STANDARD DETAIL MODIFICATION PROCEDURE

In the event it is necessary to modify any of the enclosed Standard Detail Drawings, please obtain the “BORDER FOR MODIFIED DETAILS” from the Public Works Standards CD and follow the directions as noted. Include the Drawing description at the bottom of the border.
# Standard Details

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SET IN NON-SHRINK MORTAR

MANHOLE FRAME AND COVER PER PLANS AND SPECIFICATIONS.

GRADE RINGS 3"
MINIMUM AND 12"
MAXIMUM HEIGHT.

12" TYP.

INSIDE DIA.

12" MAX

48"

18" MAX
FOR RIGID PIPE.

3" MIN.

6" MIN.

FORM CHANNEL TO 2/3 PIPE I.D. HEIGHT

6" MINIMUM THICKNESS OF 3/4"-0" COMPACTED CRUSHED ROCK UNDER BASE.

SECTION A-A

MINIMUM OF 9" PRECAST WALL BETWEEN PIPE CORES.
SEE DETAIL 302 FOR ALTERNATIVE.

KOR-N-SEAL OR APPROVED EQUAL MANHOLE ADAPTER (TYP.)

SLOPE SHELVES 1:12 TYP.

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030

WASTEWATER & STORMWATER STANDARD MANHOLE FOR 27" AND LESSER DIA. PIPES

DETAILED PER PLANS AND SPECIFICATIONS.
MANHOLE FRAME AND COVER PER PLANS/SPECS.

REDUCING TOP SLAB TO BE DESIGNED & CONSTRUCTED FOR DEPTH AND TRAFFIC CONDITIONS BY MANUFACTURER. FOR SLABS WITHIN 1'7" OF STREET, OPENING TO BE 25".

MINIMUM OF 12" PRECAST WALL BETWEEN PIPE CORING REQ'D.

O" PIPE DEFLECTION SHOWN.

SET FRAME IN NON-SHRINK GROUT.

GRADE RINGS 3" MIN. & 12" MAX. HEIGHT.

ECCENTRIC CONE OR FLAT TOP IF REQ'D.

APP'D GASKET MATERIAL, TYP.

PIPE DIA. IN.

BARREL DIA.* IN.

"A" DIM. IN.

"B" DIM. IN.

"C" DIM. IN.

30" 72" 7" 10" 7"
33" 72" 7" 10" 7"
36" 72" 7" 10" 7"
42" 84" 12" 12" 8"
48" 84" 12" 12" 8"
54" 96" 12" 12" 9"
60" 96" 12" 12" 9"
66" 108" 12" 12" 10"
72" 108" 12" 12" 10"
78" 120" 12" 12" 11"
84" 120" 12" 12" 11"
90" 132" 12" 12" 11"
96" 132" 12" 12" 11"

* APPLIES TO (2) PIPE MANHOLES WITH 0" DEFLECTION. OTHER NUMBERS OF PIPES OR DEFLECTION WILL REQUIRE LARGER SIZE.

NOTES:

STEPS TO BE AS DETAILED IN STANDARD SPECIFICATIONS.

DESIGN BARREL REINFORCING FOR CONDITIONS.

SLOPE SHELVES 1:12, 18" MINIMUM WIDTH.

CORE MANHOLE WALL 2" MIN., 4" MAX. CLEAR OF PIPE WALL. GROUT WITH NON-SHRINK GROUT & POUR 4"x4" CONCRETE COLLAR AROUND PIPE CONNECTION.

2" MIN. FOR CAST-IN-PLACE BASE

FORM GROUT CHANNEL TO 2/3 DIA. HEIGHT.

REINFORCED PRE-CAST OR CAST-IN-PLACE BOTTOM SLAB. SUBMIT CALCULATIONS & DESIGN FOR PRIOR APPROVAL.

12" MINIMUM THICKNESS OF 3/4"-0" COMPACTED CRUSHED ROCK.
MANHOLE FRAME AND COVER PER PLANS AND SPECIFICATIONS.
GRADE RINGS – 3” MINIMUM AND 12” MAXIMUM HEIGHT.
REDUCING TOP SLAB TO BE DESIGNED AND CONSTRUCTED BY MANUFACTURER FOR DEPTH AND TRAFFIC CONDITIONS (SEE NOTE).

STEPS SHALL BE ORIENTED OVER THE LEAST OBSTRUCTED PORTION OF THE SHELF AND SHALL NOT CONFLICT WITH ANY PIPE, SEE NOTE.

KOR-N-SEAL OR APPROVED EQUAL MANHOLE ADAPTER (TYP.)

6” MINIMUM THICKNESS OF 3/4”-0” COMPACTED CRUSHED ROCK.

SECTION A-A

MINIMUM OF 9” PRECAST WALL BETWEEN PIPE CORES. SEE DWG. NO. 302 FOR ALTERNATIVE.

NOTE:
FOR MANHOLES LESS THAN 2’ DEEP A CONCENTRIC CONE SHALL BE USED (NOT SHOWN), AND NO STEPS SHALL BE INSTALLED.

SLOPE SHELVES 1:12 TYP.
SLOPE SHELF AS REQUIRED

NOTES:
NO PARTITION SHALL BE INSTALLED IN STORMWATER MANHOLES.

PARTITION MATERIAL SHALL BE 1/2" H.D.P.E (TYP. PER ASSOCIATED PIPE), OR 1/8" FIBERGLASS (TYP. PER PIPE INC.) OR 16 GA. ALUMINUM OR 18 GA. STAINLESS STEEL. FIBERGLASS SHALL BE 3 OR 4 MAT LAYUP PER MANUFACTURERS’ RECOMMENDATIONS.

MAXIMUM FLOW IS 3 C.F.S. FOR INSIDE DROP MANHOLE. IF GREATER THAN 3 C.F.S. NO DROP IS ALLOWED.

FOR A 48" DIA. MANHOLE THE MAXIMUM INCOMING PIPE DIAMETER IS 15". A LARGER DIAMETER INCOMING PIPE WILL REQUIRE A SPECIAL DESIGN.

STANDARD TYPE MANHOLE SHOWN. FLATTOP MANHOLE SIMILAR.

1/2" SELF TAPPING CONCRETE ANCHORS, PHILLIPS S-12 OR APPROVED EQUAL, W/ 1/2" X 1-1/2" LG. STAINLESS STEEL BOLT & STAINLESS STEEL LOCK WASHER.

SECTION A-A

MANHOLE FRAME AND COVER AS SPECIFIED.

KOR-N-SEAL OR APPROVED EQUAL MANHOLE ADAPTER (TYP.)

SECTION B-B

DEFLECTION PLATE HEIGHT + 2" CLEAR

STAINLESS STEEL CHAIN 200LBS CAPACITY. SLACK WHEN DEFLECTION PLATE IS IN PLACE.

CLASS B PIPE ZONE

CIP REQUIRED UP TO BEDDING.

FORMED CHANNEL Ø 1:12 SLOPE

2" MIN.


SECTION C-C

NOTE: DRAWING DEPICTS 3 DRAINAGE PATHS & 1 INCOMING PIPE. AS SHOWN 2 DRAINAGE PATHS & 1 INCOMING PIPE.
SECTION A–A

IMPORTED SELECT (CRUSHED AGGREGATE) BACKFILL COMPACTED TO 95% M.D.D. PER AASHTO T–180, OR C.D.F. AS REQUIRED.

MINIMUM OF 9” WALL BETWEEN PIPES. SEE STANDARD DRAWING 302 FOR ALTERNATIVE.

SLOPE SHELVES 1:12 TYP. MIN.

PARTIAL TOP VIEW

NOTES:
1. THIS DESIGN TO BE USED FOR ALL DROPS 2 FEET AND LESS.
2. SEE DETAILS, 301,302 OR 303 FOR OTHER DIMENSIONS AND NOTES.
MANHOLE FRAME AND COVER PER PLANS AND SPECIFICATIONS.

GRADE RINGS – 3” MINIMUM AND 12” MAXIMUM HEIGHT.

STEPS SHALL BE ORIENTATED OVER THE LEAST OBSTRUCTED SHELF AND SHALL NOT CONFLICT WITH ANY PIPE.

FORM CHANNEL TO 2/3 PIPE I.D. HEIGHT

SECTION A–A

NOTES:
1. JOINTS SHALL BE WATER TIGHT AND COATED WITH WATERPROOF RUBBERIZED MASTIC MATERIAL BEFORE SETTING RISERS AND TOP. INSIDE JOINTS SHALL BE GROUTED.

2. MANHOLES SHALL HAVE A 12” MIN., 24” MAX. BOTTOM RISER. RISER TO BE BEDDED IN THE CAST-IN-PLACE CONCRETE AS THE BASE TAKES ITS’ INITIAL SET.

3. 3” TO 12” CLEARANCE BETWEEN BOTTOM RISER SECTION AND TOP OF PIPE. RISER SECTION MUST BE CAST TO ACCOMODATE PIPE (DOG HOUSE) NO SAWING OR BREAKING OF RISER WILL BE ALLOWED.

4. AFTER SHELF IS FORMED REMOVE TOP OF PIPE.
NOTES:
1. THIS MANHOLE FRAME MAY BE USED ONLY FOR LOCAL ROAD LOCATIONS.
2. MATERIAL TO BE GRAY CAST IRON ASTM A-48, CLASS 30.
APPROX. WEIGHT = 172 LBS.

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030
WASTEWATER AND STORMWATER SUBURBAN MANHOLE FRAME
PLAN

SECTION A-A

MACHINE TO TRUE 25"

27"

1"

7/8"

10"

1 1/2"

3"

31"

24 1/2"

23"

7"

NOTE:
1. MATERIAL TO BE GRAY CAST IRON ASTM-48, CLASS 30,
APPROXIMATE WEIGHT = 237 LBS.

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030
INDUSTRIAL MANHOLE FRAME

DRAWN DLS
DIV.
REV. DATE APPR.
SCALE NTS
DATE JAN 1, 2006
APPR. CR
DWG. NO. 308
DRILL 0.434"Ø +/- 0.004"
TAP 1/2"-13 NC, TYPICAL
(3) PLACES.

1¼" R. TYP.

120° TYP.

FOR WATERPROOF FRAME MACHINE
9/32"Ø WIDE x 3/16" DEEP GROOVE
ON 23¾" I.D. CIRCLE. AND INSTALL
23¼" I.D., ¼" WIDE X ¼" DEEP NEOPRENE
GASKET.

PLAN

MACHINE TO TRUE 25"

10"

1/2"

27"

1"

1"

7/8"

1/4"

7/8"

23"

24 1/2"

31"

SECTION A-A

* SUBURBAN STYLE DIMENSIONS MAY
BE USED FOR LOCAL ROAD INSTALLATION

NOTE:
1. MATERIAL TO BE GRAY CAST IRON ASTM A-48, CLASS 30. APPROXIMATE WEIGHT = 237 (INDUSTRIAL) AND APPROXIMATE WEIGHT = 172 LBS +/- (SUBURBAN).
2. ONE BOLT DOWN TAB MUST BE ORIENTED DIRECTLY OVER CENTER OF MANHOLE STEPS.

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030
WASTEWATER & STORMWATER
WATERPROOF & TAMPERPROOF MANHOLE FRAME

DRAWN DLS
DIV.
REV. DATE APPR.

SCALE NTS
DATE JAN 1, 2006
APPR. 
DWG. NO. 309
3/4" Ø TOP x 1" Ø BOTTOM HOLES.

DIMENSION TABLE

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5 1/2&quot;</td>
</tr>
<tr>
<td>B</td>
<td>6 1/2&quot;</td>
</tr>
<tr>
<td>C</td>
<td>9 1/4&quot;</td>
</tr>
<tr>
<td>D</td>
<td>3 3/4&quot;</td>
</tr>
</tbody>
</table>

PLAN

MACHINE TO TRUE

NOTES:
   APPROXIMATE WT. = 139 lbs.
2. THESE COVERS TO BE USED FOR IN-ROAD LOCATIONS ONLY.

SECTION A-A

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030

STANDARD WASTEWATER MANHOLE COVER

SCALE NTS
DATE JAN 1, 2006
APPR.
**PLAN**

**LOCKDOWN DETAIL**

**PROFILE**

**SECTION A-A**

**NOTE:**
1. MATERIAL SHALL BE GREY CAST IRON, ASTM A-48, CLASS 30. APPROXIMATE WT. = 139 lbs.

**DIMENSION TABLE**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5 1/2&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>6 1/2&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>9 1/4&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>3 3/4&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>10 7/8&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DEPARTMENT OF ENVIRONMENTAL SERVICES**

**CITY OF GRESHAM**

1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030

WASTEWATER MANHOLE TAMPERPROOF COVER

**SCALE** NTS

**DATE** JAN 1, 2006

**APPR.**
DRILL 5/8\"Ø HOE, COUNTERTBORE 1 7/16\"Ø
1/2" DEEP. (TYP)

1 1/4" RADIUS
(TYP)

1/2" Ø-13 NC x 1 1/4" STAINLESS
STEEL HEX HEAD CAP SCREW W/ 1 1/4\"Ø
OD x 3/32" THK. 8-18 STAINLESS STEEL
WASHER & 3/32" NEOPRENE WASHER. (3)
EA. REQUIRED.

MACHINE TO TRUE 24 3/4"

1 3/4" 7/16"
4 1/4" 3/8"
1"

3/4" 7/8"
3"

SECTION A-A

NOTES:
1. MATERIAL SHALL BE GRAY CAST IRON, ASTM A-48, CLASS 30. APPROXIMATE Wt. = 139 lbs

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030

WASTEWATER
WATERPROOF MANHOLE COVER

DRAWN: DLS
DIV.
REV. DATE APPR.

SCALE: NTS
DATE: JAN 1, 2006
APPR.
DWG. NO.: 312
MANHOLE STEPS MUST BE TIGHT AND FIRMLY EMBEDDED. THEY MUST ALSO MEET THE ASTM TEST FOR WITHSTANDING PULLING OUT.

MATERIALS:

PLASTIC:

MUST CONFORM WITH ASTM C-478.
STEEL REINFORCING BAR MINIMUM ½" GRADE 60 MEETING REQUIREMENTS OF ASTM A-615
ENCAPSULATED WITH INJECTION MOLDED COPOLYMER POLYPROPYLENE WITH SERRATED SURFACES.
NOTE:
1. WHERE REQUIRED BY THE ENGINEER OF RECORD OR THE CITY, GRANULAR TRENCH STABALIZATION SHALL BE PLACED PRIOR TO THE PIPE ZONE MATERIAL. SIZE AND DEPTH OF TRENCH STABILIZATION PER SOIL CONDITIONS.
2. PIPE ZONE MATERIAL SHALL BE COMPACTED TO 90% OF AASHTO - 180
3. PIPE ZONE MATERIAL SHALL BE COMPACTED AS SPECIFIED PRIOR TO BACKFILLING THE REMAINDER OF THE TRENCH.
MIN. RESURFACING SHALL BE BASED ON STREET CATEGORIZATION OR EXISTING, WHICHEVER IS GREATER UNLESS APPROVED BY ENGINEER. COMPACTED TO 91% OF RICE (SEE DETAILS 605–618)

NOTES:
1. ALL CUT EDGES SHALL BE SAND SEALED WITH ASPHALT
2. USE C.D.F. WHERE SPECIFIED AND WHERE REQUIRED BY THE ENGINEER.
3. THIS TRENCH BACKFILL REQUIRED APPLIES TO ALL UTILITIES EXCEPT WATER (SEE DETAIL 502 FOR WATER)
4. WHEN USING GEOTEXTILE FABRIC IT SHALL BE PLACED BELOW THE RESURFACING IN THE "TEE CUT" AREA EXTENDING A MINIMUM OF 6" BEYOND THE TRENCH WALLS.
5. IN AREAS WHERE NATIVE BACKFILL IS BROUGHT TO THE SURFACE AND IS TO BE SEEDED, DO NOT COMPACT THE TOP 2".

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030
TRENCH & RESURFACING DETAIL
2" x 4" stake from invert to 2' above existing grade. Stake shall be continuous and remain vertical after backfilling. End shall be painted white. See note 2.

Stamp "S" on top of curb.

Property line

6' General utility easement

6' min. depth

Service branch with riser

Trench excavation, backfill, and pipe pay length

45° bend

2% minimum slope

Riser pay length

45° max.

Service branch without riser

Trench excavation, backfill, and pipe pay length

2% minimum slope

Service branch with riser

Notes:
1. Service shall not be backfilled prior to inspection.
2. Green magnetic tape with "wastewater" in red letters shall be wrapped around the plug at the end of the sewer lateral and brought to the surface wrapped around the 2" x 4" marker.
NOTES:
1. THE TAP SHALL NOT BE MADE EXCEPT IN THE PRESENCE OF A CITY INSPECTOR; NOR SHALL ANY CONNECTION BE MADE WITHOUT CITY APPROVAL.
2. A "INSERT–A–TEE" OR "FERNCO" TYPE CONNECTION SHALL BE USED, AND SHALL BE INSTALLED PER MANUFACTURER’S SPECIFICATIONS
3. THE HOLE MADE IN MAIN SHALL BE CORED.
4. Ø OF TAP TO BE ABOVE SPRINGLINE.
5. 4” MAXIMUM HOLE FOR 8” MAIN UNLESS OTHERWISE APPROVED BY THE ENGINEER
5' x 5' PUBLIC EASEMENT ON EACH LOT.

WATERTIGHT PLUG

4" SERVICE FOR EACH LOT.

2" X 4" STAKE PROPERTY LINE

5' - 0"

6" SERVICE BRANCH FOR SIAMESE CONNECTION.

RIGHT-OF-WAY LINE

1' - 0"

5' - 0"

SEE STD. DWG. 321 FOR CLEANOUT INFORMATION AND NOTES.

STAMP "S" ON TOP OF CURB

PROPERTY LINE

SEE DETAIL 316 FOR ADDITIONAL INFORMATION.

NOTE:
1. SERVICE SHALL NOT BE BACKFILLED PRIOR TO INSPECTION.

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030

SIAMESE SERVICE BRANCH

SCALE NTS
DATE JAN 1, 2006
Dwg. No. 318
PROPERTY LINE

LOT 2

CLEANOUTS
PER PLUMBING CODE.

LOT 3

PRIVATE EALEASEMENT, 15’ MINIMUM

LOT 1

HOUSE LATERALS
IN PRIVATE
EALEASEMENTS PER
PLUMBING CODE

PRIVATE EALEASEMENT, 15’ MINIMUM

LOT 4

INSTALL STD. 4’ DIA. PRECAST
MANHOLE IN 10’ x 10’ PUBLIC
SEWER EALEASEMENT. EALEASEMENT
TO BE APPROVED BY CITY
BEFORE RECORDING.

PROPERTY LINE

RIGHT-OF-WAY

PUBLIC SANITARY SEWER MAIN LINE

6” MIN. DIA. SEWER SERVICE BRANCH. SERVICE BRANCH CAN SERVE NO MORE
7 LIVING UNITS.

PROPERTY LINE

NOTES:
1. CONNECTION PLAN FOR 4 LOT COMMON LATERAL (3 LOTS SIMILAR).
2. EALEASEMENTS TO BE RECORDED & A COPY THEREOF SUBMITTED TO CITY
CITY PRIOR TO CONSTRUCTION.
3. PRIVATE EALEASEMENT ARRANGEMENT SHOWN TO BE USED ONLY WHEN
SEWER IN PUBLIC ROAD RIGHT-OF-WAY CANNOT BE USED AS,
AS DETERMINED BY THE ENGINEER.
FRAME & COVER
SALEM IRON WKS.
#4233 & 4234 OR EQUAL.

CAST IRON CLEANOUT FRAME AND COVER.
INSTALL MECHANICAL SEAL.

IF IN GRAVEL STREET, PLACE A 2" THICKNESS OF 1/2" LEVEL 2, A.C. PAVEMENT IN A 4" DIAMETER CIRCLE AROUND THE CLEANOUT SLOPING AWAY.

GRANULAR TRENCH BACKFILL
45° SHORT BEND.

ELEVATION

FOR CONCRETE PIPE INSTALL 6" THICKNESS 3,000 PSI CONCRETE CONCRETE CRADLE FULL WIDTH OF TRENCH.

STANDARD WYE WITH PLUG AND RUBBER GASKET.

1/2" x 6" S.S. HEX HD. BOLT & S.S. HEX NUT.
FRAME SHALL BE ON 1/2" MIN. GROUT SEAL.

4" x 18" x 24" Poured-in-Place 3,000 PSI CONCRETE PAD.

UNDISTURBED EARTH BASE
### Dimension Table

<table>
<thead>
<tr>
<th>PIPE DIA.</th>
<th>X, MIN (ft)</th>
<th>Y (ft)</th>
<th>MIN VOL (cy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; TO 10&quot;</td>
<td>4</td>
<td>3</td>
<td>0.29</td>
</tr>
<tr>
<td>12&quot; TO 15&quot;</td>
<td>4</td>
<td>4</td>
<td>0.37</td>
</tr>
<tr>
<td>18&quot; TO 24&quot;</td>
<td>5</td>
<td>4</td>
<td>0.42</td>
</tr>
<tr>
<td>&gt; 24&quot;</td>
<td>TO BE DETERMINED BY ENGINEER OF RECORD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes:

1. ALL CONCRETE SHALL BE 3,000 psi 28 DAY COMPRRESSIVE STRENGTH, WITH 2" TO 4" SLUMP.

2. ANCHOR WALLS MUST BE USED WITH PIPES WITH SLOPES OVER 20%. ANCHOR WALLS TO BE EQUALLY SPACED. PROPORTION SPACING WITH SLOPE.

<table>
<thead>
<tr>
<th>PIPE SLOPE</th>
<th>WALL SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td>20%</td>
<td>21'</td>
</tr>
<tr>
<td>100%</td>
<td>12'</td>
</tr>
<tr>
<td>&gt; 100%</td>
<td>NOT ALLOWED</td>
</tr>
</tbody>
</table>

3. PLACE WALL IMMEDIATELY BELOW BELL OF PIPE WHERE POSSIBLE.
VERTICAL SECTION

<table>
<thead>
<tr>
<th>DIMENSIONS—IN.</th>
<th>BARS REQ'D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;A&quot;</td>
<td>&quot;B&quot;</td>
</tr>
<tr>
<td>6”</td>
<td>16”</td>
</tr>
<tr>
<td>8”</td>
<td>19”</td>
</tr>
<tr>
<td>10”</td>
<td>21”</td>
</tr>
<tr>
<td>12”</td>
<td>23”</td>
</tr>
<tr>
<td>15”</td>
<td>26½”</td>
</tr>
<tr>
<td>18”</td>
<td>30½”</td>
</tr>
<tr>
<td>21”</td>
<td>39”</td>
</tr>
<tr>
<td>24”</td>
<td>43”</td>
</tr>
<tr>
<td>27”</td>
<td>50”</td>
</tr>
</tbody>
</table>

NOTES:
1. ALL CONCRETE SHALL BE 3,000 PSI, 3” TO 5” SLUMP.
2. STEEL REINFORCING SHALL BE NO. 5" IN CONFORMANCE WITH ASTM A 615, GRADE 60, WITH DEFORMATIONS PER ASTM A 305.
### Notes

Contractor shall submit all information required by the above.

### Dimensions

<table>
<thead>
<tr>
<th>MINIMUM</th>
<th>MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (Diameter)</td>
<td>P</td>
</tr>
</tbody>
</table>

### Design

- **Rubber Gasket**: Design
- **Joint Clearance**: Design
- **Maximum Slope**: Design

### Class

- **Max Heads**: J
- **Min Heads**: X

### Specifications

- **Manufacturers Name**:
- **Pipe Diameter**:
- **Joint Data Form**:

### Bureau of Reclamation

- **Department of the Interior**: United States

---

**Distance A:**

Joint clearance dimensions A is at closest point within and are for bell and spigot in concentric position. All dimensions shown in inches unless otherwise noted. Applicable to the specific type or pipe joint used. Tables, unless a dimension shown in the tables, is not applicable to the specific type or pipe joint used.

---

**Typical Joint Detail and Data Form**

**City of Gresham**

**Department of Environmental Services**

**1333 N.W. Eastman Parkway, Gresham, Oregon 97030**

**Date Jan 1, 2006**

**Scale NTS**

---

**Rev. Date Appro**
NOTES:
1. INSTALL 6" DRAIN PIPE SUCH THAT THE TOP OF PIPE IS 6" BELOW GRATE OR ALIGNED WITH THE CROWN OF THE OUTLET WHICH EVER IS LESS.
2. IF CATCH BASIN WILL BE PART OF A DRIVEWAY WING, SLANT THE REBAR CAGE AND INLET FORM TO THE SLOPE OF THE TOP OF CURB IN THE WING WHEN POURING THE CATCH BASIN. MAINTAIN THE "Y2" DIMENSION AND DECREASE THE INLET AS NEEDED.
3. IF THE DISTANCE FROM TOP OF CURB TO THE GRATE IS EQUAL TO OR LESS THAN "Y2" NO CURB INLET IS REQUIRED.
4. #3 BARS SHALL BE PLACED DURING CURB CONSTRUCTION.
5. ALL BARS SHALL BE PLACED 1 ½" CLEAR OF NEAREST FACE OF CONCRETE UNLESS SHOWN OR OTHERWISE NOTED.
6. ALL BAR SPLICE LENGTHS SHALL BE A MIN. 20".
7. CLASS 3300 CONCRETE SHALL BE USED IN ALL INLET CONSTRUCTION.

<table>
<thead>
<tr>
<th>TABLE 601-C</th>
<th>CURB TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE &quot;C&quot;</td>
<td>MONOLITHIC</td>
</tr>
<tr>
<td>Y1</td>
<td>8 ½&quot;</td>
</tr>
<tr>
<td>Y2</td>
<td>5 ¾&quot;±</td>
</tr>
</tbody>
</table>

CURB DETAIL AT CATCH BASIN
NOTE:
USE VERTICAL BEADS IN CORNERS, FILLET WELD JOINT ON BOTTOM OF FRAME. GRATE MUST REST FLAT ON FRAME SURFACE.

PLAN (FRAME)  SECTION A-A

3/8" ROUND OR RECTANGULAR CROSS BARS SHALL BE FILLET WELDED, RESISTANCE WELDED OR ELECTROFORGED TO BEARING BARS

SECTION B-B

3/8" X 2" FLAT BAR EACH END

3/8" X 2 1/2" FLAT BARS @ 1 7/8" O.C. LOAD PER AASHTO H-20 OR AS APPROVED BY ENGINEER.

PLAN (GRATE)
TYPE 2 GRATE
NOTE:
USE VERTICAL BEADS IN CORNERS, FILLET WELD JOINT ON BOTTOM OF FRAME. GRATE MUST REST FLAT ON FRAME SURFACE.
BAR SIZE PER AASHTO LOAD REQUIREMENTS AND AS APPROVED BY ENGINEER.

NOTE:
THIS GRATE MAY BE REQUIRED IN HILLSIDE AREAS OR WHERE STREET SLOPES EXCEED 5 PERCENT GRADE, OR WHERE THE CATCH BASIN FRAME AND GRATE (1) IS NOT CAPABLE OF INTERCEPTING COMPLETELY THE DESIGN STORM FLOW AT THE CURB.
NOTE:
USE VERTICAL BEADS IN CORNERS, FILLET WELD JOINT ON BOTTOM OF FRAME. GRATE MUST REST FLAT ON FRAME SURFACE. BAR SIZE PER AASHTO LOAD REQUIREMENTS AND AS APPROVED BY ENGINEER.

NOTE: THIS GRATE MAY BE REQUIRED IN HILLSIDE AREAS OR WHERE STREET SLOPES EXCEED 5 PERCENT GRADE, OR WHERE THE CATCH BASIN FRAME AND GRATE (1) IS NOT CAPABLE OF INTERCEPTING COMPLETELY THE DESIGN STORM FLOW AT THE CURB.
SECTION A-A
ELEVATION

NOTE: THIS CATCH BASIN IS AN ALTERNATIVE, FOR USE IN SPECIAL CIRCUMSTANCES AS REQUIRED BY THE CITY'S ENGINEER.
NOTES:
1. INSTALL 6” DRAIN PIPE SUCH THAT THE TOP OF PIPE IS 6” BELOW GRATE OR ALIGNED WITH THE CROWN OF THE OUTLET WHICH EVER IS LESS.
2. IF CATCH BASIN WILL BE PART OF A DRIVEWAY WING, SLANT THE REBAR CAGE AND INLET FORM TO THE SLOPE OF THE TOP OF CURB IN THE WING WHEN POURING THE CATCH BASIN. MAINTAIN THE "Y2" DIMENSION AND DECREASE THE INLET AS NEEDED.
3. IF THE DISTANCE FROM TOP OF CURB TO THE GRATE IS EQUAL TO OR LESS THAN "Y2" NO CURB INLET IS REQUIRED.
4. #3 BARS SHALL BE PLACED DURING CURB CONSTRUCTION.
5. ALL BARS SHALL BE PLACED 1 1/2” CLEAR OF NEAREST FACE OF CONCRETE UNLESS SHOWN OR OTHERWISE NOTED.
6. ALL BAR SPLICE LENGTHS SHALL BE A MIN. 20” DIA.
7. CLASS 3300 CONCRETE SHALL BE USED IN ALL INLET CONSTRUCTION.

<table>
<thead>
<tr>
<th>TABLE 601-C</th>
<th>CURB TYPE</th>
<th>Curb Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE &quot;C&quot;</td>
<td>MONOLITHIC</td>
<td></td>
</tr>
<tr>
<td>Y1</td>
<td>8 1/2”</td>
<td>7 1/2”</td>
</tr>
<tr>
<td>Y2</td>
<td>5 3/4”</td>
<td>4 3/4”</td>
</tr>
</tbody>
</table>

Curb Detail at Catch Basin
NOTE:
USE VERTICAL BEADS IN CORNERS, FILLET WELD JOINT ON BOTTOM OF FRAME. GRATE MUST REST FLAT ON FRAME SURFACE.

3/8"x2" FLAT BAR EACH END
3/8"x2 1/2" FLAT
7-BARS EACH SIDE AT 1-3/4" O.C.

NOTE: 3/8" ROUND OR RECTANGULAR CROSS BARS SHALL BE FILLET WELDED, RESISTANCE WELDED OR ELECTROFORGED TO BEARING BARS
NOTE: SET "DRAINS TO RIVER" BUTTON INTO CURB BEFORE CONCRETE HAS CURED. CONTACT CITY FOR BUTTON SPECIFICATIONS (TYPICAL).

NOTE: THIS CATCH BASIN IS AN ALTERNATIVE, FOR USE IN SPECIAL CIRCUMSTANCES AS REQUIRED BY THE CITY'S ENGINEER.
1. CONCRETE SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 3300 P.S.I. IN 28 DAYS

2. FOR FRAME & GRATE DETAIL SEE STD. DWG NO. 404B

3. WHERE PRECAST INLETS ARE USED AS AN ALTERNATIVE TO CAST IN PLACE INLETS, A 4" COMPACTED LEVELING BED OF ¾"-0" CRUSHED AGGREGATE SHALL BE PROVIDED

NOTE: SET "DRAINS TO RIVER" BUTTON INTO CURB BEFORE CONCRETE HAS CURED. CONTACT CITY FOR BUTTON SPECIFICATIONS (TYPICAL).

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030
DITCH INLET
TYPE D
NOTE: SET "DRAINS TO RIVER" BUTTON INTO CURB BEFORE CONCRETE HAS CURED. CONTACT CITY FOR BUTTON SPECIFICATIONS (TYPICAL).

MIN. 6" DIA. HOLE WITH REMOVABLE PLUG

STANDARD MANHOLE STEPS

1" COMPACTED CRUSHED ROCK 6" MIN. DEPTH, AS APPROVED BY ENGINEER.

PRECAST 48" DIA. MANHOLE BASE (2', 3' OR 4' HIGH) 2' MINIMUM

PRECAST 48" DIA. MANHOLE SECTION (1'-4' HIGH)

COMBINATION CURB INLET, SEE DETAIL 405B

PRECAST 48" FLAT TOP WITH STANDARD ROUND OPENING, SEE DETAIL 405B

2" WEEP HOLE BOTH SIDES TYPICAL

SEE DETAIL 405B

1-5/8"

12" MIN.

58"

48"

2"

5"

2"

6"

8"

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030
INLET—MANHOLE STANDARD
COMBINATION CURB INLET

NOTES:

1. REINFORCING FOR INLET UNIT 3 EA. #4 HORIZONTAL BARS.

2. REINFORCING FOR TOP UNIT 2 EA. #3 HORIZONTAL BARS.

3. REINFORCING FOR INLET SLOPED BASE, 4" X 4" MESH.

4. GUTTER IS TAPERED DOWN TO GRATE INLET.

5. SET "DRAINS TO RIVER" BUTTON INTO ADJACENT CURB BEFORE CONCRETE HAS CURED, CONTACT CITY FOR BUTTON SPECIFICATIONS (TYPICAL).
SECTION B-B

NORMAL SLOPE

24" MIN

CG-2 INLET
AS REQUIRED

NORMAL PAVEMENT

FOR MANHOLE
SEE DETAIL
406A

STANDARD
MANHOLE STEPS

MANHOLE DIAMETER
AS REQUIRED

5 - #19 BARS X
CONT. @ 4" CTRS.

10 L BARS @ 5" MAX.

#10 L BARS
CONT. EA.
WAY @ 5" CTRS.

12 - #16
VERT. BARS

10 L BARS @ 5"
MAX. CTR. STAUGGER
SPICE LOCATION

12 - #16 VERT.
BARS

10 L BARS @ 5"
MAX. CTR.
SIDE (BTM.)

10 L BARS @ 5"
MAX. CTR.
SIDE (BTM.)

15 3/4" SPICE TYP.

#19 BAR EA. SIDE
1 - #16 HOOP

2 - #19 BARS X
CONT. @ 4" CTRS.

2 - #19 BAR EA. SIDE
2 - #19 BARS X
CONT. @ 4" CTRS.

PLAN

SECTION A-A

NOTE: DELETE "DRAINS BUTTON TO CURB BEFORE CURED, CONTACT CITY FOR BUTTON SPECIFICATIONS (TYPICAL).

EA. WAY @ 5" MAX.

#10 TOP BARS X CONT.

AT 2" MAX.

#16 HOOPS

2"
10'-2" FLOWLINE TRANSITION AREA
(MIN. 2" DEPRESSION)

PLAN
NOT TO SCALE

FIELD FORM AND
POUR ADDITIONAL
CONCRETE
TRANSITION TO FLAT
TOP PER PUBLIC
WORKS STANDARDS

8" FLAT TOP

MIN. 4-INCH DIA.
HOLE WITH
REMOVABLE PLUG

PRECAST 48" DIA.
MANHOLE SECTION
(1'-4' HIGH)

STANDARD
MANHOLE STEPS

NOTE: SET "DRAINS TO
RIVER" BUTTON INTO CURB
BEFORE CONCRETE HAS
CURED. CONTACT CITY
FOR BUTTON
SPECIFICATIONS (TYPICAL).

NOTES:
48-INCH DIAMETER
INLET MANHOLES FOR
USE WITH PIPES LESS
THAN 30-INCH INSIDE
DIAMETER ONLY

STANDARD FRAME AND
COVER OR APPROVED
EQUAL, CAST INTO
INLET-MANHOLE COVER
(SEE STD. DETAIL #302 & #305)

PRE-CAST 48" DIA.
MANHOLE BASE
(2', 3' OR 4' HIGH)
2' MINIMUM

NOTE: 5" OPENING
WITH TRASH BARS

DRAINS TO RIVER
BUTTON
(SEE NOTE)
FRAME AND COVER
SET IN MORTAR
SEE STD. DETAILS
308 & 309
AS CALLED OUT
ON PLANS

24" MAX.

1/2" BOLT
(STAINLESS
STEEL)

36" MAX.

12"

OVERFLOW EL.

STAINLESS CHAIN
200LB. CAPACITY
SLACK WHEN
GATE IS DOWN

12" MIN.

3" VARI

30" MIN.

FLOW

WATER TIGHT
TURN OUT GATE
IN PLACE AS
APPROVED
BY ENGINEER.
MIN. 8" DIA.

FLOW

5" MIN.

36" MIN.

12" MIN.

SECTION A–A

MANHOLE ACCESS
FROM ABOVE

INFLOW LINE(S)
PER PLAN

PLAN

MULTI–ORIFCE ELBOWS TO BE
LOCATED TO ASSURE LADDER
CLEARANCE. ORIFICE SHALL BE
MOUNTED ON BOTTOM OF
ELBOWS. ELBOWS SHALL BE
SHORT RADIUS AND SHALL NOT
EXTEND MORE THAN 8" FROM
OVERFLOW PIPE.

FABRICATED SOLID WALL HDPE
SLIGHT TAPER ON OUTLET PIPE BY
MANUFACTURER TO MAKE
WATERTIGHT CONNECTION BY
SLIPPING INTO OUTLET PIPE.

APPROVED PIPE
12" MIN.

NON SHRINK GROUT
(TYPICAL)

COMPACTED GRANULAR
MATERIAL

RESTRICTOR PLATE (FOR
FLOW CONTROL ONLY)
ORIFICE DIA.=

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030
FLOW CONTROL
MANHOLE

N.T.S.

DATE
JAN. 1, 2006

APPR. 

DRAWN

TNP

DIV.
STORMWATER

REV.

DATE

APPR.

DWG. NO. 407
NOTES:

1. THIS DETAIL REPRESENTS A DESIGN CONCEPT. FINAL DESIGN MAY VARY DEPENDING ON SITE CONDITIONS AND SHALL BE APPROVED BY THE CITY ENGINEER.

2. DETENTION PIPE TO BE MADE WATERTIGHT.
NOTE:

1. HDPE WRAP AROUND THE OUTSIDE OF THE PERFORATED SUMP SECTIONS SHALL BE ADDED IF THE DRAIN ROCK IS SMALLER THAN 2"-4".

2. 12" 90° SHORT RADIUS ELBOW PER ASTM D-1248, SDR 26 HDPE, CONNECT TO STORM DRAIN PIPE WITH FERNCO SHEAR BAND COUPLER OR APPROVED EQUAL.

3. ALL PIPE TO SEDIMENTATION M.H. & PRECAST SUMP SHALL HAVE CLASS "B" BEDDING & PIPE ZONE MATERIAL.
INSTALL ONE STANDARD STEP

POLYPROPYLENE HANGING LADDER STEPS SHALL NOT CONFLICT WITH IE IN/OUT

PLACE LADDER WITH BASE OF LADDER 6" MINIMUM BELOW FINISH GRADE OF NEW CONCRETE BASE

EXISTING SUMP CONVERTED TO SEDIMENTATION MANHOLE

NEW 12" THICK CONCRETE BOTTOM

12"

6" MIN.
1/2"-13 NC X 1-3/4" STAINLESS STEEL HEX HEAD CAP SCREW W/1-1/4" OD X 3/32" THK. 8-18 STAINLESS STEEL WASHER & 3/32" NEOPRENE WASHER, (3) EA. REQUIRED.

MACHINE TO A TRUE BEARING ALL AROUND.

SECTION A-A
2 1/2" HOSE NOZZLES

4 1/2" PUMPER NOZZLE

CONC. SIDEWALK

PLANter STRIP AREA

CONC. PAD

DRAIN ROCK VARIES

3/4" MINUS CRUSHED ROCK

UNDISTURBED EARTH

DRAIN

UNDISTURBED EARTH

"VANCOUVER" STYLE VALve BOX (SEE DETAIL 513)

CURB AND GUTTER

18" MIN. 24" MAX.

WHEN IN PLANTER STRIP

DEPTH OF BURY 6' MAX

0" MIN. 2" MAX

6" D.I. PIPE

"MECALUG" OR APPROVED EQUAL

6" FLGxMJ SHOE

MAINLINE TEE 6" SIDE OUTLET FLANGED

CONC. BLOCK HAVING MIN. 1.75 SQ. FT. BEARING AREA AND MIN. 6" THICKNESS
NOTES:

1. HYDRANT TO BE MUELLER SUPER CENTURION 250, MDL A-423 ONLY WITH 1−½” OPERATION NUT. SEE 502.12, DIVISION 5, "WATER TECHNICAL REQUIREMENTS".

2. HYDRANT COLOR TO BE YELLOW SHERWIN WILLIAMS GCC−5006, OR APPROVED EQUAL.

3. ALL MJ’S ON TEE, VALVE AND FIRE HYDRANT TO BE RESTRAINED WITH "MEGALUG" FOLLOWER GLANDS OR APPROVED EQUAL. RESTRAIN MIN. 10 LF OF PIPE EACH SIDE OF TEE ON MAIN LINE AND ALL PIPE AND FITTINGS RESTRAIN ON THE BRANCH SIDE OF TEE. NO JOINTS BETWEEN VALVE AND SHOE UNLESS PIPE RUN LENGTH IS OVER 18 LF.

4. MIN. 4’ CU. FT. OF 1−½”−¾” CLEAN DRAIN ROCK SHALL BE PLACED AROUND SHOE UP TO A MIN. OF 6” ABOVE DRAIN OUTLETS

5. WHERE CURB TIGHT SIDEWALK (NO PLANTER STRIP) AND CURB EXIST, HYDRANT PUMPER PORT SHALL BE PLACED AT BACK OF SIDEWALK, OR AS DIRECTED BY ENGINEER.

6. BURY OF HYDRANT SHALL BE MEASURED FROM BURY LINE TO BOTTOM OF CONNECTING PIPE. HYDRANT SHALL HAVE A MAX. OF A 6’ BURY, UNLESS OTHERWISE APPROVED BY THE ENGINEER.

7. HYDRANT VALVE SHALL BE MUELLER RESILIENT WEDGE GATE VALVE #A−2360−16 OR APPROVED EQUAL.

8. WHERE NO SIDEWALK EXISTS AROUND A HYDRANT, INCLUDING A PLANTER STRIP, PLACE A 5’x5’x4” THICK CONC. PAD AROUND HYDRANT. PLACE ANY ADJACENT SIDEWALK AT THE TIME HYDRANT PAD IS Poured. EXPANSION JOINT MATERIAL SHALL BE PLACED AROUND HYDRANT BARRELL WHEN PLACED IN CONCRETE.
IF NATIVE MATERIAL IS UNSUITABLE FOR BACKFILL, APPROVED GRANULAR MATERIAL WILL BE REQ'D

NATIVE MATERIAL OR 4" OF 1" MINUS AS REQUIRED.

SAW CUT EXISTING A.C. TO NEAT, STRAIGHT LINES.

PAY WIDTH NOM. PIPE Dia. + 3" + 3" END
erom. pipe dia. of exist. base rock

T-CUT 1 1/2" THICK OR DEPTH OF EXIST. TOP LIFT, WHICHEVER IS GREATER

EXIST. BASE ROCK

3/4" MINUS CRUSHED AGG. PER CITY SPECS.

PAY WIDTH

3" A.C. PAVEMENT OR SAME AS EXIST. DEPTH, WHICHEVER IS GREATER, OR AS REQ'D BY PERMIT.

12"

PIPE ZONE BEDDING (3/4" MINUS)

6"

6"

6"

6"

6"

6"

MIN. MIN. MIN.

MIN. MIN. MIN.

MIN. MIN. MIN.

MIN. MIN. MIN.

6"

12"

12"

2"

UNPAVED EASEMENT SECTION

PAVING SECTION

NOTES.

1. ALL WATER MAINS SHALL HAVE A MIN. COVER OF 36" IN RIGHT-OF-WAY AND 48" IN EASEMENTS

2. ALL TRENCH BACKFILL SHALL BE COMPACTED TO 95% OF MAX. DENSITY PER AASHTO T-180.

3. ALL TRENCH BACKFILL AND PATCHING SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY.

4. PAYMENT FOR PAVEMENT CUT AND REPAIR SHALL INCLUDE ALL A.C. AND CRUSHED AGGREGATE TO 12" BELOW FINISH GRADE.

5. SAND BACKFILL WILL BE REQ'D IN PIPE ZONE WHEN PIPE LINE IS TO BE POLYBAGGED.

6. BACKFILL SHALL BE PLACED AND COMPACTED IN LIFTS, OR AS DETERMINED IN FIELD BY THE CITY ENGINEER.
MATERIALS: (SEE 503.07, DIV.5, WATER TECHNICAL REQUIREMENTS)

1. ARMORCAST METER BOX P6000485, COVER A6000484DQ, DROP-IN A6000484DQ, IN NON-TRAFFIC AREAS. IN TRAFFIC AREAS, A "OLDCASTLE #37 METER BOX SHALL BE USED AND TRAFFIC RATED LID. (OR AN APPROVED EQUAL).

2. MUELLER CORP. STOP #B-25008 (110 COMPRESSION), A.Y. McDoNALD #4701BQ, OR AN APPROVED EQUAL.

3. 1" SOFT TEMPER, TYPE "K" COPPER TUBING COMPLYING WITH ASTM B-88.

4. MUELLER, ANGLE METER STOP NO. B-24258, (110 COMPRESSION), A.Y. McDoNALD #4602 BQ, OR AN APPROVED EQUAL.

NOTES:

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

2. ALL PIPE AND STRUCTURE ZONES SHALL BE BACKFILLED USING ¾" MINUS CRUSHED AGG. AND COMPACTED TO 95% MAX. DENSITY AS DETERMINED BY AASHO T-180.

3. WHEN AN ACTIVE CATHODIC PROTECTED SYSTEM IS ENCOUNTERED, SCH. 40 PVC SHALL BE INSTALLED WITH IMPERVIOUS PLUG AS SHOWN ABOVE.

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

5. FOR VACANT RESIDENTIAL LOTS, LOCATE SERVICE 18" INSIDE SIDE LOT LINE. LOT LINE TO BE PROJECTED PERPENDICULAR TO CURB.

6. ANGLE METER STOP SHALL BE PERPENDICULAR TO CURB LINE.

7. SET CORP. STOP WITH OPERATION NUT AT 3 OR 9 O’CLOCK.

8. TRAFFIC BEARING METER BOX AND LIDS (OLDCASTLE NO. 37 OR APPROVED EQUAL) SHALL BE USED WHERE METERS ARE LOCATED WITHIN ANY PORTION OF DRIVEWAY OR APRON AND OTHER TRAFFIC AREAS.

9. ONLY APPROVED BIT WITH CC THREADS AND TAPPING MACHINE ALLOWED FOR INSTALLATION OF CORP. STOP.

10. COPPER SERVICE SHALL BE INSTALLED IN A DIRECT LINE BETWEEN TAP AND METER.

11. COPPER TO BE ONE CONTINUOUS PIECE (NO UNIONS) UNLESS OTHERWISE APPROVED.
MATERIALS:

(ALSO SEE DIV. 5, 503.07 "WATER TECH. REQ’MENTS")

1. STANDARD VALVE BOX (SEE DETAIL 513)
2. PIPE O.D. x 2" TEE OR 2" F.I.P. SERVICE SADDLE (A.Y. McDO NALD MFG. CO. MODEL 3826 OR APPROVED EQUAL)
3. 2"BRASS M.I.P. NIPPLE, 3" OR 6" LENGTH
4. 2"F.I.P. GATE VALVE (MUELLER NO. A–2369–8 OR APPROVED EQUAL)
5. 2"M.I.P. x MUELLER 110 COMPRESSION COUPLING (NO. H–15428) OR APPROVED EQUAL
6. 2"ASTM B–88 TYPE "K" RIGID COPPER TUBING. SOFT TEMPER REQ’D WITH FLARE FITTINGS.
7. 2"90°BEND, MUELLER 110 COMPRESSION (NO. H–15526) OR APPROVED EQUAL
8. 2"ANGLE METER STOP, MUELLER NO. H–14277 (110 COMPRESION) OR APPROVED EQUAL
9. ARMORCAST METER BOX P6001534x12, COVER A6001643DZ, DROP–IN A600048Z, OR APPROVED EQUAL IN NON–TRAFFIC AREAS.

NOTES:

1. SUBSTITUTES FOR ANY MATERIALS SHOWN SHALL BE APPROVED BY THE ENGINEER.
2. ALL PIPE AND STRUCTURE ZONES SHALL BE BACKFILLED USING 3/4" MINUS CRUSHED AGG. AND COMPACTED TO 95% MAX. DENSITY AS DETERMINED BY AASHTO T–180.
3. WHEN AN ACTIVE CATHODIC PROTECTION SYSTEM IS ENCOUNTERED, SCH. 40 PVC SHALL BE INSTALLED WITH AN IMPERVIOUS CLAY PLUG, AS SHOWN.
4. METER BOX SHALL BE CENTERED OVER THE COMPLETED METER AND FITTING ASSEMBLY.
5. CUSTOMER SHALL INSTALL AN APPROVED BACKFLOW PREVENTION ASSEMBLY AT RIGHT–OF–WAY.
6. ANGLE METER STOP SHALL BE PERPENDICULAR TO CURB LINE.
MATERIALS:

1. STANDARD VALVE BOX, (SEE DETAIL 513)

2. PIPE O.D. x 2” TEE OR 2” F.I.P. SERVICE SADDLE (A.Y. MCDONALD MFG. CO. MODEL 3826 OR APPROVED EQUAL)

3. 2” BRASS M.I.P. NIPPLE, 3” OR 6” LENGTH

4. 2” F.I.P. GATE VALVE (MUELLER NO. A-2369-8 OR APPROVED EQUAL)

5. 2” M.I.P. x MUELLER 110 COMPRESSION COUPLING (NO. H-15428) OR APPROVED EQUAL.

6. 2” ASTM B-88 TYPE “K” RIGID COPPER TUBING.

7. 2” 90° BEND, MUELLER 110 COMPRESSION (NO. H-15526) OR APPROVED EQUAL.

8. ARMORCAST METER BOX P6001534X12, COVER A600164312DZ, DROP IN A600048Z.

9. 2” 90° BEND, COMP. x M.I.P. (MUELLER H-15531) OR APPROVED EQUAL.

10. 2” METER YOKE (SETTER) (MUELLER NO. B-2423-99000), OR APPROVED EQUAL.

11. 2” COMP. x F.I.P. (MUELLER H-15451) W/PVC PLUG, OR APPROVED EQUAL.

NOTES:

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

2. ALL PIPE AND STRUCTURE ZONES SHALL BE BACKFILLED USING ¾”-MINUS CRUSHED AGG. AND COMPACTED TO 95% MAX. DENSITY AS DETERMINED BY AASHTO T-180.

3. WHEN AN active cathodic protection system, is encountered, SCH. 40 PVC SHALL BE INSTALLED WITH IMPERVIOUS PLUGS, AS SHOWN.

4. METER BOXES SHALL BE CENTERED OVER THE COMPLETED METER AND FITTING ASSEMBLY.

5. CUSTOMER SHALL INSTALL AN APPROVED BACKFLOW PREVENTION ASSEMBLY AT RIGHT-OF-WAY.

6. METER SETTER SHALL BE PERPENDICULAR TO CURB LINE.
MATERIALS

1. ECLIPSE NO. 88 SAMPLING STATION WITH THREADED OUTLET NOZZLE AND BRASS INTERIOR, STAND PIPE GALVANIZED EXTERIOR OR APPROVED EQUAL.

2. ¾" TYPE "K" SOFT TEMPER COPPER TUBING.

3. ¾" QUARTER BEND M.I.P. x COMP. MUELLER H–15531 (110 COMPRESSION) OR APPROVED EQUAL.

4. ¾" F.I.P. BALL VALVE, MUELLER B–25209 OR APPROVED EQUAL.

5. ¾" CORP. STOP, MUELLER B–25008 (110 COMPRESSION XCC) OR APPROVED EQUAL.

6. STD. VALVE BOX (SEE DETAIL 513).

7. CONCRETE PAD 4" THK., x 46" LG x 31" WIDE.

NOTES

1. ALL PIPE AND STRUCTURES SHALL BE BACKFILLED WITH ¾”–0 CRUSHED ROCK COMPACTED TO MIN. 95% OF MAX. DENSITY PER AASHTO T–180

2. SET STATION AT LOT LINE UNLESS OTHERWISE SPECIFIED.

3. WHEN CROSSING CATHODICALLY PROTECTED SYSTEM, INSTALL PVC SLEEVE PER DETAIL 503.

4. WHERE NO SIDEWALK EXISTS, PLACE CONC. PAD AS SHOWN. WHERE SIDEWALK EXIST., PLACE MIN. 12" AROUND BACK OF SAMPLE STA. AND INCORPORATE INTO NEW SIDEWALK POUR.
MATERIALS

1. A.Y. MC DONALD MDL. 3826 OR APPROVED EQUAL
2. 2" M.I.P. CORP. STORP, MUELLER B–2969, OR APPROVED EQUAL
3. 2" ASTM B–88 RIGID COPPER
4. 2" BRASS ¼ BEND, MUELLER 110 COMPRESSION OR APPROVED EQUAL
5. 12"x12"x4" CONCRETE BLOCK
6. 2" BRASS ¼ BEND, F.I.P. x MUELLER 110 COMPRESSION, OR APPROVED EQUAL.
7. 2" R.W. F.I.P. GATE VALVE
8. 2" x3" BRASS M.I.P. NIPPLE
9. 2" COMBINATION AIR VALVE (VAL–MATIC NO. 202C OR APCO NO. 145C–2 OR APPROVED EQUAL).
10. 2" x 1–½" BRASS M.I.P. NIPPLE
11. 2" F.I.P. BRASS ¼ BEND
12. STD. 48" CONCRETE ECCENTRIC MANHOLE CONE W/NO STEPS
13. VALLEY IRON & STEEL FRAME NO. 106, 108 OR APPROVED EQUAL
14. VALLEY IRON & STEEL LID NO. 105, 107 OR APPROVED EQUAL
15. ¾"–MINUS CRUSHED AGGREGATE.
16. 1–½" – ¾" CLEAN DRAIN ROCK
17. 2" BRASS COUPLING, M.I.P. x MUELLER 110 COMPRESSION OR APPROVED EQUAL
18. 2" F.I.P. BRASS ¼ BEND WITH SCREEN ON OUTLET.
19. 12" MANHOLE ADJUSTMENT RING.
20. 2" UNION, MUELLER 110 COMPRESSION OR A.Y. MC DONALD
21. "HOT BOX" (EZBOX NO. EZ75 OR APPROVED EAUAL)
22. STANDARD VALVE BOX. SEE DETAIL 513.

NOTES

1. INSTALLATION LOCATED AT HIGH POINT OF MAIN.
2. 48" MANHOLE BARREL SECTIONS SHALL BE USED TO INCREASE DEPTH IF NECESSARY.
3. ALL PIPE AND STRUCTURE ZONES SHALL BE COMPACTED TO 95% OF MAX. DENSITY AS DETERMINED BY AASHTO T–180 OR AS SPECIFIED IN THE CONTRACT DOCUMENTS.
4. DETAIL NOT FOR SHALLOW INSTALLATIONS. INSTALLATIONS FOR WATERLINES WITH LESS THAN 36" OF COVER SHALL BE INDIVIDUALLY DESIGNED BY THE ENGINEER.
5. GROUT ALL AREAS WHERE COPPER PASSES THROUGH MANHOLE CONE.
6. PLACE "HOT BOX" OR APPROVED EQUAL AT BACK OF SIDEWALK IN UTILITY EASEMENT OR OBTAIN 5’ x 5’ WATER FACILITY EASEMENT.
1. USE CITY STANDARD VALVE BOXES, LIDS, AND 6” PVC EXTENSION (SEE DETAIL 513)

2. VALVE BOXES TO BE CONCRETE ENCASED AS SHOWN, IF NOT IN PAVED AREA.

3. BLOW-OFF UNIT SHALL BE BACKFILLED WITH 3/4”–0” CRUSHED ROCK AND COMPACTED TO 95% OF MAX. DENSITY AS DETERMINED BY AASHTO T–180.


5. 2” GALVANIZED TO BE ONE CONTINUOUS PIECE.

6. USE EBAA IRON "MEGALUG" OR APPROVED EQUAL RETAINER GLAND ON MJ CAP. RESTRAIN A MIN. 70 LF OF PIPE PRIOR TO BLOW-OFF OR INSTALL A STRADDLE BLOCK.

7. 2” PVC PLUG W/SQUARE NUT TO BE HAND TIGHTENED ONLY.
1. BACKFILL WITH SELECT CRUSHED AGGREGATE A MINIMUM OF 6" ON ALL SIDES.

2. ON TEMPORARY BLOW-OFFS ONLY, AN MJ CAP TAPPED 4" OR 6" MAY BE SUBSTITUTED FOR REDUCER.

3. TEMPORARY BLOW-OFF IS ONE REMOVED AT THE END OF PROJECT CONSTRUCTION. A PERMANENT BLOW-OFF REMAINS ON THE PROJECT AFTER ACCEPTANCE.

4. PLACE BLOW-OFF STANDPIPE 3 FT. INSIDE P/L. LINE AT END OF STREET (2 FT. FROM BARRICADE).

5. USE CITY STANDARD VALVE BOX, LID, AND 6" PVC EXTENSION FOR BLOW-OFF VALVE. USE "PORTLAND" STYLE VALVE BOX, LID, AND 8" PVC EXTENSION FOR BLOW-OFF STAND PIPE (SEE DETAILS 513 & 514)
NOTES:

1. ALL FILLING, FLUSHING, AND TESTING OF NEW WATERLINE FACILITIES SHALL BE DONE THROUGH A 6" DOUBLE CHECK ASSEMBLY WITH A METERING DEVICE.

2. PROVIDE TEMPORARY BLOCKING AS REQUIRED.

3. ALL PIPING AND FITTINGS SHALL BE GALVANIZED IRON.

4. FOR 8"–12" WATERLINES: FILL POINT SHALL BE 4" PIPING AND FITTINGS. FOR 14"–18" WATERLINES: FILL POINT SHALL BE 6" PIPING AND FITTINGS. FOR 20" AND LARGER: FILL POINT SHALL SIZED AS DETERMINED BY THE ENGINEER.
1. ALL VALUES ARE BASED ON THE FOLLOWING ASSUMPTIONS:
   AVG. PRESSURE = 100 PSI x 2 (safety factor); 1500 PSF SOIL BEARING
   CAPACITY; NORMAL DISTRIBUTION DESIGN VELOCITY NOT TO EXCEED 8 F/S.
2. ALL FITTINGS SHALL BE WRAPPED IN PLASTIC PRIOR TO PLACEMENT OF CONCRETE.
3. ALL THRUST BLOCKS SHALL BE FORMED TO ELIMINATE ANY CONCRETE AROUND
   FITTING BOLTS.
4. BEARING SURFACE OF THRUST BLOCKING SHALL BE AGAINST UNDISTURBED SOIL.
5. ALL CONCRETE MIX SHALL HAVE A MIN. 28 DAY STRENGTH OF 3300 PSI.
6. ALL PIPE ZONES SHALL BE GRAVEL FILLED AND COMPACTED.
7. THRUST BLOCKS FOR PLUGGED CROSS AND PLUGGED TEE SHALL HAVE #4 REBAR
   LIFTING LOOPS INSTALLED AS SHOWN.
8. VERTICAL THRUST DETAILS – SEE DWG. #509
9. STRADDLE BLOCK DETAILS – SEE DWG. #510.
10. EACH PROPOSED MECHANICAL RESTRAINT LENGTHS SHALL BE REVIEWED ON A CASE
    BY CASE BASIS BY THE ENGINEER OF RECORD.
    * BLOCK TO UNDISTURBED TRENCH WALLS
    ** THRUST BLOCKS FOR PIPES LARGER THAN 18” WILL BE INDIVIDUALLY
       DESIGNED BY THE ENGINEER OF RECORD.
NOTES:

1. GRAVITY VERTICAL THRUST BLOCKS AND MECHANICAL RESTRAINT LENGTHS VALUES SHALL BE REVIEWED BY THE ENGINEER OF RECORD.
2. KEEP CONCRETE CLEAR OF JOINT AND JOINT ACCESSORIES. FITTINGS SHALL BE WRAPPED IN PLASTIC PRIOR TO PLACEMENT OF CONCRETE.
3. CONCRETE THRUST BLOCKING SHALL BE POURED AGAINST UNDISTURBED EARTH.
4. CONCRETE MIX SHALL HAVE A MIN. 28 DAY STRENGTH OF 3300 P.S.I.
5. GRAVITY THRUST BLOCK VOLUMES FOR VERTICAL BENDS HAVING UPWARD RESULTANT THRUSTS ARE BASED ON TEST PRESSURE OF 150 P.S.I.G. AND THE WEIGHT OF CONCRETE = 4050 LBS./CU.YD.
6. VERTICAL BENDS THAT REQUIRE A GRAVITY THRUST BLOCK VOLUME EXCEEDING 5 CUBIC YARDS REQUIRE SPECIAL BLOCKING DETAILS DESIGNED BY THE ENGINEER. NOTE VOLUMS SHOWN INSIDE HEAVY LINE IN TABLE.
7. PAYMENT SHALL BE THE SAME AS FOR HORIZONTAL THRUST BLOCKS.
8. ALL REBAR SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM–123 (MIN. 3.4 MIL). REBAR SHALL BE BENT BEFORE GALVANIZATION, AND LAST 4” OF BAR SHALL BE BENT 90 DEGREES WITH A 1/2” RADIUS BEND. REBAR SHALL BE TIGHTLY FIT TO RESTRAINED FITTING.
9. FOR HORIZONTAL THRUST BLOCK DETAILS SEE DETAIL NO. 508.

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<th>VOLUME OF GRAVITY THRUST BLOCK IN CUBIC YARDS (VERTICAL BENDS)</th>
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<td>FITTING SIZE</td>
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<th>FITTING SIZE</th>
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<td>12” AND LESS</td>
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<td>14” – 16”</td>
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<td>36”</td>
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DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030
VERTICAL THRUST BLOCKING

DRAWN RWL
REV. DATE APPR.

SCALE N.T.S.
DATE JAN. 1, 2006
APPR.

DWG. NO. 509
MATERIALS:

1. CONCRETE STRADDLE BLOCK.

2. 2—MEGALUG OR APPROVED EQUAL RETAINER GLANDS

3. #4 REBAR EACH WAY, 12” O/C.

4. NO JOINTS ALLOWED BETWEEN STRADDLE BLOCK AND FITTING/BLOW-OFF ASSEMBLY.

5. FITTING/BLOW-OFF ASSEMBLY

NOTES:

1. STRADDLE BLOCKS HEIGHT AND WIDTH SHALL BE DESIGNED INDIVIDUALLY BY THE ENGINEER AND SHALL BE BASED ON THE FOLLOWING:
   a.) 200 PSI WATER PRESSURE
   b.) SOIL BRG. CAPACITY
   c.) STEEL SIZE AND SPACING

2. BEARING AREA OF BLOCK SHALL BE AGAINST UNDISTURBED SOIL.

3. STRADDLE BLOCK SHALL HAVE A MINIMUM OF 18” COVER.

4. CONCRETE SHALL HAVE A MIN. 28-DAY STRENGTH OF 3300 PSI

5. ALL FITTINGS, & PIPE WITHIN THE CONC. SHALL BE WRAPPED IN 8 MIL. PLASTIC

6. STRADDLE BLOCK HEIGHT (H) & WIDTH (W) SHALL BE DETERMINED BY THE ENGINEER OF RECORD.
ZONE 1: ONLY CROSSING RESTRICTIONS APPLY
ZONE 2: CASE-BY CASE DETERMINATION
ZONE 3: PARALLEL WATERLINE PROHIBITED
ZONE 4: PARALLEL WATERLINE PROHIBITED

NOTES:

1. WHERE THE PROPOSED WATERLINE WILL BE INSTALLED PARALLEL TO AN EXISTING GRAVITY SANITARY SEWER MAIN OR LATERAL LINE, THE SEPARATION BETWEEN THE TWO SHALL BE AS INDICATED ABOVE.

2. CROSSING:
   a. WHenever possible, the bottom of the waterline shall be 1.5 feet above the top of the sewer line. One full length of waterline shall be centered at the crossing, regardless of vertical separation.
   b. Where it is not possible for the water line to be 1.5 feet above the sewer line, or the waterline passes under the sewer line, the existing sewer line shall be exposed for a distance of 10 feet on each side of the crossing, and shall be replaced with C-900 PVC, DR-18, DR-25 or CLASS 50 DUCTILE IRON PIPE as approved by the engineer, and a length of water pipe shall be centered at the crossing, or as approved by the engineer.

3. SEPARATION FROM FORCE MAIN SANITARY SEWER SHALL BE REVIEWED ON A CASE-BY-CASE BASIS.
NOTES:

1. VALVE BOXES SHALL BE CENTERED DIRECTLY OVER THE VALVE NUT IN A VERTICAL POSITION.

2. VALVE BOX TOP SHALL BE ADJUSTED TO MEET FINISHED GRADE.

3. PVC SHALL BE ON CONTINUOUS PIECE – NO BELLS OR COUPLERS.

4. USE FOR ALL VALVES AND 2” BLOW-OFF STANDPIPES

"VANCOUVER" STYLE
18" TALL VALVE BOX
NOTES:

1. VALVE BOXES SHALL BE CENTERED DIRECTLY OVER THE STANDPIPE IN A VERTICAL POSITION.

2. VALVE BOX TOP SHALL BE ADJUSTED TO MEET FINISHED GRADE.

3. PVC SHALL BE ONE CONTINUOUS PIECE—NO BELLS OR COUPLERS.

4. USE FOR 4" & 6" BLOW-OFF STANDPIPES AND FLUSH MOUNTED CATHODIC PROTECTION TEST STATIONS ONLY.
### SPECIFICATIONS

<table>
<thead>
<tr>
<th></th>
<th>3” METER</th>
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<tr>
<td>INCOMING LINE SIZE</td>
<td>4”</td>
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<td>BY-PASS LINE SIZE</td>
<td>4”</td>
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<tr>
<td>UTILITY VAULT NO.</td>
<td>687–COG (OR APPROVED EQUAL)</td>
<td>687–COG (OR APPROVED EQUAL)</td>
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<td>LID NO. (OR APPROVED EQUAL)</td>
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### FITTINGS & VALVES BY CONTRACTOR

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<tr>
<td>B</td>
<td>4” MJxFLG ADAPTER</td>
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<td>C</td>
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<td>D</td>
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<td>F</td>
<td>4” FLGxPE CONTINUOUS D.I. PIPE</td>
<td>4” FLGxPE CONTINUOUS D.I. PIPE</td>
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### FITTINGS, VALVES & METER BY CITY

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<td>4” HERSEY/MCT METER (OR APPROVED EQUAL)</td>
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# FITTING, VALVES & METER BY CITY

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<tr>
<td>(3)</td>
<td>4&quot;x2&quot; HERSEY MFM/MCT2 COMPOUND METER (OR APPROVED EQUAL)</td>
<td>6&quot;x3&quot; HERSEY MFM/MCT2 COMPOUND METER (OR APPROVED EQUAL)</td>
<td>8&quot;x4&quot; HERSEY MFM/MCT2 COMPOUND METER (OR APPROVED EQUAL)</td>
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</table>
1. METER AND DOWNSTREAM VALVE TO BE INSTALLED BY THE CITY ONCE NEW PIPING AND FITTINGS HAVE BEEN TESTED AND ACCEPTED.

2. ALL VAULT WALL OPENINGS SHALL BE CORE DRILLED AND SEALED WITH NON-SHRINK GROUT.

3. TOP OF VAULT BE A MINIMUM 8” ABOVE FINISH GRADE.

4. INSTALL 4” DRAIN FROM BOTTOM OF VAULT FLOOR TO DAYLIGHT, TO BACKFLOW ASSEMBLY VAULT, TO STORM DRAIN SYSTEM OR TO APPROVED SUMP. IN NO CASE SHALL BACKFLOW VAULT DRAIN INTO METER VAULT.

5. VAULT SHALL BE CLEAN, DRY AND FREE OF DEBRIS PRIOR TO METER INSTALLATION.

6. ALL MECHANICAL JOINTS SHALL BE RESTRAINED WITH “MEGALUG” RETAINER GLANDS OR APPROVED EQUAL.

7. SERVICE LINE INTO VAULT SHALL BE MECHANICALLY RESTRAINED FROM MAINLINE THROUGH VAULT.

8. ALL PIPING TO BE BACKFILLED AS DESCRIBED & SHOWN IN STANDARD DETAIL 502.

9. INSTALL A MIN. OF 3 PIPE SUPPORTS IN VAULT (GRINNELL NO. 264 ELCEN NO. 59 OR APPROVED EQUAL).

10. ALL PIPING AND FITTINGS IN VAULT SHALL BE LEVEL AND MINIMUM OF 18" AND A MAX. 42" ABOVE THE FLOOR OF VAULT.

11. ONLY APPROVED RESILIENT WEDGE VALVES ARE ALLOWED.

12. ALL VAULT LIDS SHALL BE EQUIPPED WITH SYRACUSE OR BILCO LIDS (OR AN APPROVED EQUAL) SEE DETAILS 515D AND 516F FOR LID SIZES FOR VARIOUS UTILITY VAULTS.

13. ALL VAULTS SHALL BE EQUIPPED WITH OSHA APPROVED UTILITY VAULT ALUMINUM EXT. LADDER (OR AN APPROVED EQUAL).

14. PIPE BETWEEN THE TWO TEES SHALL BE ONE LEVEL CONTINUOUS PIECE OF PIPE.

15. ALL FITTINGS, VALVES AND PIPING THROUGH ENTIRE VAULT SHALL BE LEVEL AT COMPLETION OF INSTALLATION.

16. VAULT PIPE OPENINGS SHALL BE SEALED WITH NON-SHRINK GROUT. “CRYSTAL SEAL” (OR APPROVED EQUAL) AT MANUFACTURE.

17. ON THE EXTERIOR SURFACES OF ALL VAULTS WILL MAINTAIN A 2 FOOT CLEARANCE FROM OUTSIDE WALL OF VAULT TO EXCAVATED BANK OF EARTH AND WILL BE BACKFILLED WITH ¾” MINUS SELECT BACKFILL.
ATTACH LADDER SUPPORT TO INSIDE FACE OF VAULT COVER OPENING AS SHOWN. CENTERLINE OF LADDER CONNECTION MUST BE SET 7" FROM FACE OF INSIDE SURFACE OF VAULT LID.

PROVIDE 15" CLEARANCE TO ANY OBSTRUCTION ON EITHER SIDE OF LADDER.

ATTACHED LADDER SUPPORT TO FLOOR OF VAULT.

NOTE:

GALV. LADDER W/AN ALUMINUM EXT. BY UTILITY VAULT (OR APPROVED EQUAL).
CITY OF GRESHAM

CROSS CONNECTION PROGRAM

BACKFLOW ASSEMBLY AND VAULT
INSTALLATION STANDARDS

* DOUBLE CHECK VALVE ASSEMBLY
* DOUBLE CHECK DETECTOR ASSEMBLY
* REDUCED PRESSURE (R.P.) ASSEMBLY

CONTACTS

DEPARTMENT                           PHONE NO.

ENGINEERING                        618–2633
OPERATIONS                         618–2626
PLUMBING INSPECTION                618–2830
FIRE DEPARTMENT                    618–2573
UTILITY VAULT ALUMINUM EXT.
LADDER (OR
APPROVED EQUAL)

NO OTHER DEVICES SHALL BE
CONNECTED TO THE
DCVA OR DCDA.
LOCAL FIRE DEPT.
AND PLUMBING
CODE REQUIREMENTS
APPLY TO ALL WATER
FACILITIES PAST THE
BACKFLOW VAULT

CORE DRILL 18\(\phi\) HOLE IN
BOTTOM OF VAULT AND
INSTALL 12"\(\phi\)x12" DEEP PVC
SUMP W/GRATE BY UTILITY
VAULT OR (APPROVED
EQUAL) AND SEAL SUMP
W/NON-SHRINK
WATERPROOF GROUT

NO OTHER DEVICES
SHALL BE
CONNECTED TO THE
DCVA OR DCDA.
LOCAL FIRE DEPT.
AND PLUMBING
CODE REQUIREMENTS
APPLY TO ALL WATER
FACILITIES PAST THE
BACKFLOW VAULT

CORE DRILL
FOR PIPE
AND SEAL
W/NON-SHRINK
GROUT

CORE DRILL
VAULT FOR
DRAIN PIPE
AND SEAL
DRAIN PIPE
OPENING W/
NON-SHRINK
WATERPROOF
GROUT

3" GALVANIZED OR
EPoxy COATED
"STAND-ON" PIPE
SUPPORTS (OR
APPROVED EQUAL)

NOTE:
FOR SPECIFICATION OF DBL CK VALVE
BACKFLOW ASSEMBLY SEE DETAIL 516F
COAT ALL OUTSIDE CONC SURFACES OF
VAULT W/CRYSTAL SEAL (OR APPROVED
EQUAL)

FLOW
CITY OF GRESHAM

REQUIREMENTS FOR BACK FLOW PREVENTION ASSEMBLY
INSTALLATIONS ON 1 1/2” AND LARGER DOMESTIC SERVICES, IRRIGATION SERVICES AND FIRE LINE SERVICES

AN APPROVED BACK FLOW PREVENTION ASSEMBLY IS REQUIRED ON ALL 1 1/2” AND LARGER DOMESTIC METER SIZE SERVICES, PLUS ALL DEDICATED IRRIGATION AND ALL FIRE LINE SYSTEMS. AN ASSEMBLY WILL BE APPROVED BY THE CITY OF GRESHAM ONLY IF THE DEPT. OF HUMAN SERVICES HAS APPROVED ITS USE AS A BACK FLOW ASSEMBLY, AND THE ASSEMBLY IS TESTABLE. THE ASSEMBLY SHALL BE INSTALLED AT THE PROPERTY LINE. WHEN IT IS NOT POSSIBLE TO LOCATE THE ASSEMBLY AT THE PROPERTY LINE, THE PROPOSED LOCATION MUST BE APPROVED BY THE WATER DIVISION ENGINEER BEFORE INSTALLATION. A WATER SERVICE SHALL NOT BE TURNED ON UNTIL ALL REQUIRED BACK FLOW PREVENTION ASSEMBLIES ARE INSTALLED, INSPECTED, TESTED, AND REGISTERED WITH THE CITY OF GRESHAM (SEE NOTE 8 BELOW). COST OF ALL INSTALLATIONS, INCLUDING ALL COST OF INITIAL INSPECTION AND TESTING FEES, SHALL BE THE RESPONSIBILITY OF THE CUSTOMER. THE CUSTOMER WILL BE RESPONSIBLE FOR ALL MAINTENANCE AND TESTING OF THE ASSEMBLY AND VAULT WHEN USED.

CONSTRUCTION AND DESIGN STANDARDS FOR WATER FACILITIES

1. ALL PIPE WILL BE INSTALLED TO THE CITY OF GRESHAM’S PUBLIC WORKS STANDARDS.

2. THE CITY OF GRESHAM WILL BE FURNISHED WITH THREE SETS OF PLANS AND SPECIFICATIONS. THE PLANS WILL BE DRAWN AT A SCALE OF 1”=20’ FOR PLAN CHECK. ONE SET OF REVISED PLANS WILL BE RETURNED TO THE ENGINEER FOR REVISIONS.

3. THE CONTRACTOR WILL KEEP ONE SET OF APPROVED PLANS AT THE CONSTRUCTION SITE.

4. THE ENGINEER WILL FURNISH THE CITY OF GRESHAM 48–HOUR NOTICE PRIOR TO CONSTRUCTION.

5. WATER FACILITIES WILL BE INSTALLED IN THE PRESENCE OF THE CITY OF GRESHAM’S INSPECTOR. THE INSPECTOR SHALL HAVE ACCESS TO THE CONSTRUCTION SITE AT ALL TIMES.

6. NEW MAINS ARE TO BE PRESSURE TESTED AND DISINFECTED BY THE CONTRACTOR AND PROVEN TO BE BACTERIOLOGICALLY SAFE PRIOR TO PLACING NEW MAINS IN SERVICE AND PRIOR TO CONNECTION TO CITY FACILITIES.

7. UPON COMPLETION OF THE WATER FACILITY, THE ENGINEER WILL NOTIFY THE CITY OF GRESHAM 48 HOURS IN ADVANCE OF DESIRED, FINAL INSPECTION.

8. CONTRACTOR MUST COORDINATE BACK FLOW ASSEMBLY TEST WITH GRESHAM WATER QUALITY DEPT. (WATER OPERATION TELEPHONE NO. (503)618-2626), TO RECEIVE SERVICE TO PROPERTY. METER STOPS AND VALVES TO REMAIN LOCKED & OFF UNTIL THAT TIME OF COORDINATION AND APPROVED TEST.

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030
BACKFLOW ASSEMBLY
DOUBLE CHECK VALVE (DETECTOR) ASSEMBLY
BACKFLOW ASSEMBLY INSTALLATION STANDARD

TO ENSURE PROPER OPERATION AND ACCESSIBILITY OF ALL BACK FLOW PREVENTION ASSEMBLIES, THE FOLLOWING REQUIREMENTS SHALL APPLY TO INSTALLATION OF THESE ASSEMBLIES UNLESS SPECIFICALLY APPROVED BY THE WATER DIVISION ENGINEER/SUPERINTENDENT. THE CITY OF GRESHAM PUBLIC WORKS STANDARDS AND CHAPTER 5 OF THE CITY CODE WILL TAKE PRECEDENCE IN DESIGN AND INSTALLATION.

1. NO PART OF THE BACKFLOW PREVENTION ASSEMBLY SHALL BE SUBMERGED IN WATER OR INSTALLED IN A LOCATION SUBJECT TO FLOODING. IF INSTALLED IN A VAULT OR CHAMBER, ADEQUATE DRAINAGE SHALL BE PROVIDED ONTO OWNER’S PROPERTY BY EITHER DRAINAGE TO DAYLIGHT OR BY SUMP PUMP TO DAYLIGHT. TEST COCKS SHALL BE PLUGGED. THE PLUGS SHALL NOT BE OF DISSIMILAR METALS.

2. THE ASSEMBLY MUST BE PROTECTED FROM FREEZING AND OTHER SEVERE WEATHER CONDITIONS.

3. ONLY ASSEMBLIES APPROVED FOR VERTICAL INSTALLATION MAY BE INSTALLED VERTICALLY.

4. THE ASSEMBLY SHALL BE READILY ACCESSIBLE WITH ADEQUATE ROOM FOR MAINTENANCE AND TESTING. ASSEMBLIES 2 INCHES AND SMALLER SHALL HAVE AT LEAST A 12-INCH CLEARANCE BELOW AND ON BOTH SIDES OF THE ASSEMBLY; AND IF LOCATED IN A VAULT, THE TOP OF THE ASSEMBLY SHALL BE BETWEEN 18 AND 24 INCHES BELOW GRADE. ALL ASSEMBLIES LARGER THAN 2 INCHES SHALL HAVE A 12-INCH CLEARANCE ON THE BACKSIDE, A 24-INCH CLEARANCE ON THE TEST-COCK SIDE, AND 12 INCH BELOW THE ASSEMBLY. ADEQUATE CLEARANCE (3 INCHES MIN.) MUST BE MAINTAINED ABOVE O.S. & Y. GATE–VALVE STEM. HEADROOM OF 6”–0” IS REQ’D IN VAULTS. ACCESS TO THE ASSEMBLIES AND TO ANY VAULT OR CHAMBER SHALL REMAIN CLEAR AT ALL TIMES. AN OR/OSHA APPROVED CHAMBER LADDER THAT EXTENDS 3 FT. ABOVE SURFACE OF VAULT SHALL BE INSTALLED.

5. NO POST INDICATING VALVES ARE ALLOWED TO BE INSTALLED DIRECTLY ON DOUBLE CHECK DETECTOR ASSEMBLIES.

6. ONLY APPROVED DOUBLE CHECK DETECTOR ASSEMBLIES ARE TO BE USED FOR SYSTEM CONTAINMENT ON FIRE LINE SERVICES IN THE CITY OF GRESHAM. THE METER ON BYPASS ASSEMBLY SHALL READ IN CUBIC FEET.

7. IF A FIRE LINE FLOW, OR TAMPER SWITCH IS INSTALLED, IT MUST BE CONNECTED TO A MONITORED FIRE DETECTION SYSTEM APPROVED BY THE FIRE MARSHAL. NO INSTALLATION WILL MODIFY THE BACK FLOW ASSEMBLY OR INTERFERE WITH ITS OPERATION OR MAINTENANCE.

8. ALL BACK FLOW ASSEMBLIES SHALL BE INSTALLED AT THE SERVICE CONNECTION TO THE PREMISES PER OREGON ADMINISTRATIVE RULES 333–61–070, CROSS CONNECTION CONTROL REQUIREMENTS, UNLESS SPECIFICALLY APPROVED BY THE WATER DIVISION MANAGER. (SERVICE CONNECTION – A LOCATION WHERE THE PUBLIC WATER FACILITIES END AT OR NEAR THE PROPERTY LINE)

9. ALL PIPE BETWEEN MAIN AND ASSEMBLY SHALL BE RESTRAINED. USE "MEGALUG" OR APPROVED EQUAL RETAINER GLANDS ON MJ FITTINGS AND "FIELD–LOK" OR APPROVED EQUAL GASKETS ON BELL JOINTS. UNI–FLANGE ADAPTERS MAY BE USED IN VAULTS.

10. APPROVED BACK FLOW ASSEMBLY MAY NOT BE MODIFIED IN ANY WAY FROM WHICH IT WAS MANUFACTURED, TESTED AND APPROVED.
REDUCED PRESSURE (R.P.) PRINCIPLE BACKFLOW PREVENTION ASSEMBLY (R.P.)

INSTALLATION STANDARD

AS WELL AS IN THE PREVIOUSLY STATED INSTALLATION STANDARDS, THESE INSTALLATION STANDARDS SHALL APPLY TO THE INSTALLATION OF R.P. ASSEMBLIES:

R.P.’S SHALL BE UTILIZED AT PREMISES WHERE A SUBSTANCE IS HANDLED THAT WOULD BE HIGH HAZARD TO HEALTH IF INTRODUCED INTO THE POTABLE WATER SYSTEM. THE R.P. IS NORMALLY USED IN LOCATION WHERE AND AIR GAP IS IMPRactical. THE R.P. IS EFFECTIVE AGAINST BOTH BACKSHIPONAGE AND BACKPRESSURE.

1. R.P.’S MUST BE Sized TO PROVIDE AN ADEQUATE SUPPLY OF WATER AND PRESSURE FOR THE PREMISES BEING SERVED. FLOW CHARACTERISTICS ARE NOT STANDARD. CONSULT MANUFACTURER’S SPECIFICATIONS FOR SPECIFIC PERFORMANCE DATA.

2. PREMISES WHERE INTERRUPTION OF WATER SUPPLY IS CRITICAL SHOULD BE PROVIDED WITH TWO ASSEMBLIES INSTALLED IN PARALLEL. THEY SHOULD BE SIZED IN SUCH A MANNER THAT EITHER ASSEMBLY WILL PROVIDE THE MINIMUM WATER REQUIREMENTS WHILE THE TWO TOGETHER WILL PROVIDE THE MAXIMUM FLOW REQUIRED.

3. BYPASS LINES ARE PROHIBITED. PIPE FITTINGS WHICH COULD BE USED FOR CONNECTING A BYPASS LINE SHALL NOT BE INSTALLED.

4. THE ASSEMBLY SHALL BE READILY ACCESSIBLE FOR TESTING AND MAINTENANCE AND SHALL BE LOCATED IN AN AREA WHERE WATER DAMAGE TO BUILDING OR FURNISHINGS WOULD NOT OCCUR FROM RELIEF VALVE DISCHARGE. AN APPROVED AIR GAP FUNNEL ASSEMBLY MAY BE USED TO DIRECT MINOR DISCHARGES AWAY FROM THE ASSEMBLY; THIS ASSEMBLY WILL NOT CONTROL FLOW IN A CONTINUOUS RELIEF SITUATION. DRAIN LINES TO ACCOMMODATE FULL RELIEF VALVE DISCHARGE FLOW SHALL BE REQUIRED.

R.P.’S SHALL BE INSTALLED ABOVE GRADE IN WELL DRAINED AREA, BUT MAY BE INSTALLED BELOW GRADE BY APPROVAL OF WATER DIVISION ENGINEER BEFORE INSTALLATION, IF AN ADEQUATE DRAIN BY GRAVITY THROUGH A “BORESIGHT” DRAIN TO DAYLIGHT IS PROVIDED.

ENCLOSURES SHALL BE DESIGNED FOR READY ACCESS AND Sized TO ALLOW FOR THE MINIMUM CLEARANCES ESTABLISHED BELOW. REMOVABLE PROTECTIVE ENCLOSURES ARE TYPICALLY INSTALLED ON THE SMALLER ASSEMBLIES. BORE SIGHTED DAYLIGHT DRAIN PORTS MUST BE PROVIDED TO ACCOMMODATE FULL PRESSURE DISCHARGE FROM THE ASSEMBLY.

ALL ASSEMBLIES LARGER THAN 2 INCHES SHALL HAVE A MINIMUM OF 12 INCHES CLEARANCE ON THE BACK SIDE, 24 INCHES CLEARANCE ON THE TEST COCK SIDE, AND RELIEF VALVE OPENING SHALL BE AT LEAST 12 INCHES PLUS NOMINAL SIZE OF ASSEMBLY ABOVE THE FLOOR OR HIGH TEST POSSIBLE WATER LEVEL WHICHEVER IS HIGHER. HEADROOM OF 6 FEET IS REQUIRED IN VAULTS. A MINIMUM ACCESS OPENING OF 36”x72” INCHES SQUARE IS REQUIRED ON ALL VAULT LIDS. A CHAMBER LADDER MEETING OSHA REQUIREMENTS SHALL BE PERMANENTLY INSTALLED IN THE VAULT, UNLESS A SIDE ENTRY ENCLOSURE IS USED.
REDUCED PRESSURE (R.P.) PRINCIPLE BACKFLOW PREVENTION ASSEMBLY (R.P.)
INSTALLATION STANDARD

ASSEMBLIES INSTALLED MORE THAN 5 FEET ABOVE FLOOR LEVEL MUST HAVE A
SUITEABLE PLATFORM FOR USE BY TESTING OR MAINTENANCE PERSONNEL.

5. THE ASSEMBLY MUST BE PROTECTED FROM FREEZING AND OTHER SEVERE WEATHER
CONDITIONS.

6. ONLY R.P. DEVICES APPROVED FOR VERTICAL INSTALLATION WILL BE ACCEPTED.

7. THE PROPERTY OWNER ASSUMES ALL RESPONSIBILITY FOR LEAKS AND DAMAGE. THE
OWNER SHALL ALSO KEEP THE VAULT REASONABLY FREE OF SILT AND DEBRIS.

8. VARIANCES FROM THESE REGULATIONS WILL BE EVALUATED ON A CASE-BY-CASE
BASIS. ANY DEVIATIONS MUST HAVE PRIOR WRITTEN APPROVAL OF THE WATER
DIVISION ENGINEER PRIOR TO INSTALLATION.

8. APPLY CRYSTAL SEAL (OR APPROVED EQUAL) ON ALL OUTSIDE SURFACES OF
PROPOSED CONC. VAULTS

END OF R.P. INSTALLATION STANDARD

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<th>SIZE</th>
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<th>VAULT LID *</th>
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<tr>
<td>3”</td>
<td>577–LA UTILIY VAULT (OR APPROVED EQUAL)</td>
<td>2–332P UTILITY VAULT (OR APPROVED EQUAL) CENTER OFFSET</td>
</tr>
<tr>
<td>4”</td>
<td>577–LA UTILITY VAULT (OR APPROVED EQUAL)</td>
<td>2–332P UTILITY VAULT (OR APPROVED EQUAL) CENTER OFFSET</td>
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<tr>
<td>6”</td>
<td>676–WA UTILITY VAULT (OR APPROVED EQUAL)</td>
<td>2–332P UTILITY VAULT (OR APPROVED EQUAL) CENTER OFFSET</td>
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<tr>
<td>8”</td>
<td>687–WA UTILITY VAULT (OR APPROVED EQUAL)</td>
<td>2–332P UTILITY VAULT (OR APPROVED EQUAL) CENTER OFFSET</td>
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<tr>
<td>10”</td>
<td>5106–WA UTILITY VAULT (OR APPROVED EQUAL)</td>
<td>2–332P UTILITY VAULT (OR APPROVED EQUAL) CENTER OFFSET</td>
</tr>
</tbody>
</table>

NOTE:

FOR ALL BACK FLOW VAULTS ADD 57R–6 AND/OR 57R–12
RISER TO ACCOMODATE EXTRA DEPTHS DUE TO METER VAULT
DRAINING TO BACK FLOW VAULTS
"HOT-BOX" (OR APPROVED EQUAL) ENCLOSURE WITH REMOVABLE COVER

PROVIDE HEAT AND INSULATION

SUPPLY

FLOW

SCREEN

DRAIN TO DAYLIGHT PIPE

12" MIN

3" MIN

3" MIN
NOTES:

1. IF SIX FOOT GENERAL UTILITY EASEMENT IS PRESENT ALONG PROPERTY FRONTAGE PLACEMENT SHALL BE AT BACK OF SIDEWALK WITHIN UTILITY EASEMENT.

2. ON STREETS LESS THAN 28' IN WIDTH, WATERLINE LOCATION SHALL BE REVIEWED AND APPROVED BY THE ENGINEER.

3. WHERE NO PLANTER STRIP EXISTS, FIRE HYDRANTS ARE TO BE LOCATED IN LINE WITH STREET LIGHTS & STREET TREES, OR AT BACK OF WALK, IF OUTSIDE THE R.O.W., LOCATE IN A 5' X 5' EASEMENT.

4. 3" DIA. CONDUIT REQUIRED ON ALL ARTERIAL STREETS TO SERVE SIGNAL SYSTEM

5. OVERHEAD UTILITIES SHALL PROVIDE FOR A MINIMUM OF 15' CLEARANCE FROM GROUND SURFACE IN ALL AREAS WITHIN THE RIGHT-OF-WAY

*JOINT TRENCH DETAIL (OPTIONAL)
1. PCC SHALL BE 3300 PSI STRENGTH AT 28 DAYS EXCEPT IN COMMERCIAL AREAS WHERE PCC SHALL BE 5000 PSI STRENGTH AT 28 DAYS.

2. CONTRACTION JOINTS SHALL BE PLACED AT 15’ MAX. SPACING.

3. CURB EXPOSURE SHALL BE 7.5” AT ALL CATCH INLETS.

4. DRAIN BLOCKOUTS SHALL BE PLACED 2 PER LOT 6” INSIDE EACH PROPERTY LINE. DRAIN PIPE SHALL BE EXTENDED TO 1’ BEHIND BACK OF SIDEWALK WHEN SIDEWALK IS INSTALLED BEFORE THE LOT IS CONNECTED TO THE DRAIN PIPE.

5. ADD 2” WIDE AND 4” DEEP SHELF WHEN CURB IS PLACED ADJACENT TO SIDEWALK.

6. CRUSHED BASE ROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

7. WHEN A DRIVEWAY IS PLACED WHERE THERE IS AN EXISTING MONOLITHIC CURB MAKE A VERTICAL SAWCUT AT THE FACE OF CURB. REPLACE BACK PART OF CURB AND ADD DRIVEWAY WITH ONE CONTIGUOUS POUR.
1. PCC SHALL BE 3300 PSI STRENGTH AT 28 DAYS. EXCEPT IN COMMERCIAL AREAS WHERE PCC SHALL BE 5,000 PSI STRENGTH AT 28 DAYS.

2. CONTRACTION JOINTS SHALL BE PLACED AT 15’ MAX. SPACING.

3. CURB EXPOSURE SHALL BE 8.5” AT ALL CATCH INLETS.

4. DRAIN BLOCKOUTS SHALL BE PLACED 2 PER LOT 6” INSIDE EACH PROPERTY LINE. DRAIN PIPE SHALL BE EXTENDED TO 1’ BEHIND BACK OF WALK WHERE SIDEWALK IS INSTALLED BEFORE THE LOT IS CONNECTED TO THE DRAIN PIPE.

5. ADD 2” WIDE AND 4” DEEP SHELF WHEN CURB IS PLACED ADJACENT TO SIDEWALK.

6. CRUSHED BASE ROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

7. TYPE "C" CURB SHALL ONLY BE INSTALLED AT LOCATIONS (REPLACEMENT) TO MATCH EXISTING CURB TYPE.
MOUNTABLE CURB
TO BE USED FOR HIGH DENSITY DEVELOPMENT
WITH MANAGER’S APPROVAL

r=1/2"

15” 8” 1”

r=1"

6"

12” MIN.

5” MIN.

CRUSHED BASE ROCK

MOUNTABLE CURB

5’

EXISTING CURB & GUTTER

TRANSITION DETAIL

1. PCC SHALL BE 3300 PSI STRENGTH AT 28 DAYS.
2. CONTRACTION JOINTS SHALL BE PLACED AT 15’ MAX.
   SPACING.
3. ADD 2” WIDE 4” DEEP SHELF WHEN CURB IS PLACED ADJACENT TO
   SIDEWALK.
4. CRUSHED BASE ROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY
   PER AASHTO T-180.
5. ROOF DRAINS SHALL DRAIN DIRECTLY TO DRAINAGE CATCH BASINS.

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030

MOUNTABLE CURB

DRAWN DRB
DIV. TRANSPORTATION
REV. DATE APPR.

SCALE N.T.S.
DATE JAN. 1, 2006
APPR. 
DWG. NO. 604
15' MINIMUM CLEAR PATHWAY

12' MINIMUM

1% TO 4% DESIGN SLOPE

4" OF 3/4"-0 CRUSHED ROCK ON 12" OF 1 1/2"-0 CRUSHED ROCK

SUBGRADE GEOTEXTILE FABRIC

NOTES:
1. A BRANCH TURN-AROUND SHALL BE PROVIDED ON ALL DEAD-END ACCESS ROADS. THE BRANCH TURN-AROUND SHALL HAVE A MINIMUM TURNING RADIUS OF 50'.

2. SUBGRADE AND AGGREGATE SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

3. ACCESS ROAD GRADES ARE NOT TO EXCEED 10%.

4. BOLLARDS, PER DETAIL 631, ARE REQUIRED AT ALL ENTRANCES TO ACCESS ROADS.
1. Asphaltic concrete shall be compacted to 91% of rice density.

2. Subgrade and baserock shall be compacted to 95% relative density per AASHTO T-180.

3. Vehicle control devices may be installed to deter intrusion into the park. These include bollards, berms, or 6" extruded curbs.

4. A sidewalk and planter strip are not required.

5. Engineer of record is responsible for providing adequate drainage/conveyance in lieu of providing curbs.
1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

3. "NO PARKING" SHALL BE POSTED THE ENTIRE LENGTH OF ALLEY.

4. FIRE HYDRANTS WHEN REQUIRED ARE TO BE LOCATED OUTSIDE THE R.O.W IN A 5' BY 5' EASEMENT.

5. STORM WATER FROM GREEN ALLEYS SHALL BE TREATED BY RAIN GARDENS IN PUBLIC EASEMENTS NEXT TO ALLEY OR IN LANDSCAPE STRIP ON CONNECTING PUBLIC STREETS. AN INVERTED ALLEY SECTION WITH PERMEABLE SURFACE MAY BE PROPOSED AS AN ALTERNATIVE TO ADJACENT RAIN GARDENS.
1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

3. PUBLIC PARKING FOR VISITORS (3–4 SPACES) AND A BRANCH TYPE TURNAROUND SHALL BE PROVIDED AT THE END OF THE MINOR ACCESS STREET. (SEE DETAIL # 621)

4. A "DEAD END" SIGN SHALL BE POSTED AT THE ENTRANCE TO THE MINOR ACCESS STREET.

5. "NO PARKING" SHALL BE POSTED FOR THE ENTIRE LENGTH OF THE MINOR ACCESS STREET.

6. THERE IS NO REQUIREMENT FOR A SIDEWALK OR PLANTER STRIP.
1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

3. "NO PARKING" SHALL BE POSTED FOR THE ENTIRE LANE.

4. FIRE HYDRANTS, WHEN REQUIRED, ARE TO BE LOCATED OUTSIDE THE R-O-W IN A 5’ BY 5’ EASEMENT.

5. A PLANTER STRIP IS NOT REQUIRED.
1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

3. THE SIDEWALK SHALL HAVE A 5’ MINIMUM CLEAR OF ALL OBSTACLES, UNLESS APPROVED BY THE CITY ENGINEER.

4. THE MAXIMUM BLOCK LENGTH FOR A QUEUING STREET IS 400 FT.

5. "NO PARKING" SHALL BE POSTED WITHIN 30 FT. OF CURB RETURN ON QUEUING STREET.
1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RELATIVE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY. PER AASHTO T-180

3. IN HILLSIDE CONSTRAINT DISTRICT RIGHT-OF-WAY WIDTH MAY BE 40’ WITH A PAVEMENT WIDTH OF 28’.

4. THE SIDEWALK SHALL HAVE A MINIMUM 5’ AREA CLEAR OF ALL OBSTACLES UNLESS APPROVED BY THE ENGINEER.

5. LOCAL STREETS PROJECTED TO HAVE AN AVERAGE DAILY TRAFFIC (ADT) OVER 1000 VEHICLES PER DAY SHALL BE CONSTRUCTED TO A COMMUNITY STREET.

6. FIRE HYDRANTS BEHIND THE WALK ON HILLSIDE CONSTRAINT DISTRICT AND COMMERCIAL/INDUSTRIAL DISTRICTS REQUIRE A 5’ BY 5’ EASEMENT.
1. ASPHALT CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

3. THE ENGINEER MAY REQUIRE LEVEL 3 ASPHALTIC CONCRETE.

4. THE SIDEWALK SHALL HAVE A MINIMUM 5’ CLEAR OF ALL OBSTACLES UNLESS APPROVED BY THE CITY ENGINEER.
1. Asphalt concrete shall be compacted to 91% of rice density.

2. Subgrade and baserock shall be compacted to 95% relative density per AASHTO T-180.

3. The engineer may require level 3 asphaltic concrete.

4. The sidewalk shall have a minimum 5’ clear of all obstacles unless approved by the city engineer.

5. A 12’ raised median or two-way left turn lane shall separate through lanes.
115’ RIGHT-OF-WAY

4’ 35’ 14’ MEDIAN 35’ 4’

S=2% 2:1

6” MONOLITHIC CURB & GUTTER

SLOPE=2.5%

11’

2:1

S=2% 2:1

6”

16” of 1”-0 CRUSHED AGGREGATE

8” LEVEL 2 ASPHALTIC CONCRETE
(SEE NOTE 3) TOP LIFT MUST BE
1/2” DENSE GRADED. LOWER LIFTS
MAY BE 1/2” OR 3/4” DENSE GRADED.

1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY
   PER AASHTO T-180.

3. THE ENGINEER MAY REQUIRE LEVEL 3 ASPHALTIC CONCRETE.

4. THE SIDEWALK SHALL HAVE A MINIMUM 5’ CLEAR OF ALL OBSTACLES,
   UNLESS APPROVED BY CITY ENGINEER.
8" LEVEL 2 ASPHALTIC CONCRETE
SEE NOTE 3 TOP LIFT MUST BE
1/2" DENSE GRADED, LOWER LIFTS
MAY BE 1/2" OR 3/4" DENSE GRADED.

1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY
PER AASHTO T-180.

3. THE ENGINEER MAY REQUIRE LEVEL 3 ASPHALTIC CONCRETE.

4. THE SIDEWALK SHALL HAVE A MINIMUM 5' CLEAR OF ALL OBSTACLES,
UNLESS APPROVED BY CITY ENGINEER.

5. A 16' RAISED MEDIAN OR TWO-WAY-LEFT LANE SHALL SEPARATE OPPOSING
TRAVEL LANES.
8" LEVEL 2 ASPHALTIC CONCRETE
(SEE NOTE 3) TOP LIFT MUST BE
1/2" DENSE GRADED. LOWER LIFTS
MAY BE 1/2" OR 3/4" DENSE GRADED.

1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.
2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY
PER AASHTO T-180.
3. THE ENGINEER MAY REQUIRE LEVEL 3 ASPHALTIC CONCRETE.
4. THE SIDEWALK SHALL HAVE A MINIMUM 5’ CLEAR OF ALL OBSTACLES,
UNLESS APPROVED BY CITY ENGINEER.
1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

3. THE SIDEWALK SHALL HAVE A 5’ MINIMUM CLEAR OF ALL OBSTACLES, UNLESS APPROVED BY THE CITY ENGINEER.

4. THE MAXIMUM BLOCK LENGTH FOR A QUEUING STREET IS 400 FT.

5. "NO PARKING" SHALL BE POSTED WITHIN 30 FT. OF CURB RETURN ON QUEUING STREET.
1. ASPHALT CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

3. THE ENGINEER MAY REQUIRE LEVEL 3 ASPHALTIC CONCRETE.

4. THE SIDEWALK SHALL HAVE A MINIMUM 5' CLEAR OF ALL OBSTACLES UNLESS APPROVED BY THE CITY ENGINEER.
TYPICAL STREET SECTION

56'/50' RIGHT OF WAY

ROW
ROW
6" 5' 6' 16" 16'/13' 16'/13' 6" 6' 5' 6"
WALK LANDSCAPING TRAVEL TRAVEL LANDSCAPING WALK
SLOPE=2.0% SLOPE=2.0%

INSTALL STRUCTURAL SOIL FOR TREES.
SEE LARGE TREE WELL DETAIL
CURB AND GUTTER

8" OF 1"-0 CRUSHED AGGREGATE
4" OF 1/2" DENSE GRADED LEVEL 2 ASPHALTIC CONCRETE IN TWO LIFTS

GEOTEXTILE FABRIC
CONSTRUCT RAIN GARDENS IN BULBOUT AND LANDSCAPE STRIP
SEE SAMPLE STREET PLAN

1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

3. IN HILLSIDE CONSTRAINT DISTRICT PAVEMENT WIDTH OF 28' MAY BE USED WITH MANAGERS APPROVAL. PARKING SHALL BE LIMITED TO ONE SIDE OF THE STREET.

4. THE SIDEWALK SHALL HAVE A MINIMUM 5' CLEAR OF ALL OBSTACLES UNLESS APPROVED BY THE CITY ENGINEER.

5. LOCAL STREETS PROJECTED TO HAVE AN AVERAGE DAILY TRAFFIC (ADT) OVER 1,000 VEHICLES PER DAY SHALL BE CONSTRUCTED TO A CONNECTOR STREET.

6. FIRE HYDRANTS BEHIND THE WALK ON HILLSIDE CONSTRAINT DISTRICT AND COMMERCIAL/INDUSTRIAL DISTRICTS REQUIRE A 5' BY 5' EASEMENT.

7. AT ROW LINE MINIMUM SLOPE 2%, MAXIMUM SLOPE CUT 2:1, FILL 3:1.

8. "NO PARKING" SHALL BE POSTED WITHIN 30 FT. OF CURB RETURN AND NEXT TO RAIN GARDENS.

9. AT ROW LINE MINIMUM SLOPE 2%, MAXIMUM SLOPE CUT 2:1, FILL 3:1.
Green Local Transitional or Queuing Street

400' Maximum intersection spacing for Queuing Local Street.

50' Max. for Corner Bulbout

24' Min.

30' Min. to Start of Mid-Block Bulbout

22' Min. typical

6' by 10' tree well

Rain gardens detail: see rain garden detail, minimum 6% of impervious surface area.

See section view for dimensions. Sample street plan provided as example only. Actual street plan will vary.
1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

3. THE ENGINEER MAY REQUIRE LEVEL 3 ASPHALTIC CONCRETE.

4. AT ROW LINE MINIMUM SLOPE 2%, MAXIMUM SLOPE CUT 2:1, FILL 3:1.

5. THE 72' SECTION MAY BE USED AS A COMMUNITY STREET.
Neighborhood Connector

RAIN GARDENS
SEE RAIN GARDEN DETAIL
MINIMUM 6% OF IMPERVIOUS SURFACE AREA

SEE SECTION VIEW FOR DIMENSIONS.
SAMPLE STREET PLAN PROVIDED AS EXAMPLE ONLY.
ACTUAL STREET PLAN WILL VARY.

7' BY 9' TREE WELL
TYPICAL
** Tree Wells Encroach
1' Into the Sidewalk
TYPICAL STREET SECTION

80' or 72' RIGHT OF WAY

58' or 44'

6" 4'/7" 7'/0" 5' 11' 12' 11' 5' 7'/0" 4'/7" 6" 6" 6"
WALK LANDSCAPE PARKING BIKE TRAVEL TURN LANE TRAVEL BIKE PARKING LANDSCAPE WALK

SLOPE 2.0%

INSTALL STRUCTURAL SOIL FOR TREES. SEE LARGE TREE WELL DETAIL

IF THERE IS PARKING SHADOW WITH BULBOUTS CONSTRUCT RAIN GARDENS IN BULBOUT AND 5' OF SIDEWALK SEE SAMPLE STREET PLAN

5" LEVEL 2 ASPHALTIC CONCRETE (SEE NOTE 3) TOP LIFT MUST BE 1/2" DENSE GRADED. LOWER LIFT MAY BE 1/2" OR 3/4" DENSE GRADED.

16" OF 1"-0 CRUSHED AGGREGATE GEOTEXTILE FABRIC

1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

3. THE ENGINEER MAY REQUIRE LEVEL 3 ASPHALTIC CONCRETE.

4. THE SIDEWALK SHALL HAVE A MINIMUM 5' CLEAR OF ALL OBSTACLES UNLESS APPROVED BY THE CITY ENGINEER.

5. AT ROW LINE MINIMUM SLOPE 2%, MAXIMUM SLOPE CUT 2:1, FILL 3:1.

6. WHERE NO PARKING IS REQUIRED INCREASE LANDSCAPE STRIP FROM 4' TO 7'.

7. TREE WELLS ENCROACH 1’ INTO SIDEWALK

8. "NO PARKING" SHALL BE POSTED WITHIN 30 FT. OF CURB RETURN AND NEXT TO RAIN GARDENS.
Green Collector

300’ intersection spacing

5’ BY 5’ TREE WELL
TYPICAL
** Tree Wells Encroach
1’ Into the Sidewalk

8’ BY 8’ TREE WELL
TYPICAL
** Tree Wells Encroach
1’ Into the Sidewalk

RAIN GARDENS
SEE RAIN GARDEN DETAIL
MINIMUM 6% OF IMPERVIOUS SURFACE AREA

SEE SECTION VIEW FOR DIMENSIONS.
SAMPLE STREET PLAN PROVIDED AS EXAMPLE ONLY.
ACTUAL STREET PLAN WILL VARY.
1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

3. THE ENGINEER MAY REQUIRE LEVEL 3 ASPHALTIC CONCRETE.

4. WHERE LEFT TURN LANE IS ADDED INCREASE ROW BY 12 FEET.

5. PARKWAYS SHALL BE POSTED NO PARKING

6. REDUCE BIKE LANES TO 5’ AND ROW TO 60’ ON COLLECTOR PARKWAYS.
1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

3. THE ENGINEER MAY REQUIRE LEVEL 3 ASPHALTIC CONCRETE.

4. A 14’ MEDIAN OR LEFT TURN LANE WITH 2’ MEDIAN SHALL SEPARATE OPPOSING TRAVEL LANES.

5. AT ROW LINE MINIMUM SLOPE 2%, MAXIMUM SLOPE CUT 2:1, FILL 3:1.

6. ARTERIALS SHALL BE POSTED NO PARKING.
Green Major Arterial (delete second travel lane for minor arterial)

400' Minimum intersection spacing for Arterials

100' ROW

RAIN GARDENS
SEE RAIN GARDEN DETAIL
MINIMUM 6% OF IMPERVIOUS SURFACE AREA

SEE SECTION VIEW FOR DIMENSIONS.
SAMPLE STREET PLAN PROVIDED AS EXAMPLE ONLY.
ACTUAL STREET PLAN WILL VARY.

7' BY 9' TREE WELL TYPICAL
1. Compact top 12 inches of subgrade to 95% relative density

2. At 12' left turn lanes construct 4' median with 1' shy distance

3. The engineer may require level 3 asphaltic concrete.

4. At row line minimum slope 2%, maximum slope cut 2:1, fill 3:1.

5. Tree wells encroach 1' into sidewalk

6. "No parking" shall be posted within 30 ft. of curb return and next to rain gardens.
Green Major Boulevard (delete second travel lane for minor boulevard)

400' Minimum intersection spacing for Arterials

100' Minimum to DW Center

111' ROW

RAIN GARDENS
SEE RAIN GARDEN DETAIL
MINIMUM 6% OF IMPERVIOUS SURFACE AREA

SEE SECTION VIEW FOR DIMENSIONS.
SAMPLE STREET PLAN PROVIDED AS EXAMPLE ONLY.
ACTUAL STREET PLAN WILL VARY.

8' BY 8' TREE WELL
TYPICAL
** Tree Wells Encroach 1' Into the Sidewalk

6' BY 10' TREE WELL
TYPICAL
** Tree Wells Encroach 1' Into the Sidewalk
CONSTRUCT INLET INSIDE RAIN GARDEN OR OUTSIDE RAIN GARDEN IN STREET NEAR CURB OPENING DOWNHILL FROM CAREN.

2' CURB OPENING

PC

CHECK DAM

SEE RAIN GARDEN DETAIL

CHECK DAM

30' TYPICAL 50' MAX.

B

13' RAD.

2' CURB OPENING

CURB AND GUTTER

6' by 10' OR 7' BY 9' TREE WELL

SIDEWALK

A   B   MIN. AREA   STREET TYPE
1'   22.86   211    QUEUING
4'   15.92   283    TRANSITIONAL
7'   12.47   345    COMMUNITY

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030

RAIN GARDEN CORNER BULBOUT

DRAWN RCS
DIV. TRANSPORTATION
REV.
DATE
APPR.
RAIN GARDEN PLANTS

<table>
<thead>
<tr>
<th>ZONE</th>
<th>BOTANICAL NAME</th>
<th>COMMON NAME</th>
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<td>A</td>
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<td>DESCHAMPSIA CAESPITOSA</td>
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<td>JUNCUS PATENS</td>
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<td>KINNICKINNIK</td>
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<td>DEER FERN</td>
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<td>DWARF REDTWIG DOGWOOD</td>
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<td>B</td>
<td>LIRIOPE MUSCARI &quot;BIG BLUE&quot;</td>
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<td>GAUTHERIA SHALLOW</td>
<td>SALAL</td>
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<tr>
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<td>MAHONIA NERVOSA</td>
<td>LOW OREGON GRAPE</td>
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<tr>
<td>B</td>
<td>MAHONIA REPENS</td>
<td>CREEPING OREGON GRAPE</td>
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</tbody>
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PLANT 1 GALLON POTS 12" ON CENTER IN EACH ZONE. A MINIMUM OF 3 SPECIES SHALL BE USED IN EACH ZONE.

PERENNIAL ACCENT PLANTS AND BULBS MAY BE PLANTED SPORADICALLY THROUGHOUT RAIN GARDEN TO ADD SEASONAL COLOR AND VARIETY.

CHECK DAM

RAIN GARDEN TYPICAL PLAN VIEW

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DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030

RAIN GARDEN PLANTING DETAIL

SCALE N.T.S.
DATE JUNE 2007
APPR.
DWG. NO. GS–15
MONOLITHIC CURB AND WALK NEXT TO SWALE

2” SHREDDED BARK MULCH (NO BARK DUST OR CHIPS.)

4:1 6” TO 9”

2’

6” CURB EXPOSURE

DRAINAGE GEOTEXTILE OR EPDM LINER SURROUNDING DRAIN ROCK AND UNDER RAIN GARDEN

1” DRAIN ROCK

SUBGRADE GEOTEXTILE WITHIN 50’ OF ALL RAIN GARDENS

NOTE: IN HILLSIDE PHYSICAL CONSTRAINT DISTRICT OR ON SLOPES OVER 15% LINE RAIN GARDEN AND DRAIN ROCK WITH 30 MIL EPDM. INSTALL 4” DRAIN PIPE IN DRAIN ROCK. CONNECT DRAIN PIPE TO STORM SEWER INLET.

RAIN GARDEN TYPICAL SECTION

TOPSOIL MIX—EQUAL PARTS IMPORTED ORGANIC TOPSOIL, COURSE SAND AND NATIVE SOIL THOROUGHLY TILLED TOGETHER. SHALL INFILTRATE WATER WITHOUT IMMEDIATE PONDING ON THE SURFACE. IF PONDING OCCURS ADD SAND AND ORGANIC TOPSOIL AND RE-TILL UNTIL INFILTRATION OCCURS.

CONCRETE BLOCK CAST ON SUBGRADE UNDER CURB AND GUTTER EXTEND 2’ PAST END OF SWALE

RAIN GARDEN AREA SHALL BE MINIMUM 6% OF IMPERVIOUS SURFACE AREA TREATED.
5' SIDEWALK  6' 2% SLOPE
"A" VARIES  SLOPE VARIES MAX
6" UNLESS OTHERWISE NOTED
1" PAVEMENT SURFACE
6" X 6" 10 GAGE REINFORCING MESH COMMERCIAL DRIVEWAYS ONLY
2" OF 3/4"-0" CRUSHED ROCK
SEE RAIN GARDEN DETAIL
CONSTRUCTION JOINT (TYP)
SLOPE VARIES 2%
RESIDENTIAL 12' MIN.
24' MAX
28' MAX WITH THREE CAR GARAGE. (BREAK INTO THREE PANELS)
3300 PSI CONCRETE
COMMERCIAL OR ALLEY 12' MIN.
36' MAX
5000 PSI CONCRETE
COLD JOINT
NO JOINT
OPTIONAL SHALLOW TRENCH DRAIN AND GRATE FOR ALLEY STORM DRAINAGE
TYPE "C" CURB
13' RAD. RESIDENTIAL
25' RAD. COMMERCIAL
25' RAD. ALLEY
CONTRACTION JOINT AT CENTERLINE
CURB AND GUTTER
SEE RAIN GARDEN DETAIL
GREEN STREET BULBOUT DRIVEWAY DETAIL
DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030
DRAWN RCS
REV. DATE APPR.
SCALE N.T.S.
DATE JUNE 2007
APPR.
DWG. NO. GS-17
INSTALL RECYCLED RUBBER MULCH 1" MATT IN TREE WELLS ON COMMUNITY STREETS AND LARGER.

ON COMMERCIAL DEVELOPMENT ONLY IN-GROUND 4"X4" JUNCTION BOX IN BACK OF WALK WITH 1" ELECT. CONDUIT CONNECT TO ADJACENT PROPERTY.

RECYCLED RUBBER MULCH 1" MAT PERM-A-MULCH OR APPROVED EQUAL

1 3/4" DIA. CALIPER TREE HEADED @ 6' TYP. EXCEPT 2" DIA CALIPER HEADED @ 8' SHALL BE USED WHEN TREE IS IN VISION TRIANGLE. TREES SHALL BE WELL BRANCHED, BALLED AND BURLAPED. WITH 40' CANOPY AT FULL GROWTH.

CURB & GUTTER

8' MINIMUM OR TO BACK OF CURB

SCARIFY SIDES OF PLANTING PIT

(2) 4" PERF. PVC DRAIN PIPE FILLED WITH 1" WASHED RIVER ROCK

LARGE TREE WELLS SHALL BE 35' TO 50' ON CENTER, WHEREVER GREEN STREETS HAVE A LANDSCAPE STRIP OF 6' OR GREATER.
1. CONCRETE SPLASH PAD NECESSARY WHERE WATER ENTERS AND/OR EXITS RAIN GARDEN.

2. INSTALL STORM INLET NEAR LOWER RAIN GARDEN CURB OPENING, INSIDE OR OUTSIDE OF THE RAIN GARDEN.
1. Subgrade and baserock shall be compacted to 95% relative density per AASHTO T-180.

2. At 12' left turn lanes construct curb median.

3. The engineer may require Level 3 asphaltic concrete.

4. At row line maximum slope cut 2:1, fill 3:1.

5. Shadow parking with bulbout rain garden at all intersections.

6. "No Parking" shall be posted within 30 ft. of curb return and next to rain gardens.

5. Construct monolithic curb and gutter adjacent to parking lanes and all returns. Construct type C curb next to bike lanes and for medians.

8” Level 2 asphaltic concrete (see Note 3) top lift must be 1/2” dense graded. Lower lifts may be 1/2” or 3/4” dense graded. Compact of 91% of rice density.

Install structural soil for trees. See large tree well detail.

16” of 1”-0 crushed aggregate.

MAXIMUM
MONOLITHIC CURB AND GUTTER (TYPICAL)
INSTALL STRUCTURAL SOIL FOR TREES. SEE LARGE TREE WELL DETAIL

8" LEVEL 2 ASPHALTIC CONCRETE (SEE NOTE 3) TOP LIFT MUST BE 1/2" DENSE GRADED. LOWER LIFTS MAY BE 1/2" OR 3/4" DENSE GRADED.

16" OF 1"-0 CRUSHED AGGREGATE

1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.
2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.
3. THE ENGINEER MAY REQUIRE LEVEL 3 ASPHALTIC CONCRETE.
4. AT ROW LINE MAXIMUM SLOPE CUT 2:1, FILL 3:1.
5. DEVELOPMENT SHALL PROVIDE A 5 FOOT SIDEWALK EASEMENT ON EACH SIDE.
56’ RIGHT OF WAY

MONOLITHIC CURB AND GUTTER (TYPICAL)

6” LEVEL 2 ASPHALTIC CONCRETE
(SEE NOTE 3) TOP LIFT MUST BE
1/2” DENSE GRADED. LOWER LIFTS
MAY BE 1/2” OR 3/4” DENSE GRADED.

1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY
   PER AASHTO T-180.

3. THE ENGINEER MAY REQUIRE LEVEL 3 ASPHALTIC CONCRETE.

4. AT ROW LINE MAXIMUM SLOPE CUT 2:1, FILL 3:1.
8" OF 1" OPEN GRADED CRUSHED AGGREGATE

4" OF PERVIOUS ASPHALTIC CONCRETE IN TWO LIFTS OR PERVIOUS PAVERS

SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.
MONOLITHIC CURB AND GUTTER (TYPICAL)

50' RIGHT OF WAY

6.5' WALK
6' PARKING
7' TRAVEL LANE
11' TRAVEL LANE
11' PARKING
7' 6' WALK

MONOLITHIC CURB AND GUTTER (TYPICAL)

SHADOW PARKING WITH BULBOUTS. INSTALL RAMP, SIDEWALKS, LANDSCAPING AND TREES IN BULBOUT.

6" LEVEL 2 ASPHALTIC CONCRETE (SEE NOTE 3) TOP LIFT MUST BE 1/2" DENSE GRADED. LOWER LIFTS MAY BE 1/2" OR 3/4" DENSE GRADED.

9" OF 1"–0 CRUSHED AGGREGATE

1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.
2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.
3. STREET TREES SHALL BE PLANTED IN BULBOUTS.
4. AT ROW LINE MAXIMUM SLOPE CUT 2:1, FILL 3:1.
5. SIDEWALK SHALL MAINTAIN A 4’ CLEAR ADA CONTINUOUS PATHWAY.
1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.

2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

3. THE ENGINEER MAY REQUIRE LEVEL 3 ASPHALTIC CONCRETE.

4. AT ROW LINE MAXIMUM SLOPE CUT 2:1, FILL 3:1.

5. DEVELOPMENT SHALL PROVIDE A 4 FOOT SIDEWALK EASEMENT ON EACH SIDE.
54’ RIGHT OF WAY

- MONOLITHIC CURB AND GUTTER (TYPICAL)
  INSTALL STRUCTURAL
  SOIL FOR TREES.
  SEE LARGE TREE WELL DETAIL

- SHADOW PARKING WITH
  BULBOUPS CONSTRUCT RAIN GARDENS IN
  BULBOUP AND LANDSCAPE STRIP

6” LEVEL 2 ASPHALTIC CONCRETE
(SEE NOTE 3) TOP LIFT MUST BE
1/2” DENSE GRADED. LOWER LIFTS
MAY BE 1/2” OR 3/4” DENSE GRADED.

9” OF 1”-0 CRUSHED AGGREGATE

1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.
2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY
   PER AASHTO T-180.
3. THE ENGINEER MAY REQUIRE LEVEL 3 ASPHALTIC CONCRETE.
4. AT ROW LINE MAXIMUM SLOPE CUT 2:1, FILL 3:1.
5. DEVELOPMENT SHALL PROVIDE A 6 TO 10 FOOT SIDEWALK EASEMENT AND
   COLONNADE ON THE NORTH SIDE.
6. ROW IS 29’ TO THE SOUTH AND 25’ TO THE NORTH OF LEGAL CENTERLINE.
6’ LEVEL 2 ASPHALTIC CONCRETE
(SEE NOTE 3) TOP LIFT MUST BE
1/2” DENSE GRADED. LOWER LIFT
MAY BE 1/2” OR 3/4” DENSE GRADED.

1. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% OF RICE DENSITY.
2. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY
   PER AASHTO T-180.
3. THE ENGINEER MAY REQUIRE LEVEL 3 ASPHALTIC CONCRETE.
4. THE SIDEWALK SHALL HAVE A MINIMUM 5’ CLEAR OF ALL OBSTACLES UNLESS
   APPROVED BY THE ENGINEER.
5. AT ROW LINE MAXIMUM SLOPE CUT 2:1, FILL 3:1.
6. ROW IS 26.5’ TO THE WEST AND 33.5’ TO THE EAST OF LEGAL CENTERLINE.
7. CONSTRUCT MONOLITHIC CURB AND GUTTER ADJACENT TO PARKING LANES AND
   ALL RETURNS. CONSTRUCT TYPE C CURB NEXT TO BIKE LANES AND FOR MEDIANS.
PAVEMENT WIDTH EXCEPTIONS:

1. A 28' WIDTH MAY BE ALLOWED WITHIN THE HILLSIDE CONSTRAINT DISTRICTS WITH ENGINEER'S APPROVAL.

2. THE SIDEWALK IS TO BE LOCATED NEXT TO THE CURB ON THE ENTIRE LENGTH OF THE CUL-DE-SAC IN HILLSIDE CONSTRAINT DISTRICTS.

3. THE SIDEWALK SHALL HAVE A MINIMUM 5' CLEAR OF ALL OBSTACLES, UNLESS APPROVED BY THE CITY ENGINEER.

4. NO FIRE HYDRANTS ARE TO BE LOCATED IN THE CUL-DE-SAC AREA.
1. BRANCH TURNAROUND TO BE USED AT THE END OF A MINOR ACCESS STREET.

2. A "DEAD-END" SIGN SHALL BE POSTED AT ENTRANCE TO THE MINOR ACCESS STREET.

3. "NO PARKING" SHALL BE POSTED FOR THE ENTIRE MINOR ACCESS STREET.

4. THE MAXIMUM LENGTH OF THE MINOR ACCESS STREET SHALL BE 150 FT. TO THE END OF THE TURNAROUND.

5. NO FIRE HYDRANTS ARE TO BE LOCATED ON A MINOR ACCESS STREET WITH A BRANCH TURNAROUND.
1. DISTANCE "A" VARIES WITH STREET FUNCTIONAL CLASSIFICATION. SLOPE WILL VARY WITH DISTANCE "A".

2. SEE STANDARD DETAILS 602 AND 603 FOR CURB EXPOSURE DIMENSION 'e'.

3. SLOPES SHOWN ARE RELATIVE TO HORIZONTAL. TRANSITION RAMP (8.33% MAX SLOPE) SHALL NOT EXCEED MAXIMUM LENGTH OF 8'. SIDE FLARES IN PLANTER STRIP MAY BE ANY SLOPE.

4. DO NOT SLOPE LANDING MORE THAN 2% IN ANY DIRECTION.

5. CONCRETE SHALL BE 3,300 PSI AT 28 DAYS.
1. DISTANCE "A" VARIES WITH STREET FUNCTIONAL CLASSIFICATION.

2. SEE STANDARD DETAILS 602 AND 603 FOR CURB EXPOSURE DIMENSION 'e'.

3. SLOPES SHOWN ARE RELATIVE TO HORIZONTAL. TRANSITION RAMP (8.33% MAX. SLOPE) SHALL NOT EXCEED MAXIMUM LENGTH OF 8'.

4. CONCRETE SHALL BE 5,000 PSI AT 28 DAYS.
THIS TYPE OF APPROACH TO BE USED FOR HIGH VOLUME TRAFFIC GENERATORS (500 ADT OR GREATER) WITH APPROVAL OF ENGINEER.
1. LOCATION AND WIDTH OF SIDEWALK WILL VARY DEPENDING UPON FUNCTIONAL CLASSIFICATION OF THE STREET. SEE TYPICAL STREET SECTION STANDARD DETAILS.

2. PCC SHALL BE 3300 PSI STRENGTH AT 28 DAYS.

3. EXPANSION JOINTS SHALL BE PLACED IN SIDEWALK WHEN CURB AND SIDEWALK ARE ADJACENT AND THERE IS AN EXPANSION JOINT IN THE CURB.

4. CONTRACTION JOINTS SHALL BE PLACED AT ALL CHANGES OF DIRECTION, POINTS OF CURVATURE, ALIGNED WITH CURB CONTRACTION JOINTS WHEN SIDEWALK IS ADJACENT TO CURB, AND AT 15' (MAX) INTERVALS. JOINTS SHALL BE 1/8" TO 1/4" WIDE AND A MINIMUM DEPTH OF 1/3 THE THICKNESS OF THE CONCRETE.

5. ALL SURFACES SHALL BE TROWELED AND BROOMED IN A WORKMANLIKE MANNER. ALL CONTRACTION JOINTS SHALL BE STEEL TROWELED (3 IN. TYP.).
1. Two sidewalk ramps per corner are required at all new intersections. Ramps shall be located within the crosswalk and as near the continuous pedestrian route as practical.

2. A single diagonal ramp may be used only when site constraints prohibit installing two ramps and approved by City Engineer.

3. Place truncated dome detectable warning texture in the lower 2' of throat of ramp only. Arrange domes using in-line-pattern only as shown in detail. Color of texture to be brick red.

4. See standard drawing numbers 602 and 603 for curb exposure dimension "e". Match existing "e" for retrofit applications.

5. Slopes shown are relative to horizontal. Side flares in planter strip may be of any slope.

6. Sidewalk ramps shall be formed and poured separate from sidewalk and landings. Cold joints shall be keyed or doweled. Edges of the accessible route shall be poured against rigid forms or cured concrete to ensure compliance with ORS 447.310 and Americans with Disabilities Act.

7. Do not slope landing more than 2% in any direction. ADA ramp cross-slope shall not exceed 2% in new construction.

8. In alterations curb ramp slope(s) may be 10% for a max. rise of 6" or 12.5% for max. rise of 3". Curb ramp in alterations need not exceed 6' in length. ADA ramp cross-slope maybe warped to match existing gutter grade.
1. Two sidewalk ramps per corner are required at all new intersections. Ramps shall be located within the crosswalk and as near the continuous pedestrian route as practical.

2. A single diagonal ramp may be used only when site constraints prohibit installing two ramps and approved by Engineer.

3. Place truncated dome detectable warning texture in lower 2' of throat of ramp only. Arrange domes using in-line-pattern only as shown in detail. Color of texture to be brick red.

4. See standard drawing numbers 602 and 603 for curb exposure dimension "a". Match existing "a" for retrofit applications.

5. Slopes shown are relative to horizontal. Side flares in planter strip may be of any slope.

6. Sidewalk ramps shall be formed and poured separate from sidewalk and landings. Cold joints shall be keyed or dowelled. Edges of the accessible route shall be poured against rigid forms or cured concrete to ensure compliance with ORS 447.310 and ADA.

7. Do not slope landing more than 2% in any direction. ADA ramp cross-slope shall not exceed 2% in new construction.

8. In alterations curb ramp slopes(5) may be 10% for a max. rise of 6’ or 12.5% for a max. rise of 3’. Curb ramp in alterations need not exceed 6’ in length. ADA ramp cross-slope may be warped to match existing gutter grade.
DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030

DOWNTOWN CURB EXTENSION

1. USE IN DOWNTOWN PLAN DISTRICT.
2. REQUIRED WHERE ON-STREET PARKING IS ALLOWED.

4' MAX. BACK OF WALK
TO EDGE OF CROSSWALK

25' RAD.
(FACE OF CURB)

1' MIN.

10' PC TO PT

13' RAD.

4' MIN. UNOBSTRUCTED DISTANCE FROM BACK OF RAMP.

7'

17.8'

13' RAD.

10'

PC TO PT

5' MIN.

PC TO PT
SAW-CUT EXIST. PAVEMENT AND EXCAVATE ROADWAY SO THAT A NEAT EDGE REMAINS FOR PLACEMENT OF CONCRETE

DIRECTION OF TRAFFIC

10'

EDGE OF GUTTER

EXPANSION JOINT

CONCRETE CROSS WALK

SCORE JOINTS
2'x2' OC

PLAN VIEW

SAW-CUT EXIST. PAVEMENT AND EXCAVATE ROADWAY SO THAT A NEAT EDGE REMAINS FOR PLACEMENT OF CONCRETE.

9" OF CONCRETE HIGH/EARLY

SECTION

COMPACTED BASE ROCK

6"x6" WIRE MESH

EXISTING AC PAVEMENT

NOTE:
PLACE 1/2" EXPANSION JOINT AT CENTER
3" INTERLOCKING CONCRETE PAVERS
BRICK RED IN COLOR

PLAIN CONCRETE BORDER
EXPANSION JOINT SEE NOTE
CURB

PLAN VIEW

8" CONCRETE
3" CONCRETE PAVERS
1" BEDDING SAND
#4 REBAR CONT. 2" CLEAR

2" x 4" TAPERED KEYWAY
MIN. 6" OF 1"- 0"
CRUSHED BASE ROCK

NOTE:
ALL CONC. TO BE 3,300 PSI AT 28 DAYS. PROVIDE
1/2" EXPANSION JOINT AT CENTER
OF CROSSWALK OR AT 15' O.C.

SECTION

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030
PAVER CROSSWALK DETAIL
1. PATH SHALL BE CENTERED IN THE RIGHT-OF-WAY OR EASEMENT.

2. IF THE RIGHT-OF-WAY OR EASEMENT IS WIDER THAN 15’ THEN THE SHOULDERS SHALL HAVE A WEED BARRIER PLACED ON THE SUBGRADE AND BE COVERED BY 6” OF 3/4”-0 CRUSHED ROCK COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180 OR SHALL BE PORTLAND CEMENT CONCRETE.

3. SUBGRADE AND BASEROCK SHALL BE COMPACTED TO 95% RELATIVE DENSITY PER AASHTO T-180.

4. CONTRACTION JOINTS SHALL BE PLACED AT ALL CHANGES OF DIRECTION, POINTS OF CURVATURE AND AT 15’ (MAX) INTERVALS. JOINTS SHALL BE 1/8” TO 1/4” WIDE AND A MINIMUM DEPTH OF 1/3 THE THICKNESS OF THE CONCRETE.

5. ALL SURFACES SHALL BE TROWELED AND BROomed IN A WORKMANLIKE MANNER. ALL CONTRACTION JOINTS SHALL BE STEEL TROWELED (3 IN. TYP).

6. WHERE LIGHTING IS NEEDED, MEET IES STANDARDS FOR PEDESTRIAN SCALE LIGHTING. STYLE AND HEIGHT MAY VARY (UP TO 12’ HEIGHT).

7. WHERE ACCESSWAYS CONTINUE ACROSS STREETS, ADA RAMPS SHALL BE REQUIRED.

<table>
<thead>
<tr>
<th>USE</th>
<th>AGGREGATE BASE</th>
<th>CONCRETE THICKNESS</th>
<th>CONCRETE STRENGTH</th>
<th>REINFORCEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONVEHICULAR</td>
<td>2”</td>
<td>6”</td>
<td>3,300 PSI</td>
<td>N/A</td>
</tr>
<tr>
<td>HEAVY VEHICLE</td>
<td>6”</td>
<td>8”</td>
<td>5,000 PSI</td>
<td>10 GA. WIRE 6” O.C.</td>
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</tbody>
</table>

*NOTE: PARK/NATURAL AREA ACCESSWAYS MAY BE PCC OR SOFT SURFACE, BASED ON NATURAL AREA CONSTRAINTS AND ANTICIPATED LEVEL OF USE AS APPROVED BY THE MANAGER.
1 - BOLLARD TO REMOVABLE BOLLARD INSERT
3 - 3/8\textquotedbl{}-16x3/8\textquotedbl{} HEX SOCKET
SET SCREW

INSTALLATION SEQUENCE
1. DIG FOOTING HOLE AND SET POST FOOTING SLEEVE
PLUMB AND SQUARE IN CONCRETE (BY OTHERS)
2. INSERT REMOVABLE BOLLARD INSERT INTO BOLLARD.
3. TIGHTEN HEX SOCKET SET SCREWS.
4. SET THE BOLLARD AND REMOVABLE BOLLARD INSERT
INTO THE POST FOOTING SLEEVE.

POST W/ DOME TOP

3\textprime{}

2\textprime{}

2"

1\textprime{}-6"

METAL BOLLARD COLUMBIA CASCADE #2190-R
OR APPROVED EQUAL
(POWDER-COATED EVERGREEN)

REMOVABLE BOLLARD INSERT
POST FOOTING SLEEVE

3300 PSI CONCRETE

COMPACTED 3/4\textquoteright-0 CRUSHED AGGREGATE

UNDISTURBED EARTH

NOTES:
1: LOCK TAB TO BE ORIENTED OPPOSITE THE DIRECTION OF VEHICULAR ACCESS.
2: DECORATIVE STANDARD BOLLARD MAY BE APPROVED BY THE MANAGER.
SEE STANDARD DETAIL DRAWING 630 FOR ACCESSWAY DETAIL.
NOT TO EXCEED 6’

6’ TYP

3’

3’

6’ TYP

NOT TO EXCEED 6’

4’

1’10”

END OF ROAD MARKER NINE 3” RED RETRO-REFLECTORS MOUNTED ON 18”x18” BLACK DIAMOND SIGN PANEL FACING ROADWAY

14 GAUGE POST. 2” SQUARE x 8’ IN LENGTH

3/8” DRIVE RIVET & WASHER – 2 ON RECEIVER TUBE. PLACE ONE IN EACH DIRECTION

2 1/4” SQUARE BY 2’-0” LONG 12 GAUGE BREAKAWAY RECEIVER TUBE.

NOT SHAD ED (TYP)

3/8” DRIVE RIVET & WASHER

2 ON SIGN

4’ CONVENTIONAL BLACK LETTERING ON WHITE BACKGROUND

DEAD END STREET TO BE CONTINUED WITH FUTURE DEVELOPMENT

36”

19”

NOTES:

1. END OF ROAD MARKERS SHALL BE USED IN LIEU OF STREET BARRICADE WHERE NO DROP OFF HAZARD (SLOPES STEEPER THAN 3:1 FOR 18” OR GREATER VERTICALLY) EXISTS.

2. PLACE POSTS 3’ LEFT AND RIGHT OF CENTERLINE AND SPACE ADDITIONAL POSTS AT 6’ INTERVALS.

3. ANCHOR SHALL BE COVERED BY DUCT TAPE ON ALL SIDES.

4. POST SHALL BE SPRAYED WITH ANTI-SIEZE ON THE BOTTOM 2’.
NOTES:

1. STRIPING SHALL BE ALTERNATING RED (RODDA #1249 OR EQUAL) AND WHITE STRIPES 6" IN WIDTH AT A 45 DEGREE ANGLE AND SHALL BE EITHER RETRO-REFLECTIVE TAPE OR PAINTED WITH A SEALED RETRO-REFLECTIVE SURFACE.

2. THIS BARRICADE SHALL CONFORM TO SECTION 3F-1, UNIFORM MANUAL ON TRAFFIC CONTROL DEVICES—FHWA.
TOP TO BE 3/4" ABOVE BASE WITH CITY STANDARD TAG

MONUMENT BOX

A.C. TO BE TAMPERED IN

FINISHED STREET GRADE

MIN. 6" OF CONCRETE 2000 PSI MIX

UNDISTURBED SOIL

NOTE:
FOR MAJOR STREET INTERSECTIONS AS REQUIRED BY CITY ENGINEER

5/8" BY 30" IRON ROD

PLACEMENT OF BRASS CAP AND MONUMENT BOX SHALL FOLLOW MULTNOMAH COUNTY SURVEYORS OFFICE STANDARDS.
1. Mount luminaire 25 ft. above ground.

2. On streets with a planter strip between the curb and sidewalk, mount face of pole 2 ft. behind face of curb. On streets with no planter strip between the curb and sidewalk, mount pole 6" behind sidewalk.

3. All materials shall be PGE approved.

4. Collector streets and above will require 150W–250W HPS. Verify correct wattage and pole mounting height with City.
ILLUMINAIRE: 150–200 WATT –16’ POLE (SEE NOTE #7)
100 WATT –14’ POLE

1. FLUTED TAPERED POLE, COLOR BLACK
   USE 14’ POLE ON LOCAL STREETS
   USE 16’ POLE ON COLLECTOR STREETS

2. ON STREET WITH PLANTER STRIP BETWEEN THE
   CURB AND SIDEWALK, MOUNT POLE 2 FT.
   BEHIND FACE OF CURB. ON STREET WITH
   NO PLANTER STRIP MOUNT POLE AT
   CITY ENGINEERS DIRECTION.

3. USE UTILITY VAULT PRECAST CONCRETE FOOTING
   NO. 20R–LB–4–PGE WITH AN 11” BOLT CIRCLE
   FOR SIDEWALK LOCATIONS.

4. BANNER ARM/PLANT HANGER REQUIRED
   IN DOWNTOWN DISTRICT.

5. ALL MATERIALS SHALL BE PGE APPROVED.

6. DECORATIVE LIGHTING OUTSIDE OF DOWNTOWN
   AND SPECIAL COMMERCIAL DISTRICTS MUST BE
   APPROVED BY THE CITY ENGINEER.

7. LUMINAIRE WATTAGE TO BE DETERMINED BY CITY.
GE "POWER DOOR" FIXTURE
FLAT LENS STYLE HPS LAMP

NOTES:

1. 250–400 WATT HPS ROADWAY LAMP
   (WILL VARY DEPENDING ON LIGHTING REQ.)
   VERIFY CORRECT WATTAGE WITH CITY.

2. ALUMINUM DAVIT POLE MOUNTING HEIGHT 35 FT.

3. USE PRECAST CONCRETE FOOTING
   PGE # 5CL-LB OR EQUAL.

4. ALL MATERIALS SHALL BE PGE APPROVED.

FOUR 1" DIAM. GAL. STEEL BOLTS
ON 11 INCH BOLT CIRCLE
WITH 3 1/2" PROJECTION

PRECAST CONCRETE FOOTING
5/8" X 8' VERTICAL STEEL GROUND ROD
COMPACTED 3/4" MINUS CRUSHED ROCK
ALUMINUM ARM
CAST ALUMINUM COLLAR MOUNTING ASSEMBLY WITH ADJUSTABLE STAINLESS STEEL ALLEN HEAD SCREWS
DEDECORATIVE SPUN ALUMINUM LOUVERS
GLASS REFRACTOR BOWL (TYPE V)
U.V. STABILIZED POLYCARBONATE GLOBE

LAMPING: 250W HPS, 240V

16’ ALUMINUM POST
5” TO 4” TAPERED .25” WALL THICKNESS

19’-1 3/4”

14’-2 1/2”

5’ CAST ALUMINUM BASE WITH HANDHOLE

ACCESS DOOR

8”-14” DIA. BOLT CIRCLE 4 SLOTS - 90° APART

(b) HEX NUTS

GROUND LINE

FIXTURE = S5980
POST = SP5980
ARM = SA5980
HADCO
USE UTILITY VAULT PRECAST FOOTING NO. 20R-LB-4-PGE

ALL MATERIALS SHALL BE PGE APPROVED.
LUMINAIRE MOUNTED ON EXISTING POLE

POLE: EXISTING WOOD POLE

NOTES:
1. WATTAGE REQUIREMENTS WILL VARY DEPENDING ON LIGHTING REQUIREMENTS.
2. MAST ARM LENGTH WILL VARY.
3. VERIFY WATTAGE AND MAST ARM LENGTH WITH CITY.
4. ALL MATERIALS SHALL BE PGE APPROVED.

TELEPHONE CO. OR CABLE CO.
ATTACHMENT POINT

FLAT STYLE HPS LAMP
GE "POWER DOOR" FIXTURE
3/8" DRIVE RIVET & WASHER – 2 ON SIGN, MESSAGE & SIZE OF SIGN VARIES

CITY OF GRESHAM

2" SQUARE 14 GAUGE POST – LENGTH VARIES.

3/8" DRIVE RIVET & WASHER – 2 ON ANCHOR. PLACE ONE IN EACH DIRECTION 2 1/4" SQUARE 12 GAUGE BREAKAWAY ANCHOR

GROUND

SIDEWALK

RECEIVER TUBE

CRUSHED AGGREGATE

1. ANCHOR SHALL BE COVERED BY DUCT TAPE ON ALL SIDES.
2. ANCHOR SHALL BE SET IN 22" OF CONCRETE UNLESS IN SIDEWALK.
3. IF RECEIVER TUBE IS SET IN SIDEWALK IT SHALL BE 2’-2" DEEP & BACKFILLED WITH COMPACTED FILL, THEN CONCRETE FROM BOTTOM TO TOP OF WALK.
4. SIGN PLACEMENT IN SIDEWALK SHALL ALLOW FOR 5’ CLEAR PASSAGE & SIGN POST SHALL BE 12” FROM BACK OF CURB.
5. POST SHALL BE SPRAYED WITH ANTI-SEIZE ON THE BOTTOM 2’-6”.
NOTES
1. TO BE USED WHERE SIDEWALK HAS A DROP-OFF OF LESS THAN 18".
2. CENTER POST(S) ON SIDEWALK 6" PAST END OF SIDEWALK. WHEN POST(S) MUST BE SET IN THE SIDEWALK THEN THE SIDEWALK MUST HAVE A TOOLED CONTRACTION JOINT INSTALLED 12" IN FRONT OF POST(S).

NOTES
1. TEMPORARY ASPHALT ADA RAMP MAY BE USED INSTEAD OF BARRICADES OR SIGNAGE.
2. TYPE II BARRICADE TO BE USED WHERE SIDEWALK DROP-OFF EXCEEDS 18" VERTICAL WITH A SLOPE OF 1:3 OR STEEPER.
3. STRIPING FOR TYPE II BARRICADE: TYPE 1 RETRO-REFLECTIVE SHEET WITH ALTERNATING 6" RED AND WHITE STRIPES PLACED AT A 45 DEGREE ANGLE SHALL BE PLACED ON A 7 1/4" X 48" MIN. .080 GAGE ALUMINUM PANEL. PANEL TO BE ATTACHED TO 2" PRESSURE TREATED PLANK WITH 6 #8-3/4" SELF-TAPPING VANDAL PROOF SCREWS.
4. CENTER POST(S) ON SIDEWALK 6" PAST END OF SIDEWALK. WHEN POST(S) MUST BE SET IN THE SIDEWALK THEN THE SIDEWALK MUST HAVE A TOOLED CONTRACTION JOINT INSTALLED 12" IN FRONT OF POST(S).
INSTALL BRICK RED INTERLOCKING CONCRETE PERMEABLE PAVERS

IN-GROUND 4"X4" JUNCTION BOX IN BACK OF WALK (ON COMMERCIAL PROPERTY ONLY)

USE SAME ROCK AS USED TO FILL VOIDS IN PAVERS 1/4" - #10 TYP

PAVER EDGER

1" OF COARSE SAND

2" OF 3/4" - 0 CRUSHED ROCK

SIDEWALK

GEOTEXTILE FABRIC

1" ELECT. CONDUIT CONNECT TO ADJACENT PROPERTY. (AT COMMERCIAL PROPERTY ONLY)

UNDISTURBED SOIL

SOIL MIXTURE (SEE SPECS)

BRICK RED PERMEABLE CONCRETE PAVERS

CURB & GUTTER

1 3/4" DIA. CALIPER TREE HEADED @ 6' TYP. EXCEPT 2" DIA CALIPER HEADED @ 8' SHALL BE USED WHEN TREE IS IN VISION TRIANGLE. TREES SHALL BE WELL BRANCHED, BALLEED AND BURLAPED.

SCARIFY SIDES OF PLANTING PIT

(2) 4" PERF. PVC DRAIN PIPE FILLED WITH 1" WASHED RIVER ROCK

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030

TREE WELL DETAIL
NOTES:

1. ALL SURFACES SHALL BE PROPERLY PREPARED AND TACKED PRIOR TO PLACEMENT OF ASPHALT.

2. ASPHALTIC CONCRETE SHALL BE COMPACTED TO 91% RICE DENSITY.
STEP 1 COVER EXISTING MANHOLE WITH BUILDING PAPER AND CONSTRUCT A/C PAVEMENT OVER TOP OF MANHOLE.

STEP 2 SAW CUT AND REMOVE PAVEMENT AROUND MANHOLE 12" MIN. FROM MANHOLE FRAME.

STEP 3 RAISE OR LOWER MANHOLE FRAME AND IF NECESSARY INSTALL CONCRETE RINGS TO FINISH PAVEMENT PROFILE AND CROSS SLOPE.

STEP 4 WHERE APPLICABLE, BACKFILL WITH 5000 PSI EARLY STRENGTH P.C.C. AND A/C TO DEPTHS AS DIRECTED.
NOTES:
1. EXISTING SLAB SHALL BE DRILLED USING APPROPRIATE MASONARY DRILL BIT (ROTO HAMMER WILL NOT BE ALLOWED)
2. DOWELS SHALL BE PLACED AT 24" O.C.
12" WHITE THERMOPLASTIC MARKINGS

32'
TYPICAL

W260

SIGNING AND STRIPING PLAN

SIGNS TO BE INSTALLED BY OTHERS

3.0" 2.9" 2.8" 2.4" 2.0" 1.5" 0.8"

1' 1' 1' 1' 1' 1' 1' 1'

7'

PARABOLIC

PARABOLIC

2" WEDGE CUT INTO EXISTING SURFACE

MIN. 3'
MAX. 3.5'

7'

SECTION A-A

2' MAX. (WIDTH VARIES)

-12" TAPER

CLASS D MIX OR
CLASS C MIX

CURB

2" WEDGE CUT INTO EXISTING SURFACE

SECTION B-B

NOTES:
1. SPACING — SPEED HUMPS SHOULD BE PLACED ACCORDING TO THE ENGINEER’S EVALUATION OF THE PHYSICAL STREET SECTION AS WELL AS TRAFFIC OPERATIONS DATA. TYPICALLY, SPEED HUMPS SHOULD BE PLACED BETWEEN 300 AND 600 FEET APART.
2. TOLERANCE — THE TOLERANCE FOR SPEED HUMPS SHOULDN’T VARY BY MORE THAN .5" HIGH OR .25" LOW FROM THE CITY’S TEMPLATE.
NOTES:
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SPEC. RECEPTACLE COVER.
STEEL RETAINING RING.
SPEC. 24" O.D. DIA. SMOOTH FINISH CONC. TRASH RECEPTACLE.
PLASTIC TRASH BAG.
(4) 3/4" DIA. HOLES EQUALLY SPACED
FINISH GRADE CONDITION VARIES
3/4" CRUSHED ROCK, 4" DEPTH.
COMPACTED SUBBASE.

18" DIAM x 14" LONG PVC PIPE
(4) 6" #4 REBAR SET IN CONC., EQUALLY SPACED.
5" LONG x 1" DEEP x 1" WIDE "V" GROOVE
4" CONCRETE FOOTING. EXTEND SQ. CONCRETE FOOTING MIN. OF 6" BEYOND EDGE OF RECEPTACLE.

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY OF GRESHAM
1333 N.W. EASTMAN PARKWAY, GRESHAM, OREGON 97030
TRASH RECEPTACLE

DRAWN DRL
DIV. PARKS
REV. DATE APPR.

SCALE N.T.S.
DATE --
APPR.

DWG. NO. 701