General Notes:
1. All work shall be done in accordance with current City of Colorado Springs Engineering Division (the City) Standard Specifications.
2. The contractor shall obtain all required permits (excavation, concrete, traffic control, etc.), and notify City Engineering by 1500 hours the business day before inspection is required.
3. Concrete used for manholes and connections shall be a City-approved structural concrete mix design.
4. A minimum of 6-inches thick of granular bedding material shall be provided below all manholes.
5. Reinforcing bars shall be ASTM A615, Grade 60 deformed steel marked with bar designation, grade and mill marking.
6. Reinforcing shall have a minimum 2-inch clearance, except as noted.
7. Pipe entries into manholes are variable; the dimensions and reinforcing details shown are typical.
8. Manhole floors shall be finished with a City-approved concrete mix to a smooth surface that slopes towards the outlet (25% min. for manholes). Floor slope shall either be poured monolithic with the base or after floor and pipe openings are constructed. Epoxy between pipe and invert if there is a cold joint.
9. Stub-outs shall extend a minimum of 2-foot beyond outside wall surface of manholes and shall be plugged as approved by the Inspector.
10. Manhole covers installed within the driving surface shall match the roadway profile and cross slope and be recessed 1/4-inch minimum to 1/2-inch maximum from the top of the pavement.
11. No formwork shall remain inside manholes after completion.
12. Concrete walls shall be formed on both sides. Casting of sidewalls against earth is not permitted.
13. Steps shall be installed for manholes with internal height greater than 30-inches at 16-inches spacing with the top step located 6-inches below the inside cover. Steps shall conform to AASHTO M-199.
14. Outer wall of pipe shall be a minimum of 6-inches from interior side walls and top of manholes.
15. All reinforcement dimensions are on-center (O.C.) unless otherwise noted.
16. Precast manholes may be used upon annual City acceptance of shop drawings and concrete mix design.
17. Precast base slab shall be poured monolithically with bottom riser section.
18. Precast base shall fit the conditions and locations for which they are intended without any field modifications. Bases which require field cutting or modification in order to fit the location intended will be rejected by the Inspector and removed and replaced by the contractor at no additional cost.
19. Storm sewers shall have tracer wire installed per the tracer wire detail prior to acceptance.
20. All manholes shall be channelized.
21. Manholes greater than 10-feet in depth shall be designed by a structural engineer.
STORM DRAIN
MANHOLE TYPE II
(ROUND BASE)

PLAN VIEW
(ROUND BASE)

PIECE CONNECTION
PER DETAIL (TYP.)

BASE MAY BE
POURED SQUARE
AT CONTRACTORS
OPTION

STEEP

6" MIN.

BENCH

B

A

A'

B'

SECTION A-A'

SECTION B-B'

PRECAST SLAB BASE

REINFORCING
CONFORMING
TO AASHTO M199
(ASTM C 478)

(6) #4 x 1'-0"
MIN.

1'-4"

4" MIN.

3% SLOPE

HEIGHT
VARI

9" MIN. C.I.P.
CONCRETE

I.D./4

I.D.

3" CLR.

#4 @ 12"
EACH WAY

6" GRANULAR
BEDDING

6" MIN.

FLOW

0.2"+

FLOW

INVERT ELEVATIONS
SHOWN IN PROFILE

*IF OUTLET PIPE IS LARGER
MATCH PIPE CROWNS

COLORADO
SPRINGS

APPROVED:

CITY ENGINEER

ISSUED:

2/24/20

REVISION:

DRAWING NO.

**NOTES:**

1. **ECCENTRIC FLAT TOP SECTION** is only allowed when the height of the riser is less than 3–feet. For all other heights, the eccentric cone section is to be used.

2. Top slab section can be omitted for **MANHOLE TYPE II** (round base) if the internal diameter of the manhole is equal to the riser sections.

\[\Delta \text{ A CONCRETE COLLAR SHALL BE INSTALLED IN ALL ROADWAYS.}\]
PIPE to PIPE CONNECTION

(3) #4 RING BARS

6" MIN.

2"

1"

PIPE to STRUCTURE CONNECTION

(3) #4 RING BARS

6" MIN.

#5x 12" DOWELS @ 12" MAX. SPACING ALL AROUND THE PERIMETER OF CLOSURE COLLAR

NOTES:
1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT CITY OF COLORADO SPRINGS ENGINEERING DIVISION (THE CITY) STANDARD SPECIFICATIONS.
2. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS AND NOTIFY CITY ENGINEERING BY 1500 HOURS THE BUSINESS DAY BEFORE INSPECTION IS REQUIRED.
3. CONCRETE SHALL BE CITY APPROVED STRUCTURAL CONCRETE MIX DESIGN.
4. ALL REINFORCING SHALE BE GRADE 60.
PLAN

CONCRETE JOINT FASTENER (TWO PER JOINT)

STORM DRAIN

FLARED END SECTIONS

FOR CONCRETE PIPE

SECTION A-A'

END VIEW

NOTES:

1. DIMENSIONS OF END SECTIONS MAY VARY SLIGHTLY FROM THOSE SHOWN ON THE TABLES DUE TO DIFFERENT MANUFACTURER'S CONFIGURATIONS.

2. CONCRETE FLARED END SECTIONS SHALL BE FURNISHED WITH TONGUE AND GROOVE AS REQUIRED.

3. THE INSIDE CONFIGURATION AND THE JOINT OF CONCRETE END SECTION AND PIPE SHALL MATCH.

4. CONCRETE PIPE JOINT FASTENERS SHALL BE INSTALLED SO A MINIMUM OF 15–LINEAR FEET OF THE OUTLET END OF THE PIPE ARE MECHANICALLY LOCKED TOGETHER. END SECTION LENGTHS SHALL BE INCLUDED IN THIS 15–LINEAR FOOT REQUIREMENT.

5. ALL FLARED END SECTIONS SHALL HAVE RIPRAP AT OUTLET.

6. ALL FLARED END SECTIONS SHALL HAVE A 3–FOOT TOE WALL.

<table>
<thead>
<tr>
<th>PIPE DIA.</th>
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<tbody>
<tr>
<td>18–30</td>
<td>5</td>
</tr>
<tr>
<td>36–42</td>
<td>6</td>
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<tr>
<td>48–60</td>
<td>7</td>
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</tbody>
</table>

CONCRETE JOINT FASTENER (TWO PER JOINT)

STORM DRAIN

FLARED END SECTIONS

FOR CONCRETE PIPE

3/4" CANOPY TYPE ROD LUG OR APPROVED EQUAL

LOCATION OF 1" Ø HOLES

60° MAX. 30° MIN.

2'-5" 5"

3" 3" 3" 3"

5" 5"

2'-7" ± 1"

5/8" CANOPY TYPE ROD LUG OR APPROVED EQUAL

COLORADO SPRINGS

APPROVED:

CITY ENGINEER

ISSUED: 2/24/20

REvised: 

DRAWING NO. —
NOTES:
1. TRASH GUARDS ARE NOT DESIGNED TO CARRY WHEEL LOADINGS AND AS SUCH ARE NOT TO BE USED AS SAFETY GRATES.
2. IF THE FLARED END DIMENSIONS VARY FROM THOSE SHOWN IN THE STANDARD PLANS, MAKE NECESSARY ADJUSTMENTS TO TRASH GUARD DIMENSIONS.
3. TRASH RACKS ARE REQUIRED WHERE SHOWN ON PLANS.