Note:
1) Per PWDS 1.10.b.9, the applicable City standard details shall be included on construction drawings submitted for City review and approval. See also PWDS 1.3.b for detail sheet stamping requirements where engineered drawings are required.
2) Per PWDS 1.2.b, the standard details are intended to assist but not to substitute for competent work by design professionals where applicable. As noted in the PWDS, the standard details illustrate the minimum requirements and materials required by the Public Works Department for the construction of certain standard system components, and are thus not considered to be final documents until incorporated into a design approved by the City.
S.S. - 5' FROM C/L (TYP ON LOW SIDE OF STREET). SEE NOTES 1 & 2. (3' MIN CLEAR SEPARATION BETWEEN SEWER & STORM MAINS)

CURBED STREETS

NOTES:
1. 6' MIN COVER REQUIRED FOR SANITARY SEWER MAINS (4' MIN. COVER TYPICALLY REQUIRED FOR LATERALS).
2. LATERALS AND P/L CLEANOUTS TO BE INSTALLED DURING CONSTRUCTION OF SANITARY SEWER & STORM MAINS (TO AVOID FUTURE STREET CUTS).
3. WATER TO BE INSTALLED 3' IN FRONT OF FACE OF CURB ON HIGH SIDE OF STREET. 36" MIN. COVER ON ALL WATERLINES. 10' MINIMUM SEPARATION TYPICAL BETWEEN PARALLEL WATER & SEWER MAINS.
4. STORM SEWER TO BE INSTALLED ON LOW SIDE OF STREET:
   a) 2' FROM FACE OF CURB FOR <4' RIM TO INVERT
   b) 6' FROM FACE OF CURB FOR >4' RIM TO INVERT (MH SYSTEM)
5. MAINTAIN MIN. 3' HORIZ. SEPARATION BETWEEN PUBLIC UTILITIES & PARALLEL PRIVATE UTILITIES. OTHER VERTICAL AND HORIZONTAL SEPARATION DISTANCES SHALL BE AS SPECIFIED BY DEQ, ODWP, OR OTHER PUBLIC/PRIVATE UTILITY COMPANIES.
6. UNITY TRENCH PER FRANCHISE UTILITY COMPANY REQUIREMENTS.

TYP. UTILITY LOCATIONS
(CURBED STREETS)

COPYRIGHT 1996
MSTECH ENGINEERING, INC.
AUG 2018
CRESWELL, OR
101
NOTE:

UTILITIES FOR TURNPIKE STREETS OR 3/4 STREET IMPROVEMENTS SHALL BE LOCATED TO ALLOW FUTURE CONSTRUCTION OF CURBED STREETS WITHOUT RELOCATING UTILITIES. SEE DETAIL 101.

TURNPIKE STREETS

NOTES:
1. 6' MIN COVER REQUIRED FOR SANITARY SEWER MAINS (4' MIN. COVER TYPICALLY REQUIRED FOR LATERALS).
2. LATERALS AND P/L CLEANOUTS TO BE INSTALLED DURING CONSTRUCTION OF SANITARY SEWER & STORM MAINS (TO AVOID FUTURE STREET CUTS).
3. WATER TO BE INSTALLED ON HIGH SIDE OF STREET, 3' IN FRONT OF FACE OF CURB ON IMPROVED SIDE OR 3' IN FRONT OF FUTURE FACE OF CURB LOCATION, UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER AND/OR PUBLIC WORKS DIRECTOR. 10' MINIMUM SEPARATION TYPICAL BETWEEN PARALLEL WATER & SEWER MAINS.
4. MAINTAIN MIN. 3' HORIZ. SEPARATION BETWEEN PUBLIC UTILITIES & PARALLEL PRIVATE UTILITIES. OTHER VERTICAL AND HORIZONTAL SEPARATION DISTANCES SHALL BE AS SPECIFIED BY DEQ, ODWP, OR OTHER PUBLIC/PRIVATE UTILITY COMPANIES.
5. UNITY TRENCH PER FRANCHISE UTILITY COMPANY REQUIREMENTS.
SLOPE PAVEMENT AWAY FROM MONUMENT BOX EACH WAY WHERE POSSIBLE WITHOUT AFFECTING STREET PAVEMENT GRADES.

MONUMENT BOX FRAME & COVER, TYPE & SIZE AS SPECIFIED (LID NOT SHOWN THIS VIEW)

SURVEY MONUMENT WITH ALUMINUM CAP, LENGTH & PLACEMENT PER COUNTY SURVEYOR STANDARDS.

NOTES:

1. VERIFY MONUMENT BOX SIZE WITH COUNTY SURVEYOR PRIOR TO PLACEMENT. UNLESS OTHERWISE REQUIRED BY THE COUNTY SURVEYOR (BASED ON TYPE OF SURVEY MONUMENT), PROVIDE THE FOLLOWING.
   a) USE 8" DIAMETER (MINIMUM) MONUMENT BOX FOR POSTED SPEEDS LESS THAN 35 MPH.
      (EJ 3614Z BOX W/3614A LID).
   b) USE 12" DIAMETER MONUMENT BOX FOR POSTED SPEEDS EQUAL TO OR GREATER THAN 35 MPH.
      (EJ 3673Z BOX W/3673A LID).

2. FOR REPAVING PROJECTS, PROVIDE OVERLAY RISER RINGS FROM SAME MANUFACTURER, HEIGHT AS REQUIRED TO ACCOMODATE OVERLAY THICKNESS.

LAST REVISION DATE: OCT 2018

SURVEY MONUMENT BOX (IN STREETS OR PUBLIC SIDEWALKS)

(NTS)

DETAIL NO. 115

CRESWELL, OR
SIDEWALK LOCATION: PER CDC 3.4.100.F, PROPERTY-LINE SIDEWALKS & LANDSCAPE STRIP REQUIRED UNLESS OTHERWISE APPROVED IN ADVANCE BY CITY.

C/L STREET = C/L R/W

2.1 MAX

P.U.E. P/L

TYPICAL

2.1 MAX

5:1 MAX

TYP

4" MIN. COMPACTED GRANULAR BASEROCK

SUBGRADE, SEE NOTES BELOW.

- BASE LIFT AC - 3/4" DENSE GRADED MIX (LEVEL 2 JMF).
- TOP LIFT AC - 1/2" DENSE GRADED MIX (LEVEL 2 JMF).

12" OF 1"-0" GRANULAR BASEROCK (COMPACT TO 95% OPTIMUM PER AASHTO T-180)

ALT: 2" OF 3/4"-0" GRANULAR BASEROCK OVER 10" OF 1-1/2"-0" GRANULAR BASEROCK.

NOTES:

1. ALL DESIGN SUBGRADES SHALL BE COMPACTED AND PROOF-ROLLED PRIOR TO PLACEMENT OF BASEROCK. COMPACTION TESTING OF SUBGRADE MAY BE WAIVED AS OUTLINED UNDER NOTE 3.

2. IF SUBGRADE FAILS THE PROOF-ROLL, SUBGRADE SHALL BE OVEREXCAVATED TO UNDISTURBED SOIL AND BACKFILLED WITH BASEROCK OVER GEOTEXTILE REINFORCEMENT FABRIC (AS SPECIFIED) TO ALLOW COMPACTION OF UPPER (DESIGN) BASEROCK SECTION AND TO MAINTAIN STRUCTURAL INTEGRITY OF NATIVE SUBGRADE SOILS. TYPICAL MIN. OVEREXCAVATION REQUIRED IS 12-INCHES. NO RUBBER TIRED EQUIPMENT ALLOWED ON SUBGRADE FOLLOWING OVEREXCAVATION.

3. IF SUBGRADE PASSES PROOF-ROLL BUT CANNOT BE COMPACTED TO 95% OPTIMUM DENSITY PER AASHTO T-180 (OR IF CONTRACTOR CHOOSES NOT TO TEST), GEOTEXTILE SEPARATION FABRIC (AS SPECIFIED) SHALL BE PLACED ON THE SUBGRADE PRIOR TO PLACEMENT OF THE BASEROCK.

4. REINFORCEMENT FABRIC (FOR USE W/OVEREXCAVATION): NON-WOVEN (MIRAFI 1000N, GEOTEX 1001, LINQ 250EX OR EQUAL), WOVEN (MIRAFI 550X, GEOTEX 250ST, LINQ GTF250 OR EQUAL).

SEPARATION FABRIC: NON-WOVEN (MIRAFI 160N, GEOTEX 601, LINQ 150EX OR EQUAL), WOVEN (MIRAFI 500X, GEOTEX 200ST, LINQ GTF200 OR EQUAL).
SIDEWALK LOCATION: PER CDC 3.4.100.F, PROPERTY-LINE SIDEWALKS & LANDSCAPE STRIP REQUIRED UNLESS OTHERWISE APPROVED IN ADVANCE BY CITY.

C/L STREET =
C/L R/W

P/L

P.U.E.

7'

TYPICAL

VARIES

6'TYP

6'

6'

VARIES

6'TYP

1'

1.5%

4.5% TYP

S=2.0%

10" OF 1"-O" GRANULAR BASEROCK
(COMPACT TO 95% OPTIMUM PER AASHTO T-180)

NOTE: 2" OF 3/4"-0" GRANULAR BASEROCK OVER 8" OF 1-1/2"-0" GRANULAR BASEROCK.

NOTES:

1. ALL DESIGN SUBGRADES SHALL BE COMPACTED AND PROOF-ROLLED PRIOR TO PLACEMENT OF BASEROCK. COMPACATION TESTING OF SUBGRADE MAY BE WAIVED AS OUTLINED UNDER NOTE 3.

2. IF SUBGRADE FAILS THE PROOF-ROLL, SUBGRADE SHALL BE OVEREXCAVATED TO UNDISTURBED SOIL AND BACKFILLED WITH BASEROCK OVER GEOTEXTILE REINFORCEMENT FABRIC (AS SPECIFIED) TO ALLOW COMPACTION OF UPPER (DESIGN) BASEROCK SECTION AND TO MAINTAIN STRUCTURAL INTEGRITY OF NATIVE SUBGRADE SOILS. TYPICAL MIN. OVEREXCAVATION REQUIRED IS 12-INCHES. NO RUBBER TIRED EQUIPMENT ALLOWED ON SUBGRADE FOLLOWING OVEREXCAVATION.

3. IF SUBGRADE PASSES PROOF-ROLL BUT CANNOT BE COMPACTED TO 95% OPTIMUM DENSITY PER AASHTO T-180 (OR IF CONTRACTOR CHOOSES NOT TO TEST), GEOTEXTILE SEPARATION FABRIC (AS SPECIFIED) SHALL BE PLACED ON THE SUBGRADE PRIOR TO PLACEMENT OF THE BASEROCK.

4. REINFORCEMENT FABRIC (FOR USE W/OVEREXCAVATION): NON-WOVEN (MIRAFI 1000N, GEOTEX 1001, LINQ 250EX OR EQUAL), WOVEN (MIRAFI 550X, GEOTEX 250ST, LINQ GTF250 OR EQUAL).

SEPARATION FABRIC: NON-WOVEN (MIRAFI 160N, GEOTEX 601, LINQ 150EX OR EQUAL), WOVEN (MIRAFI 500X, GEOTEX 200ST, LINQ GTF200 OR EQUAL).

3½" A.C. PVMT. IN 2 LIFTS
1-1/2" CL.'C' OVER 2" CL.'B'
(SEE NOTE AT LEFT)
(COMPACT TO 91% OPTIMUM PER RICE STANDARD METHOD)

32 RESIDENTIAL CUL-DESAC MINIMUM SECTION
**Sidewalk Location:** Per CDC 3.4.100.F, property-line sidewalks & landscape strip required unless otherwise approved in advance by City.

C/L Street = C/L R/W

**Sidewalk Width:** Width varies by location & zoning, see CDC & 2019 TSP requirements.

**Notes:**

1. All design subgrades shall be compacted and proof-rolled prior to placement of baserock. Compaction testing of subgrade may be waived as outlined under note 3.

2. If subgrade fails the proof-roll, subgrade shall be overexcavated to undisturbed soil and backfilled with baserock over geotextile reinforcement fabric (as specified) to allow compaction of upper (design) baserock section and to maintain structural integrity of native subgrade soils. Typical min. overexcavation required is 12-inches. No rubber tired equipment allowed on subgrade following overexcavation.

3. If subgrade passes proof-roll but cannot be compacted to 95% optimum density per AASHTO T-180 (or if contractor chooses not to test), geotextile separation fabric (as specified) shall be placed on the subgrade prior to placement of the baserock.

4. Reinforcement fabric (for use w/overexcavation): Non-woven (MIRAFI 1000N, GEOTEX 1001, LINQ 250EX or equal), Woven (MIRAFI 550X, GEOTEX 250ST, LINQ GTF250 or equal).

Separation fabric: Non-woven (MIRAFI 160N, GEOTEX 601, LINQ 150EX or equal), Woven (MIRAFI 500X, GEOTEX 200ST, LINQ GTF200 or equal).
**SIDEWALK Width: Width varies by location & zoning, see CDC & 2019 TSP requirements.**

P.L. STREET = C/L R/W

**SIDEWAK LOCATION: PER CDC 3.4.100.F, PROPERTY-LINE SIDEWALKS & LANDSCAPE STRIP REQUIRED UNLESS OTHERWISE APPROVED IN ADVANCE BY CITY.**

**SUBGRADE, SEE NOTES BELOW.**

- Base Lift AC = 3/4" DENSE GRADED MIX (LEVEL 2 JMF).
- Top Lift AC = 1/2" DENSE GRADED MIX (LEVEL 2 JMF).

12" OF 1"-0" GRANULAR BASEROCK
(COMPACT TO 95% OPTIMUM PER AASHTO T-180)

ALT: 2" OF 3/4"-0" GRANULAR BASEROCK OVER 10" OF 1-1/2"-0" GRANULAR BASEROCK.

NOTES:

1. All design subgrades shall be compacted and proof-rolled prior to placement of baserock. Compaction testing of subgrade may be waived as outlined under Note 3.
2. If subgrade fails the proof-roll, subgrade shall be overexcavated to undisturbed soil and backfilled with baserock over geotextile reinforcement fabric (as specified) to allow compaction of upper (design) baserock section and to maintain structural integrity of native subgrade soils. TYPICAL MIN. OVEREXCAVATION REQUIRED IS 12-INCHES. NO RUBBER TIRED EQUIPMENT ALLOWED ON SUBGRADE FOLLOWING OVEREXCAVATION.
3. If subgrade passes proof-roll but cannot be compacted to 95% optimum density per AASHTO T-180 (OR IF CONTRACTOR CHOOSES NOT TO TEST), GEOTEXTILE SEPARATION FABRIC (AS SPECIFIED) SHALL BE PLACED ON THE SUBGRADE PRIOR TO PLACEMENT OF THE BASEROCK.
4. REINFORCEMENT FABRIC (FOR USE W/OVEREXCAVATION): NON-WOVEN (MIRAFI 1000N, GEOTEX 1001, LINQ 250EX OR EQUAL), WOVEN (MIRAFI 550X, GEOTEX 250ST, LINQ GTF250 OR EQUAL).

SEPARATION FABRIC: NON-WOVEN (MIRAFI 160N, GEOTEX 601, LINQ 150EX OR EQUAL), WOVEN (MIRAFI 500X, GEOTEX 200ST, LINQ GTF200 OR EQUAL).
BY SIDEWALK 3.4.100.F, PER LOCATION: SIDEWALK = C/L STREET = C/L R/W LOCATION & ZONING, SEE CDC & 2019 TSP REQUIREMENTS.

SIDEWALK LOCATION: PER CDC 3.4.100.F, PROPERTY—LINE SIDEWALKS & LANDSCAPE STRIP REQUIRED UNLESS OTHERWISE APPROVED IN ADVANCE BY CITY.

**SIDEWALK WIDTH:** WIDTH VARIES BY LOCATION & ZONING, SEE CDC & 2019 TSP REQUIREMENTS.

- BASE LIFT AC - 3/4" DENSE GRADED MIX (LEVEL 3 JMF).
- TOP LIFT AC - 1/2" DENSE GRADED MIX (LEVEL 3 JMF).

SUBGRADE, SEE NOTES BELOW.

- 15" OF 1"-0" GRANULAR BASEROCK
  (COMPACT TO 95% OPTIMUM PER AASHTO T-180)
- ALT: 2" OF 3/4"-0" GRANULAR BASEROCK OVER RICE STANDARD METHOD

NOTES:
1. ALL DESIGN SUBGRADES SHALL BE COMPACTED AND PROOF—ROLLED PRIOR TO PLACEMENT OF BASEROCK. COMPACTION TESTING OF SUBGRADE MAY BE WAIVED AS OUTLINED UNDER NOTE 3.
2. IF SUBGRADE FAILS THE PROOF—ROLL, SUBGRADE SHALL BE OVEREXCAVATED TO UNDISTURBED SOIL AND BACKFILLED WITH BASEROCK OVER GEOTEXTILE REINFORCEMENT FABRIC (AS SPECIFIED) TO ALLOW COMPACTION OF UPPER (DESIGN) BASEROCK SECTION AND TO MAINTAIN STRUCTURAL INTEGRITY OF NATIVE SUBGRADE SOILS. TYPICAL MIN. OVEREXCAVATION REQUIRED IS 12—INCHES. NO RUBBER TIRED EQUIPMENT ALLOWED ON SUBGRADE FOLLOWING OVEREXCAVATION.
3. IF SUBGRADE PASSES PROOF—ROLL BUT CANNOT BE COMPACTED TO 95% OPTIMUM DENSITY PER AASHTO T-180 (OR IF CONTRACTOR CHOOSES NOT TO TEST), GEOTEXTILE SEPARATION FABRIC (AS SPECIFIED) SHALL BE PLACED ON THE SUBGRADE PRIOR TO PLACEMENT OF THE BASEROCK.
4. REINFORCEMENT FABRIC (FOR USE W/OVEREXCAVATION): NON—WOVEN (MIRAFI 1000N, GEOTEX 1001, LINQ 250EX OR EQUAL), WOVEN (MIRAFI 550X, GEOTEX 250ST, LINQ GTF 250 OR EQUAL), SEPARATION FABRIC: NON—WOVEN (MIRAFI 150N, GEOTEX 601, LINQ 150EX OR EQUAL), WOVEN (MIRAFI 500X, GEOTEX 200ST, LINQ GTF 200 OR EQUAL).
SIDEWALK LOCATION: PER CDC 3.4.100.F, PROPERTY LINE
SIDEWALKS & LANDSCAPE STRIP REQUIRED UNLESS
OTHERWISE APPROVED IN ADVANCE BY CITY.

C/L STREET =
C/L R/W

**SIDEWALK WIDTH:** WIDTH VARIES BY
LOCATION & ZONING, SEE CDC & 2019 TSP
REQUIREMENTS.

P/L

SIDEWALK WIDTH:

- BASE LIFT AC – 3/4" DENSE
- TOP LIFT AC – 1/2" DENSE

GRANULAR BASEROCK (LEVEL 3 JMF).

GRANULAR BASEROCK

SUBGRADE, SEE NOTES BELOW.

TYPE ‘A’ CURB & GUTTER

(SEE DETAIL 210)

4" A.C. PVMT. IN 2 LIFTS
2" CL ‘C’ OVER 2" CL ‘B’
(SEE NOTE AT LEFT)

(COMPACT TO 91% OPTIMUM PER
RICE STANDARD METHOD)

ALT: 2" OF 3/4"-0" GRANULAR BASEROCK OVER
13" OF 1-1/2"-0" GRANULAR BASEROCK.

NOTES:

1. ALL DESIGN SUBGRADES SHALL BE COMPACTED AND PROOF-ROLLED PRIOR TO PLACEMENT OF
BASEROCK. COMPACTION TESTING OF SUBGRADE MAY BE WAIVED AS OUTLINED UNDER NOTE 3.
2. IF SUBGRADE FAILS THE PROOF-ROLL, SUBGRADE SHALL BE OVEREXCAVATED TO UNDISTURBED SOIL
AND BACKFILLED WITH BASEROCK OVER GEOTEXTILE REINFORCEMENT FABRIC (AS SPECIFIED)
TO ALLOW COMPACTION OF UPPER (DESIGN) BASEROCK SECTION AND TO MAINTAIN STRUCTURAL
INTEGRITY OF NATIVE SUBGRADE SOILS. TYPICAL MIN. OVEREXCAVATION REQUIRED IS 12-INCHES.
NO RUBBER TIRED EQUIPMENT ALLOWED ON SUBGRADE FOLLOWING OVEREXCAVATION.
3. IF SUBGRADE Passes PROOF-ROLL BUT CANNOT BE COMPACTED TO 95% OPTIMUM DENSITY PER
AASHTO T-180 (OR IF CONTRACTOR CHOOSES NOT TO TEST), GEOTEXTILE SEPARATION FABRIC (AS
SPECIFIED) SHALL BE PLACED ON THE SUBGRADE PRIOR TO PLACEMENT OF THE BASEROCK.
4. REINFORCEMENT FABRIC (FOR USE W/OVEREXCAVATION): NON-WOVEN (MIRAFI 1000N, GEOTEX 1001,
LINQ 250EX OR EQUAL), WOVEN (MIRAFI 550X, GEOTEX 250ST, LINQ GFT250 OR EQUAL).
SEPARATION FABRIC: NON-WOVEN (MIRAFI 160N, GEOTEX 601, LINQ 150EX OR EQUAL), WOVEN
(MIRAFI 500X, GEOTEX 200ST, LINQ GFT200 OR EQUAL).
SIDEWALK LOCATION: PER CDC 3.4.100.F, PROPERTY-LINE
SIDEWALKS & LANDSCAPE STRIP REQUIRED UNLESS
OTHERWISE APPROVED IN ADVANCE BY CITY.

C/L STREET = C/L R/W

**SIDEWALK WIDTH: WDTTH VARIES BY LOCATION & ZONING, SEE CDC & 2019 TSP REQUIREMENTS.**

P/U.E. P/L

7’ TYPICAL

4" MIN. COMPACTED GRANULAR BASEROCK

SUBGRADE, SEE NOTES BELOW.

—BASE LIFT AC — 3/4" DENSE GRADED MIX (LEVEL 3 JMF).

—TOP LIFT AC — 1/2" DENSE GRADED MIX (LEVEL 3 JMF).

ALT: 2" OF 3/4"–0" GRANULAR LEVELING COURSE OVER REMAINDER OF 1–1/2"–0" GRANULAR

BASEROCK (10" FOR MINOR COLLECTOR) (13" FOR MAJOR COLLECTOR)

NOTES:

1. ALL DESIGN SUBGRADES SHALL BE COMPACTED AND PROOF-ROLLED PRIOR TO PLACEMENT OF BASEROCK. COMPACTION TESTING OF SUBGRADE MAY BE WAIVED AS OUTLINED UNDER NOTE 3.

2. IF SUBGRADE FAILS THE PROOF-ROLL, SUBGRADE SHALL BE OVEREXCAVATED TO UNDISTURBED SOIL AND BACKFILLED WITH BASEROCK OVER GEOTEXTILE REINFORCEMENT FABRIC (AS SPECIFIED) TO ALLOW COMPACTION OF UPPER (DESIGN) BASEROCK SECTION AND TO MAINTAIN STRUCTURAL INTEGRITY OF NATIVE SUBGRADE SOILS. TYPICAL MIN. OVEREXCAVATION REQUIRED IS 12-INCHES. NO RUBBER TIRED EQUIPMENT ALLOWED ON SUBGRADE FOLLOWING OVEREXCAVATION.

3. IF SUBGRADE PASSES PROOF-ROLL BUT CANNOT BE COMPACTED TO 95% OPTIMUM DENSITY PER AASHTO T-180 (OR IF CONTRACTOR Chooses NOT TO TEST), GEOTEXTILE SEPARATION FABRIC (AS SPECIFIED) SHALL BE PLACED ON THE SUBGRADE PRIOR TO PLACEMENT OF THE BASEROCK.

4. REINFORCEMENT FABRIC (FOR USE W/OVEREXCAVATION): NON-WOVEN (MIRAFI 1000N, GEOTEX 1001, LINQ 250EX OR EQUAL), WOVEN (MIRAFI 550X, GEOTEX 250ST, LINQ GTF250 OR EQUAL).

SEPARATION FABRIC: NON-WOVEN (MIRAFI 160N, GEOTEX 601, LINQ 150EX OR EQUAL), WOVEN (MIRAFI 500X, GEOTEX 200ST, LINQ GTF200 OR EQUAL).
**SIDEWALK LOCATION:** PER CDC 3.4.100.F, PROPERTY-LINE SIDEWALKS & LANDSCAPE STRIP REQUIRED UNLESS OTHERWISE APPROVED IN ADVANCE BY CITY.

C/L STREET =
C/L R/W

**SIDEWALK WIDTH:** WDTH VARIES BY LOCATION & ZONING, SEE CDC & 2019 TSP REQUIREMENTS.

**SIDEWALK WIDTH:**
- VARIES 6' MIN ** 6'**
- 13.5' Min
- 13.5' Min
- 6' Min**

**NOTES:**
1. ALL DESIGN SUBGRADES SHALL BE COMPACTED AND PROOF-ROLLED PRIOR TO PLACEMENT OF BASEROCK. COMPACTION TESTING OF SUBGRADE MAY BE WAIVED AS OUTLINED UNDER NOTE 3.
2. IF SUBGRADE FAILS THE PROOF-ROLL, SUBGRADE SHALL BE OVEREXCAVATED TO UNDISTURBED SOIL AND BACKFILLED WITH BASEROCK OVER GEOTEXTILE REINFORCEMENT FABRIC (AS SPECIFIED) TO ALLOW COMPACTION OF UPPER (DESIGN) BASEROCK SECTION AND TO MAINTAIN STRUCTURAL INTEGRITY OF NATIVE SUBGRADE SOILS. TYPICAL MIN. OVEREXCAVATION REQUIRED IS 12-INCHES. NO RUBBER TIRED EQUIPMENT ALLOWED ON SUBGRADE FOLLOWING OVEREXCAVATION.
3. IF SUBGRADE PASSES PROOF-ROLL BUT CANNOT BE COMPACTED TO 95% OPTIMUM DENSITY PER AASHTO T-180 (OR IF CONTRACTOR Chooses NOT TO TEST), GEOTEXTILE SEPARATION FABRIC (AS SPECIFIED) SHALL BE PLACED ON THE SUBGRADE PRIOR TO PLACEMENT OF THE BASEROCK.
4. REINFORCEMENT FABRIC (FOR USE W/OVEREXCAVATION): NON-WOVEN (MIRAFI 1000N, GEOTEX 1001, LINQ 250EX OR EQUAL), WOVEN (MIRAFI 550X, GEOTEX 250ST, LINQ GTF250 OR EQUAL), SEPARATION FABRIC: NON-WOVEN (MIRAFI 160N, GEOTEX 601, LINQ 150EX OR EQUAL), WOVEN (MIRAFI 500X, GEOTEX 200ST, LINQ GTF200 OR EQUAL).
Sidewalk Location: Per CDC 3.4.100.F, Property-Line Sidewalks & Landscape Strip required unless otherwise approved in advance by City.

C/L Street = C/L R/W

**Sidewalk Width:** Width varies by location & zoning, see CDC & 2019 TSP Requirements.

Notes:
1. All design subgrades shall be compacted and proof-rolled prior to placement of baserock. Compaction testing of subgrade may be waived as outlined under Note 3.
2. If subgrade fails the proof-roll, subgrade shall be overexcavated to undisturbed soil and backfilled with baserock over geotextile reinforcement fabric (as specified) to allow compaction of upper (design) baserock section and to maintain structural integrity of native subgrade soils. Typical min. overexcavation required is 12-inches. No rubber tired equipment allowed on subgrade following overexcavation.
3. If subgrade passes proof-roll but cannot be compacted to 95% optimum density per AASHTO T-180 (or if contractor chooses not to test), geotextile separation fabric (as specified) shall be placed on the subgrade prior to placement of the baserock.
SIDEWALK LOCATION: PER CDC 3.4.100.F, PROPERTY-LINE
SIDEWALKS & LANDSCAPE STRIP REQUIRED UNLESS
OTHERWISE APPROVED IN ADVANCE BY CITY.

C/L STREET = C/L R/W

**SIDEWALK WIDTH: WIDTH VARIES BY LOCATION & ZONING, SEE CDC & 2019 TSP REQUIREMENTS.**

SIDEWALK WIDTH:

- BASE LIFT AC – 3/4" DENSE
  - TOP LIFT AC – 1/2" DENSE
  - GRANULAR BASEROCK (LEVEL 3 JMF)

SUBGRADE, SEE NOTES BELOW:

- 15” OF 1”–0” GRANULAR BASEROCK
  - COMPACT TO 95% OPTIMUM PER AASHTO T-180

ALT: 2” OF 3/4”–0” GRANULAR BASEROCK OVER 13” OF 1–1/2”–0” GRANULAR BASEROCK.

NOTES:

1. ALL DESIGN SUBGRADES SHALL BE COMPACTED AND PROOF–ROLLED PRIOR TO PLACEMENT OF BASEROCK. COMPACTION TESTING OF SUBGRADE MAY BE WAIVED AS OUTLINED UNDER NOTE 3.

2. IF SUBGRADE FAILS THE PROOF–ROLL, SUBGRADE SHALL BE OVEREXCAVATED TO UNDISTURBED SOIL AND BACKFILLED WITH BASEROCK OVER GEOTEXTILE REINFORCEMENT FABRIC (AS SPECIFIED) TO ALLOW COMPACTION OF UPPER (DESIGN) BASEROCK SECTION AND TO MAINTAIN STRUCTURAL INTEGRITY OF NATIVE SUBGRADE SOILS. TYPICAL MIN. OVEREXCAVATION REQUIRED IS 12–INCHES. NO RUBBER TIRED EQUIPMENT ALLOWED ON SUBGRADE FOLLOWING OVEREXCAVATION.

3. IF SUBGRADE PASSES PROOF–ROLL BUT CANNOT BE COMPACTED TO 95% OPTIMUM DENSITY PER AASHTO T-180 (OR IF CONTRACTOR Chooses NOT TO TEST), GEOTEXTILE SEPARATION FABRIC (AS SPECIFIED) SHALL BE PLACED ON THE SUBGRADE PRIOR TO PLACEMENT OF THE BASEROCK.

**SIDEWALK WIDTH:** WIDTH VARIES BY LOCATION & ZONING, SEE CDC & 2019 TSP REQUIREMENTS.

SIDEWALK LOCATION: PER CDC 3.4.100.F, PROPERTY-LINE SIDEWALKS & LANDSCAPE STRIP REQUIRED UNLESS OTHERWISE APPROVED IN ADVANCE BY CITY.

**C/L STREET = C/L R/W**

4" MIN. COMPACTED GRANULAR BASEROCK

VARIES 6'MIN*618'

13" OF 1"-0" GRANULAR BASEROCK

ALSO 2" OF 3/4"-0" GRANULAR BASEROCK OVER

15" OF 1"-0" GRANULAR BASEROCK

(COMPACT TO 95% OPTIMUM PER AASHTO T-180)

NOTES:

1. ALL DESIGN SUBGRADES SHALL BE COMPACTED AND PROOF-ROLLED PRIOR TO PLACEMENT OF BASEROCK. COMPAC TION TESTING OF SUBGRADE MAY BE WAIVED AS OUTLINED UNDER NOTE 3.
2. IF SUBGRADE FAILS THE PROOF-ROLL, SUBGRADE SHALL BE OVEREXCAVATED TO UNDISTURBED SOIL AND BACKFILLED WITH BASEROCK OVER GEOTEXTILE REINFORCEMENT FABRIC (AS SPECIFIED) TO ALLOW COMPACTION OF UPPER (DESIGN) BASEROCK SECTION AND TO MAINTAIN STRUCTURAL INTEGRITY OF NATIVE SUBGRADE SOILS. TYPICAL MIN. OVEREXCAVATION REQUIRED IS 12-INCHES. NO RUBBER TIRED EQUIPMENT ALLOWED ON SUBGRADE FOLLOWING OVEREXCAVATION.
3. IF SUBGRADE PASSES PROOF-ROLL BUT CANNOT BE COMPACTED TO 95% OPTIMUM DENSITY PER AASHTO T-180 (OR IF CONTRACTOR CHOOSES NOT TO TEST), GEOTEXTILE SEPARATION FABRIC (AS SPECIFIED) SHALL BE PLACED ON THE SUBGRADE PRIOR TO PLACEMENT OF THE BASEROCK.
4. REINFORCEMENT FABRIC (FOR USE W/OVEREXCAVATION): NON-WOVEN (MIRAFI 1000N, GEOTEX 1001, LINQ 250EX OR EQUAL), WOVEN (MIRAFI 550X, GEOTEX 250ST, LINQ GTF250 OR EQUAL), SEPARATION FABRIC: NON-WOVEN (MIRAFI 160N, GEOTEX 601, LINQ 150EX OR EQUAL), WOVEN (MIRAFI 500X, GEOTEX 200ST, LINQ GTF200 OR EQUAL).
NOTES:
1. 2.5% MIN. CROSS SLOPE REQUIRED FROM CENTER OF BULB TO GUTTER.
2. MAINTAIN CROWN LINE TO CENTER OF CUL-DE-SAC BULB.
NOTES:

1. 2.5% MIN. CROSS SLOPE REQUIRED FROM CENTER OF BULB TO GUTTER.
2. MAINTAIN CROWN LINE TO CENTER OF CUL-DE-SAC BULB.
3. OFFSET FROM ROADWAY CENTERLINE TO CENTER OF BULB = CURB RADIUS MINUS ONE-HALF STREET WIDTH.
NOTES:
1. TOP CURB @ A = TOP CURB @ B = CROWN @ C
2. TOP CURB @ D = TOP CURB @ E = CROWN @ F
3. MIN. GUTTER SLOPE FROM E TO B = 0.75%
4. SET CROWN @ H 0.25' MIN. ABOVE TOP CURB @ G
   (4% MIN. CROSS SLOPE FROM H TO G)
DEPRESSED CURB FOR D/W
(3/4” LIP, MAX.)

3/8" R

12" MIN.

4" MIN. THICKNESS
COMPACTED GRANULAR
BASEROCK

DEPRESSED CURB FOR
PEDESTRIAN RAMP (NO LIP),
2% TYP, 5% MAX ACROSS
TOP OF DROP CURB

TYPE A CURB & GUTTER

CURB END
(45° TAPER) TYP

CONTRACTION JOINT
@ 15' MAX
INTERVALS

3" PLASTIC PIPE COUPLING AT
BACK OF CURB AND SIDEWALK

GUTTER LINE

PAVEMENT, SIDEWALK OR
DRIVEWAY

TAPER

WEEP HOLE THROUGH CURB

MIN. 2 PER LOT

EXTEND PIPE A MIN. OF 3"
BEHIND BACK OF CURB

3" PLASTIC PIPE
(SMOOTH WALL PVC OR ABS)
TO BACK OF SIDEWALK

NOTES:
1. CONTRACTION JOINTS SHALL BE PLACED AT 15’ MIN. INTERVALS AND SHALL EXTEND
   AT LEAST 50% THROUGH THE CURB OR CURB AND GUTTER.
2. A CONTRACTION JOINT SHALL BE PLACED ACROSS SIDEWALK OVER WEEP HOLE PIPE.
3. ALL CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
4. WHERE SIDEWALKS ARE TO BE CONSTRUCTED, EXTEND
   3” PIPE TO BACK OF SIDEWALK LOCATION & INSTALL
   COUPLING AT ALL WEEP HOLE LOCATIONS.
5. INSTALL MIN. 2 WEEP HOLES ON ALL LOTS. ONE TO
   BE AT LOW POINT OF LOT, 5’ FROM P/L. WEEPHOLES
   IN EXISTING CURBS SHALL BE CORE DRILLED.
6. MONOLITHIC CURB & PUBLIC SIDEWALK OR DRIVEWAY
   APRON PLACEMENT IS NOT PERMITTED (IE. CURB
   CONCRETE & SIDEWALK OR DRIVEWAY CONCRETE
   SHALL BE PLACED SEPARATELY).

LAST REVISION DATE:
JULY 2017

COPYRIGHT 1994
WESTERN ENGINEERING, INC.

TYPE 'A'
CURB AND GUTTER
AND WEEP HOLE
(NTS)

CRESWELL, OR 210
TYPE 'C' (FULL HEIGHT) CURB

NOTES

1. 7" CURB EXPOSURE FOR ARTERIAL & COLLECTOR STREETS TYPICAL WHERE TYPE C CURB IS ALLOWED.
2. 6" EXPOSURE ALL OTHER PUBLIC STREETS, PRIVATE STREETS & PARKING LOTS.
3. A CONTRACTION JOINT SHALL BE PLACED ACROSS SIDEWALK OVER WEEP HOLE PIPE.
4. ALL CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
5. WHERE SIDEWALKS ARE TO BE CONSTRUCTED, EXTEND 3" PIPE TO BACK OF SIDEWALK LOCATION & INSTALL COUPLING AT ALL WEEP HOLE LOCATIONS.
6. INSTALL MIN. 2 WEEP HOLES ON ALL LOTS. ONE TO BE AT LOW POINT OF LOT, 5' FROM P/L. WEEP HOLES IN EXISTING CURBS SHALL BE CORE DRILLED.
7. MONOLITHIC CURB & PUBLIC SIDEWALK OR DRIVEWAY APRON PLACEMENT IS NOT PERMITTED (IE. CURB CONCRETE & SIDEWALK OR DRIVEWAY CONCRETE SHALL BE PLACED SEPARATELY).
TOOLED CONTRACTION JOINTS TYPICAL AT 5' INTERVALS

FULL DEPTH JOINT BETWEEN R/W & SIDEWALK
SIDEWALK WIDTH 1'
AS SPECIFIED
1.5%

MIN. 4" OF 3/4"-0" COMPACTED GRANULAR BASEROCK (TYPICAL UNDER ALL SIDEWALKS AND DRIVEWAYS)

DRIVEWAY SECTION (SEE BELOW)

SIDEWALK EASEMENT OR SIDEWALK PUE WHERE REQ'D @ D/W, CBU OR CORNERS.

THICKENED SECTION

STD. DRIVEWAY SECTION 14'-24' RESIDENTIAL TYP.

SIDEWALK EASEMENT OR SIDEWALK PUE WHERE REQ'D

MIN. 4" OF 3/4"-0" COMPACTED GRANULAR BASEROCK (TYPICAL UNDER ALL SIDEWALKS AND DRIVEWAYS)

CONCRETE CBU PAD TO BE MONOLITHIC WITH SIDEWALK, 6' WIDE & 8" THICK OR AS REQUIRED PER USPS REGULATIONS. SEE NOTE 8.

FOR GUTTER SLOPES STEEPER THAN 2%, USE DETAIL 214C FOR CBU.

TOOLED CONTRACTION JOINTS, SEE NOTE ABOVE

NOTES:
1. MONOLITHIC PLACEMENT OF CONCRETE FOR STREET CURB & PARALLEL PUBLIC SIDEWALK IS PROHIBITED.
2. CONCRETE THICKNESS. STANDARD SIDEWALKS SHALL BE 4" MIN. THICK. SIDEWALKS THROUGH RESIDENTIAL DRIVEWAYS (INCLUDING WINGS) SHALL BE 6" MIN. THICK. COMMERCIAL DRIVEWAYS & ALLEY APPROACHES SHALL BE 8" MIN. THICK.
3. SIDEWALKS 8' & WIDER SHALL HAVE A LONGITUDINAL CONTRACTION JOINT AT MIDPOINT.
4. CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
5. PCC APRONS JOINTED TO MATCH SIDEWALK PATTERN.
6. SIDEWALKS SHALL BE LOCATED ENTIRELY WITHIN PUBLIC RIGHT-OF-WAY OR SIDEWALK EASEMENTS, INCLUDING AT DRIVEWAYS & INTERSECTIONS.
7. ADA ACCESS TO CBU MAILBOXES SHALL CONFORM WITH SECTION 1111 OF OSSC (OREGON STRUCTURAL SPECIALTY CODE), INCLUDING AN ADA PEDESTRIAN CURB RAMP LOCATED WITHIN 50 FEET OF THE CBU. PROWAG REQUIRED 6'x6' TURNING SPACE IN FRONT OF CBU SHALL NOT EXCEED 2% IN ANY DIRECTION. CBU LAYOUT ABOVE ASSUMES STREET & CURB GRADE DOES NOT EXCEED 2%
TOOLED CONTRACTION JOINTS TYPICAL AT 5' INTERVALS

NOTE:
CONTRACTION JOINT REQUIRED AT BOTH SIDES OF DRIVEWAY AND OVER ROOF DRAINS

THICKENED SECTION

STD. DRIVEWAY SECTION 14'-24' RESIDENTIAL TYP.

DRIVEWAY WIDTH

HARD SURFACE BEHIND S/W PER CITY STANDARDS

3" PIPE AND COUPLING

3' MIN.

STD. CURB & GUTTER

WEEP HOLES TYPICAL @:
-BOTH SIDES OF D/W

<table>
<thead>
<tr>
<th>W</th>
<th>B</th>
<th>H</th>
</tr>
</thead>
</table>
| 5' | 1' | 0.27" (3-1/4"
| 6' | 2' | 0.23" (2-3/4"
| 7' | 3' | 0.19" (2-1/4"

3/4" LIP

MIN. 4" OF 3/4"-0" COMPACTED GRANULAR BASEROCK (TYPICAL UNDER ALL SIDEWALKS AND DRIVEWAYS)

NOTES:

1. SEE DETAIL 212 FOR STANDARD APRON & SIDEWALK DETAILS. USE OF THIS DETAIL REQUIRES SPECIFIC APPROVAL BY PUBLIC WORKS PRIOR TO FORMING.

2. CONCRETE THICKNESS. CONCRETE DEPTH FOR STANDARD SIDEWALKS SHALL BE 4" MIN.
SF & DUPLEX RESIDENTIAL DRIVEWAY SECTIONS INCLUDING SIDEWALKS THROUGH DRIVEWAYS SHALL BE 6" MIN. THICKNESS.

3. MONOLITHIC PLACEMENT OF CONCRETE FOR STREET CURB & PARALLEL PUBLIC SIDEWALK IS PROHIBITED.

4. CONCRETE SHALL BE 3300 PSI @ 28 DAYS.

5. PCC APRONS SHALL BE JOINTED TO MATCH SIDEWALK PATTERN.

6. PUBLIC SIDEWALKS SHALL BE LOCATED ENTIRELY WITHIN RIGHT-OF-WAY OR SIDEWALK EASEMENTS, INCLUDING SIDEWALKS THROUGH DRIVEWAY APRONS & AT CORNERS.

7. CROSS SLOPE IS MEASURED FROM HORIZONTAL.

8. RUNNING SLOPE OF SIDEWALK APPROACH TO LANDINGS SHALL TYPICALLY NOT EXCEED 1V:12H (8.33%), BUT SHALL NOT REQUIRE THE LENGTH TO EXCEED 15 FEET.

LAST REVISION DATE:
AUG 2019

RESIDENTIAL D/W APRON CURBLINE SIDEWALK UPHILL LOTS ONLY
(NTS)

CRESWELL, OR

DETAIL NO. 212A
TOOLED CONTRACTION JOINTS TYPICAL AT 5' INTERVALS

VARIABLE SIDEWALK WIDTH, 1'
RECOMM. 4' MIN. AS SPECIFIED

2% 1.5%

MIN. 4" OF 3/4"-0" COMPACTED GRANULAR BASEROCK (TYPICAL UNDER ALL SIDEWALKS AND DRIVEWAYS)

DRIVEWAY SECTION

EXPANSION JOINT REQUIRED IF PLACING CONCRETE AGAINST EXISTING CONCRETE OR PRIVATE SIDEWALK CONNECTION, AS WELL AS AT EACH PROPERTY LINE OR 100 FOOT MAXIMUM INTERVALS, WHICHER IS LESS (MATERIAL PER ODOT/OSSC 02440.10).

3" PIPE AND COUPLING (TYP)

WEEP HOLES TYPICAL @:
- BOTH SIDES OF D/W
- 2 PER LOT MINIMUM
- LOW POINTS IN CURB
- LOW END OF LOT FRONTAGE

2" TYP. OFFSET FROM PROPERTY CORNER

TOOLED CONTRACTION JOINTS, SEE NOTE ABOVE

STD. CURB & GUTTER

CONTINUE PATTERN THROUGH DRIVEWAY APRON

PLACE BOND BREAKER BETWEEN CURB AND DRIVEWAY (TYP).

STD. DRIVEWAY SECTION

HARD SURFACE BEHIND S/W PER CITY STANDARDS

NOTE:
1. MONOLITHIC PLACEMENT OF CONCRETE FOR STREET CURB & PARALLEL PUBLIC SIDEWALK IS PROHIBITED.
2. CONCRETE THICKNESS. STANDARD SIDEWALKS SHALL BE 4" MIN. THICK. SIDEWALKS THROUGH RESIDENTIAL DRIVEWAYS (INCLUDING WINGS) SHALL BE 6" MIN. THICK. COMMERCIAL DRIVEWAYS & ALLEY APPROACHES SHALL BE 8" MIN. THICK.
3. SIDEWALKS 10' & WIDER SHALL HAVE A LONGITUDINAL CONTRACTION JOINT 5' MAX. ON CENTER.
4. JOINT PCC APRONS TO MATCH SIDEWALK PATTERN.
5. CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
6. CBU MAILBOXES ON PROPERTY LINE SIDEWALKS SHALL MEET PROWAG STANDARDS, INCLUDING TURNING SPACE/LANDING FRONTING CBU (6'x6' MIN, 1½% SLOPE), LANDING APPROACH WIDTHS/SLOPES/LENGTHS, AND CONCRETE THICKNESS AS SHOWN ON DETAILS 212 & 214C, AND PEDESTRIAN CURB RAMP LOCATED WITHIN 50 FEET OF THE CBU.

PROPERTY LINE SIDEWALKS AND DRIVEWAY APRONS

(NTS)

CRESWELL, OR

DETAIL NO. 213

LAST REVISION DATE:
AUG 2019

COPYRIGHT 1996 WESTECH ENGINEERING, INC.
NOTES:
1. MAILBOX (CENTRALIZED BOX UNIT—CBU), LOCATION TO BE APPROVED BY LOCAL POSTMASTER
2. SET CBU 24" MIN. CLEAR BEHIND FACE OF CURB.
3. CONCRETE CBU PAD TO BE 8" THICK OR AS REQUIRED PER USPS REGULATIONS.
4. CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
5. ADA ACCESS TO CBU MAILBOXES SHALL CONFORM WITH SECTION 1111 OF THE OSSC (OREGON STRUCTURAL SPECIALTY CODE), INCLUDING AN ADA PEDESTRIAN CURB RAMP LOCATED WITHIN 50 FEET OF THE CBU.
NOTES:
1. BARRIER PANEL ASSEMBLY & INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER’S SPECIFICATIONS & DRAWING/DETAIL NOTES, WHICHER IS MORE STRINGENT.
2. DO NOT SCALE DRAWINGS.
3. BARRIER PANELS TO BE NDS RP SERIES OR EQUAL.
NOTES:
1. BARRIER PANEL ASSEMBLY & INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS & DRAWING/DETAIL NOTES, WHICHEVER IS MORE STRINGENT.
2. DO NOT SCALE DRAWINGS.
3. BARRIER PANELS TO BE NDS RP SERIES OR EQUAL.

BARRIER PANEL
NTS (oblique view)

TYPE 2 (5 PANELS)
NTS

TREES AS APPROVED BY CITY, PROVIDED & PLANTED BY CONTRACTOR.
PREPARED SOIL MIX
ROOT BARRIER (SET TOP 1" BELOW FINISH GRADE IN AREAS OUTSIDE OF SIDEWALKS)
ROOT BALL
3/4"-0 AGGREGATE OR CRUSHED ROCK
COMPACTED, PREPARED SOIL MIX TO BOTTOM OF ROOT BALL
PREPARED SOIL MIX BACKFILL

SECTION
NTS

LAST REVISION DATE:
FEB 2019
COPYRIGHT 1996 WESTECH ENGINEERING, INC.

24" DEEP, 38" Ø
5 PANEL ROOT BARRIER TREE WELLS
(NTS)

CRESWELL, OR
DETAIL NO.
213C
Domes shall be wet-set replaceable panels
(ADA solutions (cast-in-place, yellow) or equal)
Install truncated dome detectable warning surface
as shown & specified, Full width of ramp throat.

Spacing: D=1.6" min. to 2.40" max
0.65" min clear between dome bases

EXTEND LIMITS OF LANDING SIDEWALK AS REQUIRED TO COMPLY WITH LONGITUDINAL SLOPE LIMITS SHOWN.

GENERAL NOTES:
1. See note & detail above for required replaceable dome style & color (panel or radius style).
2. See typical street sections for sidewalk width.
3. All ramps and transitions shall be ADA & PROWAG compliant.
4. Landings & turning areas shall have a min. width & depth of 4 feet.
5. Cross slopes shown are measured from horizontal.
6. Shaded sidewalk & ramp areas to be constructed with street improvements, and shall be 6" thick concrete.
7. Drop curbs for handicap ramps shall be constructed with no lip at the gutter line or edge of pavement.
8. Provide 6-inch wide concrete landscape curb at back of ramp on downhill side of street, or as required to contain landscaping (see "A" note above).
9. Provide 4" min. compacted baserock under all S/W.
10. Where grade limits shown cannot be satisfied (ie. approach, landing or wings), construct ramp shown on detail 214B & transition to curbline sidewalk.
11. Design running slope of sidewalk approach to landings shall typically not exceed 1V:13H (7.7%), but shall not require the length to exceed 15 feet.
DOMES SHALL BE WET-SET REPLACEABLE PANELS
(ADA SOLUTIONS (CAST-IN-PLACE, YELLOW) OR EQUAL)

INSTALL TRUNCATED DOME DETECTABLE WARNING SURFACE
AS SHOWN & SPECIFIED, FULL WIDTH OF RAMP THROAT.

SPACING: D=1.6" MIN. TO 2.40" MAX
0.65" MIN CLEAR BETWEEN DOME BASES

0.9" DIA. 0.2"
DOME PROFILE

FIGURE A: TRUNCATED DOME DETAIL

SECTION

TOOLED CONTRACTION JOINTS TYPICAL AT 5' INTERVALS

MONOLITHIC CURB/RAMP
CONCRETE PLACEMENT ALLOWED
WHERE APPROVED, TO AVOID
FUTURE SETTLEMENT LIP

USE SMOOTH CURVES FOR
ANY TRANSITION TO CURBLINE
SIDEWALK SHOWN ON
DRAWINGS (TYP)

10% MAX SLOPE ON
WINGS (TYP)

R/W LINE
or S/W EASEMENT

LANDSCAPE STRIP WIDTH
PER PLANS

6" wide
LANDSCAPE CURB
AS OPTION TO
SIDE WING (TYP)

SEPARATE RAMP FOR
PROPERTY LINE SIDEWALKS

STD. CURB & GUTTER

R/W LINE

SIDEWALK WIDTH
PER PLANS

SIDEWALK WIDTH
PER PLANS (5' MIN)

6" wide
LANDSCAPE CURB
AS OPTION TO
SIDE WING (TYP)

STD. CURB & GUTTER

GENERAL NOTES:
1. SEE NOTE & DETAIL ABOVE FOR REQUIRED REPLACEABLE
   DOME STYLE & COLOR (PANEL OR RADIUS STYLE).
2. SEE TYPICAL STREET SECTIONS FOR SIDEWALK WIDTH.
3. ALL RAMPS AND TRANSITIONS SHALL BE ADA & PROWAG
   COMPLIANT.
4. LANDINGS & TURNING AREAS SHALL HAVE A MIN. WIDTH &
   DEPTH OF 4 FEET.
5. CROSS SLOPES SHOWN ARE MEASURED FROM HORIZONTAL.
6. SHADED SIDEWALK & RAMP AREAS TO BE CONSTRUCTED
   W/STREET IMPROVEMENTS, AND SHALL BE 6" THICK
   CONCRETE.
7. DROP CURBS FOR HANDICAP RAMPS SHALL BE CONSTRUCTED
   WITH NO LIP AT THE GUTTER LINE OR EDGE OF PAVEMENT.
8. PROVIDE 4-INCH MIN RADIUS ON ALL RETURNED CURBS.
9. PROVIDE 4" MIN. COMPACTED BASEROCK UNDER ALL S/W.
10. DESIGN RUNNING SLOPE OF SIDEWALK APPROACH TO
   LANDINGS SHALL TYPICALLY NOT EXCEED 1V:13H (7.7%), BUT
   SHALL NOT REQUIRE THE LENGTH TO EXCEED 15 FEET.

DOUBLE RAMPS FOR
PROPERTY LINE OR
CURBLINE SIDEWALKS
(SEE SECTION A)

INTERSECTION CURB RAMPS
PROPERTY LINE SIDEWALKS
LOCAL STREETS

CRESWELL, OR 214B
DOMES SHALL BE WET-SET REPLACEABLE PANELS  
(ADA SOLUTIONS (CAST-IN-PLACE, YELLOW) OR EQUAL)  
INSTALL TRUNCATED DOME DETECTABLE WARNING SURFACE  
AS SHOWN & SPECIFIED, FULL WIDTH OF RAMP THROAT.  
SPACING: D=1.6" MIN. TO 2.40" MAX  
0.65" MIN CLEAR BETWEEN DOME BASES  

SECTION A  
MONOLITHIC CURB/RAMP  
CONCRETE PLACEMENT ALLOWED  
WHERE APPROVED, TO AVOID  
FUTURE SETTLEMENT LIP  
6" CURB EXPOSURE  

SECTION B  
SIDEWALK EASEMENT OR  
SIDEWALK PUE WHERE NECESSARY @ CBU.  

CURBLINE SIDEWALK RAMP  
W/ADJACENT CBU  
(GUTTER SLOPE 10% MAX)  
(SEE SECTION B)  
TOOLED CONTRACTION JOINTS TYPICAL AT 5' INTERVALS  

CURB RAMPS BETWEEN INTERSECTIONS  
(NTS)  
CRESWELL, OR  
DETAIL NO. 214C  

LAST REVISION DATE:  
AUG 2019  

PROPERTY LINE  
SIDEWALK RAMP  
(SEE SECTION A)  

SIDEWALK RAMP  
(SEE SECTION B)  

CURBLINE SIDEWALK RAMP  
W/ADJACENT CBU  
(GUTTER SLOPE 10% MAX)  
(SEE SECTION B)  
TOOLED CONTRACTION JOINTS TYPICAL AT 5' INTERVALS  

CURB RAMPS BETWEEN INTERSECTIONS  
(NTS)  
CRESWELL, OR  
DETAIL NO. 214C  

LAST REVISION DATE:  
AUG 2019  

PROPERTY LINE  
SIDEWALK RAMP  
(SEE SECTION A)  

SIDEWALK RAMP  
(SEE SECTION B)  

CURBLINE SIDEWALK RAMP  
W/ADJACENT CBU  
(GUTTER SLOPE 10% MAX)  
(SEE SECTION B)  
TOOLED CONTRACTION JOINTS TYPICAL AT 5' INTERVALS  

CURB RAMPS BETWEEN INTERSECTIONS  
(NTS)  
CRESWELL, OR  
DETAIL NO. 214C  

LAST REVISION DATE:  
AUG 2019
NOTES:

1. CONCRETE APRON BE 8" MIN. THICK 3300 PCC WITH #3 REBAR @ 12" O.C. EACH WAY, OR 6"X6" 10 GA. WELDED WIRE MESH, SET ON 3" DOBIES.
2. MIN. 4" OF 3/4"-0" COMPACTED GRANULAR BASEROCK (TYPICAL UNDER ALL SIDEWALKS AND CONCRETE DRIVEWAY APPROACHES).
4. TURNING RADIUS OF ANTICIPATED LARGEST VEHICLE TO BE VERIFIED DURING DESIGN.
5. MONOLITHIC CURB & DRIVEWAY APRON PLACEMENT IS NOT PERMITTED (IE. CURB CONCRETE & DRIVEWAY APRON CONCRETE SHALL BE PLACED SEPARATELY).
6. WHERE APPROVED BY THE CITY ENGINEER & PUBLIC WORKS DIRECTOR, "DUSTPAN" STYLE COMMERCIAL DRIVEWAYS PER DETAILS 212 OR 213 MAY BE USED (BASED ON CONCRETE THICKNESS/REINFORCING AS NOTED ABOVE).
NOTES:

1. ONLY ALLOWED ON EXISTING PAVED STREETS.
2. SAWCUT THROUGH GUTTER PAN SHALL BE MADE AS CLOSE TO CURB FACE AS POSSIBLE.
3. COMPLETE CURB AND GUTTER SHALL NOT BE REMOVED UNLESS APPROVED BY THE CITY ENGINEER PRIOR TO START OF CONSTRUCTION.
4. WHEN TYPE 'C' CURBS ARE REMOVED, A MINIMUM OF 2 FEET OF PAVEMENT (MEASURED FROM THE FACE OF CURB) SHALL BE REMOVED AND REPLACED UNLESS OTHERWISE APPROVED BY THE CITY
5. ANY AC SAWCUTS WILL REQUIRE A BENCH GRIND (PER DETAILS 302A & 302B) IN CONJUNCTION WITH REPAVING.
CRUSHED ROCK BASE
(SEE TYPICAL STREET/
ALLEY SECTIONS FOR DEPTH)

COMPACTED SUBGRADE
(95% OPTIMUM PER AASHTO T-180)

NOTE:
DESIGN ALLEY CROSS-SLOPE OF 2% MAY VARY FROM
1.5% TO 4% TO PROVIDE POSITIVE DRAINAGE AND MATCH
EXISTING GRADE. CONTRACTOR TO OBTAIN CITY
APPROVAL FOR ANY VARIATION OF DESIGN GRADES.

TYPICAL VALLEY GUTTER LOCATION

CRUSHED ROCK BASE
(SEE TYPICAL ALLEY/
PARKING LOT SECTIONS
FOR DEPTH)

COMPACTED SUBGRADE

4" MIN, 3/4"-0" CRUSHED
ROCK BASE COMPACT TO 95%
OPTIMUM PER AASHTO T-180

ADA NOTE:
VALLEY GUTTERS SHALL BE ADA COMPLIANT
WHERE CROSSED BY A PEDESTRIAN ACCESS
PATH.

TYPICAL CONCRETE GUTTER SECTION

1. CONTRACTION JOINTS SHALL BE PLACED AT 15' MIN.
INTERVALS AND SHALL EXTEND AT LEAST 50%
THROUGH THE GUTTER SECTION.
2. ALL CONCRETE SHALL BE 3500 PSI @ 28 DAYS.
3. CONSTRUCT 12" WIDE BENCH MONOLITHICALLY WITH
VALLEY GUTTER FOR PAVEMENT SUPPORT. BENCH
DEPTH TO MATCH PAVEMENT THICKNESS.
4. VALLEY GUTTERS PROPOSED AT PUBLIC STREET
INTERSECTIONS MUST BE APPROVED ON A
CASE-BY-CASE BASIS BY THE PUBLIC WORKS
DIRECTOR.
AFTER BASEROCK INSTALL, GRIND 24" BENCH INTO EXTG AC PAVEMENT, THEN SAWCUT TO CLEAN UP EDGE. SEE NOTE 2 BELOW (18" MIN. BENCH WIDTH AFTER SAWCUT).

- **INITIAL SAWCUT LINE** (& NEW FULL-DEPTH BASEROCK LIMITS), DISTANCE FROM EXISTING EDGE AC AS SHOWN ON DWGS OR DIRECTED BY PUBLIC WORKS (1'-2' TYP). SEE NOTE 1.

- TACK COAT CUT EDGES & ALL GRIND SURFACES

- ORIGINAL EDGE OF EXISTING PAVEMENT BEFORE INITIAL SAWCUT.

- 18" MIN. WIDTH PRE-TACKED PAVING FABRIC (MIRAFI MTK, PETROTAC OR EQUAL)

- PLACE A.C. IN MIN. TWO LIFTS (CL. 'C' OVER CL. 'B'), OVERALL THICKNESS AS NOTED ON DWGS (3" MIN.). COMPACT TO 91% OPTIMUM DENSITY PER RICE STD. METHOD.

- TACK COAT CUT EDGES & ALL GRIND SURFACES

18" MIN. WIDTH PRE-TACKED PAVING FABRIC (MIRAFI MTK, PETROTAC OR EQUAL)

1. INITIAL SAWCUT SHOWN ABOVE** TO OCCUR PRIOR TO EXCAVATION FOR NEW BASEROCK. SAWCUT LIMITS (& NEW BASEROCK LIMITS) MAY BE INCREASED BY PUBLIC WORKS BASED ON ACTUAL FIELD CONDITIONS (IE. INADEQUATE BASEROCK AT TRANSITION POINT, ETC.).

2. AFTER INSTALLATION OF NEW BASEROCK (PRIOR TO PAVING), GRIND 24" WIDE BENCH ALONG EDGE OF EXISTING AC (2" DEEP TYP), THEN SAWCUT TO CLEAN UP EDGE AS REQUIRED (FINISHED BENCH GRIND TO EXTEND TO A POINT 18" MINIMUM FROM FINAL SAWCUT LOCATION).

3. TACK COAT CUT EDGES AND INSTALL BASE LIFT OF AC LEVEL WITH BENCH GRIND.

4. INSTALL PAVING FABRIC AT ALL JOINTS, TACK COAT ALL GRIND SURFACES & EDGES, INSTALL TOP LIFT OF AC.

5. SAND SEAL ALL JOINTS (REMOVE EXCESS SAND AFTER CURE).

6. ALONG WIDENED STREETS, THE CONTRACTOR SHALL VERIFY THAT THE PROPOSED CURB/GUTTER ELEVATIONS MATCH THE EXISTING EDGE OF PAVEMENT, BASED ON THE DESIGN STREET CROSS SLOPES SHOWN ON THE DRAWINGS AND THE SPECIFIED CURB EXPOSURE. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER PRIOR TO PLACEMENT OF CURB FORMS OR STRINGLINE. CURBS WHICH ARE PLACED TOO HIGH OR TOO LOW SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE CITY.
FIRE CODE NOTES:

A) FIRE LANES, TURNAROUNDS & ASSOCIATED IMPROVEMENTS SHALL COMPLY WITH THE MOST CURRENT VERSION OF THE OREGON FIRE CODE (OFC).

B) GRADES ALONG FIRE LANES OR ALONG TURNAROUND AREAS SHALL NOT EXCEED 10% WITHOUT PRIOR WRITTEN APPROVAL FROM THE FIRE CHIEF (OFC D103.2).

NOTES:

1. 'NO PARKING/FIRE LANE' SIGNS REQUIRED WITHIN LIMITS OF TURNAROUND AS SHOWN, & AT TYPICAL 50 FOOT MAXIMUM INTERVALS ALONG LENGTH OF FIRE LANE OR PER OFC REQUIREMENTS.

2. THESE ARE TYPICAL MINIMUM DESIGNS AS REQUIRED BY THE 2014 OFC D103.4 & FIGURE D103.1. ALTERNATE DESIGNS SHALL MEET THE APPROVAL OF THE LOCAL FIRE MARSHALL.

3. PAVEMENT DIMENSIONS SHOWN REFERS TO TOTAL DRIVABLE WIDTH BETWEEN CURBS IF PRESENT.

4. MIN. 26' PAVEMENT WIDTH AT FIRE HYDRANTS (OFC D103.1).
NOTES:
1. STRIPING SHALL BE ALTERNATING RED & WHITE STRIPES 6" WIDE & AT A 45' ANGLE.
2. STRIPING SHALL BE EITHER RETRO-REFLECTIVE TAPE OR PAINTED WITH A SEALED RETRO-REFLECTIVE SURFACE.
3. BARRICADE SHALL BE LOCATED WITHIN THE RESERVE STRIP, IF PRESENT.
4. FULL DEPTH BASEROCK SHALL EXTEND BEYOND BARRICADE POSTS AS SHOWN.
6" DIA. PRIME COATED STEEL PIPE (SCHED 40) FILLED WITH CONCRETE

PAINT PIPE AND CAP WITH SAFETY YELLOW

SLOPING CONCRETE CAP

FINISH GRADE

3300 PSI CONCRETE BASE

ROUNDED CONCRETE CAP

6-INCH BOLLARD (GUARD POST)
NOTES:
1. 8" BOLLARD TYPICALLY ONLY REQUIRED FOR LARGE COMMERCIAL/INDUSTRIAL TRUCK TRAFFIC.
NOTES:
1. BOLLARD BASE MOUNTING PLATE AND BOLLARD SHALL BE 4-INCH MAXIMUM HEIGHT WHEN IN COLLAPSED/DOWN POSITION.
2. UNLESS OTHERWISE SPECIFIED, PROVIDE WEATHER RESISTANT PADLOCK KEYED TO SPECIFIED PATTERN.
3. COLLAPSIBLE BOLLARD ASSEMBLY SHALL BE TRAFFICGUARD MODEL LPHDHB OR APPROVED EQUAL.
4. VERIFY BOLLARD HINGE LOCATION (IE. COLLAPSE DIRECTION) WITH OWNER PRIOR TO INSTALLATION.

LAST REVISION DATE: NOV 2017

30" TALL COLLAPSIBLE PADLOCKABLE BOLLARD (NTS)

CRESWELL, OR 228
FIBERGLASS POLE
GRAY OR BROWN
(TYPICAL)

POLE SHALL BE PLUMBED
VERTICALLY ±1 DEGREE
(TYPICAL)

TYPICAL LAMP POST
CROSS SECTION TYPE ONE

NOTES:
1. CONTRACTOR TO COORDINATE W/LOCAL POWER
   COMPANY FOR MATERIALS AND WORKMANSHIP
   REQUIREMENTS.
2. UNLESS OTHERWISE SHOWN ON DRAWINGS, STANDARD
   LED FIXTURE IS 49 WATT LEOTEK COBRAHEAD
   (EQUIVALENT TO 100 WATT HPS).

NOTE: PER ORS 92.044(7), STREET LIGHT
MUST BE SET 1' MINIMUM CLEAR FROM
ANY SURVEY MONUMENT

TYPICAL STREET
LAMP POST

(NTS)

CRESWELL, OR 230
POLE SHALL BE PLUMBED VERTICALLY ±1 DEGREE (TYPICAL)

FIBERGLASS POLE (TYPICAL)

POLE LOCATION
PROPERTY LINE SIDEWALKS

POLE LOCATION
CURBLINE SIDEWALKS

NOTES:
1. CONTRACTOR TO COORDINATE W/LOCAL POWER COMPANY FOR MATERIALS AND WORKMANSHIP REQUIREMENTS.
2. STANDARD LIGHT WITH 100 WATT EQUIVALENT FLAT LENS COBRAHEAD FIXTURE (200 WATT FIXTURE USES SAME POLE)

NOTE: PER ORS 92.044(7), STREET LIGHT MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT

LAST REVISION DATE: MAR 2015

COBRA HEAD STREET LIGHT (EPUD SERVICE AREA)
NOTES:
1. ALL RECONSTRUCTED & NEWLY PLATTED STREETS TO BE SIGNED IN ACCORDANCE WITH CITY STANDARDS.
2. SIGN PANEL MATERIALS TO BE ALUMINUM PER OSSC 02910, AND ALL SIGNS SHALL CONFORM WITH OREGON MUTCD.
NOTES:
1. ALL RECONSTRUCTED & NEWLY PLATTED STREETS TO BE SIGNED IN ACCORDANCE WITH CITY STANDARDS.
2. SIGN PANEL MATERIALS TO BE ALUMINUM PER OSSC 02910, AND ALL SIGNS SHALL CONFORM WITH OREGON MUTCD.
3. SIGN POSTS & SLEEVES TO HAVE 7/16" DIAMETER HOLES ON 1" HOLE CENTERS.

LAST REVISION DATE: JUNE 2019

SIGN POST WITH TELESPIAR BASE & ANCHOR (REQUIRED IN ODOT R.O.W) (NTS)

CRESWELL, OR DETAIL NO. 232
OFF-STREET PARKING DIMENSIONS

STALLS WITHIN EACH PARKING LOT MAY BE DISTRIBUTED AS FOLLOWS: 60% STANDARD SPACES, 40% MAXIMUM COMPACT SPACES. ALL COMPACT SPACES SHALL BE PERMANENTLY LABELED.

BACKING-POCKET FOR HEAD-IN PARKING WITHOUT DRIVE AISLE EXIT (MIN BACKING-POCKET WIDTH IS SAME AS WIDTH FOR STANDARD PARKING STALL).

OFF-STREET PARKING MATRIX
MINIMUM PARKING SPACE AND AISLE DIMENSIONS (FT)
ONE WAY TRAFFIC FLOW

<table>
<thead>
<tr>
<th>COMPACT (8.5' x 16&quot;)</th>
<th>STANDARD (9' x 19&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>0'</td>
<td>8.0</td>
</tr>
<tr>
<td>30'</td>
<td>8.5</td>
</tr>
<tr>
<td>45'</td>
<td>8.5</td>
</tr>
<tr>
<td>60'</td>
<td>8.5</td>
</tr>
<tr>
<td>70'</td>
<td>8.5</td>
</tr>
<tr>
<td>90'</td>
<td>8.5</td>
</tr>
</tbody>
</table>

NOTES:
1. WHERE PARKING LOT DRIVE AISLE IS A FIRE LANE, WIDTHS SHALL CONFORM WITH THE OREGON FIRE CODE (OFC) MINIMUMS OF 20 FEET IN ALL CASES (26 FOOT MINIMUM WIDTH, 20 FEET EACH WAY FROM FIRE HYDRANTS), PER OFC 503.2.1 & D103.1.
2. DRIVE AISLE WIDTH "D" IS REQUIRED FOR DRIVING / BACKING / TURNING MOVEMENTS ON BOTH SINGLE LOADED AND DOUBLE LOADED DRIVE AISLES.
3. SEE PWDS 3.28.G FOR ALLOWABLE STANDARD PARKING SPACE LENGTH REDUCTION WITH SIDEWALKS 6' OR WIDER TO ACCOMODATE BUMPER OVERHANG. LENGTH OF COMPACT SPACES NOT TO BE REDUCED.
OFF-STREET PARKING DIMENSIONS

STALLS WITHIN EACH PARKING LOT MAY BE DISTRIBUTED AS FOLLOWS:
60% STANDARD SPACES, 40% MAXIMUM COMPACT SPACES. ALL
COMPACT SPACES SHALL BE PERMANENTLY LABELED.

A- PARKING ANGLE
B- STALL WIDTH
C- STALL TO CURB DEPTH
D- DRIVE AISLE WIDTH BETWEEN
STALL LINES (SEE NOTE 1&2)
E- STALL WIDTH PARALLEL TO
AILSE
F- MODULE WIDTH (FRONT OF
STALL TO FRONT OF STALL)
G- MODULE WIDTH (FRONT OF
STALL TO FRONT OF STALL
AT BUMPER MIDPOINT)

OFF-STREET PARKING MATRIX

MINIMUM PARKING SPACE AND AISLE DIMENSIONS (FT)
ONE WAY TRAFFIC FLOW

<table>
<thead>
<tr>
<th>COMPACT (8.5' x 16')</th>
<th>STANDARD (9' x 19')</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>0'</td>
<td>8.0</td>
</tr>
<tr>
<td>30'</td>
<td>8.5</td>
</tr>
<tr>
<td>45'</td>
<td>8.5</td>
</tr>
<tr>
<td>60'</td>
<td>8.5</td>
</tr>
<tr>
<td>70'</td>
<td>8.5</td>
</tr>
<tr>
<td>90'</td>
<td>8.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.0</td>
<td>8.0</td>
<td>24.0</td>
<td>22.0</td>
<td>40.0</td>
<td>-</td>
</tr>
<tr>
<td>9.0</td>
<td>17.3</td>
<td>24.0</td>
<td>18.0</td>
<td>58.6</td>
<td>50.8</td>
</tr>
<tr>
<td>9.0</td>
<td>19.8</td>
<td>24.0</td>
<td>12.7</td>
<td>63.6</td>
<td>57.2</td>
</tr>
<tr>
<td>9.0</td>
<td>21.0</td>
<td>24.0</td>
<td>10.4</td>
<td>66</td>
<td>61.5</td>
</tr>
<tr>
<td>9.0</td>
<td>21.0</td>
<td>24.0</td>
<td>9.6</td>
<td>66</td>
<td>62.9</td>
</tr>
<tr>
<td>9.0</td>
<td>19.0</td>
<td>24.0</td>
<td>9.0</td>
<td>62.0</td>
<td>62.0</td>
</tr>
</tbody>
</table>

NOTES:
1. WHERE PARKING LOT DRIVE AISLE IS A FIRE LANE, WIDTHS SHALL CONFORM WITH THE
OREGON FIRE CODE (OFC) MINIMUMS OF 20 FEET IN ALL CASES (26 FOOT MINIMUM
WIDTH, 20 FEET EACH WAY FROM FIRE HYDRANTS), PER OFC 503.2.1 & D103.1.
2. DRIVE AISLE WIDTH "D" IS REQUIRED FOR DRIVING /
BACKING / TURNING MOVEMENTS ON BOTH SINGLE
LOADED AND DOUBLE LOADED DRIVE AISLES.
3. SEE PWDS 3.28.G FOR ALLOWABLE STANDARD
PARKING SPACE LENGTH REDUCTION WITH SIDEWALKS
6' OR WIDER TO ACCOMODATE BUMPER OVERHANG.
LENGTH OF COMPACT SPACES NOT TO BE REDUCED.
DOUBLE ACCESSIBLE PARKING SPACE

NOTES:

1. ONE ACCESSIBLE PARKING SPACE MUST BE DESIGNATED "VAN-ACCESSIBLE", THE OTHER SPACE CAN BE EITHER "VAN-ACCESSIBLE" OR STANDARD PARKING SPACE.
2. VAN-ACCESSIBLE OR WHEELCHAIR ONLY SPACES SHALL HAVE AN ADDITIONAL SIGN MOUNTED BELOW THE STANDARD PARKING SPACE PARKING SIGN.
3. VAN-ACCESSIBLE SPACE CAN BE USED BY ANY VEHICLE WITH A DMV DISABLED PERMIT.
4. MAXIMUM 2% CROSS SLOPE ALLOWED IN PARKING SPACE OR ACCESS AISLE.
5. POST MOUNTED SIGNS SHALL HAVE 7' (±3") CLEARANCE FROM SIGN BOTTOM TO GROUND.

LAST REVISION DATE: AUG 2019
NOTES:
1. SEE DETAIL 237 FOR ACCESSIBLE PARKING SPACE LAYOUT.
2. ALL PRIVATE PEDESTRIAN CROSSWALKS TO BE 6' MIN WIDTH (10' MIN FOR MULTI-USE PATHS).
INSTALL CONTRASTING SURFACE MATERIAL (IE. LIGHT-COLOR CONCRETE BETWEEN ASPHALT) FOR CROSSINGS LONGER THAN 24 FEET (CDC 3.1.300.B).
PRECAST WHEEL STOP, REINFORCED CONCRETE (5" MIN TOP WIDTH, 8" MIN BOTTOM WIDTH)

STEEL PIN (TYP), #4 (1/2") REBAR, 18" LONG. DRIVE FLUSH WITH TOP OF WHEEL STOP (2 MIN EACH WHEEL STOP).

SECTION

NOTES:

1. SEE DRAWINGS FOR LOCATION & NUMBER OF WHEEL STOPS, INCLUDING DIMENSION FROM CURB, EDGE OF PAVEMENT OR BUILDING AS APPLICABLE.

2. UNLESS OTHERWISE SPECIFIED OR SHOWN ON SITE PLAN, SET WHEEL STOPS 2 FEET FROM FACE OF CURB OR EDGE OF PAVEMENT, MEASURED FROM THE FACE OF THE WHEEL STOP (VEHICLE SIDE) TO FACE OF CURB (OR EDGE OF PAVEMENT). SET BACK FROM PROPERTY LINES PER CITY STANDARDS (3' MIN). MIN SETBACK FROM BUILDINGS AS SHOWN ON DWGS.

3. FOR USE ON HEAD-IN PARKING WITHOUT FULL HEIGHT CURBS, OR WHERE A SIDEWALK ALONG HEAD-IN PARKING IS LESS THAN 6 FEET WIDE.
EACH GATE MUST BE MIN. 6'-0" WIDE & OPEN FULLY FOR 12' CLEAR WIDTH.

---

SINGLE 3 OR 4 YARD CONTAINER INSTEAD OF TWO SMALLER CONTAINERS

---

ENCLOSURES SHALL BE LOCATED OUTSIDE OF THE PUBLIC R/W (UNLESS OTHERWISE APPROVED IN WRITING BY THE CITY).

TRASH ENCLOSURE**

RECYCLE ENCLOSURE**

**ENCLOSURES SHOWN ARE TYPICAL EXAMPLES UNLESS ALTERNATE CONFIGURATION IS APPROVED BY TRASH/RECYCLING FRANCHISEE AND CITY PLANNER.

NOTES:

1. GATES:
   (a) ALL GATES MUST ATTACH AT THE END OF THE WALLS TO PROVIDE A MINIMUM OF 12' CLEAR WORKING SPACE WHEN OPEN.
   (b) TO SERVICE THE ENCLOSURE, THE GATES MUST BE ABLE TO BE PINNED IN THE FULL OPEN POSITION.
   (c) GATES MUST OPEN FROM OUTSIDE THE ENCLOSURE.

2. FOR 5 OR 6 YARD CONTAINERS THE ENCLOSURE DEPTH MUST BE 15'.

3. WHERE REQ'D. (I.E. RESTAURANTS), GREASE BARRELS MUST BE SEPARATE FROM TRASH AND RECYCLING ENCLOSURES.

4. ROOFS OR OVERHANGS SHALL HAVE 15' OF OVERHEAD CLEARANCE.

5. IF RECYCLING IS NOT INCLUDED, AREA (A) CAN PROVIDE SERVICE FOR TRASH AND CARDBOARD FOR CONTAINER SIZES OF 1 TO 2 YARDS. IF A 3 YARD OR LARGER TRASH CONTAINER IS NEEDED, AN ADDITIONAL 12' X 12' SPACE WILL BE NECESSARY FOR CARDBOARD CONTAINER SERVICE.

6. CONCRETE PADS REQUIRED FOR ALL ENCLOSURES. WALLS, GATE & DOOR MATERIALS & HEIGHT PER CITY STANDARDS BASED ON SCREENING REQUIREMENTS.


LAST REVISION DATE: MAY 2014

TYPICAL TRASH AND RECYCLING ENCLOSURE
(NTS)

CRESWELL, OR 240
TRENCH COMPACTION: CLASS 1 GRANULAR BACKFILL – 92% OPTIMUM PER AASHTO T-180 (MODIFIED PROCTOR)
CLASS 3 NATIVE BACKFILL – 85% OPTIMUM PER AASHTO T-180

SURFACE RESTORATION CLASS –
(SEE DTLS 302–304 FOR REQ’MTS)

UNDERGROUND WARNING TAPE
(COLOR & WORDS AS REQ'D FOR WATER, SEWER, STORM, ETC.)

95% COMPACtion REQ'D FOR TOP LIFT IN STREET
(STREET BASEROCK THICKNESS) PER AASHTO T-180

SURFACE RESTORATION CLASS –
(SEE DTLS 302–304 FOR REQ’MTS)

UNDERGROUND WARNING TAPE
(COLOR & WORDS AS REQ'D FOR WATER, SEWER, STORM, ETC.)

95% COMPACtion REQ'D FOR TOP LIFT IN STREET
(STREET BASEROCK THICKNESS) PER AASHTO T-180

TRENCH BACKFILL, BEDDING, AND PIPE ZONE
(NTS)

STABLE SUBGRADE, OR TRENCH FOUNDATION STABILIZATION AS REQUIRED

NOTES:
1. CLASS 1 REQ’D, UNDER ALL EXIST. OR FUTURE IMPROVED AREAS INCLUDING SIDEWALKS.
2. WHERE NEW PIPING IS IN SAME ALIGNMENT AS EXISTING PIPING, THE PIPE EMBEDMENT SHALL EXTEND TO A MIN. OF 6" BELOW THE NEW PIPING OR 6" BELOW EXISTING PIPING, WHICHEVER IS DEEPER.
3. FOR FLEXIBLE PIPE, BOTTOM OF TRENCH SHORING SHALL BE ABOVE PIPE SPRINGLINE PRIOR TO COMPACTING BACKFILL BELOW THE PIPE SPRINGLINE AND UNDER THE PIPE HAUNCHES.
4. MINIMUM CLEARANCES SHOWN ("B") ASSUMES STANDARD 6" WALL TRENCH BOXES SET ON TRENCH BOTTOM, AND REPRESENTS WIDTH REQUIRED TO CONSOLIDATE GRANULAR MATERIAL UNDER PIPE HAUNCHES (TO AVOID LOSS OF SIDE SUPPORT WHEN TRENCH BOX IS MOVED OR PULLED FORWARD). TRENCH WIDTH REDUCTION REQUIRES PRIOR APPROVAL BASED ON ACTUAL TRENCH SHORING PROPOSED.

LAST REVISION DATE:
DEC 2018

CRESWELL, OR
DETAIL NO. 301
PLACE 4" MIN. THICKNESS, CL.'C' A.C. IN TWO EQUAL LIFTS, OR THICKNESS OF REMOVED PAVEMENT, WHICHEVER IS GREATER, TO 91% OPT. DENSITY PER RICE STD. METHOD.

MIN. TRENCH PATCH WIDTH
ROLLER WIDTH PLUS 2"

MIN. TRENCH PATCH WIDTH
ROLLER WIDTH PLUS 2"

EXISTING PAVEMENT

6" MIN. TACK COAT CUT EDGES

EXISTING PAVEMENT

UNDISTURBED BASE
(EXIST.)

3/4"-0 COMPACTED GRANULAR TRENCH BACKFILL
(OR CONTROLLED LOW STRENGTH MATERIAL [CLSM]
WHERE NOTED ON DRAWINGS).

EMBEDMENT & PIPE ZONE
SEE DETAIL 301

TRENCH WIDTH

UNDISTURBED BASE (EXIST.)

EXISTING BASE ROCK

SEAL SURFACE OVER JOINT WITH TACK MATERIAL AND SAND (AC PATCH ONLY)

NOTES:
1. ALL EXISTING AC OR PCC PAVEMENT SHALL BE SAWCUT PRIOR TO REPAVING.
2. PCC CONCRETE PAVEMENT SHALL BE REPLACED WITH 3300 PSI PCC TO A MINIMUM THICKNESS OF 6" OR TO THE THICKNESS OF REMOVED CONCRETE, WHICHEVER IS GREATER.
3. FOR PAVED DRIVEWAYS (EXCEPT COMMERCIAL OR INDUSTRIAL) WITH LESS THAN 4" EXISTING AC, PAVEMENT THICKNESS MAY BE REDUCED TO 3" AC IN 2 LIFTS, AND OVERCUT MAY BE REDUCED TO 3" EACH SIDE.

LAST REVISION DATE:
DEC 2015

MINOR OR PRIVATE STREET AND AC DRIVEWAY CUT SURFACE RESTORATION (NTS)
CRESWELL, OR
DETAIL NO. 302
PLACE 4" MIN. THICKNESS, CL. 'C' A.C. IN LIFTS. COMPACT TO 91% OPTIMUM DENSITY PER RICE STD. METHOD. (MATCH EXTG AC THICKNESS)

GRIND 24" BENCH INTO EXTG AC PAVEMENT. SEE NOTE 1 BELOW (18" MIN. WIDTH AFTER SAWCUT).

UNDISTURBED BASE (EXIST.)
3/4" – 0 GRANULAR BACKFILL (OR 'CONTROLLED LOW STRENGTH MATERIAL [CLSM] WHERE NOTED ON DRAWINGS) FROM 12" OVER PIPE TO BOTTOM OF AC (BACKFILL TYPE AS INDICATED ON DWGS). FOR CLSM, STEEL PLATE FOR 24 HOURS PRIOR TO PLACING COLD MIX OR AC SURFACE RESTORATION.

EMBEDMENT & PIPE ZONE SEE DETAIL 301

TRENCH & ROAD BASE COMPACTION STANDARDS PER DETAIL 301

SURFACE MAINT UNTIL FINAL AC. TRENCHES IN PAVED AREAS SHALL BE STEEL PLATED OR COLD PATCHED (AND MAINTAINED) AT THE END OF EACH WORKDAY. FINAL HOT PATCH REPAVING TO OCCUR WITHIN 14 DAYS OF EXCAVATION UNLESS OTHERWISE APPROVED PER PWDS G.11.b. REMOVE ALL COLD PATCH PRIOR TO FINAL PAVING.

CLASS 'A' AC PAVEMENT RESTORATION

NOTES:
1. FOLLOWING BACKFILL COMPACTOR CLSM INSTALLATION, GRIND 24" WIDE BENCH IN EXISTING AC ON BOTH SIDES & TRENCH ENDS, 2" DEEP OR HALF THE DEPTH OF EXISTING AC (3" MAX).
2. AFTER GRINDING, SAWCUT ALONG TRENCH SIDES, 6" BACK FROM TRENCH EDGE.
3. BASE LIFT(S). TACK COAT EDGES, INSTALL/COMPACT BASE LIFTS (3" MAX LIFT) TO LEVEL OF BENCH GRIND.
4. FINISH LIFT, INSTALL JOINT SEAL FABRIC, TACK COAT GRIND SURFACES & EDGES, & INSTALL TOP LIFT OF AC. SAND SEAL ALL JOINTS (REMOVE EXCESS SAND AFTER CURE).
CL. 'C' OR 'B' HMAC TO MATCH EXISTING PAVEMENT THICKNESS (4" MIN), 3" MAX LIFT THICKNESS.

PRE-TACKED PAVING FABRIC, 18" MIN WIDTH (MIFAQI MTK, PETROTAC OR EQUAL)

TACK COAT PRIOR TO PAVING & SAND SEAL JOINTS AFTER PAVING (TYP).

MIN. TRENCH PATCH WIDTH
TRENCH WIDTH + 15' EACH WAY

UNDISTURBED BASE (EXIST.)

12" "T" CUT AFTER TRENCH BACKFILL. "T" CUT CAN BE WAIVED WHEN CLSM BACKFILL IS USED.

3/4"-0 GRANULAR BACKFILL ABOVE PIPE ZONE TO BOTTOM OF AC (OR CONTROLLED LOW STRENGTH MATERIAL [CLSM] WHERE NOTED ON DRAWINGS.

BEDDING & PIPE ZONE
SEE DETAIL 301

SEE ALSO LANE COUNTY DETAILS FOR TRENCHES IN COUNTY RIGHTS-OF-WAY.

NOTES:

1. COMPACT ALL AC LIFTS TO 91% OPTIMUM DENSITY PER RICE STANDARD METHOD.
2. GRIND WIDTH SHALL BE INCREASED AS REQUIRED TO ENSURE THAT FINISH AC JOINT DOES NOT FALL IN A WHEEL PATH.
3. ASPHALT EMULSION TACK COAT SHALL BE USED BETWEEN ALL EXISTING AND NEW HMAC, AND TO SAND SEAL ALL JOINTS. ALL AC PAVEMENT CUTS SHALL BE VERTICAL & CLEAN PRIOR TO TACK COAT & PAVING.
4. ALL PAVEMENT TRENCH AREAS SHALL BE COLD PATCHED OR STEEL PLATED AT THE END OF EACH WORKDAY, & THE PLATES OR PATCH MAINTAINED UNTIL FINAL HMAC RESTORATION. COLD PATCH (IF USED) SHALL BE EXCAVATED AND REPLACED WITH HMAC WITHIN 10 CALENDAR DAYS OF PLACEMENT UNLESS OTHERWISE APPROVED BY THE PUBLIC WORKS DIRECTOR.
5. HMAC SHALL BE A COMMERCIALLY PRODUCED PLANT MIX CONFORMING TO ODOT STANDARDS ("B" OR "C" DESIGNATION REFERS TO AGGREGATE SIZE ONLY).
6. ALL EXISTING PAVEMENT MARKINGS & LEGENDS SHALL BE RESTORED IN LIKE KIND TO EQUAL OR BETTER CONDITIONS AFTER PAVING.
INSTALL TWO 2" LIFTS OF LEVEL 3 1/2-INCH ACP PER ODOT SPECS, OR MATCH EXISTING PAVEMENT THICKNESS, WHICHER IS GREATER. (3" MAX LIFT THICKNESS).

PLACE (2) 2" LIFTS, LEVEL 3 1/2-INCH ACP PER ODOT SPECS

GRIND THIS AREA 4" DEEP TO 10' MIN FROM TRENCH EDGE UNLESS OTHERWISE APPROVED BY ODOT

TACK COAT PRIOR TO PAVING & SAND SEAL JOINTS AFTER PAVING.

MIN. TRENCH PATCH WIDTH

TRENCH WIDTH + 2*GRIND WIDTH

UNDISTURBED BASE (EXIST.)

GRANULAR BACKFILL TO BE 3/4"-0 CRUSHED ROCK (UNLESS OTHERWISE NOTED ON DRAWINGS OR PERMIT). IF CLSM USED, STEEL PLATE FOR 24 HOURS MINIMUM PRIOR TO PLACING COLD MIX OR AC SURFACE RESTORATION.

SURFACE MAINT UNTIL FINAL AC.
TRENCHES IN PAVED AREAS SHALL BE STEEL PLATED OR COLD PATCHED (AND MAINTAINED) AT THE END OF EACH WORKDAY. CITY STANDARDS REQUIRE FINAL HOT PATCH REPAVING W/IN 14 DAYS OF EXCAVATION UNLESS OTHERWISE APPROVED PER PWDS 6.11.b. REMOVE ALL COLD PATCH PRIOR TO FINAL PAVING.

NOTES:
1. COMPACT ALL ACP LIFTS TO 91% OPTIMUM DENSITY PER RICE STANDARD METHOD.
2. ASPHALT EMULSION TACK COAT SHALL BE USED TO SEAL THE ACP TO THE EDGES OF THE EXISTING AC PAVEMENT. ALL AC PAVEMENT CUTS SHALL BE VERTICAL, CLEAN & ASPHALT SAND SEALED ALONG ALL EDGES AFTER INSTALLATION.
3. ALL PAVEMENT CUT AREAS SHALL BE COLD PATCHED OR PLATED AT THE END OF EACH WORK SHIFT, & THE PLATES OR PATCH MAINTAINED UNTIL FULL PAVEMENT RESTORATION IS MADE WITH ACP. COLD PATCH (IF USED) SHALL BE REPLACED WITH HOT MIX ACP WITHIN TIMEFRAME DIRECTED IN WRITING BY THE ODOT DISTRICT MANAGER OR MANAGER'S REPRESENTATIVE.
4. ACP SHALL BE A COMMERCIALY PRODUCED PLANT MIXTURE CONFORMING TO ODOT STANDARDS, OSSC 00744 (OLD "B" OR "C" DESIGNATION ON CITY DETAILS REFERS TO AGGREGATE SIZE ONLY).
5. 48" MINIMUM COVER IS REQUIRED FOR ALL GAS, ELECTRIC, TELEPHONE, FIBER OPTIC AND OTHER POTENTIALLY DANGEROUS/HIGH IMPACT UTILITY FACILITIES, ALL OTHER FACILITIES REQUIRE 36" MINIMUM COVER DEPTH.
**NOTES:**

1. SHOULDER ROCK TO BE COMPACTED TO ROAD BASE ROCK STANDARDS.
NOTES:

1. ANY TRENCH SETTLEMENT DURING WARRANTY PERIOD SHALL BE CORRECTED AT CONTRACTOR'S EXPENSE, INCLUDING SURFACE RESTORATION.
SEE DETAIL 312 FOR FRAME & GRATE
NORMAL SLOPE OF PAVEMENT
BACK OF GRATE 1-1/2" BELOW NORMAL GUTTER LEVEL
SUBGRADE ELEVATION
SUBGRADE DRAIN
10" MIN. 16" MAX.
4' MAX. (RIM TO INVERT)
6" 2' 4-1/2" 5"
6" 1' 8-7/8" 6"

SECTION A–A
FACE OF CURB
RECESSED CURB INLET SEE DETAIL ABOVE
3" SUBGRADE DRAIN HOLE (TYP OF 2)
ANGLE FRAME ON ALL 4 SIDES OF GRATE PER DETAIL 312

SECTION B–B
NOTES:
1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. ALL CONCRETE TO BE 3300 PSI @ 28 DAYS.
3. MATCH EXISTING CURB UNLESS OTHERWISE NOTED.
4. CURB–INLET NOTCH TO BE ELIMINATED AT DROP CURB LOCATIONS WHERE APPROVED BY THE CITY ENGINEER.

LAST REVISION DATE: MAY 2014
COPYRIGHT 1996 WESTECH ENGINEERING, INC.
SEE DETAIL 312 FOR FRAME & GRATE

NORMAL SLOPE OF PAVEMENT

3-1/4" OPENING

SUBGRADE ELEVATION

SECTION A-A

FACE OF CURB

RECESSED CURB INLET SEE DETAIL ABOVE

SECTION B-B

NOTES:
1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. ALL CONCRETE TO BE 3300 PSI @ 28 DAYS.
3. MATCH EXISTING CURB UNLESS OTHERWISE NOTED.
4. CURB-INLET NOTCH TO BE ELIMINATED AT DROP CURB LOCATIONS WHERE APPROVED BY THE CITY ENGINEER.

OVERSIZE SIDE-INLET GRATED CATCH BASIN

PLAN

3" SUBGRADE DRAIN HOLE (TYP OF 2)

ANGLE FRAME ON ALL 4 SIDES OF GRATE PER DETAIL 312

LAST REVISION DATE:
MAY 2014

COPYRIGHT 1996 WESTECH ENGINEERING, INC.

MAY 2014

CRESWELL, OR

DETAIL NO.

311
NOTE:

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

2. ALL STEEL SHALL BE ASTM A-36.

3. ANGLE FRAME REQUIRED ON ALL FOUR SIDES OF GRATE OPENING AS SHOWN.

<table>
<thead>
<tr>
<th>INLET TYPE</th>
<th>V</th>
<th>Y</th>
<th>W</th>
<th>NO. OF BARS</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>STANDARD</td>
<td>1' 10-3/4&quot;</td>
<td>1' 9-3/8&quot;</td>
<td>1'- 9&quot;</td>
<td>12</td>
<td>1-GRATE</td>
</tr>
<tr>
<td>OVERSIZE</td>
<td>2' 4-3/4&quot;</td>
<td>2' 3-3/8&quot;</td>
<td>1'-1-1/2&quot;</td>
<td>8</td>
<td>2-GRATES</td>
</tr>
</tbody>
</table>

CATCH BASIN GRATE DETAILS

(NTS)

CRESWELL, OR

312
NOTE: CONTRACTOR TO VERIFY CB DATA & FINISH GRADE ELEV'S PRIOR TO INSTALLATION TO ENSURE THAT TOP OF CB DOES NOT EXTEND ABOVE SURROUNDING GRADE UNLESS OTHERWISE SPECIFICALLY NOTED ON THE DRAWINGS OR APPROVED BY THE CITY.

PLAN

SECTION A - A

NOTES:

FRAME & GRATE

1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. FRAME & GRATE SHALL BE ASTM A-36 STEEL, HOT-DIPPED GALV. AFTER CONSTRUCTION.
3. ALL CONCRETE TO BE 3000 PSI MIN AT 28 DAYS.
4. PRIOR TO CB INSTALLATION, CONTRACTOR SHALL VERIFY RIM ELEVATIONS LISTED AGAINST DITCH & FINISH GRADE ELEVATIONS, & NOTIFY CITY OF ANY DISCREPANCIES.
CONTRACTOR TO VERIFY FINISH GRADE ELEV'S PRIOR TO INSTALLATION TO ENSURE THAT TOP OF OUTLET STRUCTURE DOES NOT EXTEND ABOVE SURROUNDING GRADE UNLESS OTHERWISE NOTED ON DWGS OR APPROVED BY CITY. PROVIDE OUTLET PIPE & OUTLET CHANNEL (LENGTH & CONFIGURATION PER NOTE 4) AS NOTED UNLESS OTHERWISE SHOWN ON APPROVED DWGS OR REQUIRED BY CITY.

NOTE: 
1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. FRAME & GRATE SHALL BE ASTM A-36 STEEL, HOT-DIP GALV AFTER CONSTRUCTION.
3. ALL CONCRETE TO BE 3300 PSI MIN AT 28 DAYS.
4. PROVIDE RIPRAP OUTLET CHANNEL (TYP 18" MIN THICK) W/2H:1V SIDE SLOPES, 12" MIN CHANNEL DEPTH & LENGTH AS NOTED ON DRAWINGS (10' MIN). PROVIDE GEOTEXTILE UNDER RIPRAP TO TOP OF BANK (NO LAPS). USE 5"-12" GRADED ANGULAR RIPRAP (TYP), FILL VOIDS BETWEEN STONE WITH 3/4"-0 BASEROCK.

PLAN

INSTALL SINGLE 1/2" ST. STEEL EXPANSION ANCHOR BOLT & 2" PLATE WASHER UNLESS OTHERWISE APPROVED OR REQUIRED BY CITY.

FRAME & GRATE

NOTES:

1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. FRAME & GRATE SHALL BE ASTM A-36 STEEL, HOT-DIP GALV AFTER CONSTRUCTION.
3. ALL CONCRETE TO BE 3300 PSI MIN AT 28 DAYS.
4. PROVIDE RIPRAP OUTLET CHANNEL (TYP 18" MIN THICK) W/2H:1V SIDE SLOPES, 12" MIN CHANNEL DEPTH & LENGTH AS NOTED ON DRAWINGS (10' MIN). PROVIDE GEOTEXTILE UNDER RIPRAP TO TOP OF BANK (NO LAPS). USE 5"-12" GRADED ANGULAR RIPRAP (TYP), FILL VOIDS BETWEEN STONE WITH 3/4"-0 BASEROCK.

ENERGY DISSIPATOR BASIN

NOTES:

1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. FRAME & GRATE SHALL BE ASTM A-36 STEEL, HOT-DIP GALV AFTER CONSTRUCTION.
3. ALL CONCRETE TO BE 3300 PSI MIN AT 28 DAYS.
4. PROVIDE RIPRAP OUTLET CHANNEL (TYP 18" MIN THICK) W/2H:1V SIDE SLOPES, 12" MIN CHANNEL DEPTH & LENGTH AS NOTED ON DRAWINGS (10' MIN). PROVIDE GEOTEXTILE UNDER RIPRAP TO TOP OF BANK (NO LAPS). USE 5"-12" GRADED ANGULAR RIPRAP (TYP), FILL VOIDS BETWEEN STONE WITH 3/4"-0 BASEROCK.

LAST REVISION DATE: JUNE 2014

COPYRIGHT 1996 WESTECH ENGINEERING, INC.

CRESWELL, OR 313A
NOTES:

1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. CONCRETE SHALL BE 4000 PSI @ 28 DAYS.
3. REBAR SHALL CONFORM TO ASTM A615 GRADE 60.
4. REBAR SHALL BE MIN. #4 BARS @ 6" C.C.
5. SET CB SQUARE WITH BUILDINGS OR WITH EDGE OF PARKING LOT OR DRIVEWAY WHEREIN IT LIES.
6. ADJUST PAVING SO WATER FLOWS TO CB WITH NO PONDING.

CAST IRON GRATE
TRAFFIC LOADING

4", 6" AND 12" RISERS FOR ADJUSTMENT

WELDED METAL TRAP
WITH HINGED LID

10" HOLE FOR INSERTALOK BOOT (ONE SIDE)

RECESSED GROOVE FOR GRATE TO SET FLUSH WITH TOP OF CATCH BASIN

2" LIFT HOLES (2 EA.)

SUMP

LAST REVISION DATE: JAN 2014

PARKING LOT CATCH BASIN (PRECAST CONCRETE)

CRESWELL, OR 315
CAST-IN-PLACE
REINFORCED CONCRETE
SUPPORT COLLAR

GRATE: WELDED STEEL DROP-IN
BAR GRATE (ASTM A36).
END BARS: 1/2" X 2"
CROSS BARS: 1/2" X 2" @ 2" O.C.
BIKE STRAPS: 1/8" X 1" (2 REQ'D)
16,000 LB. UNIFORM LOAD CAPACITY

GRATE DETAIL

CONCRETE COLLAR

CONSTRUCT BASIN OF WELDED
1/4" STEEL. COAT ALL SURFACES
WITH ASPHALTIC PAINT.

NOTES:
1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE,
LOCATION AND INVERT ELEVATION.
2. OUTLET: SIZE AS REQ'D. FOR INDICATED PIPE SIZE.
3. FOR JUNCTION BOX, REPLACE GRATE WITH 3/4"
STEEL PLATE. DRILL ONE, 1" LIFTING HOLE, CENTERED
IN ONE END OF THE PLATE. WELD SHIMS TO RIM AS
REQUIRED TO RAISE PLATE TO RIM ELEVATION.
4. SET CB SQUARE WITH BUILDINGS OR WITH EDGE OF
PARKING LOT OR DRIVEWAY WHEREIN IT LIES.
5. ADJUST PAVING SO WATER FLOWS TO CB WITH NO
PONDING.

LAST REVISION DATE:
JAN 2014

PARKING LOT
CATCH BASIN
(LYNCH STYLE)
(NTS)

CRESWELL, OR 316
NOTES:
1. NYLOPLAST TRAFFIC RATED DRAIN BASIN OR APPROVED EQUAL W/NYLOPLAST FRAME & GRATE.
2. HERRING–BONE STYLE GRATE TO BE DUCTILE IRON PER ASTM A536 GRADE 70–50–05.
3. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION, ORIENTATION AND INVERT ELEVATIONS.
4. CONNECTIONS TO PVC CATCH BASIN TO BE INSERTA–TEE STYLE FITTINGS (FACTORY OR FIELD INSTALLED).
5. FLOW–THRU CONFIGURATION SHOWN IS ALLOWED ONLY FOR AREA DRAINS OR JUNCTION BOXES.
6. SET CB GRATE SQUARE WITH BUILDINGS OR WITH EDGE OF PARKING LOT OR DRIVEWAY WHEREIN IT LIES.
7. ADJUST PAVING OR GRADING SO WATER FLOWS TO STRUCTURE INLET WITH NO PONDING.

NOTE: PER ORS 92.044(7), AREA DRAIN MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT.
NOTES:
1. PRECAST SECTIONS SHALL CONFORM TO ASTM C-478.
2. DISTANCE FROM TOP OF OVERFLOW TO MH RIM SHALL BE BASED ON OVERFLOW CAPACITY CALC'S BY DESIGN ENGINEER (ASSUME ORIFICE CONTROL).
3. 60" MINIMUM DIA. MANHOLE REQUIRED FOR OUTLET PIPE LARGER THAN 15" OR INLET > 21".
4. ORIFICE CLEANING ACCESS TO BE 6" CORE HOLE THROUGH FLAT- TOP (CENTERED ON OVERFLOW) WITH CI CLEANOUT BOX GROUTED TO SLAB.

SECTION A-A

POLLUTION/FLOW CONTROL MANHOLE W/OVERFLOW

CRESWELL, OR

DETAIL NO. 320
**NOTES:**

1. UNLESS OTHERWISE SHOWN ON DRAWINGS, USE 48" MANHOLE FOR SANITARY SEWER UP TO 12" DIA. & STORM DRAIN UP TO 18" DIAMETER (LARGER DIAMETER MANHOLE OTHERWISE, PER DWGS).
2. PRECAST SECTIONS SHALL MEET OR EXCEED ASTM C-478. WATERTIGHT O-RING OR MASTIC KEYLOCK JOINTS REQUIRED.
3. STEPS TO BE POLYPROPYLENE PLASTIC WITH GRADE 60 REINFORCING ROD.
GROUT OVERSIZE FLOW CHANNEL AS SHOWN & TROWEL SMOOTH.

CLEARANCE UNDER WATERLINE CASING PIPE TO BE A MINIMUM OF 1.5 TIMES THE DIAMETER OF THE STORM PIPE

SEE NOTE 1 BELOW.

END SEALS & FOUR (4) CASING SPACERS PER BORE CASING DETAIL.

8" THICK CONCRETE CASING SUPPORT (POURED IN PLACE, EACH END AFTER PLACEMENT).

STEEL CASING (1/2" MIN WALL THICKNESS), EXTEND 12" MIN BEYOND END OF CONCRETE SUPPORTS (WATERLINE SIZE AS NOTED ON DWGS & SPECS).

SECTION THRU WATERLINE

STEEL CASING PIPE, 0.5" WALL THICKNESS, FULLY WELDED AND CENTERED OVER WATERLINE.

USE OF KUENZI MANHOLES MUST BE APPROVED ON A CASE BY CASE BASIS BY THE PUBLIC WORKS DIRECTOR.

SET FRAME IN NON-SHRINK GROUT

GRADE RINGS (VARIABLE)
18" MAX. - TOP OF FLAT TOP TO RIM

FLAT TOP SECTION, 8" MIN THICKNESS
5" MIN. THICK

SEE DRAWINGS FOR INVERT ELEVATIONS AND PIPE ALIGNMENTS.

SECTION THRU STORM

1. SHOP CUT 30" CASING PIPE IN HALF (LENGTHWISE, ACROSS RADIUS) AND SHOP GRIND BEVELED EDGES FOR FULL PENETRATION WELDS. BLOCK BOTTOM HALF OF CASING PIPE IN PLACE UNDER EXISTING WATERLINE & POURED CONCRETE SUPPORTS. INSTALL CASING SPACERS (DETAIL 5080) TO SUPPORT WATERLINE & WELD HALVES OF CASING TOGETHER. USE WATER IN BOTTOM OF CASING DURING WELDING AS REQUIRED TO AVOID OVER-HEATING CASING SPACER SUPPORT LEGS.

2. MANHOLE PER MH DETAILS.
3. STEPS TO BE POLYPROPYLENE PLASTIC WITH GRADE 60 REINFORCING ROD.

LAST REVISION DATE: DEC 2018

KUENZI MANHOLE
W/W WATERLINE CASING
(EXISTING WATERLINE)

CRESWELL, OR

DETAIL NO. 331
GROUT OVERSIZE FLOW CHANNEL AS SHOWN & TROWEL SMOOTH.

CLEARANCE UNDER WATERLINE CASING PIPE TO BE A MINIMUM OF 1.5 TIMES THE DIAMETER OF THE STORM PIPE.

END SEALS & FOUR (4) CASING SPACERS PER BORE CASING DETAIL.

8" THICK CONCRETE CASING SUPPORT (POURED IN PLACE, EACH END AFTER PLACEMENT OF CASING PIPE).

STEEL CASING (1/2" MIN WALL THICKNESS), EXTEND 12" MIN BEYOND END OF CONCRETE SUPPORTS (WATERLINE SIZE AS NOTED ON DWGS & SPECS).

SECTION THRU WATERLINE

STEEL CASING PIPE, 0.5" WALL THICKNESS.

PRECAST BASE, 6" MIN THICKNESS

6" MIN COMPACTED GRANULAR BEDDING

STABLE SUBGRADE

SECTION THRU STORM

1. BLOCK CASING PIPE IN PLACE & POUR CONCRETE SUPPORTS. INSTALL CASING SPACERS TO SUPPORT WATERLINE THROUGH CASING (DETAIL 5080). INSTALL END SEALS.

2. SEE PLAN VIEWS FOR WATERLINE & STORM SIZE & CONFIGURATION. USE 72" MANHOLE UNLESS OTHERWISE SHOWN ON DRAWINGS.

3. STEPS TO BE POLYPROPYLENE PLASTIC WITH GRADE 60 REINFORCING ROD.

USE OF KUENZI MANHOLES MUST BE APPROVED ON A CASE BY CASE BASIS BY THE PUBLIC WORKS DIRECTOR.

PRECAST BASE, 6" MIN THICKNESS

6" MIN COMPACTED GRANULAR BEDDING

STABLE SUBGRADE

MANHOLE FRAME AND COVER

PVMT.

30" MAX TO STEP

12" TYP

18" MAX (TYP)

ALL OPENINGS CORED DRILLED.

GRADE RINGS (VARIABLE)

18" MAX.-TOP OF FLAT TOP TO RIM

FLAT TOP SECTION, 8" MIN THICKNESS

5" MIN. THICK

SEE DRAWINGS FOR INVERT ELEVATIONS AND PIPE ALIGNMENTS.

SECTION THRU WATERLINE

STEEL CASING PIPE, 0.5" WALL THICKNESS.

USE OF KUENZI MANHOLES MUST BE APPROVED ON A CASE BY CASE BASIS BY THE PUBLIC WORKS DIRECTOR.

PRECAST BASE, 6" MIN THICKNESS

6" MIN COMPACTED GRANULAR BEDDING

STABLE SUBGRADE

MANHOLE FRAME AND COVER

PVMT.

30" MAX TO STEP

12" TYP

18" MAX (TYP)

ALL OPENINGS CORED DRILLED.

GRADE RINGS (VARIABLE)

18" MAX.-TOP OF FLAT TOP TO RIM

FLAT TOP SECTION, 8" MIN THICKNESS

5" MIN. THICK

SEE DRAWINGS FOR INVERT ELEVATIONS AND PIPE ALIGNMENTS.

SECTION THRU WATERLINE

STEEL CASING PIPE, 0.5" WALL THICKNESS.

USE OF KUENZI MANHOLES MUST BE APPROVED ON A CASE BY CASE BASIS BY THE PUBLIC WORKS DIRECTOR.

PRECAST BASE, 6" MIN THICKNESS

6" MIN COMPACTED GRANULAR BEDDING

STABLE SUBGRADE

MANHOLE FRAME AND COVER

PVMT.

30" MAX TO STEP

12" TYP

18" MAX (TYP)

ALL OPENINGS CORED DRILLED.

GRADE RINGS (VARIABLE)

18" MAX.-TOP OF FLAT TOP TO RIM

FLAT TOP SECTION, 8" MIN THICKNESS

5" MIN. THICK

SEE DRAWINGS FOR INVERT ELEVATIONS AND PIPE ALIGNMENTS.
NOTE: PER ORS 92.044(7), MANHOLE MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT

NOTE: MAXIMUM PIPE NUMBER & DIAMETERS AS FOLLOWS:
12" DIAMETER OR LESS – 4 MAXIMUM.
15" DIAMETER – 2 MAXIMUM.
ALL OTHER CONFIGURATIONS REQUIRE STANDARD MANHOLE.
**SECTION A–A**

**NOTES:**

1. NYLOPLAST TRAFFIC RATED DRAIN BASIN OR APPROVED EQUAL WITH NYLOPLAST FRAME & MH LID.
2. MH FRAME & COVER TO BE DUCTILE IRON PER ASTM A536 GRADE 70–50–05.
3. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION, ORIENTATION AND INVERT ELEVATIONS.
4. CONNECTIONS TO PVC MANHOLE TO BE INSERTA–TEE STYLE FITTINGS (FACTORY OR FIELD INSTALLED).
5. FIVE (5) FOOT MAXIMUM ALLOWABLE DEPTH FROM RIM TO OUTLET INVERT (DEEPER APPLICATIONS REQUIRE 48" MANHOLE).
6. MAXIMUM NUMBER & CONFIGURATION OF PIPE CONNECTIONS TO BE BASED ON INSERTA–TEE RECOMMENDATIONS. PROVIDE 30" DIAMETER BASIN & 30" SOLID COVER IF REQUIRED DUE TO NO. OF PIPES, SPACING &/OR ANGLES (30" MH TO MEET ALL DETAIL REQUIREMENTS SHOWN EXCEPT DIAMETER).
SEE PLANS FOR RIM ELEVATIONS

CAST IRON GRATE AS MANUFACTURED BY NYLOPLAST OR EQUAL. (SEE DETAIL)

15" DRAIN AS MANUFACTURED BY NYLOPLAST OR EQUAL

22½° BEND, PIPE SPOOL, LENGTH AS REQ'D. RISER SIZE TO MATCH HORIZONTAL PIPE.

TEE OR TEE W/PLUGGED INLET
SEE PLANS FOR ORIENTATION AND SIZE

COMPACTED GRANULAR BACKFILL (TYP ALL)

STABLE SUBGRADE
6" MIN COMPACTED GRANULAR BEDDING

CONNECT TO MAINLINE OR MANHOLE AS SHOWN ON DRAWINGS

FLOW

SEE PLANS FOR INVERT ELEVATION, PIPE SIZE, ORIENTATION & SLOPE. PIPE MATERIAL TYPE AS SHOWN OR SPECIFIED ON DRAWINGS

AREA DRAIN

NOTES:

1. AREA DRAIN NOT FOR USE IN AREAS SUBJECT TO VEHICLE TRAFFIC.
2. USE WATERTIGHT GASKETED FITTINGS AND ADAPTORS FOR ALL PIPE CONNECTIONS.
3. ALTERNATE PRODUCTS OR CONFIGURATIONS PROPOSED SHALL INCLUDE SLANTED GRATE CONFIGURATION TO MINIMIZE GRATE BLIND-OFF BY LEAVES OR DEBRIS.
4. ANY GRATES SET IN SURFACED PEDESTRIAN AREAS SHALL CONFORM WITH ADA REQUIREMENTS, INCLUDING GRATE OPENING SIZE.

15" CAST IRON GRATE DETAIL

PRIVATE AREA DRAIN, NON-TRAFFIC AREAS

CRESWELL, OR

DETAIL NO. 355

LAST REVISION DATE: APR 2019

JO # STANDARD

(NTS)
1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. FRAME & GRATE SHALL BE ASTM A36 STEEL, HOT DIP GALVANIZED AFTER FABRICATION.
3. ALL CONCRETE TO BE 3,300 PSI AT 28 DAYS.
4. GRATED CONFIGURATION SHOWN IS TYPICALLY REQUIRED WHERE OUTFALL PIPE DISCHARGES THROUGH EMBANKMENT PERPENDICULAR TO THE DRAINAGE CHANNEL, IN ORDER TO ACCOMMODATE BANK MOWING EQUIPMENT.
5. USE NON-GRATED CONFIGURATION WHERE APPROVED BY PUBLIC WORKS DIRECTOR.
6. ARMORING OF THE FAR CHANNEL BANK IS REQUIRED UNLESS NO EROSION POTENTIAL EXISTS, AS DETERMINED BY THE CITY. ARMOR BOTTOM & BANK 10 FEET MINIMUM IN EACH DIRECTION FROM OUTFALL CENTERLINE, UNLESS OTHERWISE SHOWN ON DWGS.

LAST REVISION DATE: MAY 2019

CONCRETE PIPE END CAP WITH GRATE (NTS)

CRESWELL, OR 362
## STORM SEWER MANDREL TEST REPORT

<table>
<thead>
<tr>
<th>Station (&amp; Manhole #)</th>
<th>Size &amp; Material</th>
<th>Length (ft)</th>
<th>Results</th>
<th>Backfill Compaction Completed?</th>
<th>Date Sewer Flushed &amp; Cleaned</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>From To</td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td>Yes / No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td>Yes / No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td>Yes / No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td>Yes / No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td>Yes / No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td>Yes / No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td>Yes / No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td>Yes / No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td>Yes / No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Mandrel testing shall be conducted on a manhole to manhole (or cleanout) basis and shall be done after the line has been completely flushed out with water.

2. Mandrel testing shall be conducted after trench backfill and compaction has been completed.

3. The mandrel diameter shall be 95% of the pipe initial inside diameter. The inspector shall verify the diameter of each mandrel used during each test session.
NOTE: PER ORS 92.044(7), MANHOLE MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT.

Provide gasketed PVC cap on all stubs for future connection shown on DWG (extend pipe 2' min beyond MH wall), slope per DWG.

Steps, verify location to avoid conflicts with inside or outside drops.

Vacuum testing of extg manholes required after new connections. Seal MH as required to pass.

Slope shelves 1:12 to drain.

All inside joints & wall penetrations to be grouted following MH assembly (typ).

Steps to be Polypropylene plastic with grade 60 reinforcing rod. Add steps to extg connection MH if extg steps are absent.

Flat top MH's shall be used for all MH's less than 6' rim to invert, or with pipe connections within 5 feet of rim elev.

All pipe penetrations on sanitary sewer manholes to have rubber boots as specified.

Route toning wire up outside of MH as shown (typ all pipes).

Flow

Precast base, 6'' min thickness

6'' min compacted granular bedding

Section A-A

Notes:
1. Precast sections shall meet or exceed ASTM C-478.
2. Watertight O-ring or mastic keylock joints required, external seal at joints & pickholes.
3. Steps to be Polypropylene plastic with grade 60 reinforcing rod. Add steps to extg connection MH if extg steps are absent.

Manhole barrel joint options

Manhole frame and cover - Paved surface

Set frame in non-shrink grout

Keylock joint

Unpaved

Grade rings (variable) 18'' max. - top of cone to rim

Slope of precast eccentric cone shall face down grade. Locate steps on upstream side of manhole.

Manpan MH lid insert as req'd (see DTL 407)

All pipe penetrations on sanitary sewer manholes to have rubber boots as specified.

Route toning wire up outside of MH as shown (typ all pipes).

SECTION A-A

Notes:
1. Precast sections shall meet or exceed ASTM C-478.
2. Watertight O-ring or mastic keylock joints required, external seal at joints & pickholes.
3. Steps to be Polypropylene plastic with grade 60 reinforcing rod. Add steps to extg connection MH if extg steps are absent.

Last revision date: May 2019

Copyright 1996 Westech Engineering, Inc.

Standard manhole for 21'' pipe and smaller (sewer & storm) (nts)

Creswell, OR Detail No. 401
NOTE: PER ORS 92.044(7), MANHOLE MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT

INVERT ELEVATIONS PER DRAWINGS

VACUUM TESTING OF EXTG MANHOLES REQUIRED AFTER NEW CONNECTIONS. SEAL MH AS REQUIRED TO PASS.

SLOPE SHELVES 1:12 TO DRAIN

STEPS, VERIFY LOCATION TO AVOID CONFLICTS WITH INSIDE OR OUTSIDE DROPS

MANPAN MH LID INSERT AS REQ'D (SEE DTL 407)

MANHOLE FRAME AND COVER

PAVED SURFACE

MASTIC WRAP AS REQ'D

ALL OPENINGS CORED DRILLED.

SECTION A-A

NOTES:
1. PRECAST SECTIONS SHALL MEET OR EXCEED ASTM C-478.
2. WATERTIGHT O-RING OR MASTIC KEYLOCK JOINTS REQUIRED, EXTERNAL SEAL AT JOINTS & PICKHOLES.
3. STEPS TO BE POLYPROPYLENE PLASTIC WITH GRADE 60 REINFORCING ROD. ADD STEPS TO EXTG CONNECTION MH IF EXTG STEPS ARE ABSENT.

WESTECH ENGINEERING, INC. MAY 2019

FLAT TOP MANHOLE FOR 21" PIPE AND SMALLER (SEWER & STORM) (NTS)

CRESWELL, OR 402
NOTE: PER ORS 92.044(7), MANHOLE MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT.

MANHOLE MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT.

STEPS:
VERIFY LOCATION TO AVOID CONFLICTS WITH INSIDE OR OUTSIDE DROPS.

MANHOLE FRAME AND COVER
PAVED SURFACE

STABLE SUBGRADE

SECTION A–A

NOTES:
1. PRECAST SECTIONS SHALL MEET OR EXCEED ASTM C-478.
2. WATERTIGHT O–RING OR MASTIC KEYLOCK JOINTS REQUIRED, EXTERNAL SEAL AT JOINTS & PICKHOLES.
3. STEPS TO BE POLYPROPYLENE PLASTIC WITH GRADE 60 REINFORCING ROD. ADD STEPS TO EXTG CONNECTION MH IF EXTG STEPS ARE ABSENT.

MANHOLE
FOR 24" AND 27" PIPE
(SEWER & STORM)

PRECAST BASE, 8" MIN THICKNESS
PRECAST BASE, 8" MIN THICKNESS
6" MIN COMPACTED GRANULAR BEDDING

5" MIN. THICK
ALL PIPE PENETRATIONS ON SANITARY SEWER MANHOLES TO HAVE RUBBER BOOTS AS SPECIFIED.

FLAT TOP SECTION, 8" MIN THICKNESS

18" MAX.–TOP OF FLAT TOP TO RIM
GRADE RINGS (VARIABLE)

12" MIN.
INSIDE DIA.

60"

30" MAX.

12"

ROUTE TONING WIRE UP OUTSIDE OF MH AS SHOWN (TYP ALL PIPES).

ALL OPENINGS CORED DRILLED

MASTIC WRAP AS REQ'D

30" MAX.

UNPAVED

Paved SURFACE

SET FRAME IN NON-SHRINK GROUT

GRADE RINGS (VARIABLE)

18" MAX.–TOP OF FLAT TOP TO RIM

FLAT TOP SECTION, 8" MIN THICKNESS

ALL INSIDE JOINTS & WALL PENETRATIONS TO BE GROUTED FOLLOWING MH ASSEMBLY (TYP).

MANHOLE BARRREL JOINT OPTIONS

PRECAST BASE, 8" MIN THICKNESS

6" MIN COMPACTED GRANULAR BEDDING

LAST REVISION DATE:
MAY 2019

COPYRIGHT 1996
WESTERN ENGINEERING, INC.
A

STEPS.

VERIFY LOCATION TO AVOID CONFLICTS WITH INSIDE OR OUTSIDE DROPS

PROVIDE GASKETED PVC CAP ON ALL STUBS FOR FUTURE CONNECTION SHOWN ON DWGS (EXTEND PIPE 2' MIN BEYOND MH WALL), SLOPE PER DWGS.

(This stub not shown below)

SLOPE SHELVES 1:12 TO DRAIN

VACUUM TESTING OF EXTG MANHOLES REQUIRED AFTER NEW CONNECTIONS. SEAL MH AS REQUIRED TO PASS.

OFFSET JOINT

O-RING or BUTYL RESIN MASTIC AS SPEC'D

ALL INSIDE JOINTS & WALL PENETRATIONS TO BE GROUTED FOLLOWING MH ASSEMBLY (TYP).

MANHOLE BARREL JOINT OPTIONS

SLOPE OF PRECAST ECCENTRIC CONE SHALL FACE DOWN GRADE. LOCATE STEPS ON UPSTREAM SIDE OF MANHOLE.

FLAT TOP SECTION, 8" MIN THICKNESS

FLAT TOP SLAB TO BE 18" MIN. ABOVE TOP OF ANY INSIDE OR OUTSIDE DROPS PENETRATIONS.

ALL PIPE PENETRATIONS ON SANITARY SEWER MANHOLES TO HAVE RUBBER BOOTS AS SPECIFIED.

PRECAST BASE, 8" MIN THICKNESS

6" MIN COMPACTED GRANULAR BEDDING

NOTES:
1. PRECAST SECTIONS SHALL MEET OR EXCEED ASTM C-478.
2. WATERTIGHT O-RING OR MASTIC KEYLOCK JOINTS REQUIRED, EXTERNAL SEAL AT JOINTS & PICKHOLES.
3. STEPS TO BE POLYPROPYLENE PLASTIC WITH GRADE 60 REINFORCING ROD. ADD STEPS TO EXTG CONNECTION MH IF EXTG STEPS ARE ABSENT.

PLAN

INVERT ELEVATIONS PER DRAWINGS

SET FRAME IN NON-SHRINK GROUT

ALL INSIDE JOINTS & WALL PENETRATIONS TO BE GROUTED FOLLOWING MH ASSEMBLY (TYP).

SECTION A-A

1. PRECAST SECTIONS SHALL MEET OR EXCEED ASTM C-478.
2. WATERTIGHT O-RING OR MASTIC KEYLOCK JOINTS REQUIRED, EXTERNAL SEAL AT JOINTS & PICKHOLES.
3. STEPS TO BE POLYPROPYLENE PLASTIC WITH GRADE 60 REINFORCING ROD. ADD STEPS TO EXTG CONNECTION MH IF EXTG STEPS ARE ABSENT.
ACCESS LADDER
SEE DETAIL 401–403A

DROP ASSEMBLY
SEE DETAIL BELOW

NEW CHANNEL FOR DROP
ASSEMBLY OUTLET

INSIDE DROP BOWL W/
S.S. FASTENERS, SEE
NOTE 1

MANHOLE PENETRATION
TO BE CORE DRILLED &
BOOTED PER NOTE 3.

PIPE COUPLER

PVC DROP PIPE
TO MATCH INLET PIPE

S.S. PIPE BRACKETS @
4' MAX. SPACING
(MIN. OF 2)

ROTATE 45° PVC ELBOW TO
DIRECT FLOW TO MH OUTLET.
CROWN OF ELBOW TO MATCH
MH OUTLET PIPE CROWN, AND
CONCRETE TO BE CHANNELED
TO AVOID ANY SIZE RESTRICTION
AT BASE OF DROP PIPE ELBOW.

SECTION A–A

NOTES:

1. ALL INSIDE DROPS MUST BE APPROVED ON A CASE
BY CASE BASIS BY THE PUBLIC WORKS DIRECTOR.
MINIMUM 60° DIAMETER MANHOLE REQUIRED FOR
INSIDE DROPS UNLESS OTHERWISE APPROVED IN
WRITING BY THE PUBLIC WORKS DIRECTOR.

2. PROVIDE "RELINER" INSIDE DROP BOWL BY DURAN,
INC. OR APPROVED EQUAL. WHERE NOTED ON
DRAWINGS, FOR INLET PIPES WITH SLOPES GREATER
THAN 5%, OR WHERE REQUIRED BY PUBLIC WORKS,
PROVIDE BOWL WITH OPTIONAL HOOD AS SHOWN.

3. ALL PIPE PENETRATIONS SHALL HAVE RUBBER
BOOTS. MANHOLE BASE, BARREL & TOP TO
CONFORM WITH DETAILS 401–403A.

4. STEPS TO BE POLYPROPYLENE
PLASTIC WITH GRADE 60
REINFORCING ROD. ADD STEPS
TO EXTG CONNECTION MH IF EXTG
STEPS ARE ABSENT.

LAST REVISION DATE:
MAR 2019

INSIDE DROP CONNECTION
FOR SANITARY SEWER OR
STORM MANHOLE
(NTS)

CRESWELL, OR
DETAIL NO. 404
NOTES:
2. COVER AND FRAME TO BE MACHINED TO A TRUE BEARING ALL AROUND.
3. NOTCH LID FOR LIFTING HOOK.
NOTES:
1. COVER AND FRAME TO BE MACHINED TO A TRUE BEARING ALL AROUND.
3. LOCKDOWN FRAME & COVER SHALL BE USED ONLY WHERE SPECIFICALLY REQUIRED BY PUBLIC WORKS.
TYPICAL MANHOLE ADJUSTMENT SECTION

SAW CUT SQUARE, FULL DEPTH OF AC. SAND SEAL AFTER CONCRETE CURES

3300 PSI CONCRETE, THICKNESS TO EXTEND 1½" BELOW TOP OF CONE OR TO FLATTOP SLAB

NOTES:
1. SANITARY SEWER – 2 HOLE LIDS
   STORM DRAINS – 16 HOLE LIDS
2. SAWCUT FULL DEPTH AROUND MH AFTER PAVING (PUBLIC WORKS APPROVAL REQUIRED PRIOR TO SAWCUTTING & PRIOR TO CONCRETE PLACEMENT). REMOVE AC & EXCAVATE TO 1½ MIN BELOW TOP OF CONE OR TOP OF FLATTOP SLAB. INSTALL REBAR AND BACKFILL WITH 3300 PSI EARLY STRENGTH CONCRETE TO SURFACE. PLATE UNTIL CONCRETE REACHES 3000 PS. SAND SEAL ALL JOINTS.
3. MANHOLES LOCATED IN UNPAVED TRAFFIC AREAS, GRAVEL SHOULDERS OR ROAD MEDIANS TO BE PROVIDED WITH A MIN 8'x8' AC OR CONCRETE PAD CENTERED ON MH LID. PAD TO BE (A) MIN OF 3" AC OVER 10" COMPACTED BASEROCK (OR PUBLIC ROAD STANDARD THICKNESS IF LOCATED IN R.O.W), OR (B) 8" CONCRETE OVER 2" BACKROCK.

LAST REVISION DATE:
NOV 2018

MANHOLE RIM ADJUSTMENT DETAILS
(SEWER & STORM)

CRESWELL, OR

DETAIL NO. 407
CLEANOUT COVERS: ALL SEWER CLEANOUT LIDS TO READ "SEWER".
ALL STORM CLEANOUT LIDS TO READ "STORM" OR "C/O".

36" SQUARE CONCRETE PAD
PER DETAIL 407 IN PAVED AREAS (CONCRETE OR 3" AC PAD FOR AREAS OUTSIDE OF PAVED AREAS). SLOPE AWAY FROM CLEANOUT.

90° C.O. FRAME & COVER

RISER PIPE TO BE 8" MIN DIAMETER FOR ALL 8" & LARGER MAINLINES
PIPE TO BEAR ON COMPACTED GRANULAR BACKFILL

MECHANICAL PLUG

ROUTE TONING WIRE UP INTO CLEANOUT BOX AS SHOWN

PVC SPIGOT PLUG IN GASKETED WYE SOCKET (ASSUMES CLEANOUT BASE WYE WILL BE REMOVED WITH FUTURE SEWER EXTENSION).

6" MIN COMPACTED GRANULAR BEDDING

STABLE SUBGRADE

HANDLE

SECTION A - A

CLEANOUT FRAME & COVER

NOTES:
1. USE INLAND FOUNDRY MODEL 240 FRAME & COVER IN ALL AREAS.
3. COVER AND FRAME TO BE MACHINED TO A TRUE BEARING ALL AROUND.
NOTE: NO VERTICAL OR HORIZONTAL BENDS GREATER THAN 22-1/2" WITHIN RIGHT-OF-WAY OR PUBLIC UTILITY EASEMENT (E.I. FROM MAINLINE TO CLEANOUT).

PER ORS 92.044(7), SERVICE LINES MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT.

PRESSURE TREATED 2" X 4" WIRE TO INVERT AND EXTENDING ABOVE FINISH GRADE. STAKE SHALL BE CONTINUOUS AND REMAIN VERTICAL AFTER BACKFILLING. END SHALL BE PAINTED & LABELED (WHITE FOR SEWER) (GREEN FOR STORM), AND LABELED WITH DEPTH TO PIPE. EXTEND TONING WIRE TO PIPE.

NOTES:
1. MIN. 18" SEPARATION BETWEEN ADJACENT LATERALS.
2. ONE FULL LENGTH OF PVC PIPE (AT CROSSING) REQUIRED FOR ALL SEWER LATERALS WHICH CROSS UNDER WATER LINES WITH LESS THAN 18" MINIMUM VERTICAL CLEARANCE BETWEEN WATER LINE AND SERVICE LATERAL.
3. SERVICE SHALL NOT BE BACKFILLED PRIOR TO INSPECTION BY PUBLIC WORKS.
4. INSTALL A CONTINUOUS 12 GAUGE SOLID CORE GREEN INSULATED TRACER WIRE FROM MAINLINE WIRE TO END OF LATERAL.
5. CHIMNEY DROPS INTO MAINLINES ARE PROHIBITED.

TYPICAL, SHALLOW MAINS

SEWER AND STORM SERVICE LATERALS (SEWER & STORM)

MINIMUM SLOPE 1/4" PER FOOT (2%) 2% SLOPE TO BACK OF PUE

LATERALS SHALL BE LAID AT 90° TO RIGHT-OF-WAY OR EASEMENT LINE UNLESS OTHERWISE SHOWN ON PLANS.

SEWER OR STORM MAIN 22 1/2' STREET BEND

SEWER/STORM LATERAL 3034 PVC, SDR 35 (TO BACK OF PUE)

MANUFACTURED TEE-WYES FOR 8-INCH MAINLINES & STANDARD TEES FOR 10-INCH & LARGER MAINLINES.

SEE DETAIL 419 FOR CONNECTION TO EXISTING MAINLINES.
CLEANOUT COVERS: ALL SEWER CLEANOUT LIDS TO READ "SEWER" ALL STORM CLEANOUT LIDS TO READ "STORM" OR "CO".

1. LATERAL CLEANOUT BOXES TO BE OLYMPIC FOUNDRY M1007 OR EQUAL, SET IN SIDEWALK (WHERE SIDEWALKS EXIST OR WILL BE INSTALLED).

2. IN AREAS WITHOUT SIDEWALKS, INSTALL CLEANOUT BOX IN 6" THICK CONCRETE PAD (PAD TO BE 6" LARGER THAN TOP OF CLEANOUT BOX).

3. CLEANOUT RISER SHALL BE SAME SIZE AND MATERIAL AS LATERAL PIPE.

4. CLEANOUT BOXES TO BE LOCATED IN SIDEWALKS AS SHOWN, UNLESS OTHERWISE APPROVED BY CITY.

5. CLEANOUT PIPE SHALL BE LEFT A MINIMUM OF 18" ABOVE EXISTING GRADE UNTIL ALL CURBING IS INSTALLED AND ALL PRIVATE UTILITY TRENCHES ARE BACKFILLED. CLEANOUTS SHALL THEN BE SET NO MORE THAN 6" BELOW FINISH GRADE, AND CLEANOUT BOXES SET FLUSH WITH FINISH GRADE.

6. MECHANICAL PLUG W/SHOULders

7. CONNECT PIPE FROM BUILDING SITE TO BASE LEG OF CLEANOUT WYE (CONNECTION TO CLEANOUT RISER IS PROHIBITED).

8. LOOP TONER WIRE UP INTO CLEANOUT BOX

9. COMPACTED GRANULAR MATERIAL

10. MAXADAPTOR COUPLING (BY GRIPPER GASKET LLC) OR EQUAL

11. GASKETED PVC CAP IF NOT CONNECTED AT TIME OF CONSTRUCTION

12. NOTE: PER ORS 92.044(7), CLEANOUT BOX MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT

13. NOTES:
   a. PROTECT LAWNS & GARDENS AT ALL TIMES. PLACE EXCAVATED MATERIALS ON PLYWOOD
   b. DOUBLE VERTICAL 22 1/2° BENDS ON C.O. RISER MAY BE REPLACED WITH SINGLE VERTICAL 45° BEND WITH PRIOR APPROVAL BY PUBLIC WORKS.
   c. 22 1/2° BEND
   d. PLAIN END PIPE, 8" MIN. LENGTH
   e. 22 1/2° STREET BEND
   f. 4" OR 6" SERVICE PIPE 3034 P.V.C., S.D.R. 35
   g. WYE

LAST REVISION DATE: APR 2018

STANDARD SERVICE LATERAL CLEANOUT (SEWER & STORM)

(NTS)

CRESWELL, OR

DETAIL NO. 416
EXTEND NEW PVC TO BACK OF PUE & CAP/CONNECT PER DETAIL 416 (UNLESS OTHERWISE APPROVED IN WRITING BY PUBLIC WORKS). PER DETAIL 416, INSTALL GASKETED PVC CAP ON END UNLESS NEW LATERAL IS RECONNECTED TO EXISTING PIPING.

NOTE: PER ORS 92.044(7), CLEANOUT BOX MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT

PER DETAIL 416, INSTALL GASKETED PVC CAP ON END UNLESS NEW LATERAL IS RECONNECTED TO EXISTING PIPING.

PL

1' MIN FROM CLEANOUT BOX TO ANY SURVEY MONUMENT

4-INCH SERVICE LINE TO PROPERTY LINE CLEANOUT PER DTL 416.

6-INCH P/L CO PER DETAIL 416, W/PVC SPIGOT PLUG IN BASE OF WYE.

6-INCH SERVICE PIPE (3034 PVC) TO MAINLINE WYE CONNECTION PER DETAIL 415

4-INCH PRIVATE SERVICE LINE TO PROPERTY LINE CLEANOUT PER DETAIL 416.

6x4 WYE

6x4 WYE

NOTES:

1. SEE DETAIL 415 FOR CONNECTION OF 6-INCH COMMON SERVICE LINE TO MAIN, AND DETAIL 416 FOR CONFIGURATION OF PROPERTY LINE CLEANOUTS (ONE 6-INCH & TWO 4-INCH CLEANOUTS).

2. INSTALL PVC SPIGOT PLUG THE P/L END OF THE 6" BASE WYE.

3. CLEANOUT BOX STYLE & CONFIGURATION TO CONFORM WITH DETAIL 416.

4. SERVICE LINES SHALL CONFORM TO OREGON PLUMBING CODE REQUIREMENTS.

5. COMMON SERVICE LATERAL SERVING TWO PROPERTIES IS ALLOWED ONLY FOR REPLACEMENT SERVICES WITH THIS CONFIGURATION, AND ONLY WITH PRIOR WRITTEN APPROVAL FROM PUBLIC WORKS DIRECTOR.
PVC HUB (ASTM D-3034 SDR 35). DRIVE INTO CENTER OF RUBBER BOOT AFTER BOOT IS PLACED IN CORE HOLE.

MOLDED PVC SHOULDER TO ACT AS POSITIVE INSERTION STOP (4" & 6" TAPS).

#316 STAINLESS STEEL BAND CLAMP (9/16" SERIES 300) TO SECURE UPPER HALF OF RUBBER SLEEVE TO THE PVC HUB.

MOLDED RUBBER SLEEVE (ASTM C-443) INCLUDES MOLDED RIBS TO HOLD THE SLEEVE IN PLACE IN MAINLINE PIPE TAP, STYLE TO MATCH MAINLINE PIPE MATERIAL & DIAMETER.

SEWER OR STORM PIPE, ALIGNMENT, SLOPE & CONFIGURATION AS SHOWN ON DRAWINGS

‘22 1/2’ STREET BEND (ASTM D-3034 PVC, SDR 35) WHERE SHOWN ON LATERAL DETAILS OR PLAN CALLOUTS.

INSERTA-TEE FITTING, SEE EXPLODED VIEW ABOVE

HOLES SHALL BE DRILLED WITH INSERTA-DRILL GUIDE ANCHORED TO PIPE, OR WITH CORE DRILLING MACHINE, IN STRICT ACCORDANCE WITH MANUFACTURER’S RECOMMENDATIONS.

INSERTA-TEE “Fatboy” Fitting shall be used for all 4" & 6" Taps ON EXTG PIPE (TV & 95% MANDREL TESTING OF EXISTING MAINLINES AFTER TAP MAY BE REQUIRED AT DISCRETION OF PUBLIC WORKS DIRECTOR).

NOTES:
1. EXISTING SANITARY SEWERS – INSERTA-TEES ALLOWED ON EXISTING PVC OR DUCTILE IRON SEWER MAINS. USE ON OTHER PIPE TYPES IS SUBJECT TO CITY APPROVAL AND ACCEPTABLE PIPE CONDITION.
2. EXISTING STORM DRAINS – INSERTA-TEES ALLOWED ON ALL PIPE TYPES, SUBJECT TO CITY APPROVAL AND ACCEPTABLE PIPE CONDITION.
3. NEW MAINLINES – MANUFACTURED FITTINGS (PER DETAIL 415) SHALL BE USED FOR CONNECTION ON ALL NEW SEWER AND STORM MAINLINES.
4. THE TAP SHALL NOT BE MADE EXCEPT IN THE PRESENCE OF A CITY INSPECTOR; NOR SHALL ANY CONNECTION BE MADE WITHOUT PRIOR CITY APPROVAL.
5. CENTERLINE OF TAP SHALL BE ABOVE SPRINGLINE.
# MANHOLE VACUUM TEST REPORT

<table>
<thead>
<tr>
<th>Manhole No.</th>
<th>Manhole Diameter (inch)</th>
<th>Manhole Depth (ft)</th>
<th>Surface Restoration Complete?</th>
<th>Time Required³ (sec)</th>
<th>Time to Drop from 10&quot; Hg to 9&quot; Hg (sec)</th>
<th>Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes / No</td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes / No</td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes / No</td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes / No</td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes / No</td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes / No</td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes / No</td>
<td></td>
<td></td>
<td>Pass / Fail</td>
<td></td>
</tr>
</tbody>
</table>

1. All adjacent surface restoration shall be completed prior to conducting manhole acceptance tests, including finish paving and final adjustments to grade. Any test conducted prior to completion of surface restoration shall be considered informal, and will not count for acceptance.

2. The vacuum test head seal shall be inflated in accordance with the manufacturer's recommendations, but in all cases the grade rings and casting shall be included in the test. A vacuum of 10-inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9-inches.

3. The manhole shall pass if the time for the vacuum reading to drop to 9-inches meets or exceeds the values indicated on the following table. Times for deeper depths as required by the City Engineer. Note: Visible groundwater infiltration or leakage constitutes a failed test.

## REQUIRED MANHOLE VACUUM TEST TIMES

<table>
<thead>
<tr>
<th>Manhole Depth (feet)</th>
<th>48-inch diameter</th>
<th>60-inch diameter</th>
<th>72-inch diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>20</td>
<td>26</td>
<td>33</td>
</tr>
<tr>
<td>10</td>
<td>25</td>
<td>33</td>
<td>41</td>
</tr>
<tr>
<td>12</td>
<td>30</td>
<td>39</td>
<td>49</td>
</tr>
<tr>
<td>14</td>
<td>35</td>
<td>46</td>
<td>57</td>
</tr>
<tr>
<td>18</td>
<td>40</td>
<td>52</td>
<td>65</td>
</tr>
<tr>
<td>20</td>
<td>45</td>
<td>59</td>
<td>73</td>
</tr>
<tr>
<td>22</td>
<td>50</td>
<td>65</td>
<td>81</td>
</tr>
</tbody>
</table>

PWDS (8/2019)
Creswell, Oregon
Copyright 2014
Westech Engineering, Inc
# SANITARY SEWER AIR TEST REPORT

<table>
<thead>
<tr>
<th>Station &amp; Manhole #</th>
<th>Main/ Lateral</th>
<th>Size &amp; Material</th>
<th>Total Length (ft)</th>
<th>C¹</th>
<th>K¹</th>
<th>Test Time (Seconds) for Pressure Drop Shown (psi)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Required³  4.0 - 3.5  3.5 - 2.5</td>
<td></td>
</tr>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pass / Fail</td>
</tr>
<tr>
<td>Main</td>
<td>Lateral</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main</td>
<td>Lateral</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main</td>
<td>Lateral</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ For C and K values, see table and formulas on reverse side.
³ For total C ≤ 1.0, test time (seconds) required = 2 times K
³ For total C > 1.0, test time (seconds) required = 2 times (K/C)

## TEST PROCEDURE

1. Add air slowly to the portion of the pipe installation under test until the internal air pressure is raised to 4.0 psig (or higher pressure as required to address groundwater). *Increase the test pressure by 0.433 psi for each foot of average ground water depth over the exterior crown of the pipe under test, with the maximum test pressure not to exceed 9.0 psi.*

2. Add air slowly until the internal air pressure is raised to 4.0 psig (or higher pressure as required due to groundwater).

3. After required test pressure is reached, allow 2-minutes minimum for air temperature to stabilize, adding only the amount of air required to maintain pressure.

4. After the temperature stabilization period, disconnect the air supply.

5. Record the time required for the internal air pressure to drop from 3.5 psi (or higher as required due to groundwater backpressure) to 2.5 psi (or higher as required due to groundwater backpressure). If this time exceeds the required time (or if there is less than 1.0 psi pressure drop), the test is successful.

## ACCEPTANCE

The tested sewer section shall be considered acceptable if the pressure drop during the test time is less than 1.0 psi from the starting pressure.
### SEWER AIR TEST C AND K VALUES

<table>
<thead>
<tr>
<th>Pipe Size (inch)</th>
<th>C-Value(^1) per foot length</th>
<th>K-Value(^2) per foot length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0.00155</td>
<td>0.176</td>
</tr>
<tr>
<td>6</td>
<td>0.00233</td>
<td>0.396</td>
</tr>
<tr>
<td>8</td>
<td>0.00311</td>
<td>0.704</td>
</tr>
<tr>
<td>10</td>
<td>0.00388</td>
<td>1.100</td>
</tr>
<tr>
<td>12</td>
<td>0.00466</td>
<td>1.584</td>
</tr>
<tr>
<td>15</td>
<td>0.00582</td>
<td>2.475</td>
</tr>
<tr>
<td>18</td>
<td>0.00699</td>
<td>3.564</td>
</tr>
<tr>
<td>21</td>
<td>0.00815</td>
<td>4.851</td>
</tr>
</tbody>
</table>

\(^1\) \(C = 0.0003882dL\)  \(\text{Where } d = \text{diameter (inches)}\)

\(^2\) \(K = 0.011d^2L\)  \(\text{L = Length (ft)}\)

**Example:**

Air Test a system consisting of two mainline segments as follows:
Segment 1: 395 feet of 8-inch mainline, 100 feet of 4-inch laterals, and 35 feet of 6 inch laterals.
Segment 2: 200 feet of 8-inch mainline, 30 feet of 4-inch laterals, and 20 feet of 6 inch laterals.

<table>
<thead>
<tr>
<th>Station (Manhole #)</th>
<th>Main/ Lateral</th>
<th>Size &amp; Material</th>
<th>Total Length (ft)</th>
<th>C(^1)</th>
<th>K(^1)</th>
<th>Test Time (Seconds) for Pressure Drop Shown (psi)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>From To</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Required(^2) 4.0 - 3.5 3.5 - 2.5</td>
<td></td>
</tr>
<tr>
<td>MH A1 0+00</td>
<td>3+95 MH A2</td>
<td>Main</td>
<td>8&quot; PVC</td>
<td>395</td>
<td>1.227</td>
<td>278.1</td>
<td>310/1.46=212</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lateral</td>
<td>4&quot; PVC</td>
<td>100</td>
<td>0.155</td>
<td>17.6</td>
<td>212*2=414 sec</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6&quot; PVC</td>
<td>35</td>
<td>0.082</td>
<td>13.86</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.464</td>
<td>309.54</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.464</td>
<td>309.54</td>
</tr>
<tr>
<td>MH A2 3+95</td>
<td>5+95 MH A3</td>
<td>Main</td>
<td>8&quot; PVC</td>
<td>200</td>
<td>0.621</td>
<td>140.8</td>
<td>2*154=308 sec</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lateral</td>
<td>4&quot; PVC</td>
<td>20</td>
<td>0.047</td>
<td>5.28</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6&quot; PVC</td>
<td>30</td>
<td>0.047</td>
<td>7.92</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.714</td>
<td>154.0</td>
</tr>
</tbody>
</table>

Note: For total \(C \leq 1.0\), test time (seconds) required = 2 times \(K\)
For total \(C > 1.0\), test time (seconds) required = 2 times \((K/C)\)

The tested sewer section shall be considered acceptable when tested as described herein if the section under test does not lose air at a rate greater than 0.0015 cfm per square foot of internal sewer surface.
MANDREL TESTING REPORT

<table>
<thead>
<tr>
<th>Station (Manhole #)</th>
<th>Size &amp; Material</th>
<th>Length (ft)</th>
<th>Results</th>
<th>Backfill Compaction Completed?</th>
<th>Date Sewer Flushed &amp; Cleaned</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Mandrel testing shall be conducted on a manhole to manhole (or cleanout) basis and shall be done after the line has been completely flushed out with water.

2. Mandrel testing shall be conducted after trench backfill and compaction has been completed.

3. The mandrel diameter shall be 95% of the pipe initial inside diameter. The inspector shall verify the diameter of each mandrel used during each test session.
**PIPELINE TV INSPECTION REPORT**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Client:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>City:</td>
</tr>
<tr>
<td></td>
<td>Basin No.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>From M.H. #:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Street:</th>
<th>Pipe Dia. (in)</th>
<th>Joint Length (ft)</th>
<th>Section Length (ft)</th>
<th>Joint Type:</th>
<th>Pipe Material</th>
<th>To M.H. #:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PIPELINE DATA:**

<table>
<thead>
<tr>
<th>Cleanliness:</th>
<th>Alignment:</th>
<th>Grade:</th>
<th>Age:</th>
<th>% Est. Leaking Joints:</th>
<th>Other:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PROBLEM CODE LEGEND:**

- BP = Broken Pipe
- CC = Circumferential Crack
- LC = Longitudinal Crack
- G = Break in Grade
- L = Leak
- PJ = Pulled Joint
- PT = Protruding Tap
- ST = Service Tap
- SL = Service Left
- SR = Service Right
- RT = Roots
- U = Unpassable

**PIPE MATERIAL LEGEND:**

- AC = Asbestos Cement
- CIP = Cast Iron Pipe
- CM = Concrete, Mortar Joint
- CR = Concrete, Rubber, Gasket Jnt
- DI = Ductile Iron Pipe
- PVC = Polyvinylchloride Pipe
- TC = Terra Cotta
- VC = Vitrified Clay

**TURNAROUND:**

<table>
<thead>
<tr>
<th>Requested (Date/time):</th>
<th>Authorized (Date/time):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PWDS (8/2019)
Creswell, Oregon

Copyright 2014
Westech Engineering, Inc
FINISH GRADE

CAST IRON VALVE BOX & LID 'VANCOUVER' STYLE

7" MIN

6" PVC SEWER PIPE, ASTM D3034, SDR 35, LENGTH AS REQUIRED

VC212 VALVE BOX BASE BY 3DC, OR EQUAL

RESILIENT WEDGE GATE VALVE (GV)
EPOXY COATED PER AWWA C-550

NOTCH 1/8" DEEP INDICATING DIRECTION OF FLOW THROUGH VALVE

VANCOUVER '910' STYLE
18" TALL VALVE BOX

NOTES:
1. GV SHALL CONFORM TO AWWA C-509.
2. VALVE BOXES SHALL BE PLUMB AND CENTERED DIRECTLY OVER THE VALVE NUT.
3. PVC TO BE 1 CONTINUOUS PIECE, NO BELLS/COUPLERS.
4. SAWCUT FULL DEPTH AROUND VB AFTER PAVING (PUBLIC WORKS APPROVAL REQUIRED PRIOR TO SAWCUTTING & PRIOR TO CONCRETE PLACEMENT). BACKFILL WITH 3300 PSI EARLY STRENGTH CONCRETE TO SURFACE. PLATE UNTIL CONCRETE REACHES 3000 PS. SAND SEAL ALL JOINTS.
5. VALVE BOX LIDS ON PRESSURE SEWERS TO READ "S" OR "SEWER".

GATE VALVE AND VALVE BOX DETAIL

REFERENCE SHEET

LAST REVISION DATE:
FEB 2018

CRESWELL, OR
DETAIL NO.
501
FINISH GRADE

LOOP TONER WIRE UP INTO VALVE BOX (TYP ALL). ROUTE WIRE OUTSIDE RISER PIPE & INSIDE OF VALVE BOX AS SHOWN.

BUTTERFLY VALVE, (BFV) ENDS AS SPECIFIED EPOXY COATED PER AWWA C-550

12" X 12" PRECAST CONCRETE BLOCK ON COMPACTED GRANULAR MATERIAL

NOTCH 1/8" DEEP INDICATING DIRECTION OF FLOW THROUGH VALVE

VANCOUVER '910' STYLE 18" TALL VALVE BOX

1. BFV SHALL BE SHORT BODY TYPE B VALVE PER AWWA C-504.
2. VALVE BOXES SHALL BE PLUMB & CENTERED DIRECTLY OVER THE VALVE NUT.
3. PVC SHALL BE ONE CONTINUOUS PIECE, NO BELLS OR COUPLERS.
4. BFV ACTUATOR TO BE LOCATED ON THE CURBLINE SIDE OF WATERLINE AS SHOWN. INSTALL DI SPOOLS OR FLEX ADAPTER IF REQUIRED FOR ACTUATOR CLEARANCE.
5. SAWCUT FULL DEPTH AROUND VB AFTER PAVING (PUBLIC WORKS APPROVAL REQUIRED PRIOR TO SAWCUTTING & PRIOR TO CONCRETE PLACEMENT). BACKFILL WITH 3300 PSI EARLY STRENGTH CONCRETE TO SURFACE. PLATE UNTIL CONCRETE REACHES 3000 PSI. SAND SEAL ALL JOINTS.

BUTTERFLY VALVE AND VALVE BOX DETAILS

LAST REVISION DATE: JULY 2017

CRESWELL, OR

DETAIL NO. 502
NOTE: HYDRANT COLOR TO BE FACTORY YELLOW

4 1/2" PUMPER NOZZLE W/NST THREAD, INSTALL 5-INCH STORZ ADAPTER (HPHA) WITH SNAP-TITE STORZ BLIND CAP & CABLE.

NOTE: PER ORS 92.044(7), FIRE HYDRANT MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT

OFFSET BOLLARDS FROM STEAMER PORT PER CITY DIRECTION

12" MIN. BEHIND S/W

24" MIN. BEHIND CURB

SEE NOTE ABOVE

1. HYDRANTS TO BE KENNEDY GUARDIAN K81D or WATEROUS PACER WITH FULL SIZE (5¼") FOOT VALVE.

2. ALL FITTINGS IN CONTACT WITH CONCRETE SHALL BE WRAPPED IN PLASTIC. HYDRANT DRAIN HOLES TO REMAIN OPEN TO DRAIN ROCK AND OPERATIONAL.

3. 1-1/2" TO 3/4" CLEAN DRAIN ROCK SHALL BE PLACED A MIN. OF 6" ABOVE DRAIN OUTLET.

4. WHERE PLANTER STRIP EXISTS, HYDRANT SHALL BE PLACED SO FRONT PORT IS A MIN. OF 24" BEHIND FACE OF CURB.

5. THRUST BLOCK AT STANDARD 6" FIRE HYDRANT TEE SHALL HAVE MIN. 3.7 SQ. FT. BEARING AREA.

6. ALL HYDRANTS SHALL BE SET PLUMB.

7. FOR HYDRANT LEADS LONGER THAN 30', AN ADDITIONAL GATE VALVE SHALL BE PROVIDED WITHIN 3 FT. OF THE HYDRANT.

8. RESTRAIN ALL JOINTS ON ALL HYDRANT LEADS. RETAINER GLANDS SHALL TO BE USED IN LEIU OF THRUST BLOCK BEHIND HYDRANT.

9. PAINT CURB YELLOW 10 FEET EACH WAY FROM HYDRANT & INSTALL REFLECTIVE BLUE TRAFFIC MARKER @ STREET CENTERLINE.

LAST REVISION DATE: AUG 2019
THRU
BLOCK

TEST PORT
FOR PRE-TAP
PRESSURE TEST

STD. VALVE BOX
(VANCOUVER '910'
STYLE) W/VC212 VB
BASE & PVC RISER

ROMAC SST/SSTII, MUELLER H304,
JCM MODEL 432 OR APPROVED EQUAL
(STAINLESS STEEL SLEEVE AND STAINLESS
STEEL FLANGE)

NOTES:
1. WATER MAIN SHALL BE CLEANED & SPRAYED WITH CHLORINE SOLUTION IN TAP AREA
BEFORE ATTACHING SLEEVE.
2. TAPPING SLEEVE SHALL BE ALL STAINLESS STEEL WITH FULL PERIMETER GASKET.
3. TAPPING VALVE SHALL BE EPOXY COATED PER AWWA C-550.
4. PRE-TAP PRESSURE TEST. SLEEVE AND VALVE SHALL BE PRESSURE TESTED BEFORE
MAKING TAP. PRESSURE TEST AND TAP SHALL BE MADE IN THE PRESENCE OF AN
AUTHORIZED WATER SYSTEM REPRESENTATIVE.
5. APPROVED TAPPING MACHINE SHALL BE USED TO MAKE TAP.
6. 3/4" GRANULAR BACKFILL SHALL BE PLACED AND COMPACTED TO 92% OF MAXIMUM
DENSITY AS DETERMINED BY AASHTO T-180.
7. THRUST BLOCKING PER DETAIL 510.
8. TAP SHALL BE MADE NO CLOSER THAN 18" FROM THE NEAREST JOINT.
9. SLEEVE AND VALVE SHALL BE WRAPPED WITH 8 MIL PLASTIC PRIOR TO CONCRETE
PLACEMENT.
10. CONCRETE BLOCK(S) SHALL COMPLETELY SUPPORT TAPPING TEE AND VALVE.
11. CONTRACTOR SHALL COORDINATE ALL TAPS WITH CITY AND PERFORM ALL TAPS WITH PUBLIC WORKS
STAFF PRESENT.
12. ALL TAPPING EQUIPMENT (AND ANY TOOL COMING
IN CONTACT WITH THE PIPE THOUGH THE TAPPING
SLEEVE) SHALL BE CHLORINE DISINFECTED WITH A
300 MG/L CHLORINE SOLUTION.
**BLOW-OFF SIZES REQUIRED**

<table>
<thead>
<tr>
<th>MAIN SIZE</th>
<th>BLOW-OFF SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; - 8&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>10&quot; - 12&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>&gt;12&quot;</td>
<td>BY ENGR.</td>
</tr>
</tbody>
</table>

*Assumes 40 PSI residual press.*

**B.O. RISER**

- Provide one riser assembly for each 3 blowoffs or portion thereof.
- Riser assembly to extend 24" above finish grade.
- Threaded brass adapter to match blowoff coupling.
- Standard valve box (two required) Vancouver '910' style.
- Concrete collar per details 501 or 502 (install 1" - 2" above grade in non-paved areas).
- Loop toner wire up into valve box (route wire outside of riser pipe & inside of valve box as shown).
- Retainer gland.
- Water main.
- Std. straddle block per dwg. 511.

**NOTES:**

1. Backfill with granular backfill.
2. Required on all lines which may be extended in future or as directed by city engineer.
3. All concrete to be 3300 PSI @ 28 days.
4. Flanged ductile iron pipe and fittings may be required for 4" & larger blowoffs.

**MAINLINE BLOWOFF ASSEMBLY**

*NTS*
NOTE: PER ORS 92.044(7), VALVE BOXES MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT

PROVIDE ONE RISER ASSEMBLY FOR EACH 3 BLOWOFFS OR PORTION THEREOF.

STANDARD VALVE BOX (TWO REQUIRED) VANCOUVER 910 STYLE

THREADED BRASS PLUG. SET TOP OF PLUG ±2" BELOW VB LID.

BRASS COUPLING ON SCHED 80 PVC MALE ADAPTER

GRANULAR BACKFILL

THRUST BLOCK

STABLE SUBGRADE

SCHEDULE 80 PVC PIPE AND ELBOW

EPOXY COATED RESILIENT WEDGE GATE VALVE (2" MIN) WITH 2" SQUARE OPERATING NUT

MJ CAP & RETAINER GLAND (TAPPED TO BLOWOFF SIZE)

NOTES:
1. BACKFILL WITH GRANULAR BACKFILL.
2. ALLOWED ONLY ON PERMANENT DEAD END LINES IN CUL-DE-SACS WHICH CANNOT BE EXTENDED IN THE FUTURE.
3. ALL CONCRETE TO BE 3300 PSI @ 28 DAYS.
4. 2" BLOWOFF SIZE ASSUMES 40 PSI RESIDUAL PRESSURE.

LAST REVISION DATE: JUNE 2015

CRESWELL, OR 507

COPYRIGHT 1996 WESTECH ENGINEERING, INC.
NOTES:

1. CASING SPACERS – APS MODEL SSI, CALPICO M–SS SERIES OR APPROVED EQUIV. 4"–18" CARRIER PIPE, USE 8" WIDE BAND. >18" CARRIER PIPE, USE 12" WIDE BAND.

2. SEAL BOTH ENDS OF BORE CASING WITH END SEALS. WITHOUT SAND FILL, USE APS MODEL AZ OR APPROVED EQUIV. FASTEN TO CASING AND CARRIER PIPE WITH ST. STEEL BANDS. WITH SAND FILL, USE GROUT END CAPS (PLUG VENT TUBES AFTER SAND FILL)

3. CASING SHALL BE WELDED SMOOTH STEEL PIPE CONFORMING TO ASTM A-53, GRADE B OR APPROVED EQUIVALENT (Fy = 35,000 psi).

4. CARRIER PIPE DIAMETER & MATERIAL AS PER DWGS.

5. FOR GRAVITY SEWER OR STORM CARRIERPIPES, THE CASING ANNULAR SPACE SHALL BE COMPLETELY FILLED WITH SAND TO PREVENT FLOATATION OF CARRIER PIPE BY GROUNDWATER.

6. CARRIER PIPE SHALL BE COMPLETELY FILLED WITH WATER PRIOR TO INSTALLING OR BLOWING SAND.

7. INCREASE CASING DIA AS REQ'D TO ALLOW TRIMMING OF CASING SPACERS ON GRADE CRITICAL BORES.

CARRIER PIPE DIAMETER MIN. CASING WALL THICKNESS

<table>
<thead>
<tr>
<th>DIAMETER</th>
<th>CASING</th>
<th>MIN CASING</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot;</td>
<td>12&quot;</td>
<td>0.25 (1/4)</td>
</tr>
<tr>
<td>8&quot;</td>
<td>14&quot;</td>
<td>0.25 (1/4)</td>
</tr>
<tr>
<td>10&quot;</td>
<td>16&quot;</td>
<td>0.312 (5/16)</td>
</tr>
<tr>
<td>12&quot;</td>
<td>18&quot;</td>
<td>0.375 (3/8)</td>
</tr>
</tbody>
</table>

*1: CASING SIZE LISTED IS FOR PRESSURE PIPE. LARGER DIA CASING REQ'D FOR GRAVITY PIPE. *2: SEE PWDS 5.8.m FOR GRAVITY PIPE CASING SIZE REQUIREMENTS OR LARGER CASING SIZES.
<table>
<thead>
<tr>
<th>FITTING SIZE (Inches)</th>
<th>TEE, WYE, &amp; HYDRANTS PLUGGED CROSS</th>
<th>90° BEND</th>
<th>45° BEND</th>
<th>22 1/2° BEND</th>
<th>11 1/4° BEND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>①</td>
<td>②</td>
<td>③</td>
<td>④</td>
</tr>
<tr>
<td>2</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>4</td>
<td>1.7</td>
<td>2.4</td>
<td>1.3</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>6</td>
<td>3.7</td>
<td>5.3</td>
<td>2.9</td>
<td>1.5</td>
<td>*</td>
</tr>
<tr>
<td>8</td>
<td>6.7</td>
<td>9.5</td>
<td>5.1</td>
<td>2.7</td>
<td>1.3</td>
</tr>
<tr>
<td>10</td>
<td>10.5</td>
<td>14.8</td>
<td>8</td>
<td>4.1</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>15.1</td>
<td>21.3</td>
<td>11.6</td>
<td>5.9</td>
<td>2.9</td>
</tr>
<tr>
<td>16</td>
<td>26.8</td>
<td>37.9</td>
<td>22.5</td>
<td>10.4</td>
<td>5.2</td>
</tr>
<tr>
<td>18</td>
<td>33.9</td>
<td>47.9</td>
<td>25.9</td>
<td>12.8</td>
<td>6.7</td>
</tr>
<tr>
<td>LARGER</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

BEARING AREA OF THRUST BLOCKS (sq. ft.)

1. ALL VALUES ARE BASED ON THE FOLLOWING ASSUMPTIONS:
   AVG. PRESSURE = 100 PSI x 2 (safety factor); 1500 PSF SOIL BEARING CAPACITY;
   NORMAL DISTRIBUTION SYSTEM DESIGN VELOCITY NOT TO EXCEED 5 FPS.
2. ALL FITTINGS SHALL BE WRAPPED IN PLASTIC PRIOR TO PLACEMENT OF CONCRETE.
3. BEARING SURFACE OF THRUST BLOCKING SHALL BE AGAINST UNDISTURBED SOIL.
4. TRUCK-MIXED CONCRETE MIX SHALL HAVE A MIN. 28 DAY STRENGTH OF 3300 PSI (5" MAX SLUMP). USE
   OF HAND-MIXED SACK-CRETE TYPE CONCRETE REQUIRES WRITTEN CITY APPROVAL PRIOR TO USE, AND SHALL
   BE 4000 PSI MIX, MIXED WITH MIN AMOUNT OF WATER NECESSARY FOR WORKABILITY (5" MAX SLUMP). USE
   OF DRY SACK-CRETE MIX (BAGS OR LOOSE MIX) IS PROHIBITED FOR PERMANENT THRUST RESTRAINT.
5. ALL PIPE ZONES SHALL BE BACKFILLED WITH GRANULAR BACKFILL AND COMPACTED.
6. THRUST BLOCKS FOR PLUGGED CROSS AND PLUGGED TEE SHALL HAVE #4 REBAR LIFTING LOOPS INSTALLED
   AS SHOWN.
7. VERTICAL THRUST DETAILS—SEE DWG. 512.
8. STRADDLE BLOCK DETAILS—SEE DWG. 511.

* BLOCK TO UNDISTURBED TRENCH WALLS

** THRUST BLOCKS FOR PIPES LARGER THAN 18" WILL BE INDIVIDUALLY DESIGNED BY THE
ENGINEER.

SEE DETAIL 511

STD. 6" F.H.

3.7 FT²

3.7 FT²

UNDISTURBED
SOIL

2 X DIA.

MIN.

12"
MATERIALS

1. CONCRETE STRADDLE BLOCK.
2. EITHER (2a) ONE SERRATED-LOCK STYLE SPLIT-RING RESTRAINT HARNESS (ROMAC 600 OR EQUAL), OR (2b) TWO RETAINER GLAND WEDGE-STYLE RESTRAINTS, SET OPPOSED (EBBA MEGA-LUG OR EQUAL).
   - WEDGE STYLE RESTRAINTS SHALL BE WRAPPED WITH PLASTIC PRIOR TO CONCRETE PLACEMENT.
3. \( \leq 12" \) PIPE, \#4 REBAR @ 12" O.C. E.W., (3a) INSTALL REBAR EACH SIDE OF RESTRAINT FITTING INSIDE CONCRETE AS SHOWN. (3b) INSTALL 3 MATS OF REBAR FOR PIPE LARGER THAN 12" DIAMETER.
4. RETAINER GLAND, ON ADJACENT FITTING.
5. MJ FITTING, BEND, VALVE OR BLOWOFF.

### PIPE SIZE

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>'W'</th>
<th>'D'</th>
<th>'T'</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot;</td>
<td>12&quot;</td>
<td>8&quot;</td>
<td>12&quot;</td>
</tr>
<tr>
<td>8&quot;</td>
<td>16&quot;</td>
<td>10&quot;</td>
<td>12&quot;</td>
</tr>
<tr>
<td>10&quot;</td>
<td>20&quot;</td>
<td>12&quot;</td>
<td>12&quot;</td>
</tr>
<tr>
<td>12&quot;</td>
<td>24&quot;</td>
<td>18&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>14&quot; &amp; 16&quot;</td>
<td>28&quot;</td>
<td>24&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>18&quot;</td>
<td>32&quot;</td>
<td>30&quot;</td>
<td>18&quot;</td>
</tr>
</tbody>
</table>

6. STRADDLE BLOCK FOR \( \geq 12" \) PIPE SHALL BE VERIFIED INDIVIDUALLY FOR APPLICATION BY THE DESIGN ENGINEER AND SHALL BE BASED ON THE FOLLOWING:
   a.) 200 PSI WATER TEST PRESSURE.
   b.) SOIL BEARING CAPACITY, REBAR SIZE & SPACING VERIFIED BY THE ENGINEER.

7. BEARING AREA OF BLOCK SHALL BE AGAINST UNDISTURBED SOIL.
8. STRADDLE BLOCK SHALL HAVE A MINIMUM OF 18" COVER.
9. CONCRETE SHALL HAVE A MIN. 28 DAY STRENGTH OF 3300 PSI.
NOTES:

1. GRAVITY VERTICAL THRUST BLOCKS SHALL BE DESIGNED BY THE ENGINEER.

2. KEEP CONCRETE CLEAR OF JOINT AND JOINT ACCESSORIES. FITTINGS SHALL BE WRAPPED IN PLASTIC PRIOR TO PLACEMENT OF CONCRETE.

3. CONCRETE THRUST BLOCKING SHALL BE POURED AGAINST UNDISTURBED EARTH.

4. CONCRETE MIX SHALL HAVE A MIN. 28 DAY STRENGTH OF 3000 P.S.I.

5. THRUST BLOCK VOLUMES FOR VERTICAL BENDS HAVING UPWARD RESULTANT THRUSTS ARE BASED ON TEST PRESSURE OF 150 P.S.I.G. AND THE WEIGHT OF CONCRETE = 4050 LBS./CU.YD.

6. VERTICAL BENDS THAT REQUIRE A THRUST BLOCK VOLUME EXCEEDING 5 CUBIC YARDS REQUIRE SPECIAL BLOCKING DETAILS. SEE PLANS FOR VOLUMES SHOWN INSIDE HEAVY LINE IN TABLE.

7. ALL REBAR SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM-123 (MIN. 3.4 MIL). REBAR SHALL BE BENT BEFORE GALVANIZATION, AND LAST 4" OF BAR SHALL BE BENT 90 DEGREES WITH A 1/2" RADIUS BEND. REBAR SHALL BE TIGHTLY FIT TO RESTRAINED FITTING.

8. FOR HORIZONTAL THRUST BLOCK DETAILS SEE DRAWING NO. 510.

### Volume of Thrust Block in Cubic Yards (Vertical Bends)

<table>
<thead>
<tr>
<th>Fitting Size</th>
<th>Bend Angle</th>
<th>45°</th>
<th>22 1/2°</th>
<th>11 1/4°</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>1.1</td>
<td>0.4</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>2.7</td>
<td>1.0</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>4.0</td>
<td>1.5</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>6.0</td>
<td>2.3</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>8.5</td>
<td>3.2</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>11.5</td>
<td>4.3</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>14.8</td>
<td>5.6</td>
<td>2.3</td>
<td></td>
</tr>
</tbody>
</table>

FITTING SIZE: 12" AND LESS  
ROD SIZE: #6  
EMBEDMENT: 30"

FITTING SIZE: 14" - 16"  
ROD SIZE: #8  
EMBEDMENT: 36"

LAST REVISION DATE: JAN 2014

VERTICAL THRUST BLOCKING  
(NTS)  
CRESWELL, OR  
DETAIL NO. 512
NOTE: WATER SERVICE LINE TO BE PERPENDICULAR TO STREET FROM METER BOX TO MAINLINE.

PROVIDE METER BOXES IN UNPAVED TRAFFIC OR GRAVEL AREAS WITH A 12" WIDE x 6" MIN. THICK CONCRETE COLLAR ALL AROUND THE METER BOX.

MIN. 18" BETWEEN ADJACENT WATER LINE TAPS.

30" MIN. COVER — SEE NOTE 6

SERVICE SADDLES REQUIRED FOR ALL TAPS ON ALL MAINLINES. (ROMAC 202NS, FORD FC202, OR EQUAL)

NOTE: PER ORS 92.044(7), METER BOXES MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT.

STAMP 2" TALL "W" IN TOP OF CURB AND GUTTER PAN AT POINT OF CROSSING (TYP).

WATER MAIN

18" MAX

MIN. SIZE COMMERCIAL SERVICES SHALL BE 1-INCH.

5. FAR SIDE COMMERCIAL SERVICES SHALL BE INSTALLED IN A 4" MIN DIA SCHED 40 PVC SLEEVE WHICH BEGINS 18" FROM MAIN AND EXTENDS TO EDGE OF METER BOX.

TRACER WIRE SPLICES SHALL USE WATERTIGHT CONNECTION, TYPE DBR DIRECT BURY SPLICE KIT BY 3M (OR EQUAL).

MATERIALS:

1. BALL STYLE CORPORATION STOP: FORD FB–1100. SET AT 30° ANGLE UP FROM HORIZONTAL.

2. CENCORE BLUE HDPE (CTS OD, SDR 9, 200 PSI) CONFORMING TO AWWA C901, USE 2–3/8" LONG INSERTS ON COMPRESSION FITTINGS (McDONALD 6133T). SINGLE RESIDENTIAL SERVICE: 1" (TYP).

3. BALL STYLE 1"x3/4" LOCKING ANGLE METER STOP, FORD BA43–344WQ OR EQUAL.

4. ARMORCAST POLYMER CONCRETE METER BOX (12"x20" ID): A6001946PCK12–KO W/A6001866RCI–H7 LID IN TRAFFIC AREAS P6001866X12–EWEB W/A6001866RCI–H7 LID ELSEWHERE PROVIDE ALL METER BOXES WITH KNOCKOUTS FOR AMR RADIO-READ HEAD.

NOTES:

1. SUBSTITUTE FOR ANY MATERIALS SHOWN SHALL BE APPROVED BY THE PUBLIC WORKS DIRECTOR.

2. ALL PIPE AND BACKFILL ZONES SHALL BE BACKFILLED USING 3/4" MINUS GRANULAR MATERIAL AND COMPACTED TO 92% MAX. DENSITY DETERMINED BY AASHTO T–180.

3. SET FRONT OF METER BOX 30–INCHES BEHIND BACK OF CURB LOCATION FOR CURBLINE WALKS & FRONT OF METER BOX 10–INCHES FROM BACK OF PROPERTY LINE WALKS.

4. METER BOX SHALL BE CENTERED OVER THE COMPLETED METER ASSEMBLY.

5. MIN. SIZE COMMERCIAL SERVICES SHALL BE 1–INCH.

6. ARMORCAST POLYMER CONCRETE METER BOX (12"x20" ID): A6001946PCK12–KO W/A6001866RCI–H7 LID IN TRAFFIC AREAS P6001866X12–EWEB W/A6001866RCI–H7 LID ELSEWHERE PROVIDE ALL METER BOXES WITH KNOCKOUTS FOR AMR RADIO-READ HEAD.

SECTION A–A

INSTALL NEW BALL VALVE, RISER & COUPLING FOR RELOCATED/REPLACED METER ASSEMBLIES.

METER COUPLING (TAIL), BALL VALVE W/HANDLE & 90° ELBOW PROVIDE PRIOR TO WATER METER INSTALLATION.

LAST REVISION DATE: JUNE 2018

COPYRIGHT 1996 WESTECH ENGINEERING, INC.

TYPICAL 1" WATER SERVICE (HDPE SERVICE LINE) (NTS)

CRESWELL, OR DETAIL NO. 515
LOCK WING ANGLE BALL VALVE

USE 2–3/8” LONG INSERTS FOR HDPE W/COMPRESSION FITTINGS (McDONALD 6133T OR EQUAL)

ANGLE BALL VALVE W/ HANDLE

17”x30” METER BOX (SEE NOTE 5)

LOCK WING ANGLE BALL VALVE

PACK JOINT

1” BY-PASS

PACK JOINT

MIPxCOMPR ADAPTER

TRACER/TONE WIRE (CONNECT TO MAINLINE WIRE W/DBR WATERPROOF SPICE KIT BY 3M CO.)

CENCORE BLUE HDPE (CTS, DR 9, 200 PSI), SWEEP INTO MIPxCOMPRESSION FITTING AT BOTTOM OF METER SETTER (ON CITY SIDE)

24” MIN. TO FINISH GRADE

GRANULAR BACKFILL TO BE BELOW LOCK WING BYPASS VALVE

SECTION A–A

NOTE: PER ORS 92.044(7), METER BOXES MUST BE SET 1’ MINIMUM CLEAR FROM ANY SURVEY MONUMENT

PVC PIPE TO PROPERTY LINE, THEN PER PLUMBING CODE FROM PROPERTY LINE TO BUILDING

***TYPICAL METER LENGTHS (VERIFY)

1½” COMPOUND – 13” TYP,
2” COMPOUND – 15¼” TYP,
2” TURBINE – 17” TYP.

NOTES:

1. METER SET TO BE FORD 70 SERIES COPPERSETTER, #VBB86–15HB–11–66 (1½”) OR #VBB87–15HB–11–77 (2”) WITH RAISED LOCKING BYPASS OR APPROVED EQUAL.
2. SUBSTITUTES FOR ANY MATERIALS SHOWN SHALL BE APPROVED BY THE PUBLIC WORKS DIRECTOR.
3. ALL PIPE AND BACKFILL ZONES SHALL BE BACKFILLED USING 3/4” MINUS GRANULAR MATERIAL AND COMPACTED TO 92% OPTIMUM DENSITY PER AASHTO T–180.
4. SET METER BOX IN SIDEWALK (TYPICAL) UNLESS OTHERWISE APPROVED BY PUBLIC WORKS DIRECTOR.
   NO METERS ON PRIVATE PROPERTY WITHOUT A RECORDED EASEMENT.
5. METER BOX SHALL BE CENTERED OVER THE COMPLETED METER ASSEMBLY. METER BOX TO BE ARMORCAST
   –A6001640PCX18–KO W/A6001947TRCI–H7 LID IN TRAFFIC AREAS
   –P6001534X18–EWEB W/A6001947TRCI–H7 LID IN Non–TRAFFIC AREAS,
   PROVIDE WITH KNOCKOUTS FOR AMR RADIO–READ HEAD
6. COPPERSETTER, METER BOX, & ALL FITTINGS PROVIDED BY CONTRACTOR, CONTRACTOR TO VERIFY DIMENSIONS & CLEARANCE BASED ON ACTUAL METER TO BE PROVIDED BY THE CITY. WATER METER INSTALLED BY CONTRACTOR UNDER CITY INSPECTION & APPROVAL.
7. SEE DETAIL 517 FOR TAPPING REQUIREMENTS.
8. THREADED FEMALE PVC FITTINGS ARE NOT ALLOWED.
2" & LARGER SERVICE

MATERIALS

1. FLG X MJ RESILIENT WEDGE GATE VALVE PER AWWA C-509. 4" DIA. OR SERVICE SIZE, WHICHER IS LARGER. EPOXY COATED PER AWWA C-550.

2. CENCORE BLUE HDPE (CTS, DR 9, 200 PSI) W/OUT JOINTS PER DETAIL 516 (30" MIN COVER TO METER). FEMALE THREADED PVC FITTINGS ARE NOT ALLOWED ON OR ADJACENT TO METER SETTER. SEE DETAIL 516 FOR CONFIGURATION AT METER BOX.

3. METER STOP ASSEMBLY W/BYPASS PER PUBLIC WORKS REQUIREMENTS. SEE DETAIL 516 FOR 1-1/2 & 2" SERVICES.

4. METER BOX FOR 1-1/2" AND 2" SHALL BE PER DETAIL 516. USE TRAFFIC RATED VERSION OF BOX/LID FOR TRAFFIC AREAS. PROVIDE W/KNOCKOUTS FOR AMR RADIO-READ HEAD.

NOTES

1. SUBSTITUTE FOR ANY MATERIAL SHOWN SHALL BE APPROVED BY THE CITY ENGINEER.

2. ALL PIPE AND STRUCTURE ZONES SHALL BE BACKFILLED USING 3/4" MINUS GRANULAR MATERIAL AND COMPACTED TO 95% MAX DENSITY AS DETERMINED BY ASHTO T-180.

3. METER BOX SHALL BE CENTERED OVER THE COMPLETED METER AND FITTING ASSEMBLY.

4. CUSTOMER SHALL INSTALL AN APPROVED BACKFLOW PREVENTION DEVICE ON PRIVATE PROPERTY IMMEDIATELY DOWNSTREAM OF WATER METER IF REQUIRED BY PUBLIC WORKS.

5. FAR SIDE COMMERCIAL SERVICES SHALL BE INSTALLED IN A 4" MIN DIA SCH40 PVC SLEEVE WHICH BEGINS 2' FROM MAIN AND EXTENDS TO BACK OF FAR SIDE SIDEWALK.

7. METER BOXES IN TRAFFIC OR GRAVEL AREAS SHALL PROVIDED WITH A 12" WIDE x 6" MIN. THICK CONCRETE COLLAR ALL AROUND THE METER BOX.
1" ALUMINUM SCREENED TEE VENT
(DOWN ORIENATED DOUBLE OUTLET)
(MORRISON MR 155 OR EQUAL),
MOUNT WITH SCREEN 12" MINIMUM
ABOVE GRADE.

17"X30" ARMORCAST
METER BOX W/LID

1"x3" BRASS NIPPLE
½x1" 90° BEND.

1" A.R.I D-040-C
COMB. AIR/VAC
VALVE OR EQUAL.

17"X30" ARMORCAST
METER BOX W/OUT LID
1" HOPE PIPE W/OUT
JOINTS, SEE NOTE BELOW
90° ELL, BRASS OR
BRONZE

1" BALL STYLE
CORPORATION STOP
FORD FB-1100 OR
APPROVED EQUAL (ORIENT
NUT ON HORIZONTAL CORP
STOP TO FACE UPWARD)

PIPE NOTE, CENCORE BLUE HDPE (CTS OD, SDR 9, 200
PSI) CONFORMING TO AWWA C901, USE 2-3/8" LONG
INSERTS ON COMPRESSION FITTINGS (McDONALD 6133T).

NOTES:
1. RISER SHALL BE PROTECTED FROM VEHICULAR OR
PEDESTRIAN TRAFFIC AS APPROVED BY THE CITY
ENGINEER & PUBLIC WORKS.
2. PAINT BOLLARD & TOP SAFETY BLUE FOR POTABLE
WATER APPLICATIONS.
3. WHERE ARV ASSEMBLIES ARE INSTALLED ADJACENT
TO FENCES, BOLLARDS SHALL BE SET 3" MIN CLEAR
FROM FENCE UNLESS OTHERWISE APPROVED BY
PROPERTY OWNER.
4. EXACT LOCATION OF RISER PENTRATION THROUGH
BOX & BOLLARDS TO BE VERIFIED IN FIELD WITH
CITY ENGINEER & PUBLIC WORKS PRIOR TO RISER &
BOLLARD INSTALLATION.

LAST REVISION DATE: JUNE 2019

1" COMBINATION AIR
RELEASE VALVE
(CARV)
(NTS)
CRESWELL, OR
DETAIL NO. 518
1. Meter Vault & Piping shall conform to requirements of all public/private agencies having jurisdiction.
2. Meter Vault shall be placed within right-of-way unless otherwise approved (recorded easement to the city required for any meter on private property).
3. All materials (except the Meter) shall be furnished & installed by the Contractor. The Contractor shall install a temporary spacer spool between Meter isolation valves for testing. The temporary spool shall match the length of the actual Meter to be provided by the City.
4. Piping inside Vault & through walls to be Cl 52 ductile iron, except as otherwise shown.
5. Meter will be supplied by the City, but shall be installed by the Contractor under City inspection and approval.
6. Isolation valves in Meter Vault shall be non-rising stem gate valve (epoxy coated) with 2-inch square operating nut.
7. All MJ connections (including bypass line fittings) shall be assembled with retainer glands (EBBA Mega-Lugs or approved equal). Romac Alpha FC allowed as equal for Hymax Grip FC.
8. All pipe openings shall be core drilled (regardless of presence of 'knockouts'), and sealed watertight with non-shrink grout.
9. Pipe supports shall be galvanized standon S89 or approved equal at each isolation valve and at bypass valve.
10. Meter Vault to be utility vault 687-WA or approved equal, conforming with ASTM C-857. Provide aluminum angle frame hatch (48"x 72" min) by Syracuse Castings West or approved equal. Hatch cover top to be sand blasted non-slip.
11. Meter Vault shall be provided with an OSHA approved galvanized steel ladder and aluminum ladder safety extension. Attach to Vault with stainless steel bolts.
12. Contractor to install Sump Pump (5 gpm min) with 120V power supply, along with private power source. Sump Pump power shall conform with NEC requirements and be installed in Schedule 40 conduit.
13. Sump Pump discharge pipe shall be 2-inch Schedule 40 PVC, provided with union (for pump removal), check valve and isolation ball valve. Connect discharge to gravity storm drain or curb weep hole (at location approved by public works).
14. Sump to be 18" round concrete pipe or equal. Provide FRP grate (or slotted MH lid) with coped cutout for discharge piping (ie. lid to be removable without disassembling discharge piping). Sump to be large enough & deep enough to house pump & float, and keep water level below sloped floor.

NOTES:
- Hatch (48"x 72" min) by Syracuse Castings West or approved equal. Romac Alpha FC allowed as equal for Hymax Grip FC.
- Contractors to verify pipe & vault depth prior to ordering & provide riser as required.
- Sloped concrete floor & sump shall either be placed prior to pipe & meter installation, or else all pipe, meter & fittings to be wrapped in plastic prior to concrete placement. Groundwater Relief Hole, if provided, shall be at bottom of sump hole.
1. METER VAULT & PIPING SHALL CONFORM TO REQUIREMENTS OF ALL PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.

2. METER VAULT SHALL BE PLACED WITHIN RIGHT-OF-WAY UNLESS OTHERWISE APPROVED (RECORDED EASEMENT TO THE CITY REQUIRED FOR ANY METER ON PRIVATE PROPERTY).

3. ALL MATERIALS (EXCEPT THE METER) SHALL BE FURNISHED & INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL INSTALL A TEMPORARY SPACER SPOOL BETWEEN METER ISOLATION VALVES FOR TESTING. THE TEMPORARY SPool SHALL MATCH THE LENGTH OF THE ACTUAL METER TO BE PROVIDED BY THE CITY.

4. PIPING INSIDE VAULT & THROUGH WALLS TO BE CL 52 DUCTILE IRON, EXCEPT AS OTHERWISE SHOWN.

5. METER WILL BE SUPPLIED BY THE CITY, BUT SHALL BE INSTALLED BY THE CONTRACTOR UNDER CITY INSPECTION AND APPROVAL.

6. ISOLATION VALVES IN METER VAULT SHALL BE NON-RISING STEM GATE VALVE (EPoxy COATED) WITH 2-INCH SQUARE OPERATING NUT.

7. ALL MJ CONNECTIONS (INCLUDING BYPASS LINE FITTINGS) SHALL BE ASSEMBLED WITH RETAINER GLANDS (EBBA MEGA-LUCS OR APPROVED EQUAL). ROMAC ALPHA FC ALLOWED AS EQUAL FOR HYMAX GRIP FC.

8. ALL PIPE OPENINGS SHALL BE CORE DRILLED ( REGARDLESS OF PRESENCE OF "KNOCKOUTS"), AND SEALED WATERtight WITH NON-SHRINK GROUT.

9. PIPE SUPPORTS SHALL BE GALVANIZED STANDON S89 OR APPROVED EQUAL AT EACH ISOLATION VALVE AND AT BYPASS VALVE.

10. METER VAULT TO BE UTILITY VAULT 687-WA OR APPROVED EQUAL, WITH 2-INCH SCHEDULE 40 PVC BALL VALVE (IMPROVED). SUMP PUMP DISCHARGE PIPE SHALL BE 2-INCH SCHEDULE 40 PVC, AND USE H-20 RATED HATCH IF LID IS LESS THAN 9" ABOVE GRADE, OR IF LOCATED IN TRAFFIC AREA.

11. METER VAULT SHALL BE PROVIDED WITH AN OSHA APPROVED GALVANIZED STEEL LADDER AND ALUMINUM LADDER SAFETY EXTENSION. ATTACH TO VAULT WITH STAINLESS STEEL BOLTS.

12. CONTRACTOR TO INSTALL SUMP PUMP (5 GPM MIN) WITH 120V POWER SUPPLY, ALONG WITH PRIVATE POWER SOURCE. SUMP PUMP POWER SHALL CONFORM WITH NEC REQUIREMENTS AND BE INSTALLED IN SCHEDULE 40 CONDUIT.

13. SUMP PUMP DISCHARGE PIPe SHALL BE 2-INCH SCHEDULE 40 PVC, PROVIDED WITH UNION (FOR PUMP REMOVAL), CHECK VALVE AND ISOLATION BALL VALVE. CONNECT DISCHARGE TO GRAVITY STORM DRAIN OR CURB WEEP HOLE (AT LOCATION APPROVED BY PUBLIC WORKS).

14. SUMP TO BE 18" ROUND CONCRETE PIPE OR EQUAL. PROVIDE FRP GRATE (OR SLOTTED MH LID) WITH COPED CUTOUT FOR DISCHARGE PIPING (E. LID TO BE REMOVABLE WITHOUT DISASSEMBLING DISCHARGE PIPING). SUMP TO BE LARGE ENOUGH & DEEP ENOUGH TO HOUSE PUMP & FLOAT, AND KEEP WATER LEVEL BELOW SLOPED FLOOR.

15. PIPE SUPPORTS SHALL BE GALVANIZED STEEL CONFORMING WITH ASTM C-857. PROVIDE ALUMINUM ANGLE FRAME (TYP) HINGE EDGE OF ACCESS HATCH AT CITY APPROVED LOCATION.

16. CONTRACTOR TO VERIFY PIPE & VAULT DEPTH PRIOR TO ORDERING & PROVIDE RISER AS REQUIRED.

17. SLOPED CONCRETE FLOOR & SUMP SHALL BE EITHER BE PLACED PRIOR TO PIPE & METER INSTALLATION, OR ELSE ALL PIPE, METER & FITTINGS TO BE WRAPPED IN PLASTIC PRIOR TO CONCRETE PLACEMENT. GROUNDWATER RELIEF HOLE, IF PROVIDED, SHALL BE AT BOTTOM OF SUMP HOLE.

18. LAST REVISION DATE: MAR 2019
NOTES:
1. METER VAULT & PIPING SHALL CONFORM TO REQUIREMENTS OF ALL PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
2. METER VAULT SHALL BE PLACED WITHIN RIGHT-OF-WAY UNLESS OTHERWISE APPROVED (RECORDED EASEMENT TO THE CITY REQUIRED FOR ANY METER ON PRIVATE PROPERTY).
3. ALL MATERIALS (EXCEPT THE METER) SHALL BE FURNISHED & INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL INSTALL A TEMPORARY SPACER SPOOL BETWEEN METER ISOLATION VALVES FOR TESTING. THE TEMPORARY SPOOL SHALL MATCH THE LENGTH OF THE ACTUAL METER TO BE PROVIDED BY THE CITY.
4. PIPING INSIDE VAULT & THROUGH WALLS TO BE CL 52 DUCTILE IRON, EXCEPT AS OTHERWISE SHOWN.
5. METER WILL BE SUPPLIED BY THE CITY, BUT SHALL BE INSTALLED (AFTER PRESSURE & OTHER TESTING OF METER VAULT PIPING) BY THE CONTRACTOR UNDER CITY INSPECTION AND APPROVAL.
6. ISOLATION VALVES IN METER VAULT SHALL BE NON-RISING STEM GATE VALVE (EPoxy COATED) WITH 2-INCH SQUARE OPERATING NUT.
7. ALL MJ CONNECTIONS (INCLUDING BYPASS LINE FITTINGS) SHALL BE ASSEMBLED WITH RETAINER GLANDS (EEBA MEGA-LUGS OR APPROVED EQUAL). ROMAC ALPHA FC ALLOWED AS EQUAL FOR HYMAX GRIP FC.
8. ALL PIPE OPENINGS SHALL BE CORE DRILLED (REGARDLESS OF PRESENCE OF "KNOCKOUTS"), AND SEALED WATERTIGHT WITH NON-SHRINK GROUT.
9. PIPE SUPPORTS SHALL BE GALVANIZED STANDON S89 OR APPROVED EQUAL AT EACH ISOLATION VALVE AND AT BYPASS VALVE.
10. METER VAULT TO BE UTILITY VAULT 687-WA OR APPROVED EQUAL, CONFORMING WITH ASTM C-857. PROVIDE ALUMINUM ANGLE FRAME HATCH (48"x 72" MIN) BY SYRACUSE CASTINGS WEST OR APPROVED EQUAL (HATCH COVER TOP TO BE SAND BLASTED NON-SLIP).
   11. (1) TO BE 300 PSF PEDESTRIAN RATED WHERE LID IS SET MIN. OF 9" ABOVE GRADE.
   12. (2) TO BE H-20 RATED IF LID IS LESS THAN 9" ABOVE GRADE, OR IF LOCATED IN TRAFFIC AREA.
11. METER VAULT SHALL BE PROVIDED WITH AN OSHA APPROVED GALVANIZED STEEL LADDER AND ALUMINUM LADDER SAFETY EXTENSION. ATTACH TO VAULT WITH STAINLESS STEEL BOLTS.
13. CONTRACTOR TO INSTALL SUMP PUMP (5 GPM MIN) WITH 120V POWER SUPPLY. ALONG WITH PRIVATE POWER SOURCE, SUMP PUMP POWER SHALL CONFORM WITH NEC REQUIREMENTS AND BE INSTALLED IN SCHEDULE 40 CONDUIT.
14. SUMP PUMP DISCHARGE PIPE SHALL BE 2-INCH SCHEDULE 40 PVC, PROVIDED WITH UNION (FOR PUMP REMOVAL), CHECK VALVE AND ISOLATION BALL VALVE. CONNECT DISCHARGE TO GRAVITY STORM DRAIN OR CURB WEEP HOLE (AT LOCATION APPROVED BY PUBLIC WORKS).
15. SUMP TO BE 18" ROUND CONCRETE PIPE OR EQUAL. PROVIDE FRP GRADE (OR SLOTTED MH LID) WITH COPED CUTOUT FOR DISCHARGE PIPING. SUMP TO BE LARGE ENOUGH & DEEP ENOUGH TO HOUSE PUMP & FLOAT, AND KEEP WATER LEVEL BELOW SLOPED FLOOR.
1. METER VAULT & PIPING SHALL CONFORM TO REQUIREMENTS OF ALL PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.

2. METER VAULT SHALL BE PLACED WITHIN RIGHT-OF-WAY UNLESS OTHERWISE APPROVED (RECORDED EASEMENT TO THE CITY REQUIRED FOR ANY METER ON PRIVATE PROPERTY).

3. ALL MATERIALS (EXCEPT THE METER) SHALL BE FURNISHED & INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL INSTALL A TEMPORARY SPACER SPOOL BETWEEN METER ISOLATION VALVES FOR TESTING. THE TEMPORARY SPOOD SHALL MATCH THE LENGTH OF THE ACTUAL METER TO BE PROVIDED BY THE CITY.

4. PIPING INSIDE VAULT & THROUGH WALLS TO BE CL 52 DUCTILE IRON, 1" MJ.

5. METER WILL BE SUPPLIED BY THE CITY, BUT SHALL BE INSTALLED EXCEPT AS OTHERWISE SHOWN.

6. ISOLATION VALVES IN METER VAULT SHALL BE NON-RISING STEM GATE VALVE (EPOXY COATED) WITH 2-INCH SQUARE OPERATING NUT.

7. ALL MJ CONNECTIONS (INCLUDING BYPASS LINE FITTINGS) SHALL BE ASSEMBLED WITH RETAINER GLANDS (EBBA MEGA-LUGS OR APPROVED EQUAL). ROMAC ALPHA FC ALLOWED AS EQUAL FOR HYMAX GRIP FC.

8. ALL PIPE OPENINGS SHALL BE CORE DRILLED REGARDLESS OF GRADE IN PAVED CONDUIT.

9. PIPE SUPPORTS SHALL BE GALVANIZED STANDON S89 OR APPROVED EQUAL AT EACH ISOLATION VALVE AND AT BYPASS VALVE.

10. METER VAULT TO BE UTILITY VAULT 687-WA OR APPROVED EQUAL, CONFORMING WITH ASTM C-857. PROVIDE ALUMINUM ANGLE FRAME HATCH (48"x 72" MIN) BY SYRACUSE CASTINGS WEST OR APPROVED EQUAL (HATCH COVER TOP TO BE SAND BLASTED NON-SLIP). (1) TO BE 300 PSI PEDESTRIAN RATED WHERE LID IS SET MIN. OF 9" ABOVE GRADE. (2) TO BE H-20 RATED IF LID IS LESS THAN 9" ABOVE GRADE, OR IF LOCATED IN TRAFFIC AREA.

11. METER VAULT SHALL BE PROVIDED WITH AN OSHA APPROVED GALVANIZED STEEL LADDER AND ALUMINIUM LADDER SAFETY EXTENSION. ATTACH TO VAULT WITH STAINLESS STEEL BOLTS.

12. CONTRACTOR TO INSTALL SUMP PUMP (5 GPM MIN) WITH 120V POWER SUPPLY, ALONG WITH PRIVATE POWER SOURCE. SUMP PUMP POWER SHALL CONFORM WITH NEC REQUIREMENTS AND BE INSTALLED IN SCHEDULE 40 CONDUIT.

13. SUMP PUMP DISCHARGE PIPE SHALL BE 2-INCH SCHEDULE 40 PVC, PROVIDED WITH UNION (FOR PUMP REMOVAL), CHECK VALVE AND ISOLATION BALL VALVE. CONNECT DISCHARGE TO GRAVITY STORM DRAIN OR CURB WEEP HOLE (AT LOCATION APPROVED BY PUBLIC WORKS).

14. SUMP TO BE 18" ROUND CONCRETE PIPE OR EQUAL. PROVIDE FRP GRATE (OR SLOTTED MH LID) WITH COPED CUTOUT FOR DISCHARGE PIPING (E.J. LID TO BE REMOVABLE WITHOUT DISASSEMBLING DISCHARGE PIPING). SUMP TO BE LARGE ENOUGH & DEEP ENOUGH TO HOUSE PUMP & FLOAT, AND KEEP WATER LEVEL BELOW SLOPED FLOOR.

NOTES:

1. METER VAULT & PIPING SHALL CONFORM TO REQUIREMENTS OF ALL PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.

2. METER VAULT SHALL BE PLACED WITHIN RIGHT-OF-WAY UNLESS OTHERWISE APPROVED (RECORDED EASEMENT TO THE CITY REQUIRED FOR ANY METER ON PRIVATE PROPERTY).

3. ALL MATERIALS (EXCEPT THE METER) SHALL BE FURNISHED & INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL INSTALL A TEMPORARY SPACER SPOOL BETWEEN METER ISOLATION VALVES FOR TESTING. THE TEMPORARY SPOOD SHALL MATCH THE LENGTH OF THE ACTUAL METER TO BE PROVIDED BY THE CITY.

4. PIPING INSIDE VAULT & THROUGH WALLS TO BE CL 52 DUCTILE IRON, 1" MJ.

5. METER WILL BE SUPPLIED BY THE CITY, BUT SHALL BE INSTALLED EXCEPT AS OTHERWISE SHOWN.

6. ISOLATION VALVES IN METER VAULT SHALL BE NON-RISING STEM GATE VALVE (EPOXY COATED) WITH 2-INCH SQUARE OPERATING NUT.

7. ALL MJ CONNECTIONS (INCLUDING BYPASS LINE FITTINGS) SHALL BE ASSEMBLED WITH RETAINER GLANDS (EBBA MEGA-LUGS OR APPROVED EQUAL). ROMAC ALPHA FC ALLOWED AS EQUAL FOR HYMAX GRIP FC.

8. ALL PIPE OPENINGS SHALL BE CORE DRILLED REGARDLESS OF GRADE IN PAVED CONDUIT.

9. PIPE SUPPORTS SHALL BE GALVANIZED STANDON S89 OR APPROVED EQUAL AT EACH ISOLATION VALVE AND AT BYPASS VALVE.

10. METER VAULT TO BE UTILITY VAULT 687-WA OR APPROVED EQUAL, CONFORMING WITH ASTM C-857. PROVIDE ALUMINUM ANGLE FRAME HATCH (48"x 72" MIN) BY SYRACUSE CASTINGS WEST OR APPROVED EQUAL (HATCH COVER TOP TO BE SAND BLASTED NON-SLIP). (1) TO BE 300 PSI PEDESTRIAN RATED WHERE LID IS SET MIN. OF 9" ABOVE GRADE. (2) TO BE H-20 RATED IF LID IS LESS THAN 9" ABOVE GRADE, OR IF LOCATED IN TRAFFIC AREA.

11. METER VAULT SHALL BE PROVIDED WITH AN OSHA APPROVED GALVANIZED STEEL LADDER AND ALUMINIUM LADDER SAFETY EXTENSION. ATTACH TO VAULT WITH STAINLESS STEEL BOLTS.

12. CONTRACTOR TO INSTALL SUMP PUMP (5 GPM MIN) WITH 120V POWER SUPPLY, ALONG WITH PRIVATE POWER SOURCE. SUMP PUMP POWER SHALL CONFORM WITH NEC REQUIREMENTS AND BE INSTALLED IN SCHEDULE 40 CONDUIT.

13. SUMP PUMP DISCHARGE PIPE SHALL BE 2-INCH SCHEDULE 40 PVC, PROVIDED WITH UNION (FOR PUMP REMOVAL), CHECK VALVE AND ISOLATION BALL VALVE. CONNECT DISCHARGE TO GRAVITY STORM DRAIN OR CURB WEEP HOLE (AT LOCATION APPROVED BY PUBLIC WORKS).

14. SUMP TO BE 18" ROUND CONCRETE PIPE OR EQUAL. PROVIDE FRP GRATE (OR SLOTTED MH LID) WITH COPED CUTOUT FOR DISCHARGE PIPING (E.J. LID TO BE REMOVABLE WITHOUT DISASSEMBLING DISCHARGE PIPING). SUMP TO BE LARGE ENOUGH & DEEP ENOUGH TO HOUSE PUMP & FLOAT, AND KEEP WATER LEVEL BELOW SLOPED FLOOR.
NOTES:
1. UNLESS OTHERWISE REQUIRED BY PUBLIC WORKS, PROVIDE ONE LOCK ASSEMBLY PER VAULT.
2. VALVE LOCK ASSEMBLY TO BE HOT DIP GALVANIZED AFTER FABRICATION.

TOP VIEW

SIDE VIEW

WATER METER VAULT
BYPASS VALVE LOCK

(NTS)

CRESWELL, OR 527
METER TEST PORT CONSISTING OF SHORT BRASS NIPPLE, BRASS BALL VALVE PROVISIONS FOR LOCKING HANDLE, & BRASS PLUG IN TOP OF BALL VALVE (SIZE TO MATCH TEST PORT ON METER).

FLOW METER AS SPECIFIED (SEE SEPARATE DETAIL)

NOTES:
1. UNLESS NOTED OTHERWISE ON DRAWINGS, ALL METERS 3" & LARGER SHALL BE PROVIDED WITH A TEST PORT ASSEMBLY CONSISTING OF NIPPLE, BALL VALVE AND PLUG AS NOTED.

LAST REVISION DATE: MAR 2017
WATER METER TEST PORT ASSEMBLY (NTS)
CRESWELL, OR 528
STANDON MODEL C92 ADJUSTABLE PIPE SUPPORT (GALVANIZED STEEL TOP & BASE) OR EQUAL (PROVIDE NEOPRENE LINER FOR STEEL OR PVC PIPE)

WHERE FULLY RESTAINED SUPPORTS ARE SPECIFIED OR NOTED ON THE DRAWING, FILLET TACK WELD SUPPORT PIPE TO BASE AND TOP COLLARS AFTER INSTALLATION (E70XX ELECTRODES FOR WELDS). COAT WELDS WITH HIGH ZINC PAINT (2 COATS), TYP ALL.

FULL CIRCLE CLAMP STYLE SUPPORT

STANDON MODEL S92 ADJUSTABLE PIPE SUPPORT (GALVANIZED STEEL TOP & BASE) OR EQUAL (PROVIDE NEOPRENE LINER FOR STEEL OR PVC PIPE)

SCHEDULE 40 GALVANIZED STEEL PIPE (TYP ALL STYLES, LENGTH AS REQUIRED), DIA. PER MANUFACTURER'S RECOMMENDATIONS

INSTALL (4) EACH 1/2" X 4" STAINLESS STEEL CONCRETE ANCHORS OR STUD ANCHORS WITH NUTS (TYP ALL STYLES).

SADDLE STYLE SUPPORT

STANDON MODEL C89 ADJUSTABLE PIPE SUPPORT (GALVANIZED STEEL TOP & BASE) OR EQUAL

12" SQUARE CONCRETE PIER BLOCK FOR SUPPORT IN AREAS WITHOUT SLAB OR PAVEMENT. ANCHOR BOLTS/STUDS AS NOTED ABOVE.

FLANGE STYLE SUPPORT

BASE IN AREA W/O HARD SURFACE
1. Verify the enclosure/box dimensions & depth are adequate for clearances shown, based on the size of the DCA and fittings actually provided & installed.

2. Enclosure/box shall be centered over the completed double check assembly.

3. PER OAR 333-61-0071, DCA shall not be subject to continuous immersion.

4. DCA's shall be installed above the 100 year flood level unless otherwise approved in writing by the public works director.

5. Bypass lines around double check assemblies are not allowed.

6. DCA's shall be provided with brass or plastic plugs in all test ports.

7. DCA shall be located on private property, and shall not be installed in sidewalks or areas subject to vehicular traffic.

8. The property owner is responsible to maintain a minimum of 3 feet of maintenance access working clearance around DCA enclosures/boxes.

9. Prior to requesting approval or final inspection by the city, contractor shall have DCA tested, and copies of test reports provided to public works.

10. Property owner shall be responsible to provide freeze protection during cold weather periods as necessary.

NOTES:

PLASTIC OR POLYMER CONCRETE BOX, SIZE & DEPTH AS REQUIRED FOR CLEARANCES LISTED.

3/4"-2" FEBCO MODEL 850 DOUBLE CHECK ASSEMBLY (OR EQUAL) (SEE PLANS FOR SPECIFIED SIZE)

INCREASE ALLOWED ON DOWNSTREAM SIDE (OPTIONAL)

SURFACE PER PLAN SLOPE TO DRAIN SURFACE FLOWS AWAY FROM BOX.

OUTLET PIPE CONFIGURATION PER CUSTOMER DESIGN.

12" MIN. CLEAR TO CUSTOMER SYSTEM (DEPTH PER CUSTOMER DESIGN)

MIN. 6" THICK PEA ROCK OR CLEAN GRANULAR BASEROCK UNDER BOX FOOTPRINT.

MIN. 24" COVER (TOP FROM METER)

WATER METER SIDE

CUSTOMER SYSTEM SIDE

3/4" MIN. 6" MIN. 3" MIN.
PAD MOUNTED FIBERGLASS INSULATED ENCLOSURE W/HEATER, HOT BOX MODEL AS SHOWN ON TABLE (OR APPROVED EQUIVALENT). ANCHOR ENCLOSURE TO CONCRETE PAD PER MANUFACTURER'S REQUIREMENTS.

ELECTRICAL RECEPTACLE FOR HEAT TAPE (GFI). PROVIDE HEAT TAPE OR ENCLOSURE HEATER FOR ALL ABOVE GRADE PIPING. MOUNT RECEPTACLE 18" ABOVE SLAB ON TOP OF RIGID CONDUIT OR ON UNI-STRUT.

SCH 80 PVC PIPE, TYPICAL BOTH VERTICAL RISERS

3" PIPE SLEEVE FIELD LOCATE (TYP 2)

ELECTRICAL CONDUIT TO POWER SOURCE. COORDINATE AS REQ'D TO PROVIDE 120V POWER.

SCHEDULE 40 PVC FROM WATER SERVICE, SIZE AS SHOWN ON PLANS

NOTES:
1. RPBA – REDUCED PRESSURE BACKFLOW ASSEMBLY.
2. INSTALLATION OF RPBA & ENCLOSURE SHALL MEET OREGON HEALTH AUTHORITY, DRINKING WATER SERVICES REQUIREMENTS.
3. CONTRACTOR SHALL HAVE RPBA TESTED AND CERTIFIED PRIOR TO APPROVAL BY THE CITY.
4. RPBA & ENCLOSURE SHALL CONFORM TO REQUIREMENTS OF PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
5. ENCLOSURES SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL OTHER VAULTS OR STRUCTURES.
6. VERIFY ENCLOSURE DIMENSIONS ARE ADEQUATE FOR CLEARANCE BASED ON HEIGHT OF REDUCED PRESSURE ASSEMBLY.
7. ENCLOSURE SHALL BE CENTERED OVER THE COMPLETED REDUCED PRESSURE BACKFLOW ASSEMBLY.
8. POWER SHALL BE INSTALLED IN SCHEDULE 40 RIGID CONDUIT PER NEC REQUIREMENTS.
9. ALL CONCRETE SHALL HAVE 3,300 PSI COMpressive STRENGTH @ 28 DAYS.
10. HOT BOX DRAINAGE OPENINGS SHALL NOT BE OBSTRUCTED BY GRADING OR PLANTINGS.
11. RPBA SHALL BE INSTALLED A MIN. OF 12 INCHES ABOVE THE 100-YEAR FLOOD ELEVATION AS DETERMINED BY FEMA.

<table>
<thead>
<tr>
<th>RPBA DIAMETER</th>
<th>HOT BOX MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot;</td>
<td>HB1</td>
</tr>
<tr>
<td>1½&quot;</td>
<td>HB1</td>
</tr>
<tr>
<td>2&quot;</td>
<td>HB1.5</td>
</tr>
</tbody>
</table>

NOTE: VERIFY HB SIZE FOR OTHER MODEL RPBA DEVICES.

REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA) MFR'D BY FEBCO, MODEL 825YA (OR APPROVED EQUAL)

DO NOT OBSTRUCT ENCLOSURE OPENINGS (TYP)

4" CONCRETE PAD

SURFACE PER PLAN SLOPE TO DRAIN

MIN. 2" COMPACTED GRANULAR BASEROCK

COMPACTED SUBGRADE

SCHEDULE 40 PVC TO BUILDING. SIZE AS SHOWN ON PLANS

12. FINISH GRADE TO SLOPE AWAY FROM ENCLOSURE SLAB AT 2% MIN. SLOPE.

LAST REVISION DATE: AUG 2018

2" AND SMALLER REDUCED PRESSURE BACKFLOW ASSEMBLY (NTS)

CRESWELL, OR DETAIL NO. 541
NOTES:
1. RPBA– REDUCED PRESSURE BACKFLOW ASSEMBLY.
2. INSTALLATION OF RPBA & ENCLOSURE SHALL MEET OREGON HEALTH AUTHORITY, DRINKING WATER SERVICES REQUIREMENTS.
3. CONTRACTOR SHALL HAVE RPBA TESTED AND CERTIFIED PRIOR TO APPROVAL BY THE CITY.
4. RPBA & ENCLOSURE SHALL CONFORM TO REQUIREMENTS OF PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
5. ENCLOSURES SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL OTHER VAULTS OR STRUCTURES.
6. VERIFY ENCLOSURE DIMENSIONS ARE ADEQUATE FOR CLEARANCE BASED ON HEIGHT OF REDUCED PRESSURE ASSEMBLY.
7. ENCLOSURE SHALL BE CENTERED OVER THE COMPLETED REDUCED PRESSURE BACKFLOW ASSEMBLY.
8. POWER SHALL BE INSTALLED IN SCHEDULE 40 RIGID CONDUIT PER NEC REQUIREMENTS.
9. ALL CONCRETE SHALL HAVE 3,300 PSI COMpressive STRENGTH @ 28 DAYS.
10. HOT BOX DRAINAGE OPENINGS SHALL NOT BE OBstructED BY GRADING OR PLANTINGS.
11. RPBA SHALL BE INSTALLED A MIN. OF 12 INCHES ABOVE THE 100-YEAR FLOOD ELEVATION AS DETERMINED BY FEMA.

12. FINISH GRADE TO SLOPE AWAY FROM ENCLOSURE SLAB AT 2% MIN. SLOPE.

LAST REVISION DATE: AUG 2018

3” REDUCED PRESSURE ASSEMBLY

(NTS)

CRESWELL, OR

DETAIL NO. 543
MODEL NO. HB4E AS MANUFACTURED BY HOT BOX (1-800-736-0238) ANCHOR ENCLOSURE TO CONCRETE PAD PER MANUFACTURER'S REQUIREMENTS.

NOTE: VERIFY VAULT SIZE FOR OTHER MODEL BF DEVICES.

4" FEBCO 860 REDUCED PRESSURE ASSEMBLY (OR APPROVED EQUAL) WITH 2 OS&Y GATE VALVES (TYP) 90° VERT MJ BEND W/MEGALUGS (TYP EACH SIDE) STANDON MODEL S89 FLANGE SUPPORT OR APPROVED EQUAL (TYP).

6" MIN. COMPACTED GRANULAR BASEROCK PROVIDE EXPANSION JOINT FILLER AT PIPE PENETRATIONS (TYP) ELECTRICAL CONDUIT TO POWER SOURCE. COORDINATE AS REQ'D TO PROVIDE 120V POWER.

NOTES:
1. RPA- REDUCED PRESSURE ASSEMBLY
2. INSTALLATION OF RPA & ENCLOSURE SHALL MEET OREGON HEALTH AUTHORITY, DRINKING WATER SERVICES REQUIREMENTS.
3. CONTRACTOR SHALL HAVE RPA TESTED AND CERTIFIED PRIOR TO APPROVAL BY THE CITY.
4. RPA & ENCLOSURE SHALL CONFORM TO REQUIREMENTS OF PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
5. ENCLOSURE SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL OTHER VAULTS OR STRUCTURES.
6. VERIFY ENCLOSURE DIMENSIONS ARE ADEQUATE FOR CLEARANCE BASED ON HEIGHT OF REDUCED PRESSURE ASSEMBLY.
7. ENCLOSURE SHALL BE CENTERED OVER THE COMPLETED REDUCED PRESSURE ASSEMBLY.
8. POWER SHALL BE INSTALLED IN SCHEDULE 40 RIGID CONDUIT PER NEC REQUIREMENTS.
9. 'E' INDICATES THE ELECTRICAL RECEPTACLE. IT SHALL BE MOUNTED A MIN. OF 18" ABOVE THE SLAB.
10. ALL CONCRETE SHALL HAVE 3,300 PSI COMPRESSIVE STRENGTH @ 28 DAYS.

11. HOT BOX DRAINAGE OPENINGS SHALL NOT BE OBSTRUCTED BY GRADING OR PLANTINGS.
12. RPA SHALL BE INSTALLED A MIN. OF 12 INCHES ABOVE THE 100-YEAR FLOOD ELEVATION AS DETERMINED BY FEMA.

LAST REVISION DATE: AUG 2018 STANDARD 4" REDUCED PRESSURE ASSEMBLY (NTS) CRESWELL, OR 544
LOOP TONING WIRE UP INTO VALVE BOX, TYP (DTL 501)

MJ CAP W/RETAINER GLAND, TAPPED TO FIRE SERVICE SMALLER THAN 4" FOR BACKFLOW DEVICE INSIDE BUILDING (EXTEND TO BACKFLOW DCDA VAULT OTHERWISE).

NOTE: PER ORS 92.044(7), FIRE LINE MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT.

FIRE SERVICE LINE TO DCDA DEVICE INSIDE BUILDING.

STAMP 2" TALL "W" IN TOP OF CURB & GUTTERPAN AT POINT OF CROSSING (TYP)

MJ CAP W/RETAINER GLAND, TAPPED TO FIRE SERVICE SMALLER THAN 4" FOR BACKFLOW DEVICE INSIDE BUILDING (EXTEND TO BACKFLOW DCDA VAULT OTHERWISE).

NOTE: FIRE SERVICE LINE TO BE PERPENDICULAR FROM MAINLINE TO PROPERTY LINE OR EASEMENT BOUNDARY.

WATER MAINLINE SHOWN UNDER SIDEWALK AS EXAMPLE ONLY. USE SAME CONFIGURATION FOR WATERLINES ALONG OTHER REQUIRED ALIGNMENTS.

MATERIALS

1. FLG X MJ RESILIENT WEDGE GATE VALVE (PER AWWA C-509), 4" DIA. MINIMUM OR FIRE SERVICE SIZE, WHICHERVER IS LARGER. VALVE TO BE EPOXY COATED PER AWWA C-550. PROVIDE APPROVED RETAINER GLAND ON MJ JOINT.

2. CLASS 52 DUCTILE IRON PIPE REQUIRED WITHIN RIGHT-OF-WAY OR EASEMENT BOUNDARY OR TO DCDA VAULT (WHERE DCDA NOT INSTALLED IN BUILDING), TYP. 4" DIA OR FIRE SERVICE SIZE, WHICHERVER IS LARGER. FIELD-LOK STYLE GASKETS REQUIRED ON ALL PUSH-ON JOINTS BETWEEN MAINLINE VALVE AND DCDA VAULT.

NOTES

1. SUBSTITUTES FOR ANY MATERIAL SHOWN SHALL BE APPROVED BY THE CITY ENGINEER.

2. ALL PIPE AND BACKFILL ZONES SHALL BE BACKFILLED USING 3/4" MINUS GRANULAR MATERIAL AND COMPACTED TO 92% MAX DENSITY AS DETERMINED BY ASHTO T-180.

3. FIRE SERVICE LINE BEYOND PROPERTY OR EASEMENT LINE (TO BACKFLOW DEVICE) TO BE NFPA & NSF 61 APPROVED.

4. CUSTOMER SHALL INSTALL AN APPROVED BACKFLOW PREVENTION DEVICE ON PRIVATE PROPERTY AT A LOCATION APPROVED BY PUBLIC WORKS.
1. DCDA – DOUBLE CHECK DETECTOR ASSEMBLY
2. DCDA SHALL CONFORM TO REQUIREMENTS OF PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
3. DCDA & VAULT INSTALLATION SHALL MEET REQUIREMENTS OF OREGON HEALTH AUTHORITY, DRINKING WATER SERVICES (DWS).
4. CONTRACTOR SHALL HAVE DCDA TESTED AND CERTIFIED PRIOR TO ACCEPTANCE BY OWNER.
5. FDC SHALL NOT EXIT THROUGH THE TOP OF THE VAULT.
6. ALL PIPE OPENINGS SHALL BE SEALED WITH NON-SHRINK WATERPROOF SEAL.
7. BENDS, CROSSES AND TEES SHALL NOT BE INSTALLED WITHIN 5 FEET OF THE INSIDE VAULT WALL.
8. ALL VAULTS SHALL MEET OR EXCEED ASTM ALUMINUM HATCH (SEE NOTE 14).
9. SUMP PUMP WITH POWER SUPPLY SHALL BE INSTALLED UNLESS OTHERWISE APPROVED BY PUBLIC WORKS.
10. SUMP PUMP POWER SHALL BE INSTALLED IN SCHEDULE 40 RIGID CONDUIT PER NEC.
11. THRUST COLLAR CONCRETE SHALL BE CAST-IN-PLACE CONCRETE THRUST COLLAR WITH RETAINER GLAND CENTERED IN CONCRETE (TYPICAL BOTH ENDS).
12. THRUST COLLAR CONCRETE SHALL BE 3300 PSI @ 28 DAYS. REBAR TO BE ASTM A-615 GRADE 60.
13. PROVIDE REMOTE READER (TOUCH READ HEAD) FOR DETECTOR LOOP METER PER LOCAL JURISDICTION REQUIREMENTS, MOUNTED ON HINGE EDGE OF HATCH.
14. ALUMINUM ANGLE FRAME HATCH (3' x 5' MIN) SHALL BE BY SYRACUSE CASTINGS WEST OR APPROVED EQUAL (SAND BLOATED NON-SLIP). (1) TO BE 300 PSF PEDESTRIAN RATED EXK0–3666–RPC WHERE LID IS NOT MIN. OF 9’ ABOVE GRADE. (2) TO BE H–20 RATED ECH0–3666–RPP IF LID IS LESS THAN 9’ ABOVE GRADE, OR IN TRAFFIC AREA.
15. OSHA APPROVED GALVANIZED STEEL LADDER & ALUMINUM LADDER SAFETY EXTENSION.
16. PROVIDE BALL DRIP DRAIN VALVE TO DRAIN FDC, EITHER ON CHECK VALVE OR WITH HORIZONTAL TAPPING SADDLE.

NOTES:

1. PROVIDE FORWARD FLOW TEST PORT PER DTL 550 UNLESS ALT. LOCATION APPROVED.
2. 4" CL. 52 D.I. FLG X MJ ADAPTER W/RETAINER GLAND
3. 4" CL. 52 D.I. PIPE TO FINISH GRADE
4. 4" CL. 52 D.I. PIPE TO FINISH GRADE
5. FDC PER FIRE DEPT. REQUIREMENTS, LOCATE AS SHOWN ON PLANS.
6. 4" GLOBE OR WAFFLE STYLE SILENT CHECK VALVE W/BALL DRIP VALVE.
7. POWER CONDUIT FOR SUMP PUMP & CONTROL CONNECT TO CONNECT OS&Y VALVE TEMPER SWITCHES TO FIRE ALARM CONTROL UNIT.
8. OSHA APPROVED GALVANIZED STEEL LADDER 6'6"-WA (5'6" x 70' ID) W/H–20 RATED LID, OR EQUIVALENT. CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO ORDERING & PROVIDE RISER IF REQUIRED.
9. WHERE OTHER PIPE TYPES ARE SHOWN ON DWGS FOR FIRE LINE(S), PROVIDE COUPLINGS AS REQUIRED AT TRANSITION OUTSIDE OF VAULT.
10. 2" BALL CHECK VALVE MEGAFLANGE (TYP. BOTH ENDS)
11. FIRE DEPT. CONNECTION SET MIN. 36" ABOVE GRADE UNLESS OTHERWISE REQUIRED BY FIRE DEPT.
12. 2" SCH. 40 PVC SUMP PUMP DISCHARGE LINE. PLUMBS TO FACE OF CURB OR OTHER APPROVED DISPOSAL POINT. PROVIDE 30" MINIMUM COVER.
13. 6" MIN. CLEARANCE WHEN O.S.&Y VALVE IS FULLY OPEN
14. 2" MEGAFLANGE (TYP. BOTH ENDS)
15. MIN 5 GPM SUMP PUMP WITH POWER SUPPLY. CONTRACTOR TO COORDINATE WITH BUILDING CONTRACTOR TO CONNECT SUMP PUMP TO BUILDING POWER.
16. JOE 589 FLANGE SUPPORT OR APPROVED EQUAL (TYP.)
1. DCDA – DOUBLE CHECK DETECTOR ASSEMBLY
2. DCDA SHALL CONFORM TO REQUIREMENTS OF PUBLIC/Private Agencies Having Jurisdiction.
3. DCDA & VAULT INSTALLATION SHALL MEET REQUIREMENTS OF OREGON HEALTH AUTHORITY, DRINKING WATER SERVICES (DWS).
4. CONTRACTOR SHALL HAVE DCDA TESTED CERTIFIED PRIOR TO ACCEPTANCE BY OWNER.
5. FDC SHALL NOT EXIT THROUGH THE TOP OF THE VAULT. ALL PIPE OPENINGS SHALL BE SEALED WITH NON-SHRINK WATERTIGHT GROUT.
6. ALL PIPE OPENINGS SHALL BE SEALED WITH NON-SHRINK WATERTIGHT GROUT.
7. BENDS, CROSSES AND TEES SHALL NOT BE INSTALLED WITHIN 5 FEET OF THE OUTSIDE WALL V. ALL VAULTS SHALL MEET OR EXCEED ASTM C-857. ALL VAULT CONCRETE TO BE 4500 PSI @ 28 DAYS. REBAR TO BE ASTM A-615 GRADE 60.
8. ALL VAULTS SHALL MEET OR EXCEED ASTM C-857. ALL VAULT CONCRETE TO BE 4500 PSI @ 28 DAYS. REBAR TO BE ASTM A-615 GRADE 60.
9. SUMP PUMP WITH POWER SUPPLY SHALL BE INSTALLED UNLESS OTHERWISE APPROVED BY PUBLIC WORKS.
10. TIDE COLLAR CONCRETE SHALL BE 3300 PSI • DRINKING WATER SERVICES (DWS).
11. SUMP PUMP POWER SHALL BE INSTALLED IN SCHEDULE 40 RIGID CONDUIT PER NEC 333-061-0071.3. f).
12. THRUST COLLAR CONCRETE SHALL BE 3300 PSI • DRINKING WATER SERVICES (DWS).
13. PROVIDE REMOTE READER (TOUCH READ HEAD) FOR DETECTOR LOOP METER PER LOCAL JURISDICTION REQUIREMENTS, MOUNTED ON HINGE EDGE OF HATCH.
14. ALUMINUM ANGLE FRAME HATCH (30" x 56" MIN) SHALL BE BY SYRACUSE CASTINGS WEST OR APPROVED EQUAL (SAND BLOWED NON-SLIP). (1) TO BE 300 PSI PEDESTRIAN RATED EXKD-3666-RPC WHERE LID IS SET MIN. OF 9" ABOVE GRADE. (2) TO BE H-20 RATED EXKD-3666-RPC IF LID IS LESS THAN 9" ABOVE GRADE, OR IN TRAFFIC AREA.
15. OSHA APPROVED GALVANIZED STEEL LADDER & ALUMINUM LADDER SAFETY EXTENSION.
16. PER OTC 903.4, INSTALL APPROVED TAMPER SWITCH ON BOTH OS&Y VALVES IN VAULT, WIRED TO A LISTED FIRE ALARM CONTROL UNIT, UNLESS EXEMPTION IS GRANTED BY FIRE DEPT.
17. THRUST COLLAR CONCRETE SHALL BE 3300 PSI • DRINKING WATER SERVICES (DWS).
18. ALL VAULTS SHALL MEET OR EXCEED ASTM C-857. ALL VAULT CONCRETE TO BE 4500 PSI @ 28 DAYS. REBAR TO BE ASTM A-615 GRADE 60.
19. PROVIDE COUPLINGS AS REQUIRED AT TRANSITION OUTSIDE OF VAULT.
20. FIRE DEPT. CONNECTION SET MIN. 36" ABOVE GRADE UNLESS OTHERWISE REQUIRED BY FIRE DEPT.
21. O.S.&Y. VALVE IS FULLY OPEN 9" MIN. CLEARANCE WHEN O.S.&Y. VALVE IS FULLY OPEN.
22. PROVIDE COUPLINGS AS REQUIRED AT TRANSITION OUTSIDE OF VAULT.
23. FIRE DEPT. CONNECTION SET MIN. 36" ABOVE GRADE UNLESS OTHERWISE REQUIRED BY FIRE DEPT.
24. 4" SCH, 80 GALV. STEEL NIPPLE 4" GALV. STEEL COMPANION FLANGE 4" SCH, 80 GALV. STEEL NIPPLE
25. 2" SDH 40 PVC SUMP PUMP DISCHARGE LINE PLUMB TO FACE OF CURB OR OTHER APPROVED DISPOSAL POINT. PROVIDE 30" MINIMUM COVER.
26. 6" MIN. CLEARANCE WHEN O.S.&Y. VALVE IS FULLY OPEN.
27. 2" SCH 80 GALV. STEEL NIPPLE 4" SCH, 80 GALV. STEEL NIPPLE 4" SCH, 80 GALV. STEEL NIPPLE
28. POWER CONDUIT FOR SUMP PUMP & CONTROL CONDUIT TO CONNECT OS&Y VALVE TAMPER SWITCHES TO FIRE ALARM CONTROL UNIT. (SEE ELEC. PLANS, 30" TYP COVER). 2" SCH 80 GALV. STEEL NIPPLE 4" SCH, 80 GALV. STEEL NIPPLE 4" SCH, 80 GALV. STEEL NIPPLE
29. 6" MIN. CLEARANCE WHEN O.S.&Y. VALVE IS FULLY OPEN.
30. 4" SCH, 80 GALV. STEEL NIPPLE 4" SCH, 80 GALV. STEEL NIPPLE 4" SCH, 80 GALV. STEEL NIPPLE
31. 6" MIN. CLEARANCE WHEN O.S.&Y. VALVE IS FULLY OPEN.
32. 6" MIN. CLEARANCE WHEN O.S.&Y. VALVE IS FULLY OPEN.
FDC RISER WHERE REQUIRED.

PROVIDE ADDITIONAL PIPE SUPPORT UNDER VALVE IF FDC IS NOT INSTALLED AT VAULT.

ADAPTER W/4¼" HYDRANT THREAD (NST) TO CONNECT HOSE FOR FORWARD FLOW TEST PER NFPA 13.10.10.2.5.1 (INITIAL ACCEPTANCE TEST) & NFPA 25.13.6.2.1 (REQ'D SUBSEQUENT ANNUAL TESTING), SEE SECTION A-A.

VERTICAL NRS GATE VALVE (FLxFL) W/ HANDWHEEL

FIRE LINE FROM CITY WATER SUPPLY

VERTICAL RESILIENT SEAT GATE VALVE TO FORWARD FLOW TEST PORT

SINGLE CHECK VALVE W/BALL DRIP & PIPE FROM FDC (IF FDC REQUIRED AT VAULT).

INSTALL BLIND FLANGE ON TEE OUTLET IF FDC NOT INSTALLED AT VAULT.

PIPE SUPPORT UNDER VALVE IF FDC NOT INSTALLED AT VAULT.

SECTION A-A

NOTES:

1. THE "FORWARD FLOW TEST PORT" SHALL BE INSTALLED IN THE DCDA VAULT AS SHOWN AND SPECIFIED BY THIS DETAIL, UNLESS AN ALTERNATE PERMANENT "FORWARD FLOW TEST PORT" LOCATION IS APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVE AND AN AUTHORIZED FIRE DEPT REPRESENTATIVE, OR IF A PRIVATE FIRE HYDRANT DOWNSTREAM OF THE DCDA VAULT IS DESIGNATED AS THE REQUIRED "FORWARD FLOW TEST PORT".

2. CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE FIRE SPRINKLER SYSTEM DESIGNER/INSTALLER TO VERIFY THE FLOW RATE REQUIRED FOR THE "FORWARD FLOW TEST" OF THE BACKFLOW DEVICE, AND SHALL COORDINATE TO ENSURE THAT ALL HOSE & FLOW MEASUREMENT EQUIPMENT (HOSE MONSTER OR EQUAL) IS PROVIDED AS REQUIRED TO CONDUCT THE ACCEPTANCE "FORWARD FLOW TEST" AS REQUIRED BY NFPA 13.10.10.2.5.1.

3. ALL COMPONENTS OF THE FORWARD FLOW TEST PORT (EXCLUDING THE FIRE HOSES & FLOW MEASUREMENT EQUIPMENT) SHALL REMAIN IN PLACE TO ALLOW SUBSEQUENT "FORWARD FLOW TESTS" TO BE CONDUCTED WITHOUT ANY SYSTEM MODIFICATIONS (IE. ANNUAL FLOW TESTS AS REQUIRED PER NFPA 25.13.6.2.1).

4. CONFORM TO ALL OTHER REQUIREMENTS OF APPLICABLE DOUBLE CHECK DETECTOR ASSEMBLY DETAIL(S), NOTES & SPECIFICATIONS.
F.D.C. PER FIRE DEPT.
REQUIREMENTS, LOCATE AS SHOWN ON PLANS.
SET MIN. 36" ABOVE GRADE UNLESS OTHERWISE REQUIRED BY FIRE DEPT.

SCH 80 GALV. STEEL FDC RISER

MH, VAULT OR BOX STRUCTURE OVER CHECK VALVE OR BALL-DRIP VALVE, SEE NOTE 1.
CHECK VALVE AND/OR BALL DRIP VALVE TO BE EXPOSED & ACCESSIBLE FOR INSPECTION & MAINTENANCE.

GLOBE OR WAFER STYLE SILENT CHECK VALVE OR APPROVED EQUAL.
MEGA FLANGE ADAPTER OR EQUAL (2 PL)

CONCRETE THRUST COLLAR W/ RETAINER GLAND (PLASTIC WRAPPED) CENTERED IN CONCRETE, UNLESS FDC PIPE FULLY RESTRAINED

FDC LINE CHECK VALVE & BALL DRIP VALVE TO BE INSTALLED IN AN ACCESSIBLE LOCATION PER NFPA 13, A.17.2.5&6.
CONTRACTOR TO VERIFY THAT BALL DRIP VALVE INSTALLED IS LISTED FOR THE ORIENTATION USED (VERTICAL TYP).

SCH 80 GALV. STEEL FDC RISER

MANHOLE FRAME AND COVER

PROVIDE BALL DRIP DRAIN VALVE, CONNECTED TO CHECK VALVE (UNLESS CHECK VALVE IS INSIDE BUILDING), OR TO SERVICE SADDLE ON FDC LINE-

FLOW

SLOPE SHELF TO DRAIN

DRAIN LINE TO STORM SYSTEM OR TO DAYLIGHT

NOTES:
1. INSTALL 48" PRECAST MANHOLE PER DETAIL 402, UNLESS OTHER APPROVED VAULT OR BOX IS SHOWN OR NOTED ON DWGS.
2. ALL PIPE OPENINGS SHALL BE SEALED WITH NON-SHRINK WATERTIGHT GROUT.
3. WHERE REQUIRED, THRUST COLLAR CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
4. IF AN FDC LINE CHECK VALVE IS PROVIDED INSIDE BUILDING, AN EXTERIOR FDC LINE CHECK VALVE IS NOT REQUIRED UNLESS OTHERWISE DIRECTED IN WRITING BY FIRE CODE OFFICIAL. BALL DRIP DRAIN VALVE SHALL BE INSTALLED ON CHECK VALVE OR AT LOW POINT ON FDC LINE (DETAIL 562) TO DRAIN FDC LINE BETWEEN CHECK VALVE & FDC RISER.
5. PER NFPA 13, A10.4.1, 36" MIN COVER REQUIRED FOR "WET" FDC LINES (ANY PORTION OF FDC LINE WHICH REMAINS FILLED WHEN NOT IN USE). COVER MAY BE REDUCED TO 12" MIN ON "DRY" FDC LINE WHICH IS DRAINED COMPLETELY WHEN NOT IN USE.
6. THIS DETAIL DOES NOT SUPERCEDE REQUIREMENTS UNDER THE OREGON FIRE CODE, NFPA STANDARDS OR DIRECTION FROM FIRE CHIEF.

BELOW GRADE CHECK VALVE & BALL DRIP VALVE, IN CLOSE BOTTOM DRAIN STRUCT

(NTS)

CRESWELL, OR

560

LAST REVISION DATE: APR 2019

STANDARD
F.D.C. PER FIRE DEPT. REQUIREMENTS, LOCATE AS SHOWN ON PLANS. SET MIN. 36” ABOVE GRADE UNLESS OTHERWISE REQUIRED BY FIRE DEPT.

- F.D.C. LINE CHECK VALVE & BALL DRIP VALVE TO BE INSTALLED IN AN ACCESSIBLE LOCATION PER NFPA 13, 8.17.2.5&6.
- CONTRACTOR TO VERIFY THAT BALL DRIP VALVE INSTALLED IS LISTED FOR THE ORIENTATION USED (VERTICAL TYP).

SCH 80 GALV. STEEL FDC RISER

MH, VAULT OR BOX STRUCTURE OVER CHECK VALVE OR BALL—DRIP VALVE, SEE NOTE 1. CHECK VALVE AND/OR BALL DRIP VALVE TO BE EXPOSED & ACCESSIBLE FOR INSPECTION & MAINTENANCE.

GLOBE OR WAFER STYLE SILENT CHECK VALVE OR APPROVED EQUAL.

MEGA FLANGE ADAPTER OR EQUAL (2 PL)

12" MIN COMPACTED OPEN GRADED GRANULAR BEDDING OVER GEOTEXTILE DRAINAGE FABRIC

NOTES:
1. INSTALL 48" PRECAST MANHOLE PER DETAIL 402, UNLESS OTHER APPROVED VAULT OR BOX IS SHOWN OR NOTED ON DWGS.
2. ALL PIPE OPENINGS SHALL BE SEALED WITH NON—SHRINK WATERTIGHT GROUT.
3. WHERE REQUIRED, THRUST COLLAR CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
4. IF AN F.D.C. LINE CHECK VALVE IS PROVIDED INSIDE BUILDING, AN EXTERIOR F.D.C. LINE CHECK VALVE IS NOT REQUIRED UNLESS OTHERWISE DIRECTED IN WRITING BY FIRE CODE OFFICIAL. BALL DRIP DRAIN VALVE SHALL BE INSTALLED ON CHECK VALVE OR AT LOW POINT ON F.D.C. LINE (DETAIL 562) TO DRAIN F.D.C. LINE BETWEEN CHECK VALVE & F.D.C. RISER.
5. PER NFPA 13, A10.4.1, 36" MIN COVER REQUIRED FOR "WET" F.D.C. LINES (ANY PORTION OF F.D.C. LINE WHICH REMAINS FILLED WHEN NOT IN USE). COVER MAY BE REDUCED TO 12" MIN ON "DRY" F.D.C. LINE WHICH IS DRAINED COMPLETELY WHEN NOT IN USE.
6. THIS DETAIL DOES NOT SUPERCEDE REQUIREMENTS UNDER THE OREGON FIRE CODE, NFPA STANDARDS OR DIRECTION FROM FIRE CHIEF.
F.D.C. PER FIRE DEPT. REQUIREMENTS, LOCATE AS SHOWN ON PLANS. SET MIN. 36” ABOVE GRADE UNLESS OTHERWISE REQUIRED BY FIRE DEPT.

GALV. STEEL FDC RISER PER OFC

SERVICE SADDLE WITH BALL DRIP VALVE (AT LOW POINT ON FDC SUPPLY LINE), ANGLE DOWN TO COMPLETELY DRAIN FDC LINE

METER BOX OR IRRIGATION CONTROL BOX (2 REQ'D, 13”x24” TYP SIZE) SEE NOTE 3

FDC SUPPLY LINE PER OFC

FDC LINE TO BLDG

SLOPE FROM BLDG TO BALL DRIP DRAIN

12” MIN OPEN GRADED GRANULAR DRAIN ROCK OVER GEOTEXTILE DRAINAGE FABRIC

NOTES:
1. INSTALL BALL-DRIP DRAIN VALVE & BOX AT LOW POINT IN FDC LINE PROFILE (IE. BALL DRIP VALVE SHALL BE CONFIGURED TO DRAIN ENTIRE FDC PIPE BETWEEN FDC RISER & BUILDING WHEN FDC IS NOT IN USE).
2. CONFIGURATION SHOWN IS BASED ON FDC LINE CHECK VALVE INSIDE BUILDING (IE. FDC LINE "DRY" WHEN NOT IN USE).
3. UNLESS OTHERWISE REQUIRED TO ADDRESS UTILITY CONFLICTS OR OTHER ISSUES, COVER DEPTH FOR "DRY" FDC LINE SHALL BE 12” MIN AT ALL LOCATIONS.
4. BALL DRIP VALVE SHALL BE ACCESSIBLE IN BOX FOR INSPECTION & MAINTENANCE AS SHOWN (PROVIDE LARGER BOXES AS NECESSARY TO ACCOMPLISH THIS).
5. THIS DETAIL DOES NOT SUPERCEDE REQUIREMENTS UNDER THE OREGON FIRE CODE, NFPA STANDARDS OR DIRECTION FROM FIRE CHIEF.
WATERLINE PRESSURE TEST REPORT

<table>
<thead>
<tr>
<th>Project Location:</th>
<th>Project Name:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspector: (Print)</td>
<td>Waterline to be tested.</td>
<td></td>
</tr>
<tr>
<td>From Station:</td>
<td>To Station:</td>
<td></td>
</tr>
</tbody>
</table>

Verify that all in-line valves, including hydrant mainline valves, are open?  Yes / No

Verify that all corp stops are open?  Yes / No

Verify that pressure gauge is mounted at high point of line to be tested?  Yes / No

If no, correct for elevation difference (ie. add 0.433 psi per foot elevation difference).

System Static Pressure (psi):  
Starting Pressure (psi):  (greater of 150 psi or 1.5 times static)  
Ending Pressure (psi):

Test Length:  (2 hours minimum)  
Starting Time:  
Ending Time:

Volume Required to Reach Initial Test Pressure (gal):  
Allowable Leakage (gal):  (2 times table value below)  
Measured Leakage (gal):

TEST RESULTS:  Pass / Fail

ALLOWABLE LEAKAGE PER 1,000 FEET OF PIPELINE - gph

<table>
<thead>
<tr>
<th>Test Pressure psi</th>
<th>NOMINAL PIPE DIAMETER - in.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>200</td>
<td>0.32</td>
</tr>
<tr>
<td>175</td>
<td>0.30</td>
</tr>
<tr>
<td>150</td>
<td>0.28</td>
</tr>
</tbody>
</table>

If the pipeline under test contains various diameters, the allowable leakage shall be the sum of the allowable leakage for each size. No additional leakage allowance will be given for fire hydrant assemblies or valves.

Allowable leakage based on:  \( L = SD(P)^{1/3}/133,200 \)

Where:
- \( L \) = allowable leakage, in gallons per hour
- \( S \) = length of pipe tested, in feet
- \( D \) = nominal diameter of the pipe, in inches
- \( P \) = test pressure during the leakage test, in psig

Regardless of leakage, maximum pressure drop during test period shall not exceed 5 psi/hour.

TEST PROCEDURE

1. Apply hydrostatic pressure by pumping water from an auxiliary supply basin. Accurately determine the amount of water required to reach the initial test pressure by refilling the supply basin with a calibrated container following pressurization of pipeline.
2. Monitor test pressure for 2 hour period.
3. At the completion of the test period, re-pressurize the pipeline by pumping water from the auxiliary supply basin. Accurately determine the amount of water required to reach the test pressure by refilling the supply basin with a calibrated container following pressurization of pipeline. If the measured leakage is less than the allowable leakage, the test is successful.
EXIST. PUBLIC ROAD OR APPROVED ACCESS POINT

GRADE 25' MINIMUM OF CONSTRUCTION ENTRANCE TO DRAIN AWAY FROM STREET. GRADE ADJACENT AREAS TO DRAIN AWAY FROM TEMPORARY CONSTRUCTION ENTRANCE.

PLACE 3"-0 GRANULAR MATERIAL OVER 8-OUNCE NON-WOVEN GEOTEXTILE FABRIC AS FOLLOWS:

DRY WEATHER ACCESS
14-INCH MIN. DEPTH OVER COMPACTED SUBGRADE & FABRIC

WET WEATHER ACCESS
24-INCH MIN. DEPTH OVER UNDISTURBED SUBGRADE & FABRIC

CONSTRUCTION NOTES:
1. THE AREA OF THE CONSTRUCTION ENTRANCE SHALL BE STRIPPED OF ALL TOPSOIL, VEGETATION, ROOTS, AND OTHER NON-COMPACTABLE MATERIAL.
2. SUBGRADE SHALL BE COMPACTED AND PROOFROLLED PRIOR TO PLACEMENT OF GRANULAR MATERIAL. FAILURE TO PASS PROOFROLL WILL REQUIRE USE OF WET WEATHER SECTION.
3. FAILURE OR PUMPING OF THE DRY WEATHER SECTION WILL REQUIRE REMOVAL OF THE GRANULAR MATERIAL AND INSTALLATION OF THE WET WEATHER SECTION.

MAINTENANCE NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOW OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH 2-INCH STONE AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEANOUT OF STRUCTURES USED TO TRAP SEDIMENT.
2. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED FROM VEHICLES OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.
3. ALL TRUCKS TRANSPORTING SATURATED SOILS SHALL BE WELL SEALED. WATER DRIPPAGE FROM TRUCKS MUST BE REDUCED TO 1 GALLON PER HOUR PRIOR TO LEAVING THE SITE.
ANGLE BOTH ENDS OF FILTER FABRIC
FENCE TO ASSURE SOIL IS TRAPPED.

SILT FENCE NOTES:
1. BURY BOTTOM OF FILTER FABRIC 6"
VERTICALLY BELOW FINISHED GRADE.
2. TRENCH TO BE DUG WITH DITCH—WITCH,
BY HAND OR OTHER METHOD AS
REQUIRED TO MINIMIZE WIDTH.
3. BACKFILL & COMPACT NATIVE SOIL
IN TRENCH AFTER FENCE INSTALLATION.
4. STITCHED LOOPS TO BE INSTALLED
TO THE UPHILL SIDE OF THE FENCE.

FILTER FABRIC MATERIAL
36" WIDE ROLLS.

FILTER FABRIC MATERIAL

TOP VIEW
INTERLOCK 2"x2"
POSTS AND ATTACH.

FILTER FABRIC

USE STITCHED LOOPS
OVER 2"x2" POSTS—

SIDE VIEW

6" MAXIMUM
TRENCH WIDTH

MAINTENANCE NOTES:
1. SEDIMENT BARRIERS SHALL BE MAINTAINED UNTIL
UP—SLOPE AREA IS PERMANENTLY STABILIZED.
2. AT NO TIME SHALL MORE THAN ONE FOOT OF
SEDIMENT BE ALLOWED TO ACCUMULATE BEHIND
SEDIMENT FENCES OR BIOFILTER BAGS.
3. NEW SEDIMENT BARRIERS SHALL BE INSTALLED UPHILL
AS REQUIRED TO CONTROL SEDIMENT TRANSPORT.

FRONT VIEW

4'
6'
18''
2'-6''
6' MAX. SPACING
6" MAXIMUM TRENCH WIDTH

LAST REVISION DATE: APRIL 2014
JO # STANDARD

SEDIMENT BARRIERS
(NTS)
CRESWELL, OR
DETAIL NO.
611
PROFILE
PLACE STRAW WATTLES PARALLEL TO SLOPE CONTOURS

SECTION
STAKE SPACING 4' MAX.

FLOW
FLOW
FLOW

BARRIER SPACING FOR GENERAL APPLICATION

INSTALL PARALLEL TO CONTOURS AS FOLLOWS

<table>
<thead>
<tr>
<th>SLOPE RATIO</th>
<th>MAXIMUM SPACING ON SLOPE BETWEEN WATTLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0% OR FLATTER</td>
<td>50' O.C.</td>
</tr>
<tr>
<td>10.1% TO 20.0%</td>
<td>25' O.C.</td>
</tr>
<tr>
<td>20.1% TO 30.0%</td>
<td>10' O.C.</td>
</tr>
<tr>
<td>30.1% OR STEEPER</td>
<td>5' O.C.</td>
</tr>
</tbody>
</table>

NOTES:
1. ALL MATERIAL SHALL CONFORM TO OSHD STANDARD SPECIFICATIONS, 1996 EDITION.
2. SEDIMENT BARRIERS SHALL BE MAINTAINED UNTIL UP-SLOPE AREA IS PERMANENTLY STABILIZED.
3. AT NO TIME SHALL SEDIMENT BE ALLOWED TO ACCUMULATE ABOVE THE TOP OF THE STRAW WATTLE.
4. NEW SEDIMENT BARRIERS SHALL BE INSTALLED UPHILL AS REQUIRED TO CONTROL SEDIMENT TRANSPORT.

LAST REVISION DATE: JAN 2014

STRAW WATTLE SEDIMENT BARRIER

CRESWELL, OR 612
MAY BE USED SHORT TERM W/UTILITY WORK AND WITH PHASING OF DEVELOPMENT.

CURB INLET C.B.

AREA DRAIN

FLOW

FLOW

DITCH INLET C.B.

MAINTENANCE NOTES:

1. SEDIMENT BARRIERS SHALL BE MAINTAINED UNTIL UP-SLOPE AREA IS PERMANENTLY STABILIZED.

2. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE BEHIND SEDIMENT FENCES OR BIOFILTER BAGS.

3. NEW SEDIMENT BARRIERS SHALL BE INSTALLED UPHILL AS REQUIRED TO CONTROL SEDIMENT TRANSPORT.

LAST REVISION DATE:
APR 2014

INLET SEDIMENT CONTROL

(NTS)

CRESWELL, OR 613
BIOFILTER BAGS SHALL BE STAKED USING (2) 1\"x2\"x3\' WOOD STAKES PER BAG OR APPROVED EQUAL.

MAINTENANCE NOTES:

1. SEDIMENT BARRIERS SHALL BE MAINTAINED UNTIL UP-SLOPE AREA IS PERMANENTLY STABILIZED.
2. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE BEHIND BIOFILTER BAGS.
3. NEW SEDIMENT BARRIERS SHALL BE INSTALLED UPHILL AS REQUIRED TO CONTROL SEDIMENT TRANSPORT.
4. PT. 'A' SHALL BE 6" MIN. HIGHER THAN PT. 'B'.

PLAN VIEW

FLOW

6\" OVERLAP (TYP.)

PT. 'A'

PT. 'B'

SECTION A-A

LAST REVISION DATE:
APR 2014

DITCH AND SWALE PROTECTION

(NTS)

CRESWELL, OR

DETAIL NO. 614
NOTES:
1. EMPTY SILT SACK AS NECESSARY.
2. SILT SACK SEDIMENT CONTROL DEVICE AS MANUFACTURED BY ACF ENVIRONMENTAL AND SUPPLIED BY ACF WEST (503) 771-5115 OR APPROVED EQUAL.

LAST REVISION DATE:
JAN 2014

SILT SACK INLET DETAIL
(NTS)
CRESWELL, OR 615
CWA INSTALLATION NOTES:
1. SEE DRAWINGS FOR CWA INSTALLATION LOCATION.
2. DO NOT LOCATE WASHOUT AREA WITHIN 200' OF ANY NATURAL DRAINAGE WAY.
3. THE CWA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.
4. VEHICLE TRACKING PAD SHALL BE SLOPED 5% TOWARDS THE CWA.

CWA MAINTENANCE NOTES:
1. INSPECT BMP'S EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION.
2. THE CWA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS ACCUMULATED IN PIT SHALL BE REMOVED ONCE THE MATERIALS HAVE REACHED A DEPTH OF 18".
3. CONCRETE WASHOUT WATER, WASTED PIECES OF CONCRETE, AND ALL OTHER DEBRIS IN THE PIT SHALL BE REMOVED FROM THE JOB SITE.
4. THE CWA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT IS PLACED.
5. WHEN THE CWA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, SEED AND MULCH OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.
PLASTIC SHEETING.

MINIMUM 12" OVERLAP OF SEAMS.

BARRIER REQUIRED @ TOE OF SLOPE.

STOCKPILE DETAIL

NOTES:
1. MINIMUM 12" OVERLAP OF ALL SEAMS REQUIRED.
2. SEDIMENT BARRIER REQUIRED @ TOE OF STOCK PILE.
3. COVERING MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR TIRES ON ROPE WITH A MAXIMUM 10' GRID SPACING IN ALL DIRECTIONS.
4. PLASTIC SHEETING TO EXTEND A MINIMUM OF 12" PAST THE BOTTOM OF THE PILE ONTO SURROUNDING GRADE ON ALL SIDES.