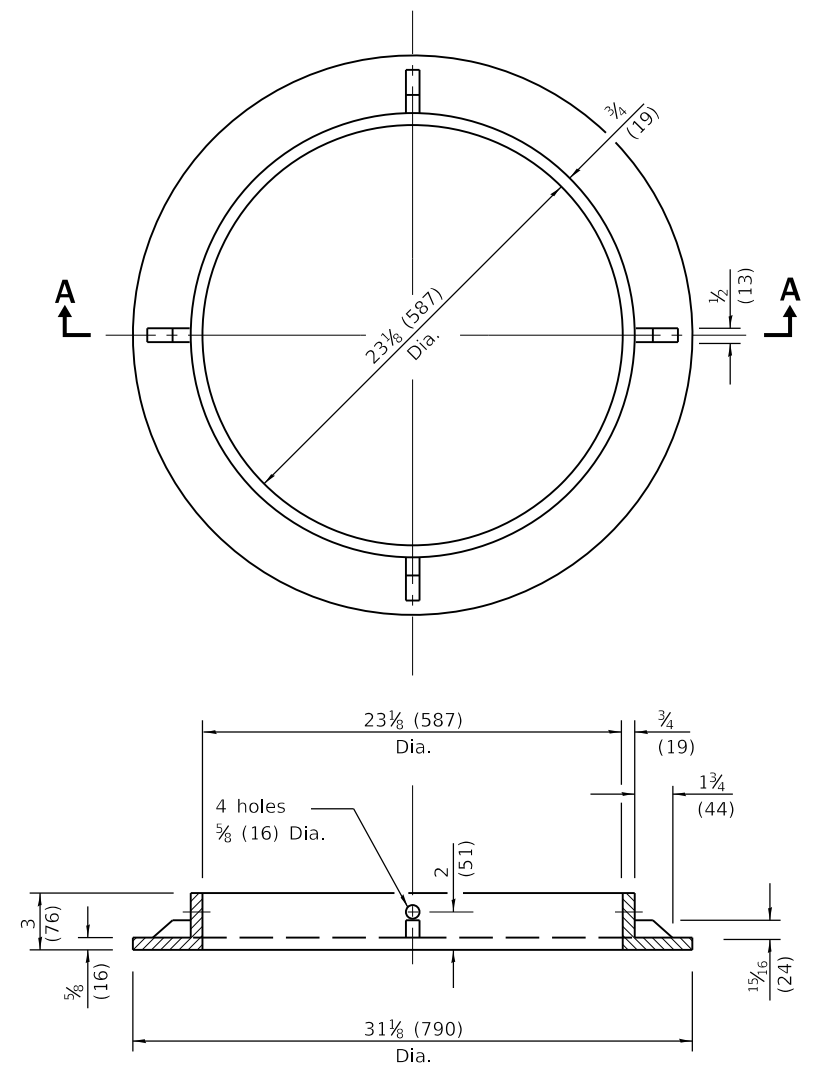
**SECTION C-C**  
**CAST OPEN LID**



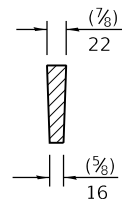
**SECTION D-D**  
**CAST CLOSED LID**  
Gray Iron



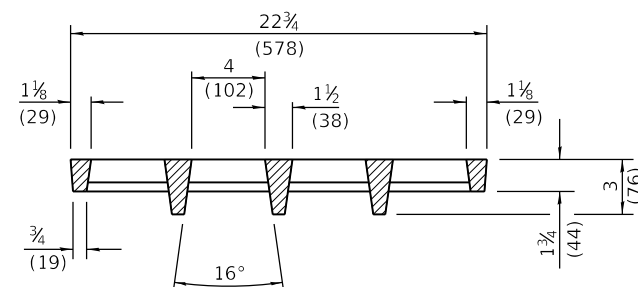
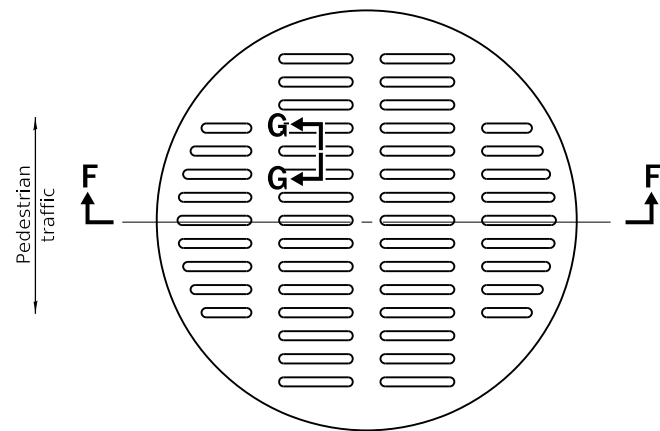
**SECTION B-B**  
**CAST FRAME**  
Gray Iron



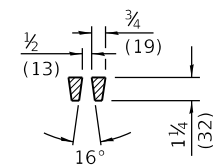
**SECTION A-A**  
**CAST BASE**  
Gray Iron



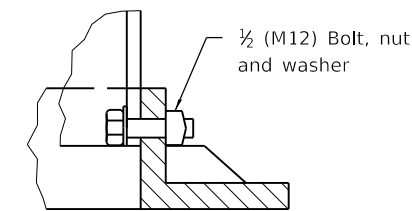
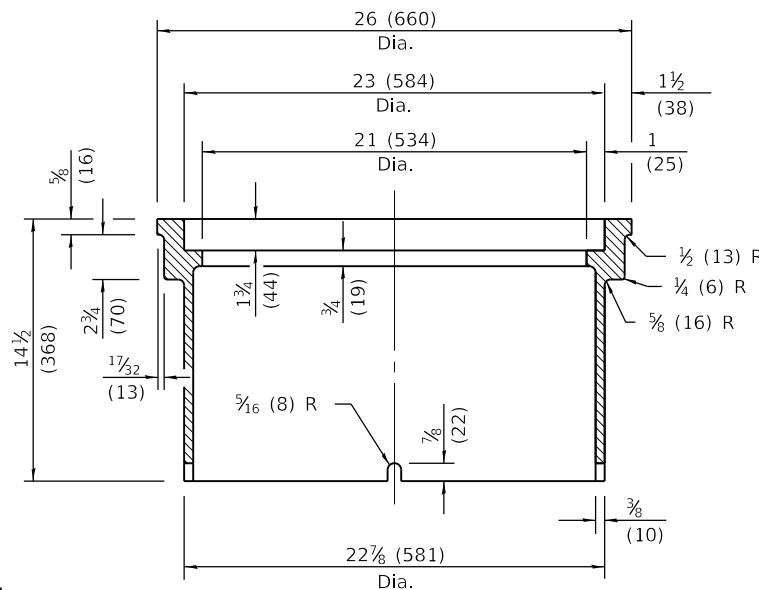
**SECTION E-E**



**SECTION F-F**  
**ADA COMPLIANT**  
**CAST OPEN LID**



**SECTION G-G**



**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.

DATE	REVISIONS
1-1-20	Revised dimension location in Section A-A.
1-1-15	Added ADA compliant open lid.
1-1-09	Switched units to English (metric).

**BASE, FRAME AND LIDS TYPE 5**

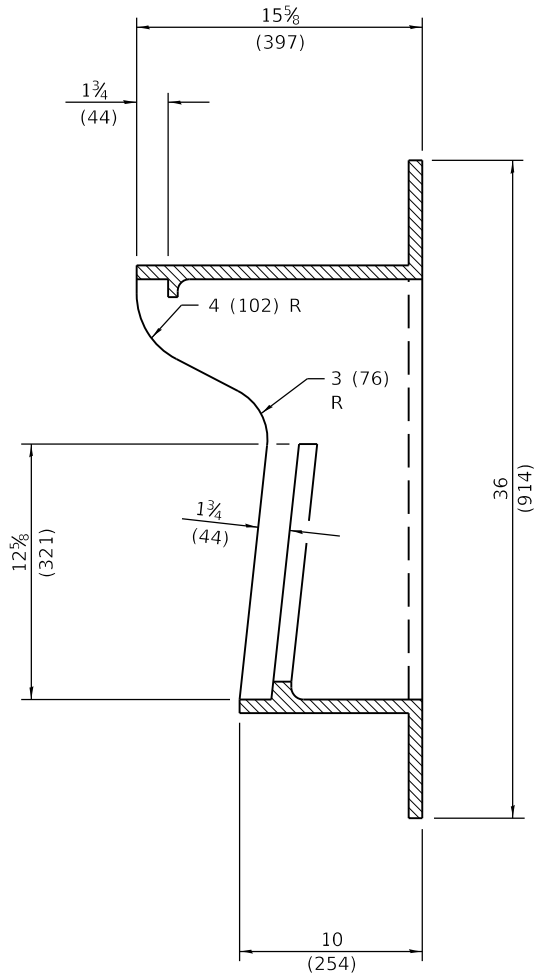
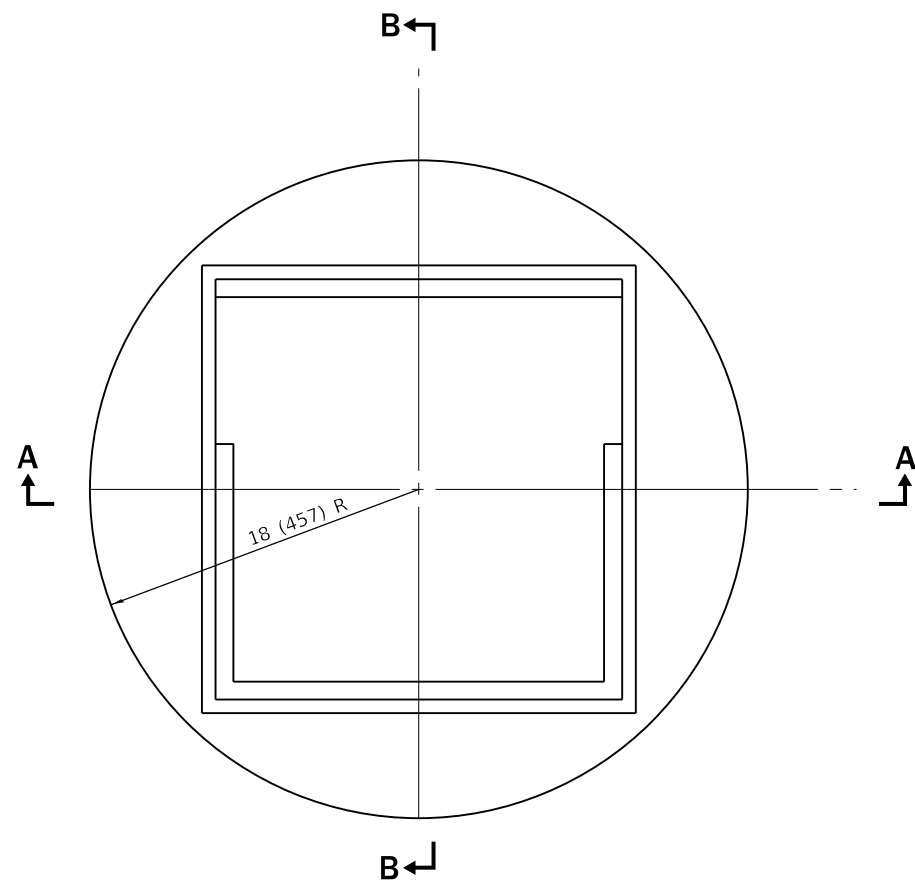
**STANDARD 604021-04**

Illinois Department of Transportation

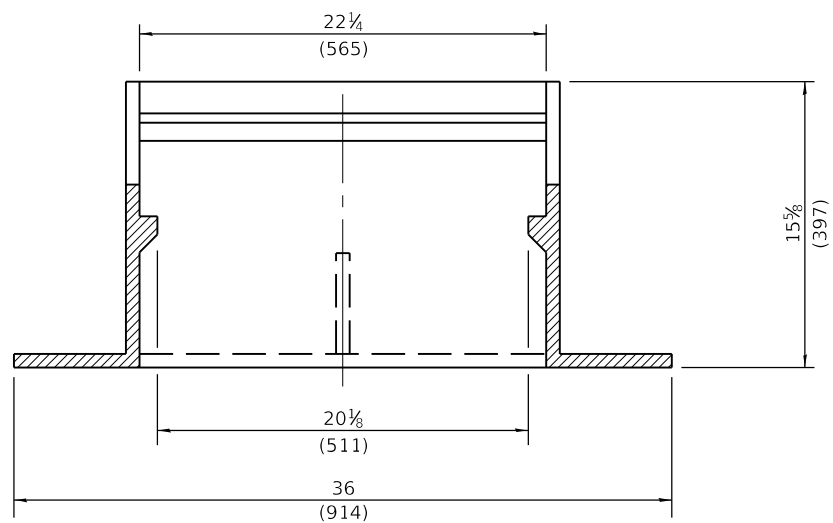
PASSED January 1, 2020  
*Michael Bond*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2020  
*J. S. Ch. E. G.*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-20  
46-T-1

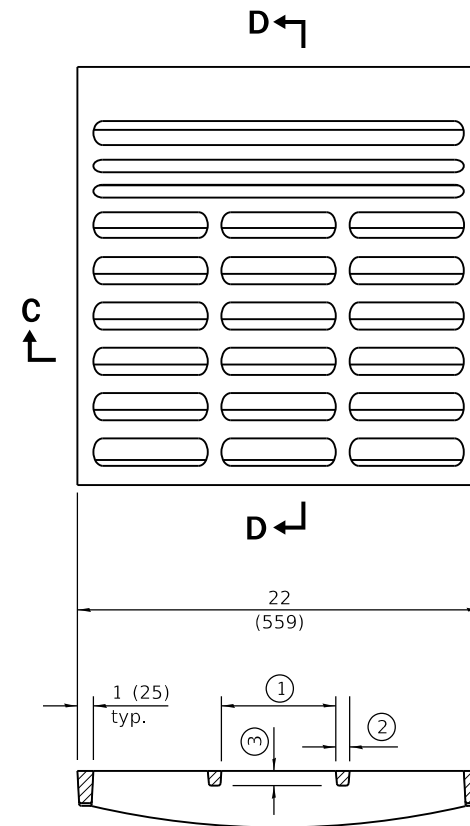


**SECTION B-B**



**SECTION A-A**

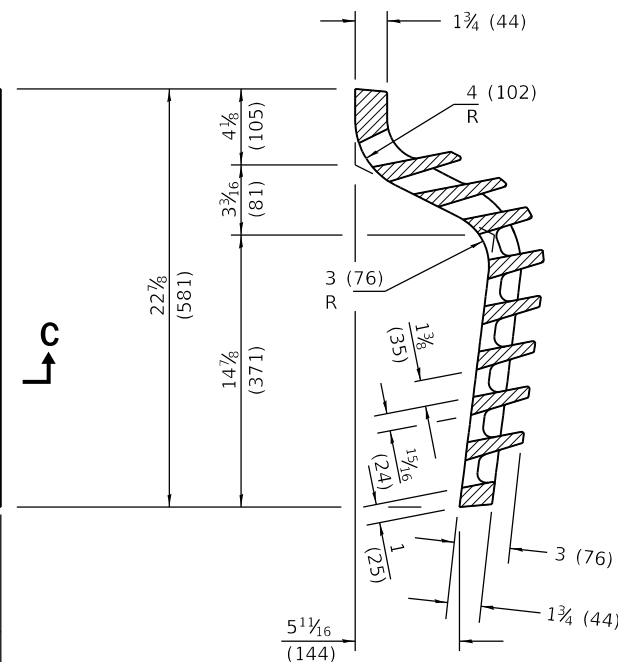
**CAST FRAME**



**SECTION C-C**

- ① = 6 1/4 (159) max. (typ.)
- ② = 3/4 (19) min. (typ.)
- ③ = 3/16 (21) min. (typ.)

**CAST GRATE**



**SECTION D-D**

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

Illinois Department of Transportation

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

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

ISSUED 1-1-97

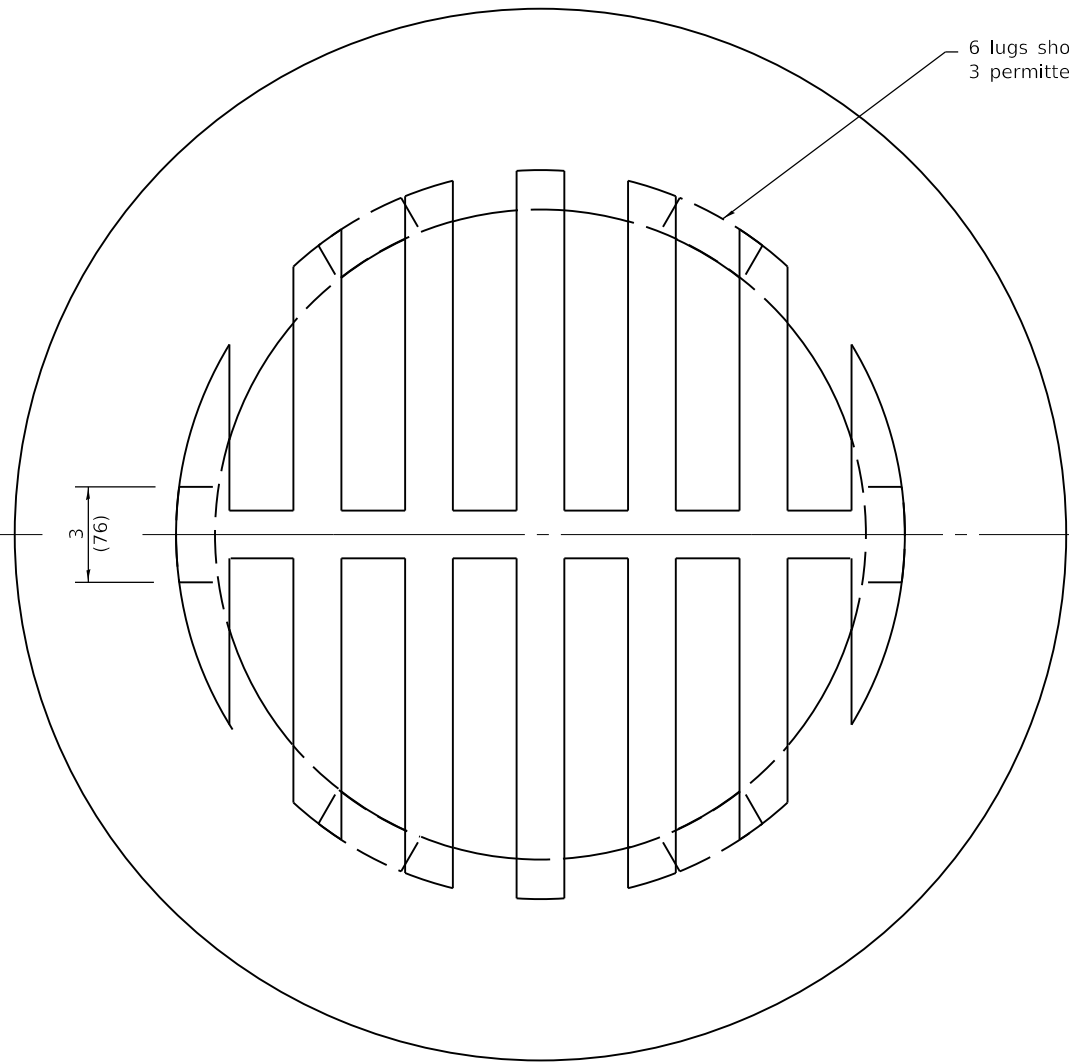
DATE	REVISIONS
1-1-15	Revised dimensions of frame and grate.
1-1-09	Switched units to English (metric).

**FRAME AND GRATE  
TYPE 6**

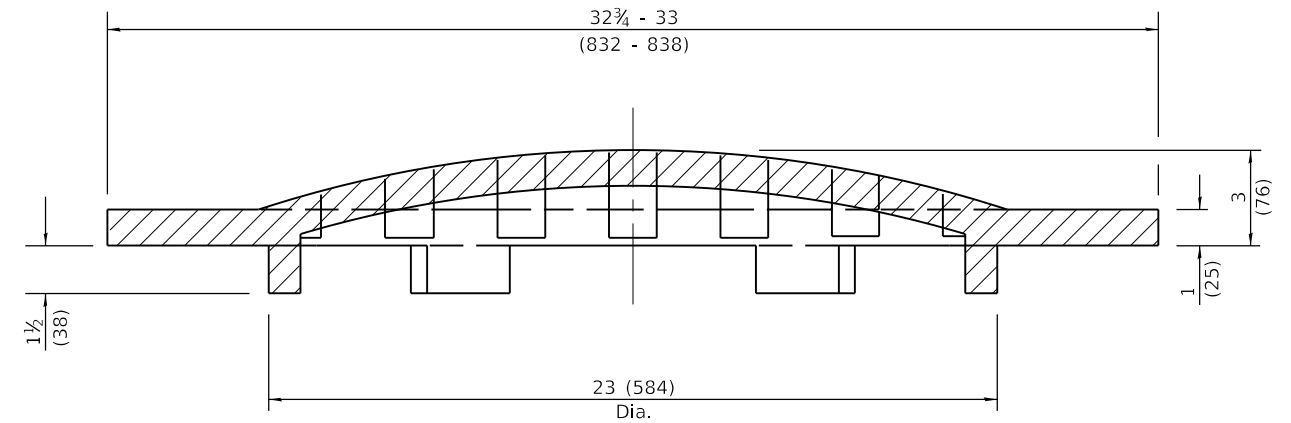
**STANDARD 604026-03**







6 lugs shown,  
3 permitted.



**SECTION A-A**

**CAST GRATE**

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

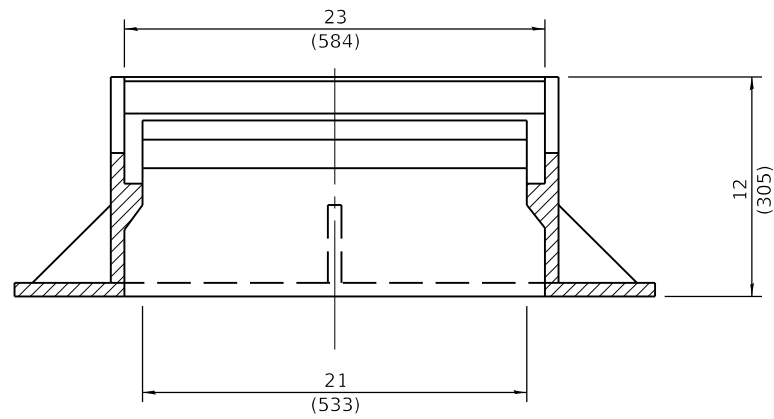
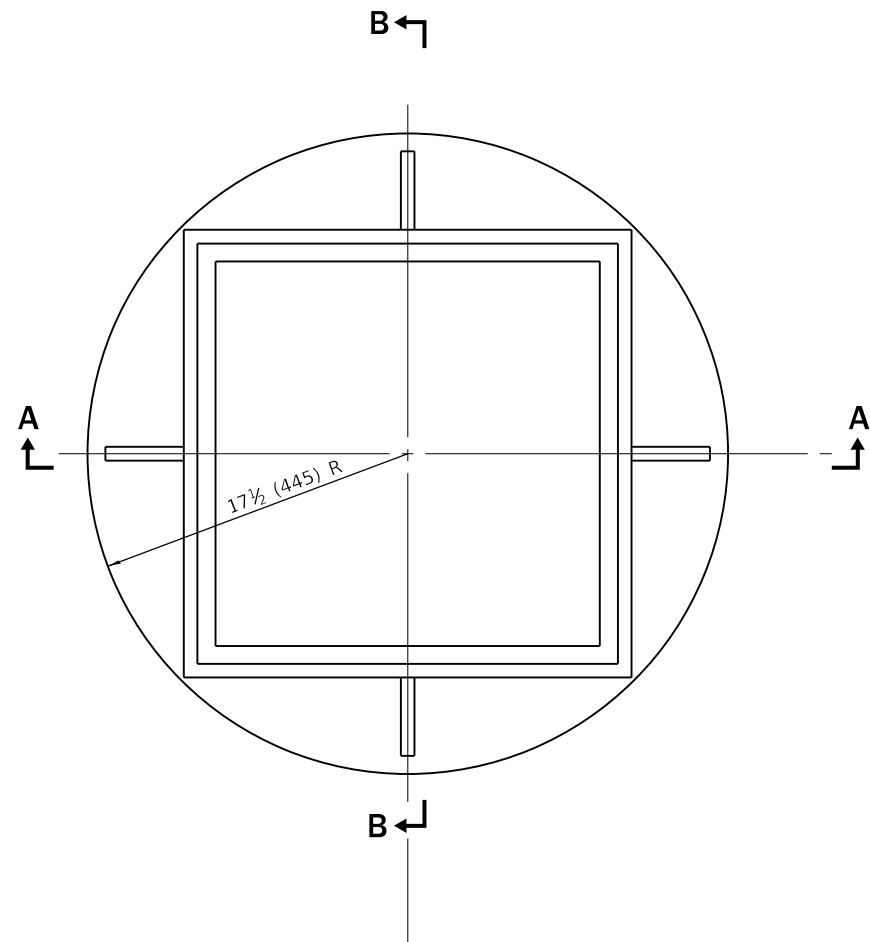
 Illinois Department of Transportation  
 PASSED January 1, 2015  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES  
 APPROVED January 1, 2015  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

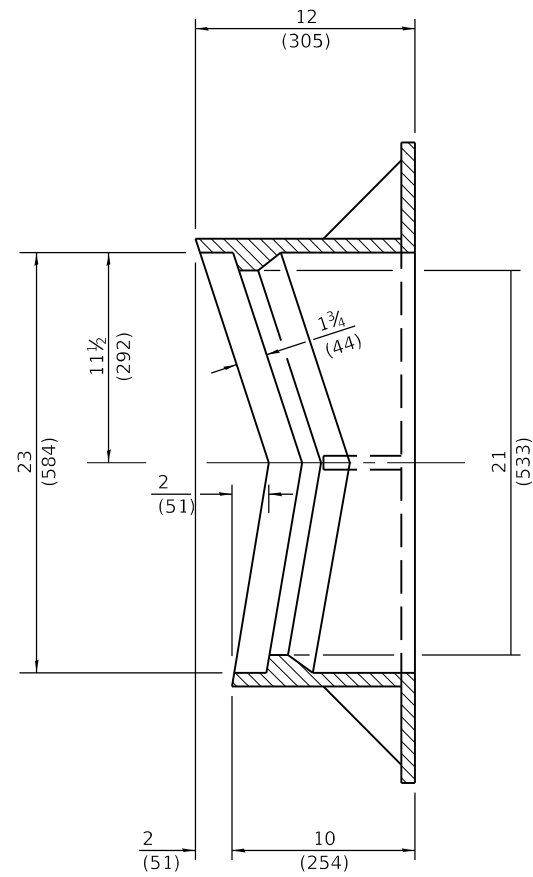
**GRATE TYPE 8**

**STANDARD 604036-03**

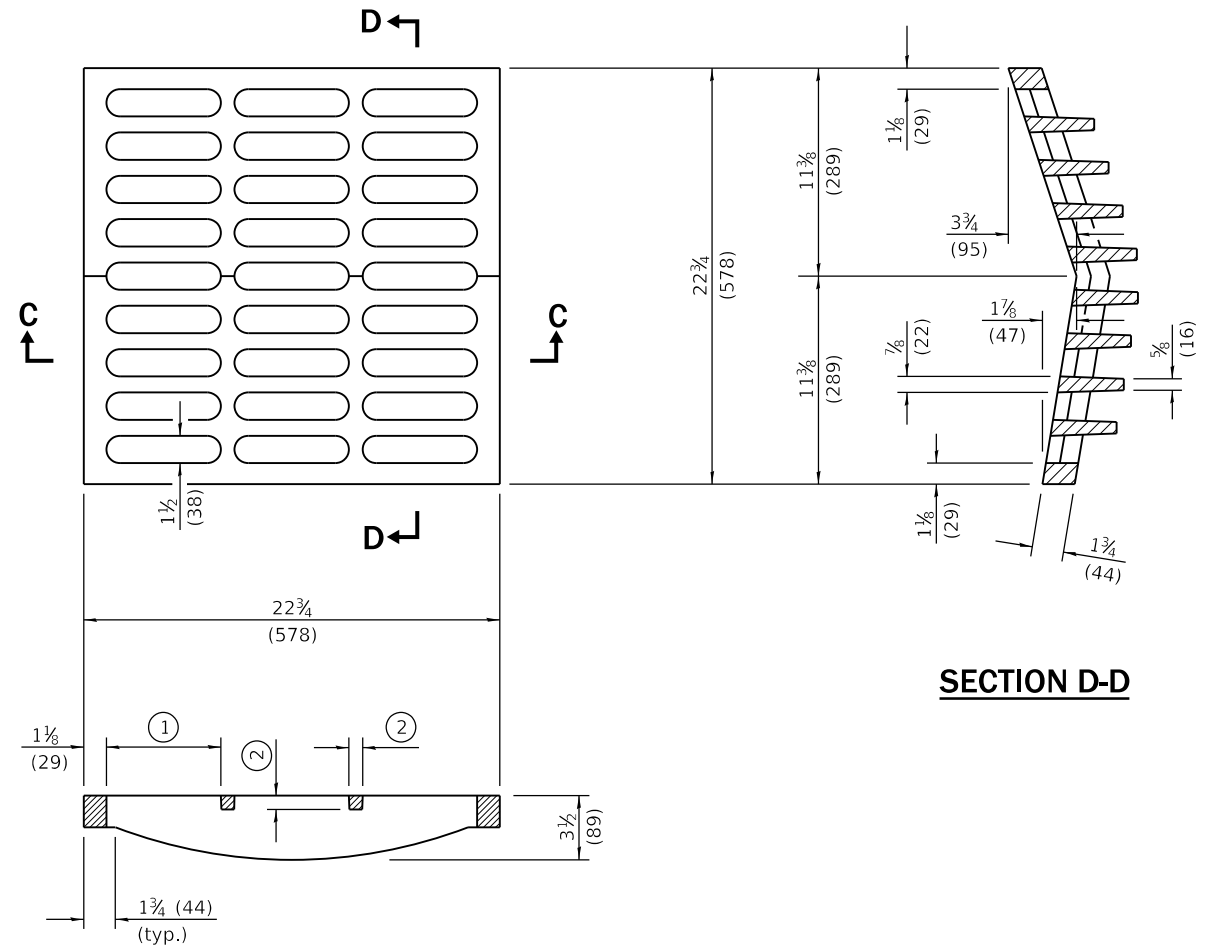


**SECTION A-A**

**CAST FRAME**



**SECTION B-B**



**SECTION D-D**

**SECTION C-C**

- ① = 6 1/4 (159) max. (typ.)
- ② = 3/4 (19) min. (typ.)

**CAST GRATE**

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

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

**FRAME AND GRATE  
TYPE 9**

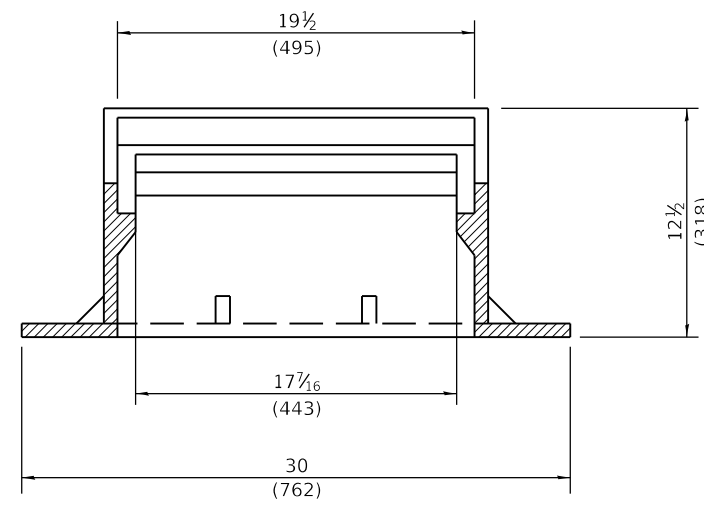
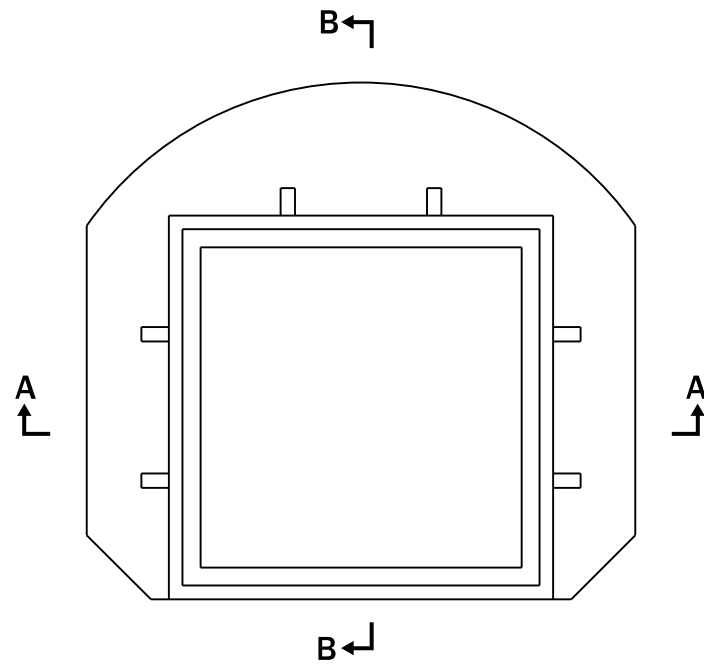
**STANDARD 604041-03**

Illinois Department of Transportation

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

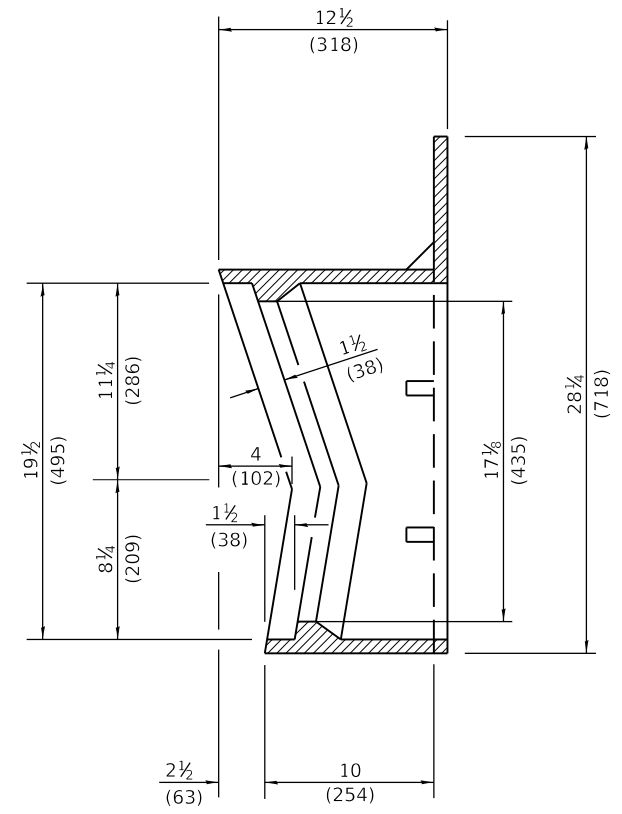
APPROVED January 1, 2015  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

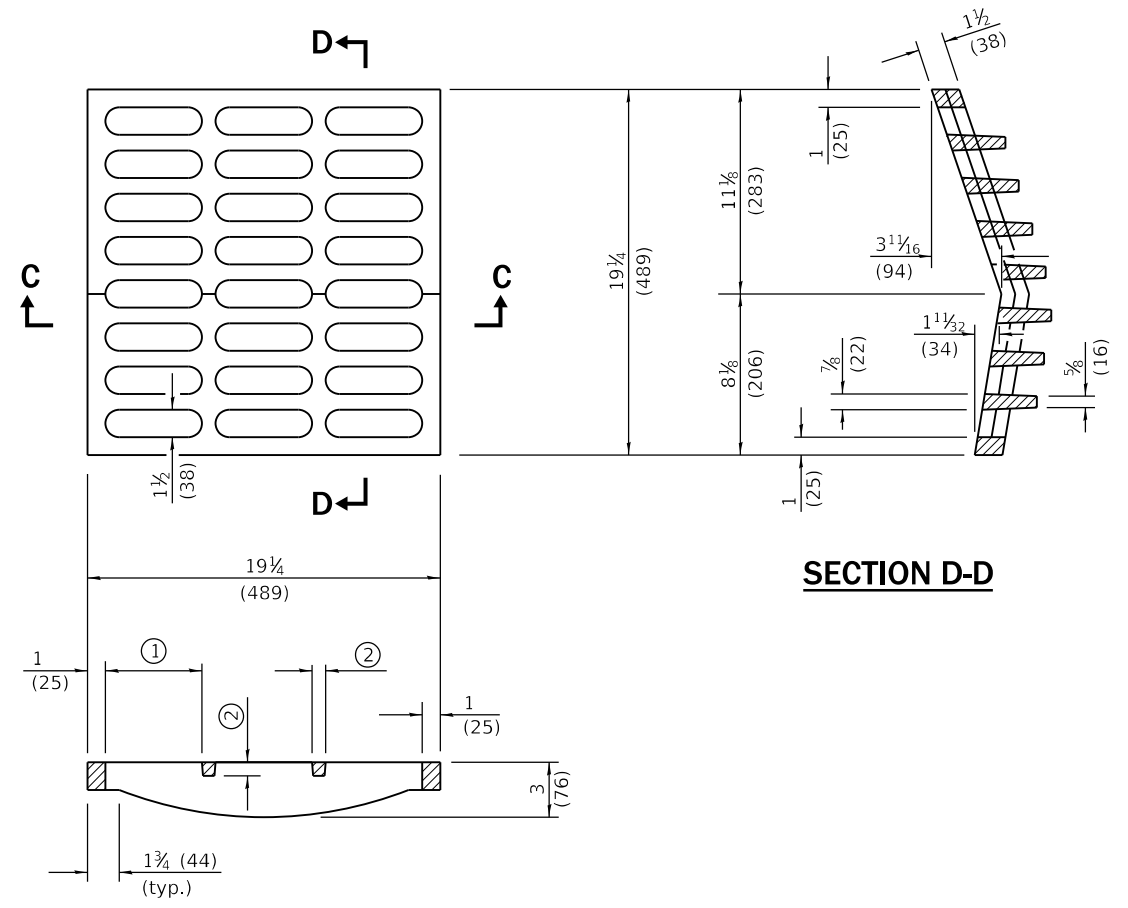


**SECTION A-A**

**CAST FRAME**



**SECTION B-B**



**SECTION D-D**

**SECTION C-C**

- ① = 6 1/4 (159) max. (typ.)
- ② = 3/4 (19) min. (typ.)

**CAST GRATE**

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

Illinois Department of Transportation

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

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

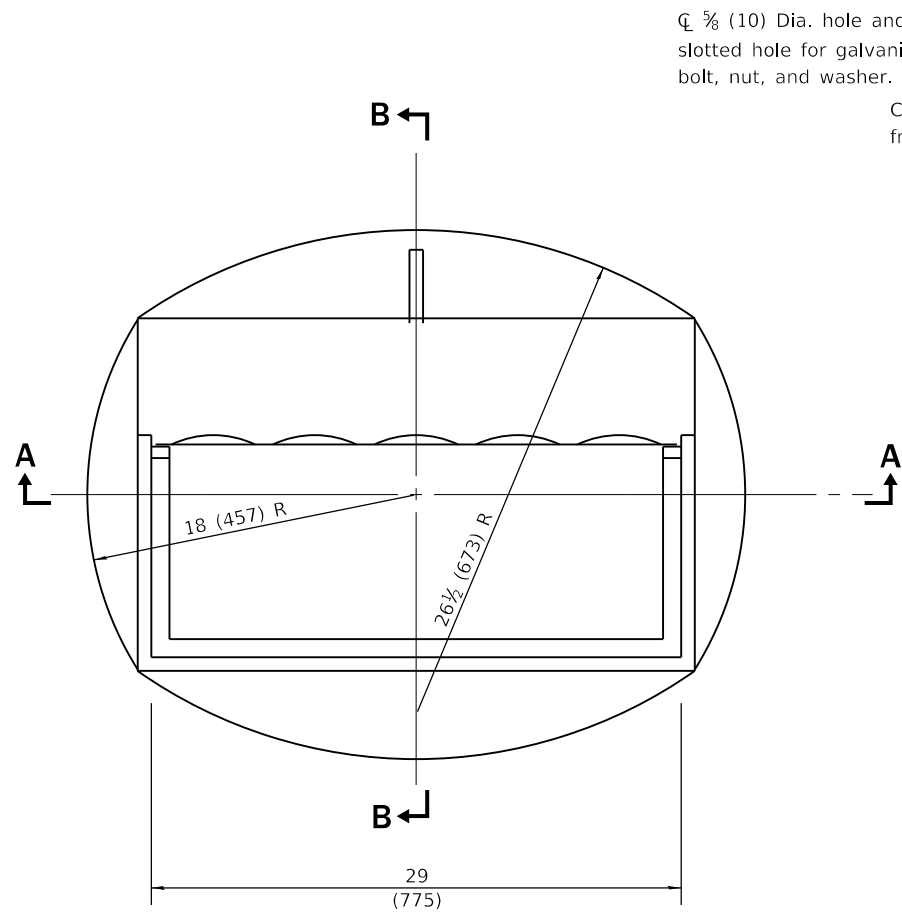
ISSUED 1-1-97

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

**FRAME AND GRATE  
TYPE 10**

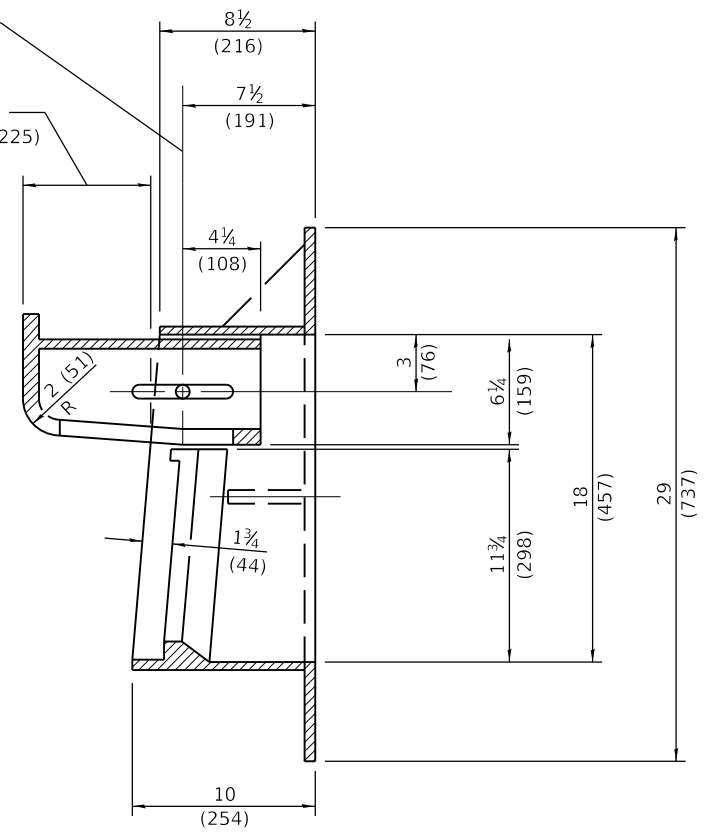
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**STANDARD 604046-03**

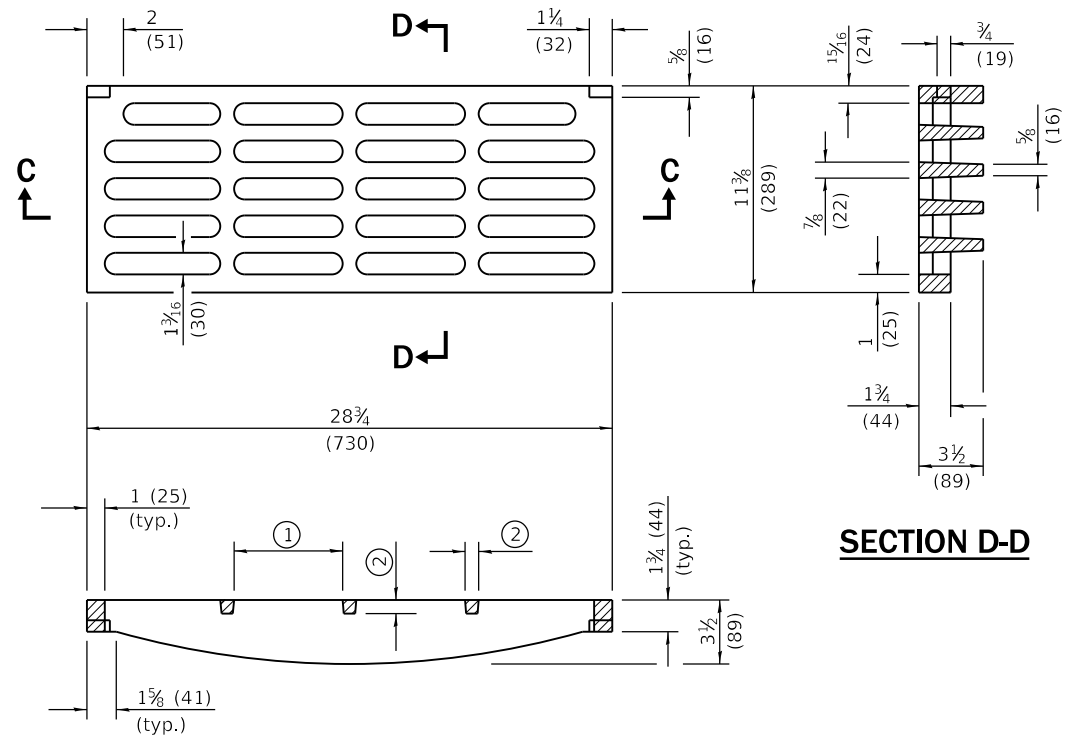


**CAST FRAME**

Ø 3/8 (10) Dia. hole and 3/8x5 1/2 (16x140) slotted hole for galvanized 1/2 (M12) bolt, nut, and washer.  
Curb box adjustable from 4 1/2 (115) to 9 (225)



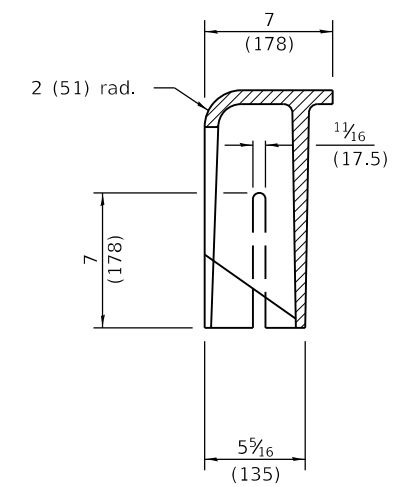
**SECTION B-B**



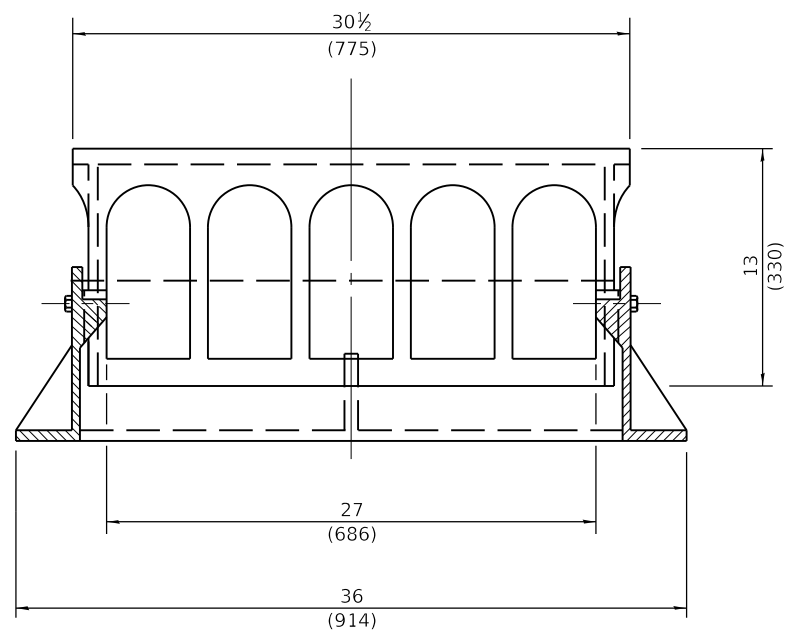
**SECTION C-C**

- ① = 6 1/4 (159) max. (typ.)
- ② = 3/4 (19) min. (typ.)

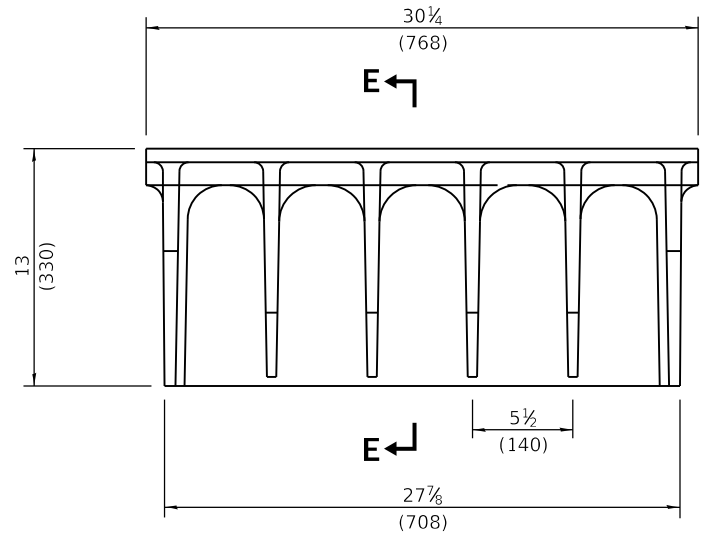
**CAST GRATE**



**SECTION E-E**



**SECTION A-A**



**ALTERNATE CURB BOX**

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

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**

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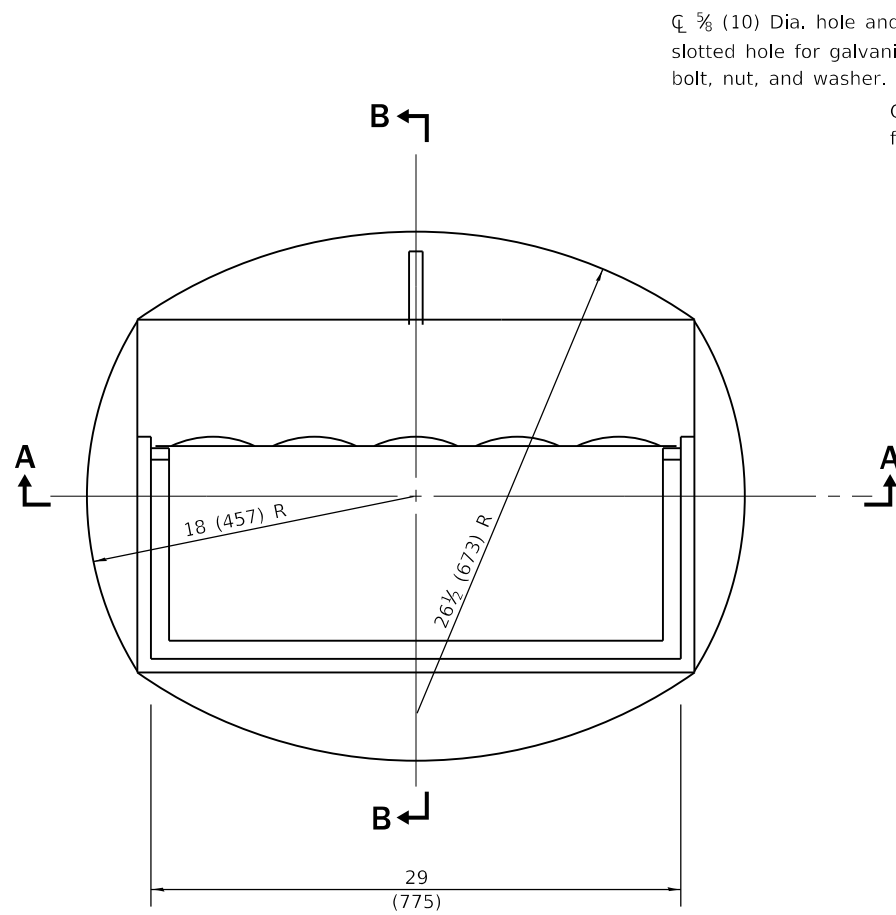
**STANDARD 604051-04**

Illinois Department of Transportation

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

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

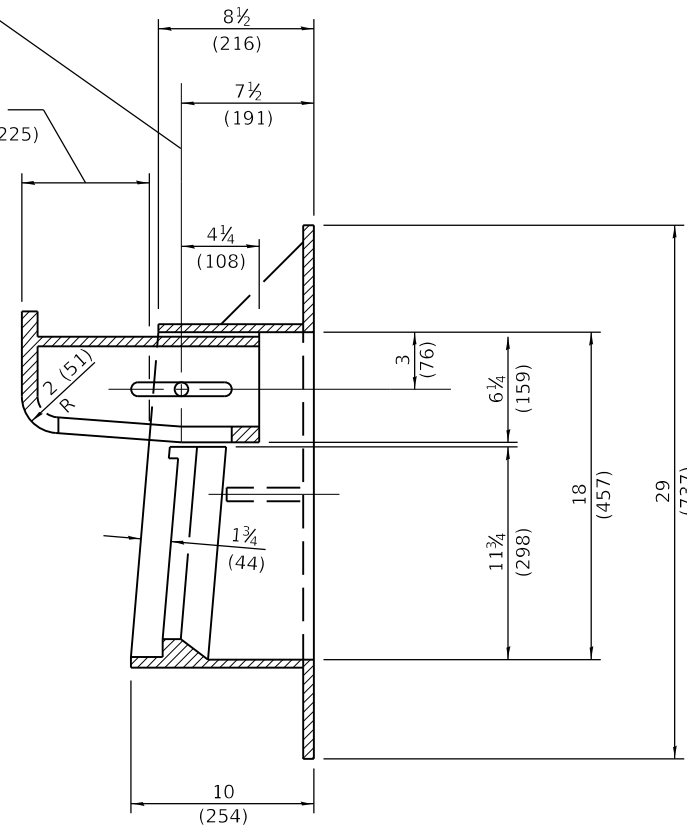
ISSUED 1-1-97



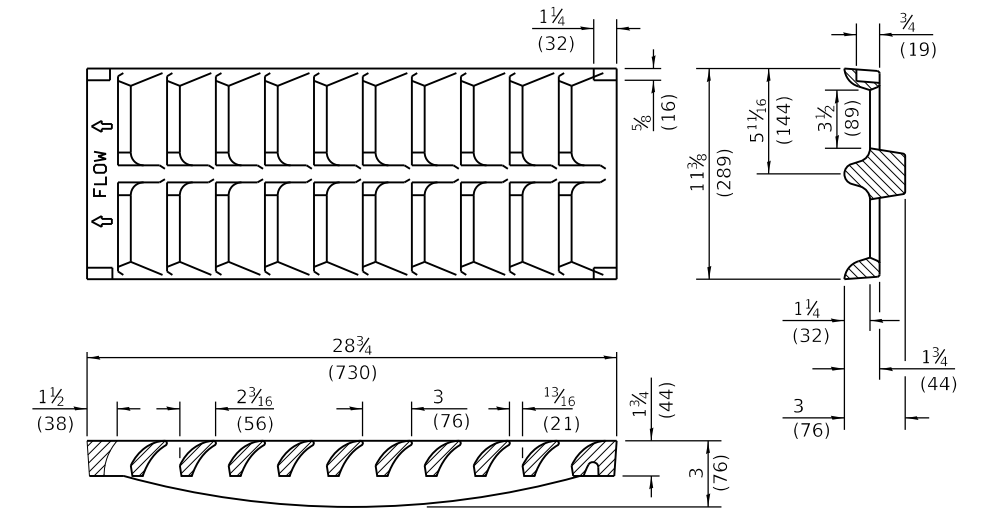
**CAST FRAME**

⌀ 5/8 (10) Dia. hole and 5/8x5 1/2 (16x140) slotted hole for galvanized 1/2 (M12) bolt, nut, and washer.

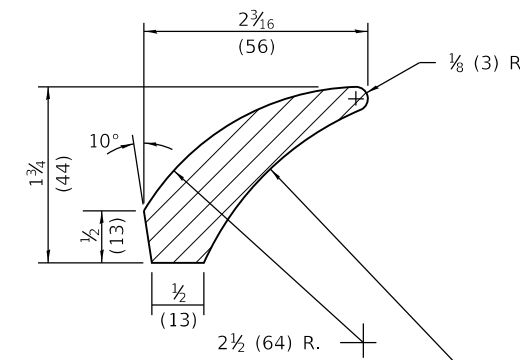
Curb box adjustable from 4 1/2 (115) to 9 (225)



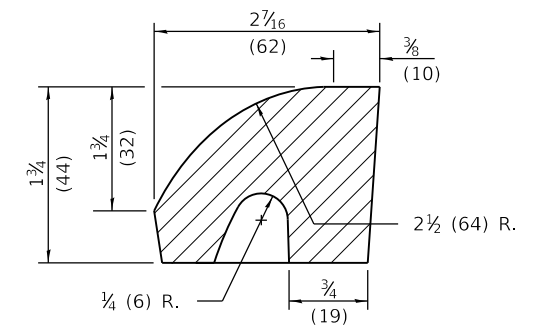
**SECTION B-B**



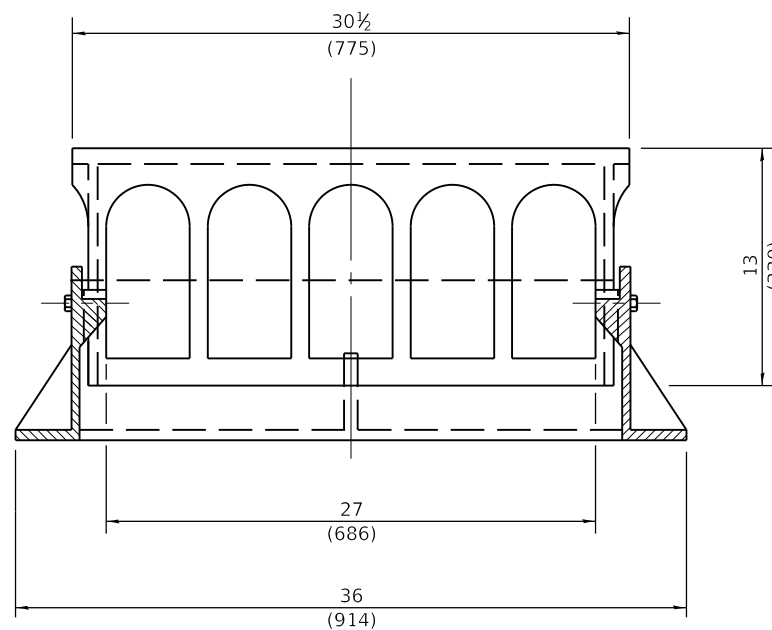
**CAST GRATE**



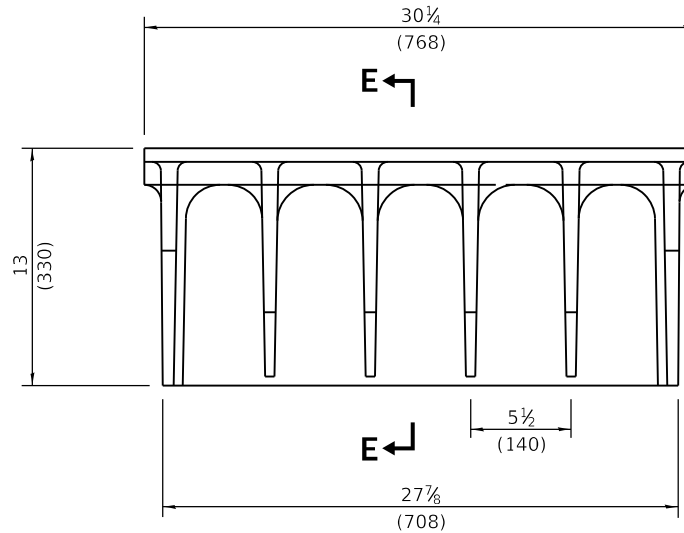
**VANE DETAIL**



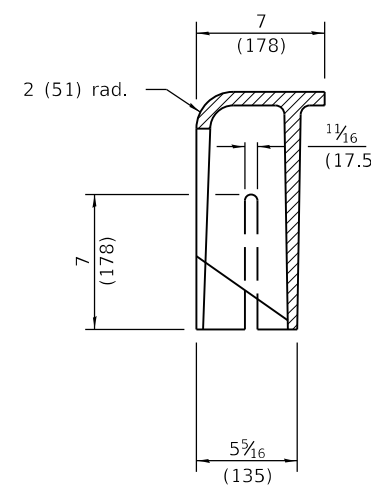
**FRONT VANE DETAIL**



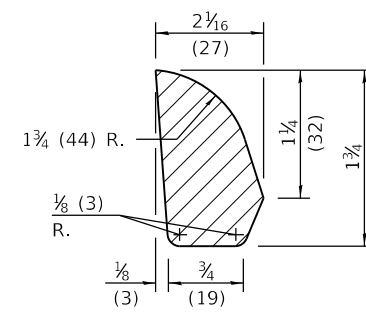
**SECTION A-A**



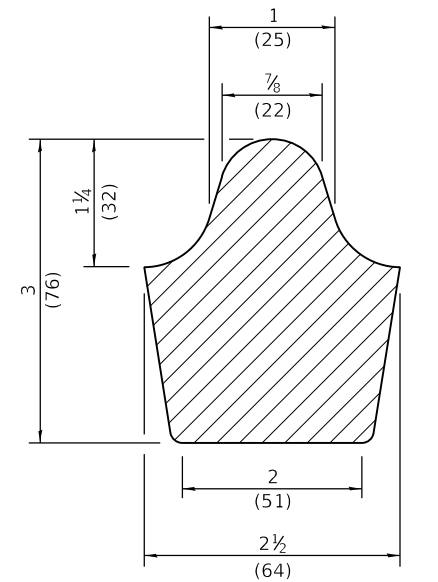
**ALTERNATE CURB BOX**



**SECTION E-E**



**SIDE RIB DETAIL**



**MIDDLE RIB DETAIL**

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

Illinois Department of Transportation

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

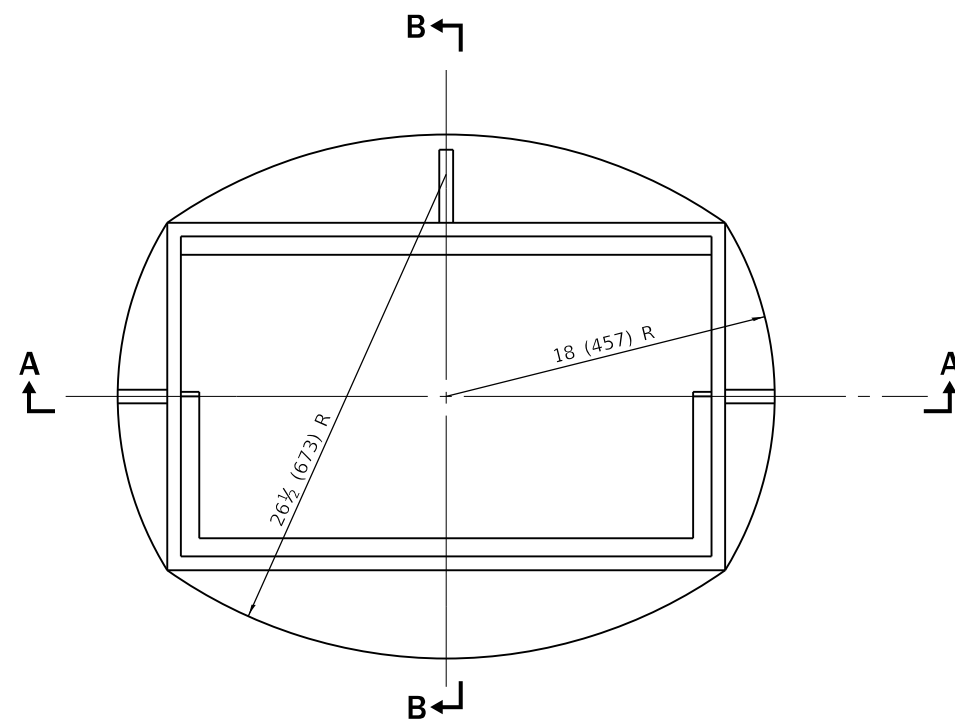
APPROVED January 1, 2015  
*[Signature]*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

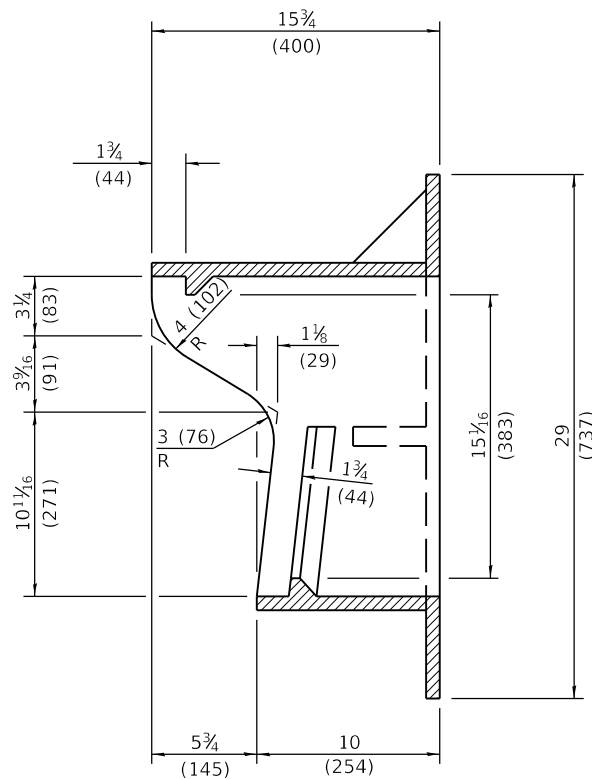
DATE	REVISIONS
1-1-15	Revised dimensions of frame and alternate curb box.
1-1-09	Switched units to English (metric).

**FRAME AND GRATE  
TYPE 11V**

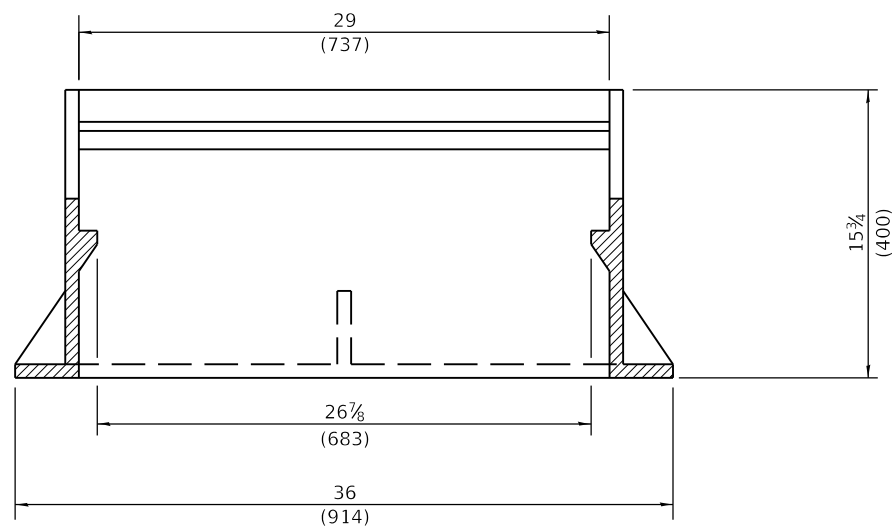
**STANDARD 604056-04**



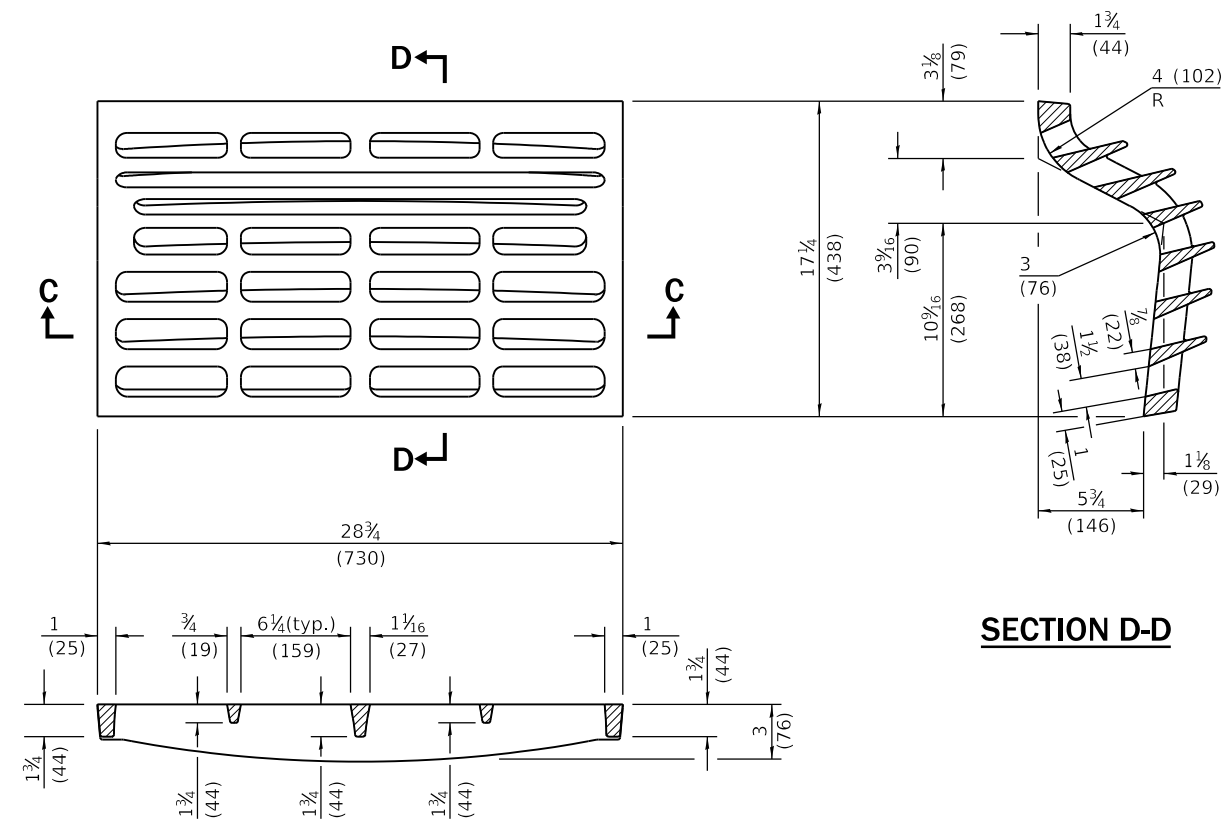
**SECTION A-A**



**SECTION B-B**



**CAST FRAME**



**SECTION C-C**

**SECTION D-D**

**CAST GRATE**

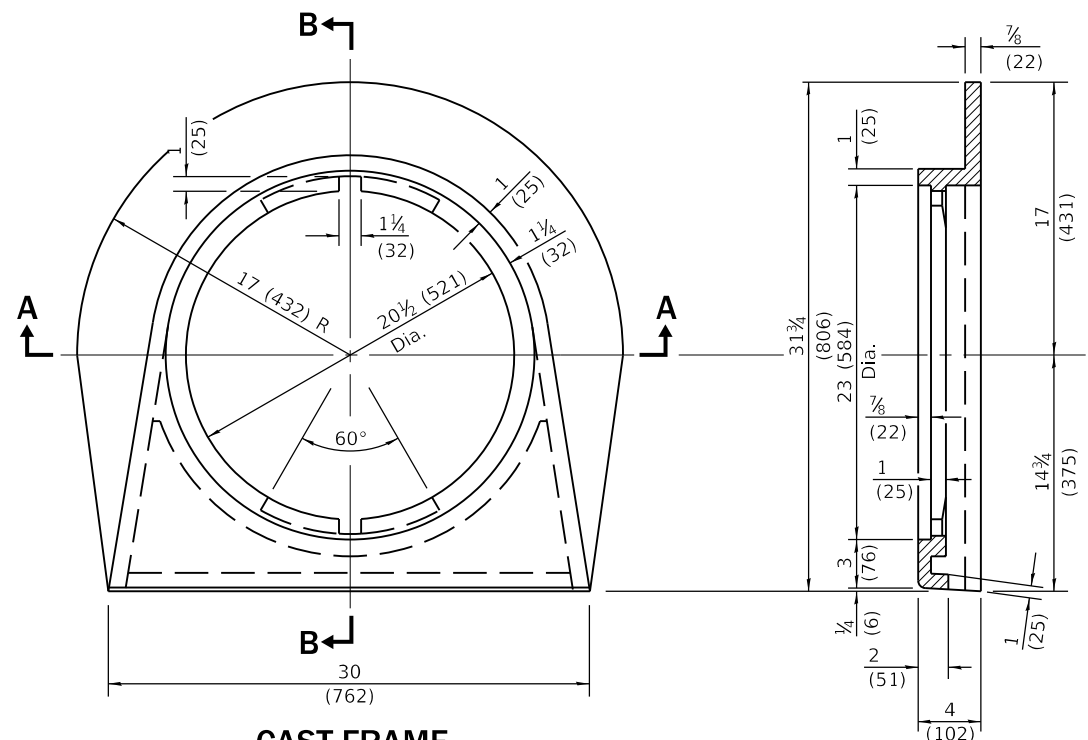
All dimensions are in inches (millimeters) unless otherwise shown.

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

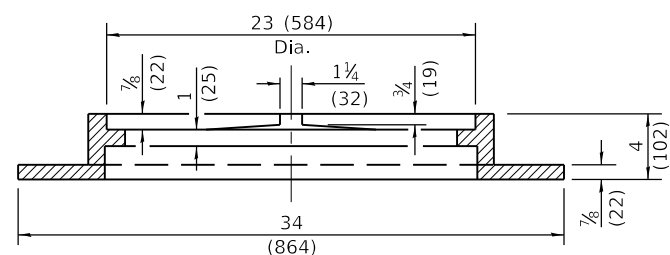
**FRAME AND GRATE  
TYPE 12**

**STANDARD 604061-03**

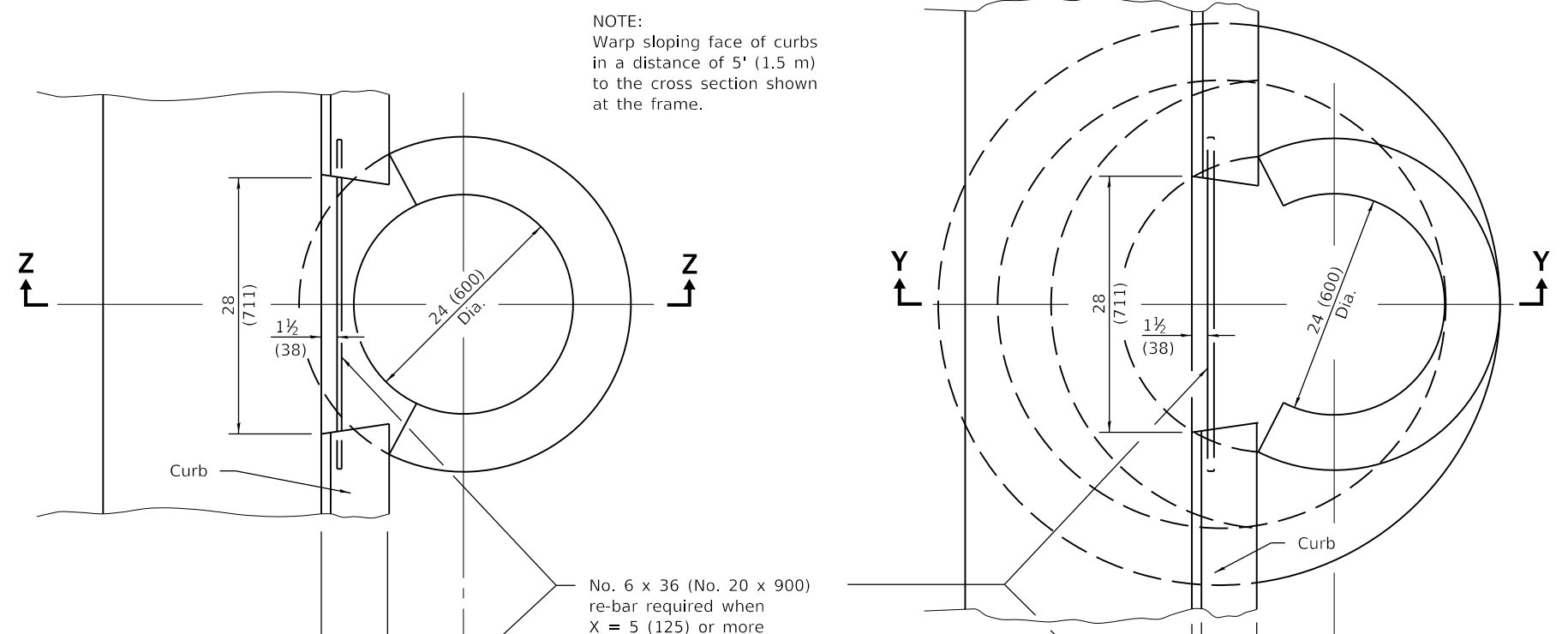


**CAST FRAME**  
(GRAY IRON)

**SECTION B-B**



**SECTION A-A**



**SECTION Z-Z**  
(WITH FRAME)

**SECTION Y-Y**  
(WITH FRAME)

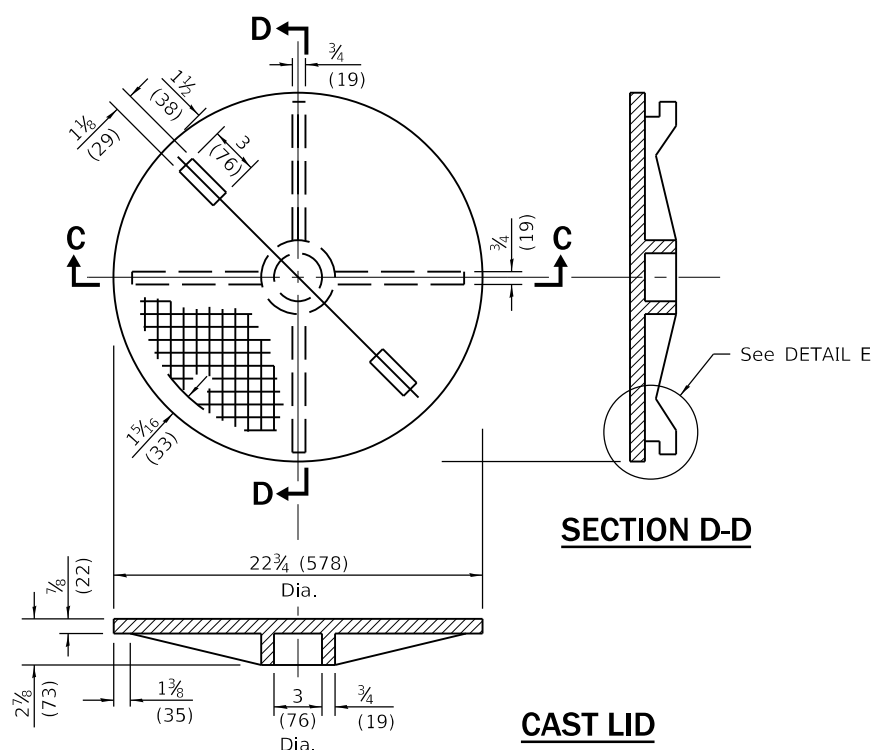
**CASE II**

**CASE I**

Slope pavement or gutter flag 12% at inlet.

Slope pavement or gutter flag 12% at inlet.

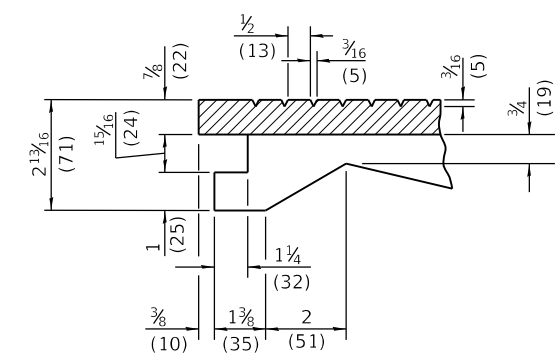
No. 6 x 36 (No. 20 x 900) re-bar required when X = 5 (125) or more



**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

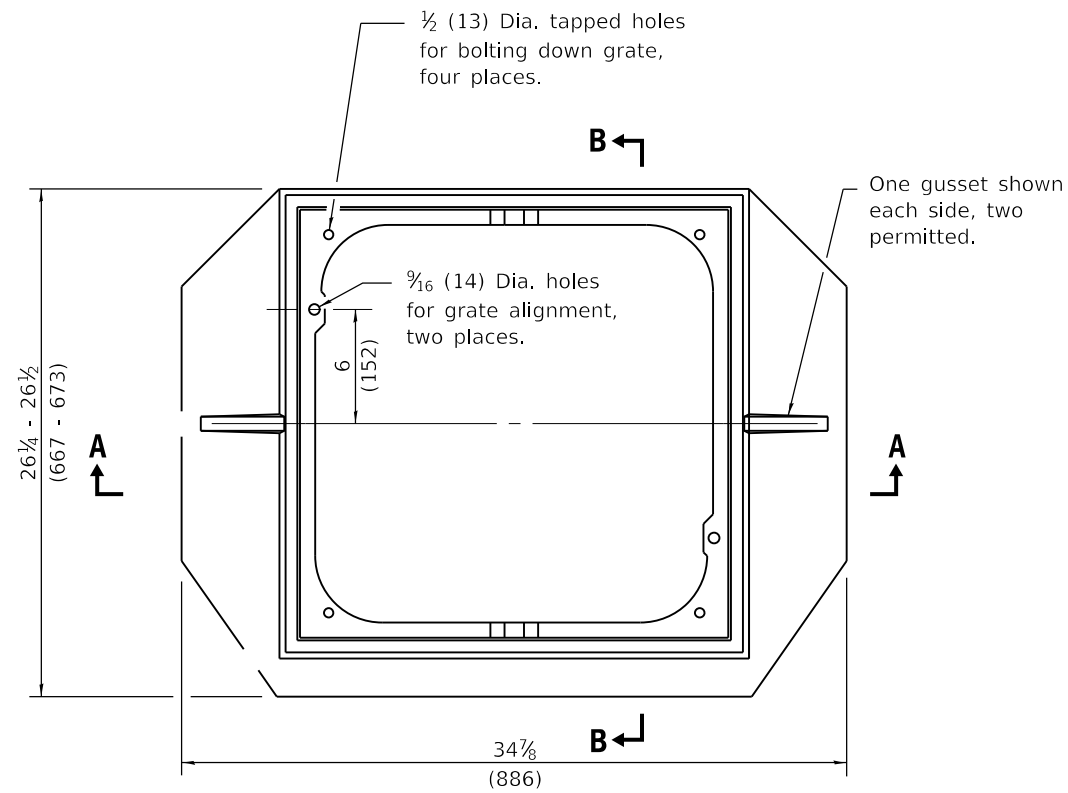
PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

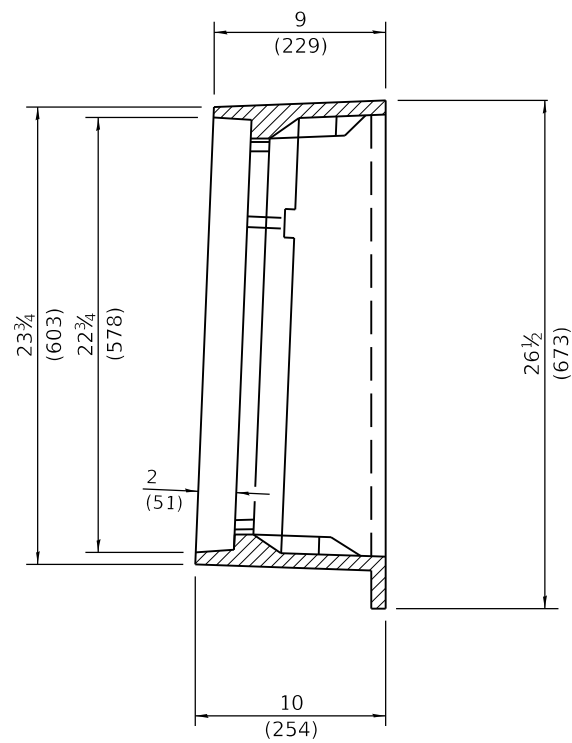
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-09

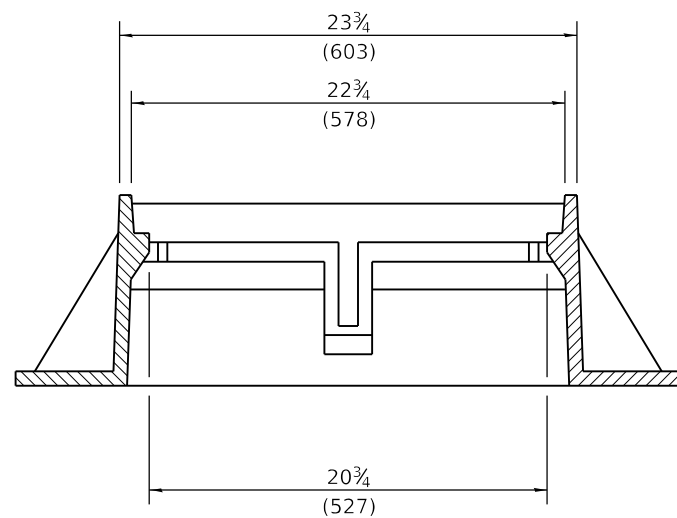


**PLAN**

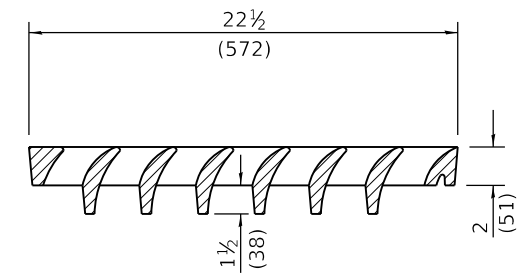
**CAST FRAME**



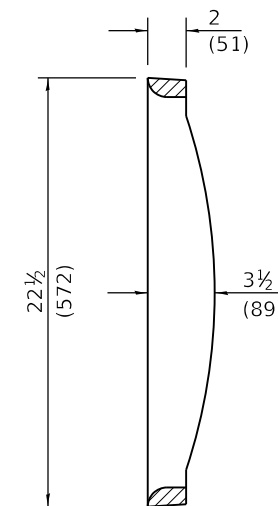
**SECTION B-B**



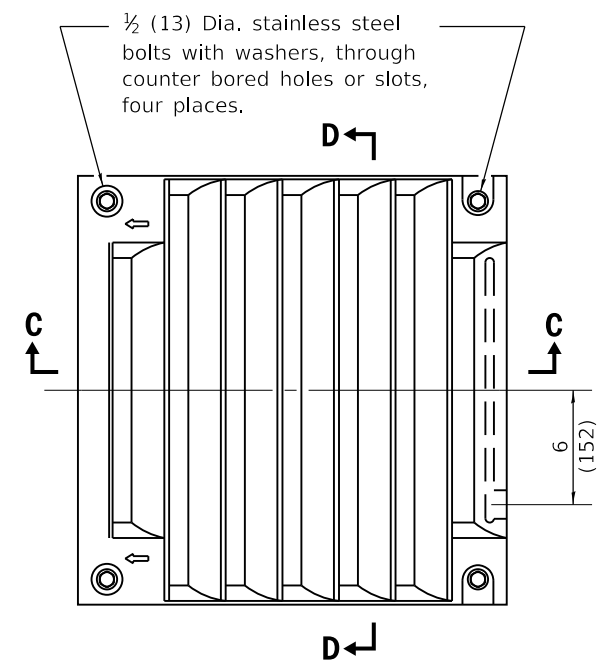
**SECTION A-A**



**SECTION C-C**



**SECTION D-D**



**CAST GRATE**

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

Illinois Department of Transportation  
 PASSED January 1, 2021  
 ENGINEER OF POLICY AND PROCEDURES  
 APPROVED January 1, 2021  
 ENGINEER OF DESIGN AND ENVIRONMENT

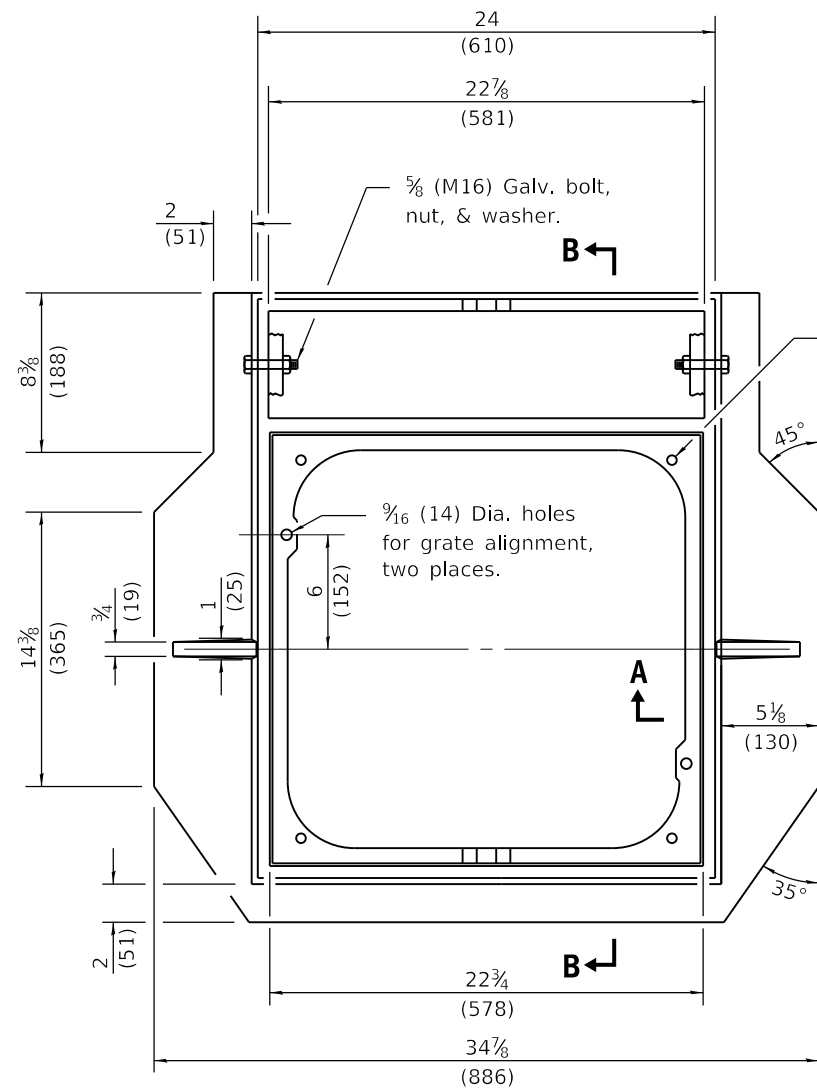
ISSUED 1-1-97

DATE	REVISIONS
1-1-21	Removed "safety bar" from frame.
1-1-15	Revised dimensions of frame.

**FRAME AND GRATE  
TYPE 20**

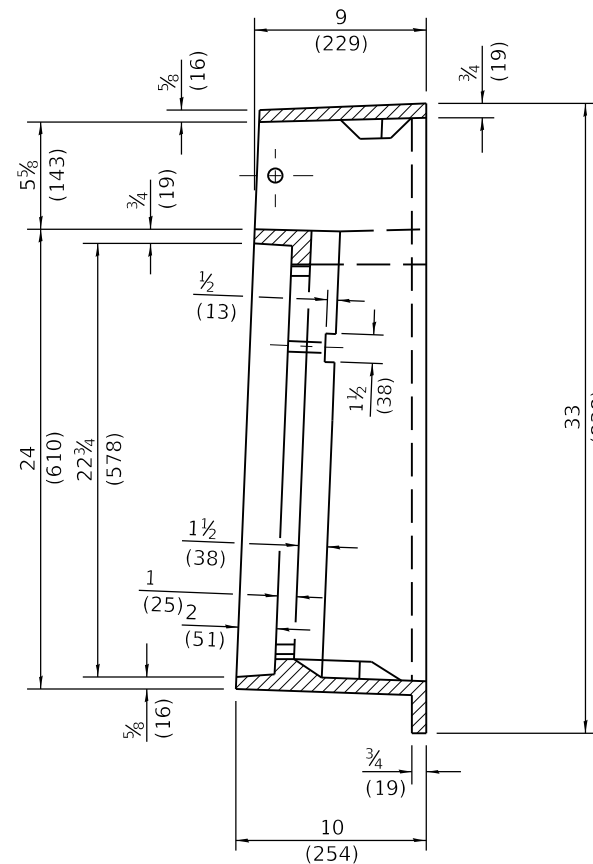
**STANDARD 604071-06**



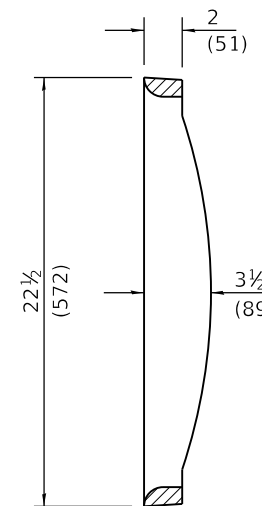


**PLAN**

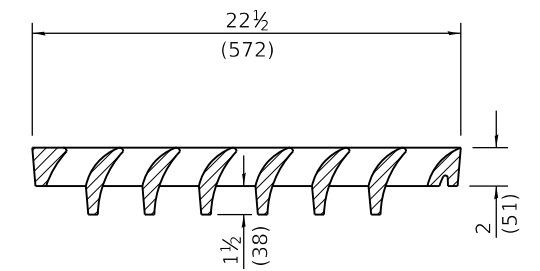
**CAST FRAME**



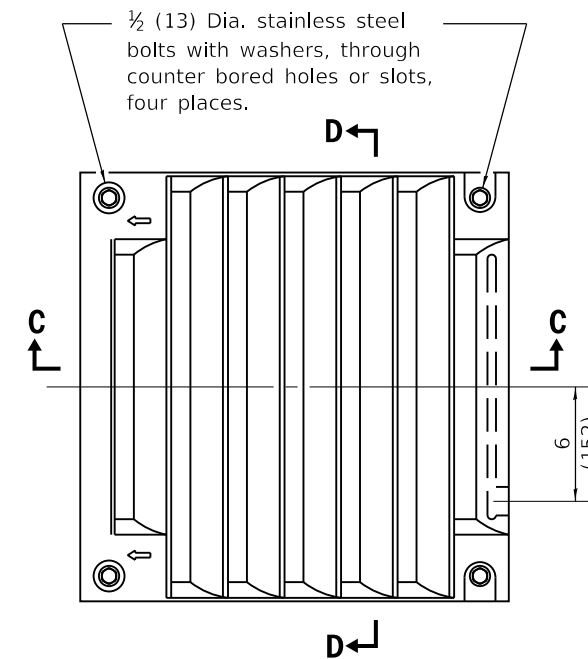
**SECTION B-B**



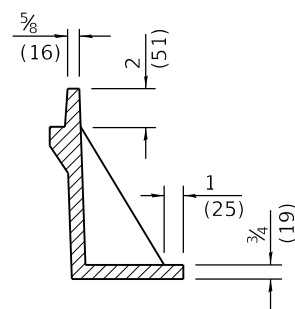
**SECTION D-D**



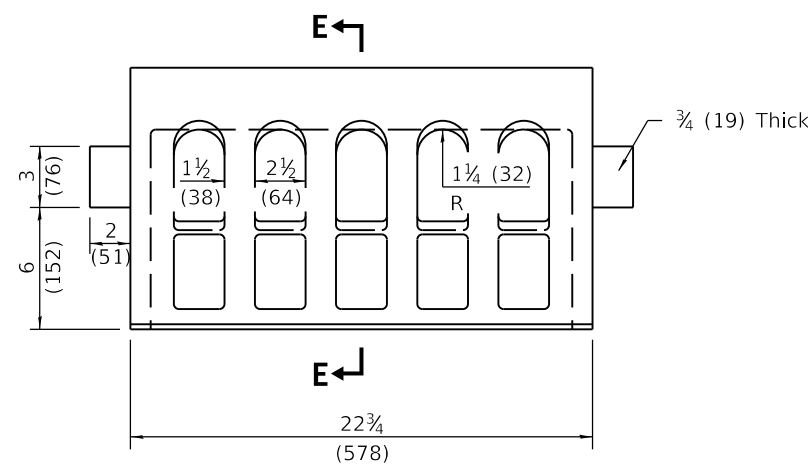
**SECTION C-C**



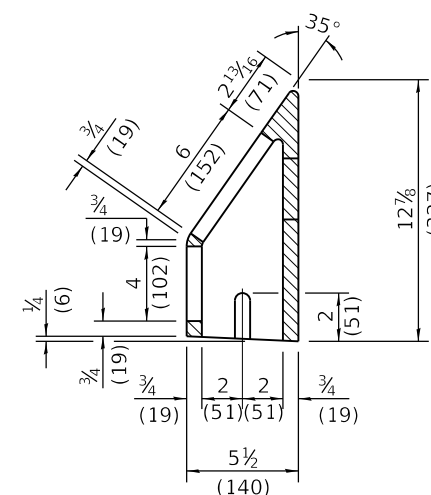
**CAST GRATE**



**SECTION A-A**



**CURB BOX**



**SECTION E-E**

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

DATE	REVISIONS
1-1-21	Removed "safety bar" from frame.
1-1-09	Switched units to English (metric).

**FRAME AND GRATE  
TYPE 21**

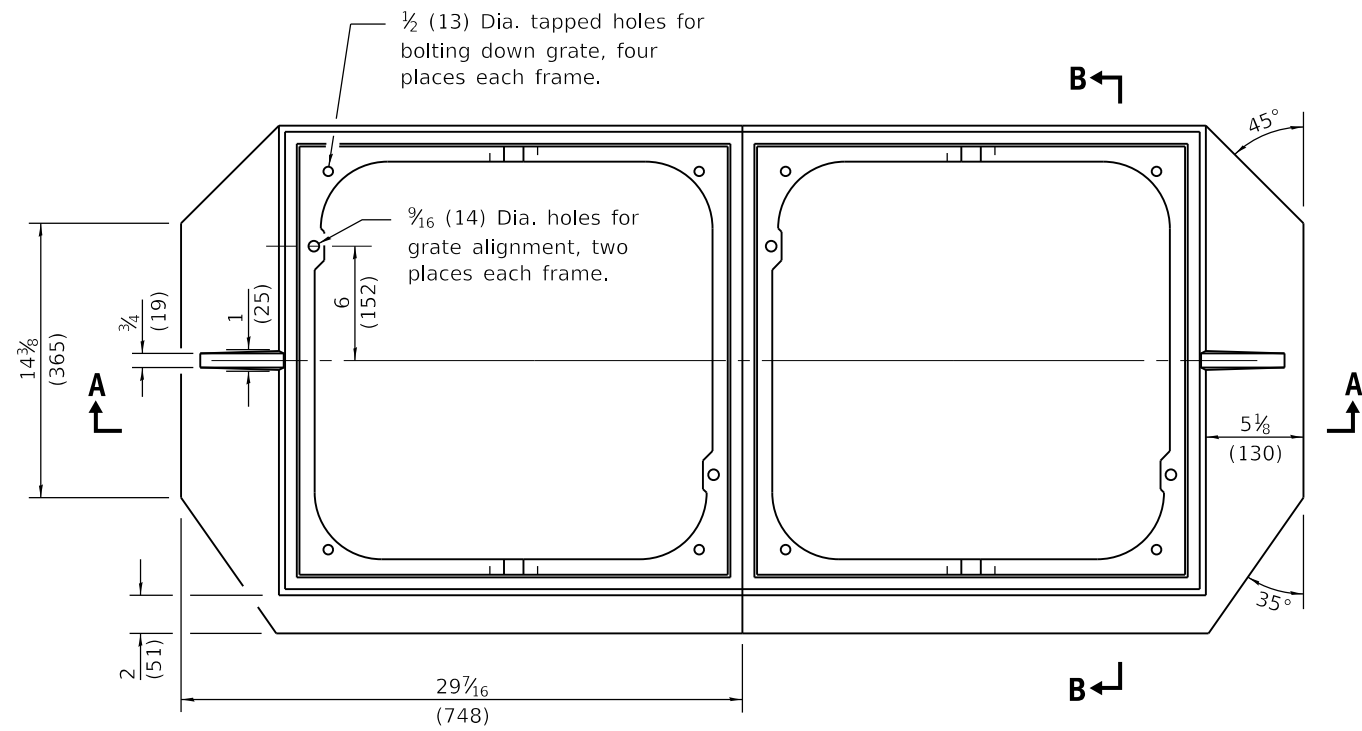
**STANDARD 604076-05**

Illinois Department of Transportation

PASSED January 1, 2021  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES

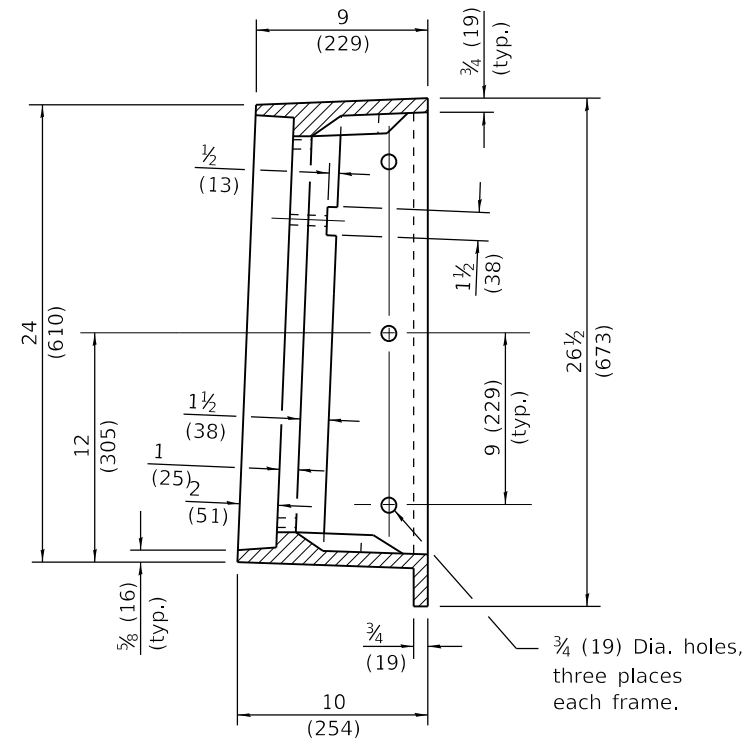
APPROVED January 1, 2021  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-99  
 46-T

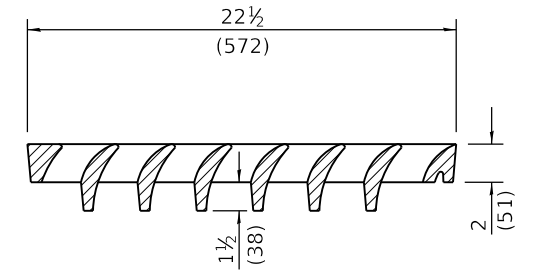


**PLAN**

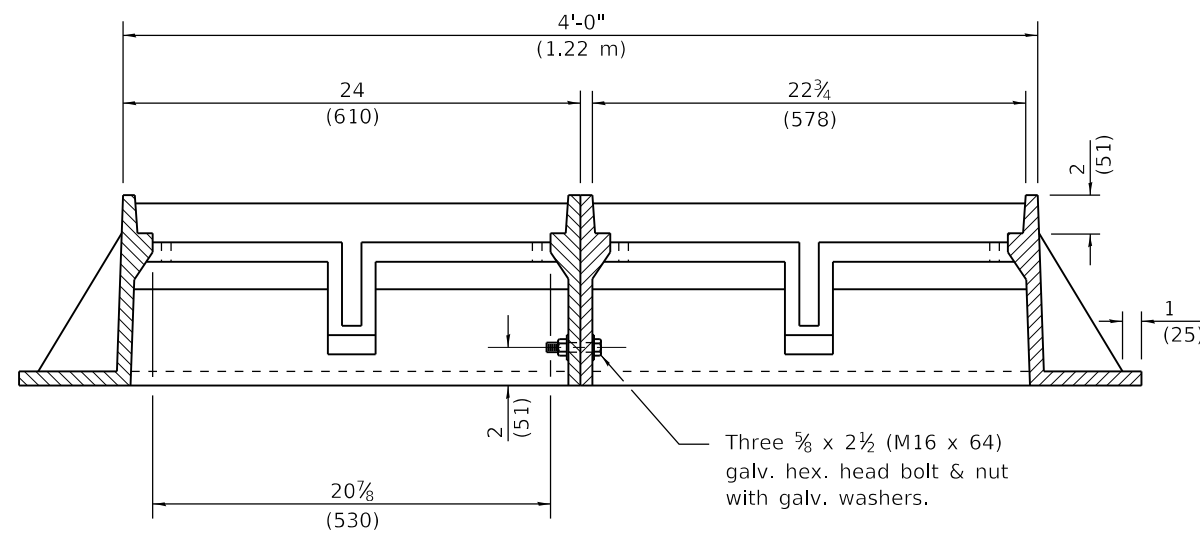
**CAST FRAME**



**SECTION B-B**

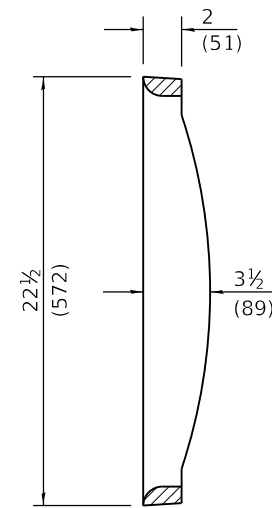


**SECTION C-C**

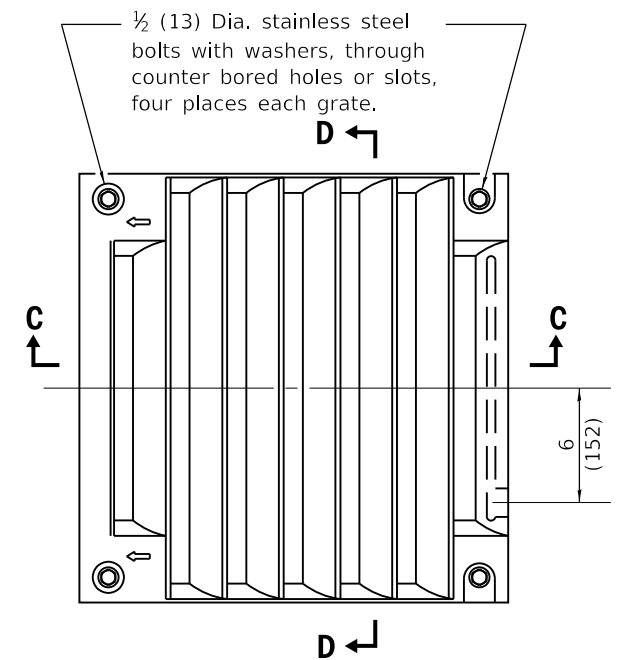


**SECTION A-A**

**CAST GRATE**



**SECTION D-D**



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

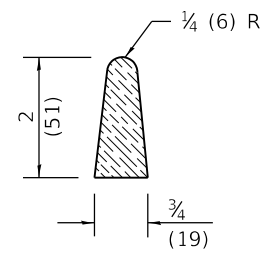
DATE	REVISIONS
1-1-21	Removed "safety bar" from frame.
1-1-09	Switched units to English (metric).

**FRAMES AND GRATES  
TYPE 22**

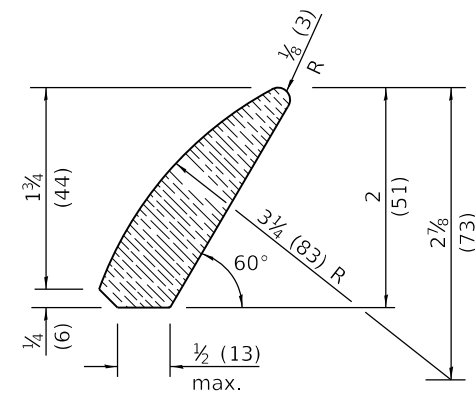
**STANDARD 604081-05**

Illinois Department of Transportation  
 PASSED January 1, 2021  
 ENGINEER OF POLICY AND PROCEDURES  
 APPROVED January 1, 2021  
 ENGINEER OF DESIGN AND ENVIRONMENT

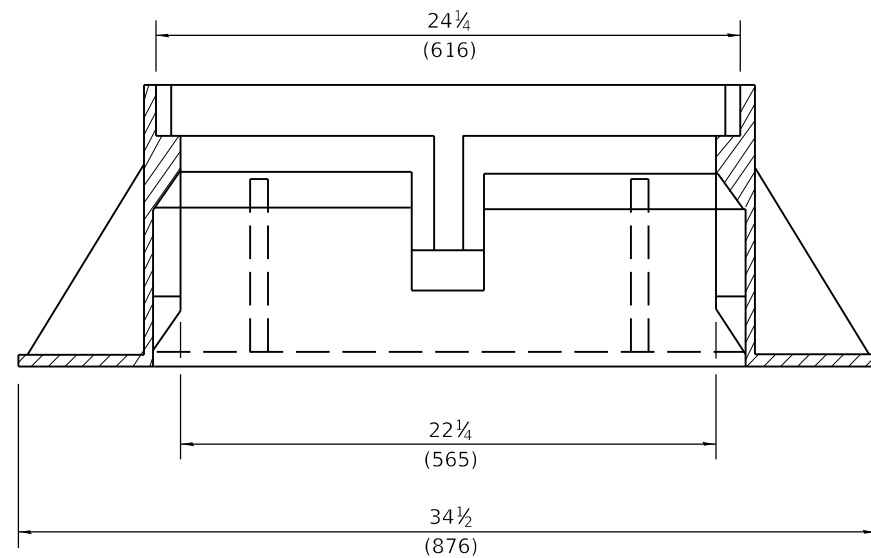
ISSUED 1-1-97



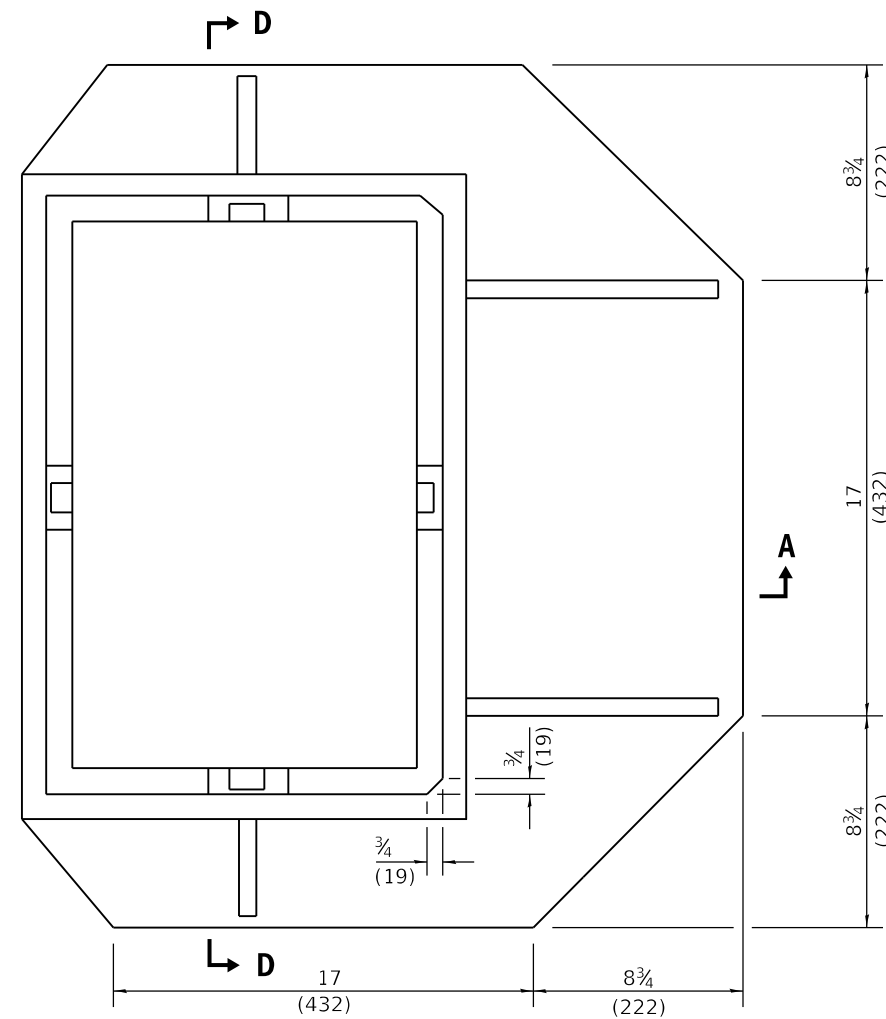
**DETAIL A**



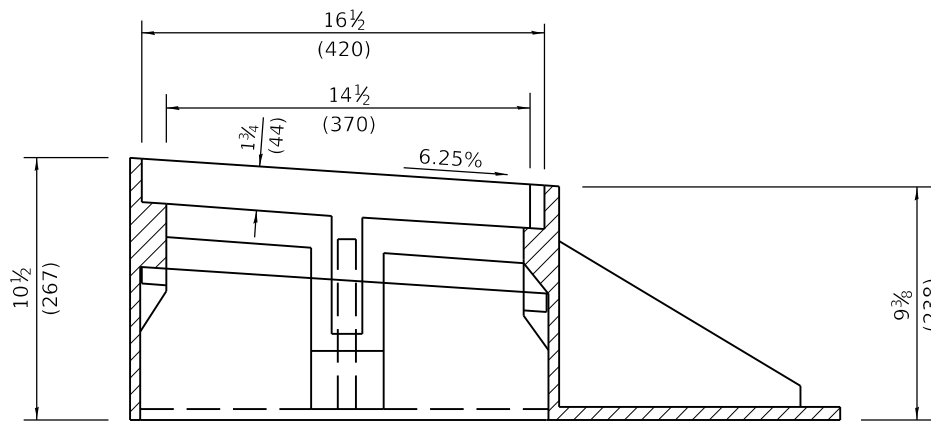
**DETAIL B**



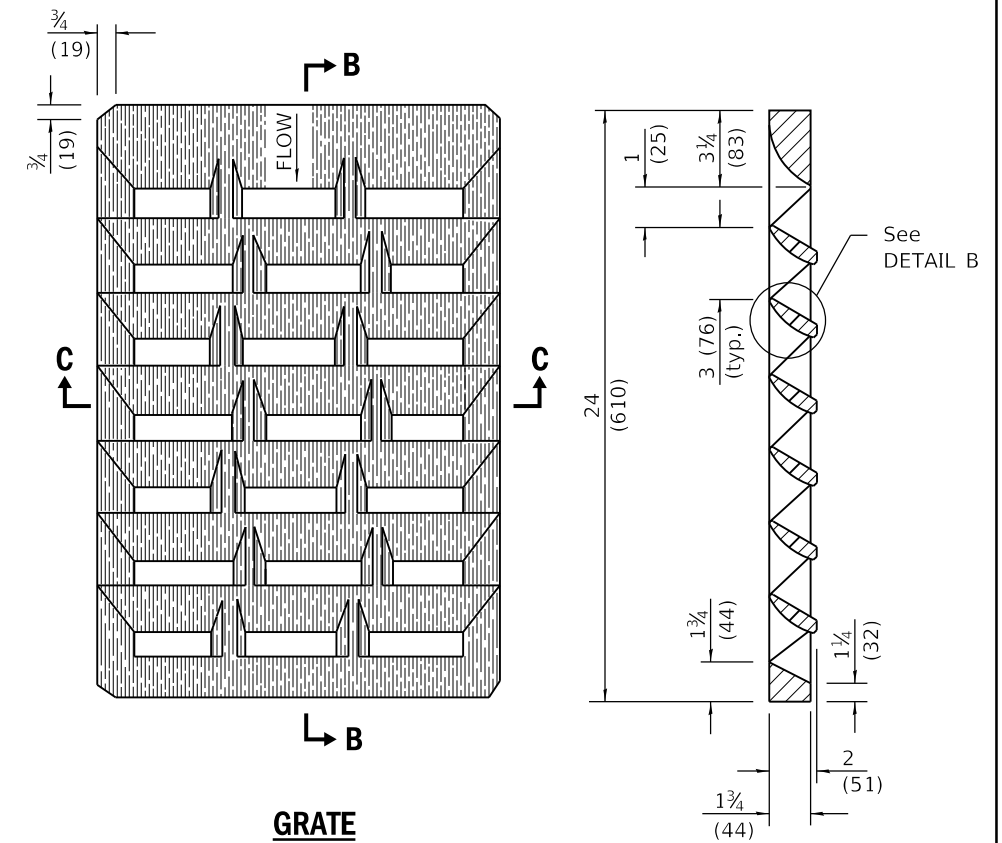
**SECTION D-D**



**PLAN - FRAME**

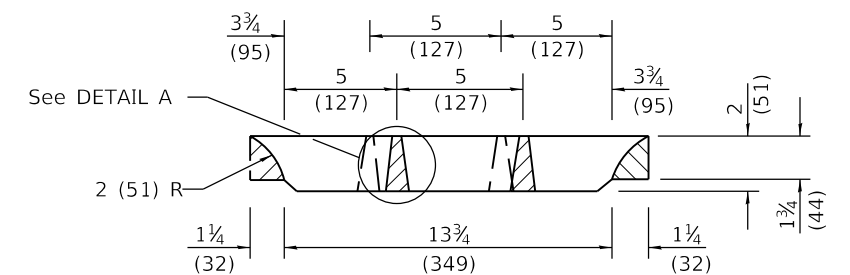


**SECTION A-A**



**GRATE**

**SECTION B-B**



**SECTION C-C**

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

Illinois Department of Transportation

PASSED January 1, 2021

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021

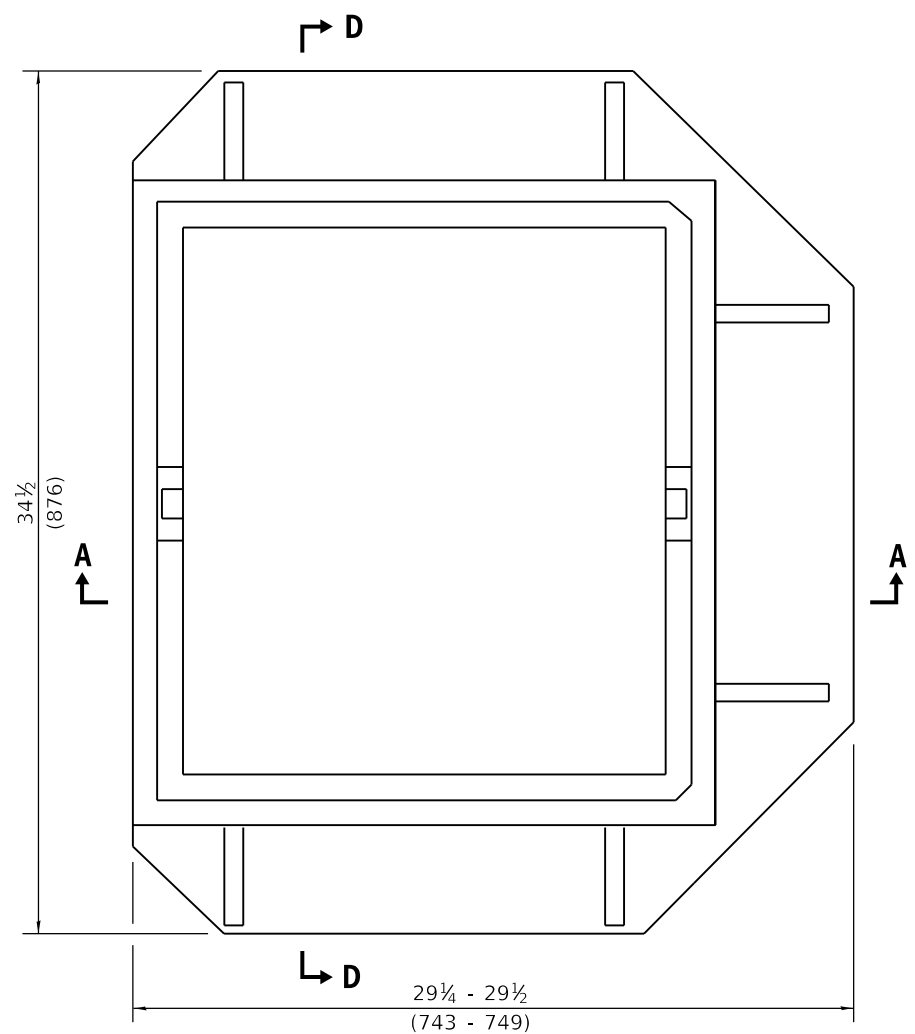
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-2021

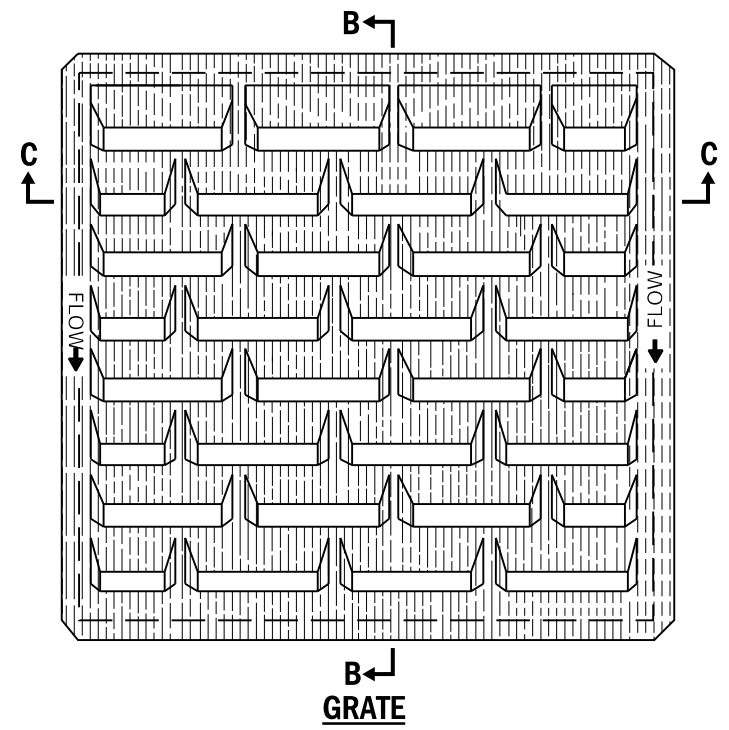
DATE	REVISIONS
1-1-21	Removed "safety bars" from frame.
1-1-15	Revised dimensions of frame.

**FRAME AND GRATE  
TYPE 23**

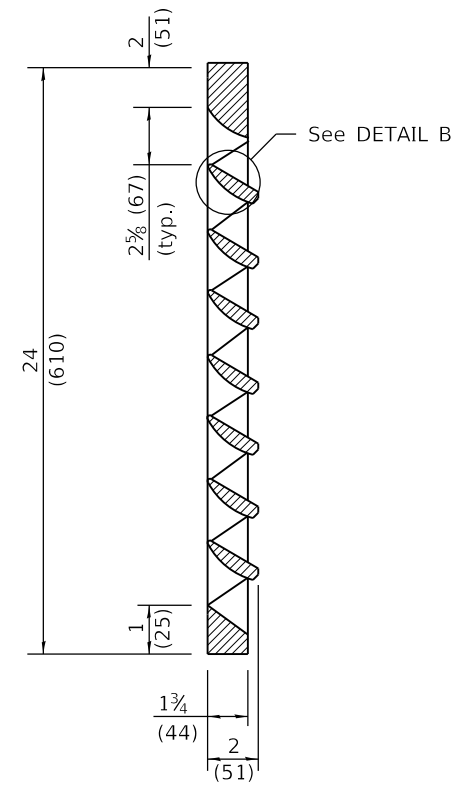
**STANDARD 604086-04**



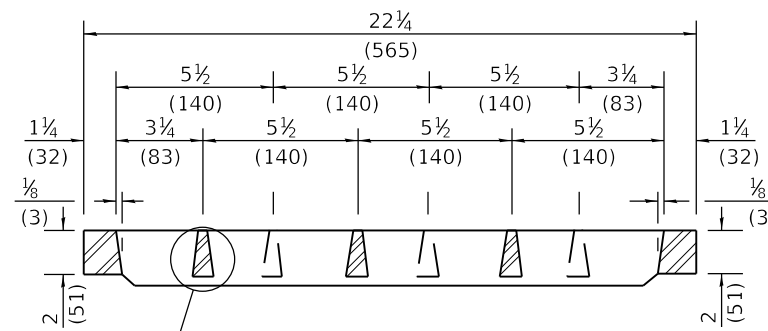
**PLAN - FRAME**



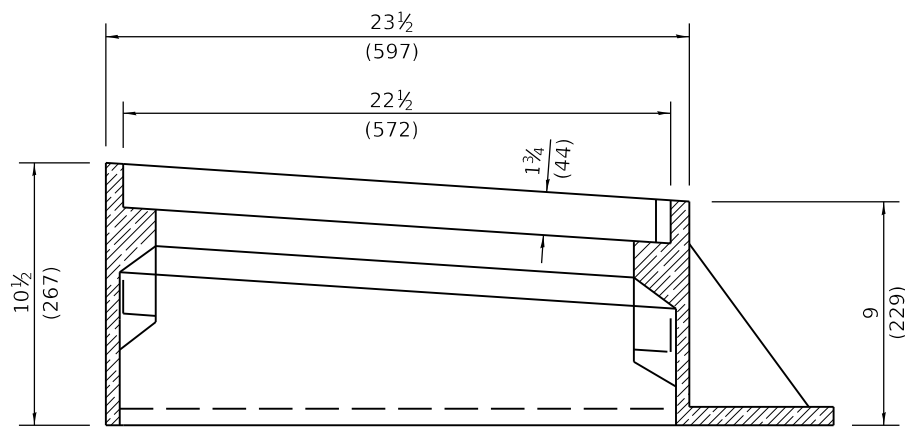
**GRATE**



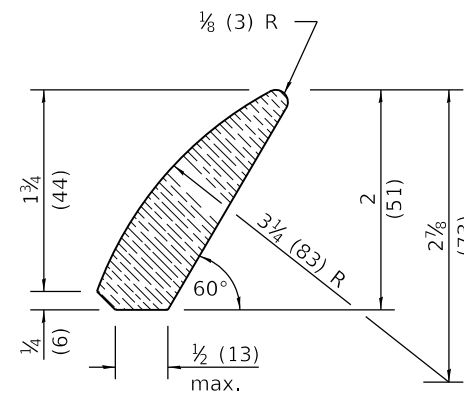
**SECTION B-B**



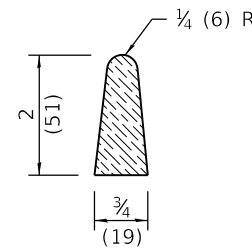
**SECTION C-C**



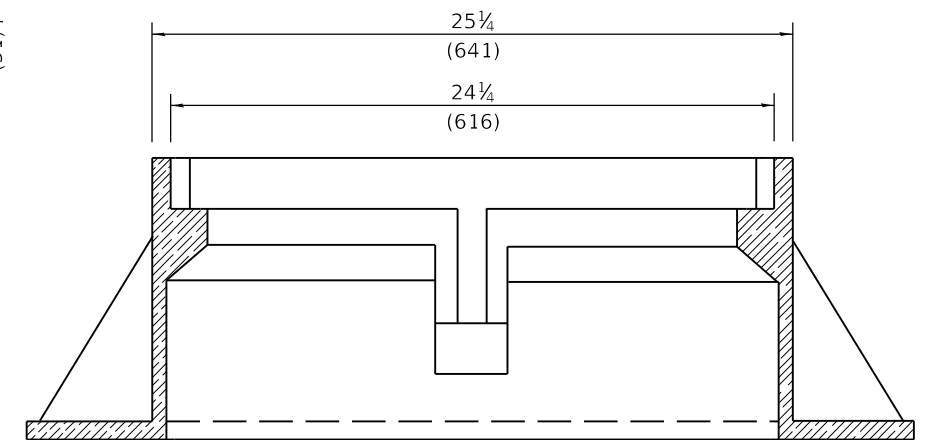
**SECTION A-A**



**DETAIL B**



**DETAIL A**



**SECTION D-D**

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

Illinois Department of Transportation

PASSED January 1, 2021  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES

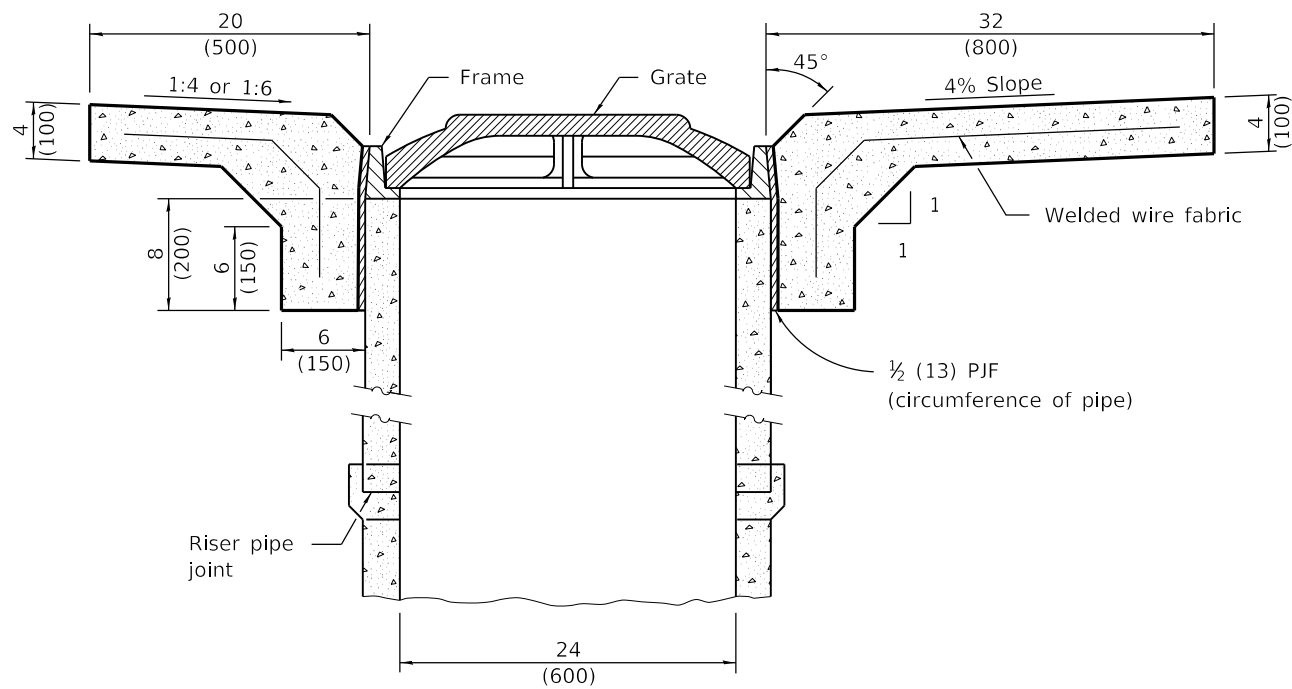
APPROVED January 1, 2021  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

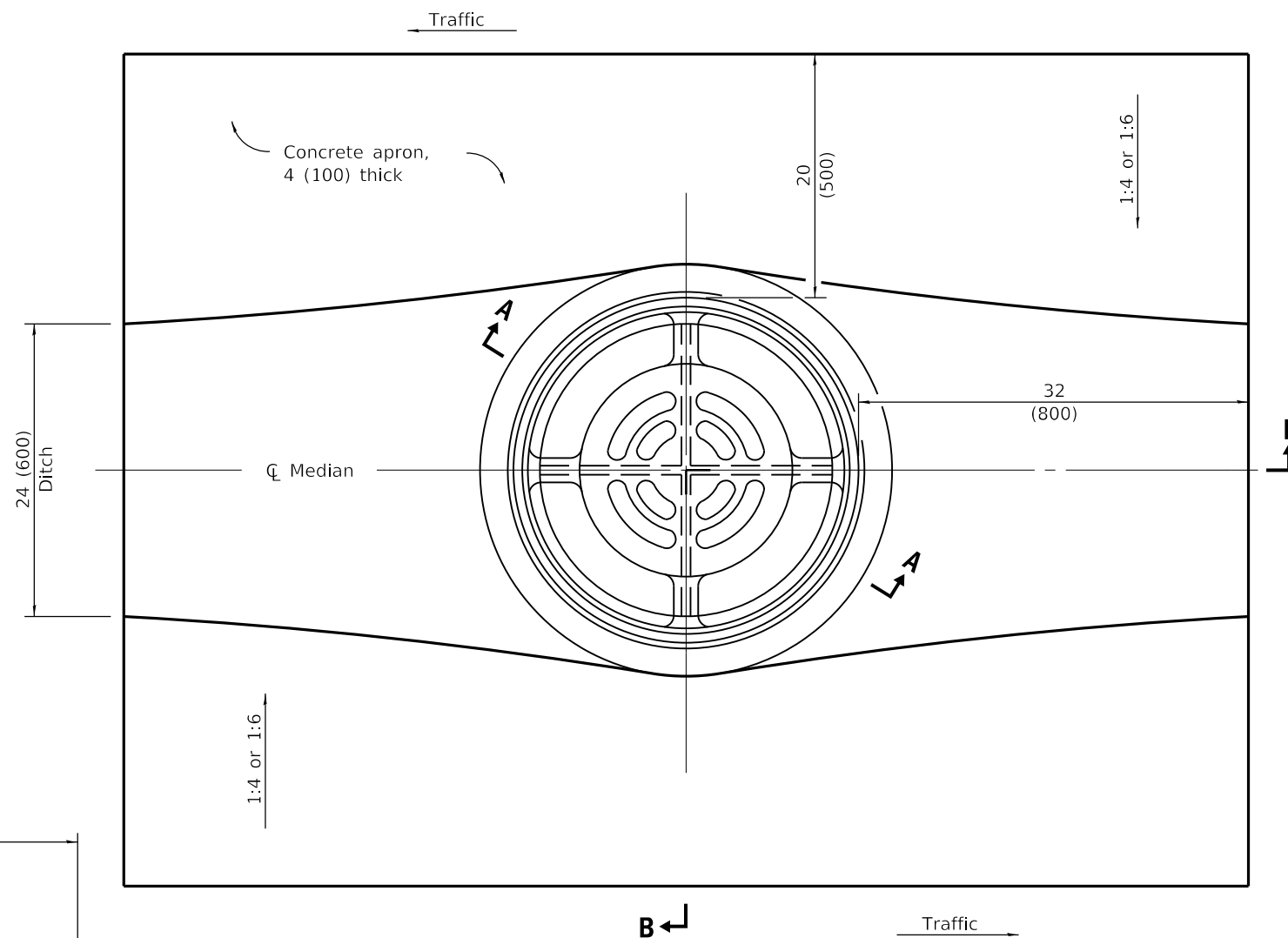
DATE	REVISIONS
1-1-21	Removed "safety bar" from frame.
1-1-15	Revised dimensions of frame.

**FRAME AND GRATE  
TYPE 24**

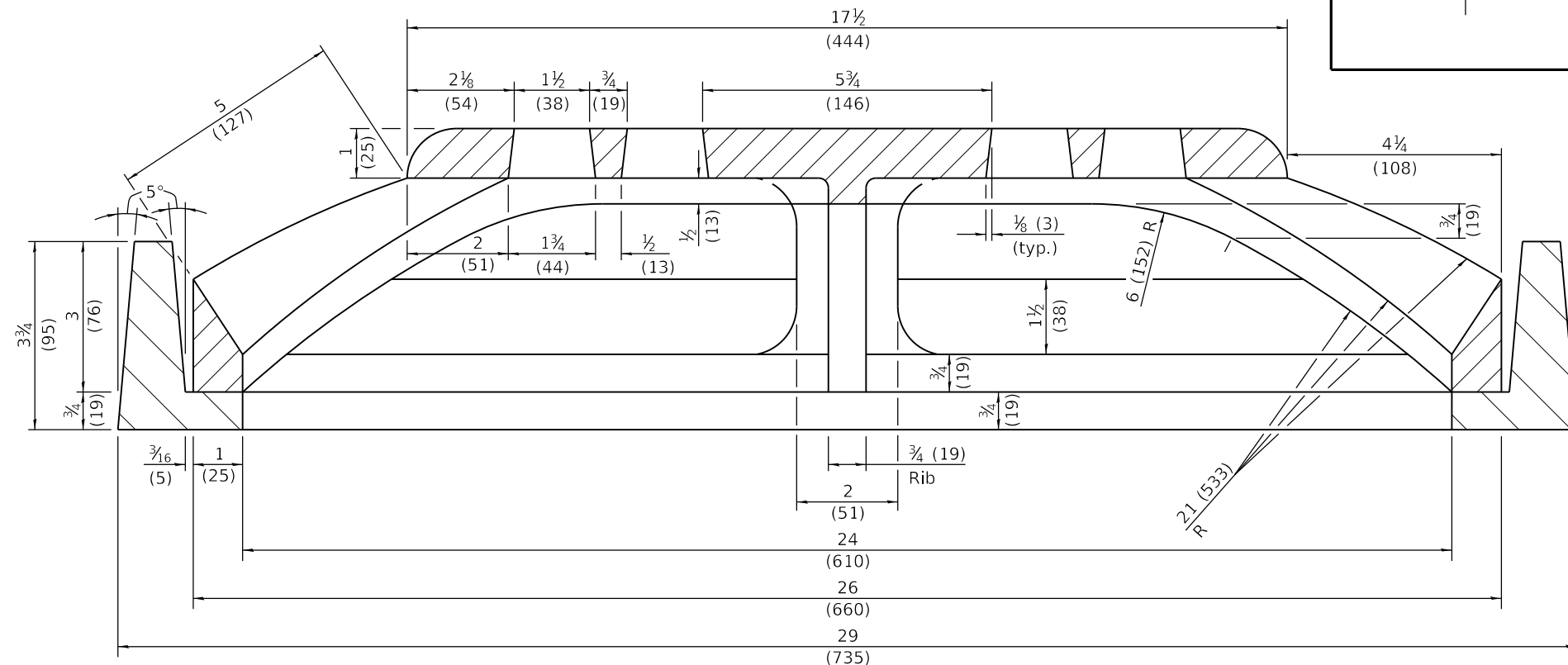
**STANDARD 604091-04**



**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.

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**

Illinois Department of Transportation

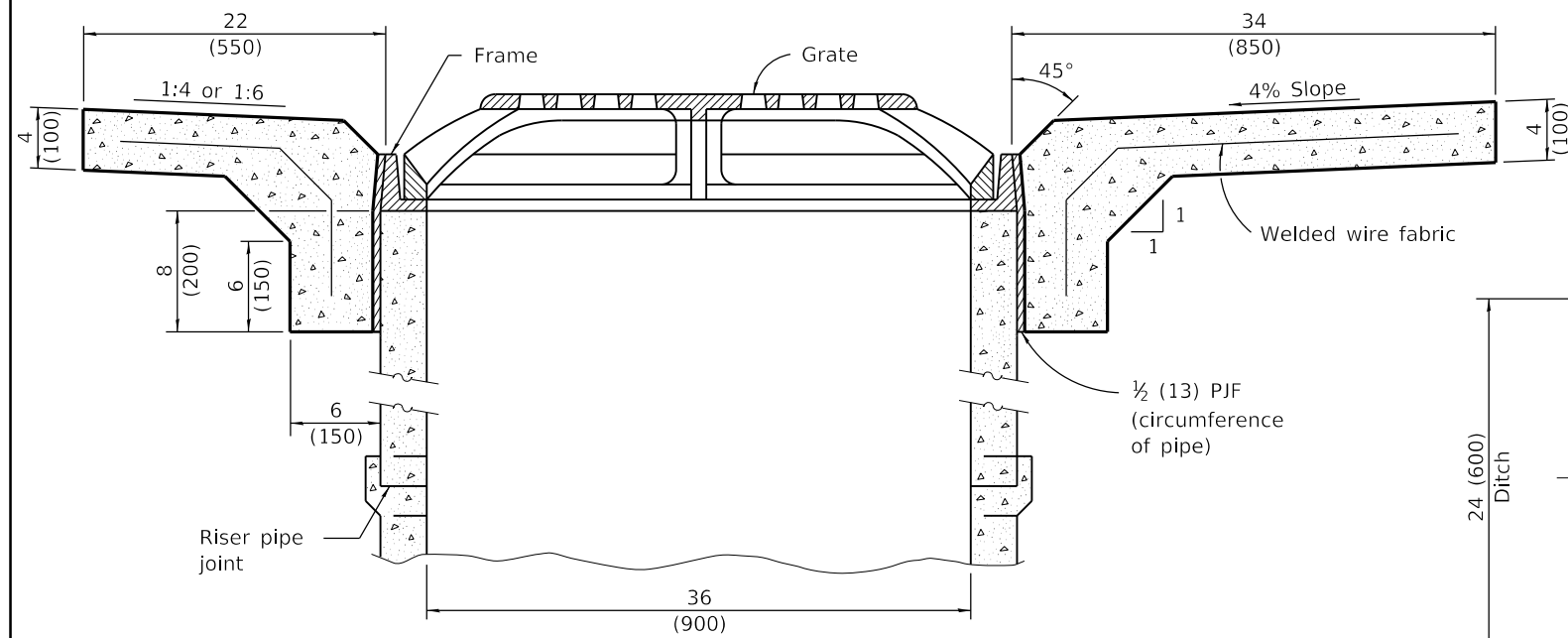
PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

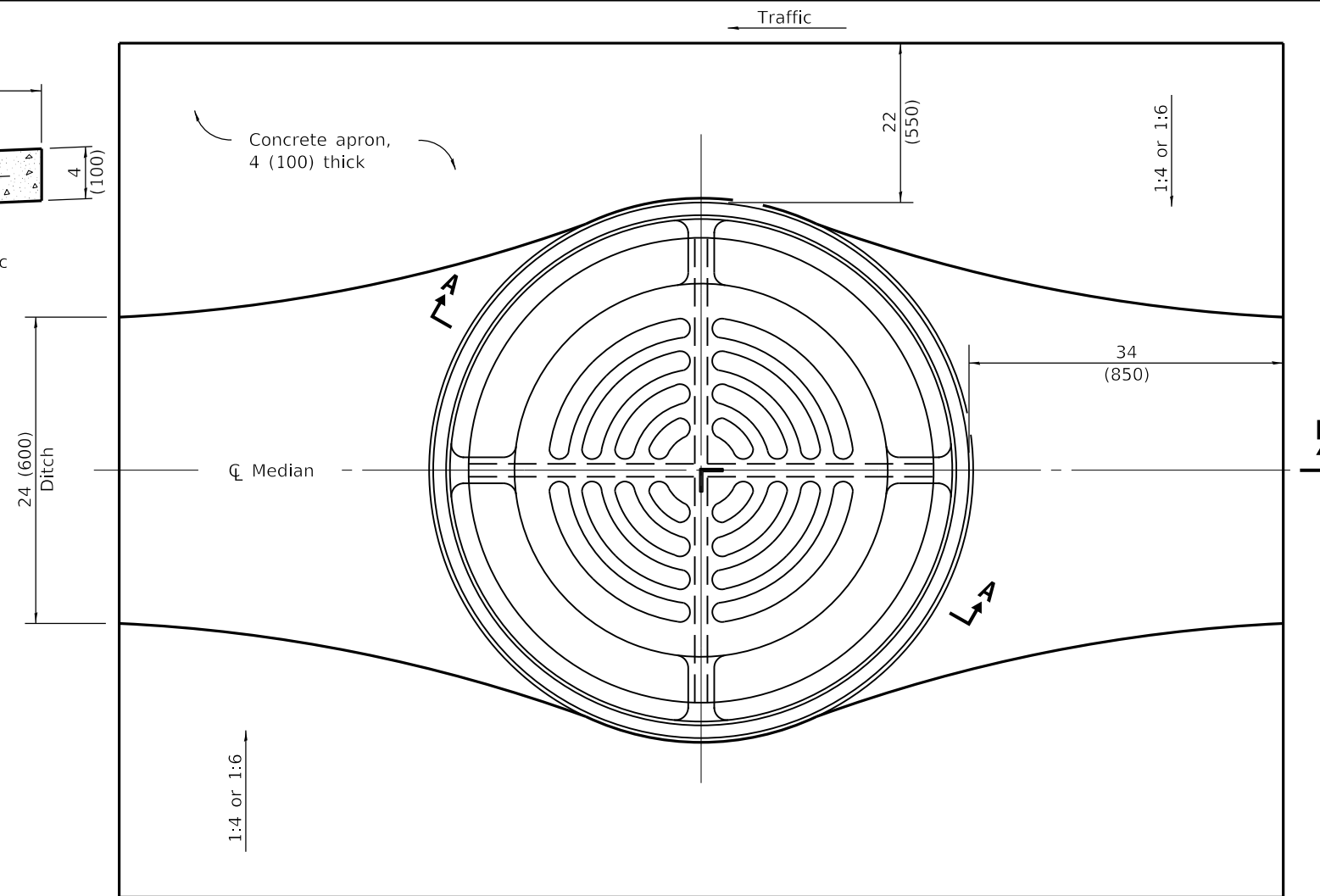
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

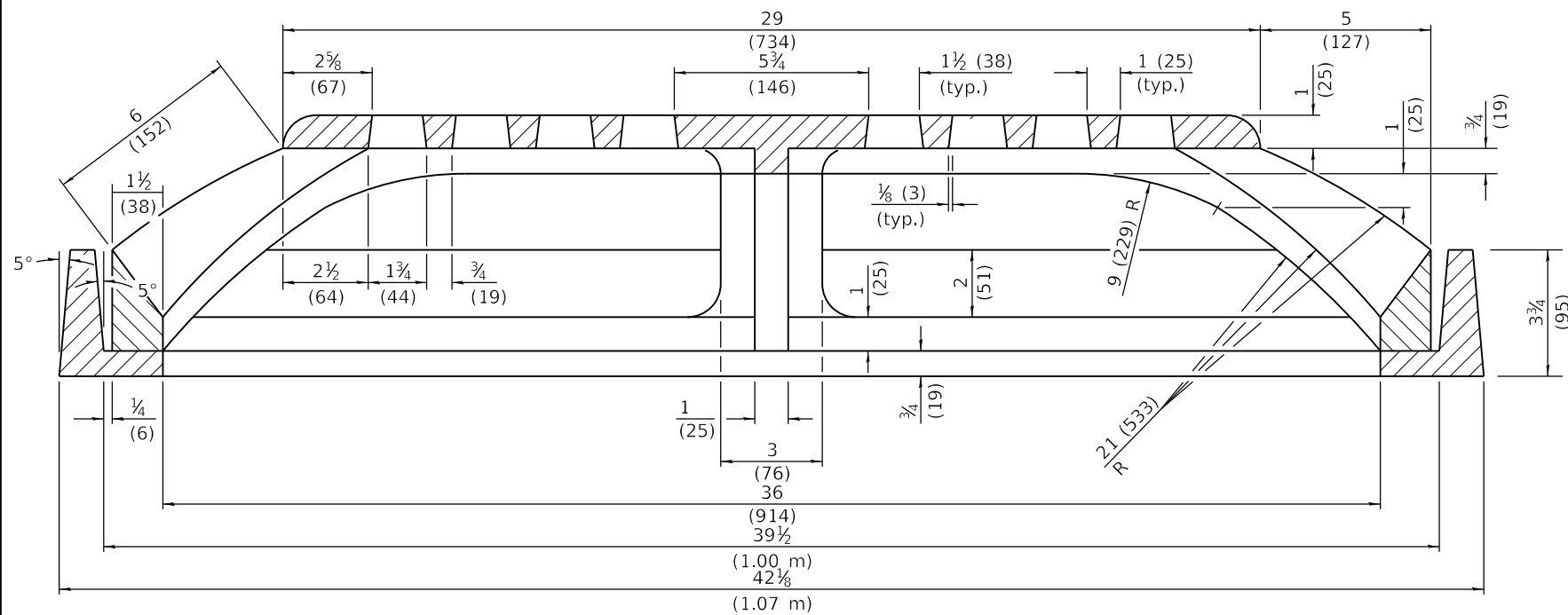
ISSUED 1-1-97



**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.

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**

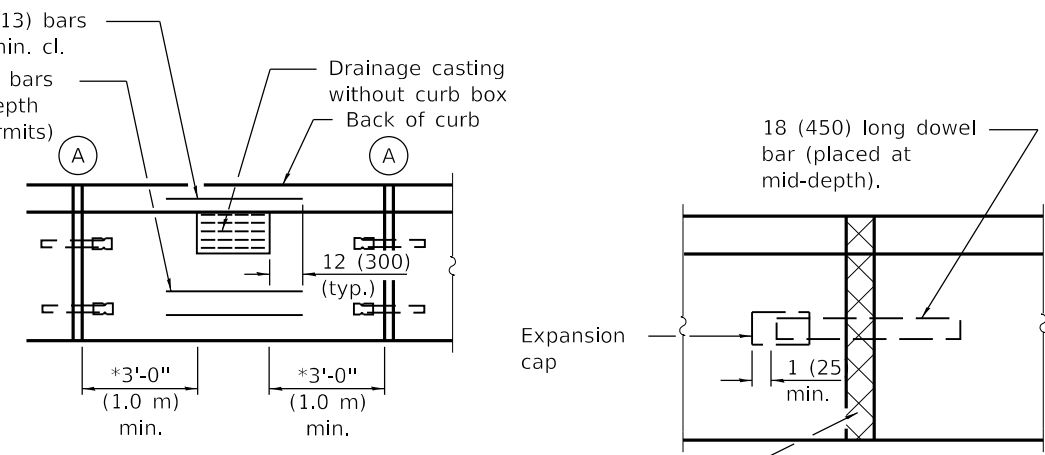
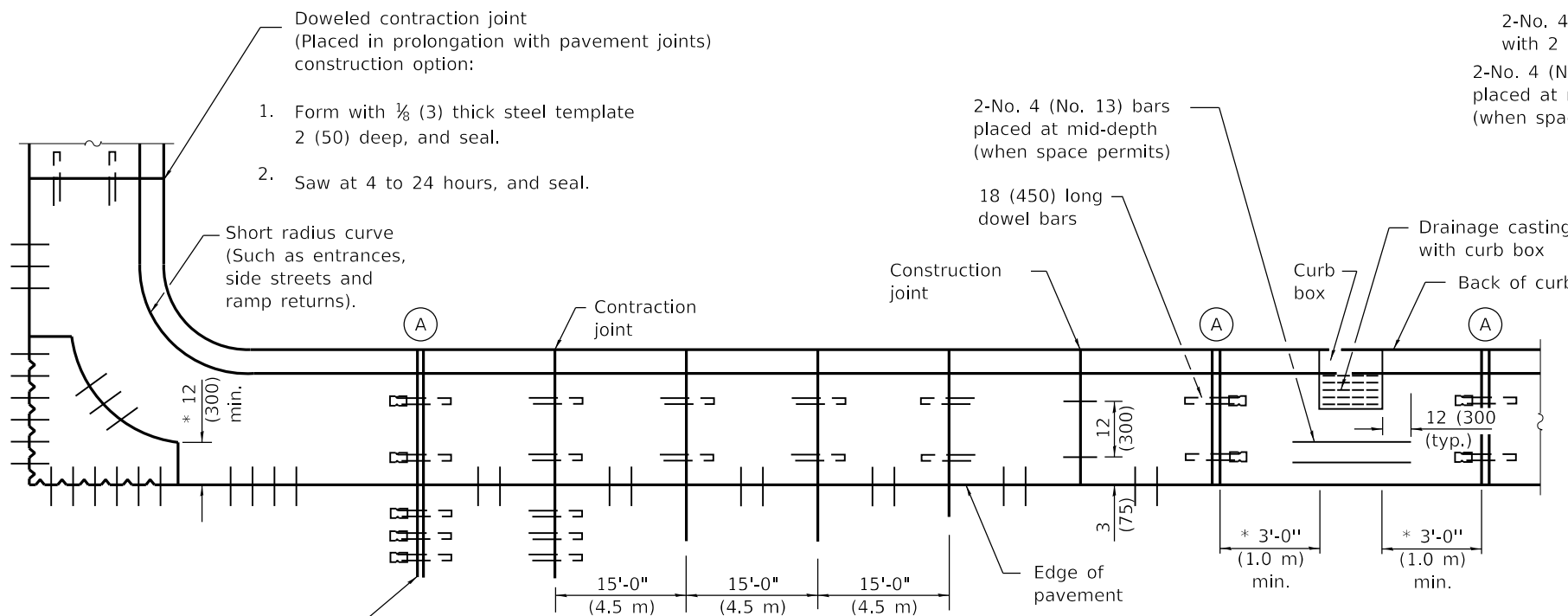
**STANDARD 604106-01**

Illinois Department of Transportation

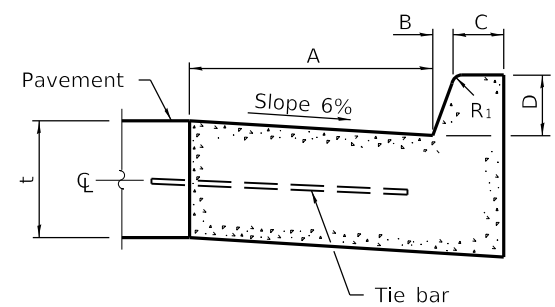
PASSED January 1, 2009  
*Scott Smith*  
 ENGINEER OF POLICY AND PROCEDURES

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

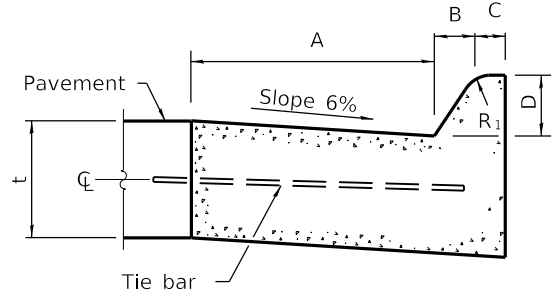
ISSUED 1-1-97



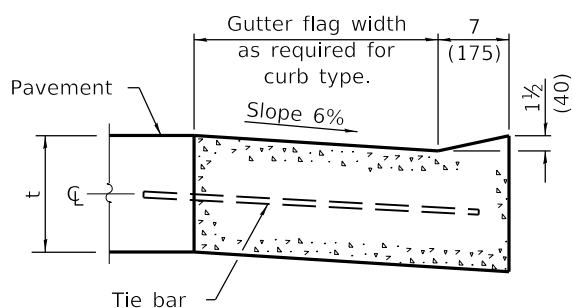
**PLAN**  
**ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE**



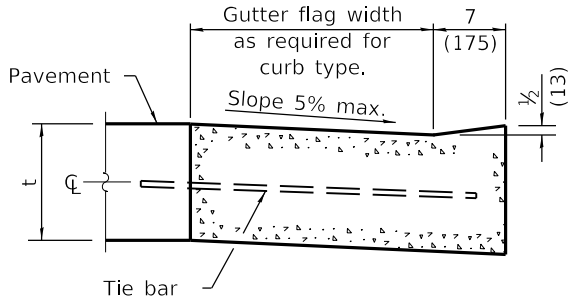
**BARRIER CURB**



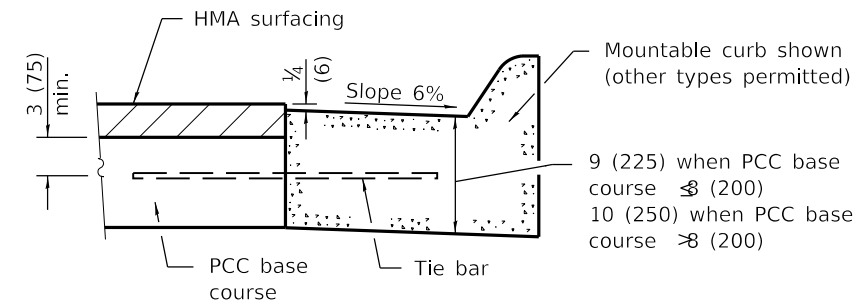
**MOUNTABLE CURB**



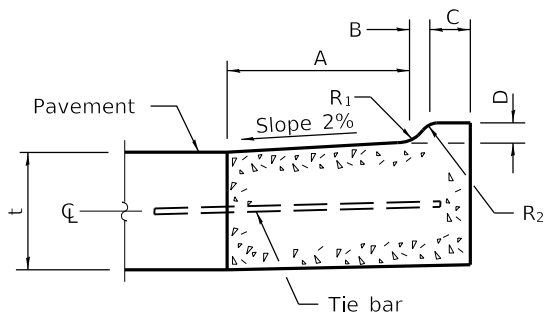
**DEPRESSED CURB (TYPICAL)**



**DEPRESSED CURB ADJACENT TO CURB RAMP ACCESSIBLE TO THE DISABLED**



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



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

TYPE	A	B	C	D	R <sub>1</sub>
B-6.06 *	6	1	6	6	1
(B-15.15)	(150)	(25)	(150)	(150)	(25)
B-6.12	12	1	6	6	1
(B-15.3)	(300)	(25)	(150)	(150)	(25)
B-6.18	18	1	6	6	1
(B-15.45)	(450)	(25)	(150)	(150)	(25)
B-6.24	24	1	6	6	1
(B-15.60)	(600)	(25)	(150)	(150)	(25)
B-9.12	12	2	5	9	1
(B-22.30)	(300)	(50)	(125)	(225)	(25)
B-9.18	18	2	5	9	1
(B-22.45)	(450)	(50)	(125)	(225)	(25)
B-9.24	24	2	5	9	1
(B-22.60)	(600)	(50)	(125)	(225)	(25)

\* For corner islands only.

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

**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.

DATE	REVISIONS
1-1-18	Revised General Note for tie bar spacing to 36 (900) cts.
1-1-15	Added B-6.06 (B-15.15) barrier curb and gutter to table (corner islands only).

**CONCRETE CURB TYPE B AND COMBINATION CONCRETE CURB AND GUTTER**  
(Sheet 1 of 2)

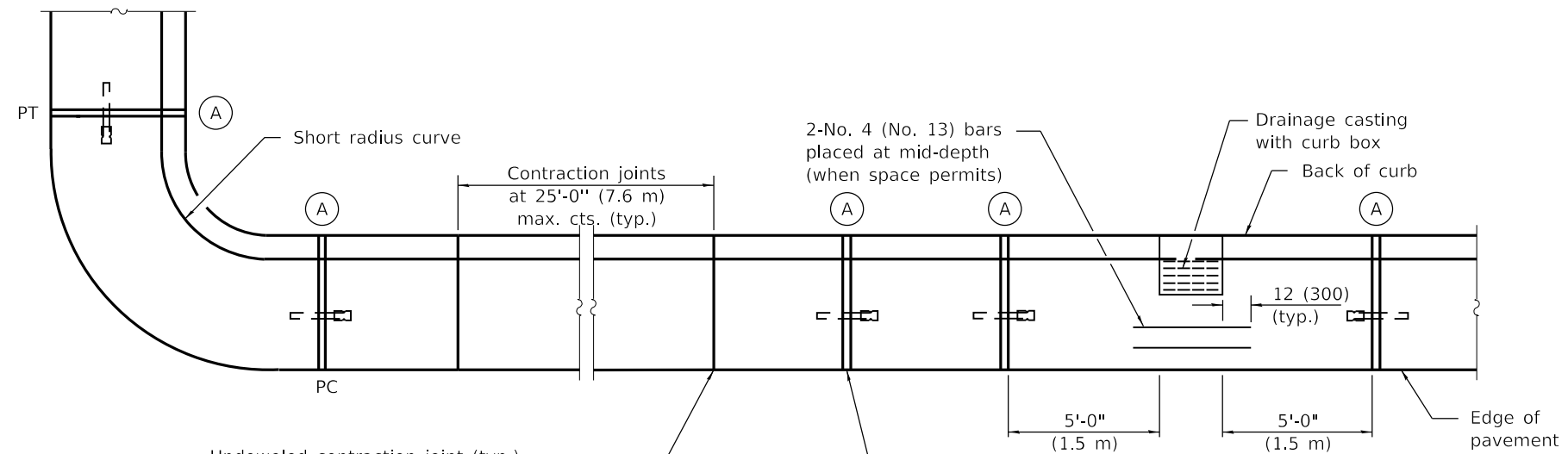
**STANDARD 606001-07**

Illinois Department of Transportation

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

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

ISSUED 1-1-97

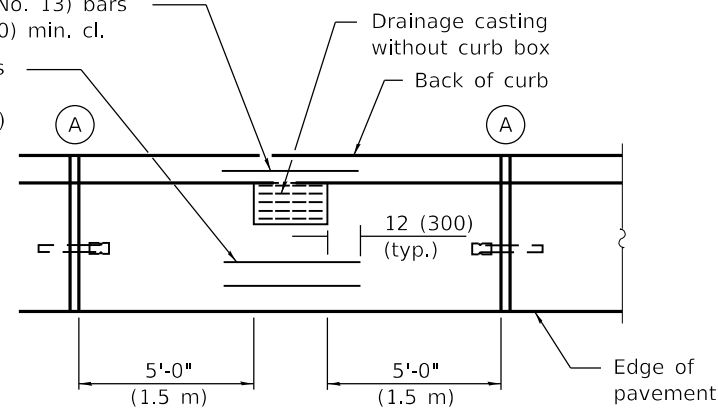


Undoweled contraction joint (typ.) construction options:

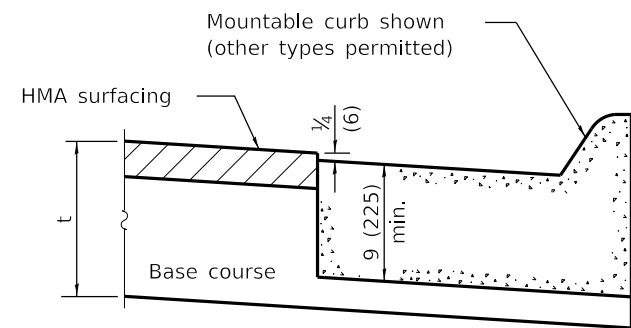
1. Form with 1/8 (3) thick steel template 2 (50) deep, and seal.
2. Saw 2 (50) deep at 4 to 24 hours, and seal.
3. Insert 3/4 (20) thick preformed joint filler full depth and width.

Construction joint  
2-No. 4 (No. 13) bars with 2 (50) min. cl.

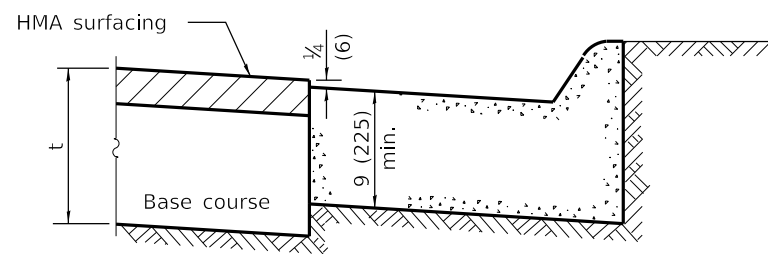
2-No. 4 (No. 13) bars placed at mid-depth (when space permits)



**PLAN**

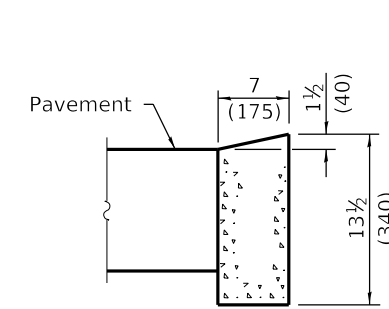


**ON DISTURBED SUBGRADE**

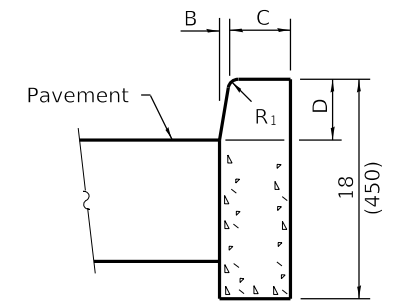


**ON UNDISTURBED SUBGRADE**

**ADJACENT TO FLEXIBLE PAVEMENT**

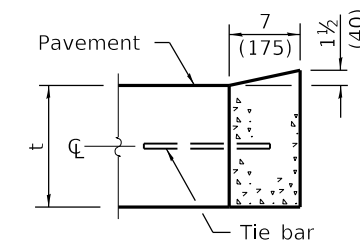


**DEPRESSED CURB**

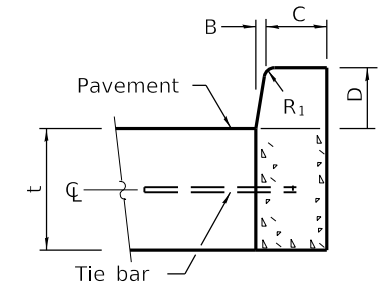


**BARRIER CURB**

**ADJACENT TO FLEXIBLE PAVEMENT**



**DEPRESSED CURB**



**BARRIER CURB**

**ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE**

**CONCRETE CURB TYPE B**

**CONCRETE CURB TYPE B AND COMBINATION CONCRETE CURB AND GUTTER**

(Sheet 2 of 2)

**STANDARD 606001-07**

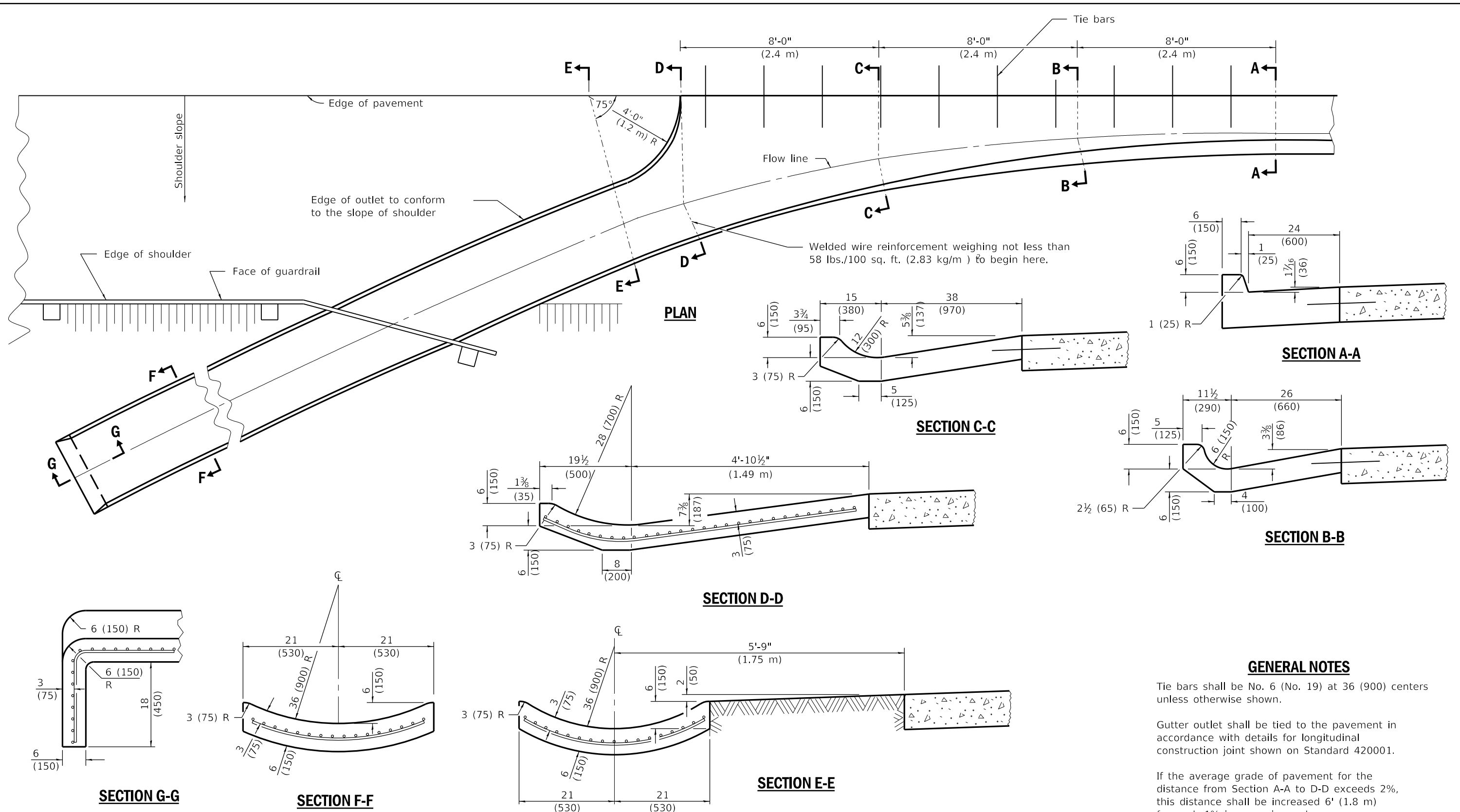
Illinois Department of Transportation

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

APPROVED January 1, 2018  
*Marcus M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97





Welded wire reinforcement weighing not less than 58 lbs./100 sq. ft. (2.83 kg/m<sup>2</sup>) to begin here.

**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**

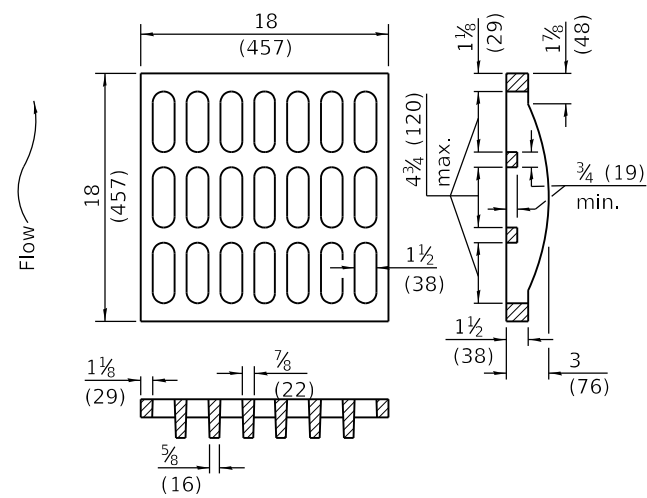
For Section A-A to E-E and curtain wall =  
 2.38 cu. yds. (1.82 m<sup>3</sup>) concrete for 9 (225) pav't.  
 2.41 cu. yds. (1.84 m<sup>3</sup>) concrete for 10 (250) pav't.  
 For Section F-F =  
 0.069 cu. yds. (0.17 m<sup>3</sup>) concrete per ft. (m)

**STANDARD OUTLET**

DATE	REVISIONS
1-1-18	Revised General Notes for tie bar spacing to 36 (900) cts.
4-1-16	Changed terminology to 'welded wire reinforcement'.

**OUTLETS FOR CONCRETE CURB AND GUTTER TYPE B-6.24 (B-15.60)**  
 (Sheet 1 of 2)  
**STANDARD 606006-04**

Illinois Department of Transportation  
 PASSED January 1, 2018  
 Michael Beard  
 ENGINEER OF POLICY AND PROCEDURES  
 APPROVED January 1, 2018  
 Matthew M. Adams  
 ENGINEER OF DESIGN AND ENVIRONMENT  
 ISSUED 1-1-97

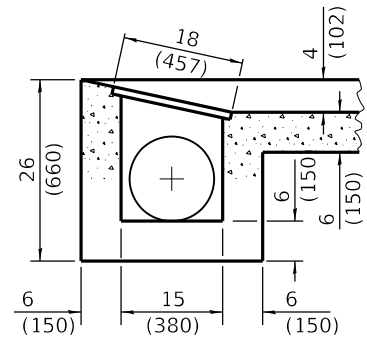


**GRATE TYPE A**

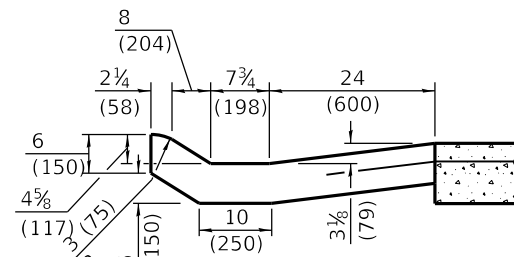
**QUANTITIES**

1.98 cu. yds. (1.51 m<sup>3</sup>) concrete for 9 (225) pav't.

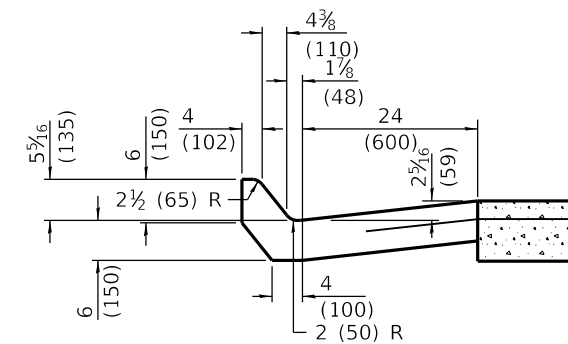
2.01 cu. yds. (1.54 m<sup>3</sup>) concrete for 10 (250) pav't.



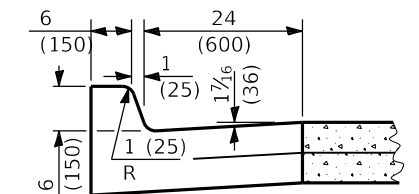
**SECTION E-E**



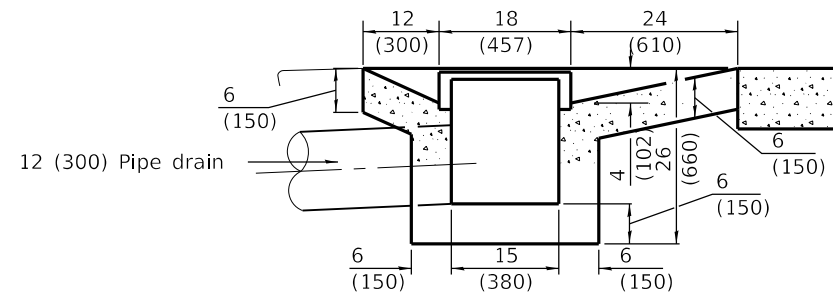
**SECTION C-C**



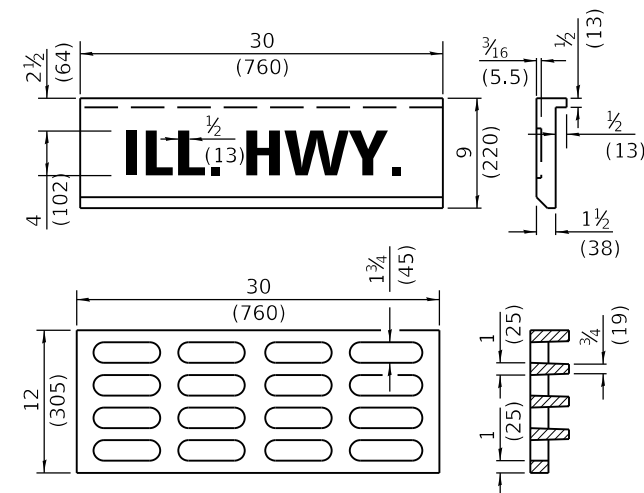
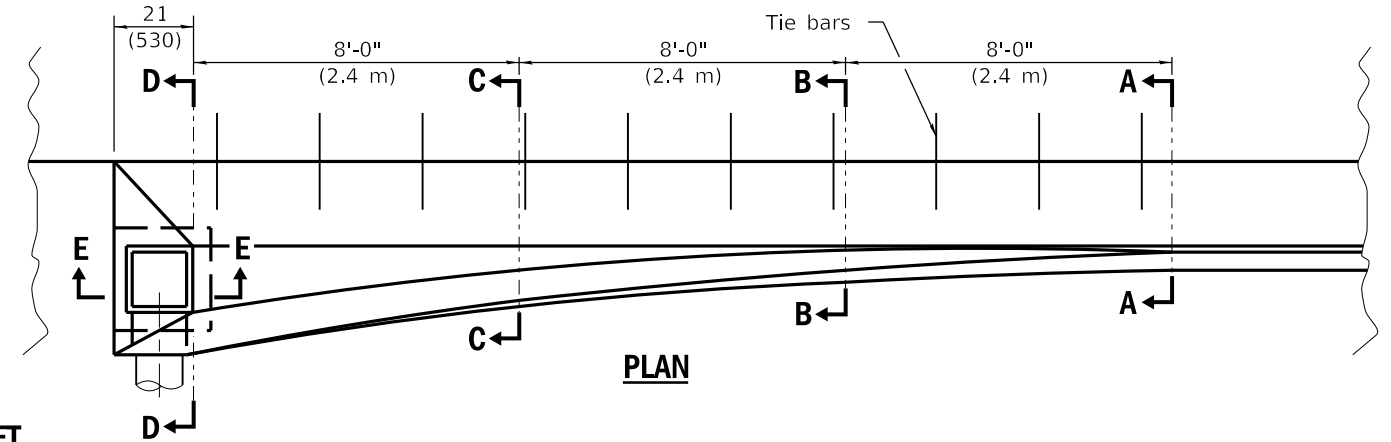
**SECTION B-B**



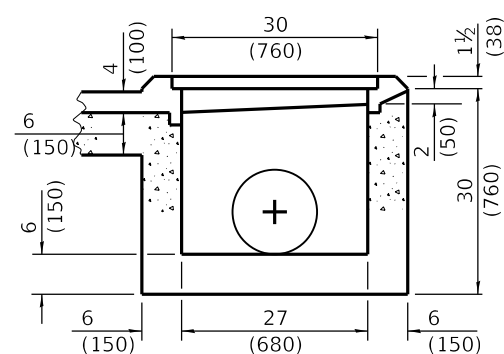
**SECTION A-A**



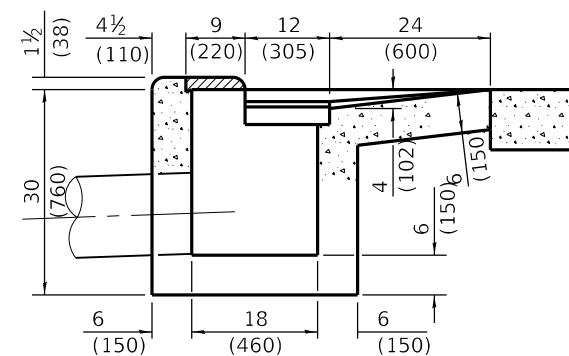
**SECTION D-D**



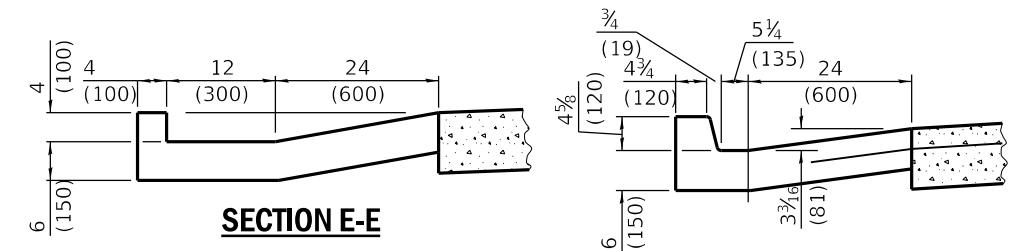
**GRATE AND COVER TYPE 2B**



**SECTION F-F**

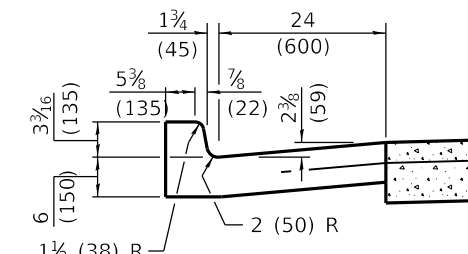


**SECTION D-D**

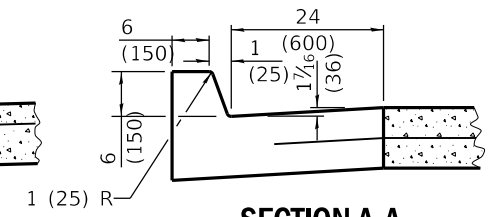


**SECTION E-E**

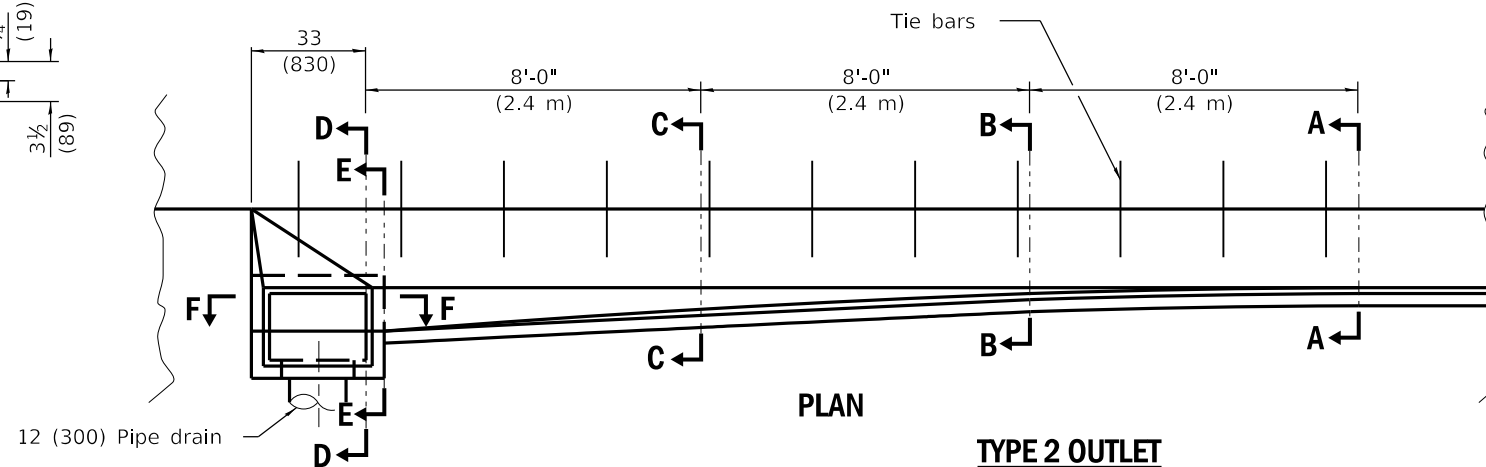
**SECTION C-C**



**SECTION B-B**



**SECTION A-A**



**QUANTITIES**

2.07 cu. yds. (1.58 m<sup>3</sup>) concrete for 9 (225) pav't.

2.07 cu. yds. (1.60 m<sup>3</sup>) concrete for 10 (250) pav't.

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

**OUTLETS FOR CONCRETE CURB AND GUTTER TYPE B-6.24 (B-15.60)**

(Sheet 2 of 2)

**STANDARD 606006-04**

Illinois Department of Transportation

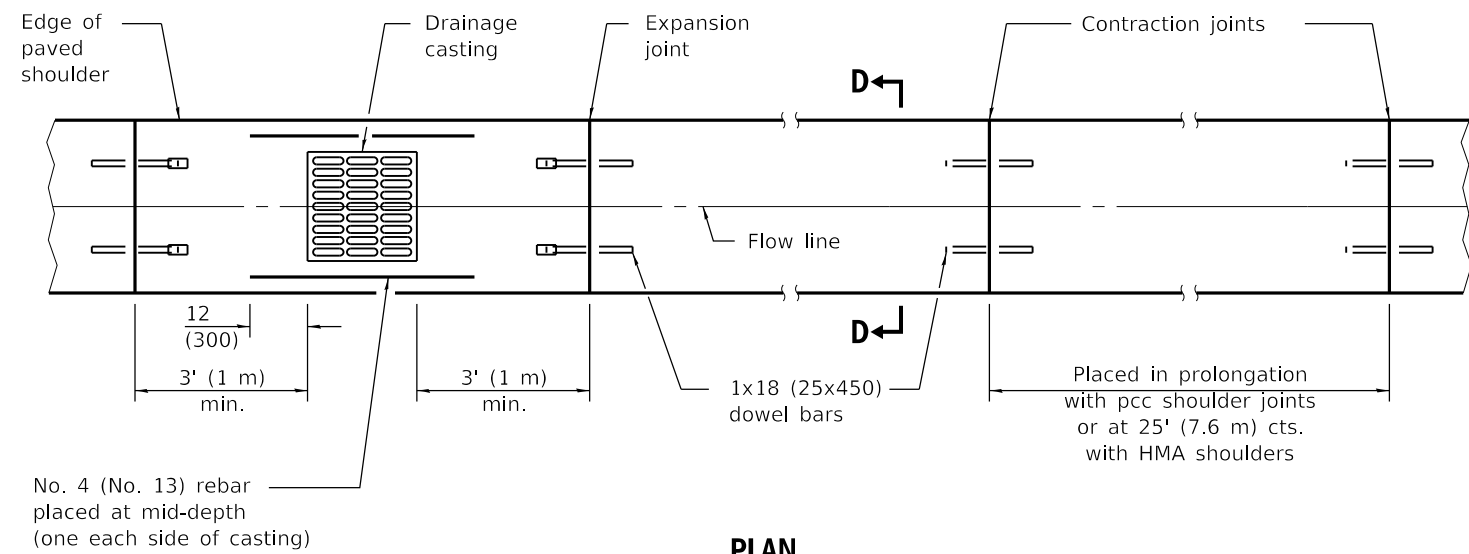
PASSED January 1, 2018

Michael Brand  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018

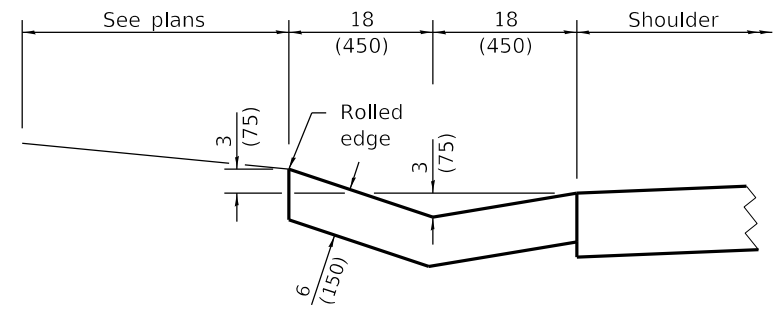
Maureen M. Beck  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 6-1-1-18

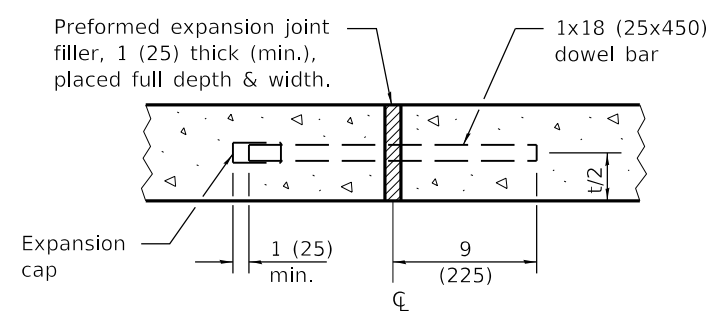


**PLAN**

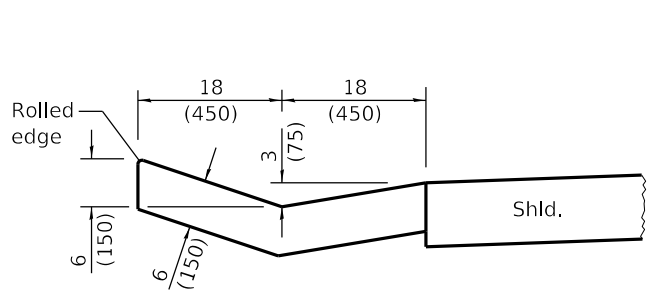
**TYPE A GUTTER**



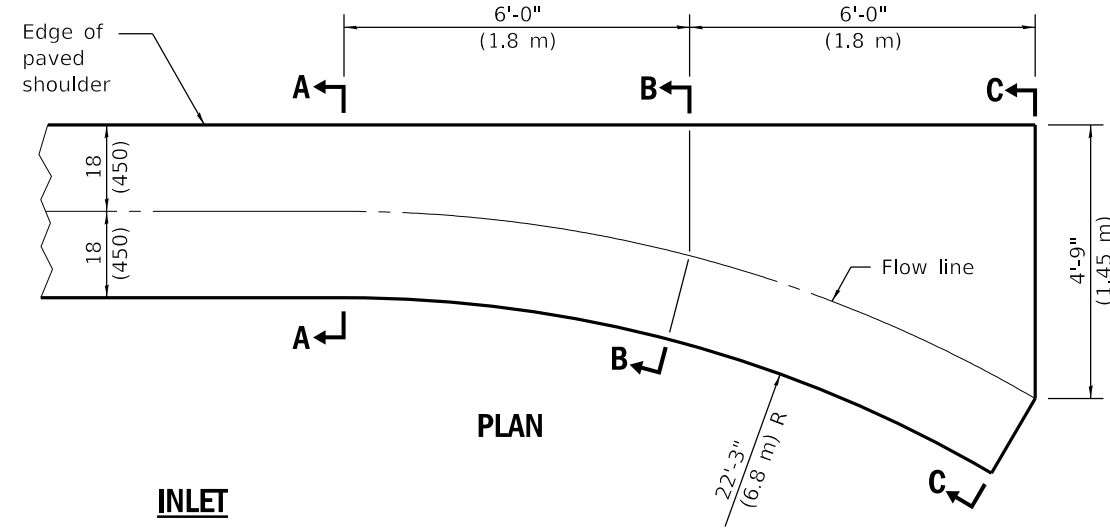
**SECTION D-D**



**EXPANSION JOINT**



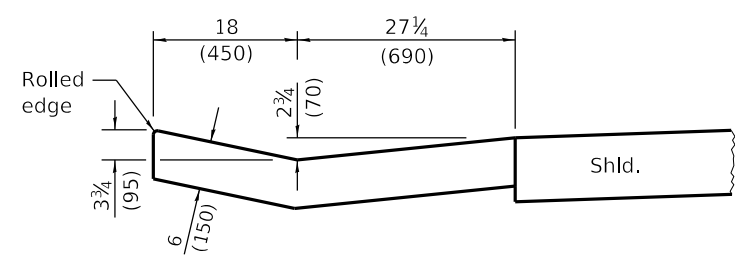
**SECTION A-A**



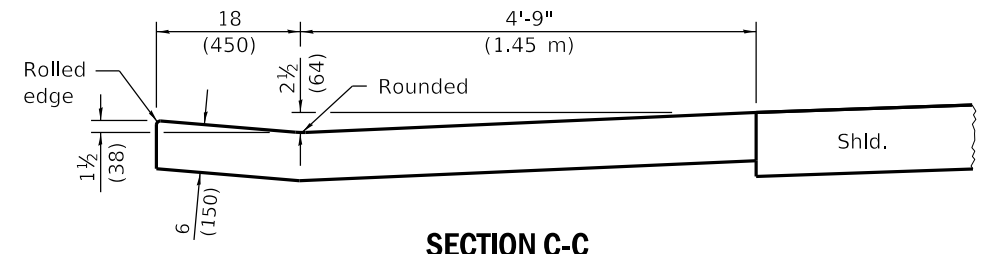
**PLAN**

**INLET**

QUANTITY OF CONCRETE  
Section A-A to C-C  
0.93 cu. yd. (0.71 m<sup>3</sup>)



**SECTION B-B**



**SECTION C-C**

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

Illinois Department of Transportation

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

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

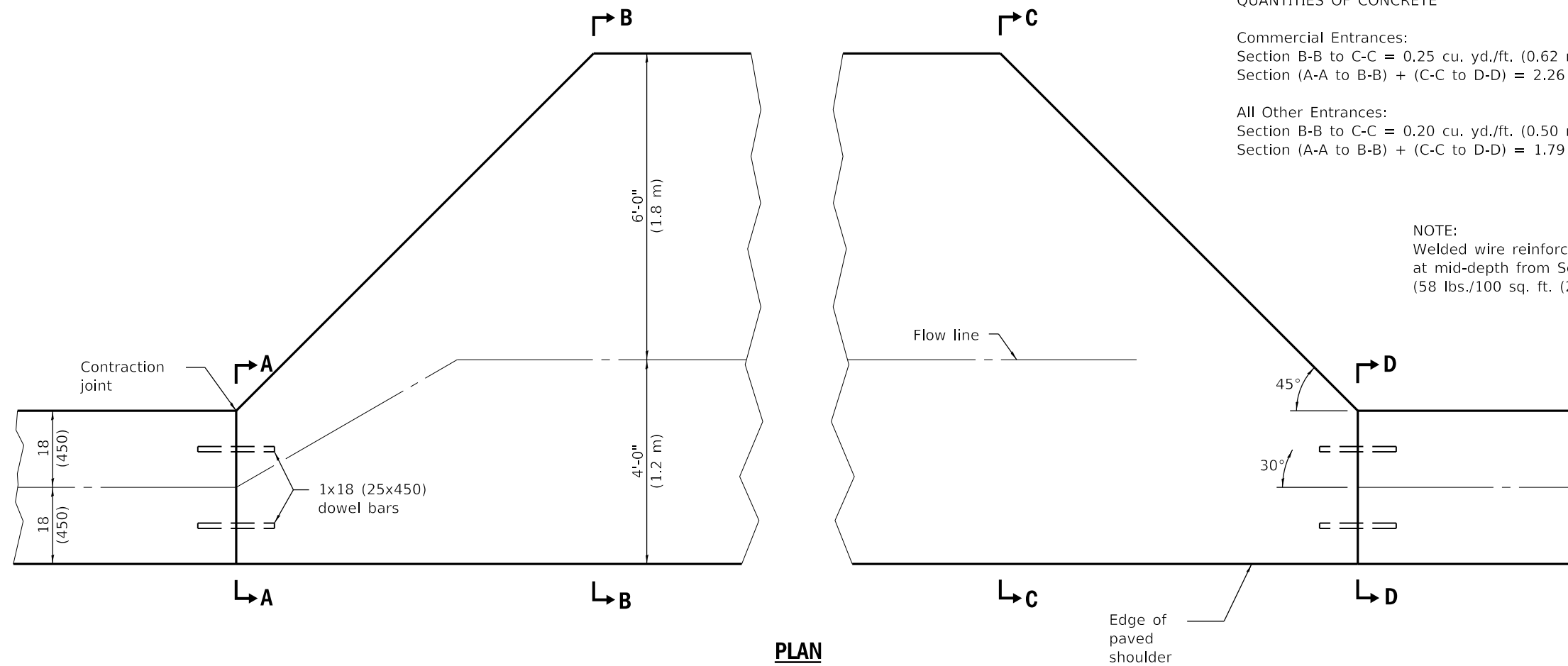
ISSUED 1-1-91  
46-T 03/05

DATE	REVISIONS
4-1-16	Changed terminology to 'welded wire reinforcement'.
1-1-09	Switched units to English (metric). Changed radii, adjusted qty's.

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

(Sheet 1 of 3)

**STANDARD 606101-05**

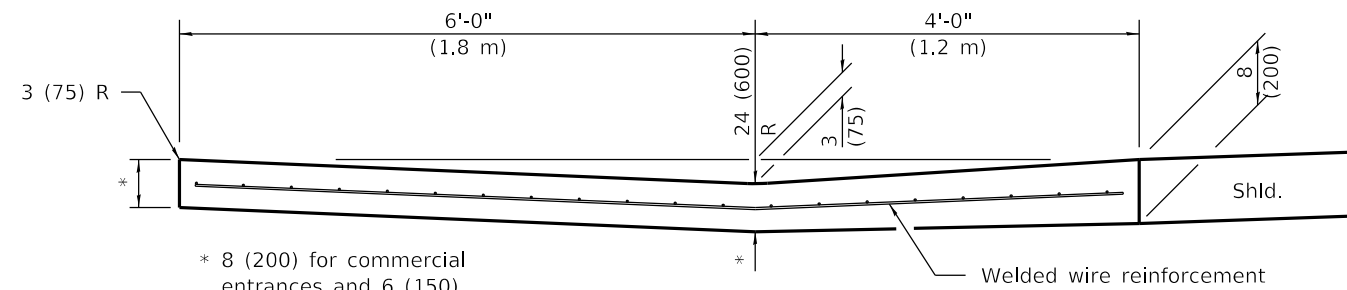
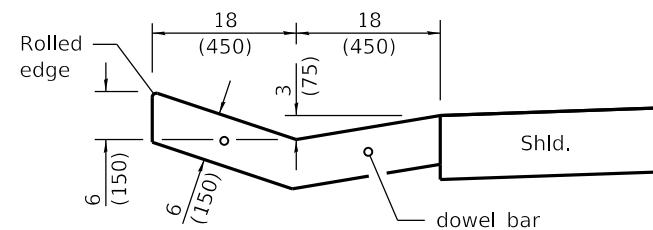


**QUANTITIES OF CONCRETE**

Commercial Entrances:  
 Section B-B to C-C = 0.25 cu. yd./ft. (0.62 m<sup>3</sup>/m).  
 Section (A-A to B-B) + (C-C to D-D) = 2.26 cu. yd. (1.73 m<sup>3</sup>).

All Other Entrances:  
 Section B-B to C-C = 0.20 cu. yd./ft. (0.50 m<sup>3</sup>/m).  
 Section (A-A to B-B) + (C-C to D-D) = 1.79 cu. yd. (1.37 m<sup>3</sup>).

**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/m<sup>2</sup>))



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

Illinois Department of Transportation

PASSED April 1, 2016

*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED April 1, 2016

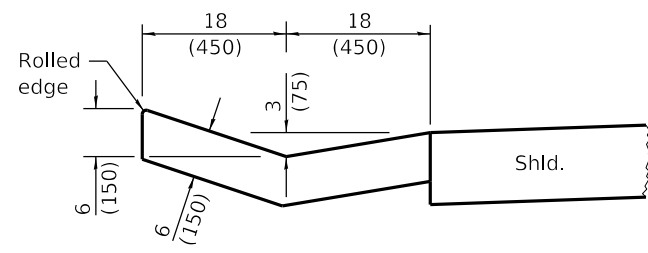
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

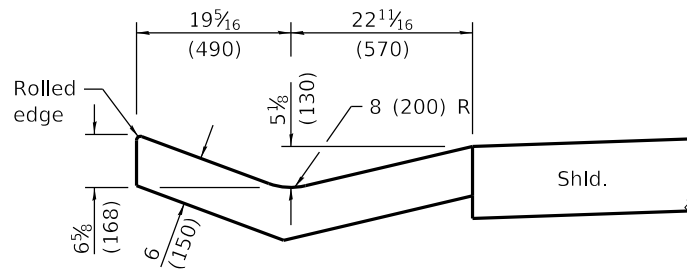
**TYPE A GUTTER**  
**(INLET, OUTLET & ENTRANCE)**

(Sheet 2 of 3)

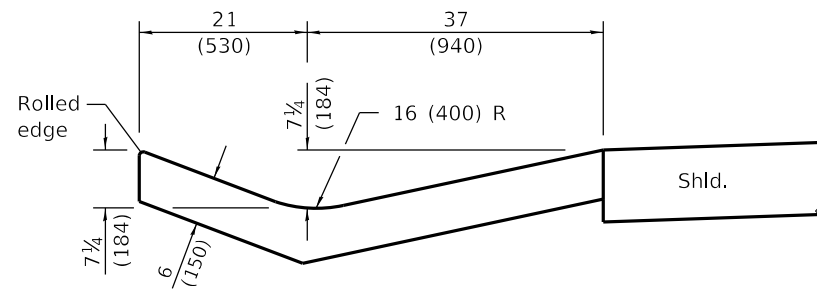
**STANDARD 606101-05**



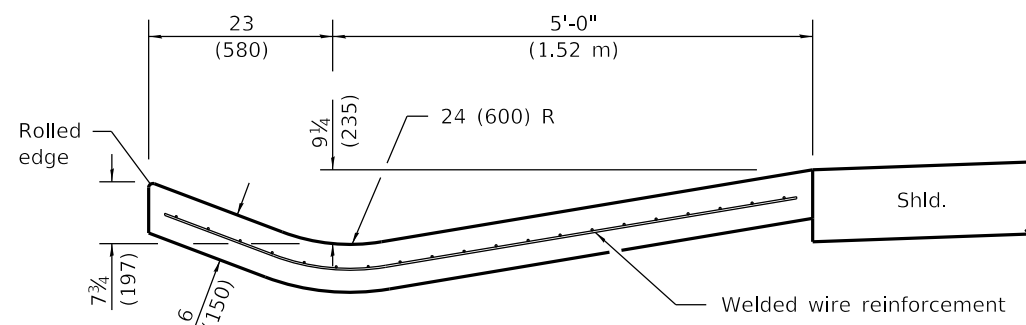
**SECTION A-A**



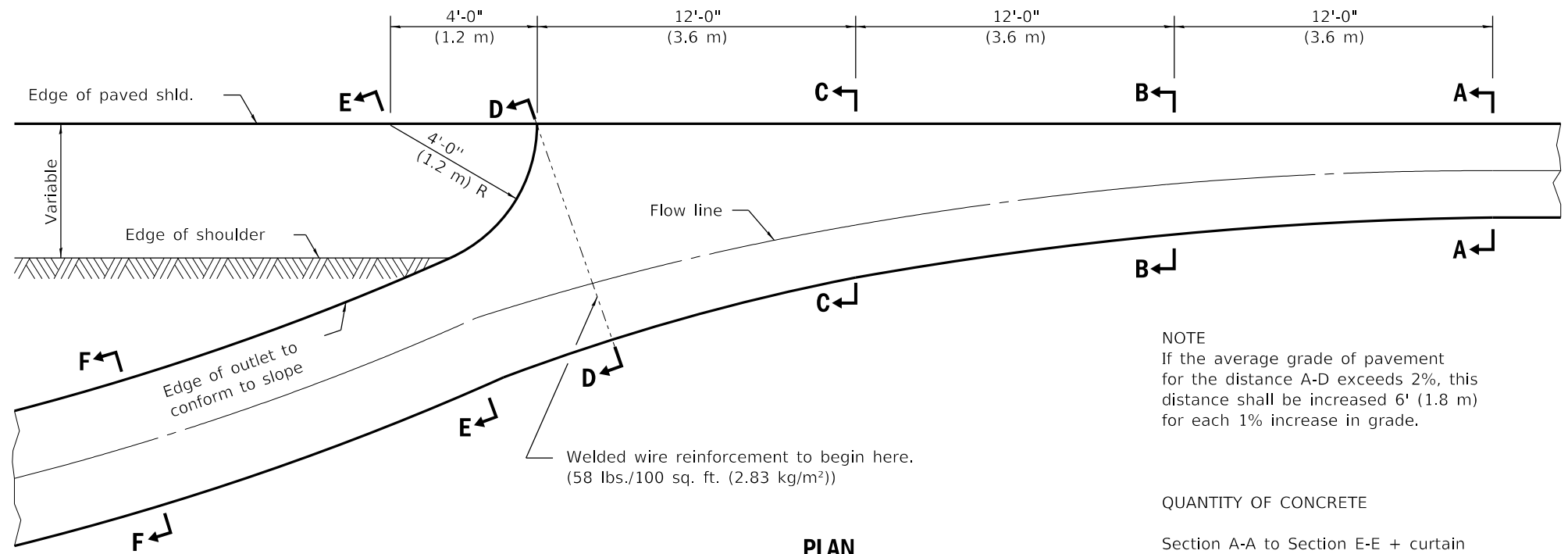
**SECTION B-B**



**SECTION C-C**



**SECTION D-D**



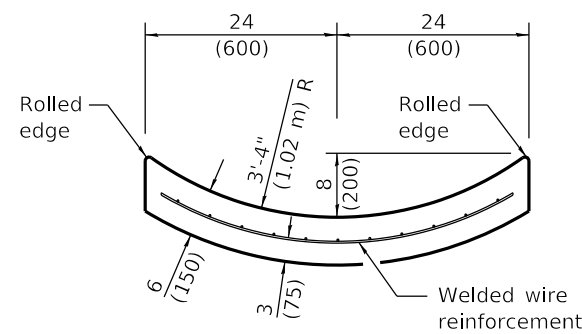
**PLAN**

**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.

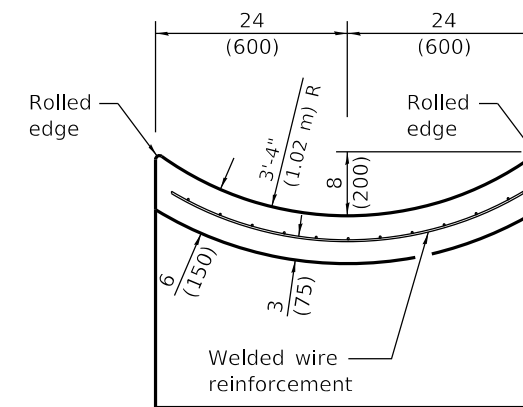
**QUANTITY OF CONCRETE**

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).

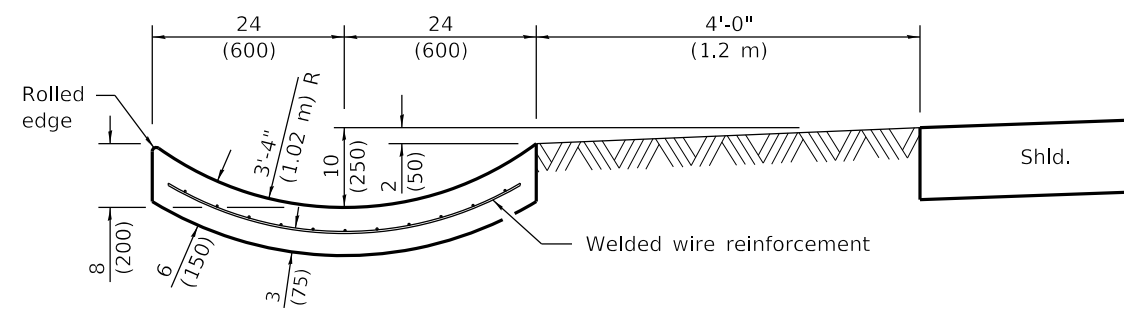
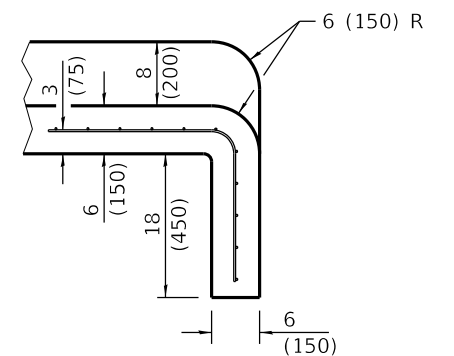
**OUTLET**



**SECTION F-F**



**SECTIONS AT END OF OUTLET**



**SECTION E-E**

Illinois Department of Transportation

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

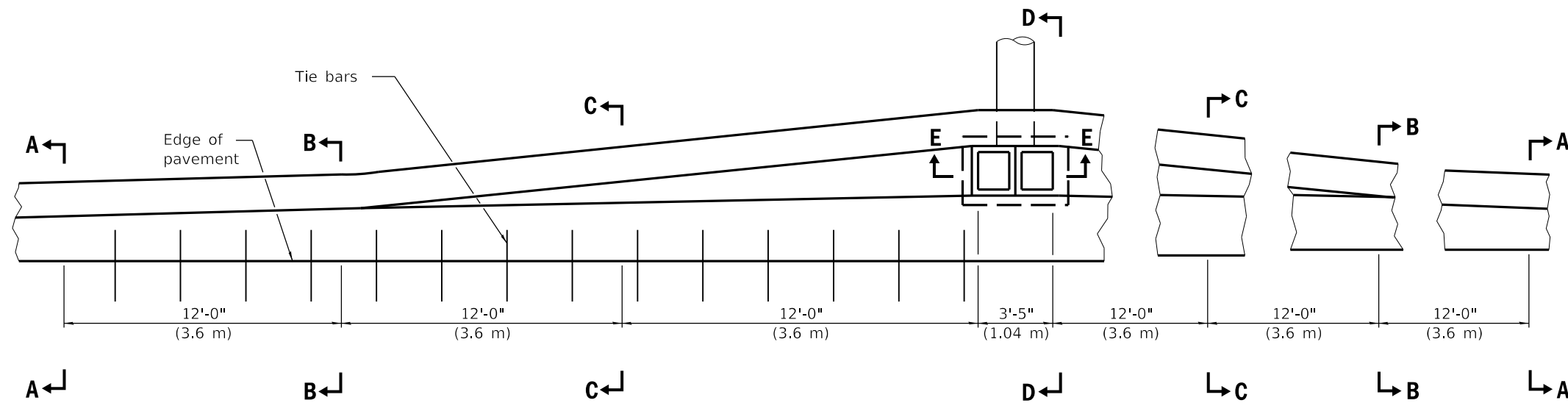
APPROVED [Signature] April 1, 2016  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

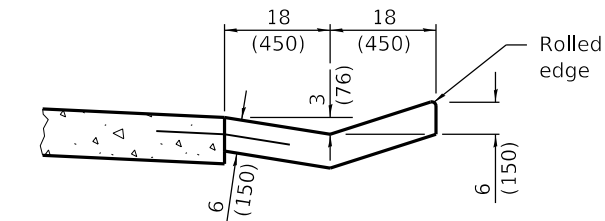
**TYPE A GUTTER  
(INLET, OUTLET & ENTRANCE)**

(Sheet 3 of 3)

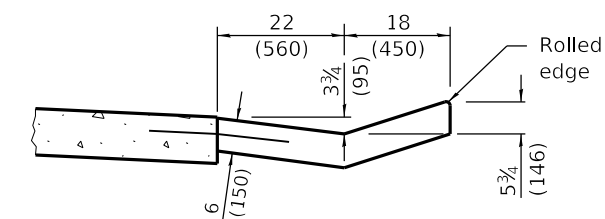
**STANDARD 606101-05**



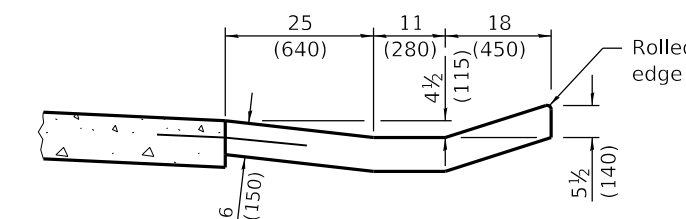
**PLAN-DOUBLE OUTLET**



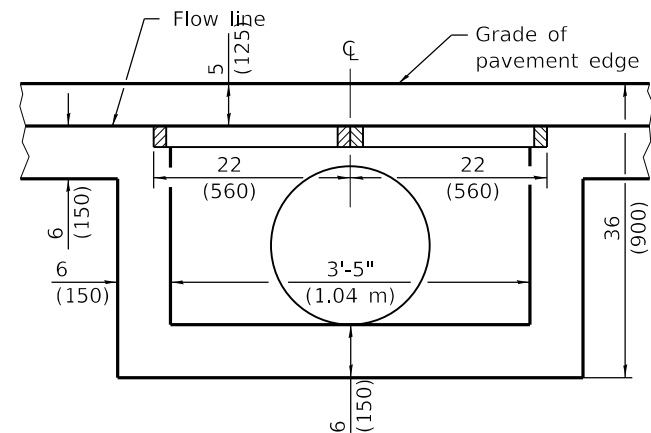
**SECTION A-A**



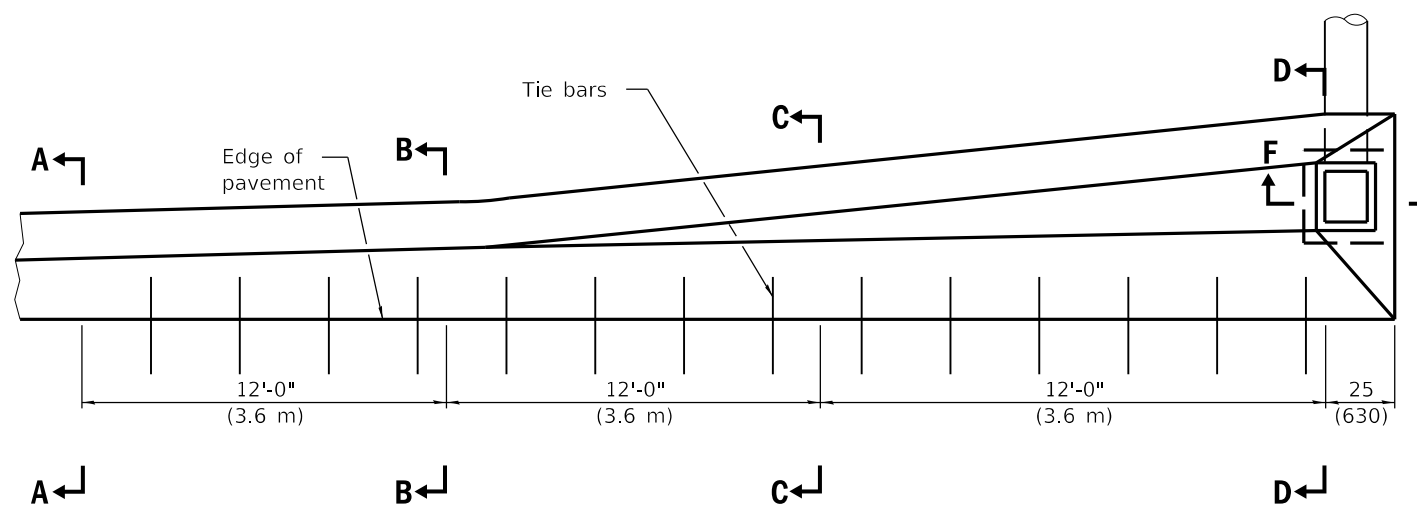
**SECTION B-B**



**SECTION C-C**



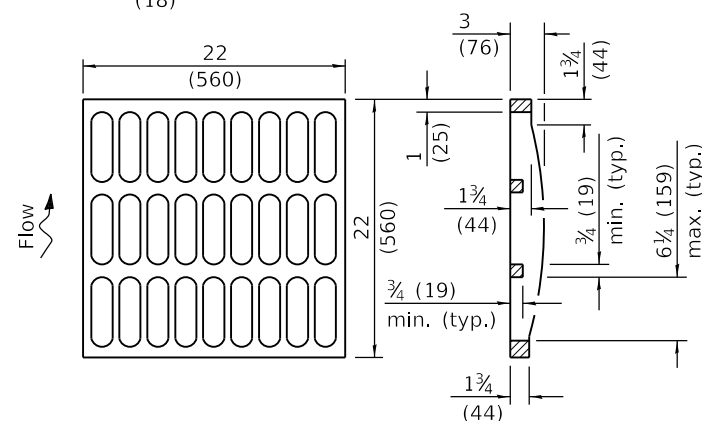
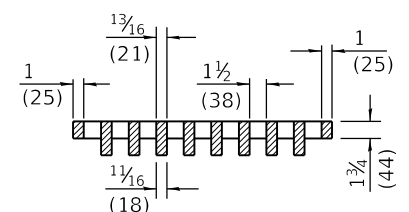
**SECTION E-E**



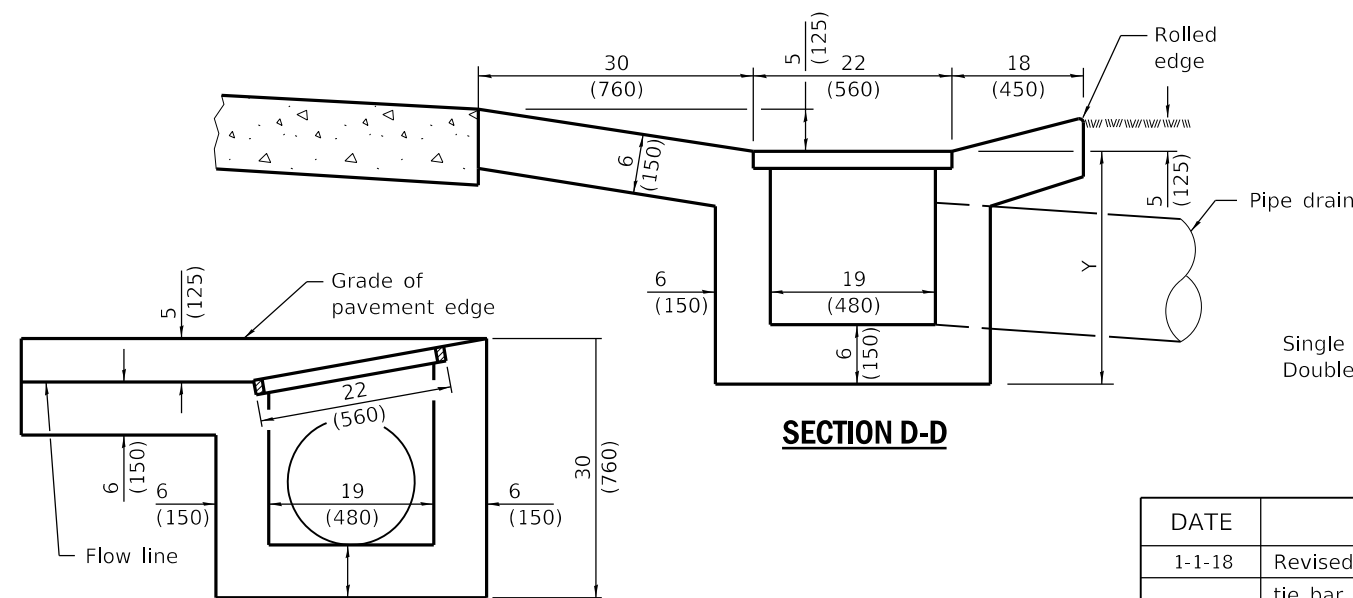
**PLAN-SINGLE OUTLET**

**QUANTITIES**

Material	Single	Double
Concrete - cu. yd. (m <sup>3</sup> )	3.3 (2.5)	6.5 (5)
Cast Iron Grate - Ea.	1	2
Pipe Drain - Dia. in. (mm)	15 (375)	18 (450)



**GRATE TYPE A**



**SECTION D-D**

Single - Y = 25 (635)  
Double - Y = 31 (775)

**SECTION F-F**

**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.

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**

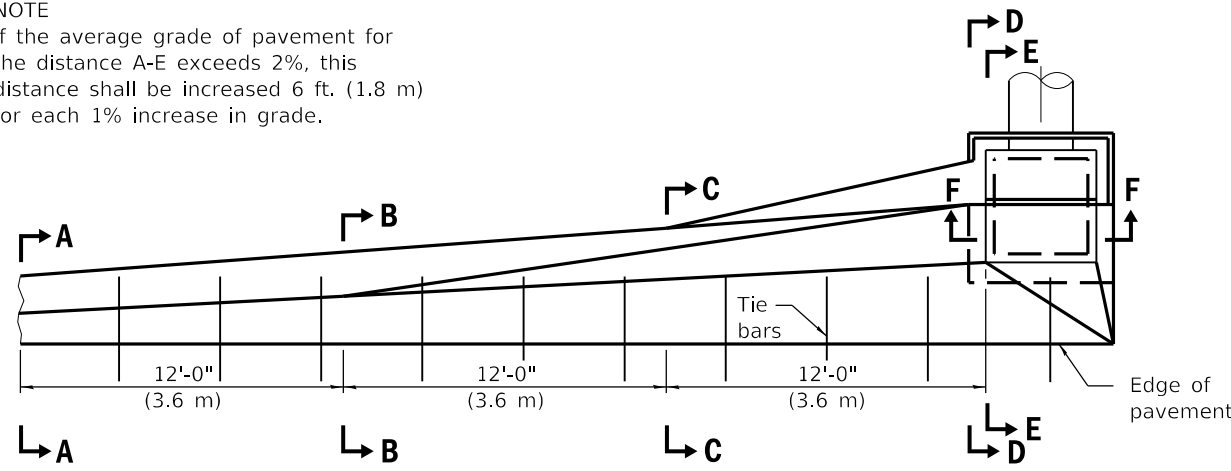
Illinois Department of Transportation

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

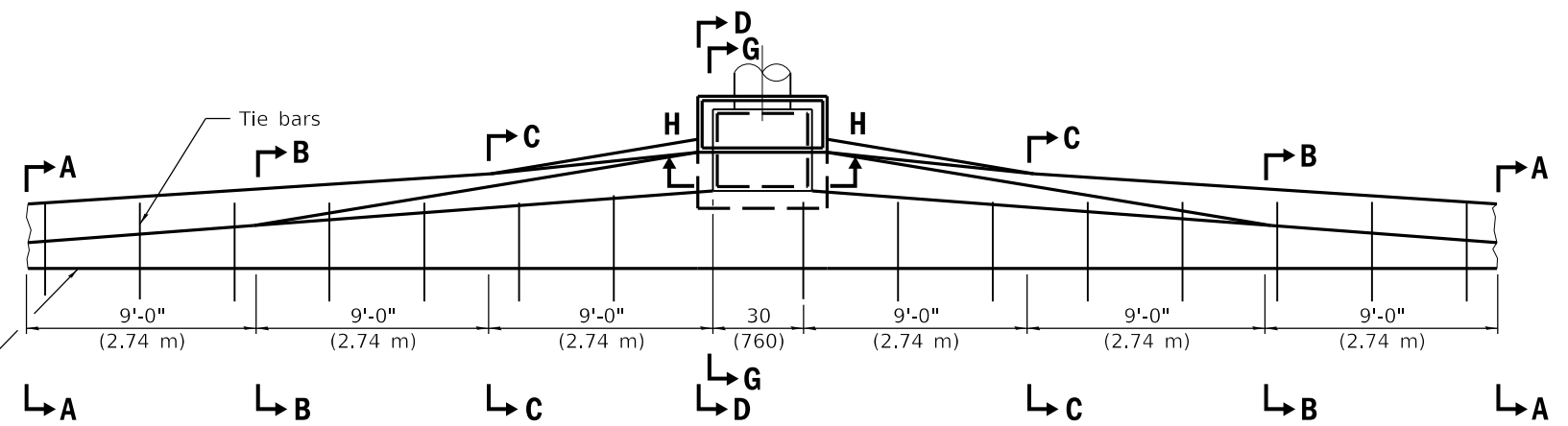
APPROVED January 1, 2018  
Maurice M. Beck  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 46-1-1-18

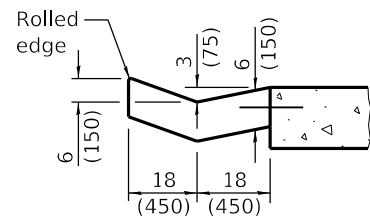
NOTE  
If the average grade of pavement for the distance A-E exceeds 2%, this distance shall be increased 6 ft. (1.8 m) for each 1% increase in grade.



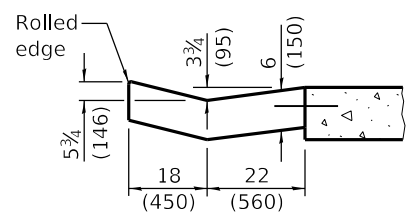
**PLAN - SINGLE OUTLET**



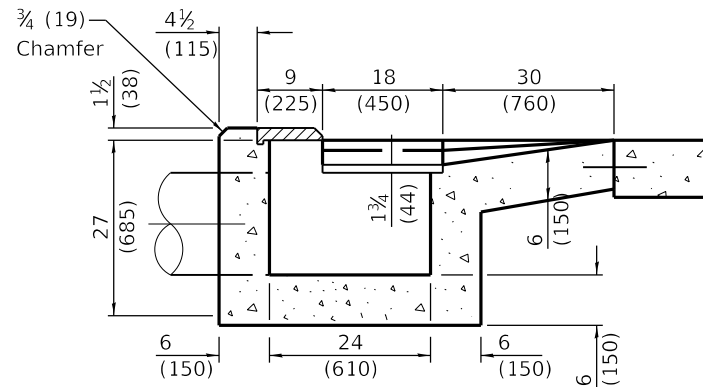
**PLAN - DOUBLE OUTLET**



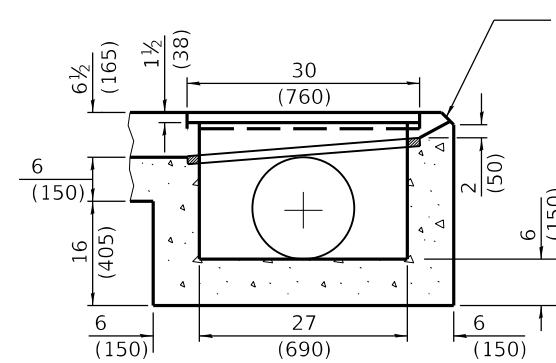
**SECTION A-A**



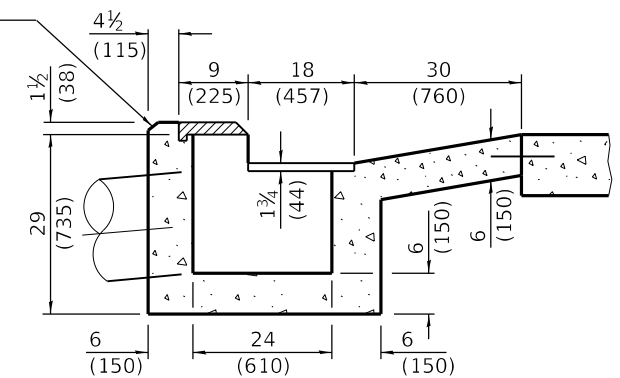
**SECTION B-B**



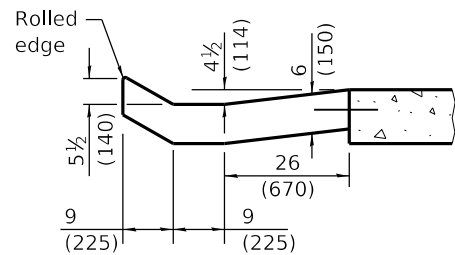
**SECTION E-E**



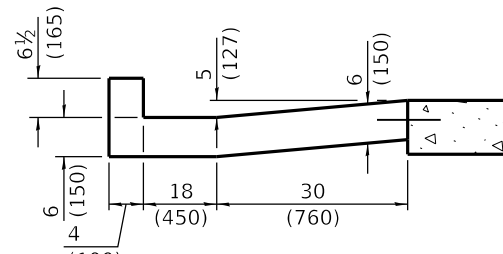
**SECTION F-F**



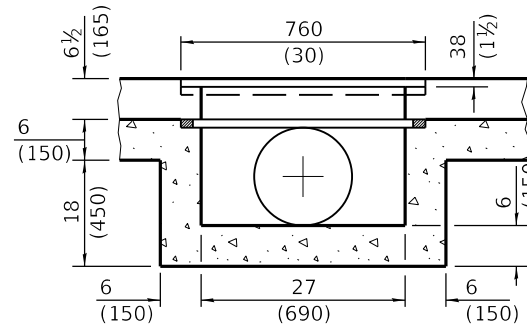
**SECTION G-G**



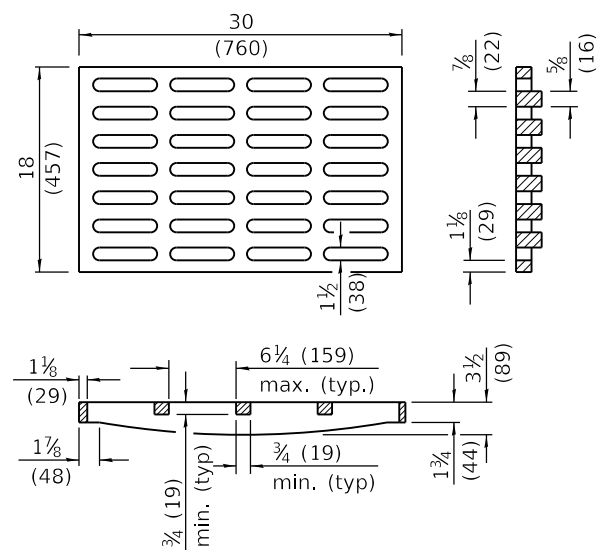
**SECTION C-C**



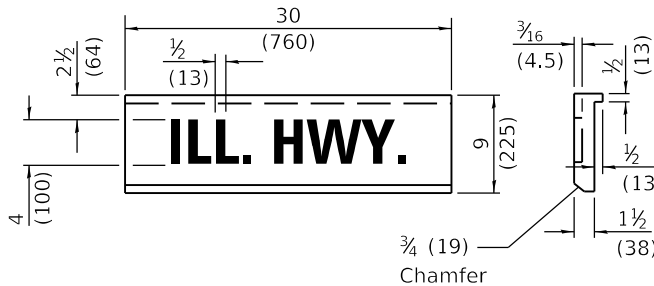
**SECTION D-D**



**SECTION H-H**



**GRATE AND COVER TYPE 2A**



**QUANTITIES**

Material	Single	Double
Concrete - cu. yd. (m <sup>3</sup> )	3.07 (2.35)	4.33 (3.31)
Cast Iron Grate - Ea.	1	1
Cast Iron Cover - Ea.	1	1
Pipe Drain - Dia. in. (mm)	15 (375)	18 (450)

**GENERAL NOTES**

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

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

DATE	REVISIONS
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**

Illinois Department of Transportation

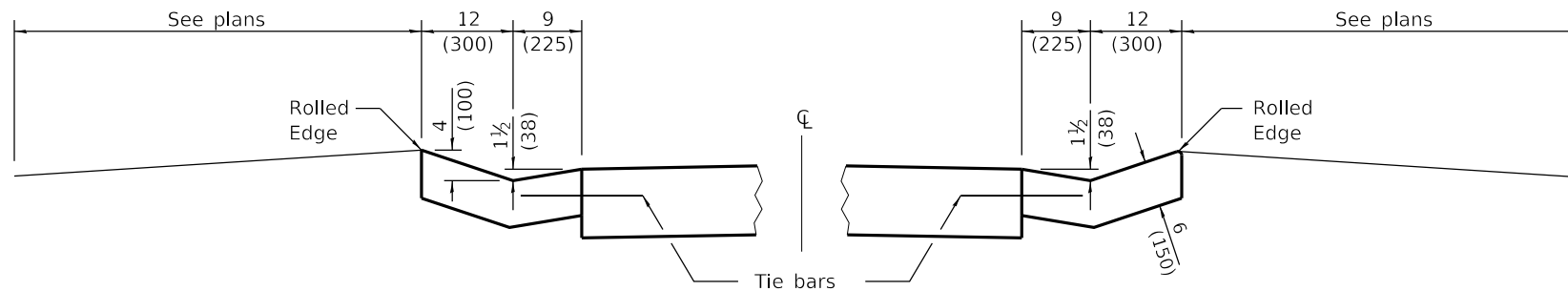
PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

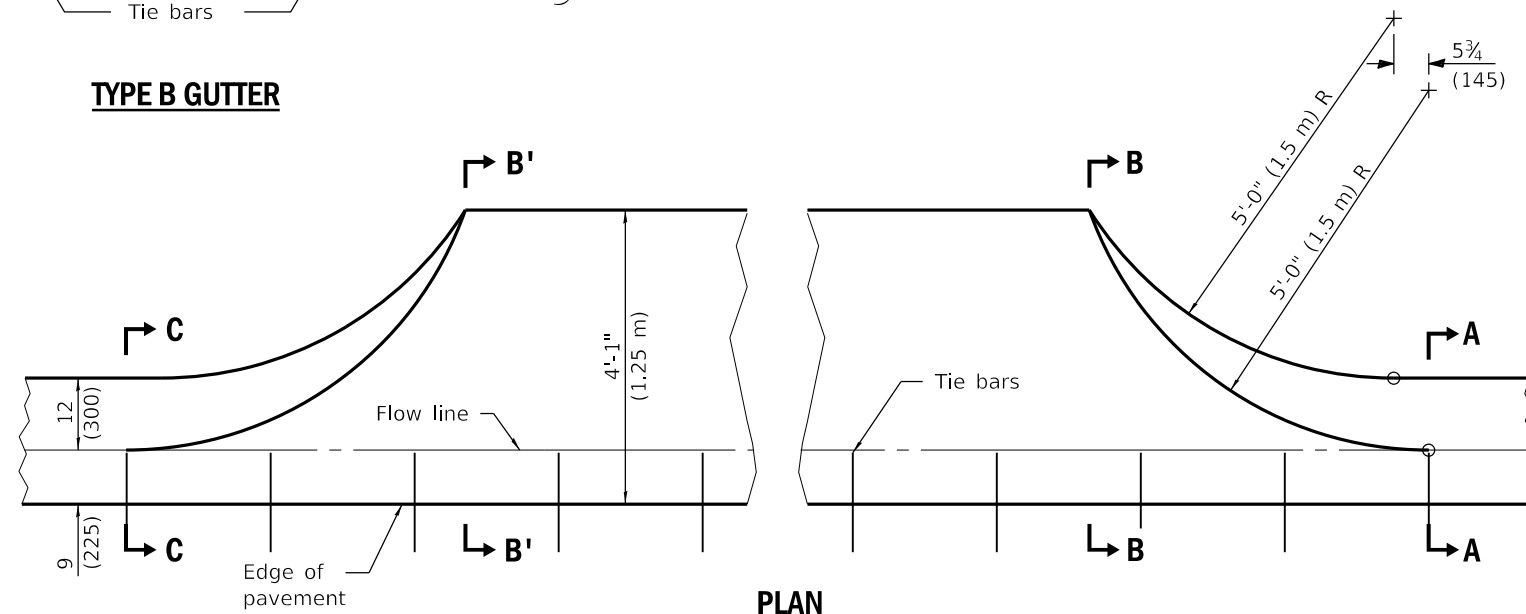
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-09

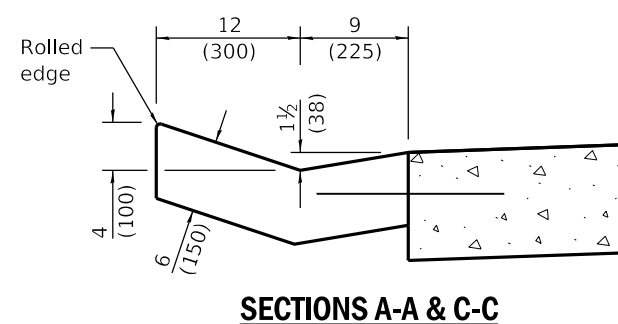


**TYPE B GUTTER**

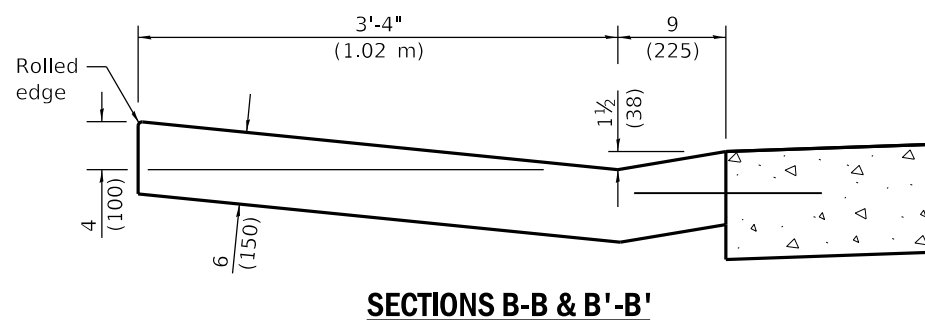


**PLAN**

QUANTITY OF CONCRETE  
 Section B'-B' to B-B = 0.076 cu. yd./ft. (0.19 m<sup>3</sup>/m)  
 Section (C-C to B'-B') + (B-B to A-A) = 0.44 cu. yd. (0.34 m<sup>3</sup>)



**SECTIONS A-A & C-C**



**SECTIONS B-B & B'-B'**

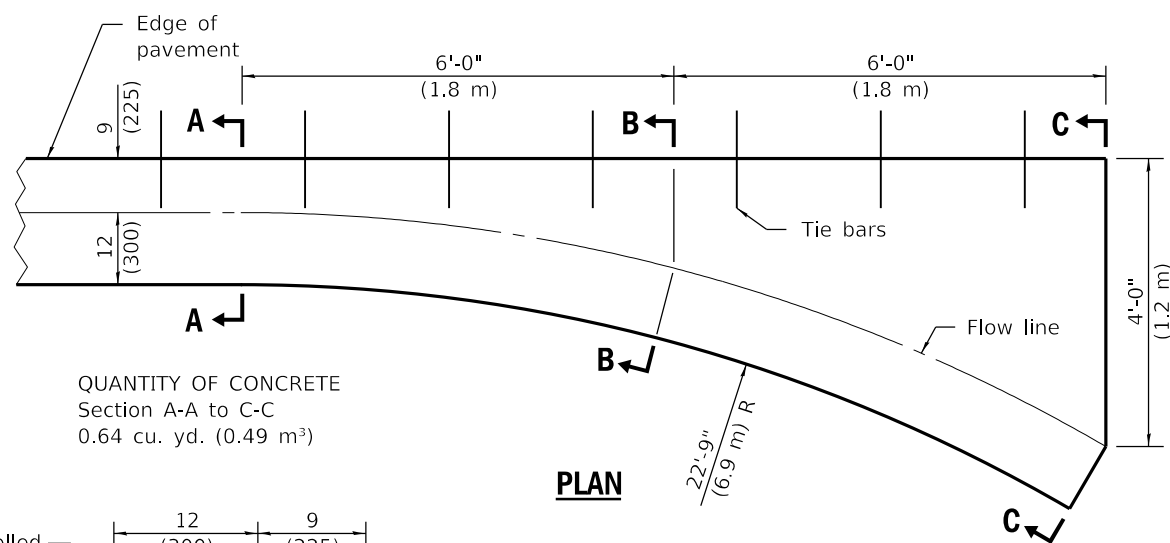
**ENTRANCE**

**GENERAL NOTES**

Gutter, gutter inlet, gutter outlet and gutter entrance shall be tied to the pavement in accordance with details for longitudinal construction joint shown on Standard 420001.

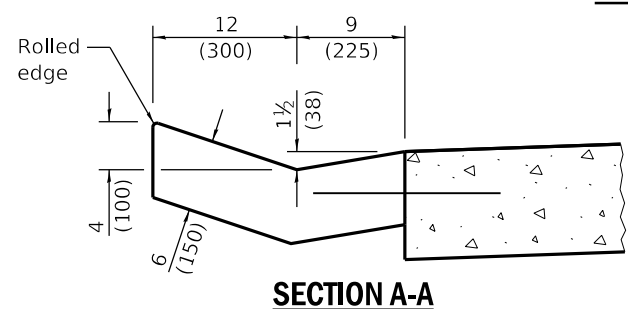
Two 1-1/4 x 18 (32 x 450) dowel bars shall be installed in all joints when the gutter is constructed adjacent to flexible pavement.

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

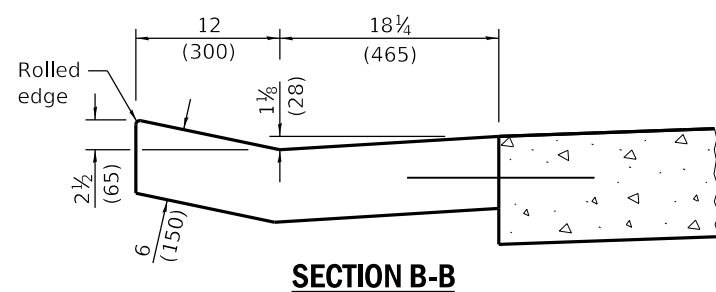


**PLAN**

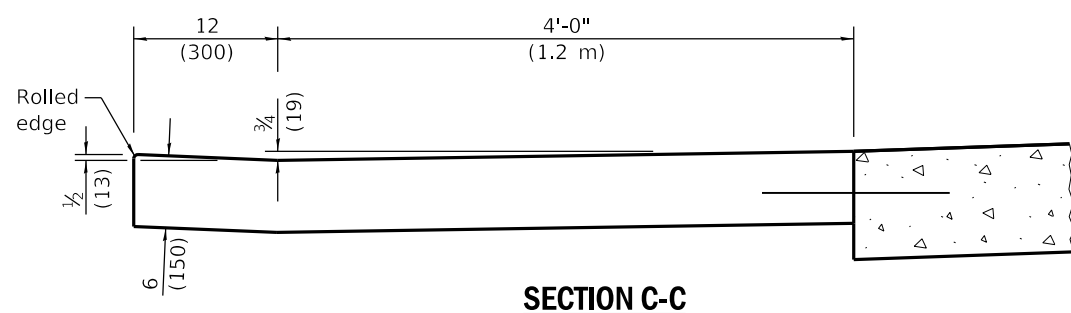
QUANTITY OF CONCRETE  
 Section A-A to C-C  
 0.64 cu. yd. (0.49 m<sup>3</sup>)



**SECTION A-A**



**SECTION B-B**



**SECTION C-C**

**INLET**

Illinois Department of Transportation

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

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

ISSUED 1-1-97

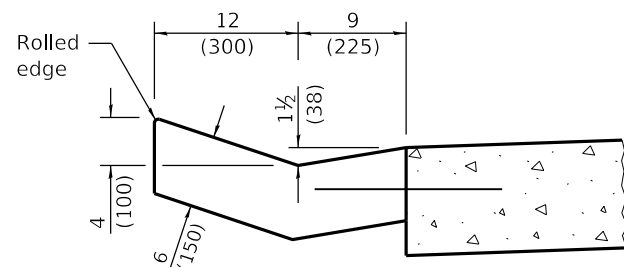
DATE	REVISIONS
1-1-18	Deleted first General Note to avoid conflict with second General Note.
4-1-16	Changed terminology to 'welded wire reinforcement'.

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

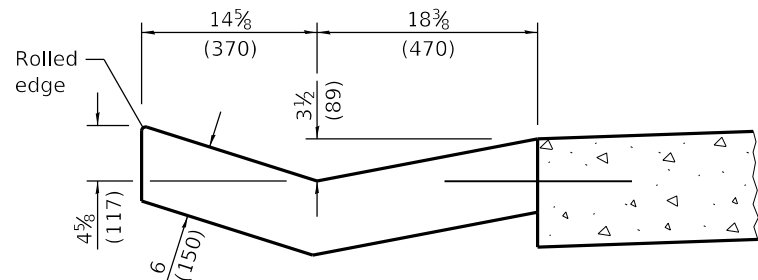
(Sheet 1 of 2)

**STANDARD 606201-04**

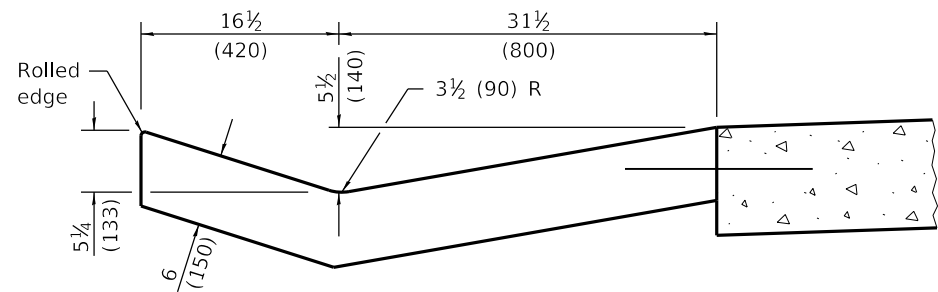




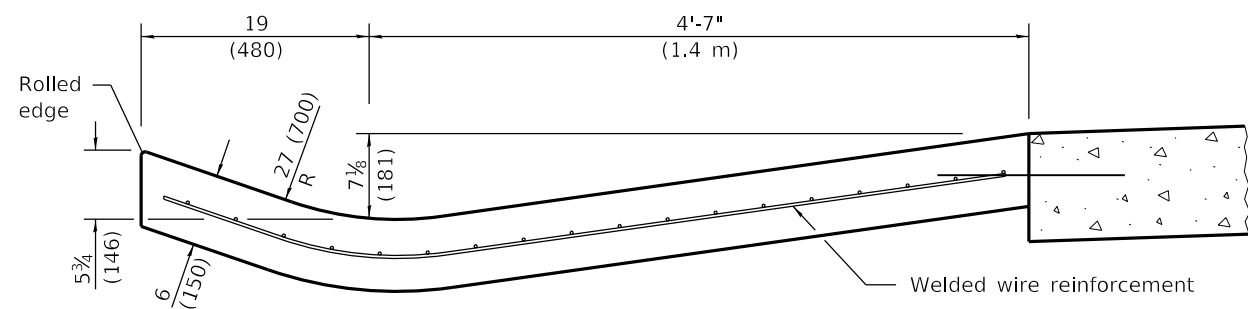
**SECTION A-A**



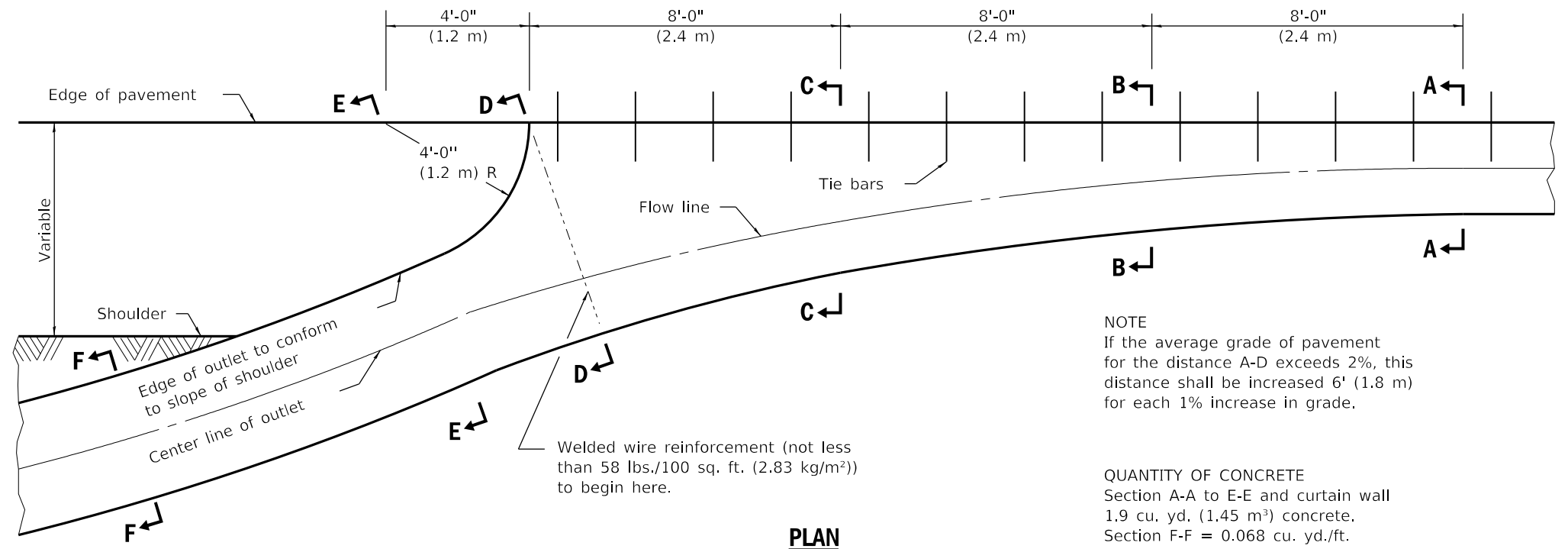
**SECTION B-B**



**SECTION C-C**



**SECTION D-D**

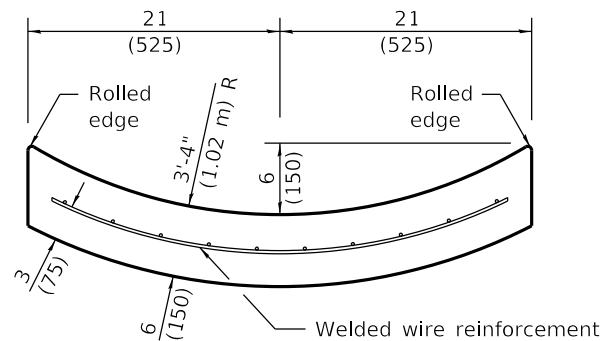


**PLAN**

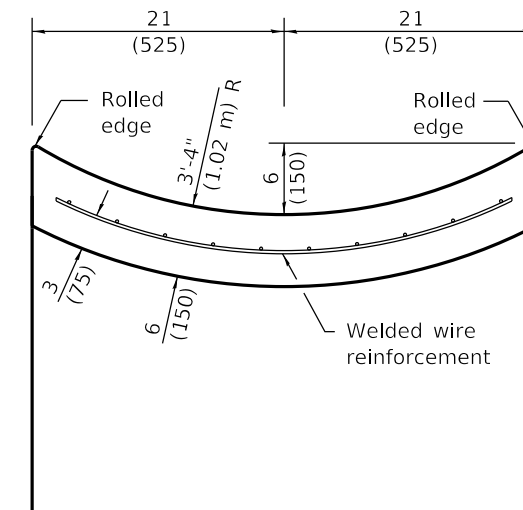
**NOTE**  
If the average grade of pavement for the distance A-D exceeds 2%, this distance shall be increased 6' (1.8 m) for each 1% increase in grade.

**QUANTITY OF CONCRETE**  
Section A-A to E-E and curtain wall 1.9 cu. yd. (1.45 m<sup>3</sup>) concrete.  
Section F-F = 0.068 cu. yd./ft. (0.17 m<sup>3</sup>/m).

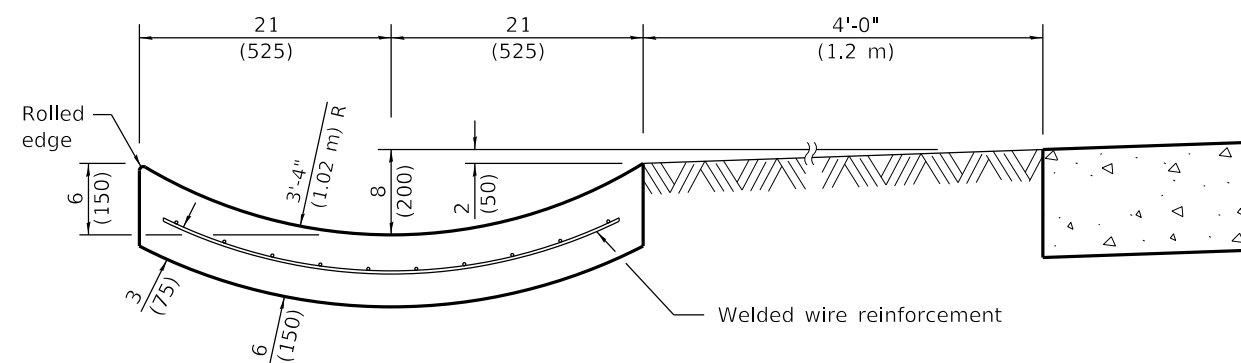
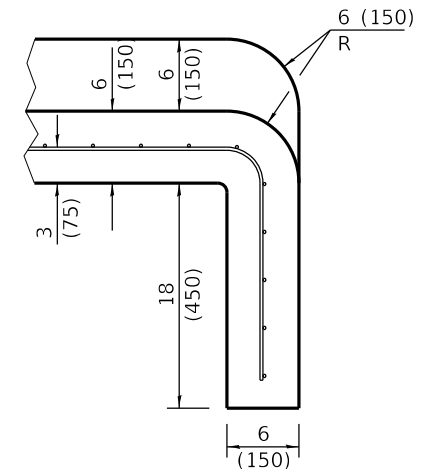
**OUTLET**



**SECTION F-F**



**SECTIONS AT END OF OUTLET**



**SECTION E-E**

Illinois Department of Transportation

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

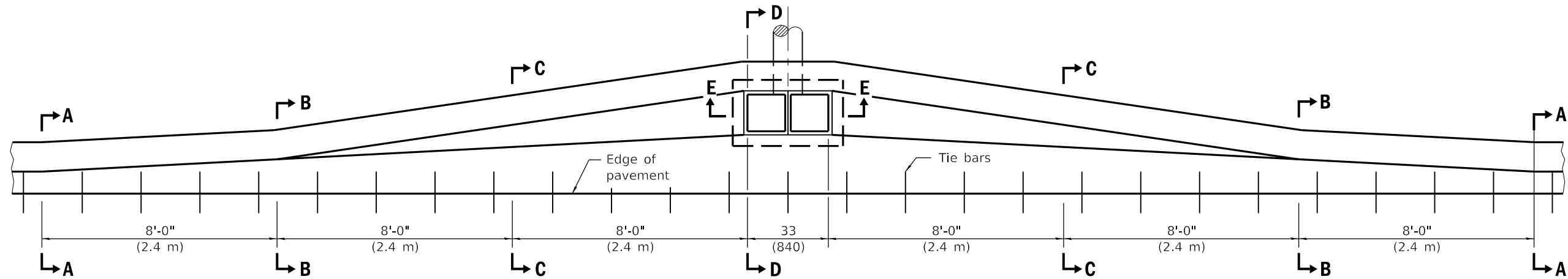
APPROVED January 1, 2018  
*Maureen M. Beck*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

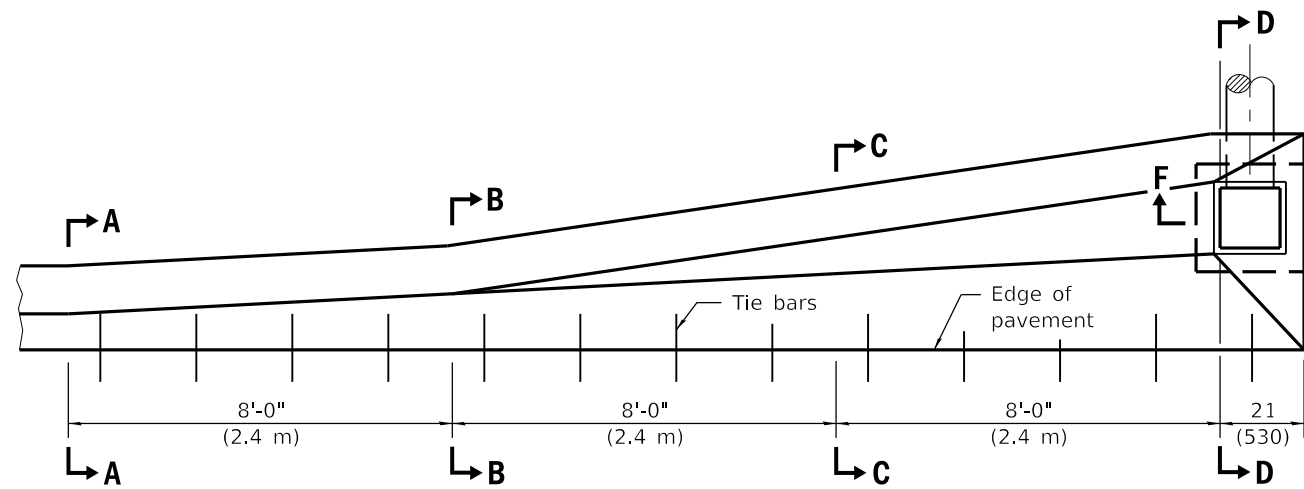
**TYPE B GUTTER  
(INLET, OUTLET & ENTRANCE)**

(Sheet 2 of 2)

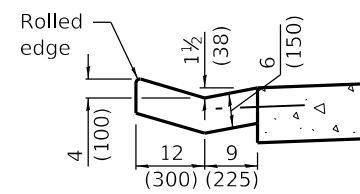
**STANDARD 606201-04**



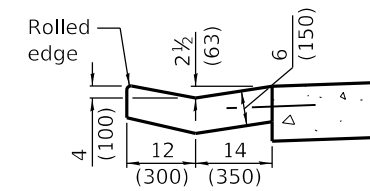
**PLAN - DOUBLE OUTLET**



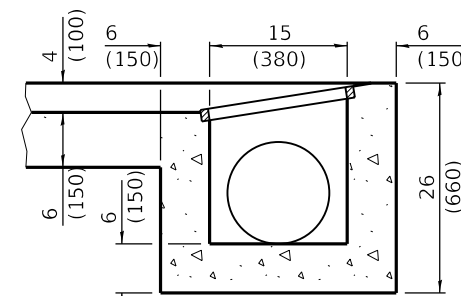
**PLAN - SINGLE OUTLET**



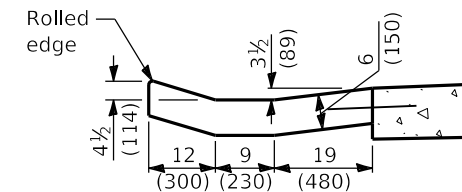
**SECTION A-A**



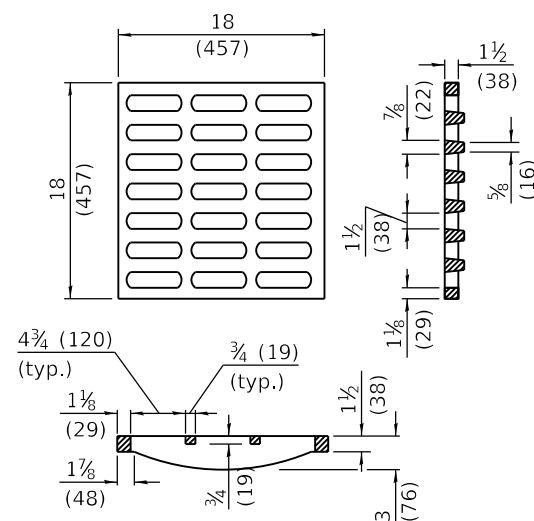
**SECTION B-B**



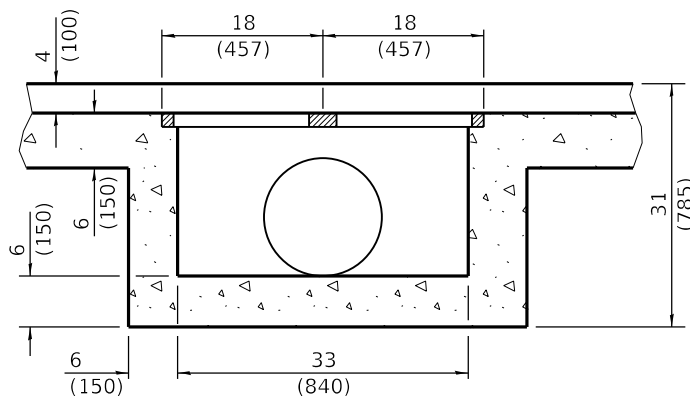
**SECTION F-F**



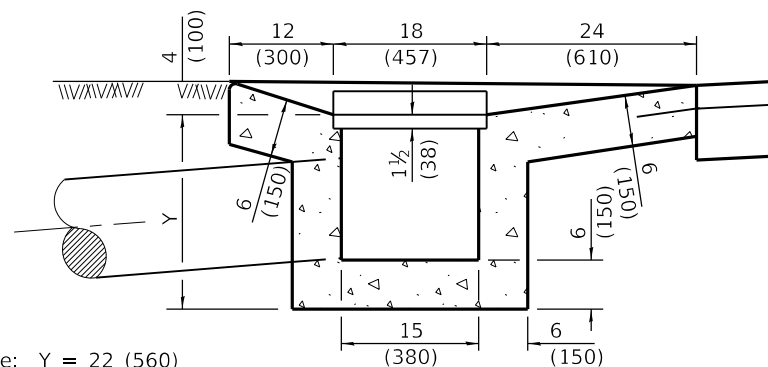
**SECTION C-C**



**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 <sup>3</sup> )	1.7 (1.3)	3.1 (2.4)
Cast Iron Grate - Ea.	1	2
Pipe Drain - Dia. in (mm)	12 (300)	15 (375)

**GENERAL NOTES**

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

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

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

DATE	REVISIONS
1-1-18	Deleted second General Note to avoid conflict with first General Note.
1-1-09	Switched units to English (metric).

**OUTLET TYPE 1 FOR TYPE B GUTTER**

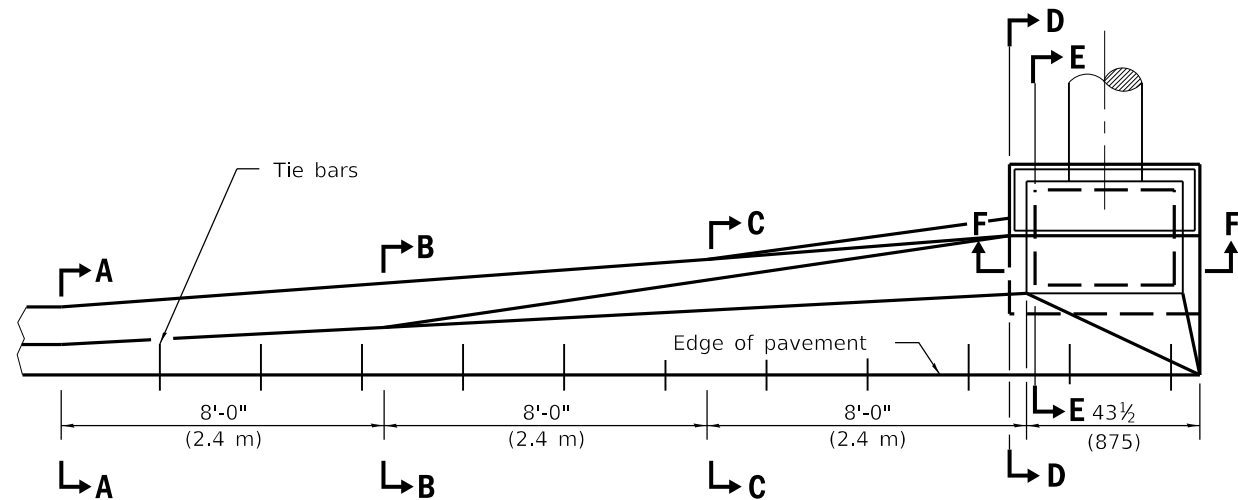
**STANDARD 606206-04**

Illinois Department of Transportation

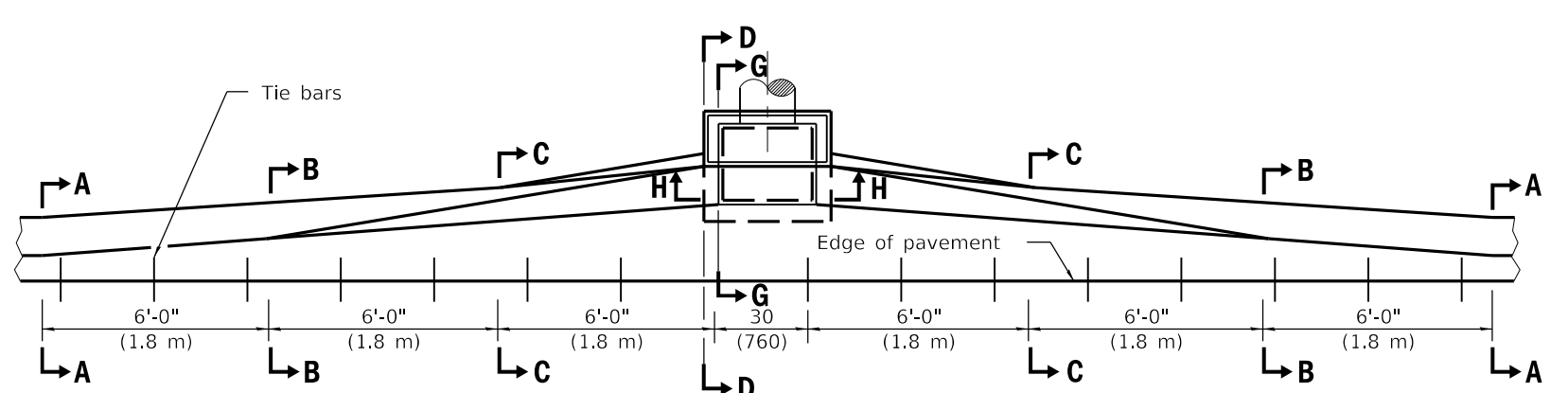
PASSED January 1, 2018  
*Michael Beard*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018  
*Marcus M. Beck*  
ENGINEER OF DESIGN AND ENVIRONMENT

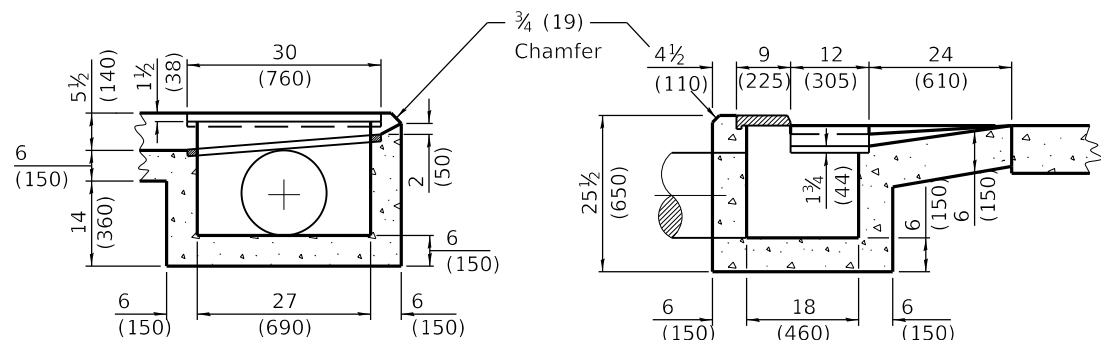
ISSUED 6-1-18



**PLAN - SINGLE OUTLET**

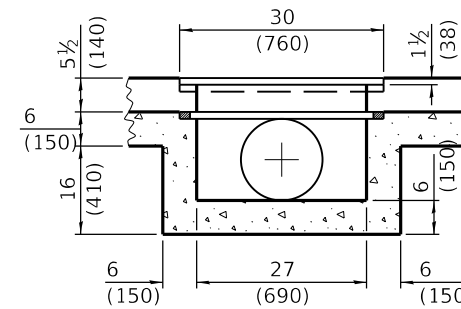


**PLAN - DOUBLE OUTLET**

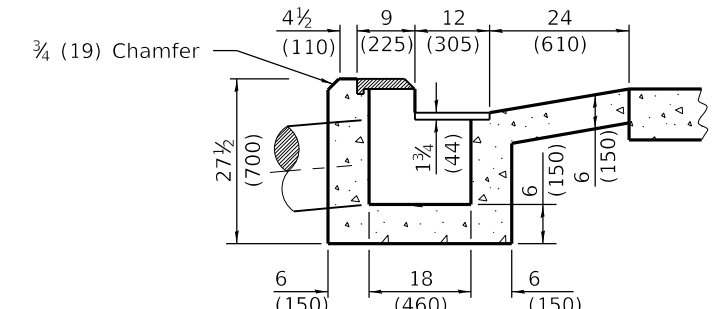


**SECTION F-F**

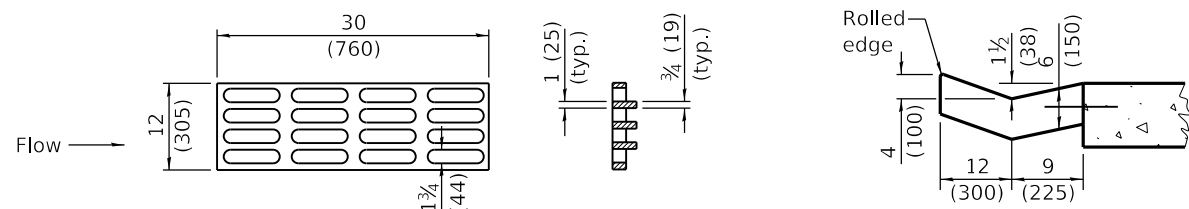
**SECTION E-E**



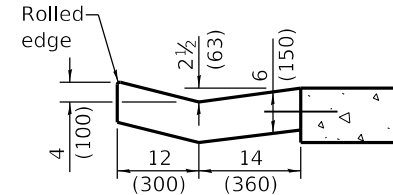
**SECTION H-H**



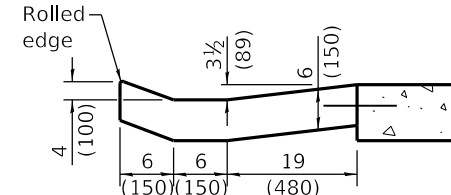
**SECTION G-G**



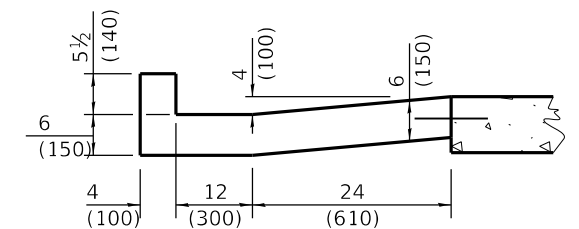
**SECTION A-A**



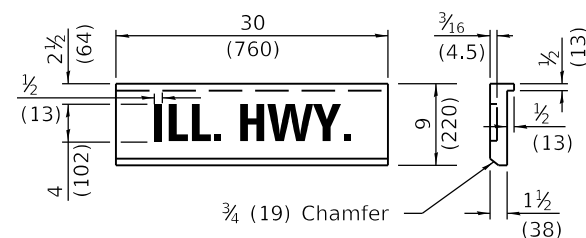
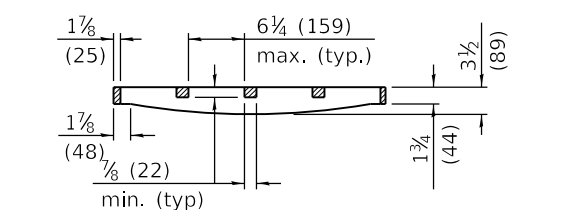
**SECTION B-B**



**SECTION C-C**



**SECTION D-D**



**GRATE AND COVER TYPE 2B**

**QUANTITIES**

Material	Single	Double
Concrete - cu. yd. (m <sup>3</sup> )	1.62 (1.24)	2.18 (1.67)
Cast Iron Grate - Ea.	1	1
Cast Iron Cover - Ea.	1	1
Pipe Drain - Dia. in. (mm)	12 (300)	15 (375)

**GENERAL NOTES**

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

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

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

DATE	REVISIONS
1-1-18	Revised tie bar notes to be consistent with other gutter Highway Standards.
1-1-09	Switched units to English (metric).

**OUTLETS TYPE 2 FOR TYPE B GUTTER**

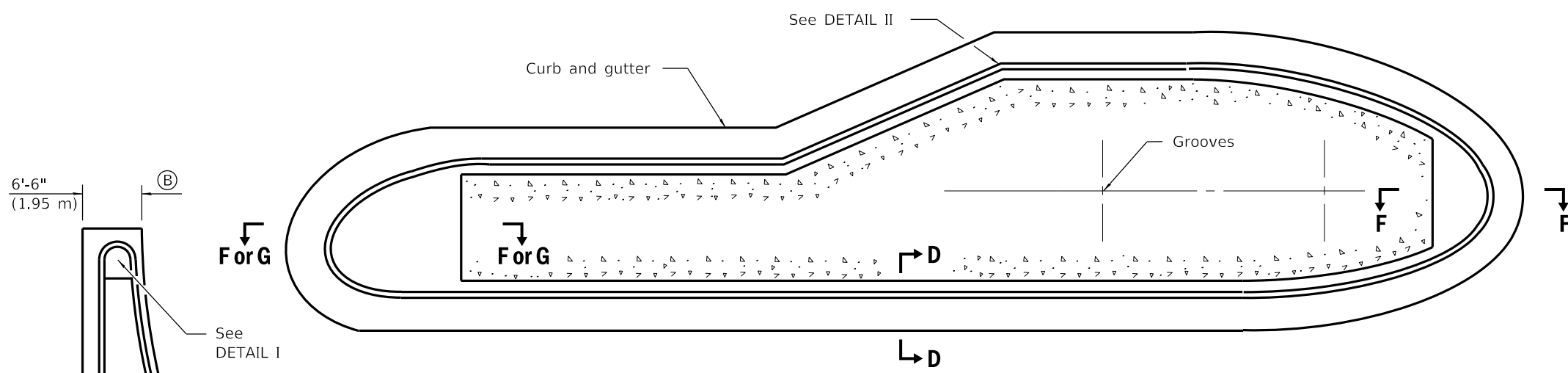
**STANDARD 606211-04**

Illinois Department of Transportation

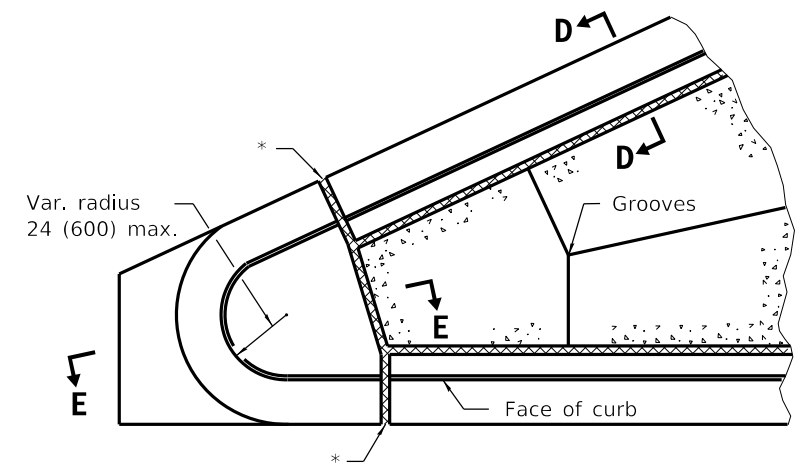
PASSED January 1, 2018  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

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

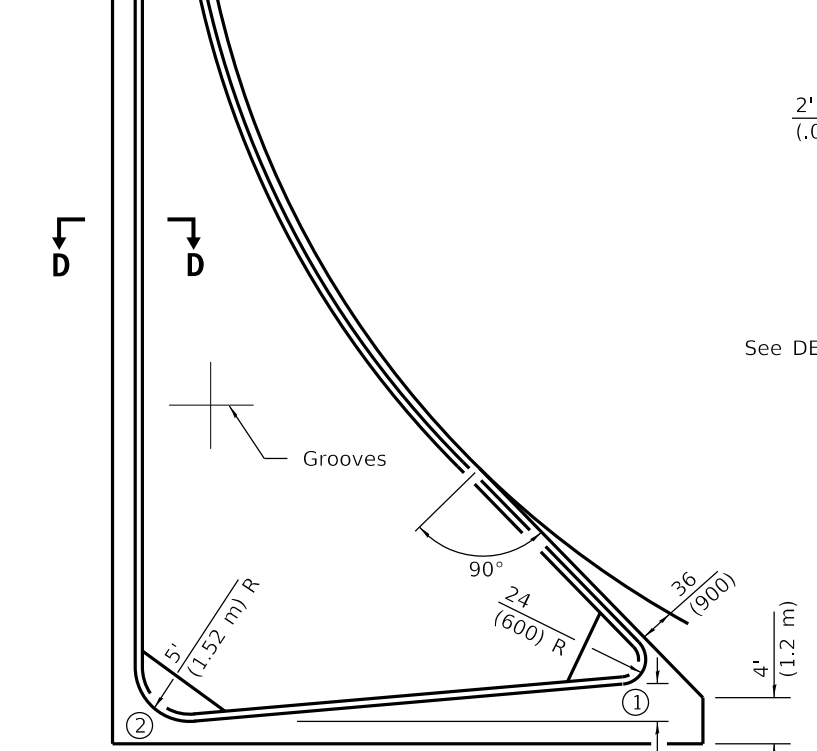
ISSUED 1-1-18



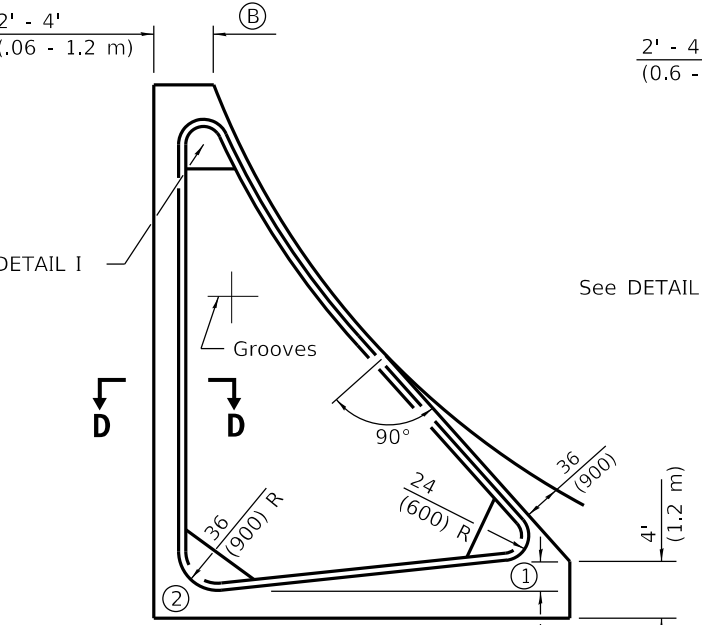
**TYPICAL PLAN OF MEDIAN ISLAND**  
(SEE SHEET 2 FOR DETAILS OF RAMPED NOSES)



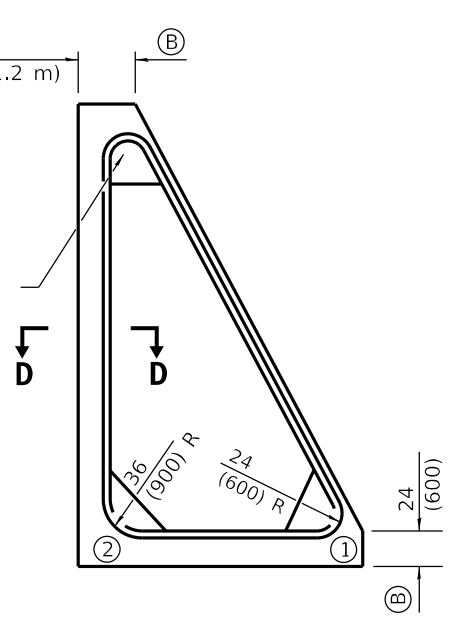
**DETAIL I**



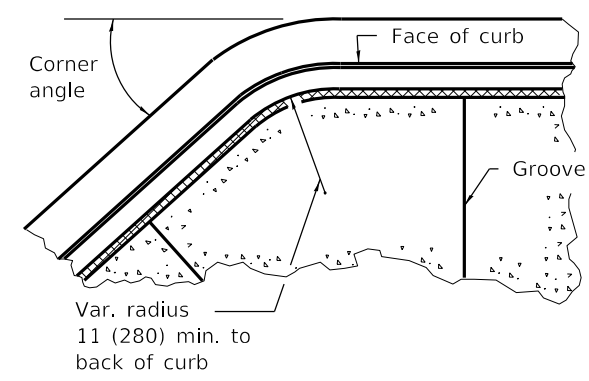
**LARGE ISLAND**  
(FREE FLOW DESIGN)  
36 (900) Offset for urban conditions



**INTERMEDIATE ISLAND**  
(FOR RIGHT TURN LANE DESIGN)  
24 (600) Offset for urban conditions



**SMALL ISLAND**



**DETAIL II**

Typical detail when corner angle is less than 90° and for other corners with radius greater than 24 (600).

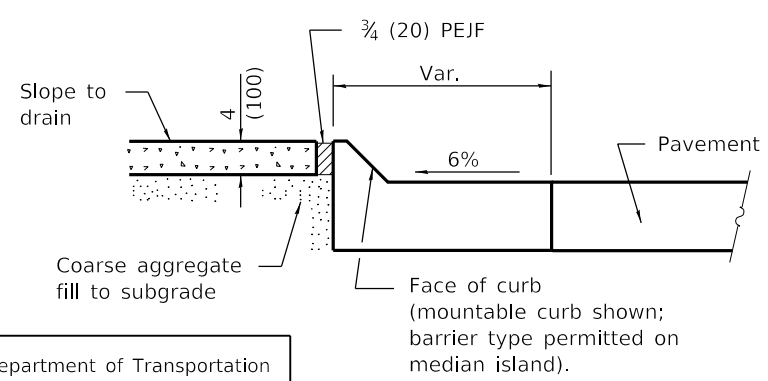
**TYPICAL PLANS OF CORNER ISLANDS**  
(SEE SHEET 2 FOR DETAILS OF RAMPED NOSES)

NOTE:  
The blockouts (B) for the islands shall be extended so that the termination will line up with proposed or existing pavement joint.

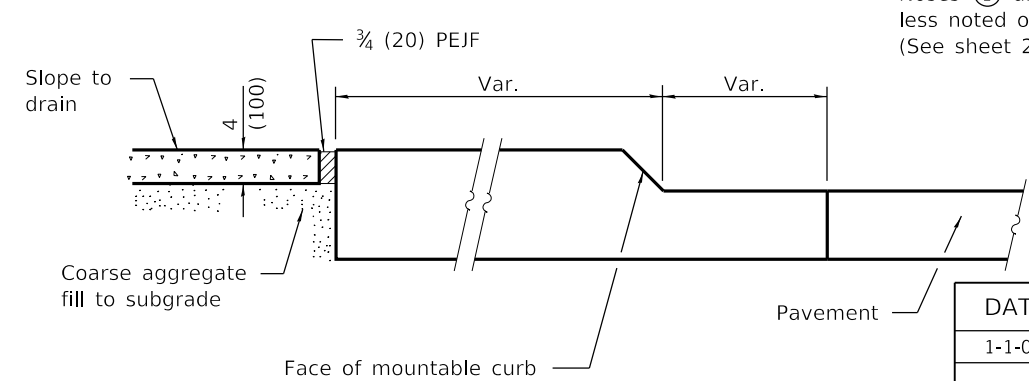
Noses (1) and (2) shall be ramped unless noted otherwise on the plans. (See sheet 2 for length)

**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.



**SECTION D-D**



**SECTION E-E**

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Switched to Hot-Mix Asphalt (HMA) terminology.

**PC CONCRETE ISLANDS AND MEDIANS**

(Sheet 1 of 2)

**STANDARD 606301-04**

Illinois Department of Transportation

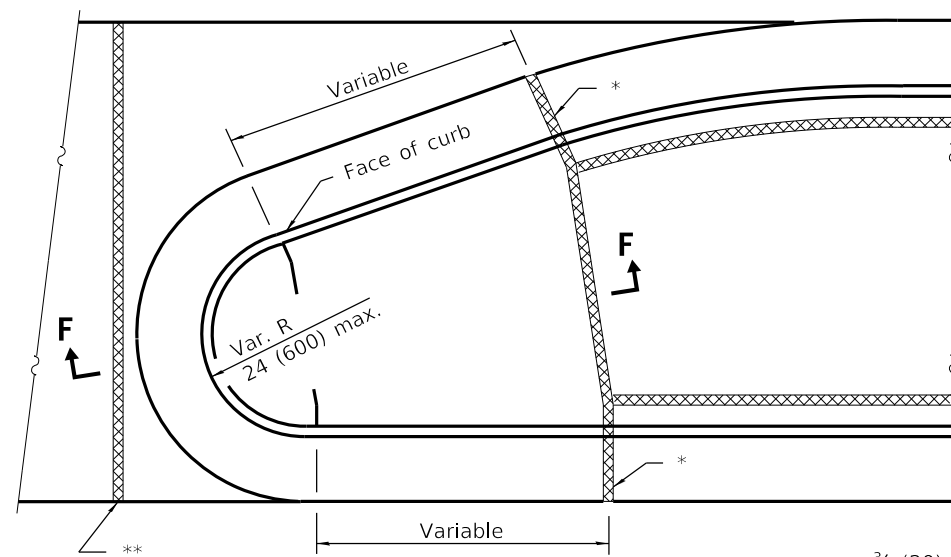
PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

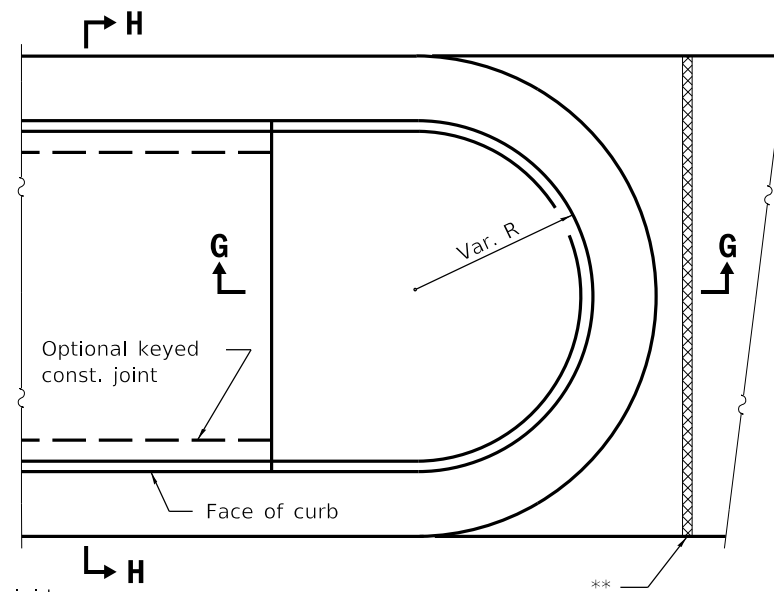
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



**TYPE P MEDIAN SURFACE**



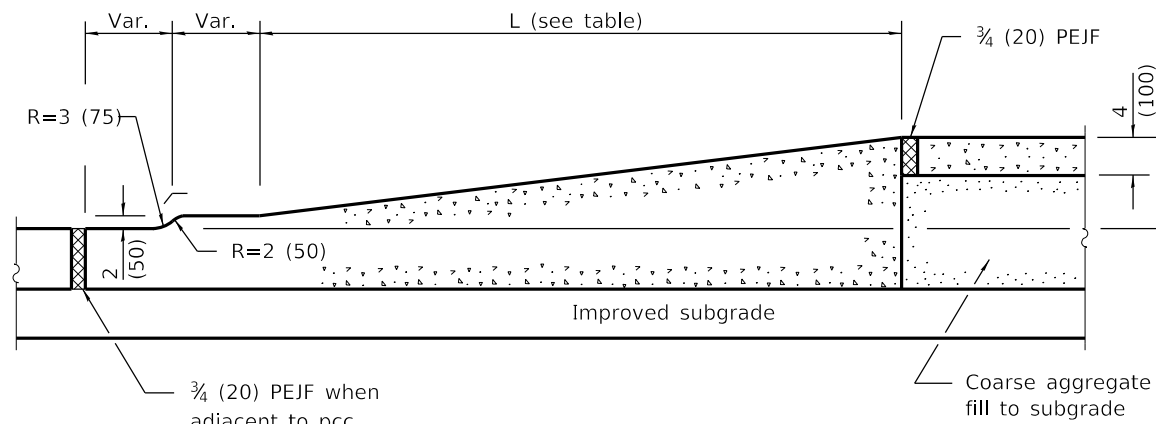
**SOLID MEDIAN**

\*\* 3/4 (20) PEJF between rigid pavement and median end. Align with joint in adjacent pavement.

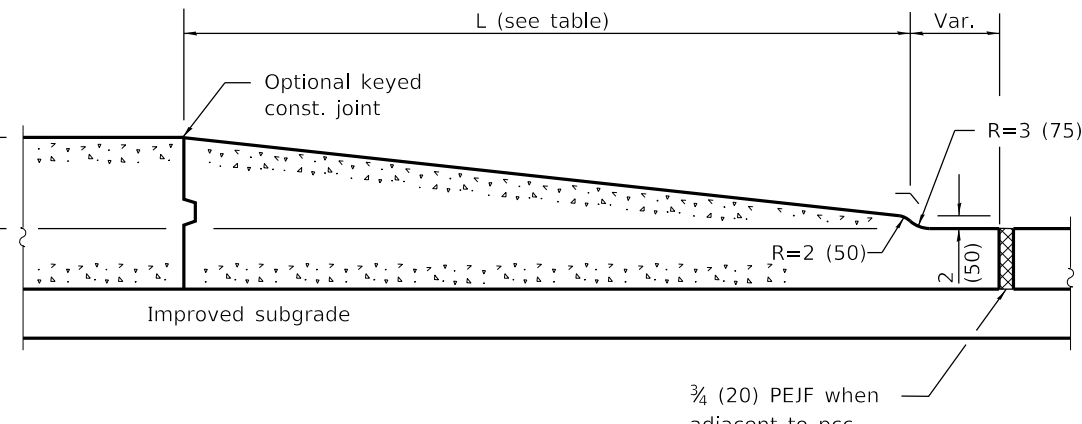
TABLE OF DIMENSIONS					
TYPE SB MEDIANS					
TYPE	A	B	C	D	R <sub>1</sub>
SB-6.06	6	1	6	6	1
(SB-15.15)	(150)	(25)	(150)	(150)	(25)
SB-6.12	12	1	6	6	1
(SB-15.30)	(300)	(25)	(150)	(150)	(25)
SB-6.18	18	1	6	6	1
(SB-15.45)	(450)	(25)	(150)	(150)	(25)
SB-6.24	24	1	6	6	1
(SB-15.60)	(600)	(25)	(150)	(150)	(25)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

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

**PLAN**  
(RAMPED NOSES)



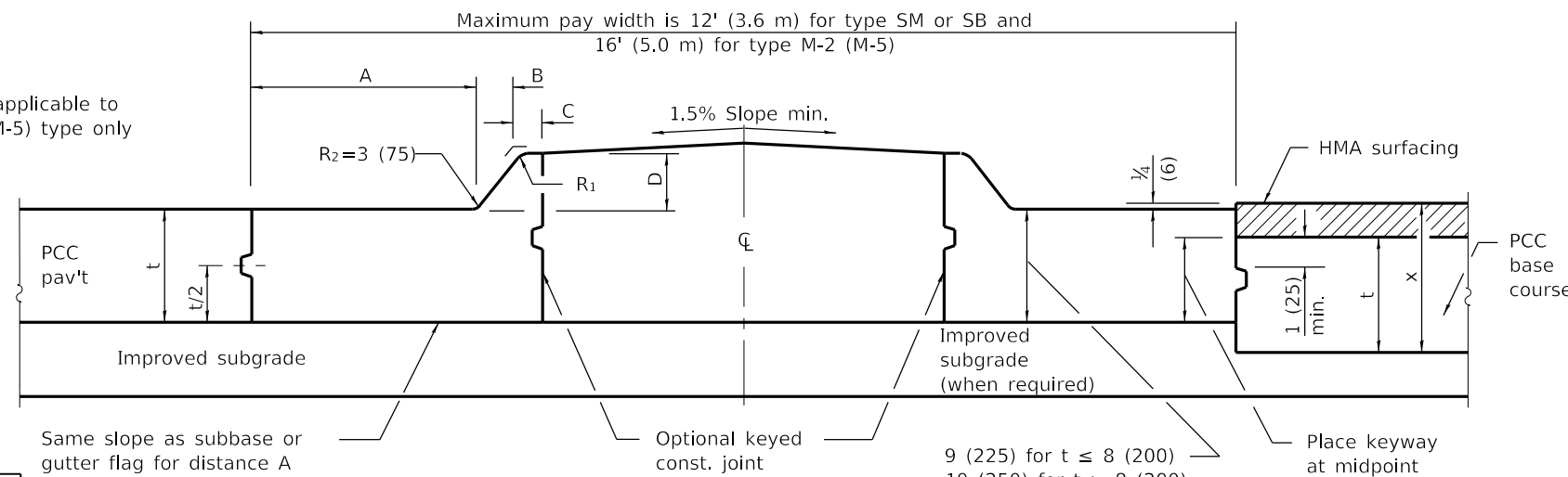
**SECTION F-F**



**SECTION G-G**

TABLE OF RAMPED NOSE LENGTHS	
TYPE OF NOSE	L
Median	6' (1.8 m)
Small Island	24 (600)
Intermediate Island	4' (1.2 m)
Large Island	6' (1.8 m)

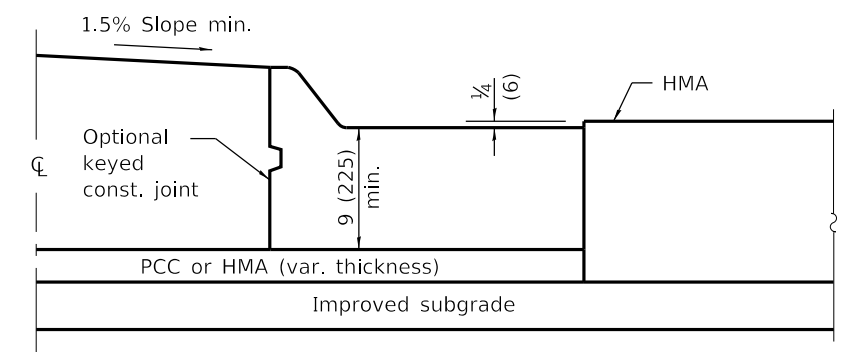
NOTE  
R<sub>2</sub> is applicable to M-2 (M-5) type only



**HALF SECTION FOR PCC PAVEMENT**

**HALF SECTION FOR PCC BASE COURSE**

**SECTION H-H**  
(TYPE SM, SB & M-5 (M-2) MEDIANS)



**HALF SECTION FOR FLEXIBLE PAVEMENT**

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

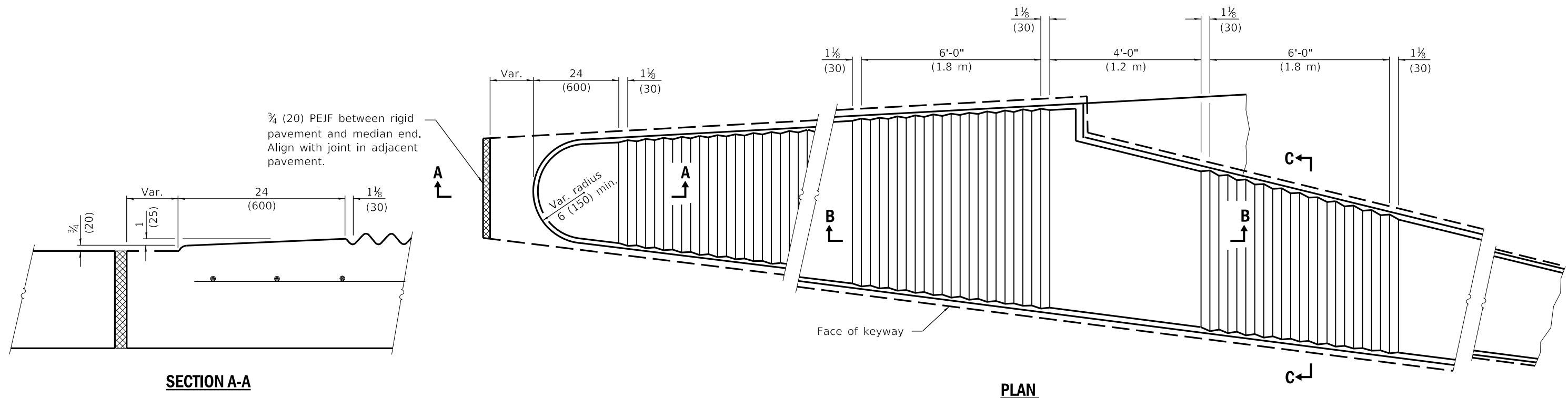
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

**PC CONCRETE ISLANDS AND MEDIANS**

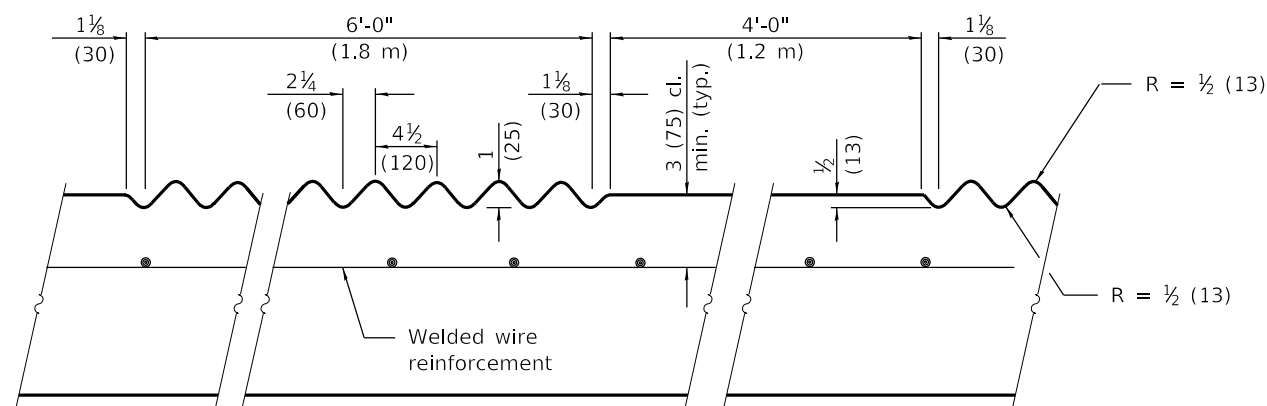
(Sheet 2 of 2)

**STANDARD 606301-04**

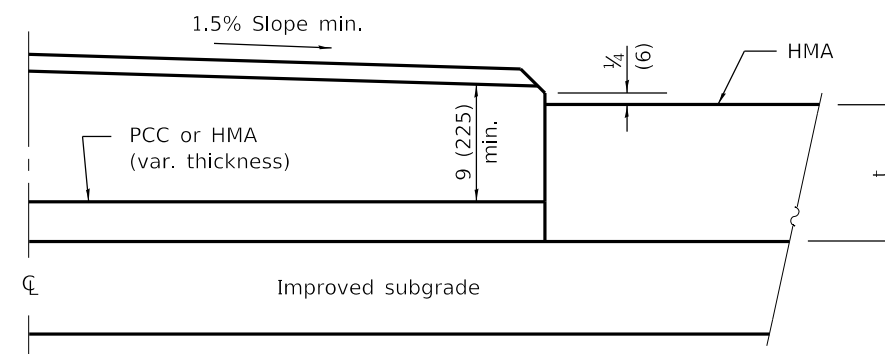


**SECTION A-A**

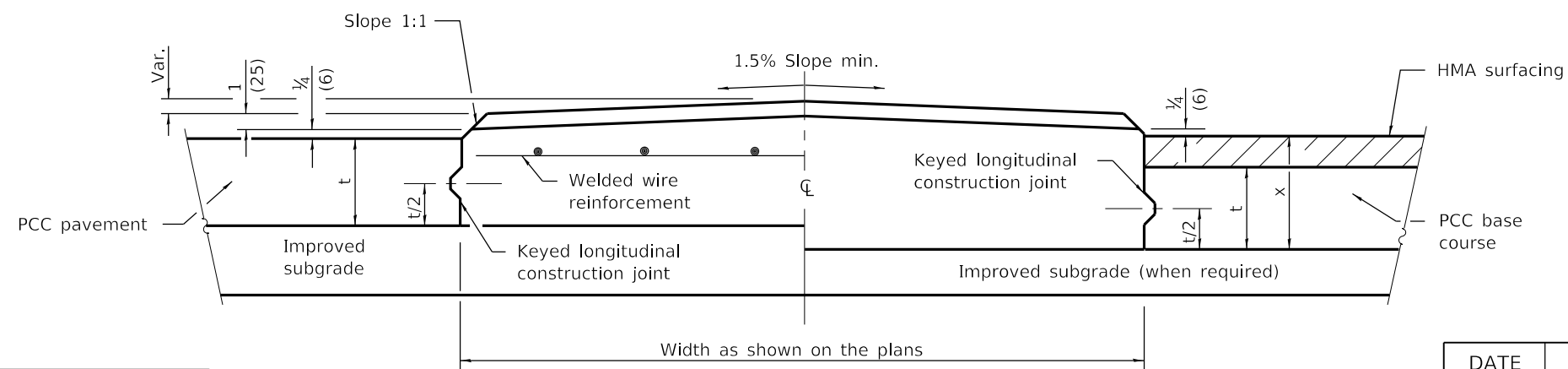
**PLAN**



**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

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

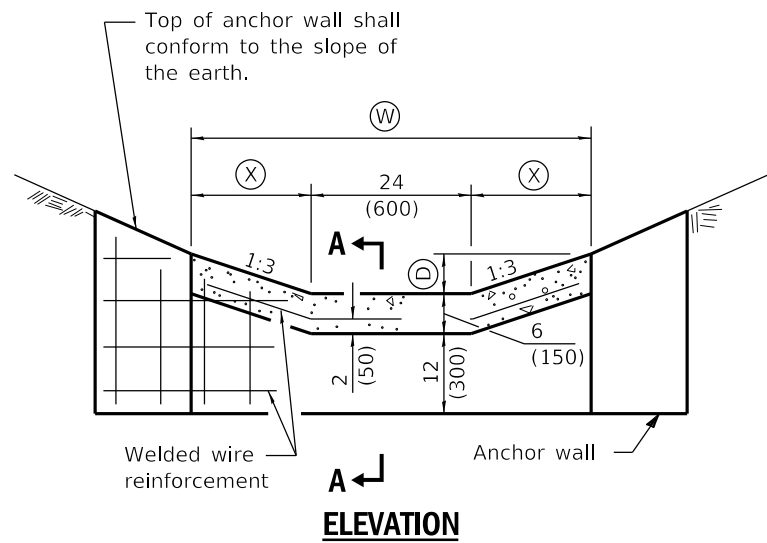
APPROVED [Signature] April 1, 2016  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97 76-T

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

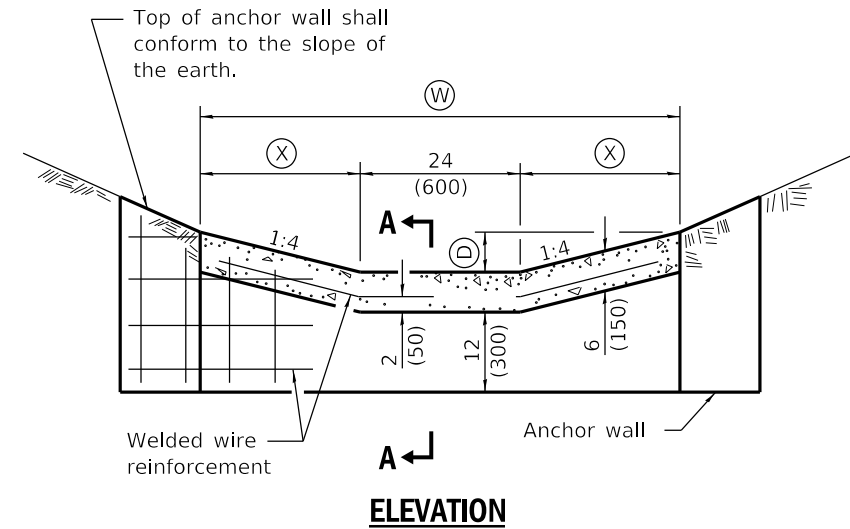
**CORRUGATED PC  
CONCRETE MEDIANS**

**STANDARD 606306-04**



**TABLE FOR PAVED DITCH TYPE A**

TYPE	(D)	(W)	(X)	Flow Area sq. ft. (m <sup>2</sup> )	Conc. Area sq. yd. (m <sup>2</sup> )
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)

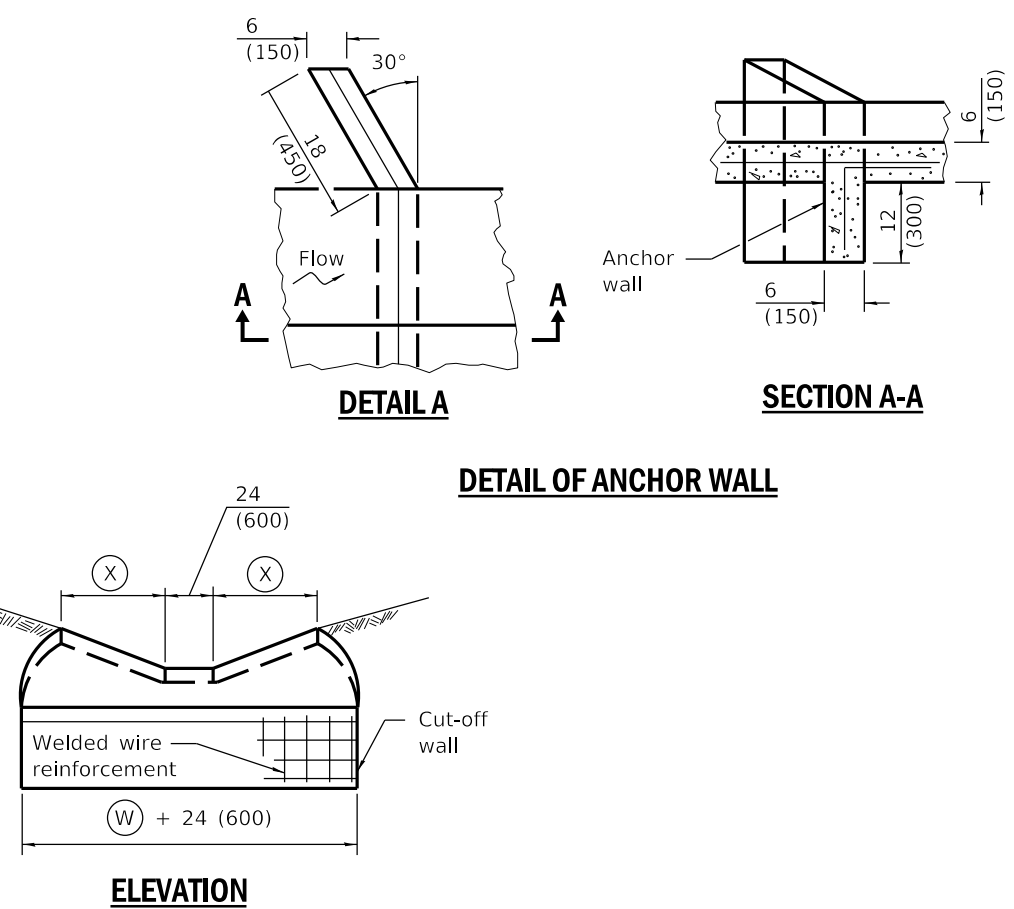
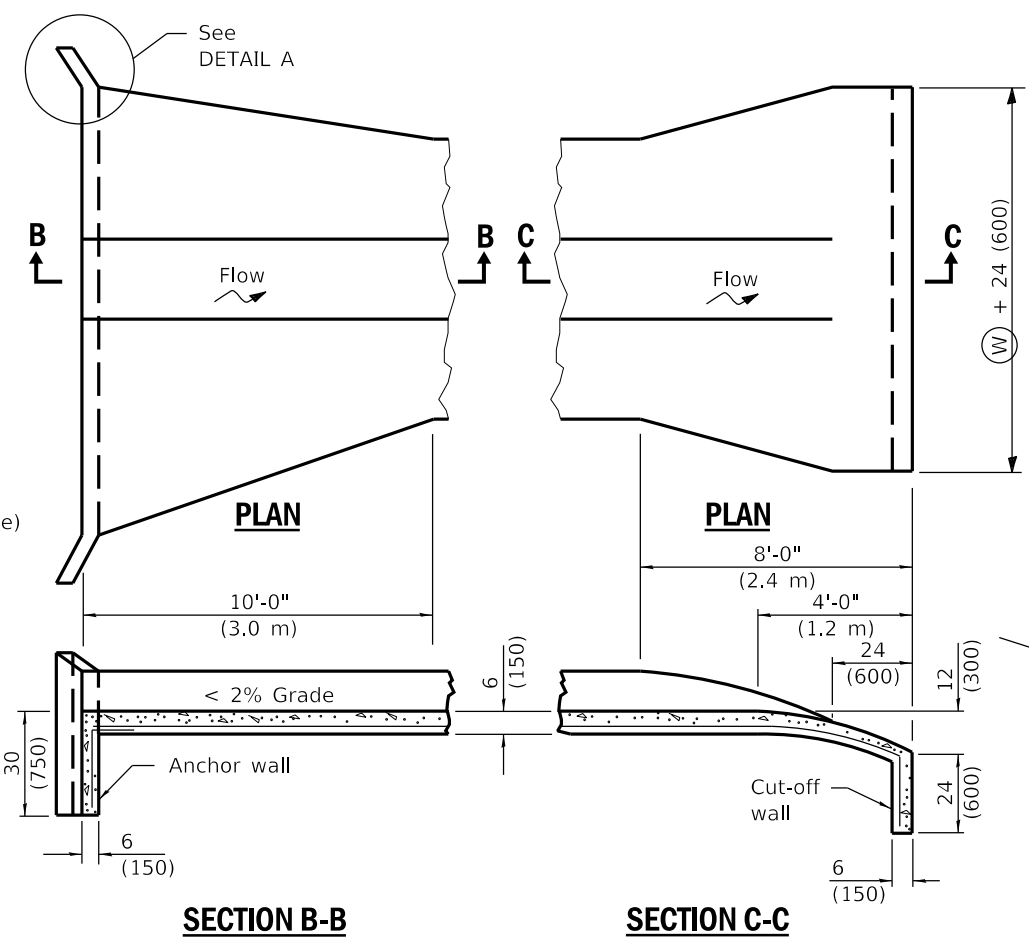
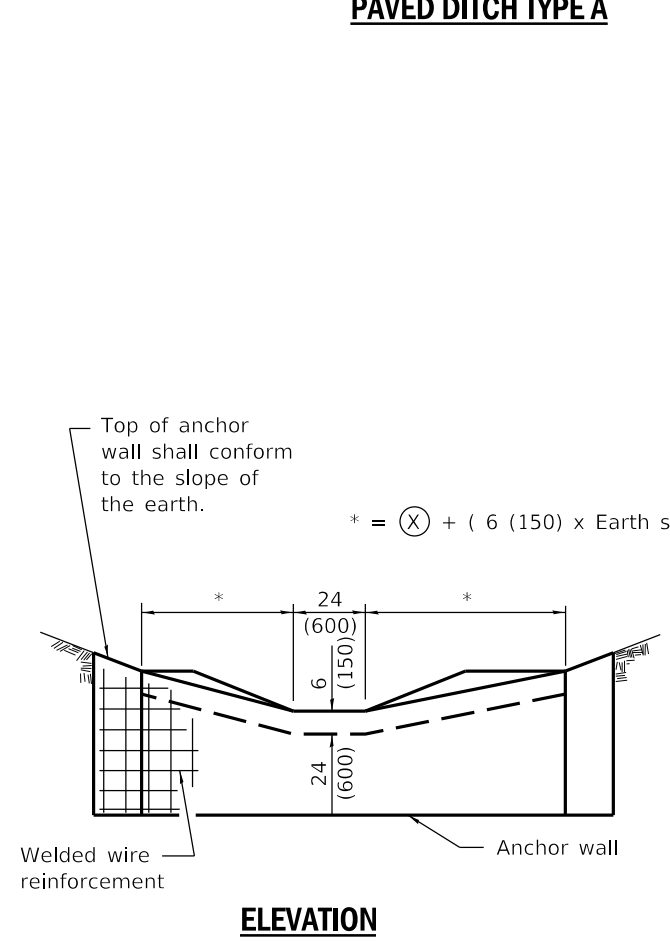


**TABLE FOR PAVED DITCH TYPE B**

TYPE	(D)	(W)	(X)	Flow Area sq. ft. (m <sup>2</sup> )	Conc. Area sq. yd. (m <sup>2</sup> )
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)

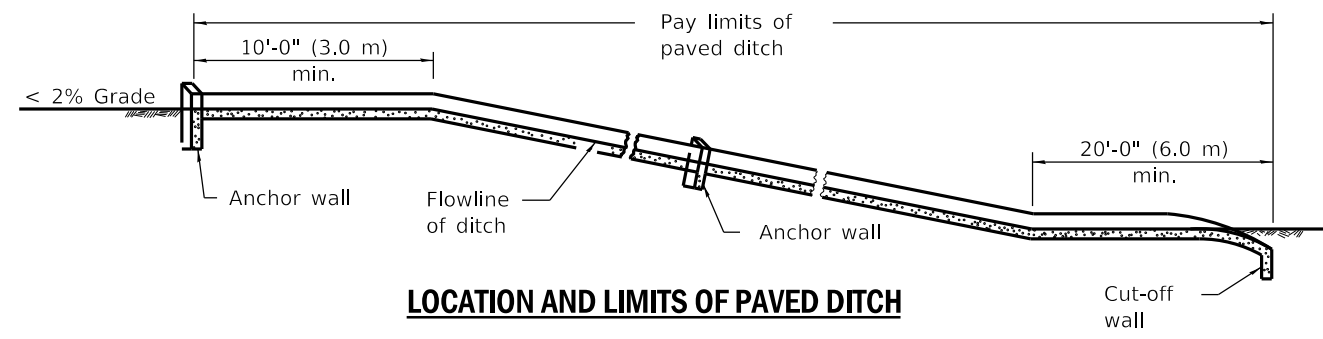
**PAVED DITCH TYPE A**

**PAVED DITCH TYPE B**



**DETAIL OF UPSTREAM END**

**DETAIL OF DOWNSTREAM END**



**GENERAL NOTES**

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

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

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

**PAVED DITCH**

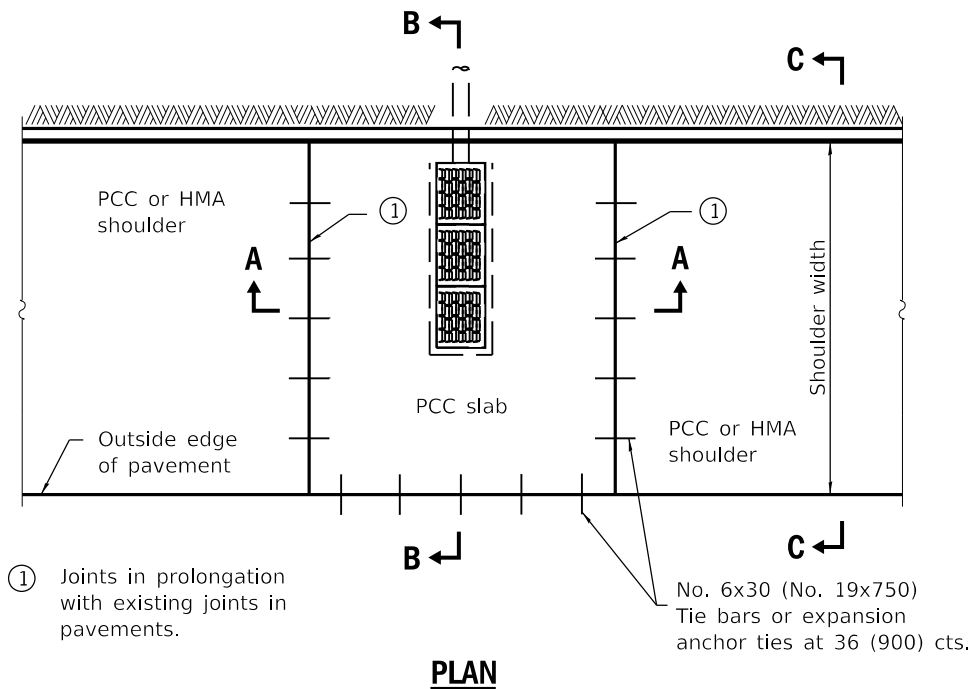
**STANDARD 606401-02**

Illinois Department of Transportation

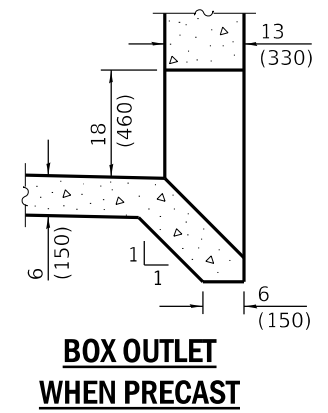
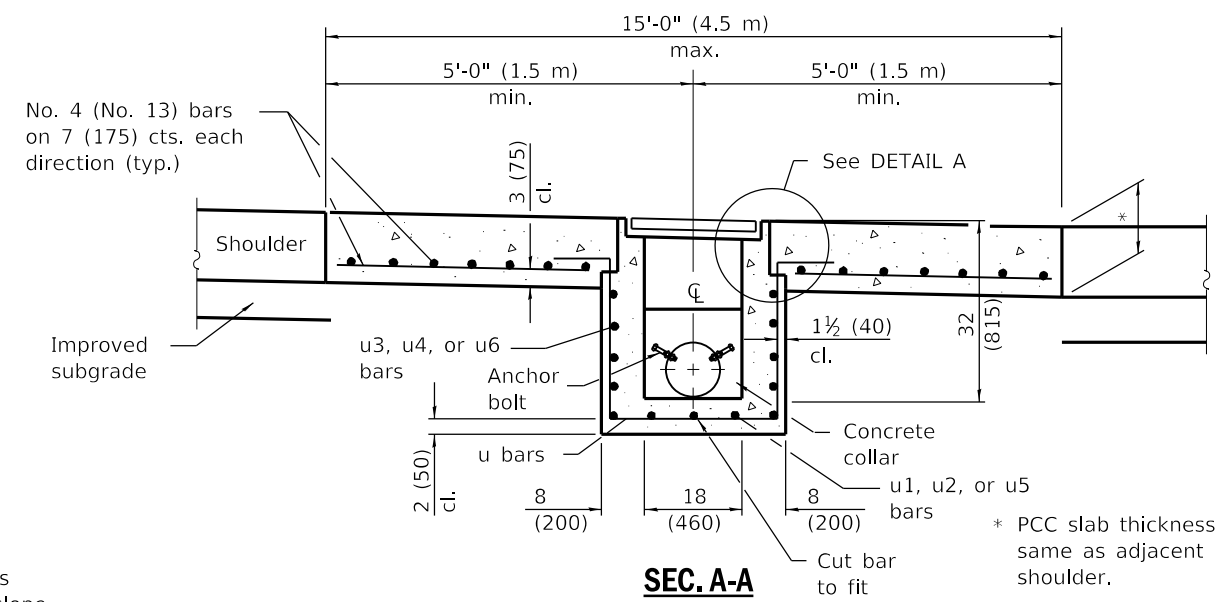
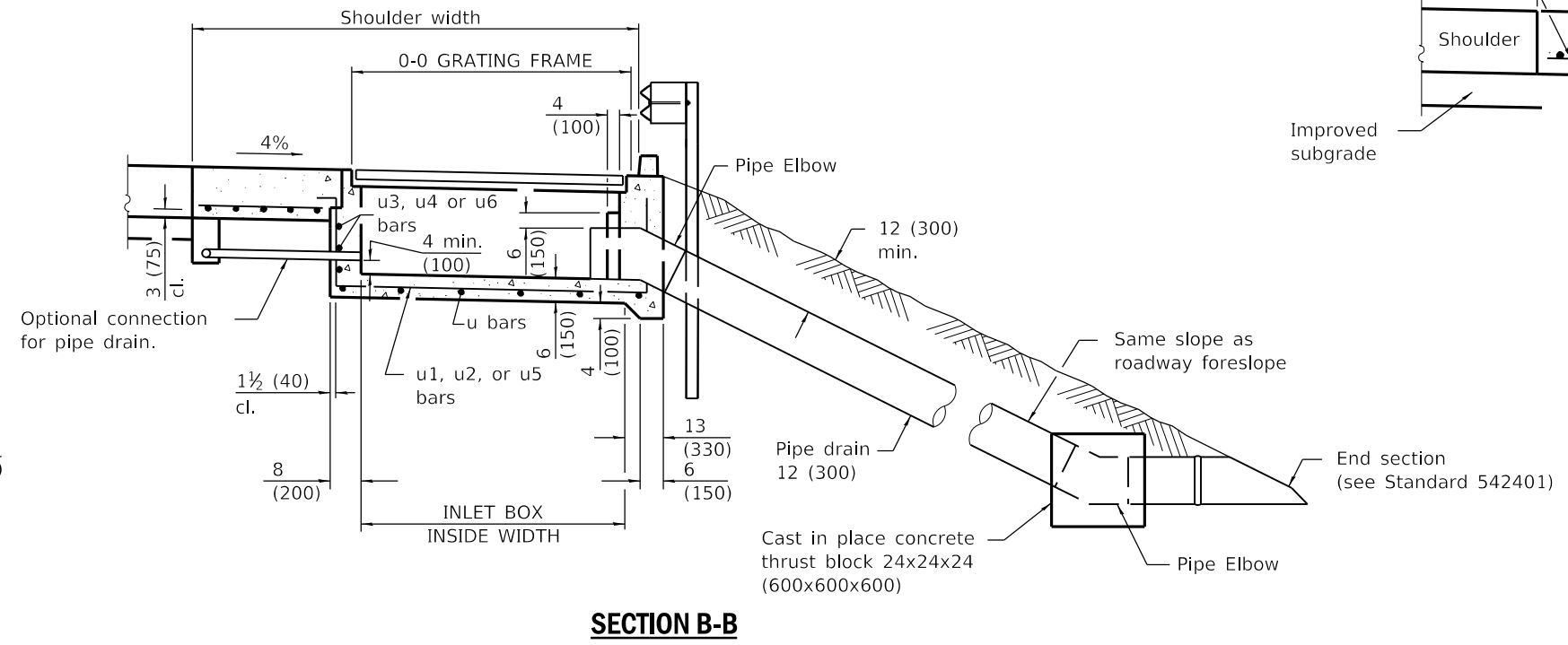
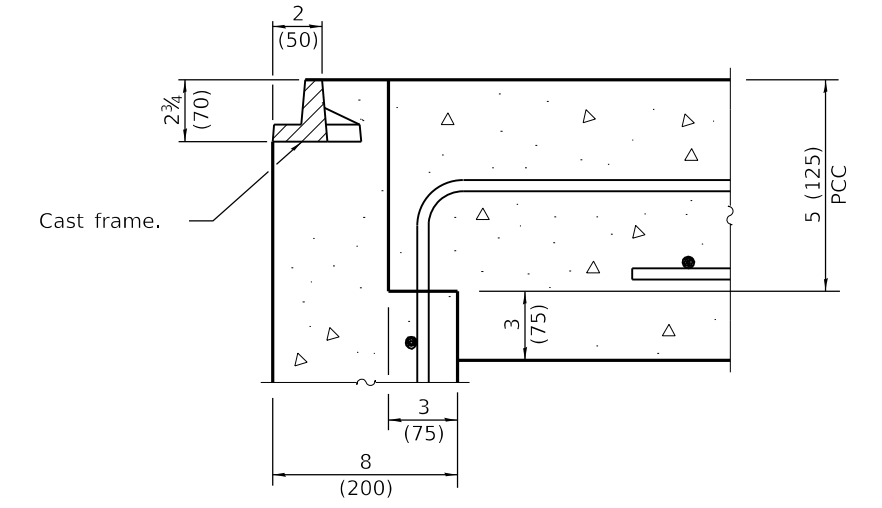
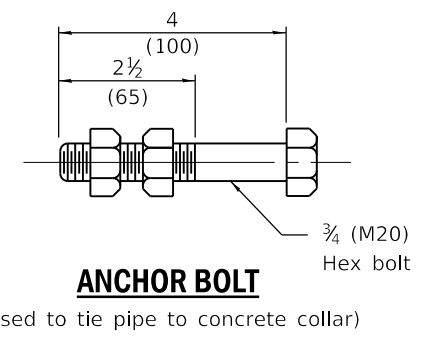
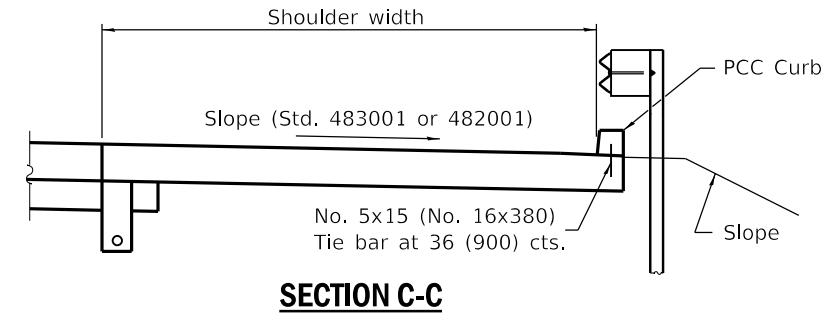
PASSED Michael Beard April 1, 2016  
ENGINEER OF POLICY AND PROCEDURES

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

ISSUED 1-1-99



**PLAN**



**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  $\frac{3}{4}$  (20).

For placement of drainage elements on existing construction with existing rigid pavement, substitute expansion anchor ties for tie bars. For nonrigid pavements or monolithic construction of PCC slab and shoulder, omit tie bars.

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

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)

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**

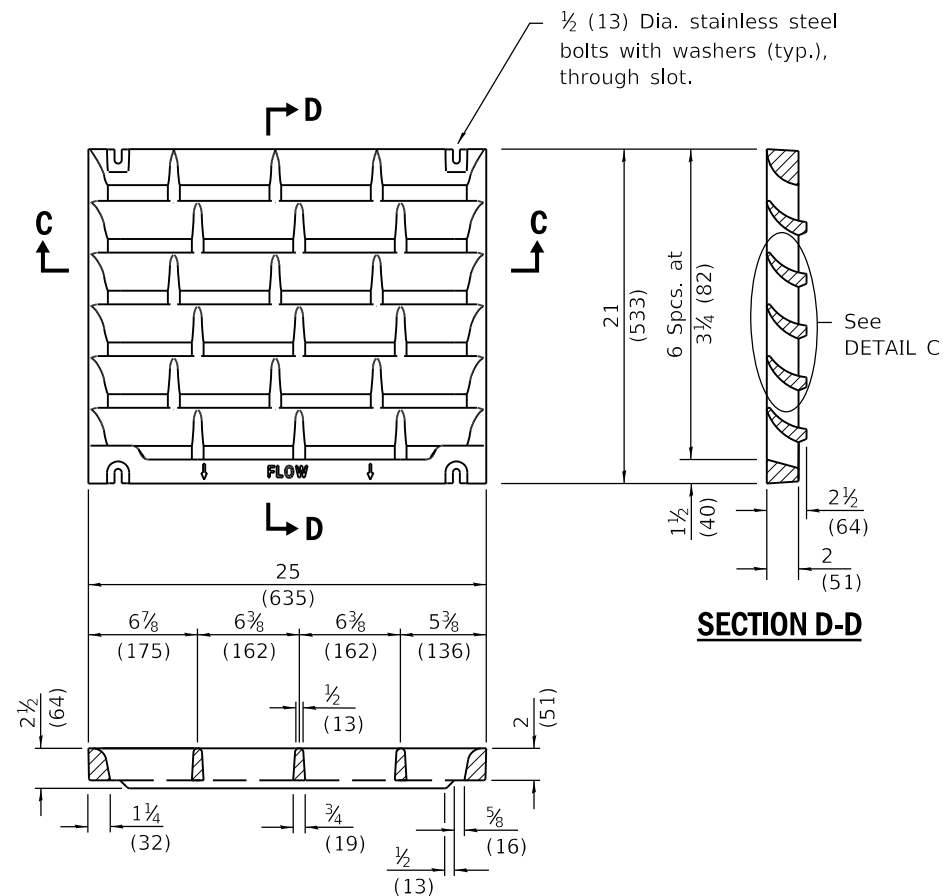
Illinois Department of Transportation

PASSED January 1, 2021  
*Michael Bond*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
*J. E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

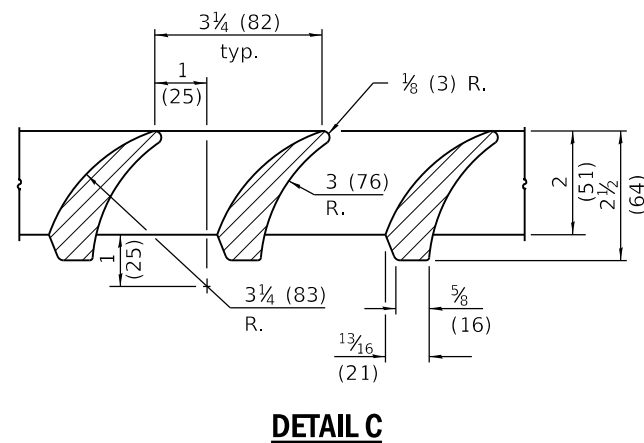




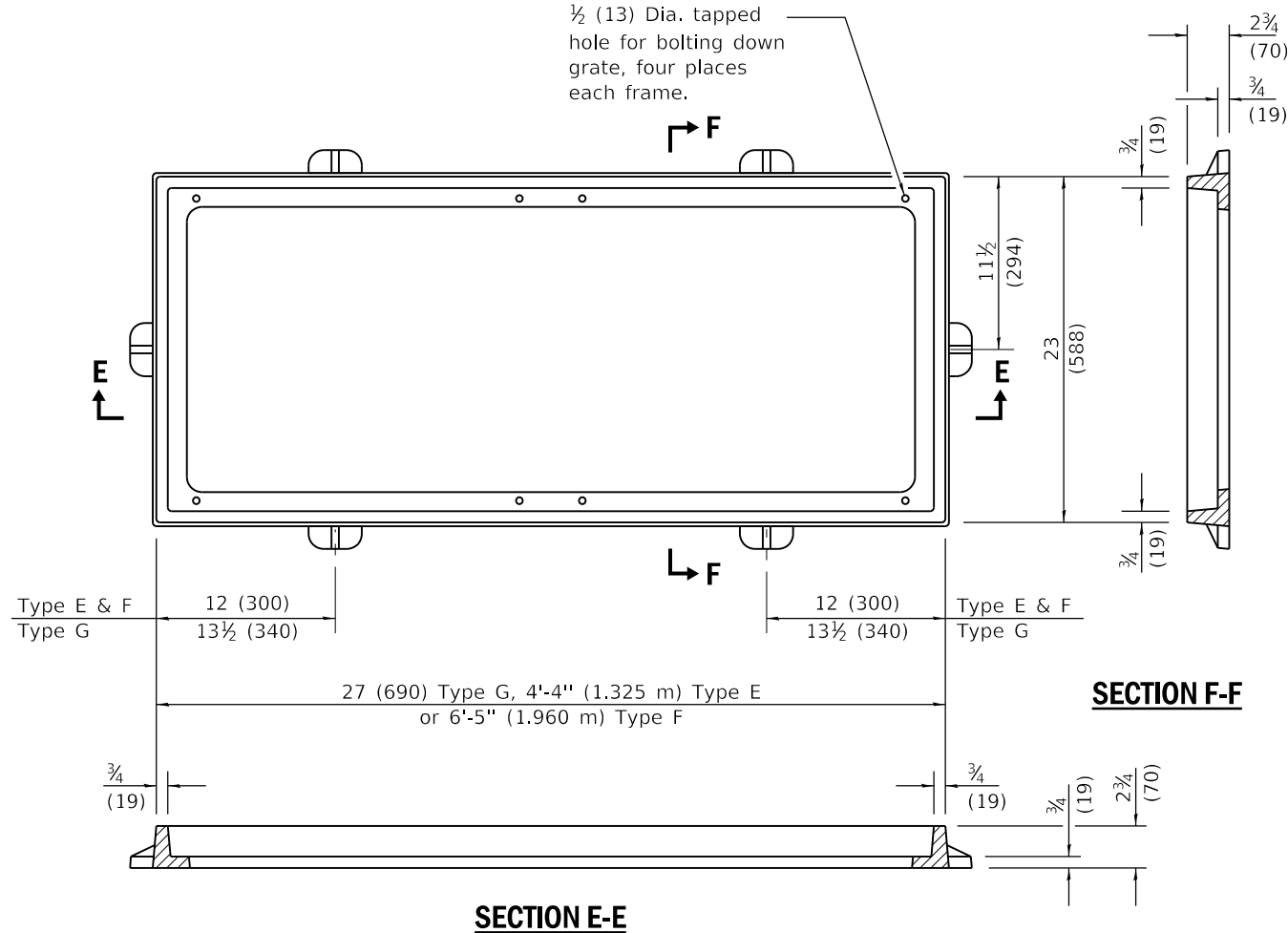
**SECTION C-C**

**DETAIL OF CAST GRATE**

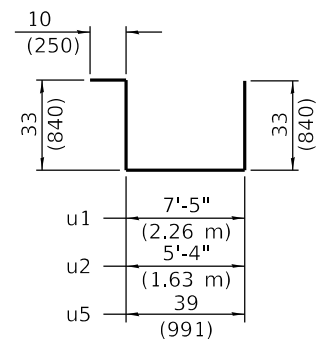
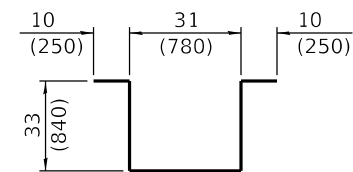
Type G requires 1 grate  
 Type E requires 2 grates  
 Type F requires 3 grates



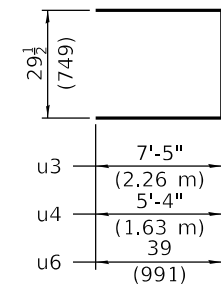
1/2 (13) Dia. tapped hole for bolting down grate, four places each frame.



**DETAIL OF CAST FRAME**  
 (Type E shown)



**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'-3 1/2" (5.27 m)
Concrete	cu. yds. (m <sup>3</sup> )		1.7 (1.3)
Reinf. bars	lbs. (kg)		126 (57.2)
Grating	sq. ft. (m <sup>2</sup> )		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'-1 1/2" (4.00 m)
Concrete	cu. yds. (m <sup>3</sup> )		1.3 (1.0)
Reinf. bars	lbs. (kg)		98 (44.5)
Grating	sq. ft. (m <sup>2</sup> )		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'-11 1/2" (2.73 m)
Concrete	cu. yds. (m <sup>3</sup> )		0.5 (0.4)
Reinf. bars	lbs. (kg)		70 (31.8)
Grating	sq. ft. (m <sup>2</sup> )		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.

**SHOULDER INLET WITH CURB**

(Sheet 2 of 2)

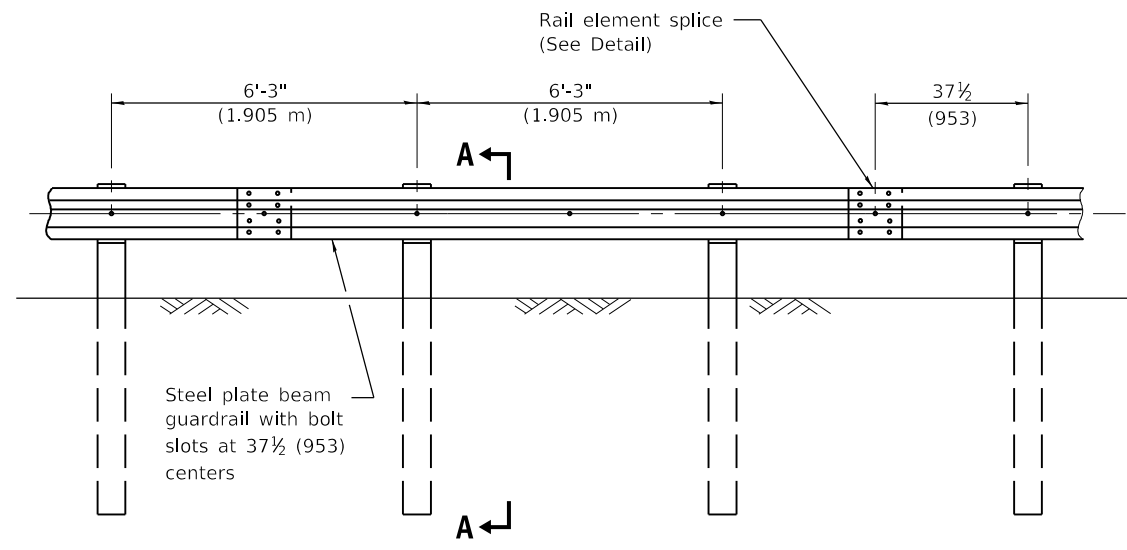
**STANDARD 610001-09**

Illinois Department of Transportation

PASSED January 1, 2021  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

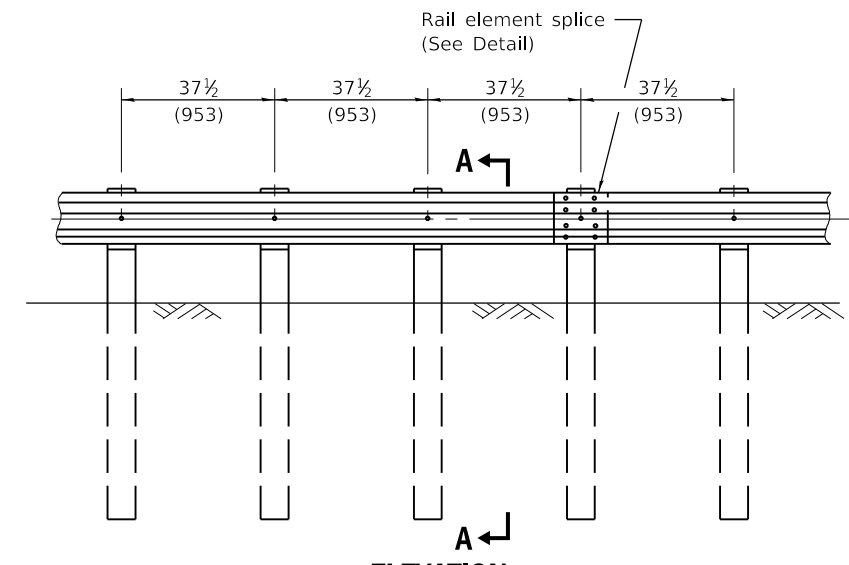
ISSUED 1-1-97



**ELEVATION**

**TYPE A**

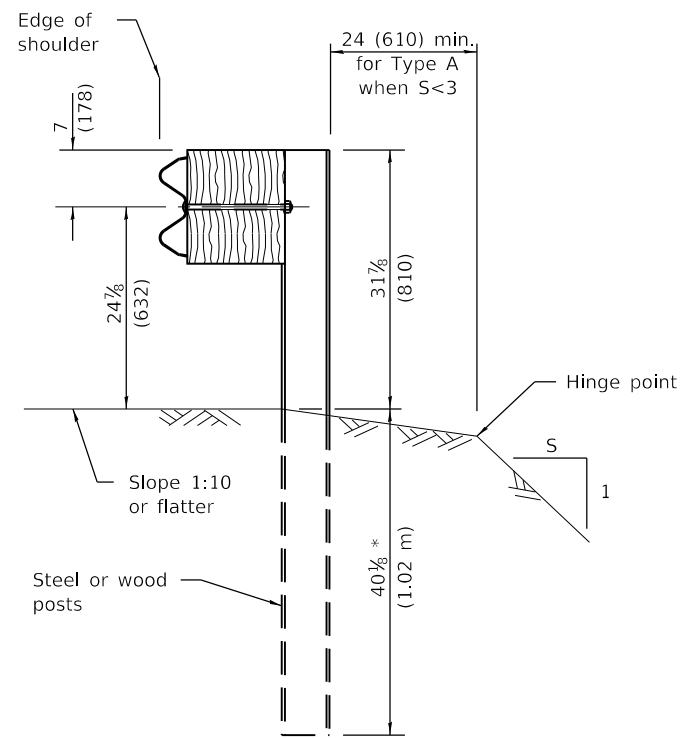
6'-3" (1.905 m) Typical post spacing



**ELEVATION**

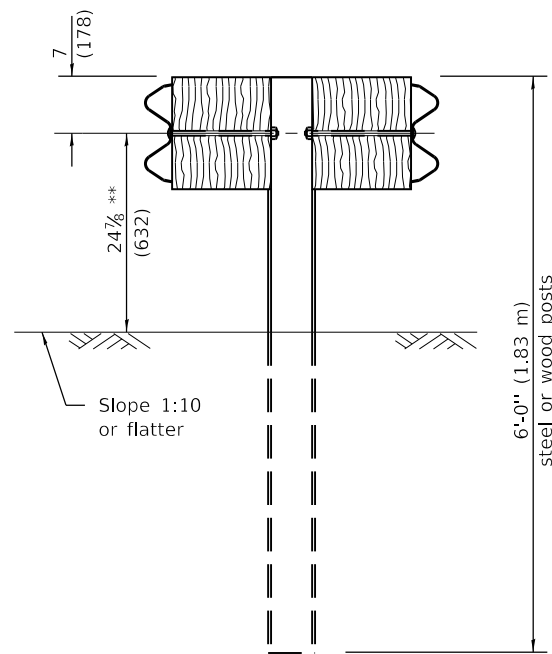
**TYPE B**

37 1/2 (953) Closed post spacing



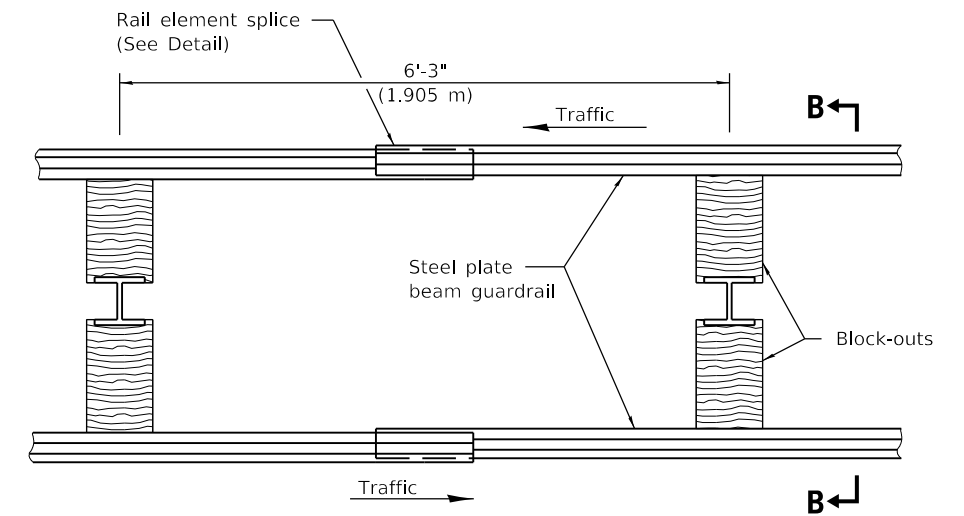
**SECTION A-A**

\* When "S" is less than 3 and the distance from the back of post is less than 24 (610), the post shall be steel and the embedment shall be 76 1/8 (1.93 m) and the minimum top of rail height shall be 31 (787).



**SECTION B-B**

\*\* When connecting Type D guardrail to an impact attenuator, adjust this dimension to match over a distance of 25'-0" (7.62 m) from point of connection if necessary.



**PLAN**

**TYPE D**

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

**GENERAL NOTES**

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

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

Illinois Department of Transportation

APPROVED January 1, 2018  
*Michael Beard*  
ENGINEER OF POLICY AND PROCEDURES

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

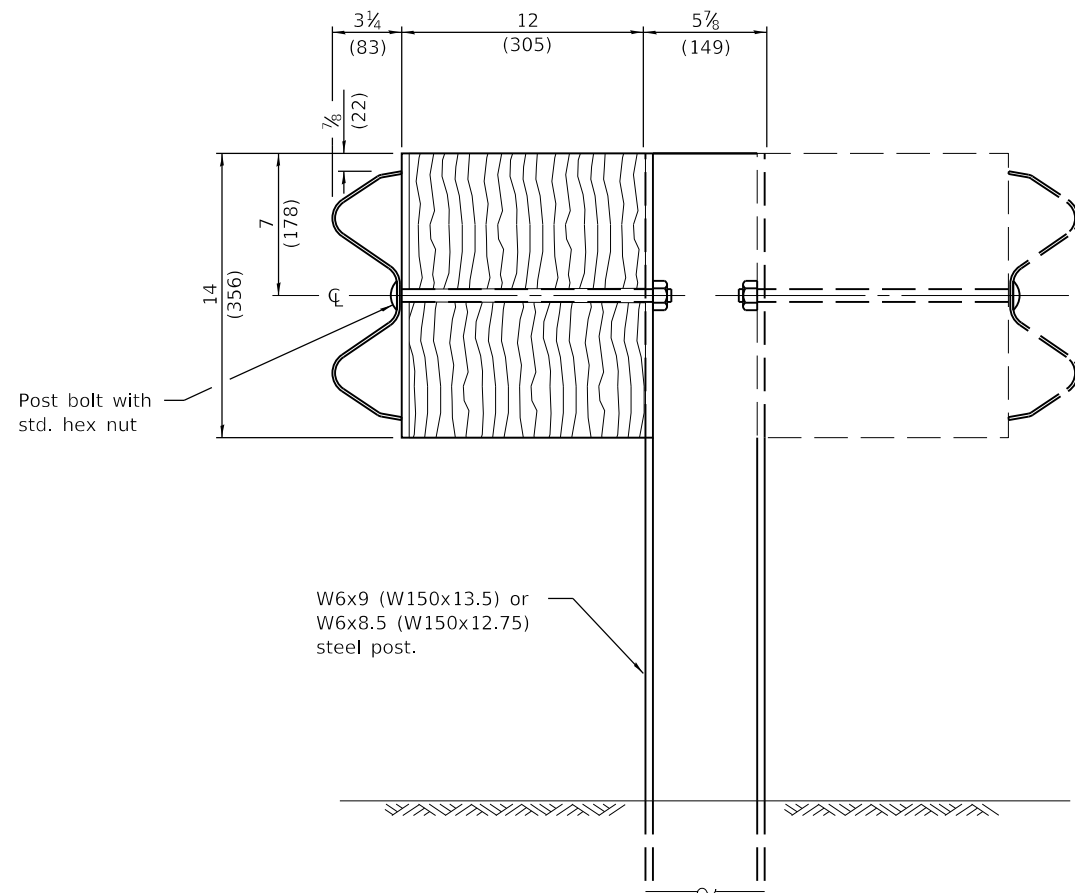
ISSUED 1-1-97

DATE	REVISIONS
1-1-18	Revised steel post to have four holes in each flange.
1-1-17	Added detail for leave-out.
	Rev. 'D' to less than 6 (150) for guardrail behind curb.

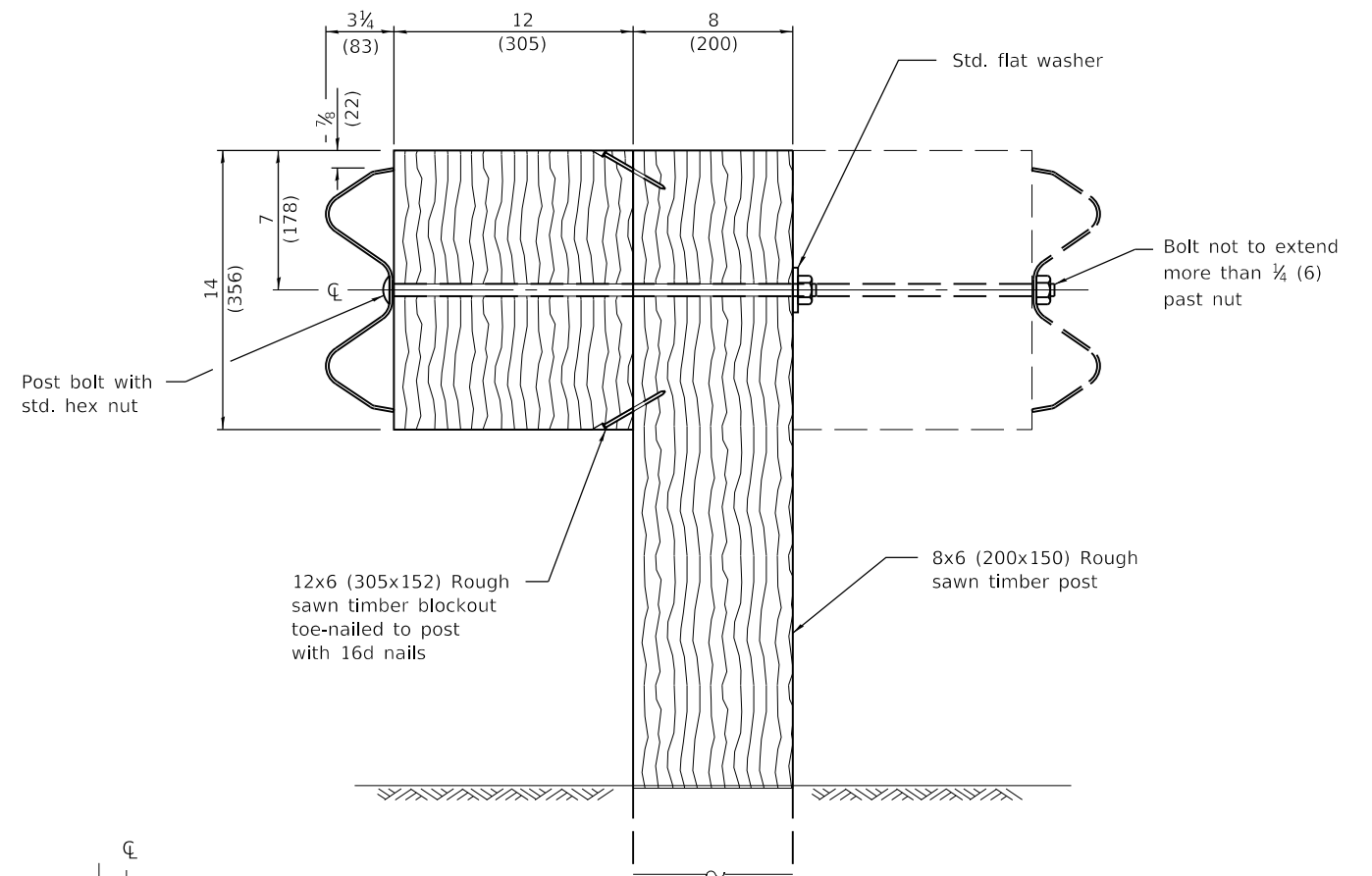
**STEEL PLATE BEAM GUARDRAIL**

(Sheet 1 of 4)

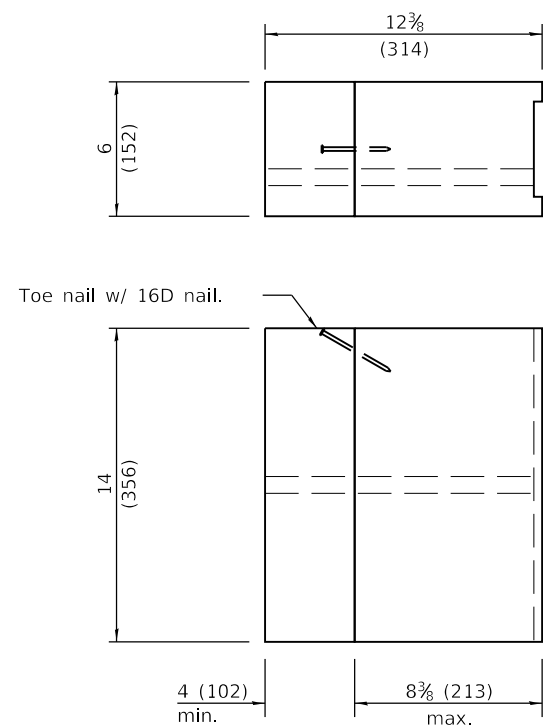
**STANDARD 630001-12**



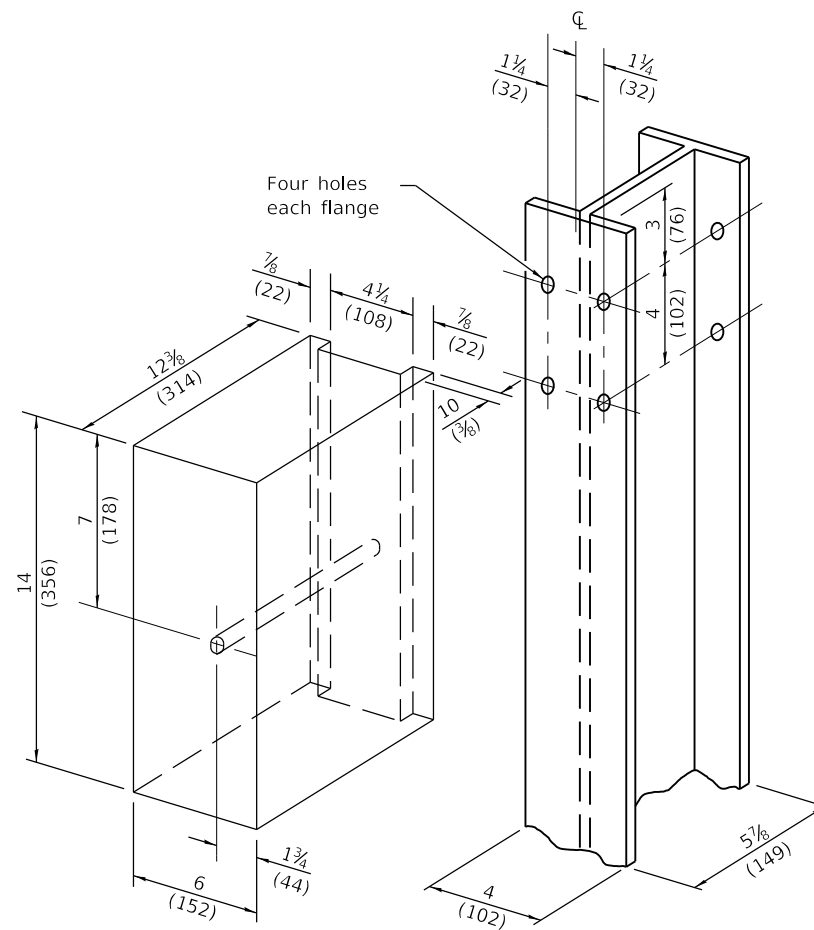
**STEEL POST CONSTRUCTION**



**WOOD POST CONSTRUCTION**

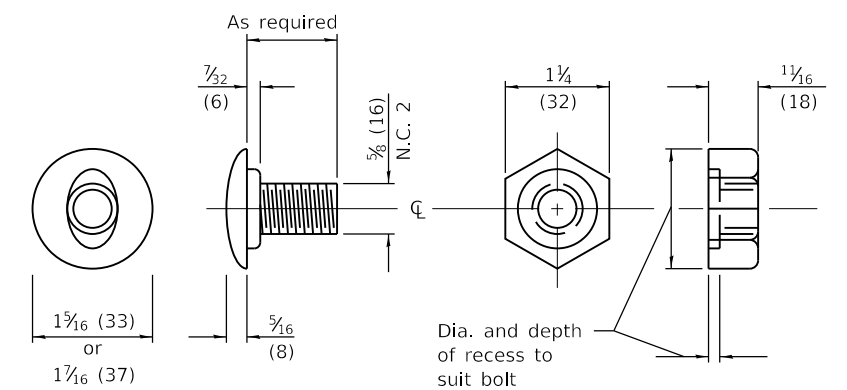


**TWO-PIECE WOOD BLOCKOUT OPTION**



Note:  
All holes 3/4 (20) dia.

**WOOD BLOCK-OUT AND STEEL POST DETAILS**



**POST OR SPLICE BOLT & NUT**

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APPROVED January 1, 2018

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APPROVED January 1, 2018

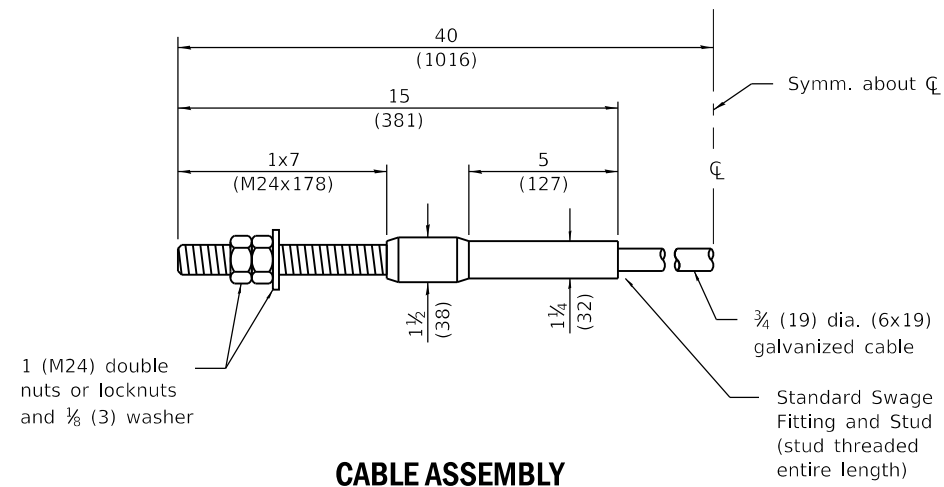
*Marcus M. Beck*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18

**STEEL PLATE BEAM GUARDRAIL**

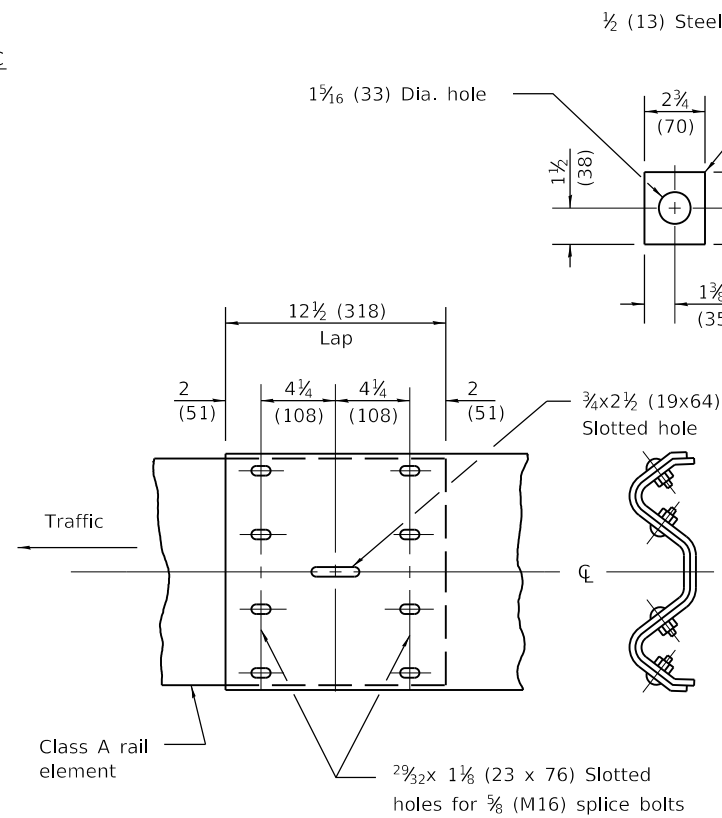
(Sheet 2 of 4)

**STANDARD 630001-12**



**CABLE ASSEMBLY**

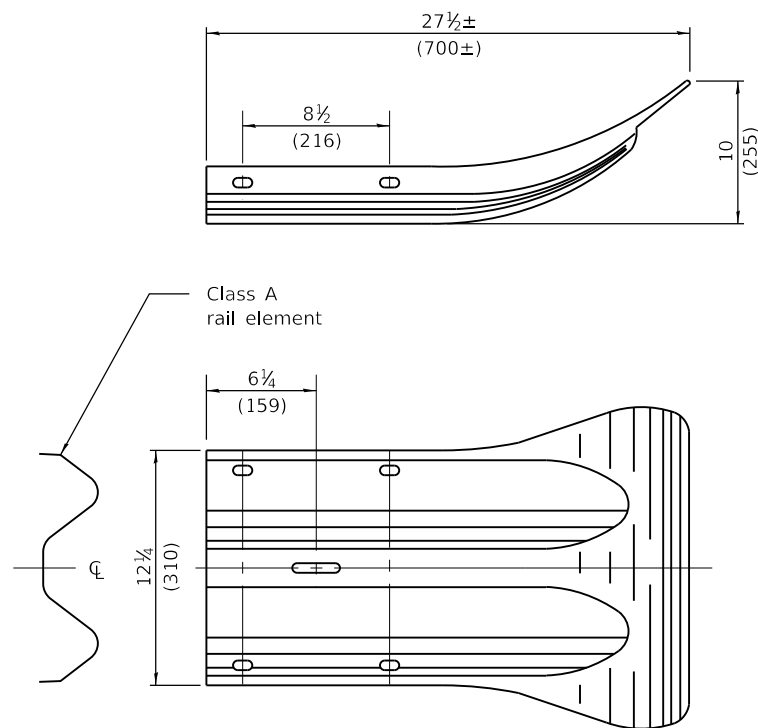
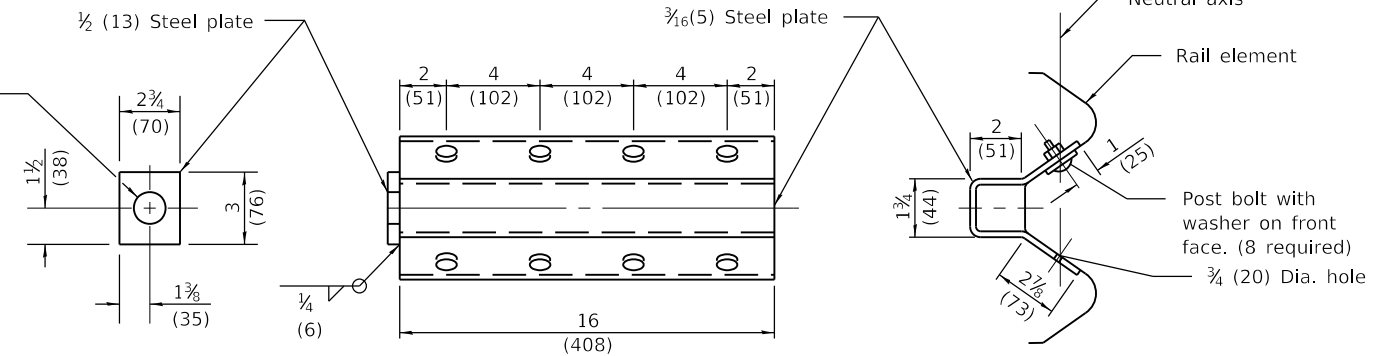
(42,800 lbs. (190 kN) min. breaking strength)  
Tighten to taut tension.



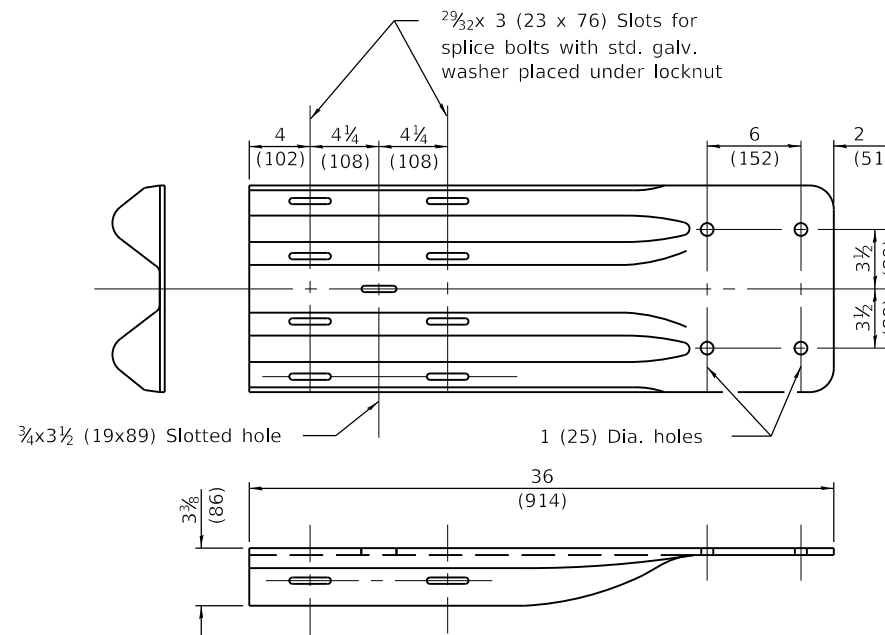
**RAIL ELEMENT SPLICE**

NOTE  
Anchor plate T shall be used to attach cable assembly to guardrail when required on traffic barrier terminals.

**ANCHOR PLATE T DETAILS**



**END SECTION**

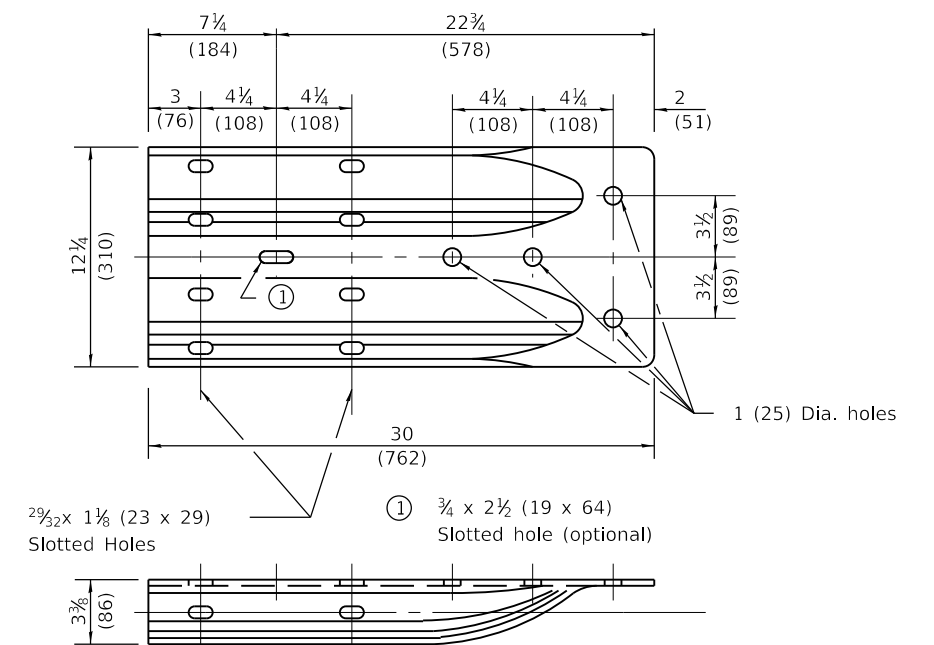


NOTE  
When end shoe is attached to a bridge parapet which has an expansion joint, the bolts shall be provided with a locknut or double nut and shall be tightened only to a point that will allow guardrail movement.

The standard end shoe shall be attached to the concrete with pre-drilled or self-drilling anchor bolts. The anchor cone shall be set flush with the surface of the concrete.

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

**END SHOE**



**ALTERNATE END SHOE**

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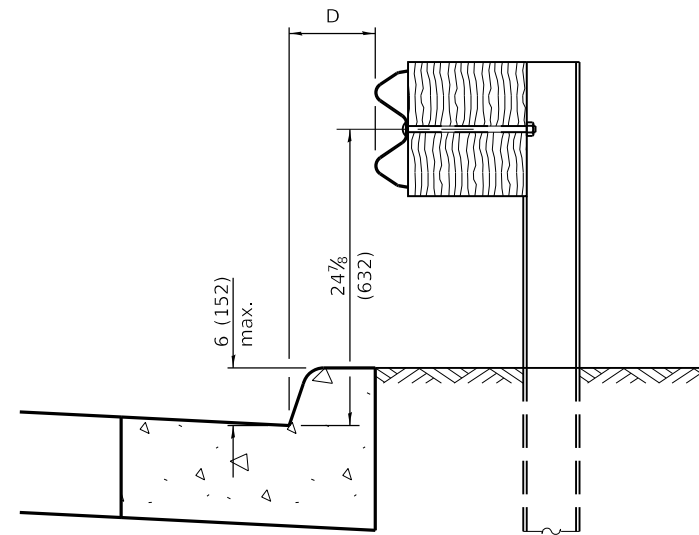
APPROVED January 1, 2018  
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ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

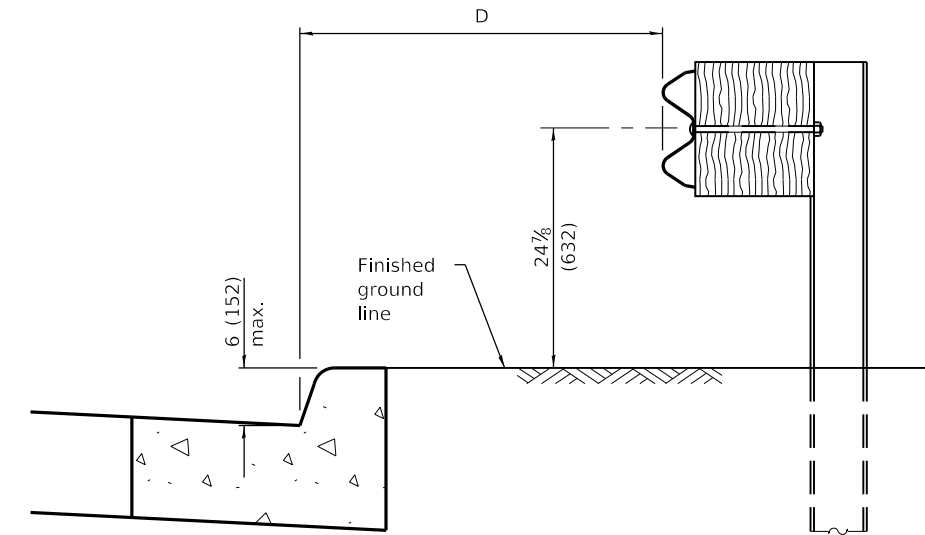
**STEEL PLATE BEAM  
GUARDRAIL**

(Sheet 3 of 4)

**STANDARD 630001-12**



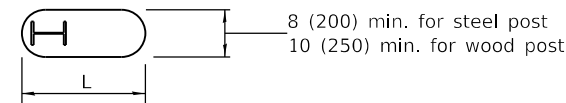
**$0 \leq D < 6 (150 \text{ m})$**



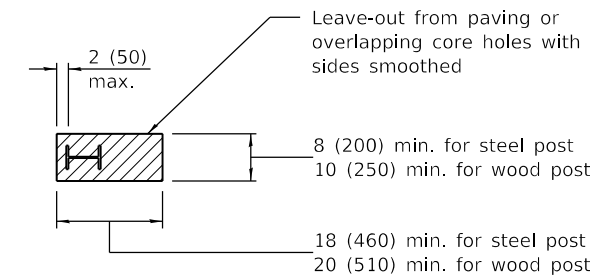
**$4'-0'' (1.2 \text{ m}) \leq D \leq 12'-0'' (3.7 \text{ m})$**

**GUARDRAIL PLACED BEHIND CURB**

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

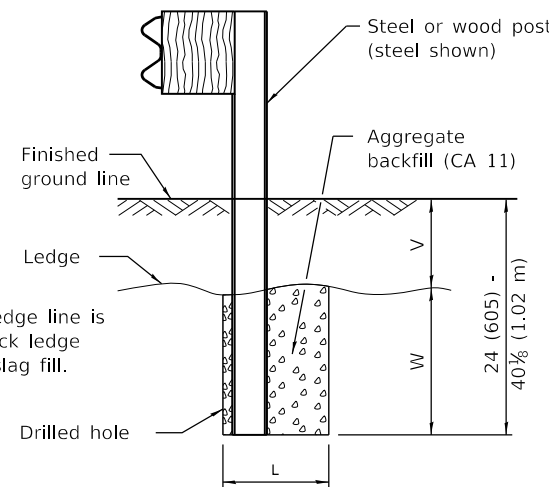


**PLAN**



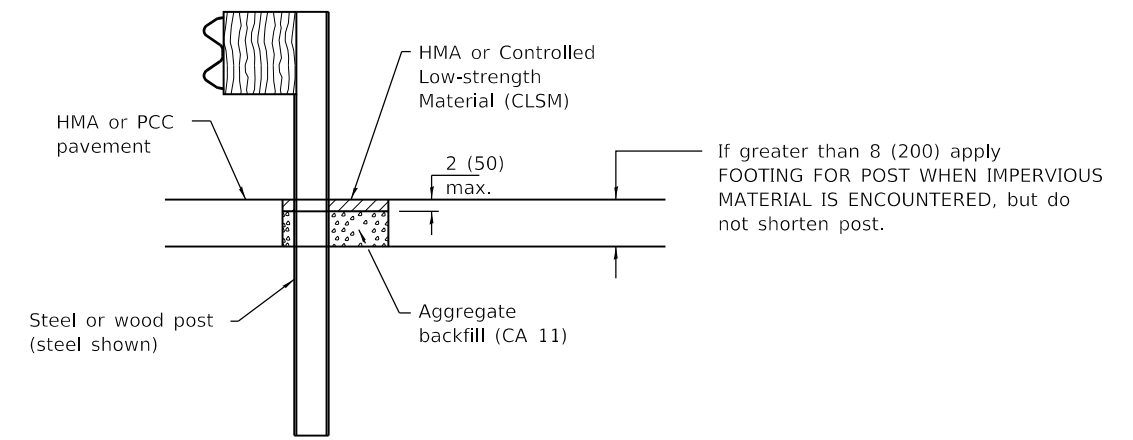
**PLAN**

V	W	L	
		Steel Post	Wood Post
0 - 6 (0 - 152)	24 (610)	21 (530)	23 (580)
> 6 - 18 (> 152 - 458)	18 (458)	14½ (368)	16½ (419)
> 18 - 31 (> 458 - 787)	12 (305)	8 (203)	10 (250)
> 31 - 40½ (> 787 - 1.02 m)	12 - 0 (305 - 0)	8 (203)	10 (250)



**ELEVATION**

**FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED**



**ELEVATION**

**LEAVE-OUT FOR POST WHEN PAVED MATERIAL IS ENCOUNTERED**

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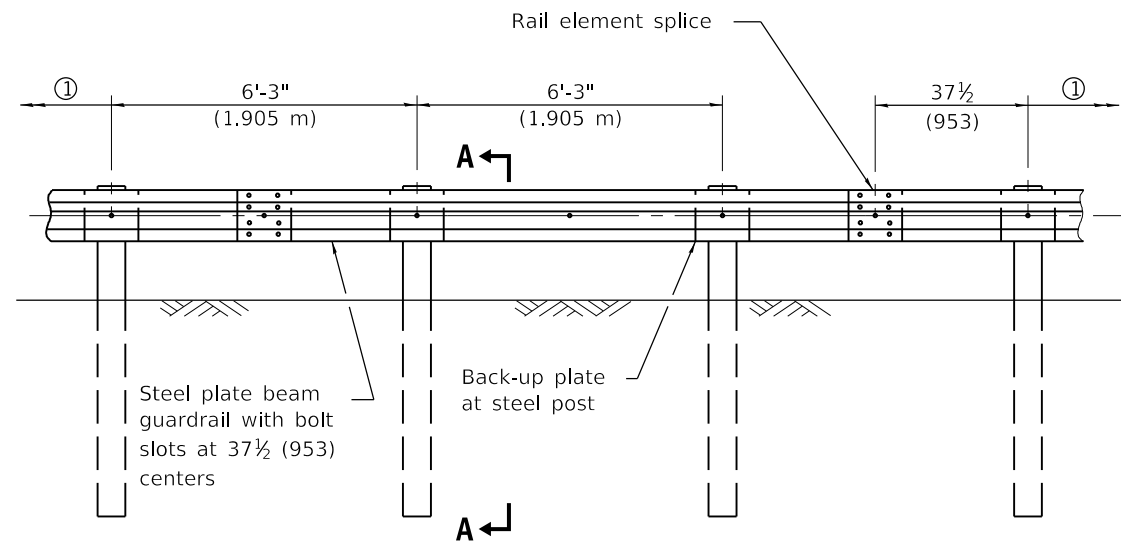
APPROVED January 1, 2018  
*Marcus M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

**STEEL PLATE BEAM GUARDRAIL**

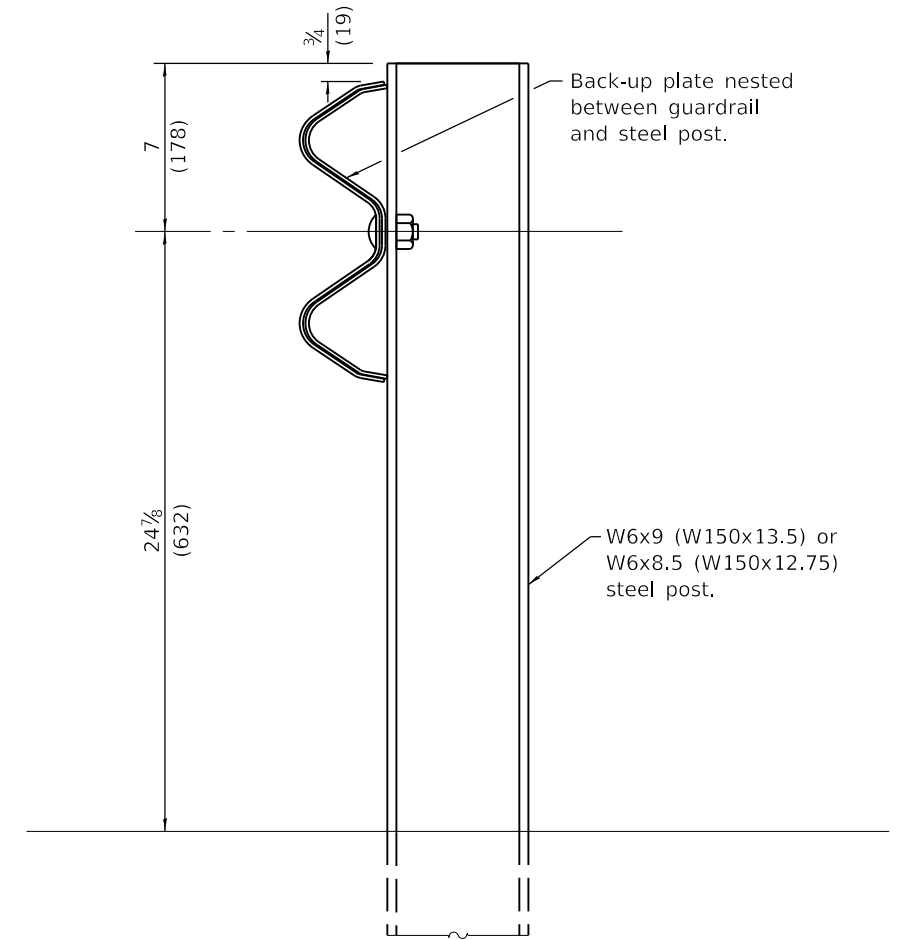
(Sheet 4 of 4)

**STANDARD 630001-12**

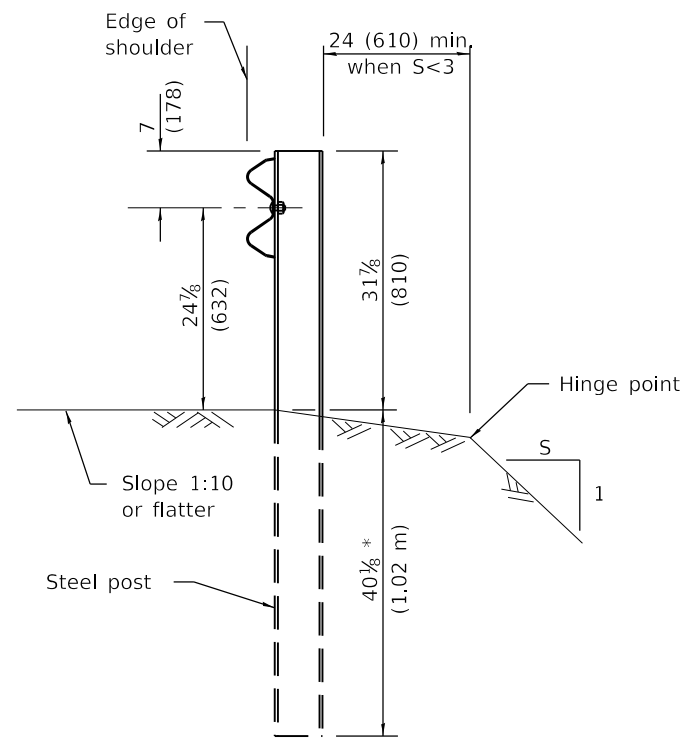


**ELEVATION**

① When connecting to long-span guardrail over culvert, the next post may be the third (farthest from culvert) CRT wood post (See Standard 630106).

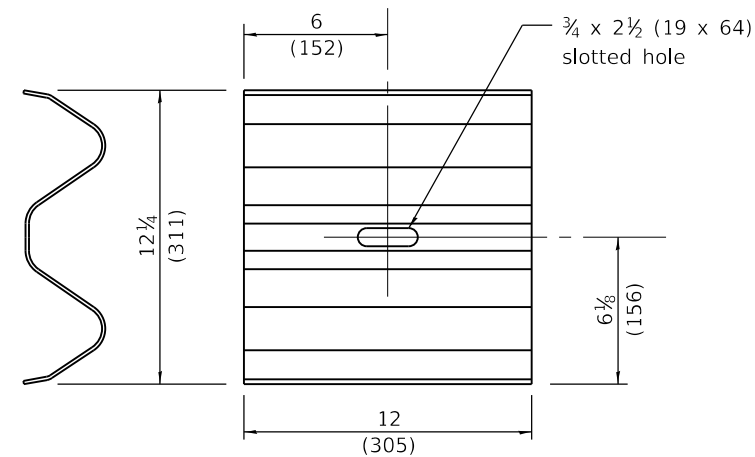


**DETAIL AT POST**



**SECTION A-A**

\* When "S" is less than 3 and the distance from the back of post is less than 24 (610), the post embedment shall be 76 1/2 (1.93 m) and the minimum top of rail height shall be 31 (787).



**BACK-UP PLATE**

**GENERAL NOTES**

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

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

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

DATE	REVISIONS
1-1-17	New standard.

**NON-BLOCKED STEEL PLATE BEAM GUARDRAIL**

(Sheet 1 of 2)

**STANDARD 630006**

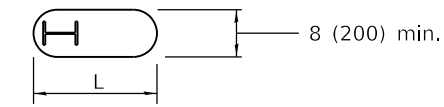
Illinois Department of Transportation

PASSED January 1, 2017  
*Michael Beard*  
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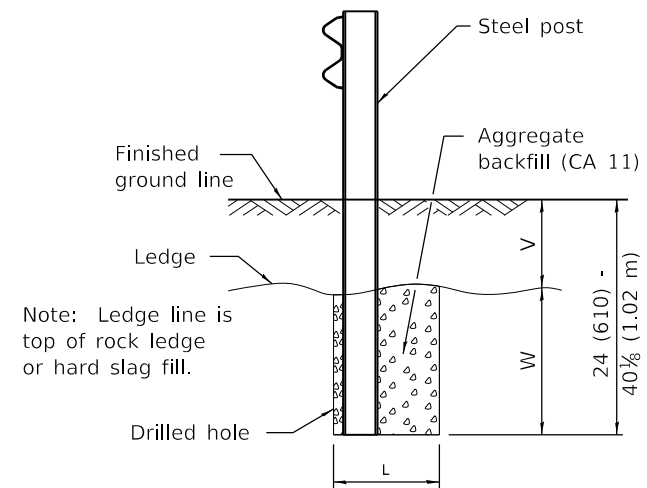
APPROVED January 1, 2017  
*Maureen M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17

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 - 40½ (> 787 - 1.02 m)	12 - 0 (305 - 0)	8 (203)



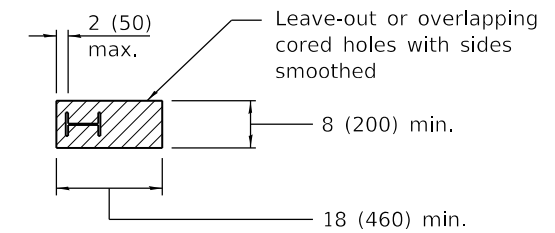
**PLAN**



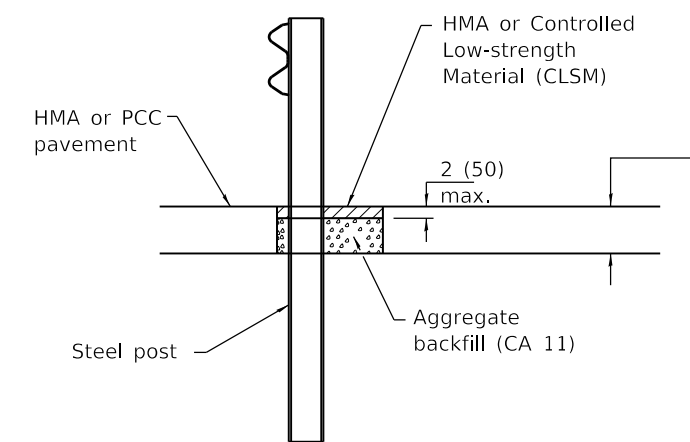
Note: Ledge line is top of rock ledge or hard slag fill.

**ELEVATION**

**FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED**



**PLAN**



If greater than 8 (200) apply FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED, but do not shorten post.

**ELEVATION**

**LEAVE-OUT FOR POST WHEN PAVED MATERIAL IS ENCOUNTERED**

Illinois Department of Transportation

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*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

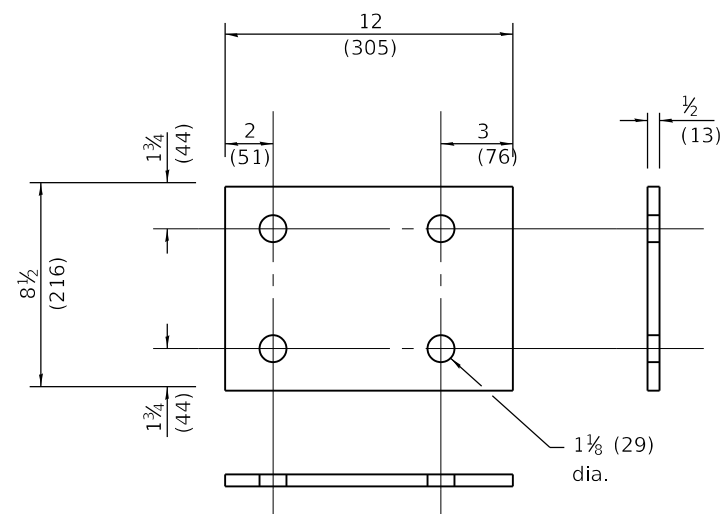
APPROVED January 1, 2017  
*Marcus M. Adams*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17

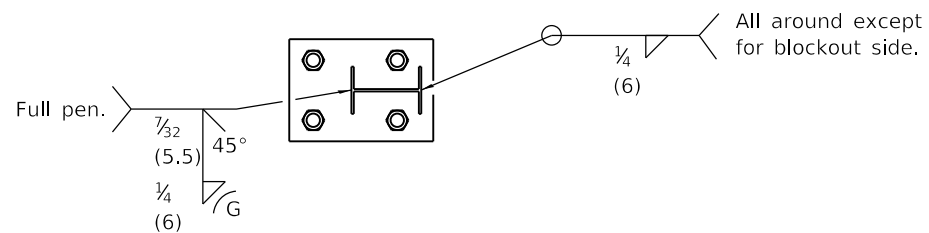
**NON-BLOCKED STEEL  
 PLATE BEAM GUARDRAIL**

(Sheet 2 of 2)

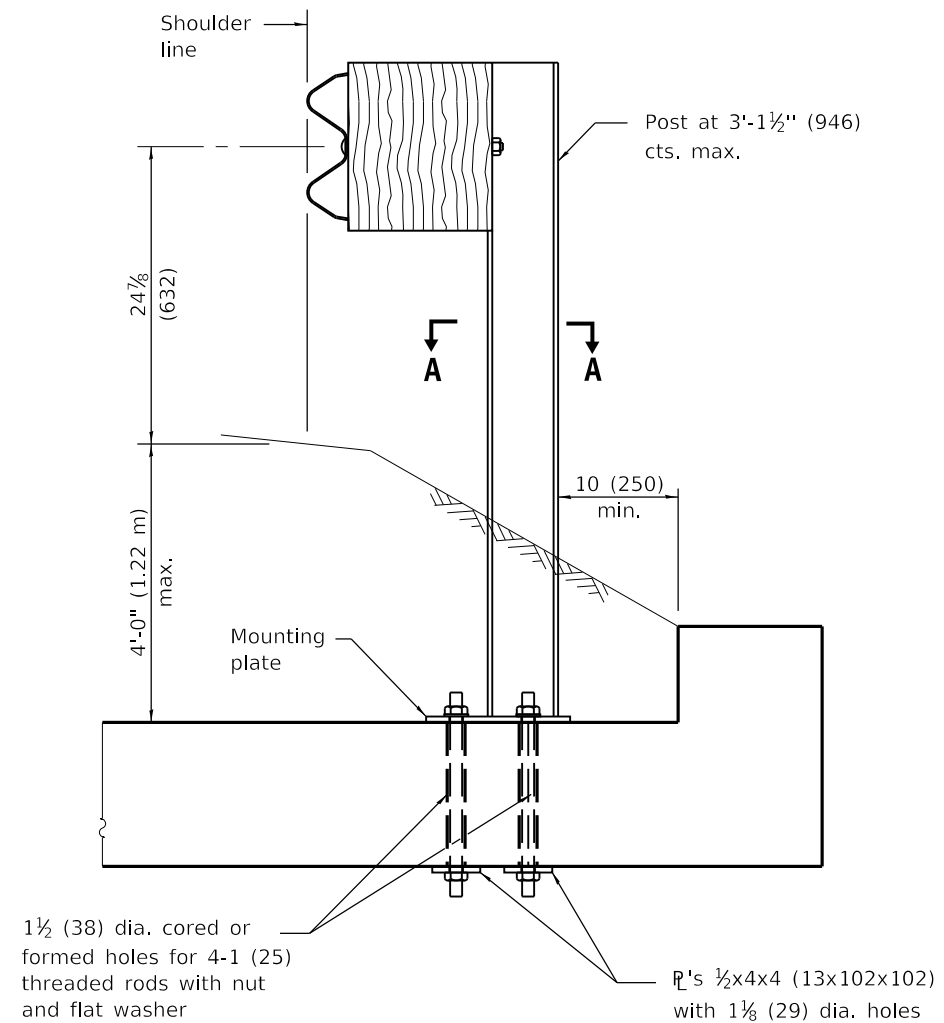
**STANDARD 630006**



**MOUNTING PLATE**



**SECTION A-A**



**CROSS SECTION**

**GENERAL NOTES**

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

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

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

DATE	REVISIONS
1-1-17	Omitted all cases but MNT.
	ON SLAB. Renamed standard.
	Added mounting plate detail.
1-1-11	Revised weld detail
	for Case IV.

**STRONG POST  
GUARDRAIL ATTACHED  
TO CULVERT**

**STANDARD 630101-10**

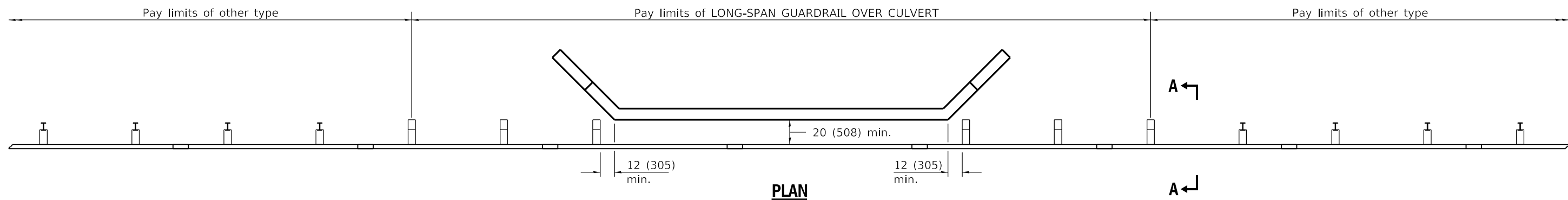
Illinois Department of Transportation

PASSED January 1, 2017  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

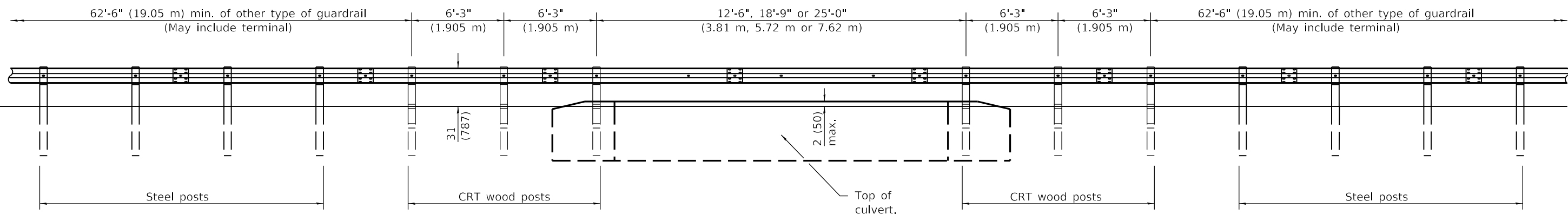
APPROVED January 1, 2017  
*Marcus M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

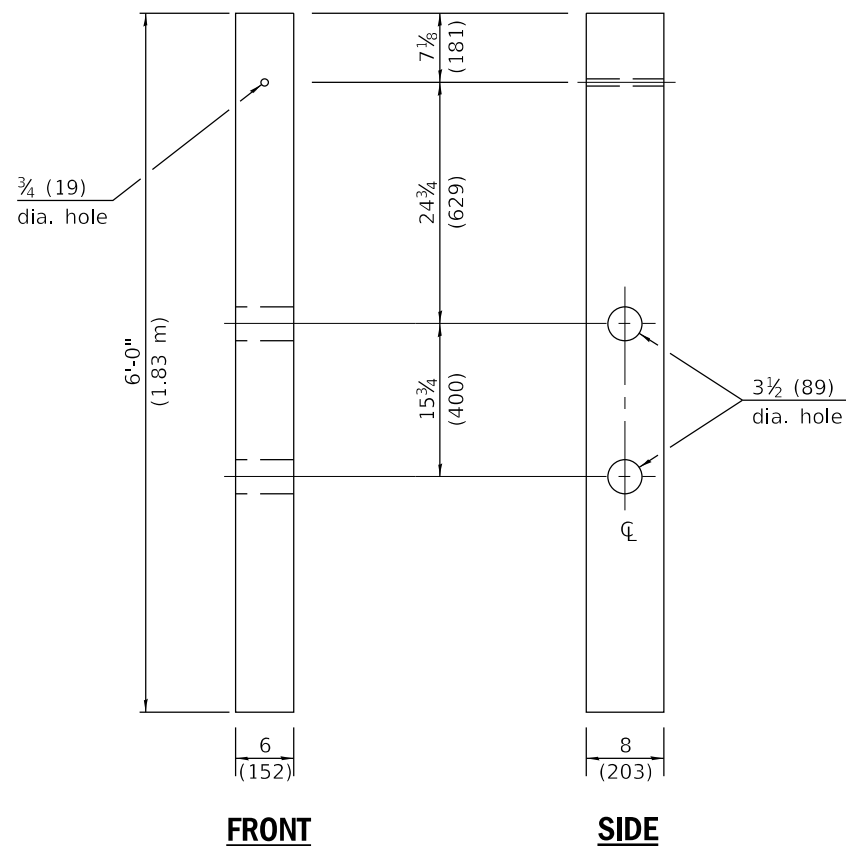




**PLAN**



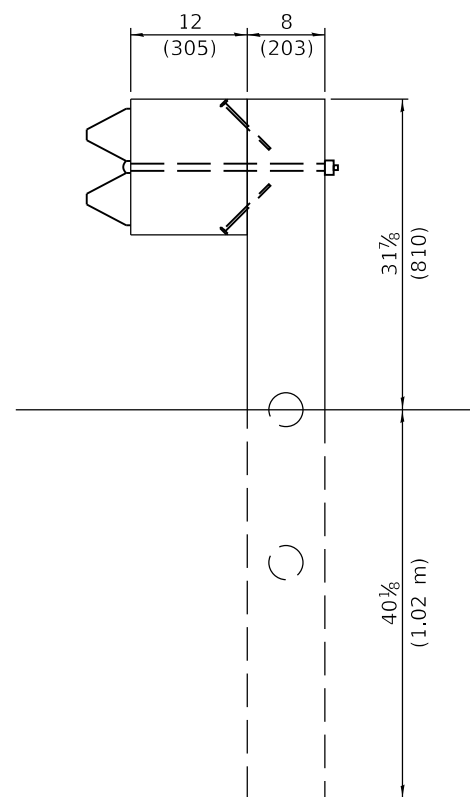
**ELEVATION**



**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.

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**

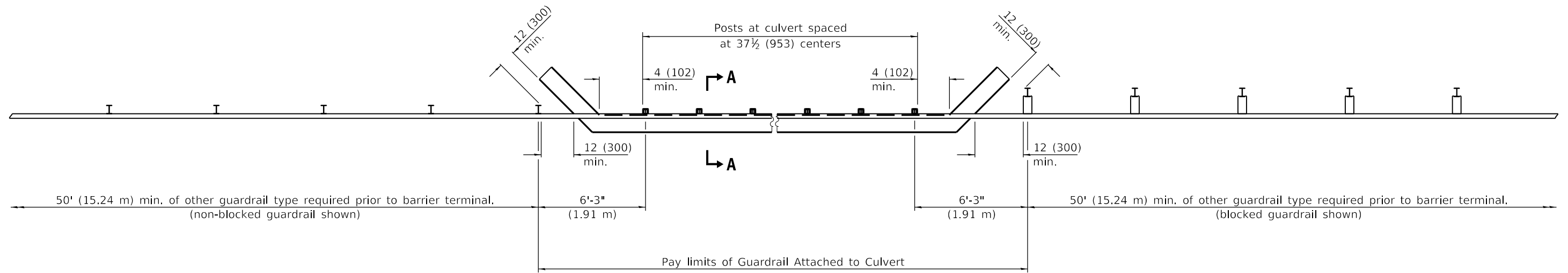
**STANDARD 630106-02**

Illinois Department of Transportation

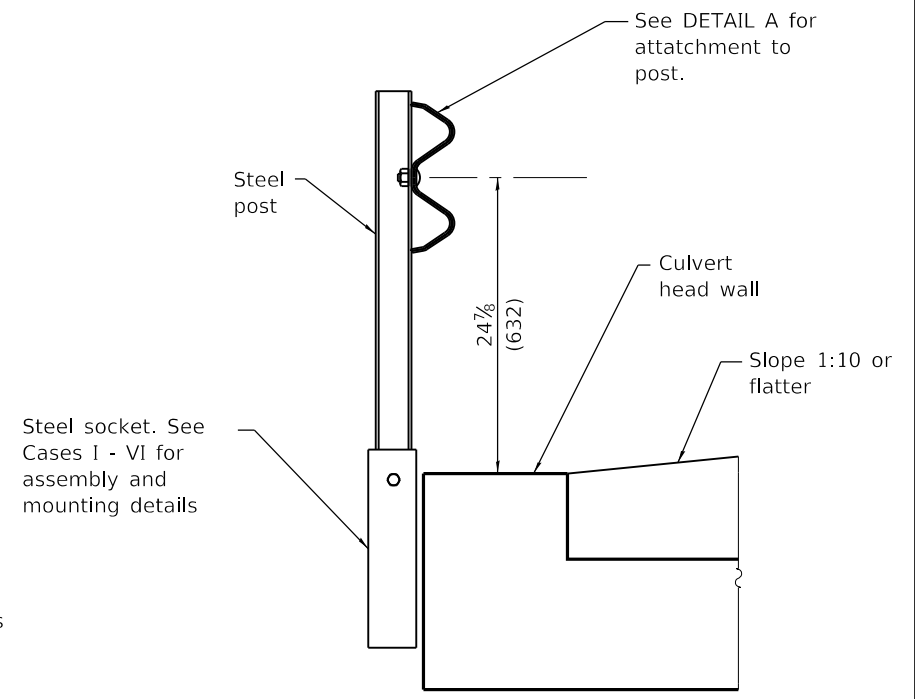
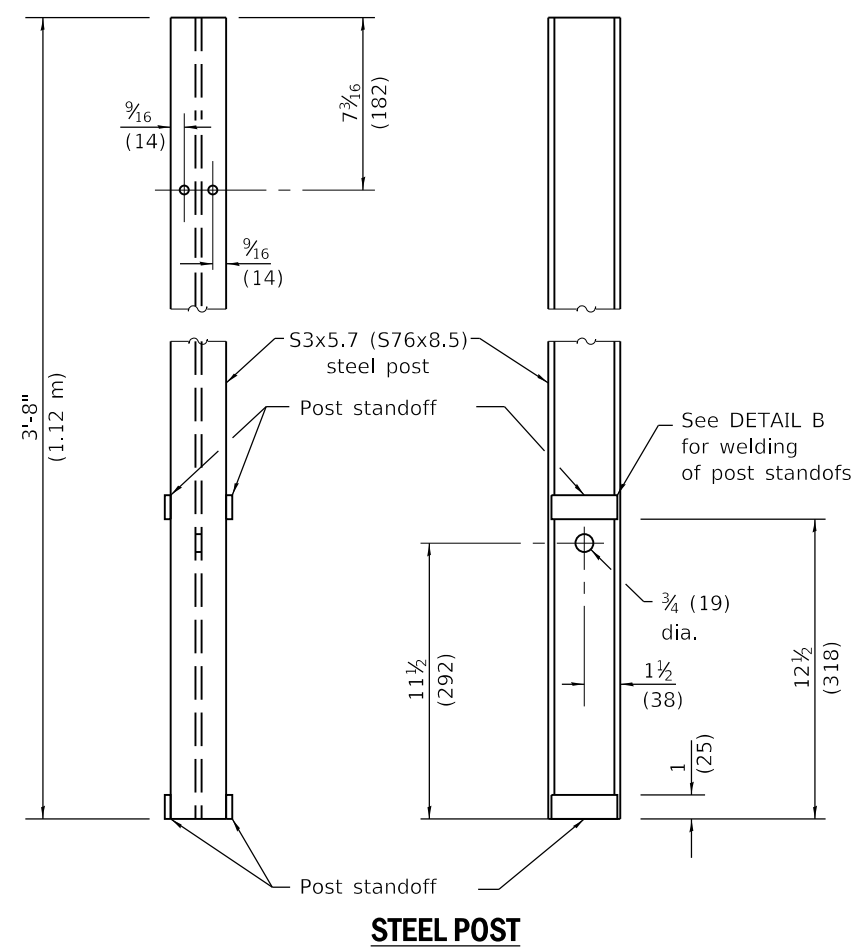
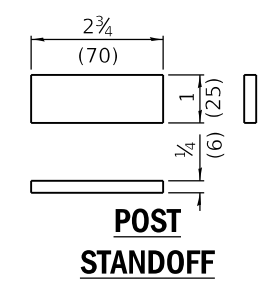
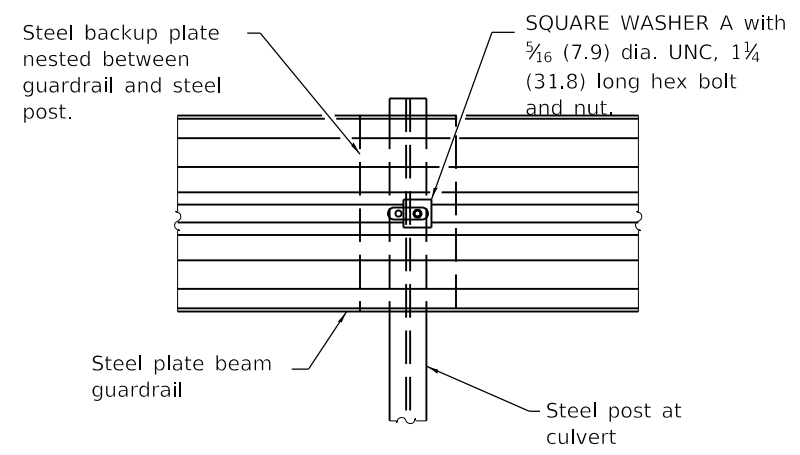
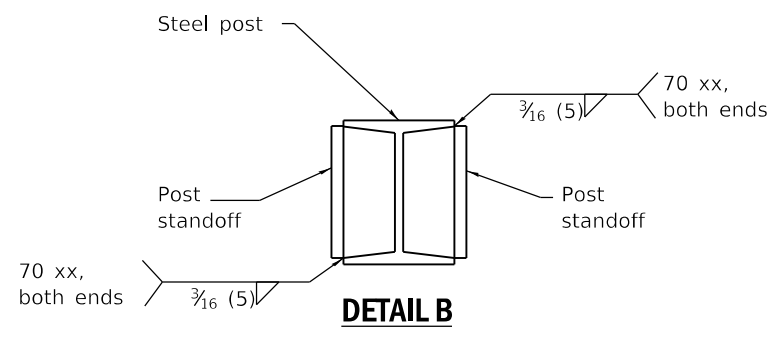
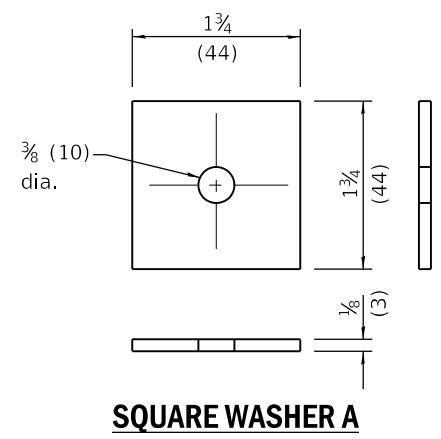
PASSED January 1, 2017  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2017  
*Maureen M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17

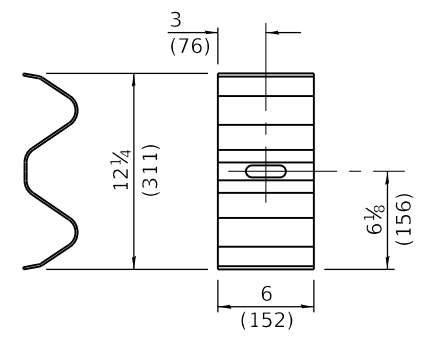


**PLAN**



**GENERAL NOTES**

See Standard 630001 for details of guardrail not shown.  
 See Standard 630006 for details of non-blocked guardrail not shown.  
 All threaded rods and bolts shall be installed with heavy hex nuts and standard washers unless noted otherwise.  
 All dimensions are in inches (millimeters) unless otherwise shown.



DATE	REVISIONS
1-1-20	Revised HHS to HSS in Top View on sheets 2-5.
1-1-17	New Standard.

**WEAK POST GUARDRAIL ATTACHED TO CULVERT**  
 (Sheet 1 of 6)

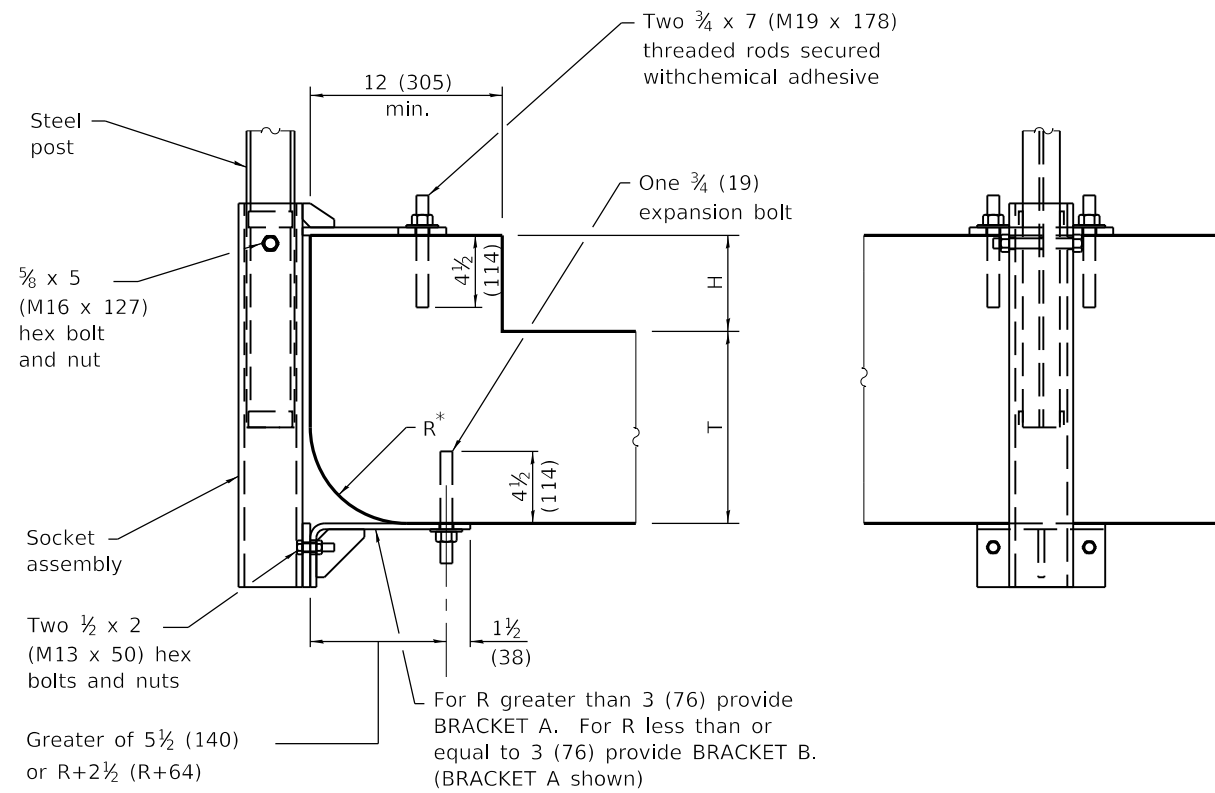
**STANDARD 630111-01**

Illinois Department of Transportation

PASSED January 1, 2020  
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 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2020  
*J. S. Egan*  
 ENGINEER OF DESIGN AND ENVIRONMENT

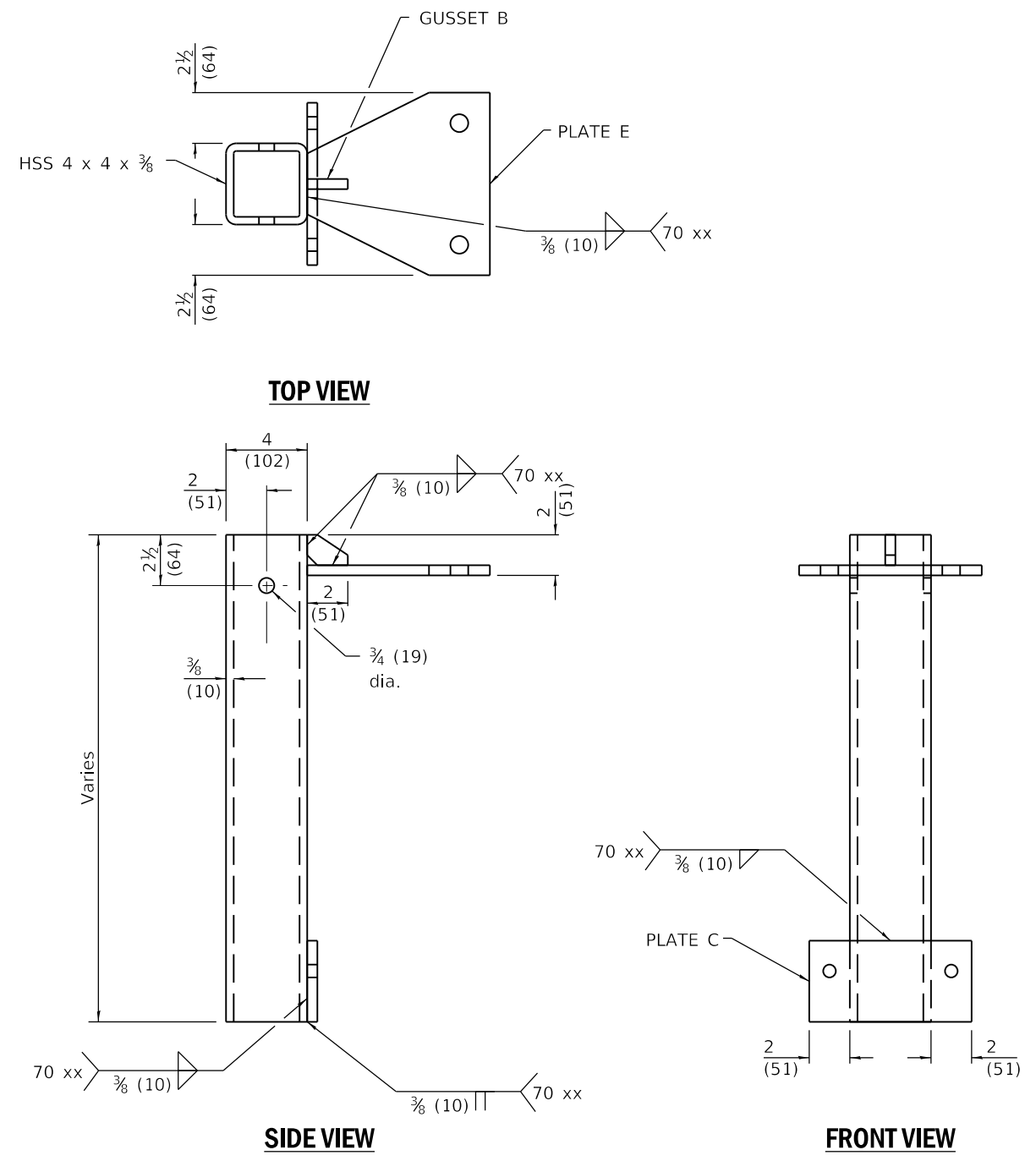
ISSUED 1-1-17



**CROSS SECTION**

**ELEVATION**

**CASE I, (H+T-R) < 18 (457), TOP MOUNT**



**SOCKET ASSEMBLY FOR CASE I**

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APPROVED January 1, 2020

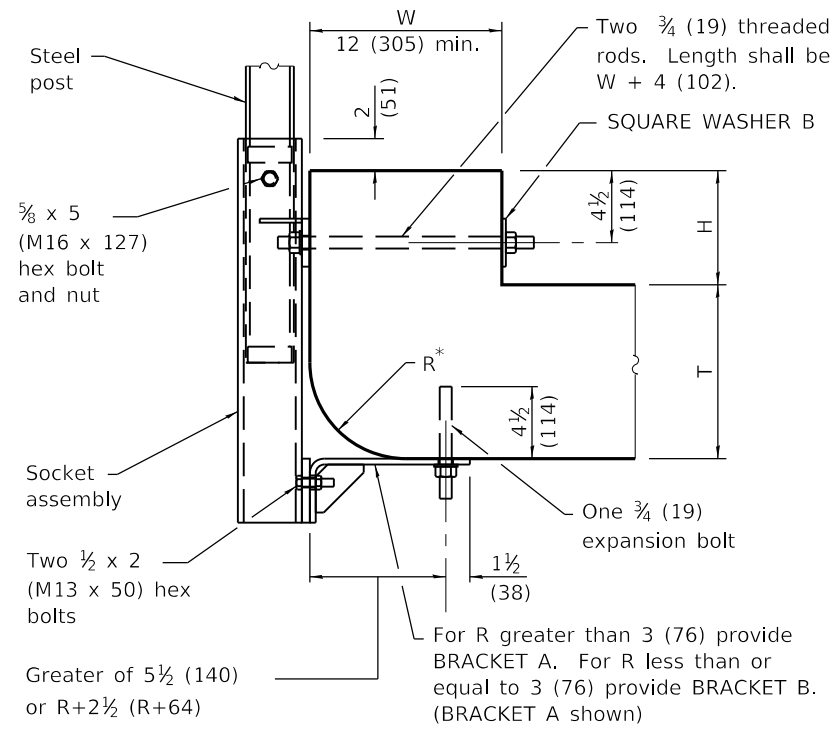
*J. S. Egan*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17

**WEAK POST GUARDRAIL ATTACHED TO CULVERT**

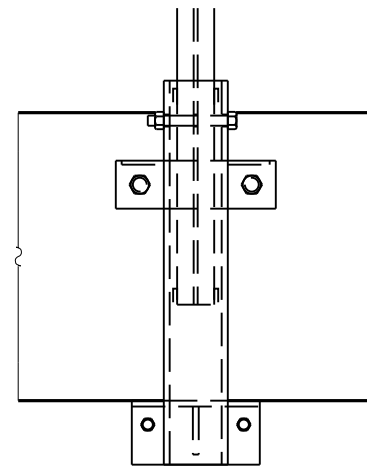
(Sheet 2 of 6)

**STANDARD 630111-01**

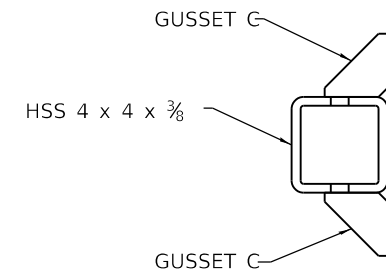


**CROSS SECTION**

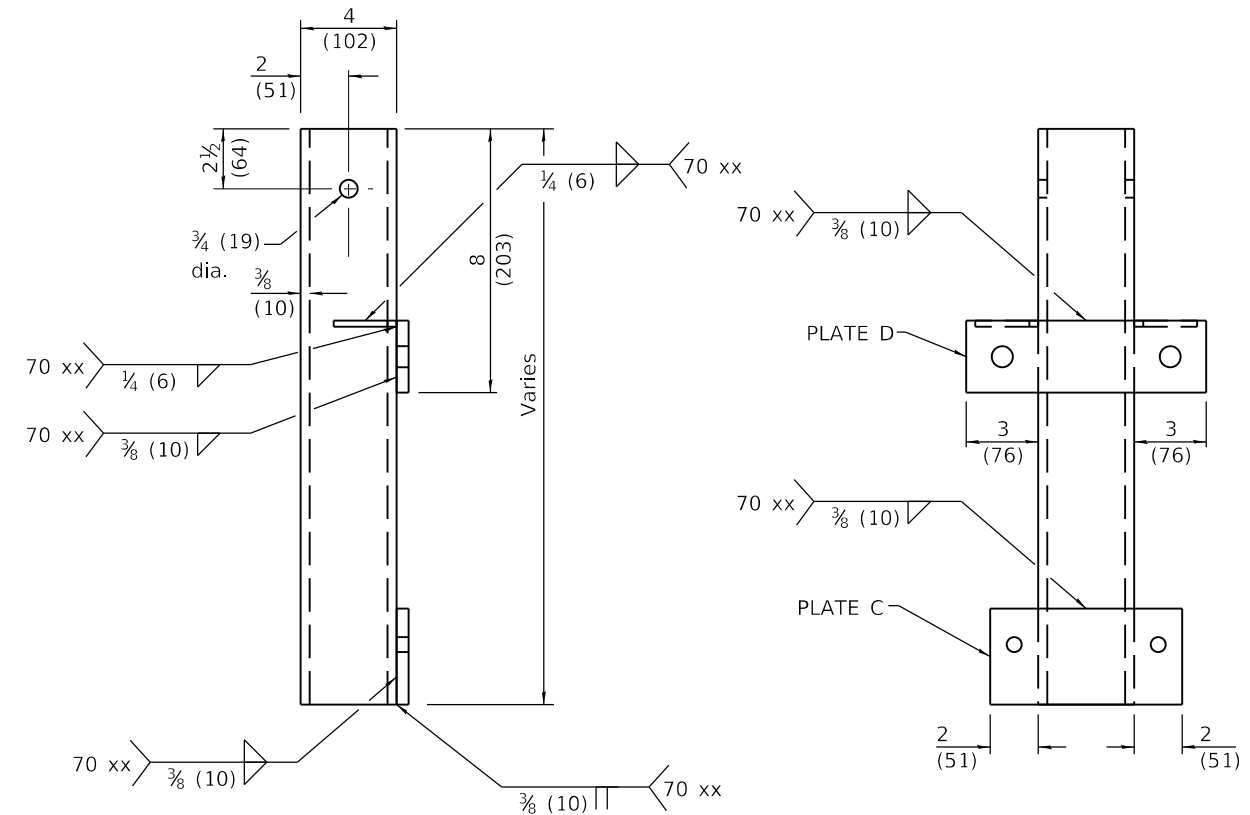
**CASE II, (H+T-R) < 18 (457), SIDE-MOUNT THROUGH-BOLT**



**ELEVATION**



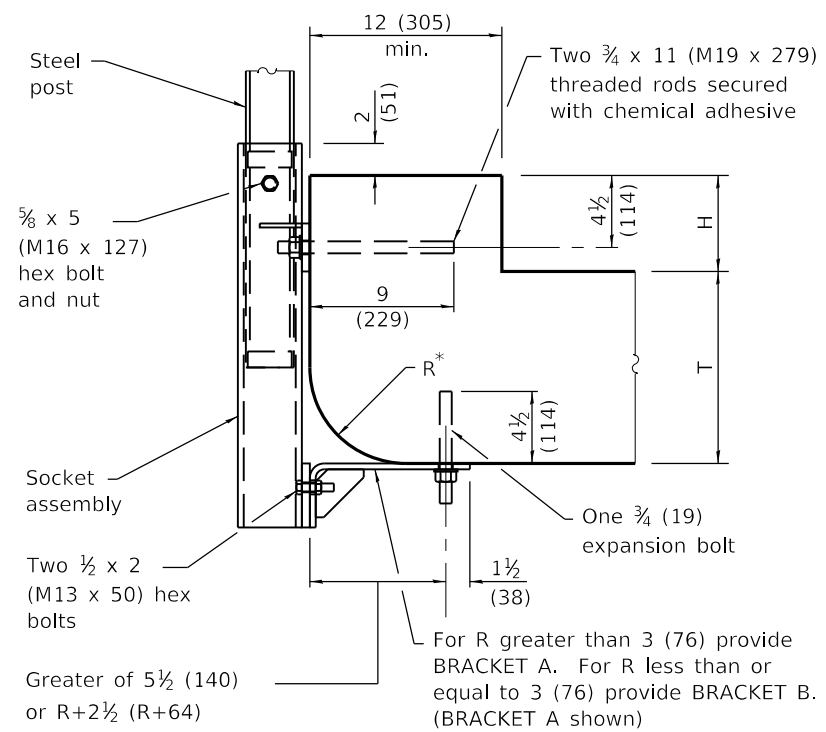
**TOP VIEW**



**SIDE VIEW**

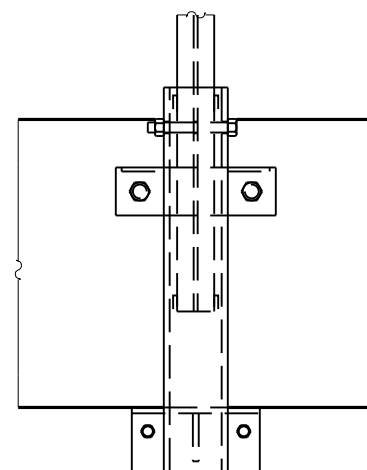
**FRONT VIEW**

**SOCKET ASSEMBLY FOR CASES II & III**



**CROSS SECTION**

**CASE III, (H+T-R) < 18 (457), SIDE-MOUNT ANCHORED**



**ELEVATION**

Illinois Department of Transportation

PASSED January 1, 2020  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES

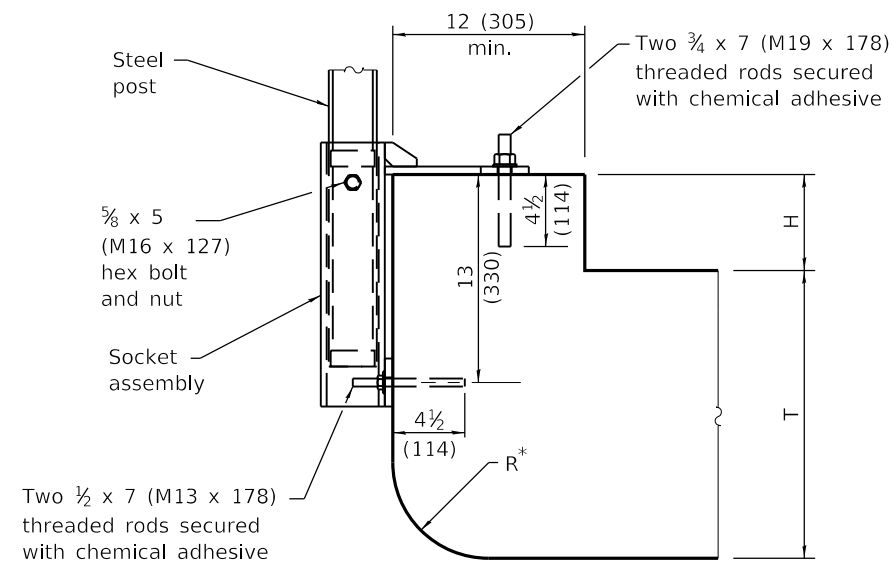
APPROVED January 1, 2020  
*J. C. Egan*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17

**WEAK POST GUARDRAIL ATTACHED TO CULVERT**

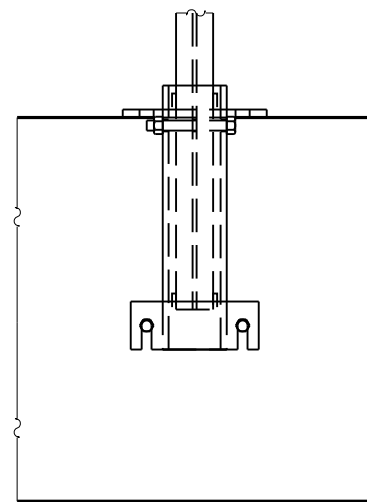
(Sheet 3 of 6)

**STANDARD 630111-01**



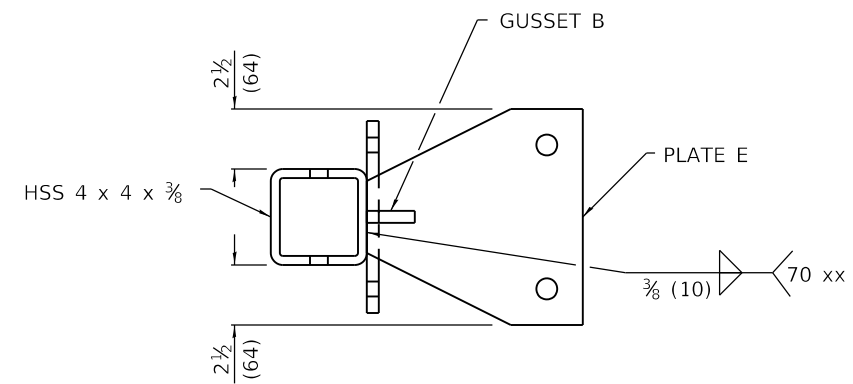
\* R varies between 0 to 6 (152)

**CROSS SECTION**

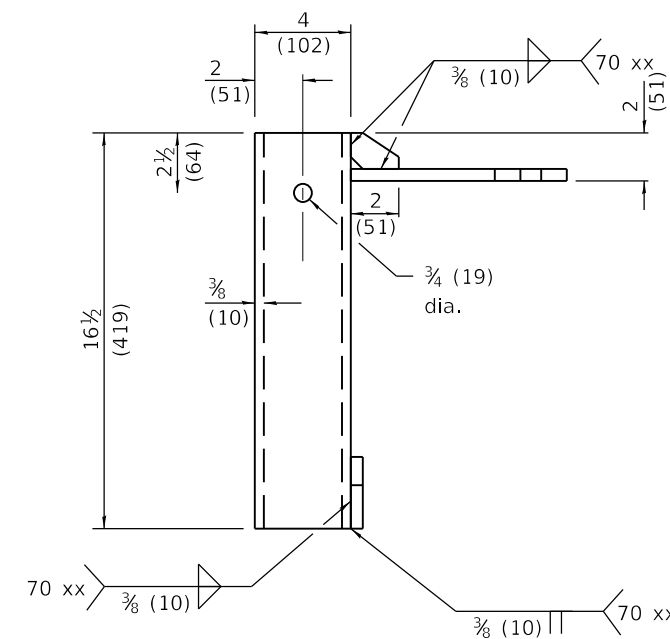


**ELEVATION**

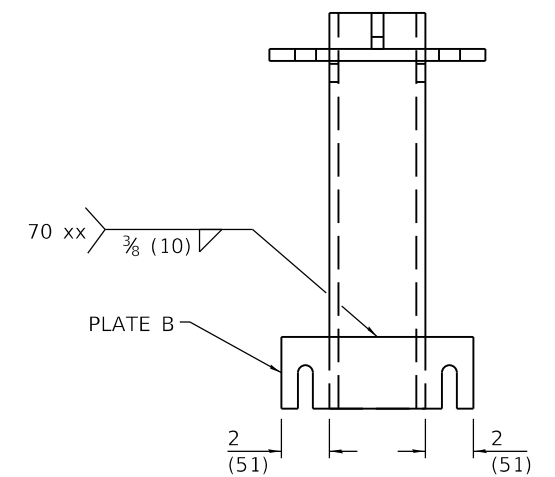
**CASE IV, (H+T-R) ≥ 18 (457), TOP MOUNT**



**TOP VIEW**



**SIDE VIEW**



**FRONT VIEW**

**SOCKET ASSEMBLY  
FOR CASE IV**

Illinois Department of Transportation

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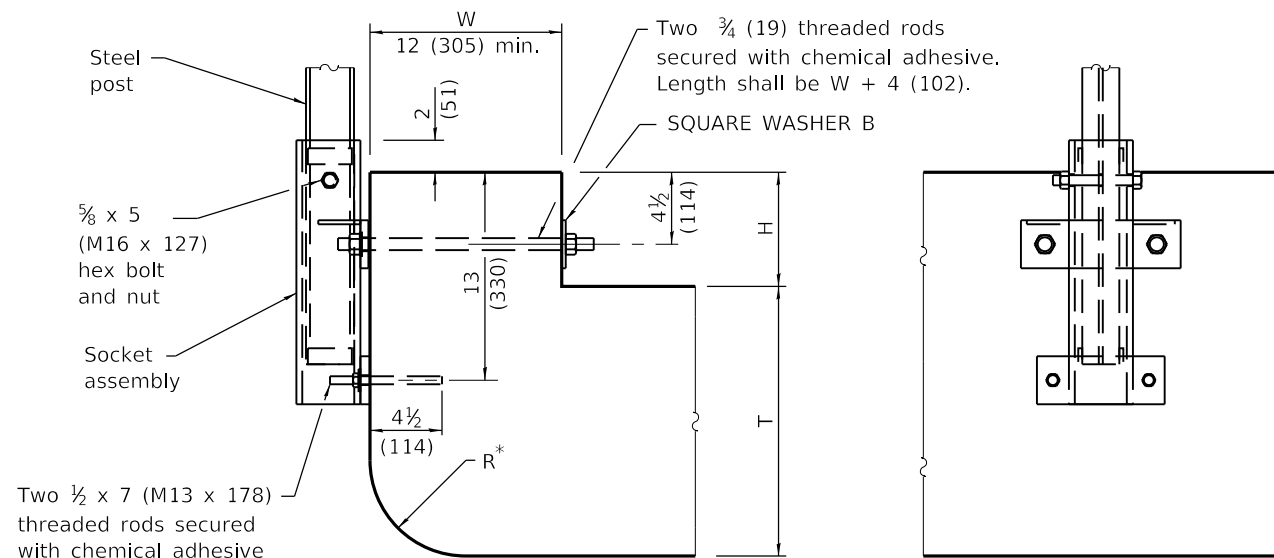
APPROVED January 1, 2020  
*J. E. Egan*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17

**WEAK POST GUARDRAIL  
ATTACHED TO CULVERT**

(Sheet 4 of 6)

**STANDARD 630111-01**

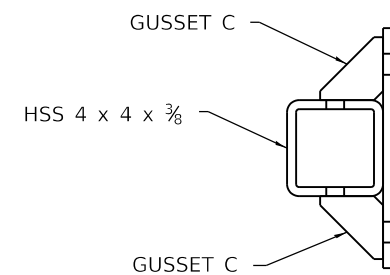


\* R varies between 0 to 6 (152)

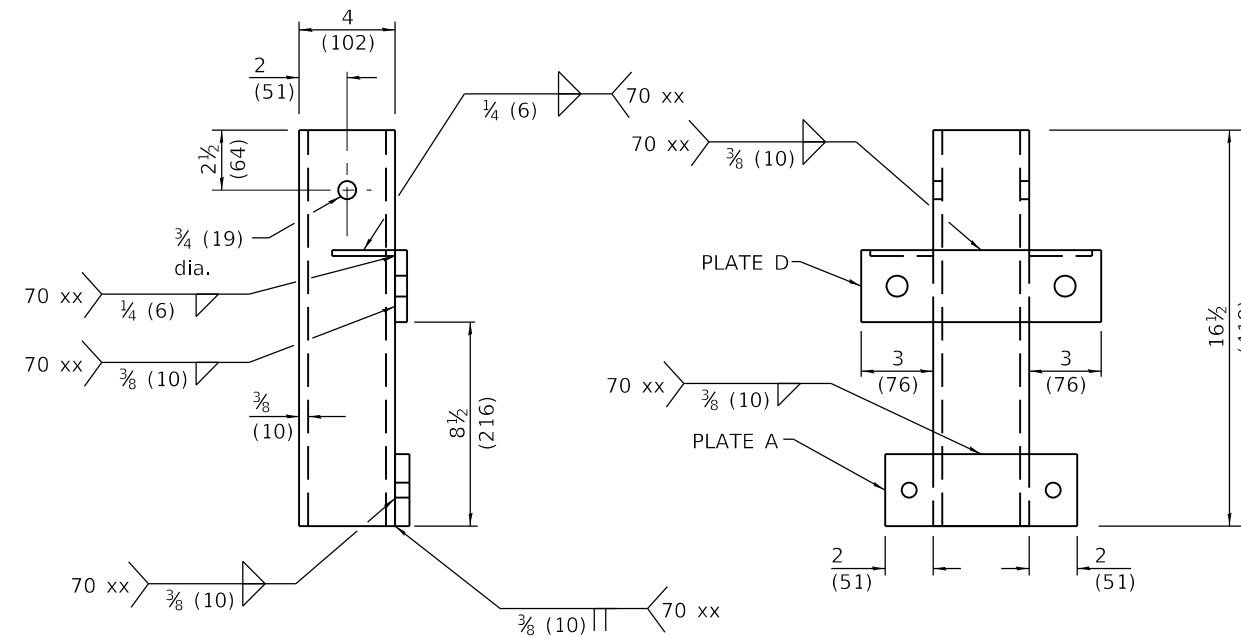
**CROSS SECTION**

**ELEVATION**

**CASE V, (H+T-R) ≥ 18 (457), SIDE-MOUNT, THROUGH-BOLT**



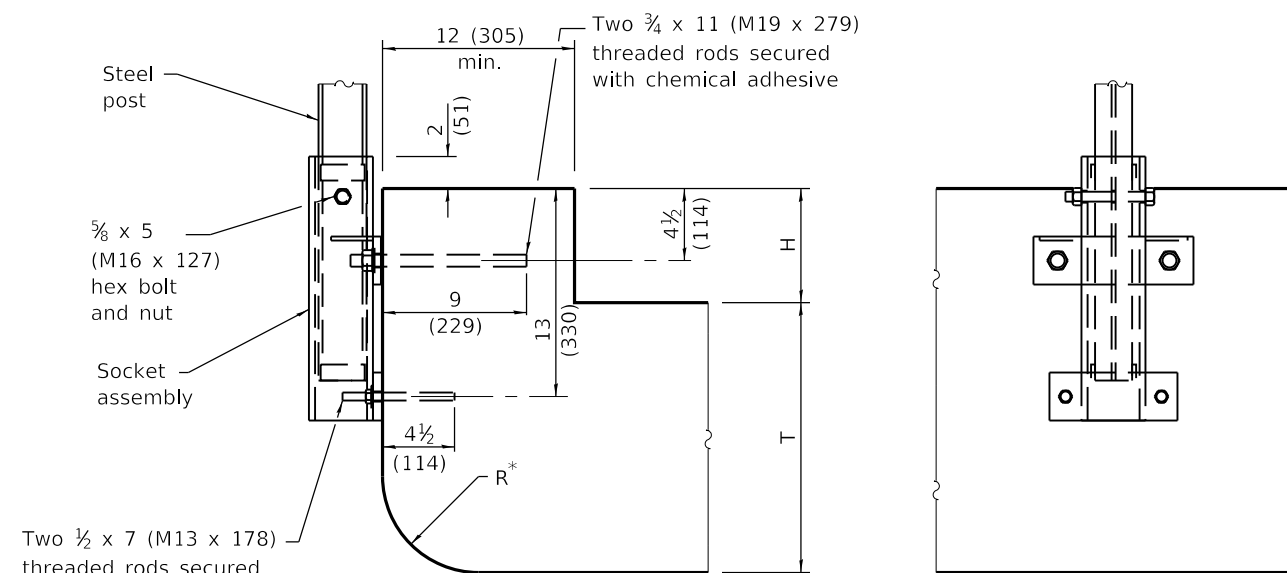
**TOP VIEW**



**SIDE VIEW**

**FRONT VIEW**

**SOCKET ASSEMBLY FOR CASES V & VI**



\* R varies between 0 to 6 (152)

**CROSS SECTION**

**ELEVATION**

**CASE VI, (H+T-R) ≥ 18 (457), SIDE-MOUNT ANCHORED**

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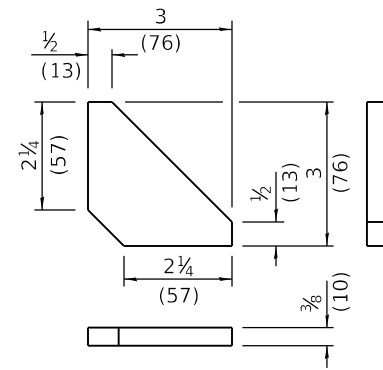
APPROVED January 1, 2020  
*J. C. Egan*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17

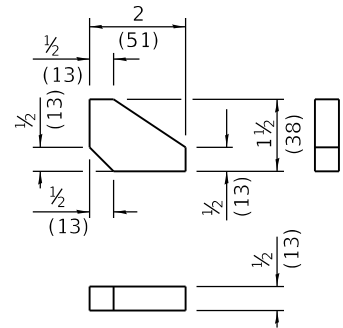
**WEAK POST GUARDRAIL ATTACHED TO CULVERT**

(Sheet 5 of 6)

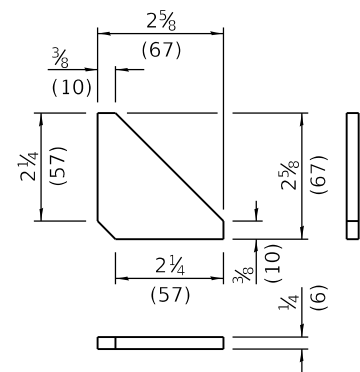
**STANDARD 630111-01**



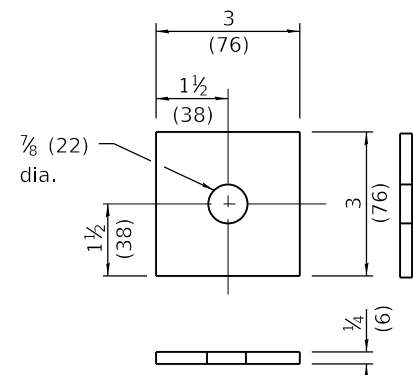
**GUSSET A**



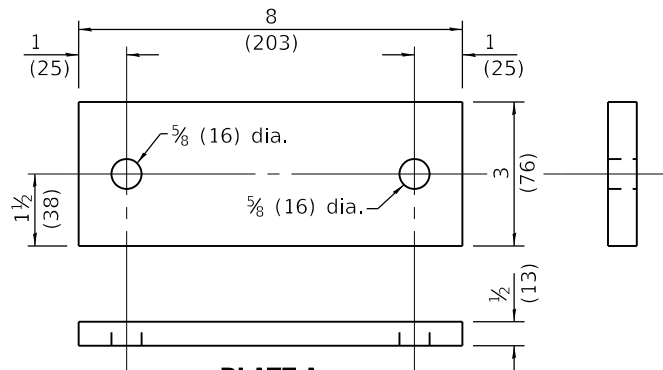
**GUSSET B**



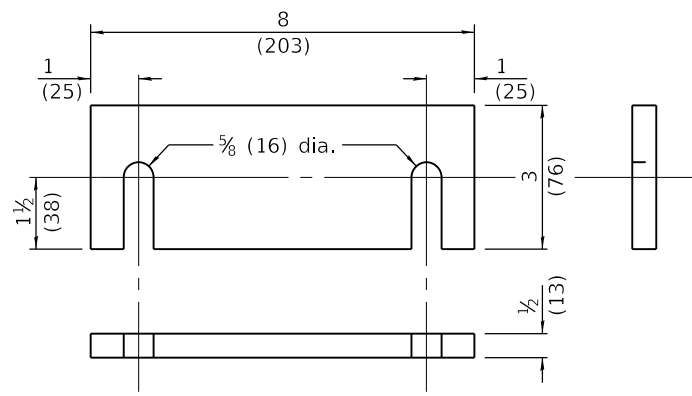
**GUSSET C**



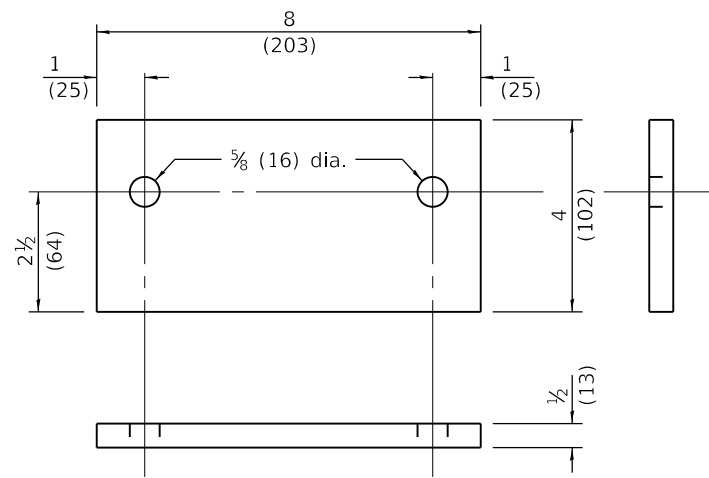
**SQUARE WASHER B**



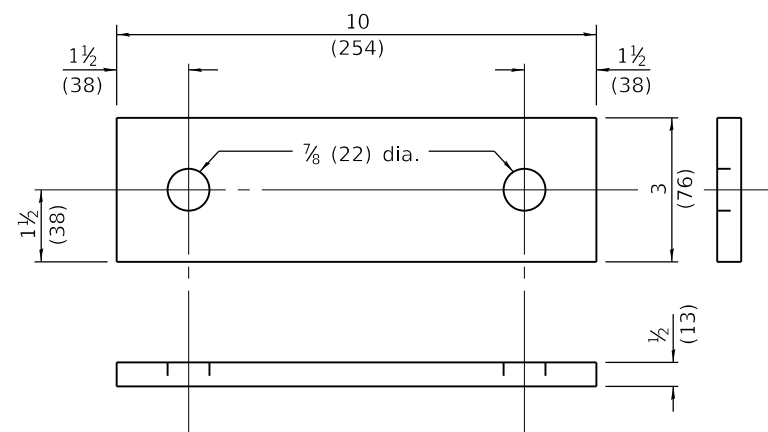
**PLATE A**



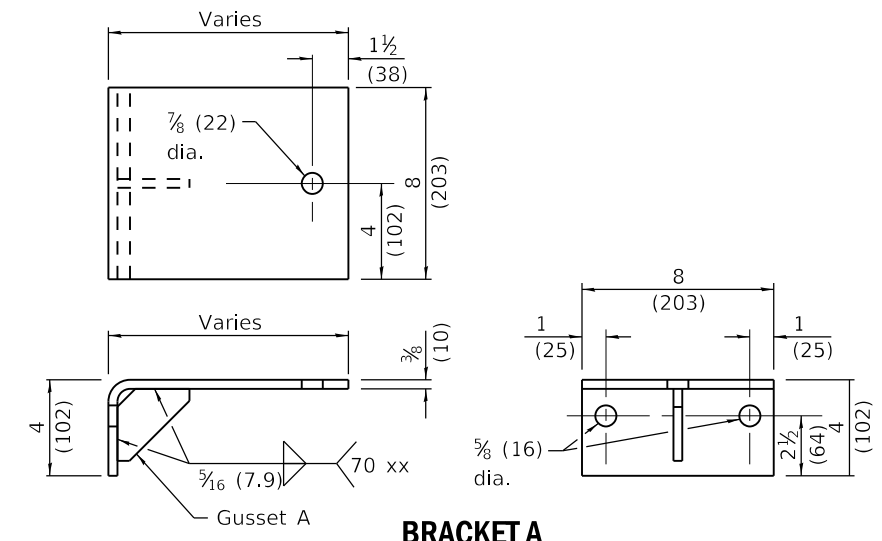
**PLATE B**



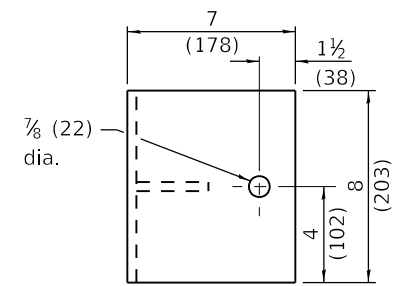
**PLATE C**



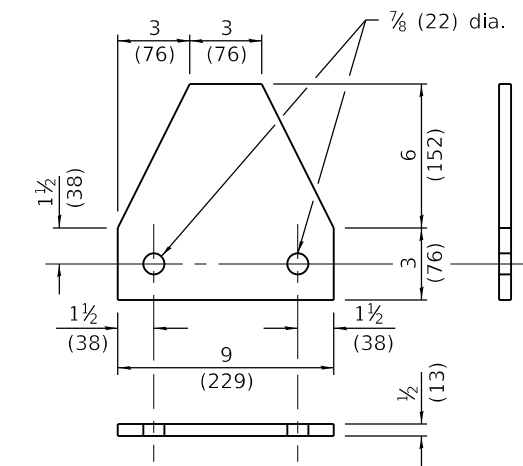
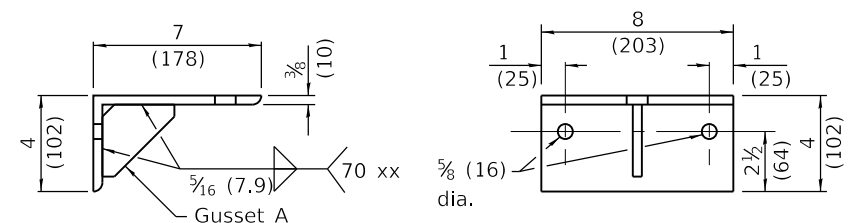
**PLATE D**



**BRACKET A**



**BRACKET B**



**PLATE E**

**WEAK POST GUARDRAIL  
ATTACHED TO CULVERT**

(Sheet 6 of 6)

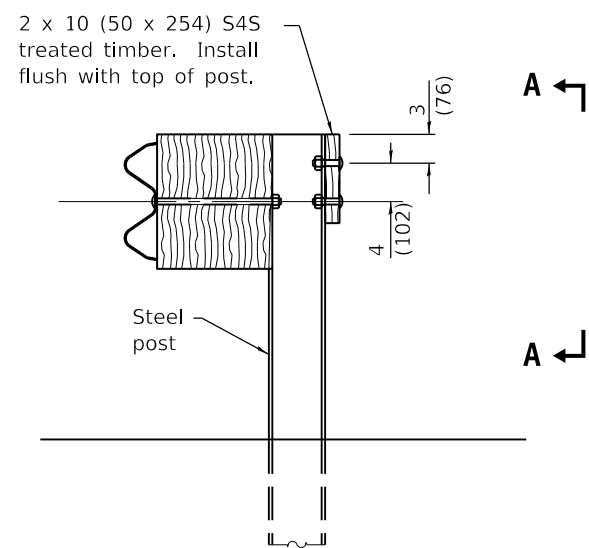
**STANDARD 630111-01**

Illinois Department of Transportation

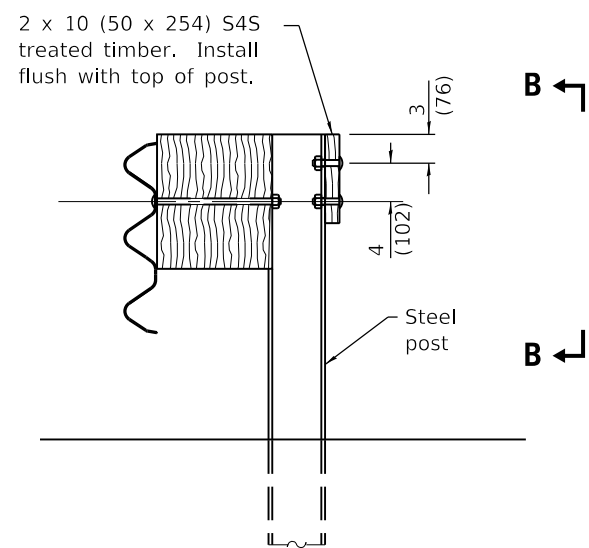
PASSED January 1, 2020  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2020  
*J. S. Edwards*  
 ENGINEER OF DESIGN AND ENVIRONMENT

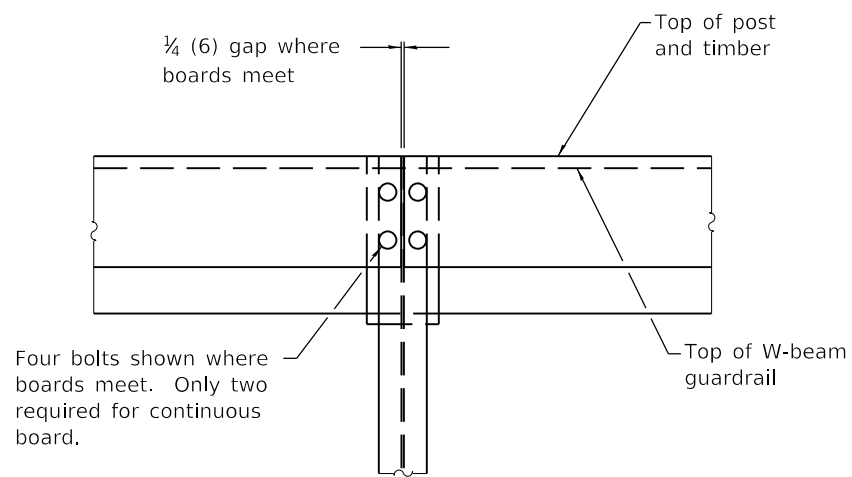
ISSUES 4-1-1 03/05/11



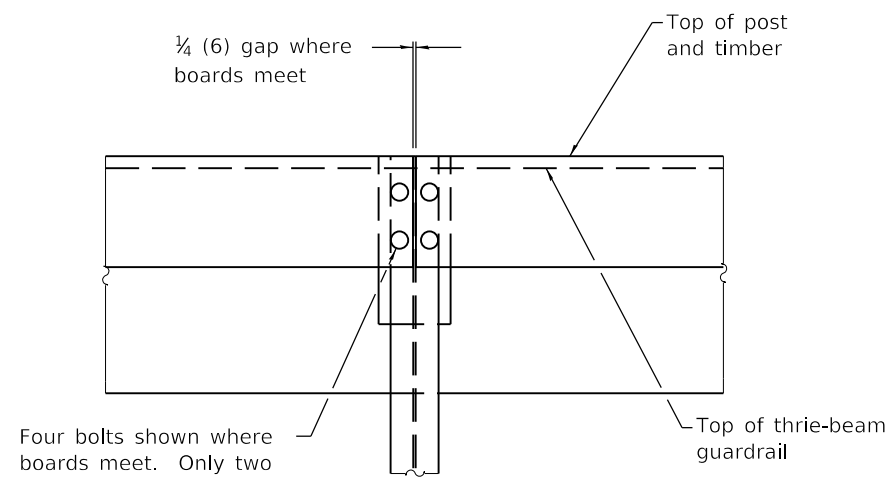
**ELEVATION WITH  
W-BEAM GUARDRAIL**



**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.

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ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2017  
*Maureen M. Adams*  
ENGINEER OF DESIGN AND ENVIRONMENT

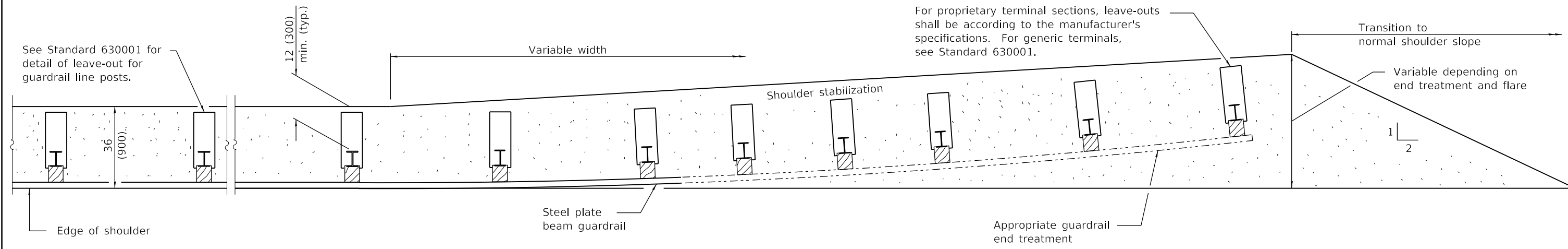
ISSUED 1-1-17

DATE	REVISIONS
1-1-17	New standard.

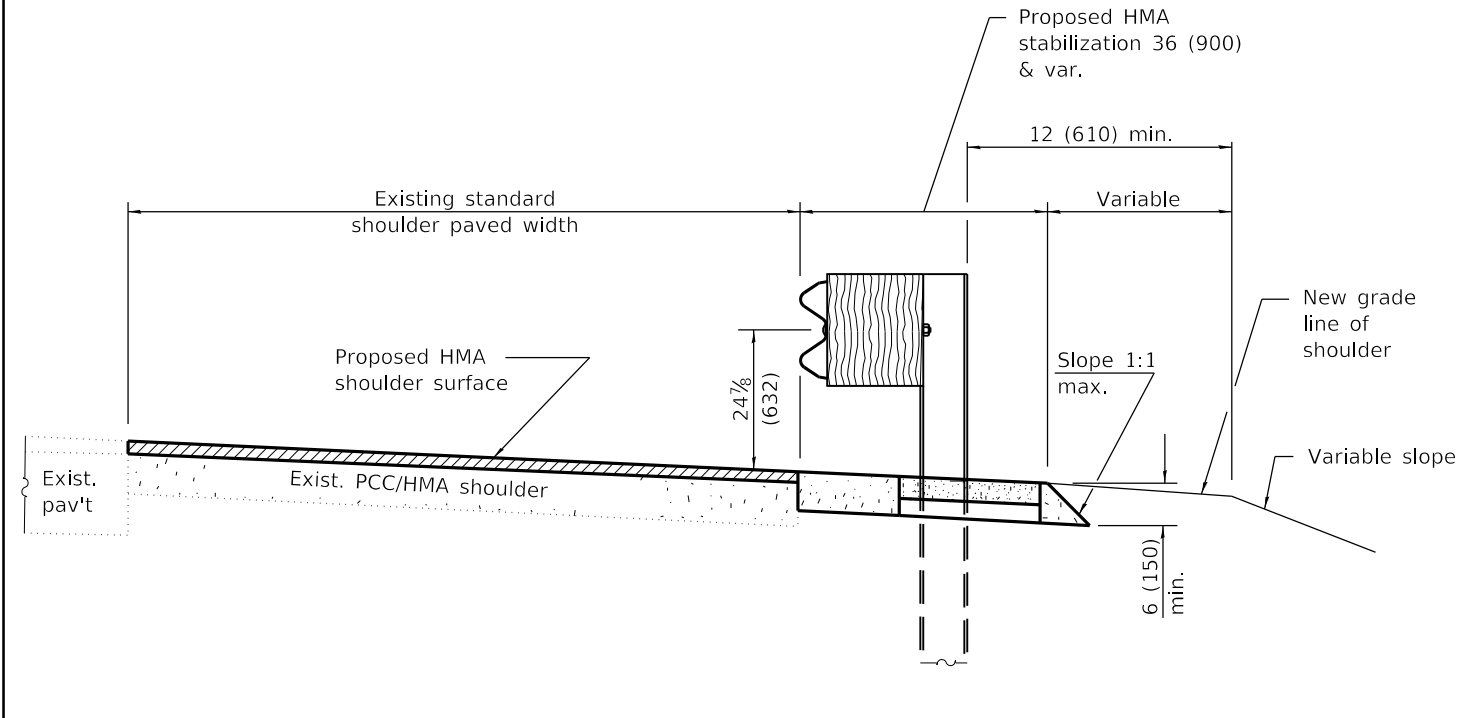
**BACK SIDE PROTECTION  
OF GUARDRAIL**

**STANDARD 630116**

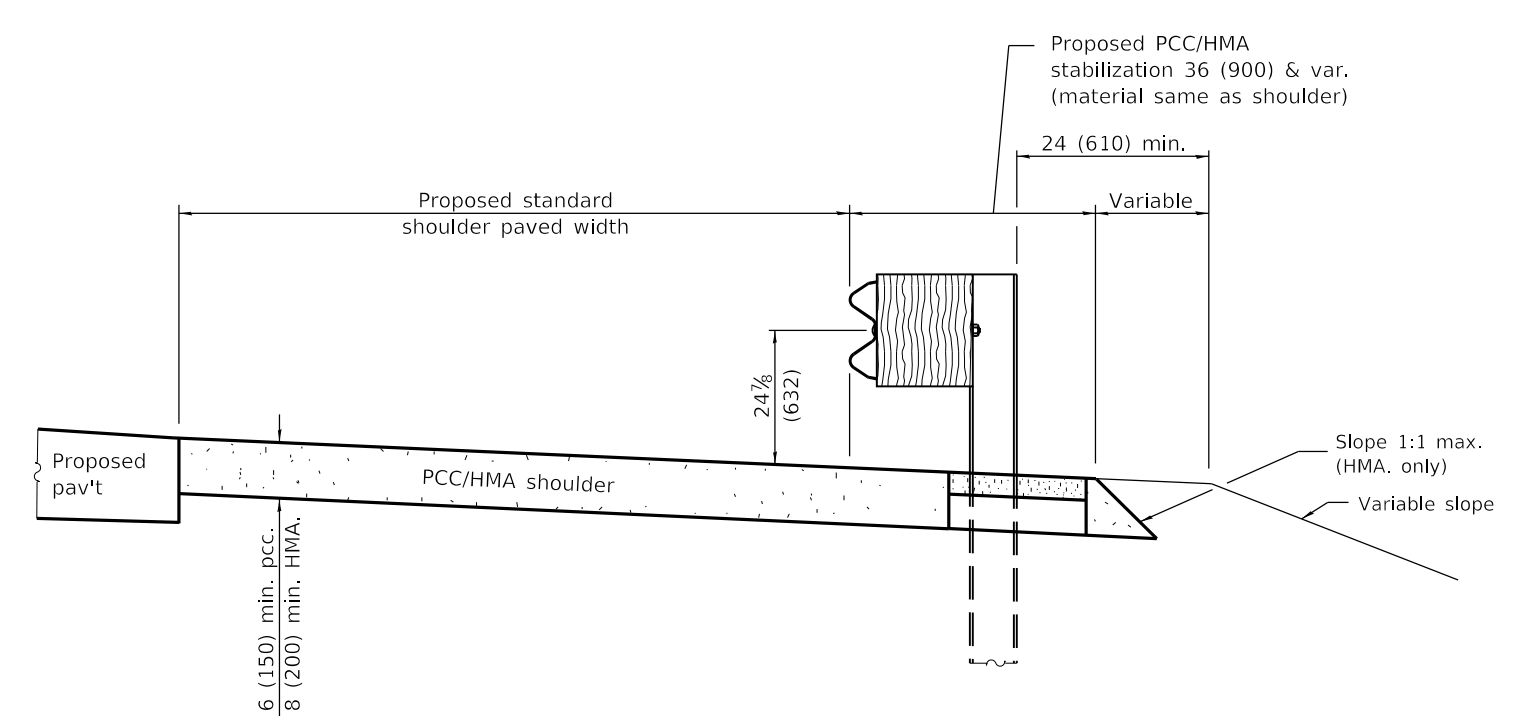




**PLAN**



**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.

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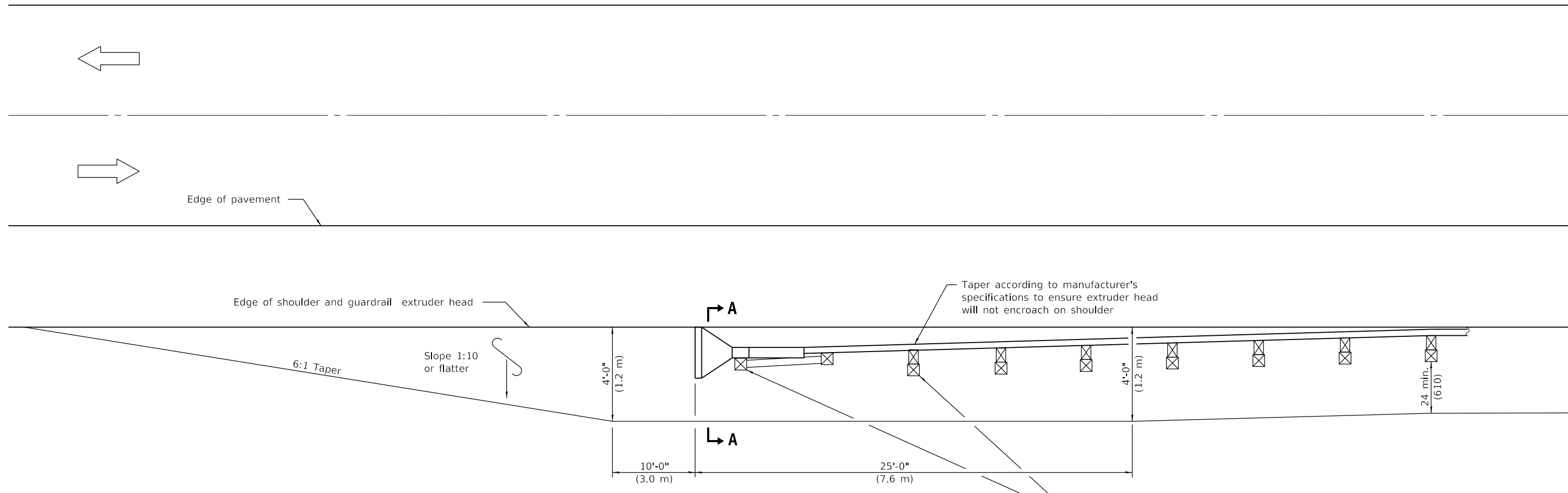
APPROVED January 1, 2017  
*Maureen M. Beck*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

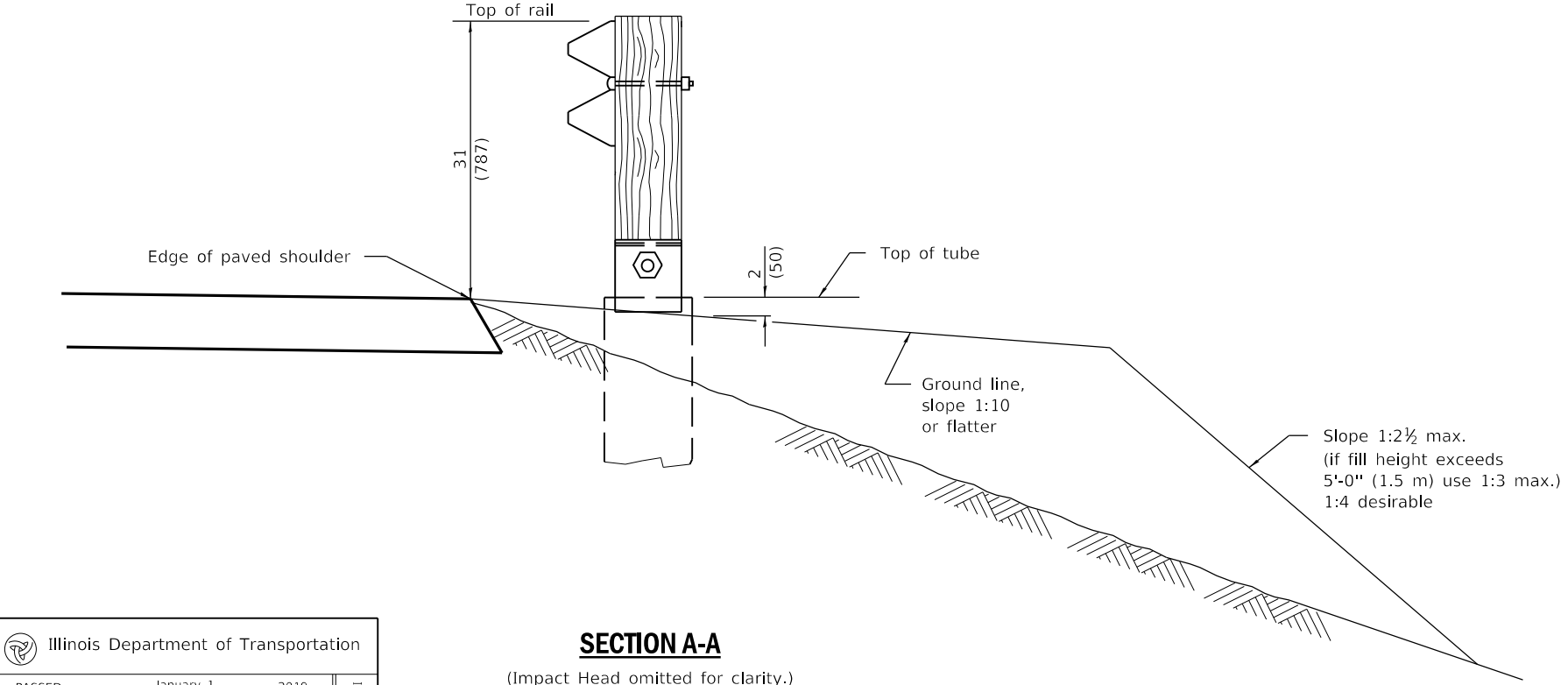
DATE	REVISIONS
1-1-17	Revised leave-outs, moved dimensions to Standard 630001.
1-1-09	Switched units to English (metric).

**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.)

Beginning length of need point varies by manufacturer. Typically occurs between posts 1 and 3.

**GENERAL NOTES**

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

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

DATE	REVISIONS
1-1-19	Removed pay limits. Revised notes regarding the taper/flare and length of need point.
1-1-18	Omitted posts from 'Pay limits of other type'.

**SHOULDER WIDENING FOR  
TYPE 1 (SPECIAL)  
GUARDRAIL TERMINALS**  
(Sheet 1 of 2)

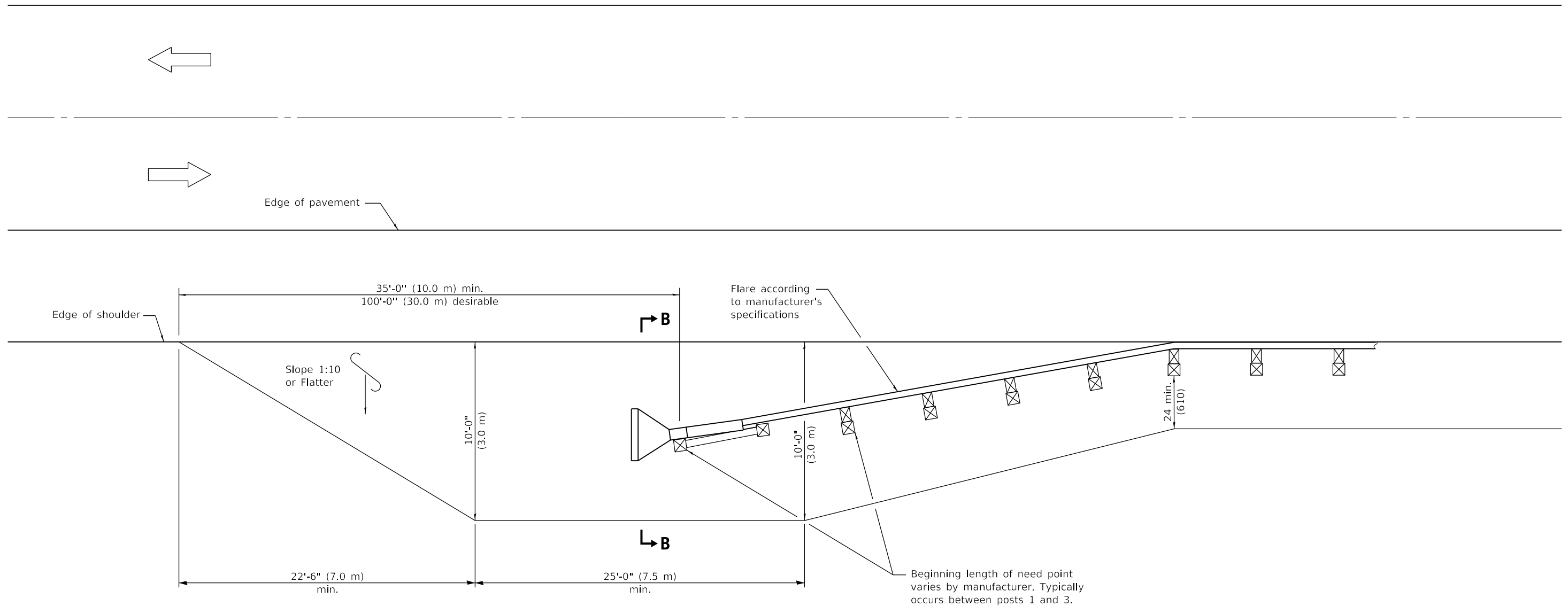
**STANDARD 630301-09**

Illinois Department of Transportation

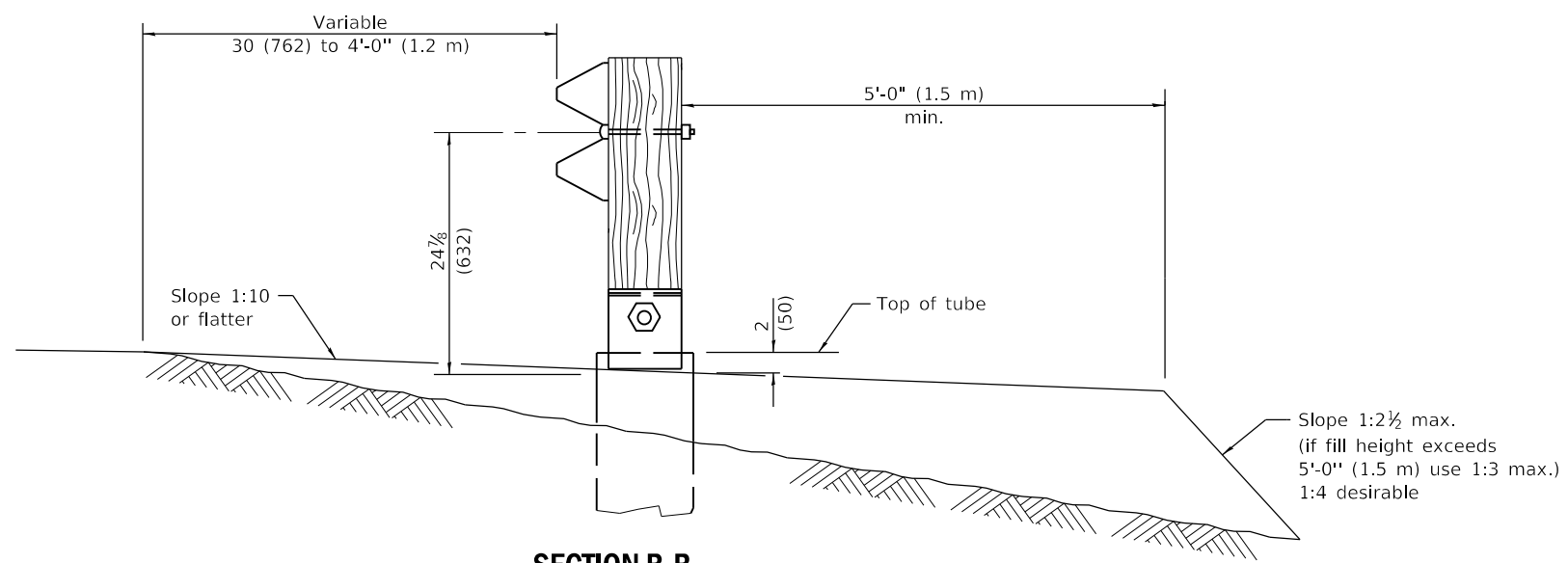
PASSED January 1, 2019  
*Michael Bond*  
ENGINEER OF POLICY AND PROCEDURES

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

ISSUED 1-1-00



**SHOULDER WIDENING TRANSITION  
FOR FLARED TERMINAL**



**SECTION B-B**  
(Impact Head omitted for clarity.)

**SHOULDER WIDENING FOR  
TYPE 1 (SPECIAL)  
GUARDRAIL TERMINALS**  
(Sheet 2 of 2)

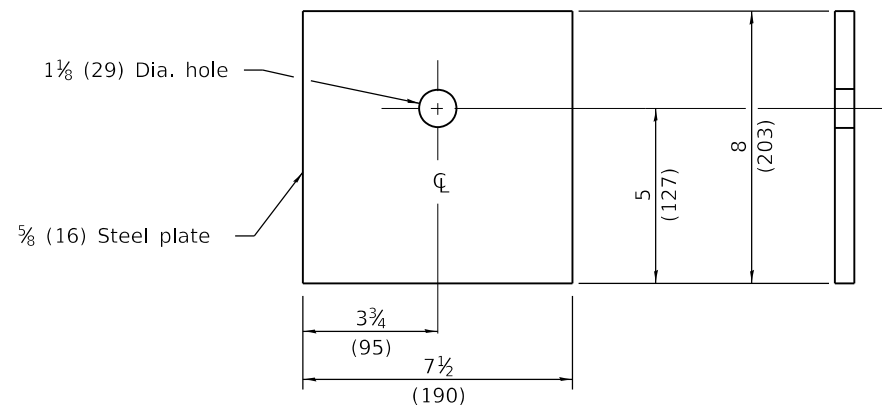
**STANDARD 630301-09**

Illinois Department of Transportation

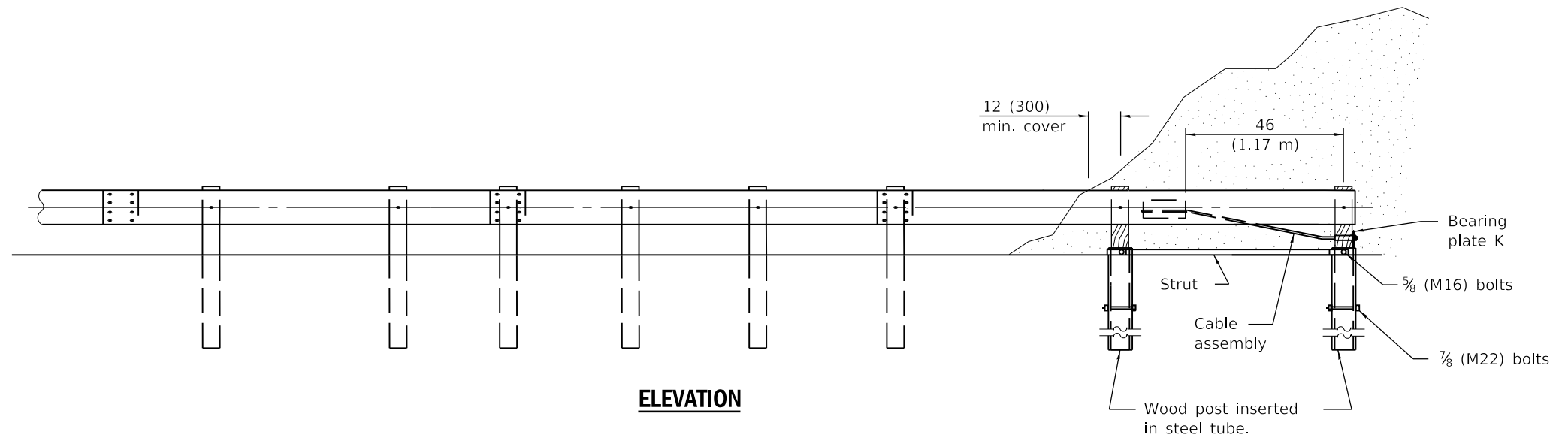
PASSED January 1, 2019  
*Michael Bond*  
ENGINEER OF POLICY AND PROCEDURES

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

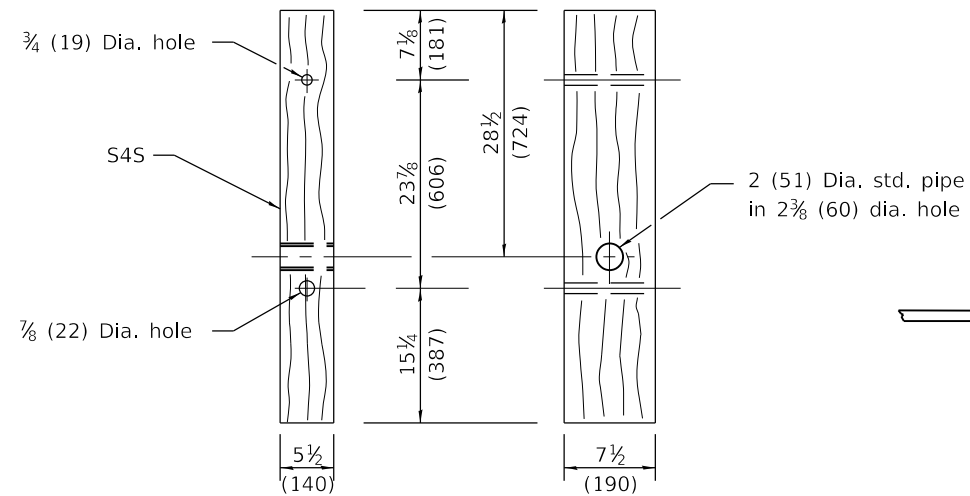
ISSUED 1-1-00



**BEARING PLATE K**



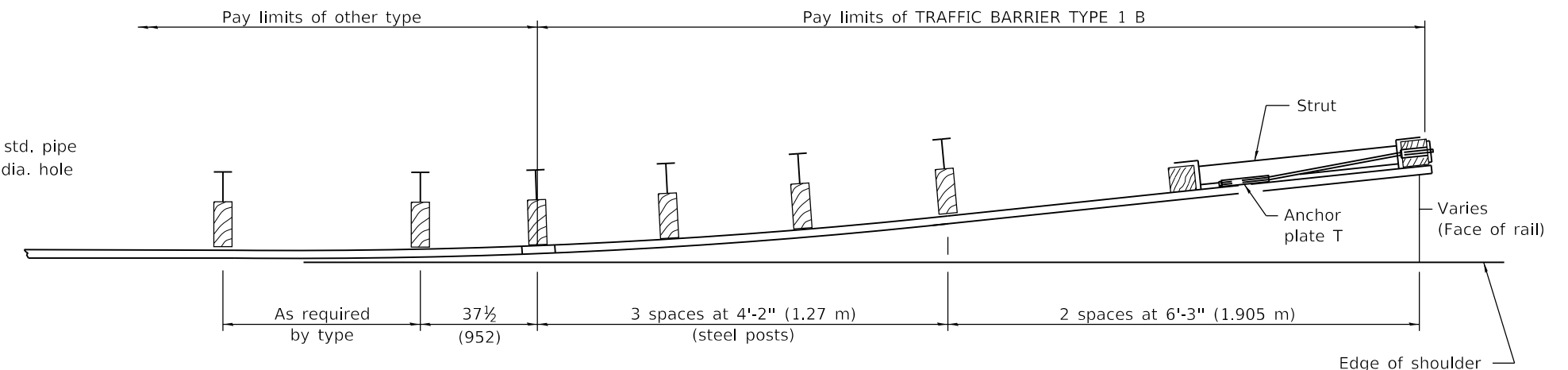
**ELEVATION**



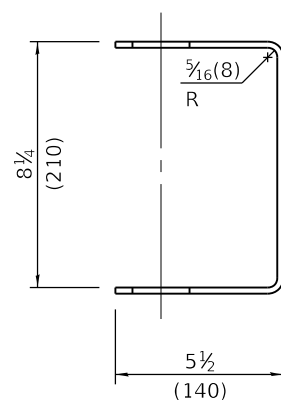
**FRONT**

**SIDE**

**WOOD POST**

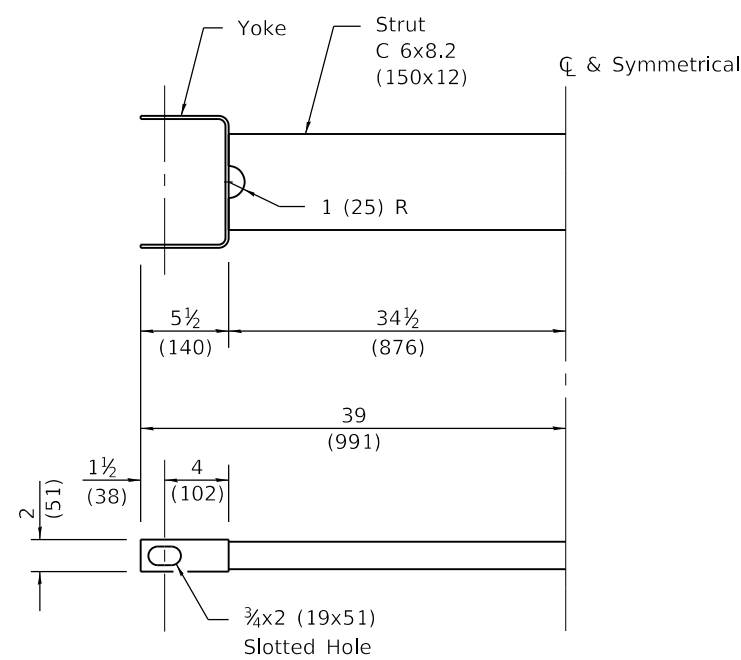


**PLAN**

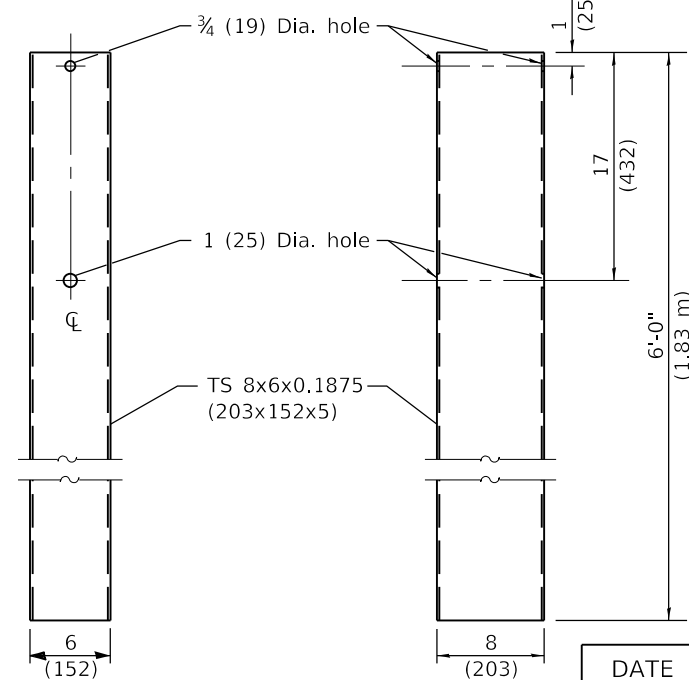


**YOKE**

3/16 (5) thick steel



**CABLE STRUT**



**FRONT**

**SIDE**

**STEEL TUBE**

**GENERAL NOTES**

See Standard 630001 for details of guardrail not shown.

The bearing plate K shall be held in position by two eight penny nails driven into the post and bent over the top of the plate.

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

DATE	REVISIONS
1-1-11	Revised steel tube length to 6'-0" (1.83 m).
1-1-10	Increased steel tube length, corrected hole locations in tube.

**TRAFFIC BARRIER  
TERMINAL, TYPE 1B**

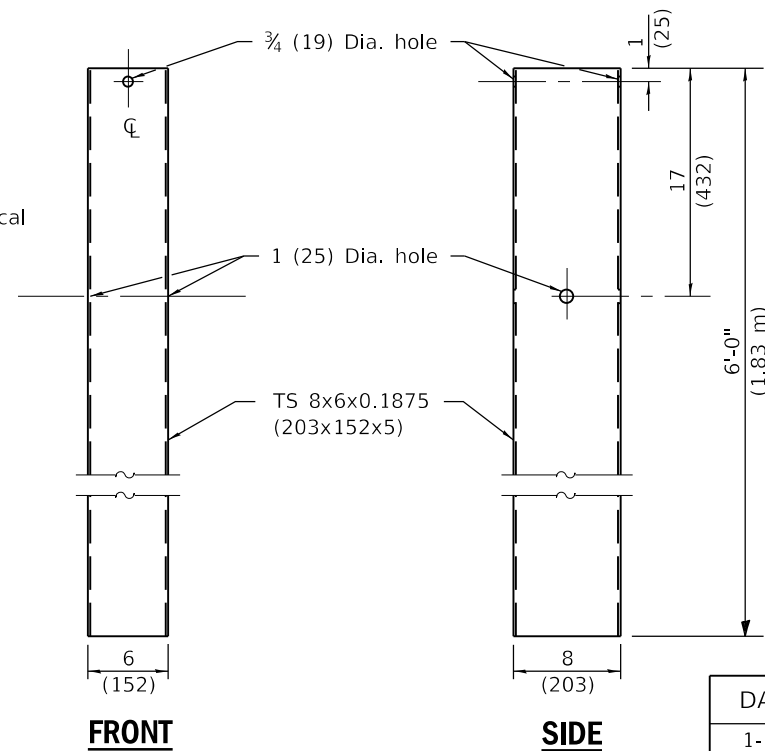
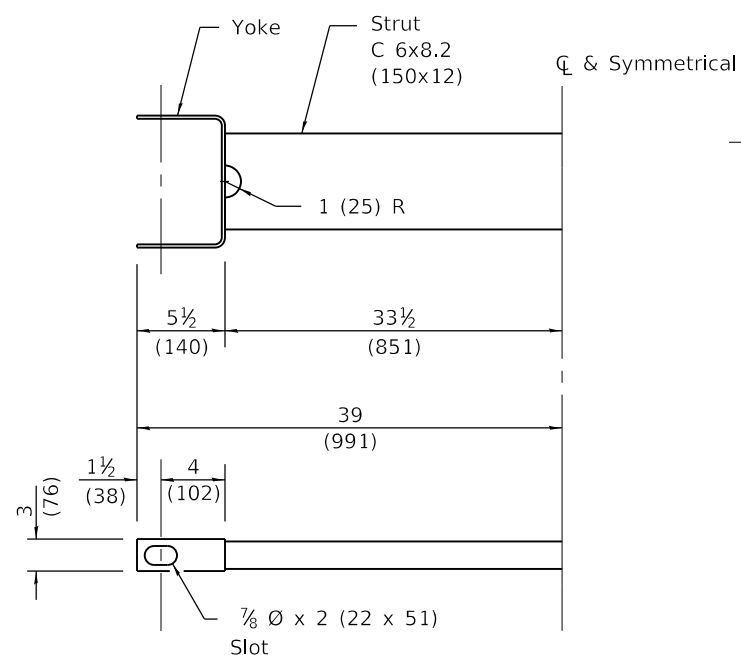
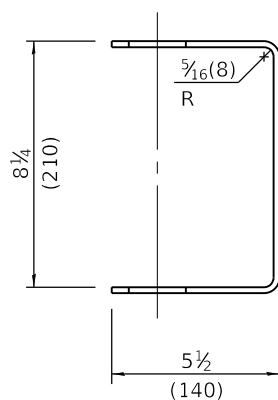
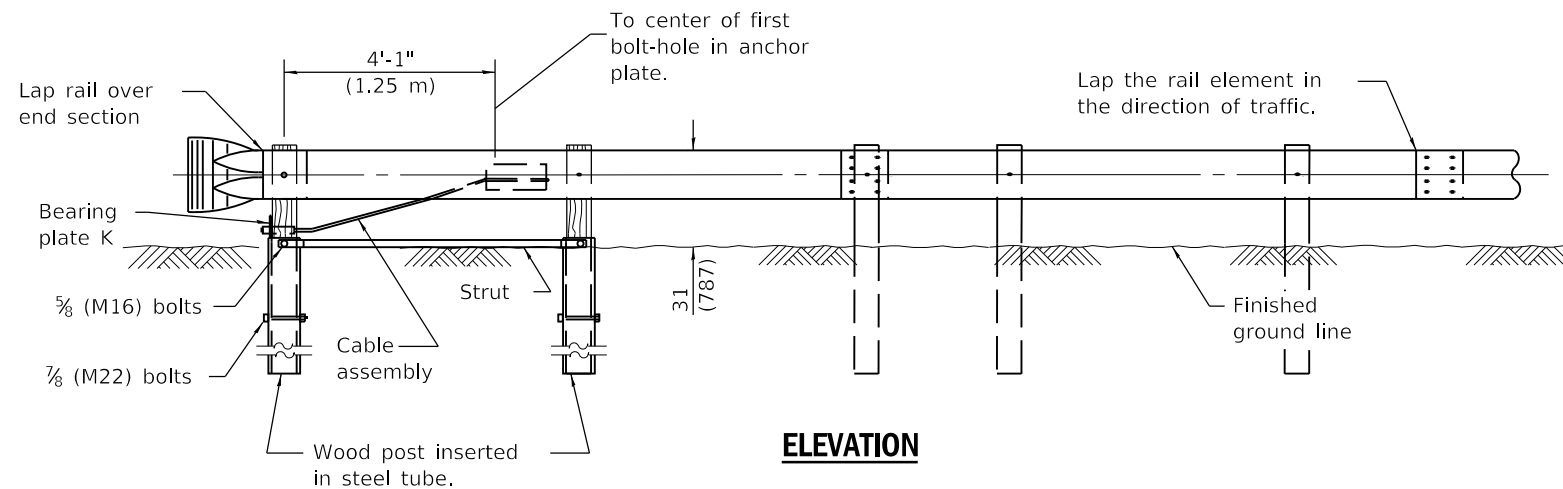
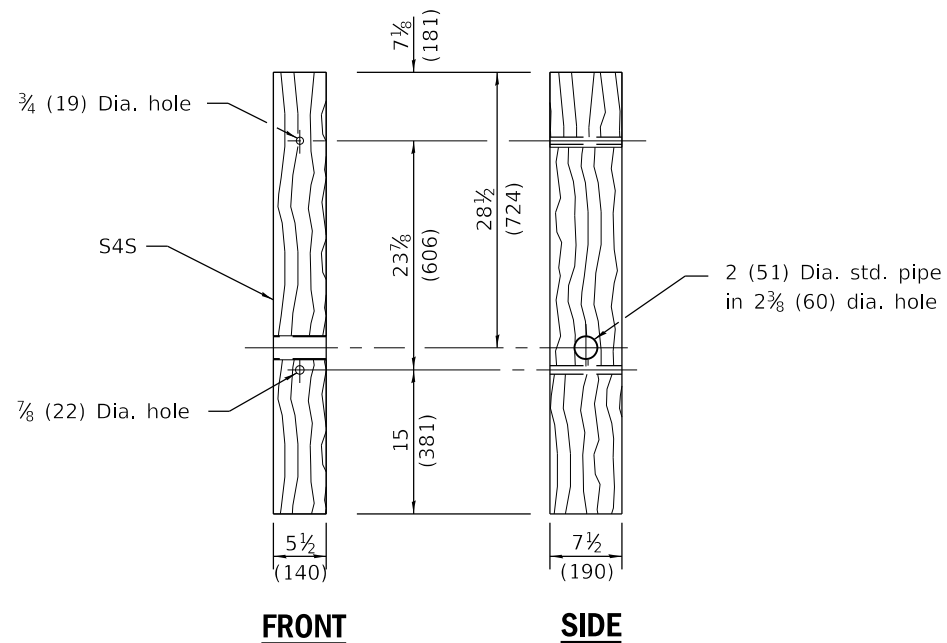
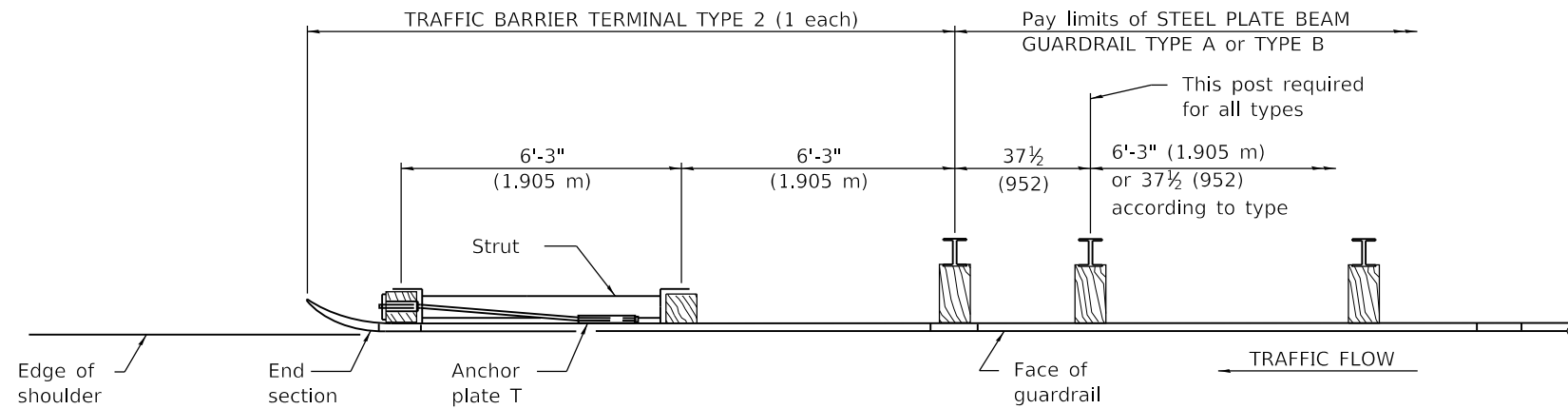
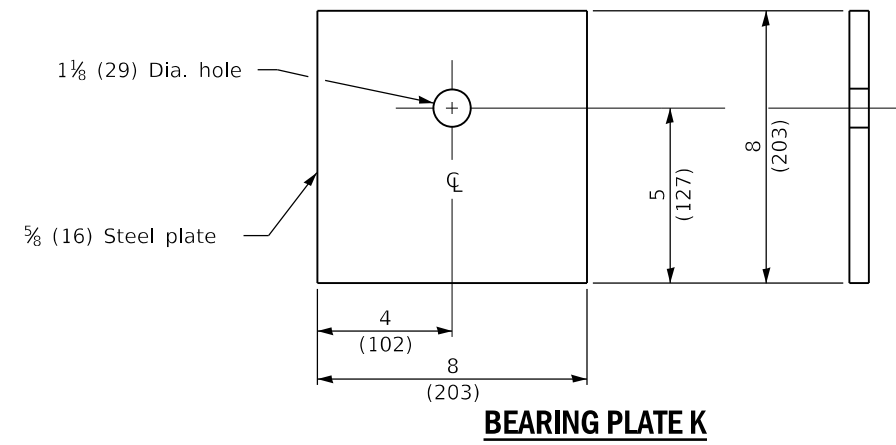
**STANDARD 631006-08**

Illinois Department of Transportation

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

APPROVED January 1, 2011  
*Scott Schick*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97  
 76-1-1



**GENERAL NOTES**

See Standard 630001 for details of guardrail not shown.

The bearing plate K shall be held in position by two eight penny nails driven into the post and bent over the top of the plate.

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

DATE	REVISIONS
1-1-17	Revised wood post length and hole spacing.
1-1-13	Corrected metric dimension for BEARING PLATE K. Changed pipe dia. in wood post.

**TRAFFIC BARRIER TERMINAL, TYPE 2**

**STANDARD 631011-10**

Illinois Department of Transportation

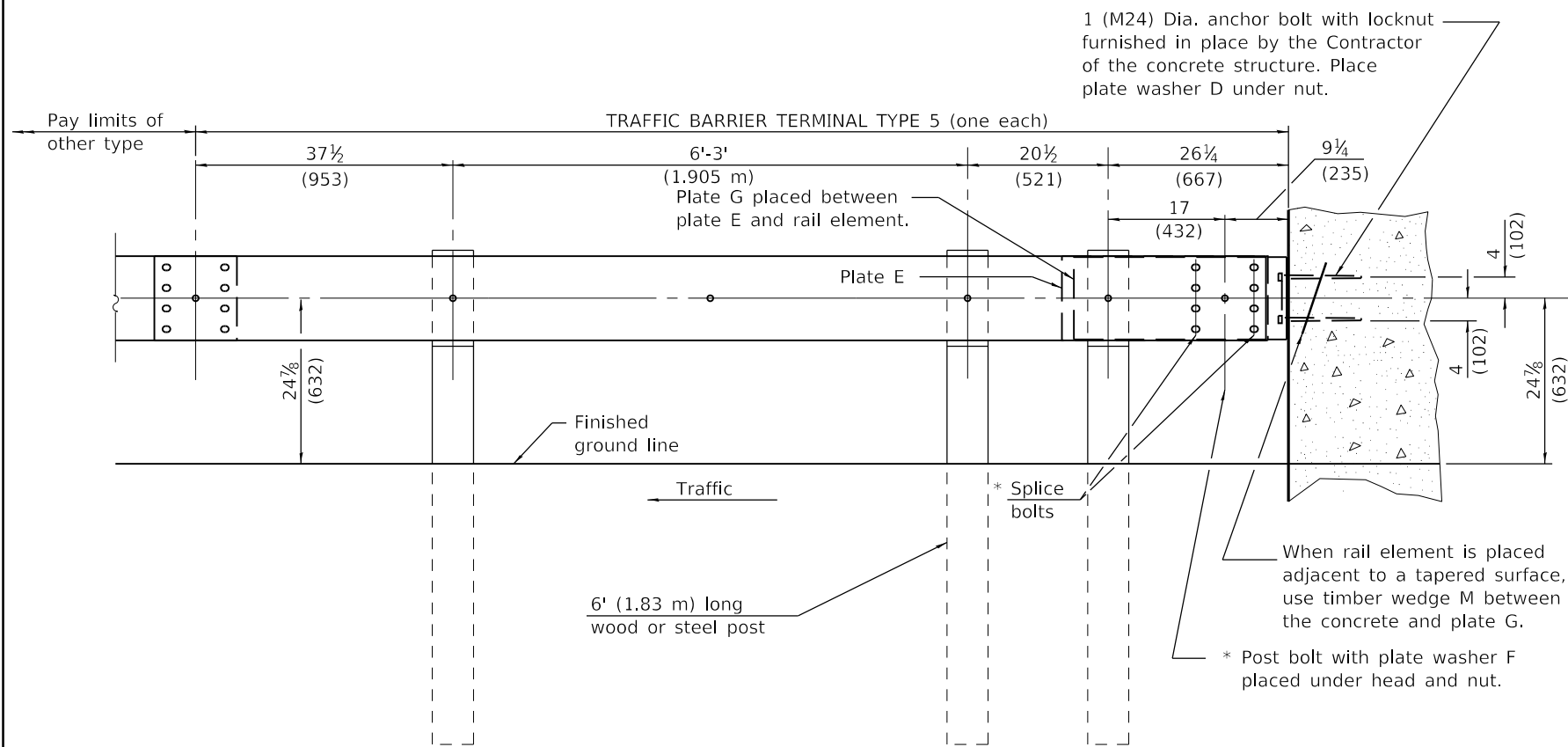
PASSED January 1, 2017

*Michael Beard*  
ENGINEER OF POLICY AND PROCEDURES

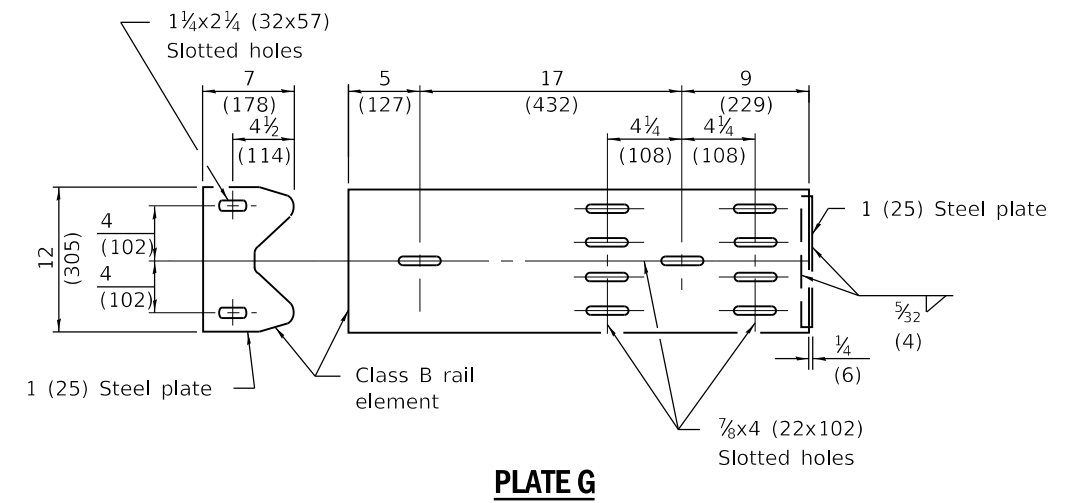
APPROVED January 1, 2017

*Marcus M. Beck*  
ENGINEER OF DESIGN AND ENVIRONMENT

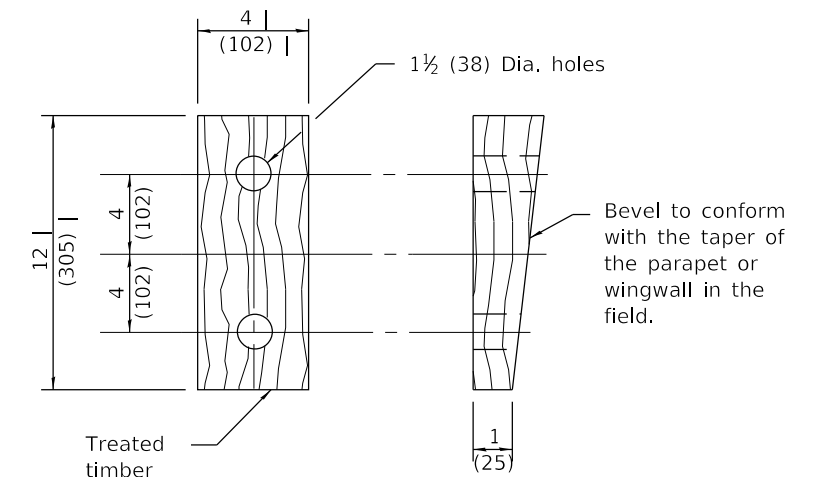
ISSUED 1-1-97



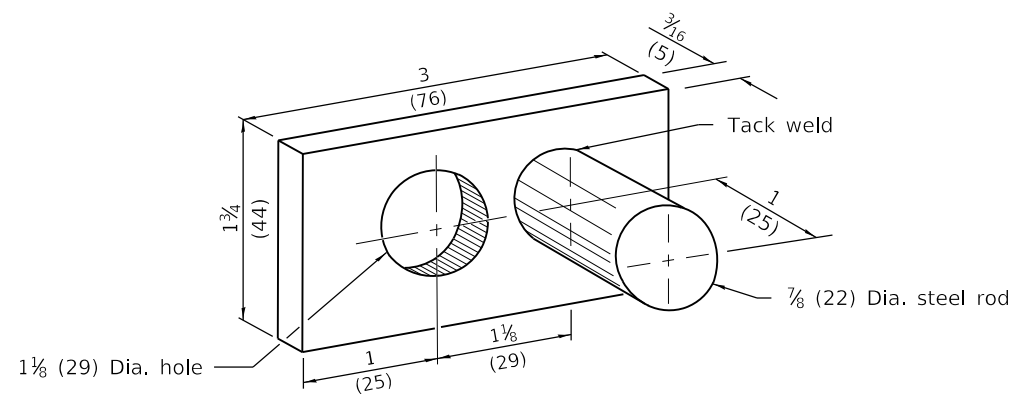
**TYPE 5 - CONCRETE BRIDGE PARAPET**



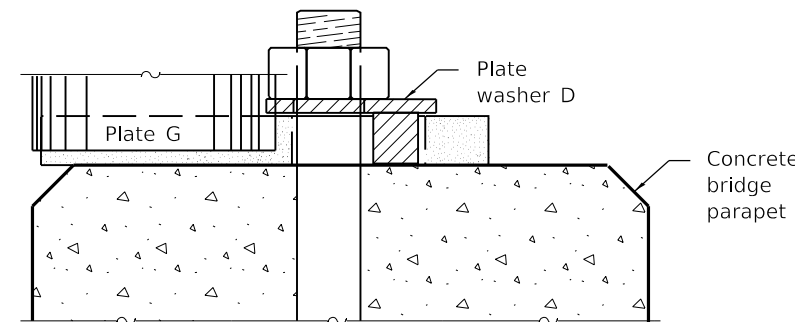
**PLATE G**



**WEDGE M**

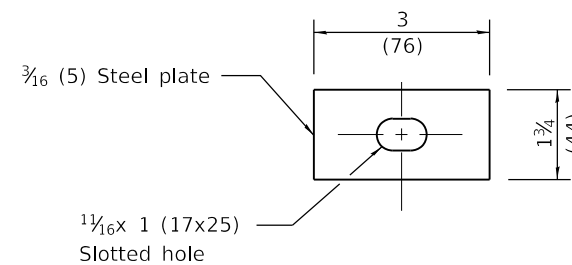


**PLATE WASHER D**

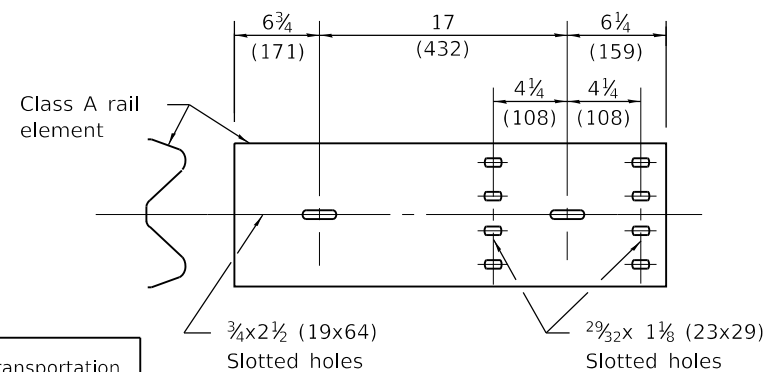


**PLACEMENT OF PLATE WASHER D**

(PLAN)



**PLATE WASHER F**



**PLATE E**

**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.

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**

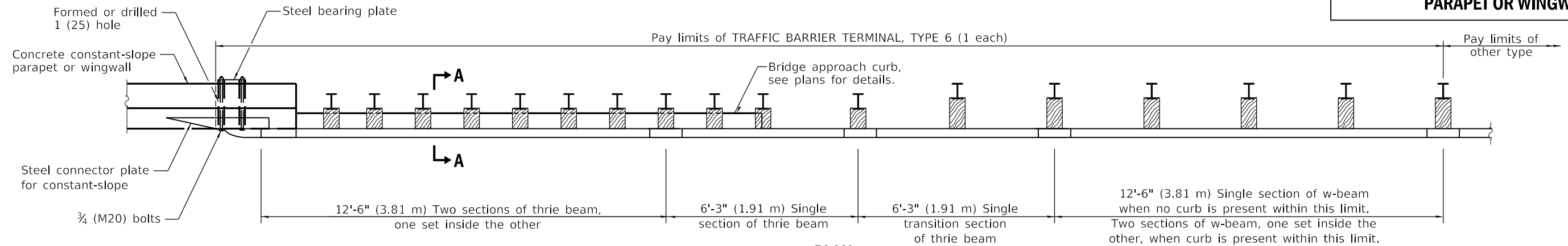
Illinois Department of Transportation

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

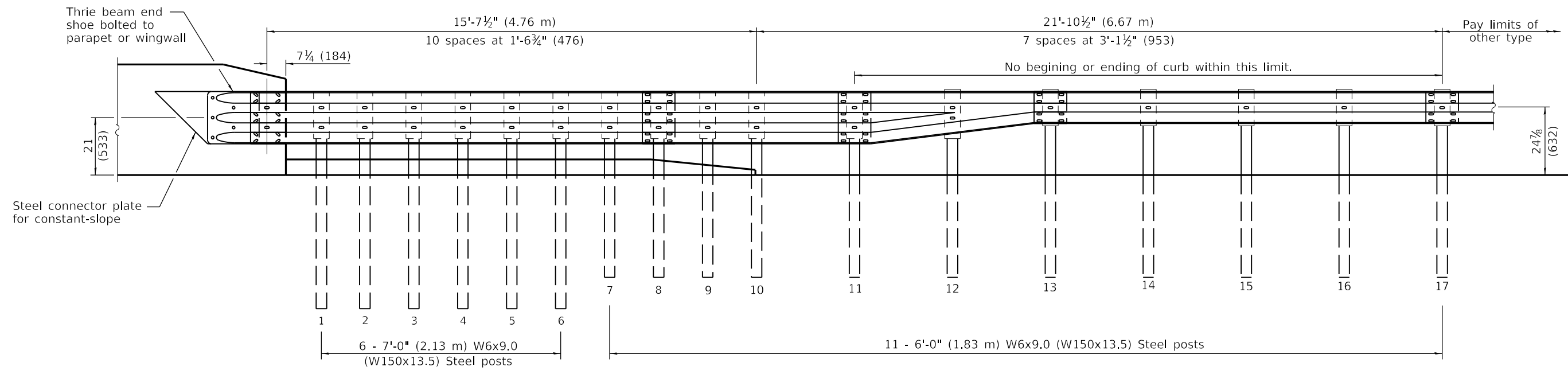
APPROVED January 1, 2015  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-15

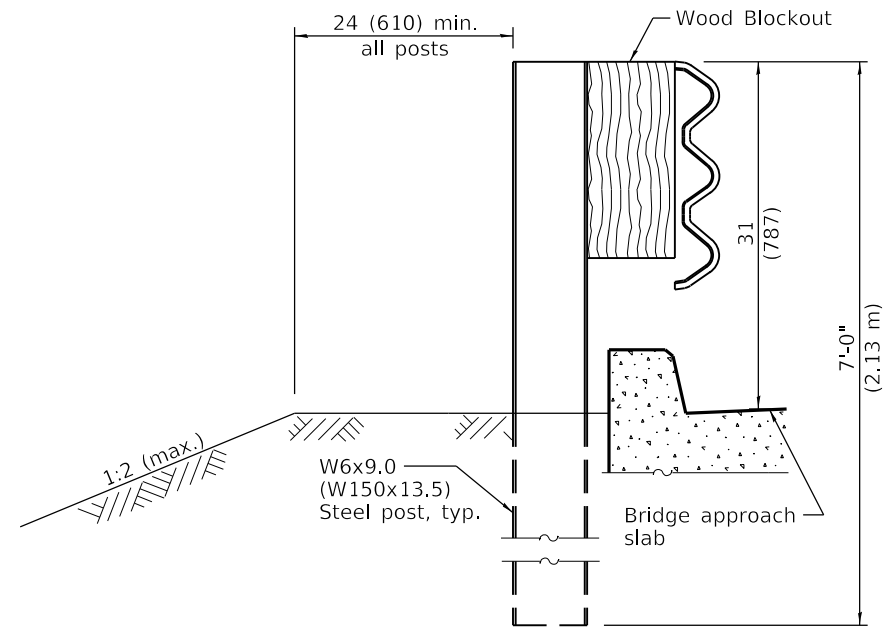
**PARAPET OR WINGWALL**



**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.

DATE	REVISIONS
1-1-21	Added Detail A and revised plate dimensions on sheet 4.
1-1-20	Revised F-Shape to constant slope parapet and added steel connector plate. Added two posts and revised post length.

**TRAFFIC BARRIER TERMINAL, TYPE 6**

(Sheet 1 of 4)

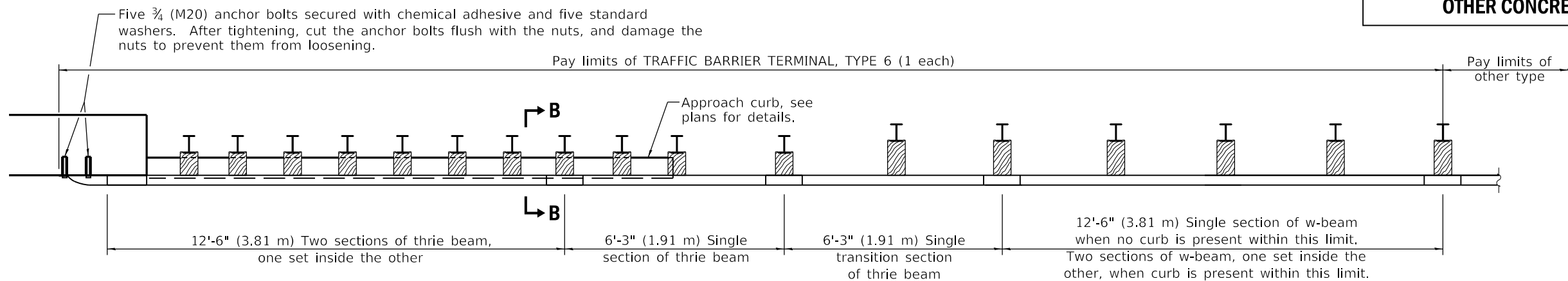
**STANDARD 631031-17**

Illinois Department of Transportation

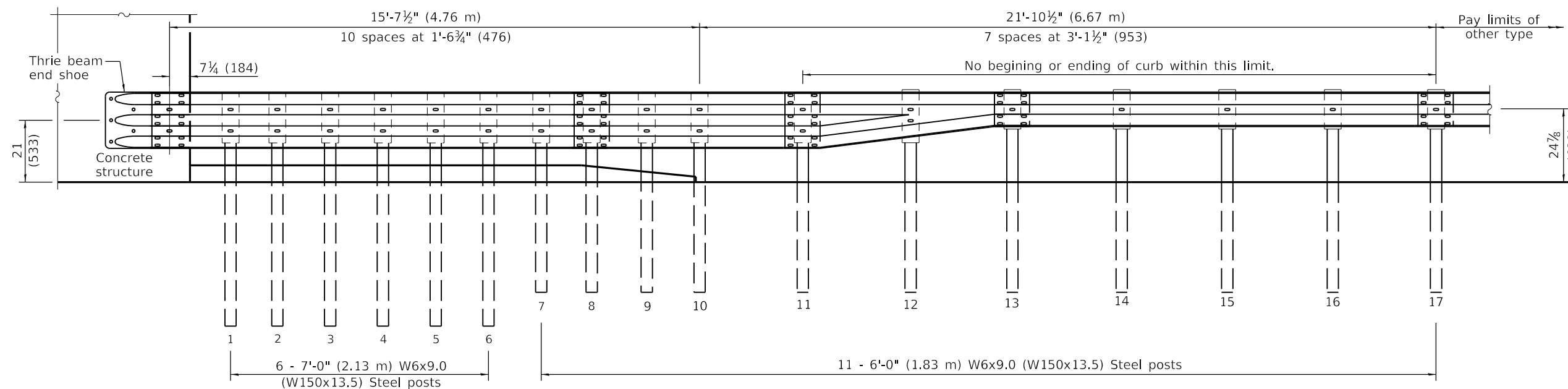
PASSED January 1, 2021  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

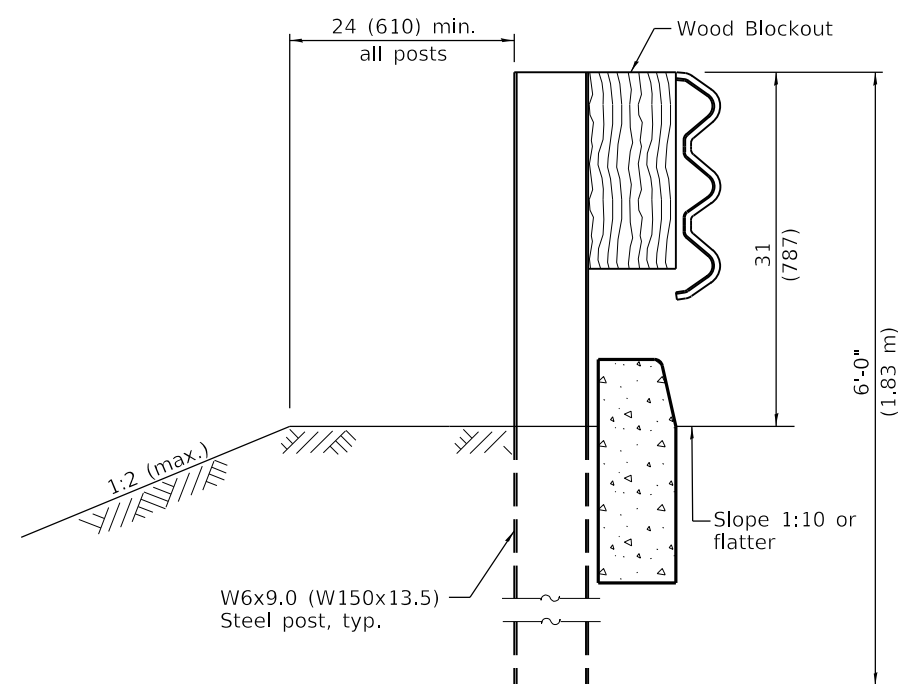
ISSUED 1-1-97



PLAN



ELEVATION



SECTION B-B

Illinois Department of Transportation

PASSED January 1, 2021

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021

ENGINEER OF DESIGN AND ENVIRONMENT

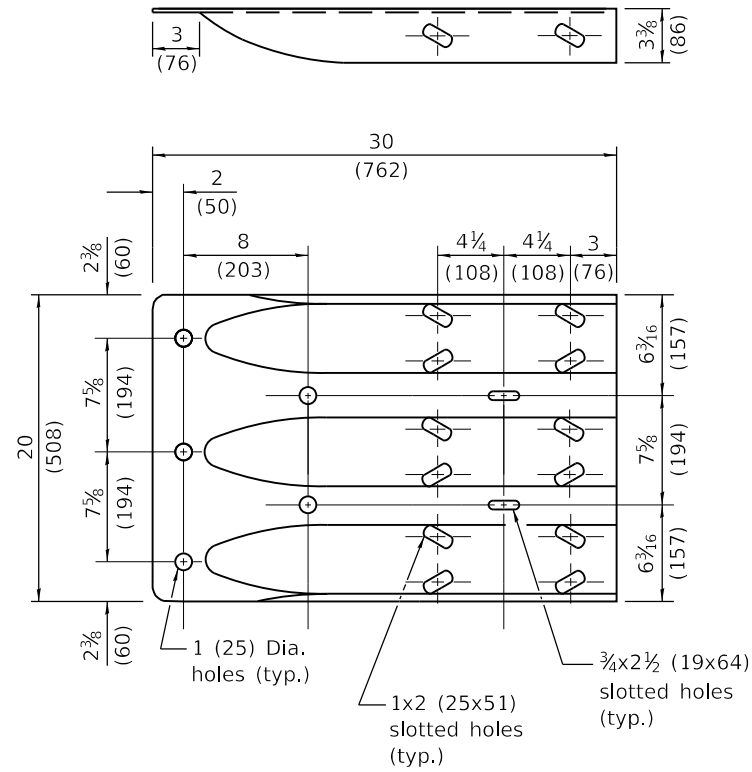
ISSUED 1-1-97

**TRAFFIC BARRIER  
TERMINAL, TYPE 6**

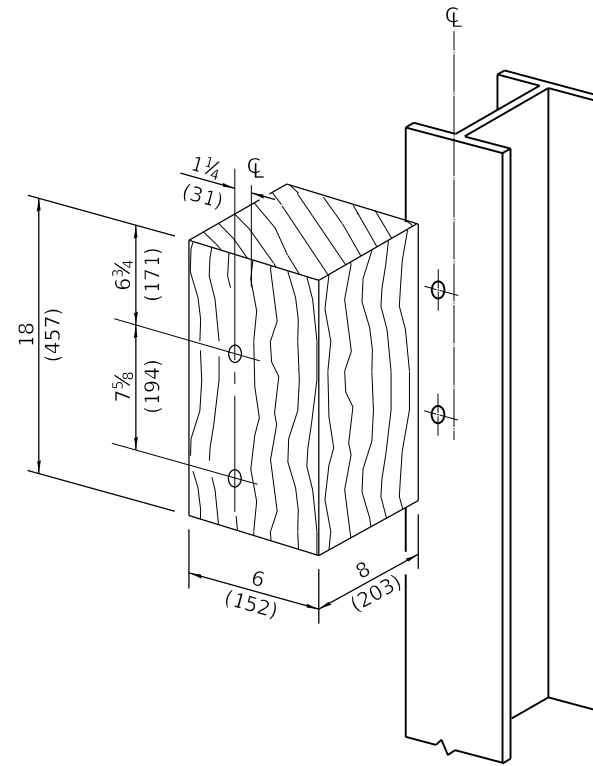
(Sheet 2 of 4)

**STANDARD 631031-17**

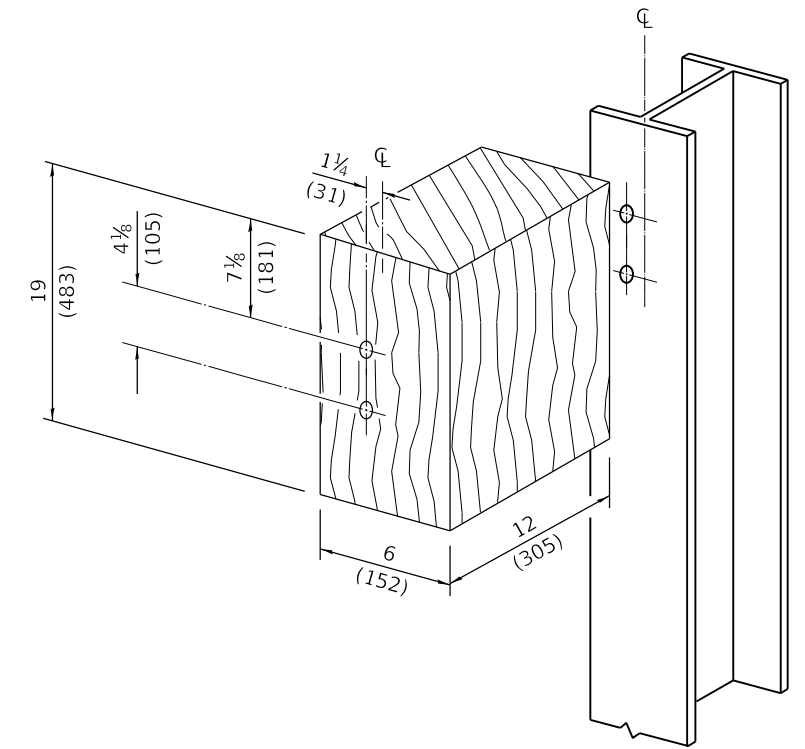




**THRIE BEAM END SHOE DETAIL**

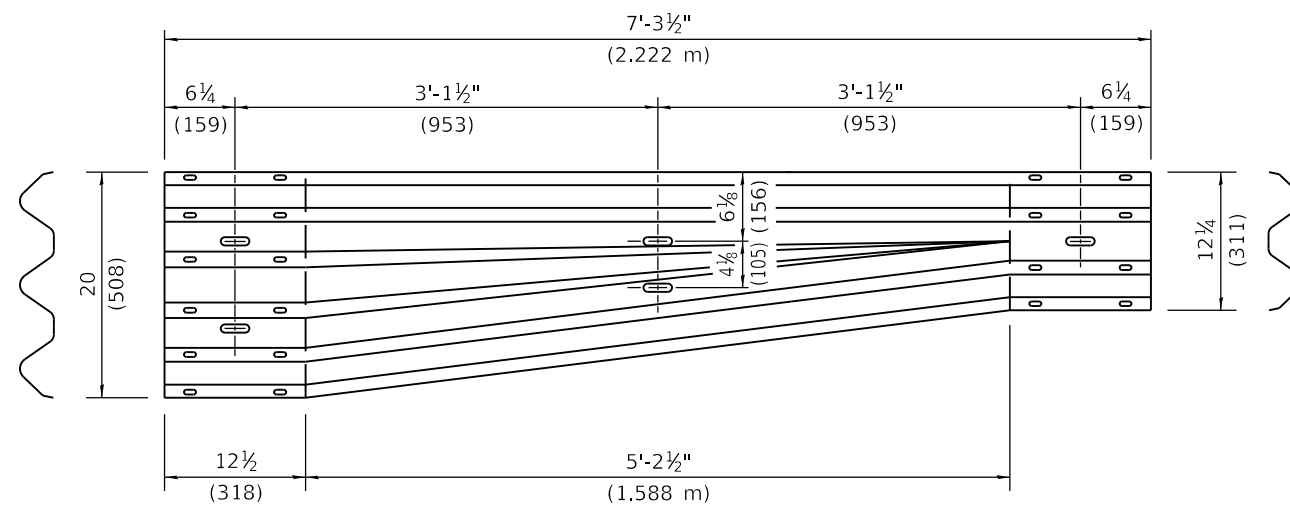


**POSTS 1-11 WOOD BLOCKOUT DETAIL**



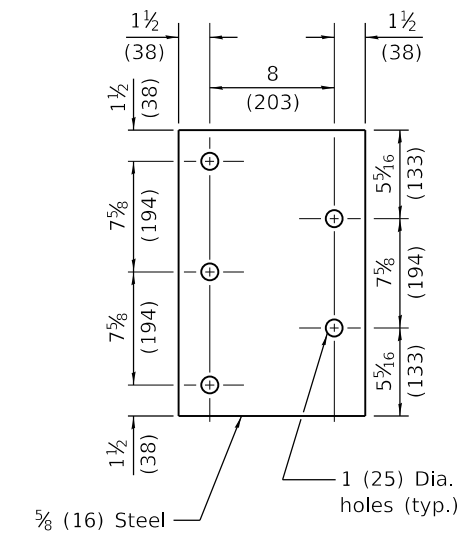
**POST 12 WOOD BLOCKOUT DETAIL**

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



**TRANSITION SECTION**

(10 gauge (3.4) rail element)



**PARAPET STEEL BEARING PLATE DETAIL**

(5 each individual 5x5x5/8 (125x125x16) steel plates with centered 1 (25) holes may be substituted for the plate shown.)

Illinois Department of Transportation

PASSED January 1, 2021

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021

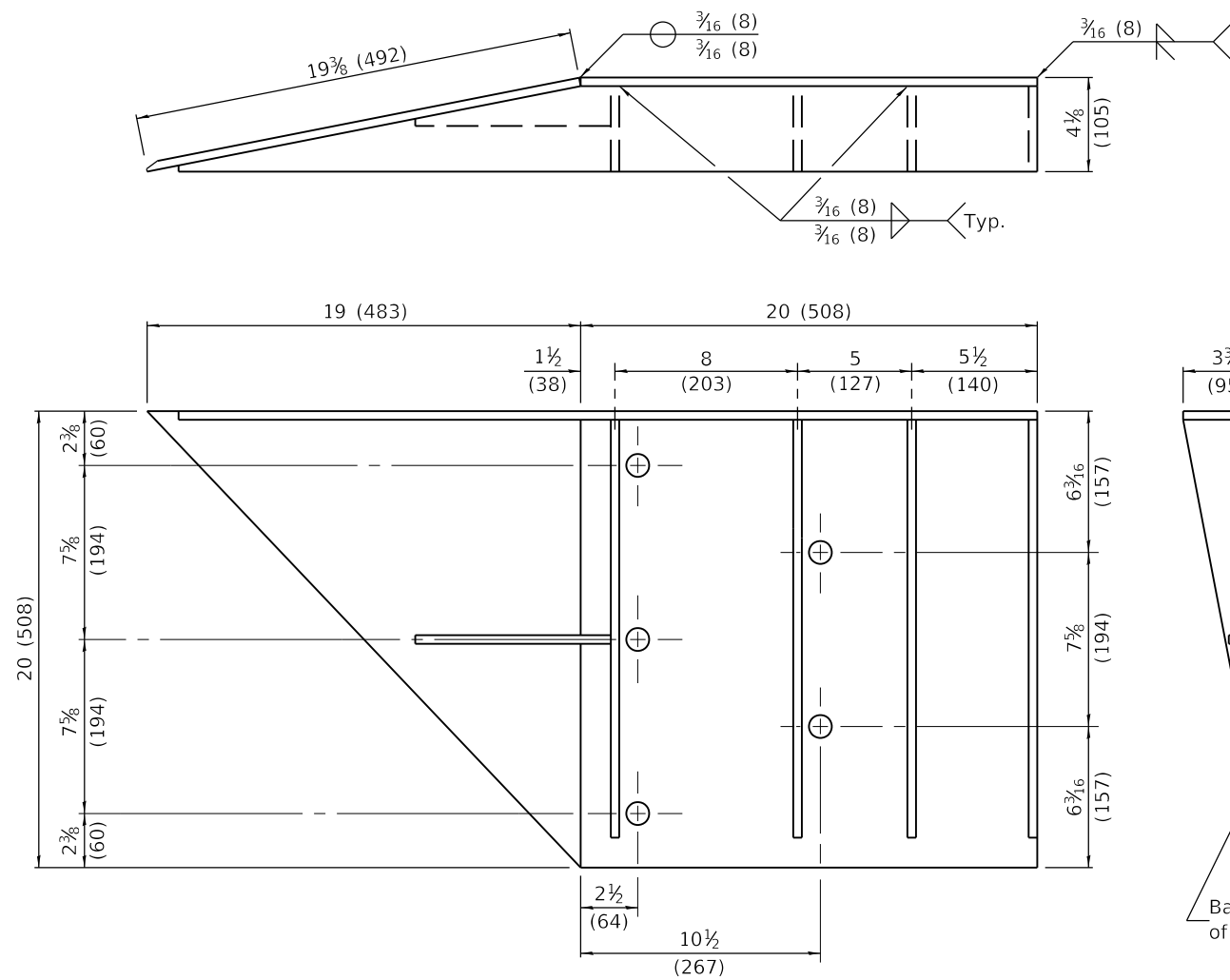
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-9-1

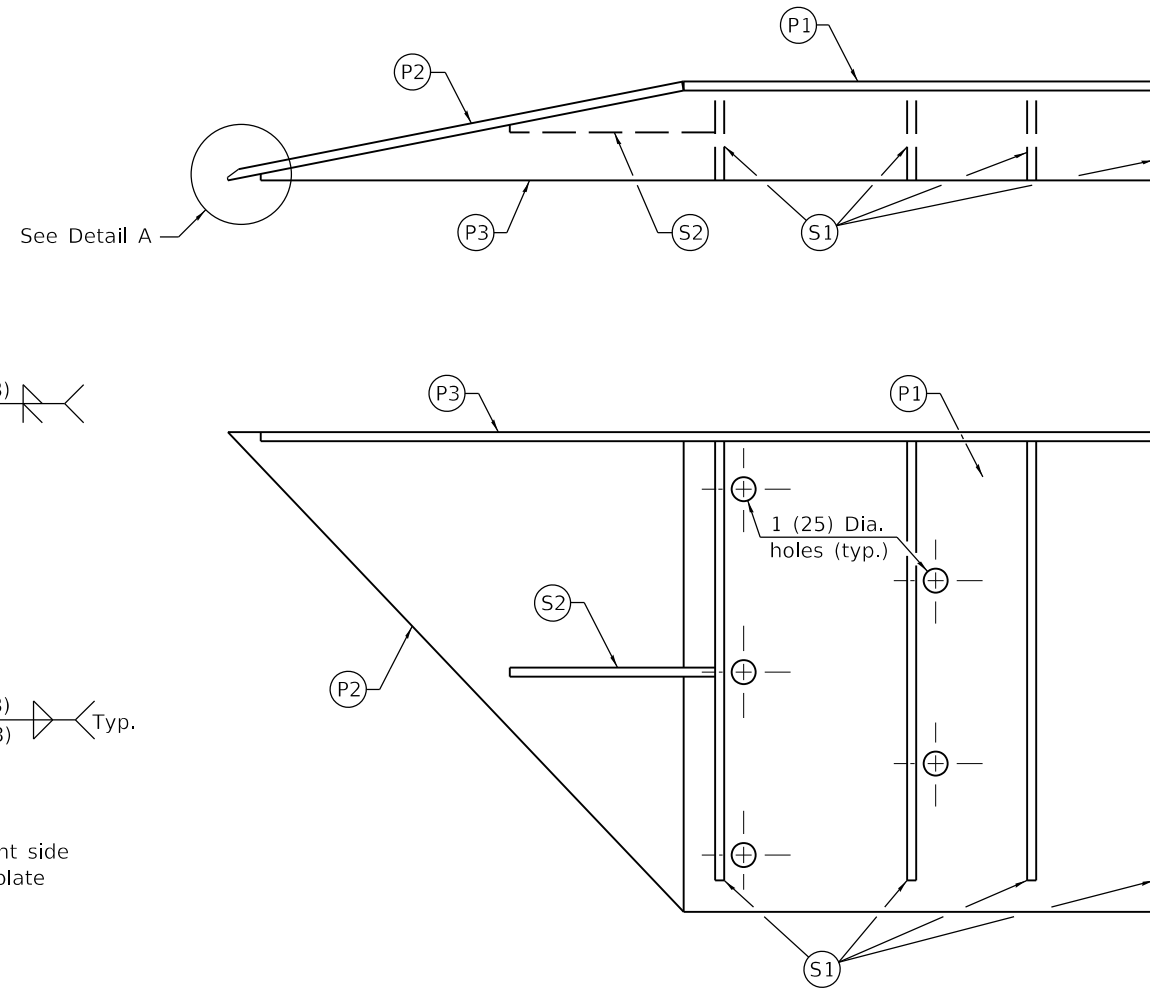
**TRAFFIC BARRIER  
TERMINAL, TYPE 6**

(Sheet 3 of 4)

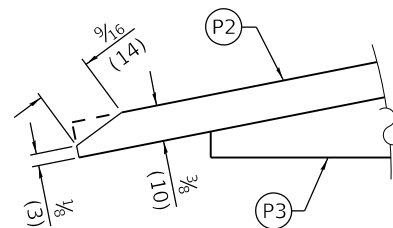
**STANDARD 631031-17**



**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		20 x 20 (508 x 508)	3/8 (10)
P2	1		19 7/8 x 20 x 27 13/16 (492 x 508 x 706)	3/8 (10)
P3	1		20 x 3 3/4 x 37 5/8 x 1/4 x 17 15/16 (508 x 95 x 956 x 6 x 456)	3/8 (10)
S1	4		18 5/16 x 1/4 x 18 5/8 x 3 3/4 (465 x 6 x 473 x 95)	3/8 (10)
S2	1		1 5/16 x 1 3/4 x 8 1/16 x 3/8 x 6 7/8 (33 x 44 x 205 x 10 x 175)	3/8 (10)

**STEEL CONNECTOR PLATE FOR CONSTANT SLOPE**

Steel connector plate shall be AASHTO M 270 Grade 36 (M 270M Grade 250) steel and galvanized according to AASHTO M 111.

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

**TRAFFIC BARRIER  
TERMINAL, TYPE 6**

(Sheet 4 of 4)

**STANDARD 631031-17**

Illinois Department of Transportation

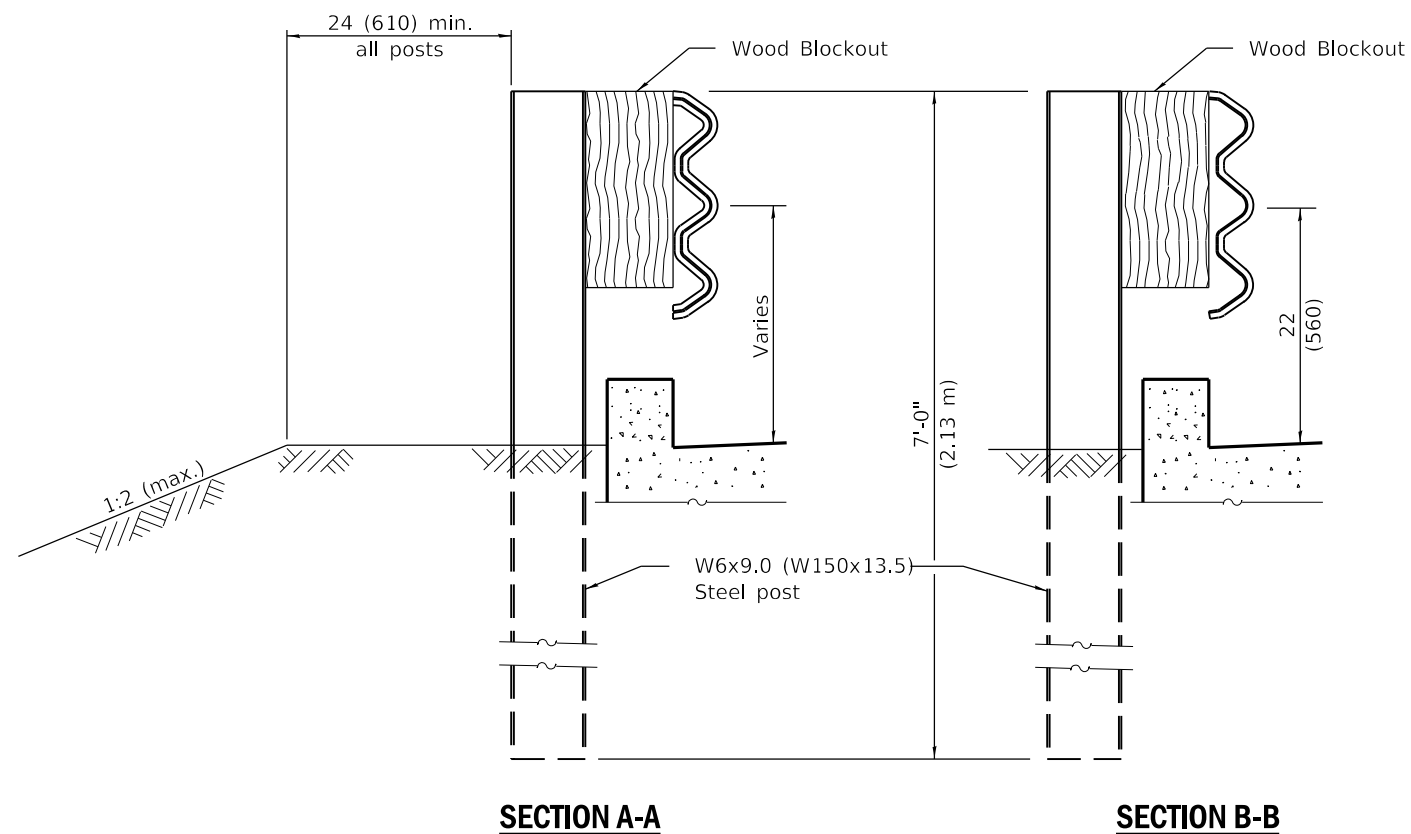
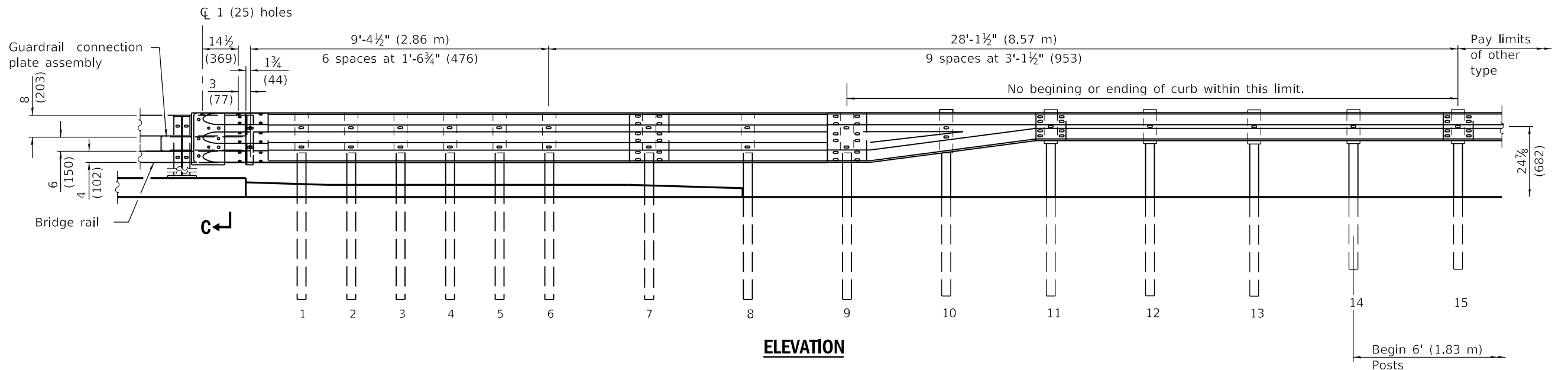
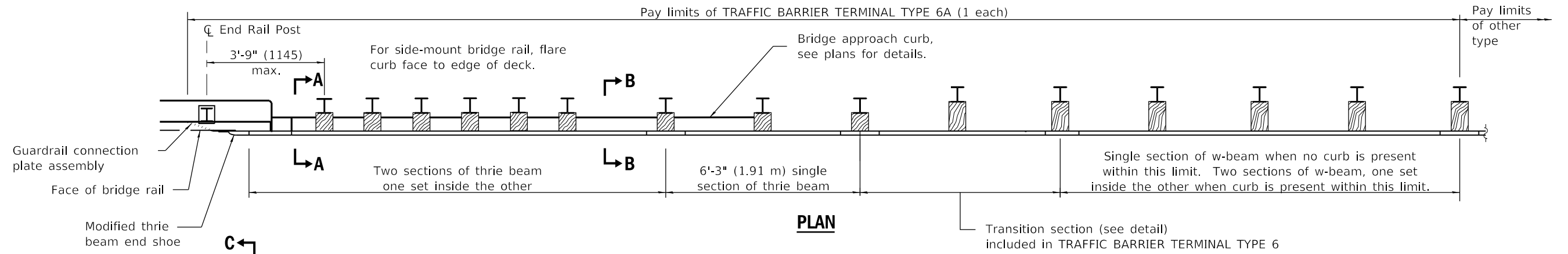
PASSED January 1, 2021

*Michael Bond*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021

*Scott E. G...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



**GENERAL NOTES**

This standard shows attachment to curb mounted bridge rail. Attachment to side mounted bridge rail is similar.

See Standard 630001 for details of guardrail not shown.

Thrie beam rail shall be bolted to block-out at all posts.

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

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

DATE	REVISIONS
1-1-17	Revised length of thrie beam. Revised length of posts.
1-1-13	Added note to see plans for bridge approach curb details.

**TRAFFIC BARRIER  
TERMINAL, TYPE 6A**

(Sheet 1 of 3)

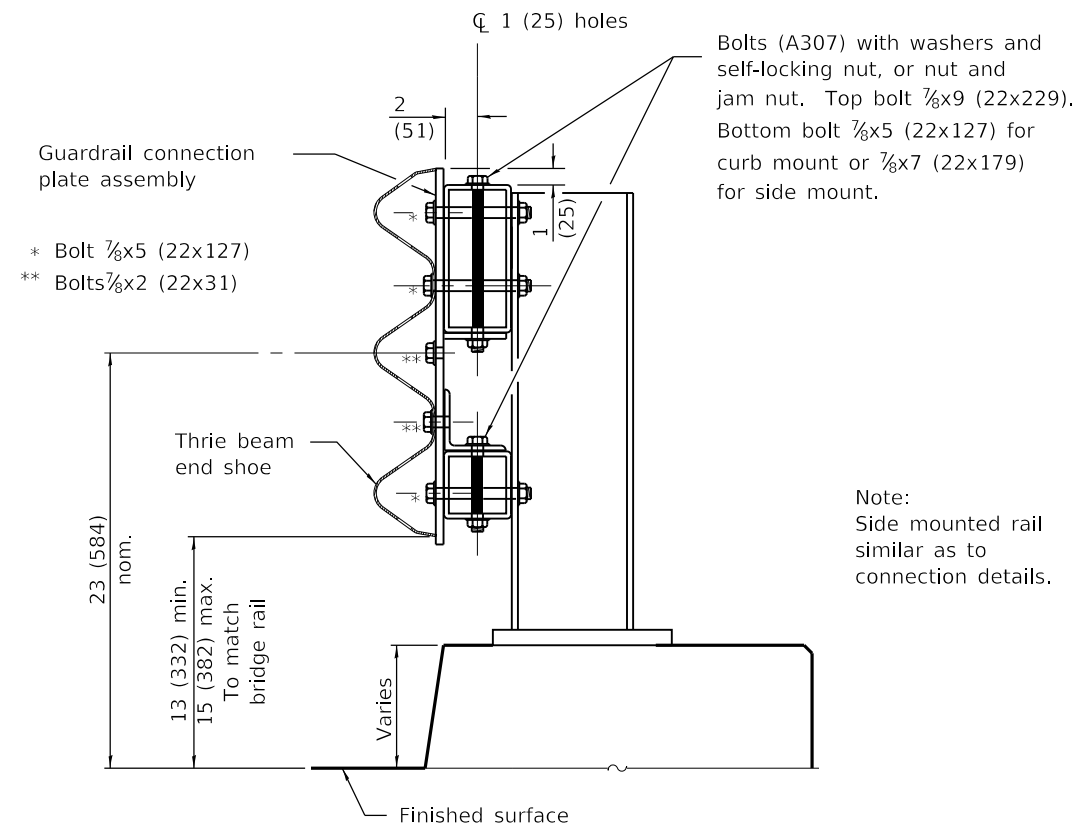
**STANDARD 631032-09**

Illinois Department of Transportation

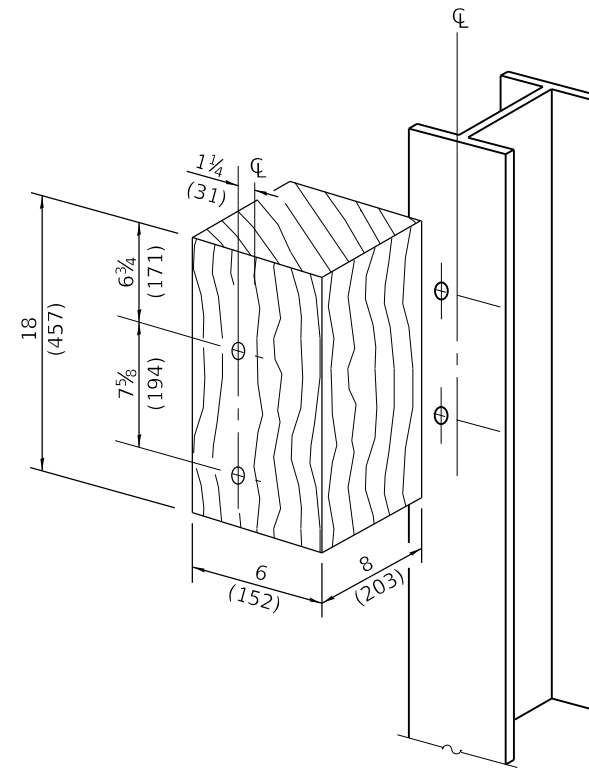
PASSED January 1, 2017  
*Michael Beard*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2017  
*Marcus M. Beck*  
ENGINEER OF DESIGN AND ENVIRONMENT

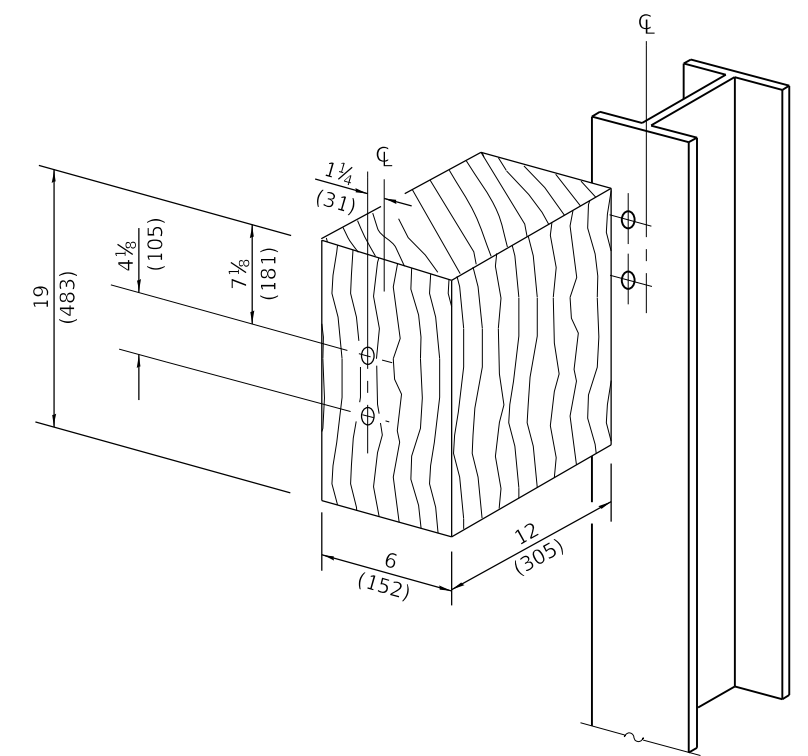
ISSUED 1-1-2003



**SECTION C-C**

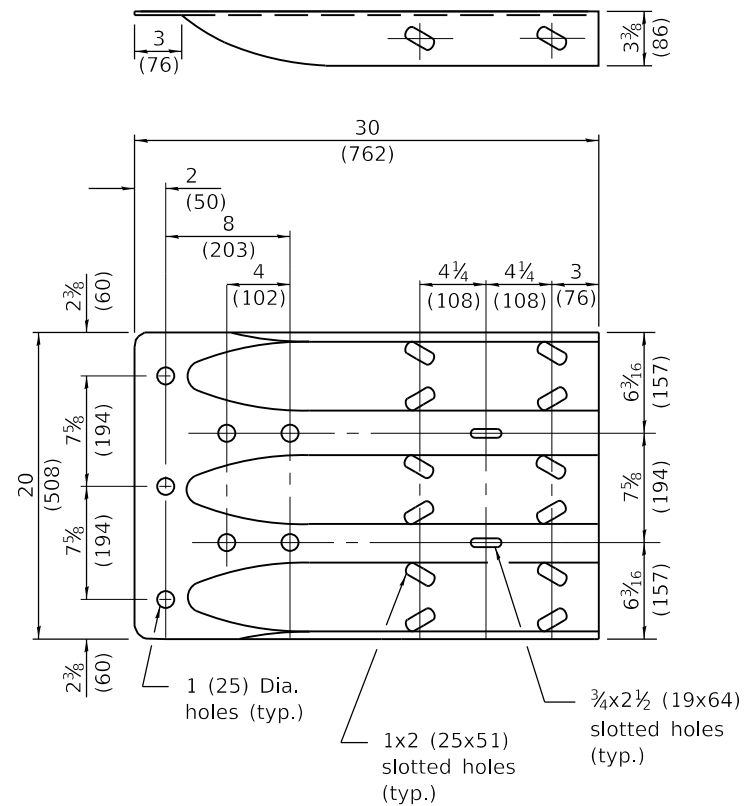


**POSTS 1-9 WOOD BLOCKOUT DETAIL**

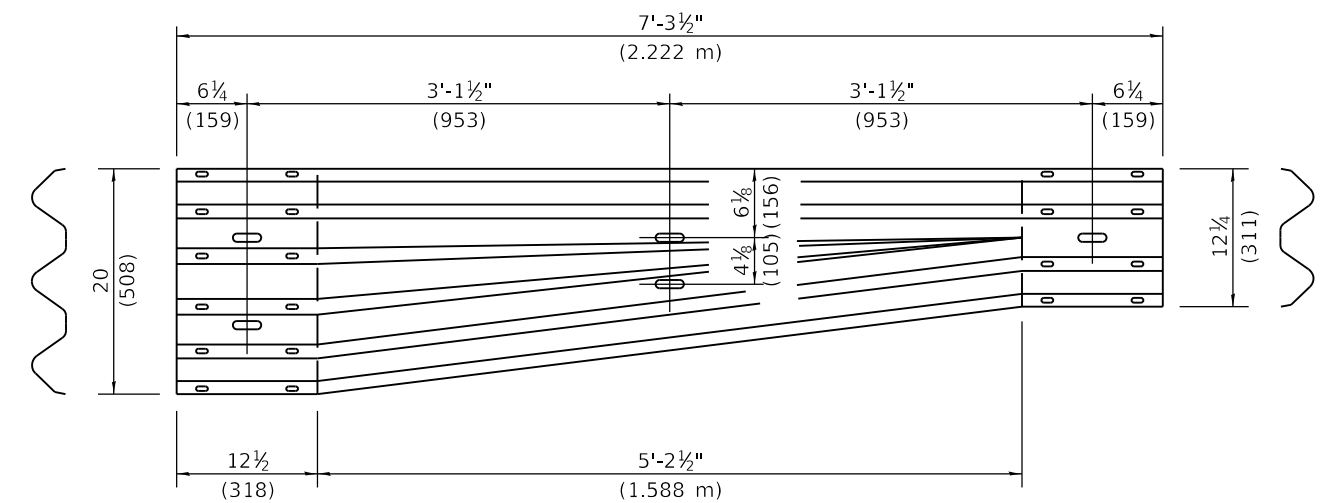


**POST 10 WOOD BLOCKOUT DETAIL**

(See Standard 630001 for post 11-15 blockouts.)



**MODIFIED THRIE BEAM END SHOE DETAIL**



**TRANSITION SECTION**  
(10 gauge (3.4) rail element)

Illinois Department of Transportation

PASSED January 1, 2017  
*Michael Beard*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2017  
*Marcus M. Beck*  
ENGINEER OF DESIGN AND ENVIRONMENT

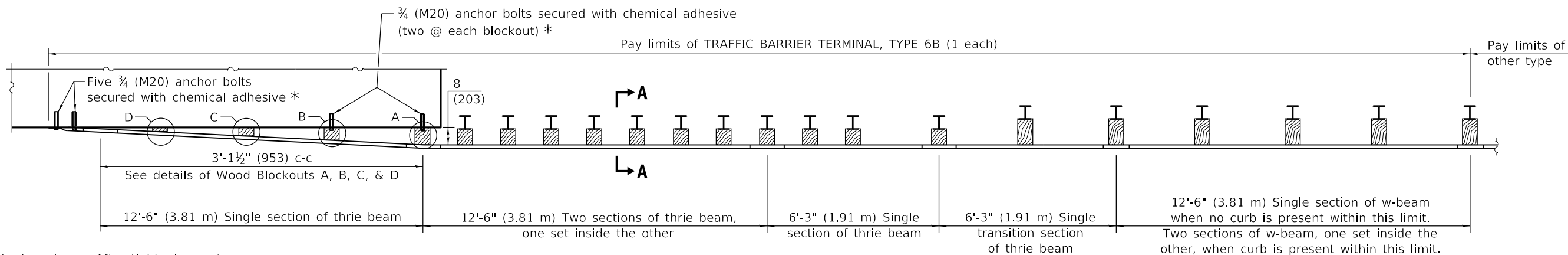
ISSUED 1-1-2003

**TRAFFIC BARRIER  
TERMINAL, TYPE 6A**

(Sheet 2 of 3)

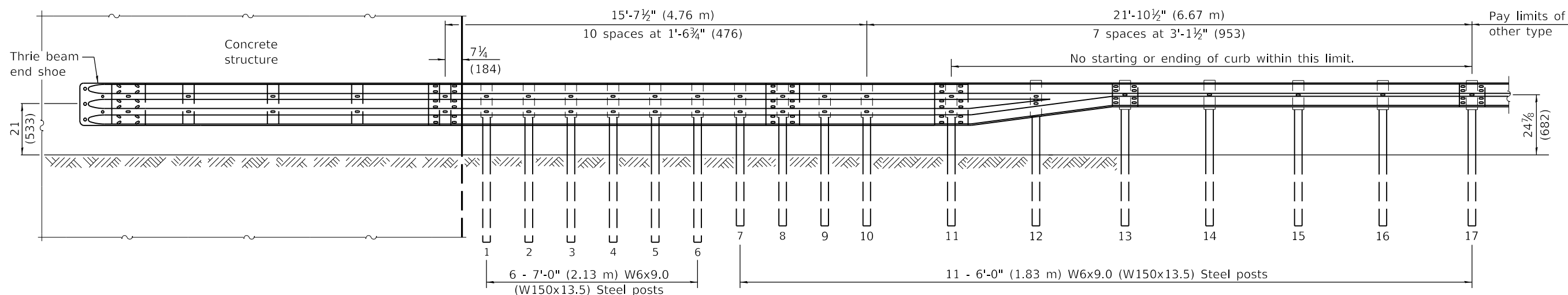
**STANDARD 631032-09**



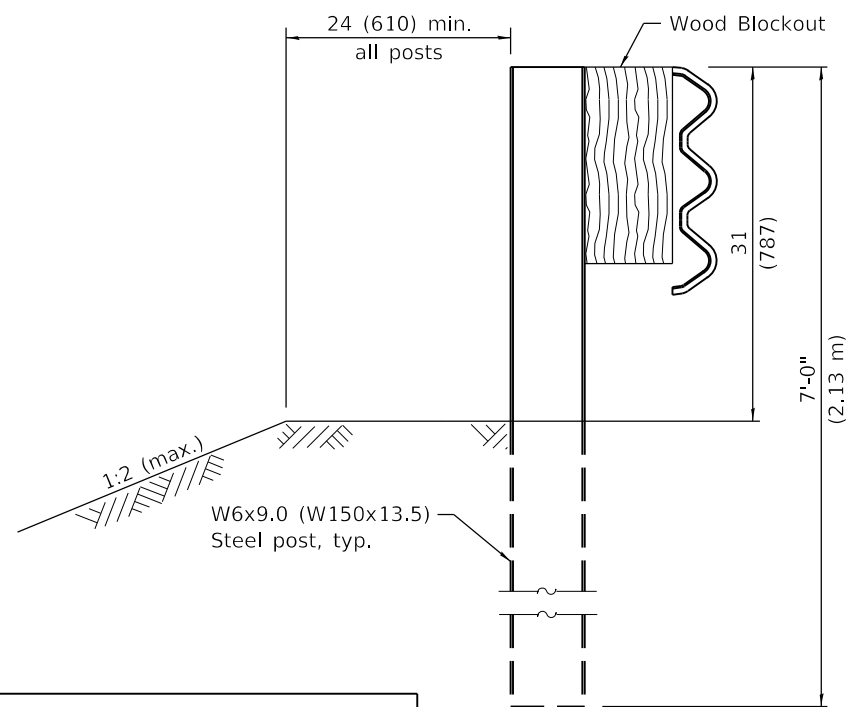


\* With standard washers. After tightening, cut the anchor bolts flush with the nuts and damage the nuts to prevent them from loosening.

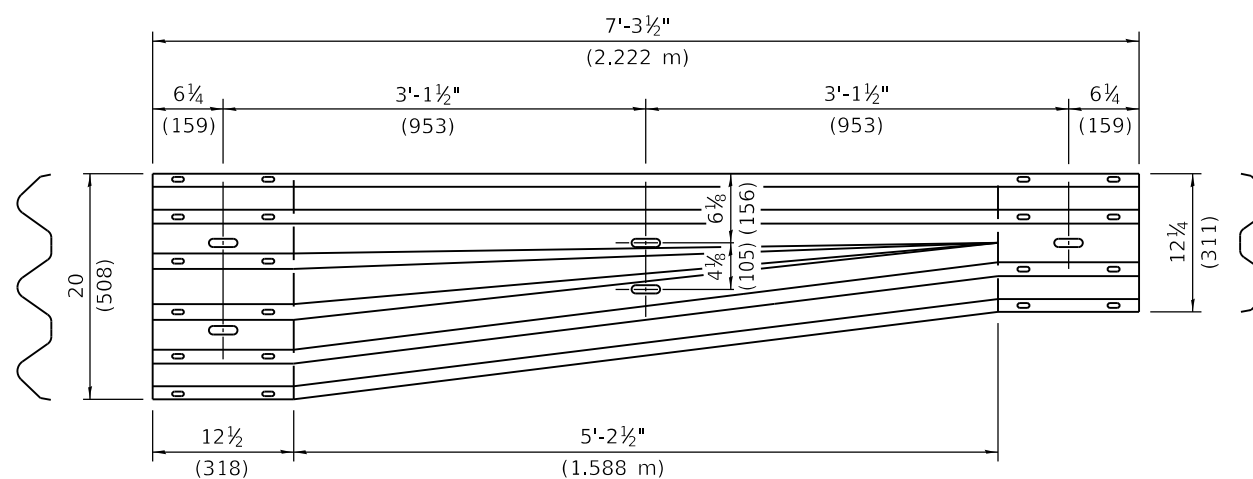
**PLAN**



**ELEVATION**



**SECTION A-A**



**TRANSITION SECTION**  
(10 gauge (3.4) rail element)

**GENERAL NOTES**

See Standard 630001 for details of guardrail not shown.

Thrie beam rail shall be bolted to block-out at all posts.

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

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

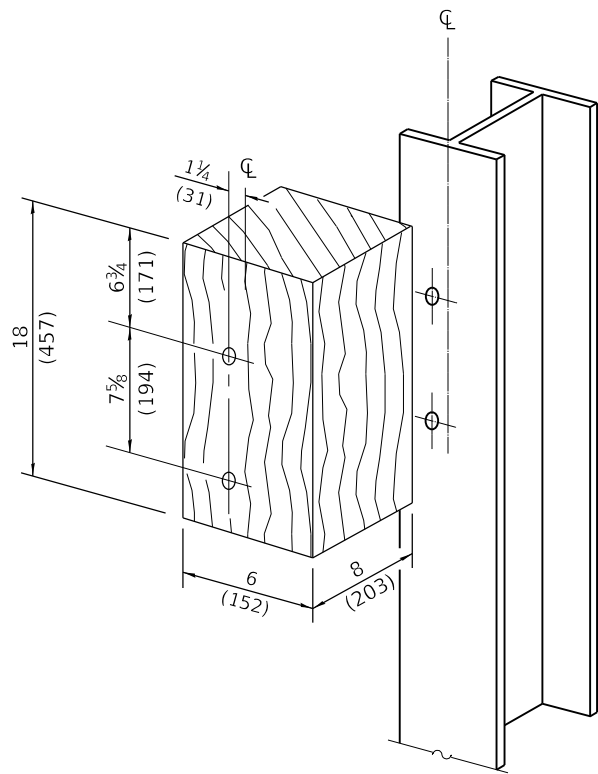
DATE	REVISIONS
1-1-20	Added two posts and revised length of posts.
1-1-17	Revised length of thrie beam and posts.

**TRAFFIC BARRIER TERMINAL, TYPE 6B**

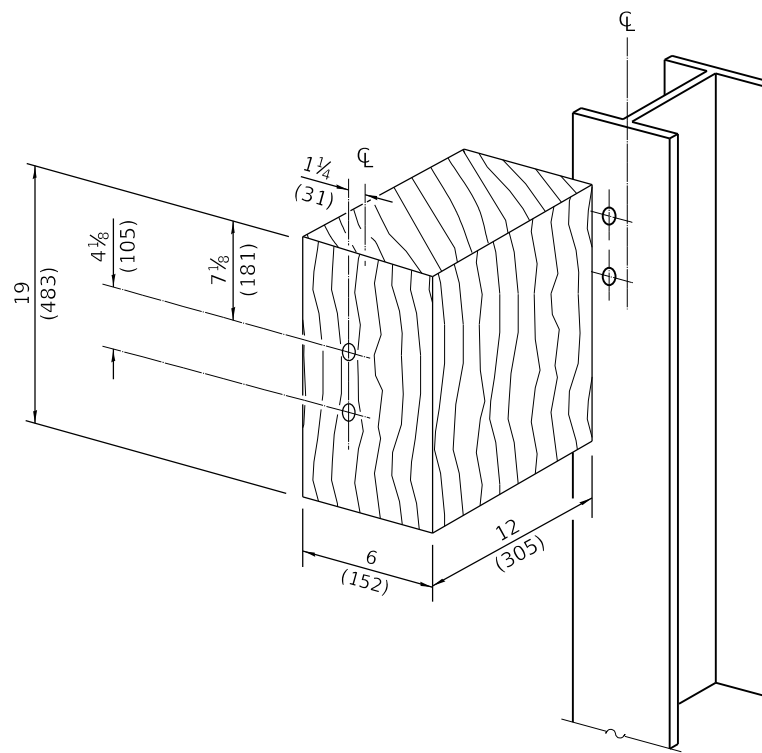
(Sheet 1 of 2)

**STANDARD 631033-08**

Illinois Department of Transportation  
 PASSED January 1, 2020  
 Michael Bond  
 ENGINEER OF POLICY AND PROCEDURES  
 APPROVED January 1, 2020  
 J. C. Egan  
 ENGINEER OF DESIGN AND ENVIRONMENT  
 ISSUED 1-1-2003

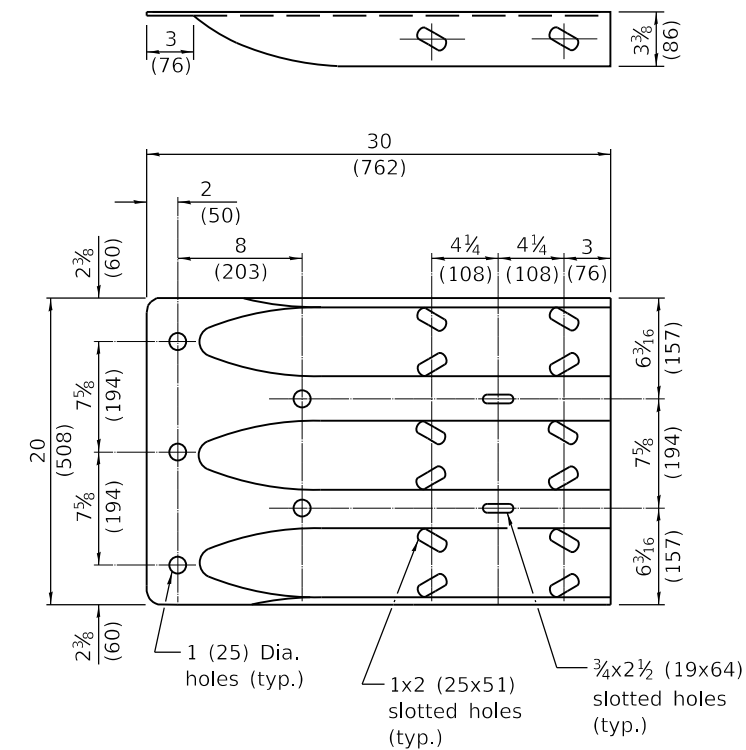


**POSTS 1-11 WOOD BLOCKOUT DETAIL**

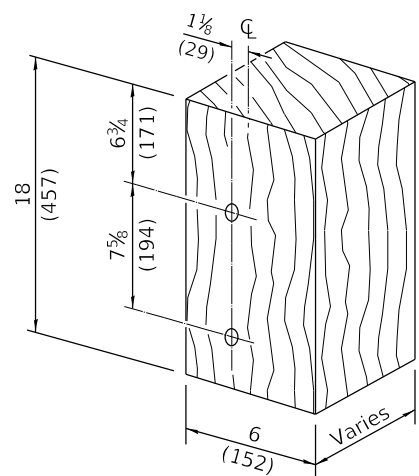


**POST 12 WOOD BLOCKOUT DETAIL**

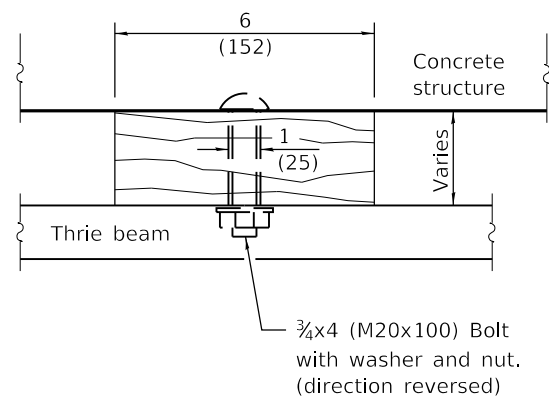
(See Standard 630001 for post 13-17 blockouts.)



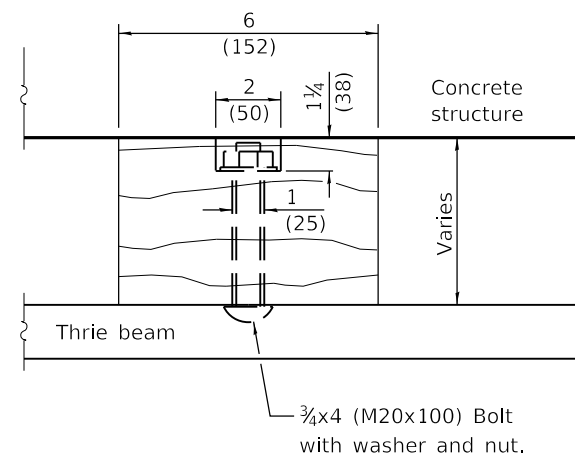
**THRIE BEAM END SHOE DETAIL**



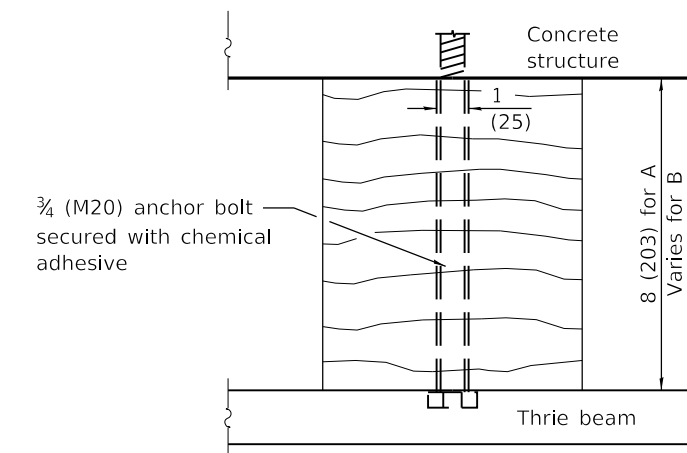
**MODIFIED THICKNESS DETAIL  
WOOD BLOCKOUTS A, B, C, & D**



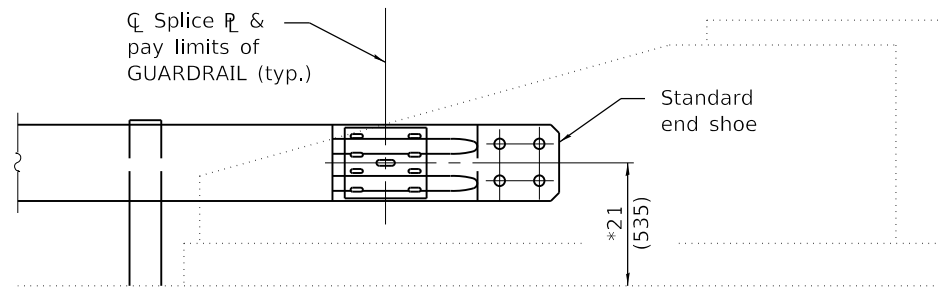
**WOOD BLOCKOUT D**



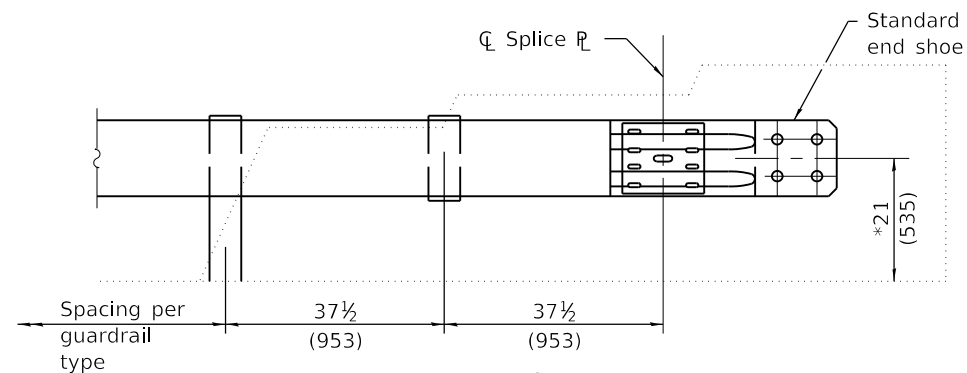
**WOOD BLOCKOUT C**



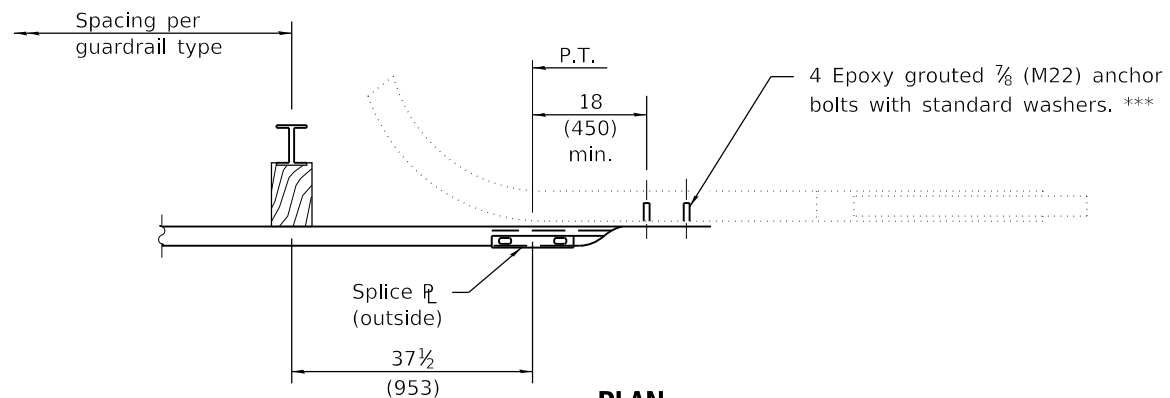
**WOOD BLOCKOUT A & B**



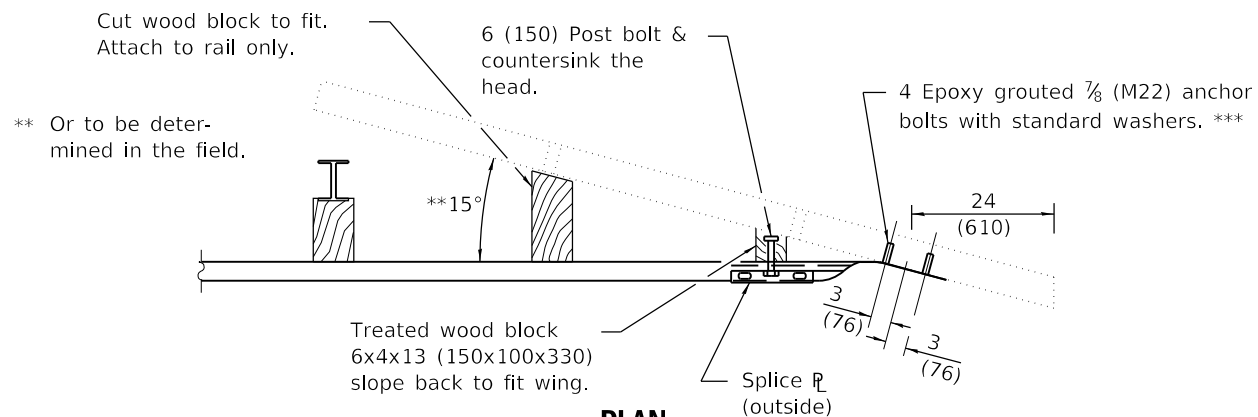
**ELEVATION**



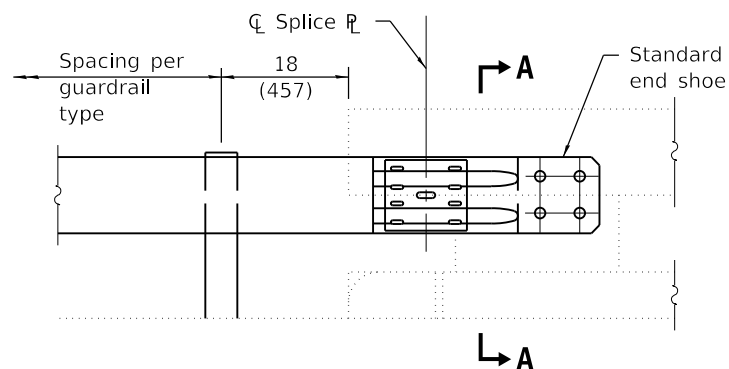
**ELEVATION**



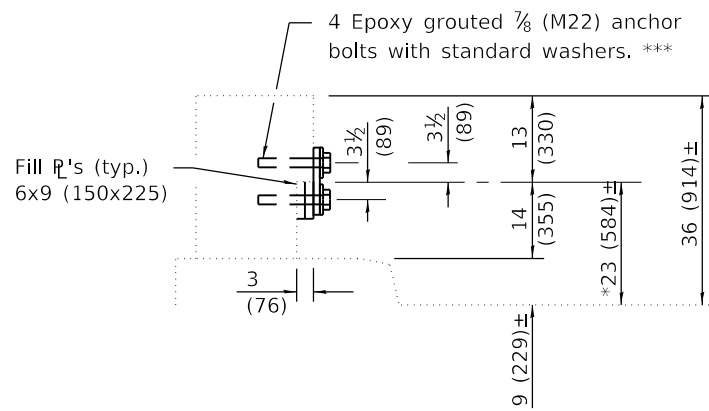
**PLAN CURVED WING**



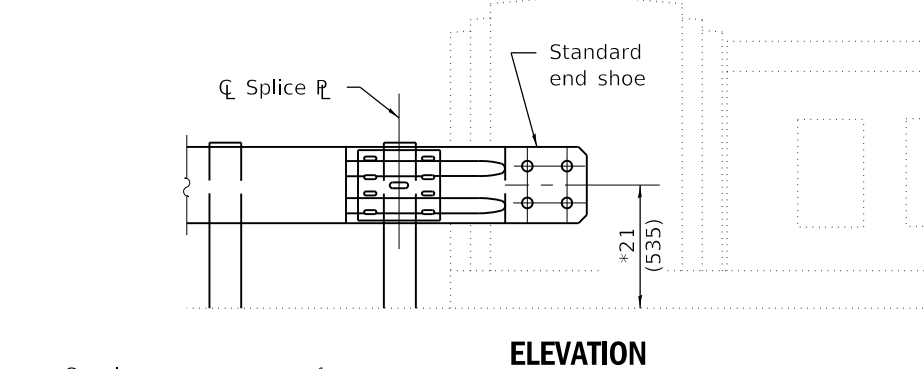
**PLAN FLARED WING**



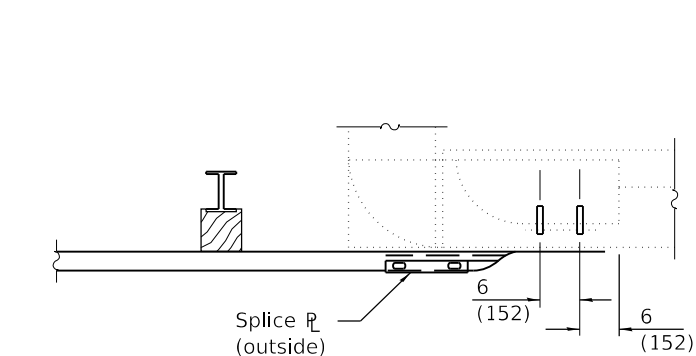
**ELEVATION**



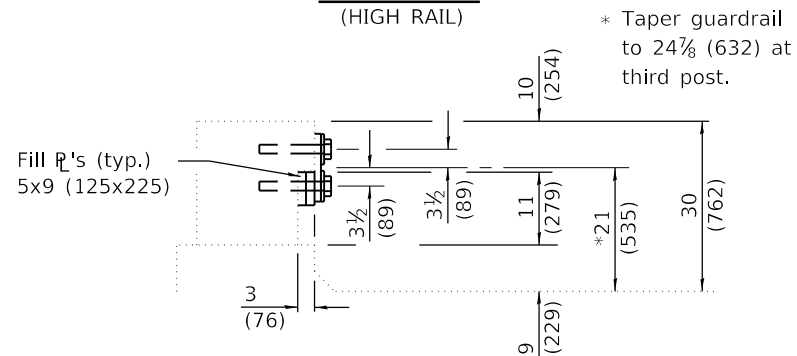
**SECTION A-A (HIGH RAIL)**



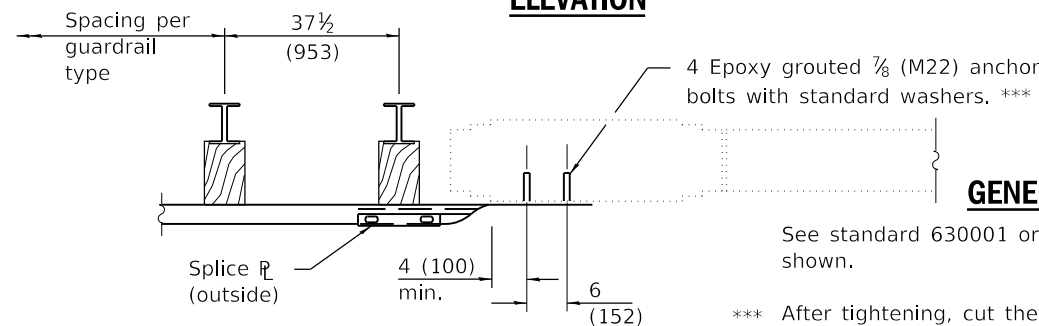
**ELEVATION**



**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.

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**

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

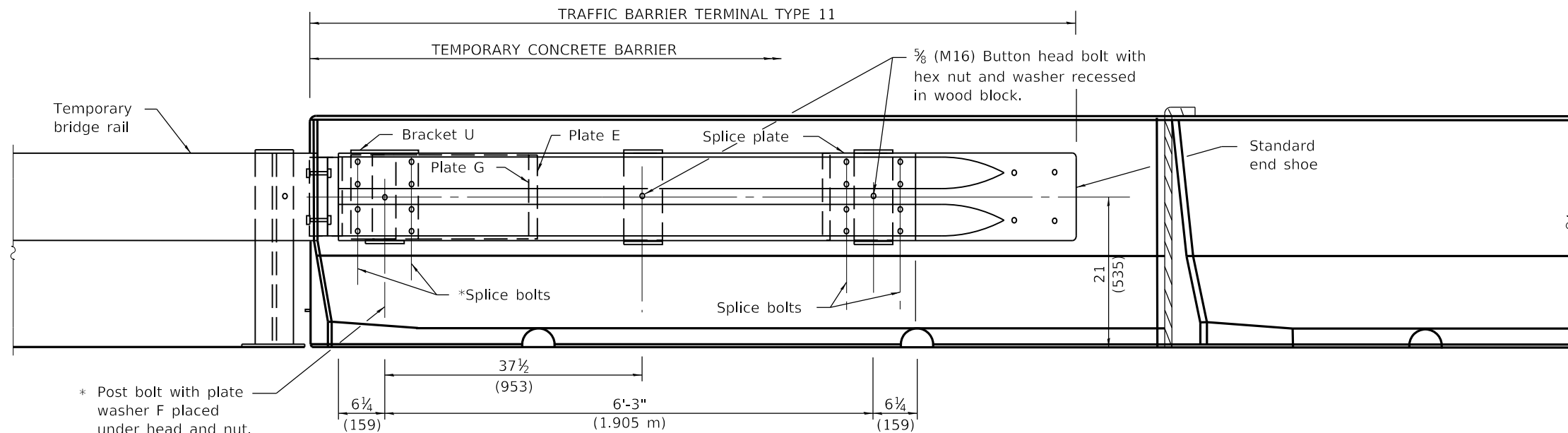
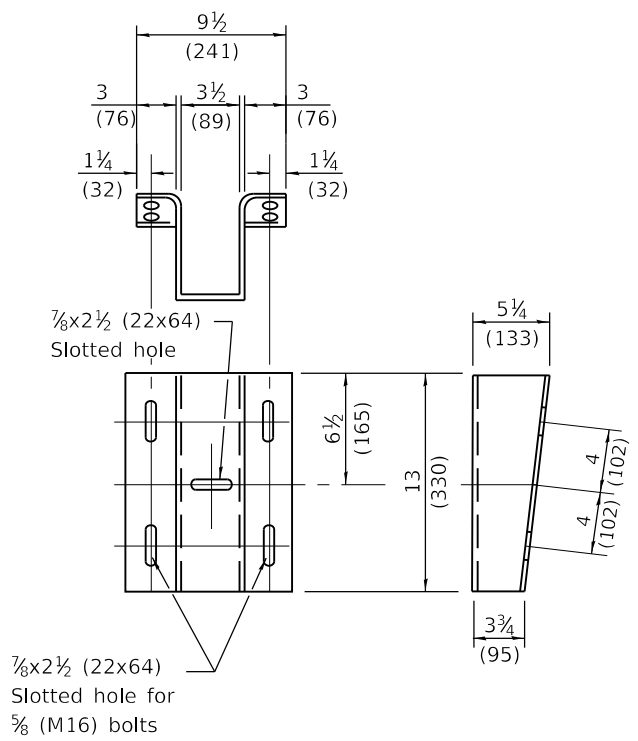
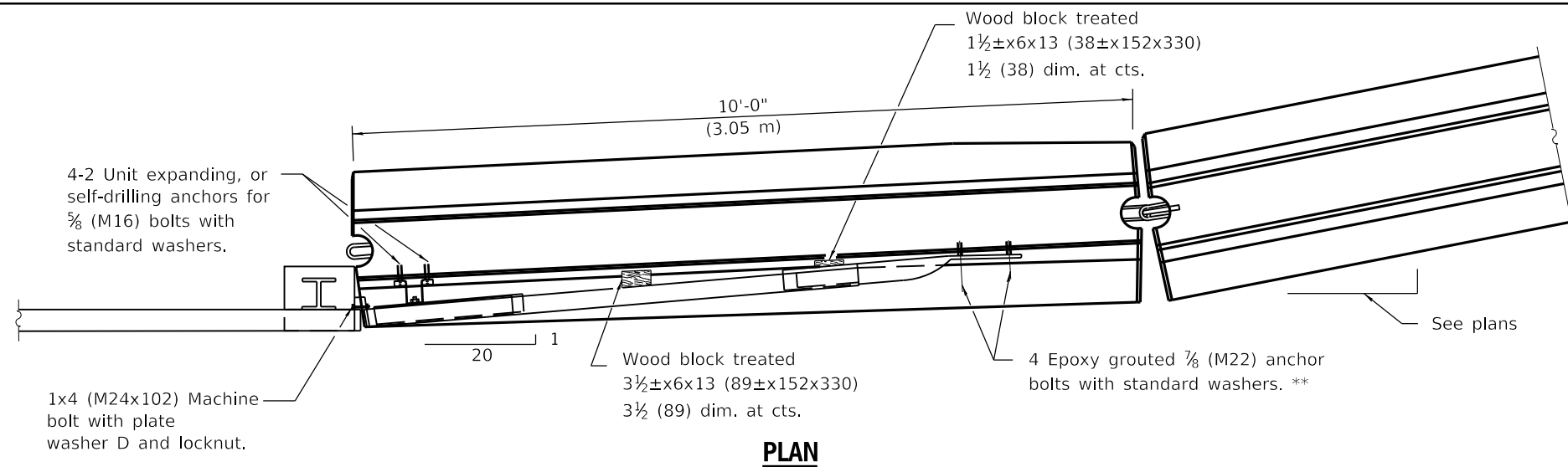
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

**REINFORCED CONCRETE HANDRAIL**





**GENERAL NOTES**

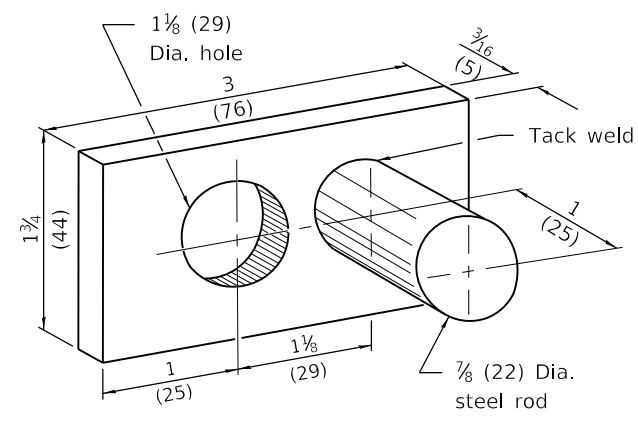
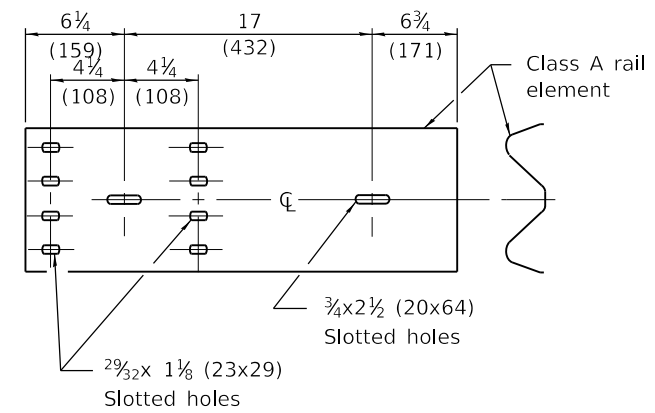
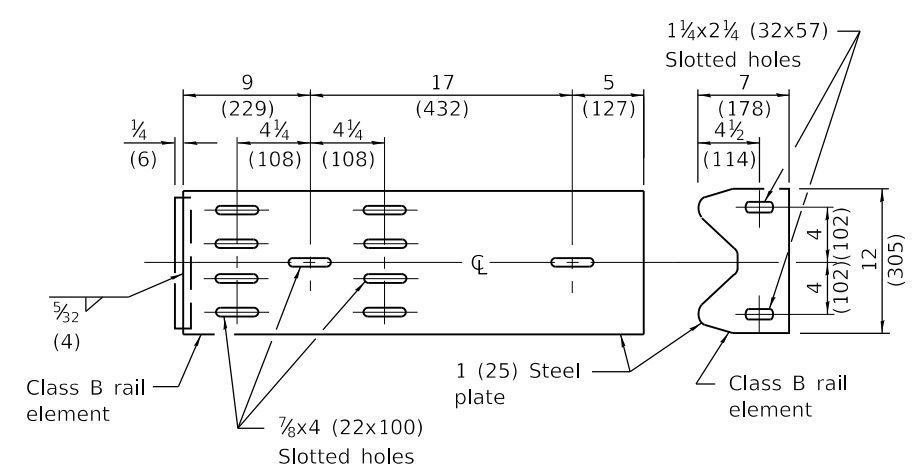
For details of guardrail not shown, see Standard 630001.

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.



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**

Illinois Department of Transportation

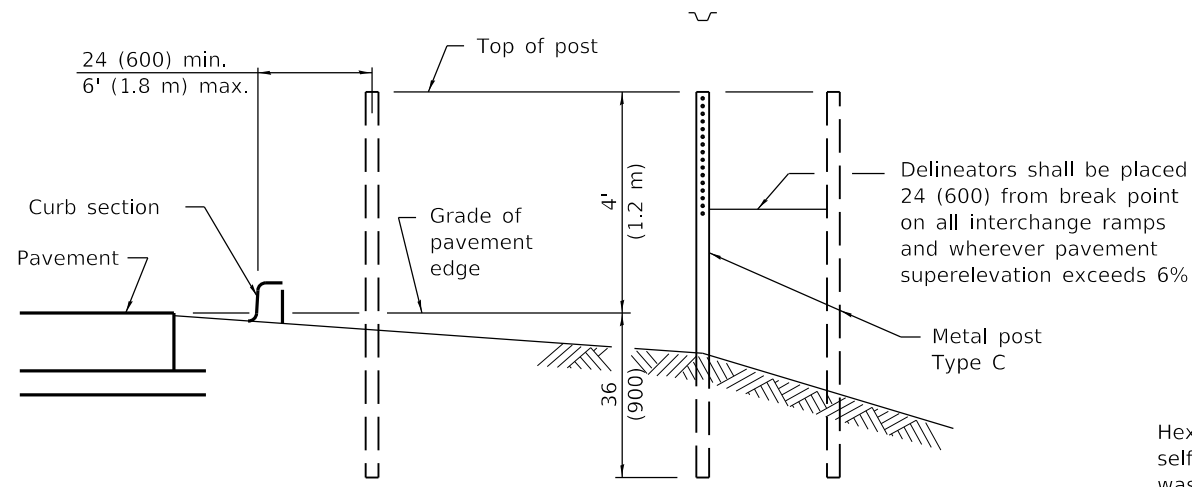
PASSED January 1, 2011  
Michael Beard  
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2011  
S. J. ...  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

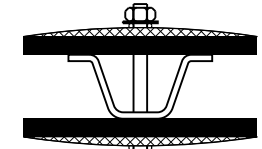
**SPACING FOR DELINEATORS  
ON HORIZONTAL CURVES**

Radius of Curve Feet (m)	Spacing on Curve Feet (m)	Spacing in Advance and Beyond Curve Feet (m)		
		1st. Space	2nd. Space	3rd. Space
Less than 100 (30)	20 (5)	40 (10)	65 (20)	125 (40)
100 - 174 (30 - 54)	30 (10)	60 (20)	90 (25)	180 (55)
175 - 224 (55 - 69)	35 (10)	70 (20)	110 (35)	200 (60)
225 - 274 (70 - 84)	40 (10)	85 (25)	125 (40)	200 (60)
275 - 349 (85 - 104)	50 (15)	95 (30)	145 (45)	200 (60)
350 - 449 (105 - 134)	55 (15)	110 (35)	170 (50)	200 (60)
450 - 549 (135 - 164)	65 (20)	125 (40)	190 (60)	200 (60)
550 - 649 (165 - 199)	70 (20)	140 (45)	200 (60)	200 (60)
650 - 749 (200 - 229)	75 (25)	150 (45)	200 (60)	200 (60)
750 - 849 (230 - 259)	80 (25)	165 (50)	200 (60)	200 (60)
850 - 949 (260 - 289)	85 (25)	175 (55)	200 (60)	200 (60)
950 - 1049 (290 - 319)	90 (25)	185 (55)	200 (60)	200 (60)
1050 - 1299 (320 - 394)	100 (30)	200 (60)	200 (60)	200 (60)
1300 - 1999 (395 - 609)	125 (40)	200 (60)	200 (60)	300 (90)
2000 - 2999 (610 - 914)	150 (45)	200 (60)	200 (60)	300 (90)
3000 - 3999 (915 - 1219)	175 (55)	200 (60)	300 (90)	300 (90)
4000 or greater (1220)	400 (120)	400 (120)	400 (120)	400 (120)



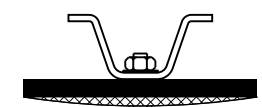
**SECTIONAL VIEW**

Hex head bolt with self locking nut and washer

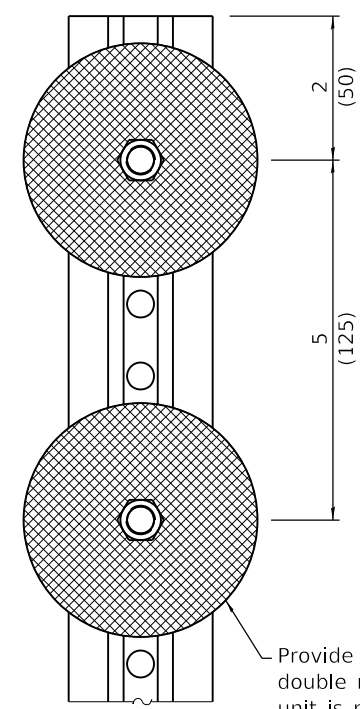


Two sided

Hex head bolt with self locking nut and washer

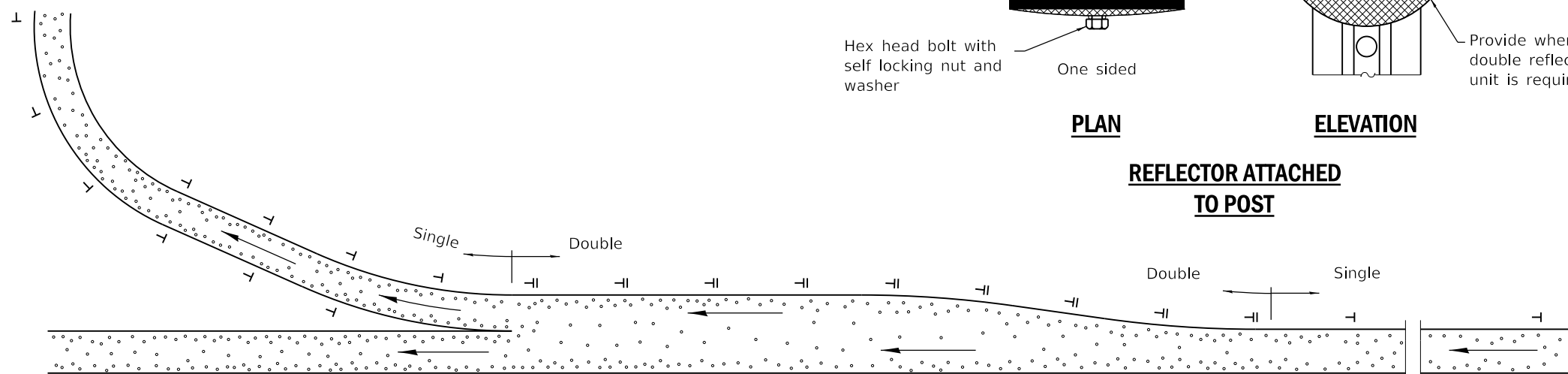


One sided

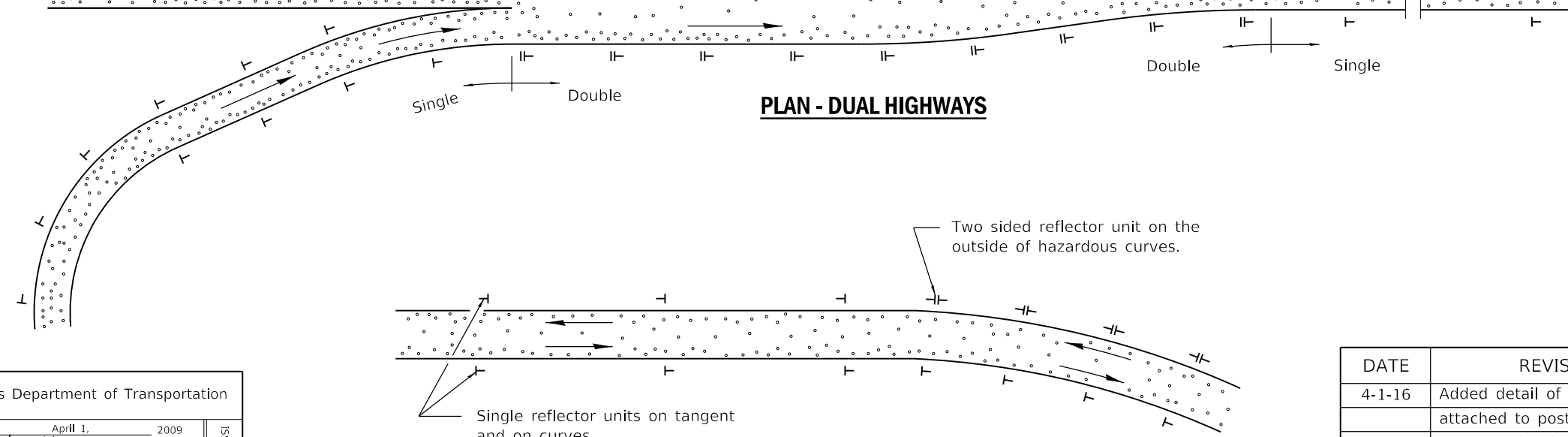


**ELEVATION**

**REFLECTOR ATTACHED TO POST**



**PLAN - DUAL HIGHWAYS**



**PLAN - TWO-WAY ROADWAYS**

**GENERAL NOTES**

Delineators on tangent sections of main line roadways shall be placed at 400' (120 m) spacing. Delineators on ramps and acceleration and deceleration lanes shall be placed at a maximum spacing of 100' (30 m).

Refer to Standard 720011 for details of metal post.

Double reflector units shall be used on the outside of all acceleration and deceleration lanes. Single reflector units shall be used on ramps. Delineators shall be used on outside of all curved sections of ramps.

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

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**

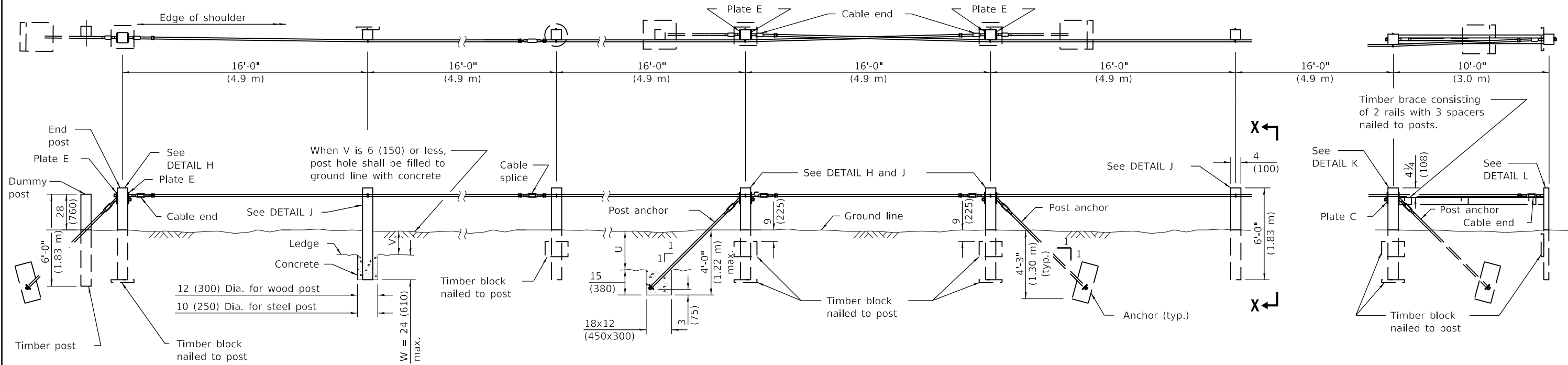
**STANDARD 635001-02**

Illinois Department of Transportation

PASSED April 1, 2009  
*Amy Allen*  
 ENGINEER OF OPERATIONS

APPROVED April 1, 2009  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



**END ANCHOR ARRANGEMENT**

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

**INTERMEDIATE ANCHOR ARRANGEMENT**

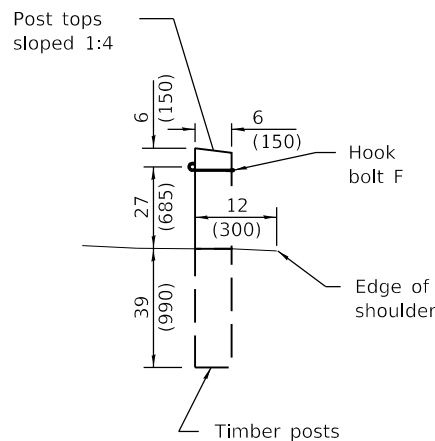
**DEAD END ANCHOR ARRANGEMENT**

**NOTES**

V + W shall not exceed 39 (990). When V is 0 to 15 (380), W = 24 (610), and posts shall be shortened as required. When V exceeds 15 (380), W shall be shortened correspondingly.

T = 15 (380) when U is 33 (840) or less. When U exceeds 33 (840) the impervious material shall be removed and the standard anchor shall be used.

Timber blocks shall be nailed to each wood post on the concave side of curve for curves having a radius of less than 600' (180 m).



**VIEW X-X**

Typical Wood Materials	
Item	Size
Post	4x4x6'-0" (100x150x1.83 m)
Block	2x12x18 (50x300x450)
Rail	2x6 (50x150)
Spacer	2x6x6 (50x150x150)

**GENERAL NOTES**

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

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

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

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

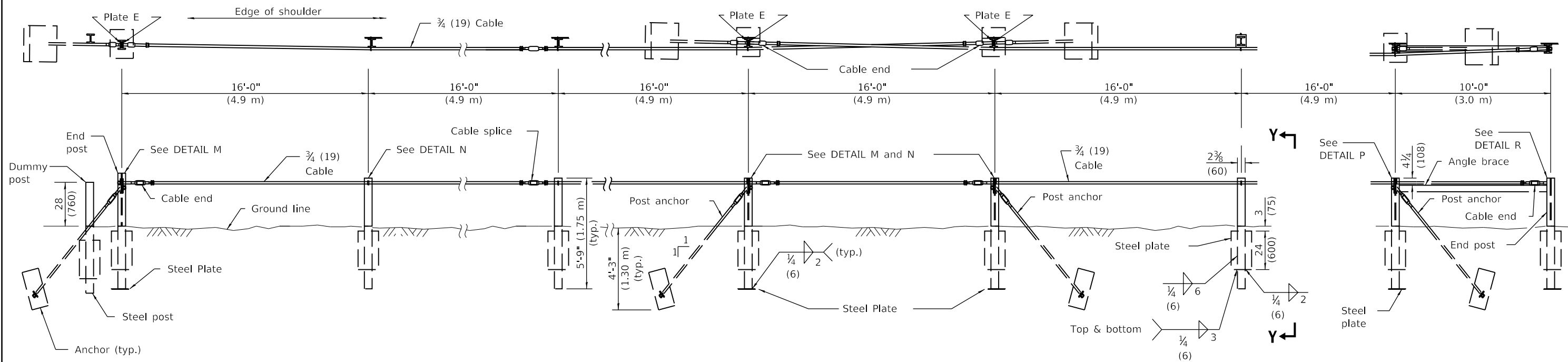
ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to Eng. (met.). omitted precast deadman and gen. note.
1-1-05	Corrected note on Post Anchor detail on sheet
	3 of 3.

**CABLE ROAD GUARD SINGLE STRAND**

(Sheet 1 of 3)

**STANDARD 636001-02**

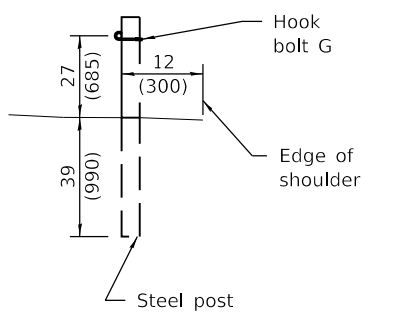


**END ANCHOR ARRANGEMENT**

**INTERMEDIATE ANCHOR ARRANGEMENT**

**DEAD END ANCHOR ARRANGEMENT**

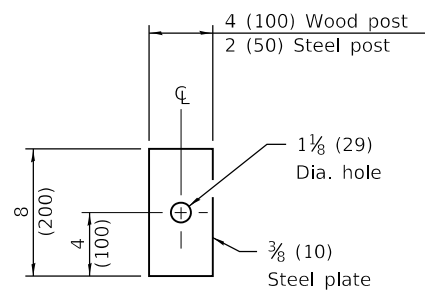
TYPICAL STEEL MATERIALS	
Item	Size
Post	S3x5.7x5'-9" (S75x8.5x1.75 m)
Bottom Plate	1/4x8x8 (6x200x200)
Side Plate	1/4x8x24 (6x200x600)
Brace	L 4x3x3/8 (L 102x76x9.5)



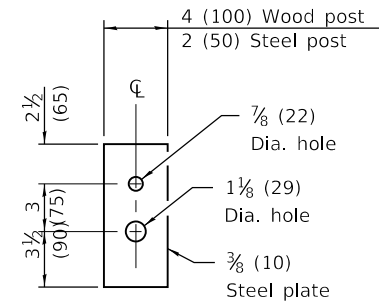
**VIEW Y-Y**

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

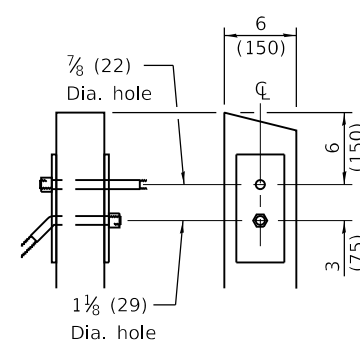
**CABLE ROAD GUARD**  
**SINGLE STRAND**  
 (Sheet 2 of 3)  
**STANDARD 636001-02**



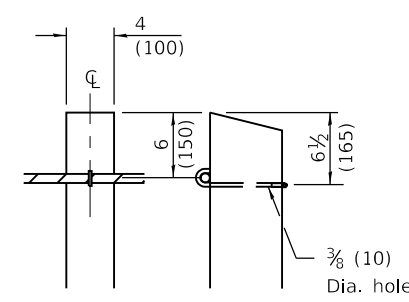
**PLATE C**



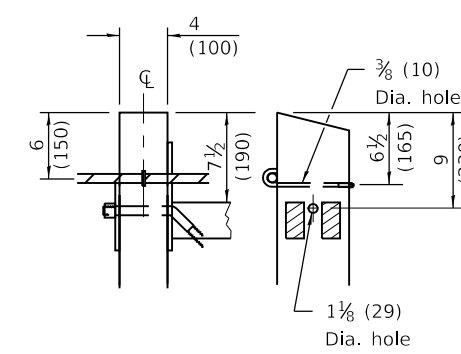
**PLATE E**



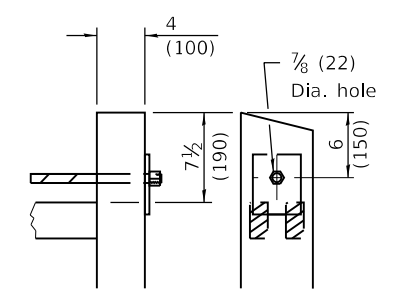
**DETAIL H**



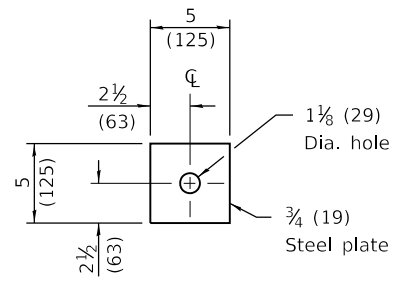
**DETAIL J**



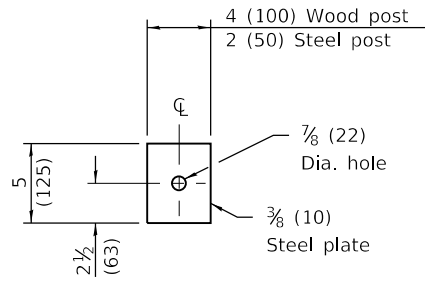
**DETAIL K**



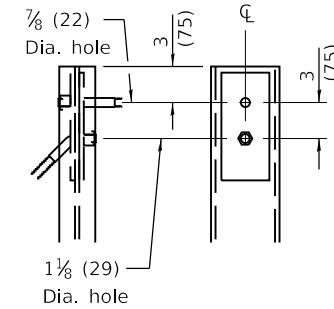
**DETAIL L**



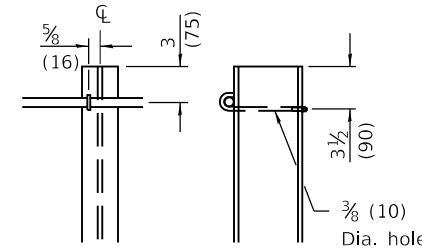
**PLATE B**



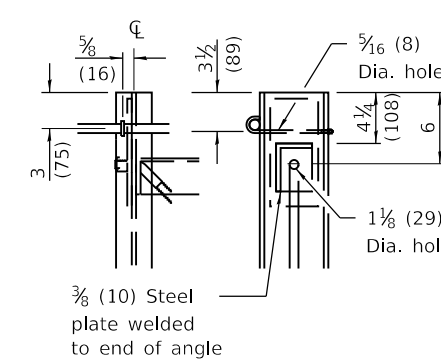
**PLATE D**



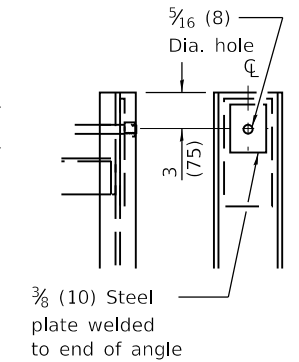
**DETAIL M**



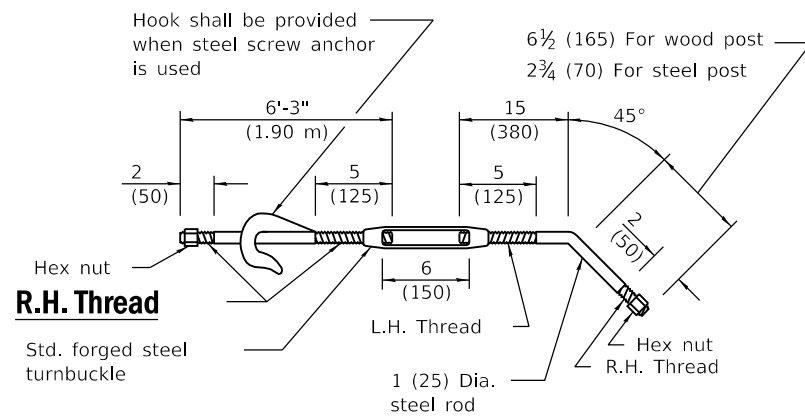
**DETAIL N**



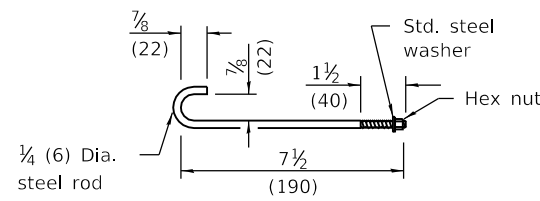
**DETAIL P**



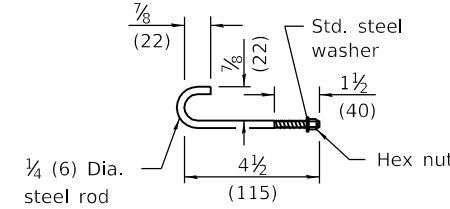
**DETAIL R**



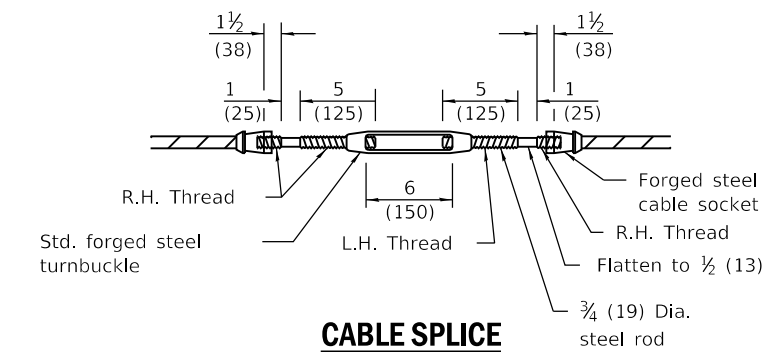
**POST ANCHOR**



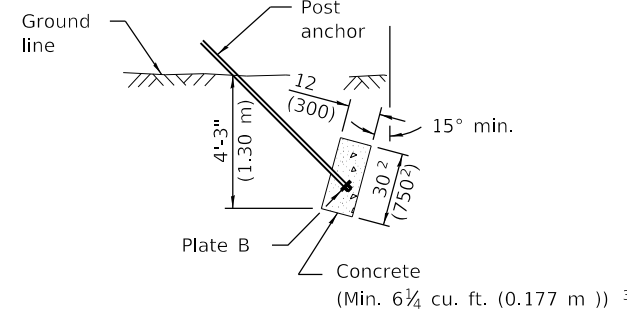
**HOOK BOLT F**



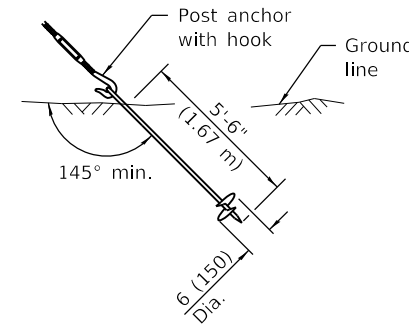
**HOOK BOLT G**



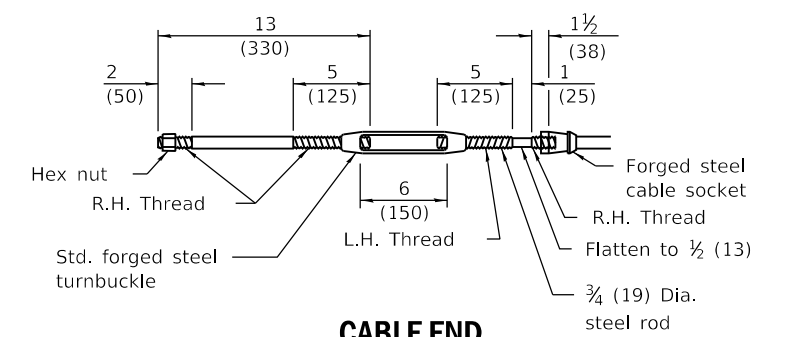
**CABLE SPLICE**



**CAST IN PLACE DEADMAN**



**STEEL SCREW**



**CABLE END**

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

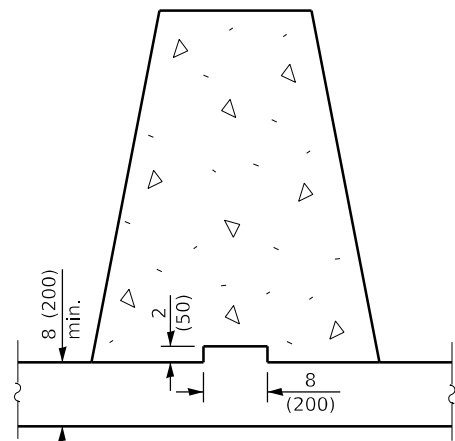
ISSUED 1-1-97

**ALTERNATE - ANCHORS**

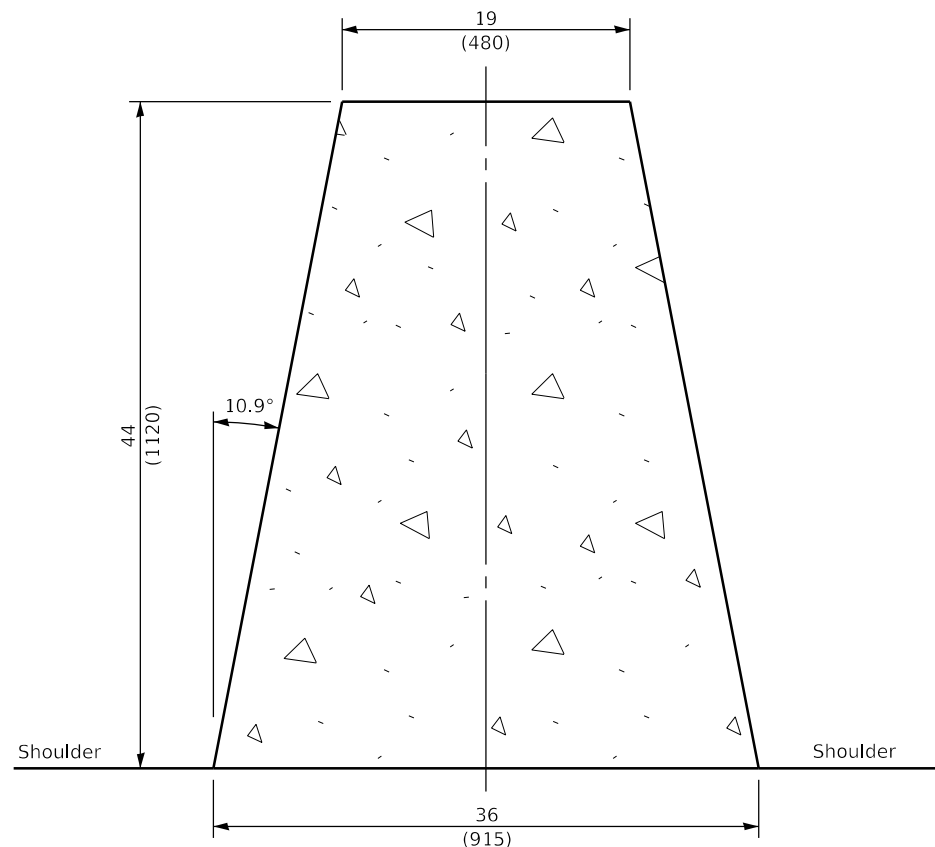
**CABLE ROAD GUARD  
 SINGLE STRAND**

(Sheet 3 of 3)

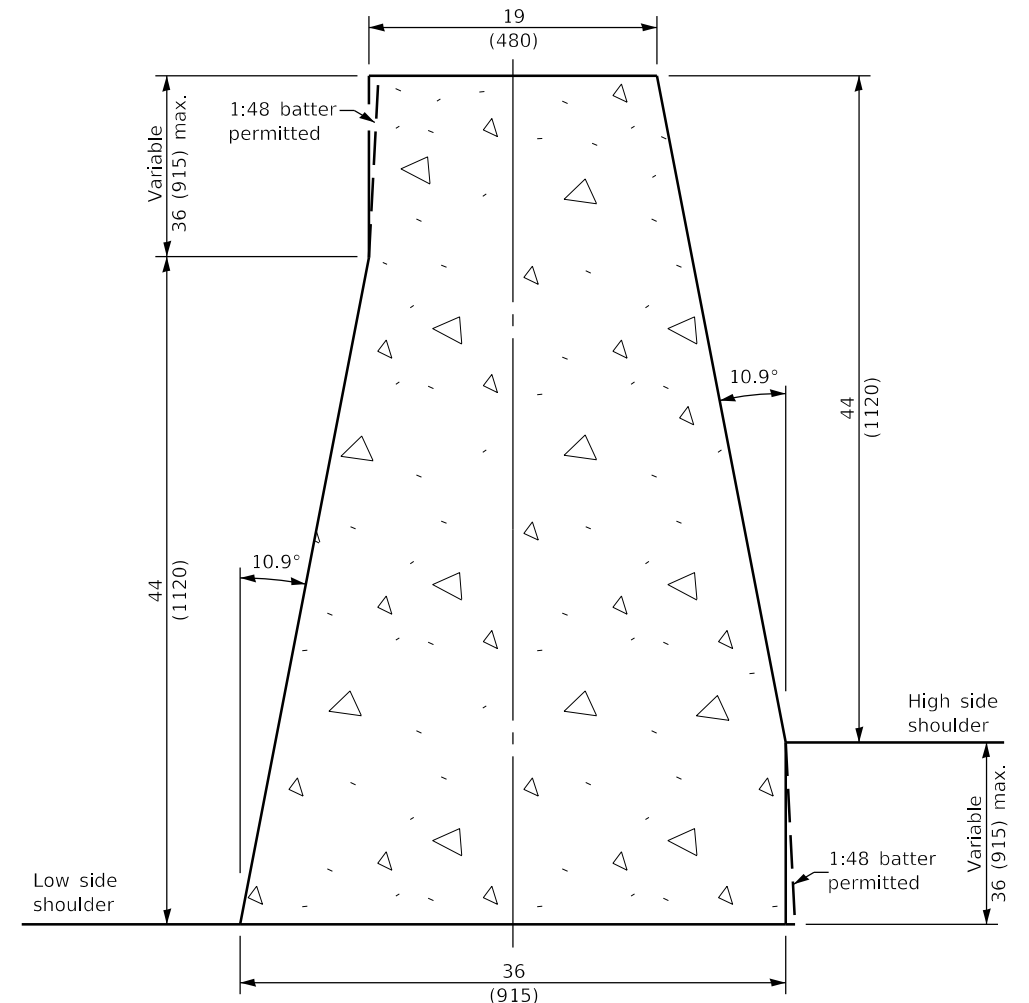
**STANDARD 636001-02**



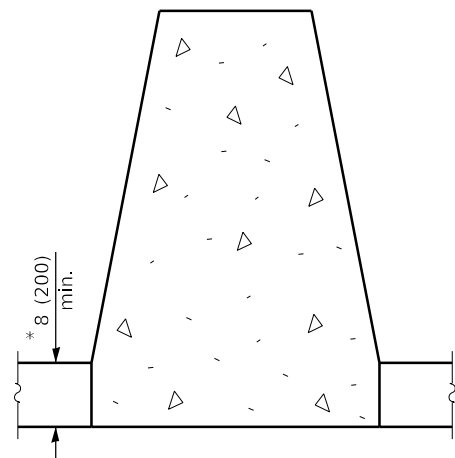
**NEW PCC BASE w/ KEYWAY**



**TYPICAL CROSS-SECTION**

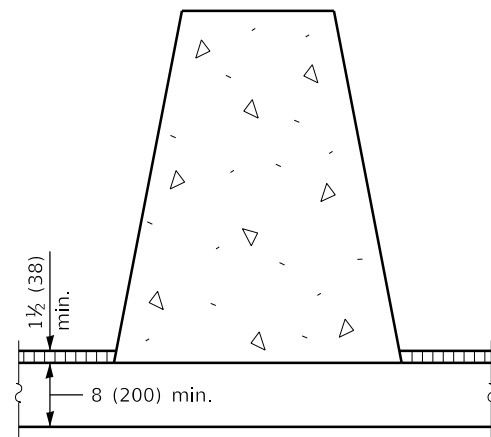


**VARIABLE CROSS-SECTION**

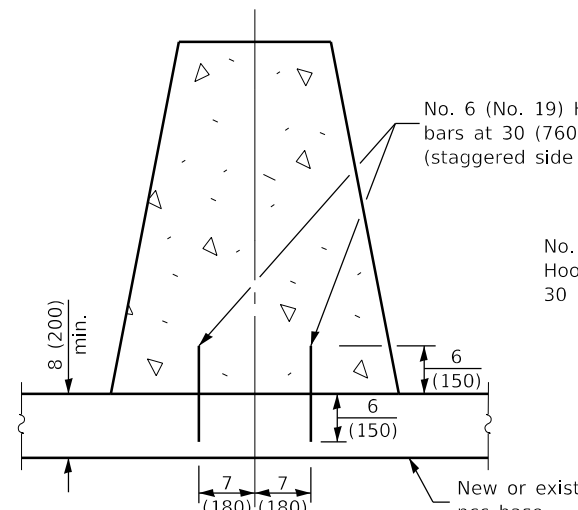


**NEW MONOLITHIC PCC BASE**

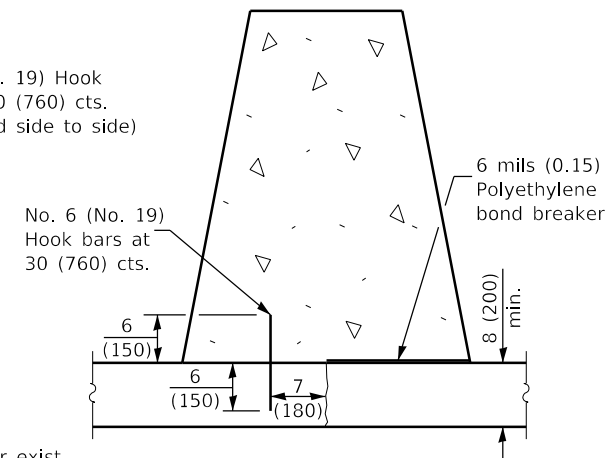
\* This dimension shall be 10 (250) min. when the barrier is confined by earth.



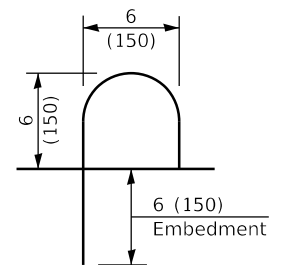
**NEW OR EXISTING HMA / PCC BASE w/ HMA OVERLAY CONFINEMENT**



**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**

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**  
(Sheet 1 of 2)

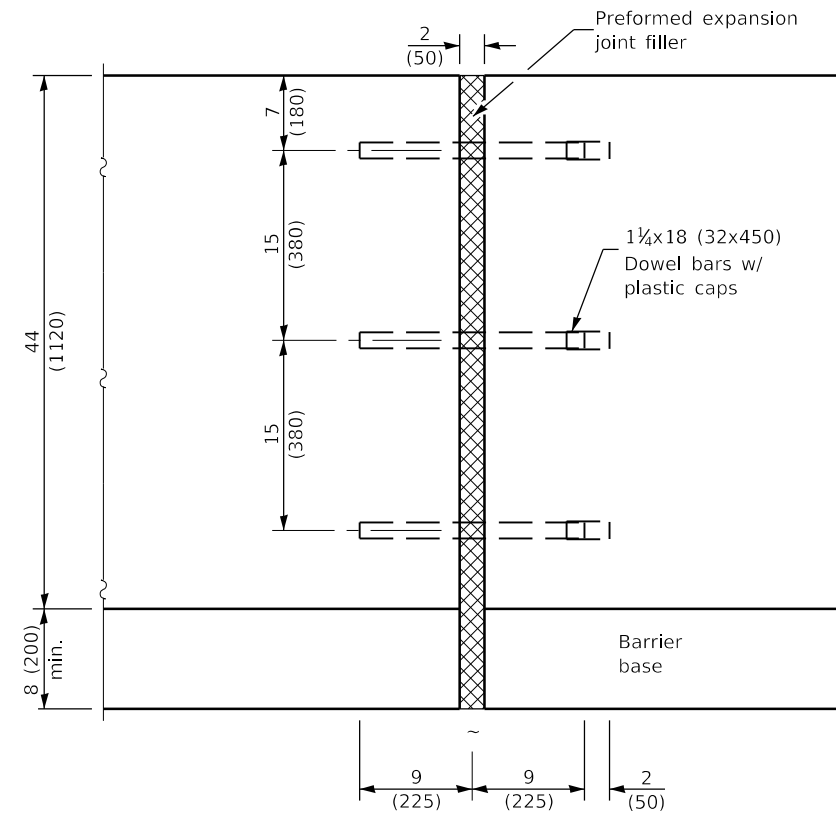
**STANDARD 637006-05**

Illinois Department of Transportation

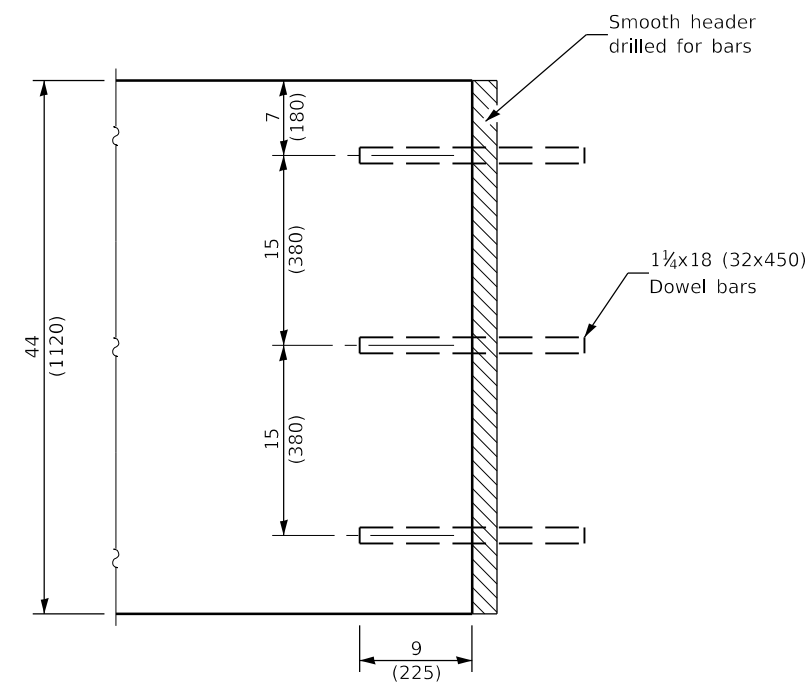
PASSED January 1, 2021  
  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

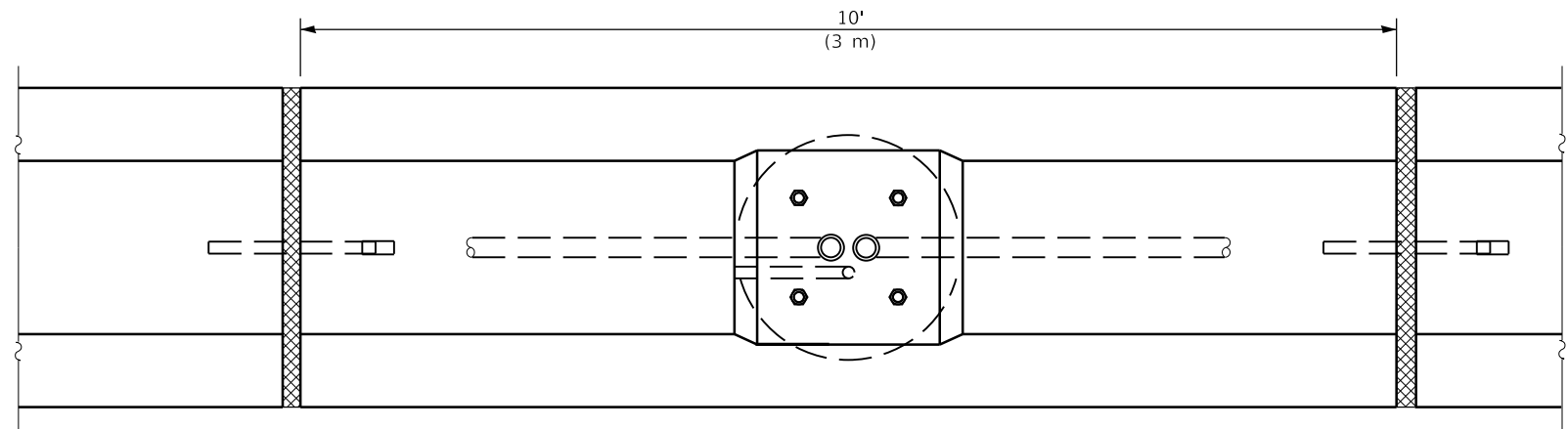
ISSUED 1-1-97  
 76-T



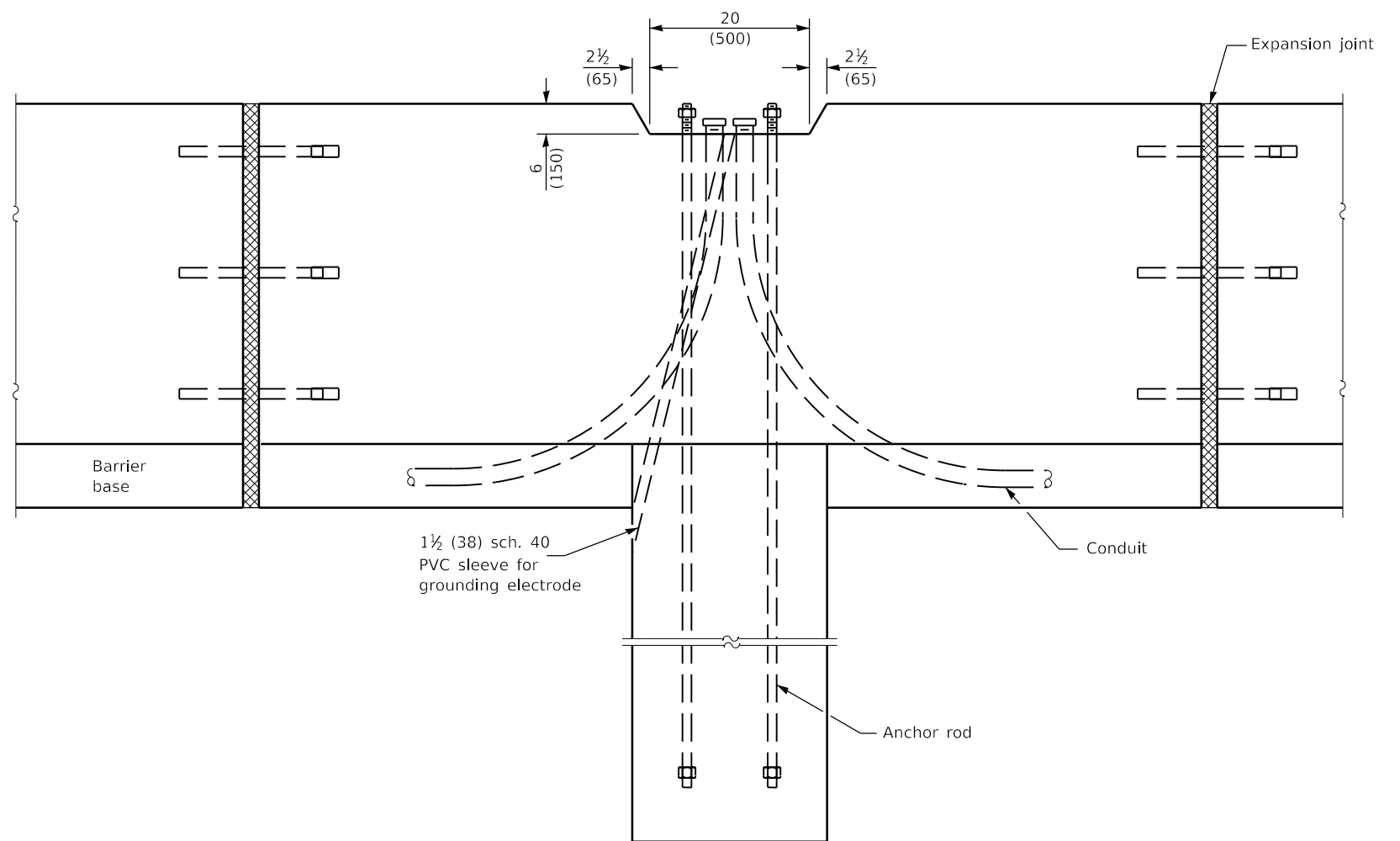
**EXPANSION JOINT**



**CONSTRUCTION JOINT**



**PLAN AT LIGHTING FOUNDATION**

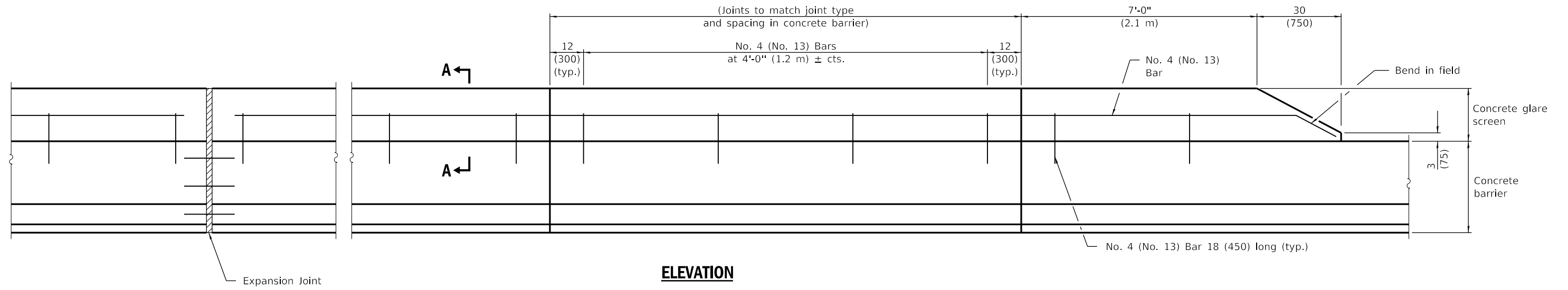


**ELEVATION AT LIGHTING FOUNDATION**

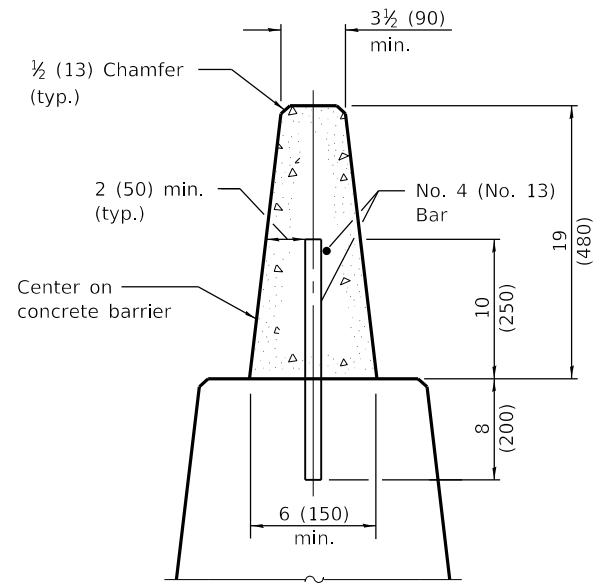
Illinois Department of Transportation  
 PASSED January 1, 2021  
 Michael Bond  
 ENGINEER OF POLICY AND PROCEDURES  
 APPROVED January 1, 2021  
 [Signature]  
 ENGINEER OF DESIGN AND ENVIRONMENT  
 46-1-1 Q3US51

**CONCRETE BARRIER,  
 DOUBLE FACE,  
 44 in. (1120 mm) HEIGHT**  
 (Sheet 2 of 2)

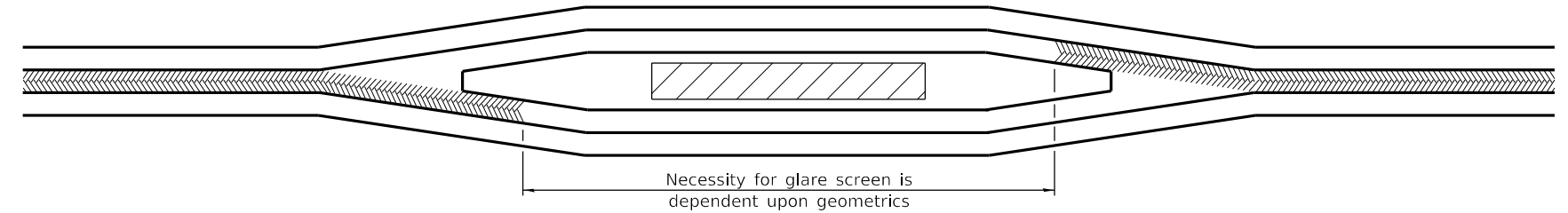
**STANDARD 637006-05**



**ELEVATION**



**SECTION A-A**



**TYPICAL APPLICATION AT MEDIAN OBSTRUCTIONS**

 Glare Screen

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

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

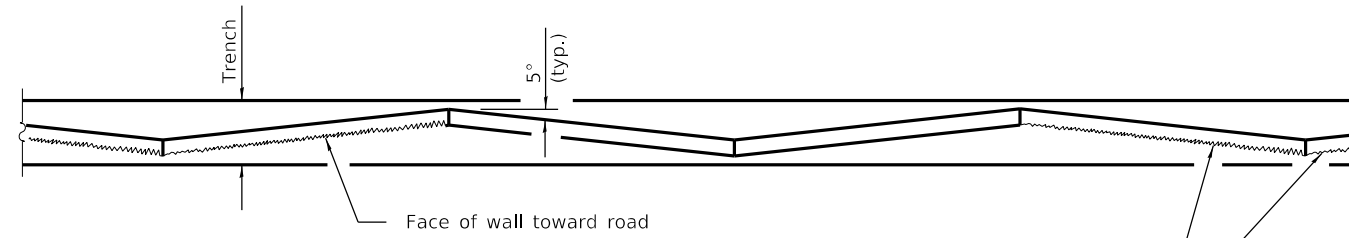
ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-04	Revised for F shape barrier.

**CONCRETE GLARE SCREEN**

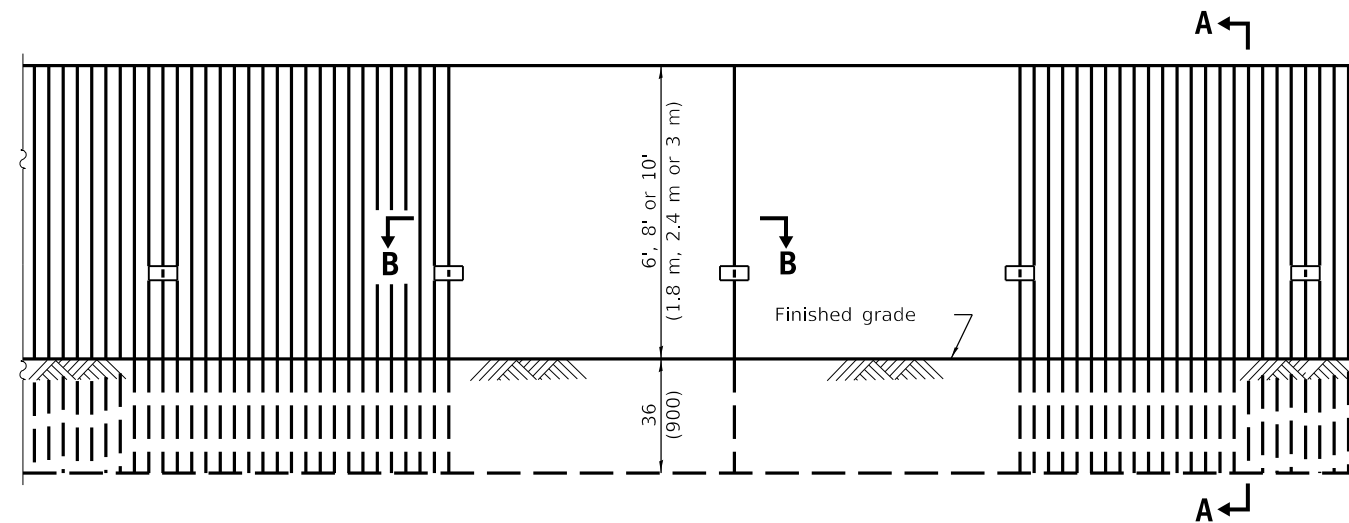
**STANDARD 638101-02**



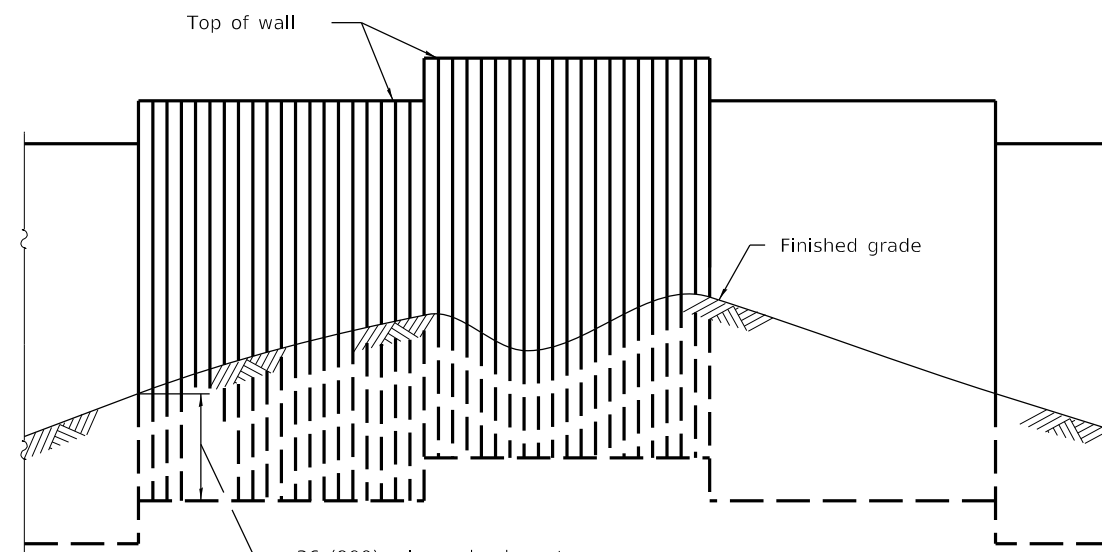


Each alternate pair of panels shall have a textured surface finish as shown, and shall be alternated with pairs having a smooth finish. The intersection of every two panels having the same finish shall point toward the road as shown.

**PLAN**

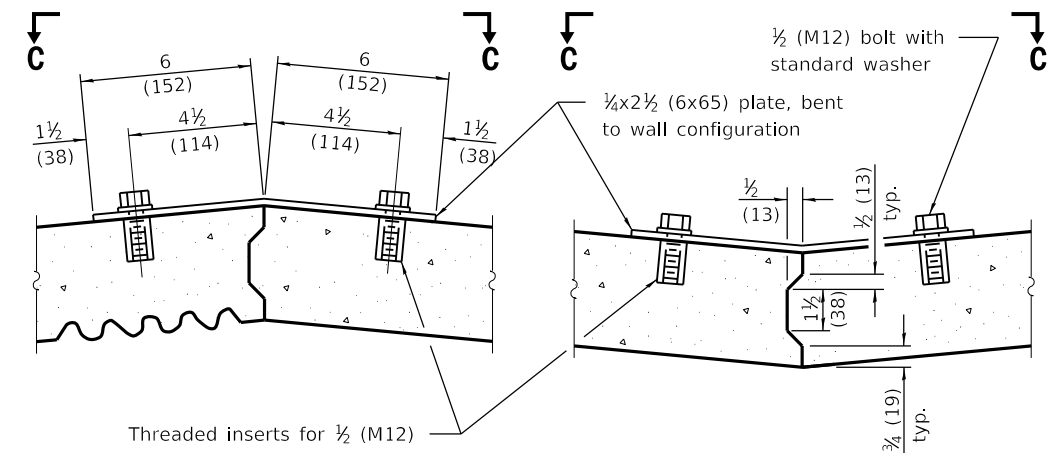


**ELEVATION**



**ELEVATION**

(Showing installation of wall in irregular ground)

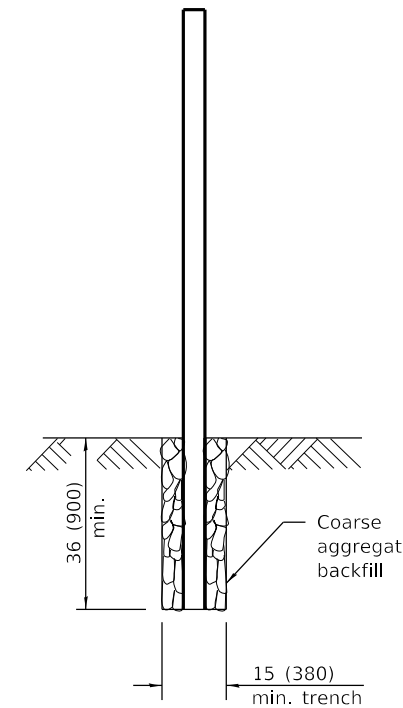


Threaded inserts for ½ (M12) bolts, precast or field drilled, as necessary, into panels.

Showing typical metal band connector dimensions

Showing typical shear key dimensions

**SECTION B-B**



**SECTION A-A**

**GENERAL NOTES**

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

ALLOWABLE STRESSES:

- Concrete: f'c = 3,500 psi (24 MPa)  
f'ci = 2,250 psi (15 MPa)
- Prestressing Steel: f's = 270,000 psi (1860 MPa)  
f'si = 189,000 psi (1300 MPa)
- Reinforcing Steel: f'y = 40,000 psi min. (270 MPa)
- Structural Steel: f's = 20,000 psi (138 MPa)
- Minimum allowable soil bearing pressure: = 1.25 tsf (120 kPa)

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

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

**SIGHT SCREEN  
PRECAST PRESTRESSED  
CONCRETE PANEL WALL**

(Sheet 1 of 2)

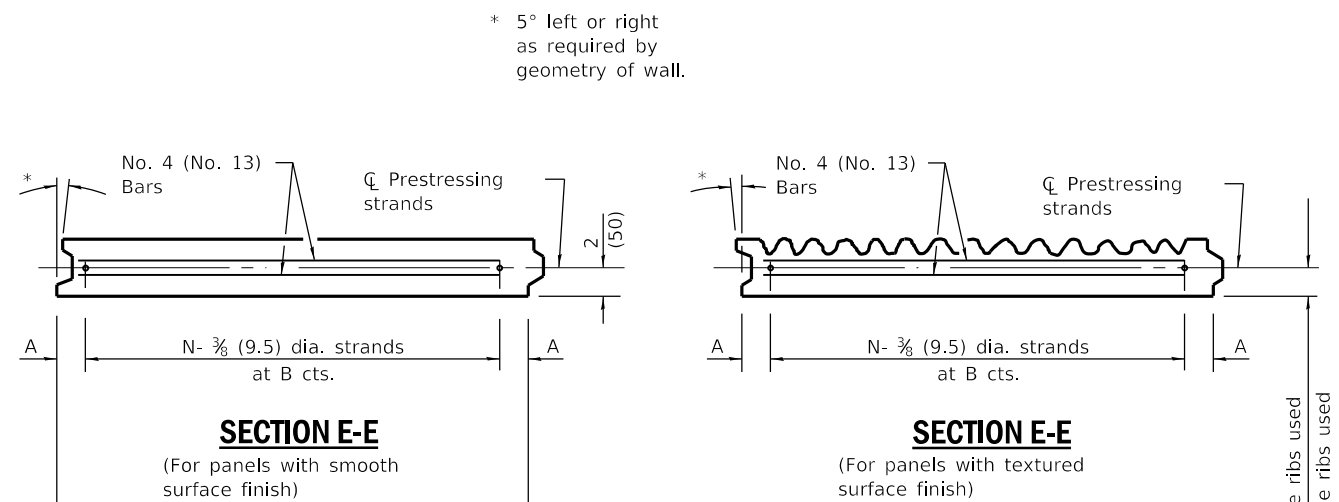
**STANDARD 639001-02**

Illinois Department of Transportation

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

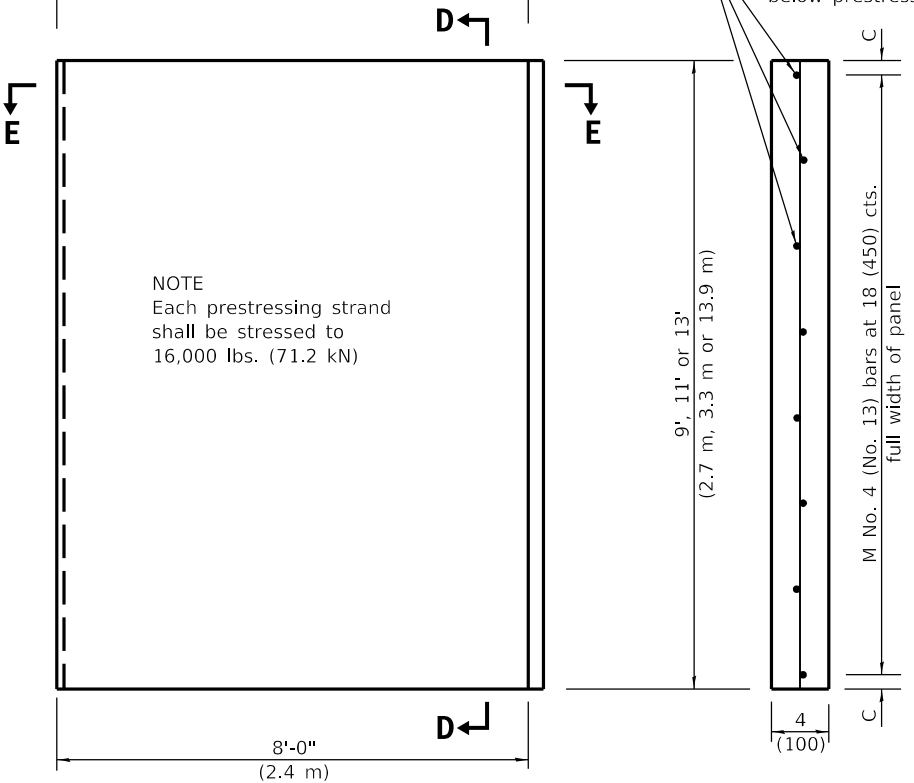
APPROVED January 1, 2009  
*Lee E. Han*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

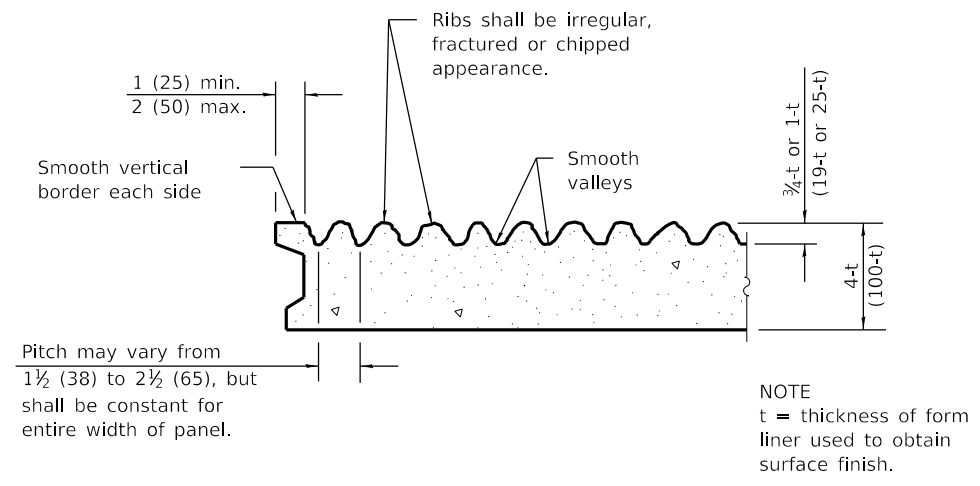
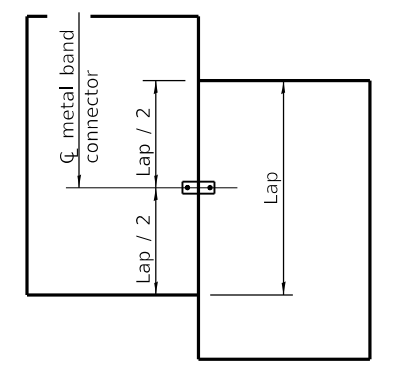
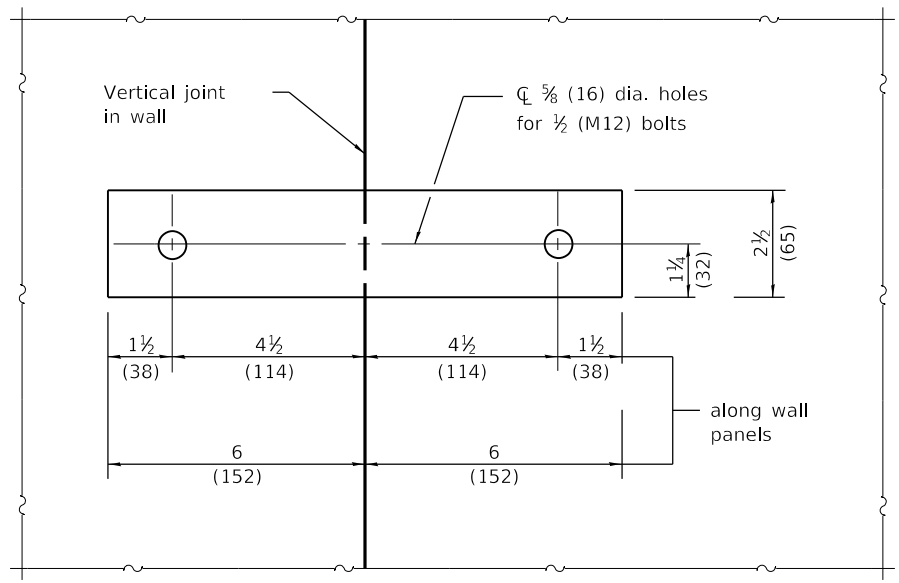


1 3/8 (40) when 1 (25) surface ribs used  
1 3/4 (45) when 3/4 (19) surface ribs used

No. 4 (No. 13) bars shall be alternated above and below prestressing strands.



**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

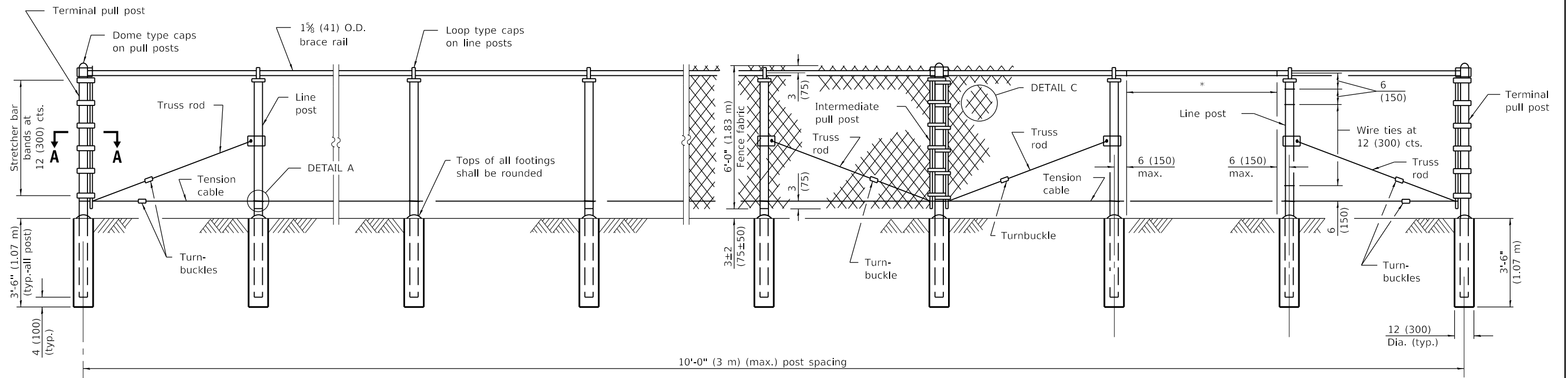
APPROVED January 1, 2009  
*Ralph E. Anderson*  
ENGINEER OF BRIDGES AND STRUCTURES

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

ISSUED 1-1-97

**SIGHT SCREEN  
PRECAST PRESTRESSED  
CONCRETE PANEL WALL**  
(Sheet 2 of 2)

**STANDARD 639001-02**



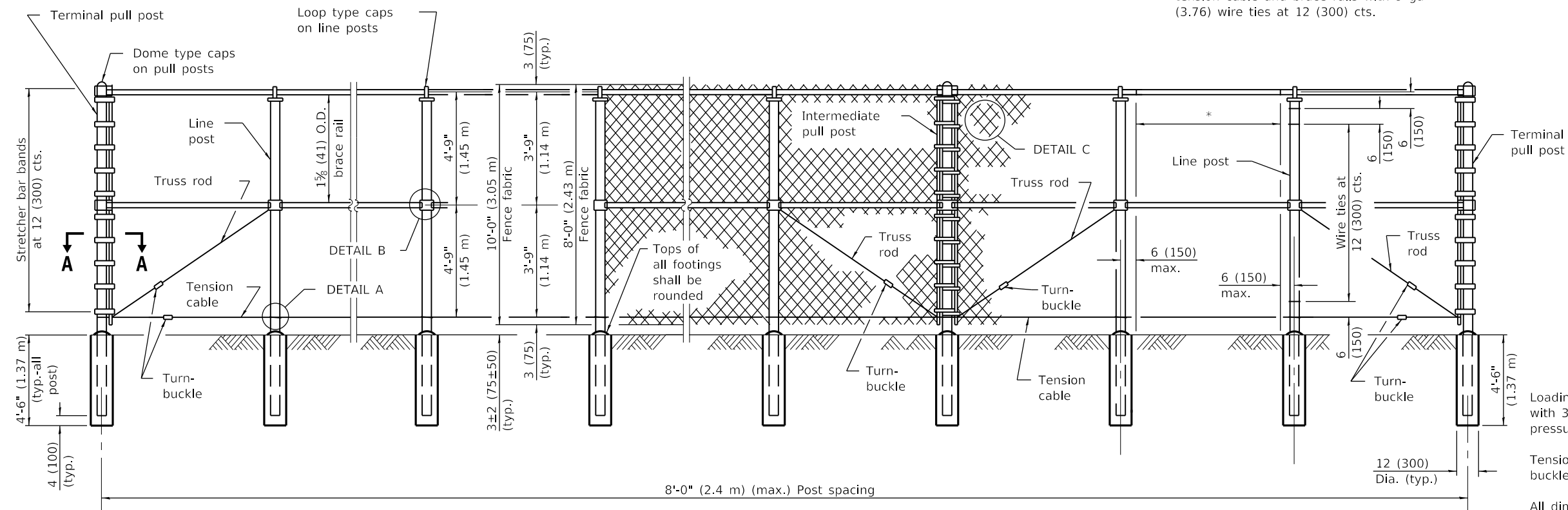
**ELEVATION - 6' (1.83 m) FENCE**

(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

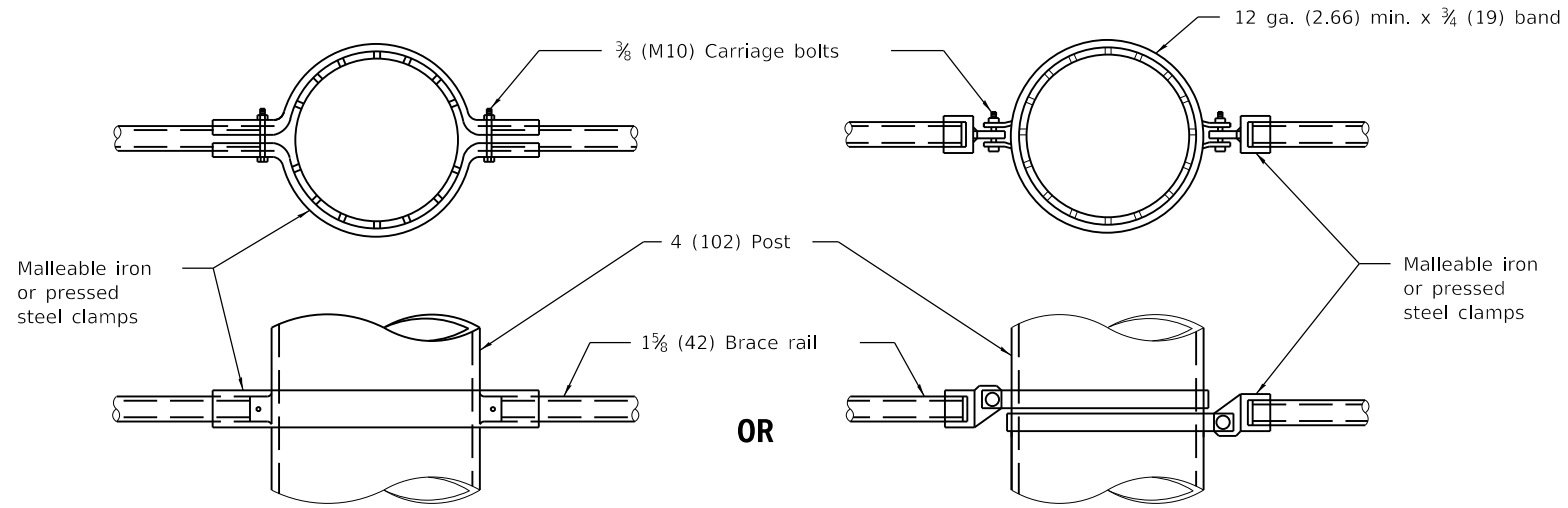
APPROVED January 1, 2009  
*Ralph E. Anderson*  
 ENGINEER OF BRIDGES AND STRUCTURES

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

ISSUED 1-1-97

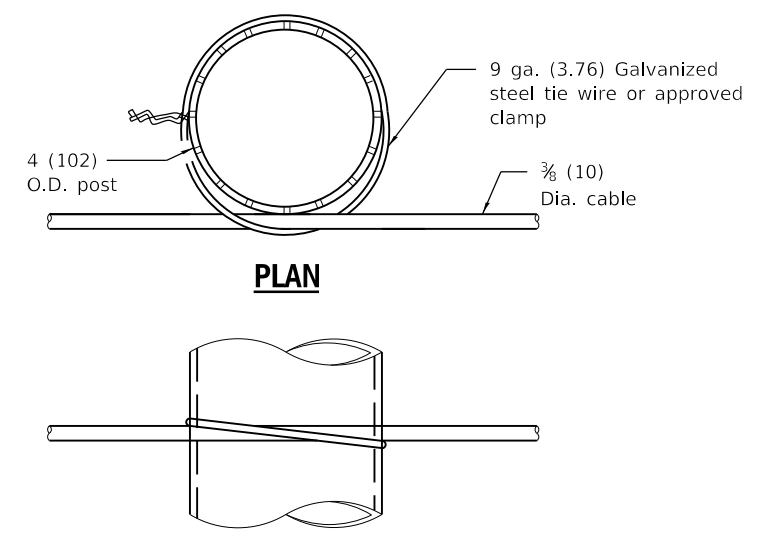
DATE	REVISIONS
1-1-09	Switched units to English (metric). Revised General Notes.
1-1-97	Renum. Standard 2365-6.

**SIGHT SCREEN CHAIN LINK FENCE**  
 (Sheet 1 of 2)  
**STANDARD 640001-01**



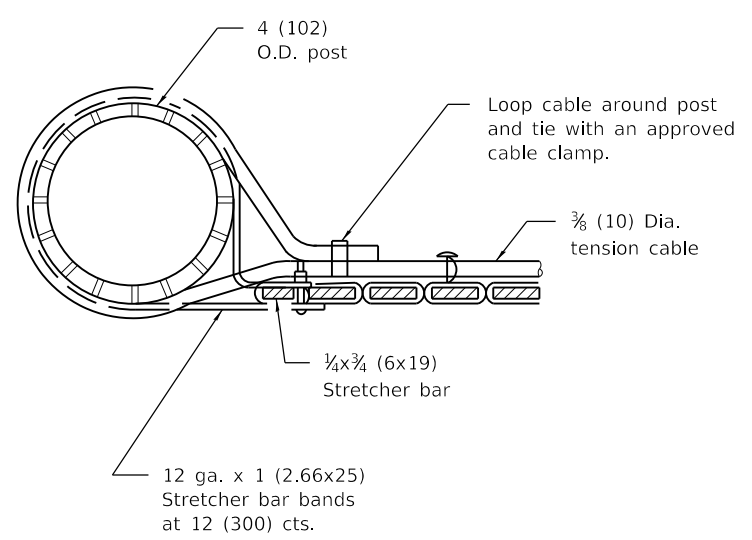
**DETAIL B**

(Showing typical method of attaching middle brace rails to posts.)



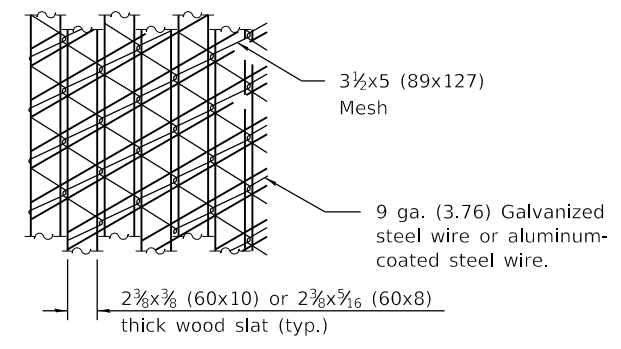
**PLAN**

**DETAIL A**



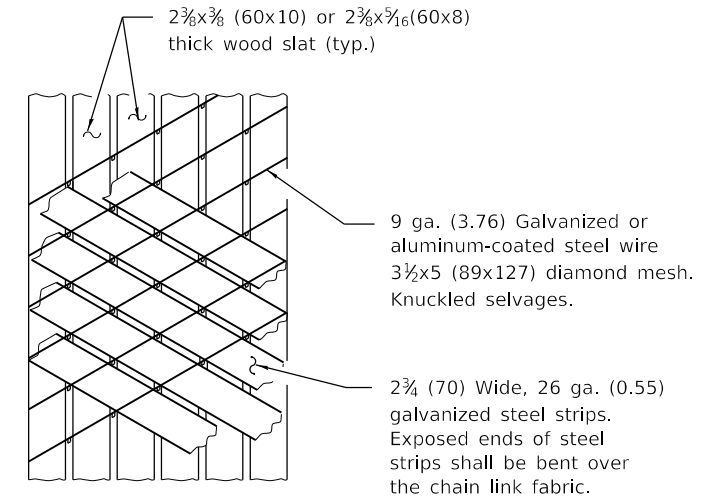
**SECTION A-A**

(Showing method of fastening bottom tension cable and fence fabric to pull posts.)



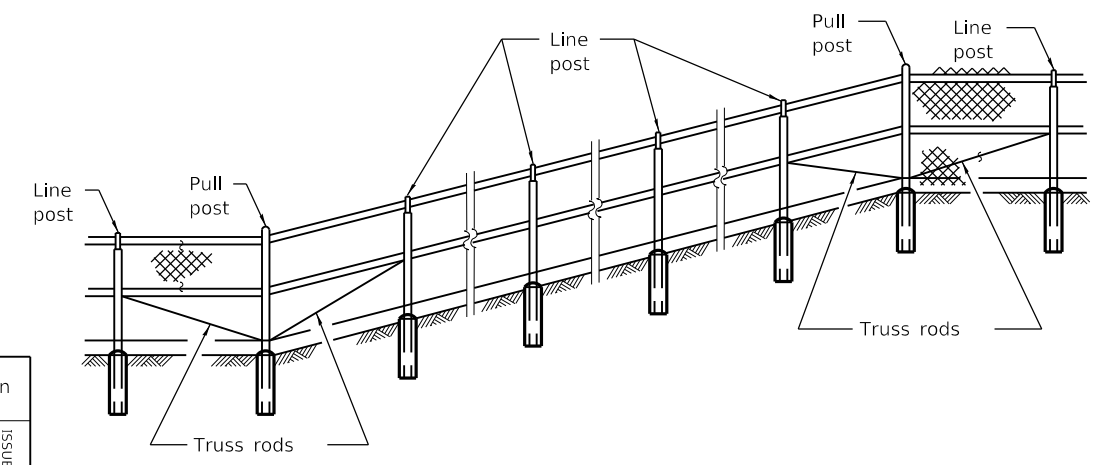
**DETAIL OF FABRIC**

(Looking from highway)

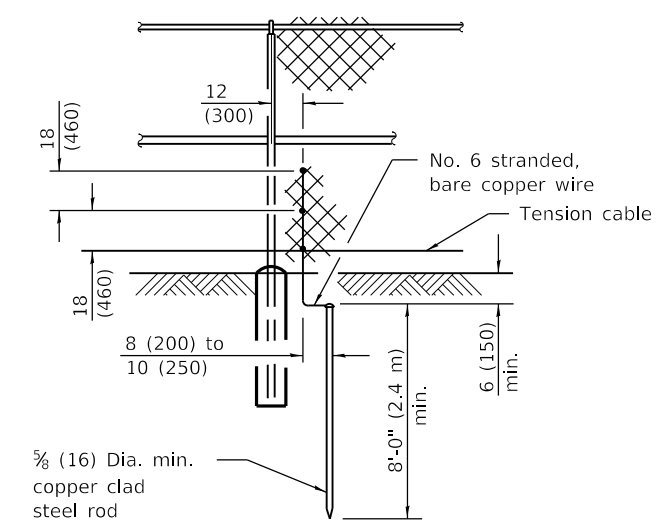


**DETAIL C**

(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

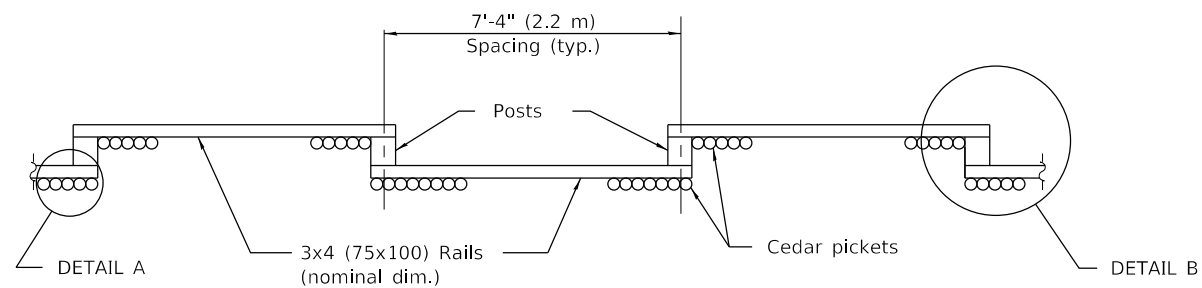
APPROVED January 1, 2009  
*Lee E. Han*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

**SIGHT SCREEN CHAIN LINK FENCE**

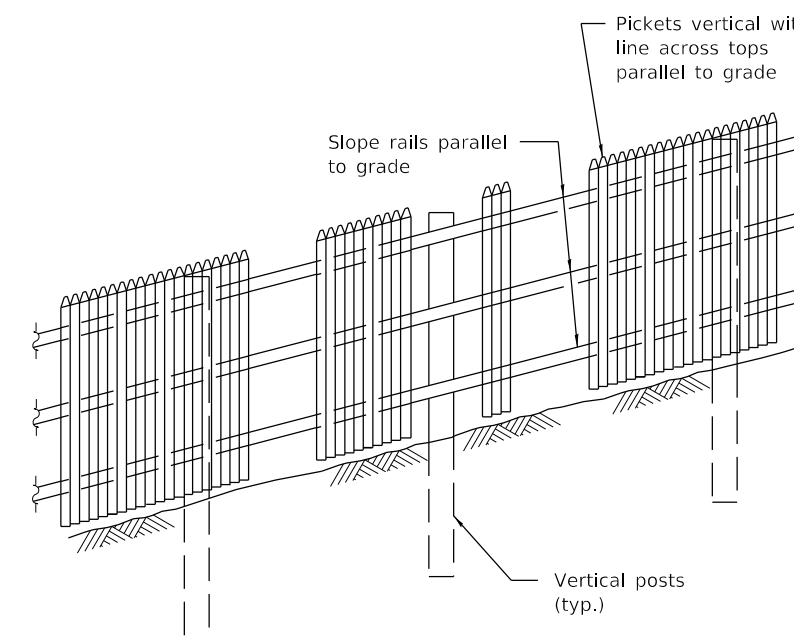
(Sheet 2 of 2)

**STANDARD 640001-01**

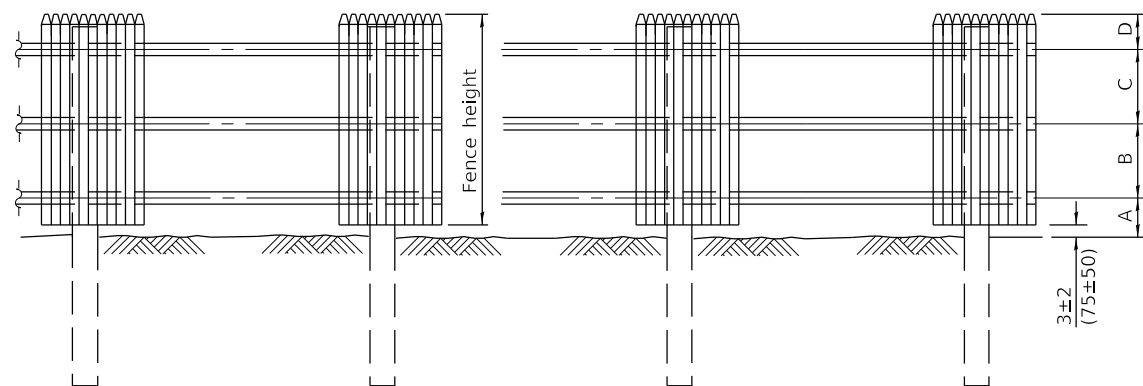


**PLAN**  
(Facing highway)

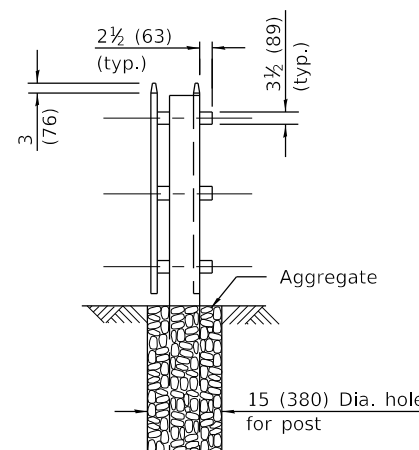
	FENCE HEIGHT	
	6'-0" (1.8 m)	8'-0" (2.4 m)
Post Size (nominal dim.)	6x8 (150x200)	8x8 (200x200)
Post Length	10'-0" (3.0 m)	14'-0" (4.3 m)
Post Embedment	4'-0" (1.2 m)	6'-0" (1.8 m)
A	15 (380)	18 (460)
B	24 (600)	33 (870)
C	24 (600)	33 (870)
D	12 (300)	15 (380)



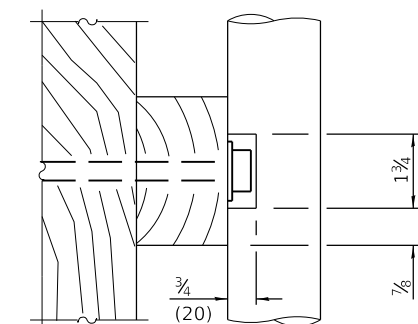
**ELEVATION**  
(Showing treatment with sloping ground)



**ELEVATION**

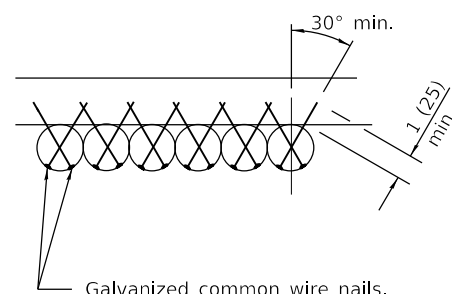


**SEC. A-A**



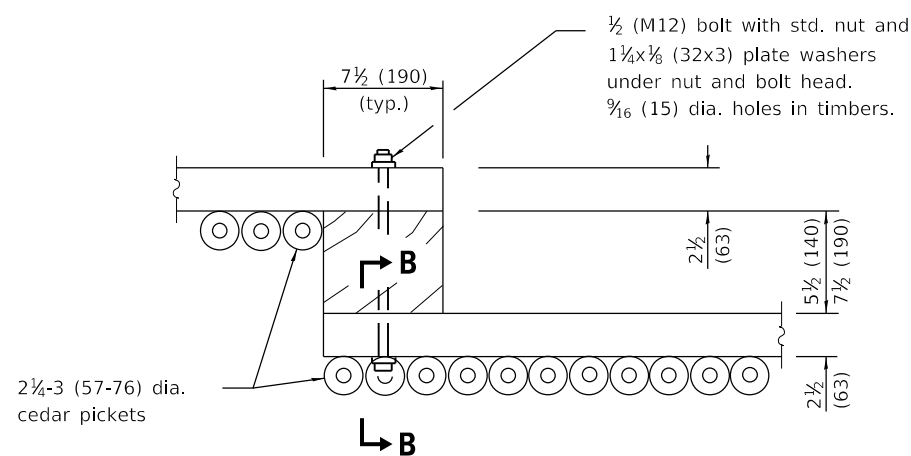
**SECTION B-B**

(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.

DATE	REVISIONS
1-1-09	Switched units to English (metric). Changed Sec. B-B to Detail B.
1-1-97	Renum. Standard 2367-3. Deleted DN Symbol.

**SIGHT SCREEN  
CEDAR STOCKADE FENCE  
TYPE S**

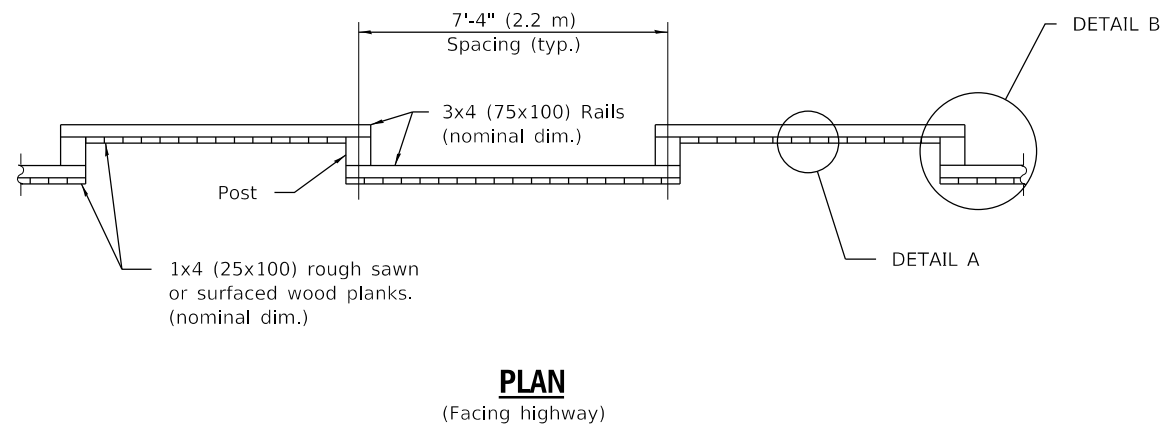
**STANDARD 641001-01**

Illinois Department of Transportation

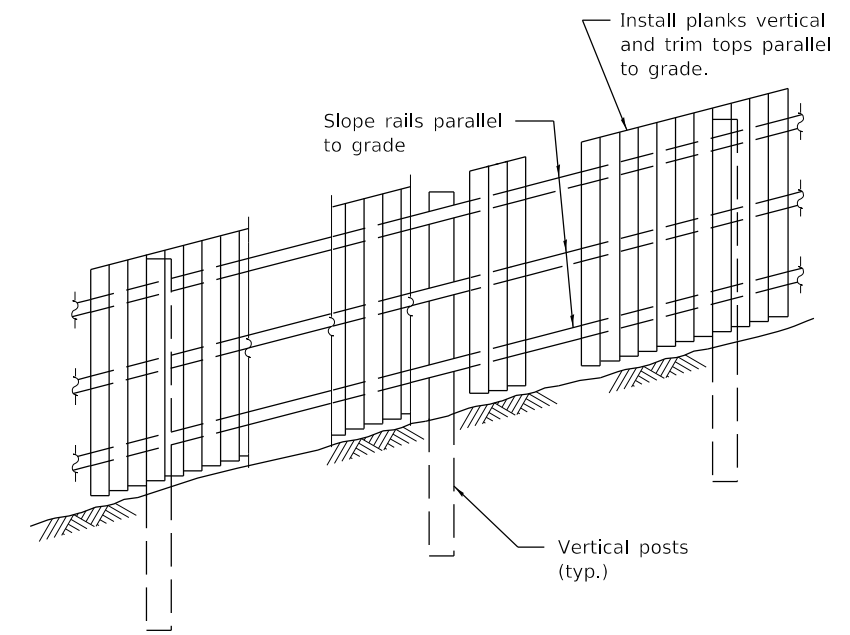
APPROVED January 1, 2009  
*Ralph E. Anderson*  
ENGINEER OF BRIDGES AND STRUCTURES

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

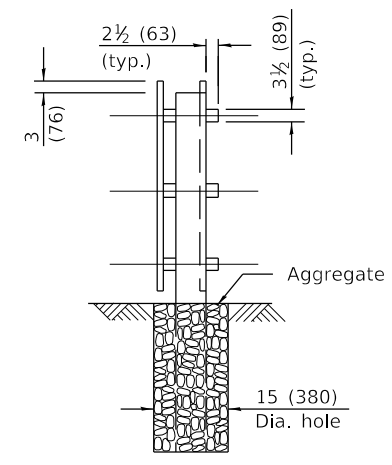
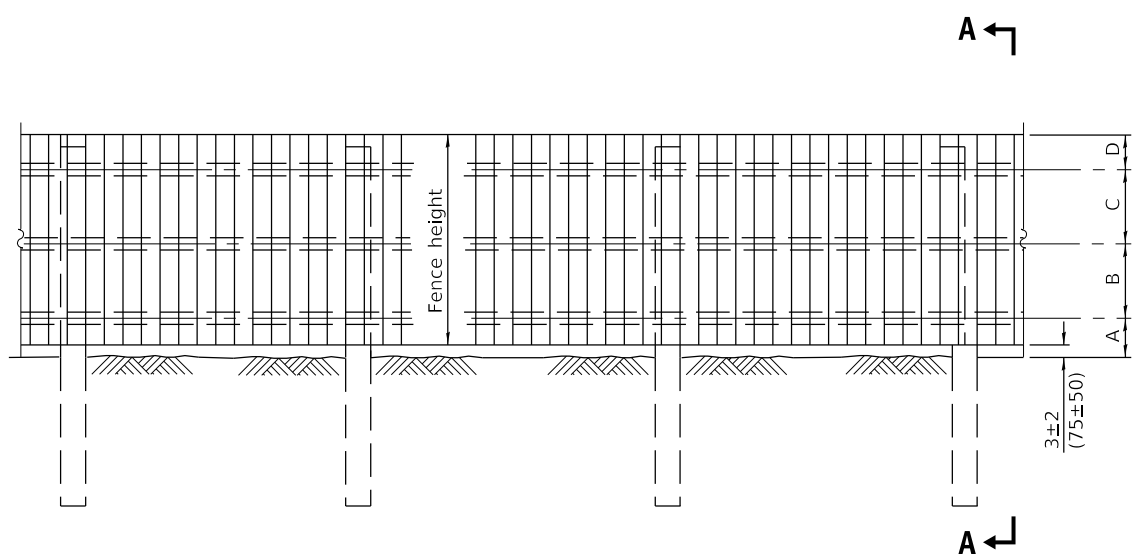
ISSUED 1-1-97



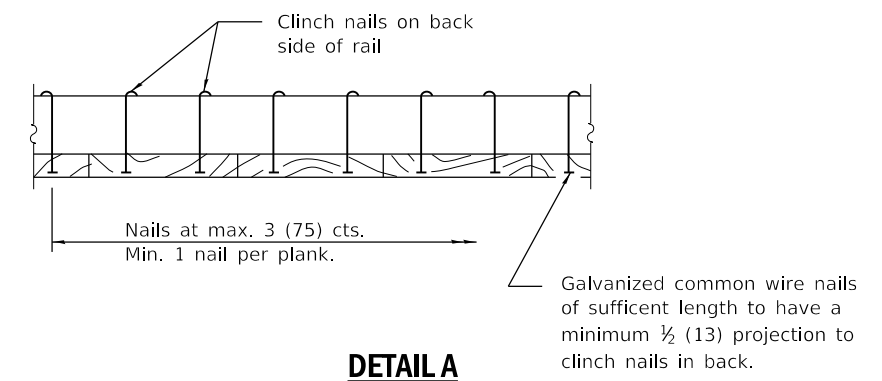
	FENCE HEIGHT	
	6'-0" (1.8 m)	8'-0" (2.4 m)
Post Size (nominal dim.)	6x8 (150x200)	8x8 (200x200)
Post Length	10'-0" (3.0 m)	14'-0" (4.3 m)
Post Embedment	4'-0" (1.2 m)	6'-0" (1.8 m)
A	15 (380)	18 (460)
B	24 (600)	33 (870)
C	24 (600)	33 (870)
D	12 (300)	15 (380)



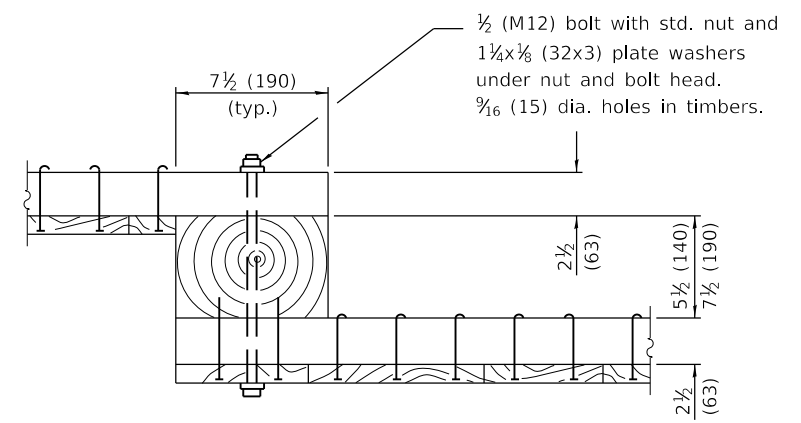
**ELEVATION**  
(Showing treatment with sloping ground)



**SEC. A-A**



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



**DETAIL B**  
(Showing typical panel to post connection details)

**GENERAL NOTES**

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

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

DATE	REVISIONS
1-1-09	Switched units to English (metric). Changed Section B-B to Detail B.
1-1-97	Renum. Standard 2367-3. Deleted DN Symbol.

**SIGHT SCREEN  
WOOD PLANK FENCE  
TYPE P**

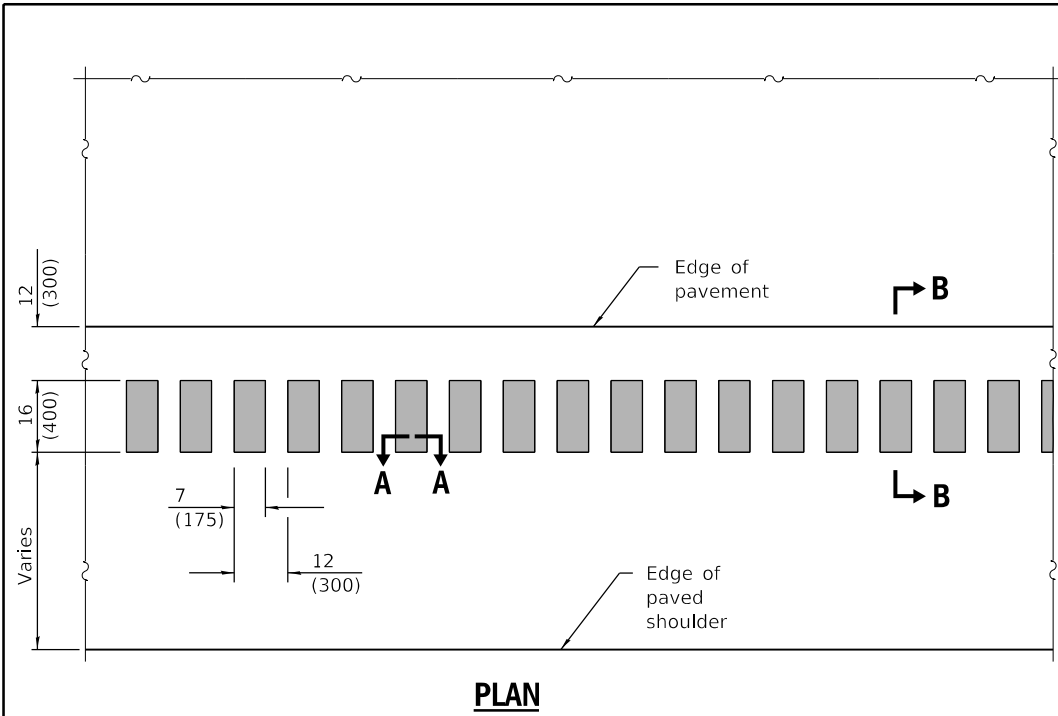
**STANDARD 641006-01**

Illinois Department of Transportation

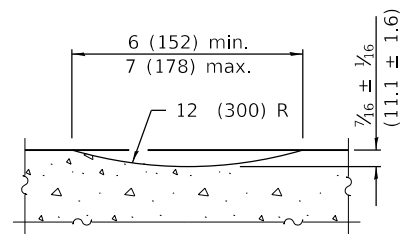
APPROVED January 1, 2009  
*Ralph E. Anderson*  
ENGINEER OF BRIDGES AND STRUCTURES

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

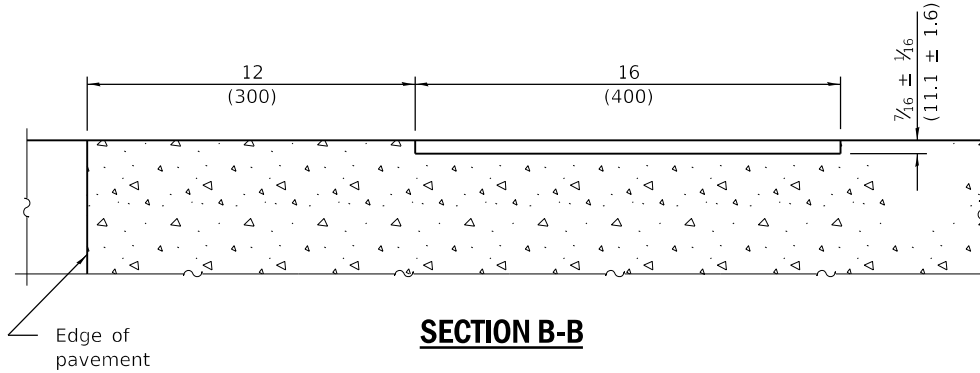
ISSUED 1-1-97



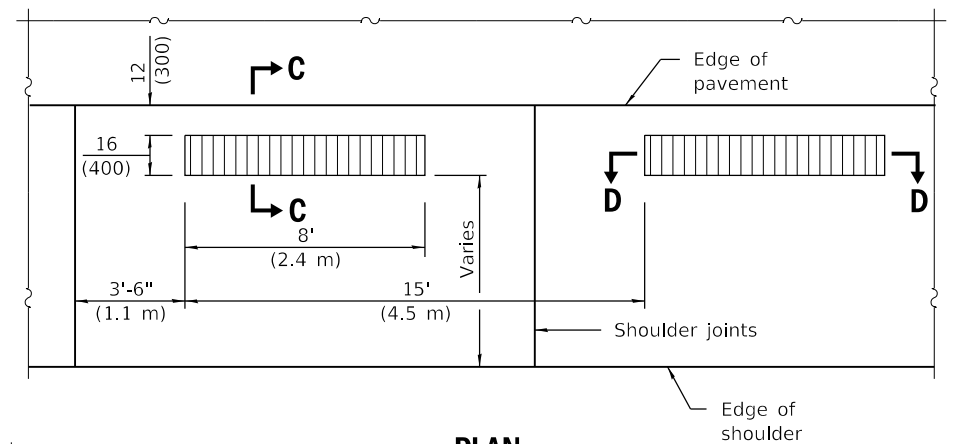
**PLAN**



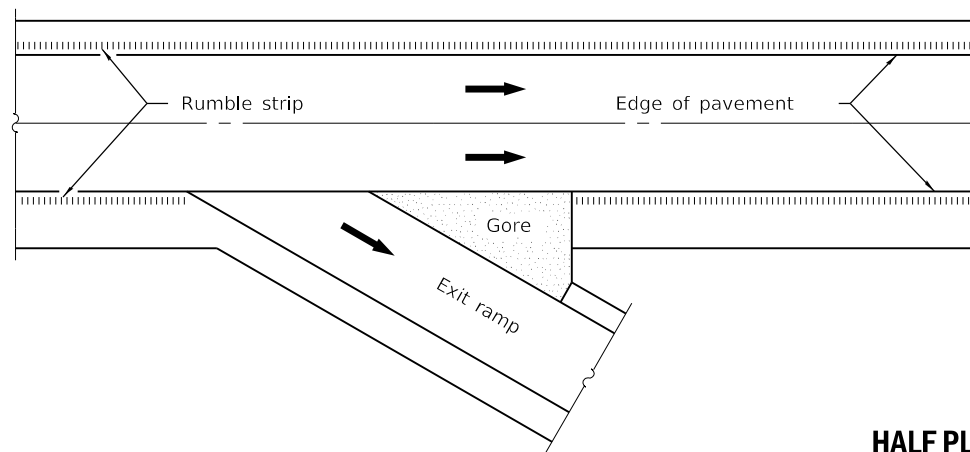
**SECTION A-A**



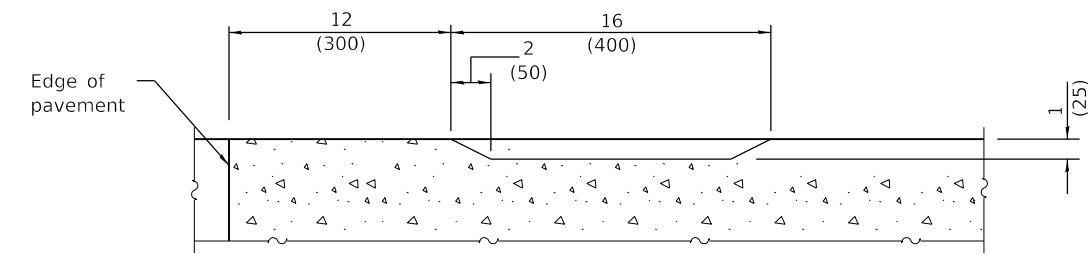
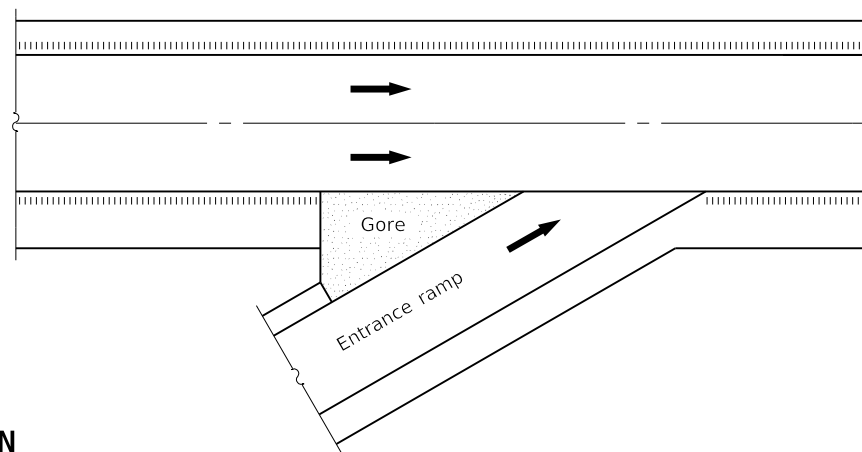
**SECTION B-B**



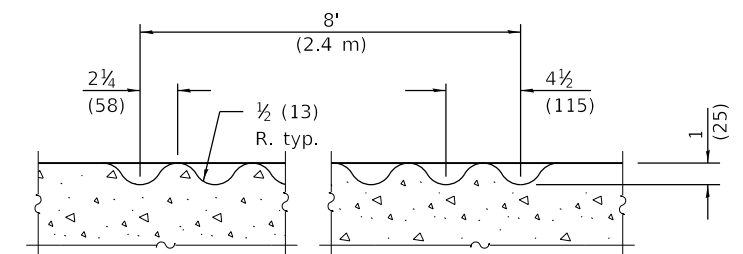
**PLAN**  
(Formed Alternate for PCC Shoulders)



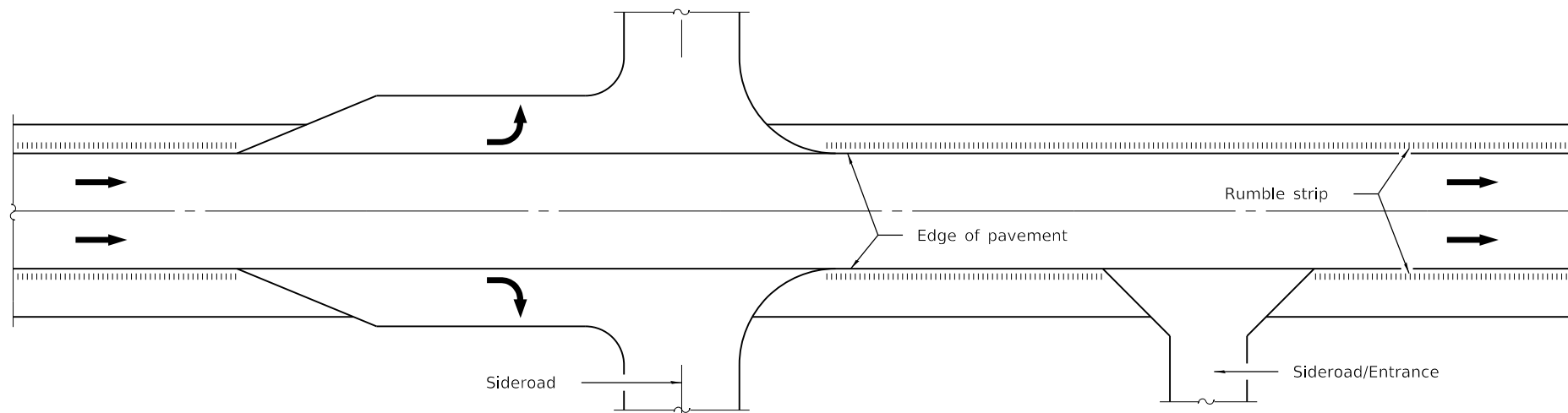
**HALF PLAN**  
**TYPICAL APPLICATION AT AN INTERCHANGE**



**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.

DATE	REVISIONS
1-1-12	Changed formed rumble strip to 16 (400) wide. Rev'd milled strip. Renamed standard.
1-1-09	Switched units to English (metric).

**SHOULDER RUMBLE STRIPS, 16 in.**

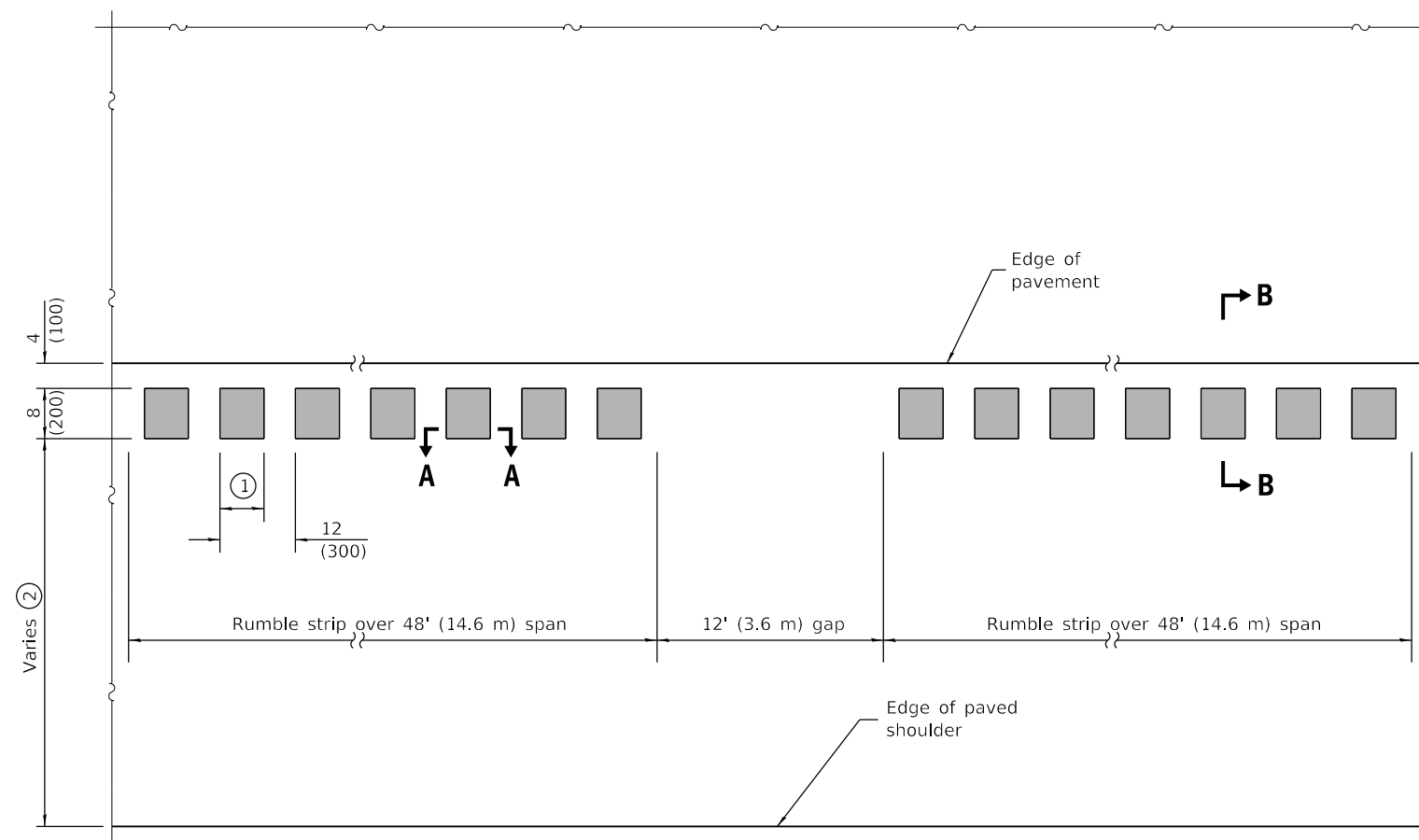
**STANDARD 642001-02**

Illinois Department of Transportation

PASSED January 1, 2012  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

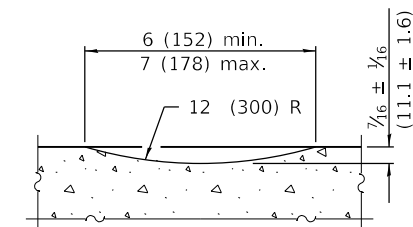
APPROVED January 1, 2012  
*Scott Schick*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-03

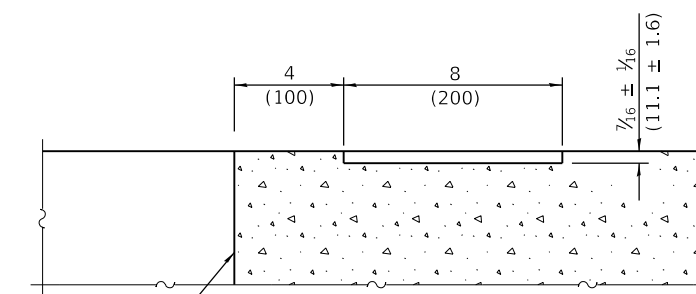


**PLAN**

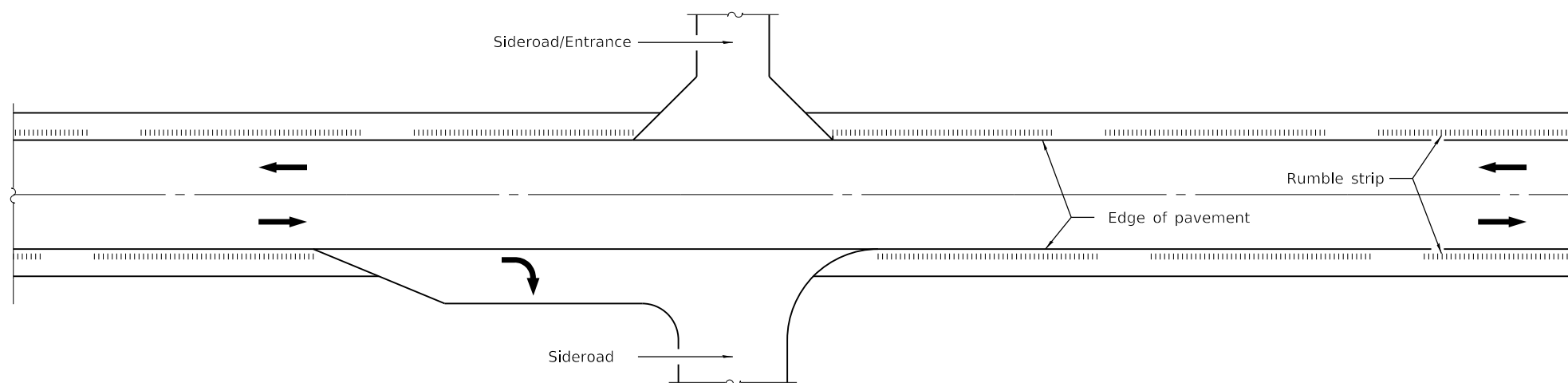
- ① See Section A-A.
- ② 4' (1.2 m) preferred, 3' (900) minimum where the paved shoulder is considered a bicycle accommodation.



**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.

DATE	REVISIONS
1-1-21	Added minimum width of paved shoulder for bicycle accommodations.
1-1-12	New standard.

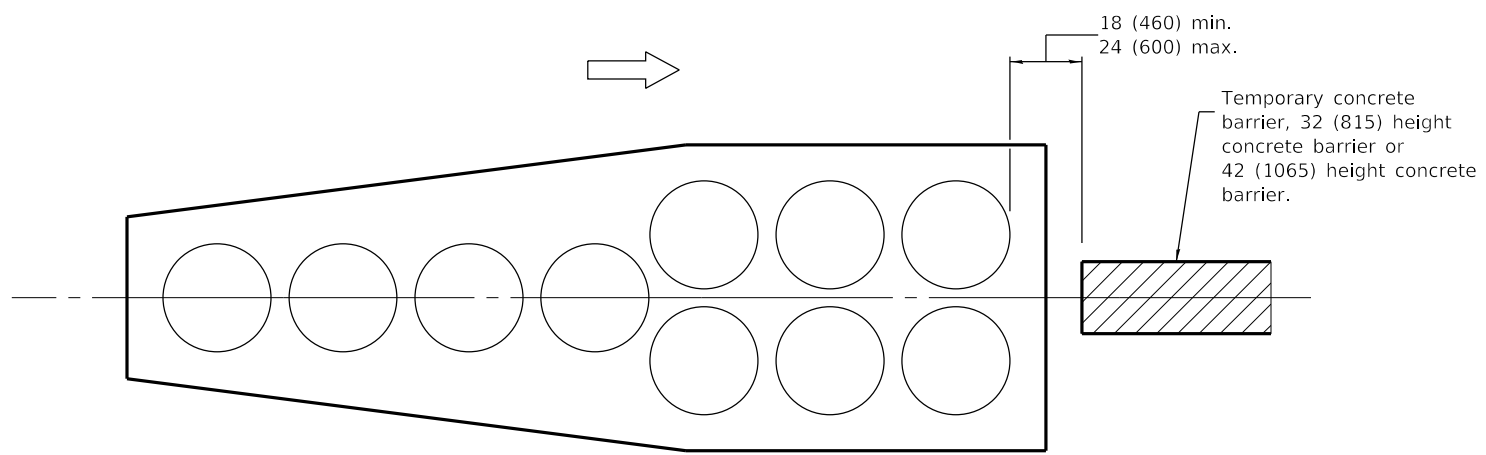
**SHOULDER RUMBLE STRIPS, 8 in.**

**STANDARD 642006-01**

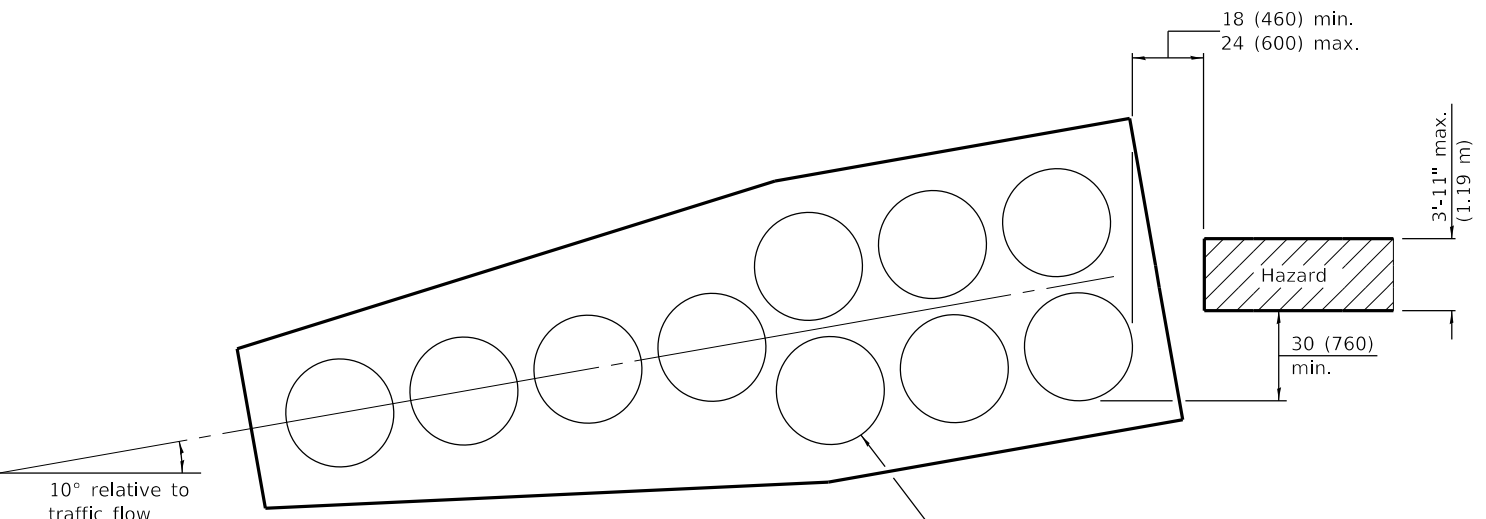
Illinois Department of Transportation  
 PASSED January 1, 2021  
*Michael Bond*  
 ENGINEER OF POLICY AND PROCEDURES  
 APPROVED January 1, 2021  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

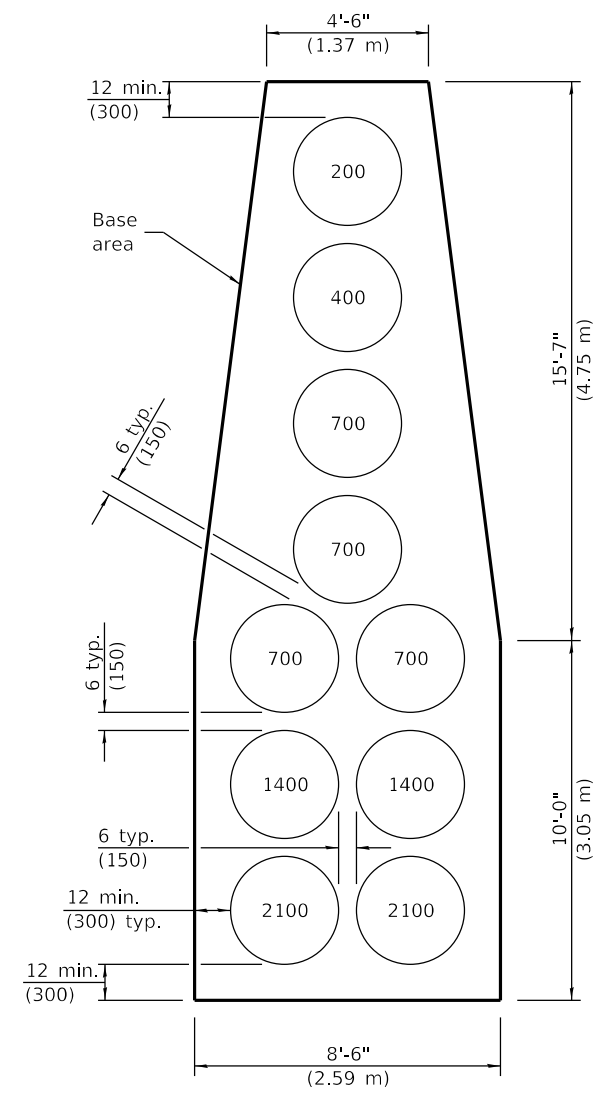




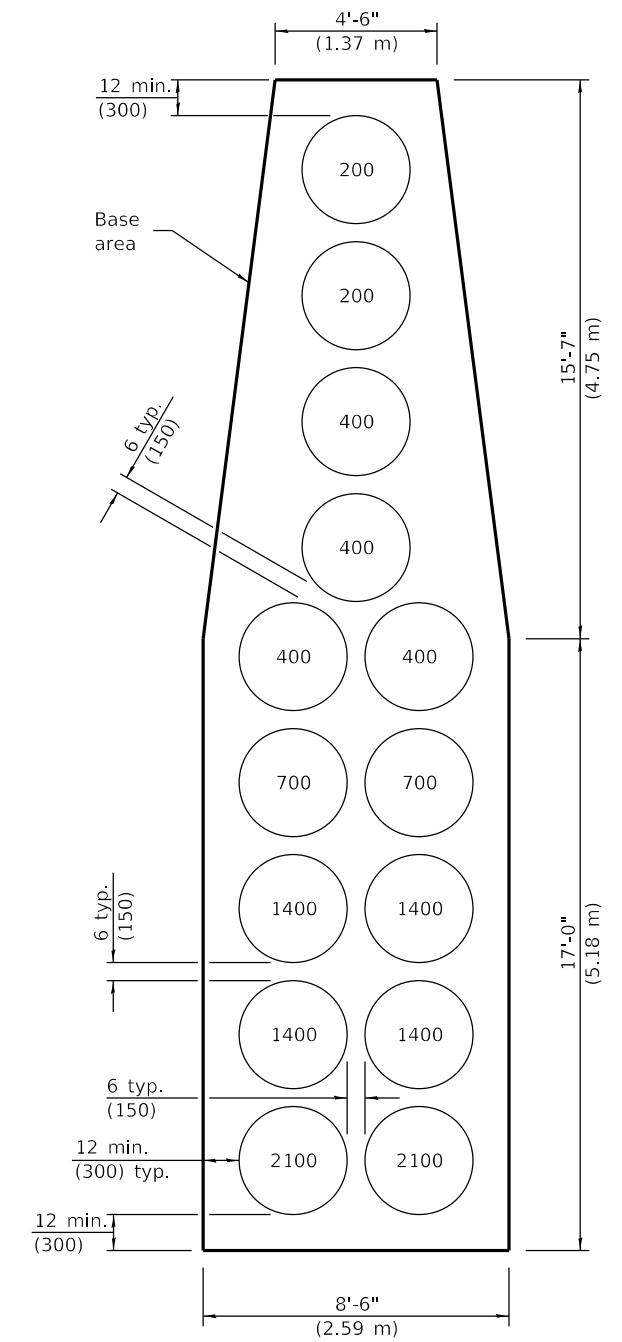
**GORE INSTALLATION**  
 (Traffic approaches on both sides)  
 (Test Level 2 array shown)



**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.

Illinois Department of Transportation

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

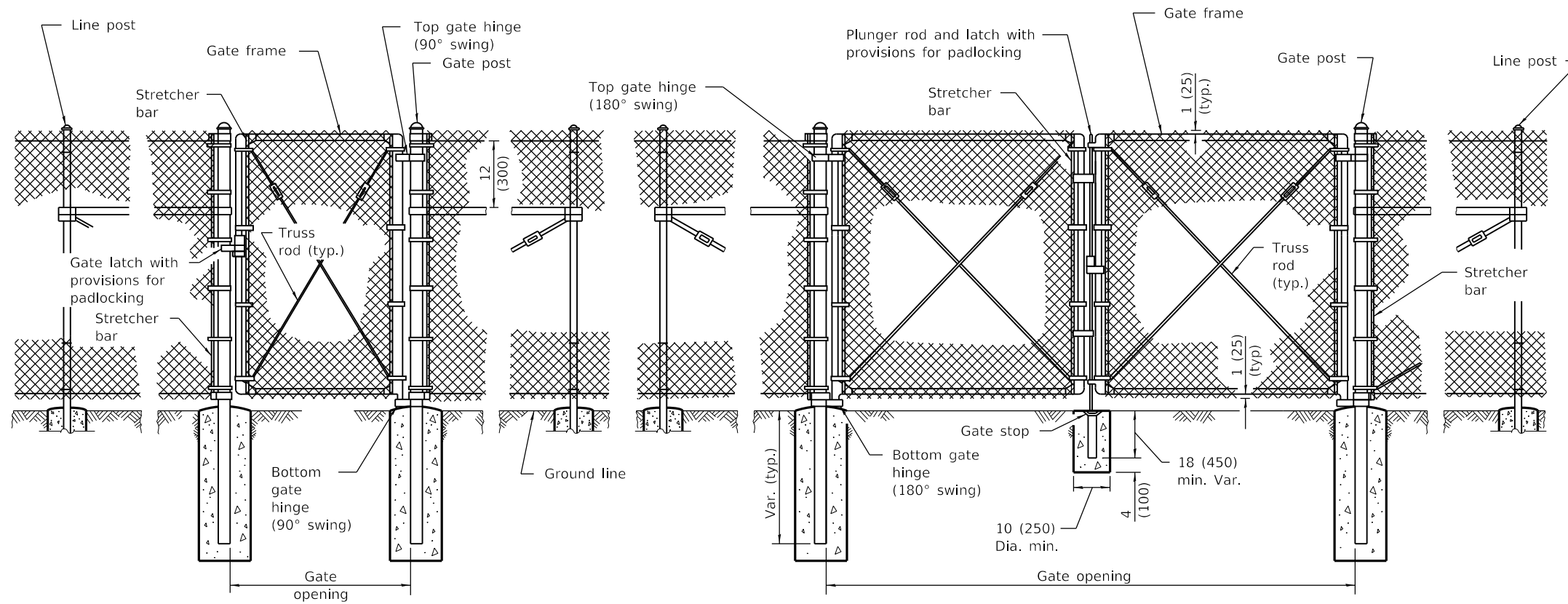
APPROVED January 1, 2014  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

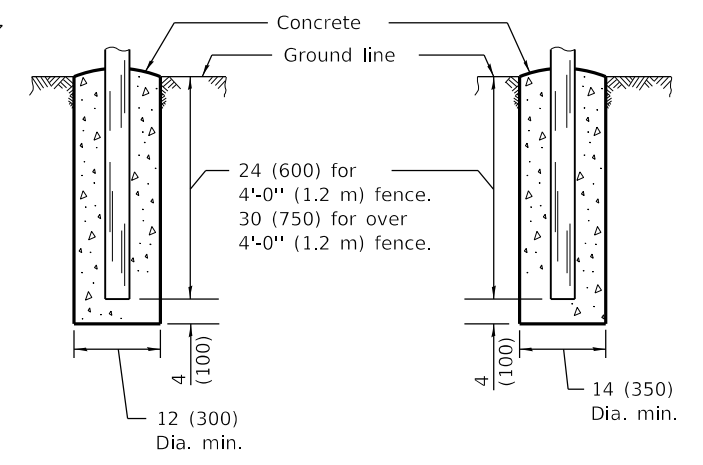
**SAND MODULE  
 IMPACT ATTENUATORS**

**STANDARD 643001-02**



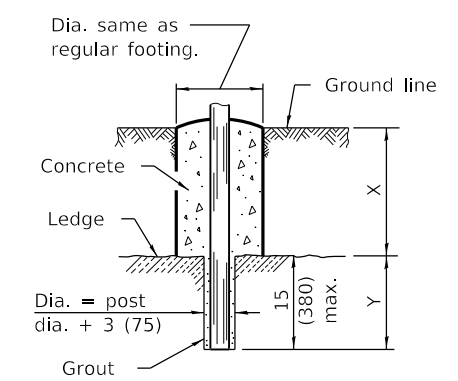
**PEDESTRIAN GATE ARRANGEMENT**

**VEHICLE GATE ARRANGEMENT**

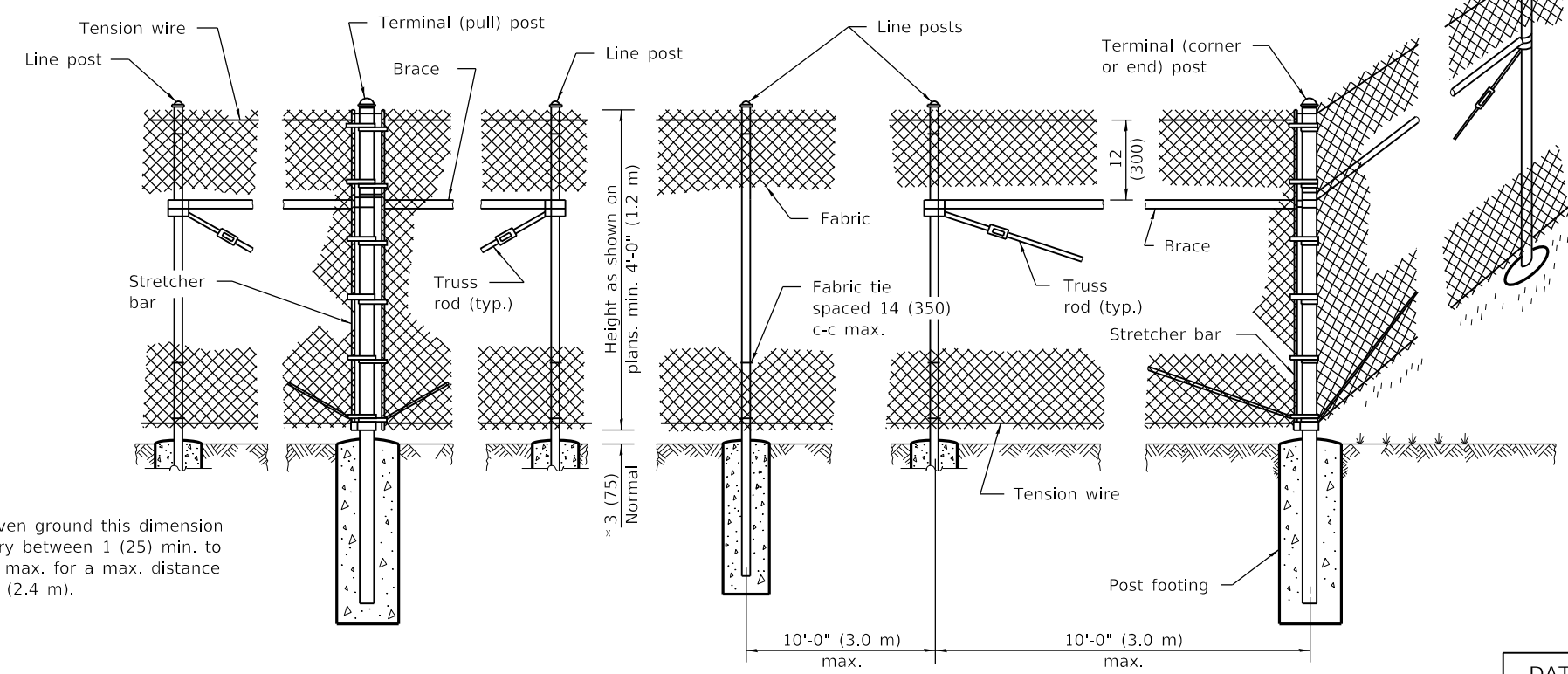


**FOOTING FOR LINE POST**

**FOOTING FOR GATE & TERMINAL POST**



**FOOTING FOR POST IN ROCK LEDGE**



**PULL POST ARRANGEMENT**

**LINE POST ARRANGEMENT**

**CORNER OR END POST ARRANGEMENT**

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

**GENERAL NOTES**  
 Pull posts shall be placed at locations determined by the Engineer. They shall be placed at 660' (200 m) intervals between posts to which the ends of the fabric are clamped or midway between such posts when the distance is less than 1320' (400 m) and greater than 660' (200 m).  
 X + Y shall not exceed 24 (600), 30 (750), or 36 (900), as applicable. When X is 0 - 9 (0 - 225), 15 (380), or 21 (525), then Y = 15 (375) and the post shall be shortened as required. When X exceeds 9 (225), 15 (380), or 21 (525), then Y shall be decreased correspondingly.

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

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

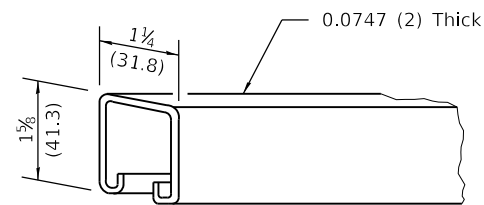
ISSUED 1-1-97

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

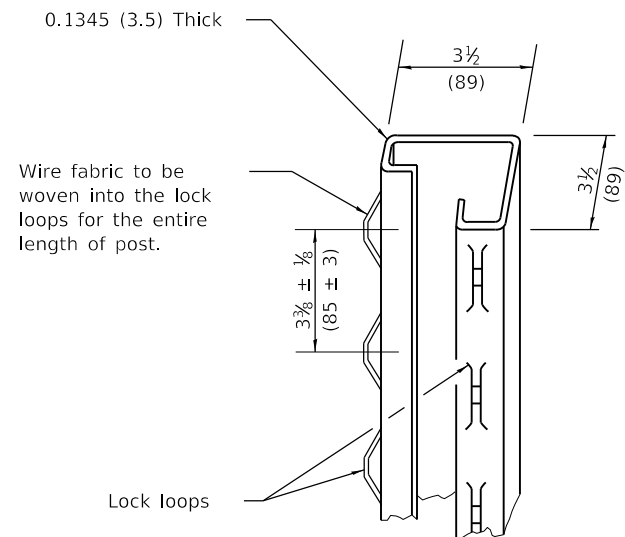
**CHAIN LINK FENCE**

(Sheet 1 of 3)

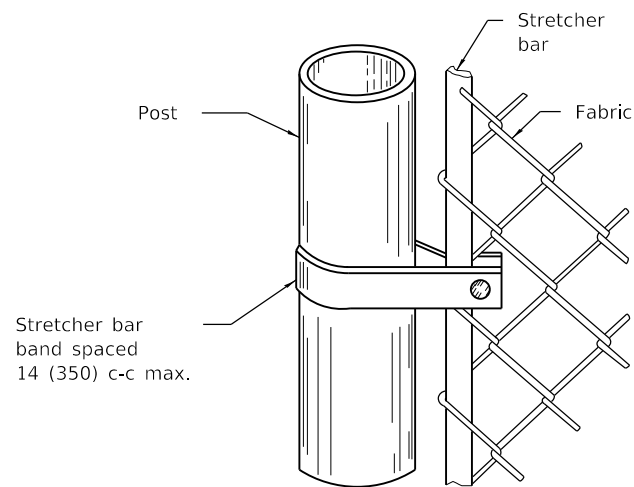
**STANDARD 664001-02**



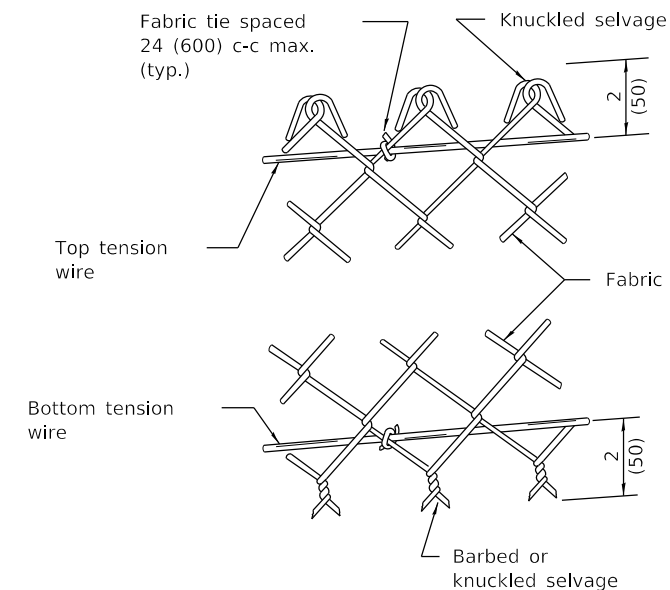
**ROLL FORMED SECTION OF BRACE**



**ROLL FORMED SECTION OF TERMINAL & GATE POST**



**METHOD OF FASTENING STRETCHER BAR TO POST**



**METHOD OF TYING FABRIC TO TENSION WIRES**

LINE POST	
Section	lbs./ft. (kg/m)
Pipe Type A 1.90 (48.3) O.D.	2.72 (4.05)
Pipe Type B 1.90 (48.3) O.D.	2.28 (3.39)
Pipe Type C 1.90 (48.3) O.D.	2.26 (3.36)
H 1.875x1.625 (47.6x41.3)	2.72 (4.05)
□	1.60 (2.38)
I	2.30 (3.42)

TERMINAL POST	
Section	lbs./ft. (kg/m)
Pipe Type A 2.375 (60.3) O.D.	3.65 (5.43)
Pipe Type B 2.375 (60.3) O.D.	3.11 (4.63)
Pipe Type C 2.375 (60.3) O.D.	3.09 (4.60)
Roll Formed 3 1/2 x 3 1/2 (89.0 x 89.0)	See detail
Sq. Tubing 2 1/2 x 2 1/2 (63.5 x 63.5)	4.32 (6.43)

HORIZONTAL BRACES	
Section	lbs./ft. (kg/m)
Pipe Type A 1.66 (42.2) O.D.	2.27 (3.38)
Pipe Type B 1.66 (42.2) O.D.	1.83 (2.72)
Pipe Type C 1.66 (42.2) O.D.	1.82 (2.71)
H 1.31x1.5 (33.3x38.1)	2.25 (3.35)
Roll Formed 1 3/8 x 1 1/4 (41.3 x 31.8)	See detail

GATE FRAMES	
Section	lbs./ft. (kg/m)
Pipe Type A 1.66 (42.2) O.D.	2.27 (3.38)
Pipe Type B 1.66 (42.2) O.D.	1.83 (2.72)
Pipe Type C 1.66 (42.2) O.D.	1.82 (2.71)

GATE POSTS *							
Gate Opening * ft. (m)		Pipe Type A		Sq. Tubing		Pipe Type B	
Single	Double	Size (O.D.)	lbs./ft. (kg/m)	Size	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)	2 1/2 (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 3 1/2 x 3 1/2 (89.0 x 89.0) roll formed section as detailed may be used as gate posts for single gate up to 6' (1.8 m) and double gate up to 12' (3.6 m).

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

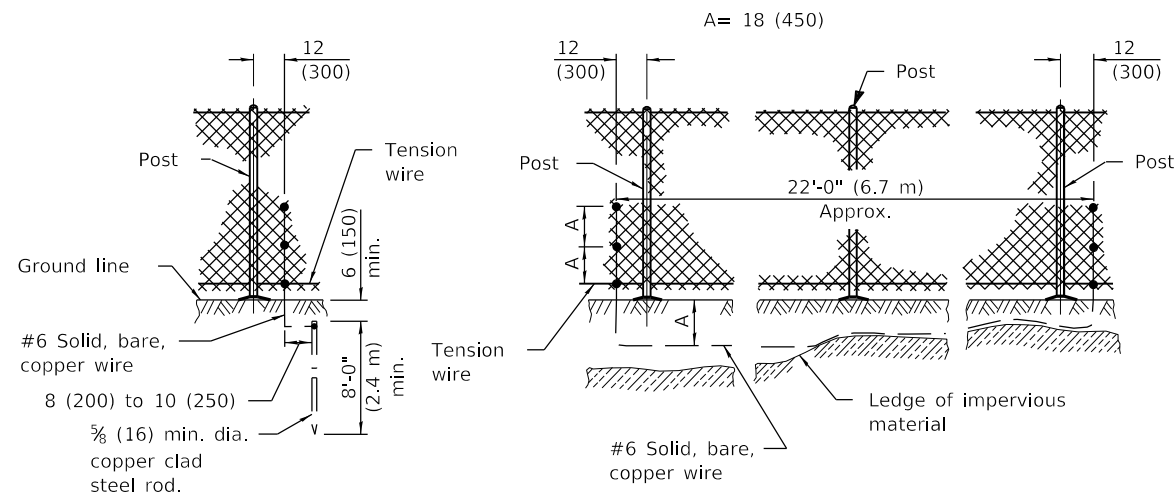
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

**CHAIN LINK FENCE**

(Sheet 2 of 3)

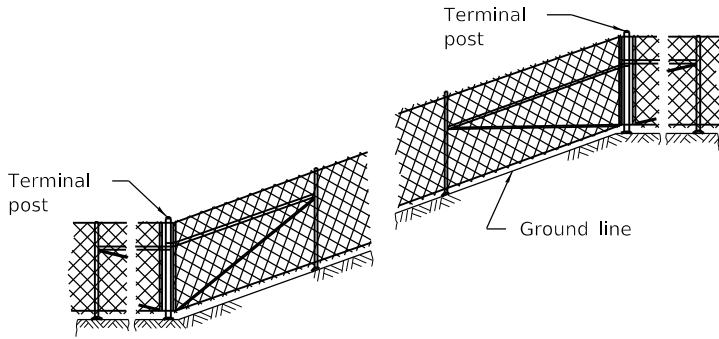
**STANDARD 664001-02**



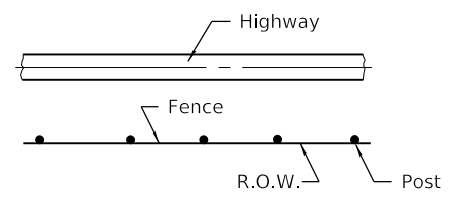
**STANDARD GROUND**

**COUNTERPOISE GROUND (ALTERNATE)**

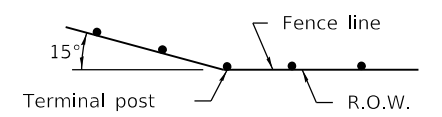
**PROTECTIVE ELECTRICAL GROUNDS**



**INSTALLATION ON SLOPES**



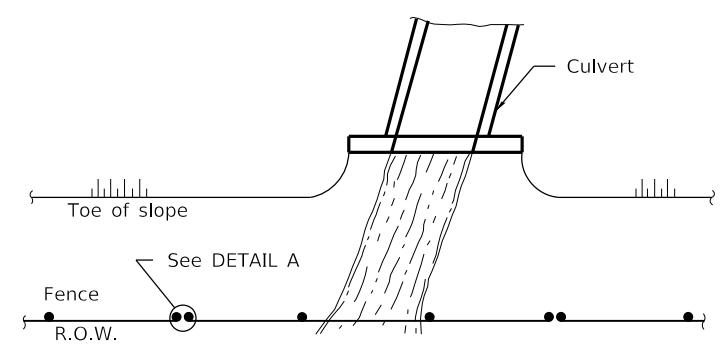
**PLAN**



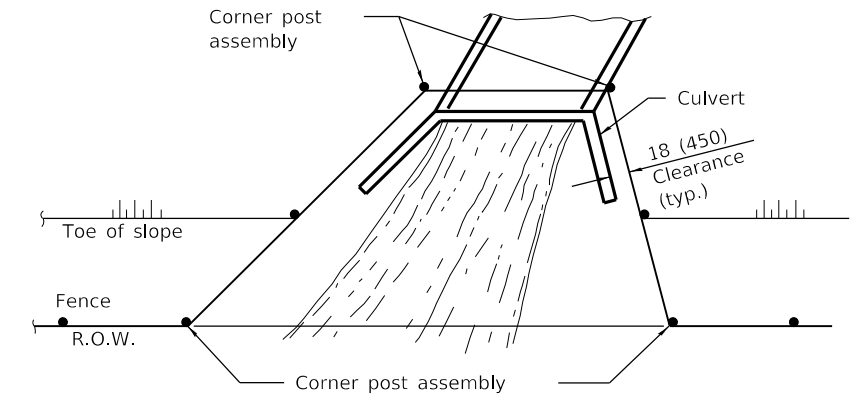
When fence line has a change in direction of 15° or more, a terminal post shall be placed as shown above.

Where angle is less than 15° and existing conditions require a terminal post, they shall be placed as directed by the Engineer.

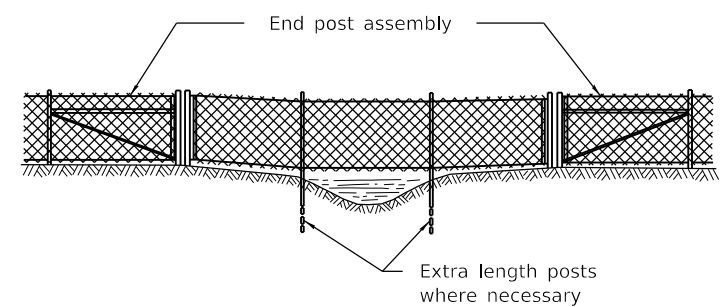
**INSTALLATION AT CORNERS**



**PLAN AT STREAM CROSSING**

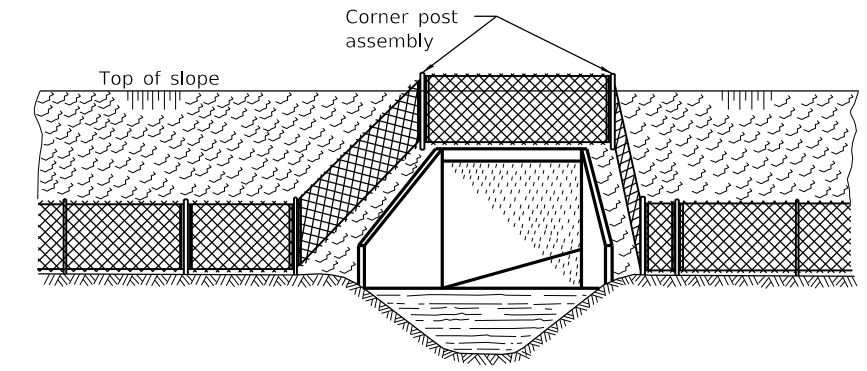


**PLAN AT HEADWALL**



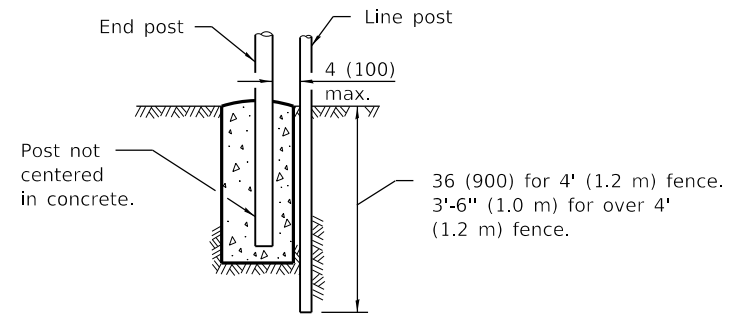
**ELEVATION INSTALLATION OVER STREAM**

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 AROUND HEADWALL**

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.



**DETAIL A**

Illinois Department of Transportation

PASSED January 1, 2009

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APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

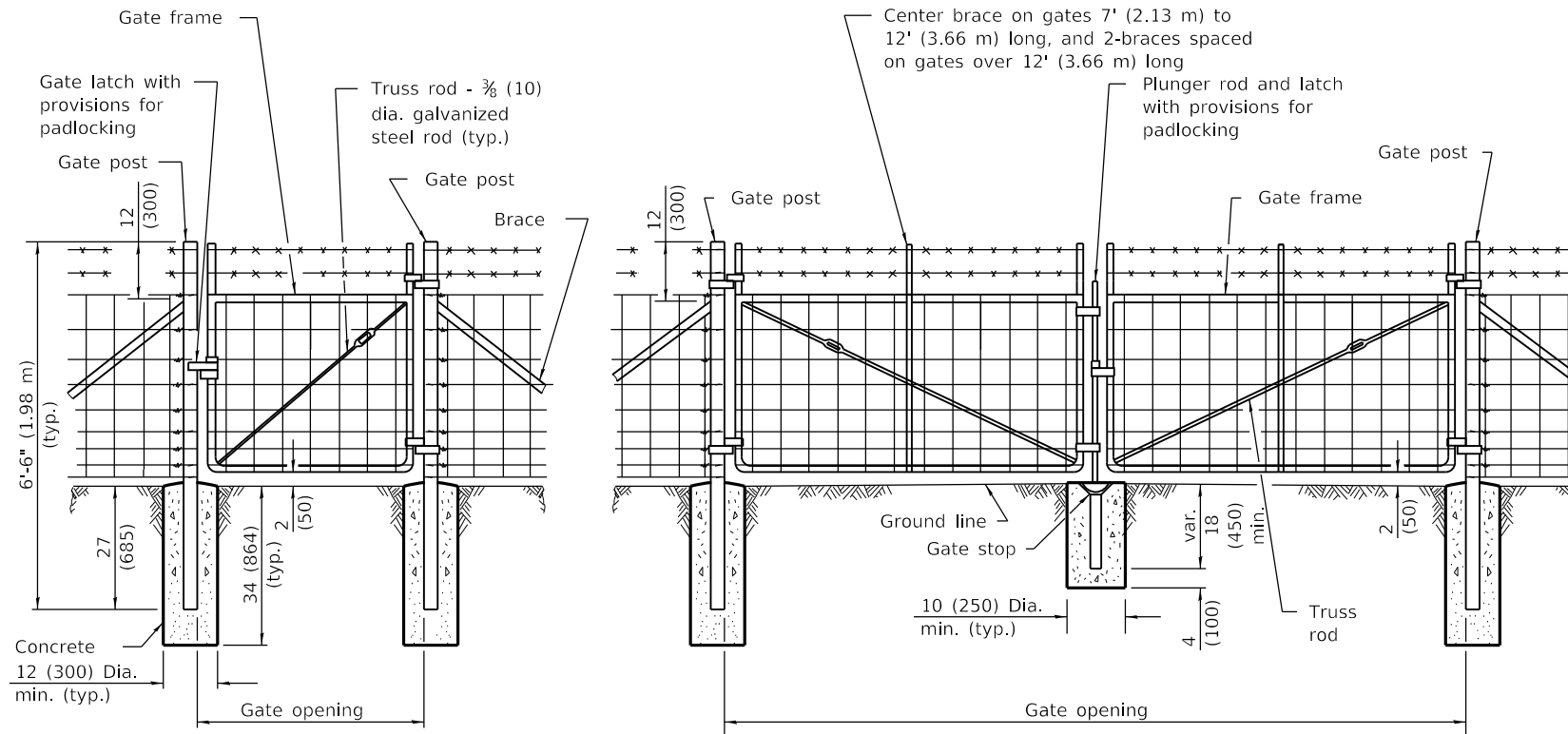
ISSUED 1-1-97

**CHAIN LINK FENCE**

(Sheet 3 of 3)

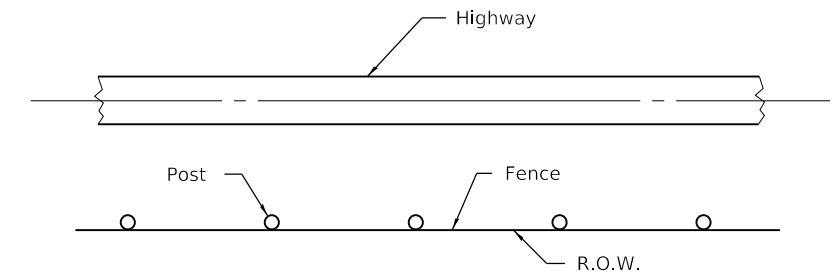
**STANDARD 664001-02**

**FENCE USING METAL POSTS**



**SINGLE GATE**

**DOUBLE GATE**



**PLAN**

**NOTES**

Barbed wires shall be tied to each post. Top and bottom wires of woven fence shall be tied to each post. Tie every other wire between, alternating on successive posts.

Barbed wires and line wires of woven fence shall be fastened to the corner, end, pull, and gate posts by wrapping the wires around the post and tying back on itself with not less than 3 twists tightly wrapped.

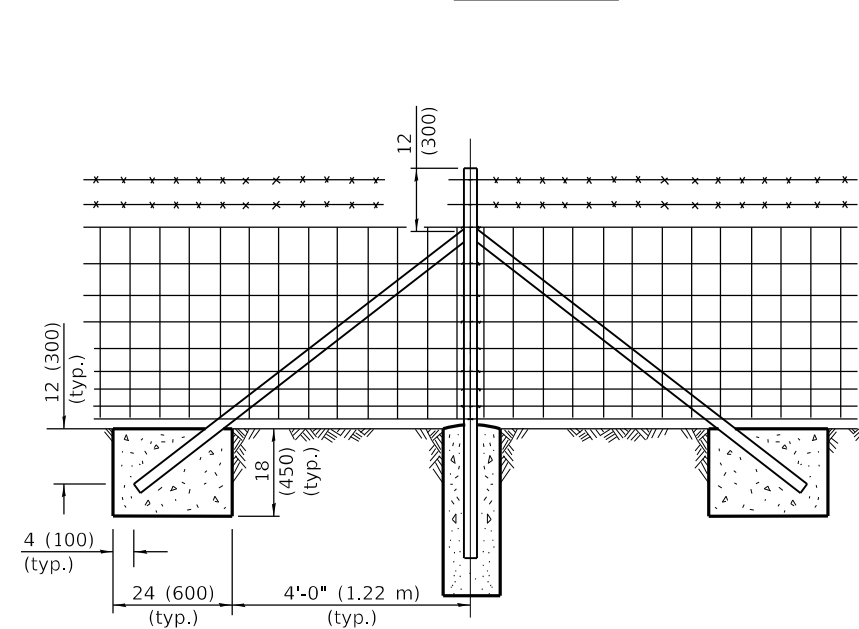
**GENERAL NOTES**

Pull posts shall be placed at the locations determined by the Engineer. They shall be placed at 660' (200 m) intervals between posts to which the ends of the fabric and barbed wires are fastened or midway between such posts when the distance is less than 1320' (400 m) and greater than 660' (200 m).

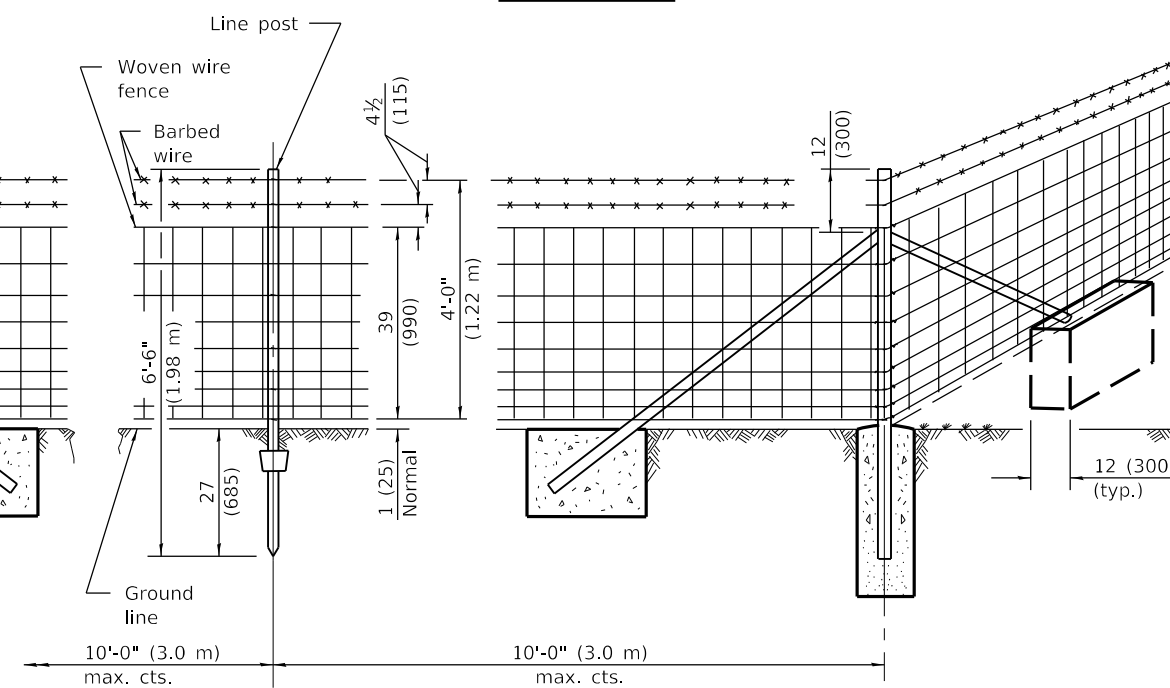
Bracing for gate posts shall be the same type used for end posts.

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

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



**PULL POST**



**LINE POST**

**CORNER OR END POST**

Illinois Department of Transportation

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APPROVED January 1, 2009

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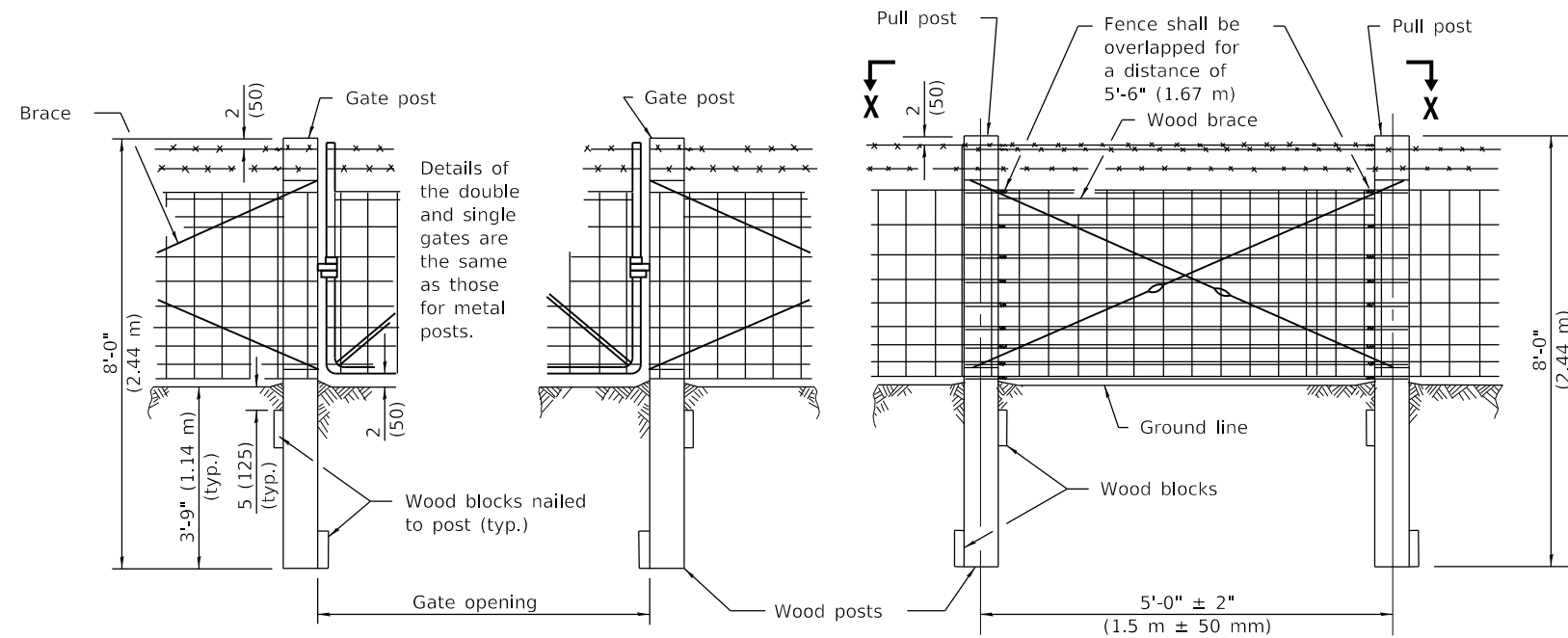
ISSUED 1-1-09

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-02	Corrected dimensions on sheet 3 and 4.

**WOVEN WIRE FENCE**

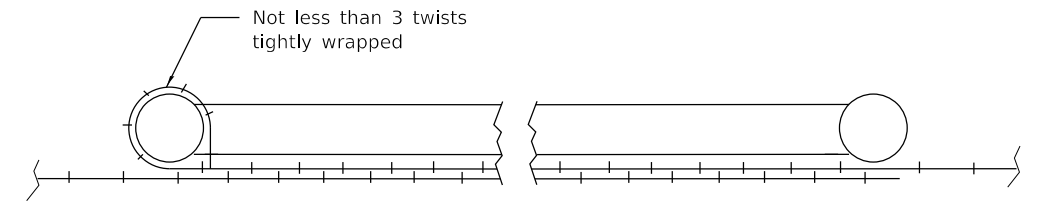
(Sheet 1 of 4)

**STANDARD 665001-02**

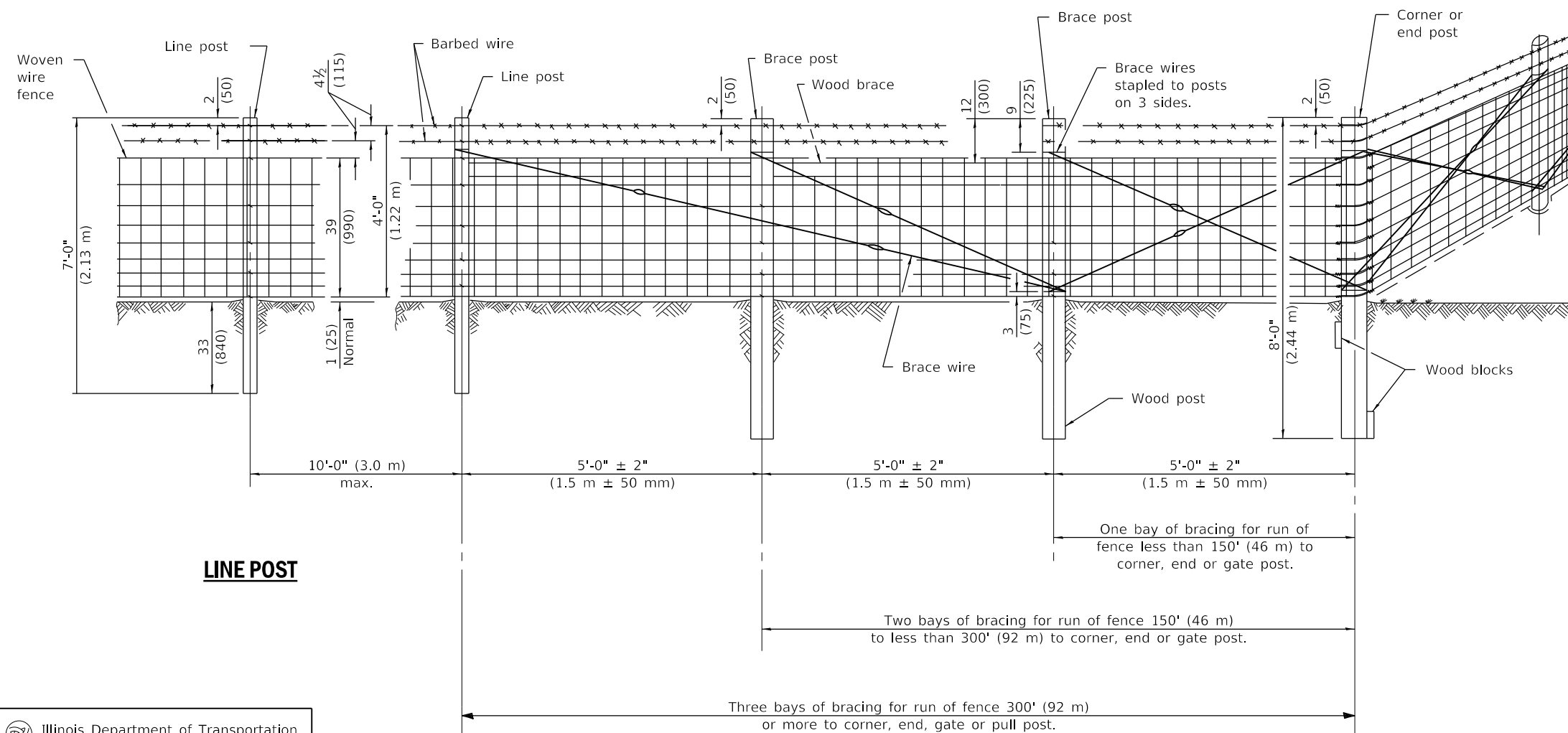


**SINGLE OR DOUBLE GATE**

**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

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

**WOVEN WIRE FENCE**

(Sheet 2 of 4)

**STANDARD 665001-02**

**METAL ITEMS**

GATE FRAMES		CORNER, END or PULL POSTS		LINE POSTS		BRACES	
Section	lbs./ft. (kg/m)	Section	lbs./ft. (kg/m)	Section	lbs./ft. (kg/m)	Section	lbs./ft. (kg/m)
Type A: Pipe 1.66 (42.2) O.D. Type B: Pipe 1.66 (42.2) O.D. Type C: Pipe 1.66 (42.2) O.D.	2.27 (3.38) 1.83 (2.72) 1.82 (2.71)	Type A: Pipe 2.375 (60.3) O.D. Type B: Pipe 2.375 (60.3) O.D. Type C: Pipe 2.375 (60.3) O.D. Tubing 2.5 (63.5) Sq. Angle 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. 3x3x¾ (76x76x7.9)	5.79 (8.62) 4.64 (6.91) 3.78 (5.63) 5.78 (8.60) 6.1 (9.08)  6.1 (9.08) min.	3.500 (88.9) O.D.   3 (76.2) Sq. 3½x3½x¾ (76x76x9.5)	7.58 (11.28)   8.80 (31.10) 8.5 (10.70)  8.5 (10.70) min.

**WOOD ITEMS**

(S4S or Rough Sawn)

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

Illinois Department of Transportation

PASSED January 1, 2009  
*[Signature]*  
ENGINEER OF POLICY AND PROCEDURES

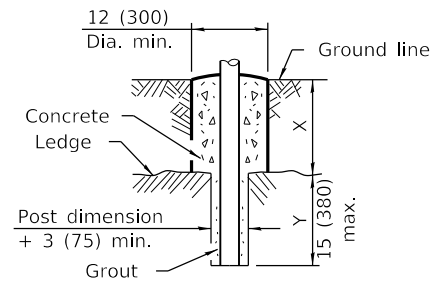
APPROVED January 1, 2009  
*[Signature]*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

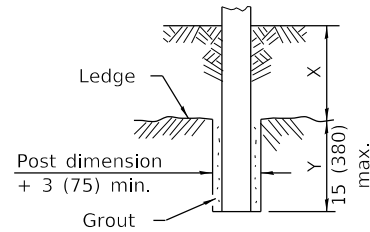
**WOVEN WIRE FENCE**

(Sheet 3 of 4)

**STANDARD 665001-02**



**METAL POST**

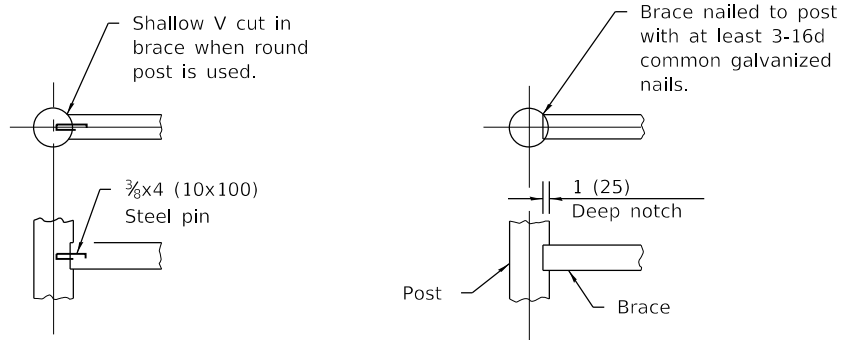


**WOOD POST**

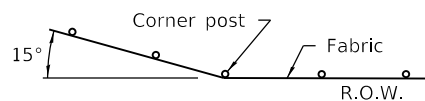
**NOTE**

X + Y shall not exceed 27 (685), 33 (840), or 3'-9" (1.14 m) as applicable. When X is 0 to 12 (300), 18 (450), or 30 (760), Y = 15 (380), and the post shall be shortened as required. When X exceeds 12 (300), 18 (450), or 30 (760), Y shall be decreased correspondingly.

**FOOTING FOR POSTS  
WHEN ROCK LEDGE IS ENCOUNTERED**



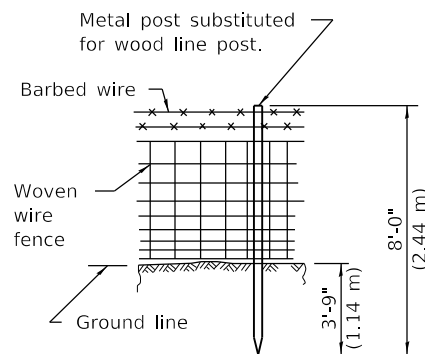
**ALTERNATE DETAILS FOR FASTENING  
WOOD BRACE TO WOOD POST**



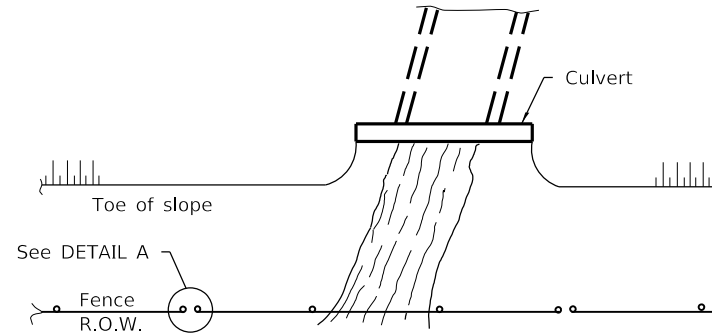
**NOTE**

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

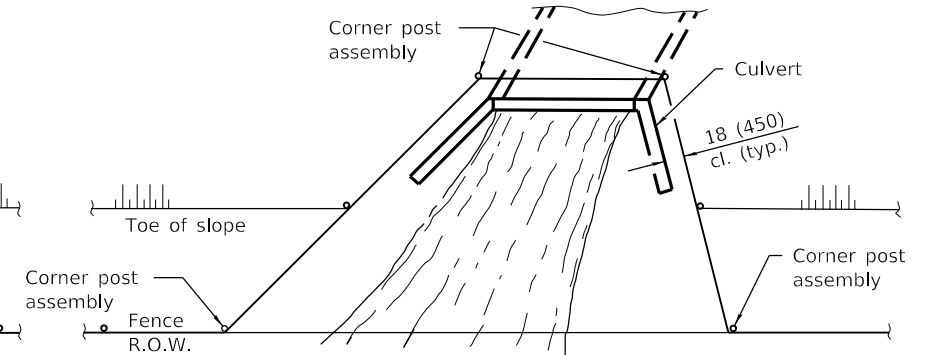
**INSTALLATION AT CORNERS**



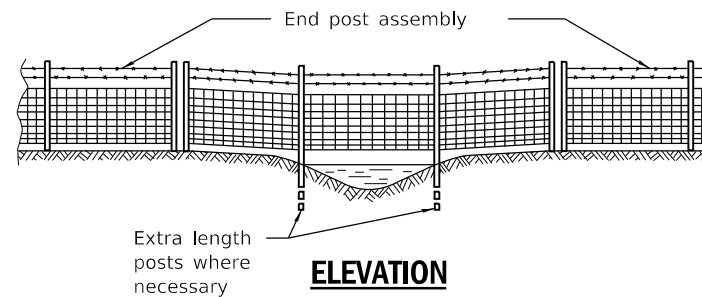
**PROTECTIVE ELECTRICAL GROUNDING  
FOR WOOD POST FENCE INSTALLATION**



**PLAN AT STREAM CROSSING**



**PLAN AT HEADWALL**

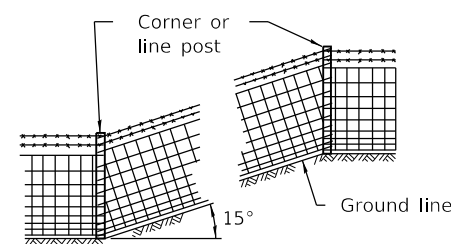


**ELEVATION**

**NOTE**

The woven wire fabric shall be replaced by barbed wire strands at 12 (300) maximum centers between the double posts shown on DETAIL A when shown on the plans.

**INSTALLATION OVER STREAM**

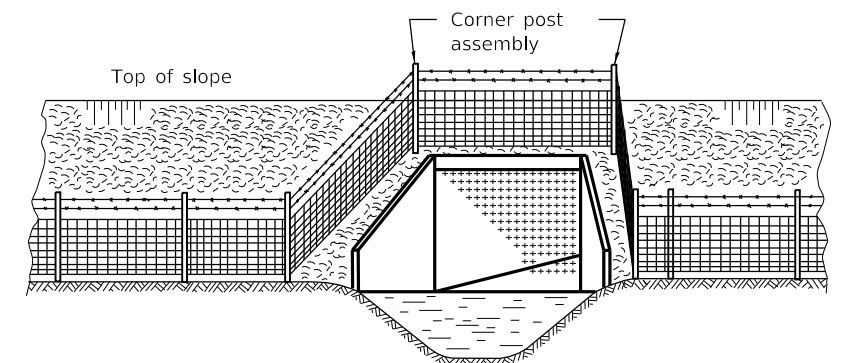


**NOTE**

Where grade line has a change in slope of 15° or more, a corner post with bracing as required shall be placed as shown above. Where angle is less than 15° line posts may be used.

When the tension of the fence tends to pull the posts from the ground, the line posts shall be anchored with the applicable concrete or wood anchorage specified for corner posts.

**INSTALLATION ON SLOPES**

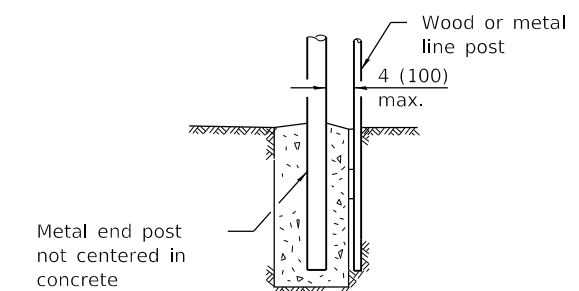


**ELEVATION**

**NOTE**

When the width of the culvert makes it necessary to anchor a post to the top of the culvert, a cast iron shoe or other device approved by the Engineer shall be used.

**INSTALLATION AROUND HEADWALL**



**DETAIL A**

**WOVEN WIRE FENCE**

(Sheet 4 of 4)

**STANDARD 665001-02**

Illinois Department of Transportation

PASSED January 1, 2009

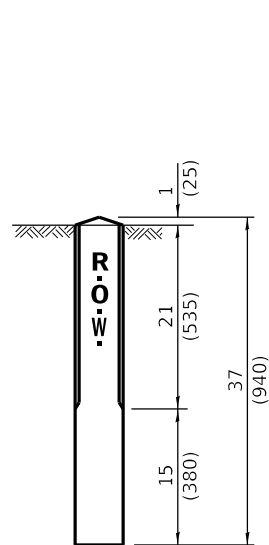
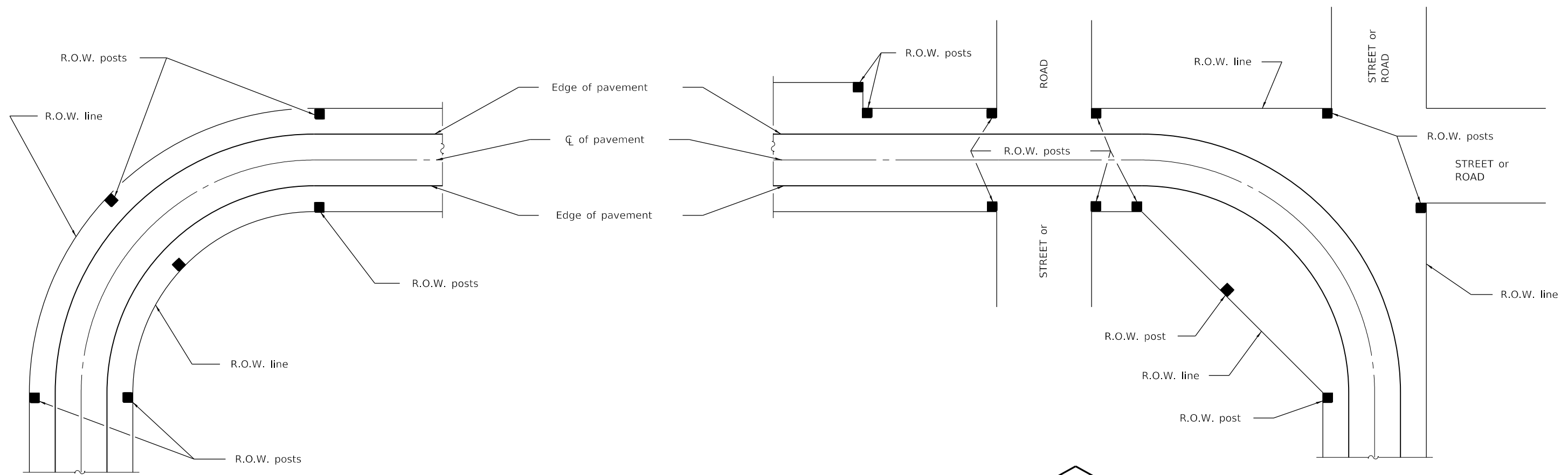
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

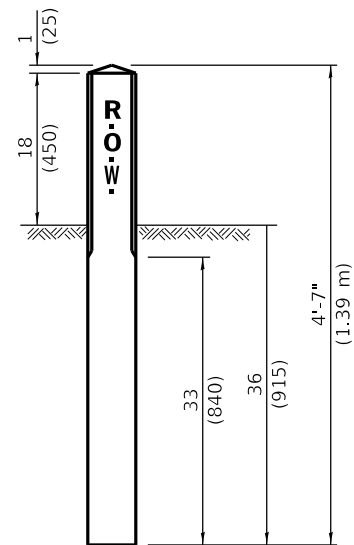
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



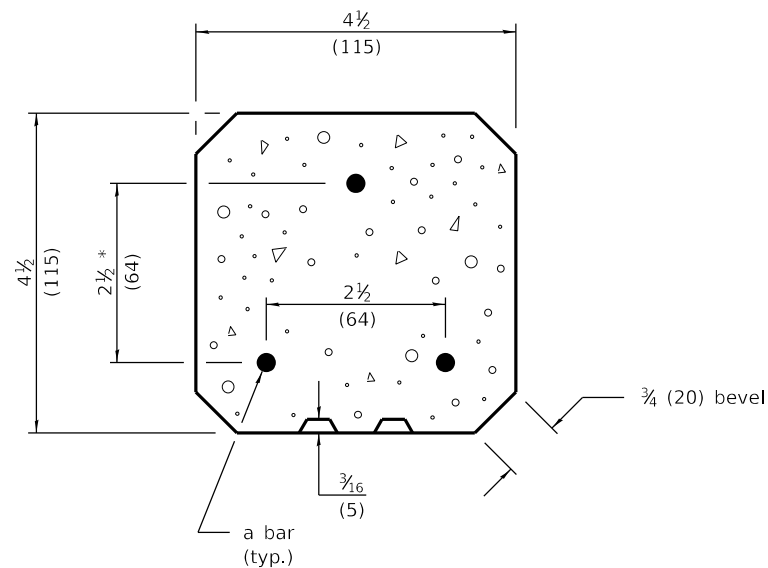


**METHOD B**

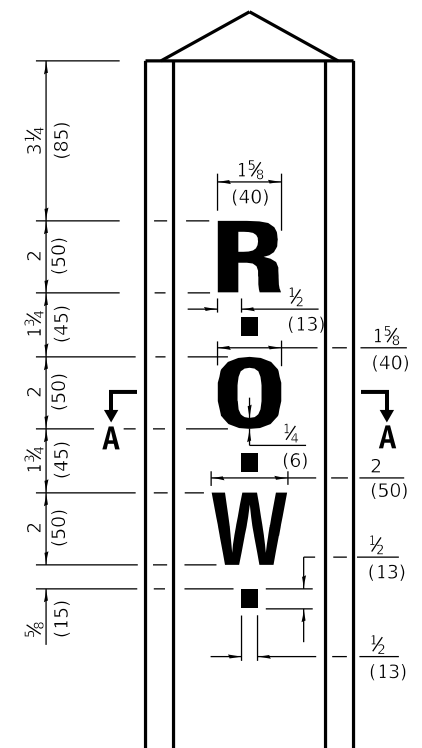


**METHOD A**

\* 2 (50) When shadow box is used.



**SECTION A-A**

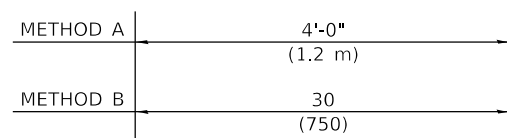


**GENERAL NOTE**

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

A 2 3/4 x 12 1/2 (70 x 310) shadow box with beveled edges, and a 3/16 (5) thick indentation may be used with the standard lettering shown.

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



**a BAR**

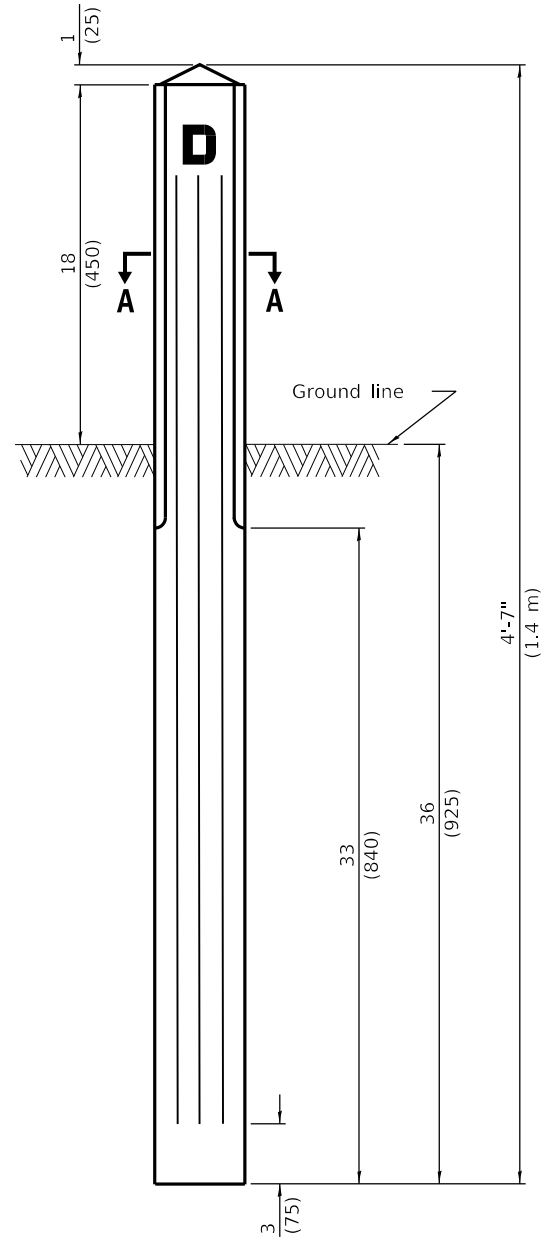
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 1744-6.

**RIGHT OF WAY MARKERS**

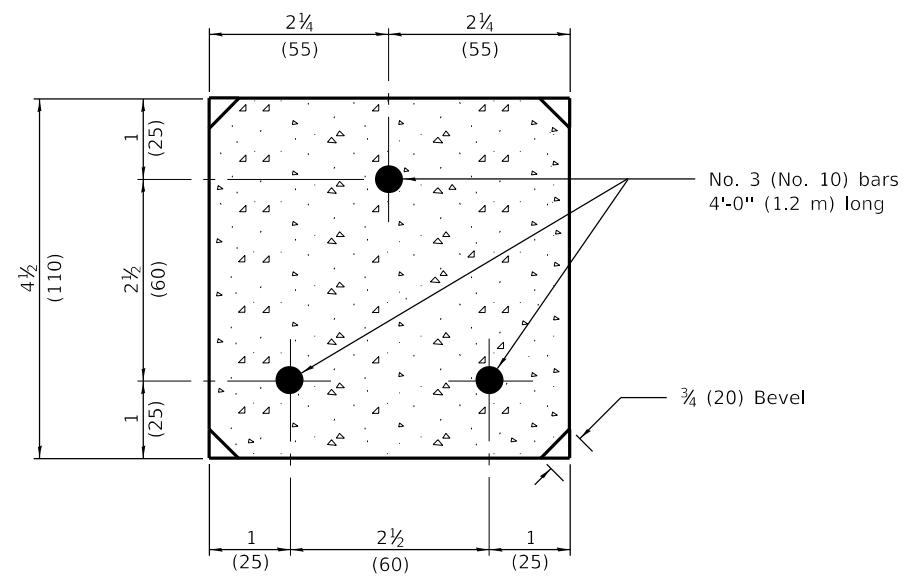
**STANDARD 666001-01**

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

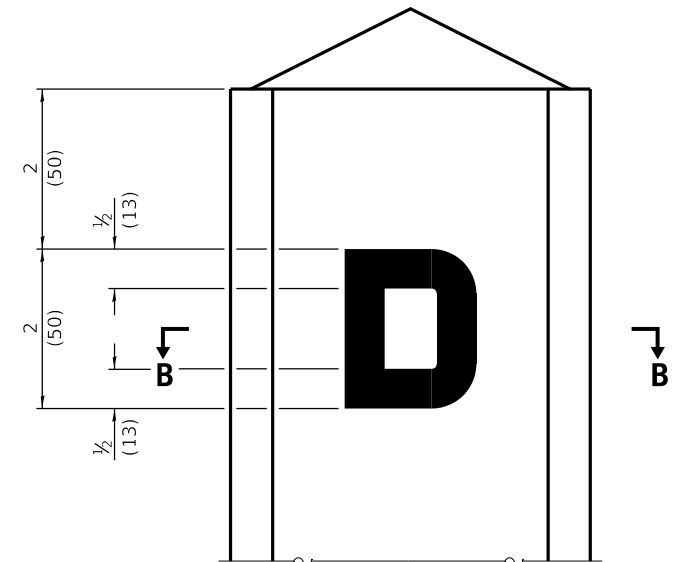
ISSUED 1-1-97



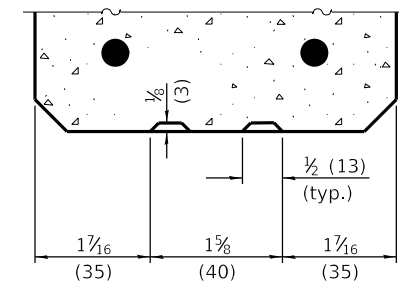
**FRONT ELEVATION**



**SECTION A-A**



**DETAIL OF LETTER**



**SECTION B-B**

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

Illinois Department of Transportation

PASSED January 1, 2009  
*[Signature]*  
 ENGINEER OF POLICY AND PROCEDURES

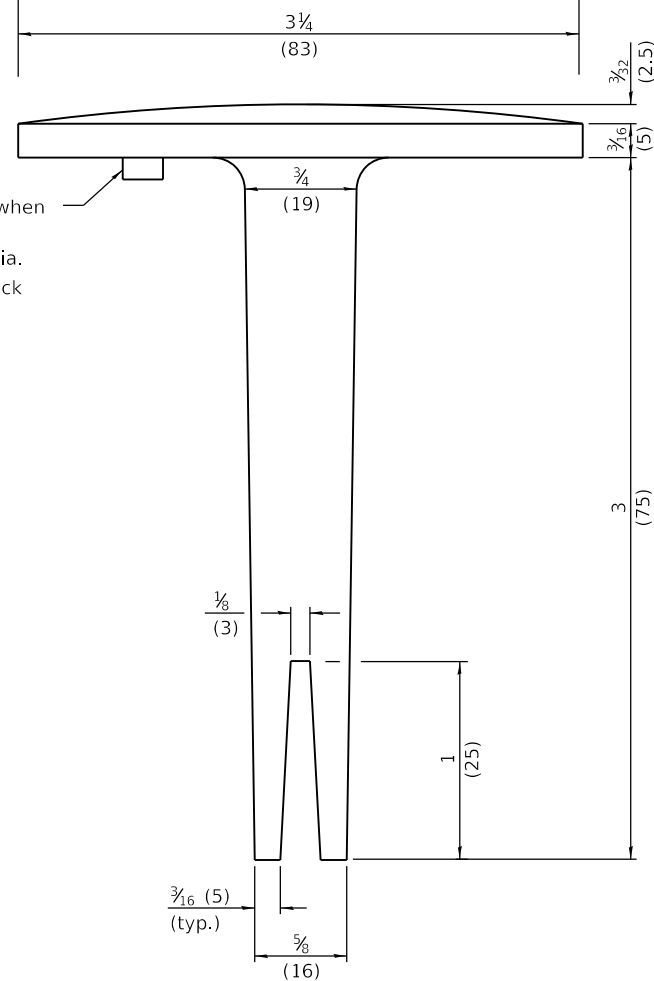
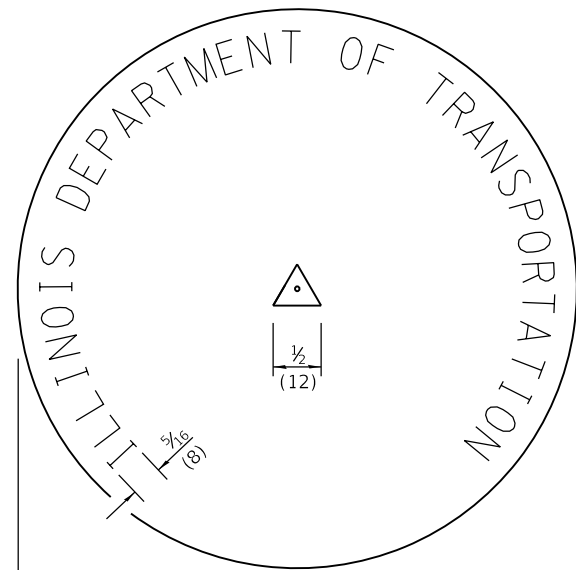
APPROVED January 1, 2009  
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 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-09

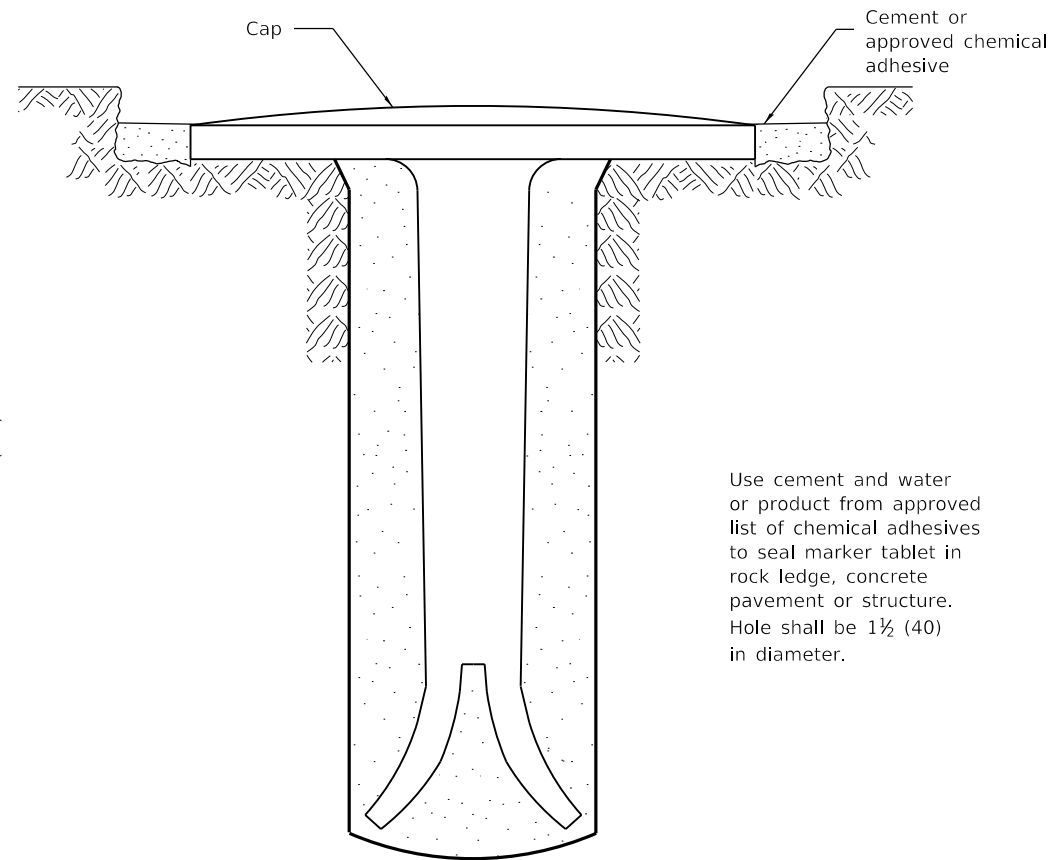
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 1999-4.

**DRAINAGE MARKERS**

**STANDARD 667001-01**



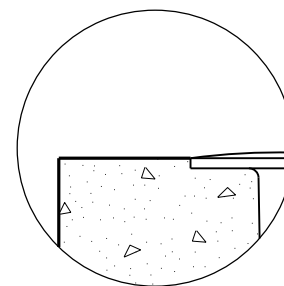
**ALUMINUM TABLET**



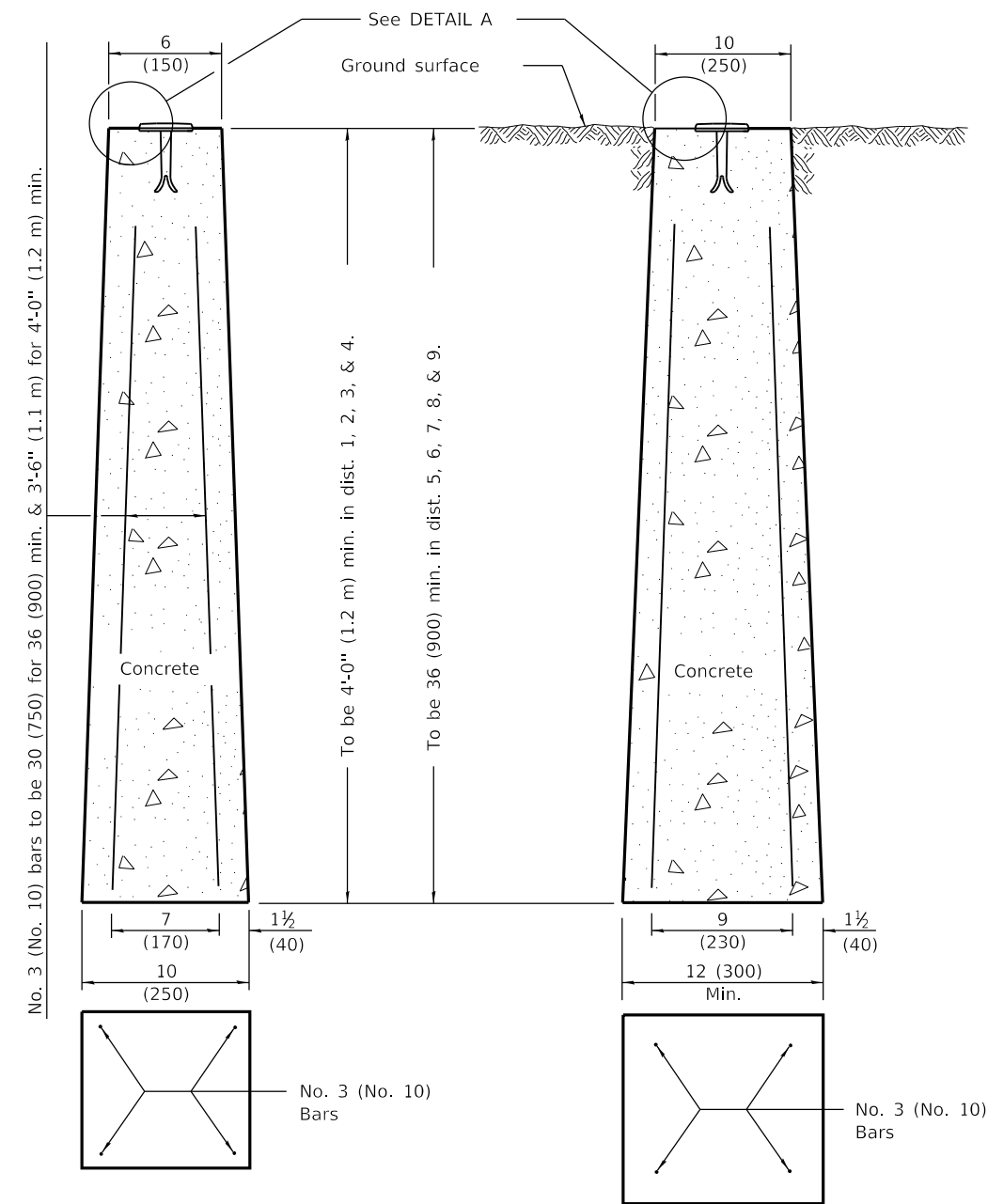
Use cement and water or product from approved list of chemical adhesives to seal marker tablet in rock ledge, concrete pavement or structure. Hole shall be 1 1/2 (40) in diameter.

Tablet constructed in rock ledge or concrete.

**TYPE I**



**DETAIL A**



**PRECAST MARKER**

**CAST-IN-PLACE MARKER**

**TYPE II**

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

Illinois Department of Transportation

PASSED January 1, 2012  
*Michael Beard*  
 ENGINEER OF POLICY AND PROCEDURES

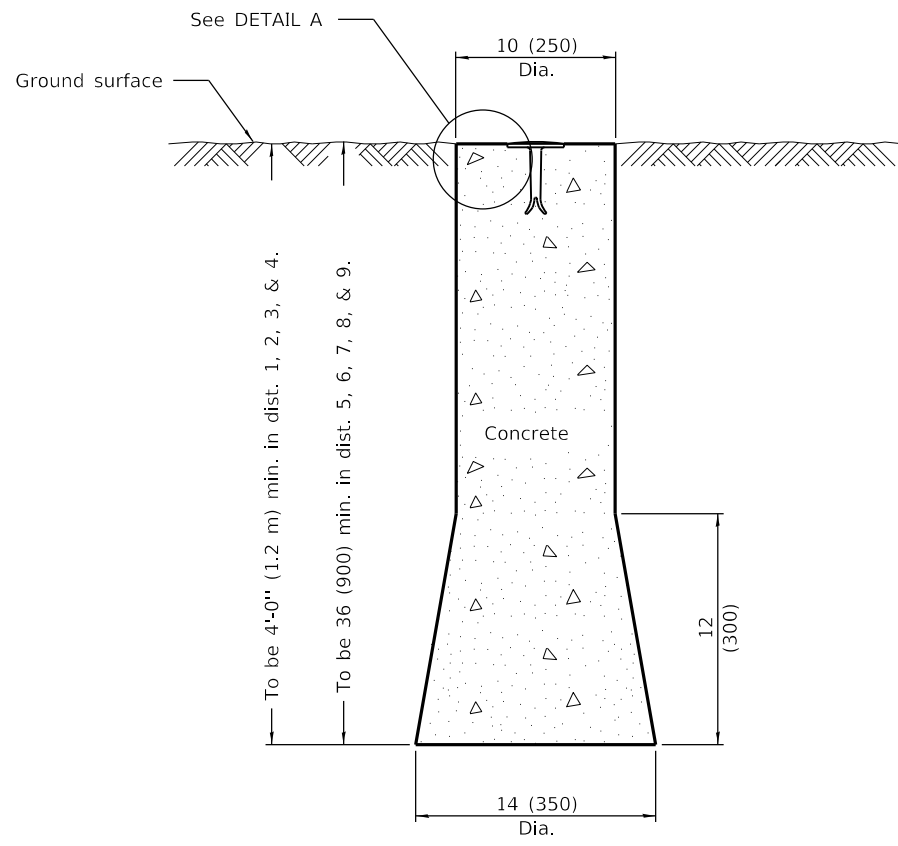
APPROVED January 1, 2012  
*Scott Schick*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

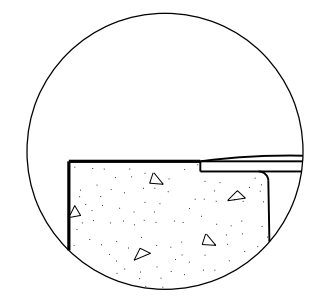
DATE	REVISIONS
1-1-12	Changed 'epoxy' references to 'chemical adhesives'.
1-1-09	Switched units to English (metric).

**PERMANENT SURVEY MARKERS**

**STANDARD 667101-02**



**ELEVATION**




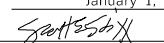
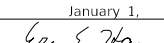
**DETAIL A**

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

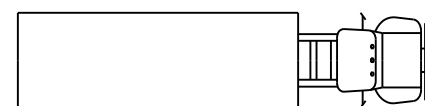
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2448.
	Revised depth.

**U.S. GEOLOGICAL SURVEY AND  
NATIONAL GEODETIC SURVEY  
BENCHMARKS RESETTING METHOD**

**STANDARD 668001-01**


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

ISSUED 1-1-97



**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.

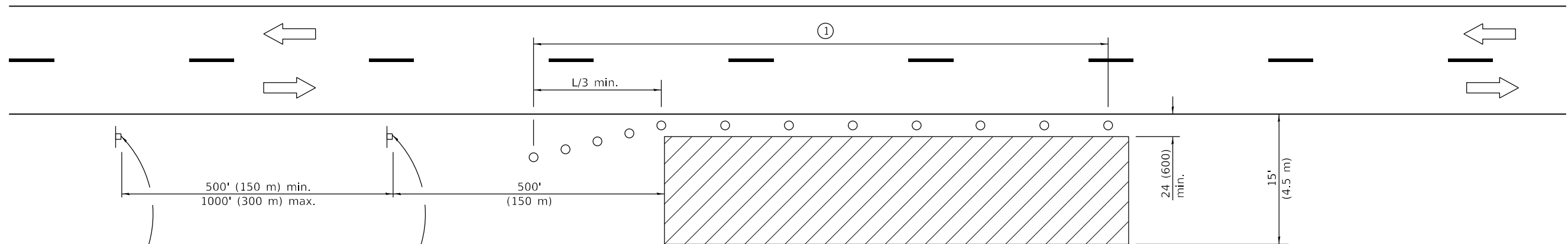
Illinois Department of Transportation  
 PASSED January 1, 2009  
  
 ENGINEER OF OPERATIONS  
 APPROVED January 1, 2009  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

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

**ROAD CONSTRUCTION AHEAD**

W20-1103(0)-48

**WORKERS SIGN**

W21-1(0)-48

For maintenance and utility projects

**ROAD WORK AHEAD**

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.

DATE	REVISIONS
1-1-14	Revised workers sign number to agree with current MUTCD.
1-1-13	Omitted text 'WORKERS' sign.

**OFF-RD OPERATIONS, 2L, 2W, 15' (4.5 m) TO 24" (600 mm) FROM PAVEMENT EDGE**

**STANDARD 701006-05**

Illinois Department of Transportation

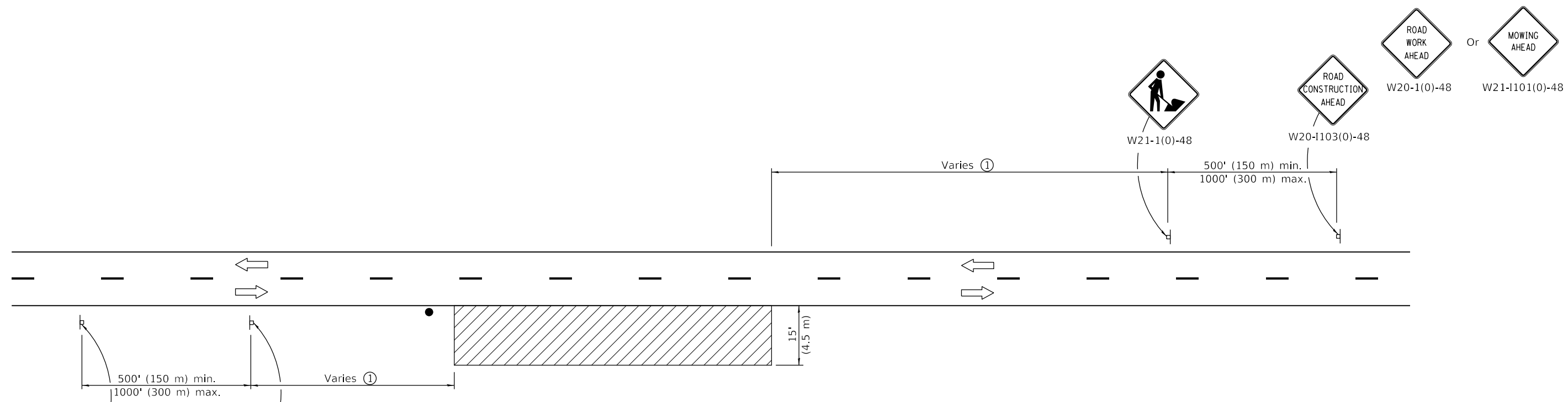
PASSED January 1, 2014

ENGINEER OF SAFETY ENGINEERING

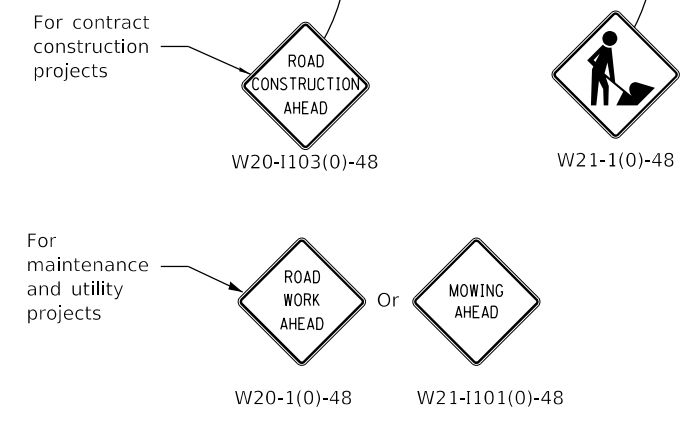
APPROVED January 1, 2014

ENGINEER OF DESIGN AND ENVIRONMENT

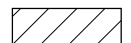


ISSUED 1-1-97



**TYPICAL APPLICATIONS**  
Shoulder work  
Utility operations



**SYMBOLS**

-  Work area
-  Sign
-  Flagger with traffic control sign when required

① Minimum distance is 200' (60 m). Maximum distance to be determined by the Engineer but should not exceed 1/2 the length required for one normal working day's operation, or 4 miles (6.4 km) whichever is less.

**GENERAL NOTES**

This Standard is used where at any time, any vehicle, equipment, workers or their activities require an intermittent or continuous moving operation on the shoulder, where the average speed is 1 mph (2 km/h) or less.

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

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

DATE	REVISIONS
1-1-14	Revised workers sign number to agree with current MUTCD.
1-1-13	Omitted text 'WORKERS' sign.

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

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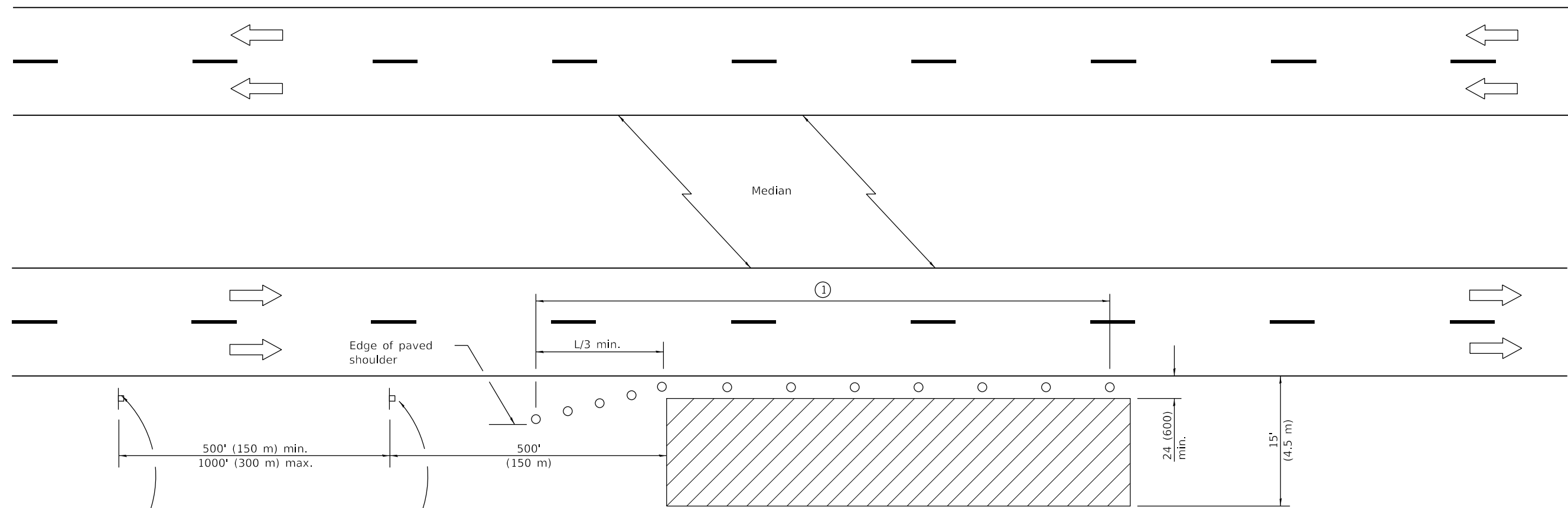
**STANDARD 701011-04**

Illinois Department of Transportation

PASSED January 1, 2014  
*[Signature]*  
ENGINEER OF SAFETY ENGINEERING

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

ISSUED 1-1-97



For contract construction projects



W20-1103(0)-48



W21-1(0)-48

For maintenance and utility projects



W20-1(0)-48

**TYPICAL APPLICATIONS**

- Utility operations
- Culvert extensions
- Side slope changes
- Guardrail installation and maintenance
- Delineator installation
- Landscaping operations
- Shoulder repair
- Sign installation and maintenance

① When the work operation exceeds one hour, cones, drums or barricades shall be placed at 25' (8 m) centers for L/3 distance, and at 50' (15 m) centers through the remainder of the work area.

**SYMBOLS**

- Work area
- Sign
- Cone, drum or barricade

**GENERAL NOTES**

This Standard is used where any vehicles, equipment, workers or their activities will encroach in the area 15' (4.5 m) to 24' (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.

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**

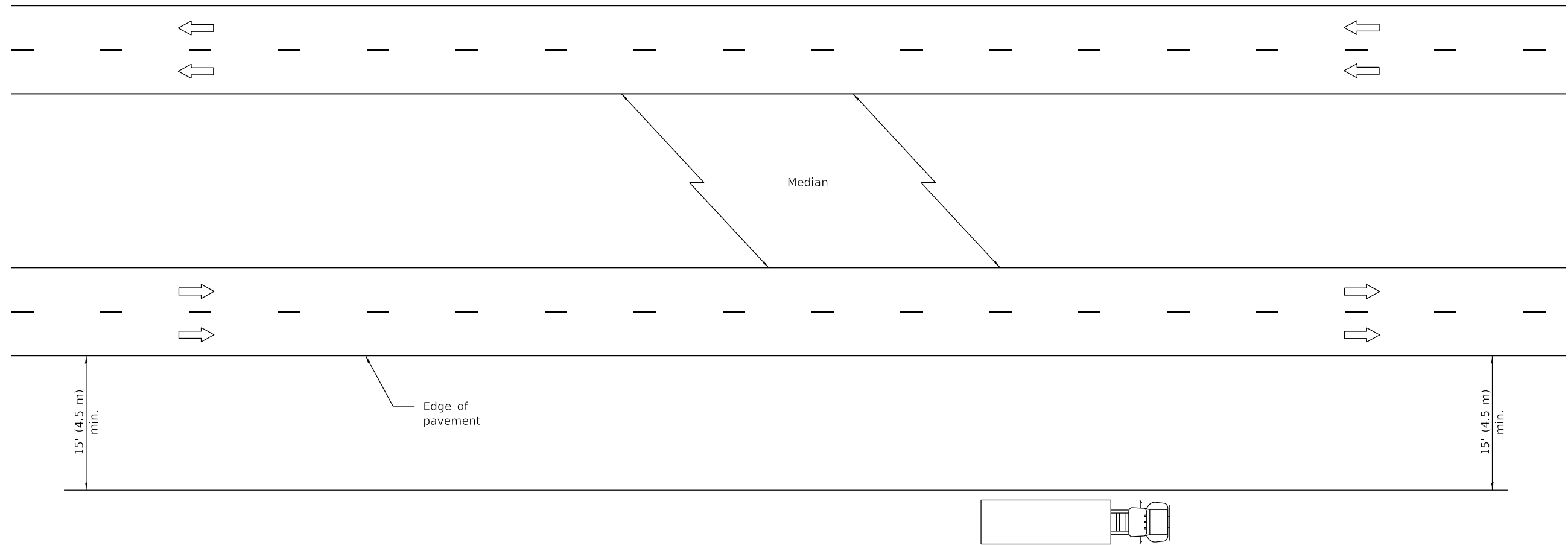
Illinois Department of Transportation

PASSED April 1, 2016  
  
 ENGINEER OF SAFETY ENGINEERING

APPROVED April 1, 2016  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97





**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.



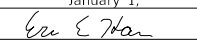
This Standard also applies to work performed in the median more than 15' (4.5 m) from either pavement.

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

DATE	REVISIONS
1-1-05	Switched units to English (metric).
1-1-05	Revised title.

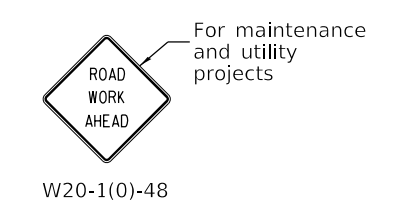
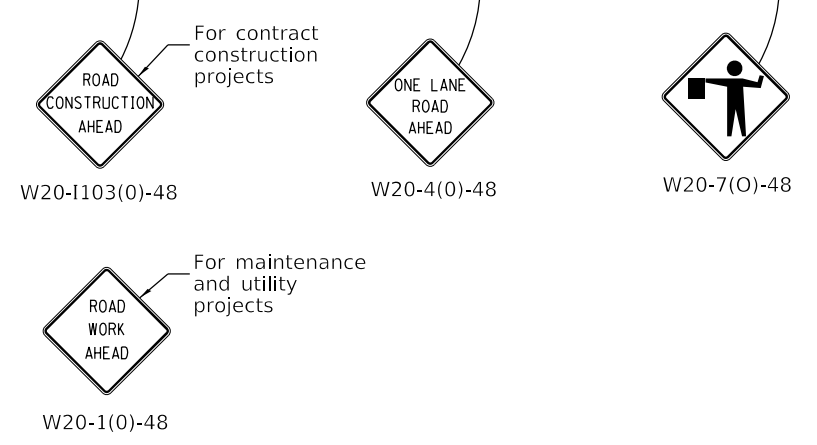
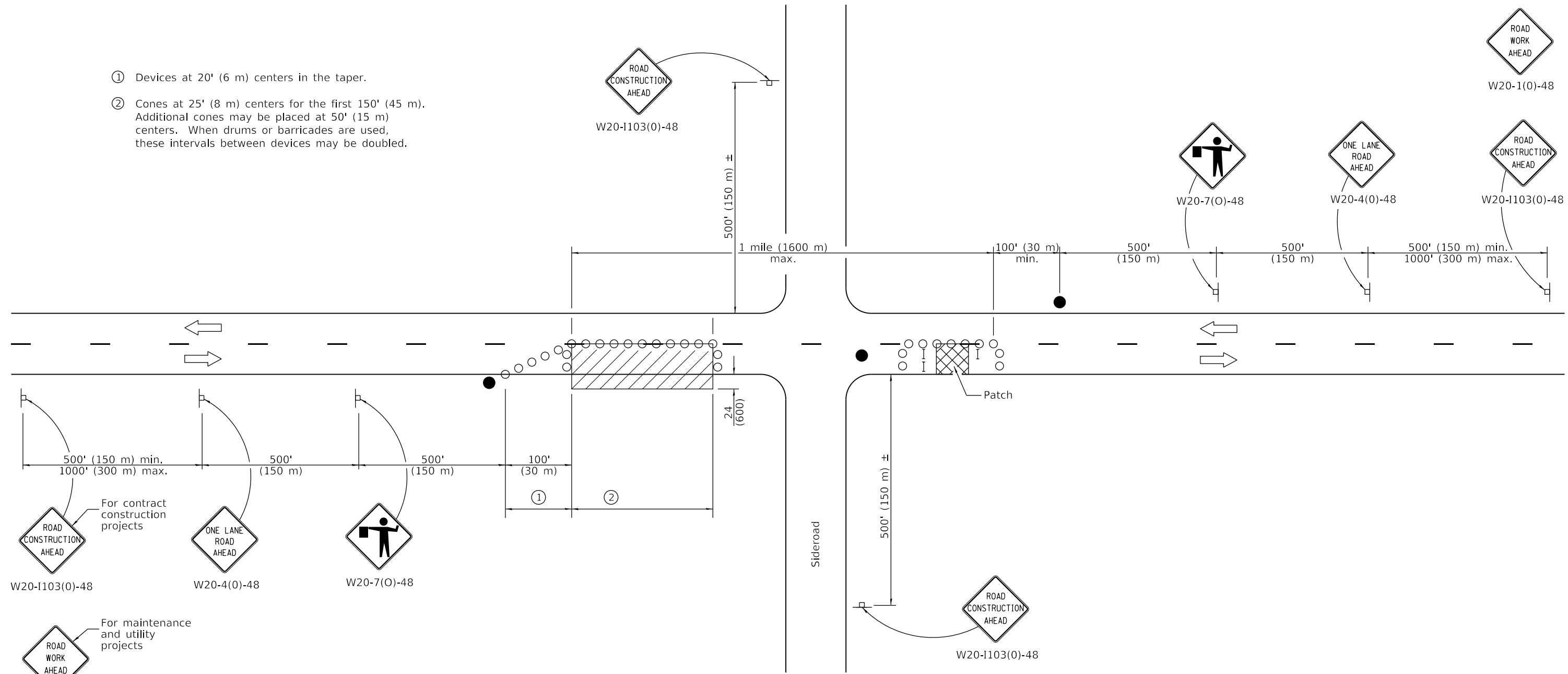
**OFF-RD OPERATIONS, MULTILANE,  
MORE THAN 15' (4.5 m) AWAY**

**STANDARD 701106-02**


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

ISSUED 1-1-97

- 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.



**SYMBOLS**

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

**TYPICAL APPLICATIONS**

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

**GENERAL NOTES**

This Standard is used where at any time, any vehicles, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) outside the edge of pavement for daylight operation.

When the distance between successive work areas exceeds 2000' (600 m), additional warning signs, flaggers, and taper shall be placed as shown.

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

Illinois Department of Transportation

APPROVED January 1, 2019  
  
 ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2019  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

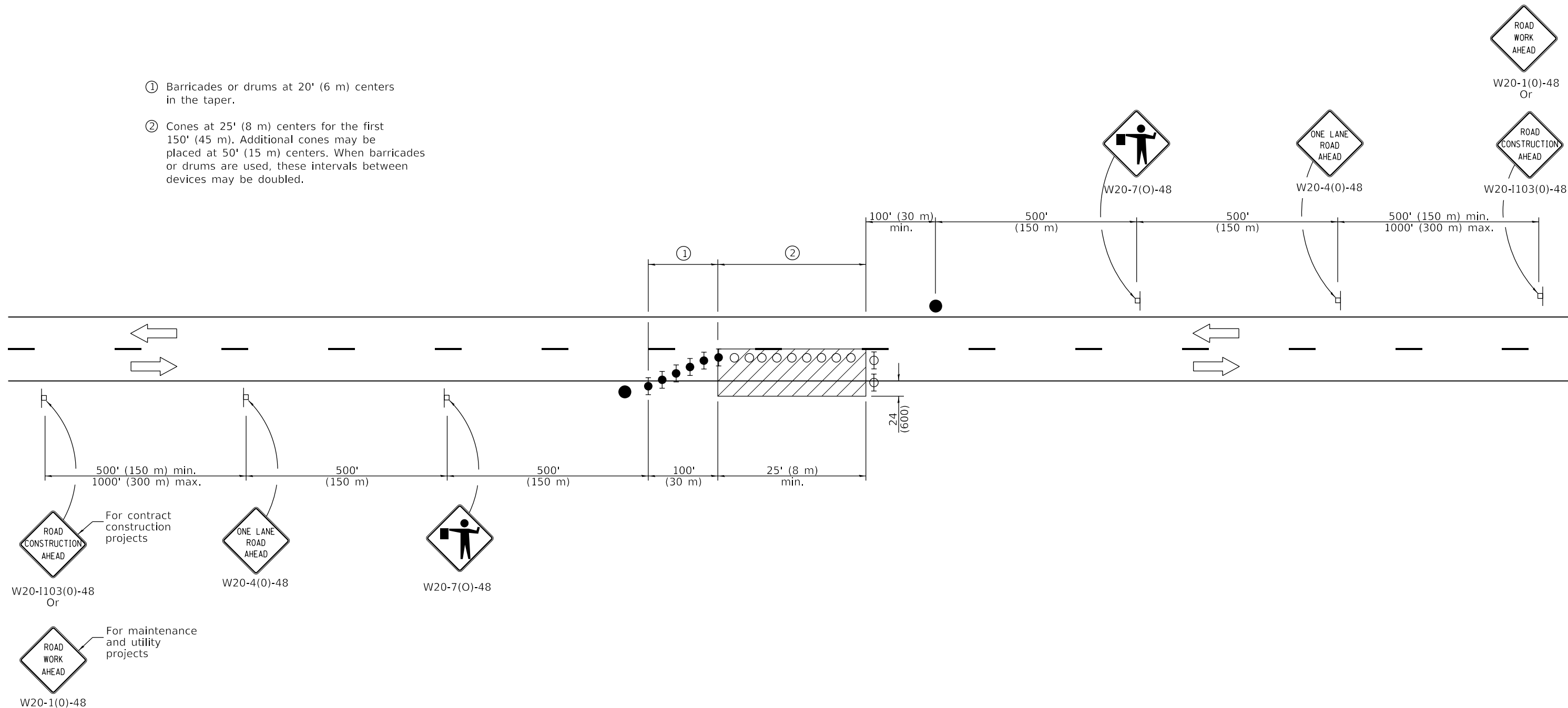
ISSUED 1-1-97

DATE	REVISIONS
1-1-19	Revised device spacing in taper.
1-1-11	Revised flagger sign.

**LANE CLOSURE, 2L, 2W,  
 DAY ONLY,  
 FOR SPEEDS ≥ 45 MPH**

**STANDARD 701201-05**

- ① Barricades or drums at 20' (6 m) centers in the taper.
- ② Cones at 25' (8 m) centers for the first 150' (45 m). Additional cones may be placed at 50' (15 m) centers. When barricades or drums are used, these intervals between devices may be doubled.



**TYPICAL APPLICATIONS**

Isolated patch  
Installation of drainage structure  
Utility operations

**SYMBOLS**

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

**GENERAL NOTES**

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) from the edge of pavement for nighttime operation.

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

DATE	REVISIONS
1-1-19	Revised device spacing in taper and added cones as an option.
1-1-18	Omitted steady burning lights in tangent.

**LANE CLOSURE, 2L, 2W,  
NIGHT ONLY,  
FOR SPEEDS ≥ 45 MPH**

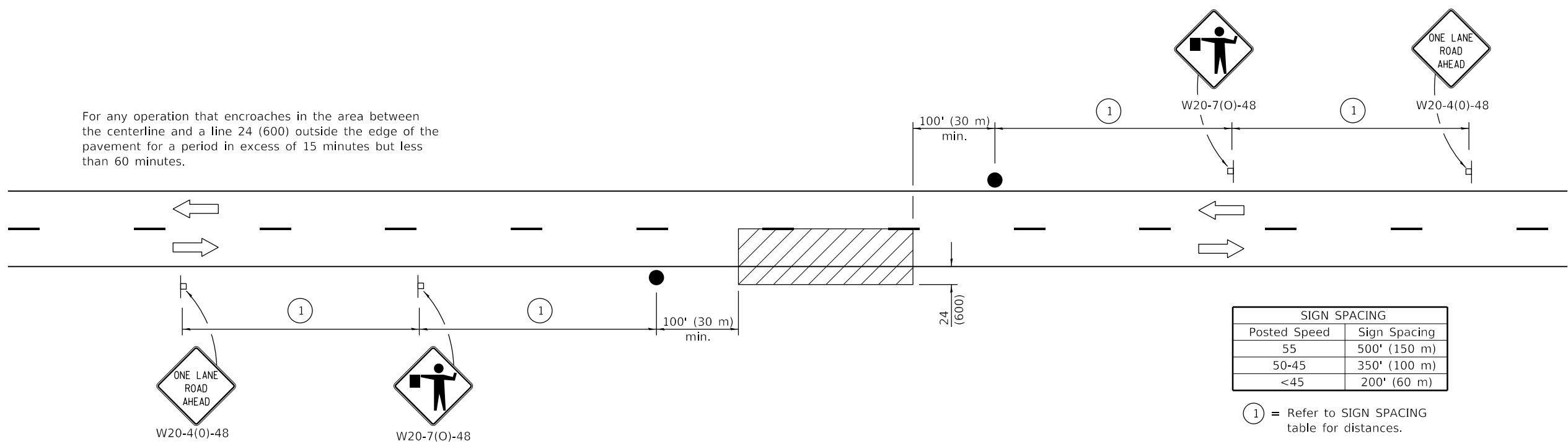
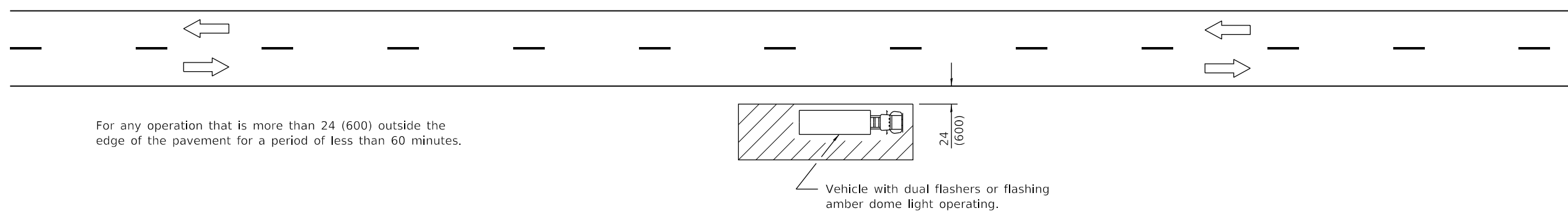
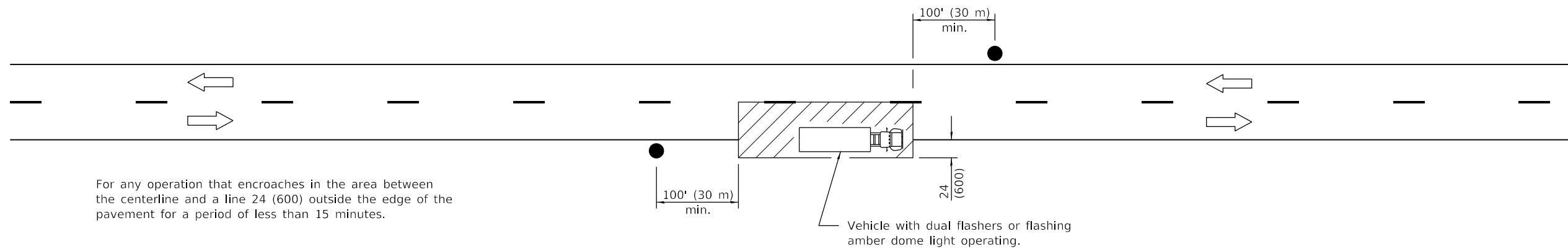
**STANDARD 701206-05**

Illinois Department of Transportation

APPROVED January 1, 2019  
*Cynthia Watt*  
ENGINEER OF SAFETY PROG. AND ENGINEERING

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

ISSUED 1-1-97



**TYPICAL APPLICATIONS**

- Marking patches
- Field survey
- String line
- Utility operations
- Cleaning up debris on pavement

**SYMBOLS**

- Work area
- Sign on portable or permanent support
- Flagger with traffic control sign

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

Illinois Department of Transportation

PASSED January 1, 2011  
*Amelia Adams*  
 ENGINEER OF SAFETY ENGINEERING

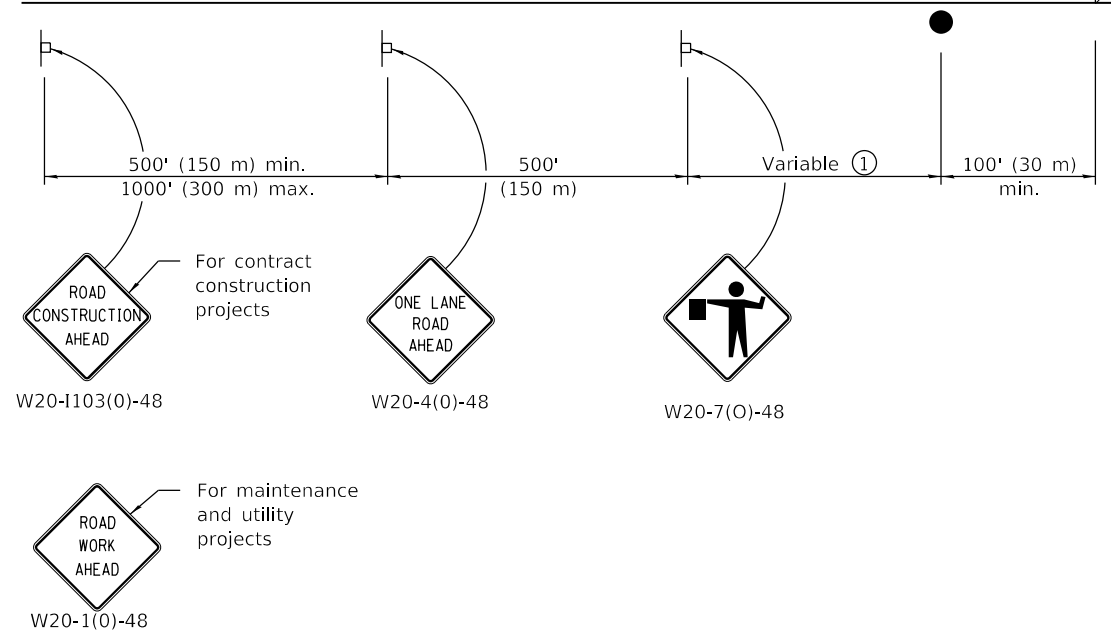
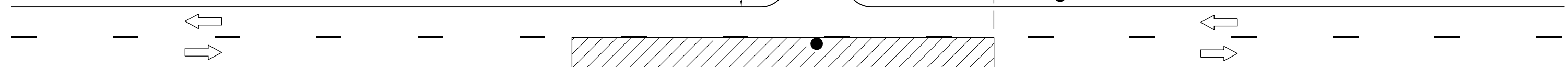
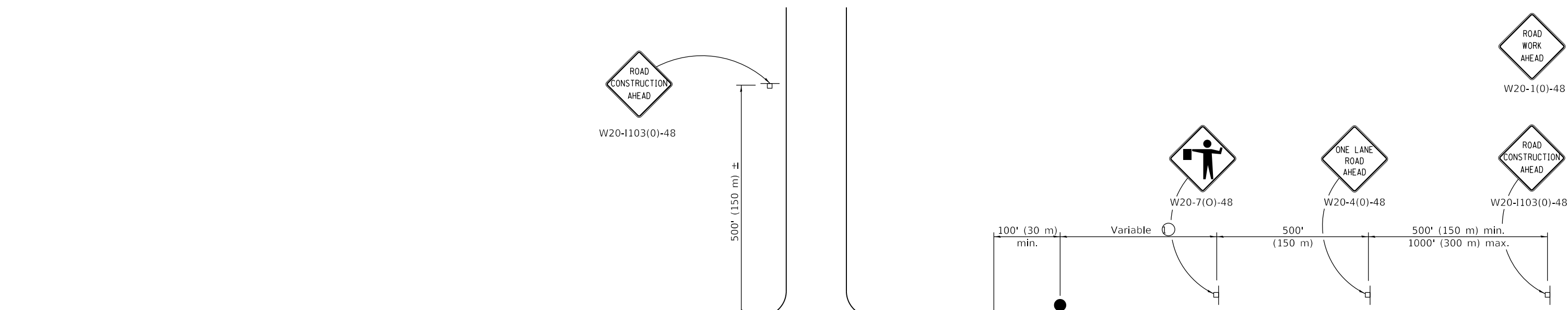
APPROVED January 1, 2011  
*Scott Schick*  
 ENGINEER OF DESIGN AND ENVIRONMENT

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.

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**

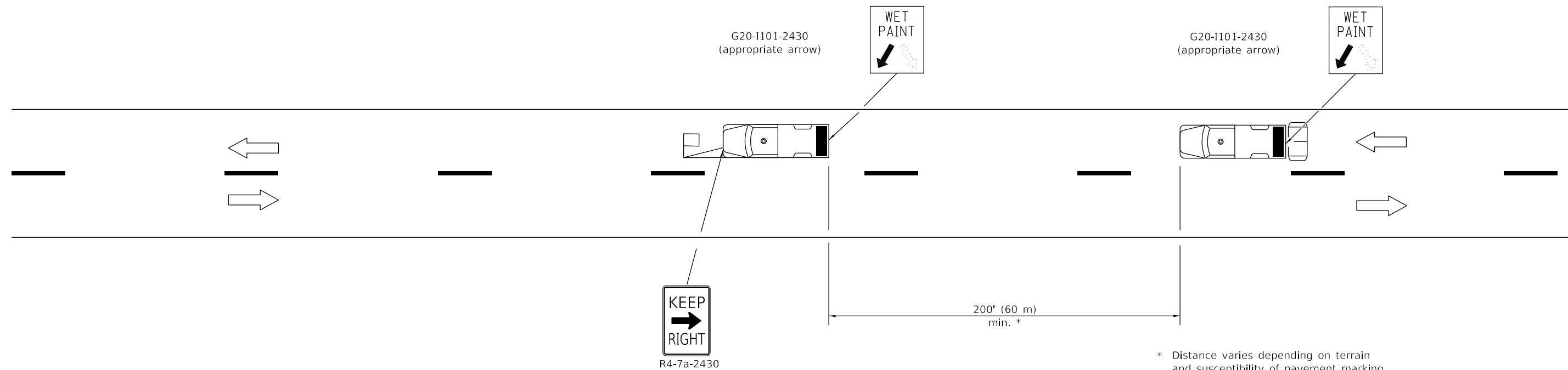
**STANDARD 701306-04**

Illinois Department of Transportation

PASSED January 1, 2018  
*Paul L. ...*  
 ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2018  
*Walter M. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97


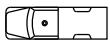




\* Distance varies depending on terrain and susceptibility of pavement marking or crack sealant to wheel tracking.

**TYPICAL APPLICATIONS**

- Landscaping work
- Utility work
- Pavement marking
- Weed spraying
- Roadometer measurements
- Debris cleanup
- Crack pouring

**SYMBOLS**

-  Arrow board (Hazard Mode only)
-  Truck with headlights, emergency flashers and flashing amber light. (visible from all directions)
-  18x18 (450x450) min. orange flag (use when guide wheel is used)
-  Truck mounted attenuator

**GENERAL NOTES**

This Standard is used where any vehicle, equipment, workers or their activities will require a continuous moving operation where the average speed is greater than 3 mph (5 km/h).

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

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

DATE	REVISIONS
1-1-09	Switched units to English (metric). Omitted Pass With Care sign.
1-1-00	Elim. speed restrictions in Standard title.

**LANE CLOSURE 2L, 2W  
MOVING OPERATIONS-  
DAY ONLY**

**STANDARD 701311-03**

Illinois Department of Transportation

PASSED January 1, 2009

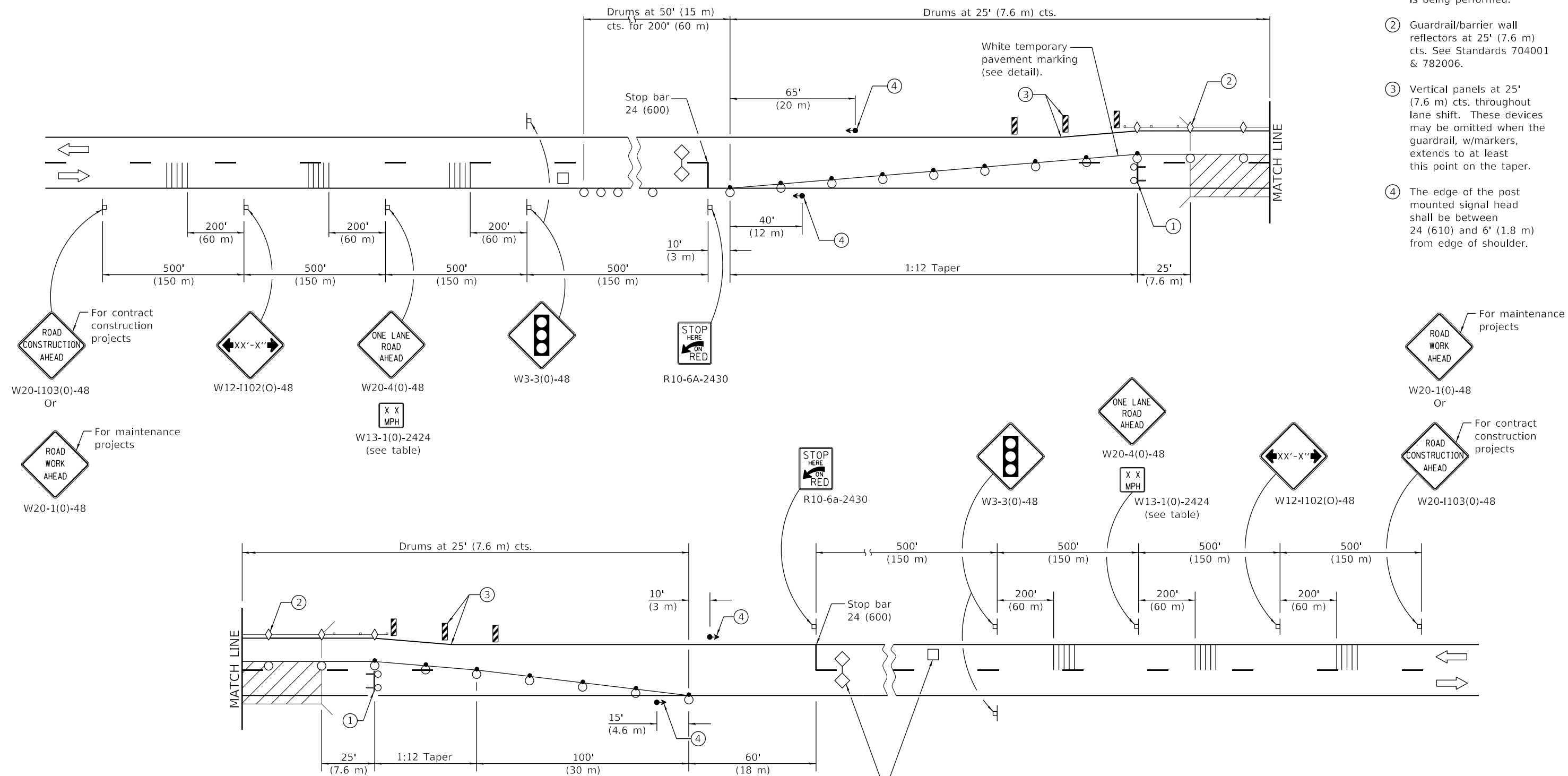
ENGINEER OF OPERATIONS

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

- 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.



Type III barricade with flashing lights

See detail for placement of detector loops.

**SYMBOLS**

- |   |   |
|---|---|
| Work area                               | Drum with steady burn bi-directional light              |
| Sign                                    | Temporary rumble strip (when specified)                 |
| Traffic signal                          | Crystal, bidirectional guardrail/barrier wall reflector |
| Detector loops                          | Double vertical panel (see detail)                      |
| Type III barricade with flashing lights | Drum  |

See Sheet 2 for GENERAL NOTES.

DATE	REVISIONS
1-1-20	Revised from F-shape to constant slope parapet.
1-1-18	Omitted lights in tangents.
	Changed lights in tapers to steady burn bi-dir.
1-1-17	Revised note ③.

**LANE CLOSURE, 2L, 2W,  
BRIDGE REPAIR,  
FOR SPEEDS ≥ 45 MPH**  
(Sheet 1 of 2)

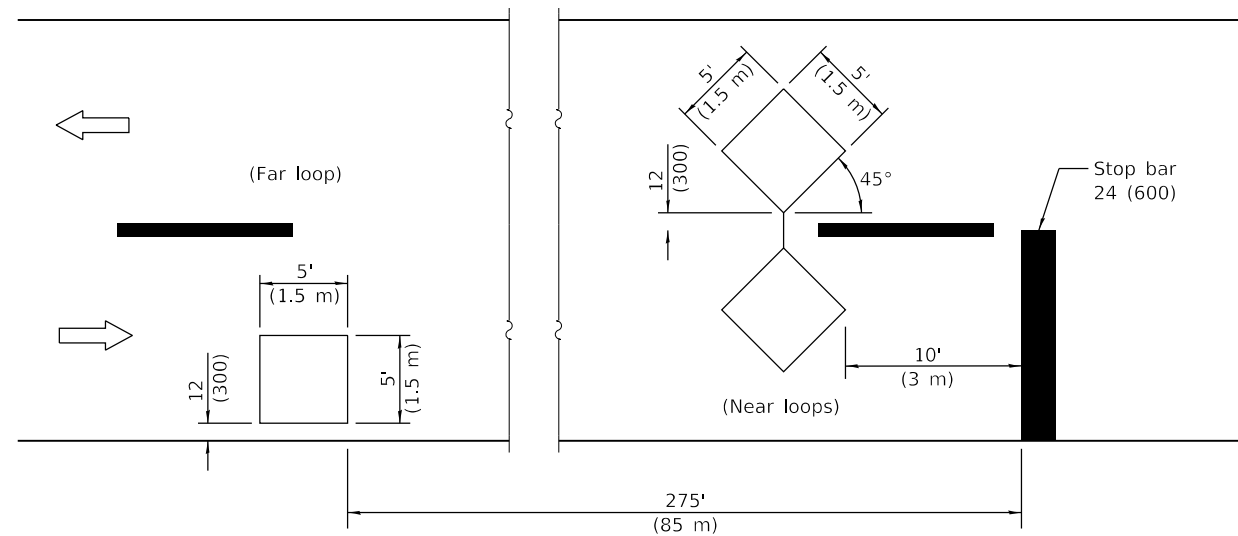
**STANDARD 701316-13**

Illinois Department of Transportation

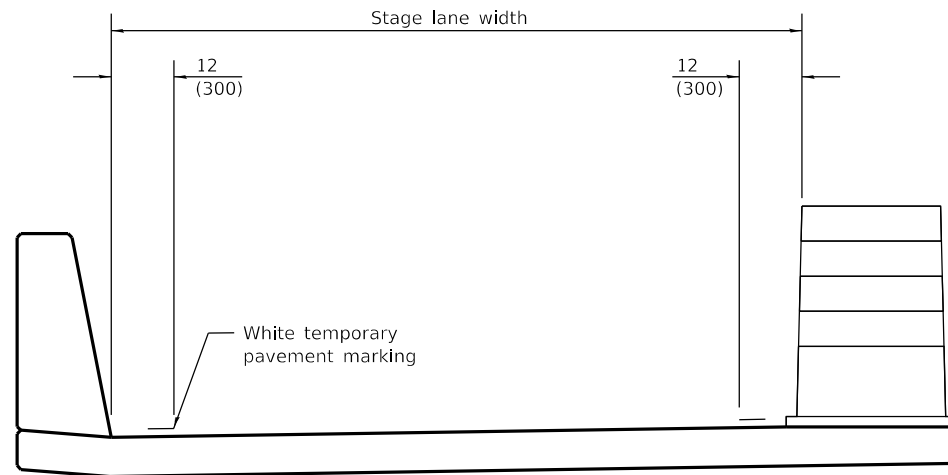
PASSED January 1, 2020  
*[Signature]*  
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2020  
*[Signature]*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



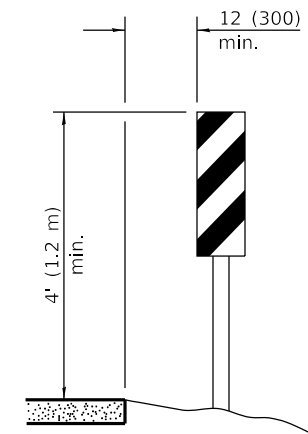
**DETECTOR LOOPS**



**TEMPORARY PAVEMENT MARKING**

TRAFFIC SIGNAL SEQUENCE						
PHASE	A			B		
INTERVAL	1	2	3	4	5	6
NORTHBOUND OR EASTBOUND	G	Y	R	R	R	R
SOUTHBOUND OR WESTBOUND	R	R	R	G	Y	R

ADVISORY SPEED LIMIT	
NORMAL POSTED SPEED	ADVISORY SPEED
55 - 45 mph	40 mph
40 mph	35 mph
35 - 30 mph	30 mph



**VERTICAL PANELS**  
(Post mounted, one each side)

**GENERAL NOTES**

This Standard is used where, at any time any vehicle, equipment, workers or their activities will encroach on one lane of a bridge and traffic signals are required.

When traffic signals are not in operation, flaggers shall be used and traffic control devices shall conform to Standard 701201 or 701206.

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

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

**LANE CLOSURE, 2L, 2W,  
BRIDGE REPAIR,  
FOR SPEEDS ≥ 45 MPH**

(Sheet 2 of 2)

**STANDARD 701316-13**

Illinois Department of Transportation

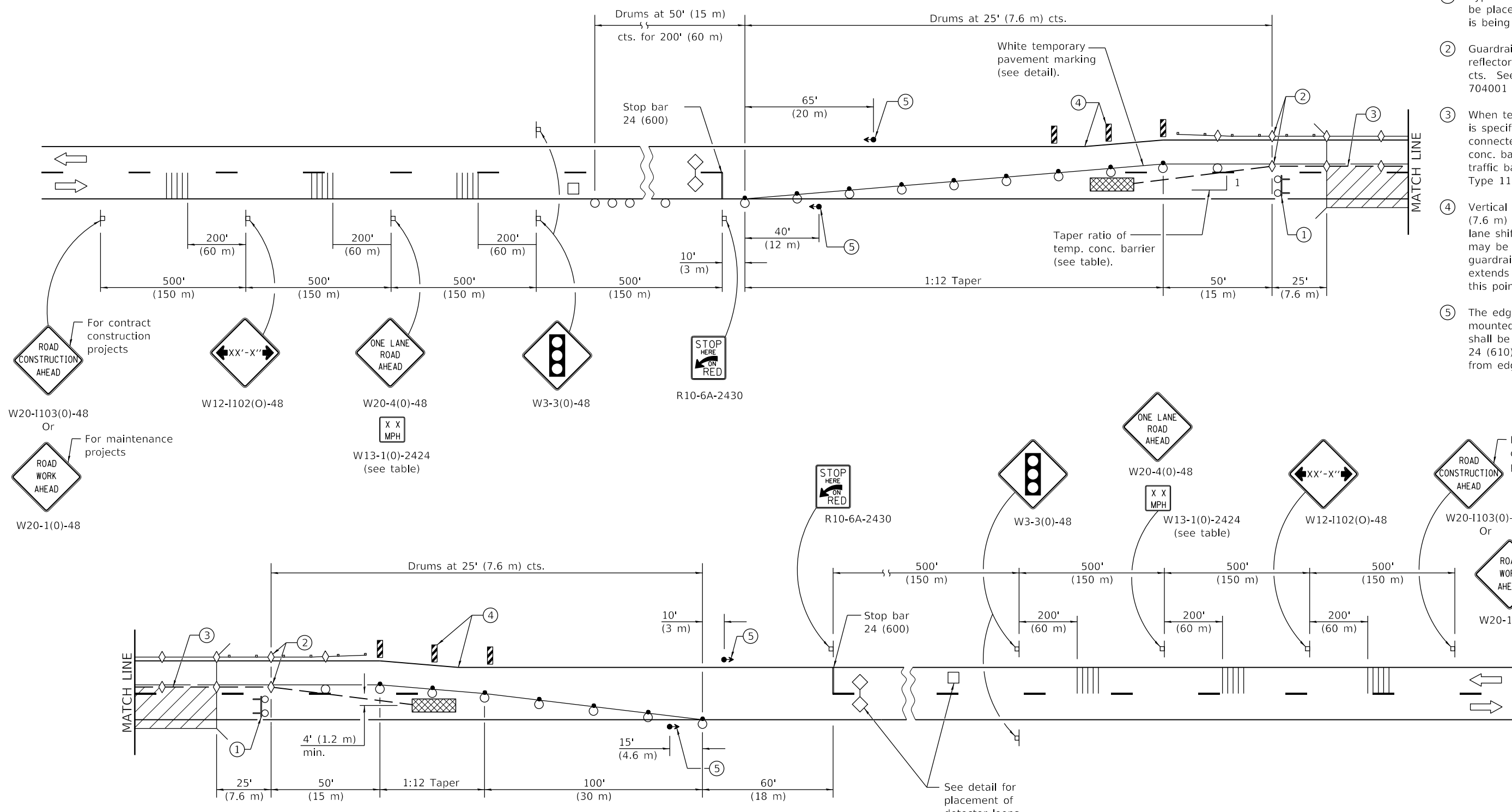
PASSED January 1, 2020  
  
 ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2020  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



- 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.



**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

See Sheet 2 for GENERAL NOTES

Illinois Department of Transportation

PASSED January 1, 2020  
*Cynthia Watt*  
 ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2020  
*J. Ed. Elk*  
 ENGINEER OF DESIGN AND ENVIRONMENT

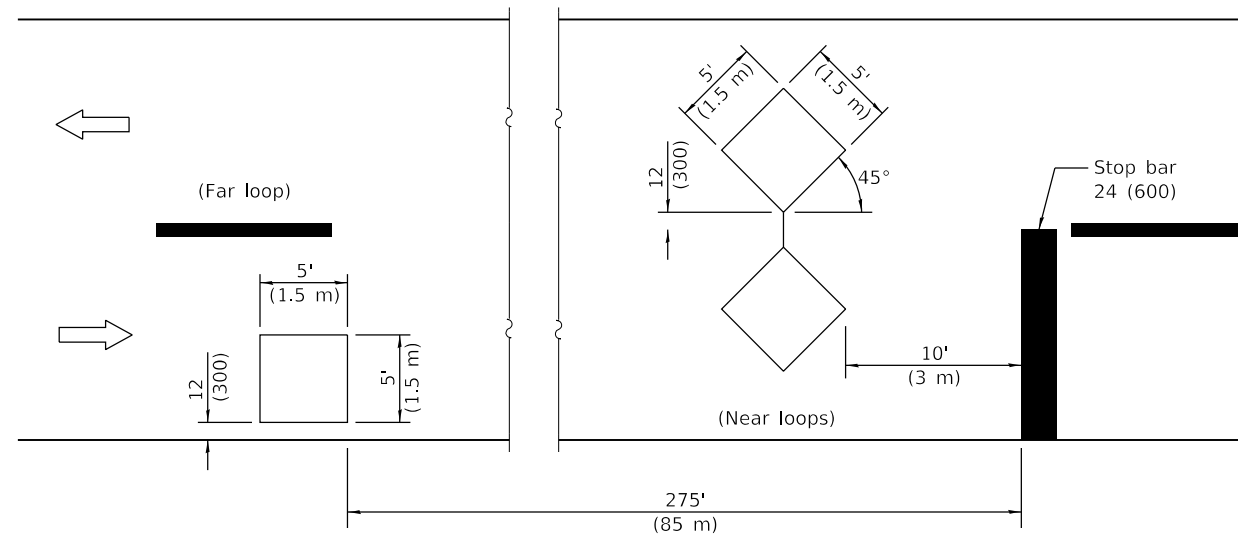
ISSUED 1-1-97

DATE	REVISIONS
1-1-20	Revised from F-shape to constant slope parapet.
1-1-18	Omitted lights in tangents.
1-1-17	Added flashing lights to Type III barricades. Revised note ④.

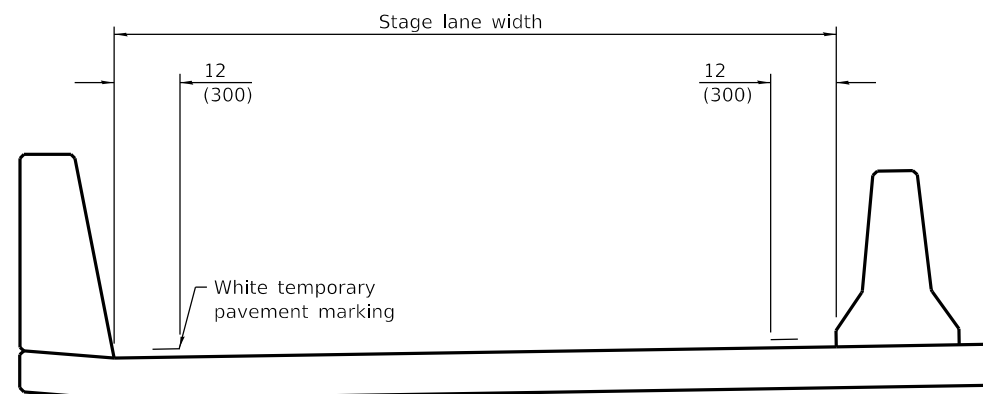
**LANE CLOSURE, 2L, 2W,  
BRIDGE REPAIR WITH BARRIER**

(Sheet 1 of 2)

**STANDARD 701321-18**



**DETECTOR LOOPS**

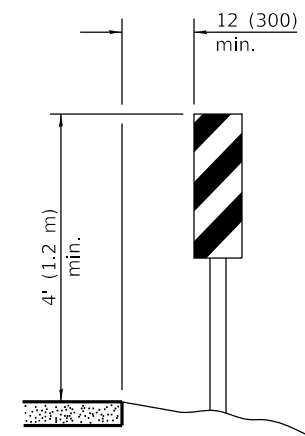


**TEMPORARY PAVEMENT MARKING**

TRAFFIC SIGNAL SEQUENCE						
PHASE	A			B		
INTERVAL	1	2	3	4	5	6
NORTHBOUND OR EASTBOUND	G	Y	R	R	R	R
SOUTHBOUND OR WESTBOUND	R	R	R	G	Y	R

TEMPORARY CONCRETE BARRIER	
NORMAL POSTED SPEED	TAPER RATIO
40 mph AND ABOVE	12:1
BELOW 40 mph	8:1

ADVISORY SPEED LIMIT	
NORMAL POSTED SPEED	ADVISORY SPEED
55 - 45 mph	40 mph
40 mph	35 mph
35 - 30 mph	30 mph



**VERTICAL PANELS**

(Post mounted, one each side)

**GENERAL NOTES**

This Standard is used where, at any time, any vehicle, equipment, workers, or their activities will encroach on one lane of a bridge. Traffic signals and a positive barrier are required.

Traffic signals shall be operational only when all traffic controls are in place. When traffic signals are not in operation, flaggers shall be used and traffic control shall conform to Standard 701201 or 701206.

Temporary concrete barrier shall be according to Standard 704001.

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

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

**LANE CLOSURE, 2L, 2W,  
BRIDGE REPAIR WITH BARRIER**

(Sheet 2 of 2)

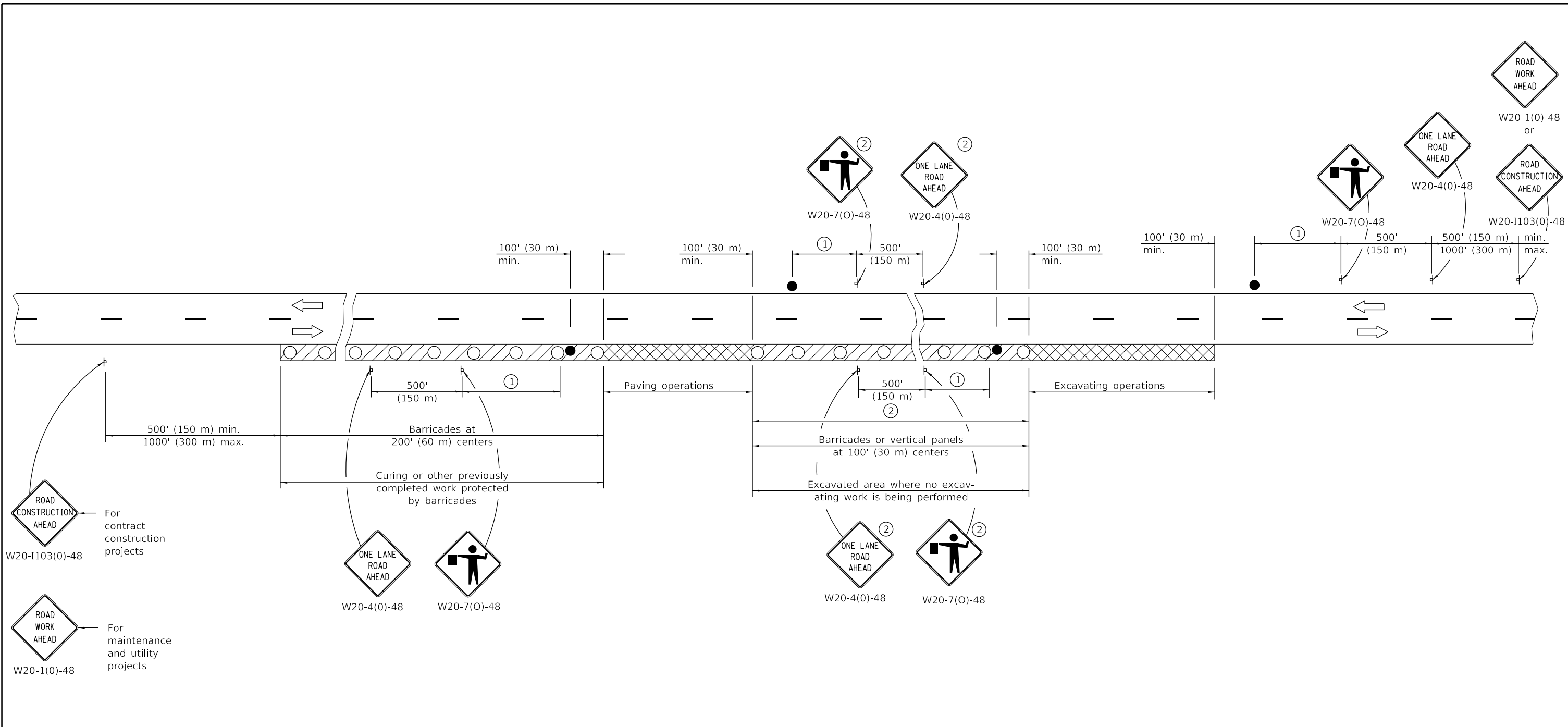
**STANDARD 701321-18**

Illinois Department of Transportation

PASSED January 1, 2020  
  
 ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2020  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



**SYMBOLS**

- Work area
- Active Work area
- Sign
- Barricade, drum, or vertical panels
- Flagger with traffic control sign

- ① Minimum distance is 200' (60 m). Maximum distance to be determined by the Engineer but in no case to exceed the length of 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

PASSED January 1, 2011  
  
 ENGINEER OF SAFETY ENGINEERING

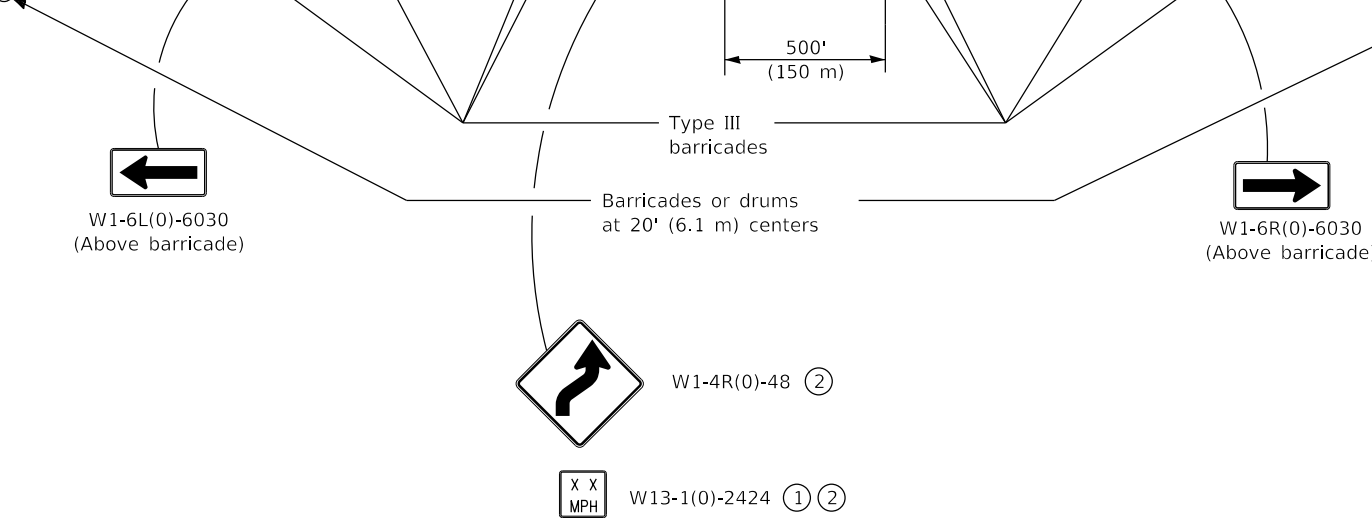
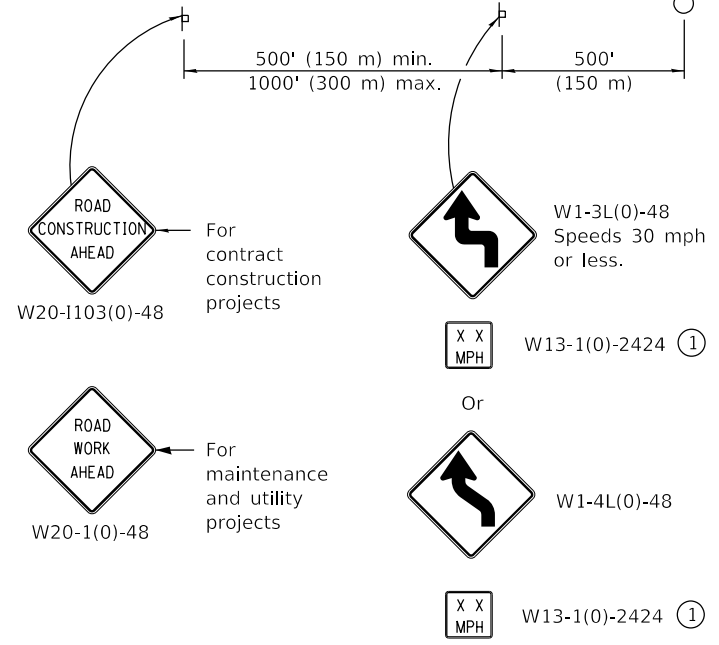
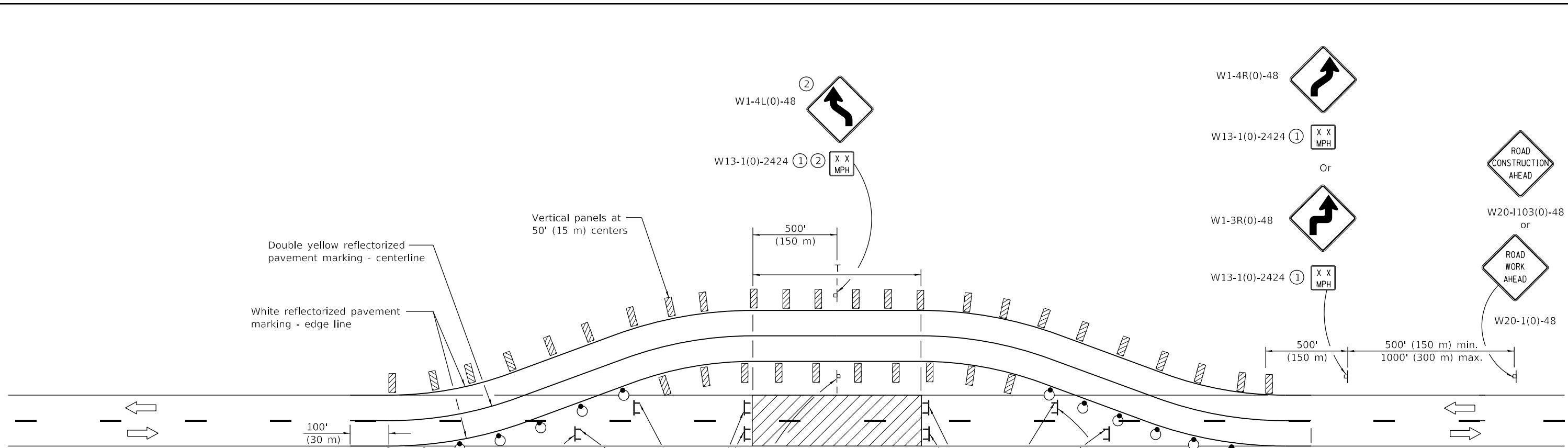
APPROVED January 1, 2011  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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

**LANE CLOSURE, 2L, 2W, PAVEMENT WIDENING, FOR SPEEDS ≥ 45 MPH**

**STANDARD 701326-04**

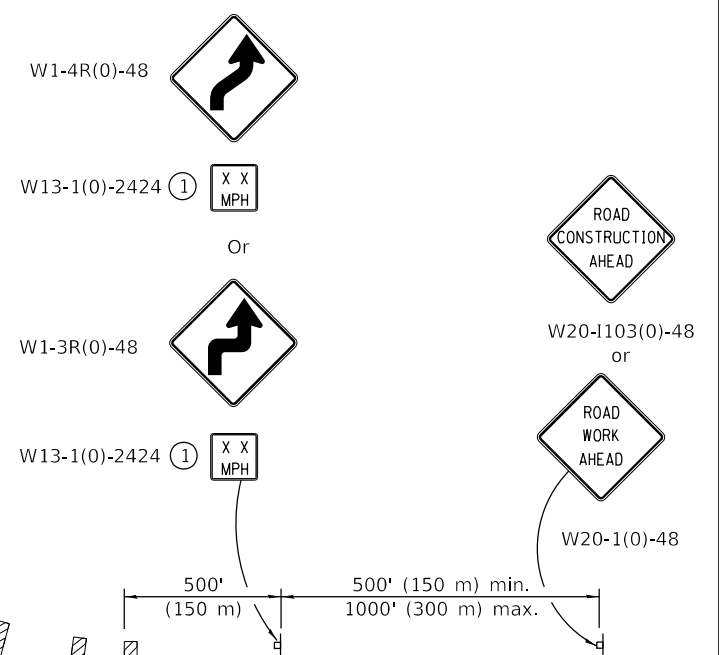


**TYPICAL APPLICATIONS**  
 Bridge construction  
 Culvert construction

**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.

DATE	REVISIONS
1-1-18	Changed lights on drums to bi-directional.
1-1-11	Changed vertical panel to double vertical panel.

**LANE CLOSURE, 2L, 2W,  
 WITH RUN-AROUND,  
 FOR SPEEDS ≥ 45 MPH**

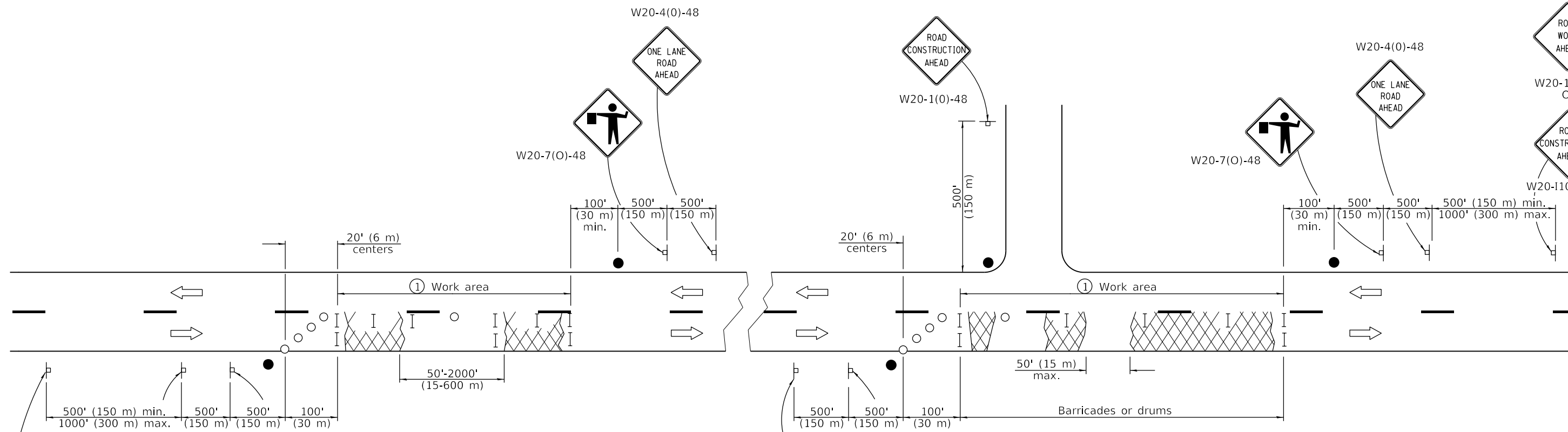
**STANDARD 701331-05**

Illinois Department of Transportation

PASSED January 1, 2018  
*Paul L. ...*  
 ENGINEER OF SAFETY PROG. AND ENGINEERING

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

ISSUED 1-1-97



**GENERAL NOTES**

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) 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 1/2 day's operation beyond the flagger sign. When the distance between successive 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.

**SYMBOLS**

- ▨ Patches
- ⊥ Sign
- Flagger with traffic control sign
- I Barricade or drum
- Cone, barricade or drum

① 1/2 mile (800 m) maximum

**TYPICAL APPLICATIONS**

Patching

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**

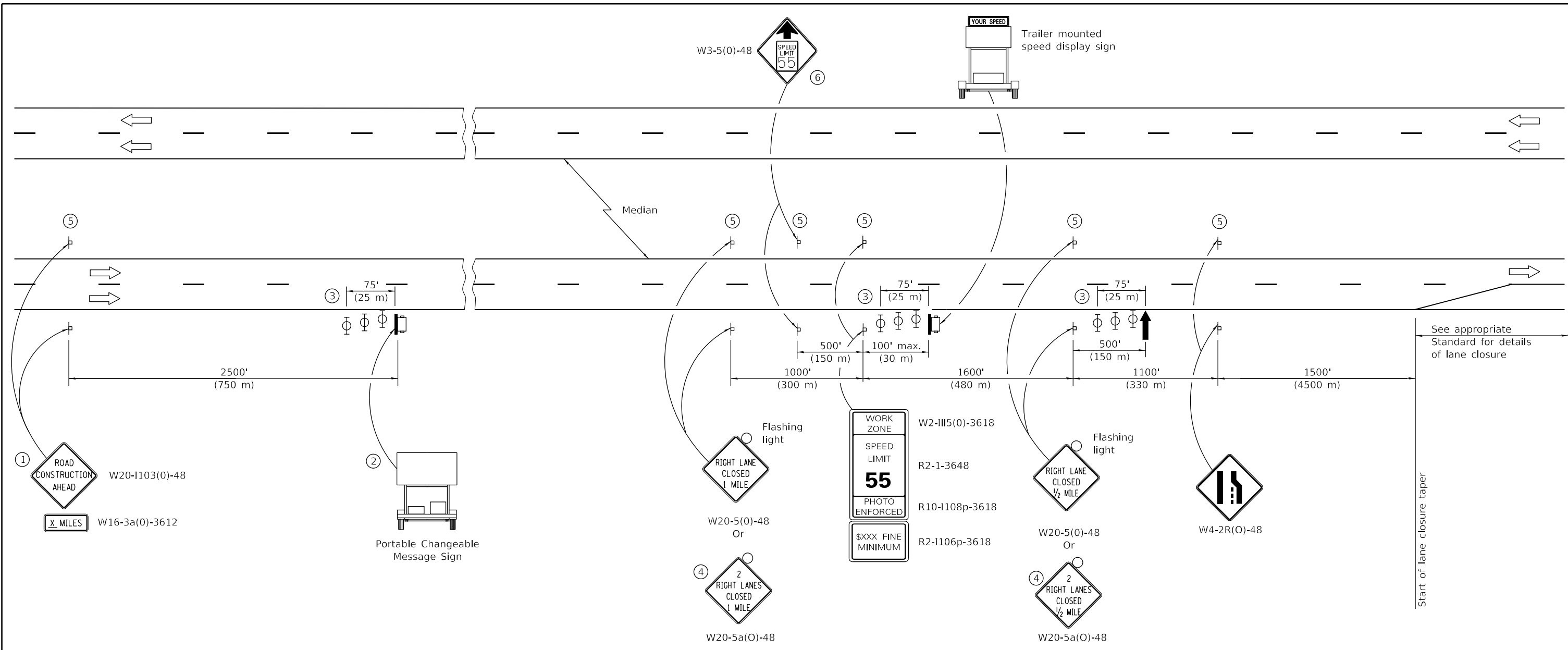
**STANDARD 701336-07**

Illinois Department of Transportation

APPROVED January 1, 2019  
*Cynthia Watt*  
ENGINEER OF SAFETY PROG. AND ENGINEERING

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

ISSUED 1-1-97



**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.

DATE	REVISIONS
1-1-21	Removed Work Zone Public Information sign and its note.
	Revised stationary sign gen. note.
1-1-17	Added trailer mounted speed display sign. Changed device spacing and note ④.

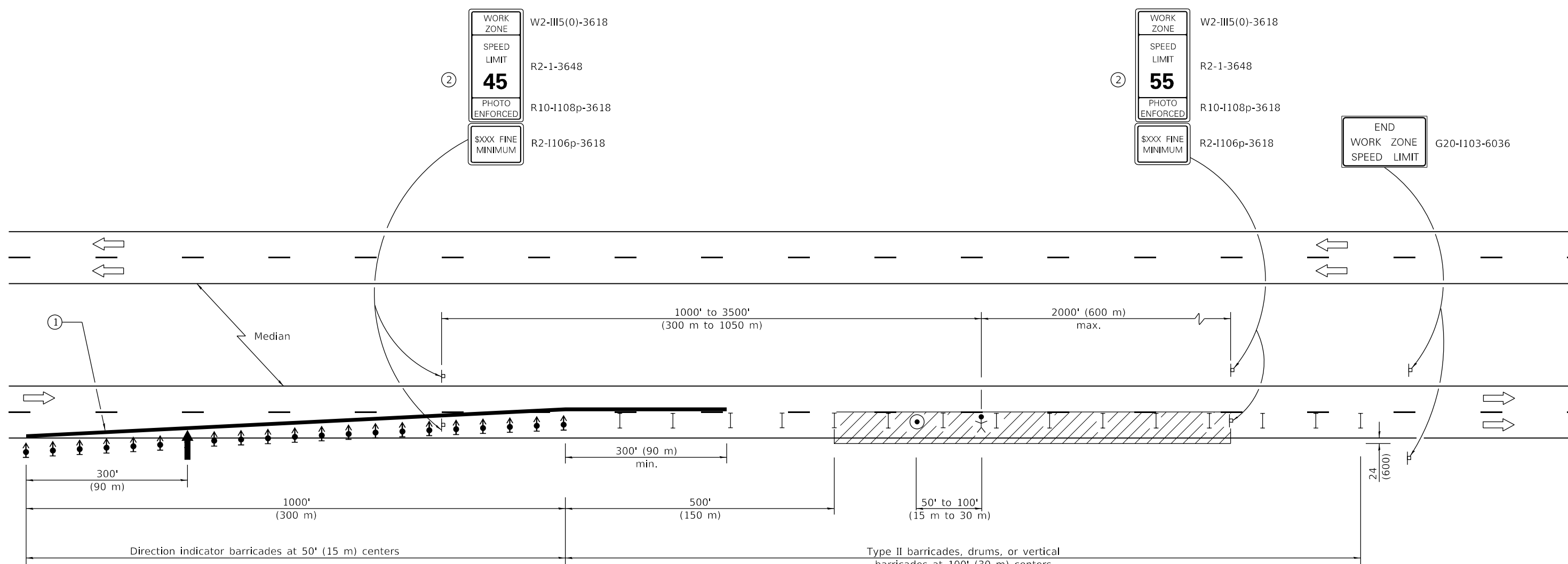
**APPROACH TO LANE CLOSURE, FREEWAY/EXPRESSWAY**  
**STANDARD 701400-10**

Illinois Department of Transportation

PASSED January 1, 2021  
*Cynthia A. Ott*  
 ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2021  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-04



See Standard 701400 for approach  
Start of lane closure taper

**SYMBOLS**

- Arrow board
- Work area
- Worker
- Sign
- Direction indicator barricade with steady burn monodirectional light
- 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.

DATE	REVISIONS
1-1-19	Replaced flagger with spotter.
1-1-18	Omitted lights in tangent.

**LANE CLOSURE,  
FREEWAY/EXPRESSWAY**

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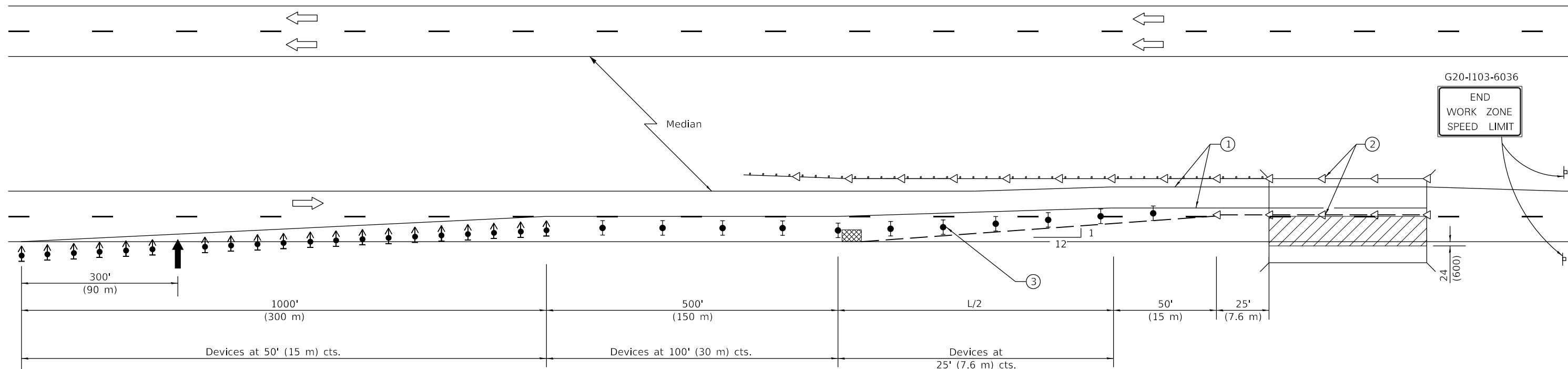
**STANDARD 701401-12**

Illinois Department of Transportation

APPROVED January 1, 2019  
*Cynthia Watt*  
ENGINEER OF SAFETY PROG. AND ENGINEERING









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

ISSUED 1-1-97



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.

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**

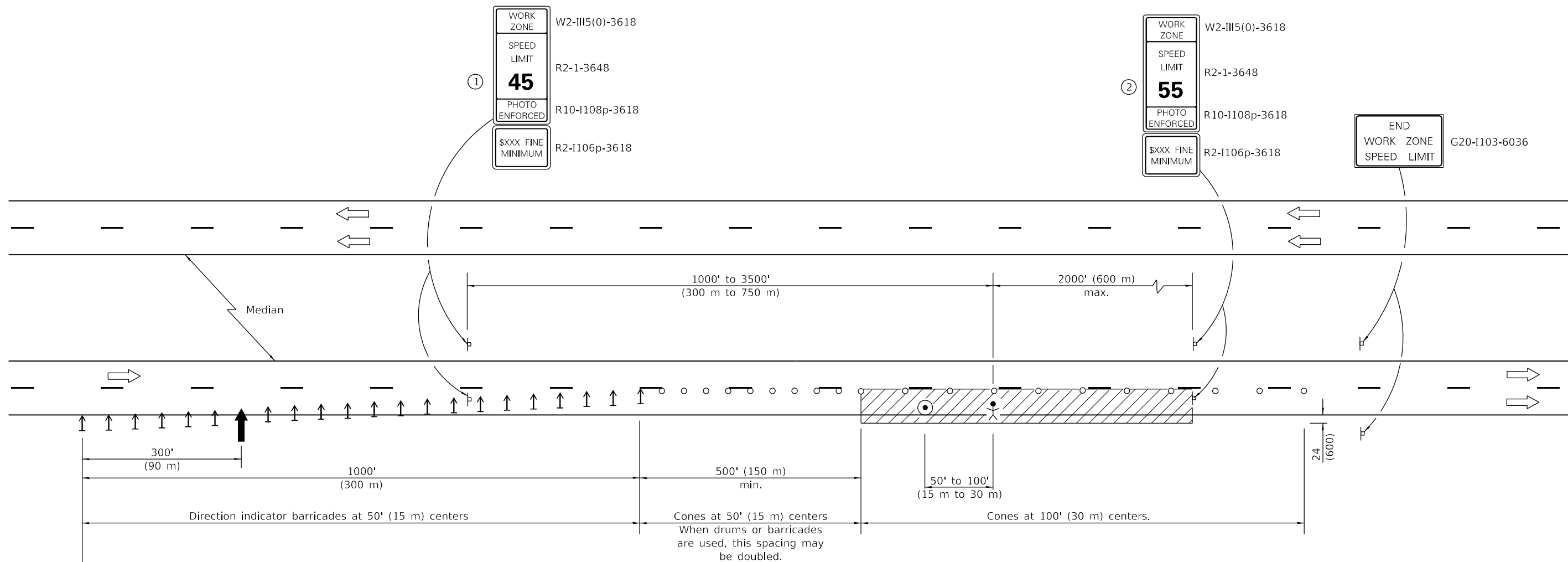
Illinois Department of Transportation

PASSED January 1, 2017  
*Paul L. ...*  
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2017  
*Maureen M. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-00





See Standard 701400 for approach  
Start of lane closure taper

**TYPICAL APPLICATIONS**

- Pavement patch
- Utility operations
- Bituminous resurfacing

**SYMBOLS**

- ↑ Arrow board
- ▨ Work area
- ⊙ Worker
- ⊥ Sign
- ↑ Direction indicator barricade
- Cone, drum or barricade
- ⊙ Spotter

- ① Work zone speed limit signs shall be moved as necessary to maintain the required spacing between the signs and the workers in each separate work activity.
- ② Work Zone Speed Limit 55 Photo Enforced sign shall be omitted when the work area dictates placement of the sign array within 500' (150 m) of the End Work Zone Speed Limit sign.

**GENERAL NOTES**

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 24 (600) of the edge of pavement for daylight operation.

This Standard must always be used in combination with Standard 701400.

This Standard also applies when work is being performed in the left lane. Under these conditions, the set up would be a mirror image to what is shown.

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

DATE	REVISIONS
1-1-19	Replaced flagger with spotter.
1-1-17	Revised END WORK ZONE SPEED LIMIT sign from orange to white background.

**LANE CLOSURE,  
FREEWAY/EXPRESSWAY,  
DAY OPERATIONS ONLY**

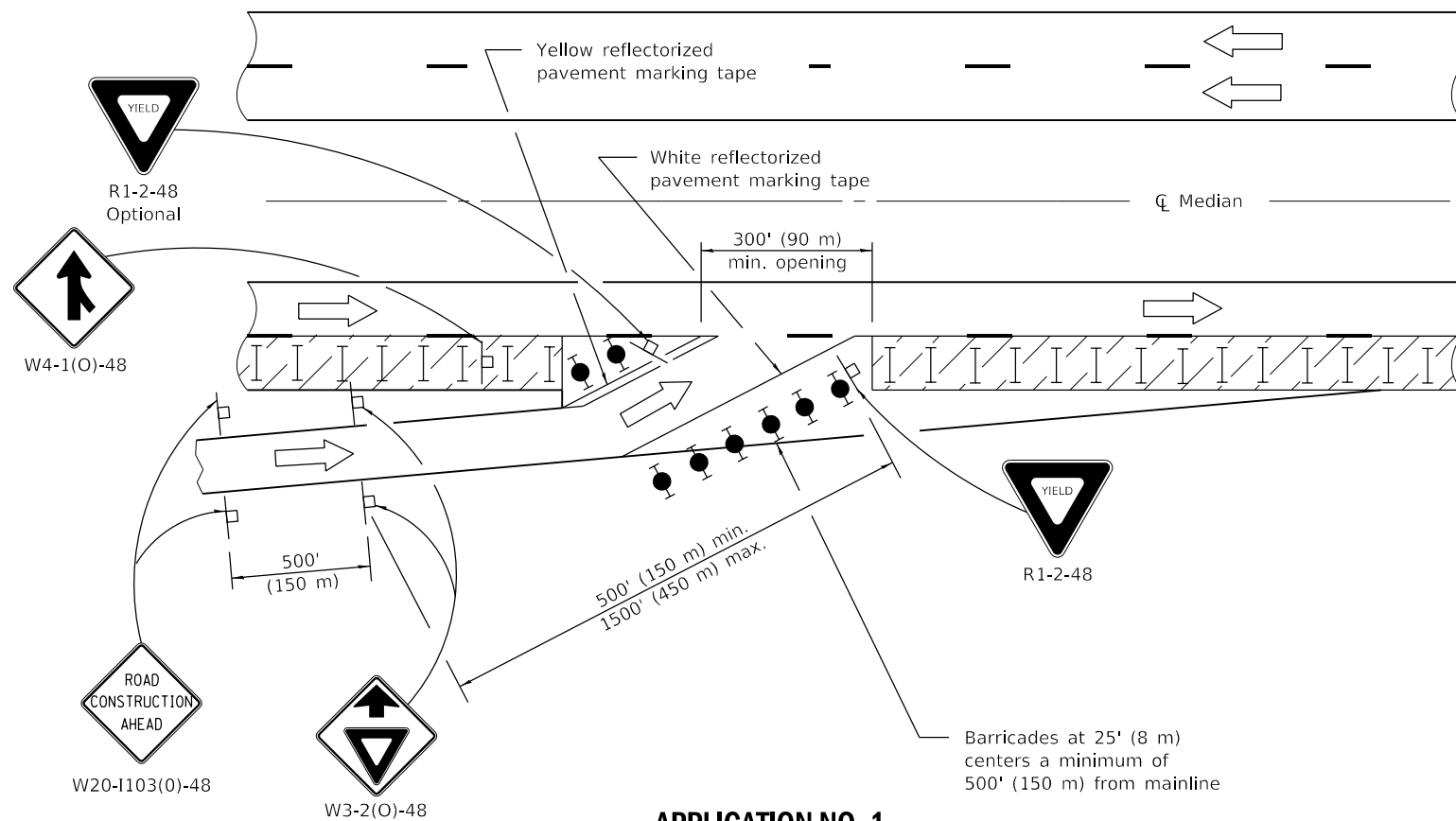
**STANDARD 701406-12**

Illinois Department of Transportation

APPROVED January 1, 2019  
*Cynthia Watt*  
ENGINEER OF SAFETY PROG. AND ENGINEERING

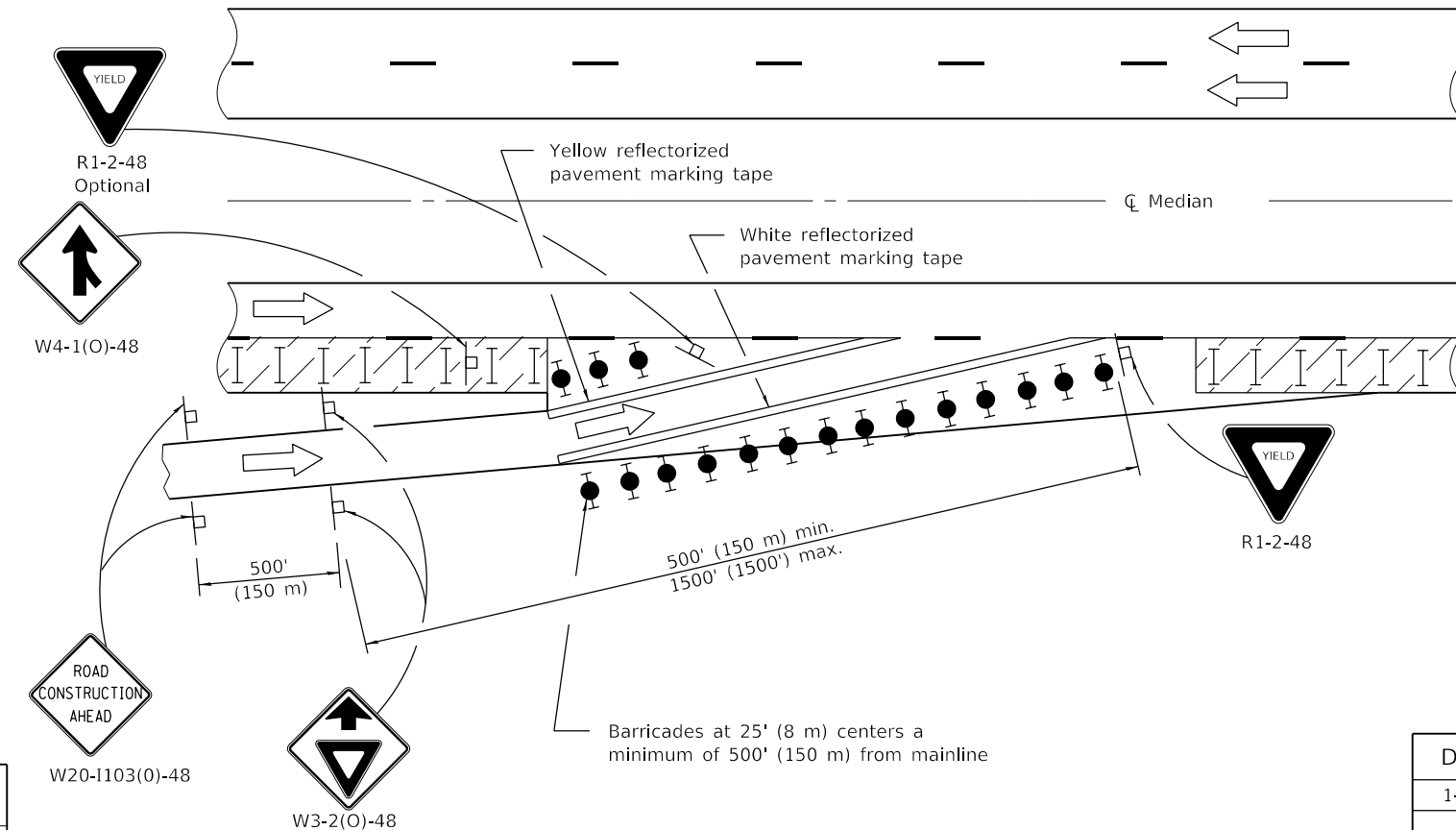
APPROVED January 1, 2019  
*Joe E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



**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.

DATE	REVISIONS
1-1-15	Revised gen. notes to limit App's 1 and 3 to five days, omit pvt. tape for ≤ 5 days.
1-1-12	Revised merge sign to agree with MUTCD. Dimensioned EXIT OPEN AHEAD sign.

**LANE CLOSURE, MULTILANE, AT ENTRANCE OR EXIT RAMP, FOR SPEEDS ≥ 45 MPH**  
(Sheet 1 of 2)

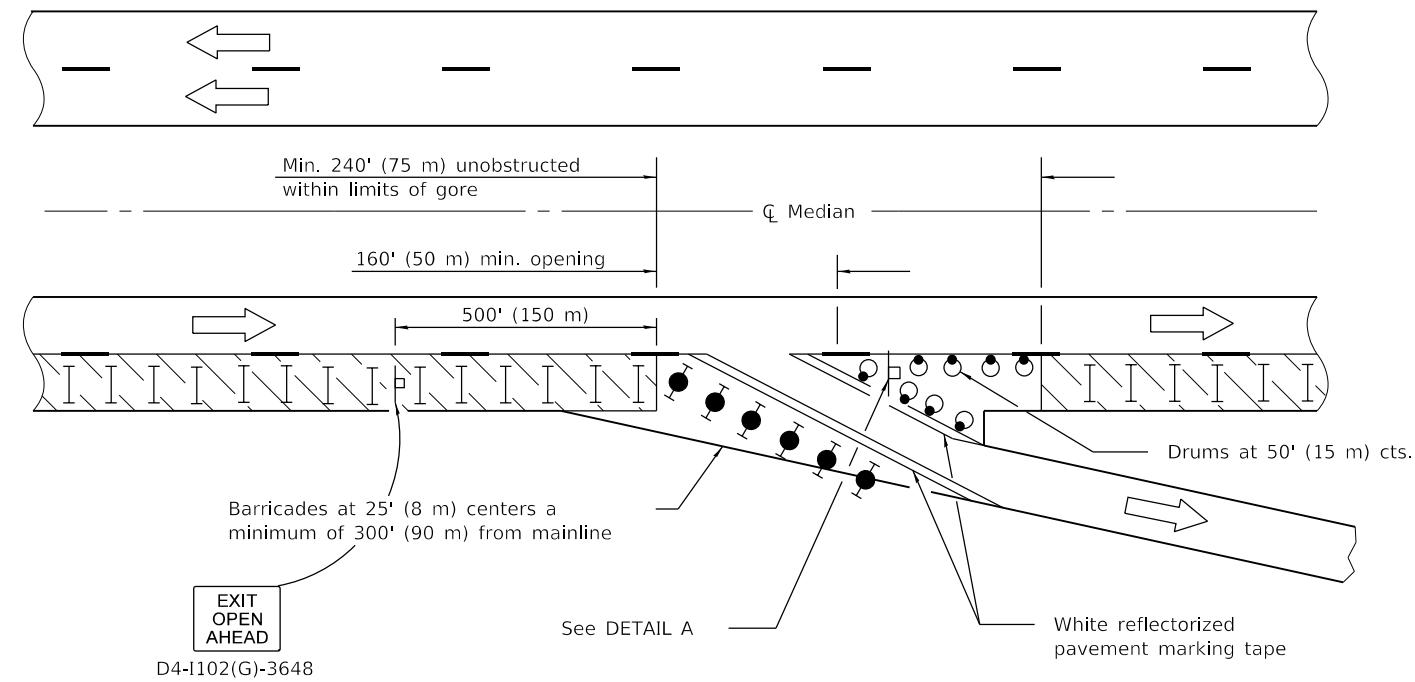
**STANDARD 701411-09**

Illinois Department of Transportation

PASSED January 1, 2015  
  
 ENGINEER OF SAFETY ENGINEERING

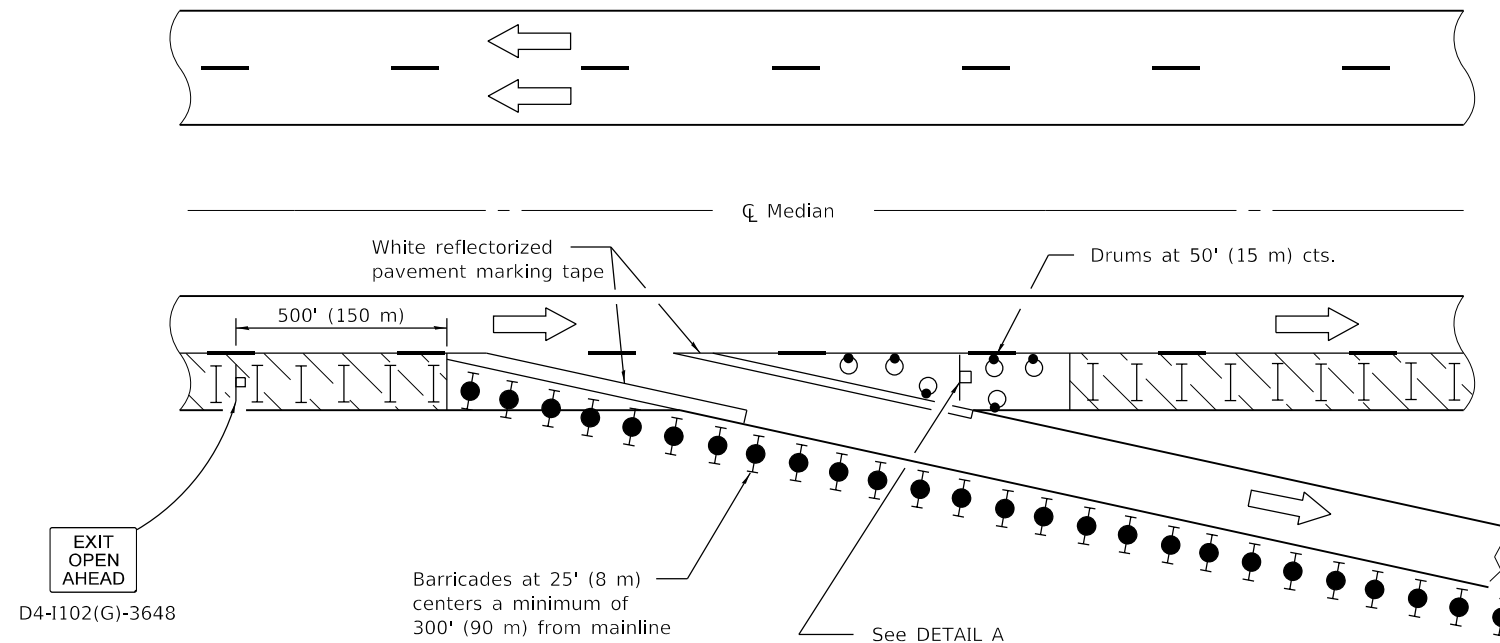
APPROVED January 1, 2015  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



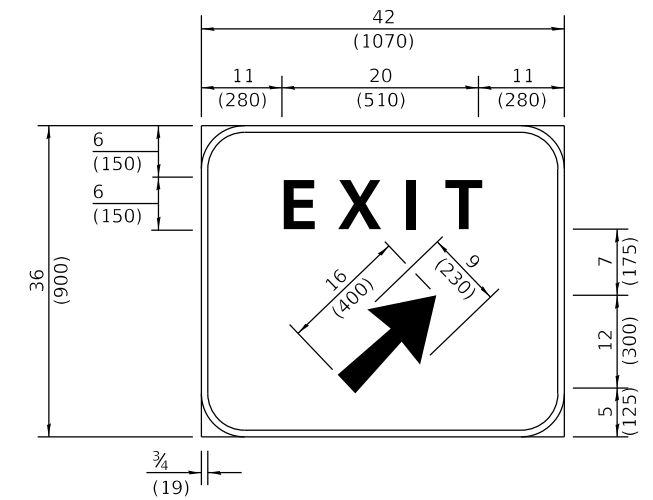
**APPLICATION NO. 3**

Application No. 3 depicts a modified exit ramp. The channelizing devices shall provide a clearly defined path for the exiting motorists. The minimum dimensions shown shall be increased as soon as the progress of the work will permit. The open portion of the ramp may be shifted, with the approval of the Engineer, to perform work in stages on the area adjacent to the ramp exit. Application No. 4 shall be put into effect as soon as possible.



**APPLICATION NO. 4**

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



**DETAIL A**

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

Illinois Department of Transportation

PASSED January 1, 2015

ENGINEER OF SAFETY ENGINEERING

APPROVED January 1, 2015

ENGINEER OF DESIGN AND ENVIRONMENT

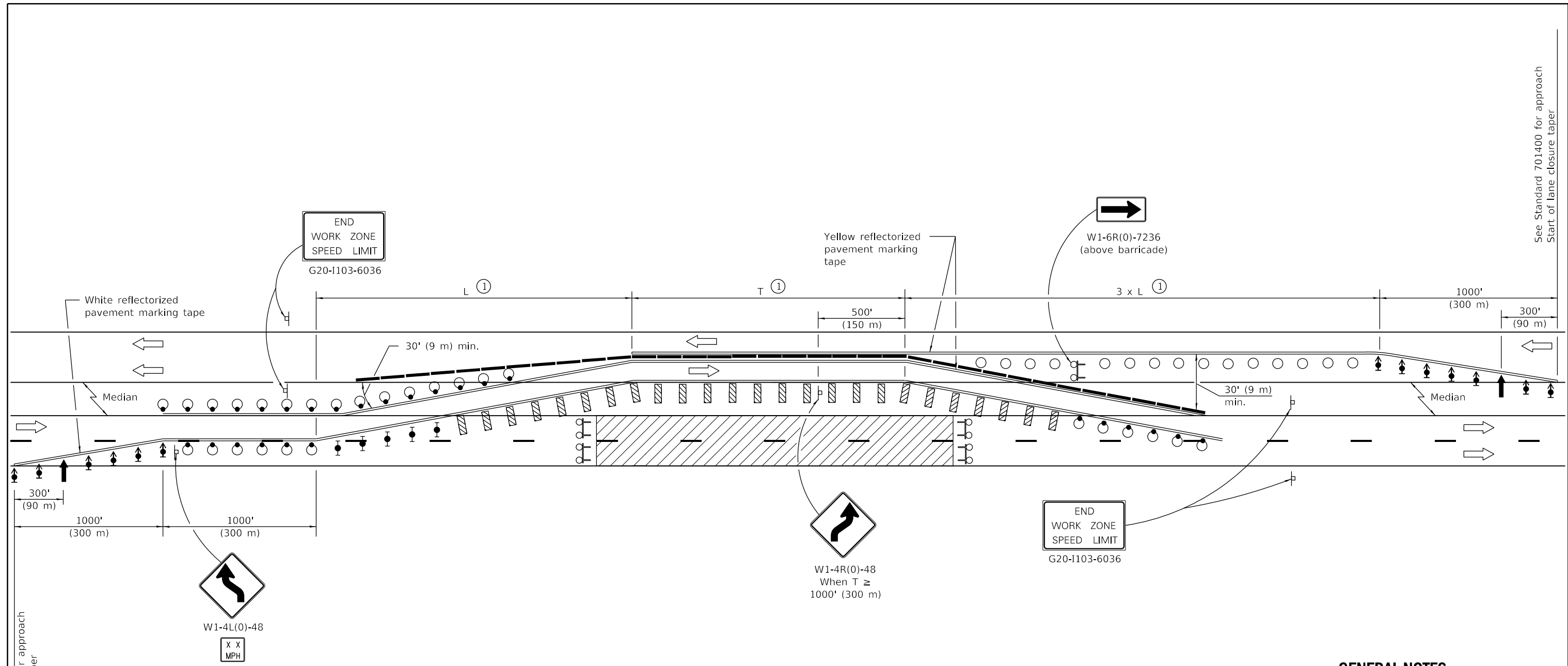
ISSUED 1-1-97

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











(Sheet 2 of 2)

**STANDARD 701411-09**

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 with steady burn monodirectional light
-  Drum with steady burn monodirectional light
-  Vertical Panel
-  Type III barricade with flashing lights
-  Temporary concrete barrier
-  Drum

① "L" and "T" shall be as shown on the plan details.

**GENERAL NOTES**

This Standard is used where at any time, any vehicle, equipment, workers or their activities require the closure of two adjacent lanes and a temporary crossover is provided by making use of one lane of pavement normally used by opposing flow of traffic and concrete barrier is used to separate the opposing traffic.

This Standard must always be used in combination with Standard 701400.

All barricades, drums, and vertical panels shall be at 50 ft. (15 m) centers.

Temporary concrete barrier shall be according to Standard 704001.

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

DATE	REVISIONS
1-1-18	Omitted lights on drums for the '3 x L' tangent.
1-1-17	Revised END WORK ZONE SPEED LIMIT sign from orange to white background.

**LANE CLOSURE,  
FREEWAY / EXPRESSWAY,  
WITH CROSSOVER AND BARRIER**

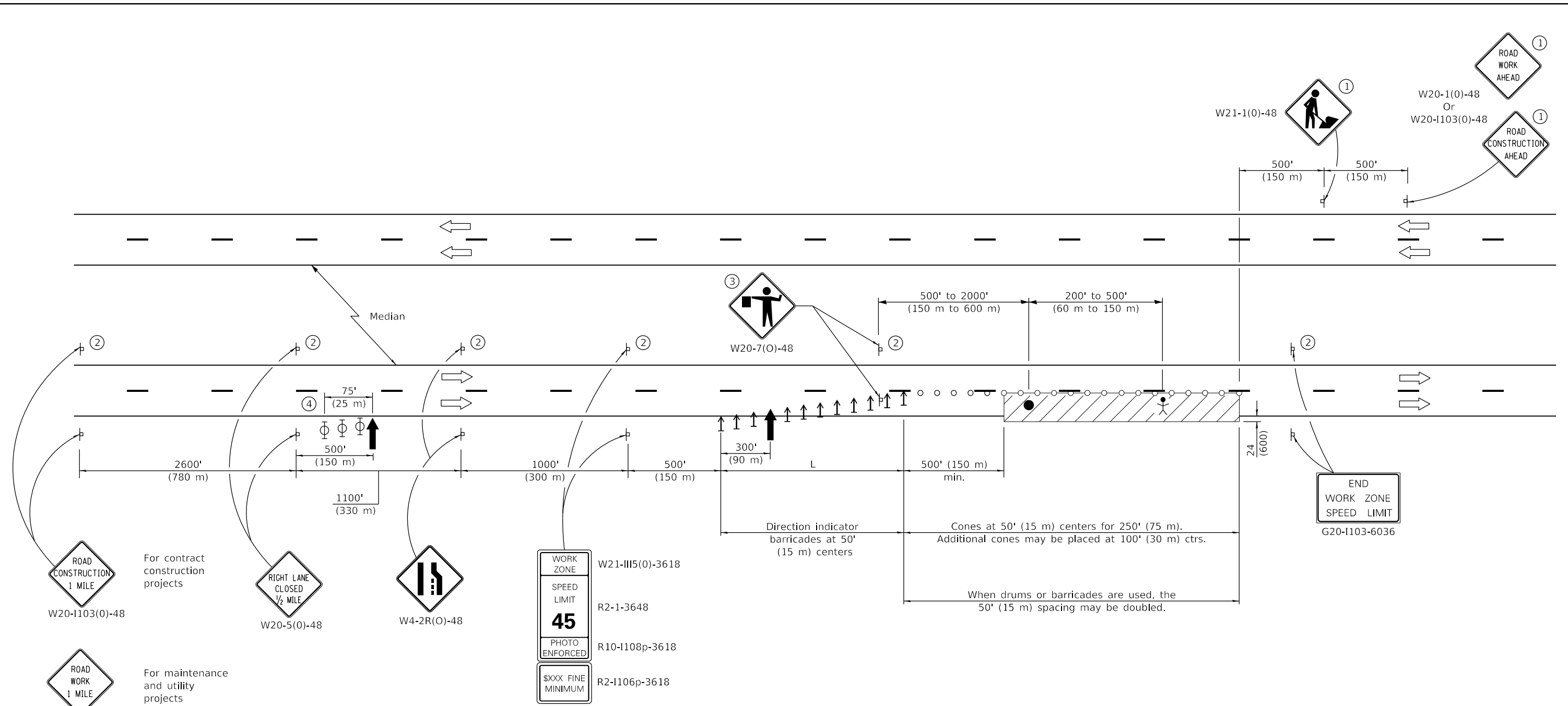
**STANDARD 701416-11**

Illinois Department of Transportation

PASSED January 1, 2018  
*Paul L. ...*  
ENGINEER OF SAFETY PROG. AND ENGINEERING

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

ISSUED 1-1-97



ROAD CONSTRUCTION 1 MILE  
W20-1103(0)-48

For contract construction projects

RIGHT LANE CLOSED 1/2 MILE  
W20-5(0)-48

W4-2R(0)-48

ROAD WORK 1 MILE  
W20-1(0)-48

For maintenance and utility projects

WORK ZONE W21-III5(0)-3618  
SPEED LIMIT 45 R2-1-3648  
PHOTO ENFORCED R10-1108p-3618  
\$XXX FINE MINIMUM R2-1106p-3618

L = lane width X taper ratio	
Normal Posted Speed	Taper Ratio
mph	
55	55/1
45	45/1

**SYMBOLS**

- ↑ Arrow board
- ▨ Work area
- ⊥ Sign
- ↑ Direction indicator barricade
- Cone, drum or barricade
- Flagger with traffic control sign
- ⚧ Worker
- ⊕ Type II barricade, drum, or vertical barricade with monodirectional flashing light

**TYPICAL APPLICATIONS**

Pavement patch  
Utility operations  
Bituminous resurfacing

- ① Undivided roadway only with left lane closure in opposite direction.
- ② Omitted when median is less than 10' (3 m).
- ③ FLAGGER signs shall be moved as necessary to maintain the required spacing between the sign and each separate work activity.
- ④ Three Type II barricades, drums, or vertical barricades at 25' (8 m) centers.

**GENERAL NOTES**

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 24 (600) of the edge of pavement.

This Standard also applies when work is being performed in the left lane. Under these conditions, LEFT LANE CLOSED signs shall be substituted for RIGHT LANE CLOSED signs. On undivided highways, signs shall be added in the opposite direction as shown.

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

DATE	REVISIONS
1-1-17	Rev. END WORK ZONE SPEED LIMIT sign. Changed device spacing at first arr. brd.
1-1-15	Revised END WORK ZONE SPEED LIMIT sign dimensions.

**LANE CLOSURE, MULTILANE, DAY OPERATIONS ONLY, FOR SPEEDS ≥ 45 MPH TO 55 MPH**

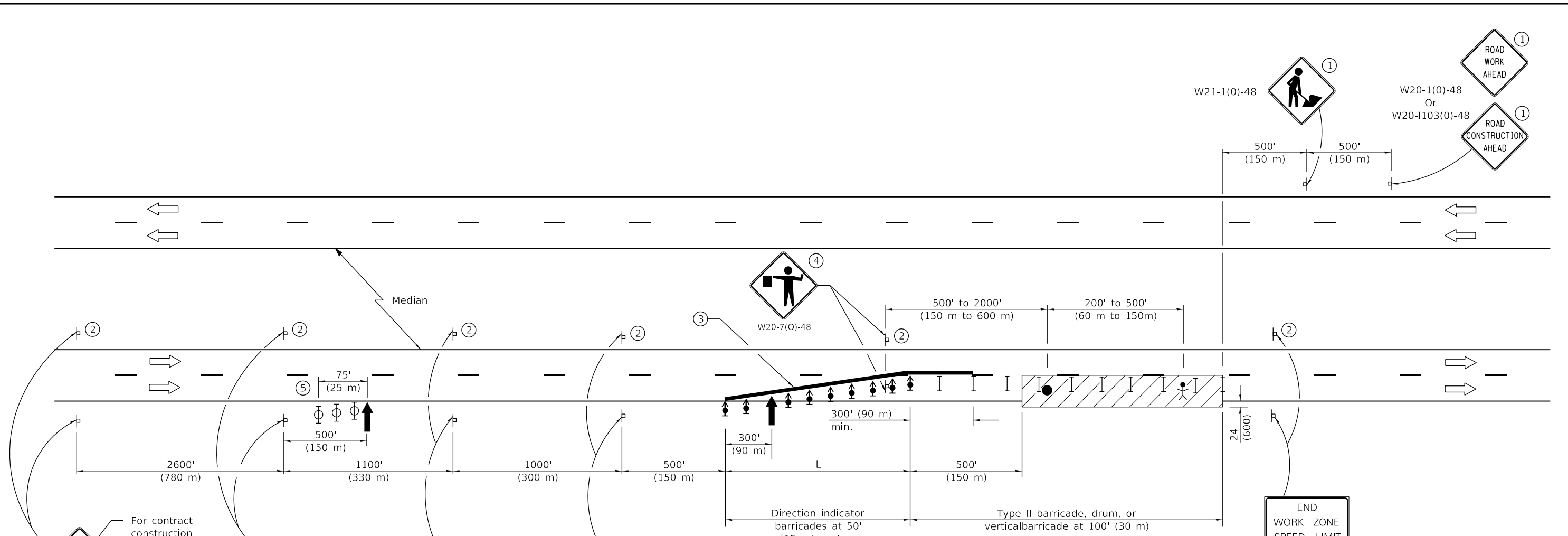
**STANDARD 701421-08**

Illinois Department of Transportation

PASSED January 1, 2017  
*Paul L. ...*  
ENGINEER OF SAFETY PROG. AND ENGINEERING

ISSUED 4-1-04

APPROVED January 1, 2017  
*Maureen M. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT



For contract construction projects

ROAD CONSTRUCTION 1 MILE  
W20-1103(0)-48

RIGHT LANE CLOSED 1/2 MILE  
W20-5(0)-48

W4-2R(0)-48

For maintenance and utility projects

ROAD WORK 1 MILE  
W20-1(0)-48

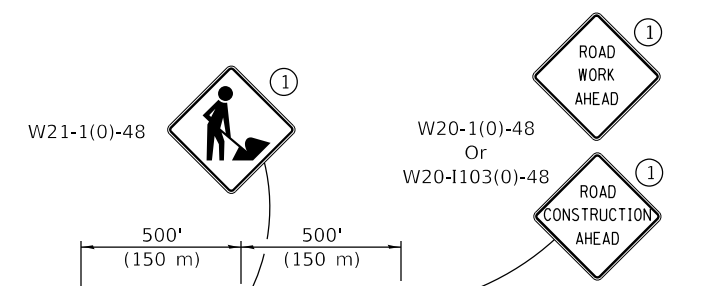
L = lane width X taper ratio	
Normal Posted Speed	Taper Ratio
mph	
55	55/1
45	45/1

WORK ZONE  
SPEED LIMIT  
**45**  
PHOTO ENFORCED  
R21-III5(0)-3618  
R2-1-3648  
R10-1108p-3618  
SXXX FINE MINIMUM  
R2-1106p-3618

**SYMBOLS**

- Arrow board
- Work area
- Sign
- Direction indicator barricade with steady burn monodirectional light
- Type II barricade, drum, or vertical barricade
- Flagger with traffic control sign
- Worker
- Type II barricade, drum, or vertical barricade with monodirectional flashing light

- ① Undivided roadway only with left lane closure in opposite direction.
- ② Omitted when median is less than 10' (3 m).
- ③ ReflectORIZED temporary pavement marking tape shall be placed throughout the taper and for 300' (90 m) along-side the work area where the closure time is greater than fourteen days. The edge line shall be white for right lane closures and yellow for left lane closures.
- ④ FLAGGER signs shall be moved as necessary to maintain the required spacing between the sign and each separate work activity.
- ⑤ Three Type II barricades, drums, or vertical barricades at 25' (8 m) centers.



**GENERAL NOTES**

This standard is used where at any time any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 24 (600) of the edge of pavement for daylight operation exceeding one day.

This standard also applies when work is being performed in the left lane. Under these conditions LEFT LANE CLOSED signs shall be substituted for RIGHT LANE CLOSED signs. On undivided highways, signs shall be added in the opposite direction as shown.

A check barricade shall be placed in the middle of the closed lane and at the shoulder at 1000' (300 m) centers.

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

DATE	REVISIONS
1-1-18	Omitted lights in tangent.
1-1-17	Rev. END WORK ZONE SPEED LIMIT sign. Changed device spacing at first arr. brd.

**LANE CLOSURE, MULTILANE, FOR SPEEDS ≥ 45 MPH TO 55 MPH**

**STANDARD 701422-10**

Illinois Department of Transportation

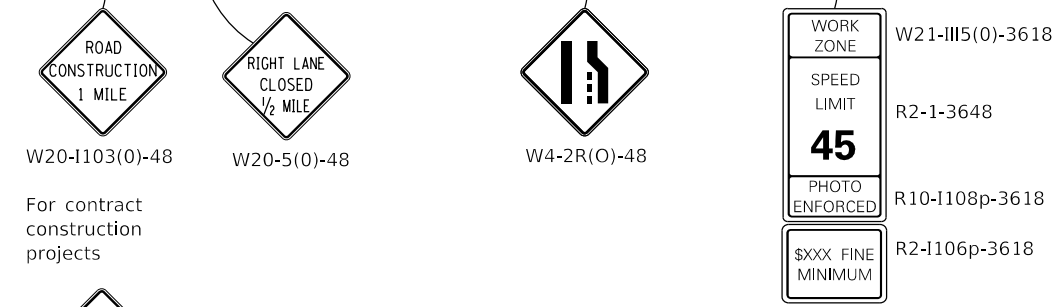
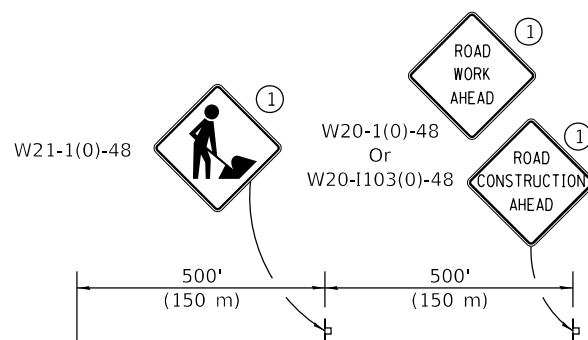
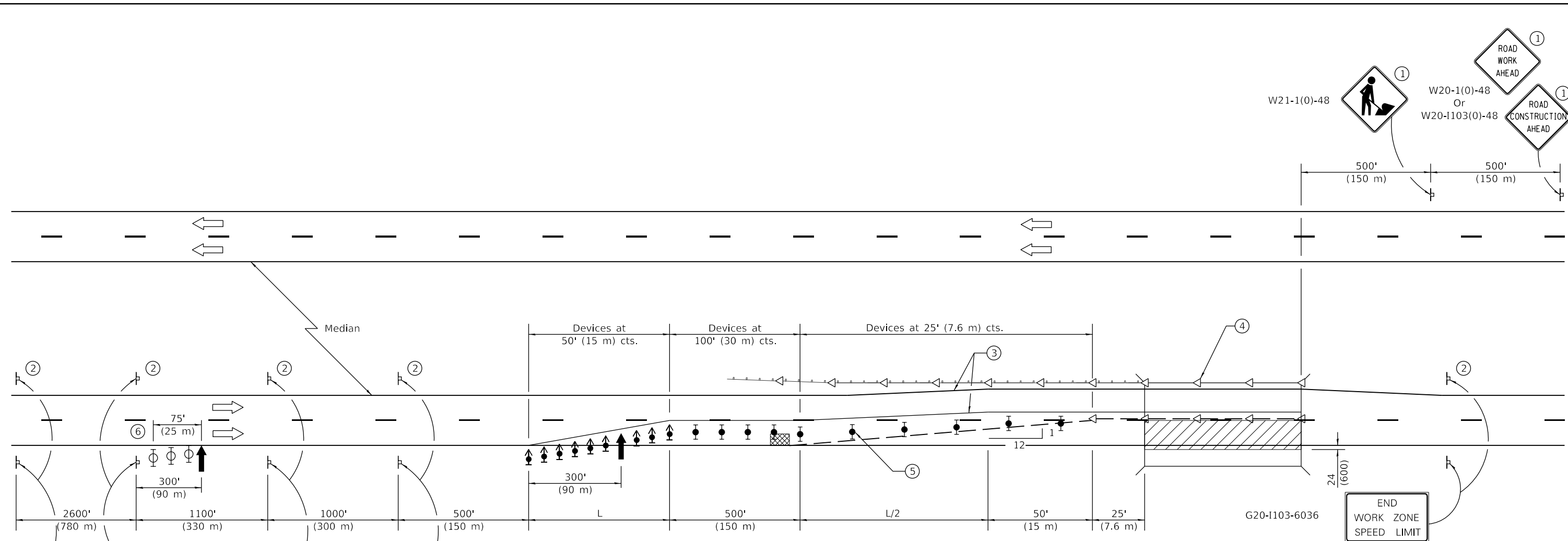
PASSED January 1, 2018

ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-04



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

W = Width of offset in feet (meters).  
S = Normal posted speed in mph (km/h).

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

DATE	REVISIONS
1-1-17	Revised END WORK ZONE SPEED LIMIT sign. Changed device spacing at first arr. brd.
4-1-16	Corrected reference to standard in note ④.

**LANE CLOSURE, MULTILANE, WITH BARRIER, FOR SPEEDS ≥ 45 MPH TO 55 MPH**

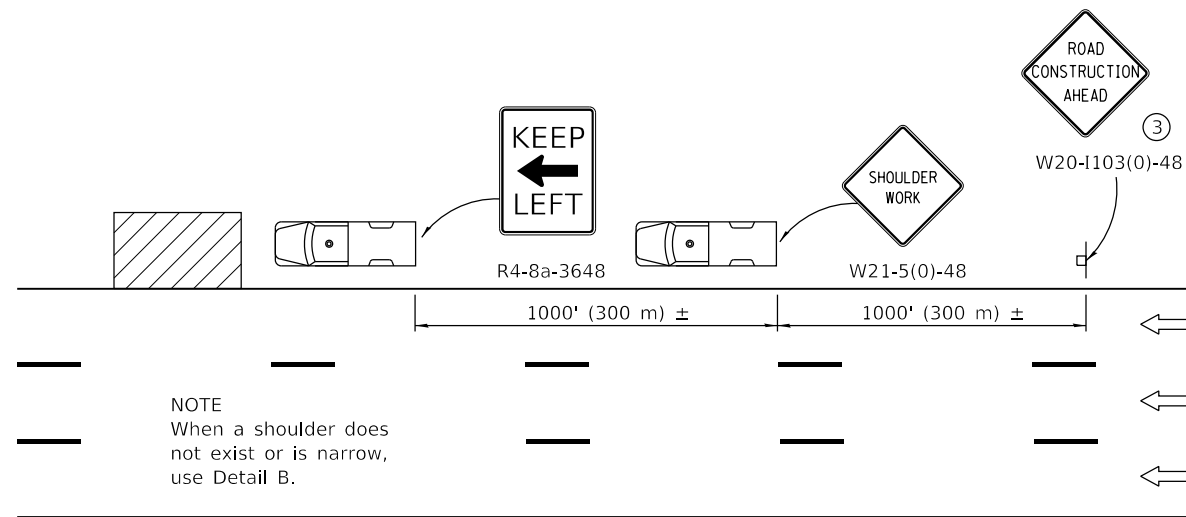
**STANDARD 701423-10**

Illinois Department of Transportation

PASSED January 1, 2017  
  
 ENGINEER OF SAFETY PROG. AND ENGINEERING

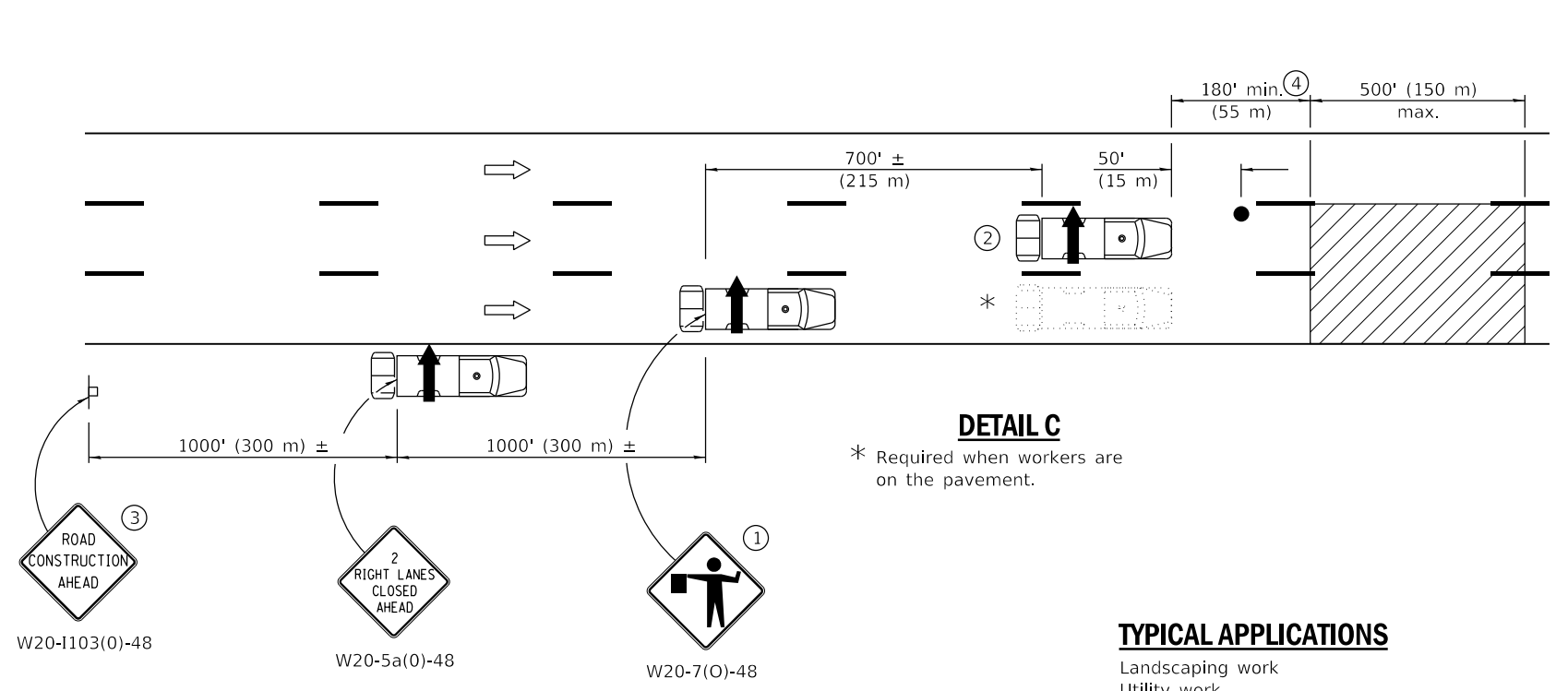
APPROVED January 1, 2017  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-00



NOTE  
When a shoulder does not exist or is narrow, use Detail B.

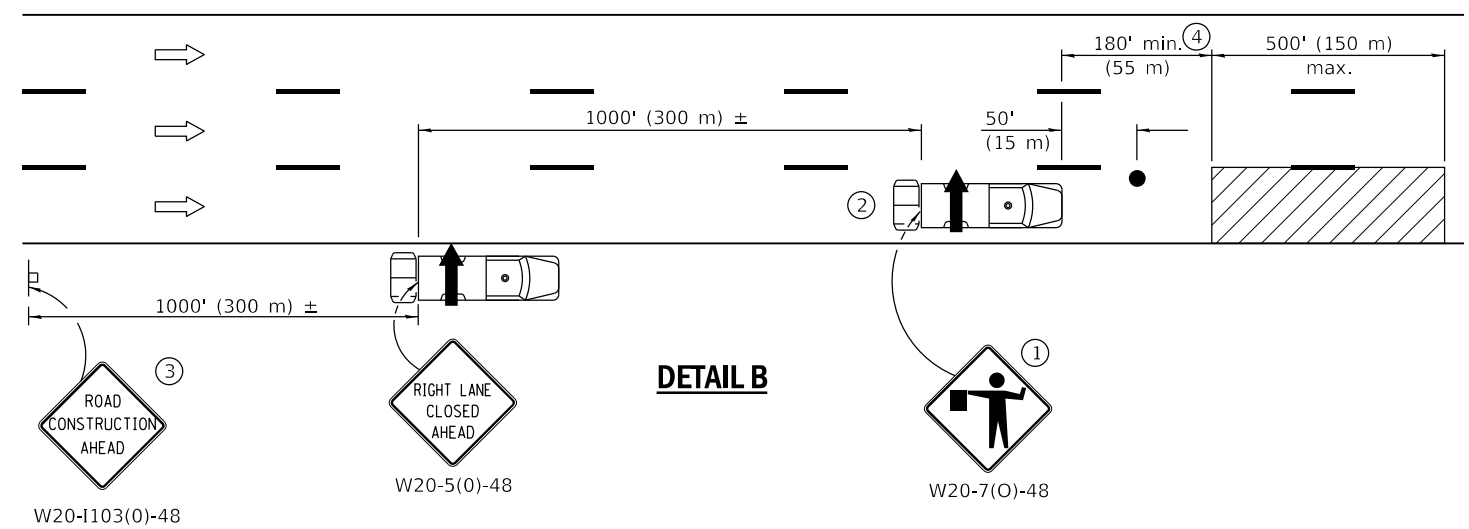
**DETAIL A**



**DETAIL C**  
\* Required when workers are on the pavement.

**TYPICAL APPLICATIONS**

- Landscaping work
- Utility work
- Pavement marking
- Weed spraying
- Roadometer measurements
- Debris cleanup
- Crack pouring



**DETAIL B**

- ① Flaggers are required when workers are on the pavement.
- ② For striping operations only. See sign arrow detail on this standard.
- ③ For stationary operations which are on the roadway or shoulder, greater than 15 minutes and up to 1 hour.
- ④ The distance between the work and the lead truck may vary according to terrain or paint/crack sealing drying time.



G20-1101-2430  
(appropriate arrow)  
② (when striping only)

**GENERAL NOTES**

This Standard is used where any vehicle, equipment, workers or their activities will require:  
1) stationary operations up to 1 hour, or 2) a continuous or intermittent moving operation where the average speed of movement is greater than 1 mph (2 km/h).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions, KEEP RIGHT signs shall be substituted for KEEP LEFT signs and arrow board indications shall be directed to the right.

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

**SYMBOLS**

- ↑ Arrow board
- ▨ Work area
- 🚚 Truck with flashing amber light
- 🚛 Truck/Trailer mounted attenuator
- Flagger with traffic control sign
- 🚧 Sign

Illinois Department of Transportation

PASSED January 1, 2017  
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2017  
ENGINEER OF DESIGN AND ENVIRONMENT

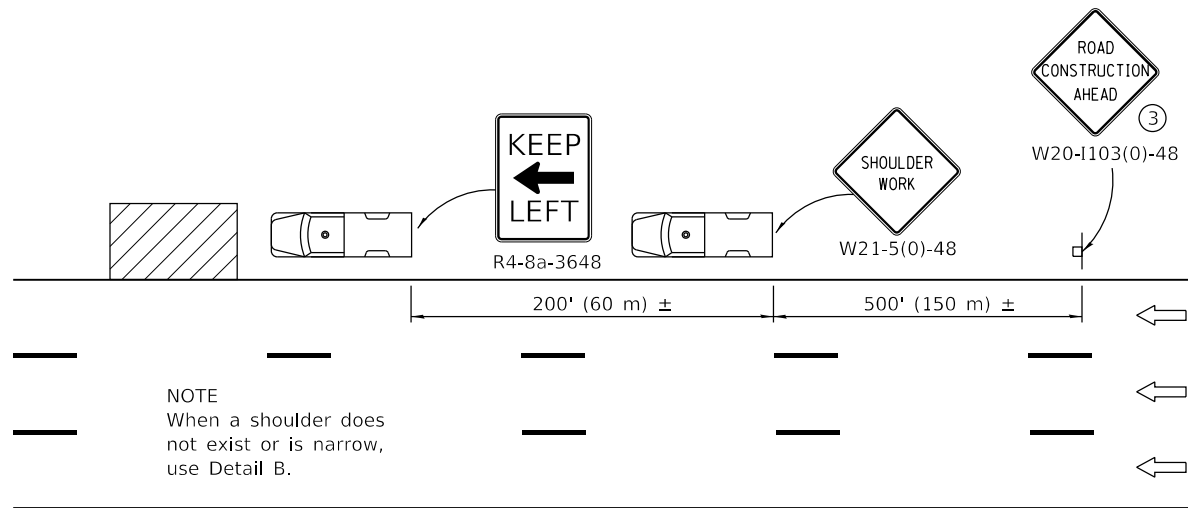
ISSUED 1-1-97

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 gen. notes.

**LANE CLOSURE, MULTILANE, INTERMITTENT OR MOVING OPER., FOR SPEEDS ≥ 45 MPH**

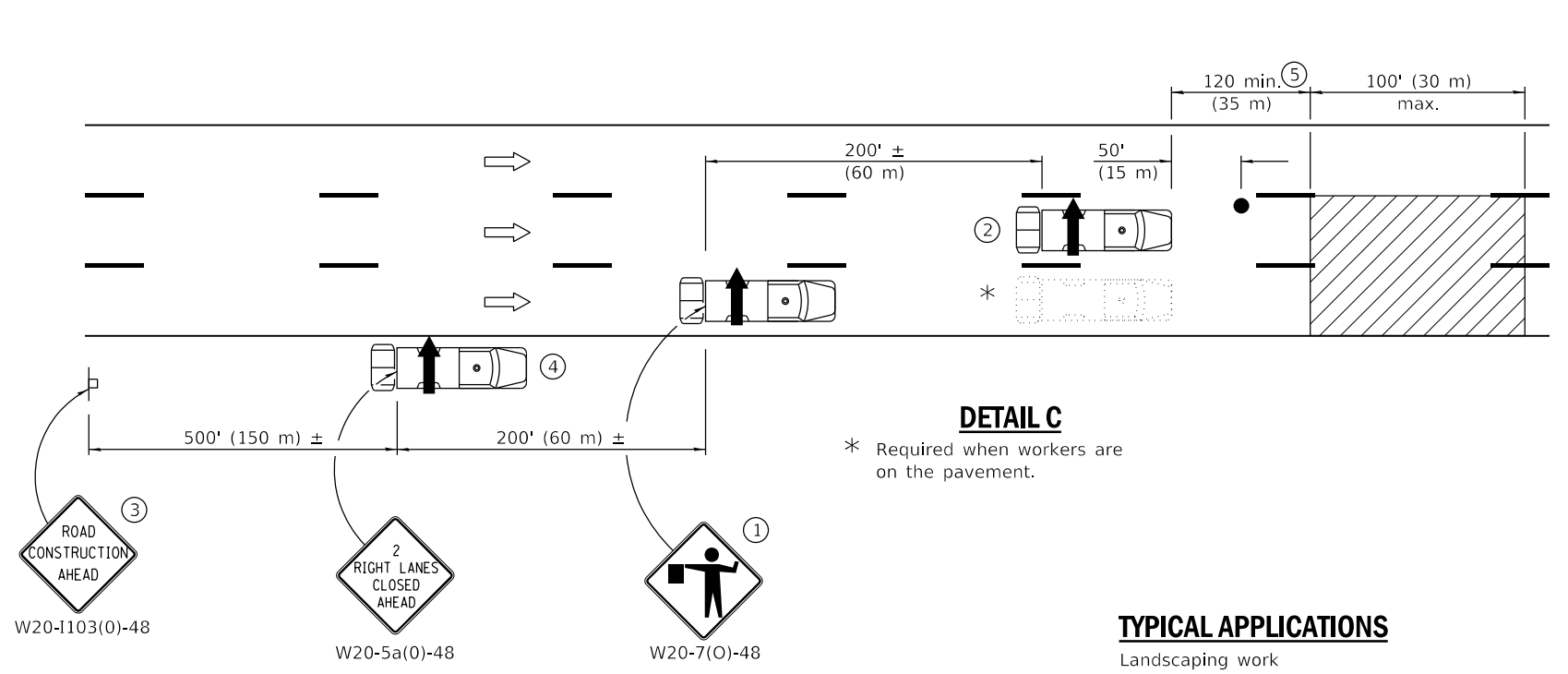
**STANDARD 701426-09**





NOTE  
When a shoulder does not exist or is narrow, use Detail B.

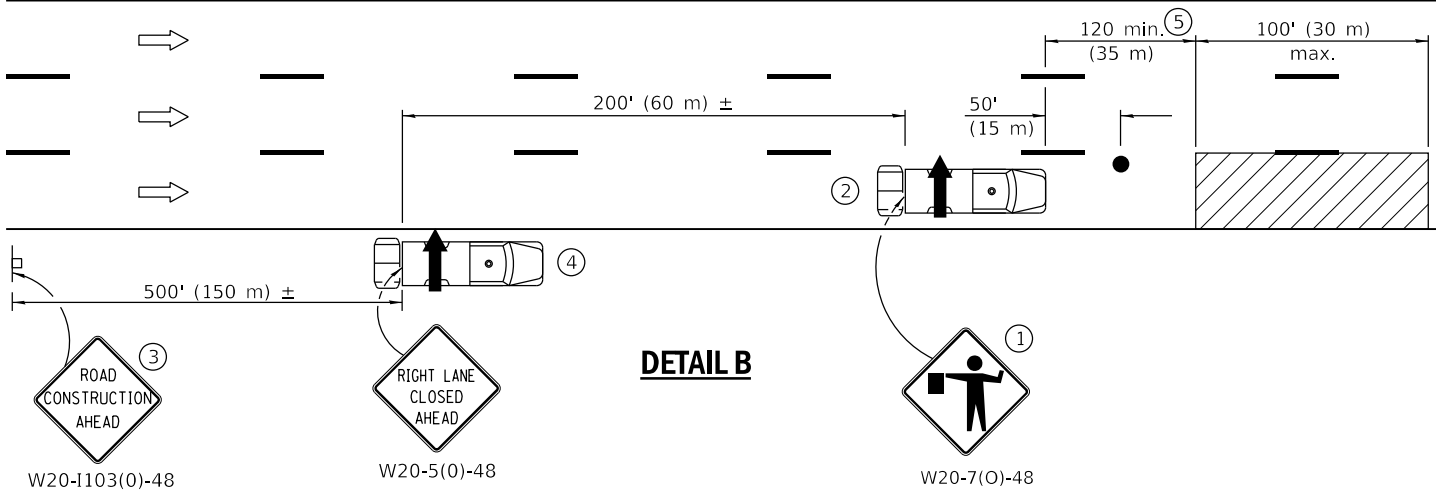
**DETAIL A**



**DETAIL C**  
\* Required when workers are on the pavement.

**TYPICAL APPLICATIONS**

- Landscaping work
- Utility work
- Pavement marking
- Weed spraying
- Roadometer measurements
- Debris cleanup
- Crack pouring



**DETAIL B**

- ① Flaggers are required when workers are on the pavement.
- ② For striping operations only. See sign arrow detail on this standard.
- ③ For stationary operations which are on the roadway or shoulder, greater than 15 minutes and up to 1 hour.
- ④ Omit truck, attenuator and arrow board when no shoulder exists due to curb and gutter.
- ⑤ The distance between the work and the lead truck may vary according to terrain or paint/crack sealing time.



G20-1101-2430  
(appropriate arrow)  
② (when striping only)

**GENERAL NOTES**

This Standard is used where any vehicle, equipment, workers or their activities will require:  
1) stationary operations up to 1 hour, or 2) a continuous or intermittent moving operation where the average speed of movement is greater than 1 mph (2 km/h).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions, KEEP RIGHT signs shall be substituted for KEEP LEFT signs and arrow board indications shall be directed to the right.

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

**SYMBOLS**

- Arrow board
- Work area
- Truck with flashing amber light
- Truck/Trailer mounted attenuator
- Flagger with traffic control sign
- Sign

DATE	REVISIONS
1-1-17	Revised 'NOTE' on DETAIL A to use DETAIL B in lieu of DETAIL C.
4-1-16	Rev. gen. notes. Added note ⑤. Rev. dist. between work and lead truck.

**LANE CLOSURE, MULTILANE, INTERMITTENT OR MOVING OPER., FOR SPEEDS ≤ 40 MPH**

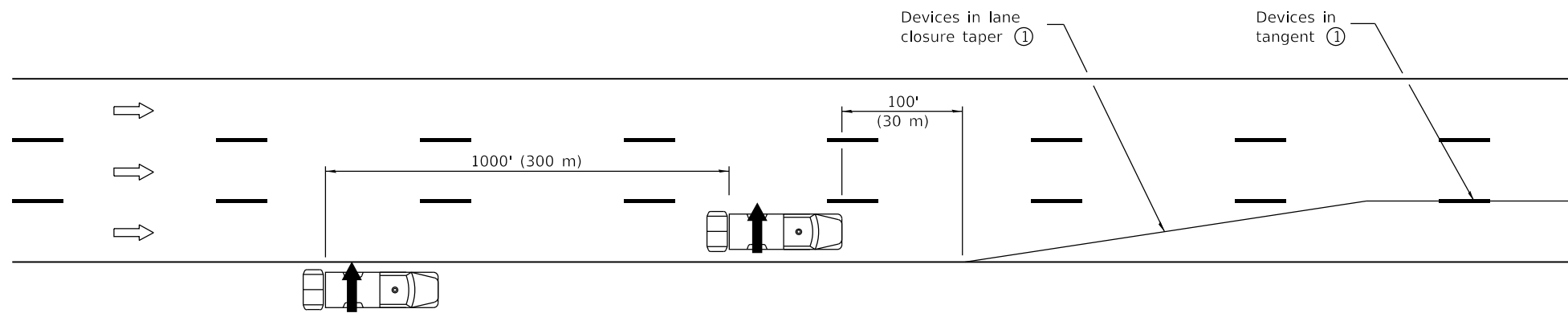
**STANDARD 701427-05**

Illinois Department of Transportation

PASSED January 1, 2017  
*Paul L. ...*  
ENGINEER OF SAFETY PROG. AND ENGINEERING

ISSUED 1-1-17

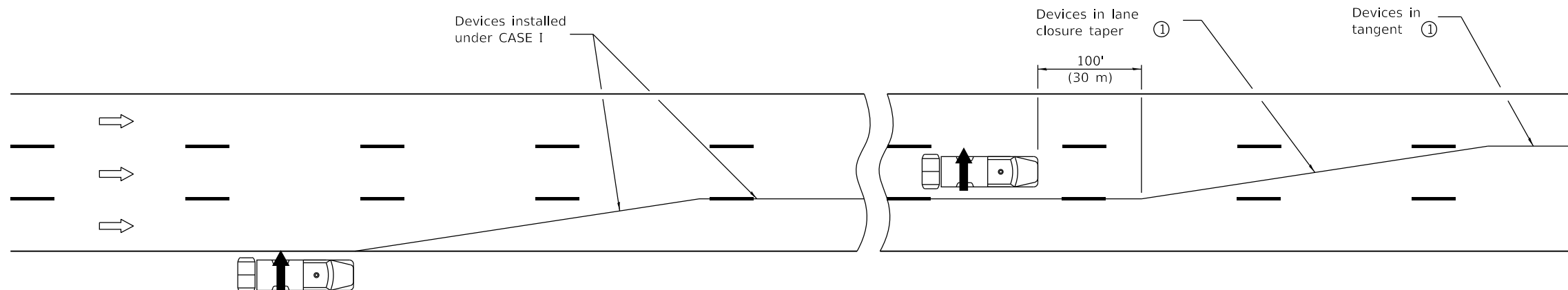
APPROVED January 1, 2017  
*Maureen M. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT



① See plans or appropriate Standard for delineating devices, spacing and length of taper/tangent.

### CASE I


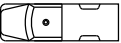

CASE I depicts the setup of delineating devices for a single outside lane closure.



### CASE II

CASE II depicts the setup of delineating devices for a two lane closure. The single lane closure device setup as depicted in CASE I shall be performed prior to the setup for the second lane closure.

### SYMBOLS

-  Arrow board
-  Truck with flashing amber light
-  Truck/Trailer mounted attenuator

### GENERAL NOTES

This Standard is used for setup and removal of lane closures on freeways/expressways having ADT greater than 25,000.

Trucks with arrow boards and truck-mounted-attenuators shall be in place as shown for the setup and removal of the lane closure taper(s) and the first 100' (30 m) of channelizing devices in the tangent(s).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions arrow board indications shall be directed to the right.

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

DATE	REVISIONS
4-1-16	Added trailer option for attenuator symbol.
1-1-14	New Standard.

## TRAFFIC CONTROL SETUP AND REMOVAL FREEWAY/EXPRESSWAY

STANDARD 701428-01

Illinois Department of Transportation

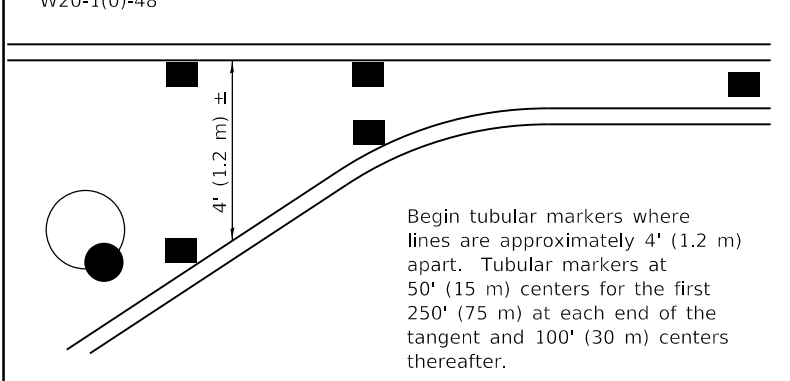
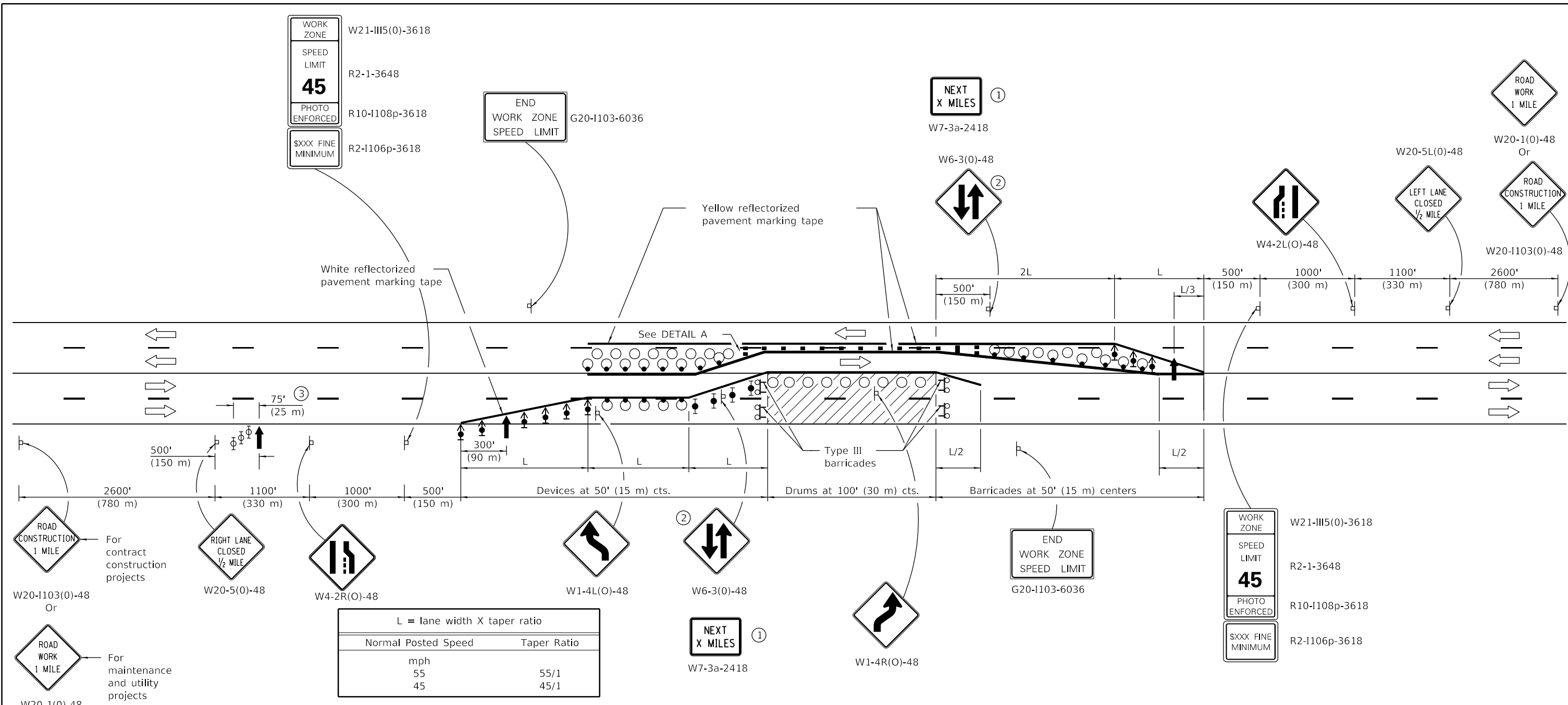
PASSED April 1, 2016

*[Signature]*  
ENGINEER OF SAFETY ENGINEERING

APPROVED April 1, 2016

*[Signature]*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



- SYMBOLS**
- ↑ Arrow board
  - ▨ Work area
  - ⊥ Sign
  - Drum with steady burn monodirectional light
  - ↑ Direction indicator barricade with steady burn monodirectional light
  - ⊥ Type II barricade with steady burn monodirectional light
  - ⊕ Type II barricade, drum or vertical barricade with monodirectional flashing light
  - Tubular marker
  - ⊥ Type III barricade with flashing monodirectional lights
  - Drum

- ① Shall be repeated every 1 mile (1.6 km).
- ② Shall be repeated every 1 mile (1.6 km) in each direction in the tangent section unless concrete barrier is used.
- ③ Three Type II barricades, drums or vertical barricades at 25' (8 m) centers.

**GENERAL NOTES**

This Standard is used where at any time, any vehicle, equipment, workers or their activities require the closure of two adjacent lanes and a temporary crossover is provided by making use of one lane of pavement normally used by opposing flow of traffic and flexible delineators are used to separate the opposing traffic.

Cones may be substituted for flexible delineators during daytime operations at half the spacing.

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

DATE	REVISIONS
1-1-18	Omitted lights on drums in tangent for westbound traffic and at work area.
1-1-17	Replaced W18-1100 plaque with W7-3a plaque. Changed flexible delineator to tubular marker.

**LANE CLOSURE, MULTILANE, UNDIV. WITH CROSSOVER, FOR SPEEDS ≥ 45 MPH TO 55 MPH**

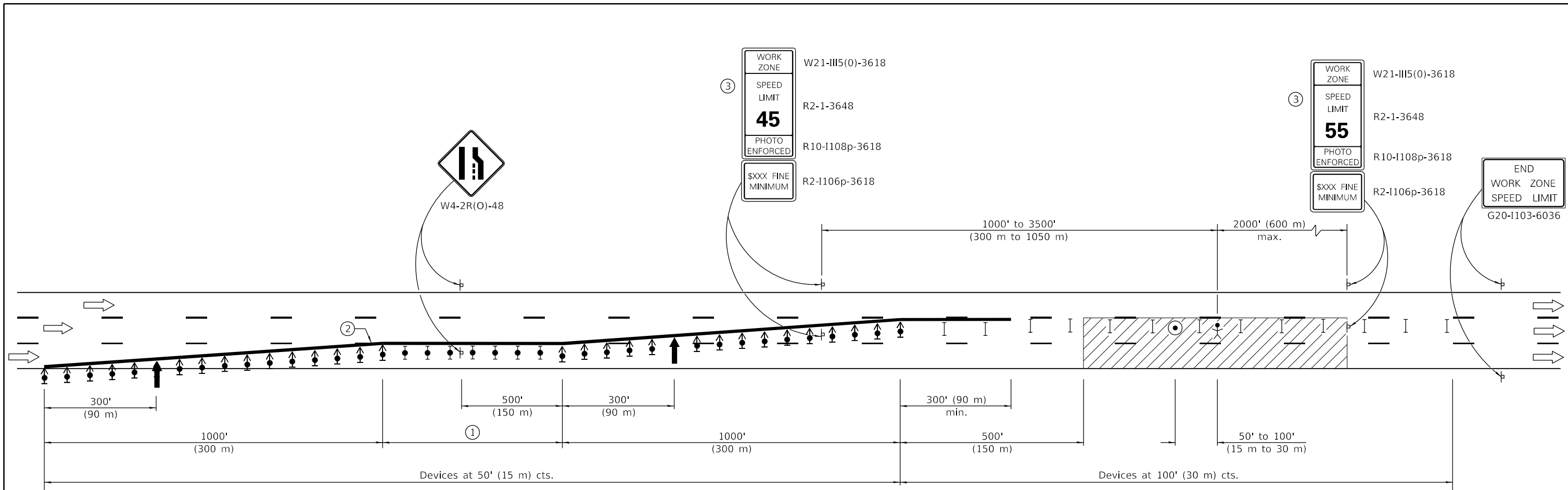
**STANDARD 701431-13**

Illinois Department of Transportation

PASSED January 1, 2018  
*Paul L. ...*  
 ENGINEER OF SAFETY PROG. AND ENGINEERING

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

ISSUED 1-1-97



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.

**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

**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

PASSED January 1, 2021  
  
 ENGINEER OF SAFETY PROG. AND ENGINEERING

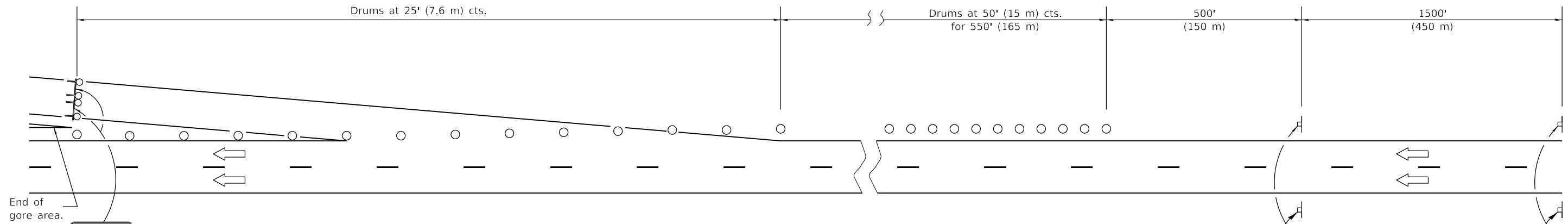
APPROVED January 1, 2021  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

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.

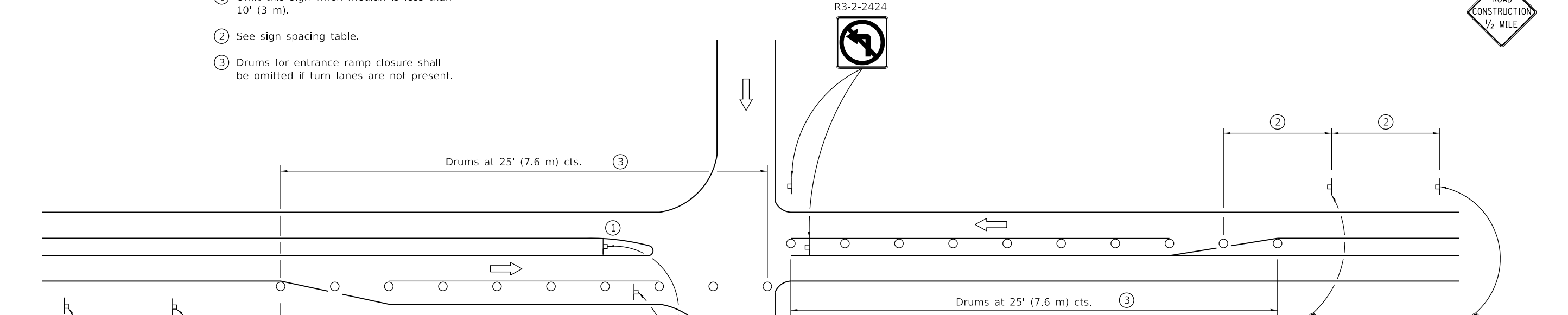
**TWO LANE CLOSURE,  
 FREEWAY/EXPRESSWAY**

**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.



**ENTRANCE RAMP CLOSURE**

**SYMBOLS**

- ▬ Sign
- ⚡ Type III barricade with flashing lights
- Drum
- ◊ ROAD CLOSED AHEAD W20-3(O)-48
- ◻ M5-1(O)-2115
- ◊ ROAD CONSTRUCTION AHEAD W20-1103(O)-48

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

SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

DATE	REVISIONS
1-1-18	Omitted lights from drums.
1-1-17	Added flashing lights to Type III barricade.

**RAMP CLOSURE  
FREEWAY/EXPRESSWAY**

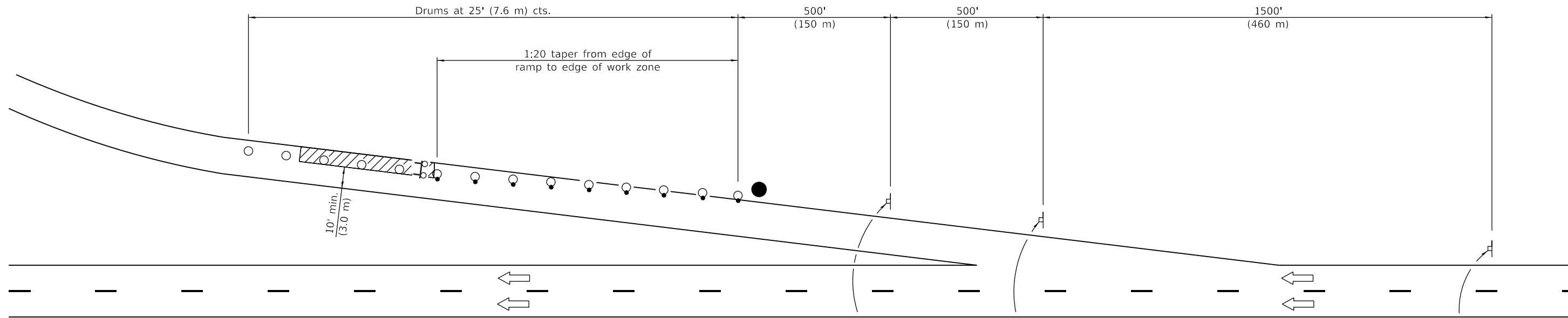
**STANDARD 701451-05**

Illinois Department of Transportation

PASSED January 1, 2018  
*Paul L. ...*  
 ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2018  
*Walter M. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-09



**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.

DATE	REVISIONS
1-1-18	Omitted lights on drums in tangent.
1-1-17	Added flashing lights to Type III barricade.

**PARTIAL EXIT RAMP CLOSURE  
FREEWAY/EXPRESSWAY**

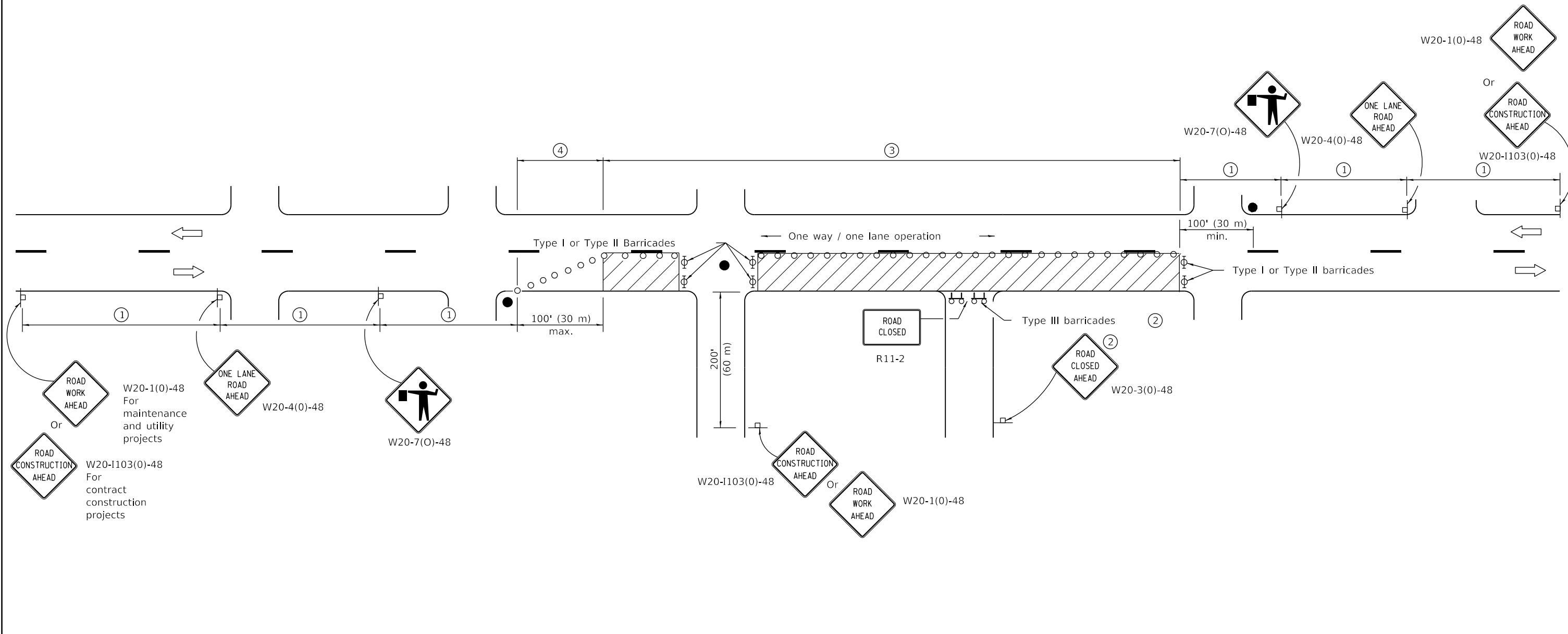
**STANDARD 701456-05**

Illinois Department of Transportation

PASSED January 1, 2018  
*Paul L. ...*  
ENGINEER OF SAFETY PROG. AND ENGINEERING

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

ISSUED 1-1-09



ROAD WORK AHEAD W20-1(0)-48  
 Or ROAD CONSTRUCTION AHEAD W20-1103(0)-48  
 For maintenance and utility projects  
 For contract construction projects

ONE LANE ROAD AHEAD W20-4(0)-48  
 W20-7(O)-48

ROAD CLOSED R11-2  
 ROAD CONSTRUCTION AHEAD W20-1103(0)-48  
 Or ROAD WORK AHEAD W20-1(0)-48

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**

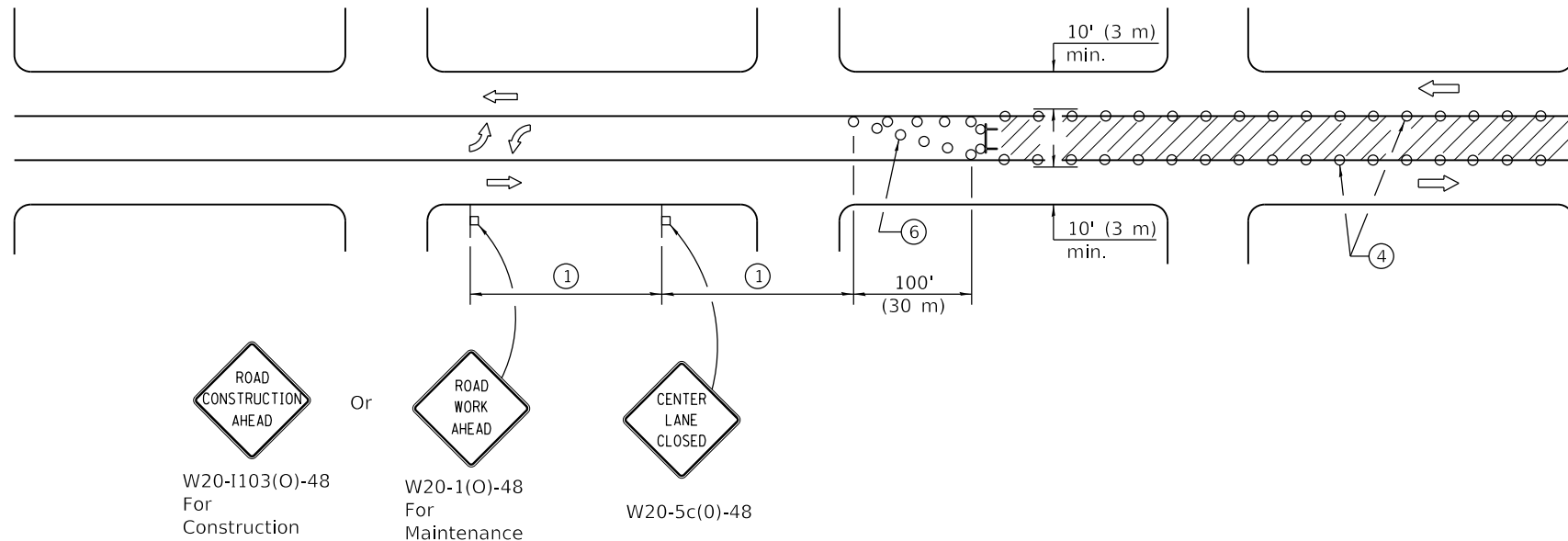
This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of one traffic lane in an urban area.

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

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

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

**URBAN LANE CLOSURE,  
 2L, 2W, UNDIVIDED**  
**STANDARD 701501-06**



W20-1103(O)-48  
For  
Construction

W20-1(O)-48  
For  
Maintenance

W20-5c(O)-48

### CASE I

(Signs required for both directions)

SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

### SYMBOLS

- Work area
- Barricade or drum with flashing light
- Flagger with traffic control sign
- Cone, drum or barricade
- Sign on portable or permanent support
- Type III barricade with flashing lights

- ① Refer to SIGN SPACING TABLE for distances.
- ② Required for speeds > 40 mph (70 km/h).
- ③ Required if work exceeds 500' (164 m) or 1 block.
- ④ Cones at 25' (8 m) centers for 250' (75 m) on approach. Additional cones may be placed at 50' (15 m) centers. When drums or type I or II barricades are used, the interval between devices may be doubled.
- ⑤ For approved sideroad closures.
- ⑥ Cones, drums or barricades at 20' (6 m) centers in taper.
- ⑦ Use flagger sign only when flagger is present.

### GENERAL NOTES

This Standard is used to close one lane of an urban, two lane, two way roadway with a bidirectional turn lane.

Case I applies when no workers are present. When workers are present, two lanes shall be closed and traffic control shall be according to Standard 701501.

Calculate L as follows:

SPEED LIMIT	FORMULAS	
	English	(Metric)
40 mph (70 km/h) or less:	$L = \frac{WS^2}{60}$	$L = \frac{WS^2}{150}$
45 mph (80 km/h) or greater:	$L = (W)(S)$	$L = 0.65(W)(S)$

W = Width of offset in feet (meters).  
S = Normal posted speed mph (km/h).

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

Illinois Department of Transportation

APPROVED January 1, 2019  
*Lyndee Watt*  
ENGINEER OF SAFETY PROG. AND ENGINEERING

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

ISSUED 1-1-01

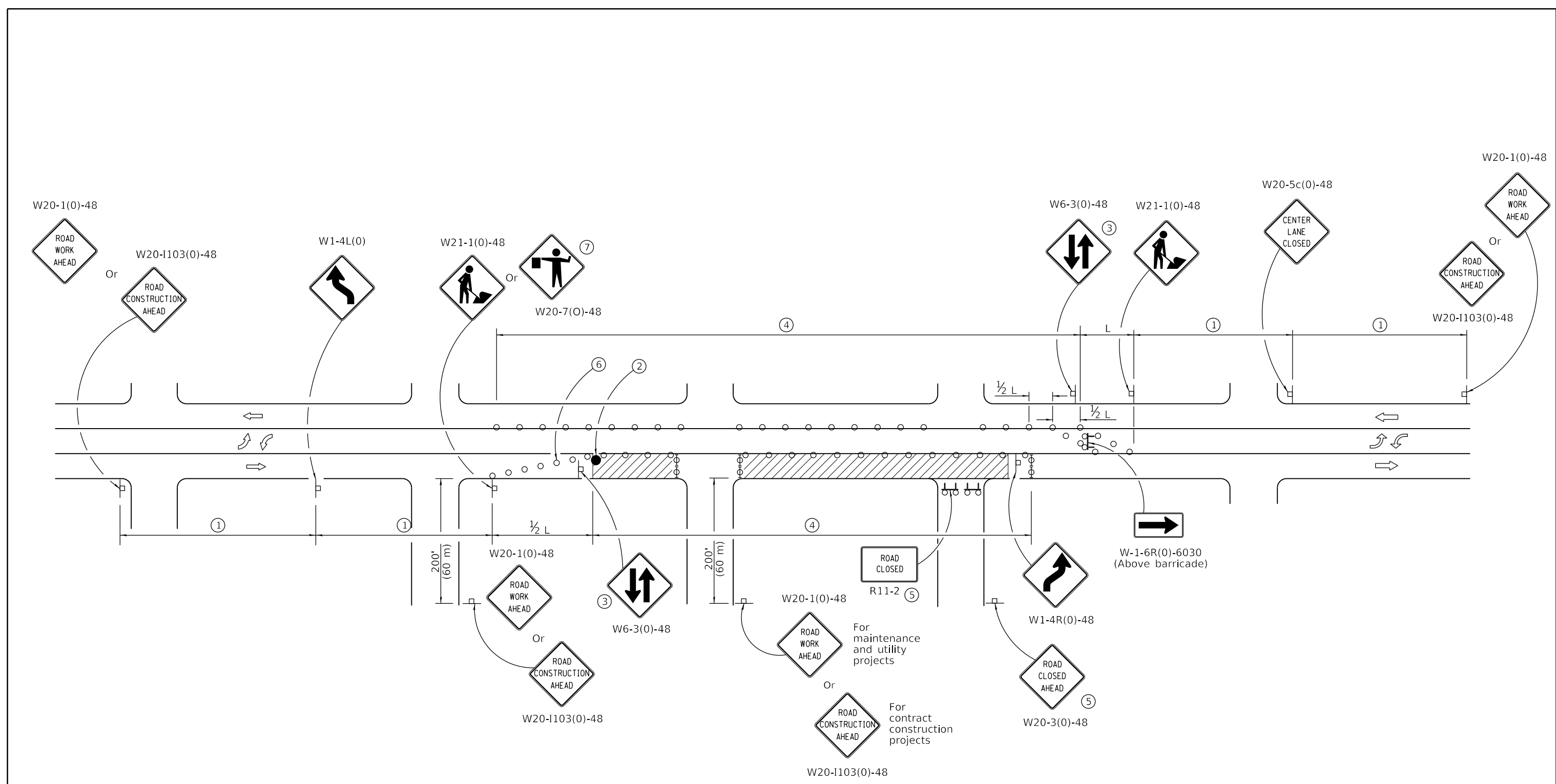
DATE	REVISIONS
1-1-19	Revised to allow cones at night.
1-1-18	Corrected sign number for TWO WAY TRAFFIC sign for CASE II.


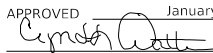
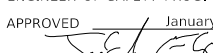
**URBAN LANE CLOSURE,  
2L, 2W, WITH BIDIRECTIONAL  
LEFT TURN LANE**

(Sheet 1 of 2)

**STANDARD 701502-09**

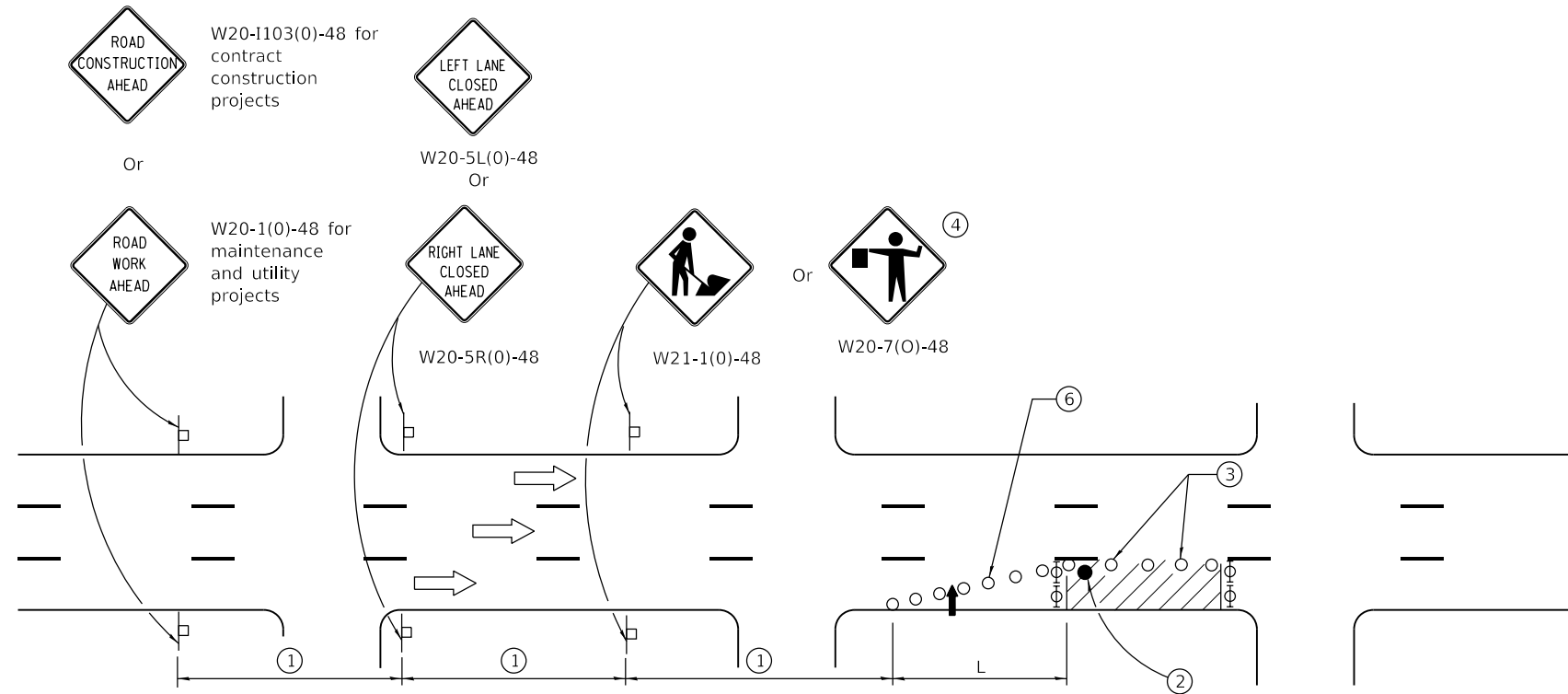




 Illinois Department of Transportation  
 APPROVED January 1, 2019  
  
 ENGINEER OF SAFETY PROG. AND ENGINEERING  
 APPROVED January 1, 2019  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

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

PASSED January 1, 2014  
  
 ENGINEER OF SAFETY ENGINEERING

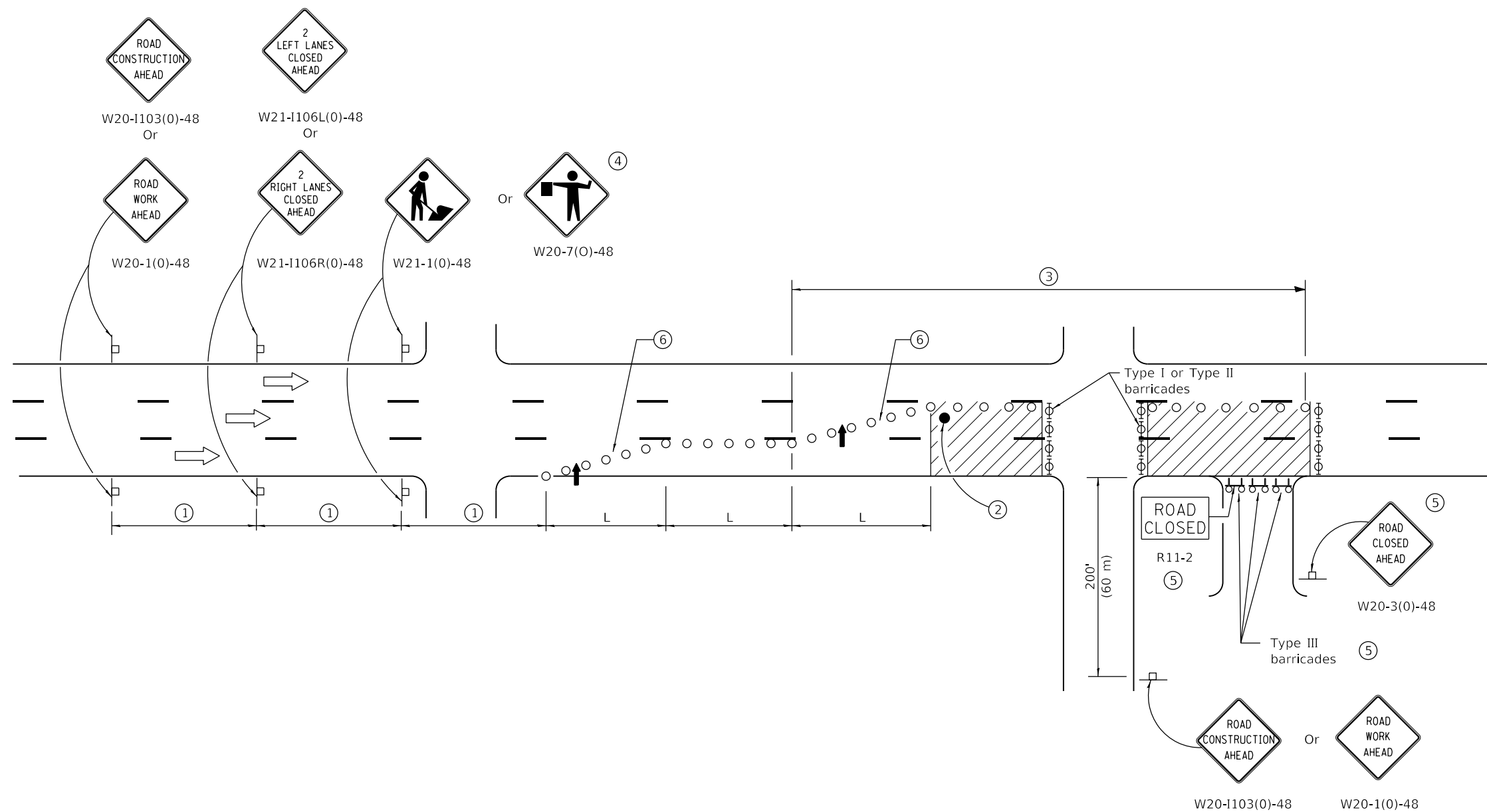
ISSUED 1-1-97


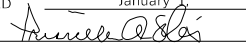

APPROVED January 1, 2014  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-14	Revised workers sign number to agree with current MUTCD.
1-1-13	Omitted text 'WORKERS' sign.

**URBAN LANE CLOSURE,  
MULTILANE, 1W OR 2W WITH  
NONTRAVERSABLE MEDIAN**  
 (Sheet 1 of 2)

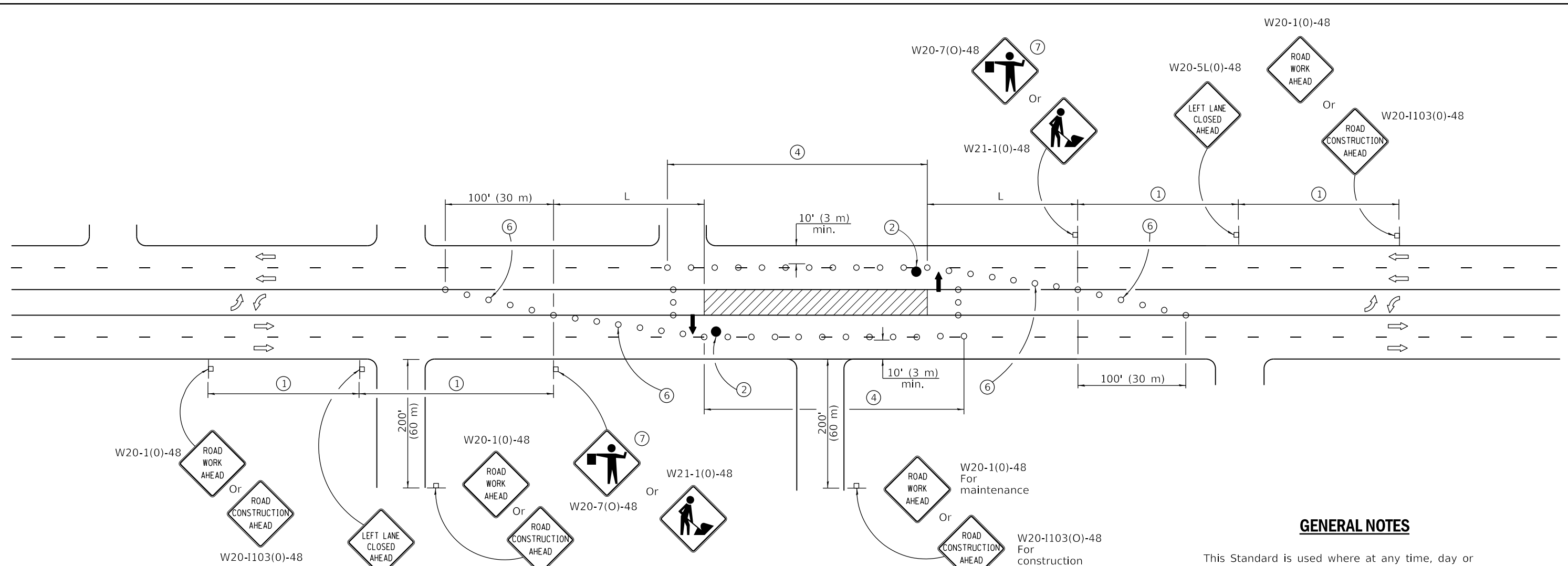
**STANDARD 701601-09**



 Illinois Department of Transportation  
 PASSED January 1, 2014  
  
 ENGINEER OF SAFETY ENGINEERING  
 APPROVED January 1, 2014  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

**URBAN LANE CLOSURE,  
 MULTILANE, 1W OR 2W WITH  
 NONTRAVERSABLE MEDIAN**  
(Sheet 2 of 2)  
**STANDARD 701601-09**



SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

- SYMBOLS**
- Arrow board
  - Work area
  - Barricade or drum with steady burning mondirectional light
  - Flagger with traffic control sign
  - Cone, drum or barricade
  - Sign on portable or permanent support
  - Type III barricade with flashing lights

**CASE I**

- ① Refer to SIGN SPACING TABLE for distances.
- ② Required for speeds > 40 mph (70 km/h).
- ③ Required if work exceeds 500' (164 m) or 1 block, repeat every 1 mile (1.6 km).
- ④ Cones at 25' (8 m) centers for 250' (75 m) on approach. Additional cones may be placed at 50' (15 m) centers. When drums or type I or II barricades are used, the interval between devices may be doubled.
- ⑤ For approved sideroad closures.
- ⑥ Cones, drums or barricades at 20' (6 m) centers in taper.
- ⑦ Use flagger sign only when flagger is present.

**GENERAL NOTES**

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of one traffic lane in an Urban area.

If the work operation is performed between 9:00 a.m. and 3:00 p.m. and does not exceed 15 min. Traffic protection shall be as shown for Standard 701426.

Calculate L as follows:

SPEED LIMIT	FORMULAS	
	English	(Metric)
40 mph (70 km/h) or less:	$L = \frac{WS^2}{60}$	$L = \frac{WS^2}{150}$
45 mph (80 km/h) or greater:	$L=(W)(S)$	$L=0.65(W)(S)$

W = Width of offset in feet (meters).

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

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

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**

Illinois Department of Transportation

APPROVED January 1, 2019  
*Cynthia Watt*  
ENGINEER OF SAFETY PROG. AND ENGINEERING

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

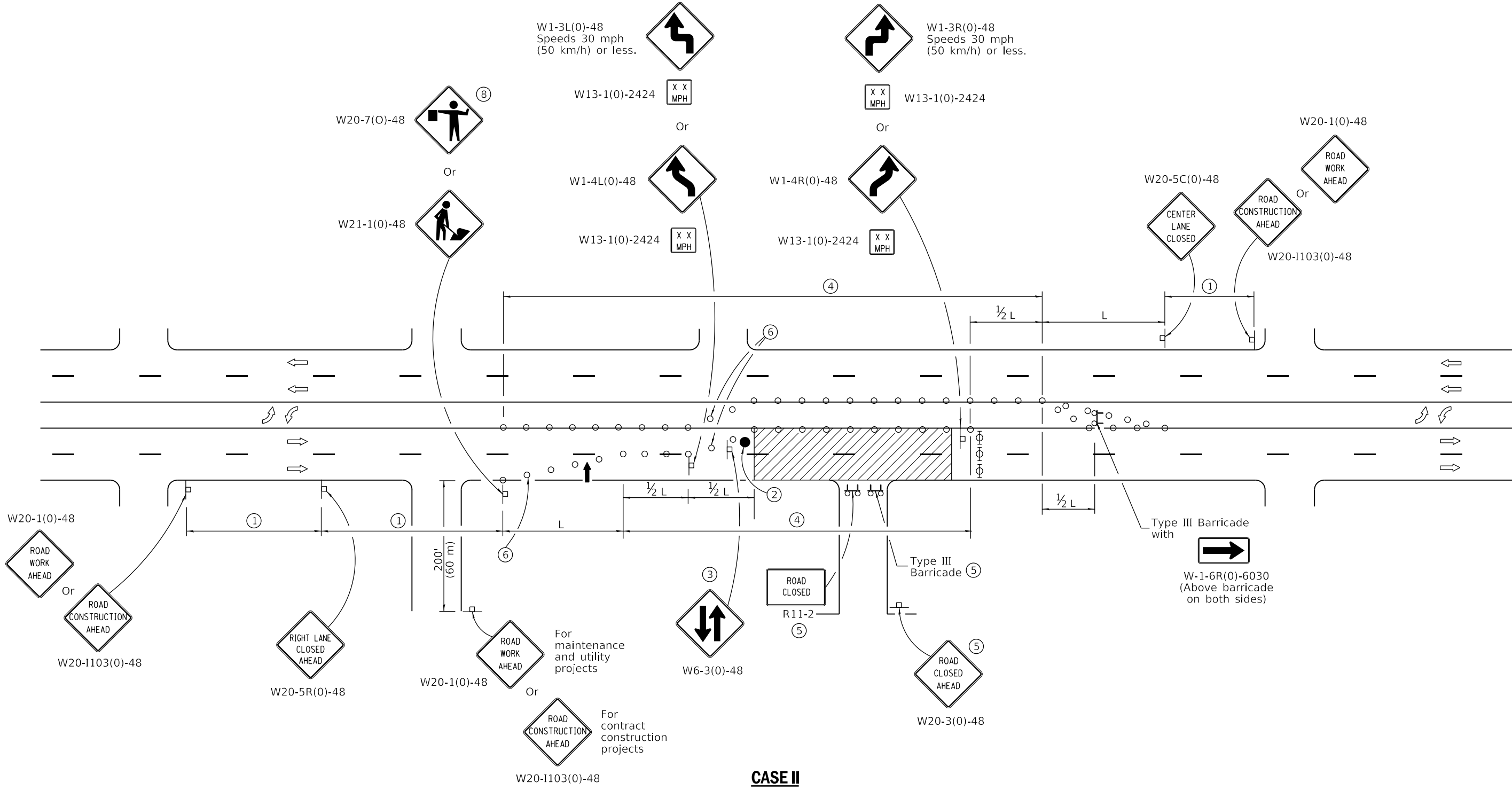
ISSUED 1-1-13

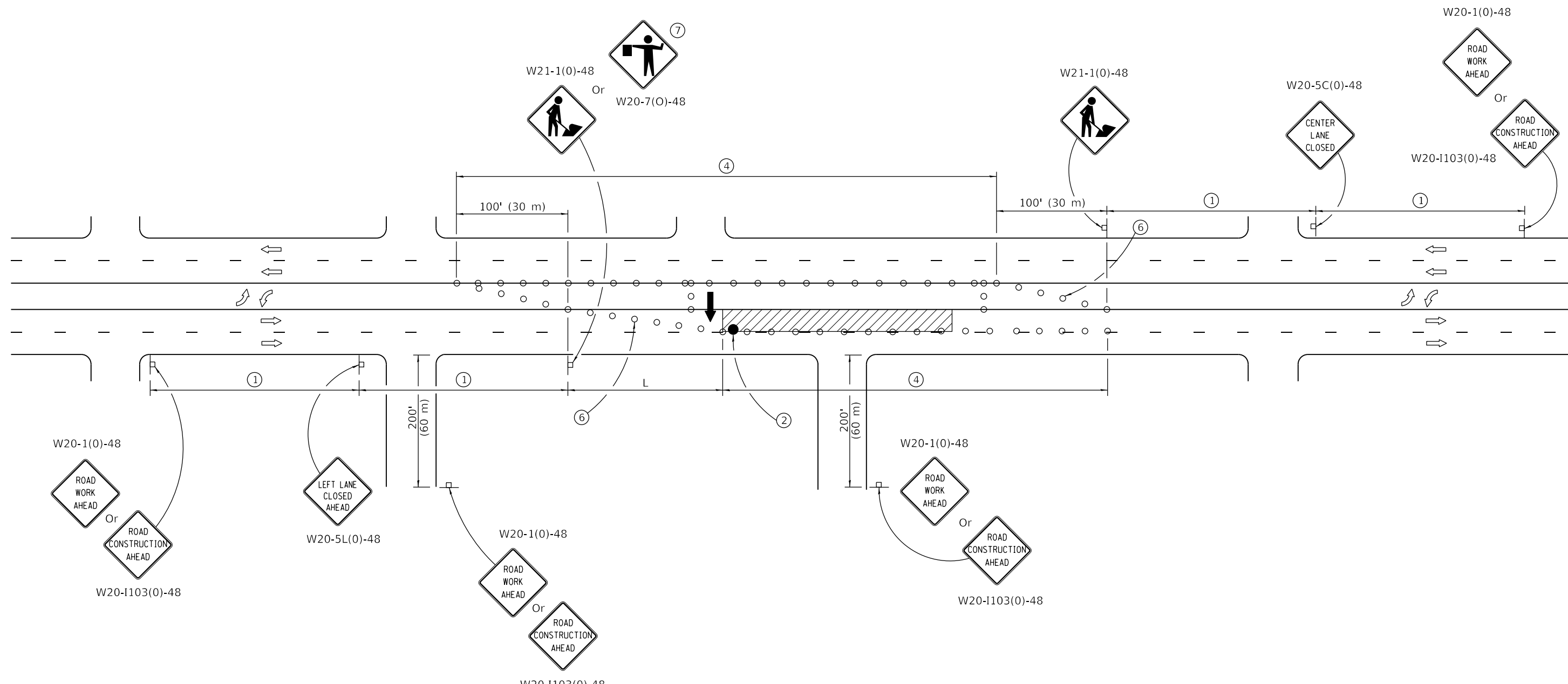
**URBAN LANE CLOSURE,  
 MULTILANE, 2W WITH  
 BIDIRECTIONAL LEFT TURN LANE**

(Sheet 2 of 4)


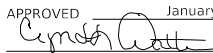
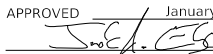
**STANDARD 701602-10**

**CASE II**



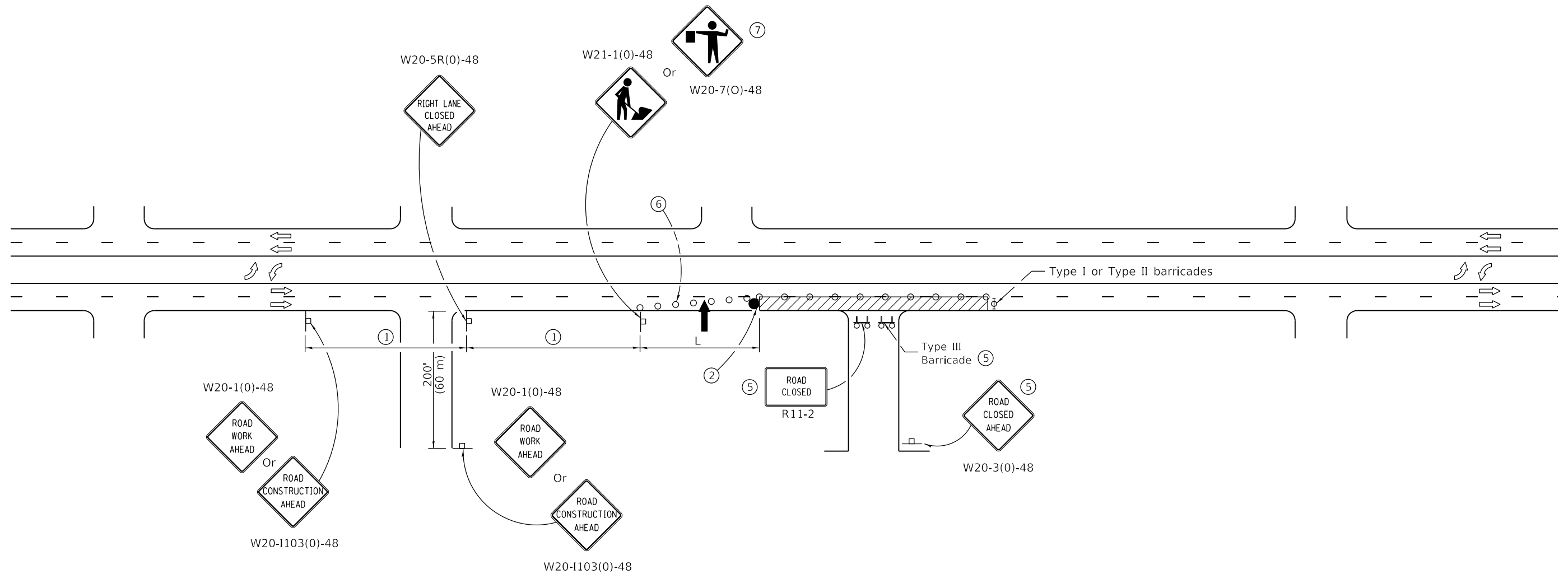


**CASE III**

 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**  
 (Sheet 3 of 4)  
**STANDARD 701602-10**



**CASE IV**

Illinois Department of Transportation

APPROVED January 1, 2019  
*Cynthia Watt*  
 ENGINEER OF SAFETY PROG. AND ENGINEERING

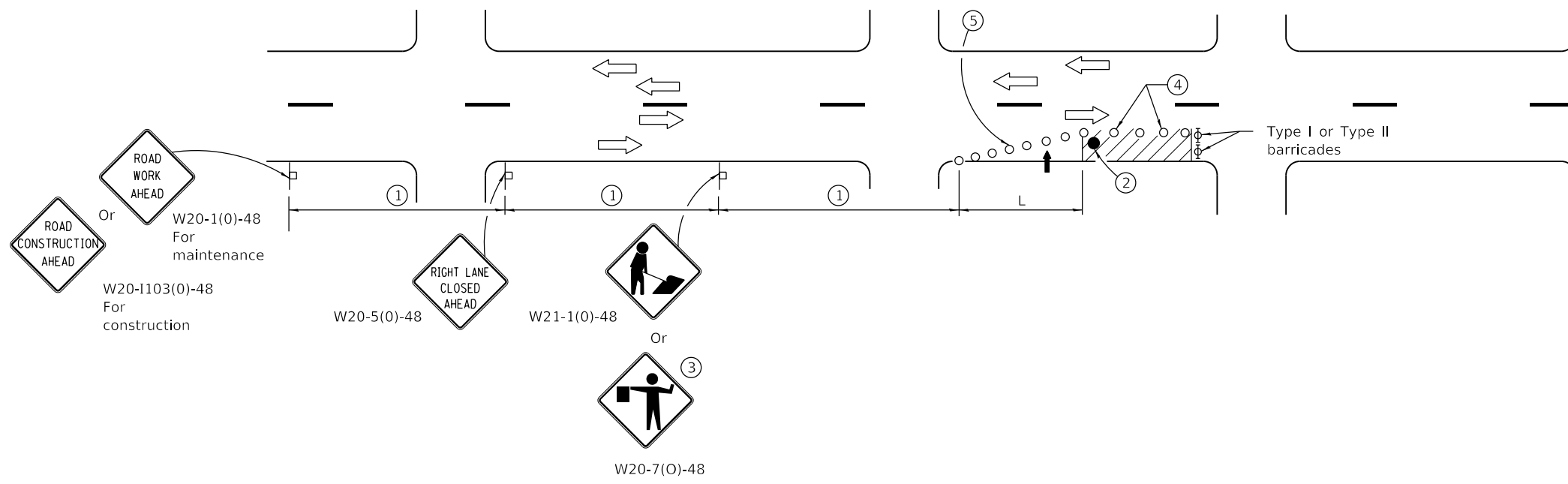
APPROVED January 1, 2019  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13


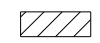


**URBAN LANE CLOSURE,  
 MULTILANE, 2W WITH  
 BIDIRECTIONAL LEFT TURN LANE**

(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

PASSED January 1, 2015  
 ENGINEER OF SAFETY ENGINEERING

APPROVED January 1, 2015  
 ENGINEER OF DESIGN AND ENVIRONMENT

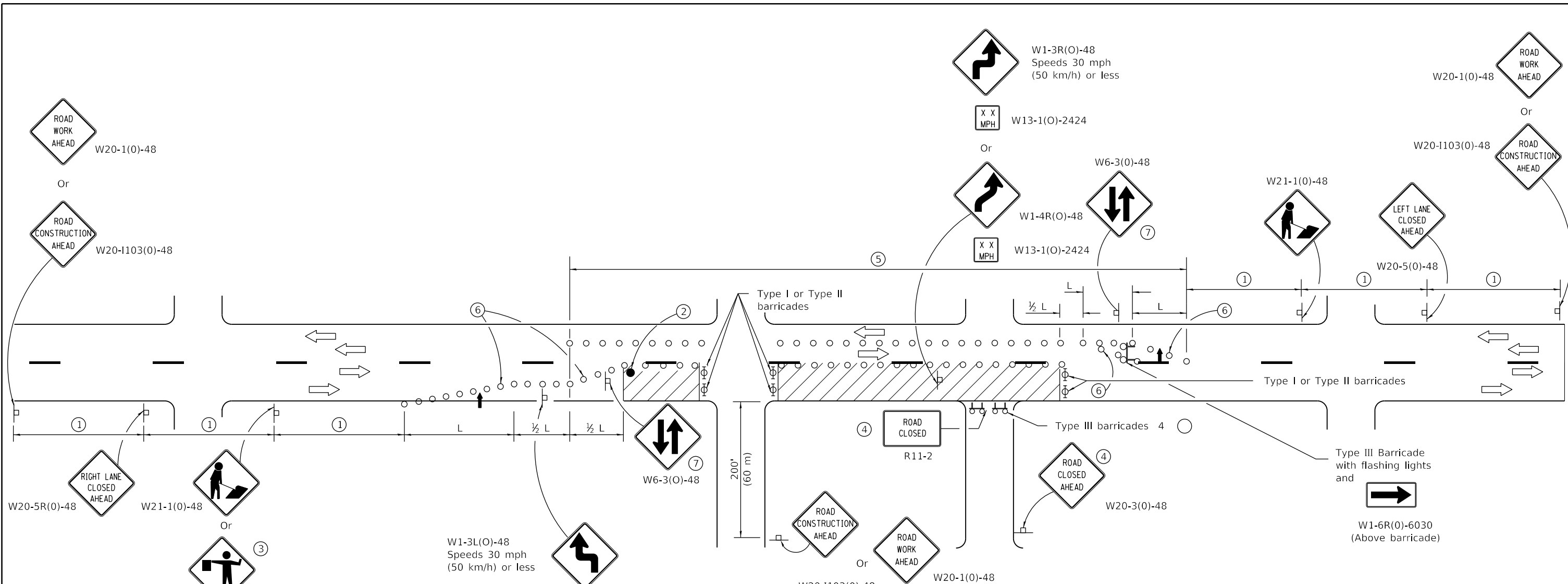
ISSUED 1-1-97

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)

- W1-3L(O)-48  
Speeds 30 mph  
(50 km/h) or less
- W13-1(O)-2424
- Or
- W1-4L(O)-48
- W13-1(O)-2424

**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

PASSED April 1, 2016  
*[Signature]*  
ENGINEER OF SAFETY ENGINEERING

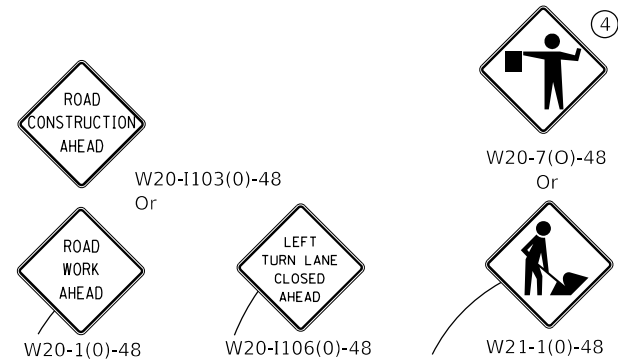
ISSUED 1-1-15

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

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**

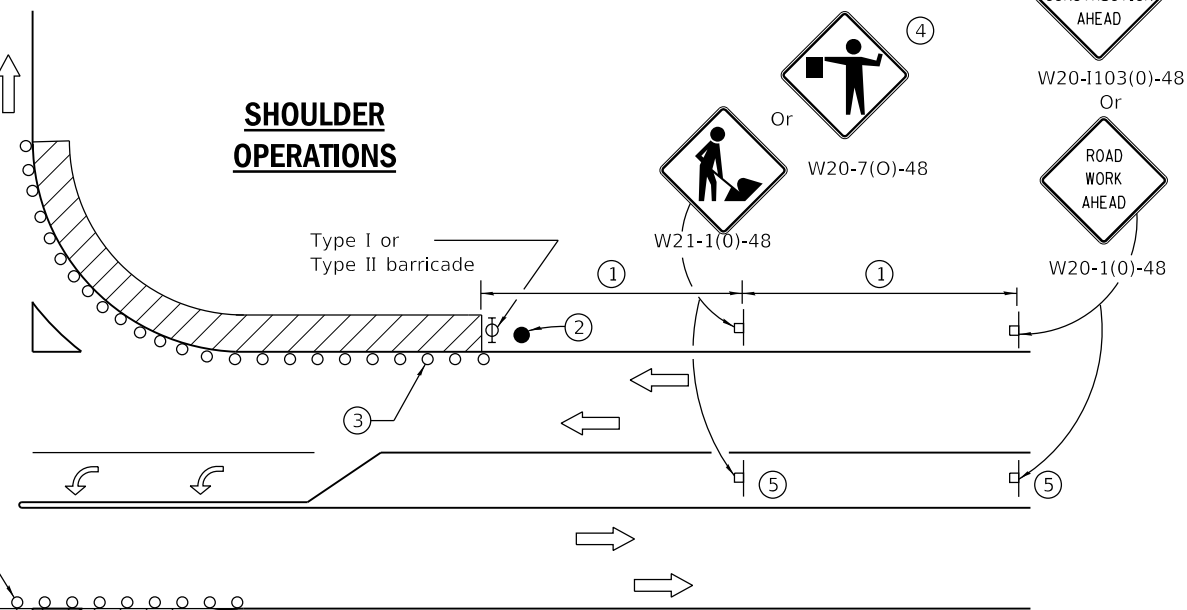
- ① Refer to SIGN SPACING TABLE for distance.
- ② Required for speed > 40 mph.
- ③ Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.
- ④ Use flagger sign only 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.

**SYMBOLS**

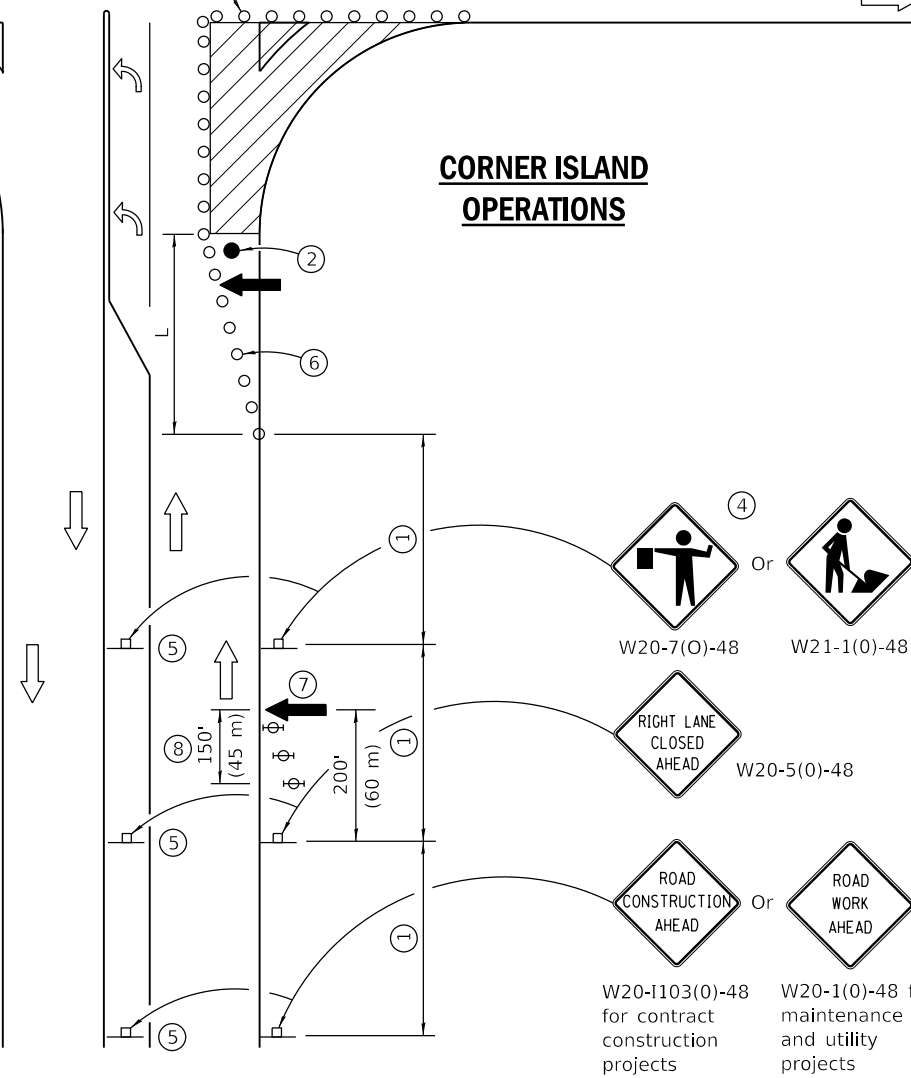
- Work area
- Cone, drum or barricade
- Sign on portable or permanent support
- Arrow board
- Barricade or drum with flashing light
- Flagger with traffic control sign

SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

**SHOULDER OPERATIONS**



**CORNER ISLAND OPERATIONS**



**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.

DATE	REVISIONS
4-1-16	Corrected sign number for LEFT TURN LANE CLOSED AHEAD.
1-1-14	Added devices at arrow board upstream from taper.
	Rev. workers sign number.

**URBAN LANE CLOSURE,  
MULTILANE INTERSECTION**

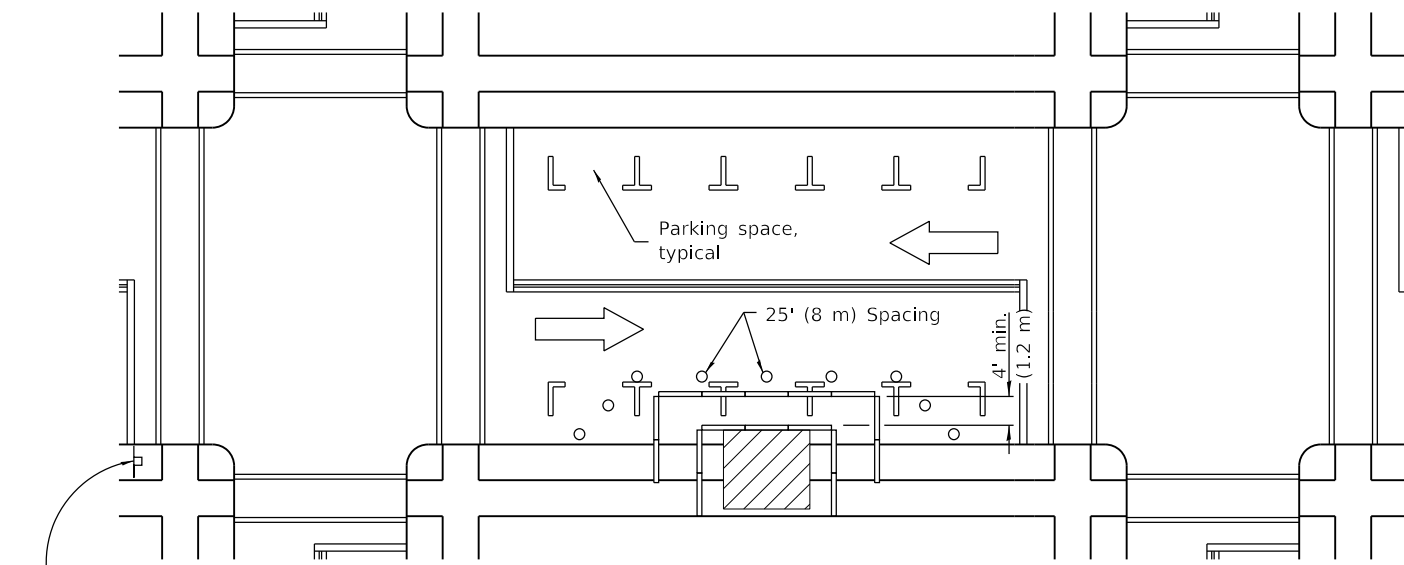
**STANDARD 701701-10**

Illinois Department of Transportation

PASSED April 1, 2016  
  
 ENGINEER OF SAFETY ENGINEERING

APPROVED April 1, 2016  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

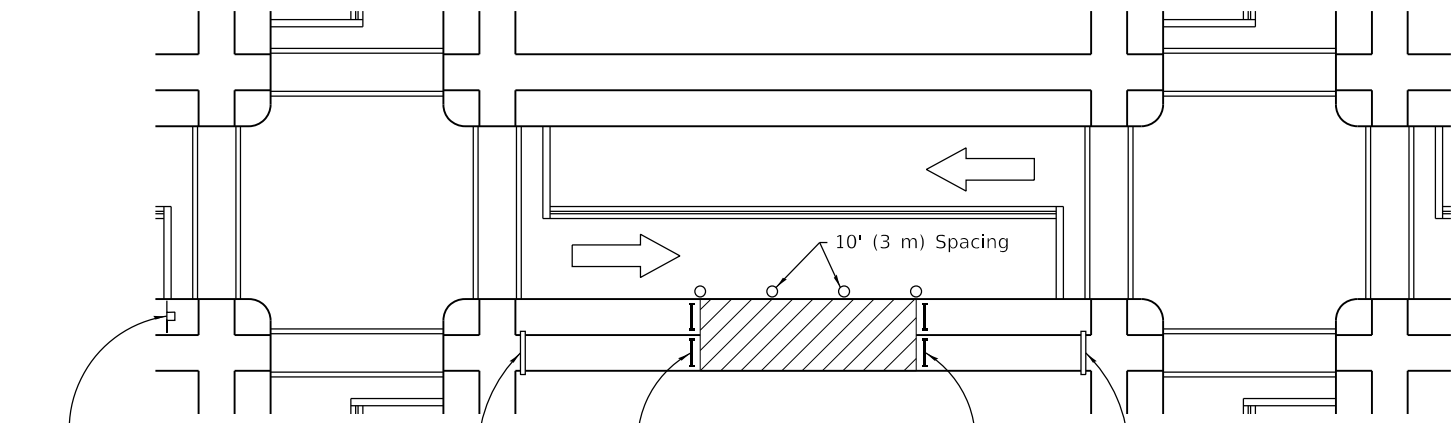
ISSUED 1-1-97



① ROAD CONSTRUCTION AHEAD  
W20-1103(0)-48 for contract construction projects

Or  
① ROAD WORK AHEAD  
W20-1(0)-48 for maintenance and utility projects

**SIDEWALK DIVERSION**



① ROAD CONSTRUCTION AHEAD  
W20-1103(0)-48 for contract construction projects

Or  
① ROAD WORK AHEAD  
W20-1(0)-48 for maintenance and utility projects

SIDEWALK CLOSED  
←  
USE OTHER SIDE  
R11-1102-2430

SIDEWALK CLOSED  
R11-1101-2418

SIDEWALK CLOSED  
→  
USE OTHER SIDE  
R11-1102-2430

**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.

**SYMBOLS**

- Work area
- Sign on portable or permanent support
- Barricade or drum
- Cone, drum or barricade
- Type III barricade
- Detectable pedestrian channelizing barricade

Illinois Department of Transportation

PASSED April 1, 2016  
*[Signature]*  
ENGINEER OF SAFETY ENGINEERING

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

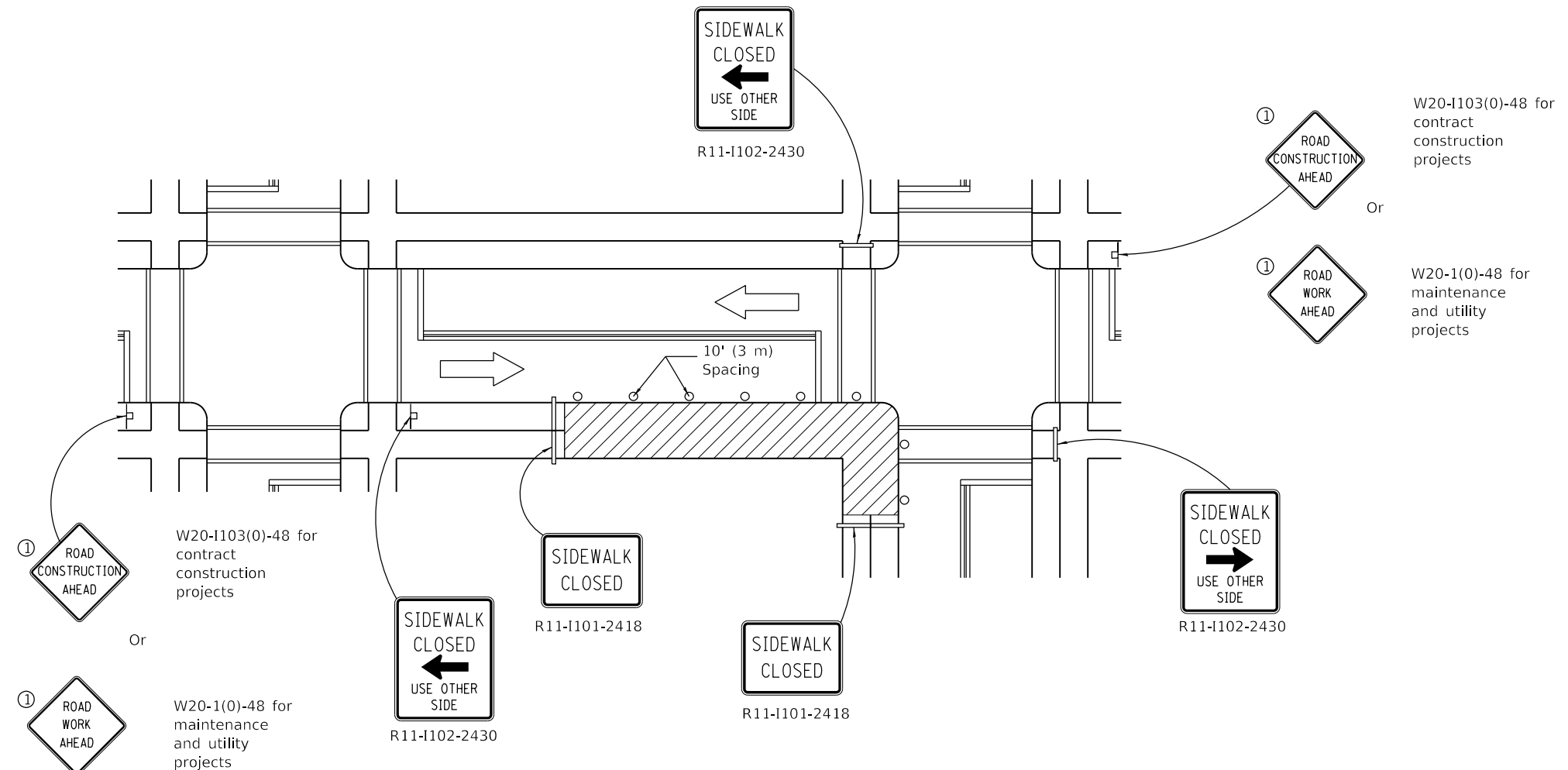
ISSUED 1-1-97

DATE	REVISIONS
4-1-16	Omitted orange safety fence from standard as this is covered in the std. spec.
1-1-12	Added SIDEWALK DIVERSION. Modified appearance of plan views. Renamed Std.

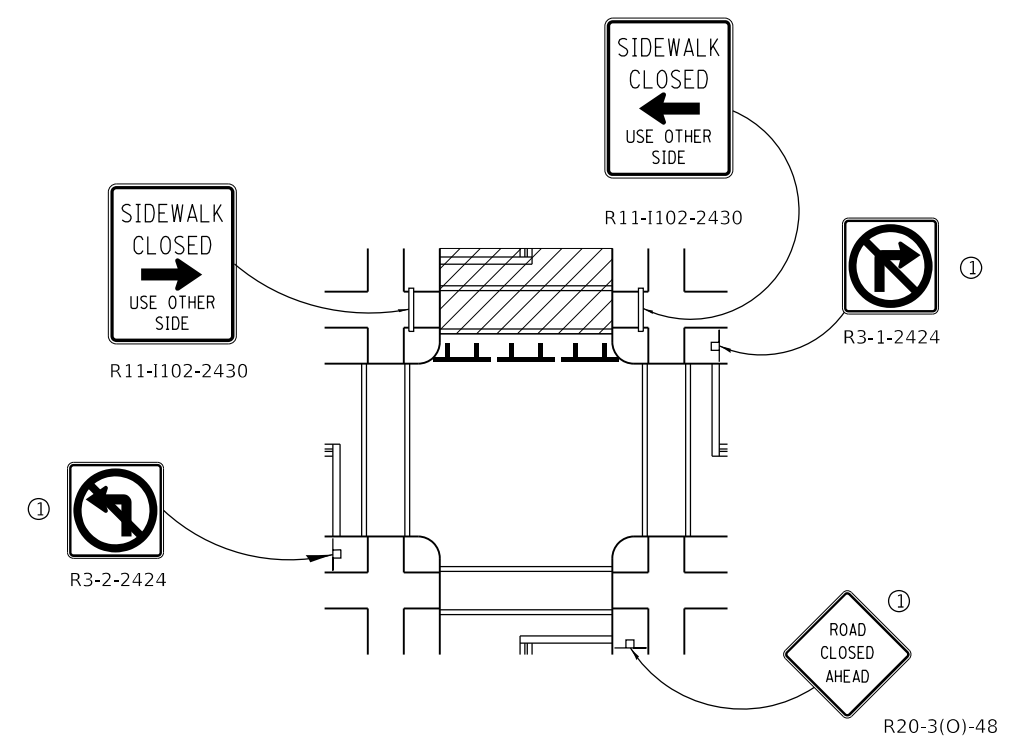
**SIDEWALK, CORNER OR CROSSWALK CLOSURE**

(Sheet 1 of 2)

**STANDARD 701801-06**



**CORNER CLOSURE**



**CROSSWALK CLOSURE**

W20-I103(0)-48 for contract construction projects  
Or  
W20-1(0)-48 for maintenance and utility projects

**SIDEWALK, CORNER OR CROSSWALK CLOSURE**

(Sheet 2 of 2)

**STANDARD 701801-06**

Illinois Department of Transportation

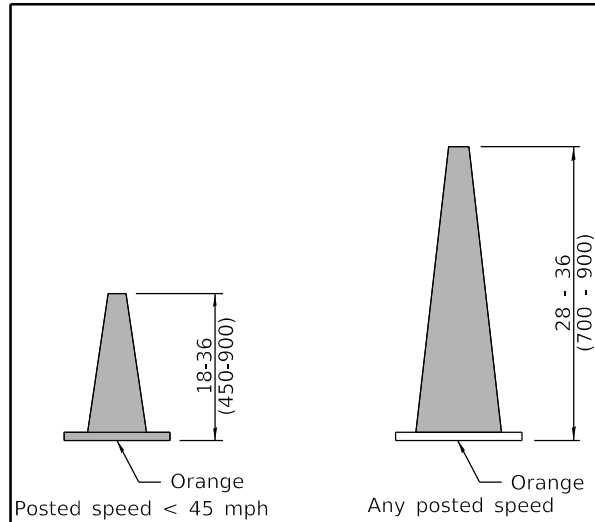
PASSED April 1, 2016

*[Signature]*  
ENGINEER OF SAFETY ENGINEERING

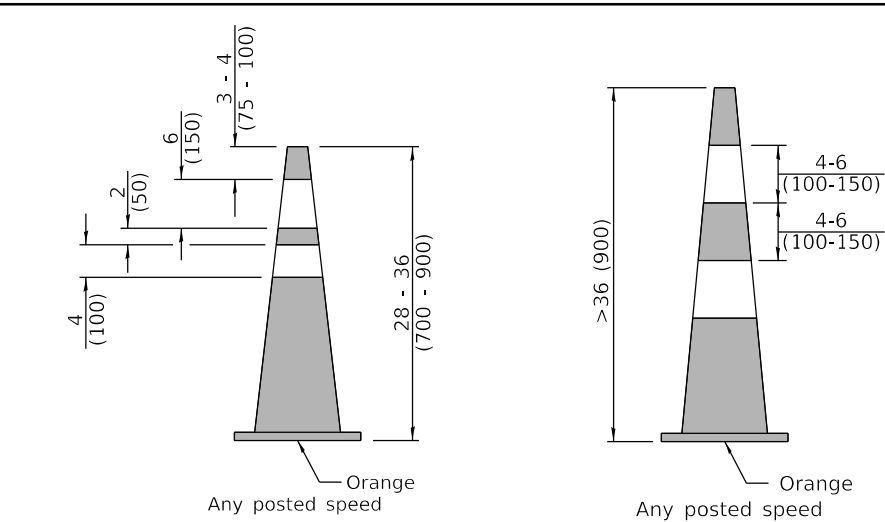
APPROVED April 1, 2016

*[Signature]*  
ENGINEER OF DESIGN AND ENVIRONMENT

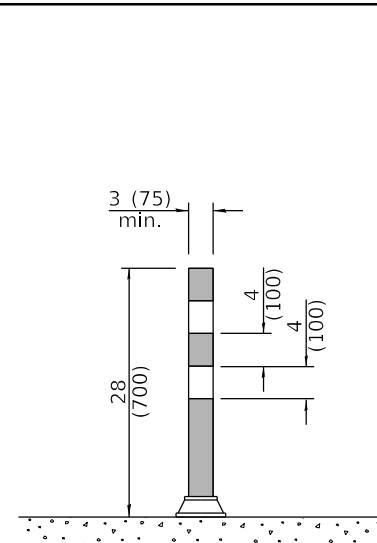
ISSUED 1-1-97



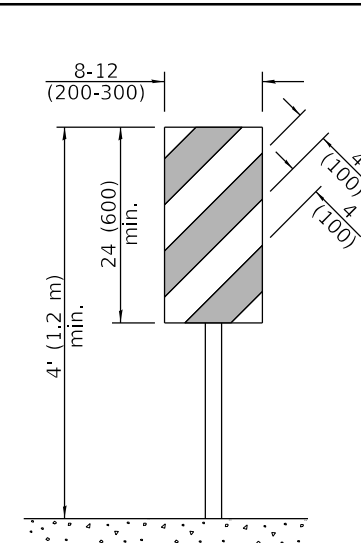
**DAYTIME USE**



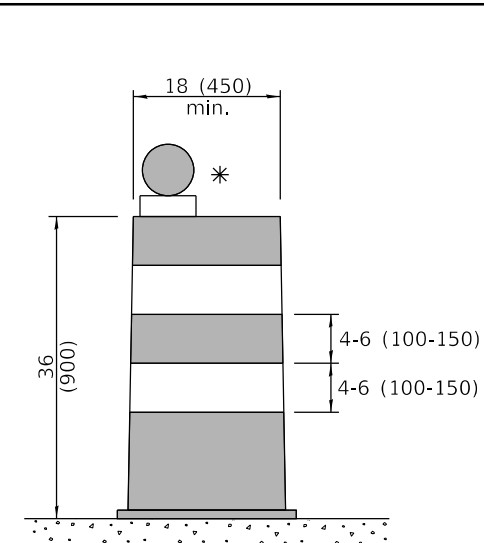
**DAY OR NIGHTTIME USE**



**TUBULAR MARKER**

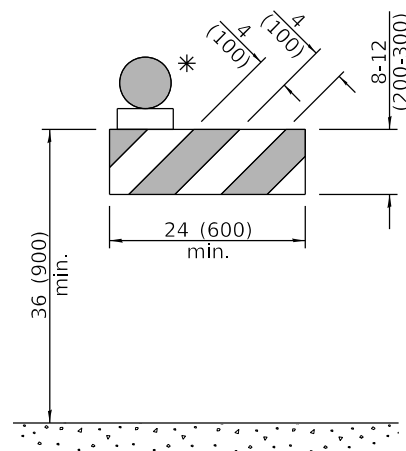


**VERTICAL PANEL  
POST MOUNTED**

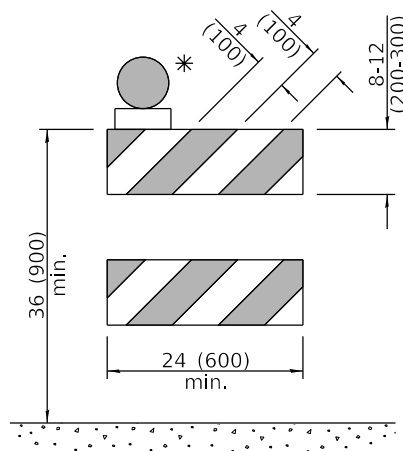


**DRUM**

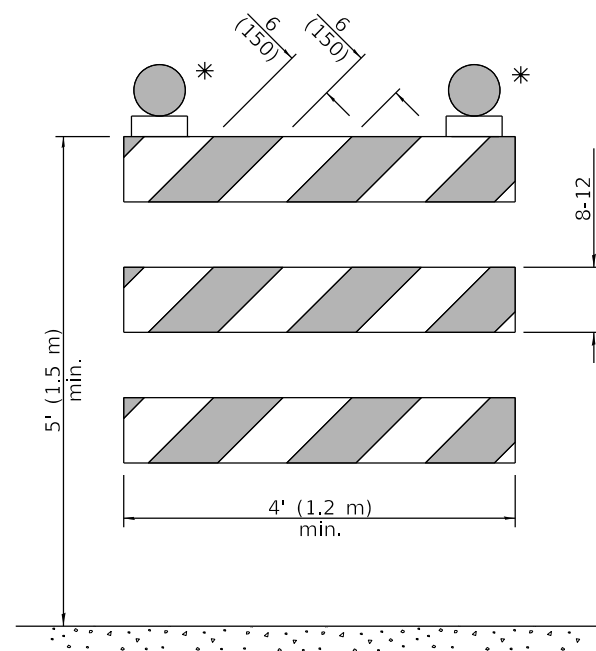
**CONES**



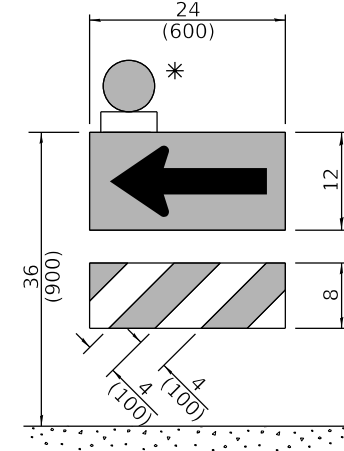
**TYPE I BARRICADE**



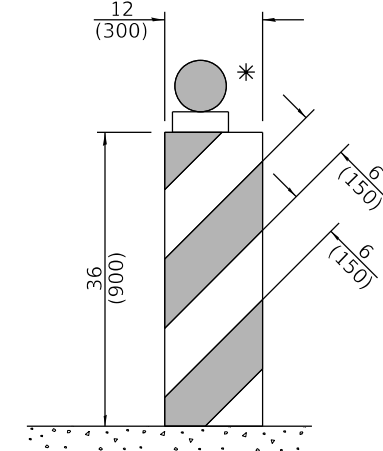
**TYPE II BARRICADE**



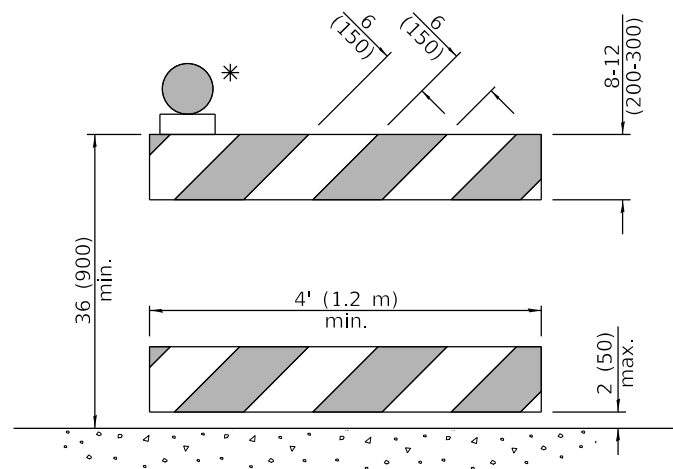
**TYPE III BARRICADE**



**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.

DATE	REVISIONS
1-1-19	Revised cone usage and added cones >36" (900 m) height.
1-1-18	Revised END WORK ZONE SPEED LIMIT sign from orange to white background.

**TRAFFIC CONTROL DEVICES**

(Sheet 1 of 3)

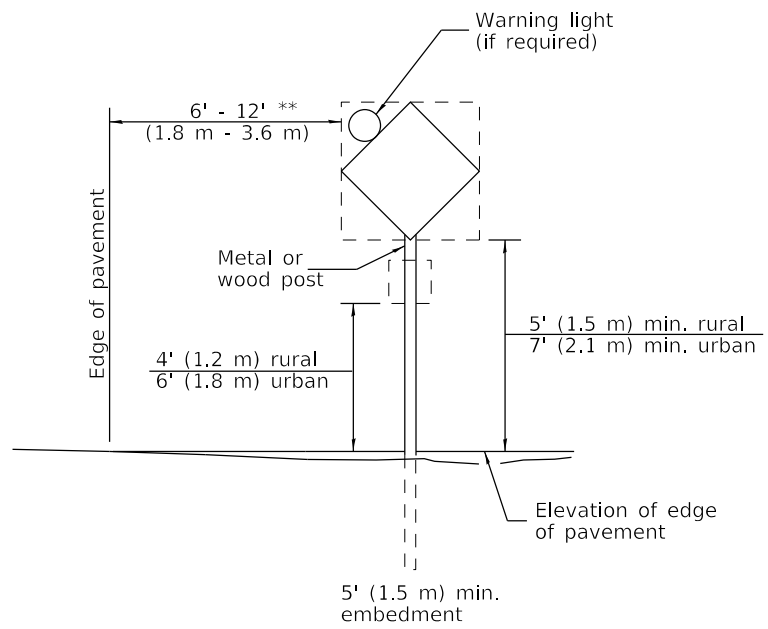
**STANDARD 701901-08**

Illinois Department of Transportation

APPROVED January 1, 2019  
  
 ENGINEER OF SAFETY PROG. AND ENGINEERING

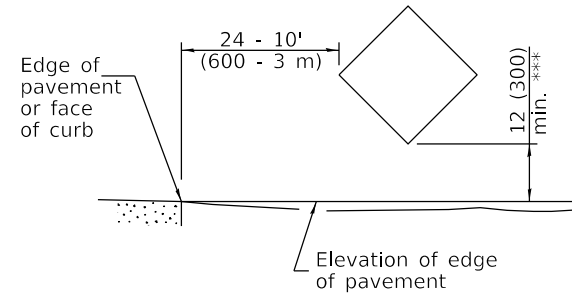
APPROVED January 1, 2019  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED  
 ET-1-1



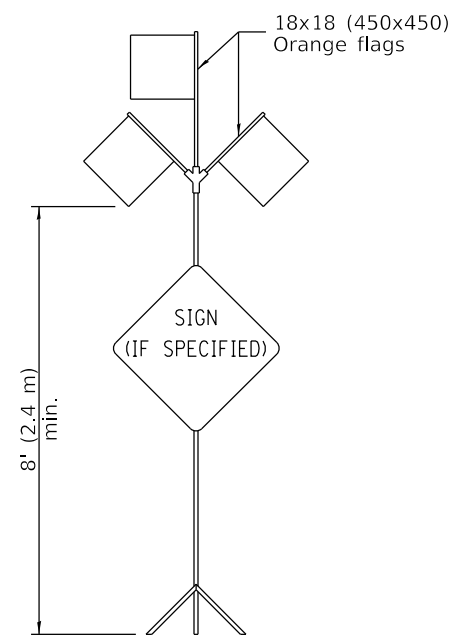
**POST MOUNTED SIGNS**

\*\* When curb or paved shoulder are present this dimension shall be 24 (600) to the face of curb or 6' (1.8 m) to the outside edge of the paved shoulder.



**SIGNS ON TEMPORARY SUPPORTS**

\*\*\* When work operations exceed four days, this dimension shall be 5' (1.5 m) min. If located behind other devices, the height shall be sufficient to be seen completely above the devices.



**HIGH LEVEL WARNING DEVICE**

ROAD CONSTRUCTION NEXT X MILES	END CONSTRUCTION
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**

WORK ZONE	W21-III5(0)-3618
SPEED LIMIT XX	R2-1-3648
PHOTO ENFORCED	R10-I108p-3618 ****
\$XXX FINE MINIMUM	R2-I106p-3618

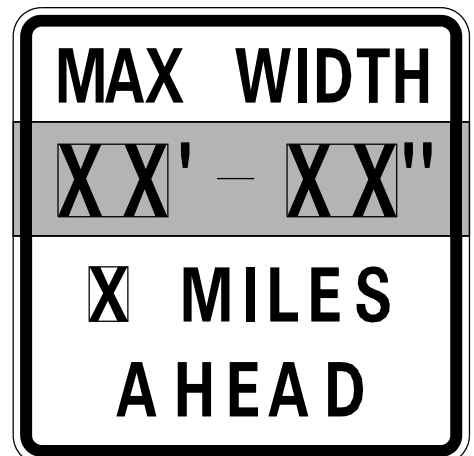
Sign assembly as shown on Standards or as allowed by District Operations.

END WORK ZONE SPEED LIMIT	G20-I103-6036
---------------------------	---------------

This sign shall be used when the above sign assembly is used.

**HIGHWAY CONSTRUCTION SPEED ZONE SIGNS**

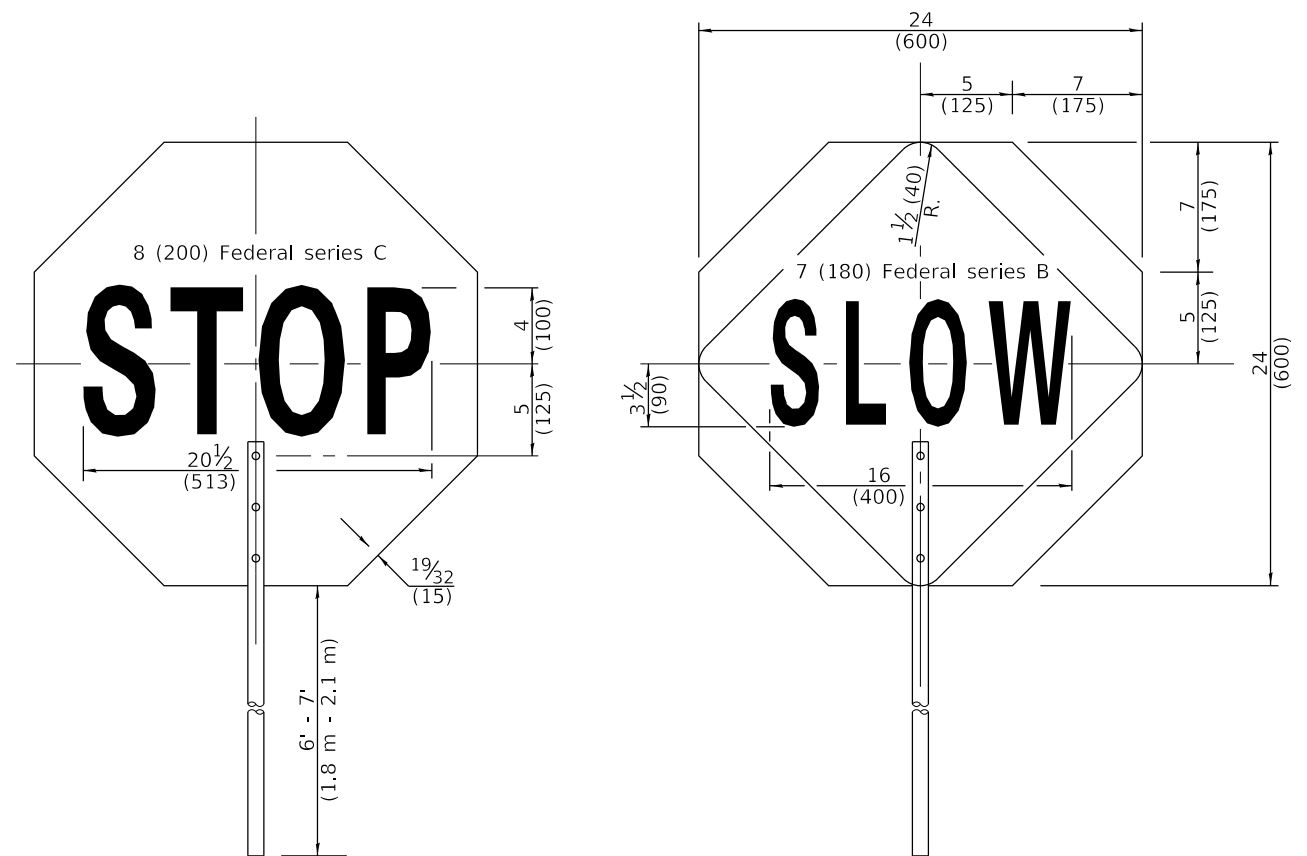
\*\*\*\* R10-I108p shall only be used along roadways under the jurisdiction of the State.



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, 2019  
*[Signature]*  
 ENGINEER OF SAFETY PROG. AND ENGINEERING

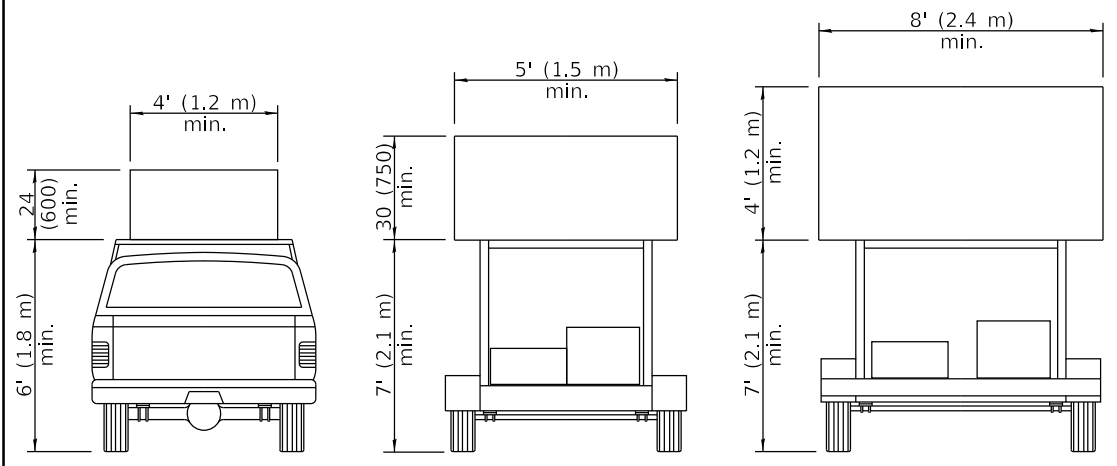
APPROVED January 1, 2019  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

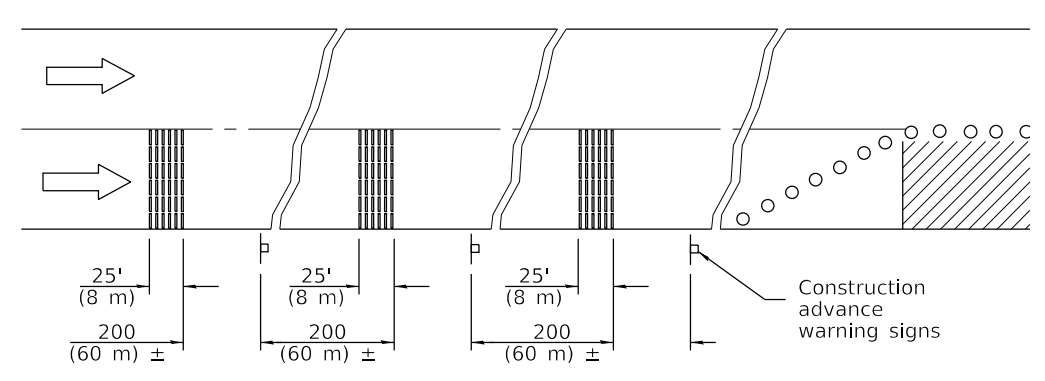
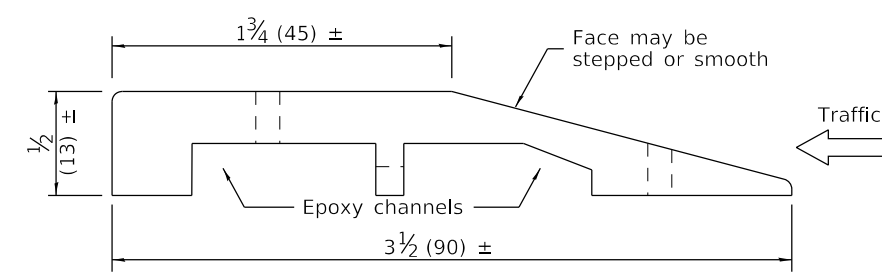
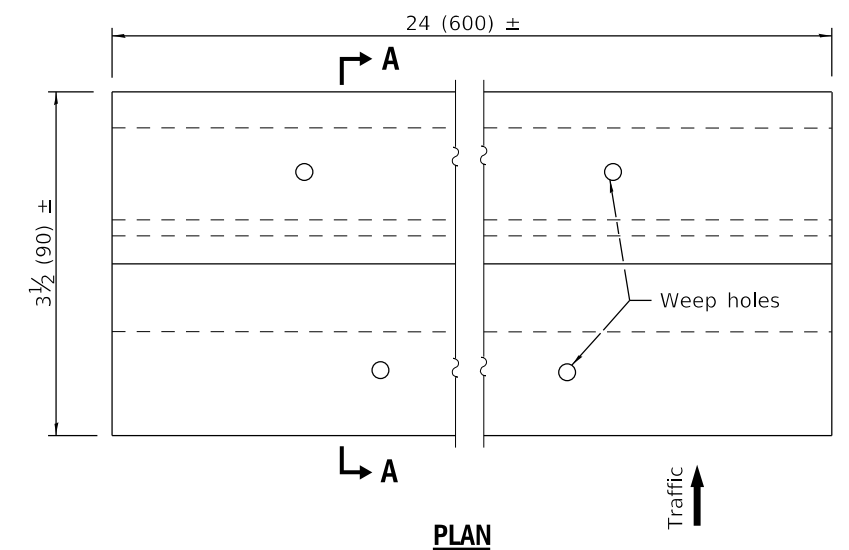
**TRAFFIC CONTROL DEVICES**

(Sheet 2 of 3)

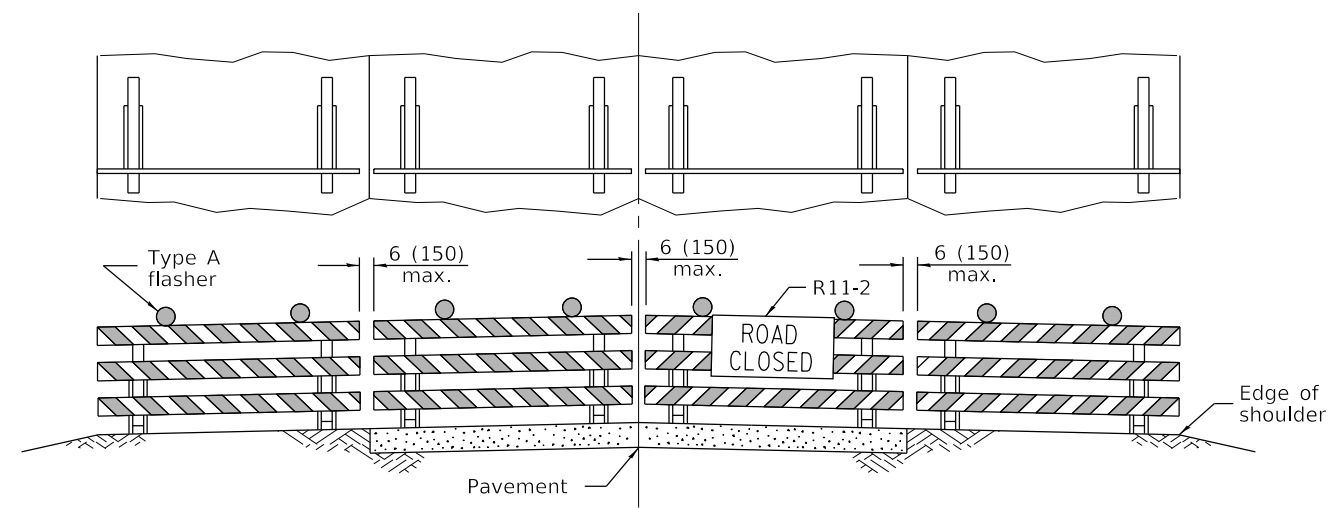
**STANDARD 701901-08**



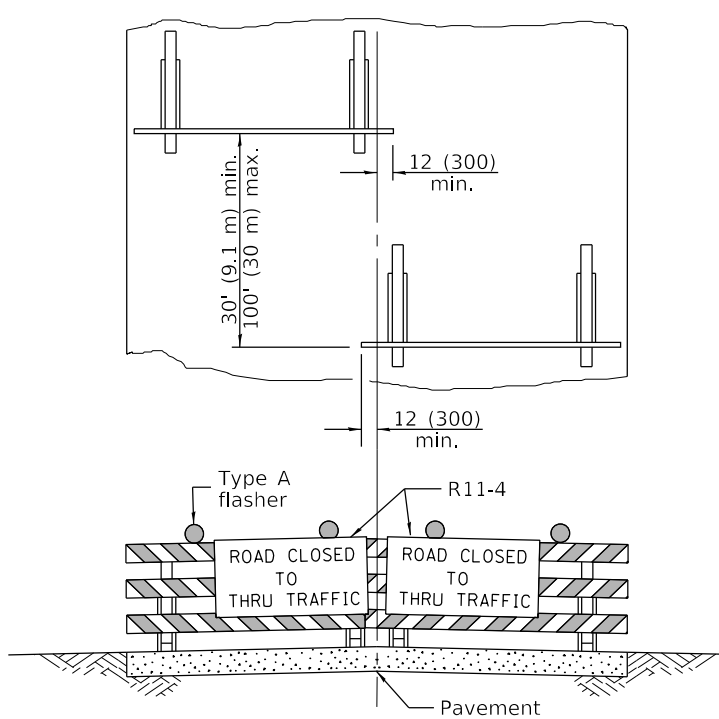
**ARROW BOARDS**



**TEMPORARY RUMBLE STRIPS**



Reflectorized striping may be omitted on the back side of the barricades. If a Type III barricade with an attached sign panel which meets NCHRP 350 is not available, the sign may be mounted on an NCHRP 350 temporary sign support directly in front of the barricade.



Reflectorized striping shall appear on both sides of the barricades. If a Type III barricade with an attached sign panel which meets NCHRP 350 is not available, the signs may be mounted on NCHRP 350 temporary sign supports directly in front of the barricade.

**TYPICAL APPLICATIONS OF TYPE III BARRICADES CLOSING A ROAD**

Illinois Department of Transportation

APPROVED January 1, 2019

*Cynthia Watt*  
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2019

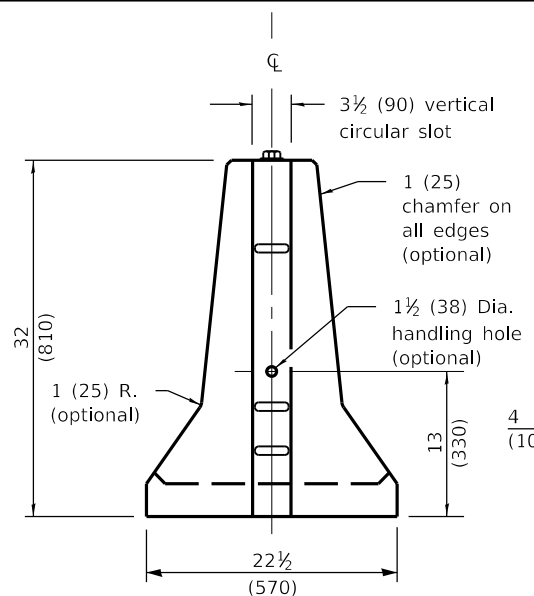
*Joe E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUES  
E1-1-1 Q3551

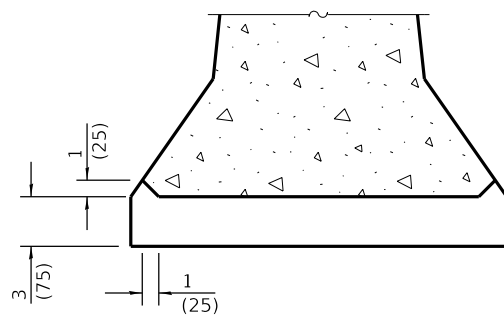
**TRAFFIC CONTROL DEVICES**

(Sheet 3 of 3)

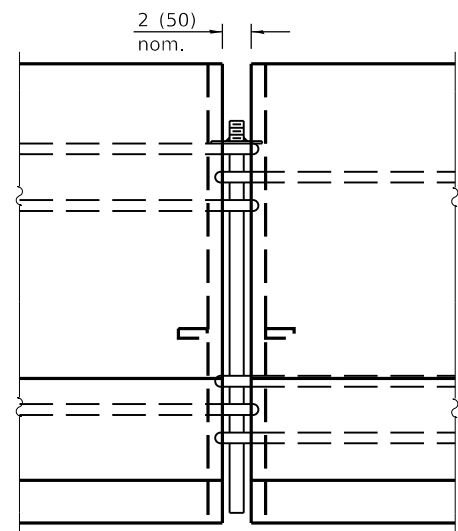
**STANDARD 701901-08**



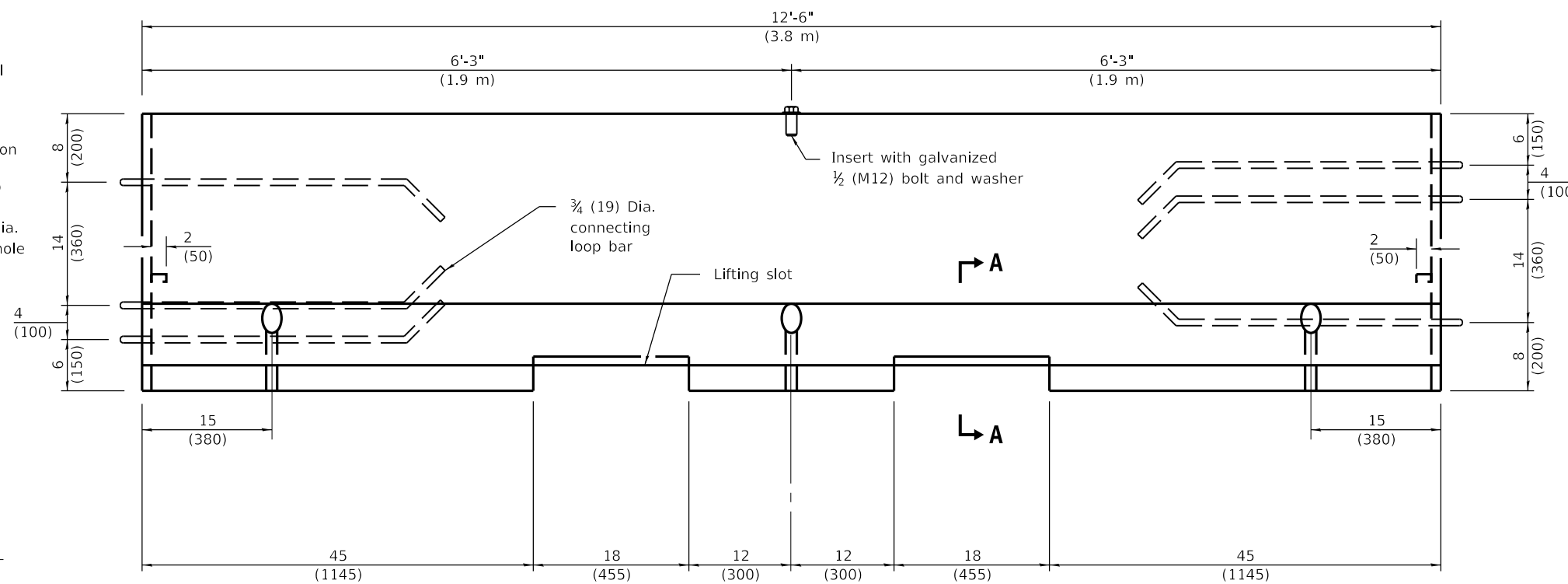
**END VIEW**  
(Showing lifting slot)



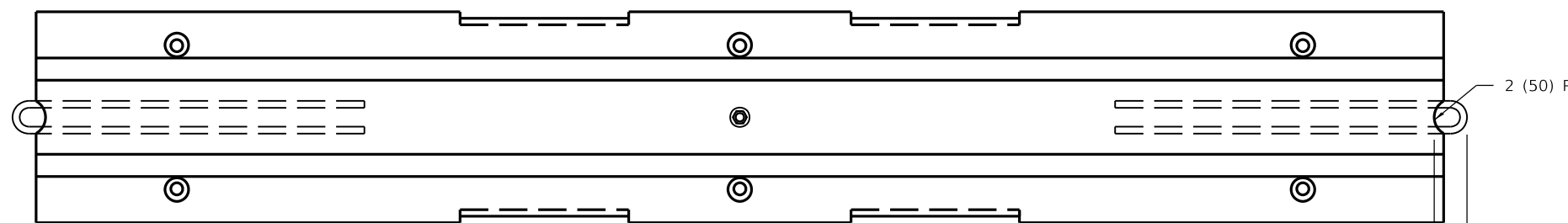
**SECTION A-A**  
**LIFTING SLOT**



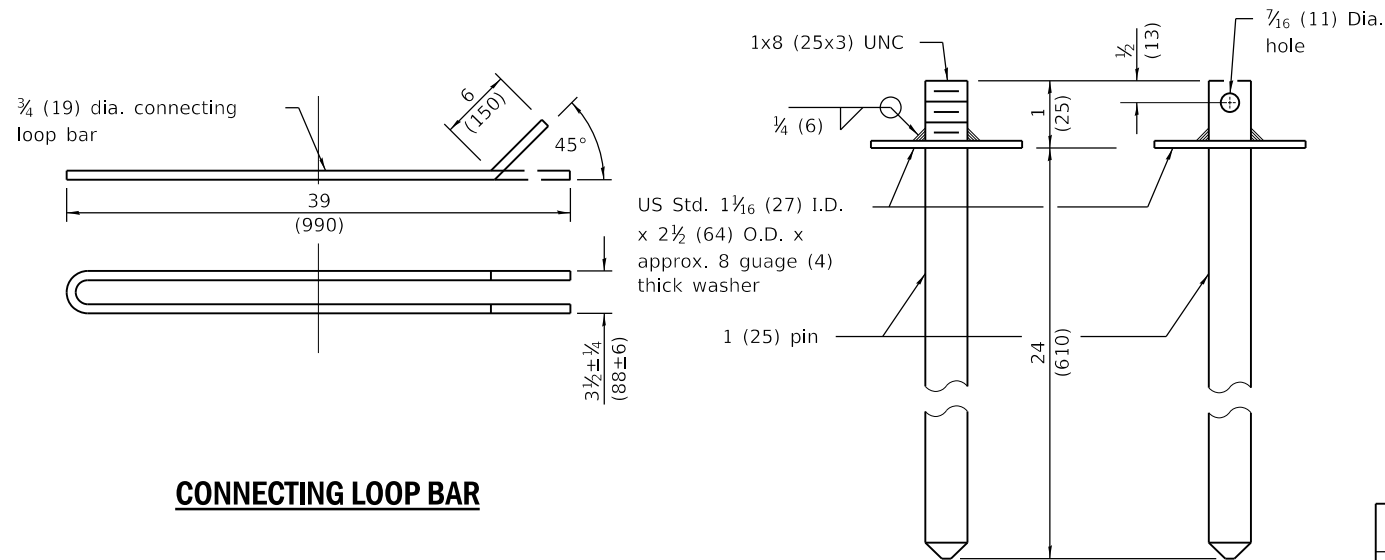
**CONNECTING DETAIL**



**ELEVATION**  
(Showing connecting loop bars and vertical panel bolt/insert)



**PLAN**

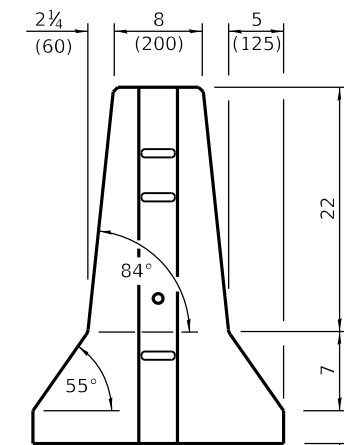


**CONNECTING LOOP BAR**

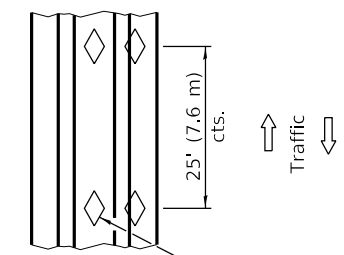
**CONNECTING AND**  
**ANCHOR PINS**

(End may be beveled 1/4 (6) max.)

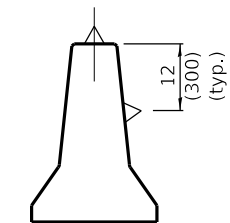
**F SHAPE DESIGN**



**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 1/2 (M12) bolt shall be capable of 3,000 lb (13 kN) pull-out strength.

When barrier separates opposing flows of traffic markers shall be on both sides of barrier.

See Standard 782006 for dimensions of Type C reflector.

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

2 1/2 (63) measured from face of barrier to end of loop bar

DATE	REVISIONS
4-1-16	Rev. opt. chamfer on all edges to 1 (25). Reference to Std. 635011 now 782006.
1-1-12	Omitted 'ALTERNATE' from connecting and anchoring pins detail.

**TEMPORARY CONCRETE BARRIER**

(Sheet 1 of 2)

**STANDARD 704001-08**

Illinois Department of Transportation

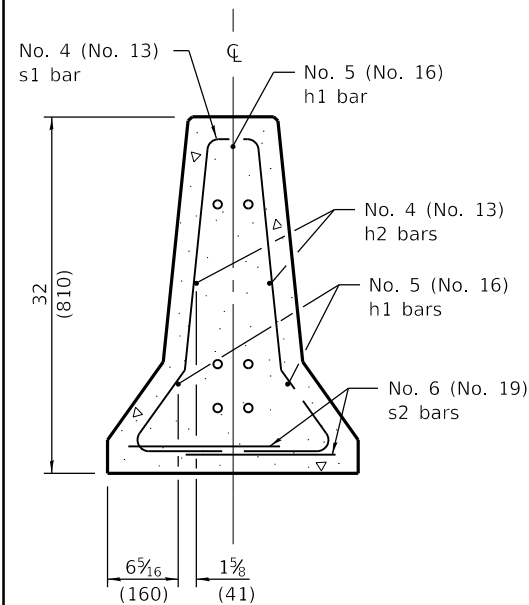
PASSED April 1, 2016  
Michael Brand  
ENGINEER OF POLICY AND PROCEDURES

APPROVED April 1, 2016  
ENGINEER OF DESIGN AND ENVIRONMENT

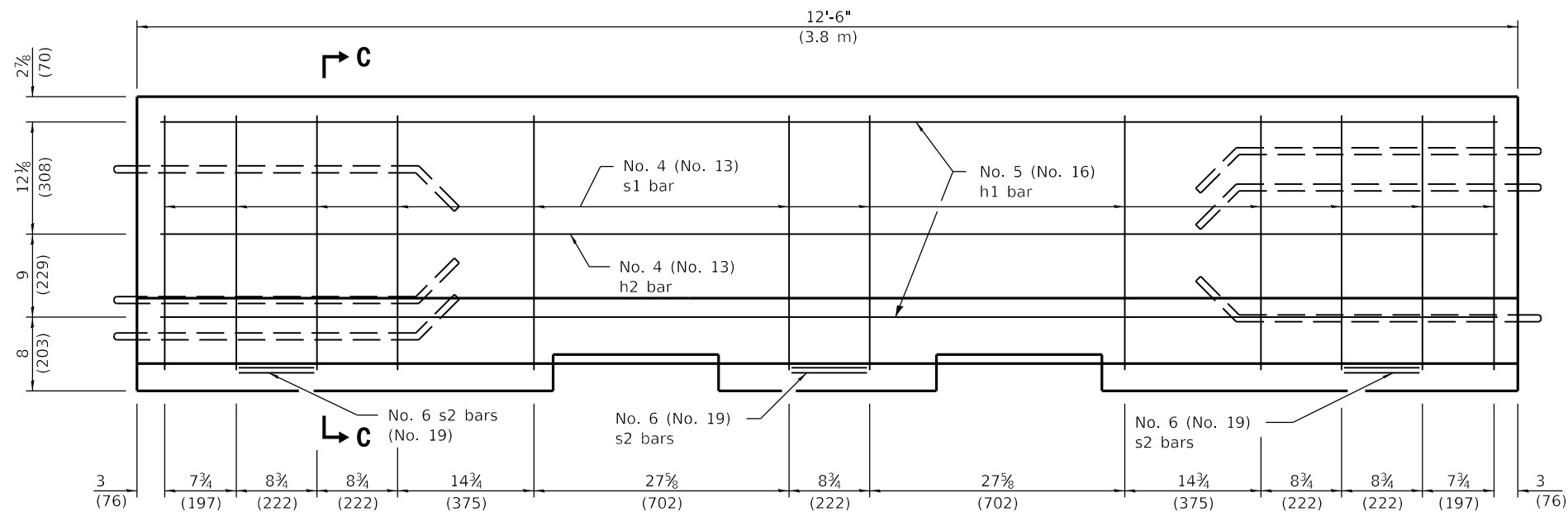
ISSUED 20-1-10-08



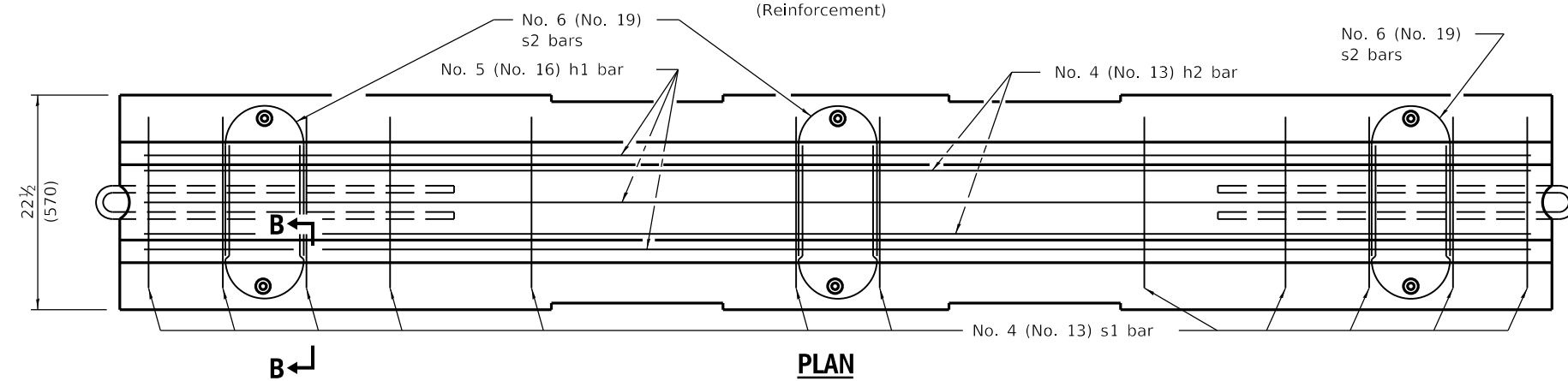
**F SHAPE DESIGN**



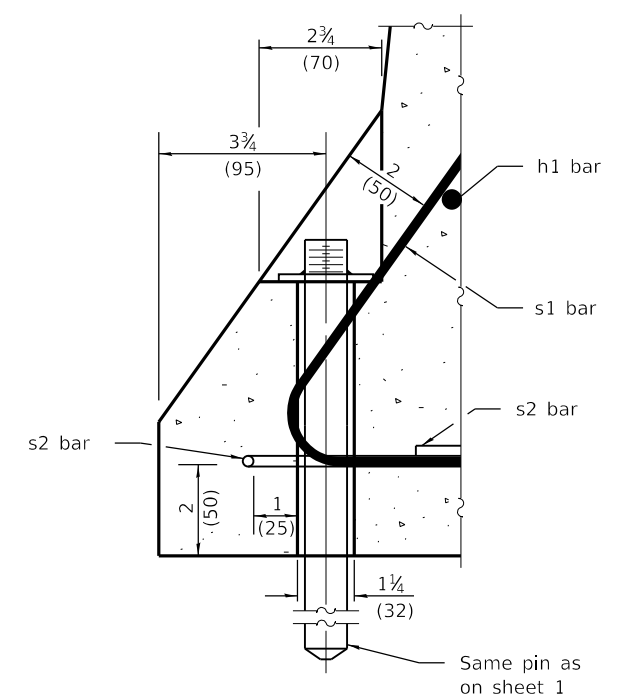
**SECTION C-C**



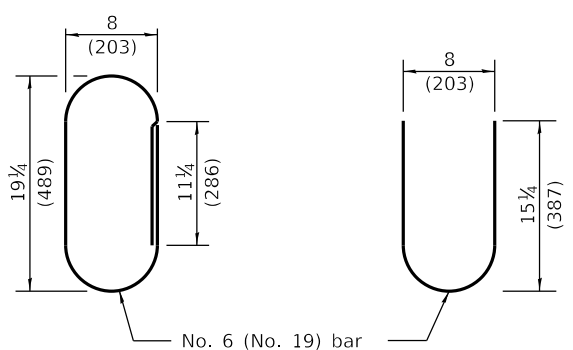
**ELEVATION**  
(Reinforcement)



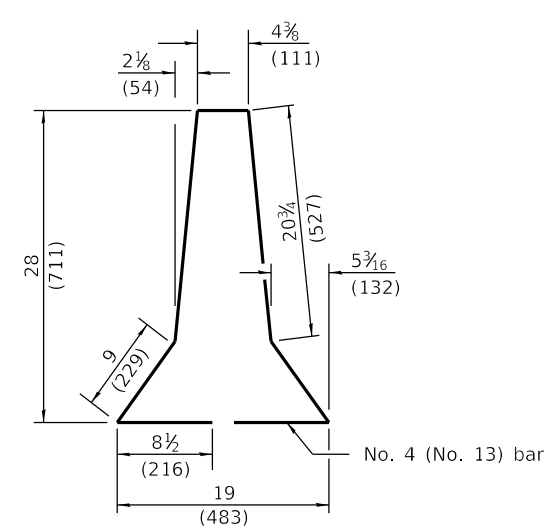
**PLAN**



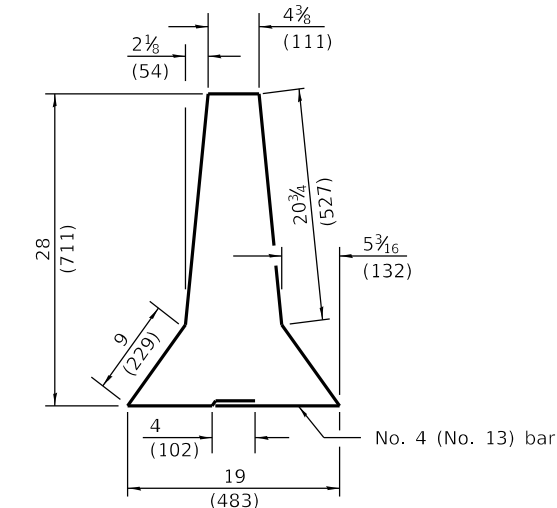
**SECTION B-B**  
**ANCHORING DETAIL**



**ALTERNATE s2 BARS**



**s1 BAR**



**ALTERNATE s1 BAR**

Illinois Department of Transportation

PASSED April 1, 2016

*Michael Beard*  
ENGINEER OF POLICY AND PROCEDURES

APPROVED April 1, 2016

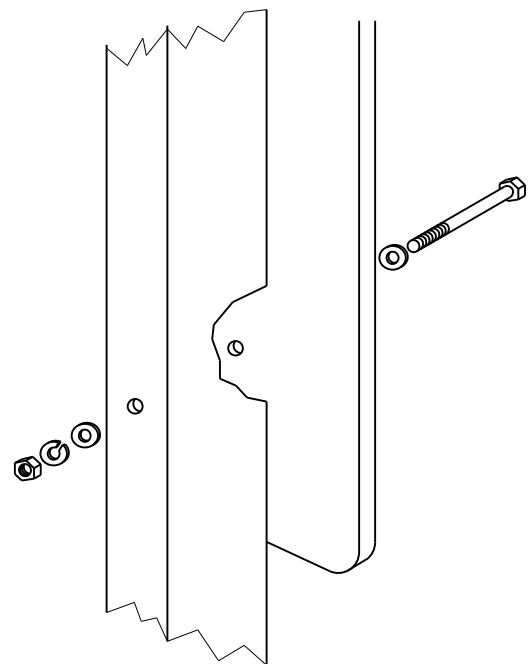
*[Signature]*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 10-1-02

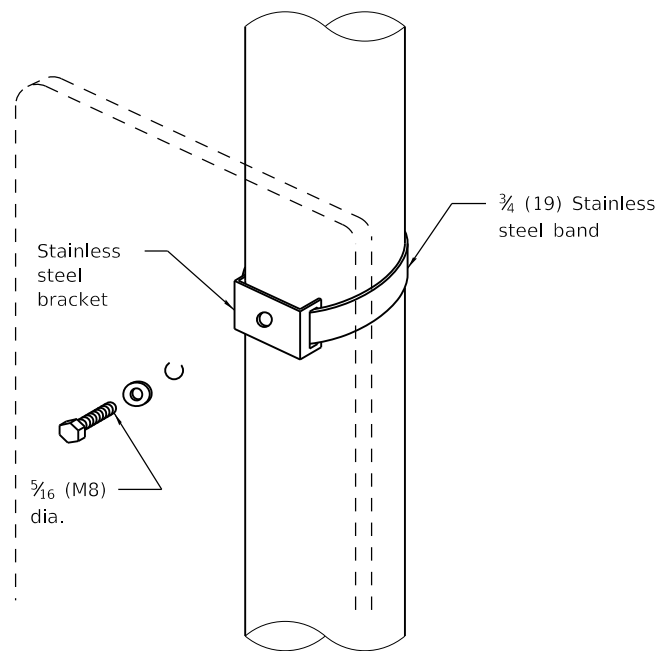
**TEMPORARY CONCRETE BARRIER**

(Sheet 2 of 2)

**STANDARD 704001-08**

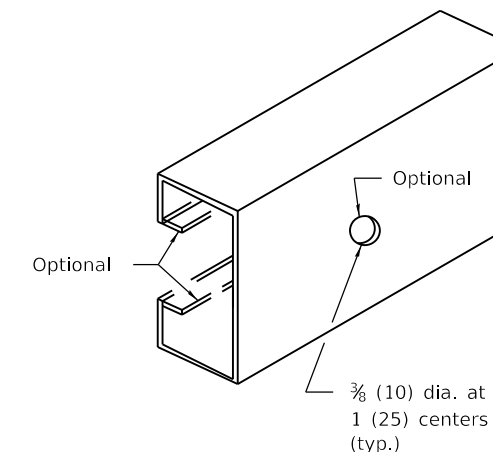
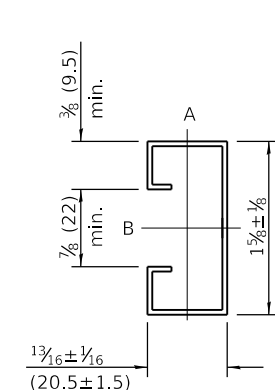


Sign panel 36 (900) wide or less

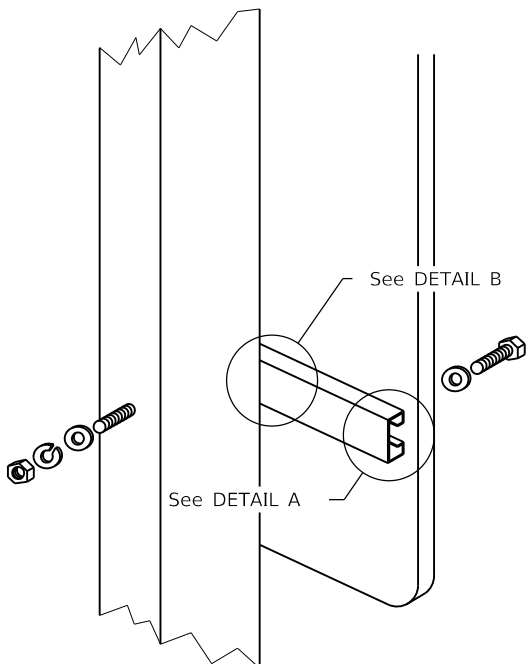


Sign panel 36 (900) wide or less

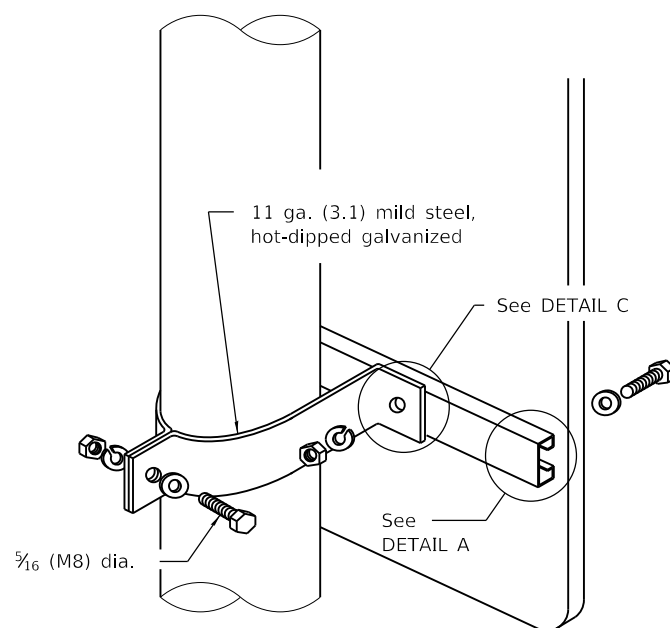
Section modulus (minimum)	Axis A	Axis B
Steel	0.050 in. <sup>3</sup> (819 mm <sup>3</sup> )	0.105 in. <sup>3</sup> (1720 mm <sup>3</sup> )
Aluminum	0.150 in. <sup>3</sup> (2458 mm <sup>3</sup> )	0.315 in. <sup>3</sup> (5162 mm <sup>3</sup> )



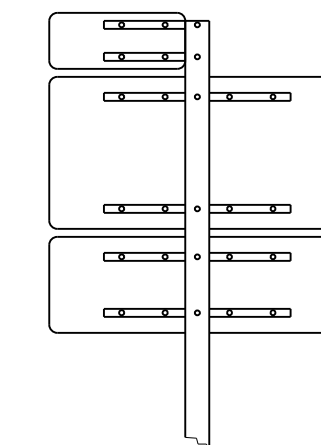
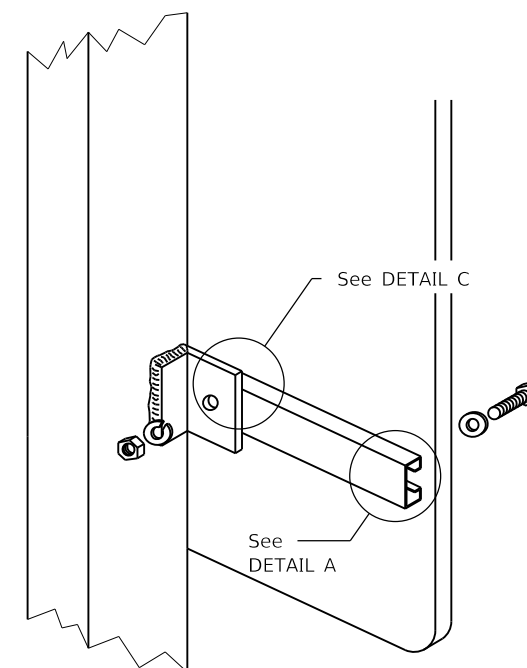
**SUPPORTING CHANNEL DETAILS**



Sign panel over 36 (900) wide



Sign panel over 36 (900) wide

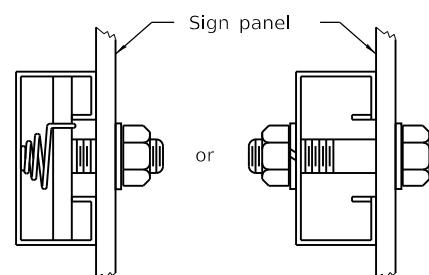


**ROUTE MARKER ASSEMBLY**

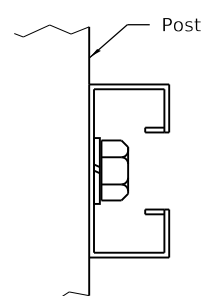
**WOOD OR TELESCOPING STEEL POSTS**

**LIGHT OR SIGNAL STANDARDS**

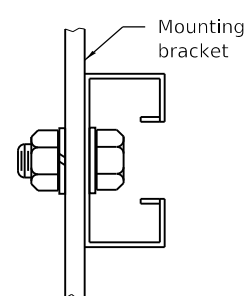
**BREAKAWAY STEEL TUBING POSTS**  
(All sign panel sizes)



**DETAIL A**



**DETAIL B**



**DETAIL C**

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**

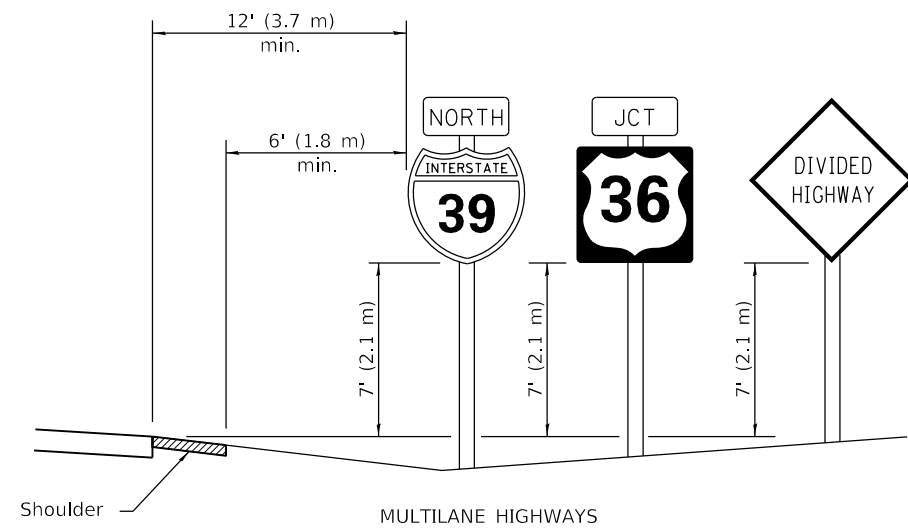
**STANDARD 720001-01**

Illinois Department of Transportation

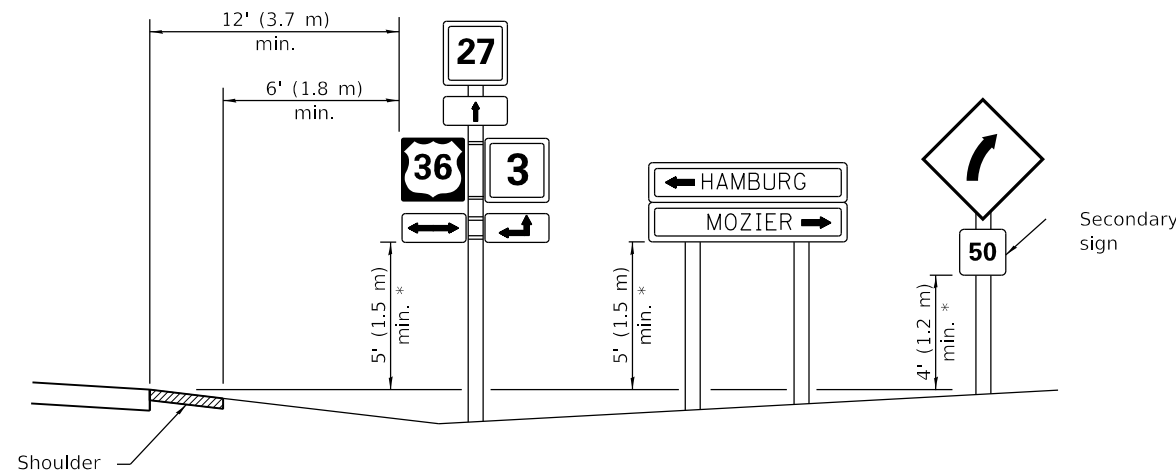
PASSED January 1, 2009  
*[Signature]*  
ENGINEER OF OPERATIONS

APPROVED January 1, 2009  
*[Signature]*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

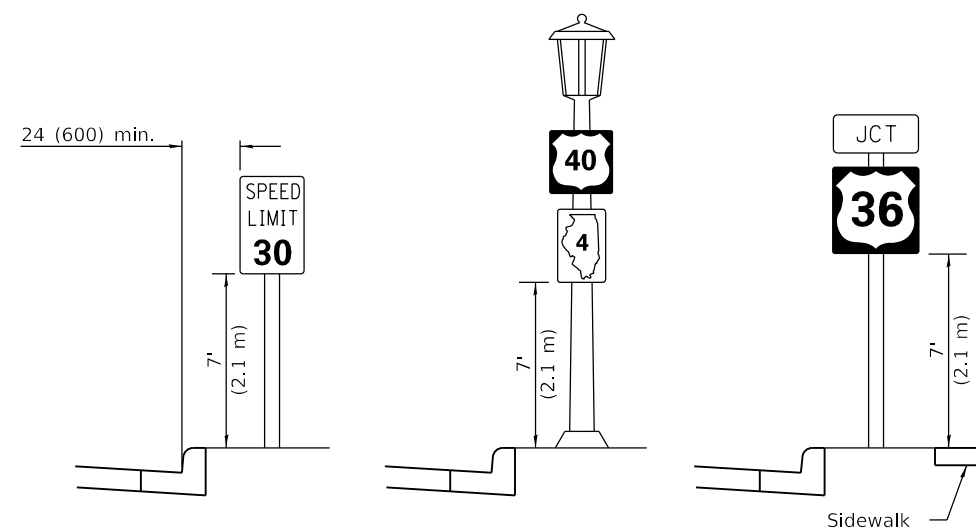


MULTILANE HIGHWAYS



\* In any area where parking is likely to occur or where there are obstructions to view or where signs are located over sidewalks, the height shall be at least 7' (2.1 m).

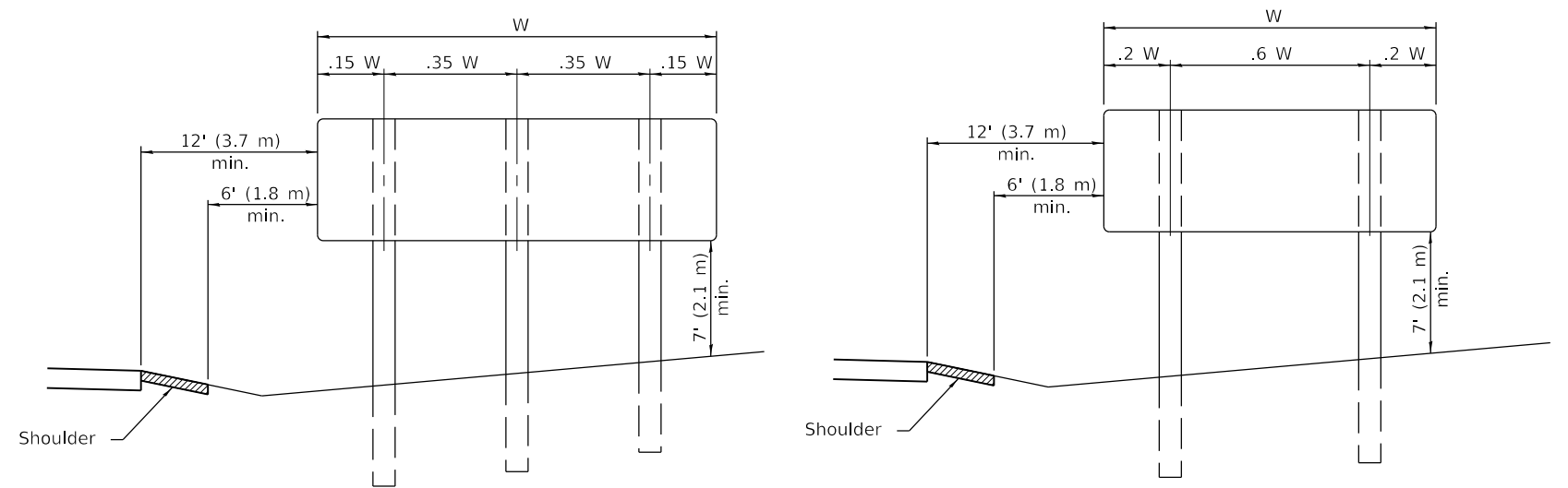
TWO LANE RURAL HIGHWAYS



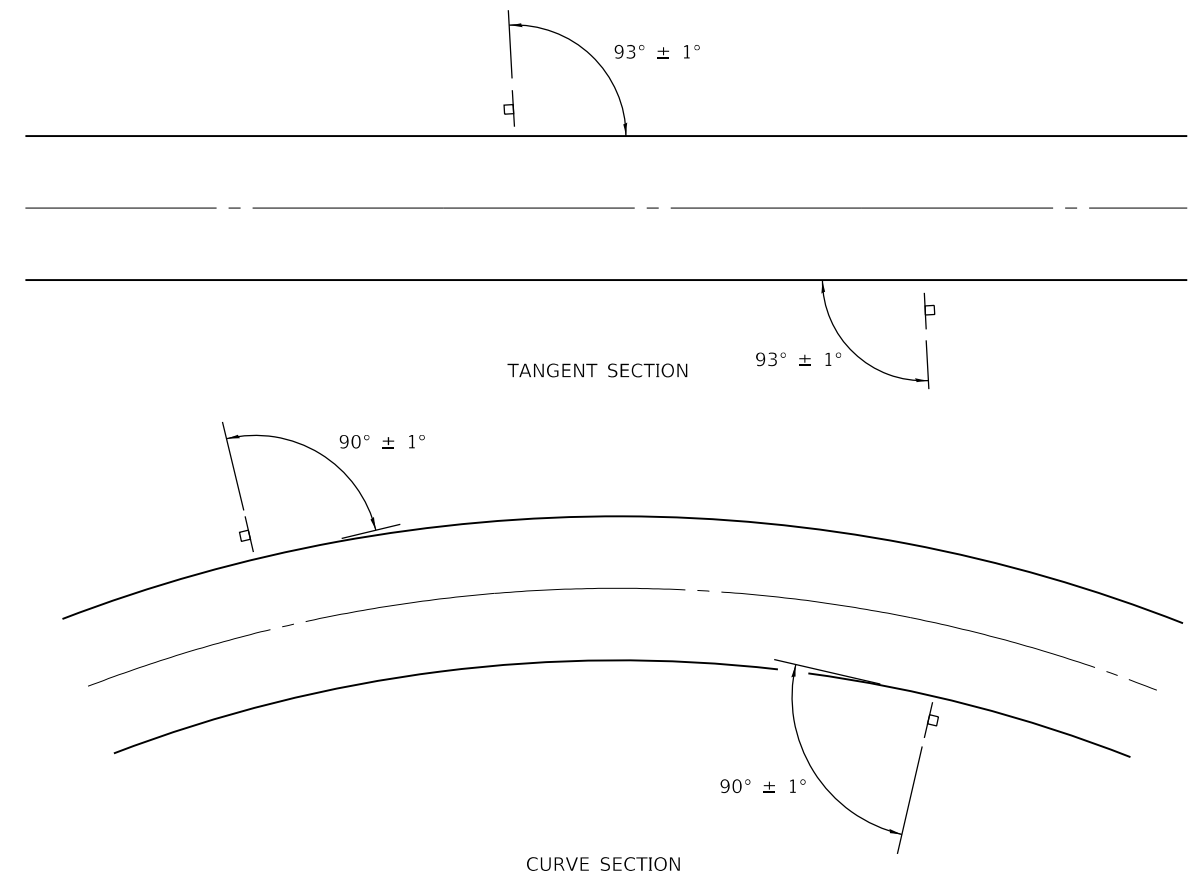
URBAN LOCATIONS

**TYPICAL INSTALLATIONS**

Signs in any area shall be erected to a uniform height above the edge of the pavement.



**POST SPACING FOR NON-FREEWAY SIGN PANELS**



**GROUND MOUNT SIGN POSITIONING**

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

Illinois Department of Transportation

PASSED January 1, 2014  
*Justin Mann*  
 ENGINEER OF OPERATIONS

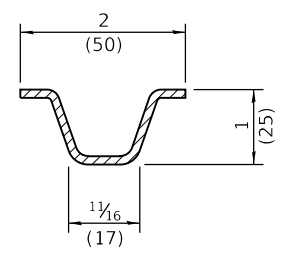
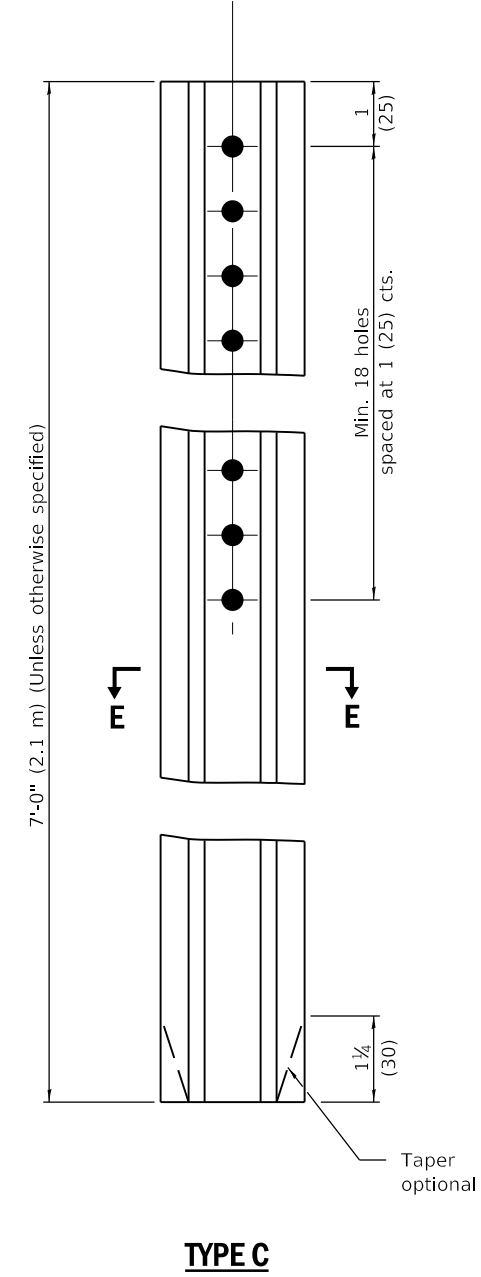
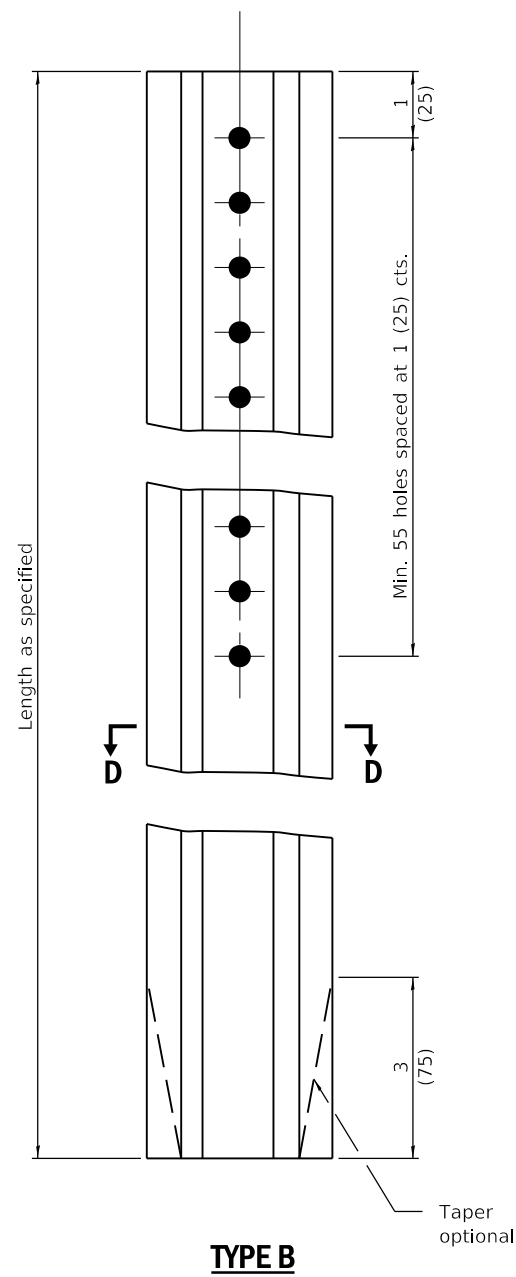
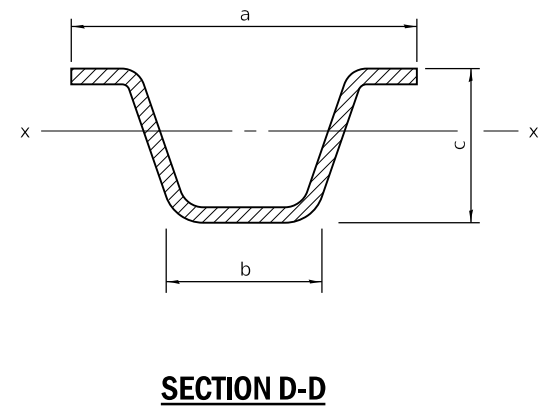
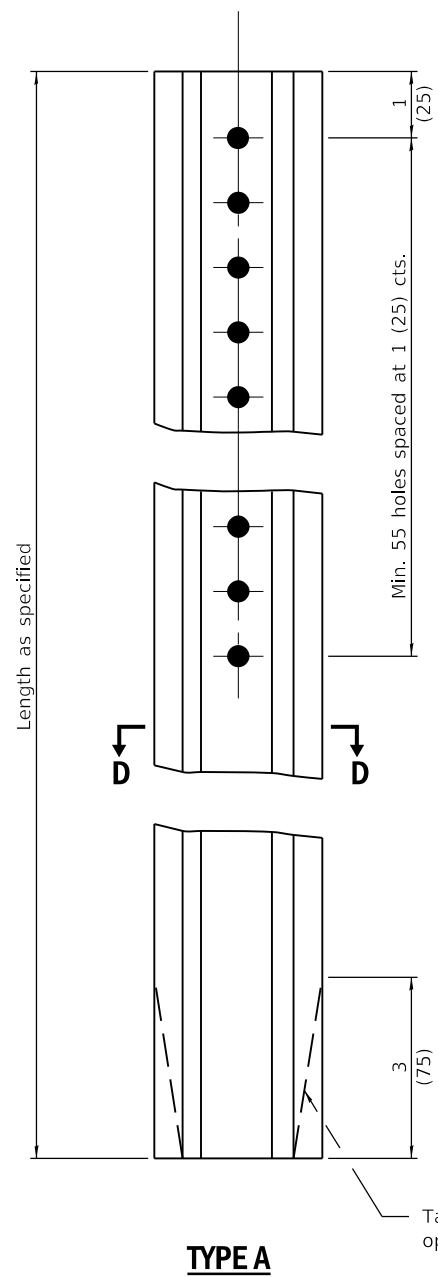
APPROVED January 1, 2014  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-14	Added shoulders and slopes.
	Changed sign distances from roadway and shoulder.
1-1-12	Rev. sign elev. for multilane hwy's. Revised sign elev. and dist. to curb for rural loc.

**SIGN PANEL ERECTION DETAILS**

**STANDARD 720006-04**



**SECTION E-E**  
Steel - 1.12 lbs./ft. (1.67 kg/m)

		a	b	c	Sx-x in. <sup>3</sup> (mm <sup>3</sup> )	lbs./ft. (kg/m)
TYPE A	Steel	3 1/16 (78)	1 1/2 (32)	1 1/16 (37)	0.223 (3,654)	2.00 (2.98)
	Aluminum	3 1/2 (89)	1 1/2 (41)	1 1/2 (48)	0.435 (7,128)	0.90 (1.34)
TYPE B	Steel	3 3/16 (81)	1 1/2 (32)	1 1/2 (38)	0.341 (5,588)	3.00 (4.46)
	Aluminum	4 3/8 (118)	2 1/2 (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.

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2350-4.

**METAL POSTS FOR SIGNS,  
MARKERS & DELINEATORS**

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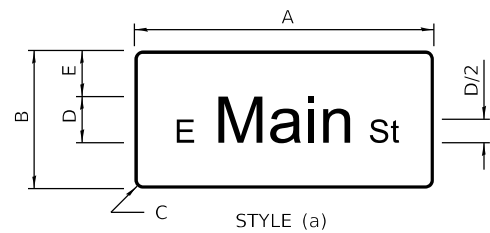
**STANDARD 720011-01**

Illinois Department of Transportation

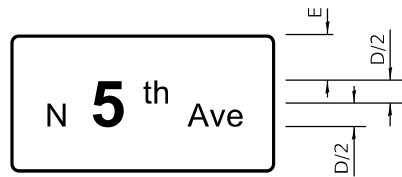
PASSED January 1, 2009  
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



STYLE (a)



STYLE (b)



STYLE (c)



STYLE (d)



STYLE (e)



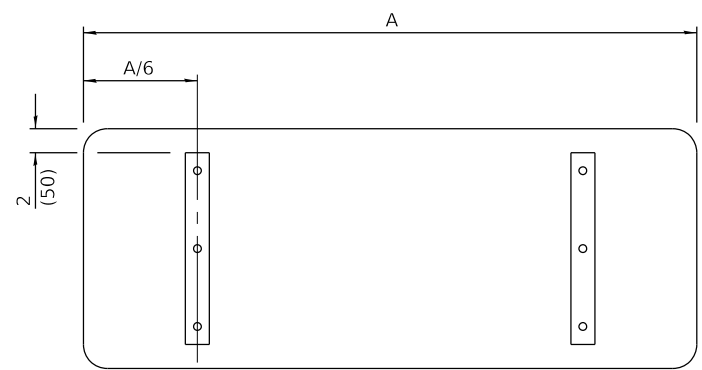
STYLE (f)

When road classification only is on the second line, it should not be abbreviated.

**TYPICAL SIGN STYLES**

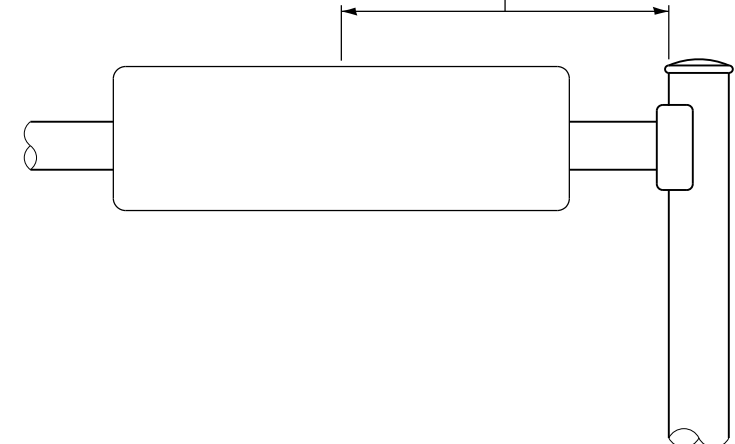
SIGN STYLE	DIMENSIONS								LETTER SIZE UC/LC PRIMARY			BORDER
	A	B	C	D	E	F	G	H	1	2	*	
a,b,d	Var.	12 (300)	1½ (40)	6 (150)	3 (75)	-	-	-	6¼ (150/115)	-	-	⅜ (10)
	Var.	18 (450)	1½ (40)	8 (200)	5 (125)	-	-	-	8/6 (200/150)	-	-	⅝ (15)
	Var.	24 (600)	1½ (40)	10 (250)	7 (175)	-	-	-	10/7½ (250/190)	-	-	⅝ (15)
	Var.	30 (750)	1⅝ (45)	12 (300)	9 (225)	-	-	-	12/9 (400/300)	-	-	¾ (20)
c,e	Var.	24 (600)	1½ (40)	6 (150)	-	-	5½ (140)	4 (100)	6¼ (150/115)	-	3 (75)	⅝ (15)
	Var.	30 (750)	1⅝ (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)	-	-	6¼ (150/115)	6¼ (150/115)	-	⅝ (15)
	Var.	30 (750)	1⅝ (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.

DATE	REVISIONS
1-1-18	Revised MOUNTING LOCATION detail.
1-1-12	Revised table and lettering to upper/lower case per current MUTCD.

**MAST ARM MOUNTED STREET NAME SIGNS**

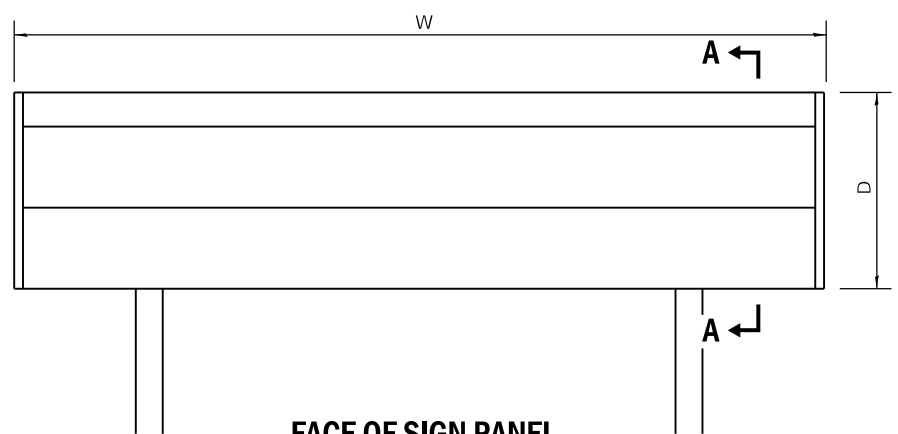
**STANDARD 720016-04**

Illinois Department of Transportation

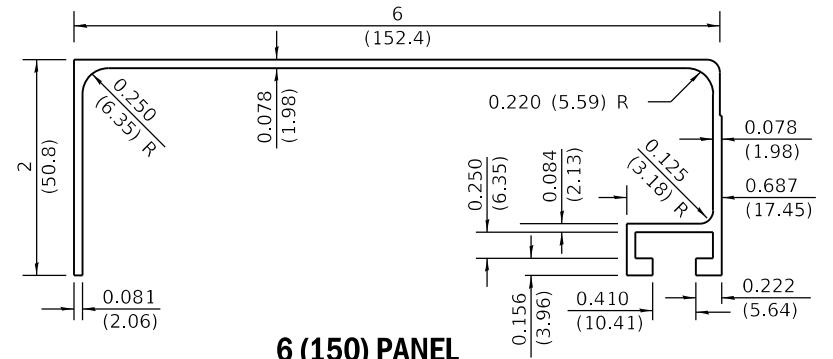
PASSED January 1, 2018  
*Amy Allen*  
 ENGINEER OF OPERATIONS

APPROVED January 1, 2018  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

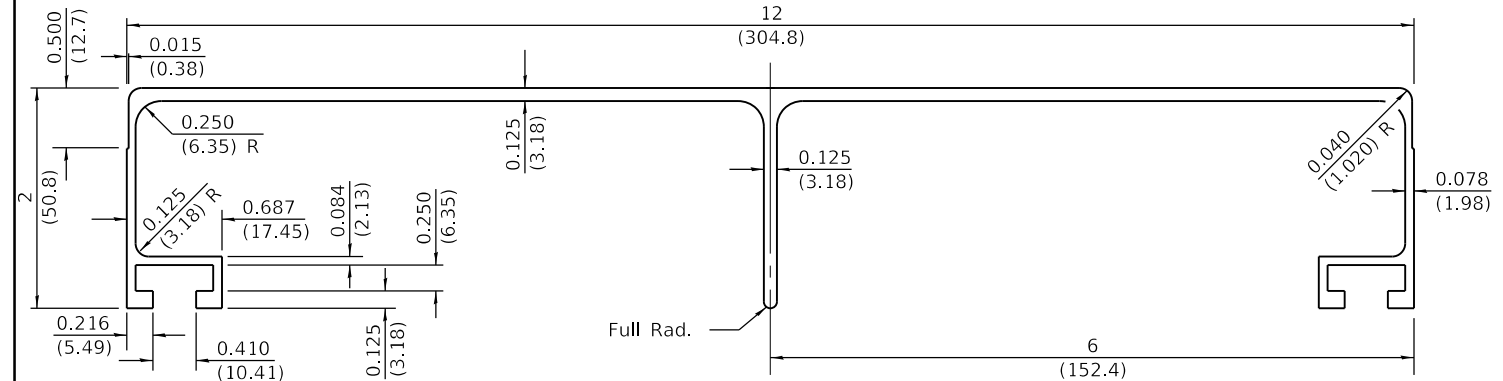
ISSUED 1-1-97



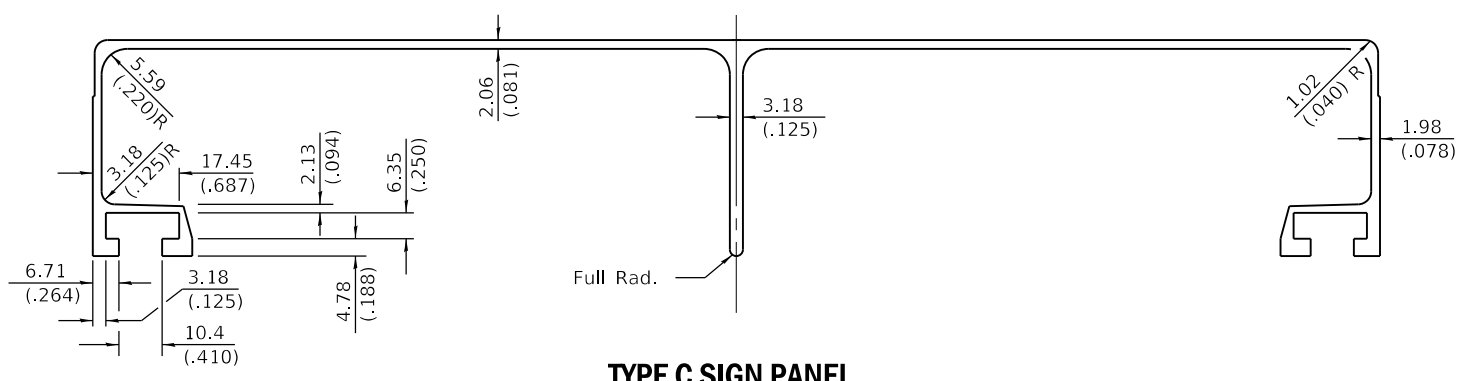
**FACE OF SIGN PANEL**



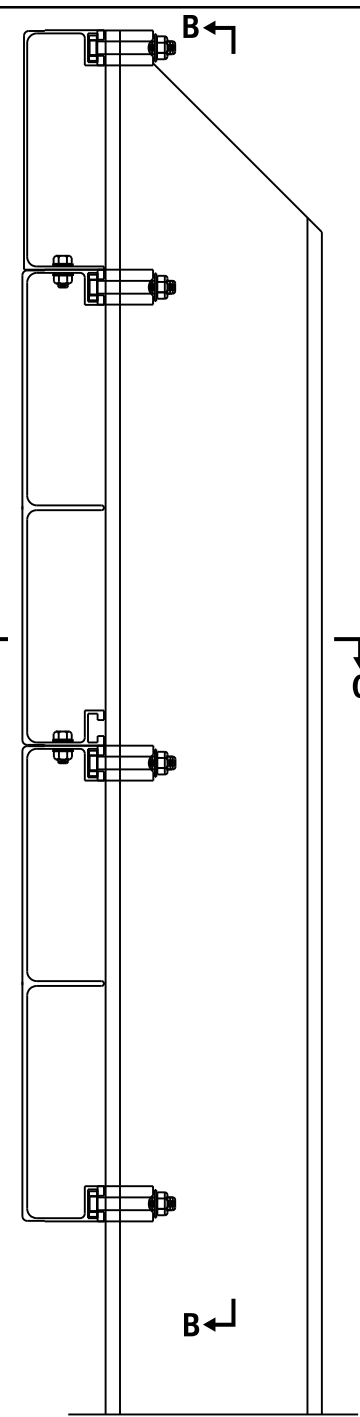
**6 (150) PANEL**



**TYPE B SIGN PANEL**



**TYPE C SIGN PANEL**

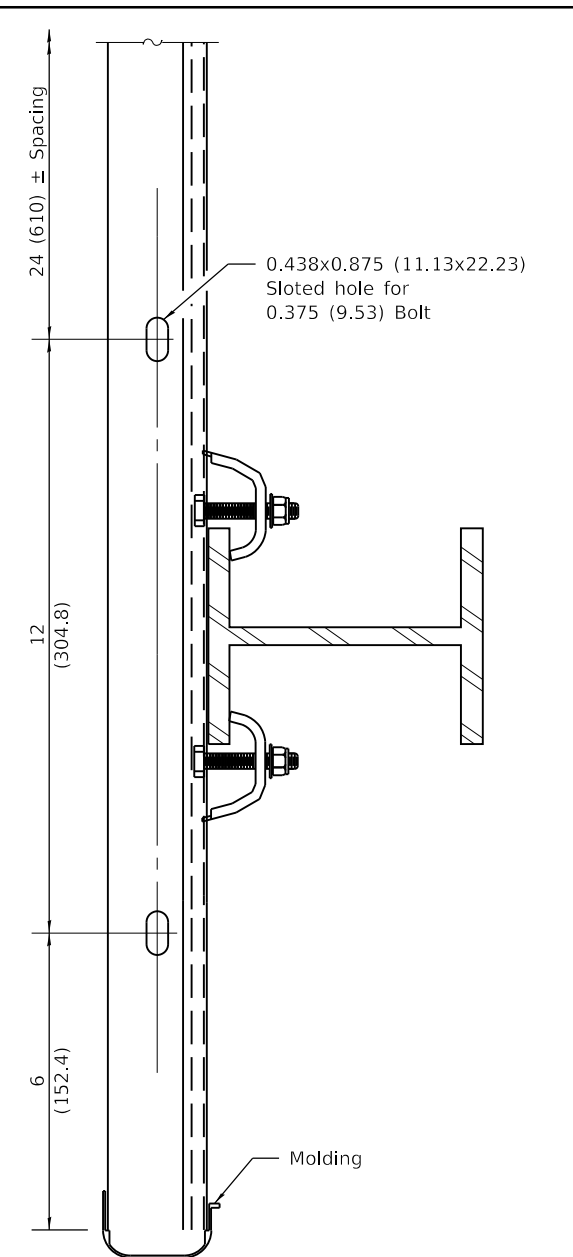


**SECTION A-A**

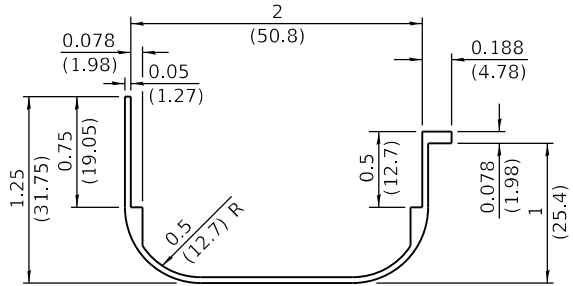


**SECTION B-B**

(Provide two post clips top and bottom. Alternate at interior panel joints on ground-mounted signs, and provide two clips at all panel joints on over-head mounted signs.)



**SECTION C-C**  
(w/o panel bolts)



**SIGN MOLDING**

(Color shall match sign facematerial. To be riveted to sign panel at 24 (600) O.C.)

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

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUES

00-1-1 03/05/01

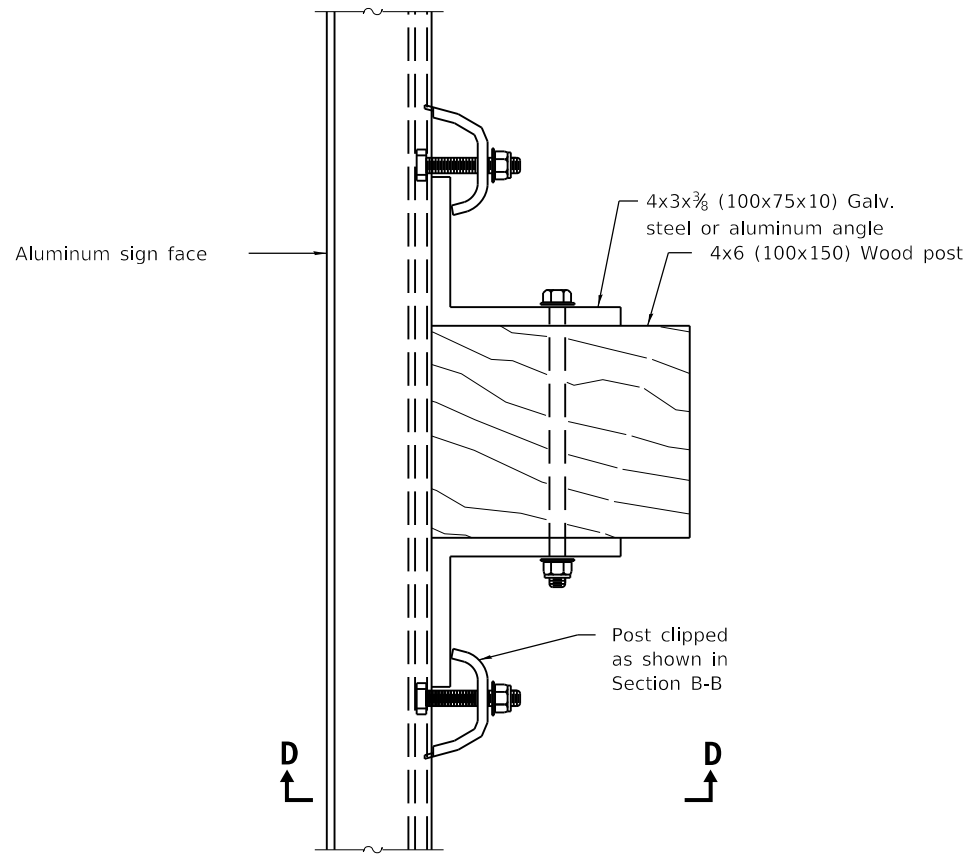
DATE	REVISIONS
1-1-09	Added aluminum clip.
	Switched units to English (metric).
1-1-03	Revised stainless steel clip design, and minor changes.

**SIGN PANELS**

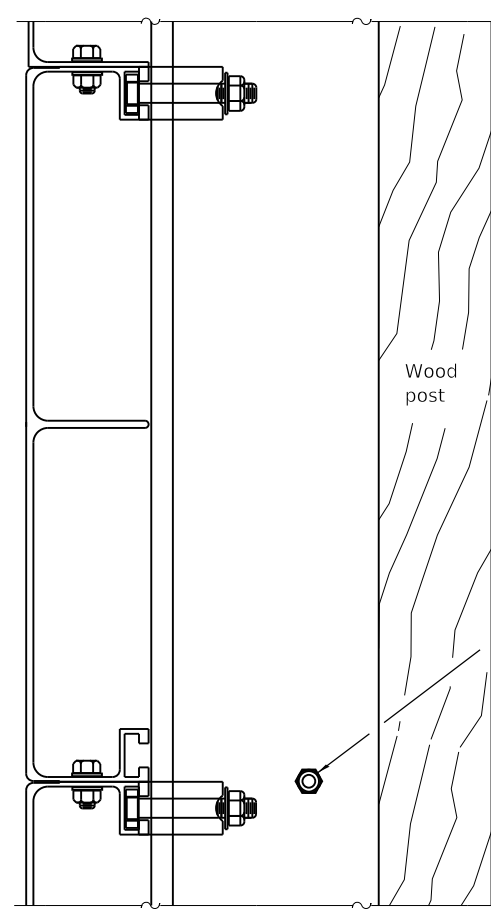
**EXTRUDED ALUMINUM TYPE**

(Sheet 1 of 2)

**STANDARD 720021-02**

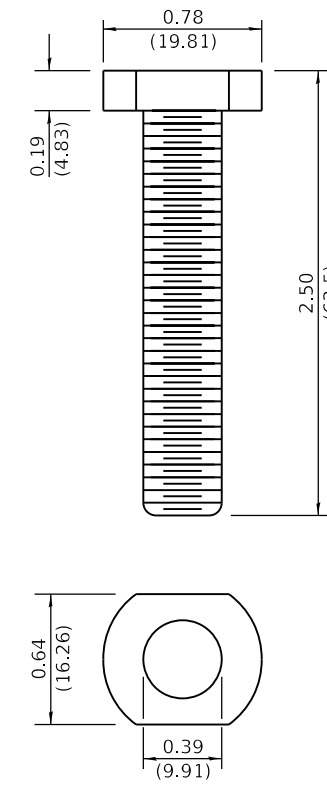


**SIGN PANEL ATTACHMENT TO WOOD POST**

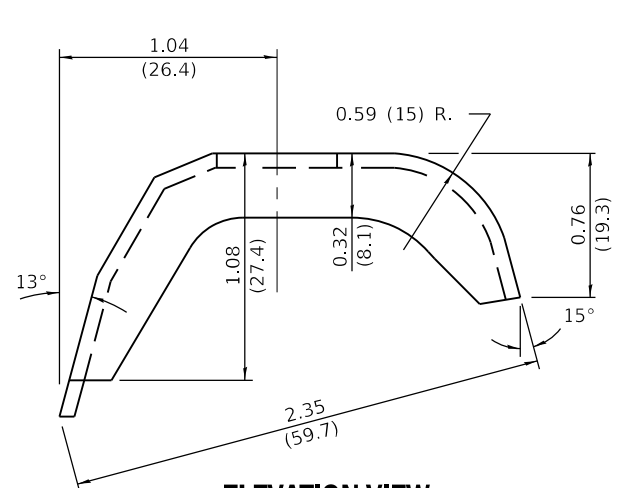
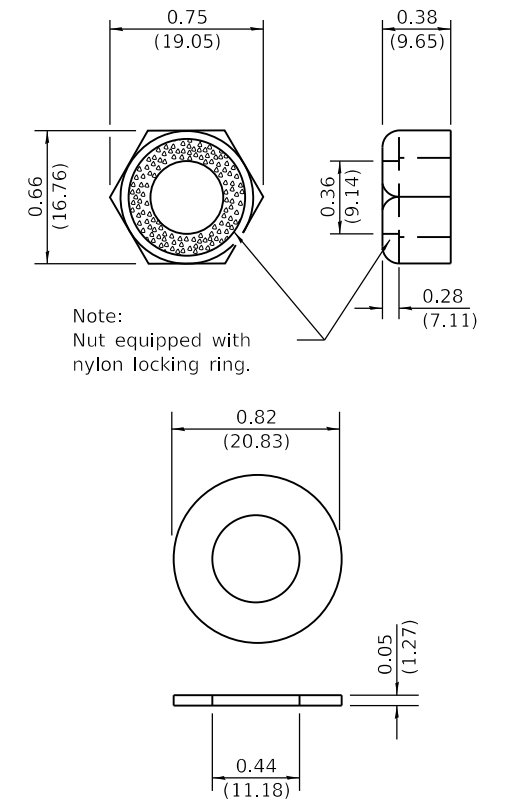


**SECTION D-D**

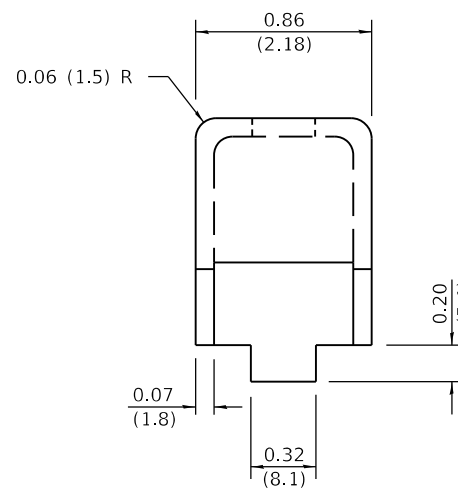
$\frac{3}{8}$  (M10) Bolt with flat washer, lock washer and nut 18 (450) O.C. (min. of 3 bolts to be used)



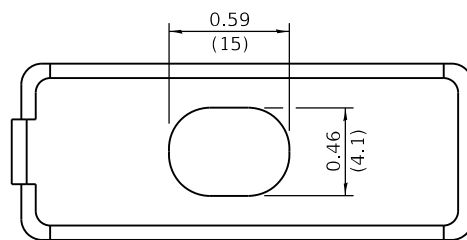
**STAINLESS STEEL CLIP NUT, BOLT AND WASHER ASSEMBLY**



**ELEVATION VIEW**

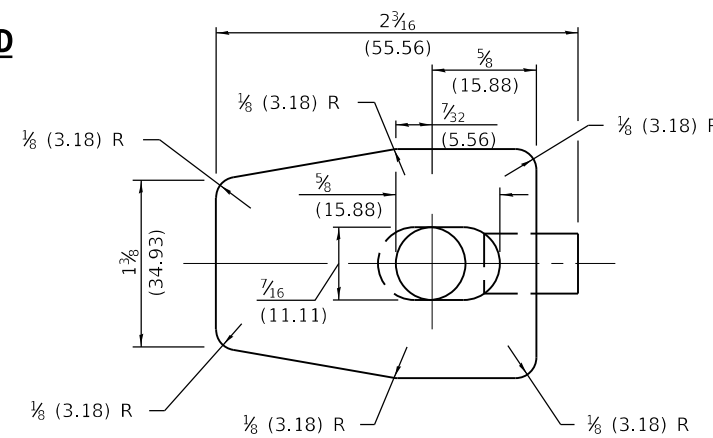


**END VIEW**

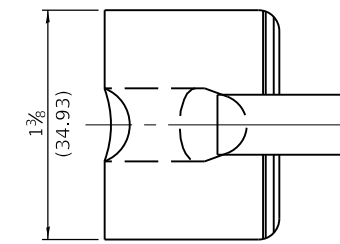


**PLAN VIEW**

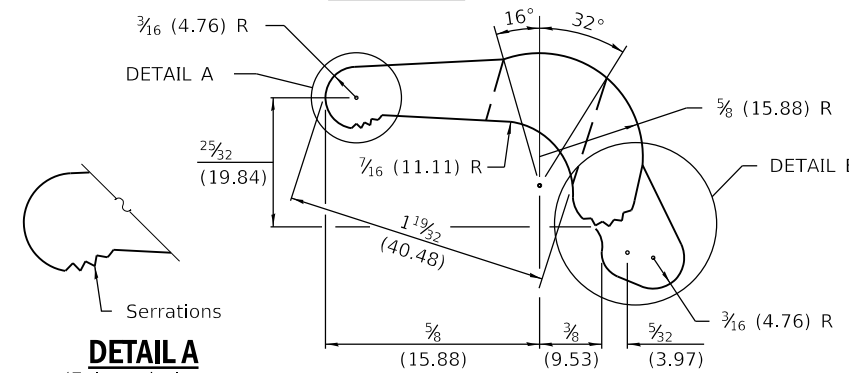
**STAINLESS STEEL CLIP**



**PLAN VIEW**

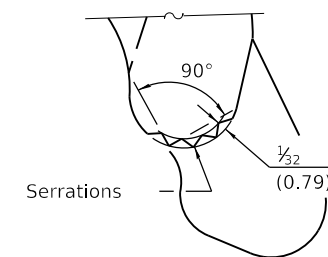


**END VIEW**



**ELEVATION VIEW**

**ALUMINUM CLIP**



**DETAIL B**  
(Enlarged detail of serrations)



**DETAIL A**  
(Enlarged view of serrations)

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

APPROVED January 1, 2009

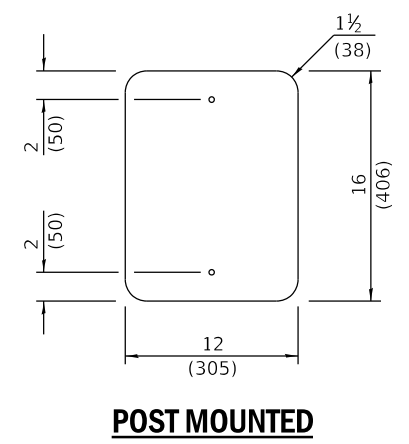
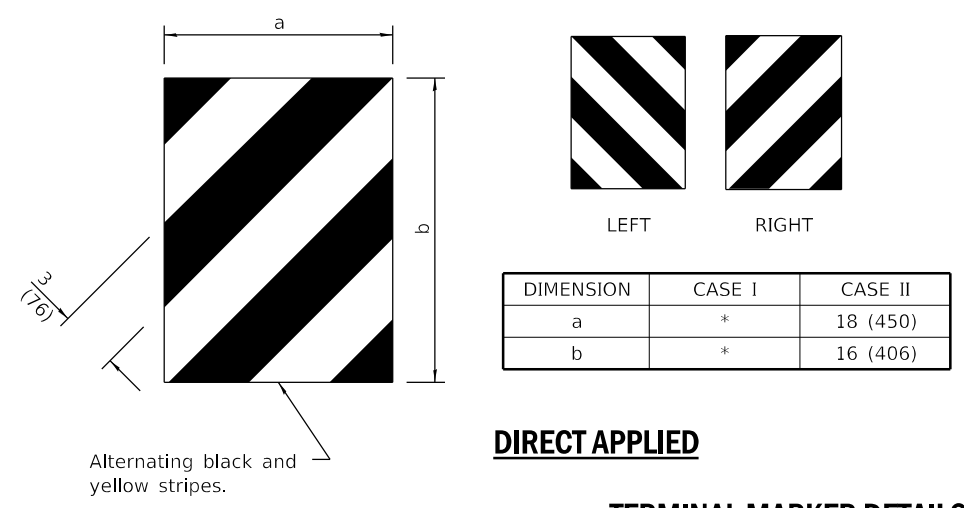
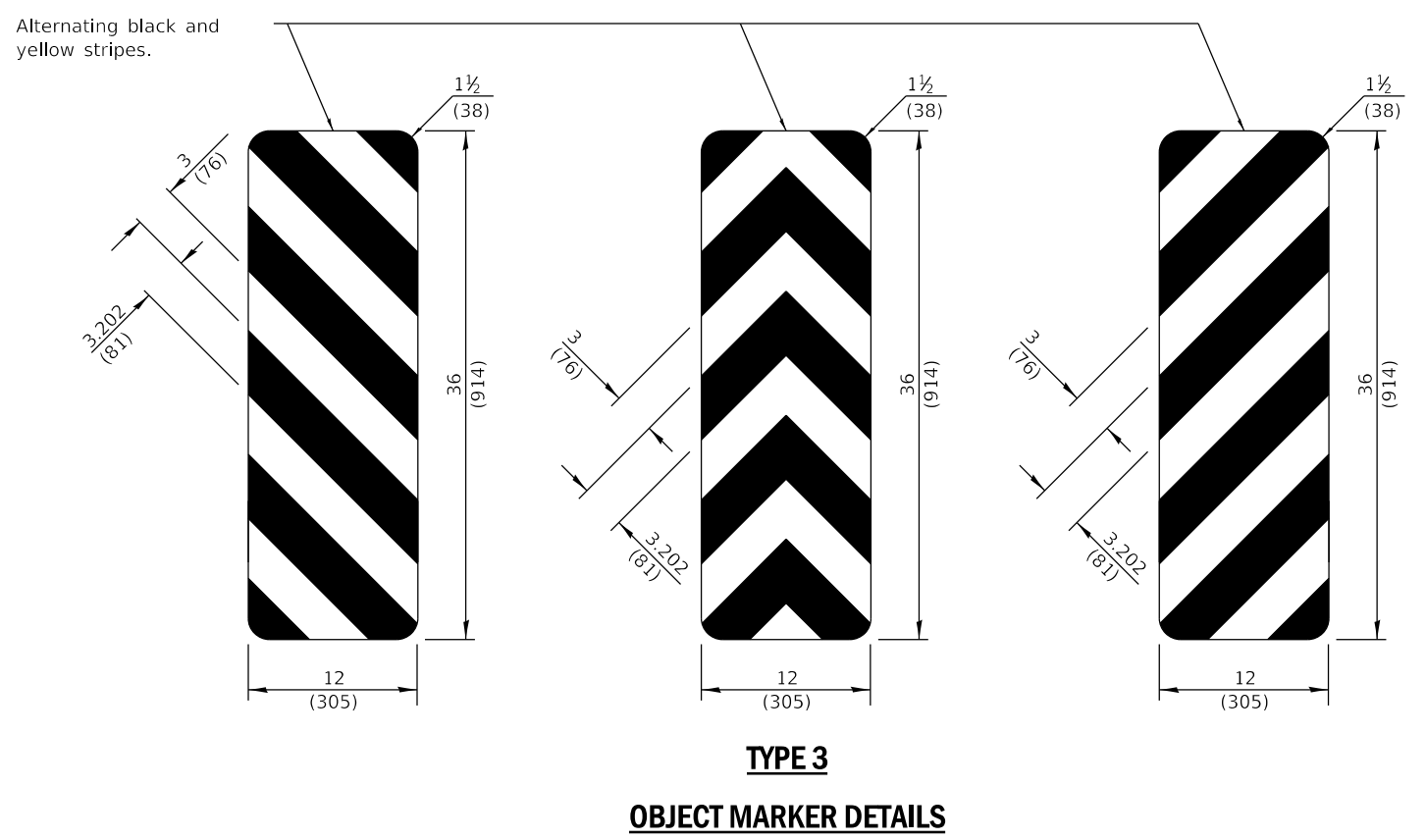
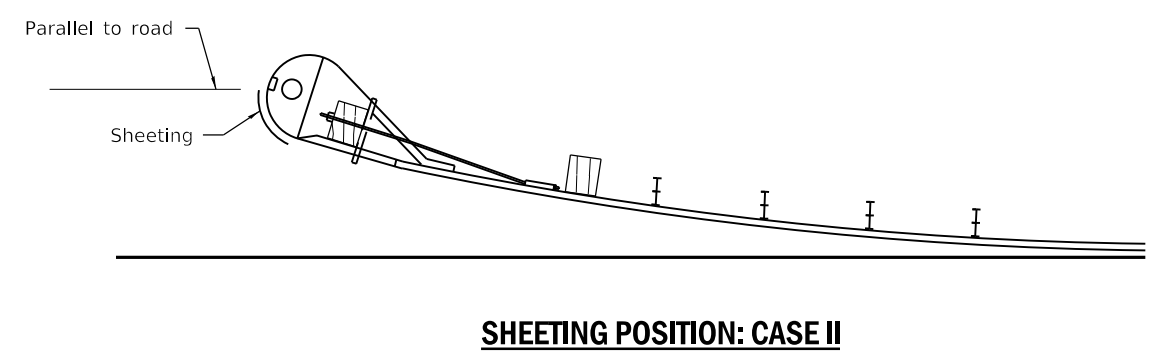
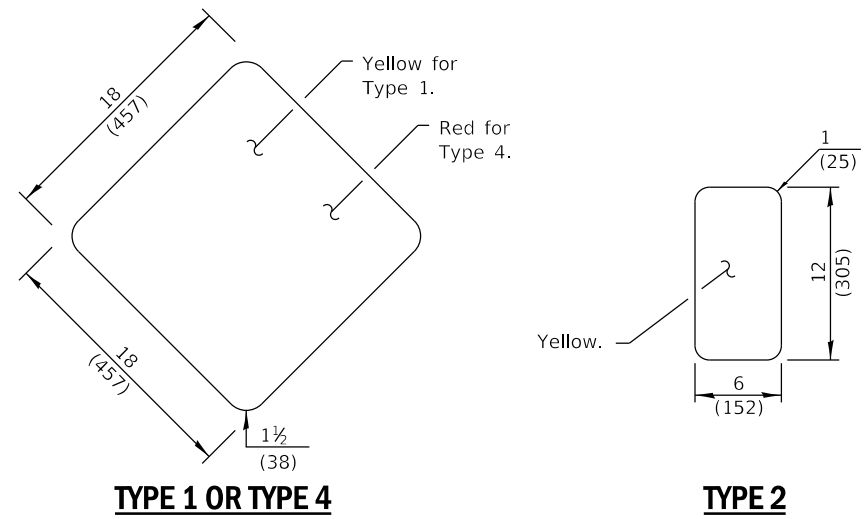
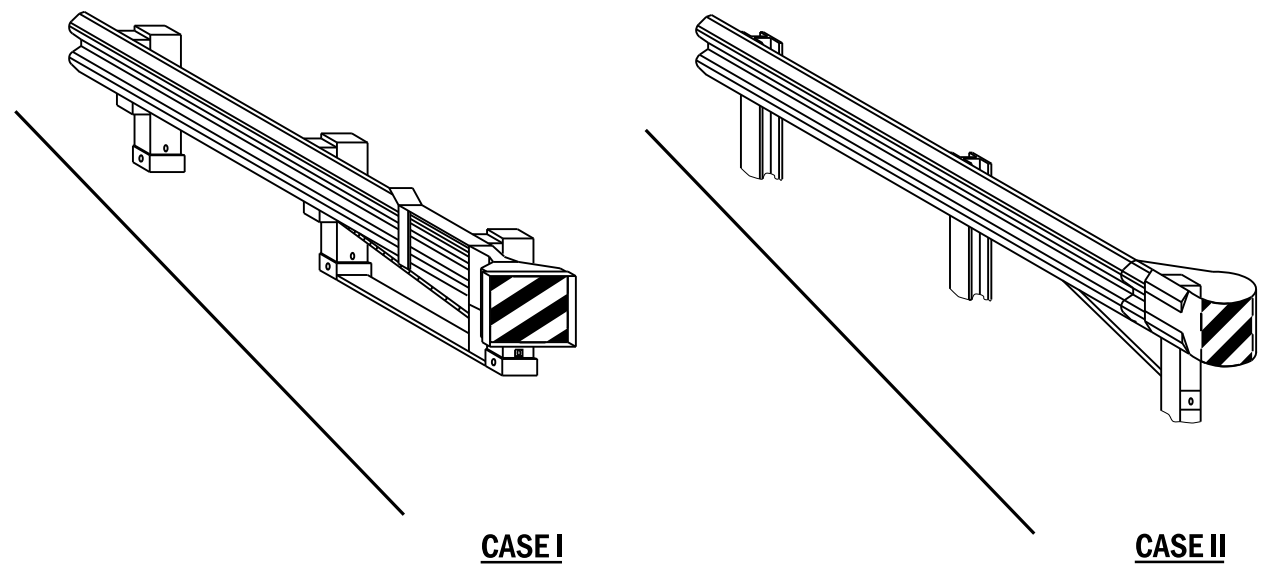
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-00

**SIGN PANELS**  
**EXTRUDED ALUMINUM TYPE**

(Sheet 2 of 2)

**STANDARD 720021-02**



**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.

**GENERAL NOTES**  
See detail on Standard 729001 for mounting markers to posts.

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

Illinois Department of Transportation

PASSED January 1, 2017

ENGINEER OF OPERATIONS

APPROVED January 1, 2017

ENGINEER OF DESIGN AND ENVIRONMENT

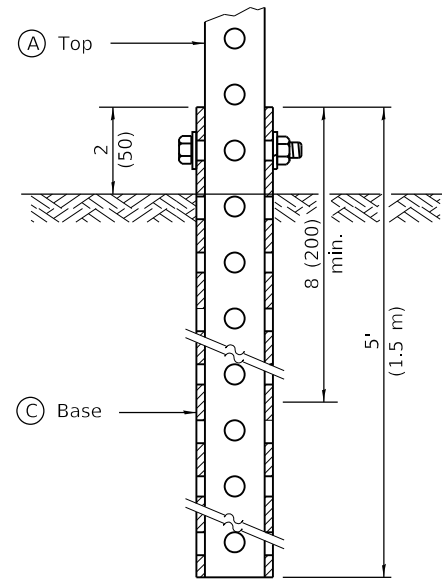
ISSUED 1-1-2016

DATE	REVISIONS
1-1-17	Omitted minimum reflective area requirement for terminal marker.
4-1-16	Renumbered standard from 635006.

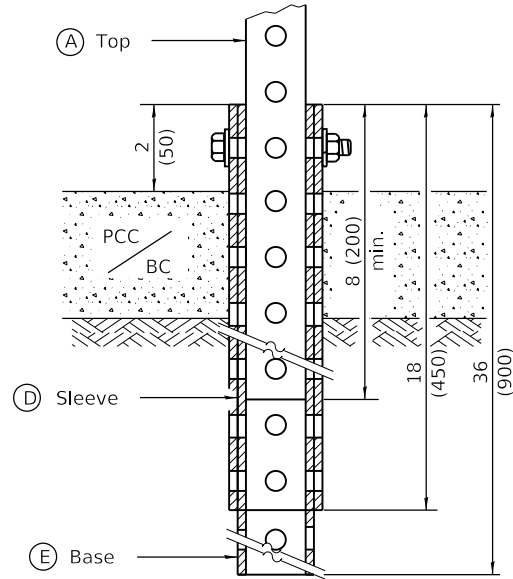
**OBJECT AND TERMINAL MARKERS**

**STANDARD 725001-01**

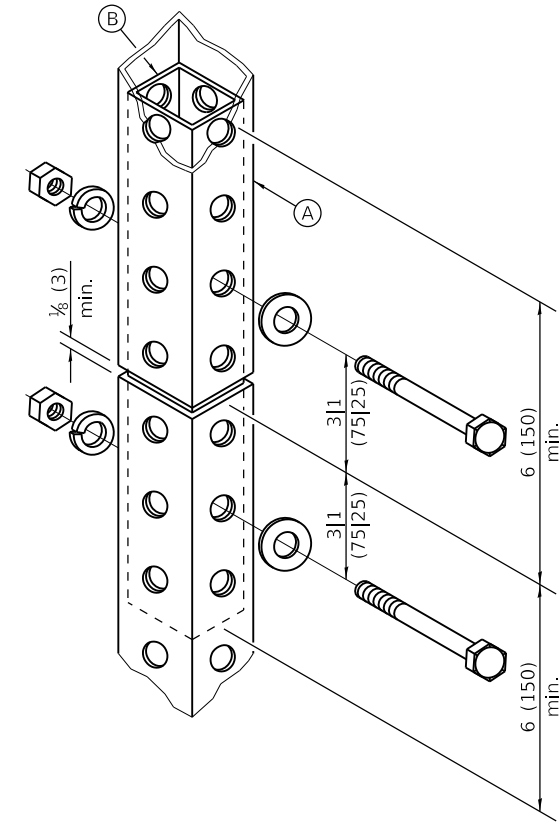




**GROUND MOUNT DETAIL**



**PAVEMENT MOUNT DETAIL**



**SPLICE DETAIL**

(A)	2 x 2 x var. (51 x 51 var.)
(B)	1 3/4 x 1 3/4 x 12 (44 x 44 x 300)
(C)	2 1/4 x 2 1/4 x 60 (57 x 57 x 1500)
(D)	2 1/2 x 2 1/2 x 18 (64 x 64 x 450)
(E)	2 1/4 x 2 1/4 x 36 (57 x 57 x 900)

**GENERAL NOTES**

All bolts 3/8" (M10) hex head zinc or cadmium plated.

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.

**TELESCOPING STEEL SIGN SUPPORT**

**STANDARD 728001-01**

Illinois Department of Transportation

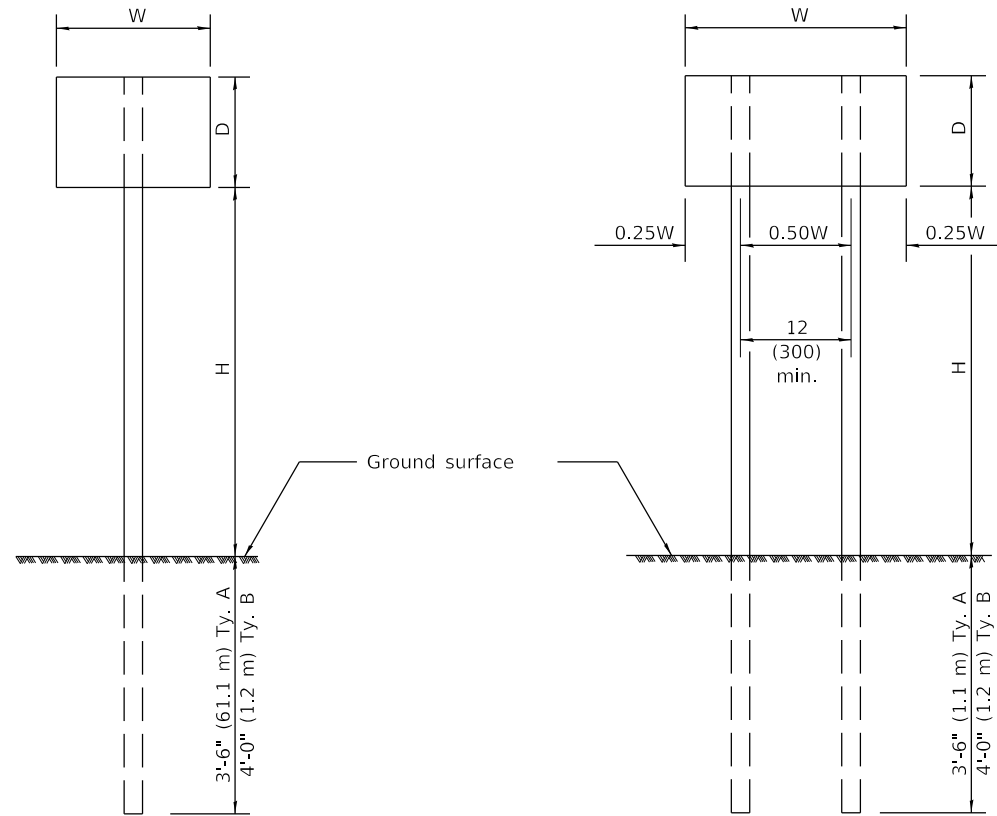
PASSED January 1, 2009

ENGINEER OF OPERATIONS

APPROVED January 1, 2009

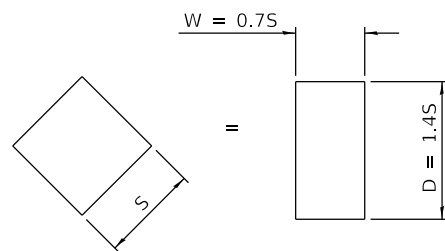
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-07



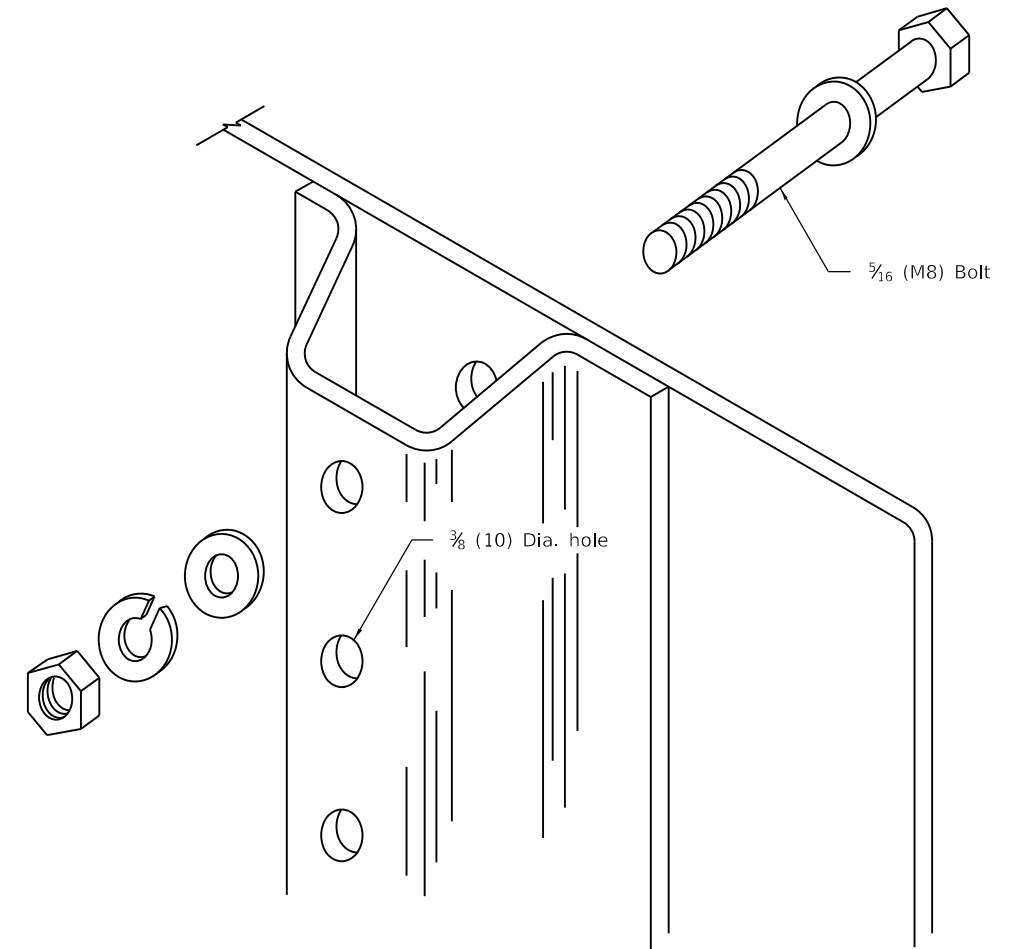
**ONE POST INSTALLATION**

**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
	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
	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
	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
	9'-0" (2.7 m)	A	B	B	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
	9'-0" (2.7 m)	B	B	2B	2B	2B



**DETAIL OF MOUNTING SIGN TO POST**

NOTE: Minimum of 2 bolts per post required.

**GENERAL NOTES**

DESIGN: Current AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

LOADING: for 60 mph (95 km/h) wind velocity with 30% gust factor, normal to sign.

SOIL PRESSURE: Minimum allowable soil pressure 1.25 tsf (120 kPa).

See Standard 720011 for details of Types A and B posts.

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

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2363-2.

**APPLICATIONS OF TYPES A & B METAL POSTS (FOR SIGNS & MARKERS)**

**STANDARD 729001-01**

Illinois Department of Transportation

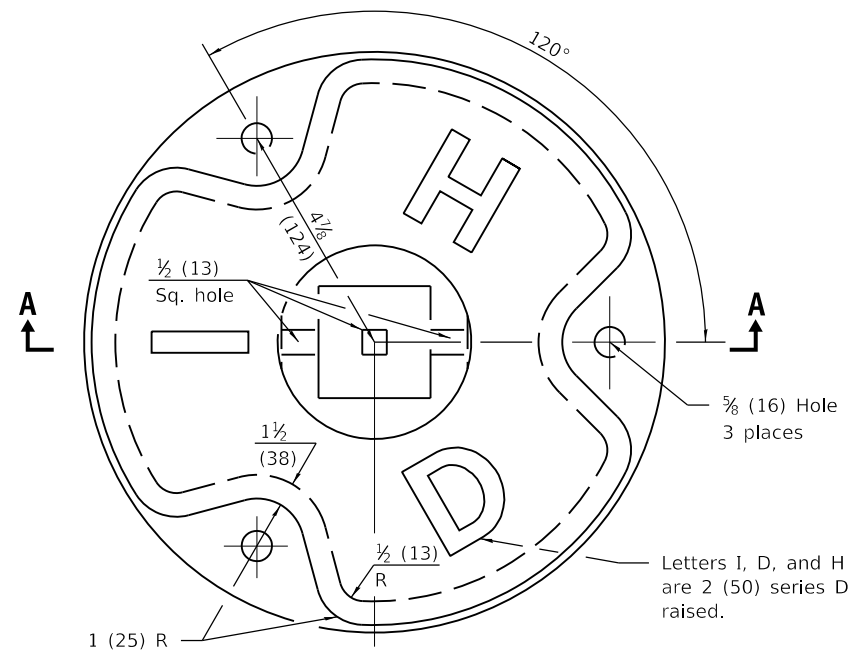
PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

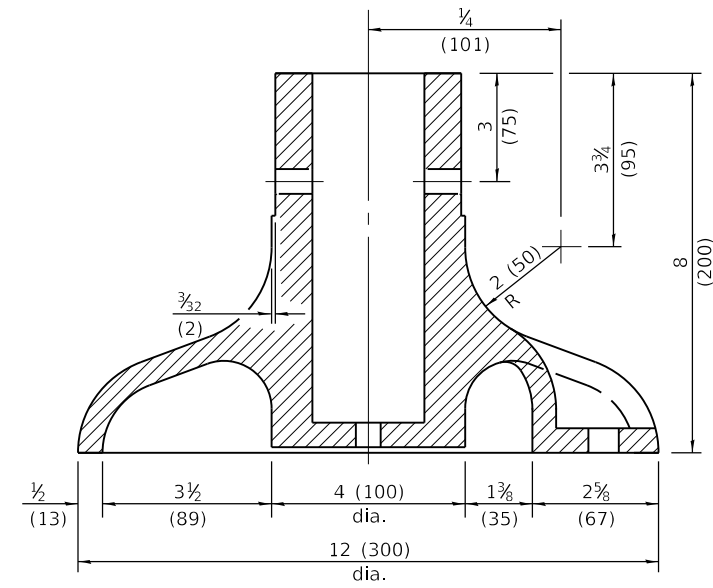
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

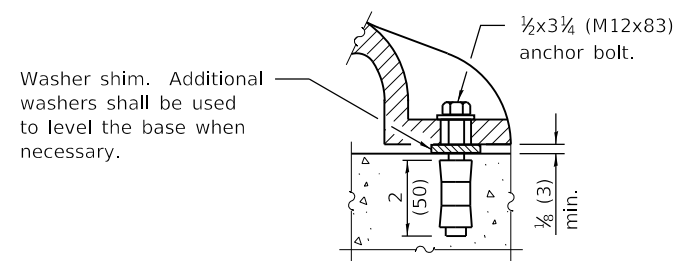
ISSUED 1-1-97



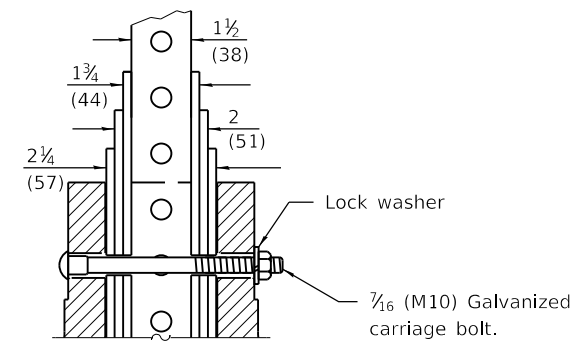
**PLAN**



**SECTION A-A**



**ANCHOR BOLT DETAIL**



**POST ASSEMBLY DETAIL**

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

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

APPROVED January 1, 2009

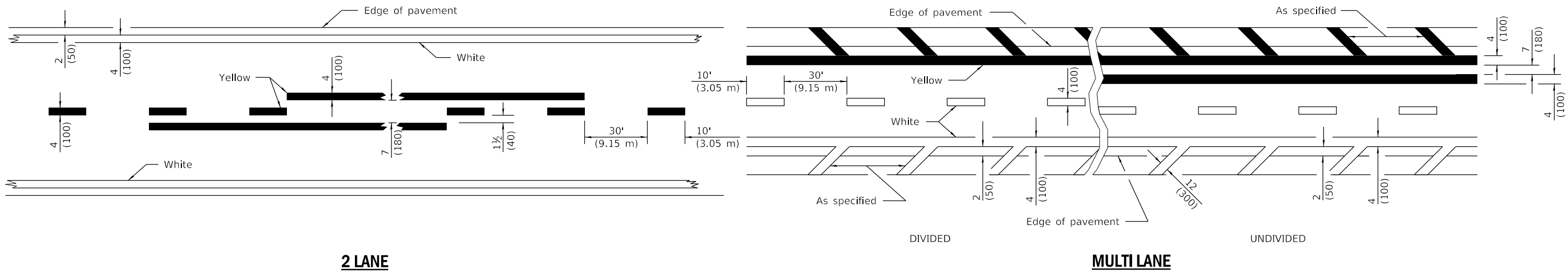
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-07

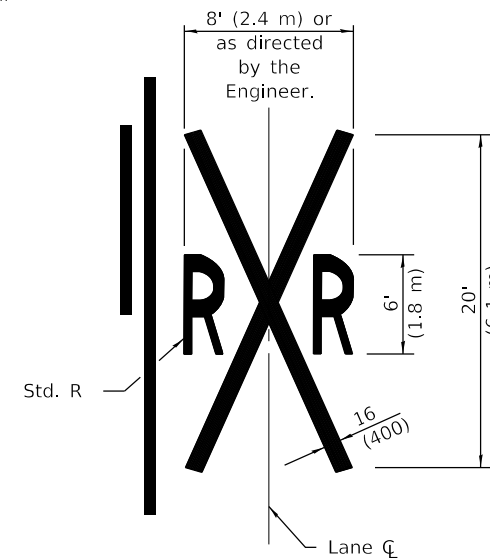
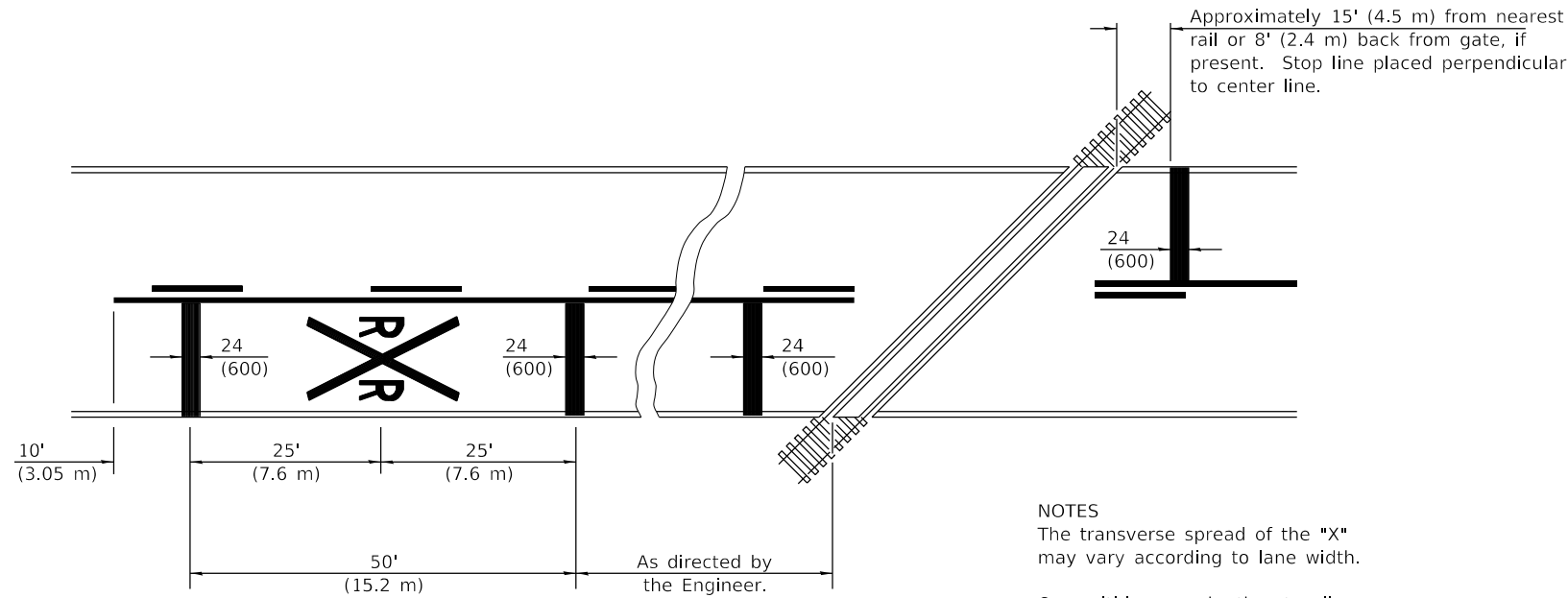
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	New Standard. Used to be part of Standard 720006.

**BASE FOR TELESCOPING STEEL SIGN SUPPORT**

**STANDARD 731001-01**



**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.

DATE	REVISIONS
1-1-15	Added symbols. Revised bike symbol. Revised note for stop line at RR crossing.
1-1-14	Added bike symbol. Renamed 'LANE DROP ARROW' detail to 'LANE-REDUCTION ARROW'.

**TYPICAL PAVEMENT MARKINGS**

(Sheet 1 of 3)

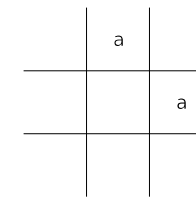
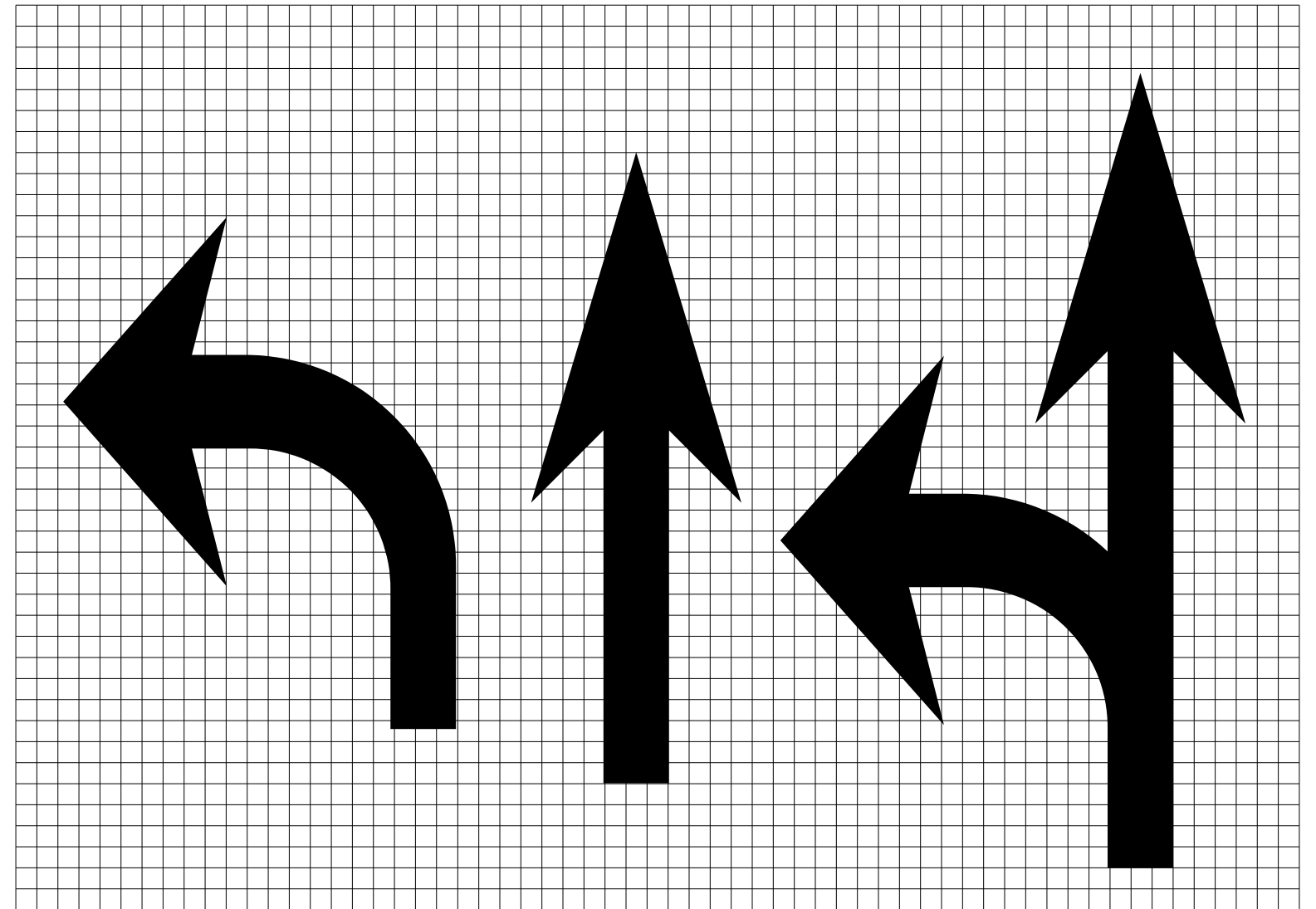
**STANDARD 780001-05**

Illinois Department of Transportation

PASSED January 1, 2015  
*Amy Allen*  
 ENGINEER OF OPERATIONS

ISSUED 1-1-97


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



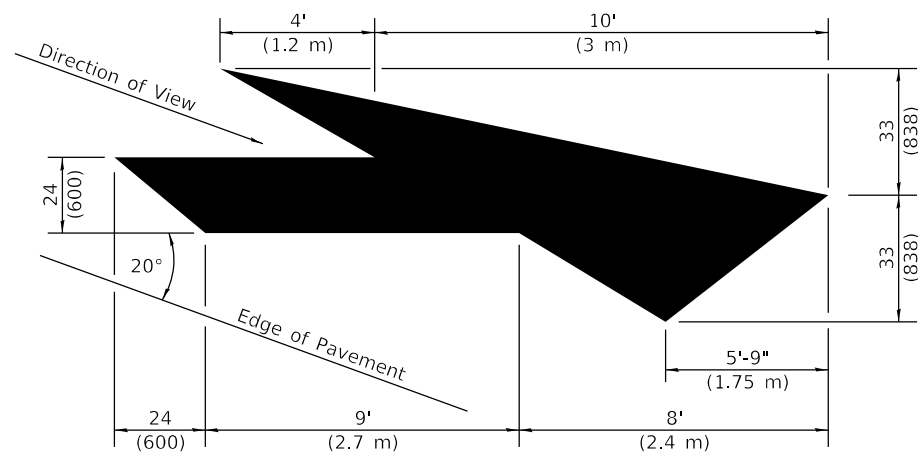
Legend Height	Arrow Size	a
6' (1.8 m)	Small	2.9 (74)
8' (2.4 m)	Large	3.8 (96)

The space between adjacent letters or numerals should be approximately 3 (75) for 6' (1.8 m) legend and 4 (100) for 8' (2.4 m) legend.

**LETTER AND ARROW GRID SCALE**

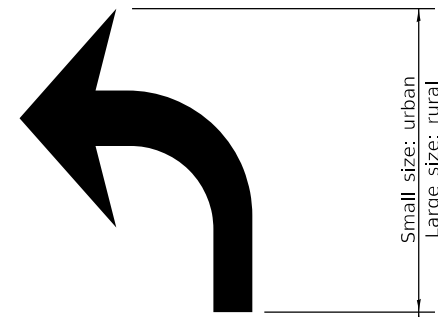
 Illinois Department of Transportation  
 PASSED January 1, 2015  
*Amy Eller*  
 ENGINEER OF OPERATIONS  
 APPROVED January 1, 2015  
*RE*  
 ENGINEER OF DESIGN AND ENVIRONMENT  
 ISSUED 1-1-97

**TYPICAL PAVEMENT MARKINGS**  
 (Sheet 2 of 3)  
**STANDARD 780001-05**



**LANE-REDUCTION ARROW**

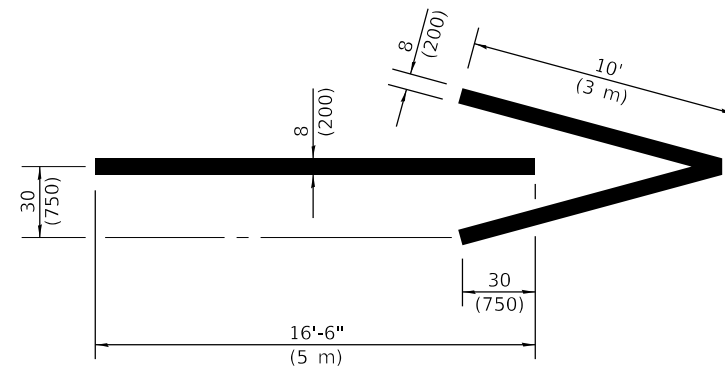
Right lane-reduction arrow shown.  
Use mirror image for left lane.



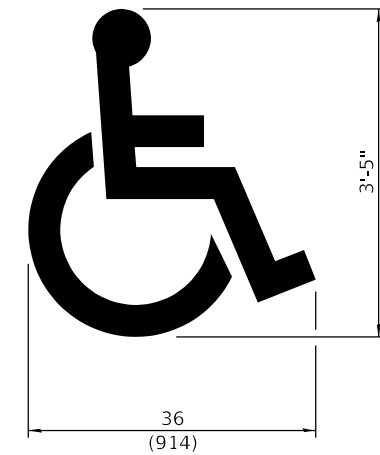
20' (6 m): urban  
50' (15 m): rural  
(Between arrow  
and word or  
between words)



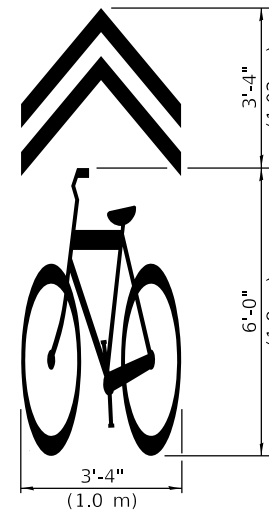
**WORD AND ARROW LAYOUT**



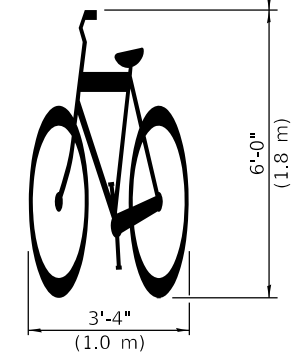
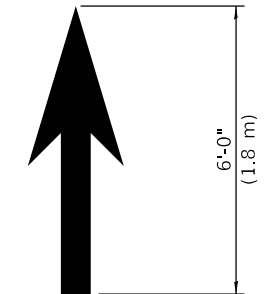
**WRONG WAY ARROW**



**INTERNATIONAL  
SYMBOL OF  
ACCESSIBILITY**



**SHARED LANE  
SYMBOL**



**BIKE SYMBOL**  
(Arrow is optional.)

Illinois Department of Transportation

PASSED January 1, 2015  
*Amy Eller*  
 ENGINEER OF OPERATIONS

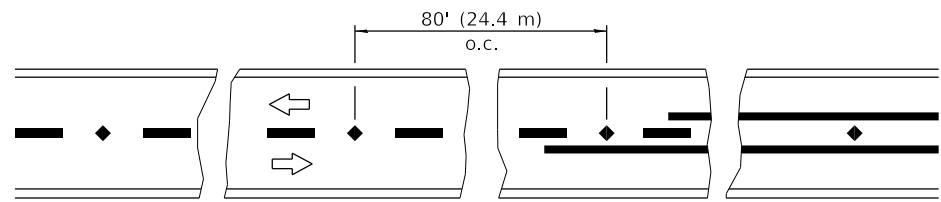
APPROVED January 1, 2015  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

**TYPICAL PAVEMENT  
MARKINGS**

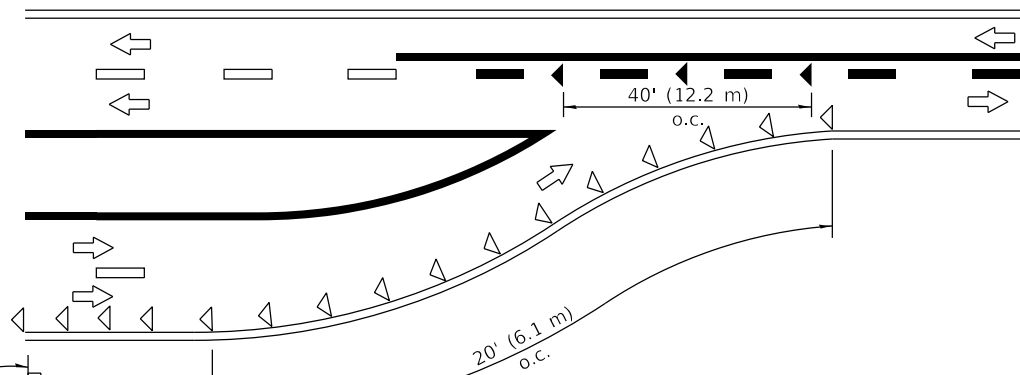
(Sheet 3 of 3)

**STANDARD 780001-05**

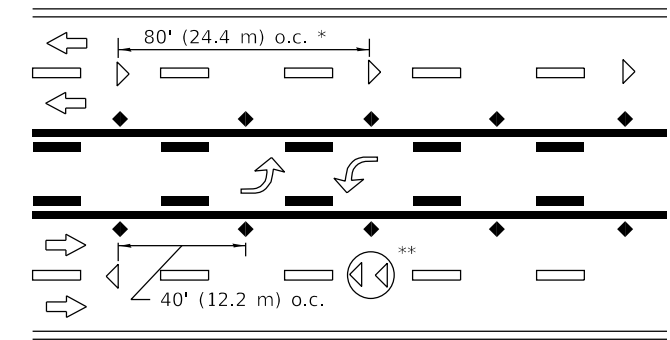


Reduce to 40' (12.2 m) o.c. on curves with posted or advisory speeds of 45 mph (70 km/h) or less.

**TWO-LANE / TWO-WAY**

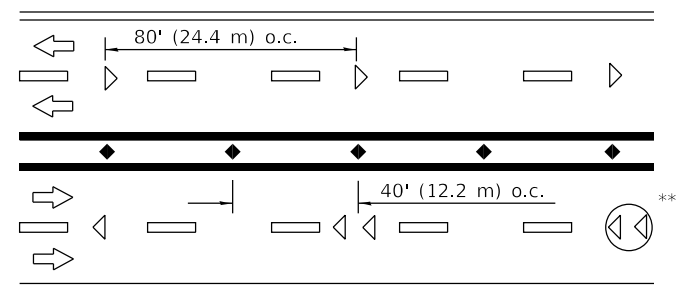


**LANE REDUCTION TRANSITION**



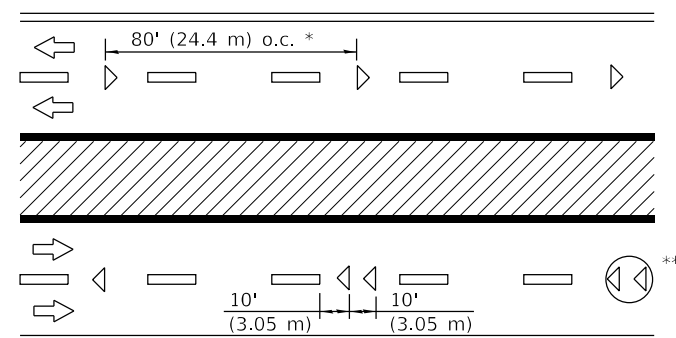
\*,\*\* See MULTI LANE DIVIDED detail for lane marker notes.

**TWO-WAY LEFT TURN**



\*,\*\* See MULTI LANE DIVIDED detail for lane marker notes.

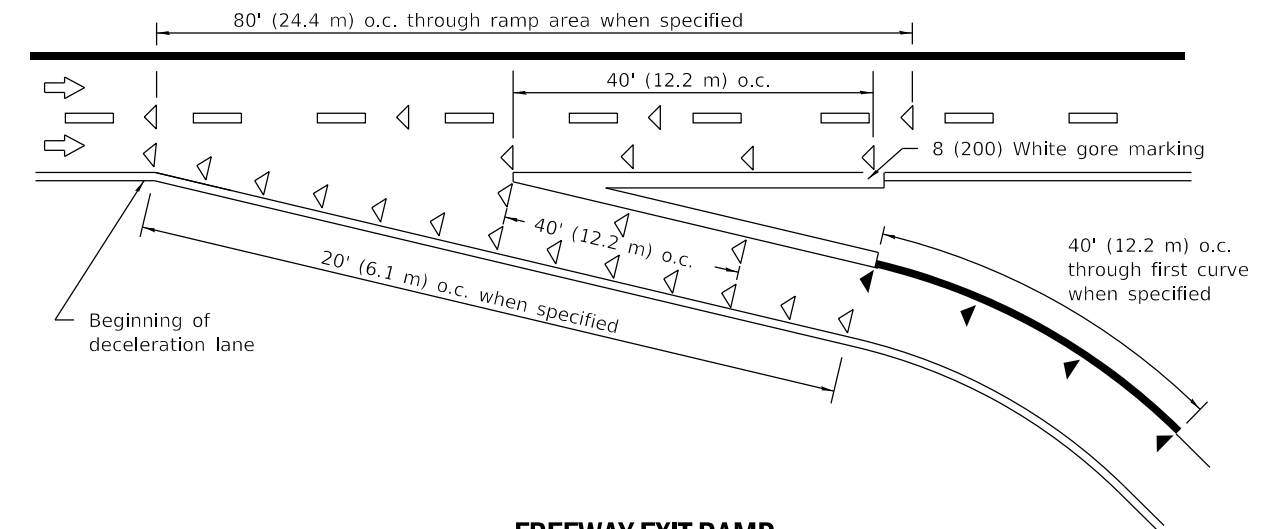
**MULTI-LANE UNDIVIDED**



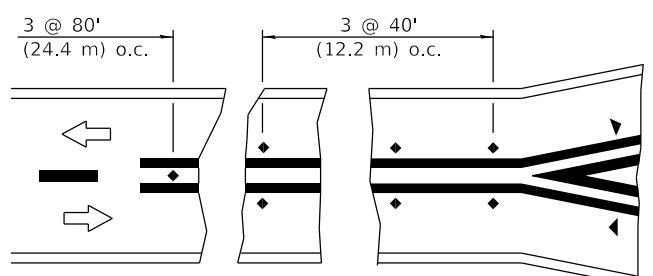
\* Reduce to 40' (12.2 m) o.c. on curves where advisory speeds are 10 mph (15 km/h) lower than posted speeds.

\*\* Where double lane line markers are specified, they shall be spaced as shown.

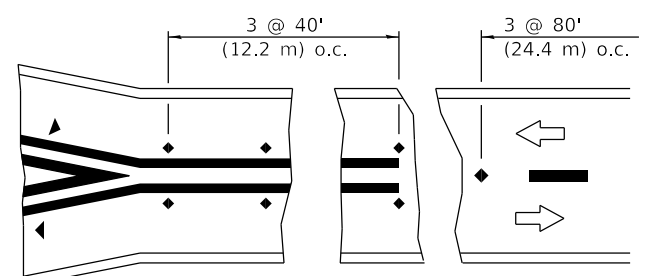
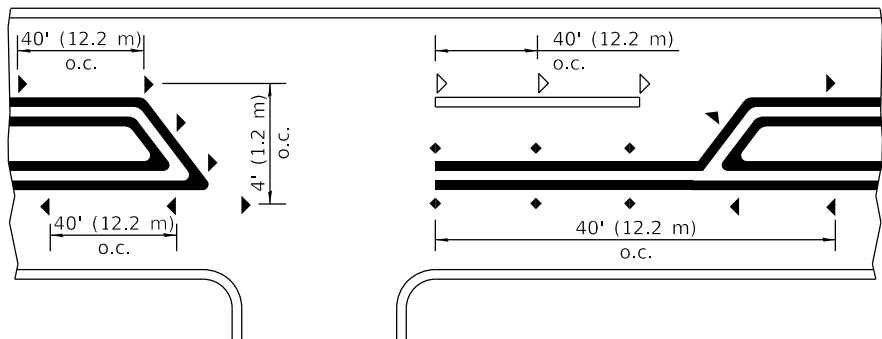
**MULTI-LANE DIVIDED**



**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

PASSED April 1, 2016  
*Amy Eller*  
 ENGINEER OF OPERATIONS

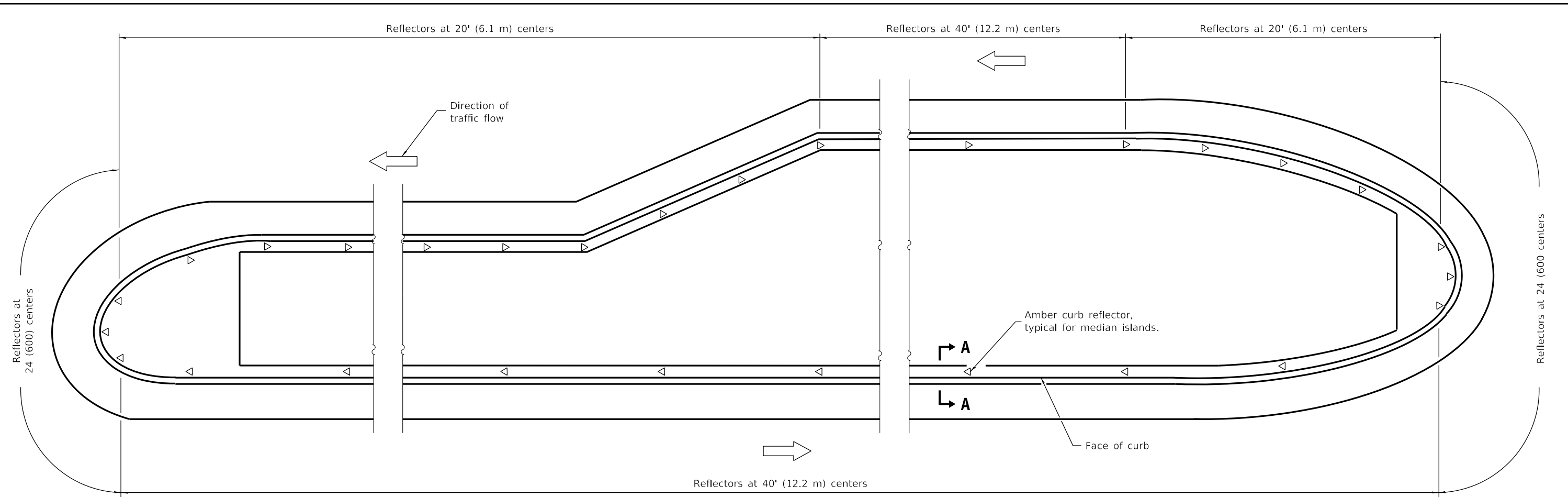
APPROVED April 1, 2016  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

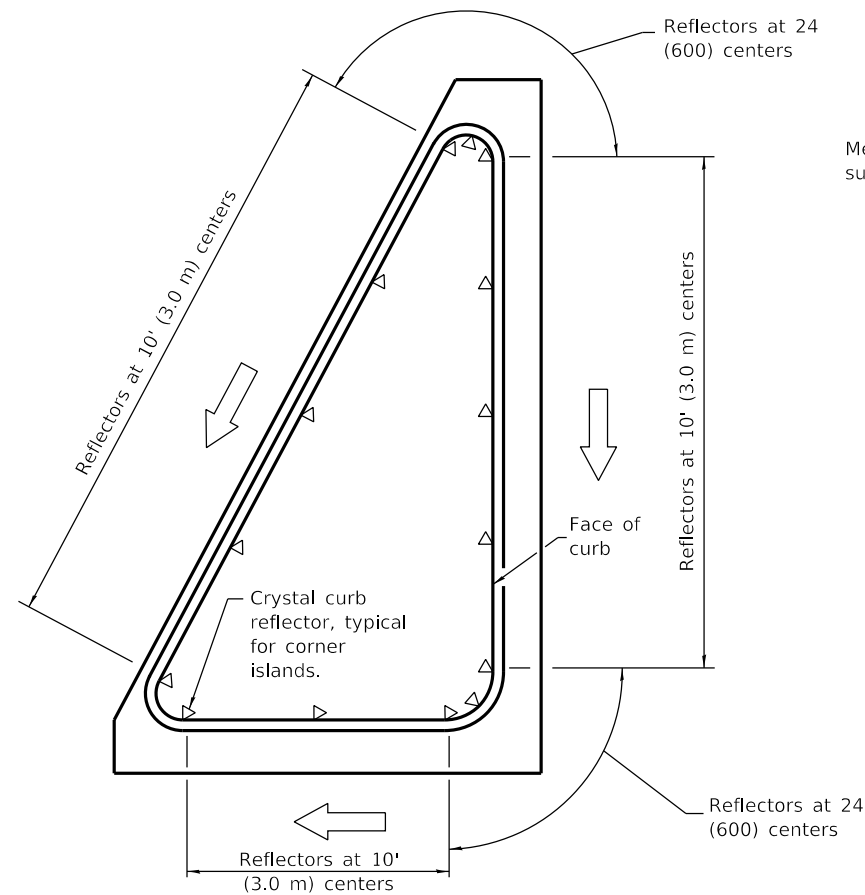
DATE	REVISIONS
4-1-16	Revised LANE ENDS sign
	W4-2 to agree with current MUTCD.
1-1-09	Switched units to English (metric).

**TYPICAL APPLICATIONS  
 RAISED REFLECTIVE  
 PAVEMENT MARKERS**

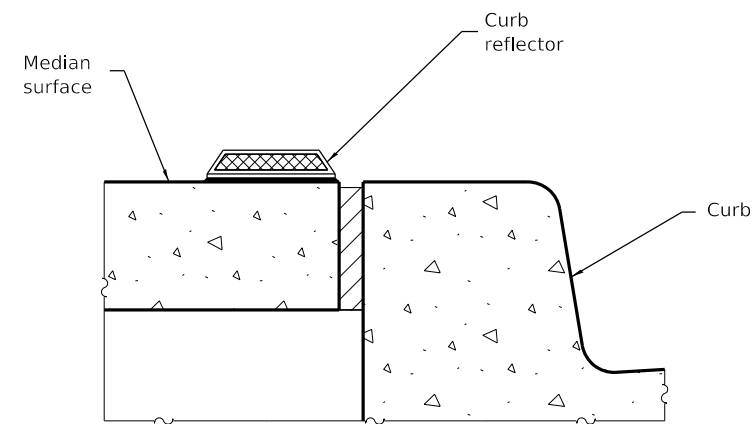
**STANDARD 781001-04**



**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.

DATE	REVISIONS
4-1-16	Revised title and removed work 'prismatic'.
1-1-12	New standard.

**CURB REFLECTORS**

**STANDARD 782001-01**

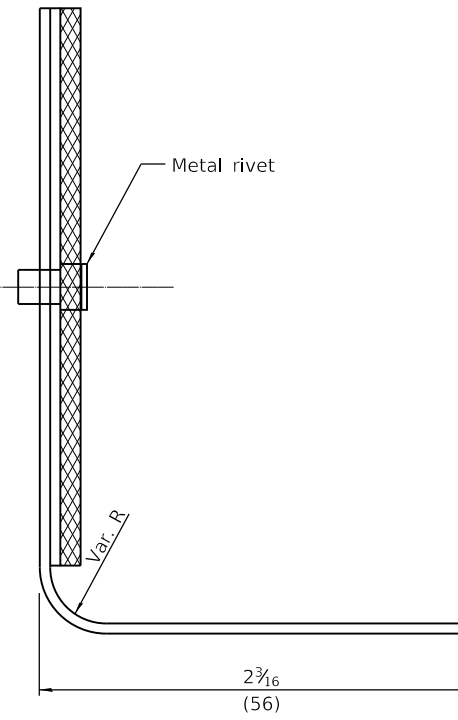
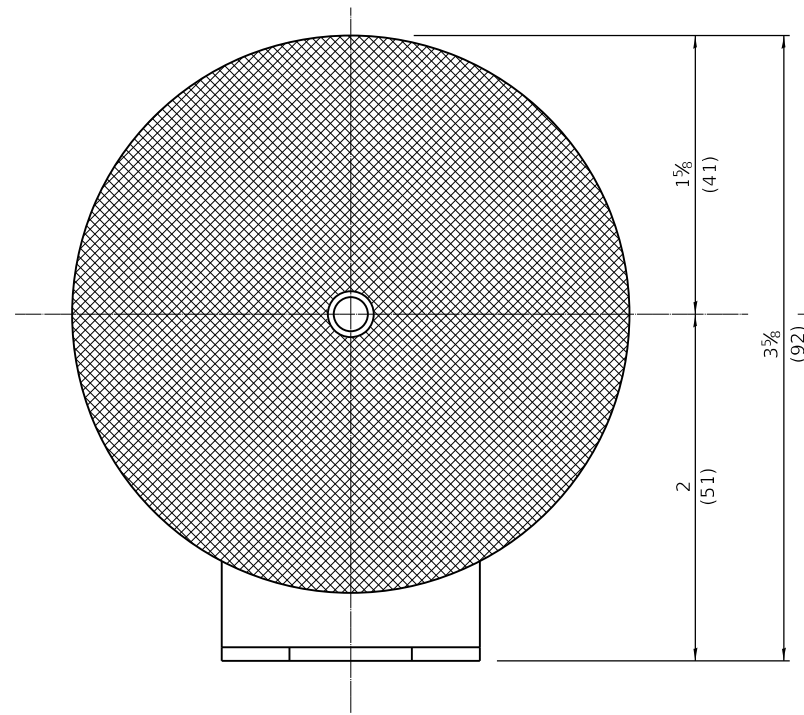
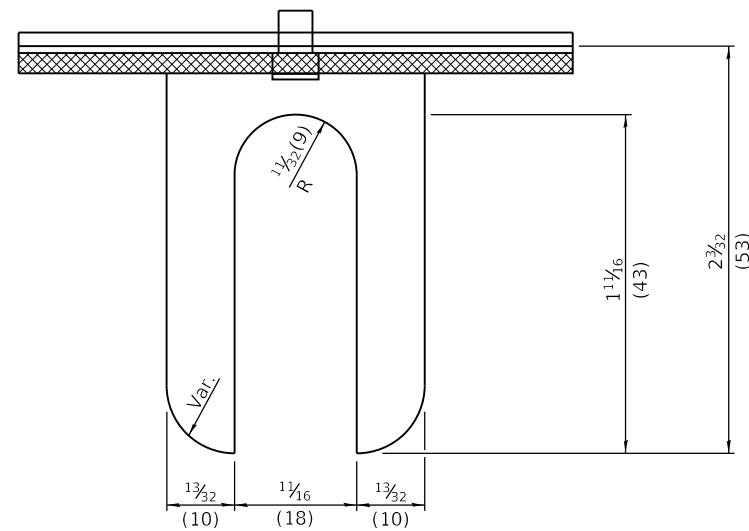
Illinois Department of Transportation

PASSED April 1, 2016  
*Amy Eller*  
 ENGINEER OF OPERATIONS

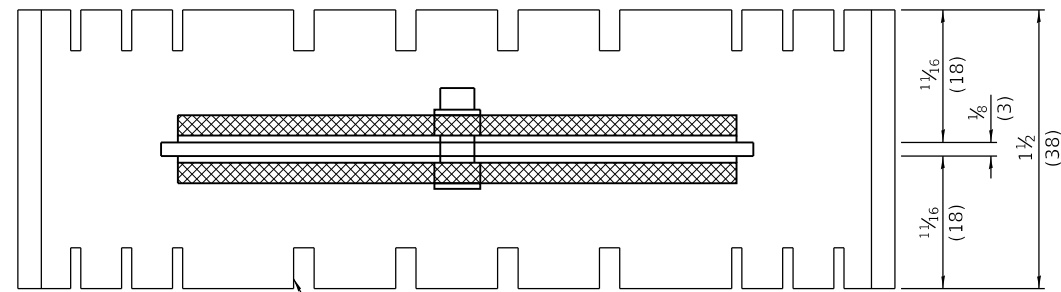
APPROVED April 1, 2016  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

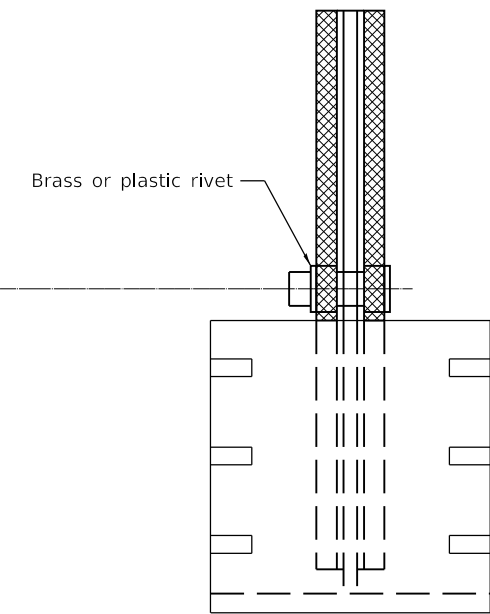
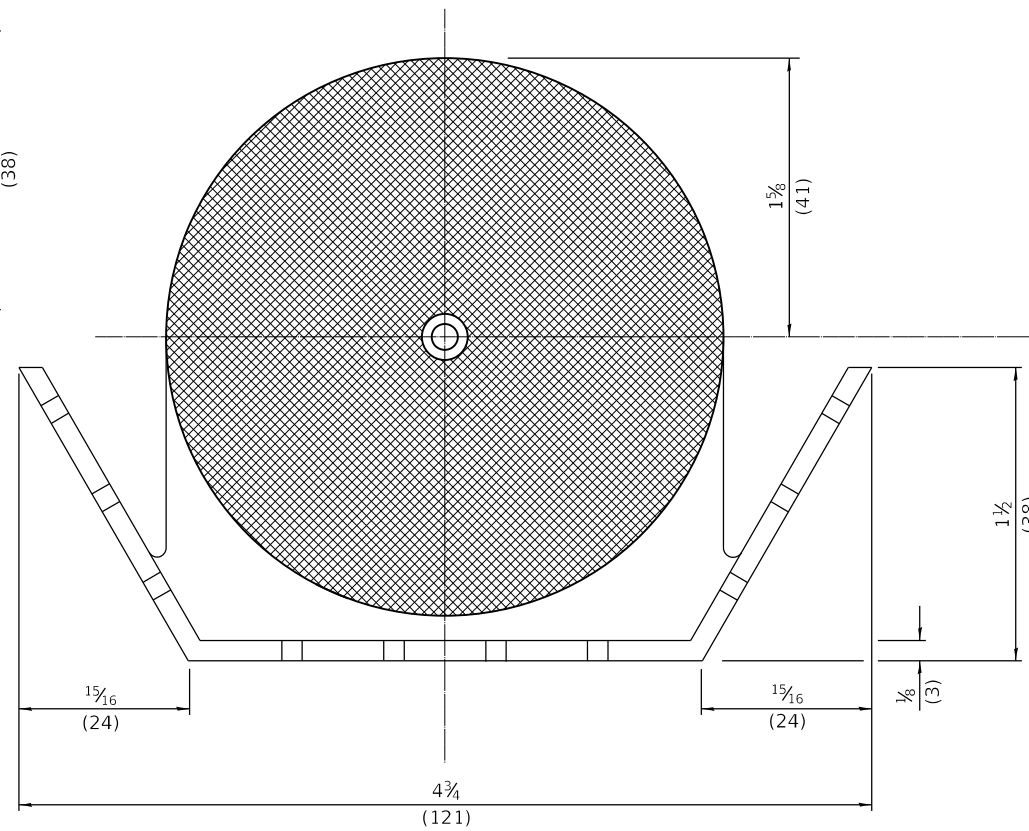




**REFLECTOR TYPE A**  
(monodirectional shown)



Adhesive weep slots or holes  
equally spaced on both sides



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

**REFLECTOR TYPE B**  
(bidirectional shown)

DATE	REVISIONS
1-1-20	Revised from F-shape to constant slope parapet, revised note 3 on sht. 3, and fixed typo.
4-1-16	Added reflector spacing detail. Moved TERMINAL MARKER to std. 725001.

**GUARDRAIL AND  
BARRIER WALL REFLECTOR  
MOUNTING DETAILS**

(Sheet 1 of 3)

**STANDARD 782006-01**

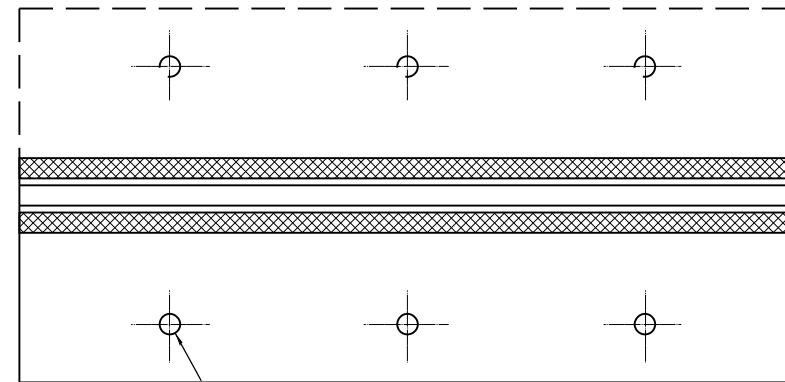
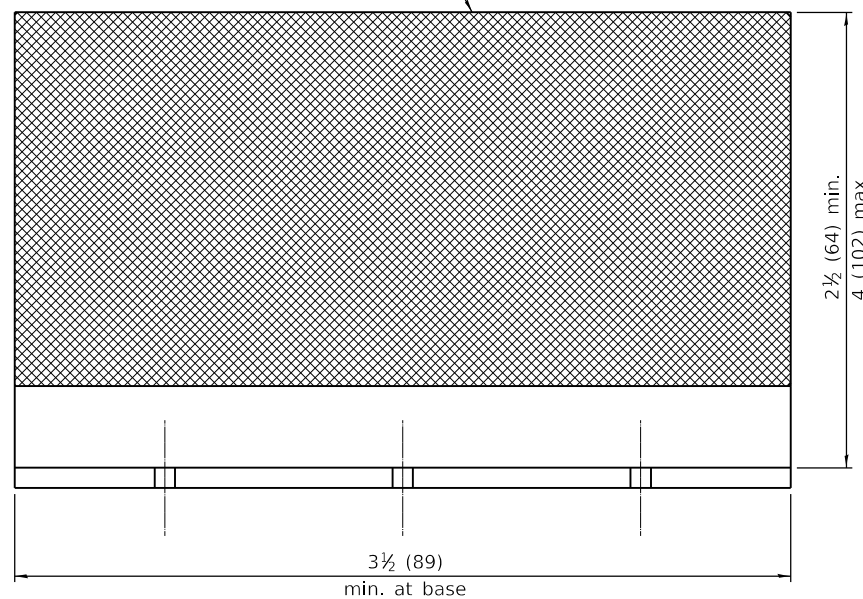
Illinois Department of Transportation

PASSED January 1, 2020  
*Amy Allen*  
ENGINEER OF OPERATIONS

APPROVED January 1, 2020  
*Joe E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

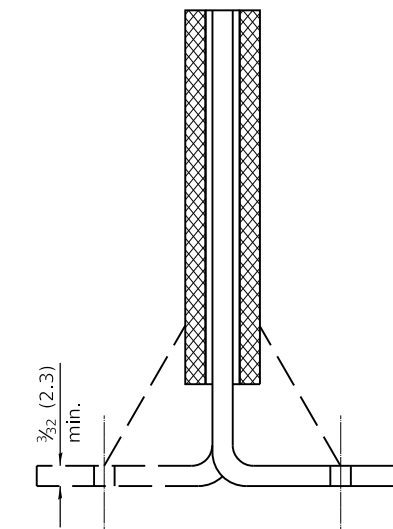
ISSUED 1-1-2000

Reflective area. May be rectangular or slight trapezoid.



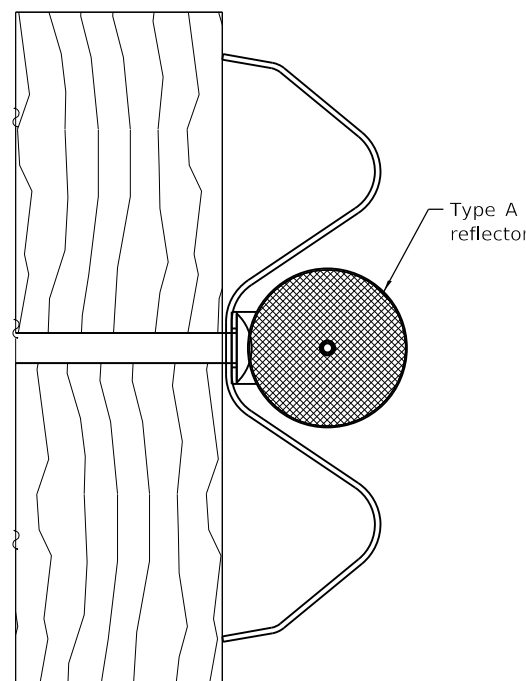
3 min. adhesive weep holes or slots each side, variable spacing.

Minimum total area of base 7.0 sq. in. (4,516 mm<sup>2</sup>)

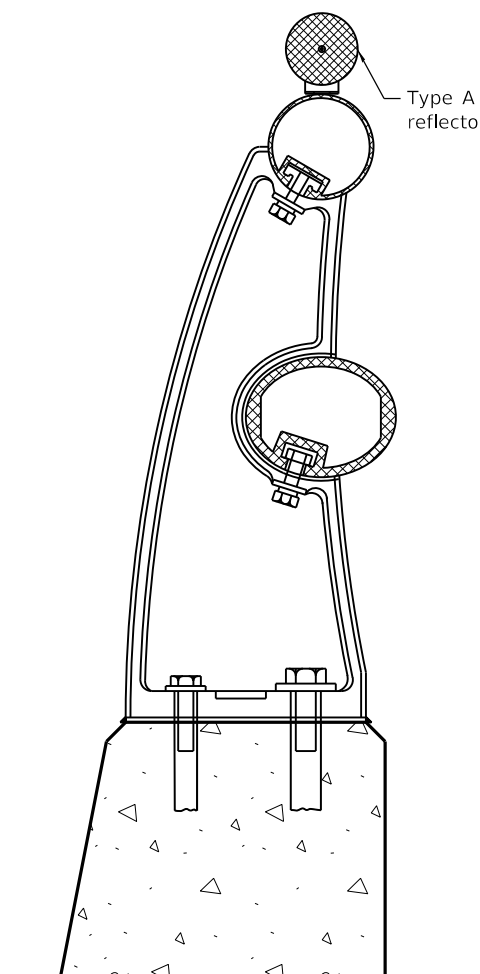
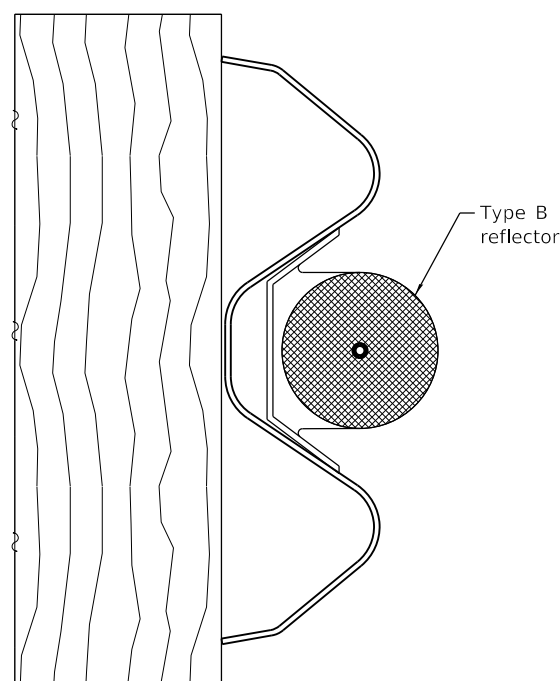


Cross section may be "T" or "L" shaped and may have side supports at ends.

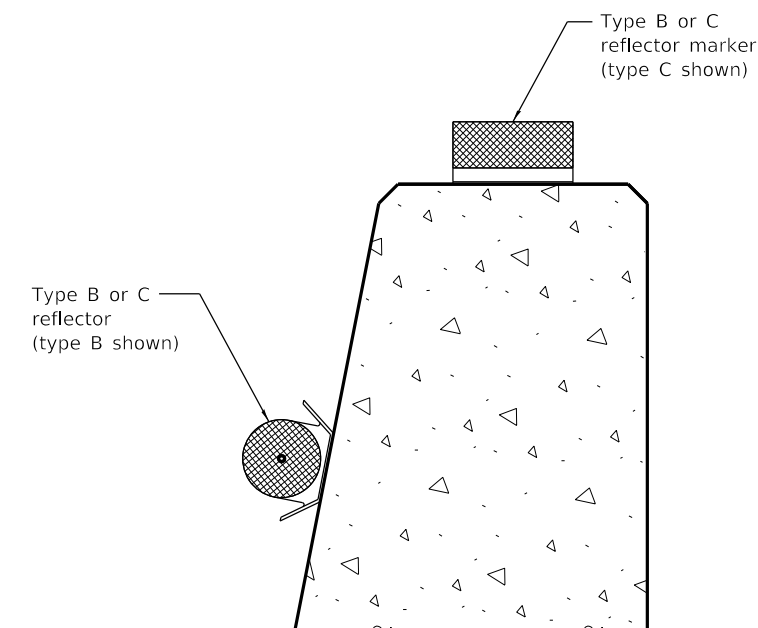
**REFLECTOR TYPE C**



**TYPICAL MOUNTING DETAIL FOR GUARDRAIL REFLECTOR**



**TYPICAL MOUNTING DETAIL FOR BRIDGE RAIL REFLECTOR**



**TYPICAL MOUNTING DETAIL FOR BARRIER WALL REFLECTOR**

Illinois Department of Transportation

PASSED January 1, 2020  
*Amy Allen*  
ENGINEER OF OPERATIONS

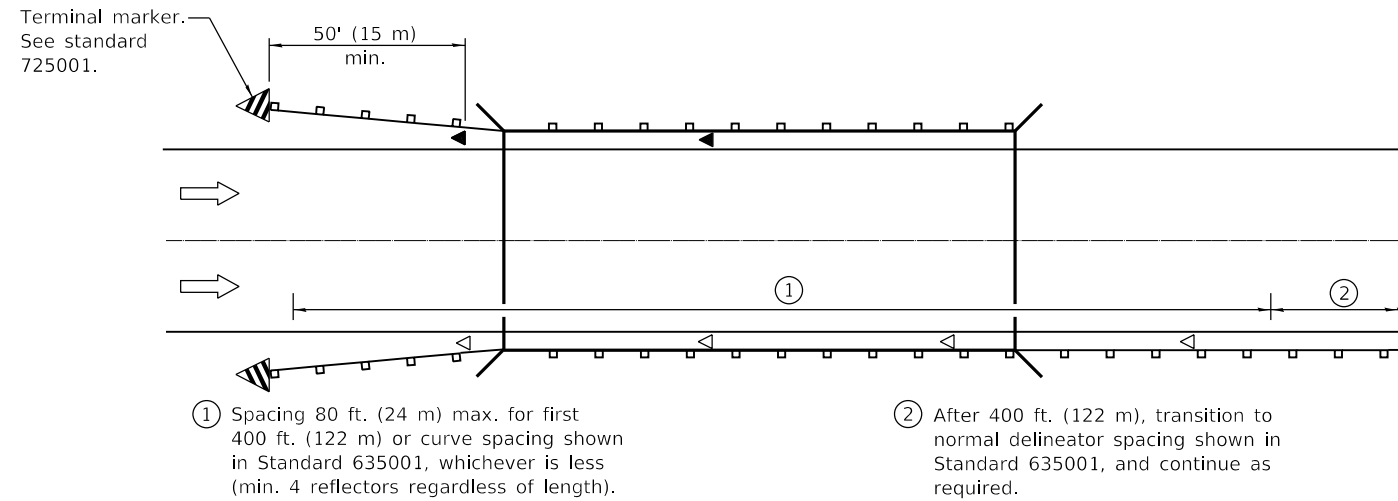
APPROVED January 1, 2020  
*Joe E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-2000

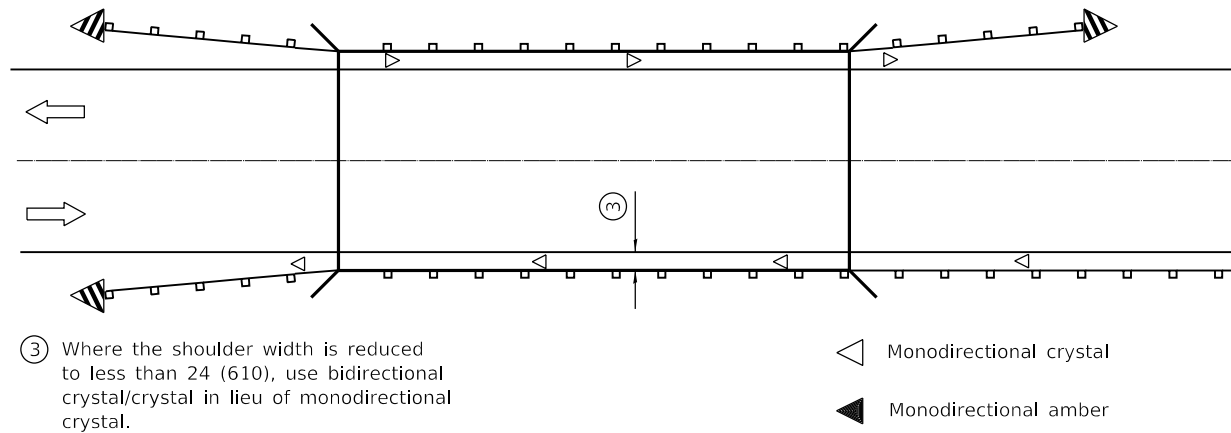
**GUARDRAIL AND BARRIER WALL REFLECTOR MOUNTING DETAILS**

(Sheet 2 of 3)

**STANDARD 782006-01**



ONE-WAY TRAFFIC



TWO-WAY TRAFFIC

**GUARDRAIL / BARRIER WALL**  
**REFLECTOR PLACEMENT DETAIL**

Illinois Department of Transportation

PASSED January 1, 2020

*Amy Allen*  
ENGINEER OF OPERATIONS

APPROVED January 1, 2020

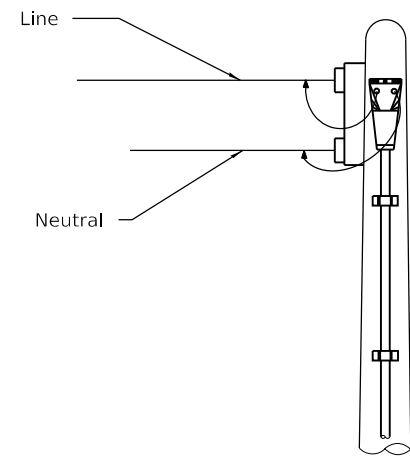
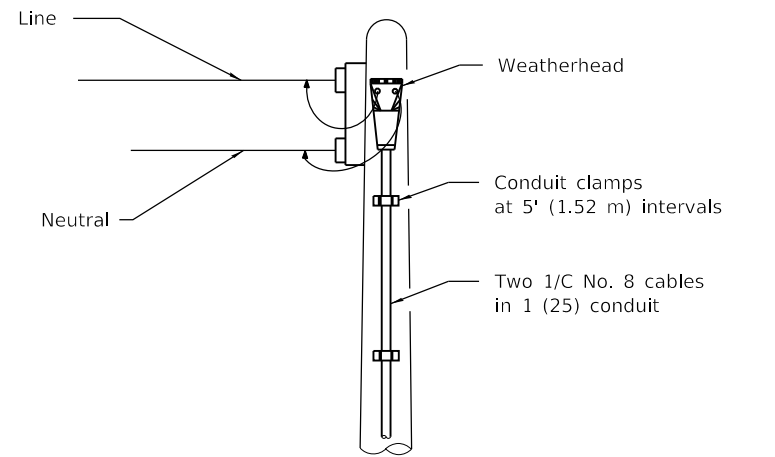
*J. E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-2000

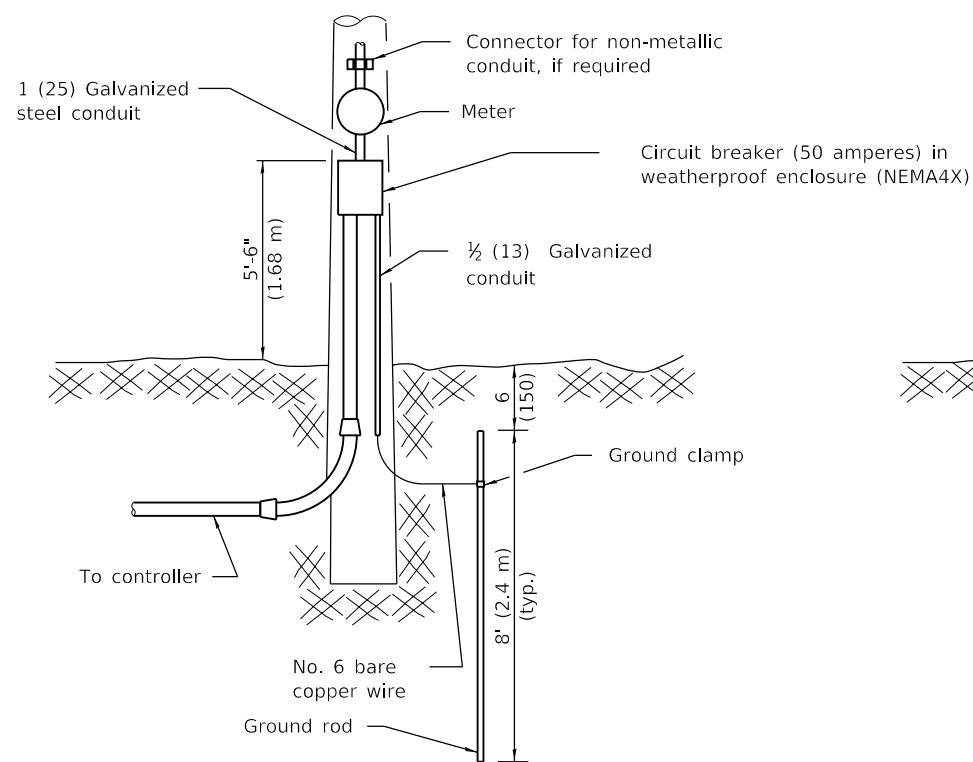
**GUARDRAIL AND  
BARRIER WALL REFLECTOR  
MOUNTING DETAILS**

(Sheet 3 of 3)

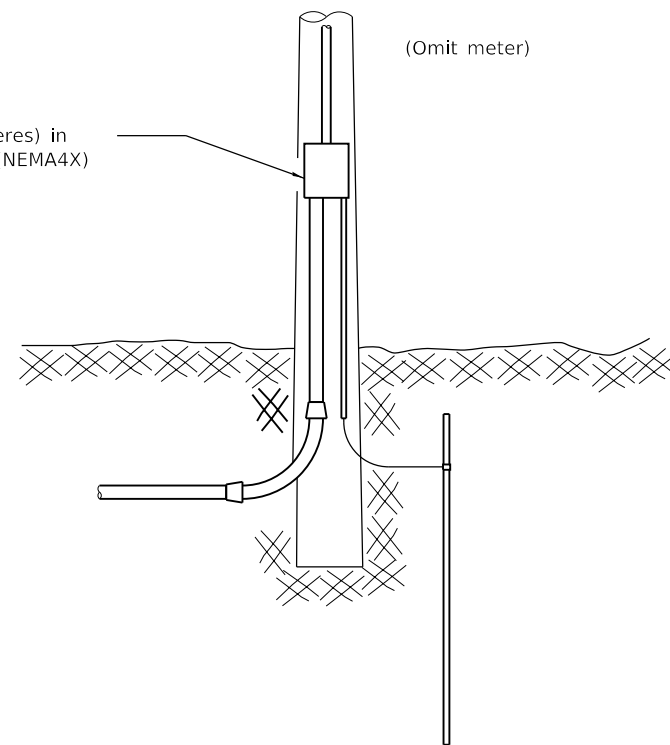
**STANDARD 782006-01**



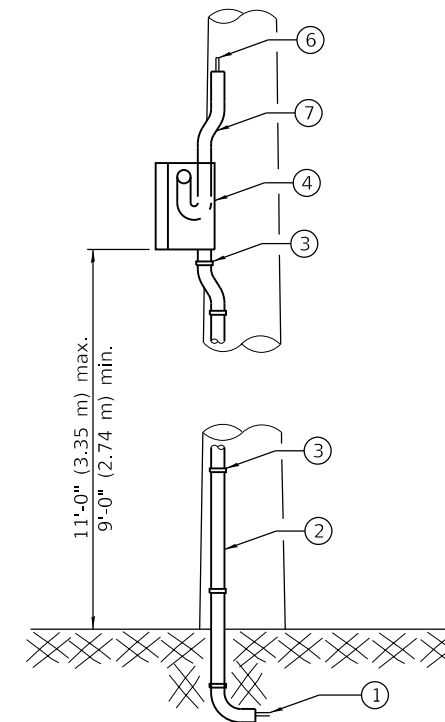
Except for the changes noted below, details for TYPE A and TYPE B service installations shall correspond.



**TYPE A**



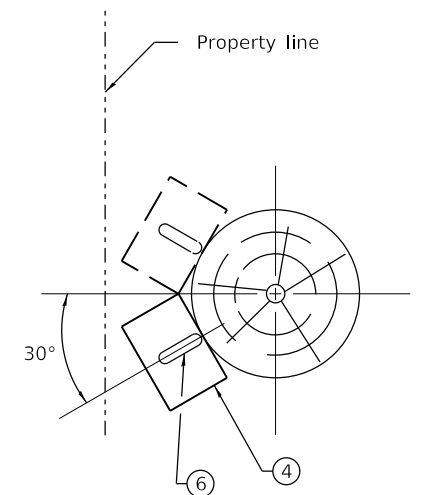
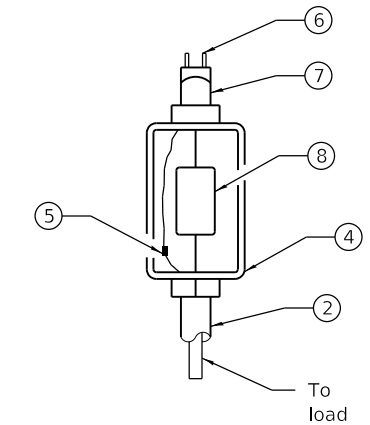
**TYPE B**



The following equipment is to be furnished and installed on the TYPE C installation.

- ① Cable in conduit (electric cable, No. 6, 2/C except where otherwise specified)
- ② Galvanized steel conduit 1 1/4 (32) with bend
- ③ Galvanized conduit clamps
- ④ Aluminum weatherproof box with gasketed cover. Weatherproof box shall be installed facing the adjacent property line. (See diagram for alternate installation.)
- ⑤ Ground stud for neutral connection
- ⑥ Service cables
- ⑦ Offset weatherproof fitting
- ⑧ Circuit breaker

**TYPE C**



**ALTERNATE INSTALLATION**

(Installation when weatherproof box cannot be installed facing the adjacent property line.)

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

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

APPROVED January 1, 2009

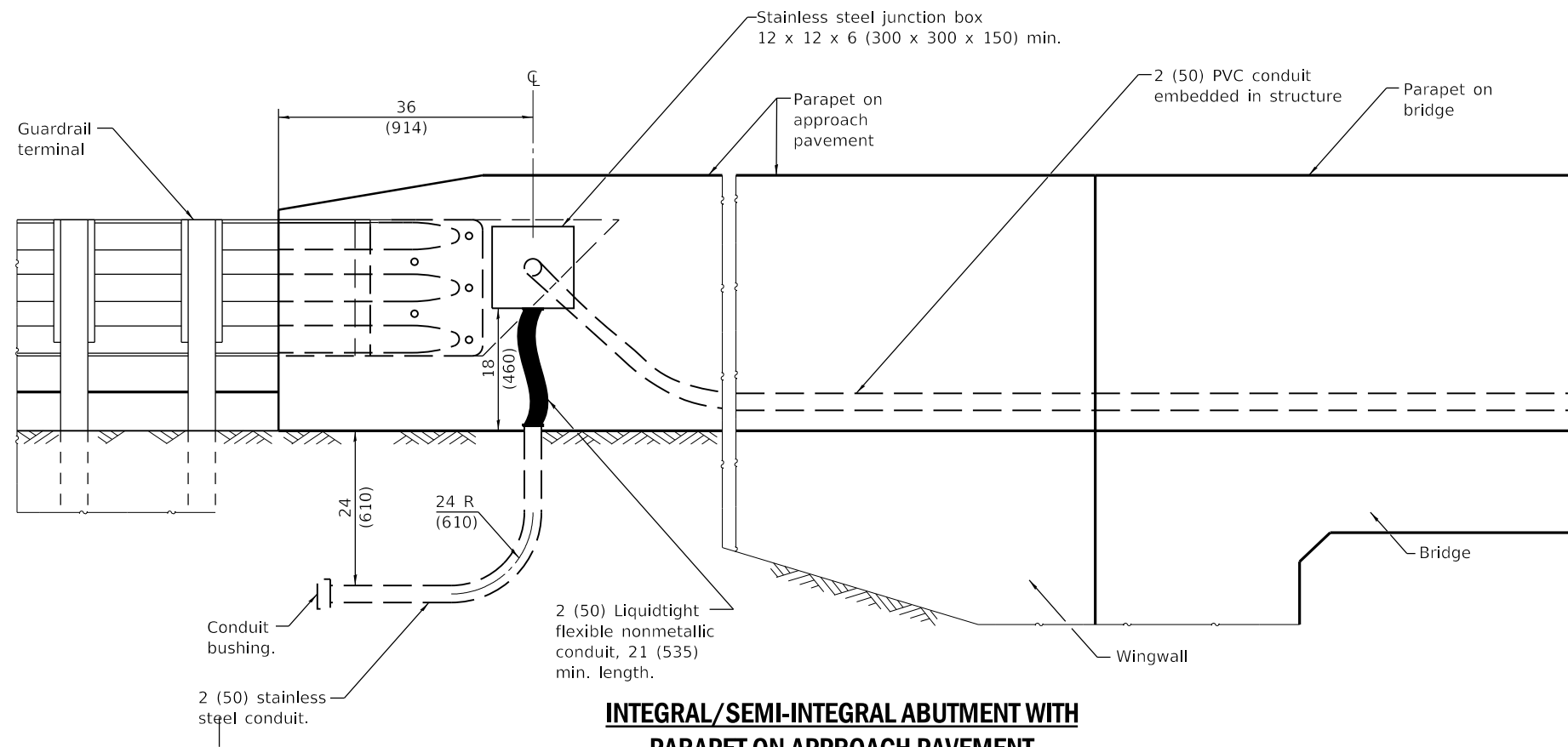
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

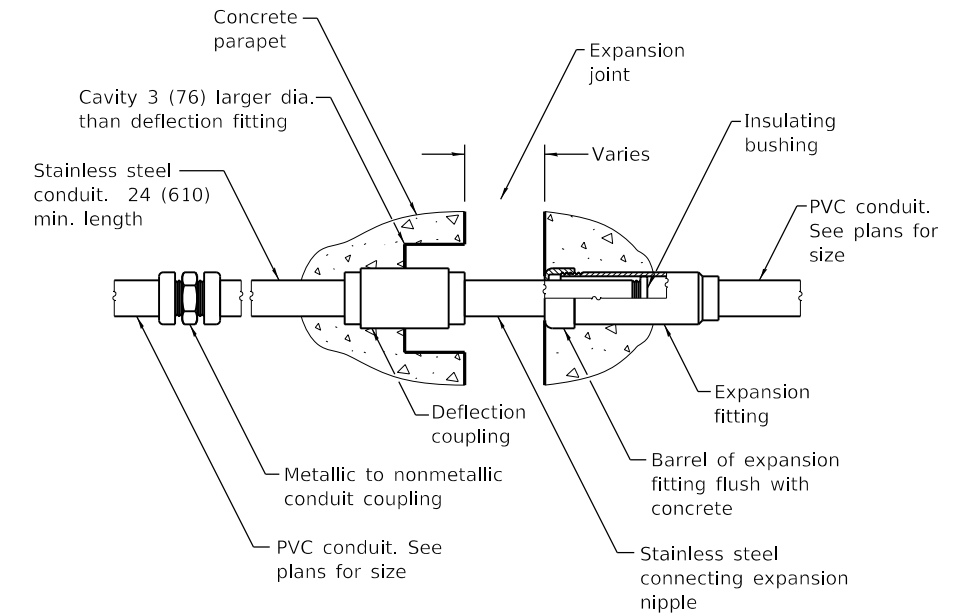
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-02	Renum. Standard 2373-1.

**ELECTRICAL SERVICE INSTALLATION DETAILS**

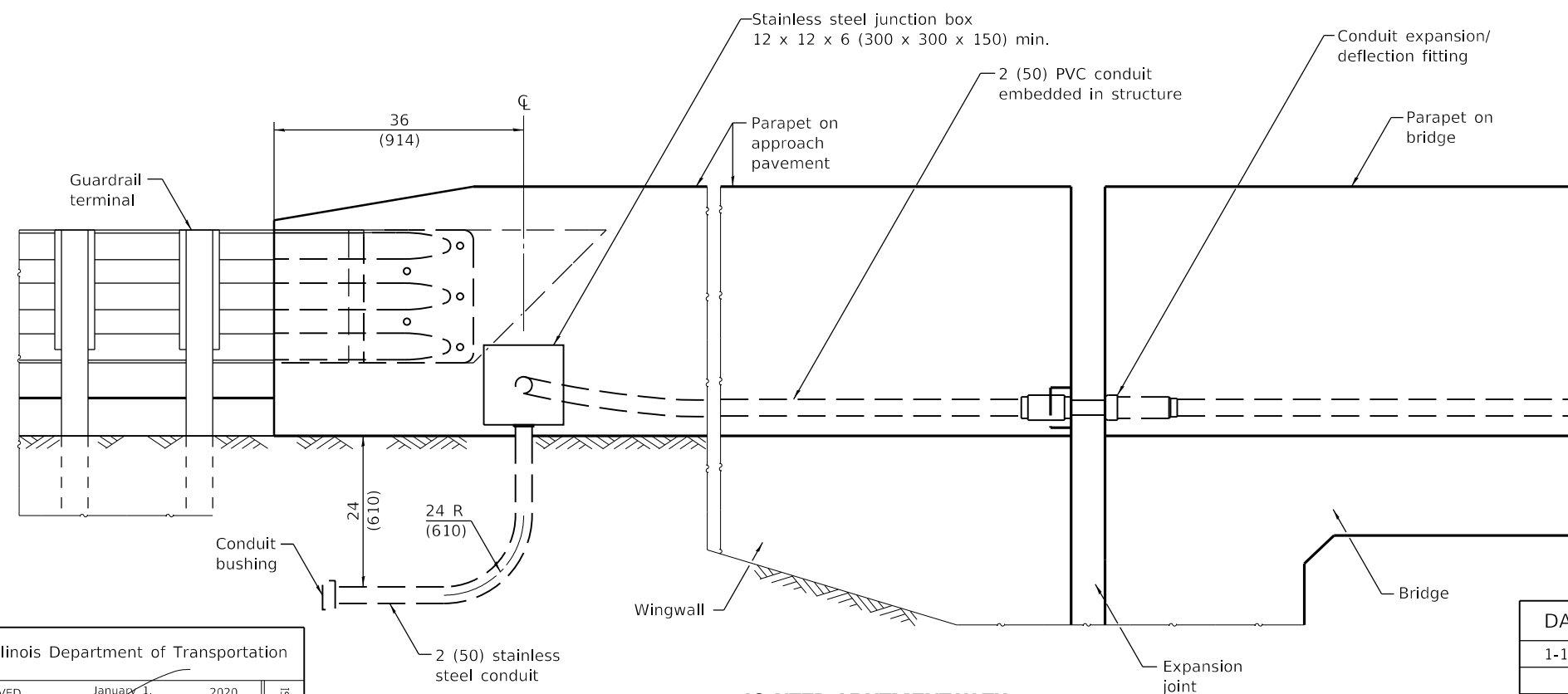
**STANDARD 805001-01**



**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.

DATE	REVISIONS
1-1-20	Revised from F-Shape to constant slope parapet, added general note for steel connector plate, revised standard name, and fixed typo.
1-1-15	New standard.

**RACEWAYS EMBEDDED  
IN STRUCTURE**

(Sheet 1 of 3)

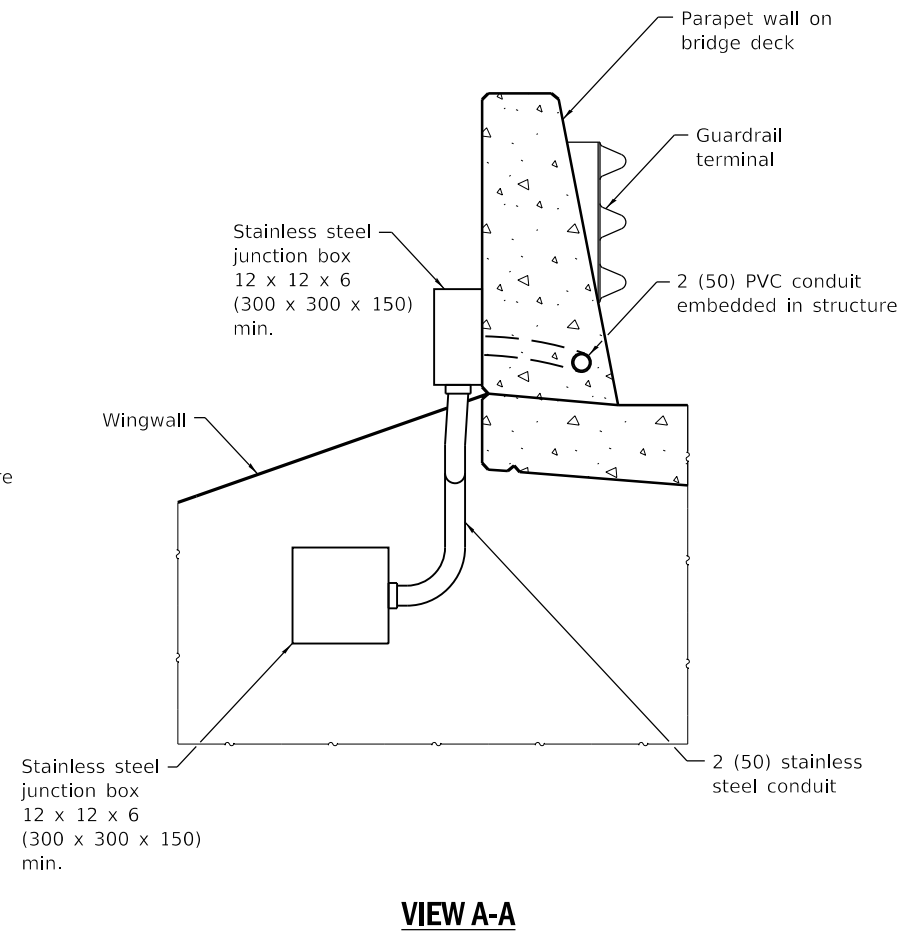
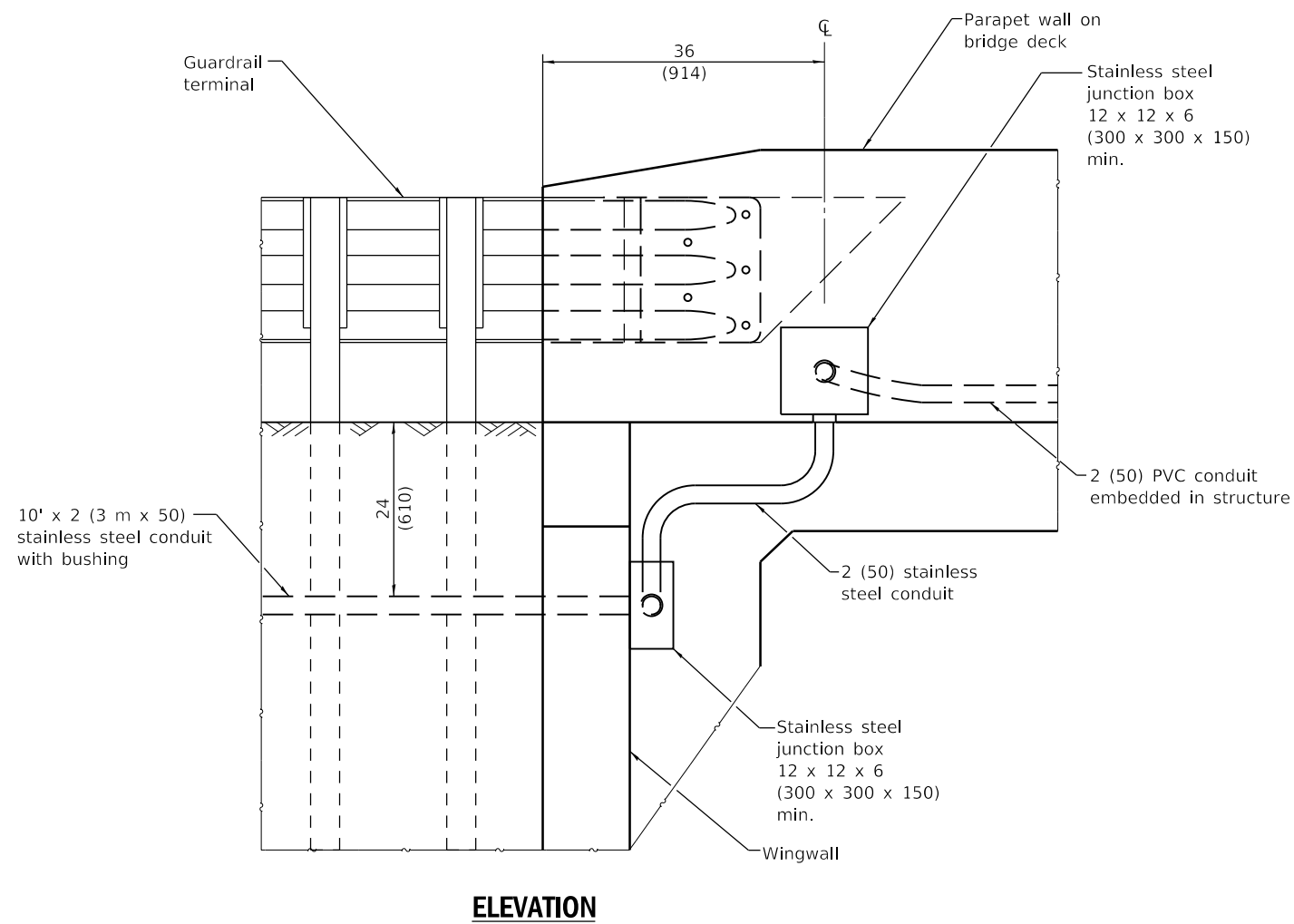
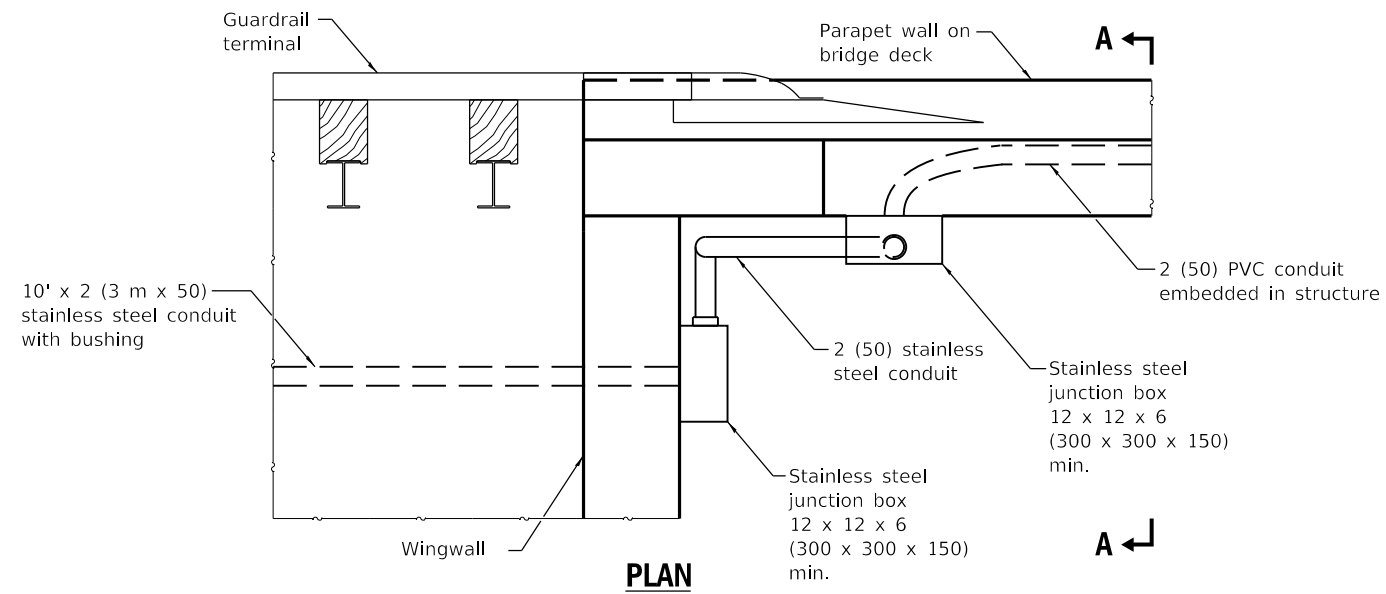
**STANDARD 812001-01**

Illinois Department of Transportation

APPROVED January 1, 2020  
*ME Reppelt*  
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2020  
*J. E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-15



**INTEGRAL/SEMI-INTEGRAL ABUTMENT WITH  
PARAPET ENDING ON BRIDGE DECK**

**RACEWAYS EMBEDDED  
IN STRUCTURE**

(Sheet 2 of 3)

**STANDARD 812001-01**

Illinois Department of Transportation

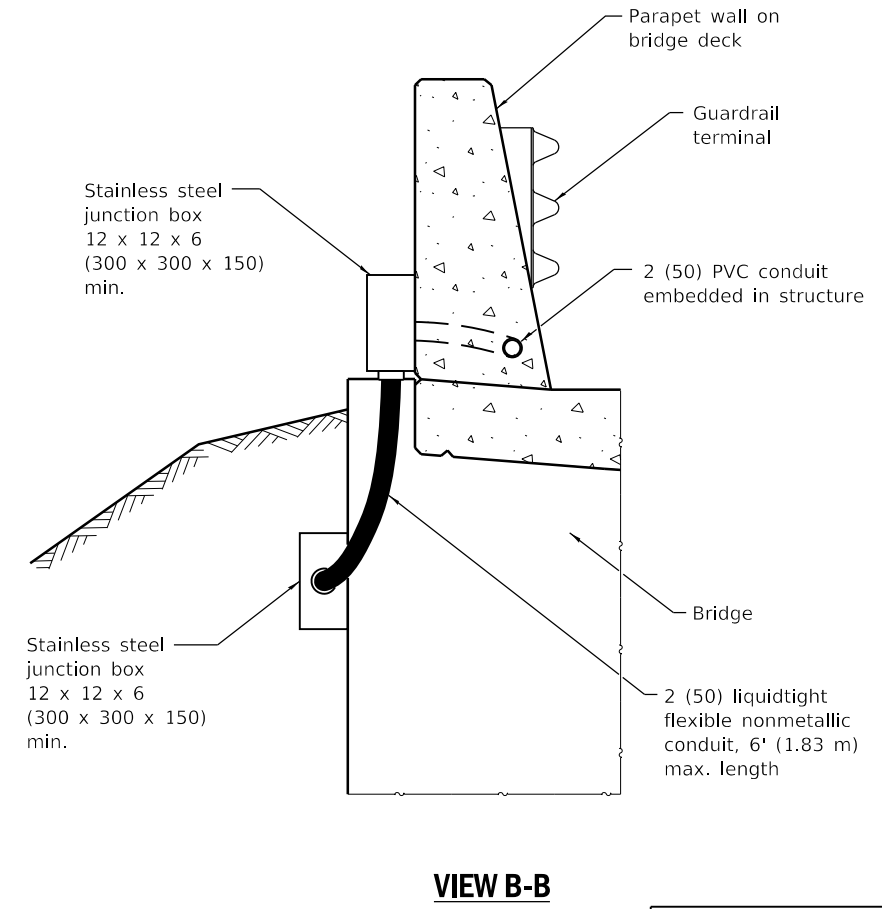
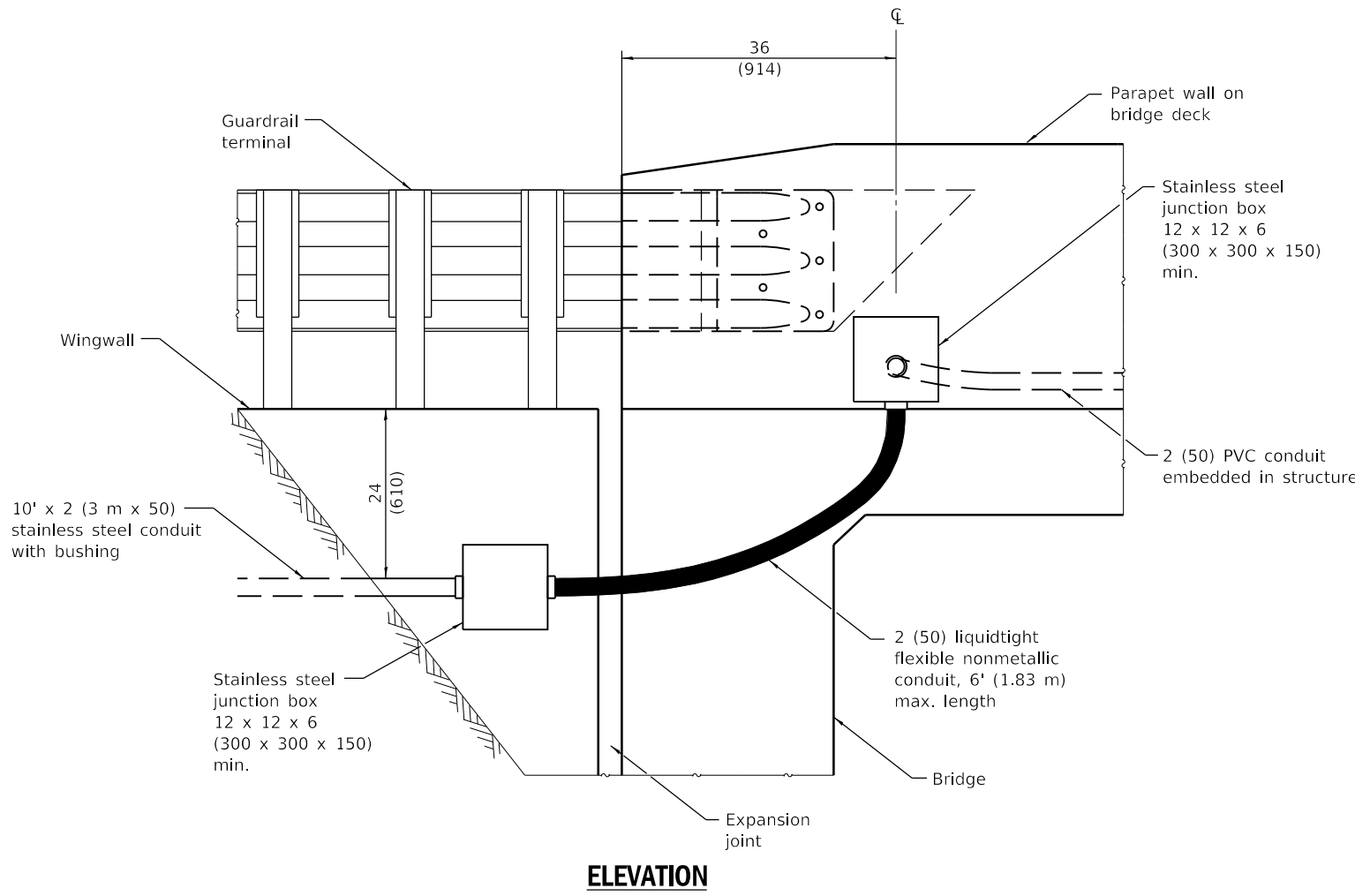
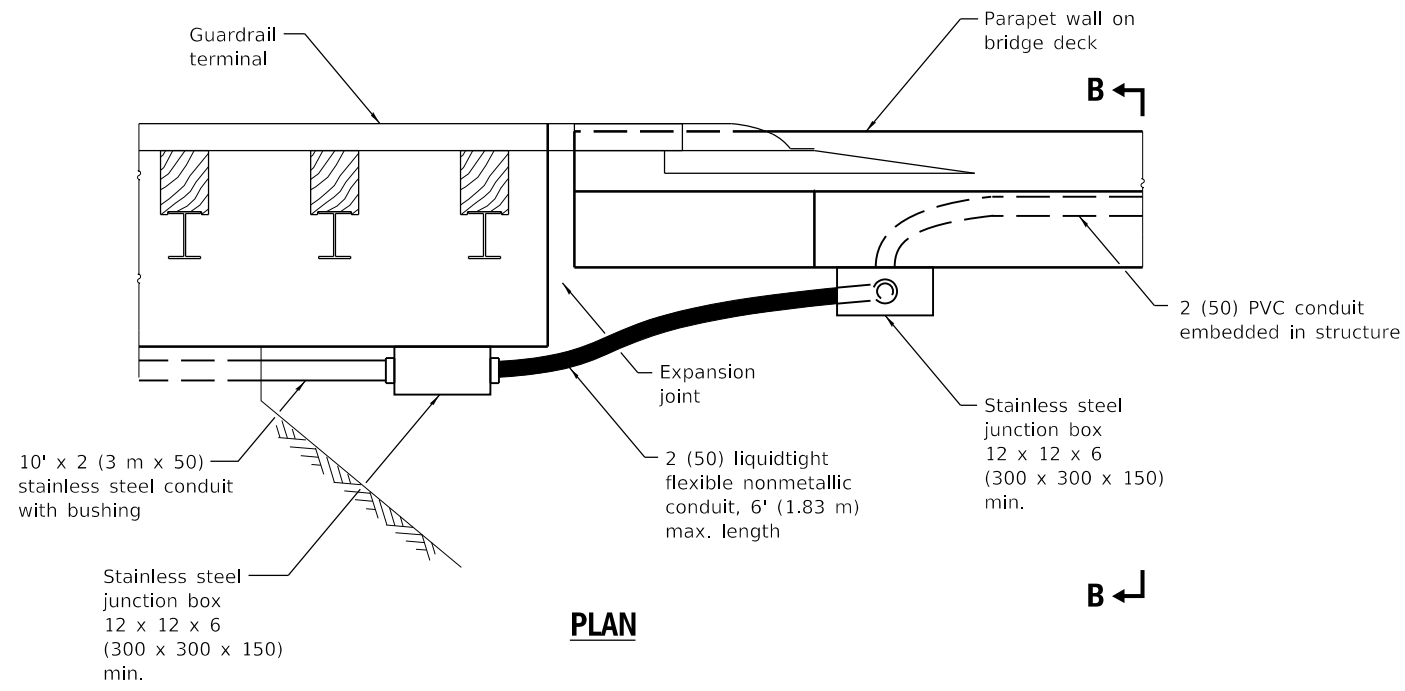
APPROVED January 1, 2020

*ME Reppelt*  
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2020

*J. E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-15



**JOINED ABUTMENT WITH  
PARAPET ENDING ON BRIDGE DECK**

**RACEWAYS EMBEDDED  
IN STRUCTURE**

(Sheet 3 of 3)

**STANDARD 812001-01**

Illinois Department of Transportation

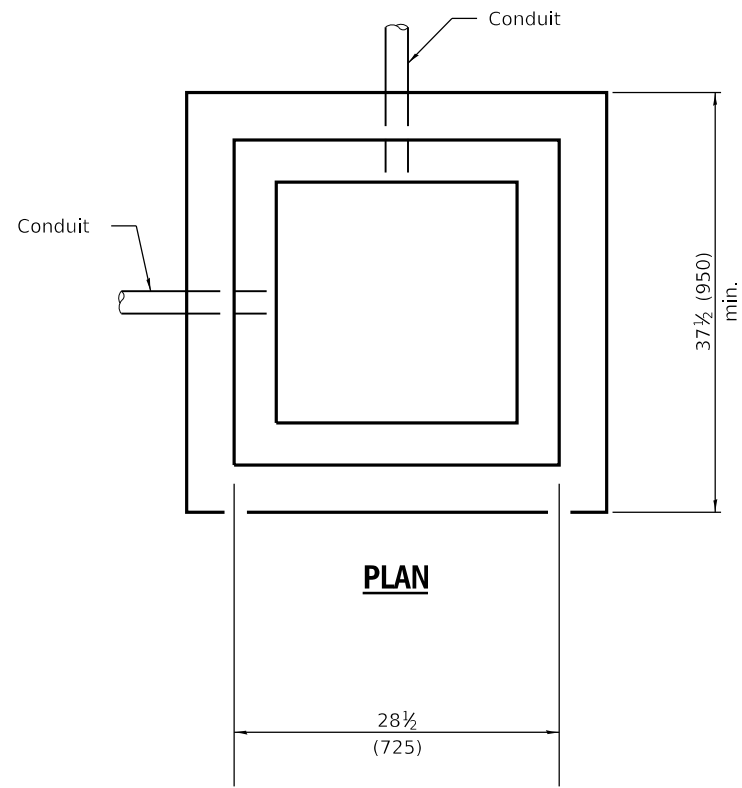
APPROVED January 1, 2020

*M. E. Reppelt*  
ELECTRICAL AND MECHANICAL UNIT CHIEF

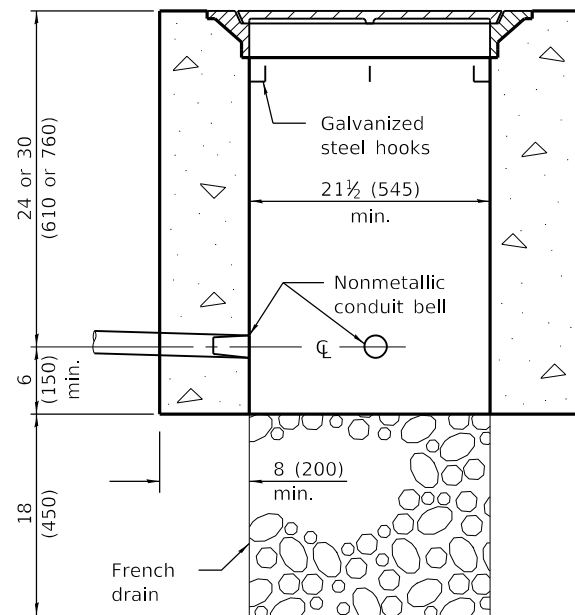
APPROVED January 1, 2020

*J. E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-15

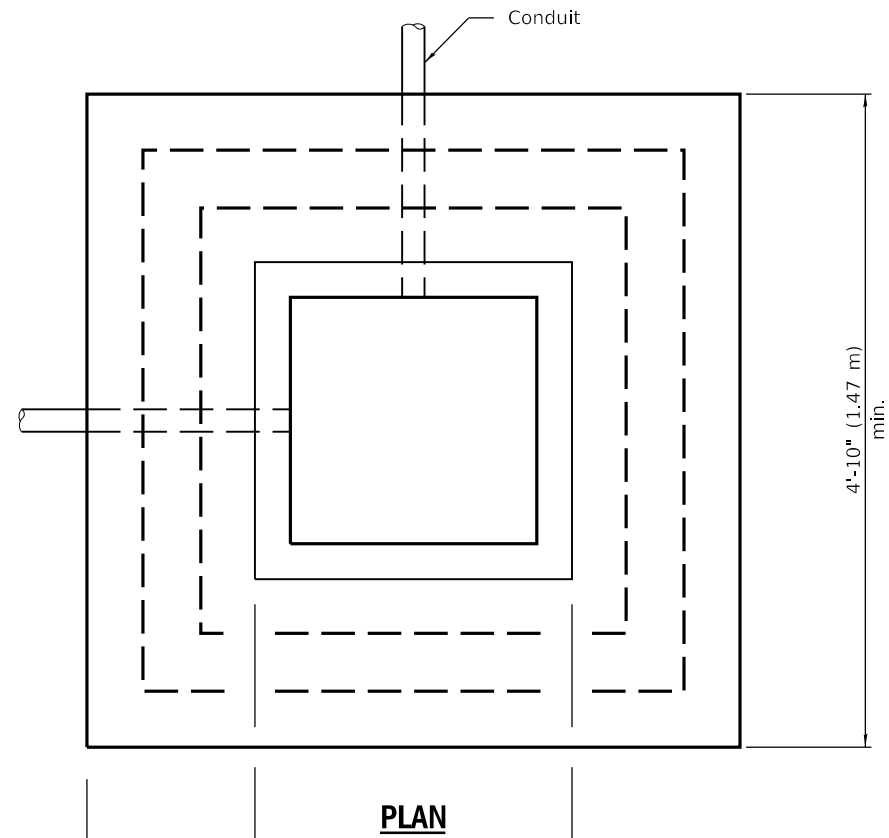


**PLAN**

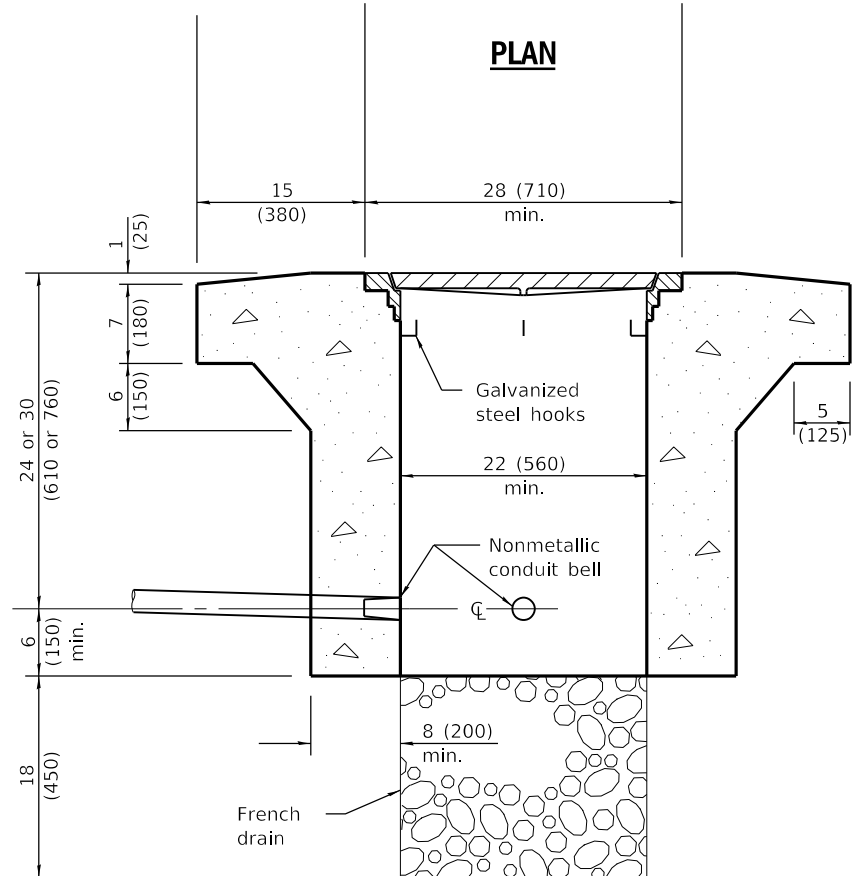


**ELEVATION**

**PORTLAND CEMENT CONCRETE**

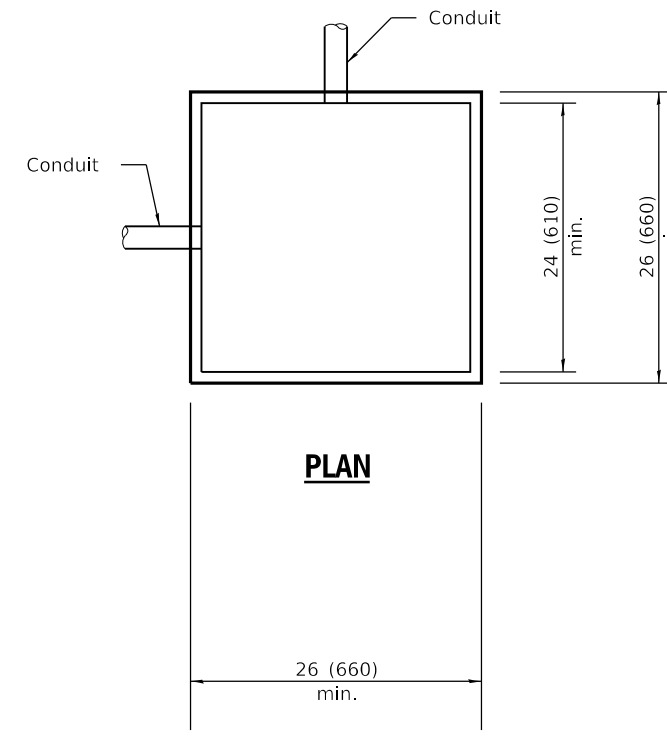


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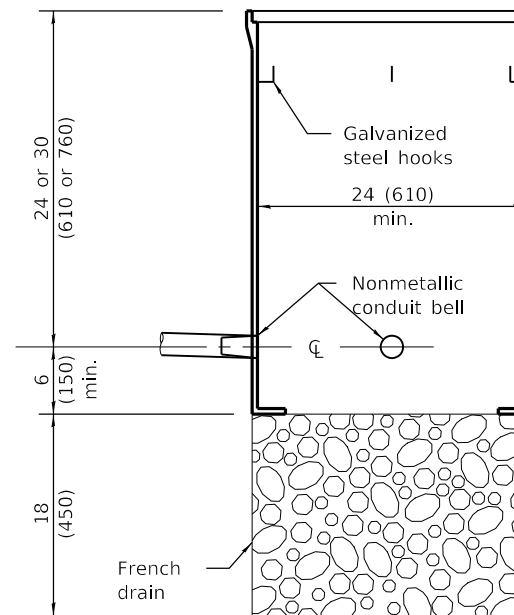


**ELEVATION**

**PORTLAND CEMENT CONCRETE  
HEAVY DUTY**



**PLAN**



**ELEVATION**

**COMPOSITE CONCRETE**

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

**QUANTITIES**

Depth	Concrete yd <sup>3</sup> (m <sup>3</sup> )	
	Handhole	Heavy Duty Handhole
30 (762)	0.61 (0.47)	0.98 (0.75)
36 (914)	0.73 (0.56)	1.10 (0.84)

Illinois Department of Transportation

PASSED January 1, 2015  
*Amy Allen*  
ENGINEER OF OPERATIONS

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

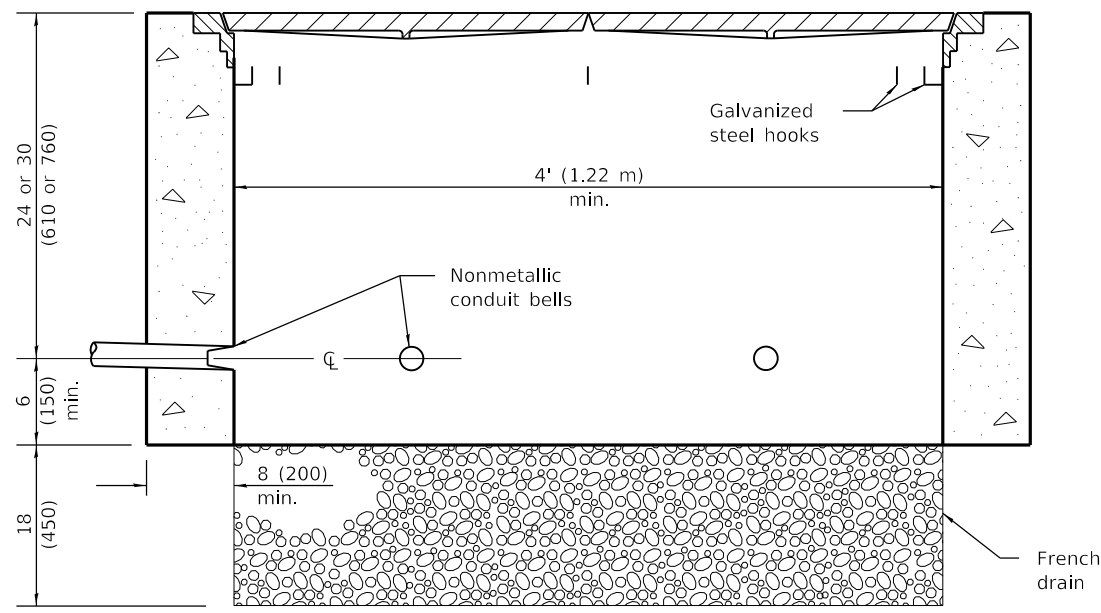
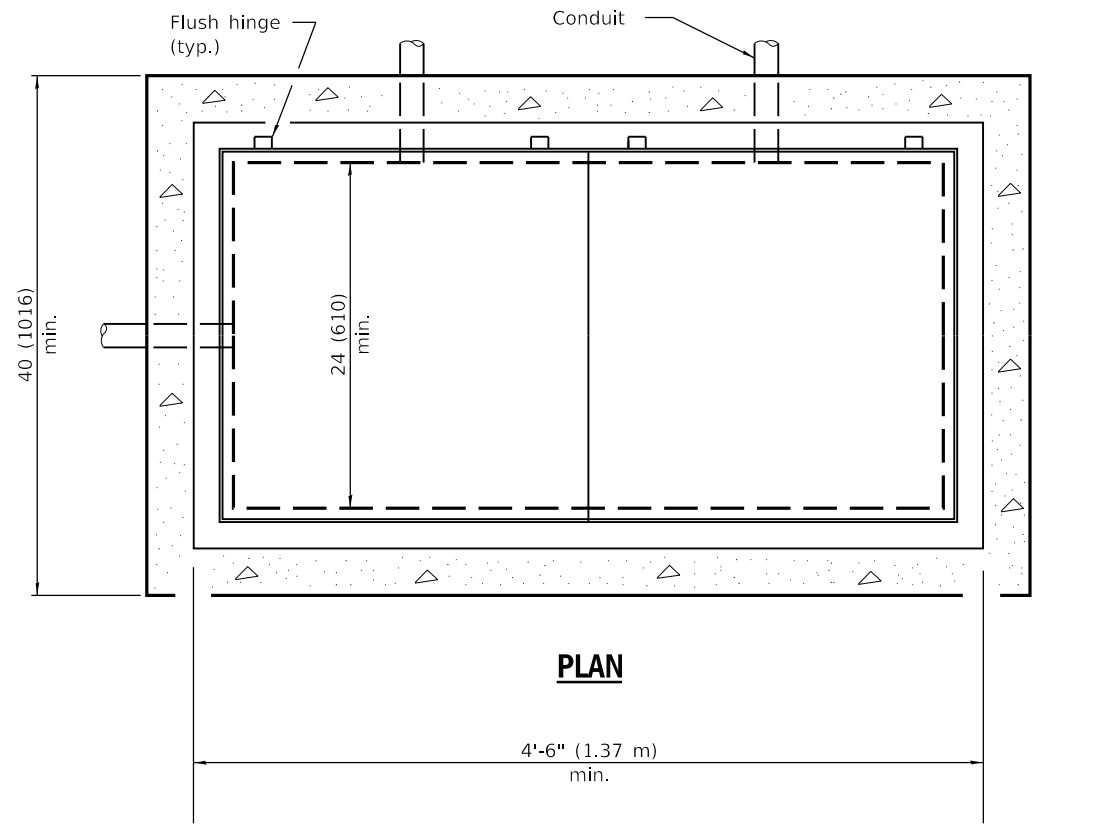
ISSUED 1-1-97

DATE	REVISIONS
1-1-15	Corrected dimension on heavy duty handhole. Added concrete quantities table.
1-1-09	Switched units to English (metric).

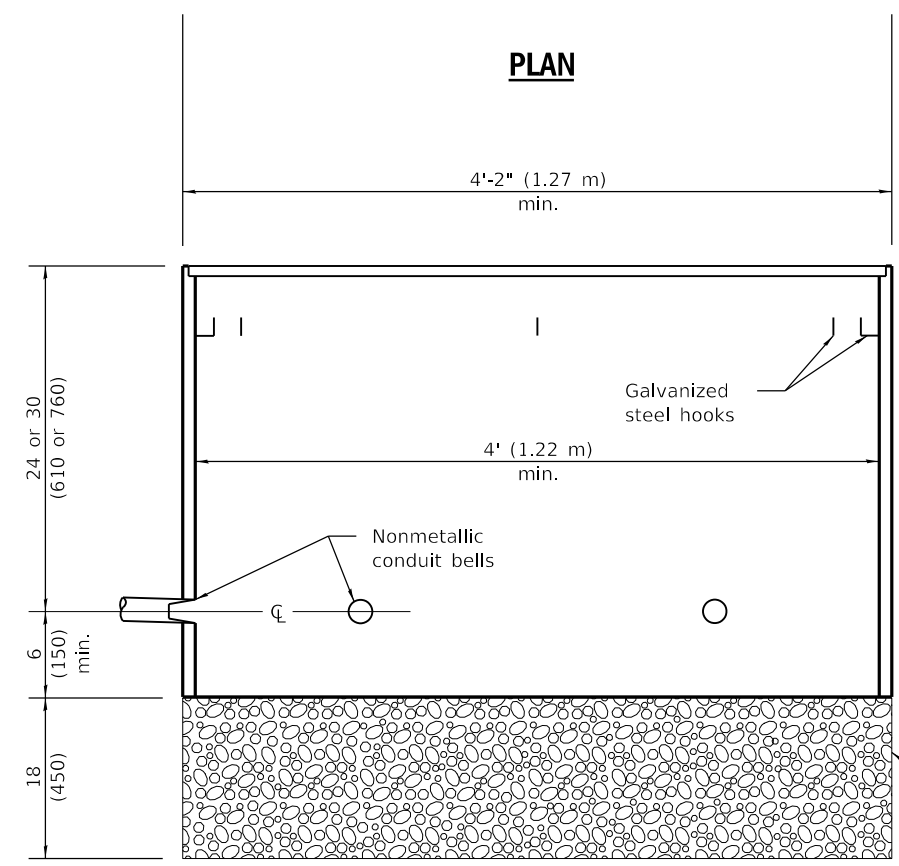
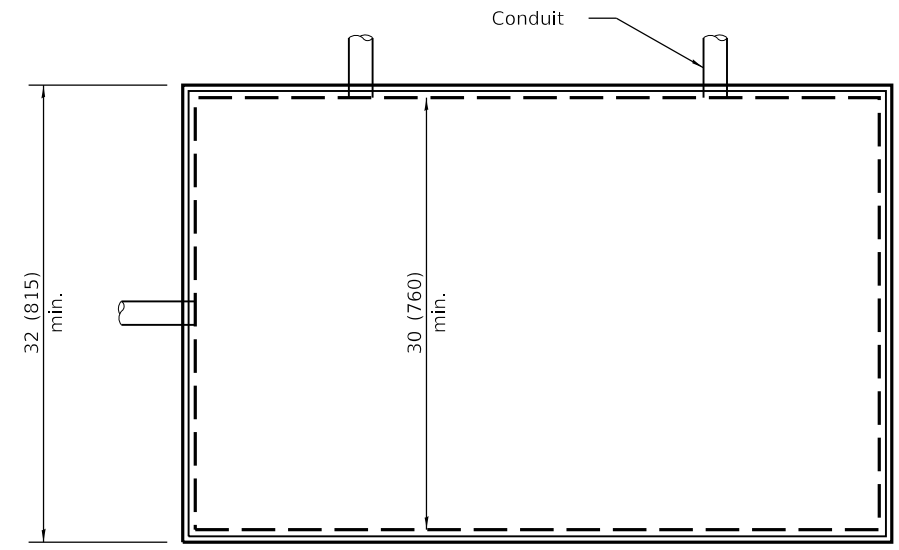
**HANDHOLES**

**STANDARD 814001-03**





**ELEVATION**  
**PORTLAND CEMENT CONCRETE**



**ELEVATION**  
**COMPOSITE CONCRETE**

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

DATE	REVISIONS
1-1-21	Corrected dimension in Portland Cement Concrete Plan view.
1-1-09	Switched units to English (metric).

**DOUBLE HANDHOLES**

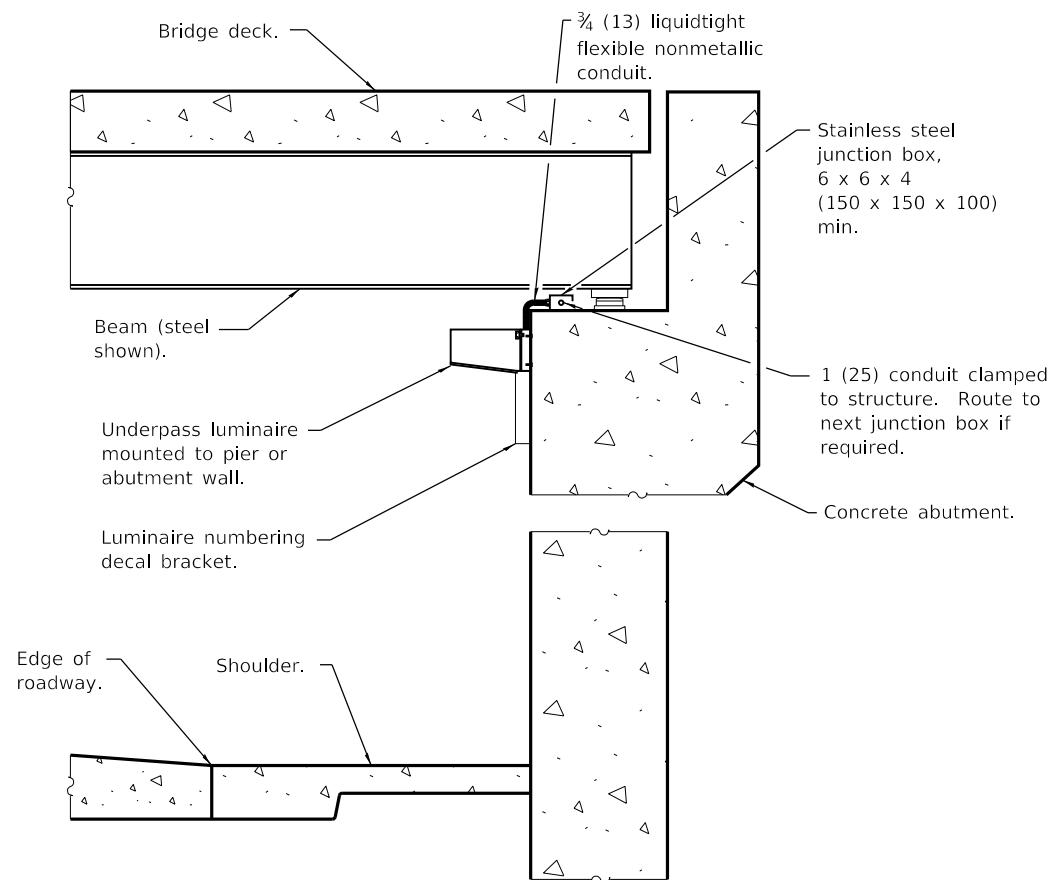
**STANDARD 814006-03**

Illinois Department of Transportation

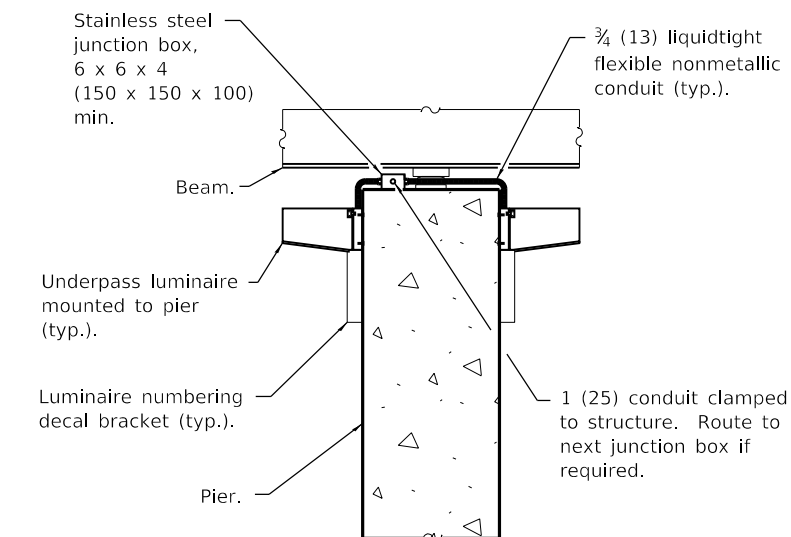
PASSED January 1, 2021  
*Amy Ellis*  
 ENGINEER OF OPERATIONS

APPROVED January 1, 2021  
*S. E. EG*  
 ENGINEER OF DESIGN AND ENVIRONMENT

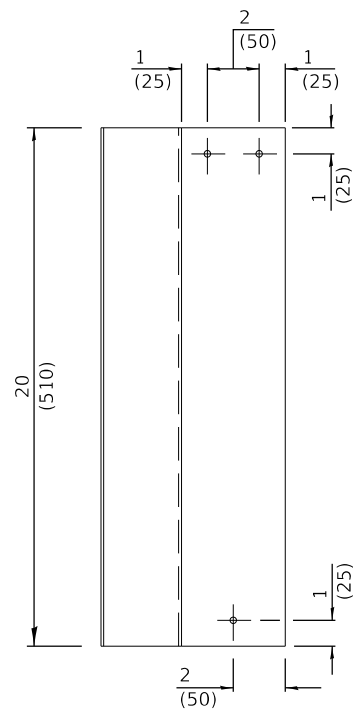
ISSUED 1-1-97



**SECTION A-A**

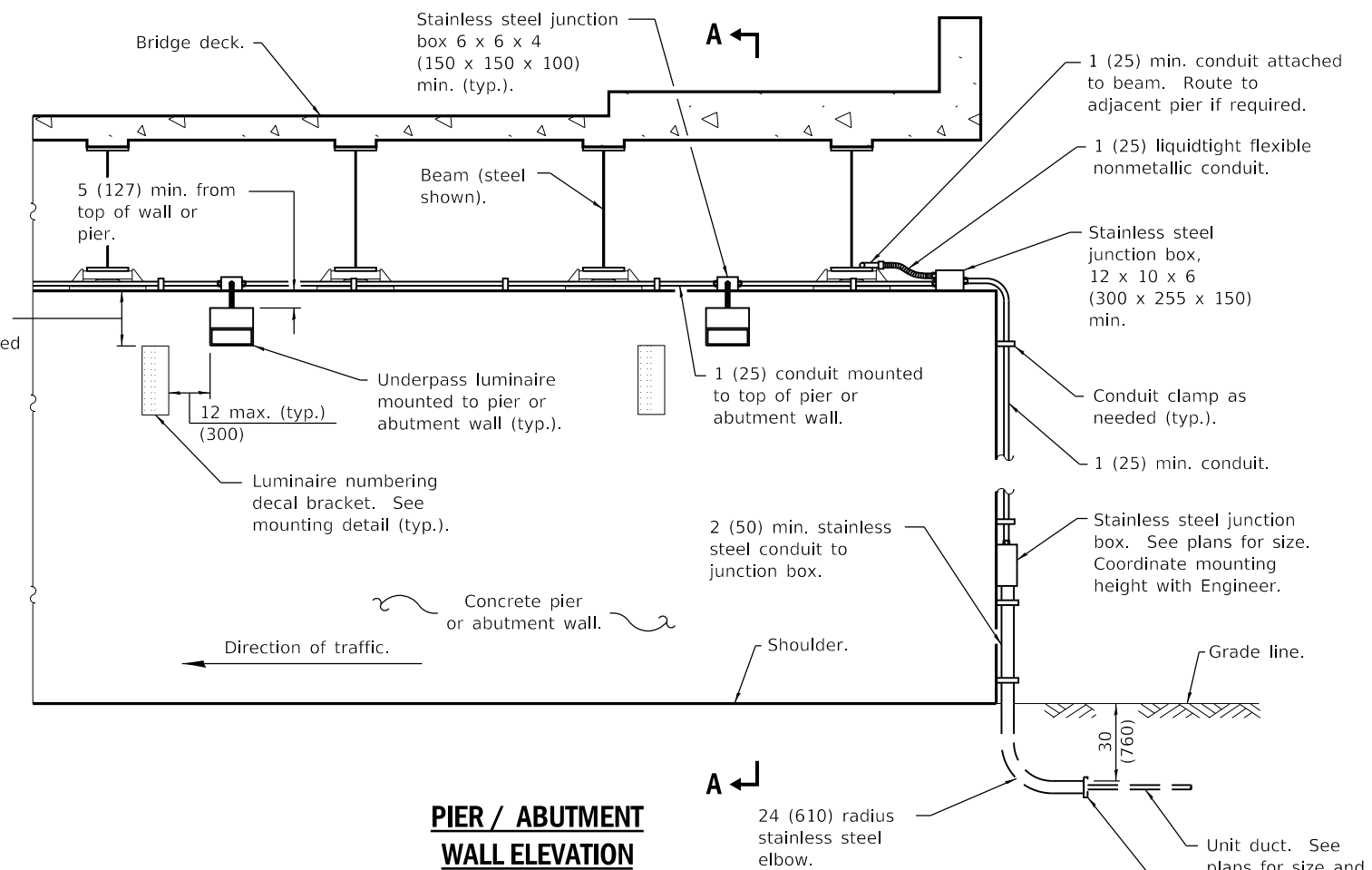


**CENTER PIER DETAIL**

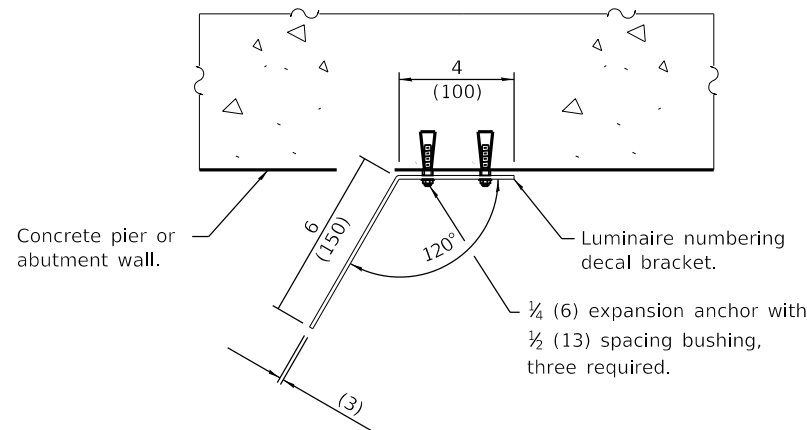


**ELEVATION**

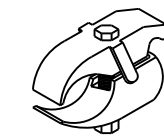
**LUMINAIRE NUMBERING DECAL BRACKET MOUNTING DETAIL**



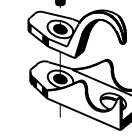
**PIER / ABUTMENT WALL ELEVATION**



**TOP VIEW**



**CONDUIT BEAM CLAMP**



**CONDUIT CLAMP**

**GENERAL NOTES**

See plans for underpass luminaire locations.

Rigid conduit may be used in lieu of flexible conduit.

Stainless steel conduit shall be used beneath any openings in the bridge deck.

Branch circuits to luminaire shown routed from underground. Branch circuits may be routed from bridge parapet above.

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

DATE	REVISIONS
4-1-16	New standard.

**UNDERPASS LIGHTING WALL MOUNT**

**STANDARD 821001**

Illinois Department of Transportation

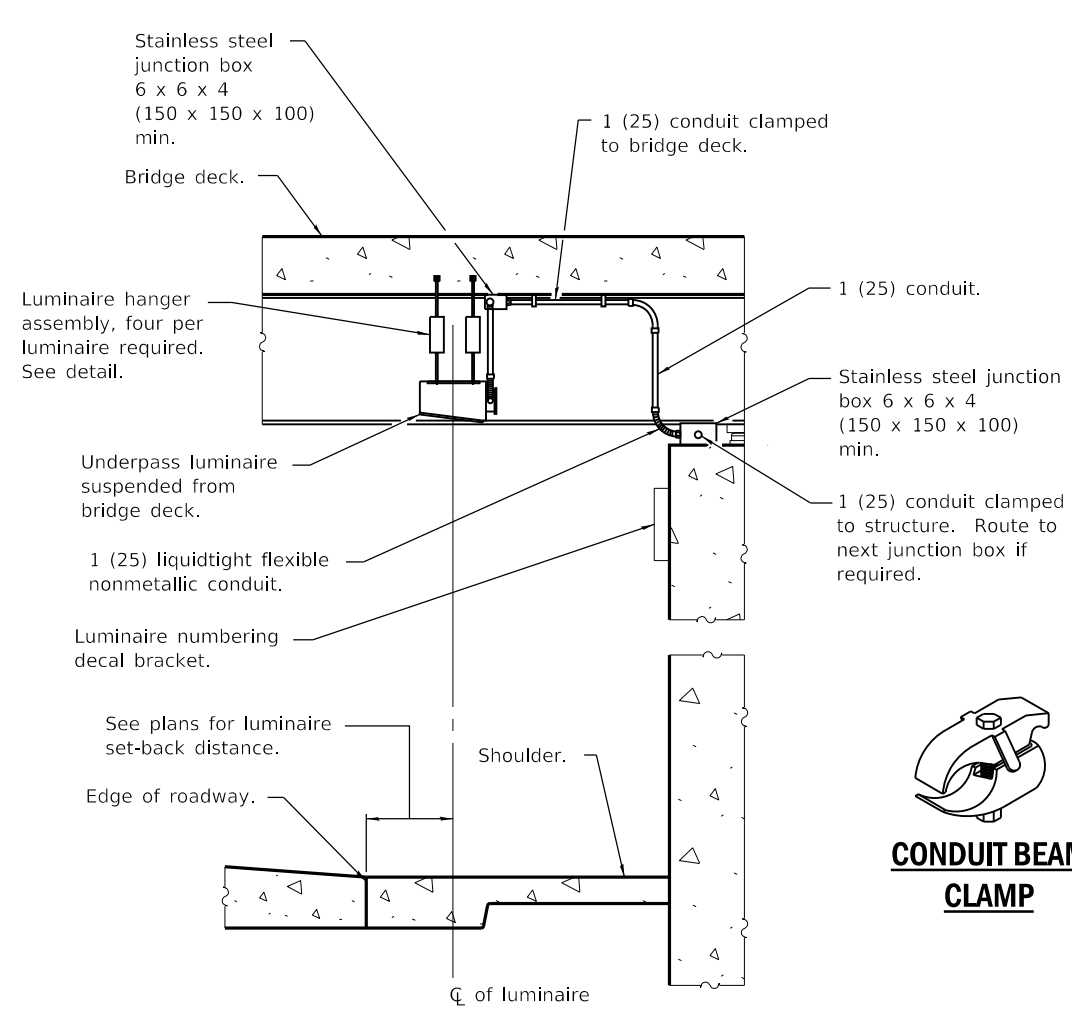
PASSED April 1, 2016

ENGINEER OF PRELIMINARY ENGINEERING

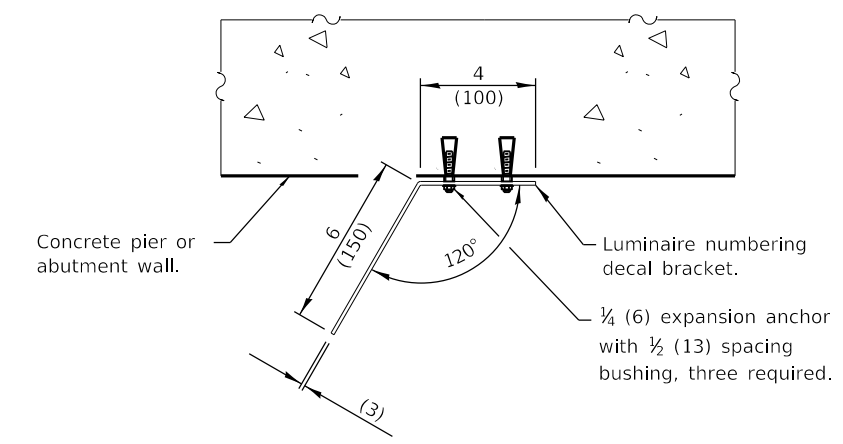
APPROVED April 1, 2016

ENGINEER OF DESIGN AND ENVIRONMENT

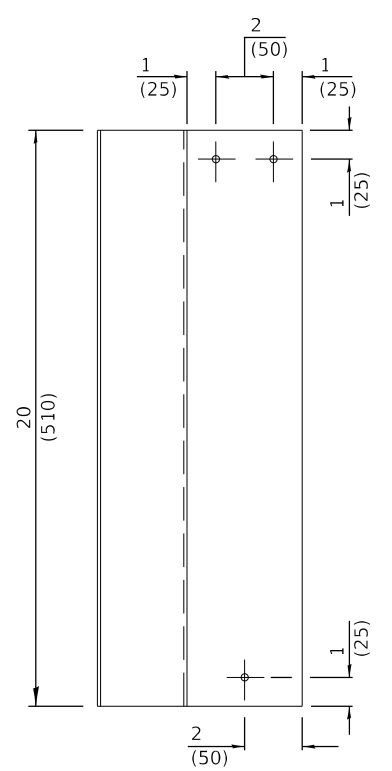
ISSUED 1-1-16



**SECTION A-A**

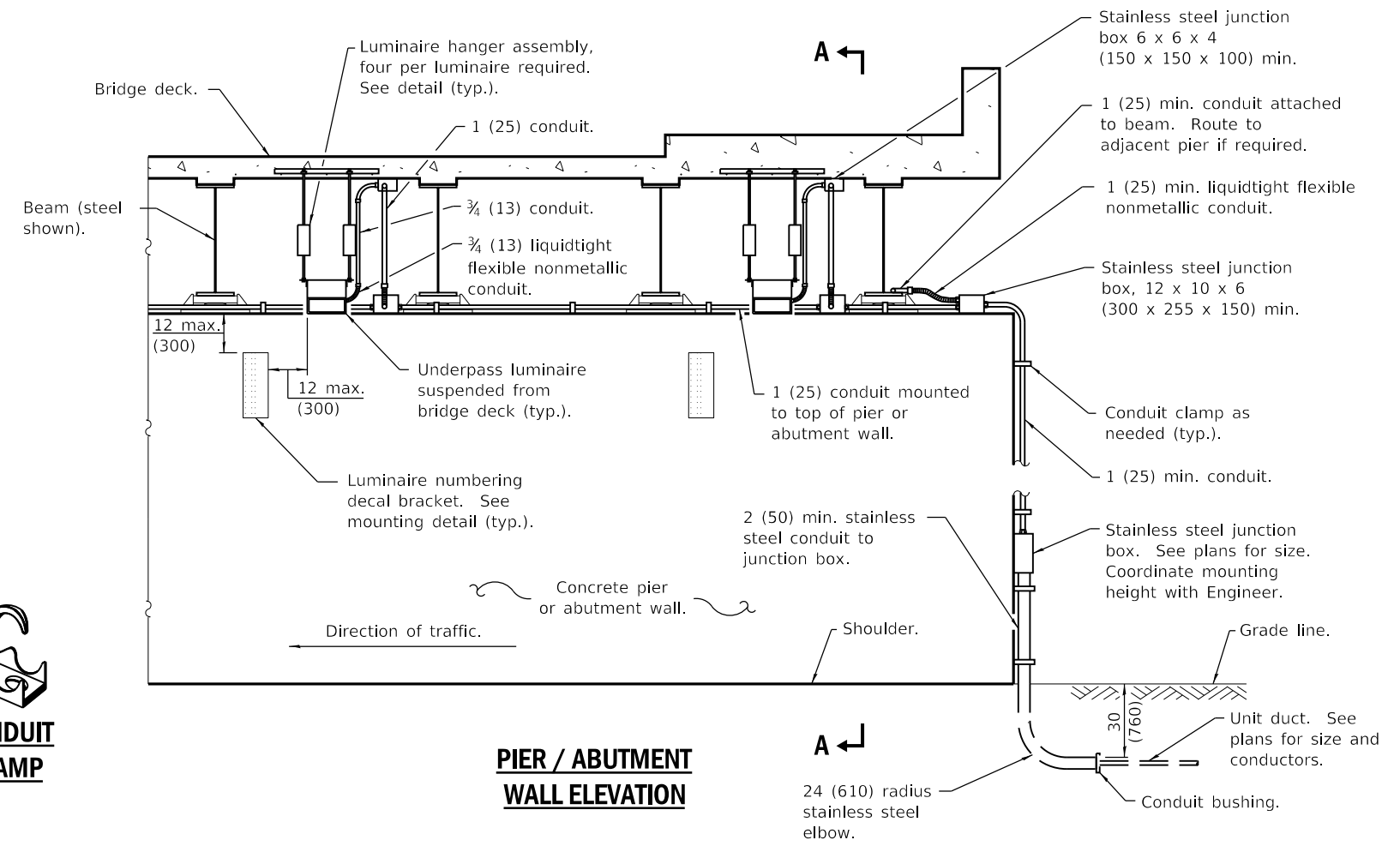
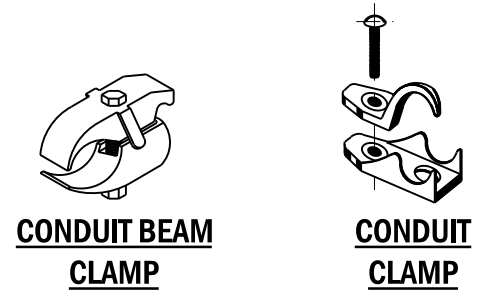


**TOP VIEW**

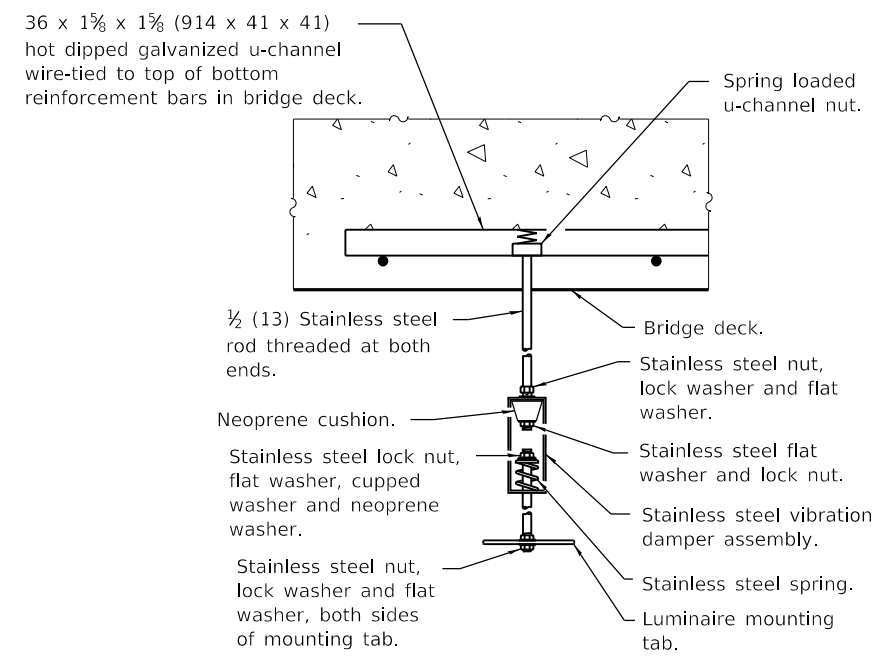


**ELEVATION**

**LUMINAIRE NUMBERING DECAL BRACKET MOUNTING DETAIL**



**PIER / ABUTMENT WALL ELEVATION**



**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

PASSED                      April 1, 2016

*[Signature]*  
ENGINEER OF PRELIMINARY ENGINEERING

APPROVED                      April 1, 2016

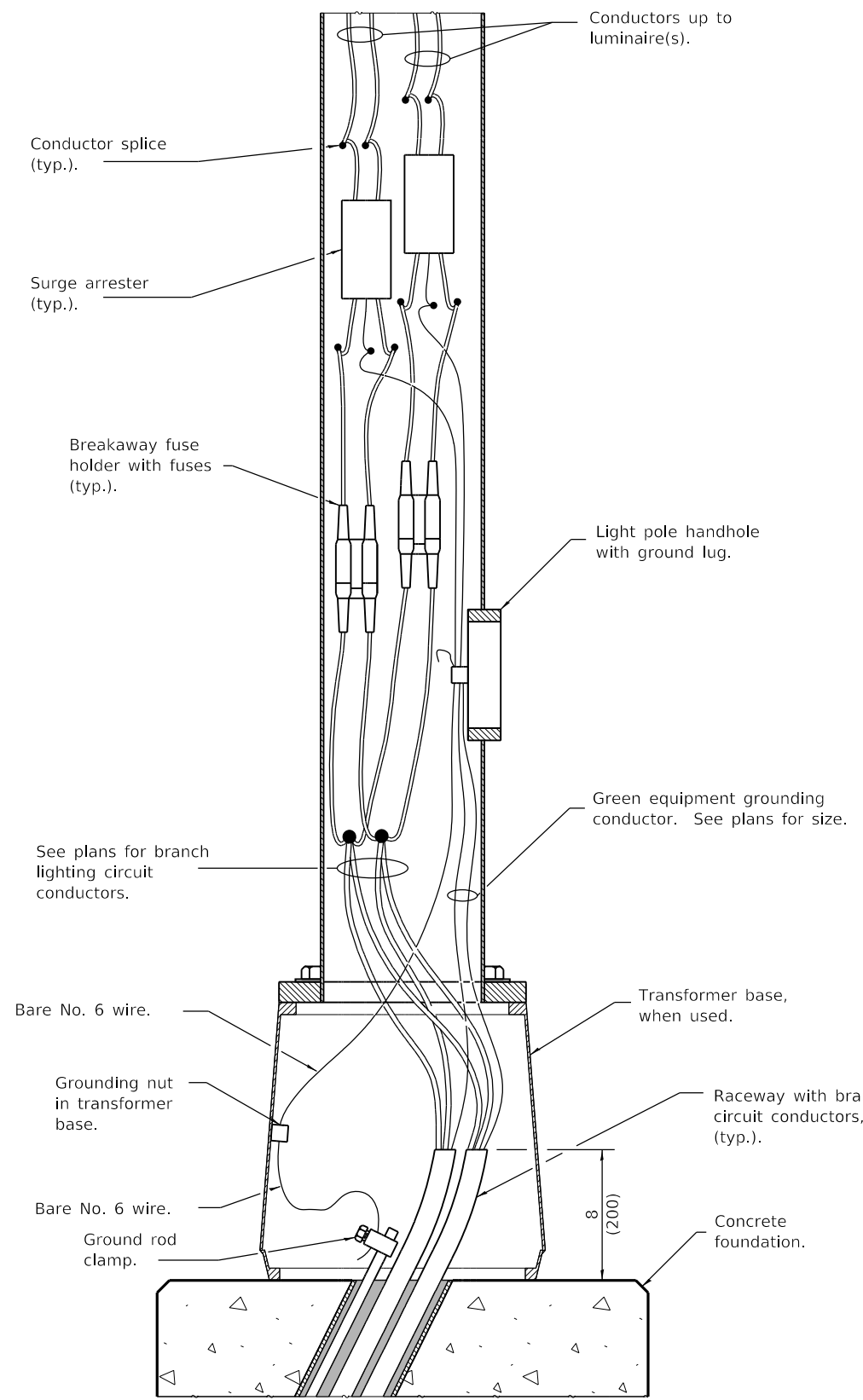
*[Signature]*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-16

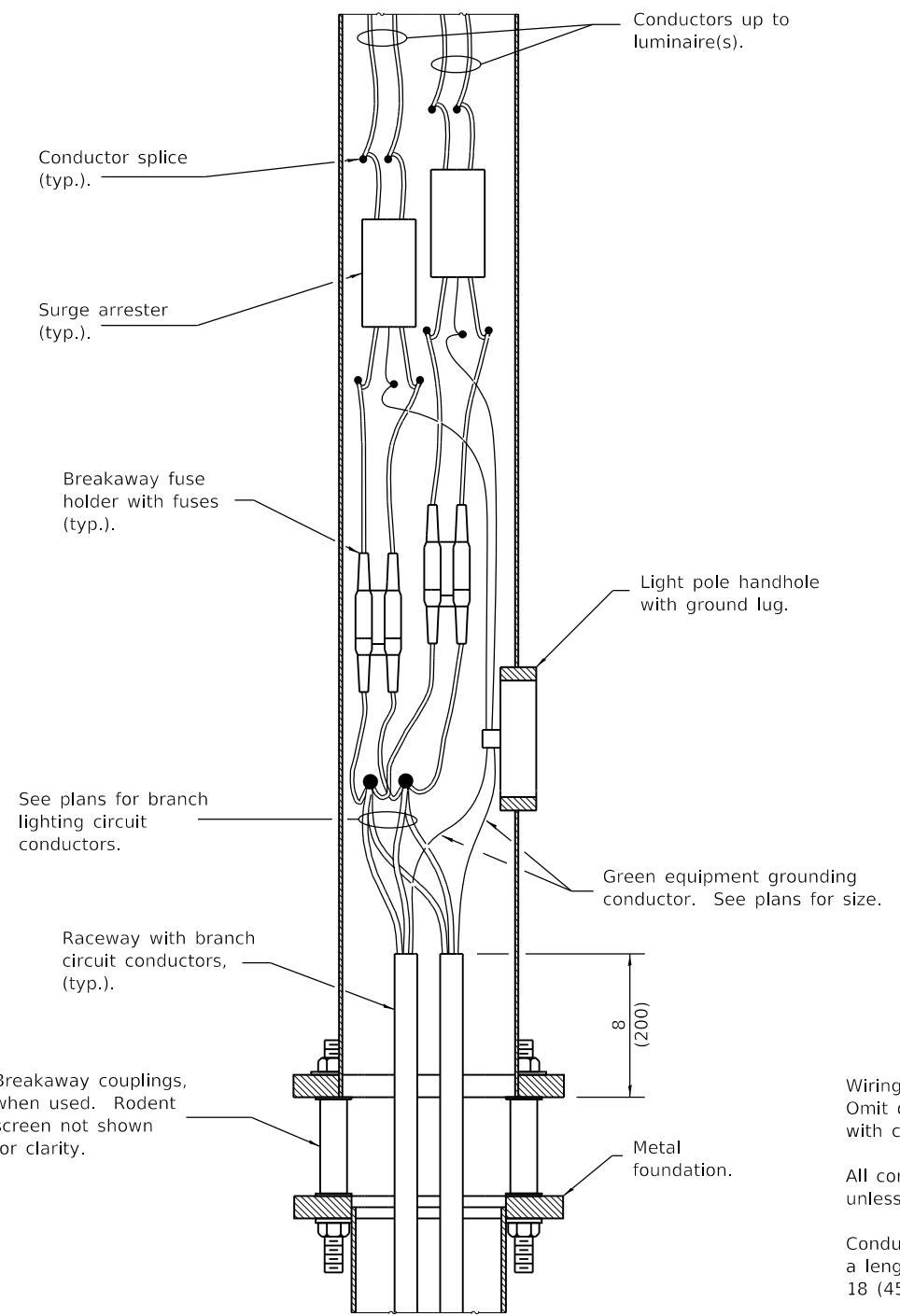
DATE	REVISIONS
4-1-16	New standard.

**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 and one surge arrester with connections for single luminaire installation.

All conductors originating in pole shall be No. 10 unless noted otherwise.

Conductors extended into light poles shall be of a length sufficient for splices to be withdrawn 18 (450) out of pole handhole.

Any voids in the foundation shall be filled with fine aggregate.

See Standard 836001 for Light Pole Foundation and ground rod.

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

Illinois Department of Transportation

PASSED January 1, 2017

ENGINEER OF PRELIMINARY ENGINEERING

APPROVED January 1, 2017

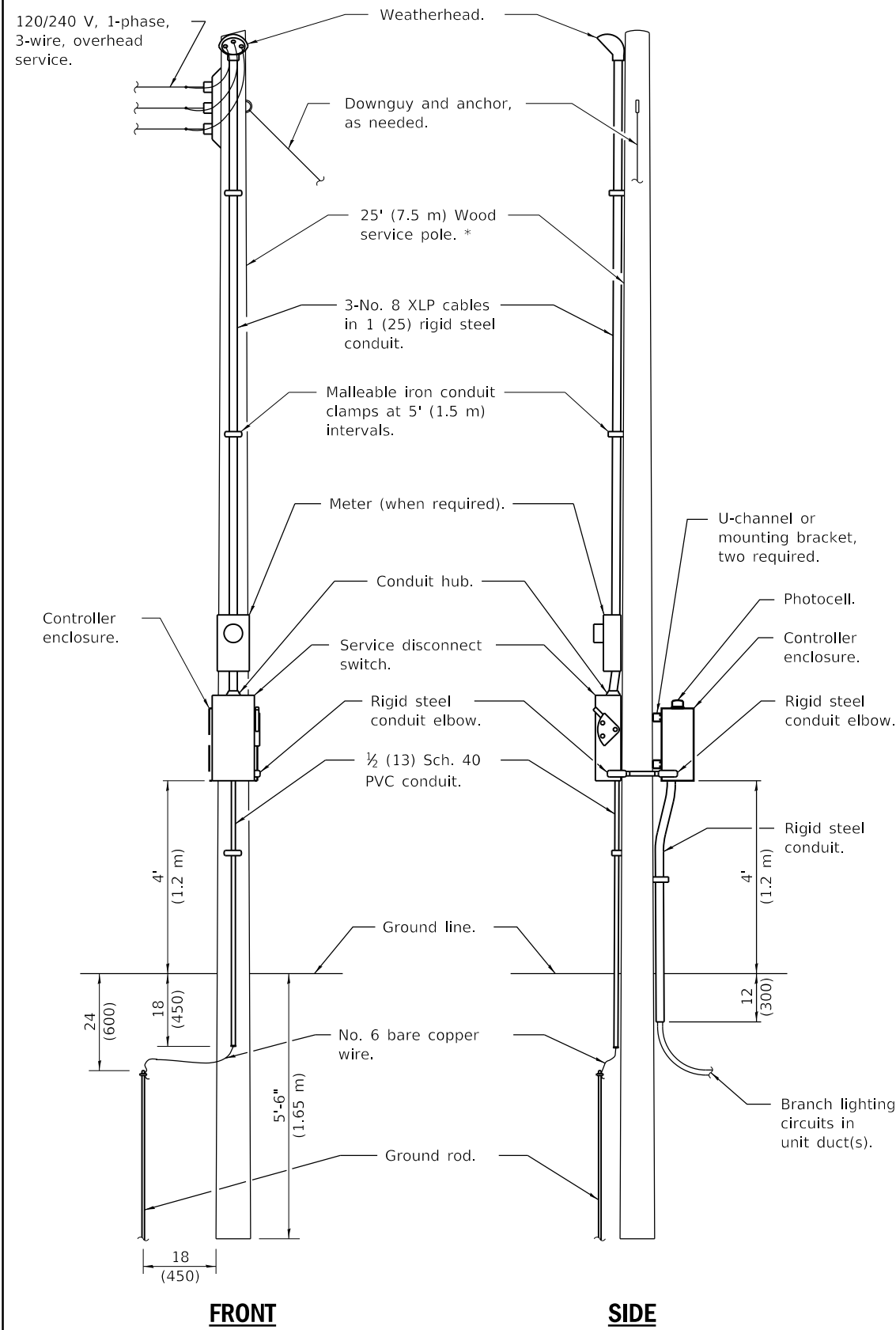
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-14

DATE	REVISIONS
1-1-17	Renamed standard.
1-1-15	Changed 'protector' to 'arrester'.

**LUMINAIRE WIRING IN POLE**

**STANDARD 821101-02**

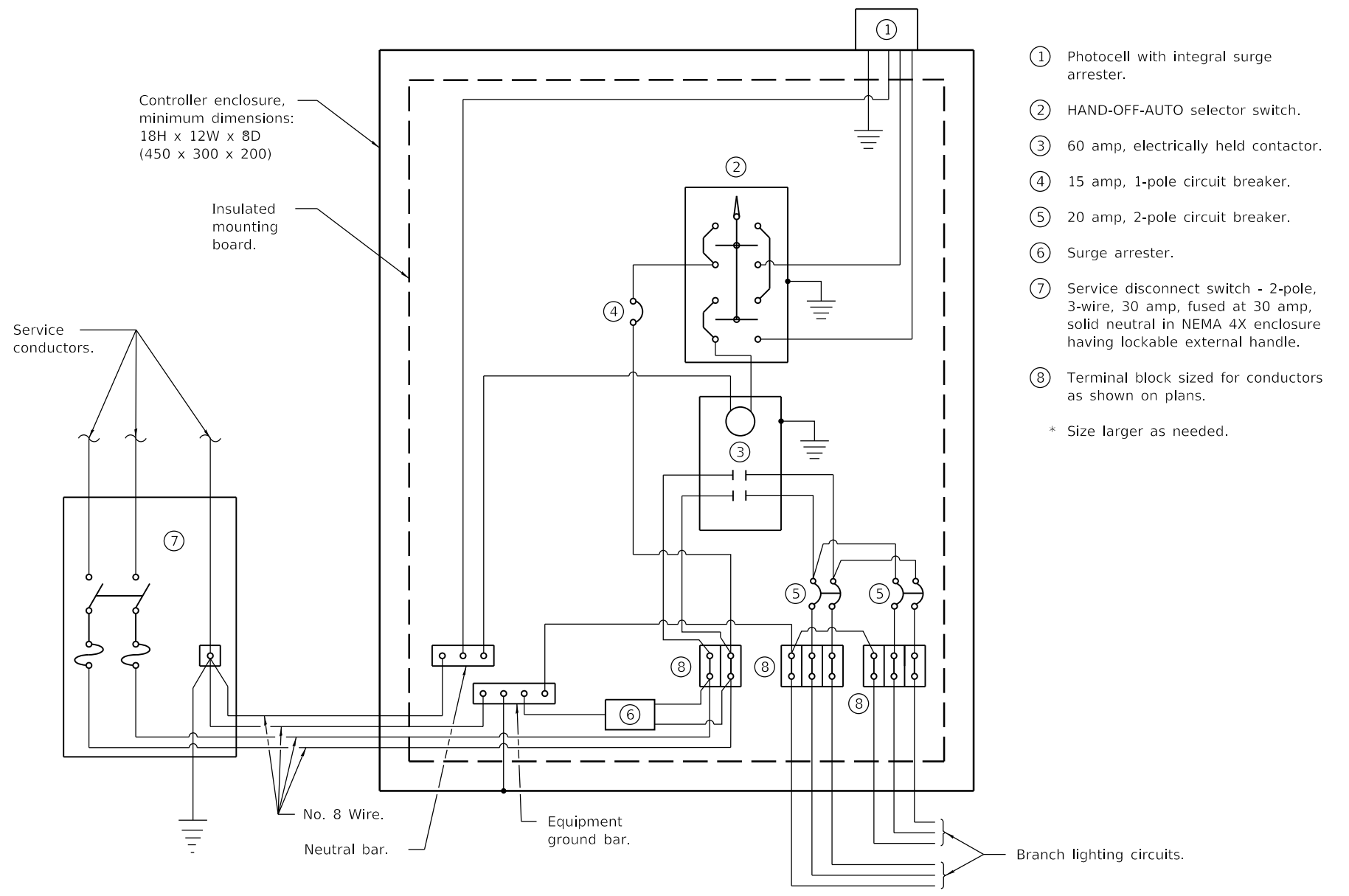


FRONT

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 12x9x1 (305x225x25) watertight pouch mounted inside controller door with as-built plans and schematics.

Provide engraved nameplate on front of enclosure reading "LIGHTING".

Enclosure shall be mounted to pole with pole-bands and lag-bolts.

Work pad not shown.

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

Illinois Department of Transportation

PASSED January 1, 2019  
*ME Reppelt*  
 ELECTRICAL AND MECHANICAL UNIT CHIEF

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

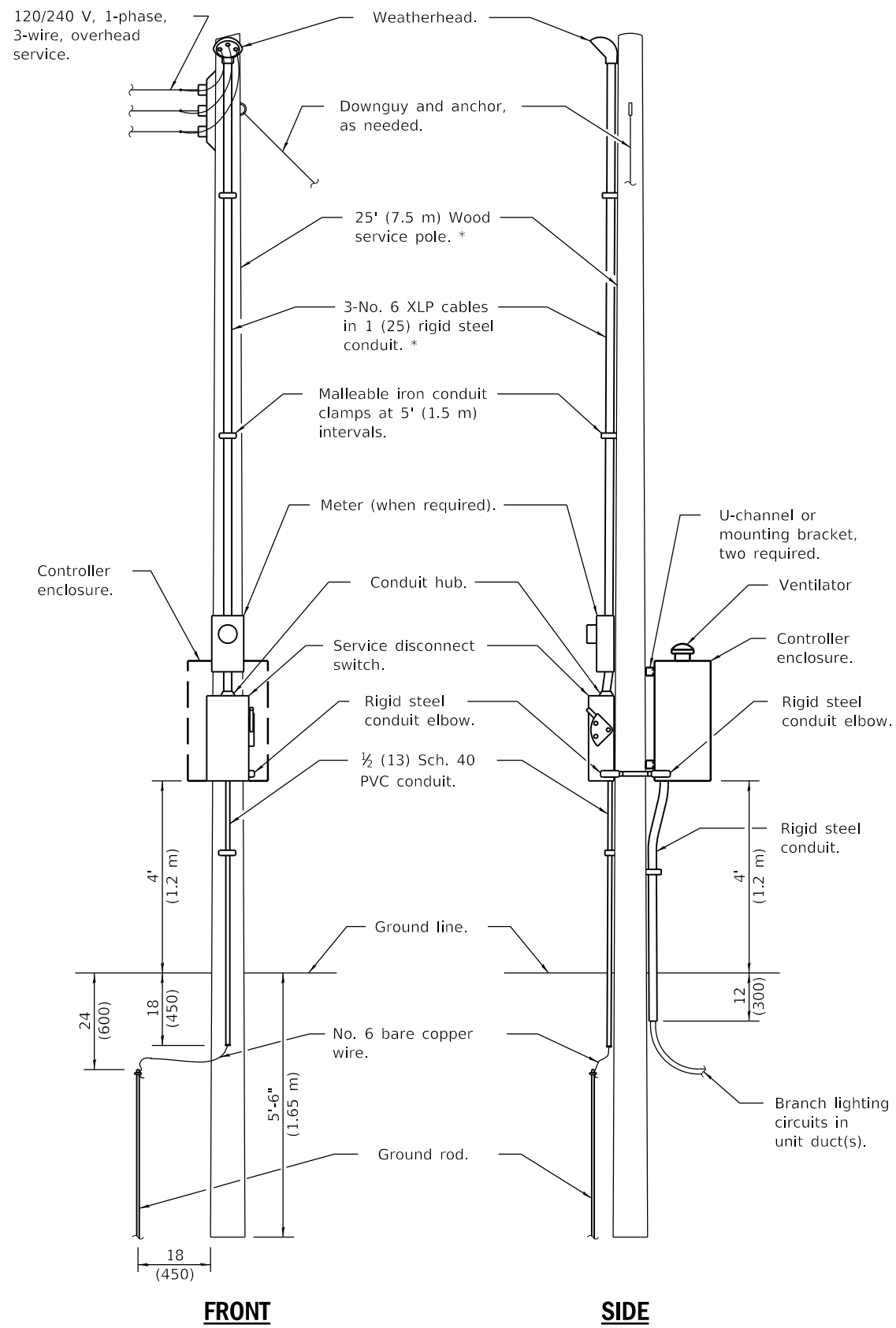
ISSUED 1-1-10

DATE	REVISIONS
1-1-19	Replaced ** note with new note regarding consulting utility company standards for installation.
4-1-16	Corrected connection at terminal block.

**LIGHTING CONTROLLER  
 POLE MOUNTED, 240V**

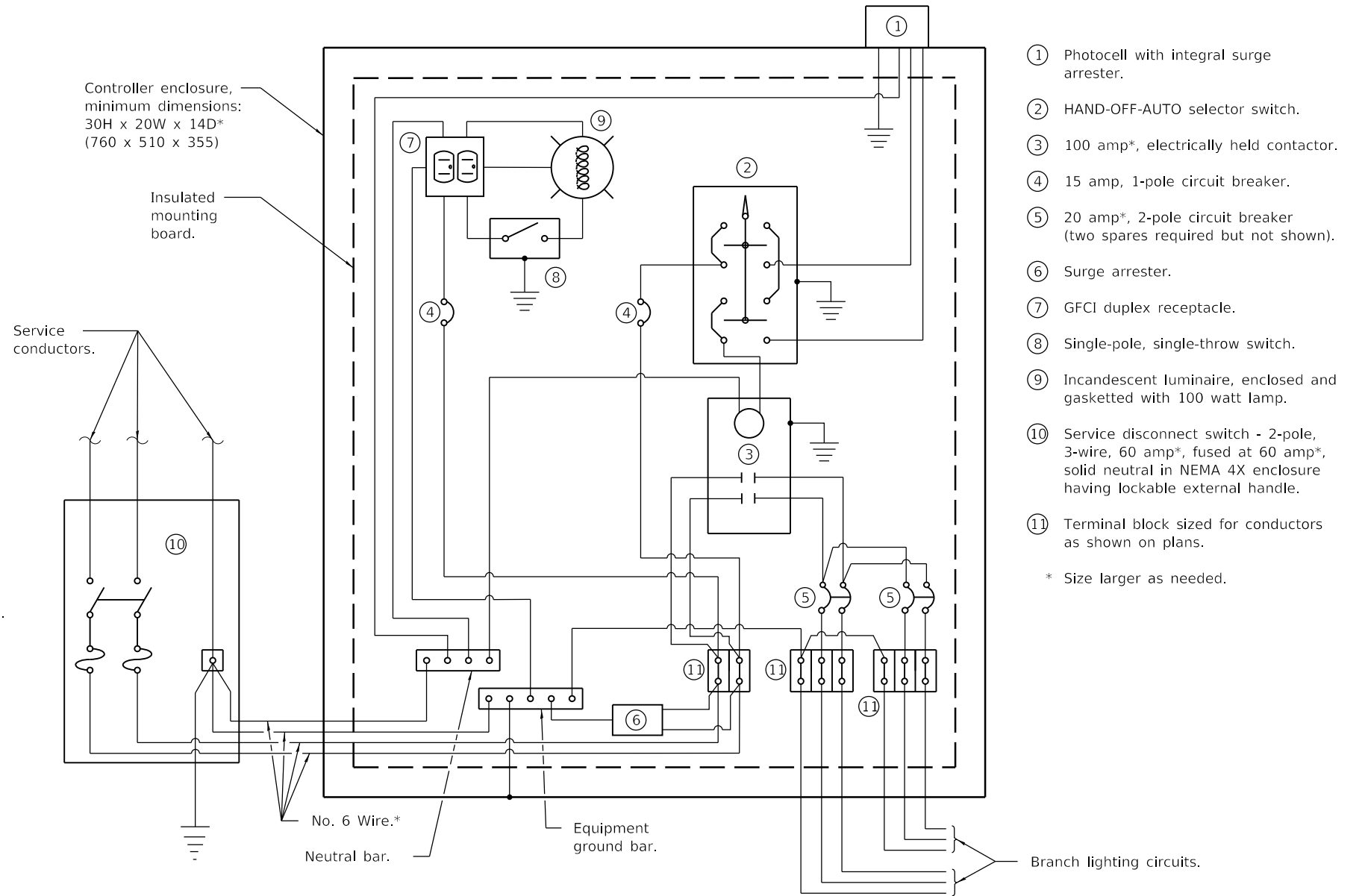
(Sheet 1 of 2)

**STANDARD 825001-04**



**ELECTRIC SERVICE INSTALLATION**

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)  
 \*Size larger as needed.



**CONTROL SCHEMATIC**

- ① Photocell with integral surge arrester.
- ② HAND-OFF-AUTO selector switch.
- ③ 100 amp\*, electrically held contactor.
- ④ 15 amp, 1-pole circuit breaker.
- ⑤ 20 amp\*, 2-pole circuit breaker (two spares required but not shown).
- ⑥ Surge arrester.
- ⑦ GFCI duplex receptacle.
- ⑧ Single-pole, single-throw switch.
- ⑨ Incandescent luminaire, enclosed and gasketed with 100 watt lamp.
- ⑩ Service disconnect switch - 2-pole, 3-wire, 60 amp\*, fused at 60 amp\*, solid neutral in NEMA 4X enclosure having lockable external handle.
- ⑪ Terminal block sized for conductors as shown on plans.

\* Size larger as needed.

Illinois Department of Transportation

PASSED January 1, 2019  
*ME Reppelt*  
 ELECTRICAL AND MECHANICAL UNIT CHIEF

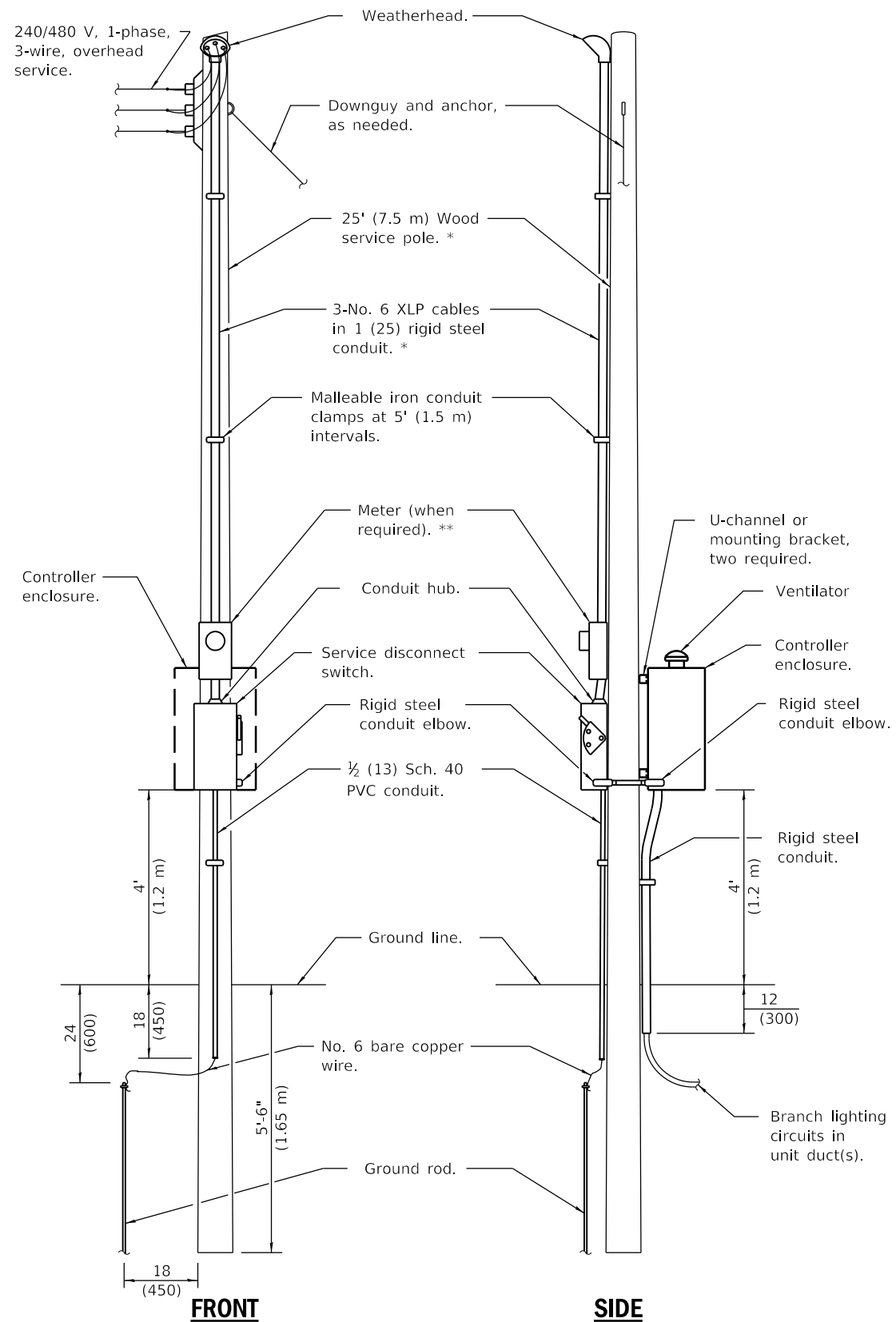
APPROVED January 1, 2019  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-10

**LIGHTING CONTROLLER  
 POLE MOUNTED, 240V**

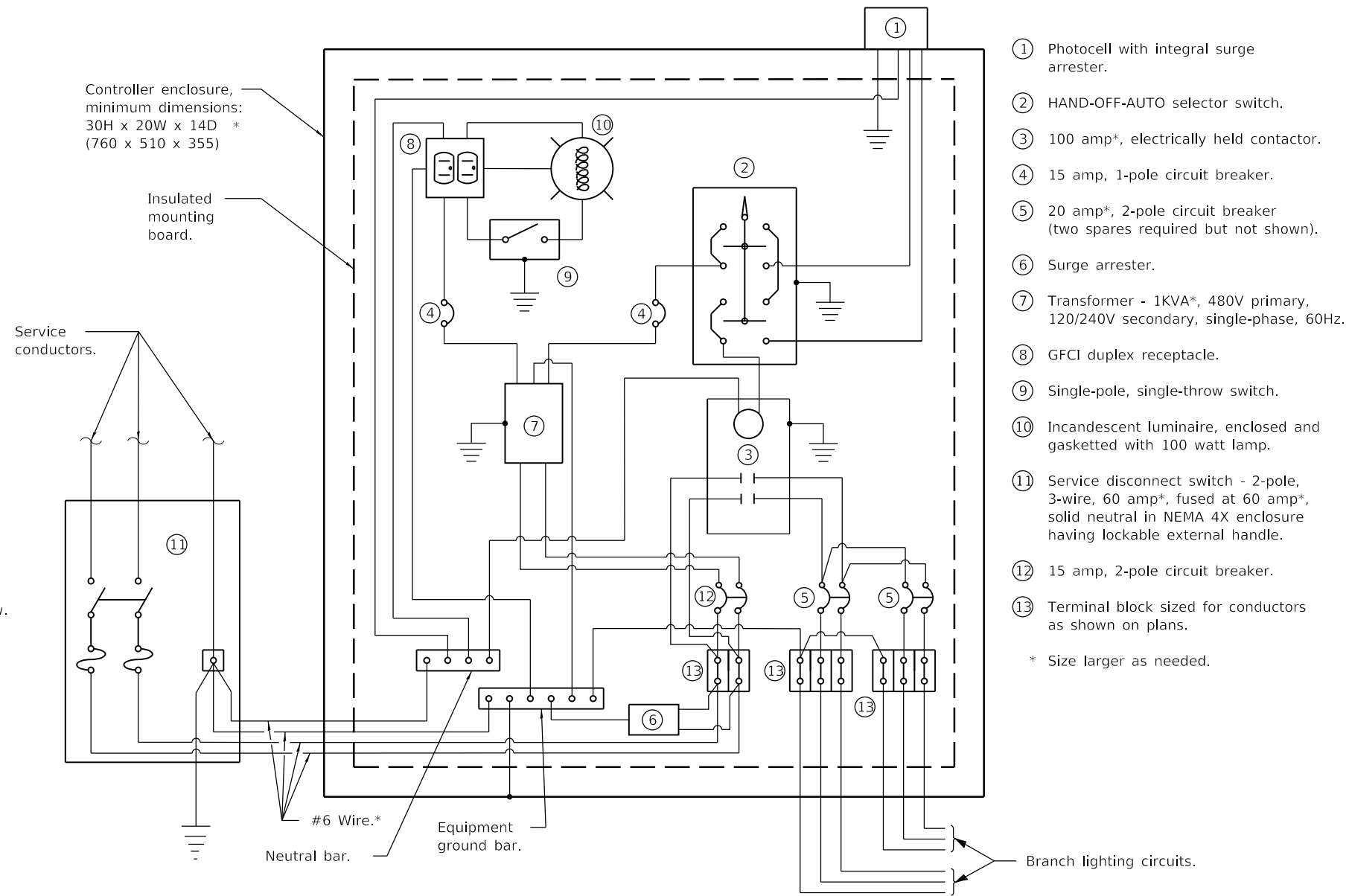
(Sheet 2 of 2)

**STANDARD 825001-04**



**ELECTRIC SERVICE INSTALLATION**

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)  
 \* Size larger as needed.  
 \*\* When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.



**CONTROL SCHEMATIC**

- ① Photocell with integral surge arrester.
  - ② HAND-OFF-AUTO selector switch.
  - ③ 100 amp\*, electrically held contactor.
  - ④ 15 amp, 1-pole circuit breaker.
  - ⑤ 20 amp\*, 2-pole circuit breaker (two spares required but not shown).
  - ⑥ Surge arrester.
  - ⑦ Transformer - 1KVA\*, 480V primary, 120/240V secondary, single-phase, 60Hz.
  - ⑧ GFCI duplex receptacle.
  - ⑨ Single-pole, single-throw switch.
  - ⑩ Incandescent luminaire, enclosed and gasketed with 100 watt lamp.
  - ⑪ Service disconnect switch - 2-pole, 3-wire, 60 amp\*, fused at 60 amp\*, solid neutral in NEMA 4X enclosure having lockable external handle.
  - ⑫ 15 amp, 2-pole circuit breaker.
  - ⑬ Terminal block sized for conductors as shown on plans.
- \* Size larger as needed.

**GENERAL NOTES**

Provide 12x9x1 (305x225x25) watertight pouch mounted inside controller door with as-built plans and schematics.

Provide engraved nameplate on front of enclosure reading "LIGHTING".

Enclosure shall be mounted to pole with pole-bands and lag-bolts.

Work pad not shown.

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

Illinois Department of Transportation

PASSED January 1, 2019

*M. E. Reppelt*  
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019

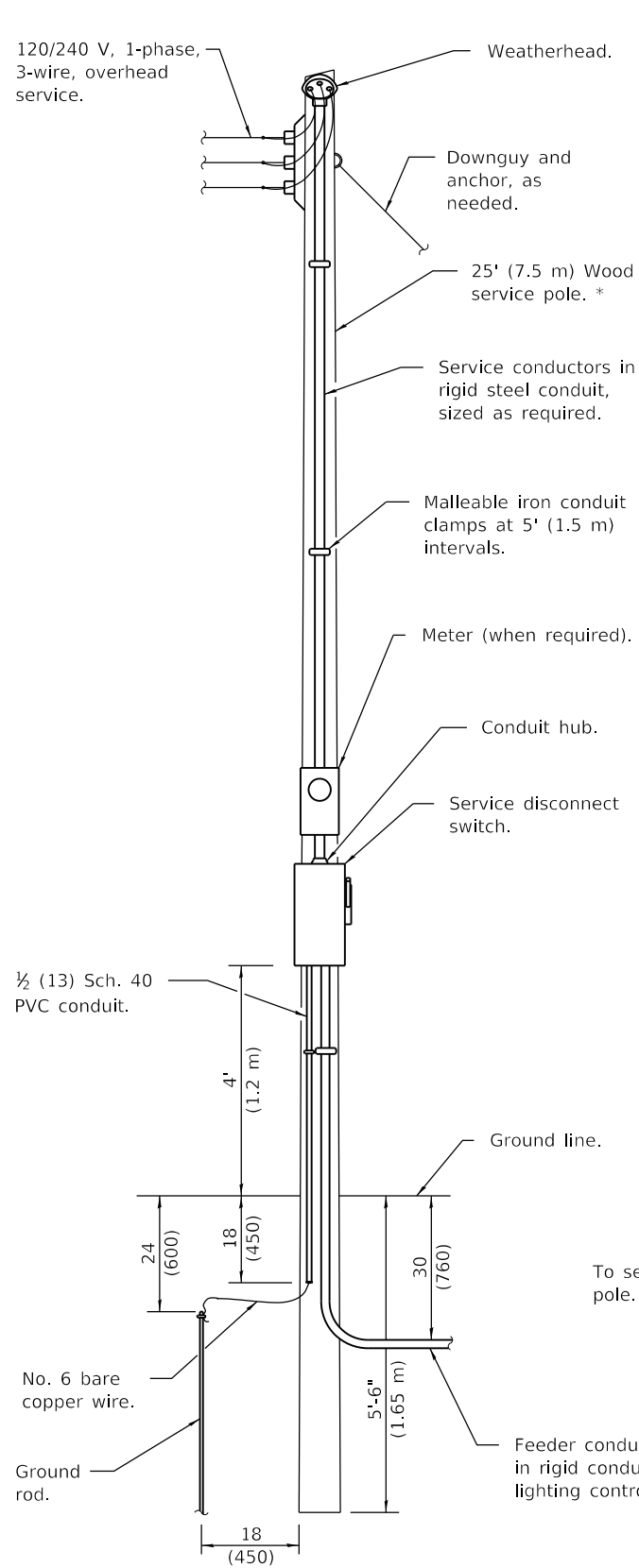
*J. E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

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.

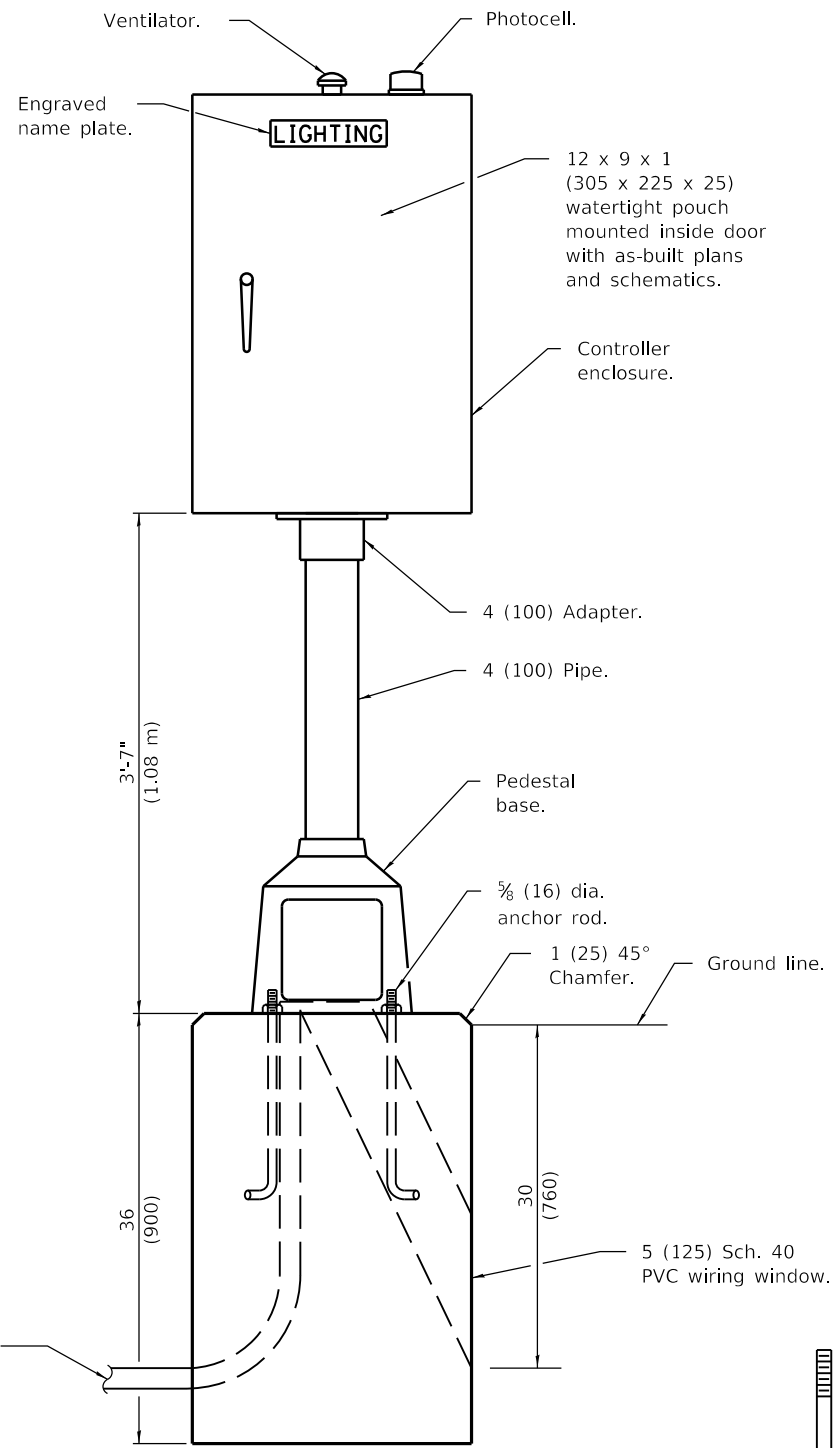
**LIGHTING CONTROLLER  
POLE MOUNTED, 480V**

**STANDARD 825006-03**

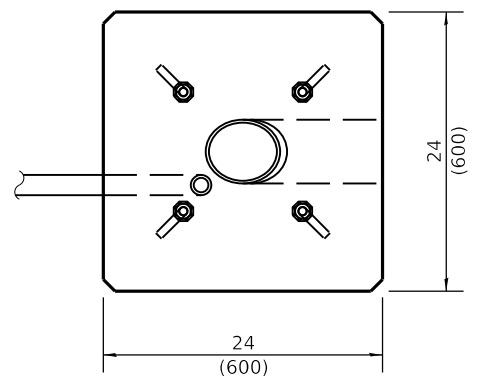


**ELECTRIC SERVICE INSTALLATION**

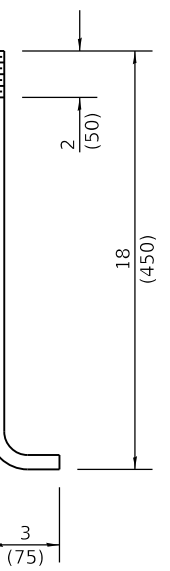
(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)  
 \* Size larger as needed.



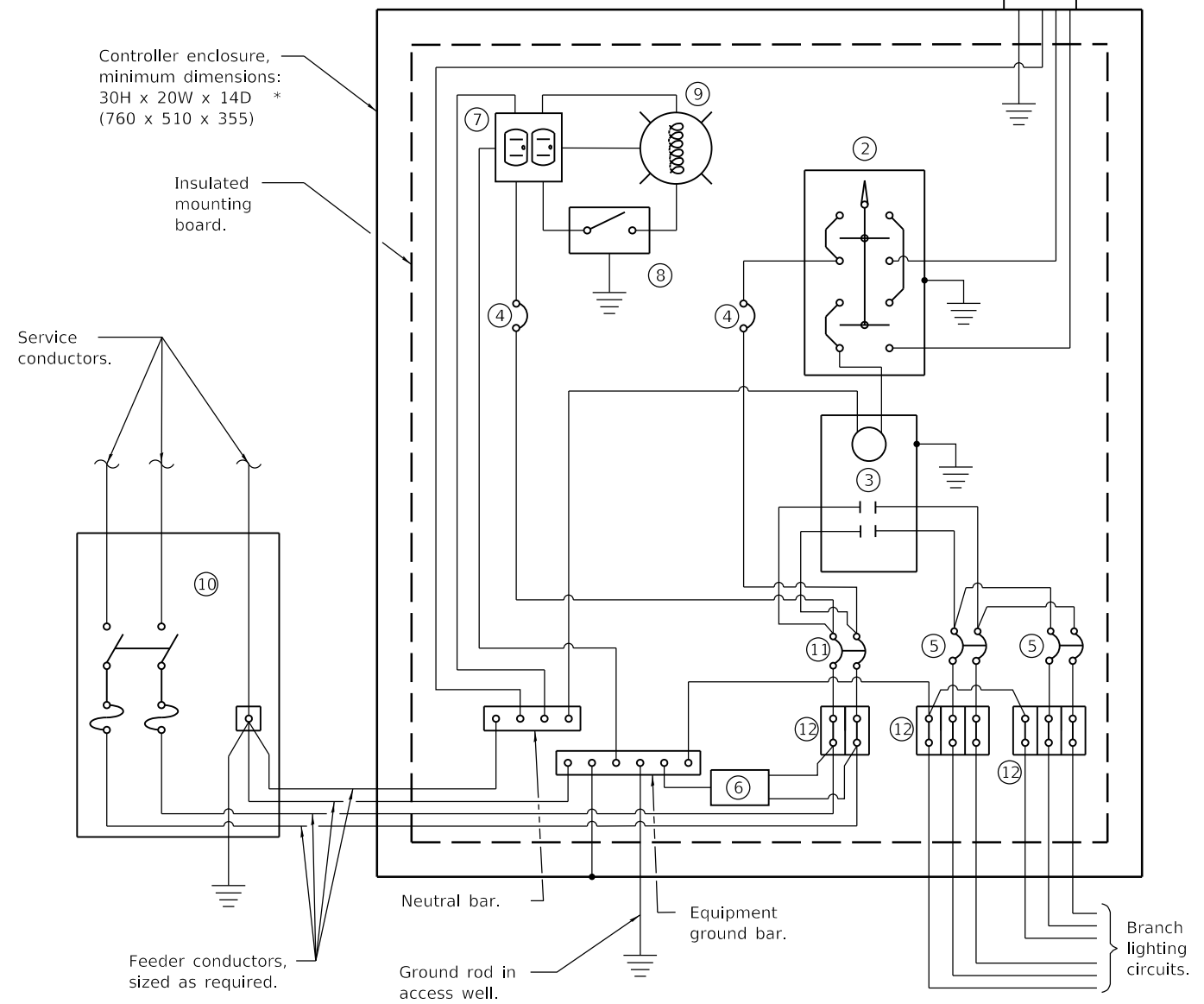
**LIGHTING CONTROLLER**



**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 gasketed with 100 watt lamp.
- ⑩ Service disconnect switch - 2-pole, 3-wire, 60 amp\*, fused at 60 amp\*, solid neutral in NEMA 4X enclosure having lockable external handle.
- ⑪ 60 amp\*, 2-pole circuit breaker.
- ⑫ Terminal block sized for conductors as shown on plans.

\* Size larger as needed.

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

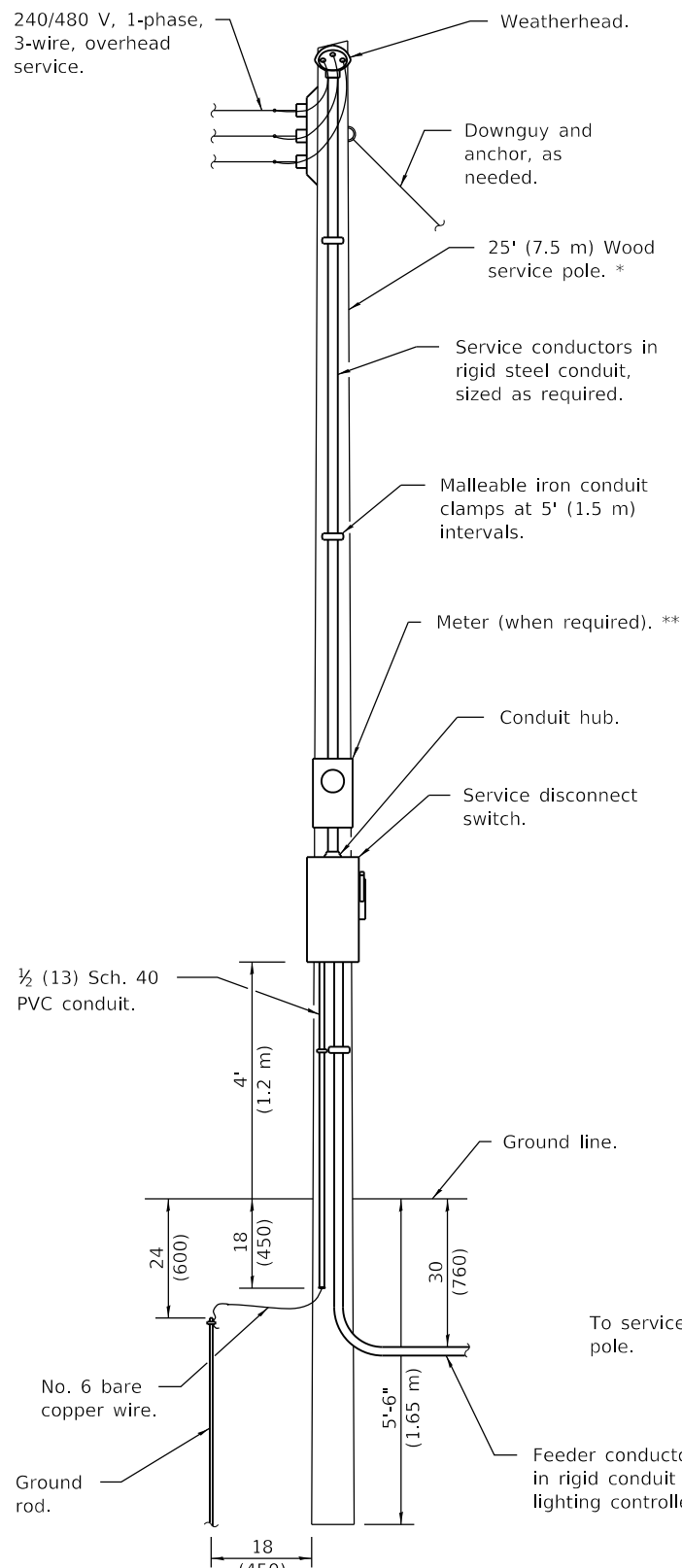
DATE	REVISIONS
1-1-19	Replaced ** note with new note regarding consulting utility company standards for installation.
1-1-15	Added note ⑫.

**LIGHTING CONTROLLER  
PEDESTAL MOUNTED, 240V**

**STANDARD 825011-04**

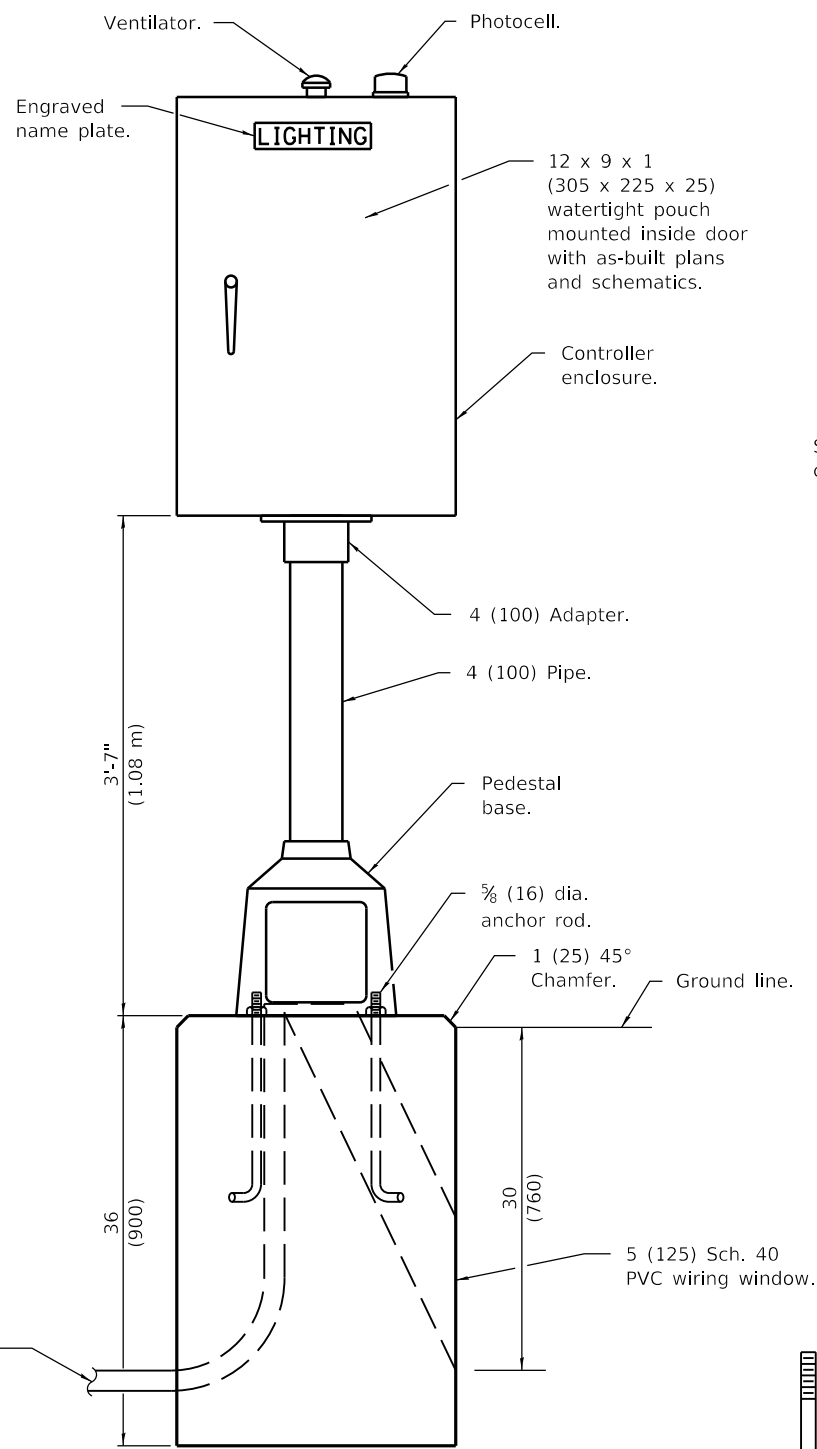
Illinois Department of Transportation  
 PASSED January 1, 2019  
 ME Reppelt  
 ELECTRICAL AND MECHANICAL UNIT CHIEF  
 APPROVED January 1, 2019  
 S. E. C. E.  
 ENGINEER OF DESIGN AND ENVIRONMENT  
 01-1-1-1-10



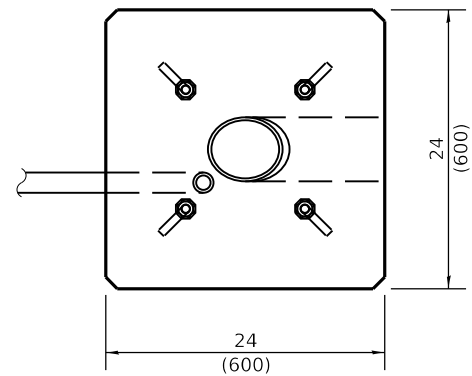


**ELECTRIC SERVICE INSTALLATION**

(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.

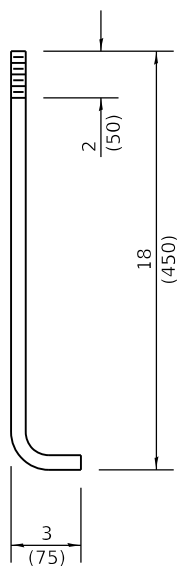


**LIGHTING CONTROLLER**

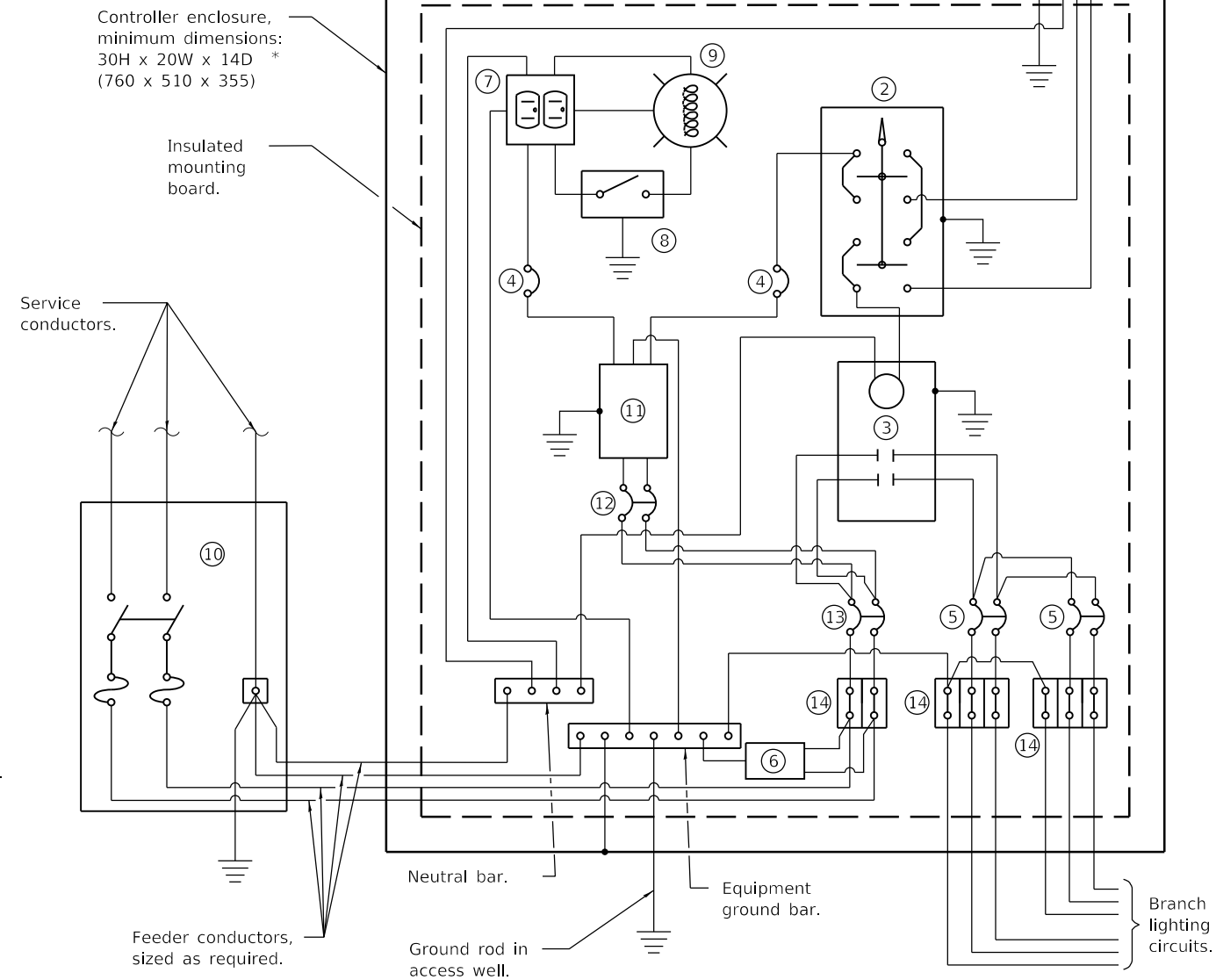


**FOUNDATION (PLAN)**

(Work pad not shown.)



**ANCHOR ROD DETAIL**



**CONTROL SCHEMATIC**

- ① Photocell with integral surge arrester.
- ② HAND-OFF-AUTO selector switch.
- ③ 100 amp\*, electrically held contactor.
- ④ 15 amp, 1-pole circuit breaker.
- ⑤ 20 amp\*, 2-pole circuit breaker (two spares required but not shown).
- ⑥ Surge arrester.
- ⑦ GFCI duplex receptacle.
- ⑧ Single-pole, single-throw switch.
- ⑨ Incandescent luminaire, enclosed and gasketed with 100 watt lamp.
- ⑩ Service disconnect switch - 2-pole, 3-wire, 60 amp\*, fused at 60 amp\*, solid neutral in NEMA 4X enclosure having lockable external handle.
- ⑪ Transformer - 1KVA\*, 480V primary, 120/240V secondary, single-phase, 60Hz.
- ⑫ 15 amp, 2-pole circuit breaker.
- ⑬ 60 amp\*, 2-pole circuit breaker.
- ⑭ Terminal block sized for conductors as shown on plans.

\* Size larger as needed.

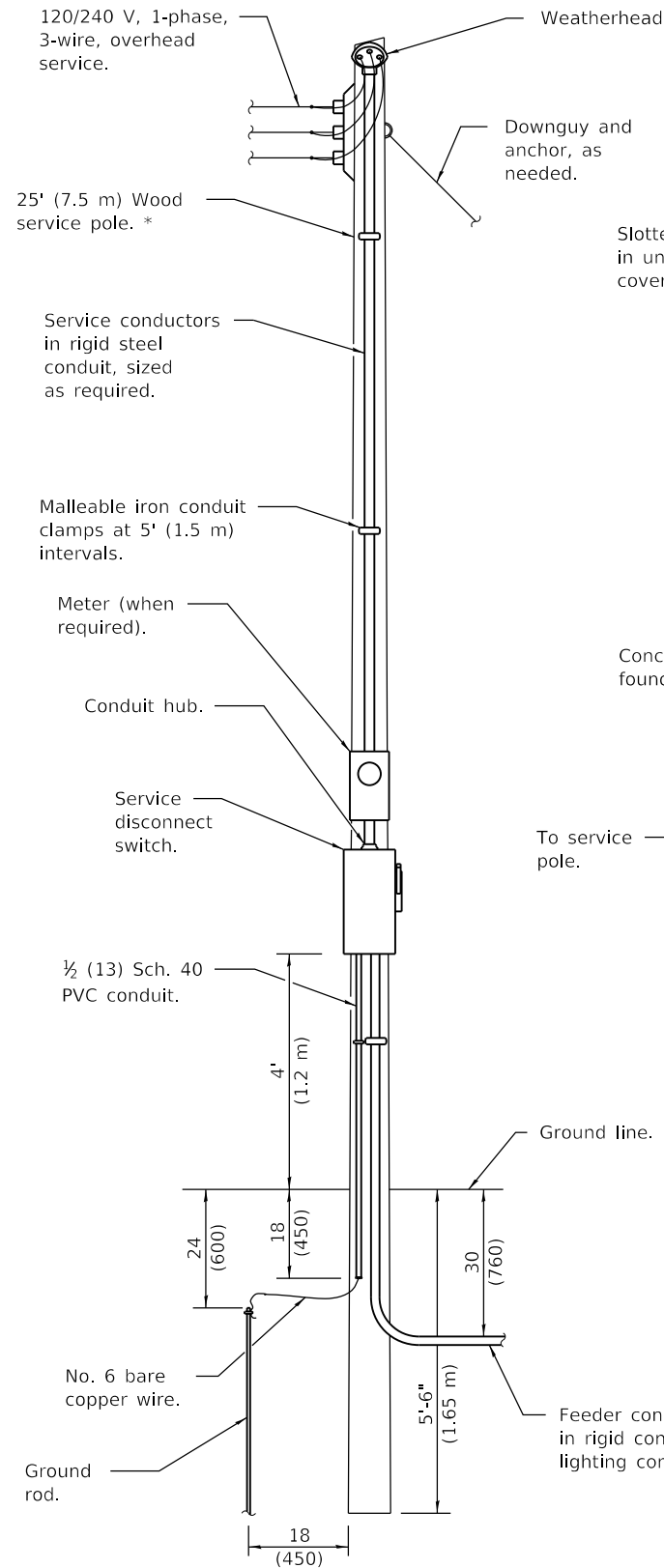
All dimensions are in inches (millimeters) unless otherwise shown.

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**

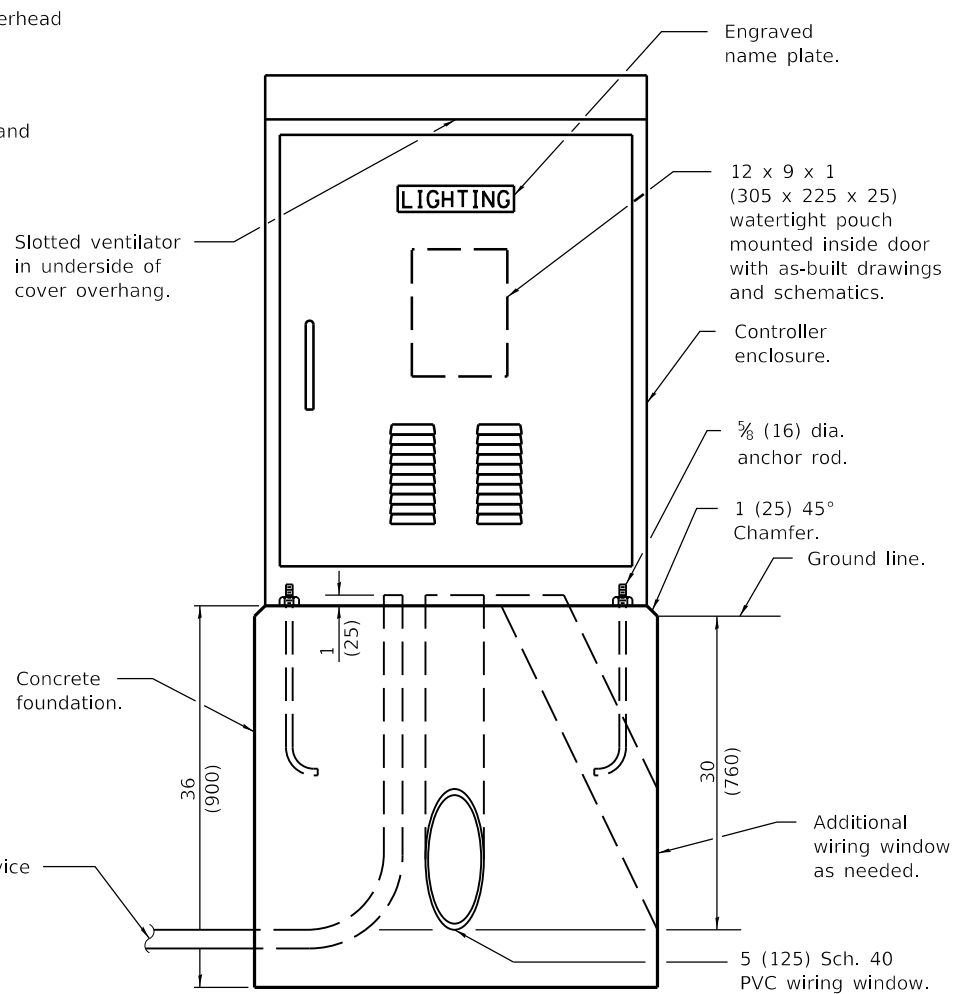
Illinois Department of Transportation  
 PASSED January 1, 2019  
 ME Reppelt  
 ELECTRICAL AND MECHANICAL UNIT CHIEF  
 APPROVED January 1, 2019  
 S. E. C. E.  
 ENGINEER OF DESIGN AND ENVIRONMENT  
 ISSUED 1-1-19



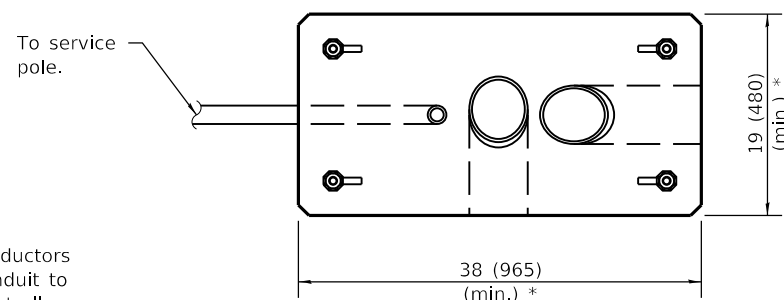
**ELECTRIC SERVICE INSTALLATION**

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

\* Size larger as needed.

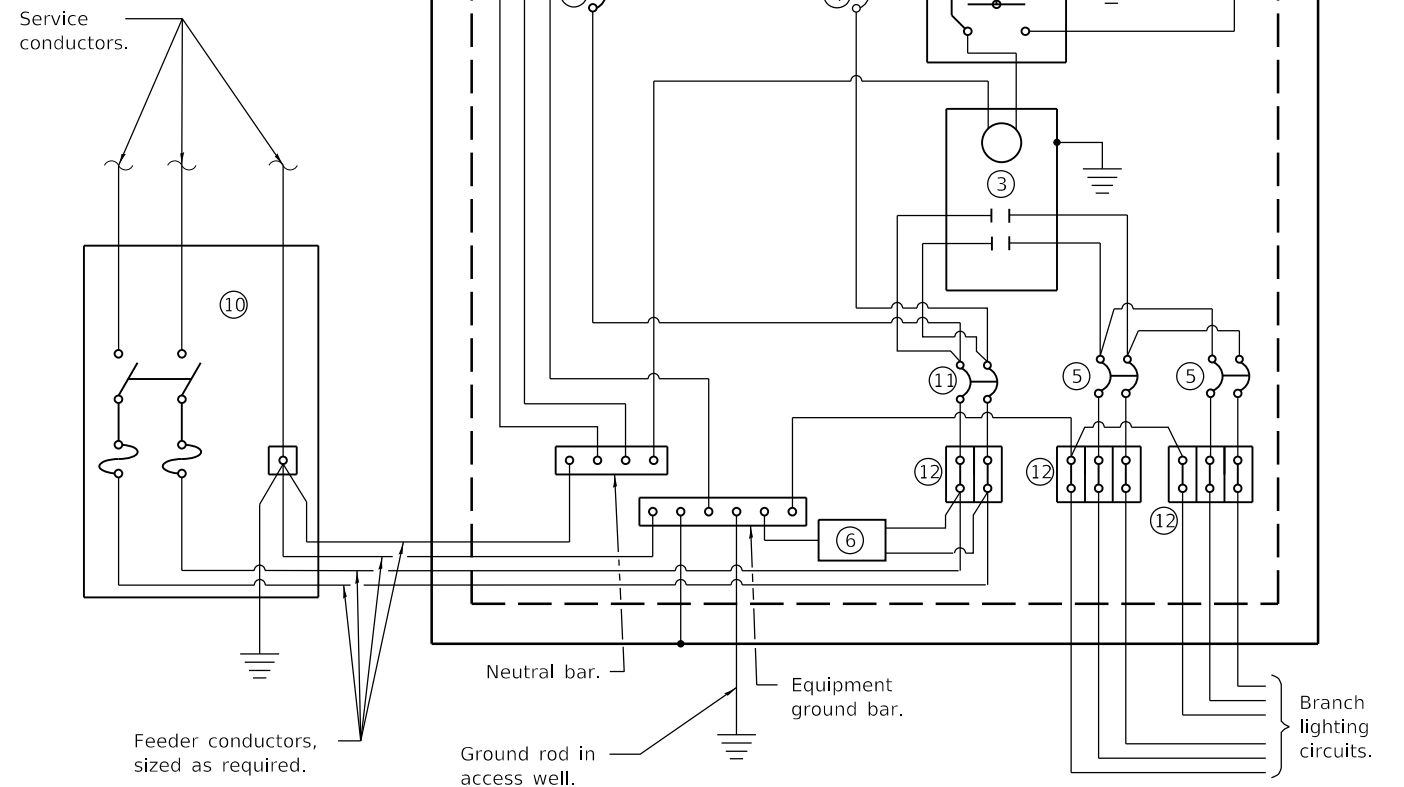


**LIGHTING CONTROLLER**



**FOUNDATION (PLAN)**

(Work pad not shown.)

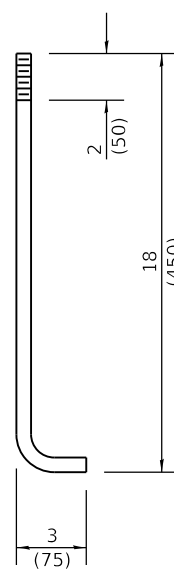


**CONTROL SCHEMATIC**

- ① Photocell with integral surge arrester.
- ② HAND-OFF-AUTO selector switch.
- ③ 100 amp\*, electrically held contactor.
- ④ 15 amp, 1-pole circuit breaker.
- ⑤ 20 amp\*, 2-pole circuit breaker (two spares required but not shown).
- ⑥ Surge arrester.
- ⑦ GFCI duplex receptacle.
- ⑧ Single-pole, single-throw switch.
- ⑨ Incandescent luminaire, enclosed and gasketed with 100 watt lamp.
- ⑩ Service disconnect switch - 2-pole, 3-wire, 100 amp\*, fused at 100 amp\*, solid neutral in NEMA 4X enclosure having lockable external handle.
- ⑪ 100 amp\*, 2-pole circuit breaker.
- ⑫ Terminal block sized for conductors as shown on plans.

\* Size larger as needed.

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



**ANCHOR ROD DETAIL**

DATE	REVISIONS
1-1-19	Replaced ** note with new note regarding consulting utility company standards for installation.
1-1-15	Added note ⑫.

**LIGHTING CONTROLLER  
BASE MOUNTED, 240V**

**STANDARD 825021-04**

Illinois Department of Transportation

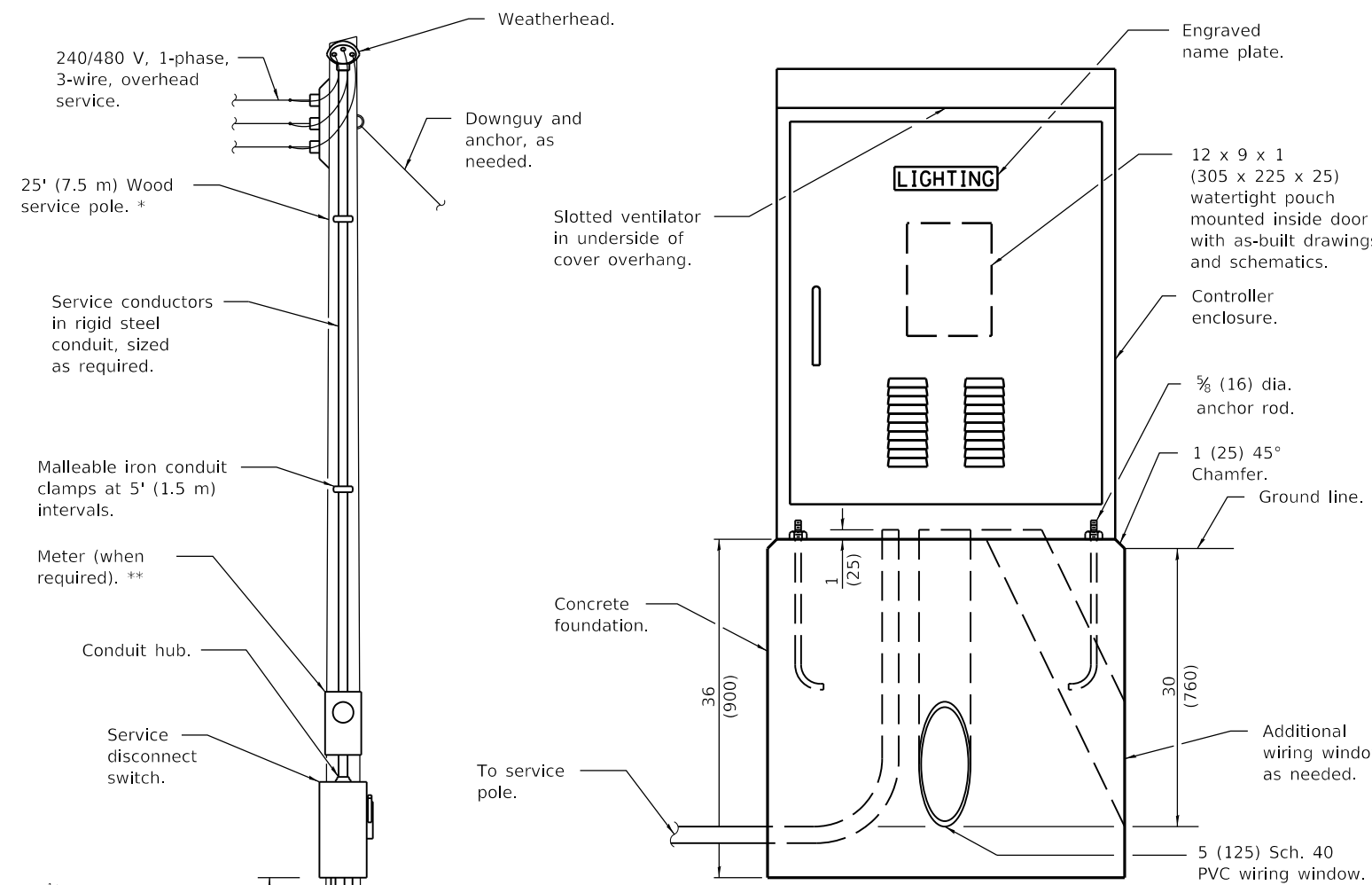
PASSED January 1, 2019

*ME Reppelt*  
ELECTRICAL AND MECHANICAL UNIT CHIEF

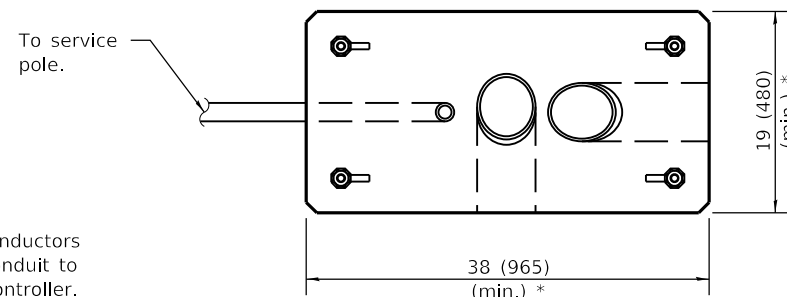
APPROVED January 1, 2019

*J. E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 01-1-19

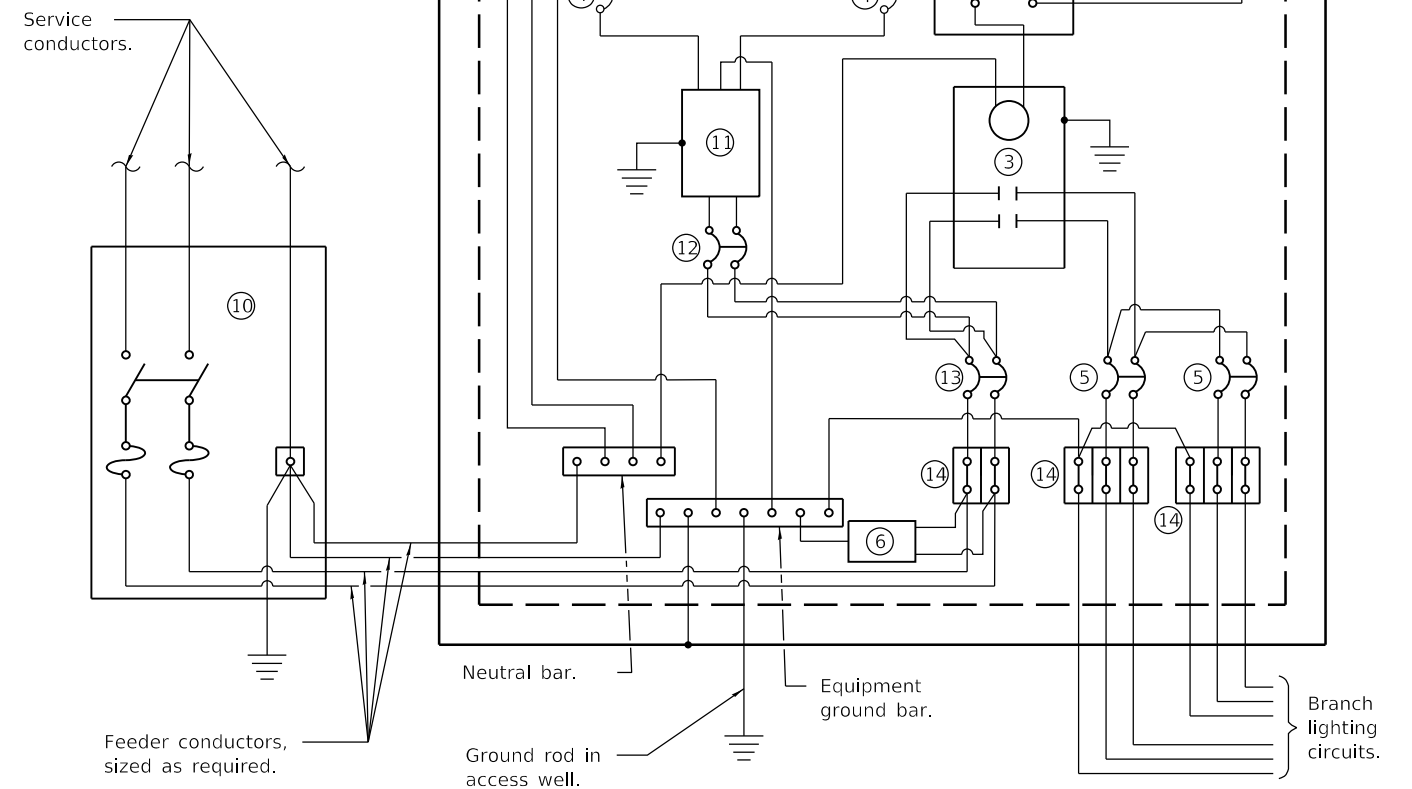


**LIGHTING CONTROLLER**



**FOUNDATION (PLAN)**

(Work pad not shown.)

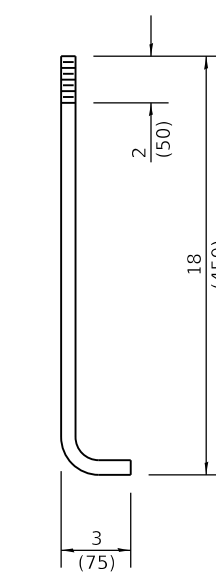


**CONTROL SCHEMATIC**

- ① Photocell with integral surge arrester.
- ② HAND-OFF-AUTO selector switch.
- ③ 100 amp\*, electrically held contactor.
- ④ 15 amp, 1-pole circuit breaker.
- ⑤ 20 amp\*, 2-pole circuit breaker (two spares required but not shown).
- ⑥ Surge arrester.
- ⑦ GFCI duplex receptacle.
- ⑧ Single-pole, single-throw switch.
- ⑨ Incandescent luminaire, enclosed and gasketed with 100 watt lamp.
- ⑩ Service disconnect switch - 2-pole, 3-wire, 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**

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**

Illinois Department of Transportation

PASSED January 1, 2019

ISSUED 1-1-10

ME Reppelt  
ELECTRICAL AND MECHANICAL UNIT CHIEF

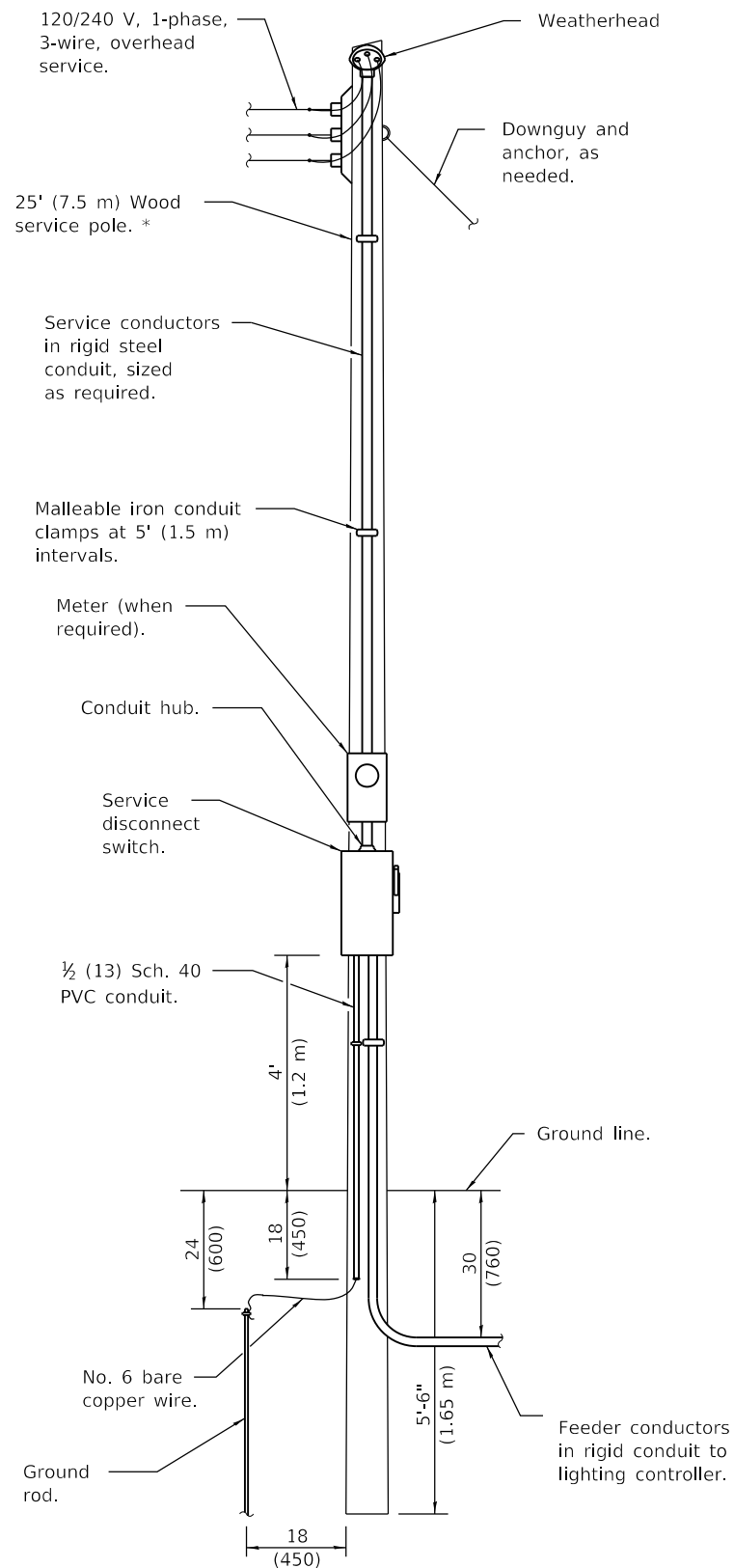
APPROVED January 1, 2019

ENGINEER OF DESIGN AND ENVIRONMENT

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

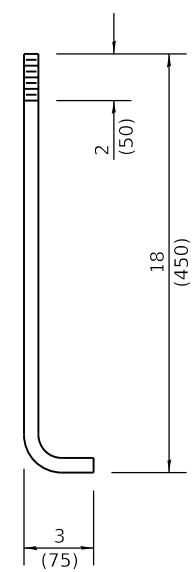
\* Size larger as needed.

\*\* When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

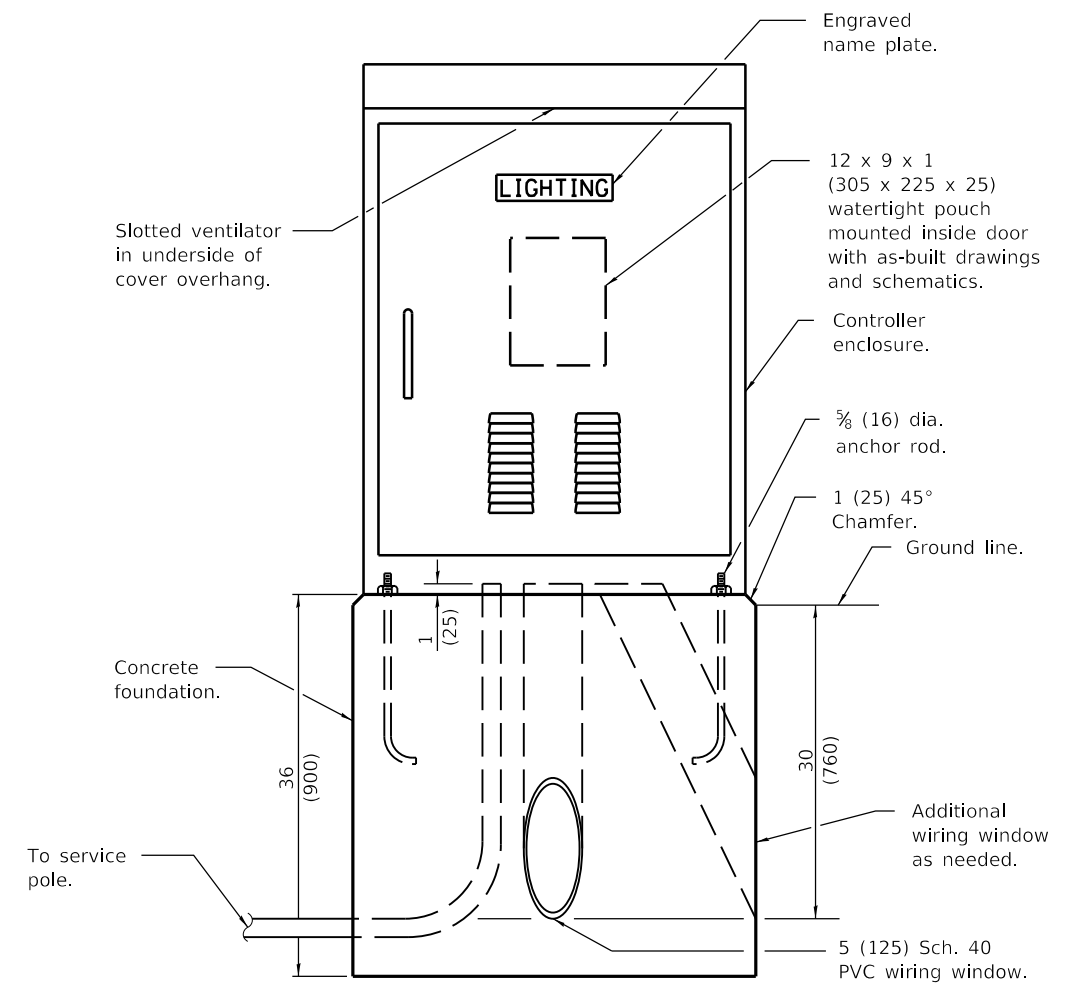


**ELECTRIC SERVICE INSTALLATION**

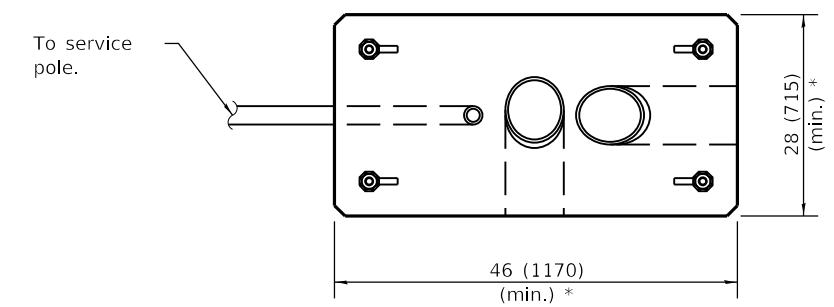
(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)  
 \* Size larger as needed.



**ANCHOR ROD DETAIL**



**LIGHTING CONTROLLER**



**FOUNDATION (PLAN)**

(Work pad not shown.)  
 \* Size larger as needed.

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

DATE	REVISIONS
1-1-19	Replaced ** note with new note regarding consulting utility company standards for installation.
1-1-15	Added note (16).

**NAVIGATION OBSTRUCTION LIGHTING CONTROLLER, 240V**  
 (Sheet 1 of 2)

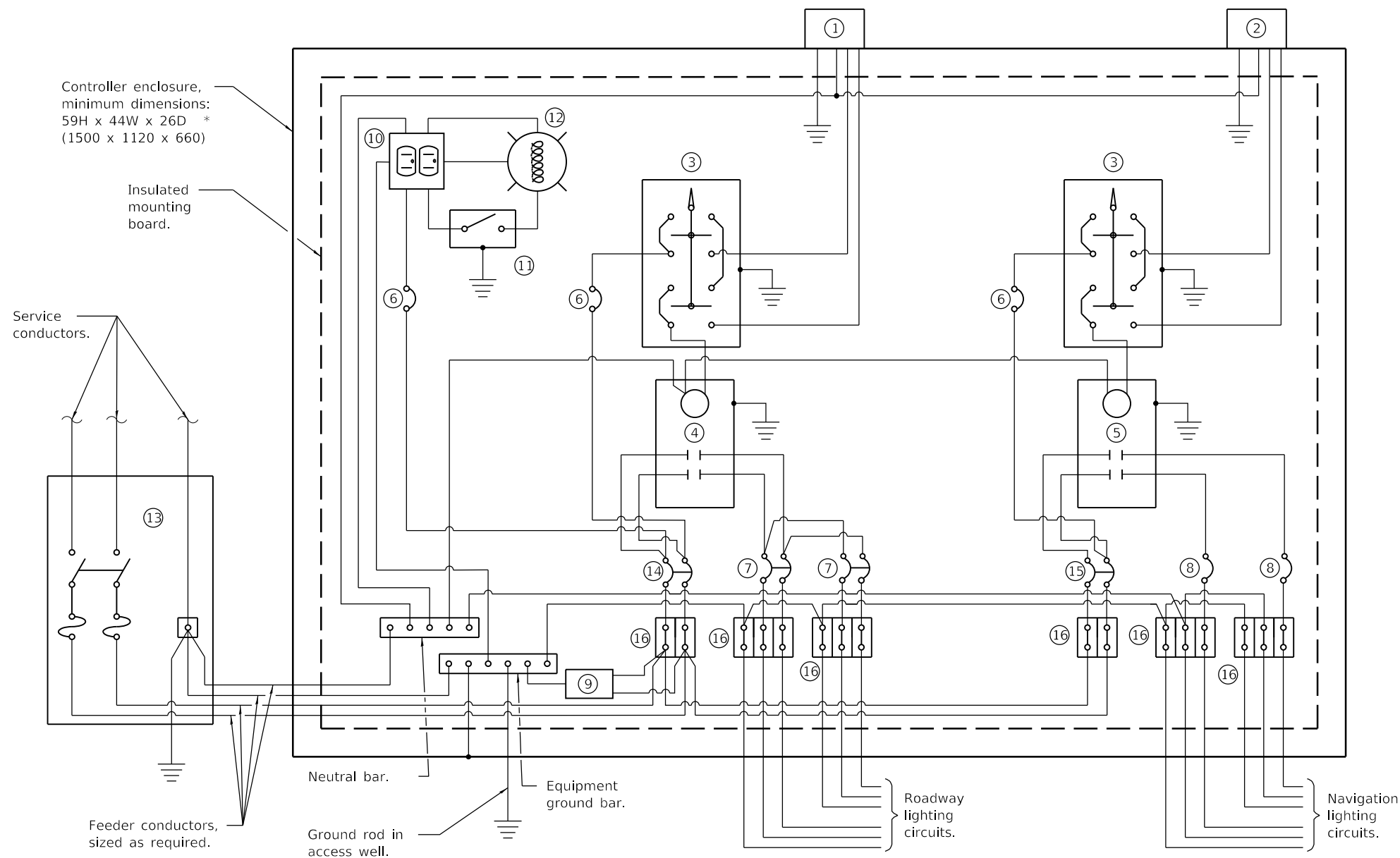
**STANDARD 826001-02**

Illinois Department of Transportation

PASSED January 1, 2019  
*ME Reppelt*  
 ELECTRICAL AND MECHANICAL UNIT CHIEF

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

ISSUED 1-1-12



Controller enclosure, minimum dimensions: 59H x 44W x 26D \* (1500 x 1120 x 660)

Insulated mounting board.

Service conductors.

Feeder conductors, sized as required.

Neutral bar.

Ground rod in access well.

Equipment ground bar.

Roadway lighting circuits.

Navigation lighting circuits.

- ① Photocell with integral surge arrester for roadway lighting.
- ② Photocell with integral surge arrester for navigation lighting.
- ③ HAND-OFF-AUTO selector switch.
- ④ 100 amp\*, electrically held contactor.
- ⑤ 60 amp\*, electrically held contactor.
- ⑥ 15 amp, 1-pole circuit breaker.
- ⑦ 20 amp\*, 2-pole circuit breaker (two spares required but not shown).
- ⑧ 20 amp\*, single-pole circuit breaker (two shown, quantity as required).
- ⑨ Surge arrester.
- ⑩ GFCI duplex receptacle.
- ⑪ Single-pole, single-throw switch.
- ⑫ Incandescent luminaire, enclosed and gasketed with 100 watt lamp.
- ⑬ Service disconnect switch - 2-pole, 3-wire, 100 amp\*, fused at 100 amp\*, solid neutral in NEMA 4X enclosure having lockable external handle.
- ⑭ 60 amp\*, 2-pole circuit breaker.
- ⑮ 30 amp\*, 2-pole circuit breaker.
- ⑯ Terminal block sized for conductors as shown on plans.

\* Size larger as needed.

**CONTROL SCHEMATIC**

Illinois Department of Transportation

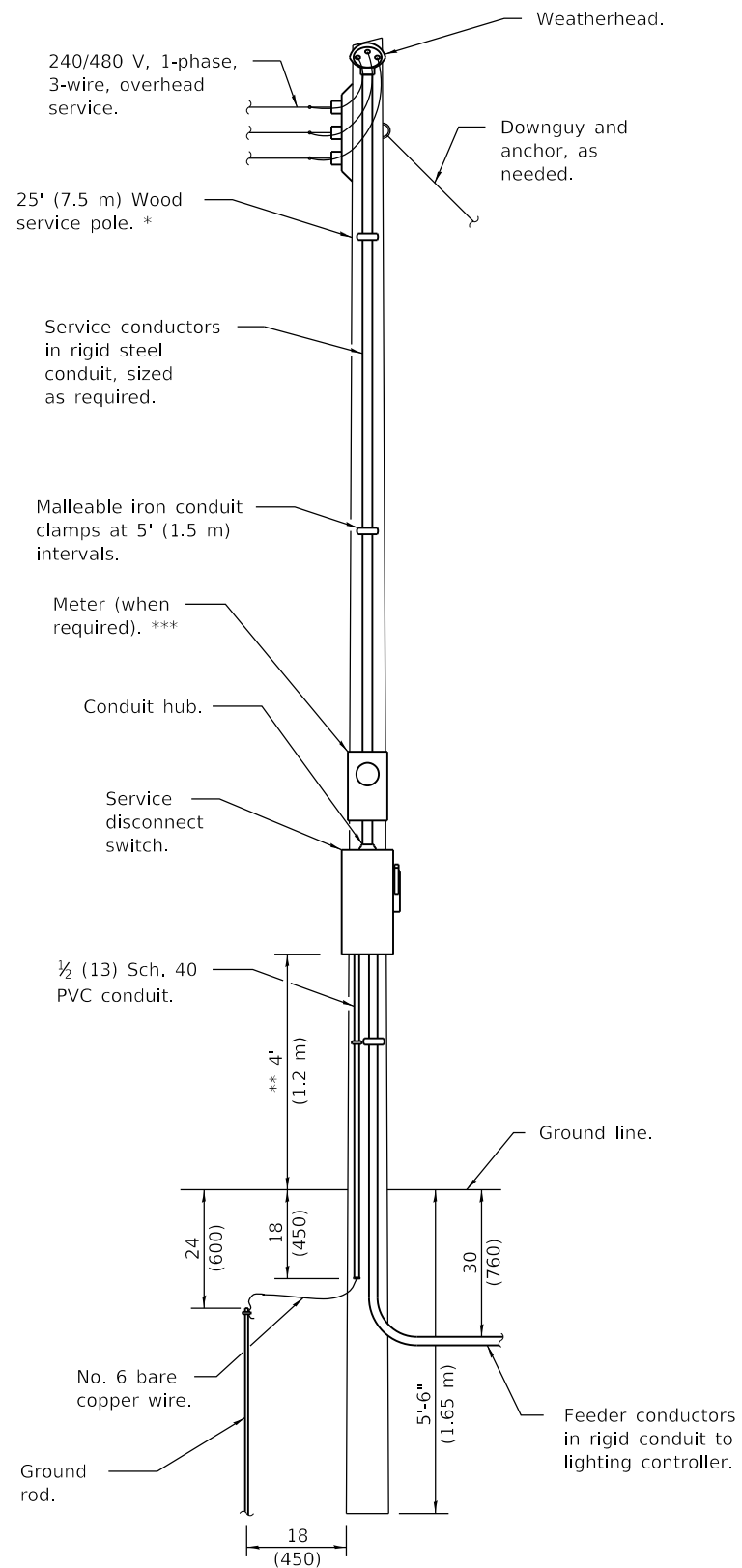
PASSED January 1, 2019  
*M. E. Reppelt*  
 ELECTRICAL AND MECHANICAL UNIT CHIEF

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

ISSUED 1-1-12

**NAVIGATION OBSTRUCTION LIGHTING CONTROLLER, 240V**  
 (Sheet 2 of 2)

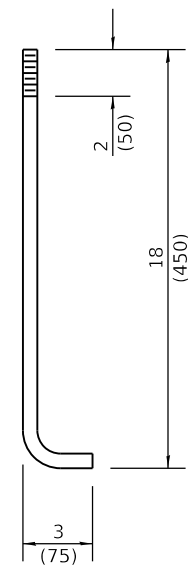
**STANDARD 826001-02**



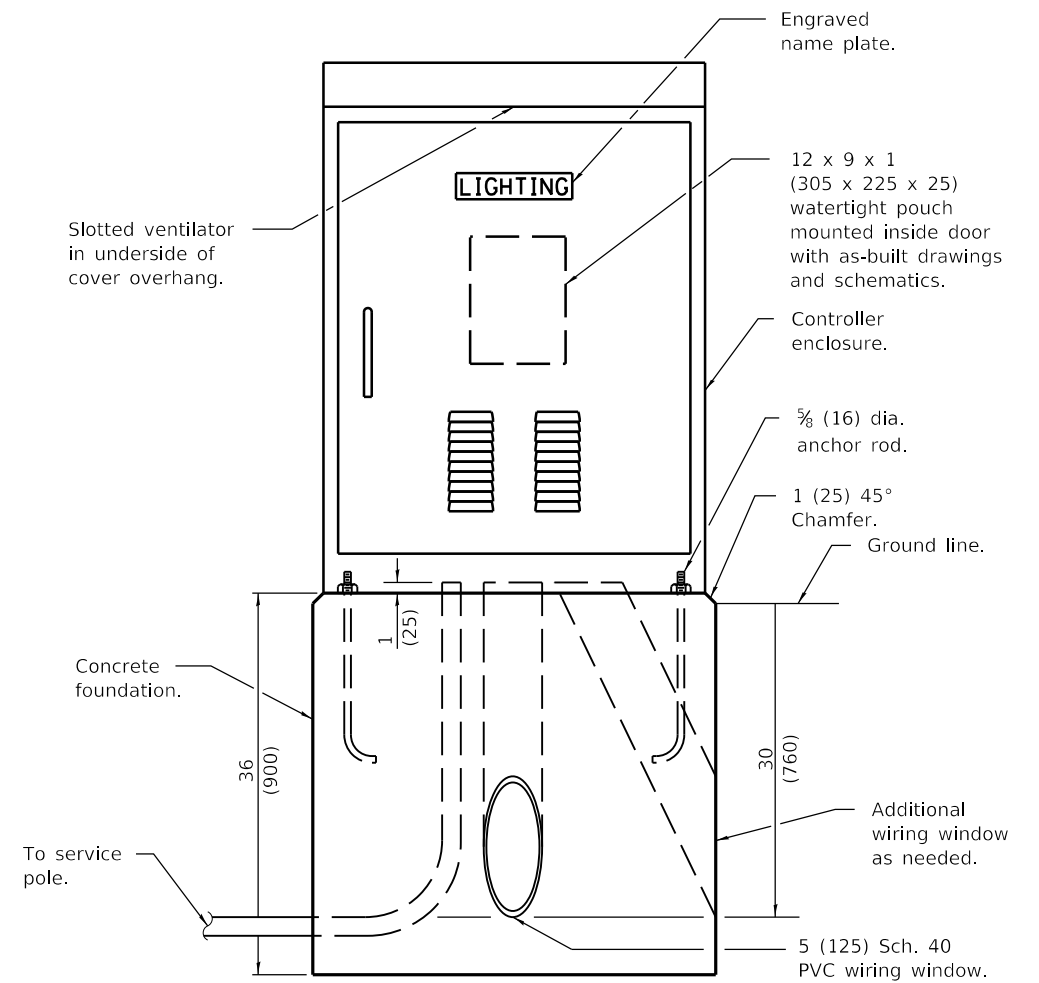
**ELECTRIC SERVICE INSTALLATION**

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

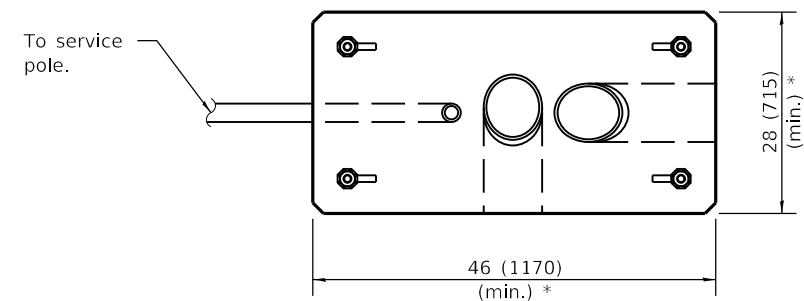
\* Size larger as needed.  
 \*\* When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.



**ANCHOR ROD DETAIL**



**LIGHTING CONTROLLER**



**FOUNDATION (PLAN)**

(Work pad not shown.)

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

DATE	REVISIONS
1-1-19	Replaced ** note with new note regarding utility company standards. Made *** the ** note.
1-1-15	Added note (18).

**NAVIGATION OBSTRUCTION LIGHTING CONTROLLER, 480V**  
 (Sheet 1 of 2)

**STANDARD 826006-02**

Illinois Department of Transportation

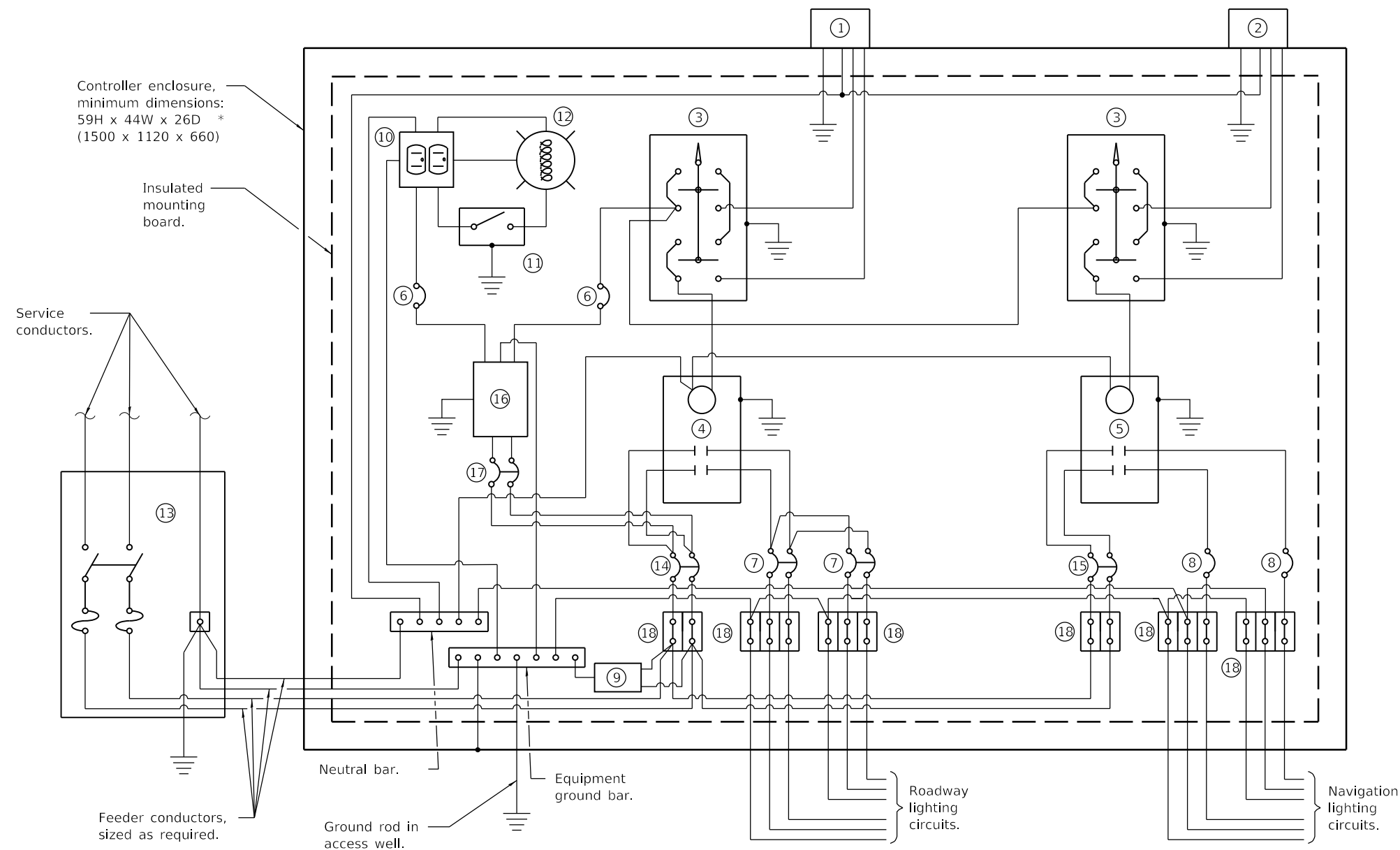
PASSED January 1, 2019

*ME Reppelt*  
 ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019

*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12



Controller enclosure,  
minimum dimensions:  
59H x 44W x 26D \*  
(1500 x 1120 x 660)

Insulated  
mounting  
board.

Service  
conductors.

Feeder conductors,  
sized as required.

Neutral bar.

Ground rod in  
access well.

Equipment  
ground bar.

Roadway  
lighting  
circuits.

Navigation  
lighting  
circuits.

### CONTROL SCHEMATIC

- ① Photocell with integral surge arrester for roadway lighting.
- ② Photocell with integral surge arrester for navigation lighting.
- ③ HAND-OFF-AUTO selector switch.
- ④ 100 amp\*, electrically held contactor.
- ⑤ 60 amp\*, electrically held contactor.
- ⑥ 15 amp, 1-pole circuit breaker.
- ⑦ 20 amp\*, 2-pole circuit breaker (two spares required but not shown).
- ⑧ 20 amp\*, single-pole circuit breaker (two shown, quantity as required).
- ⑨ Surge arrester.
- ⑩ GFCI duplex receptacle.
- ⑪ Single-pole, single-throw switch.
- ⑫ Incandescent luminaire, enclosed and gasketed with 100 watt lamp.
- ⑬ Service disconnect switch - 2-pole, 3-wire, 100 amp\*, fused at 100 amp\*, solid neutral in NEMA 4X enclosure having lockable external handle.
- ⑭ 60 amp\*, 2-pole circuit breaker.
- ⑮ 30 amp\*, 2-pole circuit breaker.
- ⑯ Transformer - 1 KVA\*, 480V primary, 120/240V secondary, single phase, 60 Hz.
- ⑰ 15 amp, 2-pole circuit breaker.
- ⑱ Terminal block sized for conductors as shown on plans.

\* Size larger as needed.

Illinois Department of Transportation

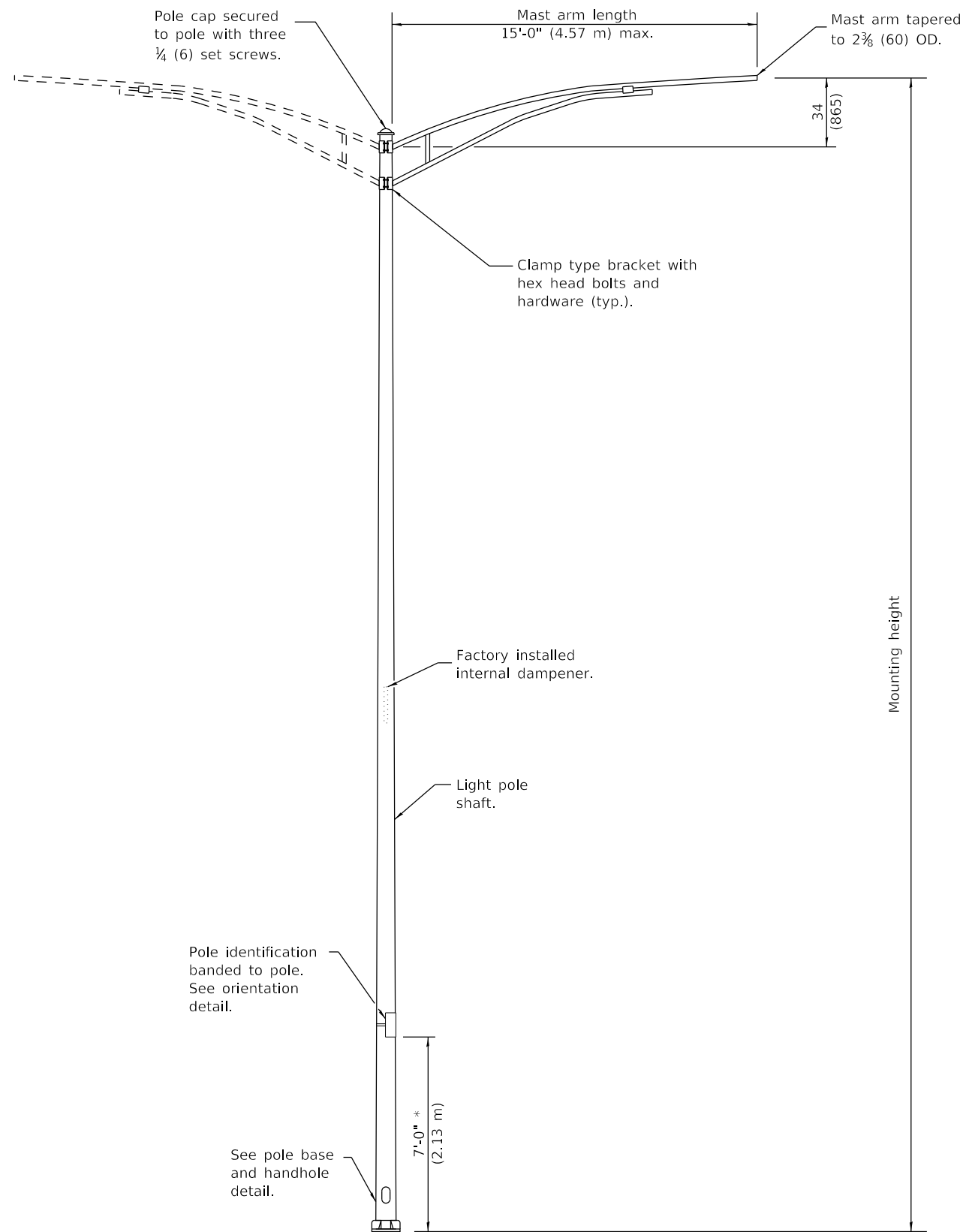
PASSED January 1, 2019  
*ME Reppelt*  
ELECTRICAL AND MECHANICAL UNIT CHIEF

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

ISSUED 1-1-12

**NAVIGATION OBSTRUCTION  
LIGHTING CONTROLLER, 480V**  
(Sheet 2 of 2)

**STANDARD 826006-02**



POLE		
MOUNTING HEIGHT	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
35' (10.7 m) or less	8 tapered to 4 1/2 (200 to 114)	0.25 (6)
Greater than 35' (10.7 m) to 45' (13.7 m)	10 tapered to 6 (250 to 150)	0.25 (6)
Greater than 45' (13.7 m) to 50' (15.2 m)	10 tapered to 6 (250 to 150)	0.312 (8)

POLE BASE	
MOUNTING HEIGHT	BOLT CIRCLE DIAMETER
35' (10.7 m) or less	11 1/2 (290)
Greater than 35' (10.7 m) to 50' (15.2 m)	15 (380)

**GENERAL NOTES**

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Voids in light pole base shall be sealed to prevent rodent entry.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

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

**MAST ARM LIGHT POLE**

(Single or twin mount)

\* Unless directed otherwise by the Engineer.

DATE	REVISIONS
1-1-15	Revised note on HANDHOLE DETAIL.
1-1-14	Added pole mounted on bridge parapet. Modified attachment of screen.

**LIGHT POLE  
ALUMINUM MAST ARM**

(Sheet 1 of 2)

**STANDARD 830001-03**

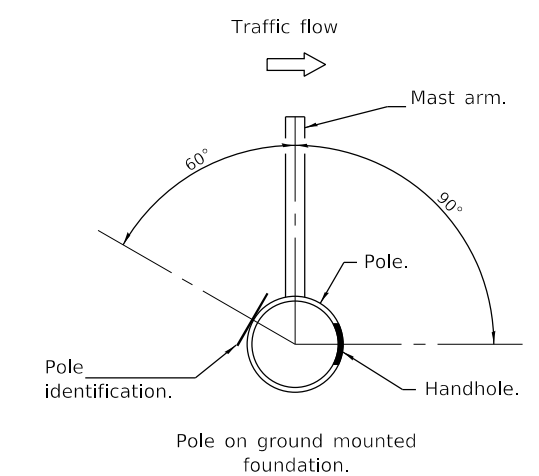
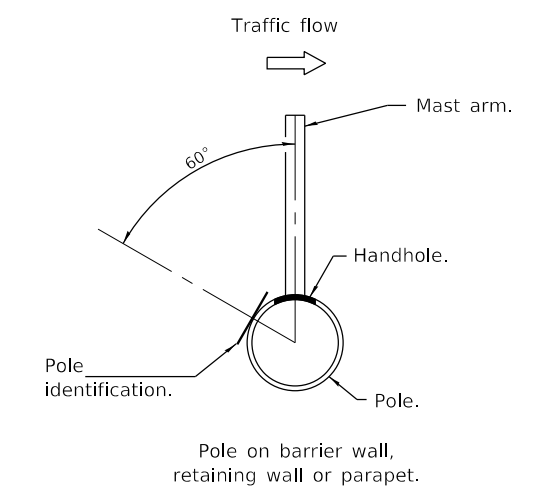
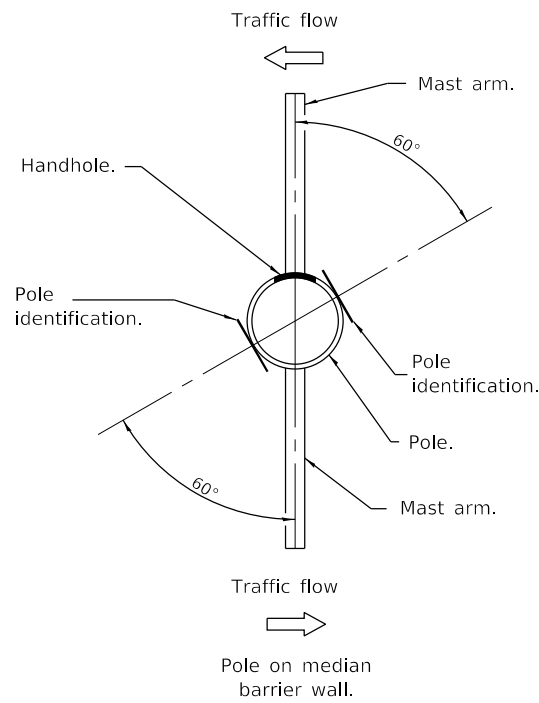
Illinois Department of Transportation

APPROVED January 1, 2015  
  
 ENGINEER OF PRELIMINARY ENGINEERING

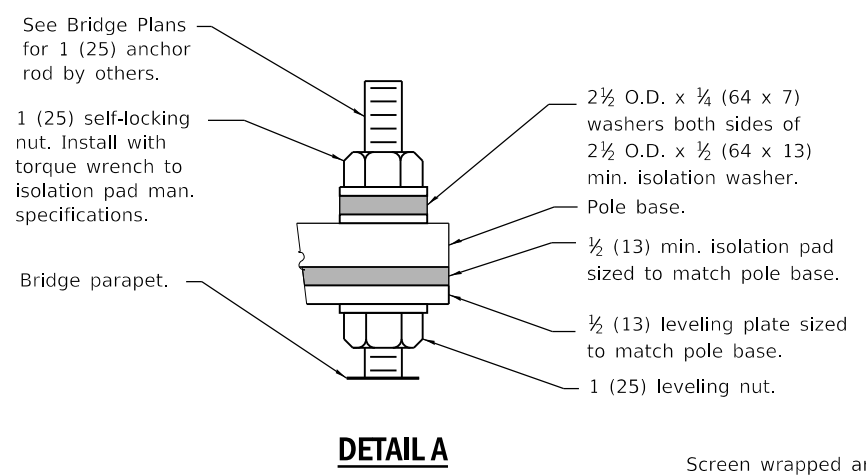
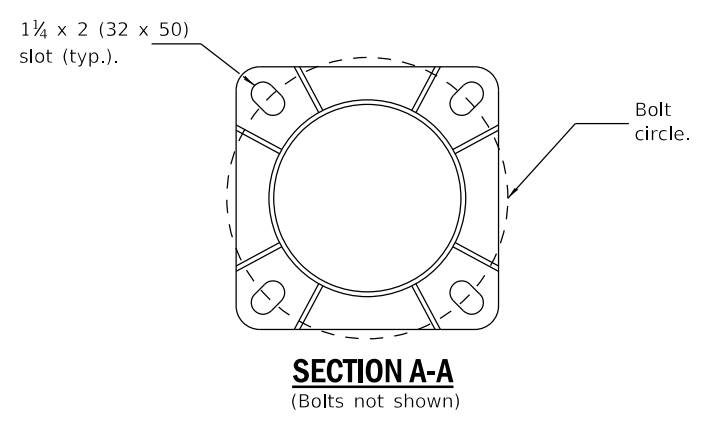
APPROVED January 1, 2015  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

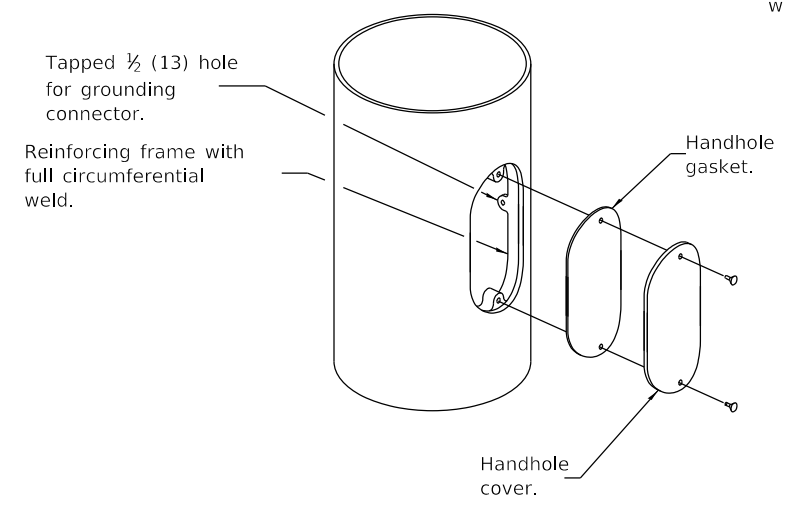




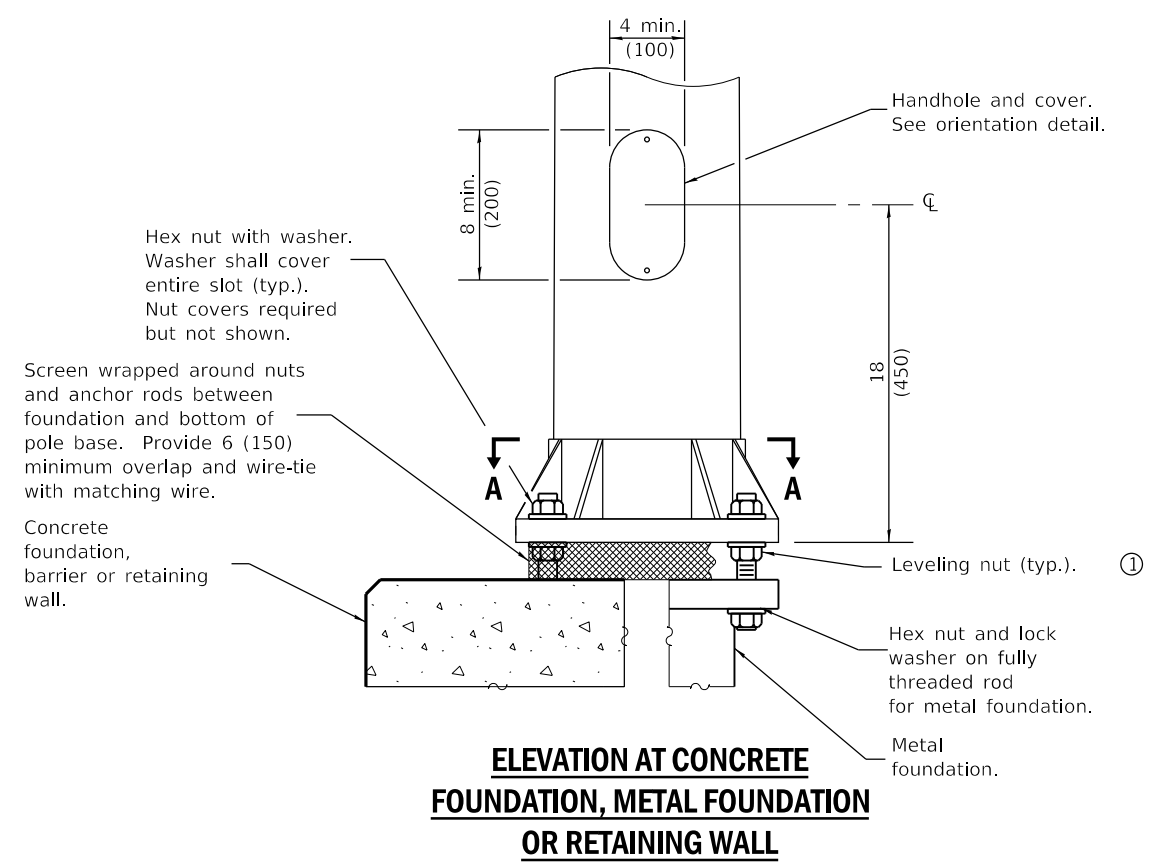
**HANDHOLE / IDENTIFICATION ORIENTATION DETAIL**



**DETAIL A**

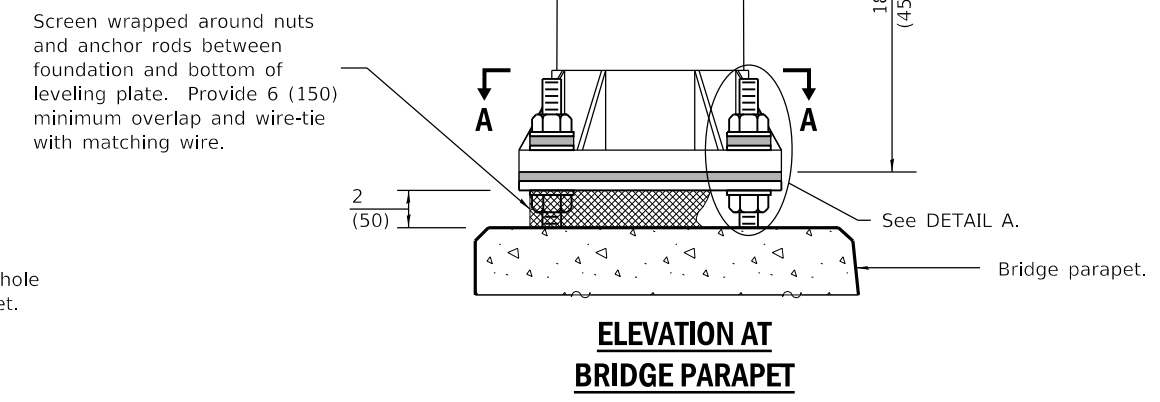


**HANDHOLE DETAIL**



**ELEVATION AT CONCRETE FOUNDATION, METAL FOUNDATION OR RETAINING WALL**

① Omit leveling nuts when breakaway devices are required.



**ELEVATION AT BRIDGE PARAPET**

**POLE BASE DETAILS**

Illinois Department of Transportation

APPROVED January 1, 2015  
*Cheryl Gentry*  
 ENGINEER OF PRELIMINARY ENGINEERING

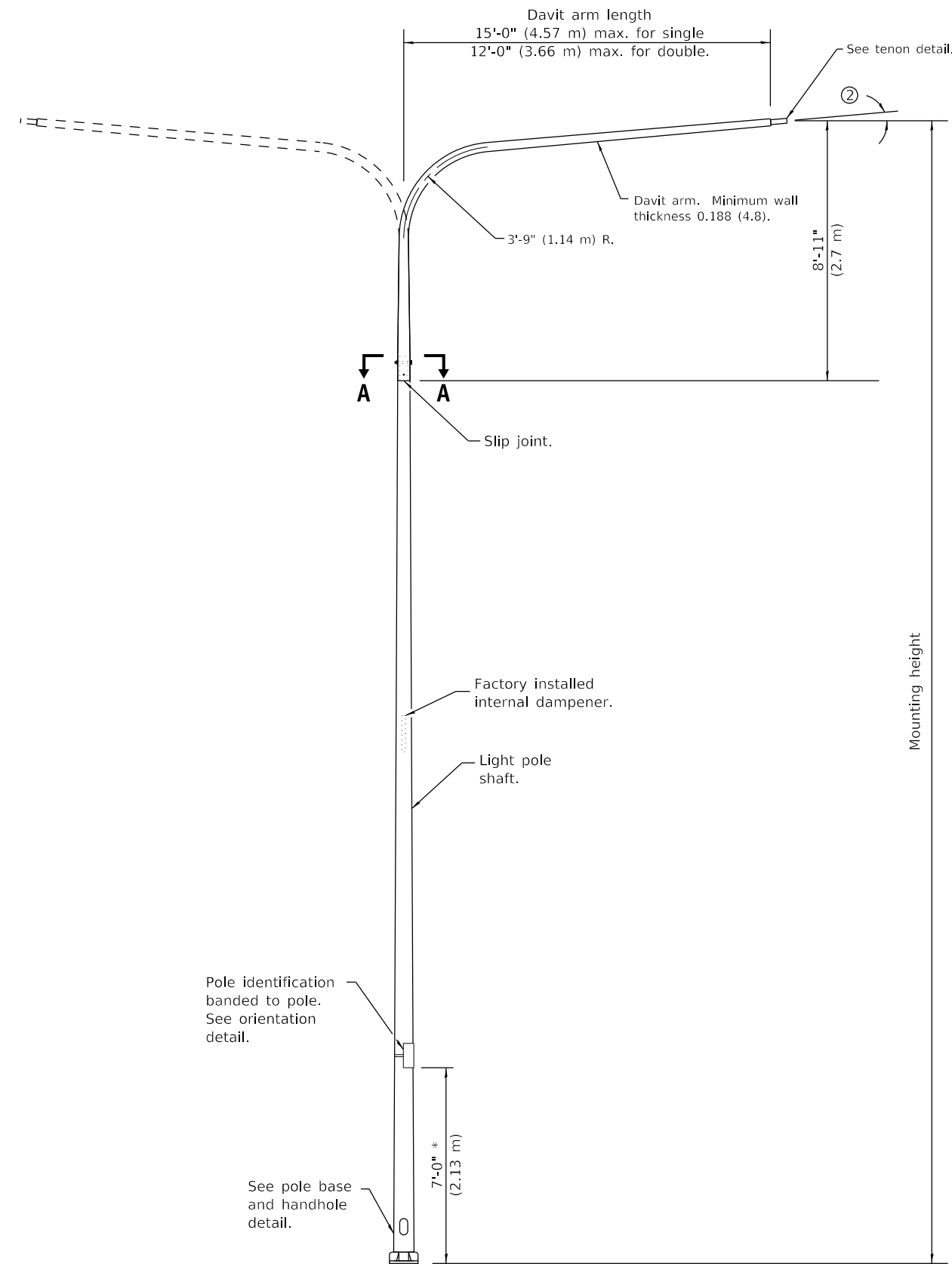
APPROVED January 1, 2015  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

**LIGHT POLE ALUMINUM MAST ARM**

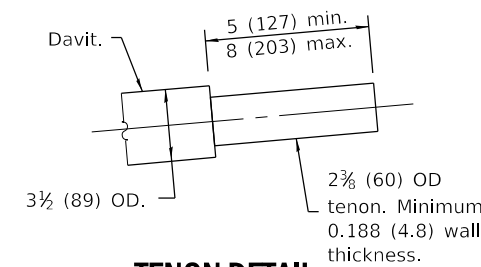
(Sheet 2 of 2)

**STANDARD 830001-03**

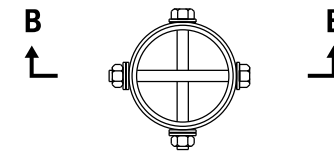


POLE BASE	
MOUNTING HEIGHT	BOLT CIRCLE DIAMETER
35' (10.7 m) or less	11½ (290)
Greater than 35' (10.7 m) to 50' (15.2 m)	15 (380)

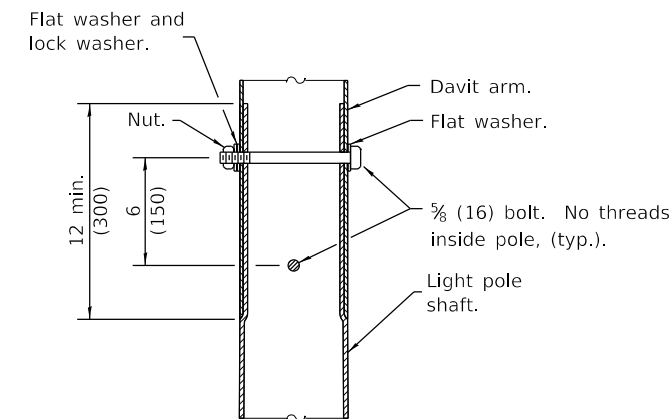
POLE LOWER SHAFT			
MOUNTING HEIGHT	LOWER SHAFT LENGTH ①	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
30' (9.1 m)	21'-1" (6.4 m)	8 tapered to 6 (200 to 114)	0.25 (6)
35' (10.7 m)	26'-1" (7.9 m)	8 tapered to 6 (200 to 114)	0.25 (6)
40' (12.2 m)	31'-1" (9.5 m)	10 tapered to 6 (250 to 150)	0.25 (6)
45' (13.7 m)	36'-1" (11.0 m)	10 tapered to 6 (250 to 150)	0.25 (6)
50' (15.2 m)	41'-1" (12.5 m)	10 tapered to 6 (250 to 150)	0.312 (8)



**TENON DETAIL**



**SECTION A-A**



**SECTION B-B**

- ① Lower shaft length shall be from the bottom of the pole base to the bottom of the slip joint.
- ② 5° max. for unloaded pole, 1.5° max. for loaded pole.

**GENERAL NOTES**

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Voids in light pole base shall be sealed to prevent rodent entry.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

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

DATE	REVISIONS
1-1-19	Revised standard to comply with the 2013 version of AASHTO.
1-1-17	Added notes ③ and ④.

**LIGHT POLE  
ALUMINUM DAVIT ARM**

(Sheet 1 of 2)

**STANDARD 830006-05**

Illinois Department of Transportation

PASSED January 1, 2019  
*ME Reppelt*  
 ELECTRICAL AND MECHANICAL UNIT CHIEF

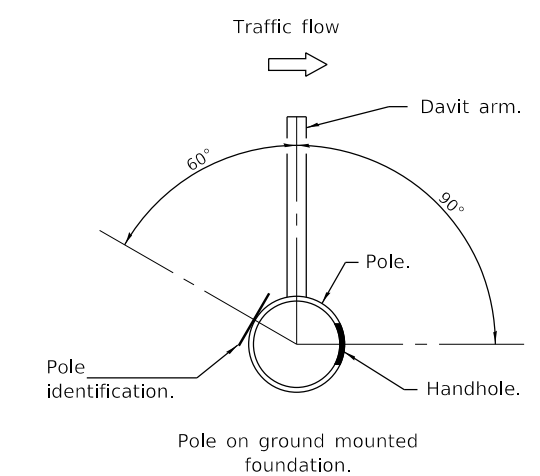
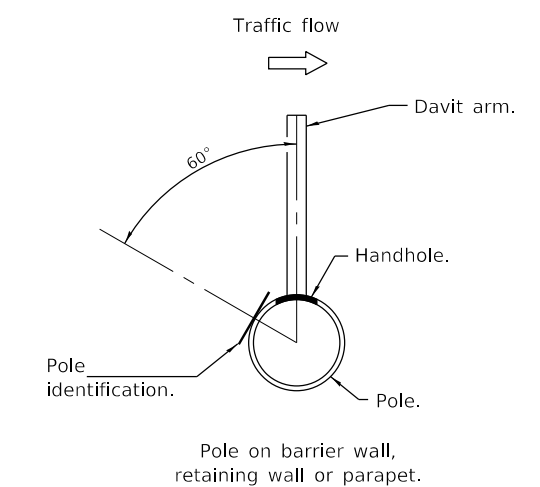
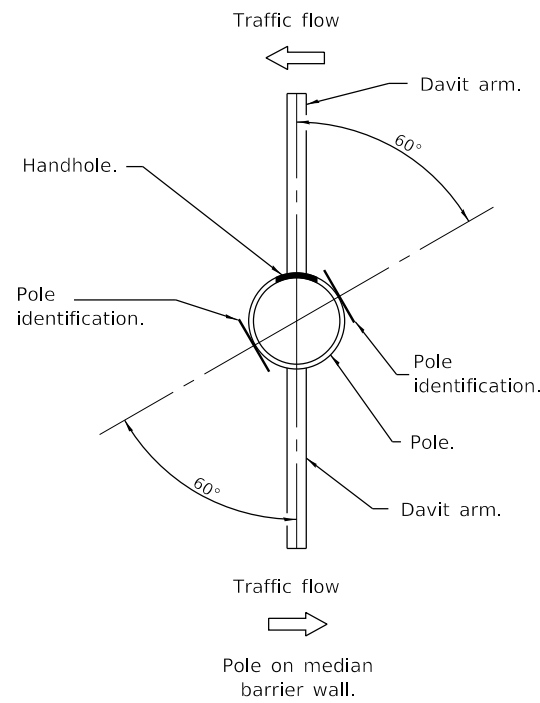
APPROVED January 1, 2019  
*J. E. C.*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

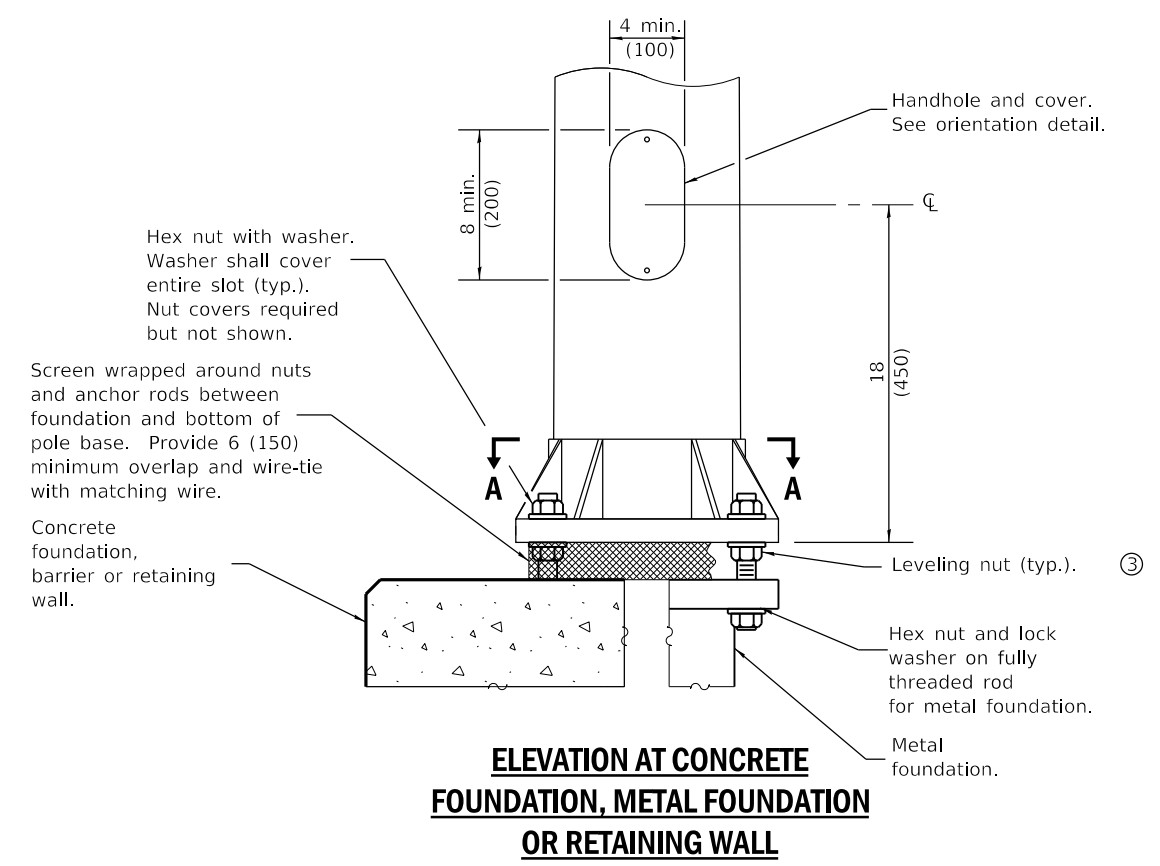
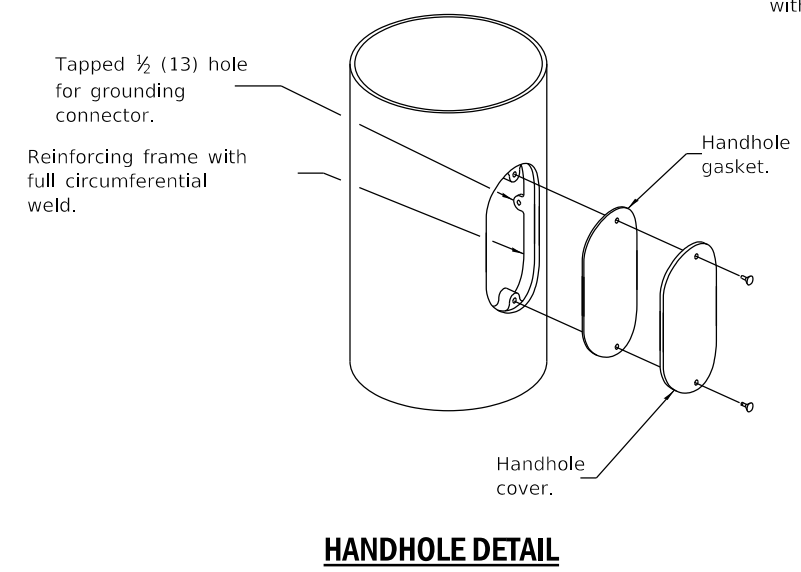
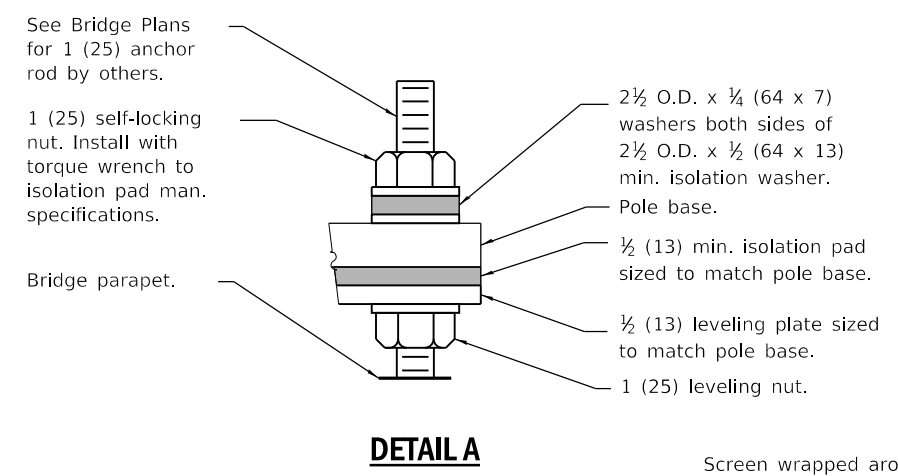
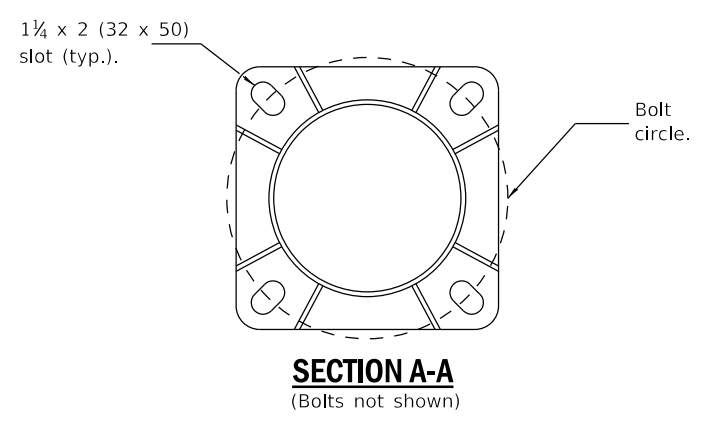
**DAVIT LIGHT POLE**

(Single or twin mount)

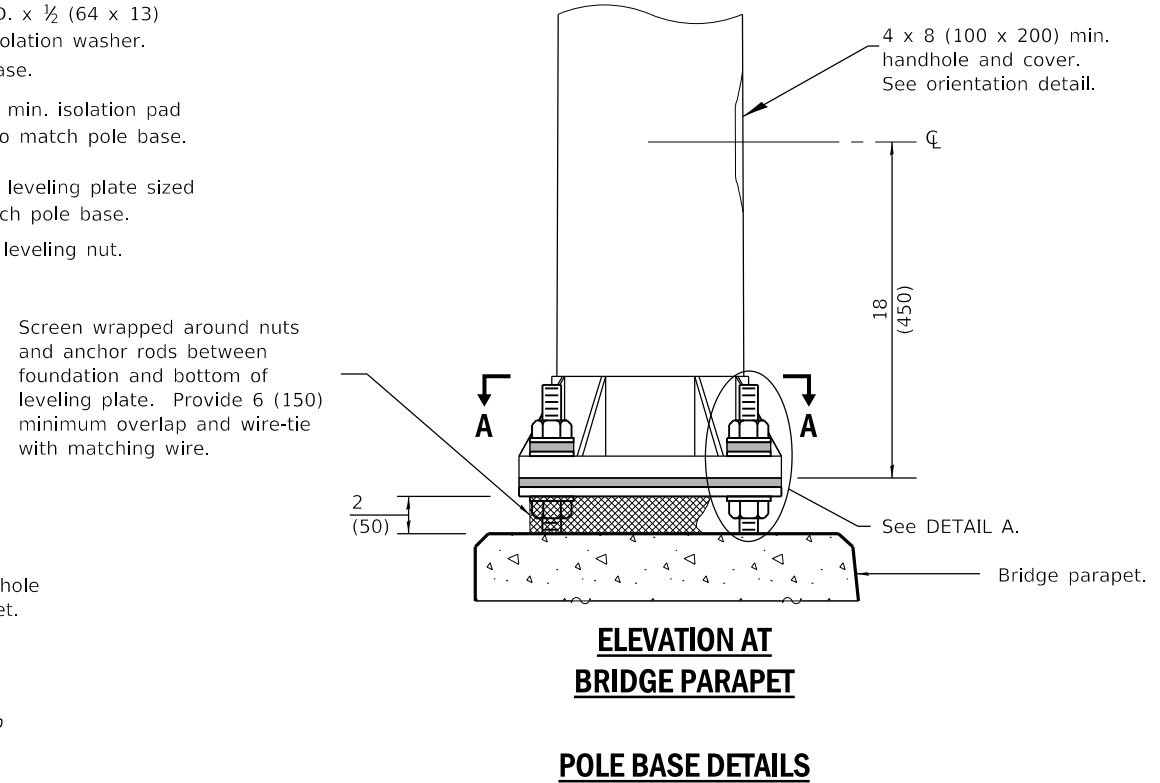
\* Unless directed otherwise by the Engineer.



**HANDHOLE / IDENTIFICATION ORIENTATION DETAIL**



③ Omit leveling nuts when breakaway devices are required.



**POLE BASE DETAILS**

Illinois Department of Transportation

PASSED January 1, 2019  
*ME Reppelt*  
 ELECTRICAL AND MECHANICAL UNIT CHIEF

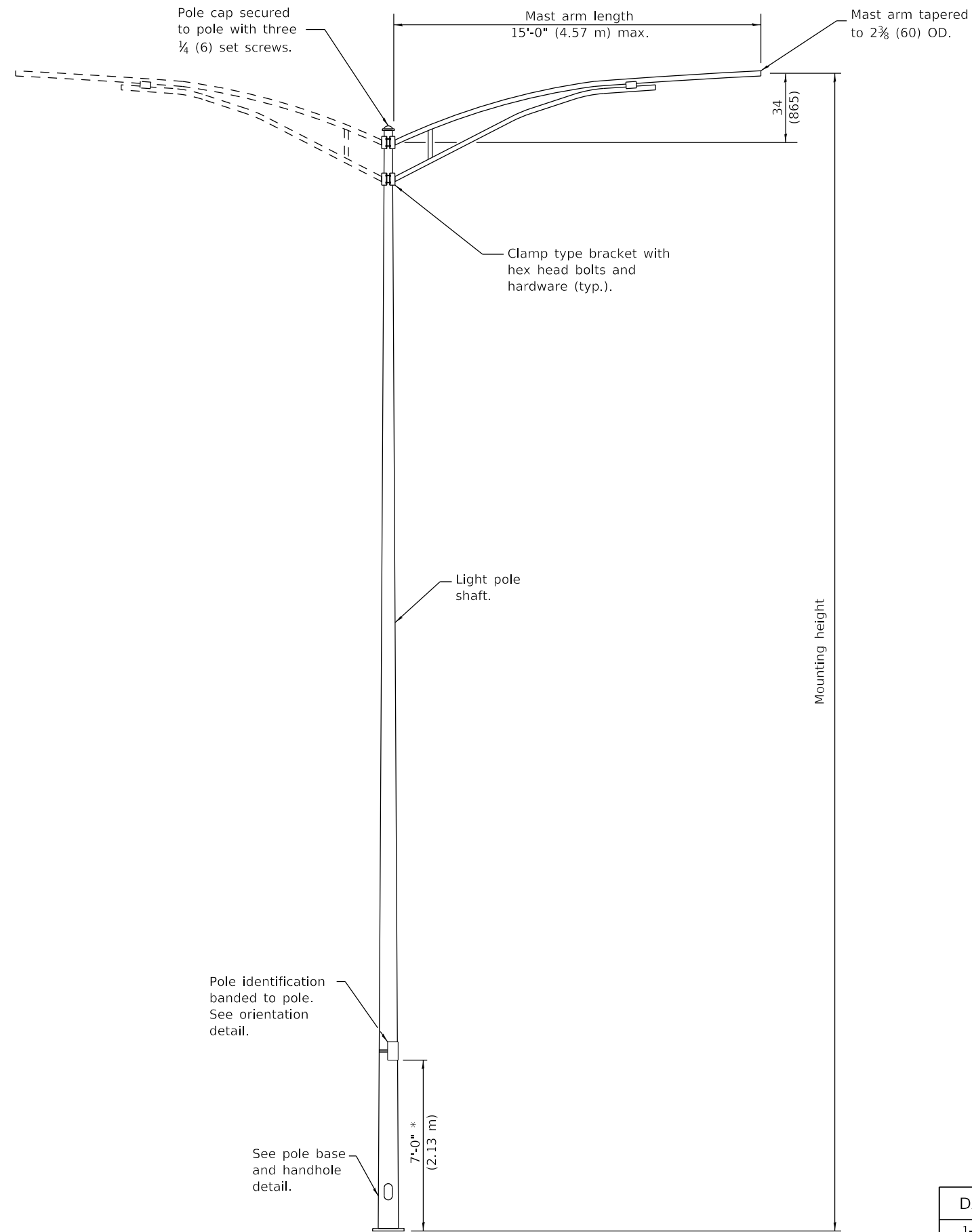
APPROVED January 1, 2019  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

**LIGHT POLE ALUMINUM DAVIT ARM**

(Sheet 2 of 2)

**STANDARD 830006-05**



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	11 1/2 (290)	1 (25)
Greater than 35' (10.7 m) to 50' (15.2 m)	15 (380)	1 1/4 (32)

**GENERAL NOTES**

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

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

DATE	REVISIONS
1-1-19	Revised POLE and BASE POLE tables.
1-1-14	Added pole mounted on bridge parapet. Modified attachment of screen.

**LIGHT POLE  
STEEL MAST ARM**

(Sheet 1 of 2)

**STANDARD 830011-03**

Illinois Department of Transportation

PASSED January 1, 2019  
*ME Reppelt*  
 ELECTRICAL AND MECHANICAL UNIT CHIEF

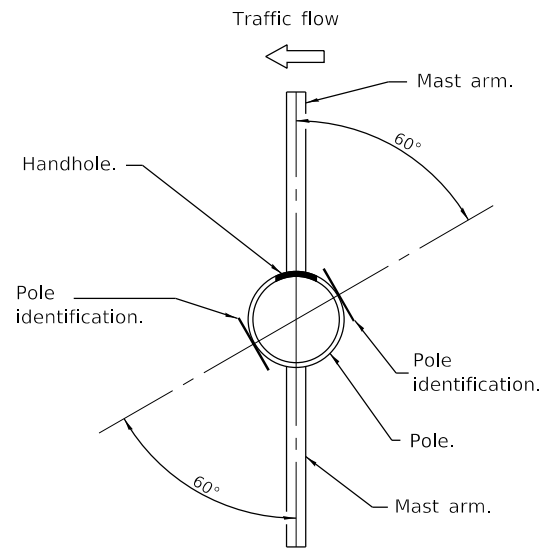
APPROVED January 1, 2019  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

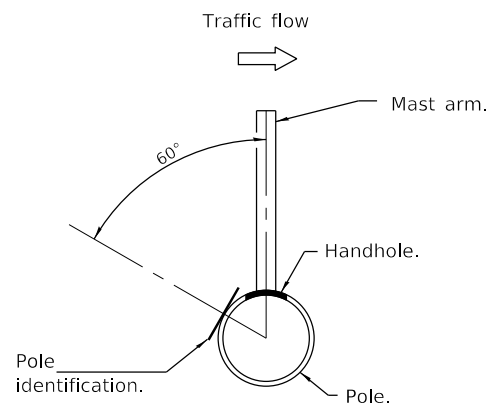
**MAST ARM  
LIGHT POLE**

(Single or twin mount)

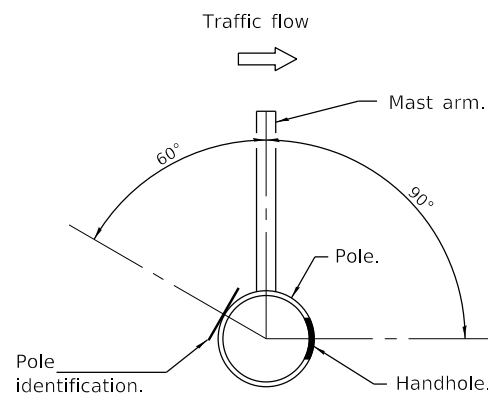
\* Unless directed otherwise by the Engineer.



Traffic flow  
 Pole on median barrier wall.

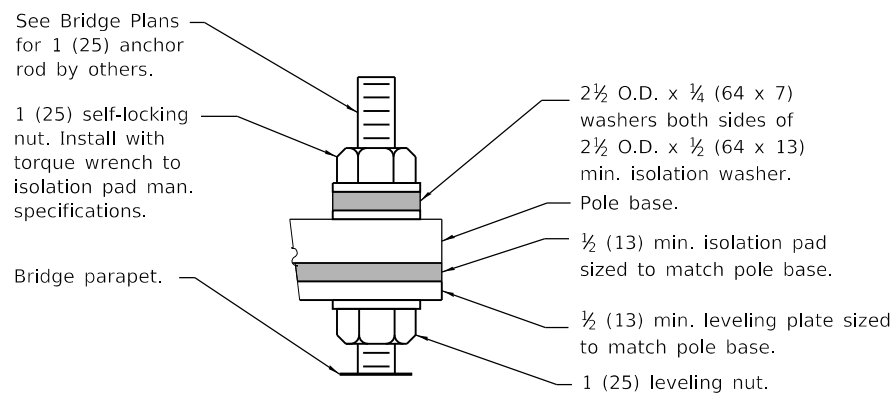
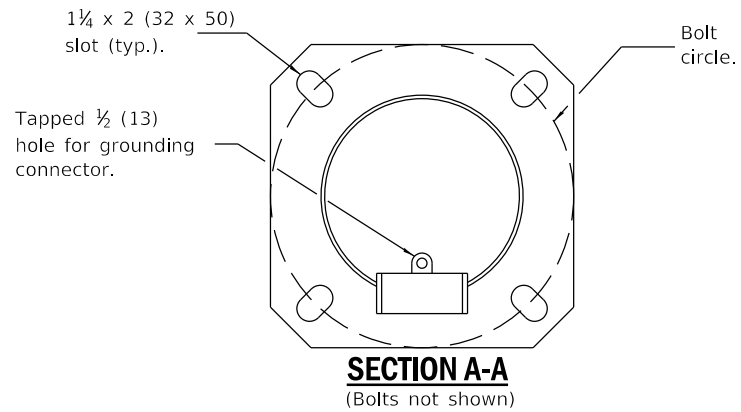


Traffic flow  
 Pole on barrier wall, retaining wall or parapet.

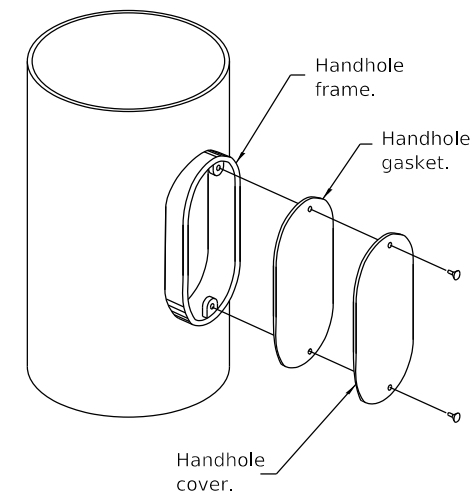


Traffic flow  
 Pole on ground mounted foundation.

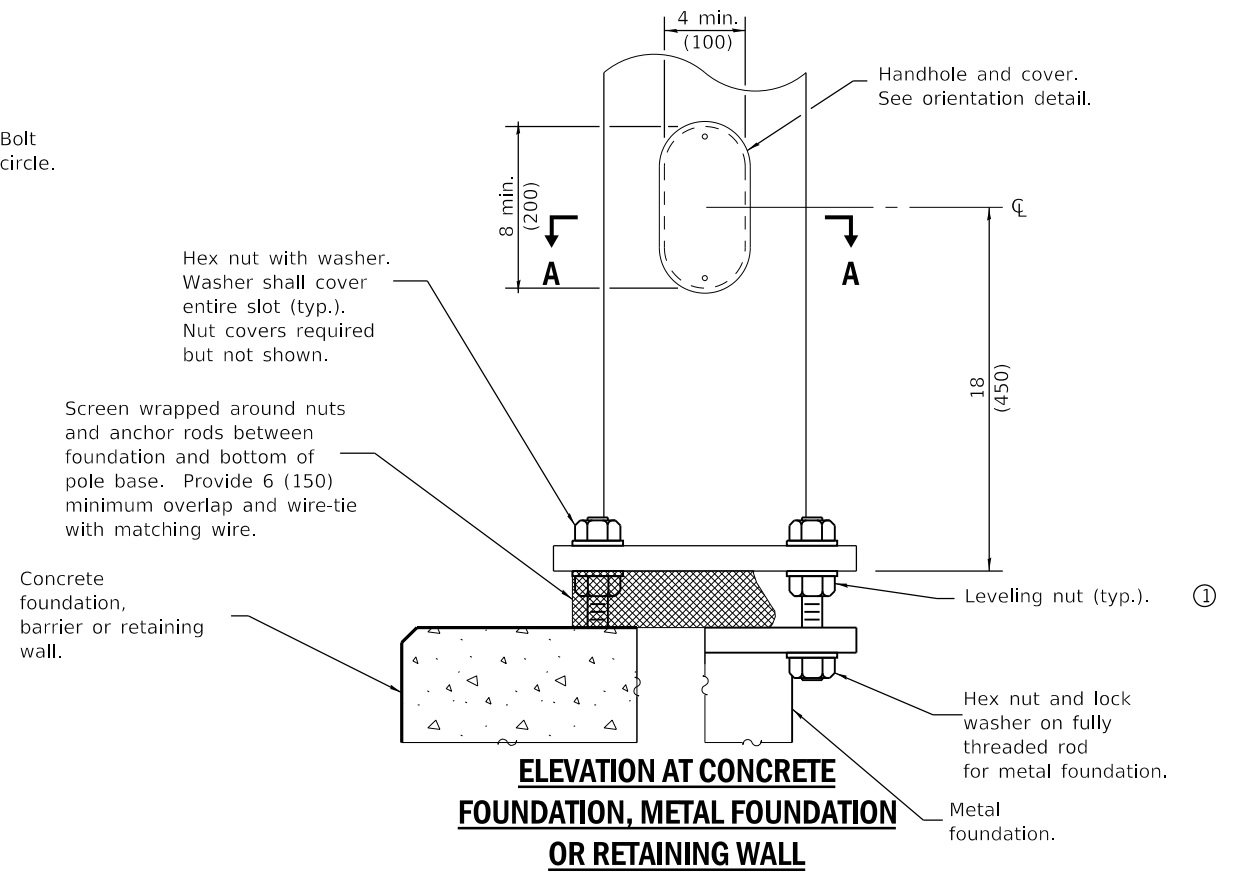
**HANDHOLE / IDENTIFICATION ORIENTATION DETAIL**



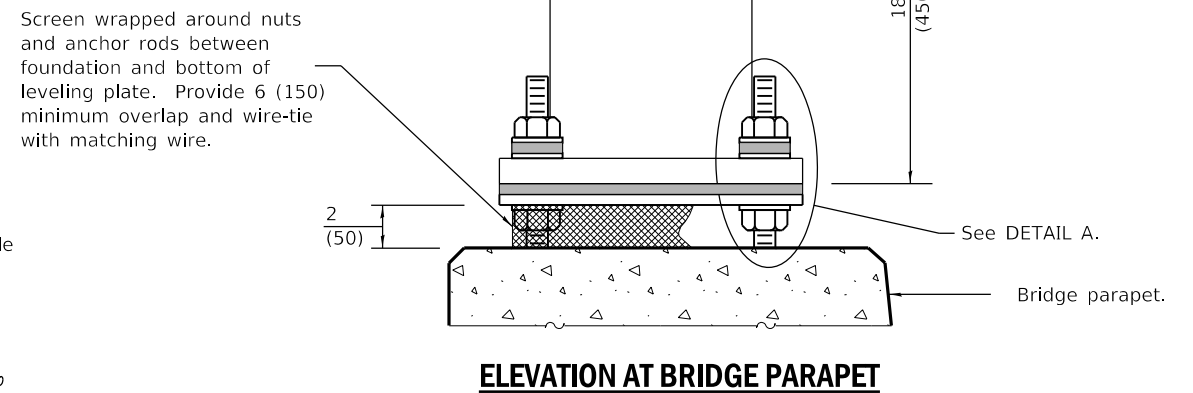
**DETAIL A**



**HANDHOLE DETAIL**



① Omit leveling nuts when breakaway devices are required.



**POLE BASE DETAILS**

**LIGHT POLE STEEL MAST ARM**

(Sheet 2 of 2)

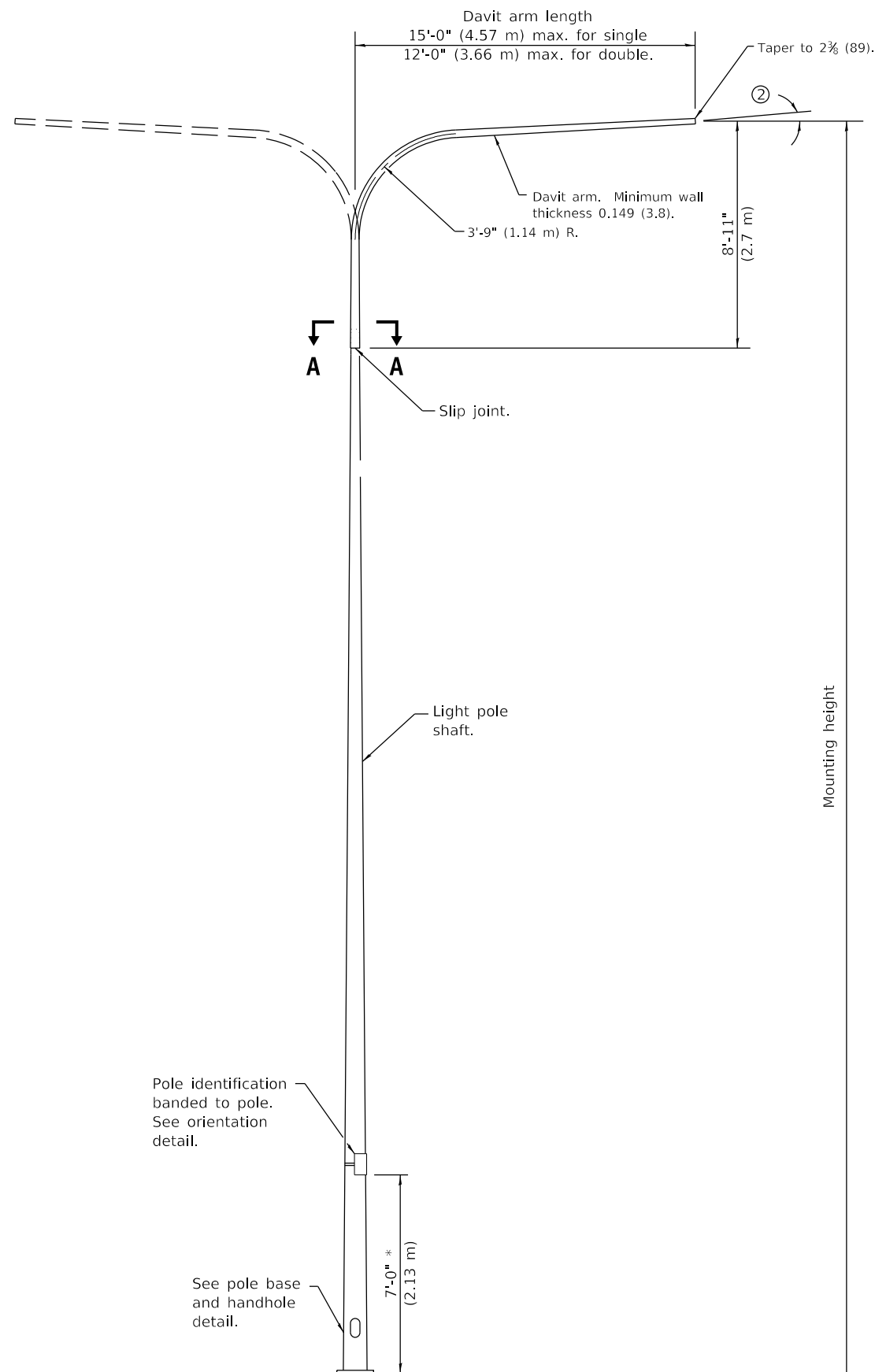
**STANDARD 830011-03**

Illinois Department of Transportation

PASSED January 1, 2019  
*ME Reppelt*  
 ELECTRICAL AND MECHANICAL UNIT CHIEF

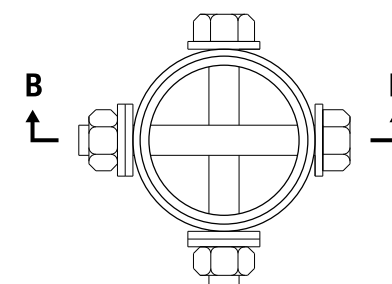
APPROVED January 1, 2019  
*J. E. C.*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

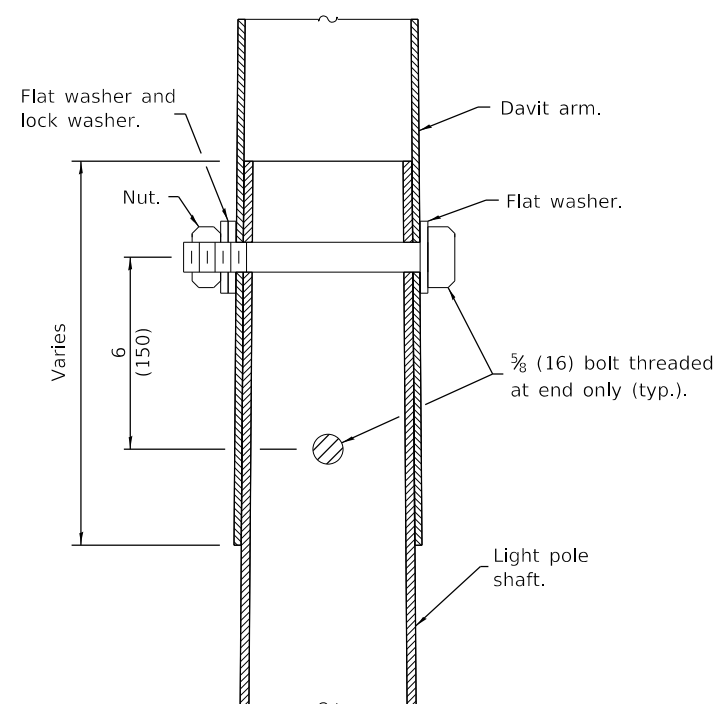


BASE PLATE		
MOUNTING HEIGHT	BOLT CIRCLE DIAMETER	BASE PLATE THICKNESS
35' (10.7 m) or less	11½ (290)	1 (25)
Greater than 35' (10.7 m) to 50' (15.2 m)	15 (380)	1¼ (32)

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



**SECTION A-A**



**SECTION B-B**

- ① Lower shaft length shall be from the bottom of the pole base to the bottom of the slip joint.
- ② 3° max. for unloaded pole, 1.5° max. for loaded pole.

**GENERAL NOTES**

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

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

**DAVIT LIGHT POLE**

(Single or twin mount)

\* Unless directed otherwise by the Engineer.

Illinois Department of Transportation

PASSED January 1, 2019  
*ME Reppelt*  
 ELECTRICAL AND MECHANICAL UNIT CHIEF

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

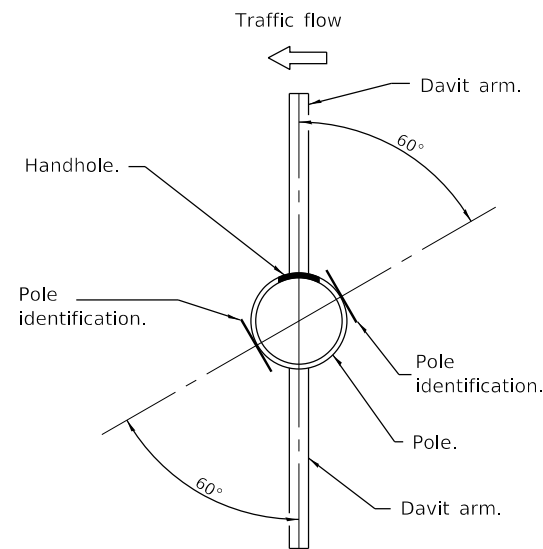
ISSUED 1-1-12

DATE	REVISIONS
1-1-19	Revised BASE PLATE table.
1-1-14	Added pole mounted on bridge parapet. Modified attachment of screen.

**LIGHT POLE  
STEEL DAVIT ARM**

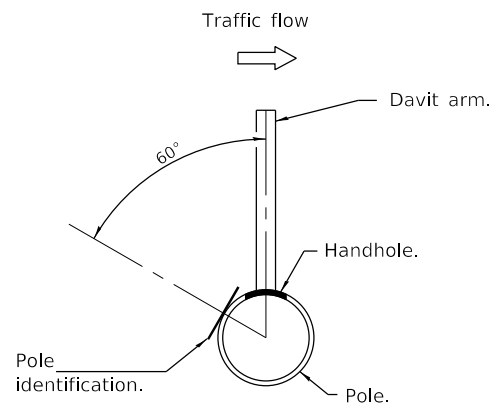
(Sheet 1 of 2)

**STANDARD 830016-03**

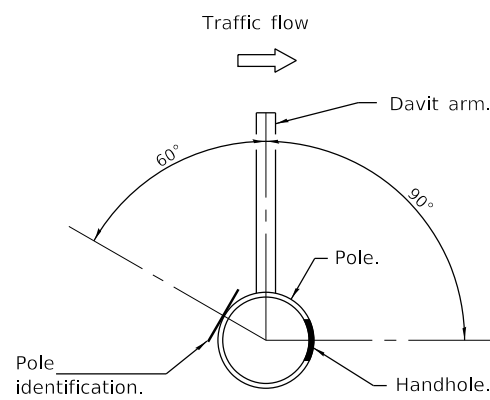


Traffic flow →

Pole on median barrier wall.

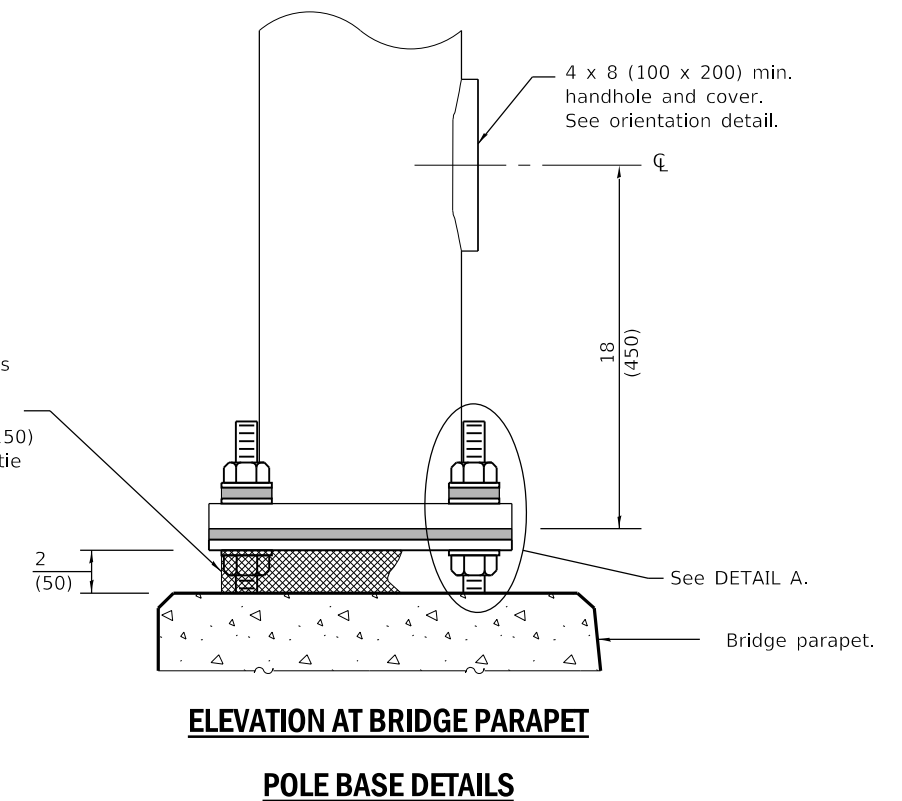
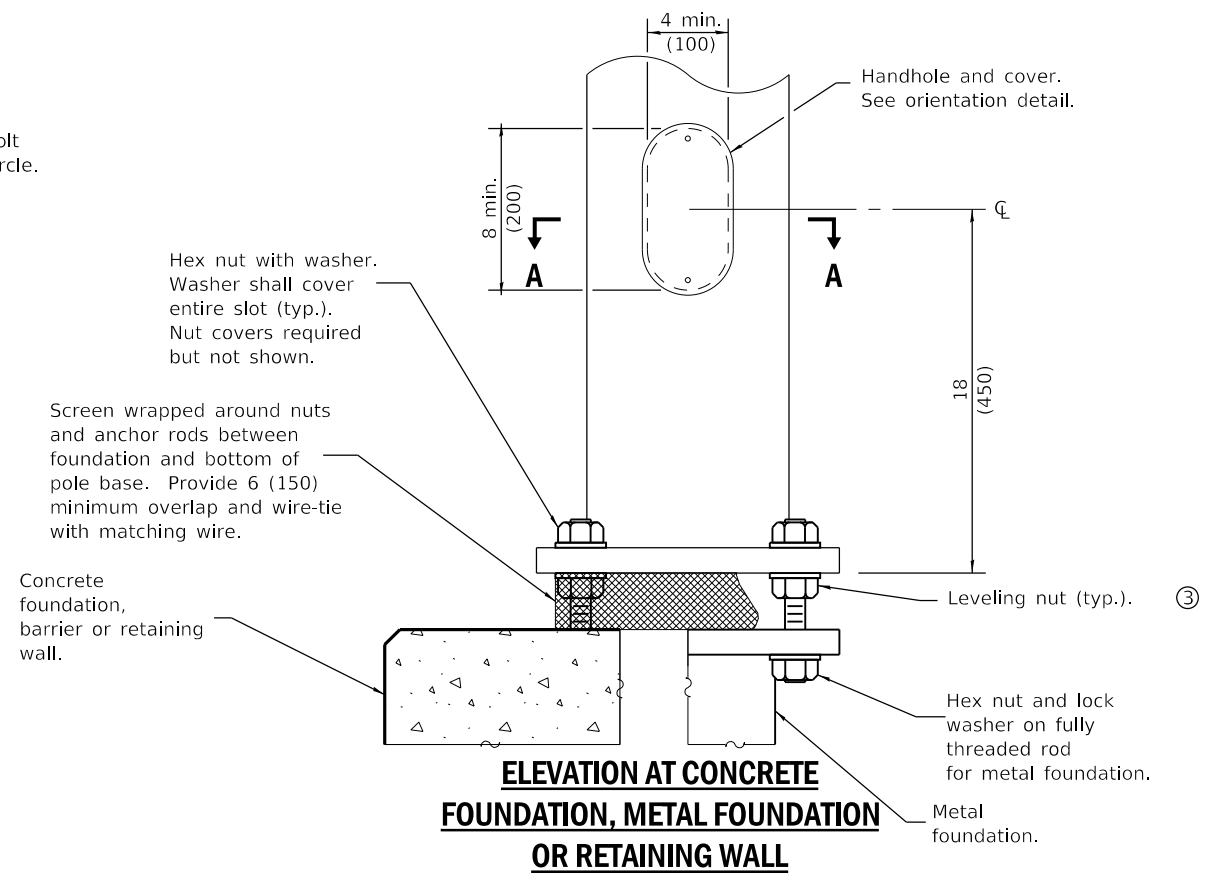
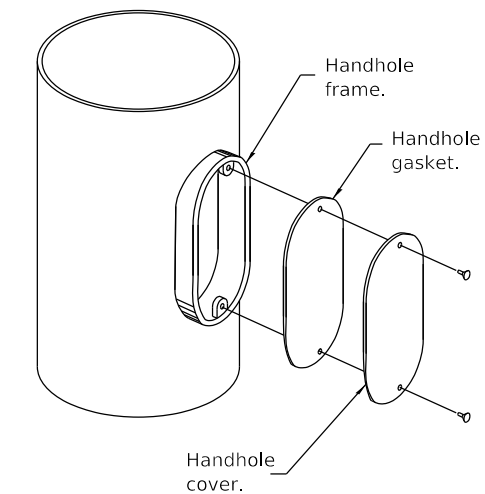
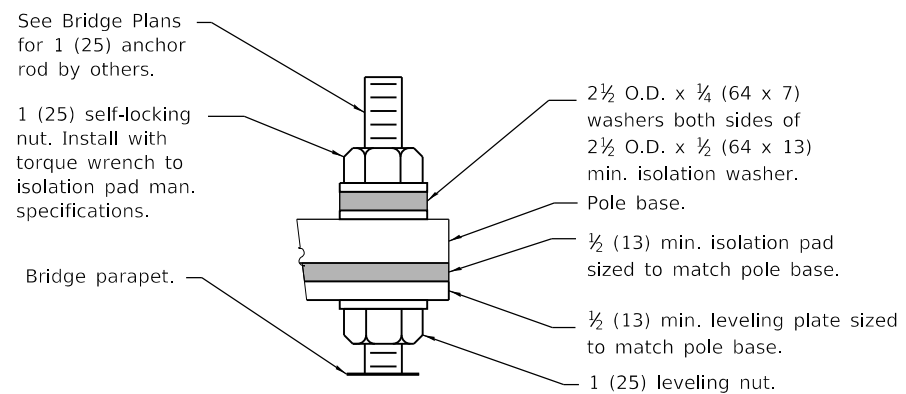
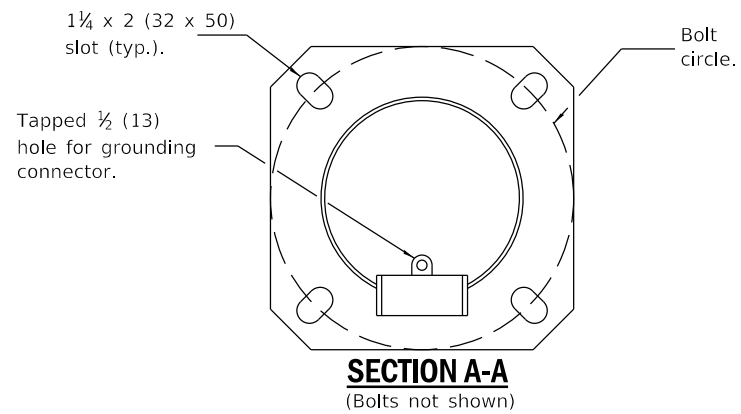


Pole on barrier wall, retaining wall or parapet.



Pole on ground mounted foundation.

**HANDHOLE / IDENTIFICATION ORIENTATION DETAIL**



**LIGHT POLE STEEL DAVIT ARM**

(Sheet 2 of 2)

**STANDARD 830016-03**

Illinois Department of Transportation

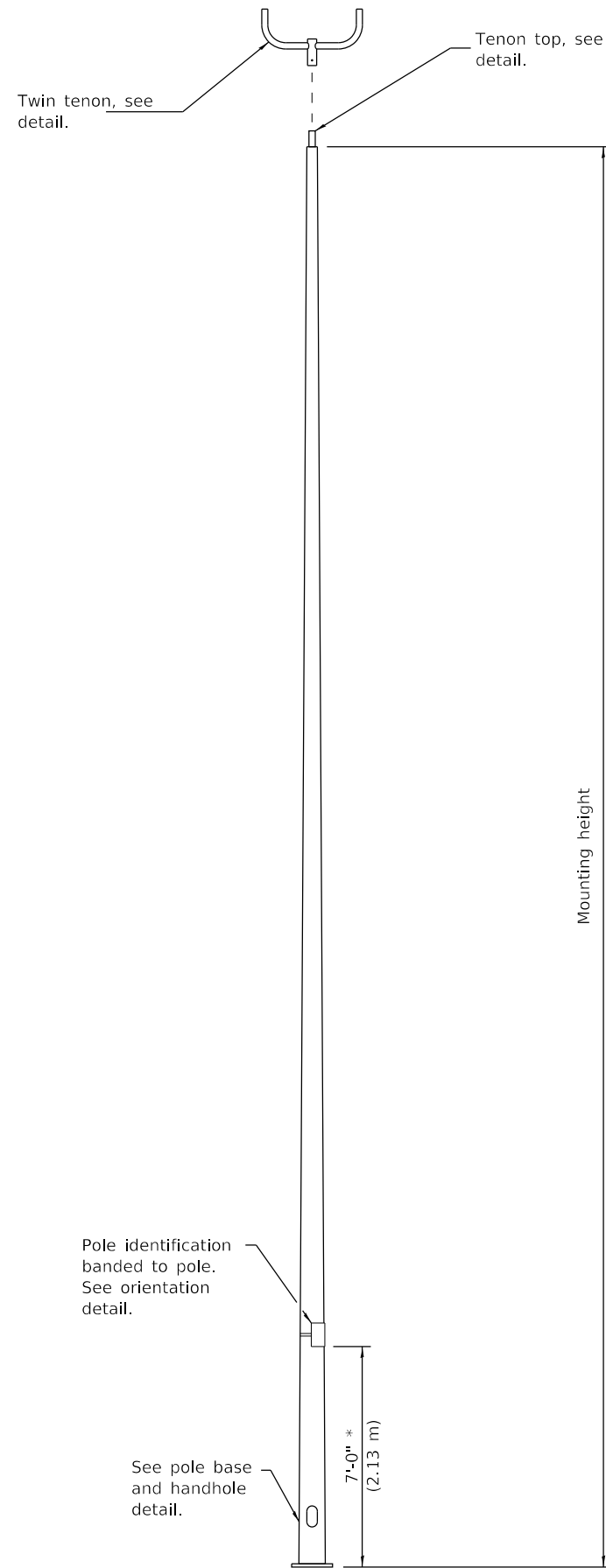
PASSED January 1, 2019

*M. E. Reppelt*  
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019

*J. E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12



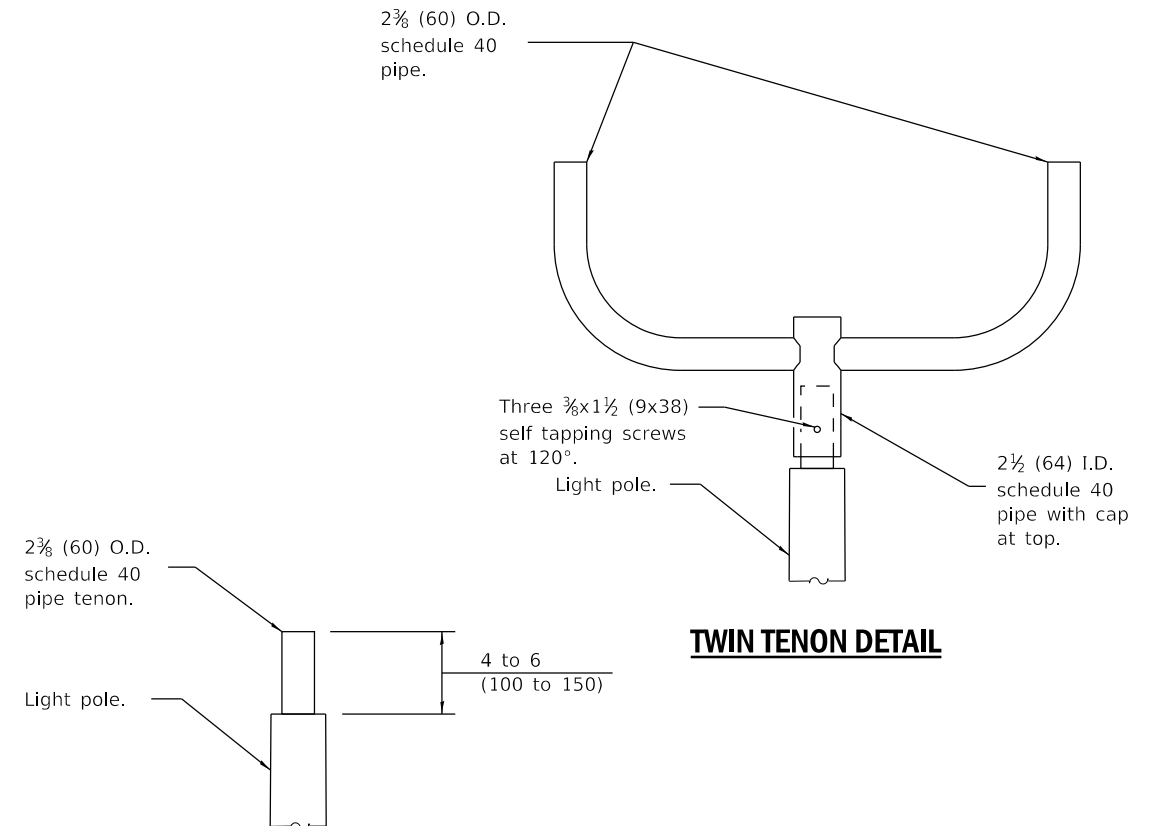
**TENON TOP LIGHT POLE**

(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



**TENON DETAIL**

**TWIN TENON DETAIL**

**GENERAL NOTES**

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

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

DATE	REVISIONS
1-1-19	Revised BASE PLATE and LIGHT POLE tables.
1-1-14	Added pole mounted on bridge parapet. Modified attachment of screen.

**LIGHT POLE STEEL TENON TOP**

(Sheet 1 of 2)

**STANDARD 830021-03**

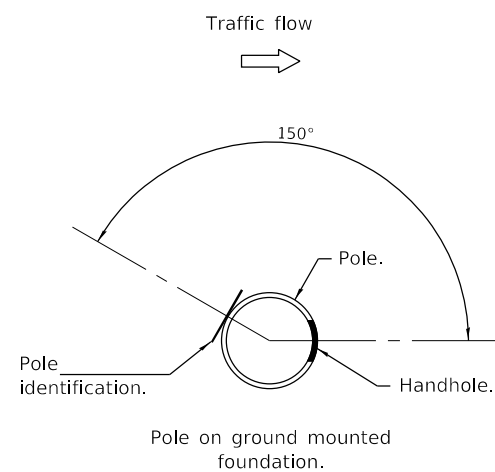
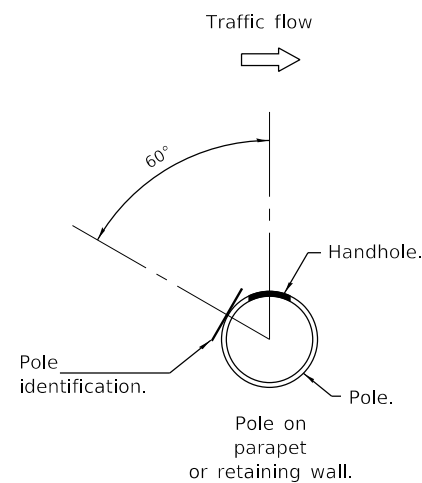
Illinois Department of Transportation

PASSED January 1, 2019  
*M. E. Reppelt*  
 ELECTRICAL AND MECHANICAL UNIT CHIEF

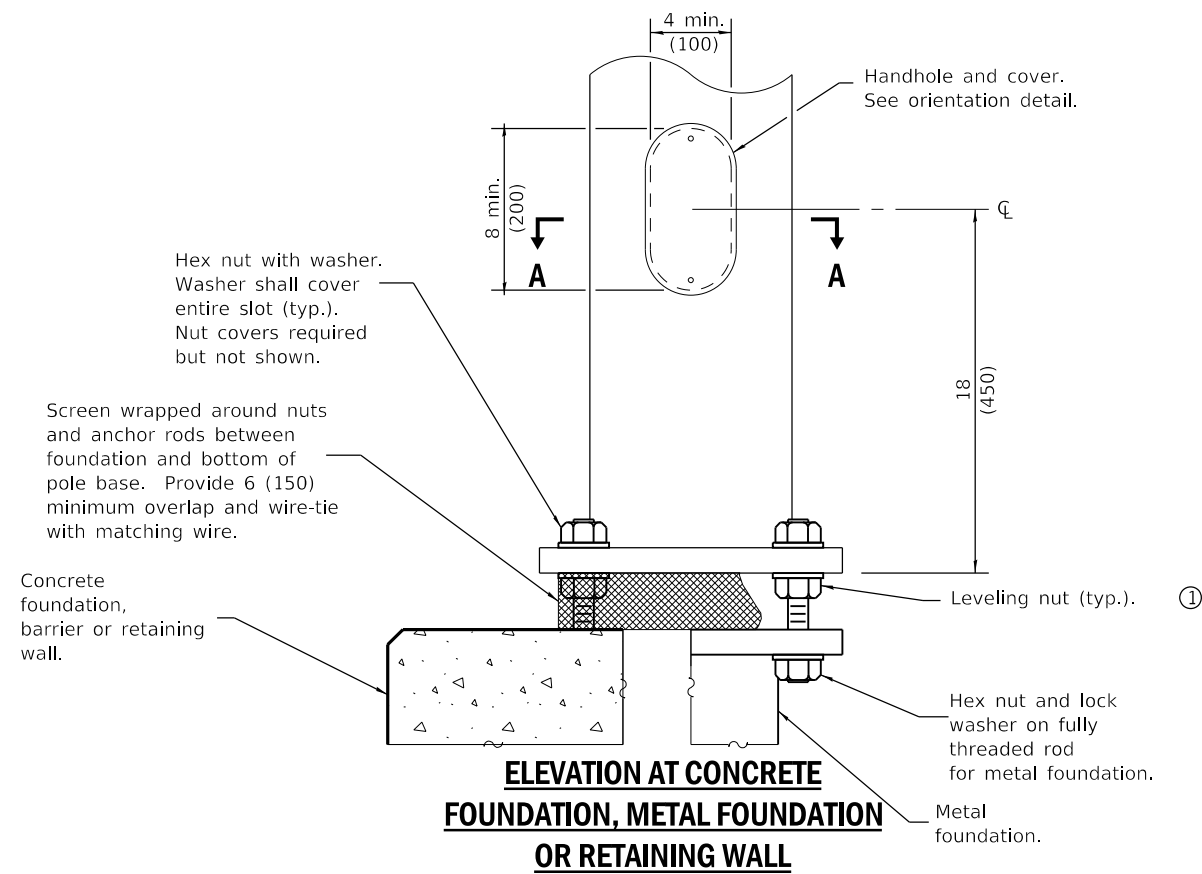
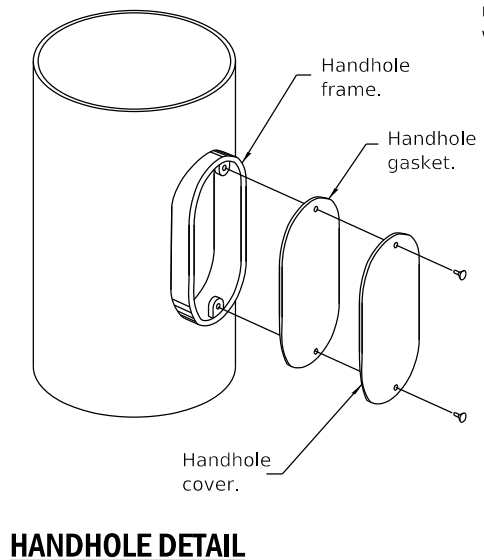
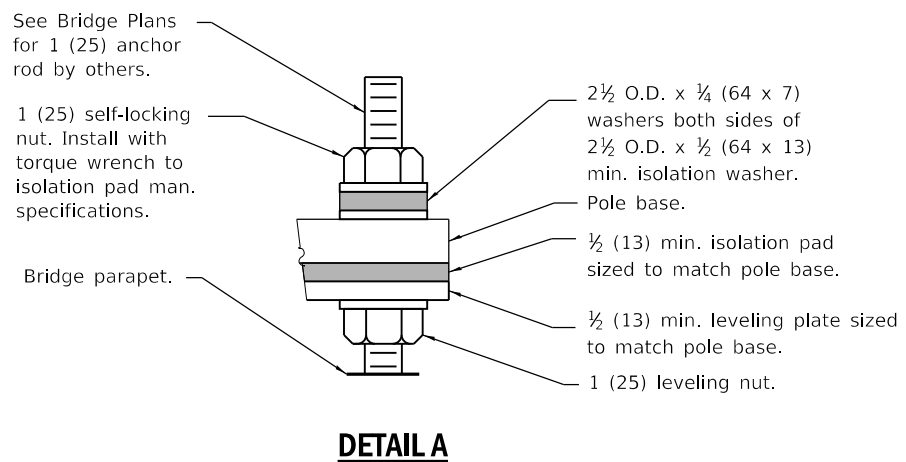
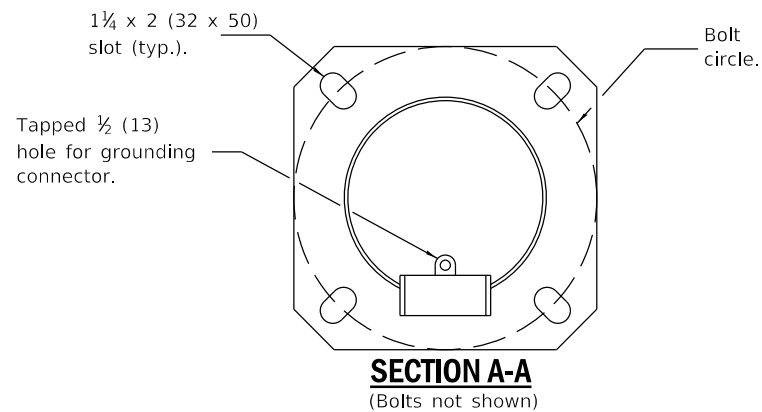
APPROVED January 1, 2019  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

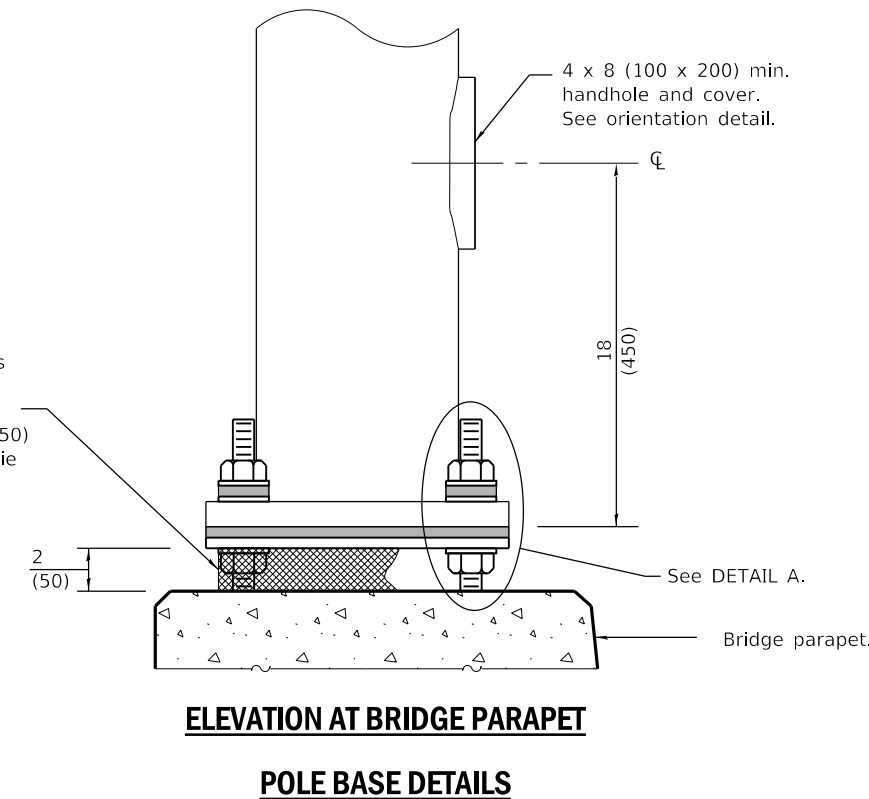




**HANDHOLE / IDENTIFICATION ORIENTATION DETAIL**



① Omit leveling nuts when breakaway devices are required.



Illinois Department of Transportation

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*M. E. Reppelt*  
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019

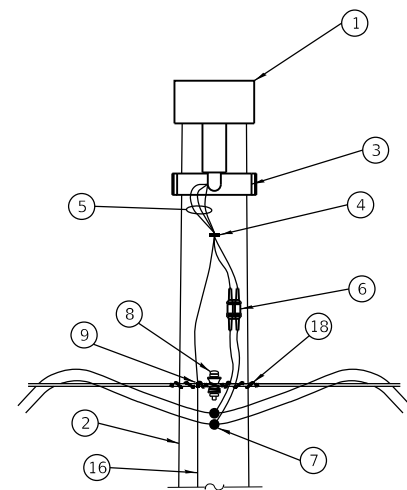
*J. E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

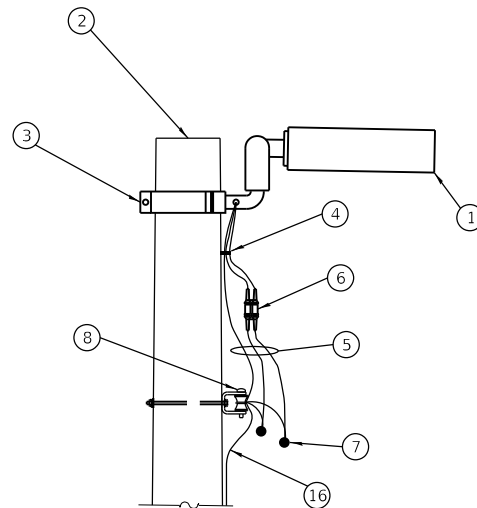
**LIGHT POLE STEEL TENON TOP**

(Sheet 2 of 2)

**STANDARD 830021-03**



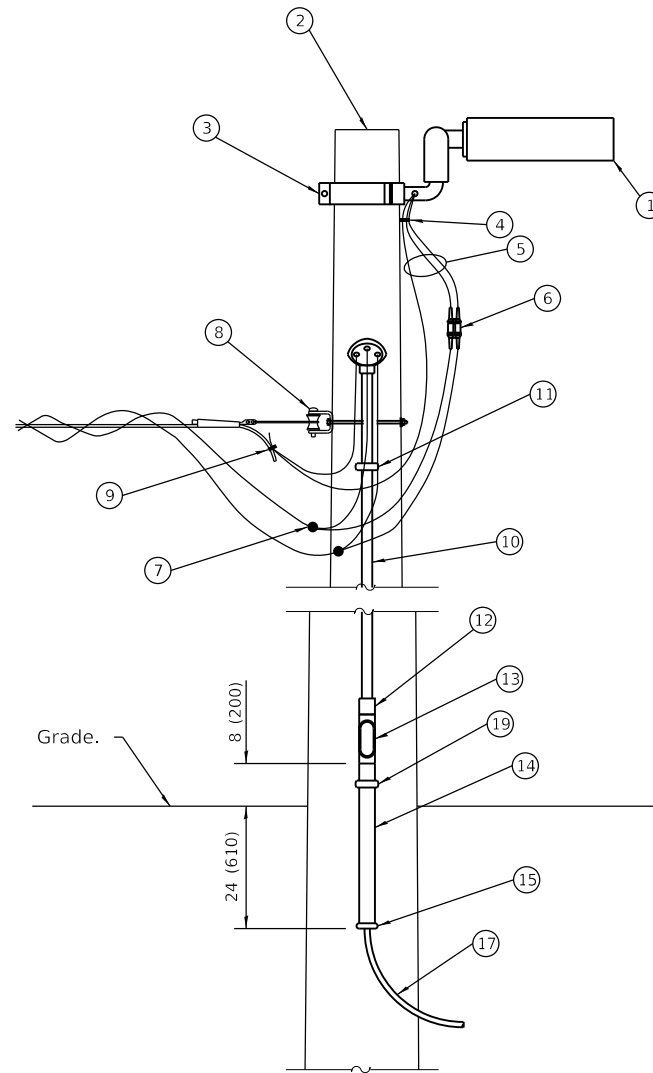
**FACING VIEW**



**SIDE VIEW**

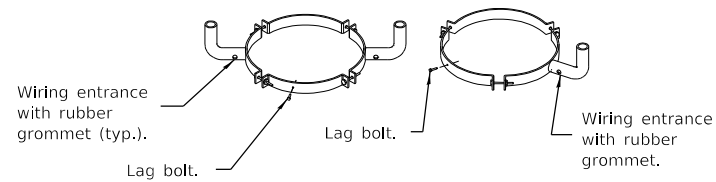
**LUMINAIRE MOUNTING DETAILS**

43' - 44' (13.1 m - 13.4 m) mounting height unless noted otherwise on plans.



**LIGHT POLE WITH CIRCUIT ROUTED UNDERGROUND**

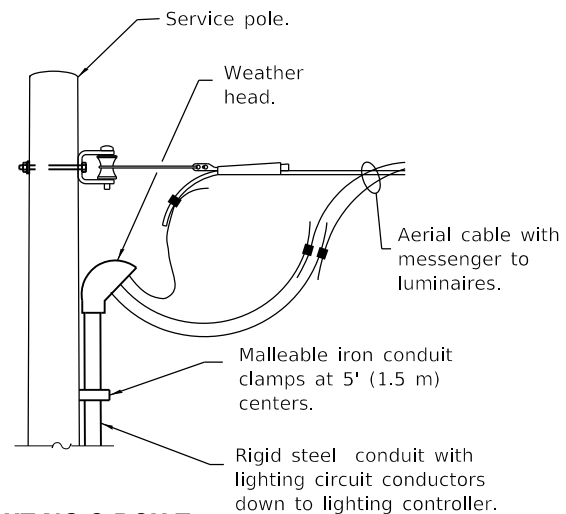
- ① Luminaire.
  - ② Wood light pole, 50' (15.2 m), class 3 (typ.). \*
  - ③ Luminaire mounting bracket.
  - ④ Cable clamps on 24 (600) centers.
  - ⑤ Three #10 XLP-USE cable.
  - ⑥ Waterproof, two-pole fuse holder with fuses.
  - ⑦ Waterproof insulation piercing tap connector.
  - ⑧ Heavy duty insulated pulley clevis with mounting bolt and hardware.
  - ⑨ Ground clamp.
  - ⑩ 1 (25) rigid steel conduit. \*
  - ⑪ Malleable iron conduit clamps, 5' (1.5 m) intervals.
  - ⑫ Threaded conduit reducer.
  - ⑬ "C" conduit, threaded.
  - ⑭ 1½ (40) rigid steel conduit. \*
  - ⑮ Conduit bushing.
  - ⑯ #6 Bare copper ground wire to 10 ft. ground rod, every third light pole.
  - ⑰ Unit duct.
  - ⑱ Wire tie.
  - ⑲ Malleable iron conduit clamp below "C" conduit.
- \* Size larger as needed.



**TWIN**

**SINGLE**

**MOUNTING BRACKET DETAILS**



**LIGHTING CIRCUIT AT SERVICE/CONTROLLER**

See standard 825001 for service installation.

**GENERAL NOTES**  
 See plans for wire and unit duct sizes and pole locations not shown.  
 Provide guy wires with strain insulators and anchors, as needed.  
 All dimensions are in inches (millimeters) unless otherwise shown.

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*ME Reppelt*  
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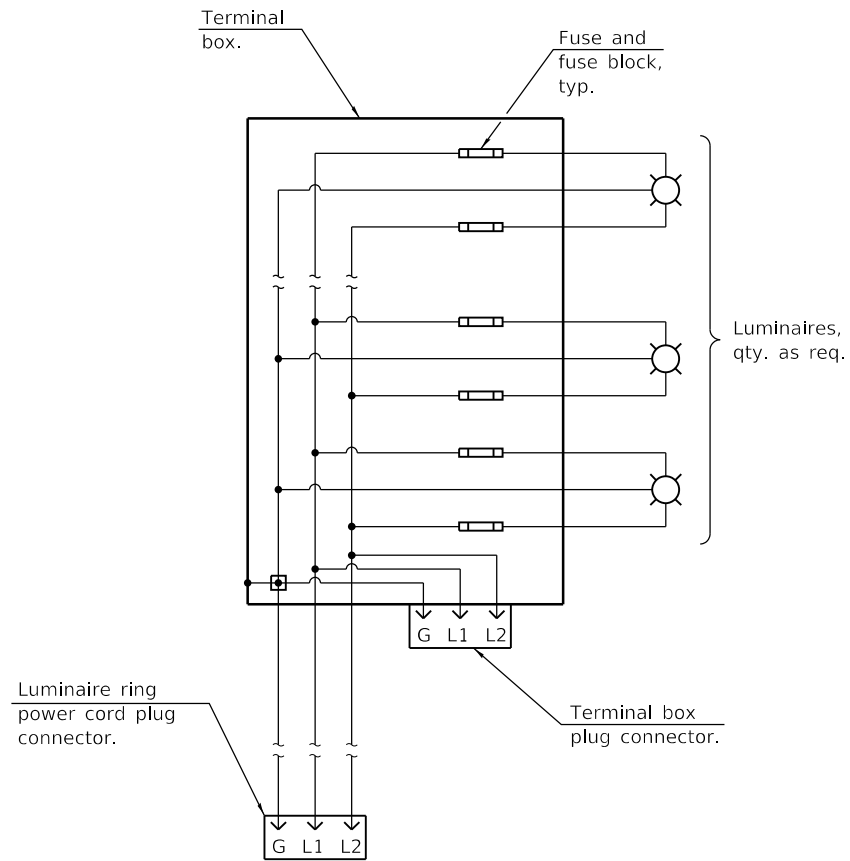
APPROVED January 1, 2019  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

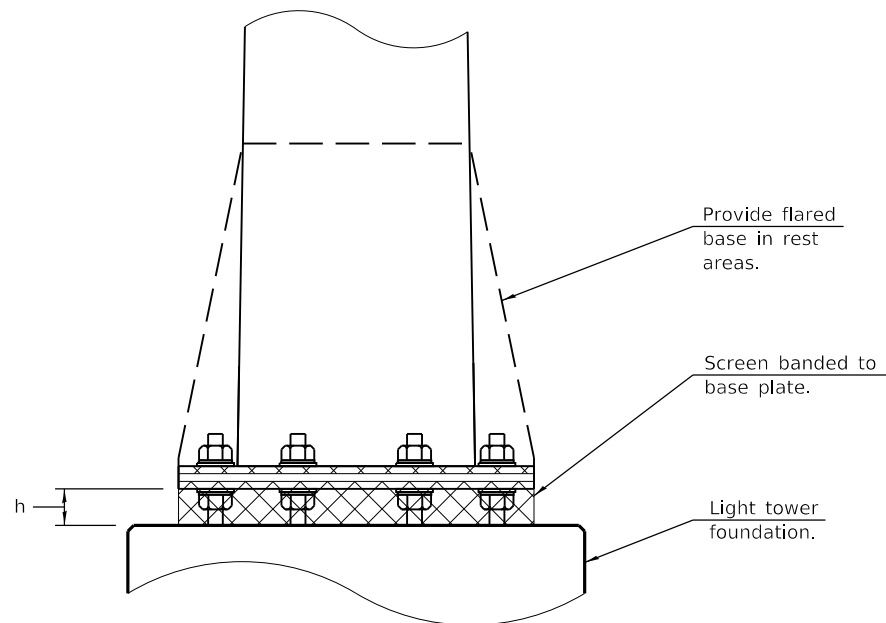
DATE	REVISIONS
1-1-19	Revised Luminaire to be horizontal.
1-1-13	New standard.

**TEMPORARY ROADWAY LIGHTING**

**STANDARD 830026-01**

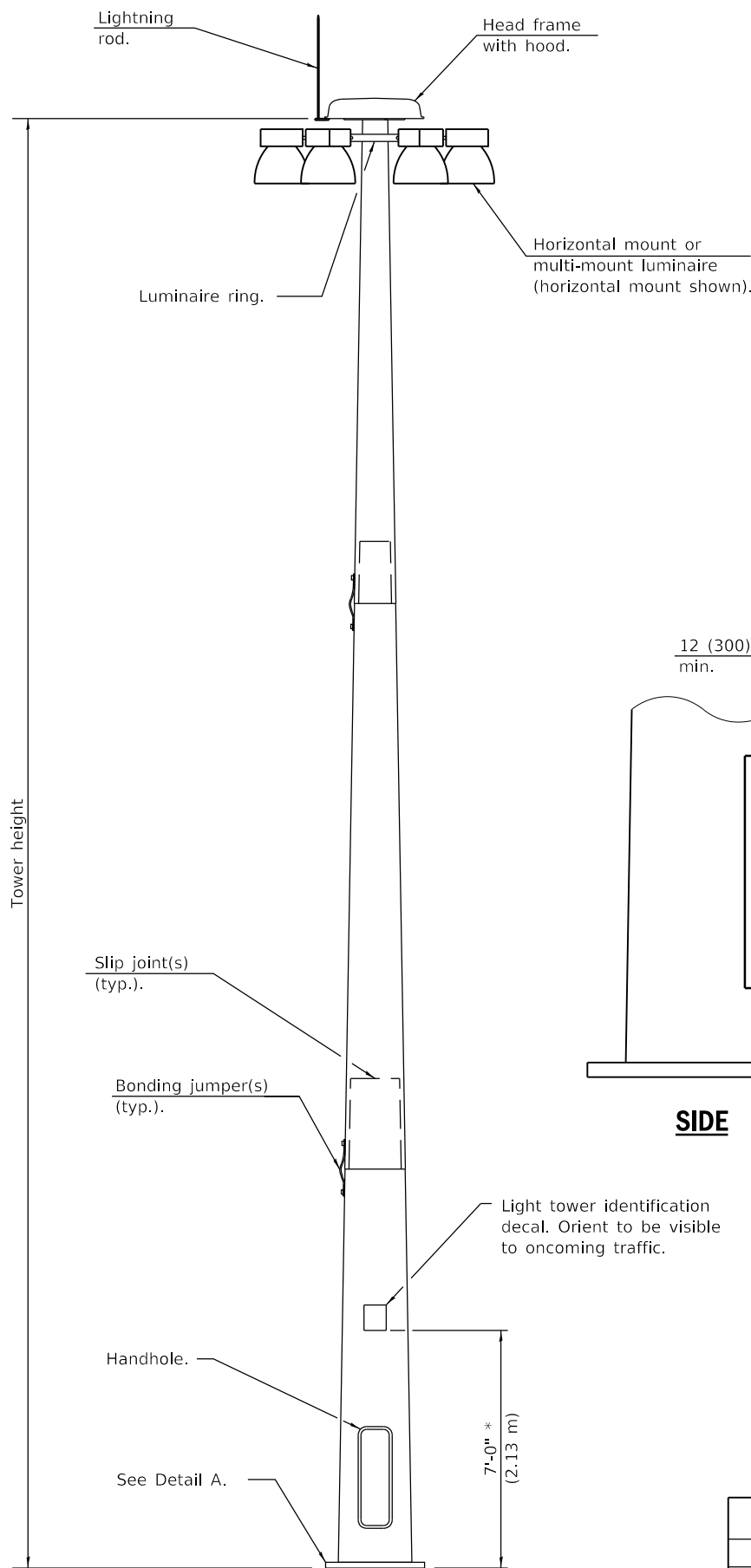


**LUMINAIRE RING WIRING DIAGRAM**



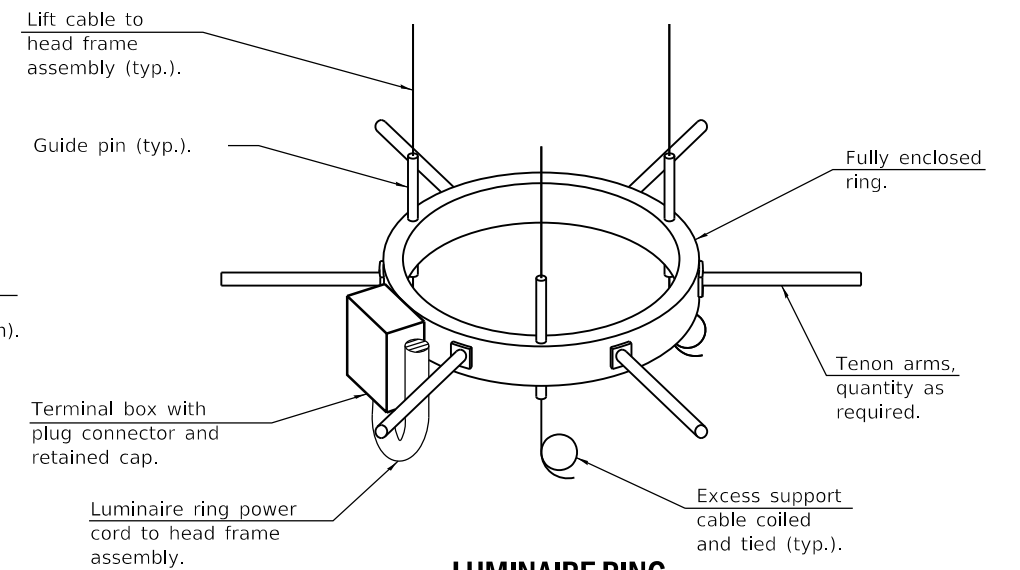
**DETAIL A**

h = Anchor rod dia. + leveling nut and washer thickness.



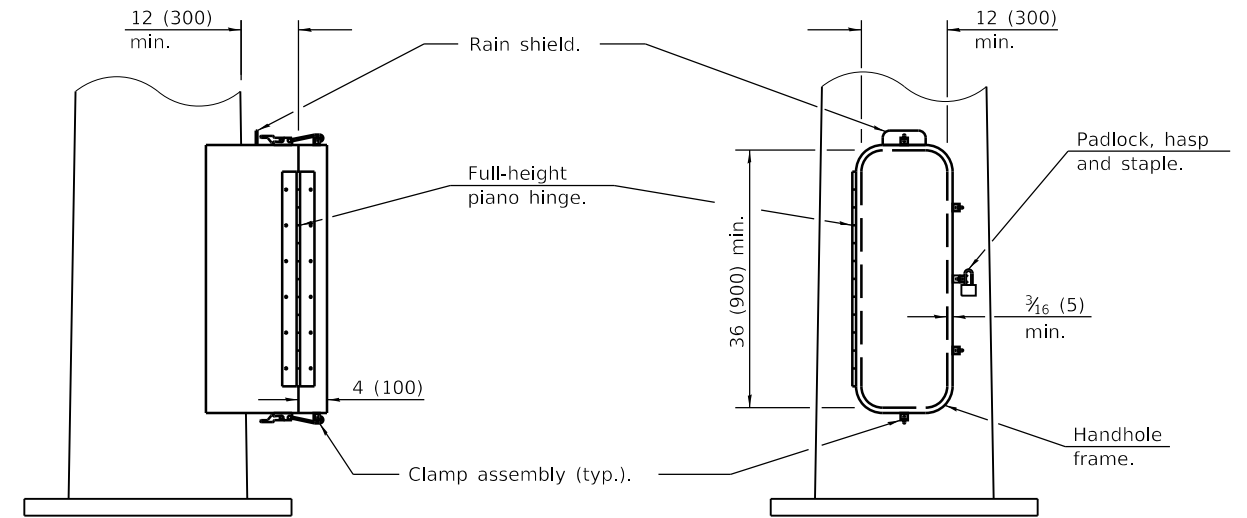
**LIGHT TOWER**

\* Unless directed otherwise by the Engineer.



**LUMINAIRE RING**

(Two or three lift cable system permitted, three lift cable type shown.)



**SIDE**

**FRONT**

**HANDHOLE**

**GENERAL NOTES**

See Standard 837001 for High Mast Tower Foundation and grounding electrode.

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

DATE	REVISIONS
1-1-15	Added light tower identification decal.
	Modified Detail A.
1-1-11	New Standard.

**LIGHT TOWER**

(Sheet 1 of 2)

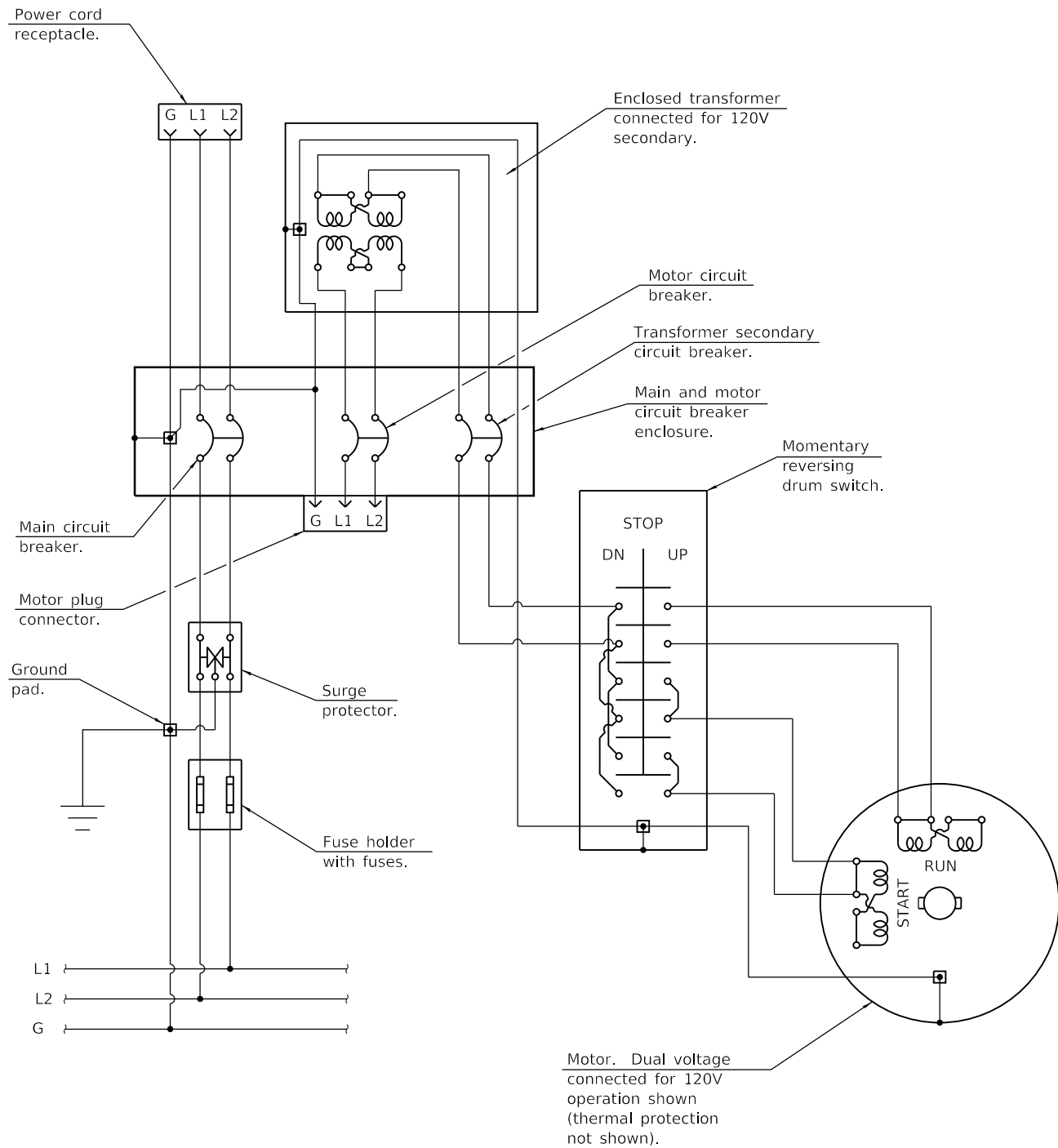
**STANDARD 835001-01**

Illinois Department of Transportation

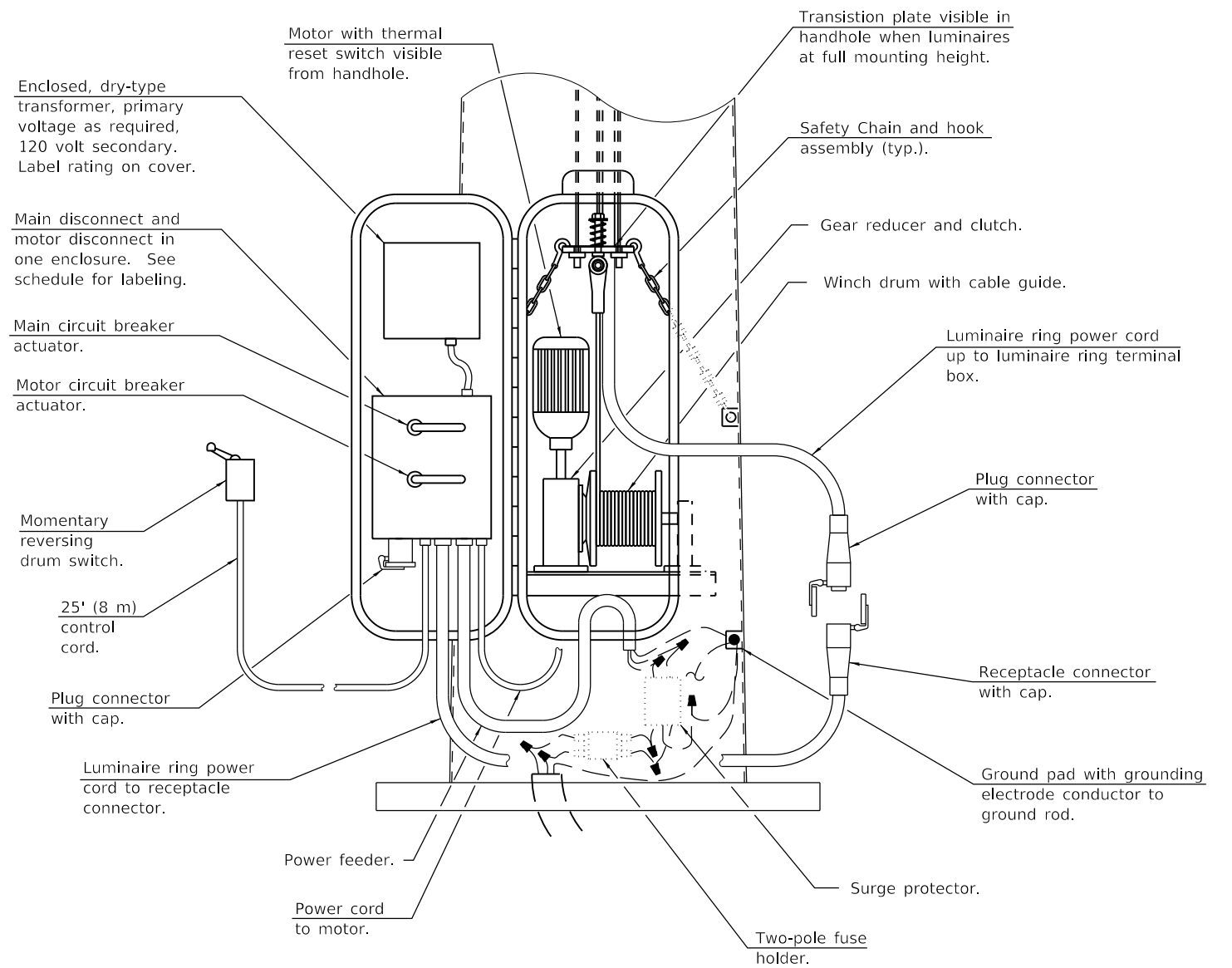
APPROVED January 1, 2015  
*Cheryl Gentry*  
 ENGINEER OF PRELIMINARY ENGINEERING

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

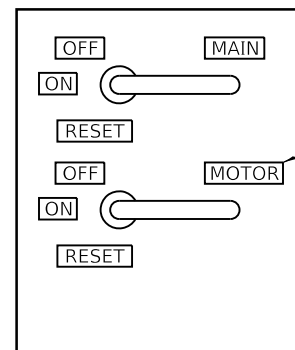
ISSUED 1-1-11



**LOWERING SYSTEM WIRING DIAGRAM**



**LOWERING AND SUPPORT MECHANISM**



**DISCONNECT SCHEDULE**

Illinois Department of Transportation

APPROVED January 1, 2015  
*Cheryl Gentry*  
ENGINEER OF PRELIMINARY ENGINEERING

APPROVED January 1, 2015  
*DR*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-11-11

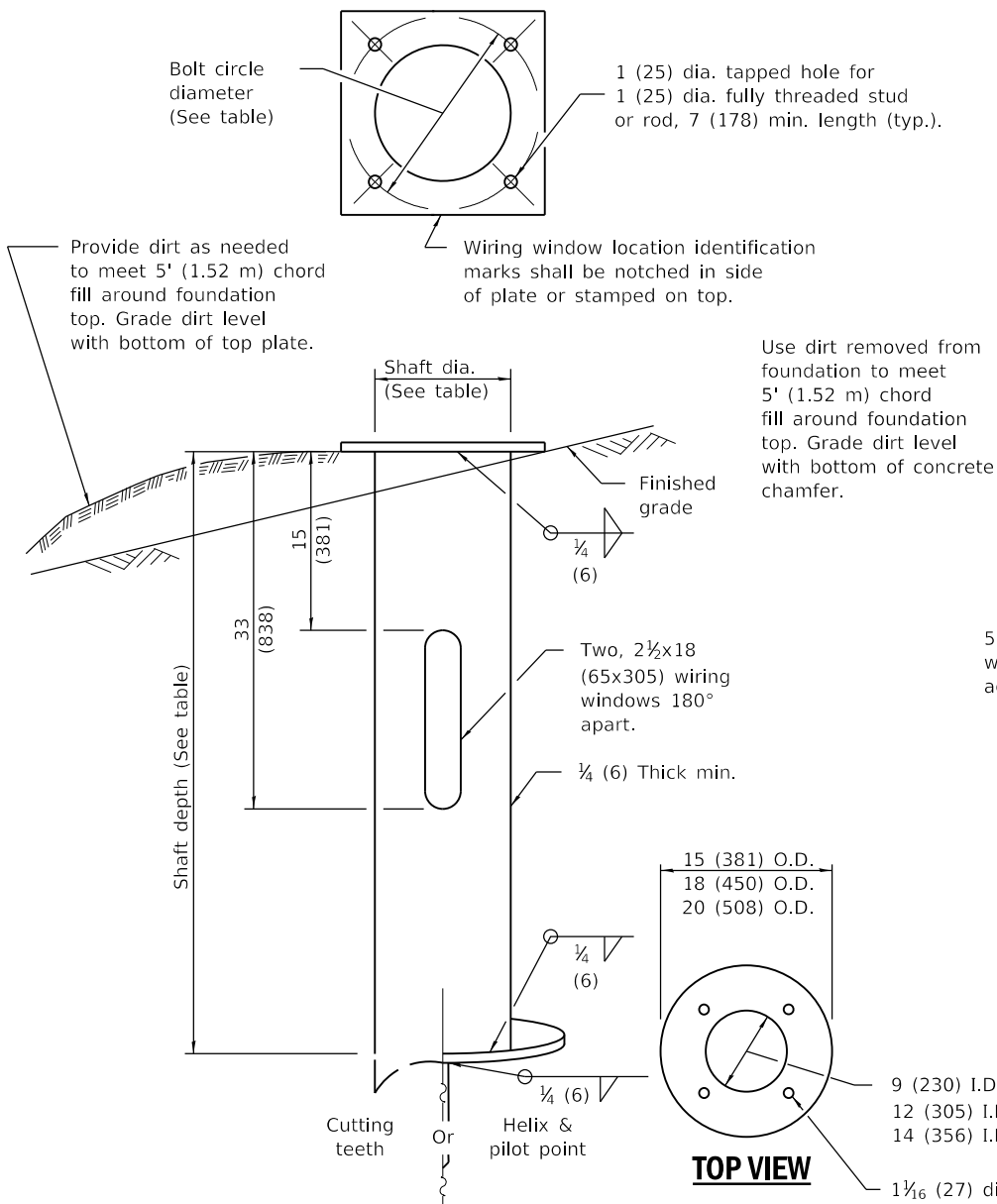
**LIGHT TOWER**

(Sheet 2 of 2)

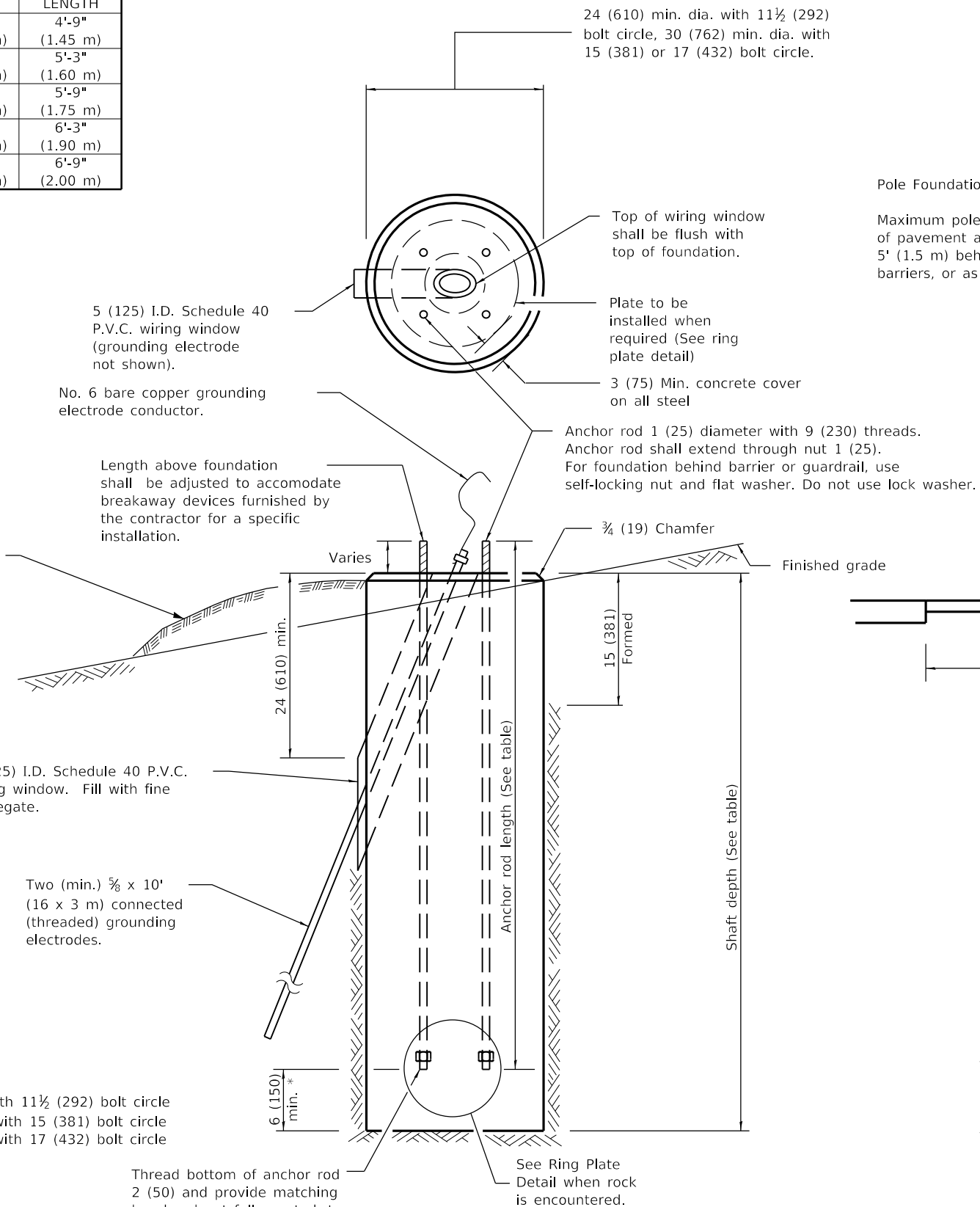
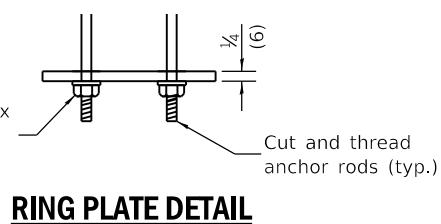
**STANDARD 835001-01**

LIGHT POLE MOUNTING HEIGHT	BOLT CIRCLE DIAMETER	METAL FOUNDATION			CONCRETE FOUNDATION		
		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.

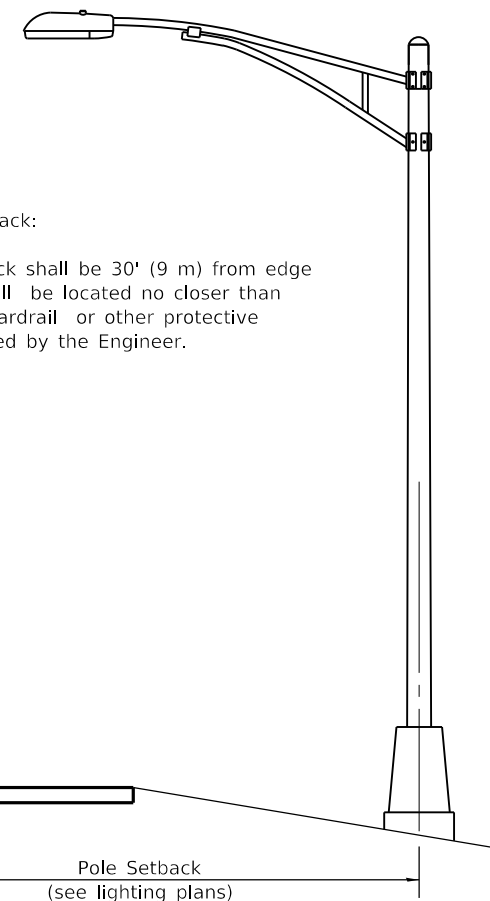


**METAL FOUNDATION**



**CONCRETE FOUNDATION**

\* If the required anchor rod length above top of foundation is less than 3 (75), anchor rods may be lowered below 6 (150).



**GENERAL NOTES**

All foundations are designed to be located on slopes not exceeding 2:1 where soils have an unconfined compressive strength of at least 1.0 TSF. The Contractor shall verify the soil strength during drilling for concrete foundations or by monitoring installation resistance of metal foundations and notify the Engineer if other conditions are encountered.

When rock is encountered the foundation depth may be reduced 6 (150) for every 12 (300) of embedment in rock. The minimum foundation depth shall be 4'-6" (1.37 m) with cut anchor rods 6 (150) above bottom of excavated hole. See ring plate detail.

Anchor rods shall be increased in diameter as needed for 50' (15.2 m) mounting height or above. The Contractor shall match the breakaway device size or slotted hole size in the pole base plate to accommodate larger rod sizes.

Transformer bases shall not be used on metal foundations.

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

DATE	REVISIONS
1-1-19	Omitted multimount luminaire to agree with BDE Manual.
1-1-18	Replaced rod hooks with nuts.

**LIGHT POLE FOUNDATION**

**STANDARD 836001-04**

Illinois Department of Transportation

PASSED January 1, 2019

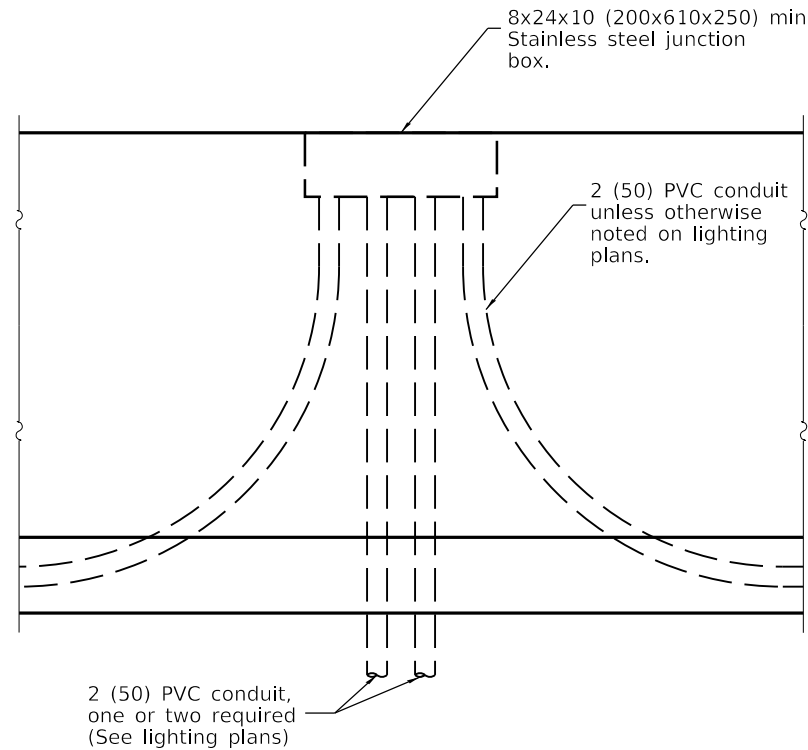
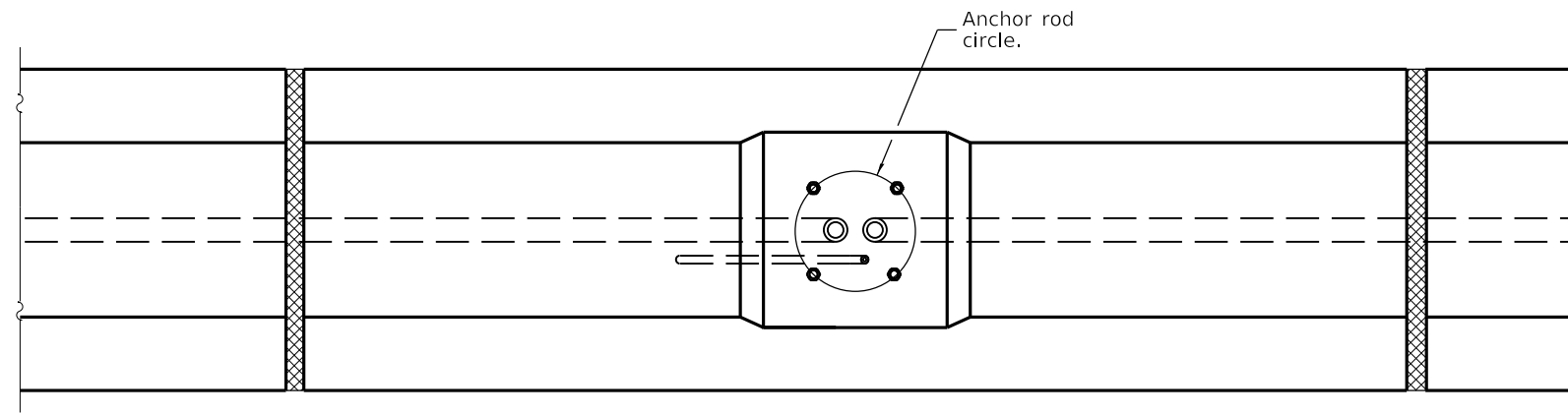
*ME Reppelt*  
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019

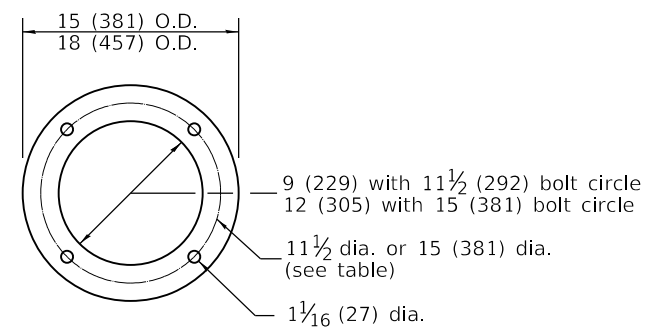
*J. E. ...*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-10

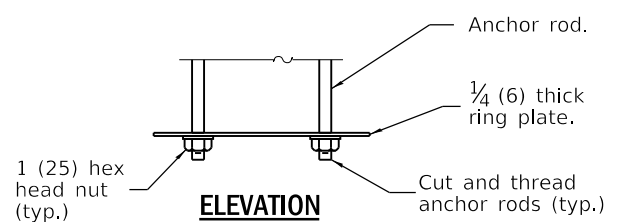
FOUNDATION TABLE				
LIGHT POLE MOUNTING HEIGHT	SHAFT DIAMETER	SHAFT DEPTH	ANCHOR ROD LENGTH	ANCHOR ROD CIRCLE DIA.
≤30' (9.1 m)	24 (610)	36 (914)	6'-2" (1.88 m)	11½ (292)
31'-35' (9.4 m - 10.7 m)	24 (610)	3'-6" (1.06 m)	6'-8" (2.03 m)	11½ (292)
36'-40' (10.9 m - 12.2 m)	30 (762)	4'-0" (1.22 m)	7'-2" (2.18 m)	15 (381)
41'-45' (12.5 m - 13.7 m)	30 (762)	4'-6" (1.37 m)	7'-8" (2.34 m)	15 (381)
46'-50' (14.0 m - 15.2 m)	30 (762)	5'-0" (1.52 m)	8'-2" (2.49 m)	15 (381)



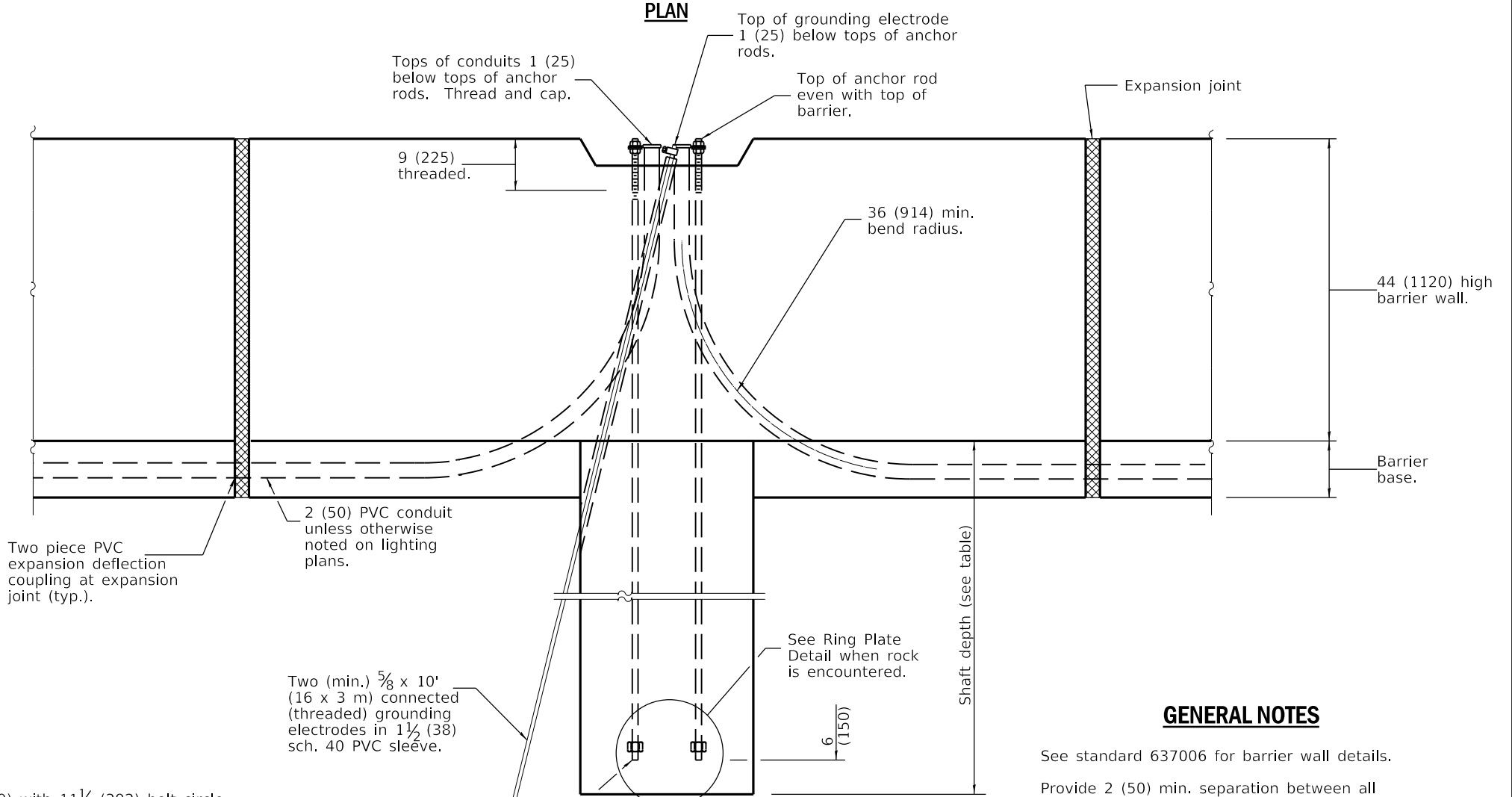
**JUNCTION BOX ELEVATION**



**PLAN**



**RING PLATE DETAIL ELEVATION**



**ELEVATION**

**LIGHT POLE FOUNDATION**

**GENERAL NOTES**

See standard 637006 for barrier wall details.

Provide 2 (50) min. separation between all conduits.

When rock is encountered the foundation depth may be reduced 6 (150) for every 12 (300) of embedment in rock. The minimum foundation depth shall be 30 (760) with cut anchor rods 6 (150) above bottom of excavated hole. See ring plate detail.

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

Illinois Department of Transportation

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ME Deppetto  
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019

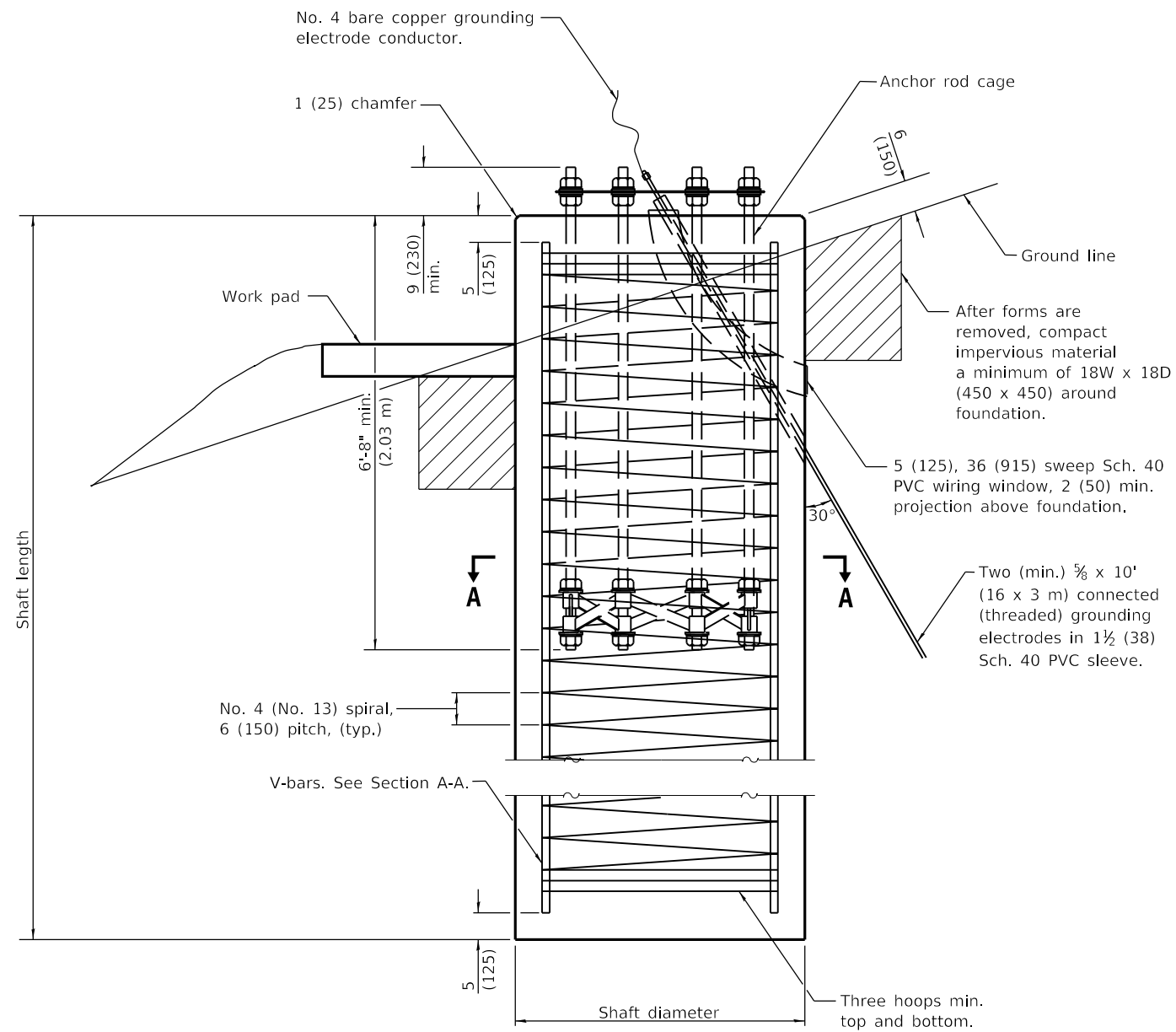
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

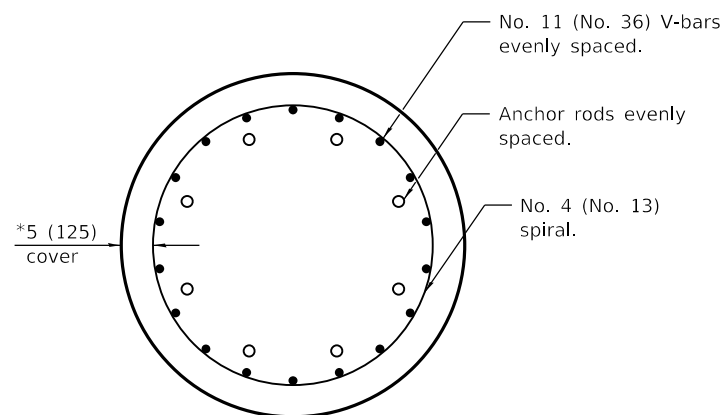
DATE	REVISIONS
1-1-19	Revised standard for new constant slope median barrier.
	Renamed standard.
1-1-14	Modified grounding meathod.
	Revised general notes.

**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 Qu in tsf (Qu in kPa)	LIGHT TOWER HEIGHT									
		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.

DATE	REVISIONS
1-1-20	Revised min. anchor rod diameters.
1-1-15	Added 6'-8" min. anchor rod embedment in foundation.
1-1-14	Revised diameter of grounding electrode sleeve.

**LIGHT TOWER  
FOUNDATION**

(Sheet 1 of 2)

**STANDARD 837001-05**

Illinois Department of Transportation

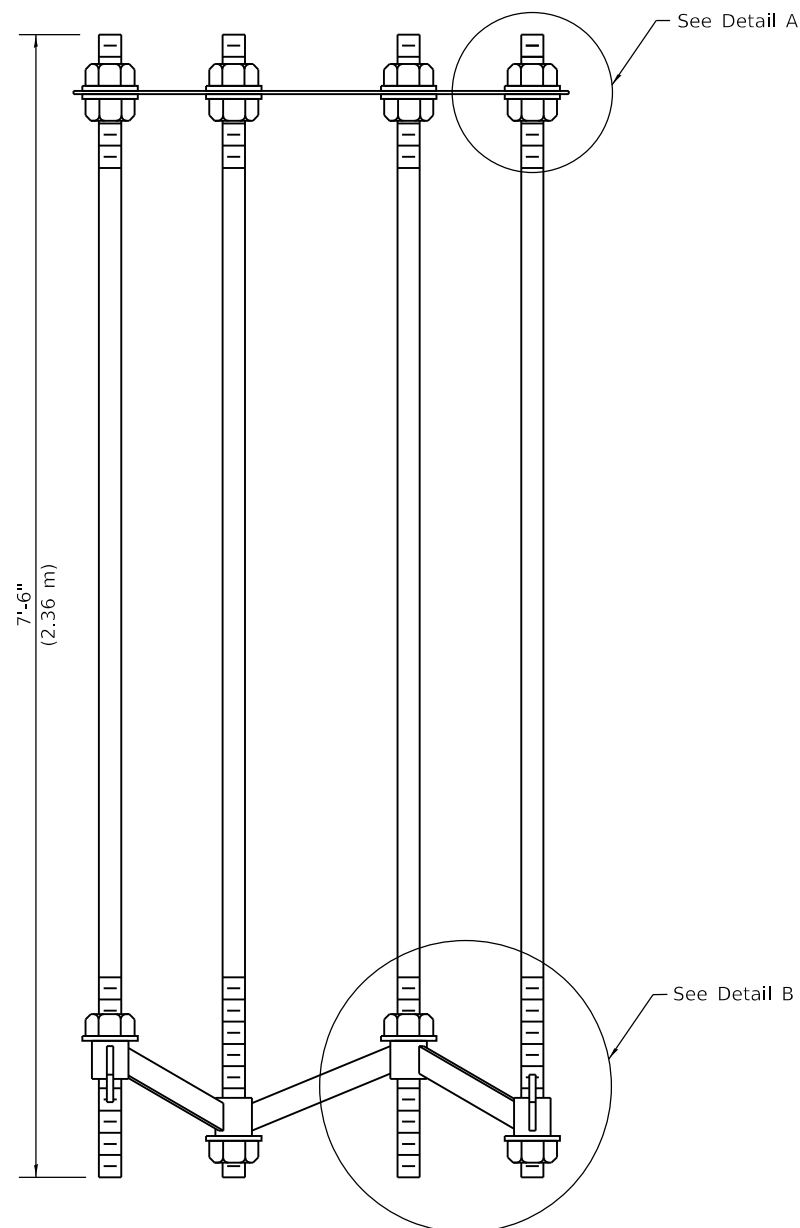
APPROVED January 1, 2020  
*ME Reppelt*  
 ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2020  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

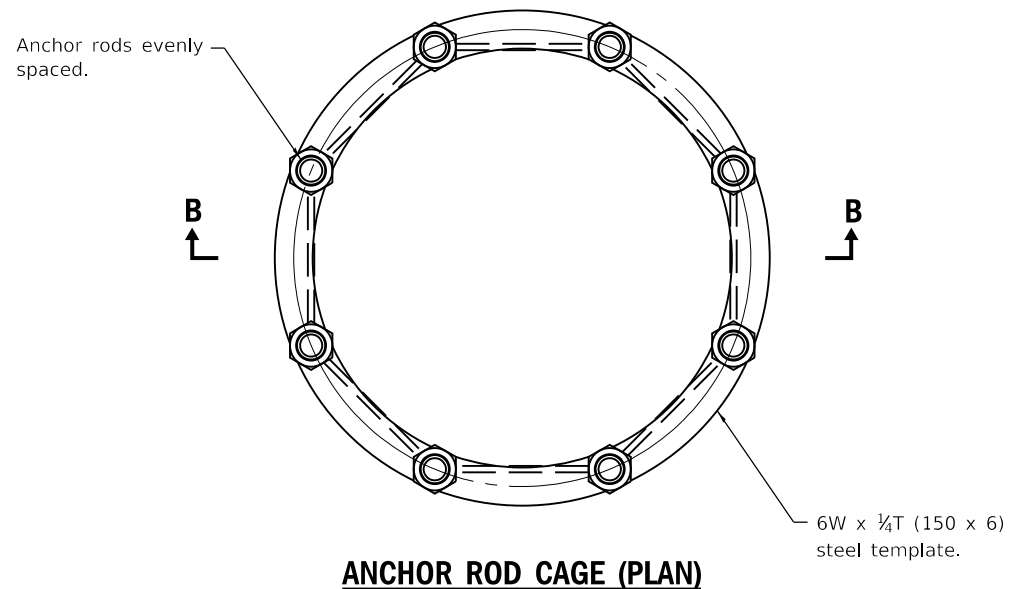
ISSUED 1-1-10

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)	2½ (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

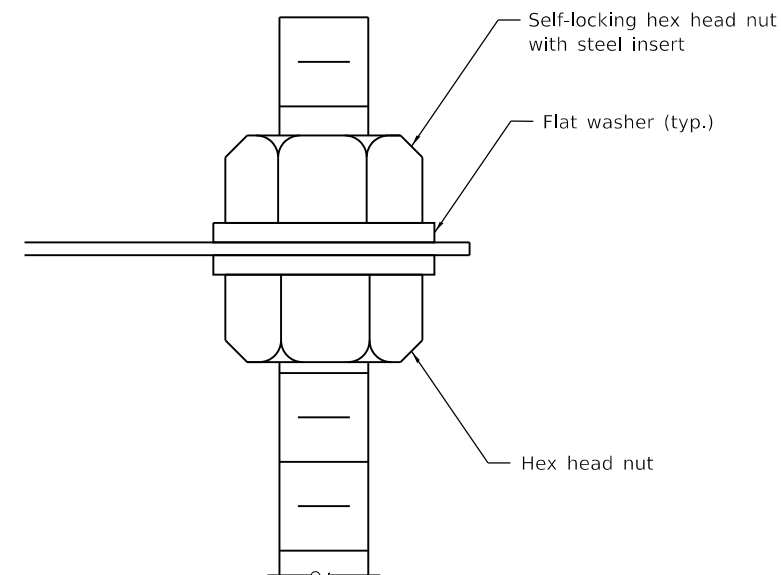
① Diameter based on a 5 (125) conc. cover. The min. cover shall be 3 (75) in dry shaft excavation and 4 (100) in a wet hole. When rock is encountered a 5 (125) cover against soil and a 2 (50) cover against rock shall be required.



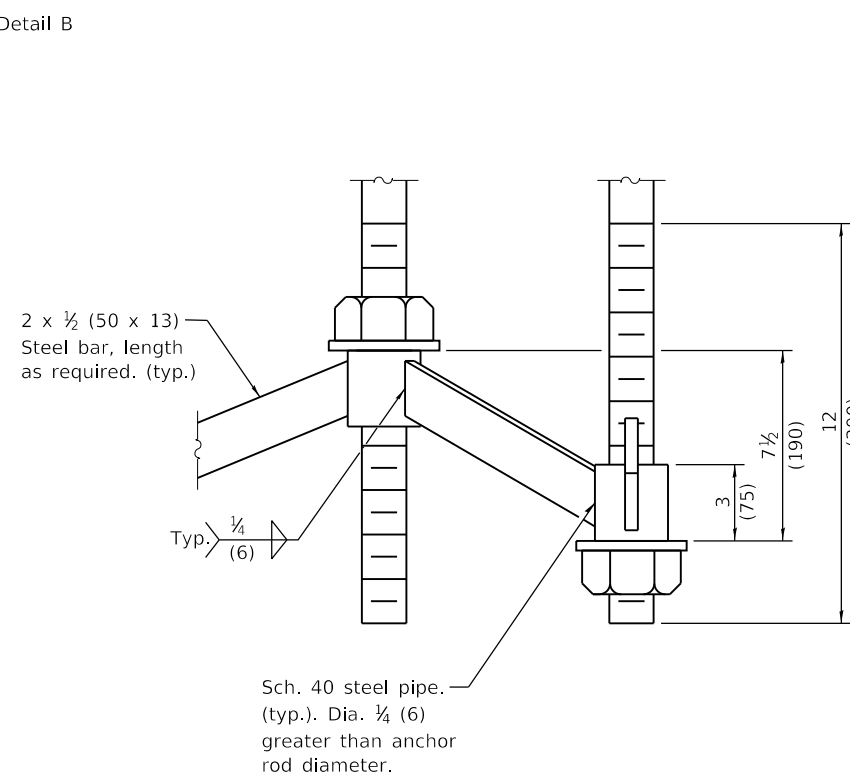
**SECTION B-B**



**ANCHOR ROD CAGE (PLAN)**



**DETAIL A**



**DETAIL B**

**GENERAL NOTES**

The shaft length(s) are based on soil borings in the plans. If different soils are encountered, the engineer shall be notified to provide a revised length.

Anchor rod quantity, diameter, and length shall be determined by the tower manufacturer and approved by the Engineer. Each foundation shall have a minimum of 8 anchor rods.

All foundation reinforcement steel shall be epoxy coated.

The cost of reinforcement shall be included in the cost of the foundation.

Steel anchor rod forms shall not be removed for a minimum of 3 days after concrete is poured. The tower shall not be set for a minimum of 7 days or as approved by the Engineer.

Coordinate the rod circle diameter of the tower with the diameter of the anchor rod cage.

The foundation shall be poured monolithically and shall have no construction joints.

Grounding electrodes shall be installed in an access well when there is a conflict in using the method shown.

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

**LIGHT TOWER FOUNDATION**

(Sheet 2 of 2)

**STANDARD 837001-05**

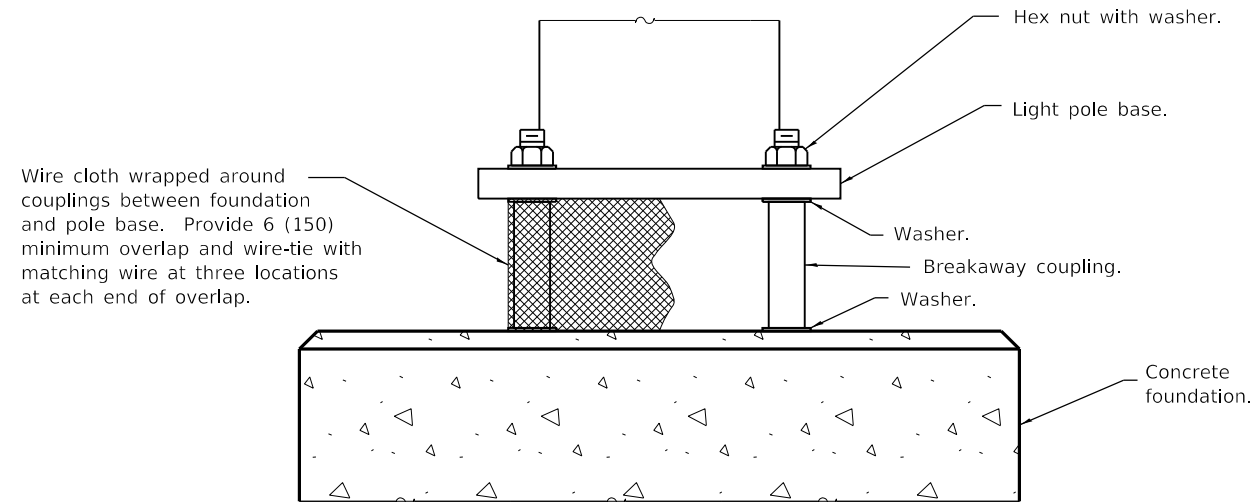
Illinois Department of Transportation

APPROVED January 1, 2020  
*ME Reppelt*  
 ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2020  
*J. E. ...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

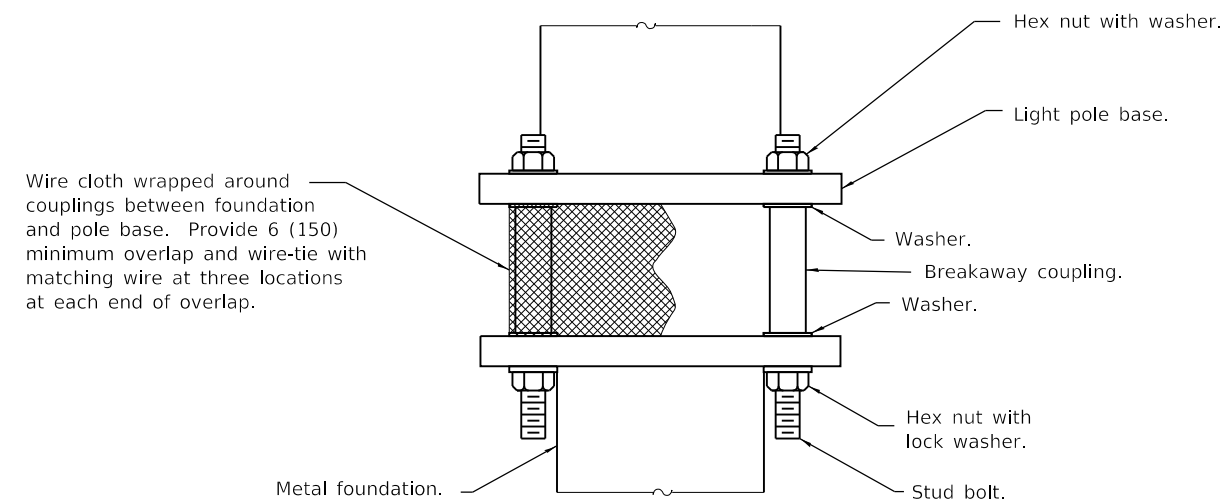
ISSUED 1-1-10





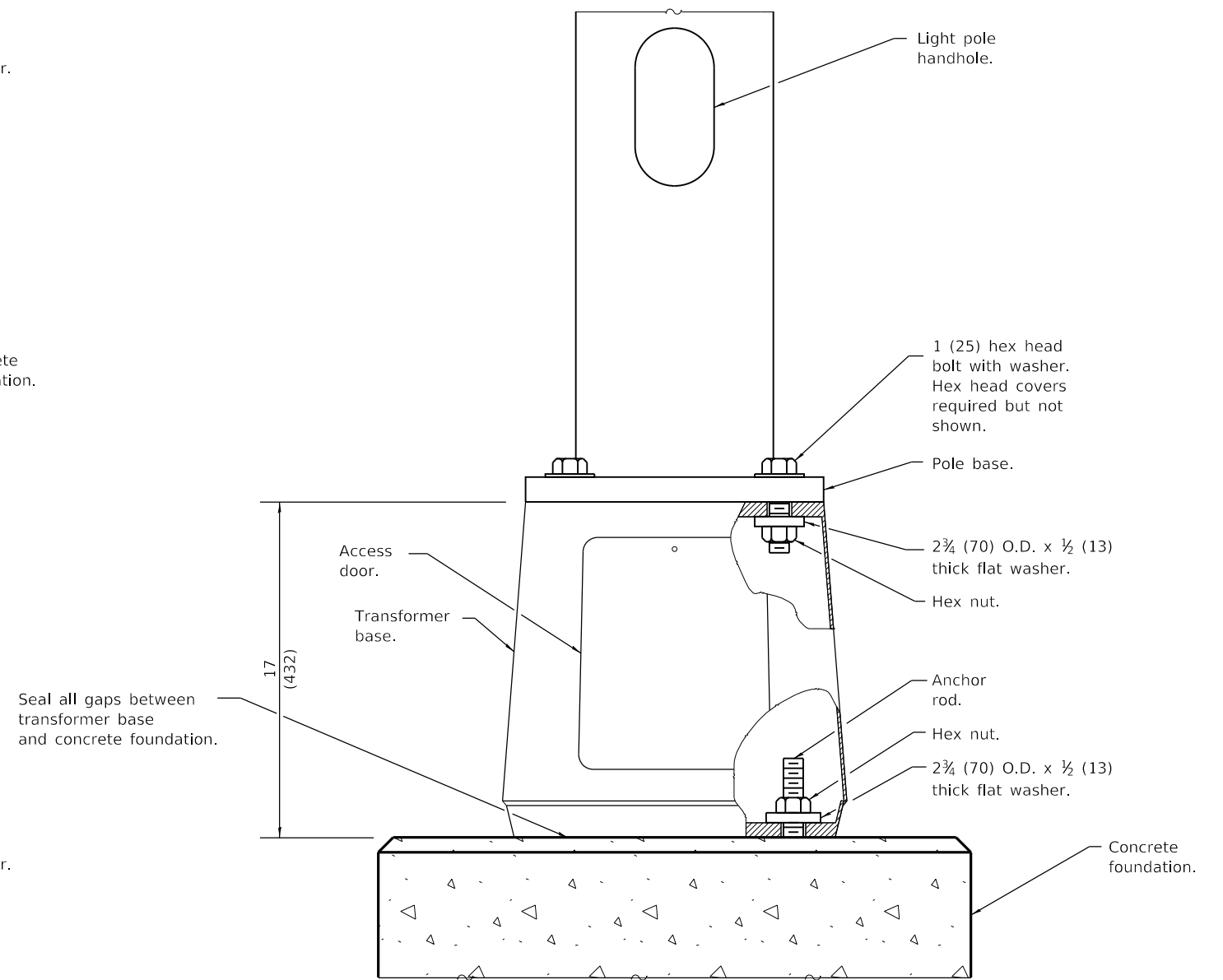
**BREAKAWAY COUPLINGS ON CONCRETE  
FOUNDATION FOR STEEL LIGHT POLE**

(Provide pole base skirt around wire cloth when required.)



**BREAKAWAY COUPLINGS ON METAL  
FOUNDATION FOR STEEL POLE**

(Provide pole base skirt around wire cloth when required.)



**BREAKAWAY TRANSFORMER BASE FOR  
STEEL OR ALUMINUM POLE**

(Steel pole shown)

See Sheet 2 for GENERAL NOTES.

Illinois Department of Transportation

PASSED January 1, 2018  
*[Signature]*  
 ENGINEER OF PRELIMINARY ENGINEERING

APPROVED January 1, 2018  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

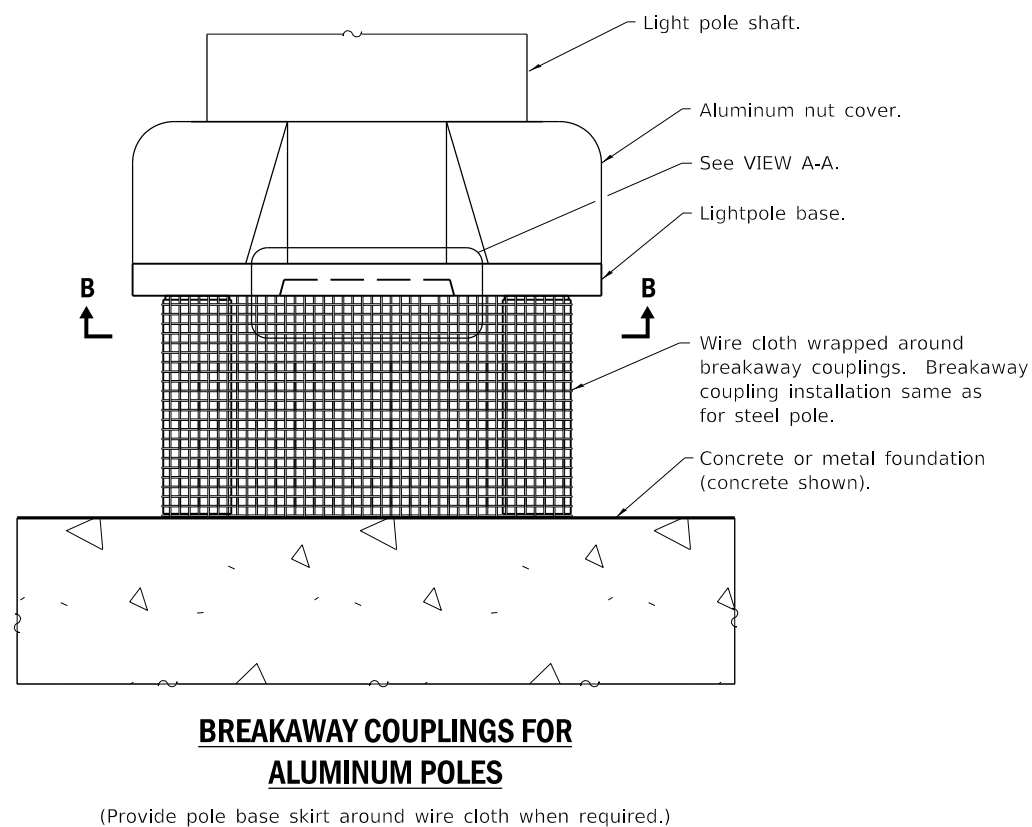
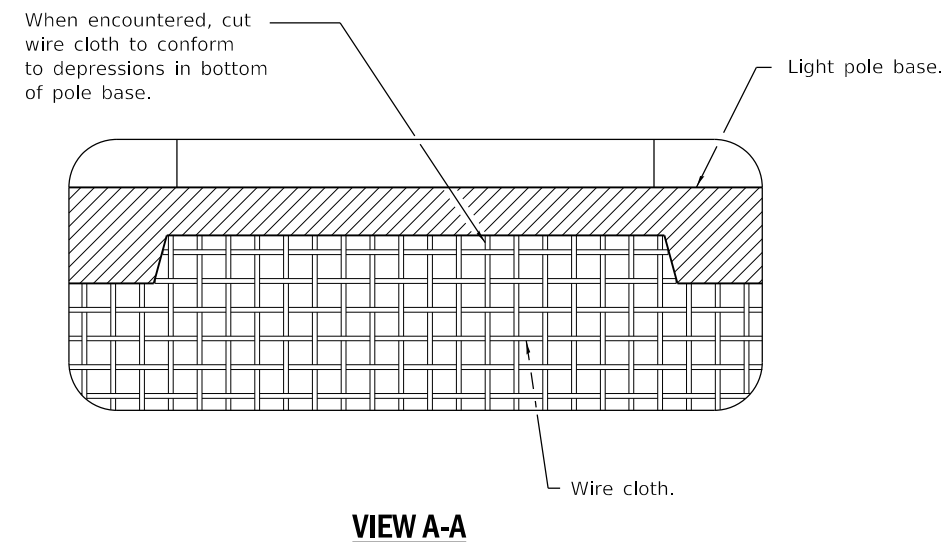
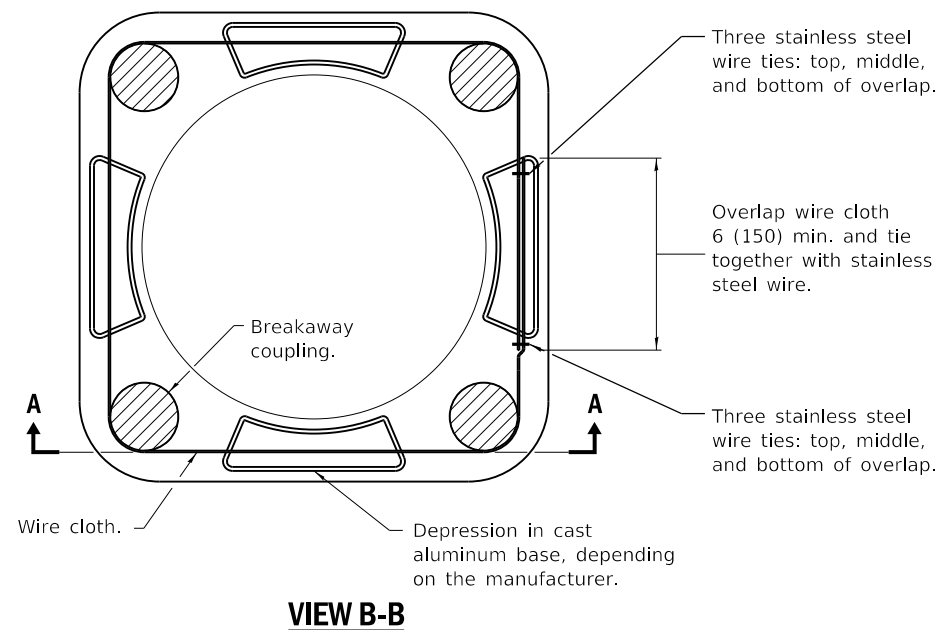
ISSUED 1-1-12

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**



**GENERAL NOTES**

See light pole standard for details not shown.

Use largest transformer base bolt circle possible.

Transformer bases shall not be installed on metal foundations.

Washers on top of pole base shall cover the entire bolt slot.

See Standard 836001 for Light Pole Foundation.

Wire cloth shall be stainless steel, have a maximum opening of  $\frac{1}{4}$  (6), and have a minimum wire size of AWG No. 16 (1.6).

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

Illinois Department of Transportation

PASSED January 1, 2018  
*[Signature]*  
 ENGINEER OF PRELIMINARY ENGINEERING

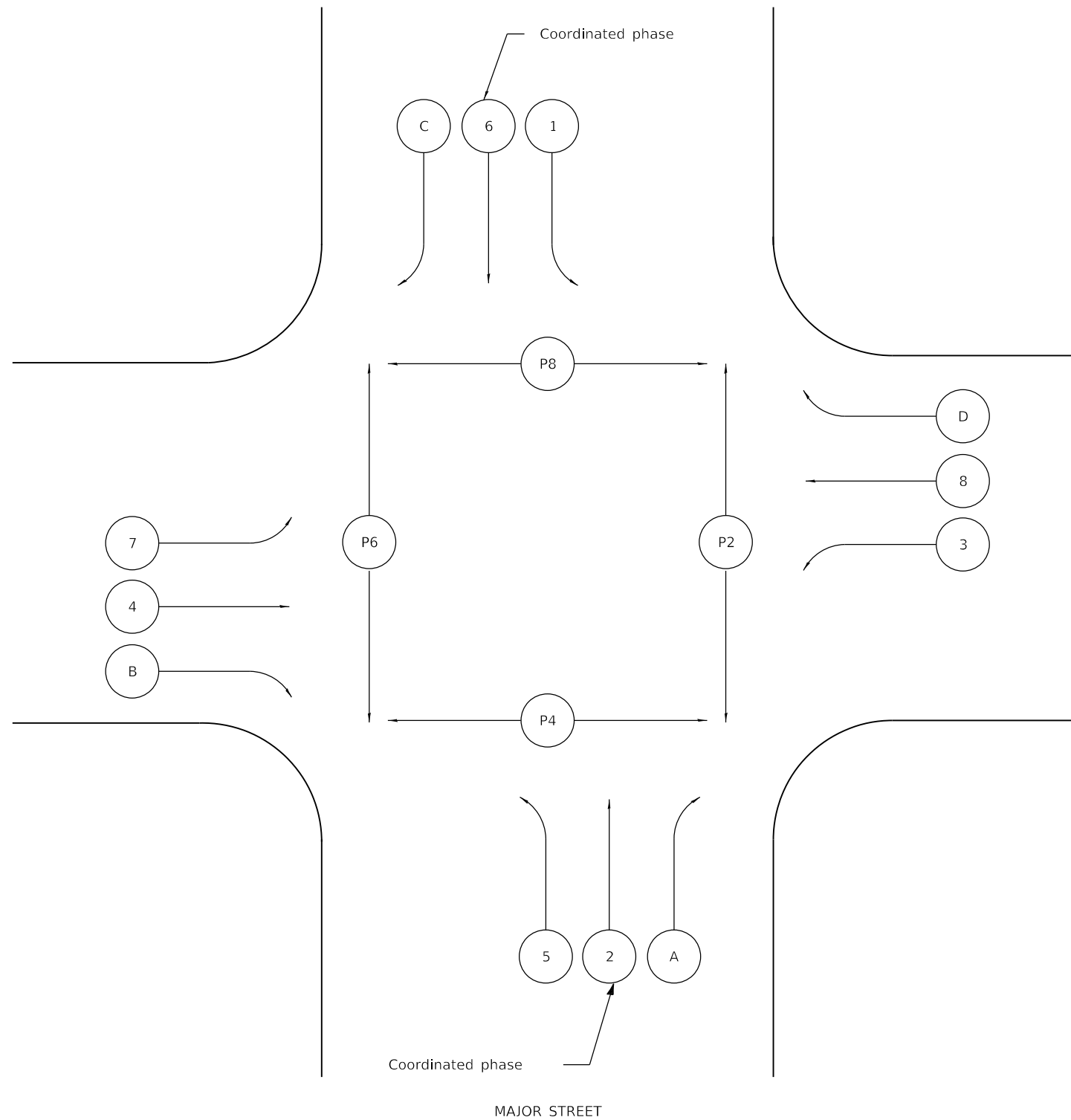
ISSUED 1-1-12

APPROVED January 1, 2018  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

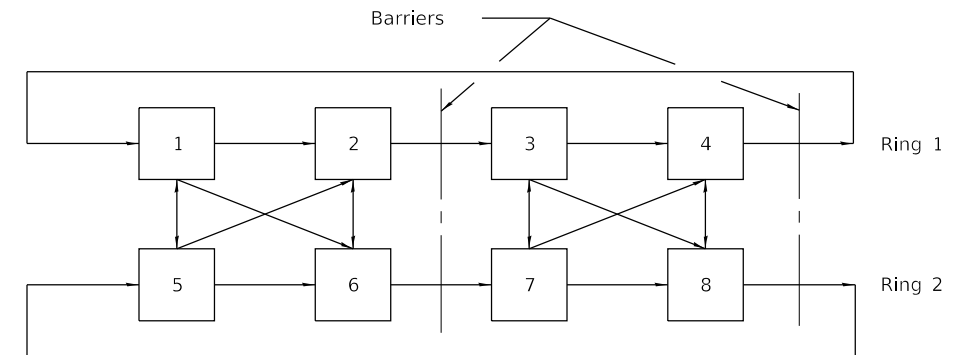
**BREAKAWAY DEVICES**

(Sheet 2 of 2)

**STANDARD 838001-01**



**STANDARD PHASE DESIGNATION DIAGRAM (NEMA)**



**NEMA EIGHT PHASE DUAL RING  
ACTUATED CONFIGURATION**

**LEGEND**

- (X), [X] Vehicular phase no. x
- (PX) Pedestrian phase no. x
- (A), (B), (C), (D) Right turn overlaps where:
  - (A) = (2) + (3)
  - (B) = (4) + (5)
  - (C) = (6) + (7)
  - (D) = (8) + (1)
- NEMA National Electrical Manufacturers Association

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

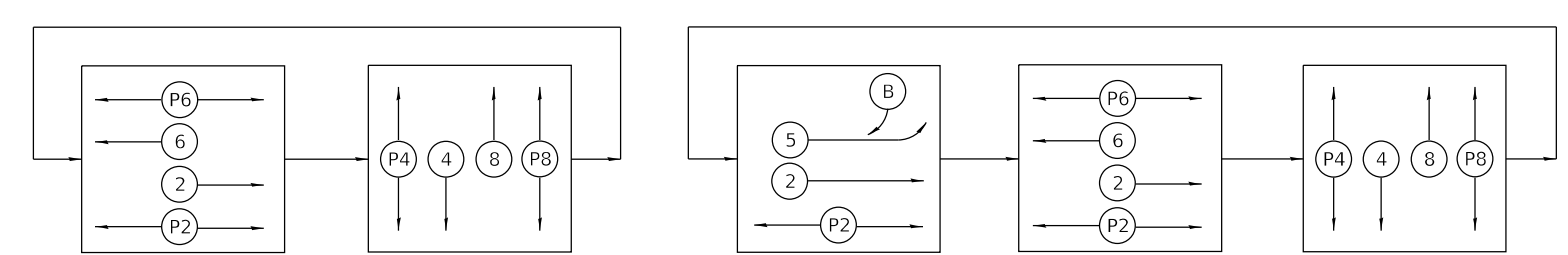
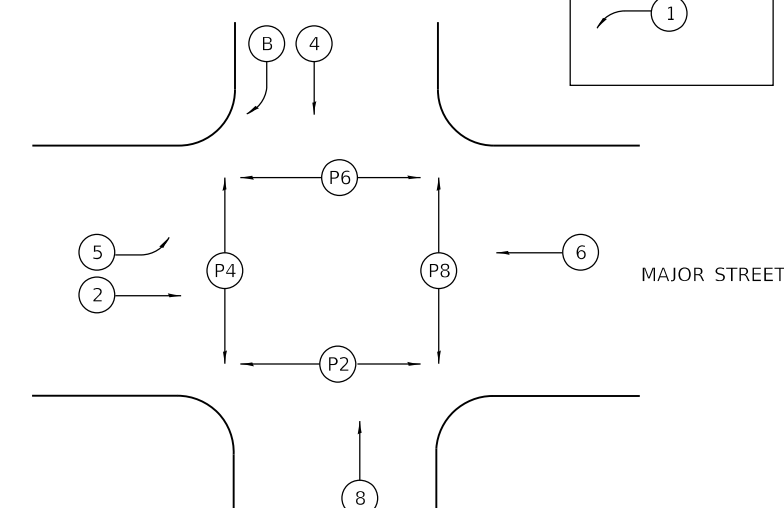
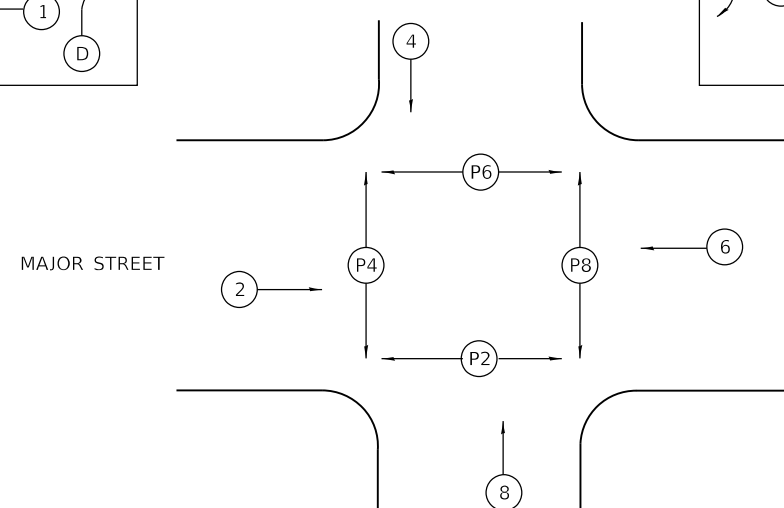
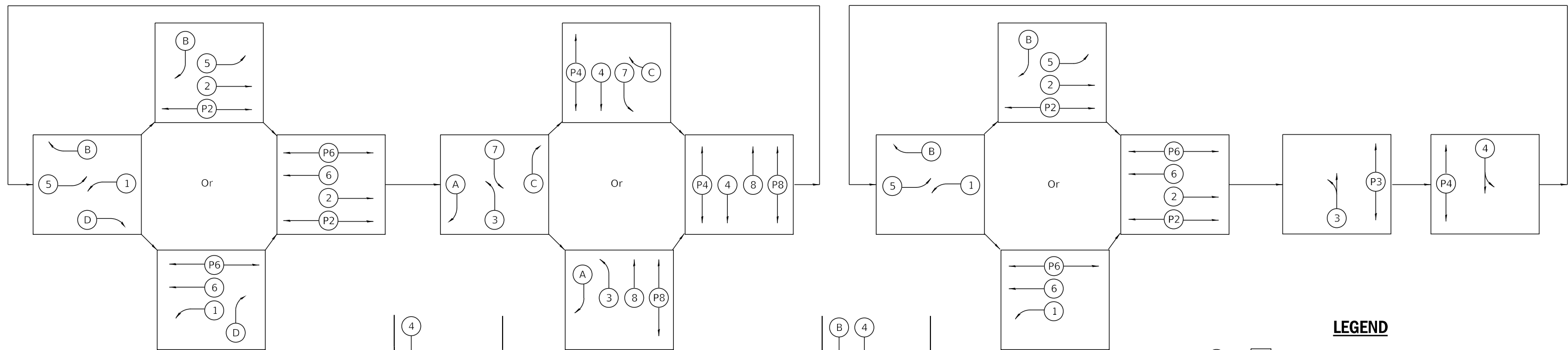
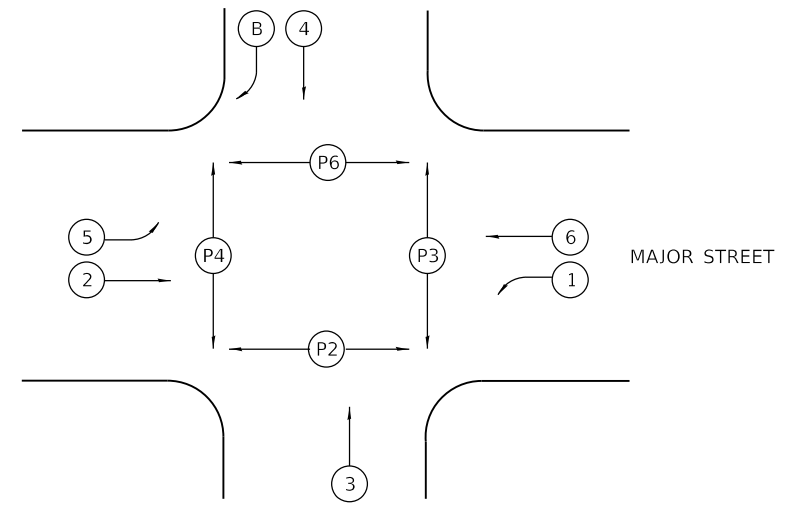
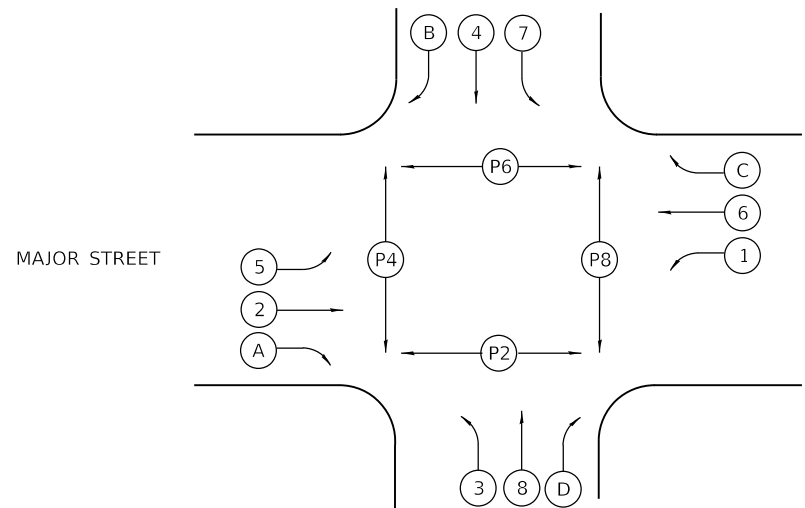
ISSUED 1-1-97

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**

(Sheet 1 of 2)

**STANDARD 857001-01**



- LEGEND**
- (X), [X] Vehicular phase no. x
  - (PX) Pedestrian phase no. x
  - (A), (B), (C), (D) Right turn overlaps where:
    - A = 2 + 3
    - B = 4 + 5
    - C = 6 + 7
    - D = 8 + 1
  - NEMA National Electrical Manufacturers Association

**PHASE DESIGNATION DIAGRAMS AND CORRESPONDING PHASE SEQUENCES**

Illinois Department of Transportation

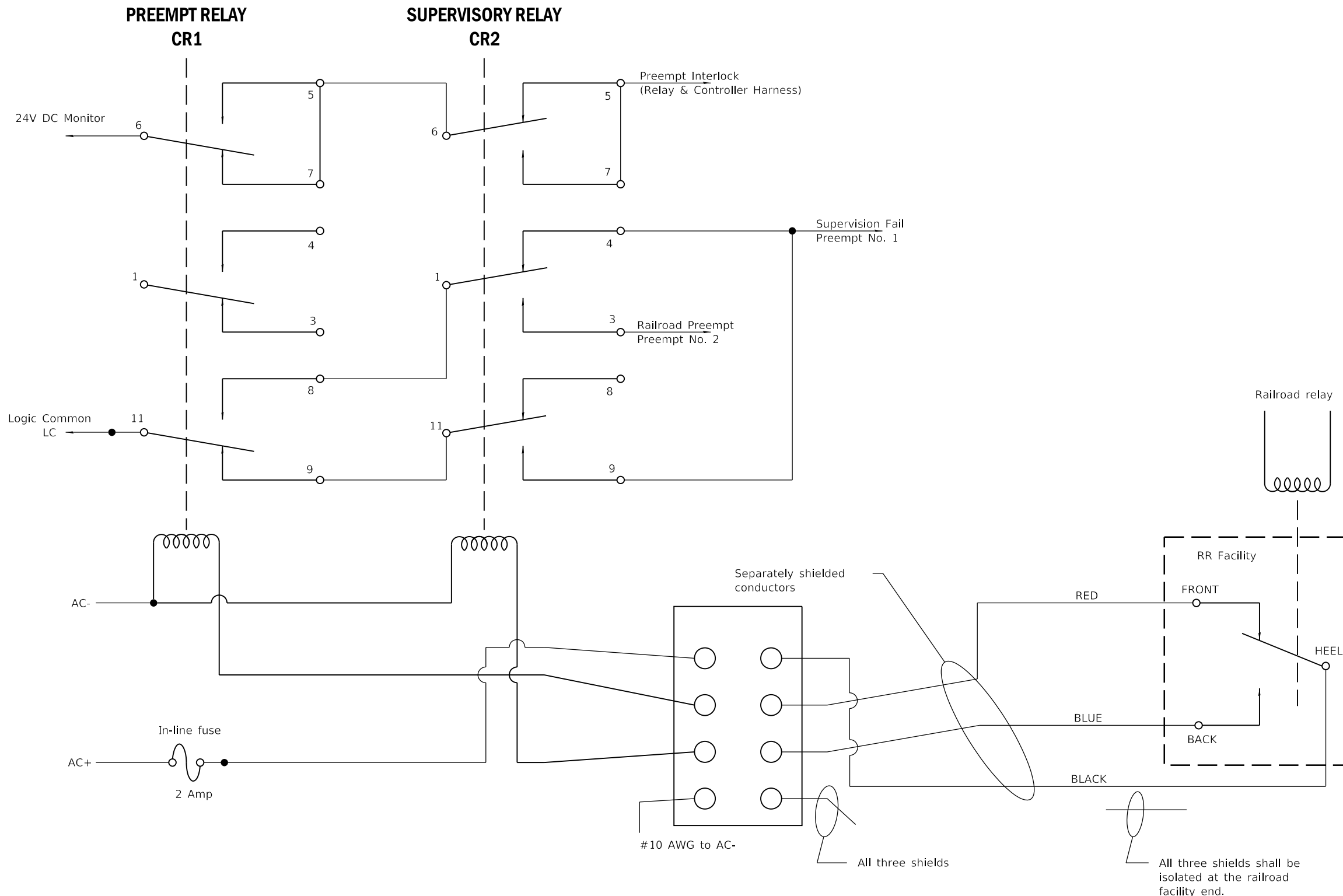
PASSED January 1, 2009  
 ENGINEER OF OPERATIONS

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.

DATE	REVISIONS
1-1-09	Omitted note regarding units of length.
1-1-04	New Standard.

**SUPERVISED RAILROAD INTERCONNECT CIRCUIT**

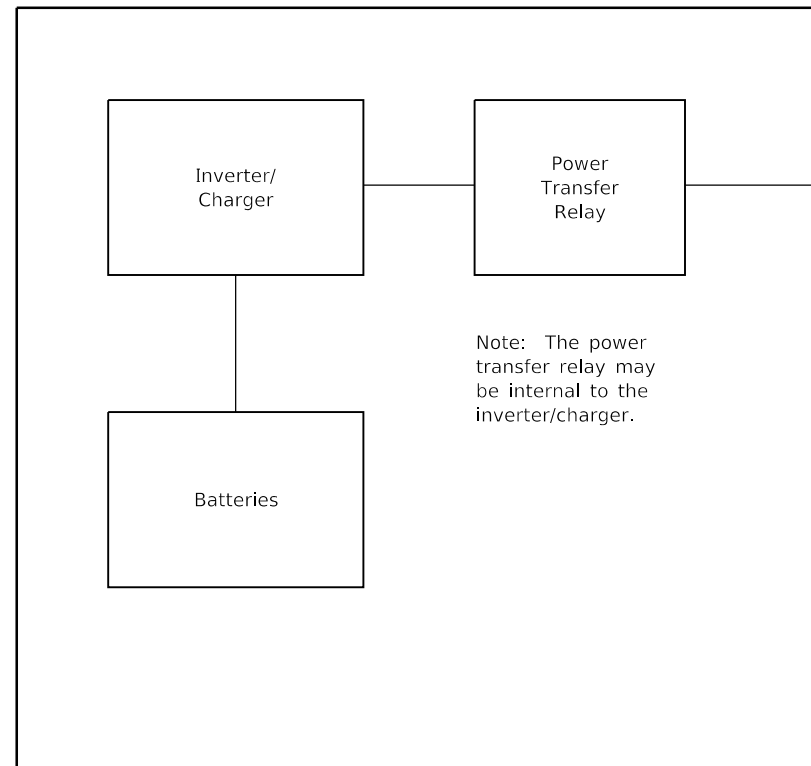
**STANDARD 857006-01**

Illinois Department of Transportation

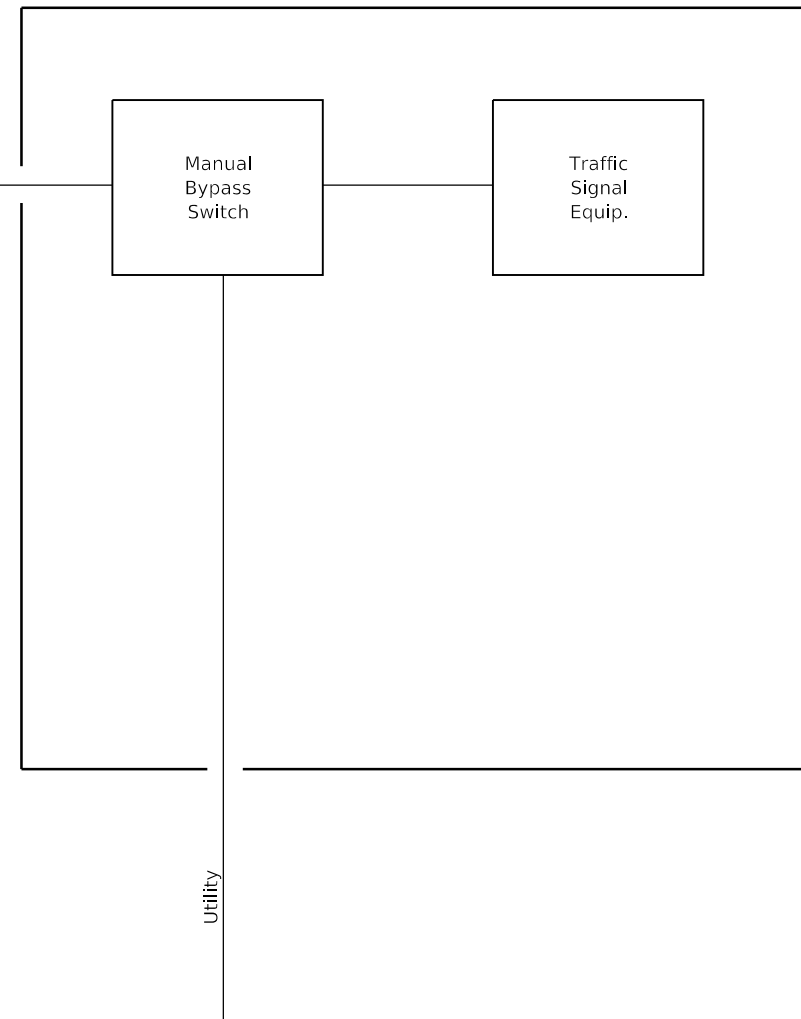
PASSED January 1, 2009  
 ENGINEER OF OPERATIONS  
 APPROVED January 1, 2009  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-04

**UPS CABINET**



**TRAFFIC SIGNAL (NEMA) CABINET**



**SINGLE LINE BLOCK DIAGRAM**

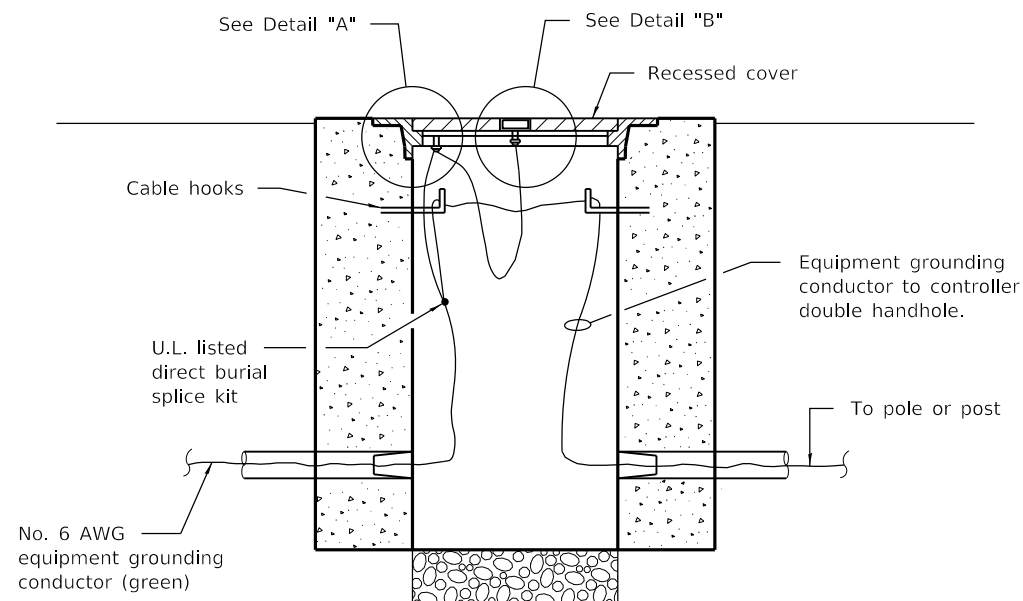
Illinois Department of Transportation  
 PASSED January 1, 2009  
 ENGINEER OF OPERATIONS  
 APPROVED January 1, 2009  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-06

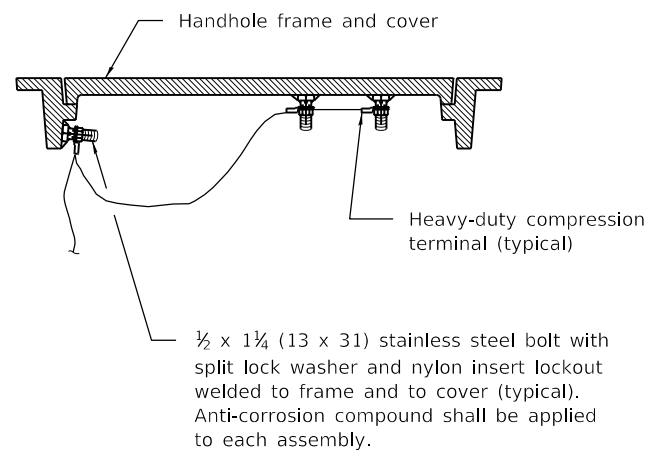
DATE	REVISIONS
1-1-09	Omitted note regarding units of length.
4-1-06	New Standard

**UNINTERRUPTABLE  
POWER SUPPLY (UPS)**

**STANDARD 862001-01**



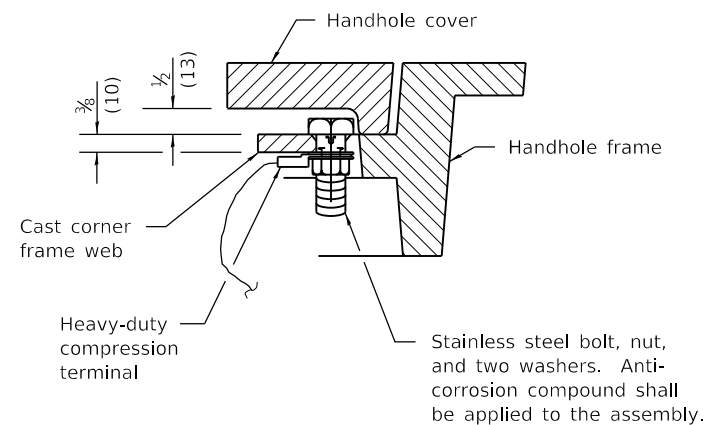
**BONDING A HANDHOLE COVER & FRAME**



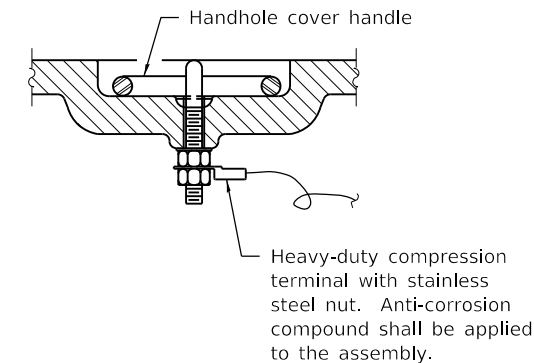
**BONDING AN EXISTING HANDHOLE COVER & FRAME**



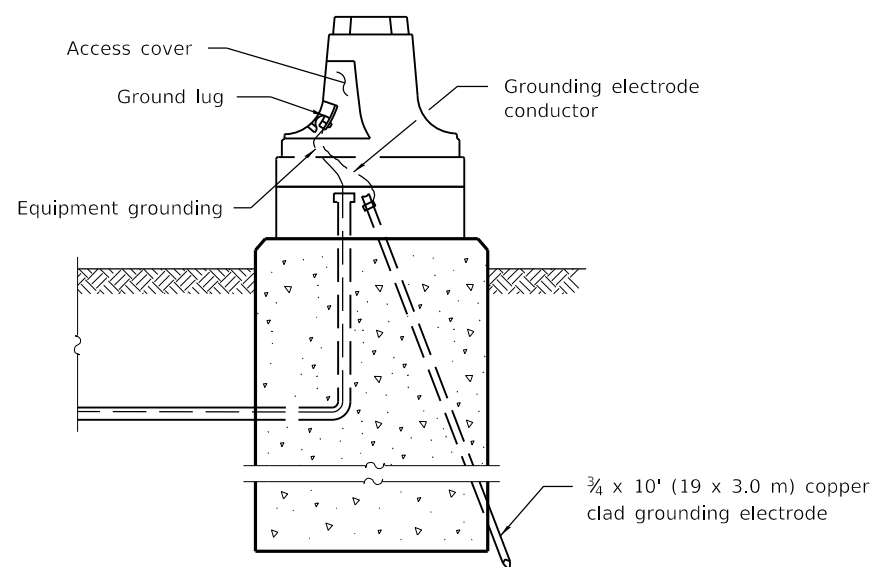
**HEAVY-DUTY COMPRESSION TERMINAL**



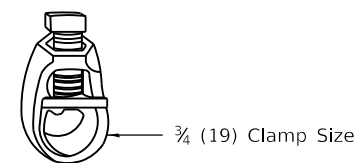
**DETAIL "A"**



**DETAIL "B"**



**GROUNDING A MAST ARM POLE/POST**



**HEAVY-DUTY GROUND ROD CLAMP**

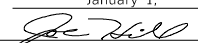
All dimensions are in inches (millimeters) unless otherwise shown.

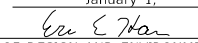
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Revised terminology.

**TRAFFIC SIGNAL  
GROUNDING & BONDING**

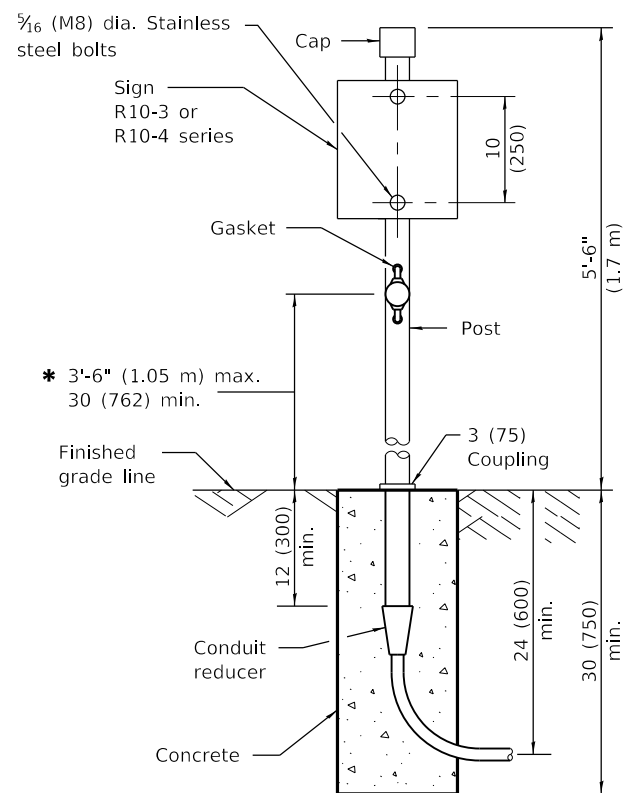
**STANDARD 873001-02**

Illinois Department of Transportation

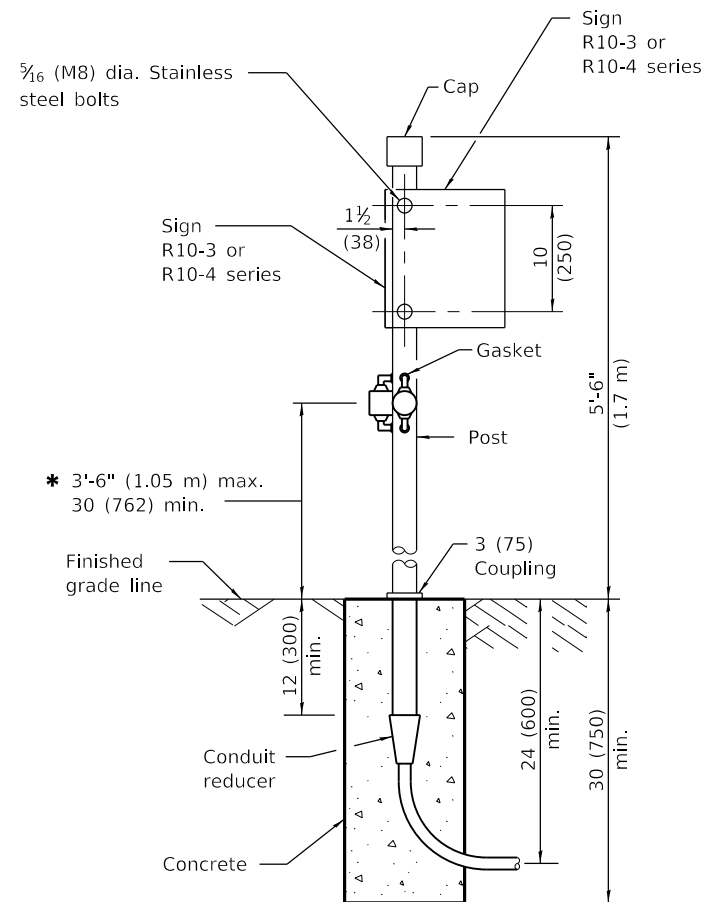
PASSED January 1, 2009  
  
 ENGINEER OF OPERATIONS

APPROVED January 1, 2009  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

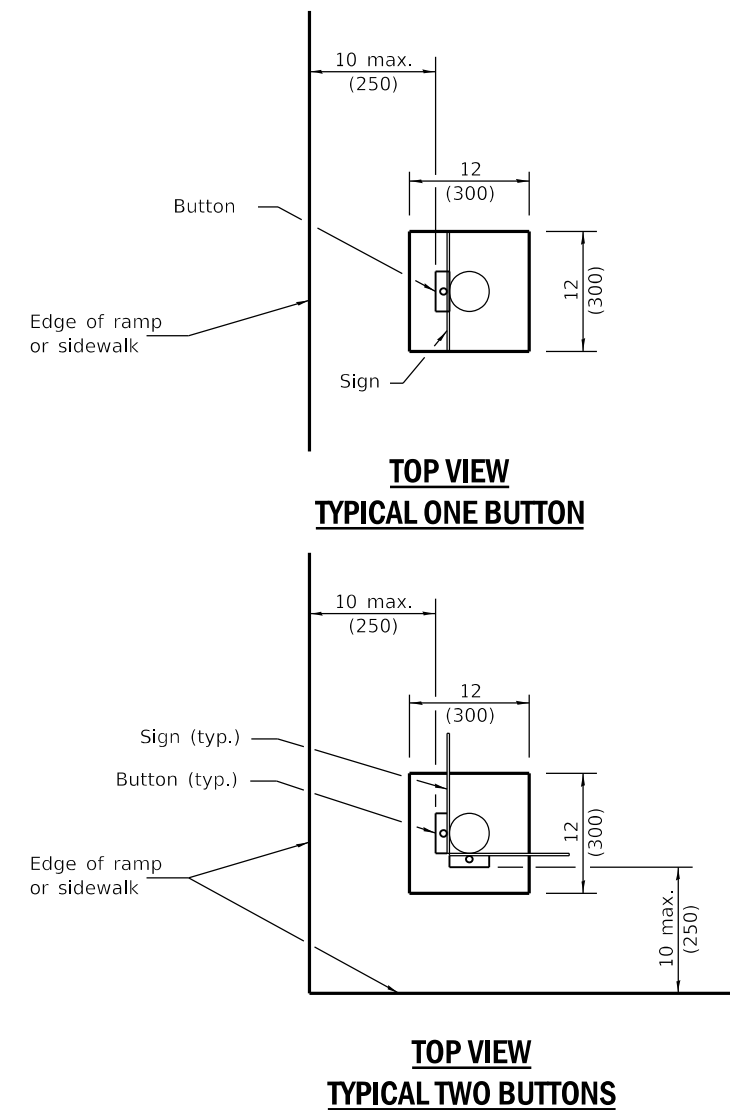
ISSUED 4-1-06



**PEDESTRIAN ONE PUSH BUTTON POST**



**PEDESTRIAN TWO PUSH BUTTON POST**



\* 36 (914) preferred

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

Illinois Department of Transportation

PASSED April 1, 2016

*Amy Allen*  
ENGINEER OF OPERATIONS

APPROVED April 1, 2016

*[Signature]*  
ENGINEER OF DESIGN AND ENVIRONMENT

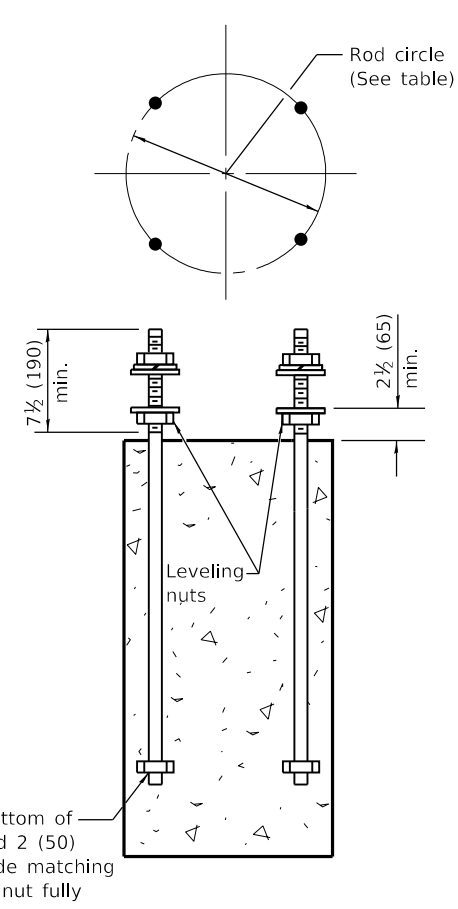
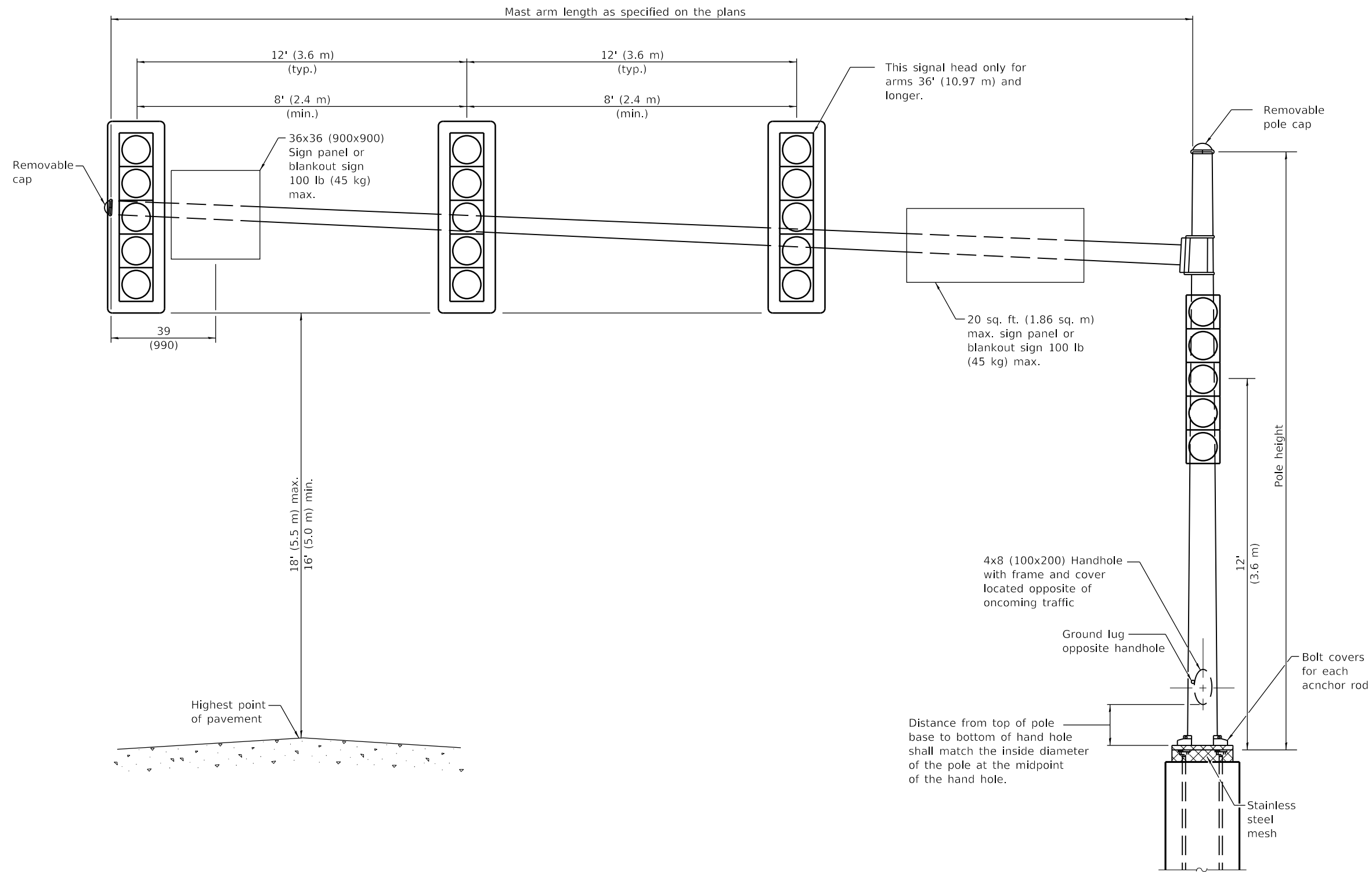
ISSUED 1-1-07

DATE	REVISIONS
4-1-16	Revised sign numbers for consistency with current MUTCD.
1-1-14	Revised and added dimensions for PROWAG reach range requirements.

**PEDESTRIAN PUSH BUTTON POST**

**STANDARD 876001-04**





**ANCHOR ROD DETAIL**

**GENERAL NOTES**

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panel or blankout sign closest to pole.

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

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
16' thru 40' (4.87 m thru 12.20 m)	18 (450)	1 3/4 x 7' (44 x 2.10 m)
42' thru 55' (12.80 m thru 16.80 m)	21 (535)	1 3/4 x 7' (44 x 2.10 m)

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'**

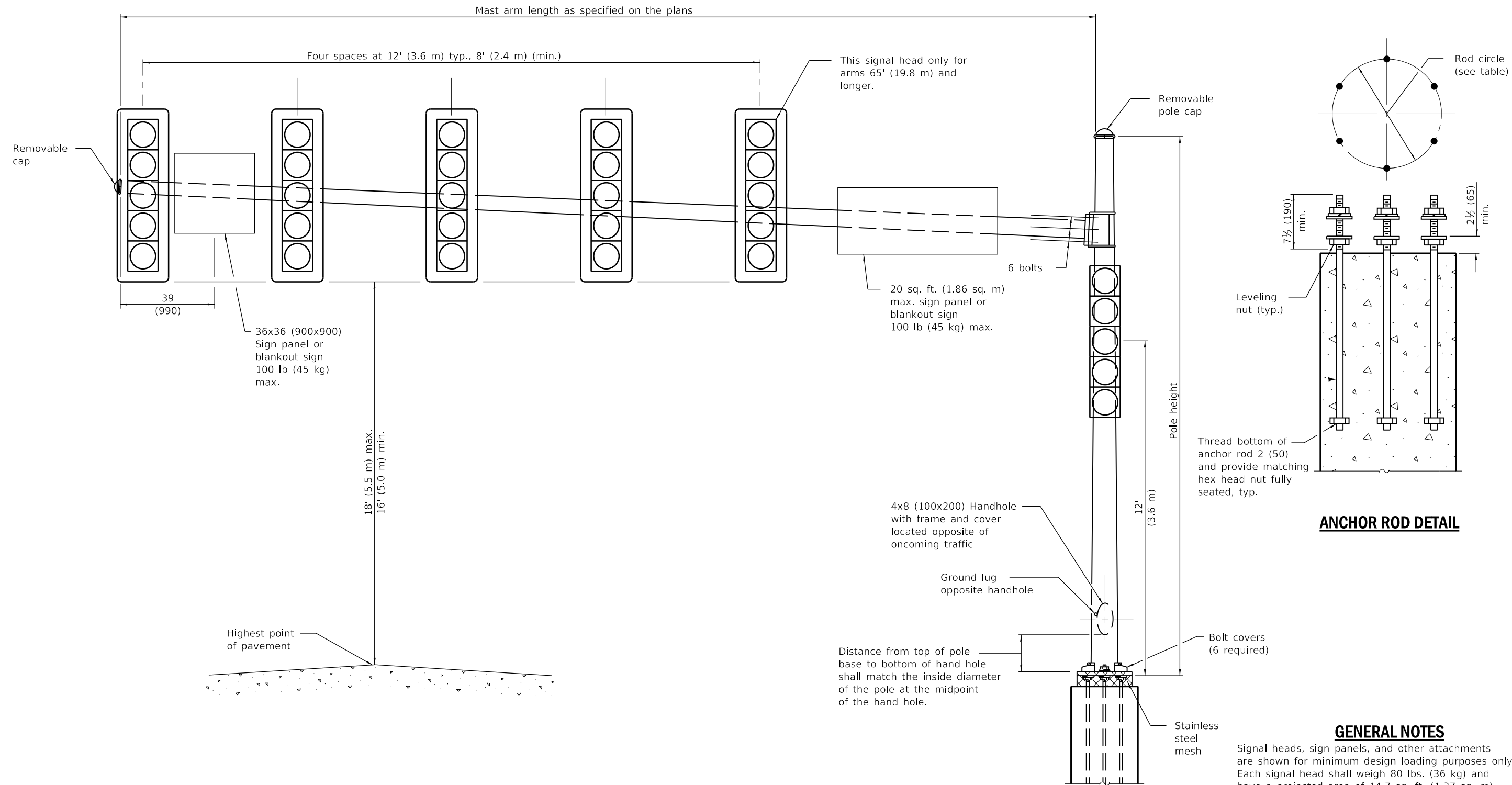
**STANDARD 877001-08**

Illinois Department of Transportation

PASSED January 1, 2020  
*Amy Ellis*  
 ENGINEER OF OPERATIONS

APPROVED January 1, 2020  
*S. E. EG*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02



**ANCHOR ROD DETAIL**

**GENERAL NOTES**

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 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.

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
56' thru 64' (17.07 m thru 19.51 m)	24 (610)	1 3/4 x 7' (44 x 2.10 m)
65' thru 75' (19.81 m thru 22.86 m)	27 (685)	2 x 7'-6" (51 x 2.29 m)

DATE	REVISIONS
1-1-18	Rev. hand hole loc. Rev. Gen. Notes for sign loc.
	Replaced rod hooks with nuts.
4-1-16	Changed sign panel to 36x36 and 100 lb max.

**STEEL MAST ARM ASSEMBLY AND POLE 56' THROUGH 75'**

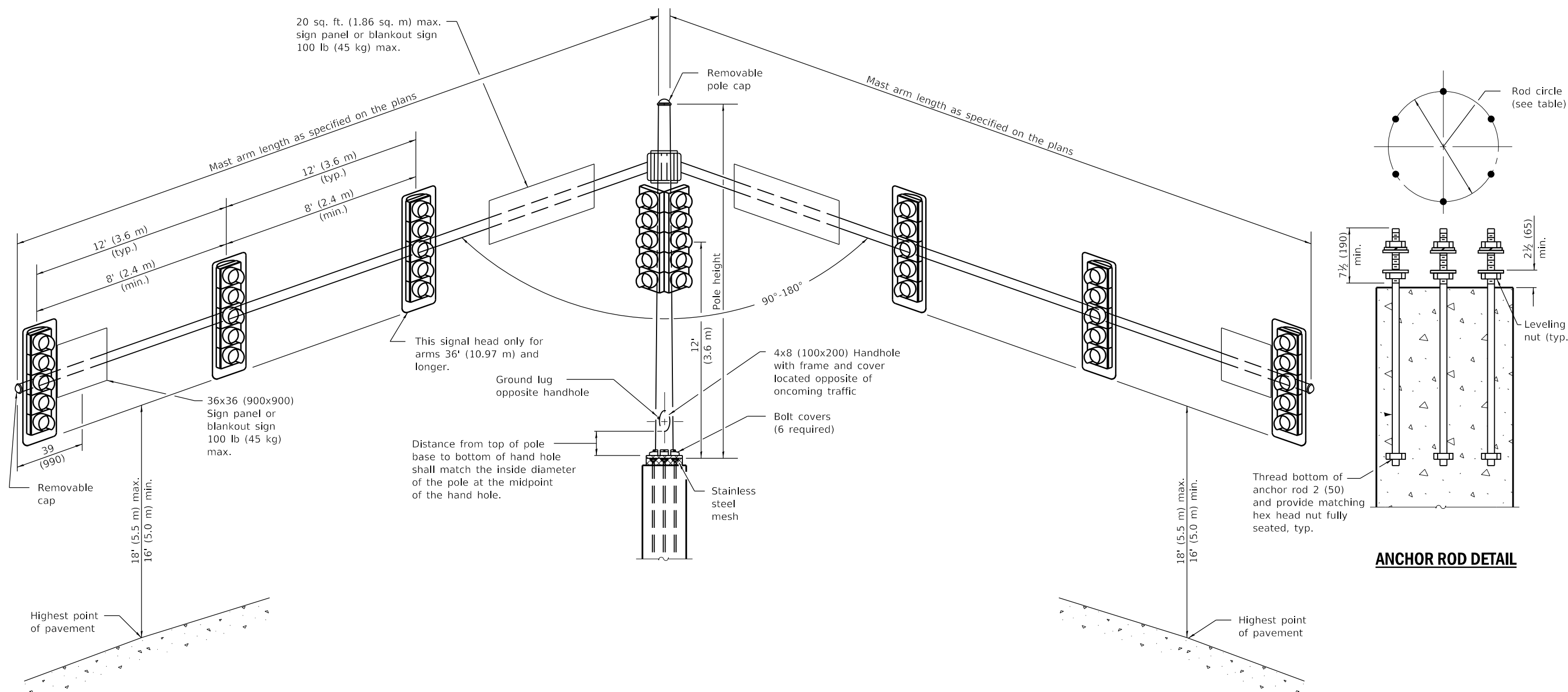
**STANDARD 877002-04**

Illinois Department of Transportation

PASSED January 1, 2018  
*Amy Allen*  
 ENGINEER OF OPERATIONS

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

ISSUED 1-1-08



20 sq. ft. (1.86 sq. m) max.  
sign panel or blankout sign  
100 lb (45 kg) max.

Mast arm length as specified on the plans

Mast arm length as specified on the plans

12' (3.6 m)  
(typ.)

12' (3.6 m)  
(typ.)

8' (2.4 m)  
(min.)

8' (2.4 m)  
(min.)

This signal head only for  
arms 36' (10.97 m) and  
longer.

Ground lug  
opposite handhole

Distance from top of pole  
base to bottom of hand hole  
shall match the inside diameter  
of the pole at the midpoint  
of the hand hole.

Pole height

12'  
(3.6 m)

4x8 (100x200) Handhole  
with frame and cover  
located opposite of  
oncoming traffic

Bolt covers  
(6 required)

Stainless  
steel  
mesh

Removable  
cap

18' (5.5 m) max.  
16' (5.0 m) min.

Highest point  
of pavement

36x36 (900x900)  
Sign panel or  
blankout sign  
100 lb (45 kg)  
max.

39  
(990)

90°-180°

7 1/2 (190)  
min.

Rod circle  
(see table)

2 1/2 (65)  
min.

Leveling  
nut (typ.)

Thread bottom of  
anchor rod 2 (50)  
and provide matching  
hex head nut fully  
seated, typ.

**ANCHOR ROD DETAIL**

Highest point  
of pavement

18' (5.5 m) max.  
16' (5.0 m) min.

**GENERAL NOTES**

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panels or blankout signs closest to pole.

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

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
16' thru 30' (4.87 m thru 9.14 m)	18 (450)	1 3/4 x 7' (44 x 2.10 m)
32' thru 50' (9.75 m thru 15.24 m)	21 (535)	2 x 7'-6" (51 x 2.29 m)

DATE	REVISIONS
1-1-18	Revised for RLFD reqs. Revised GEN. NOTES for sign locaton.
	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**

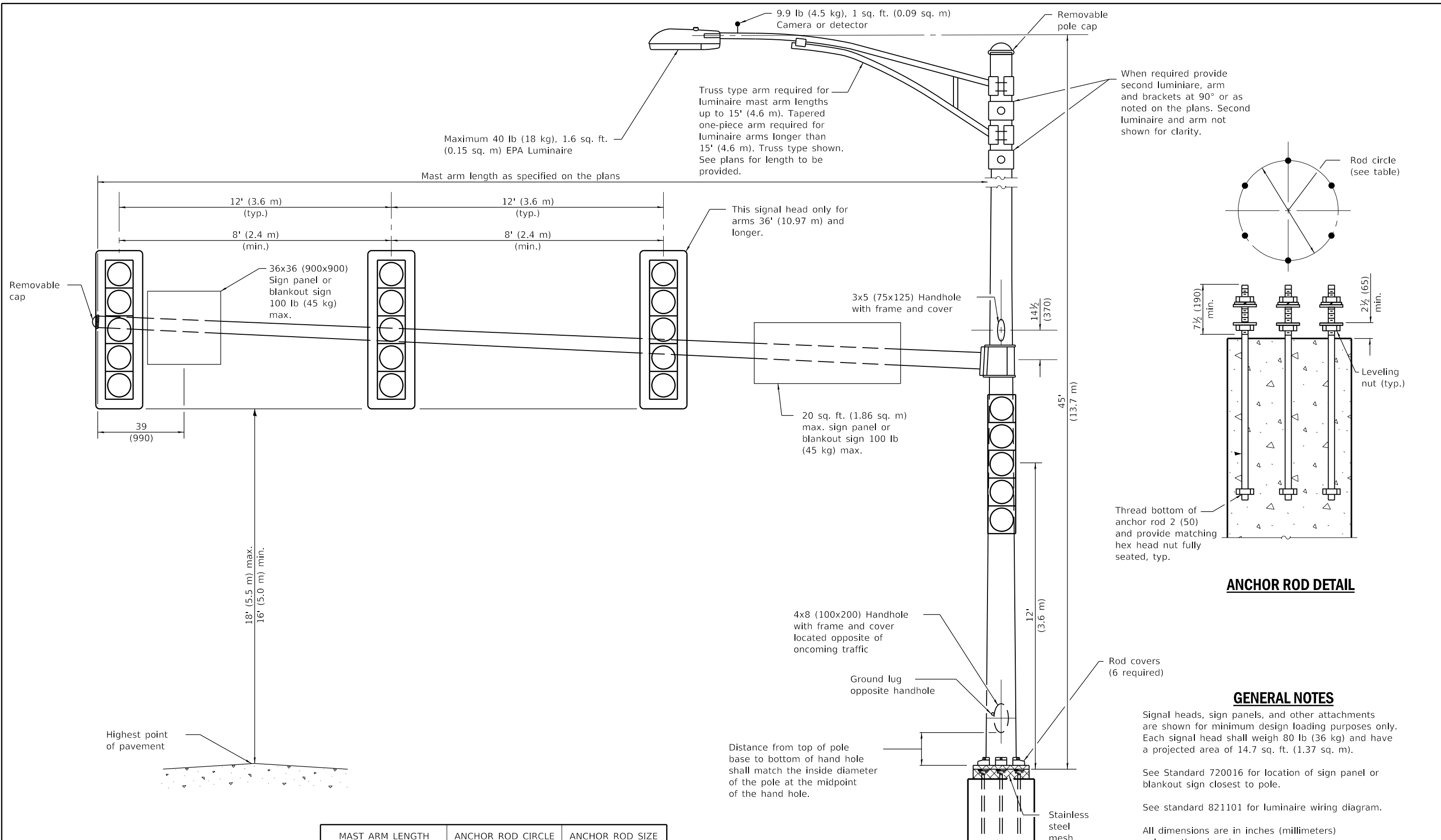
**STANDARD 877006-06**

Illinois Department of Transportation

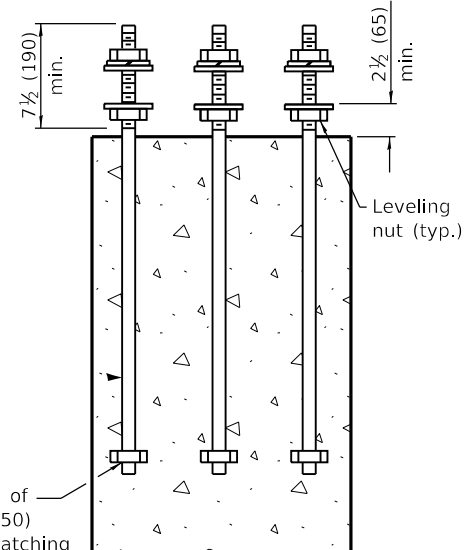
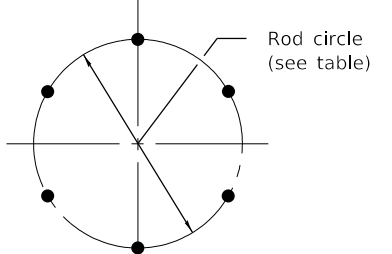
PASSED January 1, 2018  
*Amy Allen*  
ENGINEER OF OPERATIONS

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

ISSUED 1-1-02



When required provide second luminaire, arm and brackets at 90° or as noted on the plans. Second luminaire and arm not shown for clarity.



**ANCHOR ROD DETAIL**

Thread bottom of anchor rod 2 (50) and provide matching hex head nut fully seated, typ.

**GENERAL NOTES**

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).  
 See Standard 720016 for location of sign panel or blankout sign closest to pole.  
 See standard 821101 for luminaire wiring diagram.  
 All dimensions are in inches (millimeters) unless otherwise shown.

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
16' thru 35' (4.87 m thru 10.67 m)	18 (450)	1 3/4 x 7' (44 x 2.10 m)
36' thru 55' (10.97 m thru 16.80 m)	21 (535)	1 3/4 x 7' (44 x 2.10 m)

DATE	REVISIONS
1-1-19	Remove tenon top info.
	Rev. luminaire arm info.
	Rev. second luminaire info.
1-1-18	Revised for LRFD reqs. Revised
	GEN. NOTES for sign locaton.
	Revised ANCHOR ROD DETAIL.

**STEEL COMB. MAST ARM ASSEMBLY AND POLE 16' THROUGH 55'**

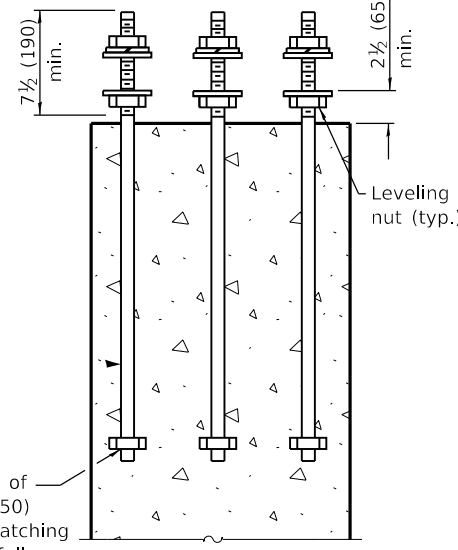
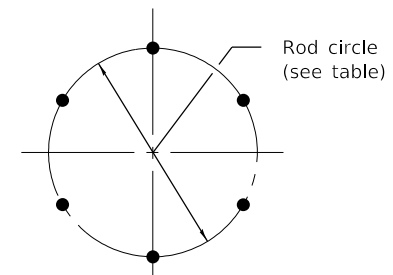
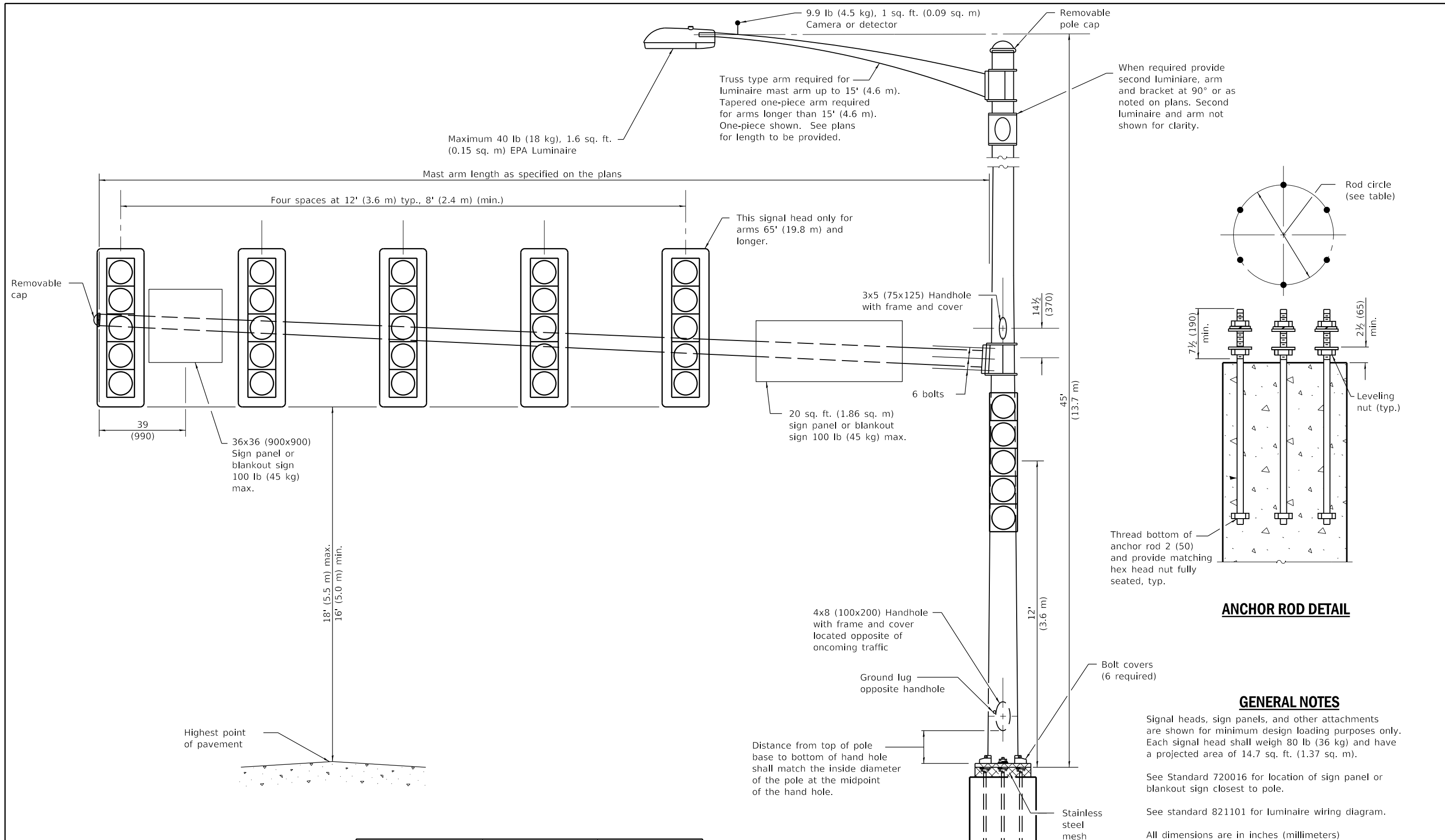
**STANDARD 877011-10**

Illinois Department of Transportation

APPROVED January 1, 2019  
*Amy Allen*  
 ENGINEER OF OPERATIONS

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

ISSUED 1-1-02



**ANCHOR ROD DETAIL**

**GENERAL NOTES**

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panel or blankout sign closest to pole.

See standard 821101 for luminaire wiring diagram.

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

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
56' thru 64' (17.07 m thru 19.51 m)	24 (610)	1 3/4 x 7' (44 x 2.10 m)
65' thru 75' (19.81 m thru 22.86 m)	27 (685)	2 x 7'-6" (51 x 2.29 m)

DATE	REVISIONS
1-1-19	Remove tenon top Info.
	Rev. luminaire arm info.
	Rev. second luminaire info.
1-1-18	Rev. hand hole location. Rev.
	Gen. Notes for sign location.
	Replaced rod hooks with nuts.

**STEEL COMB. MAST ARM ASSEMBLY AND POLE 56' THROUGH 75'**

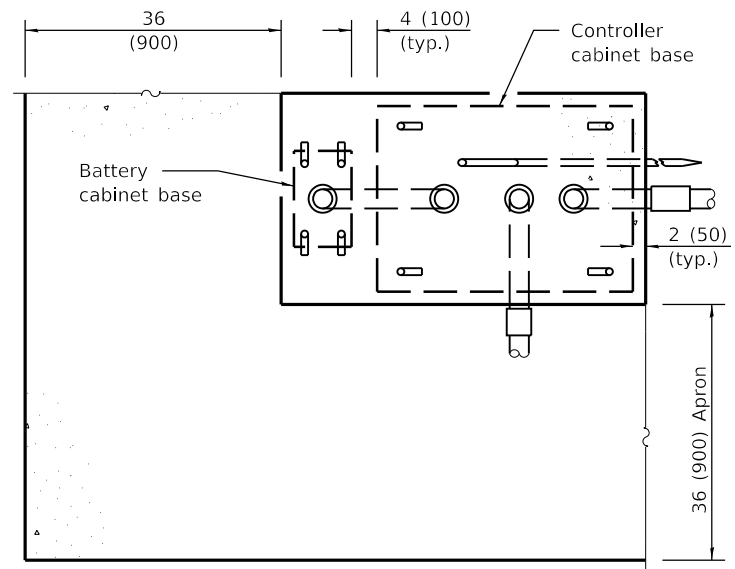
**STANDARD 877012-07**

Illinois Department of Transportation

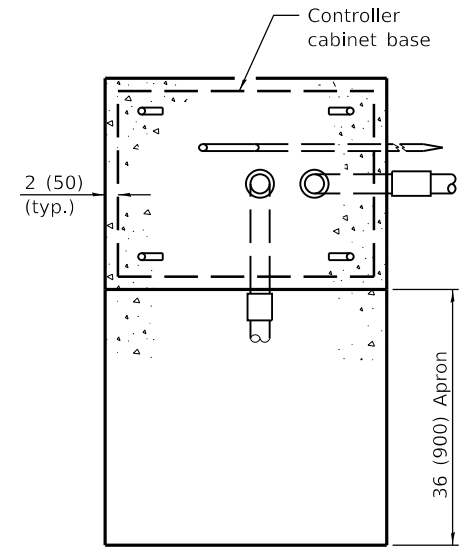
APPROVED January 1, 2019  
*Amy Allen*  
 ENGINEER OF OPERATIONS

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

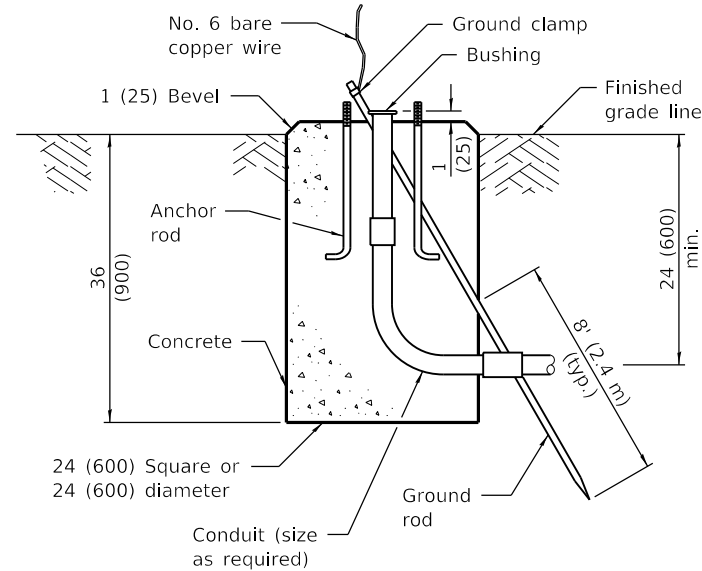
ISSUED 1-1-08



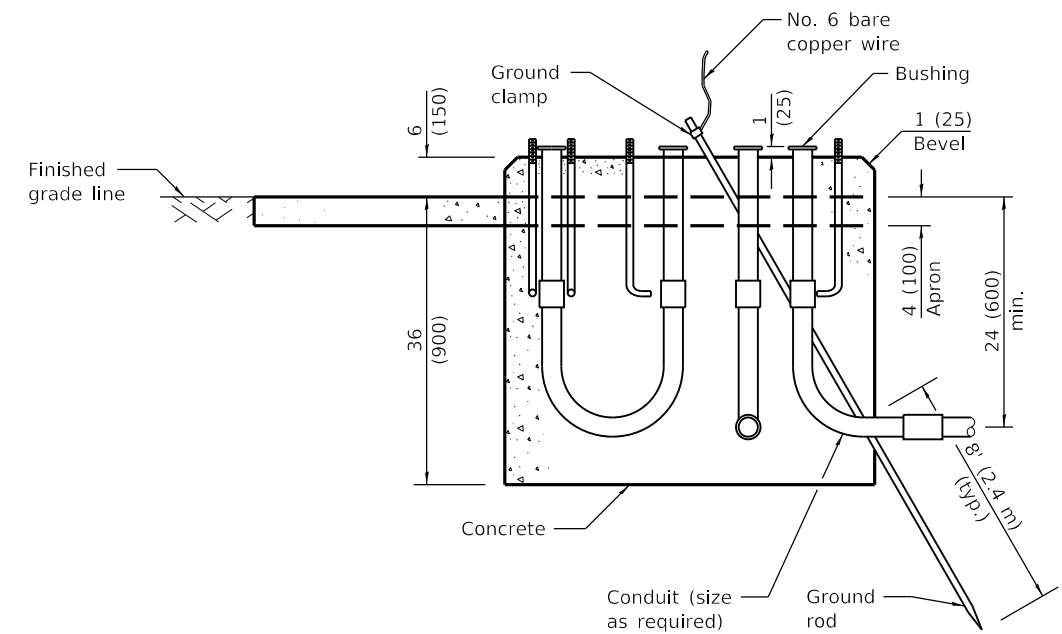
**TOP VIEW**



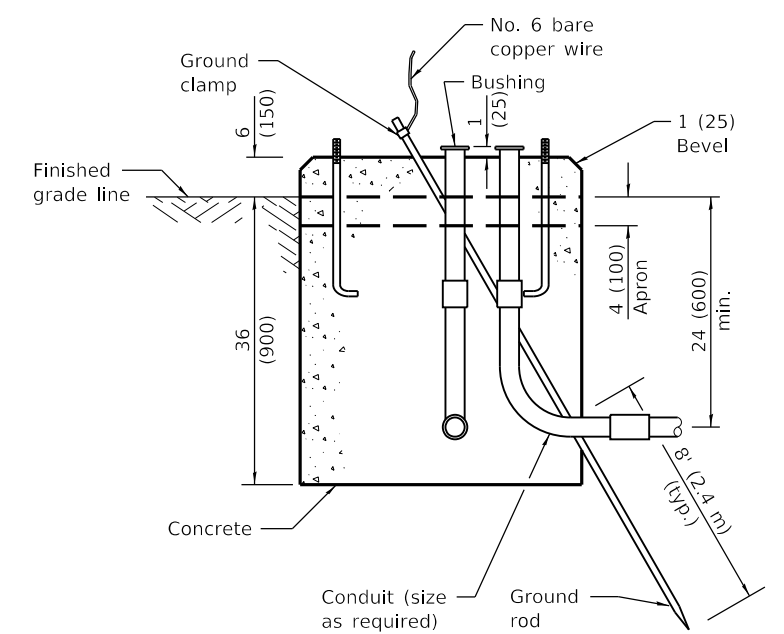
**TOP VIEW**



**TYPE A**



**TYPE C  
FOR GROUND MOUNTED  
CONTROLLER CABINET  
AND UPS BATTERY CABINET**



**TYPE D  
FOR GROUND MOUNTED  
CONTROLLER CABINET**

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

Illinois Department of Transportation

PASSED January 1, 2021  
*Amy Ellis*  
 ENGINEER OF OPERATIONS

APPROVED January 1, 2021  
*S. E. EG*  
 ENGINEER OF DESIGN AND ENVIRONMENT

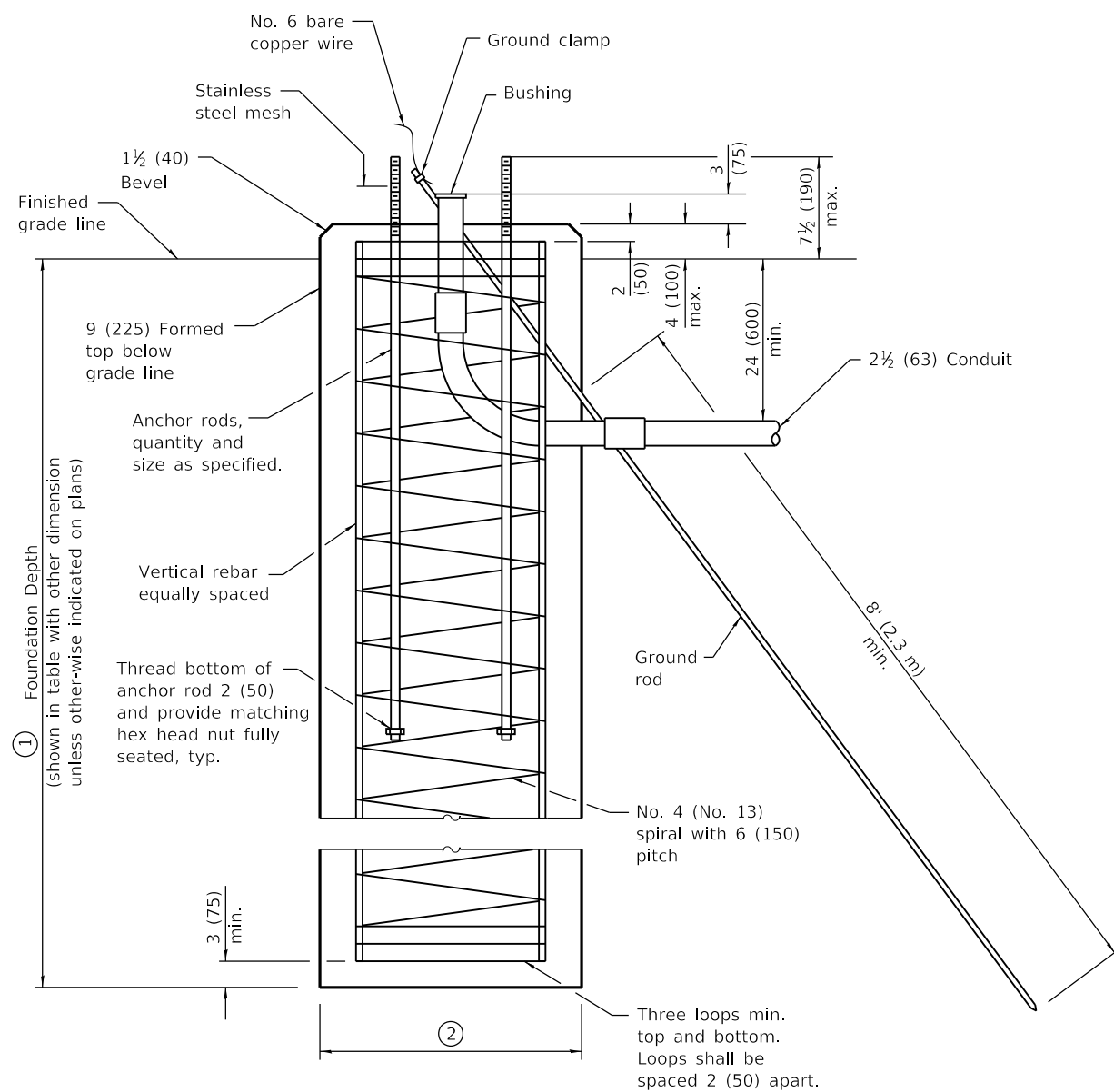
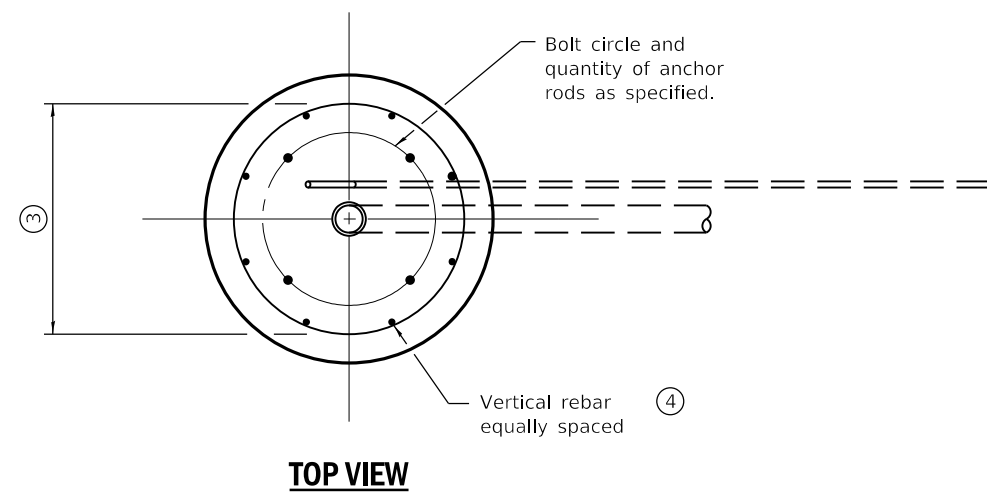
ISSUED 1-1-02

DATE	REVISIONS
1-1-21	Revised anchor rod end in Type E detail.
1-1-15	Revised TYPE E detail.

**CONCRETE  
FOUNDATION DETAILS**

(Sheet 1 of 2)

**STANDARD 878001-11**



Mast Arm Length	① Foundation Depth *	② Foundation Diameter	③ Spiral Diameter	④ Quantity of Rebars	Size of Rebars
Less than 30' (9.1 m)	10'-0" (3.0 m)	30 (750)	24 (600)	8	6 (19)
Greater than or equal to 30' (9.1 m) and less than 40' (12.2 m)	13'-6" (4.1 m)	30 (750)	24 (600)	8	6 (19)
	11'-0" (3.4 m)	36 (900)	30 (750)	12	7 (22)
Greater than or equal to 40' (12.2 m) and less than 50' (15.2 m)	13'-0" (4.0 m)	36 (900)	30 (750)	12	7 (22)
	15'-0" (4.6 m)	36 (900)	30 (750)	12	7 (22)
Greater than or equal to 50' (15.2 m) and up to 55' (16.8 m)	21'-0" (6.4 m)	42 (1060)	36 (900)	16	8 (25)
	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 ( $Q_u$ ) > 1.0 tsf (100 kpa). This strength shall be verified by boring data prior to construction or with testing by the Engineer during foundation drilling. The Bureau of Bridges & Structures should be contacted for a revised design if other conditions are encountered.

Illinois Department of Transportation

PASSED January 1, 2021  
*Amy Ellis*  
 ENGINEER OF OPERATIONS

APPROVED January 1, 2021  
*S. E. EG*  
 ENGINEER OF DESIGN AND ENVIRONMENT

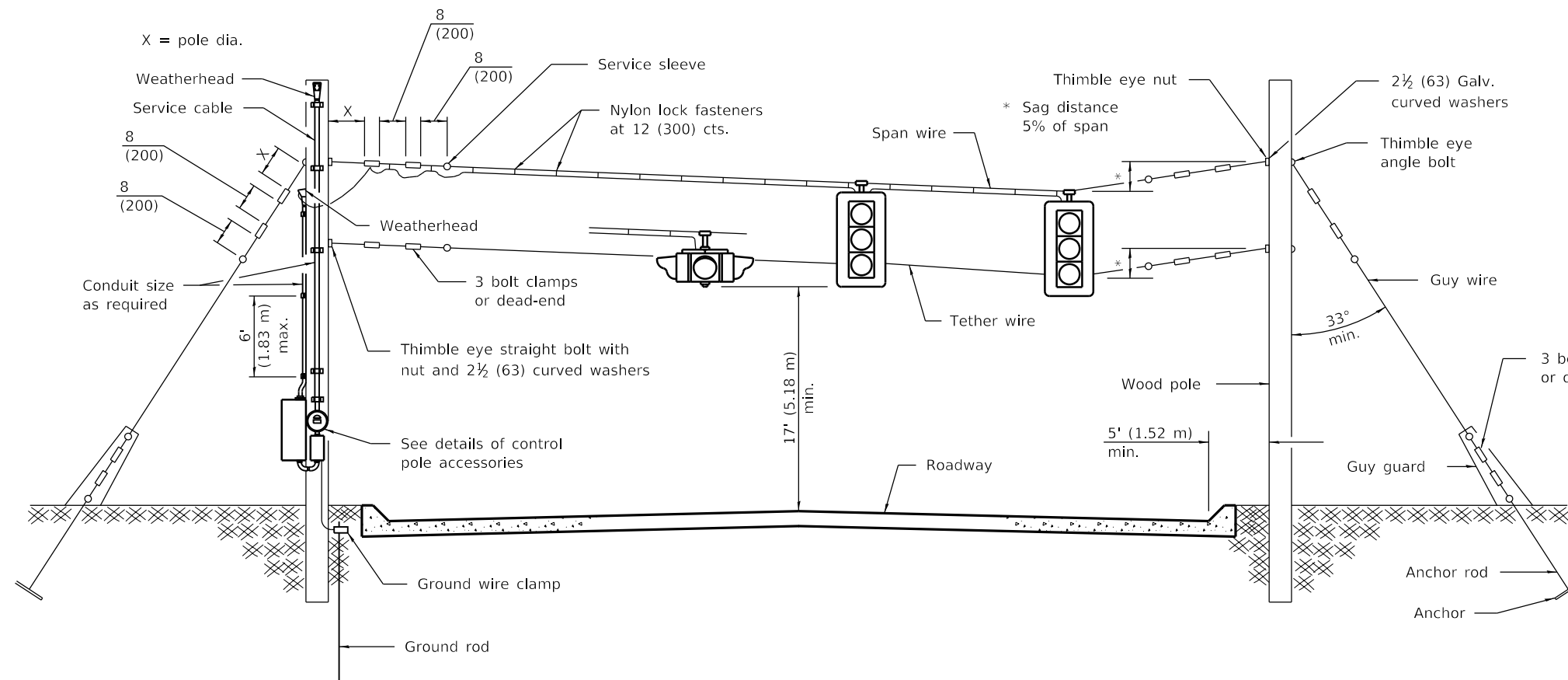
ISSUED 1-1-02

**TYPE E**

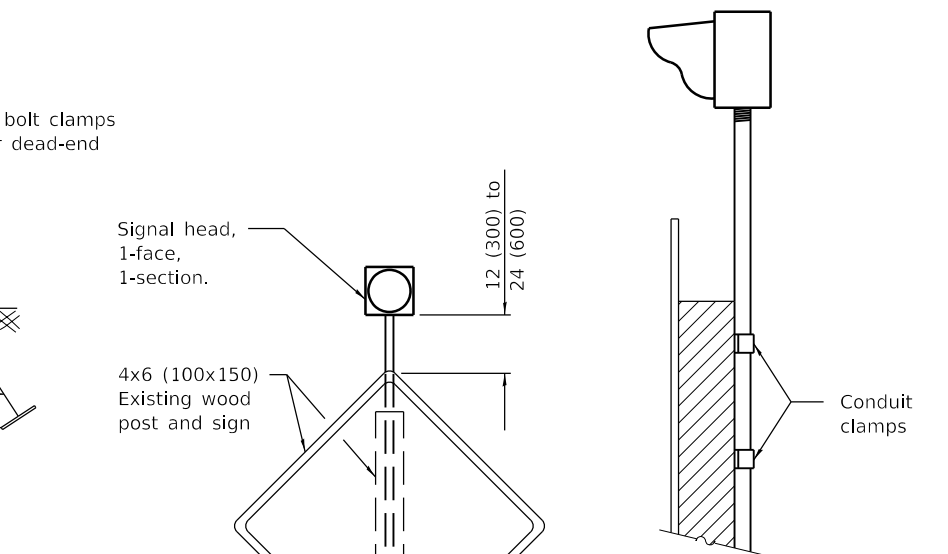
**CONCRETE FOUNDATION DETAILS**

(Sheet 2 of 2)

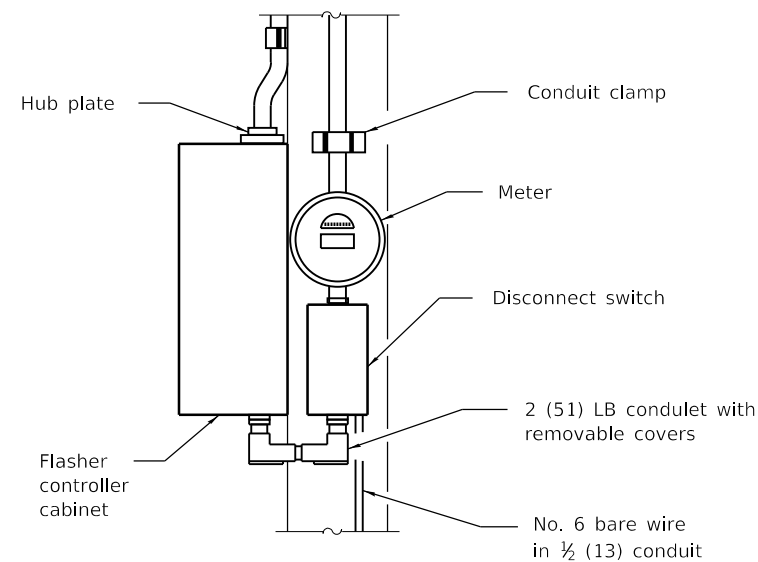
**STANDARD 878001-11**



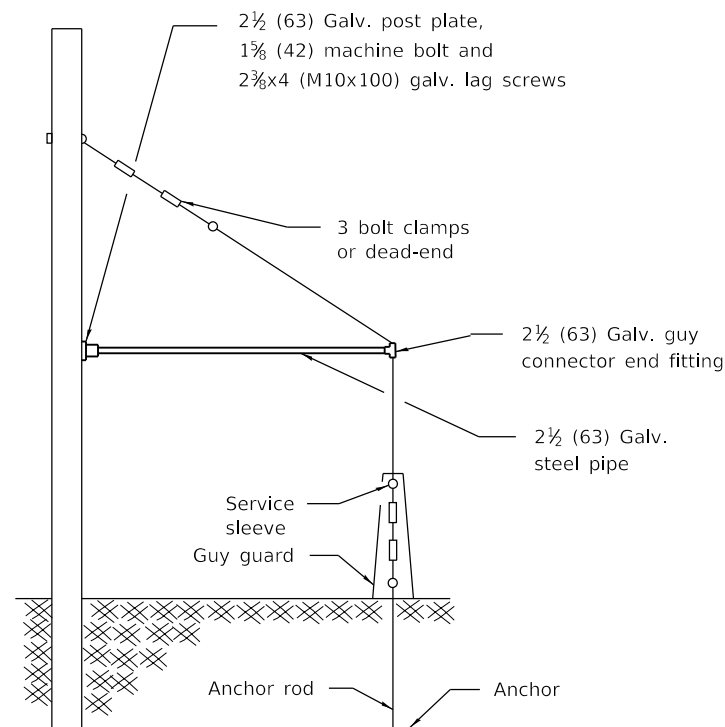
**SPAN WIRE MOUNTED SIGNALS AND FLASHING BEACON**



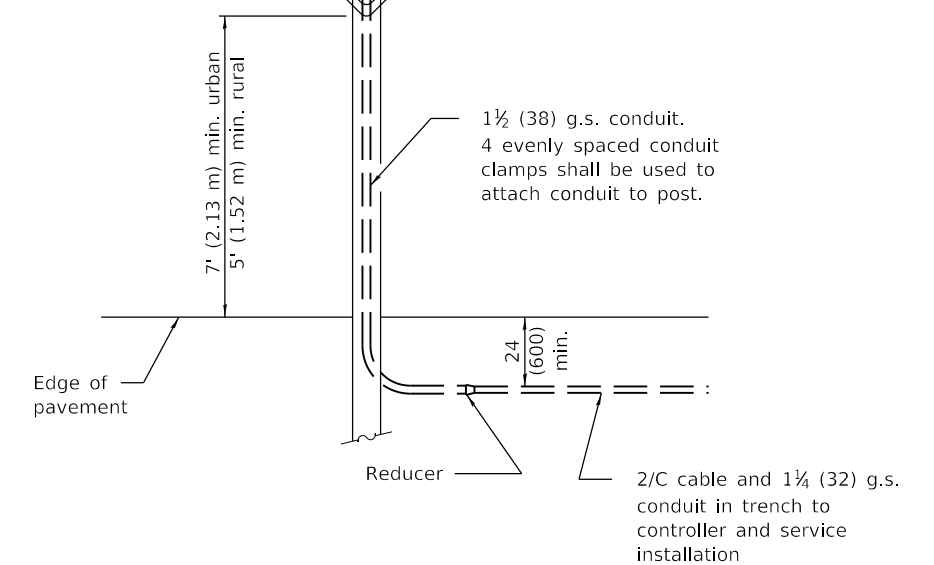
**MOUNTING DETAIL**



**CONTROL POLE DETAIL**



**SIDEWALK GUY DETAIL**



**POST MOUNTED FLASHING BEACON**

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

Illinois Department of Transportation

PASSED January 1, 2009

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APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

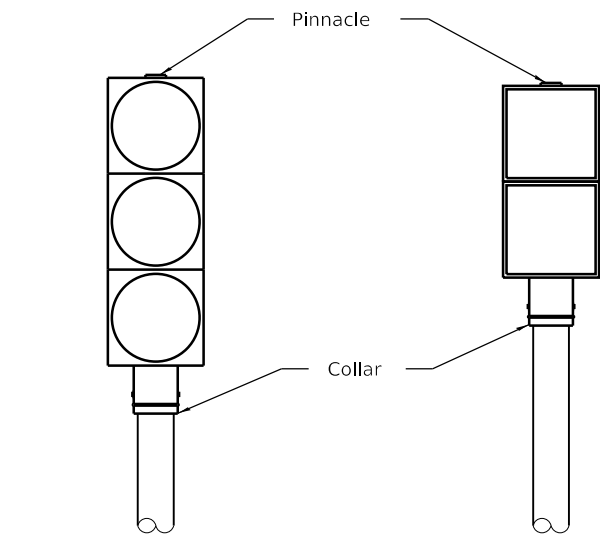
ISSUED 1-1-02

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-02	Renum. Standard 840001.

**SPAN WIRE MOUNTED SIGNALS AND FLASHING BEACON INSTALLATION**

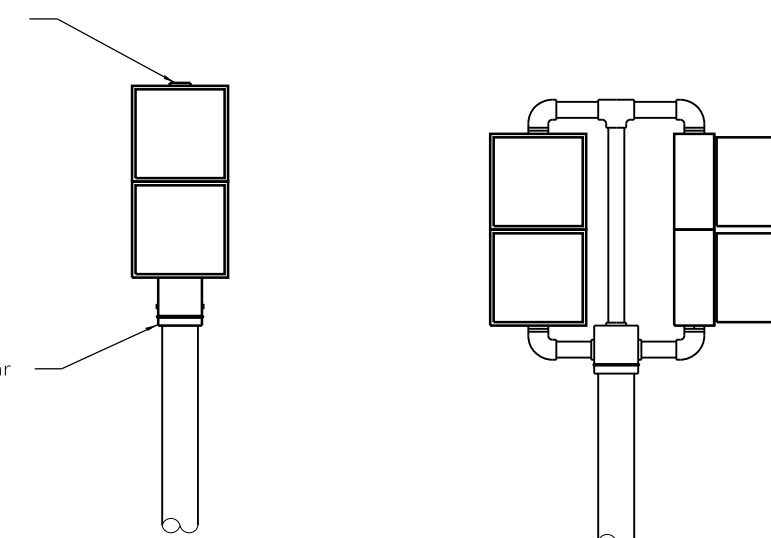
**STANDARD 880001-01**





**POST MOUNTED  
TRAFFIC SIGNAL HEAD**

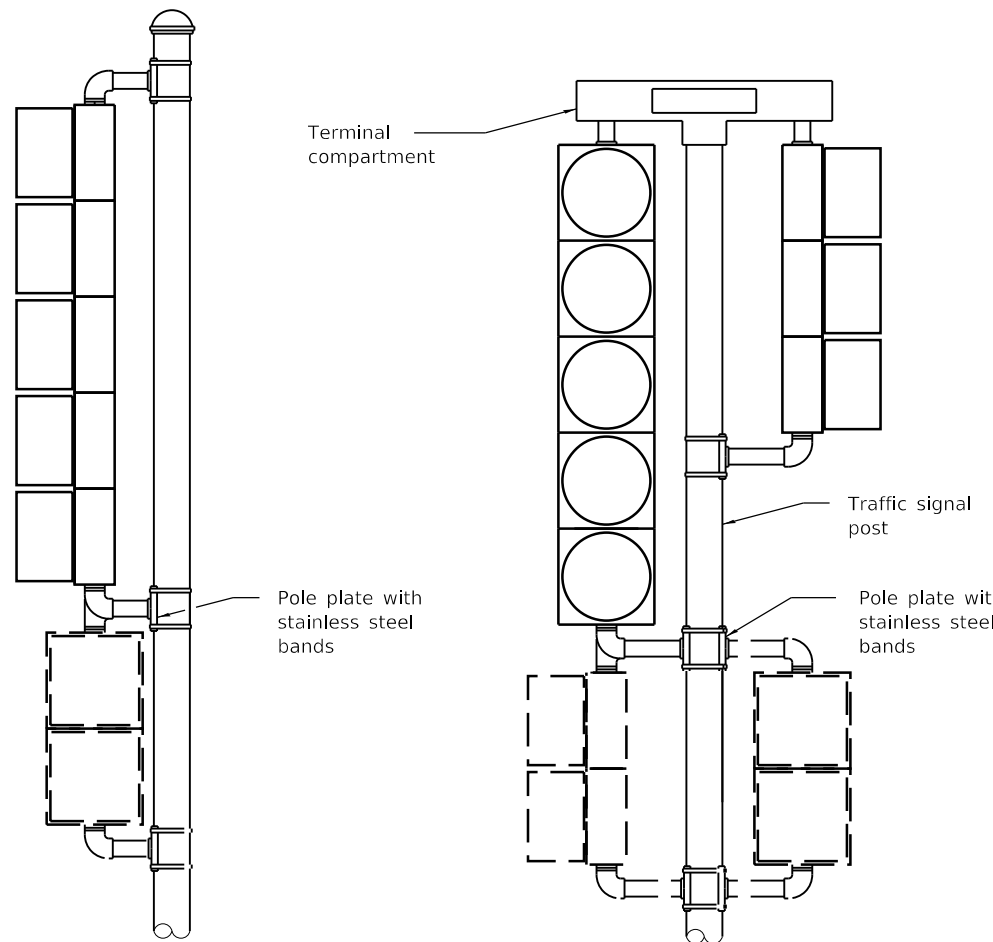
**ONE WAY**



**POST MOUNTED  
PEDESTRIAN SIGNAL HEAD**

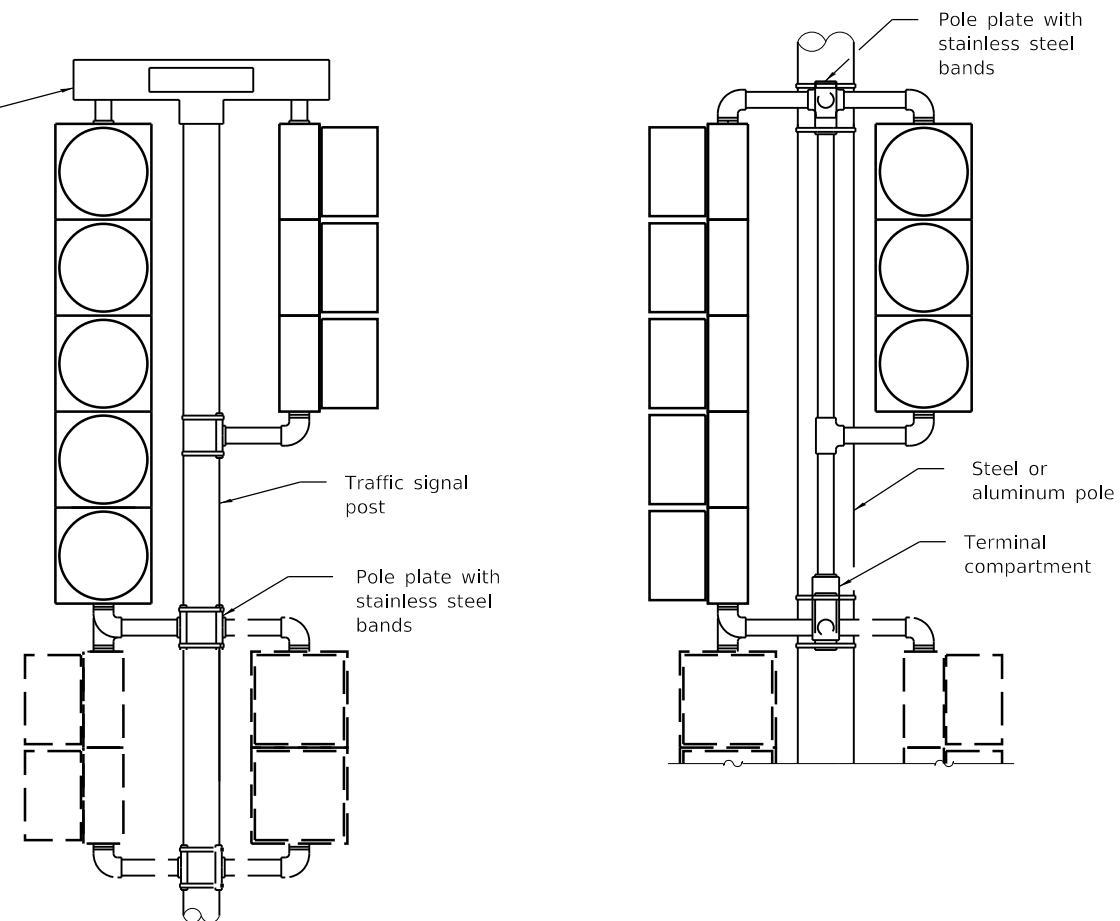
**POST MOUNTED  
PEDESTRIAN SIGNAL HEAD**

**TWO WAY**



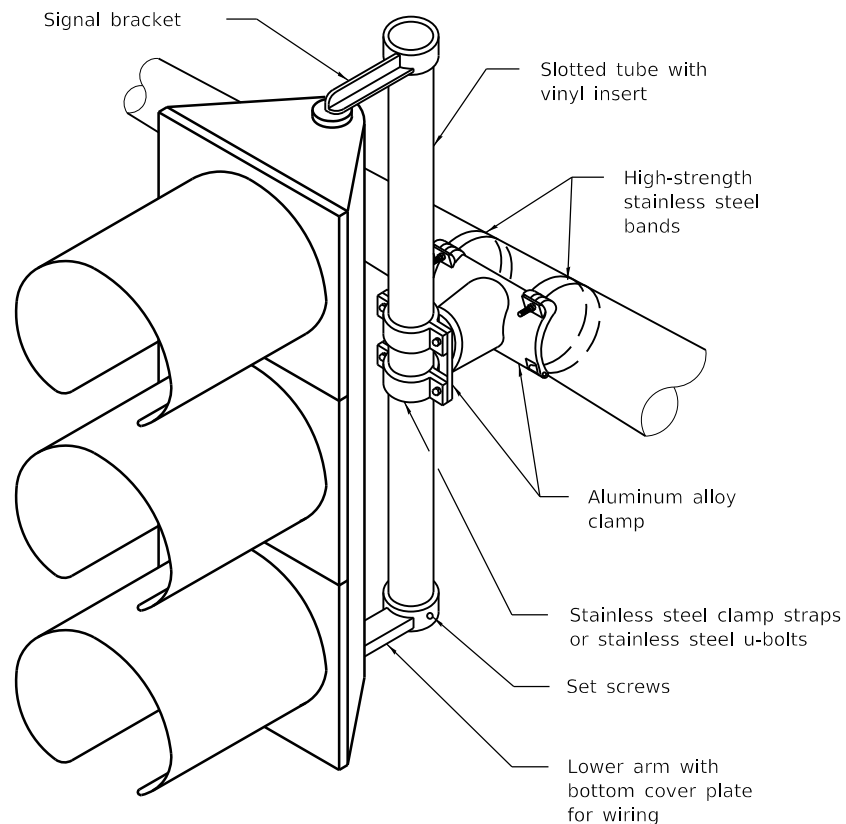
**BRACKET MOUNTED  
TRAFFIC SIGNAL HEAD**

**ONE WAY**



**BRACKET MOUNTED  
TRAFFIC SIGNAL HEAD**

**TWO WAY**



**STEEL MAST ARM MOUNTING**

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

APPROVED January 1, 2009

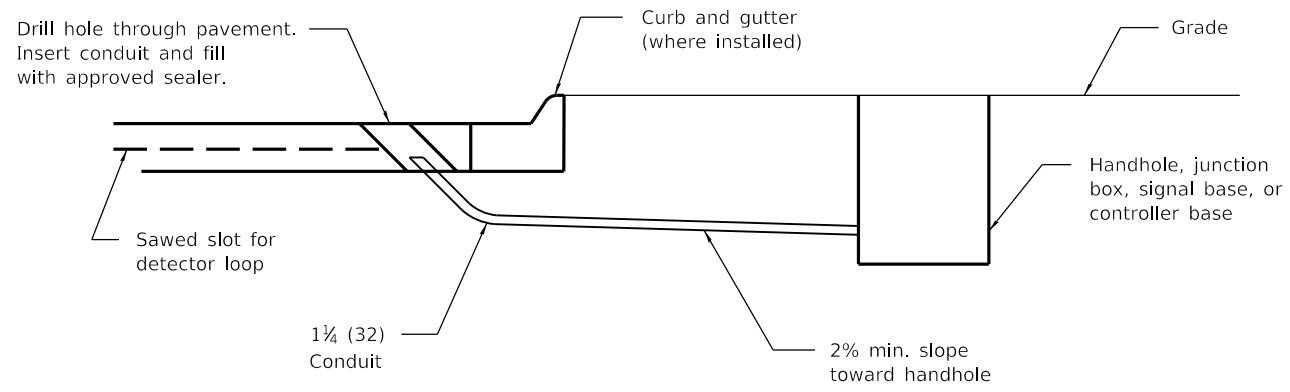
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

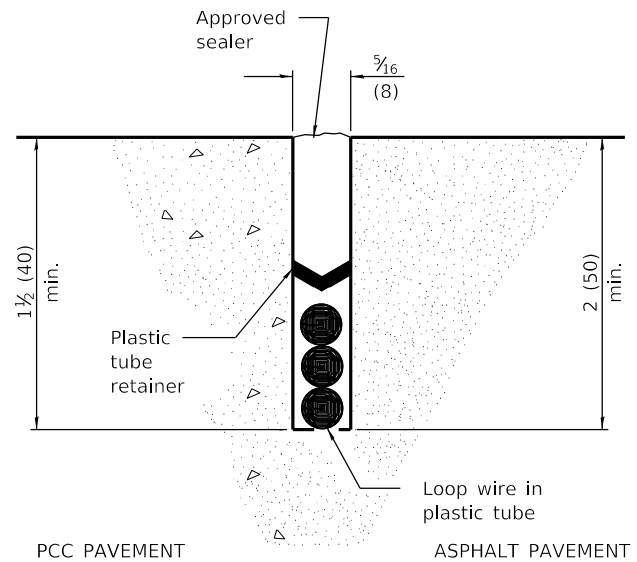
DATE	REVISIONS
1-1-09	Omitted note regarding units of length.
1-1-02	Renum. Standard 840006.

**TRAFFIC SIGNAL  
MOUNTING DETAILS**

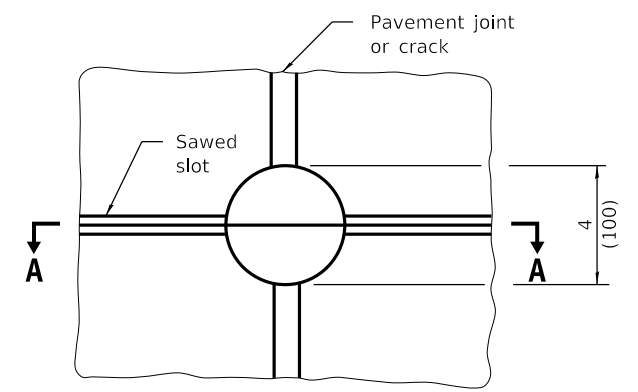
**STANDARD 880006-01**



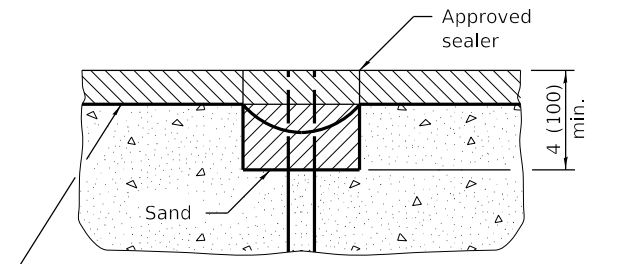
**DETECTOR LOOP LEAD-IN**



**DETECTOR LOOP INSTALLATION**



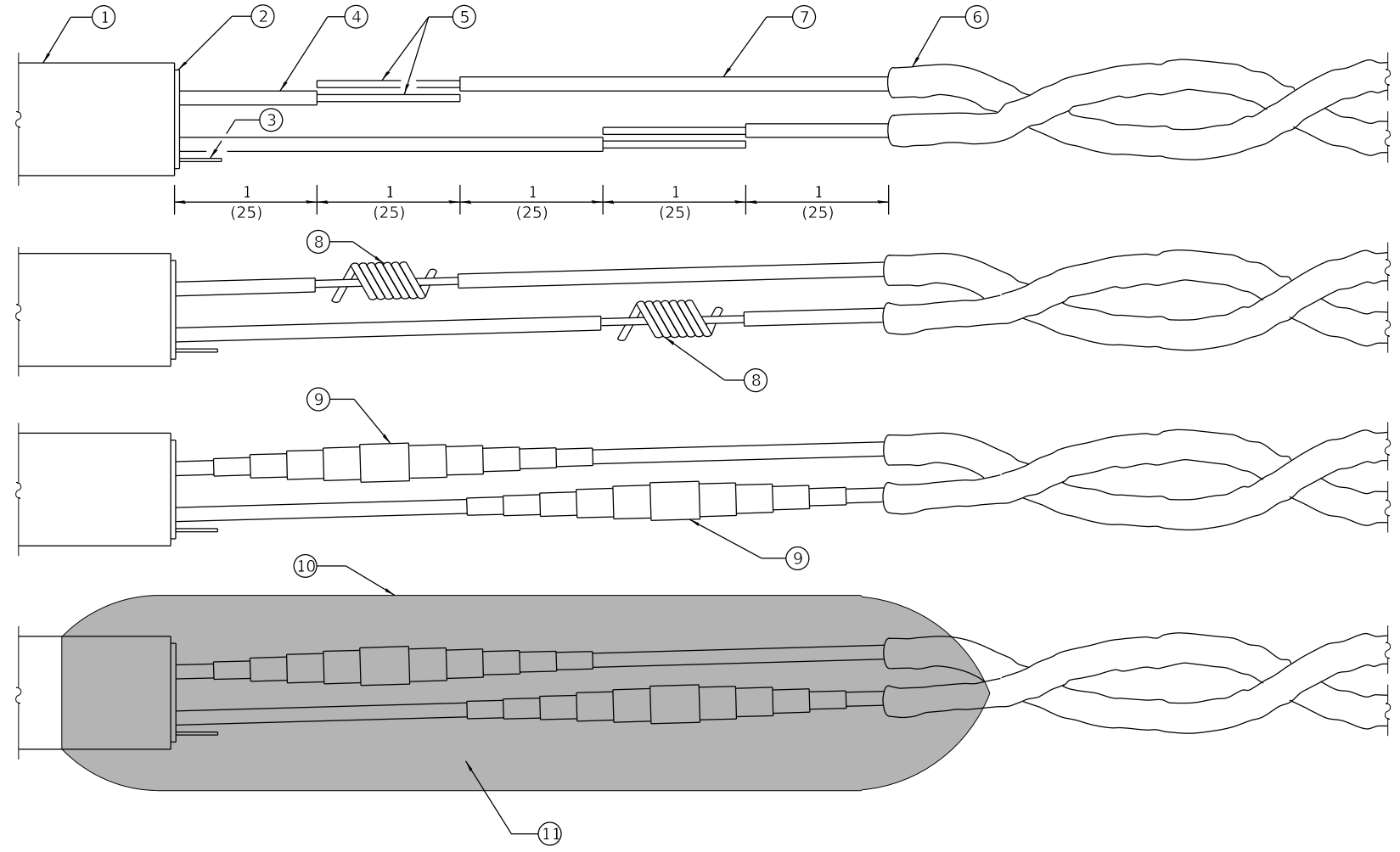
**PLAN**



**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 splice
- ⑩ = Rigid mold
- ⑪ = Waterproof and dielectric resin

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

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PASSED January 1, 2009  
ENGINEER OF OPERATIONS

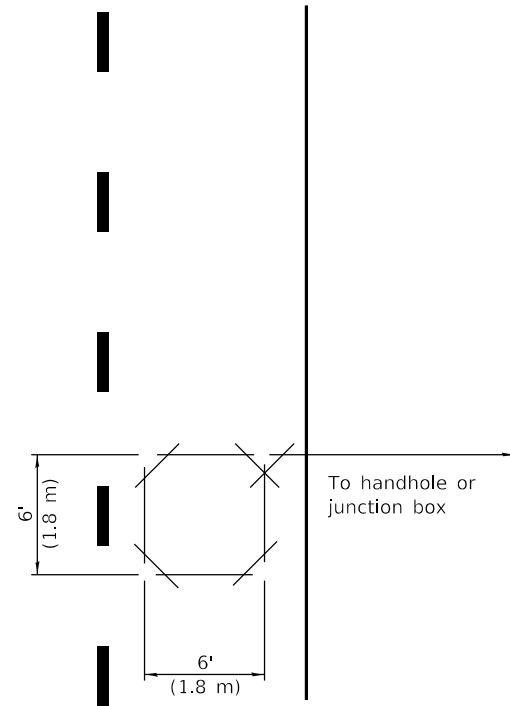
APPROVED January 1, 2009  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

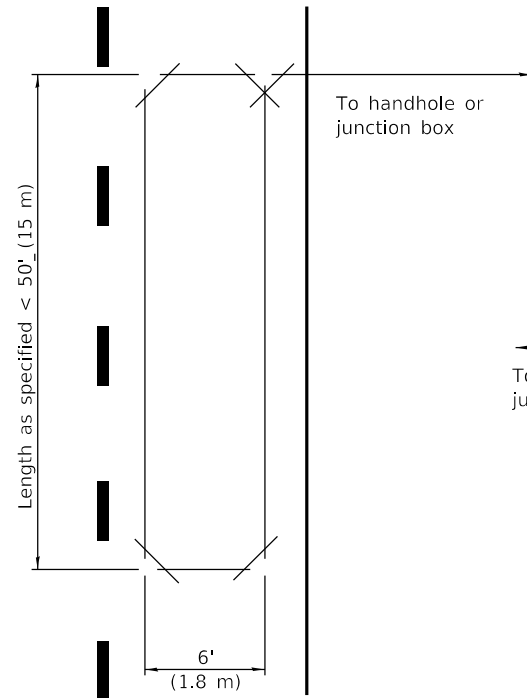
DATE	REVISIONS
1-1-09	Switched units to English (metric)
1-1-02	Renum. Standard 846001.

**DETECTOR LOOP INSTALLATIONS**

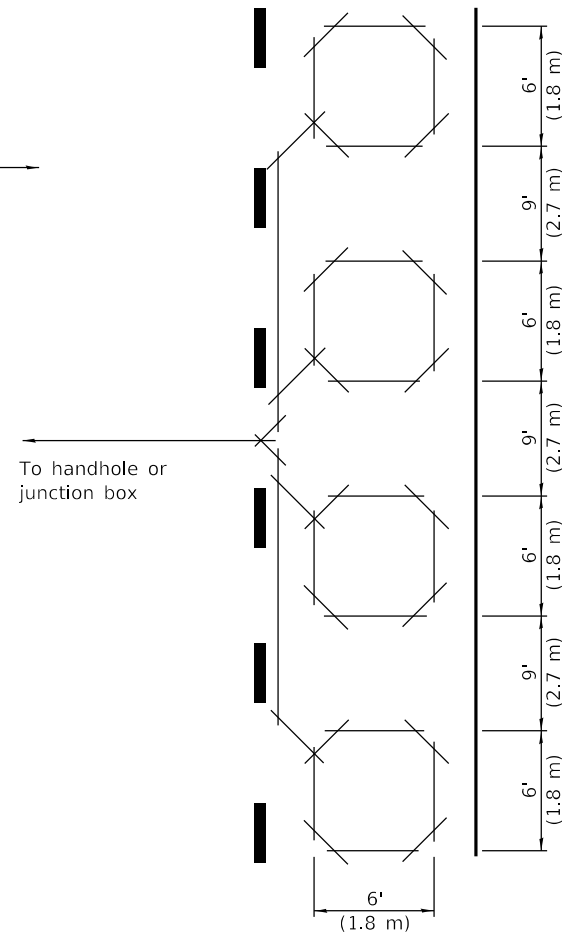
**STANDARD 886001-01**



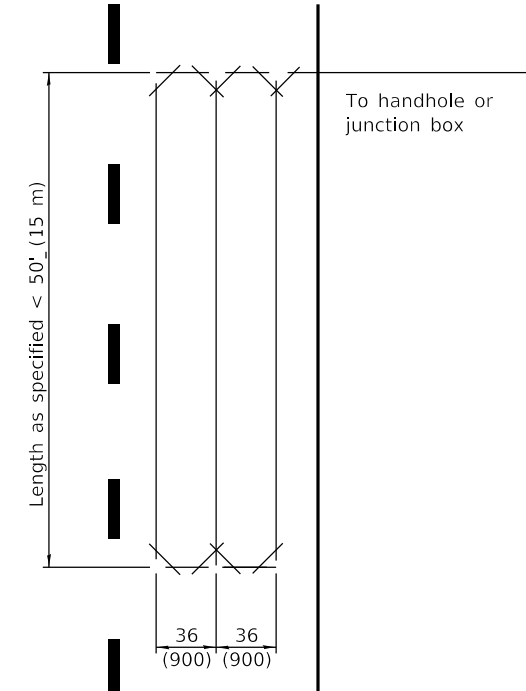
FOR POINT DETECTION  
SHORT LOOP



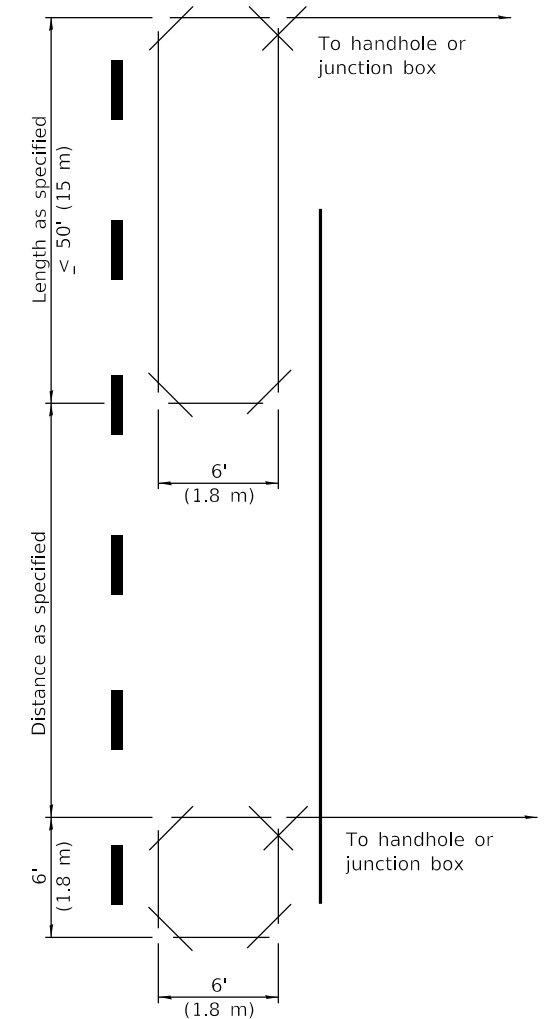
FOR PRESENCE DETECTION  
LONG LOOP



FOR PRESENCE DETECTION  
MULTIPLE LOOP IN SERIES

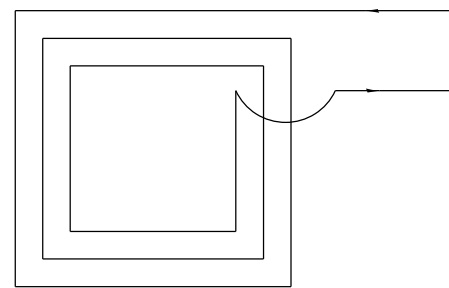


FOR PRESENCE DETECTION  
QUADRUPOLE LOOP

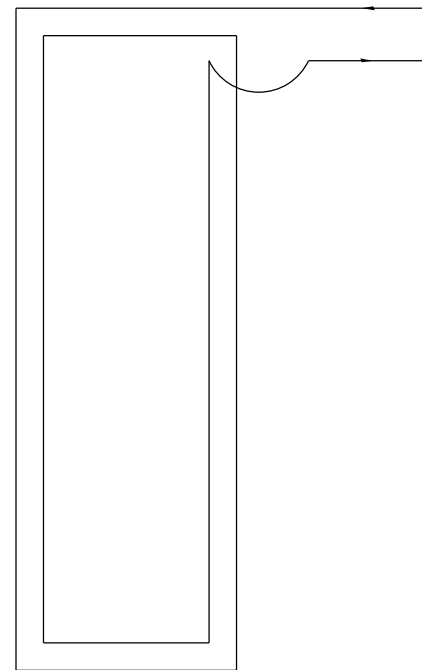


FOR EXTENDED-CALL DETECTION

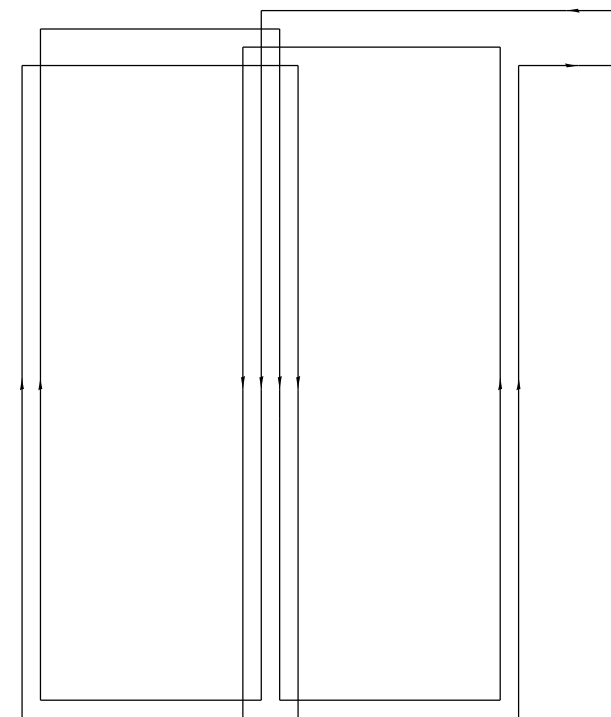
**SLOT PLAN**



SHORT LOOP



LONG LOOP



QUADRUPOLE LOOP

**WIRING DIAGRAM**

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

Illinois Department of Transportation

PASSED January 1, 2009  
*[Signature]*  
 ENGINEER OF OPERATIONS

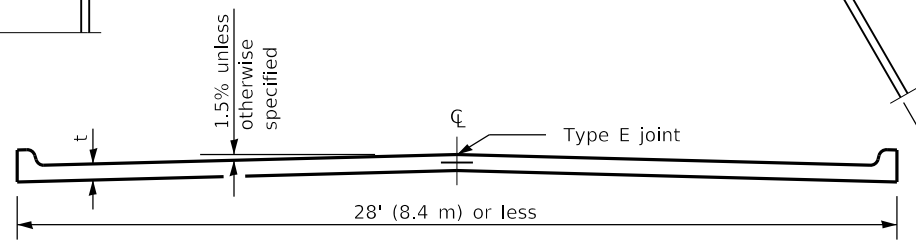
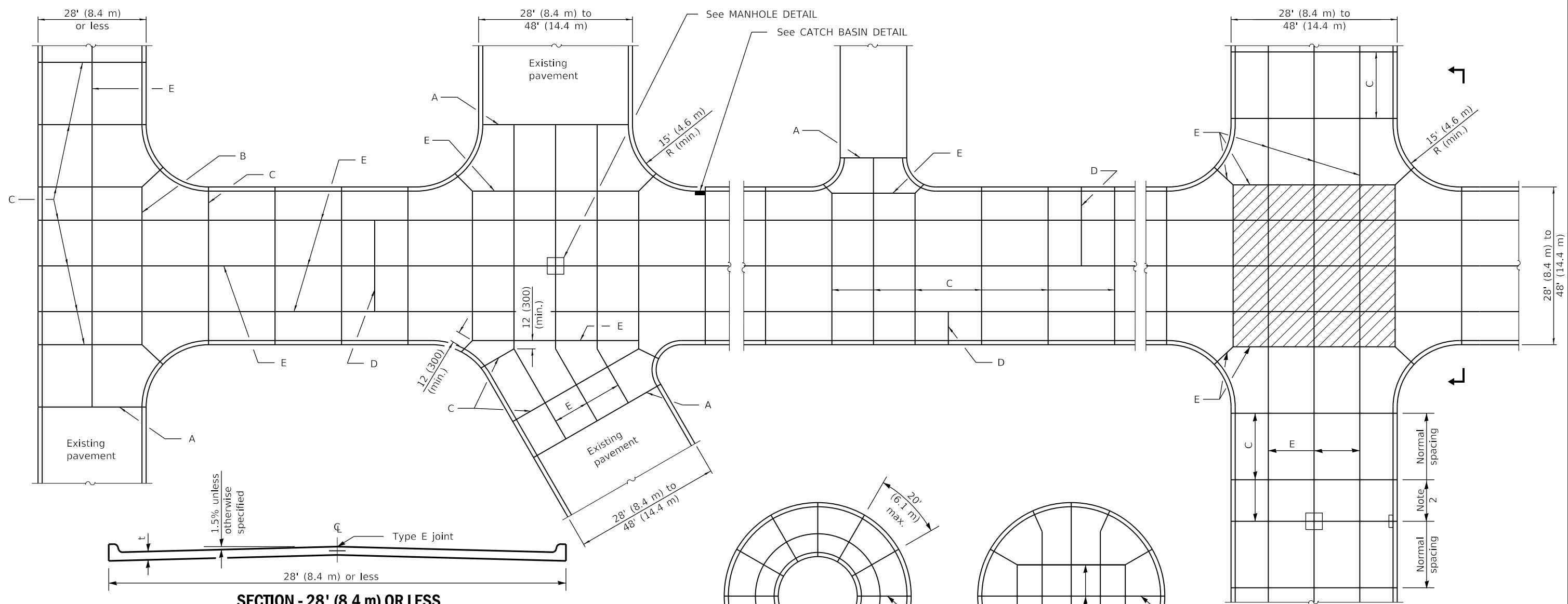
APPROVED January 1, 2009  
*[Signature]*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

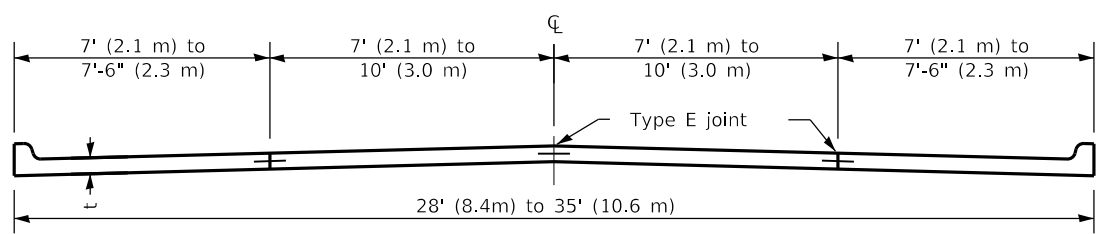
DATE	REVISIONS
1-1-09	Switched units to English (metric)
1-1-02	Renum. Standard 846006.

**TYPICAL LAYOUTS  
FOR DETECTION LOOPS**

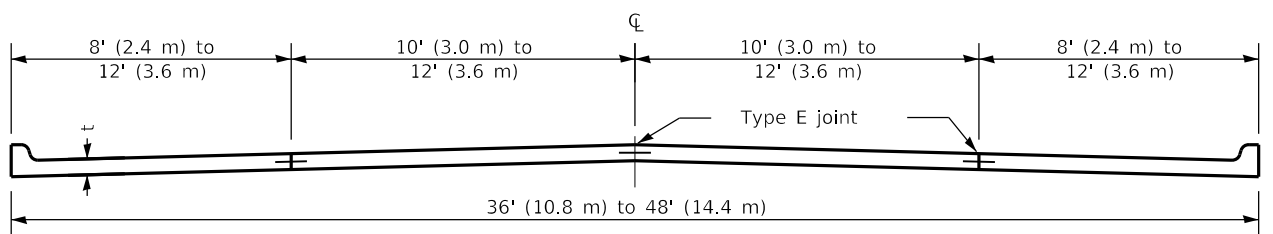
**STANDARD 886006-01**



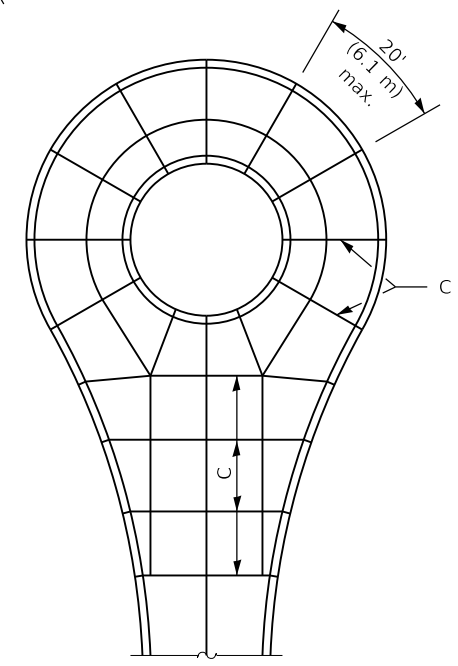
**SECTION - 28' (8.4 m) OR LESS**



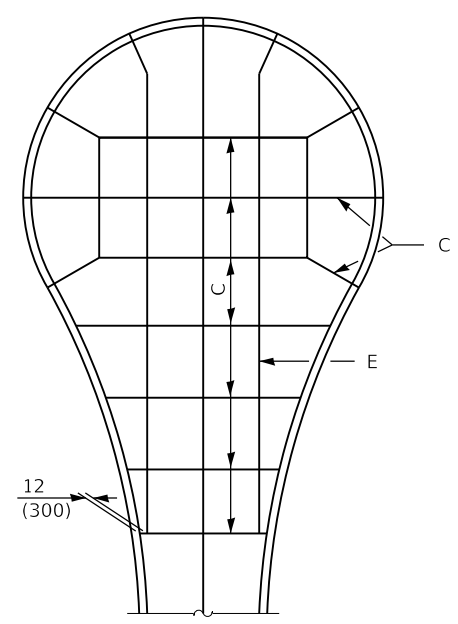
**SECTION - 28' (8.4 m) TO 35' (10.6 m) WIDTH**



**SECTION - 36' (10.8 m) TO 48' (14.4 m) WIDTH**



**CUL DE SAC  
OPEN CENTER**



**CUL DE SAC  
FULLY PAVED**

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

Illinois Department of Transportation

APPROVED January 1, 2018  
*M. L. ...*  
 ENGINEER OF LOCAL ROADS AND STREETS

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

ISSUED 1-1-97

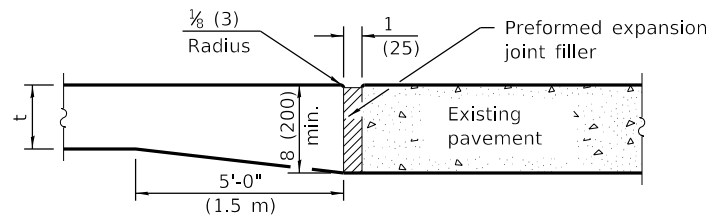
t = See typical cross section on plans for thickness

DATE	REVISIONS
1-1-18	Changed No. 6 (No. 19) bars to No. 5 (No. 16) bars.
1-1-09	Switched units to English (metric).

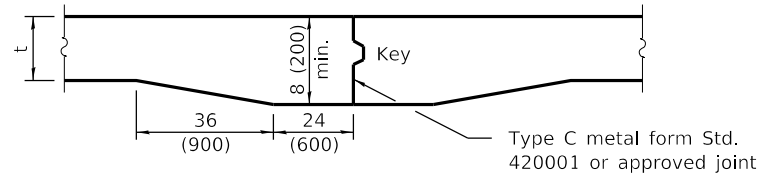
**PCC PAVEMENT SPECIAL  
(NONREINFORCED)**

(Sheet 1 of 2)

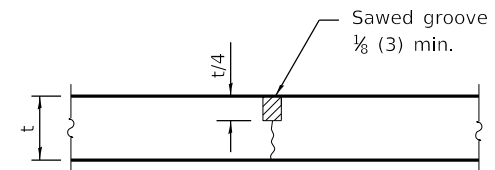
**STANDARD B.L.R. 10-7**



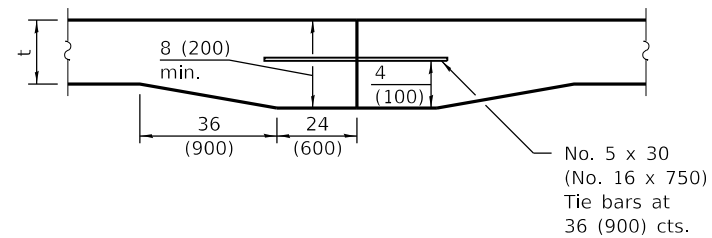
**TYPE A  
EXPANSION JOINT**



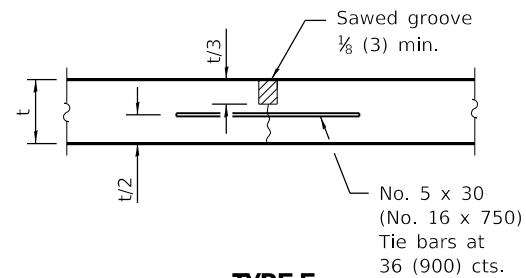
**TYPE B  
KEYED JOINT**



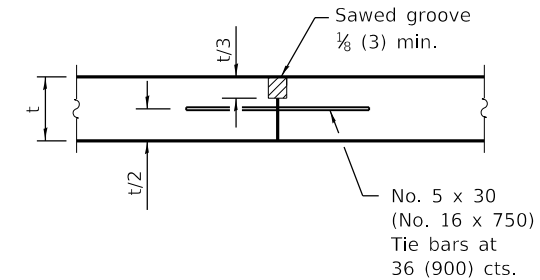
**TYPE C  
SAWED TRANSVERSE JOINT**



**TYPE D  
TIED TRANSVERSE CONSTRUCTION JOINT**



**TYPE E  
SAWED LONGITUDINAL JOINT**



**TYPE E  
LONGITUDINAL CONSTRUCTION JOINT**

**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. yards (sq. meters). This work will be paid for at the contract unit price per sq. yards (sq. meters) for portland cement concrete pavement special with integral curb of the thickness specified and shall include all materials and labor.

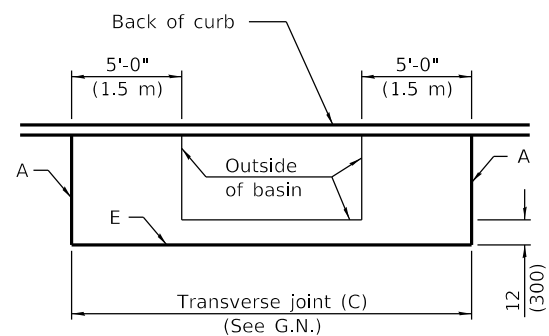
Transverse joint spacing shall not exceed 15 ft. (4.6 m).

Construct TYPE D tied transverse construction joint when construction joint does not fall at a TYPE C sawed transverse joint.

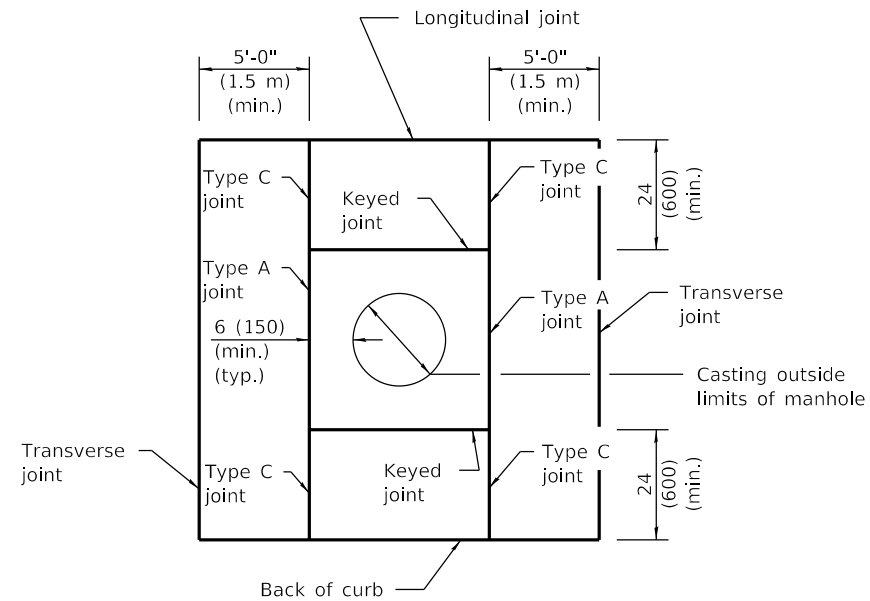
**PCC PAVEMENT SPECIAL  
(NONREINFORCED)**

(Sheet 2 of 2)

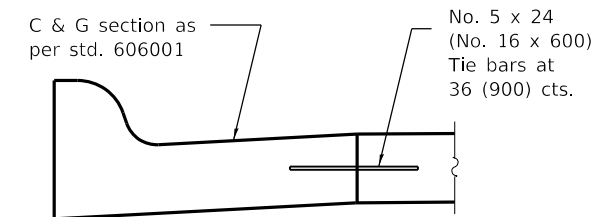
**STANDARD B.L.R. 10-7**



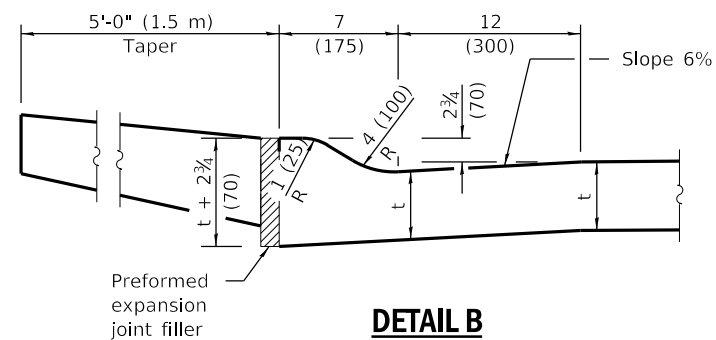
**CATCH BASIN DETAIL**



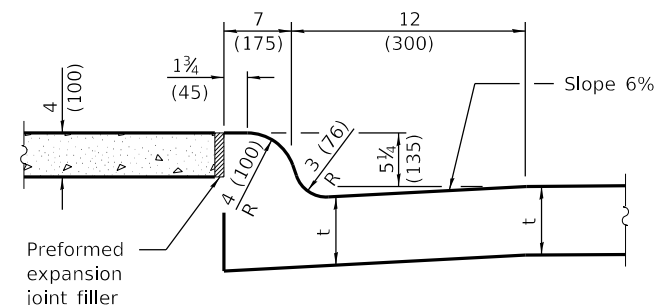
**MANHOLE DETAIL**  
Showing Joint types



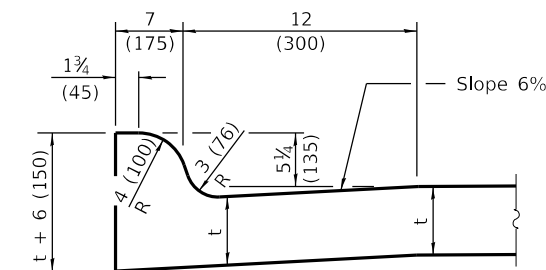
**COMB. CURB & GUTTER DETAIL**  
Alt. const. see G.N.



**DETAIL B**



**DETAIL A**



**INTEGRAL CURB**

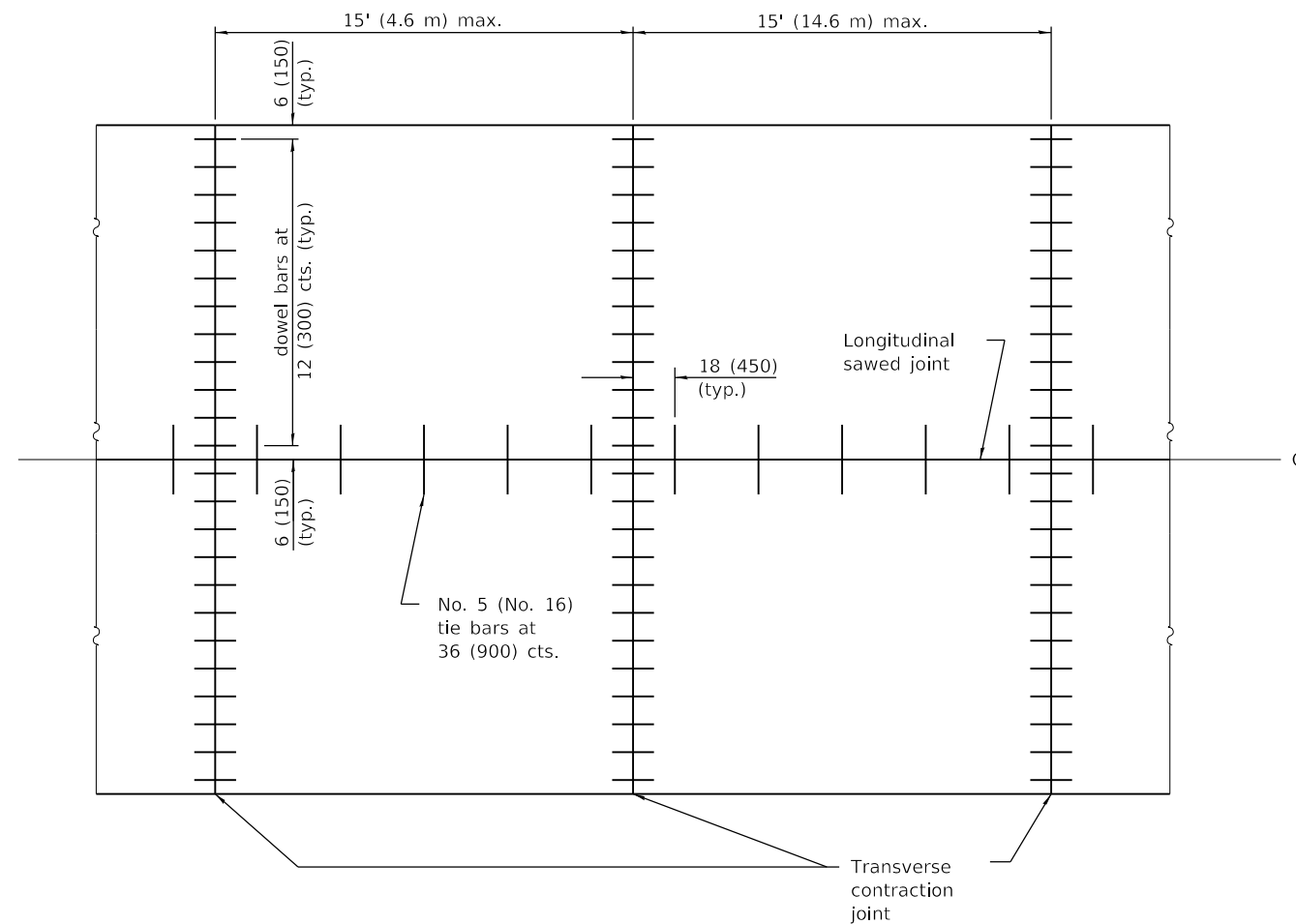
See DETAIL A for crosswalks and DETAIL B for driveways.

Illinois Department of Transportation

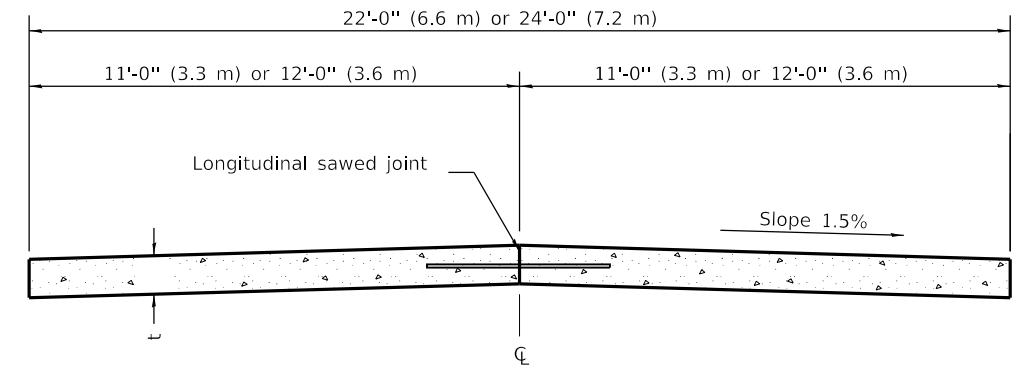
APPROVED January 1, 2018  
  
 ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2018  
  
 ENGINEER OF DESIGN AND ENVIRONMENT

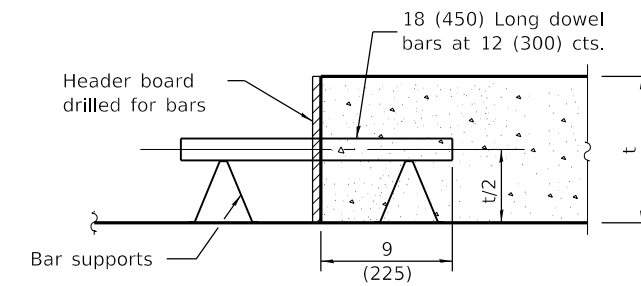
ISSUED 1-1-97



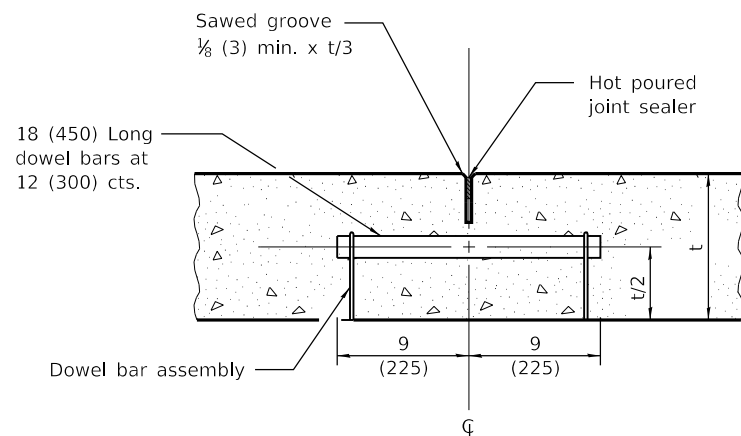
**PLAN OF PAVEMENT**



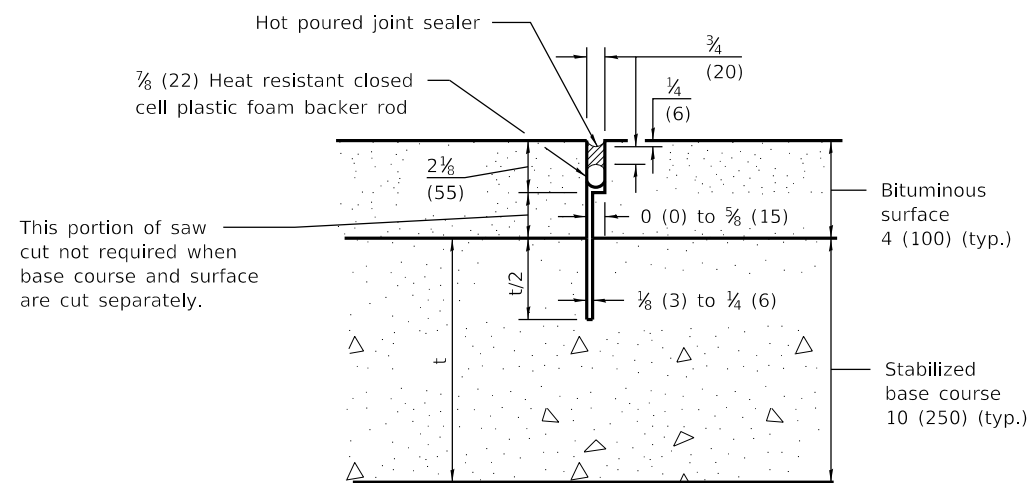
**CROSS SECTION OF PAVEMENT**



**TRANSVERSE CONSTRUCTION JOINT**



**TRANSVERSE CONTRACTION JOINT**



**TRANSVERSE CONTRACTION JOINT**

(For CAM, CFA and LFA Base Course Mixtures)

**GENERAL NOTES**

See Standard 420001 for details of Transverse Expansion Joints, Longitudinal Sawed Joints and Longitudinal Construction Joints.

Dowel bars are only required for Class I, II, or III Roads and Streets having pavement thickness of 7 (175) or greater.

t = Pavement thickness (See Typical Cross Section)

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

**DOWEL BAR TABLE**

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

DATE	REVISIONS
1-1-18	Revised dowel and tie bar sizes. Increased tie bar spacing.
	Eliminated skewed joint.
1-1-15	Added general note regarding dowel bars.

**PORTLAND CEMENT CONCRETE PAVEMENT (NONREINFORCED)**

**STANDARD B.L.R. 14-12**

Illinois Department of Transportation

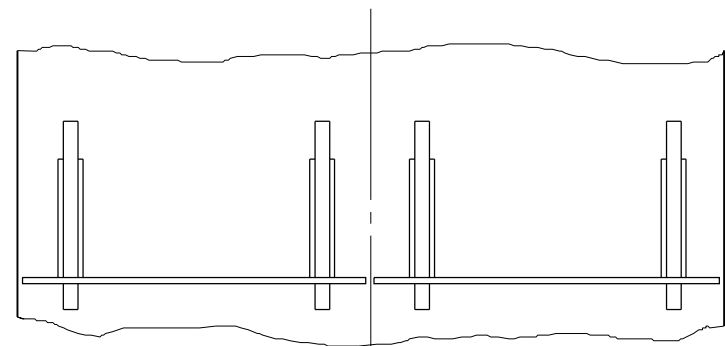
PASSED January 1, 2018

ENGINEER OF LOCAL ROADS AND STREETS

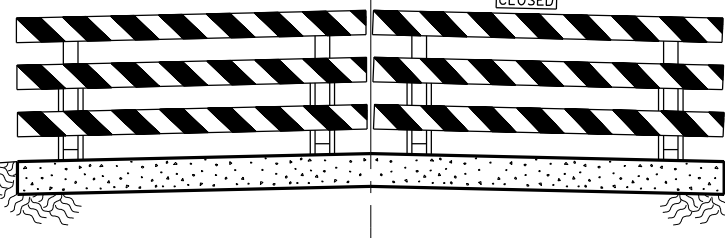
APPROVED January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT

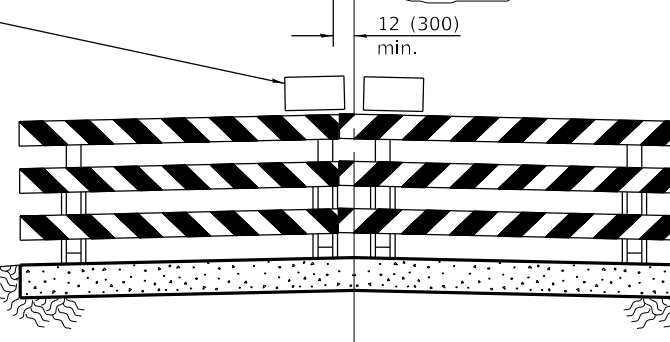
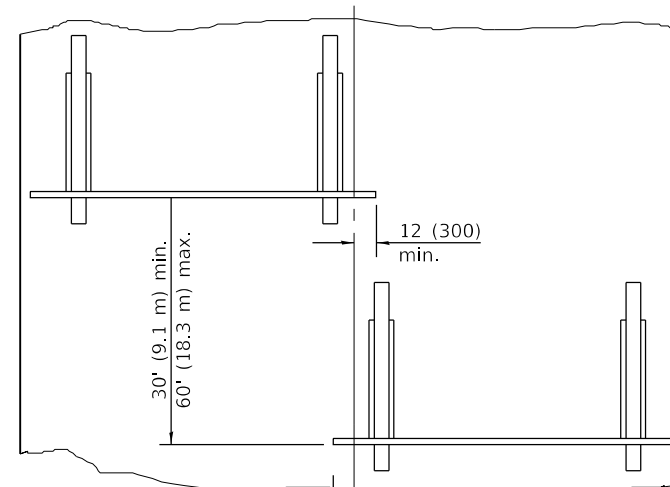
ISSUED 1-1-97



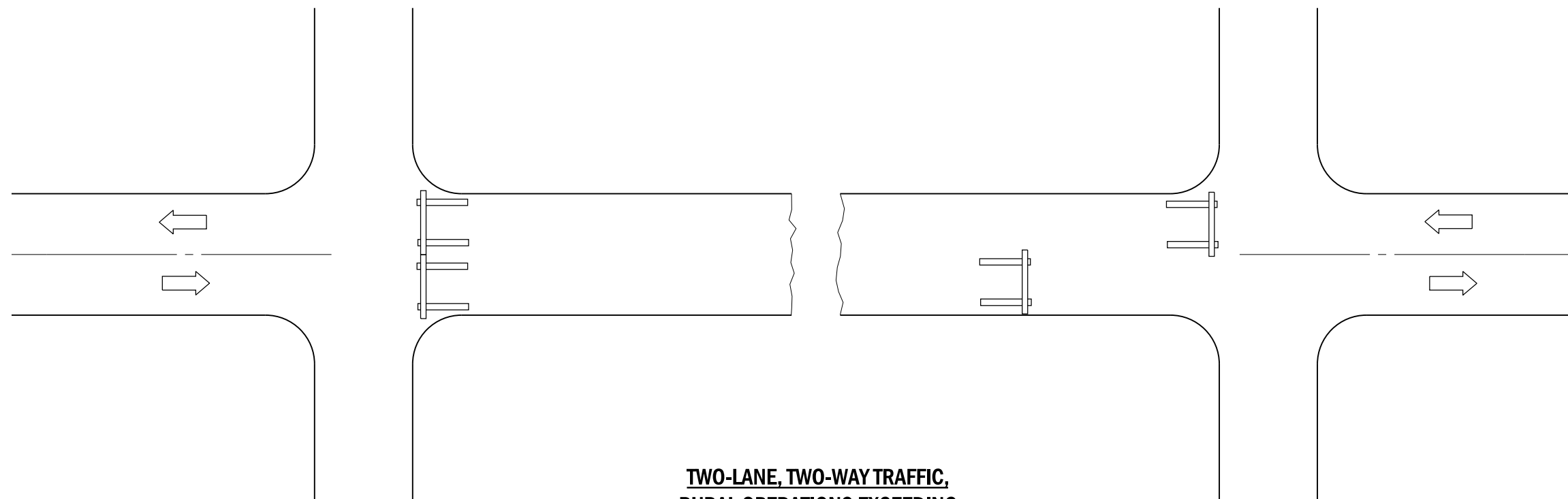
Type III Barricades with Standard Sign R11-2 or R11-4 mounted as shown.



Resident traffic and day labor force's equipment to use road shoulder for passing barricade.



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.

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-98	Rev. "R11-1" to "R11-4".
	Rev. 4th General Note.

**TRAFFIC CONTROL DEVICES -  
DAY LABOR CONSTRUCTION**

**STANDARD B.L.R. 17-4**

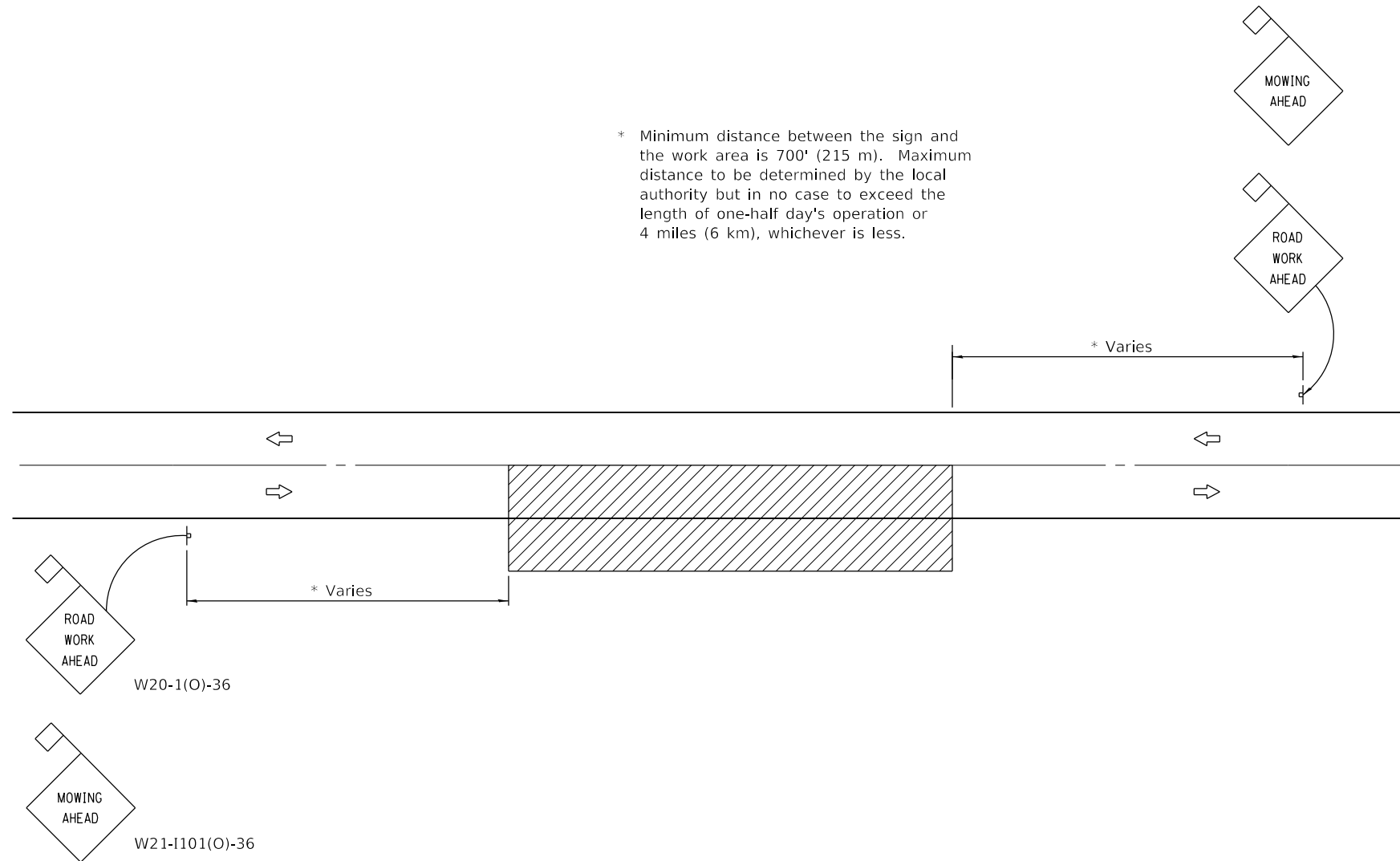
Illinois Department of Transportation

PASSED January 1, 2009  
*Charles J. Ringwald*  
ENGINEER OF LOCAL ROADS AND STREETS

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

ISSUED 1-1-97

\* Minimum distance between the sign and the work area is 700' (215 m). Maximum distance to be determined by the local authority but in no case to exceed the length of one-half day's operation or 4 miles (6 km), whichever is less.



**TWO-LANE, TWO-WAY TRAFFIC**  
**RURAL OPERATIONS**  
**DAY OPERATIONS ONLY**

**SYMBOLS**



Work area



Sign with 18x18 (450x450) min. orange flag attached.

**TYPICAL APPLICATIONS**

- MOWING
- SPREADING AGGREGATE
- WEED SPRAYING
- SURFACE MAINTENANCE
- BITUMINOUS RESURFACING
- CRACK POURING
- SHOULDER REPAIR
- CLEANING DITCHES

**GENERAL NOTES**

Maintenance operations shall be confined to one traffic lane, leaving the opposite lane open to traffic. At least 500' (150 m) of both traffic lanes shall be available for traffic movement between work areas at intervals not greater than 1000' (300 m).

When operations are on the pavement and stationary or moving at a speed less than 4 mph (6 kph), a ONE LANE AHEAD, or other appropriate sign, shall be installed in each direction between the ROAD WORK AHEAD sign and the work area. The distance between this sign and the work area shall be a minimum of 400' (120 m) but in no case to exceed the length of one-half day's operation or 4 miles (6 km), whichever is less. The distance between the two signs shall be approximately 400' (120 m).

All signs are to be removed at completion of the day's operation.

Any unattended obstacle, excavation, or pavement drop off greater than 3 (75) in the work area shall be protected by Type I or Type II barricades with flashing lights.

Longitudinal dimensions may be adjusted slightly to fit field conditions.

All vehicles, equipment, men, and their activities are restricted at all times to one side of the pavement.

Flashing lights or rotating beacons are required for all maintenance vehicles while in operation.

Applicable operations illustrated in Standard 701301 may be used when operations do not exceed 15 minutes on the pavement or 60 minutes on the shoulder respectively.

All warning signs shall have minimum dimensions of 36x36 (900x900) and have black legend on an orange reflectorized background.

When fluorescent signs are used, orange flags are not required.

This case is for use on rural local roads where the local authority considers this protection to be appropriate for the specific job conditions.

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

Illinois Department of Transportation

PASSED January 1, 2015  
*Jamie K. Klein*  
 ENGINEER OF LOCAL ROADS AND STREETS

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

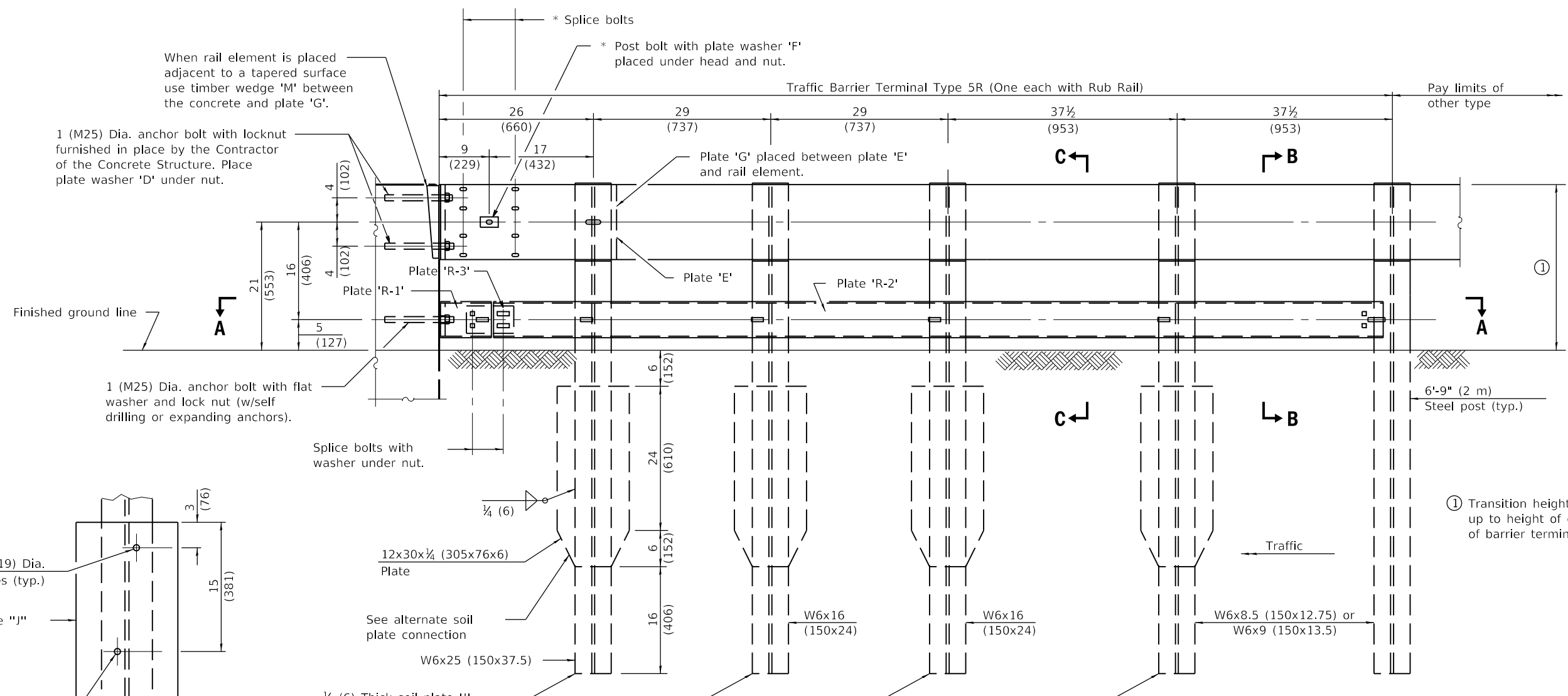
ISSUED 1-1-97

DATE	REVISIONS
1-1-15	Corrected RWA sign number.
1-1-09	Switched units to English (metric). Moved one General Note.

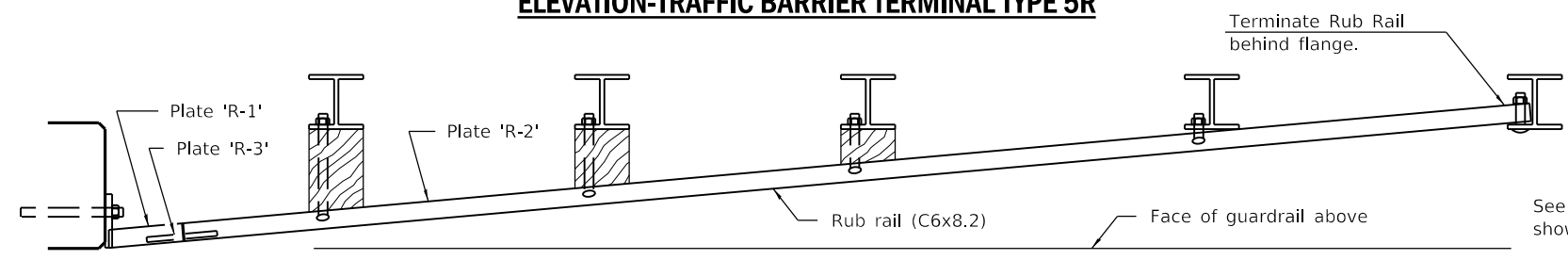
**TRAFFIC CONTROL DEVICES-  
DAY LABOR MAINTENANCE**

**STANDARD B.L.R. 18-6**

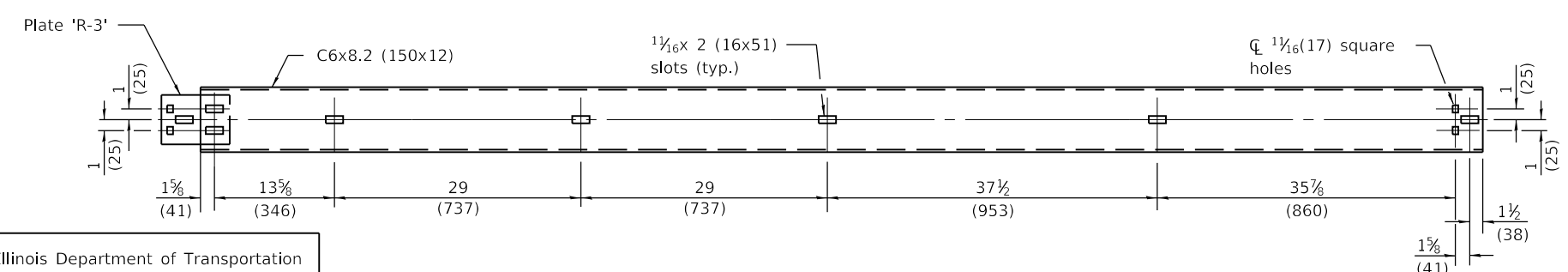




**ELEVATION-TRAFFIC BARRIER TERMINAL TYPE 5R**



**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" after the 1 (25) bolts are in place.
- \* When an expansion 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

PASSED January 1, 2012

ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2012

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

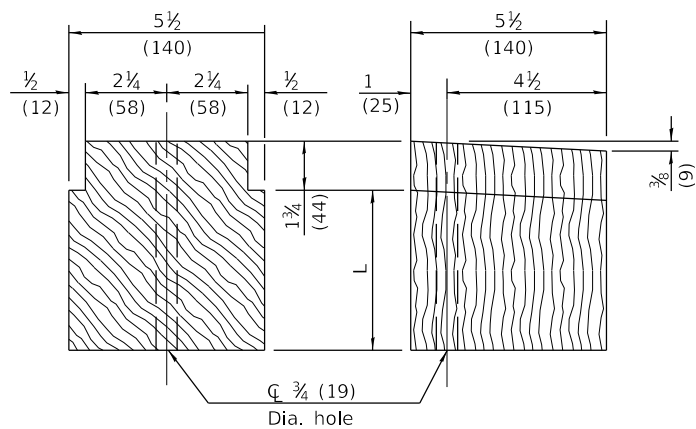
76-1

DATE	REVISIONS
1-1-12	Revised barrier terminal height per note . ①
1-1-09	Switched units to English (metric).

**TRAFFIC BARRIER TERMINAL-TYPE 5R**

(Sheet 1 of 2)

**STANDARD B.L.R. 20-7**

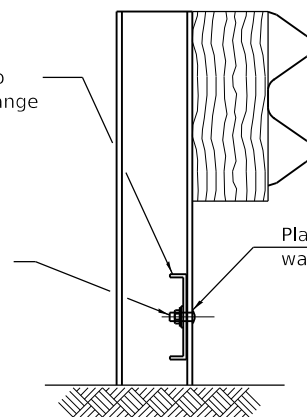


**TREATED TIMBER BLOCKING**

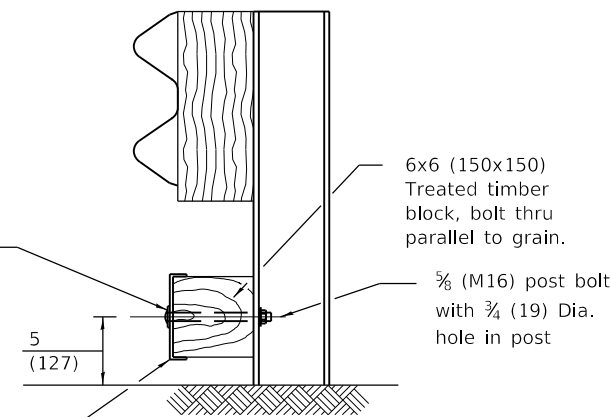
\*\* Approximate Lengths Field Verify

** L
7 3/8 (187)
5 5/8 (143)
3 7/8 (98)

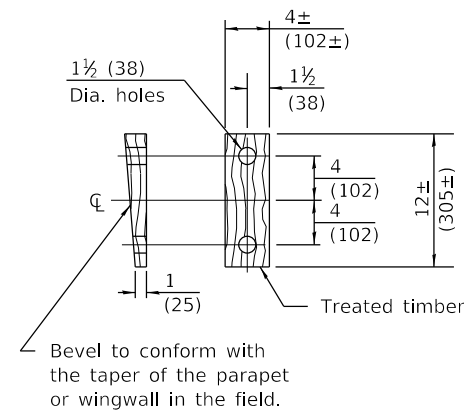
3/8 (16) Dia. post bolt with 3/4 (19) Dia. hole in post



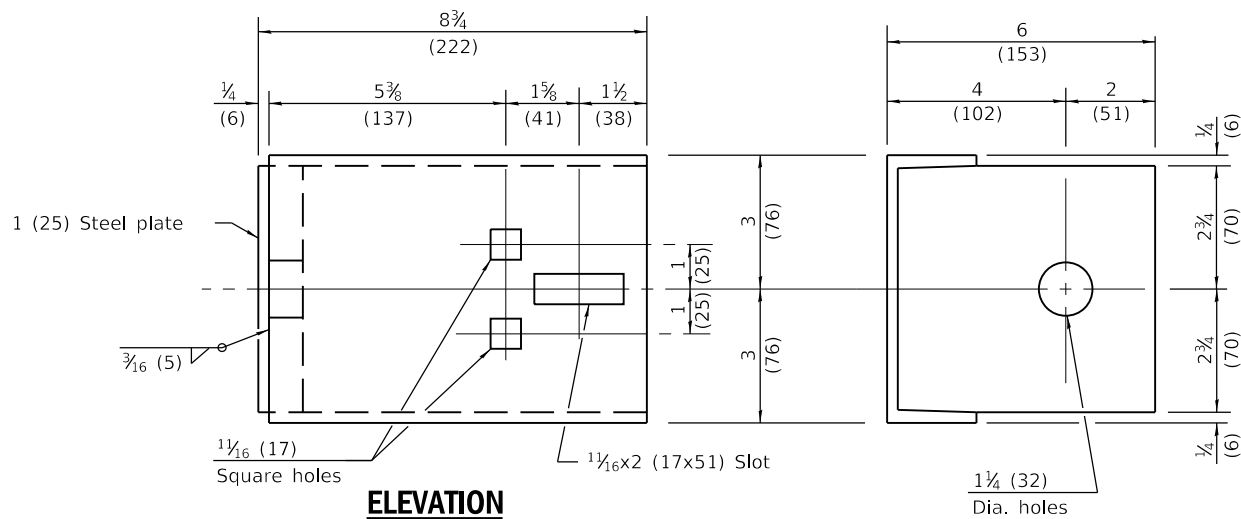
**SECTION B-B**



**SECTION C-C**

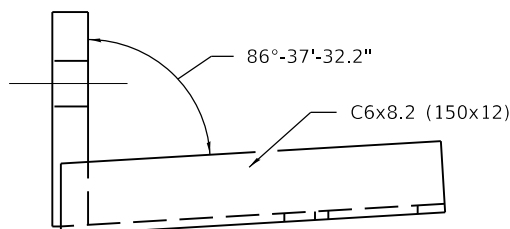


**WEDGE M**



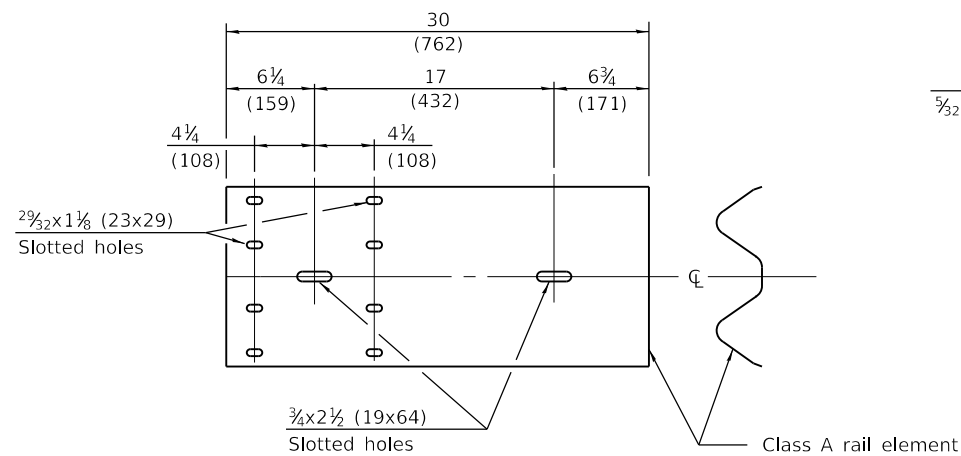
**ELEVATION**

**END VIEW**

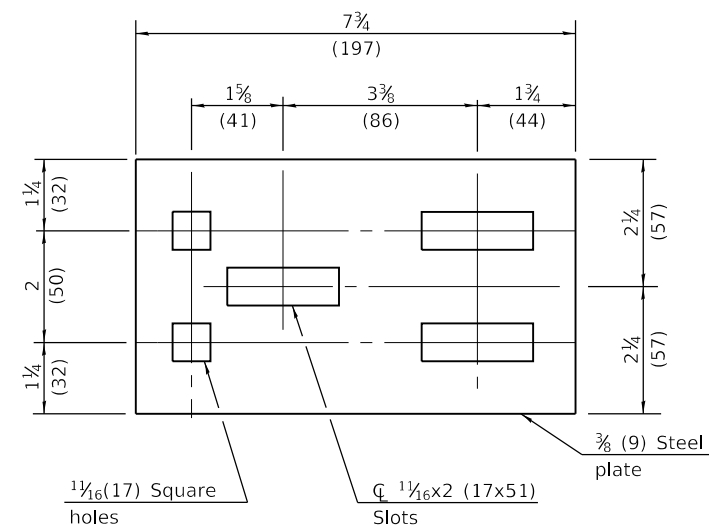


**PLAN**

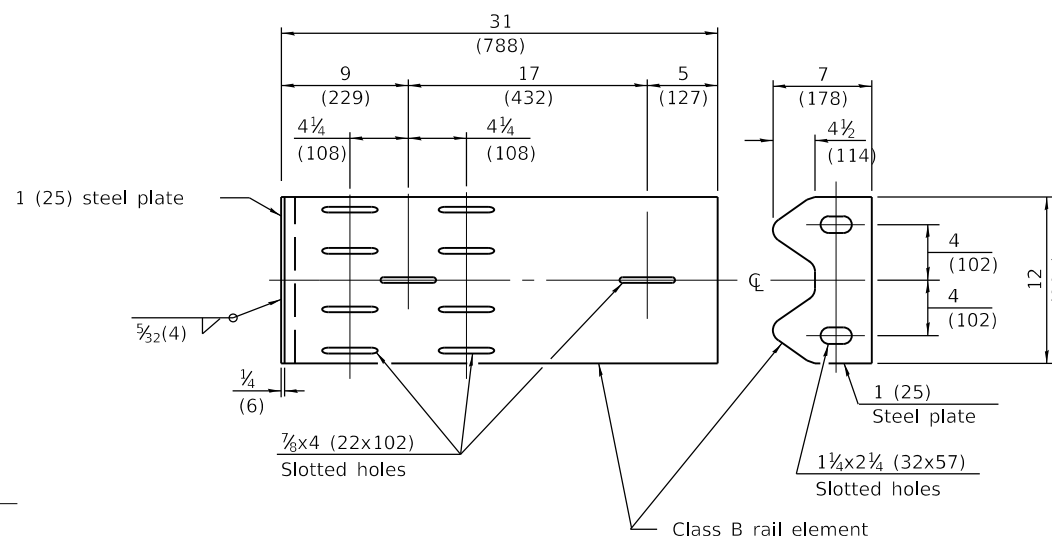
**RUB RAIL PLATE R-1**



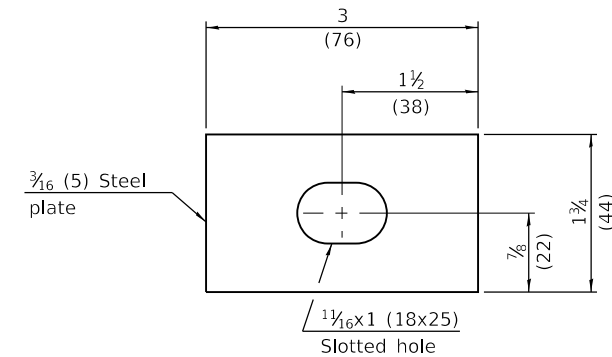
**PLATE E**



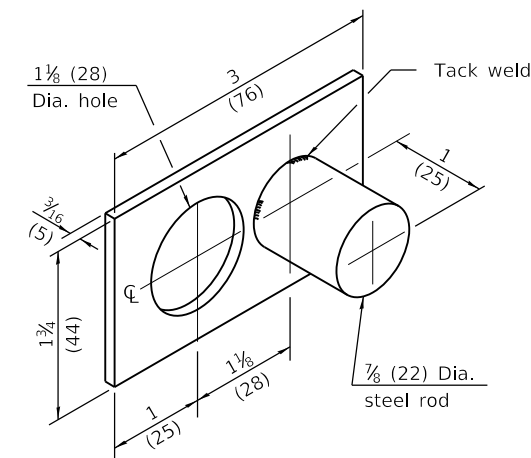
**SPLICE PLATE 'R-3'**



**PLATE G**



**PLATE WASHER F**



**PLATE WASHER D**

Illinois Department of Transportation

PASSED January 1, 2012

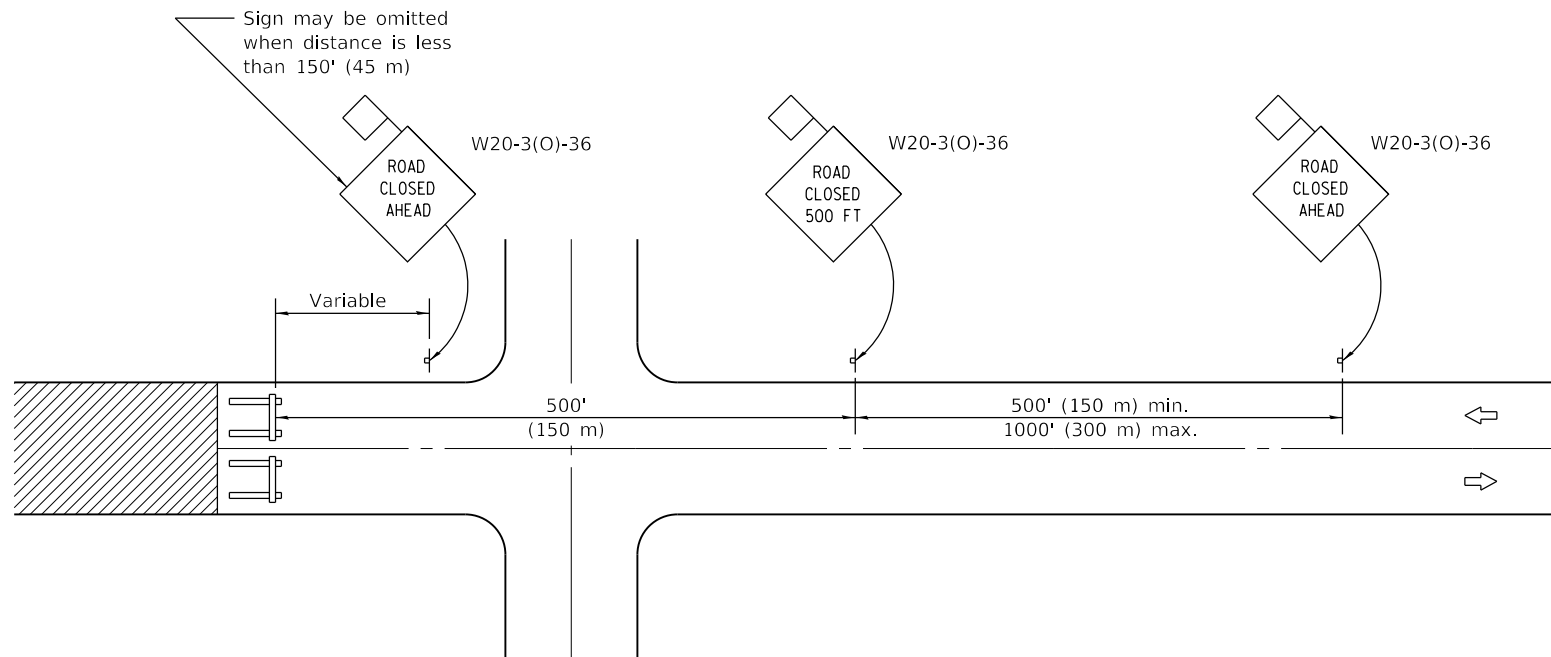
APPROVED January 1, 2012

ISSUED 1-1-97

**TRAFFIC BARRIER  
TERMINAL-TYPE 5R**

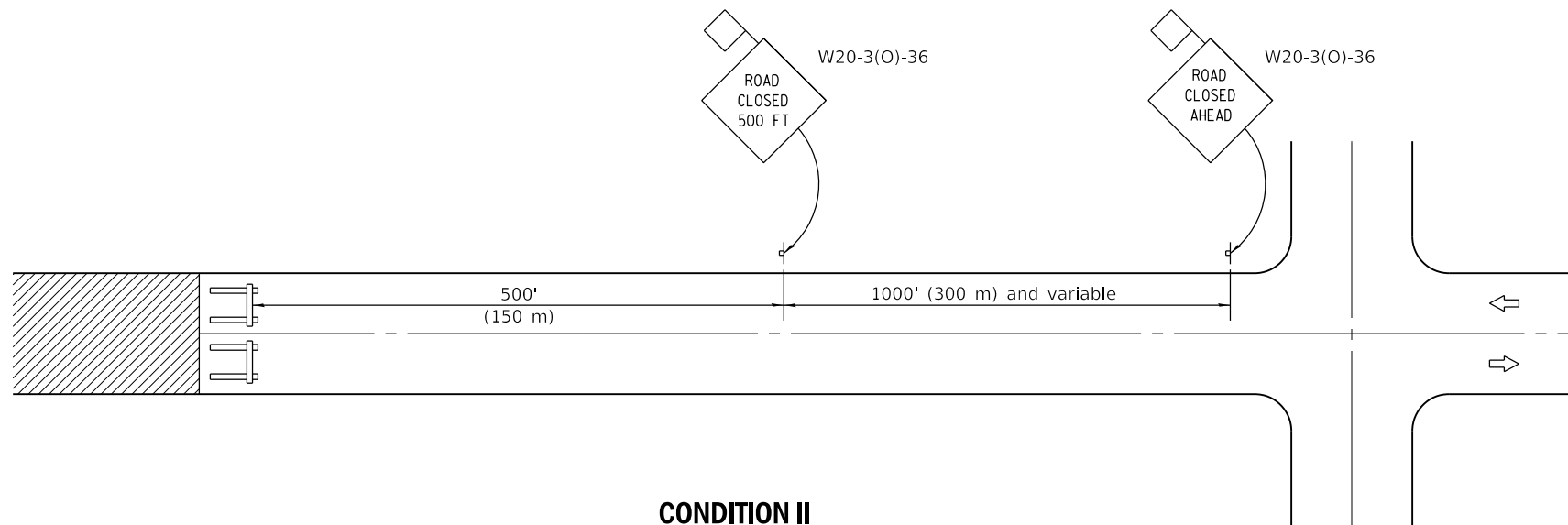
(Sheet 2 of 2)

**STANDARD B.L.R. 20-7**



**CONDITION I**

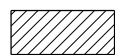
When distance from closure to crossroad is less than 1500' (450 m)



**CONDITION II**

When distance from closure to crossroad is greater than 1500' (450 m)

**SYMBOLS**



Work area



Type III Barricade



Sign with 18x18 (450x450) min. orange flag attached

**GENERAL NOTES**

Type III Barricades and R11-2-4830 signs shall be positioned as shown in "Road Closed To All Traffic" detail on Highway Standard 701901.

Two Type A Low Intensity Flashing Lights shall be used on each approach in advance of the work area during hours of darkness. One light shall be installed above the barricades and the other above the first advance warning sign.

All warning signs shall have minimum dimensions of 36 x 36 (900 x 900) and have a black legend on an orange reflectorized background.

When fluorescent signs are used, orange flags are not required.

Longitudinal dimensions may be adjusted to fit field conditions.

When the distance between the barricade and the intersection is between 1500' (450 m) and 2000' (600 m), the advance sign shall be placed at the intersection. When the distance between the barricade and the intersection is over 2000' (600 m), an additional sign shall be placed at the intersection. The additional sign shall give the distance to the barricade in miles or fractions of a mile.

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

DATE	REVISIONS
1-1-12	Omitted two notes from GENERAL NOTES.
1-1-09	Switched units to English (metric).

**TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS**

**STANDARD B.L.R. 21-9**

Illinois Department of Transportation

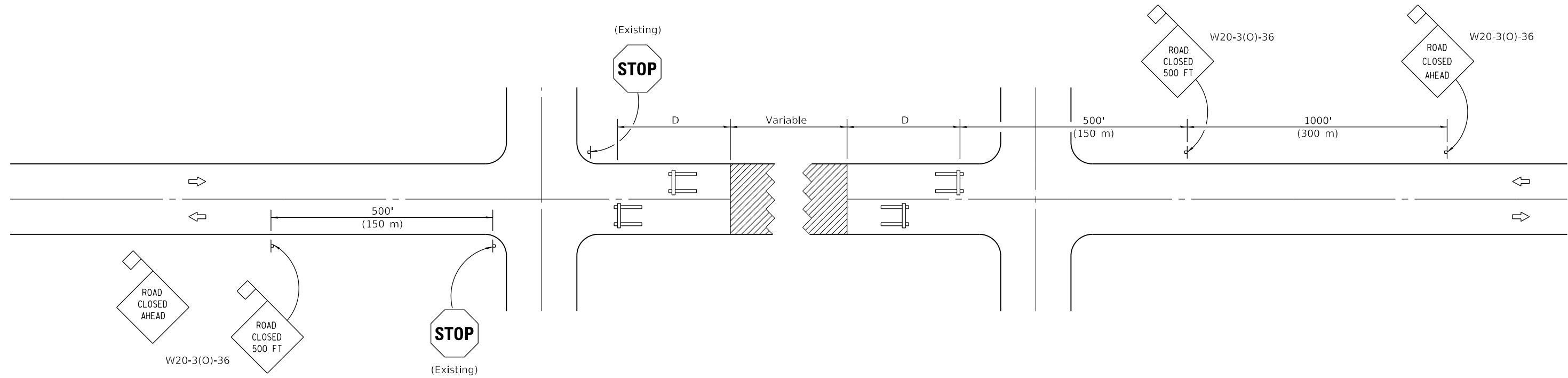
PASSED January 1, 2012  
*Danell Lewis*  
 ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2012  
*Scott S. S. S.*  
 ENGINEER OF DESIGN AND ENVIRONMENT




ISSUED 1-1-97

**CONDITION I  
APPROACH TRAFFIC STOPPED**

**CONDITION II  
APPROACH TRAFFIC  
DOES NOT STOP**



**SYMBOLS**

-  Work area
-  Type III Barricade
-  Sign with 18x18 (450x450) min. orange flag attached

**GENERAL NOTES**

Type III Barricades and R11-4-6030 signs shall be positioned as shown in the "Road Closed To All Traffic" detail on Highway Standard 701901. If the distance "D" exceeds 2000' (600 m), an additional set of barricades and R11-4-6030 shall be placed at each end of the work area.

Two Type A Low Intensity Flashing Lights shall be used on each approach in advance of the work area. One light shall be installed above each barricade. If only one barricade is required, the other light shall be installed above the first advance warning sign.

All warning signs shall have minimum dimensions of 36 x 36 (900 x 900) and have a black legend on an orange reflectorized background.

When fluorescent signs are used, orange flags are not required.

Longitudinal dimensions may be adjusted to fit field conditions.

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

DATE	REVISIONS
1-1-12	Omitted two notes from GENERAL NOTES.
1-1-09	Revised General Notes and switched units to English (metric).

**TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS**  
(TWO-LANE TWO WAY RURAL TRAFFIC)  
(ROAD CLOSED TO THRU TRAFFIC)

**STANDARD B.L.R. 22-7**

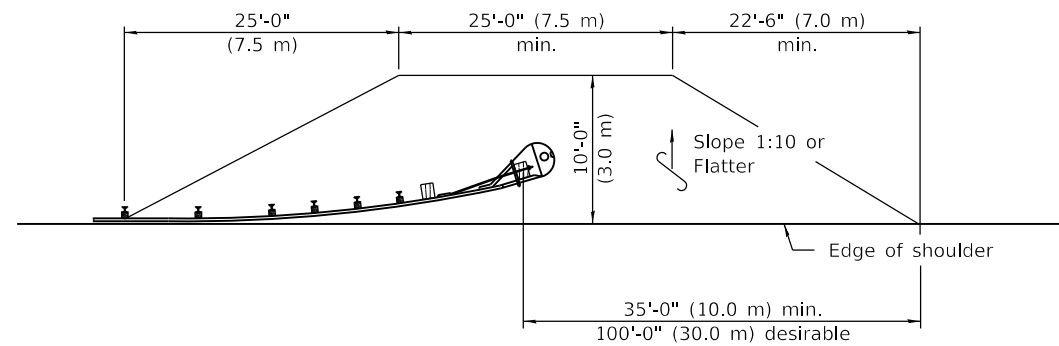
Illinois Department of Transportation

PASSED January 1, 2012  
*Donell Lewis*  
ENGINEER OF LOCAL ROADS AND STREETS

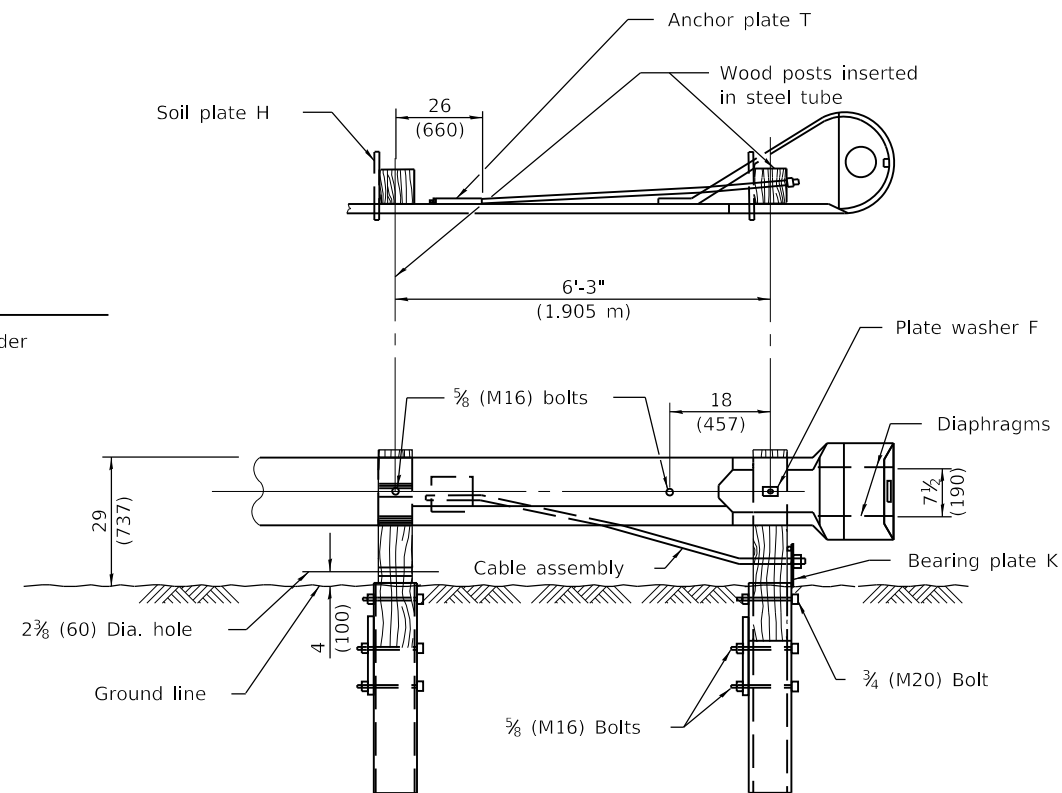
APPROVED January 1, 2012  
*Scott Esdaile*  
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

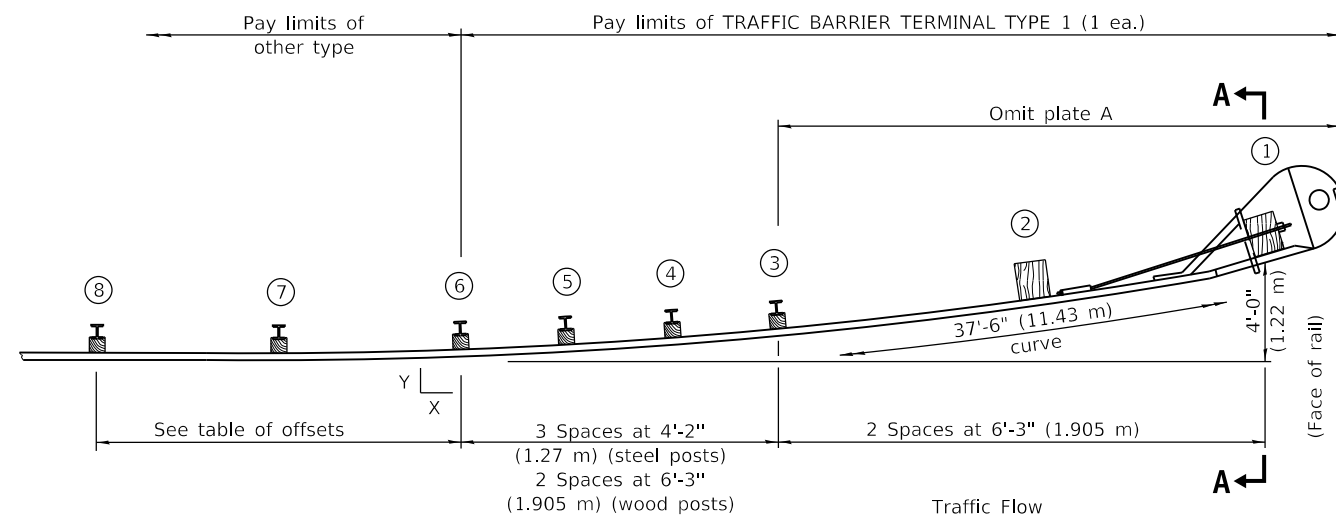
OFFSETS TO FACE OF RAIL		
Post	X ft (m)	Y ft (m)
①	37.22 (11.345)	4.0 (1.22)
②	31.09 (9.475)	2.79 (0.850)
③	24.92 (7.595)	1.79 (0.545)
④	20.79 (6.335)	1.25 (0.380)
⑤	16.64 (5.070)	0.80 (0.245)
⑥	12.49 (3.805)	0.45 (0.135)
⑦	6.25 (1.905)	0.11 (0.035)
⑧	0.00 (0.00)	0.00 (0.00)



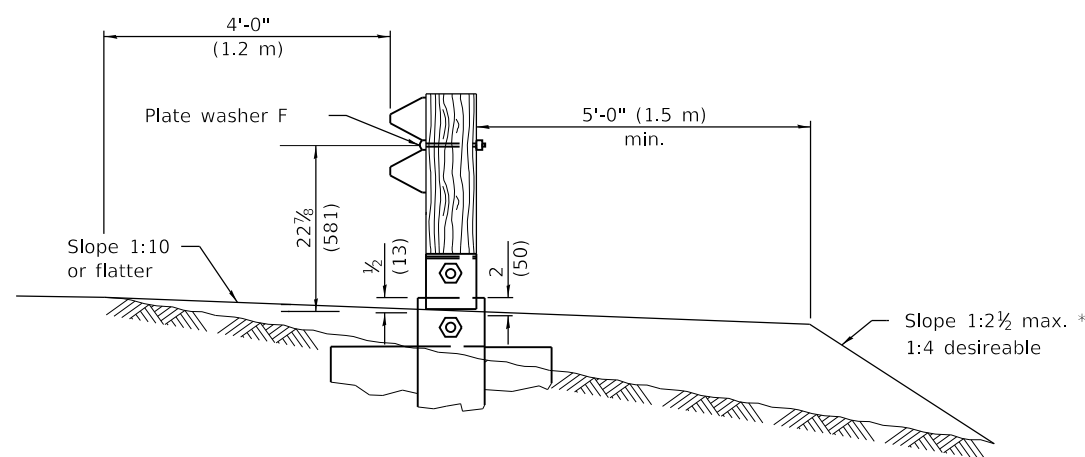
**SHOULDER WIDENING TRANSITION**



**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.

DATE	REVISIONS
1-1-12	Revised barrier terminal height and wood breakaway post.
1-1-09	Switched units to English (metric).

**TRAFFIC BARRIER  
TERMINAL TYPE 1**

(Sheet 1 of 2)

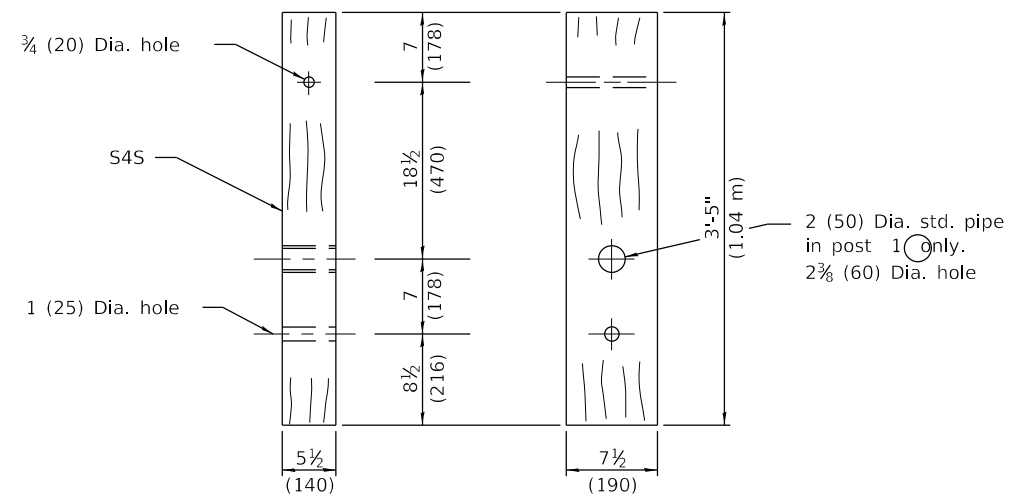
**STANDARD B.L.R. 23-4**

Illinois Department of Transportation

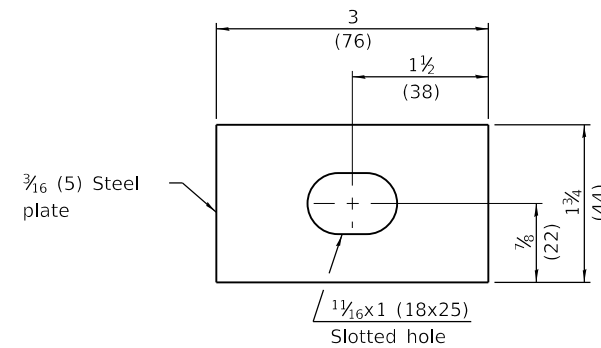
PASSED January 1, 2012  
*Danell Lewis*  
 ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2012  
*Scott Esch*  
 ENGINEER OF DESIGN AND ENVIRONMENT

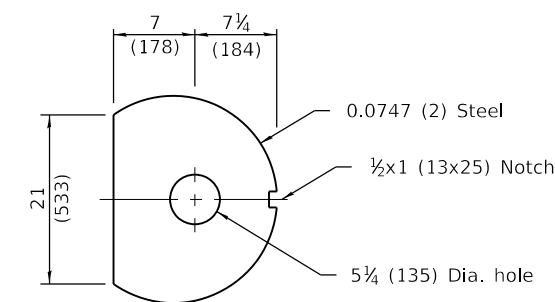
ISSUED 1-1-08



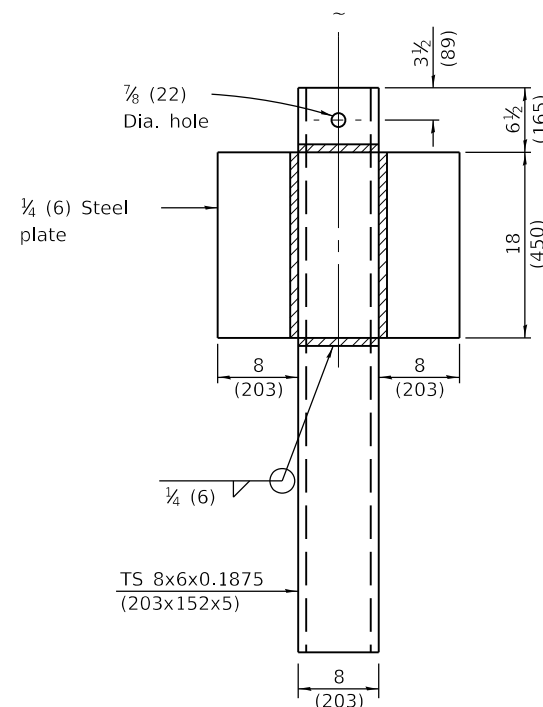
**WOOD BREAKAWAY POST**  
(2 ea.)



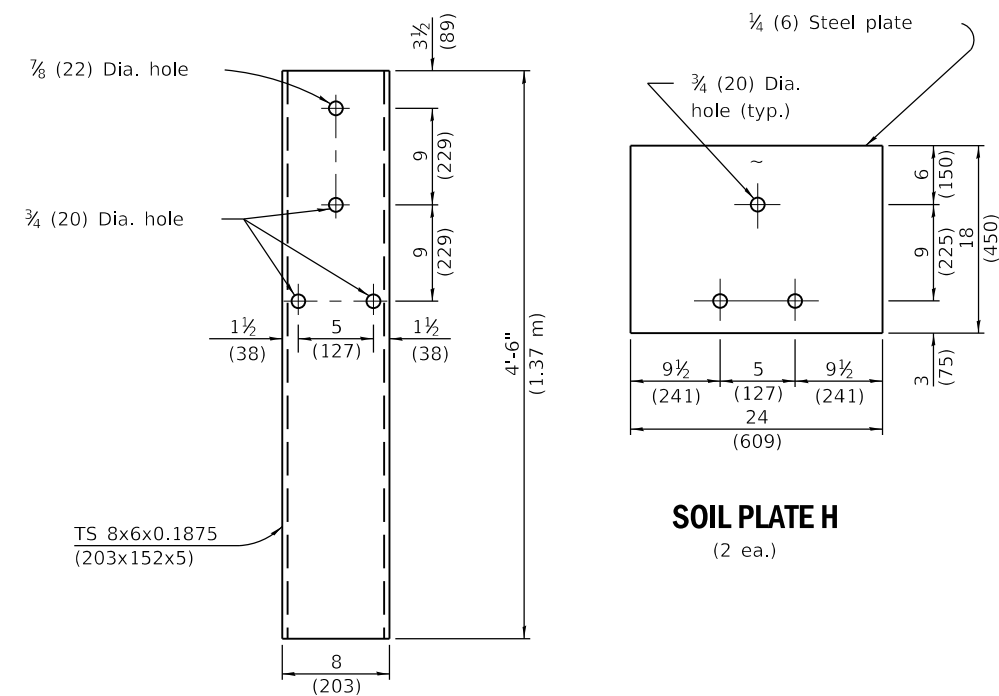
**PLATE WASHER F**  
(1 ea.)



**DIAPHRAGM**  
(2 ea.)

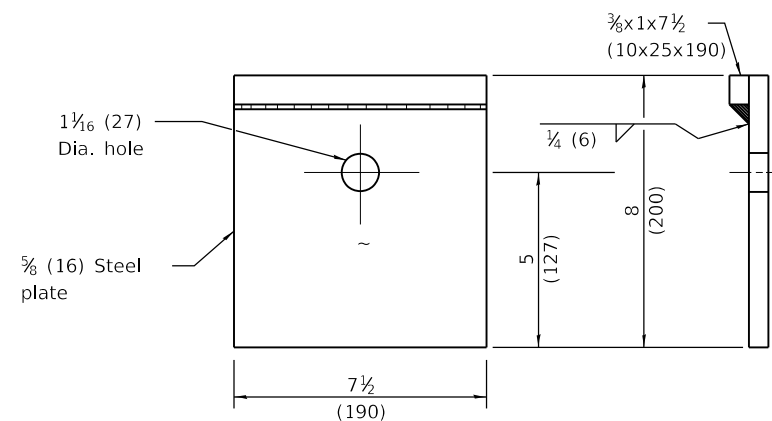


**ALTERNATE SOIL PLATE CONNECTION**

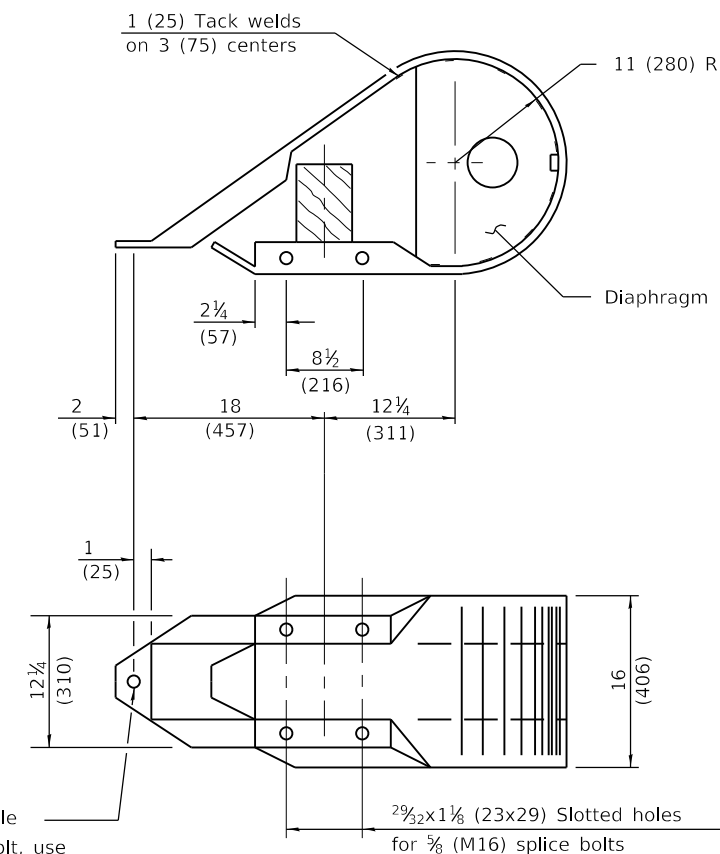


**STEEL TUBE**  
(2 ea.)

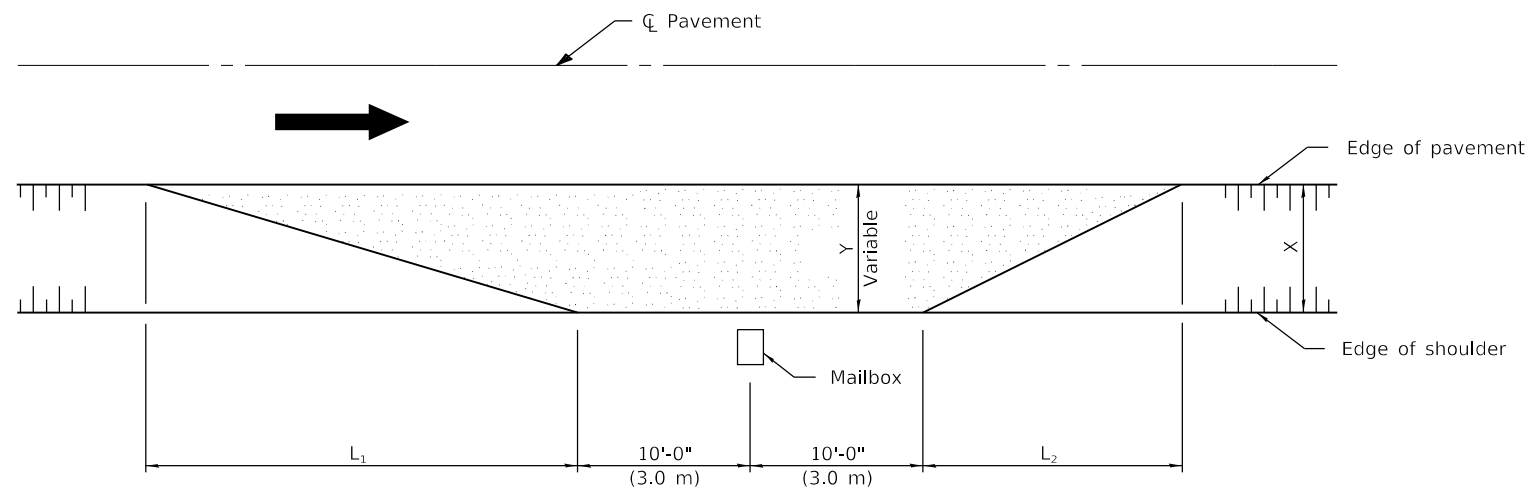
**SOIL PLATE H**  
(2 ea.)



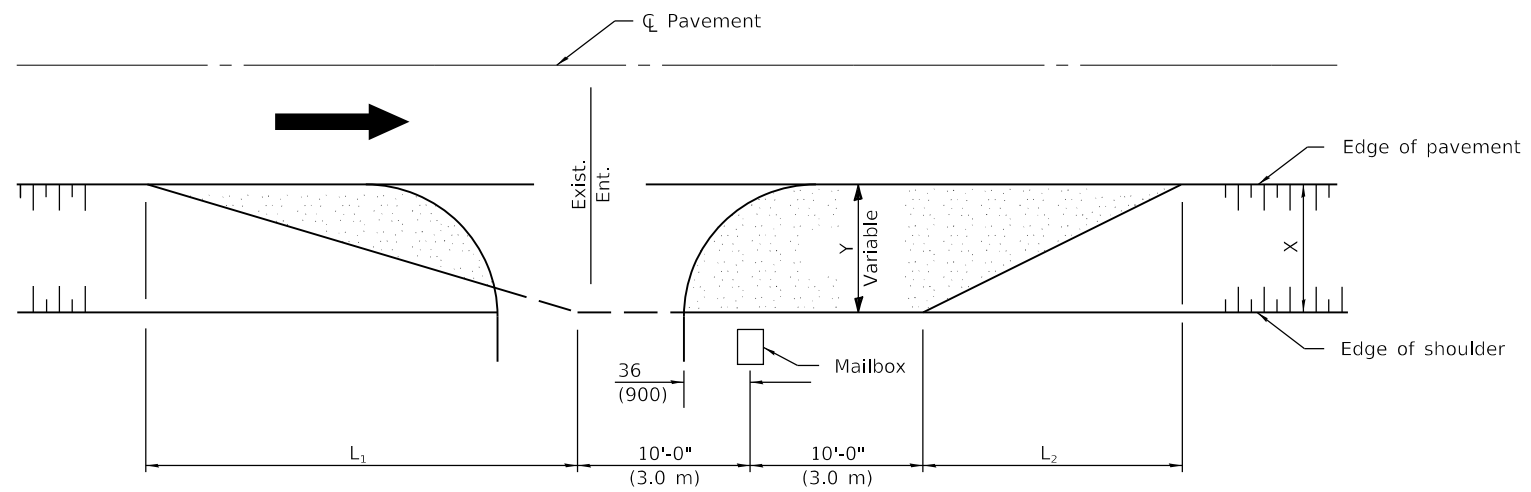
**BEARING PLATE K**  
(1 ea.)



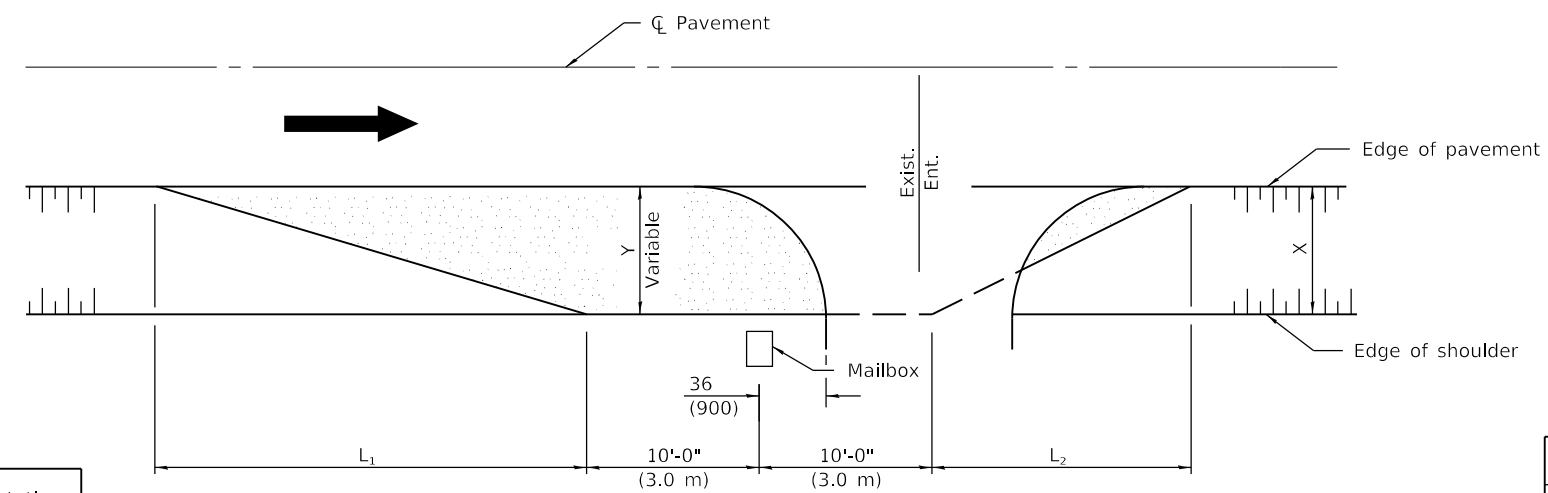
**NOSE**  
(1 ea.)



**TYPICAL APPLICATION**



**MAILBOX ON FAR SIDE OF ENTRANCE**



**MAILBOX ON NEAR SIDE OF ENTRANCE**

DIMENSIONS - ft. (m)						
Width of Shoulder (X)	12 (3.6)	10 (3.0)	8 (2.4)	6 (1.8)	5 (1.5)	4 (1.2)
Width of Turnout (Y)	8 (2.4)	8 (2.4)	6 (1.8)	4 (1.2)	4 (1.2)	4 (1.2)
L <sub>1</sub>	30 (9.0)	30 (9.0)	23 (6.9)	15 (4.5)	15 (4.5)	15 (4.5)
L <sub>2</sub>	20 (6.0)	20 (6.0)	15 (4.5)	10 (3.0)	10 (3.0)	10 (3.0)

Note:  
Dimensions for Township and District Roads may vary from the above dimensions.

**GENERAL NOTES**

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

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

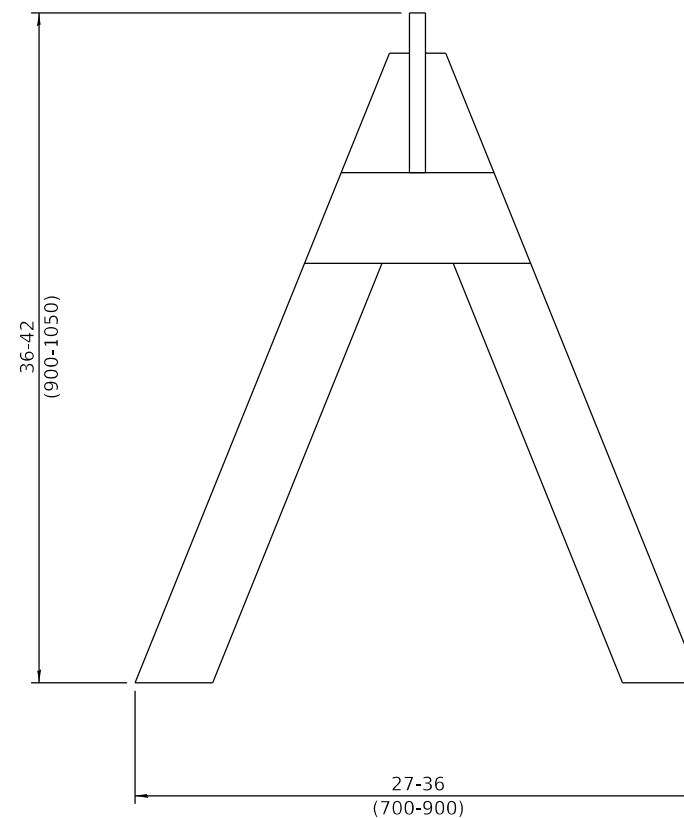
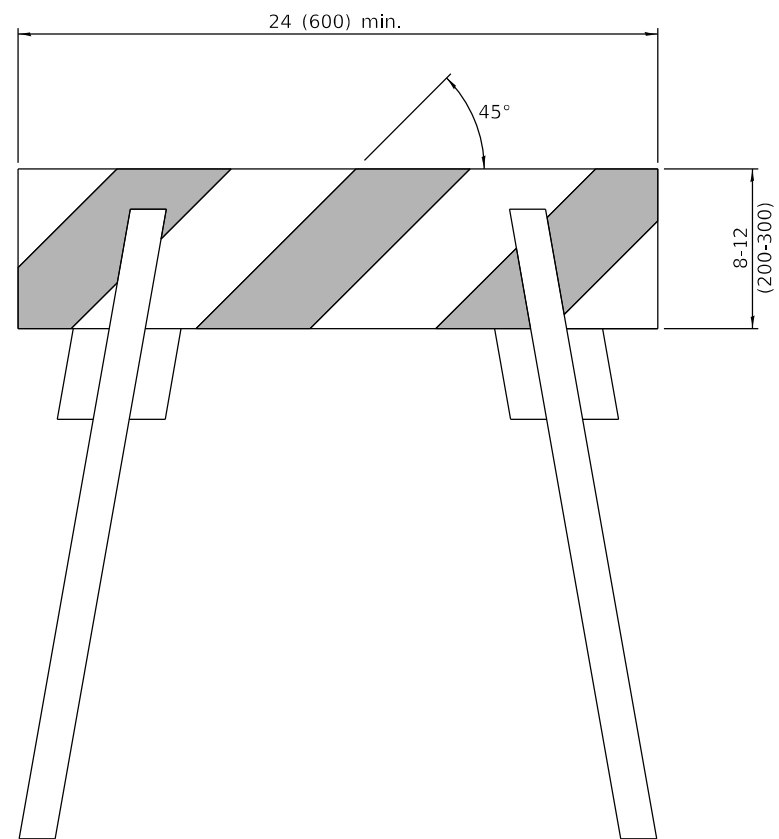
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-99	Add width of shoulder X.

**MAILBOX TURNOUT FOR LOCAL ROADS**

**STANDARD B.L.R. 24-2**

Illinois Department of Transportation  
 PASSED January 1, 2009  
*Charles J. Ringwald*  
 ENGINEER OF LOCAL ROADS AND STREETS  
 APPROVED January 1, 2009  
*Ken E. Han*  
 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).
1-1-03	New standard from 702001-02

## TYPE 1A BARRICADE FOR NON-NHS ROUTES

STANDARD B.L.R. 25-1

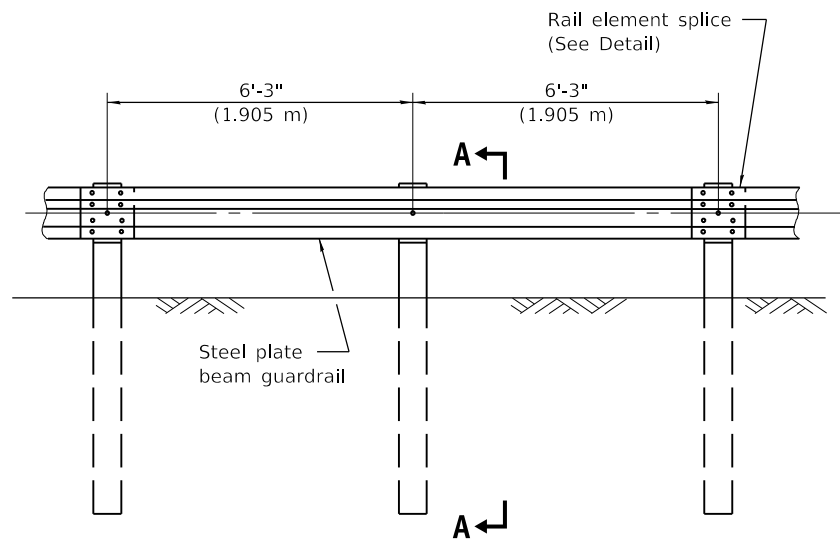
Illinois Department of Transportation

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

ISSUED 1-1-03

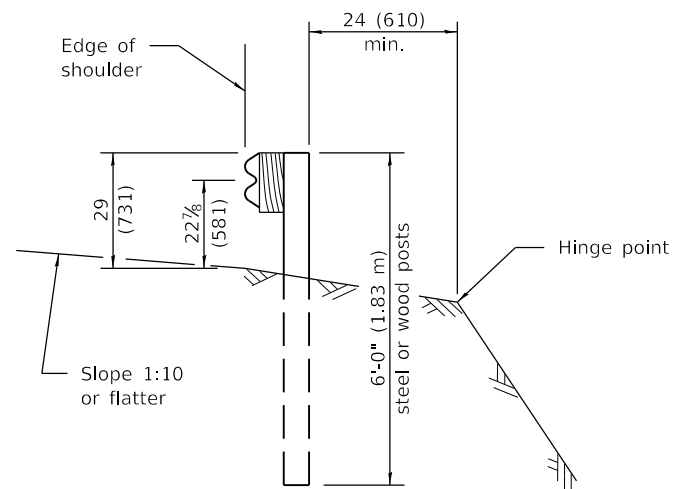




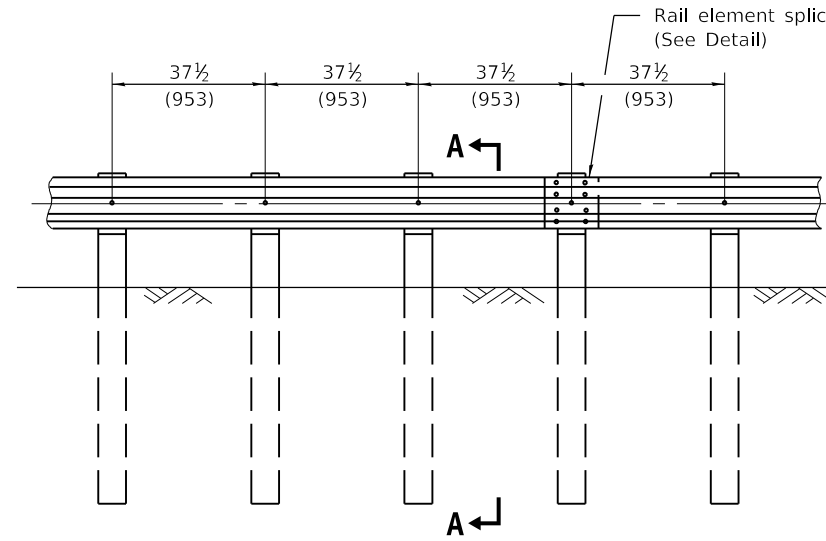
**ELEVATION**

**TYPE A**

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



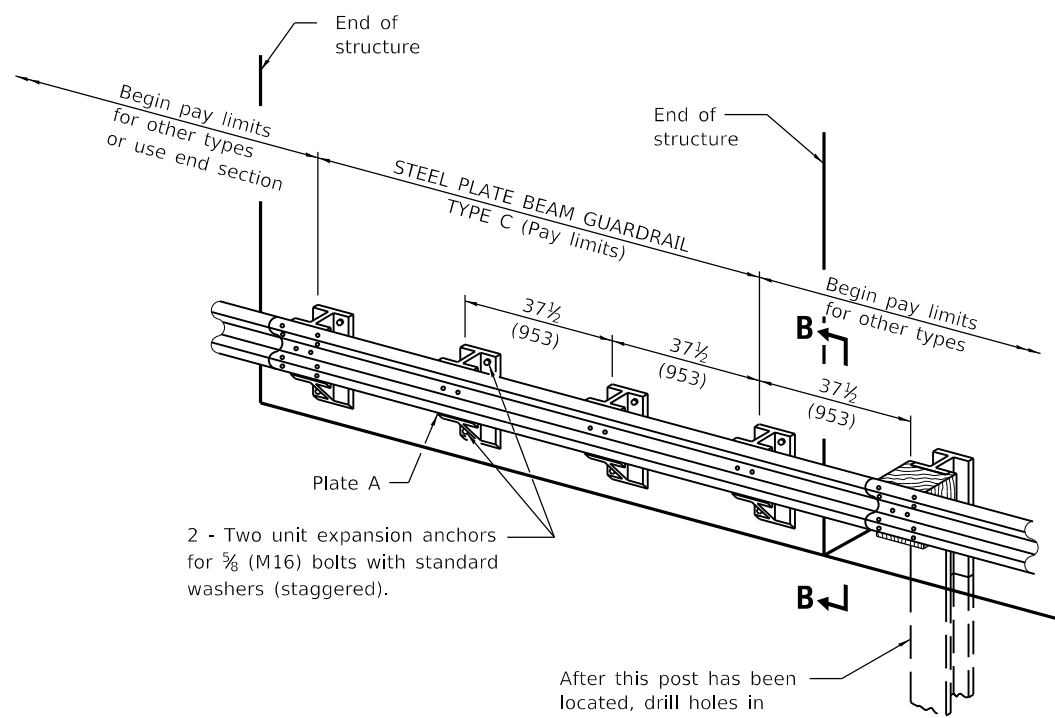
**SECTION A-A**



**ELEVATION**

**TYPE B**

37 1/2 (953) Closed post spacing

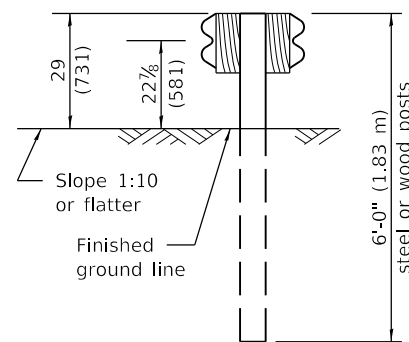


**TYPE C**

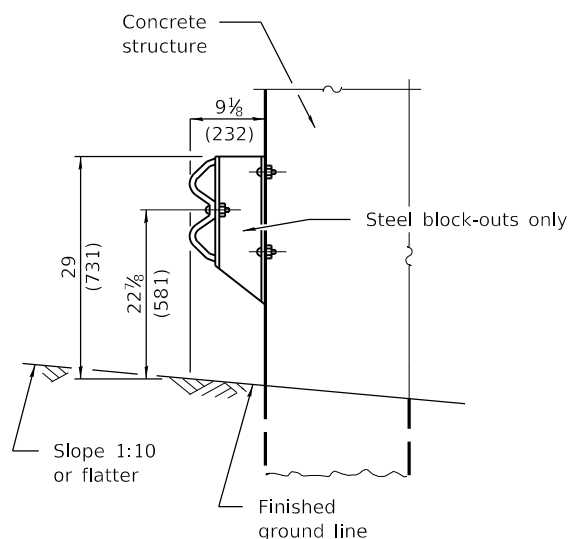
37 1/2 (953) Block-out spacing

2 - Two unit expansion anchors for 5/8" (M16) bolts with standard washers (staggered).

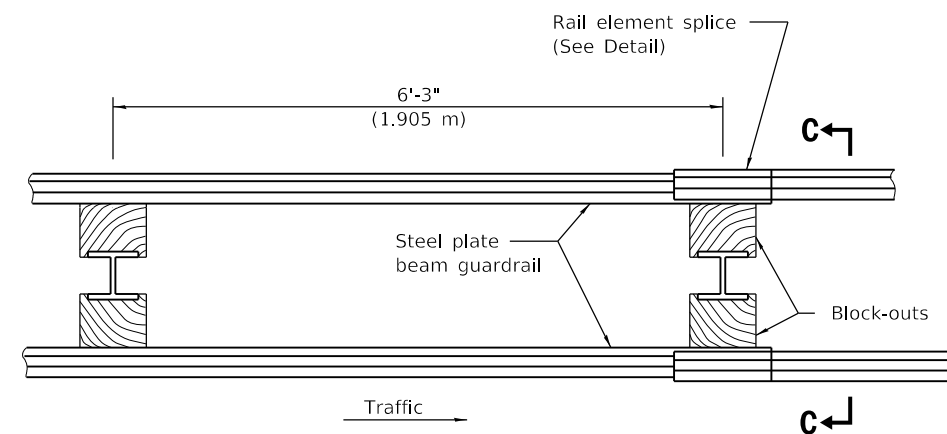
After this post has been located, drill holes in concrete for block-out attachments.



**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.

DATE	REVISIONS
1-1-12	Revised guardrail height.
	Modified table on sh. 4.
	Renamed standard.
1-1-10	Changed post length
	from 6'-9" to 6'-0".
	Modified table on sh. 4.

**STEEL PLATE BEAM GUARDRAIL**  
**29" (731mm) HEIGHT**

(Sheet 1 of 4)

**STANDARD B.L.R. 26-3**

Illinois Department of Transportation

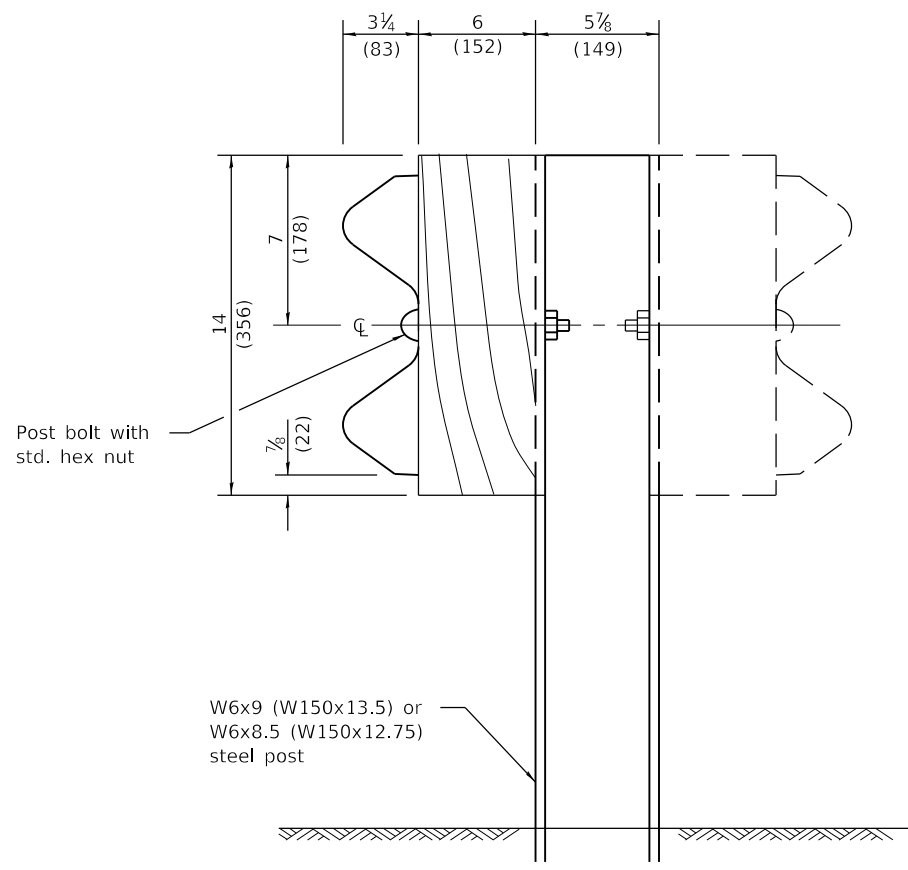
PASSED January 1, 2012

ENGINEER OF LOCAL ROADS AND STREETS

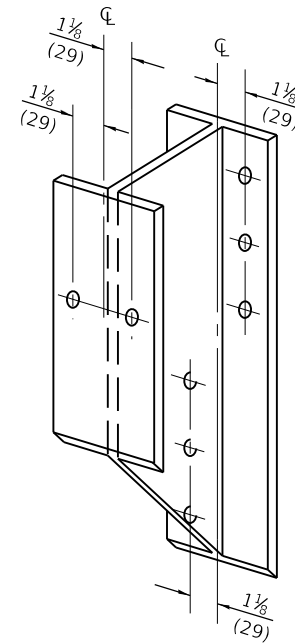
APPROVED January 1, 2012

ENGINEER OF DESIGN AND ENVIRONMENT

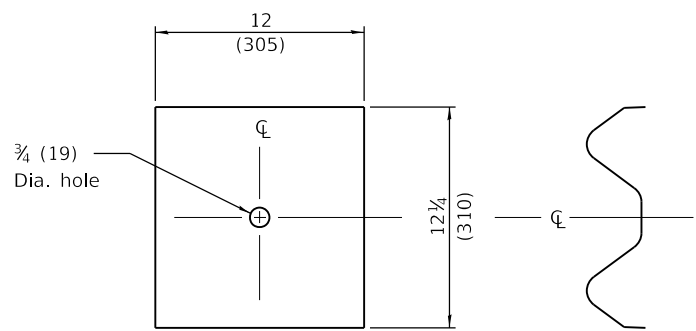
ISSUED 1-1-08



**STEEL POST CONSTRUCTION**

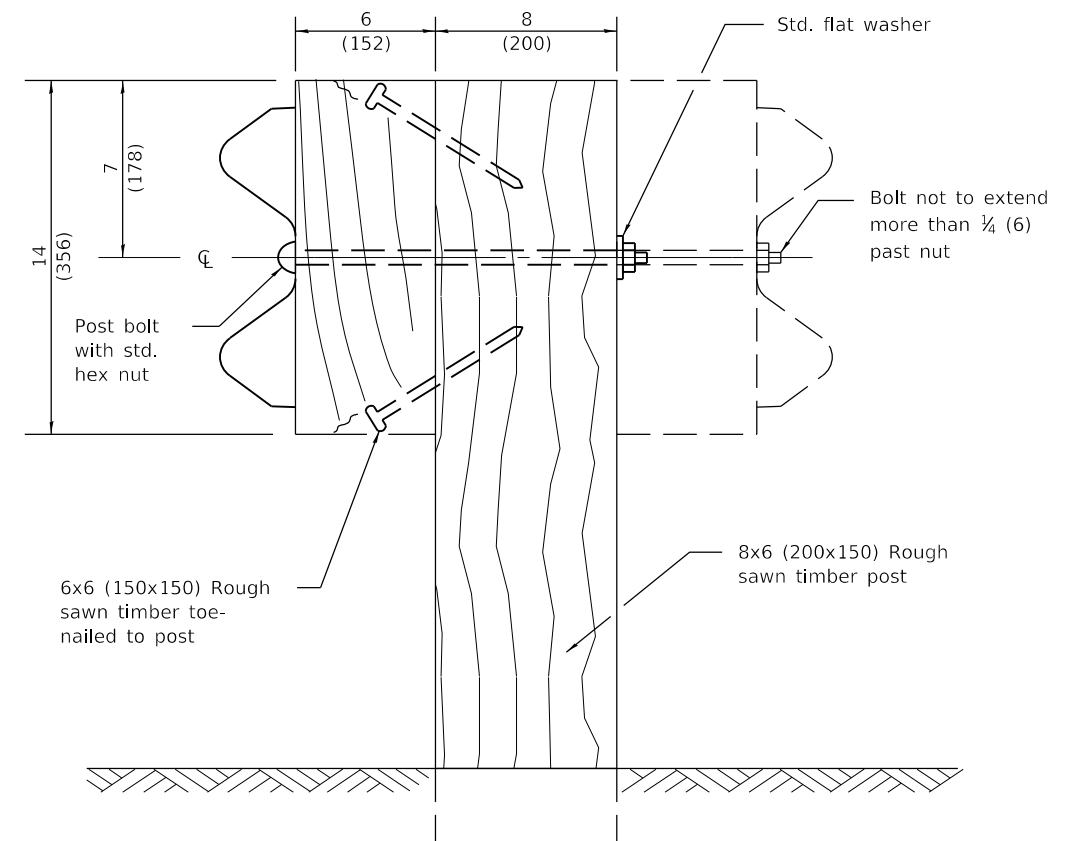


**STEEL BLOCK-OUT DETAIL**

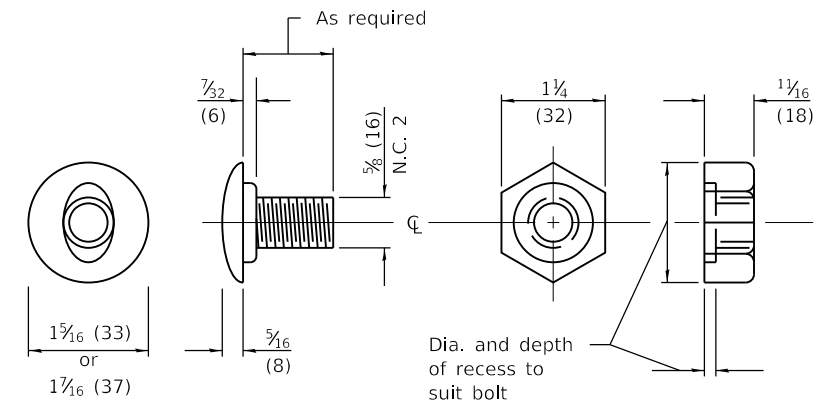


NOTE  
Plate A shall be placed between rail element and block-out at non-splice mounting points only when steel block-outs are used.

**PLATE A**



**WOOD POST CONSTRUCTION**



**POST OR SPLICE BOLT & NUT**

Illinois Department of Transportation

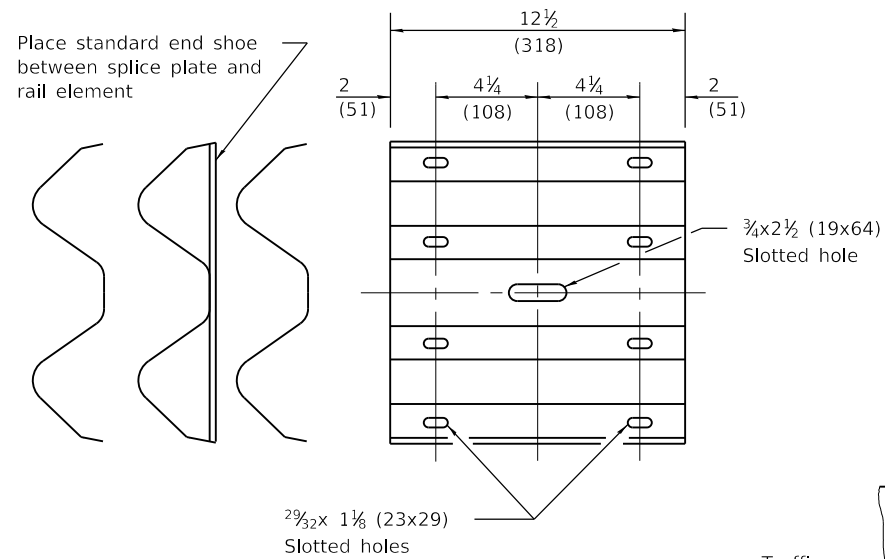
PASSED January 1, 2012  
*Donell Lewis*  
ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2012  
*Scott Esdaile*  
ENGINEER OF DESIGN AND ENVIRONMENT

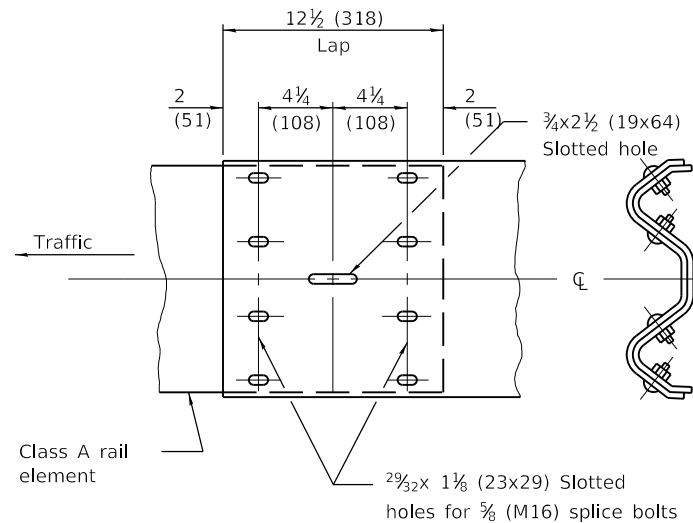
ISSUED 1-1-08

**STEEL PLATE BEAM GUARDRAIL**  
**29" (731mm) HEIGHT**  
(Sheet 2 of 4)

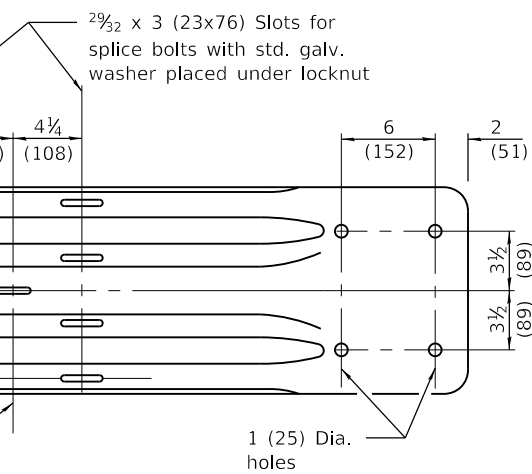
**STANDARD B.L.R. 26-3**



**SPLICE PLATE**



**RAIL ELEMENT SPLICE**

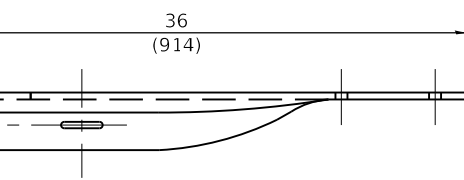


**NOTE**  
When end shoe is attached to a bridge parapet which has an expansion joint, the bolts shall be provided with a locknut or double nut and shall be tightened only to a point that will allow guardrail movement.

The standard end shoe shall be attached to the concrete with pre-drilled or self-drilling anchor bolts. The anchor cone shall be set flush with the surface of the concrete.

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

**END SHOE**

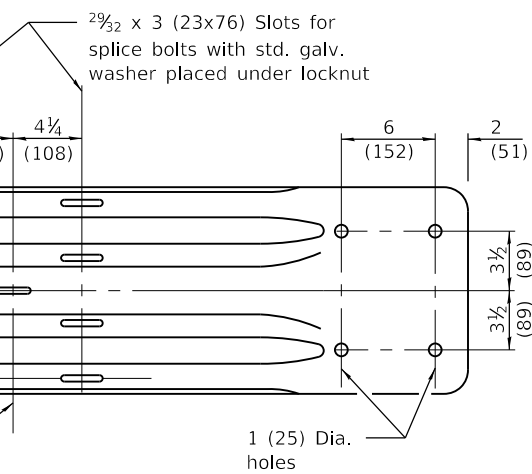


**NOTE**  
When end shoe is attached to a bridge parapet which has an expansion joint, the bolts shall be provided with a locknut or double nut and shall be tightened only to a point that will allow guardrail movement.

The standard end shoe shall be attached to the concrete with pre-drilled or self-drilling anchor bolts. The anchor cone shall be set flush with the surface of the concrete.

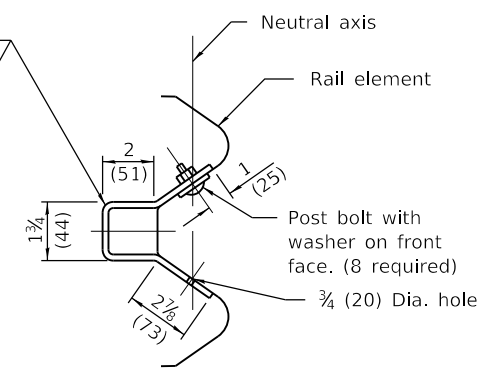
Externally threaded studs protruding from the surface of the concrete will not be permitted.

**END SHOE**

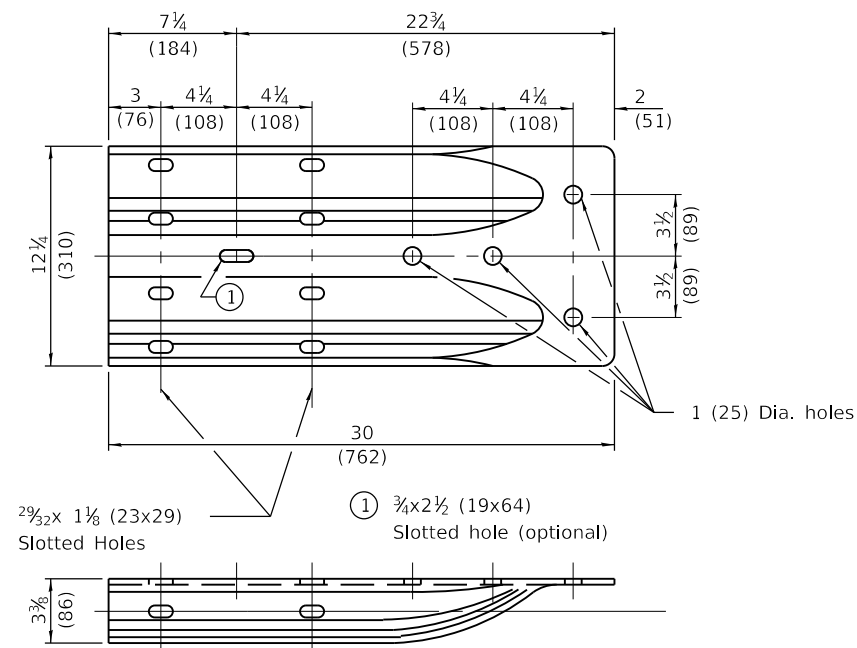


**NOTE**  
Anchor plate T shall be used to attach cable assembly to guardrail when required on traffic barrier terminals.

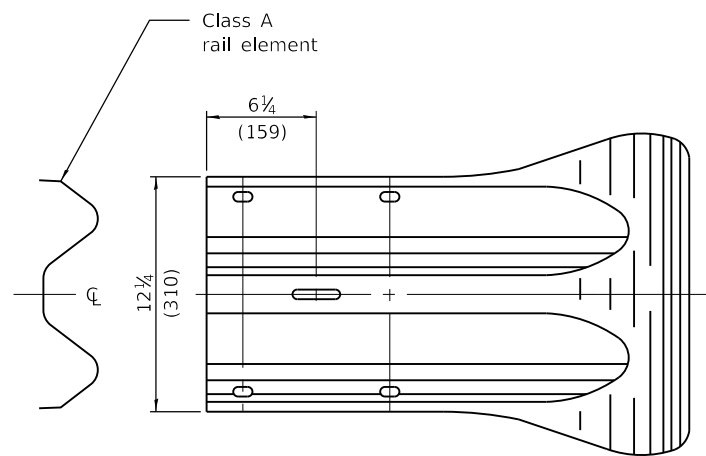
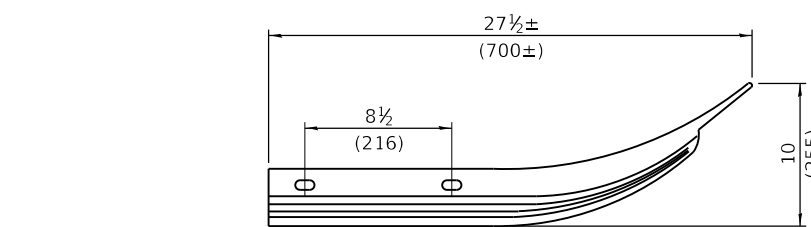
**ANCHOR PLATE T DETAILS**



**ALTERNATE END SHOE**



2 9/32 x 1 1/8 (23x29) Slotted Holes  
① 3/4 x 2 1/2 (19x64) Slotted hole (optional)



**END SECTION**

Illinois Department of Transportation

PASSED January 1, 2012

ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2012

ENGINEER OF DESIGN AND ENVIRONMENT

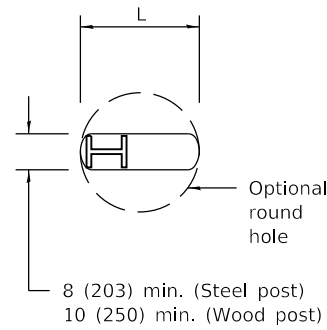
ISSUED 1-1-08

**STEEL PLATE BEAM GUARDRAIL**

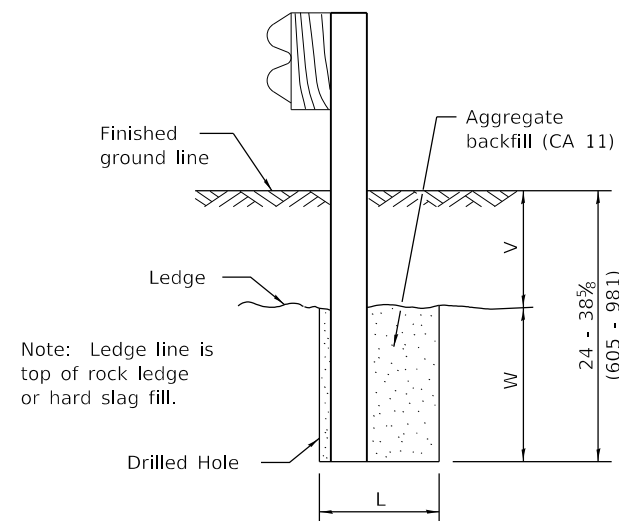
**29" (731mm) HEIGHT**

(Sheet 3 of 4)

**STANDARD B.L.R. 26-3**

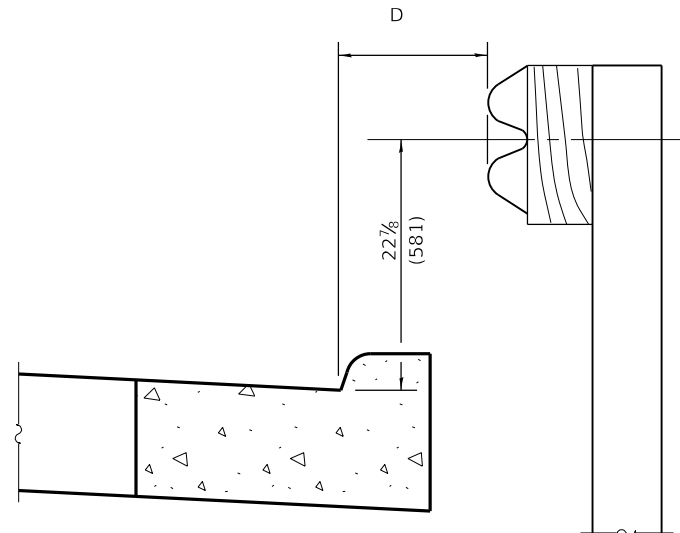


**PLAN**



**ELEVATION**

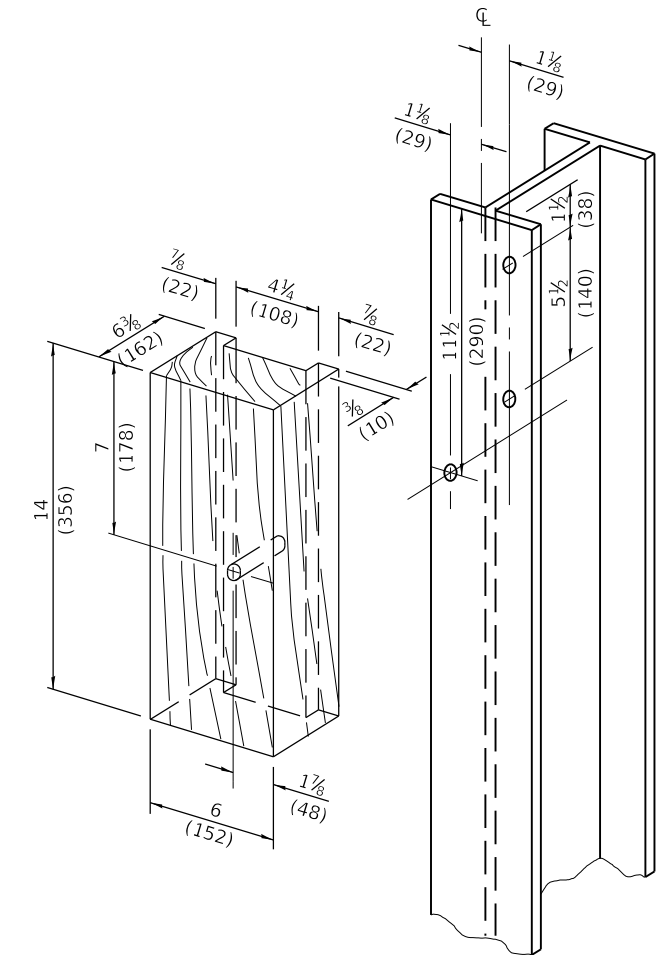
**FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED**



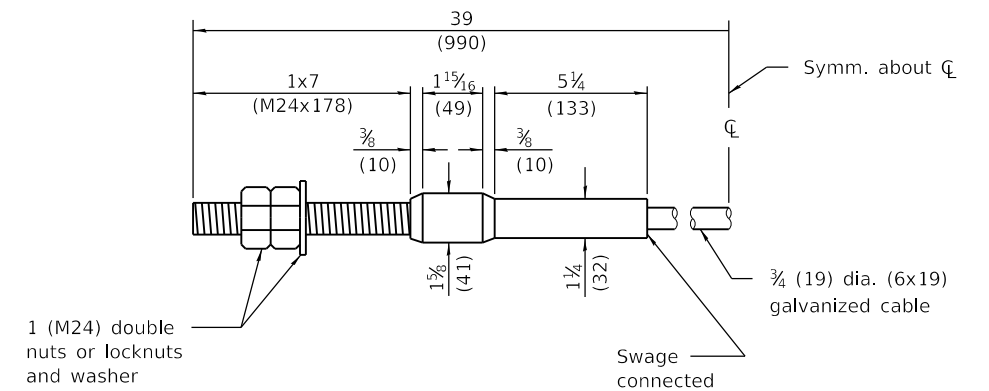
Note:  
If it is necessary for D to be more than 12 (300) and less than 10'-0" (3.0 m) Type M-2 (M-5) curb and gutter (Std. 606001) shall be used in front of and in advance of the guardrail.

**GUARDRAIL PLACED BEHIND CURB  
(D = 0 desirable to 12 (300) maximum)**

V	W	L	
		Steel Post	Wood Post
0 - 16 1/8 (0 - 410)	24 (610)	21 (530)	23 (580)
>16 1/8 - 28 1/8 (>410 - 714)	12 (305)	8 (203)	10 (250)
>28 1/8 - 38 5/8 (>714 - 981)	12 - 0 (305 - 0)	8 (203)	10 (250)



**WOOD BLOCK-OUT AND  
STEEL POST DETAILS**



**CABLE ASSEMBLY**

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

**STEEL PLATE BEAM GUARDRAIL  
29" (731mm) HEIGHT**

(Sheet 4 of 4)

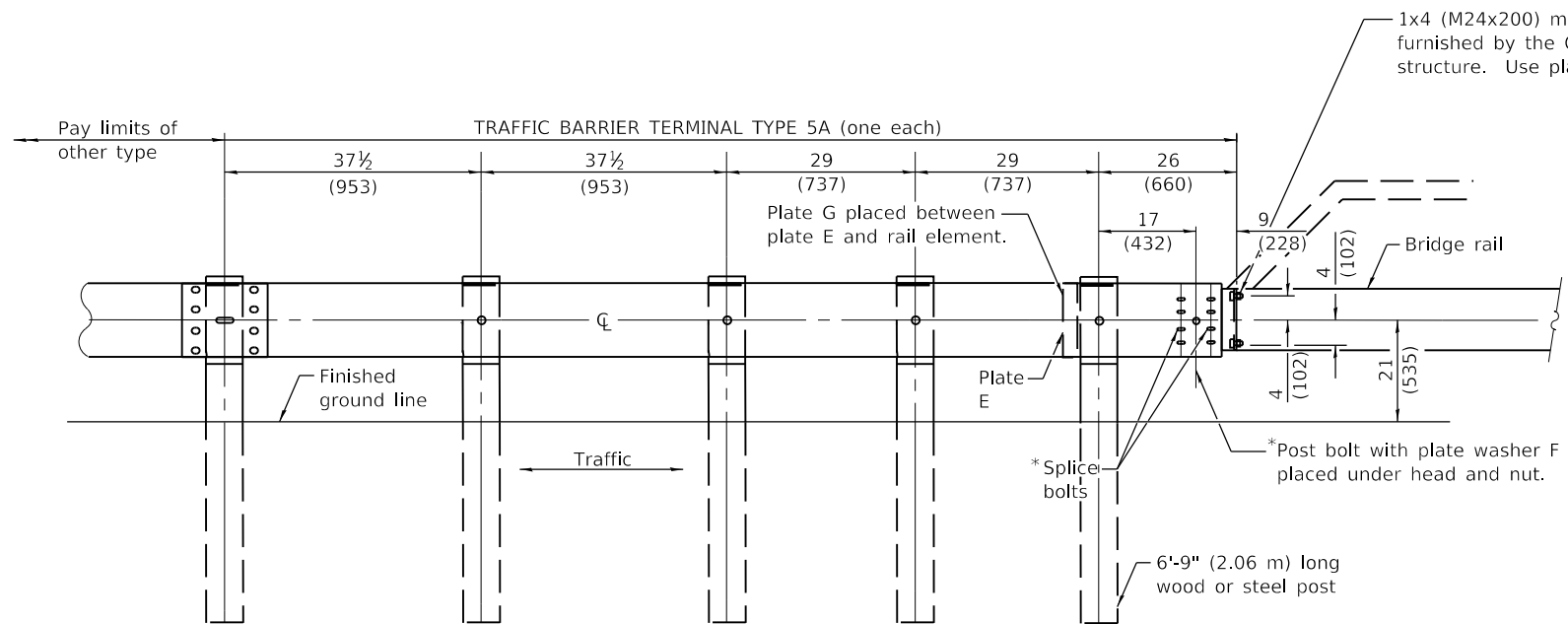
**STANDARD B.L.R. 26-3**

Illinois Department of Transportation

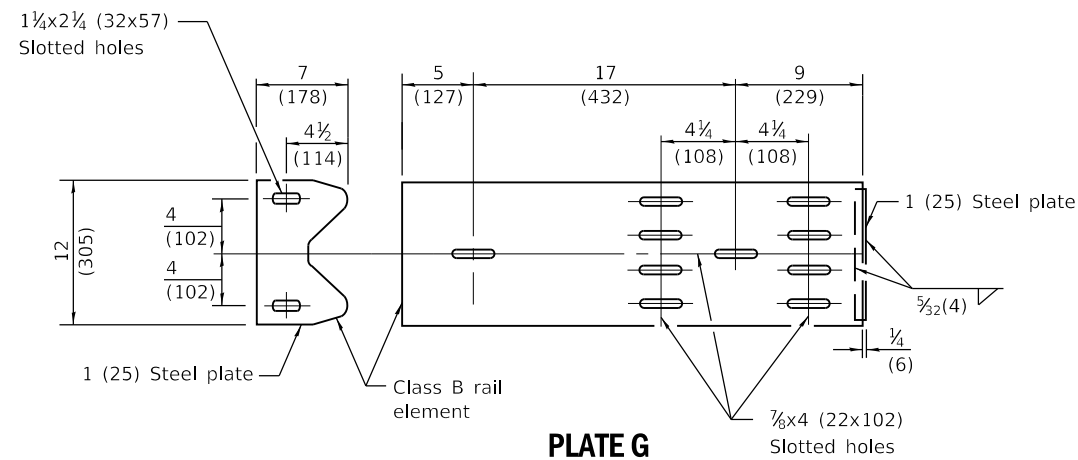
PASSED January 1, 2012  
*Danell Lewis*  
ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2012  
*Scott Esdaile*  
ENGINEER OF DESIGN AND ENVIRONMENT

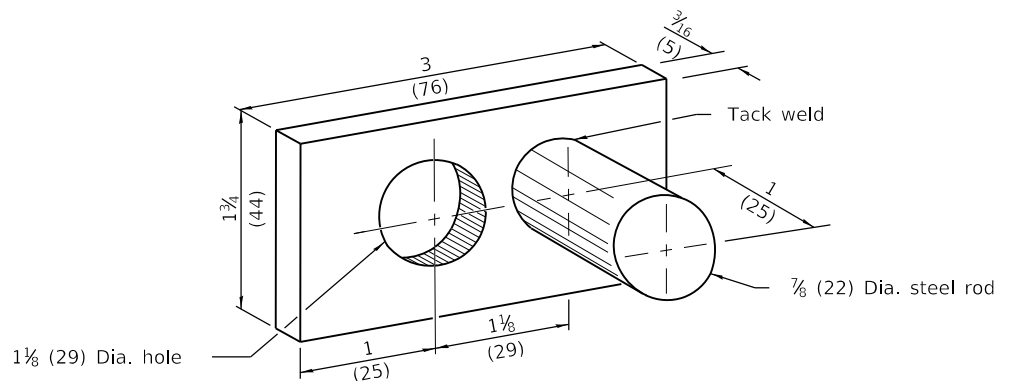
ISSUED 1-1-08



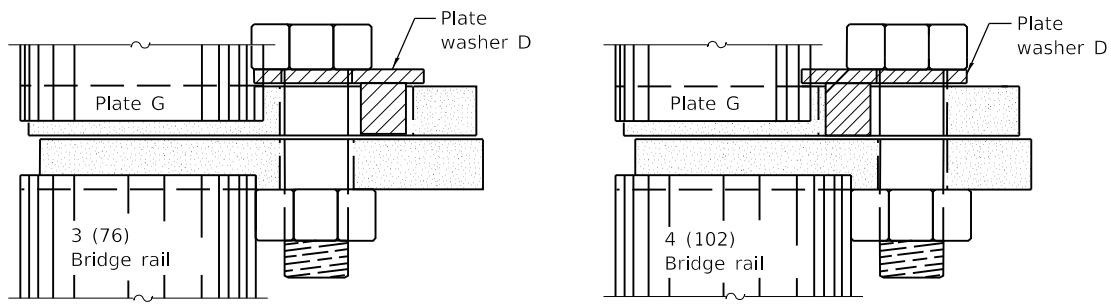
**TYPE 5A - STEEL BRIDGE RAIL**



**PLATE G**

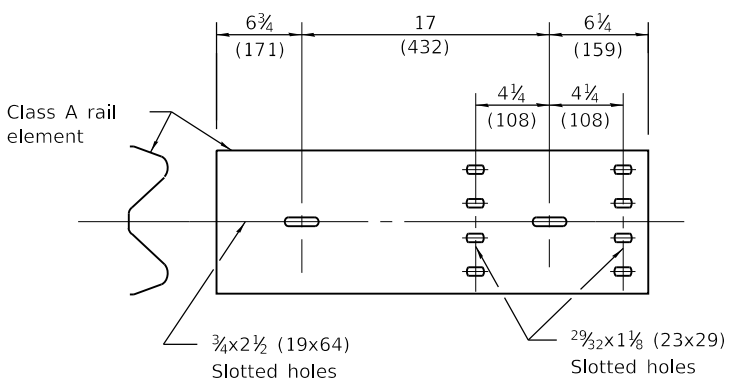


**PLATE WASHER D**

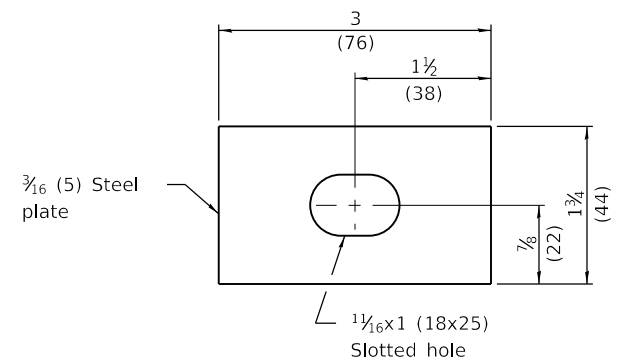


**PLACEMENT OF PLATE WASHER D**

(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.

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**

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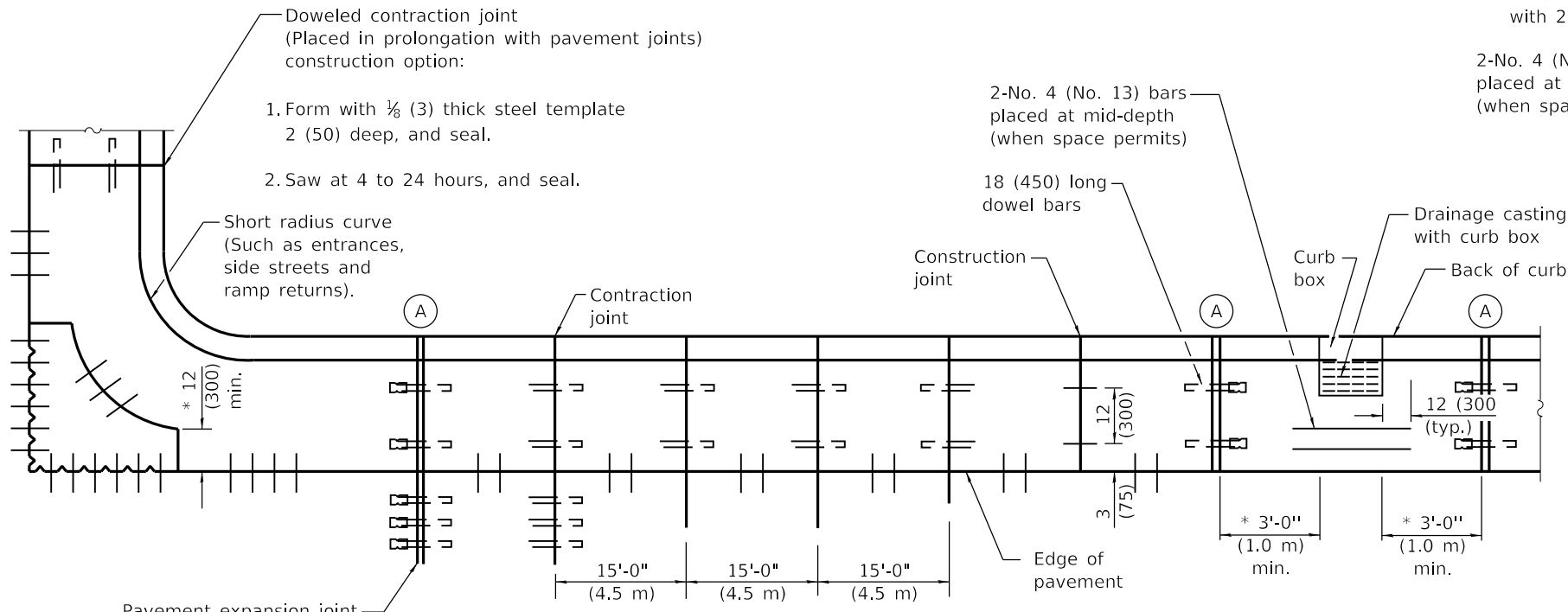
**STANDARD B.L.R. 27-1**

Illinois Department of Transportation

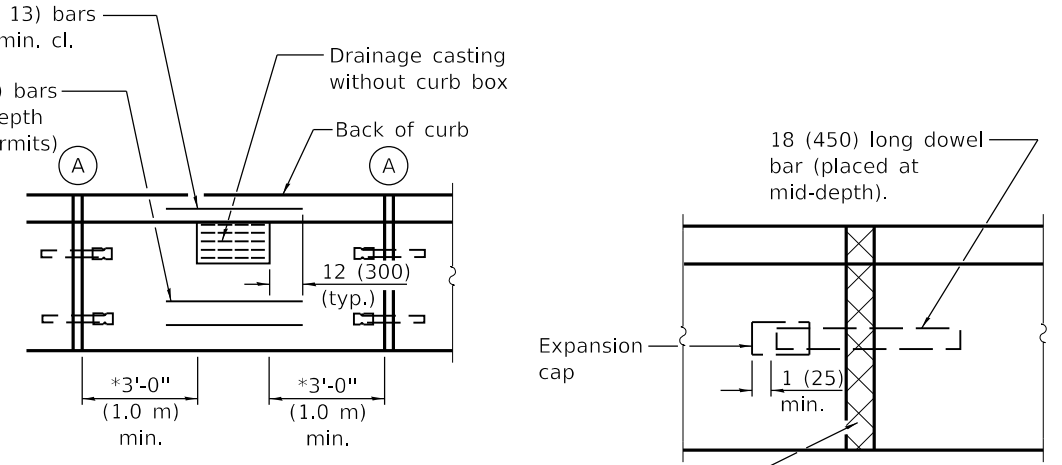
PASSED January 1, 2009  
*Charles J. Longwell*  
ENGINEER OF LOCAL ROADS AND STREETS

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

ISSUED 1-1-08

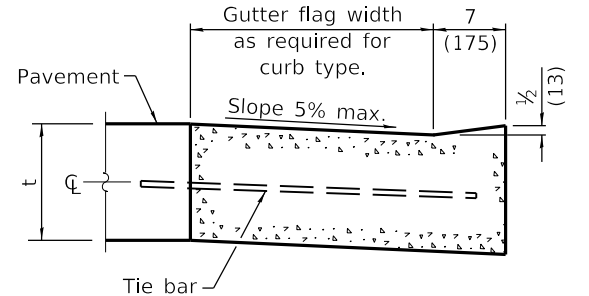


**PLAN**  
**ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE**



**DETAIL A**  
**EXPANSION JOINT**

Full depth & width 1 (25) - thick (min.) preformed expansion joint filler.



**DEPRESSED CURB ADJACENT TO CURB RAMP ACCESSIBLE TO THE DISABLED**

**GENERAL NOTES**

The bottom slope of combination curb and gutter constructed adjacent to pcc pavement shall be the same slope as the subbase or 6% when subbase is omitted.

t = Pavement thickness.

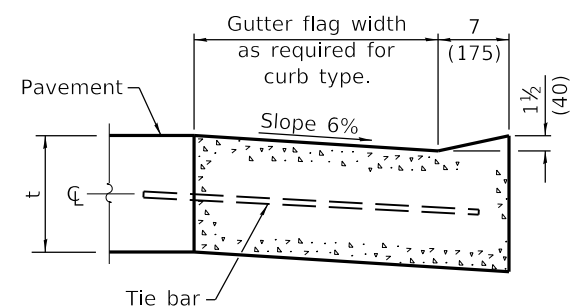
Longitudinal joint tie bars shall be No. 5 (No. 16) at 24 (600) centers in accordance with details for longitudinal construction joint shown on Standard 420001.

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

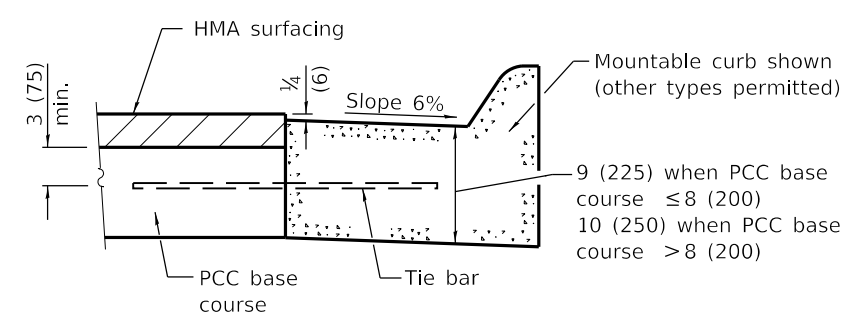
The dowel bars shown in contraction joints will only be required for monolithic construction.

See Standard 606301 for details of corner islands except reference to Standard 606001 does not apply.

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



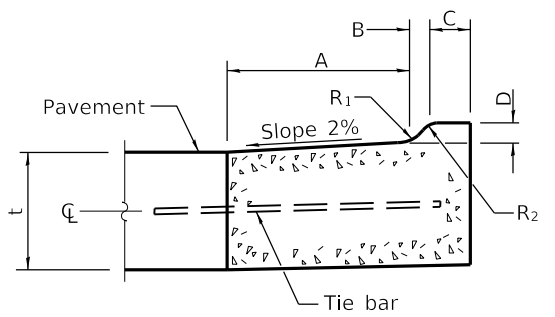
**DEPRESSED CURB (TYPICAL)**



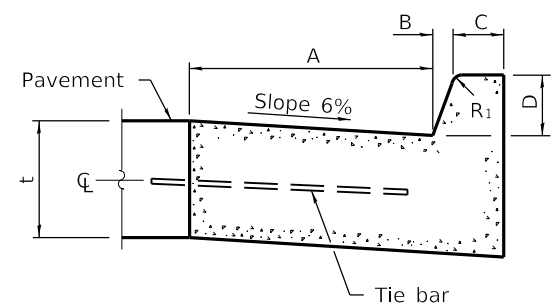
**ADJACENT TO PCC BASE COURSE WITH HMA SURFACING**

**DOWEL BAR TABLE**

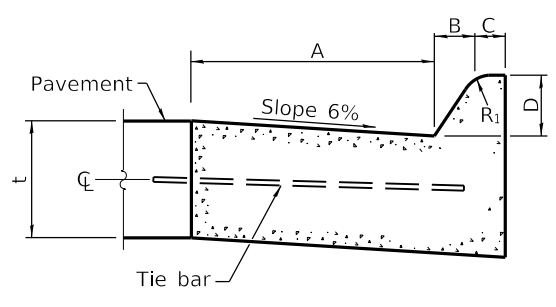
PAVEMENT THICKNESS	DOWEL BAR DIAMETER
10 (250) or greater	1 1/2 (38)
8 (200) thru 9.99 (249)	1 1/4 (32)
Less than 8 (200)	1 (25)



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



**BARRIER CURB**



**MOUNTABLE CURB**

TABLE OF DIMENSIONS BARRIER CURB

TYPE	A	B	C	D	R1
B-6.06 *	6	1	6	6	1
(B-15.15)	(150)	(25)	(150)	(150)	(25)
B-6.12	12	1	6	6	1
(B-15.3)	(300)	(25)	(150)	(150)	(25)
B-6.18	18	1	6	6	1
(B-15.45)	(450)	(25)	(150)	(150)	(25)
B-6.24	24	1	6	6	1
(B-15.60)	(600)	(25)	(150)	(150)	(25)
B-9.12	12	2	5	9	1
(B-22.30)	(300)	(50)	(125)	(225)	(25)
B-9.18	18	2	5	9	1
(B-22.45)	(450)	(50)	(125)	(225)	(25)
B-9.24	24	2	5	9	1
(B-22.60)	(600)	(50)	(125)	(225)	(25)

TABLE OF DIMENSIONS MOUNTABLE CURB

TYPE	A	B	C	D	R1	R2
M-2.06	6	2	4	2	3	2
(M-5.15)	(150)	(50)	(100)	(50)	(75)	(50)
M-2.12	12	2	4	2	3	2
(M-5.30)	(300)	(50)	(100)	(50)	(75)	(50)
M-4.06	6	4	3	4	3	NA
(M-10.15)	(150)	(100)	(75)	(100)	(75)	(50)
M-4.12	12	4	3	4	3	NA
(M-10.30)	(300)	(100)	(75)	(100)	(75)	(50)
M-4.18	18	4	3	4	3	NA
(M-10.45)	(450)	(100)	(75)	(100)	(75)	(50)
M-4.24	24	4	3	4	3	NA
(M-10.60)	(600)	(100)	(75)	(100)	(75)	(50)
M-6.06	6	6	2	6	2	NA
(M-15.15)	(150)	(150)	(50)	(150)	(50)	(50)
M-6.12	12	6	2	6	2	NA
(M-15.30)	(300)	(150)	(50)	(150)	(50)	(50)
M-6.18	18	6	2	6	2	NA
(M-15.45)	(450)	(150)	(50)	(150)	(50)	(50)
M-6.24	24	6	2	6	2	NA
(M-15.60)	(600)	(150)	(50)	(150)	(50)	(50)

\* For corner islands only.

Illinois Department of Transportation

PASSED January 1, 2018

APPROVED January 1, 2018

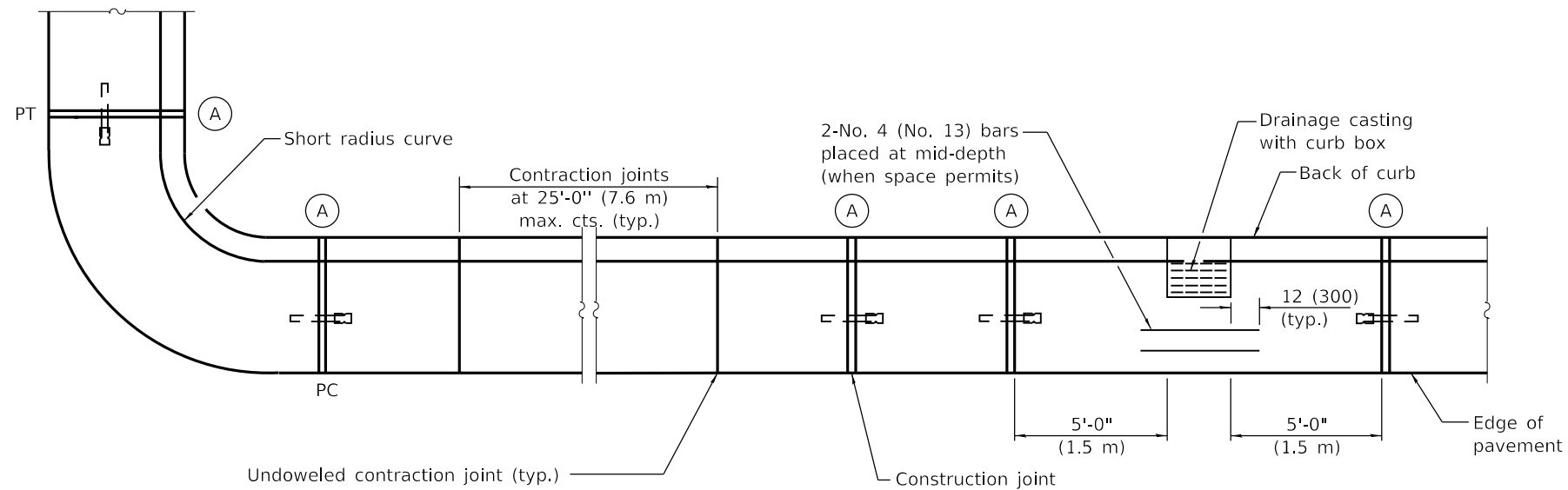
ENGINEER OF LOCAL ROADS AND STREETS

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18

**CONCRETE CURB TYPE B AND COMBINATION CONCRETE CURB AND GUTTER**  
 (Sheet 1 of 2)

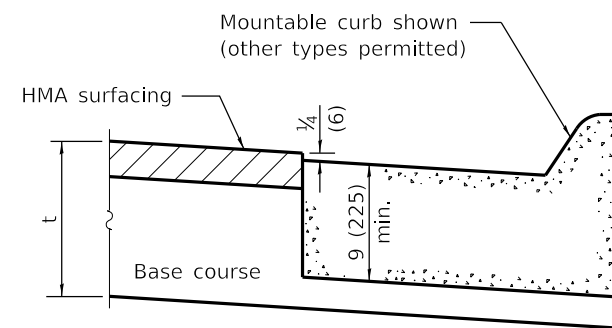
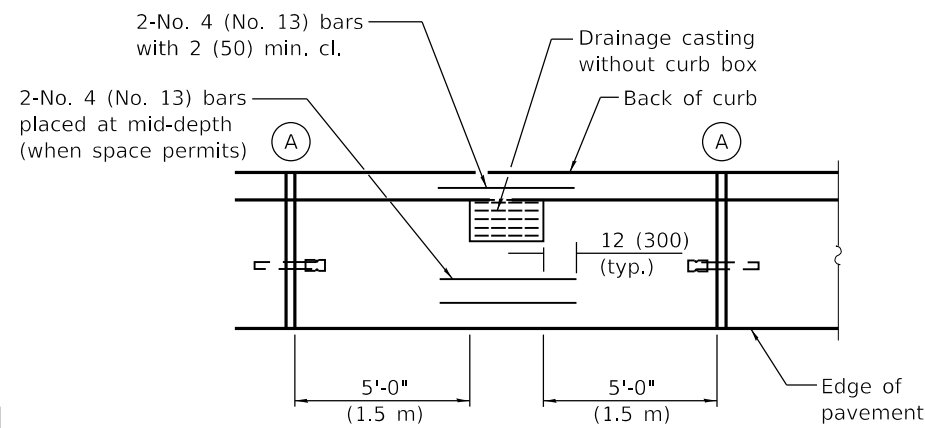
**B.L.R. 28**



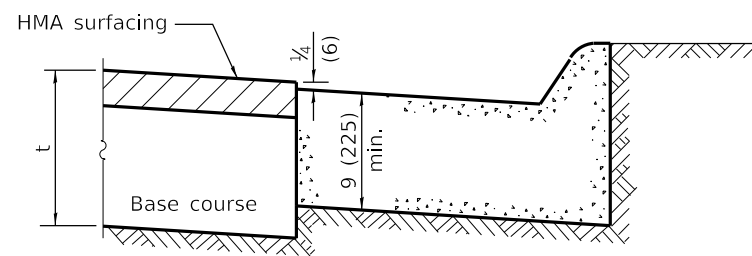
Undoweled contraction joint (typ.) construction options:

1. Form with 1/8 (3) thick steel template 2 (50) deep, and seal.
2. Saw 2 (50) deep at 4 to 24 hours, and seal.
3. Insert 3/4 (20) thick preformed joint filler full depth and width.

**PLAN**

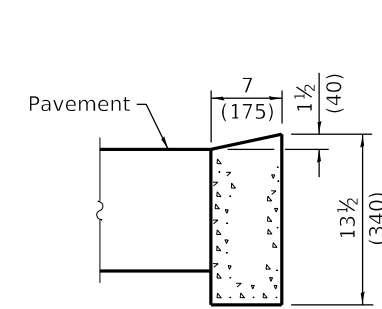


**ON DISTURBED SUBGRADE**

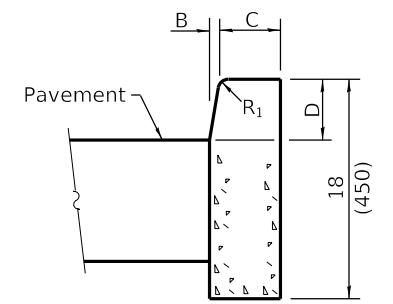


**ON UNDISTURBED SUBGRADE**

**ADJACENT TO FLEXIBLE PAVEMENT**

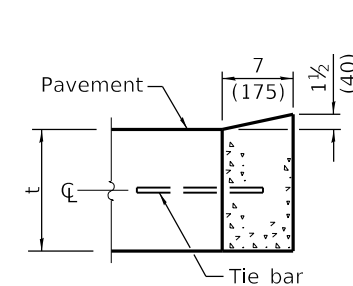


**DEPRESSED CURB**

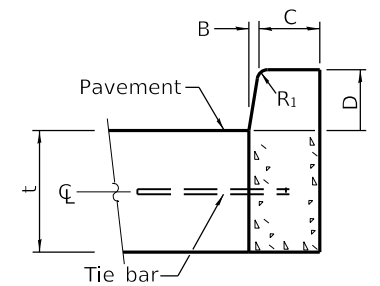


**BARRIER CURB**

**ADJACENT TO FLEXIBLE PAVEMENT**



**DEPRESSED CURB**



**BARRIER CURB**

**ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE**

**CONCRETE CURB TYPE B**

**CONCRETE CURB TYPE B AND COMBINATION CONCRETE CURB AND GUTTER**

(Sheet 2 of 2)

**B.L.R. 28**

Illinois Department of Transportation

PASSED January 1, 2018  
*Michael...*  
 ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2018  
*Marcus...*  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18