

MINNESOTA DEPARTMENT OF TRANSPORTATION

DEVELOPED BY: Design Standards

ISSUED BY: Office of Project Management and Technical Support,
Design Support Section

TRANSMITTAL LETTER NO. (16-03)

MANUAL: Standard Plates

DATED: September 21, 2016

SUBJECT: Standard Plates 4017, 4110, 4140, 7112, 8343 – Minor revisions

The following Standard Plates have been revised:

- 4017C – Catch Basin
- 4110F – Cover Casting for Manhole
- 4140D – Special Grate Castings for Catch Basin
- 7112C - Installation & Reinforcement of Catch Basin & Manhole Castings
- 8343A - High-Tension Cable Barrier Line Post Foundation

INSTRUCTIONS:

- Record the transmittal letter number, date, and subject on the transmittal record sheet located in the front of the manual. The previous Transmittal Letter No. issued for this manual was 16-02, dated July 26, 2016.
- Remove from the Standard Plate manual:
 - Standard Plate 4017C (Rev. 4-19-01), 4018 back
 - Standard Plate 4110F (Apr. 10-25-96)
 - Standard Plate 4140D (Rev. 5-5-99), 4143 back
 - Standard Plate 7112C (Rev. 3-22-13), 7111 front
 - Standard Plate 8343A (Apr. 8-19-15)
- Insert into the Standard Plate manual:
 - Standard Plate 4017C (Rev. 9-13-16)
 - Standard Plate 4018B (Apr. 4-16-14)
 - Standard Plate 4110F (Rev. 9-13-16)
 - Standard Plate 4140D (Rev. 9-13-16)
 - Standard Plate 4143E (Rev. 3-22-13)
 - Standard Plate 7111J (Rev. 3-22-13)
 - Standard Plate 7112C (Rev. 9-13-16)
 - Standard Plate 8343A (Rev. 9-13-16)
- Current Standard Plates including Transmittal Letters are available on the web at:
<http://standardplates.dot.state.mn.us/stdplate.aspx>
- Direct any technical questions regarding this transmittal to Ron Reemer, Design Standards Unit at (651) 366-4707.

Michael Elle

Michael Elle, P.E.
Design Standards Engineer

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Summary of Changes
Various Standard Plates – Minor Revisions
Transmittal Letter No. (16-03)

4017C:

1. Circled note #1 (local note flag) was previously omitted from the notes (bottom right).

4110F:

1. General note changed from Casting No. 700-7 to Casting No. 700-4.

4140D:

1. General note changed from Casting No. 700-7 to Casting No. 700-4.

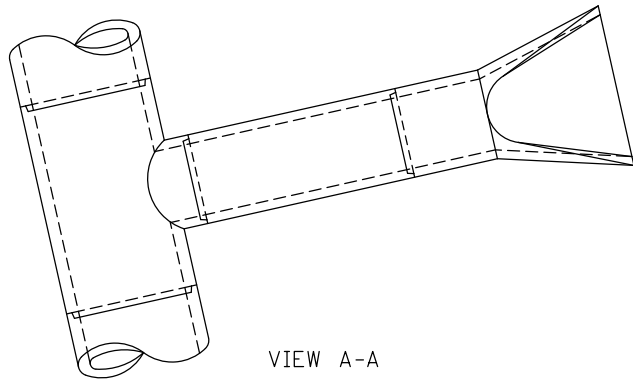
7112C:

1. Removed last sentence of circled note 5.

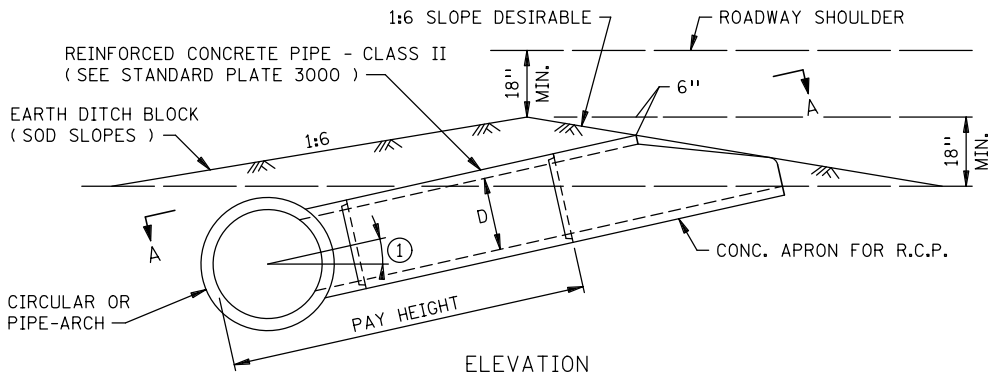
8343A:

1. Added (Optional) to circled note 3.

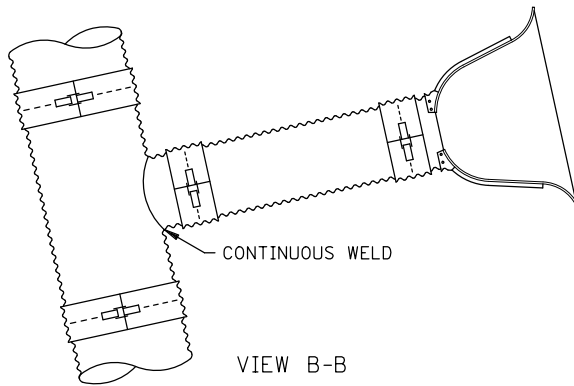
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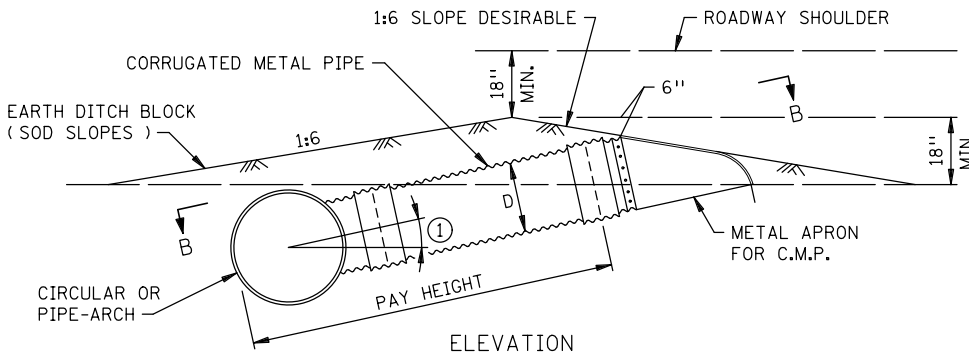
VIEW A-A



ELEVATION
REINFORCED CONCRETE PIPE
DESIGN PC



VIEW B-B



ELEVATION
CORRUGATED METAL PIPE
DESIGN PM

- NOTES:
INSIDE DIAMETER OF CATCH BASIN WILL BE INDICATED IN THE PAY ITEM.
FOR USE PRINCIPALLY FOR MEDIAN DRAINAGE.
① ANGLE WILL BE SHOWN IN PLAN FOR ARCH PIPE.

DESIGN PC
DESIGN PM

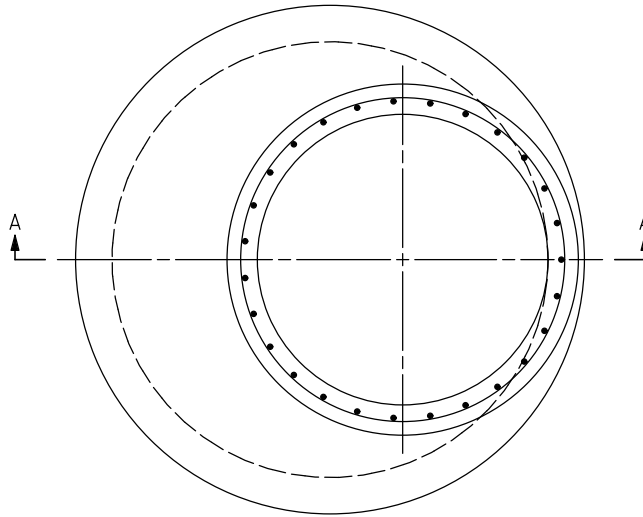
APPROVED Oct. 1, 1967
W. J. Ebern
ASSISTANT COMMISSIONER
ENGINEERING STANDARDS

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
CATCH BASIN
CONCRETE PIPE AND METAL PIPE

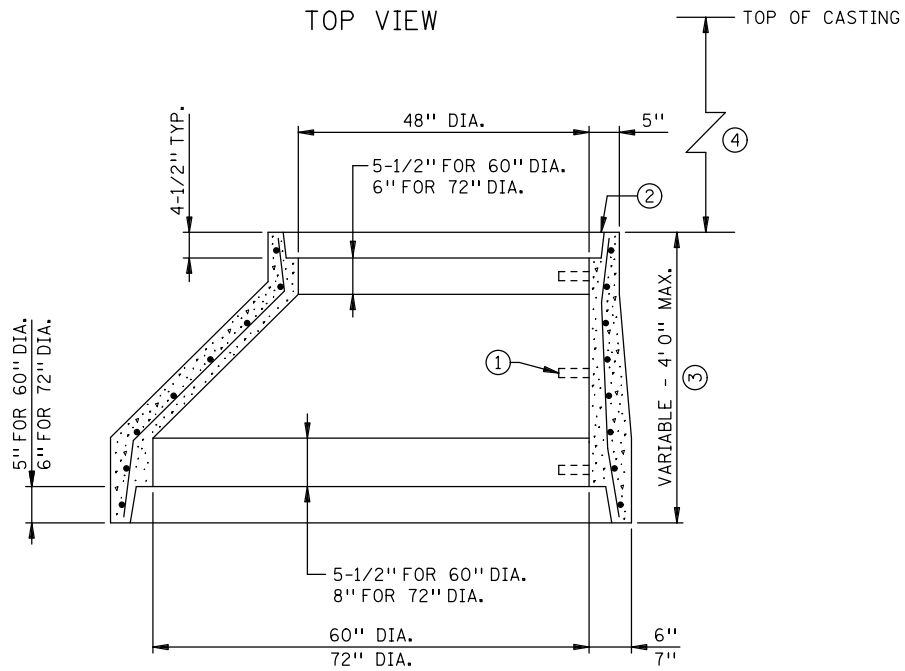
SPECIFICATION
REFERENCE
2506
REVISED
9-13-2016 M.J.E.

STANDARD
PLATE
NO.
4017C

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TOP VIEW



SECTION A-A

NOTES:

REINFORCING: SINGLE LINE STEEL WIRE FABRIC HAVING AN AREA OF NOT LESS THAN 0.15 SQ. IN. PER FOOT OF HEIGHT FOR 60" DIA. AND NOT LESS THAN 0.18 SQ. IN. PER FOOT OF HEIGHT FOR 72" DIA..

- ① REFER TO PLANS FOR ANY STEP REQUIREMENTS.
- ② SEE STANDARD PLATES INDEX FOR OTHER APPROVED JOINTS.
- ③ MANHOLE REDUCING SECTION 4' 0" HIGH. WALL THICKNESS TAPERS TO PROVIDE A SMOOTH EXTERIOR.
- ④ THE MAXIMUM DEPTH FROM THE TOP OF THE CASTING TO THE TOP OF THE REDUCING CONE IS 10'-0".

DESIGN D

APPROVED APRIL 16, 2014

Christina Ry
STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
MANHOLE OR CATCH BASIN
REDUCER CONE SECTION
PRECAST

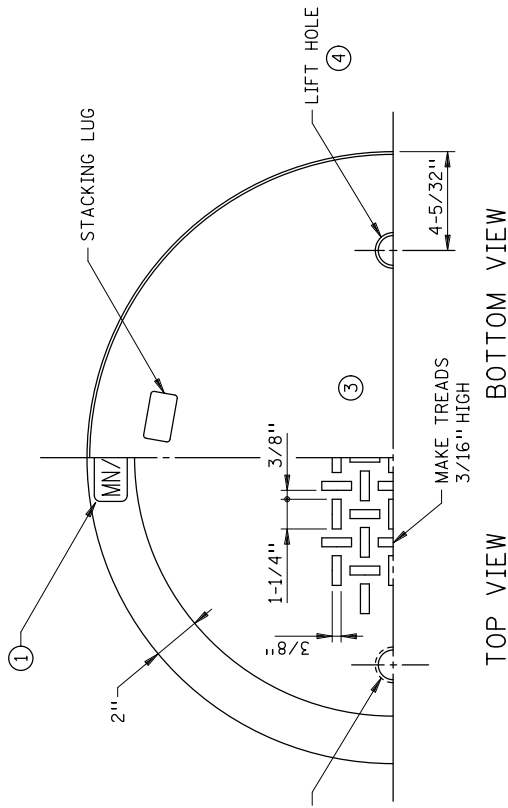
SPECIFICATION
REFERENCE

2506

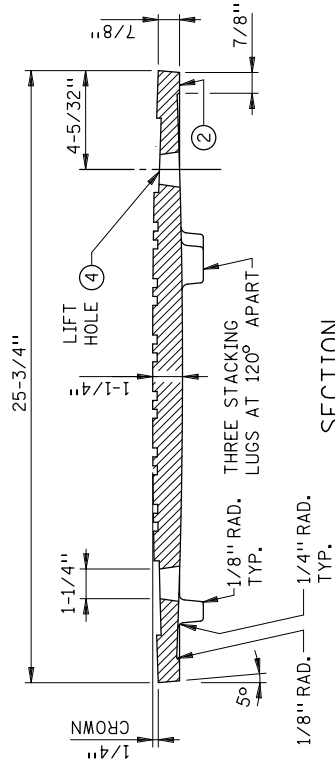
STANDARD
PLATE
NO.

4018B

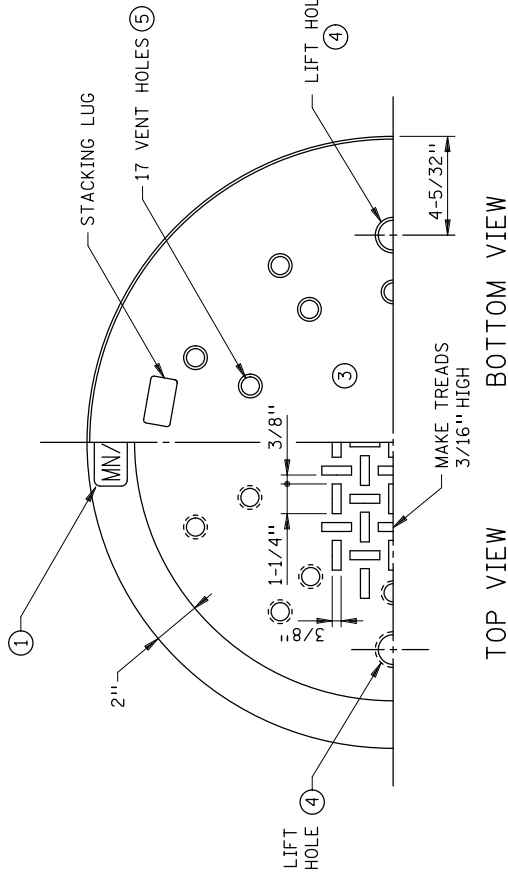
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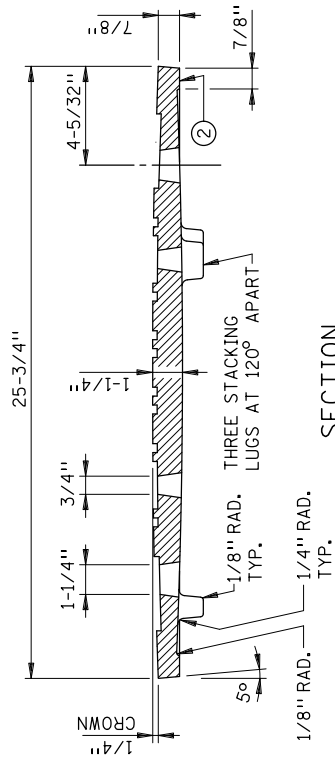
TOP VIEW BOTTOM VIEW
CASTING NO. 716



SECTION



TOP VIEW BOTTOM VIEW
CASTING NO. 715



SECTION

NOTES:

THESE COVERS TO BE USED WITH RING CASTING NO. 700-4 TO 700-10.

- ① ON OPPOSITE SIDE OF TOP SURFACE PLACE CASTING NUMBER, LETTERS (MN/DOT) AND NUMERALS TO BE 3/4" IN HEIGHT AND DEPRESSED 1/8".
- ② MACHINE FINISHED THICKNESS TO BE 13/16".
- ③ COVER SHALL BE MADE OF GRAY IRON, CLASS 35B.
- ④ LIFT HOLE 1-1/4" DIA. AT THE TOP, 1-1/2" AT THE BOTTOM.
- ⑤ EIGHT (8) VENT HOLES IN OUTER CIRCLE, NINE (9) VENT HOLES IN INNER CIRCLE. HOLES ARE 3/4" DIA. AT THE TOP AND 1" DIA. AT THE BOTTOM. INNER CIRCLE IS 2" FROM THE OUTER CIRCLE.

CASTING NO. 715 - 115 LBS.
CASTING NO. 716 - 118 LBS.

APPROVED OCTOBER 25, 1996

Gerald J. Rodbrech

STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

COVER CASTING FOR MANHOLE
(FOR USE IN ALL TRAFFIC AREAS)

SPECIFICATION
REFERENCE

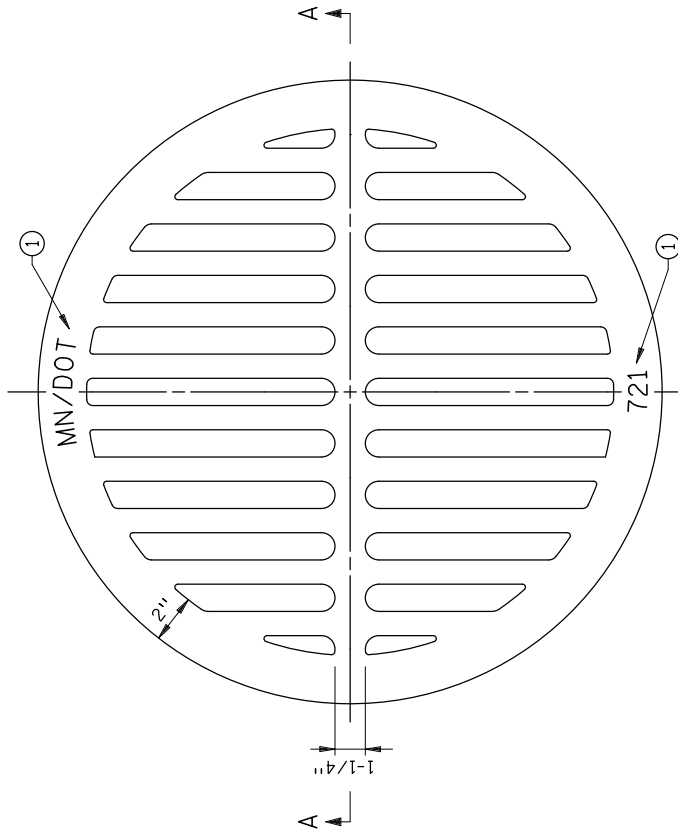
2506

REVISED
9-13-2016 M.J.E.

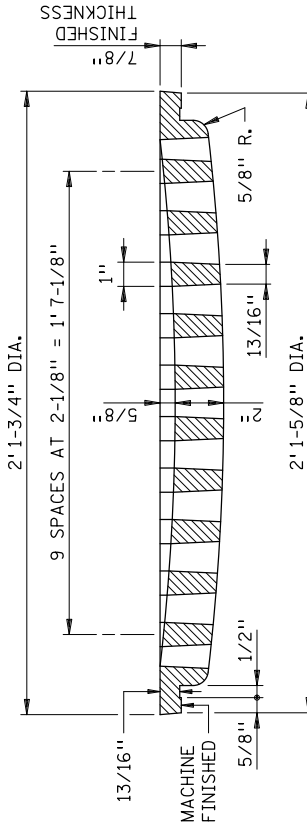
STANDARD
PLATE
NO.

4110F

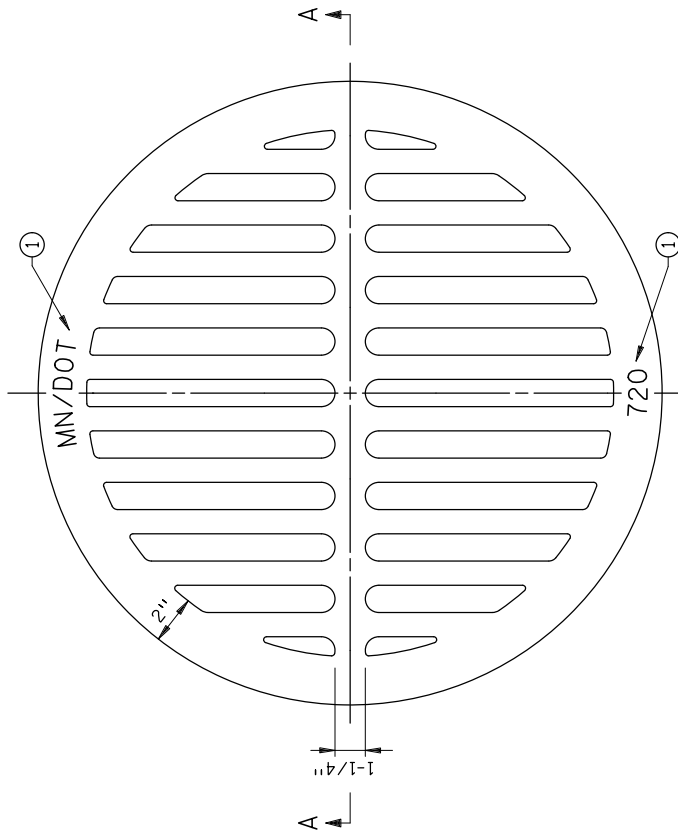
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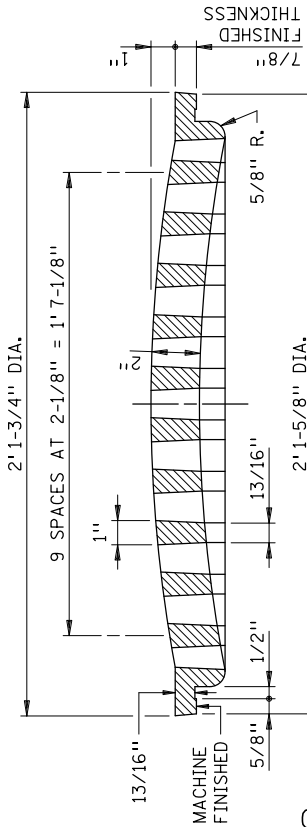
TOP VIEW
CASTING NO. 721



SECTION A-A
CONCAVE



TOP VIEW
CASTING NO. 720



SECTION A-A
CONVEX

NOTES:
① LETTERS (MN/DOT) AND NUMERALS (720 & 721) SHALL BE 3/4 INCHES IN HEIGHT AND DEPRESSED 1/8 INCHES.

THESE GRATES SHALL BE USED WITH RING CASTING NO. 700-4 TO 700-10.

CASTING NO. 720
CASTING NO. 721

APPROVED Oct. 1, 1966
W. A. Ebern
ASSISTANT COMMISSIONER
ENGINEERING STANDARDS

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
SPECIAL GRATE CASTINGS
FOR CATCH BASIN
CONVEX AND CONCAVE

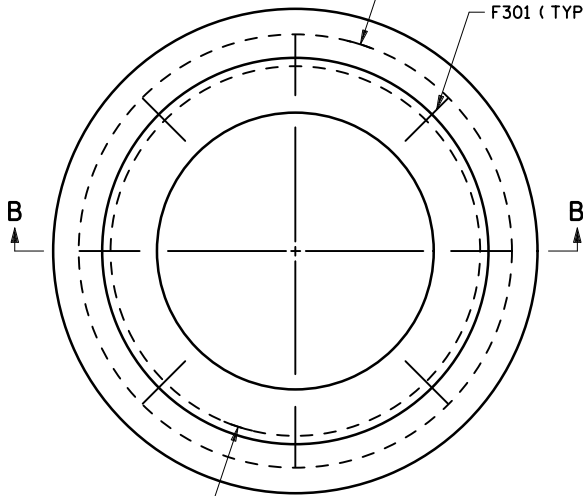
SPECIFICATION
REFERENCE
2506
REVISED
9-13-2016 M.J.E.

STANDARD
PLATE
NO.
4140D

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F303 CIRCULAR REINFORCEMENT BAR, APPROX. 3' 2" DIA.

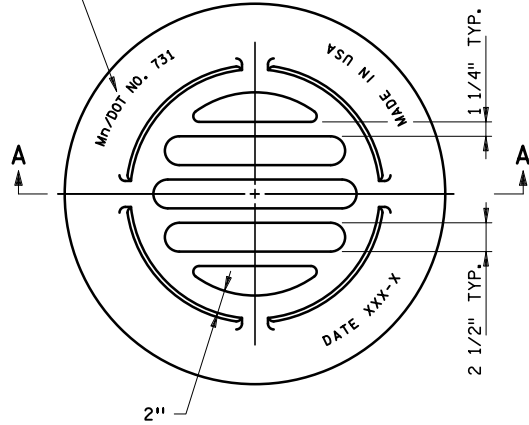
F301 (TYP.)



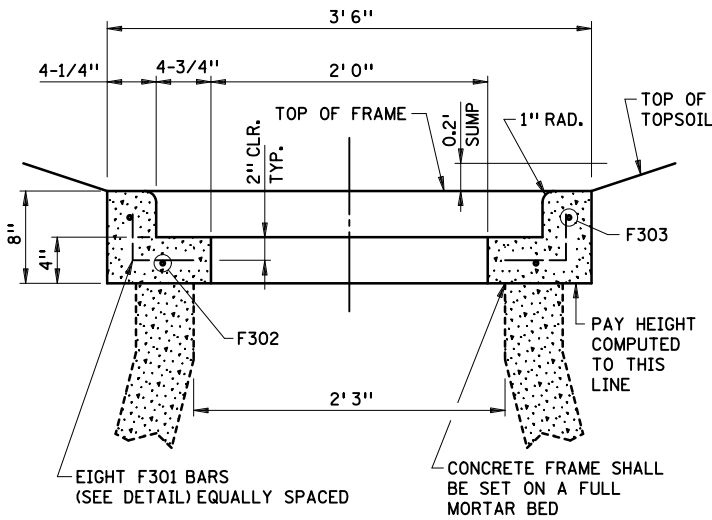
F302 CIRCULAR REINFORCEMENT BAR, APPROX. 2' 9" DIA.

TOP VIEW

3/4" LETTERS DEPRESSED 1/8"

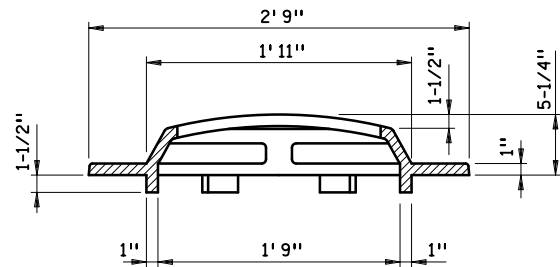


TOP VIEW



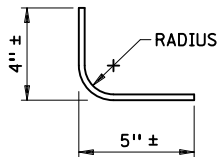
SECTION B-B

REINFORCED CONCRETE FRAME
(FOR CASTING NO. 731)



SECTION A-A

STOOL TYPE GRATE
(CASTING NO. 731)
APPROX. WEIGHT 200 LBS.



F301

NOTES:

FRAME MAY BE PRECAST OR CAST-IN-PLACE.

CASTING NO. 731 & FRAME

APPROVED MARCH 14, 1996

Gerald J. Rodbrech
STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

STOOL GRATE & CONCRETE FRAME
(MEDIAN DRAINS)

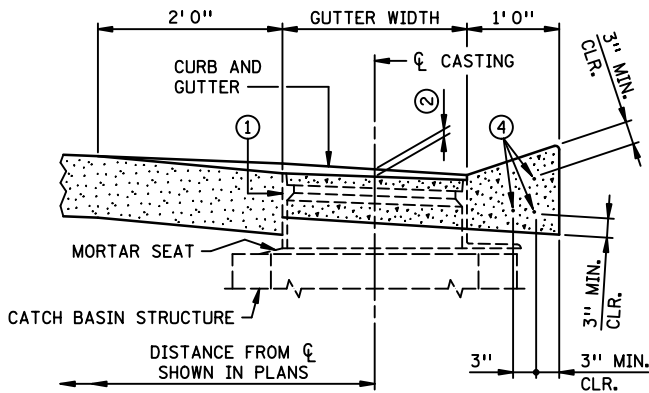
SPECIFICATION
REFERENCE
2506

REVISED
3-22-2013 M.J.E.

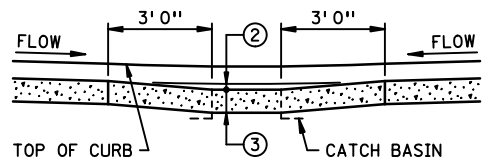
STANDARD
PLATE
NO.

4143E

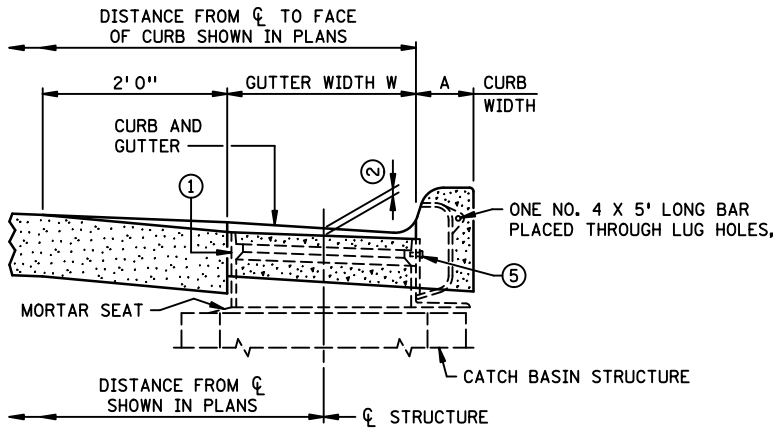
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DESIGN D CONCRETE CURB & GUTTER

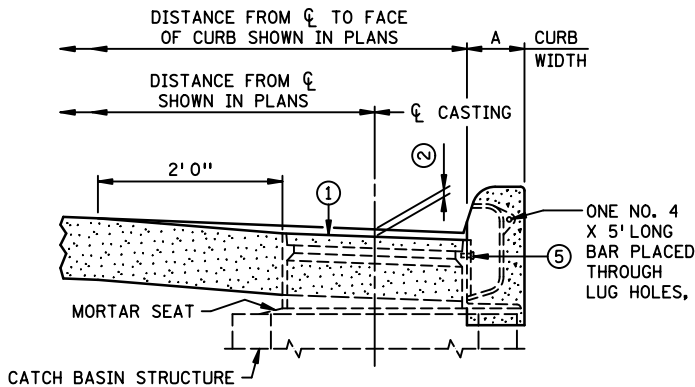


DEPRESSION (SUMP) IN FLOW LINE AT CATCH BASIN LOCATION



DESIGN B CONCRETE CURB & GUTTER

CURB BOX CASTINGS USED FOR ASSEMBLY
821B, 823A, 824, 831A & 833A



DESIGN B CONCRETE CURB

NOTES:

- COMPENSATE FOR TILT BY VARYING THE DEPTH OF MORTAR SEAT.
- DETAILS ARE TYPICAL AND APPLY TO INSTALLATION OF BOTH TELESCOPING AND NON-TELESCOPING CASTINGS. REFER TO PLANS FOR SPECIFIC ITEMS REQUIRED.
- ALL REINFORCEMENT REQUIRED IS INCIDENTAL, WITH NO DIRECT PAYMENT.
- ① CATCH BASIN CASTING.
- ② ON ALL APPLICATIONS USE .10' SUMP. SUMP SHALL BE MEASURED AT CENTER OF CASTING.
- ③ SAME THICKNESS AS ADJACENT PAVEMENT OR GUTTER.
- ④ THREE NO. 4 HORIZONTAL BARS 5' 0" LONG CENTERED ABOUT C OF CASTING.
- ⑤ CURB INLET CASTING SHALL BE FASTENED TEMPORARILY TO FRAME CASTING WITH 2 CAP SCREWS, DURING CURB CONSTRUCTION. CAP SCREWS MUST BE REMOVED AFTER CURB HAS HARDENED.

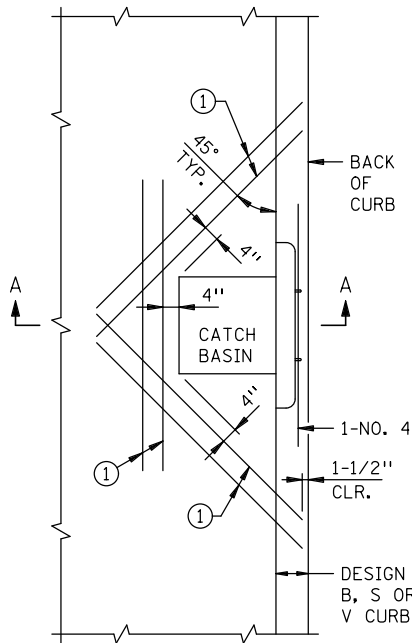
APPROVED APRIL 23, 1996
Gerald J. Rodenbeck
 STATE DESIGN ENGINEER

STATE OF MINNESOTA
 DEPARTMENT OF TRANSPORTATION
**INSTALLATION OF
 CATCH BASIN CASTINGS
 CONCRETE CURB & GUTTER**

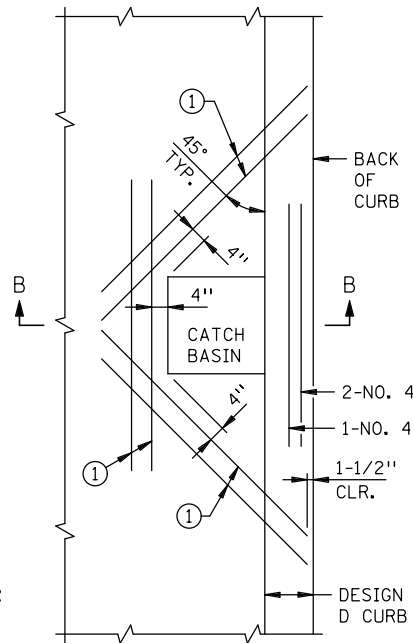
SPECIFICATION
 REFERENCE
 2531
 REVISED
 3-22-2013 M.J.E.

STANDARD
 PLATE
 NO.
7111J

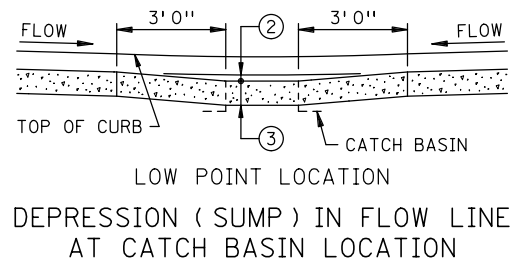
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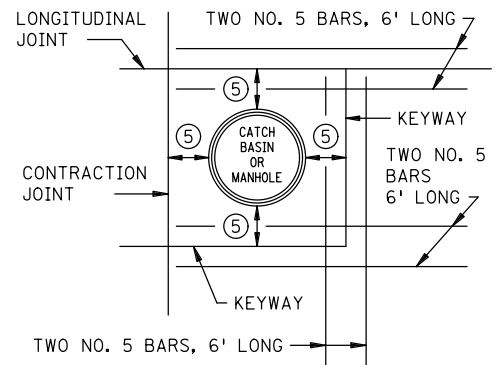
PLAN VIEW
CATCH BASIN
WITH DESIGN B, S OR V CURB



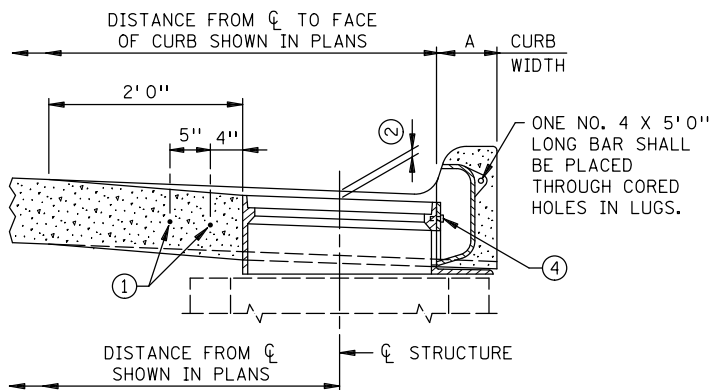
PLAN VIEW
CATCH BASIN WITH DESIGN D CURB



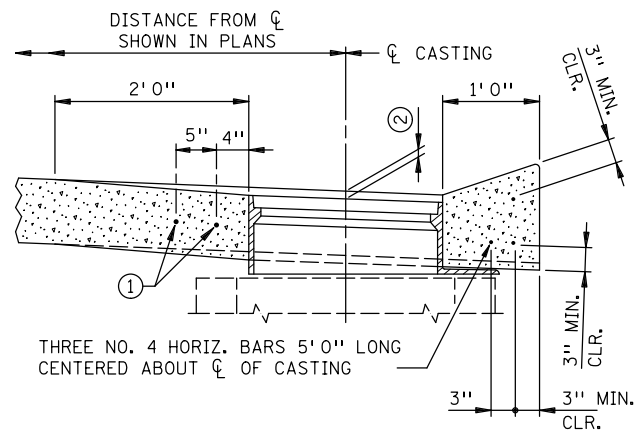
LOW POINT LOCATION
DEPRESSION (SUMP) IN FLOW LINE
AT CATCH BASIN LOCATION



PLAN VIEW
(MANHOLES)



SECTION A-A
DESIGN B CURB SHOWN



SECTION B-B
DESIGN D CURB SHOWN

CURB DESIGN	CURB BOX CASTING
B, S & V	821B, 822 & 831A
B & V	823A & 833A
B	824 & 825

NOTES:

COMPENSATE FOR TILT BY VARYING THE DEPTH OF MORTAR SEAT. DETAILS ARE TYPICAL AND APPLY TO INSTALLATION OF BOTH TELESCOPING AND NON-TELESCOPING CASTINGS. REFER TO PLANS FOR SPECIFIC ITEMS REQUIRED.

REINFORCEMENT BARS SHALL BE GRADE 60. ALL REINFORCEMENT REQUIRED IS INCIDENTAL, WITH NO DIRECT PAYMENT.

- ① ADDITIONAL SLAB REINF. - TWO NO. 5 BARS 6' 0" LONG, SPACED AT 5" CENTERS. PLACE DIRECTLY BELOW TYPICAL SLAB REINF. AT LOCATIONS SHOWN.
- ② ON ALL APPLICATIONS USE .10' SUMP. SUMP SHALL BE MEASURED AT CENTER OF CASTING.
- ③ SAME THICKNESS AS ADJACENT PAVEMENT OR GUTTER.
- ④ CURB INLET CASTING TO BE FASTENED TEMPORARILY TO FRAME CASTING WITH 2 CAP SCREWS, DURING CURB CONSTRUCTION. CAP SCREWS MUST BE REMOVED AFTER CURB HAS HARDENED.
- ⑤ WHEN PAVEMENT JOINTS ARE WITHIN 10" OF CATCH BASIN OR MANHOLE, BOX IN OPENING WITH KEYWAY JOINT.

APPROVED APRIL 23, 1996

Gerald J. Rodensch
STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
INSTALLATION & REINFORCEMENT OF
CATCH BASIN & MANHOLE CASTINGS
CONCRETE INTEGRANT CURBS

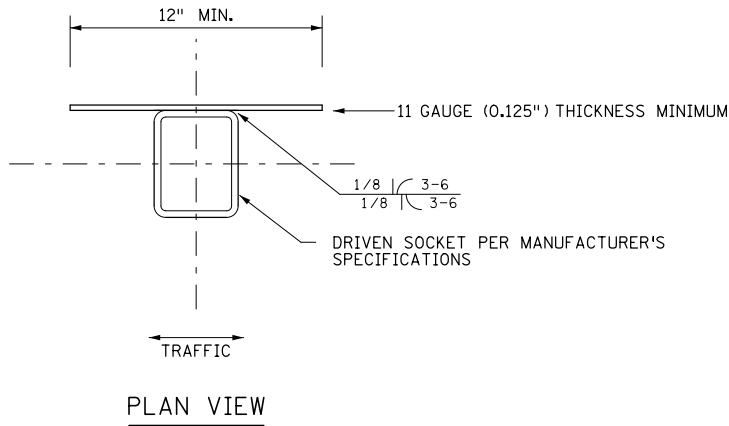
SPECIFICATION
REFERENCE
2531

REVISED
9-13-2016 M.J.E.

STANDARD
PLATE
NO.

7112C

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DESIGN DATA

COMPLY WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7TH EDITION, WITH 2015 INTERIMS.

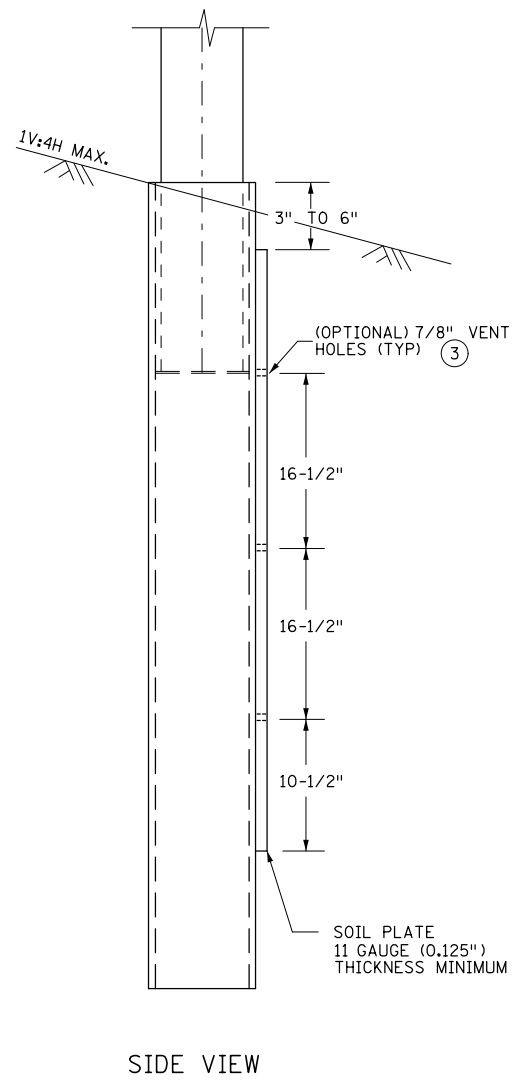
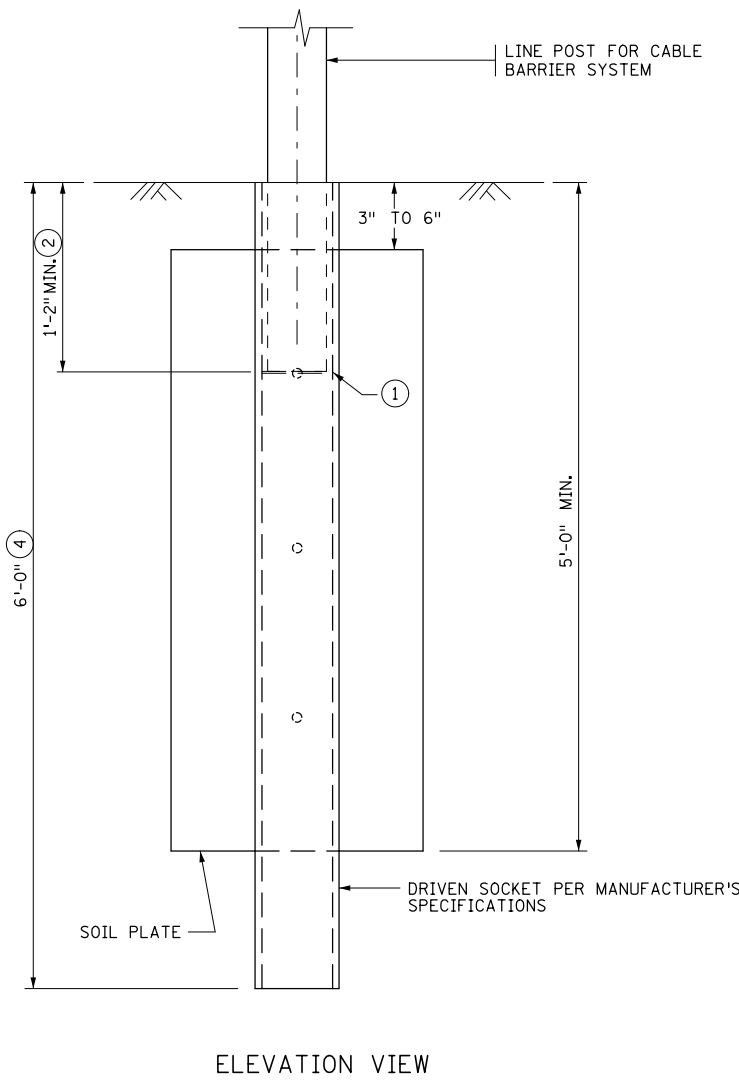
DESIGN FORCE: MAX PLASTIC MOMENT = 9000 ft-lb

MATERIAL DESIGN PROPERTIES:
STRUCTURAL STEEL:
F_y = 36000 p.s.i.
STRUCTURAL STEEL MnDOT 3306

MINIMUM SOIL PROPERTIES:
COARSE GRAINED SOIL: Φ = 30°
FINE GRAINED SOIL: C = 1000 lb/SQ.FT.

GALVANIZE ALL STEEL COMPONENTS AFTER FABRICATION PER MNDOT SPEC. 3392 AND 3394.

- ① POST STOP METHOD PER MANUFACTURER.
- ② DEPTH AS PER MANUFACTURER'S SPECIFICATIONS BASED ON THE SOCKET DEPTH SET UP IN THE FHWA APPROVED CRASH TESTED HTCB SYSTEMS MEETING NCHRP 350 OR MASH REQUIREMENTS.
- ③ THREE (OPTIONAL) 7/8" DIAMETER VENT HOLES FOR GALVANIZING. UPPER HOLE MAY ALSO BE USED FOR POST STOP IF APPLICABLE.
- ④ DRIVEN SOCKET DEPTH MUST MEET SPECIFIED DEPTH REGARDLESS OF SHALLOWER CRASH TESTED DEPTHS.



APPROVED AUGUST 19, 2015

Christy R. By
STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
**HIGH-TENSION CABLE BARRIER
LINE POST FOUNDATION**
STEEL DESIGN

SPECIFICATION
REFERENCE
2554

REVISED
9-13-2016 M.J.E.

STANDARD
PLATE
NO.

8343A

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