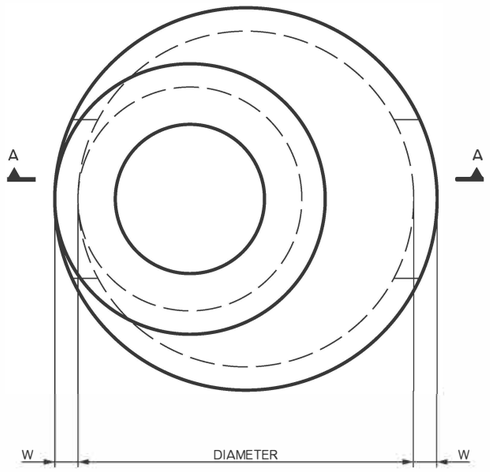
## DESIGN DATA

MATERIAL:
CLASS A CONCRETE f'c = 4 KSI
REINFORCING STEEL fy = 60 KSI

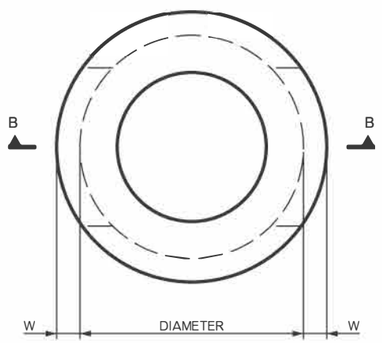
LOADING:
HL-93

DESIGN:
AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, LATEST EDITION
ASTM C478
ASTM C890
ASTM C913



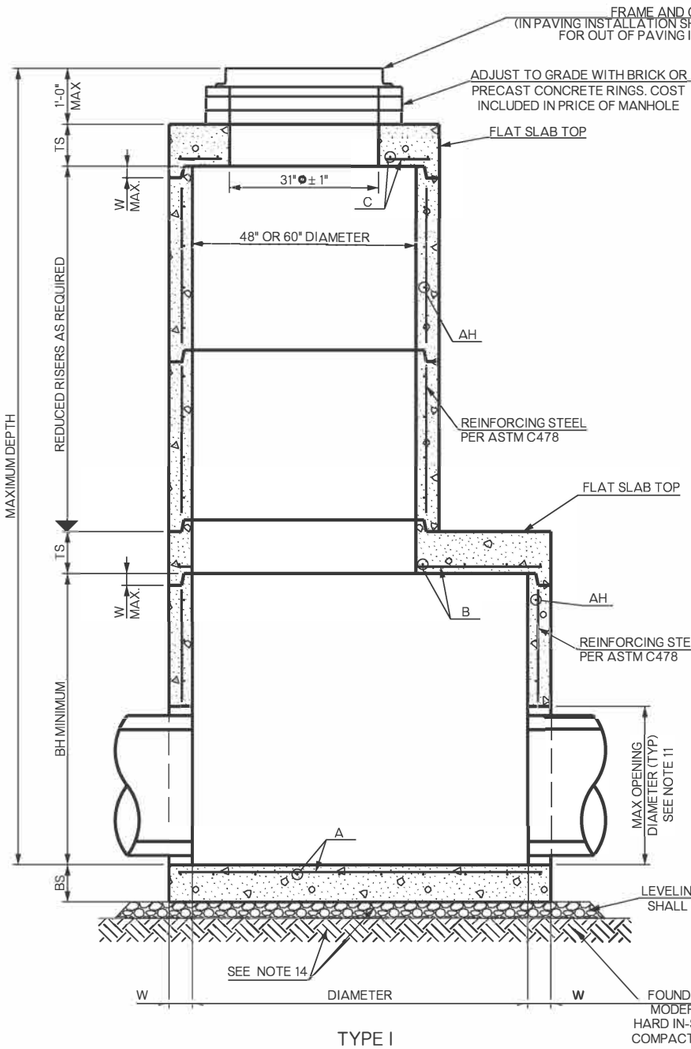

PLAN VIEW - ROUND REDUCED RISER

ROUND MANHOLE, TYPE I

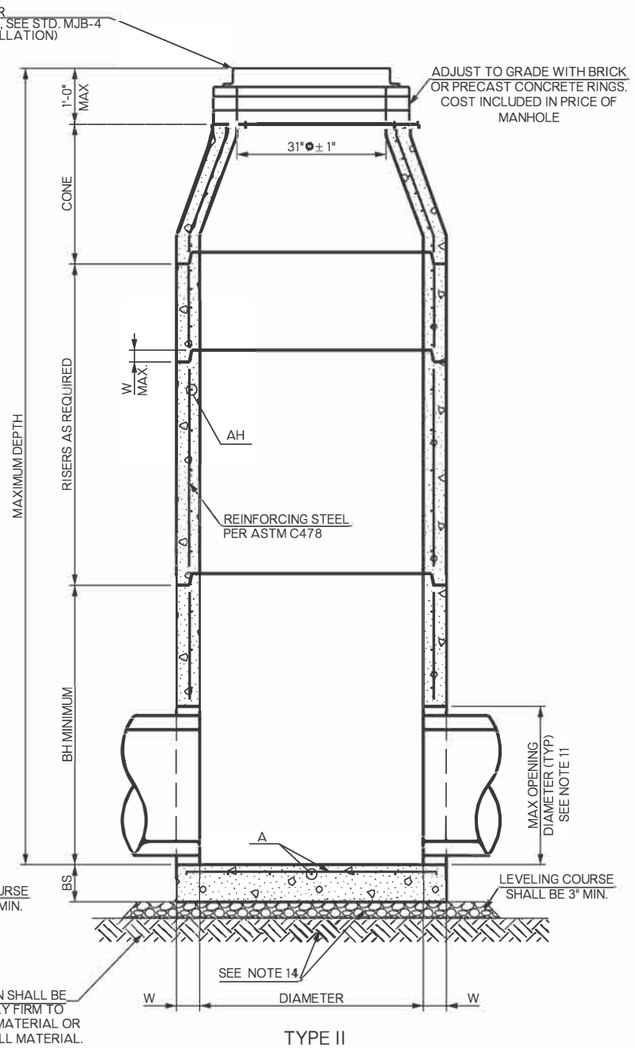



PLAN VIEW - ROUND RISER

ROUND MANHOLE, TYPE II




TYPE I
SECTION A-A
ROUND REDUCED RISER OPTION
SHOWING FLAT SLAB TOP.
CONE MAY BE USED.




TYPE II
SECTION B-B
ROUND RISER OPTION
SHOWING CONE.
FLAT SLAB TOP MAY BE USED.

## GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
2. FOR DETAILS OF FRAME AND COVER, SEE THE CURRENT VERSION OF ROADWAY STANDARD MFC-5. PRICE BID OF MANHOLE SHALL INCLUDE PAYMENT FOR THESE ITEMS AND ALL OTHER ITEMS AND LABOR NECESSARY TO COMPLETE THE INSTALLATION. PRICE BID OF ADDITIONAL DEPTH SHALL INCLUDE PAYMENT FOR ALL MATERIAL AND LABOR, PERTAINING ONLY TO THE ADDITIONAL DEPTH, NECESSARY TO COMPLETE ITS INSTALLATION.
3. SQUARE MANHOLES MAY BE SUBSTITUTED PER THE MANUFACTURER'S RECOMMENDATION. SEE THE CURRENT VERSION OF ROADWAY STANDARD PSM-1 FOR MATERIAL AND INSTALLATION DETAILS.
4. PIPE OPENINGS SHALL NOT BE LOCATED IN A CONE SECTION.
5. THERE SHALL BE A MINIMUM DISTANCE OF 6" BETWEEN AN OPENING AND ANY JOINT.
6. PROVIDE LIFTING DEVICES IN CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
7. PROVIDE GRADE 60 REINFORCING STEEL CONFORMING TO ASTM A615 OR EQUIVALENT AREA OF WELDED WIRE REINFORCING CONFORMING TO ASTM A1064. PROVIDE CIRCUMFERENTIAL REINFORCING STEEL IN VERTICAL WALLS OF BASE, RISER, AND CONE IN ACCORDANCE WITH ASTM C478.
8. PROVIDE A MINIMUM CLEAR COVER OF 1½" TO REINFORCING STEEL.
9. WALLS OR SLABS WITH A THICKNESS OF 8" OR GREATER REQUIRE A SECONDARY LAYER OF REINFORCING STEEL. PROVIDE AN AREA OF REINFORCING STEEL EQUAL TO 0.11 SQ. $IN.^2$/ FT EACH WAY IN THE SECONDARY LAYER.
10. DESIGN TONGUE AND GROOVE JOINTS FOR FULL CLOSURE ON RISER SHOULDERS, CONICAL TOPS, AND FLAT SLABS. MINIMUM SPIGOT DEPTH IS ¾".
11. MAXIMUM OPENING SHALL BE 4" LARGER THAN OUTSIDE PIPE DIAMETER. REFER TO THE MOST CURRENT VERSION OF ROADWAY DESIGN STANDARD PMD-1 FOR PIPE CONNECTION MATERIAL.
12. SEAL TONGUE AND GROOVE JOINTS WITH PREFORMED OR BULK MASTIC IN CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. TONGUE AND GROOVE JOINTS MAY BE GROUTED NO MORE THAN 1" BETWEEN EACH SECTIONS OR ½ THE JOINT DEPTH, WHICHEVER IS GREATER. JOINT SEALING SHALL BE INCLUDED IN THE COST OF THE MANHOLE.
13. DO NOT GROUT RUBBER GASKET JOINTS WITHOUT THE MANUFACTURER'S RECOMMENDATIONS.
14. THE FOUNDATION SHALL BE STABILIZED OR REMOVED AND REPLACED WITH FIRM AND STABLE FOUNDATION MATERIAL. A MINIMUM 3" THICK LEVELING COURSE SHALL BE PROVIDED BELOW THE BASE AREA OF THE MANHOLE AND EXTEND 6" BEYOND THE BASE AREA. THE LEVELING COURSE SHALL BE CONSTRUCTED WITH AGGREGATE BASE TYPE A. COSTS ASSOCIATED WITH THE FOUNDATION AND LEVELING COURSES SHALL BE INCLUDED IN THE PRICE BID OF THE MANHOLE.
15. OPENINGS IN FLAT SLAB TOPS SHALL BE ADDITIONALLY REINFORCED WITH A MINIMUM OF 0.20 SQ. IN. OF REINFORCING STEEL AT 90 DEGREES.
16. REFER TO PROJECT PLAN SHEETS FOR NUMBER, LOCATION, AND SIZE OF PIPE.
17. FLEXURAL REINFORCING STEEL SHALL NOT EXCEED SPACING OF 9" CENTER TO CENTER.
18. PRECAST CONCRETE GRADE RING WALL THICKNESS SHALL BE $\frac{1}{12}$ OF INTERNAL DIAMETER OR 4", WHICHEVER IS GREATER.
19. THE ENGINEER MAY SPECIFY THE USE OF STEPS OR LADDERS AND SHALL CONFORM TO ASTM C478.
20. THE ORIENTATION OF THE SPIGOT IS SHOWN FOR INFORMATIONAL PURPOSES ONLY AND IS AT THE DISCRETION OF THE MANUFACTURER.

### SCHEDULE OF DIMENSIONS AND REINFORCING STEEL

| DIAMETER | DEPTH ≤ 25 FT. | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | BH | BS | TS | W | A | B | C | AH |
| 48" | 12" | 6" | 6" | 5" | 0.27 $IN^2$/FT | - | 0.28 $IN^2$/FT | 0.12 $IN^2$/FT |
| 60" | 36" | 8" | 8" | 6" | 0.27 $IN^2$/FT | 0.41 $IN^2$/FT | 0.30 $IN^2$/FT | 0.15 $IN^2$/FT |
| 72" | 36" | 8" | 8" | 7" | 0.35 $IN^2$/FT | 0.48 $IN^2$/FT | 0.41 $IN^2$/FT | 0.18 $IN^2$/FT |

### BASIS OF PAYMENT

| ITEM NO. | ITEM | UNIT |
|---|---|---|
| 611(A) | (SP) PRECAST CONC RND 4' DIA MANHOLE | EACH |
| 611(A) | (SP) PRECAST CONC RND 5' DIA MANHOLE | EACH |
| 611(A) | (SP) PRECAST CONC RND 6' DIA MANHOLE | EACH |
| 611(B) | (SP) ADD'L DEPTH PRECAST RND 4' MANHOLE | VF |
| 611(B) | (SP) ADD'L DEPTH PRECAST RND 5' MANHOLE | VF |
| 611(B) | (SP) ADD'L DEPTH PRECAST RND 6' MANHOLE | VF |

TO INCLUDE A REDUCED RISER, DEPTH OF MANHOLE MUST BE A MINIMUM OF 52 INCHES.

DEPTH OF UP TO, AND INCLUDING, 6' SHALL BE INCLUDED IN PRICE BID PER MANHOLE. ANY DEPTH ABOVE 6' SHALL BE PAID FOR AS 'ADDITIONAL DEPTH.'

VALUES LISTED IN "SCHEDULE OF DIMENSIONS AND REINFORCING STEEL" ARE MINIMUM VALUES. STRUCTURES THAT PROVIDE LARGER VALUES THAN THOSE SHOWN WILL BE CONSIDERED ACCEPTABLE.

THE DETAILS SHOWN ON THIS SHEET ARE FOR STORM SEWER APPLICATIONS ONLY AND ARE NOT INTENDED FOR SANITARY SEWER APPLICATIONS.

APPROVED BY
ROADWAY ENGINEER: _____ DATE: 6/30/22

ROADWAY DESIGN DIVISION STANDARD

# PRECAST ROUND MANHOLE

OKLAHOMA Transportation

2019 SPECIFICATIONS

| PRM-1 | 2 |
|---|---|

R-50