WOODLAND DRAINAGE STANDARDS
SHEET INDEX

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GENERAL NOTES FOR STORM SEWERS


2. ALL STORM SEWER AND DRAINAGE SYSTEM CONSTRUCTION IS SUBJECT TO INSPECTION AND APPROVAL BY THE CITY OF WOODLAND’S PUBLIC WORKS DEPARTMENT. THE CONTRACTOR SHALL NOTIFY THE PUBLIC WORKS OFFICE (360) 225-7999 AT LEAST 48 HOURS PRIOR TO THE START OF ANY CONSTRUCTION. THE CITY MAY REQUIRE THAT A PRECONSTRUCTION CONFERENCE BE HELD.

3. THE CONTRACTOR IS REQUIRED TO NOTIFY ALL UTILITIES 48 HOURS PRIOR TO COMMENCEMENT OF WORK. THE CONTRACTOR MAY CONTACT THE NORTH-WEST UTILITY NOTIFICATION CENTER AT 1-800-424-5555 IN LIEU OF CONTACTING INDIVIDUAL UTILITIES.

4. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER AND/OR CONTRACTOR TO PROCEDE AND COMPLY WITH THE PROVISIONS OF ALL APPLICABLE PERMITS, EASEMENTS, LICENSES AND CERTIFICATES IN CONJUNCTION WITH THE CONSTRUCTION OF STORM SEWERS AND DRAINAGE SYSTEMS. COMPLIANCE SHALL BE AT ALL LEVELS: FEDERAL, STATE, AND CITY, RELATING TO THE PERFORMANCE OF THIS WORK. THE CONTRACTOR SHALL OBTAIN A STREET CUT PERMIT FOR WORK WITHIN THE PUBLIC RIGHT-OF-WAY.

5. THE CONTRACTOR SHALL OBTAIN AND SUBMIT AN APPROVED TRAFFIC CONTROL PLAN PRIOR TO BEGINNING CONSTRUCTION. THE PLAN SHALL BE APPROVED BY THE PUBLIC WORKS DIRECTOR.

6. ALL EROSION CONTROL BEST MANAGEMENT PRACTICES (BMPs) SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE EROSION CONTROL PLAN AND EROSION CONTROL DETAILS, PRIOR TO START OF ANY CONSTRUCTION OR LAND DISTURBING ACTIVITY.

7. THE CONTRACTOR SHALL OBTAIN ALL OFFSITE CONSTRUCTION EASEMENTS PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL VERIFY THAT ALL OFFSITE UTILITIES EASEMENTS HAVE BEEN OBTAINED BY THE OWNER PRIOR TO THE COMMENCEMENT OF ANY OFFSITE CONSTRUCTION.

8. THE CONTRACTOR IS TO VERIFY AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE ENGINEER. ITEMS TO VERIFY INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
   —INVERT AND TOP ELEVATIONS OF EXISTING STORM SEWERS
   —CENTERLINE AND TOP OF CURB ELEVATIONS

9. WATER QUALITY DEVICES WILL BE INSTALLED AND FUNCTIONING PRIOR TO COMMENCING WITH INSTALLATION OF PAVEMENT FOR ALL AREAS DRAINING INTO THE WATER QUALITY SYSTEM. VEGETATION IN BIO-FILTRATION SWALE AND POND SYSTEMS SHALL BE ESTABLISHED AND MECHANICAL DEVICES AND FILTER MEDIA SHALL BE INSTALLED. SWALES AND FILTER STRIPS WILL BE SEEDED WITH AN APPROVED SEED MIX, PER THE WESTERN WASHINGTON MANUAL. TURF IS ALLOWED FOR VEGETATED FILTERS PROVIDED THE TURF AREA IS OVERSEeded WITH THE EQUIVALENT GRASS SEED MIX.

10. ALL CATCH BASINS SHALL BE STENCILLED: “PROTECT STREAMS” OR “PROTECT GROUNDWATER.”

11. ROOF DOWNSPOUT RUNOFF MUST BE RETAINED ON EACH SPECIFIC SITE. DOWNSPOUTS SHALL NOT DRAIN TO THE STREET OR ANY ADJACENT PROPERTIES UNLESS SPECIFIC APPROVAL HAS BEEN OBTAINED.

12. THE CONTRACTOR WILL PROVIDE A TELEVISION REPORT, TAPE, AND TABULAR AS-BUILT OF ALL PUBLIC STORM MAINS AND LATERALS PRIOR TO PAVING. THIS INFORMATION WILL BE SUBMITTED TO THE CITY INSPECTOR FOR REVIEW. APPROVAL AND ACCEPTANCE OF THE TV INSPECTION WILL BE BASED UPON MANUFACTURING AND INSTALLATION SPECIFICS, AS WELL AS DEBRIS IN THE LINES. FINAL ACCEPTANCE AND CONSTRUCTION OF STORM SEWERS ARE SUBJECT TO INSPECTION AND TESTING IN ACCORDANCE WITH SECTIONS 1–05.11, 1–05.12, AND 7–04.3 OF THE STANDARD SPECIFICATIONS.
NOTES:

1. LATERALS WILL BE CONSTRUCTED TO ENTER THE BASIN PERPENDICULAR TO THE BASIN WALL. THE LATERAL WILL ENTER ONLY AT THE FRONT OR SIDE OF THE BASIN WITH NO LATERALS ALLOWED TO ENTER THE CATCH BASIN AT THE CORNERS. IF NEEDED, A BEND MAY BE USED AS THE FIRST SECTION OF PIPE OUTSIDE THE BASIN WALL. THE MAXIMUM BEND ALLOWED IS 45 DEGREES.

2. ALL REINFORCED STEEL SHALL HAVE A 1-1/2" CLEAR COVER UNLESS OTHERWISE NOTED, AND SHALL BE GRADE 40 OR GRADE 60 (ASTM A-615).

3. ANY PROTRUDING ENDS OF PIPES SHALL BE TRIMMED FLUSH WITH THE INSIDE WALLS AND GROUTED.

4. THE METAL FRAME AND GRATE SHALL BE SET TO A SLOPE TO CONFORM TO THE PARTICULAR DRAINAGE AREA (SEE DETAIL D-08).

5. ELBOW SECTION SHALL BE REMOVABLE FOR MAINTENANCE PURPOSES USING A BELL AND SPIGOT JOINT.

6. ALL PRECAST OR CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
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COMBINATION CURB INLET

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PUBLIC WORKS DIRECTOR  DATE
1. Laterals will be constructed to enter the basin perpendicular to the basin wall. The lateral will enter only at the front or side of the basin with no laterals allowed to enter the catch basin at the corners. If needed, a bend may be used as the first section of pipe outside the basin wall. The maximum bend allowed is 45 degrees.

2. All reinforced steel shall have a 1-1/2" clear cover unless otherwise noted, and shall be grade 40 or grade 60 (ASTM A-615).

3. Any protruding ends of pipes shall be trimmed flush with the inside walls and grouted.

4. The metal frame and grate shall be set to a slope to conform to the particular drainage area (see detail D-08).

5. Elbow section shall be removable for maintenance purposes using a bell and spigot joint.

G-2 Catch Basin

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PUBLIC WORKS DIRECTOR

DATE
NOTES:
1. ALL PRECAST SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478.
2. ALL Poured IN PLACE CONCRETE SHALL HAVE A 28 DAY STRENGTH OF 4,000 P.S.I. AND 2" TO 4" SLUMP.
4. USE SLANTED OR BOX FRAME AND GRATE AS REQUIRED BY CITY.
NOTES:

1. AREA INLETS TO BE CONSTRUCTED FROM CONCRETE PIPE, IN ACCORDANCE WITH ASTM C 14 UNLESS OTHERWISE SHOWN ON THE PLANS OR NOTED IN THE STANDARD SPECIFICATIONS.

2. CUTOUT HOLE SIZE IS EQUAL TO OUTLET PIPE OUTSIDE DIAMETER PLUS AREA INLET WALL THICKNESS. INSTALL TYPE 60A TRAP OR APPROVED EQUAL.

3. CONNECTION TO OUTLET PIPE TO BE GROUTED AND MADE FLUSH WITH INSIDE OF THE AREA INLET WALL.

4. CAST IRON BELL GRATE SHALL MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. THE GRATE SHALL HAVE SLOTS (HOLES) THAT CONSTITUTE 50% OPEN AREA FOR DRAINAGE. INLET BELL SURFACE SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.

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<td>OUTLET PIPE DIA Ø</td>
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<td>8”</td>
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<td>12”</td>
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NOTES:
1. WELDING NOT PERMITTED.
2. USE VANED GRATE WHERE LONGITUDINAL SLOPE EXCEEDS 4%.
3. SEATING OF GRATE SHALL BE ACCOMPLISHED BY ONE OF THE FOLLOWING:
   - ALTERNATE A SHALL BE B PADS 1-1/2" x 3/4" x 1/8" INTEGRALLY CAST WITH THE GRATE.
   - ALTERNATE B SHALL BE A MACHINED SURFACE OUTSIDE A 17" CIRCLE, BOTTOM ONLY.

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<td>1 3/4&quot; MAX</td>
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* 1 5/8" (+0", -1/16")
DRILL 3/4" VENT HOLE AT TOP OF TRAP

LOW PROFILE ELBOW

TRAP TO PREVENT SEDIMENT AND DEBRIS FROM ENTERING OUTLET PIPE

PIPE WALL TRIMMED FLUSH WITH INSIDE WALL OF INLET AND GROUTED INSIDE & OUTSIDE

INSTALL PER MANUFACTURERS SPECIFICATIONS. DO NOT GROUT TRAP, TRAP TO BE REMOVABLE FOR MAINTENANCE.
NOTES:

1. ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF A.S.T.M. C478.

2. BASE CONCRETE SHALL BE 3000 P.S.I., 2"-4" SLUMP, FLOW LINES AND INSIDE SURFACES SHALL BE TROELED SMOOTH AND UNIFORM AT TIME OF POUR.

3. JOINTS SHALL BE CONSTRUCTED SO AS TO BE WATERTIGHT. KENT-SEAL NO. 2 OR APPROVED EQUAL SHALL BE USED ON TONGUE AND GROOVE SECTIONS. PREMOLDED "O" RING MAY BE SUBSTITUTED ON BELL AND SPIGOT SECTIONS. ALL JOINTS SHALL BE GROUTED WITH PORTLAND CEMENT GROUT AND STRUCK EVEN WITH THE WALL.

4. MANHOLES UNDER 6 FEET IN DEPTH FROM RIM TO SHELF SHALL HAVE A TOP SLAB IN LIEU OF CONE.

5. ALLOWABLE DISTANCE BETWEEN PIPE KNOCKOUTS IS 8 INCHES.

STANDARD MANHOLE FOR 24-INCH OR SMALLER PIPE OR 30-INCH DUCTILE IRON PIPE
NOTES:
1. SEE STANDARD MANHOLE DETAIL D-10 FOR DETAILS ON THE MANHOLE SECTIONS AND STEP SPECIFICATIONS.
2. TEE SECTION SHALL BE REMOVABLE FOR MAINTENANCE PURPOSES.
3. ANY PROTRUDING ENDS OF PIPES SHALL BE TRIMMED FLUSH WITH THE INSIDE WALLS AND GROUTED.

SECTION A-A

BEDDING PER SECTION 9-03.12(3) OF THE STANDARD SPECIFICATIONS
NOTES:

1. ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF A.S.T.M. C478.

2. ALL PIPING TO AND FROM PRECAST DRYWELLS SHALL HAVE AT LEAST 8" OF 1-1/2" MINUS CLEAN CRUSHED ROCK COVER CONTINUOUSLY AROUND PIPE WHERE DRAIN ROCK WOULD OTHERWISE BE IN CONTACT WITH PIPE.

3. PERFORATIONS SHALL BE HORIZONTAL ROWS OF (14) 2-1/4" SQUARE OR (14) 2-3/8" ROUND HOLES, EQUALLY SPACED. ROWS SHALL BE SPACED 6-1/2" CENTER TO CENTER. PERFORATIONS SHALL BE ANGLED AS SHOWN OR HORIZONTAL.

4. STANDARD DRYWELL DEPTH SHALL BE 13 FEET UNLESS NOTED OTHERWISE.

5. ANY PROTRUDING ENDS OF PIPES SHALL BE TRIMMED FLUSH WITH THE INSIDE WALLS AND GROUTED.
NOTES:
1. VALVE BOX SHALL BE FORT VANCOUVER PATTERN NO. 910 CAST IRON OR APPROVED EQUAL.
2. MATERIAL TO BE GRAY CAST IRON CONFORMING TO ASTM A-46 CLASS 30.
3. LID TO HAVE "S" CAST IN OR STAMPED ON. "W" CASTING NOT ALLOWED.
4. TOLERANCE = 1/8".
5. SEWER CLEANOUT TO BE 8" DIAMETER.
NOTES:

1. PROVIDE UNIFORM SUPPORT UNDER BARREL, HAND TAMPER UNDER HAUNCHES.

2. BEDDING MATERIALS SHALL CONFORM TO SECTION 9-03.12(3) OF THE STANDARD SPECIFICATIONS.

3. FOR ROCK AND OTHER INCOMPRESSIBLE MATERIALS, THE TRENCH SHALL BE OVER EXCAVATED A MINIMUM OF 6 INCHES AND REFILLED WITH GRANULAR MATERIAL AS DIRECTED BY THE ENGINEER.

4. BEDDING AND BACKFILL MATERIALS IN THE PIPE ZONE SHALL BE COMPACTED TO 95%.

5. NATIVE MATERIAL MAY BE USED IN LIEU OF IMPORTED MATERIAL FOR BEDDING SPECIFIED, PROVIDED THAT THE NATIVE CONFORMS TO SECTION 9-03.12(3) OF THE STANDARD SPECIFICATIONS, AND IS APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL SUBMIT A SAMPLE OF THE MATERIAL TO THE ENGINEER AT LEAST 72 HOURS PRIOR TO USE. THE ENGINEER MAY APPROVE, REJECT OR REQUIRE LAB TESTING OF THE MATERIAL.

6. TRENCH WIDTH SHALL NOT EXCEED 1 1/2 TIMES THE ID OF THE PIPE PLUS 18 INCHES AT THE TOP OF THE PIPE ZONE.

7. ALL JOINTS SHALL BE AIR-TIGHT FOR NON-PERFORATED PIPE. THE ENGINEER MAY REQUIRE TESTING OF ANY OR ALL JOINTS AND CONNECTIONS.

8. DEPTH OF BEDDING MATERIAL BELOW PIPE

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<tr>
<td>27&quot; &amp; SMALLER</td>
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<td>LARGER THAN 27&quot;</td>
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TRAVELED UNIMPROVED STREET

WHEN NOT OTHERWISE SPECIFIED, RESURFACING SHALL CONSIST OF 6" OF 1-1/4"-0 OR CRUSHED BACKFILL
CRUSHED AGGREGATE

95% COMPACTION

PIPE ZONE 1

TRENCH EXCAVATION

HARD SURFACE (CONCRETE)

WHEN NOT OTHERWISE SPECIFIED, RESURFACING SHALL CONSIST OF 6" OF CONCRETE ON 12" OF 1-1/4"-0 CRUSHED AGGREGATE

95% COMPACTION

PIECE ZONE 1

TRENCH EXCAVATION

ROADWAY SHOULDER

SLOPE TO MATCH EXISTING (5% MIN)

6" MIN

EDGE OF EXISTING PAVEMENT

5/8"-0 CRUSHED BACKFILL
95% COMPACTION

GRANULAR BACKFILL

90% COMPACTION

NATIVE AGGREGATE

NOTES:
1. FOR PIPE-ZONE BEDDING, BACKFILL AND COMPACTION REQUIREMENTS, SEE STANDARD DETAIL D-15.
2. COMPACTION PERCENTAGES REFER TO RELATIVE DRY DENSITY AS DETERMINED BY STANDARD PROCTOR (ASTM D 698)
3. CONTRACTOR MAY USE UP TO 2-1/2" OF 5/8"-0 OR 3/4"-0 CRUSHED AGGREGATE IN LIEU OF 1-1/4"-0 BASE ROCK UNDER SURFACING FOR LEVELING COURSE.
4. ALL EXISTING PAVED SURFACES SHALL BE SAW CUT A MINIMUM OF 6" OUTSIDE OF EDGE OF TRENCH TO PROVIDE A NEAT STRAIGHT EDGE.
5. THE EDGES OF ALL EXISTING ASPHALT SURFACES SHALL BE CLEANED AND A TACK COAT SHALL BE APPLIED PER STD. SECTION 5-04.3(5). ALL JOINTS SHALL BE SEALED WITH AR-4000 AND SANDED.
6. ALL BACKFILL SHALL BE MECHANICALLY COMPACTED IN LIFTS WHICH DO NOT EXCEED RATED CAPABILITY OF EQUIPMENT USED, BUT IN NO CASE EXCEED 12" LOOSE.
7. GRANULAR BACKFILL SHALL MEET REQUIREMENTS OF SECTION 9-30.7(3) UNLESS OTHERWISE SPECIFIED.