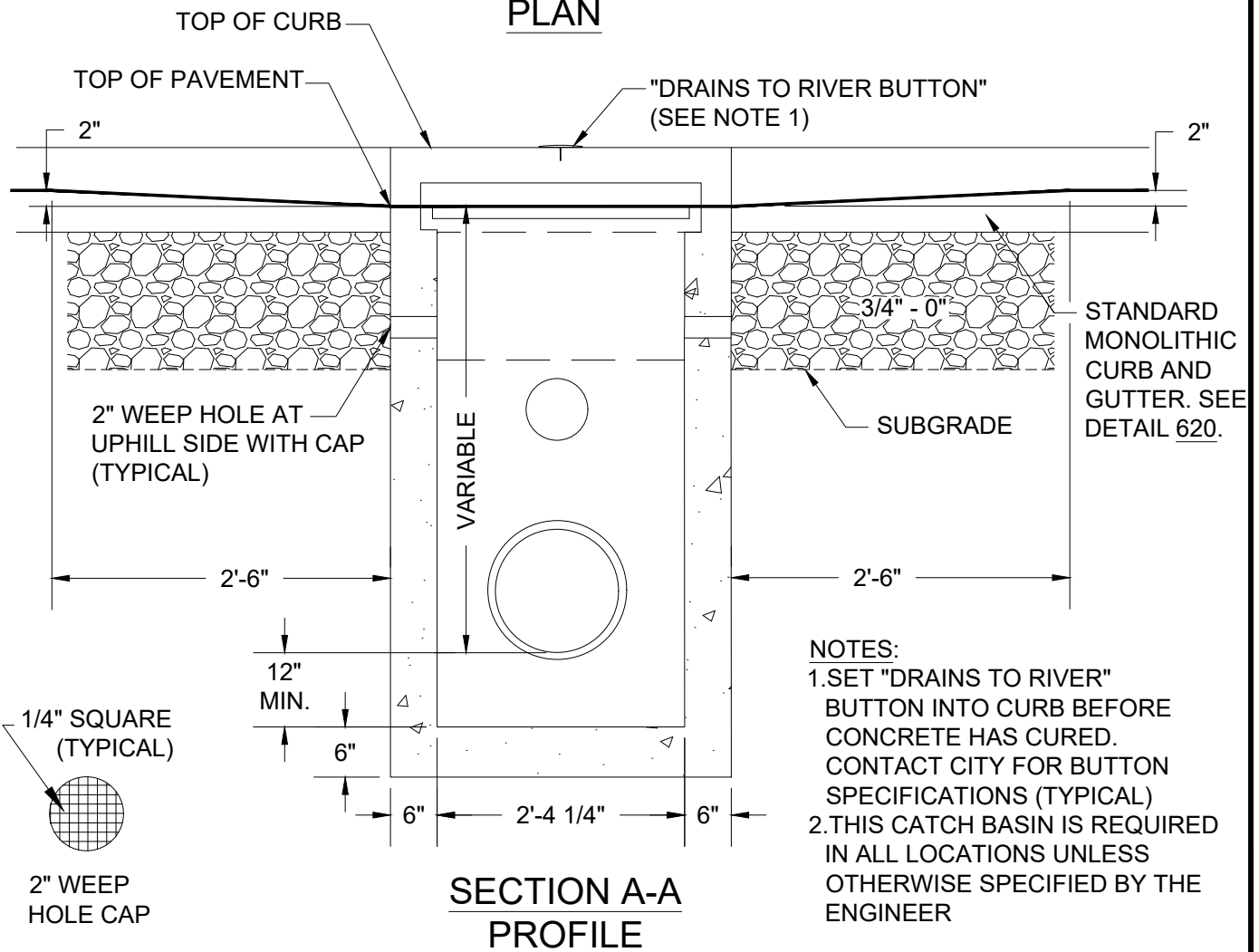
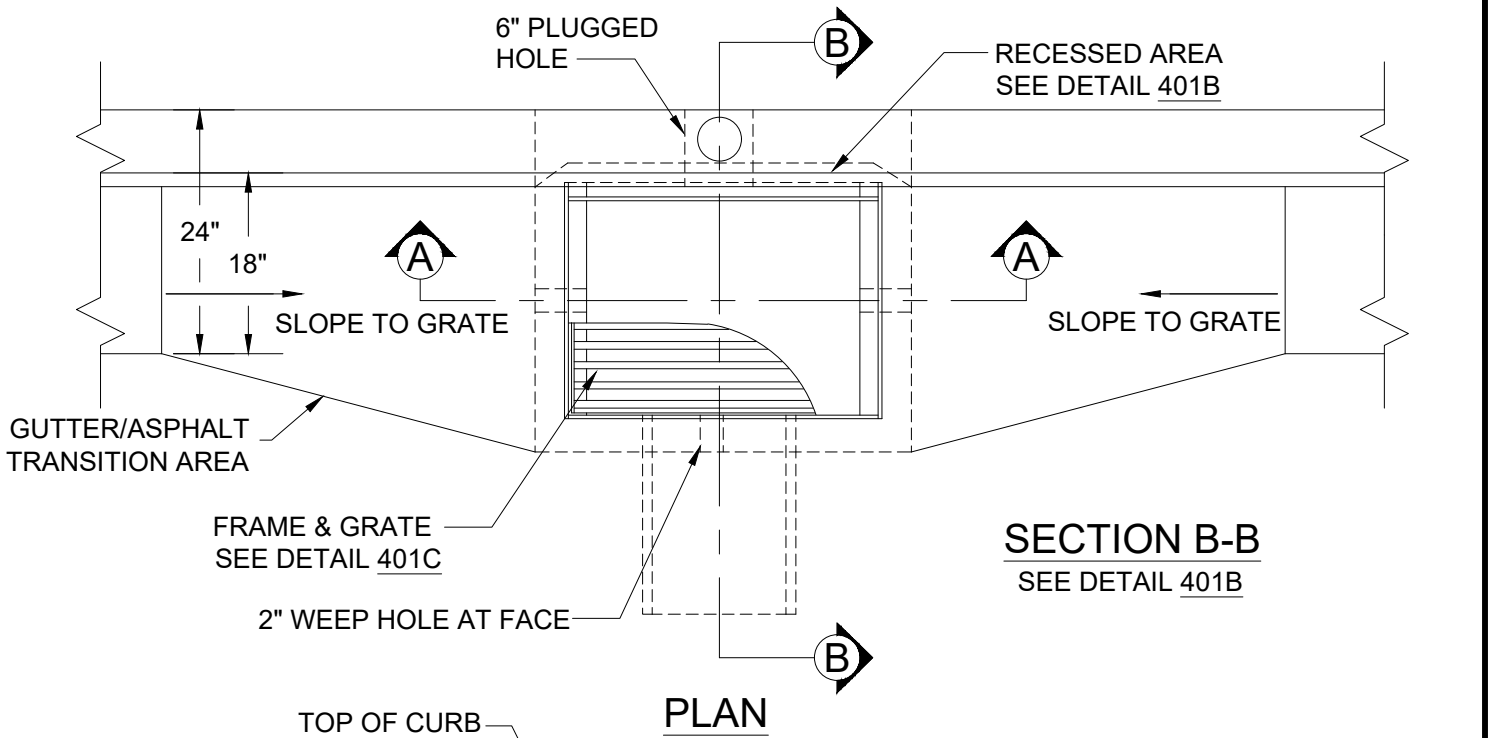


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CITY OF  
GRESHAM

CATCH BASIN

PWS VERSION: JAN 2024

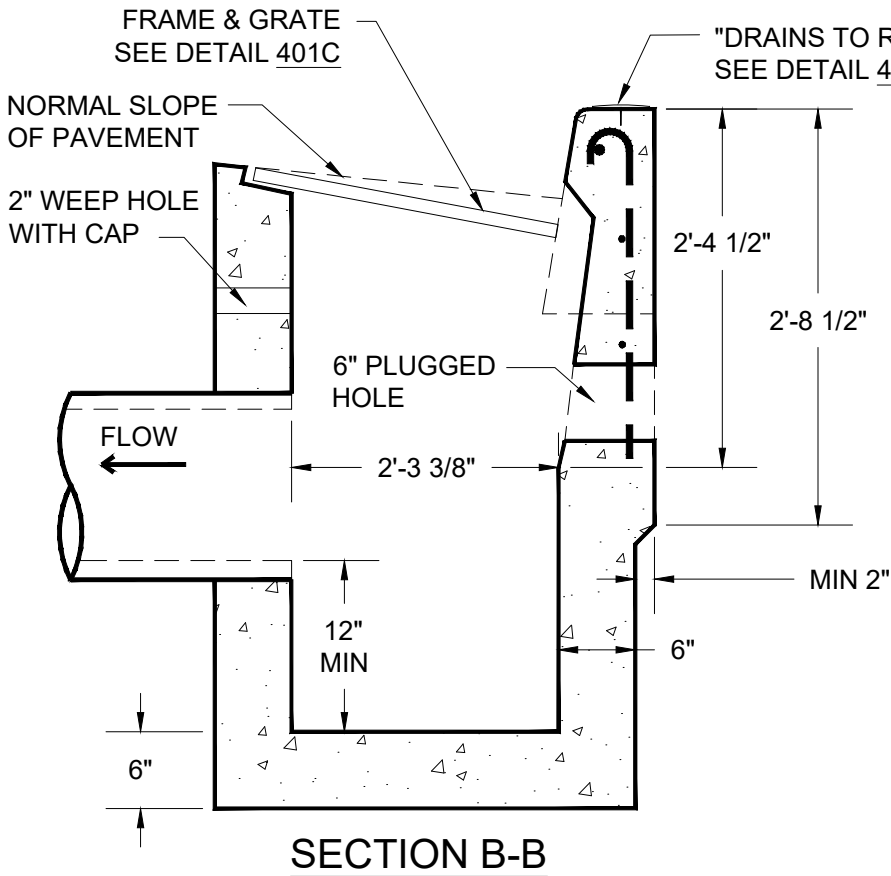
DRAWN CMC

REV. DATE JAN 2019

APPR. *[Signature]*

DETAIL NO. 401A

FILENAME: y:\inter-departmental\development engineering projects\public works standards\20 pws revision copy\details\400\_stormwater\storm\_cad\401b.dwg, Plotted 9/18/2023 1:41 PM, By: Kimberly Bogert, ANSI FULL BLEED A (8.50 X 11.00 INCHES)



**NOTES:**

1. INSTALL 6" DRAIN PIPE SUCH THAT THE TOP OF PIPE IS 6" BELOW GRATE OR ALIGNED WITH THE CROWN OF THE OUTLET, WHICHEVER IS LOWER.
2. IF CATCH BASIN WILL BE PART OF A DRIVEWAY WING, SLANT THE REBAR CAGE AND INLET FORM TO THE SLOPE OF THE TOP OF CURB IN THE WING WHEN POURING THE CATCH BASIN. MAINTAIN THE "Y2" DIMENSION AND DECREASE THE INLET AS NEEDED.
3. IF THE DISTANCE FROM TOP OF CURB TO THE GRATE IS EQUAL TO OR LESS THAN "Y2" NO CURB INLET IS REQUIRED.
4. #3 AND #5 BARS SHALL BE PLACED DURING CURB CONSTRUCTION.
5. ALL BARS SHALL BE PLACED 1 1/2" CLEAR OF NEAREST FACE OF CONCRETE UNLESS SHOWN OR OTHERWISE NOTED.
6. ALL BAR SPLICE LENGTHS SHALL BE A MIN 20".
7. CONCRETE WITH 4,000 PSI STRENGTH AT 28-DAYS SHALL BE USED IN ALL INLET CONSTRUCTION.

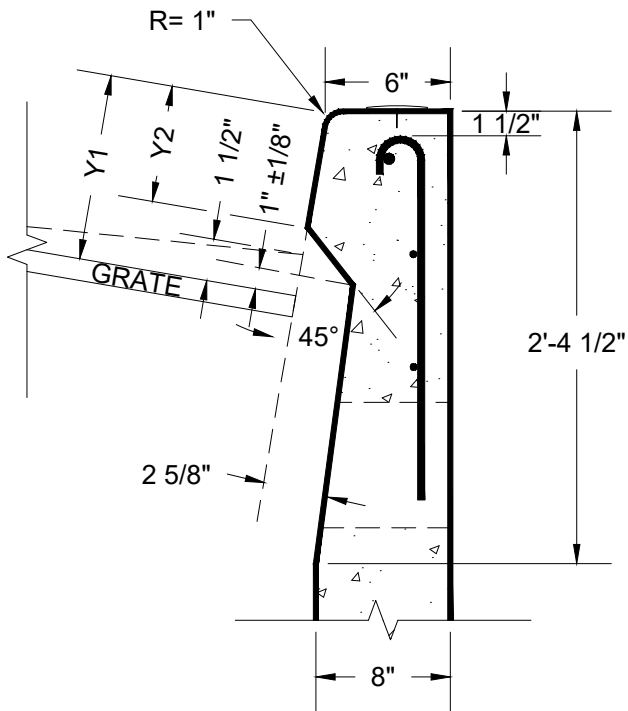
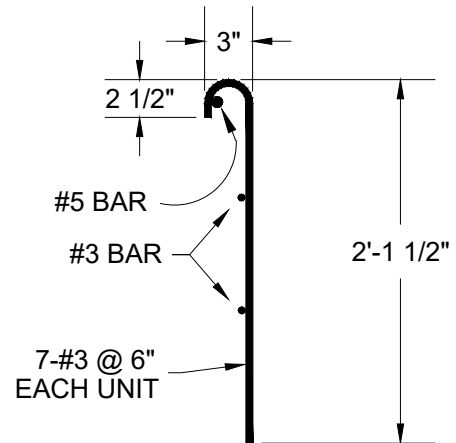


TABLE 601-C	CURB TYPE	
	TYPE 'C'	MONOLITHIC
Y1	8 1/2"	7 1/2"
Y2	5 3/4"±	4 3/4"±



**CITY OF GRESHAM**

**CATCH BASIN SECTION**

PWS VERSION: JAN 2024

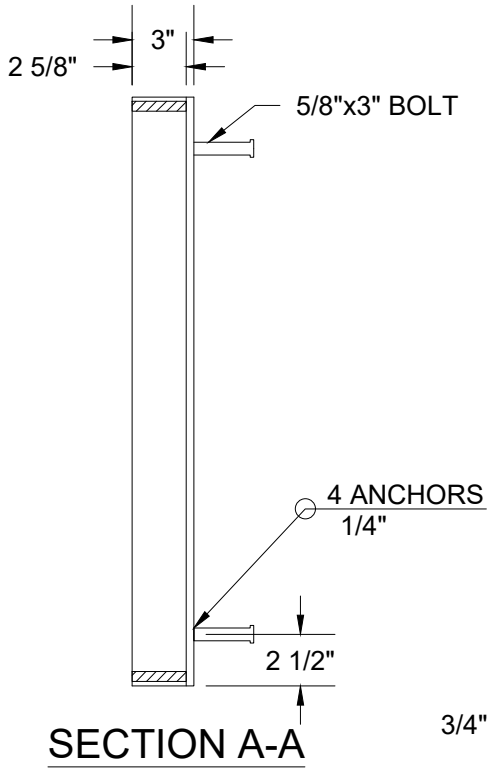
DRAWN RMS

REV. DATE MAR 2021

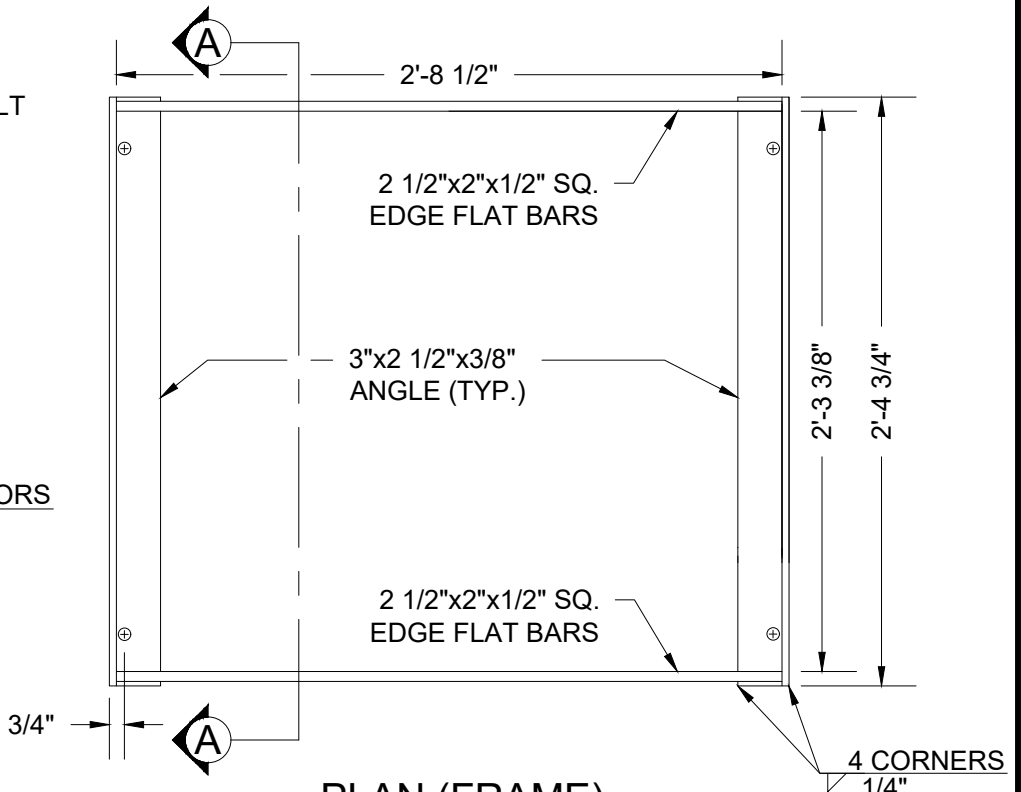
APPR. *[Signature]*

DETAIL NO. 401B

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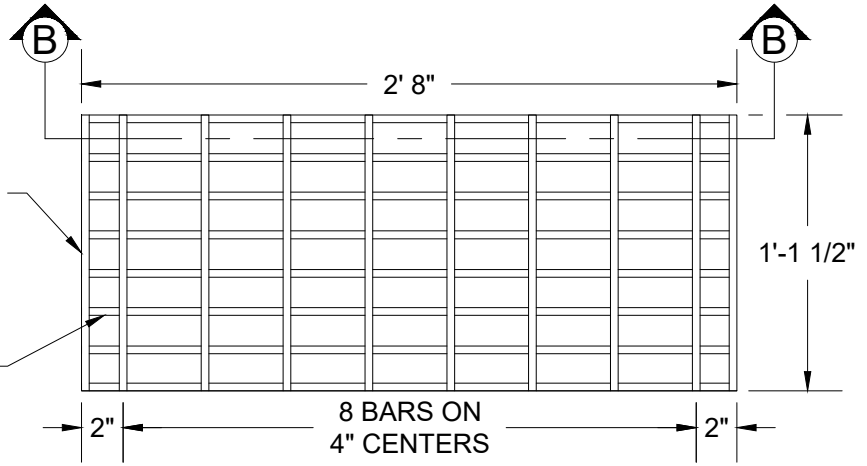


**SECTION A-A**



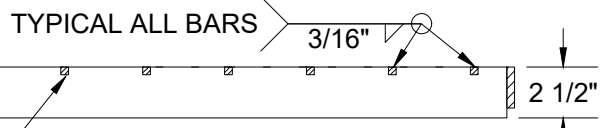
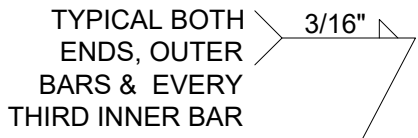
**PLAN (FRAME)**

**NOTE:**  
USE VERTICAL BEADS IN CORNERS, FILLET WELD JOINT ON BOTTOM OF FRAME. GRATE MUST REST FLAT ON FRAME SURFACE.



**PLAN (GRATE)**  
TWO GRATES REQUIRED

3/8"x2 1/2" FLAT BARS @ 1 7/8" O.C. LOAD PER AASHTO H-20 OR AS APPROVED BY ENGINEER



3/8" ROUND OR RECTANGULAR CROSS BARS SHALL BE FILLET WELDED, RESISTANCE WELDED OR ELECTROFORGED TO BEARING BARS

**SECTION B-B**

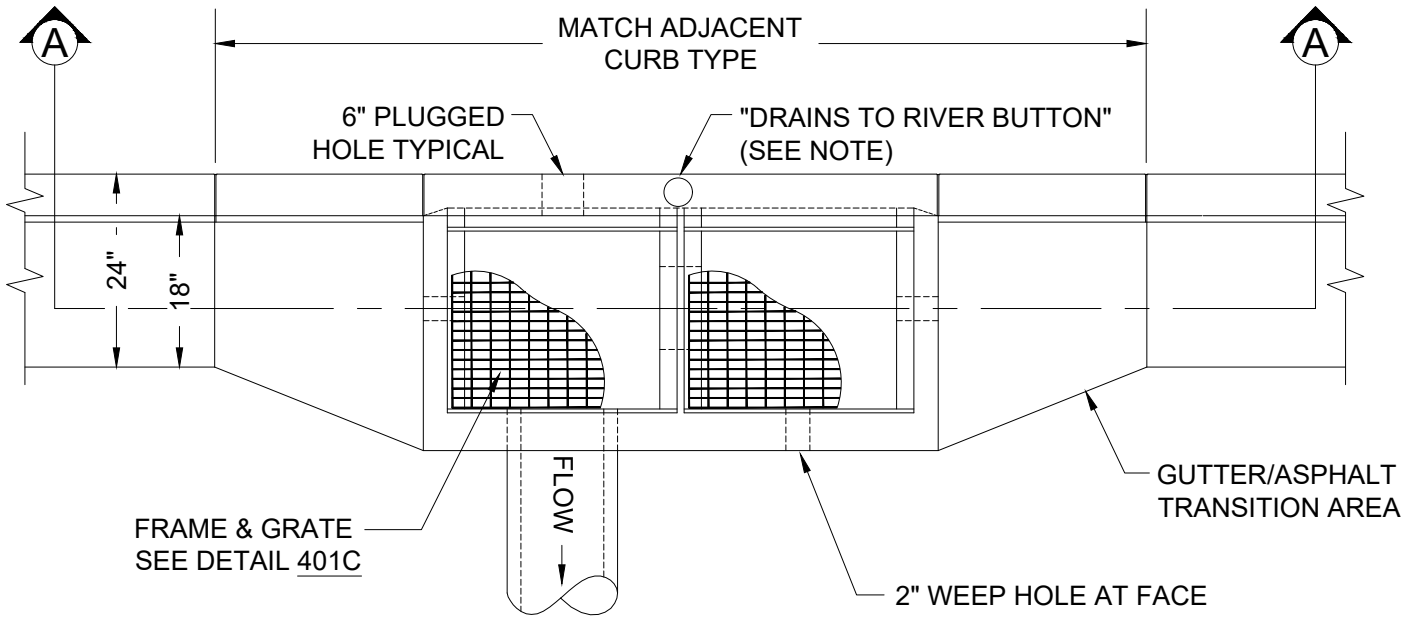
**CITY OF GRESHAM**

**CATCH BASIN FRAME AND GRATE**

PWS VERSION: JAN 2024

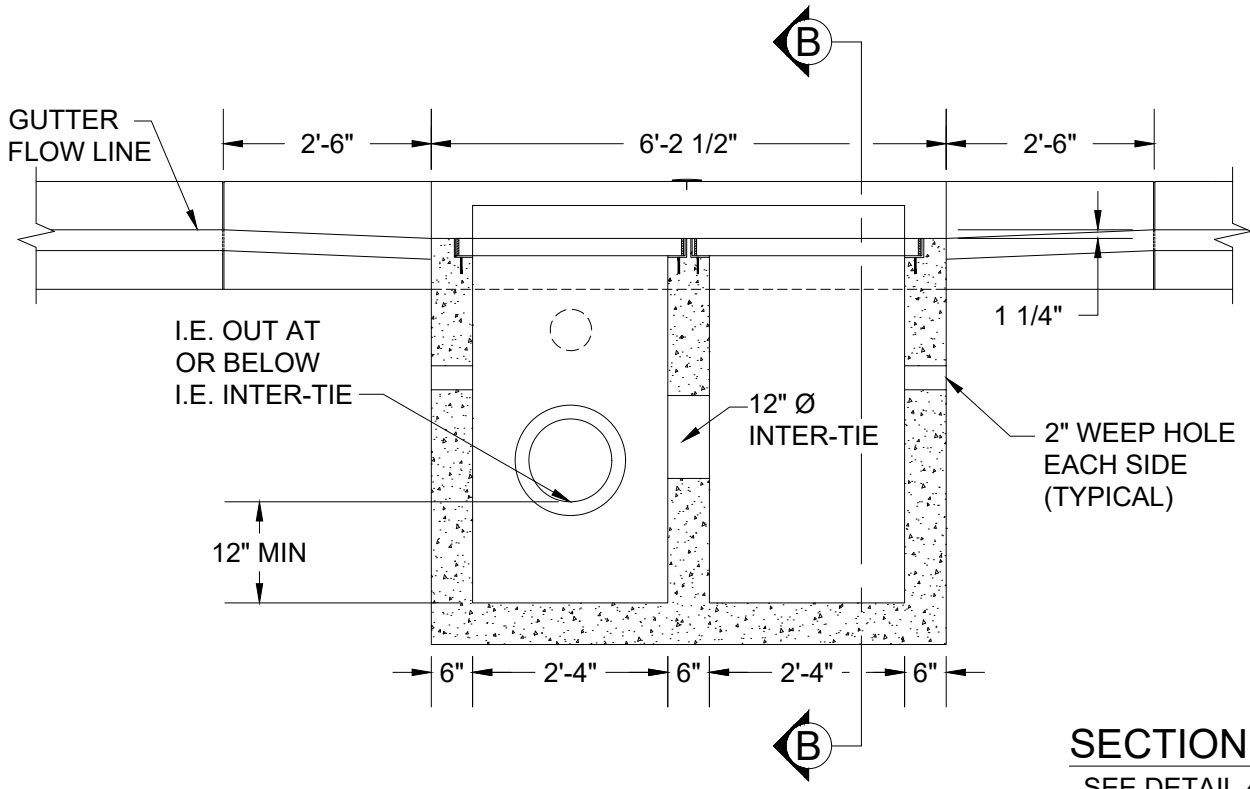
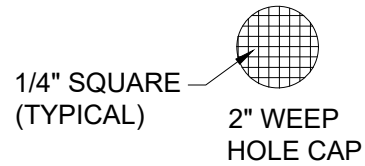
DRAWN	CMC
REV. DATE	JAN 2019
APPR.	<i>[Signature]</i>
DETAIL NO.	401C

FILENAME: y:\inter-departmental\development engineering projects\public works standards\2.0 pws revision copy\details\400\_stormwater\storm\_cad\401.dwg, Plotted 9/18/2023 1:42 PM, By: Kimberly Bogert, ANSI FULL BLEED A (8.50 X 11.00 INCHES)



**PLAN**

**NOTE:**  
 SET "DRAINS TO RIVER" BUTTON INTO CURB BEFORE CONCRETE HAS CURED. CONTACT CITY FOR BUTTON SPECIFICATIONS (TYPICAL)



**SECTION A-A**

**SECTION B-B**  
 SEE DETAIL 401B

**CITY OF GRESHAM**

**DOUBLE CATCH BASIN**

PWS VERSION: JAN 2024

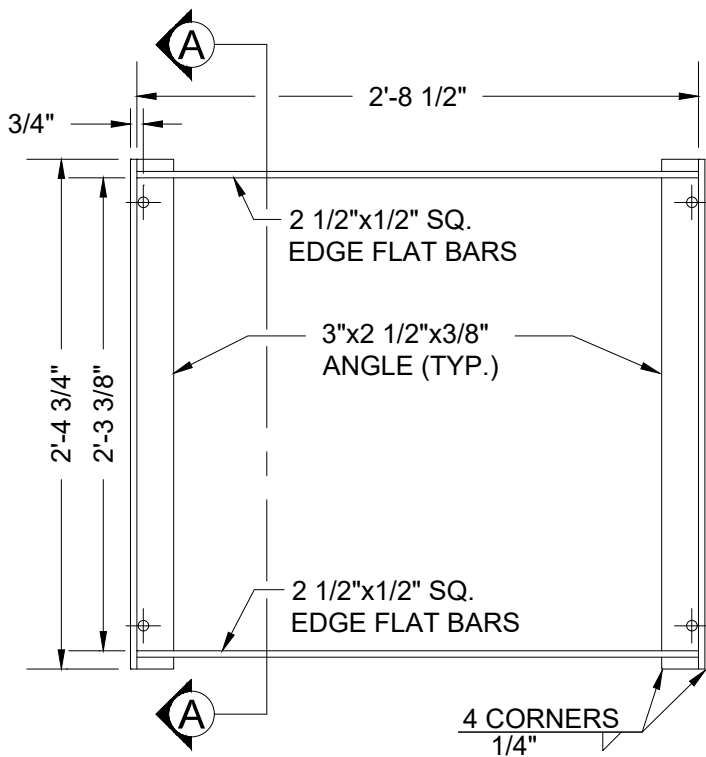
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REV. DATE JAN 2019

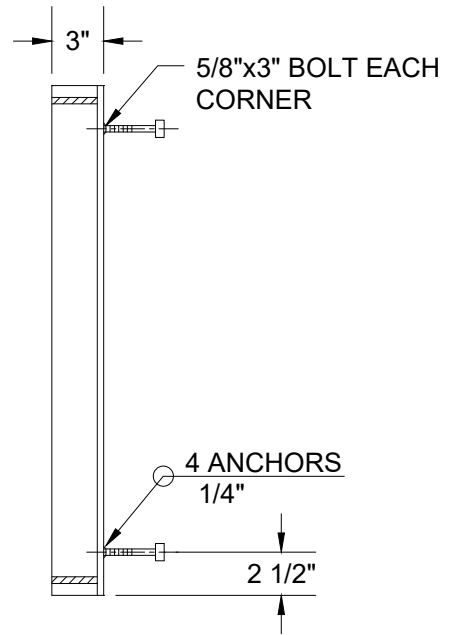
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DETAIL NO. 401D

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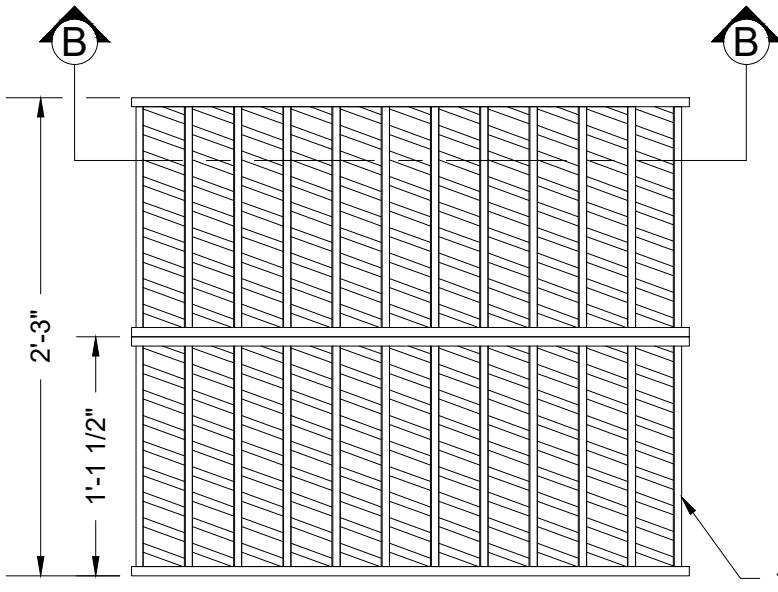


**PLAN (FRAME)**

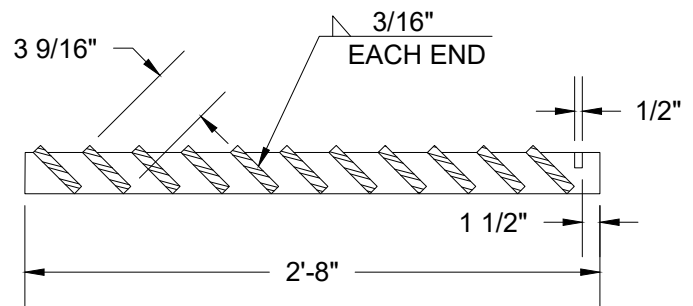


**SECTION A-A**

**NOTE:**  
USE VERTICAL BEADS IN CORNERS, FILLET WELD JOINT ON BOTTOM OF FRAME. GRATE MUST REST FLAT ON FRAME SURFACE. BAR SIZE PER AASHTO LOAD REQUIREMENTS AND AS APPROVED BY ENGINEER.



**PLAN (GRATES)**



**SECTION B-B**

**NOTE:**  
THIS GRATE MAY BE REQUIRED IN HILLSIDE AND GEOLOGIC RISK OVERLAY DISTRICTS OR WHERE STREET SLOPES EXCEED 5 PERCENT GRADE, OR WHERE THE CATCH BASIN FRAME AND GRATE (STANDARD DETAIL 401C) IS NOT CAPABLE OF INTERCEPTING COMPLETELY THE DESIGN STORM FLOW AT THE CURB.

**CITY OF GRESHAM**

**CATCH BASIN WITH P-45 GRATE**

PWS VERSION: JAN 2024

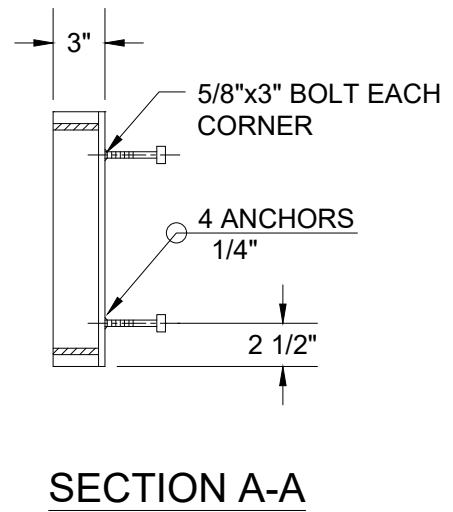
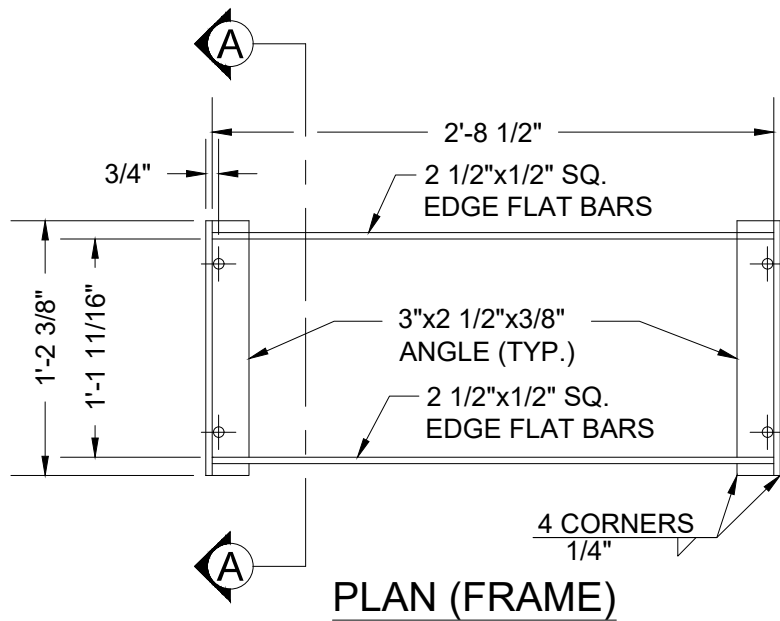
DRAWN CMC

REV. DATE JAN 2024

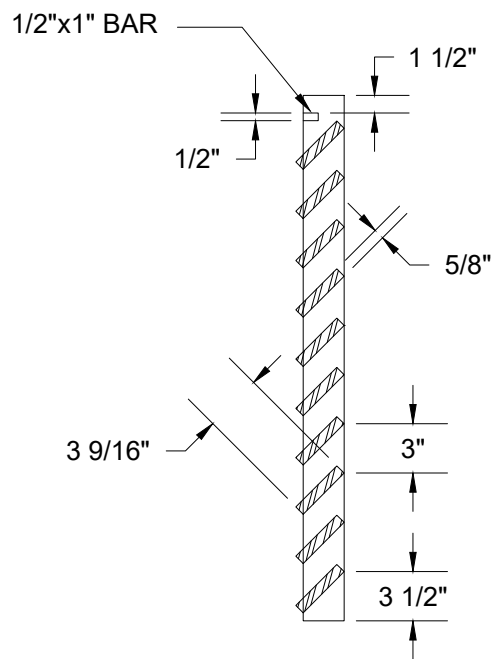
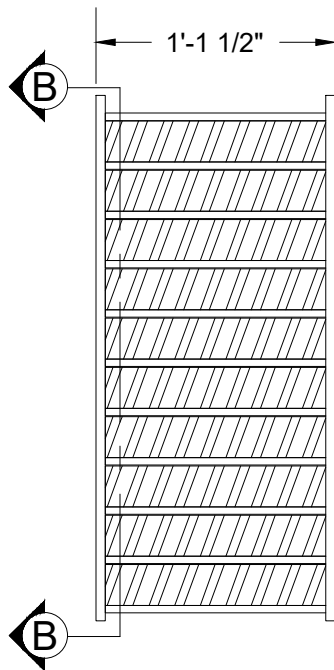
APPR. *[Signature]*

DETAIL NO. 401E

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**NOTE:**  
 USE VERTICAL BEADS IN CORNERS, FILLET WELD JOINT ON BOTTOM OF FRAME. GRATE MUST REST FLAT ON FRAME SURFACE. BAR SIZE PER AASHTO LOAD REQUIREMENTS AND AS APPROVED BY ENGINEER.



**NOTE:**  
 THIS GRATE MAY BE REQUIRED IN HILLSIDE AND GEOLOGIC RISK OVERLAY DISTRICTS OR WHERE STREET SLOPES EXCEED 5 PERCENT GRADE, OR WHERE THE CATCH BASIN FRAME AND GRATE (STANDARD DETAIL 401C) IS NOT CAPABLE OF INTERCEPTING COMPLETELY THE DESIGN STORM FLOW AT THE CURB.

**CITY OF GRESHAM**

**MODIFIED CATCH BASIN FRAME WITH SINGLE P-45 GRATE**

PWS VERSION: JAN 2024

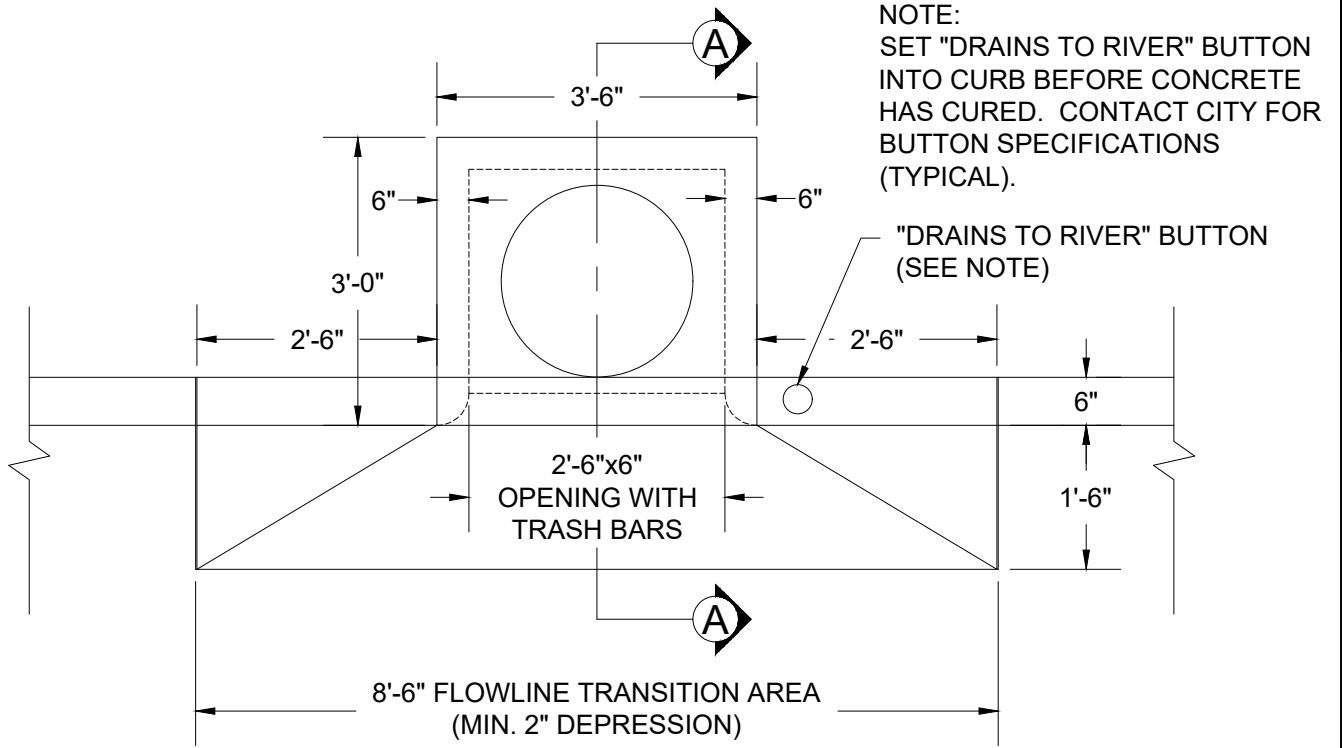
DRAWN CMC

REV. DATE JAN 2024

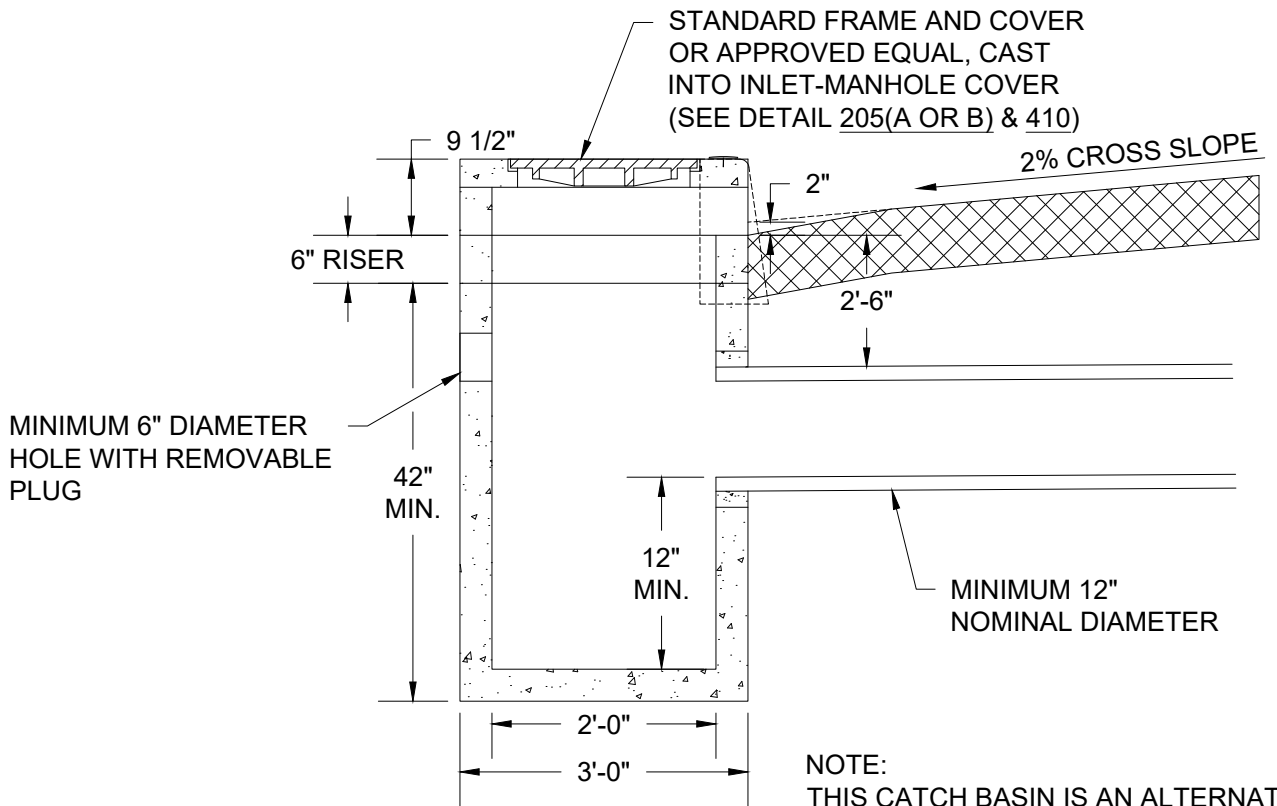
APPR. *[Signature]*

DETAIL NO. 401F

FILENAME: y:\inter-departmental\development engineering projects\public works standards\20 pws revision copy\details\400\_stormwater\storm.cad\402.dwg, Plotted 11/28/2023 1:28 PM, By: Kimberly Bogert, ANSI FULL BLEED A (8.50 X 11.00 INCHES)



**PLAN**



**SECTION A-A**

NOTE:  
THIS CATCH BASIN IS AN ALTERNATIVE, FOR USE IN SPECIAL CIRCUMSTANCES AS REQUIRED BY THE ENGINEER.

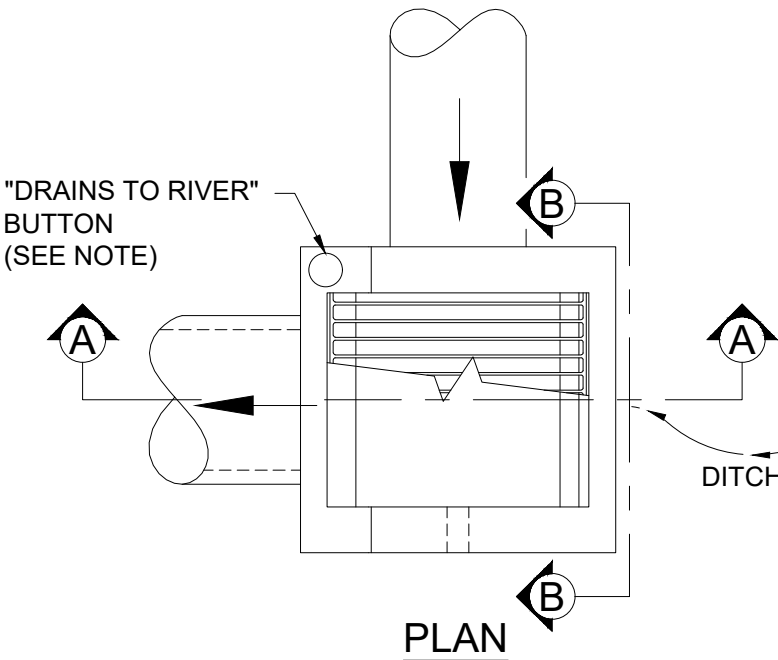
**CITY OF GRESHAM**

**NON-GRATED CATCH BASIN**

PWS VERSION: JAN 2024

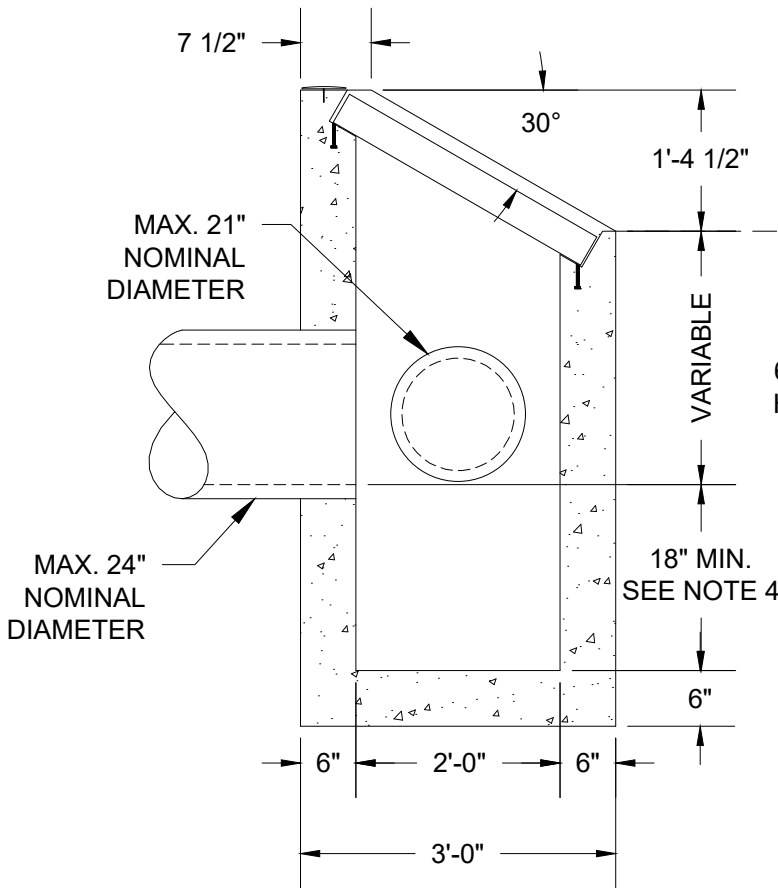
DRAWN	CMC
REV. DATE	JAN 2024
APPR.	<i>[Signature]</i>
DETAIL NO.	402

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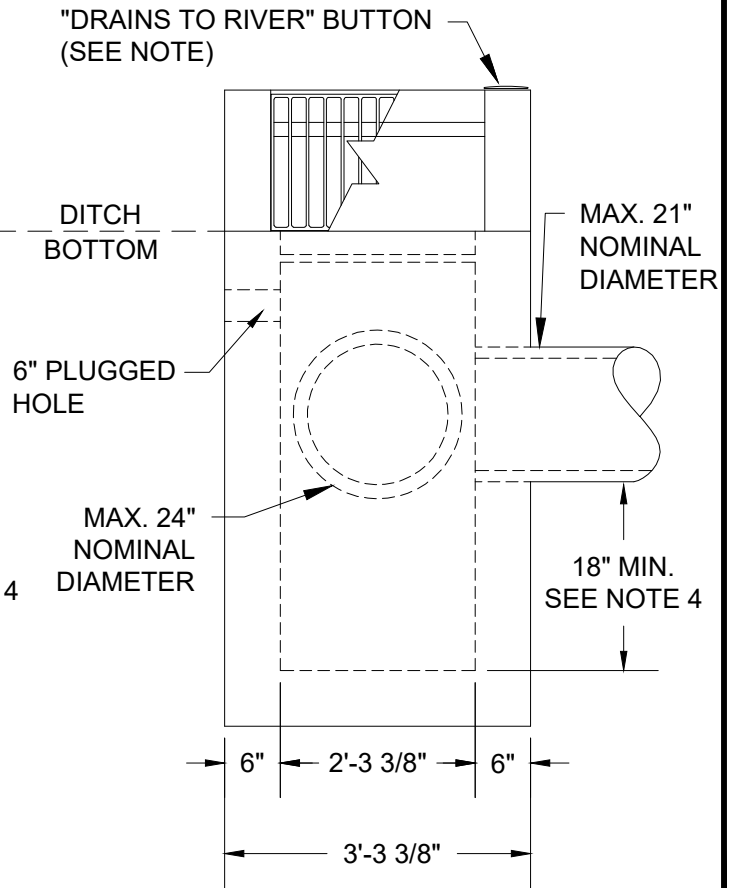


1. CONCRETE SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 4,000 P.S.I. IN 28 DAYS.
2. FOR FRAME & GRATE DETAIL SEE DETAIL 403C.
3. WHERE PRECAST INLETS ARE USED AS AN ALTERNATIVE TO CAST IN PLACE INLETS, A 4" COMPACTED LEVELING BED OF 3/4"-0" CRUSHED AGGREGATE SHALL BE PROVIDED.
4. WHEN INSTALLED AS A POND OUTLET, CHANNEL BOTTOM WITHOUT A SUMP.

NOTE: SET "DRAINS TO RIVER" BUTTON INTO CURB BEFORE CONCRETE HAS CURED. CONTACT CITY FOR BUTTON SPECIFICATIONS (TYPICAL).



SECTION A-A



SECTION B-B

CITY OF  
GRESHAM

DITCH INLET  
TYPE D - 30°

PWS VERSION: JAN 2024

DRAWN CMC

REV. DATE MAR 2021

APPR.

DETAIL NO. 403A

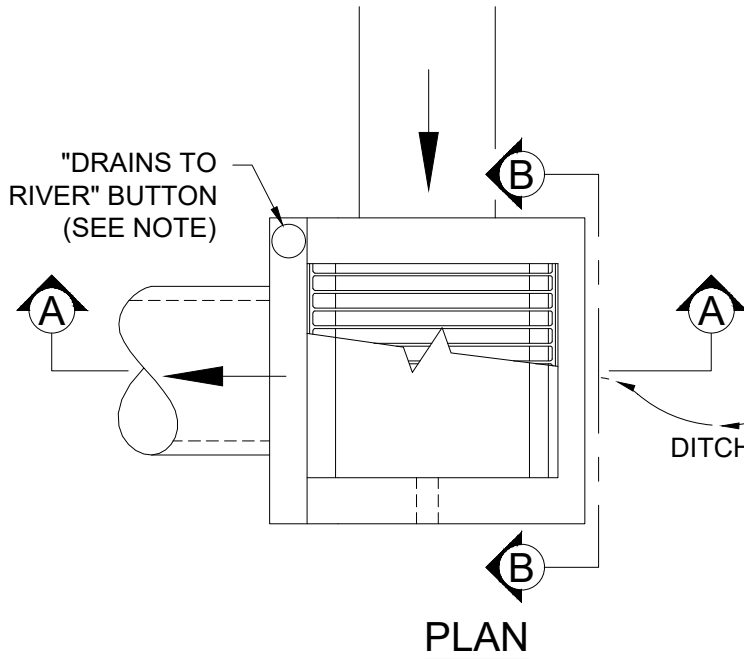


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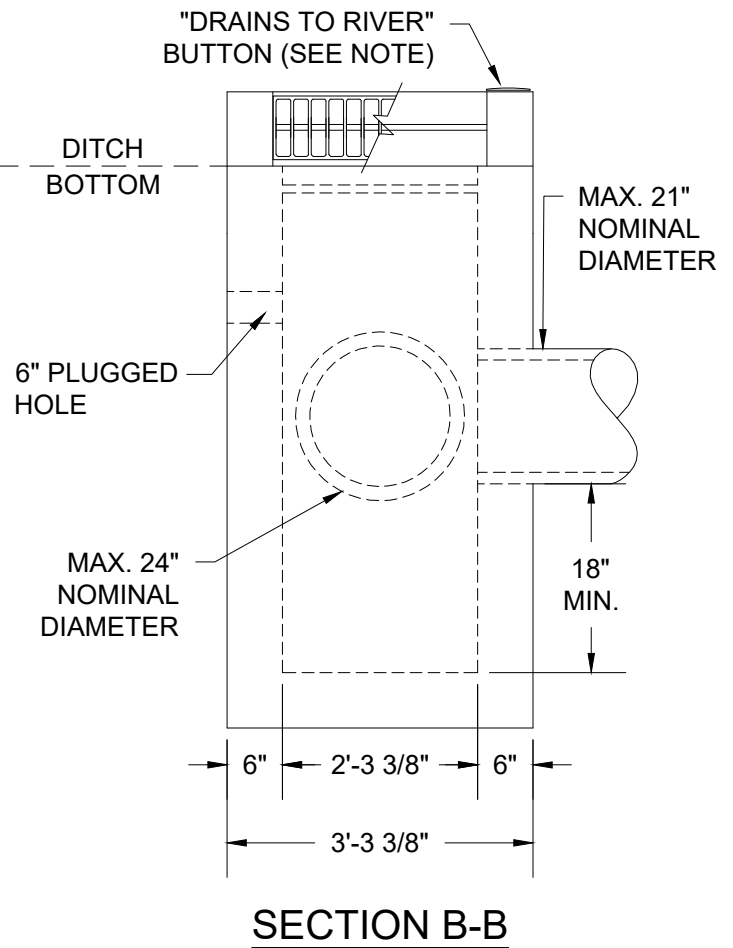
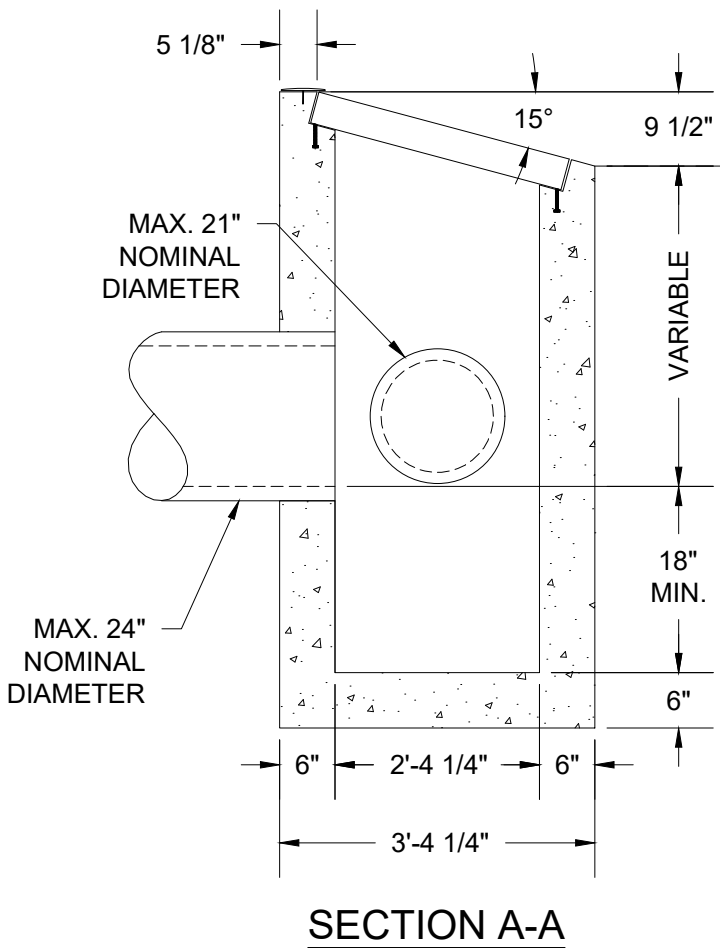
1. CONCRETE SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 4,000 P.S.I. IN 28 DAYS

2. FOR FRAME & GRATE DETAIL SEE DETAIL 403C

3. WHERE PRECAST INLETS ARE USED AS AN ALTERNATIVE TO CAST IN PLACE INLETS, A 4" COMPACTED LEVELING BED OF 3/4"-0" CRUSHED AGGREGATE SHALL BE PROVIDED



NOTE: SET "DRAINS TO RIVER" BUTTON INTO CURB BEFORE CONCRETE HAS CURED. CONTACT CITY FOR BUTTON SPECIFICATIONS (TYPICAL).



CITY OF GRESHAM

DITCH INLET  
TYPE D - 15°

PWS VERSION: JAN 2024

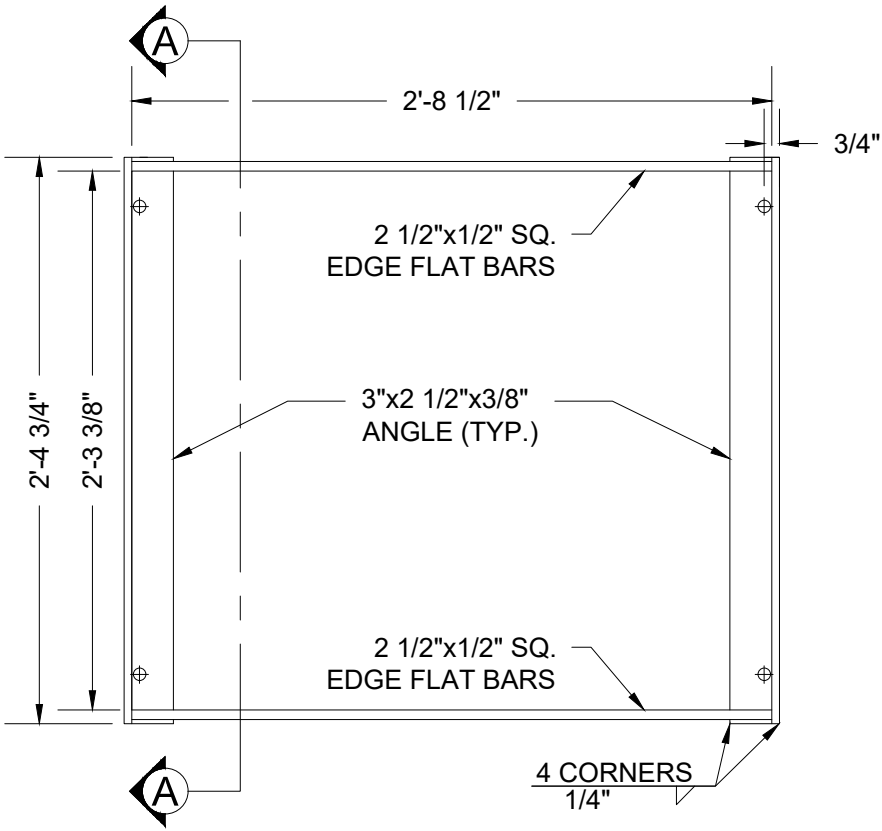
DRAWN CMC

REV. DATE MAR 2021

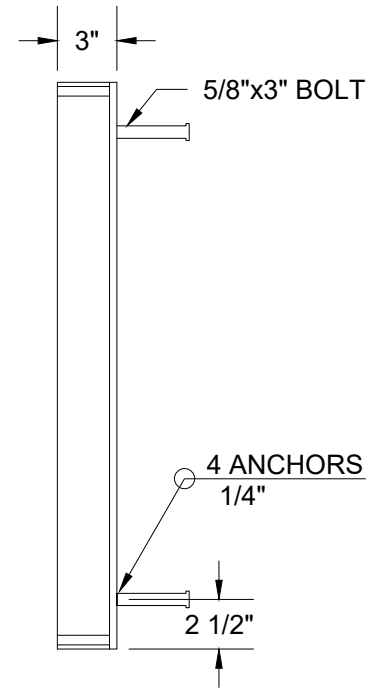
APPR. *[Signature]*

DETAIL NO. 403B

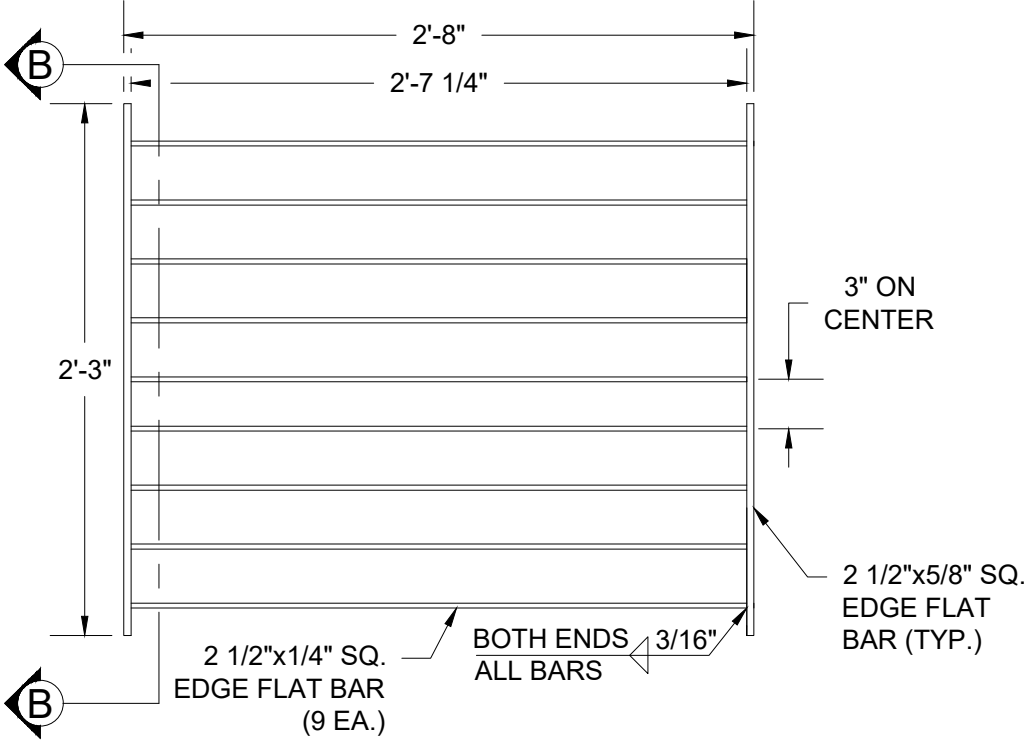
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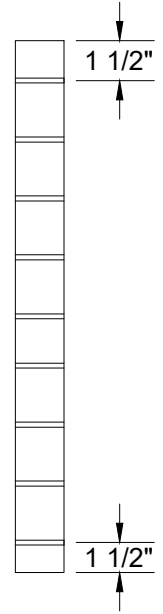
**PLAN (FRAME)**



**SECTION A-A**



**PLAN (GRATE)**



**SECTION B-B**

1. WHEN INSTALLED AS A POND OUTLET GRATE, HINGE THE TOP OF THE GRATE TO THE FRAME.

**CITY OF  
GRESHAM**

**DITCH INLET FRAME AND GRATE**

PWS VERSION: JAN 2024

DRAWN	CMC
REV. DATE	JAN 2020
APPR.	<i>[Signature]</i>
DETAIL NO.	403C

FILENAME: y:\inter-departmental\development engineering projects\public works standards\2.0 pws revision copy\details\400\_stormwater\storm cad\404a.dwg, Plotted 10/27/2023 2:18 PM, By: Kimberly Bogert, ANSI FULL BLEED A (8.50 X 11.00 INCHES)

NOTE:  
SET "DRAINS TO RIVER"  
BUTTON INTO ADJACENT  
CURB BEFORE CONCRETE  
HAS CURED. CONTACT CITY  
FOR BUTTON SPECIFICATIONS  
(TYPICAL)

FRAME & COVER  
SEE DETAIL 404B

2" WEEP HOLE  
BOTH SIDES  
(TYPICAL)

COMBINATION CURB INLET  
SEE DETAIL 404B

PRECAST 48" FLAT  
TOP WITH STANDARD  
ROUND OPENING  
SEE DETAIL 404B

MIN. 6" DIA. HOLE WITH  
REMOVABLE PLUG

STANDARD  
MANHOLE STEPS  
SEE DETAIL 210

PRECAST 48" DIA.  
MANHOLE SECTION  
(1' TO 4' HIGH)

PRECAST 48" DIA.  
MANHOLE BASE (2', 3'  
OR 4' HIGH) 2' MINIMUM

12"  
MINIMUM

1" COMPACTED CRUSHED  
ROCK 6" MIN. DEPTH, AS  
APPROVED BY ENGINEER

PROFILE

CITY OF  
GRESHAM

# INLET-MANHOLE STANDARD

PWS VERSION: JAN 2024

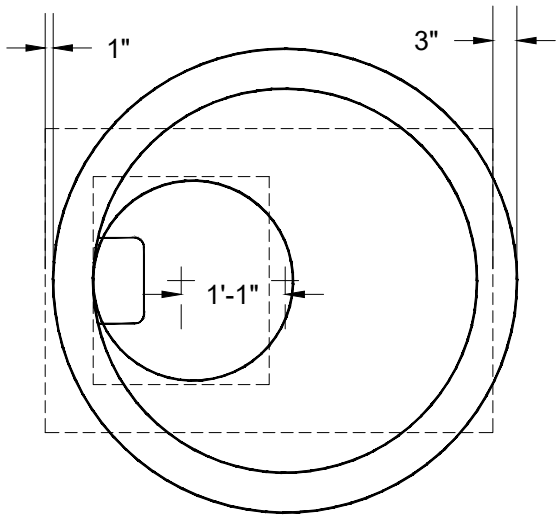
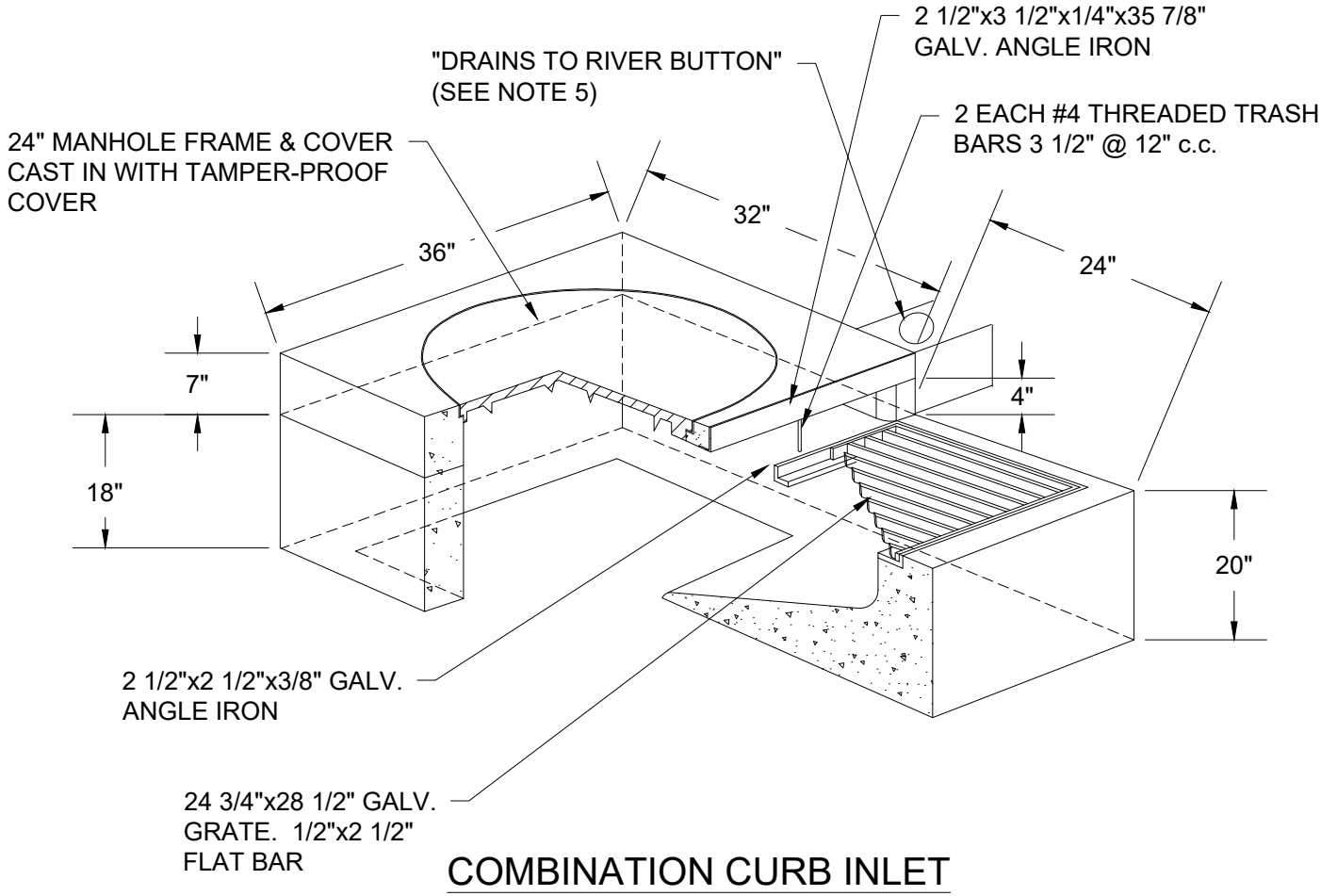
DRAWN CMC

REV. DATE JAN 2019

APPR. 

DETAIL NO. 404A

FILENAME: y:\inter-departmental\development engineering projects\public works standards\2.0 pws revision copy\details\400\_stormwater\storm cad\404b.dwg, Plotted 10/27/2023 2:19 PM, By: Kimberly Bogert, ANSI FULL BLEED A (8.50 X 11.00 INCHES)

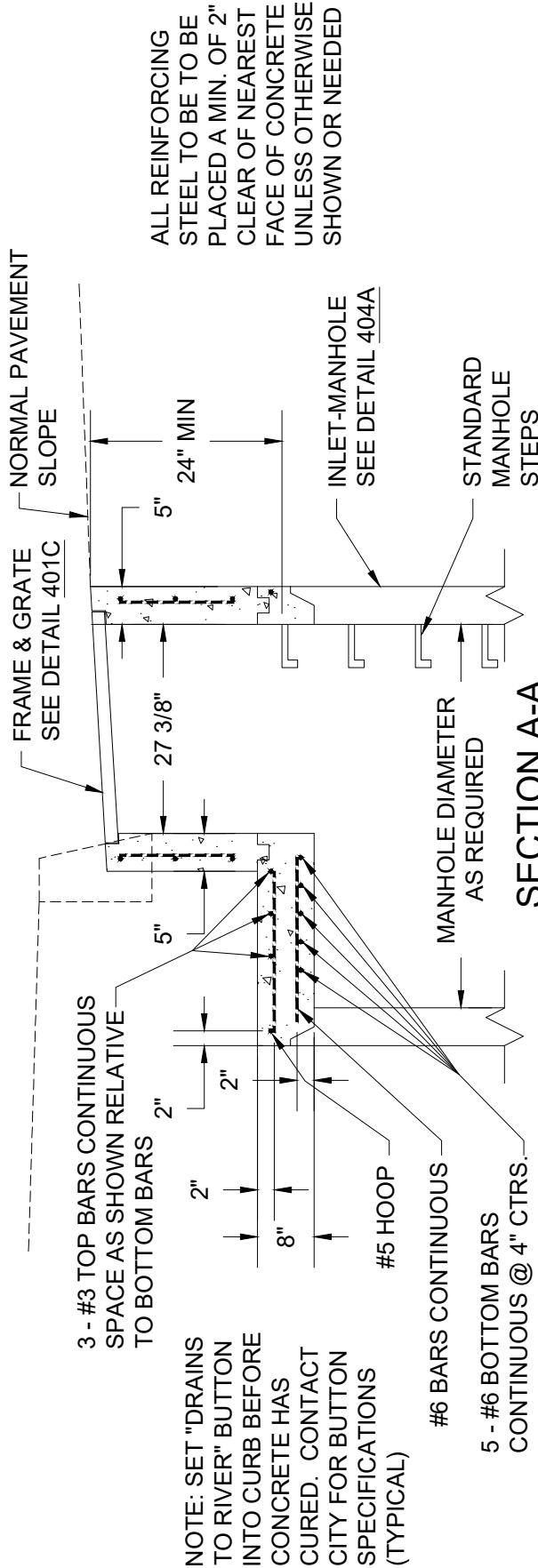


**NOTES:**

1. REINFORCING FOR INLET UNIT: 3 EA. #4 HORIZONTAL BARS.
2. REINFORCING FOR TOP UNIT: 2 EA. #3 HORIZONTAL BARS.
3. REINFORCING FOR INLET SLOPED BASE: 4" X 4" MESH.
4. GUTTER IS TAPERED DOWN TO GRATE INLET.
5. SET "DRAINS TO RIVER" BUTTON INTO ADJACENT CURB BEFORE CONCRETE HAS CURED, CONTACT CITY FOR BUTTON SPECIFICATIONS (TYPICAL).

<p><b>CITY OF GRESHAM</b></p>	<p><b>INLET-MANHOLE COMBINATION CURB INLET</b></p>	<p>DRAWN <b>CMC</b></p>
		<p>REV. DATE <b>JAN 2019</b></p>
		<p>APPR. <i>[Signature]</i></p>
		<p>DETAIL NO. <b>404B</b></p>
<p>PWS VERSION: JAN 2024</p>		

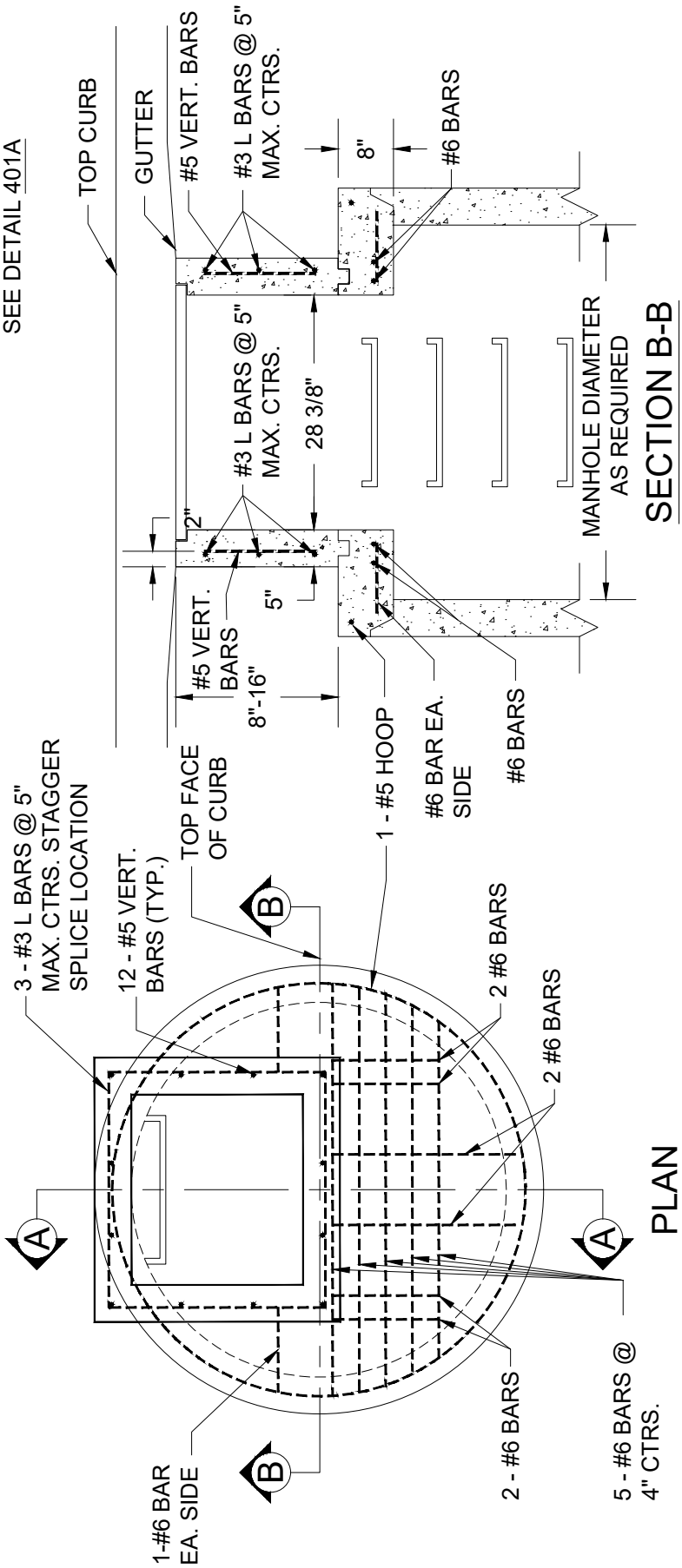
DRAWN	CMC
REV. DATE	JAN 2019
APPR.	
DETAIL NO.	404C



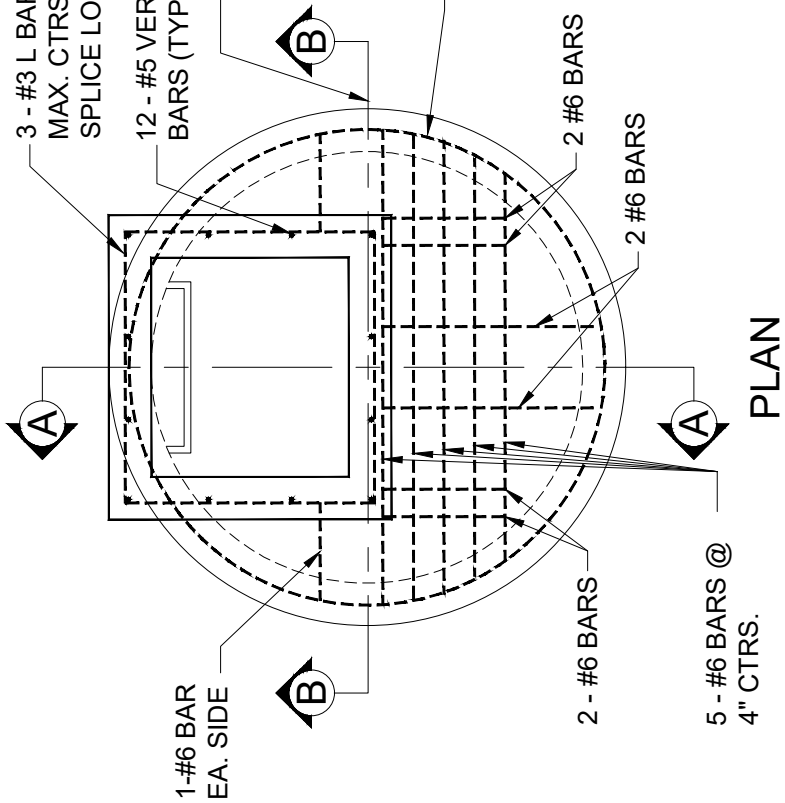
SECTION A-A

ALL REINFORCING STEEL TO BE TO BE PLACED A MIN. OF 2" CLEAR OF NEAREST FACE OF CONCRETE UNLESS OTHERWISE SHOWN OR NEEDED

GUTTER TRANSITION SEE DETAIL 401A



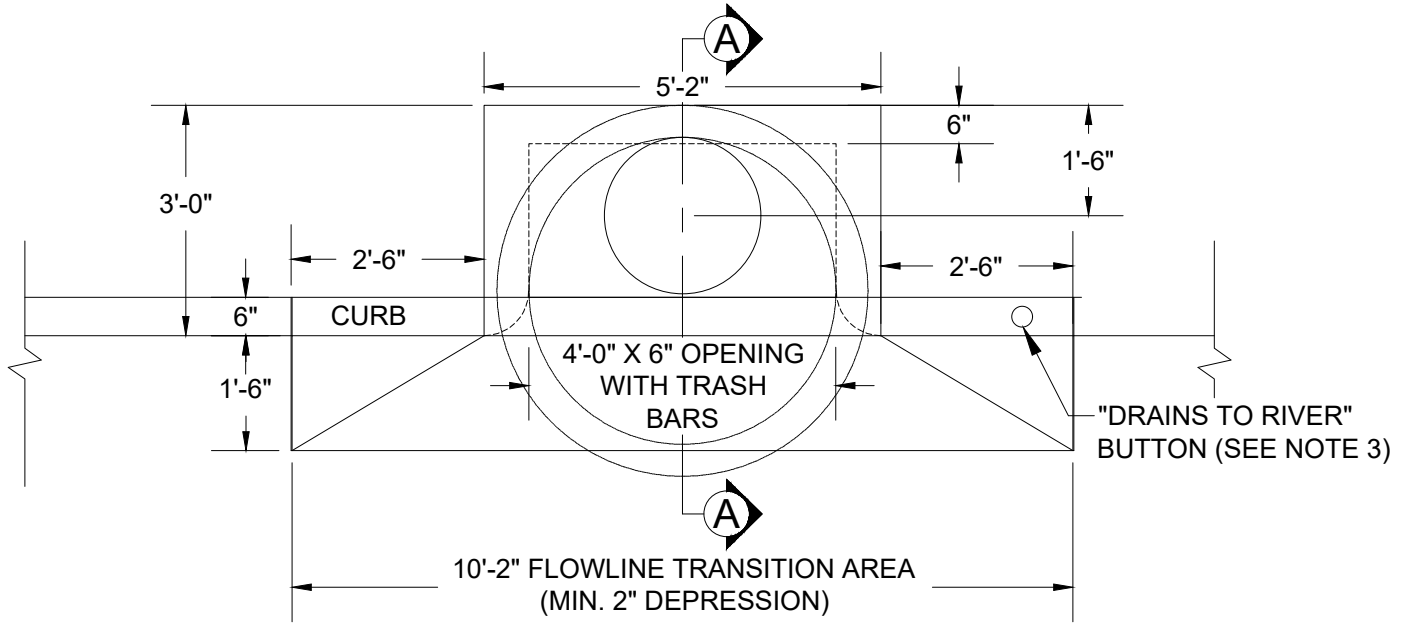
SECTION B-B



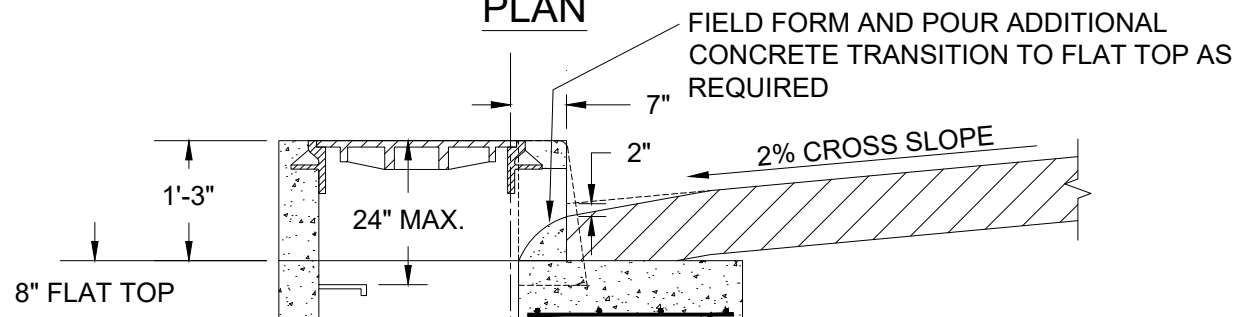
PLAN

(TOP BARS NOT SHOWN IN PLAN VIEW)

FILENAME: y:\inter-departmental\development engineering projects\public works standards\2.0 pws revision copy\details\400\_stormwater\storm\_cad\404d.dwg, Plotted 11/28/2023 1:29 PM, By: Kimberly Bogert, ANSI FULL BLEED A (8.50 X 11.00 INCHES)



**PLAN**



**NOTES:**

1. 48-INCH DIAMETER INLET MANHOLES FOR USE WITH PIPES 27-INCH AND LESSER INSIDE DIAMETER ONLY
2. STANDARD FRAME AND COVER OR APPROVED EQUAL, CAST INTO INLET-MANHOLE COVER SEE DETAIL 205(A OR B) & 410
3. SET "DRAINS TO RIVER" BUTTON INTO CURB BEFORE CONCRETE HAS CURED. CONTACT CITY FOR BUTTON SPECIFICATIONS (TYPICAL).

**SECTION A-A**

**CITY OF GRESHAM**

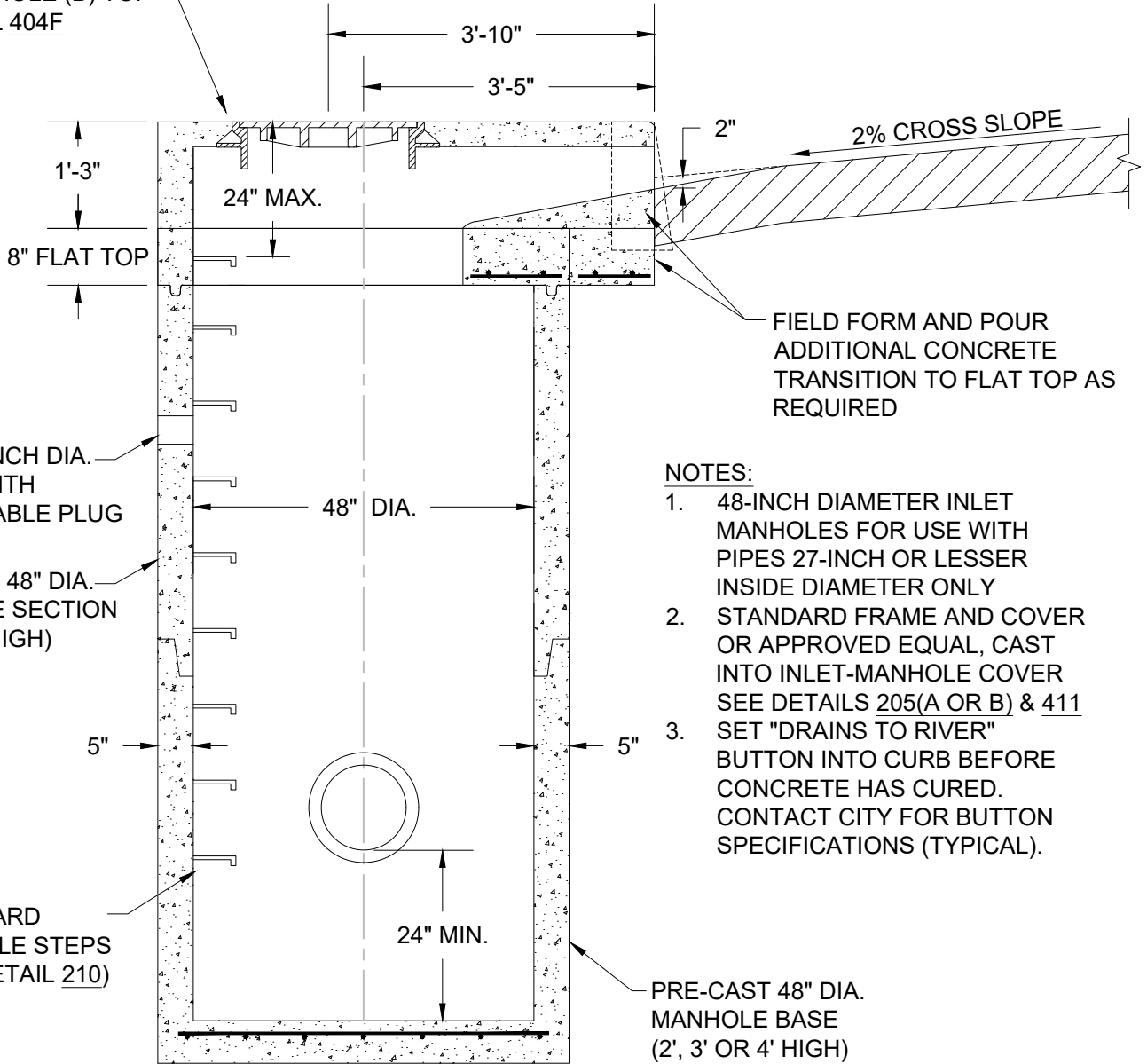
**NON-GRATED INLET-MANHOLE (A)**

PWS VERSION: JAN 2024

DRAWN	CMC
REV. DATE	JAN 2024
APPR.	
DETAIL NO.	404D

FILENAME: y:\inter-departmental\development engineering projects\public works standards\2.0 pws revision copy\details\400\_stormwater\storm cad\404e.dwg, Plotted 11/28/2023 1:28 PM, By: Kimberly Bogert, ANSI FULL BLEED A (8.50 X 11.00 INCHES)

INLET-MANHOLE (B) TOP  
SEE DETAIL 404F



**NOTES:**

1. 48-INCH DIAMETER INLET MANHOLES FOR USE WITH PIPES 27-INCH OR LESSER INSIDE DIAMETER ONLY
2. STANDARD FRAME AND COVER OR APPROVED EQUAL, CAST INTO INLET-MANHOLE COVER SEE DETAILS 205(A OR B) & 411
3. SET "DRAINS TO RIVER" BUTTON INTO CURB BEFORE CONCRETE HAS CURED. CONTACT CITY FOR BUTTON SPECIFICATIONS (TYPICAL).

**PROFILE**

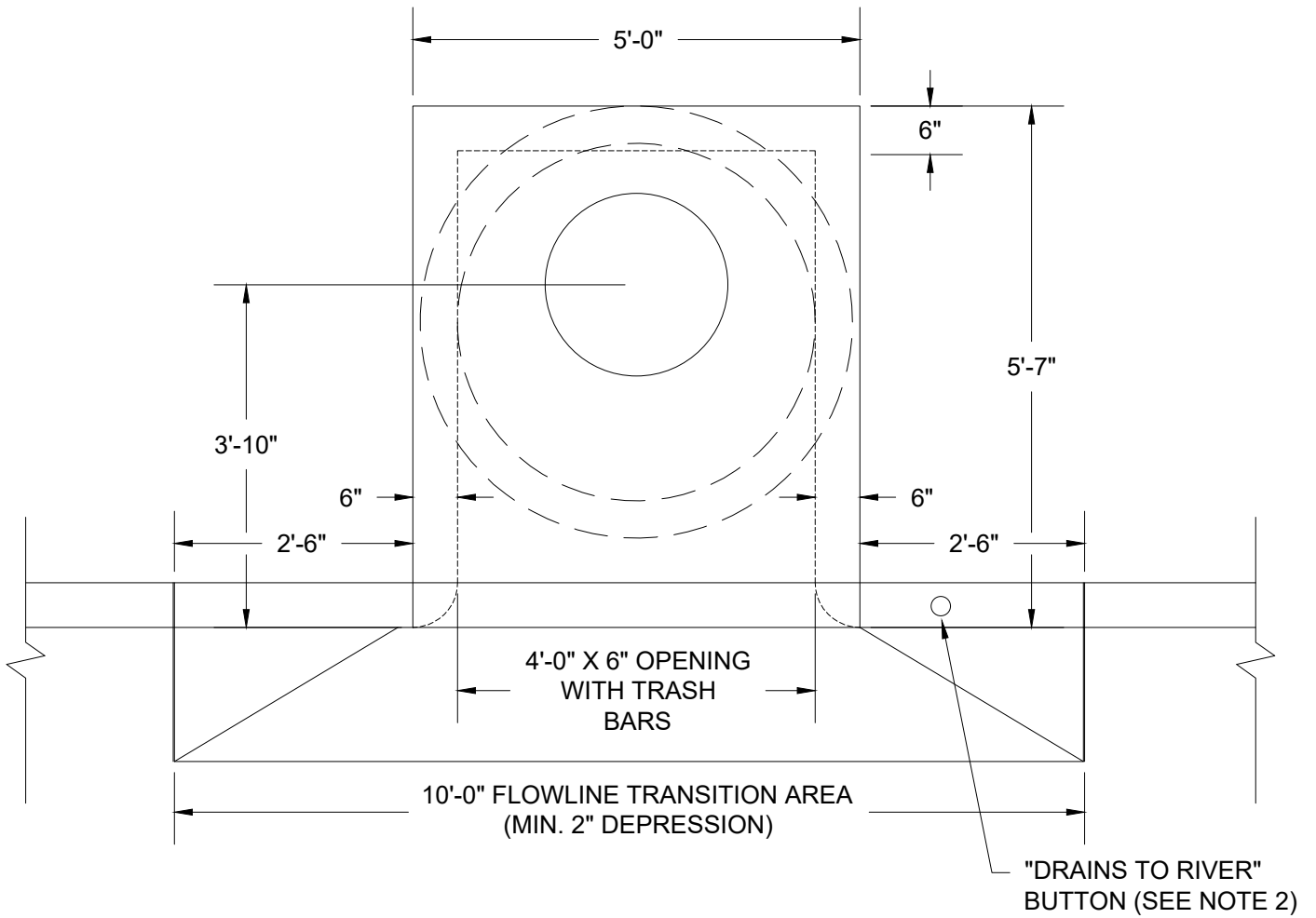
**CITY OF GRESHAM**

**NON-GRATED INLET-MANHOLE (B)**

PWS VERSION: JAN 2024

DRAWN	CMC
REV. DATE	JAN 2024
APPR.	<i>[Signature]</i>
DETAIL NO.	404E

FILENAME: y:\inter-departmental\development engineering projects\public works standards\2.0 pws revision copy\details\400\_stormwater\storm\_cad\404f.dwg, Plotted 11/28/2023 1:27 PM, By: Kimberly Bogert, ANSI FULL BLEED A (8.50 X 11.00 INCHES)



**NOTES:**

1. STANDARD FRAME AND COVER OR APPROVED EQUAL, CAST INTO INLET-MANHOLE TOP. SEE DETAILS 205(A OR B) & 411
2. SET "DRAINS TO RIVER" BUTTON INTO CURB BEFORE CONCRETE HAS CURED. CONTACT CITY FOR BUTTON SPECIFICATIONS (TYPICAL).

**CITY OF  
GRESHAM**

**NON-GRATED INLET-MANHOLE (B) TOP**

PWS VERSION: JAN 2024

DRAWN **CMC**

REV. DATE **JAN 2024**

APPR. *[Signature]*

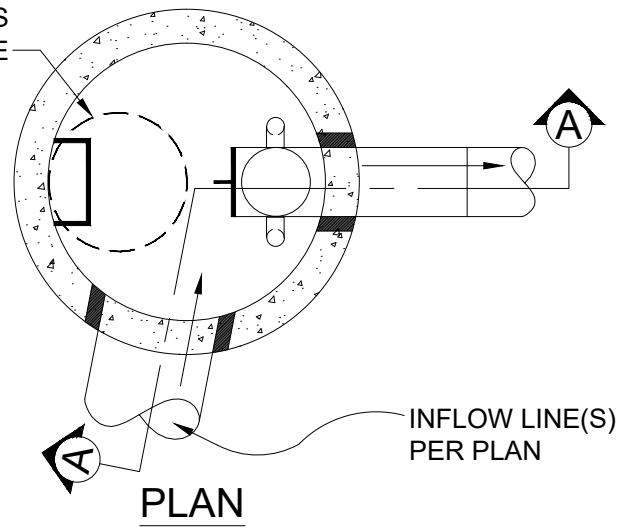
DETAIL NO. **404F**



FILENAME: y:\inter-departmental\development engineering projects\public works standards\2.0 pws revision copy\details\400\_stormwater\storm\_cad\405a.dwg, Plotted 10/27/2023 2:21 PM, By: Kimberly Bogert, ANSI FULL BLEED A (8.50 X 11.00 INCHES)

MANHOLE ACCESS FROM ABOVE

FRAME & COVER SET IN NON-SHRINK GROUT SEE DETAILS 205 & 410



PLAN

INFLOW LINE(S) PER PLAN

24" MAX.

12"

OVERFLOW ELEV.

12" MIN.

1/2" ALUMINUM TUBE

6" MIN. CLEARANCE

MULTI-ORIFICE ELBOWS TO BE LOCATED TO ASSURE LADDER CLEARANCE. ORIFICE SHALL BE MOUNTED ON BOTTOM OF ELBOWS. ELBOWS SHALL BE SHORT RADIUS AND SHALL NOT EXTEND MORE THAN 8" FROM OVERFLOW PIPE.

FABRICATED SOLID WALL HDPE CROSS PER ASTM D1248 SDR 26. SLIGHT TAPER ON OUTLET PIPE BY MANUFACTURER TO MAKE WATERTIGHT CONNECTION BY SLIPPING INTO OUTLET PIPE. CROSS SHALL BE ANCHORED TO MANHOLE WALL WITH STAINLESS STEEL BANDS AND 1/2" STAINLESS STEEL BOLT.

VARIES

3"

30" MIN.

INVERT ELV.

FLOW

FLOW

WATER TIGHT TURN OUT GATE IN PLACE. SEE DETAIL 405B

APPROVED PIPE 12" MIN.

24" MIN.

NON-SHRINK GROUT (TYPICAL)

60" MIN.

COMPACTED GRANULAR MATERIAL

5" MIN.

36" MIN.

RESTRICTOR PLATE (FOR FLOW CONTROL ONLY) ORIFICE DIA.= \_\_\_\_\_

8" MIN.

SECTION A-A

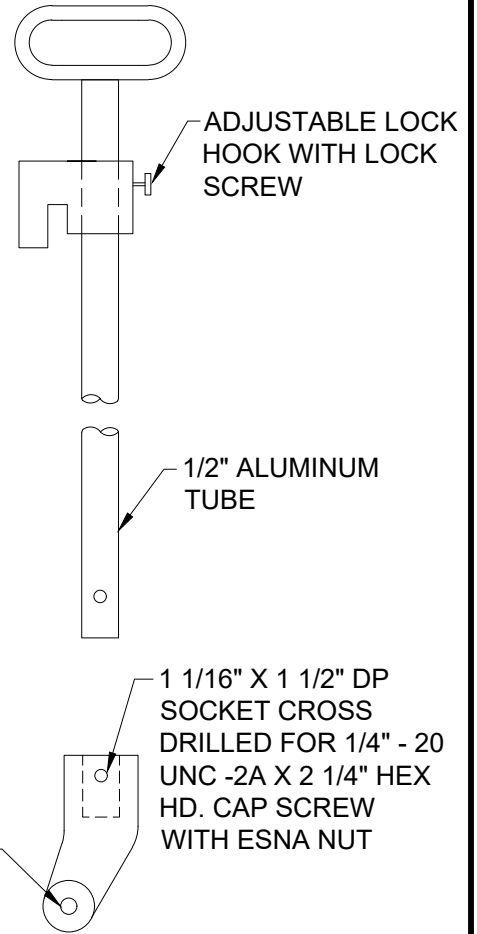
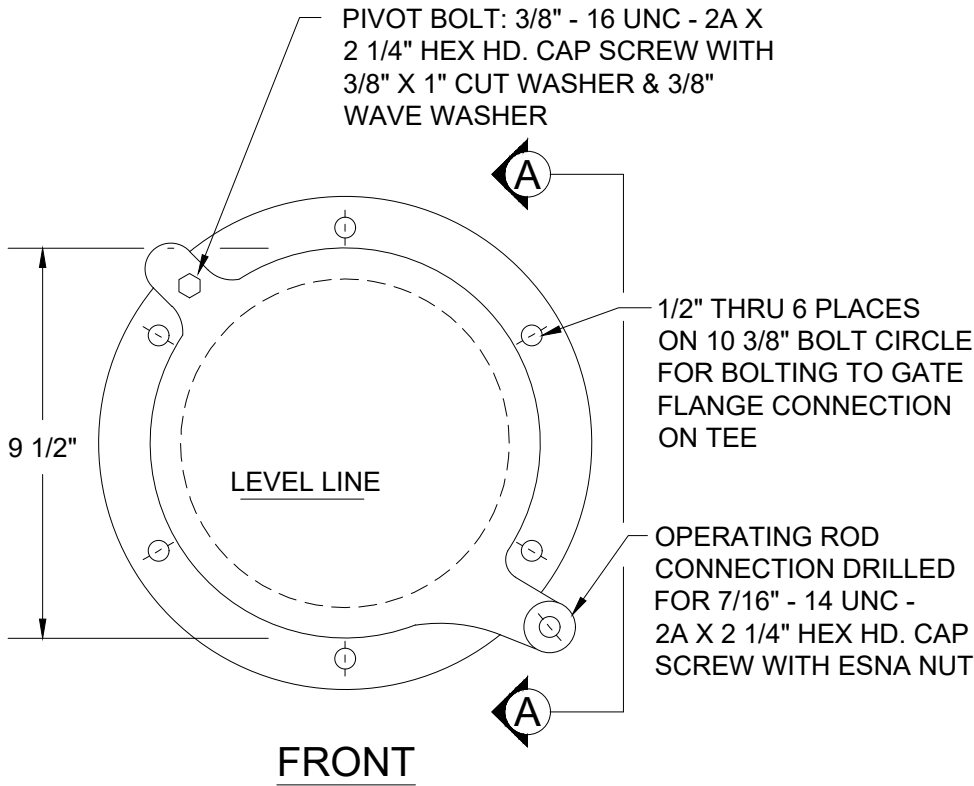
CITY OF GRESHAM

FLOW CONTROL MANHOLE

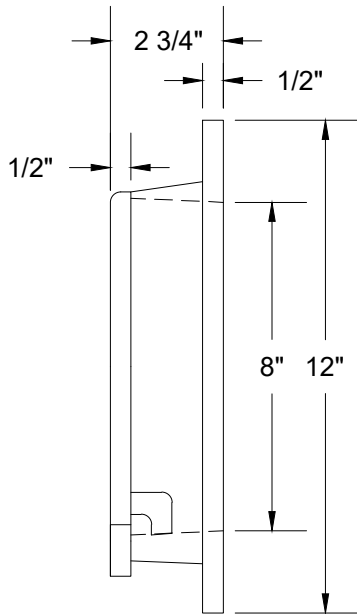
PWS VERSION: JAN 2024

DRAWN	CMC
REV. DATE	MAR 2021
APPR.	
DETAIL NO.	405A

FILENAME: y:\inter-departmental\development engineering projects\public works standards\2.0 pws revision copy\details\400\_stormwater\storm cad\405b.dwg, Plotted 10/27/2023 2:22 PM, By: Kimberly Bogert, ANSI FULL BLEED A (8.50 X 11.00 INCHES)



**LIFT HANDLE AND ADAPTER**



**SECTION A-A**

**NOTES:**

1. MATERIAL: CAST ALUMINUM ALLOY PER ASTM B26M
2. ALL FASTENERS SHALL BE STAINLESS STEEL
3. INSTALLER SHOULD CONSULT INSTRUCTION NOTES FURNISHED WITH SHEAR GATES
4. A NEOPRENE RUBBER GASKET IS REQUIRED BETWEEN THE RISER MOUNTING FLANGE AND THE GATE FLANGE
5. INSTALL SHEAR GATE WITH THE LEVEL-LINE MARKING ON A TRUE HORIZONTAL PLANE WHEN THE GATE IS IN A CLOSED POSITION

**CITY OF GRESHAM**

**8" SHEAR GATE AND LIFT HANDLE**

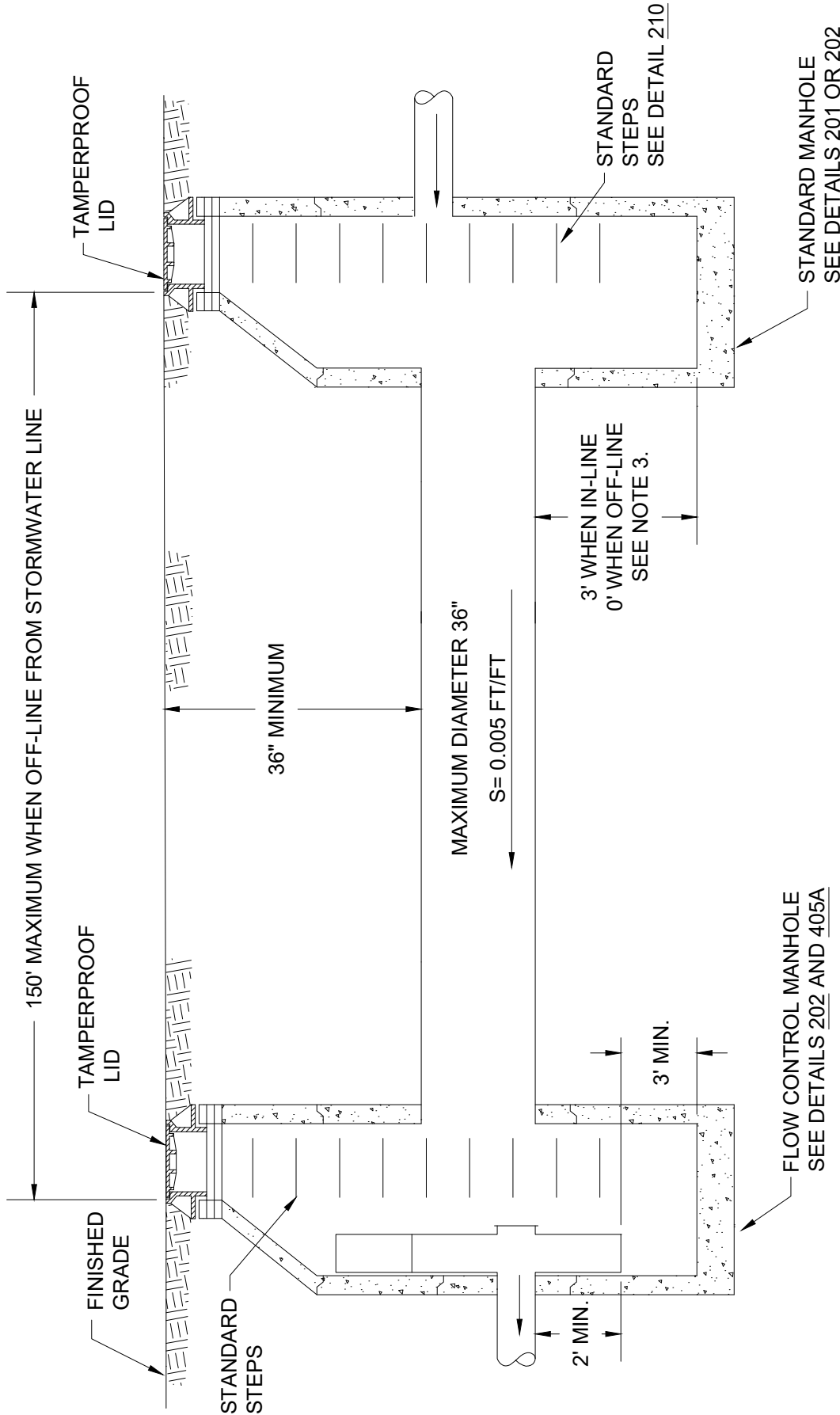
PWS VERSION: JAN 2024

DRAWN **CMC**

REV. DATE **JAN 2019**

APPR.

DETAIL NO. **405B**



**NOTES:**

1. THIS DETAIL REPRESENTS A DESIGN CONCEPT. FINAL DESIGN MAY VARY DEPENDING ON SITE CONDITIONS AND SHALL BE APPROVED BY THE ENGINEER.
2. DETENTION PIPE AND ALL CONNECTIONS SHALL BE WATERTIGHT.
3. NO SUMP SHALL BE INSTALLED ON MANHOLES WITHOUT VEHICULAR ACCESS.

**CITY OF GRESHAM**

**DETENTION PIPE  
TYPICAL CLOSED**

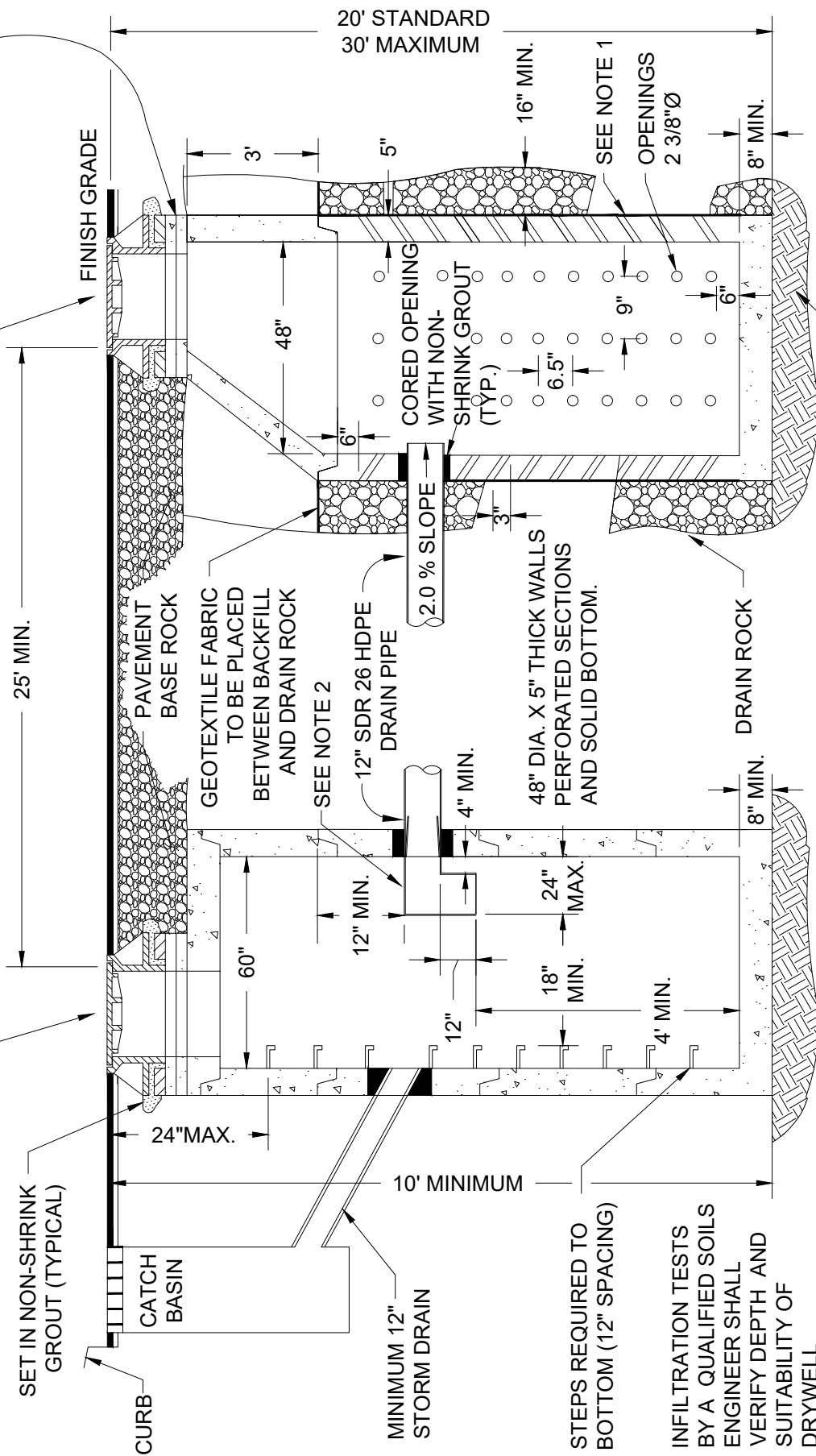
PWS VERSION: JAN 2024

DRAWN	CMC
REV. DATE	JAN 2024
APPR.	
DETAIL NO.	406

STANDARD FRAME (SEE DETAIL 205(A OR B)) AND COVER (SEE DETAIL 410). OFFSET AS APPROVED BY THE ENGINEER.

STANDARD CONE AND SECTIONS TAMPERPROOF FRAME & COVER (SEE DETAILS 207(A OR B) AND 411) OR FLAT TOP AS APPROVED BY THE ENGINEER

MAXIMUM 12" OR 3 GRADE RINGS. MINIMUM - 2" RINGS



25' MIN.

24" MAX.

60"

12" MIN.

12"

18" MIN.

24" MAX.

4" MIN.

4" MIN.

8" MIN.

6"

6"

3"

3"

48"

48"

16" MIN.

9"

6.5"

5"

3"

6"

8" MIN.

20' STANDARD  
30' MAXIMUM

2.0% SLOPE

UNDISTURBED NATIVE MATERIAL, OR 1"-0" COMPACTED CRUSHED ROCK (6" MIN. DEPTH) AS APPROVED BY THE ENGINEER

FINISH GRADE

PAVEMENT  
BASE ROCK

GEOTEXTILE FABRIC TO BE PLACED BETWEEN BACKFILL AND DRAIN ROCK

12" SDR 26 HDPE DRAIN PIPE

48" DIA. X 5" THICK WALLS PERFORATED SECTIONS AND SOLID BOTTOM.

48" DIA. X 5" THICK WALLS PERFORATED SECTIONS AND SOLID BOTTOM.

UNDISTURBED NATIVE MATERIAL, OR 1"-0" COMPACTED CRUSHED ROCK (6" MIN. DEPTH) AS APPROVED BY THE ENGINEER

UNDISTURBED NATIVE MATERIAL, OR 1"-0" COMPACTED CRUSHED ROCK (6" MIN. DEPTH) AS APPROVED BY THE ENGINEER

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UNDISTURBED NATIVE MATERIAL, OR 1"-0" COMPACTED CRUSHED ROCK (6" MIN. DEPTH) AS APPROVED BY THE ENGINEER

SEE NOTE 1

OPENINGS 2 3/8" Ø

SEE NOTE 2

CORED OPENING WITH NON-SHRINK GROUT (TYP.)

SEE NOTE 1

OPENINGS 2 3/8" Ø

SEE NOTE 1

OPENINGS 2 3/8" Ø

SEE NOTE 1

OPENINGS 2 3/8" Ø

SEE NOTE 1

OPENINGS 2 3/8" Ø

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SEE NOTE 1

OPENINGS 2 3/8" Ø

SEE NOTE 2

CORED OPENING WITH NON-SHRINK GROUT (TYP.)

SEE NOTE 1

OPENINGS 2 3/8" Ø

SEE NOTE 1

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SEE NOTE 2

CORED OPENING WITH NON-SHRINK GROUT (TYP.)

SEE NOTE 1

OPENINGS 2 3/8" Ø

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SEE NOTE 1

OPENINGS 2 3/8" Ø

SEE NOTE 1

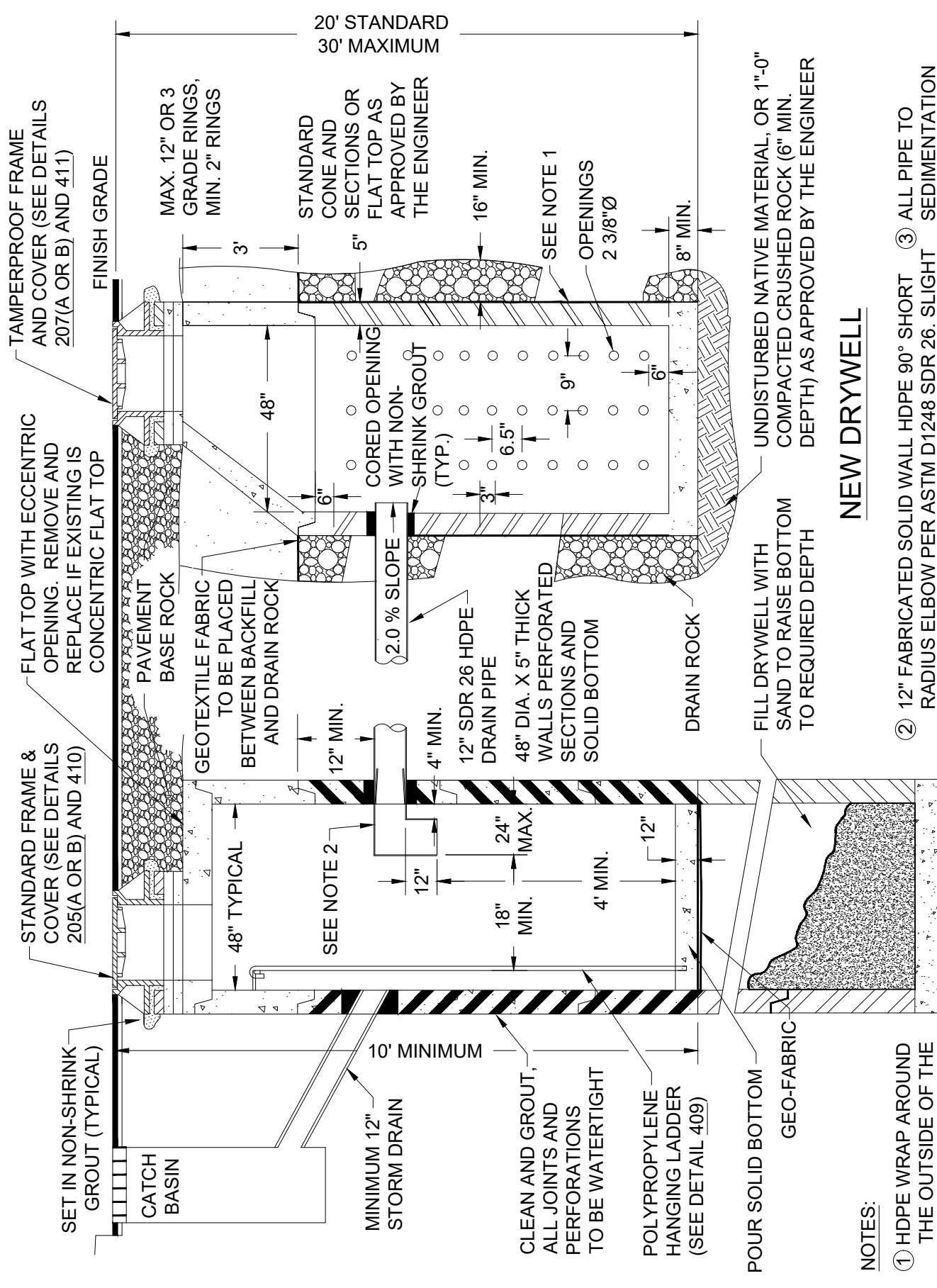
OPENINGS 2 3/8" Ø

UNDISTURBED NATIVE MATERIAL, OR 1"-0" COMPACTED CRUSHED ROCK (6" MIN. DEPTH) AS APPROVED BY THE ENGINEER

NOTES:

- ① HDPE WRAP AROUND THE OUTSIDE OF THE PERFORATED SECTIONS SHALL BE ADDED IF THE DRAIN ROCK IS SMALLER THAN 2"-4".
- ② 12" FABRICATED SOLID WALL HDPE 90° SHORT RADIUS ELBOW PER ASTM D1248 SDR 26. SLIGHT TAPER ON OUTLET PIPE BY MANUFACTURER TO MAKE WATERTIGHT CONNECTION BY SLIPPING INTO OUTLET PIPE. ELBOW SHALL BE ANCHORED TO MANHOLE WALL WITH STAINLESS STEEL BANDS AND 1/2" STAINLESS STEEL BOLT.
- ③ ALL PIPE TO SEDIMENTATION MANHOLE & PRECAST DRYWELL SHALL HAVE CLASS "B" BEDDING & PIPE ZONE MATERIAL.

DRAWN	CMC
REV. DATE	JAN 2024
APPR.	
DETAIL NO.	407



**NOTES:**

- ① HDPE WRAP AROUND THE OUTSIDE OF THE PERFORATED SECTIONS SHALL BE ADDED IF THE DRAIN ROCK IS SMALLER THAN 2"-4"
- ② 12" FABRICATED SOLID WALL HDPE 90° SHORT RADIUS ELBOW PER ASTM D1248 SDR 26. SLIGHT TAPER ON OUTLET PIPE BY MANUFACTURER TO MAKE WATERTIGHT CONNECTION BY SLIPPING INTO OUTLET PIPE. ELBOW SHALL BE ANCHORED TO MANHOLE WALL WITH STAINLESS STEEL BANDS AND 1/2" STAINLESS STEEL BOLT.
- ③ ALL PIPE TO SEDIMENTATION MANHOLE & PRECAST DRYWELL SHALL HAVE CLASS "B" BEDDING & PIPE ZONE MATERIAL

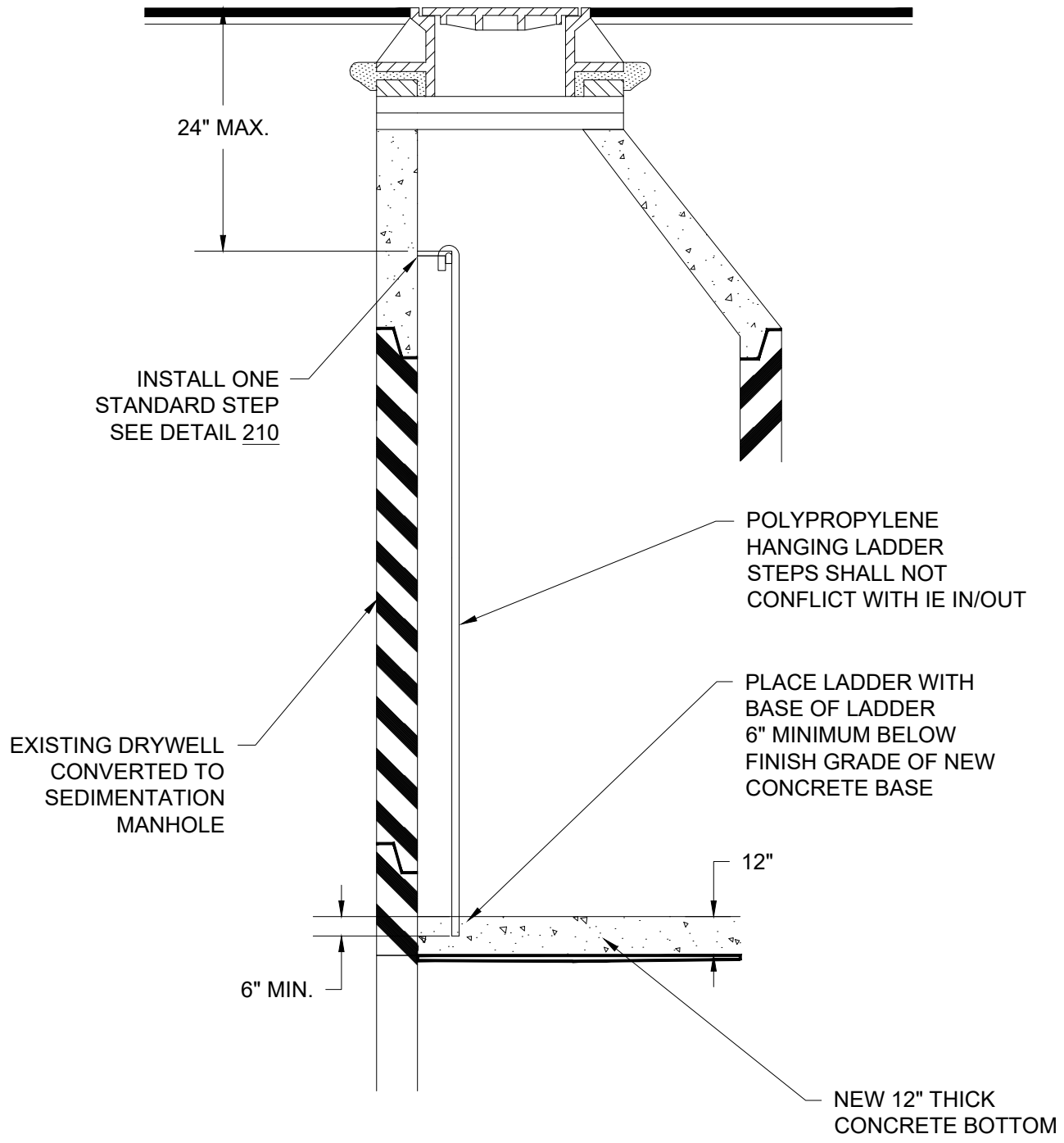


**DRYWELL SYSTEM AND  
SEDIMENTATION MANHOLE  
(TYPICAL RETROFIT INSTALLATION)**

PWS VERSION: JAN 2024

DRAWN	CMC
REV. DATE	JAN 2024
APPR.	<i>[Signature]</i>
DETAIL NO.	408

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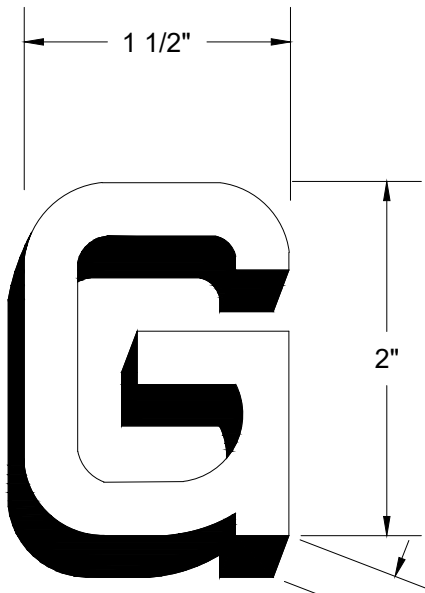
CITY OF  
GRESHAM

### POLYPROPYLENE HANGING LADDER

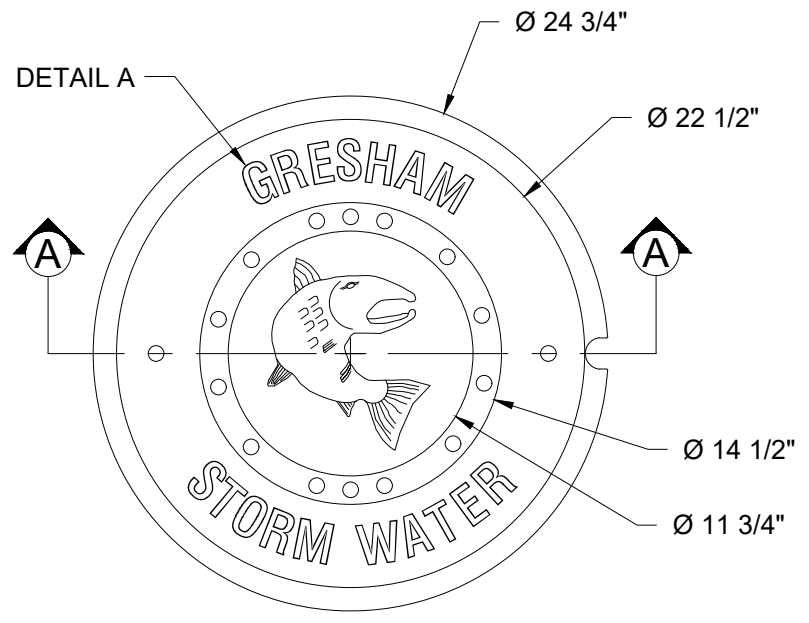
PWS VERSION: JAN 2024

DRAWN	CMC
REV. DATE	JAN 2019
APPR.	<i>[Signature]</i>
DETAIL NO.	409

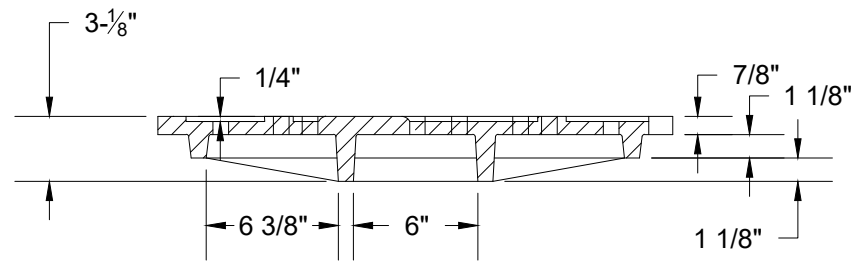
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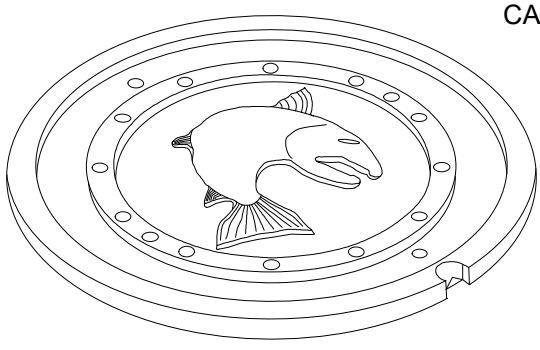
**DETAIL A**  
RAISED TEXT



**TOP VIEW**

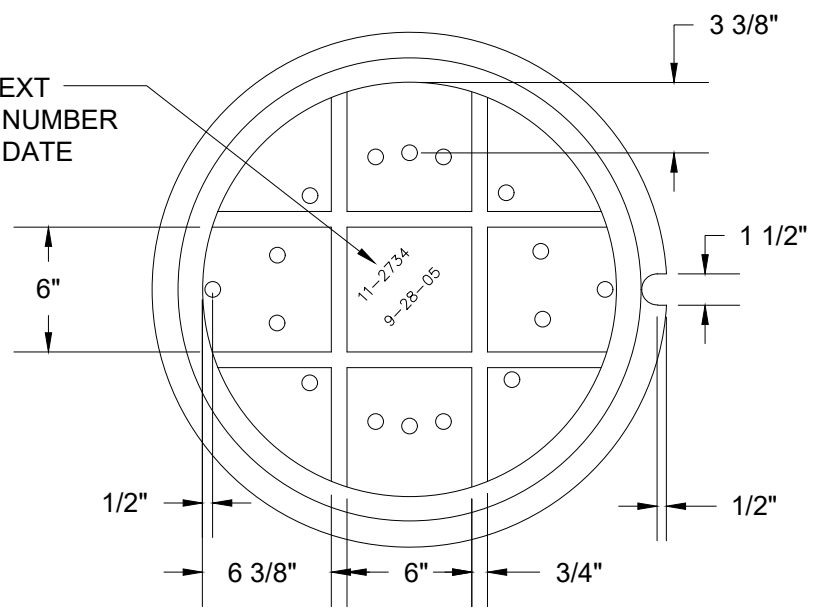


**SECTION A-A**



RAISED TEXT NOT SHOWN

RAISED TEXT  
CASTING NUMBER  
CASTING DATE



**BOTTOM VIEW**

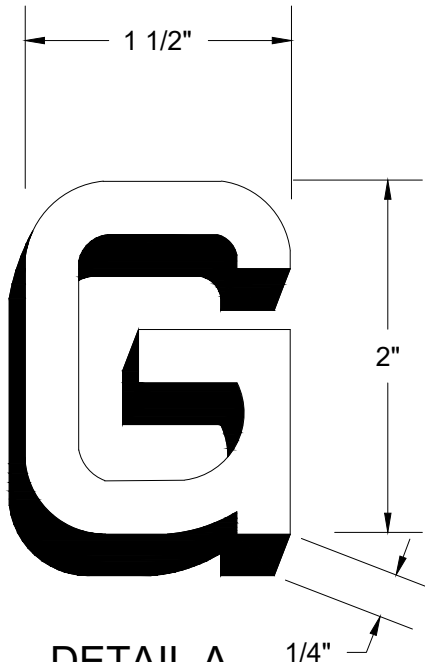
**CITY OF  
GRESHAM**

**STANDARD STORMWATER MANHOLE COVER**

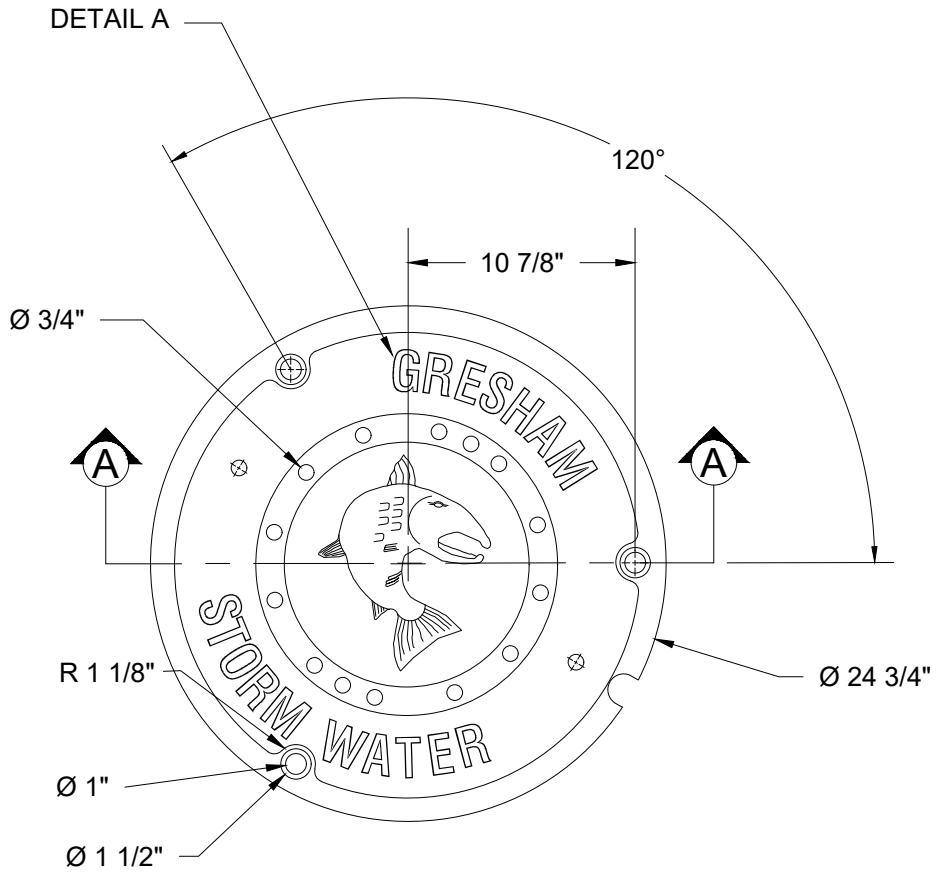
PWS VERSION: JAN 2024

DRAWN	CMC
REV. DATE	JAN 2019
APPR.	
DETAIL NO.	410

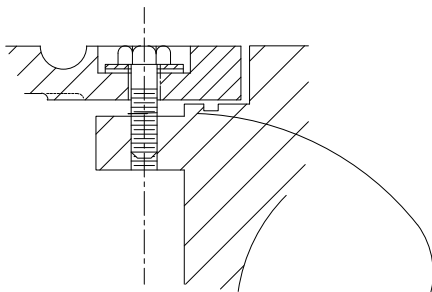
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**DETAIL A**  
RAISED TEXT

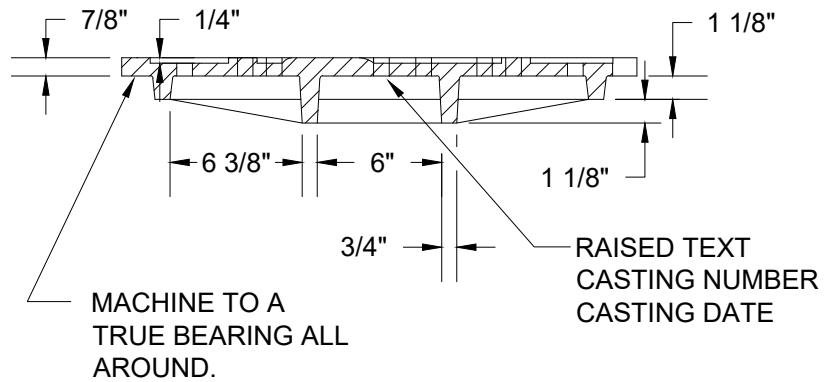


**TOP VIEW**



1/2"-13 NC X 1 1/4" STAINLESS  
STEEL HEX HEAD CAP SCREW  
W/ 1 1/4" Ø OD X 3/32" THK. 8-18  
STAINLESS STEEL WASHER & 3/32"  
NEOPRENE WASHER, (3) EA. REQUIRED.

**LOCK DOWN DETAIL**



**SECTION A-A**

**CITY OF  
GRESHAM**

**STORMWATER TAMPERPROOF  
MANHOLE COVER**

PWS VERSION: JAN 2024

DRAWN **CMC**

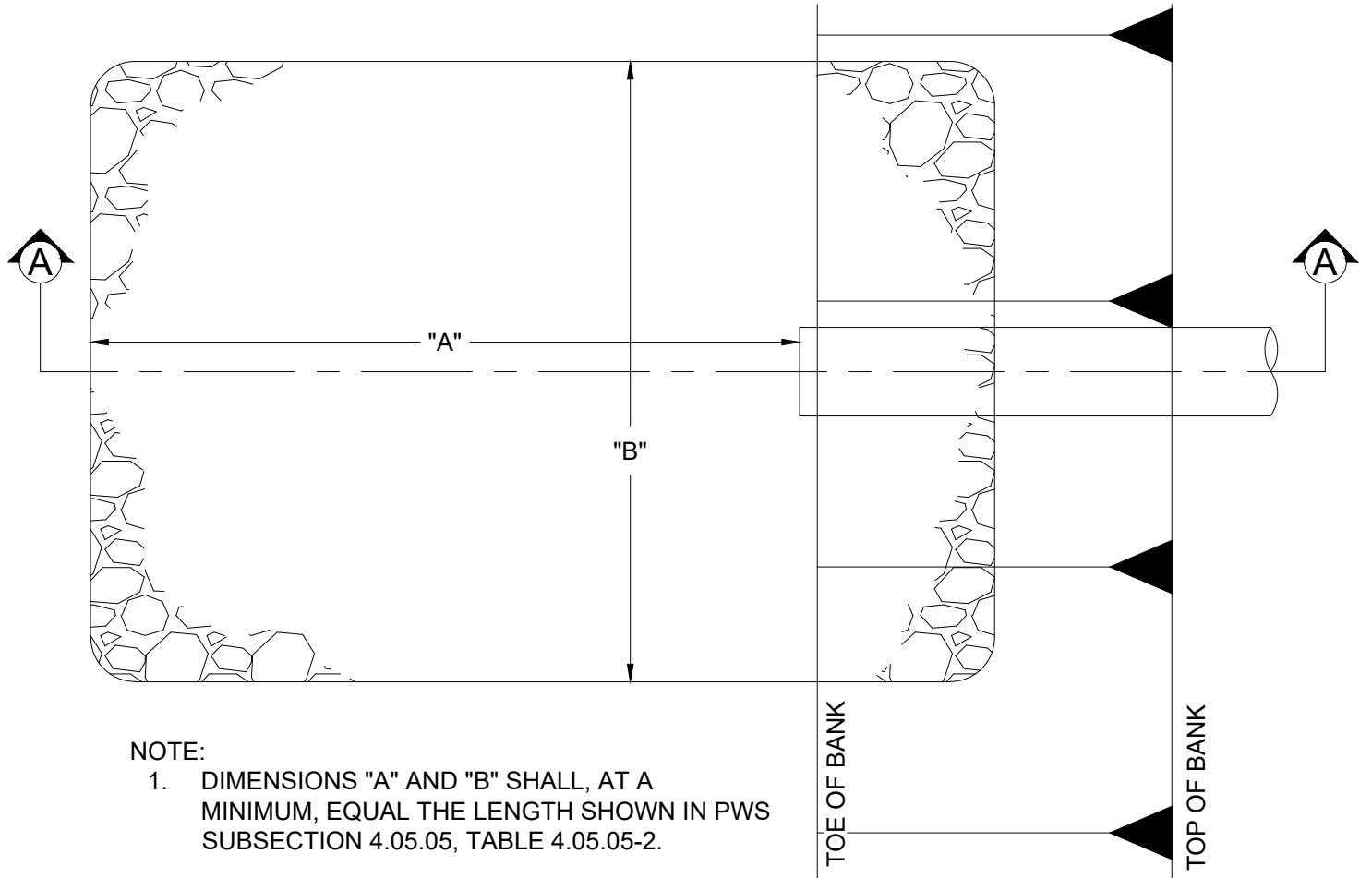
REV. DATE **JAN 2019**

APPR. *[Signature]*

DETAIL NO. **411**

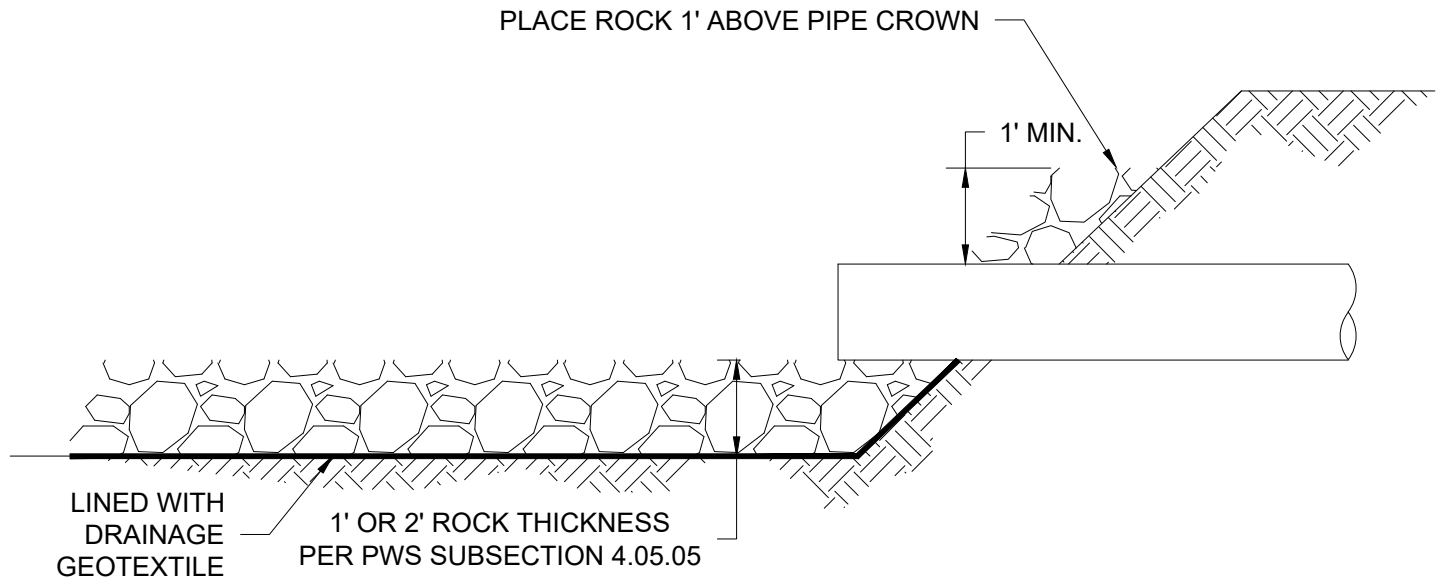


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NOTE:  
 1. DIMENSIONS "A" AND "B" SHALL, AT A MINIMUM, EQUAL THE LENGTH SHOWN IN PWS SUBSECTION 4.05.05, TABLE 4.05.05-2.

PLAN



SECTION A-A

NTS

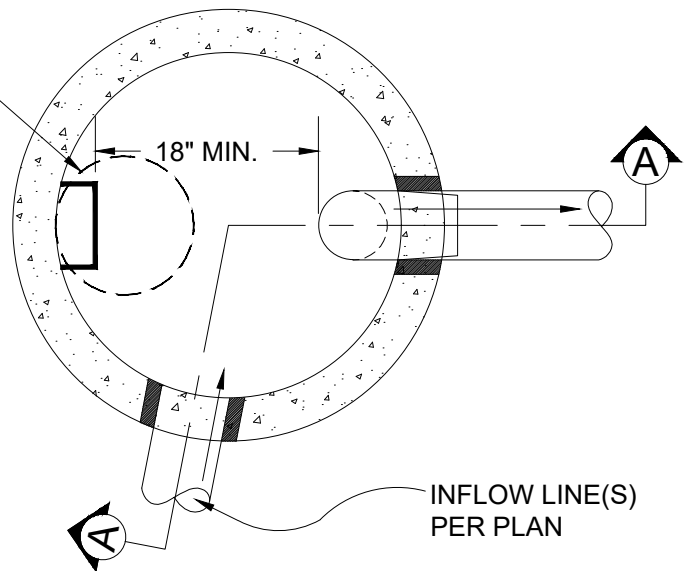
<p><b>CITY OF GRESHAM</b></p>	<p><b>OUTFALL PROTECTION</b></p>	<p>DRAWN <b>KRB</b></p>
		<p>REV. DATE <b>JAN 2024</b></p>
		<p>APPR. <i>[Signature]</i></p>
		<p>DETAIL NO. <b>412</b></p>
<p>PWS VERSION: JAN 2024</p>		

FILENAME: y:\inter-departmental\development engineering projects\public works standards\20 pws revision copy\details\400\_stormwater\storm\_cad\413.dwg, Plotted 11/28/2023 1:43 PM, By: Kimberly Bogert, ANSI FULL BLEED A (8.50 X 11.00 INCHES)

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

STANDARD FRAME & COVER SET IN NON-SHRINK GROUT SEE DETAILS 205(A OR B) & 410. OFFSET AS APPROVED BY ENGINEER.

MANHOLE ACCESS FROM ABOVE



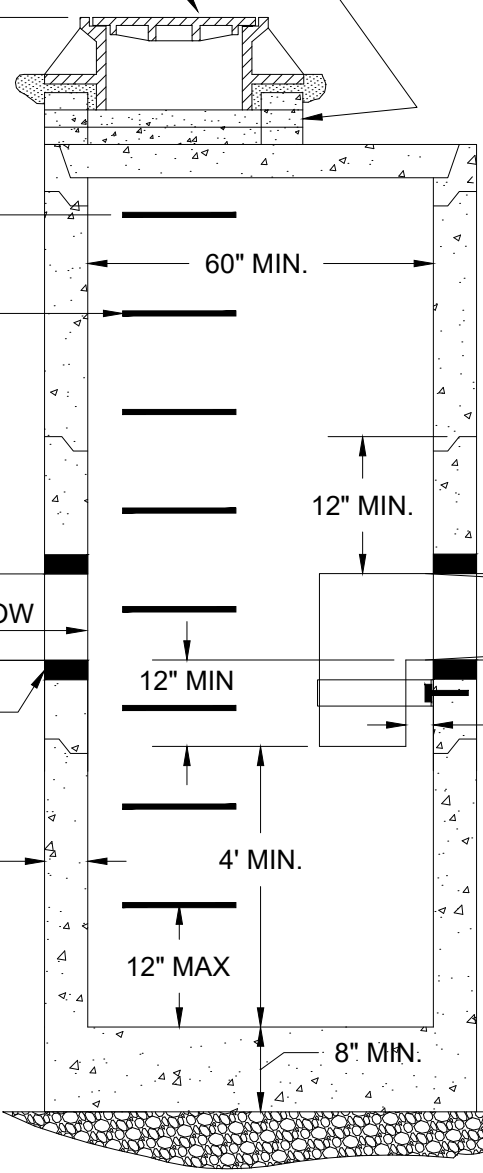
PLAN

24" MAX.

STEPS REQUIRED TO BOTTOM (12" SPACING)

NON-SHRINK GROUT (TYPICAL)

5" MIN.



SECTION A-A

FABRICATED SOLID WALL HDPE 90° SHORT RADIUS ELBOW PER ASTM D1248 SDR 26. SLIGHT TAPER ON OUTLET PIPE BY MANUFACTURER TO MAKE WATERTIGHT CONNECTION BY SLIPPING INTO OUTLET PIPE. ELBOW SHALL BE ANCHORED TO MANHOLE WALL WITH STAINLESS STEEL BANDS AND 1/2" STAINLESS STEEL BOLT.

APPROVED PIPE 12" MIN.

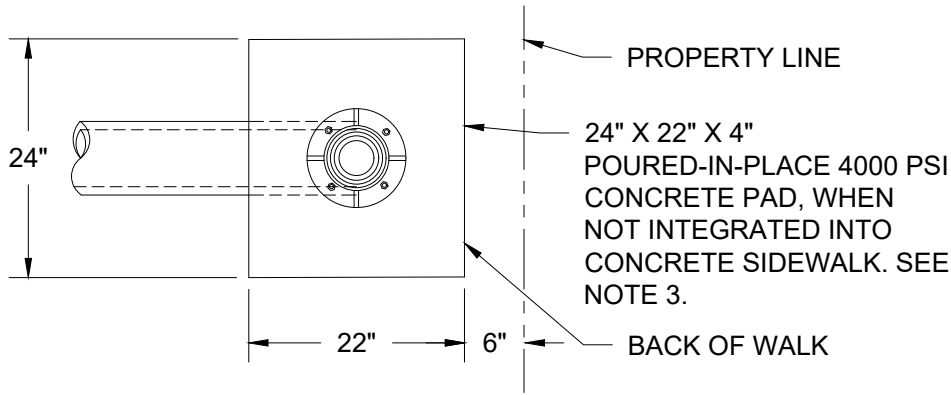
6" MINIMUM THICKNESS OF 3/4"-0" COMPACTED CRUSHED ROCK.

CITY OF GRESHAM

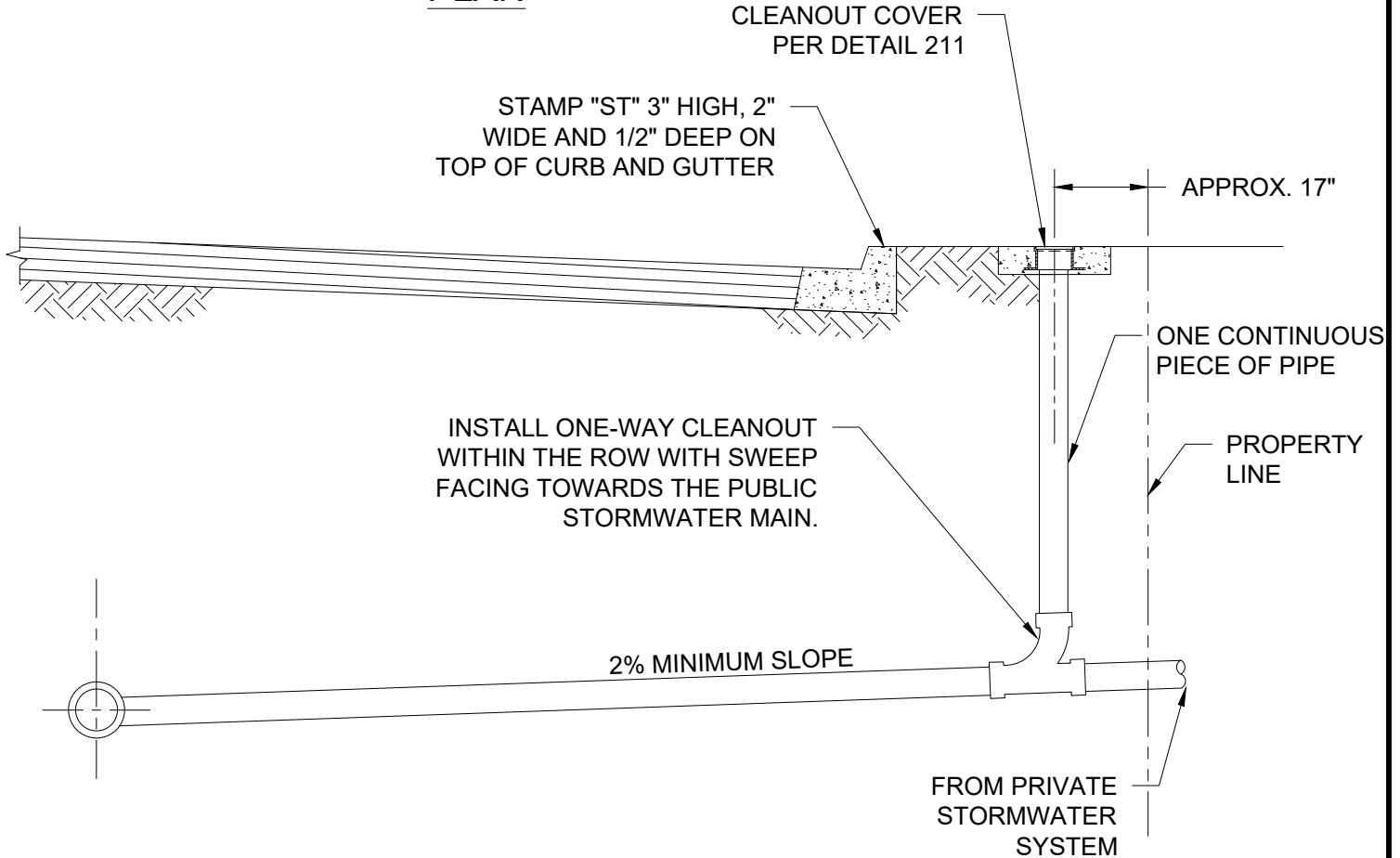
SEDIMENTATION MANHOLE

PWS VERSION: JAN 2024

DRAWN	RMS
REV. DATE	MAR 2024
APPR.	
DETAIL NO.	413



**PLAN**



**NOTES:**

1. SERVICE SHALL NOT BE BACKFILLED PRIOR TO INSPECTION.
2. INSTALL TRACER WIRE ALONG THE ENTIRE PORTION OF THE LATERAL IN THE RIGHT-OF-WAY.
3. IF THE SIDEWALK WILL BE INSTALLED DURING FUTURE CONSTRUCTION, INSTALL THE PIPE RISER 2" ABOVE GRADE AND DO NOT INSTALL A CONCRETE PAD.
4. THE STORMWATER SYSTEM LOCATED UPSTREAM OF THE CLEANOUT IS TO BE OWNED AND MAINTAINED BY THE PROPERTY OWNER.
5. MINIMUM BURY DEPTH TO BE PER PWS 4.03.02.

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**CITY OF GRESHAM**

**STORMWATER LATERAL**

PWS VERSION: JAN 2024

DRAWN KRB

REV. DATE JAN 2024

APPR. 

DETAIL NO. 414