

**RESOLUTION No. 19/20-2  
CITY OF DAYTON, OREGON**

**Title: A Resolution Adopting Public Works Design Standards Update No. 9**

**WHEREAS**, on October 6, 2006, the Dayton City Council adopted Resolution #06/07-11, A Resolution Adopting City of Dayton Public Works Design Standards (hereafter called "Standards"), and amended on February 5, 2007, by Resolution #06/07-27, A Resolution Adopting Public Works Design Standards Update No. 1; and on January 7, 2008, by Resolution #07/08-17, A Resolution Adopting Public Works Design Standards Update #2; and Resolution 07/08-31, A Resolution Adopting Public Works Design Standards Update #3; and Resolution 09/10-31, A Resolution Adopting Public Works Design Standards Update #4; and Resolution 12/13-35, A Resolution Adopting Public Works Design Standards Update #5; and Resolution 13/14-5, A Resolution Adopting Public Works Design Standards Update #6; and Resolution No. 15/16-10 A Resolution Adopting Public Works Design Standards Update #7; and Resolution No. 17/18-9 A Resolution Adopting Public Work Design Standards Update #8; and

**WHEREAS**, the Standards are subject to change as both the City's needs change and the industry standards change, or if errors are discovered in the document; and

**WHEREAS**, certain information in the Standards needs to be updated or changed.

**The City of Dayton resolves as follows:**

- 1) **THAT** Update No. 9 to the City of Dayton Public Works Design Standards, (attached hereto as Exhibit A and by this reference incorporated herein) is hereby adopted; and
- 2) **THAT** this resolution shall become effective immediately upon adoption.

**ADOPTED** this 3<sup>rd</sup> day of September 2019.

**In Favor: Mackin, Marquez, Sandoval-Perez, Wytoski**

**Opposed: None**

**Absent: Collins, Holbrook**

**Abstained: None**

**Recused: Price**

  
\_\_\_\_\_  
Elizabeth Wytoski, Mayor

9/5/19  
\_\_\_\_\_  
Date of Signing

**ATTESTED BY:**  
  
\_\_\_\_\_  
Patty Ringnalda, City Recorder

9/13/19  
\_\_\_\_\_  
Date of Enactment

**Attachment - Exhibit A**

d. Review Comments, Resubmittals:

- 1) Upon completion of the preliminary review, the City will return one (1) set of drawings outlining the required revisions (with a review letter or memo as applicable).
- 2) In order to be entitled to further review, the applicant's engineer must address respond to each comment of the prior review(s), and make all required corrections. All resubmittals and responses to comments must appear throughout to be a bona fide attempt to result in complete drawings fully conforming to City standards.
- 3) The City reserves the right to return, without review, revised drawings which have not addressed all previous review comments.
- 4) Resubmittals shall consist of a minimum of three (3) sets of full size drawings for single family residential developments, and a minimum of four (4) sets of full size drawings for commercial, industrial and multifamily residential developments, unless the City allows pdf submittals of the revised drawings.

temporary thrust restraint location shall be left open and not backfilled (but plated as necessary or required) until the permanent thrust restraint is installed and approved by the City. Unless otherwise approved in writing by the City, permanent thrust restraint shall be installed by the end of the next working day after installation of the temporary thrust restraint, but in no case later than the third calendar day following installation of the temporary thrust restraint.

**94.100.** Unless otherwise approved by the City, water service pipe on the public side of the meter shall be CenCore blue HDPE tubing (CTS, SDR 9, 200 psi) conforming to AWWA C901 (ASTM D2239 & D2737) with 2-3/8" long style compression inserts (AY McDonald 6133T CTS insert stiffener or equal) and Q style compression fittings.

**95.101.** Unless otherwise noted, water service pipe on the private side of the meter shall be Schedule 40 PVC or as approved by the OPSC.

**96.102.** Domestic, irrigation and fire backflow prevention devices and vaults shall conform to requirements of public and/or private agencies having jurisdiction. It is the responsibility of the premise owner and/or water user to provide a thermal expansion tank or other means approved by the Oregon Plumbing Specialty Code to address thermal expansion concerns in the private water system piping downstream of any backflow device or pressure regulator where applicable (see PWDS 3.22.c & OPSC 608.2&3). The premise owner and water user is hereby notified of these thermal expansion concerns, and that it is the responsibility of the premise owner and/or water user to address these concerns.

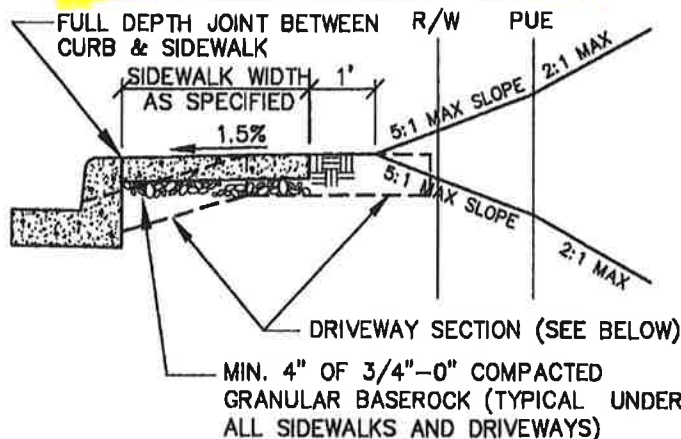
**97.103.** The work shall be performed in a manner designated to maintain water service to buildings supplied from the existing waterlines. In no case shall service to any main line or building be interrupted for more than four (4) hours in any one day. Contractor shall notify the City and all affected residents and businesses a minimum of 24 business hours (1 business day) prior to any interruption of service.

**98.104. Water Mainline Couplings.** Where shown on the drawings or required by the City, restrained sleeve couplings shall be Krauz Hymax Grip Couplings or approved equal (Romac Alpha Coupling). Unrestrained mainline couplings shall be long-style epoxy coated DI sleeve couplings, or Hymax Wide Range Coupling (short body couplings not allowed).

**99.105. Sanitary Sewer & Waterline Crossings.** Where new waterlines cross below or within 18-inches vertical separation above a sewer main or sewer service lateral, center one full length of waterline pipe at point of crossing the sewer line or sewer lateral. Unless otherwise approved in writing by the Public Works Director, existing sewer mains and/or service laterals within this zone shall be replaced with a full 12 foot length of new pipe (D2241 PVC-DR 32.5, C-900 PVC-DR 18 or CL 50 ductile iron), centered at the crossing in accordance with OAR 333-061 and local jurisdiction requirements. Connect to existing sewer lines with approved flexible reinforced couplings (MaxAdaptor Coupling by Gripper Gasket LLC or approved equal). Example: For an 8-inch waterline with 36-inches cover, 4-inch service lateral inverts within 5.67-feet (68-inches) of finish grade must have this pipe centered at the crossing.

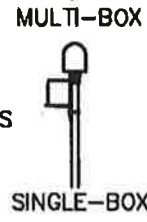
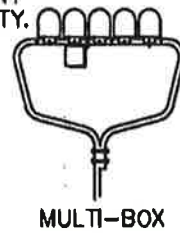
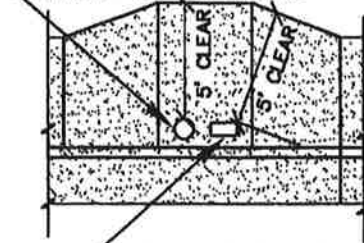


**TOOLED CONTRACTION JOINTS TYPICAL AT 5' INTERVALS (BROOM FINISH, NO SLICKS)**



**TYP. CROSS SECTION**

UTILITY POLE OR FIRE HYDRANT WHERE PRE-APPROVED BY CITY.



NON-CBU MAILBOXES (PRE-EXISTING MAILBOXES ONLY W/POST OFFICE APPROVAL, ON GALV. POSTS)

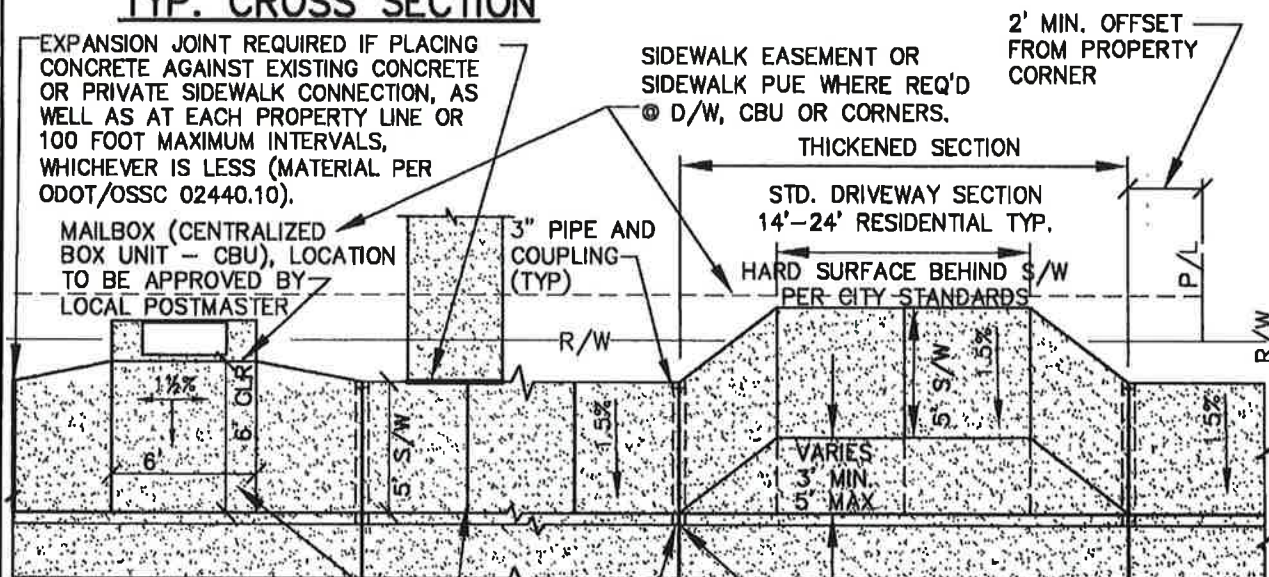
**S/W AT OBSTRUCTION**

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, WHICHEVER IS LESS (MATERIAL PER ODOT/OSSC 02440.10).

MAILBOX (CENTRALIZED BOX UNIT - CBU), LOCATION TO BE APPROVED BY LOCAL POSTMASTER

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

2' MIN. OFFSET FROM PROPERTY CORNER



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

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

5' TRANSITION  
 STD. CURB & GUTTER

**TYP. PLAN VIEW**

JOINT IN SIDEWALK TO MATCH JOINT IN CURB

**NOTES:**

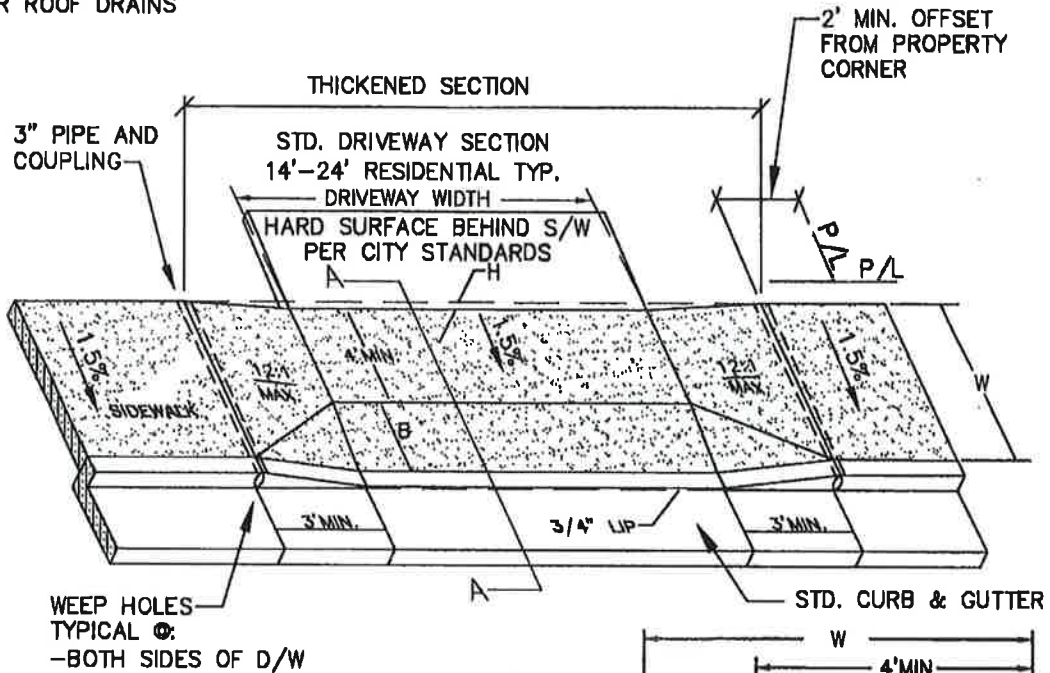
1. MONOLITHIC PLACEMENT OF CONCRETE FOR STREET CURB & PARALLEL PUBLIC SIDEWALK IS PROHIBITED.
2. CONCRETE THICKNESS, STANDARD SIDEWALKS SHALL BE 4" MIN. THICK. SIDEWALKS THROUGH RESIDENTIAL DRIVEWAYS (INCLUDING WINGS) SHALL BE 6" MIN. THICK. COMMERCIAL DRIVEWAYS & ALLEY APPROACHES SHALL BE 8" MIN. THICK.
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%.**

LAST REVISION DATE: <b>AUG 2019</b>	COPYRIGHT 1998 WESTECH ENGINEERING, INC.
<b>CURBLINE SIDEWALKS AND DRIVEWAY APRONS</b>	
(NTS)	
DAYTON, OR	DETAIL NO. <b>212</b>

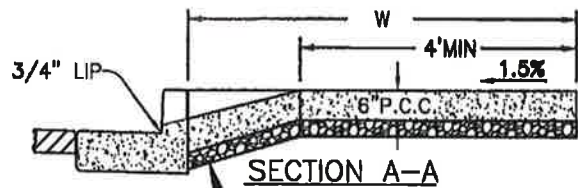


**TOOLED CONTRACTION JOINTS TYPICAL AT 5' INTERVALS (BROOM FINISH, NO SLICKS)**

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



W	B	H	
5'	1'	0.27'	(3-1/4")
6'	2'	0.23'	(2-3/4")
7'	3'	0.19'	(2-1/4")



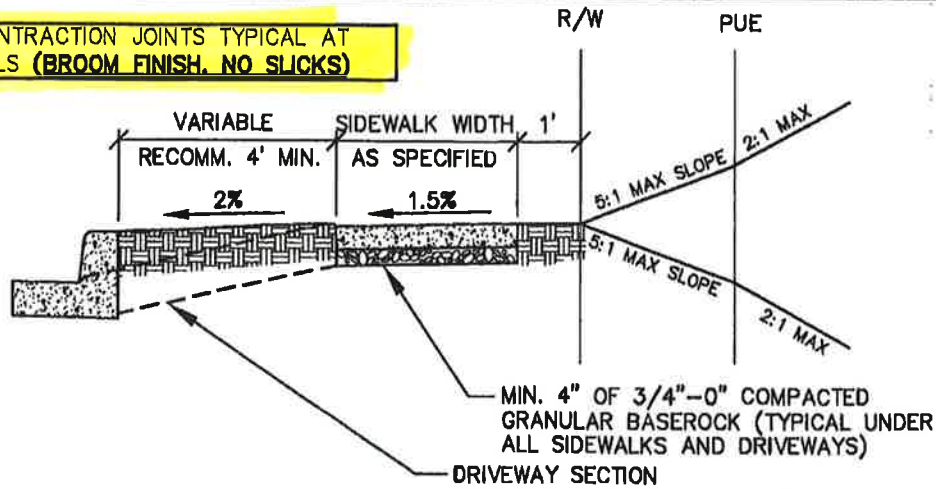
MIN. 4" OF 3/4"-0" COMPACTED GRANULAR BASEROCK (TYPICAL UNDER ALL SIDEWALKS AND DRIVEWAYS)

**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	
<b>RESIDENTIAL DW APRON CURBLINE SIDEWALK UPHILL LOTS ONLY</b>	
(NTS)	
DAYTON, OR	DETAIL NO. 212A

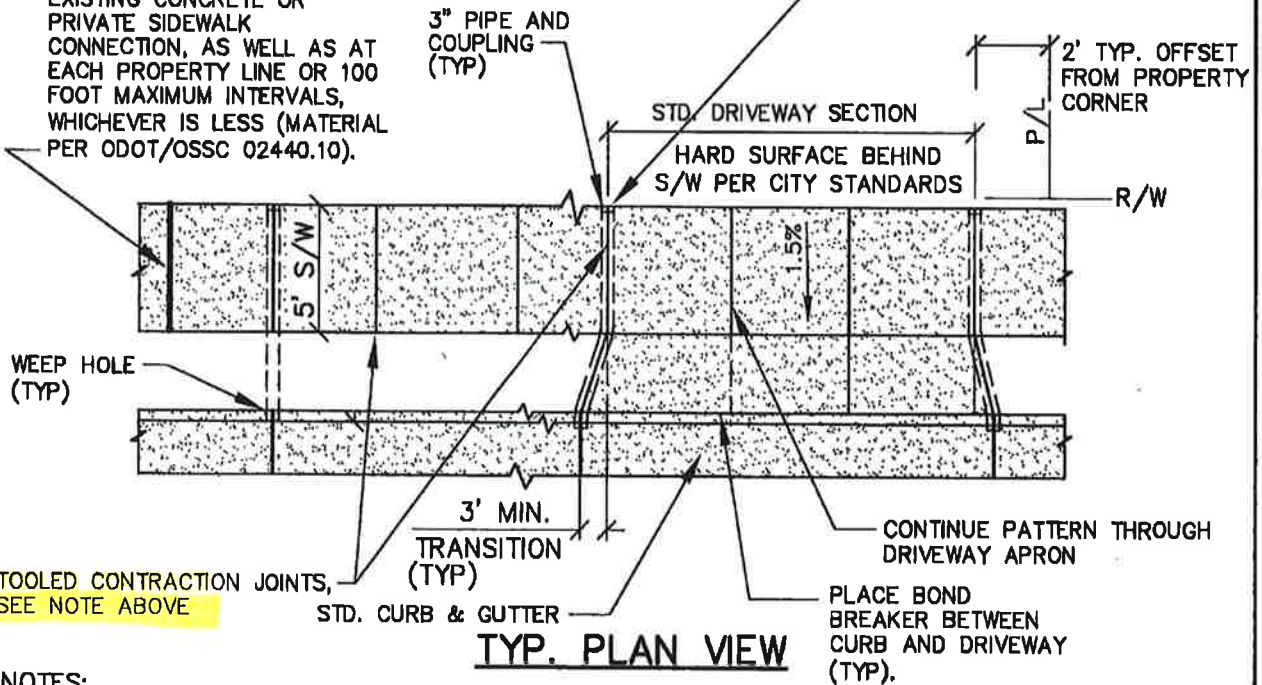
**TOOLED CONTRACTION JOINTS TYPICAL AT 5' INTERVALS (BROOM FINISH, NO SLICKS)**



**TYP. CROSS 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, WHICHEVER IS LESS (MATERIAL PER ODOT/OSSC 02440.10).

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



**TYP. PLAN VIEW**

**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 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.

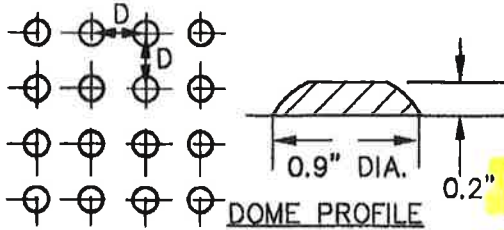
LAST REVISION DATE: <b>AUG 2019</b>	COPYRIGHT 1995 WESTECH ENGINEERING, INC.
<b>PROPERTY LINE SIDEWALKS AND DRIVEWAY APRONS</b>	
(NTS)	
DAYTON, OR	DETAIL NO. <b>213</b>



**DOMES SHALL BE WET-SET REPLACEABLE PANELS  
(ADA SOLUTIONS (CAST-IN-PLACE, BRICK RED) OR EQUAL)**

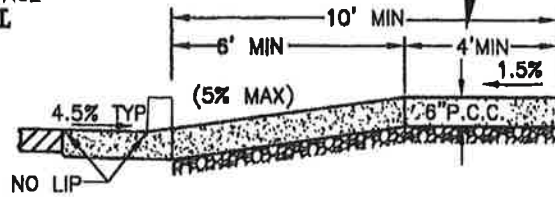
INSTALL TRUNCATED DOME DETECTABLE WARNING SURFACE AS SHOWN & SPECIFIED, **FULL WIDTH OF RAMP THROAT**

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



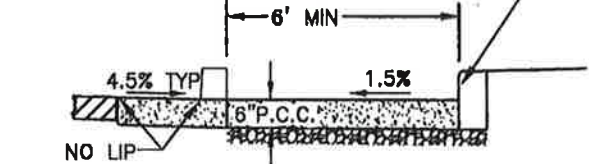
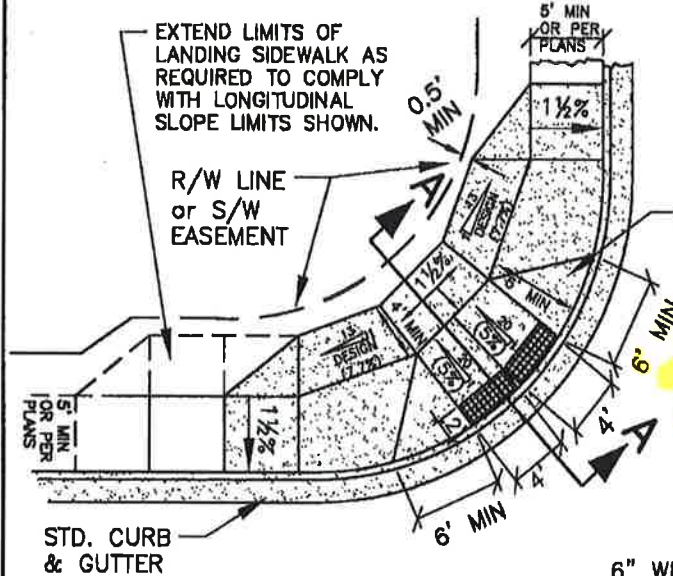
**FIGURE A: TRUNCATED DOME DETAIL**

5' WIDE TURNING SPACE REQUIRED WHERE LANDSCAPE CURB PROVIDED.



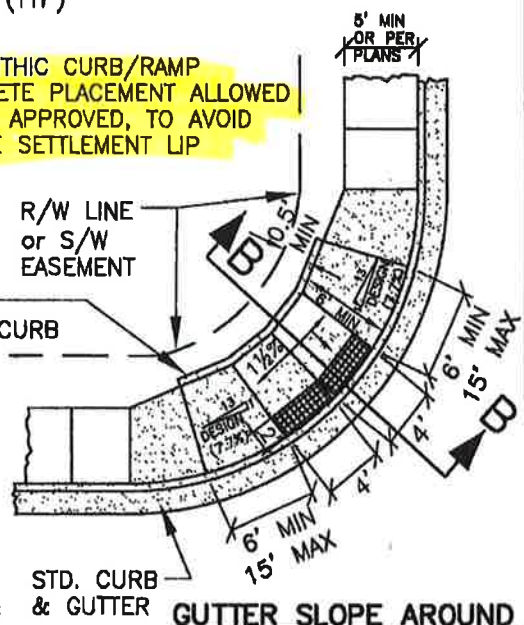
**SECTION A**

TOOLED CONTRACTION JOINTS TYPICAL AT 5' INTERVALS (BROOM FINISH, NO SLICKS)



**SECTION B**

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



**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 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.

LAST REVISION DATE:  
AUG 2019

**INTERSECTION CURB RAMPS  
CURB LINE SIDEWALKS  
LOCAL STREETS  
(NTS)**

DAYTON, OR

DETAIL NO.  
214A

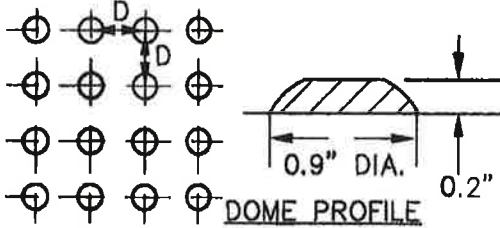


**DOMES SHALL BE WET-SET REPLACEABLE PANELS**

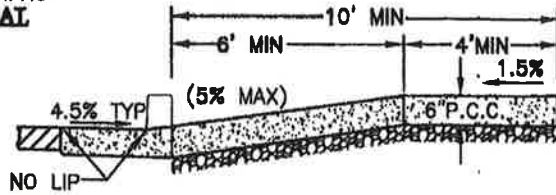
(ADA SOLUTIONS (CAST-IN-PLACE, BRICK RED) OR EQUAL)

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



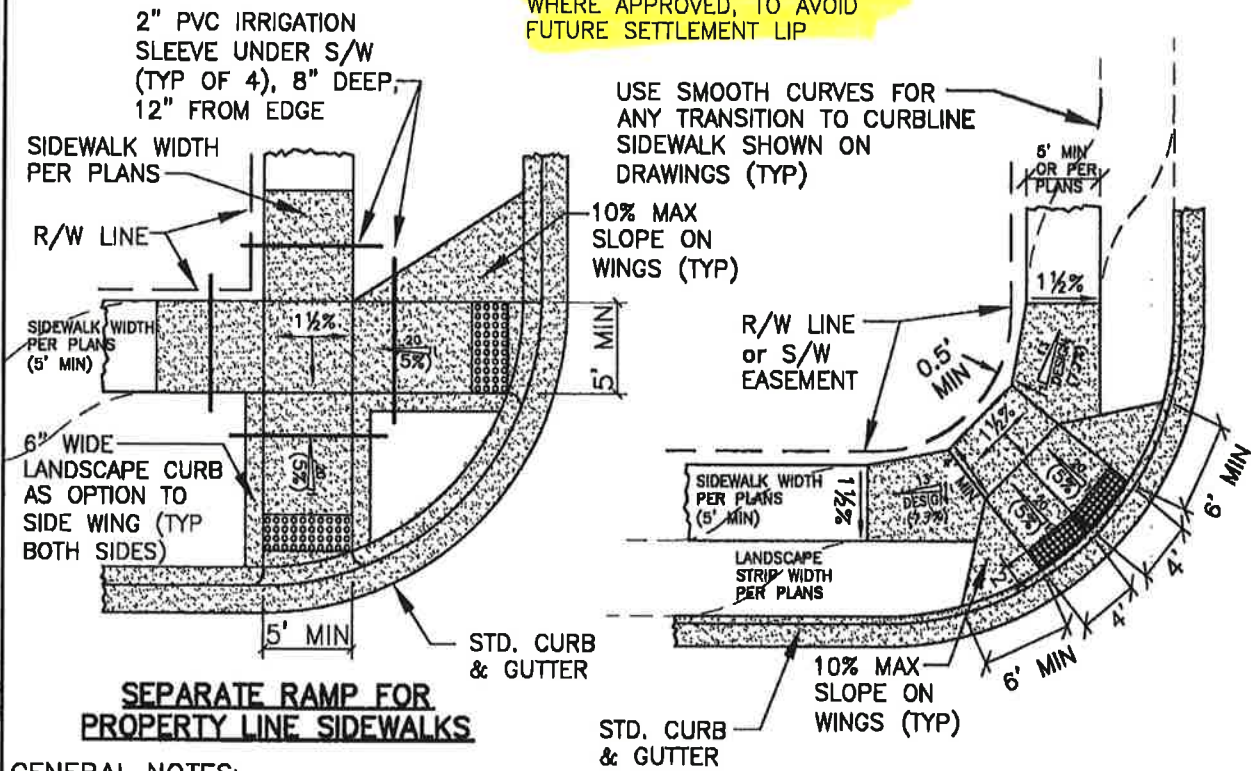
**FIGURE A: TRUNCATED DOME DETAIL**



**SECTION**

TOOLED CONTRACTION JOINTS TYPICAL AT 5' INTERVALS (BROOM FINISH, NO SUCKS)

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



**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)**

LAST REVISION DATE:	AUG 2019
<b>INTERSECTION CURB RAMPS PROPERTY LINE SIDEWALKS LOCAL STREETS</b>	
(NTS)	
DAYTON, OR	DETAIL NO. 214B

**DOMES SHALL BE WET-SET REPLACEABLE PANELS**

(ADA SOLUTIONS (CAST-IN-PLACE, BRICK RED) 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

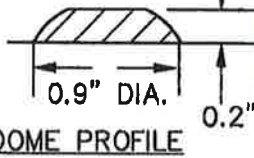
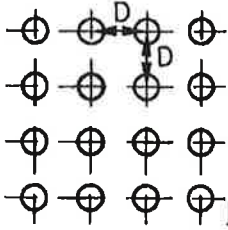
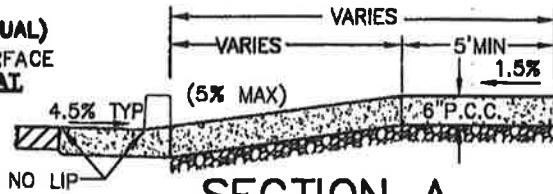
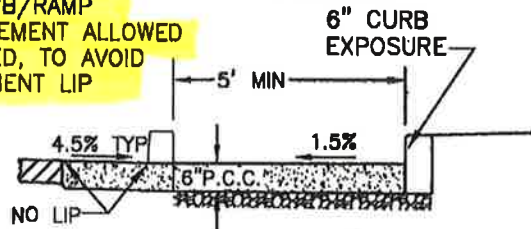


FIGURE A: TRUNCATED DOME DETAIL

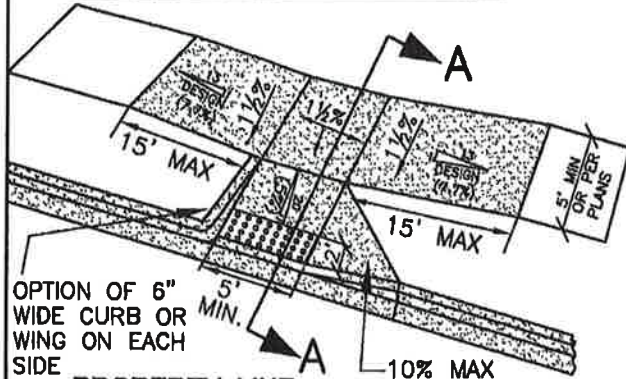
MONOLITHIC CURB/RAMP CONCRETE PLACEMENT ALLOWED WHERE APPROVED, TO AVOID FUTURE SETTLEMENT LIP



SECTION A

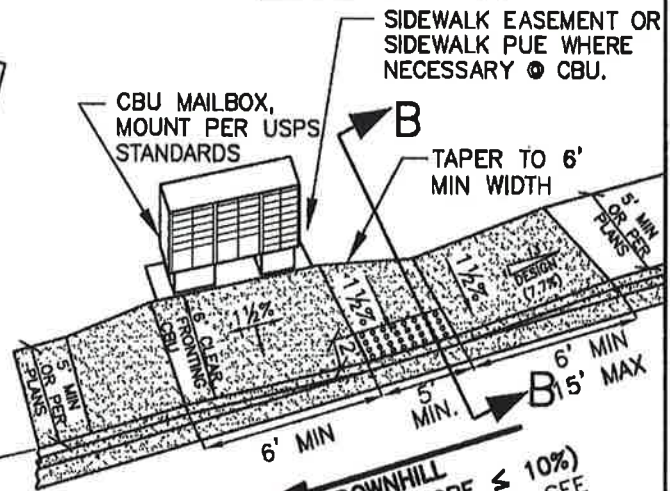


SECTION B



OPTION OF 6" WIDE CURB OR WING ON EACH SIDE

PROPERTY LINE SIDEWALK RAMP (SEE SECTION A)



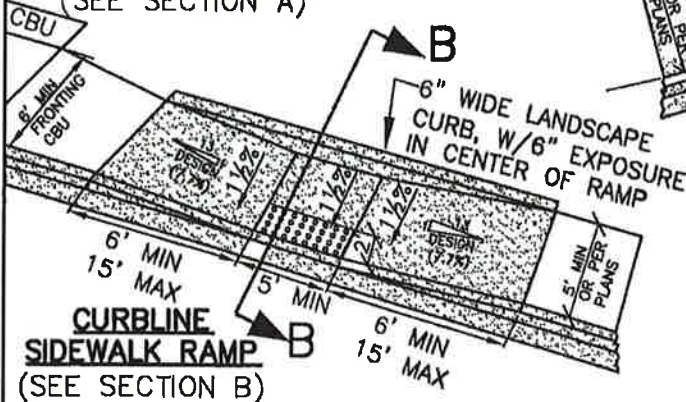
SIDEWALK EASEMENT OR SIDEWALK PUE WHERE NECESSARY @ CBU.

CBU MAILBOX, MOUNT PER USPS STANDARDS

TAPER TO 6' MIN WIDTH

DOWNHILL  
(3% ≤ GUTTER SLOPE ≤ 10%)  
(FOR GUTTER SLOPE < 3%, SEE LAYOUT DETAIL AT LEFT)

CURLINE SIDEWALK RAMP W/ADJACENT CBU (GUTTER SLOPE 10% MAX) (SEE SECTION B)



CURLINE SIDEWALK RAMP (SEE SECTION B)

**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/Ws.
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.

TOOLED CONTRACTION JOINTS TYPICAL AT 5' INTERVALS (BROOM FINISH, NO SLICKS)

LAST REVISION DATE:

AUG 2019

**CURB RAMPS BETWEEN INTERSECTIONS**

(NTS)

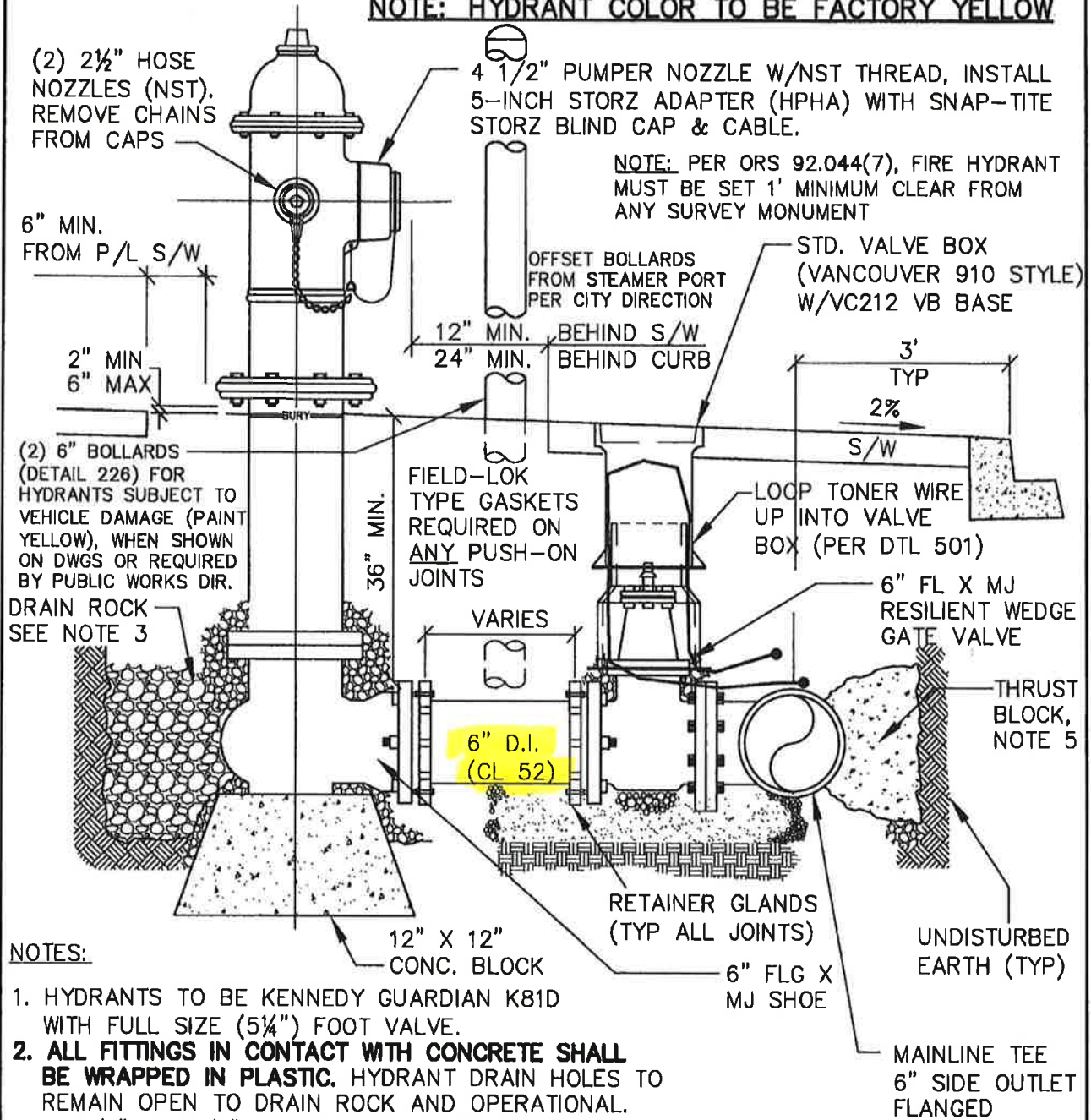
DAYTON, OR

DETAIL NO.

214C



**NOTE: HYDRANT COLOR TO BE FACTORY YELLOW**

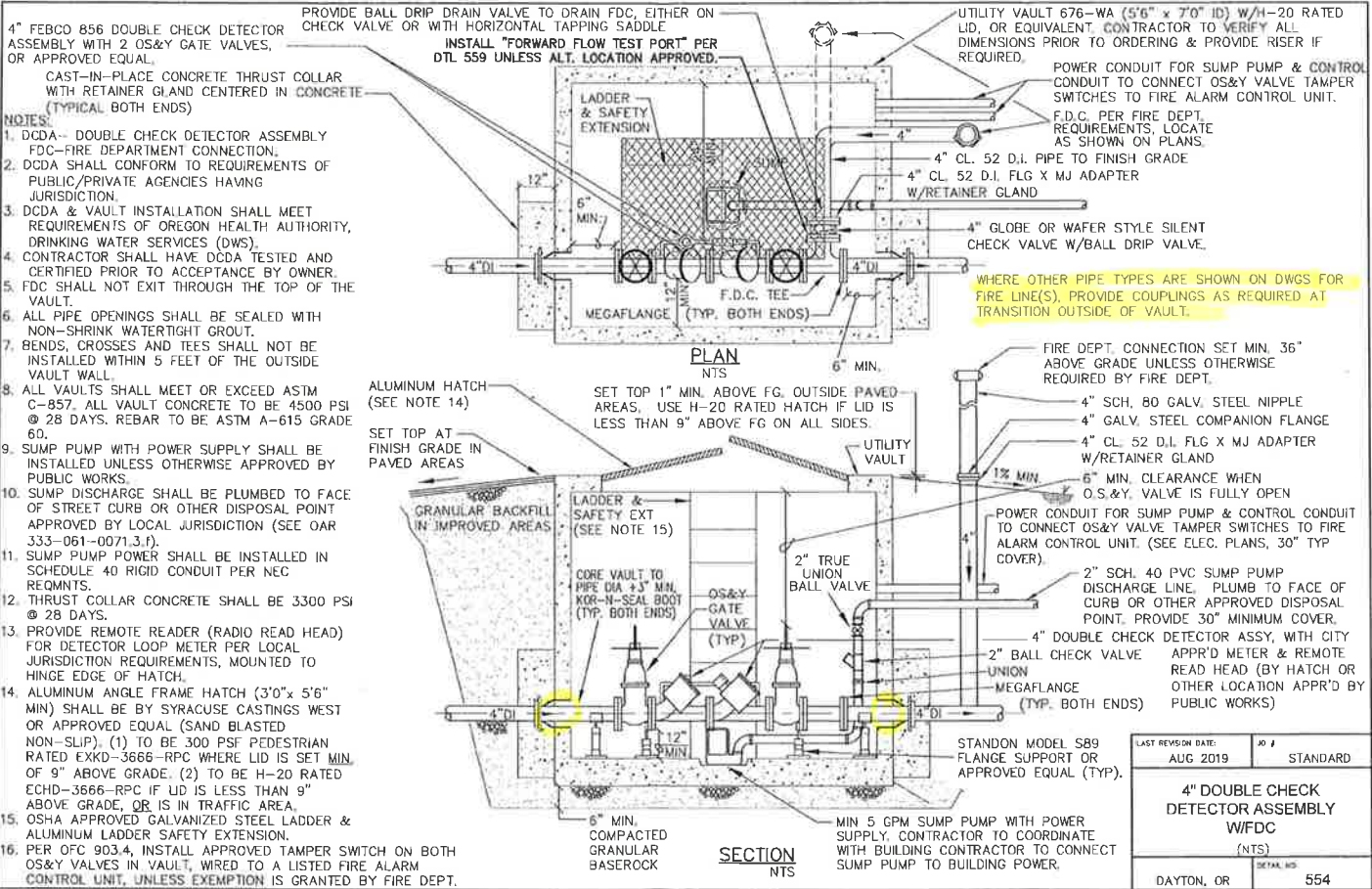


**NOTES:**

1. HYDRANTS TO BE KENNEDY GUARDIAN K81D WITH FULL SIZE (5 1/4") 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.

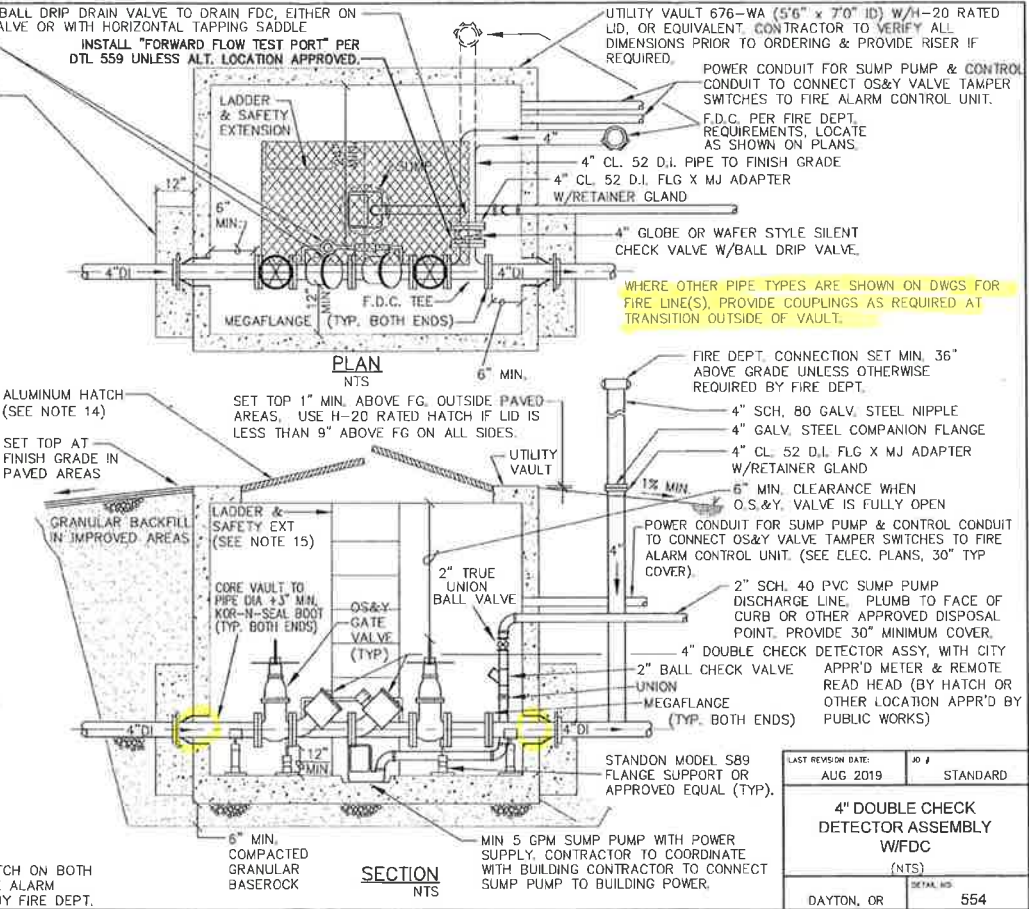
LAST REVISION DATE: AUG 2019		COPYRIGHT 1988 VESTECH ENGINEERING, INC.	
<b>STANDARD FIRE HYDRANT ASSEMBLY</b>			
(NTS)			
DAYTON, OR		DETAIL NO. <b>503</b>	



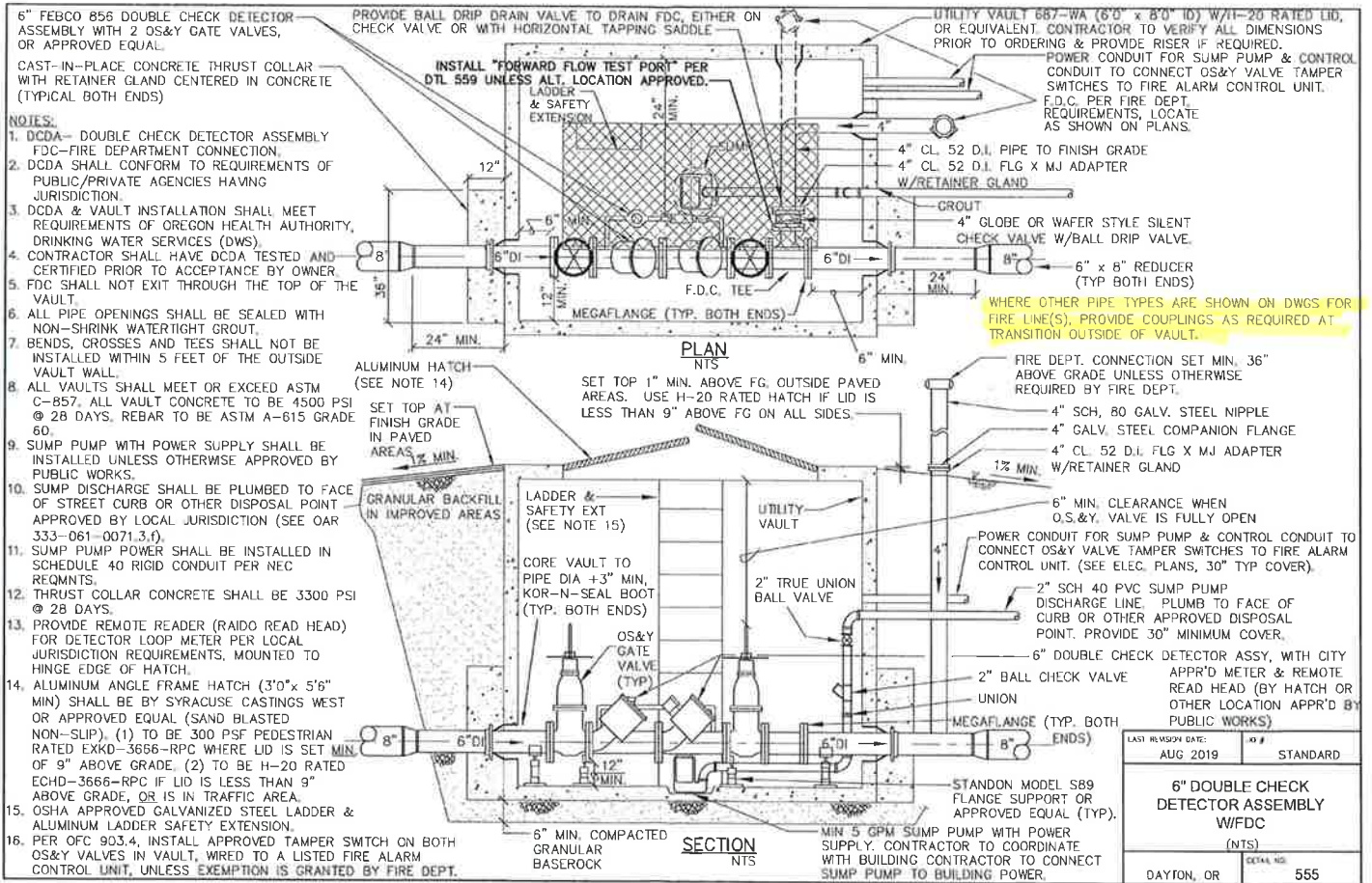


4" FBCCO 856 DOUBLE CHECK DETECTOR ASSEMBLY WITH 2 OS&Y GATE VALVES, OR APPROVED EQUAL.  
 CAST-IN-PLACE CONCRETE THRUST COLLAR WITH RETAINER GLAND CENTERED IN CONCRETE (TYPICAL BOTH ENDS)

- NOTES:**
- DCDA-- DOUBLE CHECK DETECTOR ASSEMBLY  
 FDC--FIRE DEPARTMENT CONNECTION.
  - DCDA SHALL CONFORM TO REQUIREMENTS OF PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
  - DCDA & VAULT INSTALLATION SHALL MEET REQUIREMENTS OF OREGON HEALTH AUTHORITY, DRINKING WATER SERVICES (DWS).
  - CONTRACTOR SHALL HAVE DCDA TESTED AND CERTIFIED PRIOR TO ACCEPTANCE BY OWNER.
  - FDC SHALL NOT EXIT THROUGH THE TOP OF THE VAULT.
  - ALL PIPE OPENINGS SHALL BE SEALED WITH NON-SHRINK WATERTIGHT GROUT.
  - BENDS, CROSSES AND TEES SHALL NOT BE INSTALLED WITHIN 5 FEET OF THE OUTSIDE VAULT WALL.
  - 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.
  - SUMP PUMP WITH POWER SUPPLY SHALL BE INSTALLED UNLESS OTHERWISE APPROVED BY PUBLIC WORKS.
  - SUMP DISCHARGE SHALL BE PLUMBED TO FACE OF STREET CURB OR OTHER DISPOSAL POINT APPROVED BY LOCAL JURISDICTION (SEE OAR 333-061-0071.3.f).
  - SUMP PUMP POWER SHALL BE INSTALLED IN SCHEDULE 40 RIGID CONDUIT PER NEC REQMENTS.
  - THRUST COLLAR CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
  - PROVIDE REMOTE READER (RADIO READ HEAD) FOR DETECTOR LOOP METER PER LOCAL JURISDICTION REQUIREMENTS, MOUNTED TO HINGE EDGE OF HATCH.
  - ALUMINUM ANGLE FRAME HATCH (3'0" x 5'6" MIN) SHALL BE BY SYRACUSE CASTINGS WEST OR APPROVED EQUAL (SAND BLASTED NON-SLIP). (1) TO BE 300 PSF PEDESTRIAN RATED EXKD-3666-RPC WHERE LID IS SET MIN. OF 9" ABOVE GRADE. (2) TO BE H-20 RATED ECHD-3666-RPC IF LID IS LESS THAN 9" ABOVE GRADE, OR IS IN TRAFFIC AREA.
  - OSHA APPROVED GALVANIZED STEEL LADDER & ALUMINUM LADDER SAFETY EXTENSION.
  - PER OFC 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.



LAST REVISION DATE: AUG 2019	JO # STANDARD
<b>4" DOUBLE CHECK DETECTOR ASSEMBLY W/FDC (NTS)</b>	
DAYTON, OR	
554	



6" FEBCO 856 DOUBLE CHECK DETECTOR ASSEMBLY WITH 2 OS&Y GATE VALVES, OR APPROVED EQUAL.  
 CAST-IN-PLACE CONCRETE THRUST COLLAR WITH RETAINER GLAND CENTERED IN CONCRETE (TYPICAL BOTH ENDS)

- NOTES:**
- DCDA - DOUBLE CHECK DETECTOR ASSEMBLY FDC - FIRE DEPARTMENT CONNECTION.
  - DCDA SHALL CONFORM TO REQUIREMENTS OF PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
  - DCDA & VAULT INSTALLATION SHALL MEET REQUIREMENTS OF OREGON HEALTH AUTHORITY, DRINKING WATER SERVICES (DWS).
  - CONTRACTOR SHALL HAVE DCDA TESTED AND CERTIFIED PRIOR TO ACCEPTANCE BY OWNER.
  - FDC SHALL NOT EXIT THROUGH THE TOP OF THE VAULT.
  - ALL PIPE OPENINGS SHALL BE SEALED WITH NON-SHRINK WATERTIGHT GROUT.
  - BENDS, CROSSES AND TEES SHALL NOT BE INSTALLED WITHIN 5 FEET OF THE OUTSIDE VAULT WALL.
  - 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.
  - SUMP PUMP WITH POWER SUPPLY SHALL BE INSTALLED UNLESS OTHERWISE APPROVED BY PUBLIC WORKS.
  - SUMP DISCHARGE SHALL BE PLUMBED TO FACE OF STREET CURB OR OTHER DISPOSAL POINT APPROVED BY LOCAL JURISDICTION (SEE OAR 333-061-0071.3.f).
  - SUMP PUMP POWER SHALL BE INSTALLED IN SCHEDULE 40 RIGID CONDUIT PER NEC REQMENTS.
  - THRUST COLLAR CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
  - PROVIDE REMOTE READER (RAIDO READ HEAD) FOR DETECTOR LOOP METER PER LOCAL JURISDICTION REQUIREMENTS, MOUNTED TO HINGE EDGE OF HATCH.
  - ALUMINUM ANGLE FRAME HATCH (3'0" x 5'6" MIN) SHALL BE BY SYRACUSE CASTINGS WEST OR APPROVED EQUAL (SAND BLASTED NON-SLIP). (1) TO BE 300 PSF PEDESTRIAN RATED EXKD-3666-RPC WHERE LID IS SET MIN. OF 9" ABOVE GRADE. (2) TO BE H-20 RATED ECHD-3666-RPC IF LID IS LESS THAN 9" ABOVE GRADE, OR IS IN TRAFFIC AREA.
  - OSHA APPROVED GALVANIZED STEEL LADDER & ALUMINUM LADDER SAFETY EXTENSION.
  - PER OFC 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.

PROVIDE BALL DRIP DRAIN VALVE TO DRAIN FDC, EITHER ON CHECK VALVE OR WITH HORIZONTAL TAPPING SADDLE.

UTILITY VAULT 687-WA (6'0" x 8'0" ID) W/H-20 RATED LID, OR EQUIVALENT. CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO ORDERING & PROVIDE RISER IF REQUIRED.

POWER CONDUIT FOR SUMP PUMP & CONTROL CONDUIT TO CONNECT OS&Y VALVE TAMPER SWITCHES TO FIRE ALARM CONTROL UNIT. FDC PER FIRE DEPT. REQUIREMENTS, LOCATE AS SHOWN ON PLANS.

INSTALL "FORWARD FLOW TEST PORT" PER DTL 559 UNLESS ALT. LOCATION APPROVED.

LADDER & SAFETY EXTENSION

24" MIN.

12"

6" MIN.

4" CL 52 D.I. PIPE TO FINISH GRADE

4" CL 52 D.I. FLG X MJ ADAPTER W/RETAINER GLAND

GROUT

4" GLOBE OR WAFER STYLE SILENT CHECK VALVE W/BALL DRIP VALVE.

6" x 8" REDUCER (TYP BOTH ENDS)

WHERE OTHER PIPE TYPES ARE SHOWN ON DWGS FOR FIRE LINE(S), PROVIDE COUPLINGS AS REQUIRED AT TRANSITION OUTSIDE OF VAULT.

6" MIN.

24" MIN.

MEGAFLANGE (TYP. BOTH ENDS)

F.D.C. TEE

PLAN NTS

ALUMINUM HATCH (SEE NOTE 14)

SET TOP AT FINISH GRADE IN PAVED AREAS

1 1/2" MIN.

1 1/2" MIN.

4"

6" MIN. CLEARANCE WHEN OS&Y VALVE IS FULLY OPEN

FIRE DEPT. CONNECTION SET MIN. 36" ABOVE GRADE UNLESS OTHERWISE REQUIRED BY FIRE DEPT.

4" SCH, 80 GALV. STEEL NIPPLE

4" GALV. STEEL COMPANION FLANGE

4" CL 52 D.I. FLG X MJ ADAPTER W/RETAINER GLAND

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 40 PVC SUMP PUMP DISCHARGE LINE. PLUMB TO FACE OF CURB OR OTHER APPROVED DISPOSAL POINT. PROVIDE 30" MINIMUM COVER.

2" BALL CHECK VALVE

6" DOUBLE CHECK DETECTOR ASSY, WITH CITY APPR'D METER & REMOTE READ HEAD (BY HATCH OR OTHER LOCATION APPR'D BY PUBLIC WORKS)

2" UNION

MEGAFLANGE (TYP. BOTH ENDS)

STANDON MODEL S89 FLANGE SUPPORT OR APPROVED EQUAL (TYP).

6" MIN. COMPACTED GRANULAR BASEROCK

MIN 5 GPM SUMP PUMP WITH POWER SUPPLY. CONTRACTOR TO COORDINATE WITH BUILDING CONTRACTOR TO CONNECT SUMP PUMP TO BUILDING POWER.

SECTION NTS

UTILITY VAULT

2" TRUE UNION BALL VALVE

CORE VAULT TO PIPE DIA +3" MIN, KOR-N-SEAL BOOT (TYP. BOTH ENDS)

LADDER & SAFETY EXT (SEE NOTE 15)

OS&Y GATE VALVE (TYP)

GRANULAR BACKFILL IN IMPROVED AREAS

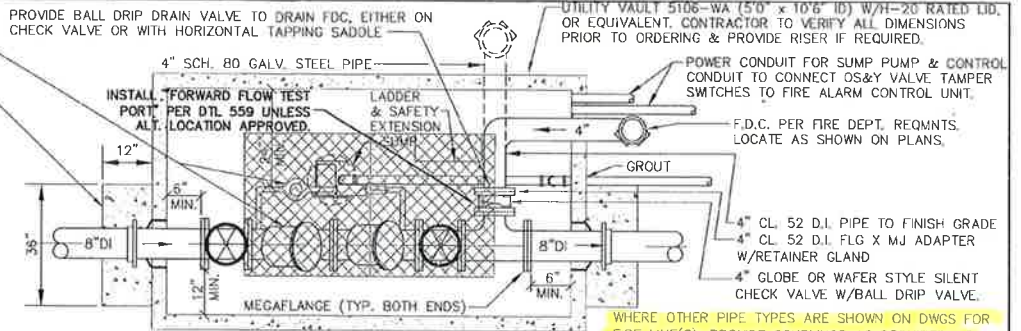
SET TOP AT FINISH GRADE IN PAVED AREAS

LAST REVISION DATE:	NO #
AUG 2019	STANDARD
<b>6" DOUBLE CHECK DETECTOR ASSEMBLY W/FDC</b>	
(NTS)	
DAYTON, OR	DETAIL NO: 555

6" FBCC 856 DOUBLE CHECK DETECTOR ASSEMBLY WITH 2 OS&Y GATE VALVES, OR APPROVED EQUAL.  
 CAST-IN-PLACE CONCRETE THRUST COLLAR WITH RETAINER GLAND CENTERED IN CONCRETE (TYPICAL BOTH ENDS)

**NOTES:**

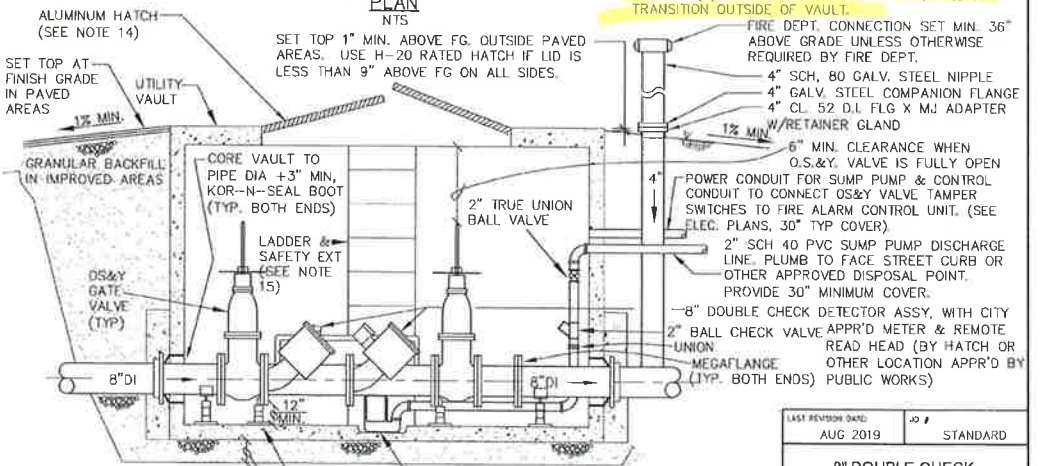
1. DCDA - DOUBLE CHECK DETECTOR ASSEMBLY
2. DCDA SHALL CONFORM TO REQUIREMENTS OF PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
3. DCDA & VAULT INSTALLATION SHALL MEET REQUIREMENTS OF OREGON HEALTH AUTHORITY, DRINKING WATER SERVICES (DWS)
4. CONTRACTOR SHALL HAVE DCDA TESTED AND CERTIFIED PRIOR TO ACCEPTANCE BY OWNER.
5. FDC SHALL NOT EXIT THROUGH THE TOP OF THE VAULT.
6. ALL PIPE OPENINGS SHALL BE SEALED WITH NON-SHRINK WATERTIGHT GROUT.
7. BENDS, CROSSES AND TEES SHALL NOT BE INSTALLED WITHIN 5 FEET OF THE OUTSIDE VAULT WALL.
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 #6.
9. SUMP PUMP WITH POWER SUPPLY SHALL BE INSTALLED UNLESS OTHERWISE APPROVED BY PUBLIC WORKS.
10. SUMP DISCHARGE SHALL BE PLUMBED TO FACE OF STREET CURB OR OTHER DISPOSAL POINT APPROVED BY LOCAL JURISDICTION (SEE OAR 333-061-0071.3.f).
11. SUMP PUMP POWER SHALL BE INSTALLED IN SCHEDULE 40 RIGID CONDUIT PER NEC REQMENTS.
12. THRUST COLLAR CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
13. PROVIDE REMOTE READER (RADIO READ HEAD) FOR DETECTOR LOOP METER PER LOCAL JURISDICTION REQUIREMENTS, MOUNTED TO HINGE EDGE OF HATCH.
14. ALUMINUM ANGLE FRAME HATCH (3'0" x 5'6" MIN) SHALL BE BY SYRACUSE CASTINGS WEST OR APPROVED EQUAL (SAND BLASTED NON-SLIP). (1) TO BE 300 PSF PEDESTRIAN RATED EXKD-3666-RPC WHERE LID IS SET MIN. OF 9" ABOVE GRADE. (2) TO BE H-20 RATED ECHD-3666-RPC IF LID IS LESS THAN 9" ABOVE GRADE, OR IS IN TRAFFIC AREA.
15. OSHA APPROVED GALVANIZED STEEL LADDER & ALUMINUM LADDER SAFETY EXTENSION.
16. PER OFC 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.



**PLAN**

NTS

SET TOP 1" MIN. ABOVE FG. OUTSIDE PAVED AREAS. USE H-20 RATED HATCH IF LID IS LESS THAN 9" ABOVE FG ON ALL SIDES.



**SECTION**

NTS

MIN 5 GPM SUMP PUMP WITH POWER SUPPLY. CONTRACTOR TO COORDINATE WITH BUILDING CONTRACTOR TO CONNECT SUMP PUMP TO BUILDING POWER.

UTILITY VAULT 5106-WA (5'0" x 10'6" ID) W/H-20 RATED LID, OR EQUIVALENT. CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO ORDERING & PROVIDE RISER IF REQUIRED.

POWER CONDUIT FOR SUMP PUMP & CONTROL CONDUIT TO CONNECT OS&Y VALVE TAMPER SWITCHES TO FIRE ALARM CONTROL UNIT.  
 F.D.C. PER FIRE DEPT. REQMENTS. LOCATE AS SHOWN ON PLANS.

4" CL 52 D.I. PIPE TO FINISH GRADE  
 4" CL 52 D.I. FLG X MJ ADAPTER W/RETAINER GLAND  
 4" GLOBE OR WAFER STYLE SILENT CHECK VALVE W/BALL DRIP VALVE.

WHERE OTHER PIPE TYPES ARE SHOWN ON DWGS FOR FIRE LINE(S), PROVIDE COUPLINGS AS REQUIRED AT TRANSITION OUTSIDE OF VAULT.

FIRE DEPT. CONNECTION SET MIN. 36" ABOVE GRADE UNLESS OTHERWISE REQUIRED BY FIRE DEPT.

4" SCH. 80 GALV. STEEL NIPPLE  
 4" GALV. STEEL COMPANION FLANGE  
 4" CL 52 D.I. FLG X MJ ADAPTER W/RETAINER GLAND

6" MIN. CLEARANCE WHEN O.S.&Y. VALVE IS FULLY OPEN  
 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 40 PVC SUMP PUMP DISCHARGE LINE. PLUMB TO FACE STREET CURB OR OTHER APPROVED DISPOSAL POINT. PROVIDE 30" MINIMUM COVER.  
 8" DOUBLE CHECK DETECTOR ASSY, WITH CITY APPR'D METER & REMOTE READ HEAD (BY HATCH OR OTHER LOCATION APPR'D BY PUBLIC WORKS)

LAST REVISION DATE:	JO #
AUG 2019	STANDARD
<b>8" DOUBLE CHECK DETECTOR ASSEMBLY W/FDC</b>	
(NTS)	
CAYTON, OR	DETAIL NO 556



# City of Dayton

## PUBLIC WORKS DESIGN STANDARDS

September 2006

Last Updated   2019

*updates & clarifications  
since 2017*

**CITY OF DAYTON  
PUBLIC WORKS DESIGN STANDARDS**

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611	Sediment Barriers ..... 4/14
612	Straw Wattle Sediment Barrier ..... 6/15
613	Inlet Sediment Control ..... 4/14
614	Ditch & Swale Protection ..... 4/14
615	Silt Sack Inlet Detail ..... 9/06
<u>616</u>	<u>Temporary Concrete Washout Area (CWA) ..... 11/18</u>
<u>617</u>	<u>Stockpile Cover Detail ..... 1/19</u>

**CITY OF DAYTON**  
**Public Works Design Standards**

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**Division 1**

**General Requirements**

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Acceptable materials shall be as outlined in these Design Standards.

- h. All other utility improvements, including telephone, electrical power, gas and cable TV shall meet the current standards of the appropriate agency as well as City standards.
- i. Traffic Control Devices shall meet the standards of the current Manual on Uniform Traffic Control Devices, including Oregon amendments.
- j. All other work not covered by the above standards shall conform to the Oregon Standard Specifications for Construction – OSSC (ODOT/APWA), most recent edition.
- k. All applicant/developers are hereby notified that the requirements of the PWDS must be addressed during the design & construction of any improvements which are ~~or may be~~ required due to land use decisions.; This applies whether or not specific PWDS requirements are referenced ~~addressed~~ during the land use approval process, noted in the land use findings or included in the land use approval conditions.

## 1.2 PURPOSE

- a. The purpose of these Standards is to provide a consistent policy under which certain physical aspects of public utility design will be implemented. Most of the elements contained in this document are Public Works oriented and most are related to the development or platting process. However, it is intended that they apply to both public and private work designated herein.
- b. These Standards cannot provide for all situations. They are intended to assist but not to substitute for competent work by design professionals. The Standards are also not intended to limit unreasonably any innovative or creative effort which could result in better quality, better cost savings, or both. Any proposed departure from the Standards will be judged on the likelihood that such variance will produce a compensating or comparable result, in every way adequate for the user and City resident.
- c. The objective is to develop Standards which will:
  - 1) be consistent with current City Ordinances.
  - 2) provide design guidance criteria to the private sector for the design of public improvements within the City of Dayton.
  - 3) provide public utility improvements designed in a manner to allow economical future maintenance.
  - 4) Develop minimal franchise and/or private utility standards for systems which will impact or potentially impact public streets and/or public utility systems.



- 14) Preliminary Review: Review of the construction drawings by the City as outlined in these standards. All City comments and provisions of these design standards must be addressed prior to final review and approval for construction.
- 15) PROWAG: Public Right-of-Way Accessibility Guidelines, sSee ADA.
- 16) PWCS: Public Works Construction Standards, consisting of Oregon Standard Specifications for Construction (OSSC (ODOT/APWA)), subject to the material and equipment specified in these PWDS. See also PWDS 1.1.f.
- 17) PWDS: Dayton Public Works Design Standards, consisting of this manual.
- 18) Residential User: The owner, lessee, or occupant of a single dwelling unit in one structure.
- 19) Right-of-Way: All land or interest therein which by deed, conveyance, agreement, easement, dedication, usage, or process of law is reserved for or dedicated to the use of the general public free of all encumbrances, within which the City shall have the exclusive right to install and maintain streets and public utilities.
- 20) Roadway: All of that portion of the right-of-way used, for vehicle movement, which exists between the curbs or proposed curbs or proposed curb lines.
- 21) Single Family Dwelling: Any residential building designed to house one family.
- 22) Standard Details: The drawings of structures or devices commonly used on City work and referred to on the construction drawings. Also called Standard Plans.
- 23) Street or Road: Any public highway, road, street, avenue, alley, way, easement or right-of-way to be used for vehicle movement.
- 24) Substantial Completion: Substantial Completion is that degree of completion of the project's facilities and operating systems sufficient to provide the City and the public the full time, uninterrupted, and continuous beneficial use and operation of the work, and after (i) all required functional and acceptance testing has been successfully completed; (ii) all final building, plumbing, mechanical and electrical inspections required have been completed and any identified critical defective or incomplete work replaced or corrected; and (iii) all required record drawings and maintenance bonds have been submitted and accepted by the City. The terms "substantially complete" and "substantially completed" as applied to all or part of the work refer to Substantial Completion thereof.
- 25) Director: The Director of Public Works of the City of Dayton or his/her authorized representative.
- 26) Survey Cut Sheets: Sheets of tabulated survey data, indicating stationing,

## 1.8 PHASED DEVELOPMENT

- a. In the case of a development approved to be constructed in phases, the construction drawings and infrastructure constructed for each phase shall be capable of standing alone.
- b. Approval by the City of construction drawings for each phase of a phased development shall be independent of the approval for all other phases.
- c. The intent of these requirements is that the time limits between approval of the construction drawings by the City and the time by which construction must begin shall apply to each phase independently.

## 1.9 REVIEW PROCEDURE

- a. Detailed provisions covering the review procedures and permitting requirements for street, site and utility construction are contained in Appendix G of these standards. The following is an overview of these requirements.
- b. Pre-design Conference: The developer and developer's engineer are required to schedule a meeting with the Public Works Director and the City Engineer after land use approval and prior to preparing final design drawings of the proposed improvements.
  - 1) A minimum of 5 working days prior to the predesign meeting, it shall be the responsibility of the developer or the developer's engineer to provide the City Engineer with copies of the following:
    - a) Base maps and topographic surveys showing existing streets and utilities within and adjacent to the property, and along and/or required proposed utility & infrastructure alignments (on-site and offsite, limits as required by the PWDS), and;
    - b) A plan or narrative summary detailing how each of the planning conditions of approval (*ie. land use conditions*) will be satisfied (*as applicable*), and;
    - c) Scaled plan view drawings showing existing and proposed lot layouts (sizes and dimensions), proposed and/or required street, sidewalk and/or -& utility (water/sewer/storm) alignments and improvement limits and conceptual layouts, existing grade contours and designation of where significant cuts or fills will be required, general alignment of any proposed retaining walls, limits of proposed or required right-of-way dedications and easements (on-site and offsite, addressing the requirements of PWDS, the development code, and planning conditions of approval, and known agency requirements), and;
    - d) Preliminary profiles or invert/slope information along gravity sewer

and storm alignments (including proposed rim elevations for all manholes, catch basins, & other structures), demonstrating the ability to meet the depth and slope requirements of the PWDS, and;

- e) Verification that the elevations shown are based on the vertical datum specified in the PWDS, as well as information on the drawings showing the location and limits of any flood plain or wetlands within the development or along offsite street/utility alignments (as wells as information on the status of any required wetland permits), and;
- f) List of (and justification for) any known variances to the PWDS requirements which will be necessary based on the preliminary layout, street and utility drawings required above, and;
- e)g) A current title report(s) covering all property where utility construction will occur (which includes a list of all existing easements, restrictions, and other encumbrances, including copies of deeds, easements or other restrictive documents referenced in that report) [a pdf copy of each title report with embedded hyperlinks to the referenced documents may be provided in lieu of a hard copy], and;
- h) A geotechnical report is typically required for sites with existing fills,
- e)i) Other information requested by the Public Works Director or the City Engineer.

- c. Construction Drawings for Review: After the pre-design meeting,-- Ffor single family residential developments, three (3) sets of complete full size construction drawings (addressing all issues noted in the pre-design meeting) shall be submitted to the City for preliminary review. For commercial, industrial and multifamily residential developments, four (4) sets of complete full size construction drawings (addressing all issues noted in the pre-design meeting) shall be submitted to the City for preliminary review. Submittal requirements are as outlined herein, and shall include a unit price engineer's estimate acceptable to the City Engineer and any required review fees (see also PWDS G.7). Incomplete submittals will be returned without review.
- d. Review Comments, Resubmittals: Upon completion of the preliminary review, the City will return one (1) set of drawings outlining the required revisions (with a review letter or memo as applicable). In order to be entitled to further review, the applicant's engineer must respond to each comment of the prior review. All submittals and responses to comments must appear throughout to be a bona fide attempt to result in complete drawings. Resubmittals shall consists of a minimum of three (3) sets of full size drawings for single family residential developments, and a minimum of four (4) sets of full size drawings for commercial, industrial and multifamily residential developments.
- e. Franchise Utility Coordination by Developer's Engineer. Once the preliminary review has been completed by the City and required revisions made, the Developer's engineer

shall circulate the drawings to all utility service companies within the City ~~(and other agencies as applicable)~~, and bring any conflicts to the attention of the City Engineer and Public Works Director. Prior to installation of any franchise utilities, all proposed drawings from utility service companies must be provided to the City for review.

- f. Coordination of Other Agency Approvals by Developer's Engineer. The Developer's engineer shall submit the drawings to all other agencies with jurisdiction as applicable, and bring any conflicts to the attention of the City Engineer and Public Works Director. Prior to final City approval of the construction drawings, ~~all proposed drawings from utility service companies must be received and approved by the City.~~ Approvals from other agencies with jurisdiction must also be received where applicable, including but not limited to the Oregon Health Authority – Drinking Water Services (OHA-DWS), Department of Environmental Quality (DEQ), Department of Transportation (ODOT), Yamhill County and railroads wherein each has jurisdiction.
- g. The applicant is responsible for the coordination with the various utilities and agencies during design and construction. The utilities and agencies may include those shown in the Appendix.
- h. Upon final approval of the drawings for a Type B permit, submit a minimum of ten (10) copies of the revised drawings to the City Engineer to be stamped as approved for construction (*see also Appendix G for Type A permit requirements*). Additional sets may be submitted for stamping at the developer's option. No changes shall be made between the final verification set of drawings approved by the City and the drawing sets submitted to the City to be stamped, without the express written approval from the City. Any unauthorized changes introduced into the final drawings submitted for stamping will invalidate the final drawing approval.
- i. Prior to issuance of the public utility construction permits, the Developer shall provide the City with the following:
- 1) Copy of an approved (*by City Attorney*) Developer/City Construction Agreement signed and notarized by the Developer, the Developer's engineer and the Developer's prime contractor.
  - 2) Any required permit fees.
  - 3) Recorded copies of all required off-site and on-site easements and right-of-way dedications, as well as recorded agreements, shall be submitted before construction permits are issued, with the following exception.
    - a) For subdivisions or partitions where all public utilities will be constructed prior to the recording of a final plat, the execution and recording of the on-site easement documents and on-site right-of-way dedications, as well as recorded agreements relating to on-site improvements, can be done in conjunction with the final plat.
  - 3)4) All easements documents (*as well as ROW dedications, easement quit-claim*



*deeds, or similar documents) shall include a legal description and a to-scale exhibit map (containing the information required under PWDS 1.11), and easements to the City shall use the City's standard form. Legal descriptions and exhibit maps shall be submitted for City review and approval prior to recording.*

- 4)5) Proposed Construction Schedule.
- 5)6) Certificates of insurance, minimum limits as outlined in the Appendix. City of Dayton and City Engineer shall be covered as additional insured.
- 6)7) Evidence of Workman's Compensation coverage from contractor performing the work.
- 7)8) Any required Waiver of Remonstrance agreements.
- 8)9) Any required performance bonds.
- 9)10) Other submittals specific to this project, including any required approvals from applicable state agencies, such as DEQ (sewer & erosion control), OHA-DWS (water), DSL, ODOT, etc.

- j. Approval of plans by the City Engineer or Public Works for issuance of a City Public Works street/site/utility construction permit does not relieve the developer, contractor or engineer from obtaining any and all reviews and permits required under the building, plumbing or electrical codes that any portions of the work may be subject to, or from any requirements under County, ODOT or other agency permits or approvals required for the project.

#### 1.10 **CONSTRUCTION DRAWING SUBMITTAL REQUIREMENTS**

- a. *Survey: All topographic surveys shall be based from an official benchmark acceptable to the City, and be based on the NAVD 1988 datum to match the FEMA flood map elevations. Existing elevation benchmarks that are based on the NGVD 1929 datum shall utilize the appropriate conversion factor to convert to the NAVD 1988 datum. All temporary benchmarks for construction purposes are to be based off accepted City benchmarks.*

Based on the NOAA VertCon website, the current conversion (*for this area*) from 1988 to 1929 datum is about 3.356 feet – see [http://www.ngs.noaa.gov/cgi-bin/VERTCON/vert\\_con.pr1](http://www.ngs.noaa.gov/cgi-bin/VERTCON/vert_con.pr1) for specific conversions by location.

**\*\*All designs subject to a Type B Public Works Permit shall be based off of a complete topographic survey of the entire project site, adjacent right-of-ways, areas adjacent to the project site and outside of adjacent to right-of-ways as necessary to provide all design elements required by these PWDS, and all offsite areas where improvements are proposed or required, including but not limited to the following.**

- 1) **\*\*Surface features, including complete & accurate topographic information,**

extended to the full limits required by these PWDS.

- 2) **\*\*Subsurface features.**
- 3) **\*\*Existing utilities (*public and private*) within and adjacent to the project site and/or limits of improvements.**
- 4) **\*\*Property lines & all survey monuments within or adjacent to the limits of the required topographic survey.**
- 5) **\*\*Right-of-way lines & centerline monuments.**

- b. **Drawing Submittal:** The drawing submittal shall include the following as applicable unless otherwise approved by the City Engineer. The following is a general overview of drawing requirements, but is not intended to be exclusive. All requirements of the individual divisions of the standards shall be satisfied.

Since projects subject to a Type B Public Works Construction Permit vary greatly in size and complexity, not all provisions in this section will apply to all projects. For instance, small projects in improved areas which do not involve any street improvements or extensions of water, sewer or storm drain mainlines will not need to provide profiles for these facilities. To assist the design engineer, the minimum elements required of all designs subject to a Type B Public Works construction permit are designated as summarized in the sentence below.

**\*\*The elements in this section 1.10 which are marked by an (\*\*) are required to be included on the drawings for all projects subject to a Type B Public Works construction permit (see PWDS G.5).** All other elements not so designated are only required if the project involves improvements or infrastructure referenced in the non-designated paragraphs or sentences. If there are questions due to the unusual nature of a project, these should be discussed with the Public Works Director at the predesign conference (PWDS 1.9.b)

- 1) **\*\*Construction drawings shall be submitted on 22" x 34" blackline sheets unless otherwise approved by the City Engineer. All drawings submitted for review and/or approval shall be stapled and bound into sets.**
- 2) **\*\*City plan review fees as required.**
- 3) **\*\*Cover Sheet (*with all information required under PWDS 1.10.d*)**
- 4) **\*\*Overall drainage, utility and street/site lighting plan.**
- 5) **\*\*Site grading plan where applicable.**
- 6) **Plan and profile for the following public utilities:**
  - a) **Streets**

- b) Water as specified
- c) Sanitary sewers
- d) Storm drains

~~7)~~ ~~\*\*Stamped storm drainage calculations, including storm drainage basin maps.~~

~~8)7)~~ \*\*Erosion control plan.

~~9)8)~~ \*\*Standard details shall be included on the construction drawings.

~~9)~~ ~~\*\*Stamped storm drainage calculations, including storm drainage basin maps.~~

~~10)~~ A geotechnical report for the development site and other impacted properties is required for sites with (a) any existing or proposed fills, (b) existing slopes steeper than 3H:1V, (c) existing or proposed retaining walls on the development property or on contiguous properties, (d) if stormwater infiltration is proposed, or (e) where there are other geotechnical concerns identified by the City Engineer or the Public Works Director.

~~10)11)~~ \*\*A current title report which includes a list of all existing easements, restrictions, and other encumbrances on all property where construction will occur, including full copies of deeds, easements or other restrictive documents referenced in the title report (a pdf copy of each title report with embedded hyperlinks to the referenced documents may be provided in lieu of a hard copy).

~~11)12)~~ \*\*Recorded copies of all easements and right-of-way dedications required in conjunction with the project, with the exception noted under PWDS 1.9.hi.3 for subdivisions or partitions where all public utilities will be constructed prior to the recording of a final plat. Easements shall be worded such that no trees, permanent structures or improvements including parallel fences shall be placed or constructed on the easement. Easements shall be a constant width between manholes, valves or other in-line structures. Easement width shall be based on the deepest portion of the line between such structures. See the Appendix for standard easement forms.

~~12)13)~~ \*\*Proposed utility plans from all franchise utilities *(final review)*.

~~13)14)~~ \*\*Engineer's unit price construction cost estimate acceptable to the City Engineer or unit price bid results (estimate to be submitted with initial review drawings preliminary and shall be updated as applicable when final review drawings are provided). Cost estimates shall include all work covered under the PWDS (excluding work covered by buildings permits for structures), and In addition to all grading, streets, water/sanitary sewer/storm drainage, driveways, parking, etc. to be constructed with the project, estimates shall include line items for street lighting and franchise utility trenching & conduit, as well as trenching



& installation of street lighting conduits, junction boxes and pole bases as applicable.

15) Design Vehicle Turning Radius. For all developments (other than single family subdivisions and/or partitions conforming with OFC requirements), provide a summary of the largest design vehicle (including emergency/fire vehicles) which will need to access the development (including vehicle size & dimensions), as well an exhibit showing turning-radius wheel-path templates for the design vehicle (auto-turn or equivalent). The development team shall be responsible to coordinate with the Fire Chief regarding the size and turning radius of the largest emergency/fire vehicle which will need to access the site.

14)16) The submittal may also be required to include a traffic study and a traffic control plan.

15)17) \*\*A written summary of all deviations from the PWDS requirements, and written justification for any variance requests (see section 1.11). It is the responsibility of the design engineer to submit a written request for any proposed deviations or variances from City standards.

c. General

- 1) \*\*A title block shall appear on each sheet of the drawing set and shall be placed in the lower right-hand corner of the sheet, across the bottom edge of the sheet or across the right-hand edge of the sheet. The title block shall include the name of the project, the sheet title and number, the name of the engineering firm, engineer's stamp, date and revision blocks. Revision blocks shall be filled in on each drawing sheet containing revisions from previously submitted or reviewed drawings.
- 2) \*\*By City convention and to minimize confusion regarding directions, for areas northerly of Palmer Creek, "plan" north (for purposes of design drawings) is considered to be parallel with the numbered streets (1st Street through 9th Street). North arrows (true north and plan north where applicable) shall be shown on each sheet containing plan views and adjacent to any other drawing which is not oriented the same as other drawings on the sheet.
- 3) \*\*The scale shall be 1"=10', 20', 40' or 50' horizontal and 1"=2', 4' or 5' vertical for all drawings except structural or mechanical drawings. The scale of corresponding plan views and profiles shall be the same.
- 4) **In cases where streets or public utilities exist or will be reconstructed, plan view scales shall not exceed 1" = 20'.**
- 5) \*\*Each plan, profile and detail shall be labeled under the drawing. The scale for the plan, profile, or detail shall be noted under the title. Details not drawn to scale shall be so noted.

- 6) **\*\*All detail drawings, including standard detail drawings, shall be included on the drawing sheets.**
- 7) **\*\*A complete legend of all symbols used shall be provided at the front of each drawing set or on the appropriate pages. In general, existing utilities shall be shown with a lighter line weight than proposed utilities.**
- 8) **\*\*Letter size shall not be smaller than 0.10-inch high.**

d. Cover Sheet

- 1) The first sheet (*Cover Sheet*) of all drawing sets shall include the following as a minimum:
  - a) **\*\*Project name.**
  - b) **\*\*Design Engineer's name, address, telephone and fax number, and email address/website.**
  - c) **\*\*Developer's name, address and telephone number, and email address.**
  - d) **\*\*Vicinity Maps showing the location of the project in respect to the nearest major street intersection and a minimum of 500 feet around the site.**
  - e) **\*\*Legend including all symbols and line types used on the construction drawings.**
  - f) **\*\*General construction notes matching format and content of notes in the Appendix. Where there is insufficient room on the cover sheet, the notes can be included on a subsequent sheet.**
  - g) **\*\*Sheet index located near lower right corner.**
  - h) **Include a summary table listing the number of lineal feet of new public streets and public mainline utilities to be constructed. Identify the length of new streets and/or utilities under County or ODOT jurisdiction separately from those under City jurisdiction. Do not include existing streets or utilities that are being replaced as part of the project with the same length, or private streets or utilities. List the size and type (*domestic, irrigation, etc.*) of all water meters proposed. Do not include length of sewer or storm service laterals.**
  - i) **\*\*The City Planning Department file or docket number shall be listed for projects which required land use approval.**

e. **\*\*Overall Drainage, Utility and Street/Site Lighting Plan.**

- 1) The overall drainage and utility plan shall show the following as a minimum:
  - a) **\*\*The location and elevation of a National Geodetic Survey, United States Geological Survey, State Highway, Yamhill County or City of Dayton bench mark which the elevations shown are based shall be shown or noted. Temporary bench marks on or near the project site shall also be shown.**
  - b) **\*\*Right-of-way lines, property lines, easement lines (*including those outside the project but intersecting or within 150 feet of the project boundaries*).**
    - (1) *This distance can be reduced with written approval from the Public Works Director, but in all cases shall extend to the far side of right-of-ways and show property lines and improvements on the far side of the street along the entire property frontage, as well as showing enough of the adjacent properties to clearly illustrate drainage patterns, setbacks and utility issues.*
  - c) **\*\*Show (& list the recording reference numbers of) all existing easements affecting the property (*on-site & off-site*), and provide callouts with blanks for the proposed new easements (*the recording references for proposed easements are to be inserted at the as-built stage*).**
  - d) **\*\*Existing and proposed streets, curbs, sidewalks, handicap ramps and driveways within the project and within 150 feet of the project boundaries (*see exception allowed under 1.10.e.1.b.1 above*).**
  - e) **\*\*Existing and proposed sanitary sewers, storm drains, waterlines and appurtenances within the project and within 150 feet of the project boundaries (*see exception allowed under 1.10.e.1.b.1 above*).**
  - f) **\*\*Existing franchise and private utilities within the project and within 150 feet of the project boundaries (*see exception allowed under 1.10.e.1.b.1 above*).**
  - g) **\*\*Lot or parcel numbers, street names and other identifying labels (*including tax lot and address numbers for all existing properties shown*). New street names are subject to the approval of the City.**
  - h) **\*\*Location and description of existing survey monuments, including but not limited to street monuments, property monuments, section corners, quarter corners and donation land claim corners within or adjacent to the limits of the work area.**



- i) **\*\*Public and franchise/private utilities and other facilities to be relocated.**
- j) Street light and site/parking light locations based on a City spacing standards or a photometric design acceptable to the City, subject to City approval for location and maximum spacing standards(see PWDS 2.28.h & 2.32).
- k) Methodology proposed for individual lot drainage. Direction of drainage arrows and the following letter legend shall be used:

Symbol	Lot drains to:
C	Curb
P	Piped Storm Drain
DB	Detention Basin
S	Subsurface Disposal
→	Flow Direction

- l) The location of all curb weepholes shall be shown unless otherwise clearly defined or noted on the drawings.
- m) **\*\*Existing drainage patterns within the project and within 150 feet of the project boundaries (see exception allowed under 1.10.e.1.b.1 above).**
- n) Floodplain, floodway and wetland boundaries, including floodplain elevation with FEMA map reference.

f. Site Grading Plan

- 1) A site grading plan is required for subdivisions, multi-family, commercial or industrial developments, and for partitions involving street improvements or cuts/fills.
- 2) A site grading plan is required for projects subject to site design review, including all commercial, industrial, or multi-family developments.
- 3) The site grading plan shall show proposed finished grade and parcel corner elevations, with the existing and proposed contours shown at maximum one (1) foot intervals and extended a minimum of 100 feet beyond the improvements. Extremely flat sites will require contour intervals closer than 1 foot as necessary to clearly illustrate proposed grading and drainage slopes and limits.
- 4) The site grading plan shall show all drainage systems and proposed erosion

control facilities, including swales along property lines as required to intercept uphill surface runoff and convey it to an approved point of disposal.

g. Drainage Calculations

- 1) \*\*A summary of drainage and detention calculations, including basin maps, shall be presented in a clear, concise and complete manner on the site grading or drainage plan sheets, or a separate sheet. These calculations shall address all runoff into the drainage system and downstream capacity. Where applicable, list information such as the design flow and pipe capacity at key points along the storm system improvements including where flow from upstream property enters the site, downstream capacity at the connection to existing system, etc., as well as key information relating to any required detention, such as detention volume required, detention volume provided, predesign in-flow rate & design storm, design out-flow rate & design storm, overflow elevation, orifice size, head above orifice at design flow, overflow route capacity, etc. If required by the City, areas contributing flow to each inlet must be computed separately and each inlet with contributing area shall be designated and shown on an accompanying contour map work sheet.

h. Plan Views

- 1) General: \*\*Information required on the overall utility plan shall be shown on the plan views as applicable, including tax lot & address numbers of all existing lots or existing parcels shown. In addition, the following shall be shown:
  - a) \*\*Utilities and vegetation in conflict with the construction or operation of the street and public utilities. Vegetation to include trees greater than 6 inches in diameter and landscape plantings within the right-of-way and easement areas.
  - b) Public and franchise or private utilities to be relocated.
  - c) Match lines with sheet number references.
  - d) \*\*All existing survey monuments within or adjacent to work areas.
  - e) Additional information as outlined below or as required by the City based on unique or unusual features of the project.
- 2) Streets (plan view)
  - a) Street stationing shall be tied to existing property corners, centerline of intersections, and/or existing street monuments.
  - b) \*\*Location, alignment and stationing of \*\*existing streets and proposed street centerline and curb faces. \*\*Location of all curbs, driveways, edge of pavement, sidewalks, etc. shall be dimensioned from right-of-way

centerline, easement boundary or other means so that its location is clearly defined.

- c) Bearing of all street centerlines.
- d) Horizontal curve data of street centerline and curb returns, including stationing of point of tangency and point of curvature, length of tangent, length of centerline curve, delta angle, radius point, and centerline radius.
- e) Location of existing and proposed street centerline monuments.
- f) Centerline stationing of all intersecting streets.
- g) Curb return plan view details (*scale not to exceed 1" = 10', with all running slopes & cross slopes of sidewalks, pedestrian ramps & landings labeled*) and separate curb return profiles (showing gutter grades) for all curb returns with pedestrian ramps, to demonstrate compliance with PROWAG requirements. Where centerline street grades and cross slope street grades of both intersecting streets is less than 1% (*including through the entire intersection*), the City Engineer may allow plans to show only top of curb elevations along curb returns at quarter-points on the curb return detail views.
- h) Location of the low points of street grades and curb returns.
- i) Crown lines along portions of streets transitioning from one typical section to another.
- j) Location, alignment & dimensions of all street frontage sidewalks, including sidewalks to be constructed with the project and sidewalks which are deferred to a future date. Sidewalks to be constructed with the project and those deferred to the future shall be clearly designated, and all required sidewalk easements shown & labeled.
- k) For residential projects or multi-tenant commercial projects, the location of CBU mailboxes shall be shown (*location must be acceptable to the local postmaster*), and the ADA access path to the CBU mailboxes must be designated per OSSC 1111, with a note designating that the CBU and the required ADA access path to the CBU must be constructed prior to City acceptance of the street improvements.
- l) Partial street improvements must be based on a full street design **for a full urban improvement** (ie. provide full design as if the entire street were being constructed as part of project, including design of sidewalks & driveway approaches, reconnection to existing driveways, etc. on both sides, as well as storm drainage design for both sides of the street and associated intersections, etc.), with the portion actually

to be constructed as part of the project being clearly designated on the plans.

Where partial street improvements cross or intersect with other public or private streets, the partial intersection design must be based on a full intersection design, including but not limited to ADA compliant pedestrian ramps on all corners, storm drainage for the entire intersection, etc.

(m) For streets which are anticipated to experience significant truck traffic (as determined by the City Engineer or Public Works), and for driveways or access points which will accommodate truck traffic and/or emergency/fire vehicles, turning-radius wheel-path templates shall be included ~~with~~ on the drawings to demonstrate that the proposed improvements allow vehicular turning movements without encroaching onto sidewalks or crossing curbs outside of the defined driveway or vehicular access path.

3) Storm Drains (plan view)

- a) **\*\*Location, stationing and \*\*size of \*\*existing and proposed storm drains and appurtenances. Show drainage facilities upstream and downstream of the project as required to illustrate conditions affecting the design.**
- b) **\*\*Drainage facilities located outside of public right-of-ways shall be stationed from the downstream end. For all manholes, catch basins, etc, located in or adjacent to streets, drainage facility stationing shall correspond to the street stationing.**
- c) Mainline stationing of all service tees.
- d) **\*\*Location of all manholes, cleanouts (including storm lateral cleanouts), junction boxes, pipelines, ditches, etc. shall be dimensioned from right-of-way centerline, easement boundary, property line or other means so that its location is clearly defined.**
- e) All manholes and other structures shall be numbered (or lettered) with a designation unique to the project and stationed to facilitate checking the plan views with the profile.
- f) **\*\*Alignment, size and depth at property line or easement line of proposed storm drain laterals.**

4) Sanitary Sewer (plan view)

- a) **\*\*Location, stationing and \*\*size of \*\*existing and proposed sanitary sewers and appurtenances.**



- b) All sanitary sewers shall be stationed from downstream manholes to upstream manholes.
- c) **\*\*Location of all manholes, cleanouts, pipelines, ditches, etc. shall be dimensioned from right-of-way centerline, easement boundary or other means so that its location is clearly defined.**
- d) Mainline stationing of all service tees.
- e) All manholes, cleanouts and other structures shall be numbered *(or lettered)* with a designation unique to the project and stationed to facilitate checking the plan views with the profile.
- f) **\*\*Existing City manholes numbers shall be used for all existing manholes or mainline cleanouts shown. Following acceptance by the City, each new sanitary sewer manhole and new mainline cleanout shall be identified on the as-builts with a number provided by the City.**
- g) **\*\*The following information shall be provided for all sanitary sewer service laterals.**
  - (1) Mainline stationing
  - (2) Alignment
  - (3) Size
  - (4) Length of service lateral
  - (5) Depth at property line or easement line
  - (6) Distance ties from property line cleanout to nearest property corners
  - (7) Location of property line cleanout.

5) Water Distribution (plan view)

- a) **\*\*Location, stationing and \*\*size of \*\*existing and proposed water mains and appurtenances.**
- b) Each valve and fire hydrant shall be identified and stationed to facilitate checking the plan views with the profile.
- c) **\*\*Location of all waterlines and hydrants shall be dimensioned from right-of-way centerline, easement boundary or other means so that its location is clearly defined.**
- d) Waterline stationing shall be independent of the street stationing.

i. Profile Views

- 1) General: Profile views shall conform to the requirements and show the information outlined under this section as applicable:

- a) Profile views shall be to the same horizontal scale and on the same sheet as the corresponding plan view.
  - b) Match lines with sheet number references.
- 2) Streets (profile view)
- a) Original ground & finish grade profile along the centerline and curbs as appropriate. For off-set or super-elevation cross-sections, both curbs shall be profiled. Ditch invert profiles shall be shown where curbs are not to be constructed. Profiles at intersections or cul-de-sacs shall be extended to the back of the far side PUE as a minimum, and to the top/bottom of cut or fill slopes where applicable.
  - b) Stationing, elevations and percent slopes for centerline or top of curb profiles.
  - c) Beginning point of all vertical curves, points of vertical intersection, end of vertical curve, length of vertical curve, K-value and design speed, and low point of vertical curve if a sag curve.
  - d) Projection of the profile of streets that may be extended or reconstructed in the future. The projected profile shall extend a minimum of 200 feet beyond the proposed work limits. The City may require profiles to be extended further where necessary due to topography or to demonstrate ability to tie to existing streets. Projected profiles shall be designed to be compatible with the restraints of the terrain.
  - e) The top of curb profiles for all cul-de-sacs, including vertical curves for any grade changes exceeding 1%, with a K-value not less than 3.
  - f) Separate curb return profiles (showing gutter grades) for intersection curb returns in accordance with requirements under PWDS 1.10.g.2.g. The location of all pedestrian ramps shall be indicated and labeled on the curb return profiles.
  - g) Unless otherwise approved or required by the City, cross sections showing existing and proposed finish grade shall be shown at 50 foot intervals to demonstrate that the proposed street grades match the surrounding grades and address drainage concerns, as well as to determine the need for slope easements, as well as at existing driveways or other access ways. Unless otherwise approved by the City in existing developed areas, the cross sections shall extend a minimum of 50 feet beyond the right-of-way line where existing cross slopes are less than five percent (<5%) and a minimum of 25 feet beyond the right-of-way line where existing cross slopes are greater than five percent (>5%).
  - h) Profiles for partial street improvements shall include information for

both the turnpike construction (*including ditch profiles as applicable*), as well as future street profiles, including cross section profiles.

3) Storm Drain (profile view)

- a) Profile of existing and proposed ground surface along centerline of pipe, with rim and pipe inverts at each manhole, catch basin, etc.
- b) Manholes and other appurtenances shall be numbered *(or lettered) with a designation unique to the project* and stationed to match the corresponding plan view.
- c) Size, slope, pipe material and class, length of storm pipe and class of backfill between consecutive manholes, catch basins, junction boxes or cleanouts.
- d) All existing or proposed public and franchise or private utilities crossing the profile and any existing utilities which potentially are in conflict with construction of the improvements.
- e) Existing drainage facilities, including offsite facilities upstream and downstream which affect the design (*ie. size, ~~and~~ capacity and/or slope of upstream and downstream system*).
- f) Profiles for ditch and creek flow lines shall be extended as appropriate to illustrate conditions affecting the design beyond the project, both upstream and downstream. Typical cross sections shall also be shown.
- g) Where mainline storm cleanouts are approved for storm lines which will be extended in the future, plan and profile showing the alignment and depth of the anticipated future extension from the proposed cleanout to the next manhole or catch basin shall be included (*without mainline grade breaks between structures*).

4) Sanitary Sewer (profile view)

- a) Profile of existing and proposed ground surface along centerline of pipe, with rim and pipe inverts at each manhole.
- b) Manholes and other appurtenances shall be numbered *(or lettered) with a designation unique to the project* and stationed to match the corresponding plan view.
- c) Size, slope, pipe material and class, length of sewer and class of backfill between consecutive manholes.
- d) All existing or proposed public and franchise or private utilities crossing the profile and any existing utilities which potentially are in conflict with

construction of the improvements.

- e) Where mainline sewer cleanouts are approved (PWDS 4.16.b.1), plan and profile showing the alignment and depth of the anticipated future extension from the proposed cleanout to the next manhole shall be included (*without mainline grade breaks between manholes*).

5) Water Distribution (profile view)

- a) Waterline profiles shall be provided for all waterlines within existing right-of-ways or along alignments paralleled (*within 15 feet*) or crossed by existing public utilities. Waterline profiles will not be required for new waterlines within new right-of-ways unless required to prevent conflicts with proposed utilities.
- b) Profile of existing and proposed ground surface along centerline of pipe, as well as existing and proposed pavement surface of adjacent streets (*where applicable*).
- c) Show the location of valves, fittings, fire hydrants and other appurtenances, with all valves and fire hydrants numbered and stationed to match the corresponding plan view.
- d) Size, pipe material and class, depth of cover and class of backfill and surface restoration.
- e) All existing public and private utilities crossing the profile and any existing utilities which potentially are in conflict with construction of the improvements.

1.11 EASEMENTS, ETC.

- a. **\*\*Utility easements to the City** (*in a form acceptable to the City and conforming to the PWDS requirements*) shall be provided and recorded for any City utilities outside of public street right-of-ways. The minimum utility easement widths and property line offset requirements are referenced in subsequent PWDS sections for Storm Drain, Sanitary Sewer and Water. Other recorded easements/instruments affecting City access and/or interests (*ie. fire lane easements, detention easements & maintenance agreements, grease interceptor maintenance agreements, common driveway maintenance agreements, etc.*) shall also be in a form acceptable to the City and conforming to the PWDS requirements.
- b. **\*\*Legal Description & Exhibit Map.** All recorded easement documents shall include a legal description of the easement area and a to-scale exhibit map (*with the easement area clearly shown and labeled, and including all information/callouts required to illustrate the information contained in the legal description, including point of beginning, bearings and distances if applicable*), except for easements created by a



plat, in which case the recorded easement documents may reference the easement as shown on the plat. Exhibit maps not drawn and plotted to scale, or not containing the information required above, will be returned for revision.

c. **\*\*Street Frontage PUE.** Easements shall include minimum eight (8) foot public utility easements (PUE) for franchise utilities along all lot lines fronting public or private streets, as well as easements for sidewalks, utility vaults, light poles, mail boxes, meter boxes, fire hydrants, lateral cleanouts, etc. that are not within the public right-of-way.

1) Since new right-of-ways typically result in the back of sidewalk being close to the right-of-way line, PUEs along public streets shall include wording that they are a "utility easement", a "public sidewalk easement", as well as a "waterline, sanitary sewer and storm drain easement to the City of Dayton."

1)2) Construction of a building or a structure within the PUE is prohibited, including footings or overhanging portions of structures located outside the easement. If the City allows a retaining wall or a fence to be constructed within or across a PUE, an encroachment license agreement shall be executed and recorded against the property stipulating that the property owner will be responsible for any restoration costs associated with removal and reconstruction of said retaining wall or fence if such removal is required to service, maintain or repair utilities installed within the PUE, whether by the City or by any franchise utility company.

e.d. **\*\*Private Easements.** Private utility easements a minimum of ten (10) feet wide (*centered on the utility pipe and offset from common property lines*) shall be provided for all private water, sanitary sewer and storm drains, ditches or channels outside of public right-of-ways and outside the boundaries of the property being served, or which is extended across the development property in order to provide service to other properties. While the City does not dictate the specific form required for use on the private easements noted above, the easement forms used shall define which properties the private easement is to the benefit of, shall include provisions that the easement cannot be extinguished without explicit written authorization from the City, and include language that the easement will not be extinguished by the doctrine of merger (*unless the properties are consolidated into a single legal lot of record*).

d.e. **\*\*Recorded copies of all required easements and agreements** shall be submitted prior to start of construction, with the exception noted under PWDS 1.9.i.3 for subdivisions or partitions where all public utilities will be constructed prior to the recording of a final plat. All recording costs shall be borne by the Developer.

## 1.12 VARIANCES TO DESIGN STANDARDS

a. Request for Variance to Specifications/Standards

1) Variances to specifications or standards may be requested as outlined below.

- 2) In considering variance requests, the City, at its sole discretion, will seek input from individuals and/or agencies which may have information that would be relevant to the decision making process.
- 3) It is to be noted that if the requested variance involves public safety, the City will rule in favor of safety.
- 4) It is the responsibility of the design engineer to submit a written request for any proposed deviations or variances from City standards. Failure by the City to detect a deviation from (*or the need for a required variance of*) the PWDS requirements during drawing review does not constitute an default approval of said variance, unless the variance was requested in writing as outlined below and approved by the City.

b. Variance Process

1) Submittal

- a) Requests for variance shall be submitted in writing to the City Engineer. This written request shall state the desired variance, the reason for the request and a comparison between the specification/standard and the variance as far as performance, etc.
- b) Any variance of these Standards should be documented and referenced to a nationally accepted specification/standard. The use thereof shall not compromise public safety or intent of the City's Standards.

2) City's Review

- a) The variance request shall be reviewed by the City Engineer who shall make one of the following decisions:
  - (1) Approve as is,
  - (2) Approve with changes, or
  - (3) Deny with an explanation.
- b) Approval of a request shall not constitute a precedent.
- c) For variances which will result in increased maintenance or increased future costs by the developer (*or the future property owners*), the variance request must be concurred with in writing by the developer/property owner prior to final approval by the City.

3) Appeal

- a) Applicant may appeal the City Engineer's decision to the City Manager.

**CITY OF DAYTON**  
**Public Works Design Standards**

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**Division 2**  
**Streets**

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- 11) Crosswalk: See Pedestrian Street Crossing.
- 12) Curb Ramp: A ramp that cuts through or is built up to the curb. Curb ramps can be perpendicular, parallel, or a combination of parallel and perpendicular.
- 13) Detectable Warning: Detectable warnings consist of small, truncated cones built in or applied to a walking surface that are detectable by cane or underfoot. On pedestrian access routes, detectable warning surfaces indicate the boundary between a pedestrian route and a vehicular route for pedestrians who are blind or have low vision. Detectable warnings shall contrast visually with the surrounding sidewalk surface.
- 14) Downstream Intersection: The nearest intersection from a driveway located in the direction of traffic flow of the nearest lane of the abutting street.
- 15) Expansion Joint: A joint to control cracking in the pavement structure and filled with preformed expansion joint filler.
- 16) Grade: The degree of inclination of a road, sidewalk or slope, in the direction of travel.
- 17) Half Street Improvement: Where allowed by the development code, half street improvements shall fully comply with the fire lane requirements of the Oregon Fire Code, including provision of additional width if on-street parking is allowed. Generally half-street improvements are allowed only if the other side of the street was previously improved and the current development is required to complete the street improvement to full urban width (*three-quarter street improvements are the minimum typically required if there are no frontage improvements, and where the far side of the street will be improved in the future in conjunction with other developments*).
- 18) Intersection: The meeting point of two streets having at least three legs.
- 19) Local or Residential Street: A facility not designed as an arterial or collector. It serves primarily to provide direct access to abutting land and offers the lowest level of traffic mobility. Through traffic movement is deliberately discouraged.
- 20) Longitudinal Joint: A joint which follows a course approximately parallel to the centerline of the roadway.
- 21) Natural Grade: The grade with the land in an undisturbed state.
- 22) One-Way Driveway: A driveway of either ingress or egress, but not both.
- 23) Parking Space: A designated space in a parking area for the parking of one motor vehicle. An off-street parking space is a designated space for the parking of one motor vehicle, which is located on private property rather than on a public street.



- 24) Pedestrian Access Route: A continuous and unobstructed path of travel provided for pedestrians with disabilities within or coinciding with a pedestrian circulation path.
- 25) Pedestrian Circulation Path: A prepared exterior or interior surface provided for pedestrian travel in a public right-of-way.
- 26) Pedestrian Street Crossing: A marked or unmarked route, providing and accessible path to travel from one side of the street to the other. Pedestrian street crossings are a component of the pedestrian access route and/or the pedestrian circulation path.
- 27) PROWAG: See definition in Division 1.
- 28) Running Slope: The grade that is parallel with the direction of pedestrian travel.
- 29) Sidewalk: A right-of-way deeded, dedicated, and designated for the use of non-motorized vehicles and pedestrians.
- 30) Streets or Roads: Any public highway, road, street, avenue, alley, easement or right-of-way used or to be used for vehicle movement. Full street improvements include curb and sidewalk on both sides, storm drainage and fully improved in accordance with these standards.
- 31) Structures: Those structures designated on the standard plans as catch basins, manholes, etc. Detailed drawings of structures or devices commonly used in City work and mentioned in these standards are included in the standard construction specifications.
- 32) Superelevation: The vertical distance between the heights of the inner and outer edges of pavement on horizontal curves.
- 33) Three-Quarter (3/4) Street: A  $\pm 75$  percent portion of the ultimate width of a street, but not less than  $25\frac{1}{2}$  feet from face of curb to edge of pavement, usually along the edge of a development, where the remaining portion of the street shall be provided when adjacent property is developed. 3/4 street improvements include curb, piped storm drainage and sidewalk on one side, storm drainage improvements stubbed across the street for future catch basins on the unimproved side, and a full depth gravel shoulder per PWDS 2.19.c & drainage facilities on the non-curbed side of the street.
- 34) Transition: The taper between portions of a street with different pavement widths.
- 35) Transverse Joint: A joint which follows a course approximately perpendicular to the centerline of the roadway.

- (1) Where noted on the drawings, Class B pavement refers to the 3/4" dense graded mix, and Class C refers to 1/2" dense graded mix.
  - b) AC pavement for public streets shall be Level 2 Job Mix Formula (JMF).
  - c) Unless otherwise specified or shown on the drawings, AC pavement for private streets and parking lots shall be Level 2 Job Mix Formula (JMF).
  - d) Where identified on the drawings, AC pavement for collector or arterial streets shall be Level 3 Job Mix Formula (JMF).
- 3) AC mix design shall be submitted to the City for review and approval prior to use.

c. **Granular Baserock**

- 1) Granular baserock shall conform to OSSC (ODOT/APWA) 02630.10 (Dense Graded Base Aggregate), with no more than 10% passing the #40 sieve and no more than 5% passing the #200 sieve. Gradation shall be as follows:
  - a) Base Rock: 1½"-0
  - b) Leveling Rock: ¾"-0
  - c) Alternate single size 1"-0 aggregate as approved by the Engineer.

d. **Concrete (Cast-in-Place)**

- 1) All concrete shall conform to the requirements of OSSC (ODOT/APWA) 00440, Commercial Grade Concrete, 3300 psi air entrained (5" slump or stiffer).
- 2) Concrete mix design shall be submitted to the City for review and approval prior to use.

e. **Street Lights**

- 1) Unless otherwise approved by the City Engineer and Public Works Director, street light poles shall be fiberglass poles designed to produce a 25-foot mounting height, with a mounting arm per the standard details. Poles shall be grey or brown in color, have a natural finish, and be provided with a direct bury base sleeve for landscape areas, and a precast concrete pole foundation for sidewalk areas.
- 2) Unless otherwise approved by the City Engineer and Public Works Director, all luminaries shall be Cobrahead flat lens type using a -49 watt LED cobrahead

fixture (*ie. equivalent to 100 watt high pressure sodium*) and photoelectric control relay.

- 3) All street lighting materials, including wire, and installation procedures shall meet current requirements for maintenance by the local electric utility company. Any line extension fees shall be the responsibility of the developer.

f. **Geotextile Fabric.**

- 1) Unless otherwise required by City Engineer, geotextile fabric shall conform with OSSC (ODOT/APWA) 02320, Geosynthetics, with minimum property values conforming to Table 02320-1 as noted below.
- 2) **Reinforcement Fabric.** Unless heavier is specified or noted on the drawings, reinforcement fabric (*for over-excavation or under embankments*) shall be non-woven fabric (*Propex Geotex 1001, Mirafi 1000N, Linq 250EX or approved equivalent*), or woven fabric (*Propex Geotex 250ST, Mirafi 550X, Linq GTF250, or approved equivalent*). Slit film fabrics are not allowed.
- 3) **Separation Fabric.** Unless heavier is specified or noted on the drawings, separation fabric (*where successful proofroll allows compaction testing of subgrade to be waived*) shall be non-woven fabric (*Propex Geotex 601, Mirafi 160N, Linq 150EX or approved equivalent*), or woven fabric (*Propex Geotex 200ST, Mirafi 500X, Linq GTF200, or approved equivalent*). Slit film fabrics are not allowed.
- 4) **Drainage Fabric.** Unless heavier fabric is specified or noted on the drawings, drainage fabric shall be conform with Type 2 Drainage Geotextile (OSSC/ODOT/APWA 02320), non-woven fabric (*Propex Geotex 601, Mirafi 160N, Linq 150EX or approved equivalent*). Slit film or woven fabrics are not allowed.
- 5) **Riprap Fabric.** Unless heavier is specified or noted on the drawings, fabric under riprap shall be conform with Type 2 Riprap Geotextile (OSSC/ODOT/APWA 02320), non-woven fabric (*Propex Geotex 1071, Mirafi 1120N, Linq 275EX or approved equivalent*). Slit film or woven fabrics are not allowed.

## 2.11 IMPROVEMENT STANDARDS BY STREET CLASSIFICATION

a. The table below summarizes the improvement standards for each road classification.

IMPROVEMENT REQUIREMENTS		
Street Classification	Min. Right-of-Way Width	Curb to Curb Width
Arterial      Ferry Street, 3 <sup>rd</sup> Street/Wallace Road	case-by case	case-by case
Collector <sup>1</sup>	60'	36'
Commercial/Industrial	60'	36'
Local III <sup>2,3</sup> ( <i>provides access to ≥80 dwelling units or serving ≥800 ADT or ≥320,000 ft<sup>2</sup></i> )	50'	34'
Local II <sup>2,3</sup> ( <i>provides access to 20-79 dwelling units or serving 200-799 ADT or ≥80,000 ft<sup>2</sup></i> )	48'	32'
Local I <sup>2,3</sup> ( <i>provides access to ≤19 dwelling units or serving ≤190 ADT or &lt;80,000 ft<sup>2</sup></i> )	46'	30'
Residential Cul-de-sac <sup>2,3</sup>	Width per local street criteria above	Width per local street criteria above
Cul-de-sac Bulb (Residential)	45' radius	38' radius
Alleys	20	18' <sup>5</sup>

Parking both sides typical all streets except as noted.  
<sup>1</sup>Collector street widths determined on a case by case basis (LUDC 7.2.302.04), with widths noted above as typical minimums.  
<sup>2</sup>See LUDC 7.2.302.04 for additional information.  
<sup>3</sup>Parking both sides for all local streets and cul-de-sacs (LUDC 7.2.302.04).  
**OFC Notes:**  

- For reference, the minimum clear widths required for fire apparatus access roads (*fire lanes*) under the Oregon Fire Code (OFC) may take precedence in some situations (*20' fire lane width required where there are no fire hydrants, 26' fire lane width required for streets with fire hydrants, OFC 503 & OFC App. D*).
- Fire lanes up to 26 feet wide shall have fire-lane/no-parking signs posted on both sides, while fire lanes wider than 26 feet (*but less than 32 feet*) shall be posted on one side (OFC D103.6.1&2).
- The OFC requirements cannot be modified solely by a land use approval.

<sup>5</sup> Width listed refers to driveable paved width, whether or not curbs are provided or required. Where curbs are not provided, gravel shoulders shall be provided on each side of paving to the extent possible.  
**Notes:**  
-If a land use variance variancee is granted for no parking on one or both sides of the street-only, one curb(s) along the no parking side(s) shall to be painted and signed for no parking at time of street construction.  
-Right-of-way widths must be adequate to accommodate the specified street, curb, and sidewalk widths (including planter strips if required), while allowing a minimum of 0.5 feet from the back of sidewalk to the right-of-way line to ensure that survey monuments are not disturbed during construction or reconstruction of sidewalks (see also ORS 209.140-155 & 92.044.7).

b. The number of travel lanes for arterial and major collector roads shall be determined by



the volume of traffic. The City may require additional turning lanes where required by Department of Public Safety-Public Works Director or a traffic engineer's report evaluating the need for additional turning lanes.

- c. Additional pavement and right-of-way width may be required to accommodate turning lanes, parking and bike lanes.

**2.12 STREET DESIGN MINIMUM SECTIONS**

- a. The street design shall result in streets which:
  - 1) are of adequate design to handle the traffic needs of the City,
  - 2) are designed in a manner to allow economical future maintenance, and,
  - 3) provide a minimum practical pavement design life of 30 years for all streets.
- b. The minimum pavement section for public streets shall conform to the following table. These pavement sections are based on subgrade compacted to 95% of AASHTO T-180 (Modified Proctor). Where subgrades cannot be compacted and tested to this standard (*or are not compacted by choice*), a thicker baserock section will be required.

<b>MINIMUM PAVEMENT SECTIONS</b>		
Street Classification	AC Pavement Thickness (inch)	Baserock Thickness (inch)
Arterial <sup>1</sup>	4	15
Collector	4	12
Commercial	4	12
Industrial	4	15
Local Residential (III) <sup>2</sup>	3	12
Local Residential (I, II) <sup>2</sup>	3	10
Cul-de-sac (Residential)	3	10
Private Street ( <i>3 or more dwelling units</i> )	3	9
Alley in Residential Zone <sup>3</sup>	2½	9
Alley in Commercial Zone <sup>3</sup>	3	10
<sup>1</sup> – Thicker baserock & AC sections may be required by ODOT or Yamhill County wherein each has jurisdiction.		

<sup>2</sup> – See LUDC 7.2.302.04 for additional information on Class I, II & III streets.

<sup>3</sup> – Assumes alleys are not used as primary vehicular access route, in which case public street rock & AC sections will be required.

- c. The City reserves the right to require an engineer designed pavement section in lieu of the standard section. This will typically be required for streets for which the City Engineer has reason to suspect unsuitable soil conditions, high percentage of trucks, where overlays are proposed, or any other conditions that may significantly affect the pavement structure design.
- d. Where required by the City, the design of overlays shall include non-destructive falling weight deflectometer tests or other tests approved by the City Engineer and the preparation of an engineering analysis of street improvements required for the design life required with all anticipated traffic, including truck traffic.
- e. Unless otherwise approved by the City Engineer, pavement designs shall be based on AC pavement conforming to OSSC (ODOT/APWA) 00744, hot mixed Asphalt Concrete (~~HMAC~~) Pavements (ACP), for standard duty mix and compacted to a minimum of 91% of maximum density (*at all locations*) as determined by the Rice Standard Method.

## 2.13 OVERLAYS

- a. All AC pavement overlays shall include non-woven fabric specifically designed for use with AC pavement.
- b. The standard minimum overlay thickness shall be 2-inches. In no case shall the overlay thickness be less than 1½-inches. This minimum thickness shall be increased as necessary to provide the required cross slopes, with smooth transitions between all variations in cross slope.
- c. Design of overlays shall be based on an analysis of the existing pavement condition by a registered professional engineer experienced in the design of pavements, and shall result in the minimum practical design life as specified. Unless otherwise approved by the City Engineer, testing of the existing pavement shall include the following as a minimum.
  - 1) Coring of the street at maximum 50 foot intervals to establish the thickness and condition of existing pavement and aggregate base.
  - 2) Non-destructive falling weight deflectometer tests on the existing pavement proposed for overlay.
  - 3) Preparation of an engineering analysis of overlay thickness required to provide the specified design life with all anticipated truck traffic.
- d. Areas of existing pavement and baserock which exhibit deflection or alligator cracking

- f. When new curbing is being placed, a stamp shall be placed to mark where each water, sanitary sewer or storm drain service lateral crosses the curbline. The curbs shall be marked on the top of the curbs with an imprinting stamp a minimum of 2-inches high. The impression for a water service shall be the letter "W". The impression for a sanitary sewer service shall be the letter "S". The impression for a storm drain service shall be the letter "D".

## 2.21 SIDEWALKS & PEDESTRIAN ACCESS ROUTES

- a. Unless otherwise allowed by the Development Code and/or approved through the Planning Department, sidewalks shall be provided on both sides of curbed streets for all road classifications, as well as for private streets.
- b. Monolithic curb & public sidewalk placement is not permitted (*ie. curb concrete & public sidewalk concrete shall be placed separately*).
- c. Drain pipe shall be installed under sidewalks as required to connect to all curb weep holes or other storm drain facilities. Surface discharge of roof drains or other drain pipes across sidewalks is not allowed, nor is the sheet flow from parking lots, commercial/industrial driveways, common residential driveways, or concentrated flow from long flaglot driveways allowed to flow -drainage across sidewalks-allowed.
- d. All sidewalks shall fully comply with all ADA and/or PROWAG standards as applicable. Handicap access ramps meeting current ADA and PROWAG standards shall be provided at all corners of intersections where crossing is permitted, regardless of curb type (*or absence of curb*), and at the ends of all sidewalks.
- e. Handicap access ramps shall be located so as to avoid conflict with storm drain catch basins.
- f. Sidewalks shall be constructed of concrete, and shall be a minimum of 4-inches thick except at driveway crossings and pedestrian ramps, which shall be a minimum of 6-inches thick (*8-inch thickness required for commercial type driveways*).

- g. Sidewalks shall meet the minimum widths outlined below. The location of sidewalks within the public right-of-way shall be as approved by the City during the design process.

MINIMUM SIDEWALK WIDTHS		
Street Classification	Min. Sidewalk Width from back of curb	Location unless otherwise approved
Ferry Street & 3 <sup>rd</sup> Street <i>(ODOT R.O.W. outside of CBO overlay zone)</i>	6 ft or current ODOT standard	Curblines
Within CBO overlay zone <sup>1,2</sup>	8 ft from property side, plus ±4' concrete planter strip to curblines <sup>3</sup>	Property Side <sup>4</sup> to Curblines
Collector Street	5 ft	Curblines
Commercial or Industrial Str.	5 ft	Curblines
Local Street	5 ft	Curblines
<p><sup>1</sup> This sidewalk standard applies to all properties within the CBO (Central Business Overlay) zone <i>(except for properties along 3<sup>rd</sup> Street where existing curbs do not exist, or for properties fronting non-curbed streets where new curbs are not required as a condition of development)</i>. This does not apply to the frontage of Courthouse Square Park, as this property is outside of the CBO zone.</p> <p><sup>2</sup> Sidewalks meeting the CBO zone standard are not required for properties within the CBO zone which contain only single-family residential structures <i>(until such time as the use of those properties changes to commercial, or such time as those properties are redeveloped to a commercial use)</i>.</p> <p><sup>3</sup> Sidewalk improvements in the CBO zone shall also include tree wells and street trees at ±30-40 foot spacing <i>(actual spacing to be as directed by Public Works, based on property &amp; building/door layouts, driveway locations, etc)</i>.</p> <p><sup>4</sup> Property line sidewalks are typically offset 6" to 1' from the rights-of-way line in order to avoid conflicts with right-of-way and property monuments.</p>		

- h. Water meters, utility poles, etc. are not permitted within sidewalks unless authorized in writing by the City Department of Public Works.
- i. Where single or clustered mailboxes or other objects are within a sidewalk, the sidewalk shall be widened to provide clearance equal to the required sidewalk width. For retrofit installations only where specifically approved in writing by Public Works, the sidewalk clear space may be reduced to 48 inches minimum, provided that all other PROWAG requirements are satisfied. All existing mailboxes shall be set on new posts at the time of sidewalk construction.



j. Sidewalks to be constructed in conjunction with street improvements or to be provided as part of a development may be deferred at the City's option until building construction except for the following situations:

- 1) Arterial or collector streets fronting corner lots.
- 2) Sidewalks along streets from which vehicular access to the fronting lot is restricted.
- 3) Sidewalks fronting existing structures.
- 4) Offsite sidewalks not abutting the property within the development.
- 5) All required ADA handicap access ramps within or adjacent to public or private streets, as well as sidewalks required for ADA compliant pedestrian access to CBU mailboxes.
- a) CBU mailbox location must be acceptable to the local postmaster, and provide for ADA compliant access.
- b) ~~including installation of a~~An ADA pedestrian access ramp must be located within 50 feet of the CBU (Oregon Structural Specialty Code 1111.4.1).
- a)c) Installation of CBU mailboxes within the curb radius at street intersections is prohibited.
- 6) Existing sidewalks which do not meet City or ADA standards which must be replaced in conjunction with a development.

k. In all cases where the construction of a sidewalk is deferred, all grading work required for future construction of the deferred sidewalks shall be completed by the developer at the time of street and utility construction, including weepholes through the curb for future rain drain pipes.

l. Sidewalk Grades & Vertical Alignment.

- 1) Except for pedestrian street crossings (see Section 2.16, Intersections & Pedestrian Crossings), the sidewalk grade for pedestrian access routes contained within the public right-of-way shall not exceed the general grade of the adjacent street.

m. Temporary transitions acceptable to the City shall be provided at points where sidewalks terminate, except where otherwise approved by Public Works and the City Engineer (*typically limited to cases where the pedestrian access route does not continue beyond the end of the sidewalk*).

- 1) A public utility pole.
- 2) A tree trimmed (*to the trunk*) to a line at least eight (8) feet above the level of the intersection.
- 3) An official warning sign or signal.
- 4) A place where the natural contour of the ground is such that there can be no cross visibility at the intersection.

### **2.23 CUL-DE-SACS, TURNAROUNDS**

- a. Cul-de-sacs shall be as short as possible and shall have a maximum length of 400 feet long and serve no more than 18 dwelling units unless otherwise approved by the Planning Commission.
- b. The standard details show the minimum requirements for cul-de-sac turnaround areas. Other turnaround geometries may be used when conditions warrant and the City Engineer approves the design and application of its use. Cul-de-sacs in commercial or industrial developments shall provide adequate turnarounds for the type of vehicle serviced by the street, as approved by the City Engineer.
- c. The minimum curb radius for transitions into cul-de-sacs bulbs shall be 25 feet and the right-of-way radius shall be sufficient to maintain the same right-of-way to curb spacing as in the adjacent portion of the street.
- d. The finished pavement grade from the center point of cul-de-sac turnarounds to the curb shall not be less than two and one-half percent negative (-2.5%).
- e. Cul-de-sac curb profiles shall be provided with a smooth vertical alignment. Curblines grade changes in excess of 1% shall use a vertical curve, with a K-value not less than 3.

### **2.24 STUB STREETS**

- a. Stub streets which allow for future extensions shall include a reserve strip at the terminus of the right-of-way provided by deed or plat conveyance to the City. The reserve strip shall be at least one foot in width and extend the full width of the right-of-way. Reserve strips may also be required along new streets which front on undeveloped property. Where reserve strips are required, they may be counted as part of the required right-of-way width.
- b. A paved turn around shall be provided for stub streets with lengths greater than 300 feet, or as required by the Oregon Fire Code (*150 foot maximum length without turnaround per OFC D103.4, unless otherwise approved by the Fire Chief*).
- c. Permanent barricades shall be placed at the end of all stubbed roads without a cul-de-sac turnaround. Vehicular access from the end of stub streets is prohibited unless explicitly

perimeter.

- 1) Accessible on-street parking spaces shall conform with the requirements of PROWAG, and shall conform with City parking space or ADA dimensions, whichever is more stringent.
- 2) Accessible on-street parking spaces shall be located as close to an accessible curb ramp as possible. Unless the accessible on-street parking spaces are provided adjacent to the intersection (*ie. at the block end*), an accessible curb ramp shall be installed at the accessible parking location.
- 3) Access aisles adjacent to head-in or angled on-street parking shall be a minimum of 8 feet in width. Parallel accessible on-street parking will require a 5 feet wide access aisle between the parking space and the curb.
- 4) Access aisles shall extend the full length of the parking spaces they serve. Access aisles (*a minimum of 8 feet in width*) shall extend from the accessible on-street parking space to the accessible curb ramp.
- 5) Slopes within the accessible on-street parking space and access aisle shall not exceed 2% in any direction.

## 2.28 PARKING LOTS

- a. Minimum pavement sections for parking lots over compacted subgrade shall conform to the following:

PARKING LOT MINIMUM PAVEMENT SECTIONS		
Classification	Pavement Thickness (inch)	Baseroack Thickness (inch)
Parking Lot Access Route	3 (AC)	10
Parking Lot	2½ (AC)	7
The minimum pavement sections shown assume competent compacted subgrade and normal light traffic loading, and may not be adequate for all locations, soil conditions or types of development. The developer and/or design engineer shall be responsible to verify adequacy of proposed sections for the use intended. See PWDS 2.30.f for requirements where use of durable non-paved surfaces is proposed.		

- b. Access routes through parking lots which are to be used (1) by delivery trucks, service vehicles or fire trucks, or (2) by automobiles in excess of 500 vehicles per day, shall conform to the minimum access route section outlined above.

- c. The dimensions for the design and layout of parking facilities shall conform to the minimum requirements shown on the Standard Details. In the event of discrepancies between the minimums in the PWDS standard details and the minimums in the development code, the larger minimums will typically apply as determined by the City (*ie. for instance, if minimum parking space dimensions in the PWDS are greater than minimums listed in the development code, the larger space requirements will control since the greater size will still comply with the minimum under the development code. The same applies to minimum drive aisle widths required in the development code, the PWDS or the Oregon Fire Code*).
- d. Parking lots and associated driveways shall maintain adequate drainage facilities to prevent water ponding or ice formation, and to prevent stormwater from sheet flowing across sidewalks. In general, this requires a minimum cross slope of two percent (2%) perpendicular with contour lines. In no case shall cross slopes less than one percent (1%) be allowed at any point. All drainage facilities shall conform to the requirements of Division 3 of these Design Standards.
- e. Curves and corners within the parking facilities shall have a minimum curb radius of 15 feet except for emergency access lanes, where a minimum curb radius of ~~25~~28 feet shall be required, unless a smaller radius is approved by the Fire Chief (OFC 503.2.4 & OFC Fig D103.1).
- f. Bumper guards or wheel barriers shall be installed so that no portion of a vehicle projects into the right-of-way or over the adjoining property.
- g. Sidewalks abutting head-in parking stalls shall be a minimum of 6 feet wide, unless wheel stops are provided (*front of wheel stop set 2 feet from the curblin e or edge of the sidewalk*). For purposes of sizing single loaded parking stalls (without wheel stops) which abut 6-inch curbs and 6 foot wide sidewalks, a maximum 1 foot bumper overhang may be assumed for standard size parking stalls (ie. standard parking stall length may be reduced by a maximum of 1 foot from the length listed on the Standard Details). Length of compact parking stalls are not to be reduced.
- h. Parking lots and associated access driveways shall be provided with security lighting configured to minimize glare onto adjacent property (*see PWDS 1.10.e.1 j*). Wall pack and/or bollard lights may be utilized as the sole source of driveway & parking lot lighting only in locations where they will not need to shine over vehicles to light the parking lot, and it is demonstrated that wall pack lights will not shine onto adjacent property.

## **2.29 DRIVEWAY SPACING & LOCATION**

- a. No more than one driveway per property shall be permitted in residential zones except for duplexes (*which can have two driveways*).
- b. Where possible, driveways for corner properties (*corner lot*) shall be located on the lowest classification street and as far from the intersection as possible.



- b.c. Driveways on through lots shall be located on the lowest classification street.
- e.d. Residential driveways of adjoining properties shall have a minimum of 15 feet clear between the edges of the driveways.
- d.e. Location of all driveways serving commercial, industrial or multifamily facilities shall be approved by the City.
- e.f. Driveways shall be separated from an intersection by a minimum of 30 feet or one-half the lot frontage, whichever is greater.

### 2.30 DRIVEWAYS, AND DRIVEWAY APPROACHES, ALLEYS

- a. Driveways shall conform to the City of Dayton Standard Details. Curb removal for driveways shall be by saw cutting.
- b. Sidewalks crossing driveway approaches shall be concrete per City standards.
- c. Driveway approaches shall be constructed to meet current ADA and PROWAG standards at all locations where sidewalks cross or will cross the driveway.
- d. Driveway approaches on curbed streets shall be constructed of concrete, and shall be a minimum of 6-inches thick (*8-inch minimum for commercial type driveways*). Driveway approaches on turnpike (*non-curbed*) segments may be either concrete or asphalt, and shall be constructed so that they do not block drainage along the street.
- e. Driveways, etc. to be paved. All driveways, parking areas and vehicle maneuvering areas shall be paved with asphalt, concrete or comparable surfacing, except where the use of durable non-paving material is approved by the City on a case-by-case basis, where required to reduce surface water runoff and protect water quality.
  - 1) Durable non-paved surfaces shall be subject to review and approval by the Public Works Director, and will require a maintenance agreement acceptable to the City be recorded against the property.
  - 2) The type of durable non-paved surface proposed shall allow for the installation of permanent marking of parking spaces, driving lanes, fire lanes & turnarounds, etc. (*ie. where permanent surface painting is not feasible, permanent colored surface delineators specifically designed for use with the durable non-paved surface proposed shall be provided and installed*).
- f. New alleys shall be paved.
- f.g. Alleys Used as Driveways. Existing alleys used as driveways for new structures (*whether or not land use approval is required*) shall be paved to City standards from the public street along the entire portion of the alley used as a driveway (*including turning/backing areas as applicable*).

- g-h. In cases where non-paved surfaces are allowed, driveways and alleys shall be provided with a minimum 10 foot paved or concrete extension of the approach beyond the back of sidewalk location in all cases (*from back of future sidewalk location for turnpike streets*). Per LUDC 7.2.303.09.A, new driveways shall be paved completely with asphalt or concrete.
- h-i. Multiple use, commercial or industrial type driveways (*and any driveway exceeding 10% slope*) shall be paved completely.
- i-j. Single family residential driveways: Driveway shall be a minimum of 12 feet wide and a maximum of 24 feet wide at the property line (LUDC 7.2.303.09.C). See PWDS 2.30.e-ed, g & km for residential driveway apron requirements on turnpike streets.
- j-k. Common driveways serving multiple lots and flag lot driveways over 150 feet in length shall be provided with an emergency turnaround meeting the requirements of Public Works, or as required by the Oregon Fire Code.
- k-l. Maximum slope of driveways shall not exceed 15%.
- l-m. The angle between a driveway centerline and the parallel vehicle travel lane shall be between 75 degrees and 105 degrees.
- m-n. For driveways connecting to a street that has not been improved to its ultimate width, the driveway profile (*ie. vertical profile*) shall be designed to allow for future street widening without reconstruction of the driveway. Driveways on turnpike or streets narrower than standard shall be constructed such that the surface of the driveway matches the future back of sidewalk elevation (*ie. future back of sidewalk elevation to be based on design street width and cross slope per current City standards, assuming the future street will be centered in the future right-of-way unless otherwise directed by the City*). This requirement applies both to new driveways and to existing driveways reconstructed in conjunction with street improvements.

## **2.31 PRIVATE STREETS, COMMON DRIVEWAYS AND FLAGLOTS**

- a. Private streets serving 3 or more single family lots or parcels or dwelling units shall be constructed to the same cross sectional specifications (AC & rock sections) as public streets - base rock & pavement section standards.
- 1) Private streets or common driveways shall be provided with sidewalks or pedestrian walkways (serving all structures) as required by City code and/or planning approval.
  - 2) Unless otherwise approved by the City Engineer and the Fire Chief, cross slope for common driveways, private streets and fire lanes shall not exceed limits for public streets (typically 5% maximum).
- b. A turn-around shall be required for any private residential street, common driveway, fire

lane or flagstem driveway which has only one outlet and which is in excess of 150 feet long, or which serves more than two residences, or as required by the Oregon Fire Code. Non-residential private streets serving more than one ownership shall provide a turn-around if in excess of 200 feet long and having only one outlet, or as required by the Oregon Fire Code. Turn-arounds for private streets shall be either a circular turn-around with a minimum paved radius of 35 feet, or a tee or hammerhead turnaround conforming to the standard details, or as required by the Oregon Fire Code.

- c. Pavement sections and widths for private streets, common driveways, flaglot drives or partition access easements serving single family lots or parcels shall conform to the following (*driveways for commercial, industrial or multi-family developments shall conform with commercial driveway & parking lot access requirements – see details*):

MINIMUM PAVEMENT WIDTH AND SECTIONS (SF homes or duplexes)			
Classification <sup>5,6</sup>	Minimum <sup>1</sup> Paved Width <sup>2</sup>	Pavement Thickness (inch)	Baseroack Thickness (inch)
Private Streets serving 3 to 6 lots or parcels <sup>3,4</sup>  Fire Lane minimum ( <i>match street section where more than 6 residences, or match parking lot access route where applicable</i> )	20 ft*	3 (AC)	9
		8 (PCC)	2
Common Drives serving 2 lots or parcels <sup>1,3</sup>	20 ft	2½ (AC)	8
		6 (PCC)	2
Flag Lot Driveway serving one single family lot or parcel <sup>1</sup>	12 ft	2½ (AC)	6
		6 (PCC)	2
Partition Access Easement (1 dwelling unit on a single lot or parcel) with a sole use driveway <sup>7</sup>	12 ft	2½ (AC)	6
		6 (PCC)	2
Partition Access Easement (2 dwelling units on a single lot or parcel) with a sole use driveway <sup>7</sup>	16 ft	2½ (AC)	6
		6 (PCC)	2
Residential driveway aprons on a turnpike street (no curbs), for portion within ROW	D/W width  24 ft max	2½ (AC)	6
		6 (PCC)	2
<p><sup>1</sup> – Wider pavement widths may be required by the local fire chief or where necessary to meet Oregon Fire Code (OFC) requirements or where necessary to meet Oregon Fire Code (OFC) requirements (20' minimum typical). Fire Lanes shall be designed to support 60,000 lb fire apparatus per OFC D102.1. OFC 503.1.1 requires that a fire lane (<i>ie. fire apparatus access road</i>) extend to within 150 feet of the furthest point on any building exterior 1<sup>st</sup> story wall.</p> <p><sup>2</sup> – Paved width shall be measured from the face of curb where curbs exist</p> <p><sup>3</sup> – See LUDC 7.2.302.07. Also, a recorded maintenance agreement is required for common driveways serving two or more lots or parcels, or for private streets.</p> <p><sup>4</sup> – Sidewalk to City standards required along one side of private street for entire length (LUDC 7.2.302.07.B.4). Provide PUE along one side of street easement for franchise utilities.</p> <p><sup>5</sup> – All common residential driveways &amp; private streets shall be designated as fire lanes and signed for no parking, and shall meet the fire apparatus access road requirements of the Oregon Fire Code where applicable.</p> <p><sup>6</sup> – See PWDS 2.29.d for hard surfacing requirements adjacent to sidewalks.</p> <p><sup>7</sup> – See LUDC 7.2.302.08. Recorded maintenance agreement is required.</p> <p><b>Note: <u>Easement widths for fire lanes or driveways across other property are to be a minimum of 5 feet wider than the paved or improved width (see also Detail 220).</u></b></p>			



- d. Flaglot Drive Earthwork & Grading. As a minimum, all grading for single flag lot drives shall be completed by the developer at the time of street and utility construction, whether or not paving is required at the time of street construction.
- e. Common Use Driveway & Fire Lane Paving. Common use driveways and fire lanes shall be paved by the developer at the time of street and utility construction to ensure that they are serviceable prior to building permit issuance per Oregon Fire Code requirements (OFC 501.4), unless an exemption is granted by the Fire Chief to allow paving to occur prior to occupancy.

### **2.32 STREET LIGHTING**

- a. Street lighting design shall be provided as part of the street design and/or development process at the developer's cost. Street lights shall be located as near as possible to lot line extensions and not in the middle of lots.
- b. Spacing and location of street lighting shall be approved by the City based on City spacing standards or a photometric design, subject also to the location and spacing standards summarized herein. The design and installation of street lights shall be paid for by the developer, including any redesign costs required to comply with City spacing or location standards. Any line extension fees shall be the responsibility of the developer.
- c. Any street light relocation, if requested by a resident or developer, must be approved by the Public Works Director, and the resident or developer will be responsible for the cost of such relocation.
- d. Unless otherwise approved by Public Works and the utility company, street lights shall be installed a minimum of 1 foot behind curblane sidewalks.
- e. Street lights may be installed between the curb and property line sidewalks provided the street light is a minimum of 3-feet behind the face of curb and 1 foot from the sidewalk.
- f. Street lights shall be placed at all street intersections and at cul-de-sac bulbs. Unless otherwise approved by the City, street light spacing shall not exceed 200 feet or 3 lot widths, whichever is less. As noted above in paragraph 1.1(d) of these standards, lesser spacing must be used whenever required in writing by the City, based on public safety concerns or by a the photometric design.
- g. Where pedestrian paths or offsite sidewalks are required in conjunction with a development project, street lights or pedestrian lighting (acceptable to the Public Works Director) shall be provided along the sidewalks or paths where adequate lighting does not already exist.

### **2.33 BARRICADES AND GUARDRAILS**

- a. Guardrails shall be provided on all streets with downhill slopes which drop 6 feet or

- (MUTCD). Location and type of signs shall conform with MUTCD and City Standards.
- c. Signs along County or State right-of-ways shall be approved by the County or ODOT as appropriate.
  - d. All signs shall be ordered, installed and paid for by the developer. Street names and sign types shall be approved by the City prior to placement of the sign order.

### **2.36 CUTTING EXISTING STREETS & RESTORATION REQUIREMENTS**

- a. Any street pavement cuts shall be repaired to PWDS standards and details, including any work by or for franchise utility companies. Finish pavement grades at transition to existing pavement shall match existing pavement grades or be feathered past joints with existing pavement as required to provide a smooth, free draining surface. Pavement surface shall be a smooth, well-sealed, tight mat without depressions or bird baths. Bony or open graded pavement surfaces, pavement which does not drain, or pavement with cracks or discontinuities along edges between new pavement and existing pavement or curbs shall be repaired to the satisfaction of the City, prior to final acceptance of the work.
- b. Unless otherwise approved in writing by Public Works, sawcuts or trenches within arterial or collector streets shall meet same requirements (*below*) as for cutting new streets (*ie. pavement less than 5 years old*).
- c. Street cuts in PCC concrete streets or concrete driveway aprons shall be restored as required by the City Engineer.
- d. Pavement more than 5 years old. All trench cuts or widening of existing paved streets (*those which do not meet the overlay/inlay requirements below*) shall include a bench grind along the joint between the new AC and existing AC per City standard details (*to avoid a full depth joints*), unless otherwise specifically approved by the City Engineer and Public Works for driveway cuts, private street cuts or public streets where existing asphalt is inadequate to support the bench grind.
- a. ~~No street in the City shall be cut by a contractor, developer or utility company within 5 years of construction, reconstruction or overlay unless approved by the City Engineer and authorized in writing by the City Council. This time period may be extended in one (1) year increments by resolution by the City Council on a case-by-case basis.~~
- b.e. Pavement less than 5 years old. No street in the City shall be cut by a contractor, developer or utility company within 5 years of construction, reconstruction or overlay unless approved by the City Engineer and authorized in writing by the City Council. This time period may be extended in one (1) year increments by resolution by the City Council on a case-by-case basis. In the event that the City allows a street to be cut within the time limit outlined herein, the trench in AC pavement streets shall be restored as follows:

- 1) Unless otherwise approved in writing, the trench shall be backfilled above the pipe zone with a Controlled Low Strength Material (CLSM) backfill (*with an unconfined compressive strength less than 200 psi*) as approved by the City Engineer and Public Works Director. The mix design shall be submitted to the City and approved prior to cutting the street.
- 2) The trench edges shall be over-cut square and straight to a minimum width of 6-inches from each edge of the trench following completion of the backfill and prior to the final patch work.
- 3) An asphalt wearing course of Class C mix shall be placed in two lifts to a minimum compacted depth of 4-inches or the depth of the existing pavement, whichever is greater.
- 4) After the trench cut is plugged as noted above, the street shall be repaved with an overlay or an inlay based on the minimum requirements summarized below, and as approved by the City Engineer and the Public Works Director.
  - a) The overlay shall cover the cut area to a minimum compacted depth of 2-inches and extend a minimum of 50 feet beyond the cut area in each direction along the street. Unless otherwise approved by the City Engineer and the Public Works Director, the overlay shall encompass the entire paved width of the street. A 2-inch deep edge grind shall be provided along all gutter or curblines to allow the new pavement to match gutter or curb grades and at each end to allow the new pavement to match existing pavement grade. Edge grinds shall be tapered to allow the full overlay depth at all locations. Butt grinds at the end of overlays shall be a minimum of 25 feet in length.
  - b) As an alternate to a full width overlay, a grind and inlay may be provided as follows. The grind & inlay shall be 2-inch minimum, or half the pavement depth, whichever is greater (*3" maximum*). Unless otherwise approved by the City Engineer and the Public Works Director, the grind & inlay shall extend a minimum of 15 feet in each direction (*parallel with curbline*) beyond any trench cut, and all inlays shall extend a minimum of 5 feet (*perpendicular to curb*) beyond any trench cut limits, with pavement limits extended as required to ensure that pavement joints do not fall in a wheel track. If the minimum inlay limits extend beyond the street centerline, it is to encompass the entire street width.
- 5) The overlay *or inlay* shall meet all requirements as outlined in PWDS 2.13, Overlays. A strip of Petrotac fabric shall be installed over all trench patch joints.

If this work is performed by a private party, a maintenance bond for the cost of the original construction and repair shall be posted with the City stating that the party shall be responsible for the condition of said pavement patches for a period

of two (2) years, and during that time shall repair to the City's satisfaction any of the patches which become settled, cracked, broken or otherwise faulty."

- e. ~~Unless otherwise approved in writing by Public Works, sawcuts or trenches within arterial or collector streets shall meet same requirements (above) as for cutting new streets.~~
- d. ~~Street cuts in PCC concrete streets shall be restored as required by the City Engineer and the Public Works Director.~~
- e. ~~Pavement more than 5 years old. All trench cuts or widening of existing paved streets (those which do not meet the overlay/inlay requirements above) shall be include a bench grind along the joint between the new AC and existing AC per City standard details (to avoid a full depth joint), unless otherwise specifically approved by the City Engineer and Public Works for driveway cuts, private street cuts or public streets where existing asphalt is inadequate to support the bench grind.~~



**CITY OF DAYTON**  
**Public Works Design Standards**

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**Division 3**

**Stormwater Management**

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## DIVISION 3 STORMWATER MANAGEMENT

### 3.1 PURPOSE

- a. In addition to the purposes outlined under Division 1 of these Design Standards, the purpose of these Standards is to ensure the development of a stormwater management system which will:
- 1) be of adequate design to safely manage all volumes of water generated upstream and on the site to an approved point of disposal;
  - 2) provide points of disposal for stormwater generated by existing upstream properties and future upstream developments;
  - 3) prevent the uncontrolled or irresponsible discharge of stormwater onto adjoining public or private property;
  - 4) prevent the capacity of downstream channels and storm drainage facilities from being exceeded, unless downstream improvements to increase capacity are provided as part of the project;
  - 5) have sufficient structural strength to resist erosion and all external loads which may be imposed;
  - 6) maximize the use of the City's natural drainage system;
  - 7) be designed in a manner to allow economical future maintenance;
  - 8) require the use of design and materials to provide a system with a minimum practical design life of not less than 50 years.

Alternate materials and methods will be considered for approval on the basis of these objectives.

- b. These Standards cannot provide for all situations. They are intended to assist but not to substitute for competent work by professional design engineers.

### 3.2 APPLICABILITY

- a. These Standards shall govern all construction and upgrading of all public and private drainage facilities in the City of Dayton and applicable work within its service areas. This standard shall apply to all drainage facilities which impact any public storm drain system, public right-of-way or easement dedicated to or located within the City of Dayton and within all off-street parking and loading areas.
- b. All storm water runoff shall be conveyed to a public storm drain or natural drainage

<b>ALLOWABLE STORM DRAINAGE PIPE BASED ON COVER DEPTH</b>	
↓ COVER DEPTH ↓ <i>(from finish grade)</i>	<b>10" – 18" DIAMETER</b>
Less than 1½' Cover	Class 50 Ductile iron pipe with bell & spigot joints and rubber gaskets.
1½' to 2½' Cover	Pipe specified for lesser depths <b>-OR-</b> Class 3, ASTM C-14 non-reinforced concrete pipe with bell & spigot joints and rubber gaskets. <b>-OR-</b> PVC pipe conforming to AWWA C900 DR 18 (6"-12") or AWWA C-905 (14"-18") with bell and spigot joints and rubber gasket.
2½' to 10' Cover	Pipe specified for lesser depths <b>-OR-</b> PVC pipe conforming to ASTM D-3034 solid wall PVC SDR 35 (6"-15") or ASTM F-679 PVC solid wall SDR 35 (18") with bell and spigot joints and rubber gasket <b>-OR-</b> HDPE (High Density Polyethylene) pipe conforming to AASHTO M-252 (8"-10") or AASHTO M-294 (12"-18"). For slopes less than 6% the pipe shall be ADS N-12 IB ST, Hancor Sure-Lok F477, or approved equal. For slopes greater than 6% the pipe shall be ADS N-12 IB WT, Hancor Blue Seal, or approved equal with watertight pressure testable fittings.
More than 10' Cover	Case by case basis.
↓ COVER DEPTH ↓ <i>(from finish grade)</i>	<b>21" – 30" DIAMETER</b>
Less than 1½' Cover	Class 50 Ductile iron pipe with bell & spigot joints and rubber gaskets.
1½' to 2½' Cover	Pipe specified for lesser depths <b>-OR-</b> Class IV (minimum), ASTM C-76 reinforced concrete pipe with bell & spigot joints and rubber gaskets <b>-OR-</b> PVC pipe conforming to AWWA C900 DR 18 (6"-12") or AWWA C-905 (14"-18") with bell and spigot joints and rubber gasket.
2½' to 10' Cover	Pipe specified for lesser depths <b>-OR-</b> ASTM F-679 PVC solid wall SDR 35 pipe with bell and spigot joints and rubber gasket <b>-OR-</b> HDPE (High Density Polyethylene) pipe conforming to AASHTO M-294. For slopes less than 6% the pipe shall be ADS N-12 IB ST, Hancor Sure-Lok F477, or approved equal. For slopes greater than 6% the pipe shall be ADS N-12 IB WT, Hancor Blue Seal, or approved equal with watertight pressure testable fittings.
More than 10' Cover	Case by case basis.
<b>GREATER THAN 30" DIAMETER, OTHER PIPE MATERIALS - Case by case basis.</b>	
<b>Driveway Culverts or Open Storm Inlets:</b> Pipe type based on cover depth, minimum size 12-inch diameter <i>(or size based on flow capacity, adjacent existing street crossing or storm drain size, whichever is greater).</i>	
<b>Pipe End Protection:</b> PVC or HDPE pipe is not allowed for culverts or <b>for exposed inlets/outfalls</b> without structures <b>unless</b> concrete end caps <b>are provided</b> <i>(6" min thickness, typically 12" larger than pipe OD unless larger size required by Public Works).</i>	
<b>Detention Systems.</b> Piping associated with detention systems <i>(ie. including detention pipe where applicable, piping between the detention basin &amp; the flow control manhole, overflow piping, etc.)</i> shall conform with the minimum requirements of this table. This pipe material table also does not apply to other <b>private</b> storm piping which fully complies with the material <b>and</b> slope requirements of the Oregon Plumbing Specialty Code (OPSC).	

g. **Manholes**

- 1) Except as modified herein, precast concrete pipe manhole sections, transition sections, eccentric cones, flat slab tops, and adjusting rings shall conform to the requirements outlined under Division 4, Sanitary Sewers and as shown in the standard details.
- 2) Steps shall not be required for manholes 4 feet or less in depth (*rim to invert*).
- 3) Manhole castings for storm manholes shall have 16-hole lids.
- 4) **Pollution/Flow Control Manholes**
  - a) Pollution/flow control manholes shall be provided with a 30-inch diameter casting and lid.

h. **Mainline Storm Cleanouts**

- 1) Except as modified herein, mainline storm cleanouts (*where approved by the City*) shall conform to the requirements outlined under Division 4, Sanitary Sewers and as shown in the standard details.
- 2) A 3,300 psi concrete collar is required for cleanouts located outside of paved areas. The shaft or chimney of the cleanout shall be a minimum of 8-inches in diameter.

i. **Concrete (Cast-in-Place)**

- 1) All concrete shall conform to the requirements of OSSC (ODOT/APWA) 00440, Commercial Grade Concrete, 3300 psi (*5" slump or stiffer*).

j. **Underground Warning Tape**

- 1) Underground warning tape shall be detectable or non-detectable acid and alkali resistant safety warning tape. The tape shall consist of a minimum 4.0 mil (0.004") thick, virgin low density polyethylene plastic film formulated for extended use underground. The tape shall be in accordance with the APWA national color code and shall be permanently imprinted in lead free black pigments suitable for direct burial.
- 2) The tape shall be safety green and shall be provided with the legend "CAUTION BURIED STORM DRAIN LINE BELOW" or approved equivalent printed continuously down the length of the tape.

k. **Toning Wire**

- 1) A continuous insulated 12 gauge solid core copper toning wire shall be supplied with non-metallic pipe. Insulation shall be green in color for storm piping.
- 2) Wire shall penetrate into manholes and catch basins within 18 inches of the rim elevation.

l. **Bore Casings and Accessories**

- 1) Carrier pipe used in bore casings shall be Ductile Iron or PVC as specified herein.
- 2) Bore casing and carrier pipe design and installation shall conform to the requirements outlined under Division 5, Water Distribution.

**3.9 GENERAL DESIGN CONSIDERATIONS**

a. **General Requirements**

- 1) The design of storm drainage systems shall include provisions to adequately control runoff from all public and private streets and the roof, footing, and area drains of residential, multifamily, commercial and industrial developments, and to provide for the future extension of the storm drainage system to serve the entire drainage basin.
- 2) All storm water runoff shall be conveyed to an approved point of disposal. In the case of private development, the developer shall pay all costs associated with designing and constructing the facilities necessary to meet this requirement.
- 3) The design storm peak discharge from the subject property may not be increased from conditions existing prior to the proposed development except where it can be satisfactorily demonstrated by the applicant that there is no adverse impact to downstream properties, and that the "remaining available downstream capacity for the site being developed" (per PWDS 3.18.g) is not exceeded.
- 4) Public storm drains within easements will be permitted only upon a showing that drainage cannot be provided from within a right-of-way. Minimum easement widths shall be as outlined herein.
- 5) Gravity Flow: Where possible, all public storm drains shall be designed to flow by gravity to an existing or new storm drain system without lift stations.
- 6) Self-Cleaning. Except for pollution control or water quality structures, all



storm drain system components shall be designed to be self-cleaning to the extent possible.

b. **Approved Point of Disposal**

- 1) Surface or subsurface drainage, caused or affected by changing of the natural grade of the existing ground or removal of natural ground cover or placement of impervious surfaces, shall not be allowed to flow over adjacent public or private property in a volume or location materially different from that which existed before development occurred, and shall be collected and conveyed in an approved manner to an approved point of disposal.
- 2) The approved point of disposal for all stormwater may be a storm drain, existing well defined open channel or creek as approved by the City Engineer and the Public Works Director. Acceptance of proposed point of disposal will depend upon the prevailing site conditions, condition and capacity of existing downstream facilities, and feasibility of alternate design.
- 3) When private property must be crossed in order to reach an approved point of disposal *(or if downstream improvements are required across private property in order to provide required capacity or depth)*, it shall be the developer's responsibility to acquire a recorded drainage easement from the private property owner meeting the approval of the City Engineer and the Public Works Director. The drainage facility installed must be a closed conduit system. Temporary drainage ditch facilities, when approved, must be engineered to contain the stormwater without causing erosion or other adverse effects to the private property.

c. **Providing for Future Development & Collection of Upstream Drainage**

- 1) As a condition of development, all developments will be required to provide public storm drainage systems *(or private storm drainage systems where approved by the City)* to serve adjacent upstream parcels in order to provide for the orderly development of the drainage area, as well as connection *(to the new system)* of existing storm lines or laterals crossed or intercepted by the new storm lines *(including manholes or catch basins which can be served by the new storm lines)*, at locations as required by the City Engineer and Public Works Director *(see also PWDS 1.6.e)*.
- 2) ~~The requirement above This~~ shall include the extension of storm drain lines in easements across the property ~~as required to collect drainage from to~~ adjoining upstream/uphill properties and across street frontages of the property to adjoining properties when the storm drain system is located in the street right-of-way. This shall include extension to the far side of streets fronting or adjacent to the development as required to avoid work within or under these streets in the future.
- 4)3) ~~The requirements above This~~ shall include storm drains which are oversized

to provide capacity for future upstream development.

- 4) Where swales along property lines are required to intercept uphill surface runoff, inlets shall be provided at spacing & location acceptable to the City Engineer.

d. **Design Factors**

- 1) The following factors as a minimum shall be addressed in the design of storm drain systems and determination of design flows.
  - a) Drainage basin to be served.
  - b) Topography of the area
  - c) Depth of excavation
  - d) Soils conditions
  - e) Land use within the area to be served.
  - f) Projected population within the area to be served at build-out.
  - g) Flows from commercial, industrial or institutional users.
  - h) Condition and size of existing storm drains
  - i) Location of approved disposal point
  - j) Maintenance, including accessibility for cleaning and inspection personnel and equipment.

3.10 **DESIGN CALCULATIONS AND CAPACITY**

a. **Design Calculations**

- 1) Design calculations shall be submitted for all drainage facilities. A summary of these drainage calculations, including basin maps, shall be included on the site plan drawings (see PWDS 1.10.g) and shall be stamped by a professional engineer licensed in the State of Oregon.
- 2) Peak design discharges shall be computed using the rational method formula,  $Q=CiA$ , where  $Q$  = flow in cfs,  $C$  = runoff coefficient,  $i$  = rainfall intensity, and  $A$  = area in acres.
- 3) If use of a Santa Barbara Urban Hydrograph (SBUH) based computer program is proposed for use in sizing storm drain pipes for peak discharge, a 50 year SBUH storm event must be used in lieu of the 10 year or 25 year rational storm

frequency to provide equivalent capacity.

a) All CN parameters (*runoff curve number*) used for SBUH calculations shall be as or more conservative than the equivalent rational method runoff coefficients listed in these standards.

a)b) The City Engineer reserves the right to verify all calculations using the rational method, and require larger pipe sizes if the rational method calculations result in higher flows than the SBUH methodology.

b. **Design Storm**

- 1) Rainfall Intensity-Duration Curve - The rainfall intensity-duration-frequency (IDF) curve for use in the City of Dayton is the ODOT Zone 7 IDF curve (*enclosed herein*).
- 2) Design Frequency - The intensity-duration design frequency is based on the time of concentration for the area and the size of the drainage facility. The adopted criteria are listed in the following table.

DESIGN STORM FREQUENCY <sup>1</sup>	
AREA	FREQUENCY
Residential areas	10-year storm
Commercial and high value districts	10-year storm
Trunk lines ( <i>18" pipe and larger</i> )	25-year storm
Minor creeks and drainage ways ( <i>not shown as a flood plain on the Flood Insurance Rate Map (FIRM)</i> )	50-year storm
Major creeks ( <i>shown as a flood plain on the FIRM</i> )	100-year storm

<sup>1</sup> See PWDS 3.10.a.3 regarding design storm when SBUH methodology used for pipe sizing.

c. **Runoff Coefficients**

- 1) The coefficients of runoff "C" are listed below *(ie. for use with rational method calculations)*. Use of coefficients other than those listed must be based on field investigations which demonstrate conclusively that the proposed coefficients are justified. See requirements above for CN runoff curve numbers required for use with Santa Barbara Urban Hydrograph (SBUH) calculations.

<b>RUNOFF COEFFICIENTS</b>			
SOIL COVER	FLAT TERRAIN S<2%	ROLLING TERRAIN 2%<S≤10%	STEEP TERRAIN S>10%
Cultivated Land	0.30	0.35	0.40
Parks & Cemeteries	0.15	0.20	0.30
Woodlands & Forests	0.10	0.15	0.20
Meadows & Pasture Land	0.25	0.30	0.35
1) Single-family residential in urban areas, except corner lots with duplex potential	0.40	0.45	0.50
2) Gravel parking lots	0.50	0.55	0.60
3) Mobile home parks	0.60	0.65	0.70
4) Multi-family residential, zero-lot-line single-family residential and potential duplex lots in single-family residential	0.70	0.75	0.80
Highly impermeable ( <i>roofs and paved areas</i> )	0.90	0.90	0.90

d. **Time of Concentration**

- 1) For land in a pre-development condition, the minimum time of concentration from the most remote point in the basin to the first defined channel (*ie.g- gutter, ditch or pipe*) shall be 10 minutes. Pre-development shall be defined as a site with natural vegetation on native soil.
- 2) For developed residential and commercial/industrial property, the maximum time of concentration from the most remote point in the development to the closest inlet shall be 10 minutes, unless calculations by an acceptable method

show the time to be longer.

### 3.11 OPEN CHANNELS

- a. Within the UGB, creation of new open channels will not generally be allowed. Where allowed by the City, ditches shall be located along or adjacent to lot lines.
- b. For reasons of maintenance and safety, bank slopes generally shall be 3H:1V or flatter unless otherwise required by the Public Works Director or the Public Works Director. Unless otherwise required by Public Works Director or the City Engineer, open channels shall generally be provided with a minimum of 1 foot freeboard above the design high water level, where required to ensure that the channel does not overflow onto private property between periods when the ditch is mowed or cleaned by the agency with jurisdiction.
- c. The maximum allowable design velocity shall be 7 fps.
- d. The minimum allowable design velocity shall be 2 fps. The installation of a concrete lined low-flow channel may be required to achieve minimum velocity necessary to ensure that the channel is self-cleaning to the extent feasible.
- e. Unless otherwise approved by the City Engineer, all piped discharges to open channels (*existing or new*) shall be mitered to match the channel side slope and include a reinforced concrete collar (*6" minimum thickness*) to prevent settlement or erosion of the pipe trench at the discharge location, and to protect the end of the pipe. Unless otherwise approve by Public Works and the City Engineer, the concrete collar shall extend from the channel bottom to the top of bank. Grates shall be provided on all inlets or outlets 18" or larger unless otherwise specifically approved by Public Works and the City Engineer, as well as at any locations required by Public Works to accommodate maintenance or mowing requirements.

### 3.12 ALIGNMENT AND LOCATION

#### a. General

- 1) Generally, storm drains shall be laid on a straight alignment between catch basins and between manholes. Lines 15-inch in diameter and smaller may be laid on horizontal curves conforming to the street curvature provided the radius of the horizontal curve is not less than 200 feet.
- 2) Variance for horizontal curves on larger size pipes shall be reviewed by the City Engineer on a case by case basis.
- 3) Where storm drains are being designed for installation parallel to other utility pipe or conduit lines, the vertical location shall be in such a manner that will permit future side connections of main or lateral storm drains and avoid conflicts with parallel utilities without abrupt changes in vertical grade of



main or lateral storm drains.

**b. Location in Relation to Water and Sewer Lines and Other Utilities**

- 1) Public storm drainage lines shall be separated from all other parallel public utilities by a minimum of 5 feet between utility centerlines, but in all cases a minimum of 3 foot clear separation shall be provided.
- 2) Installation of franchise or private utilities in a common trench with storm drain lines shall be prohibited.

**c. Location in Street Right-of-Ways**

- 1) Unless otherwise approved by the City Engineer and the Public Works Director, storm drain lines shall generally be located in the street right-of-way within six (6) feet of the face of curb.
- 2) Variance for horizontal curves on larger size pipes shall be reviewed on a case by case basis for approval by the City Engineer.

**d. Location in Easements & Easement Widths, Maintenance Access Requirements**

- 1) Minimum Easement Widths: Unless otherwise specified or authorized by the City, minimum easements widths for storm drains shall be as follows:

<b>MINIMUM STORM DRAIN EASEMENT WIDTHS</b>		
Storm Drain Diameter	Depth to Invert	
	≤ 6 feet	> 6 feet
10 - 15 inches	12 feet	12 feet plus 2 feet for each foot ( <i>or fraction thereof</i> ) deeper than 6 feet to invert.
18 - 24 inches	16 feet	16 feet plus 2 feet for each foot ( <i>or fraction thereof</i> ) deeper than 6 feet to invert.
> 24 inches	20 feet	20 feet plus 2 feet for each foot ( <i>or fraction thereof</i> ) deeper than 6 feet to invert.
<p>Note: Easements shall be a constant width between manholes or other in-line structures. Easement width shall be based on the deepest portion of the line between such structures.</p>		

- 2) Open channels located outside of public right-of-ways shall be provided with an easement widths as follows:
  - a) Channel width less than 14 feet at top of banks: Channel width plus 12 feet on one side and 2 feet on the other.

- b) Channel width greater than 14 feet at top of banks: Channel width plus 12 feet on both sides.
- 3) Public storm drains in easements will be allowed only after all reasonable attempts to place the mains in a right-of-way have been exhausted. All easement installations must be approved in writing by the City Engineer and the Public Works Director on a case-by-case basis.
- 4) When storm drains in easements are approved by the City, the storm line shall be offset a minimum of 6 feet from any property line or easement boundary, or 1/3 the required easement width, whichever is greater.
- 5) Easement locations for public storm drain lines serving a PUD, apartment complex or commercial/industrial development shall be in parking lots, private drives or similar open areas which will permit an unobstructed vehicle access for maintenance by City forces.
- 6) Maintenance Access Requirements. Where required by the Public Works Director, public storm drain lines located outside of developed street right-of-ways will require maintenance access similar to that required for sewers under PWDS 4.15.d (*ie. all-weather access lanes along mainlines and/or for access to manholes, inlets, valves or other structures, maintenance agreement, etc.*).
- 7) The conditions of the easement shall be such that the easement shall not be used for any purpose which would interfere with the unrestricted use for storm drain purposes. Under no circumstances shall a building or structure or tree be placed over a storm drain pipe or easement, nor shall any parallel fences be constructed within the easement (*access gates acceptable to the City shall be installed in fences which the City allows to be constructed across City easements*). Prohibited structures shall include decks, as well as footings or overhanging portions of structures located outside the easement.
- 8) Common placement in the easement of a sanitary sewer and storm drain line may be allowed under certain conditions subject to approval by the City Engineer and the Public Works Director. Easements wider than the minimum may be required.
- 9) Common easements will be reviewed on a case-by-case basis. Separation of utilities must meet Oregon State Department of Environmental Quality (DEQ) requirements.
- 10) All easements must be furnished to the City for review and approval prior to recording. All recording costs shall be borne by the Developer.

### 3.13 MINIMUM PIPE SIZE

- a. Public mainline, lateral or connector pipe storm drains shall not be less than 10-inches

inside diameter, and shall begin at a structure and terminate at an approved point of disposal.

b. Per 3.8.b (table), driveway culverts (or any other pipe specifically approved with an open inlet end) shall be a minimum of 12-inches diameter. Larger diameters shall be provided where required for flow capacity or where required to match the size of adjacent existing street crossings or storm drain pipes.

b.c. When two parallel pipes are installed in lieu of a box culvert, the minimum separation between the pipes shall be one foot or 1/3 the diameter, whichever is greater. This requirement may be waived if the void between the pipes below the springline is filled by grouting or other approved method.

### 3.14 MINIMUM COVER

- a. All storm drains shall be laid at a depth sufficient to protect against damage by traffic and to drain building footings where practical. Sufficient depth shall mean the minimum cover from the top of the pipe to finish grade at the storm drain alignment.
- b. Under normal conditions minimum cover shall be 24-inches above the top of the pipe in paved areas and 30-inches at all other locations.
- c. In areas of relatively flat terrain, the design engineer must demonstrate that sufficient depth is provided at the boundary of the development to properly drain the remainder of the upstream basin area tributary to the site.

### 3.15 MINIMUM SLOPE

- a. All storm drains shall be laid on a grade which will produce a mean velocity (*when flowing full*) of at least 2½ feet per second, based upon Manning's pipe friction formula using a roughness coefficient of not less than 0.013 for smooth wall pipe and 0.024 for corrugated wall pipe, or the pipe manufacturer's recommendations, whichever is greater.

against erosion and displacement by shock. This may be accomplished by installing one additional manhole to decrease the slope or to split a 90° horizontal direction change into two 45° incremental changes.

### **3.16 UNDERGROUND WARNING TAPE & TRACER WIRE**

- a. Detectable or non-detectable acid and alkali resistant safety warning tape shall be provided along the full length of all service laterals and all mainlines not located under sidewalks or paved portions of public streets.
- b. Underground warning tape shall be placed a minimum of 12-inches and a maximum of 18-inches below the finish ground surface, and shall be continuous the entire length of the service laterals installed from the mainline to the back of the PUE. Where required for mainlines not located under sidewalks or paved portions of public streets, the warning tape shall be continuous between manholes or cleanouts.
- c. All storm piping (*both public lines and private lines serving parking lots, detention basins, etc.*) shall have an electrically conductive tracer wire, 12 gauge minimum size single strand insulated copper with green sheathing, installed in the trench for the purpose of locating the pipe in the future. The tracer wire shall run the full length of the installed pipe with each end accessible from the surface through a manhole, cleanout or catch basin.

### **3.17 MANHOLES AND CATCH BASINS**

#### **a. General**

- 1) All junctions between storm drains shall be made at manholes, catch basins or detention basins.
- 2) Manholes or junction boxes shall be required at the following locations or as determined by the City Engineer:
  - a) All changes in horizontal or vertical alignment. Minor horizontal curvature in pipe less than 15 degrees may be allowed, (*without manholes or cleanouts*), depending on pipe size, street alignment, degree of curvature and reason. Maximum joint deflection shall be per manufacturer's recommendation.
  - b) All connections unless otherwise noted herein.
  - c) All changes in pipe size.
  - d) At a spacing no greater than five hundred (500) feet.
- 3) For new storm mainline and/or lateral new catch basin construction, catch basin laterals of 10 feet or less in length and 10 inches in diameter or less may

connect to the main line with a shop fabricated 90 degree "T", provided the connections is located not more than one hundred (100) feet from a manhole or cleanout on the main line and the main line is a minimum of 1415-inches or larger in diameter.

- 4) In lieu of connecting to manholes, catch basins or junction boxes, storm drain laterals draining private property may be connected directly to the public main line, provided the storm lateral diameter is 8-inches or less and is no more than half the diameter of the main line. Unless otherwise approved by Public Works, the connection to the mainlines shall be with an Inserta-Tee connection so as to provide a strong, leak-proof joint. The lateral shall not project inside the main line.

b. **Catch Basins**

1) **General**

- a) Side inlet grated catch basins shall be used at all locations. Exceptions will be considered on a case by case basis.
- b) Catch basins may be used for the junction of pipes 15-inches in diameter or less where the depth from rim to invert is less than 4 feet.
- c) Catch basins shall be designed to completely intercept the 5 year design storm gutter flow.

2) **Location**

- a) The maximum length of curb and gutter which may be drained by a catch basin is 500 feet.
- b) The maximum impervious area which may be drained by a catch basin is 20,000 square feet.
- c) Catch basins shall be installed where the improvement ends on all streets terminating on a descending grade, and piped to an approved point of disposal.
- d) Catch basins on corners shall not be located in front of handicap access ramps.
- e) Catch basins in the middle of blocks shall be located within 5 feet of the extension of a common property line.
- f) Catch basins shall be installed at all low spots, whether on private or public property, and shall be connected to a storm drainage facility.
- g) Catch basins shall be set to minimize gutter flows across new



pedestrian access ramps to the extent practicable, as determined by the Public Works Director and City Engineer.

h) Maintenance of Private Catch Basins. In order to ensure compliance with City requirements regarding stormwater discharge, all catch basins on private property (parking lots, etc.) which drain to a public storm system shall be provided with a recorded agreement allowing for inspection entry by Public Works, unless catch basins are located within a City easement, or otherwise covered by a detention system maintenance agreement. Maintenance of private catch basins and private stormwater systems shall be an ongoing responsibility of the property owner, whether or not a maintenance agreement is recorded.

3) Drop Across Catch Basin Structure

a) The vertical drop across flow-through storm drain catch basins shall not be less than 0.1 feet.

c. Manholes

1) Manhole Size

a) Manhole size shall conform to the requirements outlined under Division 4, Sanitary Sewers and the standard details.

2) Manhole Location

a) Manholes shall be installed at all pipe junctions where the depth from rim to invert exceeds 4 feet or where the pipe is 18-inches in diameter or greater. Exceptions will be reviewed on a case by case basis.

3) Drop Across Manhole Structure

a) The vertical drop across storm drain manholes shall conform to the requirements outlined under Division 4, Sanitary Sewers.

b) Where pipes of different sizes enter the same manhole, the design shall generally provide that the crowns of the pipes are set at the same elevation. Deviation requires approval by the City Engineer.

c) In cases where two pipes discharge into a manhole from opposite directions and one pipe has a slope more than 4% steeper than the pipe opposite, the invert of the pipe with the lower slope shall be set a minimum of 0.35 feet or ½ the pipe diameter, whichever is greater, above invert of the steeper pipe.

4) Rim Elevation

stringent.

- 2) Remaining available downstream capacity is defined as the downstream capacity unused during the design storm event. The *remaining available downstream capacity for the site being developed* is that portion of the remaining available downstream capacity equivalent to the ratio of the site being developed to the total undeveloped land in the basin.

c. **Detention Facility Siting & Maintenance**

- 1) Unless otherwise approved by the City Engineer and Public Works Director, all detention facilities shall be located on private property. Detention facilities located within a public right-of-way shall be configured as piped detention facilities (ie. surface detention within right-of-way is not allowed). and
- 1)2) Detention Easement & Maintenance Responsibility. All detention facilities shall be maintained by the property owner or Home Owner's Association (or similar entity acceptable to the City), including but not limited to cleaning and maintenance of outlet/flow control structures, irrigation (via a permanent irrigation system), mowing, etc.
  - a) Maintenance shall be assured through a recorded maintenance agreement acceptable to the City (see Appendix D).
  - b) All detention basins, with the exception of parking lot detention basins, shall be within a storm/detention and access easement to the City, ~~with~~
- 3) Flow Control Structure Maintenance Access Requirements. Unless otherwise approved in writing by the Public Works Director, provisions for all weather maintenance vehicle access to detention flow control structure shall be installed by the developer.
- 2)4) Grass and a permanent irrigation system shall be provided and installed by the developer for open detention basins outside of parking lots.

d. **Detention Facility Design**

- 1) General
  - a) All detention facilities and drainage calculations shall be designed and stamped by a Professional Engineer registered in the State of Oregon. Detention facilities shall be designed to protect public and private property.
  - b) Unless otherwise approved by the City Engineer, all open detention basins (*including detention chambers with open bottoms*) shall be designed as off-stream storage basins, sloped to drain completely

between design storms.

- c) The water level in the receiving stream during the design storm event must be lower than the bottom of the detention basin, unless otherwise approved by the City Engineer and the Public Works Director on a case-by-case basis. Any portion of the detention basin below the design water level in the receiving stream or storm system, or below the highest seasonal groundwater level (*for open basins or detention systems with open bottoms*), may not be utilized for storage volume in detention calculations.

2) Detention Basin Storage Capacity

- a) Detention facilities shall have storage capacities to detain the greater of the following:
  - (1) The difference between a 5-year frequency storm with pre-development conditions and a 25-year frequency storm under developed conditions.
  - (2) The difference between the *remaining available downstream capacity for the site being developed* (as defined above) under design storm conditions and a 25 year frequency storm under developed conditions.

3) Orifice

- a) The orifice size and the hydraulic head shall be adjusted to produce the allowable outflow based on the following formula:

$$D = 6.166 \left( \frac{Q}{H^{1/2}} \right)^{1/2}$$

Where:

D = Orifice diameter in inches.

Q = Discharge in cubic feet per second.

H = Hydraulic head above the orifice in feet.

- b) To prevent excessive plugging, the minimum orifice diameter shall be 1½-inches. The orifice shall be located in a pollution control manhole in an accessible location outside of the detention basin.
- c) The outlets of all detention basins shall be provided with suitable debris barriers designed to protect the outlet from blockage or plugging.
- d) Flow control orifice assemblies shall substantially conform with the

general configuration shown on the City standard details, as approved by the Public Works Director and the City Engineer (even if installed in a structure other than a manhole as shown on the details).

(1) Details for alternate structures to house the flow control assembly shall be drawn to scale, and to demonstrate that the assembly fits in the proposed structure while allowing for equivalent maintenance & cleaning access.

(2) If an alternate flow control outlet assembly is proposed which does not allow for continuous outflow from the detention system equivalent to the predevelopment flowrate, the detention storage volume shall be increased to compensate for antecedent rainfall which reduces the available detention storage prior to the start of the design storm event.

4) Overflow System

a) The detention facility shall have an overflow system with the capacity to pass a 50-year frequency storm. The overflow shall discharge into a public storm drain facility or the natural drainage course for the drainage basin where the development is located, and shall be designed to minimize the impact to downstream systems.

a)b) The overflow elevation shall be a minimum of 1 foot below the top of the top of the structure designed to contain the water.

b)c) The design of detention facilities shall ensure that overflow or system failure will not cause flooding in any habitable building area.

5) Open Basins

a) Depth - At maximum storage, the maximum allowable water depth shall not exceed 5 feet.

b) Freeboard - The maximum water surface elevation at overflow shall be a minimum of 1.0 feet below the top of the structure (*curb, bank, berm, etc.*) designed to contain the water.

c) Side Slopes & Top Width —



(1) The side slopes for detention basins shall be no steeper than 4H:1V. Steeper slopes may be used where approved by the ~~Chief of Public Safety~~Public Works Director and if access to the detention facility is restricted by chain link or other approved fencing a minimum of six (6) feet high.

(1)(2) Unless greater width is required based on site specific geotechnical or maintenance access considerations, dikes surrounding open basin detention systems shall generally have a minimum top width of 4 feet.

e)d) Bottom Slope - The bottom of all constructed and graded detention basins shall be sloped a minimum of 1% towards the outlets for drainage. Flatter slopes will require the use of a concrete valley gutter or similar method as approved by the City Engineer.

e) Maintenance & Mowing Access – Provisions for maintenance and mowing access shall be provided for interior and exterior slopes, and for the bottom of open basins.

6) Parking Lot Detention Basins

a) Depth - The maximum water depth for parking lot detention basins shall be 1 foot.

b) Freeboard - The maximum water surface elevation at overflow shall be a minimum of 0.25 feet below the top of any and all structures designed to contain the water. Landscape berming is typically not allowed for containing water on parking lot detention basins.

c) The maximum water level (*overflow*) in parking lot detention basins shall be a minimum of 1 foot below the lowest habitable floor elevation of buildings within the proximity of the basin.

d) No parking lot detention basins shall be located within the primary ingress/egress portions of the site. Parking lot detention basins shall be designed to provide a minimum 11 foot wide unflooded emergency access route at maximum water level conditions (*ie. overflow conditions*), and shall not encroach into designated fire lanes.

7) Piped Detention System

a) Unless otherwise approved, piped detention systems shall be designed as a watertight subsurface pipeline, and shall be sloped a minimum of 0.1% towards the outlet to drain. Where open-bottom subsurface stormwater detention chambers are proposed, they shall be designed as off-stream storage basins (PWDS 3.18.d.c), and licensed as infiltration systems by DEQ as applicable.



- b) Maintenance Access pPoints - A pollution control manhole with an orifice shall be provided at the downstream end of the piped detention system, and a standard manhole shall be provided at the upper end of the upstream end.
- c) Pipe type shall be based upon the depth of cover and loading conditions as specified herein.
- d) Easement widths shall conform to the minimum requirements outlined herein.

### **3.19 PRIVATE STORM DRAINAGE COLLECTION SYSTEMS**

- a. Private storm drainage collection systems shall be designed in conformance with main line standards specified herein when plumbing code grade requirements of Oregon Plumbing Specialty Code cannot be met. The private storm drainage collection systems shall conform to the detention requirements contained herein as applicable.
- b. These provisions of the PWDS do not, nor are they intended to supersede the Oregon Plumbing Specialty Code (OPSC), but are intended to allow the design engineer flexibility in the design of private storm drainage systems where the OPSC minimum slope requirements cannot be satisfied.

### **3.20 INFILTRATION SYSTEMS, DRYWELLS AND FRENCH DRAINS**

- a. Infiltration systems, drywells and french drains are not allowed as the exclusive method for draining public right-of-ways but may be used for developments on private property for buildings, paved driveways, parking and loading spaces, subject to the all of the following conditions:
  - 1) There are no public storm drain facilities, available within a reasonable distance of the development as determined by the City Engineer. The need to acquire easements across private property to access a public storm drain facility that is within a reasonable distance shall not be grounds for allowing an infiltration system unless all other criteria are met.
  - 2) If a design based on stormwater infiltration are proposed, soils infiltration tests shall be performed by a registered Professional Geotechnical Engineer licensed in the State of Oregon to document the permeability and infiltration capacity. The Geotechnical Engineer shall develop a recommended infiltration testing methodology using test methods and sound engineering principles appropriate to the specific site being tested (*test methods proposed must demonstrate infiltration capacity of the site soils, as opposed to percolation capacity*). A detailed summary of the proposed methodology and test procedures shall be submitted to the City Engineer a minimum of 7 business days in advance of the proposed testing, for review and comment by

may consider management of surface water quality and watershed health issues.

- 2) No domestic drinking water wells are present within 500 feet of the injection system.
  - 3) The injection system does not exceed a depth of 100 feet and the bottom of the infiltration structure is a minimum of 10 feet above the highest seasonal groundwater level.
- c. It should be noted that DEQ standards consider water draining from building roof areas (*that has not been mixed with any other stormwater*) differently, in that it can be discharged in a dry well without the same level of treatment required for other types of runoff, although it must still comply with the City and DEQ criteria above and receive DEQ approval prior to final City approval or construction.

### **3.21 STORM DRAIN SERVICE LATERALS**

- a. As a minimum criterion, construction of the storm service laterals shall be of the same quality and meet the same requirements as the public storm drain with regard to materials, watertightness, and location. In addition, these storm drains shall conform to the State and local plumbing codes and restrictions.
- b. Storm drain laterals shall be installed for any residential lots which do not have finish grades that slope 2% minimum to the fronting curb so as to allow both the roof and footing drains to flow to the fronting curb weep holes. In all cases, storm drain lines shall be provided as required to prevent roof and surface drainage from flowing across pedestrian access routes.
- c. A cleanout shall be installed at the right-of-way or easement line for all storm drain service laterals. The storm drain service lateral shall extend beyond the cleanout to the back of any private utility easement (PUE) fronting the right-of-way or easement.
  - 1) Where storm laterals are required or shown along flagstem or common use driveways (or which cross property other than that being served), the pipe shall be extended to the end of the driveway or to the boundary of the lot being served (whichever is farther) in conjunction with the development infrastructure construction.
- d. The minimum inside diameter of a storm drain lateral shall be four (4) inches and shall be equal to or greater than the building drain diameter.
- e. Additional storm laterals must be stubbed into the property lines sufficient to serve all residential parcels (*including those which can be further partitioned in the future*) where such service or future partition would require that new streets be cut to install such services.

- f. Where storm drain laterals tied to storm mainlines in the street, the top of curb and the gutter pan shall be stamped at the point of the service crossing as required by the standard details and standard notes.
- g. Unless otherwise approved by Public Works on a case-by-case basis, where storm drain laterals are necessary to serve/drain parcels which are located to the rear of and above (*in elevation*) another parcel which fronts a right-of-way that contains a storm drain mainline, the storm drain lateral serving the upper parcel must be directly connected to such storm mainline, and not daylight through a curb weephole.
  - 1) The storm lateral from the rear parcel shall be located within a private utility easement granted by the lower property owner, where it crosses the lower property.
  - 2) In addition to any cleanouts required by the Oregon Plumbing Specialty Code, there must also be a cleanout installed at the right-of-way boundary where the lateral serving the upper property exits the lower property into the right-of-way (*ie. property line cleanout at the ROW line*).

**CITY OF DAYTON**  
**Public Works Design Standards**

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**Division 4**

**Sanitary Sewer**

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user.

- 12) Lateral Sewer: Any public sanitary sewer which has no other common sanitary sewers discharging into it.
- 13) Mainline Sewer: Any public sanitary sewer which receives flow from one or more lateral sewers.
- 14) Noncontact Cooling Water: Water other than sewage or industrial waste which is used as a medium for carrying away excess heat from apparatus, appliance, mechanism or device in which, in the course of cooling process, is not mixed or co-mingled with any other substance or used as a means of carrying off any other substance, in suspension or in solution, thereby exiting such cooling process in substantially the same condition, save for temperature, as when it entered.
- 15) Plumbing System: All plumbing fixtures and traps, or soil, waste, special waste and vent pipes within a building and to a point five feet outside the building foundation thereof.
- 16) Private Collection System/Private Sewer: A privately owned and maintained sanitary sewer system installed to serve multi-unit structures on single ownership properties, which cannot legally be further divided, such as apartments, mobile home parks and schools or installed in commercial or industrial developments.
- 17) Property Line Cleanout: A cleanout (*to City standards*) is installed on a sanitary sewer service lateral and which is located at or near the point where the sewer service lateral leaves the public right-of-way (~~or at or near the point where it leaves the public sewer easement for sewer mainlines not constructed in public right-of-ways~~). This general term applies even if said cleanouts are not installed directly on the property line or easement boundary. Other cleanouts between the Property Line Cleanout and the building (*whether or not installed on other property lines crossed*) are private cleanouts which must conform with the Oregon Plumbing Specialty Code standards.
- 18) Public Sewer: Any sanitary sewer in the public right-of-way or easement operated and maintained by the City.
- 19) Sewer Service Lateral: That portion of the building sewer from the right-of-way line (*or easement boundary*) to a public sanitary sewer, private sanitary sewer, individual sanitary sewage disposal system, or other point of disposal. Lateral maintenance responsibility. The entire portion of the sanitary sewer lateral and building sewer from the building to the public mainline shall be the sole responsibility of the property owner for maintenance and/or repair, whether or not a property line cleanout exists (DMC 8.1.5). The required property line cleanout for new services or rehabilitated existing services is required to allow the service lateral to be located, as well as to facilitate



c. **Pressure PVC Sewer Pipe**

- 1) Where approved by the Public Works Director, PVC pressure pipe ~~4 inches through 12 inches in diameter~~ shall conform to the requirements of AWWA C-900 (*design stress of 4000 psi*), NSF approved, with cast iron pipe equivalent (CI) outside diameter dimensions. Pipe shall be PVC pipe with wall thickness equivalent to a standard dimension ratio (SDR) of 18, ~~Pressure Class 235 (per C900-07)~~.
- ~~2) Where approved by the Public Works Director, PVC pressure pipe 14 inches through 24 inches in diameter shall conform to the requirements of AWWA C-905 (design stress of 4000 psi), NSF approved, with cast iron pipe equivalent (CI) outside diameter dimensions. Pipe shall be PVC pipe with wall thickness equivalent to a standard dimension ratio (SDR) of 18, Pressure Class 235 (per C905-10).~~
- ~~3)2) Restrained joint PVC pipe shall be used in locations and configurations as required by the City Engineer (*Diamond Lok-21, Eagle Loc 900, TerraBrute CR, CertaLok C900 or approved equivalent, as approved by the City Engineer and Public Works Director for the specific application*).~~

d. **Ductile Iron Pipe**

- 1) Ductile iron pipe shall be centrifugally cast in conformance to AWWA C-151.
- 2) Ductile iron sewer pipe shall be minimum Class 50 thickness for non-pressure applications, Class 52 for pressure applications.
- 3) All ductile iron pipe and fittings shall be cement-mortar lined and seal coated in accordance with AWWA C-104.
- 4) All ductile iron pipe and fittings buried underground shall be coated on the outside with a standard coating of black bituminous paint a minimum of 1 mil thick unless otherwise specified.

e. **Joints**

- 1) Joints for pipe shall be push-on joints using factory installed elastomeric ring gaskets. The gaskets shall be securely fixed into place by the manufacturer so that they cannot be dislodged during joint assembly.
- 2) The gaskets shall be of a composition and texture which is resistant to common ingredients of sewage and industrial wastes, including oils and groundwater, and which will endure permanently under the conditions of the proposed use.

to provide a continuous ladder of 12-inch center-to-center rung spacing.

- b) Manhole steps shall be of polypropylene plastic reinforced with a 1/2-inch grade 60 reinforcing rod.
- c) There shall be no more than 30 inches from the manhole rim and the rung of the top step.

3) Manhole Grade Rings

- a) Concrete grade rings shall have precast keyway grooves, and the height from the top of the cone or the bottom of the flattop section shall not exceed eighteen (18) inches in height.

4) Manhole Frame and Cover Assemblies

- a) Castings shall be cast iron conforming to the requirements of ASTM A-48, Class 30, and shall match the dimensional requirements of the standard details.
- b) Standard frames and covers shall be used for all paved areas. Sanitary sewer manhole lids shall have 2 holes (*as opposed to storm manhole lids, which have 16 holes*).
- c) Where pressure tight manhole covers are called for, lid seals shall be a continuous round rubber gasket supplied by the manufacturer. Threaded inserts shall be cast in eccentric cones or flat slab tops and holes formed or cored in adjusting rings to match bolt size and spacing specified for the manhole casting.

5) Manhole Inflow Protector Lid Inserts

- a) All sanitary sewer manholes in low areas which are subject to flooding or water ponding (*including all lawn, landscape or gravel areas, or low areas of parking lots, or manholes closer than 4 feet clear of ~~street~~ or parking lot curblines or existing/future street curbs, adjacent to ditches, etc.*) shall be provided with inflow protector lid inserts.
- b) Manhole lid inserts shall be made of ABS or HDPE plastic, and shall include integral lifting lugs on each side of the insert allowing removal with a manhole hook (*lift straps are not an acceptable alternate*). The insert body shall be manufactured to match the dimensions and style of each specific manhole frame & cover. Each insert shall be provided with a factory installed closed cell neoprene gasket bonded to the underside of the insert rim, designed for wet or dry conditions. Manhole lid inserts shall be ManPan manhole inserts, or approved equal.

## 4.9 GENERAL DESIGN CONSIDERATIONS

### a. General Requirements

- 1) Sanitary sewer systems shall be designed and constructed to achieve total containment of sanitary wastes and maximum exclusion of infiltration and inflow.
- 2) Sewers shall be designed to convey the peak instantaneous wet weather flows anticipated over the design period without surcharging.
- 3) Gravity Flow: Where possible, all sanitary sewers shall be designed to flow by gravity to an existing or new sewer without sewage lift stations.
- 4) As a condition of sewer service, all developments will be required to provide public sewers to serve adjacent upstream parcels in order to provide for the orderly development of the drainage area, as well as connection (*to the new system*) of existing sewer lines or laterals crossed or intercepted by the new sewer lines, at locations as required by the City Engineer and Public Works Director (*see also PWDS 1.6.e*). This shall include the extension of sewer mains in easements across the property to adjoining properties and across the street frontage of the property to adjoining properties when the main is located in the street right-of-way. This shall include extension to the far side of streets fronting or adjacent to the development as required to avoid work within or under these streets in the future. This shall include trunk sewers which are oversized to provide capacity for upstream development.
- 5) Storm water, including street, roof or footing drainage, shall not be discharged into the sanitary sewer system but shall be removed by a storm drainage system separate from the sanitary sewer system.
- 6) Unpolluted (*noncontact*) cooling waters shall not be discharged into sanitary sewers.
- 7) Public sewers within easements will be permitted only upon a showing that services cannot be provided from a line within a right-of-way. Minimum easement widths shall be as outlined herein, but in no cases shall easements narrower than 15 feet be considered.

### 8) Prohibited Discharges to Sewer System:

- a) State and Federal laws and regulations and the sewer use ordinance restrict the disposal of certain chemicals and/or constituents into the sewer system and/or a Publicly Owned Treatment Works (POTW).
- b) Only water or waste that will have no harmful affects on the sewage collection system or treatment system, and that will not endanger

persons exposed to the wastes will be considered for discharge into the sewerage system. Prohibited discharges are not listed in their entirety herein (see sewer use ordinance and/or DEQ regulations for more complete list), but generally include rainwater, stormwater or groundwater of any type, waters or wastes with a pH lower than 5.5 or higher than 9.5, radioactive isotopes, high concentrations of suspended solids or BOD, fats/oils/greases, septic tank or sewer holding tank effluent, other potentially corrosive or explosive liquid, etc.

b. **Design Factors**

- 1) The following factors as a minimum shall be addressed in the design of sanitary sewers and determination of design flows.
  - a) Drainage basin to be served.
  - b) Topography of the area
  - c) Depth of excavation
  - d) Service lateral elevations
  - e) Soils conditions
  - f) Land use within the area to be served.
  - g) Projected population within the area to be served at build-out.
  - h) Per capita sewage flow.
  - i) Flows from commercial, industrial or institutional users.
  - j) Infiltration and Inflow
    - (1) Infiltration allowance for new facilities.
    - (2) Infiltration and inflow from existing facilities.
  - k) Maximum hourly and peak instantaneous flows
  - l) Condition and size of existing sewers
  - m) Location of WWTP
  - n) Pumping requirements
  - o) Maintenance, including accessibility for cleaning and inspection personnel and equipment.

#### 4.12 MINIMUM SIZE

- a. Public lateral or mainline sewers shall not be less than eight (8) inches in diameter unless approved in writing by DEQ and the City Engineer.

#### 4.13 MINIMUM DEPTH

- a. All sanitary sewers shall be laid at a depth sufficient to drain building sewers, to protect against damage by frost or traffic and to drain basement sewers where practical. Sufficient depth shall mean the minimum cover from the top of the pipe to finish grade at the sewer alignment.
- b. Under normal conditions, sanitary sewers in residential areas shall be placed in the street with the following minimum cover:
  - 1) Lateral and Mainline Sewers - Six (6) Feet
  - 2) Trunk Sewers:
    - a) In the roadway - Seven (7) feet
    - b) In easements - Eight (8) feet
  - 3) Where the topography is relatively flat and existing sewers are shallow (*five feet or less*) and cannot practically be lowered, the minimum cover may be reduced to three (3) feet. Cover depths less than three (3) feet will require the approval of the City Engineer, and will require the installation of Class 50 ductile iron pipe (*corrosion resistant mortar lined*) or Class 150 C900 PVC.
- c. ~~In new designated residential hillside subdivisions, m~~ Mainline and lateral sewers shall be placed in the street at a depth sufficient to drain building sewers on the low side of the street, including for new residential subdivisions. Deviation from these standards will be considered on a case-by-case basis when the following circumstances exist and the required documentation is submitted.
  - 1) Underlying rock strata: A request in writing must be submitted to the City Engineer together with a soils report including a plan and profile certifying bed rock exists below the undisturbed ground surface at all investigated alignments.

#### 4.14 MINIMUM SLOPE

- a. All sanitary sewers shall be laid on a slope which will produce a mean velocity when flowing full of at least two (2) feet per second based on Manning's formula using minimum roughness coefficient of 0.013 or the pipe manufacturer's recommendations, whichever is greater.



- 3) If streets have curved alignments, the minimum distance between manholes or sewer lines and the curb face shall be as listed below. For streets improved to less than full width, the location shall be measured from the future curb location. The intent is to prevent a conflict with new storm drain lines while still providing for the least number of manholes required to transverse the curve.
  - a) Center of manhole to curb face: 6-feet minimum.
  - b) Sewer centerline to curb face: 6-feet minimum.

d. **Location in Easements & Easement Widths, Maintenance Access Requirements**

- 1) Offset: When sewers in easements are approved by the City, the sewer line shall be offset a minimum of 6 feet from any property line, or 1/3 the required easement width, whichever is greater.
- 2) Sewers in easements will be allowed only after all reasonable attempts to place the mains in a right-of-way have been exhausted. All easement installations must be approved in writing by the City Engineer and Public Works Director on a case-by-case basis.
- 3) Easement locations for public sewer mains serving a PUD, apartment complex or commercial/industrial development shall be in parking lots, private drives or similar open areas which will permit an unobstructed vehicle access for maintenance by City forces.
- 4) Maintenance Access Requirements. All sewer mainlines shall be located within developed street right-of-ways, or installed along all-weather access lanes along alignments approved by the Public Works Director. Except where precluded by steep slopes, all-weather maintenance access lanes (*minimum 12' width*) shall extend along the entire length of off-street sewers unless otherwise specifically authorized in writing by the Public Works Director.

Where there are steep slopes along the sewer alignments which preclude all-weather access along the entire sewer alignment (*as determined by the City*), the access lanes shall extend to encompass all manholes or lateral connections located outside of the improved right-of-way.

If installation of a sewer main along alignments without a maintenance access road is approved by the City Engineer and Public Works Director, the minimum easement width may be increased as determined by the Public Works Director at his sole discretion (*typically by 5 feet minimum in flatter areas, and by 10 feet minimum for steep hillside areas*).

Where all-weather access lanes are located outside of parking lots, private streets, fire lanes or private driveways, the easement along the access lane alignment shall include provisions that maintenance of the all-weather access

lanes shall be the responsibility of the owner of the property on which the access lane is located.

Show all maintenance access lanes on the drawings, including dimensions and standard details for rock, AC and/or other surface sections (*minimum 2½" AC over 10" baserock typical, unless alternate surfacing is approved by the Public Works Director*).

- 5) The conditions of the easement shall be such that the easement shall not be used for any purpose which would interfere with the unrestricted use for sewer main purposes. Under no circumstances shall a building or structure or tree be placed over a sanitary sewer main or sewer easement, nor shall any parallel fences be constructed within the easement (*access gates acceptable to the City shall be installed in fences which the City allows to be constructed across City easements*). Prohibited structures shall include decks, as well as footings or overhanging portions of structures located outside the easement.
- 6) All easements must be furnished to the City for review and approval prior to recording. All recording costs shall be borne by the Developer.
- 7) Minimum Easement Widths: Unless otherwise specified or authorized by the City, minimum easements widths for sanitary sewers shall be as follows:

<b>MINIMUM SANITARY SEWER EASEMENT WIDTHS</b>		
Sewer Diameter	Depth to Invert	
	≤ 6 feet	> 6 feet
8 - 10 inches	15 feet	15 feet plus 2 feet for each foot ( <i>or fraction thereof</i> ) deeper than 6 feet to invert.
12 - 15 inches	20 feet	20 feet plus 2 feet for each foot ( <i>or fraction thereof</i> ) deeper than 6 feet to invert.
> 15 inches	25 feet	25 feet plus 2 feet for each foot ( <i>or fraction thereof</i> ) deeper than 6 feet to invert.

Note: Easements shall be a constant width between manholes or other in-line structures. Easement width shall be based on the deepest portion of the line between such structures.

- 8) Easement widths shall vary from the minimum by even foot increments. Sewers with a nominal inside diameter of 24 inches or larger will require wider easements than outlined above.
- 9) Common placement in the easement of a sanitary sewer and storm drain line may be allowed under certain conditions subject to approval by the City

same size as the existing pipe exiting the manhole, the invert of the new pipe should be a minimum of 0.35 feet above the invert of the existing pipe, or higher as required to be above the normal sewage flow level.

- 3) A detail drawing showing the steps, bench and proposed connection is required for connections to existing manholes.
- 4) The drawing shall include notes to the effect that openings for connections to existing manholes shall be made by core-drilling the existing manhole structure and installing a rubber boot. Small chipping hammers or similar light tools which will not damage or crack the manhole base may be used to shape channels. Use of large pneumatic jackhammers shall be prohibited.
- 5) Unless otherwise approved by the City Engineer, manhole steps shall be installed in any manhole tapped which does not have existing steps.

i. **Metering & Sampling Manhole**

- 1) A metering and sampling manhole shall be installed on all systems meeting one of the following criteria:
  - a) A private sewer which contributes more than 5,000 gallons per day to the public sewer.
  - b) A private sewer which serves more than one structure on the same premises (*private collection system*).
  - c) Industry or business which discharges high strength wastewater or wastewater with characteristics not commonly found in domestic sewage.
- 2) Metering and sampling manholes shall include provisions for continuous and composite sampling, continuous flow monitoring and recording, and flow paced sampling.
- 3) Sampling and flow monitoring may be required at the discretion of the City Engineer and Public Works Director. All machinery, equipment, supplies and labor required to carry out the sampling and flow monitoring program shall be provided by the Developer, and shall meet the City's prior approval.

**4.17 WORK ON EXISTING SEWERS**

a. **General**

- 1) Connections of new service laterals to existing sewers shall be made watertight. Connection shall be made where possible to existing tees or wyes previously installed and ~~pluggcapped~~. In all cases, the integrity of the existing tee or wye shall be verified by Public Works prior to connection (*see also*

PWDS 4.18.d for requirements relating to reuse of existing service laterals).

- 2) Where tees or wyes for connection are absent or unusable, connection of service laterals into existing sewer lines shall be made with approved couplings or service saddles. Taps shall be installed without protrusion into or damage to the existing sewer, and shall result in a watertight connection.
- 3) Service lateral connections to existing AC pipe shall be with approved service saddles. Connections to all other types of existing pipes shall use Insert-a-Tee type couplings. A note shall be added to the drawings stating that the coring machine for Insert-a-Tee couplings shall be anchored in accordance with the manufacturer's recommendations.

4) Existing Sewer Slope & Condition Verification.

- a) As a condition of connecting to and/or extending sewer mainlines, the design shall include verification that the existing sewer is in adequate condition and with adequate capacity to handle the new flows.
- b) This shall include verification of existing sewer slopes downstream of the connection point (*as part of the design topographic survey*), **and AND** cleaning/TV inspection of existing mainlines which meet any of the following conditions: (a) existing or design slopes less than 1.0% **or** (b) have had a history of flow or maintenance problems, **or** (c) end with mainline cleanouts, **or (d) existing mainline will be replaced as part of the project.** **Costs for cleaning and TV inspection are the responsibility of the development team.**
- c) Unless otherwise approved in writing by the City Engineer, this survey verification and TV inspection shall be done as part of the design process (*approval by the City to defer this pre-design TV inspection work shall not relieve the Developer and/or his contractor of the responsibility to correct problems subsequently discovered*). **If the development team uses sewer TV inspections previously performed by the City or others, any discrepancies discovered during construction shall remain the developer's entire responsibility.**
- a)d) The design shall include provisions to correct any adverse grade conditions, broken/obstructed pipe or other conditions found in the existing sewer which, in the opinion of the City Engineer, may cause sewer backups or significant maintenance issues upon extension of the mainline and connection of additional services. Any corrections of adverse grade conditions shall occur prior to extending the mainline or setting new manholes.

b. Manholes over Existing Sewers

- 1) Manholes constructed over existing sanitary sewers shall conform to the

requirements of OSSC (ODOT/APWA) 490.41, Manholes Over Existing Sewers. The existing pipe shall not be broken out until after the completion of the manhole test. Notes to this effect shall be placed on the construction drawings.

- c. Maintaining Sanitary Sewer Flows. The construction of sewer improvements that impact existing sewers shall address the following, including notes on the drawings.
- 1) All existing sanitary sewer system components shall remain in service through the construction operations unless specific exceptions are approved in writing by Public Works and the City Engineer, and written approval from each affected property owner.
  - 2) Sewer service from upstream and affected properties must be maintained unless such written approval is granted. The methods used to maintain sewer flows shall be the Contractor's design, subject to approval by the City. Required methods of conveying sewer flows may include, but are not limited to, bypass pumping, use of flow through plugs with periodic release of sewage flows, etc. The bypass system shall be capable of conveying flows when the sewers are flowing full. Normal unrestricted flows shall be restored at the end of each work day. Bypass systems left in place or operated outside normal working hours shall be monitored continuously by the Contractor personnel unless alternate arrangements proposed by the Contractor are acceptable to the City (*ie. high level & pump fail alarm callouts, etc.*). The Contractor shall provide for City review all submittal information required to demonstrate (*to the satisfaction of the City*) compliance with these requirements.
  - 3) Contractor shall be responsible for all costs related to cleanup, damages and fines resulting from any sewerage spill or overflow associated with any methods used to convey sewage flows during construction.

#### **4.18 SEWER SERVICE LATERALS**

a. General

- 1) Sewer service laterals are building sewers as defined above.
- 2) Sewer service laterals shall not tie into manholes unless approved by City Engineer and Public Works Director on a case-by-case basis. Where allowed, lateral inverts shall provide a minimum of 0.5 feet fall across the manhole, or the lateral shall match crowns with the outlet pipe, whichever is higher.
- 3) As a minimum criterion, construction of the sewer service lateral shall be of the same quality and meet the same requirements as the public sewer with regard to materials, watertightness, and location. In addition, these sewers shall conform to the State and local plumbing codes and restrictions. No roof, surface, foundation, or stormwater drain lines shall be connected to the public



sewers or service laterals.

- 4) Each legal lot of record shall be provided with a separate sewer service lateral connected to the public sewer main or approved private sewer main. Combined sewer service laterals will be permitted only when the property cannot legally be further divided. An example of this is a residential lot with a house and ~~unattached detached~~ garage or shop with plumbing fixtures.
- 5) Separate sewer service laterals shall be installed to serve each side of duplex lots. Separate sewer service laterals shall be installed to serve each unit of condominiums, or to serve each unit of developments with separate detached dwelling units or single family lots with separate detached accessory dwelling units (except where otherwise approved by City for ~~manufactured home parks, etc.~~).
- 6) Additional sanitary sewer laterals must be stubbed into the property lines sufficient to serve all residential parcels (including those which can be further partitioned in the future) where such service or future partition would require that new streets be cut to install such services.
- 7) Where sanitary sewer laterals connect to sewer mainlines in the street, the top of curb and the gutter pan shall be stamped at the point of the service crossing as required by the standard details and standard notes.
- 7)8) For reference only, OPSC 710.1 requires that a private backwater check valve be installed on the private building sewer when a drainage fixture is installed on a floor level that is lower than the top of the nearest upstream manhole or cleanout structure. In all cases, this backwater valve shall be installed on the private side of the property line cleanout (backwater valve is typically installed between the cleanout just outside the building and the building wall).

While this backwater valve is a private item covered under the OPSC (ie. not under Public Works jurisdiction for inspection or maintenance), property owners and homebuilders may wish to consider using a backwater valve designed to allow inspection, cleaning and maintenance to be performed from the surface (such as the Clean Check by Rectorseal). Failure to install a backwater valve per OPSC requirements will not result in any liability by the City (for either cleanup or repairs) in the event there is a sewage backup into a building which would have been prevented by a operable backwater valve installed as required by the OPSC.

8)9) Grease Removal.

- a) Provisions acceptable to Public Works shall be made for grease removal for any installations with commercial or similar kitchens, or other applications as required by Public Works.
- b) Unless otherwise approved by Public Works, a minimum two

compartment exterior gravity grease interceptor vault (1000 gallon minimum) shall be provided, particularly in any application where hot water or steam cleaning of commercial type kitchens is utilized.

Larger sizes shall be provided as required by 2017 Oregon Plumbing Specialty Code table 1014.3.6 (gravity grease interceptor sizing).

b)c) Outlet Sampling. Provisions shall be included to allow for sampling of the vault effluent (ie. details for outlet junction box, vertical drop cleanout or equivalent shall be included on the drawings).

e)d) Any proposal for a gravity grease interceptor vault smaller than 1,000 gallon capacity shall include documentation that the unit is sized per the requirements of the ~~2011~~2017 Oregon Plumbing Specialty Code (OPSC) table ~~1014.3.6 10-3~~ (or current edition).

d)e) A maintenance agreement (acceptable to the Public Works Director and City Attorney where applicable) shall be recorded against the property.

e)f) Property owner shall provide the City with a copy of a maintenance contract with a certified grease removal company, and copies of cleaning and/or maintenance work orders.

9)10) Private Sewer Pump Stations.

- a) As noted under PWDS 4.9.a.3, gravity sewer service is required where possible. Installation of private sewer pump stations is not allowed except with express prior written approval by Public Works and the City Engineer (during land use approval where applicable, and prior to submittal of project design drawings for review otherwise).
- b) Any private sewer pump stations approved by the City shall meet standards established by the Public Works Director and the City Engineer (see PWDS 4.3), the Oregon Plumbing Specialty Code and other applicable codes or standards (whichever is more stringent).
- c) An operation & maintenance agreement acceptable to the City shall be recorded against the property.

b. Service Lateral Cleanouts

- 1) A cleanout (set in a cleanout box conforming with City standard details) shall be installed at or near the right-of-way line or sewer easement boundary line for all sanitary sewer service laterals, at a location acceptable to Public Works. The sanitary sewer service lateral shall extend beyond the property line/sewer easement boundary cleanout to the back of any PUE fronting the right-of-way or easement, or to the far side of easements for public utilities, whichever is further.

a) Where sewer laterals are required or shown along flagstem or common use driveways (or which cross property other than that being served), the pipe shall be extended to the end of the driveway or to the boundary of the lot being served (whichever is farther) in conjunction with the development infrastructure construction.

- 2) For long sewer service laterals, a cleanout to City standards shall be installed on the upstream side of any intermediate property lines crossed, as well as at maximum 100-foot intervals beyond the right-of-way or easement cleanout, and at bends as required by the Oregon Plumbing Specialty Code.
- 3) Unless otherwise approved by the City Engineer, sewer service laterals shall have at least four (4) feet of cover from finish grade (*typically sidewalk grade*) at the right-of-way or easement line. Generally, the topography of the property will dictate how deep the service line must be.

c. Minimum Diameter and Slope

- 1) The minimum inside diameter of a sewer service lateral shall be four (4) inches and shall be equal to or greater than the building plumbing stub (*building drain*) diameter.
- 2) The minimum inside diameter of sewer service laterals to serve multifamily dwellings or commercial buildings shall be six (6) inches. Fixture unit equivalents shall be determined in accordance with the Oregon Plumbing Specialty Code.
- 3) Minimum sizes and slopes for sewer service laterals, based on the fixture unit equivalents, shall be in accordance with the Oregon Plumbing Specialty Code.
- 4) Sewer service laterals for townhouses and similar cluster housing developments shall be installed on a uniform slope from the main line sewer connection to a point five (5) feet from the end of the building drain conforming to the above requirements.

d. Existing Sewer Service Laterals

- 1) The City is under mandate from the Oregon Department of Environmental Quality (DEQ) to reduce infiltration and inflow (I/I) of storm runoff and groundwater into the City's sanitary sewer system. A significant portion of the (I/I) problems in the City's sewage collection system are attributable to leaking sewer service laterals or drains connected to service laterals. DEQ and City standards require that "No person shall discharge or cause to be discharged any storm water, surface water, groundwater, roof runoff, subsurface drainage to any sanitary sewer." The City requires applicants to demonstrate compliance with this ordinance by testing existing sanitary sewer service laterals (*at the expense of the applicant*) which are proposed for continuing use (see Dayton Municipal Code 8.1.3.5 & 8.1.1.6).

2) Unless waived in writing by Public Works (*for newer PVC laterals*), all existing sewer service laterals shall be air tested from the mainline to the building to verify that it is free of leaks or defects. The service laterals shall be tested at 4 to 5 psi, and a loss of 0.5 psi in 15 seconds constitutes a test failure. The service lateral shall be replaced if defective. Cleanouts per PWDS (& *plumbing code*) requirements shall be installed on existing sanitary sewer service laterals which are proposed for continuing use (*ie. those which do not already have cleanouts*).

2)3) If existing sewer service laterals are abandoned or not used, the sewer lateral shall be plugged watertight at the mainline in a manner acceptable to Public Works. All such plugged mainlines shall be inspected by Public Works prior to being covered, and may be TV inspected during the winter following the end of the first year of service to verify that the plug remains watertight. Any excavation, repairs or surface restoration required to correct leaking plugged laterals will be the responsibility of the party performing the original work.

#### 4.19 PRIVATE COLLECTION SYSTEMS

- a. Private collection system sewers shall be designed in conformance with main line standards specified herein when plumbing code grade requirements of Oregon Plumbing Specialty Code Section 1106 cannot be met.
  - 1) A manhole is required at the connection to the City system.
  - 2) A metering manhole may be required at the property line upstream from the manhole connection at the City main.
- b. PWDS 4.18, Sewer Service Laterals, must be used for sewer service lines in the system with the following exceptions:
  - 1) The minimum size sewer line upstream of the monitoring manhole structure shall be six (6) inches.
- c. See requirements and criteria under PWDS 4.18.a.9 relating to private sewer pump stations.

#### 4.20 UNDERGROUND WARNING TAPE & TRACER WIRE

- a. Detectable or non-detectable acid and alkali resistant safety warning tape shall be provided along the full length of all service laterals and all mainlines not located under sidewalks or paved portions of public streets.
- b. Underground warning tape shall be placed a minimum of 12-inches and a maximum of 18-inches below the finish ground surface, and shall be continuous the entire length of the service laterals installed from the mainline to the back of the PUE. Where required for mainlines not located under sidewalks or paved portions of public

**CITY OF DAYTON**  
**Public Works Design Standards**

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**Division 5**

**Water Distribution**

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the grid system and centralized points of consumption.

- 26) Uniform Plumbing Code: The Uniform Plumbing Code adopted by the International Association of Plumbing and Mechanical Officials, current edition as revised by the State of Oregon, called the "Oregon Plumbing Specialty Code."
- 27) Water Main: A water-supply pipe for public or community use.
- 28) Water Master Plan: The Water System Evaluation and Master Plan for the City of Dayton, Oregon, most recent revisions.

## 5.8 MATERIALS

### a. General

- 1) Unless otherwise approved by the City Engineer, materials shall conform to the minimum requirements outlined herein and as shown on the Standard Details. This listing is not intended to be complete nor designed to replace the City's Public Works Construction Standards (PWCS).
- 2) In the case of conflicts between the provisions of these design standards and the PWCS, the more stringent as determined by the City Engineer and Public Works Director shall apply. Acceptable materials shall be as outlined in these Design Standards.
- 3) It is not intended that materials listed herein are to be considered acceptable for all applications. The design engineer shall determine the materials suitable for the project to the satisfaction of the City Engineer.
- 4) All materials or products which will come in contact with or which will be used on material or products which will come in contact with potable water shall conform to the requirements of OAR 333-61-087, Product Acceptability Criteria or the National Sanitation Foundation (NSF) Standard 61, Drinking Water System Components - Health Effects as approved by the OHA-DWS.

### b. Pipe

- 1) ~~4-inch Through 12-inch~~ PVC (AWWA C-900)
  - a) PVC pressure pipe 4-inches through ~~12~~4-inches in diameter shall conform to the requirements of AWWA C-900-~~16~~ (*design stress of 4000 psi*), NSF approved, with cast iron pipe equivalent (CI) outside diameter dimensions. Pipe shall be PVC pipe with wall thickness equivalent to a standard dimension ratio (SDR) of 18, ~~Pressure Class 235 (per C900-07)~~.
- 2) ~~14-inch Through 24-inch~~ PVC (AWWA C-905)
  - a) ~~PVC pressure pipe 14-inches through 24-inches in diameter shall~~

conform to the requirements of AWWA C-905 (design stress of 4000 psi), NSF approved, with cast iron pipe equivalent (CI) outside diameter dimensions. Pipe shall be PVC pipe with wall thickness equivalent to a standard dimension ratio (SDR) of 25, Pressure Class 165 (per C905-10).

3)2) Ductile Iron

- a) Where ductile iron pipe is used for water distribution, pipe shall be Class 52 ductile iron pipe with push-on joints conforming to AWWA C-151, and cement-mortar lined and seal coated in accordance with AWWA C-104 (*ductile iron pipe threaded for flanges shall be Class 53*).
- b) All ductile iron pipe and fittings buried underground shall be coated on the outside with a standard coating of black bituminous paint a minimum of 1 mil thick unless otherwise specified.
- c) All ductile iron pipe within a single project shall be of the same manufacturer.

4)3) Rubber-ring gaskets for push-on joints shall be furnished by the pipe manufacturer to ensure compatibility with the gasket groove in the push-on bell end. Gaskets shall be suitable for the specified pipe sizes and pressure.

4) Restrained joint PVC pipe shall be used in locations and configurations as required by the City Engineer (*Diamond Lok-21, Eagle Loc 900, TerraBrute CR or approved equal, as approved by the City Engineer and Public Works Director for the specific application*).

c. **Bolts & Nuts for MJ Joints & Flanged Joints**

1) Mechanical Joints

- a) MJ joints shall be provided with corten tee-head bolts and nuts (*ASTM A242, high strength, low alloy steel conforming with AWWA C-111*).

2) Flanged Joints

- a) As a minimum, all nuts and bolts used for flanged joints shall conform to the requirements of ASME/ANSI B18.2.1 and shall be high strength, low carbon steel conforming to the requirements of ASTM A-307 Grade B, zinc plated steel conforming with AWWA C-111.

3) Areas with Corrosion Concerns

- a) For any areas where required by Public Works, MJ and flanged joints shall be provided with bolts and nuts (*low alloy steel conforming with AWWA C-111*) coated with a zinc base coat and a Xylan fluoropolymer top coating (*or approved equal*) for corrosion control and to control

- c) Each individual water service line shall be equipped with a full size locking ball valve meter stop assembly at the inlet to the meter. All meter stop assemblies shall be brass with copper pipe connector as appropriate and outlet for meter coupling.
  - d) Meter stops for 3/4-inch and 1-inch meters shall be 1-inch locking angle ball valves with compression inlet. 1-inch meter stops shall be Ford KVBA43-444WQ, or approved equivalent. Provide all services with a 1" x 3/4" adapter on the meter stop for each 1" service.
  - e) Where permitted, service line couplings shall be compression style couplings. Couplings (*where approved by Public Works*) shall be Ford C44-44Q coupling or approved equivalent, with long style compression inserts.
- 9) **1½-inch and 2-inch Services**
- a) 1½-inch water service lines shall be either blue HDPE tubing (*CTS, SDR 9, 200 psi rated*) conforming to AWWA C901 (ASTM D2239 & D2737), with long style compression inserts and Q style compression fittings (*Cencore or approved equal*), or Schedule 80 PVC pipe. All fittings on PVC pipe shall be Schedule 80 PVC. Use IPS Weld-On purple primer P70 with 711 glue or approved equivalent.
  - b) 2-inch water service lines shall be Schedule 80 PVC pipe. All fittings shall be Schedule 80 PVC. Use IPS Weld-On purple primer P70 with 711 glue or approved equivalent.
  - c) 1½-inch and 2-inch water services shall be provided with high bypass copper-setters for flanged meters, Ford VBB76-12HB-11-66 (1½") or VBB77-12HB-11-77 (2") high locking bypass or approved equivalent conforming to standard details.
    - (1) The copper-setter shall be provided with ball valves on the inlet and outlet, with inlet valve provided with a lockwing and the outlet valve provided with a handle.
    - (2) The bypass line shall be 1-inch diameter minimum, and shall be provided with a lockwing ball valve.
  - d) 2-inch and larger services shall have a mainline tee with flanged side outlet and flange x MJ resilient wedge gate valve conforming the requirements specified herein.

10) **3-inch and Larger Services**

- a) 3-inch and larger water service lines shall be reviewed on a case-by-case basis. Pipe and fittings shall be as required by the City Engineer and the

- c) The spacer shall have a flexible EPDM liner having a minimum thickness of 0.090 inches, with a hardness of durometer "A" 85-90. The liner shall have a rating of no less than 60,000 VPM and water absorption of 1% maximum. All welds are to be chemically passivated and all hardware to be stainless steel.
  - d) All spacers used for grade critical gravity sewer and storm lines shall have field replaceable runners to allow for grade and elevation adjustment.
  - e) A minimum of three (3) casing spacers per length of pipe shall be required, or 6-foot on center maximum spacing, whichever is greater.
- 6) End Seals.
- a) Where casings are filled with sand (*gravity or non-pressure pipelines*), end seals shall be grout/masonry end caps with 4" minimum diameter sand feed and vent tubes at each end. The vent tubes shall be plugged with grout after the casing is filled with sand.
  - b) Where casings are not filled with sand (*pressure pipelines*), end seals shall be Model AC (*pull-on*) or Model AW (*wrap-around with pressure sensitive butyl mastic strips*) end seals as manufactured by APS, or approved equivalent, fastened to the casing and carrier pipe with stainless steel bands.

## 5.9 GENERAL DESIGN CONSIDERATIONS

- a. Unless otherwise approved or required by the Public Works Director and the City Engineer, the water distribution system shall have sufficient capacity to maintain 40 psi at the building side of the meter entrance for one and two family dwellings. For other development, the distribution system shall have sufficient capacity to provide minimum pressure of 35 psi at the building side of the meter during periods of maximum use, and to provide sufficient volumes of water at adequate pressures to satisfy the maximum expected daily consumption plus fire flows.
- b. Normal working pressure in the distribution system should be approximately 70 psi with a range of 40 psi to 100 psi.

- c. Head loss shall be determined by the Hazen-Williams equation based on the following coefficients.

Hazen-Williams Coefficients	
Pipe Diameter	C Value
8 Inches and Less	100
10 to 12 Inches	110
Greater than 12 Inches	120

- d. Velocities in mains shall normally range from three (3) to six (6) feet per second for average demand to a maximum velocity of ten (10) feet per second for maximum day demand plus fire flow, where pressure headloss is not a concern. In general, maximum headloss for transmission and distribution mains should be limited to 3 feet per 1000 feet and 10 feet per 1000 feet respectively, provided that acceptable pressure can be maintained under maximum design flow conditions.

- e. A 20 psi residual pressure under fire flow conditions shall be maintained at all meter service connections points in the distribution system (OAR 333-061-0025.7 & OAR 333-061-0050.8.e), and positive pressure at all other locations. Generally, a maximum velocity of ten (10) feet per second under fire flow conditions will govern for sizing mains at all other locations of the service level where this criteria does not govern.

- f. For purposes of calculating projected headloss through a fire hydrant assembly, the maximum headloss values provided in AWWA C502, Table 5 shall be used (13 psi headloss @ 1500 gpm through large steamer port). Use of lower headloss values shall be based on a certified headloss curve from the hydrant manufacturer (ie. based on City approved hydrant), and the headloss through the 6-inch hydrant lead shall also be accounted for.

- f.g. Private systems shall limit velocities as required by the Oregon Plumbing Specialty Code, Installation Standards.

g.h. Providing for Future Development

- 1) As a condition of water service, all developments will be required to provide public water mains of sufficient size for fire protection to adjacent parcels, as well as connection (*to the new system*) of existing water lines, hydrants or services crossed or intercepted by or adjacent to the new waterlines, at locations as required by the City Engineer and Public Works Director (*see PWDS also 1.6.e*). This shall include the extension of water mains in easements across the property to adjoining properties and across the street frontage of the property to adjoining properties when the main is located in the street right-of-way. This



## 5.15 ALIGNMENT AND LOCATION

### a. General

- 1) Water lines shall generally be parallel to the right-of-way or easement wherein they lie.
- 2) Unless otherwise required by the City Engineer, water lines shall generally be located on the south and west sides of the right-of-way wherein they lie, or on the high side of the right-of-way for hill side streets.

### b. Location in Relation to Sanitary Sewer Lines and Other Utilities

- 1) Water mainlines shall be separated from all other utilities by a minimum of 5 feet between utility centerlines, but in all cases a minimum of 3 foot clear separation shall be provided.
- 2) Water mainlines shall generally be separated from sewer mainlines by a minimum of 10 feet. In no case shall the separation be less than 5 feet or as required by OAR 333-061.
- 3) Sanitary Sewer Main Crossings
  - a) Where a water mainline crosses below or within 18-inches vertical separation above a sanitary sewer main or lateral, one full length of AWWA C-900 PVC pipe (DR 18) shall be centered at point of crossing.

### c. Location in Right-of-Ways

- 1) Unless otherwise approved by the City Engineer and Public Works Director, water mainlines shall generally be located in the street right-of-way along general alignments shown in the standard details.
- 2) The distance between the mainline and the curb shall vary as little as possible. On curved streets, mains may be laid on a curve concentric with the street centerline with deflections no greater than the manufacturer's specifications, or mains may be laid in straight lines along the tangent between selected angle points to avoid conflicts with other utilities. The angle point and tangent section shall not be closer than 5 feet from the right-of-way line, nor more than 3 feet in front of the curb face.

### d. Location in Easements & Easement Widths, Maintenance Access Requirements

- 1) Unless otherwise specified or authorized by the City, minimum easement widths for water mainlines (*as well as water service lines or meters located on private property*) shall be fifteen (15) feet for normal depth lines. Wider

easements may be required for waterlines with cover depths greater than 5 feet.

- 2) Water mainlines with inside diameters larger than 12-inches will require wider easements (20' minimum).
- 3) Mainlines in easements will be allowed only in cases where it is required in order to loop a mainline to avoid a permanent dead end condition, and only after all reasonable attempts to loop the mainlines in a right-of-way have been exhausted.
- 4) When water mainlines in easements are approved by the City, the easement shall be centered on the mainline, and the mainline shall be offset a minimum of 6 feet from any property line. The easement shall be sized to provide a minimum of five (5) foot clear on all sides around any meter box/vault, hydrant, ARV or similar structure located on private property.
- 5) Easement locations for public water mainlines serving a PUD, apartment complex or commercial/industrial development shall be in parking lots, private drives or similar open areas which will permit an unobstructed vehicle access for maintenance by City forces.
- 6) Maintenance Access Requirements. Where required by the Public Works Director, public waterline located outside of developed street right-of-ways will require all-weather maintenance access similar to that required for sewers under PWDS 4.15.d (ie. all-weather access lanes along mainlines and/or for access to valves, meters, hydrants or other structures; maintenance agreement, etc.).
- 7) The conditions of the easement shall be such that the easement shall not be used for any purpose which would interfere with the unrestricted use for water mainline purposes. Under no circumstances shall a building or structure, trees or ornamental landscaping be placed over a water mainline or easement, nor shall any parallel fences be constructed within the easement (access gates acceptable to the City shall be installed in fences which the City allows to be constructed across City easements). Prohibited structures shall include decks, as well as footings or overhanging portions of structures located outside the easement.
- 8) Common placement in the easement of water and sewer or storm drain line may be allowed under certain conditions subject to approval by the City Engineer and Public Works Director. Easements wider than the minimum will be required. Franchise utilities shall not be placed in City utility easements.
- 9) Common easements will be reviewed on a case-by-case basis. Separation of utilities must meet OHA-DWS requirements.
- 10) All easements must be furnished to the City for review and approval prior to recording. All recording costs shall be borne by the Developer.

e. **Phased Construction**

- 1) Water mains installed by phased construction, which will be extended in the future, shall terminate with a mainline valve, blow off and permanent thrust restraint system which allows the mainline valve to be connected to without taking the line out of service.
- 2) All developments will be required to extend mains across existing or proposed streets for future extensions by the City or other developments. All terminations shall be planned and located such that new or existing pavement will not have to be cut in the future when the main is extended.
- 3) The construction plans for each phase shall be capable of standing alone, including provisions for looping and minimum fire flows.

f. **Location in Relation to Ditches and Drainage Channels**

- 1) Surface water crossings of mains shall be in accordance with OAR 333-061 and the requirements outlined herein.
- 2) Mains crossing ditches or drainage channels shall be designed to cross as nearly perpendicular to the channel as possible.
- 3) The following surface water crossings will be treated on a case-by-case basis:
  - a) Ditch or drainage channel crossing for pipes of 12-inch diameter and greater.
  - b) River or creek crossings requiring special approval from the Division of State Lands.
- 4) The minimum cover from the bottom of the ditch or drainage channel to the top of pipe shall be a minimum of thirty-six (36) inches unless otherwise approved by the City Engineer, Public Works Director and the OHA-DWS.
- 5) A scour pad centered on the water line will be required for mains where the potential for erosion exists as determined by the City Engineer and Public Works Director. The size and design of scour pads will be reviewed on a case-by-case basis by the City Engineer.

**5.16 VALVES**

a. **Valve Sizes**

- 1) In general, valves shall be the same size as the mains in which they are installed. Reducers for reconnection into existing water mains less than 8-inches in diameter (*or existing mains smaller than the new mainline*) shall be placed between the new valve and the existing line (*ie. the new valves shall be the same*

size as the larger mainline).

- 2) Unless otherwise approved or required by the City Engineer, valves shall conform to the following table.

<b>Required Valves by Size and Operating Conditions</b>		
Valve Size	Static Pressure	Valve Style
10-inch and smaller	< 120 psi	Gate Valve
8-inch & 10-inch	≥ 120 psi	Butterfly Valve
12-inch & larger	All pressures	Butterfly Valve

- 3) Valve types and materials shall conform to the requirements of these Design Standards and the Standard Construction Specifications.

b. Valve Location

- 1) Distribution system valves shall be located at the tee or cross fitting as nearly as possible.
- 2) There shall be a sufficient number of valves so located that not more than four (4) and preferable three (3) valves must be operated to effect any one particular shutdown. The spacing of valves shall be such that the length of any one shutdown in high value areas shall not exceed 500 feet nor 800 feet in other areas.
- 3) A tee-intersection shall be valved on two branches and a cross-intersection shall be valved on three branches.
- 4) Hazardous crossings (*ie. creek, railroad, freeway crossings, etc.*) shall be valved on each side of the crossing.
- 5) Distribution branches on transmission mains shall be spaced not more than 800 feet apart where practical and shall be valved and plugged.
- 6) Transmission water mains shall have valves at spacings as required by the City Engineer.

c. Mainline Tapping Tee & Valve

- 1) A tapping tee & valve to make connection to an existing, in-service line is only allowed in cases where the City determines that water service cannot be interrupted to cut in a tee or cross, and where the additional in-line valve is not needed for system isolation as outlined above.

d. Water Valve Operation

- 1) City forces shall operate all valves, including fire hydrants, on existing public water mains, on the public side of water meters, or at the connection of fire service lines to public water mains.

5.17 FIRE HYDRANTS

a. Hydrant Coverage

- 1) Preferred coverage shall result in maximum hydrant spacing of 500 feet in residential areas, 300 feet in high-value districts including industrial subdivisions and no further than 250 feet from the furthest point of any dwelling, business, garage or building. Hydrant stubs with mainline valves will be required as a minimum in undeveloped areas.

b. Hydrant Location & Availability

- 1) No fire hydrant shall be installed on a main of less than 8-inch diameter unless it is in a looped system of 6-inch mains. The hydrant lead shall be a minimum of 6-inches in diameter.
- 2) Hydrants shall be placed in locations approved by the City Engineer and the Fire Chief.
- 3) In general, hydrants shall be located at corner of each public & private street intersection where possible (*unless otherwise approved by the City Engineer and the Fire Chief*). Hydrants located at points other than intersections shall be located at the extension of property lines (*offset as required only to avoid conflict with survey monuments per ORS 92.044.7*).
- 4) Unless otherwise approved by the City, hydrants shall be placed between the sidewalk and the property line.
- 5) No hydrant shall be installed within five (5) feet of an existing utility pole or guy wire nor shall a utility or guy wire be placed within five (5) feet of an existing hydrant.
- 6) Existing or new hydrant availability for a particular property will be determined by the City and Fire Chief based on both distance and accessibility (*see also OFC C103.1 & C104*).
  - a) Existing hydrants on City streets are generally considered as available to properties on both sides of the street.
  - b) For purposes of new development, hydrants on the opposite side of an ODOT highway right-of-way are generally NOT considered to be



f. Hydrant Operation & Use

- 1) No person other than Public Works staff shall operate or flow test fire hydrants without first obtaining written authorization from the Public Works Director. This hydrant use restriction shall not apply to fire department/fire district staff in the performance of their regular duties.
- 2) All hydrant flow tests shall be performed with Public Works staff present unless otherwise approved by the Public Works Director.
- 3) Opening or operating fire hydrants with any tool other than a standard hydrant wrench designed for that purpose is prohibited.

**5.18 AIR RELEASE VALVES**

a. General

- 1) Provisions for air relief shall be provided at all high points of waterlines. Where possible, location of service taps at high points in the line is preferable to the installation of an air relief valve.
- 2) Where service taps cannot be used, an air release valve shall be permanently installed at high points on all water mains at all location where air can accumulate. An automatic air release valve shall be installed in a meter box or vault outside of the street at a location where flooding of the manhole or chamber will not occur.

b. Air Release Valve Piping

- 1) The open end of an air release pipe from automatic valves shall extend to the top of the manhole at least twelve inches above grade and provided with a screened, downward facing tee vent. Grade shall mean the existing ground elevation adjoining the meter box or vault.

**5.19 WATER SERVICE LINES**

a. General

- 1) The use of pumps on a water service line (*between the mainline and the meter*) to provide adequate pressure to a subdivision lot or property located above the pressure level of the supply main shall be prohibited.

Booster pumps installed on private property shall require the installation of a backflow device meeting City and state standards.

- 2) Each legal lot of record shall be provided with a separate water service line connected to the public or approved private water main. Combined water

service lines will be permitted only when the property cannot legally be further divided. An example of this is a residential lot with a house and unattached detached garage or shop with plumbing fixtures.

- 3) Separate water services and separate meters shall be installed to serve each side of duplex lots, and each unit of triplex residential buildings unless otherwise approved by Public Works. Separate water services and separate meters shall be installed to serve each unit of condominiums or to serve each unit of developments with separate detached dwelling units or single family lots with separate detached accessory dwelling units (except where otherwise approved by City for RV parks – DMC 8.2.16.5manufactured-home parks).
- a) Where water service lines beyond the meter are required or shown along flagstem or common use driveways (or which cross property other than that being served), the pipe shall be extended to the end of the driveway or to the boundary of the lot being served (whichever is farther) in conjunction with the development infrastructure construction. The end of the service line shall be marked with a 2x4 post wired to the pipe stub, extending 18” above grade, with the toning wire stapled to the top of the marker post.
- 4) Additional water service lines must be stubbed into the property lines sufficient to serve all residential parcels which can be further partitioned in the future where such future partition would require that the streets be cut to install such services.
- 5) Where water service lines are connected water mainlines in the street, the top of curb and the gutter pan shall be stamped at the point of the service crossing as required by the standard details and standard notes.
- ~~5)6)~~ Private pressure reducing valves (PRV) may be required by Public Works in certain areas. The installation, maintenance and repairs of such devices shall be entirely the responsibility of the property owner.

c. **Tapping requirements**

- 1) Tapping requirements for water service lines shall be as outlined below.

<b>WATER SERVICE TAPPING REQUIREMENTS</b>		
<b>Service Size</b>	<b>Mainline Type</b>	<b>Tapping Requirements</b>
1"	All pipe types	Service Saddle
1½"	All pipe types	Service Saddle
2" & larger	All pipe types	Mainline tee ( <i>or tapping saddle</i> ) with flanged valve

d. **Location**

1) **Domestic & Irrigation Services**

- a) The service lines shall extend from the main to the meter location shown on the standard details. An angle meter stop and meter box shall be located at the termination of the service line.
- b) The meter stop shall be located such that the front of the meter box is the distance behind the curb or sidewalk as shown on the standard details.
- c) In general, individual service connections shall terminate in front of the property to be served. Double services shall be located on each side of a common side property line.
- d) Domestic or irrigation service lines shall not be connected to fire protection services, including hydrant leads.

2) **Fire Service**

- a) A backflow prevention assembly (*with detector loop & detector meter*) shall be placed on fire service lines as required by the City. See PWDS 5.7 for ownership and responsibility for fire protection service from mainline connection to building.
- b) Plans for fire service lines shall meet the requirements outlined in PWDS Division 1, and shall be stamped by a licensed Civil Engineer. The portion of the fire service within the right-of-way shall conform with PWDS 5.8.f.9 (*ie. CI 52 DI pipe*), and the remainder (*on private property*) shall conform with the Oregon Fire Code and referenced standards, and shall be acceptable to the Fire Chief.

- c) Drawings for fire services shall include vicinity map, adjoining street name, width, curb and property line, location of existing water line referenced to the property line, existing hydrant locations and the distance to property pins where the service crosses the property line (*offset as required to avoid conflict with survey monuments per ORS 92.044.7*).
- d) Service taps on fire service lines are prohibited.

## 5.20 WATER METERS

### a. General

- 1) Except as otherwise required, all water meters within the service area of the City of Dayton will be furnished and installed by City forces at the request and expense of the customer. The service line, meter box and all piping & fittings within the meter box must be installed by the developer.
- 2) All meters 1½-inches and larger shall be installed by a contractor retained by the developer, under the on-site inspection and subject to the approval of Public Works.
- 3) All meters 3-inch and larger shall be calibration tested after installation and prior to being placed in service. Testing shall be done by a qualified and trained water meter tester at the developer's expense. All test results shall be submitted to Public Works for review and approval.
- 4) A backflow preventer shall be provided if required by Public Works.
- 5) Meter Sizing.
  - a) Fixture unit equivalents and demand curves (*used in determining the size of larger water meters*) shall be established in accordance with the Oregon Plumbing Specialty Code. The size of water meter required shall be based on standards determined by the Public Works Director (*based on fixture units or demand flow as directed*), and will be based on use of the City's standard compound water meter for maximum accuracy. City meter sizing criteria will include factors to minimize excessive velocities in the water system, including velocities through meters and water service lines (*in order to reduce the risk of water hammer induced pipe breakages on the public and/or private side of the meter, and to maximize the useful lifespan of the water meters installed*). Unless otherwise determined by the Public Works Director, default meter sizing (*and associated SDC charges*) will be based on the "High-Normal Flow Rate" (*for Compound Class II meters*) in Table 6-1 of AWWA M22 3<sup>rd</sup> Edition (*Sizing Water Service Lines and Meters*) published by the American Water Works Association

(AWWA).

- b) Turbine style water meters will only be allowed where approved by the Public Works Director on a case-by-case basis (*at his sole discretion*), where projected flow patterns support the use of a turbine meter. In cases where the Public Works Director allows the use of a turbine meter in place of a standard compound meter, any reduction in meter size (*due to the use of such turbine meter*) will not result in a reduction of applicable SDC fees. If turbine meters are allowed, and changes in future flow patterns result in reduced meter accuracy, the Public Works Director may require that the turbine meter be changed to a standard compound meter, at the customer's expense.

b. **Location**

1) **General**

- a) Meters shall be located at the termination of the City service line. Unless otherwise approved by the Public Works Director, meters shall be located within or immediately adjacent to the right-of-way or easement containing the water mainline.
- b) Unless otherwise approved by the Public Works Director on a case-by-case basis, meter boxes shall be located outside of driveways or other areas subject to vehicular traffic. Approval by the City for meters and meters boxes set in driveways or areas subject to vehicular traffic shall be contingent upon the Developer, builder or property owner providing a traffic rated meter box, including installation of a concrete collar around the box per City standards in traffic or gravel areas (*concrete is required both to provide lateral support for the meter box and the prevent gravel from covering the box lid*). After initial installation, the property owner shall be responsible to protect the meter box and meter from damage. Damaged meter boxes (*or concrete collars where required*) shall be repaired and/or replaced as directed by the City, at the property owner's expense.
- c) Water meters shall be located outside of buildings being served (*including meters on fire service detector loops*), at a location approved by the Public Works Director.
- d) **Easement around Meter Box/Vault.** A public utility and access easement to the City shall be provided to and around any meter boxes or meter vaults set on private property. The easement shall be sized to provide a minimum of five (5) foot clear around the meter box or vault on all sides.

2) **3/4-inch through 2-inch Meters**

- a) In the right-of-way in a location that allows for easy reading and



## 5.21 PRIVATE WATER SYSTEMS

- a. General design considerations for private water systems shall conform to requirements set forth by the OHA-DWS, by the Oregon Plumbing Specialty Code (*Chapter 10*), and these Design Standards.
- b. All public water mains within private developments shall be in public right-of-way or exclusive easements to the City of Dayton and shall conform to these design standards. Each connection of the private water system to the City system shall be through an approved backflow prevention assembly and meter.
- c. Requirements for capacity, materials, looping, valves, fire protection, service lines and meters shall also be applicable to design within PUD areas.
- d. The resale of water without written approval of the City shall be prohibited. Written authorization from the City shall be required for each service connection and for any sale of water.

## 5.22 BACKFLOW PREVENTION

### a. General

- 1) All backflow assemblies shall be testable and include provisions for testing by a certified backflow testing person or organization.
- 2) An approved backflow prevention assembly with an approved metering system shall be required for each use in the following instances:
  - a) As determined by the City Cross Connection Specialist and OHA-DWS requirements.
  - a)b) When a private line must be extended from or looped between two (2) or more City mains in order to obtain the required flow and the resultant loop is no benefit to the City grid system.
  - b)c) On all fire services, which shall also include a detector loop & detector meter configuration as approved by Public Works.
  - e)d) On all private water lines or private distribution system attached to the City's distribution system, with or without a master meter.
  - d)e) When an auxiliary water supply exists on the property being served, including but not limited to a domestic or irrigation well, or an irrigation system supplied from a surface water source (see OAR 333-061 Table 42).
  - e) As determined by the City Cross-connection Control Inspector and Oregon State Health Division requirements.

- 3) An approved reduced pressure backflow prevention assembly with an approved metering system shall be required for service connections in high hazard areas as determined by the City Engineer and Public Works Director.
- 4) The backflow assemblies must meet the City approved assembly standards, which standards are taken from the current approved list of assemblies maintained by the OHA-DWS.
- 5) Unless installed indoors or in weather proof enclosures, All backflow assemblies shall be installed in a box or vault approved by Public Works. Sump pumps per standard details shall be provided for all double check assemblies installed in vaults (3" & larger size). RP backflow devices installed below grade shall be provided with drains per OHA-DWS standards.

b. Location

- 1) The approved backflow prevention assembly shall be installed on the property being served in place accessible for City inspector and testing and located as follows:
  - a) Before any branch, immediately downstream of the meter; or
  - b) If not metered, at the property line; or
  - c) If in the building, before the first branch or hazard being controlled or as determined by the City Cross-Connection Specialist ~~Control Inspector;~~ ~~or.~~
- 2) If installed outside the building being served, it shall be placed at or adjacent to the property line or easement line in a vault or structure in accordance with the manufacturer's recommendations and as approved by the Public Works Director. Vaults must have a sump and be watertight.
  - a) Easement around Box/Vault. A public utility and access easement to the City shall be provided to and around any backflow assembly set on private property (*ie. when installed outside of the building being served*). The easement shall be sized to provide a minimum of five (5) foot clear around the box or vault on all sides.

c. Thermal Expansion Issues.

- 1) As noted under OAR 333-061-0010(190), "Thermal Expansion' means the pressure increase due to a rise in water temperature that occurs in water piping systems when such systems become "closed" by the installation of a backflow prevention assembly or other means, and will not allow for expansion beyond that point of installation."
- 2) It is the responsibility of the property owner and/or water user to provide a

thermal expansion tank or other means approved by the Oregon Plumbing Specialty Code to address thermal expansion concerns in the private water system piping (see OPSC 608.3 for expansion tank requirements).

- 3) This section shall be considered to be written notice to the premise owner and water user of these thermal expansion concerns, and notice of the responsibility of the premise owner and/or water user to address these concerns (see OAR 333-061-0070(8.b.A.iii and 8.d.B)).

e.d. Fire Department Connections (FDC)

- 1) The distance from a fire hydrant to the fire department connection (FDC) shall not exceed 40 feet unless otherwise approved in writing by the Fire Chief, but in no case shall a distance of greater than 60 feet be allowed.
- 2) FDCs connections/risers and FDC supply lines shall be installed in conformance with provisions of the Oregon Fire Code and applicable NFPA standards (*including but not limited to installation of accessible ball drip valves, cover depths for freeze protection, etc.*), with specific location and configuration subject to approval by the Fire Chief.

**5.23 UNDERGROUND WARNING TAPE & TRACER WIRE**

- a. Detectable or non-detectable acid and alkali resistant safety warning tape shall be provided along all mainlines not located under sidewalks or paved portions of public streets.
- b. Underground warning tape shall be placed a minimum of 12-inches and a maximum of 18-inches below the finish ground surface, and shall be continuous the entire length of the mainline as specified.
- c. All water pipe (*both public lines and private lines within right-of-way or easements*) shall have an electrically conductive tracer wire, 12 gauge minimum size single strand insulated copper with blue sheathing, installed in the trench for the purpose of locating the pipe in the future. The tracer wire shall run the full length of the installed pipe, with each end extended to within 12-inches of the surface through a valve box or meter box.

**5.24 MAINLINE BORED CROSSINGS**

- a. Casing size shall be adequate to permit proper construction of the carrier pipe to the required lines and grades. Carrier pipe used in bore casings shall be as specified herein.
- b. All bore crossings shall be provided with casing spacers and end seals. Casing spacer configuration shall conform to the manufacturer's recommendations, but in no case shall less than 3 spacers per length of pipe be used.

**CITY OF DAYTON**  
**Public Works Design Standards**

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**Standard Detail Drawings & Sample Test Report Forms**

**Appendix A**

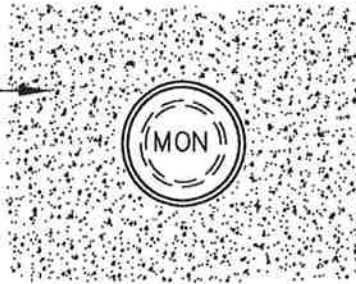
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Note:

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,

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.

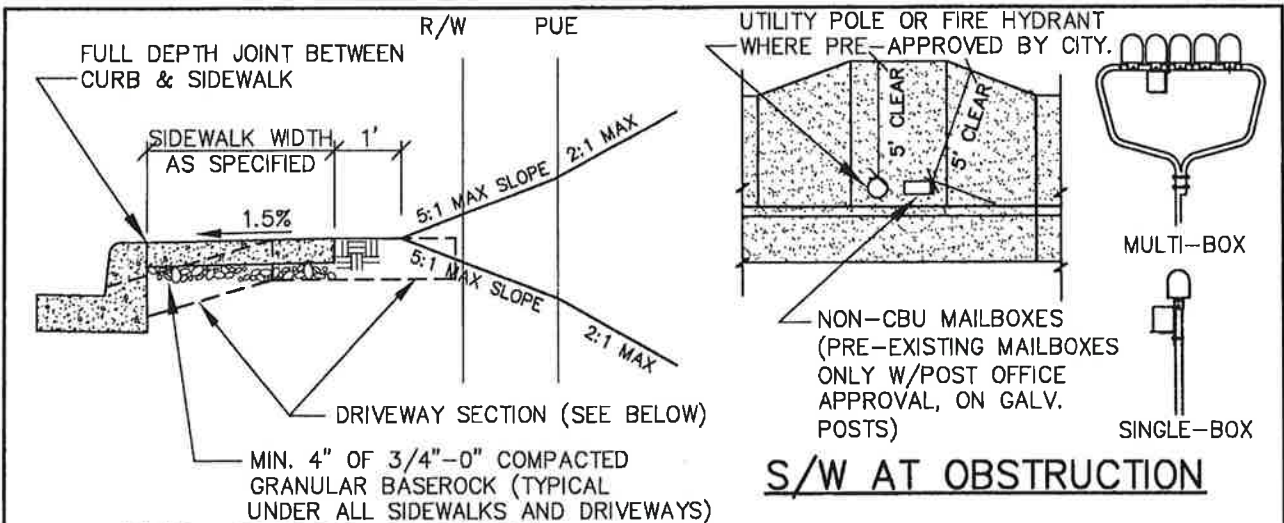
**NOTES:**

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.

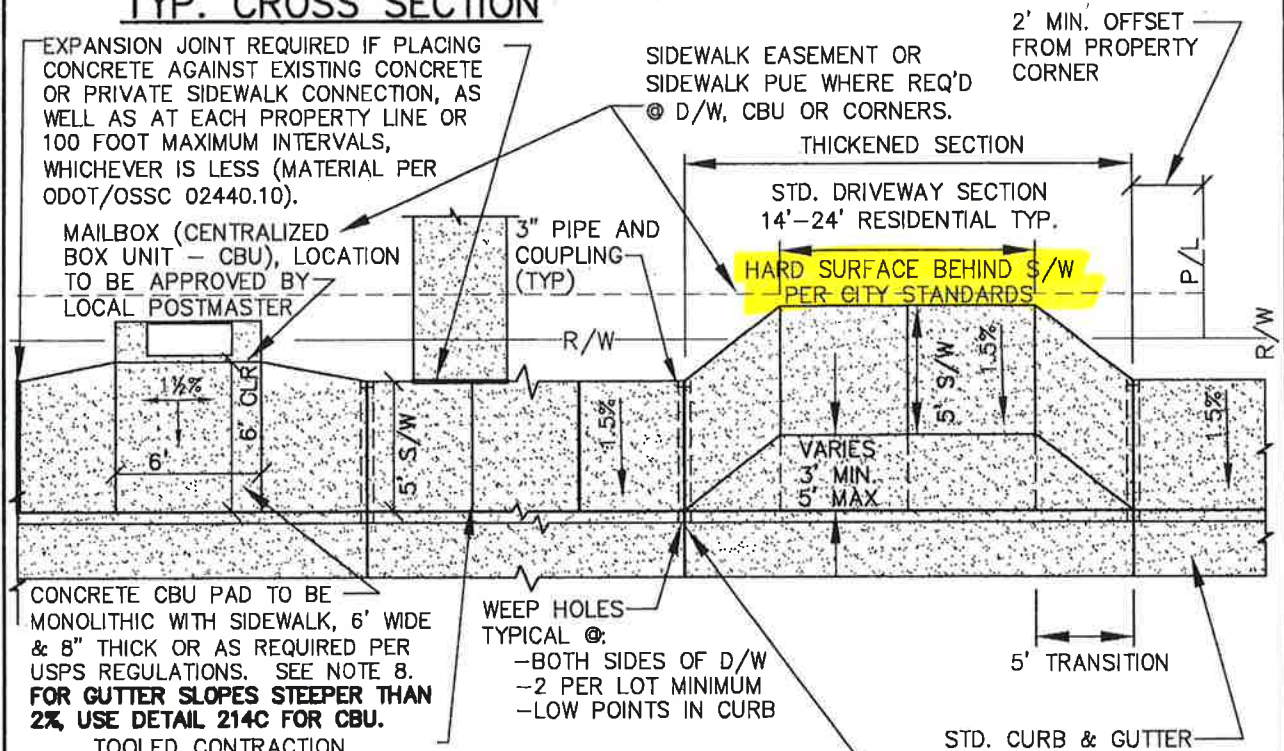
*NEW*

LAST REVISION DATE: <b>OCT 2018</b>	COPYRIGHT 1996 WESTECH ENGINEERING, INC.
<b>SURVEY MONUMENT BOX (IN STREETS OR PUBLIC SIDEWALKS)</b> (NTS)	
DAYTON, OR	DETAIL NO. <b>115</b>





**TYP. CROSS SECTION**

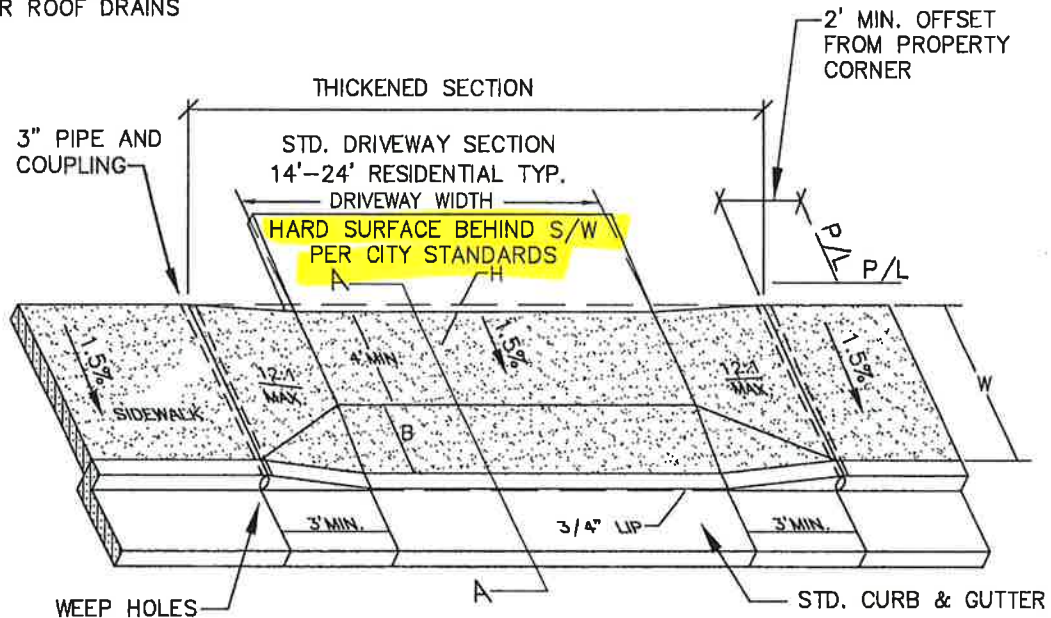


**TYP. PLAN VIEW**

- NOTES:**
1. CONCRETE DEPTH FOR STANDARD SIDEWALKS SHALL BE 4" MIN.
  2. MONOLITHIC STREET CURB & SIDEWALK PLACEMENT IS PROHIBITED FOR PUBLIC SIDEWALKS.
  3. SIDEWALKS THROUGH RESIDENTIAL DRIVEWAYS (INCLUDING WINGS) SHALL BE 6" MIN. THICKNESS. COMMERCIAL DRIVEWAYS SHALL BE 8" MIN. THICK.
  4. SIDEWALKS 8' & WIDER SHALL HAVE A LONGITUDINAL CONTRACTION JOINT AT MIDPOINT.
  5. CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
  6. PCC APRONS JOINED TO MATCH SIDEWALK PATTERN.
  7. SIDEWALKS SHALL BE LOCATED ENTIRELY WITHIN PUBLIC RIGHT-OF-WAY OR SIDEWALK EASEMENTS, INCLUDING AT DRIVEWAYS & INTERSECTIONS.
  8. 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' TURING SPACE IN FRONT OF CBU SHALL NOT EXCEED 2% IN ANY DIRECTION. **CBU LAYOUT ABOVE ASSUMES STREET & CURB GRADE DOES NOT EXCEED 2%.**

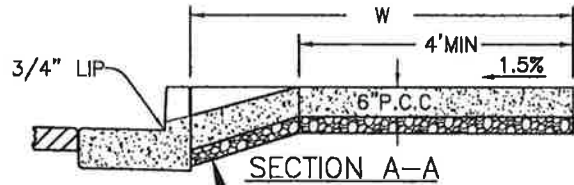
LAST REVISION DATE: NOV 2018	COPYRIGHT 1998 WESTECH ENGINEERING, INC.
<b>CURBLINE SIDEWALKS AND DRIVEWAY APRONS</b>	
(NTS)	
DAYTON, OR	DETAIL NO. 212

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



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

W	B	H	
5'	1'	0.27'	(3-1/4")
6'	2'	0.23'	(2-3/4")
7'	3'	0.19'	(2-1/4")

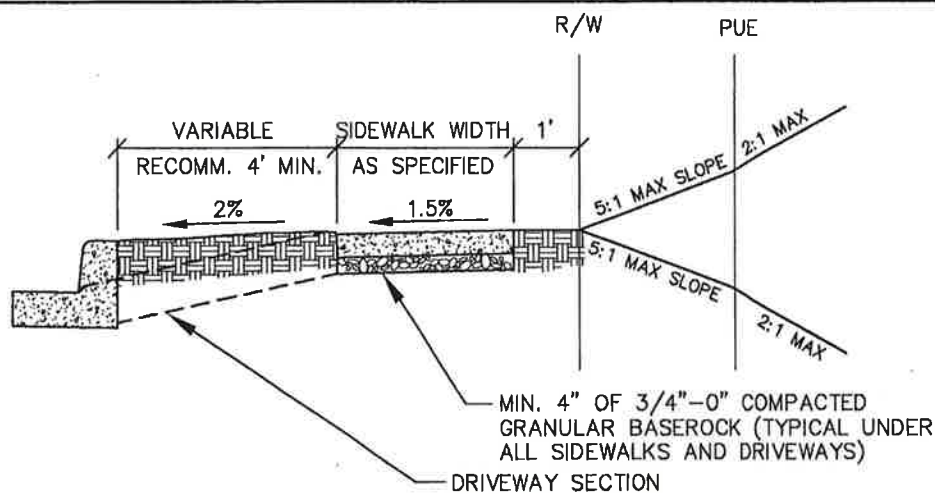


NO SCALE  
MIN. 4" OF 3/4"-0" COMPACTED  
GRANULAR BASEROCK (TYPICAL  
UNDER ALL SIDEWALKS AND  
DRIVEWAYS)

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

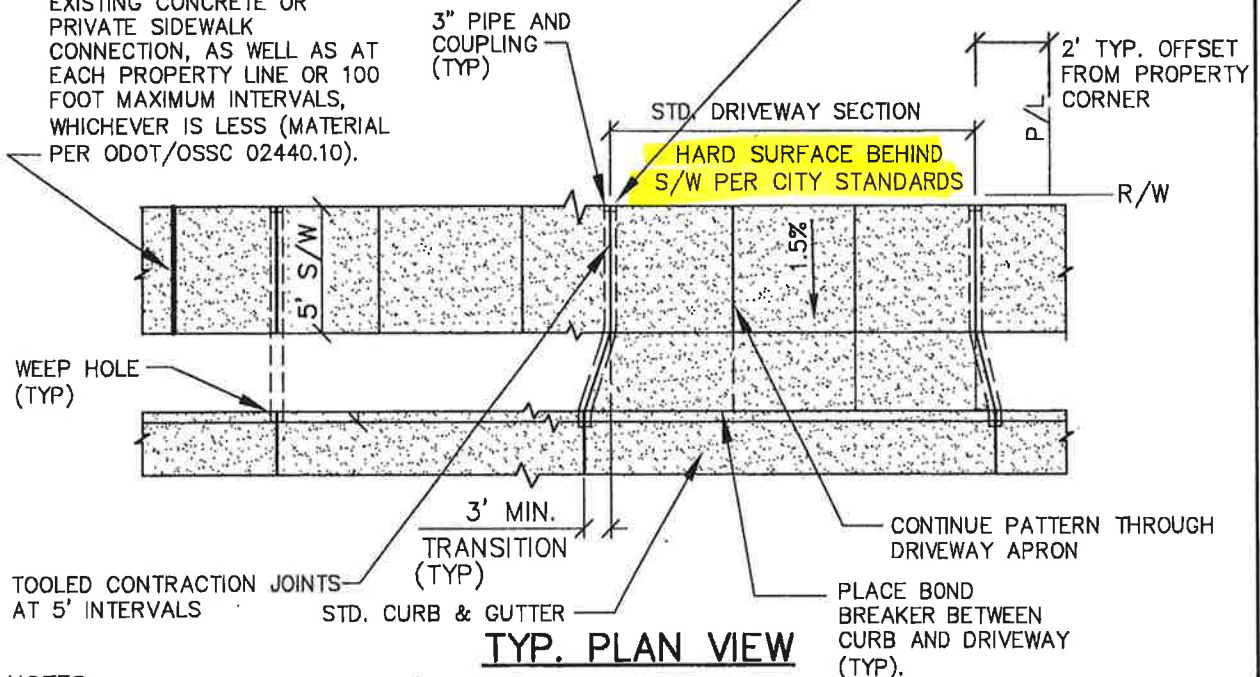
LAST REVISION DATE: NOV 2018	
<b>RESIDENTIAL D/W APRON CURBLINE SIDEWALK UPHILL LOTS ONLY</b> (NTS)	
DAYTON, OR	DETAIL NO. 212A



**TYP. CROSS 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, WHICHEVER IS LESS (MATERIAL PER ODOT/OSSC 02440.10).

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



**TYP. PLAN VIEW**

**NOTES:**

1. CONCRETE DEPTH FOR STANDARD SIDEWALKS SHALL BE 4" MIN.
2. MONOLITHIC STREET CURB & DRIVEWAY PLACEMENT IS PROHIBITED FOR PUBLIC STREETS.
3. RESIDENTIAL DRIVEWAY SECTIONS WITHIN R.O.W, INCLUDING SIDEWALKS THROUGH DRIVEWAYS SHALL BE 6" MIN. THICKNESS. COMMERCIAL D/W & ALLEY APPROACHES SHALL BE 8" MIN. THICKNESS.
4. SIDEWALKS 10' & WIDER SHALL HAVE A LONGITUDINAL CONTRACTION JOINT 5' MAX. ON CENTER.
5. JOINT PCC APRONS TO MATCH SIDEWALK PATTERN.
6. CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
7. 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.

LAST REVISION DATE: NOV 2018	COPYRIGHT 1988 WESTECH ENGINEERING, INC.
<b>PROPERTY LINE SIDEWALKS AND DRIVEWAY APRONS</b>	
(NTS)	
DAYTON, OR	DETAIL NO. <b>213</b>

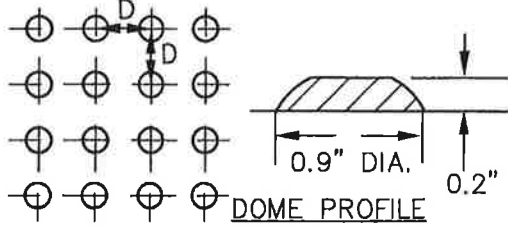


**DOMES SHALL BE RED CONCRETE INSET PANELS**

**(CASTINACT 3 OR EQUAL)**

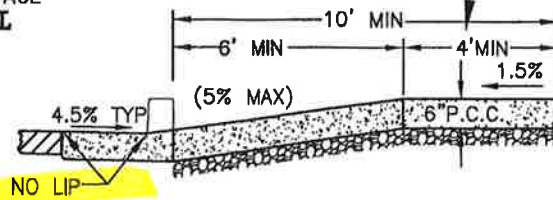
INSTALL TRUNCATED DOME DETECTABLE WARNING SURFACE AS SHOWN & SPECIFIED, **FULL WIDTH OF RAMP THROAT**

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

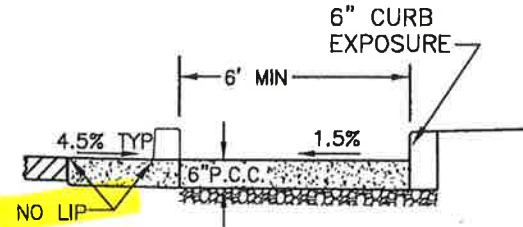


**FIGURE A: TRUNCATED DOME DETAIL**

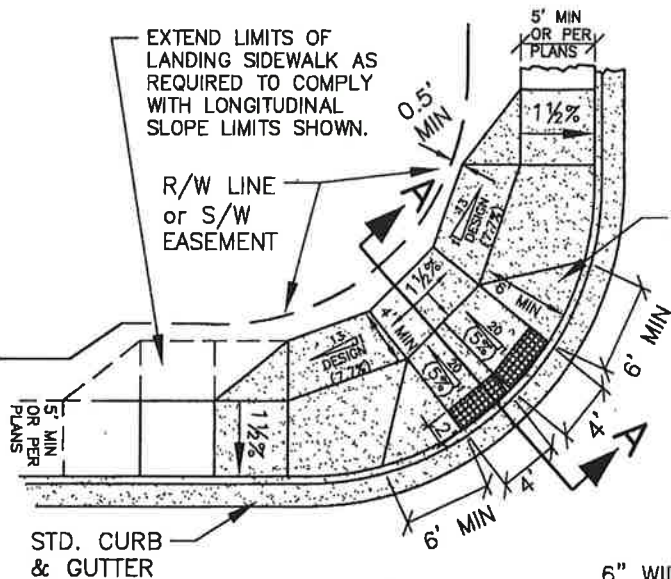
5' WIDE TURNING SPACE REQUIRED WHERE LANDSCAPE CURB PROVIDED.



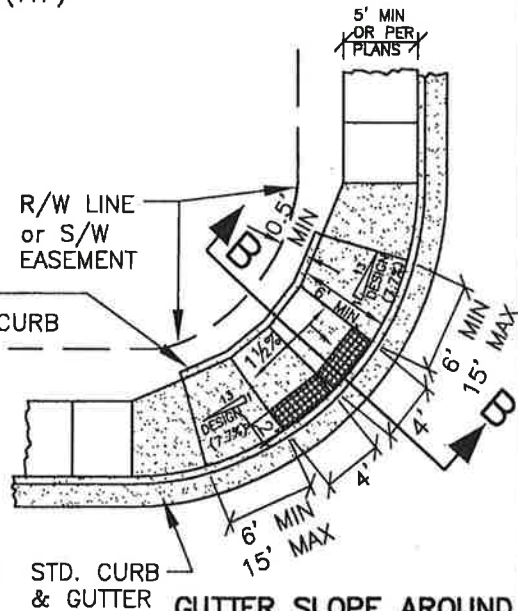
**SECTION A**



**SECTION B**



**GUTTER SLOPE 2% MAX AT CURB RAMP**  
(SEE SECTION A)



**GUTTER SLOPE AROUND RADIUS 2% MAX**  
(SEE SECTION B)

**GENERAL NOTES:**

1. SEE FIGURE A FOR RAMP TEXTURE DETAIL.
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 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. DOMES PANELS TO BE MASCO CASTINACT OR EQUAL.
10. PROVIDE 4" MIN. COMPACTED BASEROCK UNDER ALL S/W.
11. **WHERE GRADE LIMITS SHOWN CANNOT BE SATISFIED (IE. APPROACH, LANDING OR WINGS), CONSTRUCT RAMP SHOWN ON DETAIL 214B & TRANSITION TO CURBLINE SIDEWALK.**
12. 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.

LAST REVISION DATE:	JUNE 2018
<b>INTERSECTION CURB RAMPS CURB LINE SIDEWALKS LOCAL STREETS</b>	
(NTS)	
DAYTON, OR	DETAIL NO. 214A

**DOMES SHALL BE RED CONCRETE INSET PANELS  
(CASTIN TACT 3 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

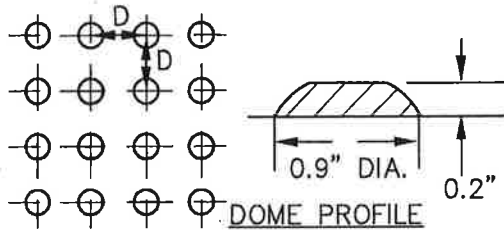
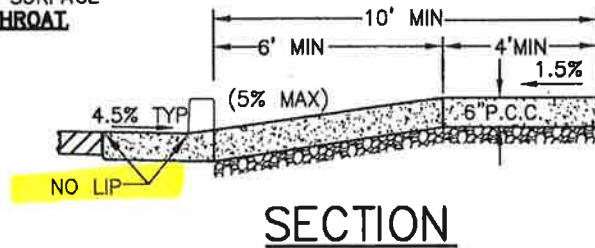
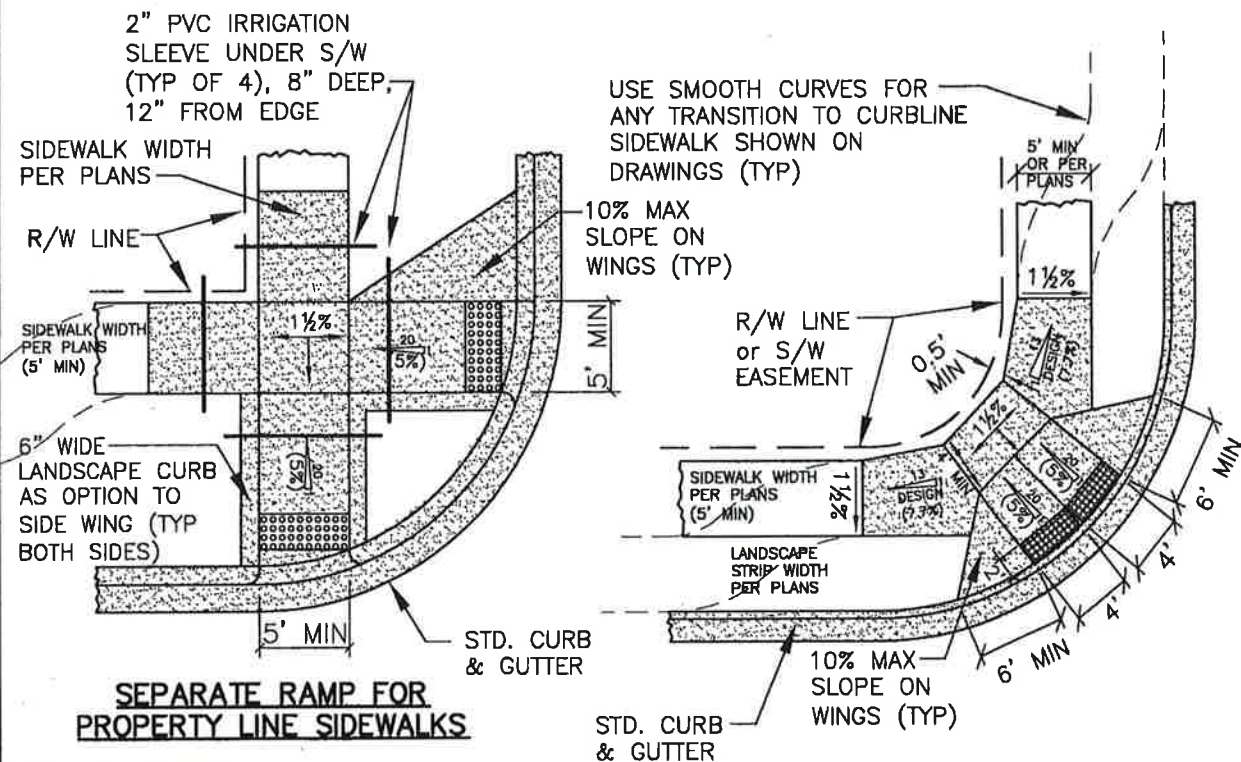


FIGURE A: TRUNCATED DOME DETAIL



SECTION



**GENERAL NOTES:**

1. SEE FIGURE A FOR RAMP TEXTURE DETAIL.
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. DOMES PANELS TO BE MASCO CASTINTACT OR EQUAL.
10. PROVIDE 4" MIN. COMPACTED BASEROCK UNDER ALL S/W.
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.

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

LAST REVISION DATE:	
JUNE 2018	
<b>INTERSECTION CURB RAMPS PROPERTY LINE SIDEWALKS LOCAL STREETS</b>	
(NTS)	
DAYTON, OR	DETAIL NO. 214B



**DOMES SHALL BE RED CONCRETE INSET PANELS**

**(CAST-IN-TACT 3 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

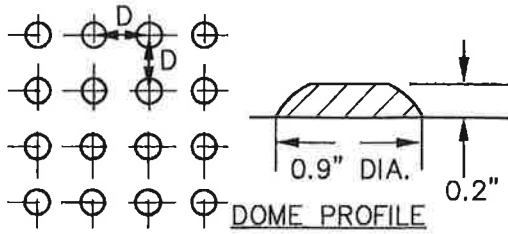
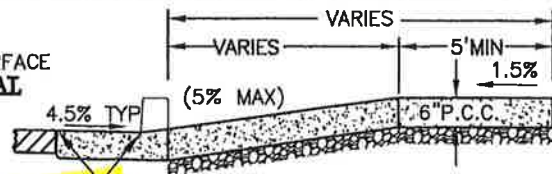
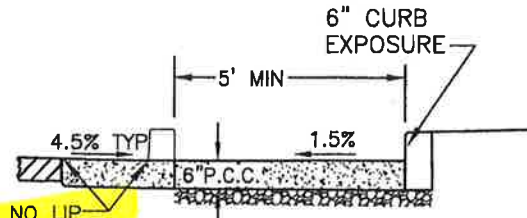


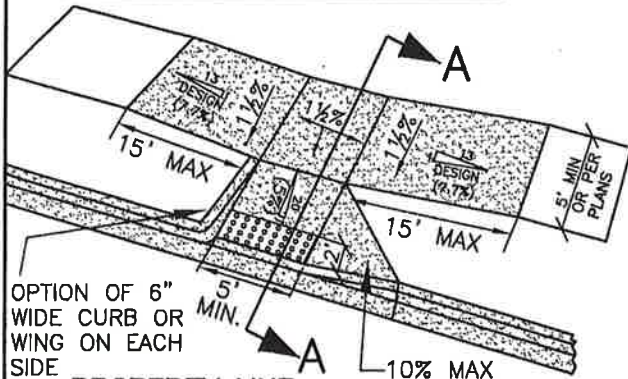
FIGURE A: TRUNCATED DOME DETAIL



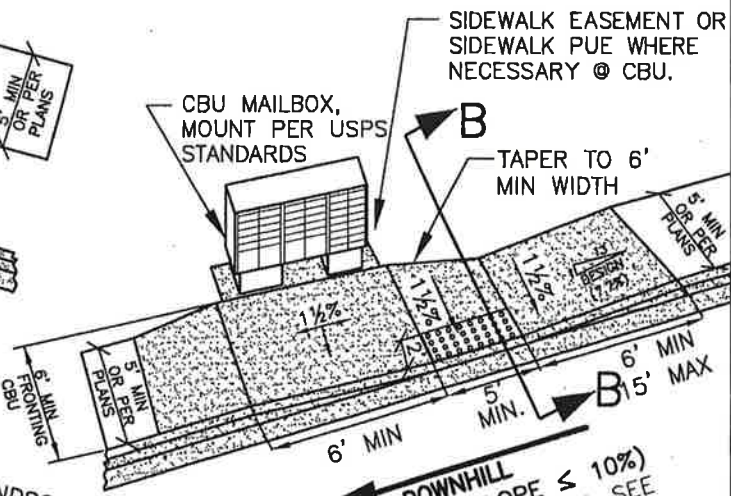
SECTION A



SECTION B

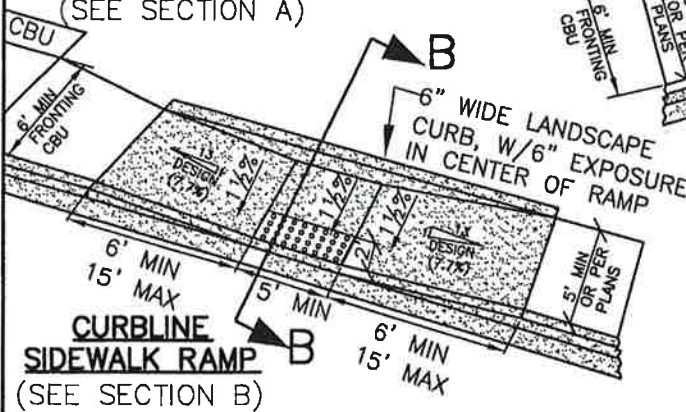


OPTION OF 6" WIDE CURB OR WING ON EACH SIDE  
**PROPERTY LINE SIDEWALK RAMP**  
(SEE SECTION A)



**DOWNHILL**  
(3% ≤ GUTTER SLOPE ≤ 10%)  
(FOR GUTTER SLOPE < 3%, SEE LAYOUT DETAIL AT LEFT)

**CURBLINE SIDEWALK RAMP W/ADJACENT CBU**  
(GUTTER SLOPE 10% MAX)  
(SEE SECTION B)

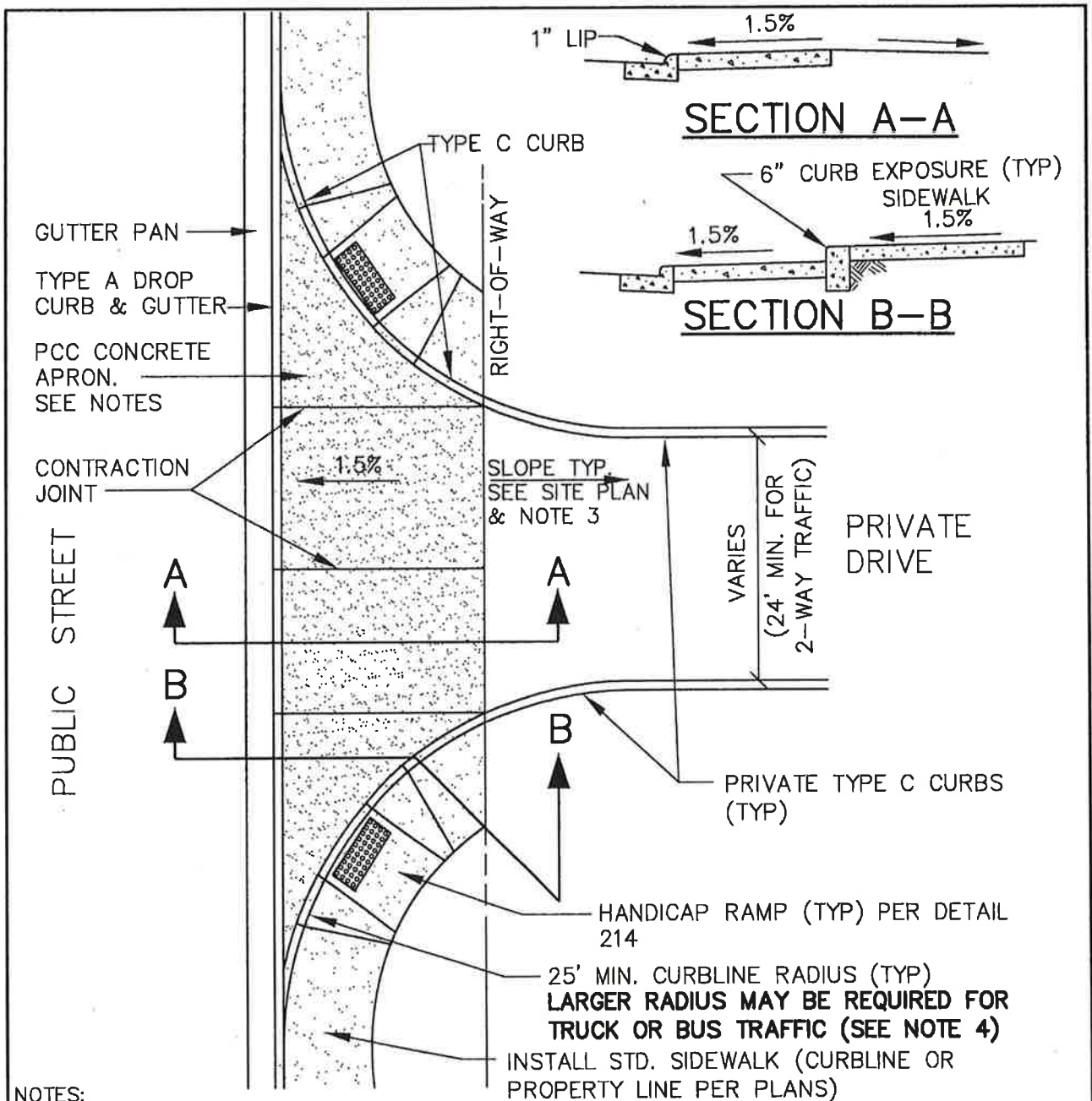


**CURBLINE SIDEWALK RAMP**  
(SEE SECTION B)

**GENERAL NOTES:**

1. SEE FIGURE A FOR RAMP TEXTURE DETAIL.
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. DOMES PANELS TO BE MASCO CASTINACT OR EQUAL.
10. PROVIDE 4" MIN. COMPACTED BASEROCK UNDER ALL S/Ws.
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.

LAST REVISION DATE:	JUNE 2018
<b>CURB RAMPS BETWEEN INTERSECTIONS</b>	
(NTS)	
DAYTON, OR	DETAIL NO. 214C



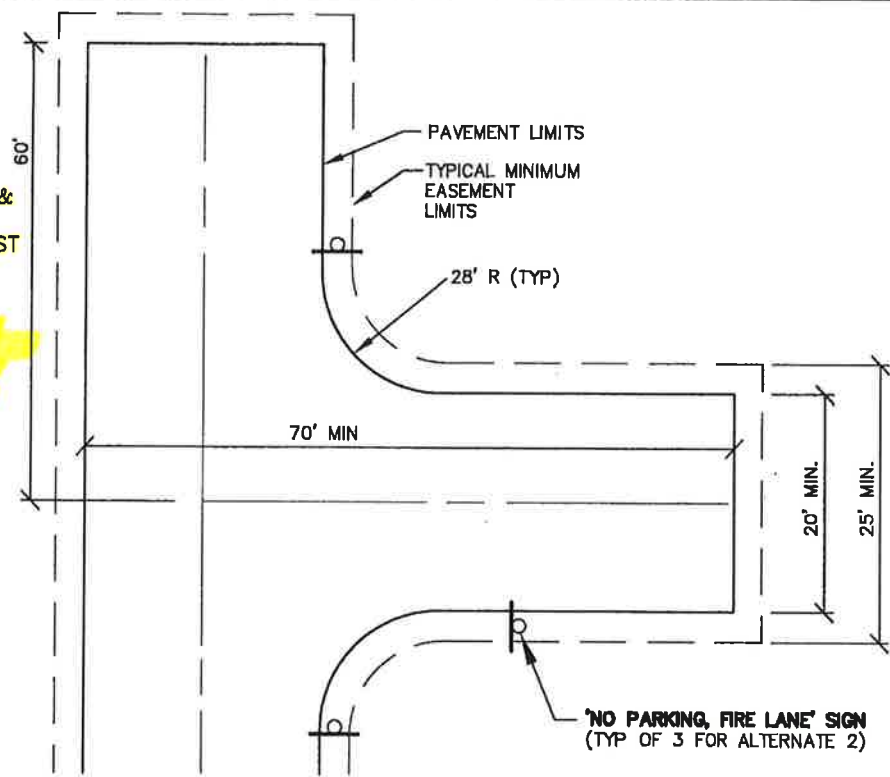
**NOTES:**

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).
3. PRIVATE CATCH BASINS ARE REQUIRED BEHIND DRIVEWAY APRON IF THE DRIVEWAY OR THE PARKING LOT BEYOND DRIVEWAY APRON SLOPES & DRAINS TOWARD THE STREET (IE. ACROSS THE PEDESTRIAN PATH).
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).

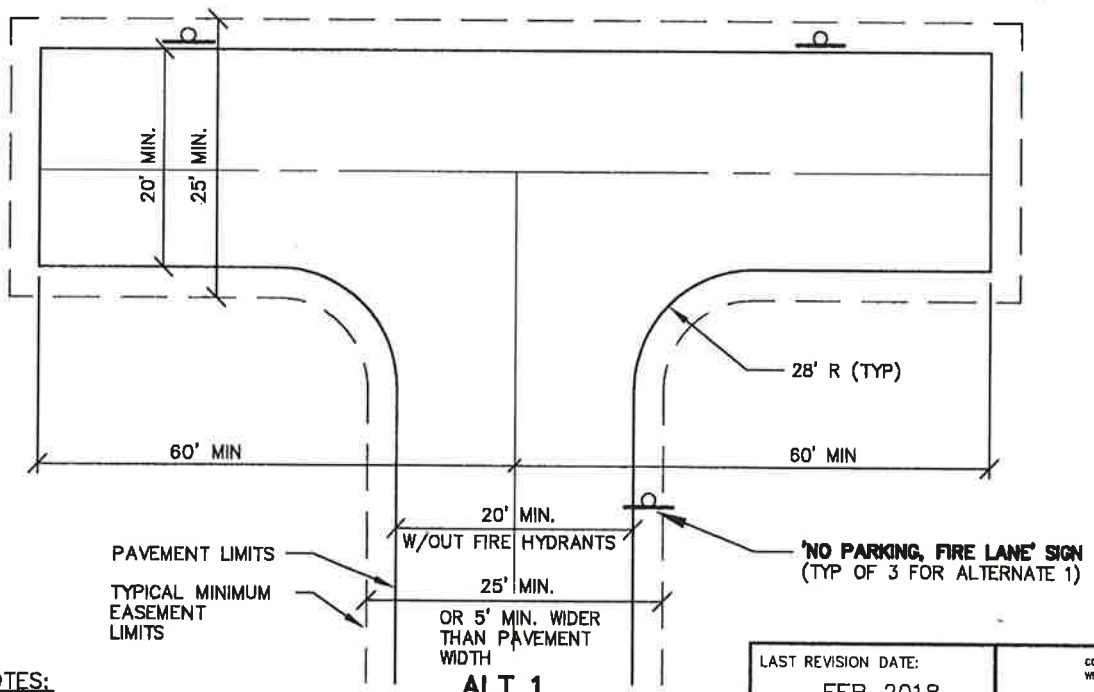
LAST REVISION DATE: DEC 2017	COPYRIGHT 1988 WESTECH ENGINEERING, INC.
<b>COMMERCIAL/INDUSTRIAL STYLE DRIVEWAY APPROACH</b> (NTS)	
DAYTON, OR	DETAIL NO. 216

**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).



**ALT 2**



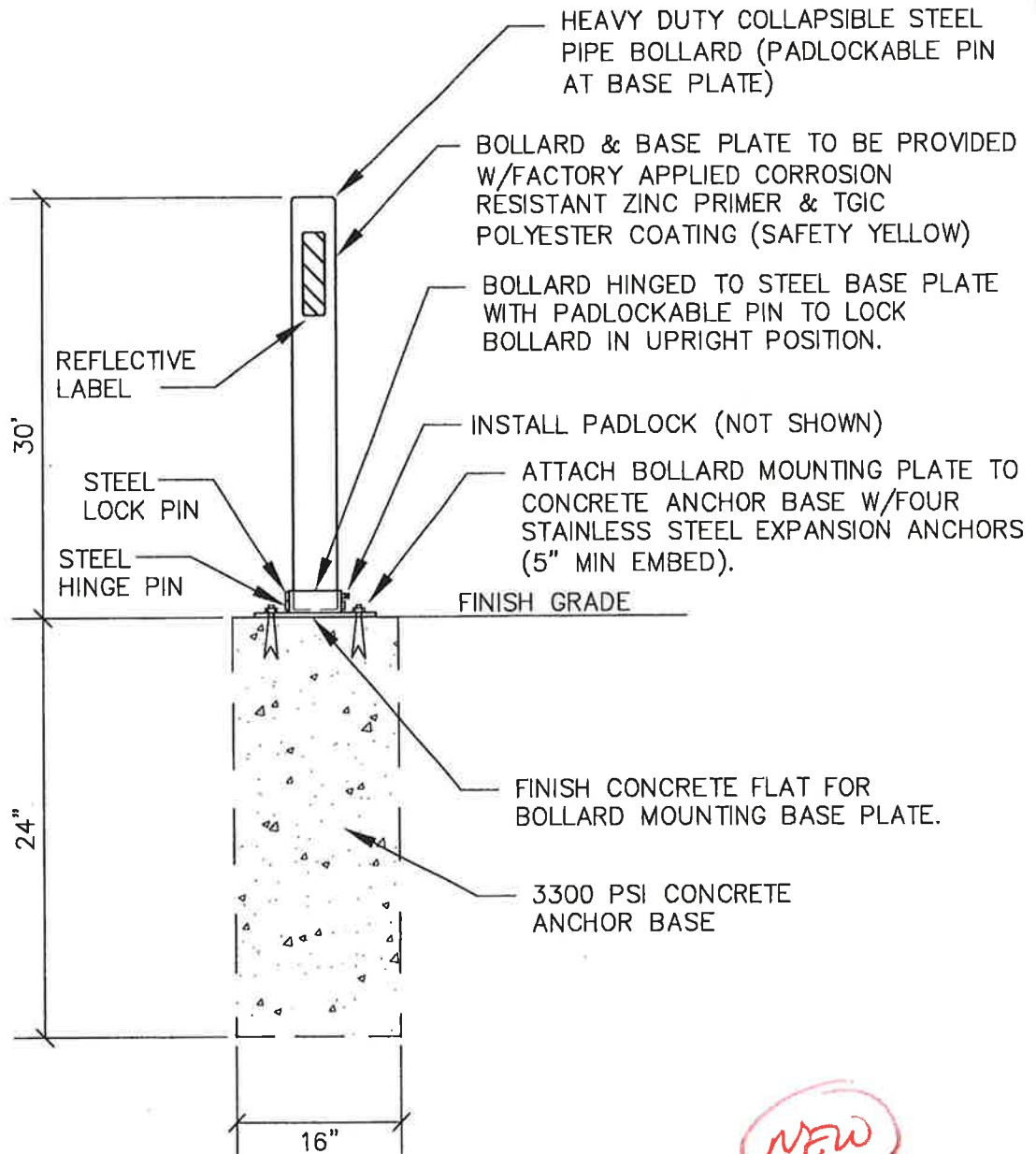
**ALT 1**

**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).

LAST REVISION DATE: FEB 2018	COPYRIGHT 1995 WESTECH ENGINEERING, INC.
<b>FIRE CODE/FIRE LANE HAMMERHEAD TURNAROUND (PRIVATE DRIVES ONLY)</b> (NTS)	
DAYTON, OR	DETAIL NO. 220





**NOTES:**

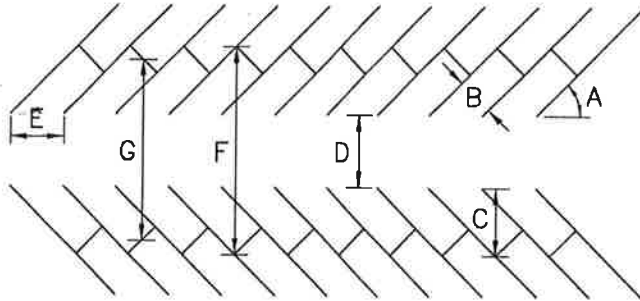
1. BOLLARD BASE MOUNTING PLATE AND BOLLARD SHALL BE 4-INCH MAXIMUM HEIGHT WHEN IN COLLAPSED/DOWN POSITION.
2. UNLESS OTHERWISE SPECIFIED, PROVIDE WEATHER RESISTANT PADLOCK KEYED TO SPECIFIED PATTERN.
3. COLLAPSIBLE BOLLARD ASSEMBLY SHALL BE TRAFFICGUARD MODEL LPHDHB OR APPROVED EQUAL.
4. VERIFY BOLLARD HINGE LOCATION (I.E. COLLAPSE DIRECTION) WITH OWNER PRIOR TO INSTALLATION.

*NEW*

LAST REVISION DATE:	
NOV 2017	
<b>30" TALL COLLAPSIBLE PADLOCKABLE BOLLARD</b>	
(NTS)	
DAYTON, OR	DETAIL NO. 228

# 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 AISLE
- 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

COMPACT (8.5' x 16')							STANDARD (9' x 19')					
A	B	C	D	E	F	G	B	C	D	E	F	G
0°	8.5	8.5	12.0	19.0	28.0	—	9.0	9.0	12.0	22.0	28.0	—
30°	8.5	15.4	12.0	17.0	41.7	34.4	9.0	17.3	12.0	18.0	45.6	37.8
45°	8.5	17.3	13.0	12.0	47.6	41.6	9.0	19.8	13.0	12.7	52.6	46.2
60°	8.5	18.1	18.0	9.8	54.2	50.0	9.0	21.0	18.0	10.4	60.0	55.7
70°	8.5	17.9	19.0	9.0	54.9	52.0	9.0	21.0	19.0	9.6	61.0	57.8
90°	8.5	16.0	24.0	8.5	56.0	56.0	9.0	19.0	24.0	9.0	62.0	62.0

**NOTES:**

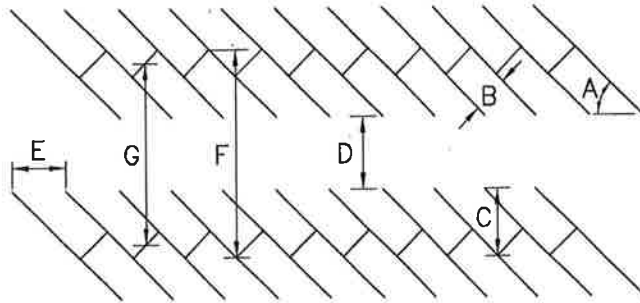
1. WHERE PARKING LOT DRIVE AISLE IS A FIRE LANE, WIDTHS SHALL CONFORM WITH THE OREGON FIRE CODE (OFC) MINIMUMS OF 20 FEET IN ALL CASES (26 FOOT MINIMUM WIDTH, 20 FEET EACH WAY FROM FIRE HYDRANTS), PER OFC 503.2.1 & D103.1.
2. DRIVE AISLE WIDTH "D" IS REQUIRED FOR DRIVING / BACKING / TURNING MOVEMENTS 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.

LAST REVISION DATE: DEC 2017	COPYRIGHT 1995 WESTECH ENGINEERING, INC.
<b>OFFSTREET PARKING DIMENSIONS ONE WAY TRAFFIC FLOW (NTS)</b>	
DAYTON, OR	DETAIL NO. <b>235</b>

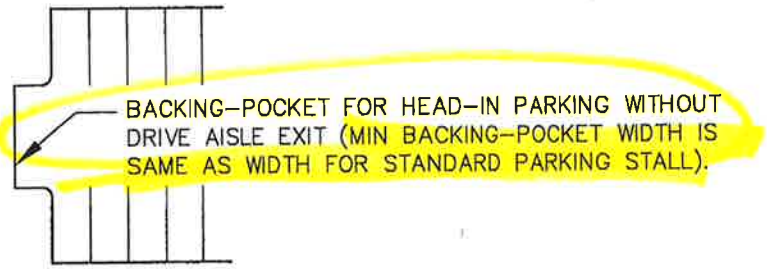


# OFF-STREET PARKING DIMENSIONS

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 AISLE
- 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

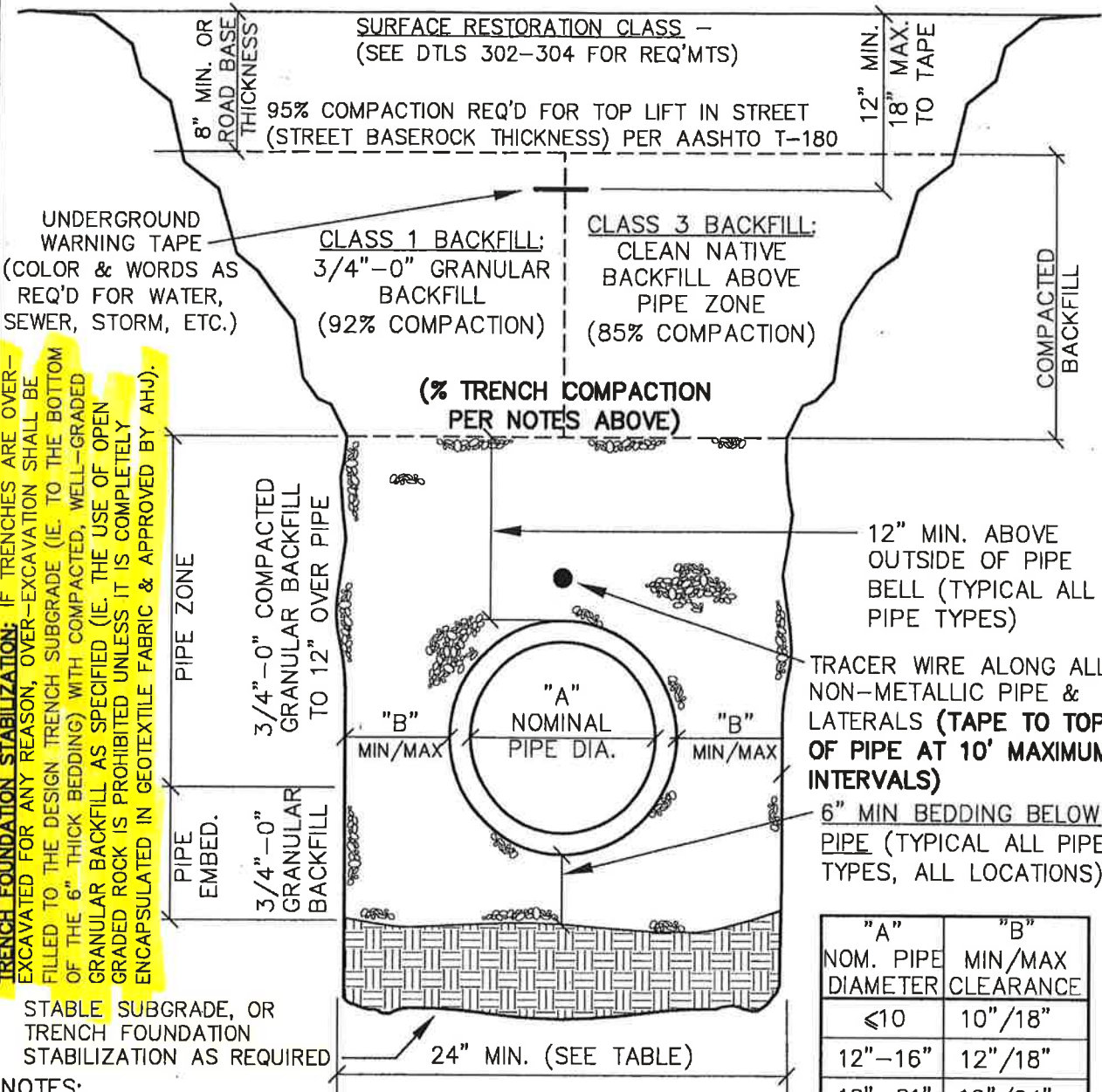
COMPACT (8.5' x 16')							STANDARD (9' x 19')					
A	B	C	D	E	F	G	B	C	D	E	F	G
0°	8.5	8.5	12.0	19.0	28.0	—	9.0	9.0	12.0	22.0	28.0	—
30°	8.5	15.4	12.0	17.0	41.7	34.4	9.0	17.3	12.0	18.0	45.6	37.8
45°	8.5	17.3	13.0	12.0	47.6	41.6	9.0	19.8	13.0	12.7	52.6	46.2
60°	8.5	18.1	18.0	9.8	54.2	50.0	9.0	21.0	18.0	10.4	60.0	55.7
70°	8.5	17.9	19.0	9.0	54.9	52.0	9.0	21.0	19.0	9.6	61.0	57.8
90°	8.5	16.0	24.0	8.5	56.0	56.0	9.0	19.0	24.0	9.0	62.0	62.0

**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 ACCOMMODATE BUMPER OVERHANG. LENGTH OF COMPACT SPACES NOT TO BE REDUCED.

LAST REVISION DATE: DEC 2017	<small>COPYRIGHT 1988 WESTECH ENGINEERING, INC.</small>
<b>OFFSTREET PARKING DIMENSIONS</b> <b>TWO WAY TRAFFIC FLOW</b> (NTS)	
DAYTON, OR	DETAIL NO. <b>236</b>

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



"A" NOM. PIPE DIAMETER	"B" MIN/MAX CLEARANCE
≤10	10"/18"
12"-16"	12"/18"
18"-21"	16"/24"
24"-30"	18"/30"
>30"	24"/36"

(SEE NOTE 4)

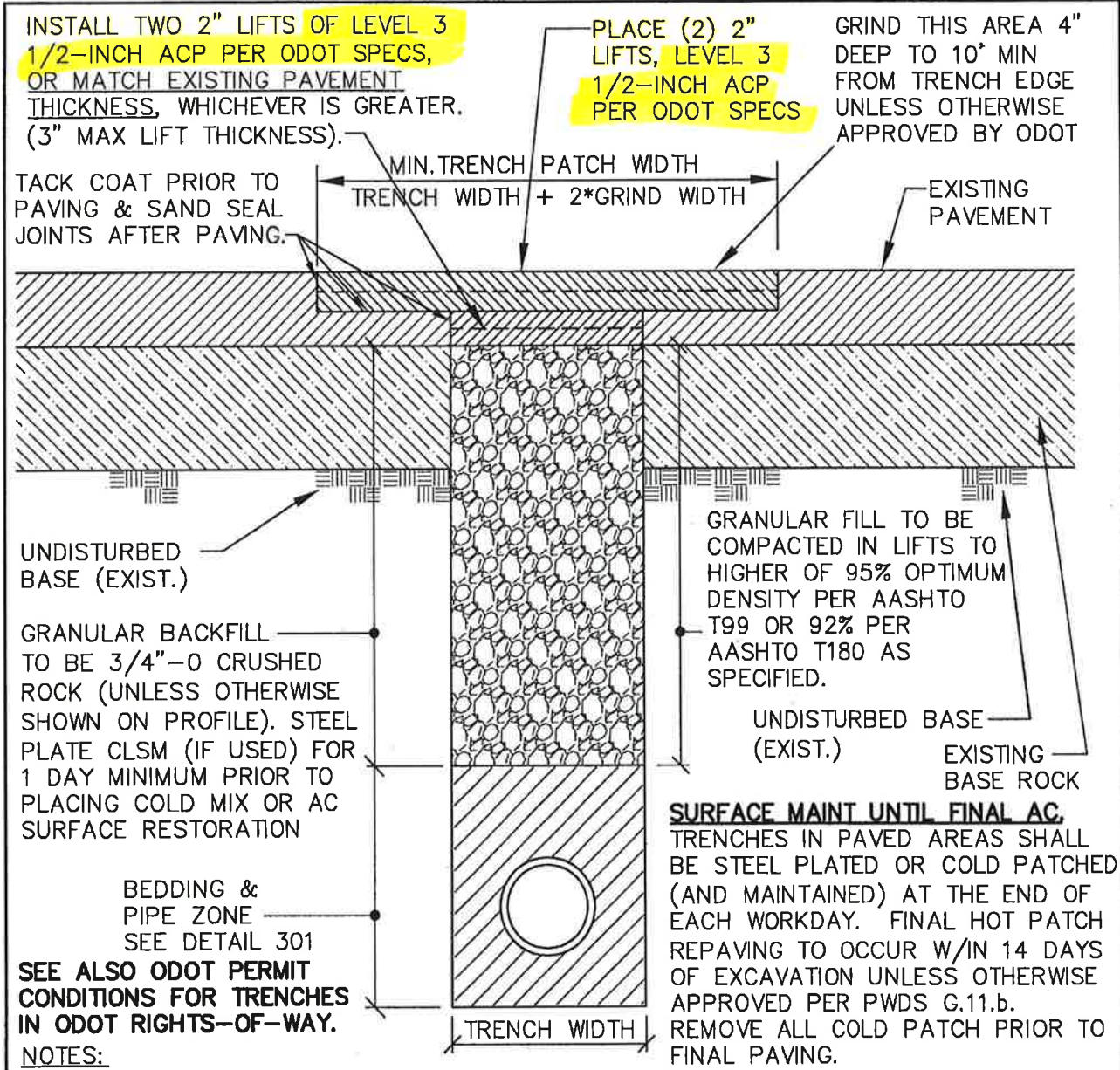
**NOTES:**

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	
<b>TRENCH BACKFILL, BEDDING, AND PIPE ZONE</b> (NTS)	
DAYTON, OR	DETAIL NO. <b>301</b>

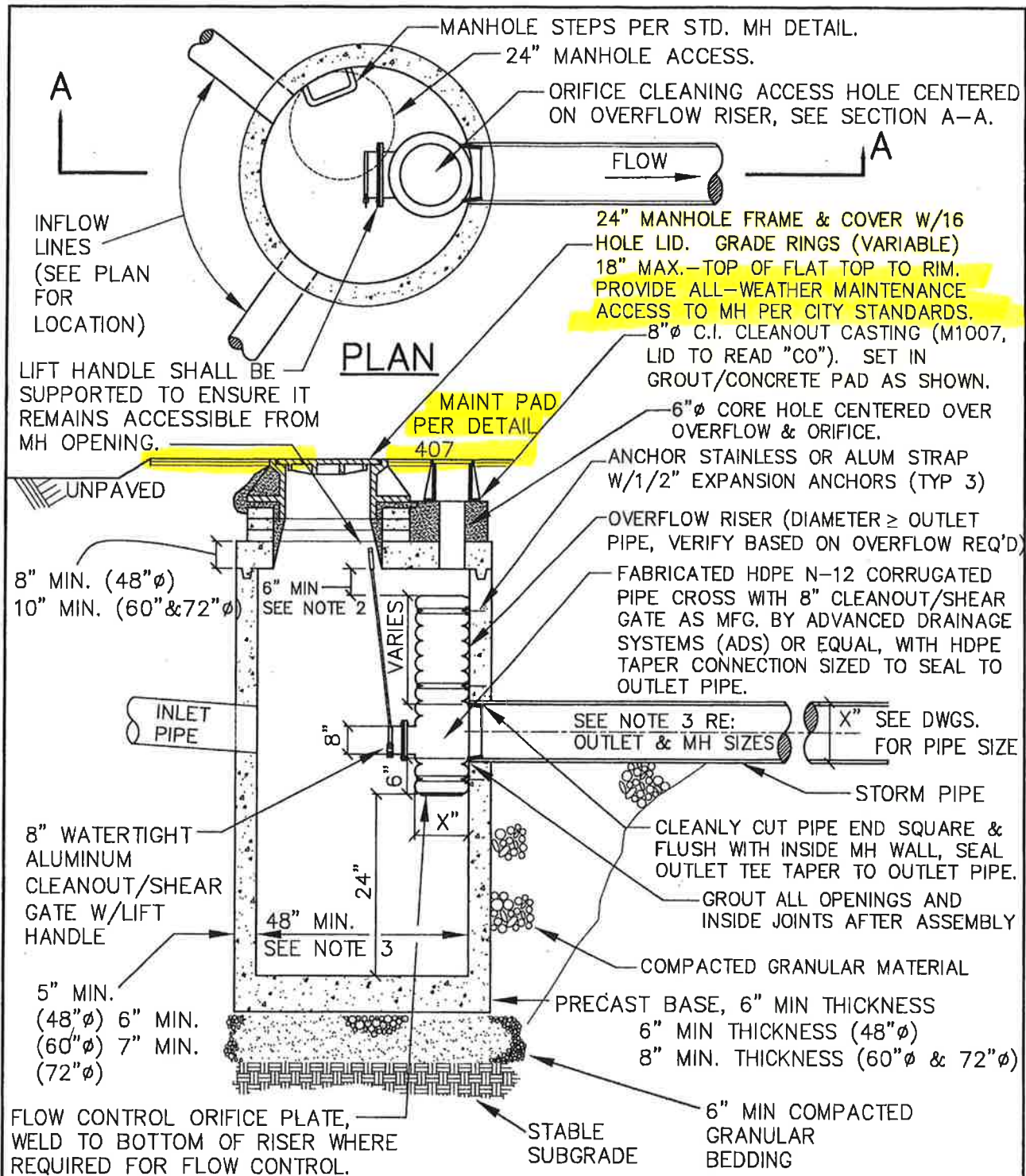
**TRENCH FOUNDATION STABILIZATION:** IF TRENCHES ARE OVER-EXCAVATED FOR ANY REASON, OVER-EXCAVATION SHALL BE FILLED TO THE DESIGN TRENCH SUBGRADE (IE, TO THE BOTTOM OF THE 6" THICK BEDDING) WITH COMPACTED, WELL-GRADED GRANULAR BACKFILL AS SPECIFIED (IE, THE USE OF OPEN GRADED ROCK IS PROHIBITED UNLESS IT IS COMPLETELY ENCAPSULATED IN GEOTEXTILE FABRIC & APPROVED BY AHJ).





- 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 FIVE CALENDAR DAYS OR AS DIRECTED BY THE DISTRICT MANAGER OR REPRESENTATIVE IN WRITING.
  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.

LAST REVISION DATE:	
FEB 2018	
<b>ODOT TRENCH CROSSING, TRENCH BACKFILL &amp; SURFACE RESTORATION</b>	
(NTS)	
DAYTON, OR	DETAIL NO. 302D



- 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.

LAST REVISION DATE:	
FEB 2019	
<b>POLLUTION/FLOW CONTROL MANHOLE W/OVERFLOW</b>	
(NTS)	
DAYTON, OR	DETAIL NO. 320



GROUT OVERSIZE FLOW CHANNEL AS SHOWN & TROWEL SMOOTH.

CLEARANCE UNDER SANITARY SEWER PIPE TO BE A MINIMUM OF 1.5 TIMES THE DIAMETER OF THE STORM PIPE



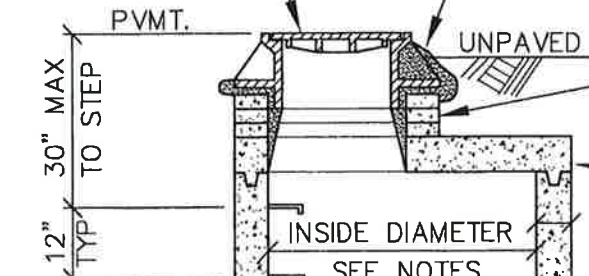
18' LENGTH, CLASS 52 DI PIPE

**SECTION THRU SANITARY SEWER**

CONNECT DUCTILE IRON PIPE TO SEWER PIPE WITH APPROVED FLEXIBLE COUPLING. (TYP BOTH ENDS) MAXADAPTOR COUPLING (BY GRIPPER GASKET LLC) OR EQUAL.

MANHOLE FRAME AND COVER

SET FRAME IN NON-SHRINK GROUT



SEE DRAWINGS FOR INVERT ELEVATIONS AND PIPE ALIGNMENTS.

ALL OPENINGS CORED DRILLED.

**SECTION THRU STORM**

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.

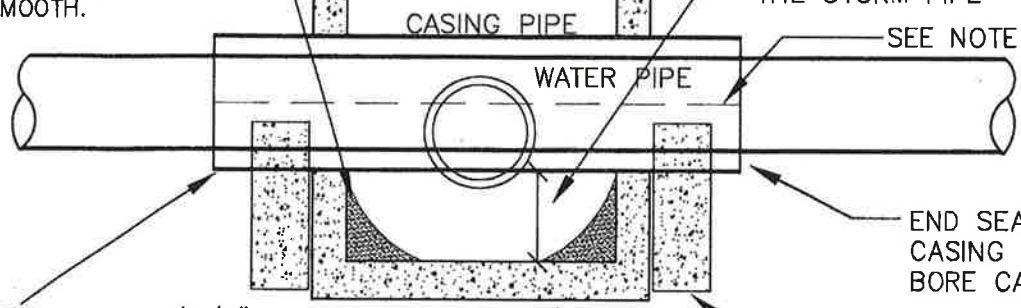
USE OF KUENZI MANHOLES MUST BE APPROVED ON A CASE BY CASE BASIS BY THE PUBLIC WORKS DIRECTOR.

LAST REVISION DATE: DEC 2018	
<b>KUENZI MANHOLE (SEWER PIPE CROSSING)</b>	
(NTS)	
DAYTON, OR	DETAIL NO. <b>330</b>



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.

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

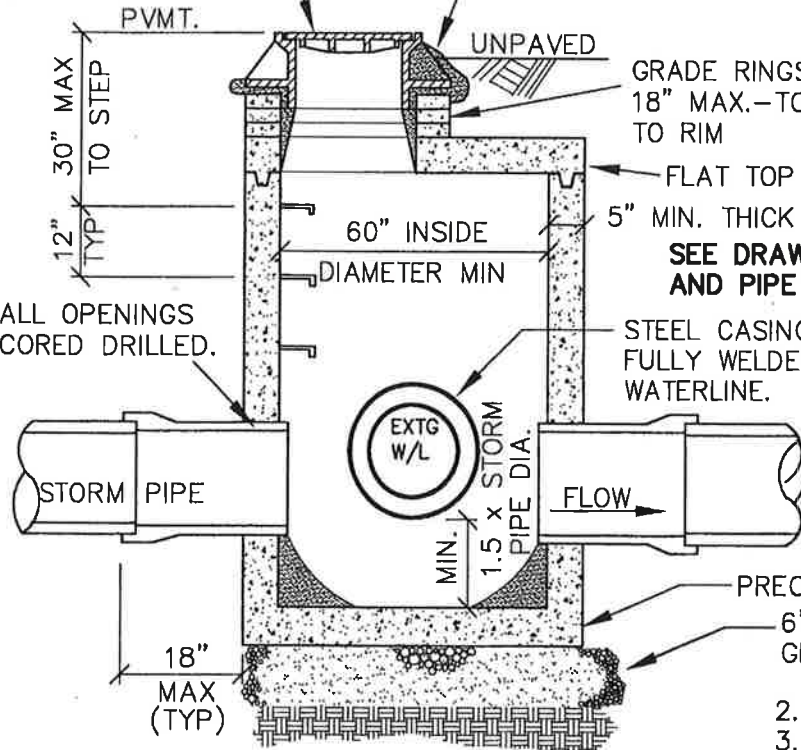
END SEALS & FOUR (4) CASING SPACERS PER BORE CASING DETAIL.

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

**SECTION THRU WATERLINE**

MANHOLE FRAME AND COVER

SET FRAME IN NON-SHRINK GROUT



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

SEE DRAWINGS FOR INVERT ELEVATIONS AND PIPE ALIGNMENTS.

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

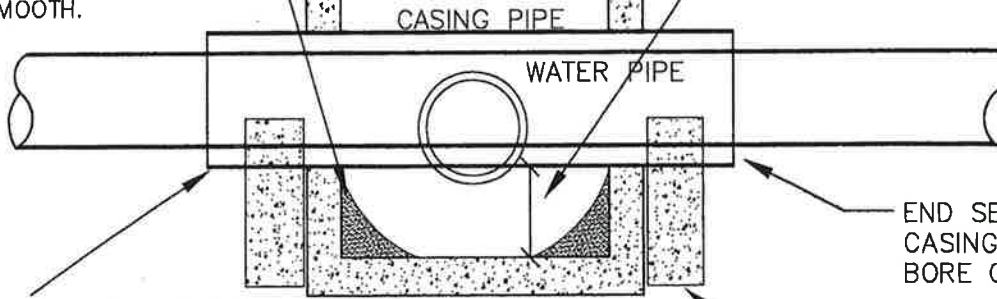
**SECTION THRU STORM**

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 & POUR 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	JO # <i>new</i> STANDARD
<b>KUENZI MANHOLE W / WATERLINE CASING (EXISTING WATERLINE)</b>	
(NTS)	
DAYTON, 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



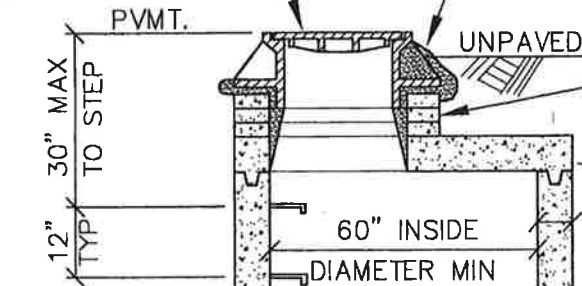
STEEL CASING (1/2" MIN WALL THICKNESS), EXTEND 12" MIN BEYOND END OF CONCRETE SUPPORTS (WATERLINE SIZE AS NOTED ON DWGS & SPECS).

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

**SECTION THRU WATERLINE**

MANHOLE FRAME AND COVER

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.

STEEL CASING PIPE, 0.5" WALL THICKNESS.

ALL OPENINGS CORED DRILLED.

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

**SECTION THRU STORM**

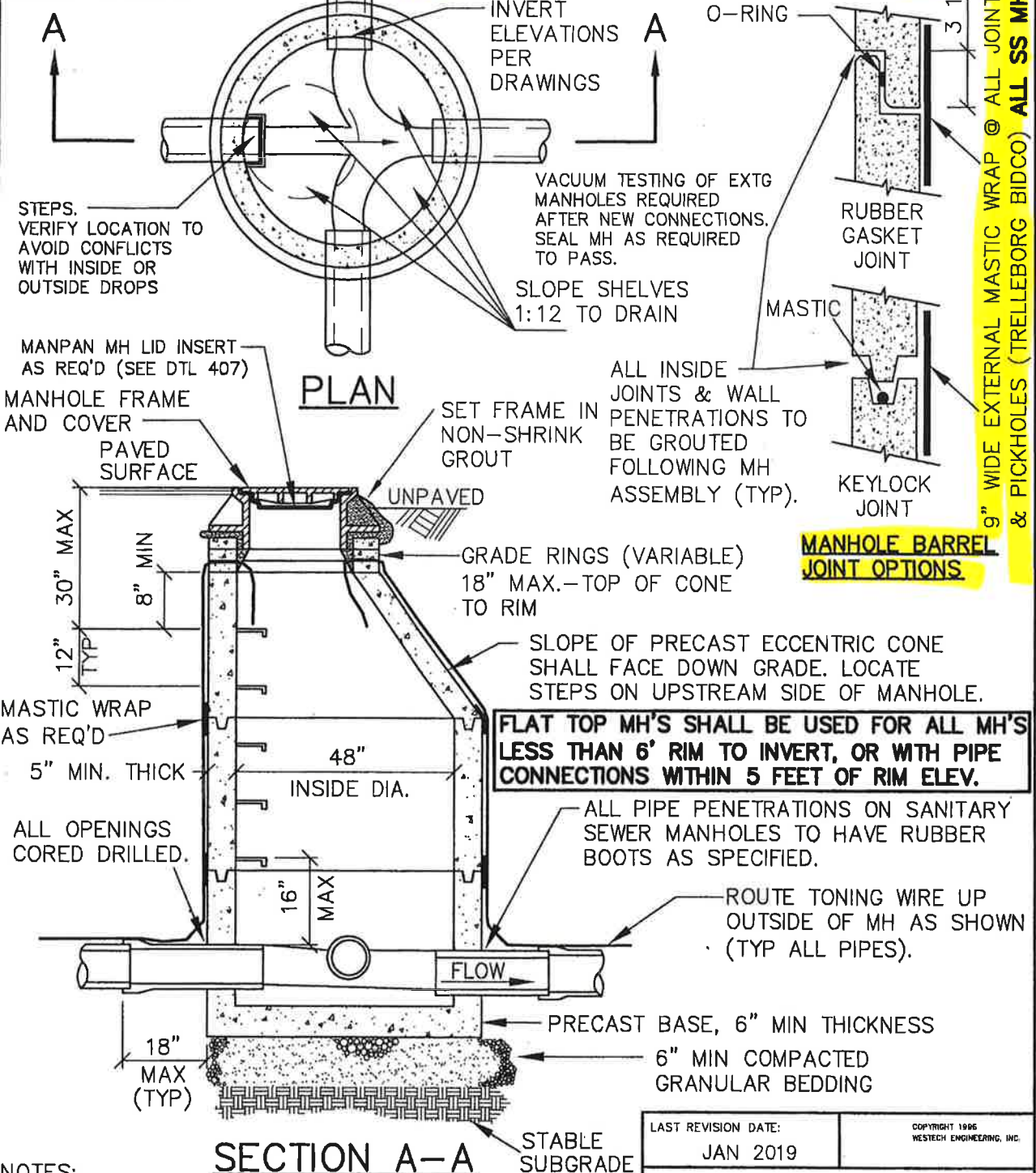
1. BLOCK CASING PIPE IN PLACE & POUR CONCRETE SUPPORTS. INSTALL CASING SPACERS TO SUPPORT WATERLINE THROUGH CASING (DETAIL 5080). INSTALL END SEALS.
2. SEE PLAN VIEWS FOR WATERLINE & STORM SIZE & CONFIGURATION. USE 72" MANHOLE UNLESS OTHERWISE SHOWN ON DRAWINGS.

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

LAST REVISION DATE: DEC 2018	JC # <i>new</i> STANDARD
<b>KUENZI MANHOLE W / WATERLINE CASING (NEW WATERLINE)</b> (NTS)	
DAYTON, OR	DETAIL NO. <b>332</b>

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 DWGS (EXTEND PIPE 2' MIN BEYOND MH WALL), SLOPE PER DWGS.



9" WIDE EXTERNAL MASTIC WRAP @ ALL JOINTS & PICKHOLES (TRELLEBORG BIDCO) ALL SS MHS

**MANHOLE BARREL JOINT OPTIONS**

**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.**

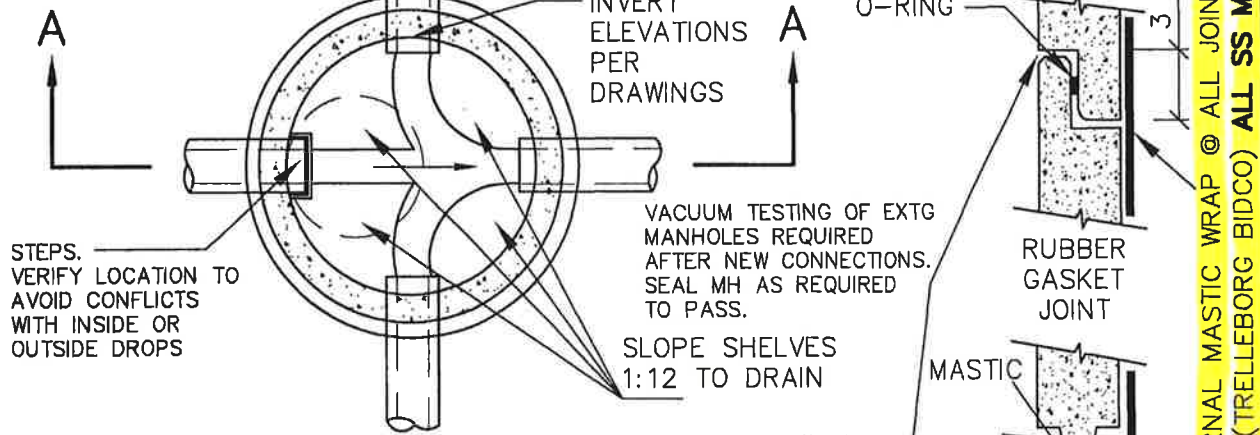
- NOTES:
1. PRECAST SECTIONS SHALL MEET OR EXCEED ASTM C-478.
  2. WATERTIGHT O-RING OR MASTIC KEYLOCK JOINTS REQUIRED, EXTERNAL SEAL AT JOINTS & PICKHOLES.
  3. STEPS TO BE POLYPROPYLENE PLASTIC WITH GRADE 60 REINFORCING ROD. ADD STEPS TO EXTG CONNECTION MH IF EXTG STEPS ARE ABSENT.

LAST REVISION DATE: JAN 2019	COPYRIGHT 1996 WESTECH ENGINEERING, INC.
<b>STANDARD MANHOLE FOR 21" PIPE AND SMALLER (SEWER &amp; STORM)</b>	
(NTS)	
DAYTON, OR	DETAIL NO. 401

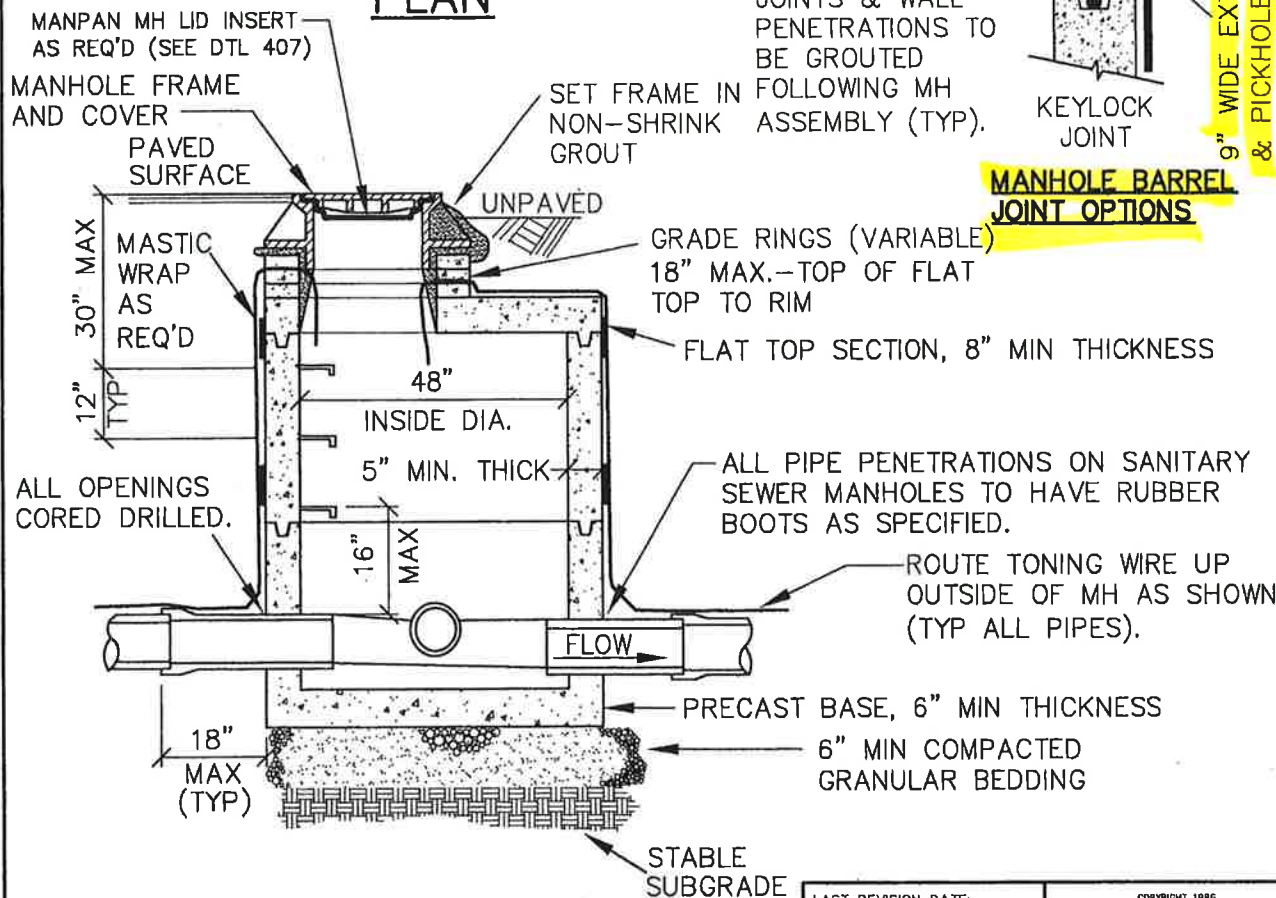


NOTE: PER ORS 92.044(7), MANHOLE MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT

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



**PLAN**



**SECTION A-A**

**NOTES:**

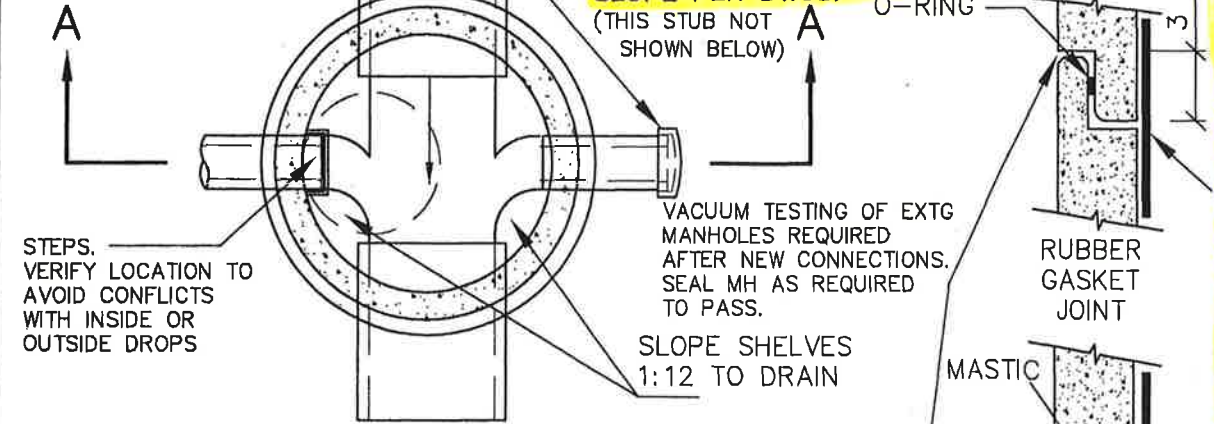
1. PRECAST SECTIONS SHALL MEET OR EXCEED ASTM C-478.
2. WATERTIGHT O-RING OR MASTIC KEYLOCK JOINTS REQUIRED, EXTERNAL SEAL AT JOINTS & PICKHOLES.
3. STEPS TO BE POLYPROPYLENE PLASTIC WITH GRADE 60 REINFORCING ROD. ADD STEPS TO EXTG CONNECTION MH IF EXTG STEPS ARE ABSENT.

LAST REVISION DATE: JAN 2019	COPYRIGHT 1986 WESTECH ENGINEERING, INC.
<b>FLAT TOP MANHOLE FOR 21" PIPE AND SMALLER (SEWER &amp; STORM)</b>	
(NTS)	
DAYTON, OR	DETAIL NO. 402

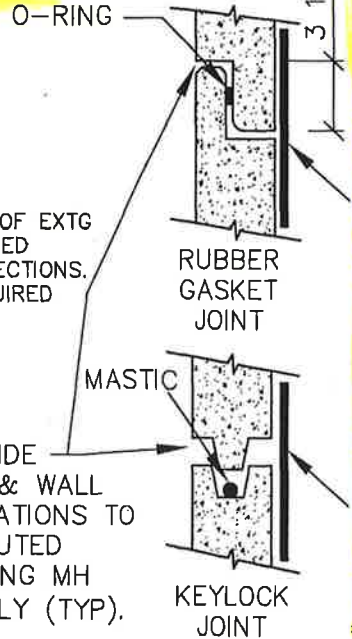
9" WIDE EXTERNAL MASTIC WRAP @ ALL JOINTS & PICKHOLES (TRELLEBORG BIDCO) ALL SS MHs

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 DWGS  
(EXTEND PIPE 2' MIN BEYOND MH WALL),  
SLOPE PER DWGS.

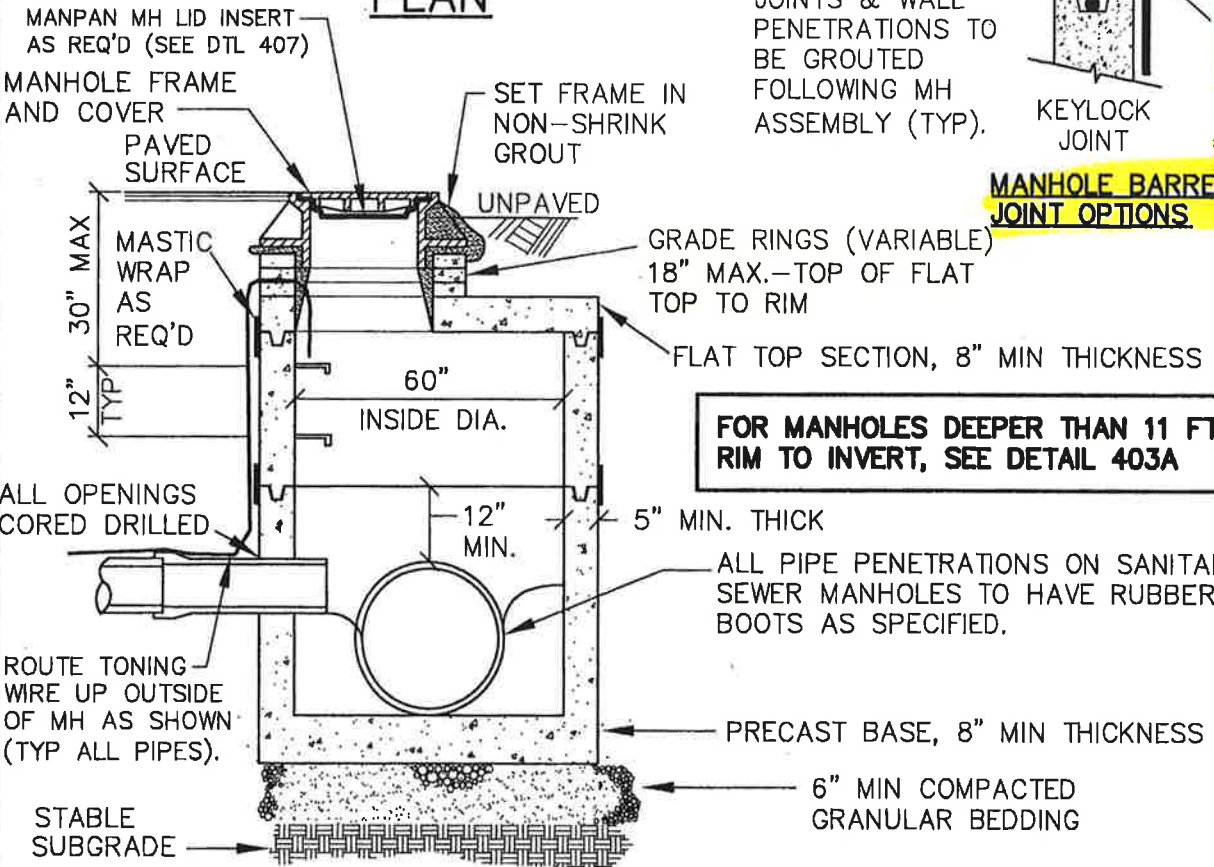


**PLAN**



**MANHOLE BARREL JOINT OPTIONS**

9" WIDE EXTERNAL MASTIC WRAP @ ALL JOINTS  
& PICKHOLES (TRELLEBORG BIDCO) ALL SS MHS



**SECTION A-A**

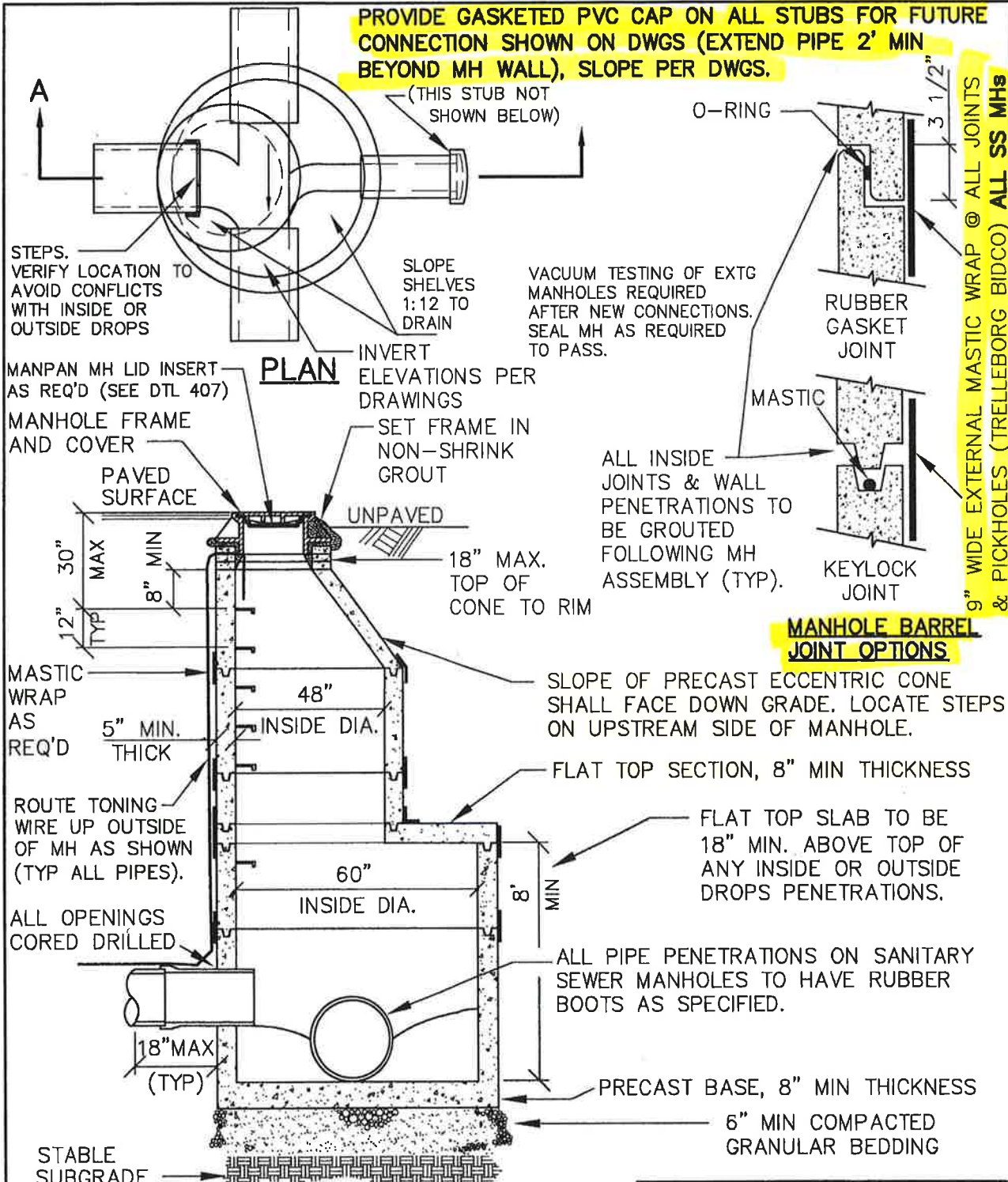
**NOTES:**

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: JAN 2019	COPYRIGHT 1995 WESTECH ENGINEERING, INC.
<b>MANHOLE FOR 24" AND 27" PIPE (SEWER &amp; STORM)</b> (NTS)	
DAYTON, OR	DETAIL NO. <b>403</b>



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

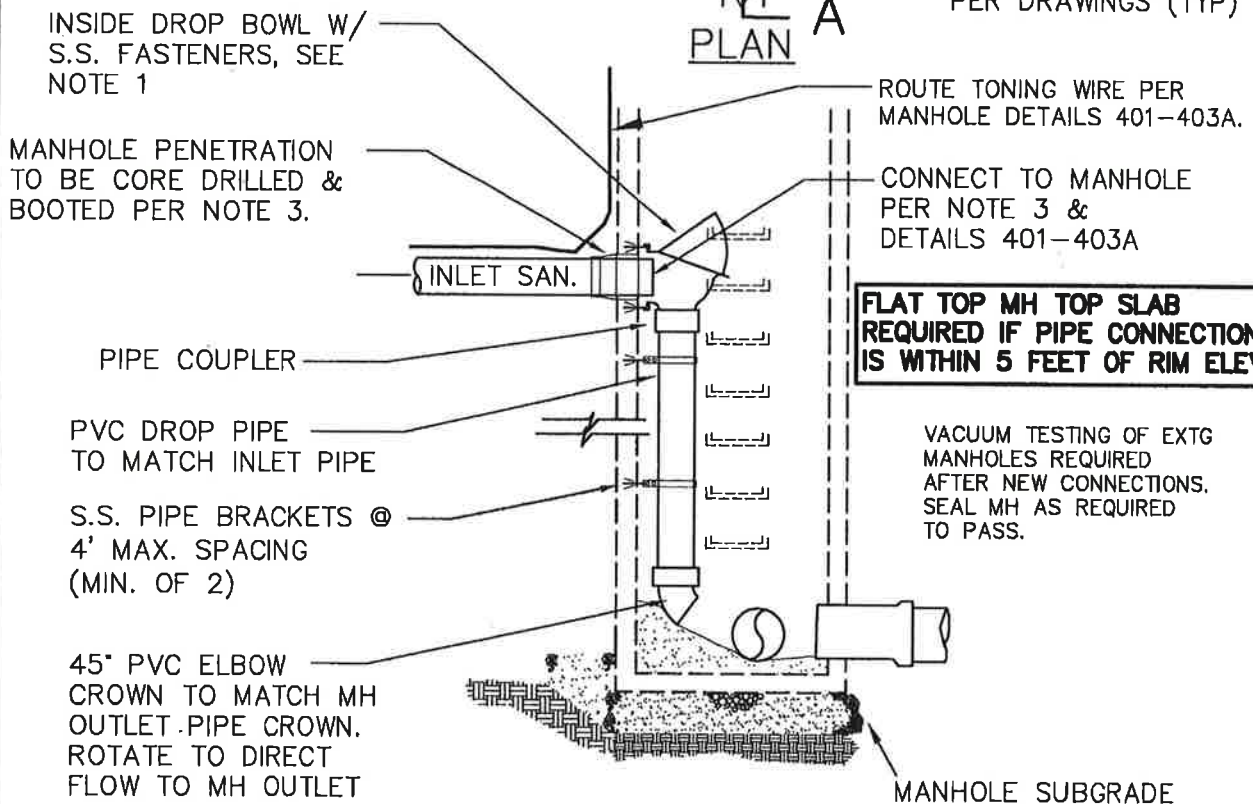
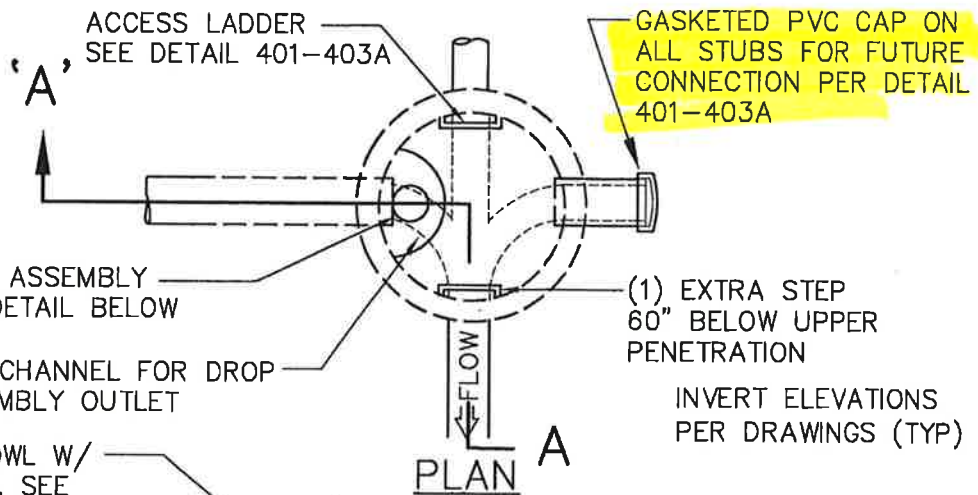


9" WIDE EXTERNAL MASTIC WRAP @ ALL JOINTS & PICKHOLES (TRELLEBORG BIDCO) ALL SS MHS

- 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.

**SECTION A-A**

LAST REVISION DATE: JAN 2019	COPYRIGHT 1995 WESTECH ENGINEERING, INC.
<b>DEEP MANHOLE FOR 24" AND 27" PIPE (SEWER &amp; STORM)</b>	
(NTS)	
DAYTON, OR	DETAIL NO. <b>403A</b>



**FLAT TOP MH TOP SLAB  
REQUIRED IF PIPE CONNECTION  
IS WITHIN 5 FEET OF RIM ELEV.**

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

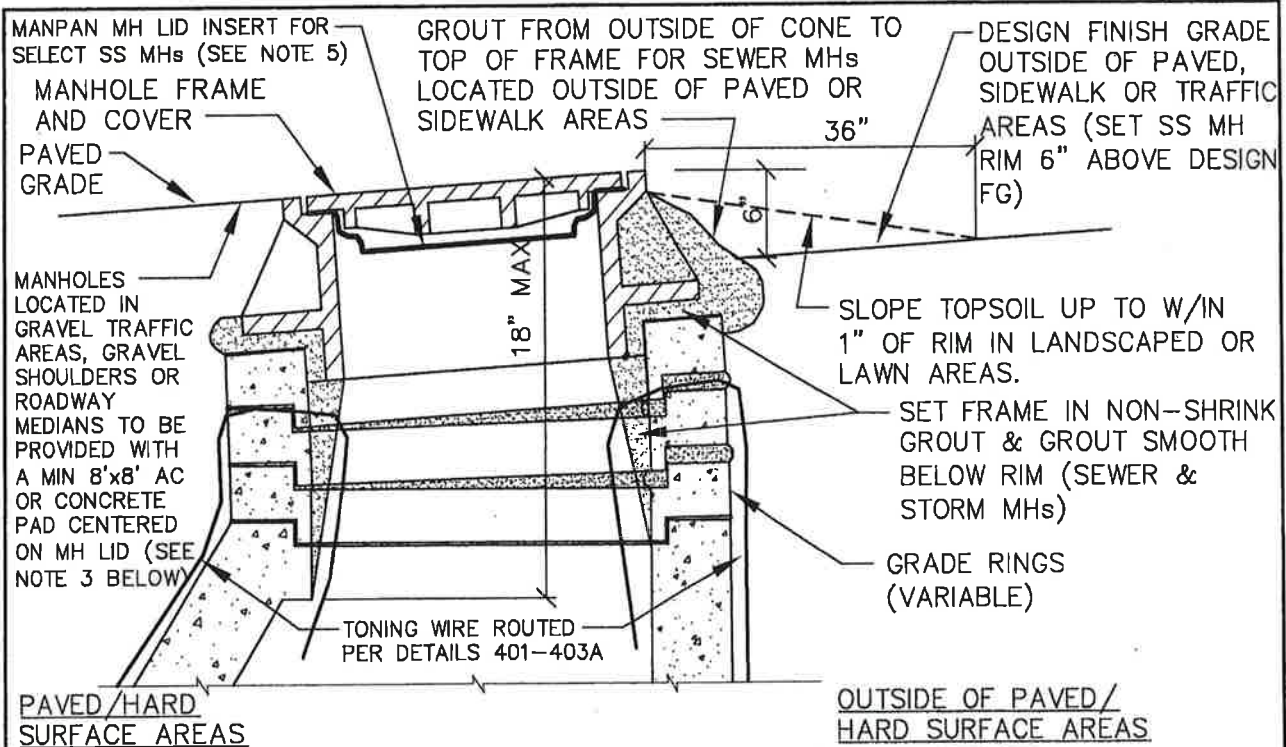
**SECTION A-A**

**NOTES:**

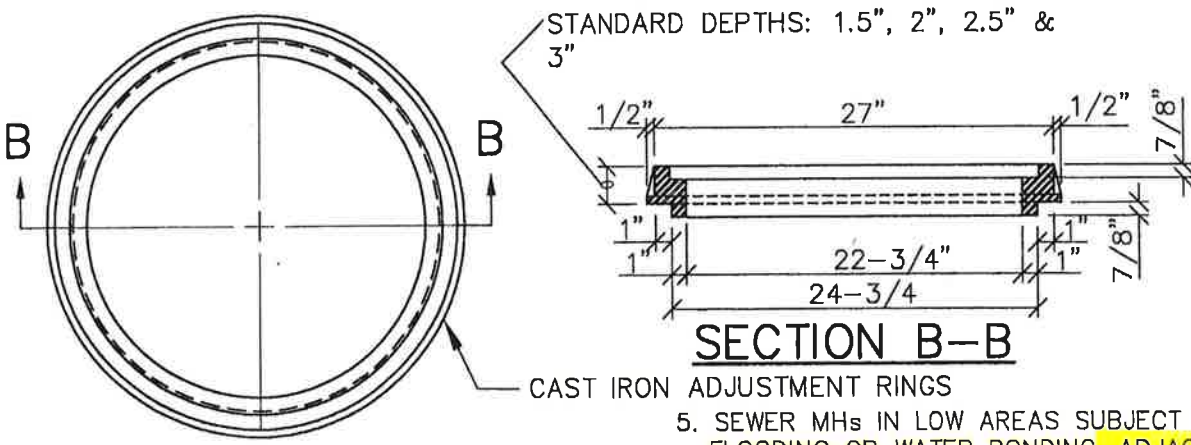
1. ALL INSIDE DROPS MUST BE APPROVED ON A CASE BY CASE BASIS BY THE PUBLIC WORKS DIRECTOR. MINIMUM 60" DIAMETER MANHOLE REQUIRED FOR INSIDE DROPS UNLESS OTHERWISE APPROVED IN WRITING BY THE PUBLIC WORKS DIRECTOR.
2. PROVIDE "RELINER" INSIDE DROP BOWL BY DURAN, INC. OR APPROVED EQUAL. WHERE NOTED ON DRAWINGS, 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: JAN 2019	
<b>INSIDE DROP CONNECTION FOR SANITARY SEWER OR STORM MANHOLE</b>	
(NTS)	
DAYTON, OR	DETAIL NO. <b>404</b>



## TYPICAL MANHOLE GRADE ADJUSTMENT



## MANHOLE ADJUSTMENT RINGS FOR RESURFACING ONLY

- NOTES:
1. CAST IRON ADJUSTMENT RINGS ALLOWED ONLY WITH OVERLAYS AND NOT ON NEW MANHOLES. MAXIMUM 1 ADJUSTMENT RING PER MANHOLE.
  2. SANITARY SEWER MHs - 2 HOLE LIDS  
STORM DRAIN MHs - 16 HOLE LIDS
  3. MH PADS IN UNPAVED TRAFFIC AREAS - 8'x8' MIN SIZE OF (A) 3" MIN. AC OVER 10" COMPACTED BASEROCK (OR PUBLIC ROAD STANDARD THICKNESS IF LOCATED IN R.O.W.) OR (B) 8" CONCRETE OVER 2" BACKROCK.
  4. MH PADS IN ROAD MEDIAN PLANTER AREAS - 4" CONC (PER DTL 212, 10' MIN SQUARE W/5' SCORING PATTERN).

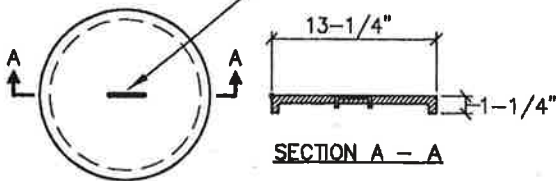
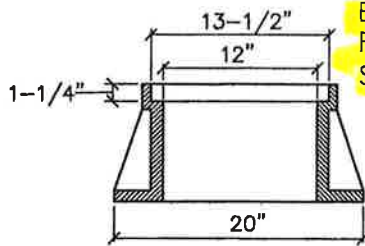
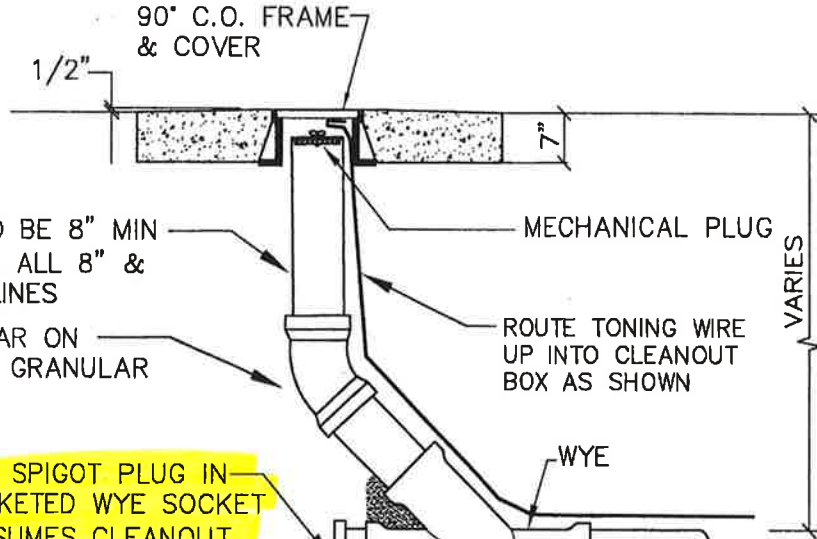
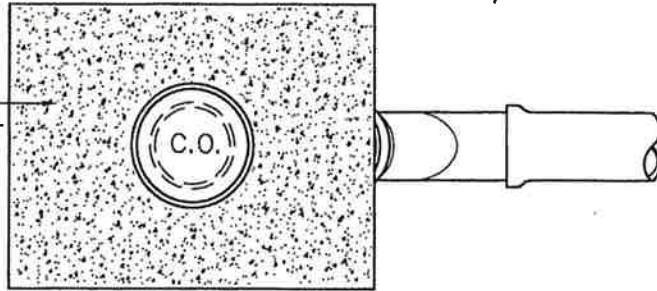
5. SEWER MHs IN LOW AREAS SUBJECT TO FLOODING OR WATER PONDING, ADJACENT TO CURBLINES OR DITCHES, ETC. SHALL BE PROVIDED WITH INFLOW PROTECTOR LID INSERTS (MAN PAN OR EQUAL). SEE CITY STANDARD CONSTRUCTION NOTES FOR LOCATION CRITERIA.

LAST REVISION DATE: NOV 2018	JO #
<b>MANHOLE RIM ADJUSTMENT DETAILS (SEWER &amp; STORM)</b>	
(NTS)	
DAYTON, OR	DETAIL NO. <b>407</b>



CLEANOUT COVERS: ALL SEWER CLEANOUT LIDS TO READ "SEWER"  
 ALL STORM CLEANOUT LIDS TO READ "STORM" OR "C/O".

24" SQUARE CONCRETE PAD  
 OR AC PAVEMENT OUTSIDE OF  
 PAVED AREAS. SLOPE AWAY  
 FROM CLEANOUT.

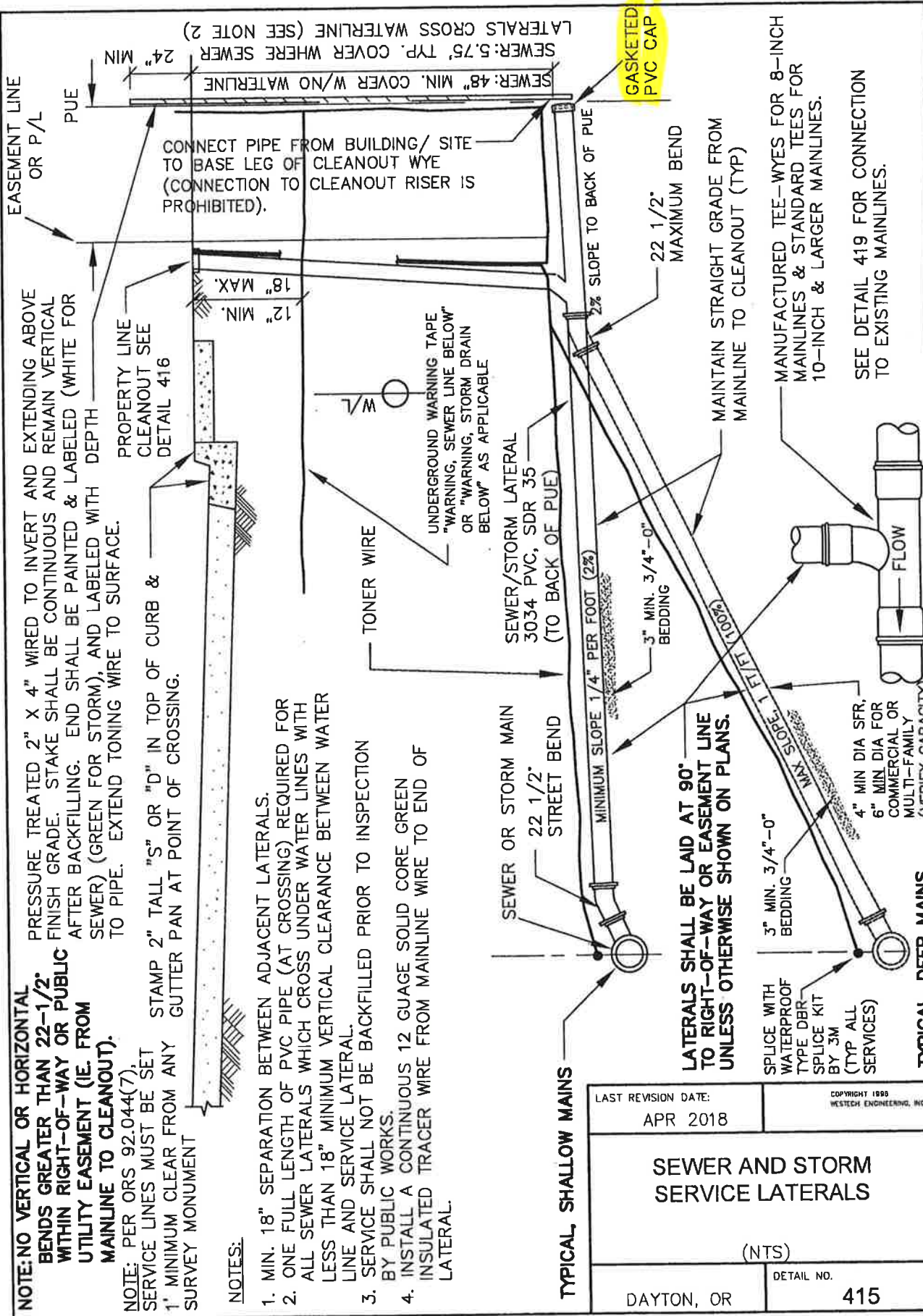


**CLEANOUT FRAME & COVER**

**NOTES:**

1. USE INLAND FOUNDRY MODEL 240 FRAME & COVER IN ALL AREAS.
2. COVER AND FRAME SHALL BE GRAY CAST IRON ASTM A-48, CLASS 30.
3. COVER AND FRAME TO BE MACHINED TO A TRUE BEARING ALL AROUND.

LAST REVISION DATE: APR 2018	COPYRIGHT 1996 WESTECH ENGINEERING, INC.
<b>MAINLINE CLEANOUT</b>	
(NTS)	
DAYTON, OR	DETAIL NO. <b>411</b>



**NOTE: NO VERTICAL OR HORIZONTAL BENDS GREATER THAN 22-1/2° WITHIN RIGHT-OF-WAY OR PUBLIC UTILITY EASEMENT (IE. FROM MAINLINE TO CLEANOUT).**

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

STAMP 2" TALL "S" OR "D" IN TOP OF CURB & GUTTER PAN AT POINT OF CROSSING.

PROPERTY LINE  
CLEANOUT SEE  
DETAIL 416

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

SEWER: 48" MIN. COVER W/NO WATERLINE  
SEWER: 5.75' TYP. COVER WHERE SEWER LATERALS CROSS WATERLINE (SEE NOTE 2)

24" MIN

12" MIN.  
18" MAX.

UNDERGROUND WARNING TAPE "WARNING, SEWER LINE BELOW" OR "WARNING, STORM DRAIN BELOW" AS APPLICABLE

TONER WIRE

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

3" MIN. 3/4"-0" BEDDING

MINIMUM SLOPE 1/4" PER FOOT (2%)

22 1/2" STREET BEND

SEWER OR STORM MAIN

22 1/2" MAXIMUM BEND

2% SLOPE TO BACK OF PUE

GASKETED PVC CAP

MANTAIN STRAIGHT GRADE FROM MAINLINE TO CLEANOUT (TYP)

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

SEE DETAIL 419 FOR CONNECTION TO EXISTING MAINLINES.

4" MIN DIA SFR,  
6" MIN DIA FOR  
COMMERCIAL OR  
MULTI-FAMILY  
(VERIFY CAPACITY)

FLOW

3" MIN. 3/4"-0" BEDDING

MAX SLOPE 1 FT/1.00 FT

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

SPLICE WITH WATERPROOF TYPE DBR SPLICE KIT BY 3M (TYP ALL SERVICES)

TYPICAL, SHALLOW MAINS

TYPICAL, DEEP MAINS

- 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.

LAST REVISION DATE: APR 2018		COPYRIGHT 1998 WESTECH ENGINEERING, INC.	
<b>SEWER AND STORM SERVICE LATERALS</b>			
(NTS)			
DAYTON, OR		DETAIL NO. <b>415</b>	



CLEANOUT COVERS: ALL SEWER CLEANOUT LIDS TO READ "SEWER"  
 ALL STORM CLEANOUT LIDS TO READ "STORM" OR "C/O".

1. NON-TRAFFIC AREAS:

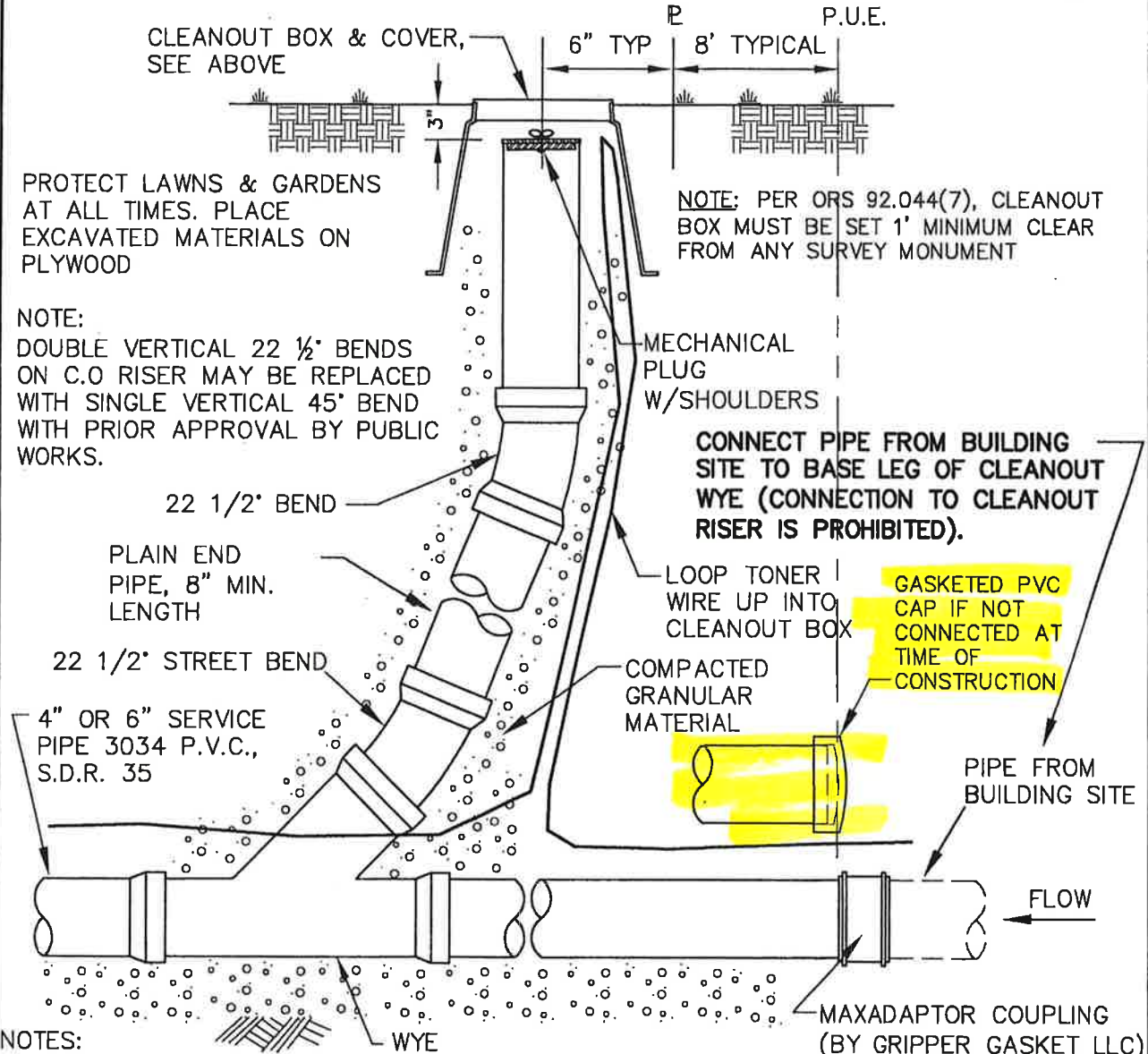
CARSON MODEL 910 T-COVER OR EQUAL (GREEN FOR SEWER, GREY FOR STORM).

2. TRAFFIC AREAS, INCLUDING DRIVEWAYS:

8" X 4" CAST IRON FRAME & COVER, OLYMPIC M1007 OR EQUAL.

8" X 6" CAST IRON FRAME & COVER, OLYMPIC M1018 OR EQUAL.

(FOR CI CLEANOUTS IN UNPAVED AREAS, SET IN 6" THICK CONCRETE PAD)



PROTECT LAWNS & GARDENS AT ALL TIMES. PLACE EXCAVATED MATERIALS ON PLYWOOD

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

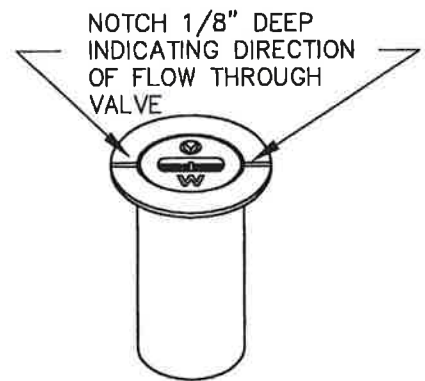
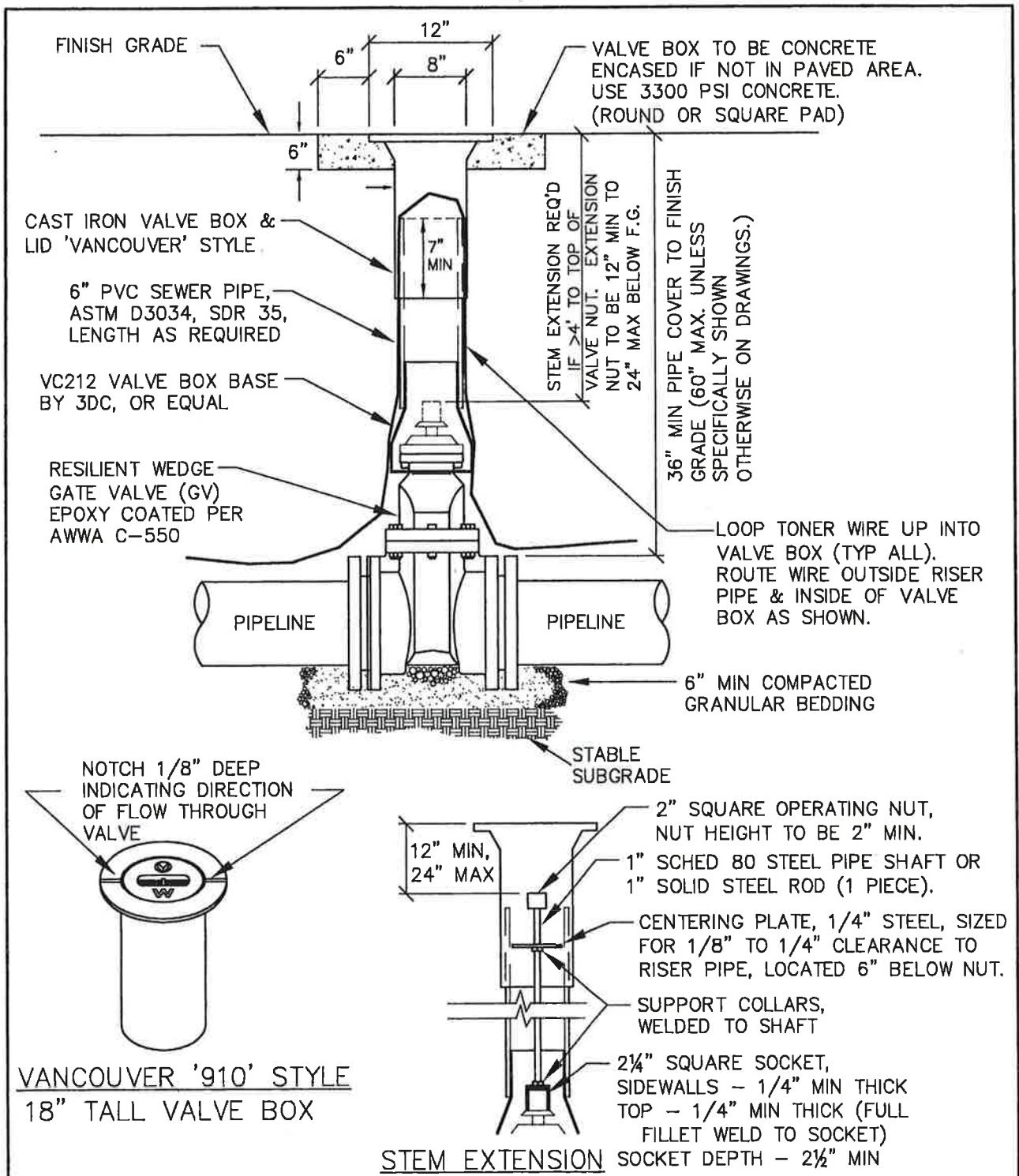
NOTE: DOUBLE VERTICAL 22 1/2" BENDS ON C.O RISER MAY BE REPLACED WITH SINGLE VERTICAL 45° BEND WITH PRIOR APPROVAL BY PUBLIC WORKS.

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

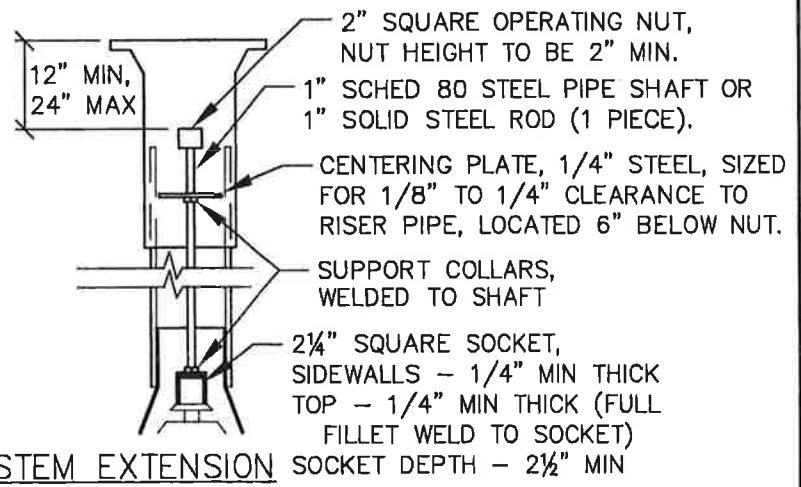
GASKETED PVC CAP IF NOT CONNECTED AT TIME OF CONSTRUCTION

- NOTES:
- CLEANOUT RISER SHALL BE SAME SIZE AND MATERIAL AS LATERAL PIPE.
  - PROVIDE CASTING FOR CLEANOUTS LOCATED IN DRIVEWAYS OR TRAFFIC AREAS (CONCRETE PAD TO BE 6" LARGER THAN TOP OF CLEANOUT BOX).
  - 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.

LAST REVISION DATE: APR 2018	COPYRIGHT 1998 WESTECH ENGINEERING, INC.
<b>STANDARD SERVICE LATERAL CLEANOUT (SEWER &amp; STORM)</b> (NTS)	
DAYTON, OR	DETAIL NO. <b>416</b>

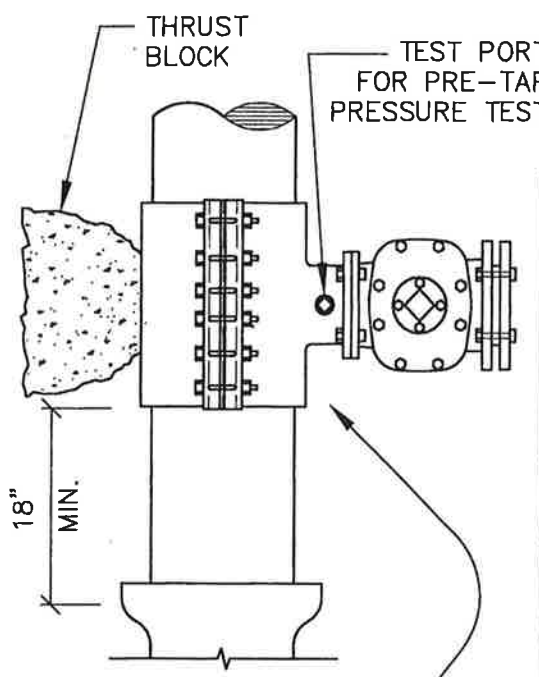


VANCOUVER '910' STYLE  
18" TALL VALVE BOX



- NOTES:**
1. GV SHALL CONFORM TO AWWA C-509.
  2. VALVE BOXES SHALL BE PLUMB AND CENTERED DIRECTLY OVER THE VALVE NUT.
  3. VALVE BOX TOP SHALL BE ADJUSTED TO FINISHED GRADE.
  4. PVC SHALL BE ONE CONTINUOUS PIECE, NO BELLS OR COUPLERS.
  5. VALVE BOX LIDS ON PRESSURE SEWERS TO READ "S" OR "SEWER".

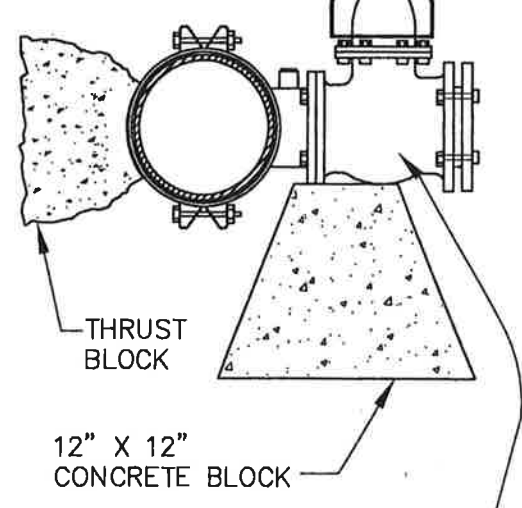
LAST REVISION DATE: FEB 2018	JD # STANDARD
<b>GATE VALVE AND VALVE BOX DETAIL</b>	
(NTS)	
DAYTON, OR	DETAIL NO. 501



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

TOP VIEW

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



12" X 12"  
CONCRETE BLOCK

RESILIENT WEDGE GATE VALVE  
(FL x MJ UNLESS OTHERWISE  
NOTED ON PLANS)

SIDE VIEW

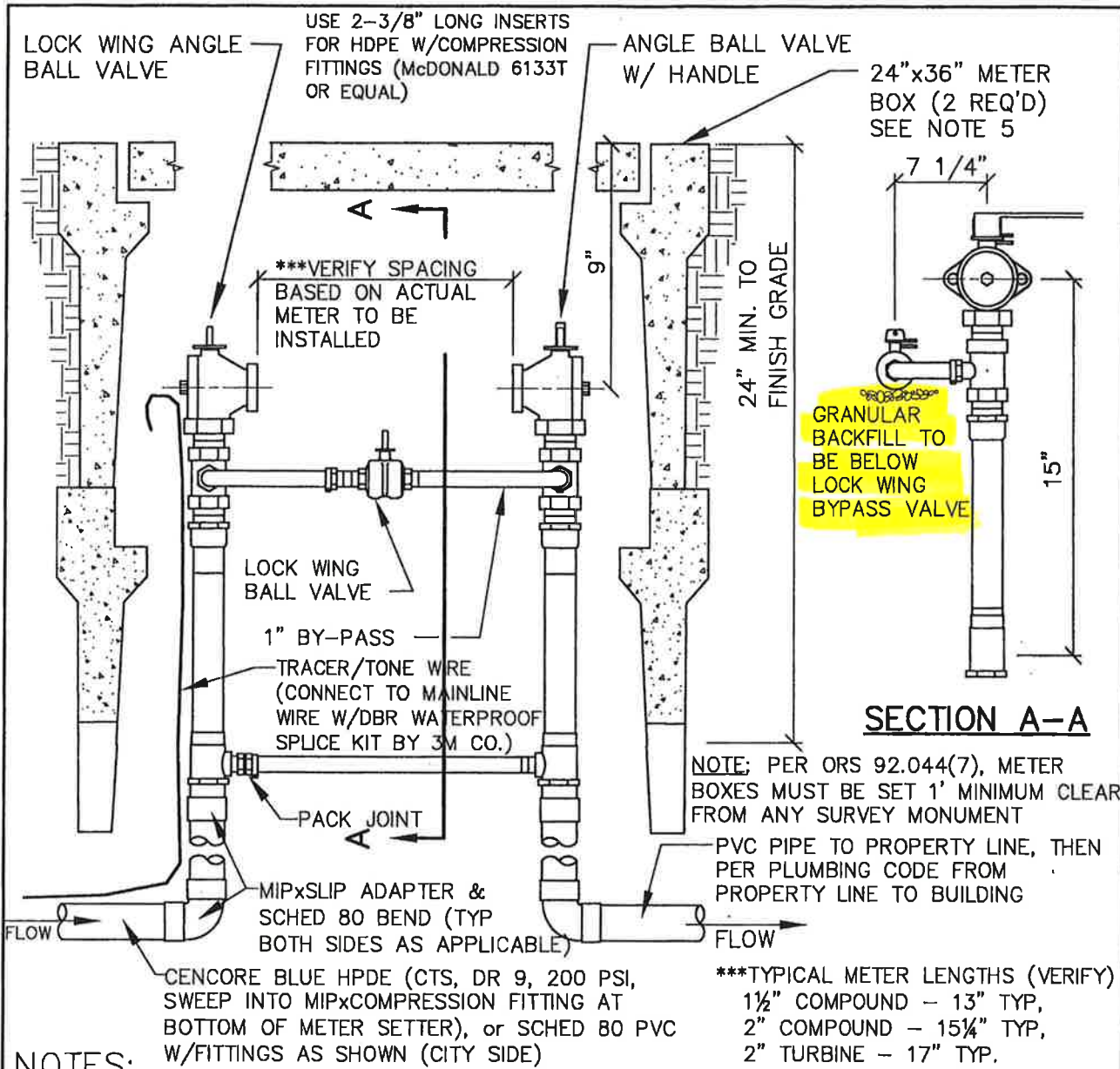
**NOTES:**

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 THROUGH THE TAPPING SLEEVE) SHALL BE CHLORINE DISINFECTED WITH A 300 MG/L CHLORINE SOLUTION.

LAST REVISION DATE: SEPT 2018	COPYRIGHT 1998 WESTECH ENGINEERING, INC.
<b>TAPPING TEE AND VALVE</b>	
(NTS)	
DAYTON, OR	DETAIL NO. <b>505</b>







**NOTES:**

1. METERS SET TO BE FORD 70 SERIES COPPERSETTER, #VBB86-15HB-11-66 (1 1/2") OR #VBB87-15HB-11-77 (2") WITH RAISED LOCKING BYPASS OR APPROVED EQUAL.
2. SUBSTITUTES FOR ANY MATERIALS SHOWN SHALL BE APPROVED BY THE CITY ENGINEER.
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 FRONT OF METER BOX 3-INCHES BEHIND SIDEWALK (TYPICAL) FOR CURBLINE WALKS. NO METERS ON PRIVATE PROPERTY WITHOUT A RECORDED EASEMENT.
5. METER BOX SHALL BE CENTERED OVER THE COMPLETED METER ASSEMBLY. METER BOX PER PWDS 5.8.H.1 (24"x36" ID, H20, GREY) - DFW2436C4-12-BODY W/ DFW2436C-4T-LID. PROVIDE WITH KNOCKOUTS FOR TOUCH-READ SENSORS.
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.**

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

\*\*\*TYPICAL METER LENGTHS (VERIFY)  
 1 1/2" COMPOUND - 13" TYP,  
 2" COMPOUND - 15 1/4" TYP,  
 2" TURBINE - 17" TYP.

LAST REVISION DATE: SEPT 2018	COPYRIGHT WESTECH ENGINEERING, INC.
<b>1-1/2" AND 2" METER SET          W/1" HIGH BY-PASS          (HDPE or PVC SERVICE LINE)          (NTS)</b>	
DAYTON, OR	DETAIL NO. <b>516</b>



1" ALUMINUM SCREENED TEE VENT  
(DOWN ORIENTED 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  
1/2"x1" 90° BEND.

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

17"x30" ARMORCAST  
METER BOX W/OUT LID

1" HDPE PIPE W/OUT  
JOINTS, SEE NOTE BELOW

90° ELL,  
BRASS OR  
BRONZE

5% MIN.  
SLOPE

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).

6" DIA. PIPE BOLLARD PER  
DETAIL 226. LOCATION PER  
PLANS (2 TYP, LOCATIONS  
TO PROTECT METER BOX,  
PAINT BLUE FOR POTABLE  
WATER, SEE NOTE 2).

SECURE TO BOLLARD  
WITH STAINLESS STEEL  
STRAP & HARDWARE  
PER DETAIL

PYLWOOD FORM &  
PLASTIC AS REQUIRED  
TO AVOID CONCRETE  
ENCASEMENT OF RISER  
PIPE.

ORIENTATION OF VENT PIPE  
THROUGH BOX WALL AS  
SHOWN ON PLANS OR AS  
DIRECTED (ORIENTATION ON  
DETAIL IS FOR CLARITY).

1" BRASS  
90° ELL

1" BRASS OR  
COPPER PIPE

1" BRASS NIPPLE &  
COUPLING

1" BRASS 90° ELL

1"x3" BRASS NIPPLE

1" BRASS COUPLING

CONCRETE SUPPORT BLOCK

COMPACTED 3/4"-0  
GRAVEL, 12" THICK (MIN)

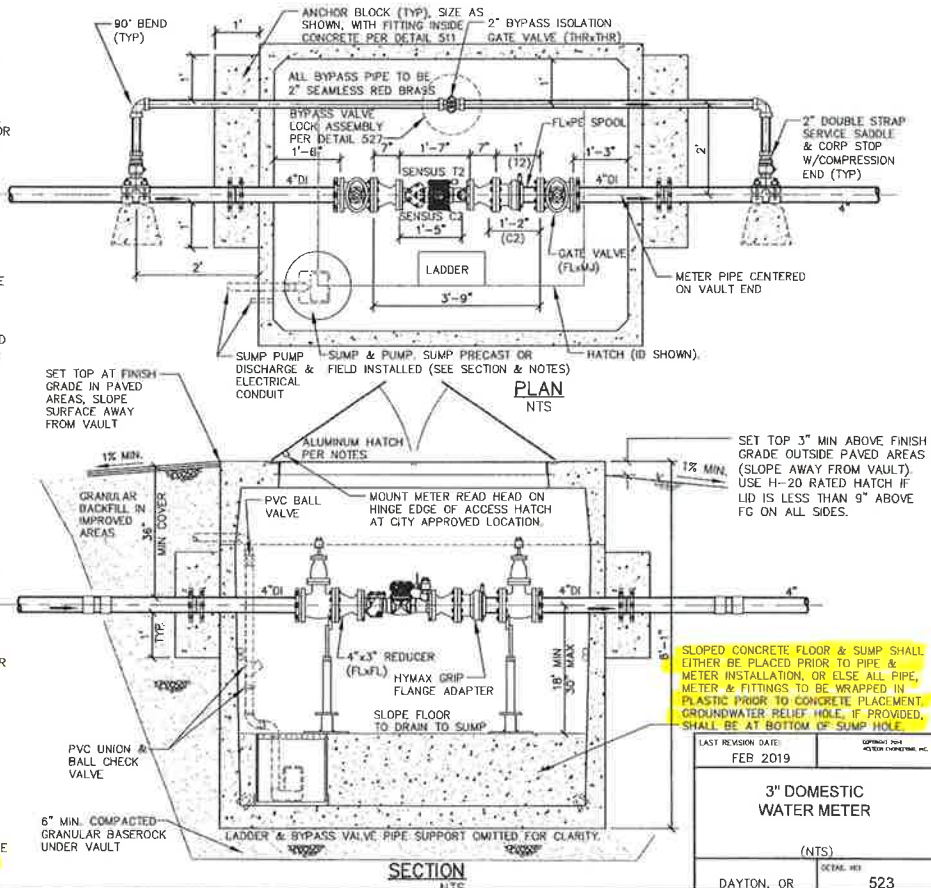
**NOTES:**

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: NOV 2018	JO #
<b>1" COMBINATION AIR RELEASE VALVE (CARV) (NTS)</b>	
DAYTON, OR	DETAIL NO. <b>518</b>

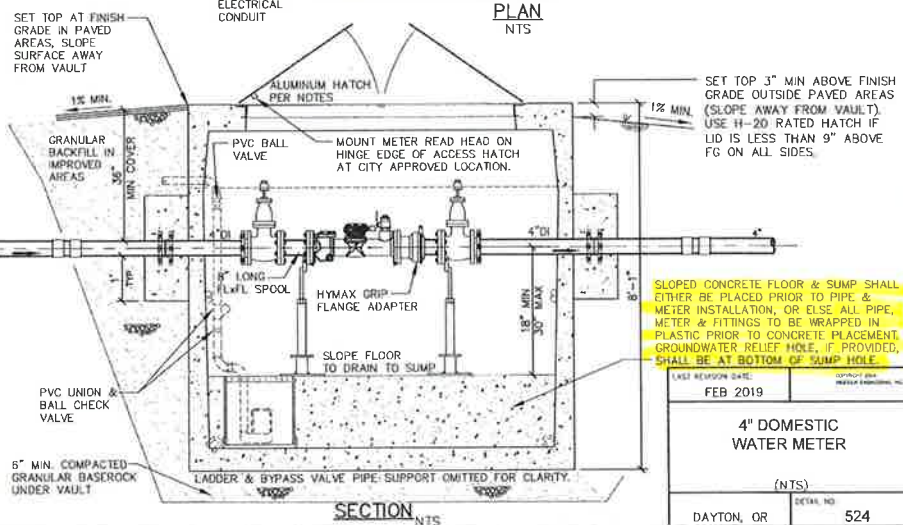
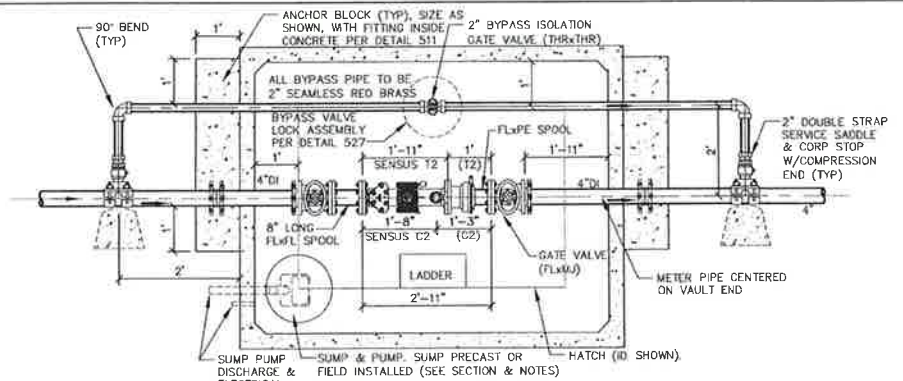
**NOTES:**

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 (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).
  - (1) TO BE 300 PSF 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 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 16" 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:**

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 (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).  
 (1) TO BE 300 PSF 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.
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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.



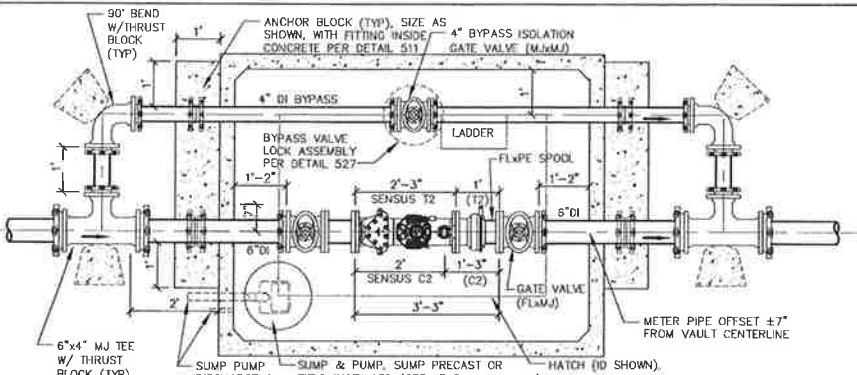
SLOPED CONCRETE FLOOR & SUMP SHALL EITHER BE PLACED PRIOR TO PIPE & METER INSTALLATION, OR ELSE ALL PIPE, METER & FITTINGS TO BE WRAPPED IN PLASTIC PRIOR TO CONCRETE PLACEMENT. GROUNDWATER RELIEF HOLE, IF PROVIDED, SHALL BE AT BOTTOM OF SUMP HOLE.

LAST REVISION DATE:	CONTRACT NO.:
FEB 2019	WATER EXHIBITION, INC.
<b>4" DOMESTIC WATER METER</b>	
(NTS)	
DAYTON, OR	DETAIL NO. 524

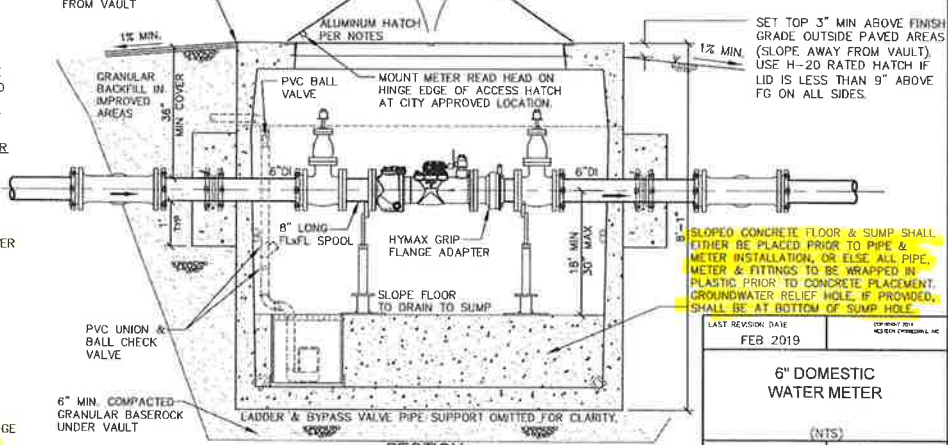


**NOTES:**

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 (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).
  - (1) TO BE 300 PSF 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 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 COPEDED 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.



**PLAN**  
NTS



**SECTION**  
NTS

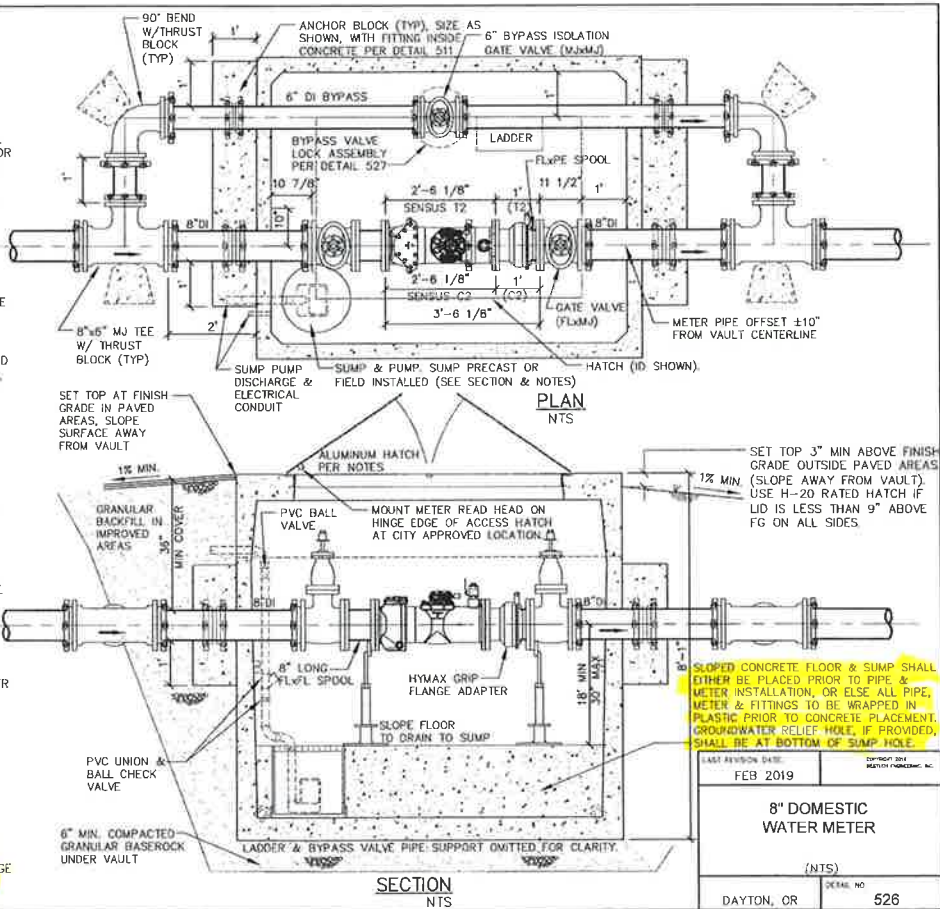
SET TOP 3" MIN ABOVE FINISH GRADE OUTSIDE PAVED AREAS (SLOPE AWAY FROM VAULT). USE H-20 RATED HATCH IF LID IS LESS THAN 9" ABOVE FG ON ALL SIDES.

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.

LAST REVISION DATE	DATE	BY
FEB 2019		DAYTON, OR
<b>6" DOMESTIC WATER METER</b>		
(NTS)		
DETAIL NO.	525	

**NOTES:**

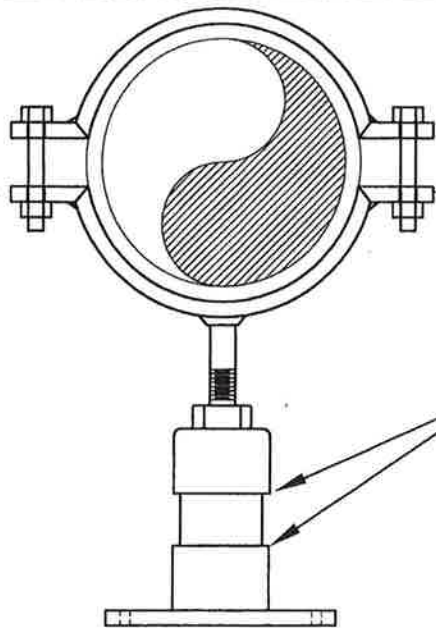
1. METER VAULT & PIPING SHALL CONFORM TO REQUIREMENTS OF ALL PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
2. METER VAULT SHALL BE PLACED WITHIN RIGHT-OF-WAY UNLESS OTHERWISE APPROVED (RECORDED EASEMENT TO THE CITY REQUIRED FOR ANY METER ON PRIVATE PROPERTY).
3. ALL MATERIALS (EXCEPT THE METER) SHALL 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 CI, S2 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 (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).  
 (1) TO BE 300 PSF 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 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 CUTOOUT 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.



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.

LAST REVISION DATE:		DRAWING NO.	
FEB 2019		METHYON ENGINEERING, INC.	
<b>8" DOMESTIC WATER METER</b>			
(NTS)			
DAYTON, OH		SERIAL NO. 526	

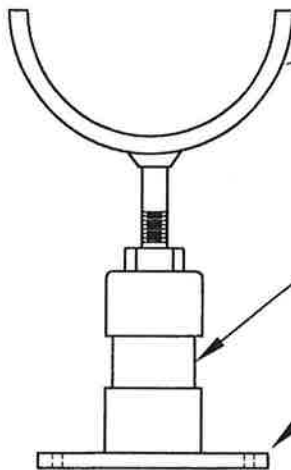




STANDON MODEL C92 ADJUSTABLE PIPE SUPPORT (GALVANIZED STEEL TOP & BASE) OR EQUAL (PROVIDE NEOPRENE LINER FOR STEEL OR PVC PIPE)

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**

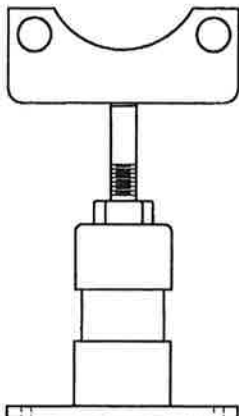


STANDON MODEL S92 ADJUSTABLE PIPE SUPPORT (GALVANIZED STEEL TOP & BASE) OR EQUAL (PROVIDE NEOPRENE LINER FOR STEEL OR PVC PIPE)

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).

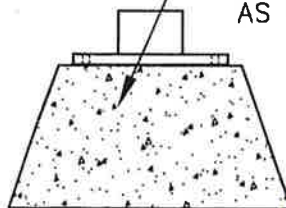
**SADDLE STYLE SUPPORT**



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/OUT HARD SURFACE**

LAST REVISION DATE: JAN 2018	COPYRIGHT 2018 WESTECH ENGINEERING, INC.
<b>GALVANIZED PIPE SUPPORTS W/GALVANIZED EXT. PIPE (FLANGE, SADDLE &amp; CLAMP)</b> (NTS)	
DAYTON, OR	DETAIL NO. 529

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.

RPBA DIAMETER	HOT BOX MODEL
1"	HB1
1½"	HB1
2"	HB1.5

NOTE: VERIFY HB SIZE FOR OTHER MODEL RPBA DEVICES.

ELECTRICAL RECEPTICAL 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.

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

DO NOT OBSTRUCT ENCLOSURE OPENINGS (TYP)

SCH 80 PVC PIPE, TYPICAL BOTH VERTICAL RISERS

12" MIN TYP (ALL WAYS)

12" MIN

4" CONCRETE PAD

SURFACE PER PLAN SLOPE TO DRAIN

3" PIPE SLEEVE FIELD LOCATE (TYP 2)

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

MIN. 2" COMPACTED GRANULAR BASEROCK

COMPACTED SUBGRADE

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

30" TYP

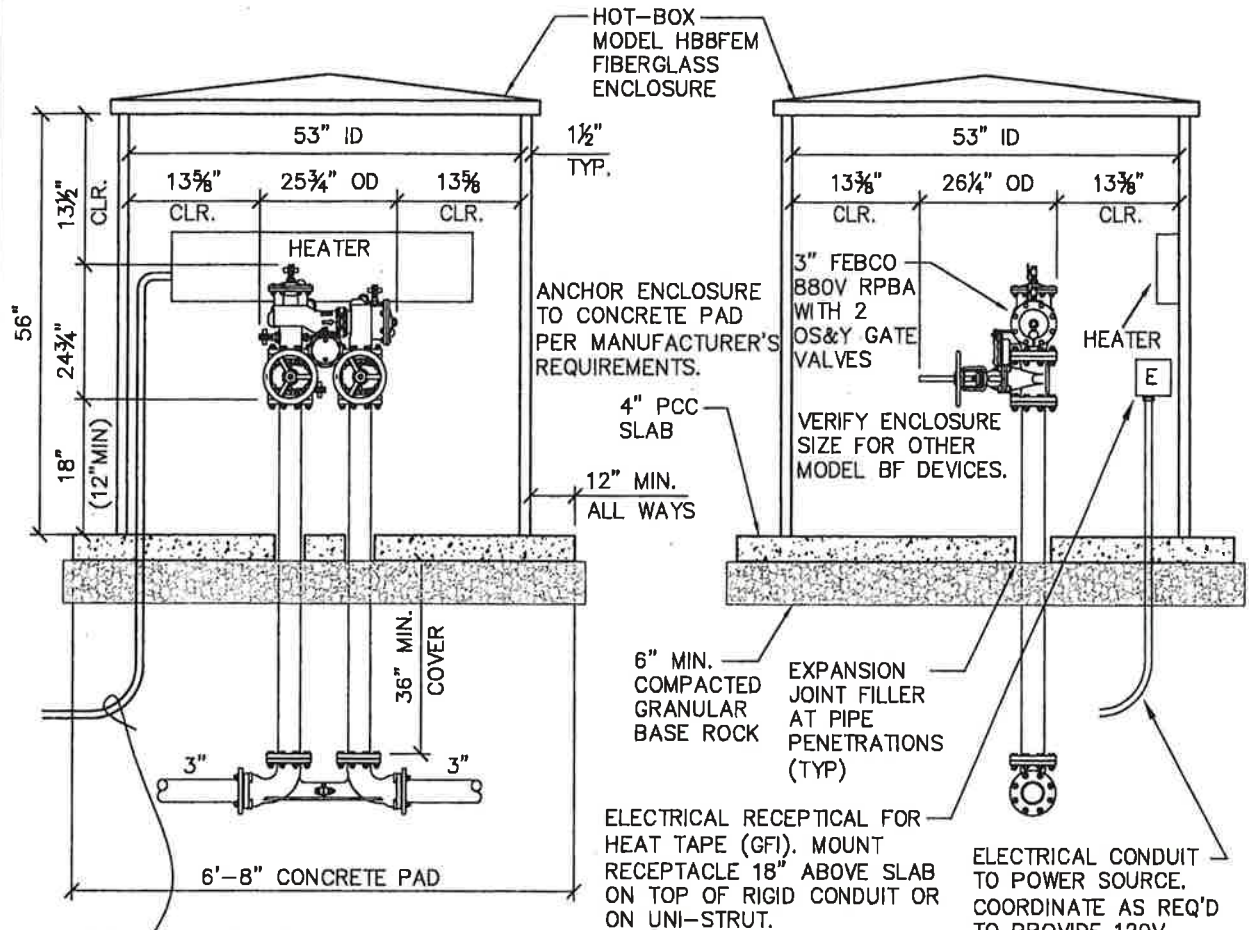
SCHEDULE 40 PVC TO BUILDING. SIZE AS SHOWN ON PLANS

**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.

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

LAST REVISION DATE: AUG 2018	JO # STANDARD
<b>2" AND SMALLER REDUCED PRESSURE BACKFLOW ASSEMBLY (NTS)</b>	
DAYTON, OR	DETAIL NO. 541



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

**FRONT VIEW**  
NTS

ELECTRICAL RECEPTACLE FOR HEAT TAPE (GFI). MOUNT RECEPTACLE 18" ABOVE SLAB ON TOP OF RIGID CONDUIT OR ON UNI-STRUT.

**SIDE VIEW**  
NTS

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

**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.

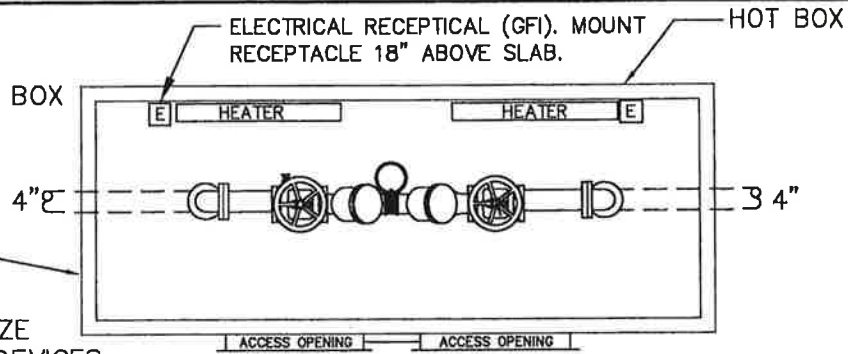
12. FINISH GRADE TO SLOPE AWAY FROM ENCLOSURE SLAB AT 2% MIN. SLOPE.

LAST REVISION DATE: AUG 2018	JO #
<b>3" REDUCED PRESSURE ASSEMBLY</b>	
(NTS)	
DAYTON, 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.



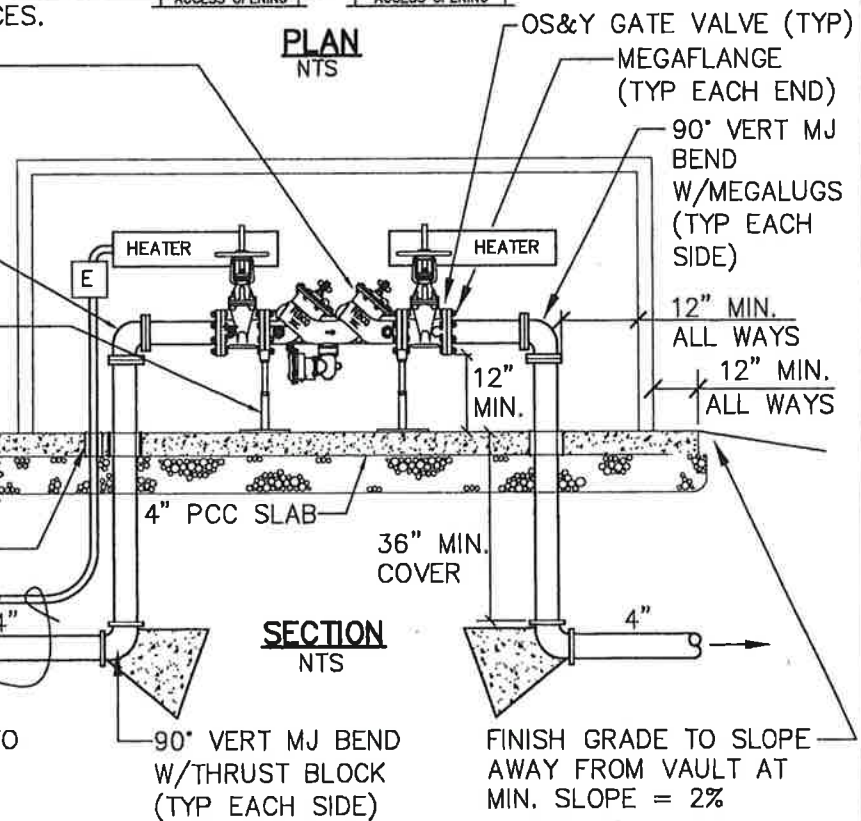
4" FEBCO 860 REDUCED PRESSURE ASSEMBLY (OR APPROVED EQUAL) WITH 2 OS&Y GATE VALVES (TYP)  
 90° VERT MJ BEND W/MEGALUGS (TYP EACH SIDE)

STANDON MODEL S89 FLANGE SUPPORT OR APPROVED EQUAL (TYP).

6" MIN. COMPACTED GRANULAR BASEROCK

PROVIDE EXPANSION JOINT FILLER AT PIPE PENETRATIONS (TYP)

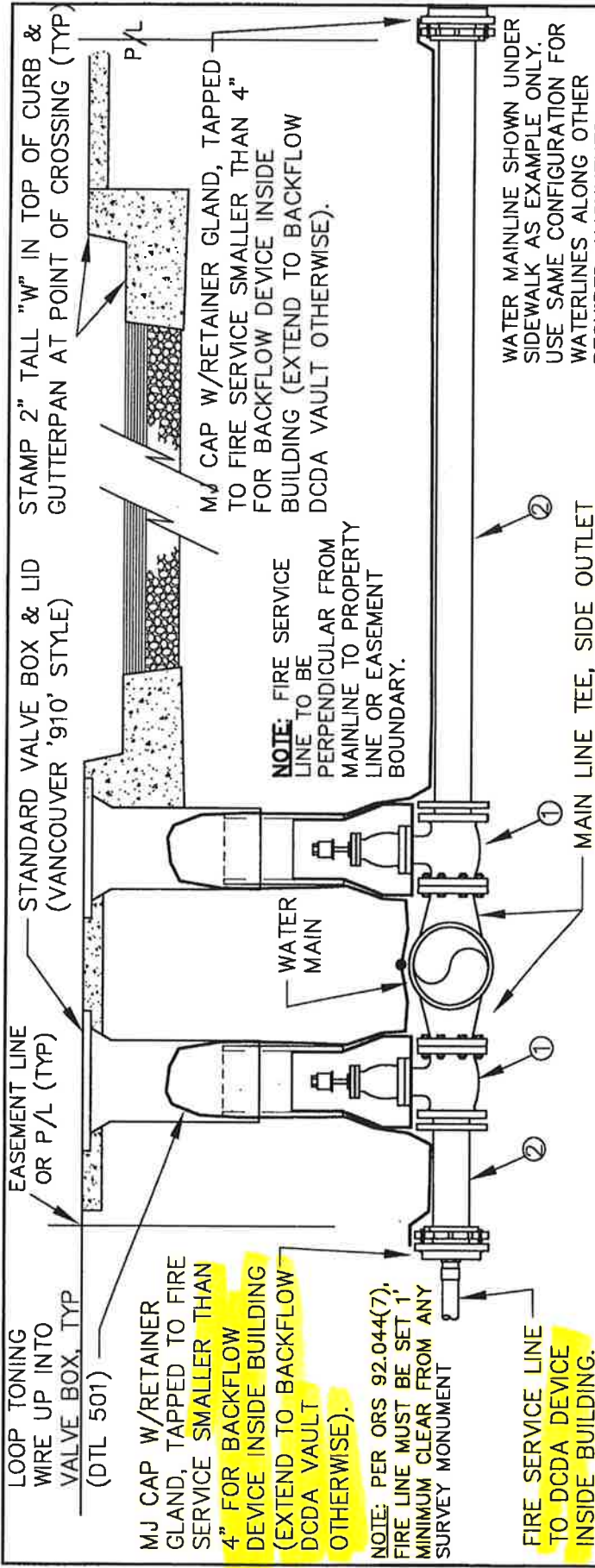
ELECTRICAL CONDUIT TO POWER SOURCE. COORDINATE AS REQ'D TO PROVIDE 120V POWER.



**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	JO # STANDARD
<b>4" REDUCED PRESSURE ASSEMBLY</b>	
(NTS)	
DAYTON, OR	DETAIL NO. <b>544</b>



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

STANDARD VALVE BOX & LID (VANCOUVER '910' STYLE)

EASEMENT LINE OR P/L (TYP)

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

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.

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

MAIN LINE TEE, SIDE OUTLET FLANGED (NEAR SIDE & FAR SIDE TEE & FIRE SERVICE CONFIGURATION SHOWN TOGETHER FOR ILLUSTRATION ONLY)

**MATERIALS**

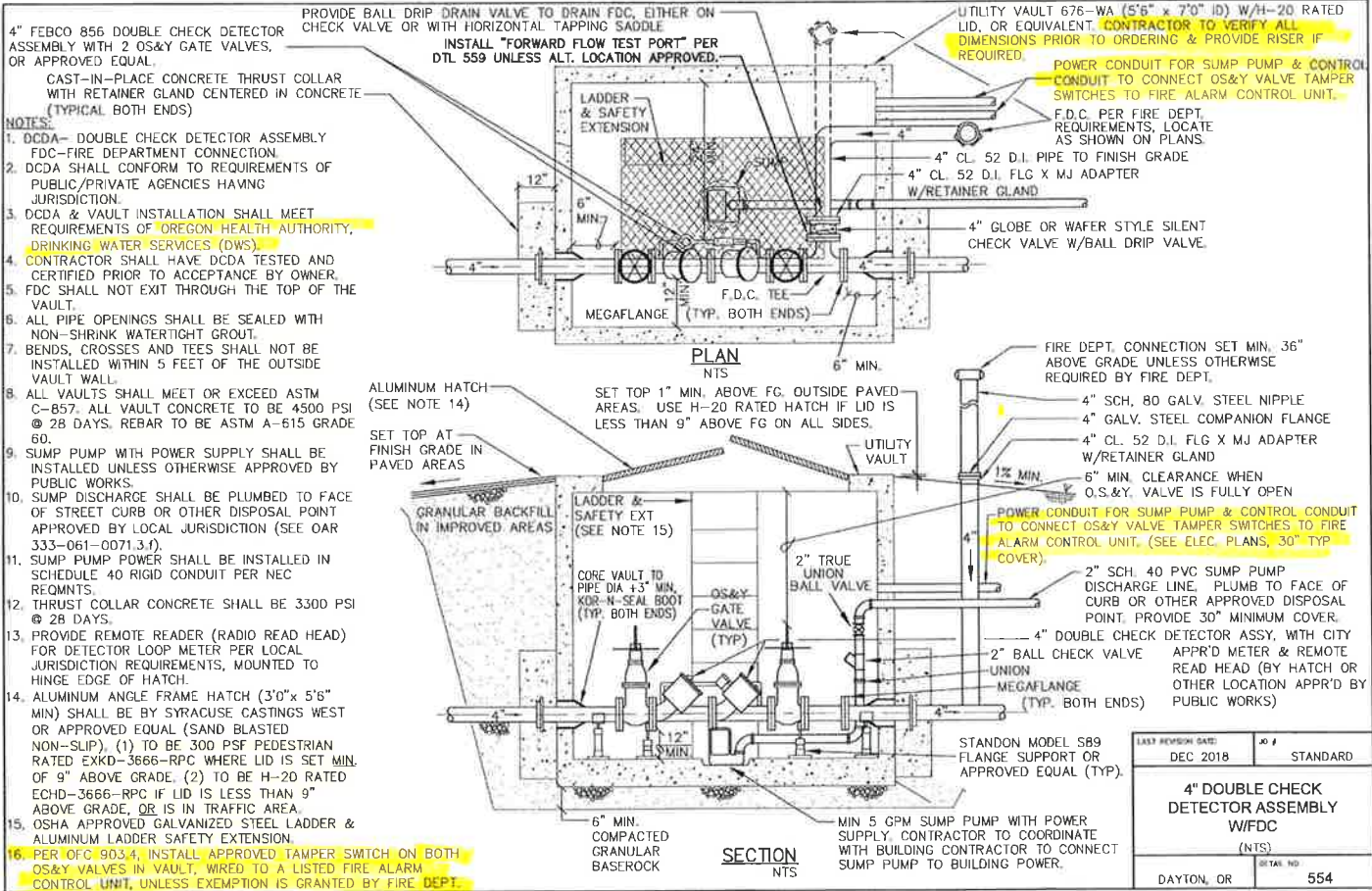
- ① FLG X MJ RESILIENT WEDGE GATE VALVE (PER AWWA C-509), 4" DIA. MINIMUM OR FIRE SERVICE SIZE, WHICHEVER IS LARGER. VALVE TO BE EPOXY COATED PER AWWA C-550. PROVIDE APPROVED RETAINER GLAND ON MJ JOINT.
- ② CLASS 52 DUCTILE IRON PIPE REQUIRED WITHIN RIGHT-OF-WAY OR EASEMENT BOUNDARY OR TO DCDA VAULT (WHERE DCDA NOT INSTALLED IN BUILDING), TYP. 4" DIA OR FIRE SERVICE SIZE, WHICHEVER 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.

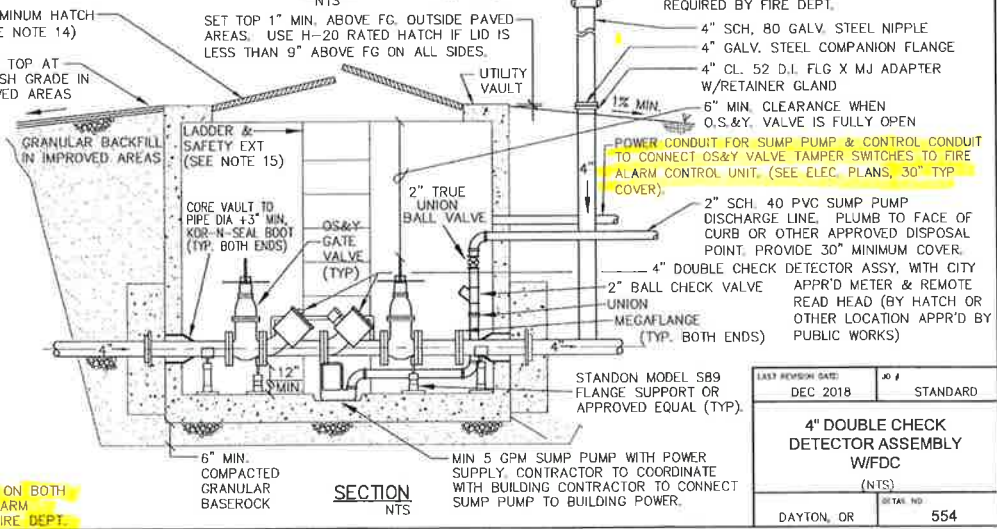
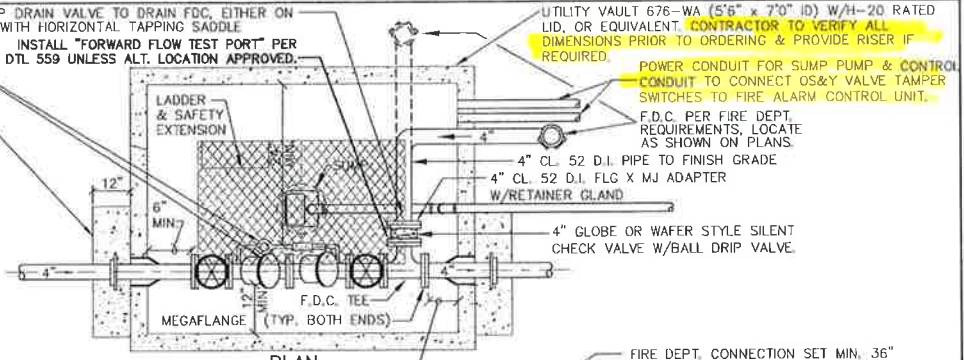
LAST REVISION DATE: AUG 2018	COPYRIGHT WESTECH ENGINEERING, INC.
<b>FIRE SERVICE LINE CONNECTION REQUIREMENTS (1-1/2" AND LARGER SERVICE)</b>	
(NTS)	
DAYTON, OR	DETAIL NO. 550



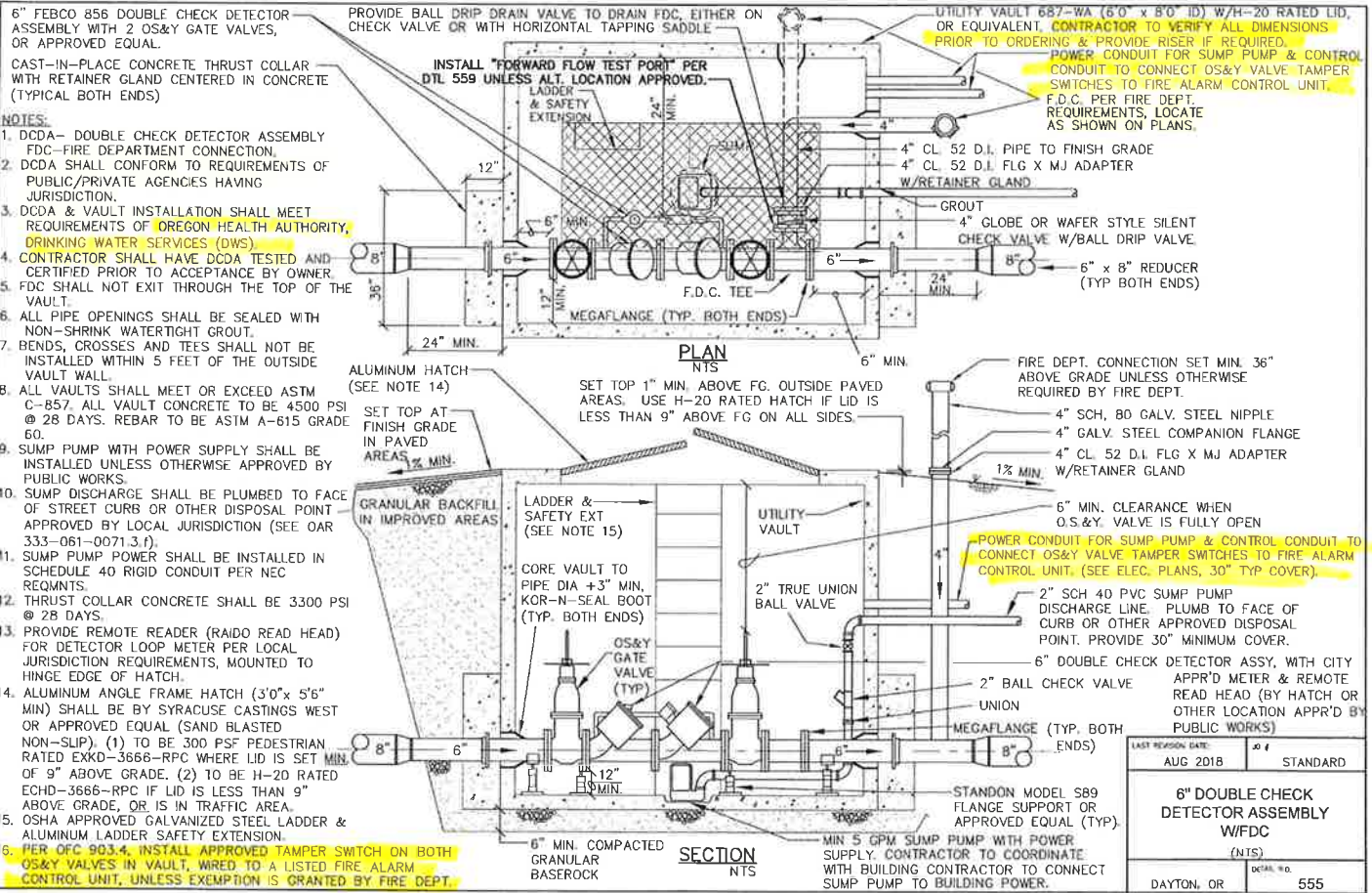


4" FEBCO 856 DOUBLE CHECK DETECTOR ASSEMBLY WITH 2 OS&Y GATE VALVES, OR APPROVED EQUAL.  
 CAST-IN-PLACE CONCRETE THRUST COLLAR WITH RETAINER GLAND CENTERED IN CONCRETE (TYPICAL BOTH ENDS)

- NOTES:**
- DCDA - DOUBLE CHECK DETECTOR ASSEMBLY  
 FDC - FIRE DEPARTMENT CONNECTION
  - DCDA SHALL CONFORM TO REQUIREMENTS OF PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
  - DCDA & VAULT INSTALLATION SHALL MEET REQUIREMENTS OF OREGON HEALTH AUTHORITY, DRINKING WATER SERVICES (DWS).
  - CONTRACTOR SHALL HAVE DCDA TESTED AND CERTIFIED PRIOR TO ACCEPTANCE BY OWNER. FDC SHALL NOT EXIT THROUGH THE TOP OF THE VAULT.
  - ALL PIPE OPENINGS SHALL BE SEALED WITH NON-SHRINK WATERTIGHT GROUT.
  - BENDS, CROSSES AND TEES SHALL NOT BE INSTALLED WITHIN 5 FEET OF THE OUTSIDE VAULT WALL.
  - 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.
  - SUMP PUMP WITH POWER SUPPLY SHALL BE INSTALLED UNLESS OTHERWISE APPROVED BY PUBLIC WORKS.
  - SUMP DISCHARGE SHALL BE PLUMBED TO FACE OF STREET CURB OR OTHER DISPOSAL POINT APPROVED BY LOCAL JURISDICTION (SEE OAR 333-061-0071.3.f).
  - SUMP PUMP POWER SHALL BE INSTALLED IN SCHEDULE 40 RIGID CONDUIT PER NEC REQMENTS.
  - THRUST COLLAR CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
  - PROVIDE REMOTE READER (RADIO READ HEAD) FOR DETECTOR LOOP METER PER LOCAL JURISDICTION REQUIREMENTS, MOUNTED TO HINGE EDGE OF HATCH.
  - ALUMINUM ANGLE FRAME HATCH (3'0" x 5'6" MIN) SHALL BE BY SYRACUSE CASTINGS WEST OR APPROVED EQUAL (SAND BLASTED NON-SLIP). (1) TO BE 300 PSF PEDESTRIAN RATED EXKD-3666-RPC WHERE LID IS SET MIN. OF 9" ABOVE GRADE. (2) TO BE H-20 RATED ECHD-3666-RPC IF LID IS LESS THAN 9" ABOVE GRADE, OR IS IN TRAFFIC AREA.
  - OSHA APPROVED GALVANIZED STEEL LADDER & ALUMINUM LADDER SAFETY EXTENSION.
  - PER IFC 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.

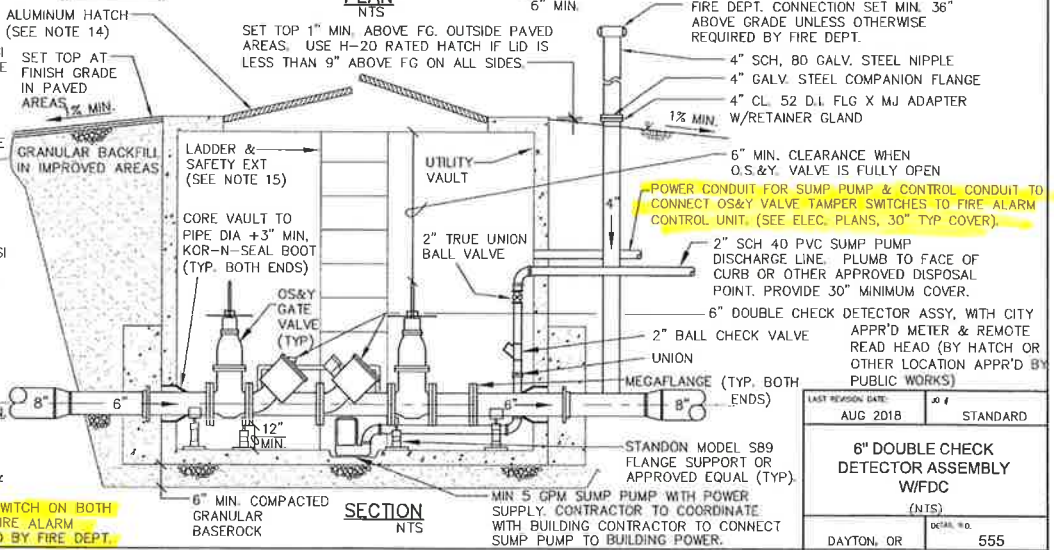
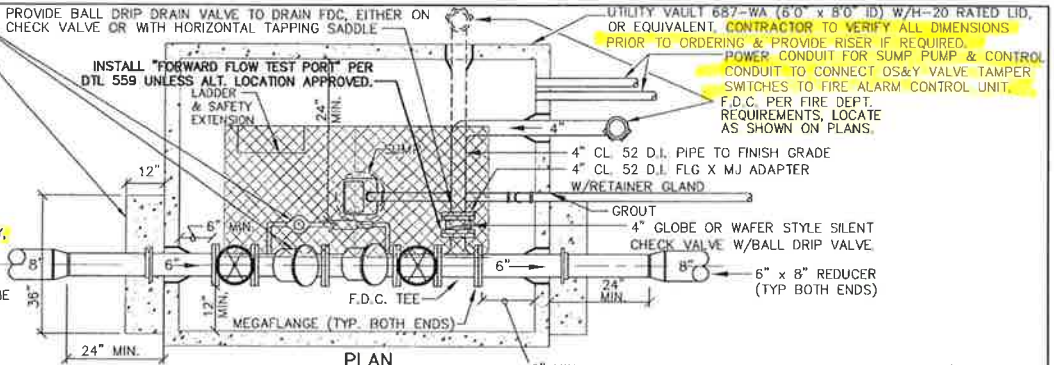


LAST REVISION DATE:	NO.:	STANDARD
DEC 2018		
<b>4" DOUBLE CHECK DETECTOR ASSEMBLY W/FDC (NTS)</b>		
DAYTON, OR	DETAIL NO.	554

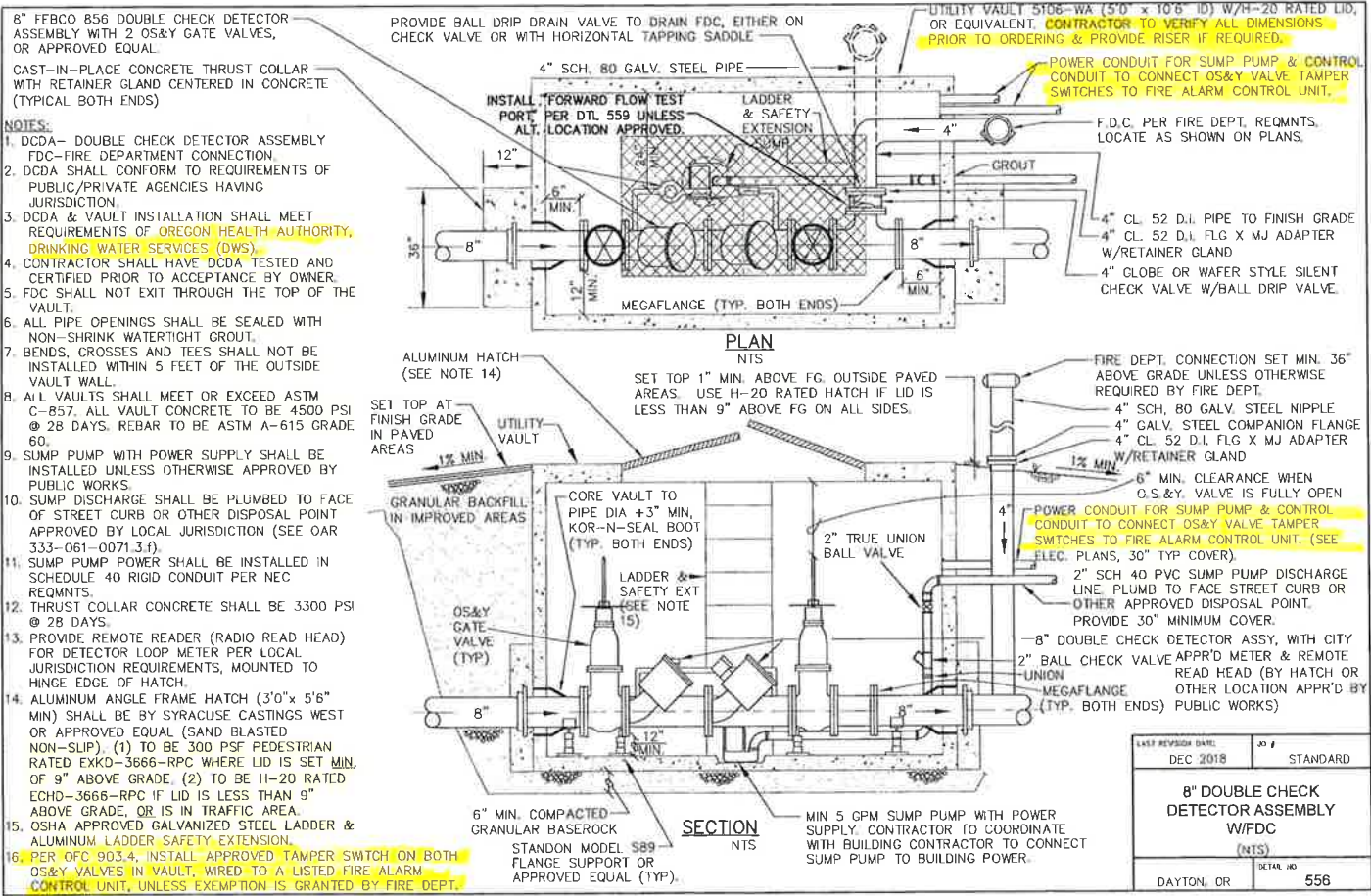


6" FEBCO 856 DOUBLE CHECK DETECTOR ASSEMBLY WITH 2 OS&Y GATE VALVES, OR APPROVED EQUAL.  
 CAST-IN-PLACE CONCRETE THRUST COLLAR WITH RETAINER GLAND CENTERED IN CONCRETE (TYPICAL BOTH ENDS)

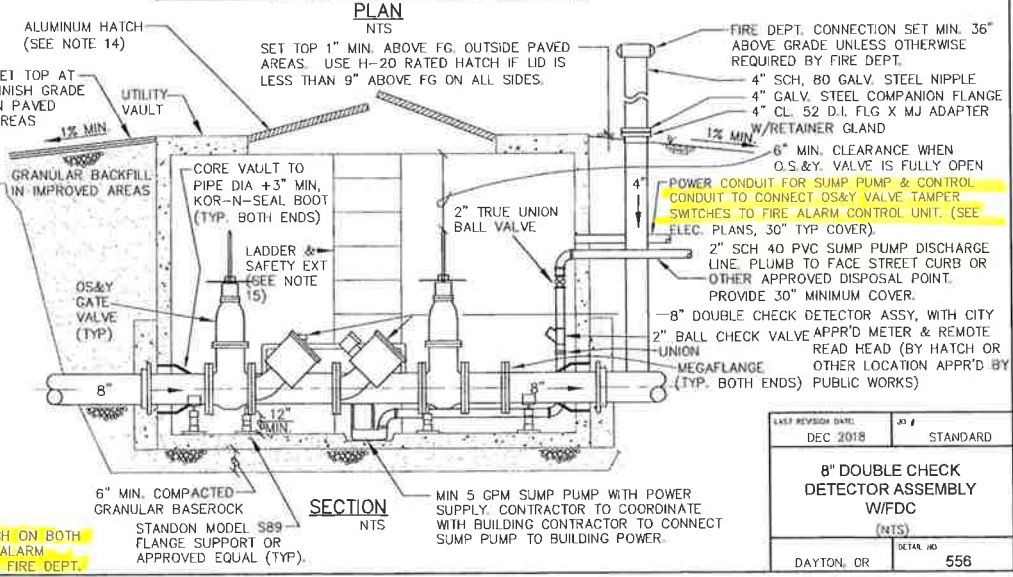
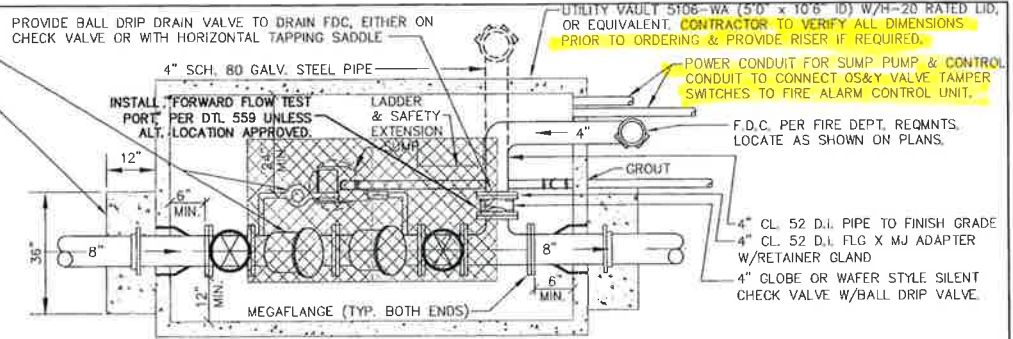
- NOTES:**
- DCDA- DOUBLE CHECK DETECTOR ASSEMBLY  
FDC-FIRE DEPARTMENT CONNECTION.
  - DCDA SHALL CONFORM TO REQUIREMENTS OF PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
  - DCDA & VAULT INSTALLATION SHALL MEET REQUIREMENTS OF OREGON HEALTH AUTHORITY, DRINKING WATER SERVICES (DWS).
  - CONTRACTOR SHALL HAVE DCDA TESTED AND CERTIFIED PRIOR TO ACCEPTANCE BY OWNER.
  - FDC SHALL NOT EXIT THROUGH THE TOP OF THE VAULT.
  - ALL PIPE OPENINGS SHALL BE SEALED WITH NON-SHRINK WATERTIGHT GROUT.
  - BENDS, CROSSES AND TEES SHALL NOT BE INSTALLED WITHIN 5 FEET OF THE OUTSIDE VAULT WALL.
  - 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.
  - SUMP PUMP WITH POWER SUPPLY SHALL BE INSTALLED UNLESS OTHERWISE APPROVED BY PUBLIC WORKS.
  - SUMP DISCHARGE SHALL BE PLUMBED TO FACE OF STREET CURB OR OTHER DISPOSAL POINT APPROVED BY LOCAL JURISDICTION (SEE OAR 333-061-0071.3.f).
  - SUMP PUMP POWER SHALL BE INSTALLED IN SCHEDULE 40 RIGID CONDUIT PER NEC REQMENTS.
  - THRUST COLLAR CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
  - PROVIDE REMOTE READER (RAIDO READ HEAD) FOR DETECTOR LOOP METER PER LOCAL JURISDICTION REQUIREMENTS, MOUNTED TO HINGE EDGE OF HATCH.
  - ALUMINUM ANGLE FRAME HATCH (3'0" x 5'6" MIN) SHALL BE BY SYRACUSE CASTINGS WEST OR APPROVED EQUAL (SAND BLASTED NON-SLIP). (1) TO BE 300 PSF PEDESTRIAN RATED EXKD-3666-RPC WHERE LID IS SET MIN. OF 9" ABOVE GRADE. (2) TO BE H-20 RATED ECHD-3666-RPC IF LID IS LESS THAN 9" ABOVE GRADE, OR IS IN TRAFFIC AREA.
  - OSHA APPROVED GALVANIZED STEEL LADDER & ALUMINUM LADDER SAFETY EXTENSION.
  - PER OFC 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.



LAST REVISION DATE:	30 4
AUG 2018	STANDARD
<b>6" DOUBLE CHECK DETECTOR ASSEMBLY W/FDC</b>	
(NTS)	
DAYTON, OR	DCI# 16.0 555

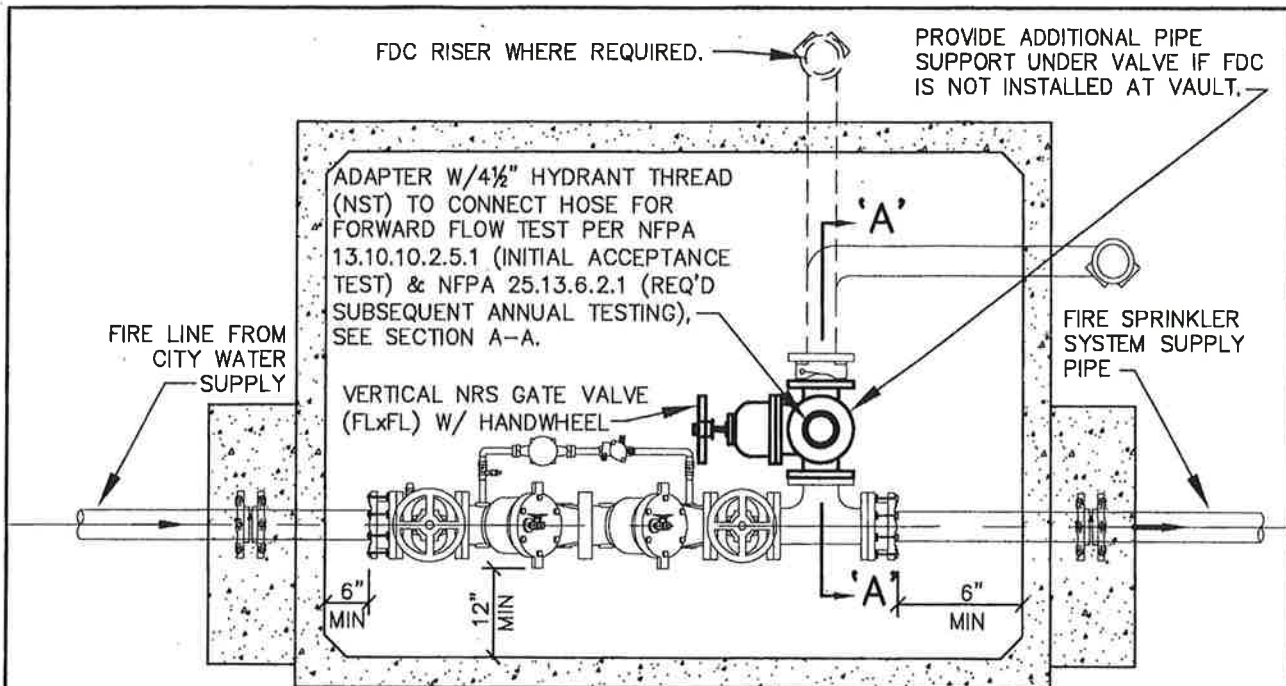


- 8" FBCC 856 DOUBLE CHECK DETECTOR ASSEMBLY WITH 2 OS&Y GATE VALVES, OR APPROVED EQUAL.
- CAST-IN-PLACE CONCRETE THRUST COLLAR WITH RETAINER GLAND CENTERED IN CONCRETE (TYPICAL BOTH ENDS)
- NOTES:**
- DCDA- DOUBLE CHECK DETECTOR ASSEMBLY FDC-FIRE DEPARTMENT CONNECTION.
  - DCDA SHALL CONFORM TO REQUIREMENTS OF PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
  - DCDA & VAULT INSTALLATION SHALL MEET REQUIREMENTS OF OREGON HEALTH AUTHORITY, DRINKING WATER SERVICES (DWS).
  - CONTRACTOR SHALL HAVE DCDA TESTED AND CERTIFIED PRIOR TO ACCEPTANCE BY OWNER.
  - FDC SHALL NOT EXIT THROUGH THE TOP OF THE VAULT.
  - ALL PIPE OPENINGS SHALL BE SEALED WITH NON-SHRINK WATER TIGHT GROUT.
  - BENDS, CROSSES AND TEES SHALL NOT BE INSTALLED WITHIN 5 FEET OF THE OUTSIDE VAULT WALL.
  - 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.
  - SUMP PUMP WITH POWER SUPPLY SHALL BE INSTALLED UNLESS OTHERWISE APPROVED BY PUBLIC WORKS.
  - SUMP DISCHARGE SHALL BE PLUMBED TO FACE OF STREET CURB OR OTHER DISPOSAL POINT APPROVED BY LOCAL JURISDICTION (SEE OAR 333-061-0071.3 f).
  - SUMP PUMP POWER SHALL BE INSTALLED IN SCHEDULE 40 RIGID CONDUIT PER NEC REQMENTS.
  - THRUST COLLAR CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
  - PROVIDE REMOTE READER (RADIO READ HEAD) FOR DETECTOR LOOP METER PER LOCAL JURISDICTION REQUIREMENTS, MOUNTED TO HINGE EDGE OF HATCH.
  - ALUMINUM ANGLE FRAME HATCH (3'0" x 5'6" MIN) SHALL BE BY SYRACUSE CASTINGS WEST OR APPROVED EQUAL (SAND BLASTED NON-SLIP). (1) TO BE 300 PSF PEDESTRIAN RATED EXKD-3666-RPC WHERE LID IS SET MIN. OF 9" ABOVE GRADE. (2) TO BE H-20 RATED ECHD-3666-RPC IF LID IS LESS THAN 9" ABOVE GRADE, OR IS IN TRAFFIC AREA.
  - OSHA APPROVED GALVANIZED STEEL LADDER & ALUMINUM LADDER SAFETY EXTENSION.
  - PER DFC 903.4, INSTALL APPROVED TAMPER SWITCH ON BOTH OS&Y VALVES IN VAULT, WRED TO A LISTED FIRE ALARM CONTROL UNIT, UNLESS EXEMPTION IS GRANTED BY FIRE DEPT.

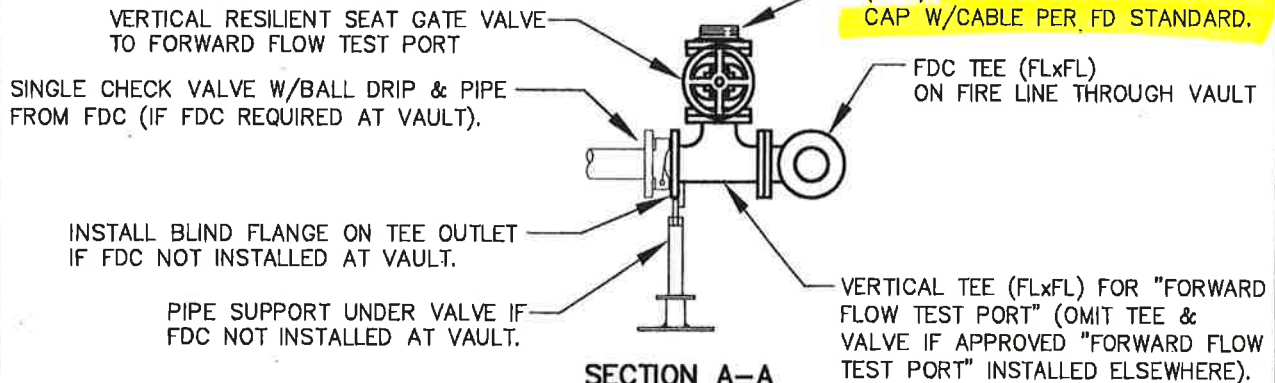


LAST REVISION DATE:	30 #	STANDARD
DEC 2018		
<b>8" DOUBLE CHECK DETECTOR ASSEMBLY W/FDC</b>		
(NTS)		
DAYTON, OR	DETAIL NO	556





**PLAN**  
NTS



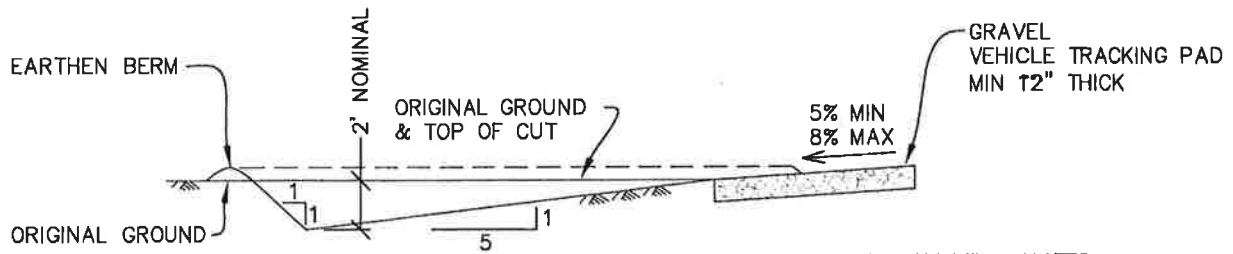
**SECTION A-A**  
NTS

**NOTES:**

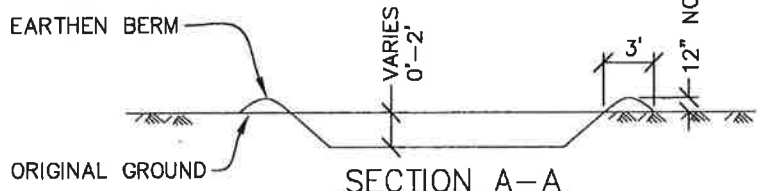
1. THE "FORWARD FLOW TEST PORT" SHALL BE INSTALLED IN THE DCDA VAULT AS SHOWN AND SPECIFIED BY THIS DETAIL, UNLESS AN ALTERNATE PERMANENT "FORWARD FLOW TEST PORT" LOCATION IS APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVE AND AN AUTHORIZED FIRE DEPT REPRESENTATIVE, OR IF A PRIVATE FIRE HYDRANT DOWNSTREAM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

LAST REVISION DATE: NOV 2018	JO #
<b>4" FORWARD FLOW TEST PORT INSIDE DCDA VAULT (FOR NFPA 13 &amp; 25 TESTS)</b> (NTS)	
DAYTON, OR	DETAIL NO. <b>559</b>

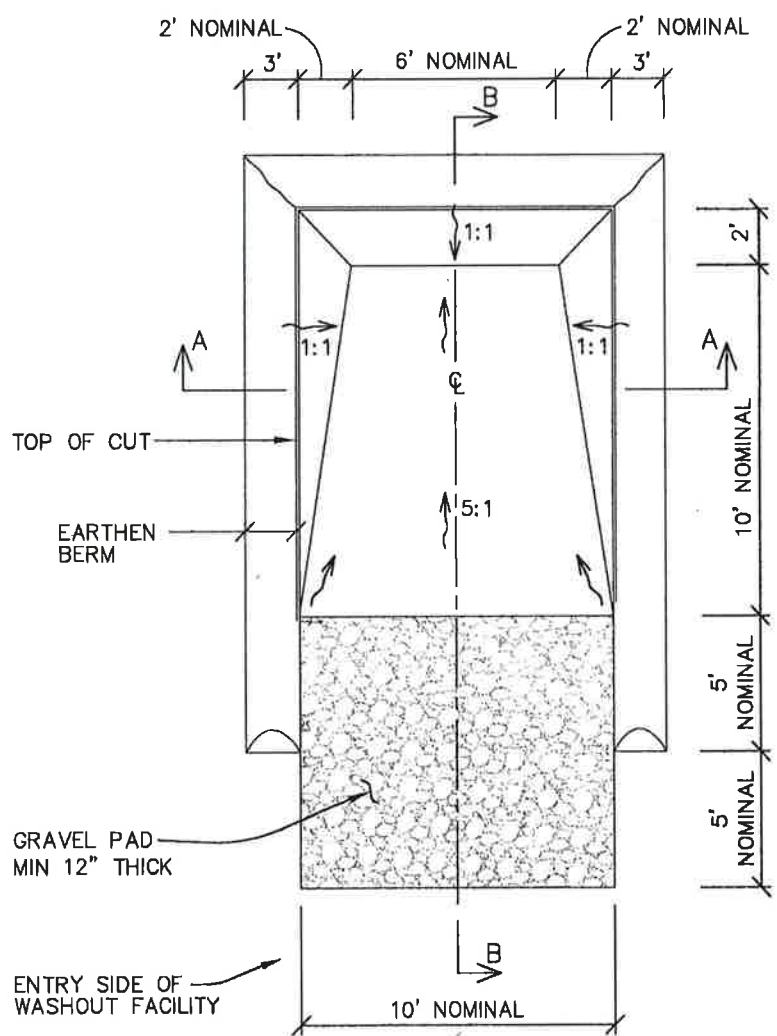




SECTION B-B



SECTION A-A



CONCRETE WASHOUT AREA PLAN

N.T.S.

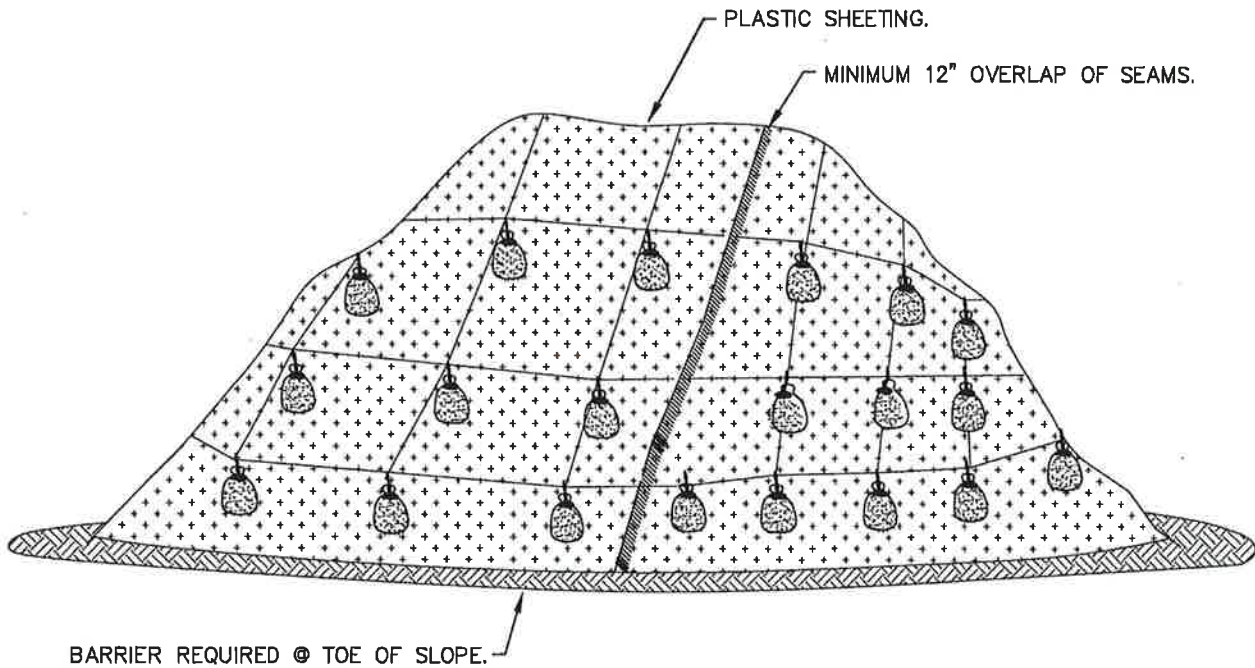
CWA INSTALLATION NOTES:

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.

LAST REVISION DATE: NOV 2018	JO # STANDARD
<b>TEMPORARY CONCRETE WASHOUT AREA (CWA)</b> (NTS)	
DAYTON, OR	DETAIL NO. 616



## 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 ROPES 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.

LAST REVISION DATE: <b>JAN 2019</b>	<div style="border: 1px solid red; border-radius: 50%; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin: 0 auto; color: red; font-weight: bold; font-size: 12px;">NEW</div> <small>10-11</small> STANDARD
<b>STOCKPILE COVER DETAIL</b> (NTS)	
DAYTON, OR	DETAIL NO. <b>617</b>

**CITY OF DAYTON**  
**Public Works Design Standards**

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**Standard Construction Notes**

**Appendix B**

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Notes:

- 1) The developer's engineers can request the standard construction notes in digital format from the City Engineer.
- 2) Per PWDS 1.10.d.1.f, all applicable City standard notes are to be included on construction drawings submitted for City review and approval. Supplemental notes may be added at the discretion of the design engineer.

ODOT requirements in accordance with the current MUTCD (including Oregon amendments). Access to driveways shall be maintained at all times.

~~11.12.~~ Unless authorized in writing by the City prior to the start of the work, no work within any existing public roadway shall disrupt traffic flow for more than 14 consecutive days (timeframe applies independently and separately to each block or intersection where traffic control work is required).

~~12.13.~~ **Record Drawings.** The Contractor shall maintain one complete set of approved drawings on the construction site at all times whereon he will record any approved deviations in construction from the approved drawings, as well as the station locations and depths of all existing utilities encountered (whether or not existing utilities are shown on the construction drawings). These field record drawings shall be kept up to date at all times and shall be available for inspection by the City upon request. Information on the field record drawings shall include reference measurements and materials type.

~~13.14.~~ Upon completion of construction of public facilities, Contractor shall submit a clean set of field record drawings containing all as-built information to the Design Engineer for use in the preparation of As-Built drawings for submittal to the City.

~~14.15.~~ The Contractor shall submit a suitable maintenance bond prior to final payment or final approval where required by public and/or private agencies having jurisdiction.

~~15.16.~~ Contractor shall procure and conform to DEQ stormwater permit No. 1200C for construction activities where 1 acre or more are disturbed.

~~16.17.~~ Elevations shown on the drawings are based from \_\_\_\_\_ (City; OSHD, etc) Bench Mark \_\_\_\_\_, Elevation \_\_\_\_\_ (adjusted 19\_\_), consisting of a \_\_\_\_\_ (brass cap; monument, etc.) Located at \_\_\_\_\_, which is based on the NAVD 1988 datum corresponding to the FEMA flood map elevations.

~~17.18.~~ **Address Numbers.** Per OFC 505.1, all new and existing buildings shall have approved address numbers (4" minimum number height, color to contrast with background) placed in a position that is plainly legible and visible from the fronting street. For flaglots or other situations where the structure is not visible from the public street, an address sign shall be installed near the entrance to the driveway or private road. Temporary address signs shall be mounted in a visible location prior to and during any construction, and the permanent numbers mounted prior to occupancy, in a position that is plainly legible and visible from the street fronting the property.

~~18.19.~~ Contractor is solely responsible for assuring that any site, street or utility work within the jurisdiction of the City, meets or exceeds any and all legal requirements and any and all industry best practices in the design, construction and/or performance of such site, street or utility work. Contractor is solely responsible for payment of any assessment, fine, penalty, claim, damages or costs that result from Contractor's (1) performing site, street or utility work or (2) failing to perform site, street or utility work that meets or exceeds any and all legal



requirements and industry best practices. The City may require and Contractor shall provide the City with confined space entry plans conforming with the requirements of OR-OSHA, traffic control plans, or other plans or performance descriptions necessary or desirable for the Public Works Director to assure that these requirements can be met in performing the work. The City's acceptance, review, or comments on or about the adequacy of any such plan shall not remove or reduce Contractor's sole responsibility to meet any and all legal requirements, administrative requirements, or industry best practices, and Contractor specially assumes, will defend, and will indemnify the City ~~for~~against any claims, liability, damages, fines, fees or assessments related in any manner to Contractor's site, street or utility work.

19.20. All construction water must be obtained through an approved hydrant meter or bulk water meter, at a location approved by Public Works.

20.21. The Contractor shall provide the City and the project engineer with the names and 24 hour telephone numbers of at least two persons associated with the project who can be contacted outside of regular work hours in case of emergencies.

21.22. Notice to Property Owners, Contractor Responsibility. When work performed by Contractor will impact or interrupt water/sewer/storm drainage utility service or interrupt vehicular or pedestrian access to any public or private property, Contractor shall notify all the affected parties prior to the anticipated impact a minimum of 48 hours in advance. In addition, Contractor shall provide door hangers or equivalent a minimum of 24 hours (and a maximum of 48 hours) before such interruption of utility service (or vehicular/pedestrian access) to all residences, structures or businesses impacted by the work (Contractor is responsible to coordinate with the City staff a minimum of 1 week prior in order to verify area of impact or interruption). In addition to the written notice, a representative of the Contractor shall knock on the front door of all affected residences or businesses on the morning that the work will commence, and attempt to notify the residents or businesses regarding the start of the work.

#### **EXISTING UTILITIES & FACILITIES:**

22.23. ATTENTION: Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in OAR 952-001-0010 through OAR 952-001-0090. You may obtain copies of the rules by calling the center. (Note: the telephone number for the Oregon Utility Notification Center is (503) 232-1987).

23.24. The location and descriptions of existing utilities shown on the drawings are compiled from available records and/or field surveys. The engineer or utility companies do not guarantee the accuracy or the completeness of such records. Contractor shall field verify sizes and locations of all existing utilities prior to construction.

24.25. The Contractor shall locate and mark all existing property and street monuments prior to construction. Any survey monuments disturbed during construction of the project shall be replaced by a Registered Land Surveyor at the Contractor's expense. The monuments shall be replaced within a maximum of 90 days, and the County Surveyor shall be notified in writing as required by ORS 209.150.

~~25-26.~~ Contractor shall field verify location and depth of all existing utilities where new facilities cross or are closely parallel to the existing facilities. All utility crossings marked or shown on the drawings shall be potholed using hand tools or other non-invasive methods prior to excavating or boring. Contractor shall be responsible for exposing potential utility and other conflicts far enough ahead of construction to ~~determinemake~~ necessary grade, alignment or depth modifications without delaying the work or requiring otherwise unnecessary materials, fittings or structures. If grade, alignment or depth modification is necessary, Contractor shall notify the Design Engineer, and the Design Engineer shall obtain approval from the City Engineer prior to construction. ~~All utility crossings shall be potholed as necessary prior to excavating or boring to allow the Contractor to prevent grade or alignment conflicts.~~

~~26-27.~~ All existing facilities shall be maintained in-place by the Contractor unless otherwise shown or directed. Contractor shall take all precautions necessary to support, maintain, or otherwise protect existing utilities and other facilities at all times during construction. Contractor to leave existing facilities in an equal or better-than-original condition and to the satisfaction of the City Engineer.

~~27-28.~~ Except where otherwise shown on the drawings and explicitly approved in writing by the City, existing City utilities crossed, intercepted by or in the vicinity of new utility lines or facilities (of the same system) shall be connected to the new City utility system at locations as required by the City Engineer and Public Works Director. Existing City utility lines which are parallel with, or which are replaced or superseded by the new utility lines (as determined by the City), shall be abandoned or removed as part of the project (and existing facilities or structures served by the abandoned lines shall be connected to the new system as applicable), as required by the City Engineer and Public Works Director.

~~28-29.~~ Utilities that are abandoned in place, or interfering portions of utilities, shall be removed by the Contractor to the extent necessary to accomplish the work. The Contractor shall plug the remaining exposed ends of abandoned utilities (grout or concrete plugs, if used, shall be installed to fill the full pipe diameter for a distance of two times the pipe diameter back from the pipe end).

~~29-30.~~ Contractor shall remove all existing signs, mailboxes, fences, landscaping, etc., as required to avoid damage during construction and replace them to existing or better condition.

~~30-31.~~ Unless otherwise approved by the City, all springs, field tiles or drain lines intercepted or exposed during construction shall be connected to catch basins or new storm lines, except for field tiles or drain lines which are removed completely during construction, or are located and plugged at 50 foot maximum intervals uphill of the location intercepted (grout plugs, if used, shall have a length of two times the pipe diameter). Any abandoned drain tiles downstream of the intercepting trenches shall be plugged with grout for a distance of two times the pipe diameter back from the pipe end.

~~31-32.~~ Any septic tanks encountered during construction shall be pumped out. Contractor shall break bottom of tank out and backfill with pea gravel unless otherwise required by public agencies

having jurisdiction. Septic tank removal to be in accordance with County Sanitarian requirements.

32.33. Any wells encountered shall be abandoned per state of Oregon water resources department requirements.

33.34. Any fuel tanks encountered shall be removed and disposed of per State of Oregon DEQ requirements. Backfill with compacted granular material.

#### **GRADING, PAVING & DRAINAGE:**

34.35. Contractor to review soils/geotechnical report prepared by \_\_\_\_\_ (dated /20 ), and conform to all recommendations listed in the report or requirements shown on these plans, whichever is more stringent.

35.36. The Contractor shall be responsible for managing construction activities to insure that public streets and right-of-ways are kept clean of mud, dust or debris. Dust abatement shall be maintained by adequate watering of the site by the Contractor.

36.37. Unless otherwise noted, all grading, rocking and paving to conform to OSSC (ODOT/APWA) Specifications, 2015 edition.

37.38. Clear and grub within work limits all surface vegetation, trees, stumps, brush, roots, etc. Do not damage or remove trees except as approved by the engineer or as shown on the drawings. Protect all roots two inches in diameter or larger on trees which are not scheduled for removal.

38.39. Strip work limits, removing all organic matter which cannot be compacted into a stable mass. All trees, brush and debris associated with clearing, stripping or grading shall be removed and disposed of off-site. Fills are not to be placed prior to approval of stripping limits and depths and concurrence of such approval by the City.

39.40. Immediately following fine grading operations, compact subgrade to 95% of the maximum dry density per AASHTO T-180 test method (Modified Proctor). Subgrade must be inspected and approved by the City prior to placing embankments or base rock.

40.41. Engineered fills shall be constructed and compacted in 6" lifts over approved subgrade. All fills within public right-of-ways and easements shall be engineered, with each lift compacted to 95% of the maximum dry density per AASHTO T-180 test method (Modified Proctor).

41.42. All fills outside of public right-of-ways which are within potential building envelopes shall be engineered and comply with the Oregon Structural Specialty Code, with each lift compacted to 90% of the maximum dry density per AASHTO T-180 test method (Modified Proctor). Fills outside of building envelopes which are over 12-inches in depth shall also be engineered and compacted.

42.43. Unless otherwise shown on the drawings, straight grades shall be run between all finish grade

elevations and/or finish contour lines shown. Finish pavement grades at transition to existing pavement shall match existing pavement grades or be feathered past joints with existing pavement as required to provide a smooth, free draining surface.

43.44. Contractor is responsible for coordinating with the City for the following proof-rolls (witnessed by the City, with a fully loaded rock truck). Performance of proof-rolls summarized below are required for all public street, fire lane or common use driveway improvements. Performance of a proof-roll does not replace the requirement for density testing where specified or where required by City standards.

--Subgrade proof-roll: prior to fabric or baserock placement.

--Curbline proof-roll: prior to placement of curb & gutter.

--Finished rock proof-roll: prior to paving.

If the subgrade is disturbed after the subgrade proofroll, or if inclement weather (ie. significant rain) occurs between the time any proof roll is performed and baserock placement, curb placement or paving, another proof roll may be required by the City.

44.45. Crushed granular baserock shall conform to the requirements of OSSC (ODOT/APWA) 02630.10 (Dense Graded Base Aggregate), with no more than 10% passing the #40 sieve and no more than 5% passing the #200 sieve, and shall be approved by the City prior to placement.

45.46. Compact granular baserock to 95% of the maximum dry density per AASHTO T-180 test method (Modified Proctor). Prior to placing AC pavement, written compaction test results for baserock and trench backfill must be received by the City, and a finished rock grade proof-roll (witnessed by the City) must be performed.

46.47. Paving of streets shall not be allowed until after completion of all of the following as a minimum, including submittal of acceptable written test results to the City where applicable:

--all required testing, inspection and proofroll of baserock;

--installation and testing of new water, sewer and storm drain lines under paved areas (including trench compaction testing and submittal of test results to the City);

--review and approval of the franchise and/or private utility plans by the City Engineer; and

--installation of all franchise utilities or sleeves located under or crossing paved areas, curbs or sidewalks.

47.48. A.C. Pavement shall conform to OSSC (ODOT/APWA) 00744 (hot mixed Asphalt Concrete (HMAC)-Pavements (ACP)) for standard duty mix, and shall be approved by the City prior to placement. Unless otherwise approved in writing by the City (prior to paving), base course paving shall be 3/4 inch dense graded mix and wearing/leveling course paving shall be 1/2 inch dense graded mix (Level 2 JMF for local streets/parking lots/fires lanes, and Level 3 JMF for collector/arterial streets). AC Pavement shall be compacted to a minimum of 91% of maximum density (at all locations) as determined by the Rice standard method, based on nuclear density testing.

49. Pavement Joint Locations. Per OSSC 744.44, place ACP in panel widths to minimize the number of longitudinal joints to a minimum. For multi-lift paving, offset the longitudinal



and/or transverse joints in one panel by at least 6-inches from the joints in the panel immediately below (OSSC 744.44.a). Longitudinal pavement panel joints/seams shall be at or within 6 inches of the centerline of the street unless otherwise approved by Public Works Director and agency with jurisdiction. Where approved, joints offset from centerline shall be installed at or within 6 inches of lane lines or fog lines. In no case shall longitudinal pavement joints be allowed in travel lanes or adjacent to travel lane wheel paths.

- 48.50. Pavement surface shall be a smooth, well-sealed, tight mat without depressions or bird baths. Bony or open graded pavement surfaces shall be repaired to the satisfaction of the City, prior to final acceptance of the work.
- 49.51. ~~ACP HMAC~~ mixtures shall be placed only when the surface is dry and weather conditions are such that proper handling, finishing and compaction can be accomplished. In no case shall ~~ACP HMAC~~ mixtures be placed when the surface temperature is below the minimum established under 2015 OSSC (ODOT/APWA) 00744.40 (Season and Temperature Limitations) or the project specifications, whichever is more stringent.
- 50.52. Contractor shall protect new pavement against traffic as required, until it has cooled sufficiently to avoid tracking.
- 51.53. All existing or constructed manholes, cleanouts, monuments, gas valves, water valves and similar structures shall be adjusted by the Contractor to match finish grade of the pavement, sidewalk, landscaped area or median strip wherein they lie.
- 52.54. Street pavement widening cross slope shall be a minimum of 2% and a maximum of 5% except at intersections, where the street cross slopes shall not exceed 2% maximum (intersection defined from end of curb radius both directions) to comply with ADA and PROWAG standards. Prior to placing curbs, Contractor shall field verify pavement widening cross slope and contact City if the design pavement widening cross slope is not within the limits stated above.
- 53.55. All street signs, traffic control signs, curb & pavement painting or striping, and/or reflectors shall be installed (in conformance with City and MUTCD standards) prior to requesting final inspection by the City. All crosswalk striping and roadway emblems shall be thermoplastic.
56. Pavement Markings. All stop bars, crosswalk striping and other roadway marking and emblems shall be pre-formed thermoplastic (Premark BD by Ennis-Flint). Installation shall be by methods and by a contractor approved by Public Works.
- 54.57. Unless otherwise shown on the drawings, no cut or fill slopes shall be constructed steeper than 2H:1V maximum.
- 55.58. All planter areas shall be backfilled with approved top soil minimum 8" thick. Stripping materials shall **not** be used for planter backfill.
- 56.59. Contractor shall hydroseed all exposed slopes and disturbed areas which are not scheduled to

be landscaped.

~~57.60.~~ Grading shown on the drawings is critical to functioning of detention system and shall be strictly followed.

~~58.61.~~ Contractor shall coordinate and ensure that detention volumes are inspected and approved by public agencies having jurisdiction prior to paving and landscaping.

- **Curbs & Sidewalks**

~~59.62.~~ Unless otherwise shown or indicated on the drawings, 6-inches nominal curb exposure used for design of all parking lot and street grades.

~~60.63.~~ Unless otherwise approved in writing by the City and any other agency with jurisdiction, monolithic curb & sidewalk shall not be placed in the public right-of-way (ie. curb concrete & sidewalk concrete shall be placed separately). Joint material shall be placed at spacing and locations as noted on the standard details.

~~61.64.~~ Construction of all curbs & sidewalks shall conform to the applicable requirements of OSSC (ODOT/APWA) Section 00759, Miscellaneous Portland Cement Concrete Structures, including placement, curing, finishing and the repairing of minor defects. Major defects (as determined by the City) will require removal and replacement of the defective portions as directed.

~~62.65.~~ Where new curbing connects to existing curbing or is installed along existing streets or pavement, the gutter grade shall match the existing street grades so as to allow drainage from the street to the gutter, as well as through any transitions or connections between old & new curbs. The Contractor shall notify the City in writing of any grade discrepancies or problems prior to curb placement. Curbs that are placed too high or too low shall be removed and replaced as directed by the City

~~63.66.~~ Finish sidewalk grades at transition to existing sidewalks shall match existing sidewalk grades as required to form a continuous, smooth, free draining surface. The Contractor shall notify the City in writing of any grade discrepancies or problems prior to sidewalk placement.

~~64.67.~~ Each lot shall be provided with a minimum two 3-inch diameter weep holes per lot in curbs on each frontage to provide for lot drainage. As a minimum, one weep hole shall be located 5 feet from the property line on the low point in the lot frontage at the time of curb construction. Weep holes shall also be provided as required for existing drainpipes whether or not shown on the drawings, for additional drainpipes shown on the drawings, as well as on both sides of driveway aprons. Contractor shall install drainpipe (smooth wall PVC or ABS) from each weep hole to the back of sidewalk location prior to acceptance of the curbing by the City, and shall connect to existing drain piping where such piping exists within or adjacent to the right-of-way or easement. Where storm drain laterals for lots are constructed to curb weepholes in conjunction with subdivision or development improvements (ie. where storm drain laterals

from storm mainline is not provided), the Contractor shall install 3" x 4" eccentric reducers just past the back of sidewalk to transition to 4-inch PVC rain drain lines as applicable.

65.68. Weep holes installed in existing curbs shall be core drilled and sealed as required by Public Works.

66.69. New or replacement curbs shall be stamped with an 'S', 'D' or a 'W' at the point where each sanitary sewer, storm drain or water service lateral crosses the curb, respectively. Letters shall be a minimum of 2-inches high. Existing curbs crossed by new services shall have letters routed or cut into the concrete, unless otherwise approved in writing by the City.

67.70. Contractor shall construct handicap access ramps at all intersections in accordance with current ADA and PROWAG requirements.

68.71. All curbs, sidewalks and driveway approaches shall be constructed using batch plant 3300-psi concrete, air entrained (5" slump or stiffer), and shall be cured with Type 1 or Type 1D clear curing compound. All sidewalks shall fully comply with all ADA and PROWAG standards.  
--Standard sidewalks shall be a minimum of 4-inches thick.  
--All pedestrian ramps and standard residential driveways shall be a minimum of 6-inches thick.  
--Commercial or industrial use driveways and alley approaches shall be minimum 8-inches thick.

69.72. Curb & sidewalk concrete shall be placed only during periods when it will not be damaged by rain (protect unhardened concrete from precipitation). Concrete shall not be placed on frozen baserock. Do not begin concrete placement until temperature in the shade is a minimum of 35°F and rising, and stop placement if air temperature falls below 35°F. Protect concrete from freezing for a minimum of 5 days after placement per OSSC (ODOT/APWA) 0000440.40.d & 00756.40 or the project specifications, whichever is more stringent.

70.73. Contraction joints shall be installed directly over any pipes that cross under the sidewalk, to control cracking. In general, cracks in new curbs or sidewalks (at locations other than contraction joints) are not acceptable, and cracked panels shall be removed & replaced unless otherwise approved by Public Works.

71.74. Contractor shall conduct a flood test of all new or replacement pedestrian ramps after concrete is cured to demonstrate that the ramp does not hold water. After water is poured into the ramp area, the inspector shall check the ramp 15 minutes later to determine if water is ponding in the ramp or gutter area. If water is ponding in the ramp or gutter area and the pond is more than 1-foot in length or ¼-inch in depth, the Contractor shall be required to make repairs in an approved manner at his sole expense.

72.75. Where trench excavation requires removal of PCC curbs and/or sidewalks, the curbs and/or sidewalks shall be sawcut and removed at a tooled joint unless otherwise authorized in writing by the City. The sawcut lines shown on the drawings are schematic and not intended to show the exact alignment of such cuts.



~~73.76.~~ Unless otherwise approved in writing by Public Works, areas along curbs and public sidewalks shall be backfilled with approved topsoil, as well as being seeded and mulched (or hydroseeded).

### **PIPED UTILITIES:**

~~74.77.~~ Contractor shall coordinate and pay all costs associated with connecting to existing water, sanitary sewer and storm sewer facilities.

~~75.78.~~ Unless otherwise noted, materials and workmanship for water, sanitary sewer and storm sewer shall conform to OSSC (ODOT/APWA) Specifications, 2015 edition.

~~76.79.~~ The Contractor shall have appropriate equipment on site to produce a firm, smooth, undisturbed subgrade at the trench bottom, true to grade. The bottom of the trench excavation shall be smooth, free of loose materials or tooth grooves for the entire width of the trench prior to placing the granular bedding material.

~~77.80.~~ **Bedding and Backfill.** All pipes shall be bedded with minimum 6-inches of 3/4" minus crushed rock bedding and backfilled with compacted 3/4" minus crushed rock in the pipe zone (crushed rock shall extend a minimum of 12-inches over the top of the pipe in all cases). Crushed rock trench backfill shall be used under all improved areas, including sidewalks. Granular trench backfill shall be compacted to 92% of the maximum dry density per AASHTO T-180 test method (Modified Proctor).

~~81.~~ **Trench Foundation Stabilization.** If trenches are over-excavated for any reason, over-excavation shall be filled to the design trench subgrade (ie. to the bottom of the 6" thick pipe bedding layer) with compacted, well-graded granular backfill as specified (the use of open graded rock for trench foundation stabilization is prohibited unless it is completely encapsulated in geotextile fabric & approved in writing by the City).

~~82.~~ Temporary thrust restraint on pressure pipelines shall be provided at all locations where necessary due to construction sequencing shown on the drawings, required by City standards or chosen by the Contractor. The adequacy of the temporary thrust restraint shall be the Contractor's sole responsibility, but shall be acceptable to the City and any other agency with jurisdiction. Any movement of the pipe or fittings during pressurization of the pipeline or connection shall be considered evidence that the temporary thrust restraint is not adequate, and the pipeline or connection shall be depressurized and the thrust restraint increased as necessary. Re-pressure testing or re-chlorination, if deemed necessary at the sole discretion of the City, shall be completed at the Contractor's expense.

~~78.83.~~ Contractor shall arrange for and pay all costs to abandon existing sewer and water services not scheduled to remain in service.

~~79.84.~~ All piped utilities abandoned in place shall have all openings closed with concrete plugs with a minimum length equal to 2 times the diameter of the abandoned pipe.



**80.85.** The end of all utility stubs shall be marked with a painted 2-x-4, extending 2 feet minimum above finish grade (painted white for sanitary sewer, green for storm), and wired to pipe stub. Tracer wire shall be extended (and attached) to the top of the 2-x-4 post. Type of utility (ie. sewer, storm, etc) and depth below grade to pipe invert shall be clearly & permanently labeled on the marker post.

**81.86.** Contractor shall provide all materials, equipment and facilities required for testing all utility piping in accordance with City construction specifications.

**82.87. Tracer (Toning) Wire.** All ~~non-metallic~~ water, sanitary and storm sewer piping shall have an electrically conductive insulated 12 gauge solid core copper tracer wire the full length of the installed pipe using blue wire for water and green for storm and sanitary piping.

--Tracer wire shall be taped to the top of the pipe at 10 foot maximum intervals and shall be extended up into all valve boxes, and manholes and catch basins and accessible from the surface.

-- All tracer wire splices shall be made with corrosion resistant waterproof wire nuts (DBR direct bury splice kit by 3M Company, or equal).

--Tracer wire penetrations into manholes shall be within 18 inches of the rim elevation and adjacent to manhole steps. The tracer wire shall be tied to the top manhole step or otherwise supported to allow retrieval from the outside of the manhole or catch basin.

**83.88. Warning Tape.** Detectable or non-detectable acid and alkali resistant safety warning tape shall be provided along the full length of all water, sanitary sewer and storm drain service laterals and along the full length of all water, sanitary sewer and storm drain mainline segments not located under sidewalks or paved portions of public streets. Underground warning tape shall be continuous the entire length of service laterals installed from the mainline to the back of the PUE.

**84.89.** No trenches in roads or driveways shall be left in an open condition overnight. All such trenches shall be closed before the end of each work day and normal traffic flows restored.

**85.90.** Before mandrel testing, TV inspection or final acceptance of gravity sewer or storm pipelines, all trench compaction shall be completed and all sewers and storm drains flushed & cleaned to remove all mud, debris & foreign material from the pipelines, manholes and/or catch basins.

**86.91.** Where future extensions are shown upstream of new manholes (sewer or storm), catch basins or junction boxes, pipe stubs (with gasketed caps) shall be installed at design grades to a point 2' minimum outside of the structure.

**92.** Timing for Trench Work on Existing Public Streets. Unless authorized in writing by the City prior to the start of the work: trenching within existing paved streets shall be backfilled and repaved within 14 days of the start of excavation unless the trenches are completely plated or repaired with cold patch; trenches within each block or intersection shall be permanently repaved within 21 days of the start of excavation (including completion of all inspections, testing & corrective work required by City standards prior to paving). These timeframes apply

independently and separately to each block or intersection where trenching work occurs.

- **Water**

87.93. City forces to operate all valves on existing public water mains, on the public side of water meters, or at the connection of fire service lines to public water mains.

88.94. No person other than Public Works staff shall operate or flow test fire hydrants without first obtaining written authorization from the Public Works Director. This hydrant use restriction shall not apply to fire department/fire district staff in the performance of their regular duties. All hydrant flow tests shall be performed with Public Works staff present unless otherwise approved by the Public Works Director. Opening or operating fire hydrants with any tool other than a standard hydrant wrench designed for that purpose is prohibited.

89.95. All water mains shall be C-900 PVC (DR 18) or Class 52 ductile iron. All fittings 4-inches through 24-inches in diameter shall be ductile iron fittings in conformance with AWWA C-153 or AWWA C-110. The minimum working pressure for all MJ cast iron or ductile iron fittings 4-inches through 24-inch in diameter shall be 350 psi for MJ fittings and 250 psi for flanged fittings.

90.96. All water mains to be installed with a minimum 36 inch cover to finish grade unless otherwise noted or directed. Service lines to be installed with a minimum 30 inches cover within the right-of-way. Deeper depths may be required as shown on the drawings or to avoid obstructions.

91.97. Unless otherwise approved by the City Engineer, all valves shall be flange connected to adjacent tees or crosses (where such fittings are installed adjacent to valves). In-line valves shall be MJ x MJ.

92.98. Thrust restraint (concrete thrust blocks) shall be provided on all bends, tees and other direction changes per local jurisdiction requirements and as specified or shown on the drawings. All concrete shall conform to the requirements of OSSC (ODOT/APWA) 00440, Commercial Grade Concrete, 3300 psi (5" slump or stiffer). Concrete mix design shall be submitted to the City for review and approval prior to use. If hand mixed sack-crete type concrete is proposed by the Contractor and approved by the Public Works Director, it shall be a 4000 psi minimum mix (approved by the City prior to use), mixed with the minimum amount of water necessary for workability (5" slump or stiffer). In no case will dry sack-crete mix (either in bags or as loose mix) be considered as an acceptable substitute for an approved mixed concrete.

93.99. Where approved by the City prior to construction, temporary thrust restraint may be used at mainline connections where it is not possible (prior to pressurization of the connection and placing the waterline in service) to install permanent concrete thrust blocks, straddle blocks or other permanent thrust restraint as required or shown/noted on the drawings. Trenches at the temporary thrust restraint location shall be left open and not backfilled (but plated as necessary or required) until the permanent thrust restraint is installed and approved by the City. Unless

otherwise approved in writing by the City, permanent thrust restraint shall be installed by the end of the next working day after installation of the temporary thrust restraint, but in no case later than the third calendar day following installation of the temporary thrust restraint.

~~94.100.~~ Unless otherwise approved by the City, water service pipe on the public side of the meter shall be CenCore blue HDPE tubing (CTS, SDR 9, 200 psi) conforming to AWWA C901 (ASTM D2239 & D2737) with 2-3/8" long style compression inserts (AY McDonald 6133T CTS insert stiffener or equal) and Q style compression fittings.

~~95.101.~~ Unless otherwise noted, water service pipe on the private side of the meter shall be Schedule 40 PVC or as approved by the OPSC.

~~96.102.~~ Domestic, irrigation and fire backflow prevention devices and vaults shall conform to requirements of public and/or private agencies having jurisdiction.

~~97.103.~~ The work shall be performed in a manner designated to maintain water service to buildings supplied from the existing waterlines. In no case shall service to any main line or building be interrupted for more than four (4) hours in any one day. Contractor shall notify the City and all affected residents and businesses a minimum of 24 business hours (1 business day) prior to any interruption of service.

~~98.104.~~ Water Mainline Couplings. Where shown on the drawings or required by the City, restrained sleeve couplings shall be Krauz Hymax Grip Couplings or approved equal (Romac Alpha Coupling). Unrestrained mainline couplings shall be long-style epoxy coated DI sleeve couplings, or Hymax Wide Range Coupling (short body couplings not allowed).

~~99.105.~~ Sanitary Sewer & Waterline Crossings. Where new waterlines cross below or within 18-inches vertical separation above a sewer main or sewer service lateral, center one full length of waterline pipe at point of crossing the sewer line or sewer lateral. Unless otherwise approved in writing by the Public Works Director, existing sewer mains and/or service laterals within this zone shall be replaced with a full 12 foot length of new pipe (D2241 PVC-DR 32.5, C-900 PVC-DR 18 or CL 50 ductile iron), centered at the crossing in accordance with OAR 333-061 and local jurisdiction requirements. Connect to existing sewer lines with approved flexible reinforced couplings (MaxAdaptor Coupling by Gripper Gasket LLC or approved equal). Example: For an 8-inch waterline with 36-inches cover, 4-inch service lateral inverts within 5.67-feet (68-inches) of finish grade must have this pipe centered at the crossing.

~~100.106.~~ Contractor shall install temporary chlorination & sample taps, restrained caps/plugs and blowoffs as required on new waterlines for flushing, pressure testing, chlorination and bacteriological testing (configuration to be acceptable to the City or other agency with jurisdiction). Chlorination and sample taps shall be located within 18-inches of the end of each mainline segment to be chlorinated & tested, and configured to ensure that all portions of the pipelines are adequately disinfected.

~~101.107.~~ Pressure Testing. All waterlines, services and appurtenances shall be pressure tested



for leakage. All testing shall conform to requirements as outlined on City testing forms contained in the PWDS. The hydrostatic test shall be performed with all service line corporation stops open and meter stops closed, and with all hydrant line valves open. Prior to the start of each pressure test, the position of all mainline valves, hydrant line valves and service line corporation stops in the test segment shall be verified.

~~102.108.~~ Cleaning & Flushing. After the pressure test and prior to disinfecting, the water lines shall be thoroughly flushed through hydrants, blow offs or by other approved means.

~~103.109.~~ Disinfection & Bacteriological Testing. All water mains and service lines shall be chlorine disinfected per local jurisdiction requirements, AWWA C-651 or OAR 333-061 (25 mg/L minimum chlorine solution, 24 hours contact time), whichever is more stringent. Unless otherwise approved by the Public Works Director, a City representative shall witness the application of the chlorine solution and the chlorine testing at the end of the 24 hour contact period. After the 24 hour chlorine contact period, the free chlorine concentration shall be checked, and if it is found to be 10 mg/L or more, the chlorine solution shall be drained (otherwise the line shall be rechlorinated), the waterline flushed with potable water, and a minimum of two consecutive samples taken at least 24 hours apart shall be collected from the waterline for microbiological analysis (ie. one sample immediately after flushing, and another sample a minimum of 1624 hours later). Contractor to pay for laboratory analysis of water samples taken under the supervision of the City. If the results of both analyses indicate that the water is free of coliform organisms, the waterline may be placed in service. Should the initial treatment prove ineffective, the flushing & chlorination shall be repeated until confirmed tests show acceptable results. Contractor shall coordinate with Public Works to ensure that both a high level chlorine test kit and a chlorine residual test kit is available at the site during testing.

~~104.110.~~ Disinfection of Connections. For connections which cannot be disinfected with the waterline mainlines as noted above, all fittings, valves and appurtenances, including tool surfaces which will come in contact with potable water, shall be thoroughly cleaned by washing with potable water and then swabbed or sprayed with a one percent (1%) hypochlorite solution (10,000 mg/L) in accordance with the requirements of AWWA C-651 and OAR 333-061.

~~105.111.~~ Disposal of Chlorinated Water. The chlorine residual in water from testing, disinfection or flushing activities shall be neutralized in accordance with DEQ standards prior to discharge to the storm system or ditch discharging to surface waters. Care should be exercised to balance the amount of dechlorinating chemical against the chlorine present. Where required by Public Works, the Contractor shall provide a field chlorine residual test kit to verify adequate dechlorination of water being discharged.

~~106.112.~~ Capping of Chlorination Taps, Pressure Test Taps, Temporary Sample Taps, etc. Unless otherwise approved or required by the City, all extra pipe and fittings attached to chlorination, pressure test or temporary sampling taps shall be removed and the corporation stop capped at the mainline tap or saddle after the new waterline is placed in service (to avoid depressurizing the mainline after disinfection). Wrap each capped corporation stop in plastic prior to backfilling. The location of all such capped corporation stops shall be shown



on the Contractor's record drawings.

~~107.113.~~ Unless otherwise shown on the drawings AND explicitly approved in writing by the City, any existing waterlines abandoned in place shall be physically disconnected from valves and other connection points to the existing water system. A blind flange or restrained MJ plug (as applicable) shall be installed on the back side of all valves from which abandoned waterlines are disconnected. Remove valve boxes from abandoned valves prior to repaving or surface restoration.

• **Sewer & Storm Manholes**

~~108.114.~~ All precast sanitary sewer manholes shall be provide with integral rubber boots. Lockdown lids shall be used on manholes outside of public right-of-way only where specifically required by Public Works.

~~109.115.~~ All connections to existing manholes shall be made by core-drilling the existing manhole structure and installing a rubber boot. Connections to manholes shall be watertight and shall provide a smooth flow into and through the manhole. Small chipping hammers or similar light tools which will not damage or crack the manhole base may be used to shape channels. Use of large pneumatic jackhammers shall be prohibited.

~~110.116.~~ Unless otherwise approved in writing by the City Engineer, manhole steps shall be installed in any manhole tapped which does not have existing steps.

~~111.117.~~ Manhole channel depths (sewer & storm) shall be to the heights shown on the drawings, but in no case shall be the channel depth be less than 2/3 of the pipe diameter. Flow channels in manholes shall be of such shape (semi-circular bottoms) and slope to provide smooth transition between inlet and outlet sewer size/ invert to minimize turbulence and to ensure that the manhole channels are self-cleaning. Channels, as well as shelves between the channels and the manhole walls, shall be sloped to drain per plan details.

~~112.118.~~ All sanitary sewer manholes in low areas which are subject to flooding or water ponding (including all lawn, landscape or gravel areas, or low areas of parking lots, or manholes closer than 4 feet clear of ~~street or~~ parking lot curblines or existing/future street curbs, adjacent to ditches, etc.) shall be provided with inflow protector lid inserts (whether or not such MH inserts are specifically noted on each applicable drawings sheet). Manhole inflow inserts shall be of ABS or HDPE plastic, and shall include integral lifting lugs on each side of the insert allowing removal with a manhole hook (lift straps are not an acceptable alternate), a factory installed closed cell neoprene rubber gasket bonded to the underside of the insert rim. Unless waived in writing by Public Works (case by case basis), a clog-free vent-valve valve (rubber check by Tideflex) shall be provided on each unit. Inserts shall be ManPan manhole inserts or approved equal.

~~113.119.~~ Vacuum Testing (New MHs). All sanitary sewer manholes shall be vacuum tested following completion of paving or final surface restoration. All testing shall conform to requirements as outlined on City testing forms contained in the PWDS. Visible groundwater

infiltration or leakage constitutes a failed manhole test, whether or not the vacuum test is successful.

~~114.120.~~ Vacuum Testing (Existing MHs). Existing sanitary sewer manholes to which new pipes are connected (or where existing pipe connections are modified) shall be sealed as required and pass a vacuum test prior to final approval.

~~115.121.~~ Vacuum Testing (Existing MHs). Existing sanitary sewer manholes where pavement or surfacing is replaced around the manhole shall be sealed as required and pass a vacuum test following completion of paving or final surface restoration.

• **Sewer & Storm Warranty Inspections**

~~122.~~ Re-inspection of the sanitary sewer systems by cleaning & TV inspection shall be performed during the last month of the warranty period, as well as visual inspection of all sanitary sewer manholes during the wet weather season (any visible groundwater infiltration or leakage constitutes a failed manhole test, and will require warranty correction). Based on the results of the TV inspections and/or the City's warranty inspections, additional warranty tests may include mandrel testing or low pressure air testing. The results of these test(s) will be used by Public Works to determine if final acceptance of the system is warranted and what corrective work is required prior to final acceptance. The cost of these re-inspections and any corrective work shall be the responsibility of the Developer. The warranty period will not be considered to be complete, and maintenance bonds will not be released until after all warranty inspections are finished and any resulting corrective work is completed.

• **Sanitary Sewer**

~~116.123.~~ Unless otherwise shown, sanitary sewer pipe shall be PVC in conformance with ASTM D3034, SDR 35. All other appurtenances and installation to conform to the City specifications.

~~117.124.~~ Sanitary sewer laterals for single family residential & each side of duplexes shall be a minimum of 4-inches in diameter (6-inch minimum for other laterals), and shall include toning wire and warning tape per standard details.

~~118.125.~~ **Sewer Cleaning.** After manhole channeling and prior to leakage testing, mandrel testing and/or TV inspection, flush and clean all sewers, and remove all foreign material from mainlines and manholes. Failure to clean all dirt, rock and debris from pipelines prior to TV inspection will result in the need to re-clean and re-TV the sewer lines.

~~119.126.~~ **Sewer Leakage Testing.** Sanitary sewer pipe and appurtenances shall be tested for leakage. Leakage tests shall include an air test of all sewer mains and laterals prior to paving, and a separate air test of all sewer mains and laterals following excavation and backfilling of any franchise utility trenches or other utility work that crosses sanitary sewer laterals. All testing shall conform to requirements as outlined on City testing forms contained in the PWDS.

~~120.127.~~ **Sewer Mandrel Testing.** Contractor shall conduct deflection test of flexible sanitary



sewer pipes by pulling an approved mandrel through the completed pipe line following trench compaction. The diameter of the mandrel shall be 95% of the initial pipe diameter. Test shall be conducted not more than 30 days after the trench backfilling and compaction has been completed.

~~121.128.~~ **Sewer TV Inspection.** Upon completion of all sewer construction, testing and repair, the Contractor shall conduct a color TV acceptance inspection of all mainlines in accordance with OSSC (ODOT/APWA) 445.74 to determine compliance with grade requirements of OSSC (ODOT/APWA) 445.40.b (no deviation greater than 1/32-inch per inch of pipe diameter [1/2-inch max for pipes >16-inch diameter], & no reverse sloping pipe inverts) and to verify pipelines are adequately cleaned. The TV inspection shall be conducted by an approved technical service which is equipped to make audio-visual recordings of the TV inspections on DVD. Unless otherwise required by the agency with jurisdiction, a standard 1-inch diameter ball shall be suspended in front of the camera during the inspection to determine the depth of any standing water. Sufficient water to reveal low areas or reverse grades shall be discharged into the pipe immediately prior to initiation of the TV inspection. The DVD and written report shall be delivered to the City Engineer.

~~122.129.~~ Prior to or concurrent with connection to a sanitary sewer lateral, it shall be demonstrated to the City that the sewer lateral is not obstructed. This shall be accomplished by “snaking” the service lateral downstream of the connection point to the mainline, or similar method acceptable to the City. City personnel or authorized agent shall be present during the “snaking” or other demonstration method.

130. Sewer service from upstream and affected properties shall be maintained during construction unless prior written City approval is granted. Bypass pumping or other methods used to maintain sewer flows shall be the Contractor’s design, subject to approval by the City. The bypass system shall be capable of conveying flows when the sewers are flowing full. Normal unrestricted flows shall be restored at the end of each work day. Bypass systems left in place or operated outside normal working hours shall be monitored continuously by the Contractor personnel unless alternate arrangements proposed by the Contractor are acceptable to the City (ie. high level & pump fail alarm callouts, etc.). The Contractor shall provide for City review all submittal information required to demonstrate (to the satisfaction of the City) compliance with these requirements. Contractor shall be responsible for all costs related to cleanup, damages and fines resulting from any sewerage spill or overflow associated with any methods used to convey sewage flows during construction.

- **Storm Drain**

~~123.131.~~ Storm drain pipe materials shall conform to the construction drawings and City requirements. Contractor shall use uniform pipe material on each pipe run between structures unless otherwise directed or approved. Jointed HDPE pipe shall not be used for slopes exceeding ten percent (10%).

~~124.132.~~ Catch basins and junction boxes shall be set square with buildings or with the edge of the parking lot or street wherein they lie. Storm drain inlet structures and paving shall be

adjusted so water flows into the structure without ponding water.

~~125.133.~~ Unless otherwise approved by the City Engineer, all storm drain connections shall be by manufactured tee or wye fittings.

~~126.134.~~ Unless otherwise shown on the drawings, all storm pipe inlets & outfalls shall be beveled flush to match the slope wherein they lie.

~~127.135.~~ Sweep (deflect) storm drain pipe into catch basins and manholes as required. Maximum joint deflection shall not exceed 5 degrees or manufacturers recommendations, whichever is less.

~~128.136.~~ Unless otherwise specified or directed, install storm drain pipe in accordance with manufacturer's installation guidelines.

~~129.137.~~ **Storm Cleaning.** After manhole channeling and prior to mandrel testing or final acceptance, flush and clean all sewers, and remove all foreign material from the mainlines, manholes and catch basins.

~~130.138.~~ **Storm Mandrel Testing.** Contractor shall conduct deflection test of flexible storm sewer pipes by pulling an approved mandrel through the completed pipe line following trench compaction. The diameter of the mandrel shall be 95% of the initial pipe diameter. Test shall be conducted not more than 30 days after the trench backfilling and compaction has been completed.

~~131.139.~~ Prior to acceptance, the City will typically lamp storm lines upstream & downstream of structures to verify that the pipes are clean and there is no grout or concrete in the mainlines, and that there are no observable bellies in the line. When necessary, sufficient water to reveal low areas shall be discharged into the pipe by the Contractor prior to any such inspection by the City.

## **STREET LIGHTS**

~~132.140.~~ Street lights shall be installed after all other earthwork and public utility installations are completed and after rough grading of the property is accomplished to prevent damage to the poles.

~~133.141.~~ Public street light poles, conduit and junction boxes shall conform with the requirements of the City and the power company providing service. Junction boxes shall be H-20 rated and set to finish grade. Direct bury street light poles shall be set to a depth as specified by the manufacturer, but not less than 5 feet.

~~134.142.~~ Street light poles shall be installed within one degree (1°) of plumb.

~~135.143.~~ All public street lights shall be energized and fully operational prior to requesting final inspection by the City.



## **FRANCHISE & PRIVATE UTILITIES**

~~136.~~144. Unless otherwise shown on the drawings and approved in writing by all jurisdictions having authority, new and relocated franchise utilities (power, cable TV, telephone & gas) shall be installed underground in conjunction with the development.

~~137.~~145. Franchise utility plans shall be submitted to Public Works and the City Engineer for review prior to installation. All franchise utility street crossings shall be installed at right angles to the street centerline, and all crossings of water, sewer or storm mainlines or laterals shall be as close to perpendicular as feasible.

~~138.~~146. Where franchise utilities are installed along new public or private streets, franchise utilities shall either be extended across the entire frontage of the property or to the end of the street improvements (whichever is further) or conduit shall be provided for extension of franchise utilities in the future without additional excavation along the new street frontage.

~~139.~~147. Developer and/or Contractor shall coordinate with gas, power, telephone, and cable TV company for installation/location of utilities and/or conduits in common trenches, as well as location of vaults, pedestals, etc., as required to serve all existing homes and new lots within the development. The Contractor shall be responsible for providing franchise utility companies adequate written notice of availability of the open trench (typically 10 days minimum), and reasonable access to the open trench for installation of franchise utilities as required to serve each lot within the development or along offsite improvements (even though how or whether the homes will connect to such franchise utility service lines will be up to the homebuilder or homeowner).

~~140.~~148. Unless otherwise approved in writing by the City, all above-grade facilities shall be located in PUEs (where PUEs exist or will be granted by the development), and otherwise shall be placed in a location outside the proposed sidewalk location. Contractor shall grade street frontage PUEs so that all franchise utility pedestals and vaults can be set to finished grade as measured from the back of the public sidewalk (whether the sidewalk is installed with street construction or deferred to a later time).

~~141.~~149. Installation of private utilities (including either franchise utilities or private water, sewer or storm services) in a common trench with public water, sanitary sewer or storm drains, or within 35 feet horizontally of (ie. clear separation) and paralleling public water, sanitary sewer or storm drains is prohibited.

~~142.~~150. Power, telephone and TV trenching and conduits shall be installed per utility company requirements with pull wire. Contractor shall verify with utility company for size, location and type of conduit prior to construction, and shall ensure that trenches are adequately prepared for installation per utility company requirements. All changes in direction of utility conduit runs shall have long radius steel bends.

~~143.~~151. Contractor shall notify and coordinate with franchise utilities for relocation of power

## **EROSION CONTROL NOTES**

*The erosion control notes and details contained in these PWDS also apply to work under separate building permits issued without the need for a Public Works Construction Permit. City Code requires that erosion control measures be provided for work under such building permits, to minimize runoff, siltation and pollution both during and after construction (DMC 7.2.304.03 & 7.2.301.02).*

### **General**

1. Approval of an erosion/sedimentation control (ESC) plan does not constitute an approval of permanent road or drainage design (e.g. size and location of roads, pipes, restrictors, channels, retention facilities, utilities, etc.)
2. The implementation of ESC plans and the construction, maintenance, replacement and upgrading of ESC facilities is the responsibility of the applicant/contractor until all construction is completed and approved and vegetation/landscaping is established as provided for on the construction drawings, or until 75% coverage without bare spots (ie. vegetation well established and not just showing).
3. The erosion control measures shown on the ESC plan are considered the minimum required for anticipated site conditions, and shall be supplemented and/or upgraded by the applicant/contractor as required to control erosion or sediment within the project boundaries and avoid impacts to adjacent property. Additional measures shall be installed as required to ensure that all paved areas are kept clean for the duration of the project.
4. The boundaries of the clearing limits shown on the plans shall be clearly flagged in the field prior to construction. During the construction period, no disturbance beyond the flagged clearing limits shall be permitted. The flagging shall be maintained by the applicant/contractor for the duration of construction. Sediment fence may be used as the flagging for the clearing limits at the discretion of the Contractor.
5. The ESC facilities must be installed and maintained in conjunction with all clearing, grading and construction activities, and in such a manner as to insure that sediment and sediment laden water do not enter the drainage system, roadways, or violate applicable water standards. The Contractor shall be financially responsible for all costs, violations, fines and/or penalties resulting from failure to adequately control erosion or sediment.
6. Erosion control facilities and sediment fences on active sites shall be inspected by the Contractor at least daily during any period with measurable precipitation. Any required repairs or maintenance shall be completed immediately. The erosion control facilities on inactive sites shall be inspected and maintained by the Contractor a minimum of once a month or within 24 hours following the start of a storm event, or within 24 hours of notification for failure of erosion control devices.
7. Sediment protection (silt sack inserts with biobags) for storm drain inlets, catch basin and area drains shall be installed and maintained for the duration of the project, and until permanent

vegetation/landscaping is established.

8. At no time shall sediment accumulation within a trapped catch basin exceed 50% of the sediment capacity. All catch basins and conveyance lines shall be cleaned prior to paving, by the Contractor as their cost. The cleaning operation shall not flush sediment laden water into the downstream system. Contractor shall also verify that all catch basins and conveyance lines are clean, and all trash or sediment deposits are removed, prior to requesting final inspection of the project by the City.
9. In addition to hydroseeding, for slopes 2H:1V or steeper (or where slope protection matting is indicated on the drawings or required by Public Works), the erosion matting shall be a type that has a extended term functional longevity (ie. minimum 24 months degradability) and specifically designed for use of 2:1 or steeper slopes to ensure that the steep slopes are protected until they have adequate vegetation cover established before the matting biodegrades away. Erosion control matting shall be SC150 matting by North American Green, or approved equal (consisting of a full layer of 70% straw and 30% coconut fiber stitched with degradable thread between a heavyweight UV stabilized polypropylene top net and a lightweight photodegradable polypropylene bottom net).
10. The Contractor shall provide (at Contractor's expense) site watering as necessary to prevent wind erosion of fine-grained soils, and to support vegetation until it is established as specified herein, or as required by an erosion control permit or to comply with City/state/federal erosion control standards.
11. Soil or native fill stockpiles placed or left in place during wet weather periods shall be covered with UV resistant plastic or tarps anchored and weighted in place. Stockpile covering shall also include installation of sediment fences or other sediment barrier around the stockpile on all sides. Inactive stockpiles shall not be left uncovered for more than 7 days during dry weather periods.

#### **Sediment Fences**

- ~~11.12.~~ Sediment fences shall consist of standard strength filter fabric fastened securely to stitched post loops, and shall be installed on the upslope side of the posts, with 6 inches of the fabric extended into a trench along the sediment fence alignment. The fabric shall not extend more than 30 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
- ~~12.13.~~ The sediment fence (filter fabric barrier) shall be purchased in a continuous roll cut to the length of the barrier to minimize joints. When joints are necessary, the sediment fence shall be spliced together only at a support post, with a minimum 6 inch overlap, and both ends securely fastened to a post. The support post ends of each sediment fence section shall be twisted together by at least 2 turns and both stakes installed into the ground together.
- ~~13.14.~~ The filter fabric fence shall be installed to follow the contours where feasible. The fence posts shall be spaced a maximum of 6 feet apart and driven securely into the ground, and shall be provided with additional support as required to contain all silt and sediment capture. Filter

**CITY OF DAYTON**  
**Public Works Design Standards**

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**Standard Easement Forms, Etc.**

**Appendix D**

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Note: Forms in this appendix are sample model documents only, included for convenience of reference by developers. These sample documents are for reference only, and may not have the proper margins and spacing required by the County Clerk for recording.

The documents are subject to modification by the City to address project specific conditions *(as required by the Public Works Director, the City Engineer or the City Attorney)*.

Easement Procedure Summary *(similar procedure for ROW dedications)*.

- For easements from a developer or property owner to the City, the easement legal description and to-scale exhibit map for the proposed easement shall be submitted to the City for review and approval. Exhibit maps not drawn and plotted to scale, or not containing the information required under PWDS 1.11.b, will be returned for revision.
- Once approved, the City will attach the legal description and exhibit map to the appropriate City easement form *(modified by the City as applicable based on specific project conditions)*, and it will be returned to the developer for execution and recording at the County.
- A photocopy of recorded easements documents must be returned *(hard copy or email)* to the City after recording *(ie. to the City Planner, Public Works Director & City Engineer)*.
- All recording costs shall be borne by the Developer.



**After recording, return to:**

Dayton City Recorder  
PO Box 339  
Dayton, OR 97114-0339

**PUBLIC UTILITY EASEMENT**

\_\_\_\_\_ and \_\_\_\_\_ (collectively "Grantor"), for good and fair consideration the receipt of which is hereby acknowledged, does hereby grant unto the City of Dayton, ("Grantee" & "City"), a permanent exclusive public utility easement and non-exclusive inspection & maintenance access easement ("Easement") over, across, and through the real property described in EXHIBIT A and depicted in EXHIBIT B (the "Easement Area") for constructing, reconstructing, installing, and maintaining water, sanitary sewer, storm drainage and other associated utilities not deemed incompatible by the Grantee, including the right to utilize routes on and across the Grantor's property as required to access said easement. The easement is in gross for the benefit of the Grantee/City in perpetuity, and subject to the conditions relating to merger and/or vacation/extinguishment as summarized herein.

The Easement Area referenced above is located within the following described properties:

- Lot \_\_, Block \_\_, \_\_\_\_\_ subdivision plat, Yamhill County Deed Records
  - Tract described in Deed Reference Number \_\_\_\_\_, Yamhill County Deed Records.
- (collectively the Grantor's Property)

The parties further agree as follows:

1. The true and actual consideration paid for this easement is \$ \_\_\_\_\_.

The true and actual consideration for this easement consists wholly of value other than money, including the mutual promises and conditions contained herein.

2. Grantor Rights & Obligations. The Grantor agrees not to plant, build, construct or create (or permit others to plant, build, construct, or create) any cuts, fills, flora, buildings or other structures including fences or parallel utilities in the Easement Area that may interfere with Grantee's use of the Easement Area as set forth herein. Prohibited structures in the Easement Area include but are not limited to decks, footings, or overhanging portions of structures which are located outside of the Easement Area. Grantor may use the Easement Area for permitted parking and/or access so long as that use does not interfere with Grantee's use of the Easement Area.

The Grantor agrees not to construct cuts or fills within or on the easement area without express written approval by the Grantee, since this will interfere with the use of the easement for the purposes set forth herein. Any such approval by the Grantee shall be contingent on the Grantor performing all work required to mitigate impacts due to such cuts or fills, including reconstructing or resetting the utilities and appurtenances as directed by the Grantee, at the Grantor's sole expense.

3. Construction, Repair, Inspection and Maintenance. Grantee shall be responsible for the construction, installation, maintenance, and repair of any Grantee utilities in the Easement Area, except to the extent the need for such maintenance and repair is caused by the gross negligence or willful misconduct of Grantor. The Grantee may remove any obstructions in the Easement Area that interfere with Grantee's use of the Easement Area without any payment to the Grantor including but not limited to trees, undergrowth, buildings, overhangs, fences, shrubbery, cut areas or fill material. Grantee agrees that with the exception of appurtenances which must be at or above grade, all of the utilities will be placed underground. The Grantee shall return the Easement Area to a good condition (i.e. repair/replace soil disturbance; removal of construction debris, rocks/gravel and other materials; etc.) with all damage resulting from or arising out of said use to be repaired by Grantee. The Easement shall include the right of the Grantee, its employees, agents, contractors, consultants and assigns to have ingress and egress to and along the Easement Area for the purposes summarized herein, as well as the right to utilize routes on or across the Grantor's Property as required for inspection or maintenance access, including ingress and egress along any all-weather access lanes required by City standards. In the event Grantor installs cross fences in the Easement Area, Grantor agrees to construct gates allowing Grantee to access the Easement Area.

Grantor shall be responsible for maintenance and repair of any all-weather access lanes which are provided along (or to provide access to) City utilities, in a manner and condition to allow the City, its employees, agents, contractors, consultants and assigns to have vehicular access along said access lane at all times and during all seasons for the purpose of inspecting, maintaining or repairing City utilities.

4. Compliance with Laws. In utilizing the Easement Area, both parties agree to comply with any applicable State, local or Federal laws or regulations for public health or safety, construction or environmental protection.
5. Title Warranty. Grantor represents and warrants that to the best of its knowledge, Grantor owns the entire fee simple interest in the Property, which is free to the best of Grantor's knowledge from all encumbrances (except for easements, conditions and restrictions of record), and has the full power and lawful authority to grant this Easement.
6. Entire Agreement. This Easement is the final and complete agreement between the parties concerning the rights granted herein, and supersedes all prior understandings with respect to it. Except as otherwise set forth in this Easement, this Easement may not be modified or terminated, nor may any obligations under it be waived, except by written instrument signed by all parties to the Easement. The Grantee may vacate or terminate this easement in accordance with state law and local ordinance, subject to the condition that the easement will not be considered abandoned until City Council has declared (in writing) the easement abandoned and no longer in use by (or of benefit to) the City.
7. Further Cooperation. Each of the parties agree to execute such other documents and to perform such other acts as may be reasonably necessary or desirable to further the expressed and intent purpose of this Easement.

**CITY OF DAYTON**  
**Construction Drawing Review, Public Works Permit, Construction Requirements & Procedures**

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**PWDS Appendix G**  
**Construction Drawing Review, Public Works Permit,**  
**Construction Requirements & Procedures**

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prepared by and certified by a registered professional civil engineer licensed by the State of Oregon.

## **G.7 CONSTRUCTION DRAWING REVIEW PROCESS AND REVIEW FEES**

- a. All construction drawings (*plans*) for Type A or Type B permits shall be reviewed in general conformance with the procedures outlined in PWDS Section 1.9 of the Public Works Design Standards (PWDS), including providing preliminary drawings and scheduling a pre-design meeting (*per PWDS 1.9.a*) between the developer's engineer and Public Works (& City Engineer as applicable) to receive input regarding design issues related to required improvements.

The submittal for construction drawing review shall be filed by the responsible party (*ie. the design engineer for public improvements*) with the Public Works Director for any permit or permits required by these standards.

In addition to requirements, documents and information listed under PWDS 1.10.b (*full list is not reproduced here*), such submittal for construction drawing review shall include the following as applicable.

- 1) Name and address of the owner or owners of the property;
- 2) Name and address of the developer of the property;
- 3) Name, address, and phone number of the designer (*design engineer for public improvements*);
- 4) Description of the work area location, including addresses as applicable;
- 5) Preliminary plans (*3 sets for single family residential developments, and 4 sets for commercial, industrial and multifamily developments*) showing a vicinity map and details of the proposed project, including street widths and property lines, existing and proposed utility locations. In the case of public improvements, preliminary plans shall include all applicable information outlined under PWDS 1.10.
- 6) Estimated construction cost of the proposed project, or estimates based on the construction cost estimate schedule established by the Public Works Director or the City Engineer.
- 7) Plan review fees as prescribed by resolution of the City Council (*for franchise utilities, see Section G.9e*).
- 8) Review fees required in Subsection (7) of this section are nonrefundable, and are required to support permit plan review.
  - a) A plan review fee deposit based on a percentage (to be set by resolution of the City Council) of the initial engineer's estimate of all



construction work related to the project (ie. all work covered under the PWDS) is due at submission of the engineered construction drawings for review (see also PWDS 1.10.b.13 for costs to be included in the estimate).

- b) Monthly billings of any City costs exceeding the plan review fee deposit, payable within 30 days.
  - c) Final reconciliation of project review and inspection costs, including City Engineer review & inspection costs and Public Works staff expenses, will be determined at project completion. Any final balance due the City must be paid before City approval and/or acceptance of the project.
- 9) Evidence that all federal and state laws and regulations have been complied with, including a copy of any permits required by federal, state, or county agencies.
- 10) A current title report(s) covering all property where utility construction will occur (which includes a list of all existing easements, restrictions, and other encumbrances, including copies of deeds, easements or other restrictive documents referenced in that report) [a pdf copy of each title report with embedded hyperlinks to the referenced documents may be provided in lieu of a hard copy].
- ~~10)11)~~ Such other information as the Public Works Director shall find reasonably necessary for the determination of whether plans should be approved for permit.

## **G.8 CONSTRUCTION PERMIT APPLICATION**

- a. Application Form. Following review and approval of the plans by the City, an application for a construction permit as required by these standards shall be filed with the Public Works Director. Such applications shall be in the form prescribed by the City and shall include the following information as a minimum:
  - 1) Name and address of the owner or owners of the property.
  - 2) Name and address of the developer of the property.
  - 3) Name and address of the designer (*design engineer for public improvements*).
  - 4) Name and address of the party doing the work, including subcontractors.
  - 5) Location of the work area, including addresses as applicable.
- b. Supplemental Information Required. Prior to issuance of the public utility construction permits, the Developer shall provide the City with the following (*see*

**SECTION 01300**  
**CONTRACTOR CONSTRUCTION SUBMITTALS**

**PART 1: GENERAL**

1.1 SCOPE

- a. Construction submittals for review by the City are required for all material & equipment which is incorporated into work covered under the PWDS or which will be turned over to the City for operation and maintenance, including but not limited to streets/sidewalks, water/sewer/storm drainage improvements, pump stations, treatment facilities (water, sewer or storm), storage reservoirs, bridges, etc.
- b. Delivery prior to approval of any material or equipment for which submittals are required will be at the Contractor's risk. Material or equipment for which submittals are required shall not be incorporated into the work until after the submittals have been reviewed and approved.
- c. Construction Submittal Format & Number of Copies.
  - 1) Contractor will be allowed to provide electronic/pdf copies of highlighted/marked-up submittals and associated submittal cover sheet, conditional upon submittals being complete and configured in accordance with the requirements of this section.
  - 2) If the Contractor fails to provide submittals in full conformance with this section, the Public Works Director and/or City Engineer may require all subsequent submittals to be submitted in hard copy format (three copies minimum).

1.2 GENERAL SUBMITTAL REQUIREMENTS

- a. Review by Engineer-of-Record Required.
  - 1) Unless otherwise approved in writing by the Public Works Director, all submittals to the City (*with the exception of the laboratory and test reports*) shall be first reviewed by the Engineer-of-Record, who is responsible to verify that the submittals conform with the approved design and with PWDS requirements before they are forwarded to the City for review. Direct submittals from contractors, subcontractors or suppliers will not be accepted by the City unless otherwise noted herein.
  - 2) Prior to submitting to the Engineer-of-Record, the Contractor shall carefully review the correctness and thoroughness of the material, verify all field measurements, and coordinate all aspects of each item being submitted.
  - 3) The Contractor shall carefully review and ensure that all submittals are tailored to the project by highlighting appropriate information and/or deleting or crossing out non-applicable information, and that all options and equipment furnished are indicated, and ensure that the submittal is otherwise organized and marked as required herein or in the individual specification sections as applicable.
  - 4) **The Contractor shall verify his review by affixing his stamp of approval and signature to the front page of each submittal package.**
- b. Direct Supplier/Subcontractor Submittals Not Accepted. All submittals to the City, with the exception of the laboratory test certificates, shall be made only after review by the Engineer-of-

Record. Submittals from subcontractor or suppliers will not be accepted.

- c. Sequential Numbering. All submittal reports shall be numbered sequentially. Resubmittals shall be designated with the same number as the original submittal followed by a designation letter (ie. Submittal "5A" for the first resubmittal of submittal 5, Submittal "5B" for second, etc.).
- d. Specified Cover Sheet. All submittals shall be accompanied by a completed copy of the submittal report cover sheet included under Part 4 of this section.
- 1) A separate submittal report cover sheet shall be prepared for each submittal. Generally, items under a single PWDS division can be included on the same submittal report. Each submittal report shall clearly designate the PWDS division & section(s) that apply to the material or equipment being submitted on.
  - 2) A single submittal report shall not be used for items under different PWDS divisions.
  - 3) All submittal report cover sheets shall reference the item(s) that it covers, the applicable PWDS division & section(s), the Contractor's name, the Project title and location, and the date of submission. Submittal shall also indicate whether the information is for review and approval by the City, for record purposes or for the fulfillment of the operation and maintenance requirements.
- e. The Contractor shall provide copies of each submittal as follows unless otherwise directed by the City:
- 1) Material and Equipment Construction Submittals – Four (4) copies provided to City if pdf submittals are dis-allowed as noted above.
  - 2) Quality Control Submittals – The Contractor or the laboratory shall submit one copy of all test certificates, and calibration certificates directly to the following; Public Works Director and City Engineer.
  - 3) Informational Submittals – The Contractor shall submit one copy of all licenses and permits directly to the following; Public Works Director and City Engineer.
- f. Substitutions. Manufacturers submitting proposals for equipment which will require changes to the design shown on the Drawings or specified herein shall also include detailed information on structural, electrical, mechanical and other miscellaneous changes or modifications required to adapt their equipment to the design shown, or as specified below. Provision of such information or acceptance for review shall not be construed as approval of such substitute.
- ~~g. Highlighting and/or Marking. All submittals shall be tailored to the project by highlighting appropriate information and/or deleting or crossing out non-applicable information *(as well as being marked, labeled or identified with where the product will be used, as applicable)*. All options and equipment furnished shall be so indicated. **Failure to follow these instructions will result in the submittal being returned to the Contractor without review.**~~
- ~~g-h. Complete Submittals Required. **Failure to provide complete submittals, or failure to follow the instructions outlined in this section *(including but not limited to highlighting applicable information and/or crossing out non-applicable information)*, will result in the incomplete submittal being returned to the Contractor without review, at the discretion of the City Engineer or the Public Works Director.**~~