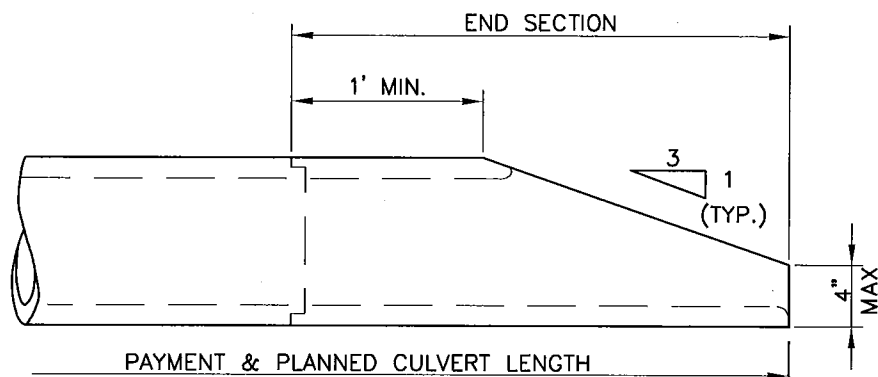
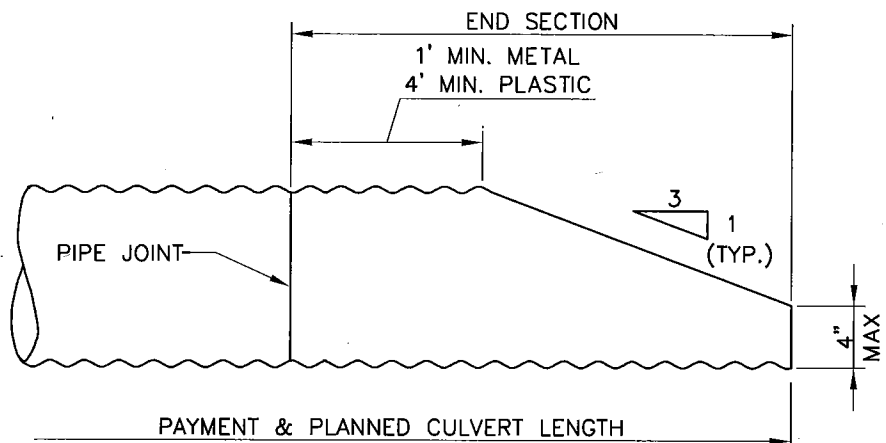


PLAN



ELEVATION

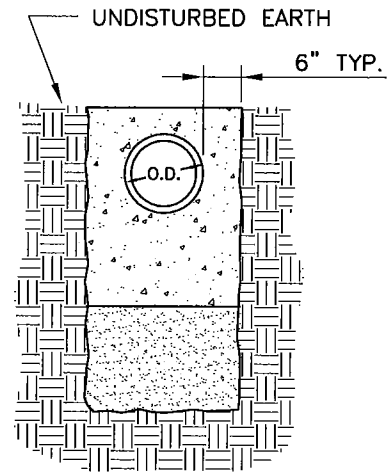
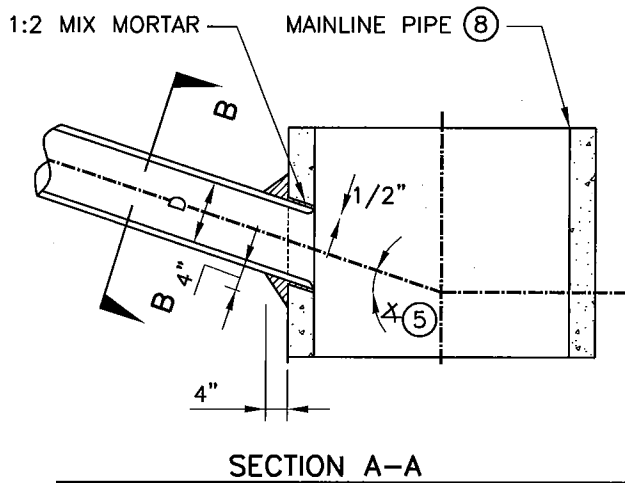
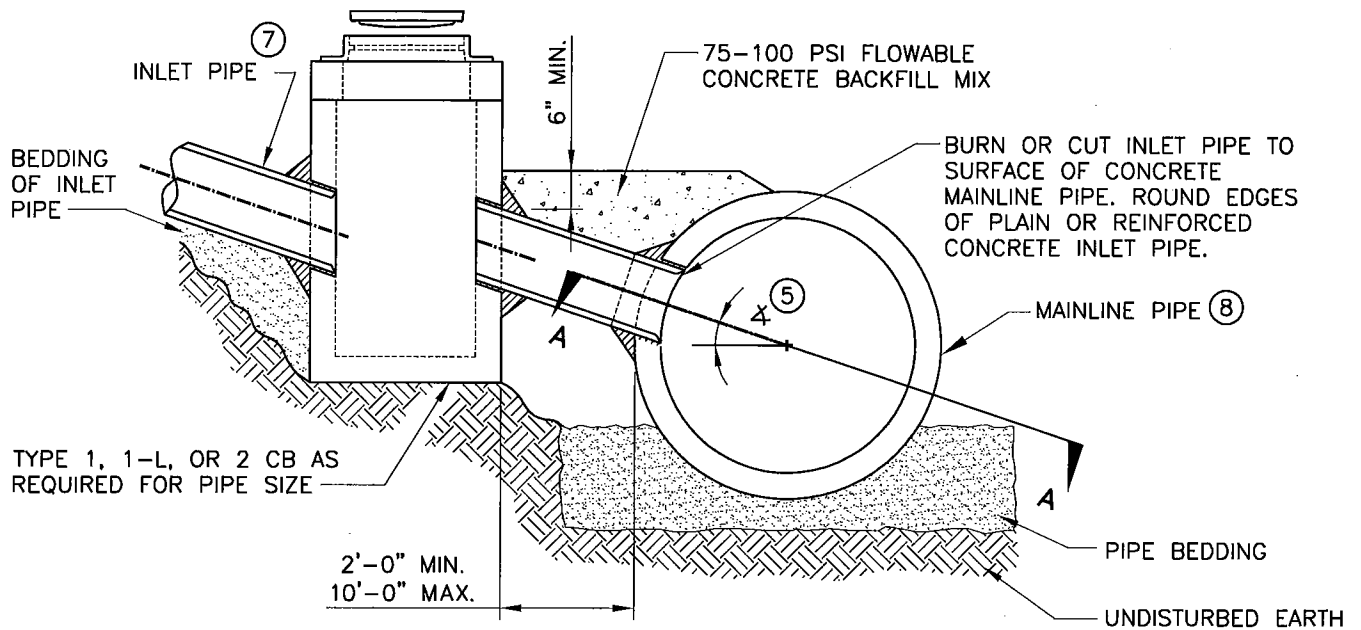
**CONCRETE PIPE**



**METAL & PLASTIC PIPE**

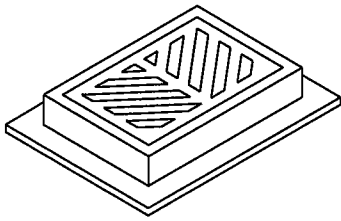
NOTES:

- ① SIDE SLOPE SHALL BE WARPED TO MATCH THE BEVELED PIPE END.
- ② PIPE SHALL BE BEVELED TO MATCH SLOPE IF SLOPE DIFFERS FROM 3:1.
- ③ PIPE SHALL BE ROTATED TO CONFORM TO SLOPE WHEN ON SKEW.

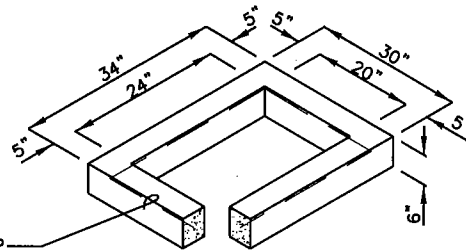


**NOTES:**

1. "D", THE INSIDE DIAM. OF THE INLET PIPE, SHALL BE 24 IN. OR LESS. FOR LARGER VALUES OF "D", USE AN APPROVED STRUCTURE.
2. IN NO CASE SHALL THE OUTSIDE DIAM. OF THE INLET PIPE EXCEED ONE-HALF THE INSIDE DIAM. OF THE MAIN STORM SEWER.
3.  $\text{C}$  OF INLET PIPE SHALL BE ON RADIUS OF MAIN STORM DRAIN.
4. THE MIN. OPENING INTO THE EXISTING STORM DRAIN SHALL BE THE OUTSIDE DIAM. OF THE INLET PIPE PLUS 1 IN.
- (5) FIELD TAPPING ONLY WHERE ANGLE IS 0° TO 45°.
- (6) SEE SEC. 7.04.
- (7) SEE SEC. 7.03 FOR ALLOWED INLET PIPE TYPE.
8. MAINLINE SHALL HAVE 48 IN. MIN. DIAM.

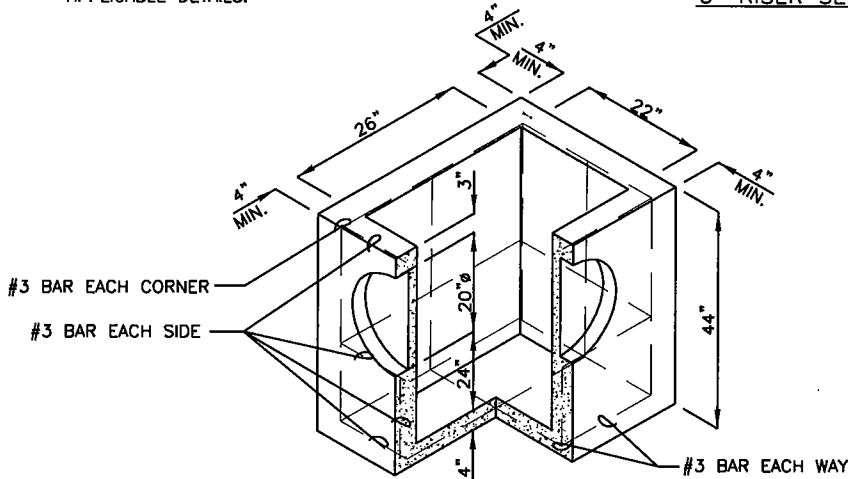


**FRAME AND GRATE**  
SEE SEC. 7.05 AND  
APPLICABLE DETAILS.



1 #3 BAR HOOP

**6" RISER SECTION**

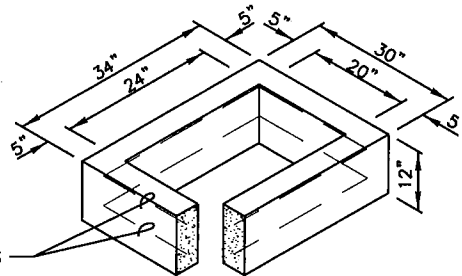


#3 BAR EACH CORNER

#3 BAR EACH SIDE

#3 BAR EACH WAY

**PRECAST BASE SECTION**  
(MEASUREMENT AT THE TOP  
OF THE BASE)

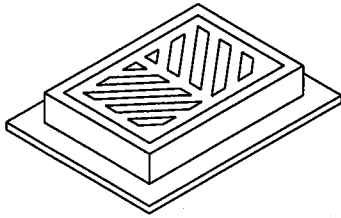


2 #3 BAR HOOPS

**12" RISER SECTION**

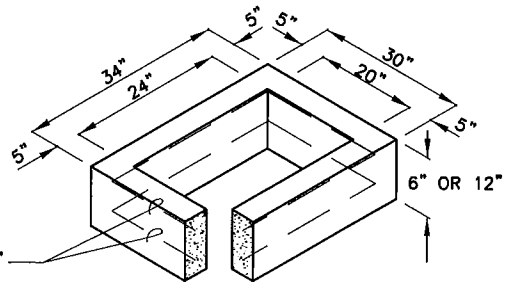
**NOTES:**

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQ. IN. PER FT. MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2 IN. MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS.
6. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES, WITH MAX. DIAM. OF 20 IN. KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5 FT.
8. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2" PER FT.
9. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
10. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
11. FOR CATCH BASINS IN PARKING LOTS REFER TO WSDOT/APWA STANDARD DWG. B1-b.
12. EDGE OF RISER OR BRICK SHALL NOT BE MORE THAN 2 IN. FROM VERTICAL EDGE OF CATCH BASIN WALL.

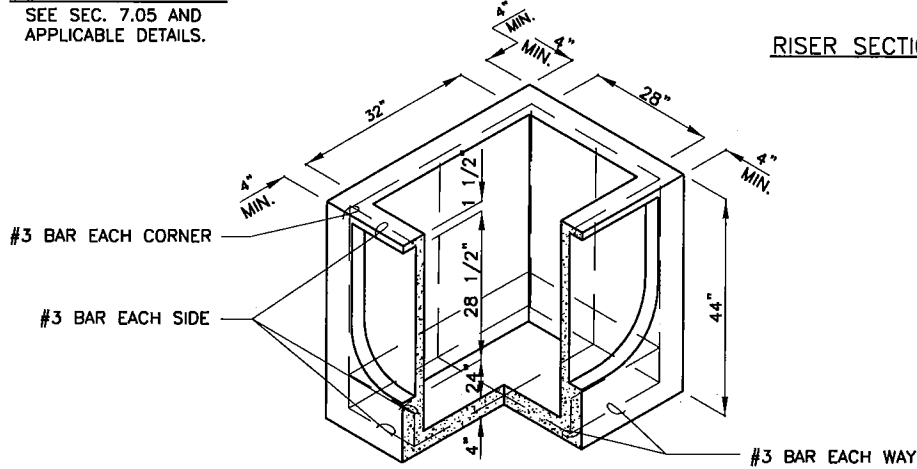


**FRAME AND GRATE**  
SEE SEC. 7.05 AND  
APPLICABLE DETAILS.

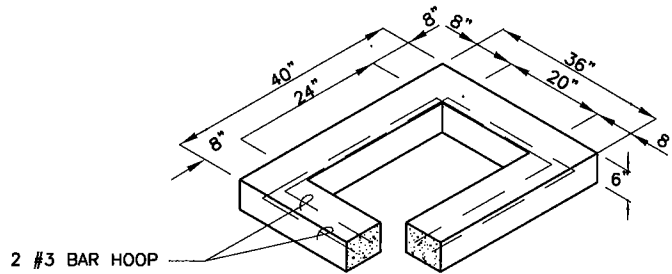
- 1 #3 BAR HOOP FOR 6"
- 2 #3 BAR HOOP FOR 12"



**RISER SECTION**



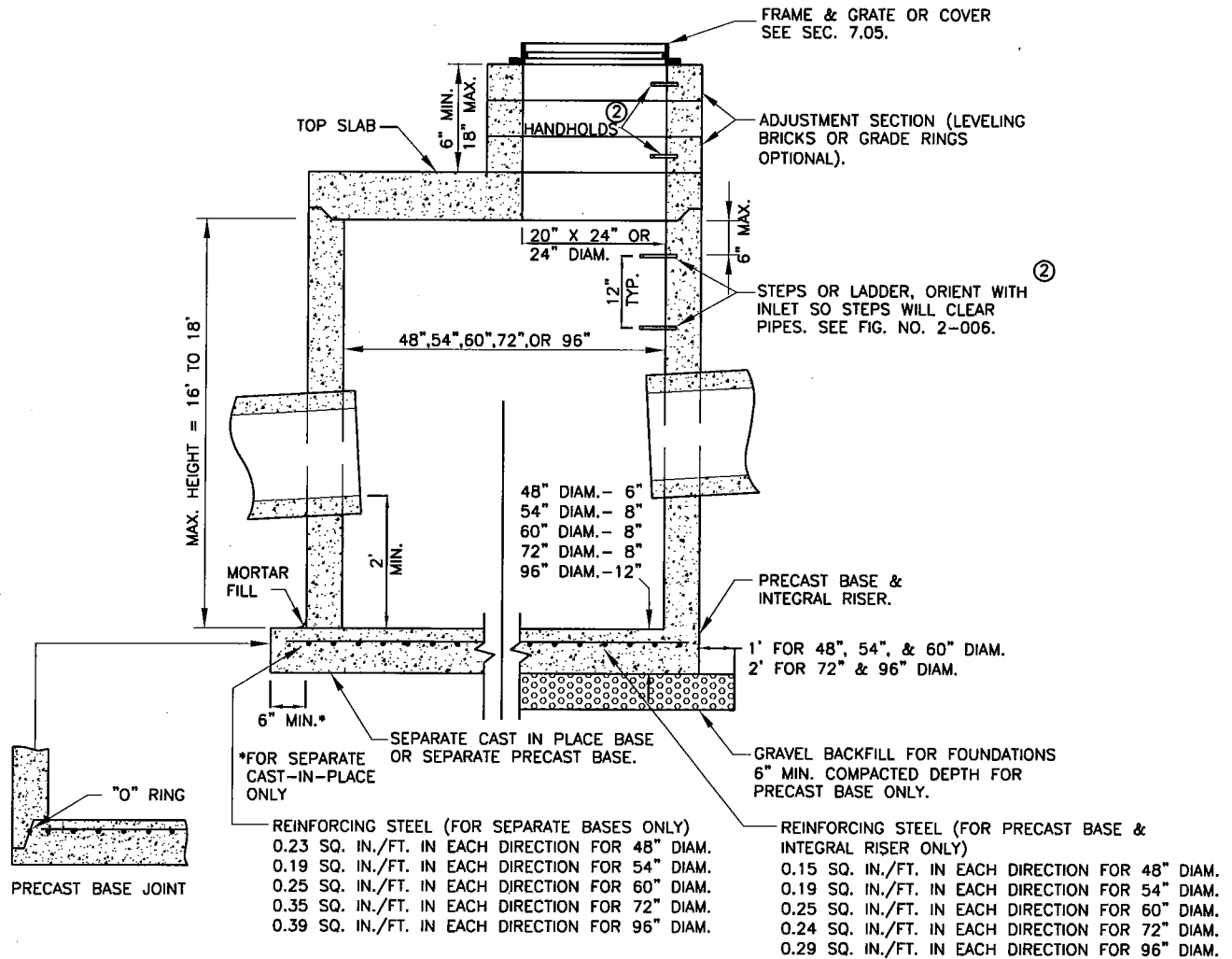
**PRECAST BASE SECTION**  
(MEASUREMENT AT THE TOP  
OF THE BASE)



**6" REDUCING SECTION**

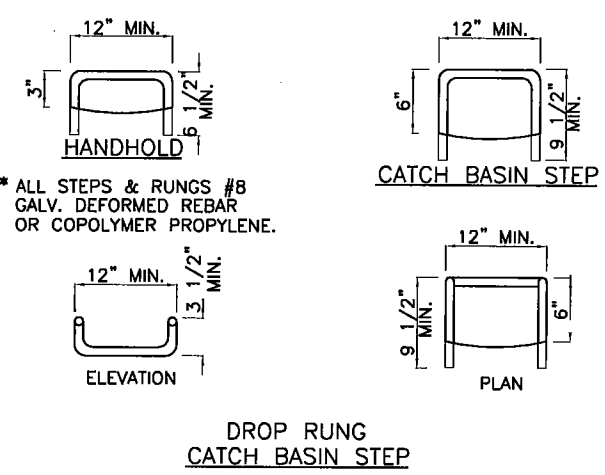
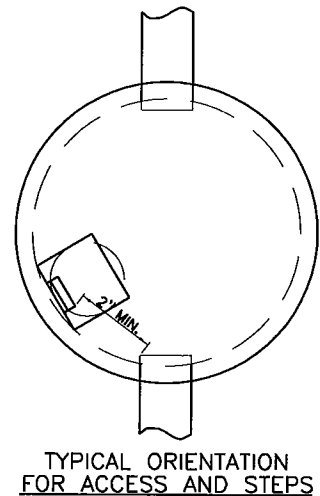
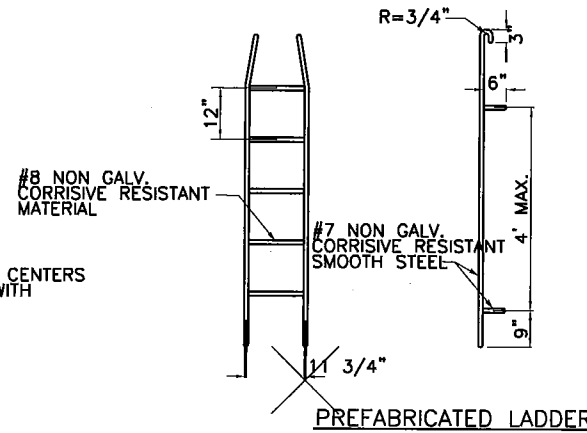
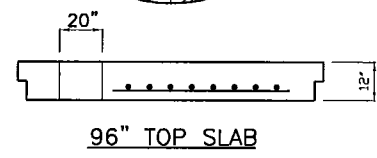
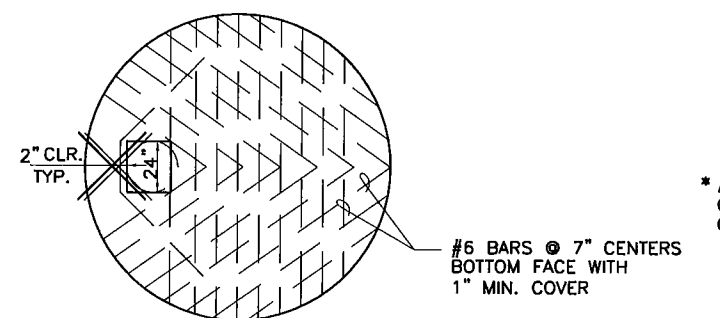
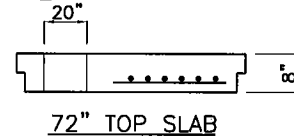
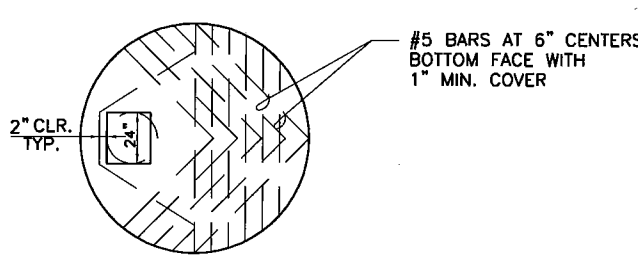
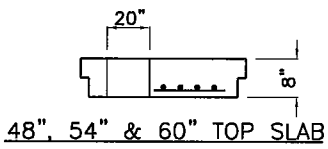
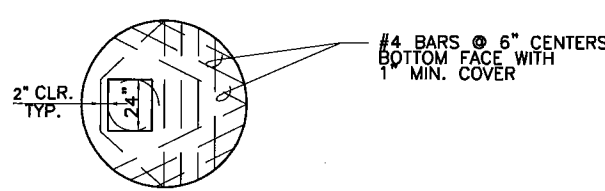
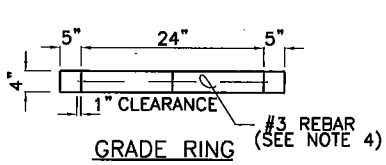
**NOTES:**

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) AND C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQ. IN. PER FT. MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2 IN. MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS.
6. KNOCKOUTS MAY BE ON ALL 4 SIDES WITH MAX. DIAM. OF 28 IN. KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
7. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2" PER FT.
8. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-62ID. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
9. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
10. MAX. DEPTH FROM FINISHED GRADE TO PIPE INVERT SHALL BE 5 FT.
11. EDGE OF REDUCING SECTION OR BRICK SHALL NOT BE MORE THAN 2 IN. FROM VERTICAL EDGE OF CATCH BASIN WALL.



## NOTES:

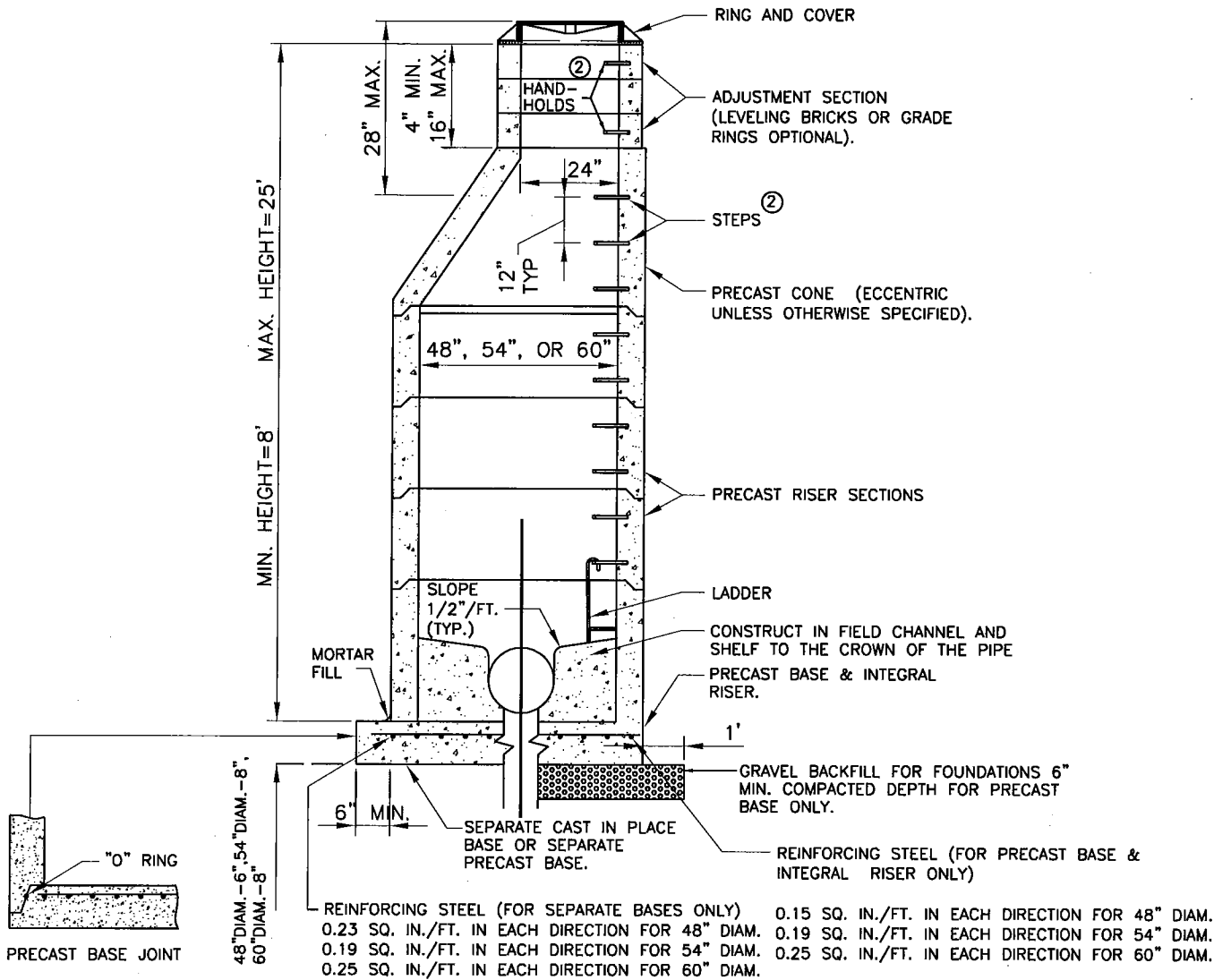
1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M199) AND ASTM C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN CATCH BASIN SHALL HAVE 6" MIN. CLEARANCE. SEE FIG. NO. 7-006, CATCH BASIN DETAILS. HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HANDHOLD BETWEEN THE LAST STEP AND TOP OF THE MANHOLE.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2 IN. MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. KNOCKOUT OR CUTOUT HOLE SIZE SHALL EQUAL PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS. MAX. HOLE SIZE SHALL BE 36 IN. FOR 48 IN. CATCH BASIN, 42 IN. FOR 54 IN. C.B., 48 IN. FOR 60 IN. C.B., 60 IN. FOR 72 IN. C.B., 84 IN. FOR 96 IN. C.B. MIN. DISTANCE BETWEEN HOLES SHALL BE 8 IN. FOR 48 IN., 54 IN. AND 60 IN. C.B.; 12 IN. FOR 72 IN. AND 96 IN. C.B.
6. CATCH BASIN FRAMES AND GRATES OR COVERS SHALL BE IN ACCORDANCE WITH SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
7. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1 IN. MIN. CLEARANCE.
8. MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT.
9. FOR DETAILS SHOWING LADDER, STEPS, HANDRAILS AND TOP SLABS. SEE FIG. 7-006.
10. SEE THE WSDOT/APWA STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.



\* ALL STEPS & RUNGS #8 GALV. DEFORMED REBAR OR COPOLYMER PROPYLENE.

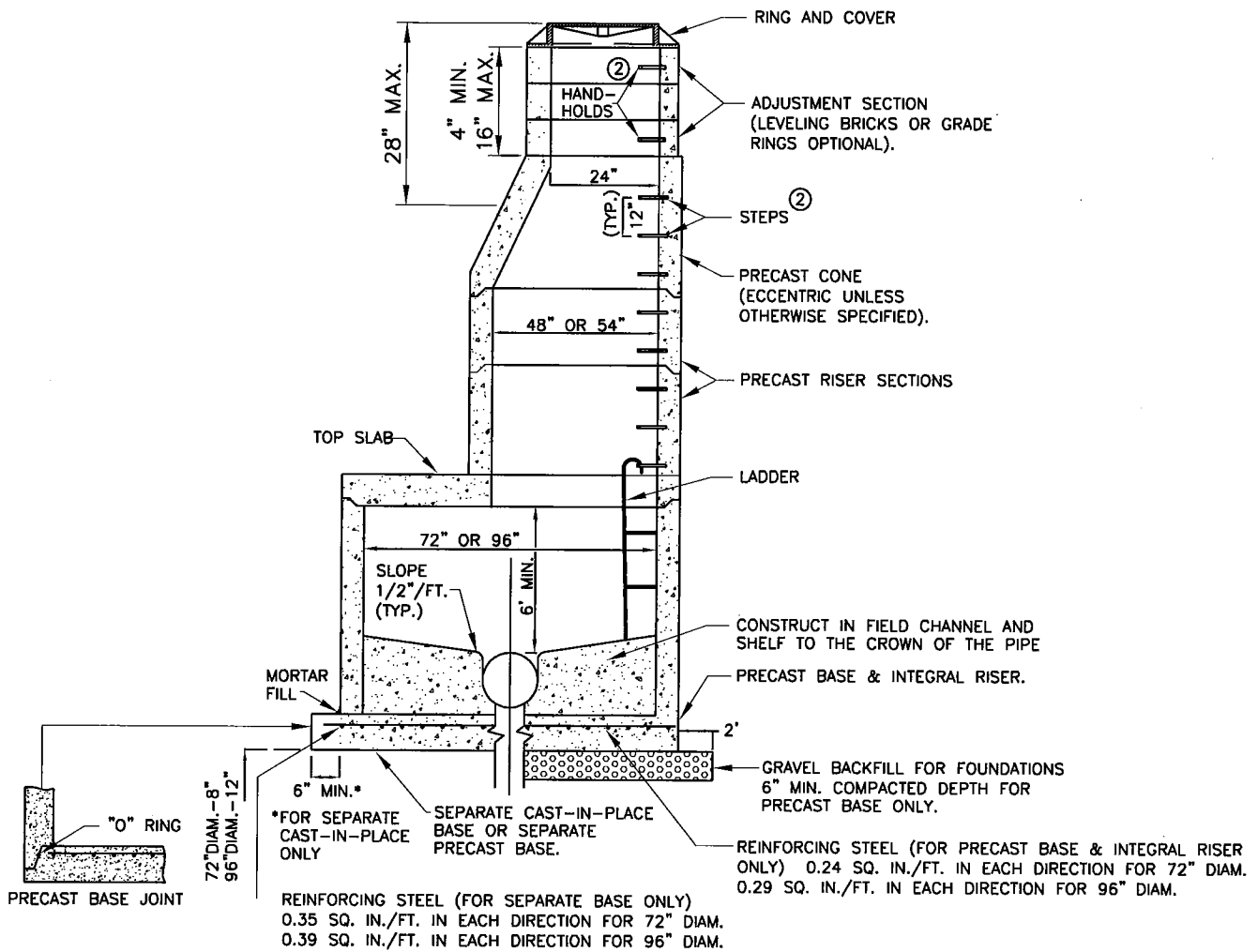
**NOTES:**

- PROPRIETARY CATCH BASIN HANDHOLDS AND STEPS ARE ACCEPTABLE, PROVIDED THAT THEY CONFORM TO SEC. R, ASTM C478, AASHTO M-199 AND MEET ALL WISHA REQUIREMENTS.
- CATCH BASIN STEP/HANDHOLD LEGS SHALL BE PARALLEL OR APPROXIMATELY RADIAL AT THE OPTION OF THE MANUFACTURER, EXCEPT THAT ALL STEPS IN ANY CATCH BASIN SHALL BE SIMILAR. PENETRATION OF OUTER WALL BY A LEG IS PROHIBITED.
- HANDHOLDS AND STEPS SHALL HAVE "DROP" RUNGS AS SHOWN ON DETAIL OR PROTUBERANCES TO PREVENT SIDEWAYS SLIP.
- SLAB OPENING MAY BE 24" X 20" OR 24" DIAM.
- AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQ. IN. PER FT. MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497.
- LADDERS OR STEPS SHALL EXTEND TO WITHIN 16 IN. OF BOTTOM OF CATCH BASIN.
- HANGING LADDERS SHALL BE PERMANENTLY FASTENED AT TOP BY HANGING ON STEP OR BY BOLTING OR EMBEDDING IN CONCRETE. EACH SHALL BE EMBEDDED AT BOTTOM IN BASE.
- ADDITIONAL SAFETY FEATURES MAY BE REQUIRED IN VERY DEEP OR UNUSUAL STRUCTURES.



**NOTES:**

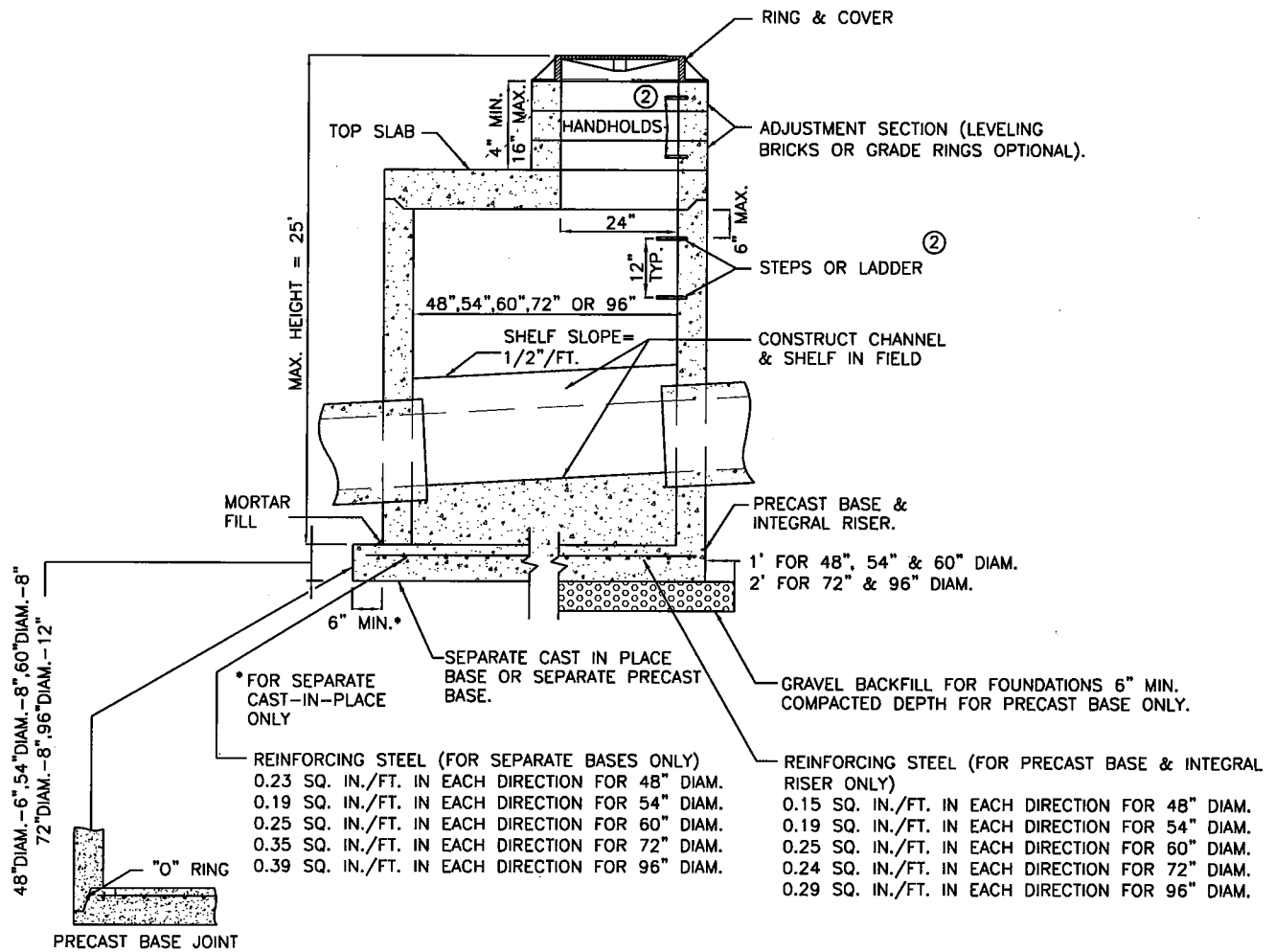
1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3 IN. MIN. CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6 IN. MIN. CLEARANCE. SEE FIG. 7-011, "MANHOLE DETAILS." HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HAND HOLD BETWEEN THE LAST STEP AND THE TOP OF THE MANHOLE.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. ALL PRECAST CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2 IN. MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. KNOCKOUT OR CUTOUT HOLE SIZE SHALL EQUAL PIPE OUTER DIAM. PLUS MANHOLE WALL THICKNESS. MAX. HOLE SIZE SHALL BE 36 IN. FOR 48 IN. MANHOLE, 42 IN. FOR 54 IN. MANHOLE, 48 IN. FOR 60 IN. M.H. MIN. DISTANCE BETWEEN HOLES SHALL BE 8 IN.
6. MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE WITH SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
7. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1 IN. MIN. CLEARANCE.
8. FOR HEIGHTS OF 12 FT. OR LESS, MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 LBS. PER SQ. FT. FOR HEIGHTS OVER 12 FT. MIN. SOIL BEARING VALUE SHALL EQUAL 3,800 LBS. PER SQ. FT.
9. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE FIG. 7-011, "MANHOLE DETAILS."
10. SEE THE WSDOT/APWA STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.



## NOTES:

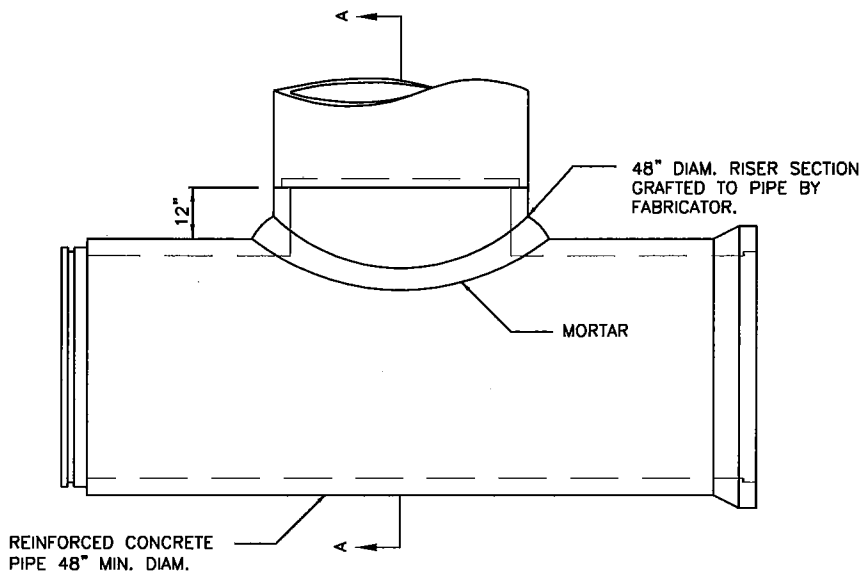
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- ② HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3 IN. MIN. CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6 IN. MIN. CLEARANCE. SEE FIG. 7-011, "MANHOLE DETAILS." HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH MIN. OF ONE HANDHOLD BETWEEN THE LAST STEP AND THE TOP OF THE MANHOLE.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2 IN. MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. KNOCKOUT OR CUTOUT HOLE SIZE SHALL EQUAL PIPE OUTER DIAM. PLUS MANHOLE WALL THICKNESS. MAX. HOLE SIZE SHALL BE 60 IN. FOR 72 IN. MANHOLE, 84 IN. FOR 96 IN. MANHOLE. MIN. DISTANCE BETWEEN HOLES SHALL BE 12 IN.
6. MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE WITH SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
7. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1 IN. MIN. CLEARANCE.
8. FOR HEIGHTS OF 12 FT. OR LESS, MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT. FOR HEIGHTS OVER 12', MIN. SOIL BEARING VALUE SHALL EQUAL 3,800 POUNDS PER SQUARE FOOT.
9. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE FIG. 7-011, "MANHOLE DETAILS."
10. SEE THE WSDOT/APWA STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.



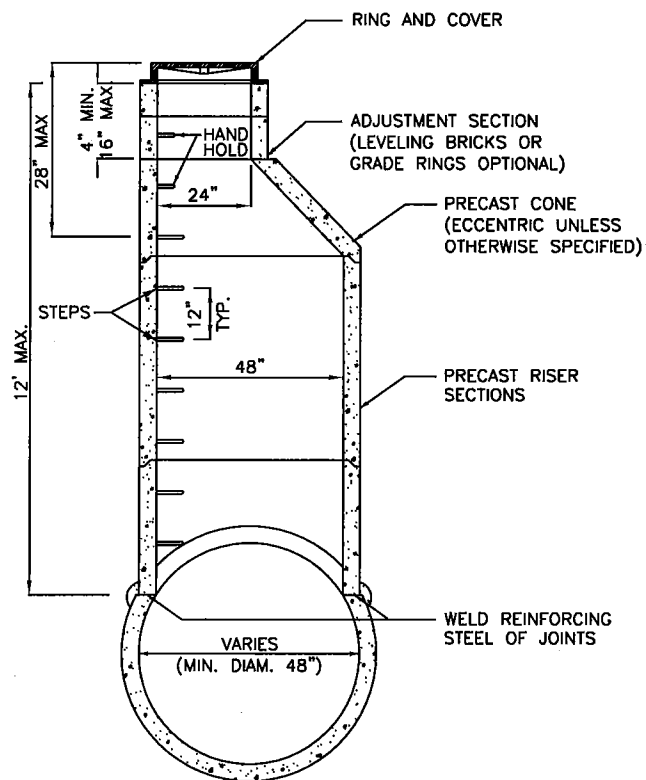


## NOTES:

- MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
- HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3 IN. MIN. CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6 IN. MIN. CLEARANCE. SEE FIG. 2-011, "MANHOLE DETAILS." HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HANDHOLD BETWEEN THE LAST STEP AND THE TOP OF THE MANHOLE.
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- MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE WITH SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
- ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1 IN. MIN. CLEARANCE.
- FOR HEIGHTS OF 12 FT. OR LESS, MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 LBS. PER SQ. FT. FOR HEIGHTS OVER 12 FT., MIN. SOIL BEARING VALUE SHALL EQUAL 3,800 LBS. PER SQ. FT.
- FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE FIG. 7-011, "MANHOLE DETAILS."
- SEE THE WSDOT/APWA STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.



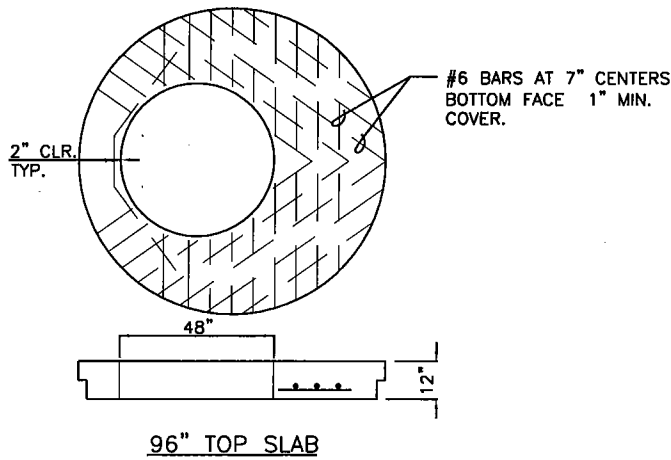
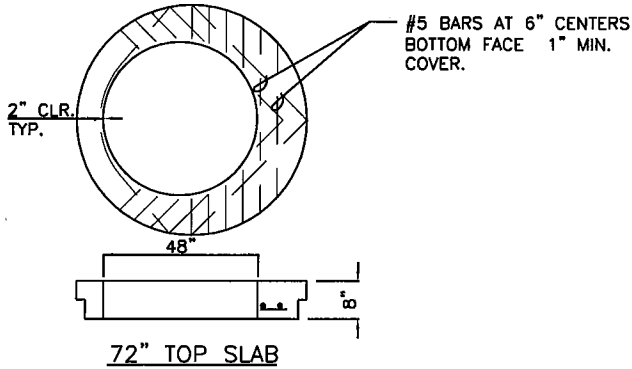
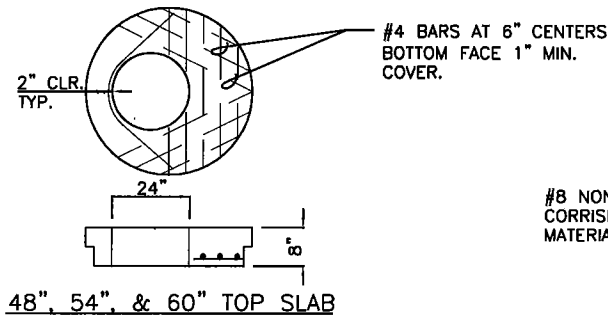
ELEVATION



SECTION A-A

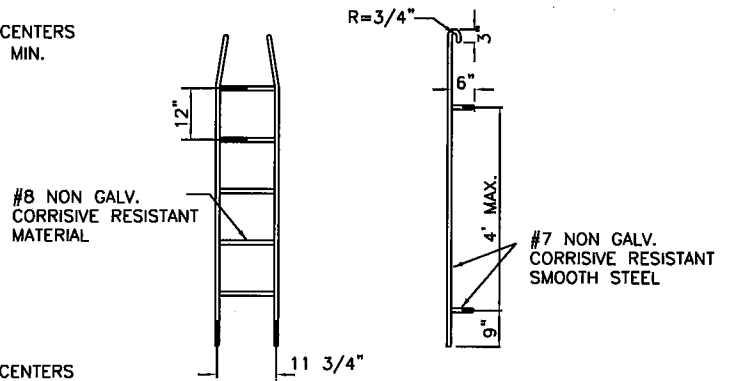
**NOTES:**

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3 IN. MIN. CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6 IN. MIN. CLEARANCE. SEE FIG. 7-011, "MANHOLE DETAILS."
3. MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE WITH SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
4. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
5. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE FIG. 7-011, "MANHOLE DETAILS".
6. NOT FOR USE IN TRAFFIC BEARING AREAS.



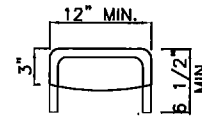
**NOTES:**

1. PROPRIETARY MANHOLE HANDHOLDS AND STEPS ARE ACCEPTABLE, PROVIDED THAT THEY CONFORM TO SEC. R, ASTM C478, AASHTO M199 AND MEET ALL WISHA REQUIREMENTS.
2. MANHOLE STEP/HANDHOLD LEGS SHALL BE PARALLEL OR APPROXIMATELY RADIAL AT THE OPTION OF THE MANUFACTURER, EXCEPT THAT ALL STEPS IN ANY MANHOLE SHALL BE SIMILAR. PENETRATION OF OUTER WALL BY A LEG IS PROHIBITED.
3. HANDHOLDS AND STEPS SHALL HAVE "DROP" RUNGS OR PROTUBERANCES TO PREVENT SIDEWAYS SLIP.
4. LADDERS OR STEPS SHALL EXTEND TO WITHIN 16" OF BOTTOM OF MANHOLE.
5. HANGING LADDERS SHALL BE PERMANENTLY FASTENED AT TOP BY HANGING ON STEP OR BY BOLTING OR EMBEDDING IN CONCRETE. EACH SHALL BE EMBEDDED AT BOTTOM IN BASE.
6. ADDITIONAL SAFETY FEATURES MAY BE REQUIRED IN VERY DEEP OR UNUSUAL STRUCTURES.

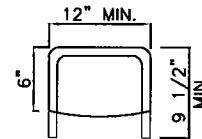


**PREFABRICATED LADDER**

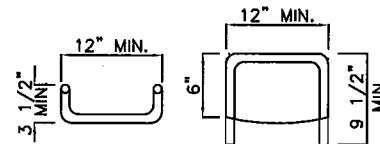
\* ALL STEPS & RUNGS  
1" DIAM. GALV. REBAR OR  
COPOLYMER PROPYLENE.



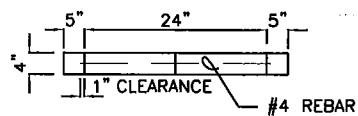
**HANDHOLD**



**MANHOLE STEP**

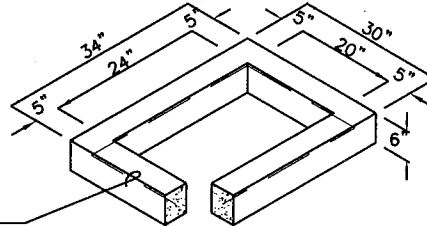
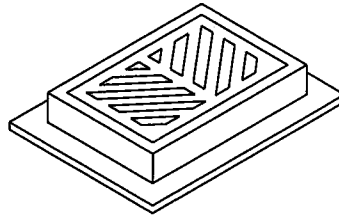


**MANHOLE DROP RUNG STEP**



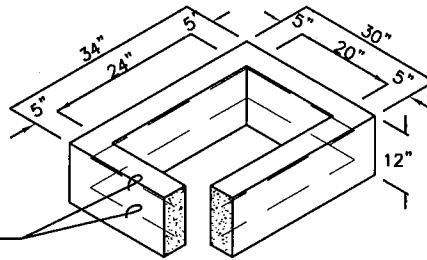
**GRADE RING**

FRAME AND GRATE  
SEE SEC. 7.05 AND  
APPLICABLE  
DETAILS.



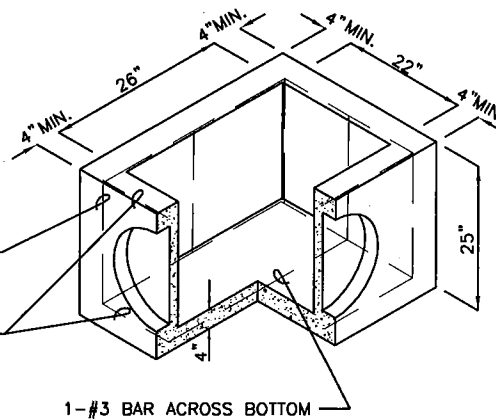
6" RISER SECTION

1 #3 BAR HOOP



12" RISER SECTION

2 #3 BAR HOOPS



PRECAST BASE SECTION  
(MEASUREMENT AT THE  
TOP OF THE BASE)

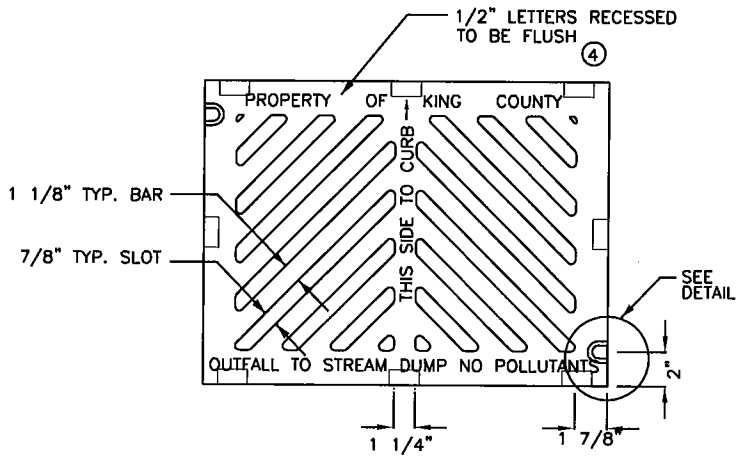
#3 BAR EACH CORNER

#3 BAR EACH SIDE  
TOP AND BOTTOM

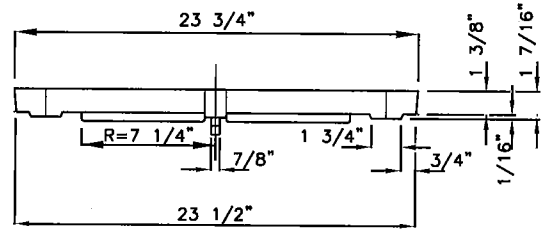
1-#3 BAR ACROSS BOTTOM

**NOTES:**

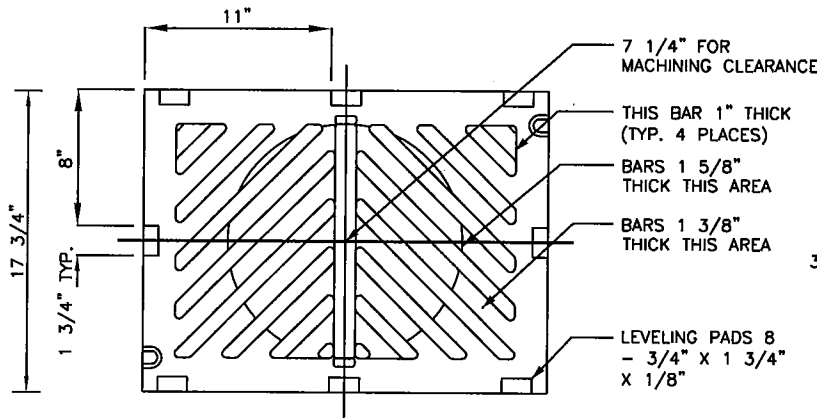
1. CURB INLET TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQ. IN. PER FT. MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497. WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CURB INLET WALL THICKNESS.
6. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES WITH MAX. DIAM. OF 17 IN..
7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5 FT.
8. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2 IN. PER FT.
9. CONCRETE INLET FRAME AND GRATES SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-62ID. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY OTHER COVER POSITION.
10. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.



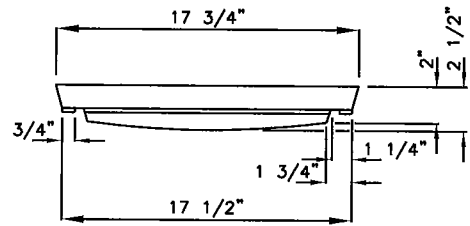
**TOP VIEW**



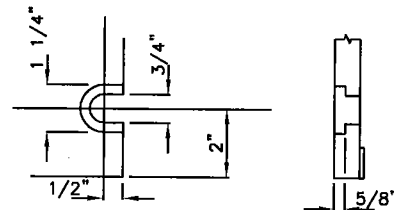
**SIDE VIEW**



**BOTTOM VIEW**



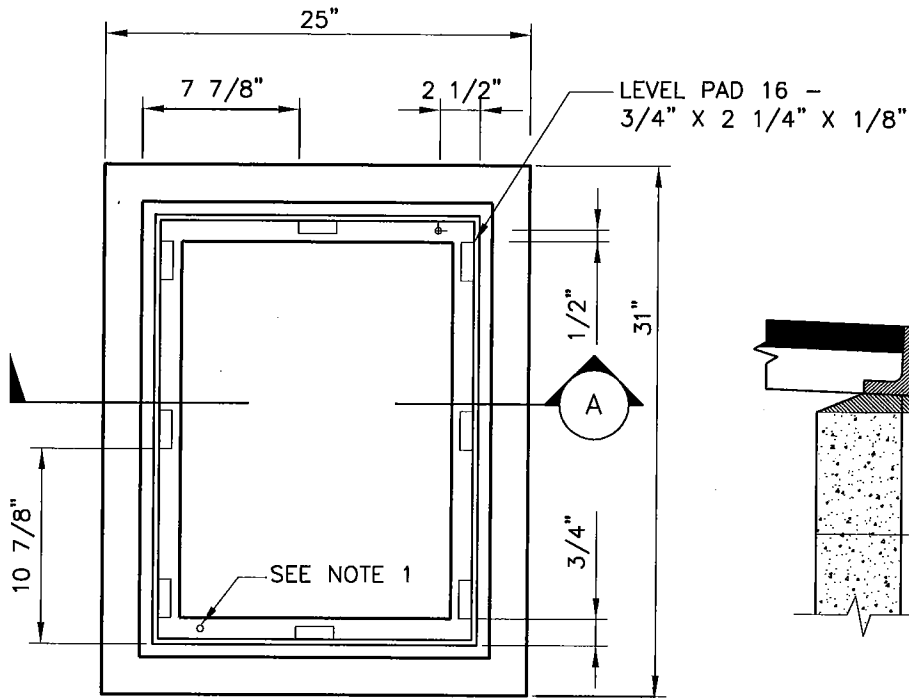
**END VIEW**



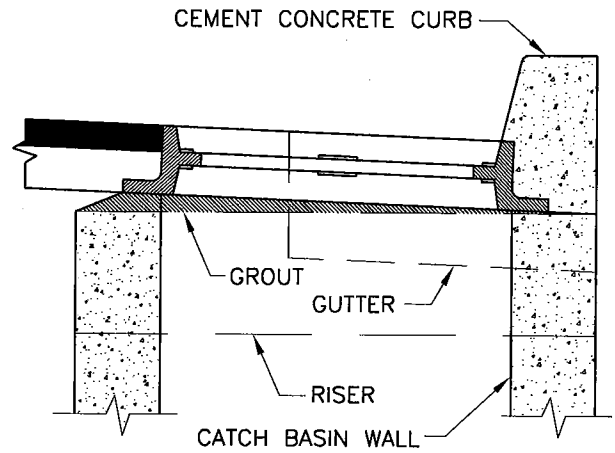
**SLOT DETAIL**  
SEE NOTE 1

**NOTES:**

1. SLOT FORMED AND RECESSED FOR 5/8 IN.-11 NC X 2 IN. SOCKET HEAD (ALLEN HEAD) CAP SCREW.
2. GRATE SHALL BE CAST IRON PER ASTM A48 CLASS 30 UNLESS OTHERWISE SPECIFIED.
3. SEE SEC. 7.05.
- ④ THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF GRATE IS ON PRIVATE SYSTEM.
5. GRATES SHALL BE MIN 32 IN. CLEAR OF WHERE WHEELCHAIR RAMPS ARE FLUSH WITH PAVEMENT.

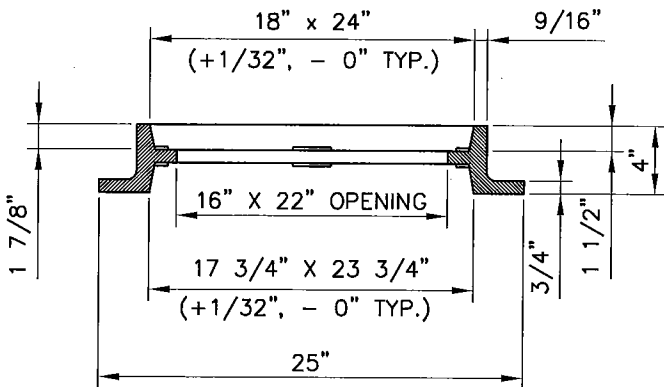


PLAN

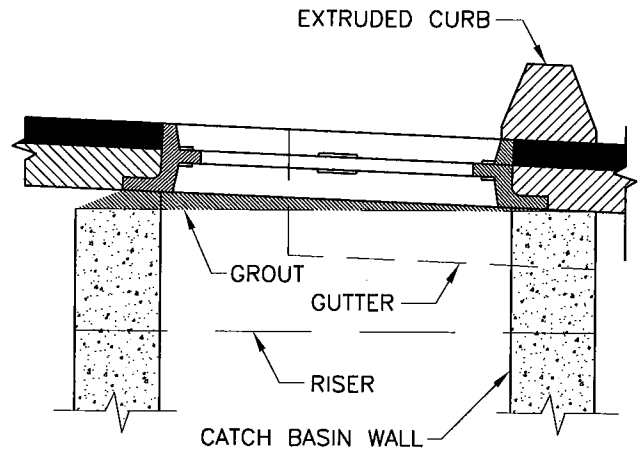


VERTICAL CURB

SEE NOTE 4



SECTION A

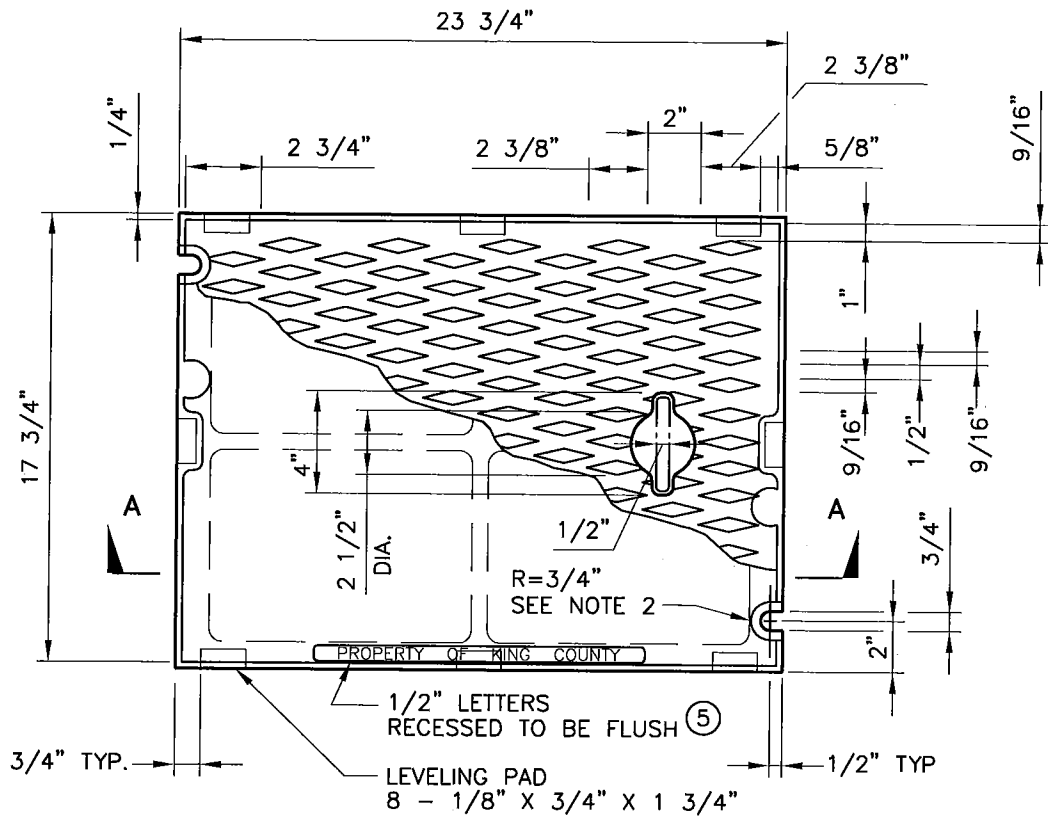


EXTRUDED CURB

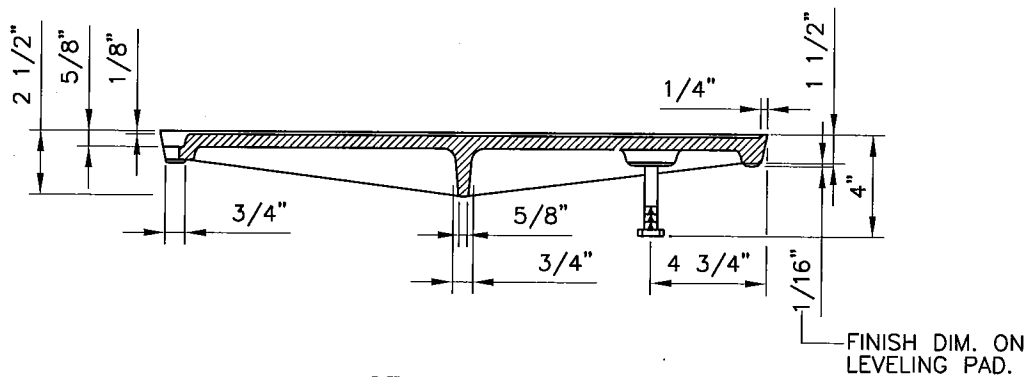
SEE NOTE 4

**NOTES:**

1. DRILL AND TAP FOR, AND PROVIDE, TWO LOCKING BOLTS 5/8 IN.-11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS 2 IN. LONG WHEN USED WITH SOLID COVER (FIG. 7-015) OR WHEN SPECIFIED BY ENGINEER.
2. FRAME MATERIAL IS DUCTILE IRON PER ASTM A48 CLASS 30.
3. SET FRAME TO GRADE AND CONSTRUCT ROAD AND GUTTER TO BE FLUSH WITH FRAME.
4. SEE SEC. 7.05.



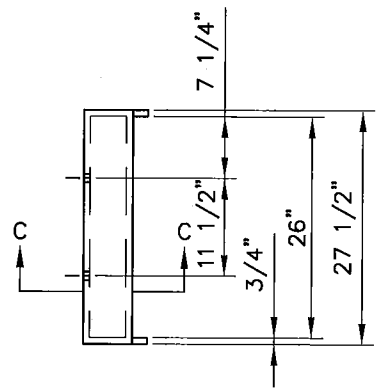
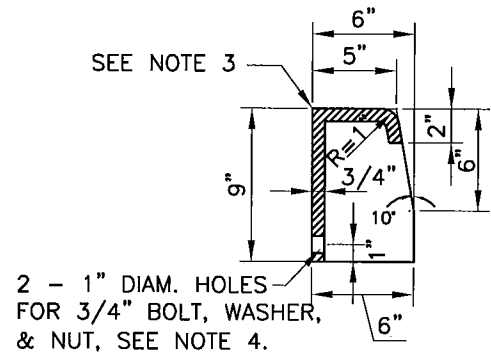
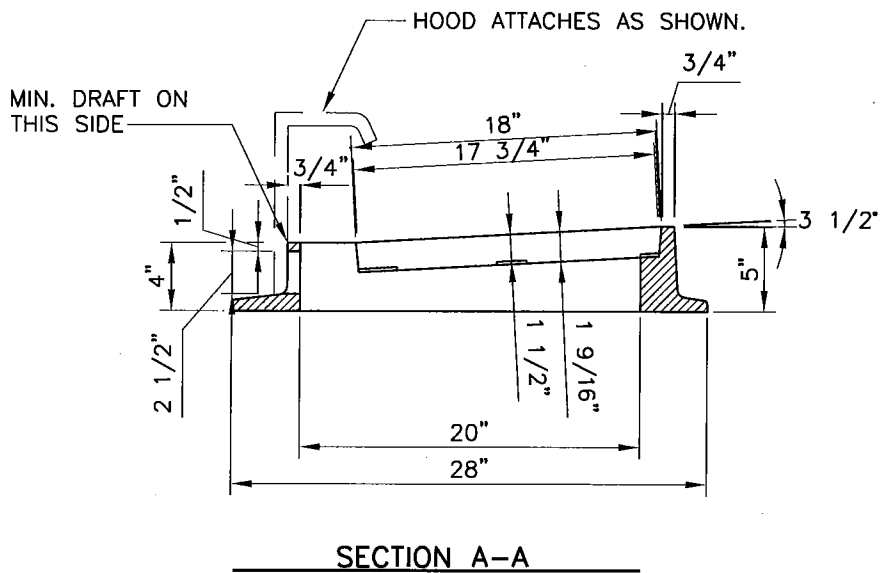
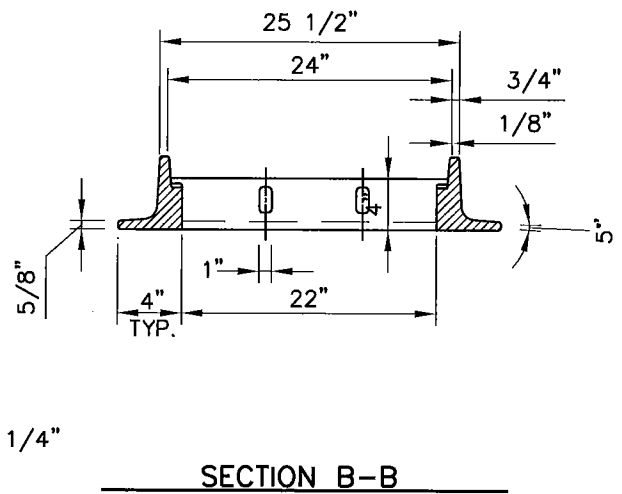
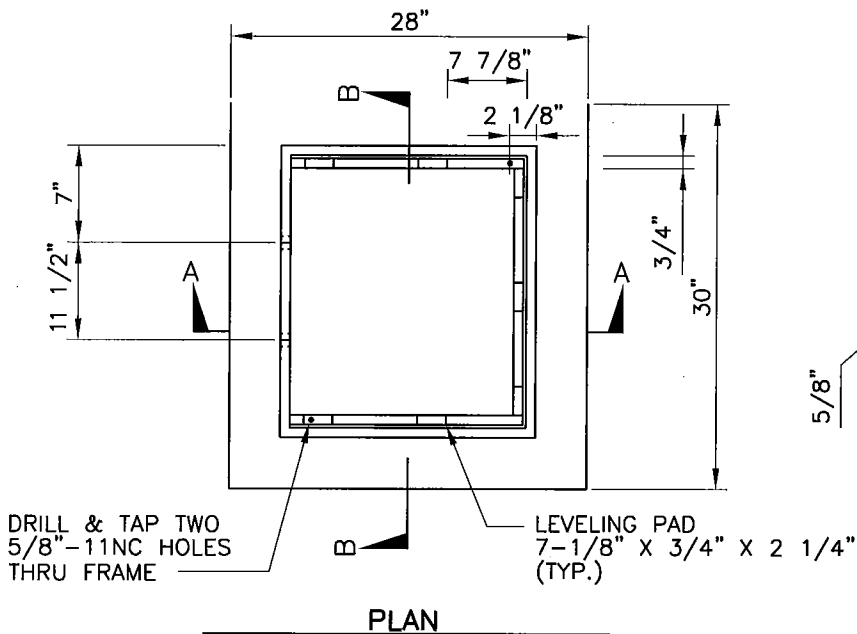
PLAN COVER



SECTION A-A

**NOTES:**

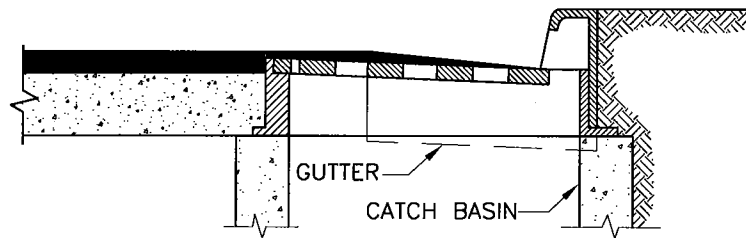
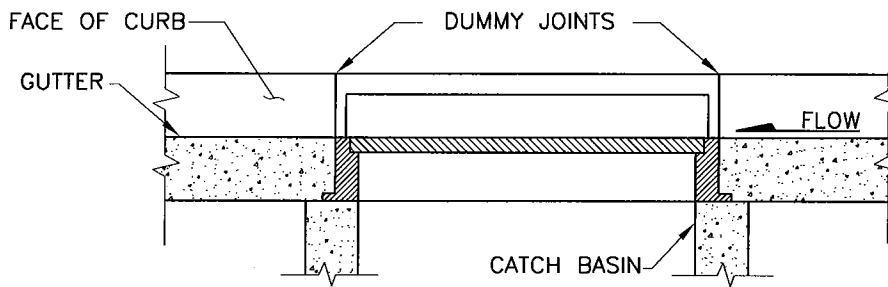
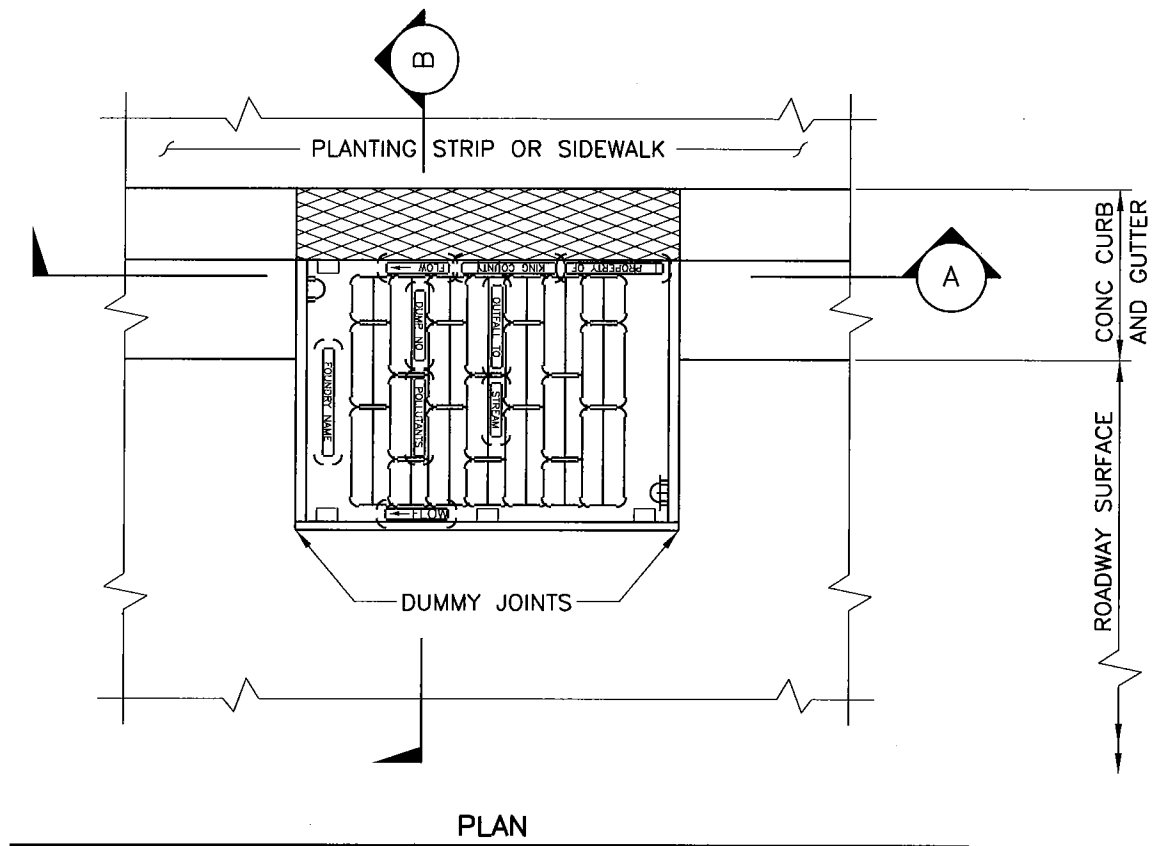
1. USE WITH FRAME (FIG. 7-014) DRILLED AND TAPPED FOR LOCKING BOLTS.
2. USE WITH TWO LOCKING BOLTS 5/8 IN.-11 NC STAINLESS STEEL TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS, MIN. 2 IN. LONG.
3. MATERIAL IS CAST IRON PER ASTM A48 CLASS 30.
4. SEE SEC. 7.05.
- ⑤ THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF COVER IS ON A PRIVATE SYSTEM.



**NOTES:**

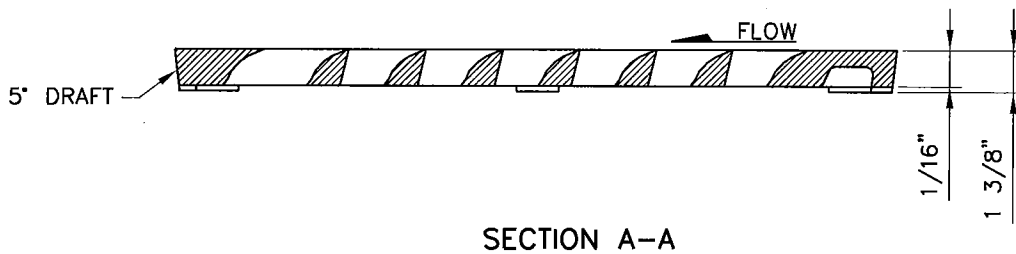
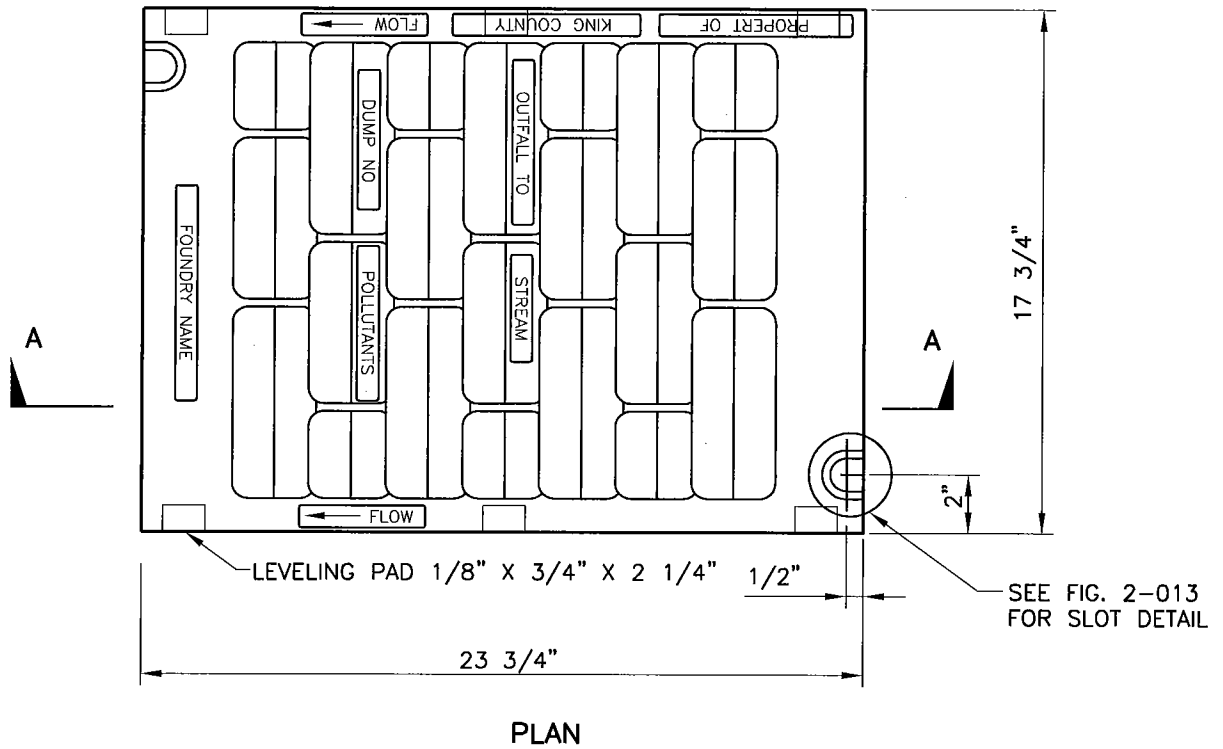
1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. SEE FIG. 7-018 FOR VANED GRATE.
3. PATTERN ON TOP SURFACE OF HOOD SHALL BE 3/16 IN. NON-SKID DIAMOND.
4. BOLT, WASHER, AND NUT SHALL BE GALVANIZED OR CORROSION RESISTANT.
5. SEE SEC. 7.05.





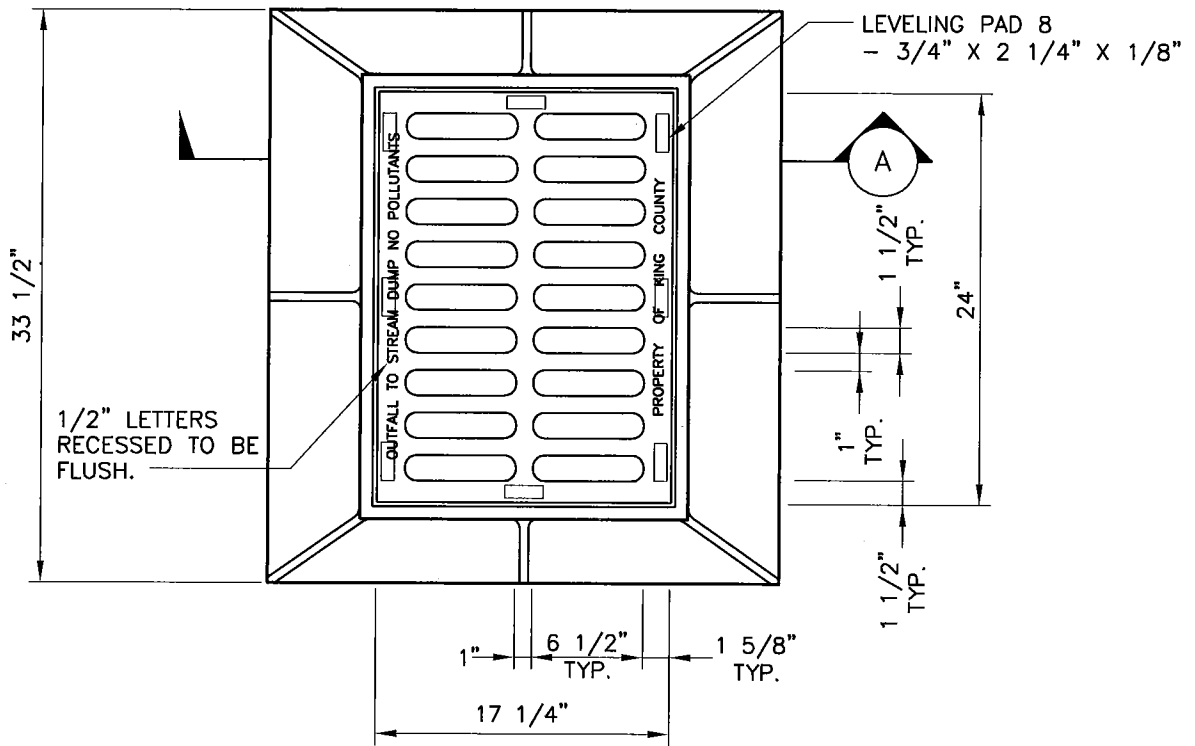
**NOTES:**

1. SET TO GRADE AND CONSTRUCT ROAD AND GUTTER TO BE FLUSH WITH FRAME.
2. SEE SEC. 3.04 FOR JOINT REQUIREMENTS.

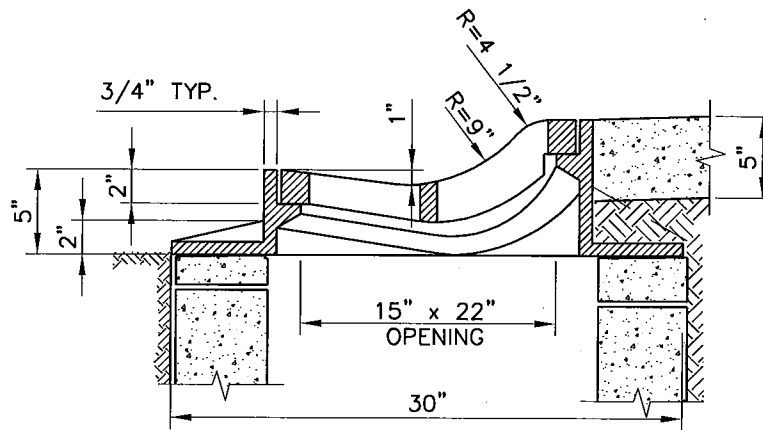


**NOTES:**

1. SELF-LOCK VANED GRATE MANUFACTURER SUBJECT TO APPROVAL BY ENGINEER.
2. USE WITH TWO LOCKING BOLTS 5/8 IN.-11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS 2 IN. LONG. NOTE SLOT DETAIL.
3. MATERIAL IS DUCTILE IRON ASTM A536 GRADE 80-55-06.
4. "OUTFALL TO STREAM DUMP NO POLLUTANTS" MAY BE LOCATED ON BORDER AREA.
5. SEE SEC. 7.05.
6. THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF GRATE IS ON PRIVATE SYSTEM.



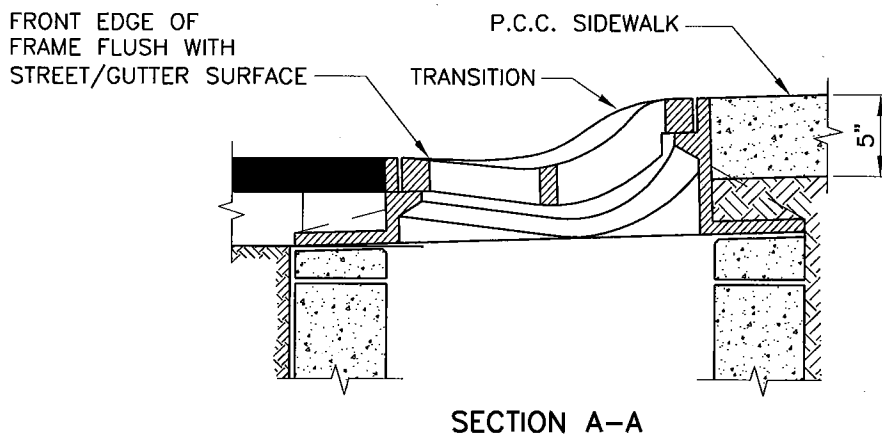
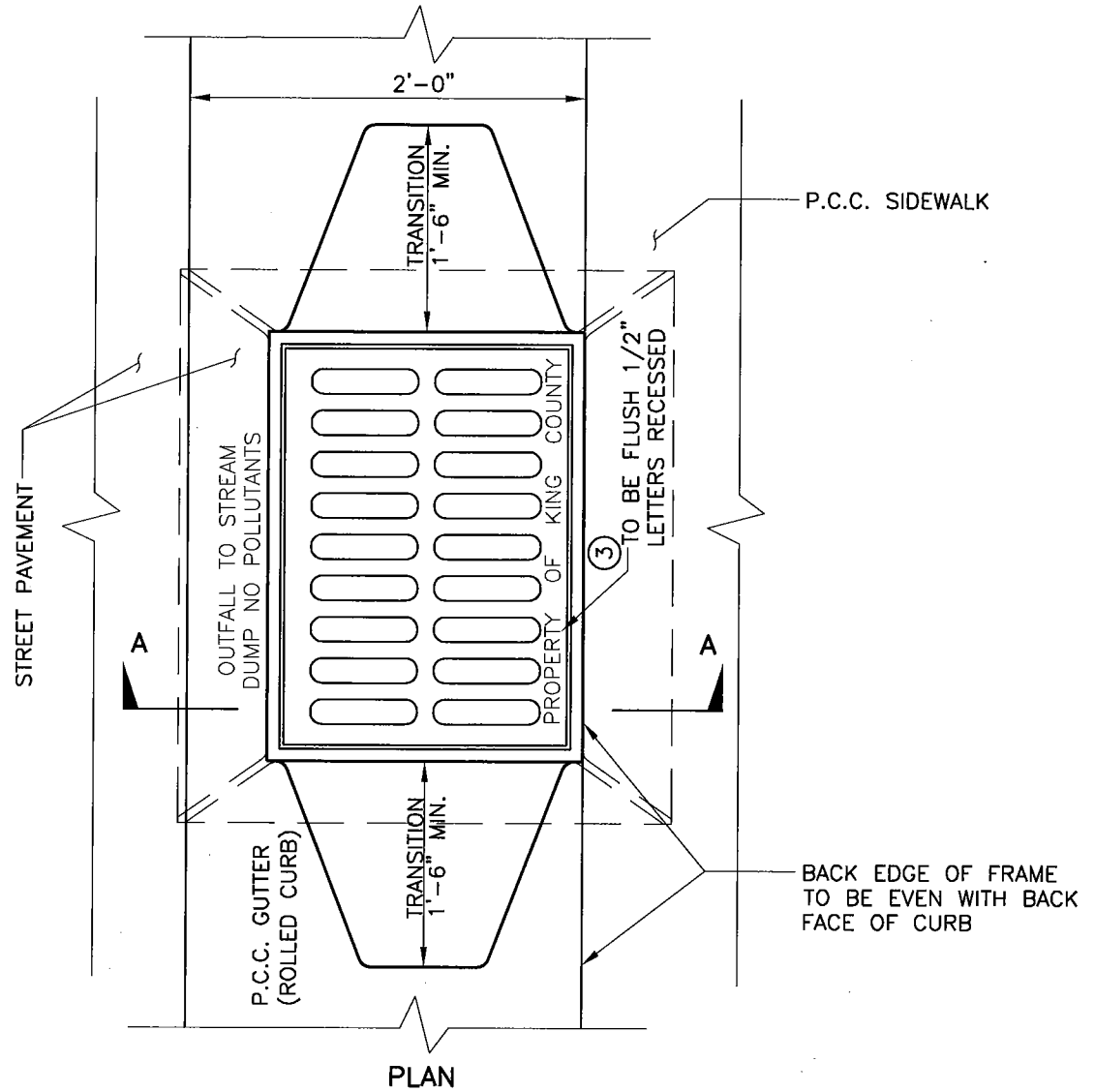
PLAN



SECTION A

**NOTES:**

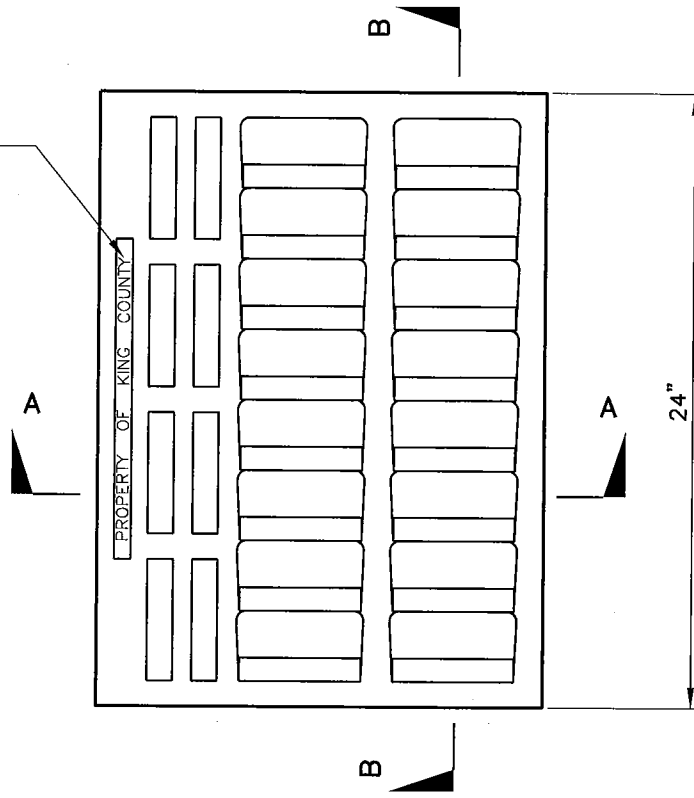
1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. SEE SEC. 7.05.
3. THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF ON A PRIVATE SYSTEM.
4. NOT TO BE USED ON THICKENED EDGE ROADWAYS.



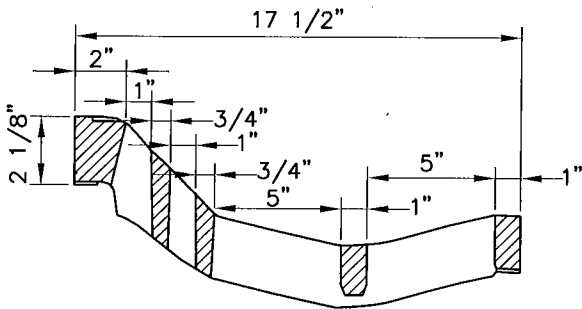
### NOTES

1. SET FRAME TO GRADE AND CONSTRUCT ROAD AND CURB TO BE FLUSH AT FRONT AND BACK OF FRAME.
2. SEE SEC. 7.05.
- ③ THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF GRATE IS ON A PRIVATE SYSTEM.
4. NOT TO BE USED ON THICKENED EDGE ROADWAYS.

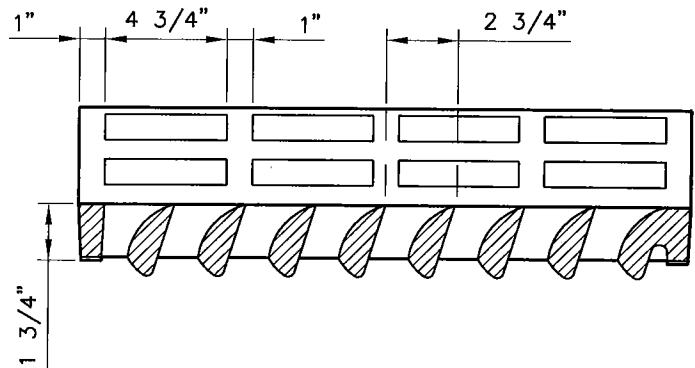
1/2" LETTERS  
RECESSED TO  
BE FLUSH



PLAN



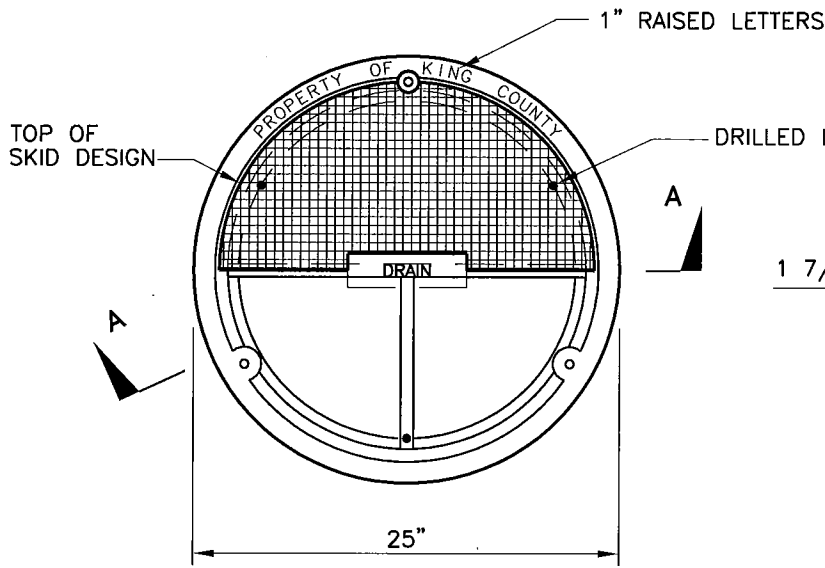
SECTION A-A



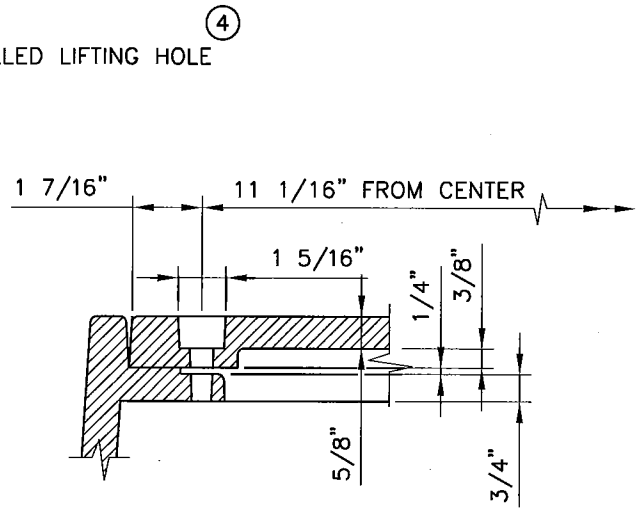
SECTION B-B

**NOTES:**

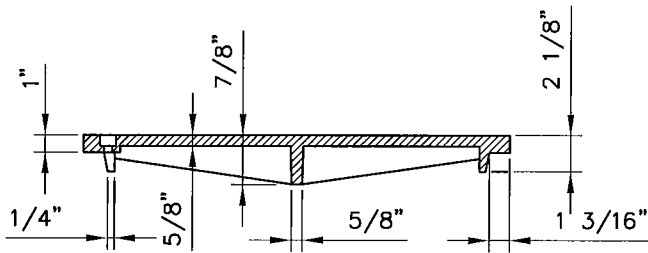
1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. SEE SEC. 7.05.
3. THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF ON A PRIVATE SYSTEM.



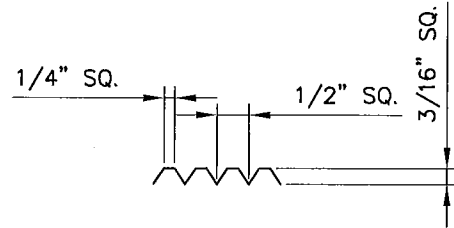
PLAN



BOLT-DOWN DETAIL



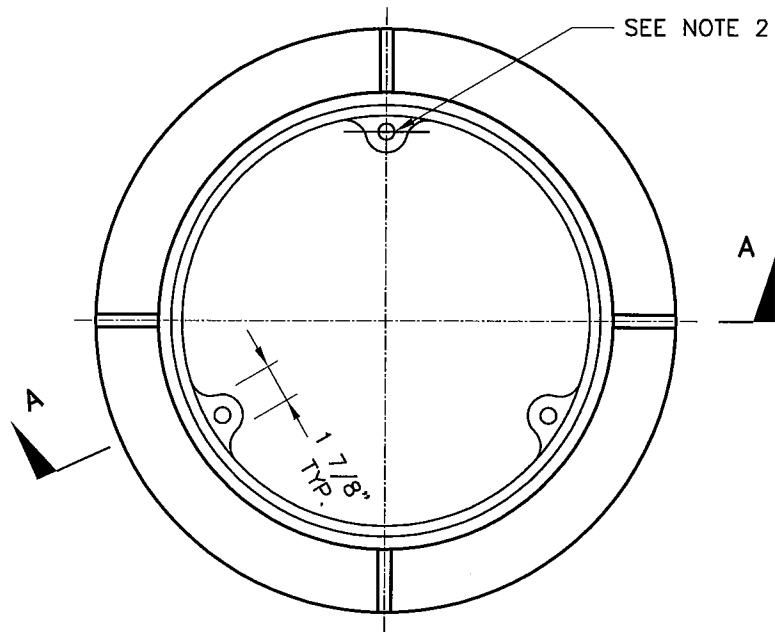
SECTION A-A



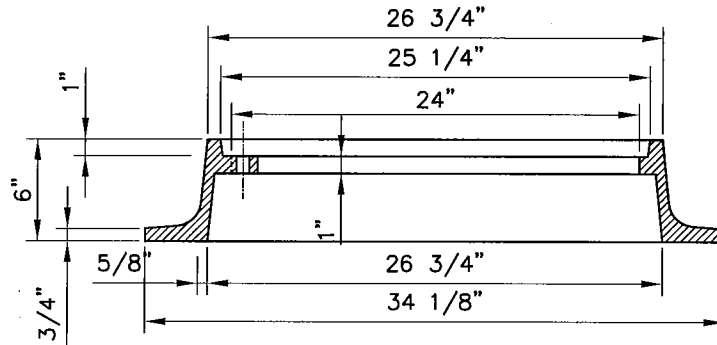
COVER SKID DESIGN DETAIL

**NOTES:**

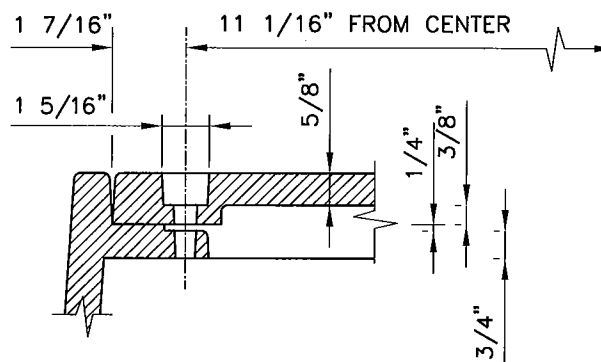
1. USE WITH THREE LOCKING BOLTS 5/8 IN.-11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS 2 IN. LONG. DRILL HOLES SPACED 120° AT 11 1/16 IN. RADIUS.
2. MATERIAL IS DUCTILE IRON ASTM A536 GRADE 80-55-06
3. SEE SEC. 7.05.
- ④ DRILL THREE 1 IN. HOLES SPACED AT 120° AND 9 1/2 IN. RADIUS.



PLAN



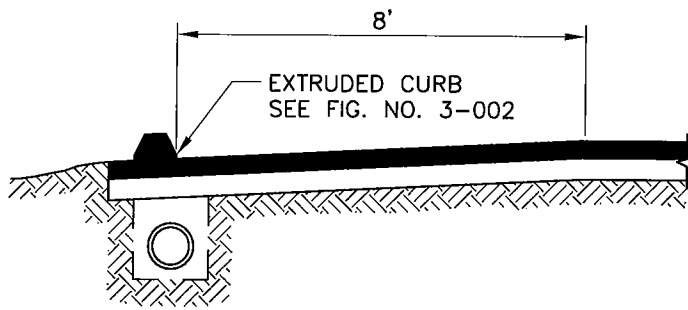
SECTION A-A



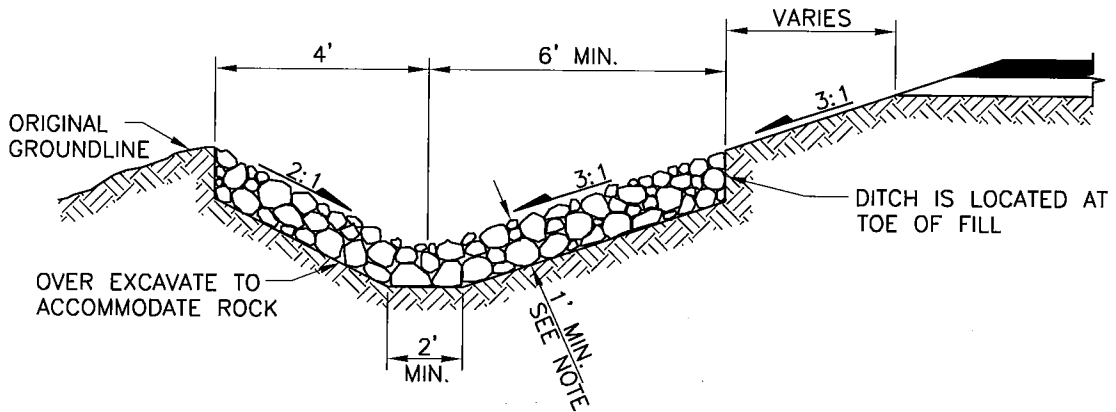
BOLT-DOWN DETAIL

**NOTES:**

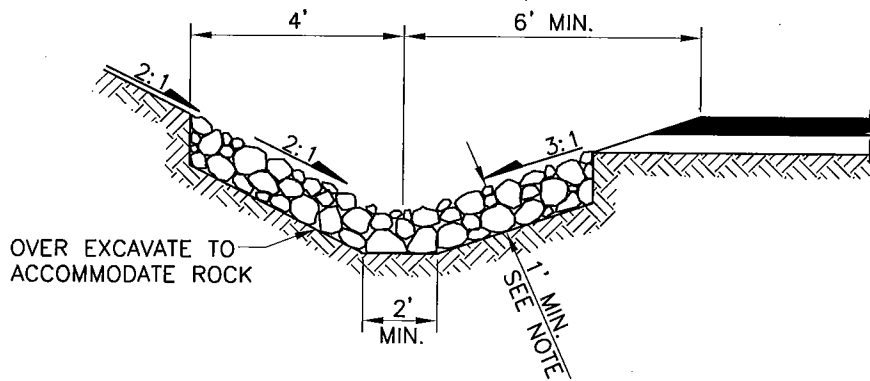
1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. DRILL AND TAP THREE 5/8 IN.-11 NC HOLES THROUGH FRAME AT 120° AND 11 1/16 IN. RADIUS.
3. SEE SEC. 7.05.



CURBED SHOULDER



ROCK-LINED SHOULDER DITCH IN FILL SECTION

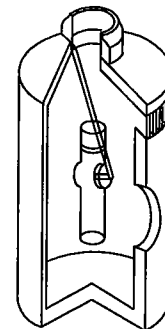
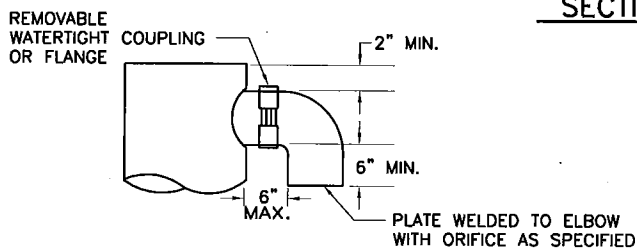
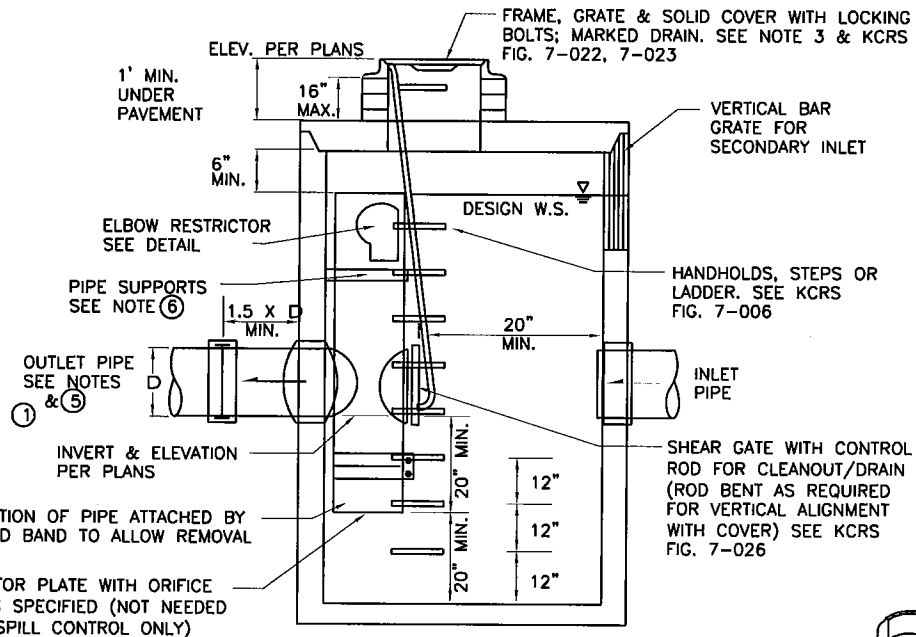
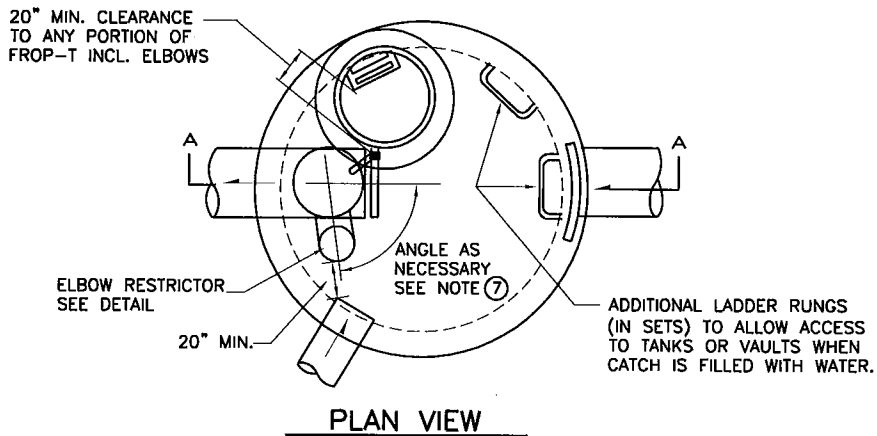


ROCK-LINE SHOULDER DITCH IN CUT SECTION

**NOTES:**

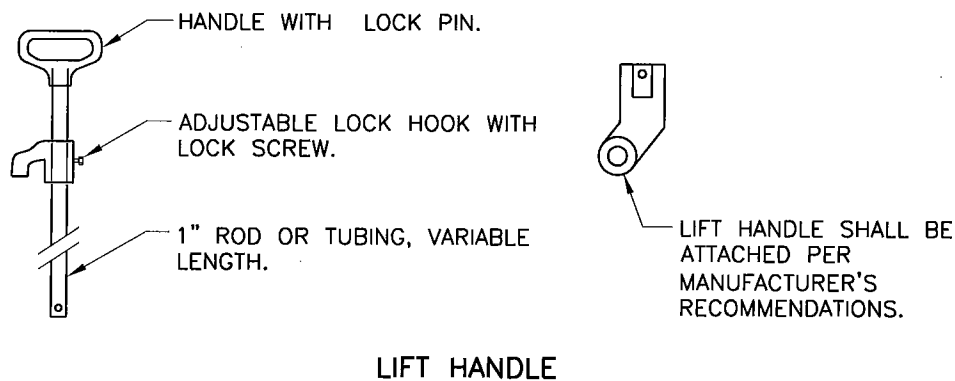
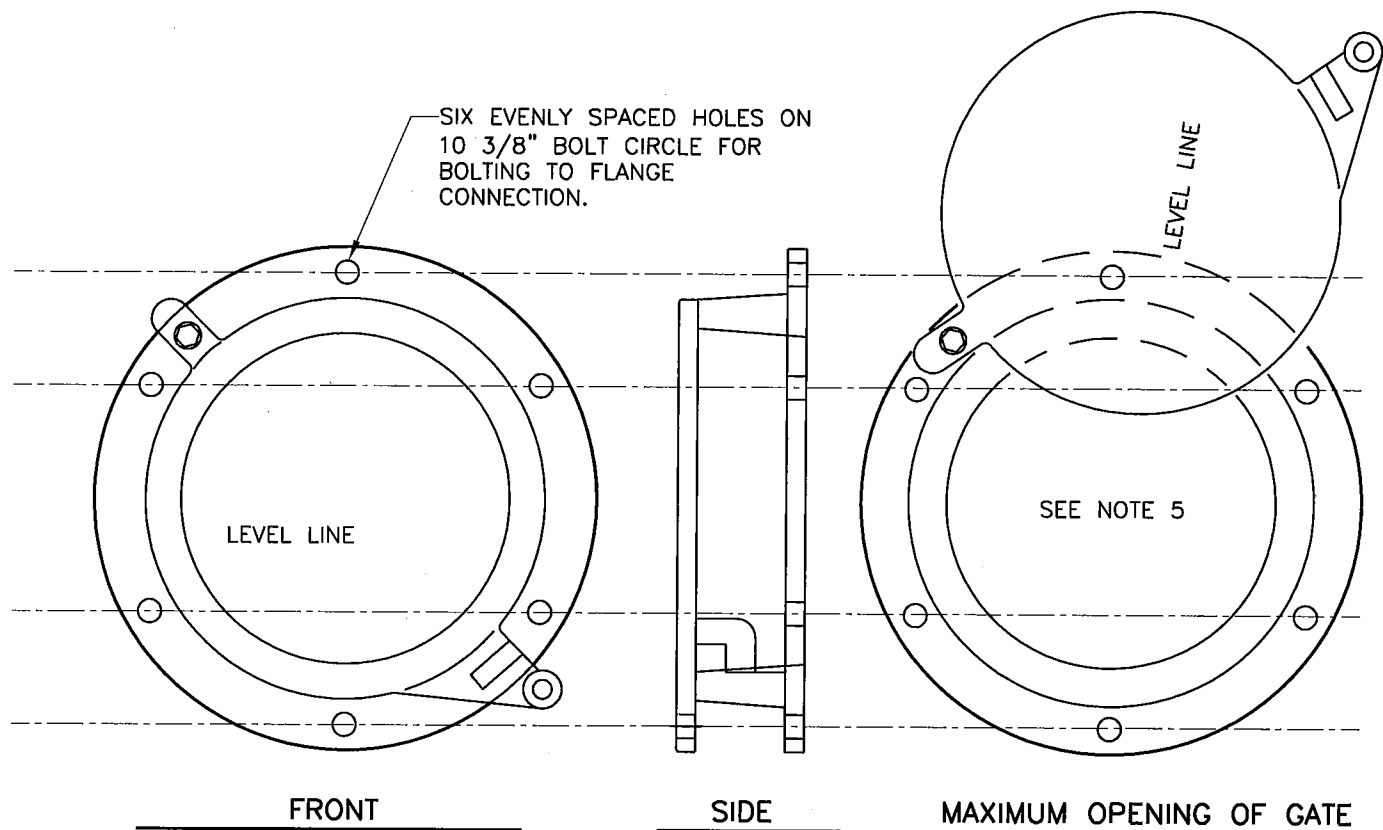
1. DEEPER ROCK FILL MAY BE SPECIFIED.
2. SEE SEC. 7.02.





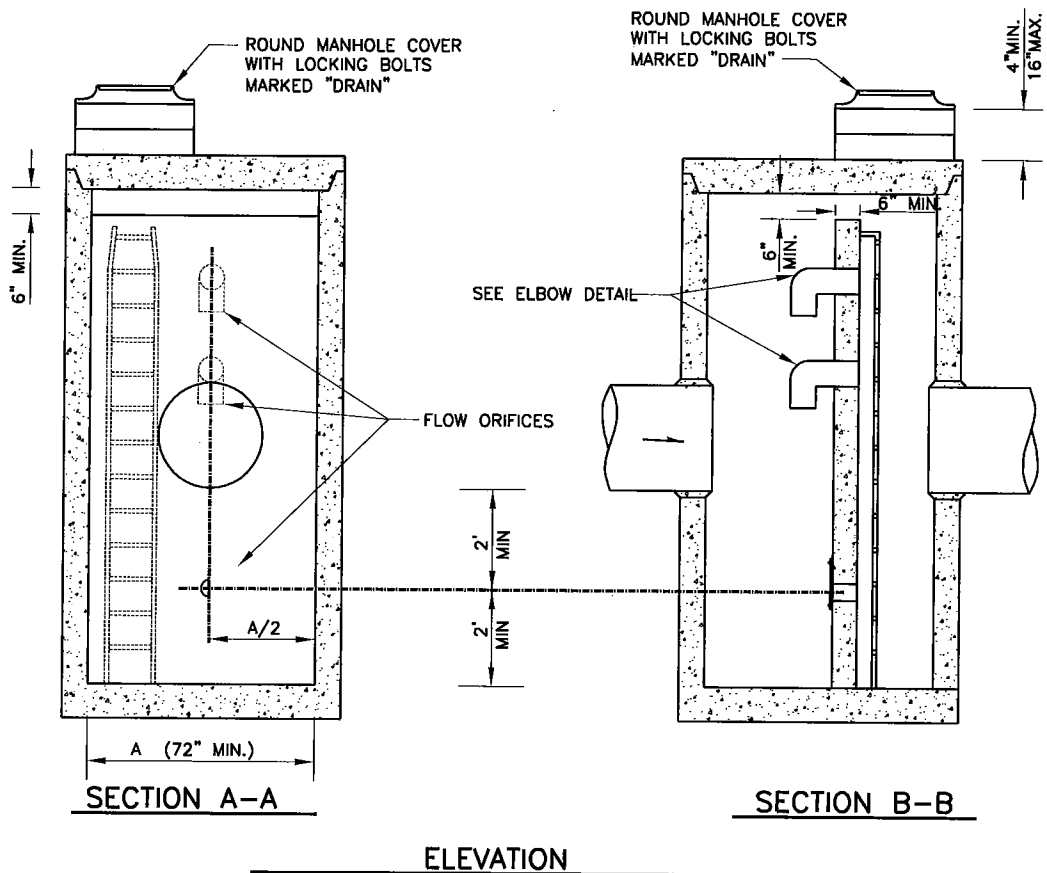
**NOTES:**

- ① USE A MINIMUM OF A 54 IN. DIAM. TYPE 2 CATCH BASIN.
- 2. OUTLET CAPACITY: 100-YEAR DEVELOPED PEAK FLOW.
- ③ METAL PARTS: CORROSION RESISTANT. NON-GALVANIZED PARTS PREFERRED. GALVANIZED PIPE PARTS TO HAVE ASPHALT TREATMENT 1.
- 4. FRAME AND LADDER OR STEPS OFFSET SO:
  - A. CLEANOUT GATE IS VISIBLE FROM TOP;
  - B. CLIMB-DOWN SPACE IS CLEAR OF RISER AND CLEANOUT GATE;
  - C. FRAME IS CLEAR OF CURB.
- ⑤ IF METAL OUTLET PIPE CONNECTS TO CEMENT CONCRETE PIPE, OUTLET PIPE TO HAVE SMOOTH O.D. EQUAL TO CONCRETE PIPE I.D. LESS 1/4 IN.
- ⑥ PROVIDE AT LEAST ONE 3 X 0.090 GAUGE SUPPORT BRACKET ANCHORED TO CONCRETE WALL WITH 5/8 IN. STAINLESS STEEL EXPANSION BOLTS OR EMBEDDED SUPPORTS 2 IN. INTO M/H WALL (VERTICAL SPACING).
- ⑦ LOCATE ELBOW RESTRICTOR(S) AS NECESSARY TO PROVIDE MIN. CLEARANCE AS SHOWN.
- 8. LOCATE ADDITIONAL LADDER RUNGS IN STRUCTURES USED AS ACCESS TO TANKS OR VAULTS TO ALLOW ACCESS WHEN CATCH BASIN IS FILLED WITH WATER.

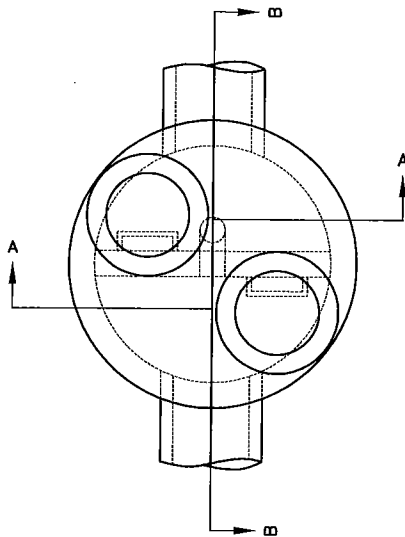


**NOTES:**

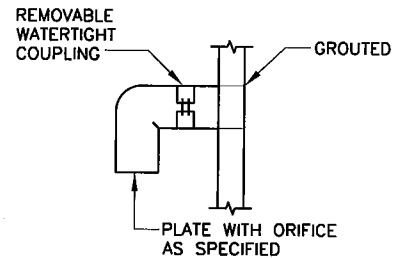
1. SHEAR GATE SHALL BE ALUMINUM ALLOY PER ASTM B-26-ZG-32a OR CAST IRON ASTM A48 CLASS 30B AS REQUIRED.
2. GATE SHALL BE 8 IN. DIAM. UNLESS OTHERWISE SPECIFIED.
3. GATE SHALL BE JOINED TO TEE SECTION BY BOLTING (THROUGH FLANGE), WELDING, OR OTHER SECURE MEANS.
4. LIFT ROD: AS SPECIFIED BY MFR. WITH HANDLE EXTENDING TO WITHIN ONE FOOT OF COVER AND ADJUSTABLE HOOK LOCK FASTENED TO FRAME OR UPPER HANDHOLD.
5. GATE SHALL NOT OPEN BEYOND THE CLEAR OPENING BY LIMITED HINGE MOVEMENT, STOP TAB, OR SOME OTHER DEVICE.
6. NEOPRENE RUBBER GASKET REQUIRED BETWEEN RISER MOUNTING FLANGE AND GATE FLANGE.
7. MATING SURFACES OF LID AND BODY TO BE MACHINED FOR PROPER FIT.
8. FLANGE MOUNTING BOLTS SHALL BE 3/8 IN. DIAM. STAINLESS STEEL.
9. ALTERNATE CLEANOUT/SHEAR GATES TO THE DESIGN SHOWN ARE ACCEPTABLE, PROVIDED THEY MEET THE MATERIAL SPECIFICATIONS ABOVE AND HAVE A SIX BOLT, 10 3/8 IN. BOLT CIRCLE FOR BOLTING TO THE FLANGE CONNECTION.



ELEVATION



PLAN



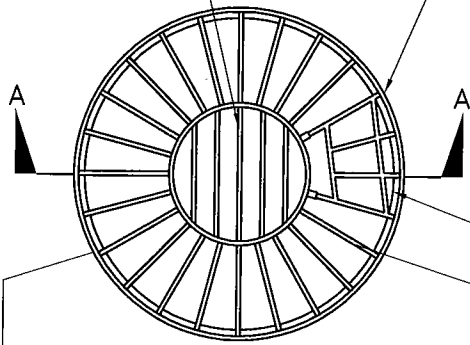
ELBOW DETAIL

NOTES:

1. PIPE SIZE, SLOPES AND ALL ELEVATIONS: PER PLANS.
2. OUTLET CAPACITY: NOT LESS THAN COMBINED INLETS.
3. CATCH BASIN: TYPE 2, TO BE CONSTRUCTED IN ACCORDANCE WITH FIG. 7-005 AND AASHTO M199 UNLESS OTHERWISE SPECIFIED.
4. COVERS: ROUND, SOLID MARKED "DRAIN," WITH LOCKING BOLTS SEE FIG. 7-022 AND 7-023.
5. ORIFICES: SIZED AND LOCATED AS REQUIRED, WITH LOWEST ORIFICE MIN. 2 FT. FROM BASE.
6. BAFFLE WALL SHALL HAVE #4 BAR AT 12 IN. SPACING EACH WAY.
7. PRECAST BAFFLE WALL SHALL BE KEYED AND GROUTED IN PLACE.
8. BOTTOM ORIFICE PLATE TO BE 1/4 IN. MIN. NON-GALVANIZED CORROSIVE RESISTANT MATERIAL AND ATTACHED WITH 1/2 IN. STAINLESS STEEL BOLTS. OMIT ORIFICE PLATE IF ONLY FOR OIL SEPARATION.
9. UPPER FLOW ORIFICE SHALL BE ALUMINUM, ALUMINIZED STEEL OR GALVANIZED STEEL. SEE FIG. 7-025. NON GALVANIZED CORROSIVE RESISTANT MATERIAL SHALL HAVE TREATMENT 1.

3/4" DIAMETER SMOOTH BARS EQUALLY SPACED (4" O.C. MAX.)

4 HOOK CLAMPS EVENLY PLACED SEE DETAIL BELOW.



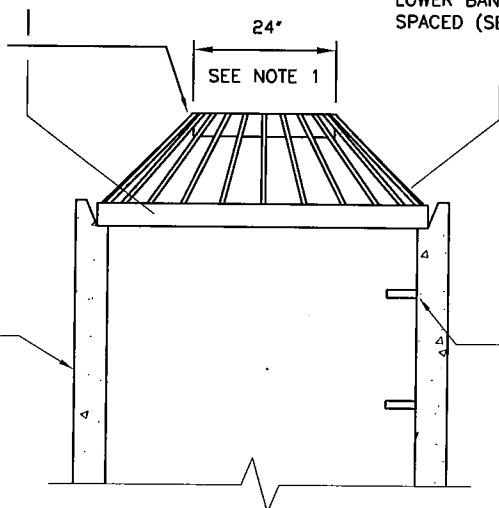
PROVIDE MAINTENANCE ACCESS BY WELDING 4 CROSSBARS TO 4 VERTICAL BARS AS SHOWN. HINGE UPPER ENDS WITH FLANGES/BOLTS AND PROVIDE LOCKING MECHANISM (PADLOCK) ON LOWER END. LOCATE STEPS DIRECTLY BELOW.

LOWER STEEL BAND 3/4"x4" WIDE FORMED TO FIT IN GROOVE OF CB RISER

**PLAN VIEW**

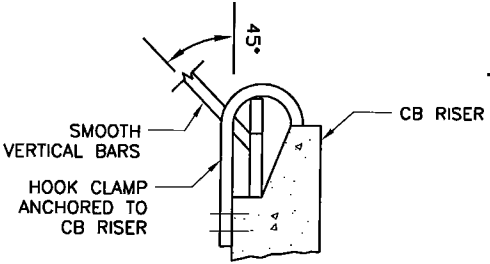
3/4" DIA. SMOOTH ROUND BARS WELDED EQUALLY SPACED. BARS SHALL BE TO UPPER AND LOWER BANDS. BANDS EVENLY SPACED (SEE NOTE 1)

UPPER STEEL BAND 3/4"x4" WIDE



STANDARD GALVANIZED STEPS OR LADDER

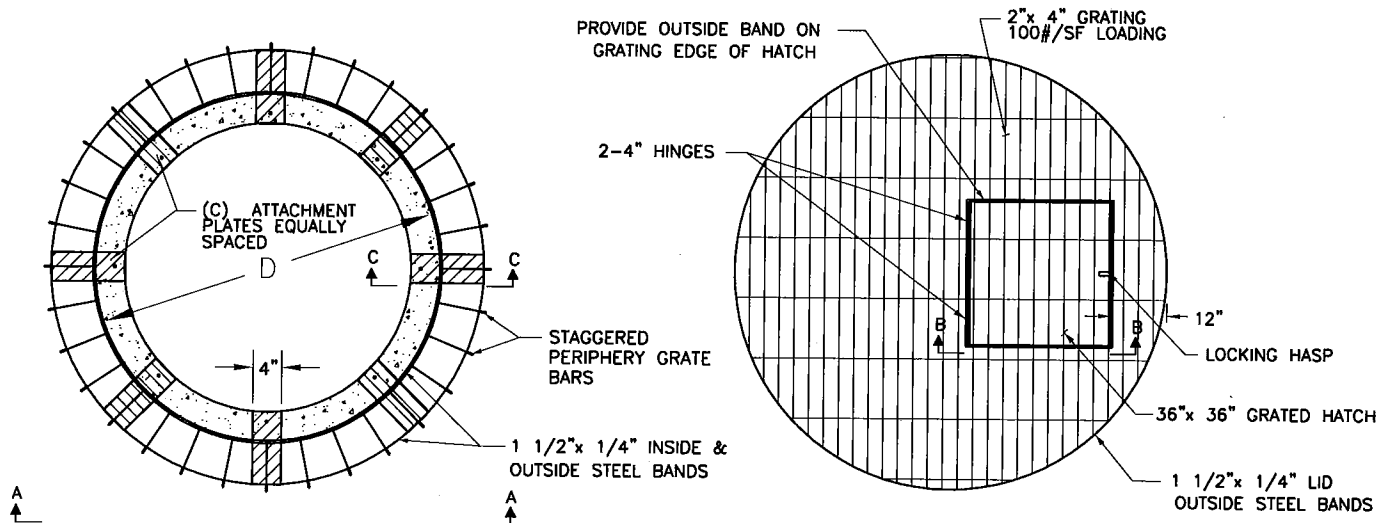
**SECTION A-A**



**DETAIL HOOK CLAMP**  
NTS

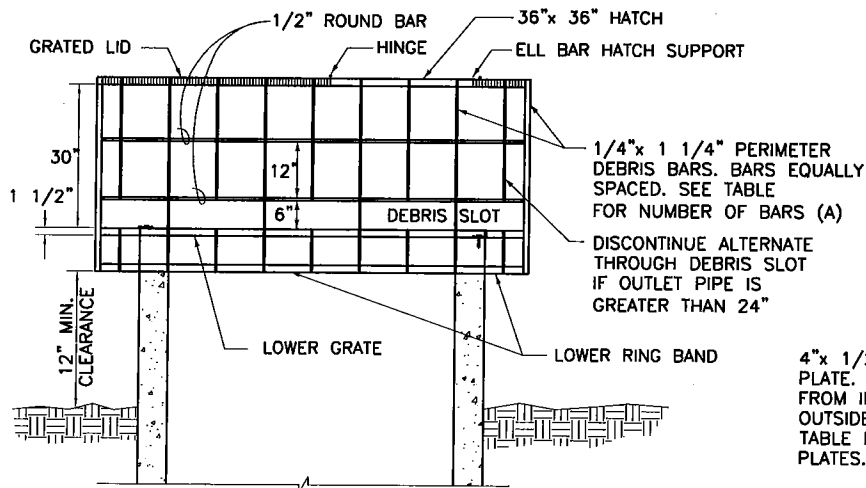
**NOTES:**

1. DIMENSIONS ARE FOR ILLUSTRATION ON 54 IN. DIAMETER CB. FOR DIFFERENT DIAMETER CB'S, ADJUST TO MAINTAIN 45° ANGLE ON "VERTICAL" BARS AND 4 IN. O.C. MAXIMUM SPACING OF BARS AROUND LOWER STEEL BAND.
2. METAL PARTS MUST BE CORROSION RESISTANT, STEEL BARS MUST BE GALVANIZED.
3. THIS DEBRIS BARRIER IS ALSO RECOMMENDED FOR USE ON THE INLET TO ROADWAY CROSS-CULVERTS WITH HEIGHT POTENTIAL FOR DEBRIS COLLECTION (EXCEPT ON TYPE 2 STREAMS)
4. USE OF THIS STRUCTURE WITHIN THE ROAD RIGHT-OF-WAY SHALL MEET THE MINIMUM CLEAR ZONE REQUIREMENTS.

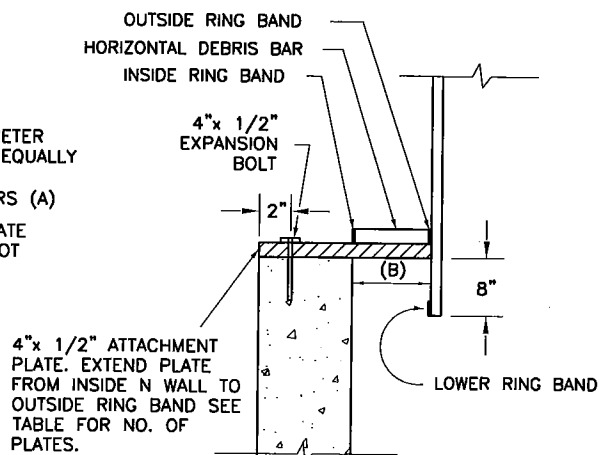


LOWER GRATING PLAN

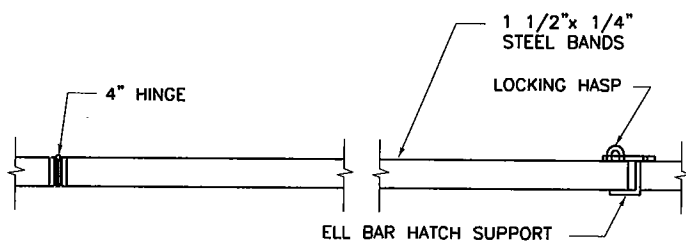
GRATED LID



SECTION A-A



SECTION C-C



SECTION B-B

NOTES:

1. ALL PARTS OF THE CAGE SHALL BE GALVANIZED STEEL AND JOINTS WELDED. IN ADDITION WHERE SPECIFIED, DEBRIS CAGE SHALL BE SHOP PAINTED FLAT BLACK. WHERE PAINTING IS SPECIFIED PRE-TREAT GALVANIZED METAL PER MIL-P-15328 THEN FINISH WITH FLAT BLACK ETCHING PRIMER 2 MILS DRY.
2. UNLESS INDICATED OTHERWISE ALL BANDS AND BARS SHALL BE 1 1/2" X 1/4".
3. GRATED LID SHALL BE CONSTRUCTED TO WITHSTAND A 100 PSF LOADING.

TABLE OF VARIABLES

CB DIA. INSIDE	No. OF BARS (A)	(B)	No. OF ATTACHMENT PLATES (C)	(D)
48"	26	8"	4	60"
54"	29	8"	6	67"
60"	32	10"	6	74"
72"	39	12"	8	88"
96"	50	12"	8	116"