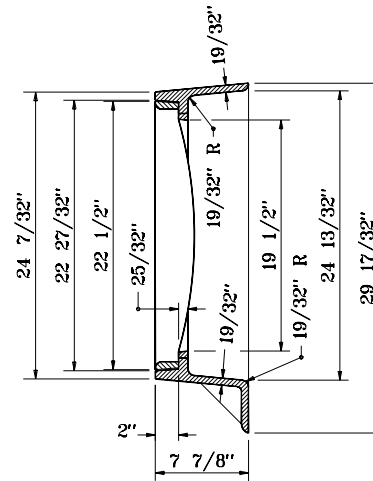
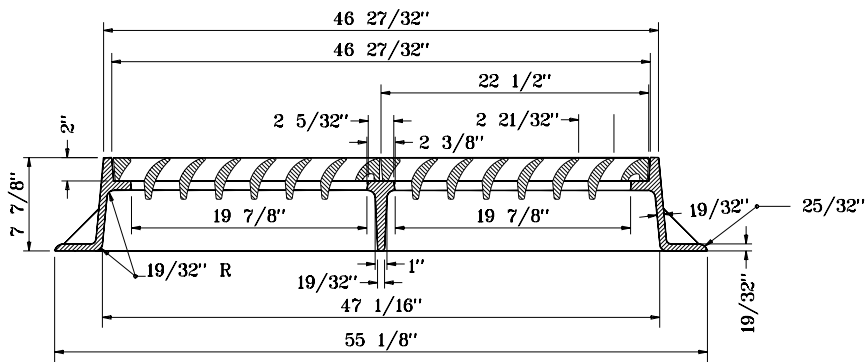


PLAN



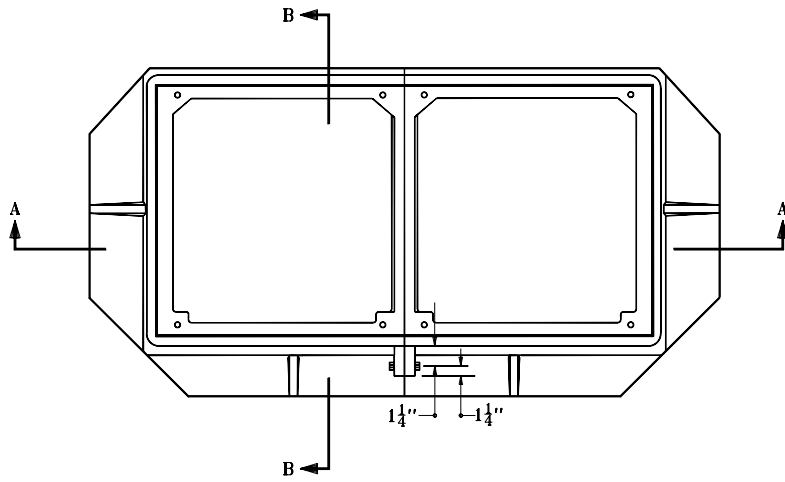
SECTION B-B



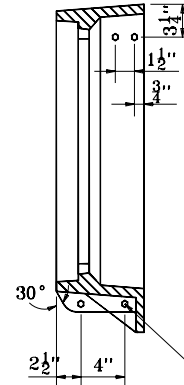
SECTION A-A

**FRAME
CASTING TYPE 5**

| | |
|--------------------------------------|--|
| INDIANA DEPARTMENT OF TRANSPORTATION | |
| CASTING TYPE 5 | |
| FRAME | |
| SEPTEMBER 2001 | |
| STANDARD DRAWING NO. E 720-ICCA-01 | |
| | /s/ Anthony L. Uremovich 9-04-01 DESIGN STANDARDS ENGINEER DATE |
| | /s/ Firooz Zandi 9-04-01 CHIEF HIGHWAY ENGINEER DATE |
| DESIGN STANDARDS ENGINEER | |

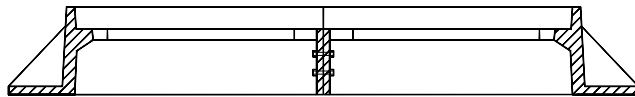


PLAN



SECTION B-B

4 - $\frac{5}{8}$ " hex head stainless steel cap screws and flat washers



SECTION A-A

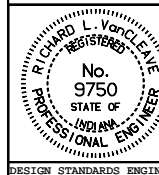
INDIANA DEPARTMENT OF TRANSPORTATION

CASTING TYPE 5

ALTERNATE BOLTED FRAME

SEPTEMBER 2001

STANDARD DRAWING NO. **E 720-ICCA-02**



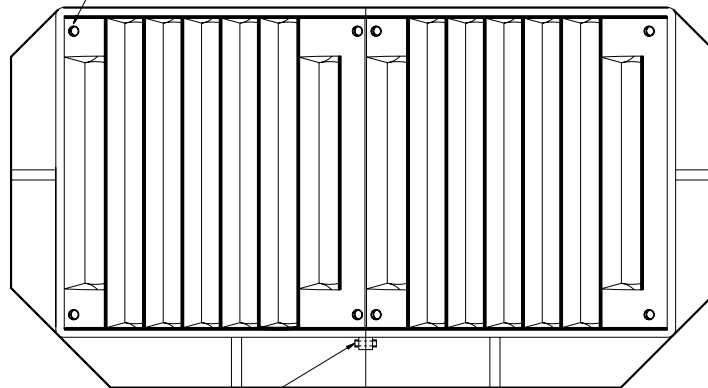
/s/ Anthony L. Uremovich 9-04-01
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 9-04-01
CHIEF HIGHWAY ENGINEER DATE

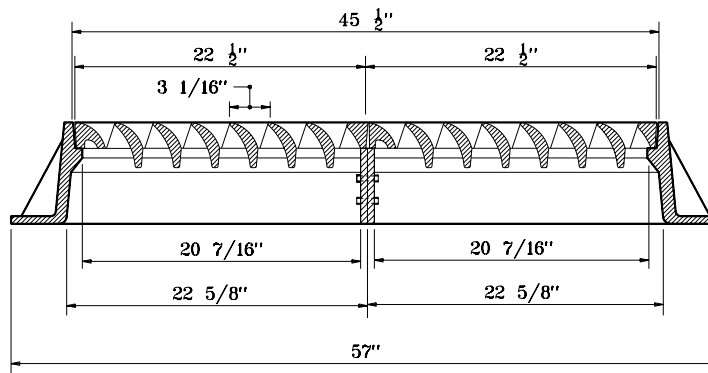
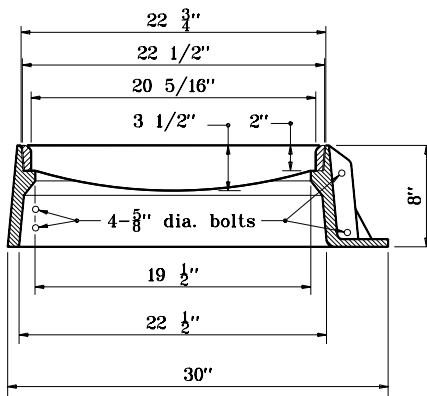
DESIGN STANDARDS ENGINEER

Grate is bolted to
frame with 1/2" hex head
SS bolts. 4 req'd. each grate.

BARRIER SIDE

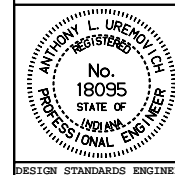


4-5/8" dia. bolts ← Left hand flow →



**FRAME AND GRATE
CASTING TYPE 5 (ALTERNATE)**

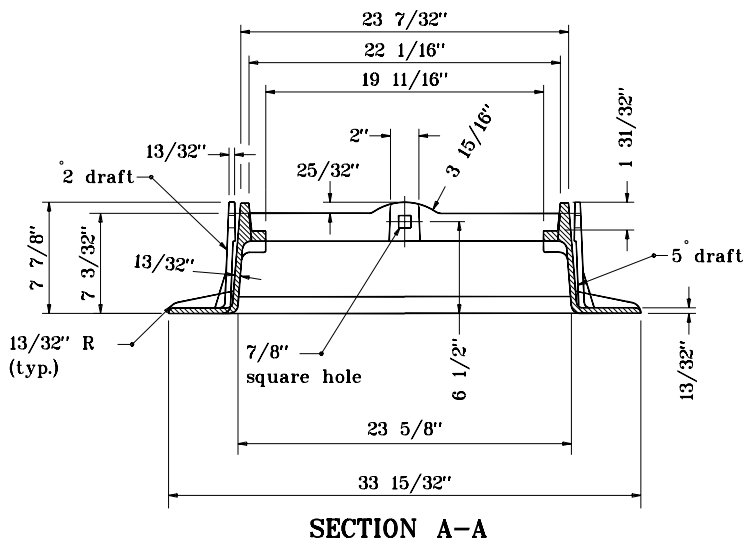
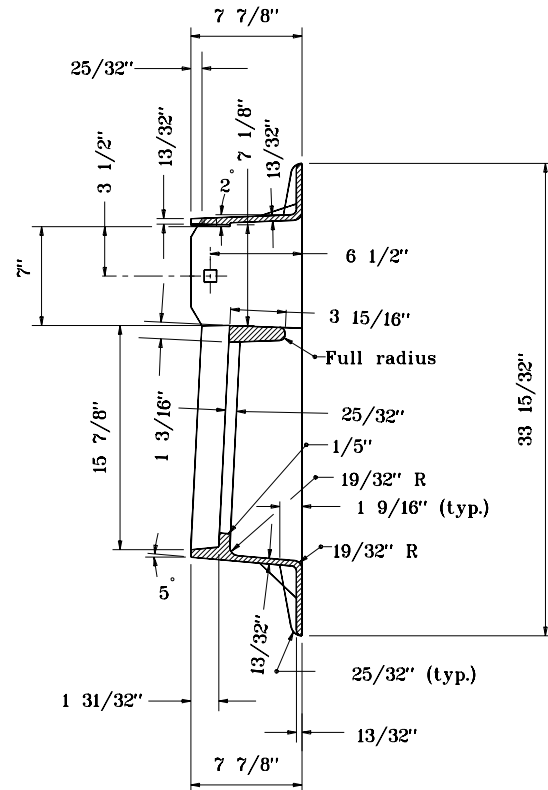
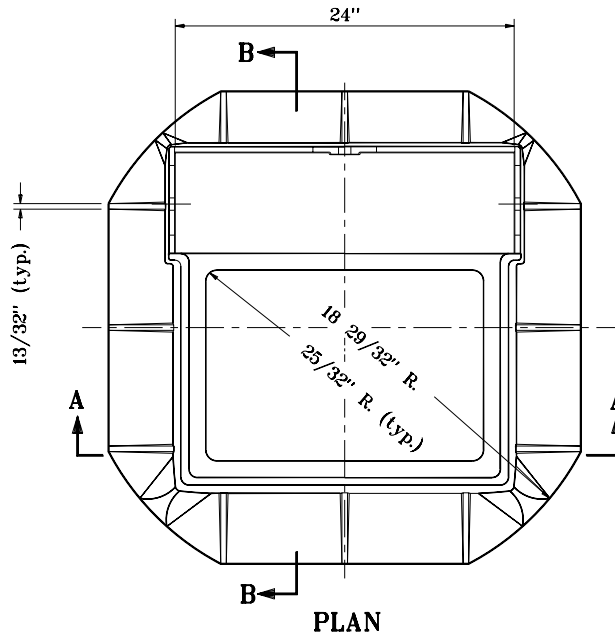
INDIANA DEPARTMENT OF TRANSPORTATION
CASTING TYPE 5 (ALTERNATE)
FRAME AND GRATE
SEPTEMBER 2001
STANDARD DRAWING NO. **E 720-ICCA-03**



/s/ Anthony L. Uremovich 9-04-01
DESIGN STANDARDS ENGINEER DATE

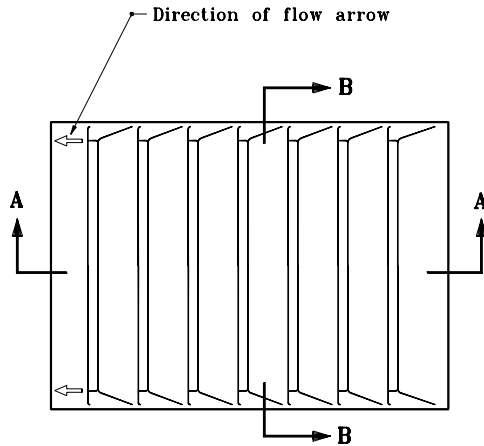
/s/ Firooz Zandi 9-04-01
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

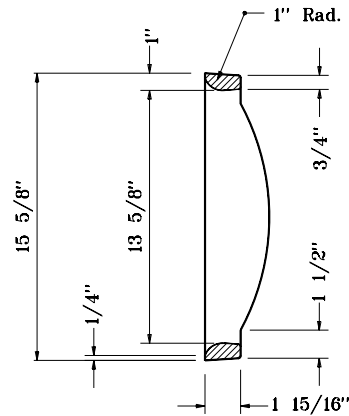


**FRAME
CASTING TYPE 8**

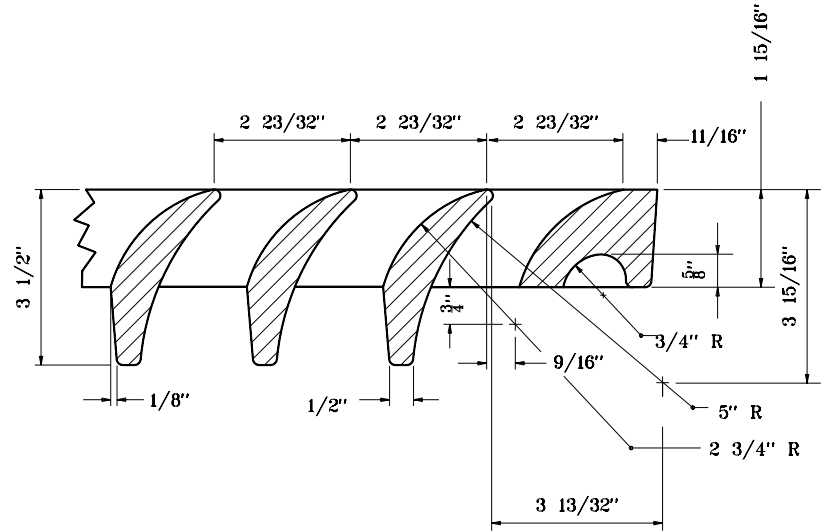
| | |
|---|---|
| INDIANA DEPARTMENT OF TRANSPORTATION | |
| CASTING TYPE 8 | |
| FRAME | |
| SEPTEMBER 1998 | |
| STANDARD DRAWING NO. E 720-ICCA-04 | |
| DETAILS PLACED IN THIS FORMAT 11-15-99 | |
| | /s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE |
| | /s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE |
| | DESIGN STANDARDS ENGINEER ORIGINALLY APPROVED 9-01-98 |



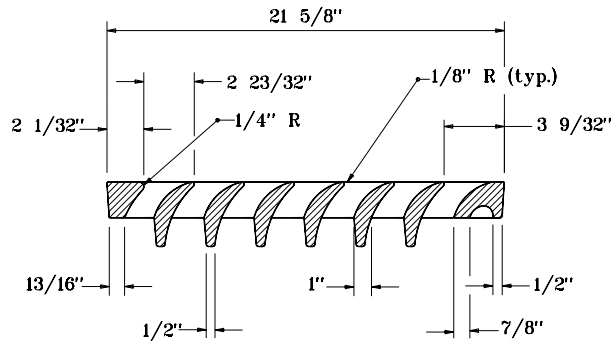
PLAN



SECTION B-B



DETAIL OF SECTION A-A
GRATE
CASTING TYPE 8



SECTION A-A

INDIANA DEPARTMENT OF TRANSPORTATION

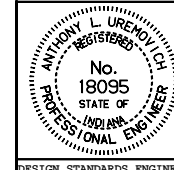
CASTING TYPE 8

GRATE

SEPTEMBER 1998

STANDARD DRAWING NO. E 720-ICCA-05

DETAILS PLACED IN THIS FORMAT 11-15-99



/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

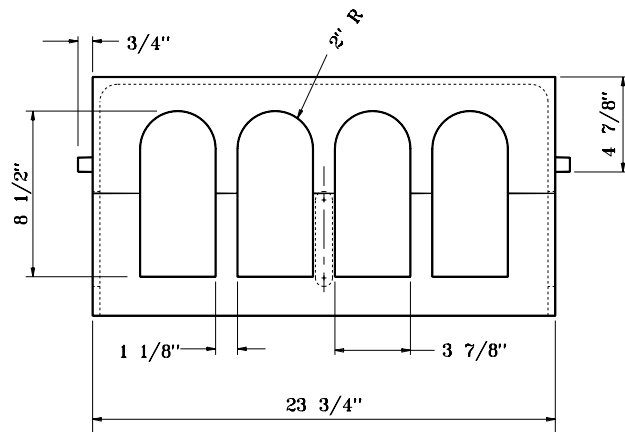
/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

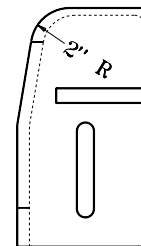
ORIGINALLY APPROVED 9-01-98

GENERAL NOTES

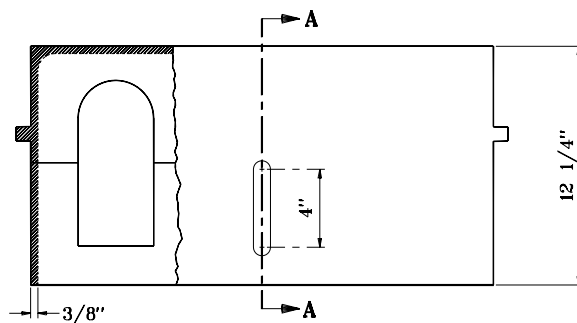
1. Curb box adjustable from 5 1/4" to 8 3/4".



FRONT

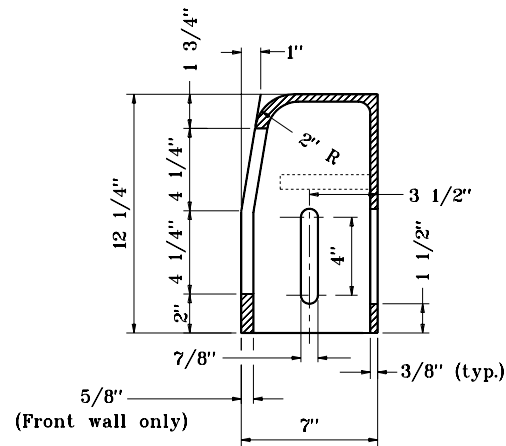


SIDE



BACK

**CURB BOX
CASTING TYPE 8**



SECTION A-A

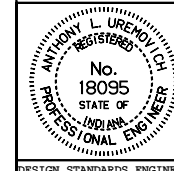
INDIANA DEPARTMENT OF TRANSPORTATION

CASTING TYPE 8

CURB BOX

SEPTEMBER 1998

STANDARD DRAWING NO. **E 720-ICCA-06**



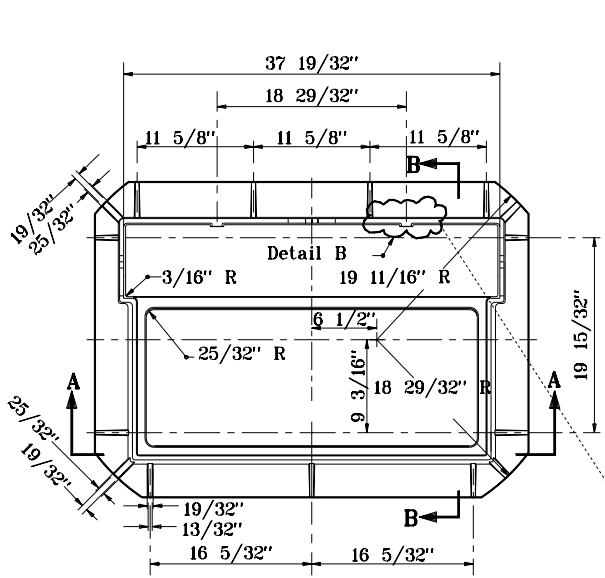
DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

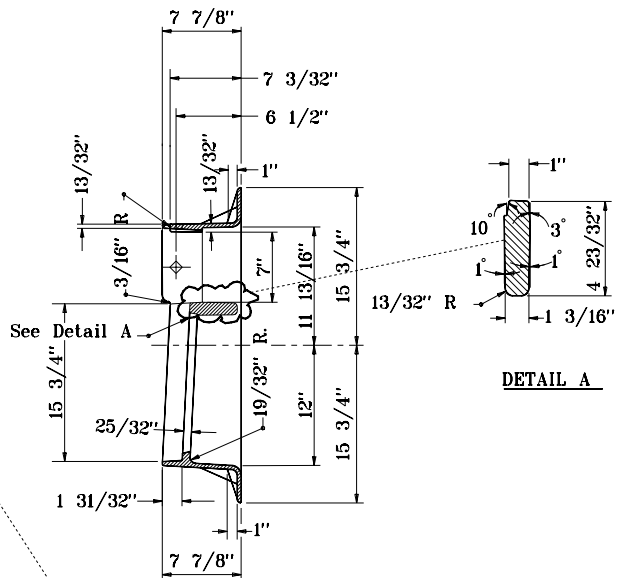
/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 9-01-98

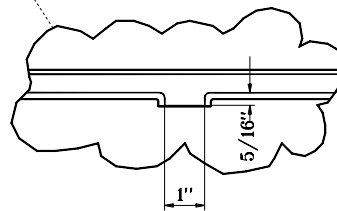


PLAN

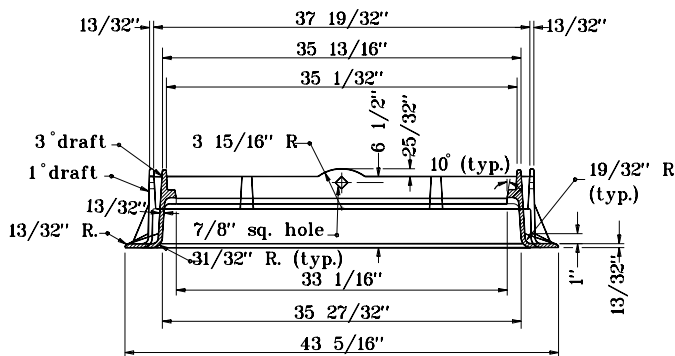


SECTION B-B

DETAIL A



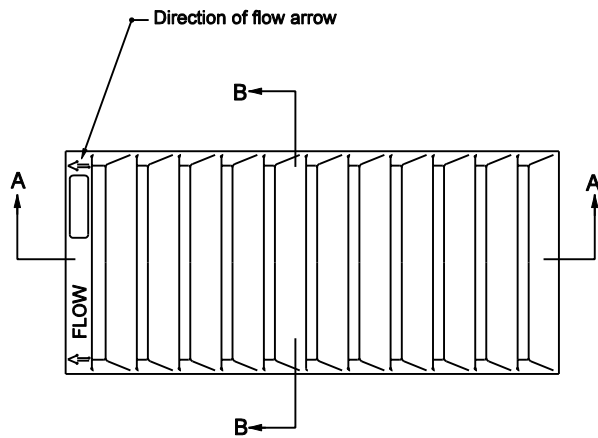
DETAIL B



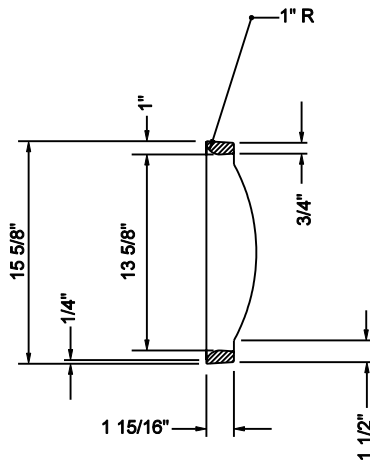
SECTION A-A

**FRAME
CASTING TYPE 10**

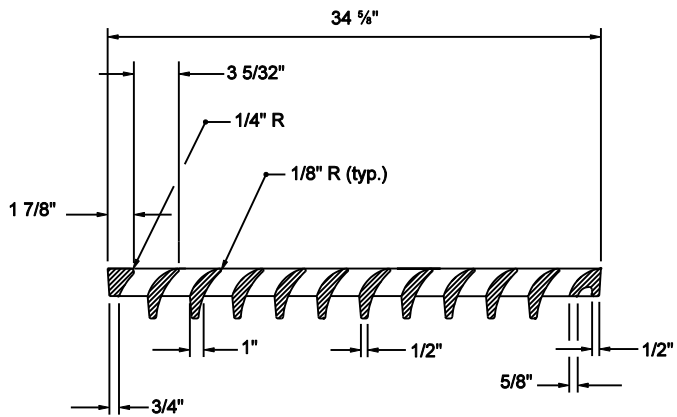
| | |
|---|--|
| INDIANA DEPARTMENT OF TRANSPORTATION | |
| CASTINGS TYPE 10 | |
| FRAME | |
| SEPTEMBER 1998 | |
| STANDARD DRAWING NO. E 720-ICCA-08 | |
| | DETAILS PLACED IN THIS FORMAT 11-15-99 /s/ Anthony L. Uremovich 11-15-99 <small>DESIGN STANDARDS ENGINEER DATE</small> |
| | /s/ Firooz Zandi 11-15-99 <small>CHIEF HIGHWAY ENGINEER DATE</small> |
| | <small>DESIGN STANDARDS ENGINEER ORIGINALLY APPROVED 9-01-98</small> |



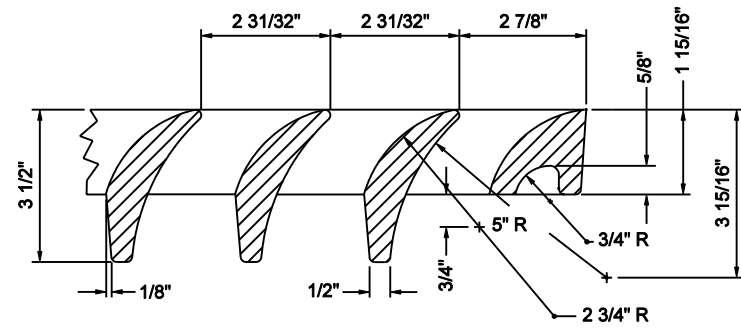
PLAN



SECTION B-B



SECTION A-A



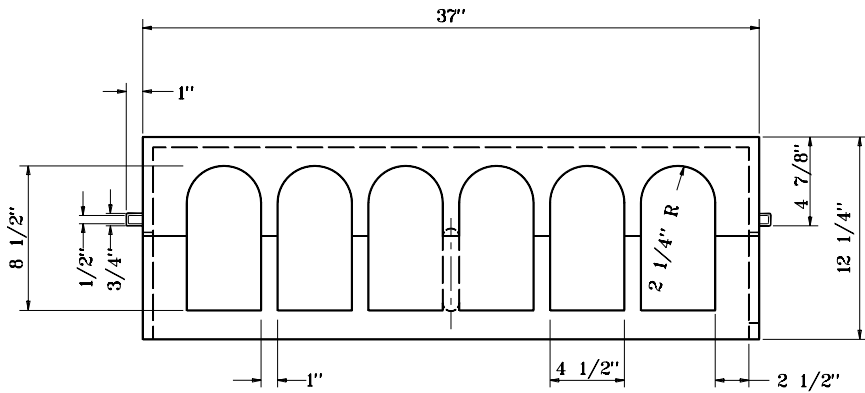
DETAIL OF SECTION A-A

GRATE
CASTING TYPE 10

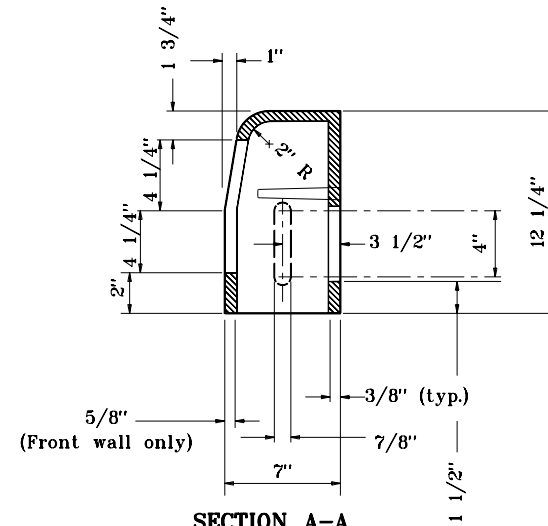
| | |
|--------------------------------------|--|
| INDIANA DEPARTMENT OF TRANSPORTATION | |
| CASTING TYPE 10 GRATE | |
| SEPTEMBER 2003 | |
| STANDARD DRAWING NO. E 720-ICCA-09 | |
| | /s/ Richard L. VanCleave 9-02-03 DESIGN STANDARDS ENGINEER DATE |
| | /s/ Richard K. Smutzer 9-02-03 CHIEF HIGHWAY ENGINEER DATE |
| DESIGN STANDARDS ENGINEER | |

GENERAL NOTES

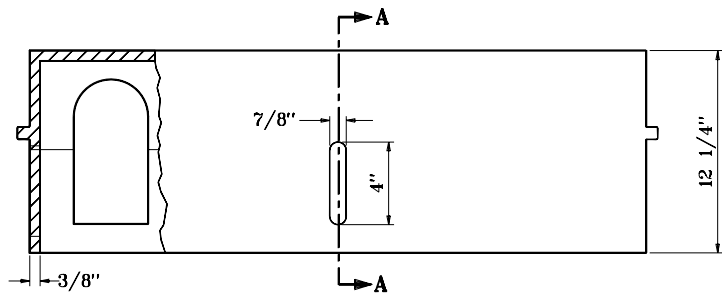
1. Curb box adjustable
5 1/4" to 8 3/4".



FRONT

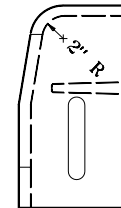


SECTION A-A



BACK

**CURB BOX
CASTING 10**



SIDE

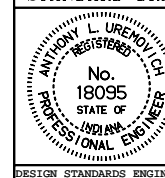
INDIANA DEPARTMENT OF TRANSPORTATION

CASTING TYPE 10

CURB BOX

SEPTEMBER 1998

STANDARD DRAWING NO. E 720-ICCA-09A



DETAILS PLACED IN THIS FORMAT 11-15-99

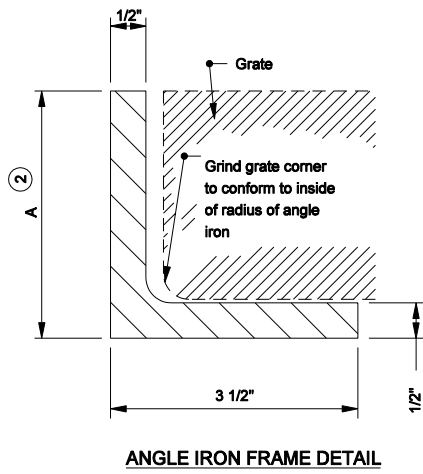
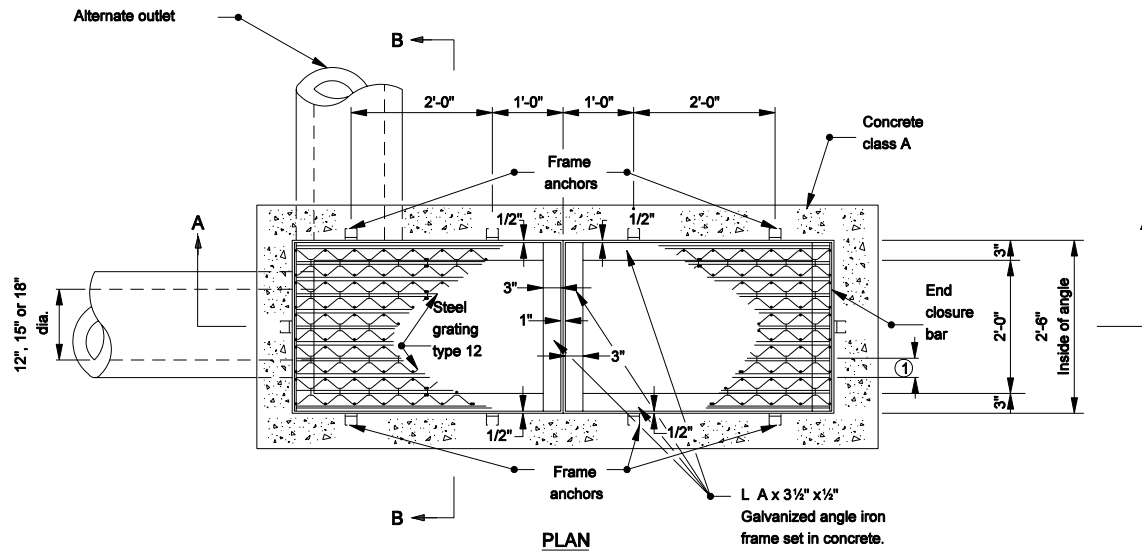
/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED

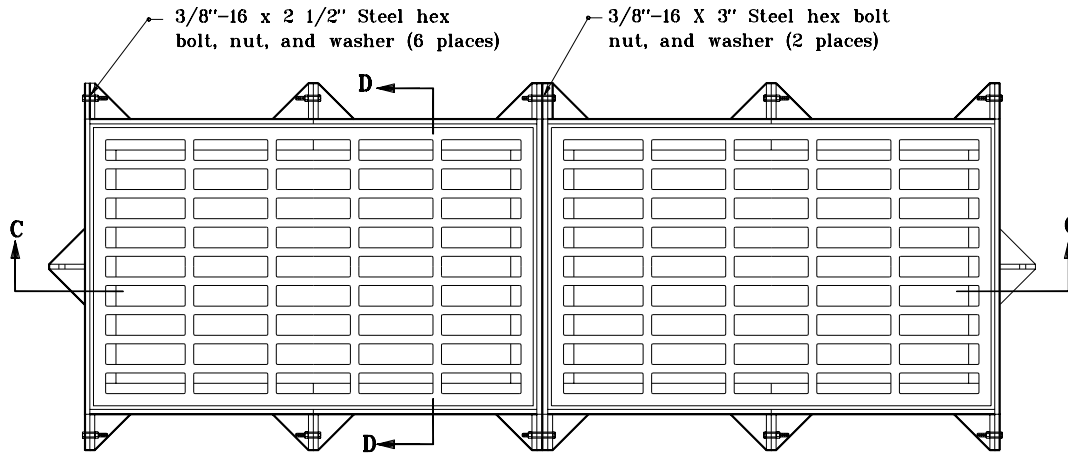
9-01-98



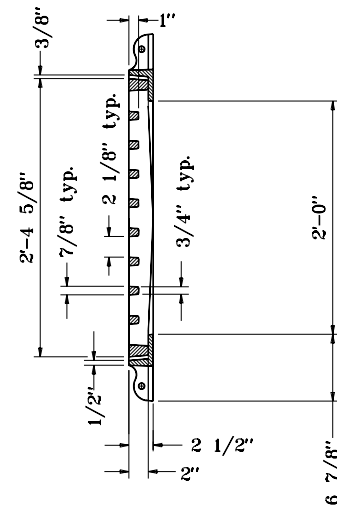
NOTES

- ① Bar spacing shall be 1 1/4" c. to c. minimum and 2 1/2" c. to c. maximum.
- ② The dimensions of the angle iron frame shall be as shown except that the A dimension may vary according to type of grating used.
- ③ For Section A-A, Section B-B see Standard Drawing E 720-INST-08.

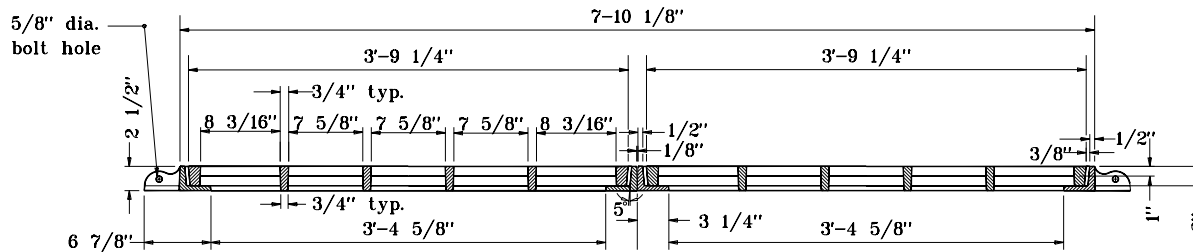
| | | | | | | | | | | | |
|--|--|--------------------------|---------|---------------------------|------|--|--|------------------------|---------|------------------------|------|
| INDIANA DEPARTMENT OF TRANSPORTATION | | | | | | | | | | | |
| STEEL GRATING TYPE 12 FRAME AND GRATE | | | | | | | | | | | |
| SEPTEMBER 2005 | | | | | | | | | | | |
| STANDARD DRAWING NO. E 720-ICCA-10 | | | | | | | | | | | |
| | <table style="width: 100%; border: none;"> <tr> <td style="border: none;">/s/ Richard L. VanCleave</td> <td style="border: none; text-align: right;">9-01-05</td> </tr> <tr> <td style="border: none;">DESIGN STANDARDS ENGINEER</td> <td style="border: none; text-align: right;">DATE</td> </tr> <tr> <td colspan="2" style="border: none;"> </td> </tr> <tr> <td style="border: none;">/s/ Richard K. Smutzer</td> <td style="border: none; text-align: right;">9-01-05</td> </tr> <tr> <td style="border: none;">CHIEF HIGHWAY ENGINEER</td> <td style="border: none; text-align: right;">DATE</td> </tr> </table> | /s/ Richard L. VanCleave | 9-01-05 | DESIGN STANDARDS ENGINEER | DATE | | | /s/ Richard K. Smutzer | 9-01-05 | CHIEF HIGHWAY ENGINEER | DATE |
| /s/ Richard L. VanCleave | 9-01-05 | | | | | | | | | | |
| DESIGN STANDARDS ENGINEER | DATE | | | | | | | | | | |
| | | | | | | | | | | | |
| /s/ Richard K. Smutzer | 9-01-05 | | | | | | | | | | |
| CHIEF HIGHWAY ENGINEER | DATE | | | | | | | | | | |
| DESIGN STANDARDS ENGINEER | | | | | | | | | | | |



PLAN



SECTION D-D



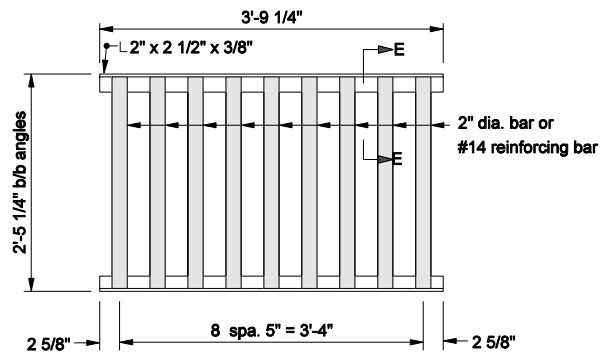
SECTION A-A

**GRATE AND FRAME CASTING
ALTERNATE TYPE 12**

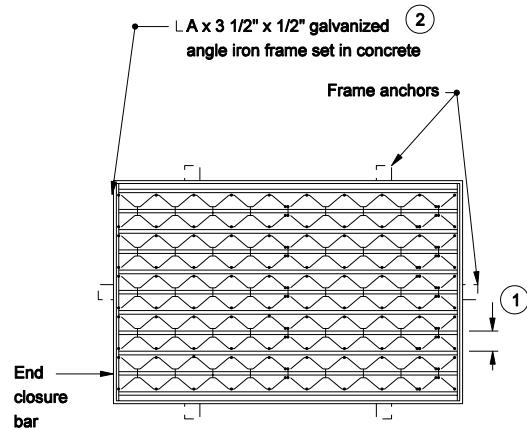
INDIANA DEPARTMENT OF TRANSPORTATION
CASTING TYPE 12 (ALTERNATE)
FRAME AND GRATE
 SEPTEMBER 1998

STANDARD DRAWING NO. E 720-ICCA-11

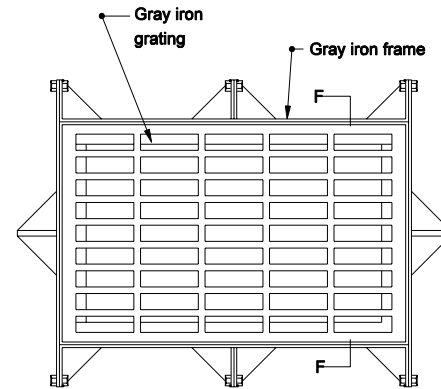
| | |
|---------------------------|---|
| | DETAILS PLACED IN THIS FORMAT 11-15-99 |
| | /s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE |
| | /s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE |
| DESIGN STANDARDS ENGINEER | ORIGINALLY APPROVED 9-01-98 |



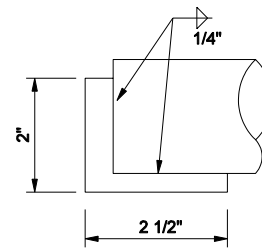
ALTERNATE STEEL GRATING
(To be used with steel frame type 12A)



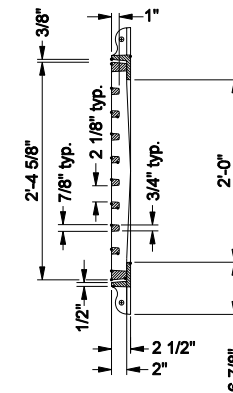
STEEL GRATING AND FRAME
TYPE 12A



GRATE AND FRAME CASTING
ALTERNATE TYPE 12A



SECTION E-E



SECTION F-F

GENERAL NOTES

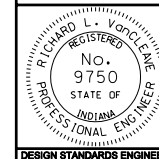
- 1 Spacing shall be $1 \frac{7}{8}$ " c. to c. min., and $2 \frac{3}{8}$ " c. to c. max.
- 2 The dimensions of the angle iron frame shall be as shown except that the A dimension may vary according to type of grating used.

INDIANA DEPARTMENT OF TRANSPORTATION

STEEL GRATING TYPE 12A
FRAME AND GRATE

SEPTEMBER 2005

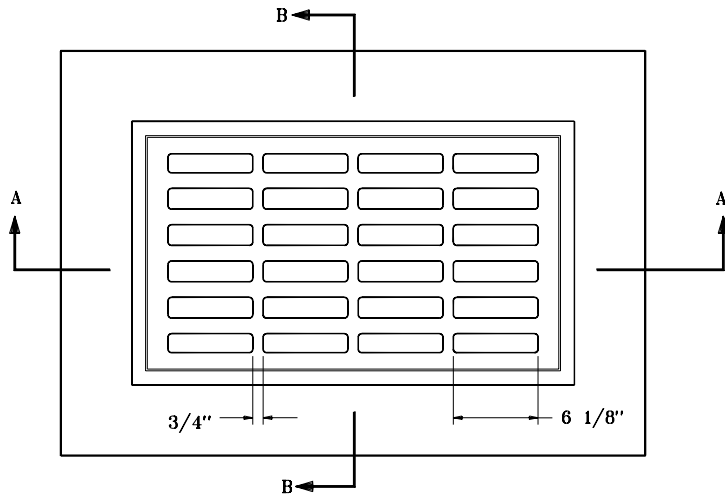
STANDARD DRAWING NO. E 720-ICCA-12



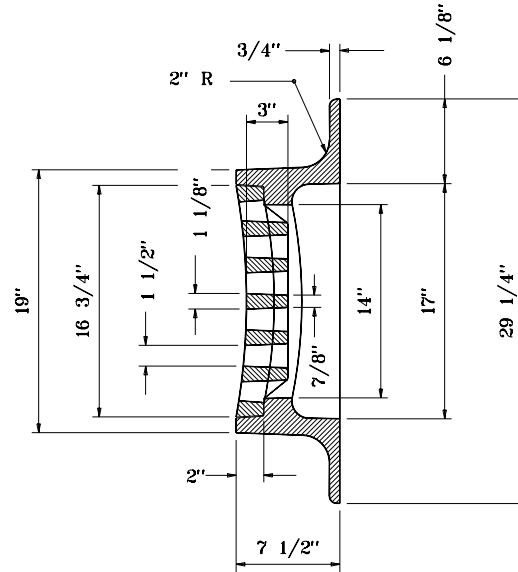
/s/ Richard L. VanCleave 9-01-05
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 9-01-05
CHIEF HIGHWAY ENGINEER DATE

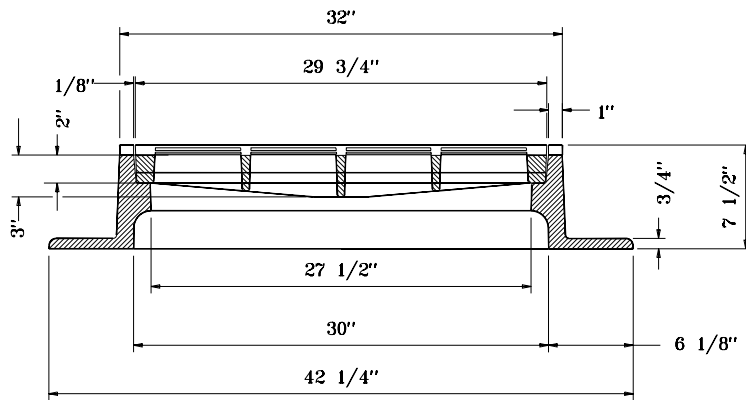
DESIGN STANDARDS ENGINEER



PLAN



SECTION B-B

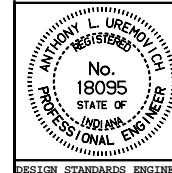


SECTION A-A

**FRAME AND GRATE
CASTING TYPE 13**

INDIANA DEPARTMENT OF TRANSPORTATION
CASTING TYPE 13
FRAME & GRATE
 SEPTEMBER 1998

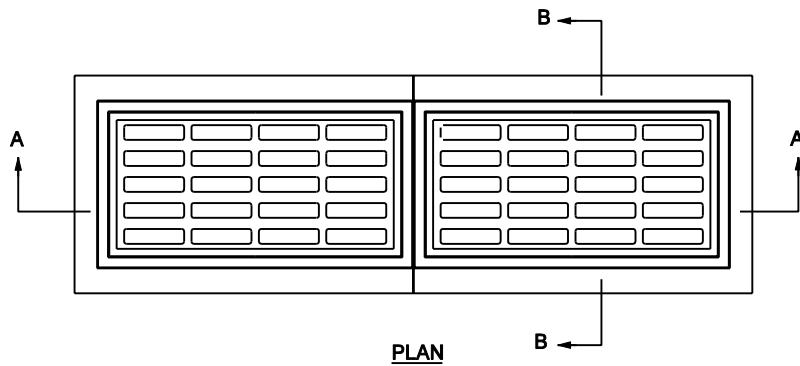
STANDARD DRAWING NO. **E 720-ICCA-13**



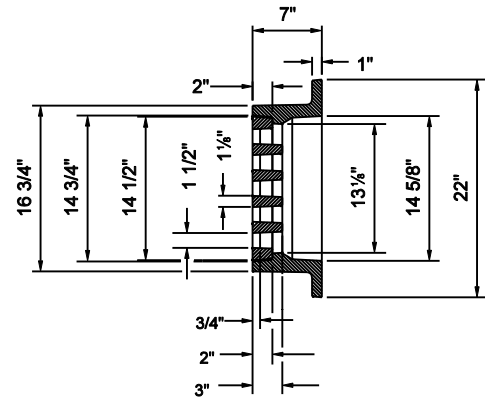
DETAILS PLACED IN THIS FORMAT 11-15-99
 /s/ Anthony L. Uremovich 11-15-99
 DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
 CHIEF HIGHWAY ENGINEER DATE
 ORIGINALLY APPROVED 9-01-98

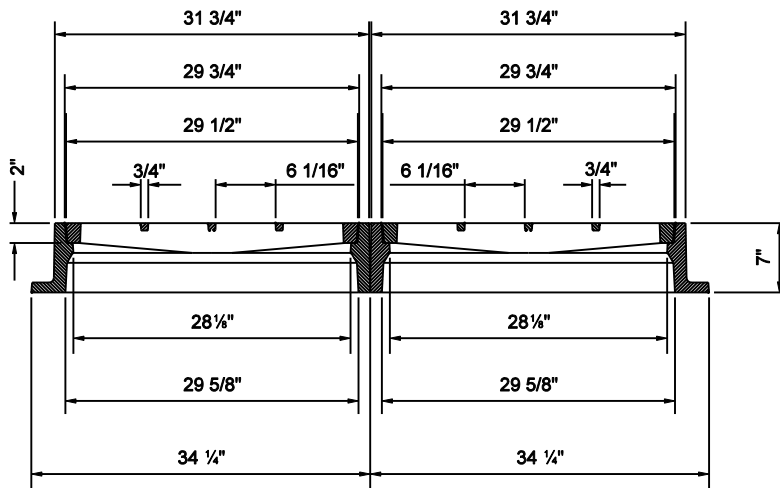
DESIGN STANDARDS ENGINEER



PLAN



SECTION B-B



SECTION A-A

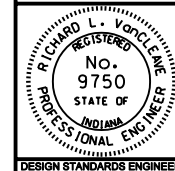
FRAME AND GRATE
CASTING TYPE 14

INDIANA DEPARTMENT OF TRANSPORTATION

CASTING TYPE 14
FRAME AND GRATE

SEPTEMBER 2003

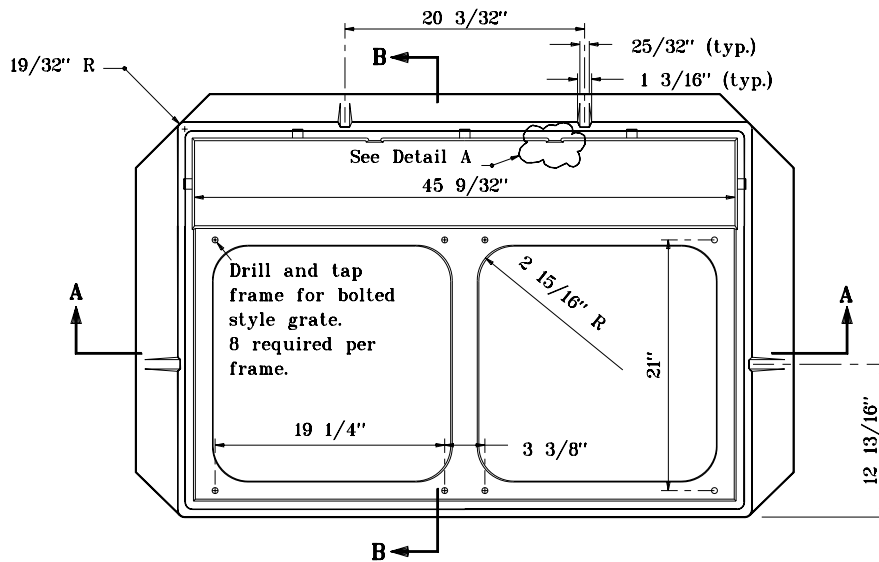
STANDARD DRAWING NO. E 720-ICCA-15



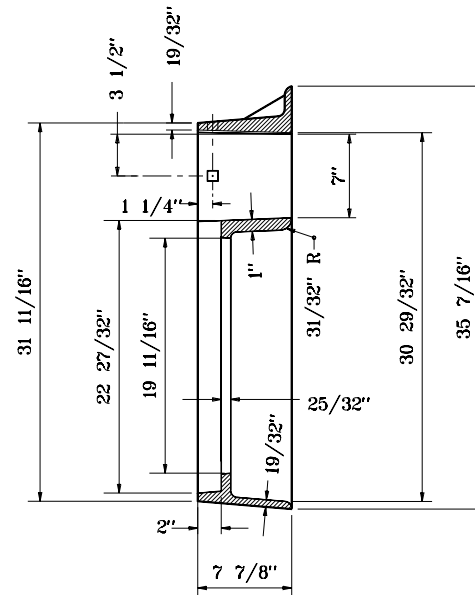
/s/ Richard L. VanCleave 9-02-03
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 9-02-03
CHIEF HIGHWAY ENGINEER DATE

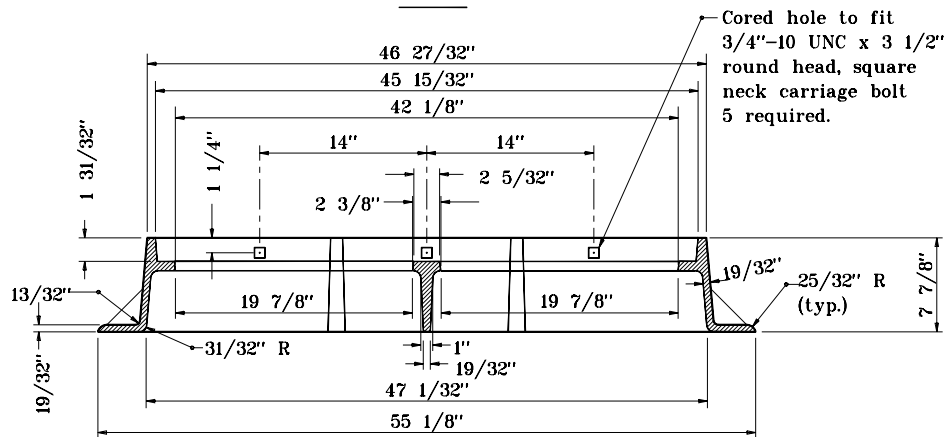
DESIGN STANDARDS ENGINEER



PLAN

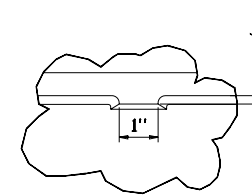


SECTION B-B



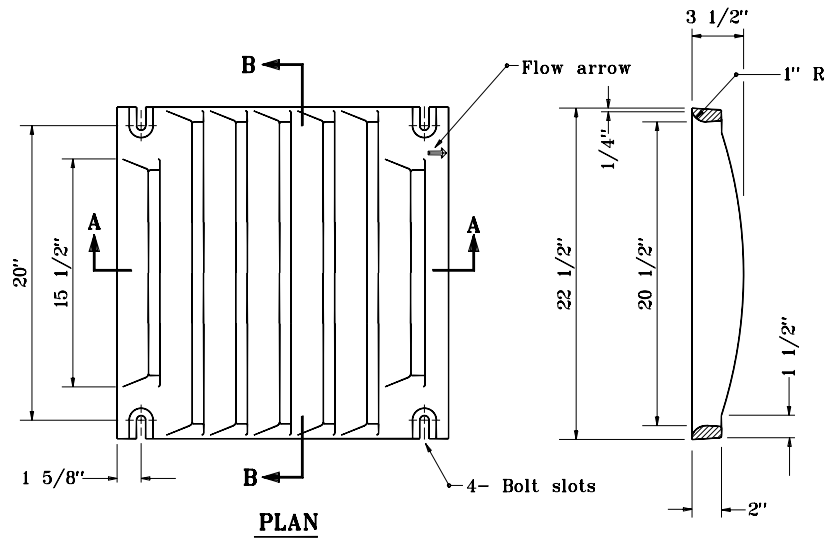
SECTION A-A

**FRAME
CASTING TYPE 15**



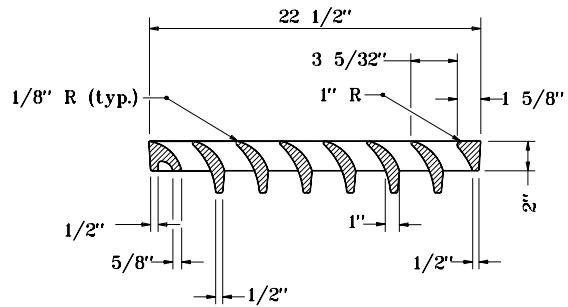
DETAIL A

| | |
|--|---|
| INDIANA DEPARTMENT OF TRANSPORTATION | |
| CASTING TYPE 15 | |
| FRAME | |
| SEPTEMBER 1998 | |
| STANDARD DRAWING NO. E 720-ICCA-16 | |
| DETAILS PLACED IN THIS FORMAT 11-15-99 | |
| | /s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE |
| | /s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE |
| DESIGN STANDARDS ENGINEER | ORIGINALLY APPROVED 9-01-98 |

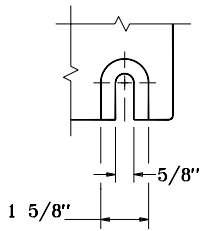


PLAN

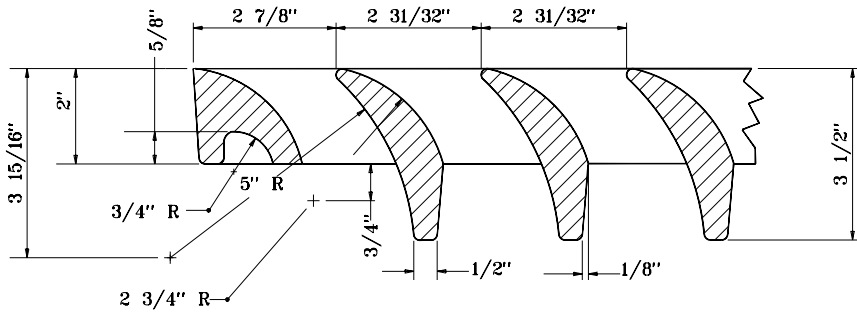
SECTION B-B



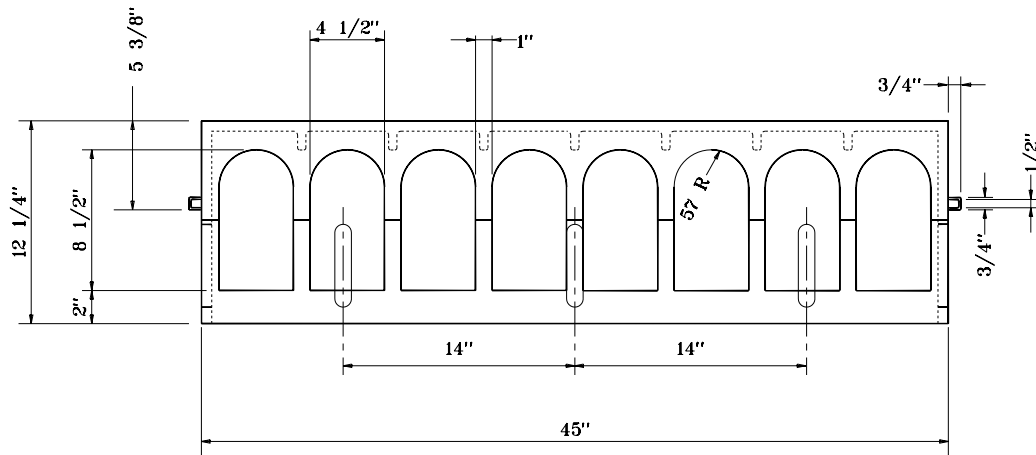
SECTION A-A



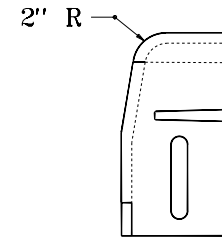
BOLT SLOT DETAIL



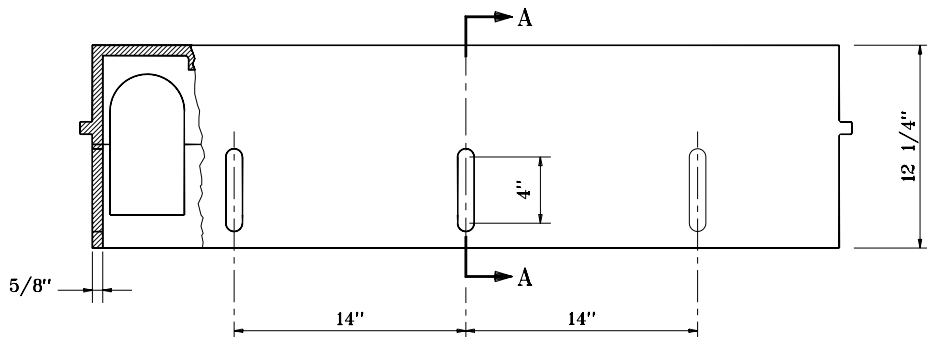
| | |
|---|---|
| INDIANA DEPARTMENT OF TRANSPORTATION | |
| CASTING TYPE 15 | |
| GRATE | |
| SEPTEMBER 1998 | |
| STANDARD DRAWING NO. E 720-ICCA-17 | |
| | DETAILS PLACED IN THIS FORMAT 11-15-99 |
| | /s/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE |
| | /s/ Firooz Zandi 11-15-99 CHIEF HIGHWAY ENGINEER DATE |
| DESIGN STANDARDS ENGINEER | ORIGINALLY APPROVED 9-01-98 |



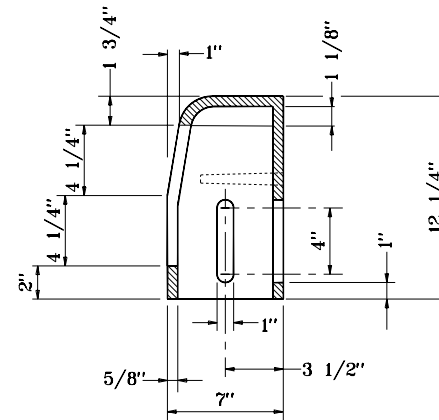
FRONT



SIDE



BACK



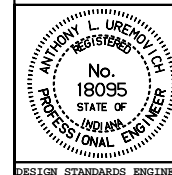
SECTION A-A

INDIANA DEPARTMENT OF TRANSPORTATION

**CASTING TYPE 15
CURB BOX**

SEPTEMBER 1998

STANDARD DRAWING NO. **E 720-ICCA-18**



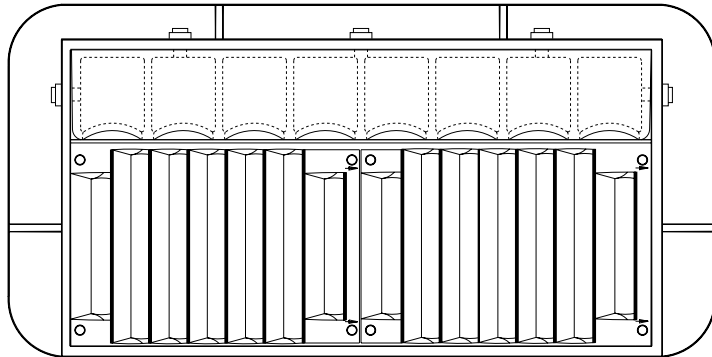
DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
CHIEF HIGHWAY ENGINEER DATE

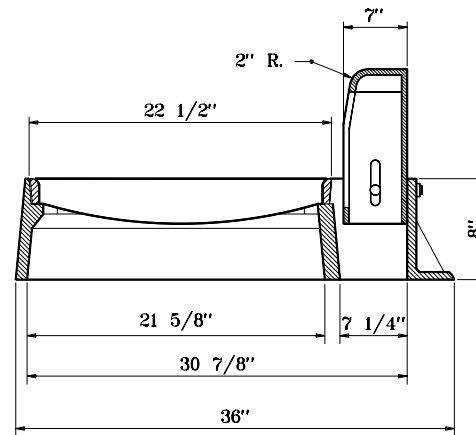
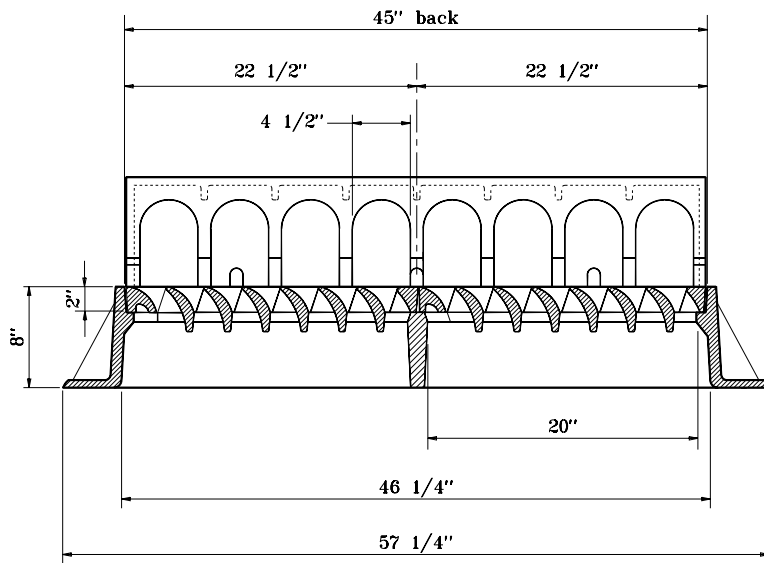
DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 9-01-98



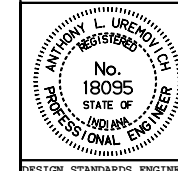
GENERAL NOTES

1. Curb adjustment $5\frac{1}{2}''$ to $9\frac{1}{2}''$.



INDIANA DEPARTMENT OF TRANSPORTATION
CASTING TYPE 15 (ALTERNATE)
FRAME, GRATE, AND CURB BOX
 SEPTEMBER 1998

STANDARD DRAWING NO. **E 720-ICCA-19**



DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Anthony L. Uremovich 11-15-99
 DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99
 CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

ORIGINALLY APPROVED 9-01-98