

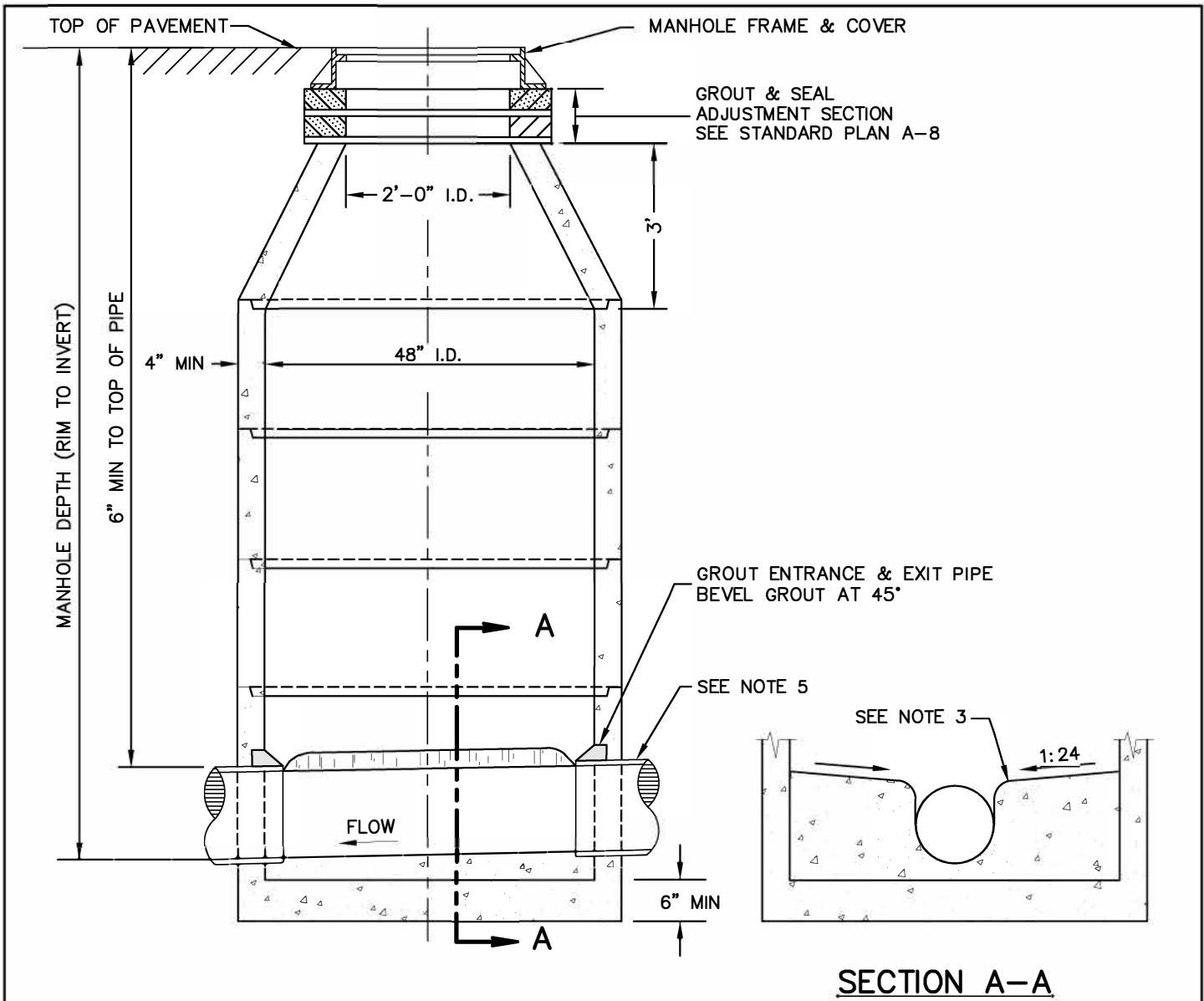
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CITY OF SPOKANE STANDARD PLANS – SECTION Z

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 ***X-### = New Standard Plan

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SECTION A-A


NOTES:

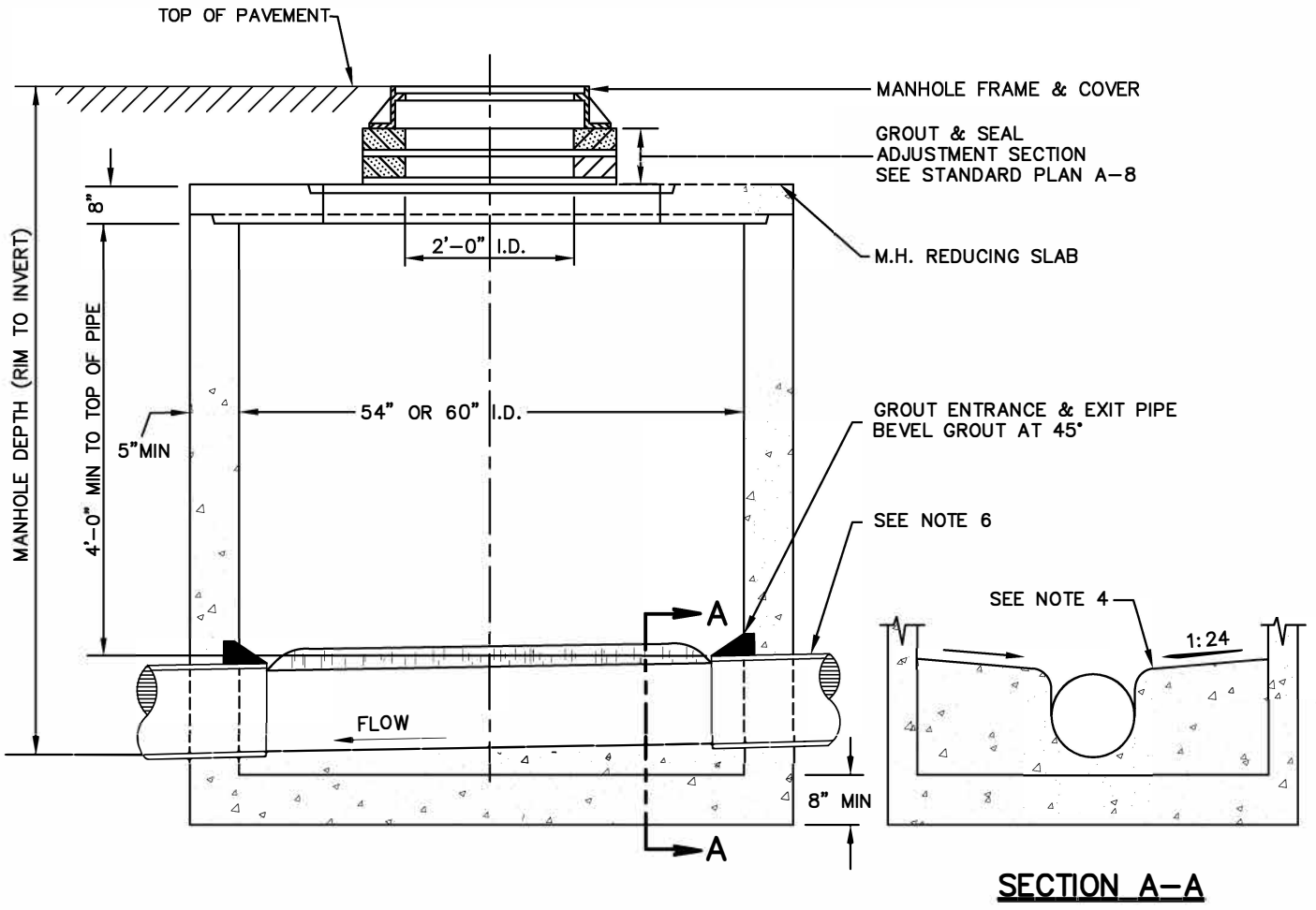
1. SEE STANDARD PLANS A-12/A-13 FOR MANHOLE FRAME & COVER, AND Z-118 FOR BASE & FOUNDATION.
2. MANHOLE STEPS ARE REQUIRED, SEE Z-109.
3. FORM SHELF & SMOOTH CONTINUOUS CHANNEL WITH COMMERCIAL GRADE CONCRETE.
4. MANHOLES EXCEEDING A 20 FT DEPTH SHALL HAVE BARREL SECTIONS WITH MINIMUM 54" DIAMETER, SEE Z-102.
5. MAX PIPE DIA = 24". ANGULAR RUNS EXCEEDING 45° OR ADDITIONAL JUNCTIONS MAY REQUIRE LARGER MANHOLE. DESIGN VERIFICATION IS REQUIRED.
6. SEE STANDARD PLAN A-8 FOR ADJUSTMENT SECTION REQUIREMENTS.
7. IN AREAS WHERE SEASONAL HIGH GROUNDWATER REACHES THE MANHOLE BASE, RESISTANCE TO BUOYANCY SHALL BE ADDRESSED. IN ADDITION, MANHOLE EXTERIOR SHALL BE COATED AND JOINTS SHALL BE WRAPPED ON THE EXTERIOR TO PREVENT GROUNDWATER INFILTRATION INTO THE SEWER.

APPROVED BY

 DIRECTOR OF ENGINEERING SERVICES DAN BULLER, P.E.

ADOPTED: _____
 REVISED: 04/2024
 SUPERSEDES: 05/2021
 CHECKED BY: SJS
 SCALE: NTS
 REVISED BY: LWK/MLD

MANHOLE - 48"		ENGINEERING SERVICES CITY OF SPOKANE, WASHINGTON	STANDARD PLAN No. Z-101




NOTES:

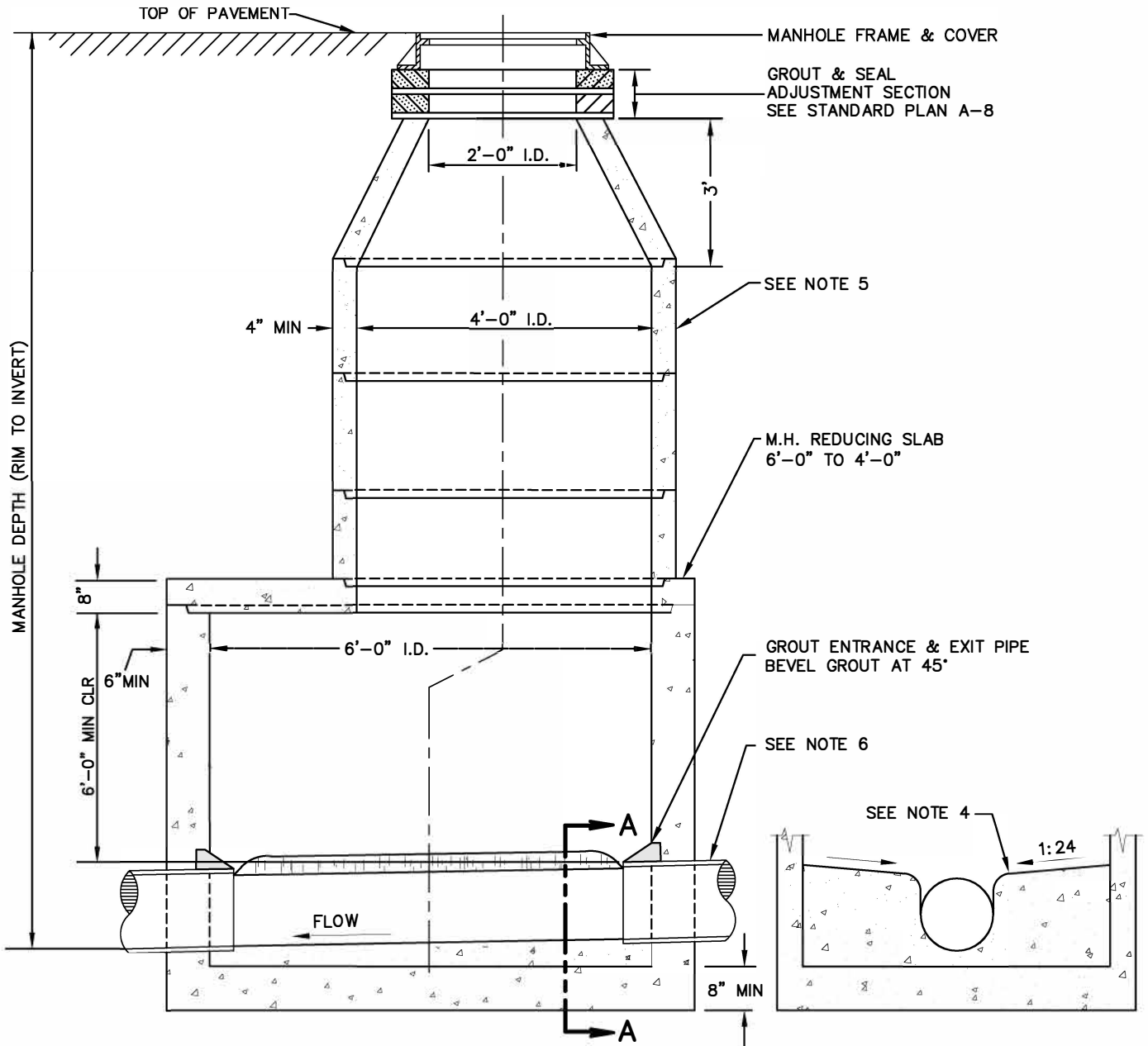
1. SEE STANDARD PLANS A-12/A-13 FOR MANHOLE FRAME & COVER, AND Z-118 FOR BASE & FOUNDATION.
2. MANHOLE STEPS ARE REQUIRED, SEE Z-109.
3. FORM SHELF & SMOOTH CONTINUOUS CHANNEL WITH COMMERCIAL GRADE CONCRETE.
4. REDUCING SLAB SHALL BE INSTALLED WITH A 24" OPENING CENTERED ON THE SLAB.
5. MAX PIPE DIA. = 30" FOR 54" MANHOLE AND 36" FOR 60" MANHOLE. ANGULAR RUNS EXCEEDING 45° OR ADDITIONAL JUNCTIONS MAY REQUIRE LARGER MANHOLE. DESIGN VERIFICATION IS REQUIRED.
6. SEE STANDARD PLAN A-8 FOR ADJUSTMENT SECTION REQUIREMENTS.
7. IN AREAS WHERE SEASONAL HIGH GROUNDWATER REACHES THE MANHOLE BASE, RESISTANCE TO BUOYANCY SHALL BE ADDRESSED. IN ADDITION, MANHOLE EXTERIOR SHALL BE COATED AND JOINTS SHALL BE WRAPPED ON THE EXTERIOR TO PREVENT GROUNDWATER INFILTRATION INTO THE SEWER.

APPROVED BY

 DIRECTOR OF ENGINEERING SERVICES DAN BULLER, P.E.

ADOPTED: _____
 REVISED: 04/2024
 SUPERSEDES: 05/2021
 CHECKED BY: SJS
 SCALE: NTS
 REVISED BY: LWK/MLD

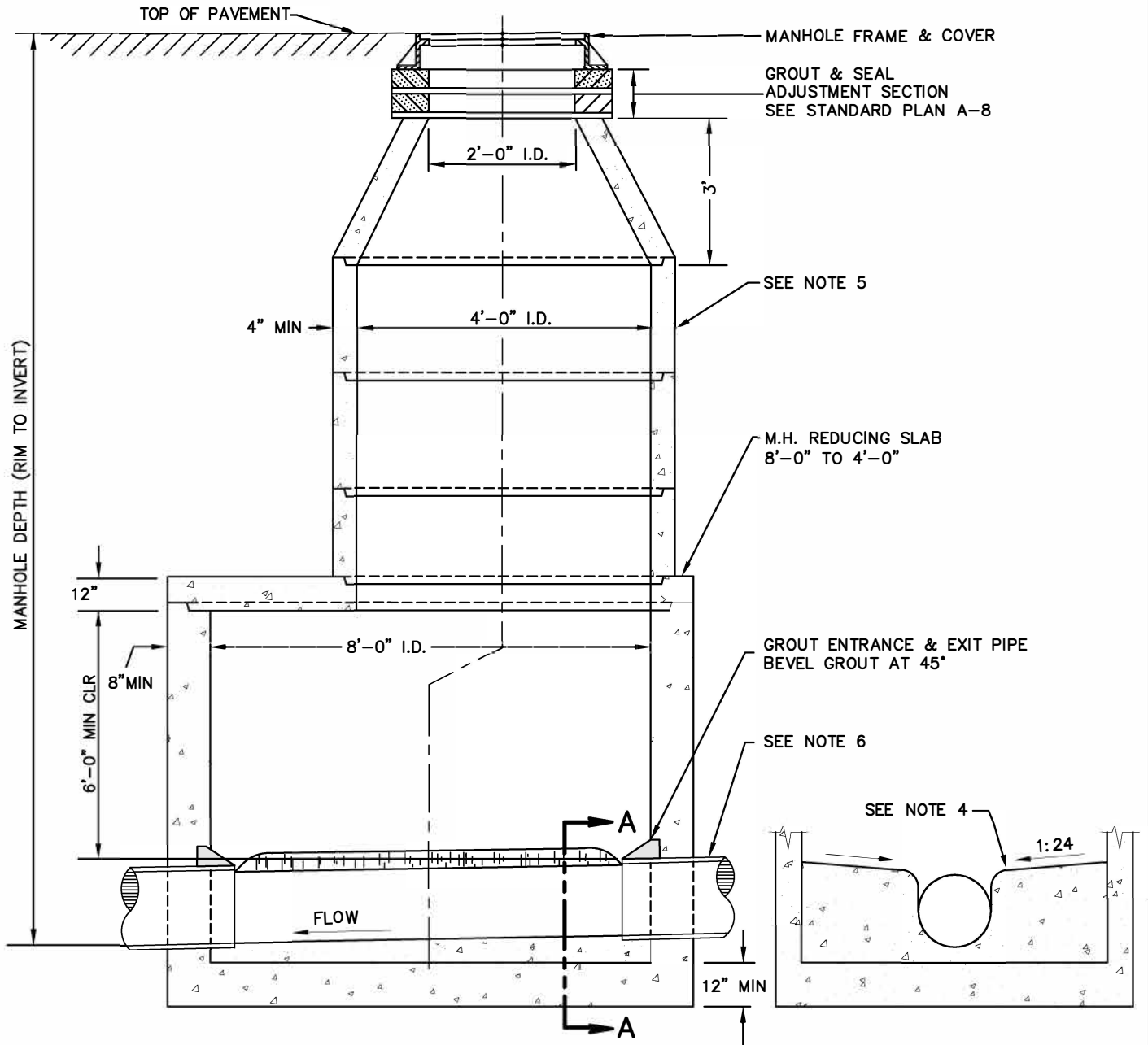
<p>MANHOLE - 54" & 60"</p> 	<p>ENGINEERING SERVICES CITY OF SPOKANE, WASHINGTON</p>	<p>STANDARD PLAN No. Z-102</p>
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NOTES:

1. SEE STANDARD PLANS A-12/A-13 FOR MANHOLE FRAME & COVER, AND Z-118 FOR BASE & FOUNDATION.
2. MANHOLE STEPS ARE REQUIRED, SEE Z-109.
3. ACCESS HOLE TO BE CENTERED OVER CHANNEL.
4. FORM SHELF & SMOOTH CONTINUOUS CHANNEL WITH COMMERCIAL GRADE CONCRETE.
5. MANHOLES EXCEEDING A 20 FT DEPTH SHALL HAVE BARREL SECTIONS 54" I.D. OR GREATER IN WHICH CASE A BARREL DIA X 24" REDUCING SLAB SHALL BE USED IN PLACE OF THE CONE, 24" OPENING CENTERED ON SLAB.
6. MAX PIPE DIA. = 48" ANGULAR RUNS EXCEEDING 45° OR ADDITIONAL JUNCTIONS MAY REQUIRE LARGER MANHOLE. DESIGN VERIFICATION IS REQUIRED.
7. SEE STANDARD PLAN A-8 FOR ADJUSTMENT SECTION REQUIREMENTS.
8. IN AREAS WHERE SEASONAL HIGH GROUNDWATER REACHES THE MANHOLE BASE, RESISTANCE TO BUOYANCY SHALL BE ADDRESSED. IN ADDITION, MANHOLE EXTERIOR SHALL BE COATED AND JOINTS SHALL BE WRAPPED ON THE EXTERIOR TO

<p>APPROVED BY</p> <p>DIRECTOR OF ENGINEERING SERVICES DAN BULLER, P.E.</p>	<p>ADOPTED: _____</p> <p>REVISED: 048/2024</p> <p>SUPERSEDES: 10/2019</p> <p>CHECKED BY: SJS</p> <p>SCALE: NTS</p> <p>REVISED BY: LWK/MLD</p>	<p>MANHOLE - 72"</p> <p>ENGINEERING SERVICES CITY OF SPOKANE, WASHINGTON</p>	<p>STANDARD PLAN No. Z-103</p>
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NOTES:

1. SEE STD PLANS A-12/A-13 FOR MANHOLE FRAME & COVER, AND Z-118 FOR BASE & FOUNDATION.
2. MANHOLE STEPS ARE REQUIRED, SEE Z-109.
3. ACCESS HOLE TO BE CENTERED OVER CHANNEL.
4. FORM SHELF & SMOOTH CONTINUOUS CHANNEL WITH COMMERCIAL GRADE CONCRETE.
5. MANHOLES EXCEEDING A 20 FT DEPTH SHALL HAVE BARREL SECTIONS 54" I.D. OR GREATER.
6. MAX PIPE DIA. = 72" ANGULAR RUNS EXCEEDING 45° OR ADDITIONAL JUNCTIONS MAY REQUIRE LARGER MANHOLE. DESIGN VERIFICATION IS REQUIRED.
7. SEE STANDARD PLAN A-8 FOR ADJUSTMENT SECTION REQUIREMENTS.
8. IN AREAS WHERE SEASONAL HIGH GROUNDWATER REACHES THE MANHOLE BASE, RESISTANCE TO BUOYANCY SHALL BE ADDRESSED. IN ADDITION, MANHOLE EXTERIOR SHALL BE COATED AND JOINTS SHALL BE WRAPPED ON THE EXTERIOR TO PREVENT GROUNDWATER INFILTRATION INTO THE SEWER.

SECTION A-A

APPROVED BY

 DIRECTOR OF ENGINEERING SERVICES DAN BULLER, P.E.

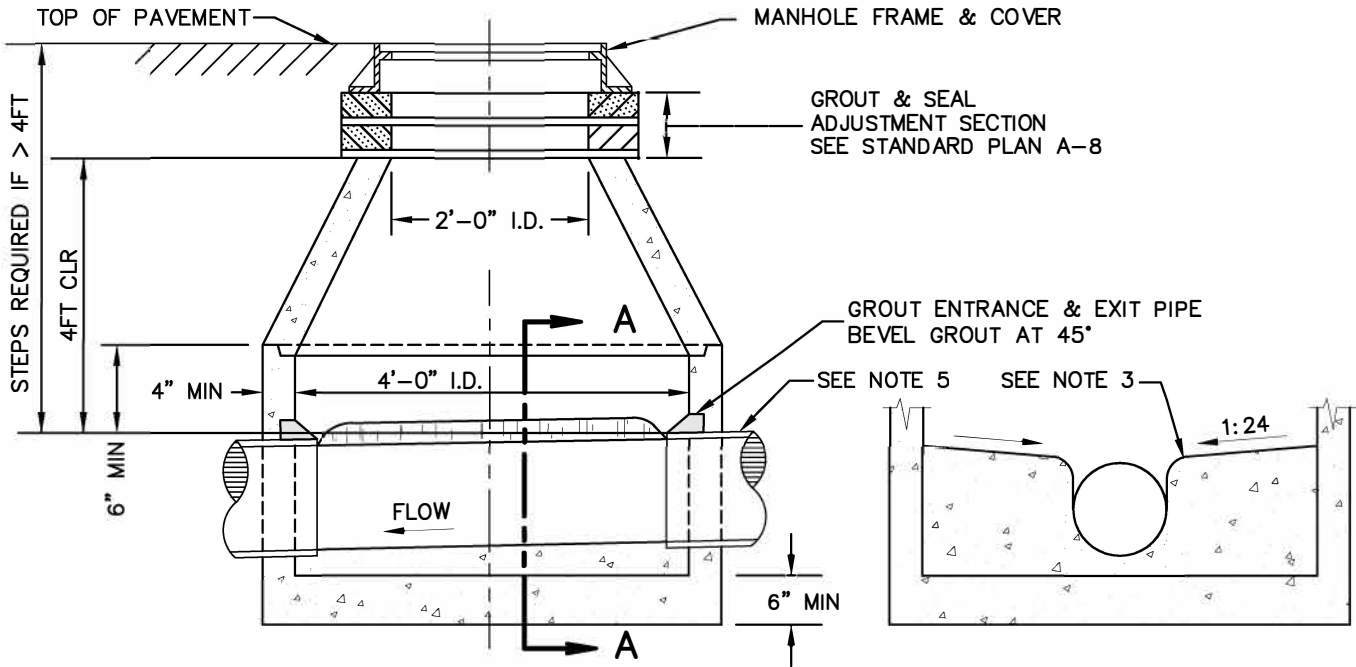
ADOPTED: _____
 REVISED: 04/2024
 SUPERSEDES: 10/2019
 CHECKED BY: SJS
 SCALE: NTS
 REVISED BY: LWK/MLD



MANHOLE - 96"

ENGINEERING SERVICES
 CITY OF SPOKANE, WASHINGTON

STANDARD
 PLAN No.
Z-104



SECTION A-A


NOTES:

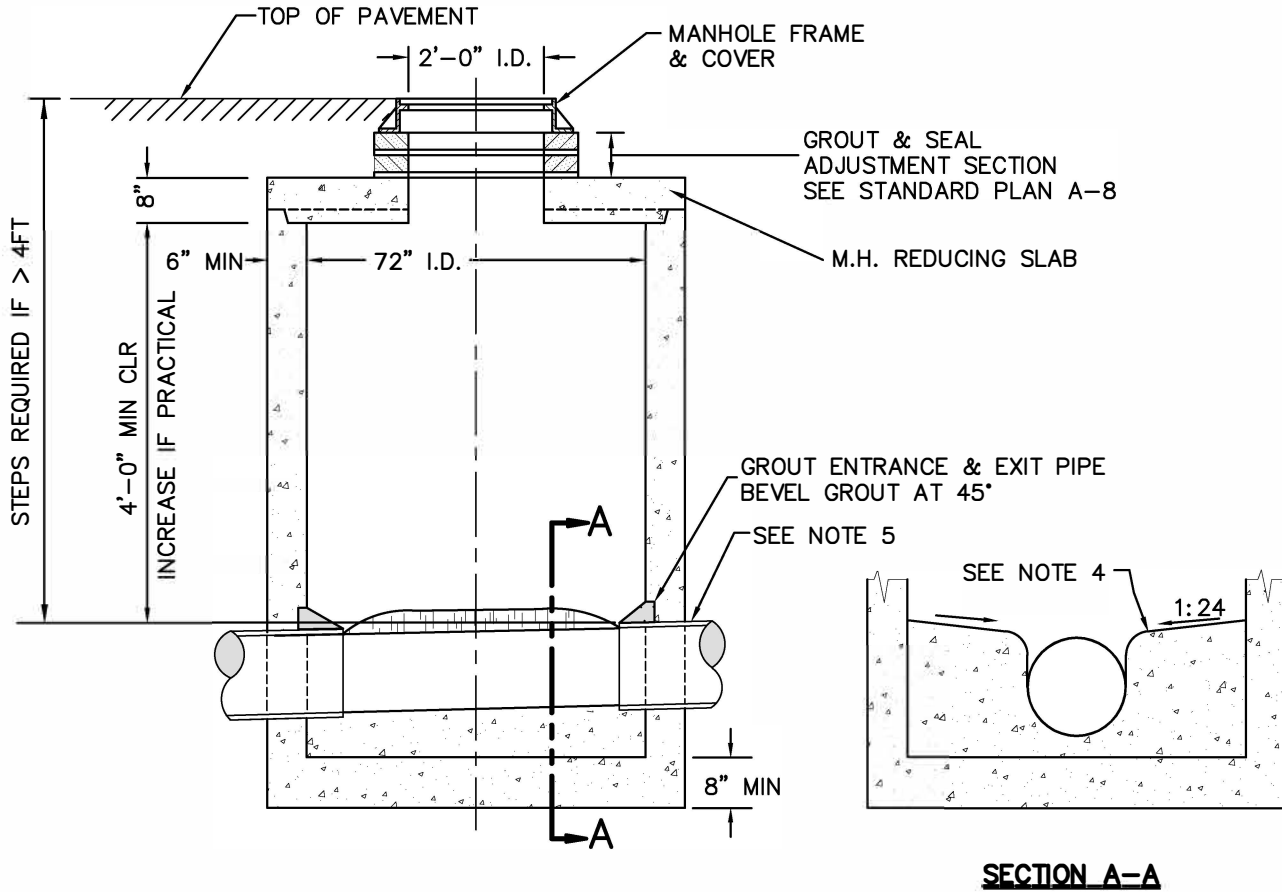
1. SEE STANDARD PLANS A-12/A-13 FOR MANHOLE FRAME & COVER, AND Z-118 FOR BASE & FOUNDATION.
2. SEE Z-109 FOR MANHOLE STEP DETAILS IF REQUIRED.
3. FORM SHELF & SMOOTH CONTINUOUS CHANNEL WITH COMMERCIAL GRADE CONCRETE.
4. IN GENERAL, SHALLOW MANHOLES ARE NOT ALLOWED. THIS DETAIL MAY BE ALLOWED WITH PRIOR PERMISSION OF THE SEWER DEPARTMENT ENGINEER WHERE SUFFICIENT VERTICAL CLEARANCE DOES NOT EXIST TO CONSTRUCT THE MANHOLE SHOWN ON Z-101. THIS DETAIL WILL NOT BE PERMITTED IN NEW INSTALLATIONS.
5. IN EXTREME SITUATIONS AND WITH APPROVAL OF THE SEWER DEPARTMENT ENGINEER, THE PIPE MAY BE LOCATED IN THE CONE AND THE BASE SLAB POURED IN PLACE.
6. SEE STANDARD PLAN A-8 FOR ADJUSTMENT SECTION REQUIREMENTS.
7. IN AREAS WHERE SEASONAL HIGH GROUNDWATER REACHES THE MANHOLE BASE, RESISTANCE TO BUOYANCY SHALL BE ADDRESSED. IN ADDITION, MANHOLE EXTERIOR SHALL BE COATED AND JOINTS SHALL BE WRAPPED ON THE EXTERIOR TO PREVENT GROUNDWATER INFILTRATION INTO THE SEWER.

APPROVED BY

 DIRECTOR OF ENGINEERING SERVICES DAN BULLER, P.E.

ADOPTED: _____
 REVISED: 04/2024
 SUPERSEDES: 10/2019
 CHECKED BY: SJS
 SCALE: NTS
 REVISED BY: LWK/MLD

MANHOLE - 48" SHALLOW		ENGINEERING SERVICES CITY OF SPOKANE, WASHINGTON	STANDARD PLAN No. Z-105
CITY OF SPOKANE, WASHINGTON			



SECTION A-A

NOTES:

1. SEE STANDARD PLANS A-12/A-13 FOR FRAME & COVER, AND Z-118 FOR BASE & FOUNDATION.
2. SEE Z-109 FOR MANHOLE STEP DETAILS IF REQUIRED.
3. REDUCING SLAB SHALL BE INSTALLED WITH 24" OPENING CENTERED ON THE SLAB.
4. FORM SHELF & SMOOTH CONTINUOUS CHANNEL WITH COMMERCIAL GRADE CONCRETE.
5. MAX PIPE DIA. = 48". ANGULAR RUNS EXCEEDING 45° OR ADDITIONAL JUNCTIONS MAY REQUIRE LARGER MANHOLE. DESIGN VERIFICATION IS REQUIRED.
6. SEE STANDARD PLAN A-8 FOR ADJUSTMENT SECTION REQUIREMENTS.
7. IN AREAS WHERE SEASONAL HIGH GROUNDWATER REACHES THE MANHOLE BASE, RESISTANCE TO BUOYANCY SHALL BE ADDRESSED. IN ADDITION, MANHOLE EXTERIOR SHALL BE COATED AND JOINTS SHALL BE WRAPPED ON THE EXTERIOR TO PREVENT GROUNDWATER INFILTRATION INTO THE SEWER.

APPROVED BY

 DIRECTOR OF ENGINEERING SERVICES DAN BULLER, P.E.

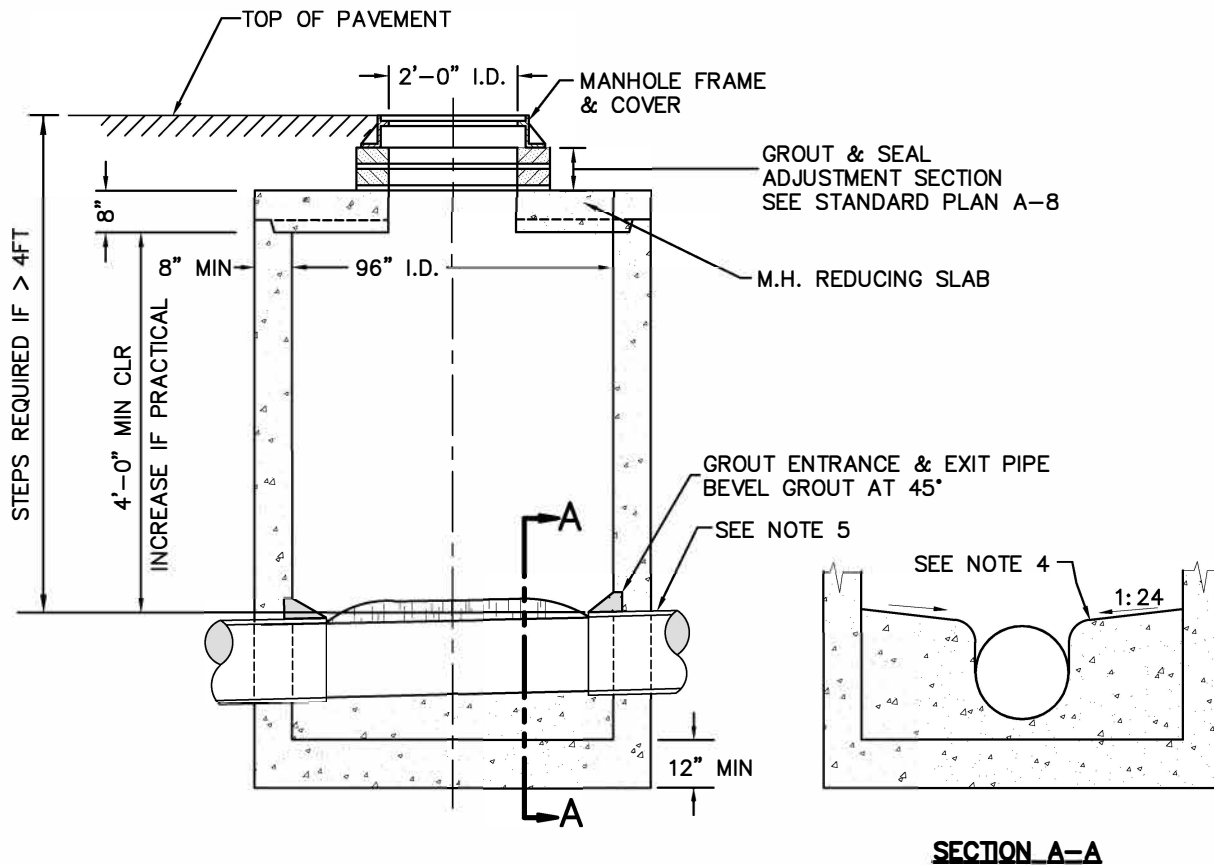
ADOPTED: _____
 REVISED: 04/2024
 SUPERSEDES: 10/2019
 CHECKED BY: SJS
 SCALE: NTS
 REVISED BY: LWK/MLD



MANHOLE - 72" SHALLOW

ENGINEERING SERVICES
 CITY OF SPOKANE, WASHINGTON

STANDARD
 PLAN No.
Z-106



NOTES:

1. SEE STANDARD PLANS A-12/A-13 FOR FRAME & COVER, AND Z-118 FOR BASE & FOUNDATION.
2. SEE Z-109 FOR MANHOLE STEP DETAILS IF REQUIRED.
3. REDUCING SLAB SHALL BE INSTALLED WITH 24" OPENING CENTERED ON THE SLAB.
4. FORM SHELF & SMOOTH CONTINUOUS CHANNEL WITH COMMERCIAL GRADE CONCRETE.
5. MAX PIPE DIA. = 72". ANGULAR RUNS EXCEEDING 45° OR ADDITIONAL JUNCTIONS MAY REQUIRE LARGER MANHOLE. DESIGN VERIFICATION IS REQUIRED.
6. SEE STANDARD PLAN A-8 FOR ADJUSTMENT SECTION REQUIREMENTS.
7. IN AREAS WHERE SEASONAL HIGH GROUNDWATER REACHES THE MANHOLE BASE, RESISTANCE TO BUOYANCY SHALL BE ADDRESSED. IN ADDITION, MANHOLE EXTERIOR SHALL BE COATED AND JOINTS SHALL BE WRAPPED ON THE EXTERIOR TO PREVENT GROUNDWATER INFILTRATION INTO THE SEWER.

APPROVED BY

 DIRECTOR OF ENGINEERING SERVICES DAN BULLER, P.E.

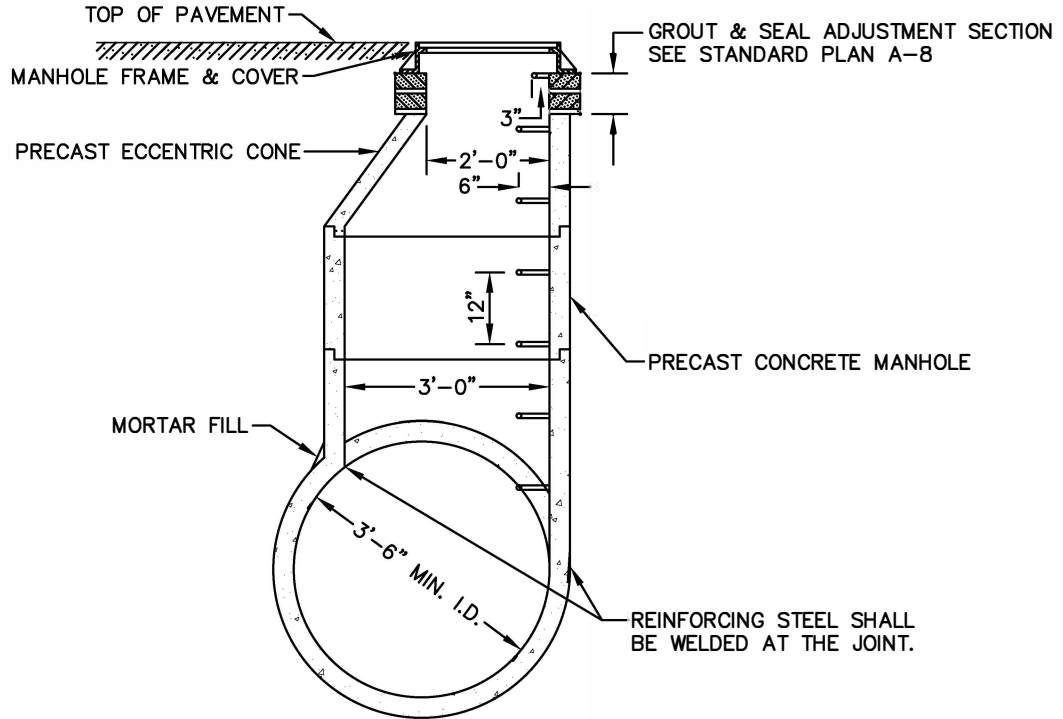
ADOPTED: _____
 REVISED: 04/2024
 SUPERSEDES: 10/2019
 CHECKED BY: SJS
 SCALE: NTS
 REVISED BY: LWK/MLD



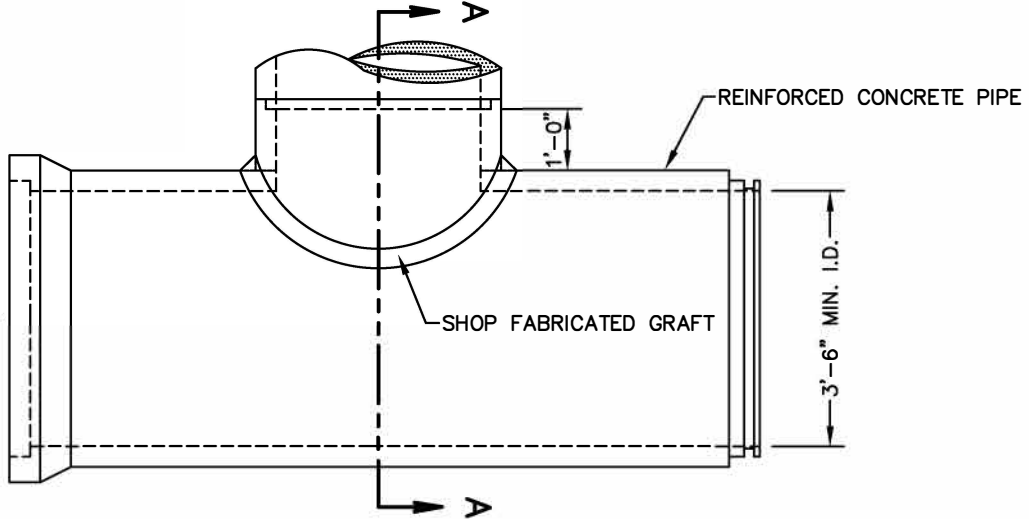
MANHOLE - 96" SHALLOW

ENGINEERING SERVICES
 CITY OF SPOKANE, WASHINGTON

STANDARD
 PLAN No.
Z-106A



SECTION A-A




NOTES:

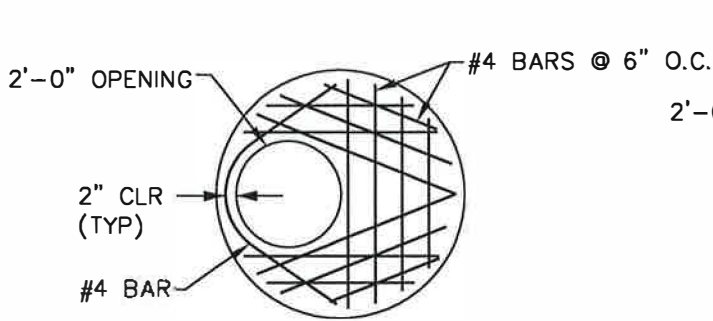
1. SEE SECTIONS 7-05 & 9-12.4 FOR PRECAST CONCRETE MANHOLES.
2. SEE STANDARD PLANS A-12 & A-13 FOR MANHOLE FRAME & COVER.
3. SEE STANDARD PLAN Z-109 FOR M.H. STEP DETAILS.
4. CONE & BARREL JOINT(S) MAY BE EITHER TONGUE & GROOVE OR REVERSE TONGUE & GROOVE.
5. CONE ADJUSTMENT SECTION & BARREL JOINT(S) TO BE SEALED PER SECS 7-05 & 9-04.
6. ADDITIONAL REINFORCING AND/OR SPECIAL BEDDING FOR THE REINFORCED CONC PIPE SHALL BE AS SPECIFIED.
7. RISER DIA MAY BE 4'-0" FOR REINFORCED CONC PIPE SIZES 4'-0" & LARGER.
8. SEE STANDARD PLAN A-8 FOR ADJUSTMENT SECTION REQUIREMENTS.
9. IN AREAS WHERE SEASONAL HIGH GROUNDWATER REACHES THE MANHOLE BASE, RESISTANCE TO BUOYANCY SHALL BE ADDRESSED. IN ADDITION, MANHOLE EXTERIOR SHALL BE COATED AND JOINTS SHALL BE WRAPPED ON THE EXTERIOR TO PREVENT GROUNDWATER INFILTRATION INTO THE SEWER.

APPROVED BY

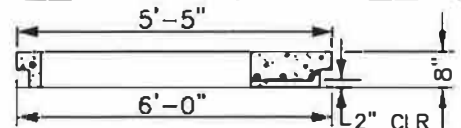
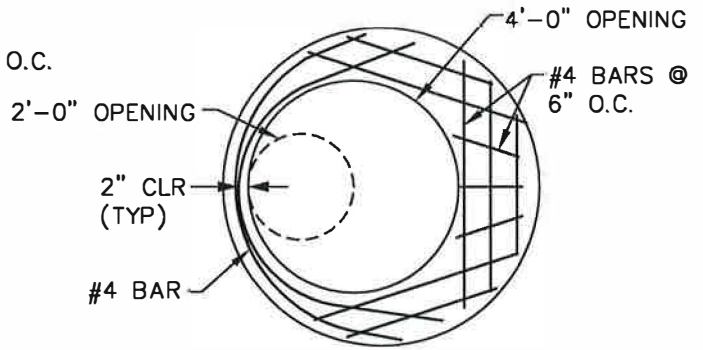
 DIRECTOR OF ENGINEERING SERVICES DAN BULLER, P.E.

ADOPTED: _____
 REVISED: 04/2024
 SUPERSEDES: 10/2019
 CHECKED BY: JAG
 SCALE: NTS
 DWG/REV. BY: MDH/MLD

MANHOLE – TYPE V
 ENGINEERING SERVICES CITY OF SPOKANE, WASHINGTON
STANDARD PLAN No. Z-107

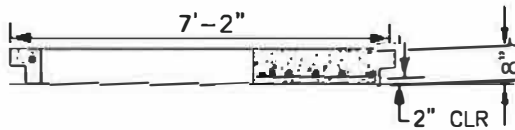
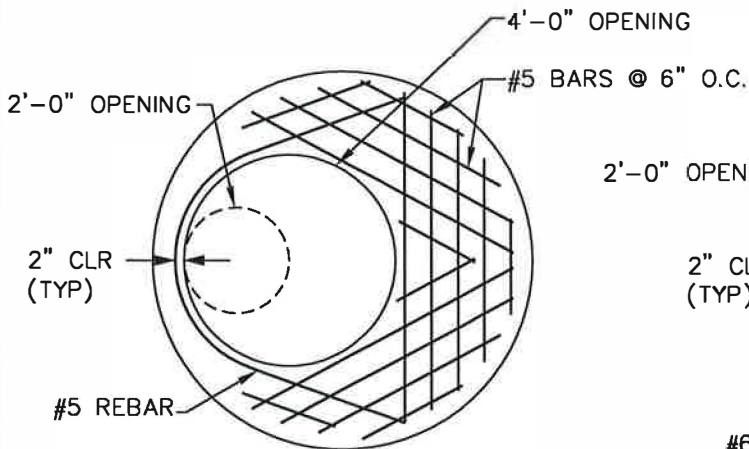


SLAB FOR 4'-0" I.D. MANHOLE

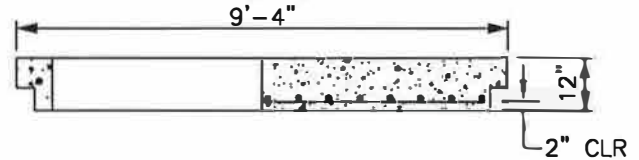
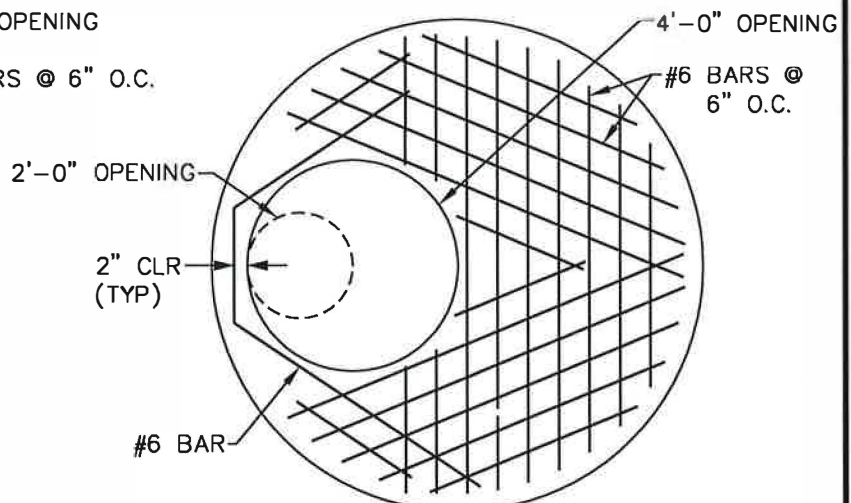


SLAB FOR 4'-6" I.D. MANHOLE

SLAB FOR 5'-0" I.D. MANHOLE



SLAB FOR 6'-0" I.D. MANHOLE



SLAB FOR 8'-0" I.D. MANHOLE

NOTES:


1. PLACE REBAR NEAR BTM FACE OF SLAB AT INDICATED CLEARANCES.
2. REINFORCING STEEL SHALL BE STD DEFORMED BAR; YIELD STRESS, $F_y = 40$ KSI.

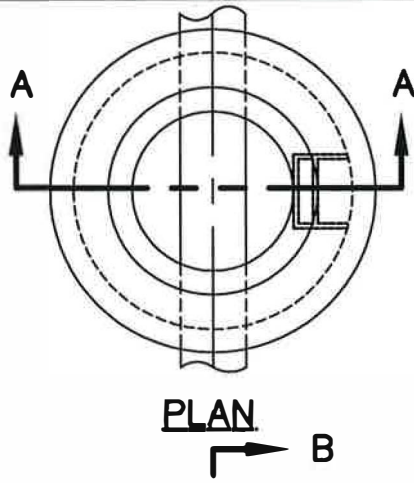
APPROVED BY

 DIRECTOR, ENGINEERING SERVICES TOM L. ARNOLD, P.E.

 PRINCIPAL ENGINEER, DESIGN KEN M. BROWN, P.E.

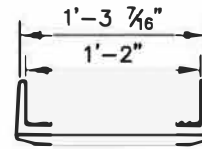
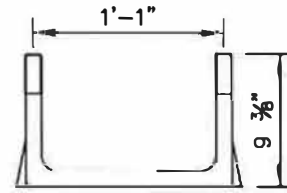
ADOPTED: 2/86
 REVISED: 4/2004
 SUPERSEDES:
 SCALE: NTS
 DWG/REV. BY: MDH

MANHOLE - REDUCING SLAB
 REINFORCEMENT DETAILS
 ENGINEERING SERVICES
 CITY OF SPOKANE, WASHINGTON
 STANDARD PLAN No. Z-108

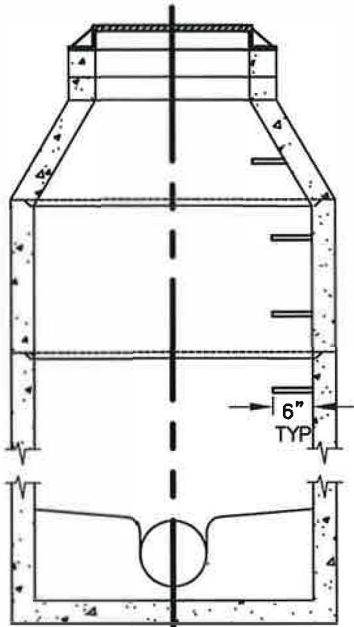


PLAN

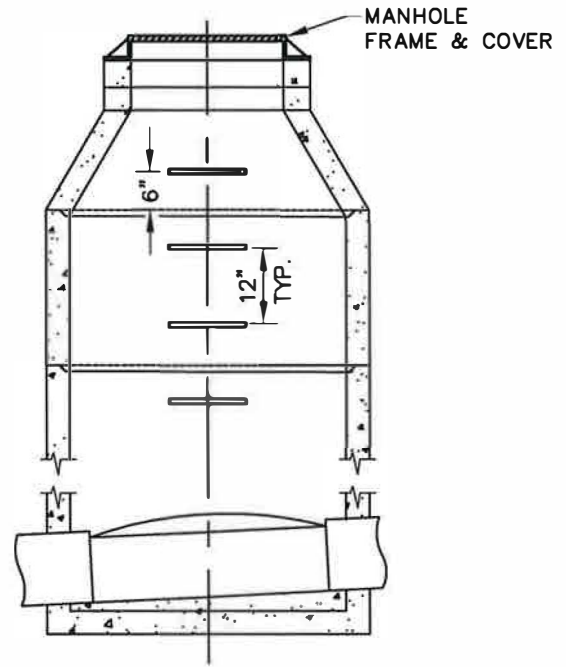
B



MANHOLE STEP



SECTION A-A



SECTION B-B

NOTES:

1. MANHOLE STEPS SHALL BE GROUTED INTO THE PRECAST CONCRETE WALL. STEPS SHALL BE UNIFORMLY SPACED AT 12" O.C. VERTICALLY, LEVELED HORIZONTALLY, & ALIGNED ALONG THE MANHOLE'S C/L.
2. MANHOLES W/ OUT REDUCING SLABS SHALL HAVE THE STEPS LOCATED ABOVE THE SHELF. MANHOLES WITH REDUCING SLABS SHALL HAVE THE STEPS CENTERED BELOW THE SLAB ACCESS HOLE & THE UPSTREAM PIPE.
3. MANHOLE STEPS SHALL BE POLYPROPYLENE W/ANTI-SLIP TREAD DESIGN & TWO REFLECTORS PER STEP.

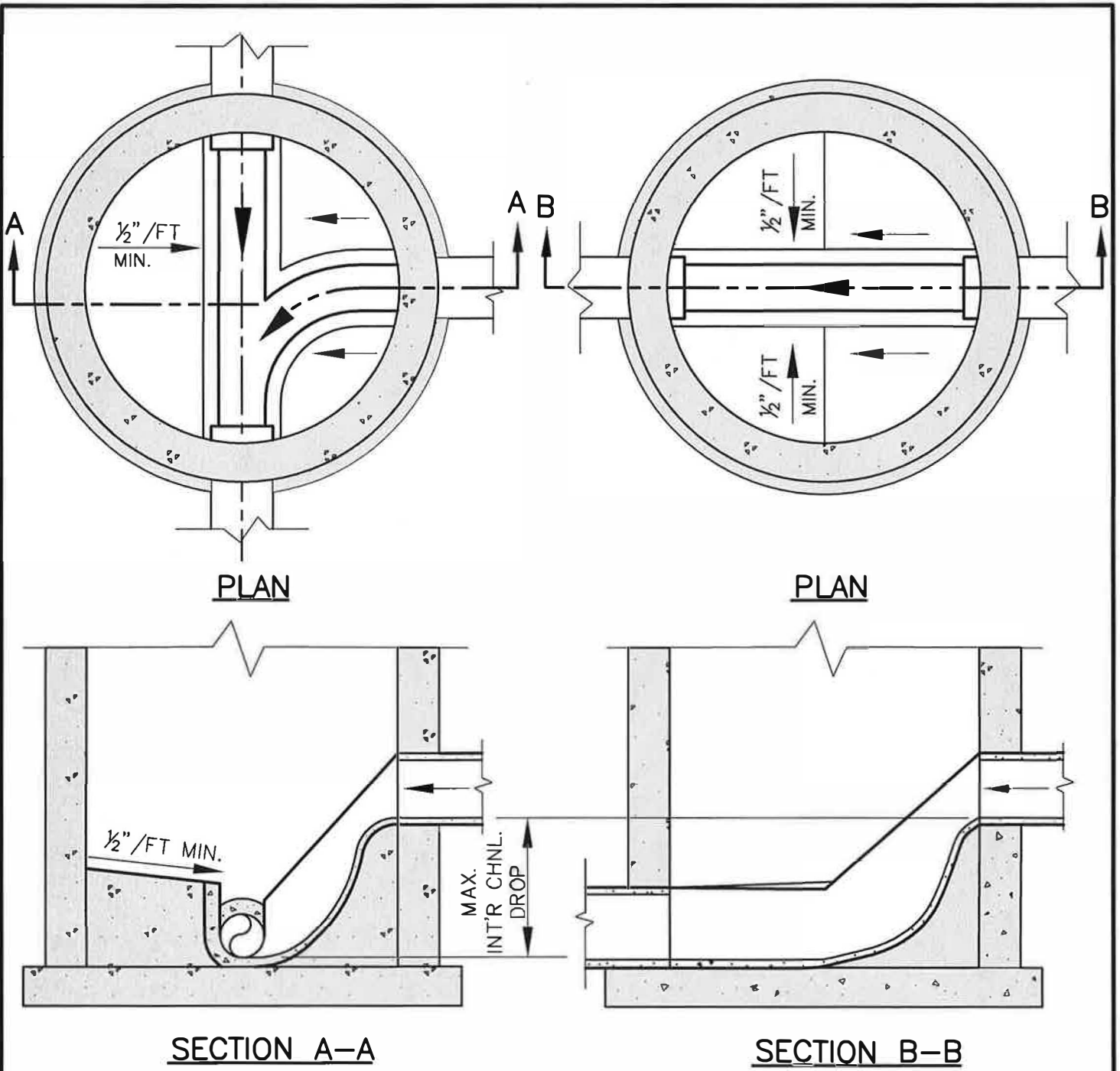
APPROVED BY

 DIRECTOR, ENGINEERING SERVICES PERRY M. TAYLOR, P.E.

 PRINCIPAL ENGINEER, CONST. KENNETH M. BROWN, P.E.


ADOPTED: 02/1986
 REVISED: 04/2012
 SUPERSEDES: 09/2010
 CHECKED BY: SJS
 SCALE: NTS
 REVISED BY: LWK

MANHOLE STEP DETAILS		
ENGINEERING SERVICES CITY OF SPOKANE, WASHINGTON	STANDARD PLAN No. Z-109	




MANHOLE I.D. INCHES	MAX. INT'R CHNL. DROP INCHES
48	18
54	22
72	30
96	40

APPROVED BY

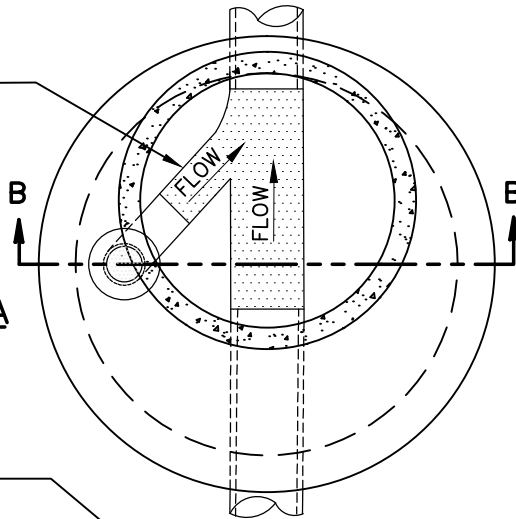
 DIRECTOR, ENGINEERING SERVICES TOM L. ARNOLD, P.E.

 PRINCIPAL ENGINEER, DESIGN GARY S. NELSON, P.E.

ADOPTED: 2/86
 REVISED: 05/2007
 SUPERSEDES: 12/98
 CHECKED BY: JAG
 SCALE: NTS
 DWG/REV. BY: DGB/MDH

MANHOLE - INTERIOR CHANNEL DROP
 ENGINEERING SERVICES
 CITY OF SPOKANE, WASHINGTON
 STANDARD PLAN No. Z-110

DROP CHANNEL TO BE ALIGNED W/ DIRECTION OF SEWER CHANNEL FLOW

SECTION A-A



NOTES:

1. SEE SECTIONS 7-05 & 9-12.4 FOR PRECAST CONCRETE MANHOLES.
2. SEE STD PLANS A-12 & A-13 FOR MANHOLE FRAME & COVER.
3. SEE STD PLAN Z-108 FOR MANHOLE REDUCING SLABS.
4. SEE STD PLAN Z-109 FOR MANHOLE STEP DETAILS.
5. SEE STD PLAN Z-118 FOR BASE & FOUNDATION DETAILS.
6. CONE, REDUCING SLAB & BARREL JOINTS MAY BE EITHER TONGUE & GROOVE OR REVERSE TONGUE & GROOVE.
7. ADJUSTMENT SECTION, CONE, REDUCING SLAB & BARREL JOINTS TO BE SEALED PER SEC 7-05.3.
8. ACCESS HOLES OF MANHOLE & REDUCING SLAB TO BE CENTERED OVER CHANNEL.
9. D.I. PIPE JOINTS SHALL BE FLANGE JOINTS, EXCEPT AS NOTED OTHERWISE.
10. INT'R DROPS SHALL REQ'D THE APPROVAL OF THE CITY ENGR SERVICES DEPT. DROPS ARE UTILIZED WHERE BEDROCK PREVENTS FULL-DEPTH EXCAVATION.
11. SEE STANDARD PLAN A-8 FOR ADJUSTMENT SECTION REQUIREMENTS.

MANHOLE FRAME & COVER
TOP OF PAVEMENT
PRECAST CONCENTRIC CONE

M.H. REDUCING SLAB, TYPE II 72 OR II 96 W/ 4'-0" DIA OPEN'G. SEE STD PLANS Z-103, Z-104, & Z-108.

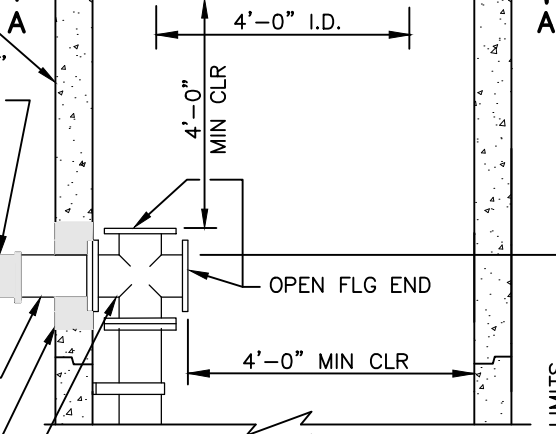
M.H.-PRECAST CONC, TYPE II 72 OR II 96

ROMAC COUPLER OR EQUAL, 1'-6" MAX DIST FROM C/L OF COUPLER TO M.H. WALL

SEWER LINE, 12" DIA. MAX

8'-6" MIN DEPTH FOR M.H. TYPE II 72
8'-10" MIN DEPTH FOR M.H. TYPE II 96

2'-0" I.D.
GROUT & SEAL ADJUSTMENT SECTION SEE STANDARD PLAN A-8



D.I. PIPE SPOOL (CL 53) FLG X P.E.

GROUT & EMBED SPOOL BOLT HEADS FOR ATTACHMENT OF TEE/CROSS FLG

TEE OR CROSS D.I. PIPE

JOINTS PER NOTE 9

D.I. PIPE (CL 53) FLG X P.E.

PIPE CLAMPS, STAINLESS STEEL, (2) EA MIN @ 5'-0" MAX O.C. ATTACHED W/ S.S. EXPANSION ANCHORS & S.S. BOLTS

ELBOW, 45-DEG D.I. PIPE M.J. (TYTON) X P.E.

FORMED DROP CHANNEL

SECTION B-B

6'-0" OR 8'-0" I.D. 7" (6'-0" I.D.)
8" (8'-0" I.D.)

VERTICAL PAY LIMITS CROWN-TO-CROWN

SLOPE 1/2" / FT

SANITARY SEWER

APPROVED BY

[Signature]
ENGINEERING SERVICES DIRECTOR KYLE TWHIG
CITY ENGINEER DAN BULLER, P.E.

ADOPTED: _____
REVISED: 10/2019
SUPERSEDES: 01/2017
CHECKED BY: JAG
SCALE: NTS
DWG/REV. BY: MDH/TSS

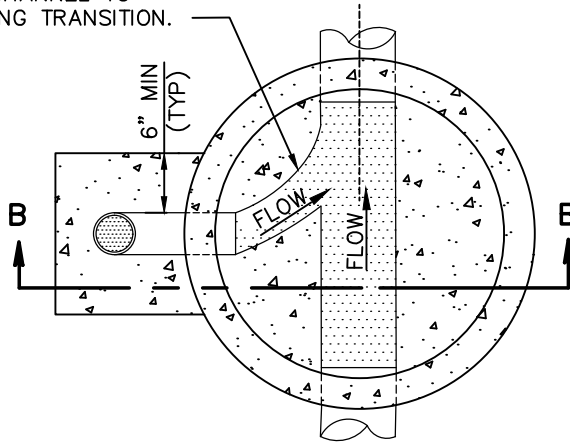
MANHOLE-INTERIOR D.I.P. DROP



ENGINEERING SERVICES
CITY OF SPOKANE, WASHINGTON

STANDARD PLAN No.
Z-111

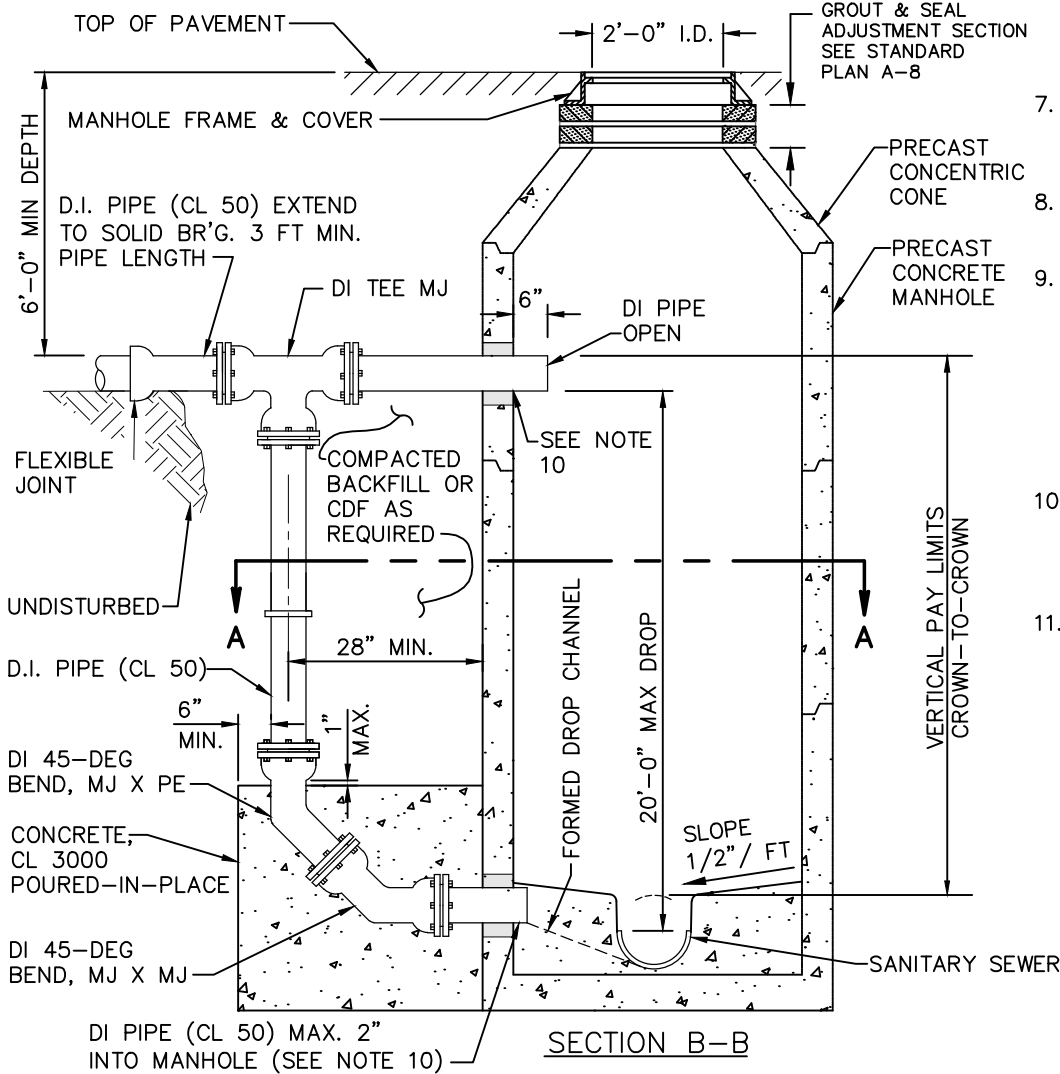
DROP CHANNEL TO BE ALIGNED W/ DIRECTION OF SEWER CHANNEL FLOW. SHAPE CHANNEL TO PROVIDE SMOOTH SWEEPING TRANSITION.



SECTION A-A

NOTES:

1. SEE SECS 7-05 & 9-12.4 FOR PRECAST CONCRETE MANHOLES.
2. SEE STD PLANS A-12 & A-13 FOR MANHOLE FRAME & COVER.
3. SEE STD Z-109 FOR MANHOLE STEP DETAILS.
4. SEE STD PLAN Z-118 FOR BASE & FOUNDATION DETAILS.
5. CONE & BARREL JOINTS MAY BE EITHER TONGUE & GROOVE OR REVERSE TONGUE & GROOVE.
6. ADJUSTMENT SECTION, CONE & BARREL JOINTS TO BE SEALED PER SEC 7-05.3.
7. ACCESS HOLE TO BE CENTERED OVER CHANNEL.
8. D.I. PIPE JOINTS SHALL BE MECHANICAL JOINTS.
9. EXT'R PIPE DROPS SHALL REQUIRE THE APPROVAL OF THE CITY ENGR SERVICES DEPT. DROPS ARE UTILIZED WHERE BEDROCK PREVENTS FULL-DEPTH EXCAVATION.
10. GROUT ENTIRE CIRCUMFERENCE OF PIPE ANNULUS AROUND PIPE PENETRATION.
11. SEE STANDARD PLAN A-8 FOR ADJUSTMENT SECTION REQUIREMENTS.



SECTION B-B

APPROVED BY

[Signature]
 ENGINEERING SERVICES DIRECTOR
 KYLE TWHIG
 CITY ENGINEER
 DAN BULLER, P.E.

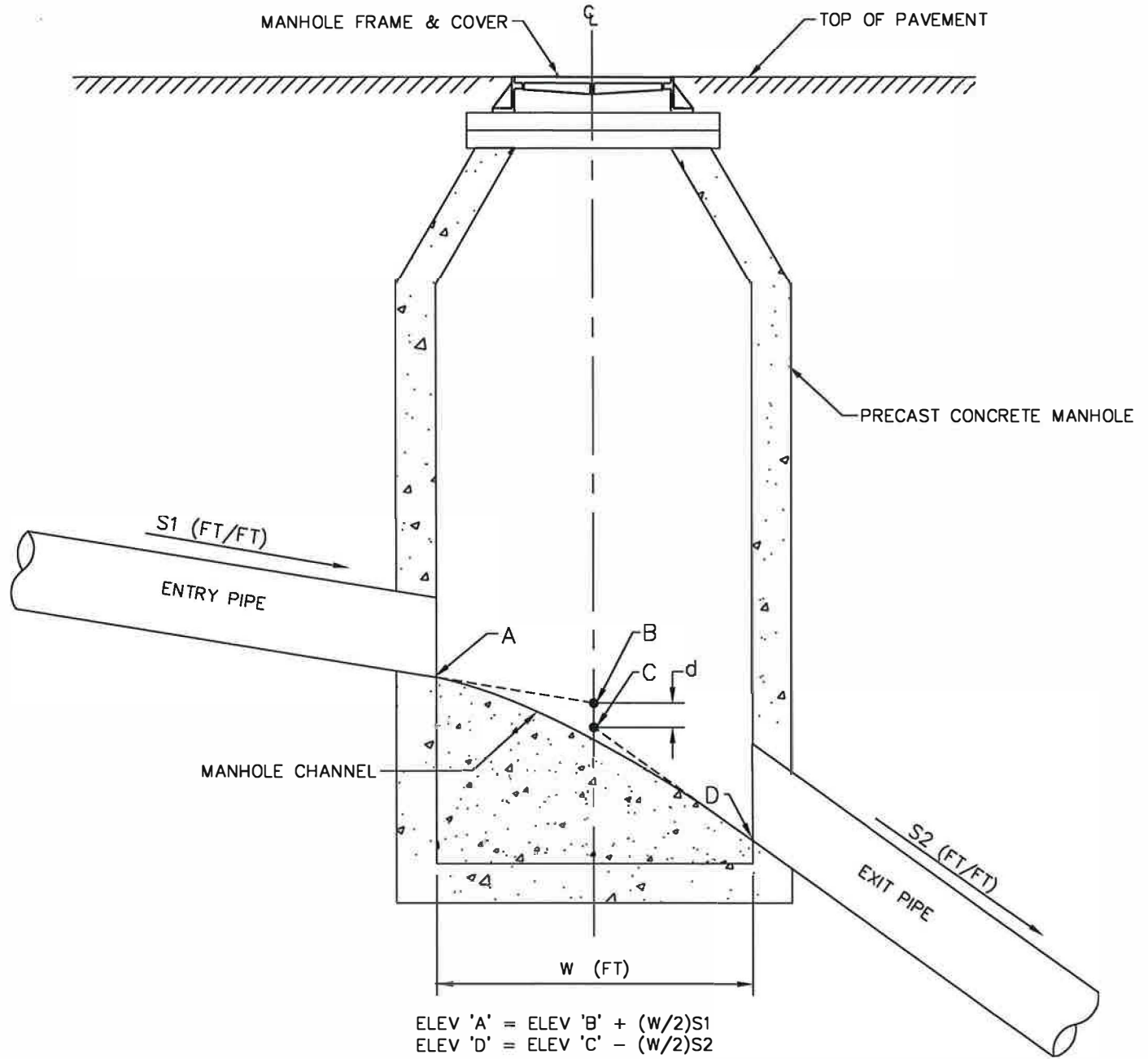
ADOPTED: _____
 REVISED: 10/2019
 SUPERSEDES: 01/2017
 CHECKED BY: JAG
 SCALE: NTS
 DWG/REV. BY: MDH/MLD

MANHOLE - EXTERIOR D.I.P. DROP



ENGINEERING SERVICES
 CITY OF SPOKANE, WASHINGTON

STANDARD
 PLAN No.
Z-112



NOTES:

1. ELEV 'A' IS THE INVERT ELEVATION OF THE ENTRY PIPE @ THE MANHOLE WALL ON GRADE S1.
2. ELEV'S 'B' & 'C' ARE THE DESIGN INVERT ELEVATIONS OF THE ENTRY/EXIT PIPES @ THE MANHOLE C/L.
3. ELEV 'D' IS THE INVERT ELEVATION OF THE EXIT PIPE @ THE MANHOLE WALL ON GRADE S2.
4. DIMENSION 'd' IS THE REQ'D MIN CHANNEL DROP PER DESIGN STD 4.2-6.
5. SEE STD PLANS Z-110, Z-111, & Z-112 FOR CHANNEL DROPS IN EXCESS OF THE MIN DROP.

APPROVED BY

Thomas J. Arnold
 DIRECTOR, ENGINEERING SERVICES TOM L. ARNOLD, P.E.
K. Brown
 PRINCIPAL ENGINEER, DESIGN KEN M. BROWN, P.E.

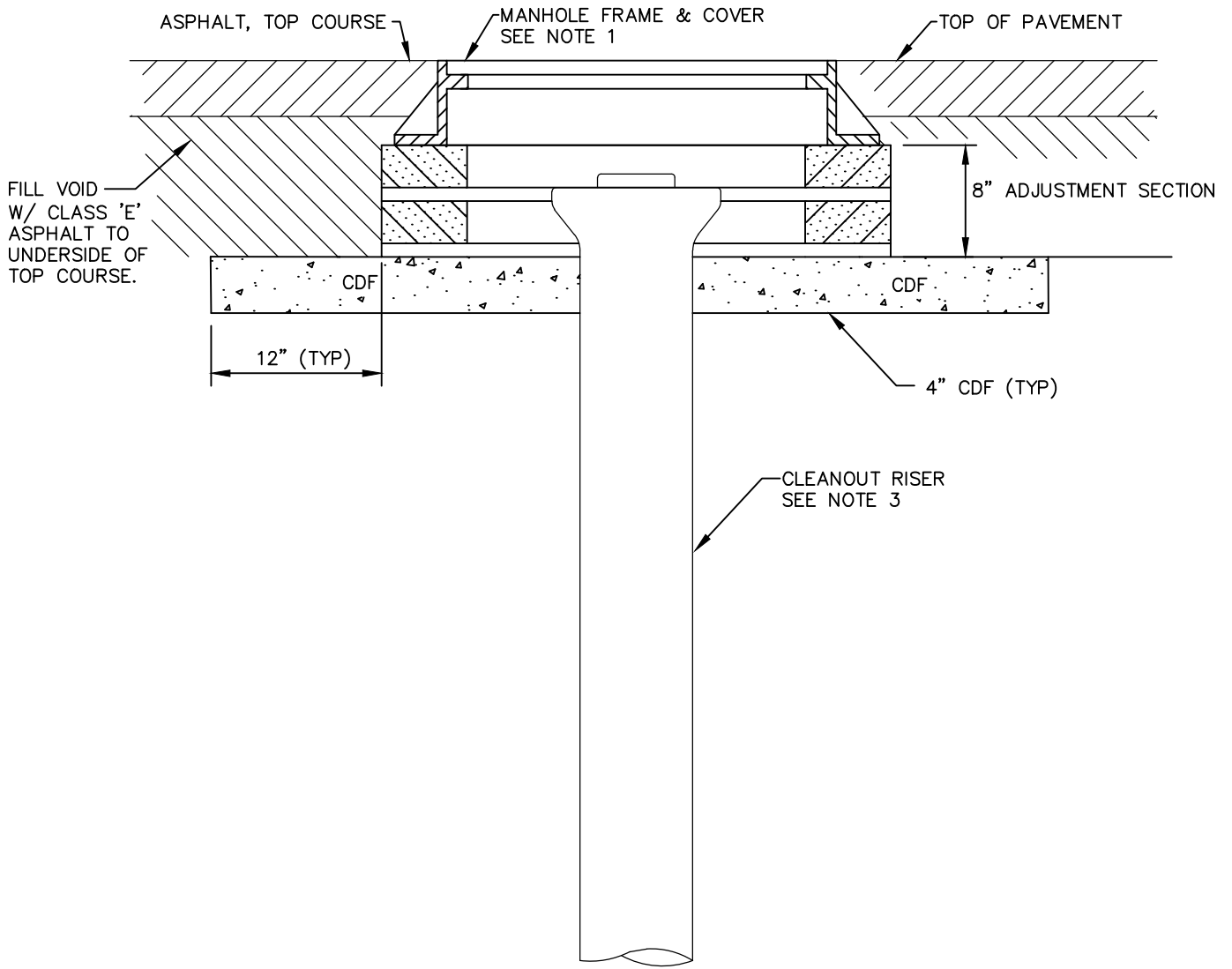
ADOPTED: 4/2004
 REVISED:
 SUPERSEDES: Z-111 12/98
 SCALE: NTS
 DWG/REV. BY: MDH/TSS

MANHOLE - PIPE INVERT ELEVATIONS



ENGINEERING SERVICES
 CITY OF SPOKANE, WASHINGTON

STANDARD
 PLAN No.
 Z-113



NOTES:

1. SEE STD PLANS A-12 & A-13 FOR MANHOLE FRAME & COVER.
2. ACCESS HOLE TO BE CENTERED OVER CLEANOUT.
3. TOP OF CLEANOUT SHALL EXTEND TO A POINT NOT LESS THAT 6" NOR MORE THAN 12" BELOW TOP OF MANHOLE COVER. CLEANOUTS SHALL BE PLUGGED W/ A REMOVABLE STOPPER WHICH SHALL PREVENT PASSAGE OF DIRT OR WATER.

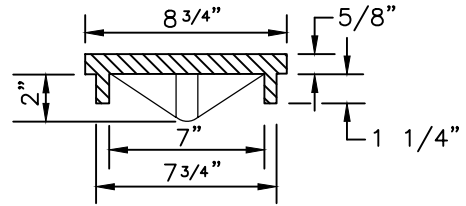
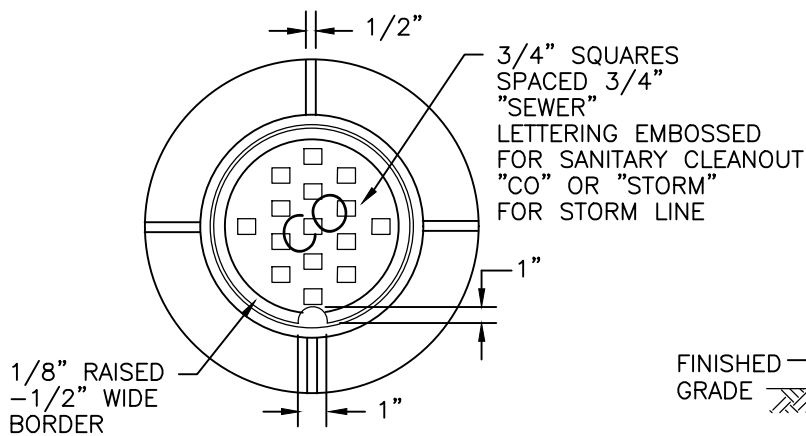
APPROVED BY

 ENGINEERING SERVICES DIRECTOR
 KYLE TWOHIG

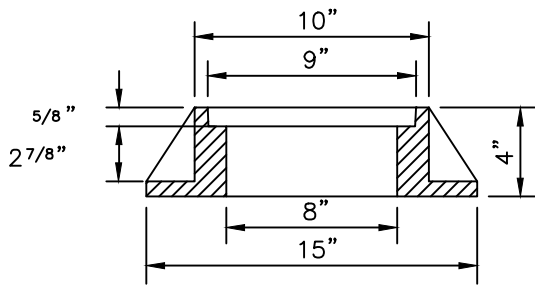
 CITY ENGINEER
 DAN BULLER, P.E.

ADOPTED: _____
 REVISED: 10/2019
 SUPERSEDES: 4/2004
 SCALE: _____ NTS
 DWG/REV. BY: _____ TSS

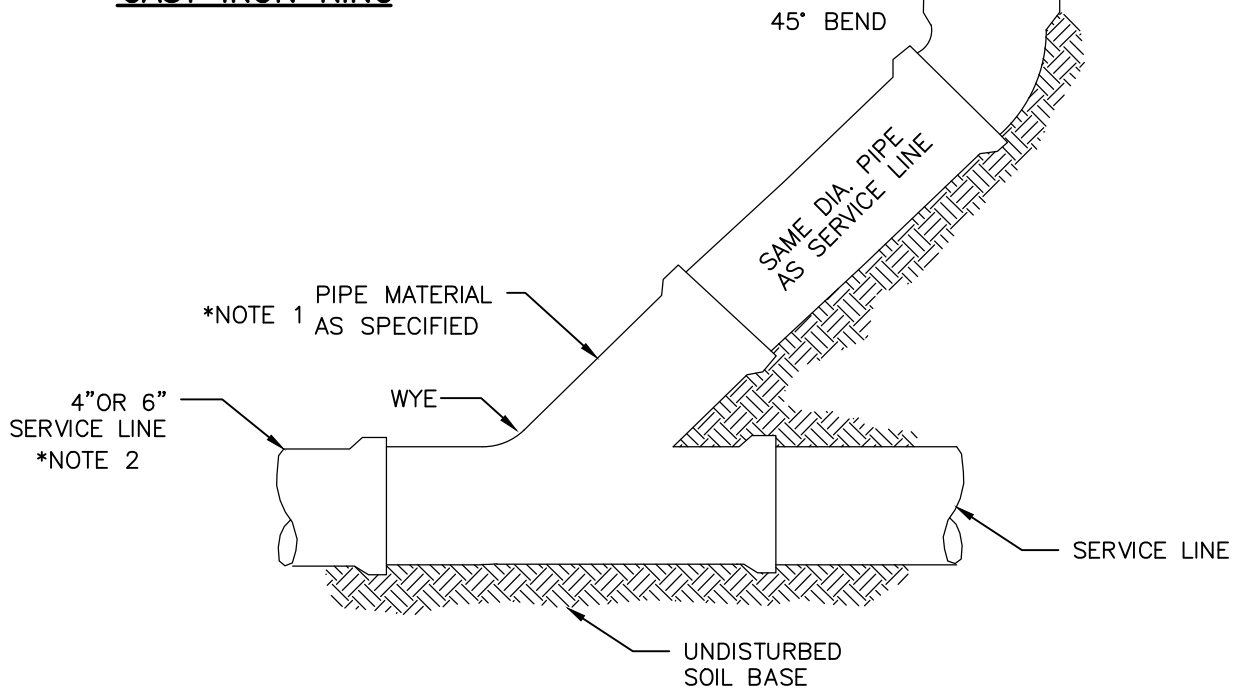
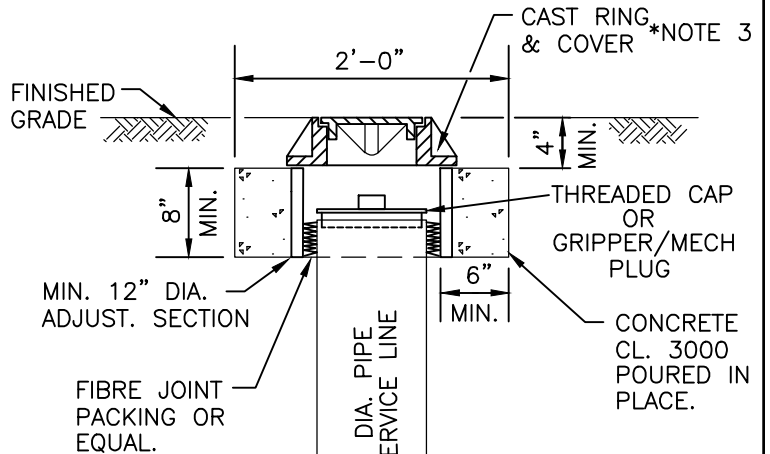
SEWER CLEANOUT			ENGINEERING SERVICES	STANDARD
CITY OF SPOKANE, WASHINGTON			PLAN No.	Z-114



CAST IRON COVER



CAST IRON RING



SEWER CLEAN-OUT

NOTES:

1. FOR SERVICE AND CLEANOUT CONSTRUCTION REQUIREMENTS, REFER TO THE CITY OF SPOKANE SIDE SEWER INSTALLATION HANDBOOK.
2. 8" OR LARGER SERVICE LINES/LATERALS REQUIRE A MANHOLE.
3. CLEANOUT TO BE INSTALLED OUTSIDE OF BUILDING FOOTPRINT. HDPE RING AND COVER WITH "SEWER" ALLOWED IN NON-TRAFFIC AREAS.

APPROVED BY

 DIRECTOR OF ENGINEERING SERVICES DAN BULLER, P.E.

ADOPTED: 04/2023
 REVISED: _____
 SUPERSEDES: _____
 CHECKED BY: DCS
 SCALE: NTS
 DWG/REV. BY: /EWS

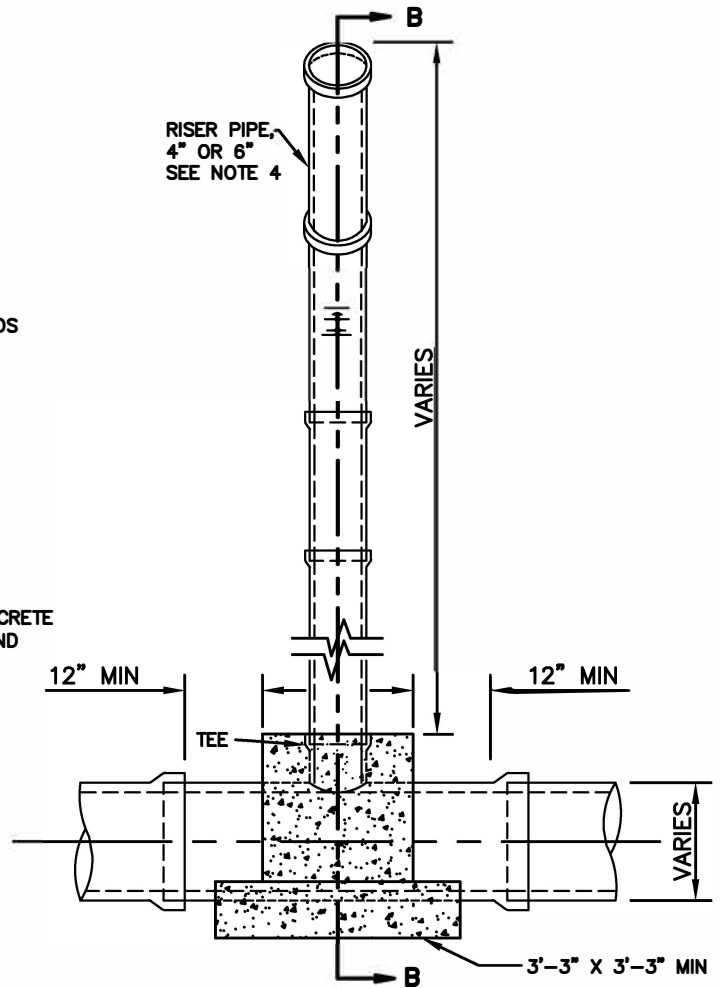
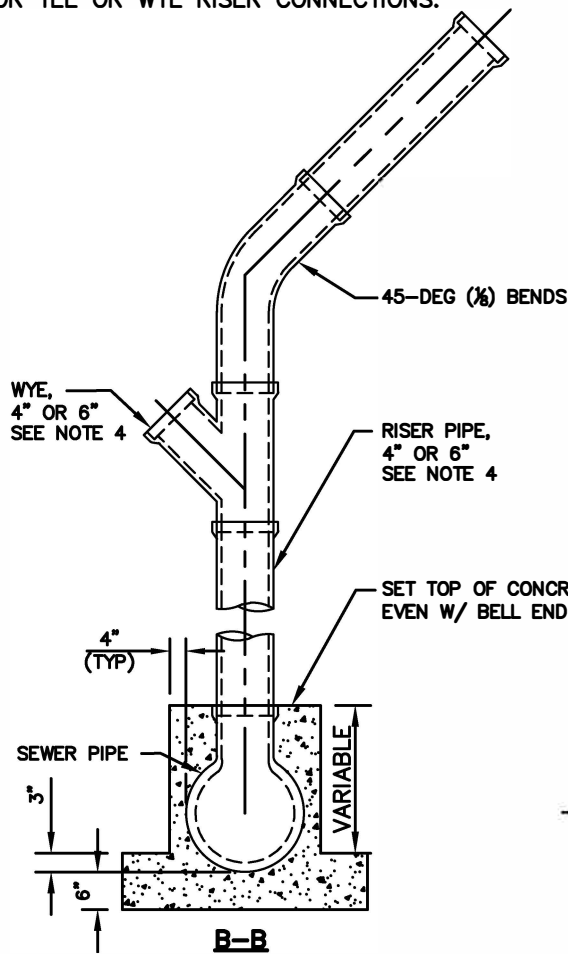


SIDE SEWER CLEAN-OUT

ENGINEERING SERVICES
 CITY OF SPOKANE, WASHINGTON

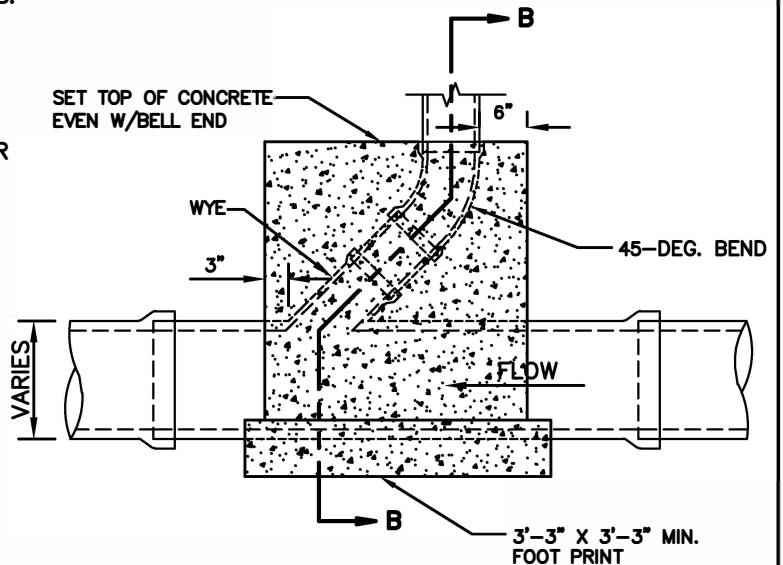
STANDARD
 PLAN No.
Z-114A

SEE STANDARD PLAN Z-116 FOR REQUIREMENTS FOR USE OR TEE OR WYE RISER CONNECTIONS.




NOTES:

1. SEE SEC 7-17 FOR SANITARY SEWER PIPE.
2. SEE DESIGN STANDARD 4.3 FOR SIDE-SEWERS.
3. CONCRETE SHALL BE CLASS 3000 PER SEC 6-02.
4. A MAX OF (2) SIDE-SEWER BRANCHES ARE ALLOWED OFF A VERTICAL RISER. SIDE-SEWER BRANCHES SHALL BE NO LARGER THAN THE SIZE OF THE VERTICAL RISER. VERTICAL RISER SHALL BE MAX 6" DIAMETER PIPE.
5. USE OF THIS RISER CONNECTION IS FOR SPECIAL CONDITIONS ONLY AND REQUIRES PRIOR APPROVAL OF THE CITY ENGINEER.



APPROVED BY

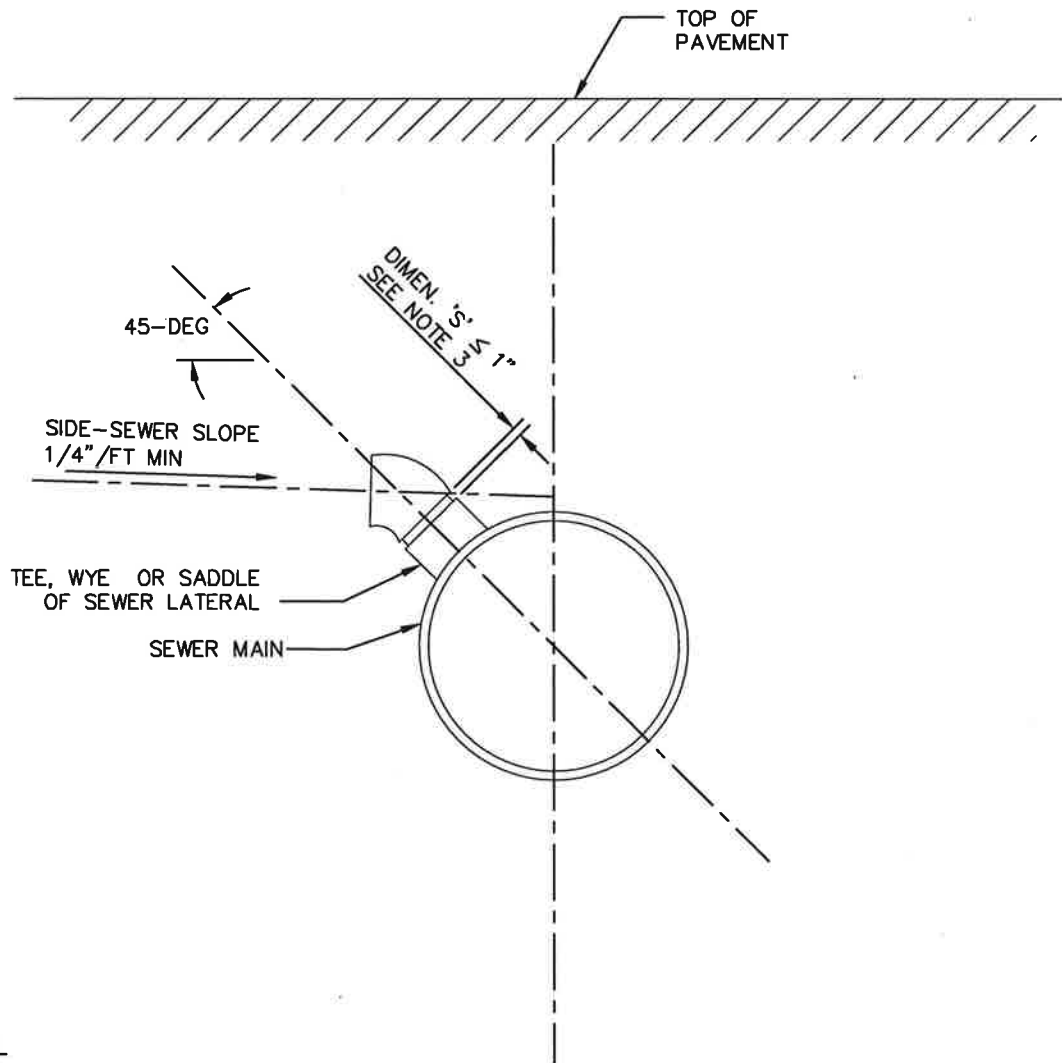
 ENGINEERING OPERATIONS MANAGER KYLE TWOHIG

 CITY ENGINEER DANIEL ALBERT BULLER, P.E.

ADOPTED: 4/2004
 REVISED: 02/2018
 SUPERSEDES: 04/2013
 SCALE: NTS
 REVISED BY: MDH/MLD

**SIDE-SEWER
RISER CONNECTION**



ENGINEERING SERVICES
CITY OF SPOKANE, WASHINGTON

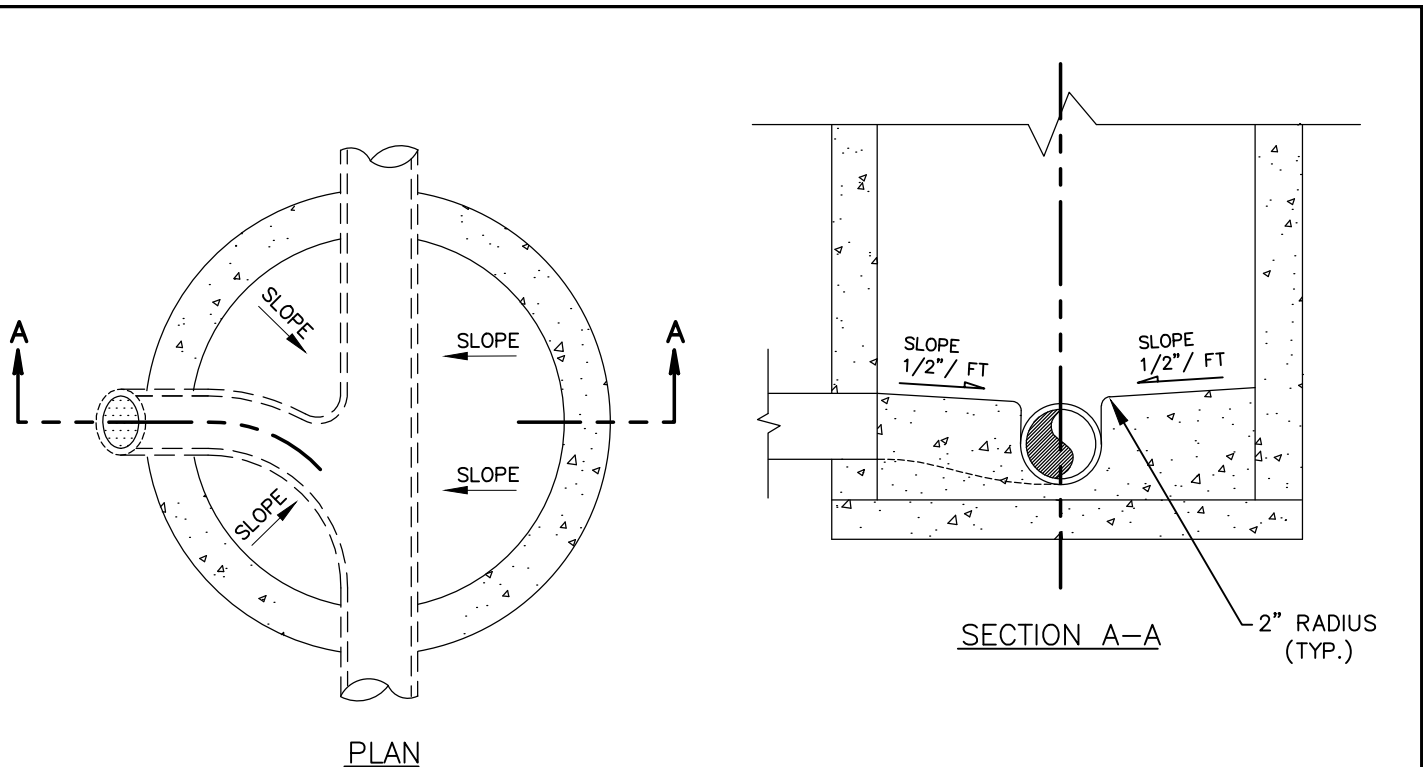
STANDARD
PLAN No.
Z-115



NOTES:

1. SEE DESIGN STANDARD 4.3 FOR SIDE-SEWERS.
2. RESIDENTIAL AREAS REQUIRE A 4" MIN SIDE-SEWER STUB. COMMERCIAL AREAS REQUIRE A 6" MIN SIDE-SEWER STUB.
3. DIMENSION 'S' MAY BE INCREASED TO PROVIDE A DESIRED SIDE-SEWER DEPTH @ PROPERTY LINE, IF APPROVED BY THE CITY ENGINEER.
4. THE FIRST SIDE SEWER CONNECTION OF ANY SIZE (4" OR 6") DOWNSTREAM OF AN END OF RUN MANHOLE SHALL BE A WYE CONNECTION.
5. FOR OTHER 4" SIDE SEWER CONNECTIONS, TEES OR WYES MAY BE USED TO CONSTRUCT SIDE SEWER CONNECTIONS.
6. ONLY WYE CONNECTIONS SHALL BE USED FOR 6" SIDE SEWERS CONNECTING TO SEWER MAINS UP TO AND INCLUDING 21" DIAMETER.
7. TEES OR WYES ARE ALLOWED FOR 6" SIDE SEWER CONNECTIONS TO SEWER MAINS LARGER THAN 21" DIAMETER.

<p>APPROVED BY</p>  <p>ENGINEERING OPERATIONS MANAGER KYLE TWOHIG</p>  <p>CITY ENGINEER DANIEL ALBERT BULLER, P.E.</p>	<p>ADOPTED: 4/2004 REVISED: 01/2017 SUPERSEDES: 4/2013 SCALE: NTS DWG/REV. BY: PCF/MLD</p>	<p style="text-align: center;">SIDE-SEWER TYPICAL CONNECTION</p> <p style="text-align: center;">ENGINEERING SERVICES CITY OF SPOKANE, WASHINGTON</p>	<p>STANDARD PLAN No. Z-116</p>
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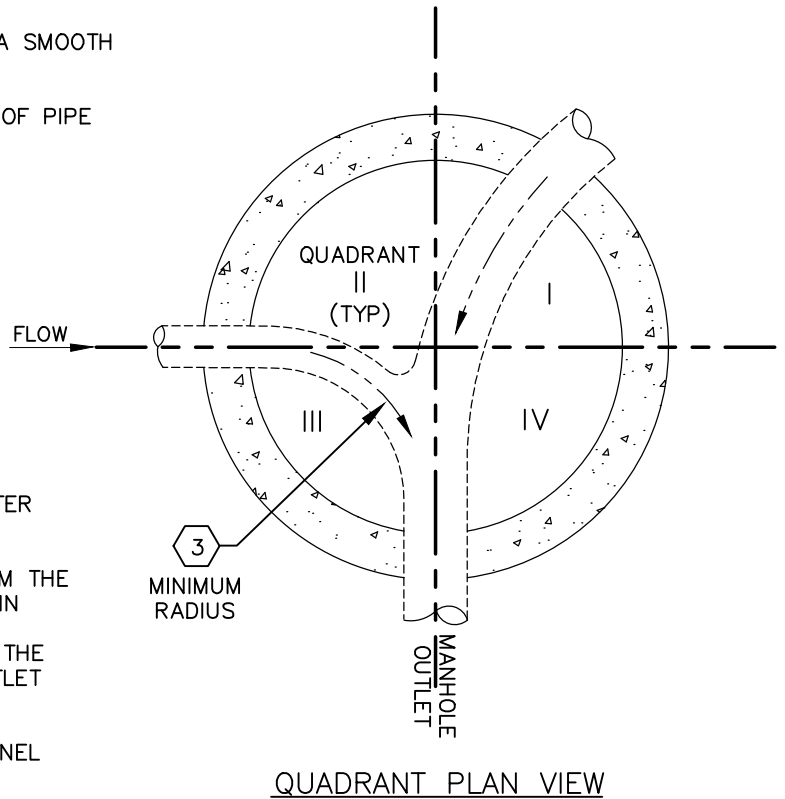



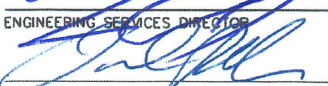
GENERAL NOTES:

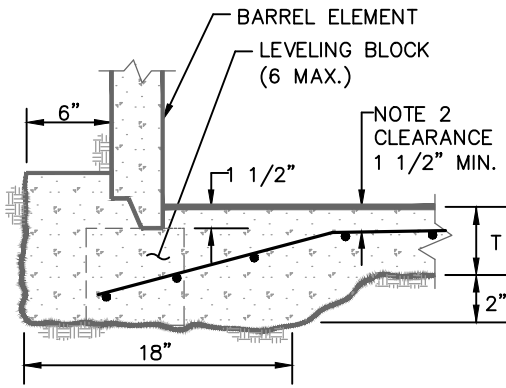
1. THE SHELF AND CHANNEL SHALL HAVE A SMOOTH FINISH
2. CONSTRUCT SHELF TO THE CROWN LINE OF PIPE
3. SLOPE BENCHES 1:24

QUADRANT NOTES:

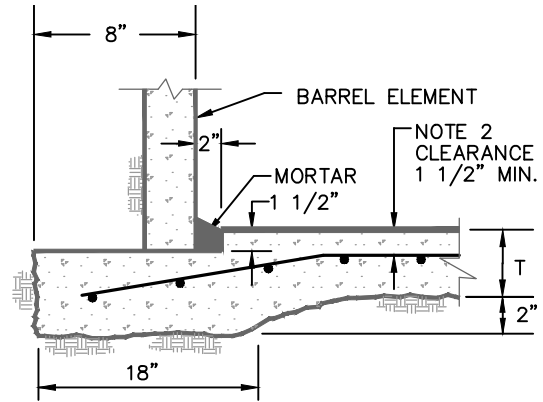
- 1 NO SEWER PIPE (CENTERLINE) SHALL ENTER MANHOLE IN QUADRANT III & IV
- 2 EXCEPT FOR A MANHOLE INLET 180° FROM THE CENTERLINE OF ANY CHANNEL ENTERING IN QUADRANT I OR II SHALL BE A SMOOTH, CONTINUOUS ARC THAT IS A TANGENT TO THE CENTERLINE OF THE OUTLET PIPE AT OUTLET MANHOLE WALL
- 3 MINIMUM RADIUS OF ANY MANHOLE CHANNEL CENTERLINE SHALL BE EQUAL TO THE MANHOLE INSIDE DIAMETER



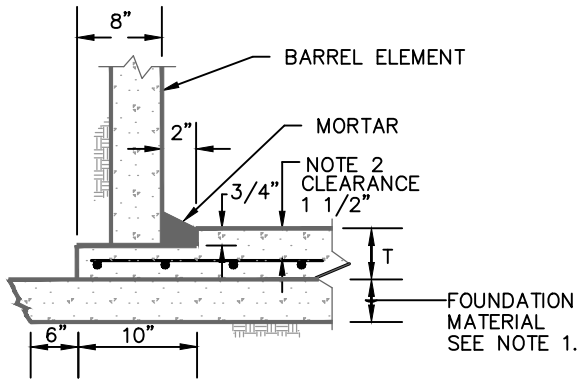
APPROVED BY		ADOPTED: <u>02/2019</u>		MANHOLE CHANNEL DETAIL – TYPICAL	
 ENGINEERING SERVICES DIRECTOR KYLE TWOHIG		REVISED: _____			
 CITY ENGINEER DAN BULLER, P.E.		SUPERSEDES: _____		ENGINEERING SERVICES CITY OF SPOKANE, WASHINGTON	
		CHECKED BY: <u>WRP</u>			
		SCALE: <u>NTS</u>			
		REVISED BY: <u>CDJ</u>			



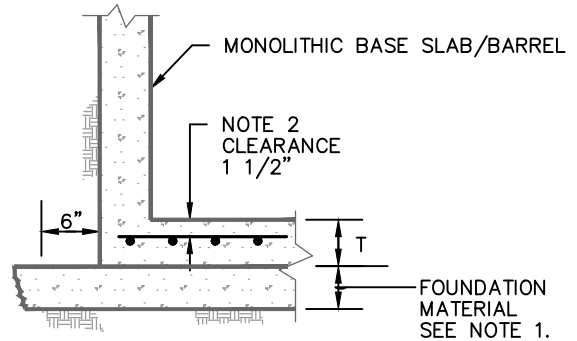
CAST IN PLACE BASE SLAB
(CAST AROUND BARREL)



CAST IN PLACE BASE SLAB
(SEPARATE FROM BARREL)



PRECAST BASE SLAB



**PRECAST MONOLITHIC
BASE SLAB / BARREL**

GENERAL NOTES:

1. 6" MINIMUM COMPACTED DEPTH OF BEDDING MATERIAL MEETING THE REQUIREMENTS OF THE SPECIAL PROVISIONS, OR 4" OF GROUT AS DIRECTED BY THE ENGINEER. COMPACT BEDDING MATERIAL TO 92%, MINIMUM.
2. SEE SCHEDULE FOR BASE SLAB REINFORCEMENT.
3. SEE PLAN B-102C BASE DETAILS FOR DRYWELLS

BASE SLAB MINIMUM REINFORCEMENT SCHEDULE			
BARREL SIZE	T	METHOD OF SLAB CONSTRUCTION	
		PRECAST OR CAST-IN-PLACE	MONOLITHIC SLAB & BARREL
≤ 48"	6"	#4 @ 10" E.W.	#4 @ 10" E.W.
54"	8"	#4 @ 12" E.W.	#4 @ 12" E.W.
72"	8"	#4 @ 6 1/2" E.W.	#4 @ 10" E.W.
96"	12"	#4 @ 6" E.W.	#4 @ 8" E.W.

APPROVED BY

Katy Allen
DIRECTOR, ENGINEERING SERVICES KATY D. ALLEN, P.E.
Jim R. Smith
PRINCIPAL ENGINEER, DESIGN JIM R. SMITH, P.E.

ADOPTED: 2/90
REVISED: 12/98
SUPERSEDES: 7/91

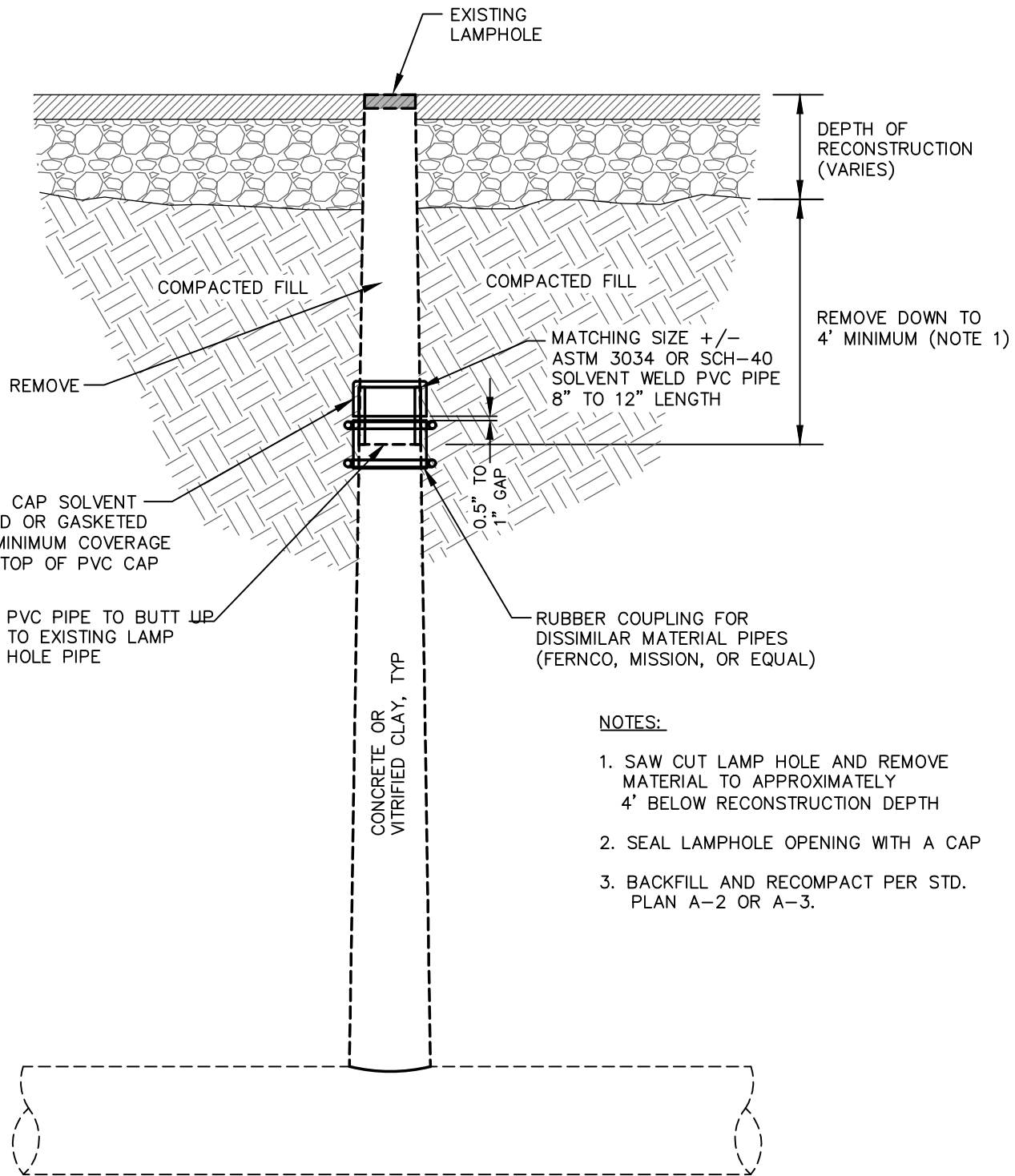
SCALE: N.T.S.
DWG./REV. BY: REP

**CATCH BASIN, DRYWELL & MANHOLE
BASE SLAB AND FOUNDATION DETAILS**





ENGINEERING SERVICES
CITY OF SPOKANE, WASHINGTON

STANDARD
PLAN No.
Z-118



NOTES:

1. SAW CUT LAMP HOLE AND REMOVE MATERIAL TO APPROXIMATELY 4' BELOW RECONSTRUCTION DEPTH
2. SEAL LAMPHOLE OPENING WITH A CAP
3. BACKFILL AND RECOMPACT PER STD. PLAN A-2 OR A-3.

APPROVED BY

 DIRECTOR OF ENGINEERING SERVICES KYLE TWOHIG

 CITY ENGINEER DAN BULLER, P.E.

ADOPTED: 03/2022
 REVISED: _____
 SUPERSEDES: _____
 CHECKED BY: DS
 SCALE: NTS
 REVISED BY: CJ/EWS

LAMPHOLE ABANDONMENT

ENGINEERING SERVICES
 CITY OF SPOKANE, WASHINGTON

STANDARD
 PLAN No.
Z-119