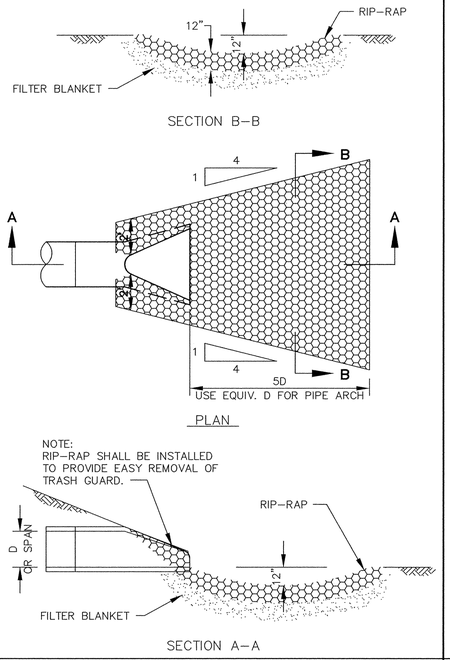
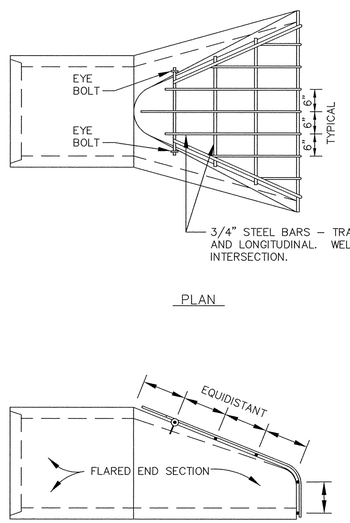
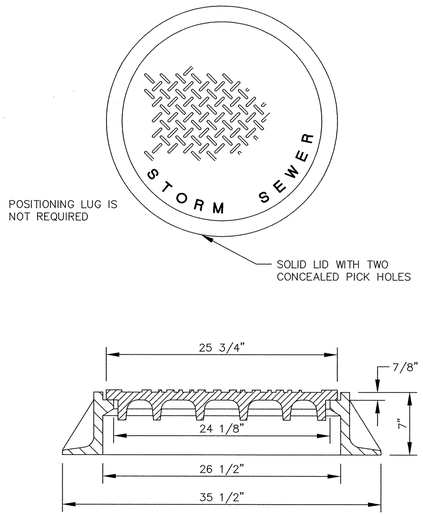


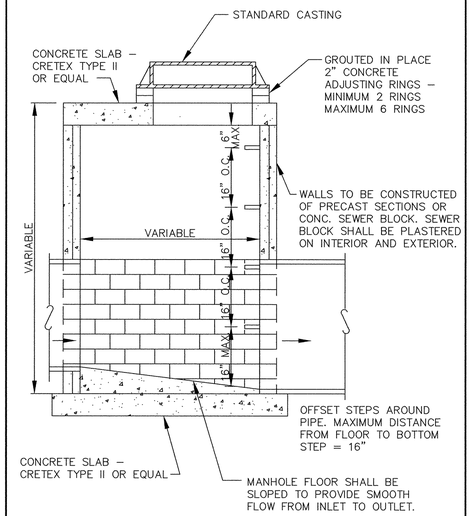
RIP-RAP INSTALLATION



TRASH GUARD

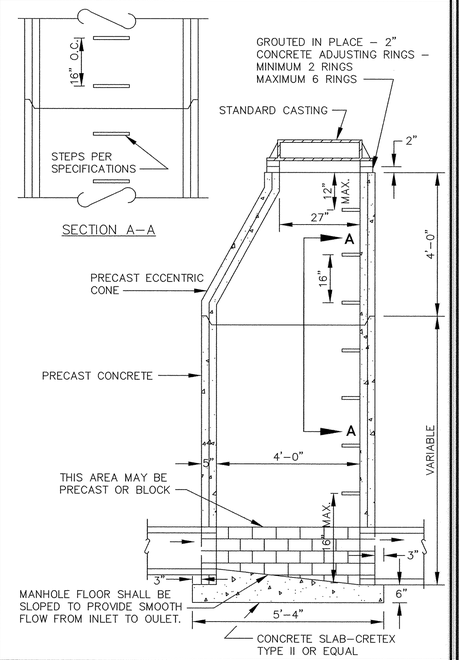


STANDARD MANHOLE CASTING



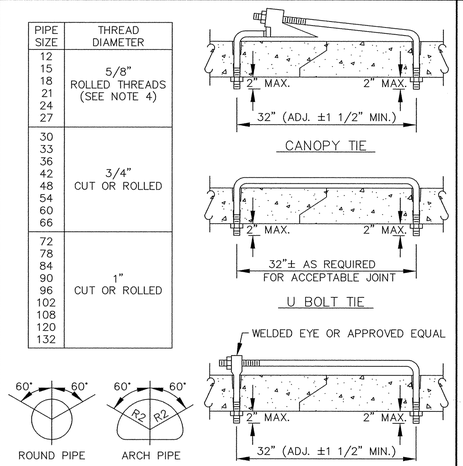
NOTE:
THIS TYPE MANHOLE SHALL BE USED WHEN SPECIFIED OR WHEN THE MANHOLE DEPTH IS LESS THAN EIGHT FEET.

SLAB TOP MANHOLE



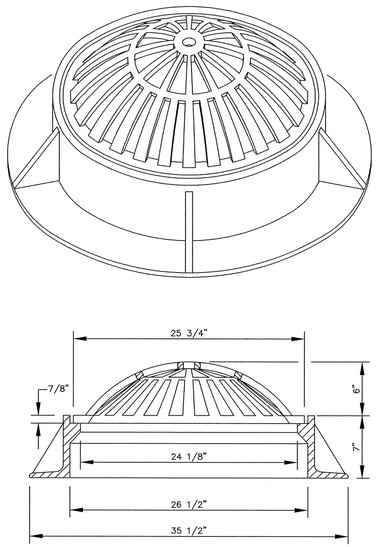
STANDARD MANHOLE

PIPE SIZE	THREAD DIAMETER
12 15 18 21 24 27	5/8" ROLLED THREADS (SEE NOTE 4)
30 33 36 42 48 54 60 66	3/4" CUT OR ROLLED
72 78 84 90 96 102 108 120 132	1" CUT OR ROLLED



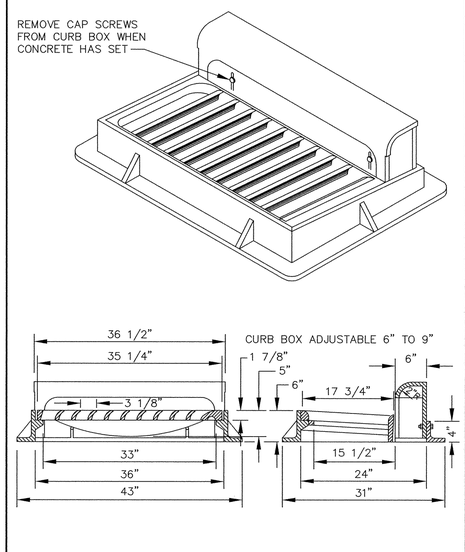
NOTE:
1. HOLES SHALL BE CAST-IN OR DRILLED 16" FROM OUTSIDE EDGE OF JOINT.
2. NUTS AND WASHERS ARE NOT REQUIRED ON INSIDE OF PIPE WITH 27" DIAMETER OR LESS.
3. TIES ARE NOT REQUIRED FOR BELL PIPE 24" AND SMALLER. ON OTHER SIZES, TIE MAY BE INSERTED FROM INSIDE.
4. CUT THREADS MAY BE USED IF WASHER AND NUT ARE USED.
5. PIPE SIZES LISTED ARE INSIDE DIAMETER OF ROUND PIPE OR EQUIVALENT DIAMETER OF PIPE ARCH.

CONCRETE PIPE JOINT TIES



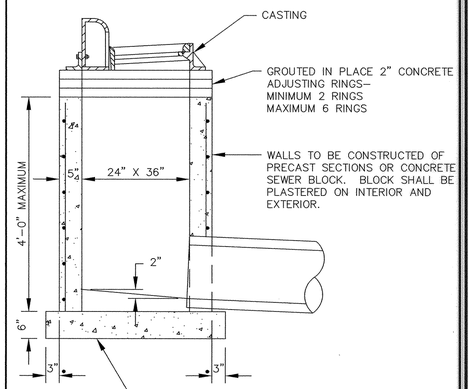
CASTINGS SHALL BE NEENAH R-2561A OR EQUAL

BEEHIVE CASTING



CASTINGS SHALL BE NEENAH R-3067-V OR EQUAL

STANDARD INLET CASTING



NOTE:
REINFORCING SHALL CONSIST OF A SINGLE LINE OF STEEL WIRE FABRIC HAVING AN AREA OF NOT LESS THAN 0.17 SQ. IN. PER FOOT OF HEIGHT.

SHALLOW CATCH BASIN

RECORD PLAN
JANUARY 1997

ER292-D4

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE 8/21/96 REG. NO. 15316

MSA CONSULTING ENGINEERS

1326 ENERGY PARK DRIVE
ST. PAUL, MINNESOTA 55108
(612) 644-4389

REVISIONS	DATE	DESCRIPTION

DESIGNED SEE
CHECKED
DRAWN RKM
GRAPHIC SCALE
0 HORIZ.
0 VERT.

CITY OF ELK RIVER
HILLSIDE ESTATES FIFTH ADDITION
STORM SEWER DETAILS

DATE JULY 1996 | SHEET 15 OF 16 SHEETS | PROJECT NO. 230-292

1060

DRAWING NUMBER

DRAWING NUMBER
HILLSE5 96
15

Fri Aug 9 15:23:09 1996