

DISTRIBUTION: 71

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| MINNESOTA DEPARTMENT OF TRANSPORTATION | TRANSMITTAL LETTER NO. (08-04) |
| DEVELOPED BY: Design Standards | MANUAL: Standard Plates |
| ISSUED BY: Design Services Section | DATED: December 12, 2008 |
| SUBJECT: Index Update (1 - 4), Standard Plate 9322K (1 of 2). | |

Standard Plate Index (1 - 4) - This is an update of the Index dated May 2008.

Standard Plate 9322K (1 - 2) - The Office of Technical Support, Design Standards Unit, is re-issuing this plate due to a plotting error.

INSTRUCTIONS:

1. Record the transmittal letter number, date, and subject on the transmittal record sheet located in the front of the manual.
2. Remove from the manual: Standard Plate Index (1 - 4) and Standard Plate No. 9322J (1 - 2) (approved, 10-21-08).
3. Insert in the manual: Standard Plate Index (1 - 4) (December 2008); Standard Plate No. 9322K (1 of 2) (revised 12-10-08), back Standard Plate No. 9322K (2 of 2) (approved 10-21-08).
4. Current Standard Plates and Standard Plate Transmittal Letters are available on the web in PDF format at: <http://www.dot.state.mn.us/design/standard-plates/index.html>. The Standard Plates Index is available in Excel format at: <http://www.dot.state.mn.us/design/standard-plates/plate-index.html>.
5. Any technical questions regarding this transmittal should be directed to Hatem Qamhieh, Assistant Design Standards Engineer, at (651) 366-4706.
6. Any questions concerning missing manual sheets or extra transmittal letters should be directed to Map & Manual Sales, M.S. 260, Room 110, (651) 366-3014. Please furnish in writing any address changes to: Mail Room G-18, Transportation Building, 395 John Ireland Blvd., St. Paul, MN 55155. Any questions concerning mailing of this material should be directed to the Mail Room G-18 (651) 366-3051.

Michael Elle

Michael Elle, P.E.
Design Standards Engineer

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STANDARD PLATES

| | |
|----------------------------------------|-------------|
| BLANK | 0000 SERIES |
| PAVEMENT | 1000 SERIES |
| BLANK | 2000 SERIES |
| CULVERTS AND APPURTENANCES | 3000 SERIES |
| SEWER APPURTENANCES | 4000 SERIES |
| EROSION CONTROL STRUCTURES | 5000 SERIES |
| BLANK | 6000 SERIES |
| CURB, CURB AND GUTTER, SIDEWALK..... | 7000 SERIES |
| BARRICADES, SIGNALS, MARKERS, ETC..... | 8000 SERIES |
| MISCELLANEOUS | 9000 SERIES |

PLATE NO.

000 SERIES—BLANK

1000 SERIES—PAVEMENT

| | |
|-------|------------------------------------------------|
| 1070L | Reinforced Panel Over Culverts |
| 1103J | Typical Dowel Bar Assembly |
| 1141D | Pavement Keyway For Keyed Joint Construction |
| 1150Q | Construction of Header Joints |
| 1210F | Concrete Pavement Adjacent to Railway Crossing |

2000 SERIES—BLANK

3000 SERIES—CULVERTS AND APPURTENANCES

| | |
|-------|------------------------------------------------------------------------------------------|
| 3000L | Reinforced Concrete Pipe (5 Sheets) |
| 3001B | Reinforced Concrete Reducer Pipe |
| 3002B | Reinforced Concrete Increaser Pipe |
| 3006G | Gasket Joint for R.C. Pipe (2 Sheets) |
| 3007D | Shear Reinforcement for Precast Drainage Structures |
| 3014J | Reinforced Concrete Pipe Arch (2 Sheets) |
| 3020F | Reinforced Precast Concrete Cattle Pass (60" & 72") |
| 3022C | Precast Concrete Safety Apron (3 Sheets) |
| 3030A | Precast Cattle Pass Transition Section |
| 3031B | Connection between Existing 4 Ft. X 6 Ft. Cattle Pass and New Precast Transition Section |
| 3040F | Corrugated Metal Pipe Culvert (Standard 2-2/3" x 1/2" Corrugation) |
| 3041D | Corrugated Metal Pipe (3" x 1" Corrugation) |
| 3050B | Design Data Structural Plate Structures (18" Corner Radius) |
| 3051B | Design Data Structural Plate Structures (31" Corner Radius) |
| 3065C | Connection between Existing Culv. & New "C" Culv. Barrel (2 Sheets) |
| 3066A | C.M. Extension for Box Culvert |
| 3100G | Concrete Apron for Reinforced Concrete Pipe |
| 3110G | Concrete Apron for Reinforced Concrete Pipe-Arch |
| 3114H | Sectional Concrete Apron for Reinforced Concrete Pipe-Arch |
| 3122K | Metal Apron for C.M. Pipe-Arch Culvert |
| 3123J | Metal Apron for C.S. Pipe |
| 3124B | Metal Apron Connection |
| 3125A | Inlet Protection for Metal Culverts (90" dia. to 96" dia.) |
| 3126B | Inlet Protection for Structural Plate Pipe (60" thru 96" dia. or span) |
| 3127A | Inlet Protection for Structural Plate Pipe (102" thru 180" dia. or span) |

PLATE NO.

| | |
|-------|-------------------------------------------------------------------------------|
| 3128H | Metal Safety Apron & Grate (2 Sheets) |
| 3129A | Metal Apron for Corrugated Polyethylene Pipe (Use at Entrances and Driveways) |
| 3131C | Precast Concrete Headwall for Subsurface Drains |
| 3132A | Grate for 1:4 Precast Concrete Aprons |
| 3133C | Riprap at RCP Outlets |
| 3134C | Riprap at CMP Outlets |
| 3135A | Hand-Placed Riprap at Precast Concrete Cattle Pass |
| 3136B | Slotted Vane Drain for P.V.C. Pipe |
| 3137B | Slotted Drain for 12" thru 30" Dia. C.M. Pipe (Stackable) |
| 3138B | Slotted Drain for 12" thru 30" Dia. C.M. Pipe (Not Stackable) |
| 3139A | Riprap at Precast Concrete End Sections |
| 3142A | Outlet Screen for C.M. & S.C. Pipes |
| 3143C | Inspection Tees |
| 3145F | Concrete Pipe Ties |
| 3146C | Anti-Seepage Diaphragm (For CMP and CMP-A) |
| 3148A | Safety Slope Metal End Section for Circular & Arched Pipes (2 Sheets) |
| 3221C | Corrugated Steel Pipe Coupling Band (3 Sheets) |

4000 SERIES--SEWER APPURTENANCES

List of Castings for Design Structures (2 sheets)

Standard Casting Assemblies

Typical Concrete Manhole or Catch Basin and Casting Combinations

| | |
|-------|---------------------------------------------------------------------------------------|
| 4000J | Manhole or Catch Basin (Masonry, Field Constructed) - Design A |
| 4002F | Manhole or Catch Basin (Masonry, Field Construction) - Design C |
| 4003B | 30" Precast Catch Basin – Design N |
| 4005L | Manhole or Catch Basin Type A & B Cone Sections Precast - Design F |
| 4006L | Manhole or Catch Basin Precast - Designs G and H |
| 4007C | Precast Mechanical Joint Sewer Manhole |
| 4008E | Catch Basin (Sectional Concrete Pipe) - Design I |
| 4009H | Manhole or Catch Basin (Sectional Concrete Pipe) - Design J |
| 4010H | Concrete Short Cone & Adjusting Ring (Sectional Concrete) |
| 4011E | Precast Concrete Base |
| 4017C | Catch Basin (Concrete Pipe and Metal Pipe) - Designs PC and PM |
| 4018A | Manhole or Catch Basin (Reducer Cone Section Precast) Design D |
| 4020J | Manhole or Catch Basin (For Use With or Without Traffic Loads) (2 sheets) |
| 4021F | Precast Curb Opening Catch Basin |
| 4022A | Manhole or Catch Basin Cover (3 ft. X 2 ft. Opening) |
| 4024A | 48" Dia. Precast Shallow Depth Catch Basin - Design SD |
| 4025B | Drop Inlets or Catch Basins - Design DI (Concrete & Metal) |
| 4026A | Concrete Encased Concrete Adjusting Rings |
| 4101D | Ring Casting For Manhole or Catch Basin |
| 4108F | Adjusting Rings for Catch Basins and Manholes |
| 4110F | Cover Casting for Manhole (For Use in all Traffic Areas) – Casting No. 715 and 716 |
| 4125D | Catch Basin Frame Casting (For Square Grate) – Casting No. 806 |
| 4126F | Catch Basin Frame Casting – Casting No. 801 |
| 4129G | Catch Basin Frame Casting (For Square Grate) - Casting No. 802A |
| 4132F | Catch Basin Frame Casting (For Square Grate) – Casting No. 805 |
| 4133A | Curb Box Casting for Catch Basin - Casting No. 824 |
| 4134A | Curb Box Casting for Catch Basin (For Design B Curbs) - Casting No. 825 |
| 4140D | Special Grate Castings for Catch Basin (Convex and Concave) - Casting No. 720 and 721 |
| 4143E | Stool Grate & Concrete Frame (Median Drains) - Casting No. 731 |
| 4149C | Grate Casting for Catch Basin - Casting No. 810 |

PLATE NO.

- 4150C Grate Casting for All Pipe Drainage Structures
- 4151B Grate Casting for Catch Basin (Square Type) - Casting No. 811
- 4152C Catch Basin Grate Casting - Casting No. 814A
- 4153A Catch Basin Grate Casting - Casting No. 815
- 4154B Catch Basin Grate Casting - Casting No. 816
- 4160D Curb Box Casting for Catch Basin - Casting No. 823A and 833A
- 4161F Curb Box Casting for Catch Basin - Casting No. 821B, 822 and 831A
- 4180J Manhole or Catch Basin Step

5000 SERIES--EROSION CONTROL STRUCTURES

- 5010A Reinforced Concrete Pipe Energy Dissipator

6000 SERIES -- Blank**7000 SERIES--CURB, CURB AND GUTTER, SIDEWALK**

- 7000E Integrant Curbs (Design B, Design V and Design D)
- 7020J Concrete Curb (Design B, Design V, Design S, Design DR and Design BR) (2 Sheets)
- 7035M Concrete Walk & Curb Returns at Entrances
- 7036F Pedestrian Curb Ramp (For the Handicapped) (2 sheets)
- 7065C Bituminous Curb
- 7100H Concrete Curb and Gutter (Design B and Design V)
- 7102I Concrete Curb and Gutter (Design BR, D, S, B4, B5 and D3) (2 Sheets)
- 7105C Concrete Median (Mountable Type)
- 7107H Entrance Nose (Urban Design)
- 7108F Exit Nose (Urban Design)
- 7109C Median Nose and Island (Undivided to Divided Roadway)
- 7111J Installation of Catch Basin Castings (Concrete Curb and Gutter)
- 7112C Installation & Reinforcement of Catch Basin & Manhole Castings (Concrete Integrant Curbs)
- 7113A Concrete Approach Nose Detail

8000 SERIES -- BARRICADES, SIGNALS, MARKERS, ETC.

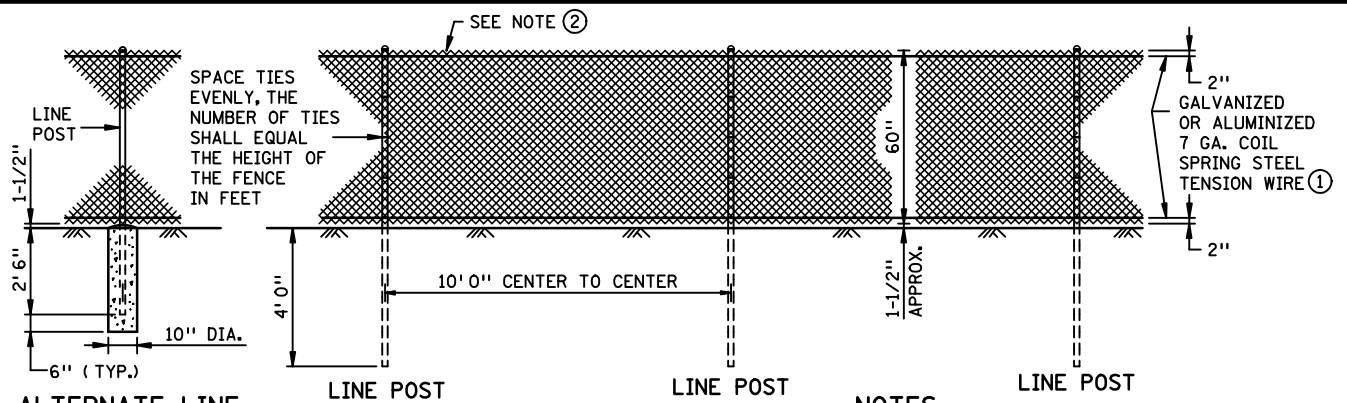
- 8000I Standard Barricades
- 8002G Permanent Barricade
- 8105B Equipment Pad A (Cast-in-Place or Precast)
- 8106B Equipment Pad B (Cast-in-Place or Precast)
- 8110D Traffic Signal Bracketing (Pole Mounted)
- 8111D Traffic Signal Bracketing (Pedestal Mounted) (3 Sheets)
- 8112E Pedestal Foundation (Traffic Control Signals)
- 8114A P.V.C. Handhole/Pullbox (No Vehicle Load) (2 Sheets)
- 8115D Pedestrian Push Button Installation
- 8117F Precast Concrete Hand Hole (Or Pullbox) (2 Sheets)
- 8118D Service Equipment & Pole Traffic Control Signals
- 8119C Ground Mounted Cabinet Foundation
- 8120M Pole Foundation (PA85)
- 8121E Transformer Base and Pole Base Plate (PA85M, PA90 and PA100) (2 Sheets)
- 8122D Pedestal and Pedestal Base (For Traffic Control Signals Support)
- 8123E Pole and Mast Arm (Luminaires and Traffic Lights Assembly) For All Pole Types (2 Sheets)
- 8124E Mast Arm Signal Head Mounts (One-Way & Two-Way Mounts) (3 Sheets)
- 8126H Pole Foundation (PA90 and PA100)

PLATE NO.

8127B Light Base - Design E (40 ft. Pole or Less)
8128B Light Base - Design H (49 ft. Pole)
8130D Saw Cut Loop Detectors
8140B Roadway Lighting Service Cabinet
8150C Installation of Culvert Markers
8307R W-Beam Guardrail & End Anchorages (Installation with Wood Posts) (4 Sheets)
8308A Reinforced Concrete Median Barrier Type F (Non-Glare Screen Type) Design 8308 (3 Sheets)
8309A Reinforced Concrete Median Barrier Type F & Glare Screen Design 8309 (3 Sheets)
8316C Post Seat for Anchorage on Footing or Box Culverts
8318C Guardrail Anchorage Plate for Bridges and BCT'S
8326D Flexible Plastic Glare Screen
8329H Eccentric Loader Breakaway Cable Terminal (ELT) (4 Sheets)
8330G 3-Cable Guardrail (With Wood Posts) (Assembly Details) (2 Sheets)
8331B 3-Cable Guardrail (With Steel Posts) (3 Sheets)
8332B Anchor Bolt Cluster for Light Poles
8333B 3-Cable Guardrail Anchor (Anchor Details) (4 Sheets)
8337B Temporary Portable Precast Concrete Barrier (Type "F") (2 Sheets)
8338C W-Beam Guardrail & End Anchorages (Installation with Steel Posts) (4 Sheets)
8339A 3-Cable (Steel Posts) to W Beam (Wood Posts) Guardrail Transition
8340A 3-Cable (Steel Posts) to W Beam (Steel Posts) Guardrail Transition
8400E Pipe Railing
8401C At Grade Pipe Railing (Adjacent to Sidewalk)

9000 SERIES--MISCELLANEOUS

9000D Approaches and Entrances (Recommended Standards)
9101B Shaping and Sodding of Slopes at Box Culvert Ends
9102D Turf Establishment Areas (At Pipe Culvert Ends)
9303B Geodetic Survey Disks (Aluminum) (2 Sheets)
9308A Survey Monument Cap (2 Sheets)
9309G PLS (Public Land Survey) Monument (2 Sheets)
9320G Woven Wire Fence (Wood Post)
9321E Woven Wire Fence (Steel Post)
9322K Chain Link Fence (2 Sheets)
9323D Barbed Wire Fence (Wood Post)
9324C Barbed Wire Fence (Steel Post)
9350A Mailbox Support (Swing-Away Type)

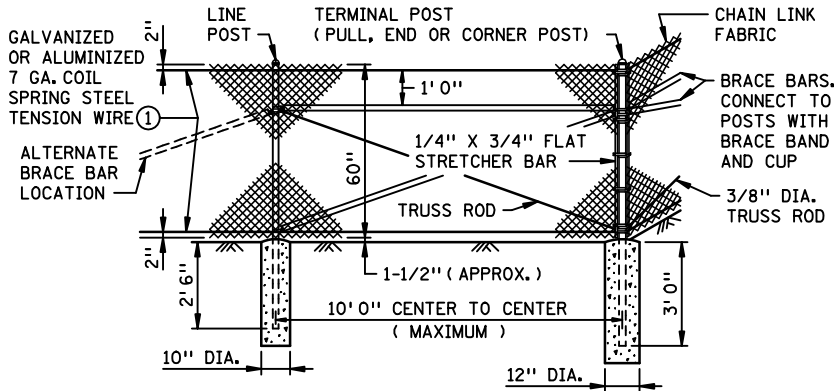


ALTERNATE LINE POST ANCHORAGE

LINE SECTION

NOTES:

- TERMINAL POSTS SHALL BE: END, CORNER OR PULL POSTS, 8'-0" LONG NPS (NOMINAL PIPE SIZE) 2" NOMINAL (NOM.) INSIDE DIAMETER (I.D.) AASHTO M181, 3.65 LBS./FT. OR ASTM F1043 ROLL FORMED, (3-1/2" X 3-1/2") 5.10 LBS./FT.
- LINE POSTS SHALL BE: 7'-6" (CONCRETE BASE ONLY) OR 9'-0" LONG NPS 1-1/2" NOM. I.D. AASHTO M181, 2.72 LBS./FT. OR ASTM F1043 ROLL FORMED (1-5/8" X 1-7/8") 2.40 LBS./FT. MIN.
- BRACE BARS SHALL BE: NPS 1-1/4" NOM. I.D. AASHTO M181, 2.27 LBS./FT. OR ASTM F1043 ROLL FORMED (1-1/4" X 1-5/8") 1.35 LBS./FT.
- PULL POST SPACING NOT TO EXCEED 500 FT.
- CHAIN LINK FABRIC SHALL BE: 9 GA., 2 IN. MESH WITH KNUCKLED SELVAGE TOP AND BOTTOM, AND CONFORM TO THE REQUIREMENTS OF AASHTO M181 TYPE II OR IV. DESIGN 60-9322 SHALL BE FURNISHED IN TYPE II (ALUMINUM COATED STEEL). DESIGN 60V-9322 SHALL BE TYPE IV (VINYL COATED FABRIC).



PULL, END OR CORNER POST & ADJACENT LINE POST

WIRE TIES MAY BE 9 GA. GALVANIZED OR ALUMINIZED STEEL OR 0.179 IN. MIN. ALUMINUM ALLOY CONFORMING TO ASTM B211, ALLOY 1100-H18. USE 12 GA. GALVANIZED STEEL OR 9 GAGE ALUMINUM ALLOY 1350-H19 HOG RINGS FOR TENSION WIRE TIES.

WHERE THE FENCE MUST CROSS SMALL BODIES OF WATER, SUCH AS PONDS THAT FREEZE DURING THE WINTER, USE 11 GA. GALVANIZED OR ALUMINIZED STEEL OR 0.149 IN. ALUMINUM TIES. PROVIDE ONLY 2 TIES BETWEEN LINE POSTS.

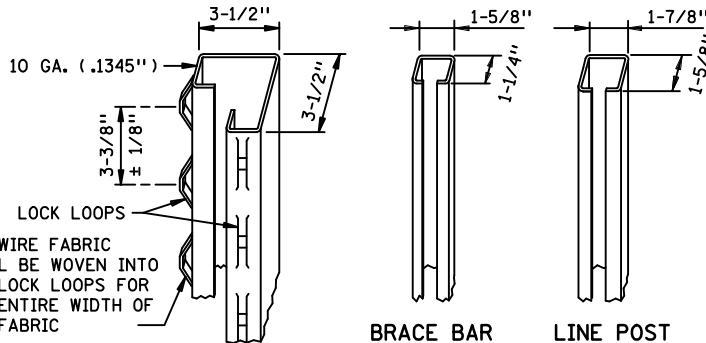
WHEN THE DRIVEN LINE POST ANCHORAGE IS USED, THE REQUIREMENTS FOR THE ALTERNATE CONCRETE ANCHORAGE IS WAIVED.

A CONCRETE ANCHORAGE SHALL BE USED FOR ALL TERMINAL POSTS AND FOR FIRST LINE POST(S) ADJACENT TO THE TERMINAL POSTS.

THE TOP OF THE CONCRETE ANCHORAGE SHALL BE CROWNED 1 IN. ABOVE THE NATURAL GROUND.

- ① A BOTTOM TENSION WIRE IS REQUIRED ONLY WHEN THE FENCE IS 10 FT. OR LESS FROM THE EDGE OF A ROADWAY SHOULDER.
- ② FENCES WITH A TENSION WIRE SHALL HAVE EITHER: AN ASTM F552 LINE POST CAP (LOOP TYPE), WITH THE TENSION WIRE PASSING THROUGH THE POST CAP WHEN USING ROUND POSTS; OR USE METHOD SHOWN IN "ALTERNATE ROLL FORMED END OR CORNER POST" DETAIL, IF USING ALTERNATE POSTS. A HOG RING SHALL ATTACH THE TENSION WIRE TO THE FABRIC AND SHALL BE LOCATED NO MORE THAN 6 IN. ON EACH SIDE OF A POST. ADDITIONAL HOG RINGS SHALL BE SPACED A MAXIMUM 18 IN. APART.

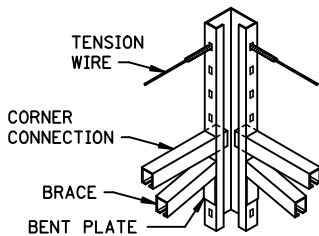
SEE SHEET 2 OF 2 FOR GATE DETAILS.



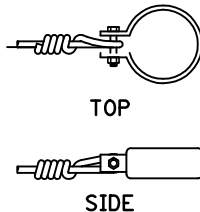
PULL, END OR CORNER POST

ALTERNATE ROLL FORMED DETAILS

GALVANIZE PER SPEC. 3394



ALTERNATE ROLL FORMED END OR CORNER POST TOP & BRACE RAIL CORNER CONNECTION



TYPICAL WIRE END CLAMP

DESIGNATION: FENCE FABRIC HEIGHT-9322; EXAMPLE: DESIGN 60-9322

APPROVED **OCTOBER 21, 2008**

M. Rakus
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION

**CHAIN LINK FENCE
STEEL POSTS - LINE POSTS**

SPECIFICATION REFERENCE

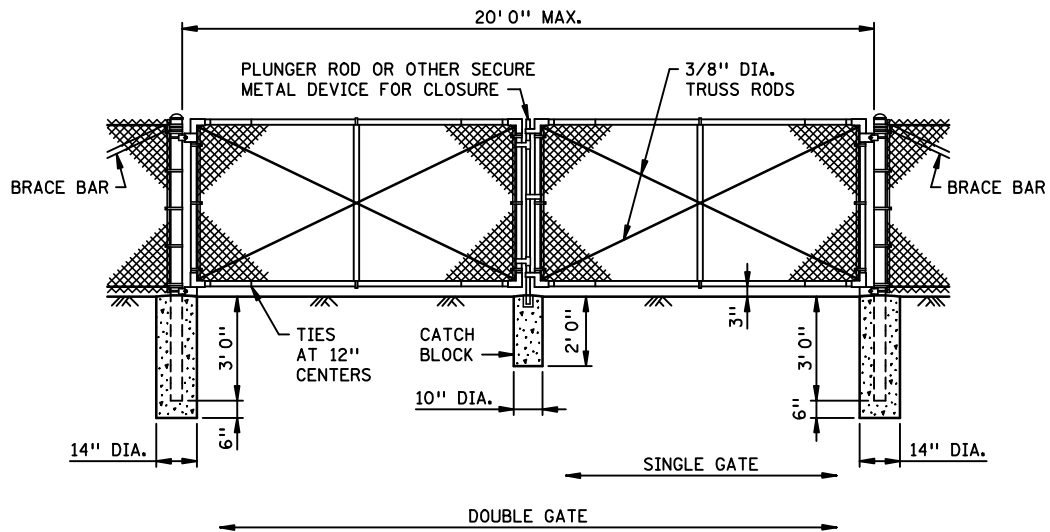
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REVISED
12-10-2008 M.J.E.

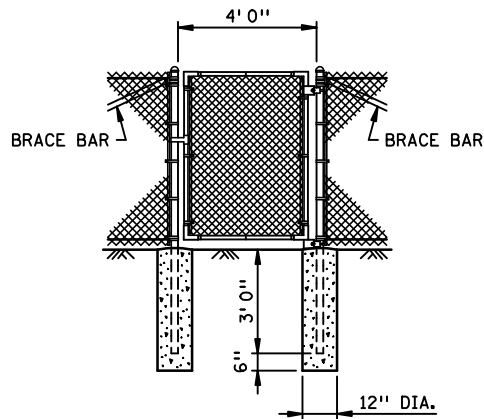
STANDARD PLATE NO.

9322K

1 OF 2



VEHICULAR GATE



PEDESTRIAN GATE

NOTES:

- POSTS FOR PEDESTRIAN GATES SHALL BE:
NPS 2" NOM. I.D. AASHTO M181, 3.65 LBS./FT., 8'-0" LENGTH.
- POSTS FOR VEHICULAR GATES SHALL BE:
NPS 3-1/2" NOM. I.D. AASHTO M181, 9.12 LBS./FT., 8'-0" LENGTH.
- FRAMES FOR PEDESTRIAN GATES SHALL BE:
NPS 1" NOM. I.D. AASHTO M181, 1.68 LBS./FT.
- FRAMES FOR VEHICULAR GATES SHALL BE:
NPS 1-1/2" NOM. I.D. AASHTO M181, 2.72 LBS./FT.
- SEE SHEET 1 FOR POST, FABRIC AND BRACE BAR REQUIREMENTS.

APPROVED OCTOBER 21, 2008

Milakus

STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

CHAIN LINK FENCE
GATES

SPECIFICATION
REFERENCE

2557

STANDARD
PLATE
NO.

9322K

2 OF 2