GENERAL NOTES:

1. MATERIALS AND WORKMANSHIP FOR DRAINAGE WORK SHALL CONFORM TO THE LATEST EDITION OF THE WSDOT/APWA "STANDARD SPECIFICATIONS FOR ROAD, BRIDGE & MUNICIPAL CONSTRUCTION".

2. MATERIALS AND WORKMANSHIP FOR STORM SEWER WORK SHALL CONFORM TO THE LATEST EDITION OF THE "CITY OF BATTLE GROUND STANDARD DETAILS" & "CITY OF BATTLE GROUND STORMWATER DESIGN AND CONSTRUCTION REQUIREMENTS."

3. THE CONTRACTOR IS TO VERIFY ALL INVERT AND TOP ELEVATIONS OF EXISTING STORM SEWERS, AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE ENGINEER.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO THE START OF CONSTRUCTION AND TO NOTIFY THE ENGINEER OF ANY POTENTIAL CONFLICTS. THE CONTRACTOR SHALL POTHOLE OVER ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION TO DETERMINE THEIR EXACT LOCATION. CALL 811 OR (360) 696-4848 (UTILITY COORDINATING COUNCIL), FOR LOCATION OF EXISTING UTILITIES, A MINIMUM OF 2 WORKING DAYS PRIOR TO START OF CONSTRUCTION.

5. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER AND/OR CONTRACTOR TO PROCURE ALL APPLICABLE PERMITS, LICENSES AND CERTIFICATES RELATIVE TO THE TRADES TO COMPLETE THE PROJECT AND FOR THE USE OF SUCH WORK WHEN COMPLETED. COMPLIANCE SHALL BE AT ALL LEVELS, FEDERAL, STATE AND CITY, RELATING TO THE PERFORMANCE OF THIS WORK.

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

7. ALL CATCH BASINS AND CURB INLETS SHALL BE STENCILED AS FOLLOWS: "DUMP NO WASTE-DRAINS TO STREAM". (SEE STD. DETAIL TR-8.09)

8. SIGNS SHALL BE INSTALLED ALONG WATER QUALITY BIOFILTRATION SYSTEMS THAT READS: "WATER QUALITY FILTER-PLEASE LEAVE VEGETATED". (SEE STD. DETAIL TR-7.13)

9. PIPES OVER 15" DIA. SHALL HAVE A TRASH SCREEN AT END OF PIPE, EXCEPT WHERE PIPE IS LOCATED WITHIN A FENCED STORM FACILITY. (SEE STD. DETAIL ST-6.06)

10. LOCKING LID MUST BE USED ON MANHOLES LOCATED IN NON-HARDSCAPE AREAS EXCEPT WHERE MANHOLE IS LOCATED WITHIN FENCED STORM FACILITY.

11. MATERIAL CERTIFICATION FOR ALL STORM MANHOLES, CATCH BASINS, AND CURB INLETS SHALL BE PROVIDED TO THE CITY INSPECTOR.

12. ALL ROOF AND LOWPOINT DRAINS TO BE DIRECTED TO APPROVED DRAINAGE PER PLANS.

TESTING:

1. ALL MAIN LINE RUNS, REGARDLESS OF SIZE, AND LATERALS OVER 50 FEET IN LENGTH SHALL BE TELEVISION INSPECTED. TOLERANCES FOR BELLIES SHALL BE NO MORE THAN ½" IN 8-INCH PIPE, ¾" IN 10-INCH PIPE, AND 1" IN PIPES 12-INCHES OR GREATER. VARIATIONS IN EXCESS OF THESE TOLERANCES MUST BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE CITY.

2. EXFILTRATION TEST WSDOT SPECIFICATION 7-04.3(1)B FOR DETAINAGE OR AS REQUIRED BY CITY ENGINEER.

N.T.S.

STORMWATER GENERAL NOTES & TESTING

STANDARD DETAIL

THE CITY OF BATTLE GROUND

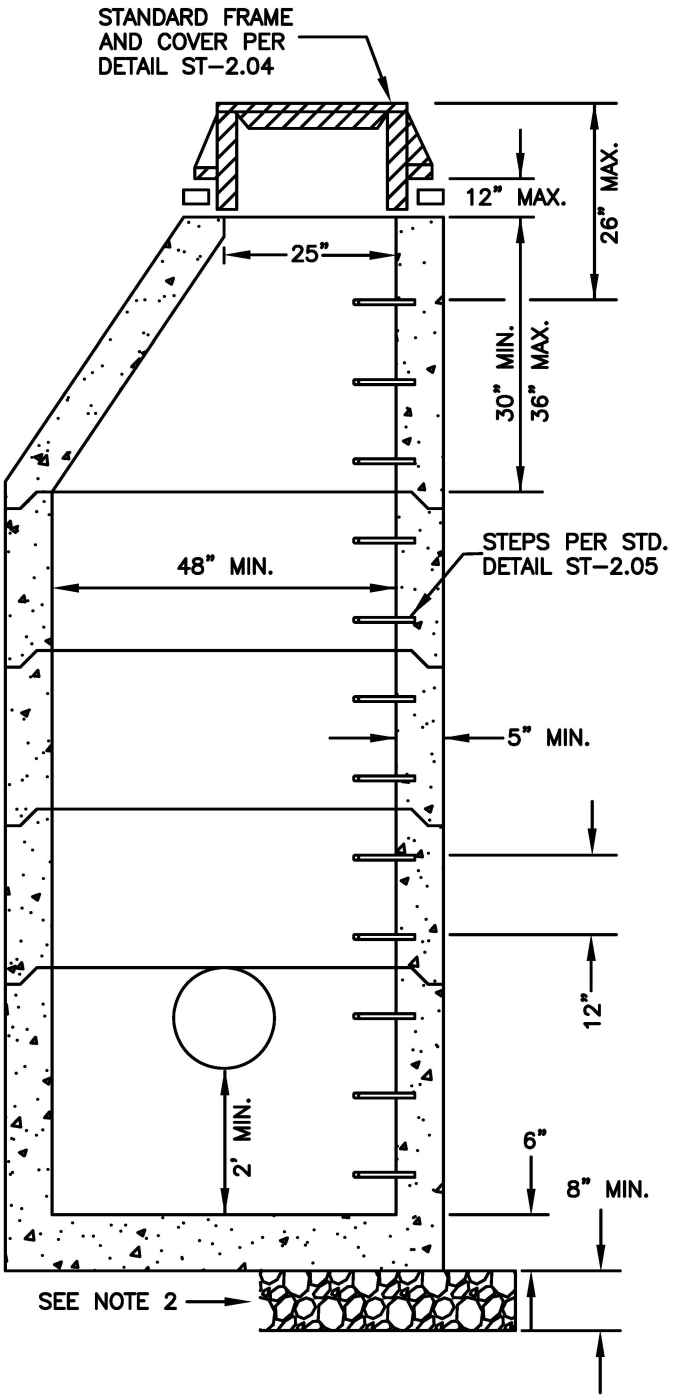
CITY OF BATTLE GROUND
APPROVED

Mark Henry 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	8/12/98	BSG	GGH
2	8/30/05	MDB	MCH
3	7/22/09	RMJ	RMJ
4	2/28/17	CAS	KDU

ST-1.00



CONSTRUCTION NOTES:

1. IN OVER EXCAVATED AREAS PROVIDE SUPPORT FOR THE PIPE AS FOLLOWS: PLACE ¾" MINUS CRUSHED ROCK OVER UNDISTURBED GROUND IN 6" LAYERS AND COMPACT.
2. BACKFILL MATERIAL BELOW & TO SIDE OF STRUCTURE SHALL BE ASTM D2321 CLASS I OR II CRUSHED STONE OR GRAVEL, PLACED UNIFORMLY. BACKFILL TO MEET WSDOT 7–05 & AASHTO T–99 95% COMPACTION.
3. ALL DIMENSIONS SUBJECT TO ALLOWABLE SPECIFICATION TOLERANCES.
4. ANY PROTRUDING ENDS OF PIPES SHALL BE TRIMMED FLUSH WITH THE INSIDE WALLS AND GROUTED TO THE SATISFACTION OF ENGINEER.
5. LIFT HOLES MUST BE GROUTED.

STRUCTURE NOTES:

1. MANHOLE TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 & C890 UNLESS SHOWN ON PLANS OR NOTED IN WSDOT STANDARD SPECIFICATIONS.
2. ALL PRECAST MANHOLE SECTIONS AND CONES SHALL CONFORM TO ASTM C–478 WITH CAST IN STEPS.
3. BASE CONCRETE SHALL BE 3000 P.S.I., 2–4 IN. SLUMP. FLOW LINES AND INSIDE SURFACES SHALL BE TROWELED SMOOTH & UNIFORM AT TIME OF POUR.
4. CAST–IN–PLACE, MONOLITHIC MANHOLE MAY BE SUBSTITUTED WITH SPECIFIC APPROVAL OF THE CITY ENGINEER.
5. JOINTS SHALL BE CONSTRUCTED SO AS TO BE WATERTIGHT. KENT–SEAL NO. 2 OR APPROVED EQUAL SHALL BE USED ON TONGUE & GROOVE SECTIONS, AND ON RISER RINGS PREMOLDED "O–RING" MAY BE SUBSTITUTED ON BELL & SPIGOT SECTIONS. ALL JOINTS SHALL BE GROUTED WITH PORTLAND CEMENT CONCRETE GROUT & STRUCK EVEN WITH THE WALL.
6. MANHOLES UNDER 6'–0" IN DEPTH FROM RIM TO BOTTOM SHALL HAVE A TOP SLAB IN LIEU OF CONE, SEE STD. DETAIL ST–2.03.
7. WHIRLY GIG © MANHOLE RISER COLLAR SYSTEM MAY BE USED IN PLACE OF RISER RING.
8. ALL REINFORCED STEEL SHALL HAVE 1 ½" CLEAR COVER UNLESS OTHERWISE NOTED, AND SHALL BE GRADE 60 (ASTM A615).
9. STEEL REINFORCED OR POLYPROPYLENE FIBER REINFORCED UNITS ARE ALLOWABLE.

N.T.S.

MANHOLE

STANDARD DETAIL

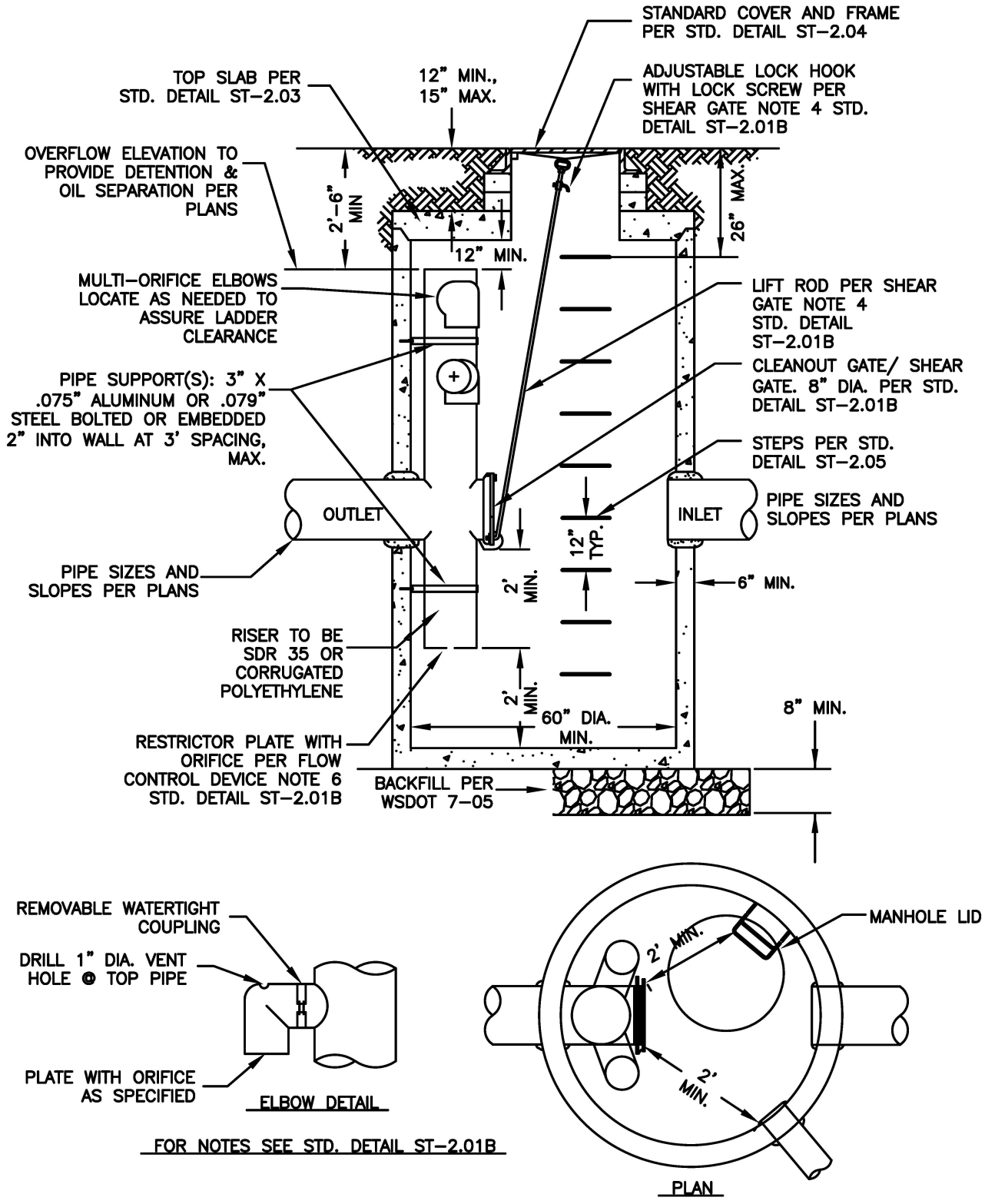
CITY OF BATTLE GROUND
APPROVED

Mark Hennes 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	8/12/98	BSG	GGH
2	7/22/09	RMJ	RMJ
3	3/22/17	CAS	KDU

ST–2.00



FOR NOTES SEE STD. DETAIL ST-2.01B

SHEET 1 OF 2 N.T.S.

FLOW CONTROL MANHOLE (TEE TYPE)

STANDARD DETAIL

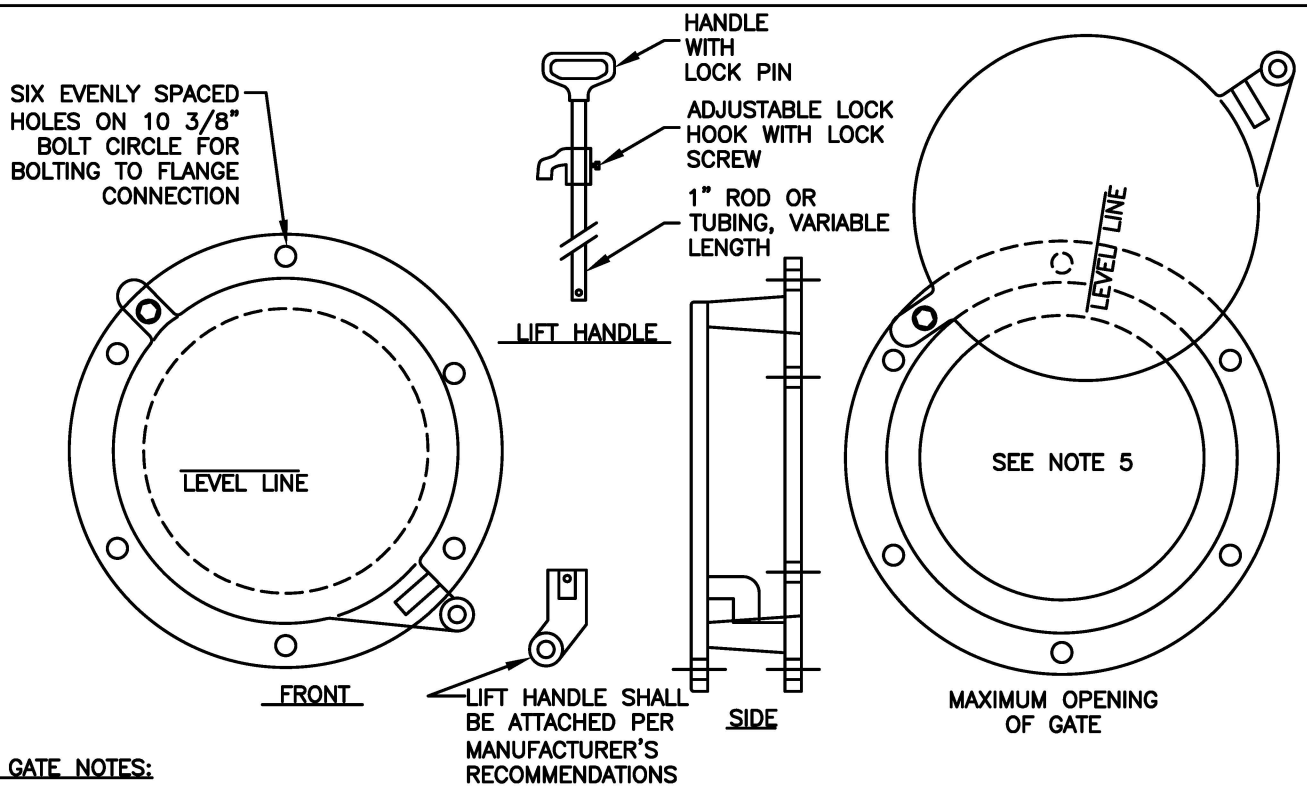
CITY OF BATTLE GROUND
APPROVED

Mark Hency 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	7/22/09	RMJ	RMJ
2	3/22/17	CAS	KDU

ST-2.01A



SHEAR GATE NOTES:

1. SHEAR GATE SHALL BE ALUMINUM ALLOY PER ASTM B-26-ZG-32a OR CAST IRON ASTM A48 CLASS 30B AS REQUIRED.
2. GATE SHALL BE 8" DIA. UNLESS OTHERWISE SPECIFIED.
3. GATE SHALL BE JOINED TO TEE SECTION BY BOLTING (THROUGH FLANGE), WELDING, OR OTHER SECURE MEANS.
4. LIFT ROD: AS SPECIFIED BY MFR. WITH HANDLE EXTENDING TO WITHIN ONE FOOT OF COVER AND ADJUSTABLE HOOK LOCK FASTENED TO FRAME OR UPPER HANDHOLD. IF ATTACHED TO STEPS, MAKE SURE IT DOES NOT CREATE A TRIP HAZARD OR REDUCE ENTRY SPACE. MUST BE OPERATIONAL WITHOUT ENTERING MANHOLE.
5. GATE SHALL NOT OPEN BEYOND THE CLEAR OPENING BY LIMITED HINGE MOVEMENT, STOP TAB, OR SOME OTHER DEVICE.
6. NEOPRENE RUBBER GASKET REQUIRED BETWEEN RISER MOUNTING FLANGE AND GATE FLANGE.
7. MATING SURFACES OF LID AND BODY TO BE MACHINED FOR PROPER FIT.
8. FLANGE MOUNTING BOLTS SHALL BE 3/8" DIA. STAINLESS STEEL.
9. ALTERNATE CLEANOUT/SHEAR GATES TO THE DESIGN SHOWN ARE ACCEPTABLE, PROVIDED THEY MEET THE MATERIAL SPECIFICATIONS ABOVE AND HAVE SIX BOLTS, 10-3/8" BOLT CIRCLE FOR BOLTING TO THE FLANGE CONNECTION.

FLOW CONTROL DEVICE NOTES:

1. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE STD. DETAIL ST-2.01A.
2. THE RESTRICTOR/SEPARATOR AND PIPE SUPPORTS SHALL BE OF THE SAME MATERIAL AND SHALL BE FABRICATED FROM 0.060" ALUMINUM OR 0.064" ALUMINIZED STEEL OR 0.064" GALVANIZED STEEL PIPE IN ACCORDANCE WITH AASHTO M 36, M 196, M 197 AND M 274. GALVANIZED STEEL SHALL HAVE TREATMENT 1.
3. THE VERTICAL RISER STEM OF THE RESTRICTOR/SEPARATOR SHALL BE THE SAME DIAMETER AS THE HORIZONTAL OUTLET PIPE WITH AN 8" MIN. SIZE.
4. FRAME AND LADDER, OR STEPS TO BE OFFSET SO THAT:
   A. CLEANOUT GATE IS VISIBLE FROM TOP.
   B. CLIMB-DOWN SPACE IS CLEAR OF RISER AND CLEANOUT GATE.
   C. FRAME IS CLEAR OF CURB (IF ANY EXISTS).
5. MULTI-ORIFICE ELBOWS MAY BE LOCATED AS SHOWN OR ALL ON ONE SIDE OF RISER TO ASSURE LADDER CLEARANCE. SIZE OF ELBOWS TO BE DETERMINED BY ENGINEER.
6. RESTRICTOR PLATE WITH ORIFICE AS SPECIFIED IN THE PLANS. OMIT PLATE IF ONLY FOR OIL POLLUTION CONTROL. SPECIFIED OPENING TO BE CUT ROUND AND SMOOTH EDGED.

FOR DETAIL SEE STD. DETAIL ST-2.01A

FLOW CONTROL MANHOLE (TEE TYPE)

STANDARD DETAIL

THE CITY OF BATTLE GROUND

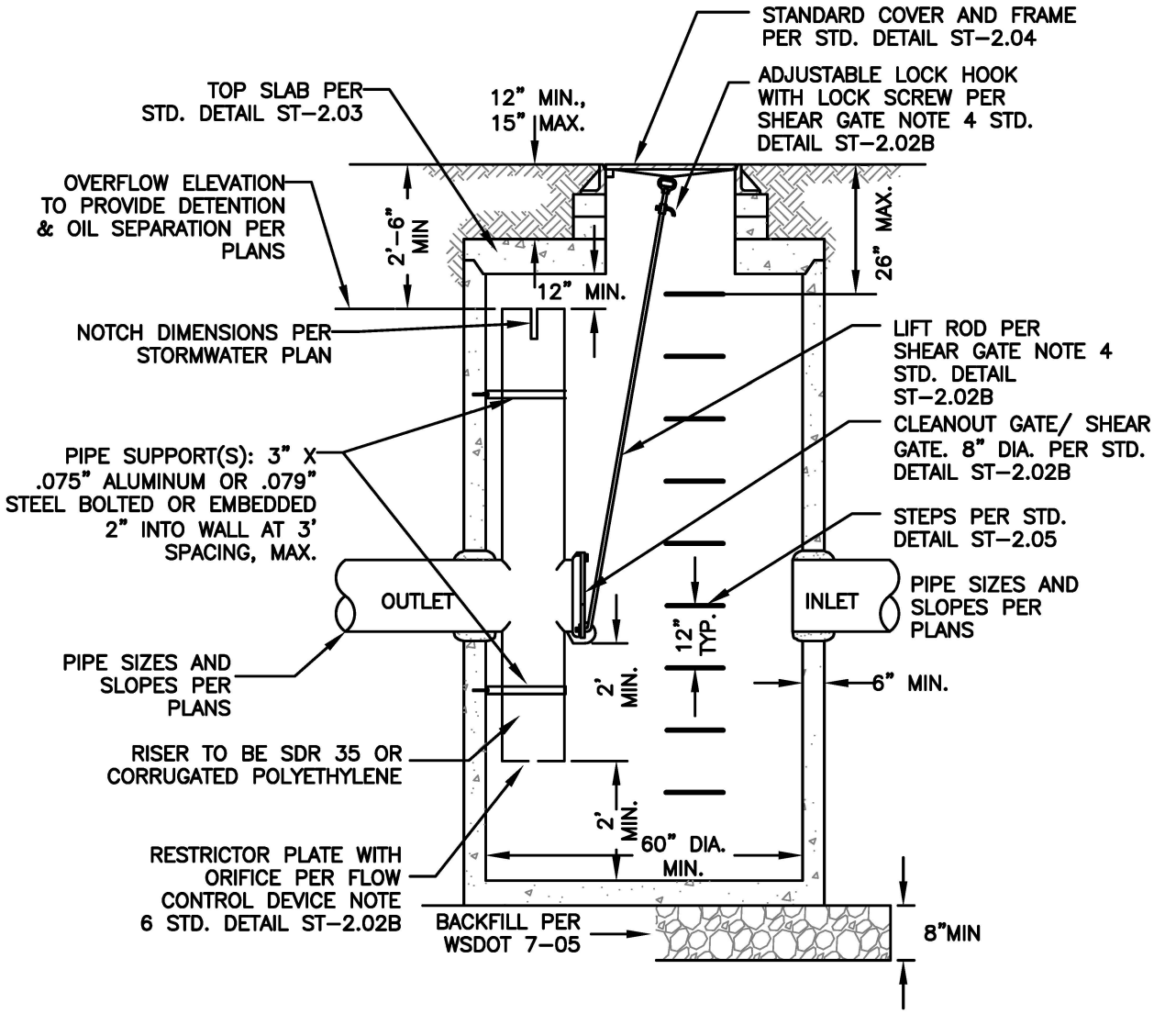
CITY OF BATTLE GROUND
APPROVED

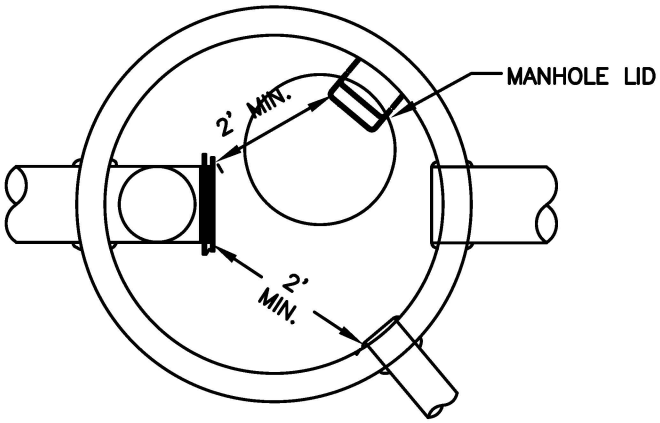
Mark Henry 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	7/22/09	RMJ	RMJ
2	4/12/17	CAS	KDU

ST-2.01B





FOR NOTES SEE STD. DETAIL ST-2.02B

PLAN

N.T.S.

FLOW CONTROL MANHOLE (NOTCH TYPE)

STANDARD DETAIL

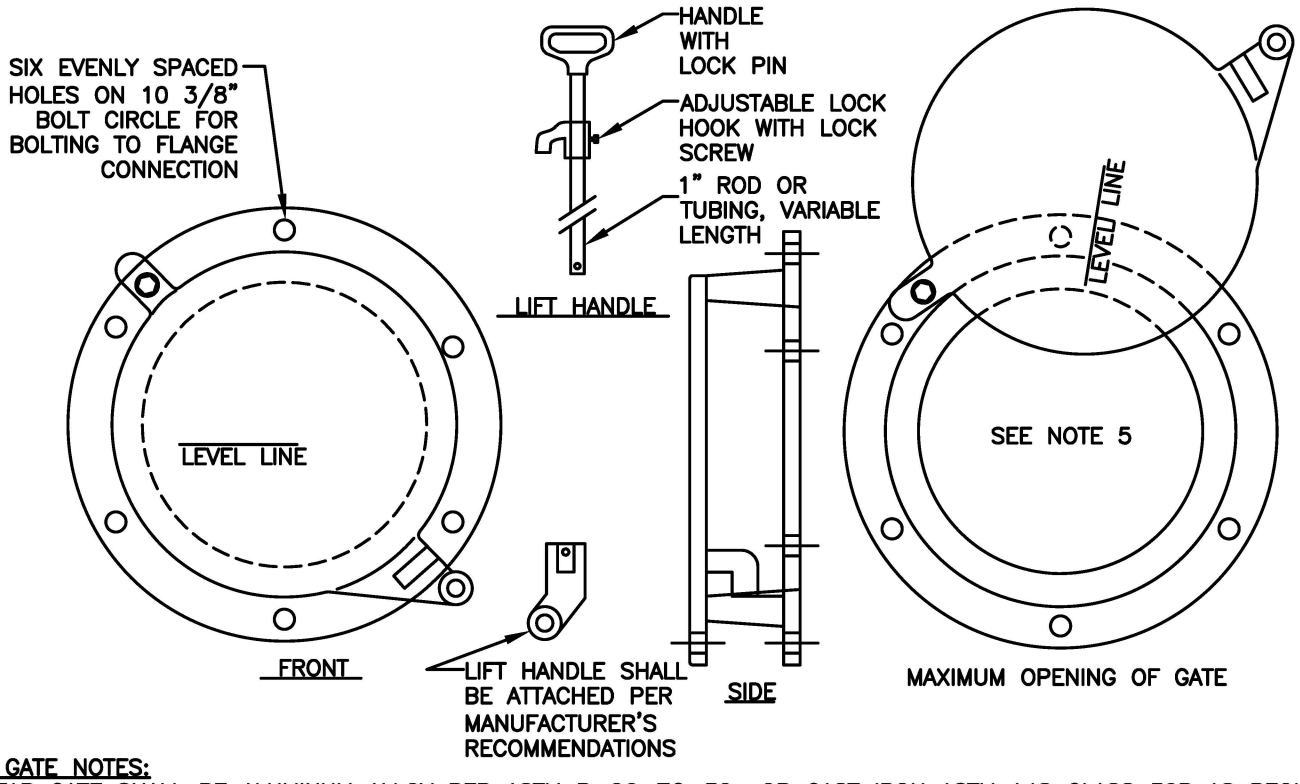
CITY OF BATTLE GROUND
APPROVED

Mark Hennes 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	11/30/11	JMH	BGK
2	3/30/17	CAS	KDU

ST-2.02A



SHEAR GATE NOTES:

1. SHEAR GATE SHALL BE ALUMINUM ALLOY PER ASTM B-26-ZG-32a OR CAST IRON ASTM A48 CLASS 30B AS REQUIRED.
2. GATE SHALL BE 8" DIA. UNLESS OTHERWISE SPECIFIED.
3. GATE SHALL BE JOINED TO TEE SECTION BY BOLTING (THROUGH FLANGE), WELDING, OR OTHER SECURE MEANS.
4. LIFT ROD: AS SPECIFIED BY MFR. WITH HANDLE EXTENDING TO WITHIN ONE FOOT OF COVER AND ADJUSTABLE HOOK LOCK FASTENED TO FRAME OR UPPER HANDHOLD. IF ATTACHED TO STEPS, MAKE SURE IT DOES NOT CREATE A TRIP HAZARD OR REDUCE ENTRY SPACE. MUST BE OPERATIONAL WITHOUT ENTERING MANHOLE.
5. GATE SHALL NOT OPEN BEYOND THE CLEAR OPENING BY LIMITED HINGE MOVEMENT, STOP TAB, OR SOME OTHER DEVICE.
6. NEOPRENE RUBBER GASKET REQUIRED BETWEEN RISER MOUNTING FLANGE AND GATE FLANGE.
7. MATING SURFACES OF LID AND BODY TO BE MACHINED FOR PROPER FIT.
8. FLANGE MOUNTING BOLTS SHALL BE 3/8" DIA. STAINLESS STEEL.
9. ALTERNATE CLEANOUT/SHEAR GATES TO THE DESIGN SHOWN ARE ACCEPTABLE, PROVIDED THEY MEET THE MATERIAL SPECIFICATIONS ABOVE AND HAVE SIX BOLTS, 10-3/8" BOLT CIRCLE FOR BOLTING TO THE FLANGE CONNECTION.

FLOW CONTROL DEVICE NOTES:

1. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE STD. DETAIL ST-2.02A.
2. THE RESTRICTOR/SEPARATOR AND PIPE SUPPORTS SHALL BE OF THE SAME MATERIAL AND SHALL BE FABRICATED FROM 0.060" ALUMINUM OR 0.064" ALUMINIZED STEEL OR 0.064" GALVANIZED STEEL PIPE IN ACCORDANCE WITH AASHTO M 36, M 196, M 197 AND M 274. GALVANIZED STEEL SHALL HAVE TREATMENT 1.
3. THE VERTICAL RISER STEM OF THE RESTRICTOR/SEPARATOR SHALL BE THE SAME DIAMETER AS THE HORIZONTAL OUTLET PIPE WITH AN 8" MIN. SIZE.
4. FRAME AND LADDER, OR STEPS TO BE OFFSET SO THAT:
   A. CLEANOUT GATE IS VISIBLE FROM TOP.
   B. CLIMB-DOWN SPACE IS CLEAR OF RISER AND CLEANOUT GATE.
   C. FRAME IS CLEAR OF CURB (IF ANY EXISTS).
5. MULTI-ORIFICE ELBOWS MAY BE LOCATED AS SHOWN OR ALL ON ONE SIDE OF RISER TO ASSURE LADDER CLEARANCE. SIZE OF ELBOWS TO BE DETERMINED BY ENGINEER.
6. RESTRICTOR PLATE WITH ORIFICE AS SPECIFIED IN THE PLANS. OMIT PLATE IF ONLY FOR OIL POLLUTION CONTROL. SPECIFIED OPENING TO BE CUT ROUND AND SMOOTH EDGED.

FOR DETAIL SEE STD. DETAIL ST-2.02A

N.T.S.

FLOW CONTROL MANHOLE NOTES

STANDARD DETAIL

CITY OF BATTLE GROUND
APPROVED

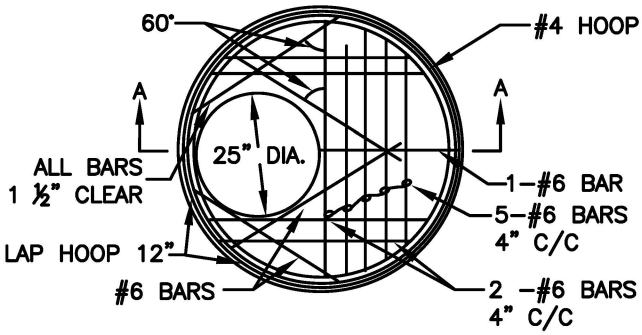
Mark Henry

06/11/2018

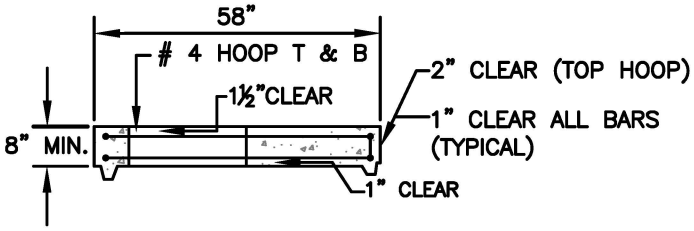
CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	11/30/11	JMH	BGK
2	3/30/17	CAS	KDU

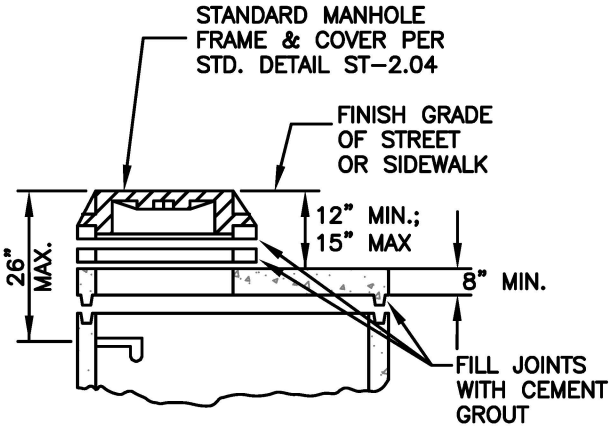
ST-2.02B



PLAN VIEW



SECTION A-A



FLAT SLAB ALTERNATE

NOTES:

1. ALL PRECAST SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478.
2. ALL POURED IN PLACE CONCRETE SHALL HAVE A 28 DAY STRENGTH OF 3000 P.S.I. & 2" TO 4" SLUMP. INSIDE SURFACES SHALL BE TROWELED SMOOTH AND UNIFORM AT TIME OF POUR.
3. ALL REINFORCING SHALL BE GRADE 40 STEEL.
4. MANHOLES UNDER 6'-0" IN DEPTH FROM RIM TO BOTTOM SHALL HAVE TOP SLAB IN LIEU OF CONE.
5. WHIRLY GIG © MANHOLE RISER COLLAR SYSTEM MAY BE USED IN PLACE OF RISER RING.

N.T.S.

TOP SLAB FOR MANHOLE

STANDARD DETAIL

CITY OF BATTLE GROUND
APPROVED

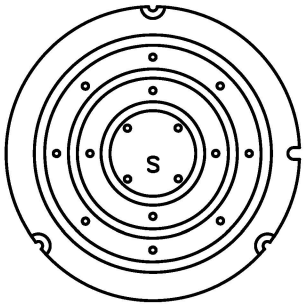
Mark Hency 06/11/2018

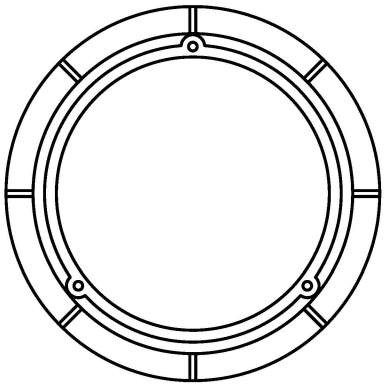
CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	8/12/98	BSG	GGH
2	8/30/05	ALL	MCH
3	3/28/07	JMH	MCH
4	7/22/09	RMJ	RMJ
5	3/24/17	CAS	KDU

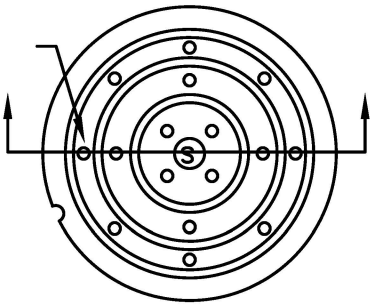
ST-2.03

LOCKING

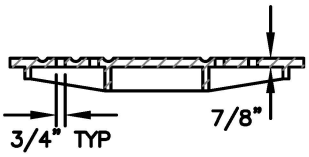




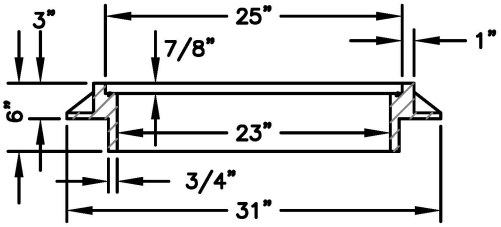
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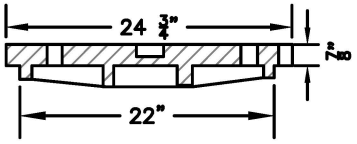


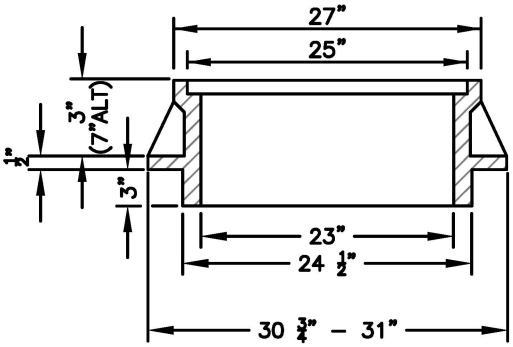
16 HOLE STORM SEWER ONLY



LOCKING LID TO BE D&L FOUNDRY PART NUMBER A-2107-R5-03 HALF & HALF OR APPROVED EQUAL.







STANDARD & LOCKING FRAME

NOTES:

1. MANUFACTURED MANHOLE COVERS AND FRAMES SHALL BE PART OF THE ***BUY AMERICA*** PROGRAM PER 0605.GR1 OF THE WSDOT GENERAL SPECIAL PROVISIONS DIVISION 1.
2. COVER & FRAME TO BE MACHINED TO A TRUE BEARING ALL AROUND.
3. MATERIAL SHALL BE OF GRAY CAST IRON. A.S.T.M. A-48, CLASS 30.
4. LOCKING LID MUST BE USED ON MANHOLES LOCATED IN NON-HARDSCAPE AREAS EXCEPT IN FENCED STORM FACILITIES.

N.T.S.

MANHOLE FRAMES & COVERS

STANDARD DETAIL

CITY OF BATTLE GROUND
APPROVED

Mark Henrey

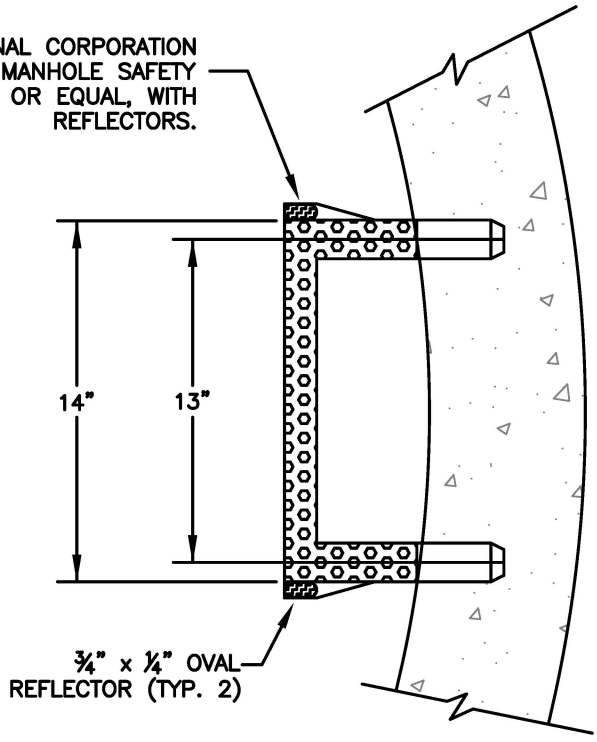
06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	8/12/98	BSG	GGH
2	8/30/05	ALL	MCH
3	3/28/07	JMH	MCH
4	7/22/09	RMJ	RMJ
5	4/28/17	CAS	KDU

ST-2.04

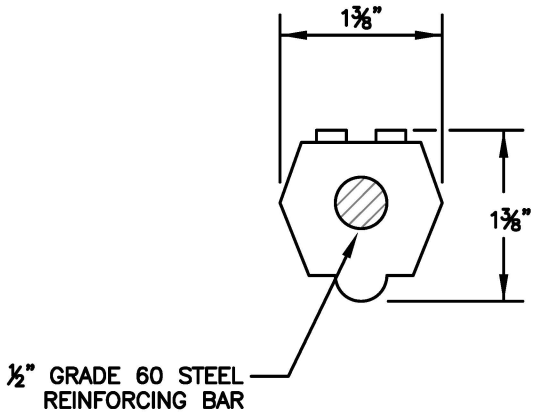
LANE INTERNATIONAL CORPORATION
POLYPROPYLENE MANHOLE SAFETY
STEP P-14850, OR EQUAL, WITH
REFLECTORS.

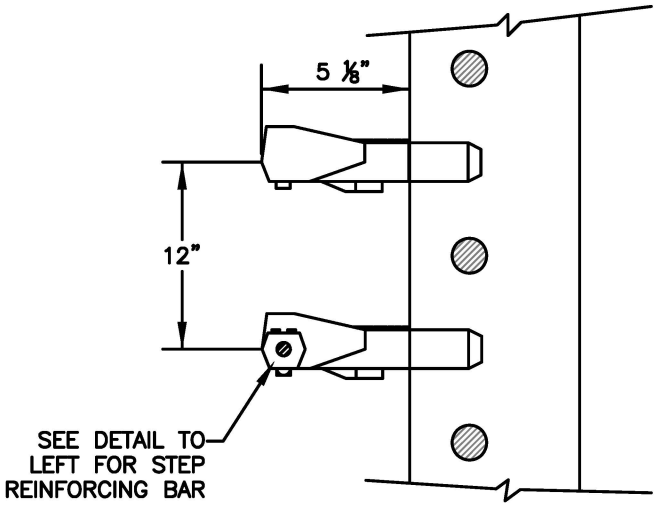


PLAN

NOTES:

1. ALL STEPS MUST MEET ASTM C-478 AND AASHTO M-199 SPECIFICATIONS, POLYPROPYLENE ASTM D4104-08, THE 1/2" GRADE 60 DEFORMED REINFORCING BAR ASTM A-615.
2. INSTALLATION METHOD MUST RESIST 1,500 LB. HORIZONTAL PULL OUT FORCE AND 500 LB. VERTICAL LOAD





ELEVATION

N.T.S.

MANHOLE STEP

STANDARD DETAIL

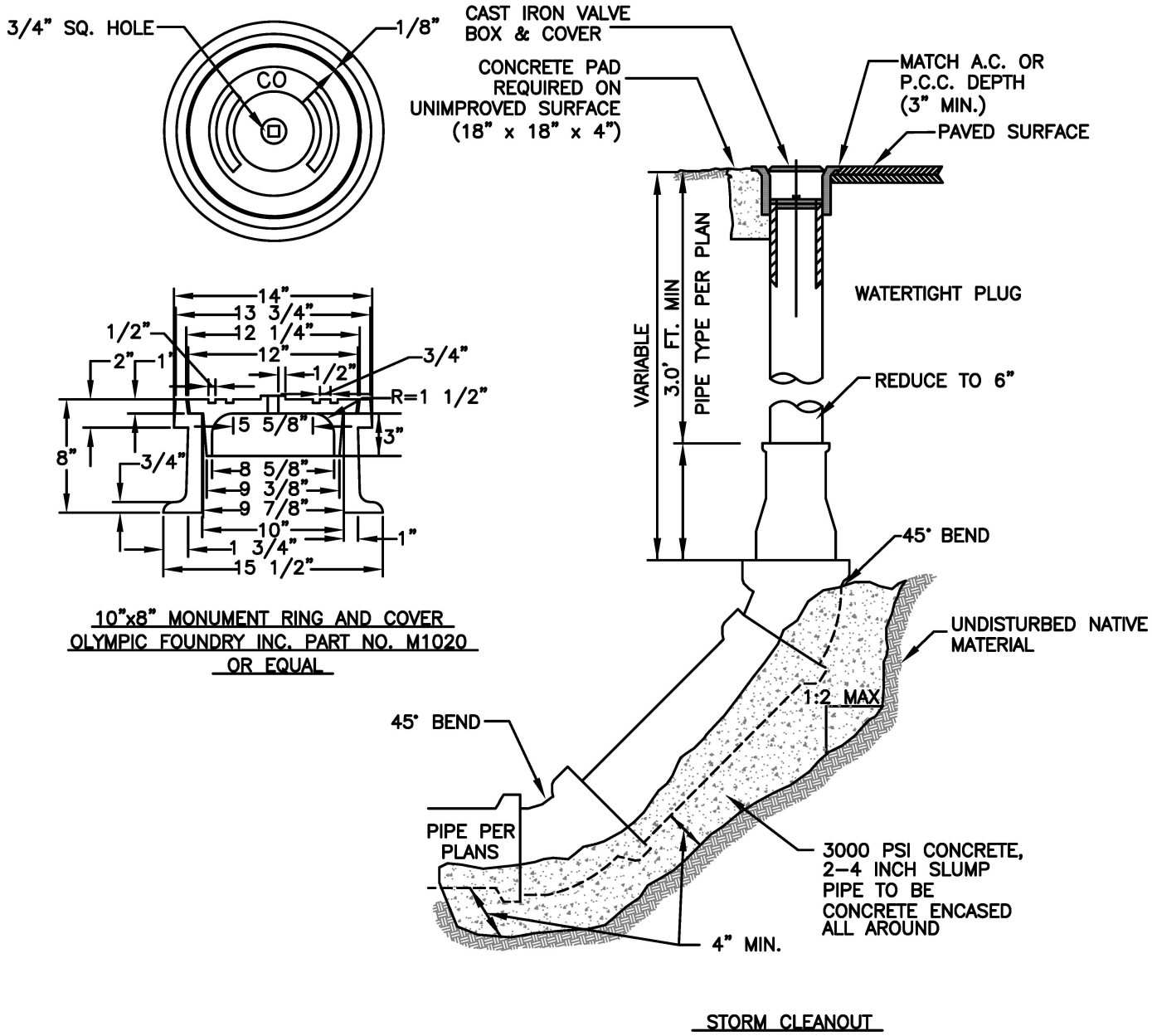
CITY OF BATTLE GROUND
APPROVED

Mark Hency 06/11/2018

CITY ENGINEER DATE

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3	3/28/07	JMH	MCH
4	7/22/09	RMJ	RMJ
5	3/28/17	CAS	KDU

ST-2.05



10"x8" MONUMENT RING AND COVER
OLYMPIC FOUNDRY INC. PART NO. M1020
OR EQUAL

STORM CLEANOUT

NOTES:

1. MANUFACTURED COVER AND FRAME SHALL BE PART OF THE ***BUY AMERICA*** PROGRAM PER 0605.GR1 OF THE WSDOT GENERAL SPECIAL PROVISIONS DIVISION 1.
2. VALVE BOX SHALL BE GRAY CAST IRON MATERIAL CONFORMING TO ASTM A-46 CLASS 30.
3. CLEANOUT SHALL BE INSTALLED OUTSIDE OF RIGHT OF WAY UNLESS ENGINEER RECEIVES PRIOR APPROVAL FROM CITY.

N.T.S.

CLEANOUT

STANDARD DETAIL

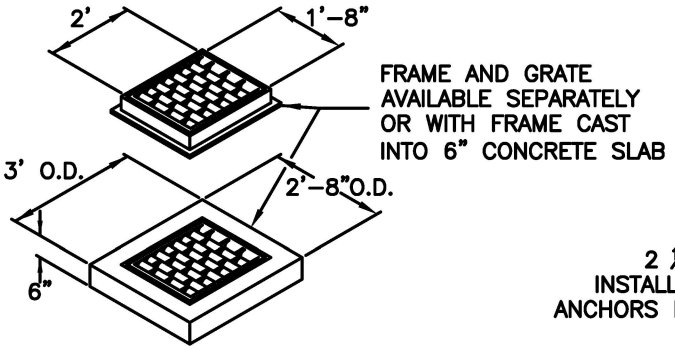
CITY OF BATTLE GROUND
APPROVED

Mark Henrey 06/11/2018

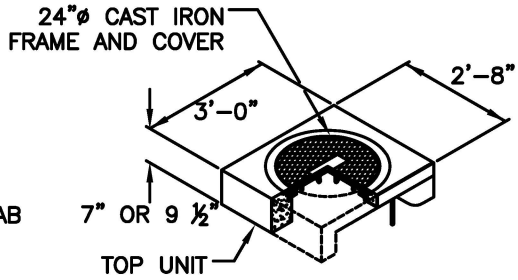
CITY ENGINEER DATE

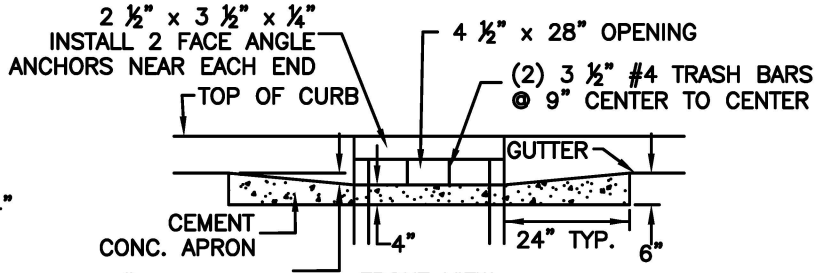
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1	8/12/98	BSG	GGH
2	8/30/05	ALL	MCH
3	3/28/07	JMH	MCH
4	7/22/09	RMJ	RMJ
5	3/28/17	CAS	KDU

ST-2.06

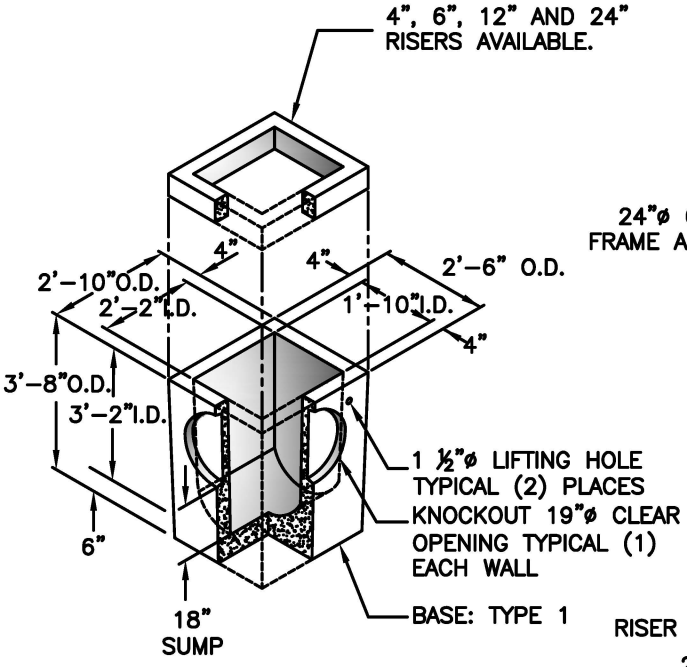


CATCH BASIN TOP

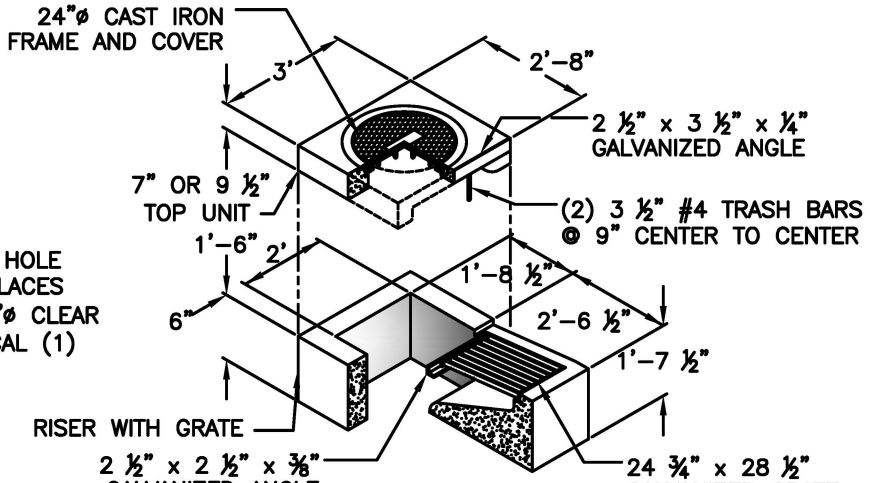




FRONT VIEW
CURB INLET TOP
(CITY OF BATTLE GROUND PREFERRED TOP)



BASE UNIT



COMBINATION CURB INLET TOP

FOR NOTES STD. DETAIL ST–3.00B

CATCH BASIN (TYPE 1)

STANDARD DETAIL

CITY OF BATTLE GROUND
APPROVED

Mark Hency 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	8/12/98	BSG	GGH
2	8/30/05	ALL	MCH
3	7/22/09	RMJ	RMJ
4	3/31/17	CAS	KDU

ST–3.00A

CONSTRUCTION NOTES:

1. IN OVER EXCAVATED AREAS PROVIDE SUPPORT FOR THE PIPE AS FOLLOWS: PLACE ¾" MINUS CRUSHED ROCK OVER UNDISTURBED GROUND IN 6" LAYERS AND COMPACT.
2. BACKFILL MATERIAL BELOW & TO SIDE OF STRUCTURE SHALL BE ASTM D2321 CLASS I OR II CRUSHED STONE OR GRAVEL, PLACED UNIFORMLY. BACKFILL TO MEET WSDOT 7-05 & AASHTO T-99 95% COMPACTION.
3. ALL DIMENSIONS SUBJECT TO ALLOWABLE SPECIFICATION TOLERANCES.
4. LATERALS WILL BE CONSTRUCTED TO ENTER THE STRUCTURE PERPENDICULAR TO THE WALL. THE LATERAL WILL ENTER ONLY AT THE LOCATION OF KNOCKOUT WITH NO LATERALS ALLOWED TO ENTER THE BASE AT THE CORNERS. IF NEEDED, A 45° BEND (MAX.) MAY BE USED WITHIN 5 FEET OF STRUCTURE.
5. TAPER GUTTER DOWN TO INLET. (CURB INLET & COMBINATION CURB INLET ONLY)
6. GUTTER PAN TO BE UTILIZED ON CATCH BASIN TOP AND COMBINATION CURB INLET TOP PER STD. DETAIL ST-5.00.
7. USE VANED GRATE WHERE LONGITUDINAL SLOPE IS 4% OR GREATER, SEE STD. DETAIL ST-5.02.
8. USE HERRINGBONE GRATE WHERE LONGITUDINAL SLOPE IS LESS THAN 4%, SEE STD. DETAIL ST-5.02.
9. INSTALL INLET STENCIL PER STD. DETAIL TR-8.09.
10. INSTALL REMOVABLE OUTLET TRAP OR EQUAL PER STD. DETAIL ST-5.01.
11. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
12. ANY PROTRUDING ENDS OF PIPES SHALL BE TRIMMED FLUSH WITH THE INSIDE WALLS AND GROUTED TO THE SATISFACTION OF ENGINEER.
13. LIFT HOLES MUST BE GROUTED.

STRUCTURE NOTES:

1. STRUCTURE TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 & C890 UNLESS SHOWN ON PLANS OR NOTED IN WSDOT STANDARD SPECIFICATIONS.
2. BASE CONCRETE SHALL BE 3000 P.S.I., 2-4 IN. SLUMP. FLOW LINES AND INSIDE SURFACES SHALL BE TROWELED SMOOTH & UNIFORM AT TIME OF POUR.
3. CAST-IN-PLACE, MONOLITHIC BASE UNIT MAY BE SUBSTITUTED WITH SPECIFIC APPROVAL OF THE ENGINEER.
4. ALL JOINTS SHALL BE GROUTED WITH PORTLAND CEMENT CONCRETE GROUT & STRUCK EVEN WITH THE WALL. RISERS SHALL BE PREMOLDED.
5. ALL REINFORCED STEEL SHALL HAVE 1 ½" CLEAR COVER UNLESS OTHERWISE NOTED, AND SHALL BE GRADE 60 (ASTM A615).
6. STEEL REINFORCED OR POLYPROPYLENE FIBER REINFORCED UNITS ARE ALLOWABLE.
7. MANUFACTURED COVERS, FRAMES, AND GRATES SHALL BE PART OF THE ***BUY AMERICA*** PROGRAM PER 0605.GR1 OF THE WSDOT GENERAL SPECIAL PROVISIONS DIVISION 1
8. BASE UNIT SHALL HAVE 18" SUMP BELOW INVERT OUT.

FOR DETAIL STD. DETAIL ST-3.00A

CATCH BASIN (TYPE 1) NOTES

STANDARD DETAIL

THE CITY OF BATTLE GROUND

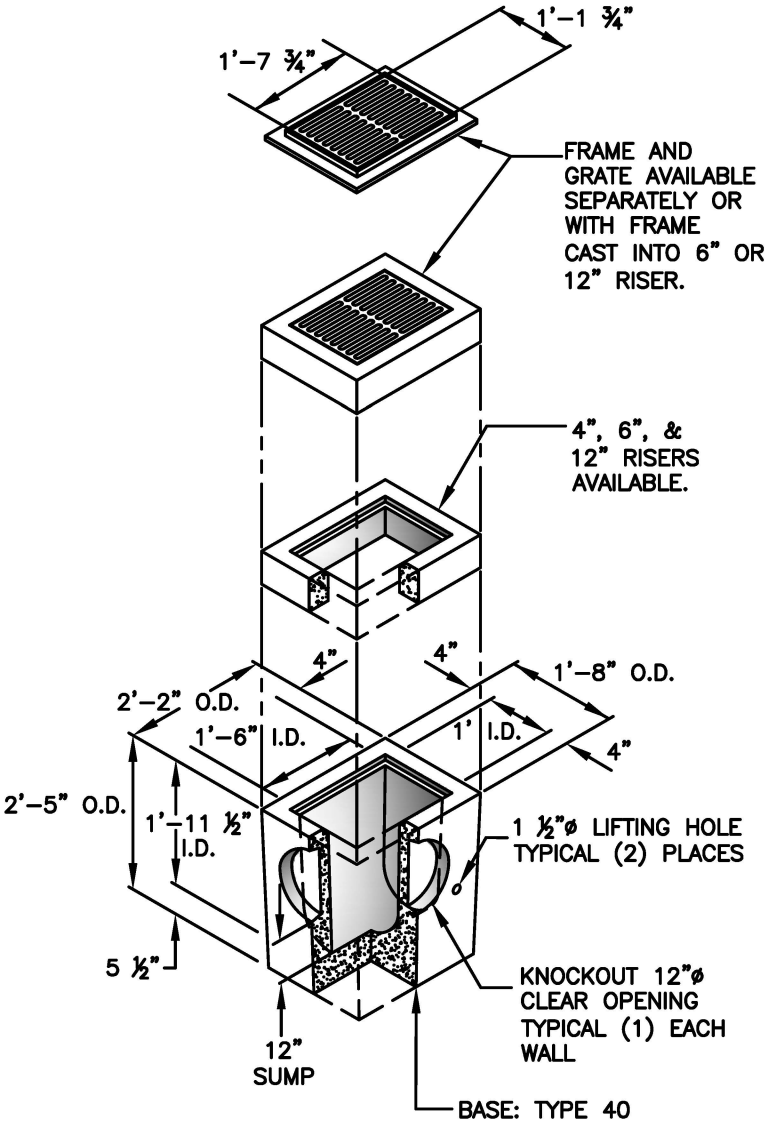
CITY OF BATTLE GROUND
APPROVED

Mark Hennes 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	8/12/98	BSG	GGH
2	8/30/05	ALL	MCH
3	7/22/09	RMJ	RMJ
4	4/07/17	CAS	KDU

ST-3.00B



CONSTRUCTION NOTES:

1. IN OVER EXCAVATED AREAS PROVIDE SUPPORT FOR THE PIPE AS FOLLOWS: PLACE ¾" MINUS CRUSHED ROCK OVER UNDISTURBED GROUND IN 6" LAYERS AND COMPACT.
2. BACKFILL MATERIAL BELOW & TO SIDE OF STRUCTURE SHALL BE ASTM D2321 CLASS I OR II CRUSHED STONE OR GRAVEL, PLACED UNIFORMLY. BACKFILL TO MEET WSDOT 7–05 & AASHTO T–99 95% COMPACTION.
3. ALL DIMENSIONS SUBJECT TO ALLOWABLE SPECIFICATION TOLERANCES.
4. LATERALS WILL BE CONSTRUCTED TO ENTER THE STRUCTURE PERPENDICULAR TO THE WALL. THE LATERAL WILL ENTER ONLY AT THE LOCATION OF KNOCKOUT WITH NO LATERALS ALLOWED TO ENTER THE BASE AT THE CORNERS. IF NEEDED, A 45° BEND (MAX.) MAY BE USED WITHIN 5 FEET OF STRUCTURE.
5. GUTTER PAN TO BE UTILIZED PER STD. DETAIL ST–5.00.
6. INSTALL INLET STENCIL PER STD. DETAIL TR–8.09.
7. INSTALL REMOVABLE OUTLET TRAP OR EQUAL, SEE STD. DETAIL ST–5.01.
8. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'–0".
9. ANY PROTRUDING ENDS OF PIPES SHALL BE TRIMMED FLUSH WITH THE INSIDE WALLS AND GROUTED TO THE SATISFACTION OF ENGINEER.
10. LIFT HOLES MUST BE GROUTED.

STRUCTURE NOTES:

1. STRUCTURE TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 & C890 UNLESS SHOWN ON PLANS OR NOTED IN WSDOT STANDARD SPECIFICATIONS.
2. BASE CONCRETE SHALL BE 3000 P.S.I., 2–4 IN. SLUMP. FLOW LINES AND INSIDE SURFACES SHALL BE TROWELED SMOOTH & UNIFORM AT TIME OF POUR.
3. CAST–IN–PLACE, MONOLITHIC BASE UNIT MAY BE SUBSTITUTED WITH SPECIFIC APPROVAL OF THE ENGINEER.
4. ALL JOINTS SHALL BE GROUTED WITH PORTLAND CEMENT CONCRETE GROUT & STRUCK EVEN WITH THE WALL. RISERS SHALL BE PREMOLDED.
5. ALL REINFORCED STEEL SHALL HAVE 1 ½" CLEAR COVER UNLESS OTHERWISE NOTED, AND SHALL BE GRADE 60 (ASTM A615).
6. STEEL REINFORCED OR POLYPROPYLENE FIBER REINFORCED UNITS ARE ALLOWABLE.
7. MANUFACTURED GRATE AND FRAME SHALL BE PART OF THE ***BUY AMERICA*** PROGRAM PER 0605.GR1 OF THE WSDOT GENERAL SPECIAL PROVISIONS DIVISION 1.
8. BASE UNIT SHALL HAVE 12" SUMP BELOW INVERT OUT.

N.T.S.

CATCH BASIN (TYPE 40)

STANDARD DETAIL

THE CITY OF BATTLE GROUND

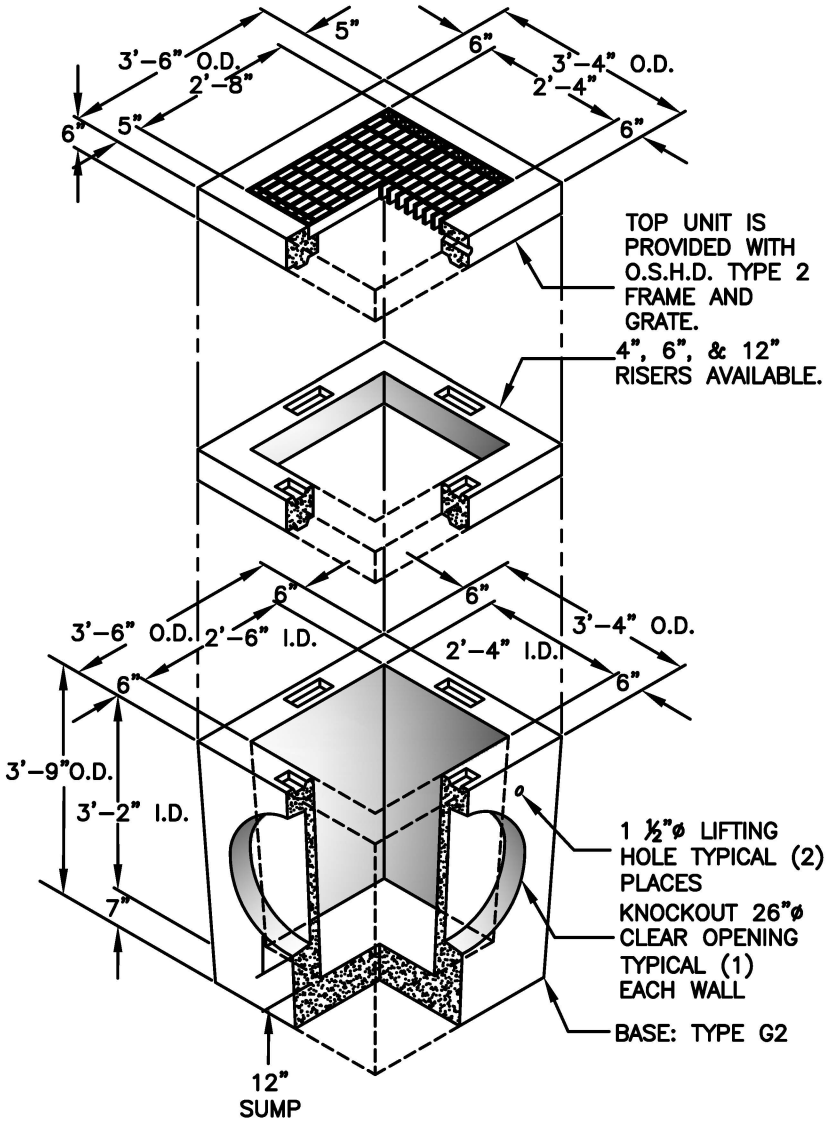
CITY OF BATTLE GROUND
APPROVED

Mark Hennes 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	8/12/98	BSG	GGH
2	8/30/05	ALL	MCH
3	7/22/09	RMJ	RMJ
4	4/07/17	CAS	KDU

ST–3.01



CONSTRUCTION NOTES:

1. IN OVER EXCAVATED AREAS PROVIDE SUPPORT FOR THE PIPE AS FOLLOWS: PLACE ¾" MINUS CRUSHED ROCK OVER UNDISTURBED GROUND IN 6" LAYERS AND COMPACT.
2. BACKFILL MATERIAL BELOW & TO SIDE OF STRUCTURE SHALL BE ASTM D2321 CLASS I OR II CRUSHED STONE OR GRAVEL, PLACED UNIFORMLY. BACKFILL TO MEET WSDOT 7–05 & AASHTO T–99 95% COMPACTION.
3. ALL DIMENSIONS SUBJECT TO ALLOWABLE SPECIFICATION TOLERANCES.
4. LATERALS WILL BE CONSTRUCTED TO ENTER THE STRUCTURE PERPENDICULAR TO THE WALL. THE LATERAL WILL ENTER ONLY AT THE LOCATION OF KNOCKOUT WITH NO LATERALS ALLOWED TO ENTER THE BASE AT THE CORNERS. IF NEEDED, A 45° BEND (MAX.) MAY BE USED WITHIN 5 FEET OF STRUCTURE.
5. GUTTER PAN TO BE UTILIZED PER STD. DETAIL ST–5.00.
6. INSTALL INLET STENCIL PER STD. DETAIL TR–8.09.
7. INSTALL REMOVABLE OUTLET TRAP OR EQUAL, SEE STD. DETAIL ST–5.01.
8. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'–0".
9. ANY PROTRUDING ENDS OF PIPES SHALL BE TRIMMED FLUSH WITH THE INSIDE WALLS AND GROUTED TO THE SATISFACTION OF ENGINEER.
10. LIFT HOLES MUST BE GROUTED.

STRUCTURE NOTES:

1. STRUCTURE TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 & C890 UNLESS SHOWN ON PLANS OR NOTED IN WSDOT STANDARD SPECIFICATIONS.
2. BASE CONCRETE SHALL BE 3000 P.S.I., 2–4 IN. SLUMP. FLOW LINES AND INSIDE SURFACES SHALL BE TROWELED SMOOTH & UNIFORM AT TIME OF POUR.
3. CAST–IN–PLACE, MONOLITHIC BASE UNIT MAY BE SUBSTITUTED WITH SPECIFIC APPROVAL OF THE ENGINEER.
4. ALL JOINTS SHALL BE GROUTED WITH PORTLAND CEMENT CONCRETE GROUT & STRUCK EVEN WITH THE WALL. RISERS SHALL BE PREMOLDED.
5. ALL REINFORCED STEEL SHALL HAVE 1 ½" CLEAR COVER UNLESS OTHERWISE NOTED, AND SHALL BE GRADE 60 (ASTM A615).
6. STEEL REINFORCED OR POLYPROPYLENE FIBER REINFORCED UNITS ARE ALLOWABLE.
7. MANUFACTURED GRATE AND FRAME SHALL BE PART OF THE ***BUY AMERICA*** PROGRAM PER 0605.GR1 OF THE WSDOT GENERAL SPECIAL PROVISIONS DIVISION 1.
8. BASE UNIT SHALL HAVE 12" SUMP BELOW INVERT OUT.

N.T.S.

CATCH BASIN (TYPE G2)

STANDARD DETAIL

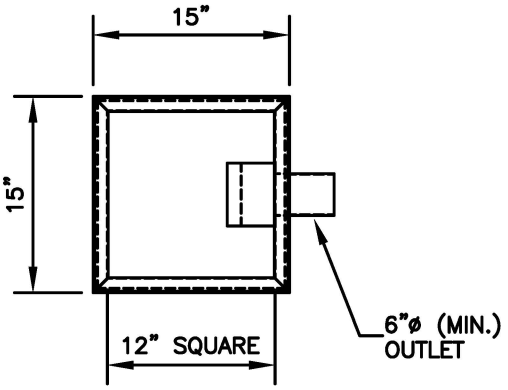
CITY OF BATTLE GROUND
APPROVED

Mark Henry 06/11/2018

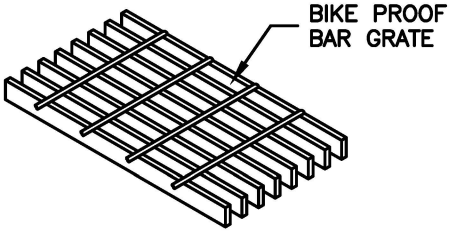
CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	8/12/98	BSG	GGH
2	8/30/05	ALL	MCH
3	7/22/09	RMJ	RMJ
4	4/07/17	CAS	KDU

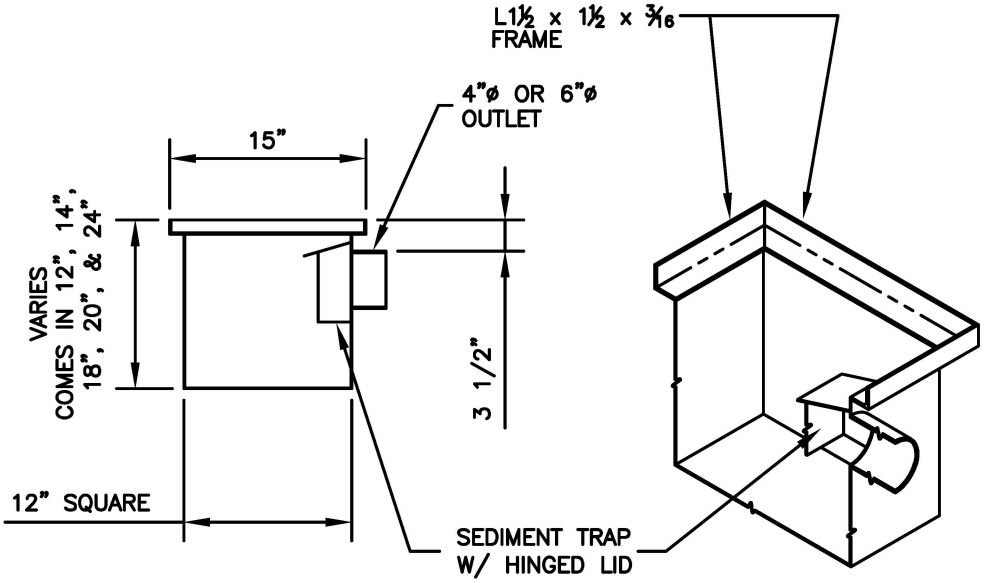
ST–3.02



PLAN VIEW



GRATING



SIDE VIEW

ISOMETRIC SECTION

STATE APPROVED – ASPHALT DIPPED

NOTES:

1. THIS CATCH BASIN CAN BE USED IN AREAS OUTSIDE RIGHT OF WAY AND TRAVELED WAY OR AS APPROVED BY CITY ENGINEER.
2. BOX FABRICATED FROM 10 GA. MATERIAL

N.T.S.

CATCH BASIN (STEEL)

STANDARD DETAIL

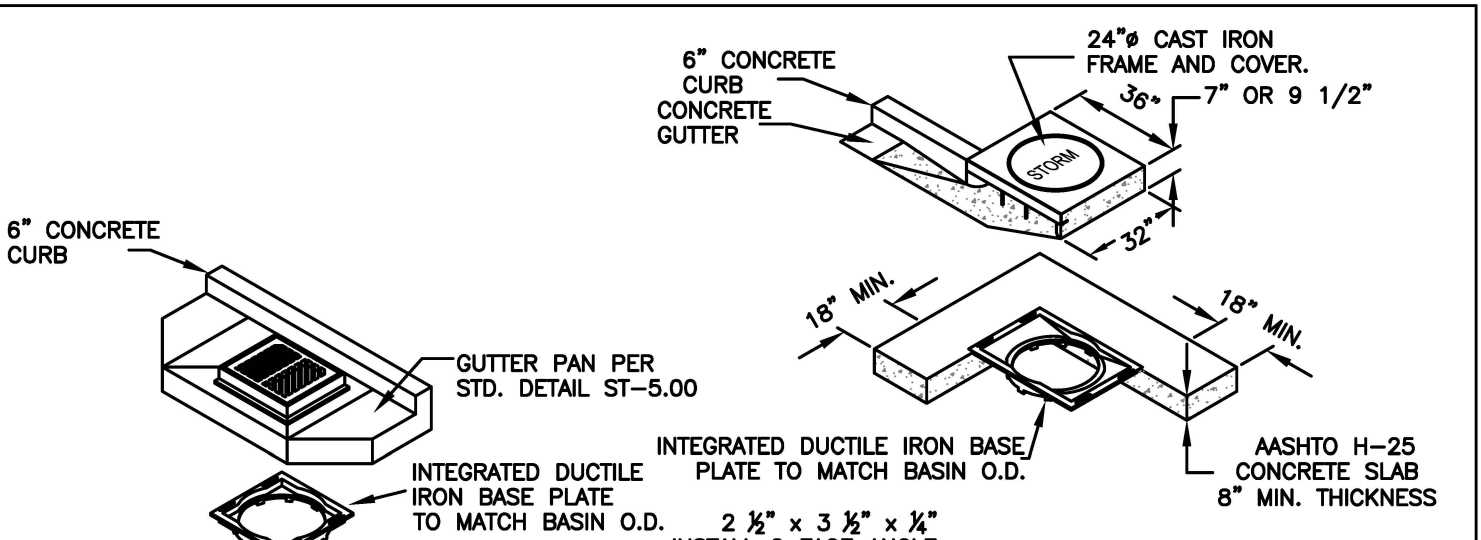
CITY OF BATTLE GROUND
APPROVED

Mark Henry 06/11/2018

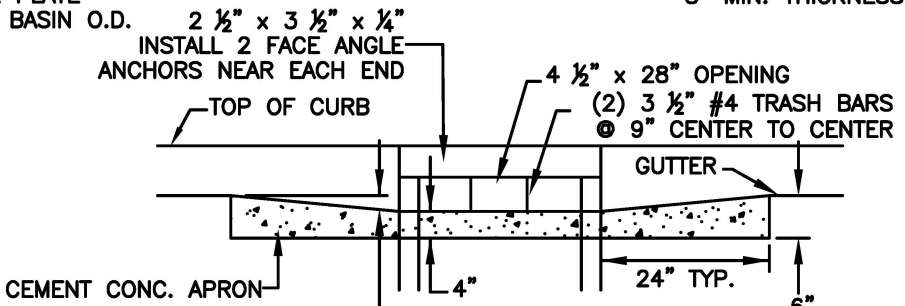
CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
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2	4/7/17	CAS	KDU

ST–3.03



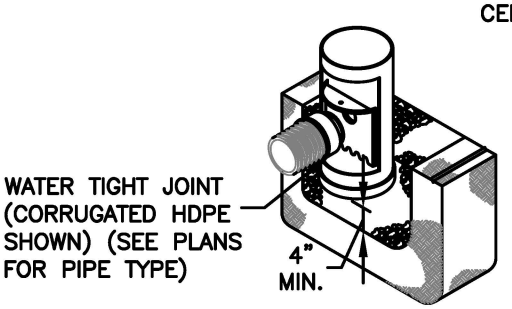
CATCH BASIN TOP

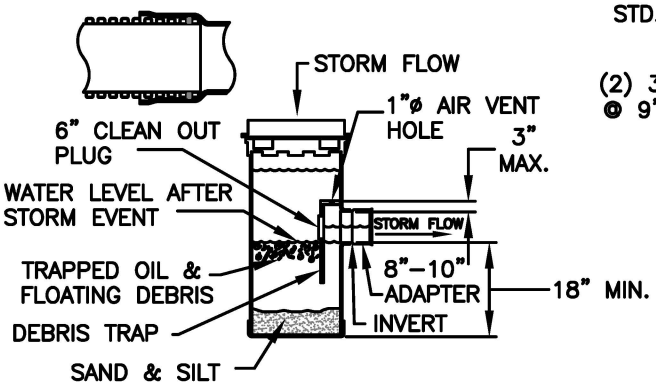


FRONT VIEW

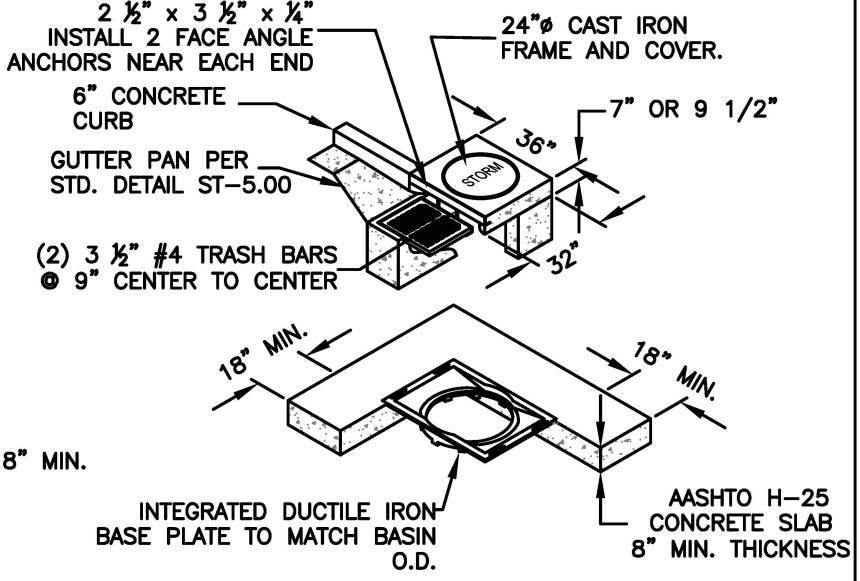
CURB INLET TOP

(CITY OF BATTLE GROUND PREFERRED TOP)





BASE UNIT



COMBINATION CURB INLET TOP

SEE NOTES STD. DETAIL ST-3.04B

N.T.S.

CATCH BASIN (NYLOPLAST OR EQUAL)

STANDARD DETAIL

CITY OF BATTLE GROUND
APPROVED

Mark Henery 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	7/22/09	RMJ	RMJ
2	4/7/17	CAS	KDU

ST-3.04A

CONSTRUCTION NOTES:

1. BACKFILL MATERIAL BELOW & TO SIDE OF STRUCTURE SHALL BE ASTM D2321 CLASS I OR II CRUSHED STONE OR GRAVEL, PLACED UNIFORMLY. BACKFILL TO MEET WSDOT 7-05 & AASHTO T-99 95% COMPACTION.
2. BASE PLATE SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
3. ALL CAST-IN-PLACE CONCRETE SHALL BE CLASS 3,000.
4. USE VANED GRATE WHERE LONGITUDINAL SLOPE IS 4% OR GREATER, SEE STD. DETAIL ST-5.02.
5. USE HERRINGBONE GRATE WHERE LONGITUDINAL SLOPE IS LESS THAN 4%, SEE STD. DETAIL ST-5.02.
6. INSTALL INLET STENCIL PER STD. DETAIL TR-8.09.
7. TAPER GUTTER DOWN TO INLET. (CURB INLET & COMBINATION CURB INLET ONLY)
8. GUTTER PAN TO BE UTILIZED ON CATCH BASIN TOP AND COMBINATION CURB INLET TOP PER STD. DETAIL ST-5.00.
9. THE MAX. DEPTH FROM FINISHED GRADE TO THE PIPE INVERT IS 5'.
10. FRAME MUST BE INSTALLED WITH FLANGE DOWN.

STRUCTURE NOTES:

1. DRAIN BASIN TO BE 24" DIAMETER NYLOPLAST OR EQUAL (ROUND) STRUCTURE.
2. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS.
3. VARIOUS TYPES OF INLET & OUTLET ADAPTERS ARE AVAILABLE FOR CORRUGATED POLYETHYLENE, SDR 35, & CL 52 D.I..
4. DRAIN BASIN FRAME & GRATE SHALL BE IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATIONS & MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
5. MANUFACTURED COVERS, FRAMES, AND GRATES SHALL BE PART OF THE ***BUY AMERICA*** PROGRAM PER 0605.GR1 OF THE WSDOT GENERAL SPECIAL PROVISIONS DIVISION 1

FOR DETAIL SEE STD. DETAIL ST-3.04A

CATCH BASIN (NYLOPLAST OR EQUAL) NOTES

STANDARD DETAIL

THE CITY OF BATTLE GROUND

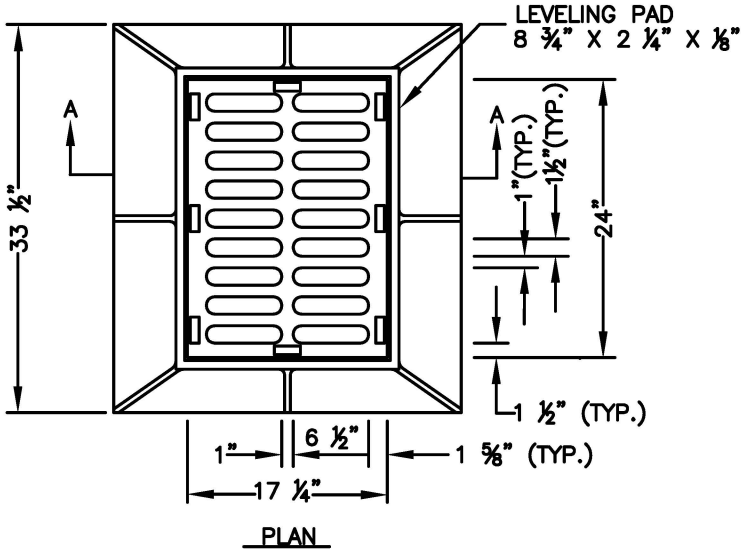
CITY OF BATTLE GROUND
APPROVED

Mark Hennes 06/11/2018

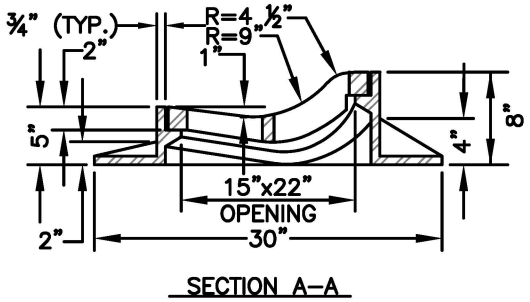
CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	8/12/98	BSG	GGH
2	8/30/05	ALL	MCH
3	7/22/09	RMJ	RMJ
4	4/12/17	CAS	KDU

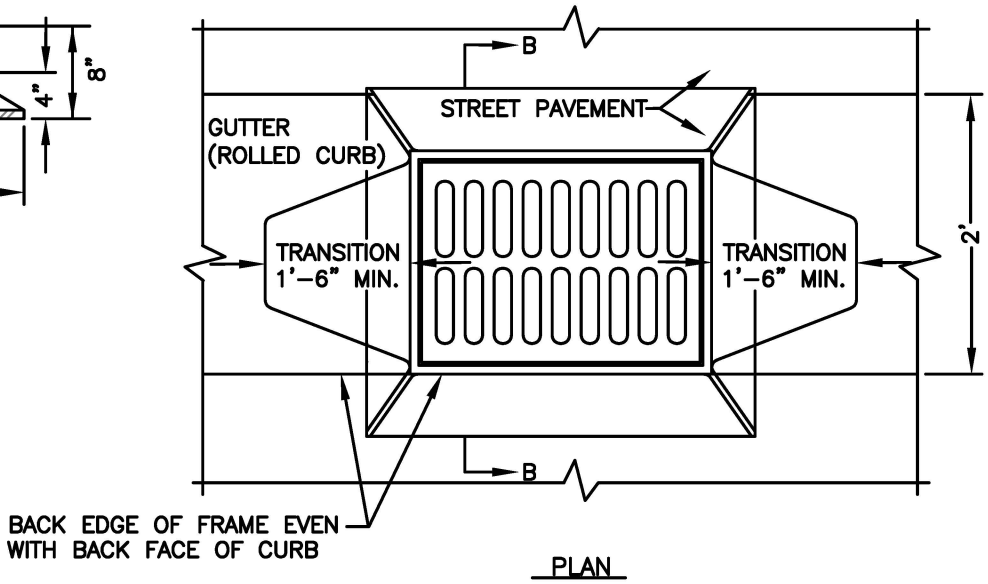
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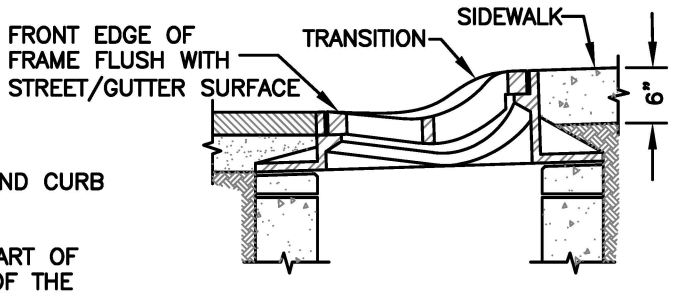
PLAN



SECTION A–A



PLAN



SECTION B–B

NOTES:

1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. SET FRAME TO GRADE AND CONSTRUCT ROAD AND CURB TO BE FLUSH AT FRONT AND BACK OF FRAME.
3. MANUFACTURED GRATE AND FRAME SHALL BE PART OF THE ***BUY AMERICA*** PROGRAM PER 0605.GR1 OF THE WSDOT GENERAL SPECIAL PROVISIONS DIVISION 1.

N.T.S.

CATCH BASIN (ROLLED CURB)

STANDARD DETAIL

CITY OF BATTLE GROUND
APPROVED

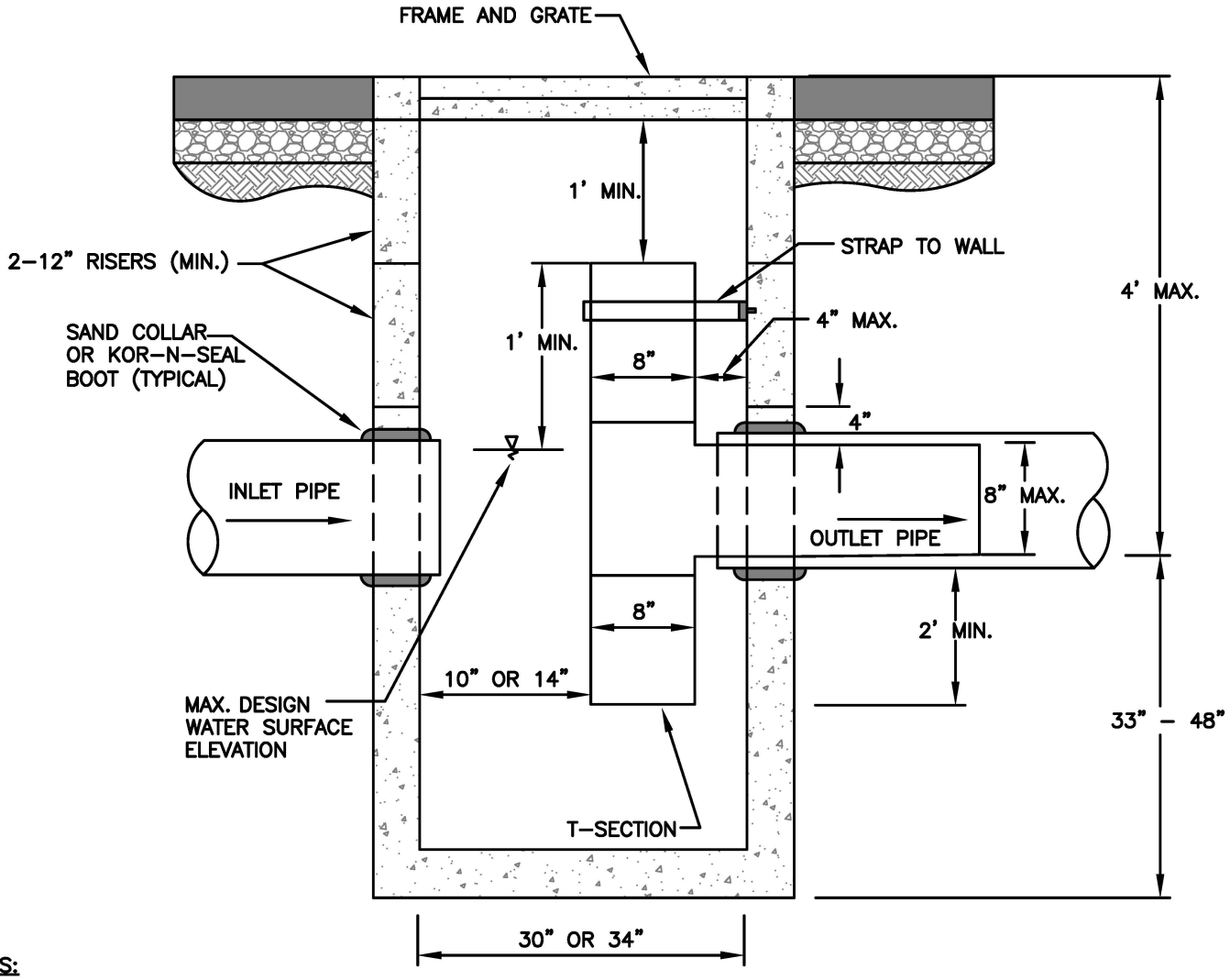
Mark Henrey

06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	7/22/09	RMJ	RMJ
2	4/11/17	CAS	KDU

ST–3.05



NOTES:

1. MAX. OUTLET PIPE DIAMETER IS 8 INCHES. VERTICAL RISER SECTION SHALL BE ALIGNED PLUMB VERTICALLY. HORIZONTAL RISER SECTION SHALL MATCH OUTLET PIPE SLOPE.
2. ALL METAL PARTS AND SURFACES MUST BE CORROSION RESISTANT. STEEL HARDWARE SHALL BE GALVANIZED. PIPES SHALL BE GALVANIZED, ASPHALT COATED (TREATMENT_1) OR ALUMINIZED. COMPLETE CORROSION PROTECTION MUST BE ASSURED.
3. APPLY NON–SHRINK GROUT TO INSIDE AND OUTSIDE OF ALL JOINTS, RINGS, RISERS AND FRAMES.
4. PENETRATE CARRIER PIPE THROUGH WALL.
5. USE APPROVED WATERTIGHT STRUCTURE ADAPTOR.
6. SLIP SMOOTH–BORE HORIZONTAL LEG OF FLOW CONTROL TEE INSIDE CARRIER PIPE.
7. NOT FLOW CONTROL JOINT OUTSIDE OF STRUCTURE.
8. SEE VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

SPILL CONTROL (SC) SEPARATOR

STANDARD DETAIL

THE CITY OF BATTLE GROUND

CITY OF BATTLE GROUND
APPROVED

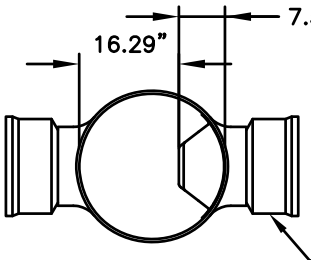
Mark Henrey

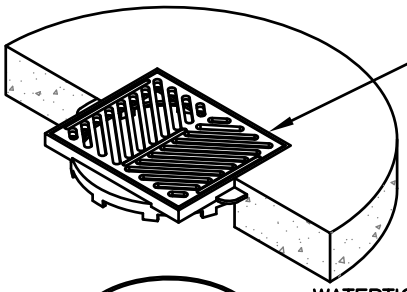
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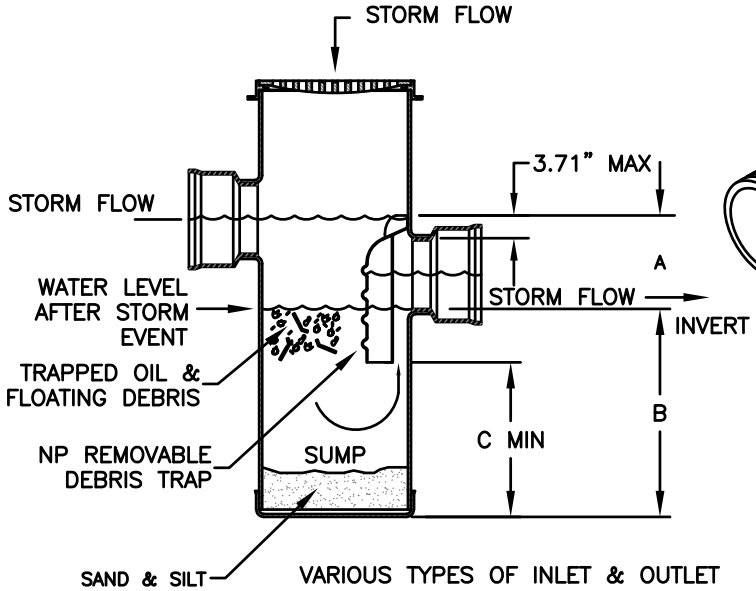
CITY ENGINEER DATE

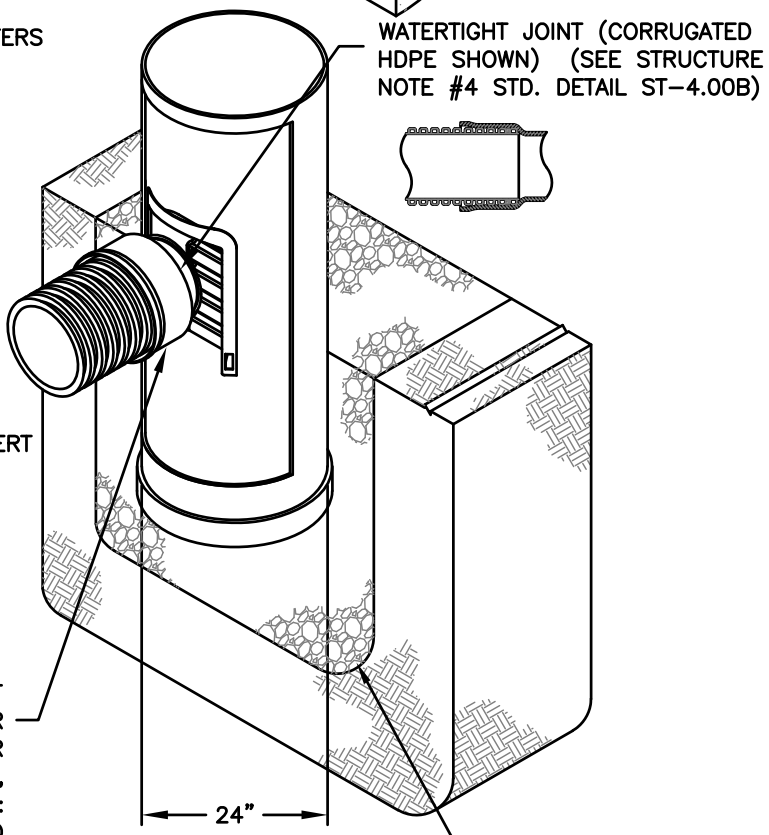
REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	12/29/16	KDU	KDU
2	4/12/17	CAS	KDU

ST–3.06









VARIOUS TYPES OF INLET & OUTLET ADAPTERS AVAILABLE: 4" – 12" FOR CORRUGATED HDPE (ADS N–12/HANCOR DUAL WALL, ADS/HANCOR SINGLE WALL), PVC SEWER (EX: SDR 35), PVC DWV(EX: SCH 40), PVC C900, CORRUGATED AND RIBBED PVC. (SEE STRUCTURE NOTE #4 STD. DETAIL ST–4.00B)

BACKFILL MATERIAL BELOW & TO SIDE OF STRUCTURE SHALL BE ASTM D2321 CLASS I OR II CRUSHED STONE OR GRAVEL, PLACED UNIFORMLY. BACKFILL TO MEET WSDOT 7–05 & AASHTO T–99 95% COMPACTION.

PERCENTAGE OF REMOVEABLE DEBRIS TRAP OPEN AREAS VS OUTLET PIPE OPEN AREA	
PIPE SIZE	PART # TBD
4"	537%
6"	251%
8"	141%
10"	90%
12"	61%

PIPE SIZE	A	B	C
4"	7.51	28.24	12.00
6"	9.25	26.50	12.00
8"	11.29	28.46	16.00
10"	13.21	30.54	20.00
12"	15.05	32.70	24.00

N.T.S.

DRAIN BASIN (NYLOPLAST OR EQUAL)

STANDARD DETAIL

CITY OF BATTLE GROUND
APPROVED

Mark Hennes 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	7/22/09	RMJ	RMJ
2	3/2/10	RMJ	RMJ
3	4/11/17	CAS	KDU

ST–4.00A

CONSTRUCTION NOTES:

1. DRAIN BASIN SHALL BE LOCATED OUTSIDE RIGHT-OF-WAY UNLESS APPROVED BY CITY ENGINEER.
2. PVC SURFACE DRAINAGE INLETS SHALL INCLUDE THE DRAIN BASIN TYPE AS INDICATED ON THE CONTRACT DRAWING AND REFERENCED WITHIN THE CONTRACT SPECIFICATIONS.
3. THE DUCTILE IRON GRATES FOR EACH OF THESE FITTINGS ARE TO BE CONSIDERED AN INTEGRAL PART OF THE SURFACE DRAINAGE INLET AND SHALL BE FURNISHED BY THE SAME MANUFACTURER.
4. THE SURFACE DRAINAGE INLETS SHALL BE AS MANUFACTURED BY NYLOPLAST, A DIVISION OF ADVANCED DRAINAGE SYSTEMS, INC., OR PRIOR APPROVED EQUAL.
5. THE DRAIN BASINS REQUIRED FOR THIS CONTRACT SHALL BE MANUFACTURED FROM PVC PIPE STOCK, UTILIZING A THERMO-MOLDING PROCESS TO REFORM THE PIPE STOCK TO THE SPECIFIED CONFIGURATION.
6. THE DRAINAGE PIPE CONNECTION STUBS SHALL BE MANUFACTURED FROM PVC PIPE STOCK AND FORMED TO PROVIDE A WATERTIGHT CONNECTION WITH THE SPECIFIED PIPE SYSTEM.
7. THIS JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR JOINTS FOR DRAIN AND SEWER PLASTIC PIPE USING FLEXIBLE ELASTOMERIC SEALS. THE FLEXIBLE ELASTOMERIC SEALS SHALL CONFORM TO ASTM F477.
8. THE PIPE BELL SPIGOT SHALL BE JOINED TO THE MAIN BODY OF THE DRAIN BASIN OR CATCH BASIN.
9. THE RAW MATERIAL USED TO MANUFACTURE THE PIPE STOCK THAT IS USED TO MANUFACTURE THE MAIN BODY AND PIPE STUBS OF THE SURFACE DRAINAGE INLETS SHALL CONFORM TO ASTM D1784 CELL CLASS 12454.
10. THE GRATES AND FRAMES FURNISHED FOR ALL SURFACE DRAINAGE INLETS SHALL BE DUCTILE IRON FOR SIZES 8", 10", 12", 15", 18", 24", AND 30" AND SHALL BE MADE SPECIFICALLY FOR EACH BASIN SO AS TO PROVIDE A ROUND BOTTOM FLANGE THAT CLOSELY MATCHES THE DIAMETER OF THE SURFACE DRAINAGE INLET.
11. GRATES FOR DRAIN BASINS SHALL BE CAPABLE OF SUPPORTING H-20 WHEEL LOADING FOR TRAFFIC AREAS OR H-10 LOADING FOR PEDESTRIAN AREAS.
12. THE SPECIFIED PVC SURFACE DRAINAGE INLET SHALL BE INSTALLED USING CONVENTIONAL FLEXIBLE PIPE BACKFILL MATERIALS AND PROCEDURES.
13. BEDDING AND BACKFILL FOR SURFACE DRAINAGE INLETS SHALL BE PLACED AND COMPACTED UNIFORMLY IN ACCORDANCE WITH ASTM D2321. THE DRAIN BASIN BODY WILL BE CUT AT THE TIME OF THE FINAL GRADE. NO BRICK, STONE OR CONCRETE BLOCK WILL BE REQUIRED TO SET THE GRATE TO THE FINAL GRADE HEIGHT.
14. FOR H-20 LOAD RATED INSTALLATIONS, A CONCRETE RING WILL BE POURED UNDER AND AROUND THE GRATE AND FRAME. THE CONCRETE SLAB MUST BE DESIGNED TAKING INTO THE CONSIDERATION LOCAL SOIL CONDITIONS, TRAFFIC LOADING, AND OTHER APPLICABLE DESIGN FACTORS.
15. FOR OTHER INSTALLATION CONSIDERATIONS SUCH AS MIGRATION OF FINES, GROUND WATER, AND SOFT FOUNDATIONS REFER TO ASTM D2321 GUIDELINES.

STRUCTURE NOTES:

1. REMOVABLE DEBRIS TRAP AVAILABLE WITH ALL 24" STRUCTURE OPTIONS (CUSTOM BASIN, ROAD & HIGHWAY, HERRINGBONE & CURB INLET).
2. 8" – 30" GRATES AND 12" – 30" FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. (SEE NYLOPLAST DRAWING NO. 7001-110-065).
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC.
5. ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS (SEE NYLOPLAST DRAWINGS NO. 7001-110-012, 7001-110-013, & 7001-110-014).
6. GRATES SHALL MEET H-10 LOAD RATING FOR 12" – 24" PEDESTRIAN.
7. GRATES SHALL MEET H-20 LOAD RATING FOR 30" PED & 12" – 30" STANDARD.
8. 8" & 10" PED/STD GRATES ARE RATED FOR LIGHT DUTY APPLICATIONS ONLY.
9. MANUFACTURED GRATES AND FRAMES SHALL BE PART OF THE ***BUY AMERICA*** PROGRAM PER 0605.GR1 OF THE WSDOT GENERAL SPECIAL PROVISIONS DIVISION 1.

FOR DETAIL SEE STD. DETAIL ST-4.00A

N.T.S.

DRAIN BASIN (NYLOPLAST OR EQUAL) NOTES

STANDARD DETAIL

THE CITY OF BATTLE GROUND

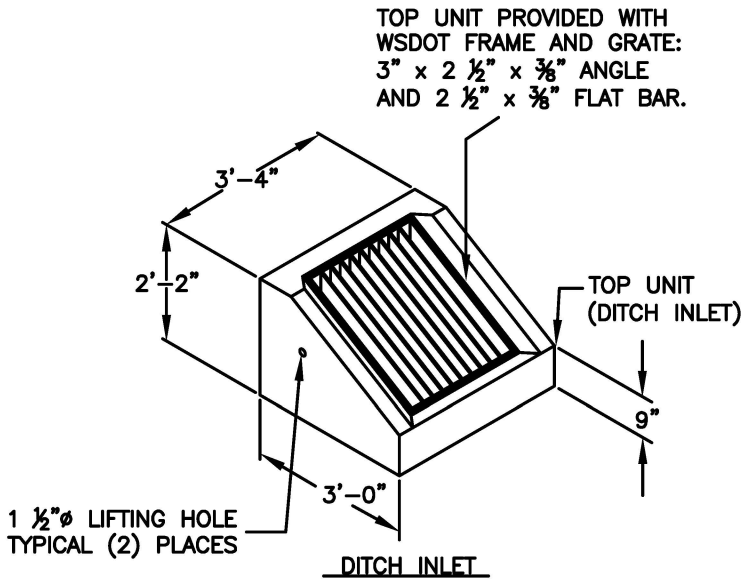
CITY OF BATTLE GROUND
APPROVED

Mark Henry 06/11/2018

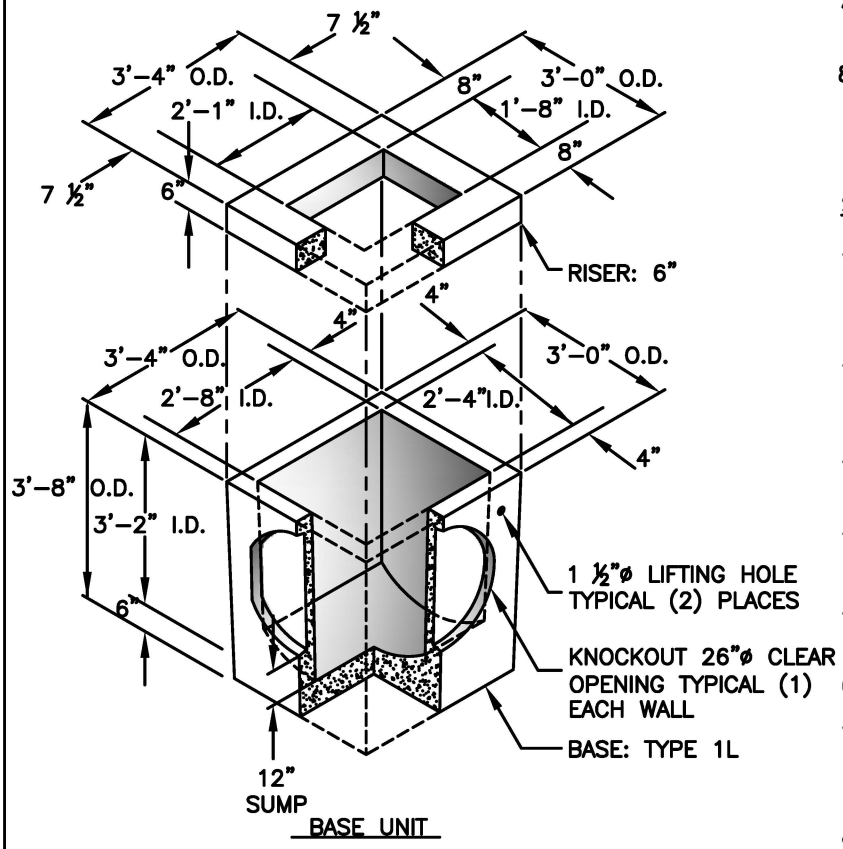
CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	7/22/09	RMJ	RMJ
2	3/2/10	RMJ	RMJ
3	4/13/17	CAS	KDU

ST-4.00B



DITCH INLET



BASE UNIT

CONSTRUCTION NOTES:

1. IN OVER EXCAVATED AREAS PROVIDE SUPPORT FOR THE PIPE AS FOLLOWS: PLACE ¾" MINUS CRUSHED ROCK OVER UNDISTURBED GROUND IN 6" LAYERS AND COMPACT.
2. BACKFILL MATERIAL BELOW & TO SIDE OF STRUCTURE SHALL BE ASTM D2321 CLASS I OR II CRUSHED STONE OR GRAVEL, PLACED UNIFORMLY. BACKFILL TO MEET WSDOT 7–05 & AASHTO T–99 95% COMPACTION.
3. ALL DIMENSIONS SUBJECT TO ALLOWABLE SPECIFICATION TOLERANCES.
4. LATERALS WILL BE CONSTRUCTED TO ENTER THE STRUCTURE PERPENDICULAR TO THE WALL. THE LATERAL WILL ENTER ONLY AT THE LOCATION OF KNOCKOUT WITH NO LATERALS ALLOWED TO ENTER THE BASE AT THE CORNERS. IF NEEDED, A 45° BEND (MAX.) MAY BE USED WITHIN 5 FEET OF STRUCTURE.
5. INSTALL REMOVABLE OUTLET TRAP OR EQUAL PER STD. DETAIL ST–5.01.
6. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'–0".
7. ANY PROTRUDING ENDS OF PIPES SHALL BE TRIMMED FLUSH WITH THE INSIDE WALLS AND GROUTED TO THE SATISFACTION OF ENGINEER.
8. LIFT HOLES MUST BE GROUTED.

STRUCTURE NOTES:

1. STRUCTURE TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 & C890 UNLESS SHOWN ON PLANS OR NOTED IN WSDOT STANDARD SPECIFICATIONS.
2. BASE CONCRETE SHALL BE 3000 P.S.I., 2–4 IN. SLUMP. FLOW LINES AND INSIDE SURFACES SHALL BE TROWELED SMOOTH & UNIFORM AT TIME OF POUR.
3. CAST–IN–PLACE, MONOLITHIC BASE UNIT MAY BE SUBSTITUTED WITH SPECIFIC APPROVAL OF THE ENGINEER.
4. ALL JOINTS SHALL BE GROUTED WITH PORTLAND CEMENT CONCRETE GROUT & STRUCK EVEN WITH THE WALL. RISERS SHALL BE PREMOLDED.
5. ALL REINFORCED STEEL SHALL HAVE 1 ½" CLEAR COVER UNLESS OTHERWISE NOTED, AND SHALL BE GRADE 60 (ASTM A615).
6. STEEL REINFORCED OR POLYPROPYLENE FIBER REINFORCED UNITS ARE ALLOWABLE.
7. MANUFACTURED GRATE AND FRAME SHALL BE PART OF THE ***BUY AMERICA*** PROGRAM PER 0605.GR1 OF THE WSDOT GENERAL SPECIAL PROVISIONS DIVISION 1
8. BASE UNIT SHALL HAVE 12" SUMP BELOW INVERT OUT.

N.T.S.

DITCH INLET (TYPE 1L)

STANDARD DETAIL

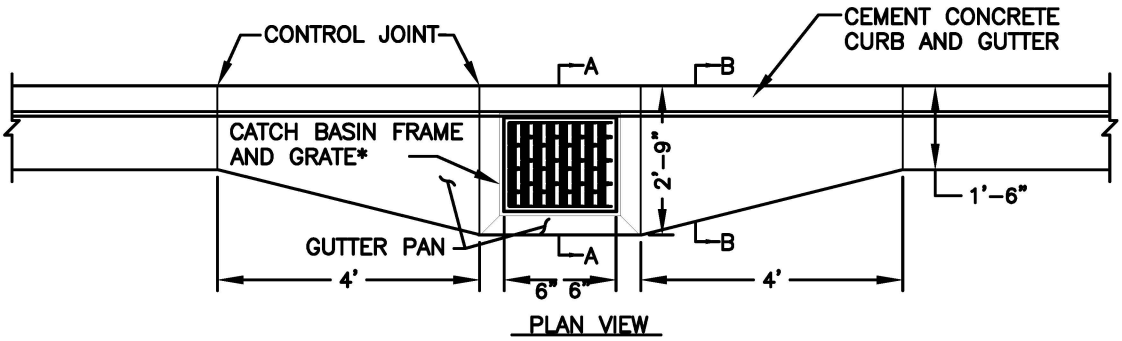
CITY OF BATTLE GROUND
APPROVED

Mark Henrey 06/11/2018

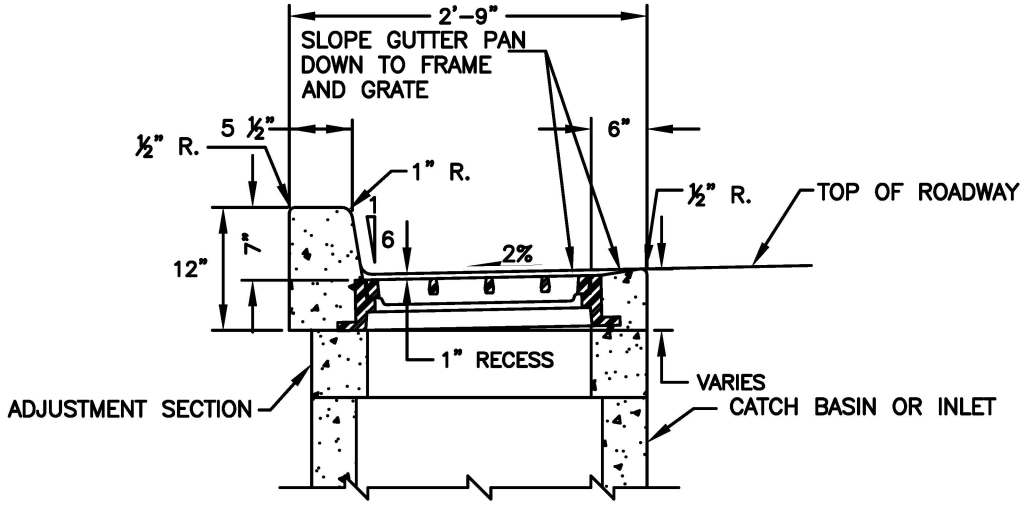
CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
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2	4/11/17	CAS	KDU

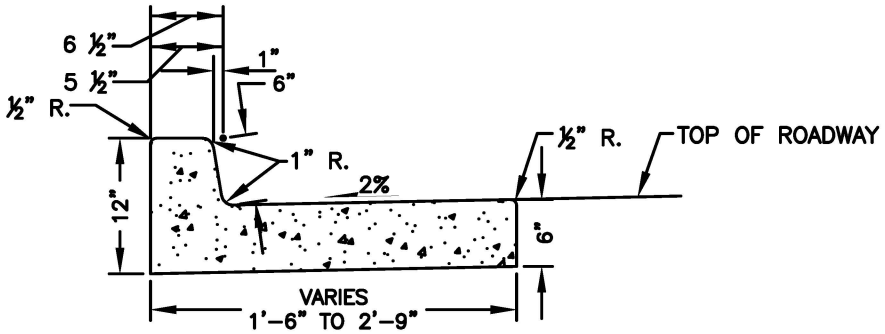
ST–4.01



PLAN VIEW



SECTION A



SECTION B

*NOTES:

1. USE VANED GRATE WHERE LONGITUDINAL SLOPE IS 4% OR GREATER, SEE STD. DETAIL ST-5.02.
2. USE HERRINGBONE GRATE WHERE LONGITUDINAL SLOPE IS LESS THAN 4%, SEE STD. DETAIL ST-5.02.

N.T.S.

GUTTER PAN

STANDARD DETAIL

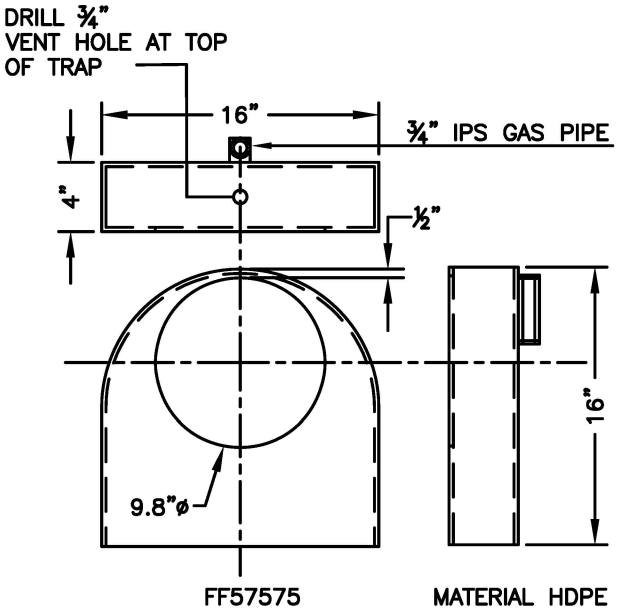
CITY OF BATTLE GROUND
APPROVED

Mark Hennes 06/11/2018

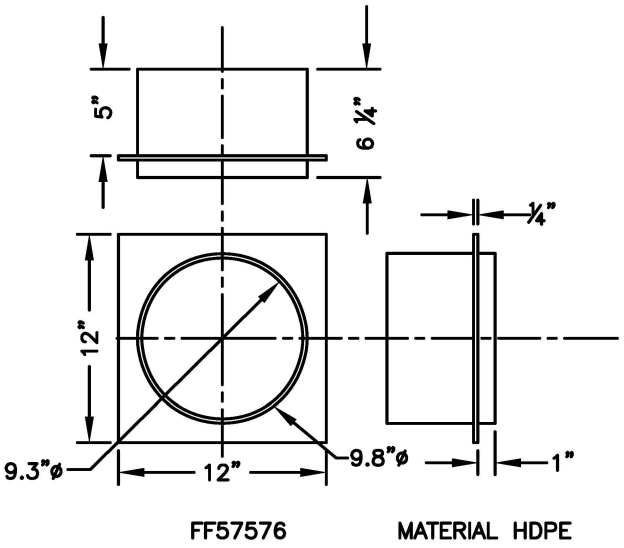
CITY ENGINEER DATE

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2	4/11/17	CAS	KDU

ST-5.00

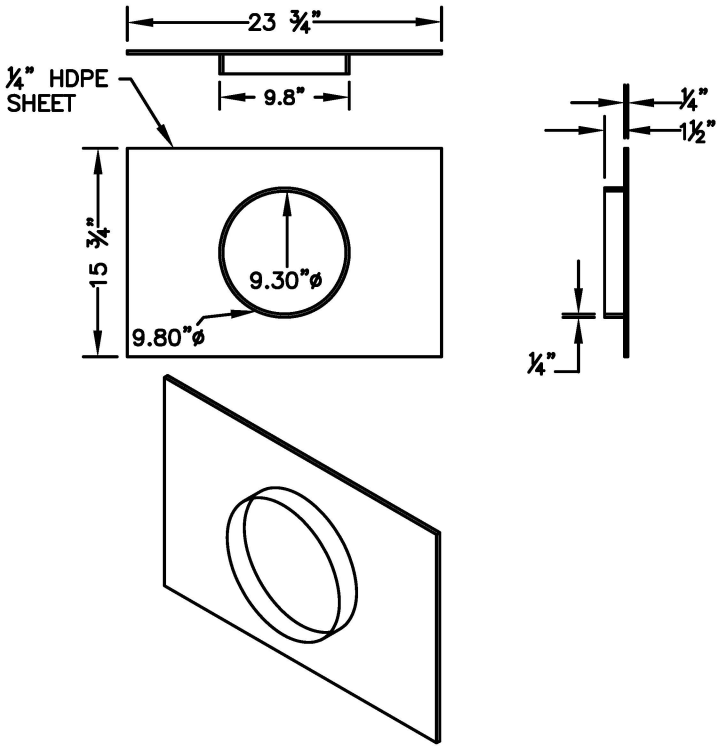


LOW PROFILE ELBOW

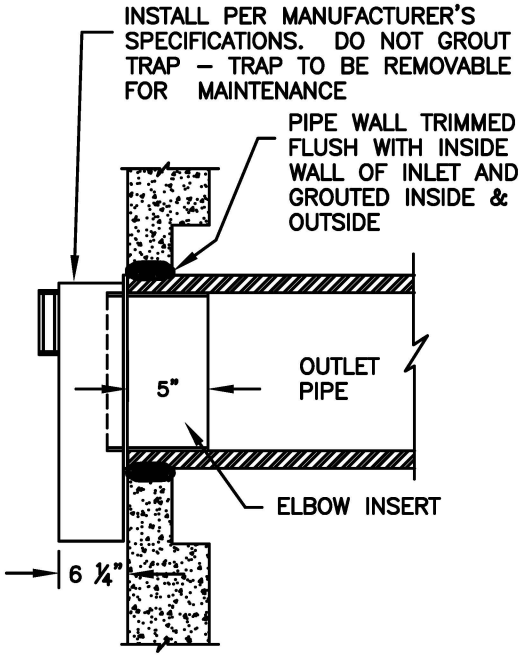


ELBOW INSERT

ZYMARK, ULTRATECH, BONAIR BRANDS OR EQUIVALENT



10" HDPE FLAT FACE ADAPTOR
FORD FABRICATIONS OR EQUIVALENT



N.T.S.

OUTLET TRAP

STANDARD DETAIL

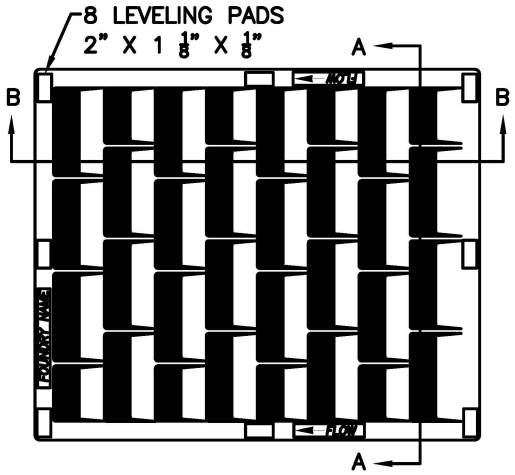
CITY OF BATTLE GROUND
APPROVED

Mark Henry 06/11/2018

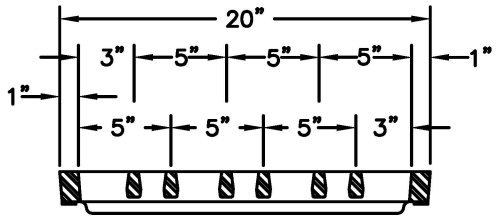
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2	4/12/17	CAS	KDU

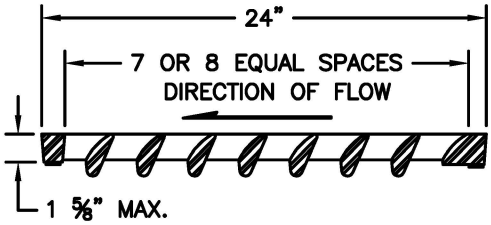
ST–5.01



PLAN VIEW

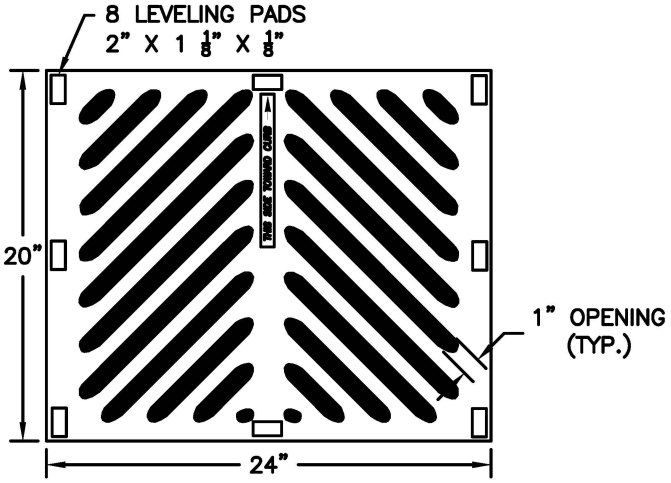


SECTION A–A



SECTION B–B

VANED



HERRINGBONE

NOTES:

1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. USE VANED GRATE WHERE LONGITUDINAL SLOPE IS 4% OR GREATER.
3. USE HERRINGBONE GRATE WHERE LONGITUDINAL SLOPE IS LESS THAN 4%.
4. REFER TO WSDOT STANDARD SPECIFICATIONS 9–05.15(2) FOR ADDITIONAL REQUIREMENTS.
5. THE THICKNESS OF THE GRATE SHALL NOT EXCEED 1 5/8".
6. MANUFACTURED GRATE AND FRAME SHALL BE PART OF THE ***BUY AMERICA*** PROGRAM PER 0605.GR1 OF THE WSDOT GENERAL SPECIAL PROVISIONS DIVISION 1.

N.T.S.

STORM GRATES

STANDARD DETAIL

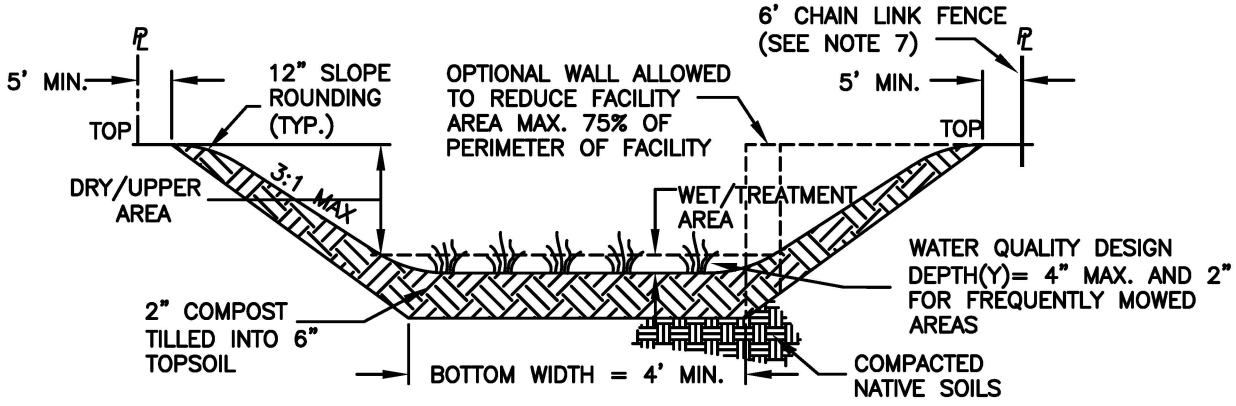
CITY OF BATTLE GROUND
APPROVED

Mark Harvey 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	7/22/09	RMJ	RMJ
2	4/12/17	CAS	KDU

ST–5.02



WET/TREATMENT*

MIX 1

TALL OR MEADOW FESCUE	75–80 PERCENT
SEASIDE/COLONIAL BENTGRASS	10–15 PERCENT
REDTOP	5–10 PERCENT

MIX 2

TALL FESCUE	60–70 PERCENT
SEASIDE/COLONIAL BENTGRASS	10–15 PERCENT
MEADOW FOXTAIL	10–15 PERCENT
ALSIKE CLOVER	6–10 PERCENT
MARSHFIELD BIG TREFOIL	1–5 PERCENT
REDTOP	1–6 PERCENT

APPLICATION RATE IS APPROX. 80 lbs/ACRE
*SEED MIX PER STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON, VOLUME V.

DRY/UPPER**

GROUNDCOVER

COMMON NAME	BOTANICAL NAME
KINNIKINNIK	ARCTOSTAPHYLOS UVA–URSI
EPIMEDIUM	EPIMEDIUM GRANDIFLORUM
CREEPING FORGET ME NOT	OMPHALODES VERNA
----------	EUONYMUS LANCEOLATA
YELLOW ROOT	XANTHORHIZA SIMPLISSIMA
----------	GENISTA
WHITE LAWN CLOVER	TRIFOLIUM REPENS
WHITE SWEET CLOVER	MELILOTUS ALBA
----------	RUBUS CALYCINOIDES
STRAWBERRY	FRAGARIA CHILOENSIS
BROADLEAF LUPINE	LUPINUS LATIFOLIUS

GRASSES (DROUGHT–TOLERANT, MINIMUM MOWING)

COMMON NAME	BOTANICAL NAME
DWARF TALL FESCUES	FESTUCA SPP. (E.G., MANY MUSTANG, SILVERADO)
HARD FESCUE	FESTUCA OVINA DURIUSCULA (E.G., RELIANT, AURORA)
TUFTED FESCUE	FESTUCA AMETHYSTINE
BUFFALO GRASS	BUCHLOE DACTYLOIDES
RED FESCUE	FESTUCA RUBRA
TALL FESCUE GRASS	FESTUCA ARUNDINACEA
BLUE OATGRASS	HELICTOTRICHON SEMPERVIRENS

APPLICATION RATE IS APPROX. 80 lbs/ACRE
**GROUNDCOVER & GRASSES PER STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON, VOLUME V.

BIOSWALE SECTION

STANDARD DETAIL

CITY OF BATTLE GROUND
APPROVED

Mark Henry 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	7/22/09	RMJ	RMJ
2	3/30/17	CAS	KDU

ST–6.00A

NOTES:

1. IF BIOSWALE IS INSTALLED DURING A PERIOD OF WET WEATHER (OCT 1–APRIL 30), BIOSWALE SHALL BE ESTABLISHED BY SODDING. SINCE SOD IS NOT AVAILABLE IN RECOMMENDED GRASSES, IT SHOULD BE OVER SOWN WITH A RECOMMENDED MIX AT THE BEGINNING OF THE GROWING SEASON. IT IS RECOMMENDED TO INSTALL A SOD THAT IS A MIX OF CREEPING FESCUE AND HARD & SHEEP FESCUES.
2. THE DESIGN OF WATER QUALITY FACILITIES SHALL MEET THE STANDARD AS SET FORTH IN BGMC 18.250.
3. SOD SHALL BE LAID PERPENDICULAR TO SLOPE FROM BOTTOM TO TOP, WITH JOINTS STAGGERED.
4. SWALE LONGITUDINAL SLOPE: 1.5–2.5% (0.5% MIN.). UNDERDRAINS REQUIRED FOR SLOPES LESS THAN 1.5%, SEE STD. DETAIL ST–6.01.
5. FLOW SPREADERS REQUIRED FOR SLOPES GREATER THAN 2.5% OR FOR SWALES WHICH EXCEED 100' IN LENGTH. FLOW SPREADERS TO BE INSTALLED IN A MAXIMUM OF 50' INTERVALS. THE SPREADER SHALL BE INSTALLED LEVEL AND ON CONTOUR, SEE STD. DETAIL ST–6.03.
6. SWALE SHALL HAVE 75% COVERAGE OF PROPER VEGETATION AS APPROVED BY THE CITY INSPECTOR PRIOR TO PAVING.
7. INSTALL FENCE AT PROPERTY LINE (℄).

BIOSWALE SECTION NOTES

STANDARD DETAIL

THE CITY OF BATTLE GROUND

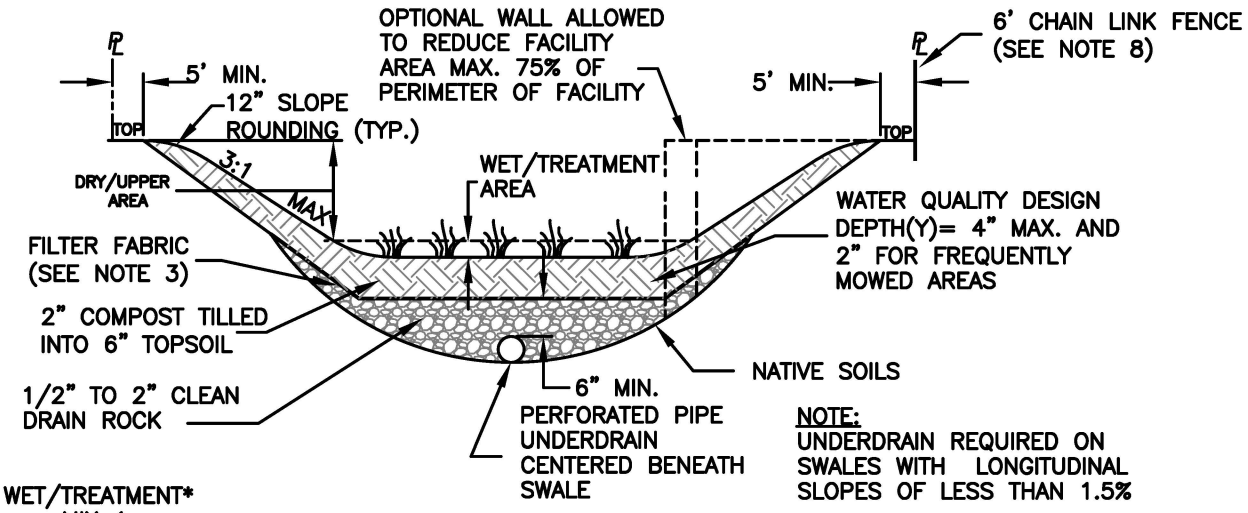
CITY OF BATTLE GROUND
APPROVED

Mark Henery 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	7/22/09	RMJ	RMJ
2	3/30/17	CAS	KDU

ST–6.00B



NOTE:
UNDERDRAIN REQUIRED ON SWALES WITH LONGITUDINAL SLOPES OF LESS THAN 1.5%

WET/TREATMENT*

MIX 1

TALL OR MEADOW FESCUE	75–80 PERCENT
SEASIDE/COLONIAL BENTGRASS	10–15 PERCENT
REDTOP	5–10 PERCENT

MIX 2

TALL FESCUE	60–70 PERCENT
SEASIDE/COLONIAL BENTGRASS	10–15 PERCENT
MEADOW FOXTAIL	10–15 PERCENT
ALSIKE CLOVER	6–10 PERCENT
MARSHFIELD BIG TREFOIL	1–5 PERCENT
REDTOP	1–6 PERCENT

APPLICATION RATE IS APPROX. 80 LBS/ACRE
*SEED MIX PER STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON, VOLUME V.

DRY/UPPER**

GROUNDCOVER

COMMON NAME	BOTANICAL NAME
KINNIKINNIK	ARCTOSTAPHYLOS UVA–URSI
EPIMEDIUM	EPIMEDIUM GRANDIFLORUM
CREEPING FORGET ME NOT	OMPHALODES VERNA
----------	EUONYMUS LANCEOLATA
YELLOW ROOT	XANTHORHIZA SIMPLISSIMA
----------	GENISTA
WHITE LAWN CLOVER	TRIFOLIUM REPENS
WHITE SWEET CLOVER	MELILOTUS ALBA
----------	RUBUS CALYCINOIDES
STRAWBERRY	FRAGARIA CHILOENSIS
BROADLEAF LUPINE	LUPINUS LATIFOLIUS

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BUFFALO GRASS	BUCHLOE DACTYLOIDES
RED FESCUE	FESTUCA RUBRA
TALL FESCUE GRASS	FESTUCA ARUNDINACEA
BLUE OATGRASS	HELICTOTRICHON SEMPERVIRENS

APPLICATION RATE IS APPROX. 80 LBS/ACRE
**GROUNDCOVER & GRASSES PER STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON, VOLUME V.

BIOSWALE SECTION WITH UNDERDRAIN

STANDARD DETAIL

CITY OF BATTLE GROUND
APPROVED

Mark Henry 06/11/2018

CITY ENGINEER DATE

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1	7/22/09	RMJ	RMJ
2	3/30/17	CAS	KDU

ST–6.01A

NOTES:

1. IF BIOSWALE IS INSTALLED DURING A PERIOD OF WET WEATHER (OCT 1–APRIL 30), BIOSWALE SHALL BE ESTABLISHED BY SODDING. SINCE SOD IS NOT AVAILABLE IN RECOMMENDED GRASSES, IT SHOULD BE OVER SOWN WITH A RECOMMENDED MIX AT THE BEGINNING OF THE GROWING SEASON. IT IS RECOMMENDED TO INSTALL A SOD THAT IS A MIX OF CREEPING FESCUE AND HARD & SHEEP FESCUES.
2. FLOW SPREADERS SHALL BE INSTALLED AT SWALE MIDPOINT FOR SHORT SWALE LENGTHS OF +– 100FT, AND AT A MAXIMUM INTERVAL OF 50'. THE SPREADER SHALL BE INSTALLED LEVEL AND ON CONTOUR., SEE STD. DETAIL ST–6.03.
3. THE DESIGN OF WATER QUALITY FACILITIES SHALL MEET THE STANDARD AS SET FORTH IN BGMC 18.250.
4. INSTALL MIRAFI 140N FILTER FABRIC OR EQUIVALENT ABOVE DRAIN ROCK.
5. UNDERDRAIN MUST INFILTRATE OR DRAIN FREELY TO AN ACCEPTABLE DISCHARGE POINT.
6. SOD SHALL BE LAID PERPENDICULAR TO SLOPE FROM BOTTOM TO TOP, WITH JOINTS STAGGERED.
7. SWALE SHALL HAVE 75% COVERAGE OF PROPER VEGETATION AS APPROVED BY THE CITY INSPECTOR PRIOR TO PAVING.
8. INSTALL FENCE AT PROPERTY LINE (℄).

BIOSWALE SECTION WITH UNDERDRAIN NOTES

STANDARD DETAIL

THE CITY OF BATTLE GROUND

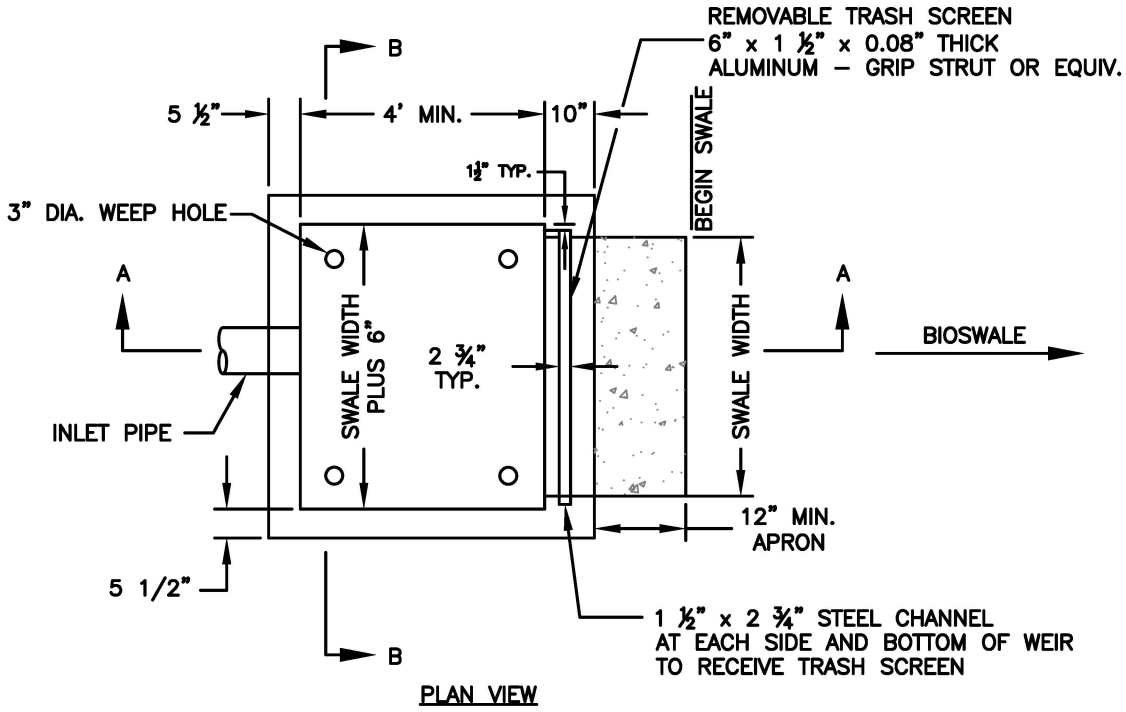
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APPROVED

Mark Henery 06/11/2018

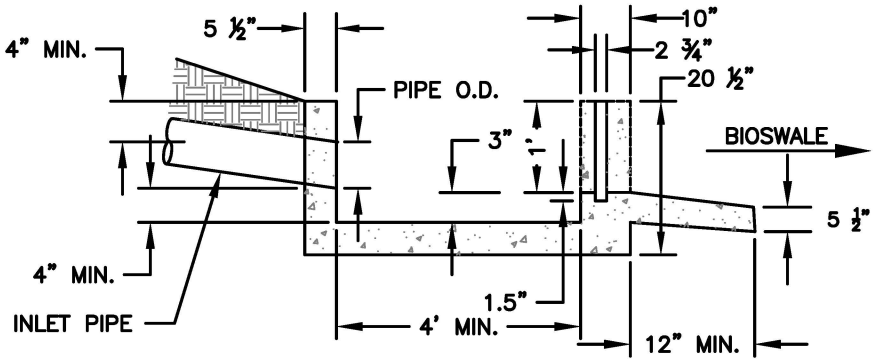
CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	7/22/09	RMJ	RMJ
2	3/30/17	CAS	RMJ

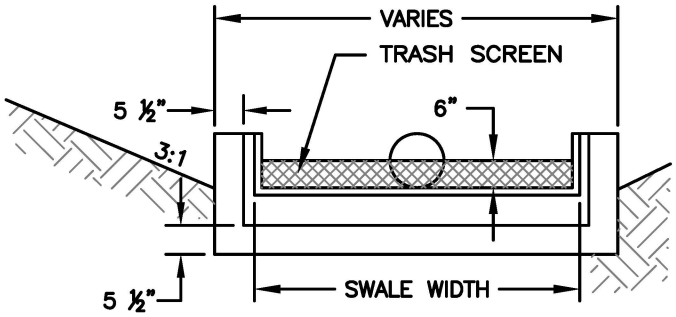
ST–6.01B



PLAN VIEW



SECTION A–A



SECTION B–B

NOTE:

1. CONCRETE SHALL BE 3000 PSI MIN. MEETING WSDOT STANDARD SPECIFICATIONS 6–02.3(2)B.
2. BIOSWALE SEDIMENTATION TRAP IS REQUIRED WITH ALL BIOSWALES, UNLESS OMISSION IS APPROVED BY CITY ENGINEER.

N.T.S.

BIOSWALE SEDIMENTATION TRAP

STANDARD DETAIL

THE CITY OF BATTLE GROUND

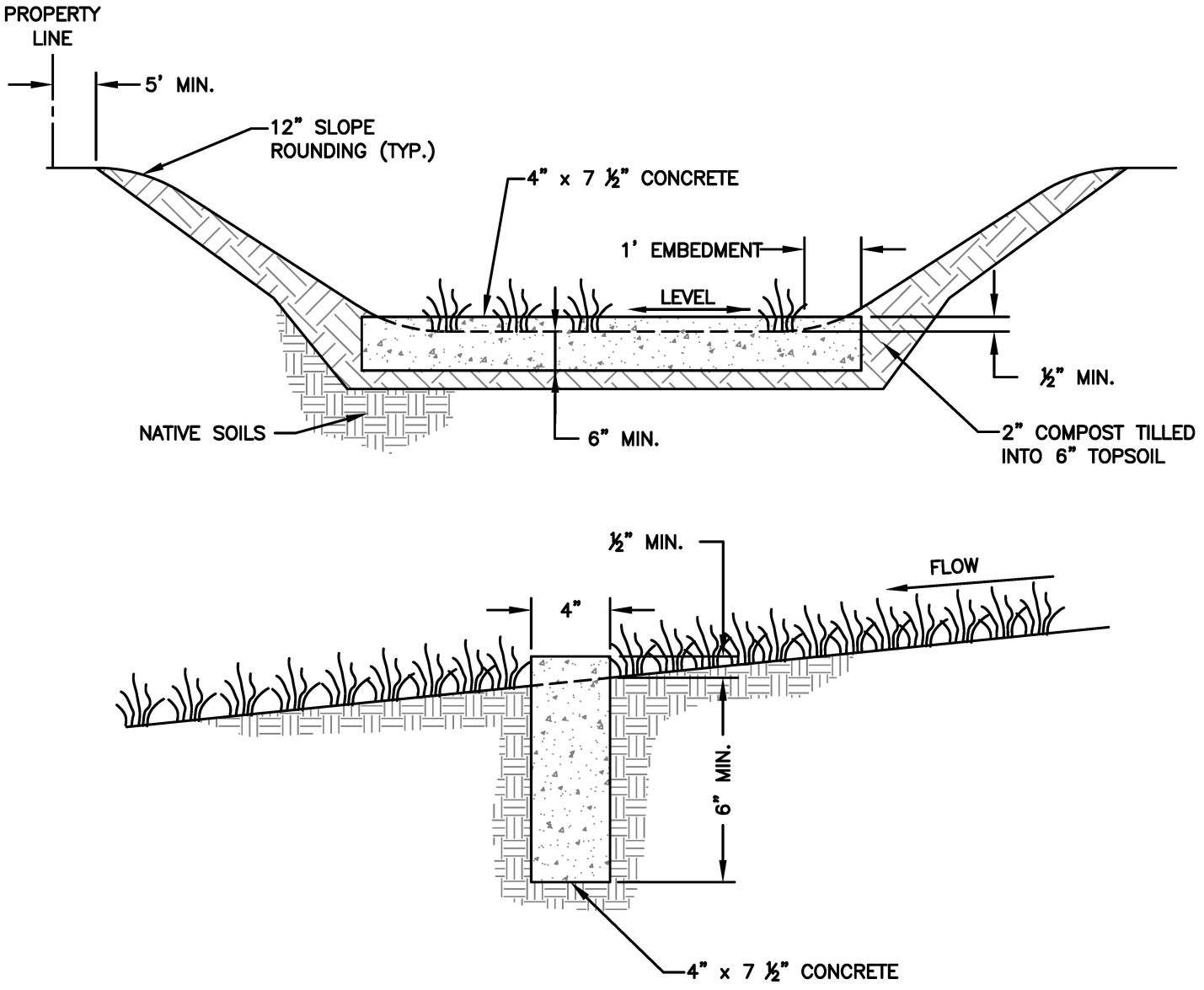
CITY OF BATTLE GROUND
APPROVED

Mark Henry 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	7/22/09	RMJ	RMJ
2	3/22/18	CAS	KDU

ST–6.02



NOTES:

1. FLOW SPREADERS REQUIRED FOR SLOPES GREATER THAN 2.5% OR FOR SWALES WHICH EXCEED 100' IN LENGTH. FLOW SPREADERS TO BE INSTALLED IN A MAXIMUM OF 50' INTERVALS. THE SPREADER SHALL BE INSTALLED LEVEL AND ON CONTOUR.
2. CONCRETE SHALL BE 3000 PSI MIN. MEETING WSDOT STANDARD SPECIFICATIONS 6-02.3(2)B.

N.T.S.

FLOW SPREADER

STANDARD DETAIL

THE CITY OF BATTLE GROUND

CITY OF BATTLE GROUND
APPROVED

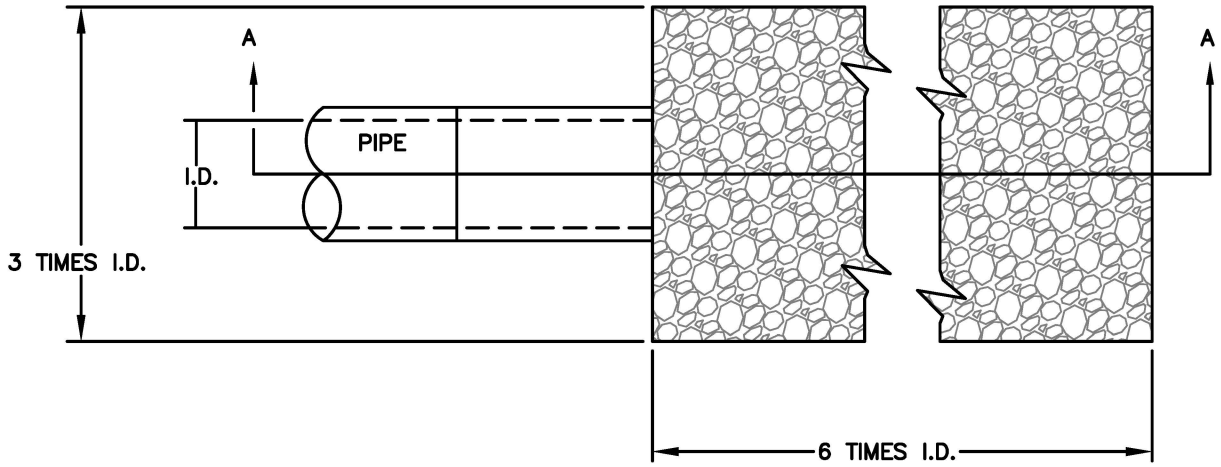
Mark Henrey

06/11/2018

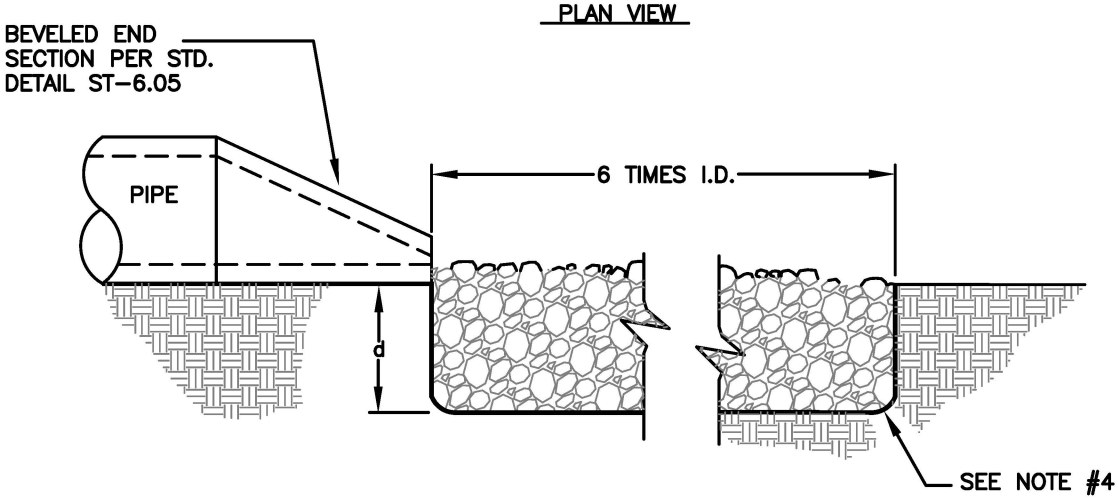
CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	7/22/09	RMJ	RMJ
2	3/31/17	CAS	KDU

ST-6.03



PLAN VIEW



SECTION 'A-A'

NOTES:

1. ROCK MATERIAL SHALL BE BETWEEN 3" AND 8" AND INSTALLED PER WSDOT 9-13.1.
2. d = 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 4.5".
3. IN A WELL-DEFINED CHANNEL EXTEND RIP-RAP UP THE CHANNEL BANKS TO AN ELEVATION OF 6" ABOVE THE MAXIMUM TAILWATER DEPTH OR TO THE TOP OF THE BANK, WHICHEVER IS LESS.
4. A FILTER BLANKET OR FILTER FABRIC SHALL BE INSTALLED BETWEEN THE RIP-RAP AND SOIL FOUNDATION.

N.T.S.

RIP-RAP

STANDARD DETAIL

THE CITY OF BATTLE GROUND

CITY OF BATTLE GROUND
APPROVED

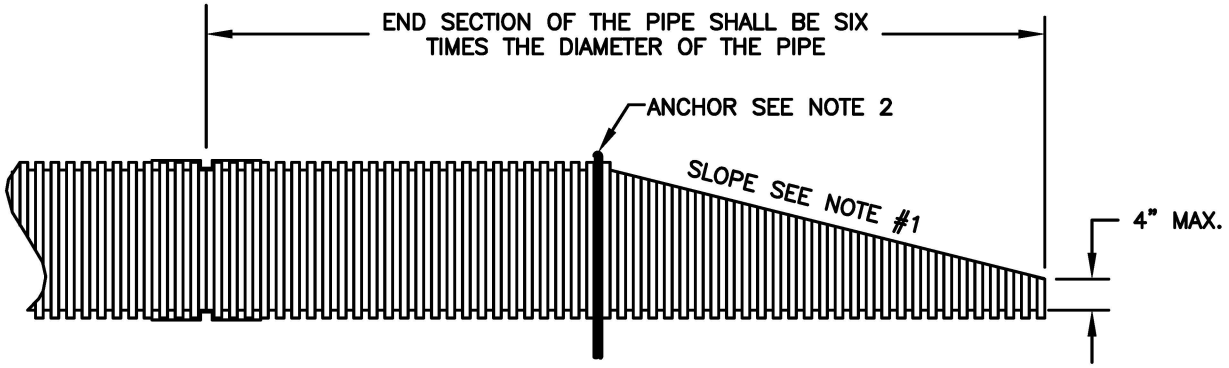
Mark Henrey

06/11/2018

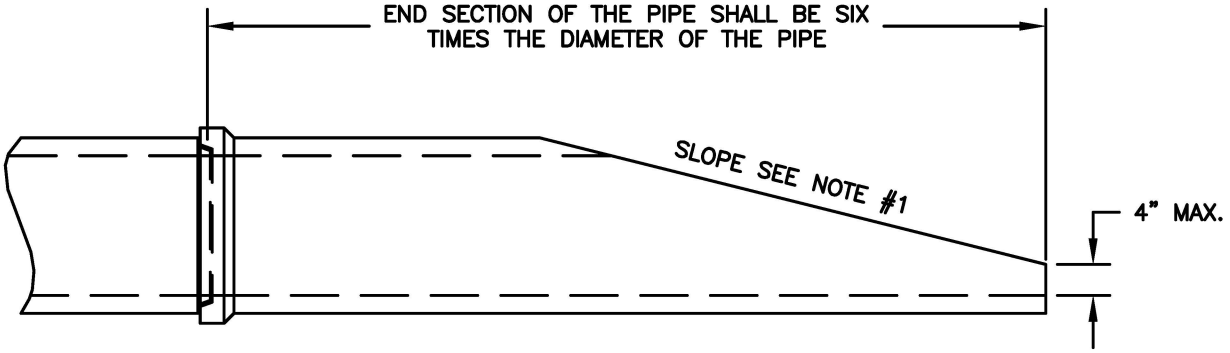
CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	7/22/09	RMJ	RMJ
2	3/31/17	CAS	KDU

ST-6.04



CORRUGATED POLYETHYLENE



DUCTILE IRON OR CONCRETE PIPE

NOTES:

1. THE CULVERT ENDS SHALL BE BEVELED TO MATCH THE EMBANKMENT OR DITCH SLOPE, WITHOUT EXCEEDING THE LIMITS SHOWN ON THE PLAN. SLOPE FOR BEVELED END SECTION SHALL MATCH BANK SIDE SLOPE UP TO A MAX. OF 3:1.
2. THE END OF CORRUGATED POLYETHYLENE SHALL BE ANCHORED. SEE STD. DETAIL ST–7.03.
3. FOR PIPES 15" OR LARGER, TRASH SCREEN REQUIRED. SEE STD. DETAIL ST–6.06.

N.T.S.

BEVELED END SECTION

STANDARD DETAIL

THE CITY OF BATTLE GROUND

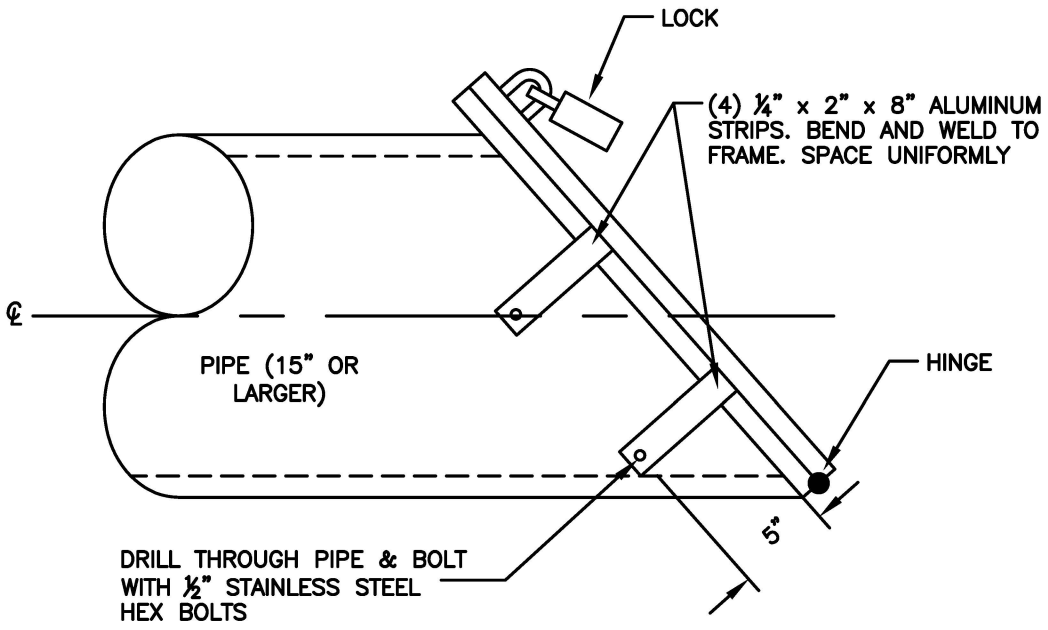
CITY OF BATTLE GROUND
APPROVED

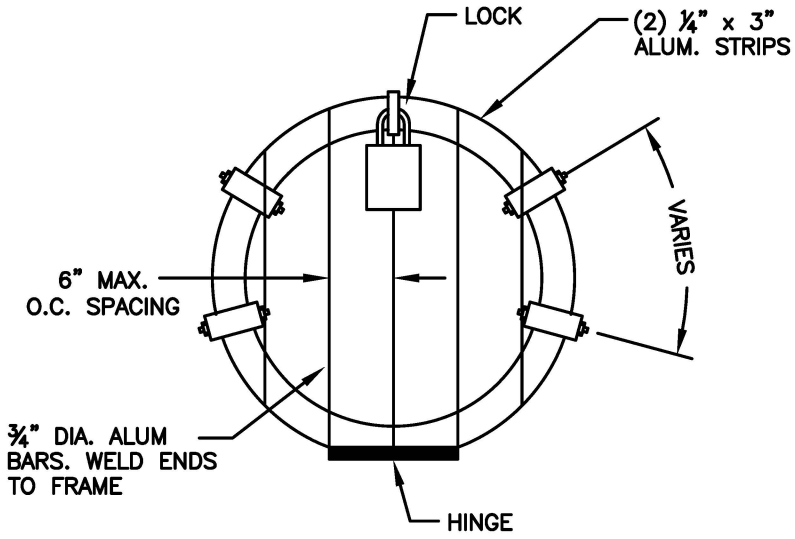
Mark Henrey 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	7/22/09	RMJ	RMJ
2	3/31/17	CAS	KDU

ST–6.05





NOTES:

1. WELD ALL JOINTS.
2. SUBMITTAL SHOP DRAWING REQUIRED TO CITY INSPECTOR FOR REVIEW AND APPROVAL.
3. CONTRACTOR TO BE RESPONSIBLE FOR SUPPLYING LOCK. SPECIFICATIONS ON LOCK TO BE PROVIDED BY CITY INSPECTOR.

N.T.S.

TRASH SCREEN

STANDARD DETAIL

THE CITY OF BATTLE GROUND

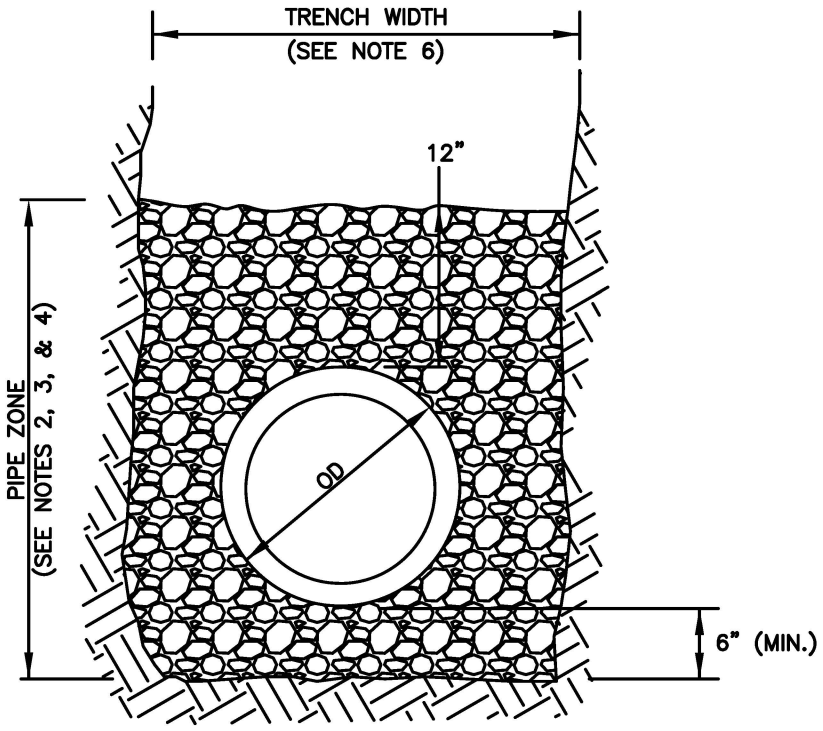
CITY OF BATTLE GROUND
APPROVED

Mark Hency 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	8/12/98	BSG	GGH
2	7/22/09	RMJ	RMJ
3	4/13/17	CAS	KDU

ST-6.06



NOTES:

1. WHERE DIRECTED BY THE ENGINEER, GRANULAR TRENCH FOUNDATION STABILIZATION SHALL BE PLACED PRIOR TO PLACEMENT OF THE BEDDING. SIZE AND DEPTH ARE DEPENDENT ON SOIL CONDITIONS.
2. PIPE ZONE CONSTRUCTION SHALL BE PER WSDOT 7-08.3(1)C.
3. PIPE ZONE MATERIAL SHALL BE PER WSDOT 9-03.12(3).
4. BEDDING AND BACKFILL MATERIALS IN THE PIPE ZONE SHALL BE COMPACTED TO 95% OF THE STANDARD PROCTOR (AASHTO T99) PRIOR TO BACKFILLING THE REMAINDER OF THE TRENCH.
5. FOR ROCK AND OTHER INCOMPRESSIBLE MATERIALS, THE TRENCH SHALL BE OVER-EXCAVATED A MINIMUM OF 6" AND REFILLED WITH GRANULAR MATERIAL AS DIRECTED BY THE ENGINEER.
6. TRENCH WIDTH SHALL NOT EXCEED ONE AND ONE-HALF THE INSIDE DIAMETER OF THE PIPE PLUS 18" CENTERED IN TRENCH.

N.T.S.

PIPE BEDDING (FLEXIBLE PIPE)

STANDARD DETAIL

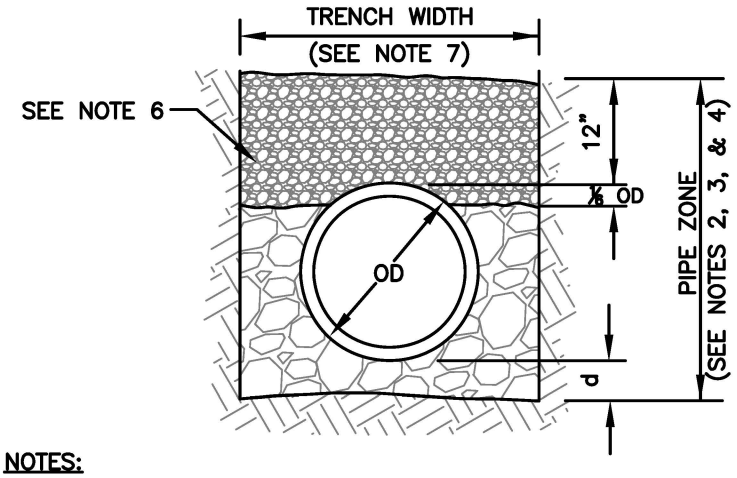
CITY OF BATTLE GROUND
APPROVED

Mark Hennes 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	8/12/98	BSG	GGH
2	8/30/05	ALL	MCH
3	3/28/07	JMH	MCH
4	7/22/09	RMJ	RMJ
5	3/31/17	CAS	KDU

ST-7.00



NOTES:

1. WHERE DIRECTED BY THE ENGINEER, GRANULAR TRENCH FOUNDATION STABILIZATION SHALL BE PLACED PRIOR TO PLACEMENT OF THE BEDDING. SIZE AND DEPTH ARE DEPENDENT ON SOIL CONDITIONS.

2. PIPE ZONE CONSTRUCTION SHALL BE PER WSDOT 7-08.3(1)C.

3. PIPE ZONE MATERIAL SHALL BE PER WSDOT 9-03.12(3).

4. BEDDING AND BACKFILL MATERIALS IN THE PIPE ZONE SHALL BE COMPACTED TO 95% OF THE STANDARD PROCTOR (AASHTO T99) PRIOR TO BACKFILLING THE REMAINDER OF THE TRENCH.

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

6. ALTERNATIVE PRECOVER MATERIALS ARE ALLOWABLE FROM PIPE CENTERLINE TO ONE FOOT ABOVE THE TOP OF PIPE. ALTERNATE PRECOVER MATERIALS MUST BE PREAPPROVED BY THE INSPECTOR AND MAY BE SAND, SCREENINGS, GRAVEL, OR OTHER CLEAN GRANULAR MATERIAL CONTAINING NO ROCK LARGER THAN 1-1/4" IN DIAMETER.

7. TRENCH WIDTH SHALL NOT EXCEED ONE AND ONE-HALF THE INSIDE DIAMETER OF THE PIPE PLUS 18". CENTERED IN THE TRENCH.

LEGEND:
OD = OUTSIDE DIAMETER
d = DEPTH OF BEDDING MATERIAL BELOW PIPE

DEPTH OF BEDDING MATERIAL BELOW PIPE	
OD	d (min) (SEE NOTE 3)
27" & SMALLER	4"
LARGER THAN 27"	6"

N.T.S.

PIPE BEDDING (RIGID PIPE)

STANDARD DETAIL

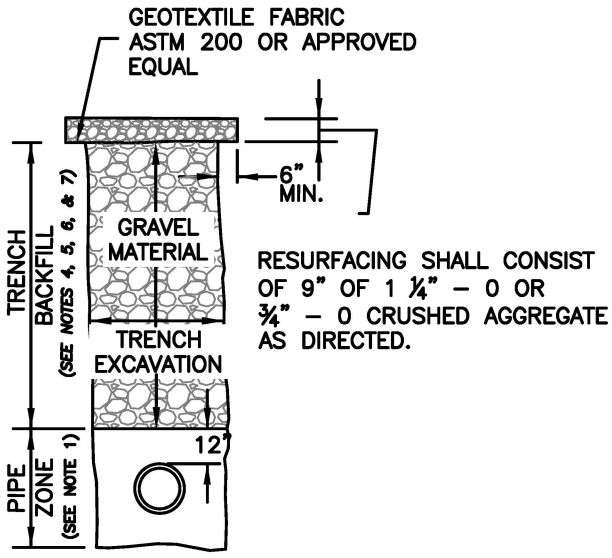
CITY OF BATTLE GROUND
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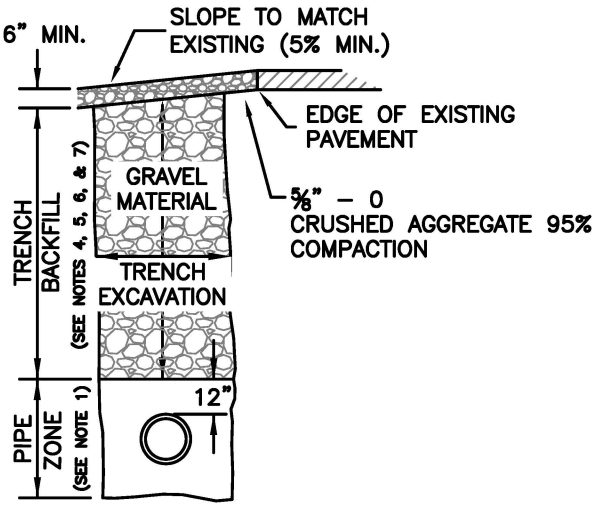
CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	8/12/98	BSG	GGH
2	8/30/05	ALL	MCH
3	3/28/07	JMH	MCH
4	7/22/09	RMJ	RMJ
5	7/22/09	CAS	KDU

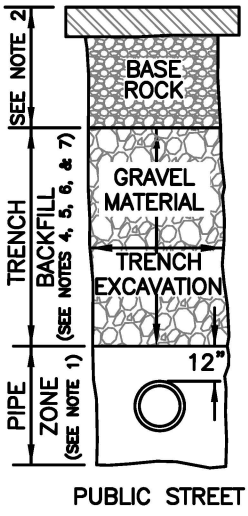
ST-7.01



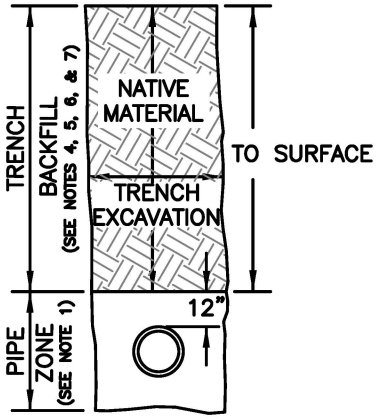
TRAVELED UNIMPROVED STREET



ROADWAY SHOULDER



PUBLIC STREET



UNTRAVELED EASEMENT

NOTES:

1. FOR PIPE ZONE REQUIREMENTS, SEE STD. PLANS ST–7.00 (FLEXIBLE PIPE) AND/OR ST–7.01 (RIGID PIPE).
2. ALL EXISTING PAVED SURFACES SHALL BE RESTORED PER STD. DETAIL TR–5.07A & TR–5.07B.
3. TRENCH BACKFILL CONSTRUCTION SHALL BE PER WSDOT 7–08.3(3).
4. TRENCH BACKFILL MATERIAL SHALL BE PER WSDOT 9–03.15 (NATIVE) OR 9–03.19 (GRAVEL).
5. TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO 95% OF THE STANDARD PROCTOR (AASHTO T99).
6. ALL BACKFILL SHALL BE MECHANICALLY COMPACTED IN LIFTS WHICH IN NO CASE EXCEED 12" LOOSE.

N.T.S.

TRENCH BACKFILL

STANDARD DETAIL

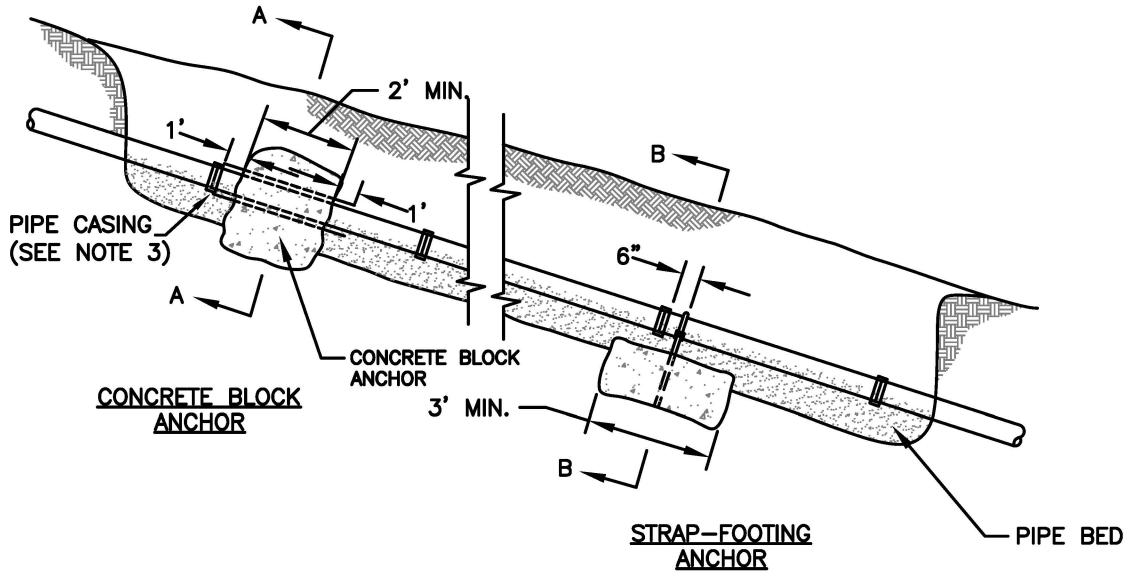
CITY OF BATTLE GROUND
APPROVED

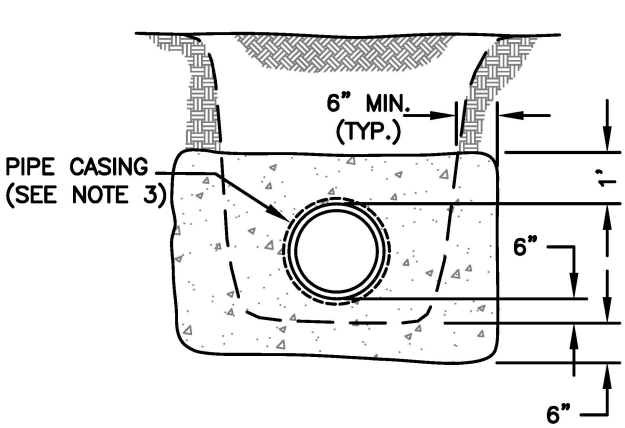
Mark Henry 06/11/2018

CITY ENGINEER DATE

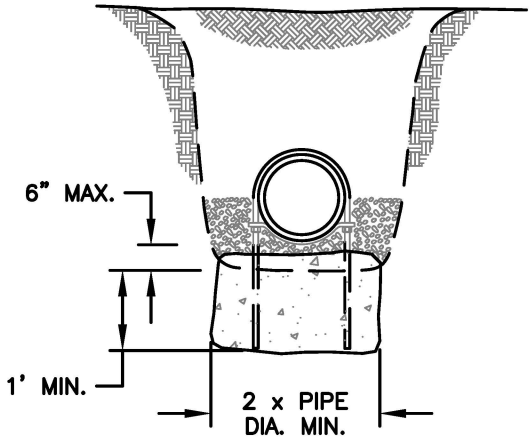
REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	8/12/98	BSG	GGH
2	8/30/05	ALL	MCH
3	3/28/07	JMH	MCH
4	7/22/09	RMJ	RMJ
5	4/6/17	CAS	KDU

ST–7.02





SECTION A–A



SECTION B–B

NOTES:

1. CONCRETE SHALL BE 3000 PSI MIN. MEETING WSDOT STANDARD SPECIFICATIONS 6–02.3(2)B.
2. CONCRETE SHALL BE POURED AGAINST FORMS OR STABLE UNDISTURBED SOIL.
3. FOR HDPE, PIPE MUST BE FREE TO SLIDE INSIDE A 4' (MIN.) LONG SECTION OF PIPE ONE SIZE DIAMETER LARGER.
4. ANCHORS TO BE USED WHERE GRADE IS 20% OR GREATER. MINIMUM SPACING AS FOLLOWS:
   NOT OVER 36' CENTER TO CENTER ON GRADES OF 20% AND UP TO 35%
   NOT OVER 24' CENTER TO CENTER ON GRADES OF 35% AND UP TO 50%
   NOT OVER 16' CENTER TO CENTER ON GRADES OF 50% AND MORE

N.T.S.

PIPE ANCHOR

STANDARD DETAIL

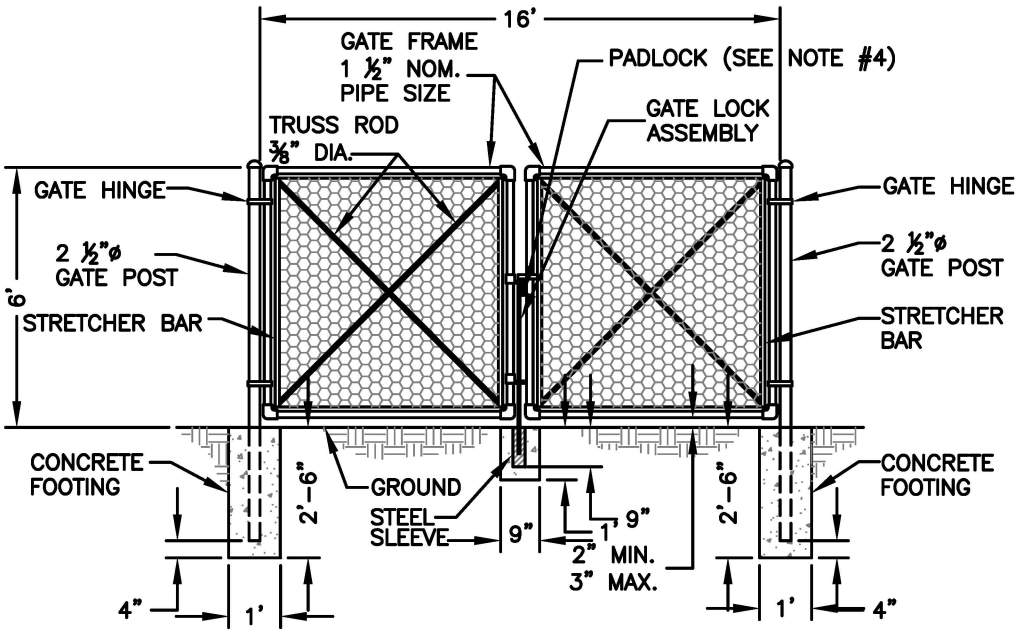
CITY OF BATTLE GROUND
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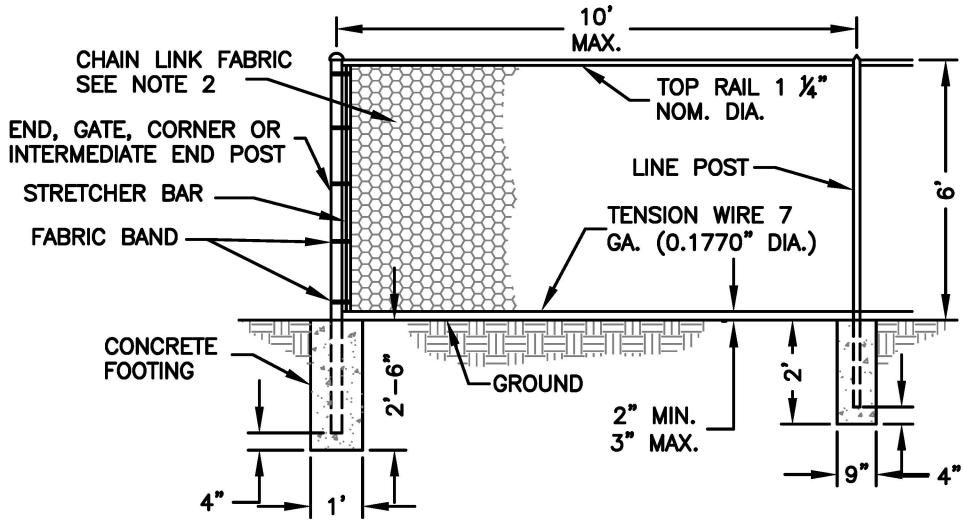
Mark Hennes 06/11/2018

CITY ENGINEER DATE

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1	7/22/09	RMJ	RMJ
2	4/6/17	CAS	KDU

ST–7.03





NOTES:

1. ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRENT STATE OF WASHINGTON STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION.

2. CHAIN LINK FENCE FABRIC TO MEET OR EXCEED REQUIREMENTS OF WSDOT STANDARD SPECIFICATIONS 9-16.1(1)A. CHAIN LINK FENCE FABRIC SHALL BE HOT DIP GALVANIZED WITH A MINIMUM OF 0.8 OUNCE PER SQUARE FOOT OF SURFACE AREA. FENCING MATERIALS SHALL BE COATED WITH AN ULTRAVIOLET INSENSITIVE PLASTIC OR OTHER INERT MATERIAL AT LEAST 2 MILS IN THICKNESS. ANY PRETREATED OR COATING SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. THE MANUFACTURER'S WRITTEN SPECIFICATIONS DETAILING THE PRODUCT AND METHOD OF FABRICATION SHALL BE PROVIDED TO CITY OF BATTLE GROUND PRIOR TO CONSTRUCTION.

3. FENCE SHALL BE BLACK VINYL COATED.

4. FENCE SHALL BE STRETCHED FROM CORNER POST TO CORNER POST. WRAPPING OF FENCE AROUND CORNER POST IS NOT PERMITTED.

5. CONTRACTOR TO BE RESPONSIBLE FOR SUPPLYING LOCK. SPECIFICATIONS ON LOCK TO BE PROVIDED BY CITY INSPECTOR.

N.T.S.

CHAIN LINK FENCE & GATE

STANDARD DETAIL

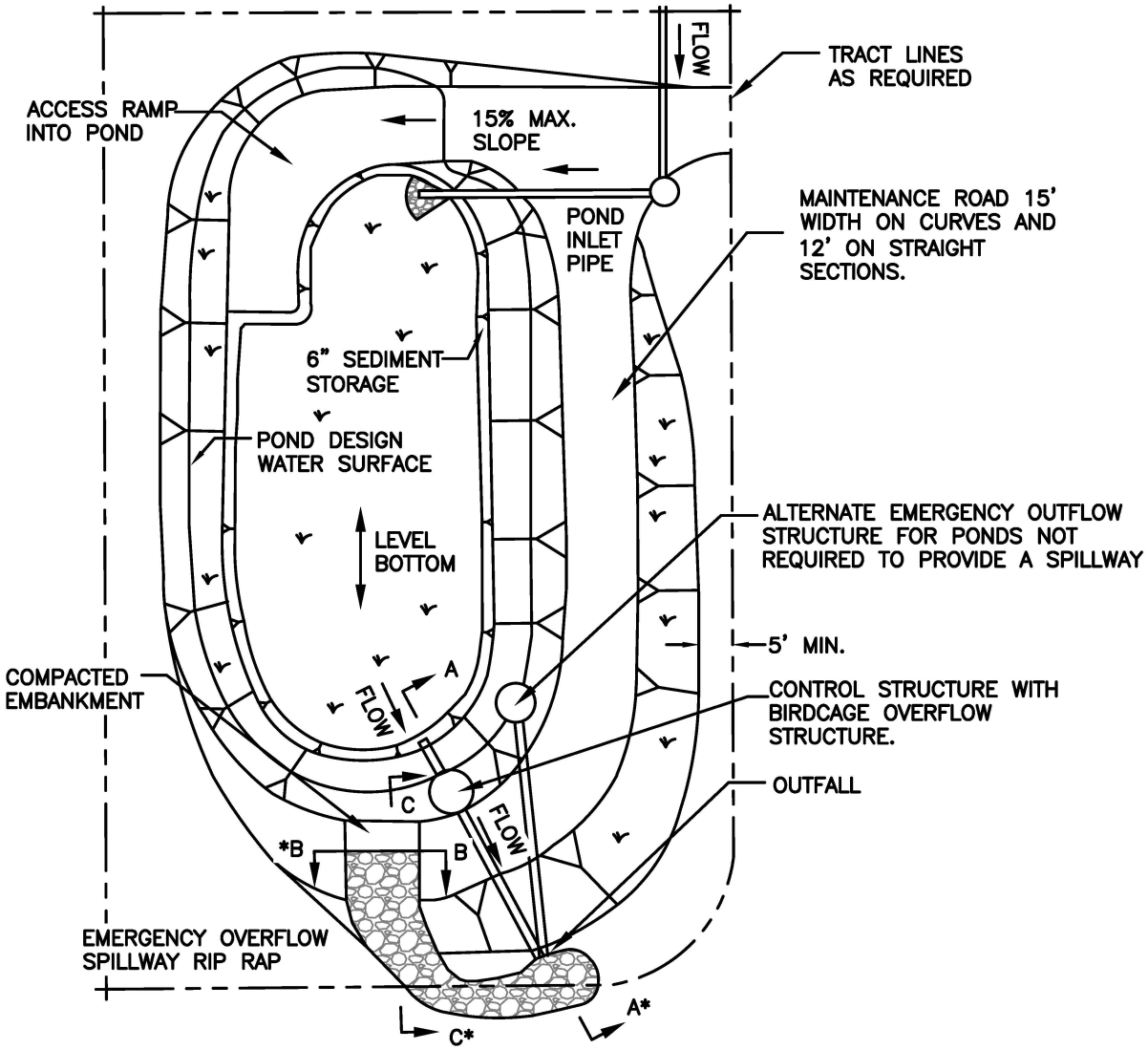
CITY OF BATTLE GROUND
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Mark Henry 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	8/12/98	BSG	GGH
2	7/22/09	RMJ	RMJ
3	4/17/17	CAS	KDU

ST-8.00



NOTES:

1. PONDS SHALL HAVE AT LEAST 75% OF VEGETATION COVERAGE ESTABLISHED TO A HEIGHT OF AT LEAST 3" PRIOR TO RECEIVING STORMWATER RUNOFF.
2. THIS DETAIL IS A SCHEMATIC REPRESENTATION ONLY. ACTUAL CONFIGURATION WILL VARY DEPENDING ON SPECIFIC SITE CONSTRAINTS AND APPLICABLE DESIGN CRITERIA.
3. APPLY GRASS SEED AT 2.5 TO 3.0 POUNDS PER 1,000 SQUARE FEET.
4. REFER TO VOLUME III OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

STORMWATER TRACT "LOW GROW" SEED MIX	
SEED NAME	PERCENTAGE OF MIX
DWARF TALL FESCUE	40%
DWARF PERENNIAL RYE "BARCLAY"	30%
RED FESCUE	25%
COLONIAL BENTGRASS	5%

* REFER TO ST-9.01 and ST-9.02

N.T.S.

TYPICAL DETENTION POND PLAN

STANDARD DETAIL

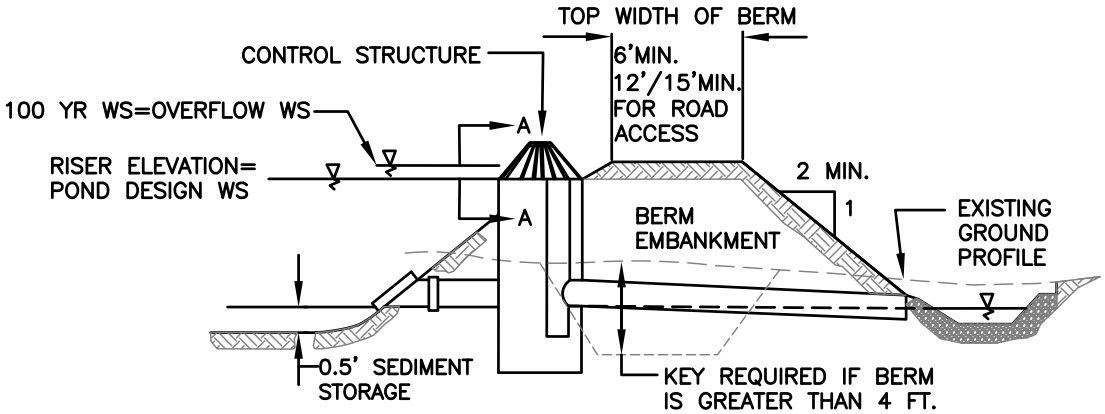
CITY OF BATTLE GROUND
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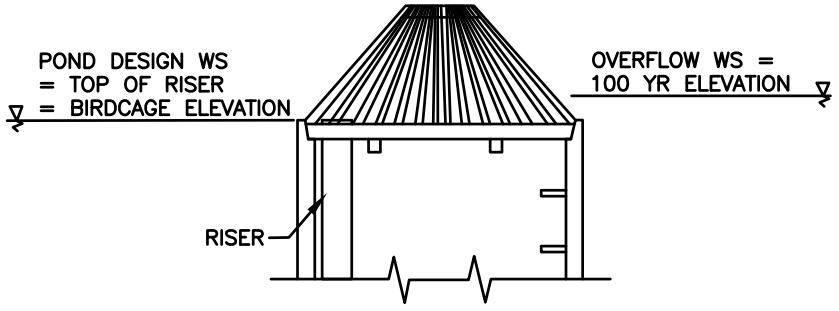
Mark Hennes 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	12/29/16	KDU	KDU
2	03/19/18	CAS	KDU

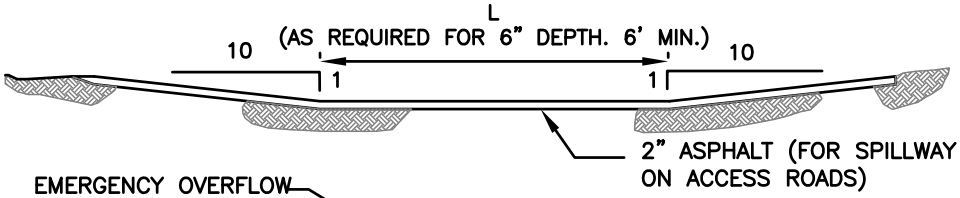
ST-9.00

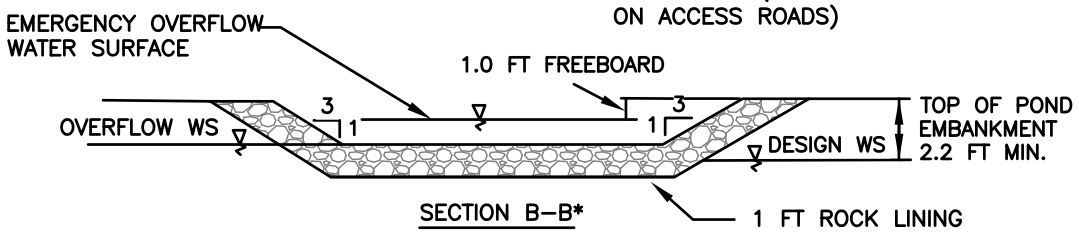




SECTION A–A
NTS

SECTION B–B HAS 2 OPTIONS

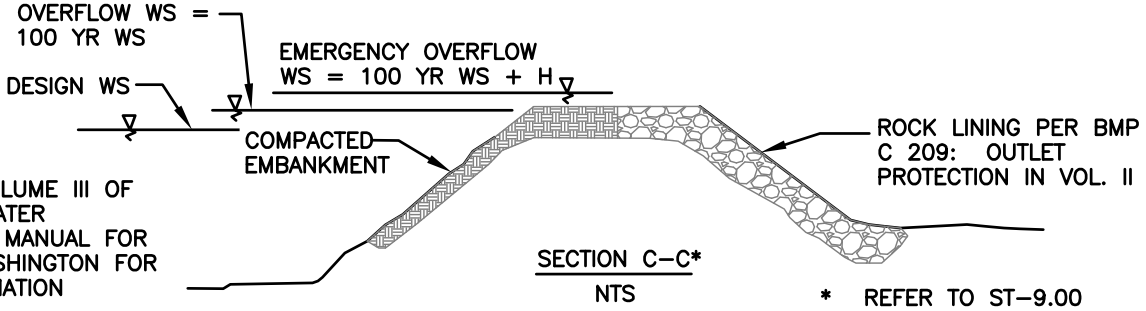




SECTION B–B*

EMERGENCY OVERFLOW SPILLWAY

NTS



SECTION C–C*

NTS

NOTES:

REFER TO VOLUME III OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION

* REFER TO ST–9.00

N.T.S.

TYPICAL DETENTION POND PROFILE

STANDARD DETAIL

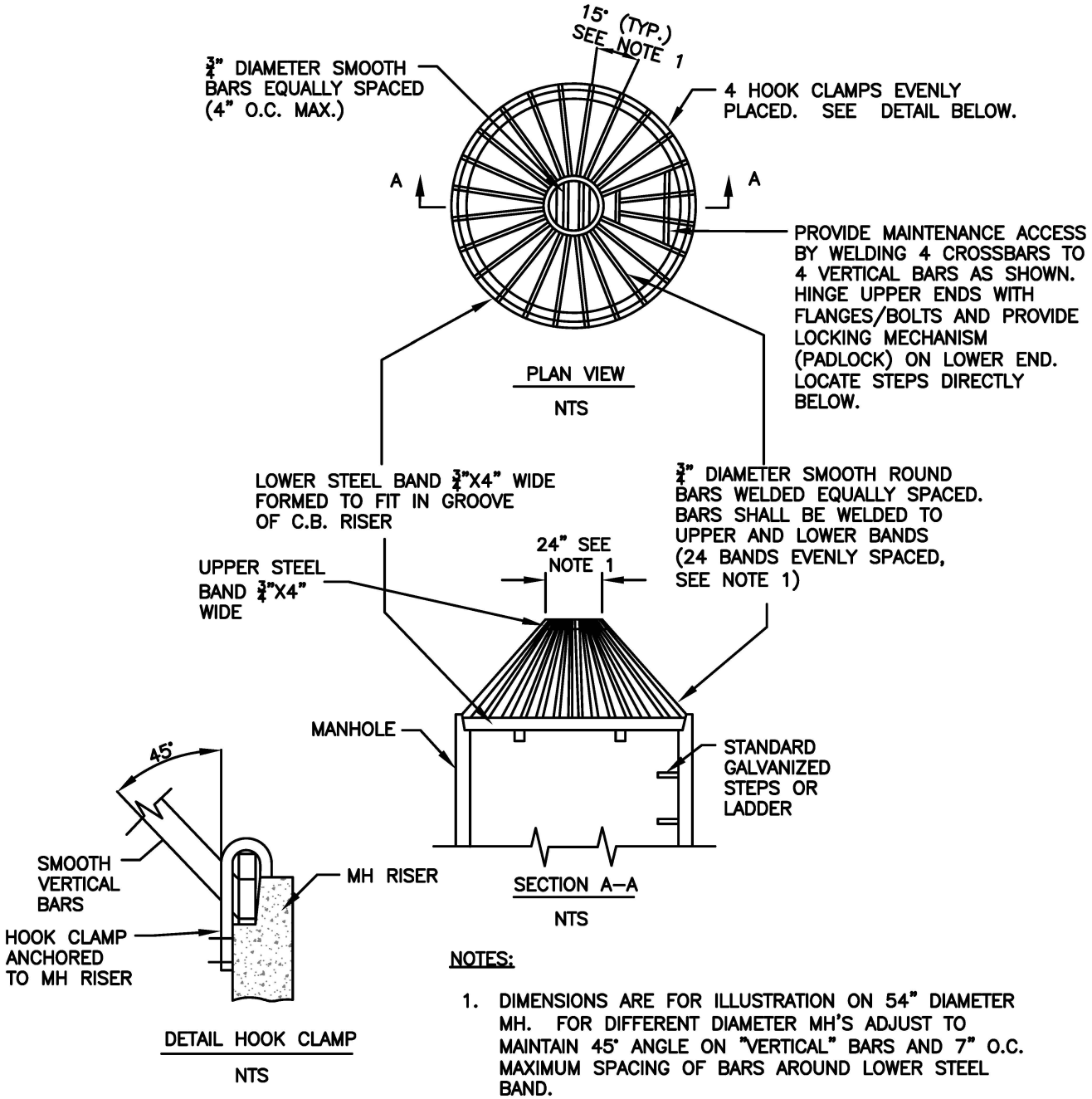
CITY OF BATTLE GROUND
APPROVED

Mark Hennes 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	12/29/16	KDU	KDU
2	03/19/18	CAS	KDU

ST–9.01



NOTES:

1. DIMENSIONS ARE FOR ILLUSTRATION ON 54" DIAMETER MH. FOR DIFFERENT DIAMETER MH'S ADJUST TO MAINTAIN 45° ANGLE ON "VERTICAL" BARS AND 7" O.C. MAXIMUM SPACING OF BARS AROUND LOWER STEEL BAND.
2. METAL PARTS MUST BE CORROSION RESISTANT; STEEL BARS MUST BE GALVANIZED.
3. REFER TO VOLUME III OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

BIRDCAGE OVERFLOW STRUCTURE

STANDARD DETAIL

THE CITY OF BATTLE GROUND

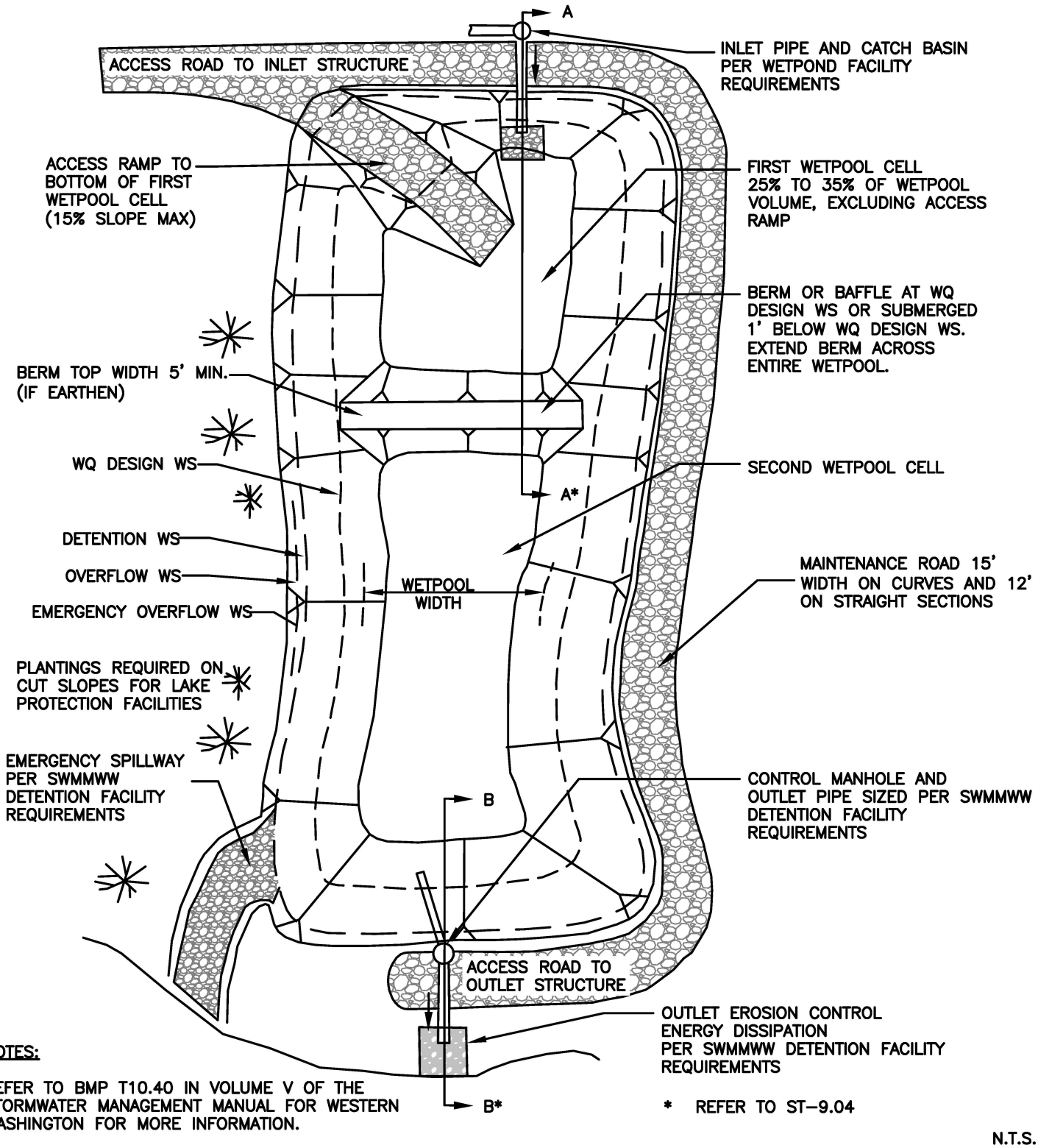
CITY OF BATTLE GROUND
APPROVED

Mark Henrey 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	12/29/16	KDU	KDU
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ST–9.02



NOTES:

REFER TO BMP T10.40 IN VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

* REFER TO ST-9.04

N.T.S.

TYPICAL COMBINED WETPOND-DETENTION POND PLAN

STANDARD DETAIL

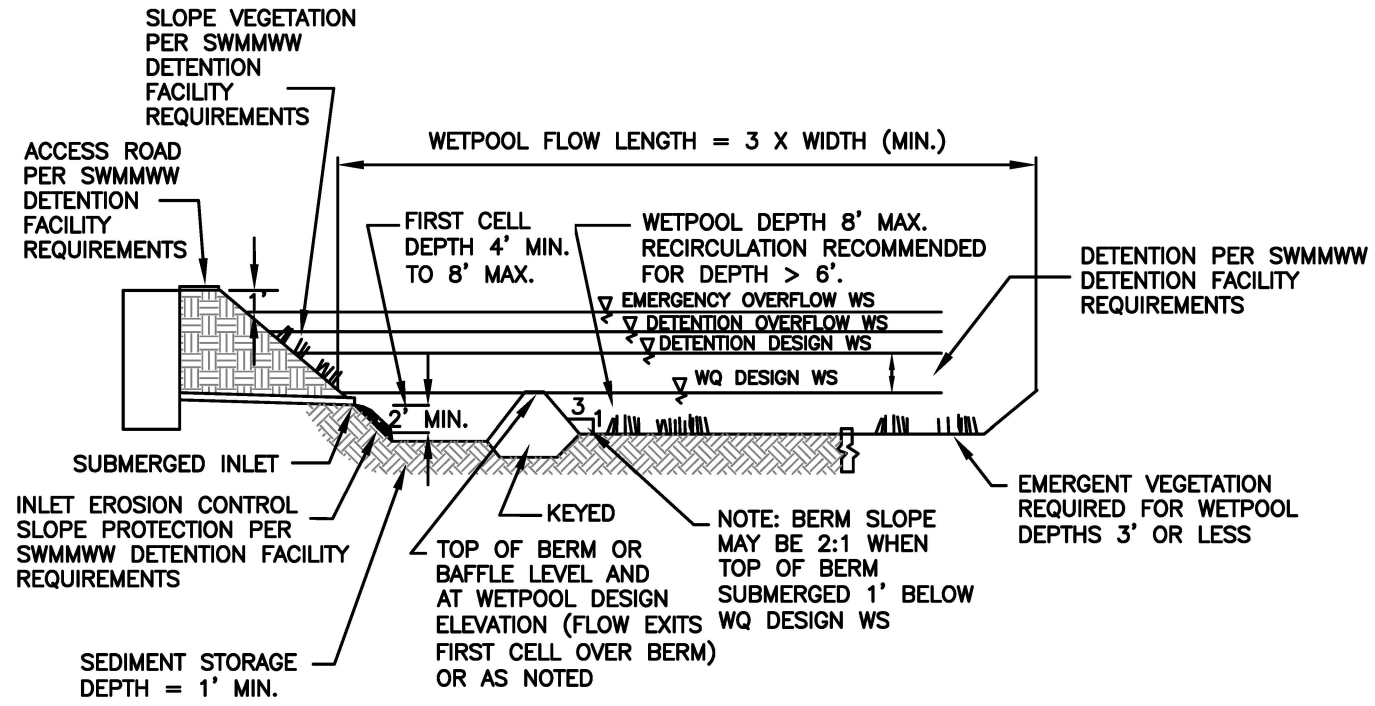
CITY OF BATTLE GROUND
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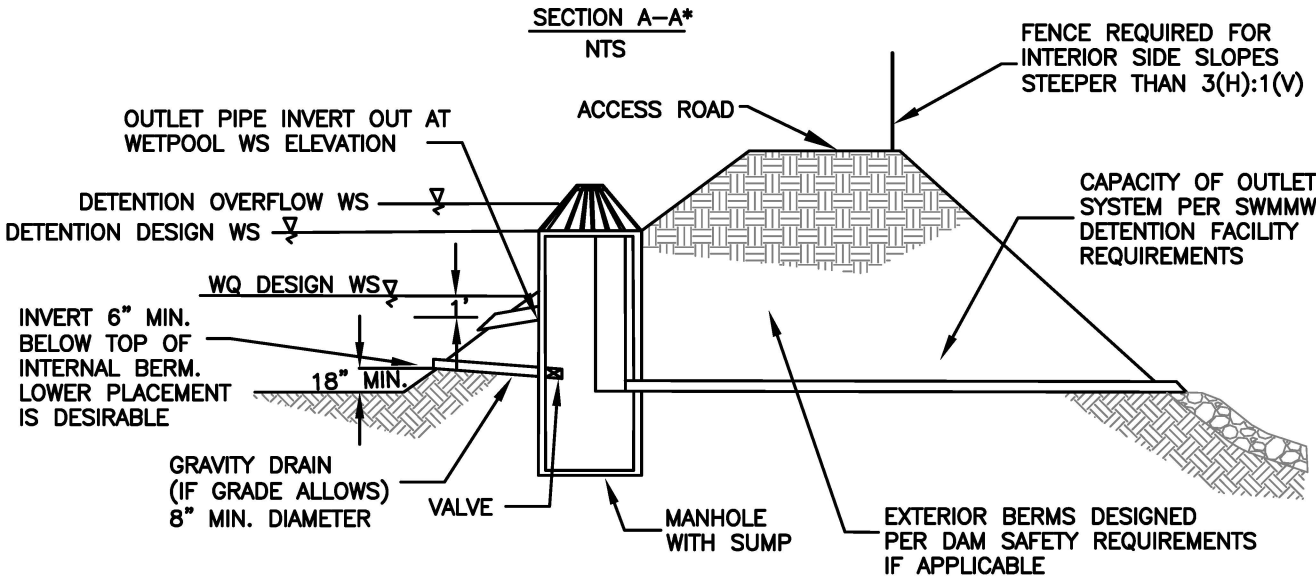
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ST-9.03



SECTION A–A*
NTS



SECTION B–B*
NTS

* REFER TO ST–9.03

NOTES:

1. SEE DETENTION FACILITY REQUIREMENTS FOR LOCATION, INTERIOR AND EXTERIOR SIDESLOPES, EMERGENCY SPILLWAY OVERFLOW, AND SETBACK REQUIREMENTS.
2. REFER TO VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

COMBINED DETENTION–WETPOND PROFILE

STANDARD DETAIL

THE CITY OF BATTLE GROUND

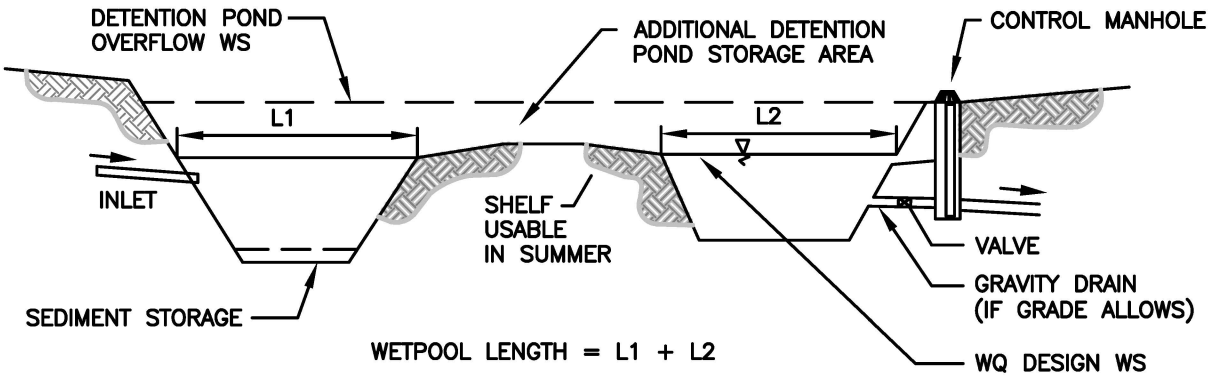
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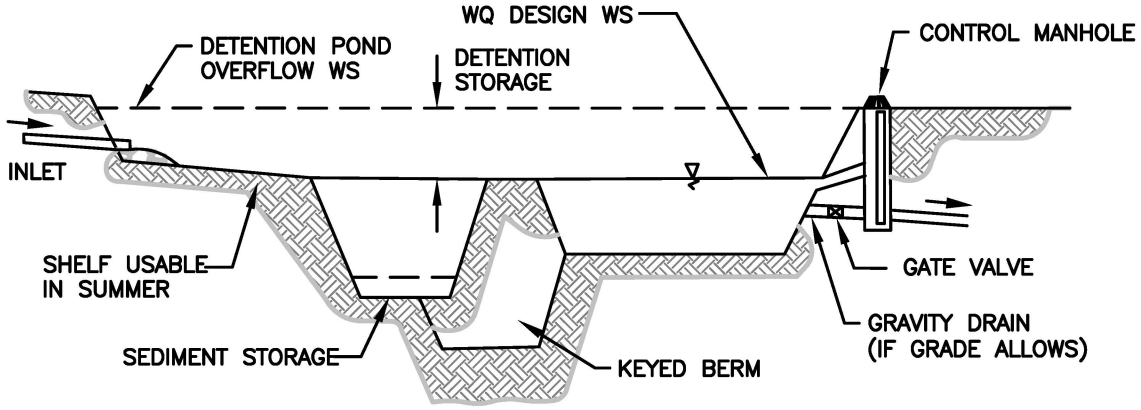
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ST–9.04



SECTION VIEW

NTS



SECTION VIEW

NTS

NOTES:

1. THESE EXAMPLES SHOW HOW THE COMBINED DETENTION/WETPOOL CAN BE CONFIGURED TO ALLOW FOR "SHELVES" FOR JOINT USE OPPORTUNITIES IN DRY WEATHER. OTHER OPTIONS MAY ALSO BE ACCEPTABLE.
2. REFER TO VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

DETENTION AND WETPOOL ALTERNATE CONFIGURATIONS

STANDARD DETAIL

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ST-9.05

EMERGENT WETLAND PLANT SPECIES RECOMMENDED FOR WETPONDS			
SPECIES	COMMON NAME	NOTES	MAXIMUM DEPTH
INUNDATION TO 1–FOOT			
AGROSTIS EXARATA (1)	SPIKE BENT GRASS	PRAIRIE TO COAST	TO 2 FEET
CAREX STIPATA	SAWBREAK SEDGE	WET GROUND	
ELEOCHARIS PALUSTRIS	SPIKE RUSH	MARGINS OF PONDS, WET MEADOWS	TO 2 FEET
GLYCERIA OCCIDENTALIS	WESTERN MANNAGRASS	MARSHES, POND MARGINS	TO 2 FEET
JUNCUS TENUIS	SLENDER RUSH	WET SOILS, WETLAND MARGINS	
OENANTHE SARMENTOSA	WATER PARSLEY	SHALLOW WATER ALONG STREAM AND POND MARGINS; NEEDS SATURATED SOILS ALL SUMMER	
SCIRPUS ATROCINCTUS (FORMERLY S. CYPERINUS)	WOOLGRASS	TOLERATES SHALLOW WATER; TALL CLUMPS	
SCIRPUS MICROCARPUS	SMALL–FRUITED BULRUSH	WET GROUND TO 18 INCHES DEPTH	18 INCHES
SAGITTARIA LATIFOLIA	ARROWHEAD		
INUNDATION TO 1 TO 2 FEET			
AGROSTIS EXARATA (1)	SPIKE BENT GRASS	PRAIRIE TO COAST	
ALISMA PLANTAGO–AQUATICA	WATER PLANTAIN		
ELEOCHARIS PALUSTRIS	SPIKE RUSH	MARGINS OF PONDS, WET MEADOWS	
GLYCERIA OCCIDENTALIS	WESTERN MANNAGRASS	MARSHES, POND MARGINS	
JUNCUS EFFUSUS	SOFT RUSH	WET MEADOWS, PASTURES, WETLAND MARGINS	
SCIRPUS MICROCARPUS	SMALL–FRUITED BULRUSH	WET GROUND TO 18 INCHES DEPTH	18 INCHES
SPARGANIUM EMMERSUM	BUR REED	SHALLOW STANDING WATER, SATURATED SOILS	
INUNDATION TO 1 TO 3 FEET			
CAREX OBNUPTA	SLOUGH SEDGE	WET GROUND OR STANDING WATER	1.5 TO 3 FEET
BECKMANIA SYZIGACHNE (1)	WESTERN SLOUGHGRASS	WET PRAIRIE TO POND MARGINS	
SCIRPUS ACUTUS (2)	HARDSTEM BULRUSH	SINGLE TALL STEMS, NOT CLUMPING	TO 3 FEET
SCIRPUS VALIDUS (2)	SOFTSTEM BULRUSH		
INUNDATION GREATER THAN 3 FEET			
NUPHAR POLYSEPALUM	SPATTERDOCK	DEEP WATER	3 TO 7.5 FEET
NYMPHAEA ODORATA (1)	WHITE WATERLILY	SHALLOW TO DEEP PONDS	TO 6 FEET

NOTES:

1. NON–NATIVE SPECIES. BECKMANIA SYZIGACHNE IS NATIVE TO OREGON. NATIVE SPECIES ARE PREFERRED.
2. SCIRPUS TUBERS MUST BE PLANTED SHALLOWER FOR ESTABLISHMENT, AND PROTECTED FROM FORAGING WATERFOWL UNTIL ESTABLISHED. EMERGING AERIAL STEMS SHOULD PROJECT ABOVE WATER SURFACE TO ALLOW OXYGEN TRANSPORT TO THE ROOTS.
3. SEE BMP T10.10 IN VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

PRIMARY SOURCES: MUNICIPALITY OF METROPOLITAN SEATTLE, WATER POLLUTION CONTROL ASPECTS OF AQUATIC PLANTS, 1990. HORTUS NORTHWEST, WETLAND PLANTS FOR WESTERN OREGON, ISSUE 2, 1991. HITCHCOCK AND CRONQUIST, FLORA OF THE PACIFIC NORTHWEST, 1973.

WETPOND EMERGENT WETLAND PLANT SPECIES

STANDARD DETAIL

THE CITY OF BATTLE GROUND

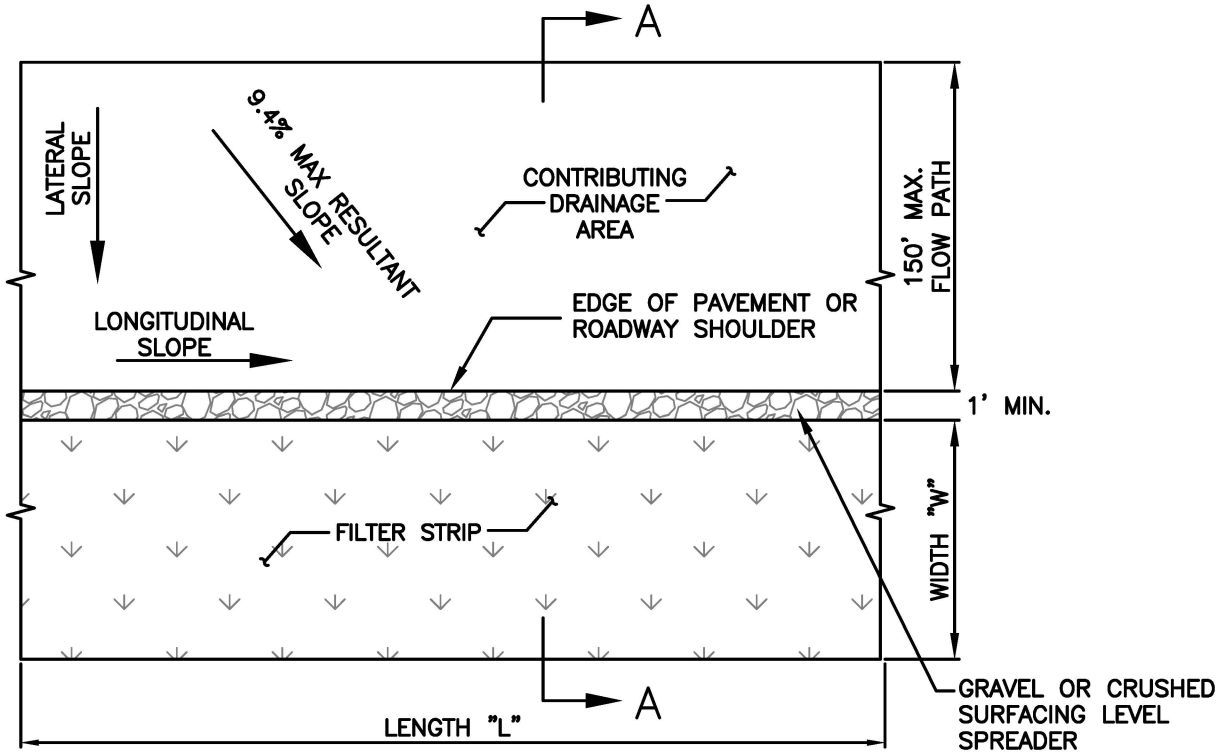
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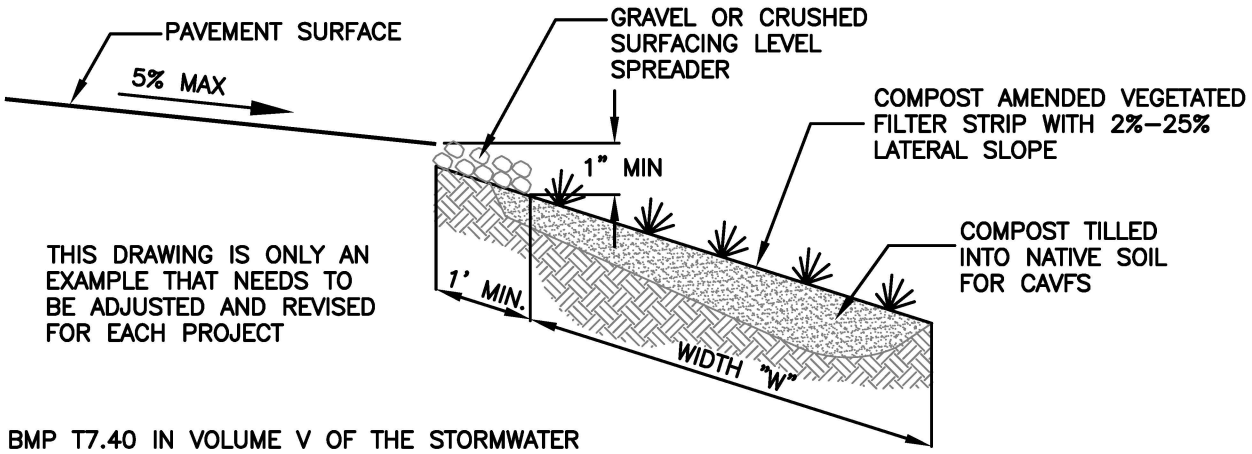
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ST–9.06



PLAN



THIS DRAWING IS ONLY AN EXAMPLE THAT NEEDS TO BE ADJUSTED AND REVISED FOR EACH PROJECT

NOTE:

REFER TO BMP T7.40 IN VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON.

SECTION A–A

N.T.S.

COMPOST AMENDED VEGETATED FILTER STRIP

STANDARD DETAIL

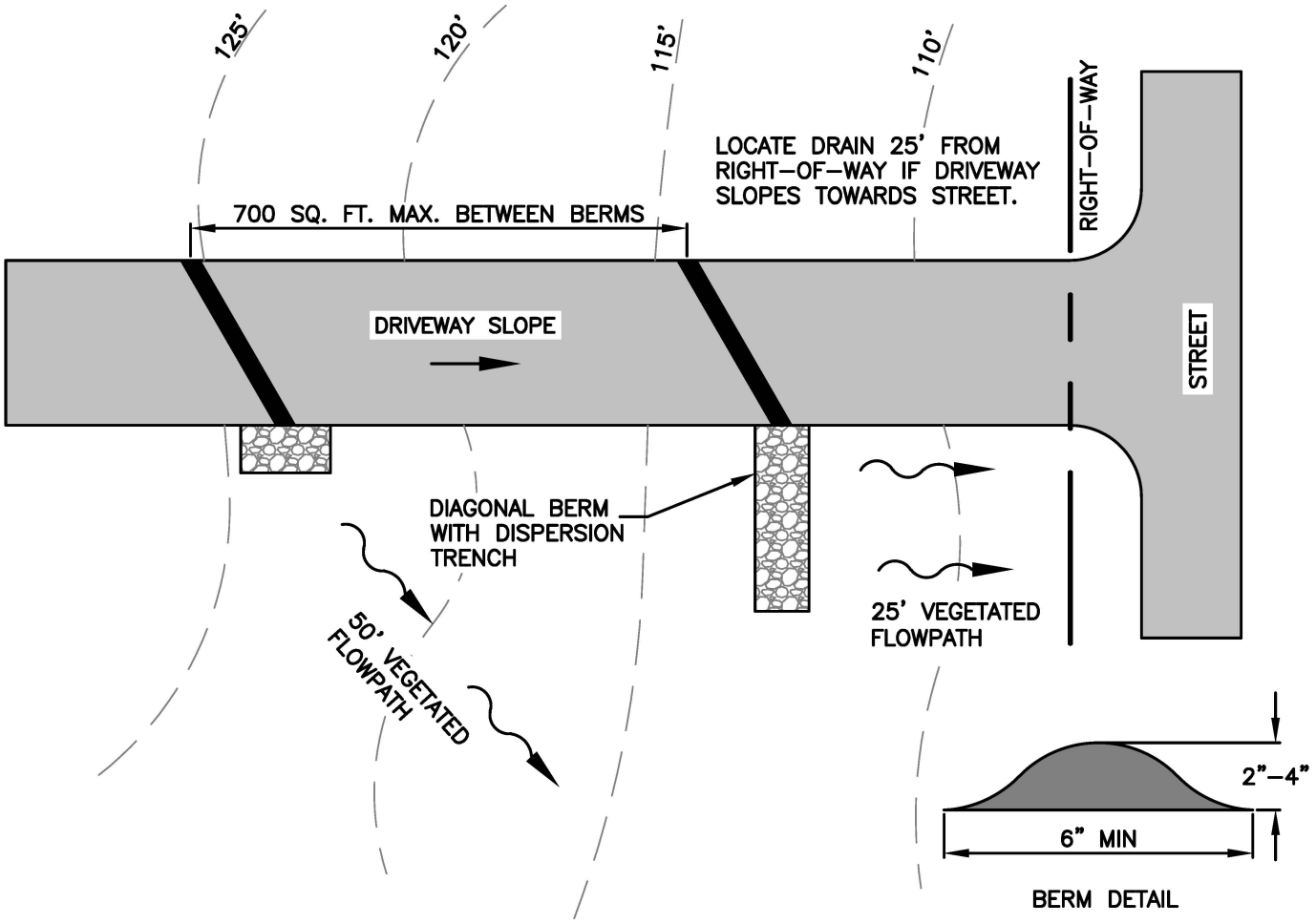
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ST–10.00



STEEP DRIVEWAY WITH DIAGONAL BERMS

NOTE:

REFER TO BMP T5.11 IN VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

CONCENTRATED FLOW DISPERSION – DIAGONAL BERMS

STANDARD DETAIL

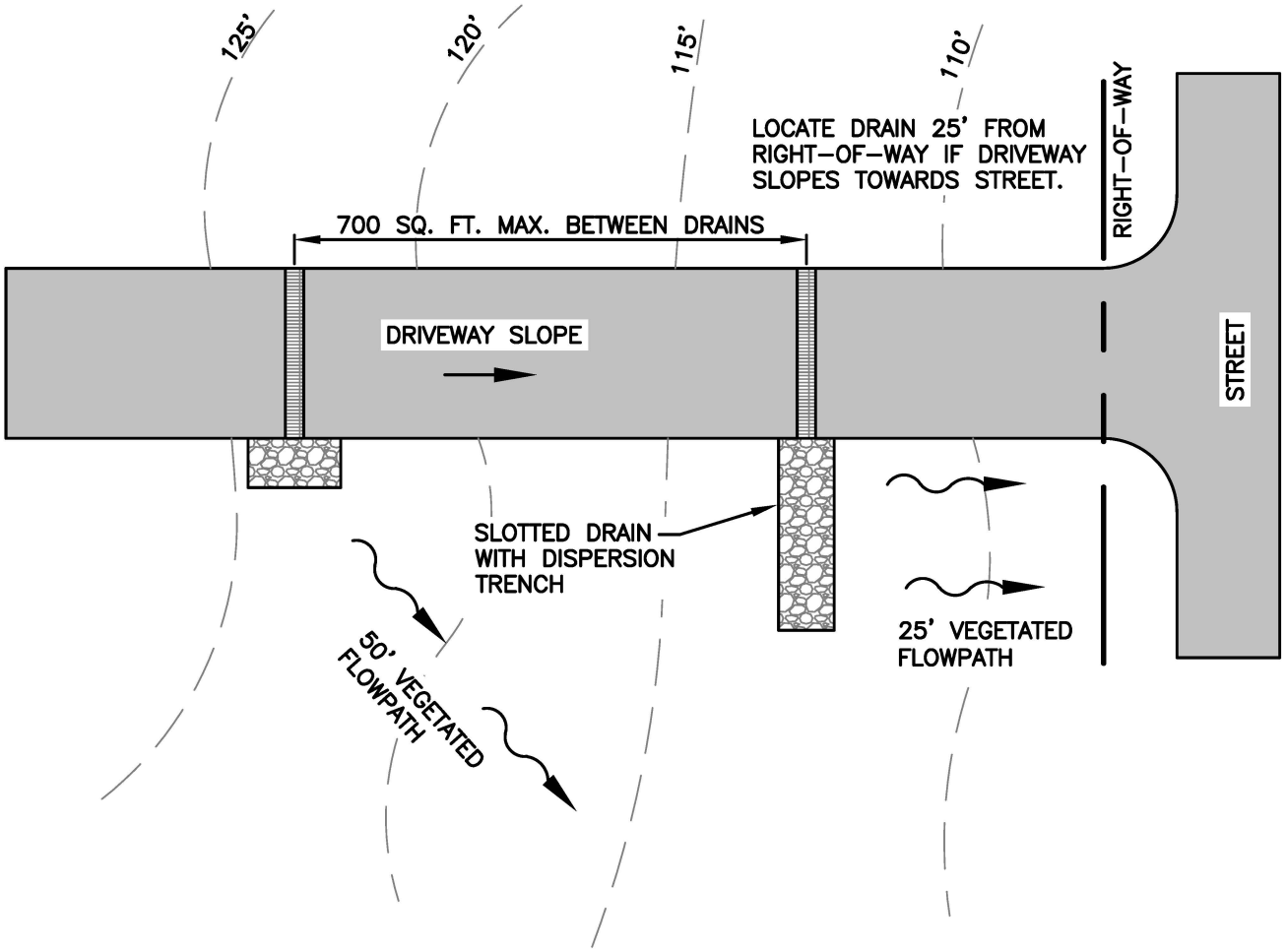
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ST-10.01



STEEP DRIVEWAY WITH SLOTTED DRAINS

NOTE:

REFER TO BMP T5.11 IN VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

CONCENTRATED FLOW DISPERSION – SLOTTED DRAINS

STANDARD DETAIL

THE CITY OF BATTLE GROUND

CITY OF BATTLE GROUND
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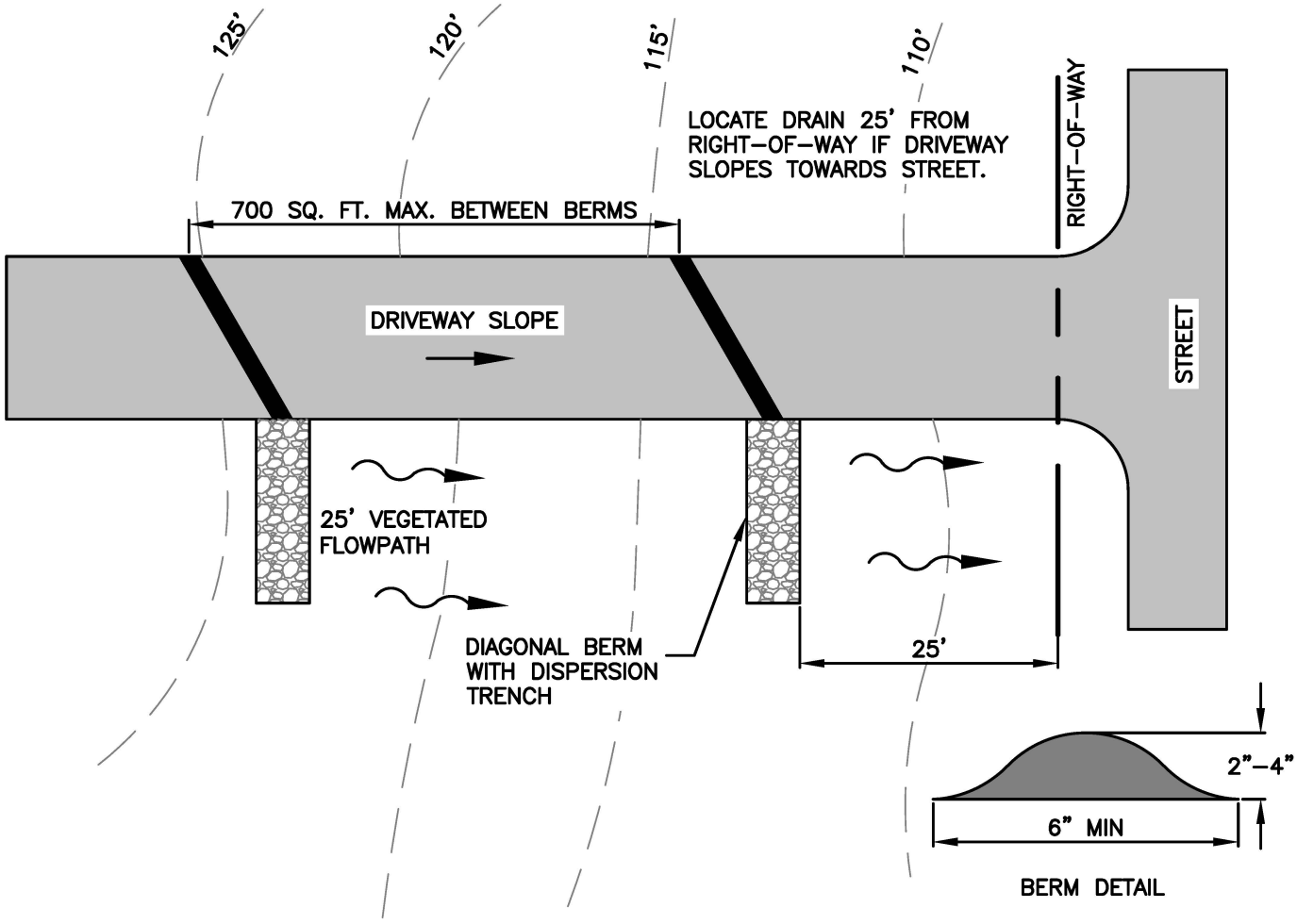
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SHEET FLOW DRIVEWAY DISPERSION TRENCH
DRIVEWAY SLOPE VARIES AND SLOPES TOWARDS STREET

NOTE:

REFER TO BMP T5.12 IN VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

SHEET FLOW DISPERSION TRENCH

STANDARD DETAIL

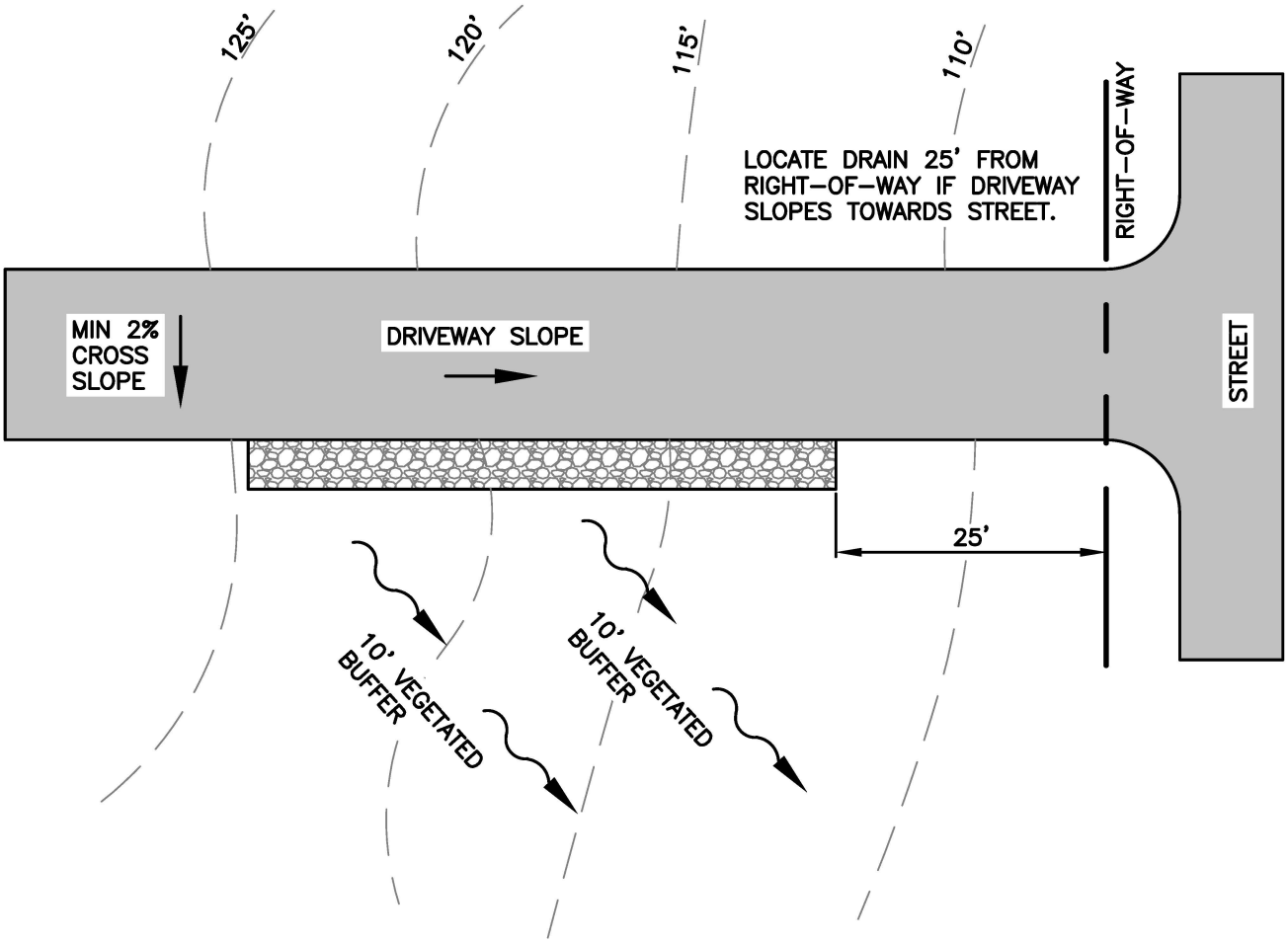
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SHEET FLOW DISPERSION FROM A DRIVEWAY
FLAT TO MODERATELY SLOPING DRIVEWAYS

NOTE:

REFER TO BMP T5.12 IN VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

SHEET FLOW DISPERSION

STANDARD DETAIL

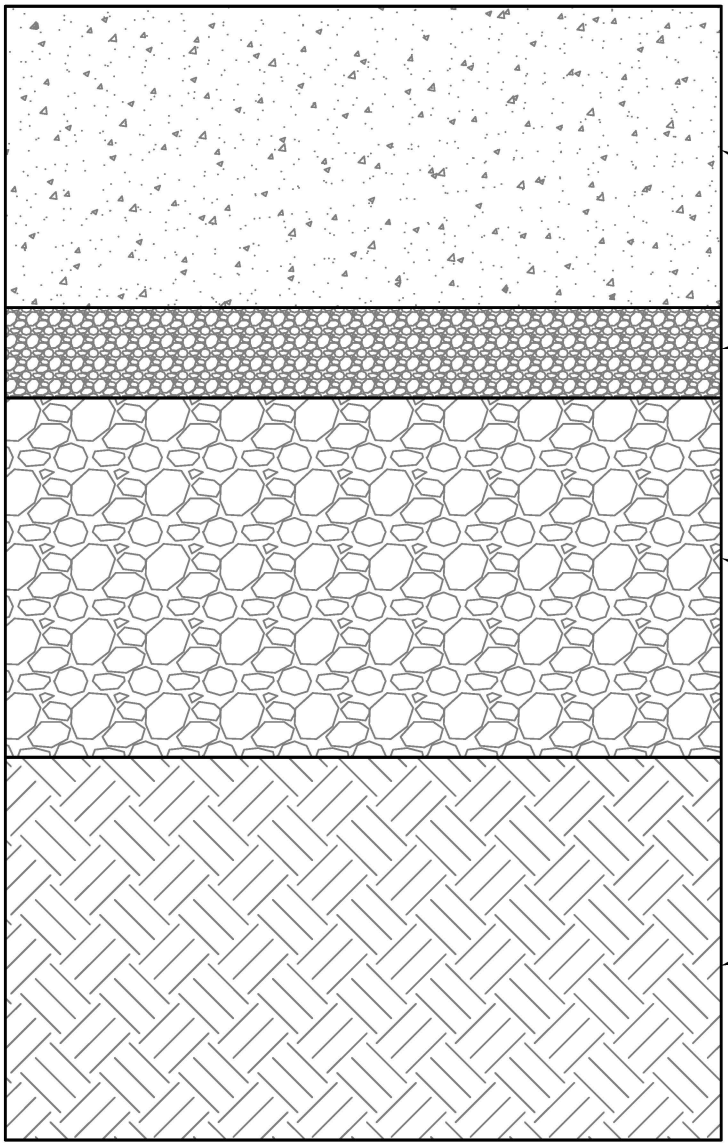
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NOTE:

REFER TO BMP T5.15 IN VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

PERMEABLE PAVEMENT SECTION

STANDARD DETAIL

THE CITY OF BATTLE GROUND

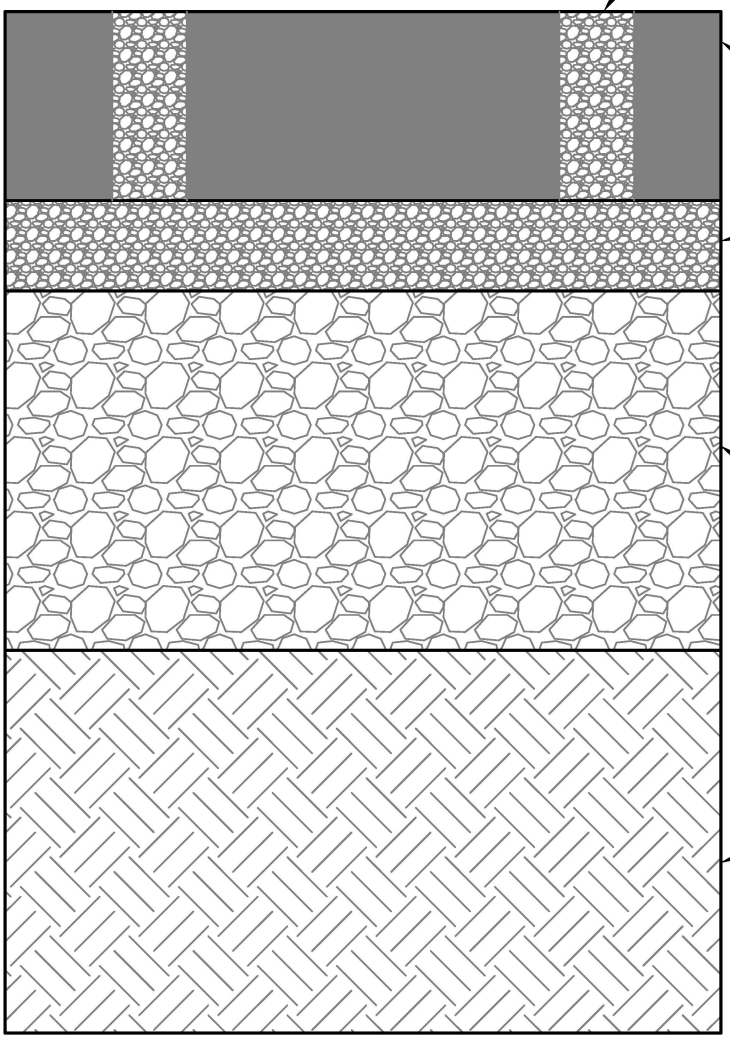
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NOTE:

REFER TO BMP T5.15 IN VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

PERMEABLE PAVER SECTION

STANDARD DETAIL

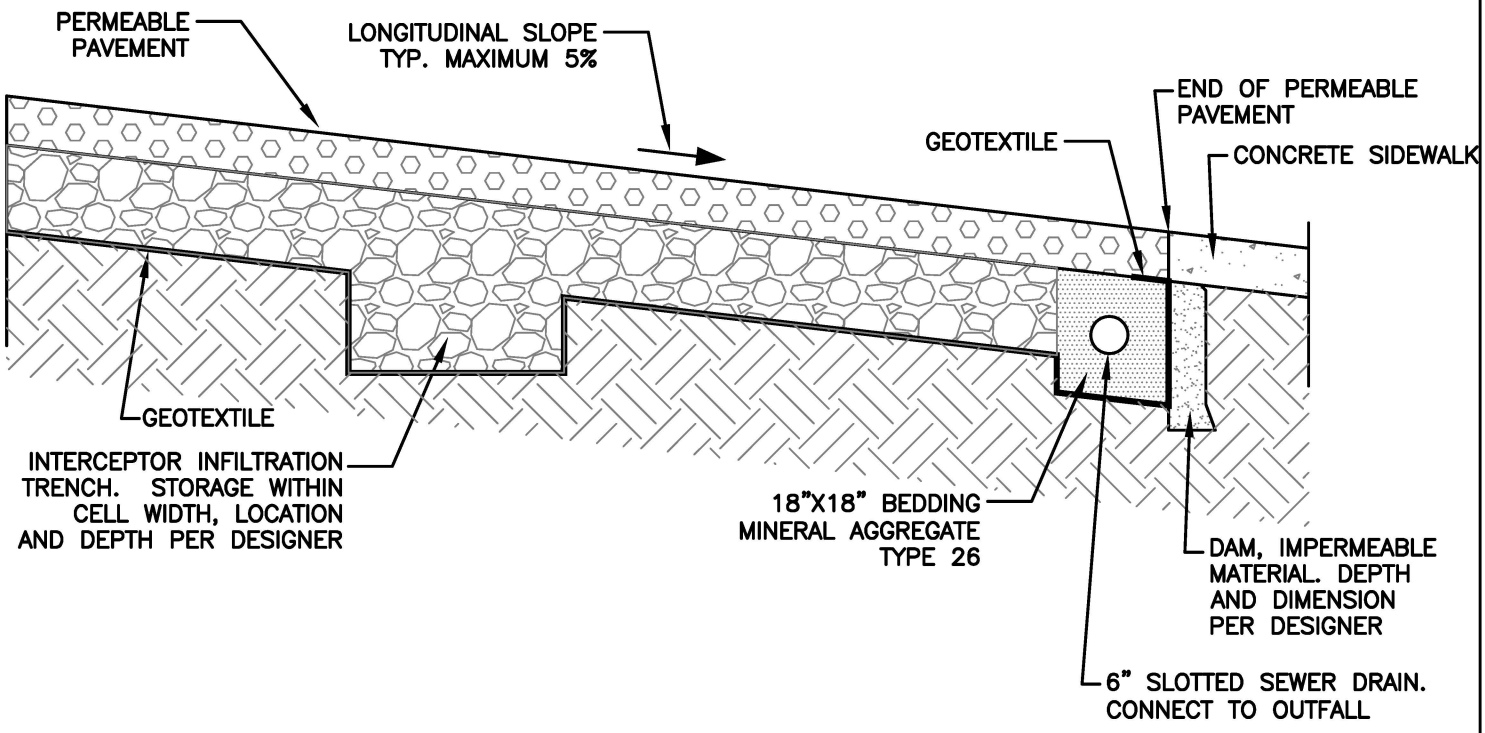
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INTERCEPTOR INFILTRATION TRENCH

N.T.S.

PERMEABLE PAVEMENT INTERCEPTOR INFILTRATION TRENCH

STANDARD DETAIL

THE CITY OF BATTLE GROUND

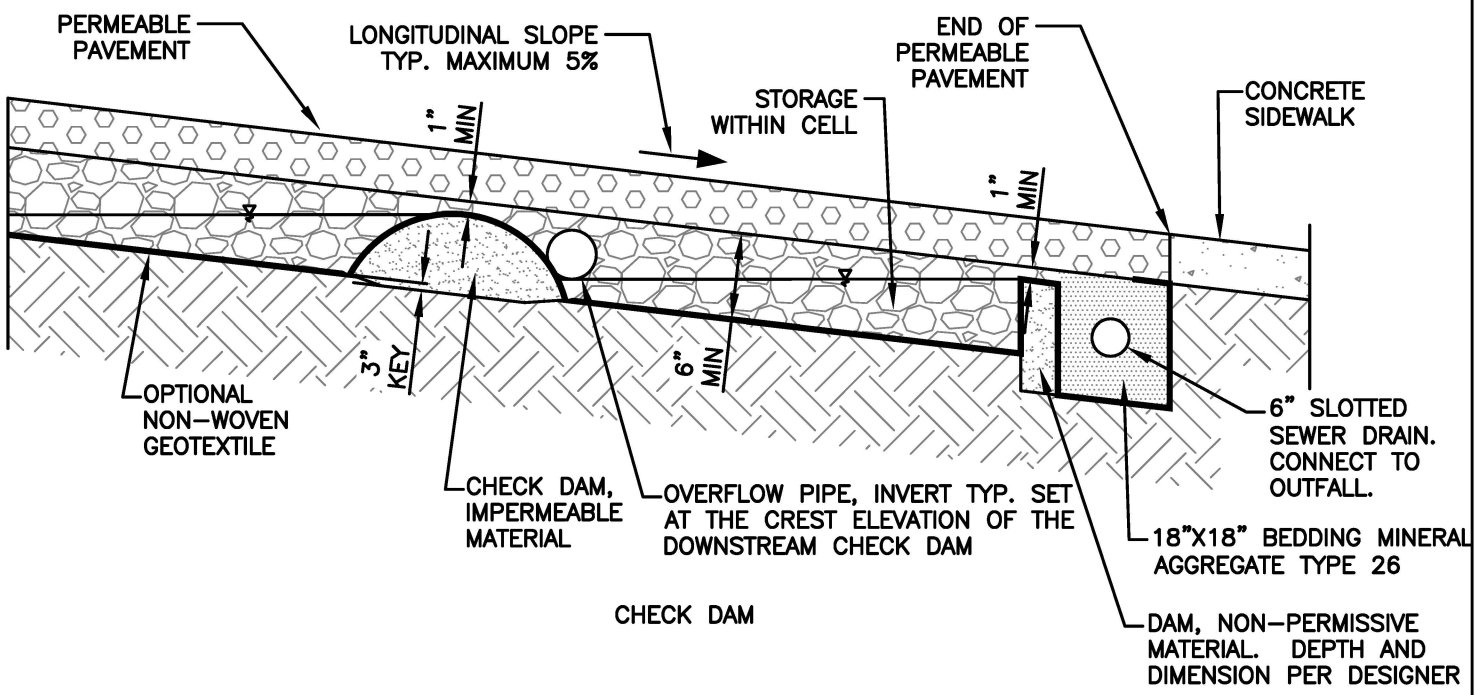
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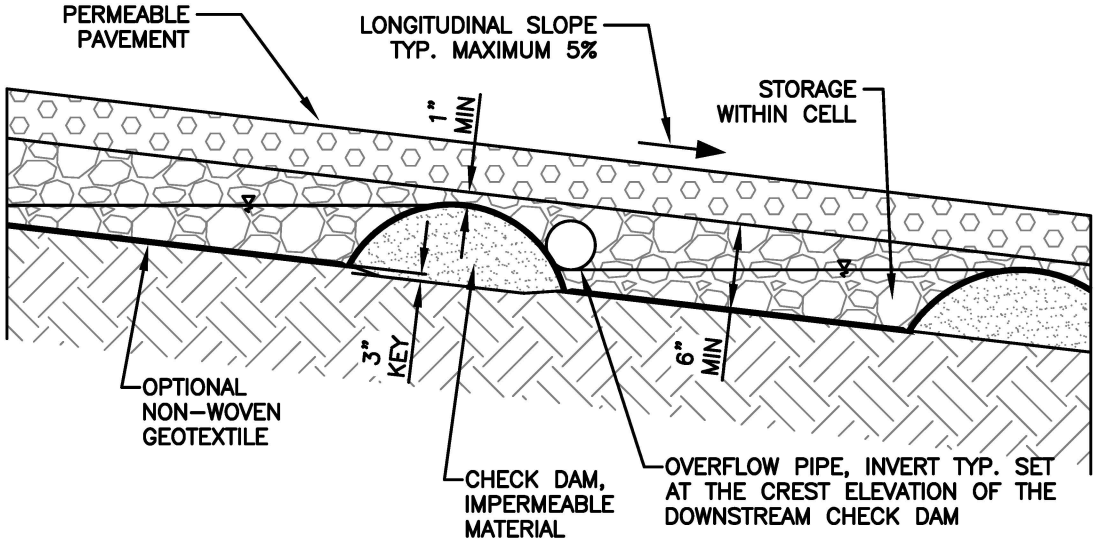
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CHECK DAM



CHECK DAM

N.T.S.

PERMEABLE PAVEMENT CHECK DAM

STANDARD DETAIL

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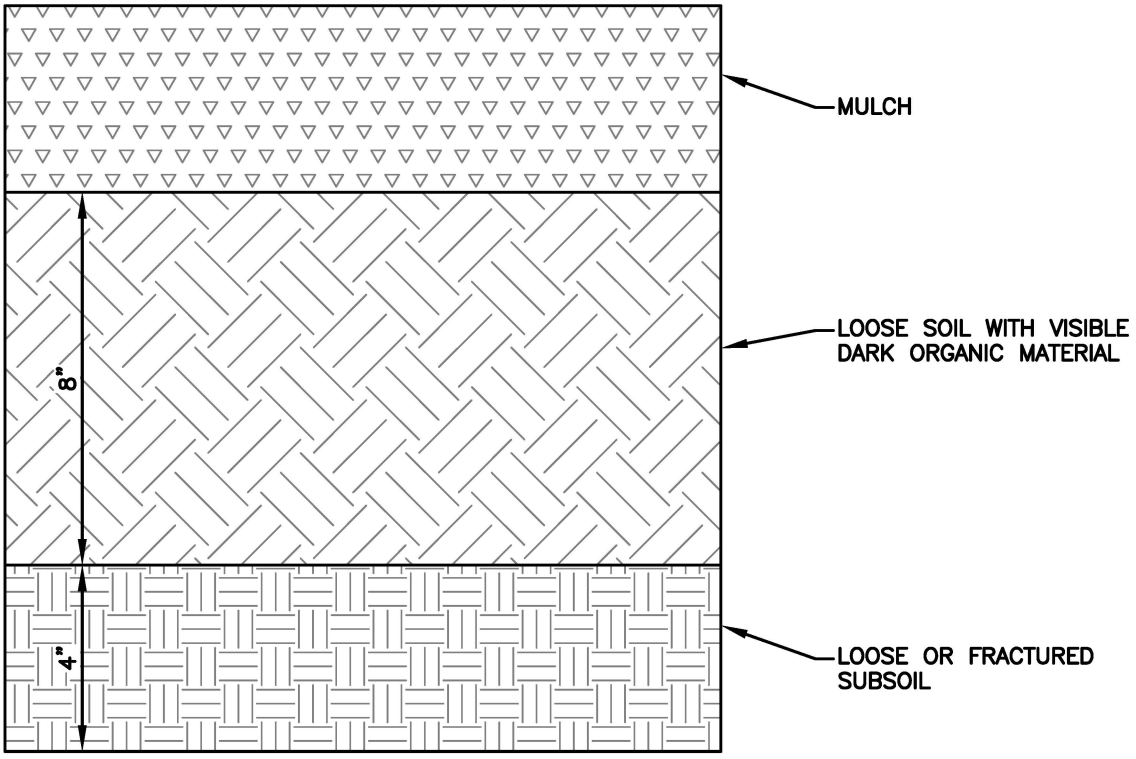
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ST-10.08



NOTE:

REFER TO BMP T5.13 IN VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

PLANTING BED CROSS–SECTION

STANDARD DETAIL

THE CITY OF BATTLE GROUND

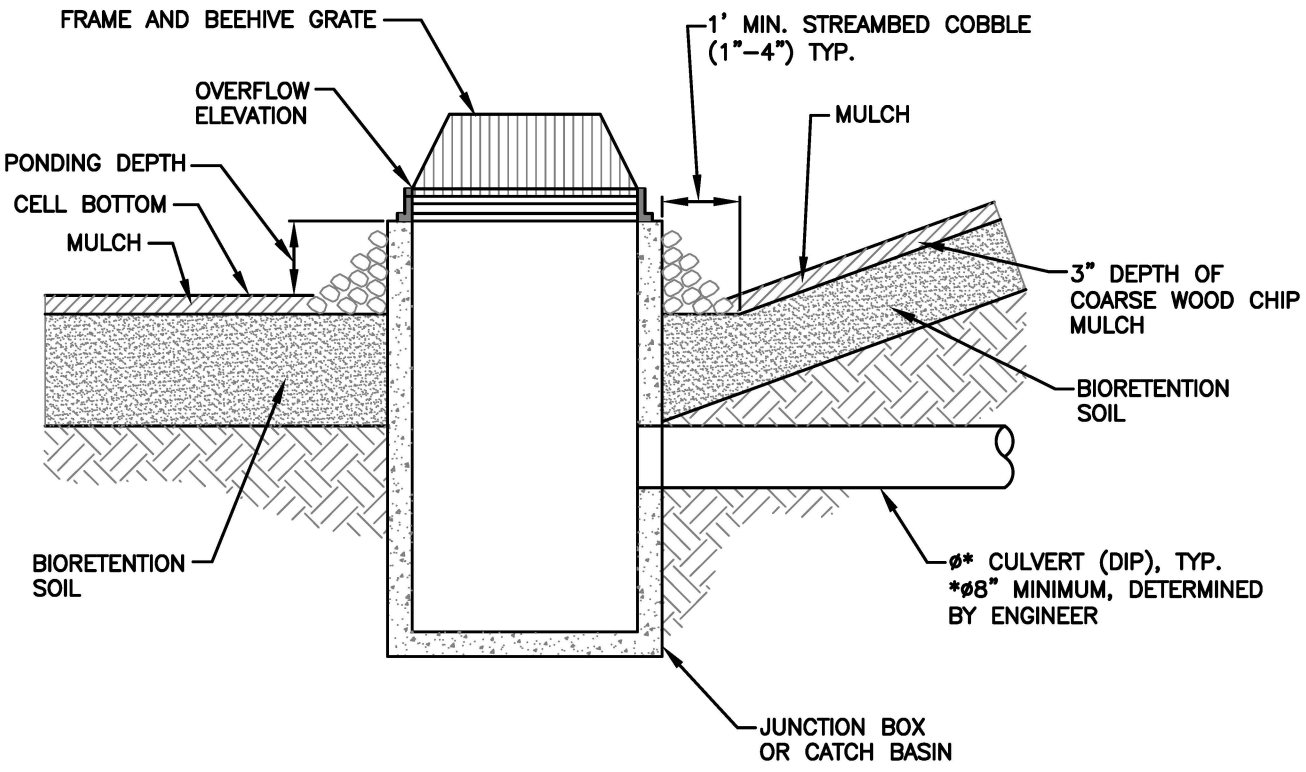
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ST–11.00



NOTE:

1' MINIMUM FREEBOARD FROM TOP OF RISER TO INLET.

N.T.S.

BIORETENTION OUTLET STRUCTURE

STANDARD DETAIL

THE CITY OF BATTLE GROUND

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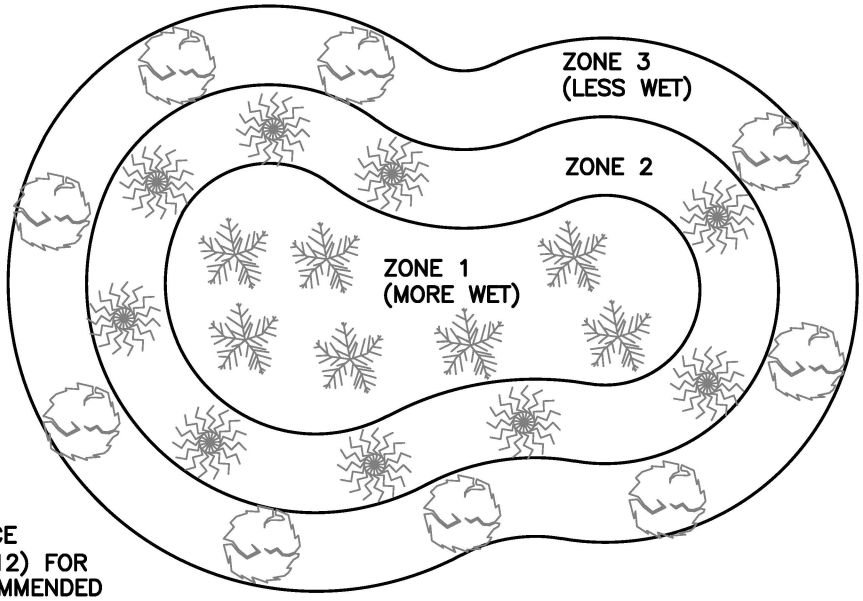
ST–11.01

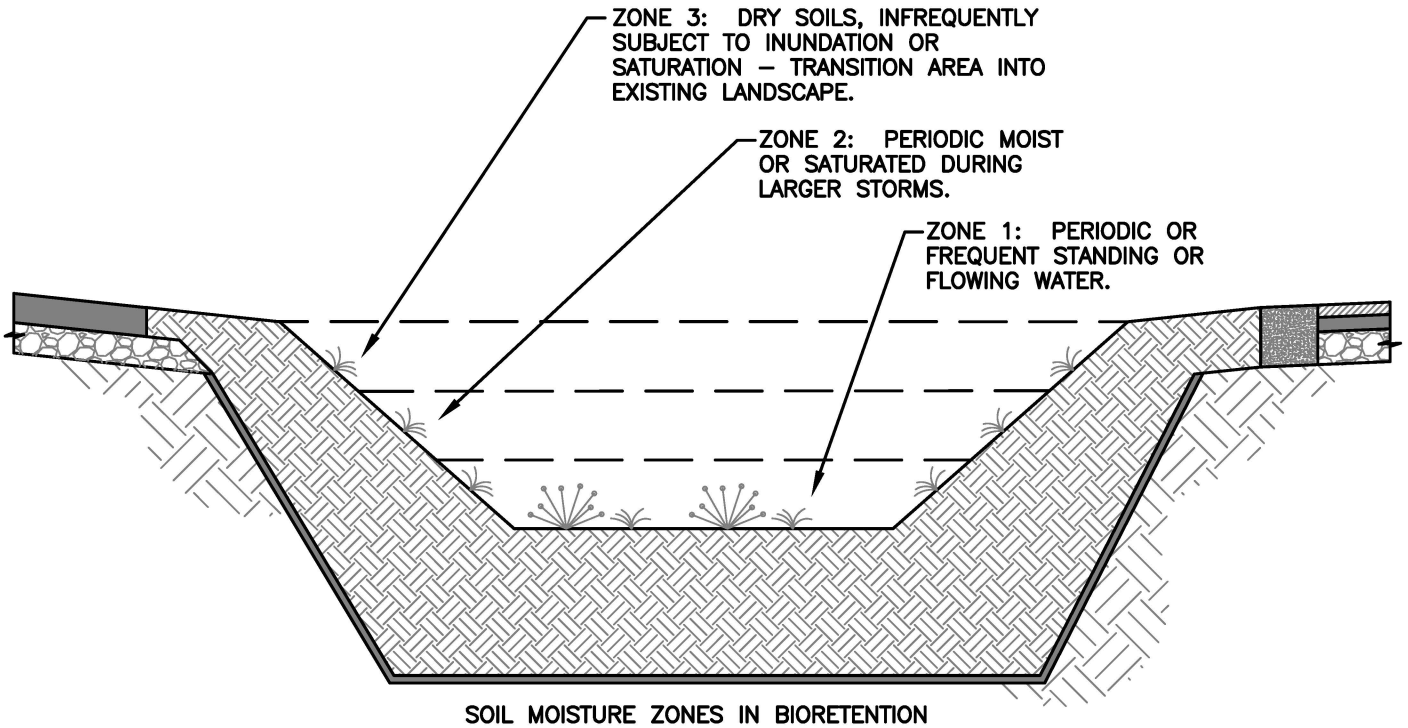
ZONE 1
CLUSTERED WILD ROSE
SLOUGH SEDGE
COMMON RUSH

ZONE 2
PACIFIC COAST IRIS
MOCK–ORANGE
SLOUGH SEDGE
DWARF ARCTIC WILLOW
DWARF DOGWOOD
PACIFIC SUNSET MAPLE

ZONE 3
SHRUBBY CINQUEFOIL
WILD COASTAL STRAWBERRY
SNOWBERRY

SEE THE LID TECHNICAL GUIDANCE MANUAL FOR PUGET SOUND (2012) FOR ADDITIONAL GUIDANCE AND RECOMMENDED PLANT SPECIES.





SOIL MOISTURE ZONES IN BIORETENTION

NOTE:

SEE LOW IMPACT DEVELOPMENT TECHNICAL GUIDANCE MANUAL FOR PUGET SOUND FOR MORE INFORMATION.

N.T.S.

BIORETENTION PLANTING ZONES

STANDARD DETAIL

THE CITY OF BATTLE GROUND

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ST–11.02

GENERAL GUIDELINES FOR MINERAL AGGREGATE GRADATION	
SIEVE SIZE	PERCENT PASSING
3/8"	100
#4	95–100
#10	75–90
#40	25–40
#100	4–10
#200	2–5

COMPOST TO AGGREGATE RATIO: 60–65 PERCENT MINERAL AGGREGATE, 35–40 PERCENT COMPOST BY VOLUME.

ORGANIC MATTER CONTENT: 5–8 PERCENT BY WEIGHT.

CATION EXCHANGE CAPACITY (CEC) MUST BE GREATER THAN OR EQUAL TO 5 MILLIEQUIVALENTS/100g DRY SOIL. NOTE: SOIL MIXES MEETING THE ABOVE SPECIFICATIONS DO NOT HAVE TO BE TESTED FOR CEC. THEY WILL READILY MEET THE MINIMUM CEC.

COMPOST SHALL MEET THE REQUIREMENTS OF SECTION 7.4 BEST MANAGEMENT PRACTICES (BMPs) FOR INFILTRATION AND BIORETENTION TREATMENT, BMP T7.30: BIORETENTION CELLS, SWALES AND PLANTER BOXES, OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON.

TYPE 26 MINERAL AGGREGATE

UNDER–DRAIN AGGREGATE FILTER AND BEDDING LAYER GRADATION	
SIEVE SIZE	PERCENT PASSING
3/4"	100
1/4"	30–60
#8	20–50
#50	3–12
#200	0–1

N.T.S.

BIORETENTION SOIL MIX

STANDARD DETAIL

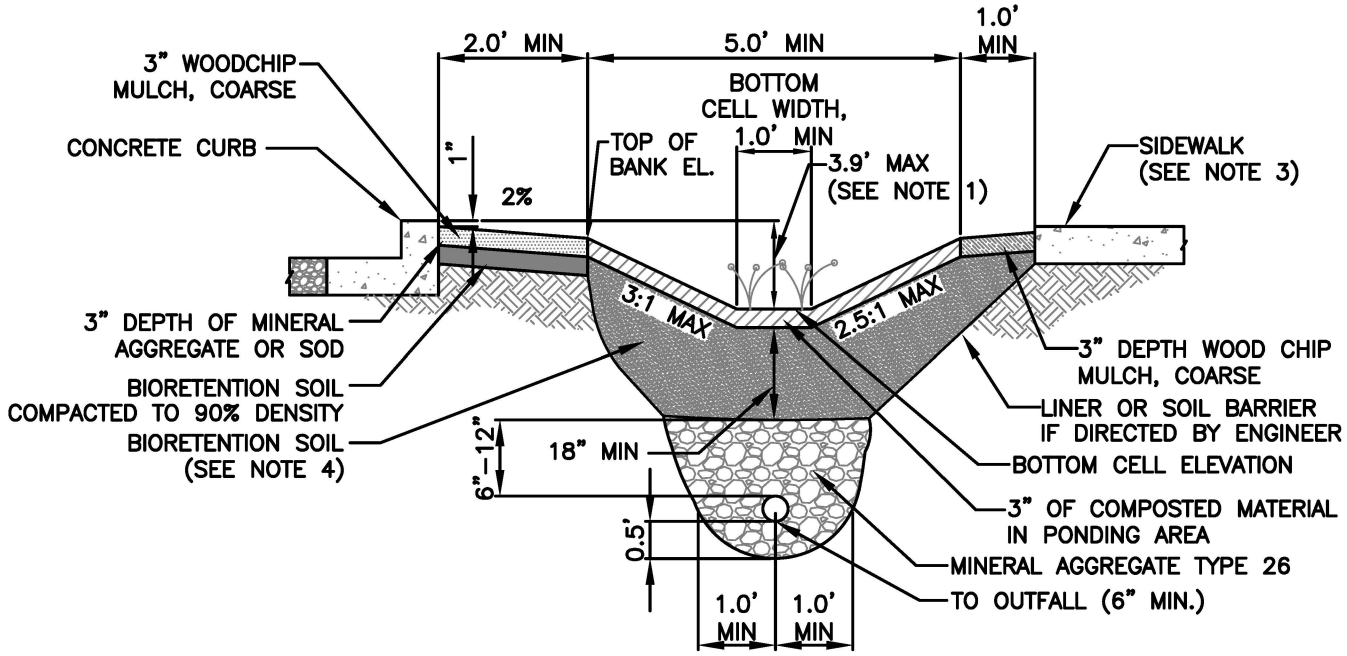
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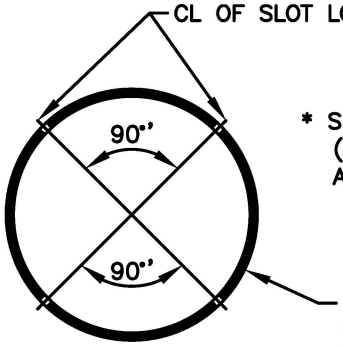
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ST–11.03



NOTES:

1. DEPTH OVER 4' REQUIRES GUARD RAIL.
2. 4:1 MAX WHEN WITHIN 50–FEET OF INTERSECTIONS.
3. SIDEWALK ELEVATION MUST BE SET ABOVE OVERFLOW ELEVATIONS.
4. SCARIFY SUBGRADE 3" MIN. BEFORE BIORETENTION SOIL INSTALLATION.
5. BIORETENTION SOIL MIXTURE SHOULD BE COMPACTED TO 85% PER ASTM 1577.



* SLOTS ARE TO BE 0.064" WIDE (ON 45° CENTERS) BY 1.0" LONG AND SPACED 0.3" APART.

SSD SLOT DETAIL

N.T.S.

BIORETENTION CELL SECTION WITH CURB

STANDARD DETAIL

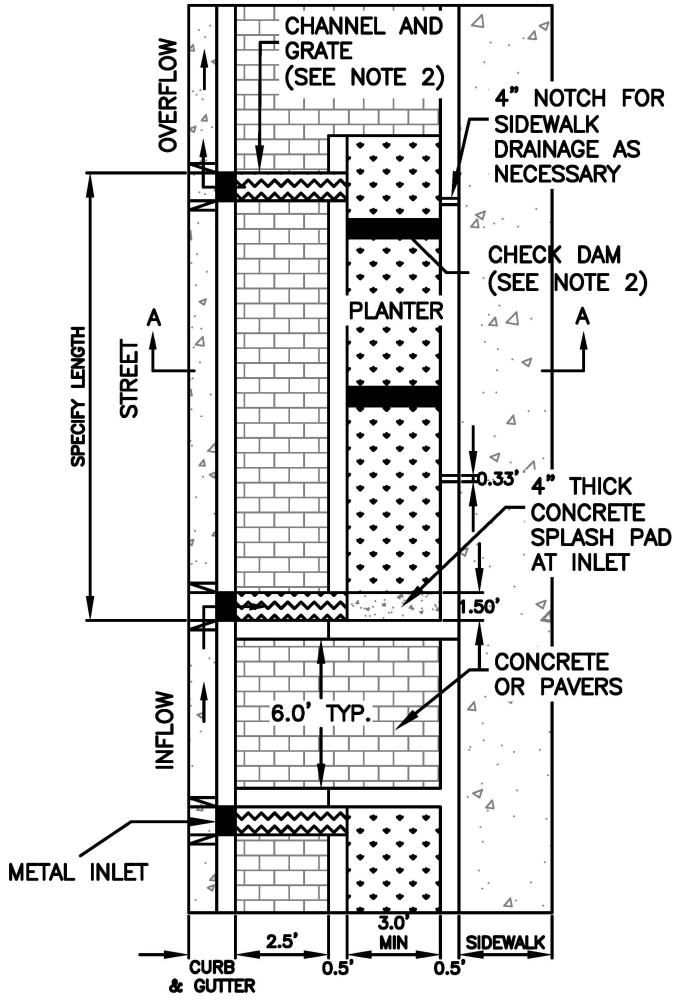
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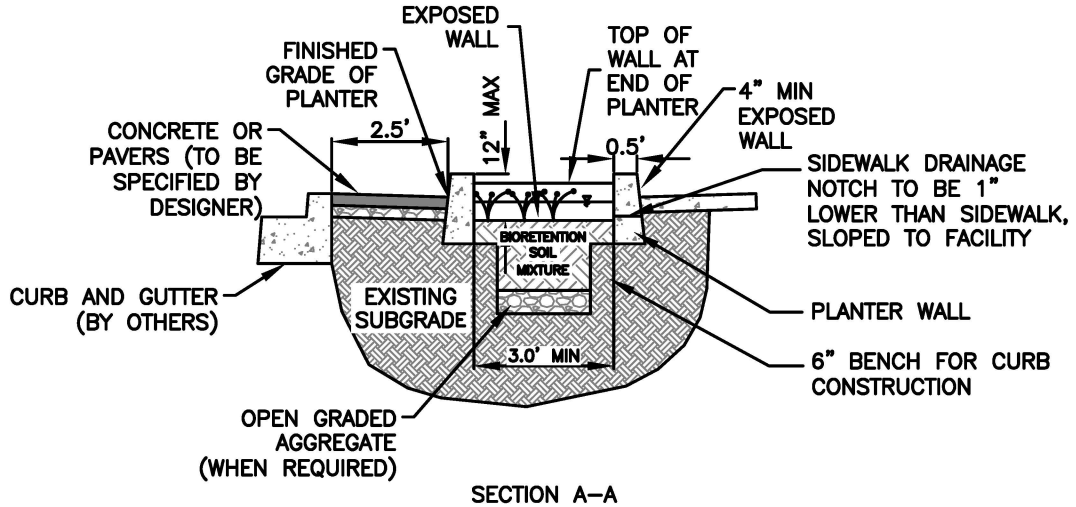
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ST–11.04



DESIGNER INFORMATION

1. ADAPT PLAN VIEW EXAMPLE TO ENGINEERED DESIGN.
2. INCLUDE BEGINNING AND ENDING STATIONS FOR EACH FACILITY. PROVIDE STATIONS AND/OR DIMENSIONS AND ELEVATIONS AT EVERY INLET, OUTLET, CHECK DAM, PLANTER CORNERS AND SIDEWALK NOTCH.
3. LONGITUDINAL SLOPE OF PLANTER MATCHES ROAD.
4. SIDEWALK ELEVATION MUST BE SET ABOVE INLET AND OUTLET TO DRAIN TO STREET BEFORE SIDEWALK.
5. MINIMUM INTERIOR PLANTER WIDTH IS 3 FEET. A MINIMUM 4 FEET INTERIOR PLANTER WIDTH IS REQUIRED FOR STREET TREES IN PLANTER.
6. EXISTING UTILITY LINES MUST BE SLEEVED OR RELOCATED. PROPOSED UTILITY LINES TO BE LOCATED OUT OF THE FACILITY.
7. AREA AND DEPTH OF FACILITY ARE BASED UPON ENGINEERING CALCULATION AND RIGHT-OF-WAY CONSTRAINTS.
8. MAY USE CONCRETE OR PAVERS.
9. REFER TO BMP T7.30 IN VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.



SECTION A-A

N.T.S.

BIORETENTION PLANTER

STANDARD DETAIL

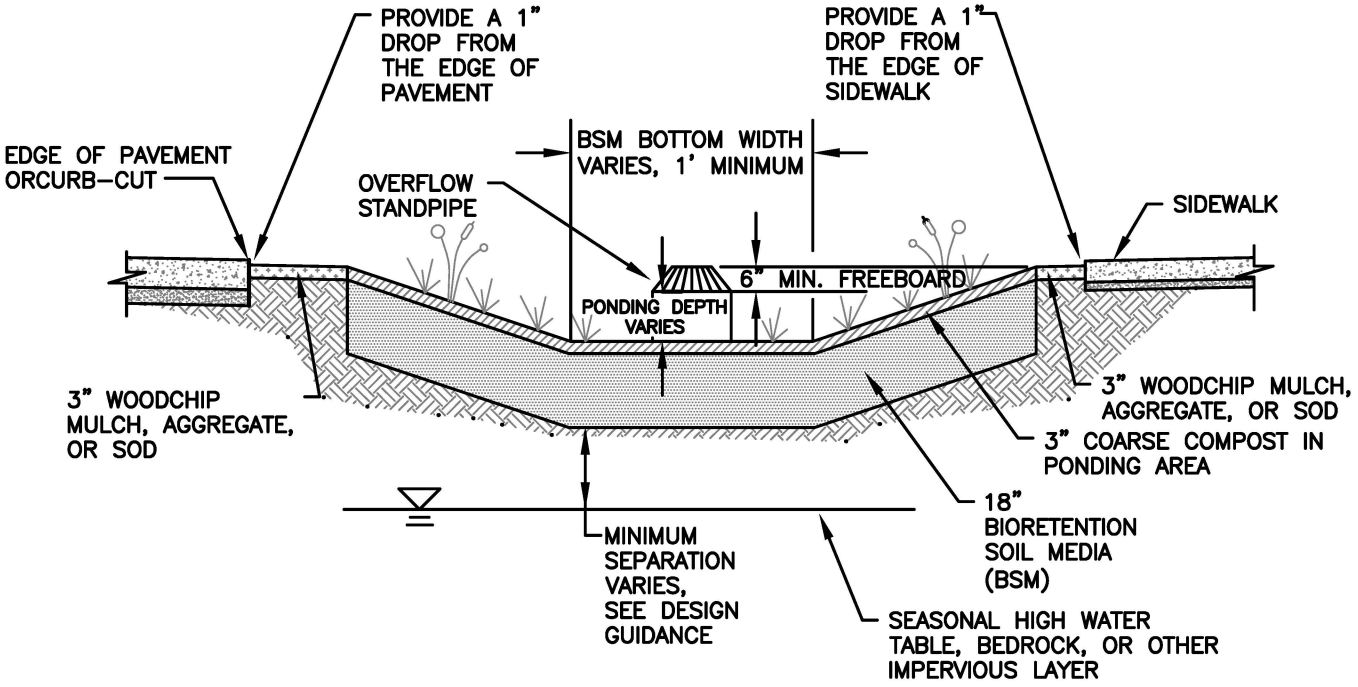
CITY OF BATTLE GROUND APPROVED

Mark Hensley 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	12/29/16	KDU	KDU
2	02/15/17	CAS	KDU

ST-11.05



NOTES:

1. SCARIFY SUBGRADE 3" MIN. BEFORE BIORETENTION SOIL INSTALLATION.
2. COMPACT BSM TO 85% PER ASTM 1577.
3. REFER TO BMP T7.30 IN VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

TYPICAL BIORETENTION

STANDARD DETAIL

THE CITY OF BATTLE GROUND

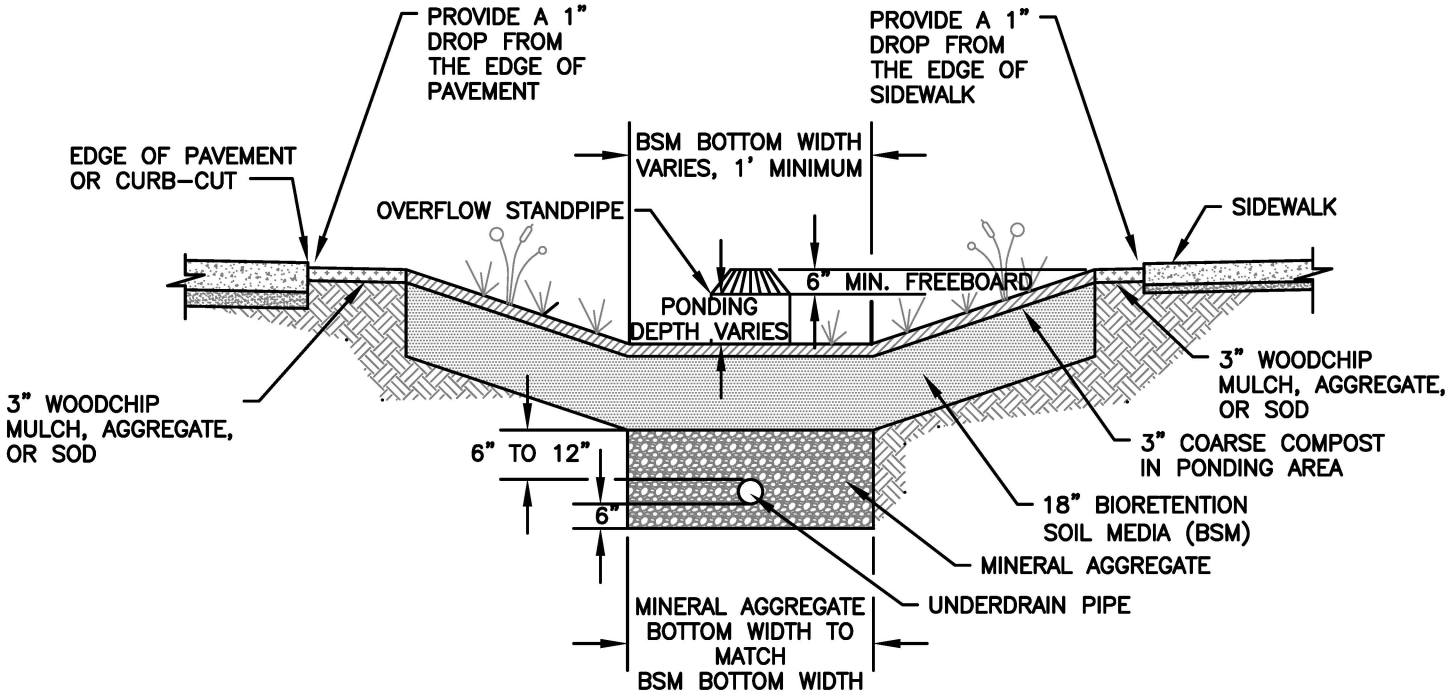
CITY OF BATTLE GROUND
APPROVED

Mark Henrey 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	01/16/17	KDU	KDU
2	02/16/17	CAS	KDU

ST–11.06



NOTES:

1. SCARIFY SUBGRADE 3" MIN. BEFORE BIORETENTION SOIL INSTALLATION.
2. COMPACT BSM TO 85% PER ASTM 1577.
3. REFER TO BMP T7.30 IN VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

BIORETENTION WITH UNDERDRAIN

STANDARD DETAIL

THE CITY OF BATTLE GROUND

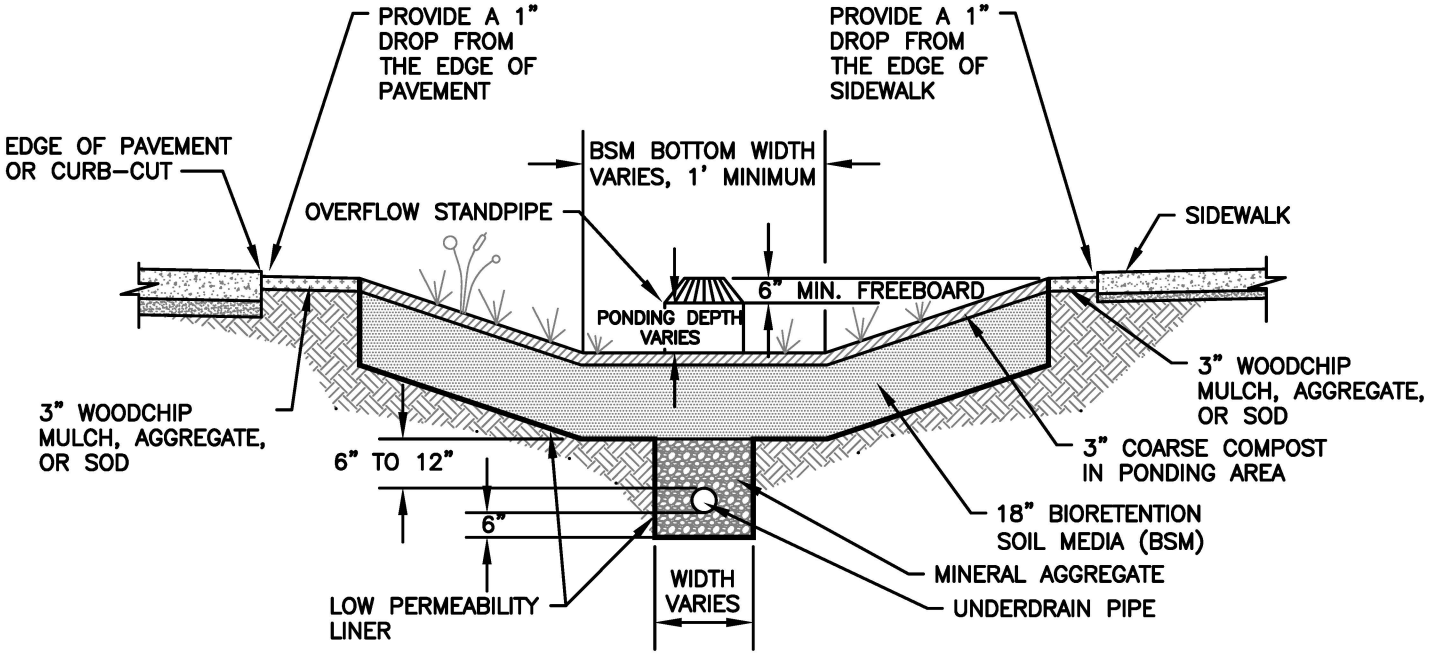
CITY OF BATTLE GROUND
APPROVED

Mark Henrey 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	01/23/16	KDU	KDU
2	02/16/17	CAS	KDU

ST–11.07



NOTES:

1. SCARIFY SUBGRADE 3" MIN. BEFORE BIORETENTION SOIL INSTALLATION.
2. COMPACT BSM TO 85% PER ASTM 1577.
3. REFER TO BMP T7.30 IN VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

BIORETENTION WITH LINER (NOT LID)

STANDARD DETAIL

THE CITY OF BATTLE GROUND

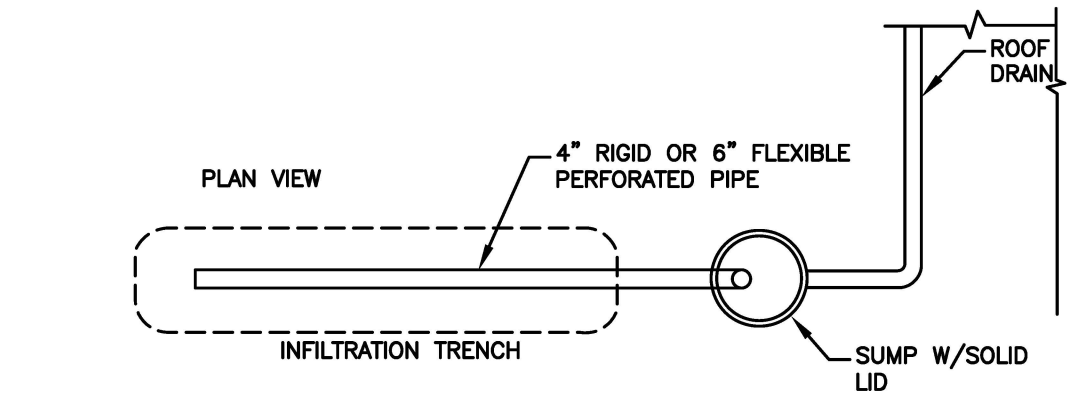
CITY OF BATTLE GROUND
APPROVED

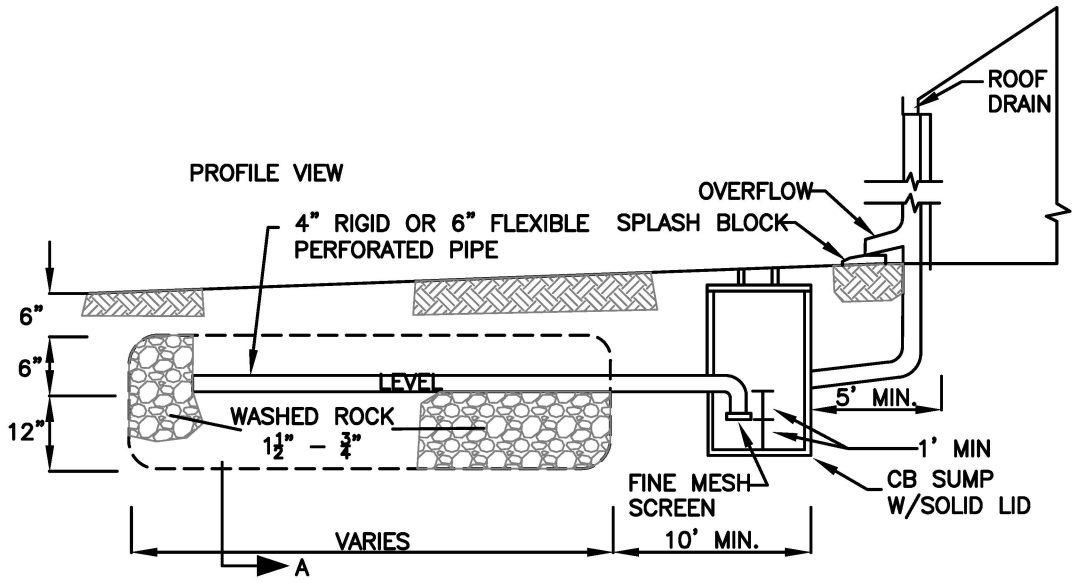
Mark Henrey 06/11/2018

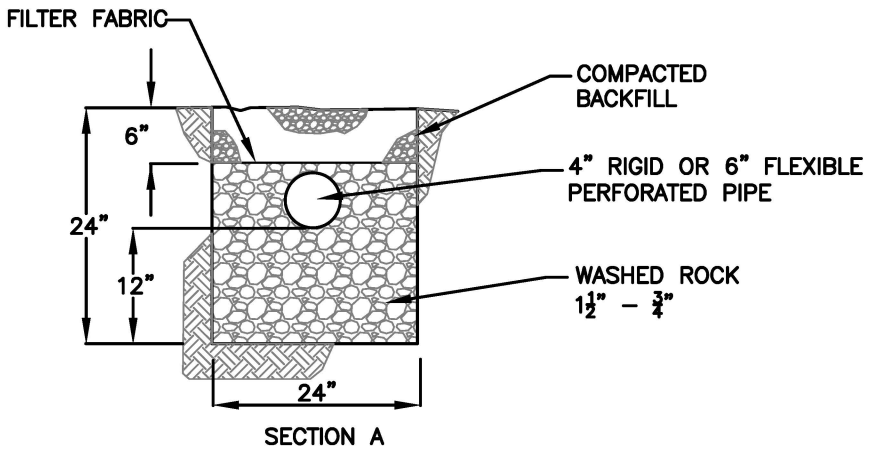
CITY ENGINEER DATE

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1	01/23/16	KDU	KDU
2	02/16/17	CAS	KDU

ST–11.08







NOTE:

REFER TO BMP T5.10A IN VOLUME III OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

TYPICAL DOWNSPOUT INFILTRATION TRENCH

STANDARD DETAIL

THE CITY OF BATTLE GROUND

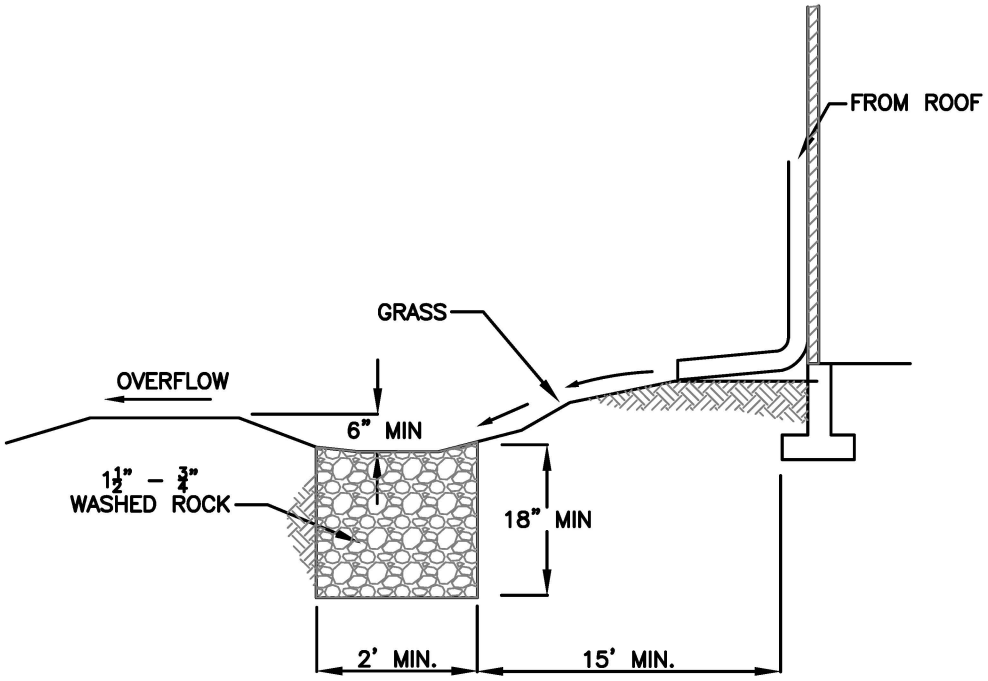
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Mark Hennes 06/11/2018

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1	12/29/16	KDU	KDU
2	02/17/17	CAS	KDU

ST–12.00



CROSS SECTION

NOTES:

1. SAME LENGTH DIMENSIONS AND SITE LIMITATION AS TYPICAL SYSTEM.
2. REFER TO BMP T5.10A IN VOLUME III OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

ALTERNATIVE DOWNSPOUT INFILTRATION TRENCH SYSTEM FOR COARSE SAND AND GRAVEL

STANDARD DETAIL

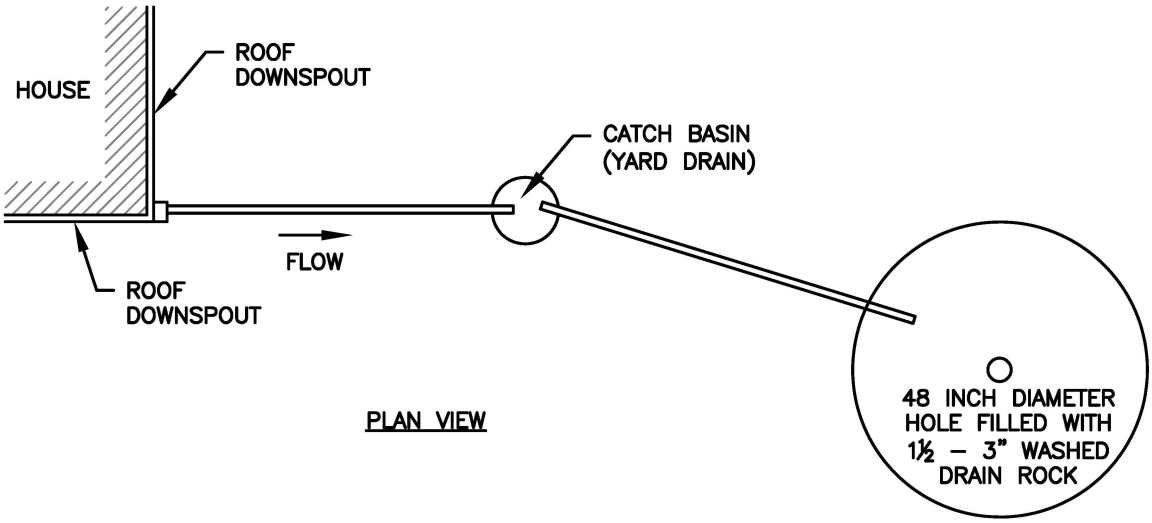
CITY OF BATTLE GROUND
APPROVED

Mark Hennes 06/11/2018

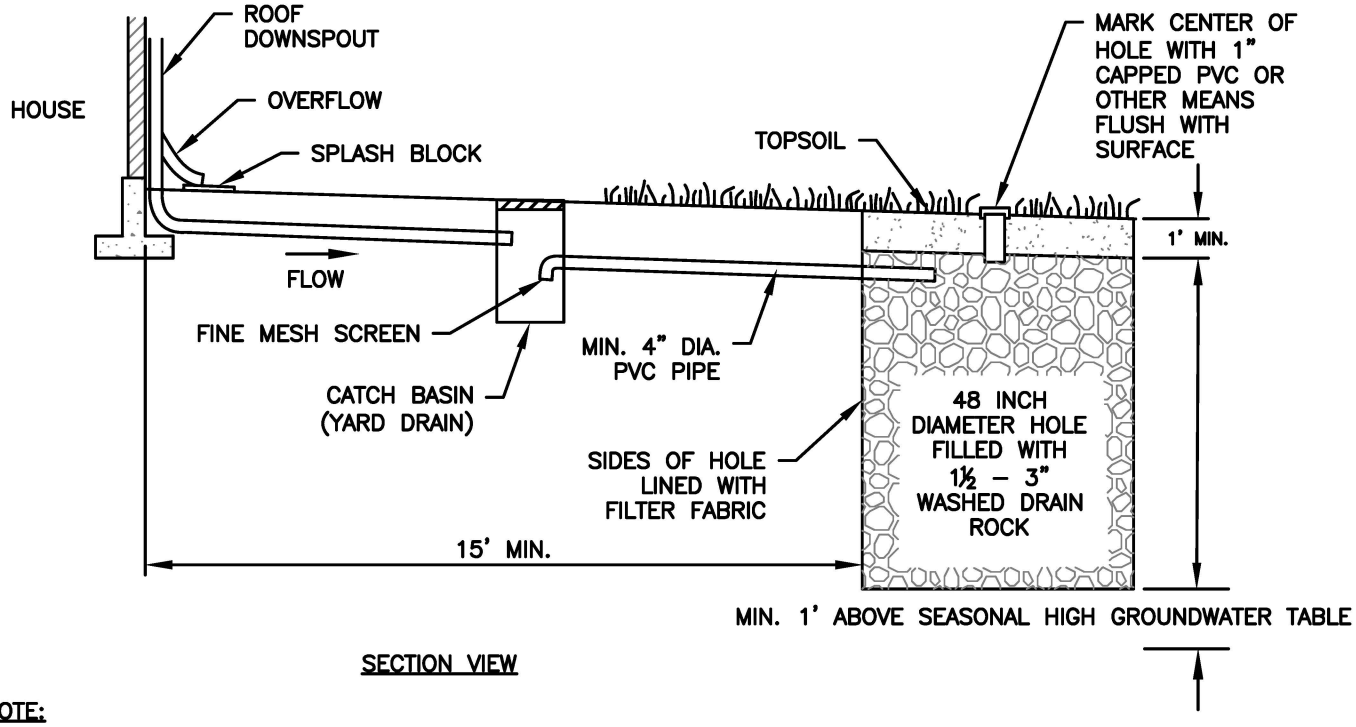
CITY ENGINEER DATE

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1	12/29/16	KDU	KDU
2	02/17/17	CAS	KDU

ST–12.01



PLAN VIEW



SECTION VIEW

NOTE:

REFER TO BMP T5.10A IN VOLUME III OF THE STROMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

TYPICAL DOWNSPOUT INFILTRATION DRYWELL

STANDARD DETAIL

THE CITY OF BATTLE GROUND

CITY OF BATTLE GROUND
APPROVED

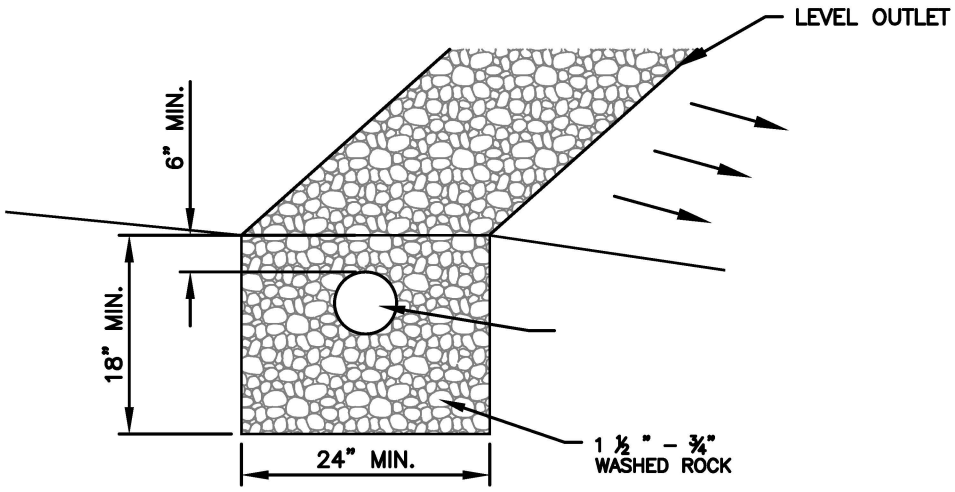
Mark Henrey

06/11/2018

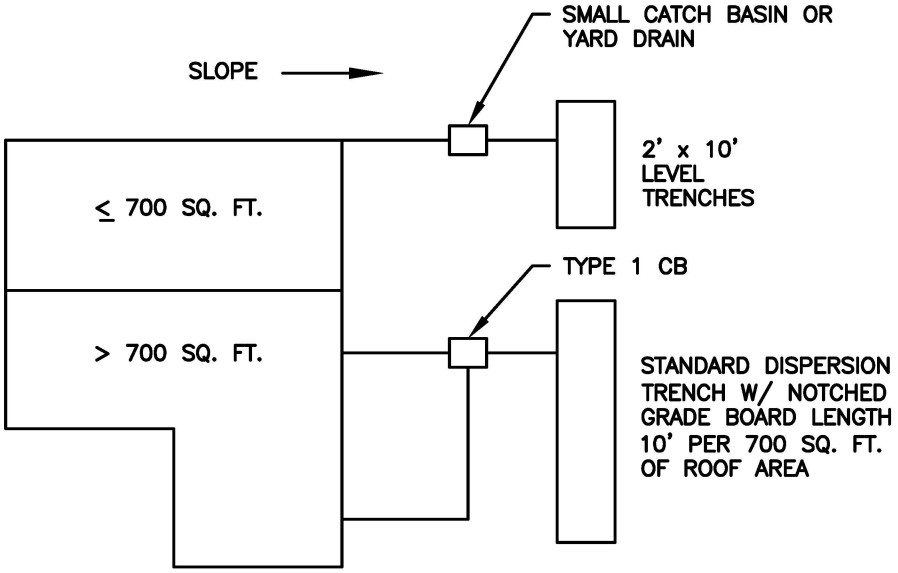
CITY ENGINEER DATE

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1	12/29/16	KDU	KDU
2	02/17/17	CAS	KDU

ST–12.02



TRENCH CROSS–SECTION



PLAN VIEW OF ROOF

NOTE:

REFER TO BMP T5.10B IN VOLUME III OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

TYPICAL DOWNSPOUT DISPERSION TRENCH

STANDARD DETAIL

THE CITY OF BATTLE GROUND

CITY OF BATTLE GROUND
APPROVED

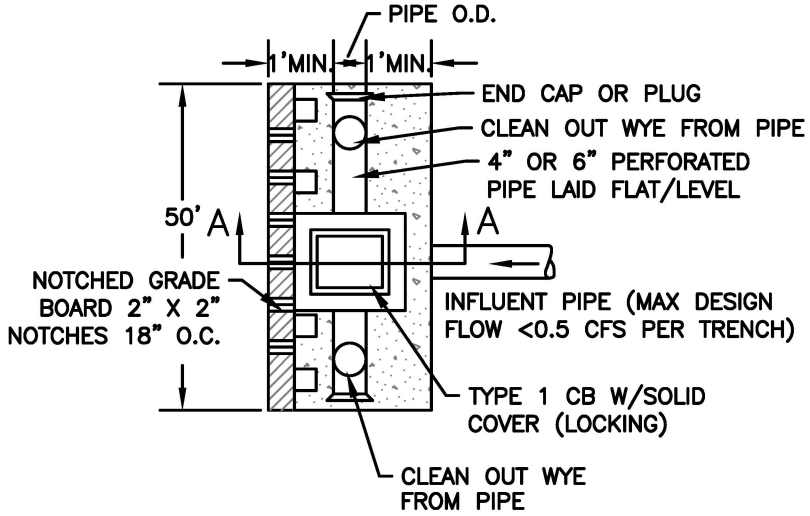
Mark Henrey

06/11/2018

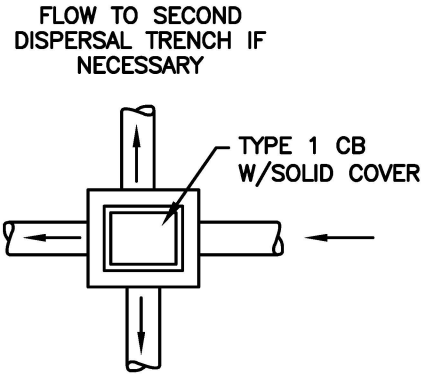
CITY ENGINEER DATE

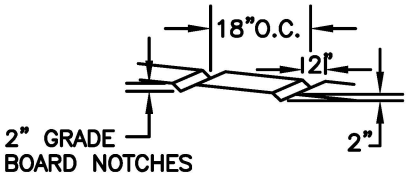
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2	02/17/17	CAS	KDU

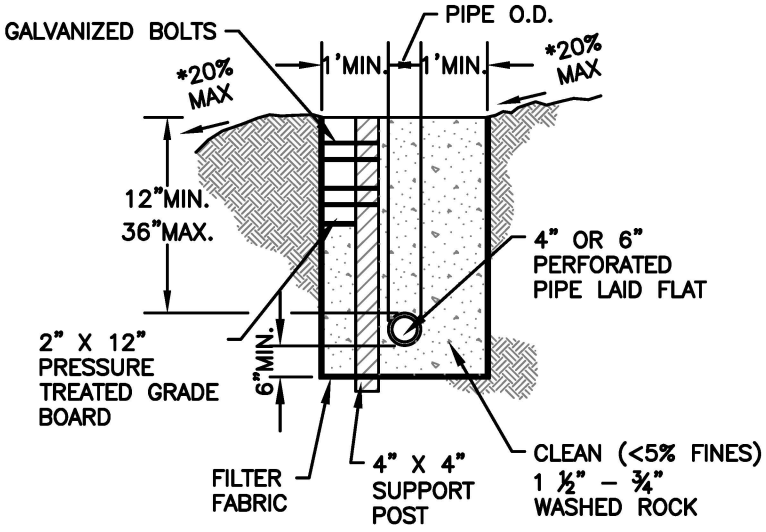
ST–12.03



PLAN







*15% MAX FOR FLOW CONTROL/WATER QUALITY TREATMENT IN RURAL AREAS.

SECTION A–A

NOTES:

1. THIS TRENCH SHALL BE CONSTRUCTED SO AS TO PREVENT POINT DISCHARGE AND/OR EROSION.
2. TRENCHES MAY BE PLACED NO CLOSER THAN 50 FEET TO ONE ANOTHER. (100 FEET ALONG FLOWLINE)
3. TRENCH AND GRADE BOARD MUST BE LEVEL. ALIGN TO FOLLOW CONTOURS OF SITE.
4. SUPPORT POST SPACING AS REQUIRED BY SOIL CONDITIONS TO ENSURE GRADE BOARD REMAINS LEVEL.
5. TRENCHES SERVING UP TO 700 SQUARE FEET OF ROOF AREA MAY BE SIMPLE 10–FOOT–LONG BY 2–FOOT WIDE GRAVEL TRENCHES. FOR ROOF AREAS LARGER THAN 700 SQUARE FEET, A DISPERSION TRENCH WITH NOTCHED GRADE BOARD OR ALTERNATIVE MATERIAL APPROVED BY THE LOCAL PLAN APPROVAL AUTHORITY MAY BE USED. THE TOTAL LENGTH OF THIS DESIGN MUST NOT EXCEED 50 FEET AND MUST PROVIDE AT LEAST 10 FEET OF TRENCH PER 700 SQUARE FEET OF ROOF AREA.
6. REFER TO BMP T5.10B IN VOLUME III OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

STANDARD DISPERSION TRENCH WITH NOTCHED GRADE BOARD

STANDARD DETAIL

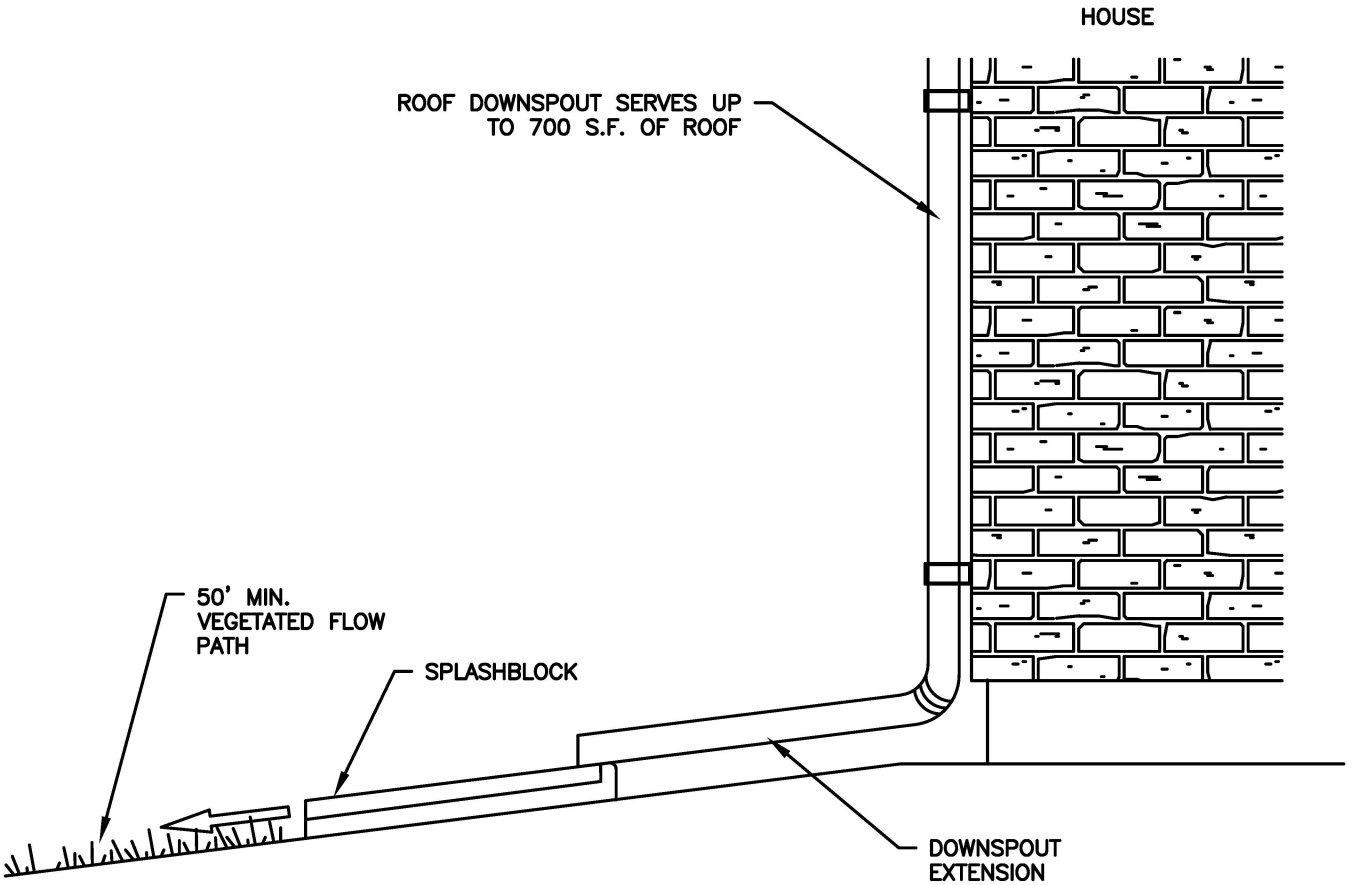
CITY OF BATTLE GROUND
APPROVED

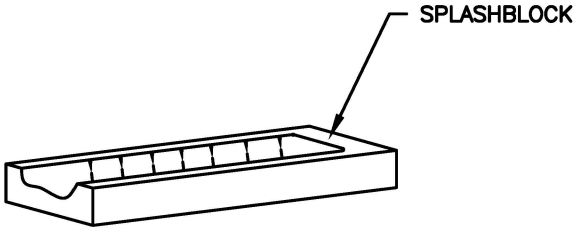
Mark Henrey 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	12/29/16	KDU	KDU
2	02/17/17	CAS	KDU

ST–12.04





NOTE:

REFER TO BMP T5.10B IN VOLUME III OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

DOWNSPOUT SPLASHBLOCK DISPERSION

STANDARD DETAIL

THE CITY OF BATTLE GROUND

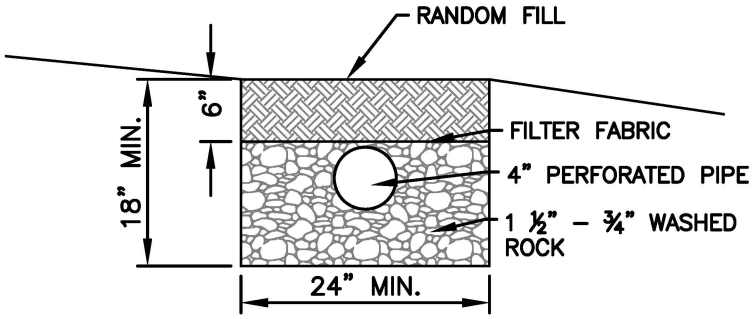
CITY OF BATTLE GROUND
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Mark Henrey 06/11/2018

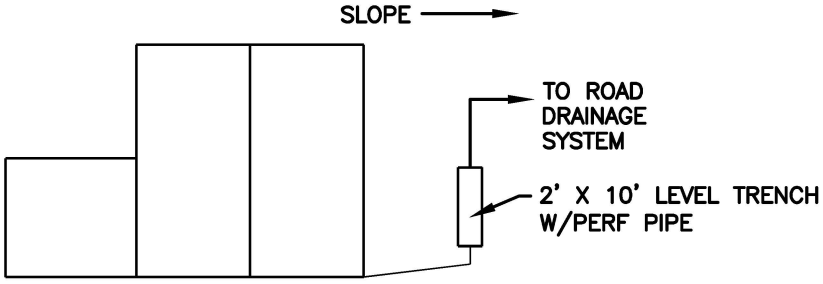
CITY ENGINEER DATE

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1	12/29/16	KDU	KDU
2	02/17/17	CAS	KDU

ST-12.05



TRENCH CROSS SECTION



PLAN VIEW OF ROOF

NOTE:

REFER TO BMP T5.10C IN VOLUME III OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

PERFORATED STUB–OUT CONNECTION

STANDARD DETAIL

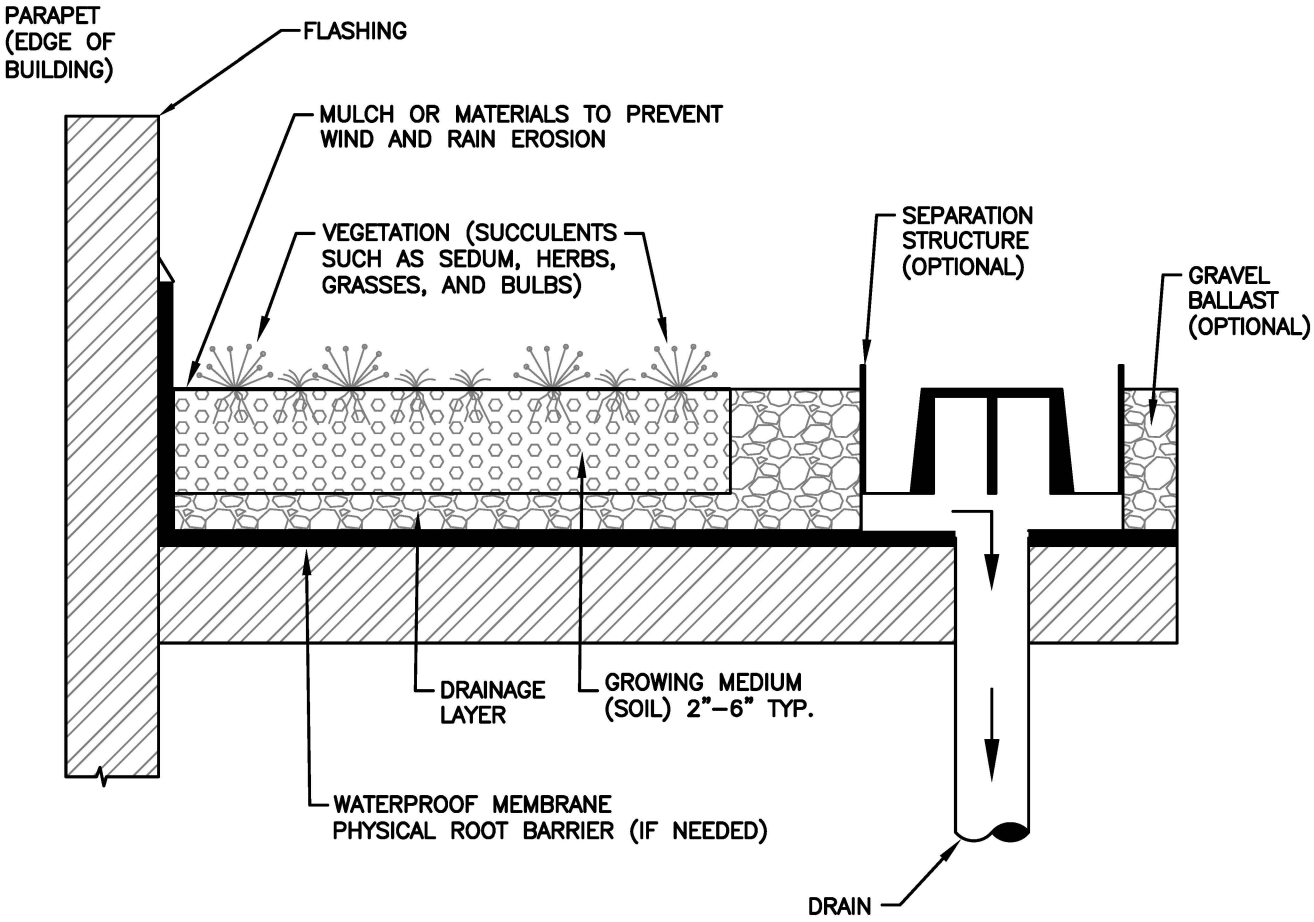
CITY OF BATTLE GROUND
APPROVED

Mark Henrey 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	12/29/16	KDU	KDU
2	02/17/17	CAS	KDU

ST–12.06



NOTE:

REFER TO BMP T5.17 OF VOLUME V OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON FOR MORE INFORMATION.

N.T.S.

VEGETATED ROOF SECTION

STANDARD DETAIL

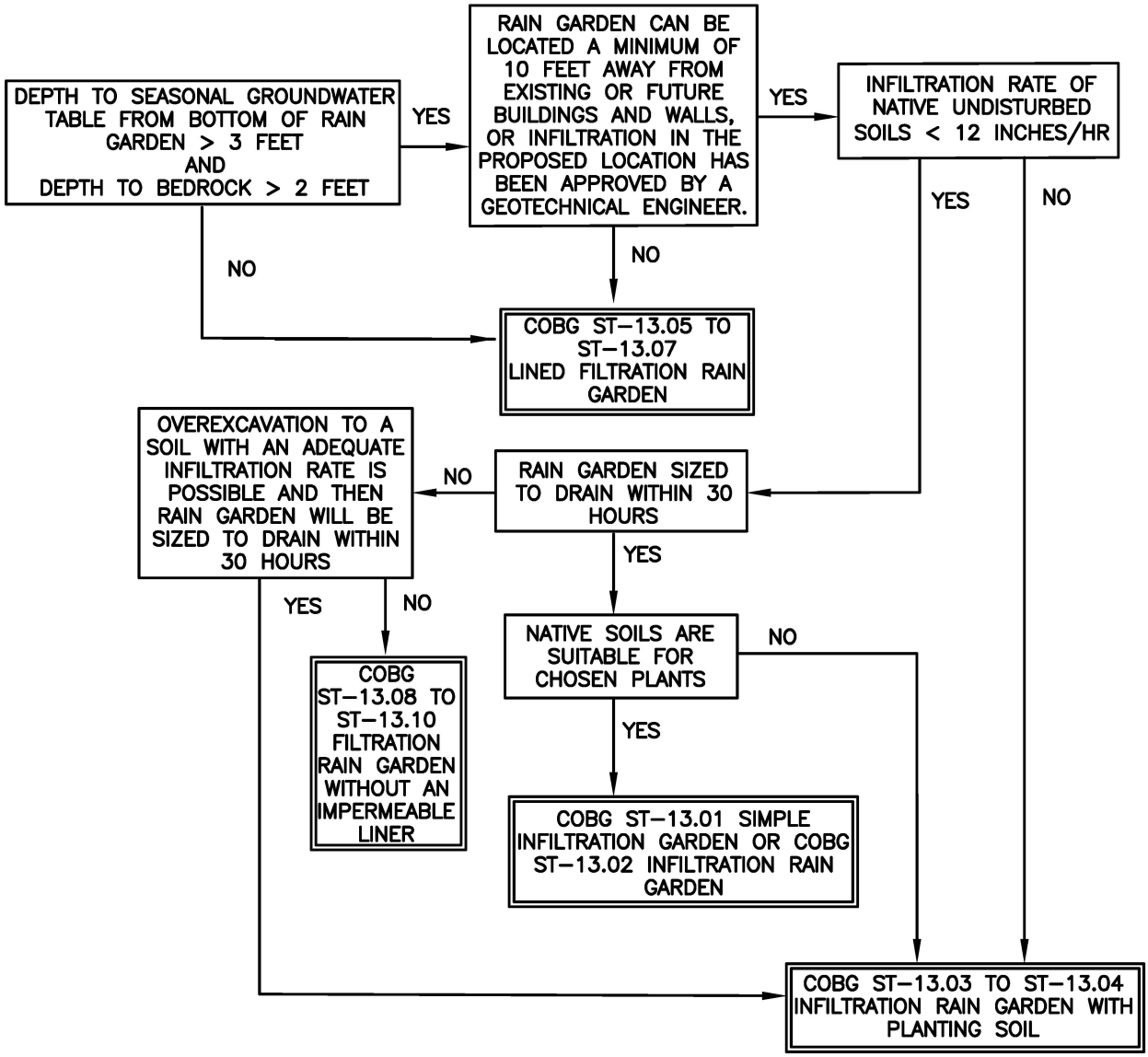
CITY OF BATTLE GROUND
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CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	12/29/16	KDU	KDU
2	02/21/17	CAS	KDU

ST–12.07



RAIN GARDEN FLOW CHART

STANDARD DETAIL

THE CITY OF BATTLE GROUND

CITY OF BATTLE GROUND
APPROVED

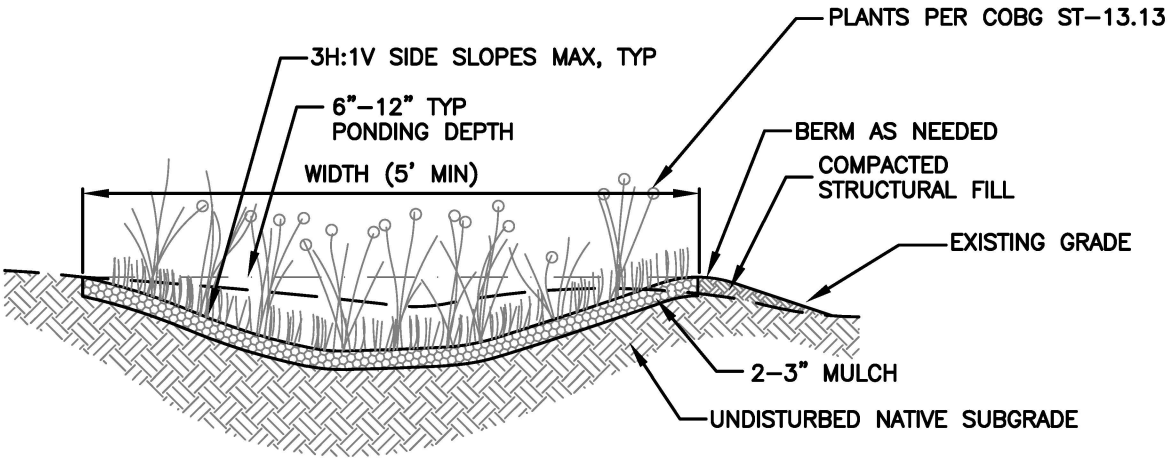
Mark Henrey

06/11/2018

CITY ENGINEER DATE

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1	01/23/17	KDU	KDU
2	02/09/17	CAS	KDU

ST-13.00



INFILTRATION RAIN GARDEN NOTES

DESIGN NOTES:

1. PLANT PER COBG ST-13.13. NATIVE PLANTS ARE PREFERRED. NON-NATIVE AND INVASIVE SPECIES CAN REPRODUCE DOWNSTREAM DAMAGING HABITAT AND CHANGING HYDROLOGY. IF NON-NATIVES ARE CHOSEN, BE SURE THAT THEY WILL NOT DAMAGE DOWNSTREAM WATERWAYS.

CONSTRUCTION NOTES:

2. BUILD AND VEGETATE RAIN GARDEN AS EARLY AS POSSIBLE TO ESTABLISH PLANTINGS BEFORE DIRECTING STORMWATER RUNOFF TO IT OR DIVERT STORMWATER AROUND FACILITY. PREFERABLY, THIS PERIOD WOULD LAST A MINIMUM OF 3 MONTHS OR PER LANDSCAPE ARCHITECT/DESIGNER GUIDELINES.
3. INFILTRATION AREAS (THE AREA OF THE RAIN GARDEN AS DEFINED BY THE TOP ELEVATION OF THE FACILITY) SHALL BE FENCED OFF FROM INITIAL EXCAVATION UNTIL PROJECT COMPLETION TO PREVENT COMPACTION OF THE SUBGRADE, DIRT TRACKING ONTO ANY LAYER OF THE FACILITY, AND STOCKPILING OF CONSTRUCTION MATERIALS THAT MAY CLOG THE SURFACE.
4. DURING EXCAVATION OF NATIVE SOILS TO THE BOTTOM OF THE FACILITY, RAINFALL MAY CAUSE FINES TO CLOG THE SURFACE OF THE FACILITY. IF THIS OCCURS DURING CONSTRUCTION, HAND RAKE THE SURFACE TO A DEPTH OF 3" TO RESTORE INFILTRATION CAPACITY.
5. NOTIFY INSPECTOR 24 HOURS IN ADVANCE OF CONSTRUCTING THIS FACILITY.

	PONDING DEPTH	SOIL DRAINAGE RATES				
		0.01-0.24 IN/HR	0.25-0.49 IN/HR	0.50-0.99 IN/HR	1.00-2.49 IN/HR	2.50+ IN/HR
GOOD	6"-12"	19%	12%	10%	7%	6%
BETTER	6"-12"	29%	18%	14%	11%	8%
BEST	6"	54%	43%	34%	27%	18%
	12"	NA	36%	31%	25%	17%

NOTE:

SIZE THE TOP SURFACE OF THE PONDING AREA FOR THE RAIN GARDEN BY MULTIPLYING THE CONTRIBUTING AREA BY THE ABOVE PERCENTAGES.

N.T.S.

SIMPLE INFILTRATION RAIN GARDEN

STANDARD DETAIL

THE CITY OF BATTLE GROUND

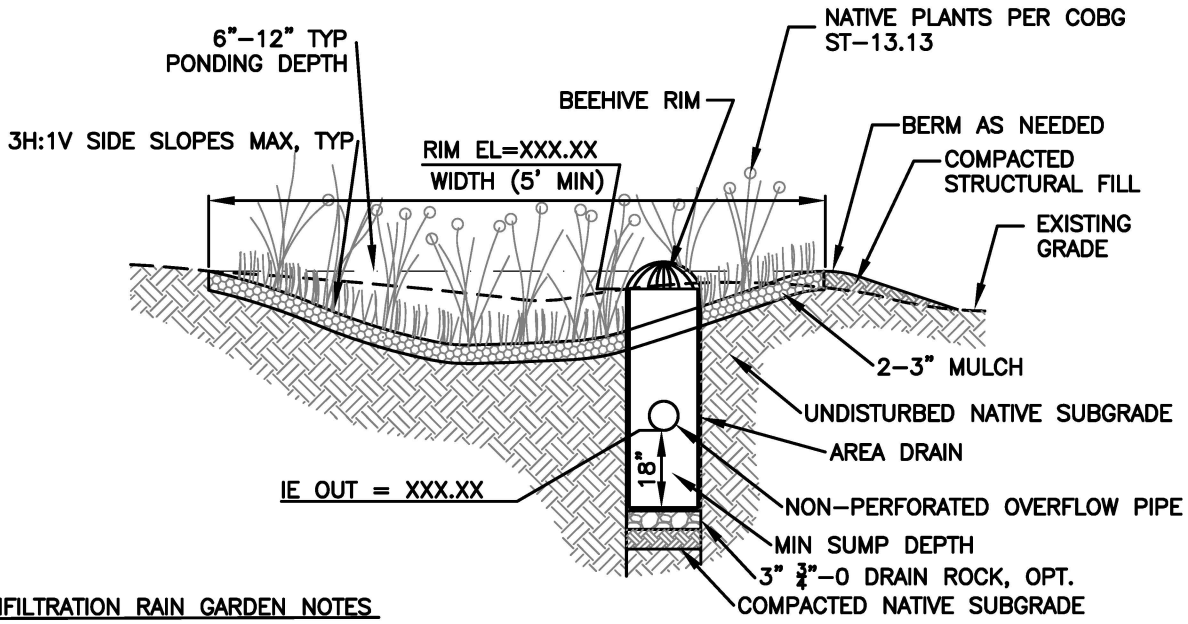
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1	01/23/17	KDU	KDU
2	02/08/17	CAS	KDU

ST-13.01



INFILTRATION RAIN GARDEN NOTES

DESIGN NOTES:

1. PLANT PER COBG ST–13.13. NATIVE PLANTS ARE PREFERRED. NON–NATIVE AND INVASIVE SPECIES CAN REPRODUCE DOWNSTREAM DAMAGING HABITAT AND CHANGING HYDROLOGY. IF NON–NATIVES ARE CHOSEN, BE SURE THAT THEY WILL NOT DAMAGE DOWNSTREAM HABITAT.

CONSTRUCTION NOTES:

2. BUILD AND VEGETATE RAIN GARDEN AS EARLY AS POSSIBLE TO ESTABLISH PLANTINGS BEFORE DIRECTING STORMWATER RUNOFF TO IT, OR DIVERT STORMWATER AROUND FACILITY. PREFERABLY, THIS PERIOD WOULD LAST A MINIMUM OF 3 MONTHS OR PER LANDSCAPE ARCHITECT/DESIGNER GUIDELINES.
3. INFILTRATION AREAS (THE AREA OF THE RAIN GARDEN AS DEFINED BY THE TOP ELEVATION OF THE FACILITY) SHALL BE FENCED OFF FROM INITIAL EXCAVATION UNTIL PROJECT COMPLETION TO PREVENT COMPACTION OF THE SUBGRADE, DIRT TRACKING ONTO ANY LAYER OF THE FACILITY AND STOCKPILING OF CONSTRUCTION MATERIALS THAT MAY CLOG THE SURFACE.
4. DURING EXCAVATION OF NATIVE SOILS TO THE BOTTOM OF THE FACILITY, RAINFALL MAY CAUSE FINES TO CLOG THE SURFACE OF THE FACILITY. IF THE NATIVE SOIL HAS BEEN EXPOSED TO RAINFALL, HAND RAKE THE SURFACE TO A DEPTH OF 3" TO RESTORE INFILTRATION CAPACITY.
5. NOTIFY INSPECTOR 24 HOURS IN ADVANCE OF CONSTRUCTING THIS FACILITY.
6. DURING AREA DRAIN INSTALLATION, DISTURB NATIVE SOILS AS LITTLE AS POSSIBLE.

	PONDING DEPTH	SOIL DRAINAGE RATES				
		0.01–0.24 IN/HR	0.25–0.49 IN/HR	0.50–0.99 IN/HR	1.00–2.49 IN/HR	2.50+ IN/HR
GOOD	6"–12"	19%	12%	10%	7%	6%
BETTER	6"–12"	29%	18%	14%	11%	8%
BEST	6"	54%	43%	34%	27%	18%
	12"	NA	36%	31%	25%	17%

NOTE:

SIZE THE TOP SURFACE OF THE PONDING AREA FOR THE RAIN GARDEN BY MULTIPLYING THE CONTRIBUTING AREA BY THE ABOVE PERCENTAGES.

N.T.S.

INFILTRATION RAIN GARDEN

STANDARD DETAIL

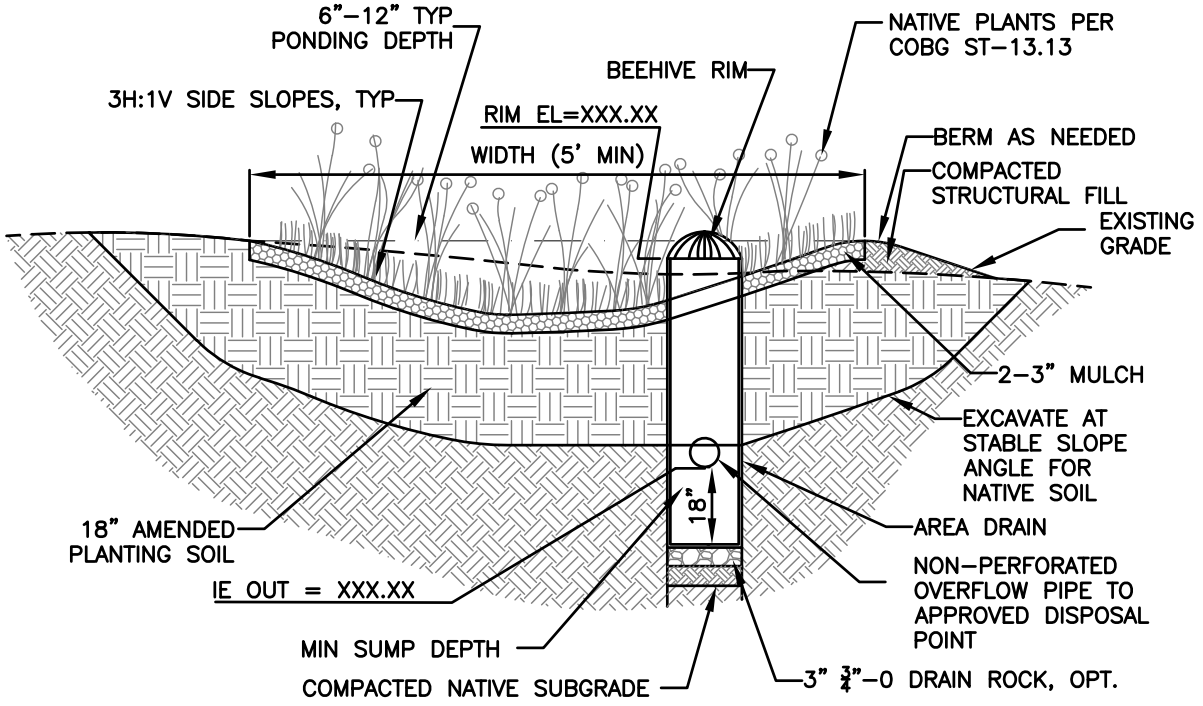
CITY OF BATTLE GROUND
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Mark Henrey 06/11/2018

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REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	01/23/17	KDU	KDU
2	02/09/17	CAS	KDU

ST–13.02



INFILTRATION RAIN GARDEN WITH PLANTING SOIL NOTES

DESIGN NOTES:

1. PLANT PER COBG ST–13.13. NATIVE PLANTS ARE PREFERRED. NON–NATIVE AND INVASIVE SPECIES CAN MOVE DOWNSTREAM DAMAGING HABITAT AND CHANGING HYDROLOGY. IF NON–NATIVES ARE CHOSEN, BE SURE THAT THEY WILL NOT DAMAGE DOWNSTREAM HABITAT.

CONSTRUCTION NOTES:

2. BUILD AND VEGETATE RAIN GARDEN AS EARLY AS POSSIBLE TO ESTABLISH PLANTINGS BEFORE DIRECTING STORMWATER RUNOFF TO IT OR DIVERT STORMWATER AROUND FACILITY. PREFERABLY, THIS PERIOD WOULD LAST A MINIMUM OF 3 MONTHS OR PER LANDSCAPE ARCHITECT/DESIGNER GUIDELINES.
3. INFILTRATION AREAS (THE AREA OF THE RAIN GARDEN AS DEFINED BY THE TOP ELEVATION OF THE FACILITY) SHALL BE FENCED OFF FROM INITIAL EXCAVATION UNTIL PROJECT COMPLETION TO PREVENT COMPACTION OF THE SUBGRADE, DIRT TRACKING ONTO ANY LAYER OF THE FACILITY AND STOCKPILING OF CONSTRUCTION MATERIALS THAT MAY CLOG THE SURFACE.
4. DURING EXCAVATION OF NATIVE SOILS TO THE BOTTOM OF THE FACILITY, RAINFALL MAY CAUSE FINES TO CLOG THE SURFACE OF THE FACILITY. IF THE NATIVE SOIL HAS BEEN EXPOSED TO RAINFALL, HAND RAKE THE SURFACE TO A DEPTH OF 3" TO RESTORE INFILTRATION CAPACITY.
5. NOTIFY INSPECTOR 24 HOURS IN ADVANCE OF CONSTRUCTING THIS FACILITY.
6. DURING AREA DRAIN INSTALLATION, DISTURB NATIVE SOILS AS LITTLE AS POSSIBLE.

N.T.S.

INFILTRATION RAIN GARDEN WITH PLANTING SOIL (1)

STANDARD DETAIL

CITY OF BATTLE GROUND
APPROVED

Mark Henrey 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	01/23/17	KDU	KDU
2	02/09/17	CAS	KDU

ST–13.03

AMENDED PLANTING SOIL MIX SPECIFICATIONS

1. AMENDED PLANTING SOIL MIX SHALL HAVE THE FOLLOWING CHARACTERISTICS:
   a. 60% LOAMY SAND AND 40% COMPOST.
   b. ORGANIC CONTENT MATTER FROM 5–8% BY WEIGHT
   c. CATION EXCHANGE CAPACITY (CEC) GREATER THAN OR EQUAL TO 5 MILLIEQUIVALENTS/100 GRAMS OF DRY SOIL
   d. 2–5% MINERAL FINES CONTENT
   e.

US STANDARD SIEVE SIZE	PERCENT PASSING
3/8"	100
#4	95–100
#10	75–90
#40	25–40
#100	4–10
#200	2–5

   MINIMUM LONG–TERM HYDRAULIC CONDUCTIVITY OF 1 INCH/HOUR PER ASTM D2434 AT 85% COMPACTION PER ASTM D 1557.
   f. MAXIMUM IMMEDIATE HYDRAULIC CONDUCTIVITY OF 12 INCHES/HOUR.
2. AMENDED PLANTING SOIL MIX MAY BE CREATED BY TESTING ON–SITE NATIVE SOILS AND MIXING MATERIALS FROM OFF–SITE AS NEEDED TO ACHIEVE THE CHARACTERISTICS DESCRIBED IN NOTE 1 ABOVE.
3. AMENDED PLANTING SOIL MIX SHOULD BE UNIFORMLY MIXED WITH A SOIL MIXER.
4. PLACEMENT OF AMENDED PLANTING SOIL MIX SHALL OCCUR PER THE FOLLOWING GUIDELINES:
   a. PLACE SOIL IN 12" LIFTS, KEEPING MACHINERY OUTSIDE OF INFILTRATION AREA.
   b. DO NOT PLACE SOILS IF SATURATED.
   c. COMPACT EACH LIFT WITH WATER OR BOOT PACKING UNTIL JUST SATURATED TO 85% COMPACTION. DO NOT COMPACT WITH HEAVY MACHINERY OR VIBRATORY COMPACTION.

	PONDING DEPTH	SOIL DRAINAGE RATES				
		0.01–0.24 IN/HR	0.25–0.49 IN/HR	0.50–0.99 IN/HR	1.00–2.49 IN/HR	2.50+ IN/HR
GOOD	6"–12"	19%	12%	10%	7%	6%
BETTER	6"–12"	29%	18%	14%	11%	8%
BEST	6"	54%	43%	34%	27%	18%
	12"	NA	36%	31%	25%	17%

NOTE:

SIZE THE TOP SURFACE OF THE PONDING AREA FOR THE RAIN GARDEN BY MULTIPLYING THE CONTRIBUTING AREA BY THE ABOVE PERCENTAGES.

N.T.S.

INFILTRATION RAIN GARDEN WITH PLANTING SOIL (2)

STANDARD DETAIL

THE CITY OF BATTLE GROUND

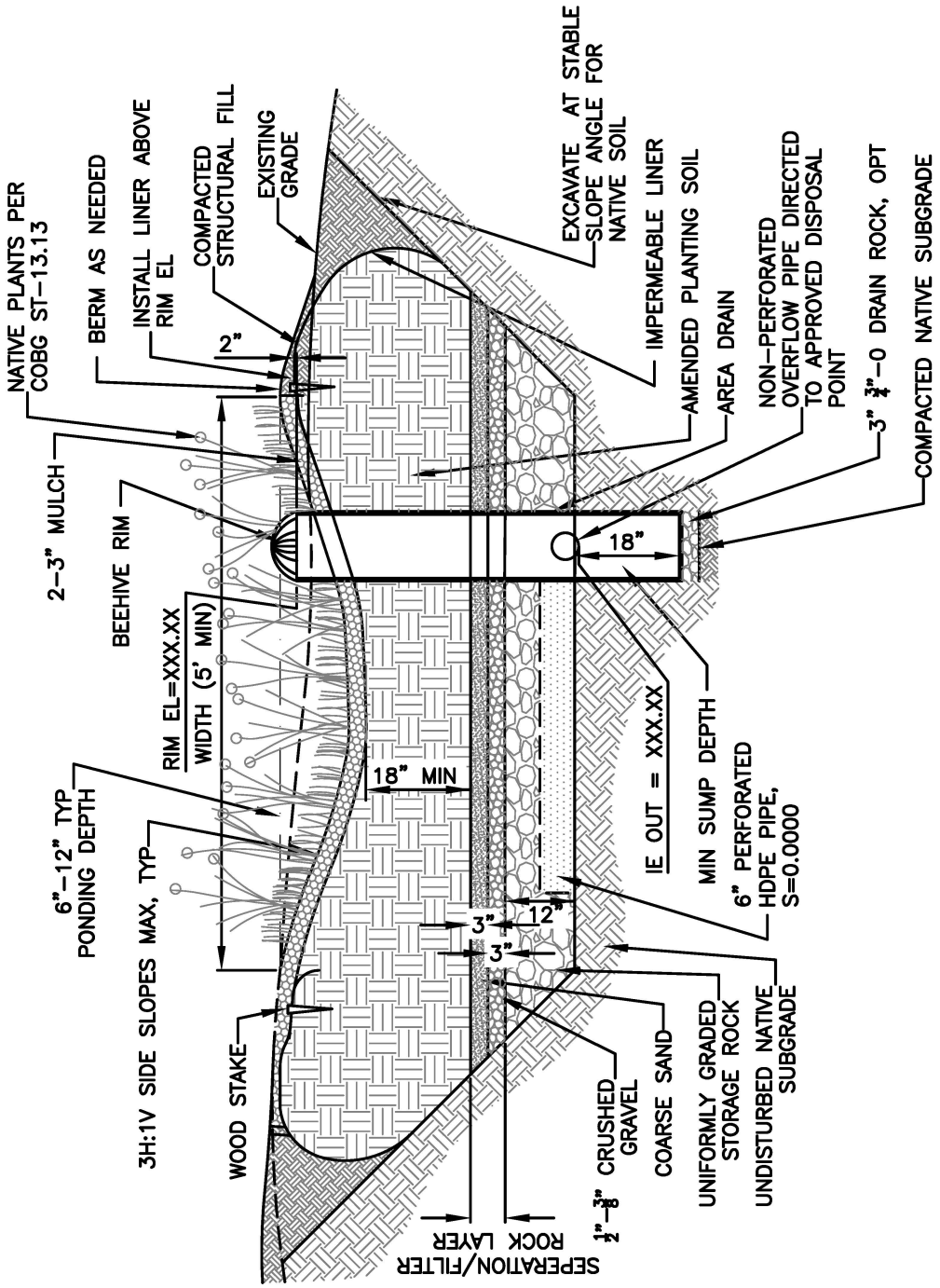
CITY OF BATTLE GROUND
APPROVED

Mark Henrey 06/11/2018

CITY ENGINEER DATE

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1	01/23/17	KDU	KDU
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ST–13.04



N.T.S.

LINED FILTRATION RAIN GARDEN (1)

STANDARD DETAIL

CITY OF BATTLE GROUND
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06/11/2018

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1	01/23/17	KDU	KDU
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ST-13.05

FILTRATION RAIN GARDEN NOTES
DESIGN NOTES:

1. PLANT PER COBG ST–13.13. NATIVE PLANTS ARE PREFERRED, BECAUSE NON–NATIVE AND INVASIVE SPECIES CAN MOVE DOWNSTREAM DAMAGING HABITAT AND CHANGING HYDROLOGY. IF NON–NATIVES ARE CHOSEN, BE SURE THAT THEY WILL NOT DAMAGE DOWNSTREAM HABITAT.
2. IMPERMEABLE LINER MAY BE 30 MIL PE OR PVC POND LINER OR BENTONITE CLAY MAT.

CONSTRUCTION NOTES:

3. BUILD AND VEGETATE RAIN GARDEN AS EARLY AS POSSIBLE TO ESTABLISH PLANTINGS BEFORE DIRECTING STORMWATER RUNOFF TO IT OR DIVERT STORMWATER AROUND FACILITY. PREFERABLY, THIS PERIOD WOULD LAST A MINIMUM OF 3 MONTHS.
4. INFILTRATION AREAS (THE AREA OF THE RAIN GARDEN AS DEFINED BY THE TOP ELEVATION OF THE FACILITY) SHALL BE FENCED OFF FROM INITIAL EXCAVATION UNTIL PROJECT COMPLETION TO PREVENT COMPACTION OF THE SUBGRADE, DIRT TRACKING ONTO ANY LAYER OF THE FACILITY AND STOCKPILING OF CONSTRUCTION MATERIALS THAT MAY CLOG THE SURFACE.
5. DURING EXCAVATION OF NATIVE SOILS TO THE BOTTOM OF THE FACILITY, RAINFALL MAY CAUSE FINES TO CLOG THE SURFACE OF THE FACILITY. IF THE NATIVE SOIL HAS BEEN EXPOSED TO RAINFALL, HAND RAKE THE SURFACE TO A DEPTH OF 3" TO RESTORE INFILTRATION CAPACITY.
6. NOTIFY INSPECTOR 24 HOURS IN ADVANCE OF CONSTRUCTING THIS FACILITY.
7. DURING AREA DRAIN INSTALLATION, DISTURB NATIVE SOILS AS LITTLE AS POSSIBLE.
8. DO NOT PUNCTURE LINER ANYWHERE EXCEPT AT THE TOP AS SHOWN. IF AN ALTERNATE LINER CONFIGURATION IS USED, ENSURE THAT DURING EVERY STORM FOR EVERY DEPTH OF WATER THAT MAY BE RETAINED, THE LINER PROTECTS STRUCTURES FROM WATER DAMAGE.

AMENDED PLANTING SOIL MIX SPECIFICATIONS

1. AMENDED PLANTING SOIL MIX SHALL HAVE THE FOLLOWING CHARACTERISTICS:
   a. 60% LOAMY SAND AND 40% COMPOST.
   b. ORGANIC CONTENT MATTER FROM 5–8% BY WEIGHT
   c. CATION EXCHANGE CAPACITY (CEC) GREATER THAN OR EQUAL TO 5 MILLIEQUIVALENTS/100 GRAMS OF DRY SOIL
   d. 2–5% MINERAL FINES CONTENT
   e.

US STANDARD SIEVE SIZE	PERCENT PASSING
3/8"	100
#4	95–100
#10	75–90
#40	25–40
#100	4–10
#200	2–5

   MINIMUM LONG–TERM HYDRAULIC CONDUCTIVITY OF 1 INCH/HOUR PER ASTM D2434 AT 85% COMPACTION PER ASTM D 1557.
   f. MAXIMUM IMMEDIATE HYDRAULIC CONDUCTIVITY OF 12 INCHES/HOUR.
2. AMENDED PLANTING SOIL MIX MAY BE CREATED BY TESTING ON–SITE NATIVE SOILS AND MIXING MATERIALS FROM OFF–SITE AS NEEDED TO MEET THE SPECIFICATIONS IN NOTE 1 ABOVE.
3. AMENDED PLANTING SOIL MIX SHOULD BE UNIFORMLY MIXED WITH A SOIL MIXER.
4. PLACEMENT OF AMENDED PLANTING SOIL MIX SHALL OCCUR PER THE FOLLOWING GUIDELINES:
   a. PLACE SOIL IN 12" LIFTS, KEEPING MACHINERY OUTSIDE OF INFILTRATION AREA.
   b. DO NOT PLACE SOILS IF SATURATED.
   c. COMPACT EACH LIFT WITH WATER OR BOOT PACKING UNTIL JUST SATURATED TO 85% COMPACTION. DO NOT COMPACT WITH HEAVY MACHINERY OR VIBRATORY COMPACTION.

N.T.S.

LINED FILTRATION RAIN GARDEN (2)

STANDARD DETAIL

THE CITY OF BATTLE GROUND

CITY OF BATTLE GROUND
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Mark Henrey 06/11/2018

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ST–13.06

SEPARATION/FILTER ROCK SPECIFICATIONS

1. SEPARATION/FILTER ROCK SHALL BE WASHED ROCK.
2. THE COARSE SAND PORTION SHALL MEET HAVE THE FOLLOWING GRADATION:

US. STANDARD SIEVE SIZE	PERCENT PASSING
3/8"	100
#4	54–82
#10	34–56
#40	9–17
#100	0–3

3. THE 1/2"–3/8" CRUSHED GRAVEL PORTION SHALL MEET THE FOLLOWING GRADATION (ASTM C–33):

US. STANDARD SIEVE SIZE	PERCENT PASSING
1/2"	100
3/8"	85–100
#4	10–30
#10	0–10
#8	0–10
#16	0–5

4. UNIFORMLY GRADED STORAGE ROCK SHALL MEET THE FOLLOWING GRADATION:

US. STANDARD SIEVE SIZE	PERCENT PASSING
1 1/2"	100
1"	95–100
1/2"	25–60
#4	0–10
#8	0–5

UNIFORMLY GRADED STORAGE ROCK SHALL HAVE A MINIMUM VOID RATIO OF 30%.

LINED FILTRATION RAIN GARDEN (3)

STANDARD DETAIL

THE CITY OF BATTLE GROUND

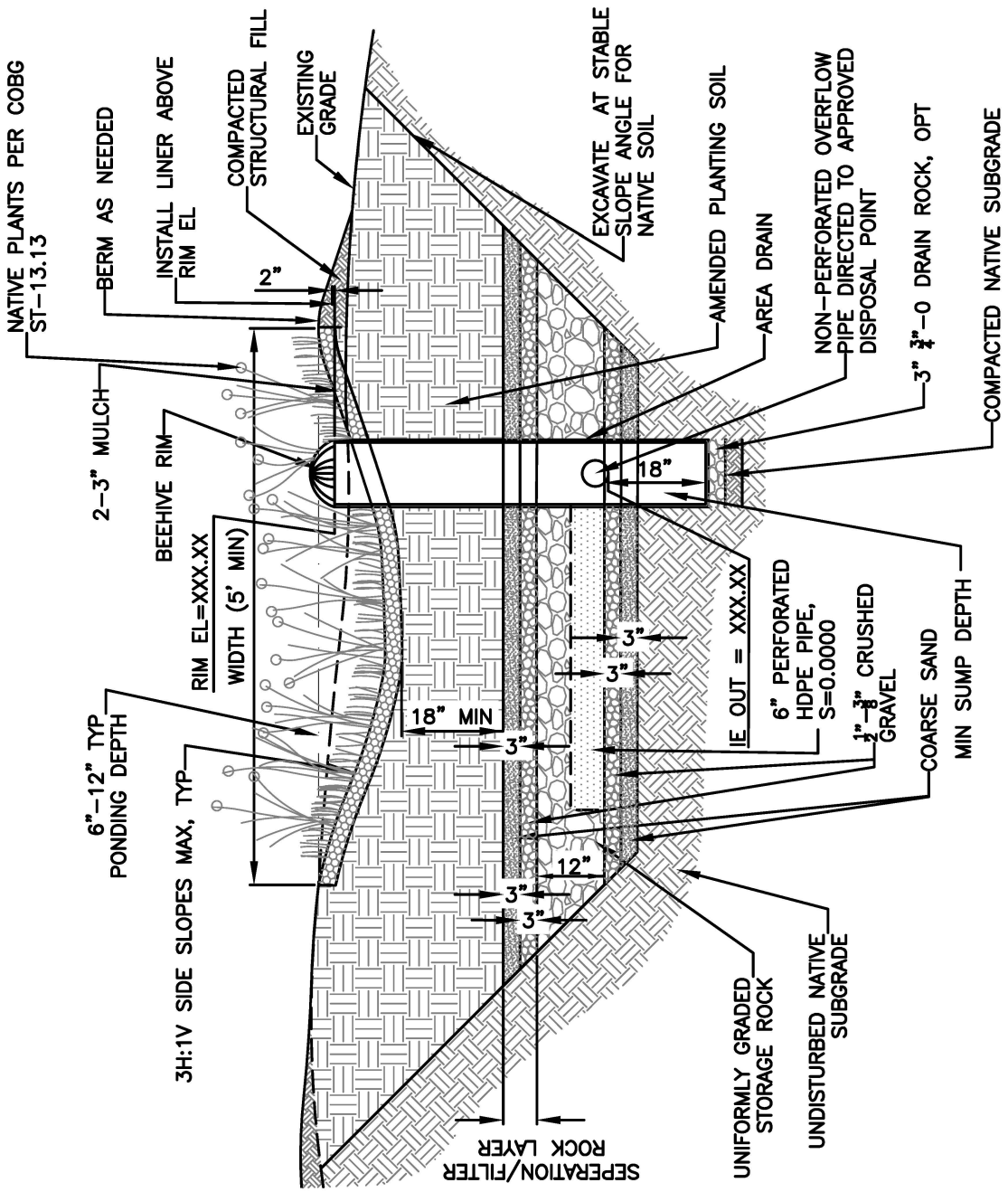
CITY OF BATTLE GROUND
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Mark Henrey 06/11/2018

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ST–13.07



N.T.S.

FILTRATION RAIN GARDEN WITHOUT IMPERMEABLE LINER (1)

STANDARD DETAIL

CITY OF BATTLE GROUND
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1	01/23/17	KDU	KDU
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ST-13.08

FILTRATION RAIN GARDEN NOTES

DESIGN NOTES:

1. PLANT WITH PLANTS PER COBG ST-13.13. NATIVE PLANTS ARE PREFERRED, BECAUSE NON-NATIVE AND INVASIVE SPECIES CAN MOVE DOWNSTREAM AND DAMAGE HABITAT. IF NON-NATIVES ARE CHOSEN, BE SURE THAT THEY WILL NOT DAMAGE DOWNSTREAM HABITAT.

CONSTRUCTION NOTES:

2. BUILD AND VEGETATE RAIN GARDEN AS EARLY AS POSSIBLE TO ESTABLISH PLANTINGS BEFORE DIRECTING STORMWATER RUNOFF TO IT OR DIVERT STORMWATER AROUND FACILITY. PREFERABLY, THIS PERIOD WOULD LAST A MINIMUM OF 3 MONTHS.
3. INFILTRATION AREAS (THE AREA OF THE RAIN GARDEN AS DEFINED BY THE TOP ELEVATION OF THE FACILITY) SHALL BE FENCED OFF FROM THE FIRST DAY OF EARTH MOVING UNTIL PROJECT COMPLETION TO PREVENT COMPACTION OF THE SUBGRADE, DIRT TRACKING ONTO ANY LAYER OF THE FACILITY AND STOCKPILING OF CONSTRUCTION MATERIALS THAT MAY CLOG THE SURFACE.
4. DURING EXCAVATION OF NATIVE SOILS TO THE BOTTOM OF THE FACILITY, RAINFALL MAY CAUSE FINES TO CLOG THE SURFACE OF THE FACILITY. IF THE NATIVE SOIL HAS BEEN EXPOSED TO RAINFALL, HAND RAKE THE SURFACE TO A DEPTH OF 3" TO RESTORE INFILTRATION CAPACITY.
5. NOTIFY INSPECTOR 24 HOURS IN ADVANCE OF CONSTRUCTING THIS FACILITY.
6. DURING AREA DRAIN INSTALLATION, DISTURB NATIVE SOILS AS LITTLE AS POSSIBLE.

AMENDED PLANTING SOIL MIX SPECIFICATIONS

1. AMENDED PLANTING SOIL MIX SHALL HAVE THE FOLLOWING CHARACTERISTICS:
   a. 60% LOAMY SAND AND 40% COMPOST.
   b. ORGANIC CONTENT MATTER FROM 5-8% BY WEIGHT
   c. CATION EXCHANGE CAPACITY (CEC) GREATER THAN OR EQUAL TO 5 MILLIEQUIVALENTS/100 GRAMS OF DRY SOIL
   d. 2-5% MINERAL FINES CONTENT
   e.

US STANDARD SIEVE SIZE	PERCENT PASSING
3/8"	100
#4	95-100
#10	75-90
#40	25-40
#100	4-10
#200	2-5

   MINIMUM LONG-TERM HYDRAULIC CONDUCTIVITY OF 1 INCH/HOUR PER ASTM D2434 AT 85% COMPACTION PER ASTM D 1557.
   f. MAXIMUM IMMEDIATE HYDRAULIC CONDUCTIVITY OF 12 INCHES/HOUR.
2. AMENDED PLANTING SOIL MIX MAY BE CREATED BY TESTING ON-SITE NATIVE SOILS AND MIXING MATERIALS FROM OFF-SITE AS NEEDED TO ACHIEVE THE CHARACTERISTICS DESCRIBED IN NOTE 1 ABOVE.
3. AMENDED PLANTING SOIL MIX SHOULD BE UNIFORMLY MIXED WITH A SOIL MIXER.
4. PLACEMENT OF AMENDED PLANTING SOIL MIX SHALL OCCUR PER THE FOLLOWING GUIDELINES:
   a. PLACE SOIL IN 12" LIFTS TO A DEPTH OF 24" TOTAL (AFTER COMPACTION) WITH MACHINERY ADJACENT STORMWATER QUALITY FACILITY.
   b. DO NOT PLACE SOILS IF SATURATED.
   c. COMPACT EACH LIFT TO 85% COMPACTION WITH WATER UNTIL SATURATED. DO NOT COMPACT WITH HEAVY MACHINERY OR WITH VIBRATORY COMPACTION. BOOT PACKING THE LIFTS IS ACCEPTABLE.

FILTRATION RAIN GARDEN WITHOUT IMPERMEABLE LINER (2)

STANDARD DETAIL

THE CITY OF BATTLE GROUND

CITY OF BATTLE GROUND
APPROVED

Mark Henry 06/11/2018

CITY ENGINEER DATE

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1	01/23/17	KDU	KDU
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ST-13.09

SEPARATION/FILTER ROCK SPECIFICATIONS

1. SEPARATION/FILTER ROCK SHALL BE WASHED ROCK.
2. THE COARSE SAND PORTION SHALL MEET THE FOLLOWING GRADATION:

US STANDARD SIEVE SIZE	PERCENT PASSING
$\frac{3}{8}$"	100
#4	54–82
#10	34–56
#40	9–17
#100	0–3

3. THE $\frac{1}{2}$"–$\frac{3}{8}$" CRUSHED GRAVEL PORTION SHALL MEET THE FOLLOWING GRADATION (ASTM C–33):

US STANDARD SIEVE SIZE	PERCENT PASSING
$\frac{1}{2}$"	100
$\frac{3}{8}$"	85–100
#4	10–30
#10	0–10
#8	0–10
#16	0–5

4. UNIFORMLY GRADED STORAGE ROCK SHALL MEET THE FOLLOWING GRADATION:

US STANDARD SIEVE SIZE	PERCENT PASSING
1$\frac{1}{2}$"	100
1"	95–100
$\frac{1}{2}$"	25–60
#4	0–10
#8	0–5

UNIFORMLY GRADED STORAGE ROCK SHALL HAVE A MINIMUM VOID RATIO OF 30%.

FILTRATION RAIN GARDEN WITHOUT IMPERMEABLE LINER (3)

STANDARD DETAIL

THE CITY OF BATTLE GROUND

CITY OF BATTLE GROUND
APPROVED

Mark Hennes 06/11/2018

CITY ENGINEER DATE

REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	01/23/17	KDU	KDU
2	02/09/17	CAS	KDU

ST–13.10

INFILTRATION RAIN GARDEN WITH PLANTING SOIL

	PONDING DEPTH	SOIL DRAINAGE RATES				
		0.01–0.24 IN/HR	0.25–0.49 IN/HR	0.50–0.99 IN/HR	1.00–2.49 IN/HR	2.50+ IN/HR
GOOD	6"–12"	19%	12%	10%	7%	6%
BETTER	6"–12"	29%	18%	14%	11%	8%
BEST	6"	54%	43%	34%	27%	18%
	12"	NA	36%	31%	25%	17%

NOTE:

SIZE THE TOP SURFACE OF THE PONDING AREA FOR THE RAIN GARDEN BY MULTIPLYING THE CONTRIBUTING AREA BY THE ABOVE PERCENTAGES.

N.T.S.

STANDARD DETAIL

ST–13.11

REVISIONS:	DATE:	DRAWN:	DESIGNED:
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2	02/09/17	CAS	KDU

CITY OF BATTLE GROUND
APPROVED

Mark Heuey

CITY ENGINEER

06/11/2018

DATE

INFILTRATION RAIN GARDEN WITH PLANTING SOIL NOTES

DESIGN NOTES:

1. PLANT PER COBG ST-13.13. NATIVE PLANTS ARE PREFERRED, BECAUSE NON-NATIVE AND INVASIVE SPECIES CAN REPRODUCE DOWNSTREAM DAMAGING HABITAT AND CHANGING HYDROLOGY. IF NON-NATIVES ARE CHOSEN, BE SURE THAT THEY WILL NOT DAMAGE DOWNSTREAM HABITAT.

CONSTRUCTION NOTES:

2. BUILD AND VEGETATE RAIN GARDEN AS EARLY AS POSSIBLE TO ESTABLISH PLANTINGS BEFORE DIRECTING STORMWATER RUNOFF TO IT OR DIVERT STORMWATER AROUND FACILITY. PREFERABLY, THIS PERIOD WOULD LAST A MINIMUM OF 3 MONTHS OR PER LANDSCAPE ARCHITECT/DESIGNER GUIDELINES.
3. INFILTRATION AREAS (THE AREA OF THE RAIN GARDEN AS DEFINED BY THE TOP ELEVATION OF THE FACILITY) SHALL BE FENCED OFF FROM INITIAL EXCAVATION UNTIL PROJECT COMPLETION TO PREVENT COMPACTION OF THE SUBGRADE, DIRT TRACKING ONTO ANY LAYER OF THE FACILITY AND STOCKPILING OF CONSTRUCTION MATERIALS THAT MAY CLOG THE SURFACE.
4. DURING EXCAVATION OF NATIVE SOILS TO THE BOTTOM OF THE FACILITY, RAINFALL MAY CAUSE FINES TO CLOG THE SURFACE OF THE FACILITY. IF THE NATIVE SOIL HAS BEEN EXPOSED TO RAINFALL, HAND RAKE THE SURFACE TO A DEPTH OF 3" TO RESTORE INFILTRATION CAPACITY.
5. NOTIFY INSPECTOR 24 HOURS IN ADVANCE OF CONSTRUCTING THIS FACILITY.

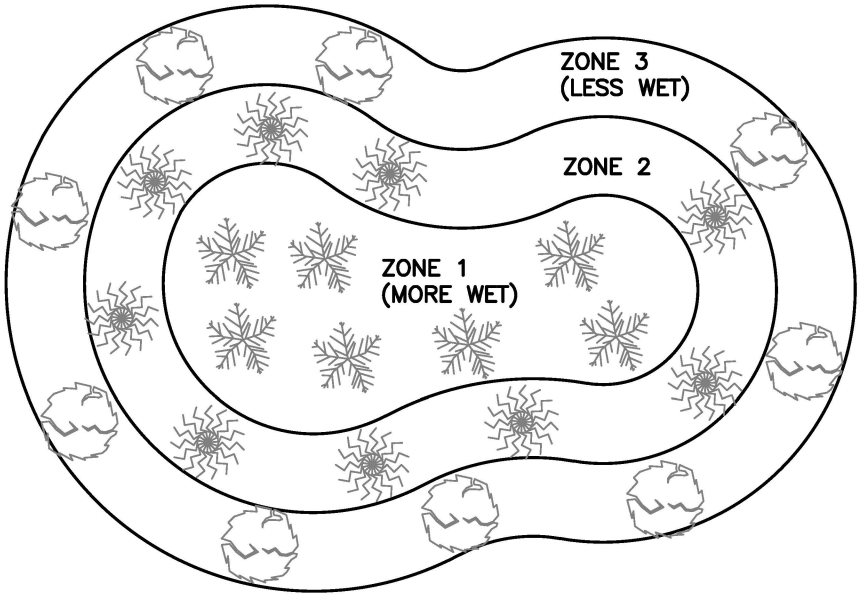
AMENDED PLANTING SOIL MIX SPECIFICATIONS

1. AMENDED PLANTING SOIL MIX SHALL HAVE THE FOLLOWING CHARACTERISTICS:
   a. 60% LOAMY SAND AND 40% COMPOST.
   b. ORGANIC CONTENT MATTER FROM 5-8% BY WEIGHT
   c. CATION EXCHANGE CAPACITY (CEC) GREATER THAN OR EQUAL TO 5 MILLIEQUIVALENTS/100 GRAMS OF DRY SOIL
   d. 2-5% MINERAL FINES CONTENT
   e.

US STANDARD SIEVE SIZE	PERCENT PASSING
3/8"	100
#4	95-100
#10	75-90
#40	25-40
#100	4-10
#200	2-5

   MINIMUM LONG-TERM HYDRAULIC CONDUCTIVITY OF 1 INCH/HOUR PER ASTM D2434 AT 85% COMPACTION PER ASTM D 1557.
   f. MAXIMUM IMMEDIATE HYDRAULIC CONDUCTIVITY OF 12 INCHES/HOUR.
2. AMENDED PLANTING SOIL MIX MAY BE CREATED BY LABORATORY TESTING THE ON-SITE NATIVE SOILS AND MIXING MATERIALS FROM OFF-SITE AS NEEDED TO ACHIEVE THE CHARACTERISTICS DESCRIBED IN NOTE 1 ABOVE.
3. AMENDED PLANTING SOIL MIX SHOULD BE UNIFORMLY MIXED WITH A SOIL MIXER.
4. PLACEMENT OF AMENDED PLANTING SOIL MIX SHALL OCCUR PER THE FOLLOWING GUIDELINES:
   a. PLACE SOIL IN 12" LIFTS, KEEPING MACHINERY OUTSIDE OF INFILTRATION AREA.
   b. DO NOT PLACE SOILS IF SATURATED.
   c. COMPACT EACH LIFT WITH WATER OR BOOT PACKING UNTIL JUST SATURATED TO 85% COMPACTION. DO NOT COMPACT WITH HEAVY MACHINERY OR VIBRATORY COMPACTION.

INFILTRATION RAIN GARDEN WITH PLANTING SOIL NOTES					STANDARD DETAIL
THE CITY OF BATTLE GROUND	CITY OF BATTLE GROUND APPROVED Mark Henrey 06/11/2018 CITY ENGINEER DATE	REVISIONS:	DATE:	DRAWN:	DESIGNED:	ST-13.12
		1	01/23/17	KDU	KDU	
		2	02/09/17	CAS	KDU	



ZONE	PLANTS (SUN)	PLANTS (SHADE)
1	DAGGER–LEAF RUSH	SLOUGH SEDGE
1	TAPER–TIPPED RUSH	SMALL–FRUITED BULRUSH
1	OREGON IRIS	DWARF RED–TWIG DOGWOOD
1	DWARF RED–TWIG DOGWOOD	LADY FERN
1	DOUGLAS SPIREA	DEER FERN
1	ALPINE SPIREA	BLACK TWINBERRY
2	DAYLILY	SWORD FERN
2	WESTERN COLUMBINE	LADY FERN
2	CRIMSON FLAG	SNOWBERRY
2	DWARF RED–TWIG DOGWOOD	SALAL
2	DWARF TALL OREGON GRAPE	BOXWOOD HONEYSUCKLE
2	BOXWOOD HONEYSUCKLE	
3	GAURA SISKIYOU PINK	WILD GINGER
3	ECHINACEA WHITE SWAN	INSIDE–OUT FLOWER
3	GAYFEATHER	WESTERN BLEEDING HEART
3	COREOPSIS CREME BRULEE	SWORD FERN
3	PENNISETUM HAMELN	EVERGREEN HUCKLEBERRY
3	BLUE OAT GRASS	LOW OREGON GRAPE
3	DWARF OREGON GRAPE	VINE MAPLE
3	SHRUBBY WALLFLOWER	CASCARA
3	PERSIAN IRONWOOD	INDIAN PLUM
3	CUTLEAF CRABAPPLE	
3	RED–FLOWERING CURANT	

RAIN GARDEN PLANTING ZONES

STANDARD DETAIL

THE CITY OF BATTLE GROUND

CITY OF BATTLE GROUND
APPROVED

Mark Henry 06/11/2018

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REVISIONS:	DATE:	DRAWN:	DESIGNED:
1	02/15/17	KDU	KDU
2	02/27/17	CAS	KDU

ST–13.13