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NOTES:

1. ALL MATERIAL IN PIPE ZONE INCLUDING 6" BENEATH THE PIPE SHALL CONFORM TO SEC 9–03.12(3) FOR SAND OR NATIVE MATERIAL EXCEPT AS FOLLOWS:
   a) IF ROCK OR GROUND WATER IS PRESENT, PIPE ZONE MATERIAL SHALL BE CSTC PER SEC 9–03.9(3).
   b) FOR RIGID SEWERS, PIPE ZONE MATERIAL ABOVE THE SPRING LINE MAY EITHER BE PER SEC 9–03.12(3), SAND OR NATIVE, OR 9–03.14(1), GRAVEL BORROW, EXCEPT THAT MAX MATERIAL SIZE SHALL BE 1-IN PER 1-FT OF PIPE DIAMETER UP TO A 2" MAX.

2. COMPACTION METHODS IN PIPE ZONE SHALL BE PER SECTION 7–09.3(9).

3. REFER TO 7–08.3(1)C FOR ADDITIONAL REQUIREMENTS.

4. WHERE TRENCH EXCAVATION IS PAID SEPARATELY, PAYMENT LIMITS SHALL BE PER SEC 2–09.4.

5. BEDDING TO BE INSTALLED PER SECTION 7–09.3(9). A LIFT LAYER UP TO A MAXIMUM OF 18 INCHES MAY BE APPROVED BY THE ENGINEER.
NOTES:


2. SEE CITY OF SPOKANE (COS) PAVEMENT CUT POLICY IN THE COS DESIGN STD'S, APPENDIX 'F' FOR ADD'NL REQ'MTS.

3. WATER LINES REQUIRE 6" MINUS MAT'L FOR THE ENTIRE BACKFILL. 12" MINUS MAT'L MAY BE USED FOR OTHER UTILITIES.

4. COMPACTION ABOVE THE PIPE ZONE SHALL BE MEASURED PER SEC 2-03.3(14)D. FOR ROADWAY & TRAVELED AREAS COMPACT TOP 2-FT IN 4" MAX LIFTS. COMPACT BELOW TOP 2-FT TO TOP OF PIPE ZONE IN 8" MAX LIFTS. FOR NON-TRAVELED AREAS COMPACT IN 8" MAX. Lifts. Engineer may waive the 92% compaction to a lesser value for grass swales or other planting areas.

5. FOR DEVIATION FROM LIFT THICKNESS, SEE SEC 7-08.3(3) FOR SEWER/STORM & SEC 7-09.3(11) FOR WATER UTILITIES.

6. TRENCH EXCAVATION MATERIALS SHALL BE USED FOR BACKFILL IF MATERIALS MEET GRADUATION REQ'MTS ABOVE. IMPORTED BACKFILL SHALL MEET THE REQ'MTS OF SEC 9-03.14(1), GRAVEL BORROW.

7. CONTROLLED DENSITY FILL (CDF) PER SEC 2-09.3(1)(E), MAY BE USED IN LIEU OF NATIVE BACKFILL WHERE IT IS NOT PRACTICAL TO COMPACT BACKFILL TO THE REQ'D DENSITY. SUCH USE SHALL BE PRE-APPROVED BY THE ENGINEER. SEE STD PLAN A-3 FOR CDF BACKFILL REQ'MTS.
CDF BACKFILL FOR UTILITY TRENCHES

NOTES:

1. REPLACE HOT MIX ASPHALT (HMA) OR CONCRETE PAVEMENT PER CITY STANDARD PLANS W−102, W−108, & W−109.

2. SEE CITY OF SPOKANE (COS) PAVEMENT CUT POLICY IN THE COS DESIGN STANDARDS, APPENDIX ‘F’ FOR ADDITIONAL REQUIREMENTS.

3. BEDDING MATERIAL PER SEC 7−08.3(1)c MAY BE USED AS AN ALTERNATIVE TO CDF & CAPPED W/ CDF TO SERVE AS A LOCATION MARKER FOR THE UTILITY.

4. 30# TAR PAPER SHALL BE PLACED THE FULL LENGTH AND WIDTH OF A UTILITY TRENCH WHEN THE UTILITY IS ENCASED IN CDF OR CONCRETE AND THE REMAINDER OF THE TRENCH IS BACKFILLED WITH CDF OR CONCRETE.
NOTES APPLY TO GRAVITY & PRESSURE SEWER MAINS INSTALLED W/IN THE RESTRICTIVE ZONE

1. SEWER MAINS 24" DIA & LARGER MAY REQUIRE MORE STRINGENT CONSTRUCTION STANDARDS.
2. SEWER MATERIALS & JOINTS SHALL MEET WATER MAIN STANDARDS.
3. SEWER MAINS SHALL BE INSTALLED & TESTED IN ACCORDANCE W/ SEC. 7-17.
4. THE RESTRICTIVE ZONE IS SYMMETRICAL ABOUT THE WATER LINE.
WATER/SEWER CROSSINGS

IS THE SEWER A PRESSURE MAIN?

NO

NO TO BOTH

SEWER ABOVE WATER OR CLEARANCE < 18”?

NO SPECIAL REQUIREMENTS

YES TO EITHER

PRESSURE MAINS SHALL BE INSTALLED BELOW WATER MAINS IN ALL CASES.

CASE WATER OR WASTEWATER PIPE W/PIPE MEETING THE REQUIREMENTS FOR SANITARY SEWERS FOR A MIN. 10’ MEASURED PERPENDICULAR ON EITHER SIDE OF CROSSING.

EXCEPTIONS:
WHEN INSTALLING A WATER MAIN:

• THE CASING LENGTH FOR CROSSING SIDE SEWERS MAY BE REDUCED TO A MIN. 5’ MEASURED PERPENDICULAR ON EITHER SIDE OF CROSSING PROVIDED THAT THE CASING IS PLUGGED AT BOTH ENDS WITH AN 18” LENGTH OF NON-SHRINK GROUT;
• STORM SEWER PIPE TO/FROM CATCH BASINS/INLETS NEED NOT BE CASED IF THE EXISTING PIPE IS DI FOR ENTIRE LENGTH OR, IF THE EXISTING STORM SEWER PIPE IS NOT DI, THEN AN 18’ SEGMENT OF THE EXISTING STORM SEWER PIPE IS REPLACED WITH A SINGLE PIECE OF DI PIPE, CENTERED ON THE WATER MAIN.

NOTES:

1. CROSSING WATER/SEWER LINES OR THEIR CASINGS SHALL HAVE A 6” MIN VERTICAL SEPARATION.

2. FLOW CHART APPLIES TO BOTH EXISTING & NEW SERVICES & MAINS.

3. DISTANCES GIVEN ABOVE ARE MEASURED FROM OUTSIDE OF PIPES OR OTHER CASINGS.

4. DESIGNER/INSTALLER SHALL MAKE ALL REASONABLE ATTEMPTS TO MEET THE FOLLOWING:
• SEWER BENEATH WATER BY AT LEAST 18”
• CROSSINGS AS CLOSE TO 90° AS POSSIBLE
TYPICAL STREET

NOTES:
1. LOCATIONS ARE STANDARD FOR UNDERGROUND INSTALLATIONS & VARIATION SHALL REQUIRE PRE-APPROVAL BY THE CITY ENGINEER.

2. ALL LOCATIONS & DEPTHS OF EXISTING UTILITIES SHALL BE VERIFIED BY RESPECTIVE OWNERS PRIOR TO NEW INSTALLATIONS.

TYPICAL ALLEY

CALL BEFORE YOU DIG 456-8000
TYPICAL STREET

SIDES OF ALLEY

NOTES:
1. LOCATIONS ARE STANDARD FOR UNDERGROUND INSTALLATIONS & VARIATION SHALL REQUIRE PRE-APPROVAL BY THE CITY ENGINEER.

2. ALL LOCATIONS & DEPTHS OF EXISTING UTILITIES SHALL BE VERIFIED BY RESPECTIVE OWNERS PRIOR TO NEW INSTALLATIONS.

TYPICAL ALLEY

CALL BEFORE YOU DIG 456-8000

UNDERGROUND UTILITY LOCATION
FOR NEW DEVELOPMENTS

ENGINEERING SERVICES
CITY OF SPOKANE, WASHINGTON

STANDARD PLAN No. A-7

ADOPTED: 05/2007
REVISED: 11/2018
SUPERSEDES: ___________
CHECKED BY: JAG
SCALE: NTS
DGW/REV. BY: RLB/JHM

APPROVED BY
ENGINEERING OPERATIONS MANAGER: KYLE TRONG
CITY ENGINEER: DANIEL ALBERT BULLER, P.E.
NOTES:

1. ADJUSTMENT SECTION SHALL BE CONSTRUCTED WITH PRE-FABRICATED REINFORCED CONCRETE GRADE RINGS (RISERS) CONFORMING TO ASTM C478 AND SHALL BE GROUTED IN PLACE.

2. GRADE RINGS SHALL BE A CONTINUOUS LOOP OF REINFORCED CONCRETE AND SHALL BE FLAT. GRADE RINGS SHALL BE A UNIFORM DIMENSION THROUGHOUT ITS CROSS SECTION.

3. GRADE RINGS REINFORCEMENT SHALL BE A MINIMUM OF ONE FULL HOOP OF STEEL REINFORCING OF MINIMUM YIELD STRESS $f_y = 40$ KSI.

4. IN ADDITION TO THE GRADE RINGS, IF NECESSARY FOR PROPER FINAL ADJUSTMENT HEIGHT OF LESS THAN 2", WEDGES OF PRE-FABRICATED CERAMIC OR CONCRETE BRICK AS APPROVED BY THE ENGINEER MAY BE USED AND SHALL BE GROUTED IN PLACE.

5. ADJUSTMENT SECTION SHALL BE SEALED PER SECTION 7–05.
SEE PLAN AND PROFILE FOR CASING LENGTH AND INVERT ELEVATIONS

ELEVATION

PIPE JOINT (TYP)

CASING INSULATOR SEE NOTE 5

INSULATOR SPACING SEE NOTE 5

NOTE 5

NOTE 5

A

A

CASING SEAL (TYP) EACH END USE PULL-ON, WRAP-AROUND TYPE SEALS, SEE NOTE 8

CASING PIPE

3" MIN GAP

SEE NOTE 7

VOIDS OUTSIDE CASING PIPE SHALL BE FILLED BY PRESSURE GROUTING, VIA INTERIOR GROUT PORTS IN BEDROCK AND POORLY GRADED COBBLES

CASING PIPE

LOWER GROUT PORTS (TYP) 1" OR 2" DIA SPACED AT 10-FT O.C.

NOTE 5

NOTE 5

CASING PIPE

CARRIER PIPE

SUPERSEDES: 05/2007

CHECKED BY: JAG

SCALE: NTS

DWG/REV. BY: TSS/MDH

ENGINEERING SERVICES

CITY OF SPOKANE, WASHINGTON

STANDARD PLAN No. A-9

NOTES:

1. CASING SHALL BE SMOOTH STEEL PIPE MANUFACTURED TO ASTM A-53, TYPE E, GRADE B, FOR NPS UP TO 26-INCH DIA & ASTM A-252, GRADE 2, FOR NPS GREATER THAN 26-INCH DIA, THAT CONFORMS TO AWWA C-200 QUALITY CONTROL PROCEDURES & HAVE A MIN YIELD OF 35 KSI.

2. CARRIER PIPE SHALL BE INSTALLED PER MANUFACTURER’S REQMTS & CITY OF SPOKANE CONTRACT PROVISIONS.

3. ALL STEEL CASING JOINT WELDS SHALL MEET AWWA C206 WELDS AND OBSTRUCTIONS ON INTERIOR OF CASING BOTTOM THIRD (RADIAL) SHALL BE GROUND SMOOTH.

4. CARRIER PIPE SHALL BE PRESSURE TESTED PER CITY OF SPOKANE CONTRACT PROVISIONS PRIOR TO SEALING ENDS OF CASING PIPE.

5. PER-FABRICATED CASING INSULATORS SHALL BE POSITIONED & SPACED PER MANUFACTURER’S REQMTS & CASING/ CARRIER PIPE APPLICATION. INSULATOR SPACING SHALL NOT EXCEED 8-FT O.C. NOR BE LOCATED MORE THAN 11-6" FROM CARRIER PIPE JOINTS. CASING INSULATORS SHALL BE PRE-APPROVED BY THE ENGINEER PRIOR TO PLAN APPROVAL OR INSTALLATION. THE CONTRACTOR SHALL COORDINATE W/ THE INSULATOR MANUFACTURER SO THAT THE INSULATOR RUNNER POSITIONS AROUND THE OUTER CIRCUMFERENCE OF THE CARRIER PIPE DO NOT INTERFERE W/ THE GROUT PORT POSITIONS AROUND THE INTR Circumference of the CASING PIPE AND NOT OCCUPY THE 5:00 THROUGH 7:00 POSITION RADIALY CARRIER PIPE ≥18" DIAMETER SHALL HAVE A MINIMUM OF 8 RUNNERS.

6. USE OF ROLLER TYPE CASING INSULATOR/SPACERS SHALL BE USED IF REQUESTED BY THE ENGINEER ON CASING LENGTHS ≥600 LF.

7. INSULATOR RUNNER HEIGHT SHALL EXTEND BEYOND THE O.D. OF THE CARRIER PIPE’S BELL OR JOINT A MIN OF 1". RUNNER LENGTH SHALL EXCEED RUNNER HEIGHT BY A 2:1 MIN RATIO. RUNNER WIDTH SHALL BE EQUAL TO OR GREATER THAN RUNNER HEIGHT. MIN CLEARANCE SHALL BE 3" BETWEEN RUNNERS NEAR TOP OF CARRIER PIPE & INSIDE DIA OF CASING PIPE. CASING INSULATORS SHALL HAVE STAINLESS STEEL (SS) ATTACHMENT BANDS CONNECTED TO THE CARRIER PIPE VIA (SS) BOLTS/NUTS. CORKSCREW OF CARRIER PIPE/SPACERS SHALL BE CORRECTED SO THAT DESIGNED NUMBER OF SPACERS SUPPORT PIPE RADILY.

8. CASING PIPE SHALL BE SEALED AT BOTH ENDS W/ A STD ‘PULL-ON’ OR ‘WRAP-AROUND’ SYNTHETIC RUBBER CASING SEAL. SECURE CASING SEAL W/ STAINLESS STEEL BANDS. CASING SEALS SHALL BE PRE-APPROVED BY THE ENGINEER PRIOR TO PLAN APPROVAL OR INSTALLATION.

9. ALSO SEE UNION PACIFIC, BNSF OR WSDOT FOR ADDITIONAL REQUIREMENTS FOR RAILROAD AND HIGHWAY UNDERCROSSINGS.
NOTES:

1. CUT-OFF WALLS PLACED WITHIN THE CITY R-O-W SHALL BE CONSTRUCTED USING MACHINE EXCAVATABLE CDF AS DESCRIBED IN SECTION 2-09.3(1)E. PIPE SHALL BE WRAPPED WITH 6 MIL PLASTIC.

2. CUT-OFF WALLS NOT PLACED WITHIN THE CITY R-O-W MAY BE CONSTRUCTED USING CLAY OR A BENTONITE PEA GRAVEL SLURRY.

3. CUT-OFF WALL SHALL BE WRAPPED WITH WOVEN GEOTEXTILE FABRIC FOR SEPARATION, SEE SEC 9-33. OVERLAP ALL FABRIC JOINTS 1'-6" MIN.

4. CUT-OFF WALL SHALL BE FULL WIDTH OF TRENCH.

5. L = 3' FOR CDF CUT-OFF WALL  
   L = 6' FOR CLAY OR BENTONITE PEA GRAVEL SLURRY CUT-OFF WALL

*d = 6" ON ROCK FOUNDATION  
   4" ON OTHER MATERIALS

PLAN

FOR BACKFILL MATERIAL  
REFER TO A-1 & A-2

ELEVATION

APPROVED BY

ENGINEERING SERVICES  
CITY OF SPOKANE, WASHINGTON

STANDARD PLAN No.  
A-10
ELEVATION
CONCRETE PIPE ANCHORS

SECTION A-A

NOTES:
1. ALL REINFORCING STEEL SHALL BE NO. 4 BARS.
2. "E" SHALL BE 8" UNLESS OTHERWISE SPECIFIED, AND SHALL BE CONSTRUCTED IN UNDISTURBED SOIL.
3. CONCRETE SHALL BE CLASS 3000 OR BETTER.

SECTION B-B

CONSTRUCTION OF Anchor FOR TRENCH WITH SLOPING WALLS

CONSTRUCTION OF Anchor FOR TRENCH WITH VERTICAL WALLS

4 #4 BARS

4 MIL PVC LINER. ALL AROUND AS BOND BREAKER

UNDISTURBED SOIL

APPROVED BY
CITY ENGR.

SUPV. DES. ENGR.

SCALE _ NONE __________
ADOPTED _6/92_ __________

PIPE ANCHOR

DEPT. OF PUBLIC WORKS
ENGR. DIVISION SPOKANE, WA

REVISED __________
SUPERSEDES __________

STANDARD PLAN No.
A-11
ASTM A-48, CL. 30B
CAST IRON FRAME

CAST IRON FRAME
MIN. WEIGHT 168 LBS.

24" DIA. CLEAR OPENING

1/2"

26-3/4"

24" C.O.

6"

3/4"

5/8"

1"

26-3/4"

34-1/8"

SECTION A-A

COVER SKID DESIGN DETAIL

NOTES:
1. THE APPROPRIATE WORD "SEWER", "STORM", OR "WATER" SHALL BE EMBOSSED ON EACH MANHOLE COVER WITH 3/16" RAISED LETTERS.
2. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT W/ ANY COVER POSITION.

AUSTED: 2/1999
REVISION: 05/2007
SUPERSEDES: 6/1995
CHECKED BY: JAG
SCALE: NTS
DWG/REV. BY: RLB

MANHOLE FRAME AND COVER

ENGINEERING SERVICES CITY OF SPOKANE, WASHINGTON

STANDARD PLAN No. A-12
MANHOLE FRAME AND COVER
3-POINT BOLT DOWN

DRAWING NOTES:
1. MATERIALS SHALL CONFORM TO SECTION 9-05.15(1) OF THE SPECIFICATIONS
2. 3" TO OF 1" DIA. PICK HOLE. TYP. 2 PLACES INDEXED AT 180°.

CAST IRON FRAME

DUCTILE IRON COVER

SECTION A-A

SEE STANDARD DETAIL A-12 FOR DETAIL OF NONSKID PATTERN

DRILL & TAP
5/8" X 1 1/2" L.G. SOCKET HEAD CAP SCREW
23.3125" B.C. (TYP.)

BACK TO SECTION A - TOC
NOTES:
1. BIKE RACK SHALL BE POWDER COATED BLACK.
2. RACK DIMENSIONS MAY VARY BY MANUFACTURER.
3. DESIGNED FOR USE BY 2 BICYCLES.

MOUNTING:
1. BASE PLATE SHALL BE MOUNTED VIA 8 – 5/8" DIA. WEDGE ANCHOR WITH TAMPER RESISTANT SECURITY NUT.
2. RACK SHALL BE SET FIRM AND ALIGNED WITH A 1/16" ± TOLERANCE FROM PLUMB.
3. STEEL SHIMS SHALL BE INSTALLED PRIOR TO ANCHORING IN PLACE WHEN NEEDED.
NOTES:
1. BIKE RACK PLACEMENT SHOULD AVOID VEHICLE DOOR ZONES.
2. BIKE RACKS MUST BE WITHIN 50' OF BUILDING ENTRANCE.
3. CITY OF SPOKANE RESERVES THE RIGHT TO ISSUE VARIANCES.
4. * = RECOMMENDED
NOTES:
1. BIKE HITCH SHALL BE GALVANIZED OR STAINLESS STEEL.
2. RACK DIMENSIONS MAY VARY BY MANUFACTURER.

MOUNTING:
1. BASE PLATE SHALL BE MOUNTED VIA 8-1/2" DIA. WEDGE ANCHOR WITH TAMPER RESISTANT SECURITY NUT.
2. RACK SHALL BE SET FIRM AND ALIGNED WITH A 1/4" ± TOLERANCE FROM PLUMB.
3. STEEL SHIMS SHALL BE INSTALLED PRIOR TO ANCHORING IN PLACE WHEN NEEDED.

ELEVATION VIEW

PLAN VIEW