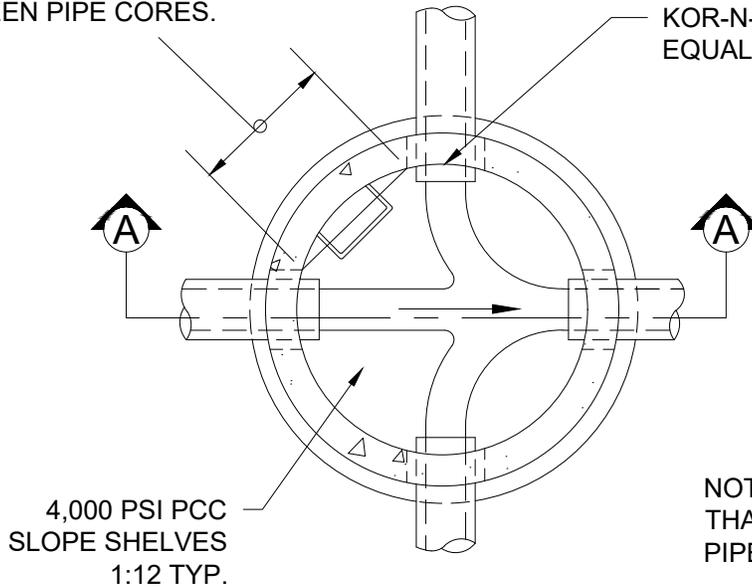


FILENAME: y:\inter-departmental\development engineering projects\public works standards\200 pws revision copy\details\200\_general\general cad\201.dwg, Plotted 11/24/2025 8:36 AM, By: Anthony Dollowitch, ANSI FULL BLEED A (8.50 X 11.00 INCHES)

MINIMUM OF 12" PRECAST WALL BETWEEN PIPE CORES.

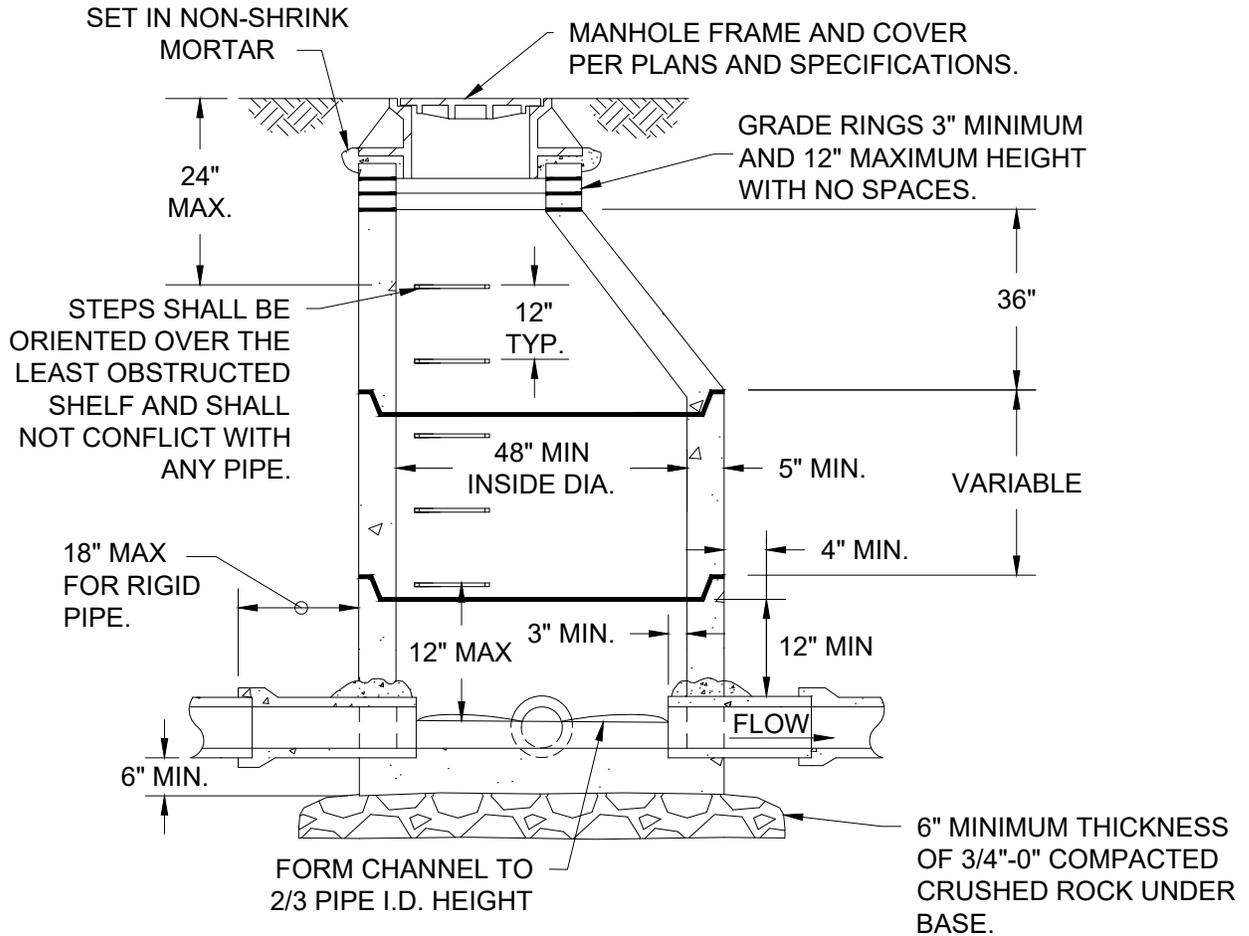
KOR-N-SEAL OR APPROVED EQUAL MANHOLE ADAPTOR



4,000 PSI PCC SLOPE SHELVES 1:12 TYP.

NOTE: FOR MANHOLES LESS THAN 60" FROM RIM TO TOP OF PIPE, SEE STANDARD DETAIL 203.

**PLAN**



SET IN NON-SHRINK MORTAR

MANHOLE FRAME AND COVER PER PLANS AND SPECIFICATIONS.

GRADE RINGS 3" MINIMUM AND 12" MAXIMUM HEIGHT WITH NO SPACES.

24" MAX.

36"

STEPS SHALL BE ORIENTED OVER THE LEAST OBSTRUCTED SHELF AND SHALL NOT CONFLICT WITH ANY PIPE.

12" TYP.

VARIABLE

48" MIN INSIDE DIA.

5" MIN.

18" MAX FOR RIGID PIPE.

4" MIN.

12" MAX

3" MIN.

12" MIN

6" MIN.

FLOW

FORM CHANNEL TO 2/3 PIPE I.D. HEIGHT

6" MINIMUM THICKNESS OF 3/4"-0" COMPACTED CRUSHED ROCK UNDER BASE.

**SECTION A-A**

**CITY OF GRESHAM**

**STANDARD MANHOLE FOR 27" AND LESSER DIAMETER PIPES**

PWS VERSION: JAN 2026

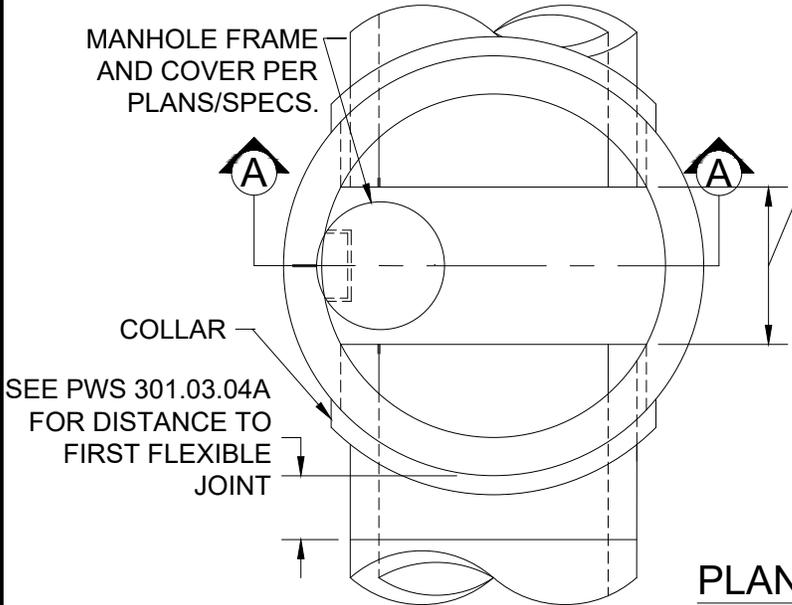
DRAWN AAD

REV. DATE NOV 2025

APPR. *[Signature]*

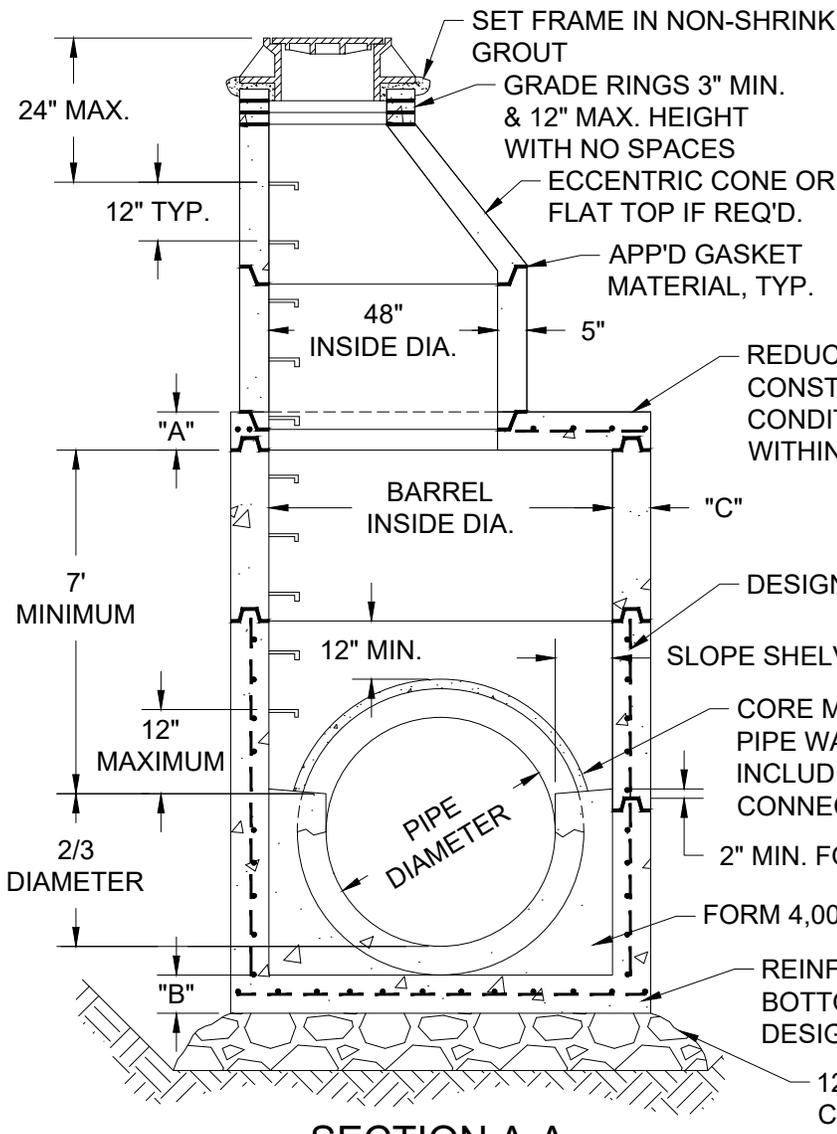
DETAIL NO. 201

FILENAME: y:\inter-departmental\development\_engineering\_projects\public\_works\_standards\200\_pws\_revision\_copy\details\200\_general\general\_cad\202.dwg, Plotted 11/24/2025 8:36 AM, By: Anthony Dollowitch, ANSI FULL BLEED A (8.50 X 11.00 INCHES)



MINIMUM OF 12" PRECAST WALL BETWEEN PIPE CORING REQ'D.

PIPE DIA. IN.	BARREL DIA.* IN.	MINIMUMS		
		"A" DIM. IN.	"B" DIM. IN.	"C" DIM. IN.
30"	72"	7"	10"	7"
33"	72"	7"	10"	7"
36"	72"	7"	10"	7"
42"	84"	12"	12"	8"
48"	84"	12"	12"	8"
54"	96"	12"	12"	9"
60"	96"	12"	12"	9"
66"	108"	12"	12"	10"
72"	108"	12"	12"	10"
78"	120"	12"	12"	11"
84"	120"	12"	12"	11"
90"	132"	12"	12"	11"
96"	132"	12"	12"	11"



\* APPLIES TO (2) PIPE MANHOLES WITH 0° DEFLECTION. OTHER NUMBERS OF PIPES OR DEFLECTION WILL REQUIRE LARGER SIZE.

NOTES:  
STEPS TO BE AS DETAILED IN STANDARD DETAIL 210

REDUCING TOP SLAB TO BE DESIGNED & CONSTRUCTED FOR DEPTH AND TRAFFIC CONDITIONS BY MANUFACTURER. FOR SLABS WITHIN 17" OF STREET, OPENING TO BE 25"

DESIGN BARREL REINFORCING FOR CONDITIONS

SLOPE SHELVES 1:12, 18" MINIMUM WIDTH

CORE MANHOLE WALL 2" MIN., 4" MAX. CLEAR OF PIPE WALL. GROUT WITH NON-SHRINK GROUT & INCLUDING 4"x4" COLLAR AROUND PIPE CONNECTION

2" MIN. FOR CAST-IN-PLACE BASE

FORM 4,000 PSI PCC CHANNEL TO 2/3 DIA. HEIGHT

REINFORCED PRE-CAST OR CAST-IN-PLACE BOTTOM SLAB. SUBMIT CALCULATIONS & DESIGN FOR PRIOR APPROVAL

12" MINIMUM THICKNESS OF 3/4"-0" COMPACTED CRUSHED ROCK

CITY OF GRESHAM

STANDARD MANHOLE FOR 30" AND LARGER DIAMETER PIPES

PWS VERSION: JAN 2026

DRAWN KCK

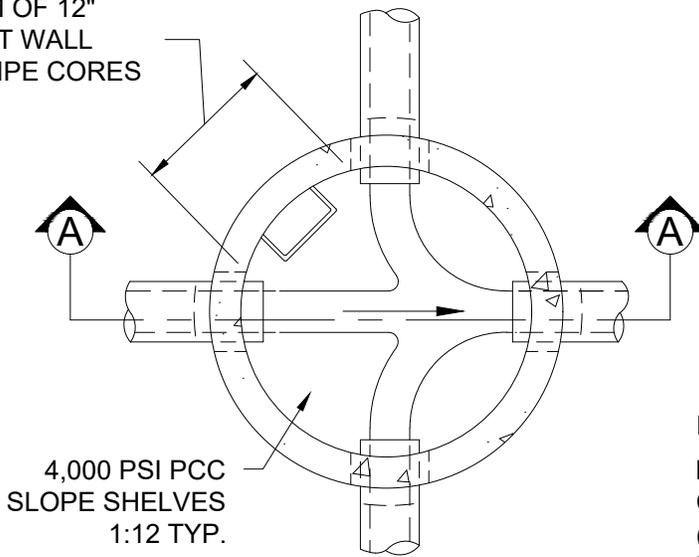
REV. DATE NOV 2025

APPR. *[Signature]*

DETAIL NO. 202

FILENAME: y:\inter-departmental\development engineering projects\public works standards\200 pws revision copy\details\200\_general\general cad\203.dwg, Plotted 11/24/2025 8:36 AM, By: Anthony Dollowitch, ANSI FULL BLEED A (8.50 X 11.00 INCHES)

MINIMUM OF 12"  
PRECAST WALL  
BETWEEN PIPE CORES

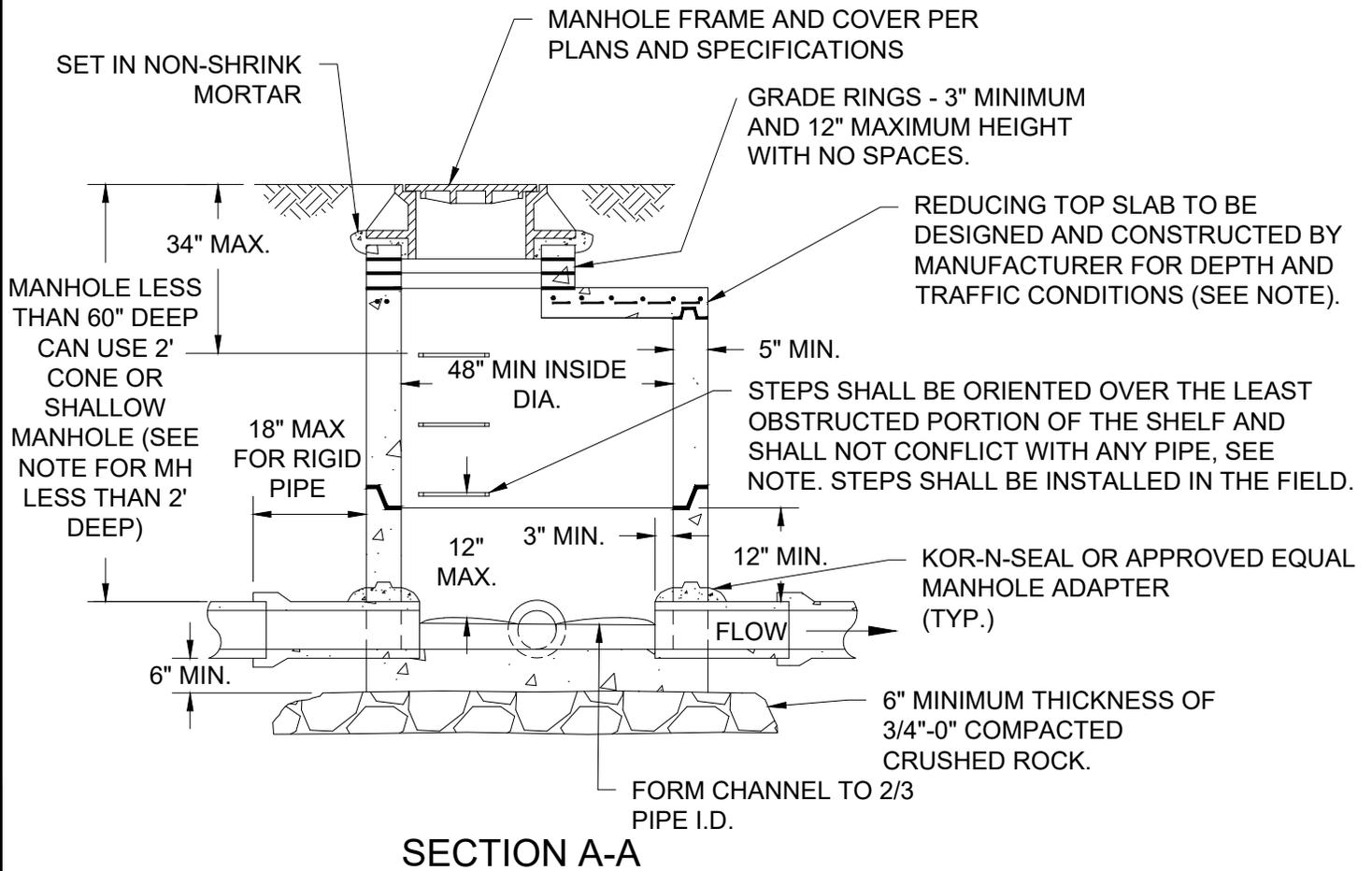


4,000 PSI PCC  
SLOPE SHELVES  
1:12 TYP.

**PLAN**

NOTE:

FOR MANHOLES LESS THAN 2' DEEP A CONCENTRIC FLATTOP SHALL BE USED (NOT SHOWN), AND NO STEPS SHALL BE INSTALLED.



SET IN NON-SHRINK  
MORTAR

MANHOLE FRAME AND COVER PER  
PLANS AND SPECIFICATIONS

GRADE RINGS - 3" MINIMUM  
AND 12" MAXIMUM HEIGHT  
WITH NO SPACES.

REDUCING TOP SLAB TO BE  
DESIGNED AND CONSTRUCTED BY  
MANUFACTURER FOR DEPTH AND  
TRAFFIC CONDITIONS (SEE NOTE).

MANHOLE LESS  
THAN 60" DEEP  
CAN USE 2'  
CONE OR  
SHALLOW  
MANHOLE (SEE  
NOTE FOR MH  
LESS THAN 2'  
DEEP)

34" MAX.

48" MIN INSIDE  
DIA.

5" MIN.

STEPS SHALL BE ORIENTED OVER THE LEAST  
OBSTRUCTED PORTION OF THE SHELF AND  
SHALL NOT CONFLICT WITH ANY PIPE, SEE  
NOTE. STEPS SHALL BE INSTALLED IN THE FIELD.

18" MAX  
FOR RIGID  
PIPE

12" MAX.

3" MIN.

12" MIN.

KOR-N-SEAL OR APPROVED EQUAL  
MANHOLE ADAPTER  
(TYP.)

FLOW

6" MIN.

6" MINIMUM THICKNESS OF  
3/4"-0" COMPACTED  
CRUSHED ROCK.

FORM CHANNEL TO 2/3  
PIPE I.D.

**SECTION A-A**

**CITY OF  
GRESHAM**

**SHALLOW MANHOLE FOR 27" AND LESSER  
DIAMETER PIPES**

PWS VERSION: JAN 2026

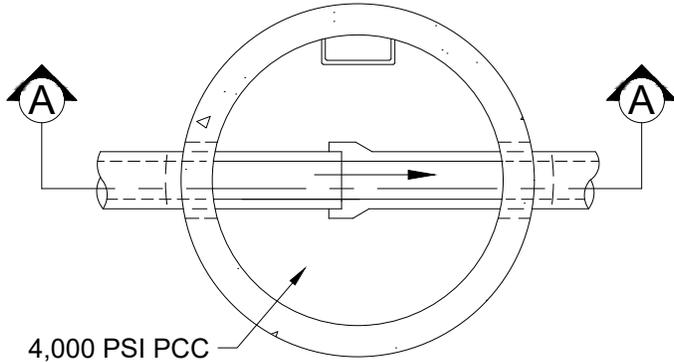
DRAWN AAD

REV. DATE NOV 2025

APPR. *[Signature]*

DETAIL NO. 203

FILENAME: y:\inter-departmental\development engineering projects\public works standards\200 pws revision copy\details\200\_general\general cad\204.dwg, Plotted 11/24/2025 8:36 AM, By: Anthony Dolowitz, ANSI FULL BLEED A (8.50 X 11.00 INCHES)

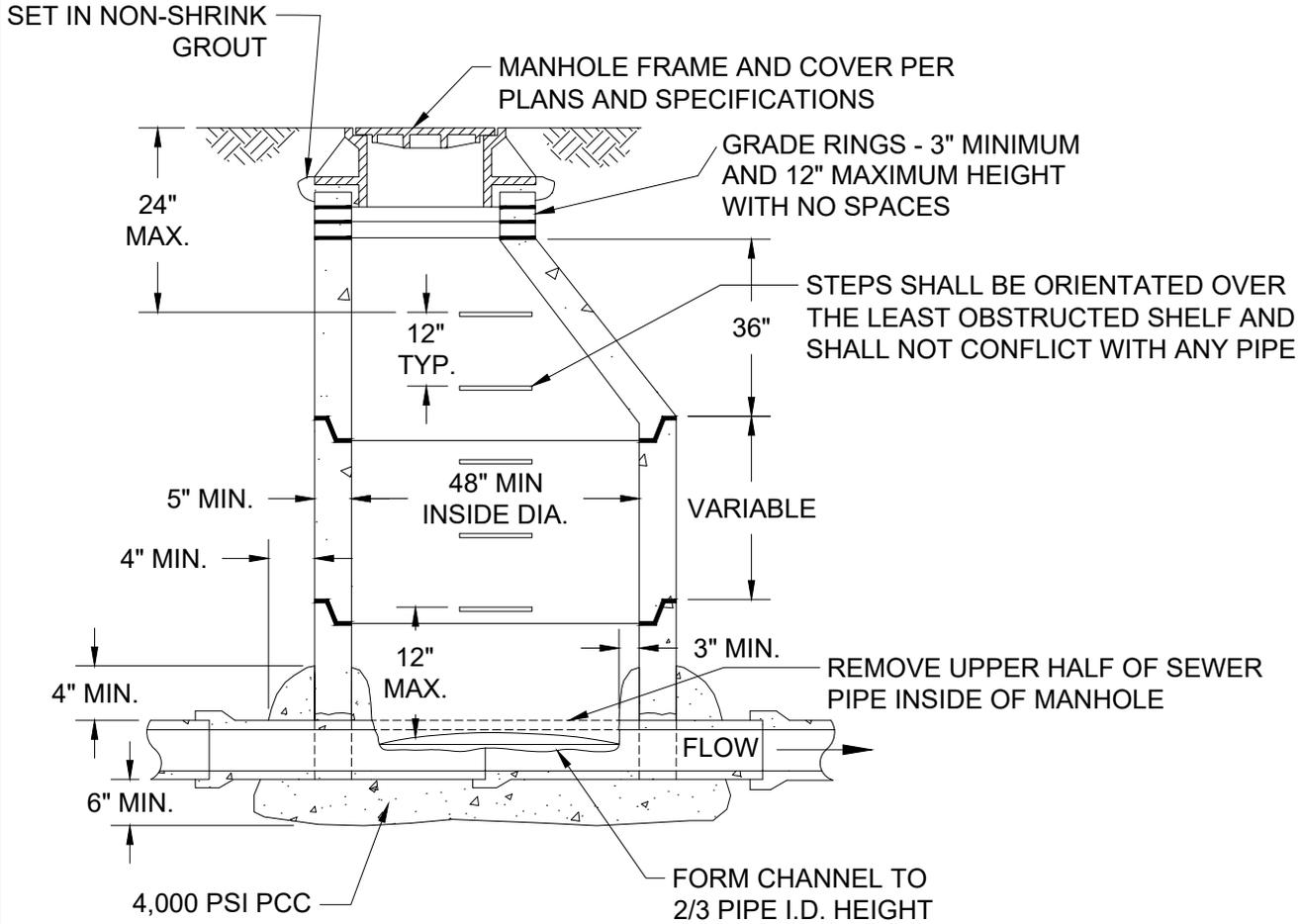


4,000 PSI PCC  
SLOPE SHELVES  
1:12 TYP.

**PLAN**

**NOTES:**

1. JOINTS SHALL BE WATER TIGHT AND COATED WITH WATERPROOF RUBBERIZED MASTIC MATERIAL BEFORE SETTING RISERS AND TOP. INSIDE JOINTS SHALL BE GROUTED.
2. MANHOLES SHALL HAVE A 12" MIN., 24" MAX. BOTTOM RISER. RISER TO BE BEDDED IN THE CAST-IN-PLACE CONCRETE AS THE BASE TAKES ITS INITIAL SET.
3. 3" TO 12" CLEARANCE BETWEEN BOTTOM RISER SECTION AND TOP OF PIPE. RISER SECTION MUST BE CAST TO ACCOMODATE PIPE (DOG HOUSE) NO SAWING OR BREAKING OF RISER WILL BE ALLOWED.
4. AFTER SHELF IS FORMED REMOVE TOP OF PIPE.



**SECTION A-A**

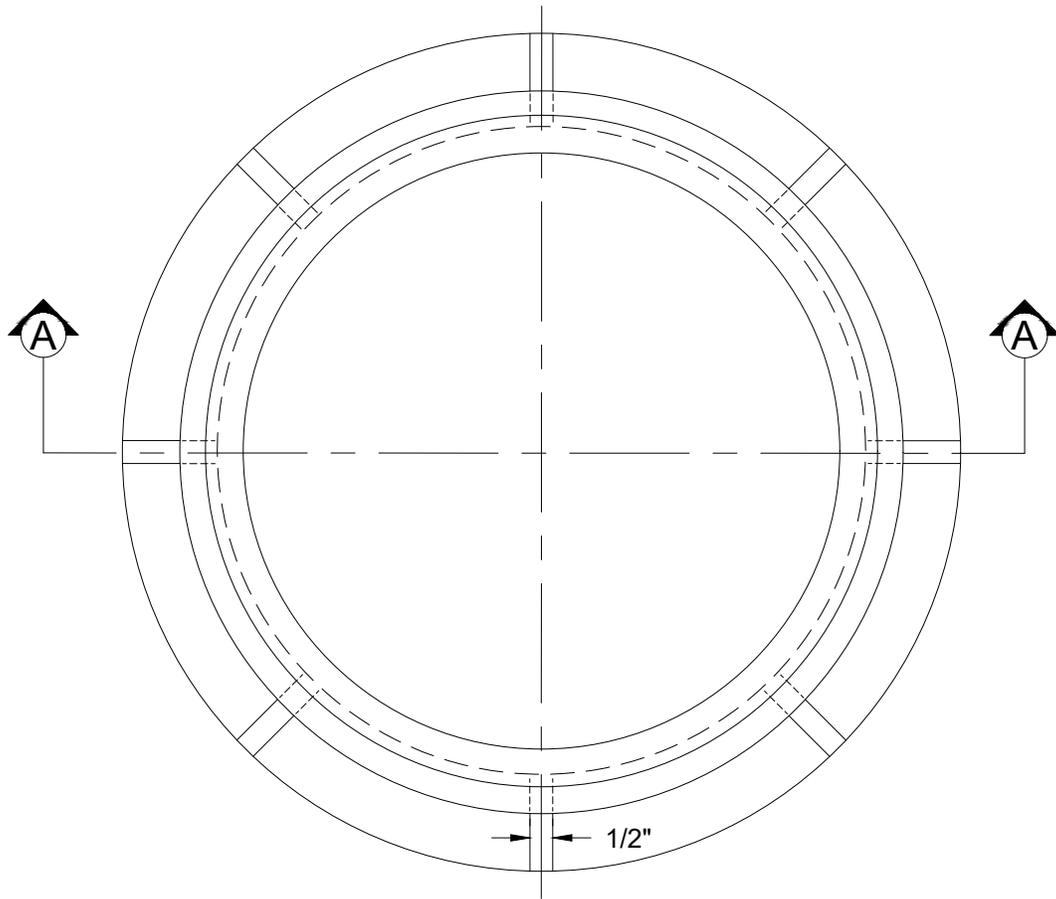
**CITY OF GRESHAM**

**CAST-IN-PLACE MANHOLE**

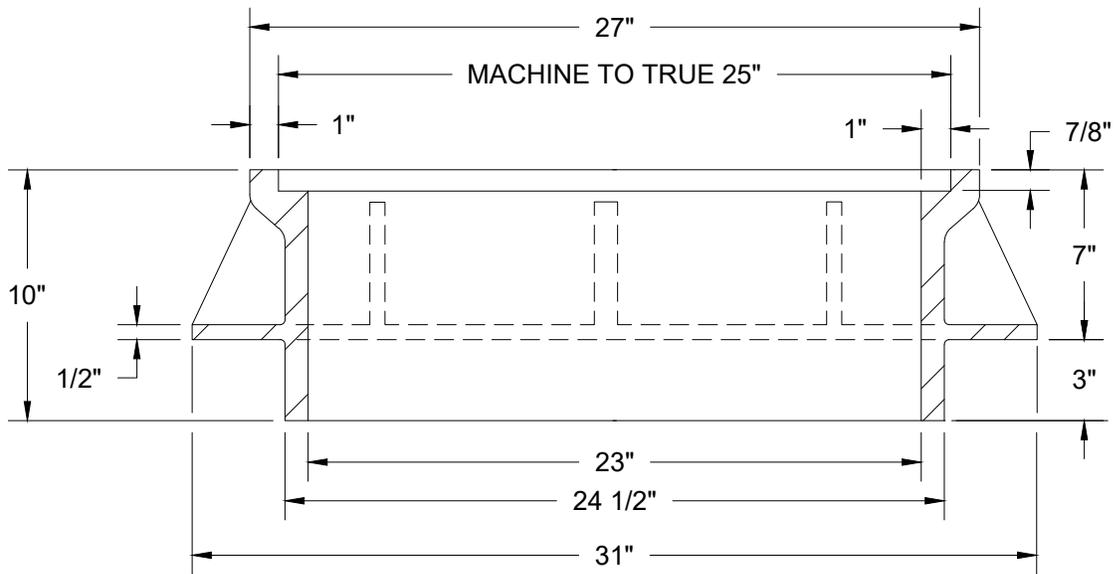
PWS VERSION: JAN 2026

DRAWN	KRB
REV. DATE	NOV 2025
APPR.	<i>[Signature]</i>
DETAIL NO.	204

FILENAME: y:\inter-departmental\development engineering projects\public works standards\200 pws revision copy\details\200\_general\general cad\205a.dwg, Plotted 11/24/2025 8:36 AM, By: Anthony Dollowitch, ANSI FULL BLEED A (8.50 X 11.00 INCHES)



**PLAN**



**SECTION A-A**

**NOTES:**

1. MATERIAL TO BE GRAY CAST IRON ASTM A48, CLASS 30, APPROXIMATE WEIGHT = 237 LBS.
2. TO BE USED IN ASPHALT GREATER THAN 4" IN DEPTH.

**CITY OF  
GRESHAM**

**STANDARD MANHOLE FRAME**

PWS VERSION: JAN 2026

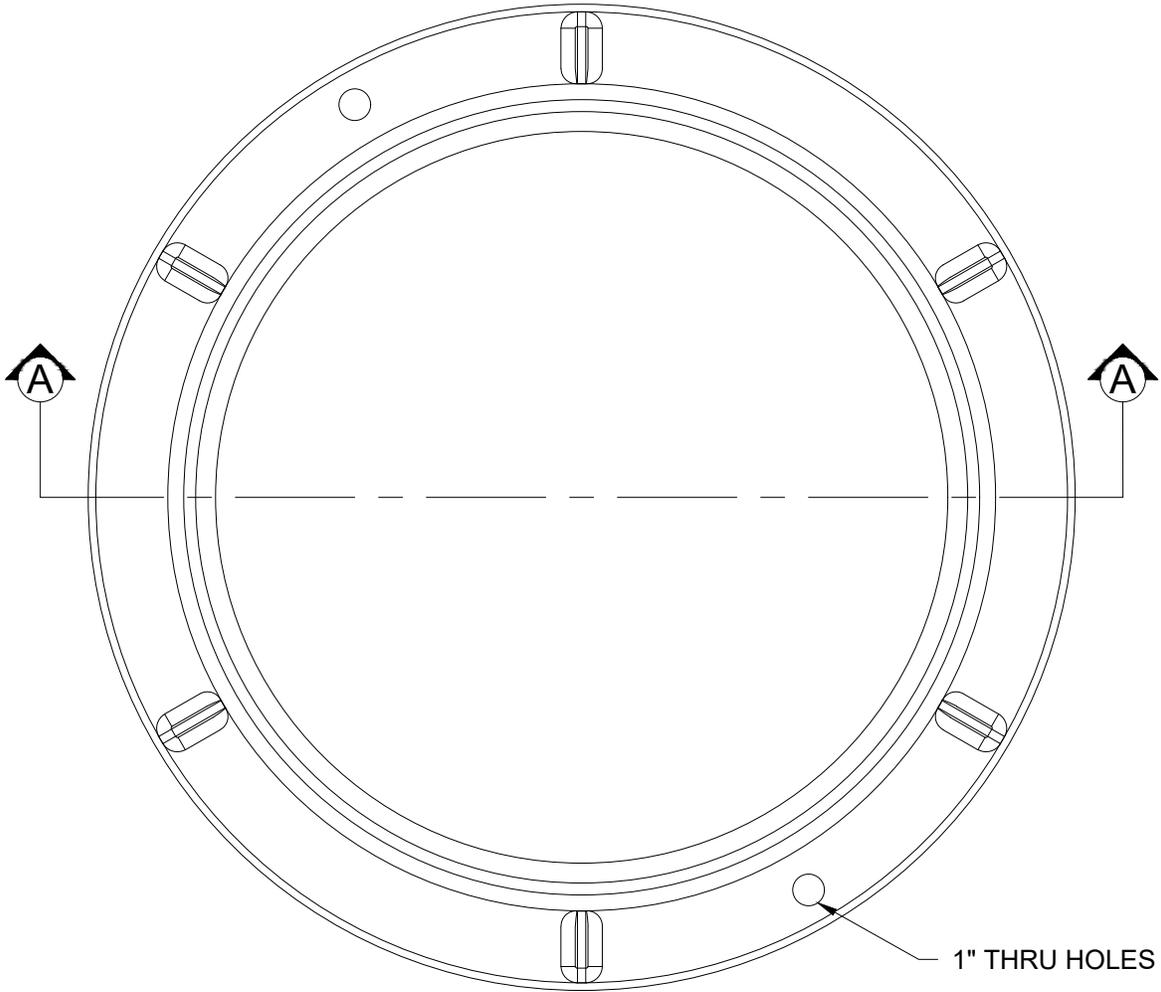
DRAWN **KCK**

REV. DATE **JAN 2019**

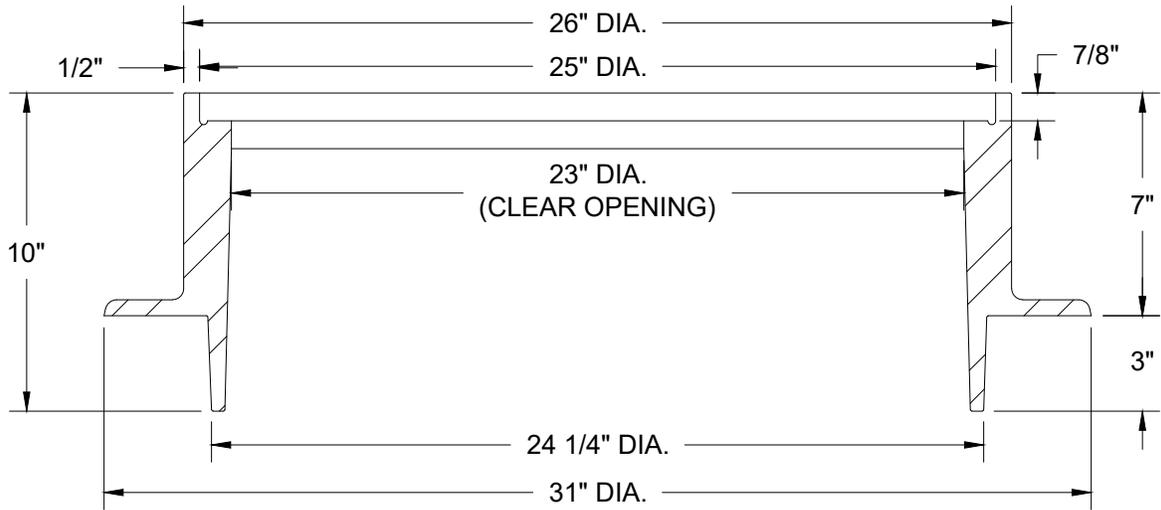
APPR. *[Signature]*

DETAIL NO. **205A**

FILENAME: y:\inter-departmental\development engineering projects\public works standards\200 pws revision copy\details\200\_general\general cad\205b.dwg, Plotted 11/24/2025 8:36 AM, By: Anthony Dollowitch, ANSI FULL BLEED A (8.50 X 11.00 INCHES)



**PLAN**



**SECTION A-A**

**NOTES:**

1. MANHOLE FRAME MANUFACTURED BY EJ, PRODUCT NUMBER 2603Z2, OR APPROVED EQUAL.
2. MATERIAL TO BE GRAY CAST IRON ASTM A48, CLASS 30.
3. TO BE USED IN ASPHALT GREATER THAN 4" IN DEPTH.

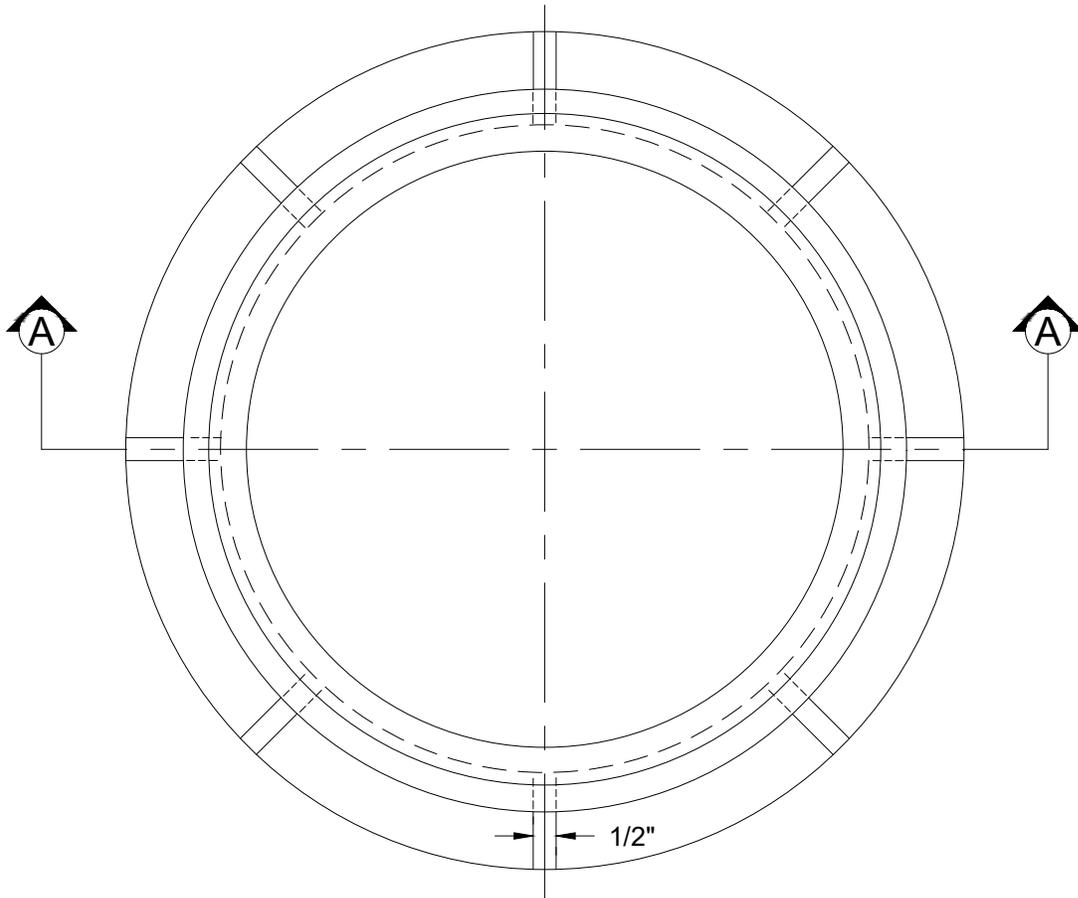
**CITY OF  
GRESHAM**

**STANDARD MANHOLE STRAIGHT WALL FRAME**

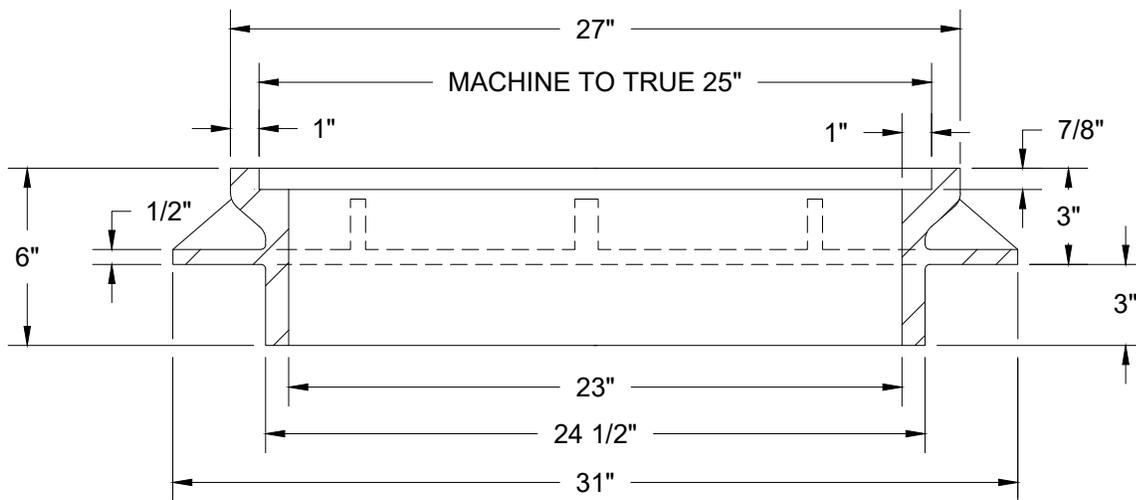
PWS VERSION: JAN 2026

DRAWN	KRB
REV. DATE	NOV 2025
APPR.	<i>[Signature]</i>
DETAIL NO.	205B

FILENAME: y:\inter-departmental\development engineering projects\public works standards\200 pws revision copy\details\200\_general\general cad\206a.dwg, Plotted 11/24/2025 8:36 AM, By: Anthony Dollowitch, ANSI FULL BLEED A (8.50 X 11.00 INCHES)



**PLAN SECTION**



**SECTION A-A**

**NOTES:**

- 1. THIS MANHOLE FRAME MAY BE USED ONLY FOR LOCAL ROAD LOCATIONS.
- 2. MATERIAL TO BE GRAY CAST IRON ASTM A48, CLASS 30. APPROX. WEIGHT = 172 LBS.

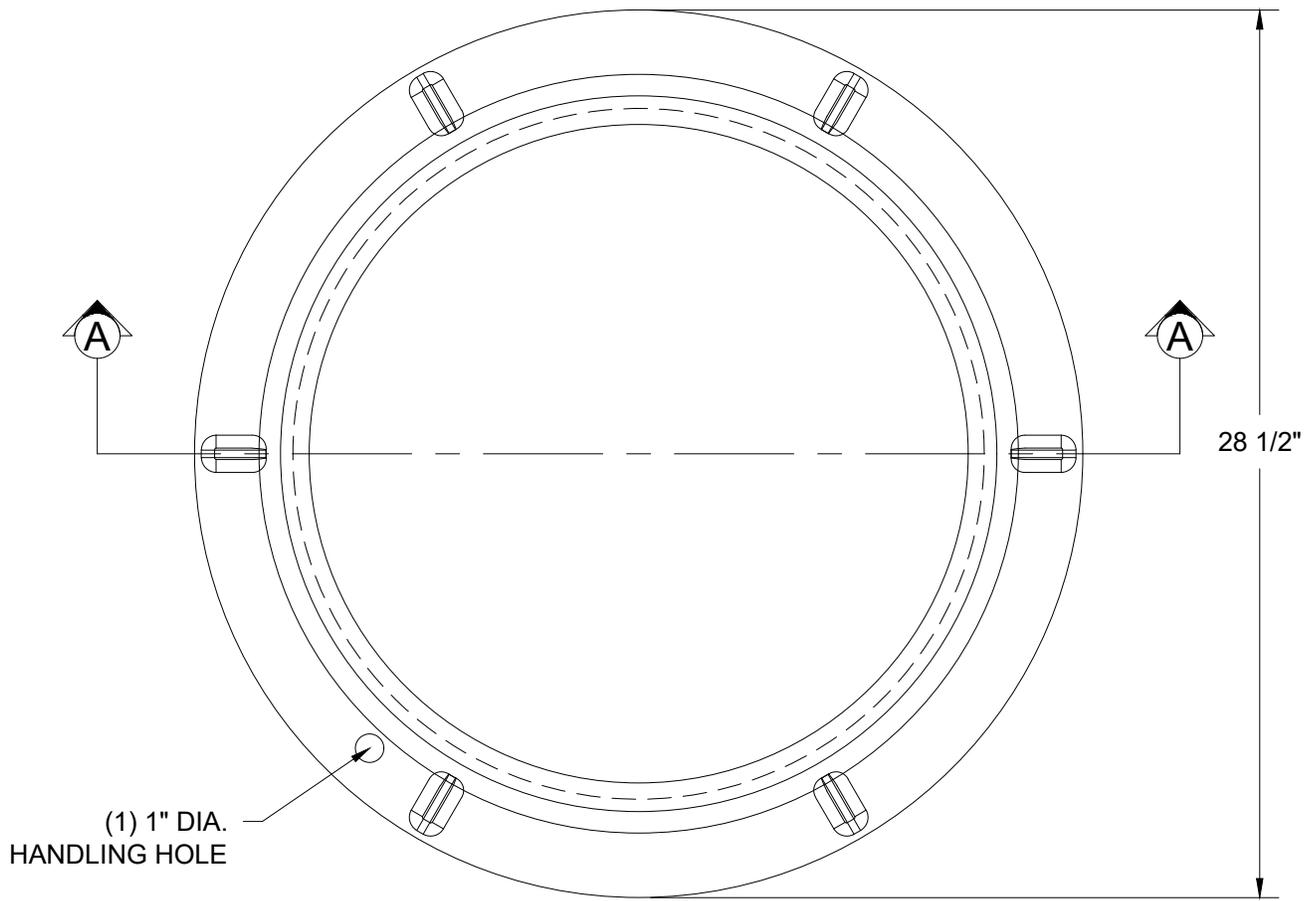
**CITY OF GRESHAM**

**SUBURBAN MANHOLE FRAME**

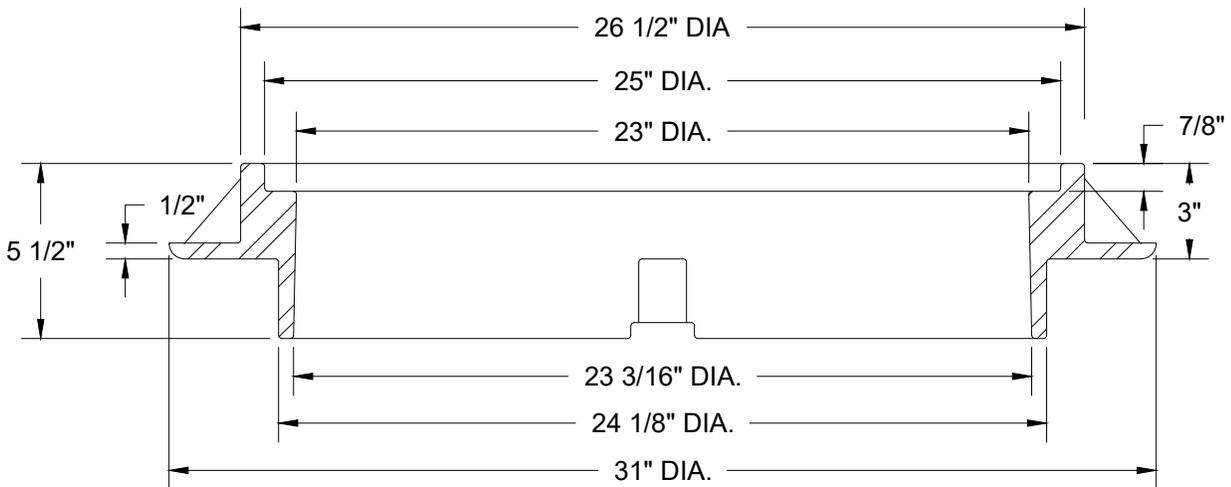
PWS VERSION: JAN 2026

DRAWN	KCK
REV. DATE	JAN 2019
APPR.	<i>[Signature]</i>
DETAIL NO.	206A

FILENAME: y:\inter-departmental\development engineering projects\public works standards\200 pws revision copy\details\200\_general\general cad\206b.dwg, Plotted 11/24/2025 8:36 AM, By: Anthony Dollowitch, ANSI FULL BLEED A (8.50 X 11.00 INCHES)



### PLAN SECTION



### SECTION A-A

#### NOTES:

1. THIS MANHOLE FRAME MAY BE USED ONLY FOR LOCAL ROAD LOCATIONS.
2. MANHOLE FRAME MANUFACTURED BY EJ, PRODUCT NUMBER 2601Z, OR APPROVED EQUAL.
3. MATERIAL TO BE GRAY CAST IRON ASTM A48, CLASS 30.

CITY OF  
GRESHAM

SUBURBAN MANHOLE STRAIGHT WALL FRAME

PWS VERSION: JAN 2026

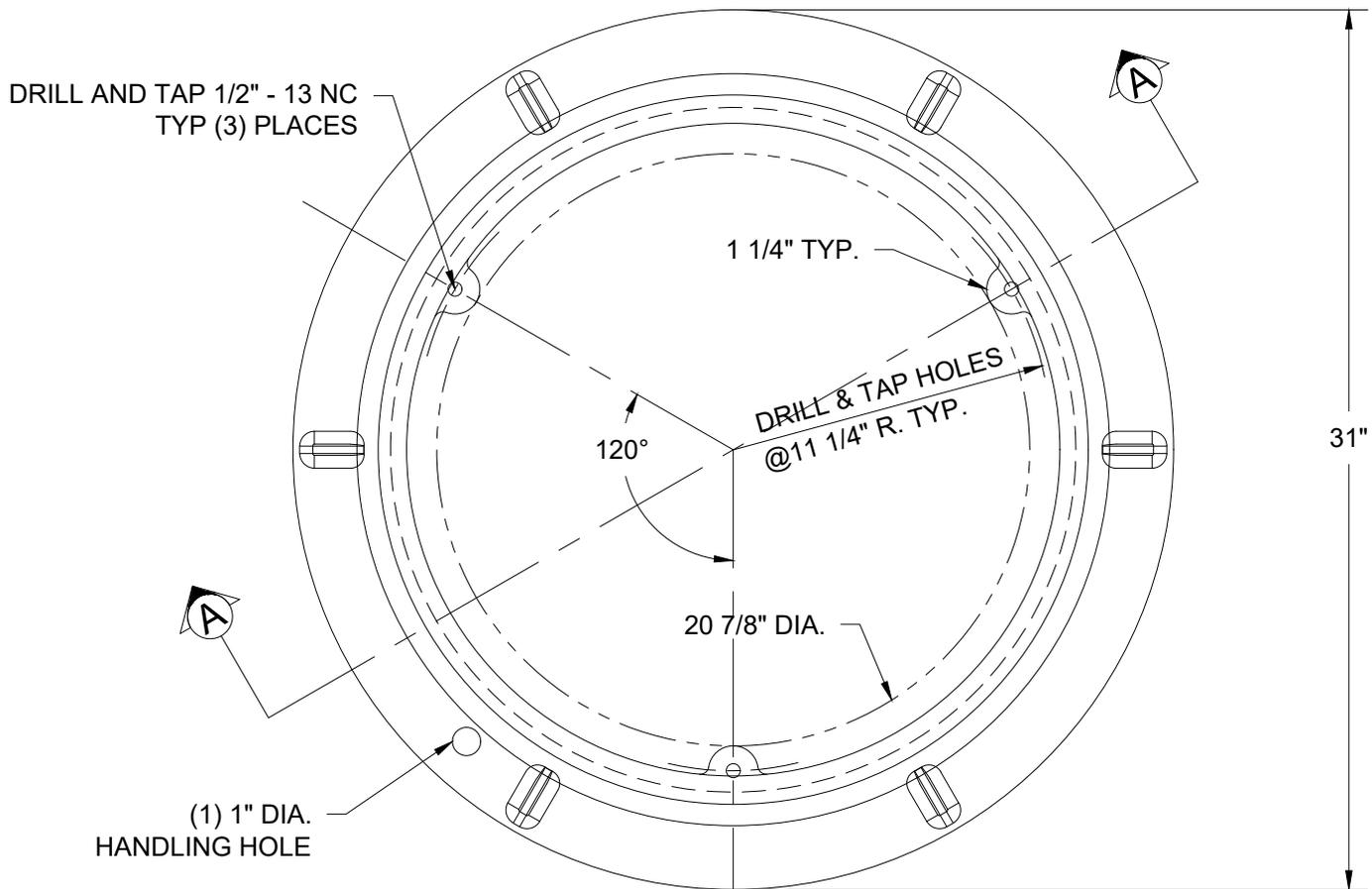
DRAWN AAD

REV. DATE NOV 2025

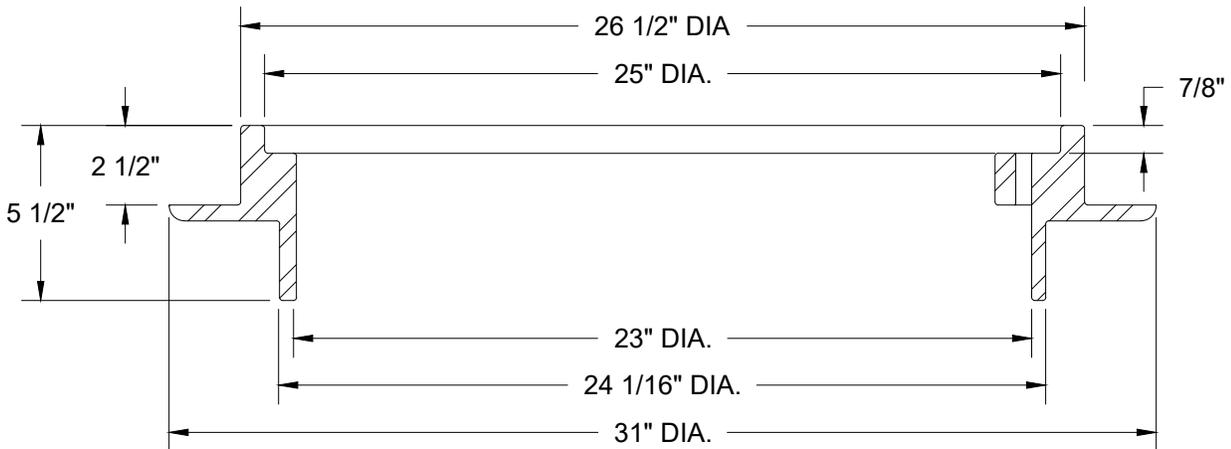
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DETAIL NO. 206B

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**PLAN SECTION**



**SECTION A-A**

**NOTES:**

1. THIS MANHOLE FRAME MAY BE USED ONLY FOR LOCAL ROAD LOCATIONS.
2. MANHOLE FRAME MANUFACTURED BY EJ, PRODUCT NUMBER 2601ZPT, OR APPROVED EQUAL.
3. MATERIAL TO BE GRAY CAST IRON ASTM A48, CLASS 30. APPROXIMATE WEIGHT = 172 LBS
4. ONE BOLT DOWN TAB MUST BE ORIENTED DIRECTLY OVER CENTER OF MANHOLE STEPS

**CITY OF GRESHAM**

**SUBURBAN TAMPERPROOF AND WATERTIGHT MANHOLE STRAIGHT WALL FRAME**

PWS VERSION: JAN 2026

DRAWN AAD

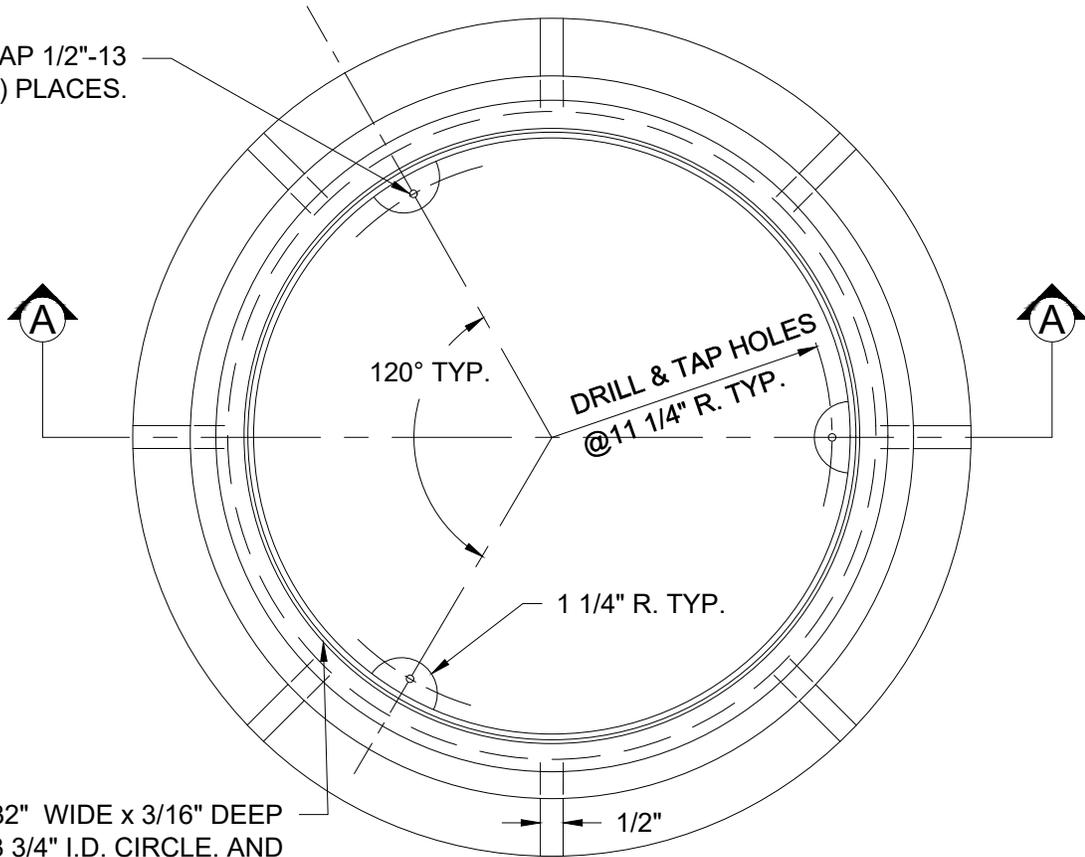
REV. DATE NOV 2025

APPR. *[Signature]*

DETAIL NO. 206C

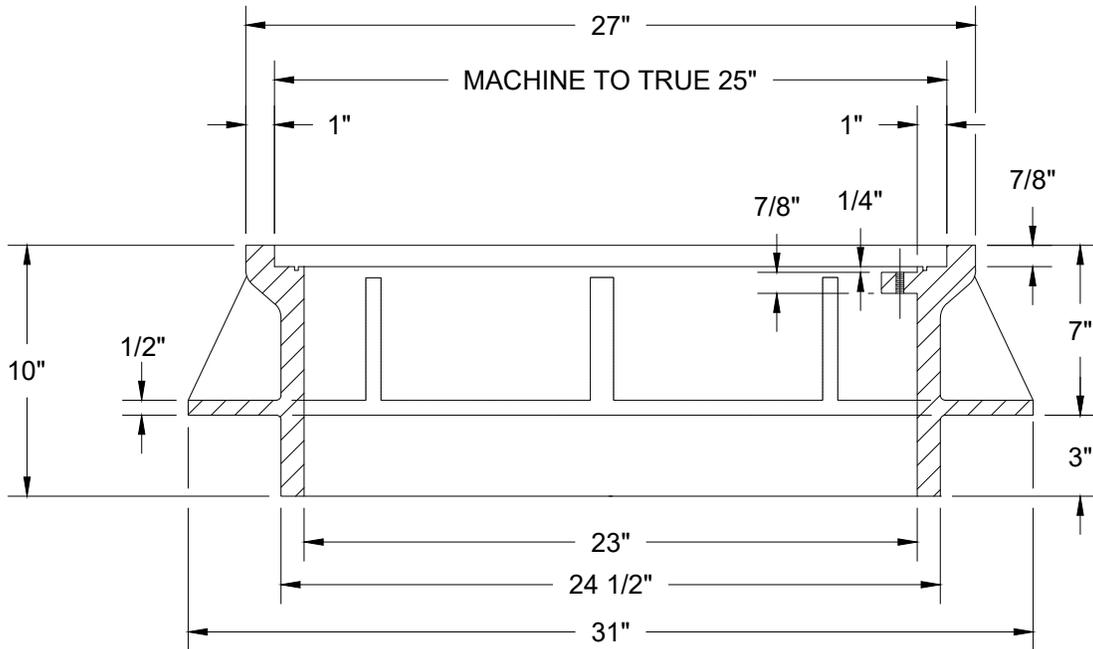
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DRILL AND TAP 1/2"-13 NC, TYPICAL (3) PLACES.



MACHINE 9/32" WIDE x 3/16" DEEP GROOVE ON 23 3/4" I.D. CIRCLE. AND INSTALL 23 3/4" I.D., 1/4" WIDE X 1/4" DEEP NEOPRENE GASKET.

**PLAN**



**SECTION A-A**

**NOTE:**

1. MATERIAL TO BE GRAY CAST IRON ASTM A48, CLASS 30. APPROXIMATE WEIGHT = 237 (INDUSTRIAL)
2. TO BE USED IN ASPHALT GREATER THAN 4" IN DEPTH .
3. ONE BOLT DOWN TAB MUST BE ORIENTED DIRECTLY OVER CENTER OF MANHOLE STEPS

**CITY OF GRESHAM**

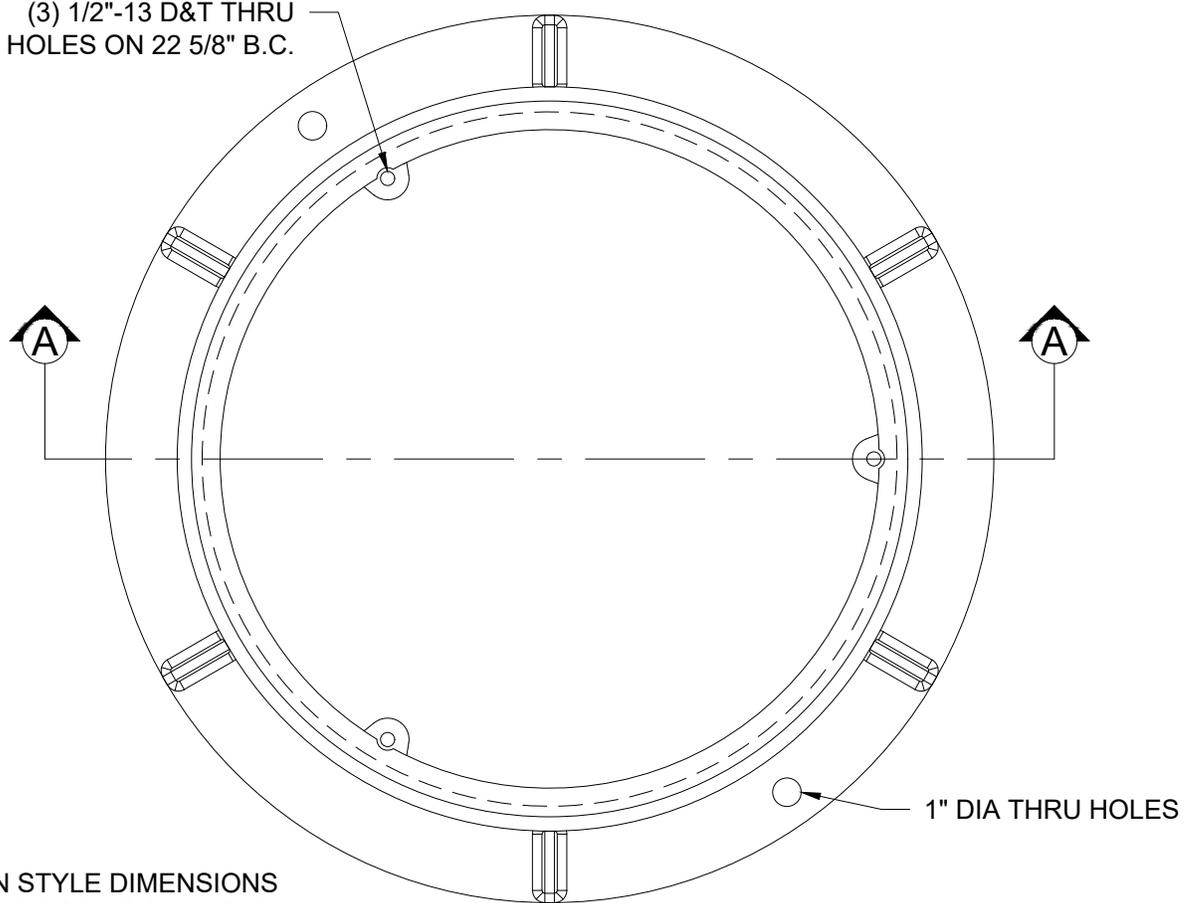
**TAMPERPROOF AND WATERTIGHT MANHOLE FRAME**

PWS VERSION: JAN 2026

DRAWN	AAD
REV. DATE	NOV 2025
APPR.	<i>[Signature]</i>
DETAIL NO.	207A

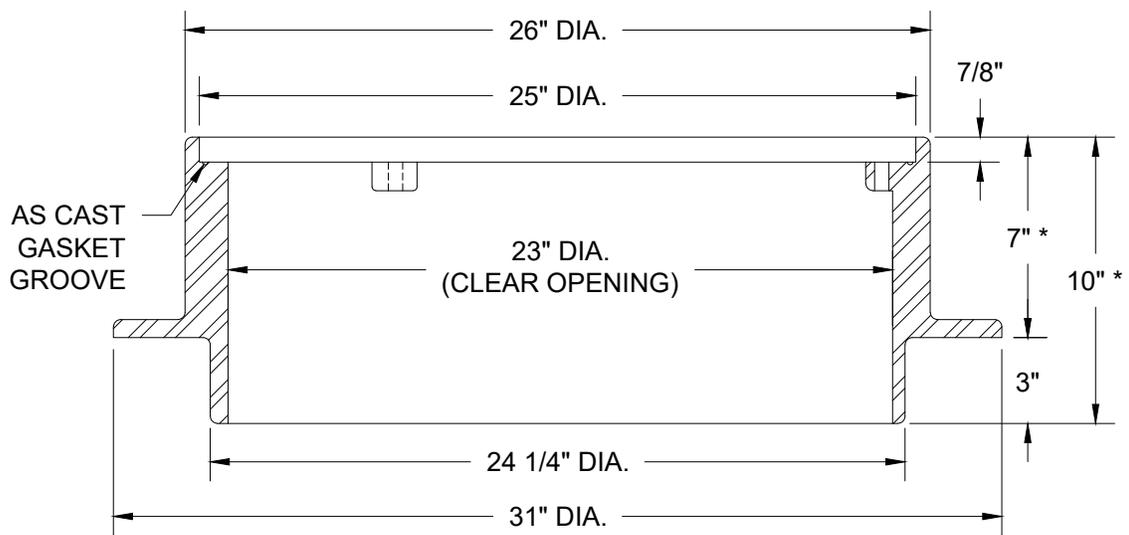
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(3) 1/2"-13 D&T THRU HOLES ON 22 5/8" B.C.



\* SUBURBAN STYLE DIMENSIONS MAY BE USED FOR LOCAL ROAD INSTALLATION. SEE DETAIL 206C.

**PLAN**



**SECTION A-A**

**NOTE:**

- 1. MATERIAL TO BE GRAY CAST IRON ASTM A48, CLASS 30.
- 2. MANHOLE FRAME MANUFACTURE BY EJ, PRODUCT NUMBER 2603Z2PT, OR APPROVED EQUAL.

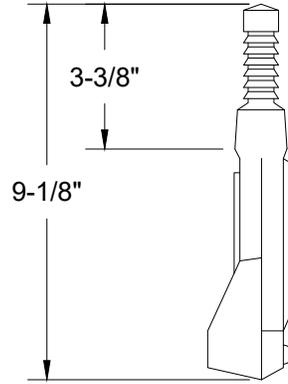
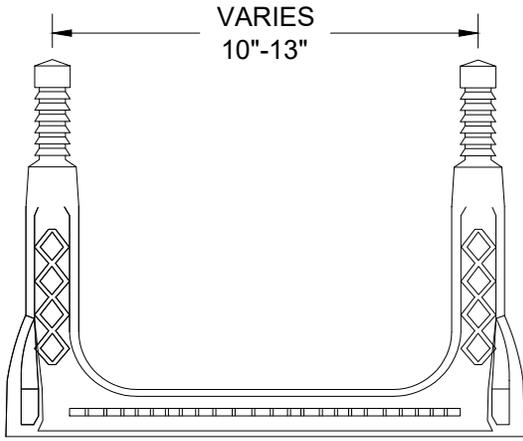


**STANDARD TAMPERPROOF AND WATERTIGHT MANHOLE STRAIGHT WALL FRAME**

PWS VERSION: JAN 2026

DRAWN	KRB
REV. DATE	JAN 2024
APPR.	<i>[Signature]</i>
DETAIL NO.	207B

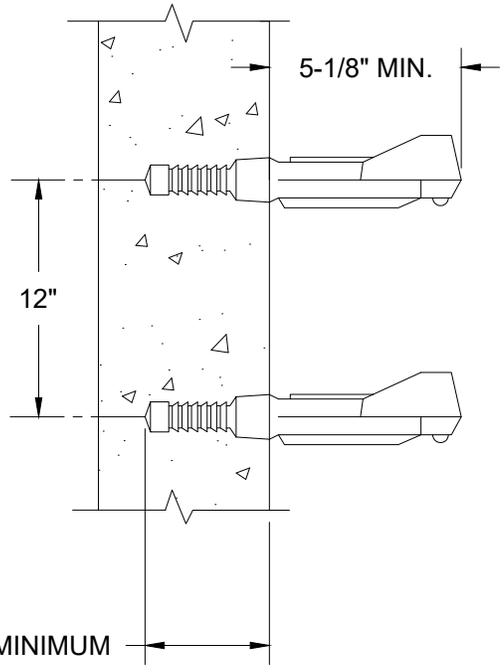
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COPOLYMER POLYPROPYLENE PLASTIC



1/2" GRADE 60 REINFORCEMENT



**NOTE:**

MANHOLE STEPS MUST BE TIGHT AND FIRMLY EMBEDDED. THEY MUST ALSO MEET THE ASTM TEST FOR WITHSTANDING PULLING OUT.

**MATERIALS:**

PLASTIC: MUST CONFORM WITH ASTM C478.  
STEEL REINFORCING BAR MINIMUM 1/2" GRADE 60 MEETING REQUIREMENTS OF ASTM A615  
ENCAPSULATED WITH INJECTION MOLDED COPOLYMER POLYPROPYLENE WITH SERRATED SURFACES.

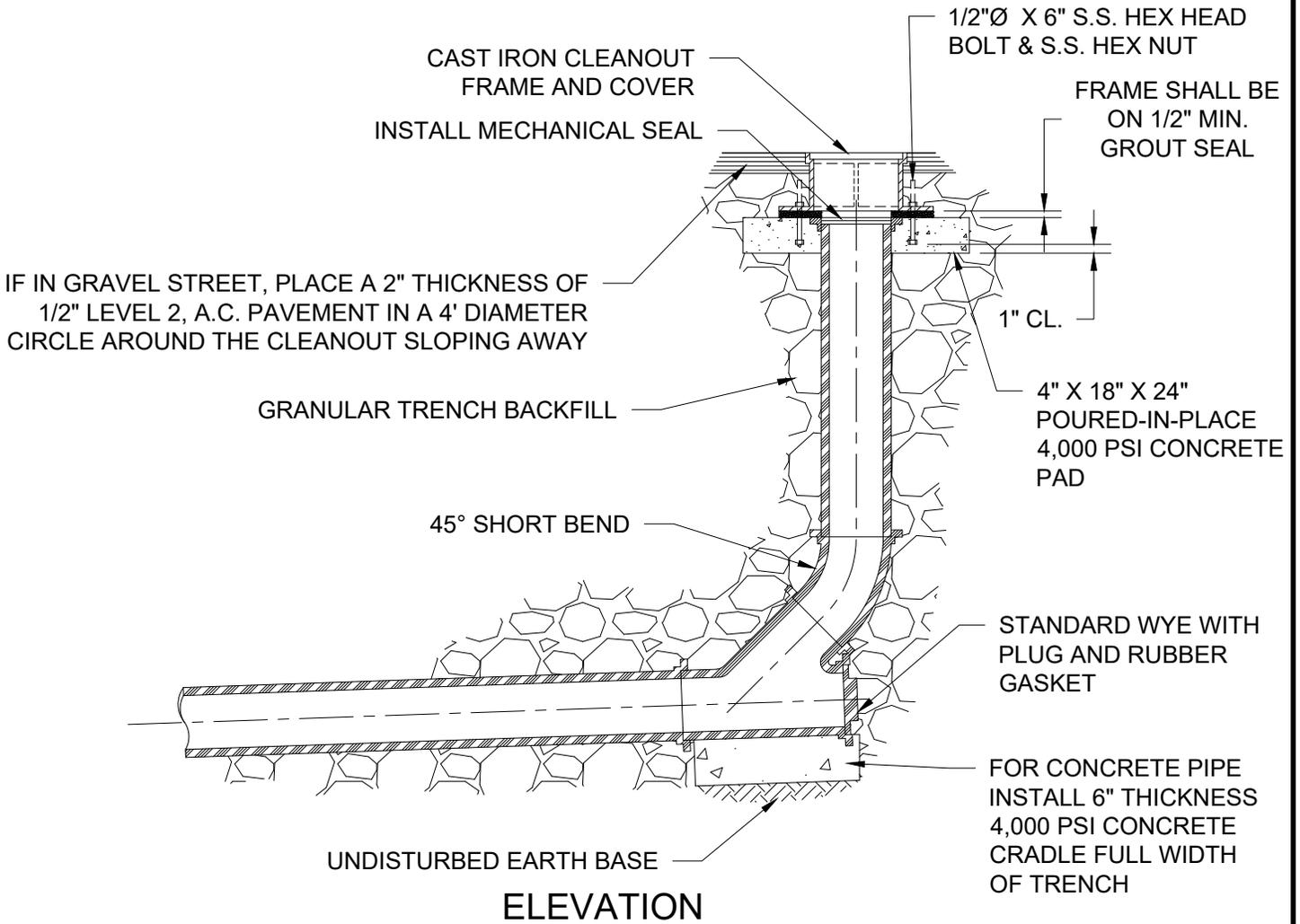
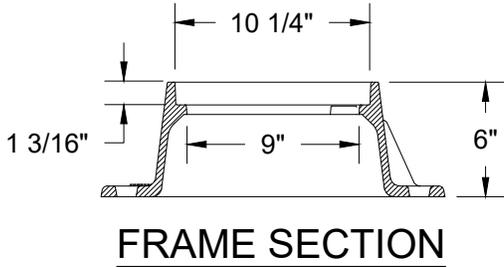
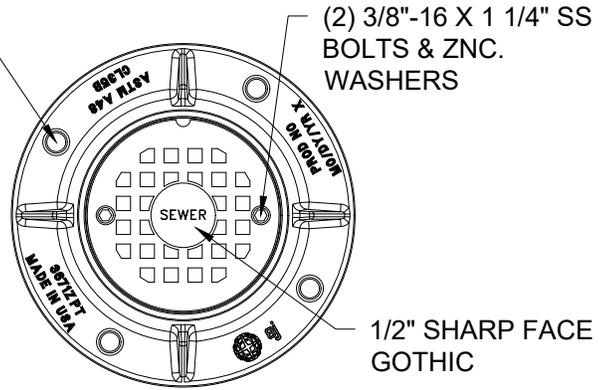
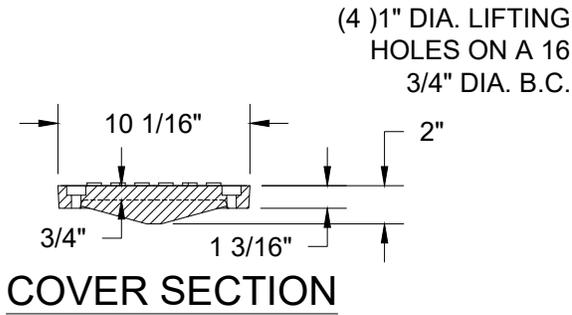


**MANHOLE STEP**

PWS VERSION: JAN 2026

DRAWN	KCK
REV. DATE	JAN 2020
APPR.	
DETAIL NO.	210

FILENAME: y:\inter-departmental\development engineering projects\public works standards\200 pws revision copy\details\200\_general\general cad\211.dwg, Plotted 11/24/2025 8:37 AM, By: Anthony Dolloiwitch, ANSI FULL BLEED A (8.50 X 11.00 INCHES)



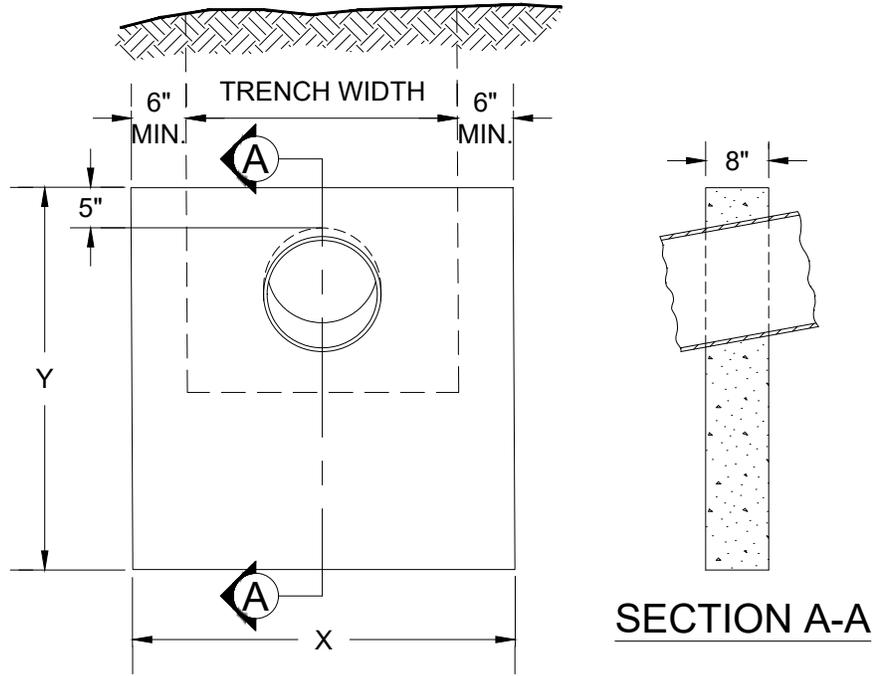
**CITY OF GRESHAM**

**STANDARD CLEANOUT**

PWS VERSION: JAN 2026

DRAWN	KCK
REV. DATE	JAN 2024
APPR.	<i>[Signature]</i>
DETAIL NO.	211

FILENAME: y:\inter-departmental\development\_engineering\_projects\public\_works\_standards\20\_pws\_revision\_copy\details\200\_general\general\_cad\212.dwg, Plotted 11/24/2025 8:37 AM, By: Anthony Dollowitch, ANSI FULL BLEED A (8.50 X 11.00 INCHES)



DIMENSION TABLE			
PIPE DIA.	X, MIN. (ft)	Y (ft)	MIN VOL (CY)
6" TO 10"	4	3	0.29
12" TO 15"	4	4	0.37
18" TO 24"	5	4	0.42
> 24"	TO BE DETERMINED BY ENGINEER OF RECORD		

**NOTES:**

1. ALL CONCRETE SHALL BE 4,000 PSI 28 DAY COMPRESSIVE STRENGTH, WITH 2" TO 4" SLUMP.
2. ANCHOR WALLS MUST BE USED WITH PIPES WITH SLOPES OVER 20%. ANCHOR WALLS TO BE EQUALLY SPACED. PROPORTION SPACING WITH SLOPE.

PIPE SLOPE	WALL SPACING
20%	21'
100%	12'
> 100%	NOT ALLOWED

3. PLACE WALL IMMEDIATELY BELOW BELL OF PIPE WHERE POSSIBLE.

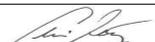
**CITY OF  
GRESHAM**

**PIPE ANCHOR WALL**

PWS VERSION: JAN 2026

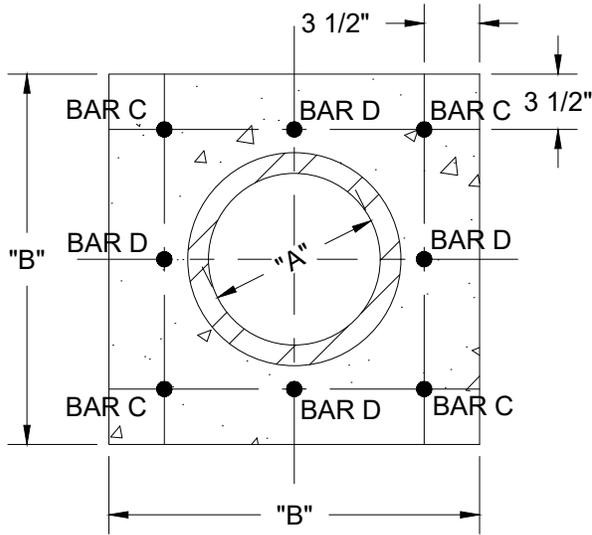
DRAWN **KCK**

REV. DATE **JAN 2024**

APPR. 

DETAIL NO. **212**

FILENAME: y:\inter-departmental\development engineering projects\public works standards\200 pws revision copy\details\200\_general\general cad\213.dwg, Plotted 11/24/2025 8:37 AM, By: Anthony Dollowitch, ANSI FULL BLEED A (8.50 X 11.00 INCHES)



DIMENSIONS (IN.)		BARS REQ'D
"A"	"B"	
6	16	C
8	19	C
10	21	C
12	23	C
15	26 1/2	C
18	30 1/2	C
21	39	C & D
24	43	C & D
27	50	C & D

VERTICAL SECTION

NOTES:

1. ALL CONCRETE SHALL BE 4,000 PSI, 3" TO 5" SLUMP.
2. STEEL REINFORCING SHALL BE NO. 5 IN CONFORMANCE WITH ASTM A615, GRADE 60, WITH DEFORMATIONS PER ASTM A305.

**CITY OF  
GRESHAM**

**PIPE CONCRETE ENCASEMENT**

PWS VERSION: JAN 2026

DRAWN **KRB**

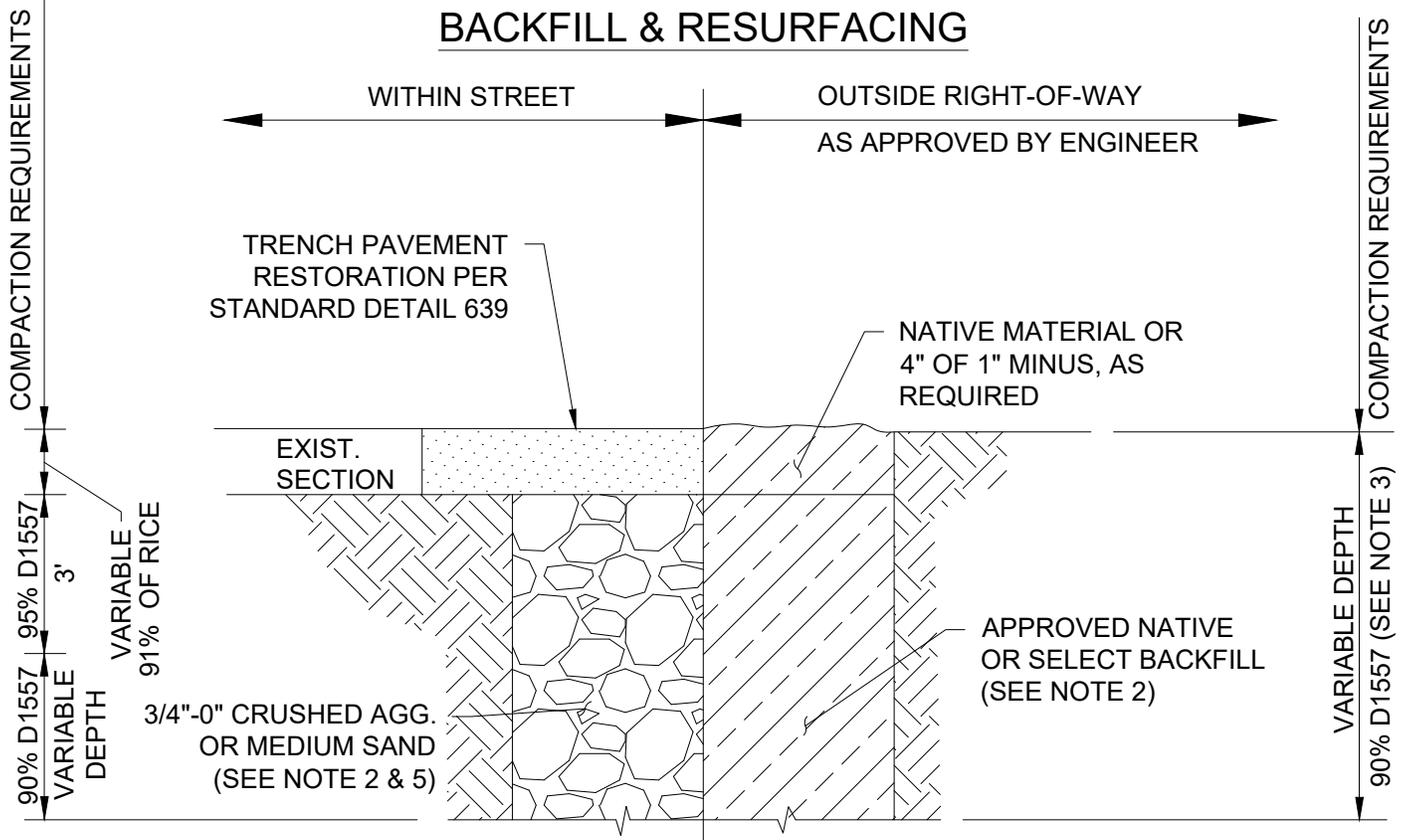
REV. **JAN 2024**  
DATE

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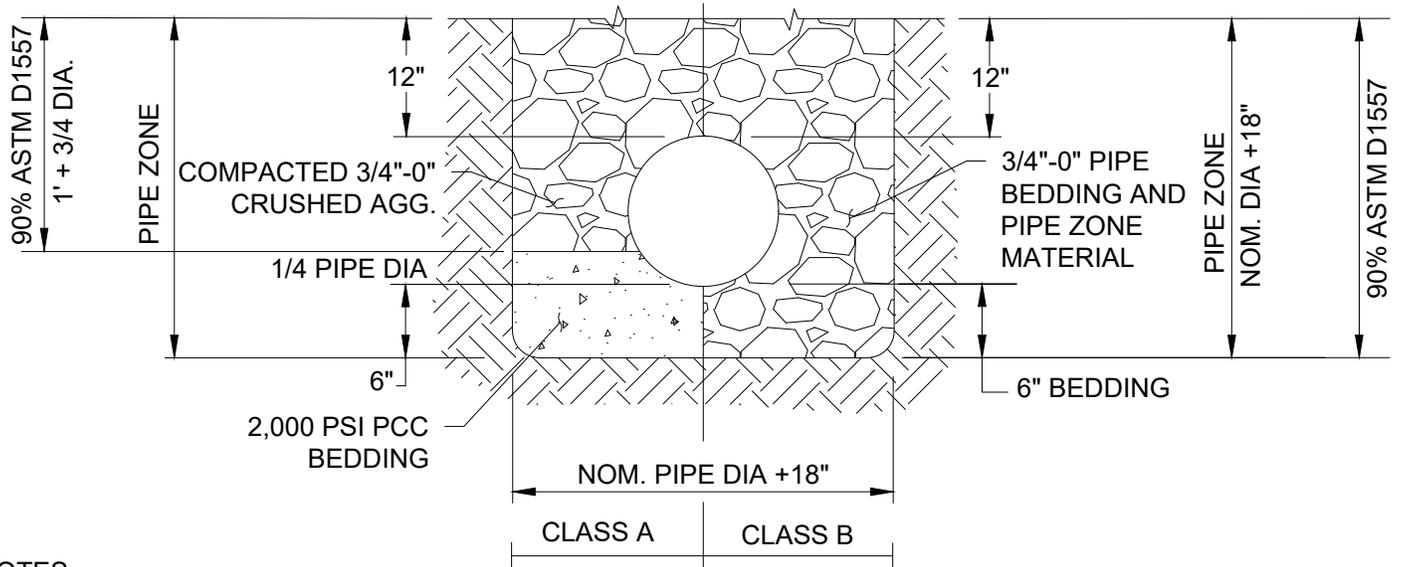
DETAIL NO. **213**

FILENAME: y:\inter-departmental\development\_engineering\projects\public\_works\_standards\200\_general\revision\_copy\details\200\_general\general\_cad\214.dwg, Plotted 11/24/2025 8:37 AM, By: Anthony Dolloiwitch, ANSI FULL BLEED A (8.50 X 11.00 INCHES)

## BACKFILL & RESURFACING



## BEDDING & PIPE ZONE



**NOTES:**

1. WHERE REQUIRED BY THE ENGINEER OF RECORD OR THE CITY, GRANULAR TRENCH STABILIZATION SHALL BE PLACED PRIOR TO THE PIPE ZONE MATERIAL. SIZE AND DEPTH TO BE BASED ON SOIL CONDITIONS.
2. USE CLSM WHERE SPECIFIED AND WHERE REQUIRED BY THE ENGINEER.
3. IN AREAS WHERE NATIVE BACKFILL IS BROUGHT TO THE SURFACE AND IS TO BE SEED, DO NOT COMPACT THE TOP 2".
4. WHERE WATERLINES ARE WRAPPED WITH POLYETHYLENE ENCASEMENT OR EQUIVALENT, SAND SHALL BE USED WITHIN THE ENTIRE PIPE ZONE AREA.
5. MEDIUM SAND NOT FOR USE IN AREAS OF HIGH GROUNDWATER

**CITY OF GRESHAM**

## TRENCH AND BACKFILL

PWS VERSION: JAN 2026

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REV. DATE	OCT 2025
APPR.	
DETAIL NO.	214