

STORM DRAIN GENERAL NOTES:

1. MATERIALS AND WORKMANSHIP FOR STREET AND DRAINAGE WORK SHALL CONFORM TO WSDOT "STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION" (CCC 40.386), AND STANDARD DETAIL SHEETS ATTACHED HEREWITH.
2. PRECAST DRAINAGE STRUCTURES PREVIOUSLY APPROVED BY WASHINGTON DEPARTMENT OF TRANSPORTATION AND THE CLARK COUNTY PUBLIC WORKS DEPARTMENT MAY BE SUBSTITUTED FOR ANY NEW STANDARD CAST-IN-PLACE UNIT. HOWEVER, IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASSURE THAT THE PRECAST DRAINAGE STRUCTURES COMPLY WITH THE DESIGN INVERTS AND RIM ELEVATIONS.
3. THE CONTRACTOR IS TO VERIFY ALL INVERT AND TOP ELEVATIONS OF EXISTING STORM DRAINS, AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE ENGINEER.
4. CONTRACTOR TO VERIFY CENTERLINE AND TOP OF THE CURB ELEVATIONS PRIOR TO CONSTRUCTION TO ENSURE COMPLIANCE WITH THE CONSTRUCTION DRAWINGS AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE ENGINEER.
5. 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 DIG TEST HOLES OVER ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION TO DETERMINE THEIR EXACT LOCATION. CALL 1-800-553-4344 FOR UTILITIES LOCATE, A MINIMUM OF 48 HOURS PRIOR TO START OF CONSTRUCTION.
6. 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 COUNTY RELATING TO THE PERFORMANCE OF THIS WORK.
7. ALL EROSION CONTROL DEVICES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN AND EROSION CONTROL DETAILS, PRIOR TO START OF CONSTRUCTION (CCC 40.386 AND CLARK COUNTY STORMWATER MANUAL (CCSWM)).
8. THE DEVELOPER SHALL OBTAIN ALL OFFSITE CONSTRUCTION EASEMENTS PRIOR TO THE START OF CONSTRUCTION. THE APPLICANT SHALL VERIFY THAT ALL OFFSITE UTILITIES EASEMENTS HAVE BEEN OBTAINED BY THE OWNER PRIOR TO PLAN APPROVAL FOR OFFSITE CONSTRUCTION.
9. A CLARK COUNTY APPROVED MEDALLION WITH THE WORDS "PROTECT WATER, ONLY RAIN IN DRAIN" MESSAGE SHALL BE INSTALLED AT ALL CATCH BASINS, INLETS AND MANHOLES CAPABLE OF ACCEPTING STORMWATER.
10. PER CCSWM SIGNS SHALL BE INSTALLED AS FOLLOWS:
 

ALONG WATER QUALITY BIOFILTRATION SYSTEMS TO READ  
"WATER QUALITY FILTER – PLEASE LEAVE VEGETATED"



FENCED RETENTION AND DETENTION BASINS TO READ  
"[PUBLIC/PRIVATE] STORMWATER CONTROL FACILITY"

PRIVATE SYSTEMS NOT MAINTAINED BY CLARK COUNTY SHALL INCLUDE ADDRESS AND CONTACT INFORMATION OF RESPONSIBLE PARTY.

REFER TO STANDARD DETAILS, CCSWM BOOK 2 FOR STANDARD SIGN LAYOUT.
11. VEGETATION IN STORMWATER FACILITIES SHALL BECOME FULLY ESTABLISHED PRIOR TO COMMENCING WITH INSTALLATION OF PAVEMENT FOR ALL AREAS DRAINING INTO THE WATER QUALITY SYSTEM. WATER QUALITY SWALES SHOULD BE GENERALLY VEGETATED WITH RECOMMENDED GRASSES IN THE SWALE BOTTOM; GRASSES, GROUND COVER, AND SHRUBS ON THE SIDE SLOPES; AND GROUND COVERS, SHRUBS, AND TREES ON THE ADJACENT DRY AREAS. PLANTING PLANS MUST BE INDIVIDUALLY TAILORED TO UNIQUE CONDITIONS AT EACH SITE.
12. PER CCC 40.386 AND CCSWM, ALL LOTS WITHIN THE URBAN GROWTH AREA MUST BE DESIGNED TO PROVIDE POSITIVE DRAINAGE FROM BOTTOM OF FOOTINGS TO AN APPROVED STORMWATER SYSTEM. POSITIVE DRAINAGE MAY BE ACCOMPLISHED BY THE USE OF THE BMP'S SHOWN IN THE CCSWM, BOOK 2.
13. PRIVATE SYSTEMS MUST MEET PLUMBING CODE, HAVE AN OPERATIONS AND MAINTENANCE MANUAL, MAINTENANCE COVENANT OVER THE REQUIRED EASEMENT, AND COVENANT TO CLARK COUNTY FOR INSPECTION AND REVIEW.

NO.	REVISIONS	DATE	BY

DWG: D1.0.DWG

	Department of Public Works  <b>CLARK COUNTY</b> WASHINGTON proud past, promising future	STORM DRAIN GENERAL NOTES   APPROVED COUNTY ENGINEER	STANDARD <b>D1.0</b> DETAIL
	01/07/16 DATE	DESIGNED DRAWN DATE 01/30/15	

STORM DRAIN GENERAL NOTES –CONTINUED–:


13. PER CCC 40.386 AND CCSWM, ALL LOTS WITHIN THE URBAN GROWTH AREA MUST BE DESIGNED TO PROVIDE POSITIVE DRAINAGE FROM BOTTOM OF FOOTINGS TO AN APPROVED STORMWATER SYSTEM. POSITIVE DRAINAGE MAY BE ACCOMPLISHED BY THE USE OF THE BMP'S SHOWN IN THE CCSWM, BOOK 2.

PRIVATE SYSTEMS MUST MEET PLUMBING CODE, HAVE AN OPERATIONS AND MAINTENANCE MANUAL, MAINTENANCE COVENANT OVER THE REQUIRED EASEMENT, AND COVENANT TO CLARK COUNTY FOR INSPECTION AND REVIEW.

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SHEET 2 OF 2

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	<p><i>[Signature]</i> COUNTY ENGINEER</p>	<p>APPROVED <b>01/07/16</b> DATE</p>

**NOTES:**

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M-199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6" MIN. CLEARANCE. SEE STD. DETAIL D1.5, "MANHOLE DETAILS."
3. MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATIONS SEC. 7-05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
4. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
5. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE STD. DETAIL D1.5, "MANHOLE DETAILS."
6. NOT FOR USE IN TRAFFIC BEARING AREAS.

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MANHOLE TYPE 4

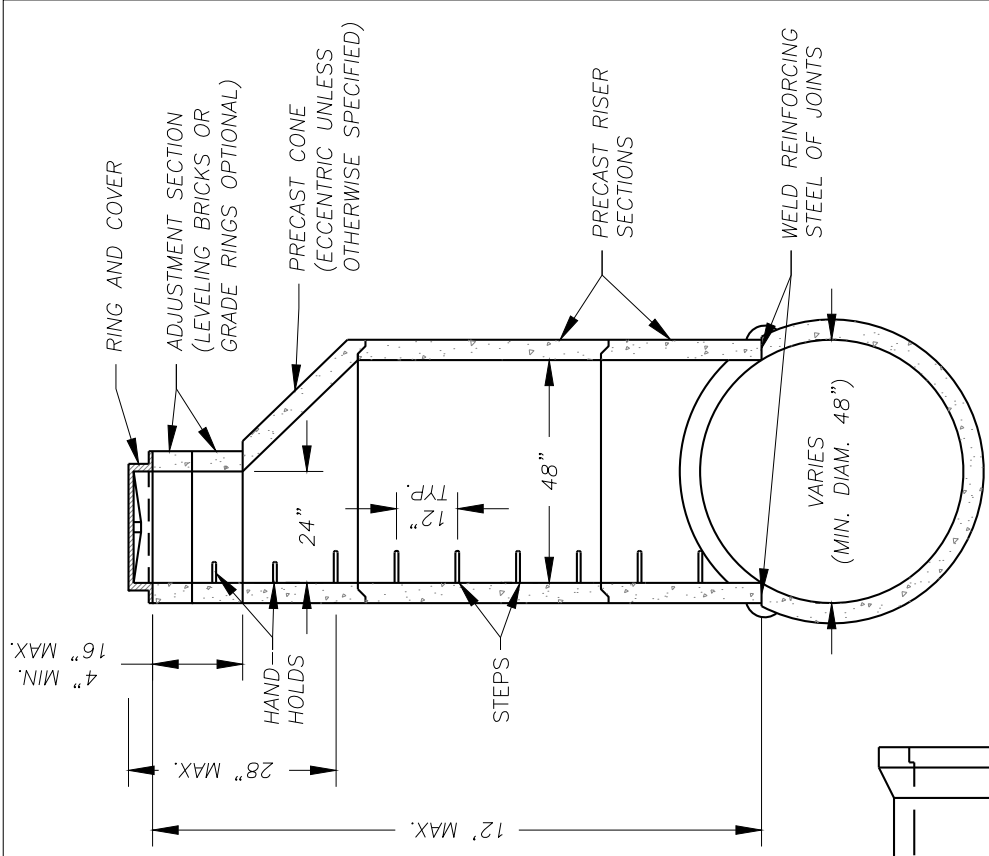
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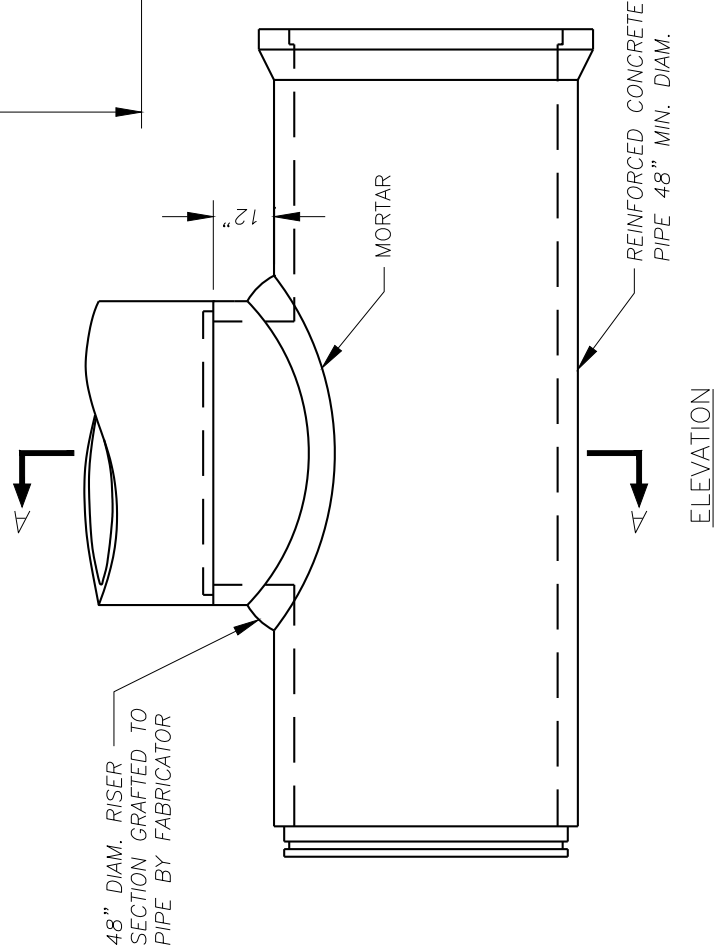
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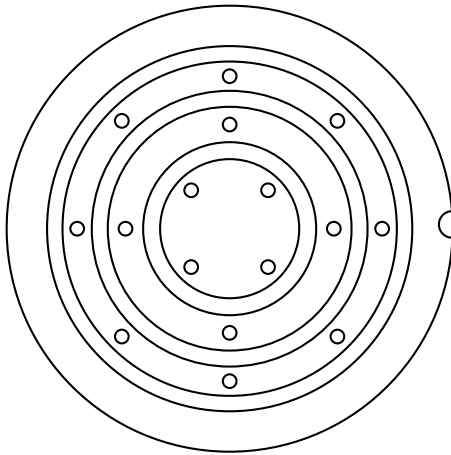
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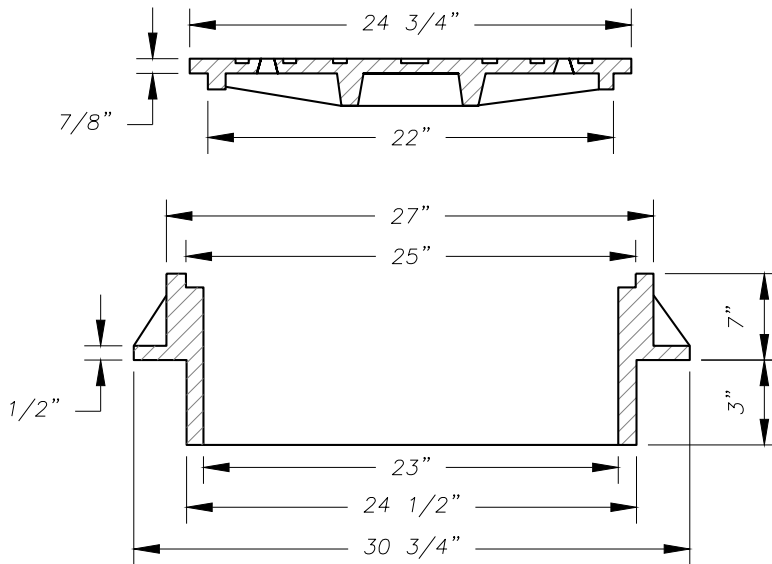
SECTION A-A



ELEVATION



COVER



NOTES:

1. COVER MATERIAL TO BE DUCTILE IRON ASTM A536 GRADE 80-55-06.
2. RING MATERIAL TO BE GRAY CAST IRON ASTM A-48 CLASS 30.
3. SEE WSDOT STANDARD SPECIFICATIONS SEC. 7-05.
4. RING AND COVER TO BE MACHINED TO A TRUE BEARING ALL AROUND.
5. NOTCH LID FOR LIFTING HOOK.

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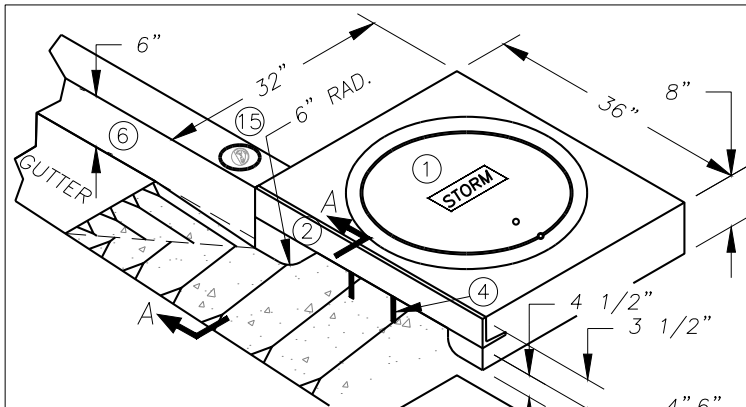


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MANHOLE  
RING AND COVER  
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DATE 01/30/15

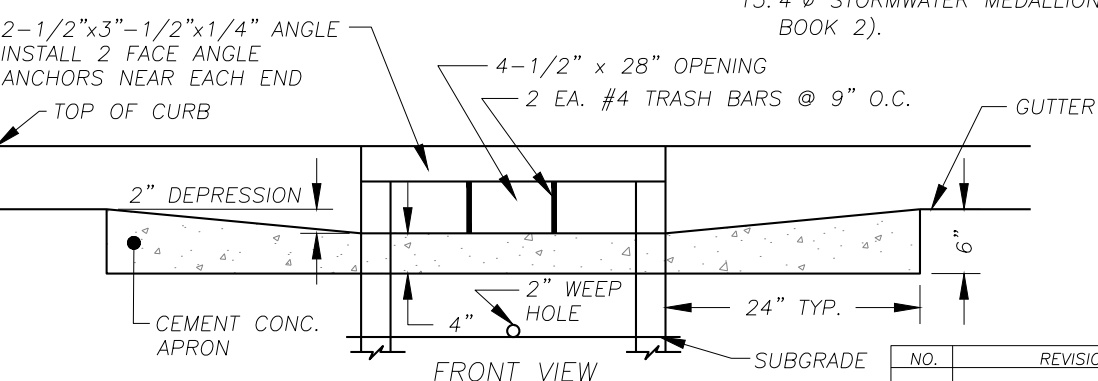
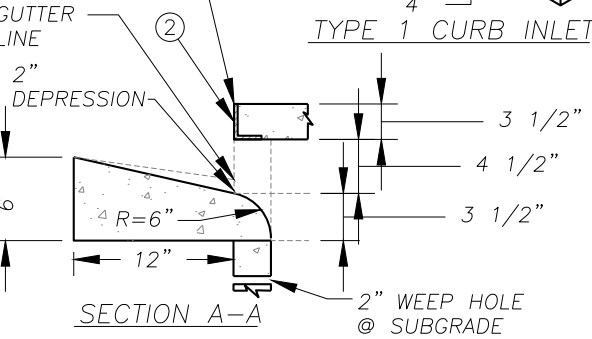
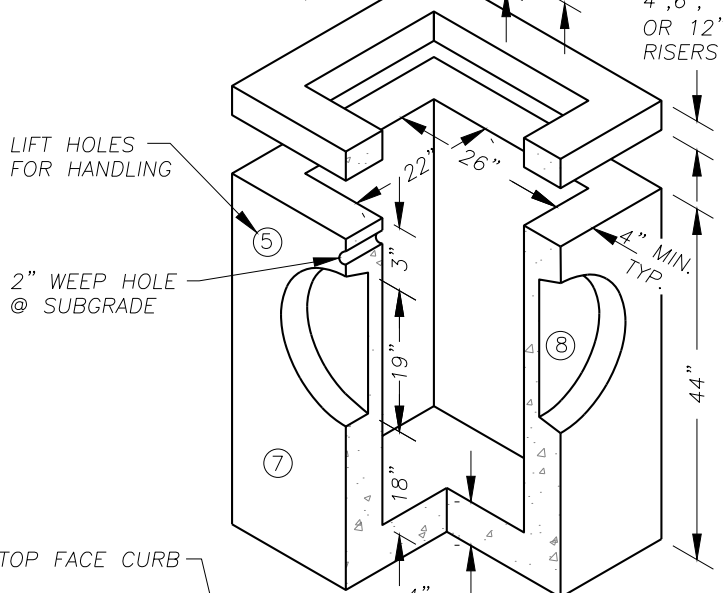




- ① 24" CAST IRON LOCKING FRAME & COVER
- ② 2 1/2"x3 1/2"x1/4"x 35 7/8" GALVANIZED ANGLE IRON
- ③ NOT USED
- ④ 2 EA. #4 TRASH BARS @ 9" O.C.
- ⑤ 2 EA. BASE UNIT LIFT HOLES
- ⑥ 6" CURB AND 12" GUTTERS
- ⑦ STANDARD TYPE 1 BASE UNIT
- ⑧ PIPE KNOCKOUTS ALL FOUR SIDES.

**NOTES:**

1. CURB INLET TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 & C890 UNLESS SHOWN ON PLANS OR NOTED IN WSDOT STANDARD SPECIFICATIONS.
2. REINFORCING FOR INLET UNIT, 3 EA. #4 HORIZONTAL BARS.
3. REINFORCING FOR TOP UNIT, 2 EA. #3 HORIZONTAL BARS.
4. ALL REBAR TO MEET ASTM A615 GRADE 60.
5. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497. WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
6. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4,000.
7. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
8. KNOCKOUTS OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS INLET WALL THICKNESS.
9. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES WITH MAX. DIAM. OF 17".
10. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
11. ANY PROTRUDING ENDS OF PIPES SHALL BE TRIMMED FLUSH WITH THE INSIDE WALLS AND GROUTED TO THE SATISFACTION OF ENGINEER.
12. GUTTER IS TAPERED DOWN TO INLET.
13. INSTALL REMOVABLE OUTLET PIPE TRAP OR EQUAL, SEE STD. DETAIL D2.1.
14. CONTRACTOR SHALL HAVE THE OPTION OF FURNISHING PRECAST OR CAST-IN-PLACE INLET STRUCTURES, UNLESS SPECIFIED.
15. 4"Ø STORMWATER MEDALLION (FIG. 9.1 CCSWM, BOOK 2).



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CONCRETE CURB INLET

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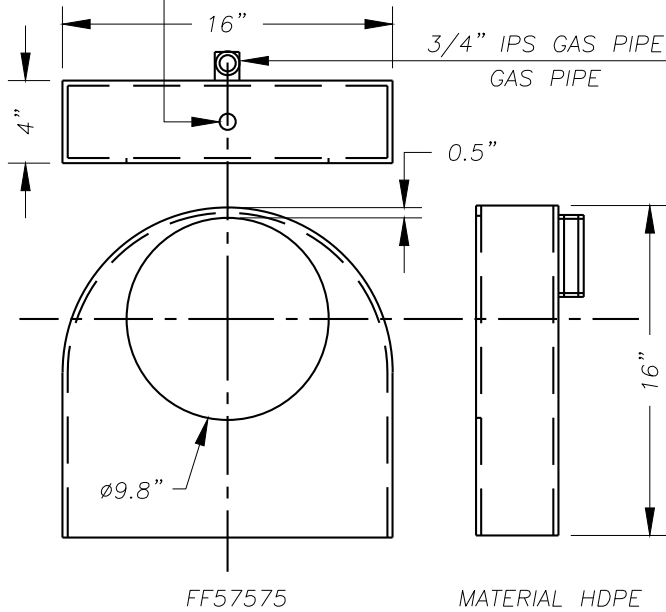
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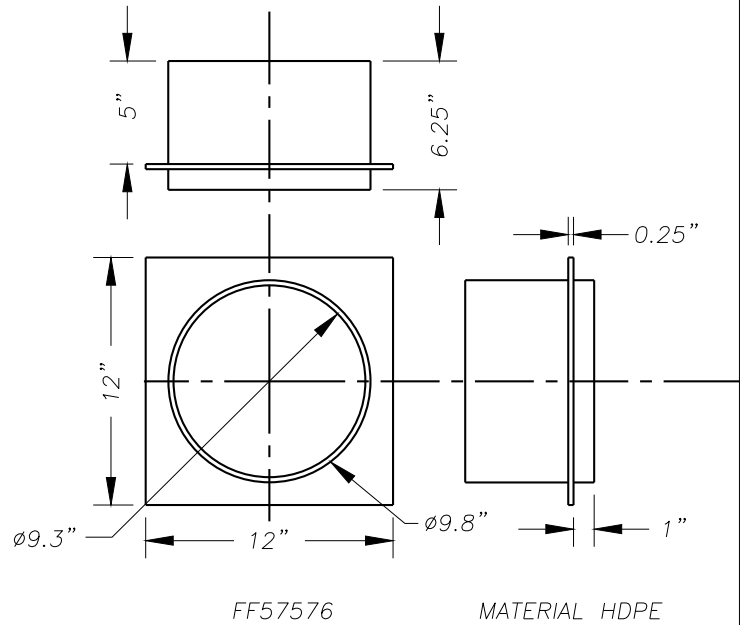
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 DETAIL  
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DRILL 3/4"  
VENT HOLE AT  
TOP OF TRAP



LOW PROFILE ELBOW

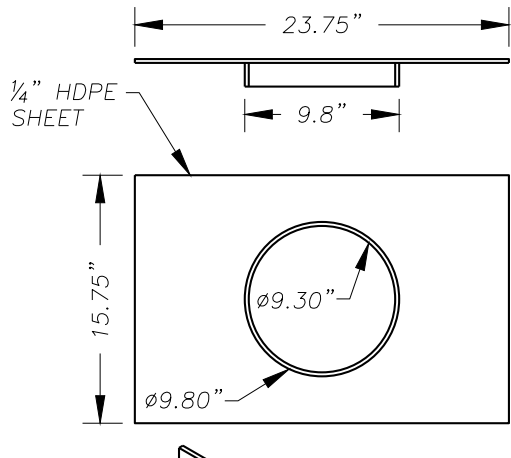


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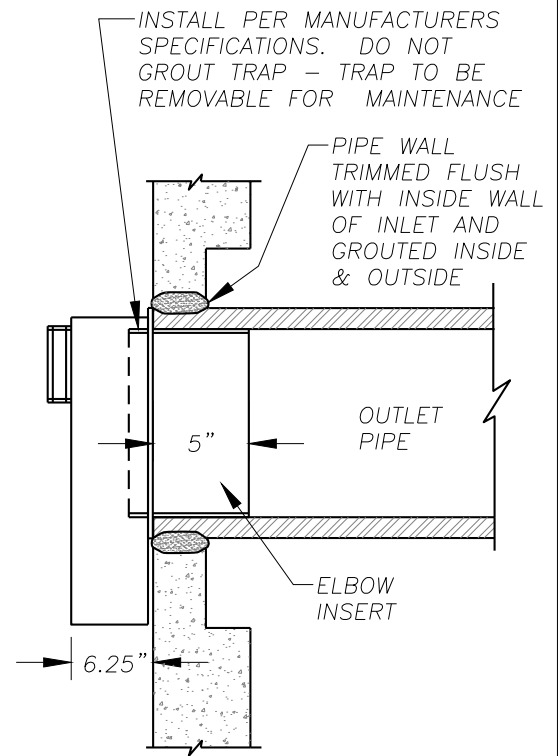
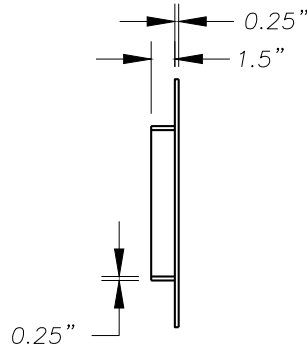
MATERIAL HDPE

ELBOW INSERT

ZYMARK, ULTRATECH, BONAIR BRANDS OR EQUIVALENT



10" HDPE FLAT FACE ADAPTOR  
FORD FABRICATIONS OR EQUIVALENT



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DEBRIS TRAP

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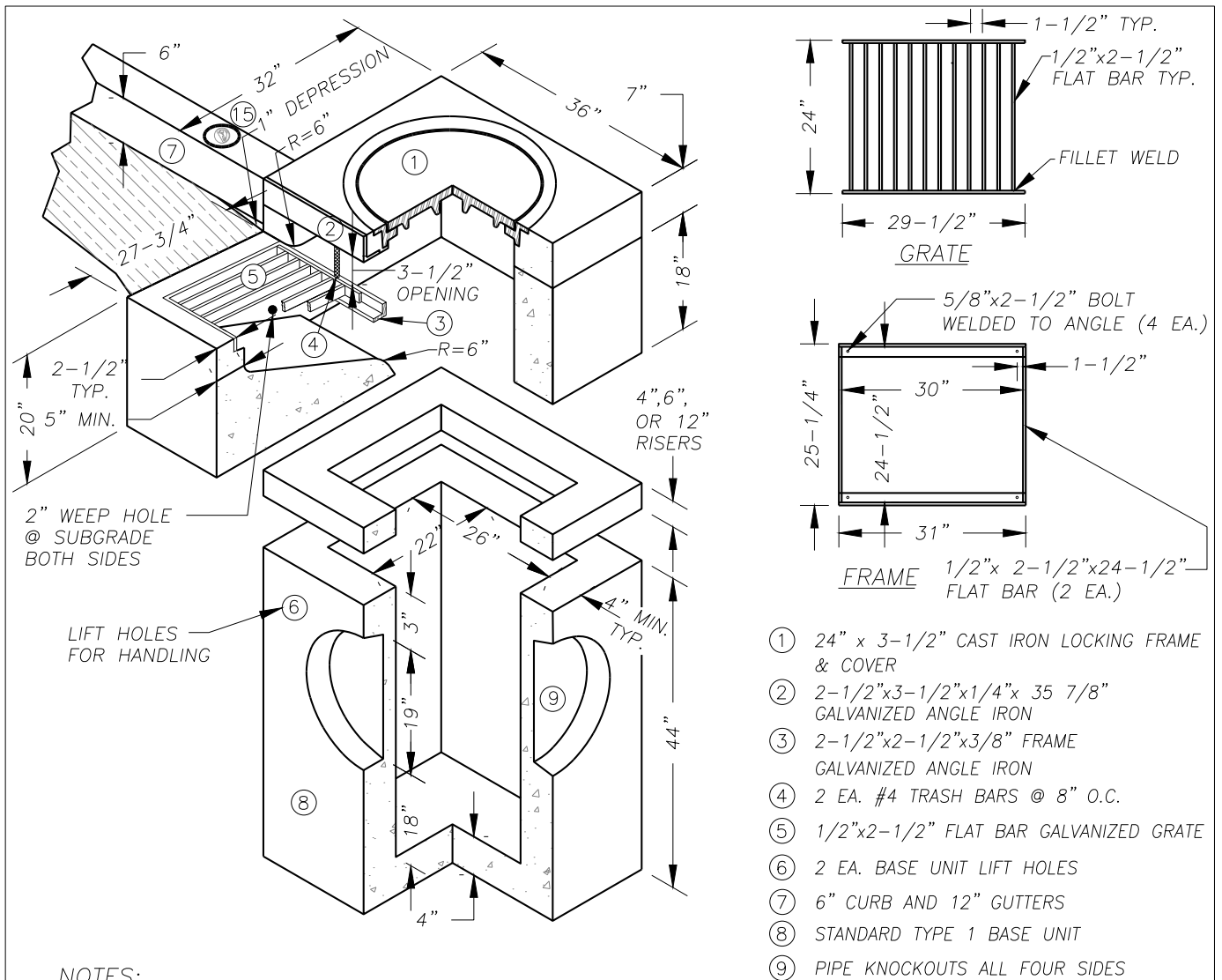
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STANDARD

**D2.1**

DETAIL  
DESIGNED  
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DATE 01/30/15



**NOTES:**

1. COMBINATION CURB INLET TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 & C890 UNLESS SHOWN ON PLANS OR NOTED IN WSDOT STANDARD SPECIFICATIONS.
2. REINFORCING FOR INLET UNIT, 3 EA. #4 HORIZONTAL BARS; REINFORCING FOR TOP UNIT, 2 EA. #3 HORIZONTAL BARS; REINFORCING FOR INLET SLOPED BASE, 4x4 MESH.
3. ALL REBAR TO MEET ASTM A615 GRADE 60.
4. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497. WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
5. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4,000.
6. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
7. KNOCKOUTS OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS INLET WALL THICKNESS.
8. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES WITH MAX. DIAM. OF 20".
9. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
10. ANY PROTRUDING ENDS OF PIPES SHALL BE TRIMMED FLUSH WITH THE INSIDE WALLS AND GROUTED TO THE SATISFACTION OF ENGINEER.
11. GRATE TO HAVE 1" DEPRESSION AT GUTTER INLET WITH GUTTER TO BE TAPERED DOWN TO INLET.
12. INSTALL REMOVABLE OUTLET PIPE TRAP OR EQUAL, SEE STD. DETAIL D2.1.
13. CONTRACTOR SHALL HAVE THE OPTION OF FURNISHING PRECAST OR CAST-IN-PLACE INLET STRUCTURES, UNLESS SPECIFIED.
14. SEE STD. DETAIL 4.1 FOR BASIN GUTTER PAN DETAIL.
15. 4"Ø STORMWATER MEDALLION (FIG. 9.1 CCSWM, BOOK 2).

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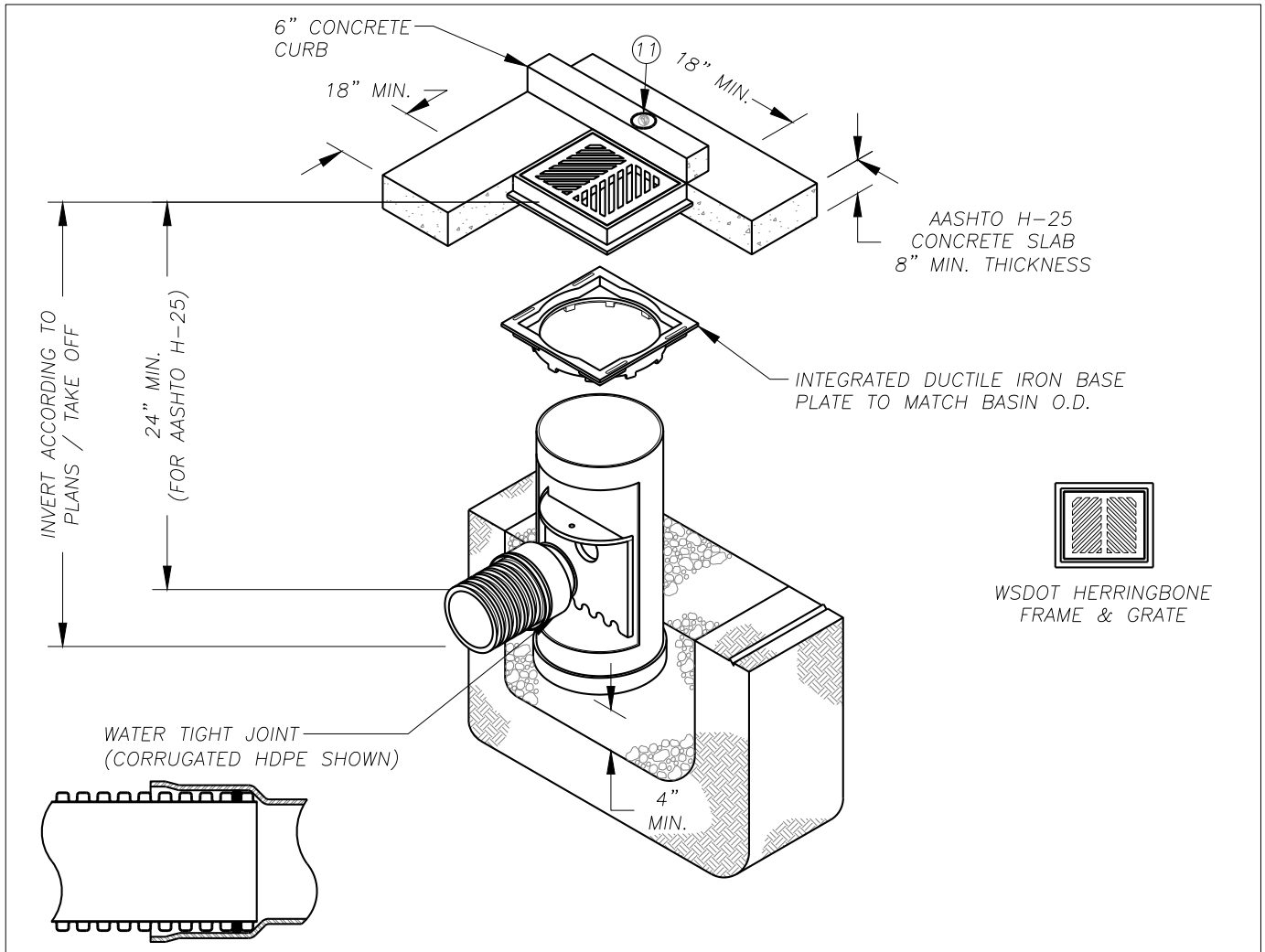
CONCRETE COMBINATION CURB INLET

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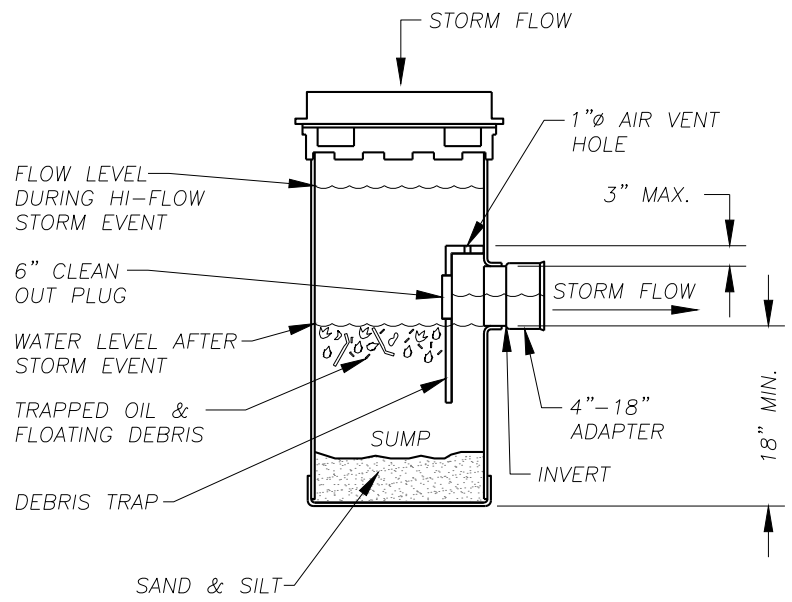
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STANDARD  
**D3.0**  
 DETAIL  
 DESIGNED  
 DRAWN  
 DATE 01/30/15



**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 AVAILABLE: 4" - 18" FOR CORRUGATED HDPE (ADS N-12, ADS SINGLE WALL, HANCOR DUAL WALL), SDR 35, SCH 40 DWV, CORRUGATED & RIBBED PVC.
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC.
5. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
6. 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 M41-10 & AASHTO T-99 95% COMPACTION.
7. 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.
8. FRAME MUST BE INSTALLED WITH FLANGE DOWN.
9. BASE PLATE SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
10. ALL CAST-IN-PLACE CONCRETE SHALL BE CLASS 4,000.
11. 4"Ø STORMWATER MEDALLION (CCSWM, BOOK 2).



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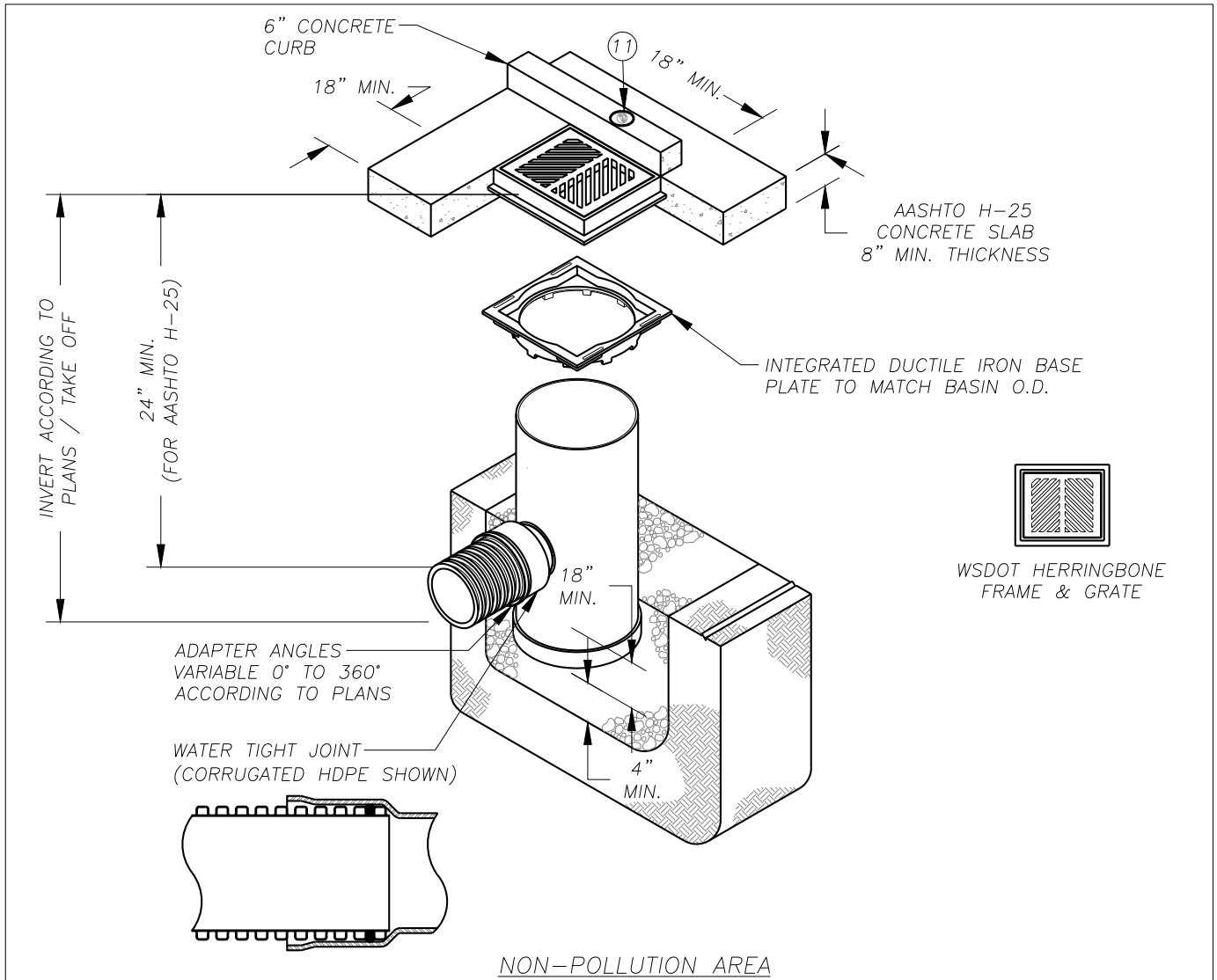
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DRAIN BASIN H-25 24 IN. NYLOPLAST OR EQUAL  
WITH DEBRIS TRAP AND HERRINGBONE GRATE

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**NOTES:**

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2. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS.
3. VARIOUS TYPES OF INLET & OUTLET ADAPTERS AVAILABLE: 4" - 24" FOR CORRUGATED HDPE (ADS N-12, ADS SINGLE WALL, HANCOR DUAL WALL), SDR 35, SCH 40 DWV, CORRUGATED & RIBBED PVC.
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC.
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8. FRAME MUST BE INSTALLED WITH FLANGE DOWN.
9. BASE PLATE SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
10. ALL CAST-IN-PLACE CONCRETE SHALL BE CLASS 4,000.
11. 4"Ø STORMWATER MEDALLION (CCSWM, BOOK 2).

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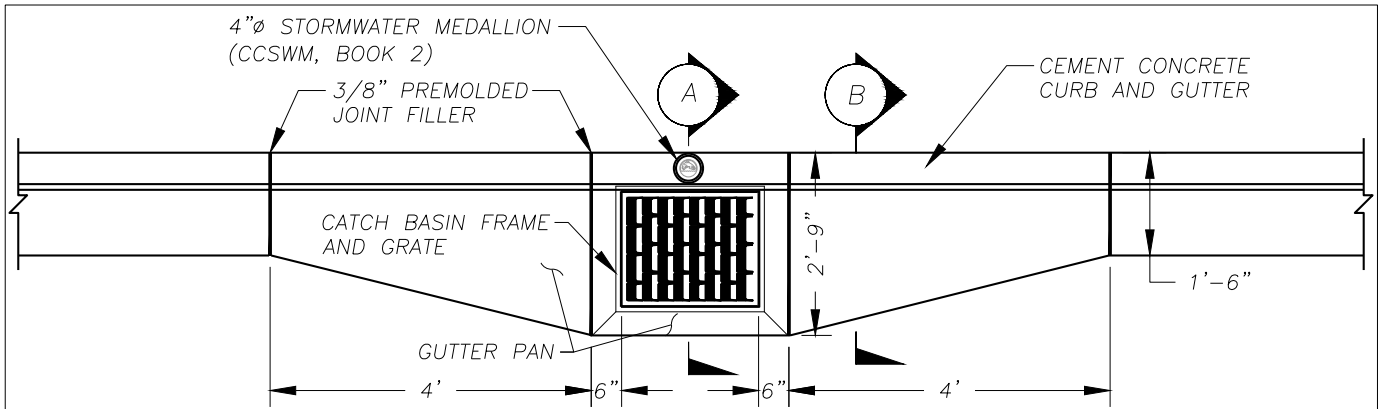
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DRAIN BASIN H-25 24 IN. NYLOPLAST OR EQUAL  
WITH HERRINGBONE GRATE

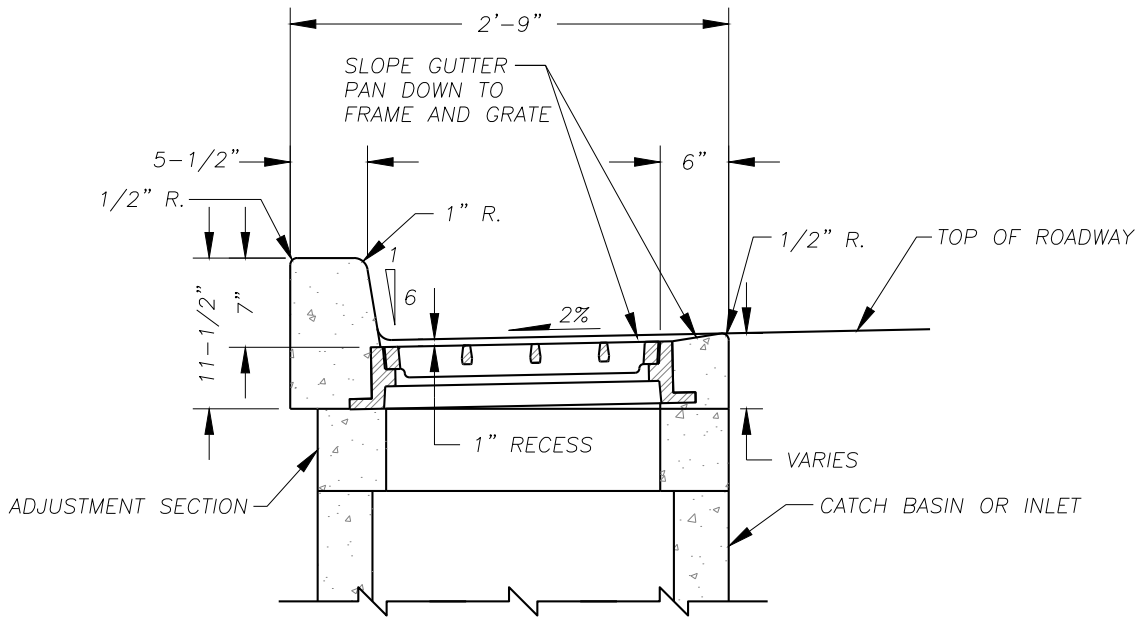
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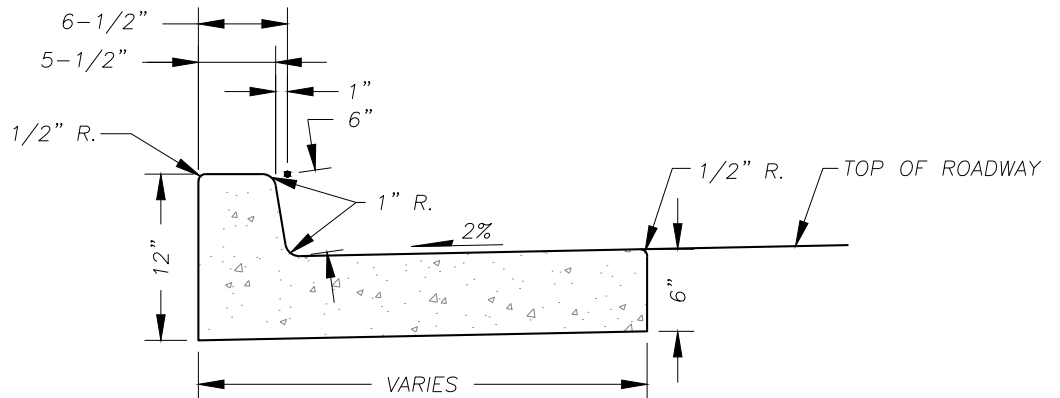
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CATCH BASIN GUTTER PAN  
PLAN VIEW



SECTION A



SECTION B

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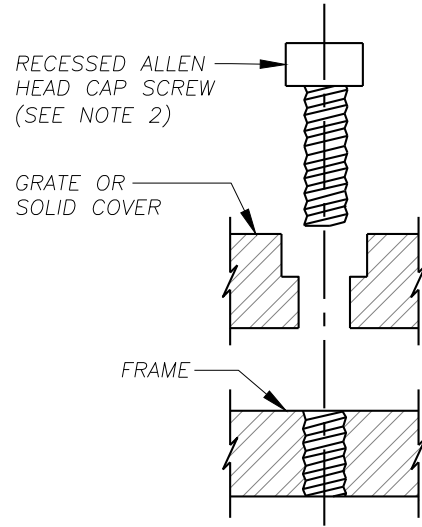
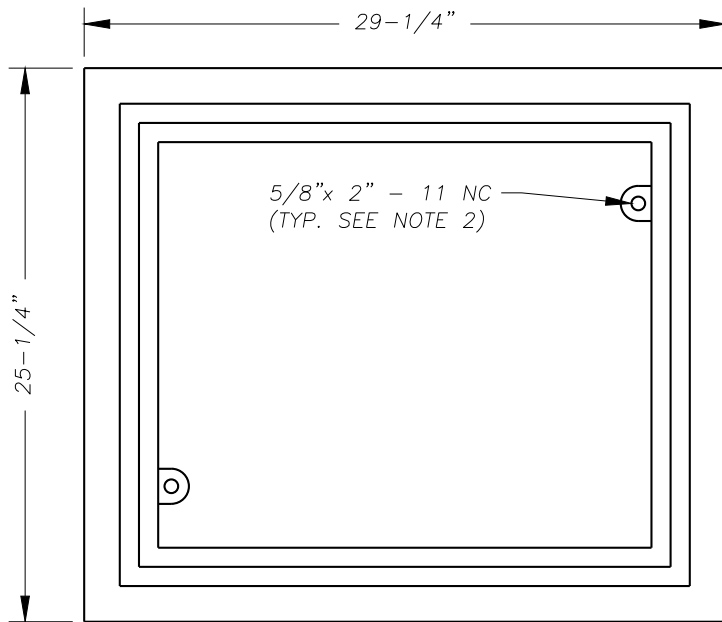
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CATCH BASIN GUTTER PAN

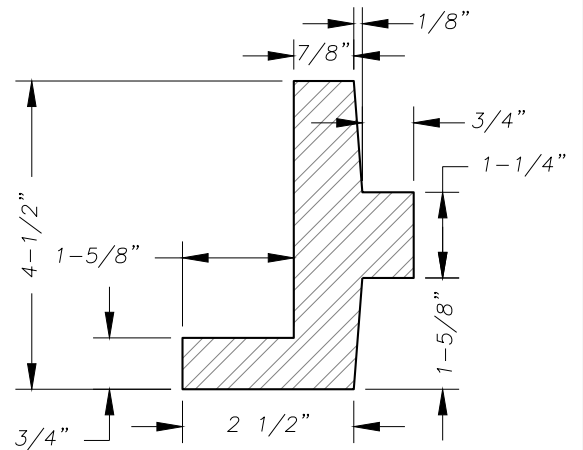
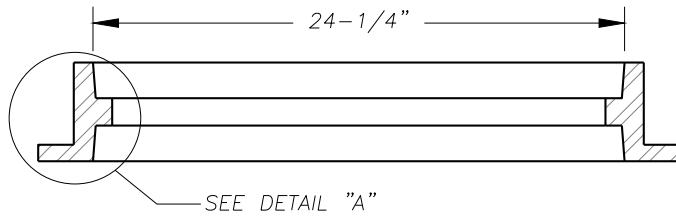
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DATE

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DESIGNED  
DRAWN  
DATE 01/30/15



BOLT DOWN DETAIL



DETAIL "A"

NOTES:

1. THIS FRAME IS DESIGNED TO ACCOMMODATE 20"x 24" GRATES OR COVERS AS SHOWN ON STD. DETAILS D4.3 AND D4.4.
2. WHEN BOLT DOWN GRATES OR COVERS ARE SPECIFIED, PROVIDE TWO HOLES IN THE FRAME THAT ARE VERTICALLY ALIGNED WITH THE GRATE OR COVER SLOTS. TAP EACH HOLE TO ACCEPT A 5/8"x 2" - 11 NC ALLEN HEAD CAP SCREW. LOCATION OF BOLT DOWN HOLES VARIES AMONG DIFFERENT MANUFACTURERS.
3. REFER TO WSDOT STANDARD SPECIFICATIONS 9-05.15(2) FOR ADDITIONAL REQUIREMENTS.
4. SEE WSDOT STANDARD SPECIFICATIONS SECTION 7-05.

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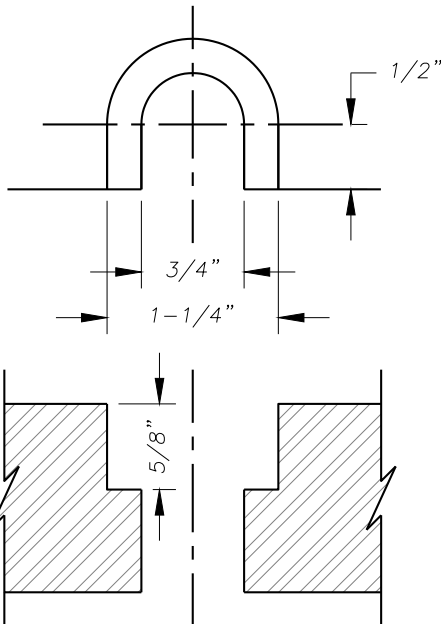
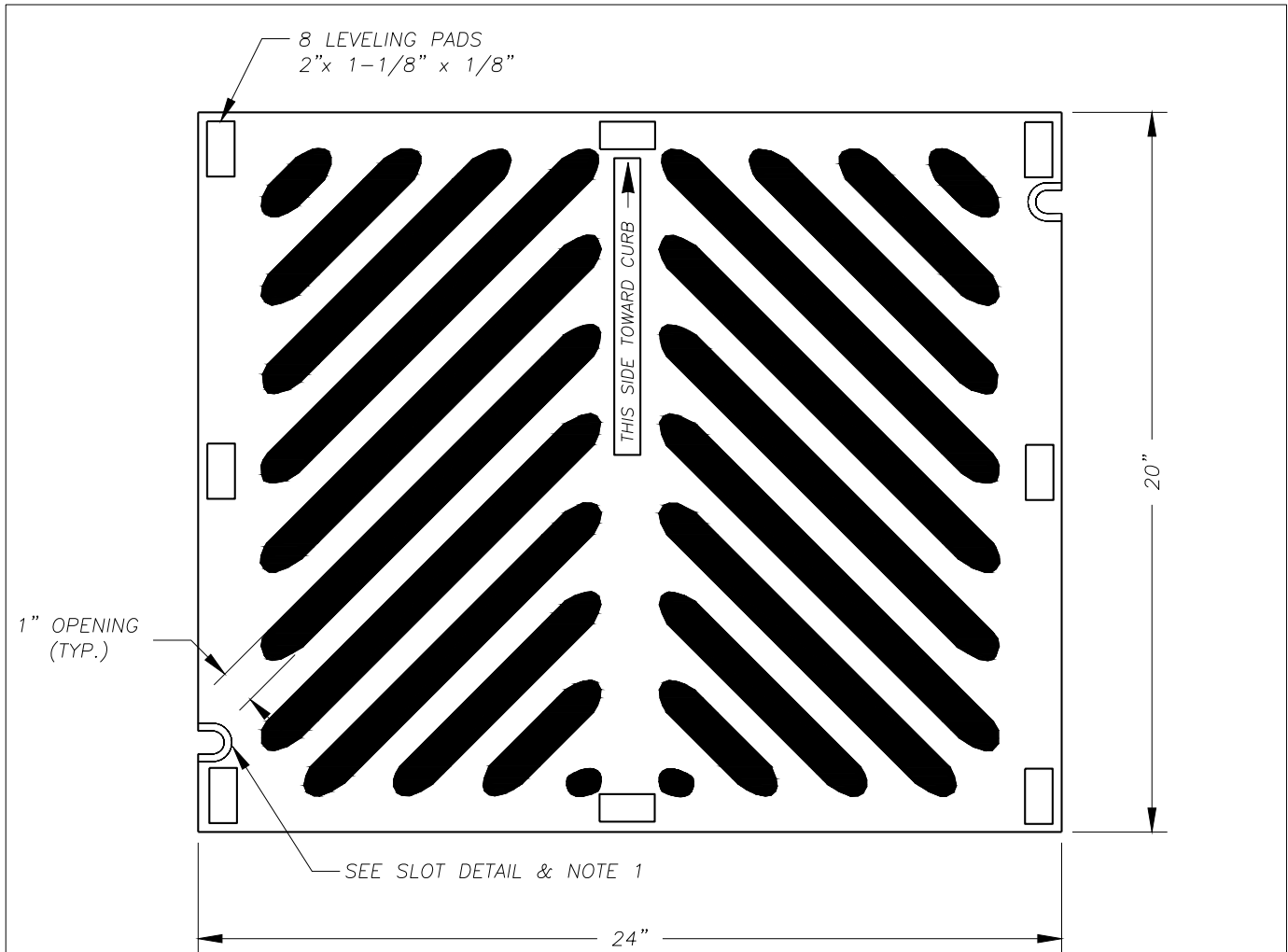
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REVERSIBLE FRAME  
FOR CATCH BASIN

*[Signature]*  
APPROVED  
COUNTY ENGINEER

01/07/16  
DATE

STANDARD  
**D4.2**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15



SLOT DETAIL

NOTES:

1. WELDING NOT PERMITTED.
2. USE VANED GRATE PER STD. DETAIL D4.4 WHERE LONGITUDINAL SLOPE EXCEEDS 4%.
3. WHEN BOLT DOWN GRATES ARE SPECIFIED, PROVIDE TWO SLOTS IN THE GRATE THAT ARE VERTICALLY ALIGNED WITH THE HOLES IN THE FRAME. LOCATION OF BOLT DOWN SLOTS VARIES AMONG DIFFERENT MANUFACTURERS.
4. REFER TO WSDOT STANDARD SPECIFICATIONS 9-05.15(2) FOR ADDITIONAL REQUIREMENTS.
5. FOR FRAME DETAIL, SEE STD. DETAIL D4.2.
6. THE THICKNESS OF THE GRATE SHALL NOT EXCEED 1-5/8".

NO.	REVISIONS	DATE	BY

DWG: D4.3.DWG



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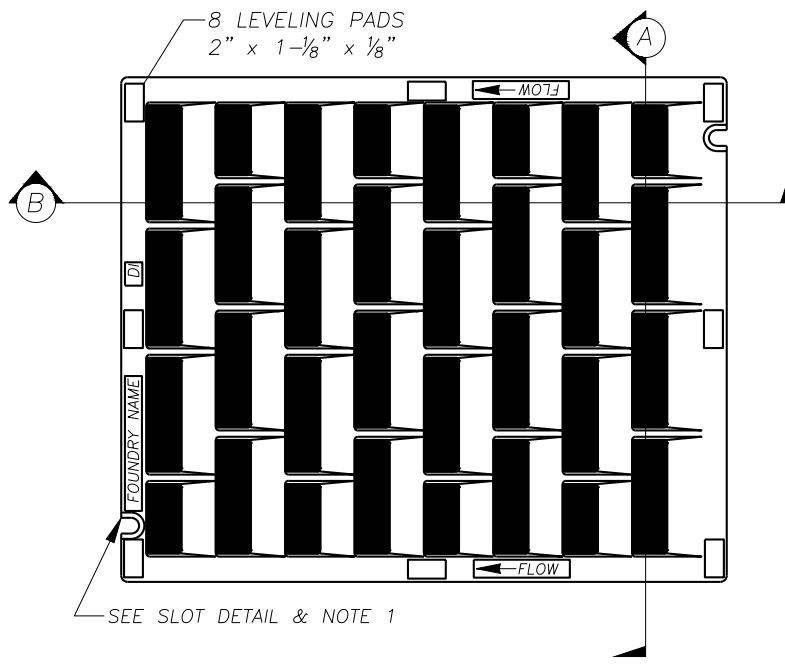
HERRINGBONE GRATE  
FOR CATCH BASIN

*[Signature]*  
APPROVED  
COUNTY ENGINEER

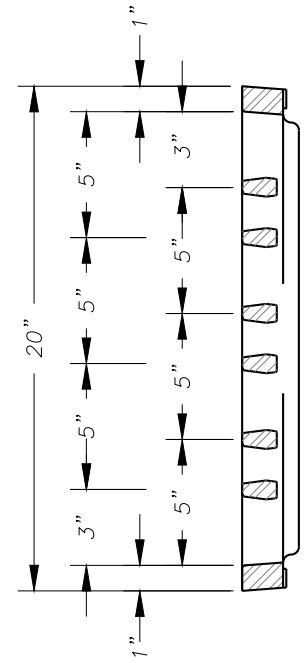
01/07/16  
DATE

STANDARD  
**D4.3**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15

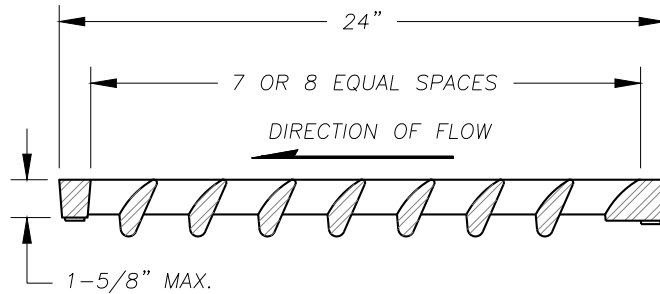




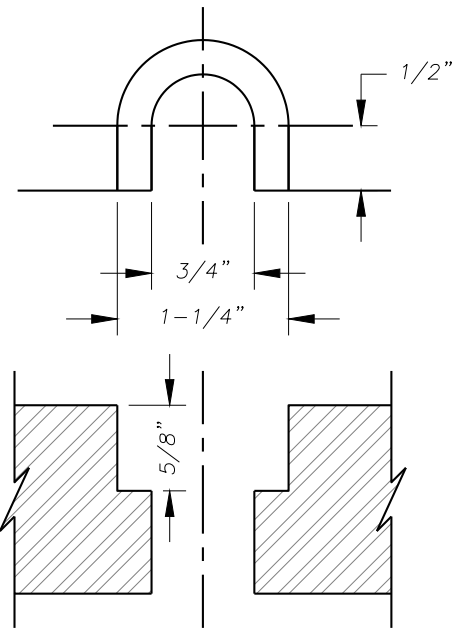
PLAN VIEW



SECTION A



SECTION B



SLOT DETAIL

NOTES:

1. WELDING NOT PERMITTED.
2. USE HERRINGBONE GRATE PER STD. DETAIL D4.3 WHERE LONGITUDINAL SLOPE IS LESS THAN 4%.
3. WHEN BOLT DOWN GRATES ARE SPECIFIED, PROVIDE TWO SLOTS IN THE GRATE THAT ARE VERTICALLY ALIGNED WITH THE HOLES IN THE FRAME. LOCATION OF BOLT DOWN SLOTS VARIES AMONG DIFFERENT MANUFACTURERS.
4. REFER TO WSDOT STANDARD SPECIFICATIONS 9-05.15(2) FOR ADDITIONAL REQUIREMENTS.
5. FOR FRAME DETAIL, SEE STD. DETAIL D4.2.

NO.	REVISIONS	DATE	BY

DWG: D4.4.DWG

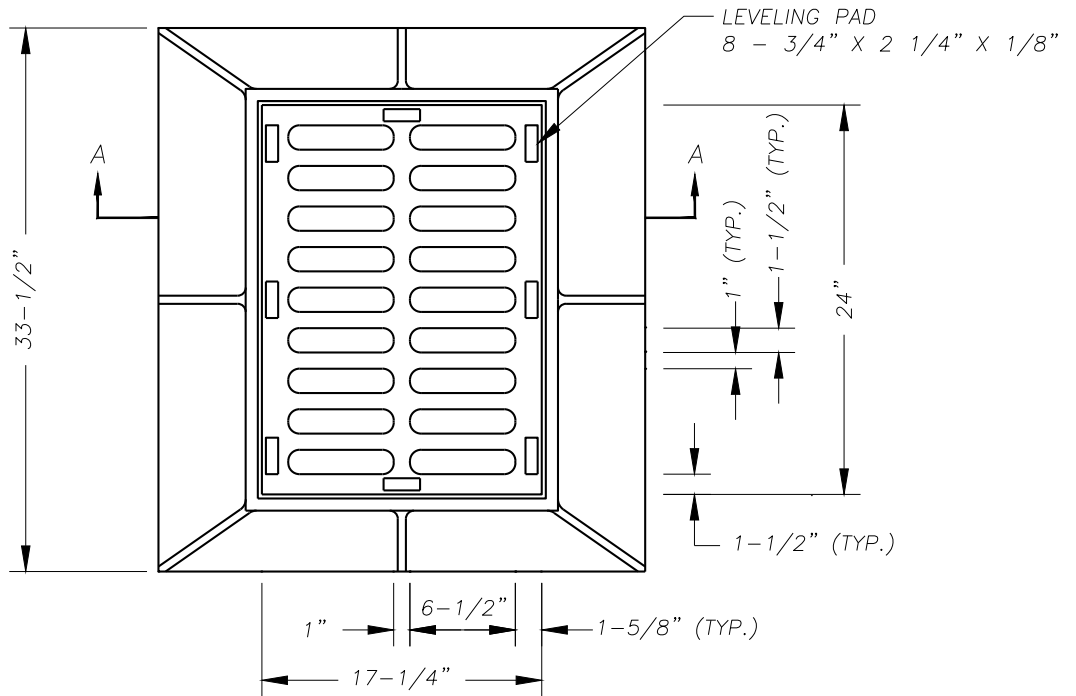


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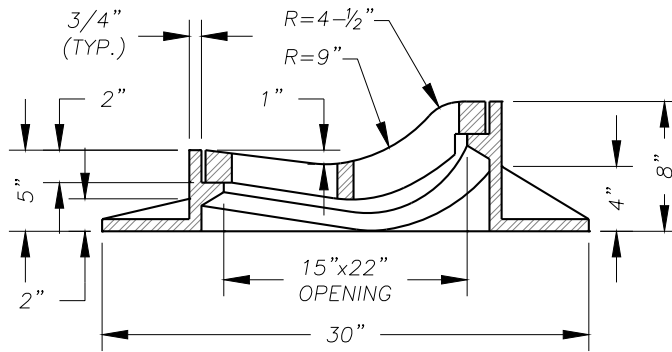
VANED GRATE  
FOR CATCH BASIN  
APPROVED  
*[Signature]*  
COUNTY ENGINEER

01/07/16  
DATE

STANDARD  
**D4.4**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15



PLAN



SECTION A-A

NOTES:

1. WELDING NOT PERMITTED
2. USE ROLLED CURB VANE GRATE PER STD. DETAIL D4.7 WHERE LONGITUDINAL SLOPE IS GREATER THAN 4%.
3. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
4. SEE WSDOT STANDARD SPECIFICATIONS SECTION 7-05.

NO.	REVISIONS	DATE	BY

DWG: D4.5.DWG

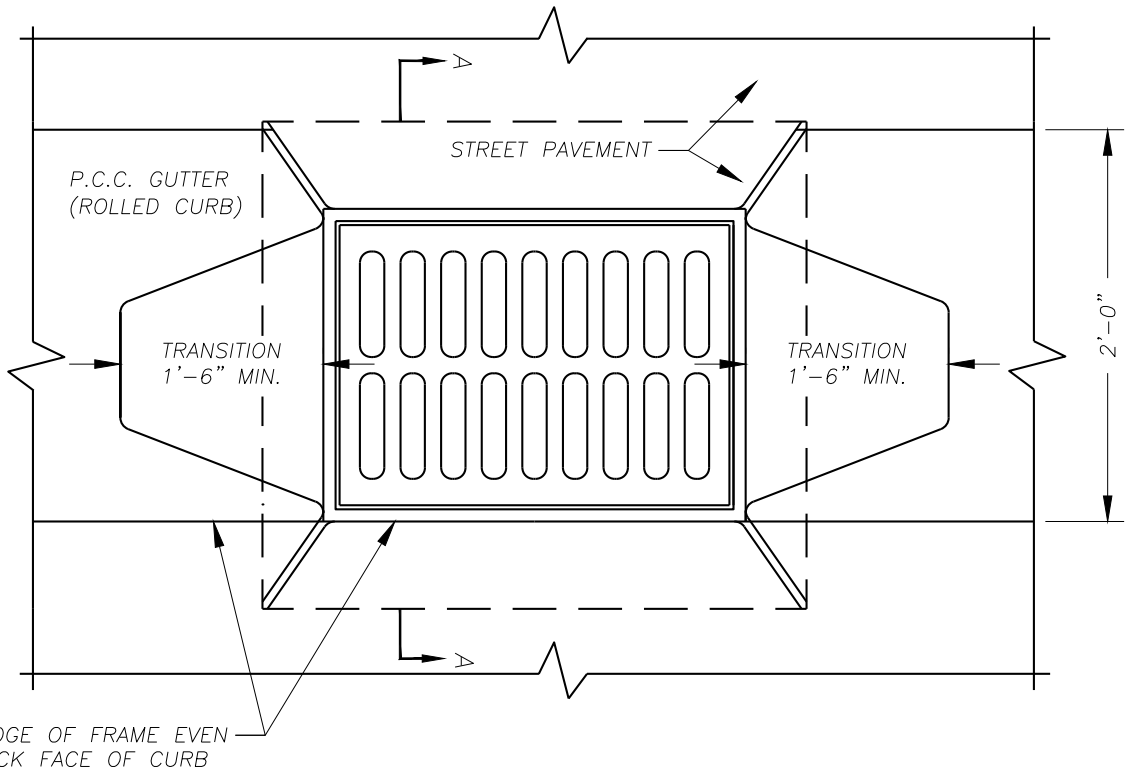


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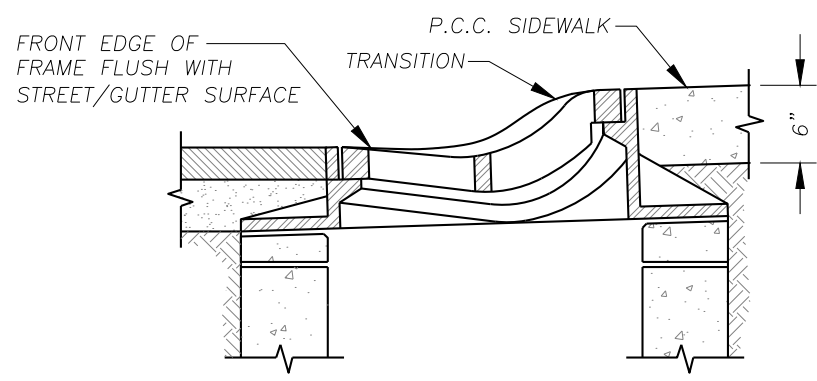
ROLLED CURB  
FRAME AND GRATE  
*[Signature]*  
APPROVED  
COUNTY ENGINEER

01/07/16  
DATE

STANDARD  
**D4.5**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15



PLAN



SECTION A-A

NOTES:

1. WELDING NOT PERMITTED.
2. USE ROLLED CURB VANE GRATE PER STD. DETAIL D4.7 WHERE LONGITUDINAL SLOPE IS GREATER THAN 4%.
3. SET FRAME TO GRADE AND CONSTRUCT ROAD AND CURB TO BE FLUSH AT FRONT AND BACK OF FRAME.
4. SEE WSDOT STANDARD SPECIFICATIONS SECTION 7-05.

NO.	REVISIONS	DATE	BY

DWG: D4.6.DWG



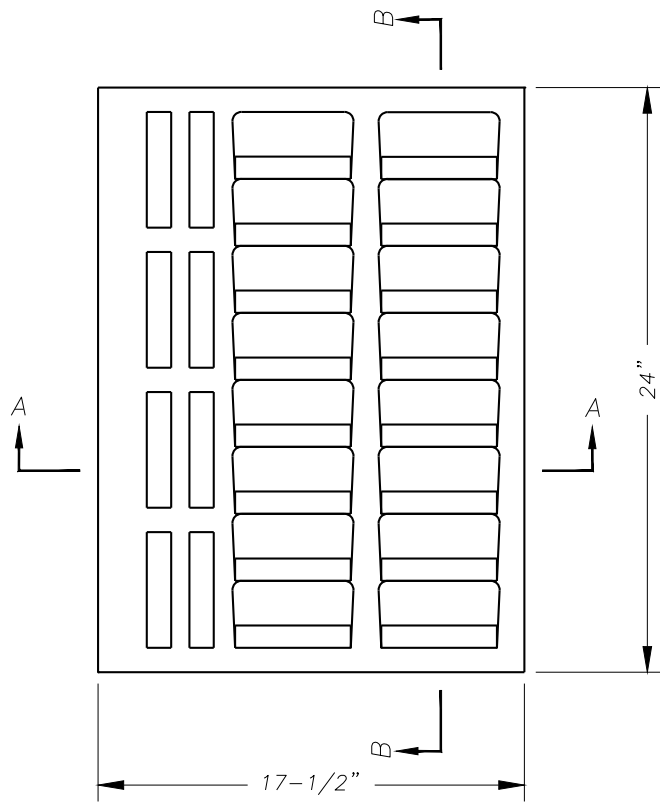
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ROLLED CURB  
FRAME AND GRATE INSTALLATION

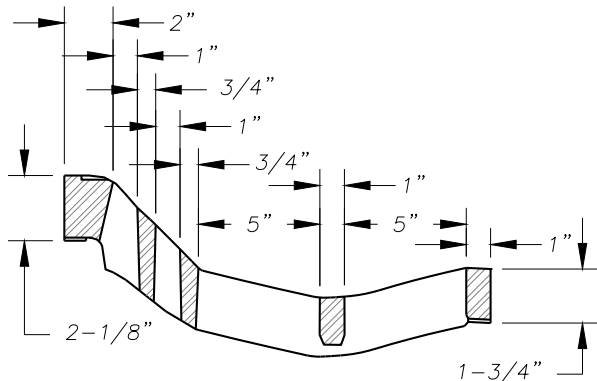
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01/07/16  
DATE

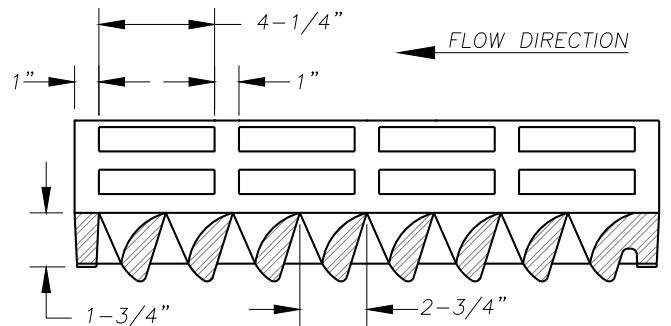
STANDARD  
**D4.6**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15



PLAN



SECTION A-A



SECTION B-B

NOTES:

1. WELDING NOT PERMITTED.
2. USE ROLLED CURB VANE GRATE WHERE LONGITUDINAL SLOPE IS GREATER THAN 4%.
3. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
4. SEE WSDOT STANDARD SPECIFICATIONS SECTION 7-05.

DWG: D4.7.DWG

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ROLLED CURB  
VANED GRATE  
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APPROVED  
01/07/16  
DATE

STANDARD  
**D4.7**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15

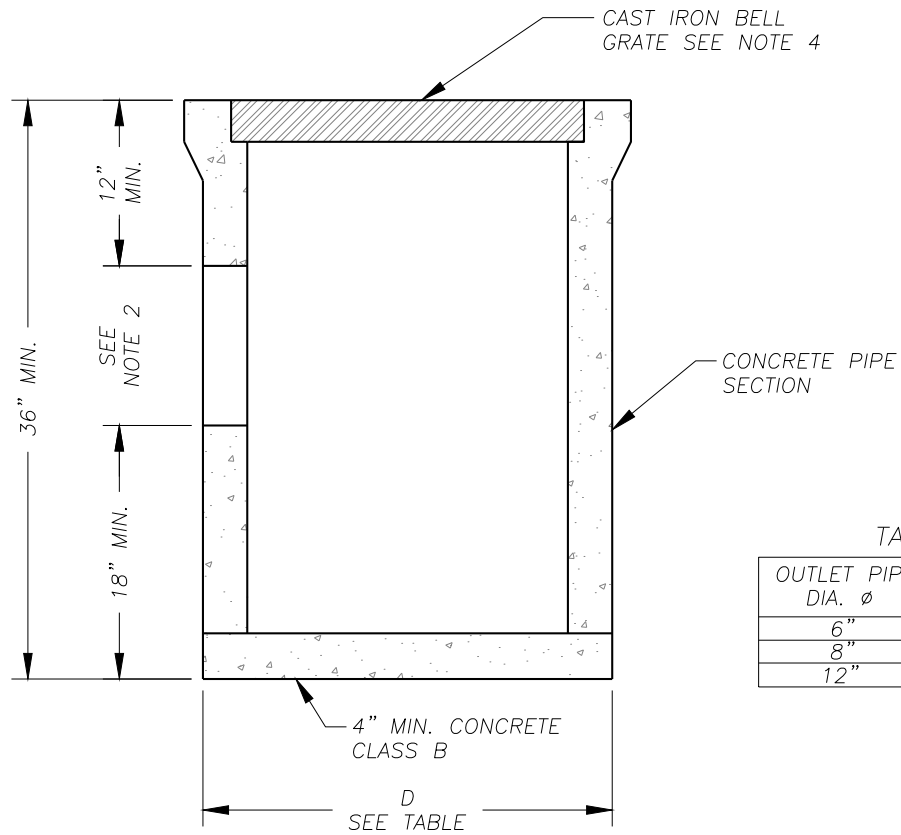


TABLE 1

OUTLET PIPE DIA. $\phi$	INLET DIA. $\phi$
6"	12"
8"	18"
12"	24"

AREA INLET APPROVED FOR USE IN PRIVATE STORM DRAIN SYSTEMS ONLY

NOTES:

1. AREA INLETS TO BE CONSTRUCTED FROM CONCRETE PIPE, IN ACCORDANCE WITH ASTM C 14 UNLESS OTHER WISE SHOWN ON THE PLANS OR NOTED IN THE STANDARD SPECIFICATIONS.
2. KNOCKOUTS OR CUTOUT HOLE SIZE IS EQUAL TO THE OUTLET PIPE OUTSIDE DIAMETER PLUS AREA INLET WALL THICKNESS.
3. CONNECTION TO OUTLET PIPE TO BE MORTARED (INSIDE/OUTSIDE) AND MADE FLUSH WITH INSIDE OF THE AREA INLET WALL.
4. CAST IRON BELL GRATE SHALL MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATIONS RR-F-621D. THE GRATE SHALL HAVE SLOTS (HOLES) THAT CONSTITUTE 50% OPEN AREA FOR DRAINAGE. INLET BELL SURFACE SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
5. AREA INLET TO BE USED FOR PRIVATE STORM SYSTEMS ONLY.

NO.	REVISIONS	DATE	BY

DWG: D5.DWG



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STANDARD AREA INLET  
PRIVATE

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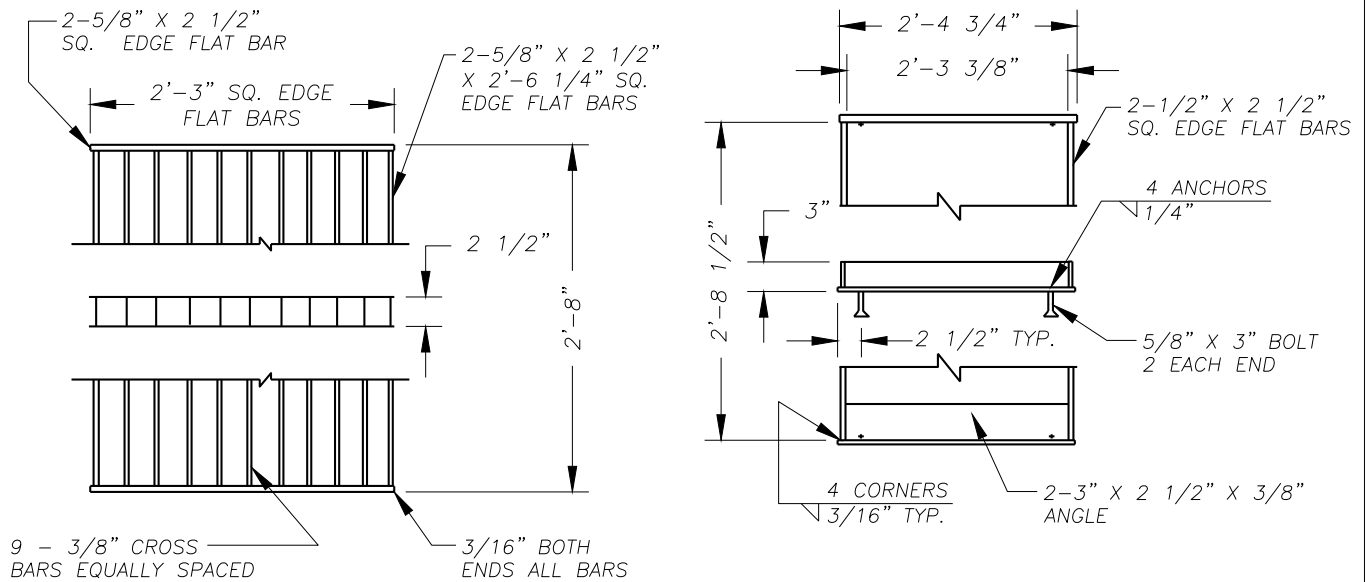
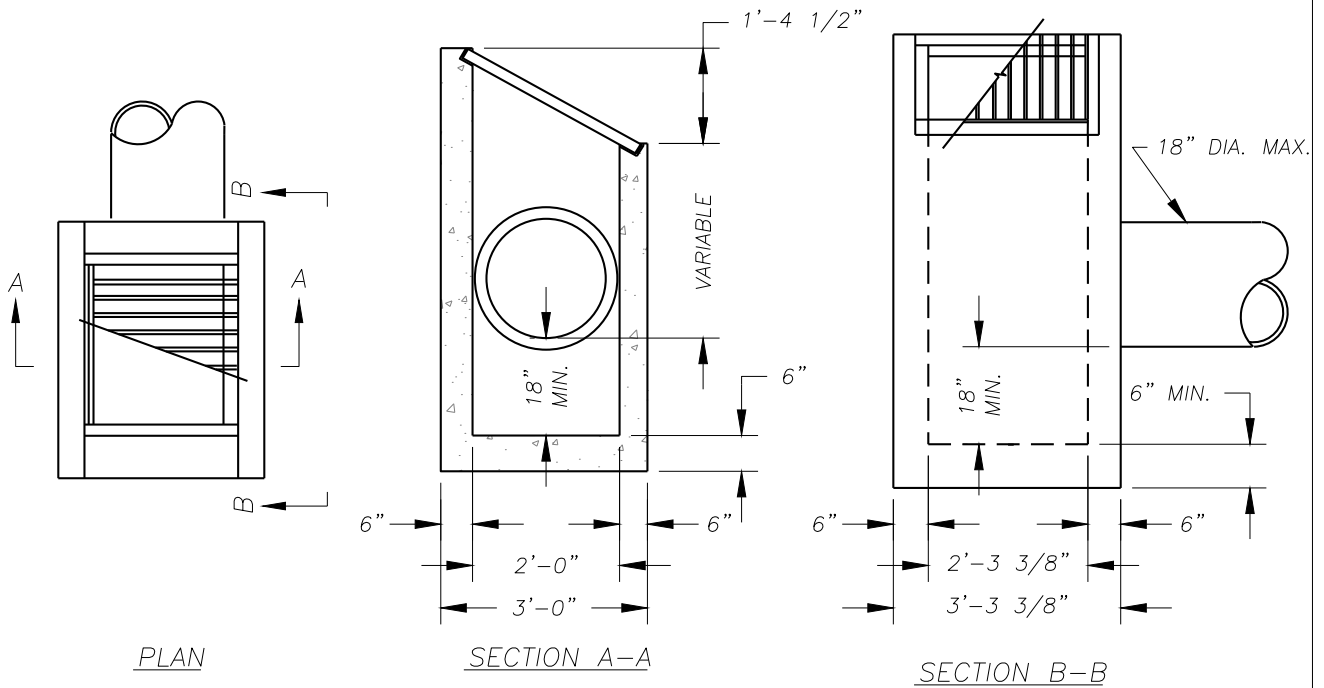
01/07/16  
DATE

STANDARD

**D5**

DETAIL

DESIGNED  
DRAWN  
DATE 01/30/15



**NOTES:**

1. DITCH INLET CONSTRUCTION IN ACCORDANCE WITH ASTM C-478.
2. CATCH BASIN, FRAME, AND GRATES SHALL BE FLAT BAR STEEL OR APPROVED EQUAL.
3. INSIDE FRAME DIMENSIONS: 2'-3 3/8"x 2'-8 1/2".
4. 3/8" CROSS BARS SHALL BE FLUSH WITH THE GRATE SURFACE AND MAY BE FILLET WELDED, RESISTANCE WELDED OR ELECTROFORGED TO BEARING BARS.

NO.	REVISIONS	DATE	BY

DWG: D6.DWG



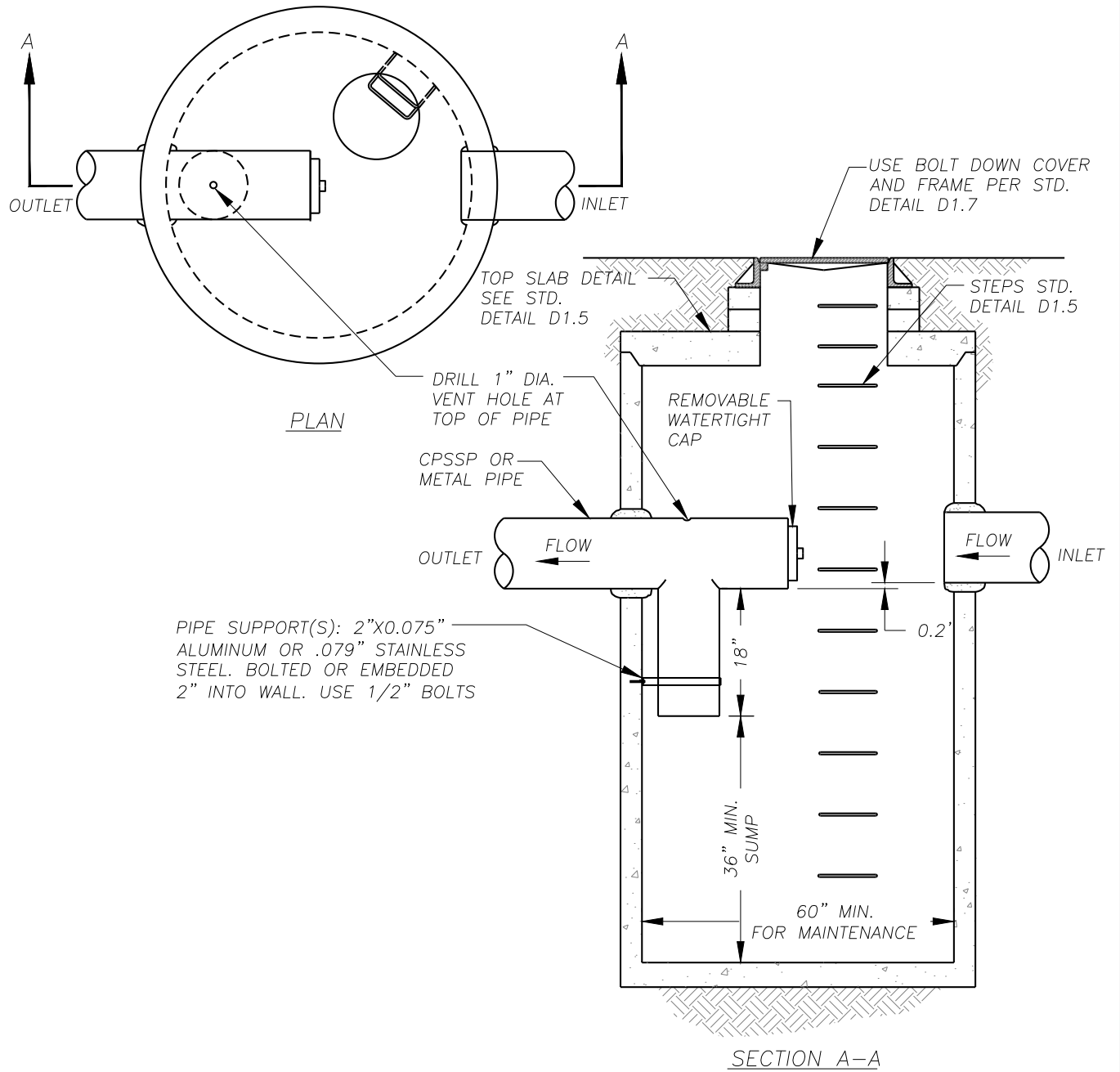
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CONCRETE DITCH INLET

*[Signature]*  
APPROVED  
COUNTY ENGINEER

01/07/16  
DATE

STANDARD  
**D6**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15



NOTES:

1. EXCEPT AS SHOWN OR NOTED, UNITS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS FOR WSDOT CATCH BASIN TYPE 2, 60" MINIMUM DIAMETER. SEE WSDOT STANDARD PLAN B-10.20-00.
2. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE STD. DETAIL D1.5.
3. CPSSP-CORRUGATED POLYETHYLENE STORM SEWER PIPE.

NO.	REVISIONS	DATE	BY

DWG: D7.DWG



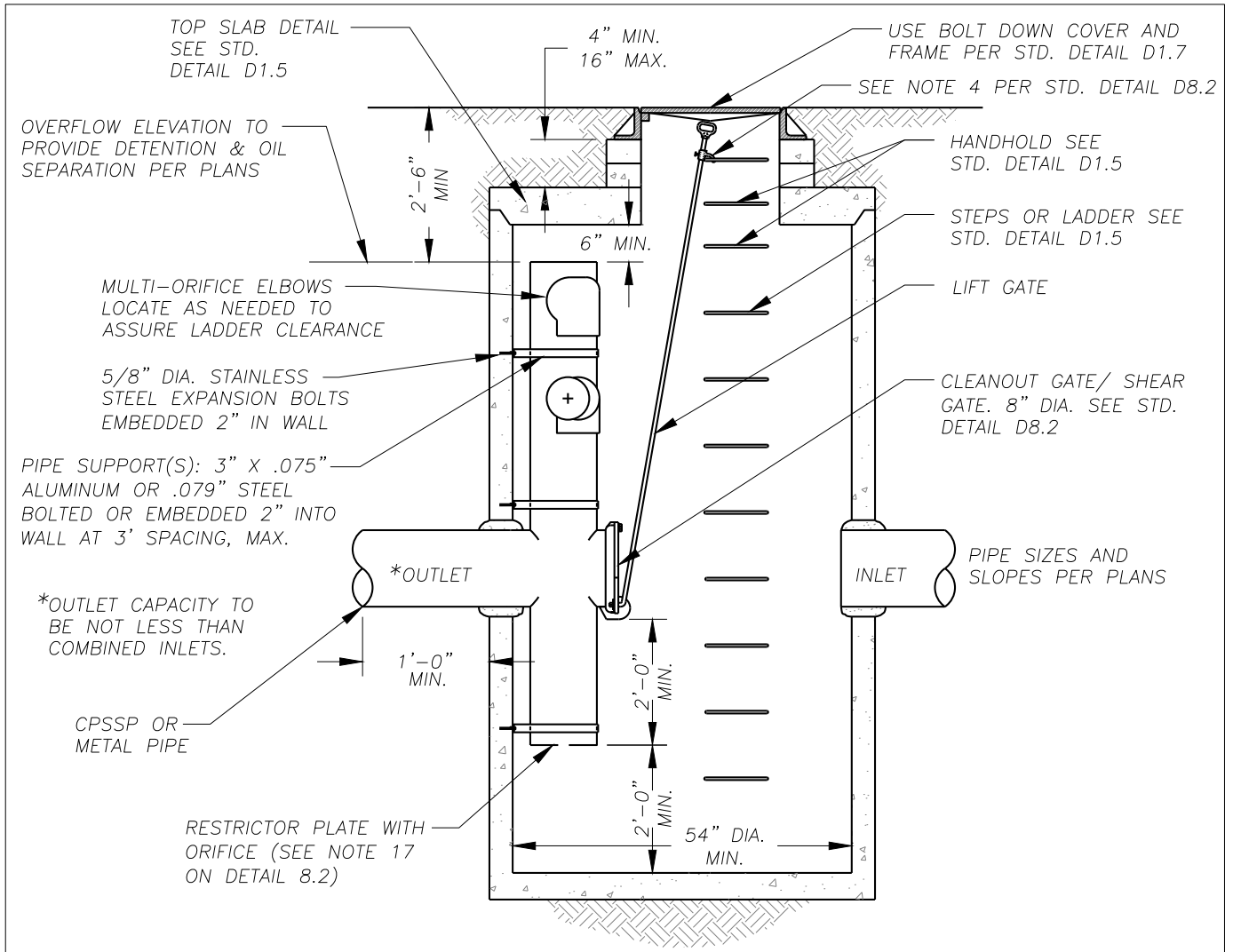
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CATCH BASIN TYPE 2  
SEDIMENTATION MANHOLE

*[Signature]*  
APPROVED  
COUNTY ENGINEER

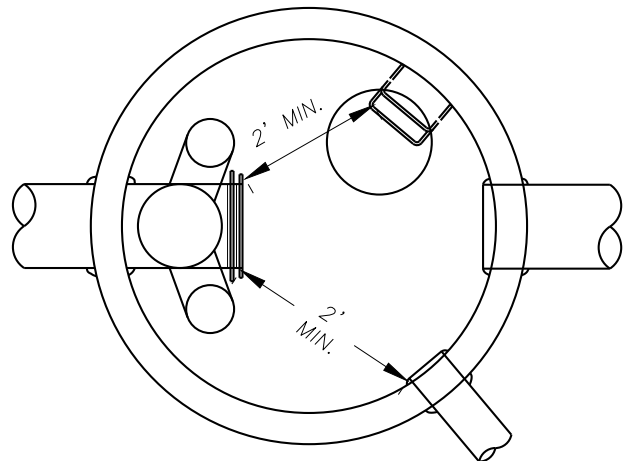
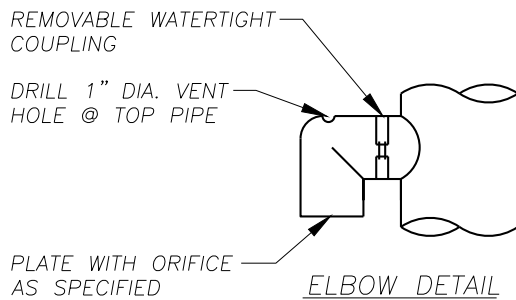
01/07/16  
DATE

STANDARD  
**D7**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15



CATCH BASIN TYPE 2

SEE WSDOT STANDARD PLAN B-10.20-00



PLAN

NO.	REVISIONS	DATE	BY

DWG: D8.1.DWG



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CATCH BASIN TYPE 2 - FLOW CONTROL MANHOLE  
TEE TYPE (CONTINUED ON D8.2)

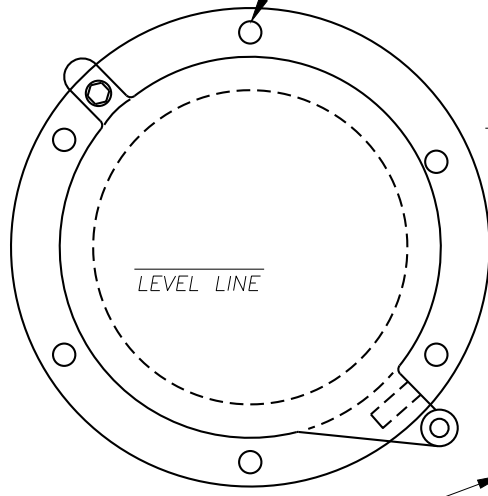
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APPROVED  
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01/07/16  
DATE

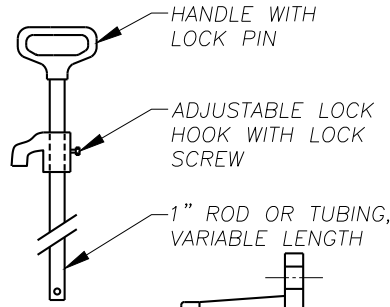
STANDARD  
**D8.1**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15



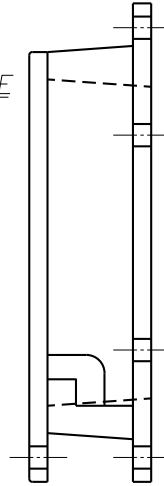
SIX EVENLY SPACED HOLES ON 10 3/8" BOLT CIRCLE FOR BOLTING TO FLANGE CONNECTION



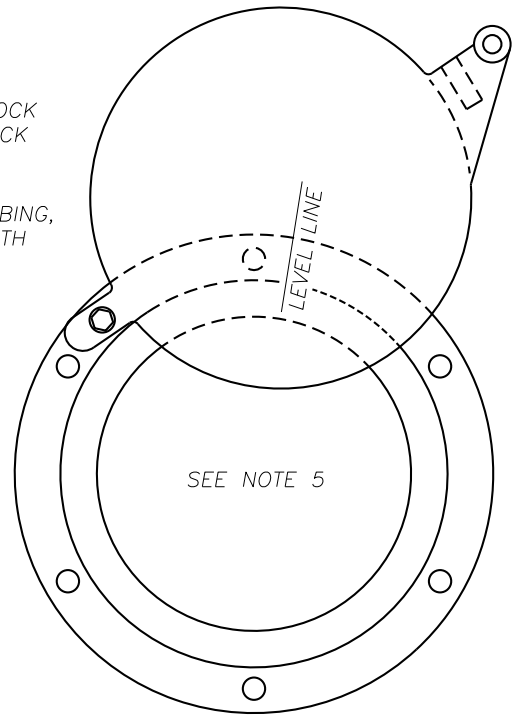
FRONT



LIFT HANDLE



SIDE



MAXIMUM OPENING OF GATE

LIFT HANDLE SHALL BE ATTACHED PER MANUFACTURER'S RECOMMENDATIONS

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" DIAM. 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" DIAM. STAINLESS STEEL.
9. ALTERNATE CLEANOUT/SHEAR GATES TO THE DESIGN SHOWN ARE ACCEPTABLE, PROVIDED THEY MEET THE MATERIAL SPECIFICATIONS ABOVE AND HAVE A SIX BOLTS, 10-3/8" BOLT CIRCLE FOR BOLTING TO THE FLANGE CONNECTION.

FLOW CONTROL DEVICE NOTES:

10. EXCEPT AS SHOWN OR NOTED, UNITS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS FOR WSDOT CATCH BASIN TYPE 2, 54" MIN. DIA.
11. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE STD. DETAIL D1.5.
12. 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.
13. OUTLET SHALL BE CONNECTED TO CULVERT OR SEWER PIPE WITH A STANDARD COUPLING BAND FOR CORRUGATED METAL PIPE OR GROUTED INTO THE BELL OF CONCRETE PIPE.
14. THE VERTICAL RISER STEM OF THE RESTRICTOR/SEPARATOR SHALL BE THE SAME DIAMETER AS THE HORIZONTAL OUTLET PIPE WITH AN 8" MIN. SIZE.
15. 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).
16. 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.
17. 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.

NO.	REVISIONS	DATE	BY

DWG: D8.2.DWG



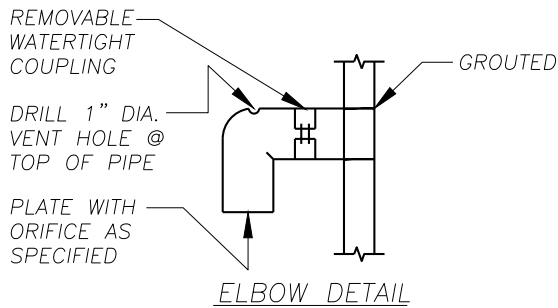
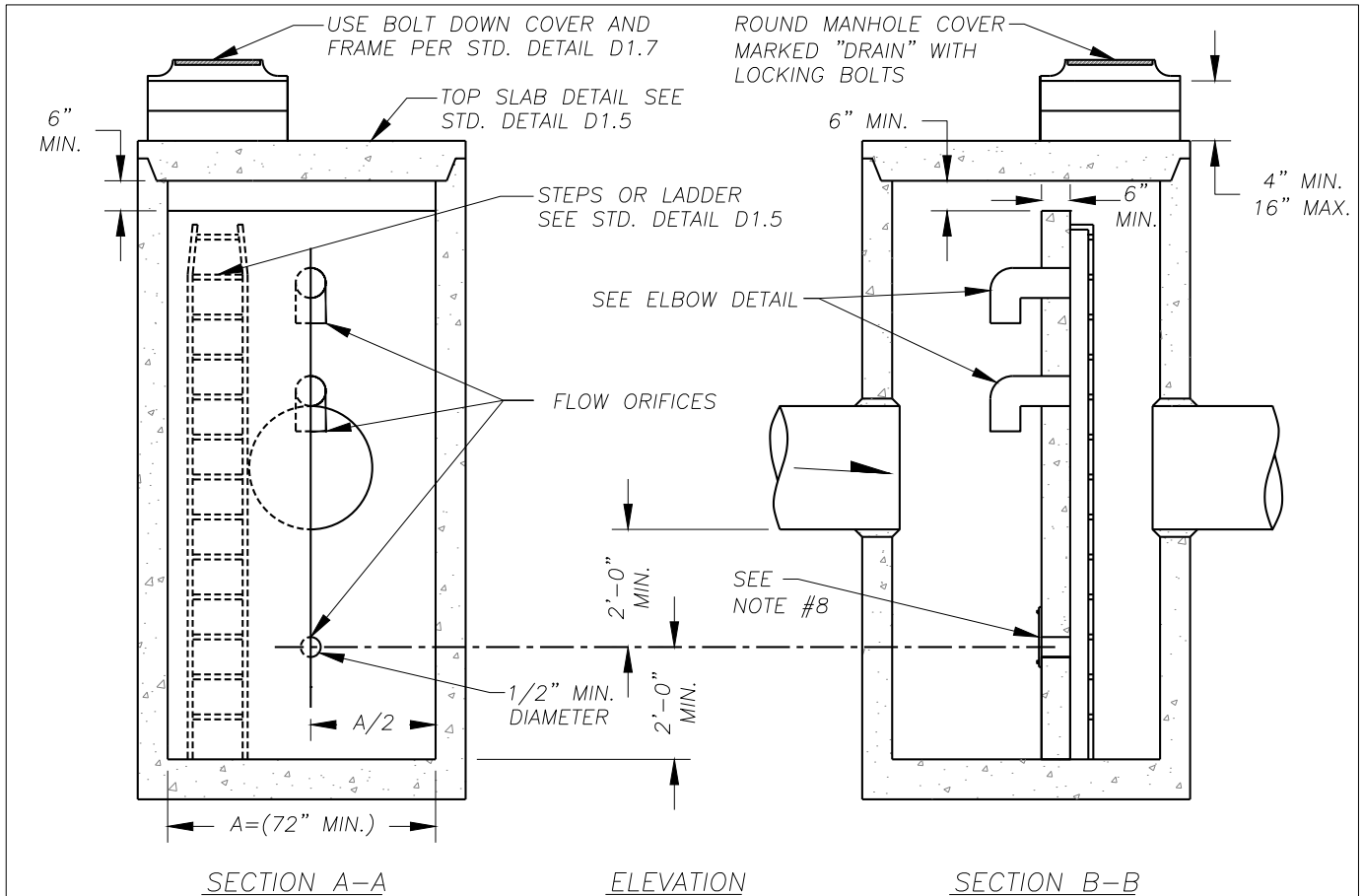
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CATCH BASIN TYPE 2 - SHEAR GATE DETAIL  
AND NOTES (CONTINUED FROM D8.1)

*[Signature]*  
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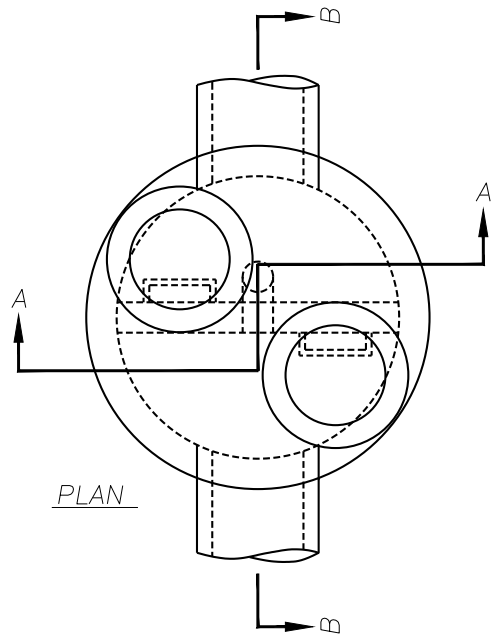
01/07/16  
DATE

STANDARD  
**D8.2**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15



**NOTES:**

1. PIPE SIZE, SLOPES AND ALL ELEVATIONS: PER PLANS.
2. OUTLET CAPACITY: NOT LESS THAN COMBINED INLETS.
3. EXCEPT AS SHOWN OR NOTED, UNIT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS FOR WSDOT CATCH BASIN TYPE 2, 72" MIN. DIA.
4. COVERS: ROUND, SOLID MARKED "DRAIN," WITH BOLT DOWN COVER, SEE STD. DETAIL D1.7.
5. ORIFICES: SIZED AND LOCATED AS REQUIRED, WITH LOWEST ORIFICE MIN. 2' FROM BASE.
6. BAFFLE WALL SHALL HAVE #4 BAR AT 12" SPACING EACH WAY.
7. PRECAST BAFFLE WALL SHALL BE KEYED AND GROUTED IN PLACE.
8. BOTTOM ORIFICE PLATE TO BE 1/4" MIN. STAINLESS STEEL OR POLYETHYLENE EQUIVALENT AND ATTACHED WITH 1/2" STAINLESS STEEL BOLTS. OMIT ORIFICE PLATE IF ONLY FOR OIL SEPARATION.
9. UPPER FLOW ORIFICE SHALL BE ALUMINUM, ALUMINIZED STEEL OR STAINLESS STEEL. SEE STD. DETAIL D8.1.



NO.	REVISIONS	DATE	BY

DWG: D9.DWG



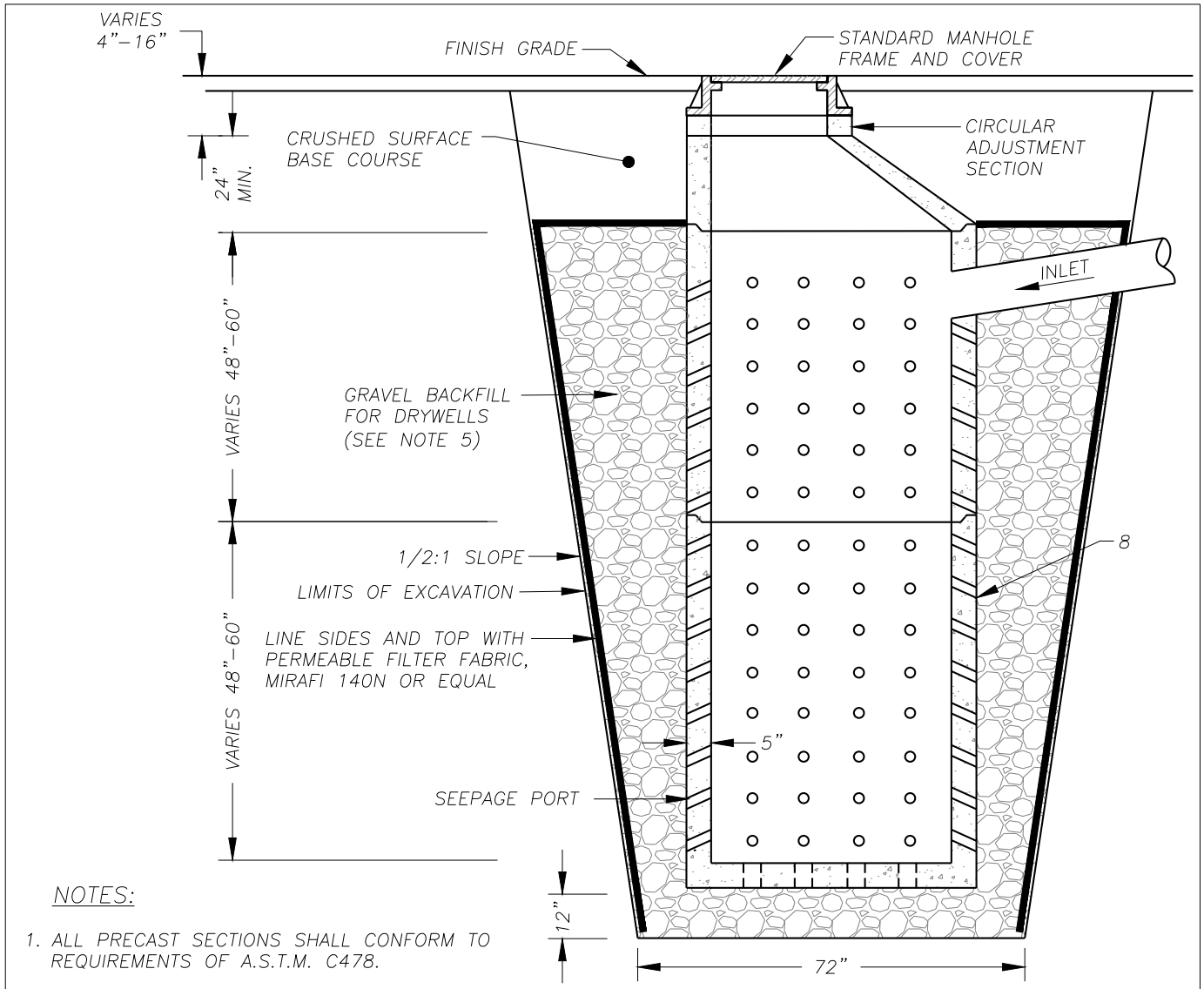
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CATCH BASIN TYPE 2 - FLOW CONTROL MANHOLE  
BAFFLE TYPE

*[Signature]*  
APPROVED  
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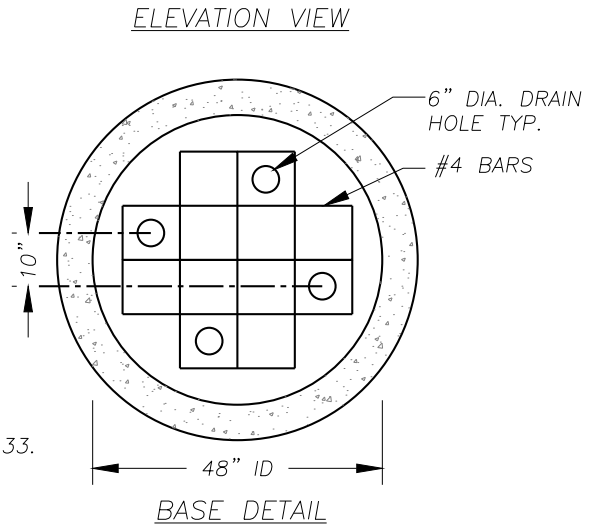
01/07/16  
DATE

STANDARD  
**D9**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15



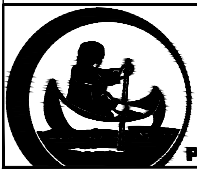
**NOTES:**

1. ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF A.S.T.M. C478.
2. PRECAST CONE SECTIONS MAY BE ECCENTRIC OR CONCENTRIC.
3. ALL PIPING TO AND FROM PRECAST DRYWELLS SHALL HAVE AT LEAST 8" OF CRUSHED ROCK COVER CONTINUOUSLY AROUND PIPE WHERE DRAIN ROCK WOULD OTHERWISE BE IN CONTACT WITH PIPE.
4. PERFORATIONS SHALL BE HORIZONTAL ROWS OF (14) 2-1/4" SQUARE OR (14) 2-3/8" ROUND HOLES, EQUALLY SPACED. ROWS SHALL BE SPACED 6-1/2" CENTER TO CENTER.
5. GRAVEL BACKFILL FOR DRYWELLS PER WSDOT STANDARD SPECIFICATIONS 9-03.12(5).
6. UNDERGROUND DRAINAGE GEOTEXTILE, MODERATE SURVIVABILITY, CLASS A. SEE WSDOT SPECIFICATIONS 9-33.
7. TYPICAL DRYWELL DEPTH IS 13'.
8. SEEPAGE PORT ORIENTATION VARIES AMONG MANUFACTURERS.



DWG: D10.DWG

NO.	REVISIONS	DATE	BY



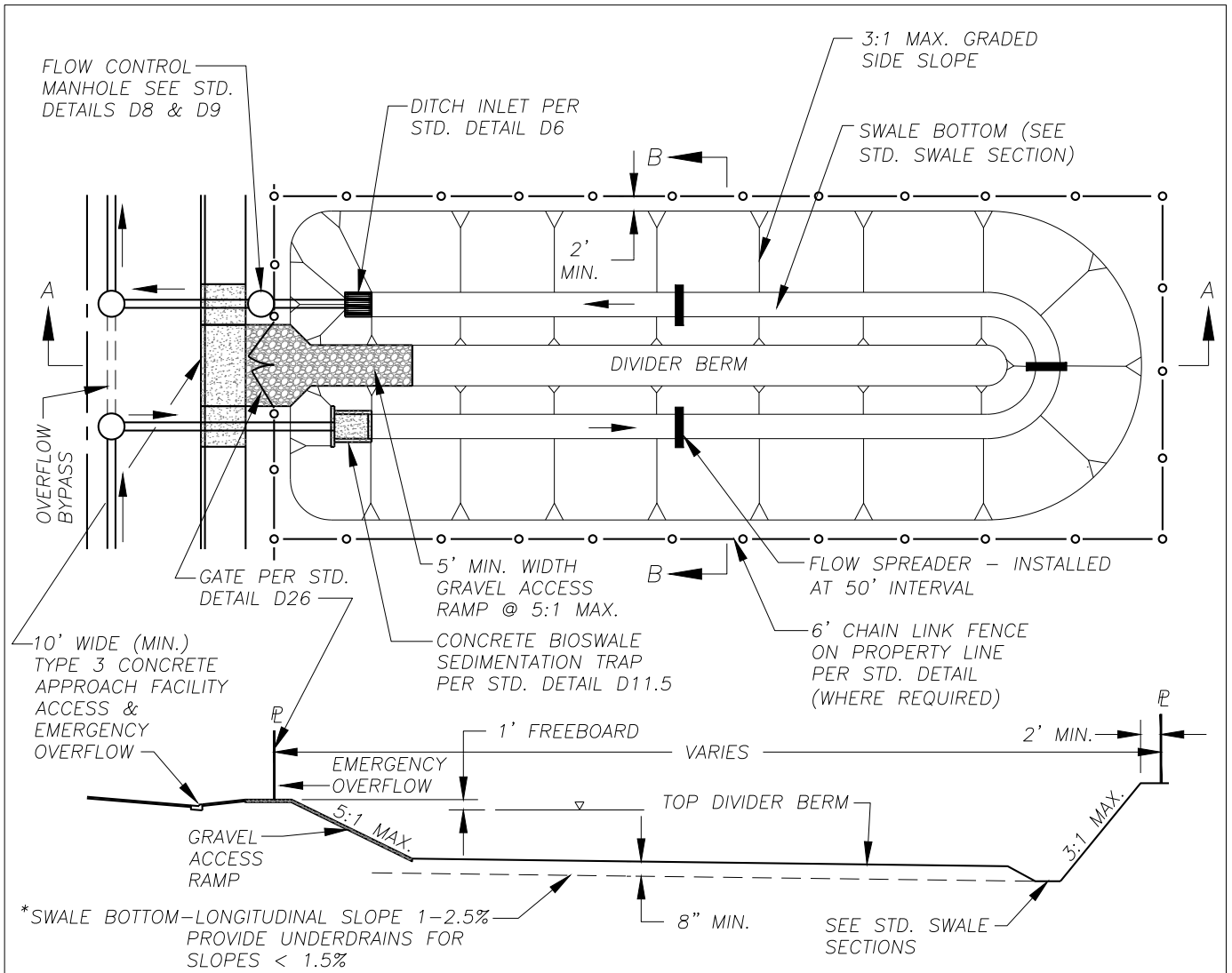
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PRECAST CONCRETE DRYWELL

*[Signature]* APPROVED  
 COUNTY ENGINEER

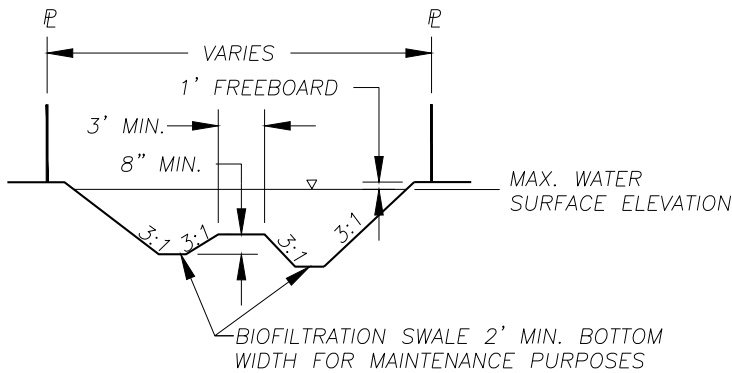
01/07/16  
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STANDARD  
**D10**  
 DETAIL  
 DESIGNED  
 DRAWN  
 DATE 01/30/15



SECTION A-A

\*NOTE:  
SWALE DESIGN REQUIRES A MINIMUM OF 9 MINUTES OF RESIDENCE TIME ( $n=0.20$ ).



SECTION B-B

NOTES:

1. THE DESIGN OF THE STORMWATER FACILITIES SHALL MEET THE DESIGN STANDARD AS SET FORTH IN CCC 40.386 AND CCSWM.
2. THIS DETAIL IS AN EXAMPLE STORMWATER FACILITY FOR URBAN INFILL. EACH SWALE NEEDS TO BE ENGINEERED TO SITE SPECIFIC CONDITIONS AND ELEVATIONS.
3. SEE STANDARD SWALE SECTIONS, AND FLOW SPREADER DETAILS.

NO.	REVISIONS	DATE	BY

DWG: D11.0.DWG



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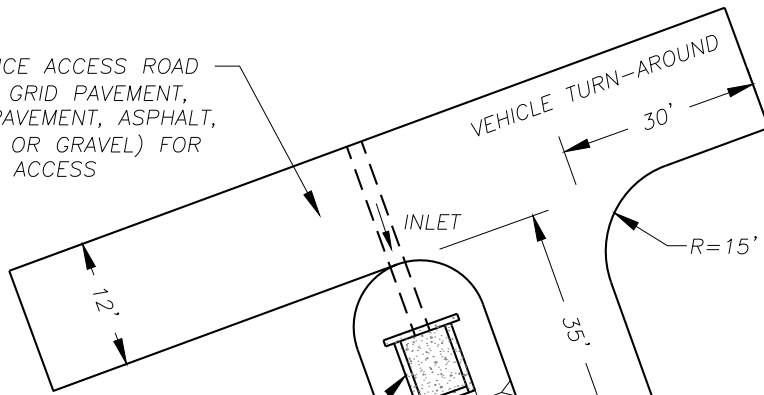
EXAMPLE STORMWATER FACILITY  
FOR URBAN INFILL DEVELOPMENT

APPROVED  
*[Signature]*  
COUNTY ENGINEER

01/07/16  
DATE

STANDARD  
**D11.0**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15

MAINTENANCE ACCESS ROAD  
(MODULAR GRID PAVEMENT,  
POROUS PAVEMENT, ASPHALT,  
CONCRETE OR GRAVEL) FOR  
VEHICULAR ACCESS



CONCRETE BIOSWALE  
SEDIMENTATION TRAP  
PER STD. DETAIL D11.5

5' WIDE MAINTENANCE ACCESS  
RAMP 5:1 MAX. SLOPE

FLOW SPREADER AT  
MINIMUM 50' INTERVAL

\*SWALE BOTTOM-LONGITUDINAL SLOPE 1-2.5%  
PROVIDE UNDERDRAINS FOR  
SLOPES < 1.5%

\*NOTE:  
SWALE DESIGN REQUIRES A MINIMUM OF  
9 MINUTES OF RESIDENCE TIME.  
MINIMUM LENGTH = 100'

DITCH INLET PER  
STD. DETAIL D6

OUTLET

NOTES:

1. THE DESIGN OF WATER QUALITY FACILITIES SHALL MEET THE DESIGN STANDARD AS SET FORTH IN CCC 40.386.
2. THIS DETAIL IS AN EXAMPLE BIOFILTRATION SWALE FOR STORMWATER TREATMENT.
3. SEE STANDARD SWALE SECTIONS, AND FLOW SPREADER DETAILS.

NO.	REVISIONS	DATE	BY

DWG: D11.1.DWG



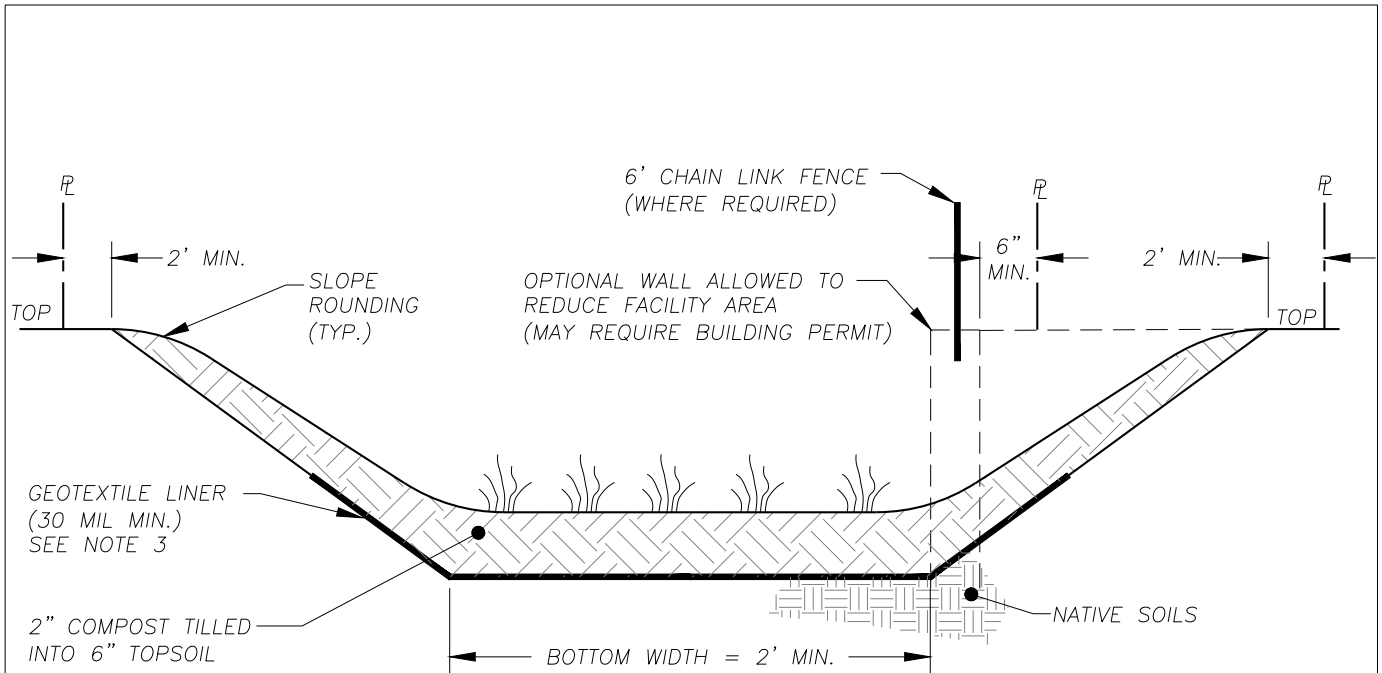
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EXAMPLE BIOFILTRATION SWALE SCHEMATIC

*[Signature]*  
APPROVED  
COUNTY ENGINEER

01/07/16  
DATE

STANDARD  
**D11.1**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15



**NOTE:**

IF BIOFILTRATION SWALE IS INSTALLED DURING A PERIOD OF WET WEATHER, IT CAN 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.

**NOTES:**

1. THE DESIGN OF WATER QUALITY FACILITIES SHALL MEET THE STANDARD AS SET FORTH IN CCC 40.386 AND CCSWM.
2. SOD SHALL BE LAID PERPENDICULAR TO SLOPE FROM BOTTOM TO TOP, WITH JOINTS STAGGERED.
3. FOR NATIVE SOILS WITH CLASSIFICATIONS A-1-a, A-1-b, A-3, A-2-4, AND A-2-5 AS DEFINED IN AASHTO SPEC. M145, INSTALL A 30 MIL GOETEXTILE LINER OR EQUIVALENT WITH PERMEABILITY RATE OF (LESS THAN) 2.4 INCHES/HOUR.
4. SWALE LONGITUDINAL SLOPE: 1%-2.5% MAX. UNDERDRAINS REQUIRED FOR SLOPES LESS THAN 1.5%, SEE STD. DETAIL D11.3.
5. SWALE SHALL HAVE A VIABLE STAND OF VEGETATION APPROVED BY THE COUNTY INSPECTOR PRIOR TO PAVING.
6. FOR LOW-GROWING TURF SEED MIX, SEE TABLE 8.2 IN CCSWM, BOOK 2 - BMP DESIGN.
7. FOR WET AREA SEED MIX, SEE TABLE 8.4 IN CCSWM, BOOK 2 - BMP DESIGN.

DWG: D11.2.DWG

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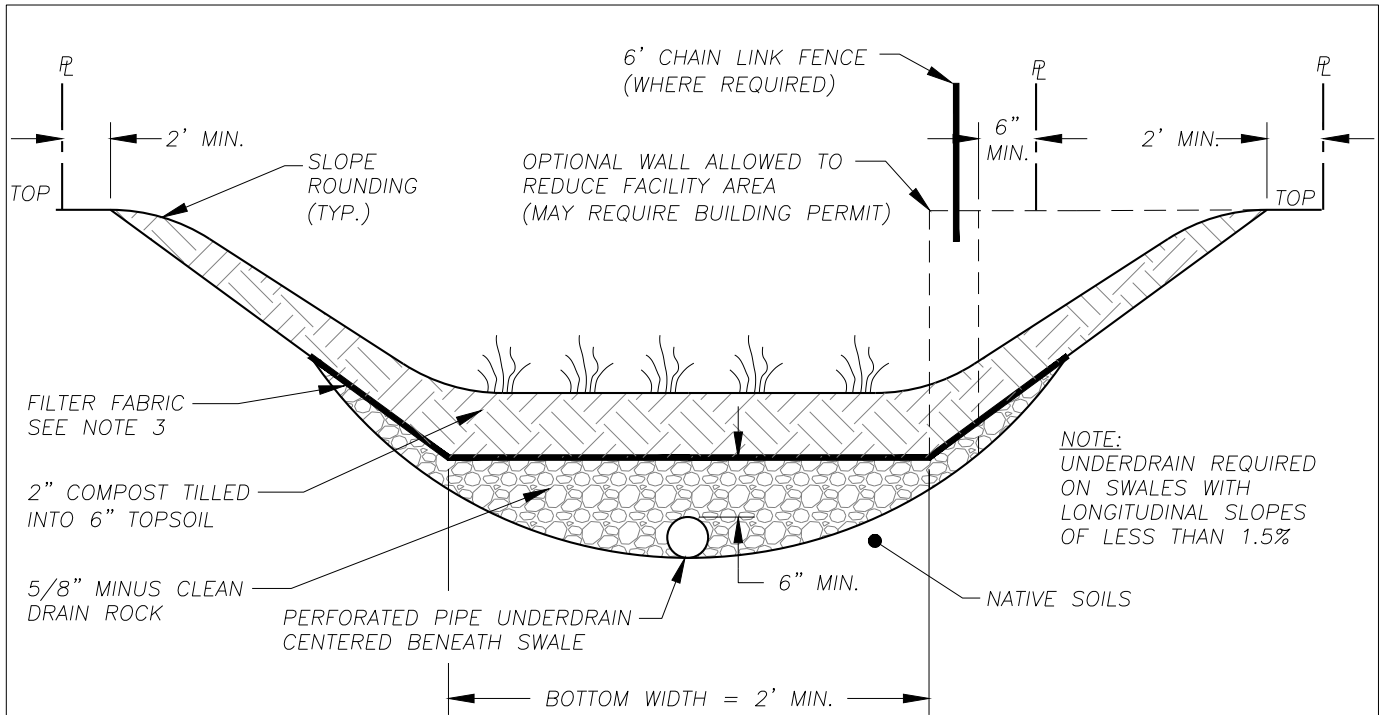
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TYPICAL BIOFILTRATION SWALE SECTION

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**NOTE:**

IF BIOFILTRATION SWALE IS INSTALLED DURING A PERIOD OF WET WEATHER, IT CAN 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.

**NOTES:**

1. THE DESIGN OF WATER QUALITY FACILITIES SHALL MEET THE STANDARD AS SET FORTH IN CCC 40.386 AND CCSWM.
2. SOD SHALL BE LAID PERPENDICULAR TO SLOPE FROM BOTTOM TO TOP, WITH JOINTS STAGGERED.
3. INSTALL MIRAFI 140N FILTER FABRIC OR EQUIVALENT ABOVE DRAIN ROCK.
4. UNDERDRAIN MUST INFILTRATE OR DRAIN FREELY TO AN ACCEPTABLE DISCHARGE POINT.
5. SWALE SHALL HAVE A VIABLE STAND OF VEGETATION APPROVED BY THE COUNTY INSPECTOR PRIOR TO PAVING.
6. FOR LOW-GROWING TURF SEED MIX, SEE TABLE 8.2 IN CCSWM, BOOK 2 – BMP DESIGN.
7. FOR WET AREA SEED MIX, SEE TABLE 8.4 IN CCSWM, BOOK 2 – BMP DESIGN.

DWG: D11.3.DWG

NO.	REVISIONS	DATE	BY



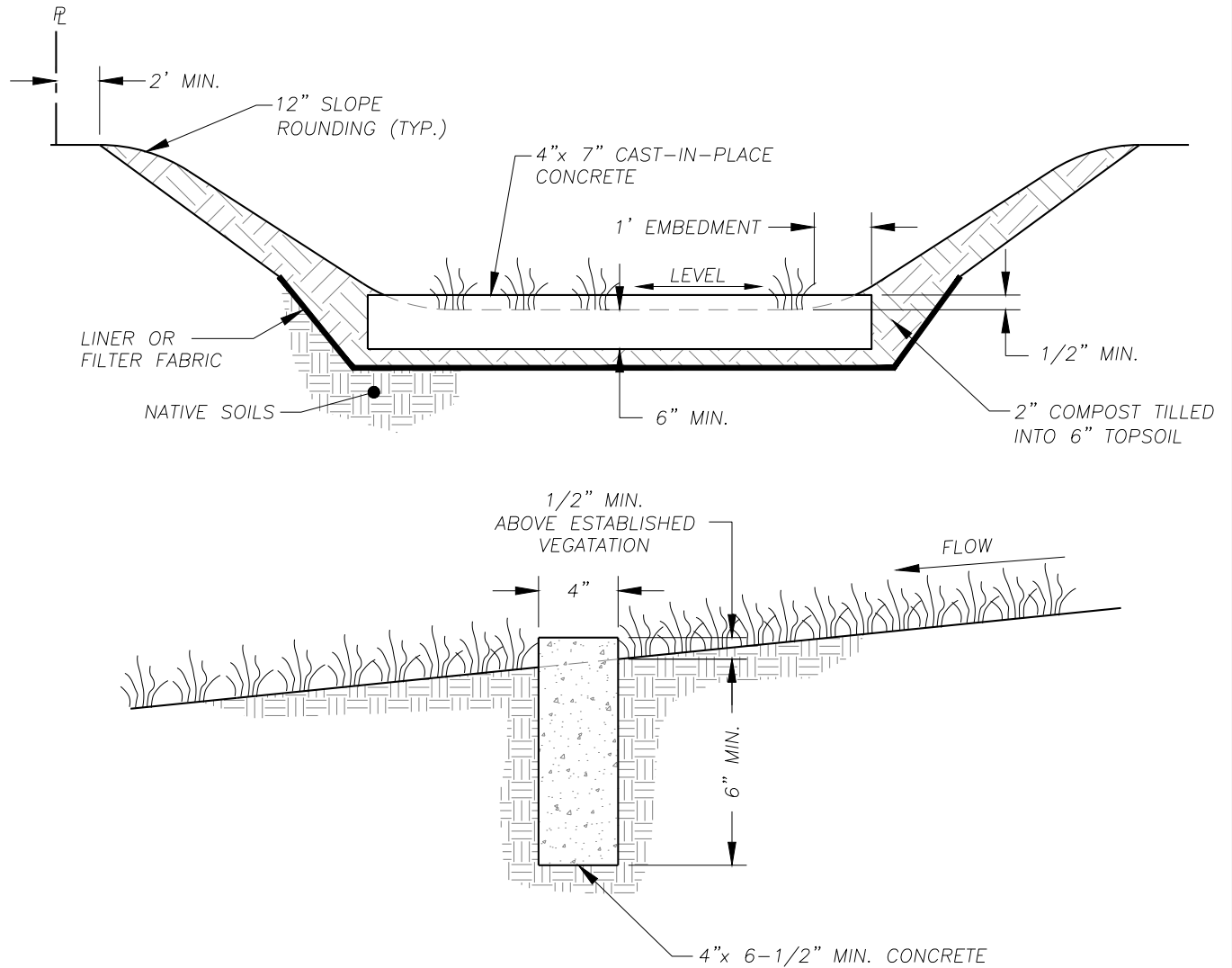
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TYPICAL BIOFILTRATION SWALE SECTION  
WITH UNDERDRAIN

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**D11.3**  
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DRAWN  
DATE 01/30/15



**NOTES:**

1. LEVEL SPREADERS SHALL BE INSTALLED AT A MINIMUM INTERVAL OF 50', TO KEEP THE FLOWS FROM CONCENTRATING. THE SPREADER SHALL BE INSTALLED LEVEL AND ON CONTOUR.
2. CONCRETE SPREADER SHALL BE CAST-IN-PLACE. TOP OF SPREADER SHALL BE BROOM FINISHED IN THE DIRECTION OF FLOW.
3. SEE STD. DETAIL D11.2 FOR SEED MIX.

NO.	REVISIONS	DATE	BY

DWG: D11.4.DWG



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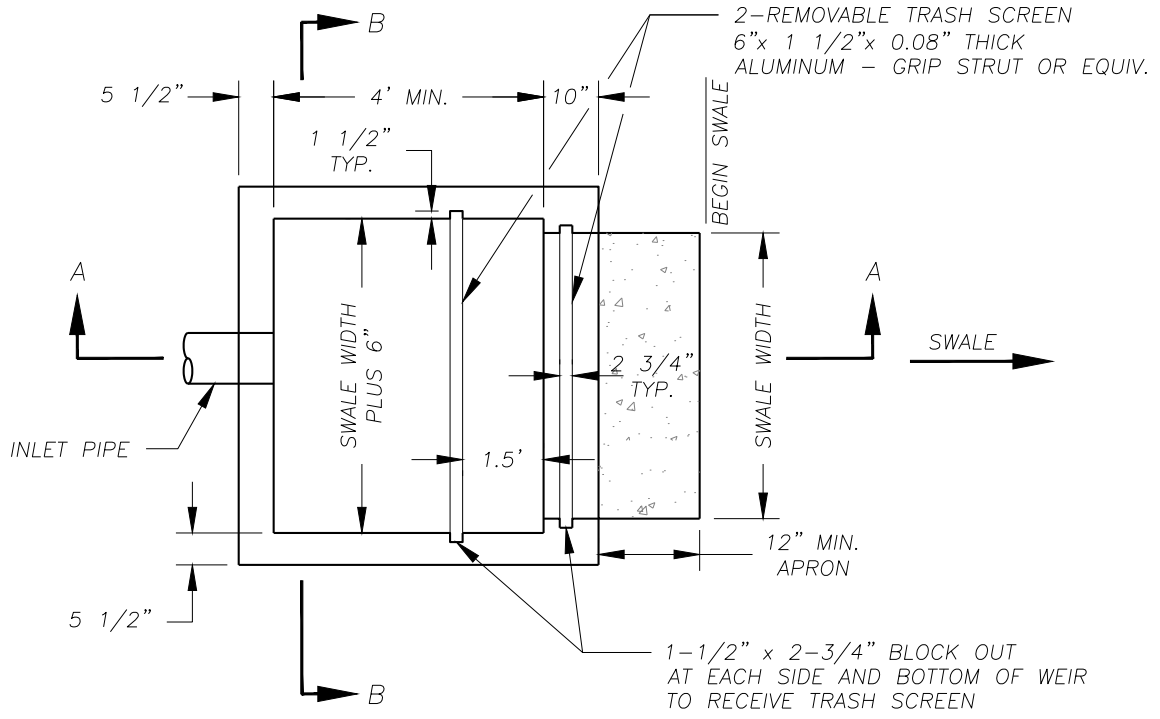
**FLOW SPREADER CURB**

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APPROVED  
COUNTY ENGINEER

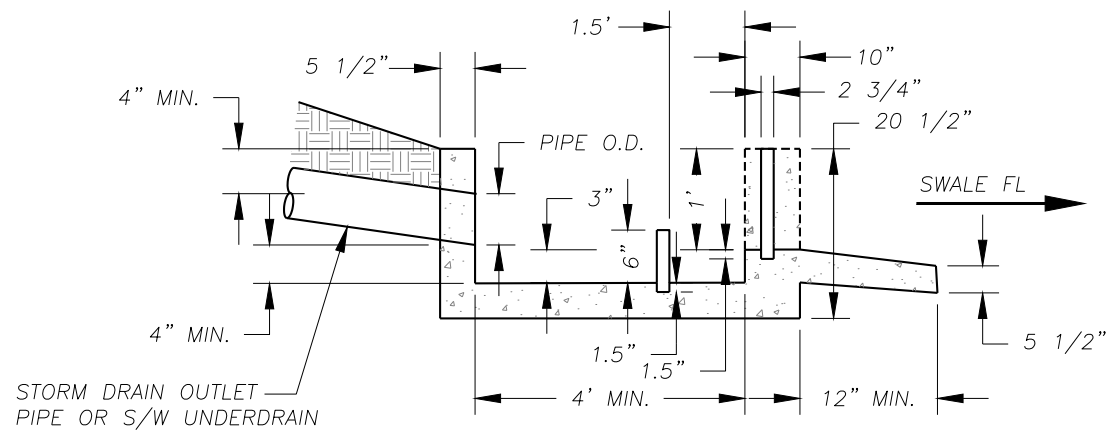
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STANDARD  
**D11.4**  
DETAIL  
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DRAWN  
DATE 01/30/15

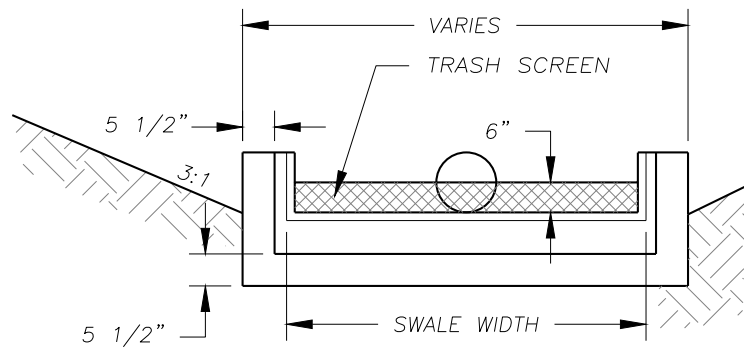




PLAN VIEW



SECTION A-A



SECTION B-B

NOTE:

1. ALL CONCRETE SHALL BE 3000 PSI.
2. STRUCTURE CAN BE USED AS AN AFFECTIVE TEMPORARY EROSION CONTROL SEDIMENTATION TRAP DURING SITE GRADING.
3. TRASH SCREEN CAN BE LINED WITH FILTER FABRIC FOR SEDIMENT REMOVAL.
4. SEDIMENTATION TRAP IS REQUIRED WITH ALL SWALES, UNLESS OMISSION APPROVED BY REVIEWING AUTHORITY.

NO.	REVISIONS	DATE	BY

DWG: D11.5.DWG



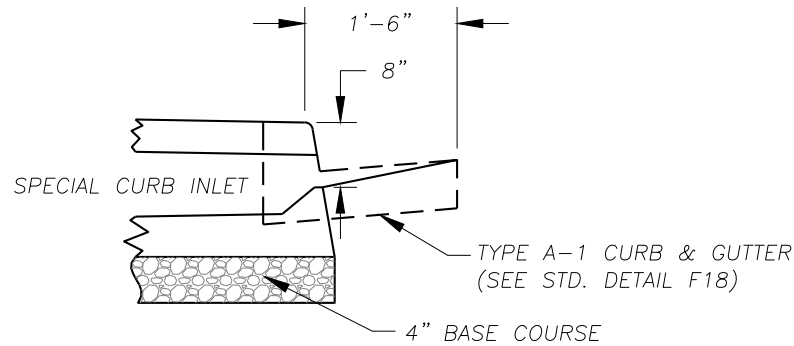
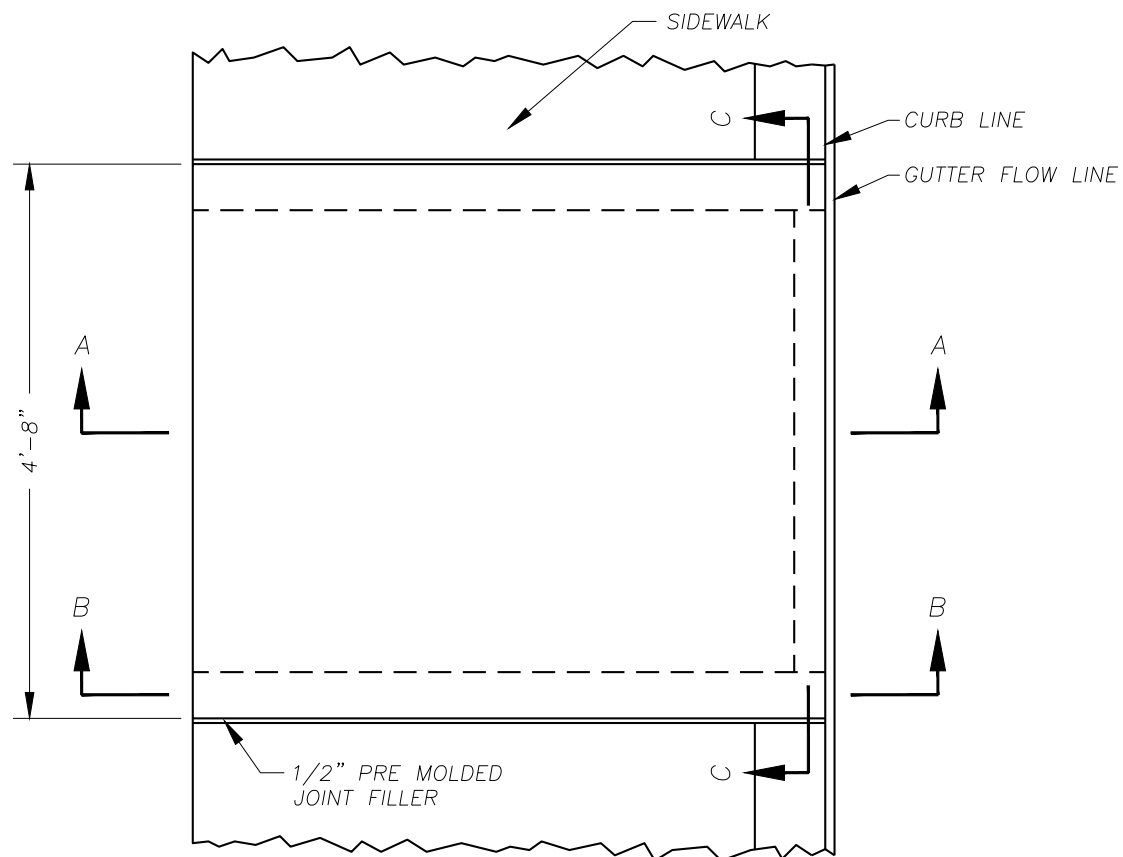
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BIOFILTRATION SWALE SEDIMENTATION TRAP

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COUNTY ENGINEER

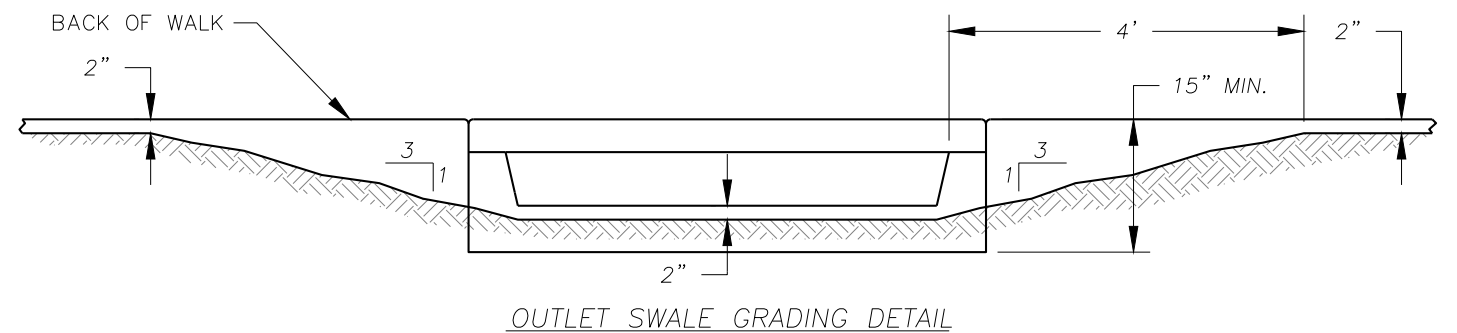
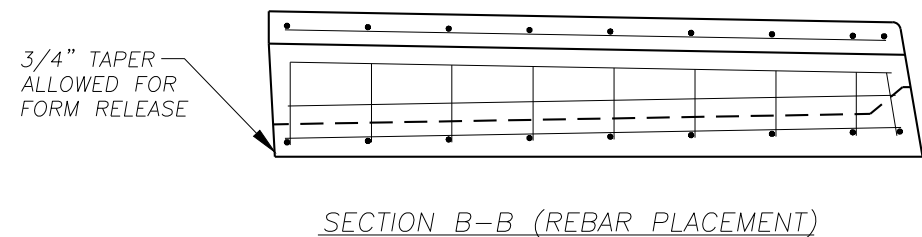
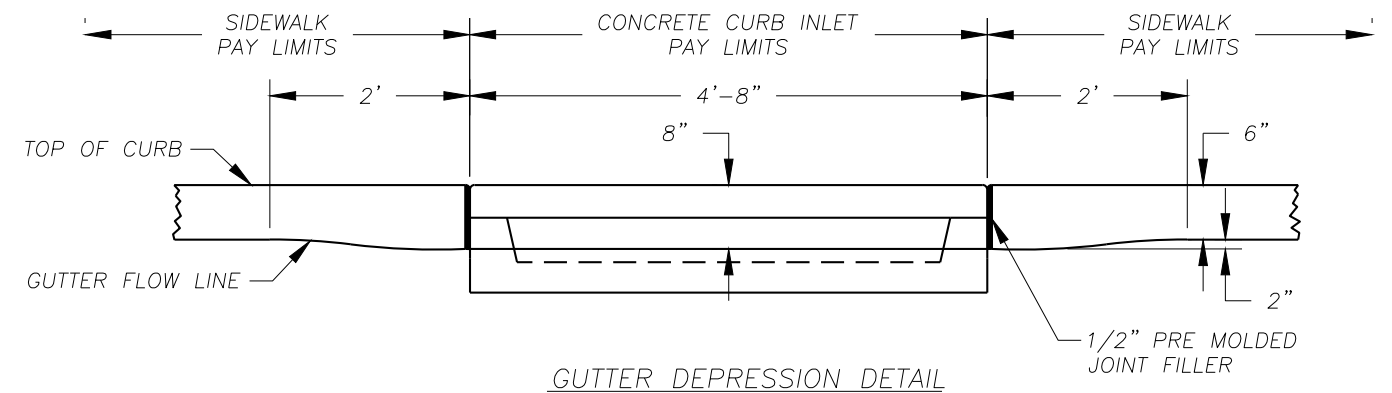
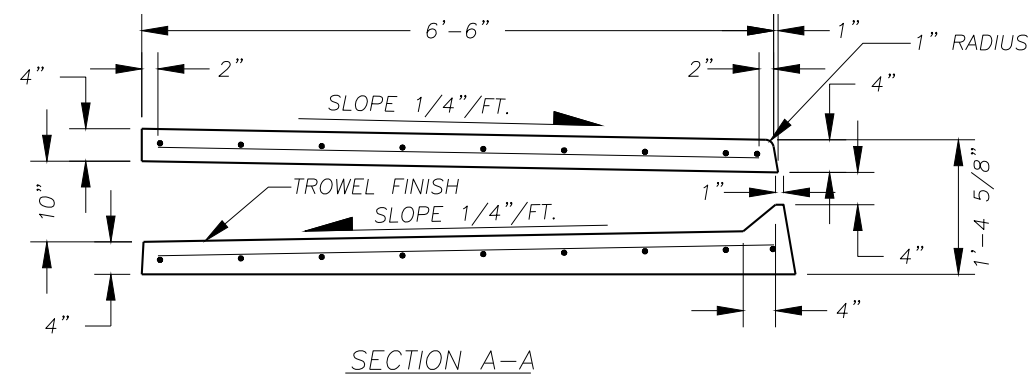
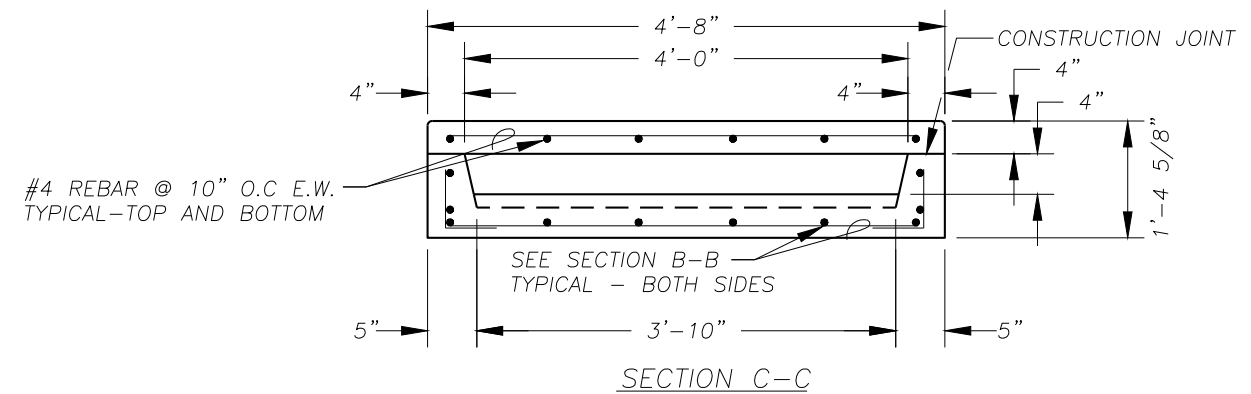
01/07/16  
DATE

STANDARD  
**D11.5**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15



**GENERAL NOTES:**

1. CURB INLET SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C 478 (AASHTO M-199) & ASTM C 890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE PROJECT SPECIAL PROVISIONS.
2. TOP SURFACE TO BE BROOM FINISHED.
3. ALL EXTERNAL EDGES NOT LABELED SHALL BE TROWELLED WITH 1/4" RADIUS EDGER.



NO.	REVISIONS	DATE	BY

DWG: D11.6.DWG



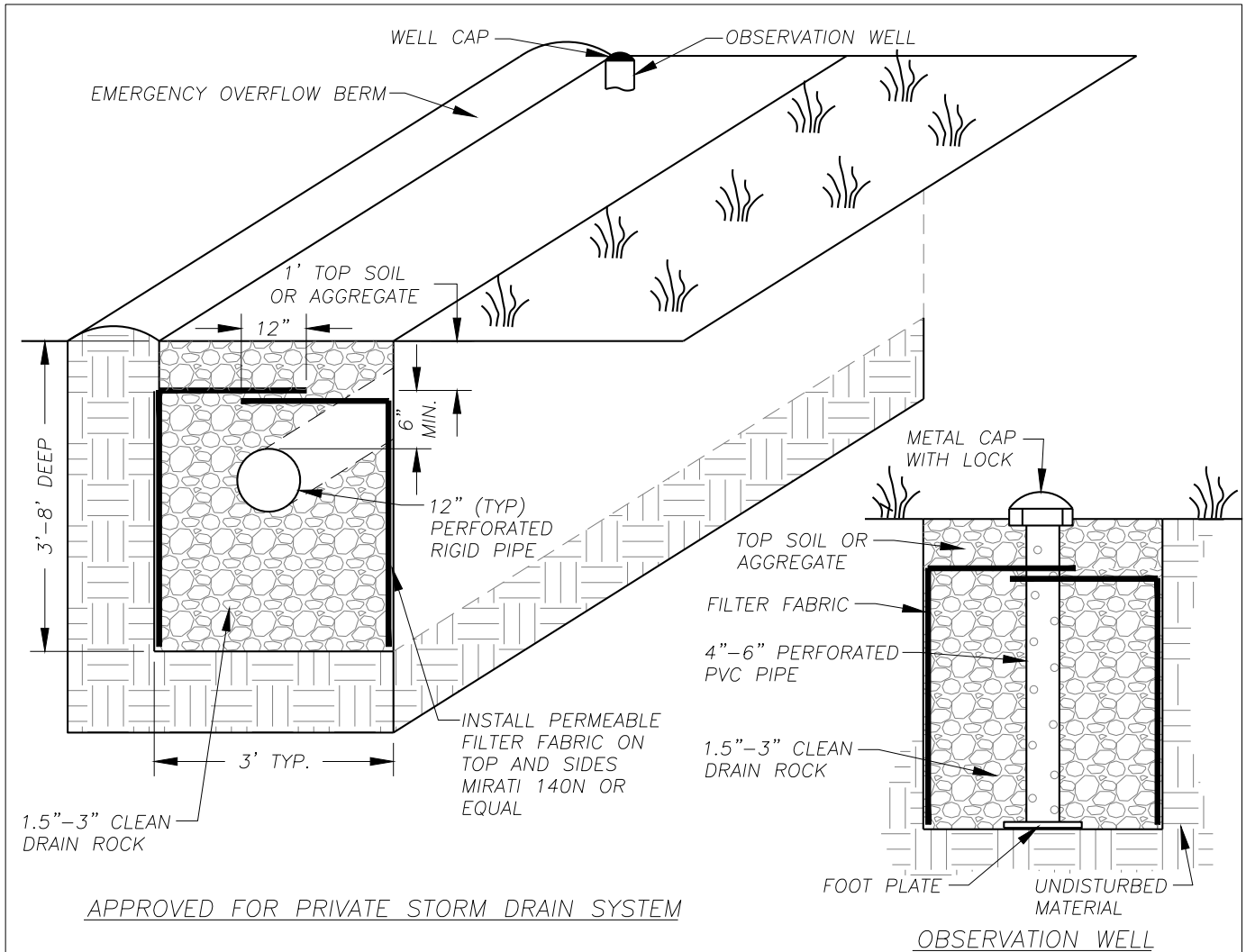
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SPECIAL CURB INLET  
OUTLET BEHIND WALK TO SWALE

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COUNTY ENGINEER

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APPROVED FOR PRIVATE STORM DRAIN SYSTEM

NOTES:

1. DRAIN ROCK SHALL BE LINED ON BOTH SIDES AND OVER LAPPED ON TOP WITH GEOTEXTILE MATERIAL.
2. THE INFILTRATION TRENCH IS GENERALLY USED FOR SMALL DRAINAGE AREAS, AN EMERGENCY SPILLWAY MAY NOT BE NECESSARY. HOWEVER, AN OVERFLOW OUTLET MAY BE REQUIRED TO BE PROVIDED.
3. AN OBSERVATION WELL SHOULD BE INSTALLED AT THE LOWER END OF THE INFILTRATION TRENCH TO CHECK WATER LEVELS, DRAWDOWN TIME, SEDIMENT ACCUMULATION, AND CONDUCT WATER QUALITY MONITORING. FOR LARGER TRENCHES A 12"-36" WELL CAN BE INSTALLED TO FACILITATE MAINTENANCE OPERATIONS SUCH AS PUMPING OUT OF SEDIMENT. THE TOP OF THE WELL IS TO BE CAPPED TO DISCOURAGE VANDALISM AND TAMPERING. PUBLIC INFILTRATION TRENCH REQUIRES A CLEANOUT TO BE INSTALLED AT END OF PERFORATED PIPE.
4. THE STONE AGGREGATE IS TO BE PLACED IN LIFTS AND COMPACTED USING PLATE COMPACTORS. THE MAXIMUM LOOSE LIFT THICKNESS IS TO BE 12".
5. FOLLOWING THE DRAIN ROCK PLACEMENT, THE GEOTEXTILE MUST BE FOLDED OVER THE TOP TO FORM A 12" MINIMUM LONGITUDINAL OVERLAP. THE UPSTREAM ROLL SHALL OVERLAP A MINIMUM OF 2' OVER THE DOWNSTREAM ROLL (PROVIDE SHINGLE AFFECT).
6. VOIDS BETWEEN THE GEOTEXTILE AND THE EXCAVATION SIDES MUST BE AVOIDED.
7. IF VERTICALLY EXCAVATED WALLS BECOME DIFFICULT TO MAINTAIN, USE TRAPEZOIDAL SECTION.
8. PER CCSWM BMP T5.10B.

DWG: D12.DWG

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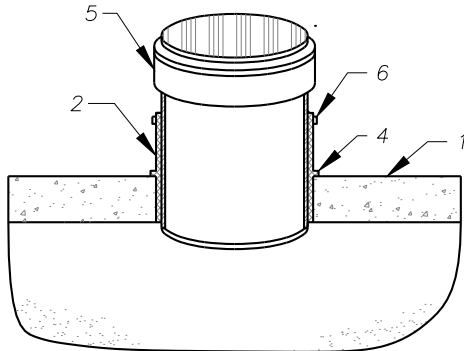
INFILTRATION TRENCH  
PRIVATE  
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COUNTY ENGINEER

01/07/16  
DATE

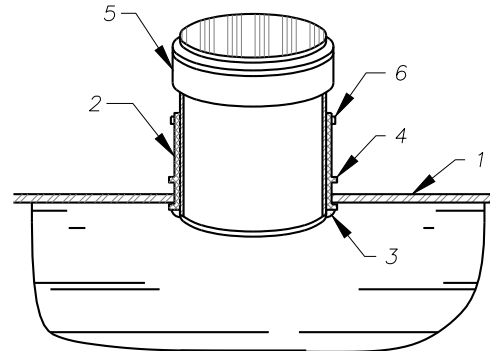
STANDARD  
**D12**  
DETAIL  
DESIGNED  
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DATE 01/30/15

NOTE:

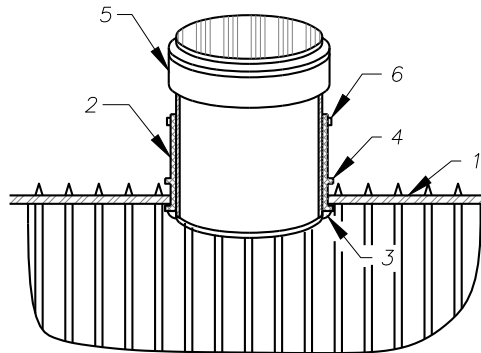
AIR TIGHT SEAL IS ACCOMPLISHED WHEN PVC HUB (NO. 5) IS DRIVEN INTO RUBBER SLEEVE (NO. 2) CAUSING THE RUBBER SLEEVE TO COMPRESS BETWEEN PIPE WALL (NO. 1).



CONCRETE OR CLAY



PVC



PROFILE WALL

NOTES:

1. MAINLINE PIPE WALL WHERE BRANCH LINE IS CONNECTED.
2. COMPLETE RUBBER SLEEVE CONSISTING OF C-443 SPECIFICATIONS.
3. RUBBER SEGMENT WHICH IS MOLDED ONTO THE RUBBER SLEEVE. THIS SEGMENT SNAPS OUT ON THE INSIDE OF THE DRILLED HOLE (PLASTIC PIPE ONLY) AND HELPS HOLD THE FITTING IN PLACE, NOT CREATING THE SEAL.
4. RUBBER SEGMENT WHICH IS MOLDED INTO THE RUBBER SLEEVE. THIS PREVENTS THE RUBBER SLEEVE FROM GOING THROUGH THE DRILLED HOLE WHEN PVC HUB IS BEING DRIVEN INTO THE RUBBER SLEEVE.
5. SDR-35 PVC HUB (ASTM D-3034 SEWER PIPE) WHICH IS DRIVEN INTO THE CENTER OF THE RUBBER SLEEVE AFTER THE RUBBER SLEEVE IS IN THE HOLE.
6. STAINLESS STEEL BAND. PUT ON ABOVE AS AN ADDED PRECAUTION.

NO.	REVISIONS	DATE	BY

DWG: D13.DWG



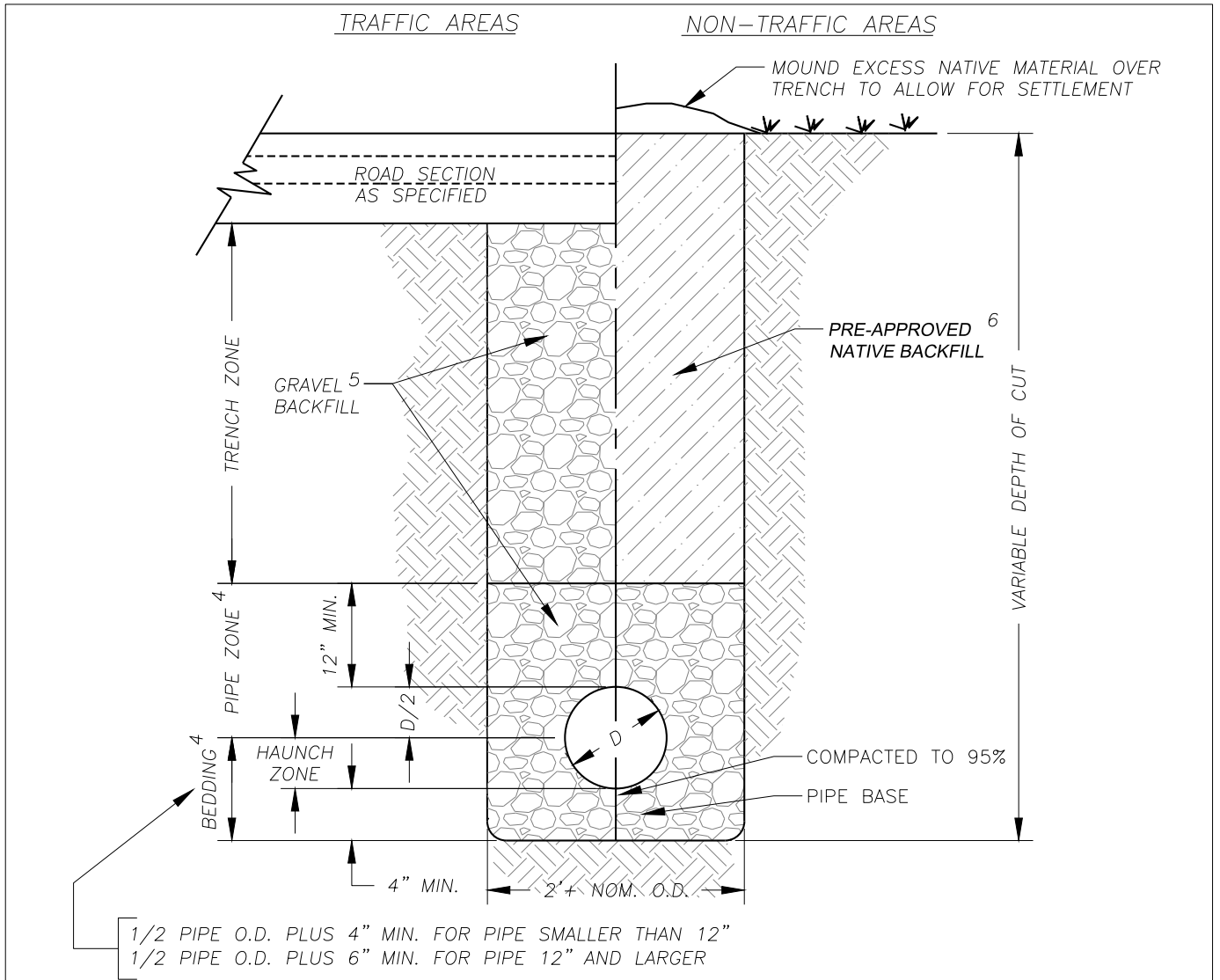
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TYPICAL SADDLE TAPS/TEES

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DATE 01/30/15



**NOTES:**

1. FOR INSTALLATION OF DRAINAGE PIPE IN NEW DEVELOPMENT.
2. GENERAL PIPE INSTALLATION REQUIREMENTS SHALL BE PER SECTION 7-08 OF WSDOT STANDARD SPECIFICATIONS.
3. TRENCH BACK FILL SHALL CONFORM TO CCC 40.350.030(C)(4)(e).
4. PIPE ZONE AND BEDDING MATERIAL SHALL CONFORM TO WSDOT STANDARD SPECIFICATIONS 9-03.12(3)
5. GRAVEL BACKFILL PER WSDOT SPECIFICATIONS SECTION 9-03.19, AND COMPACTED TO 95% MAX. DENSITY (AASHTO T-99). NATIVE SOILS MAY BE USED UPON APPROVAL BY REVIEWING AUTHORITY IF TESTING SHOWS MATERIAL IS CLASSIFIED AS A-1 OR A-3 BY AASHTO.
6. OUTSIDE THE ROADWAY PRISM, SUITABLE NATIVE BACKFILL SHALL BE COMPACTED TO 90% MAX. DENSITY (AASHTO T-99).
7. ALL COMPACTION SHALL BE IN ACCORDANCE WITH THE COMPACTION CONTROL TEST OF WSDOT STANDARD SPECIFICATIONS 2-03.3(14)D.
8. CONTACT CCPW FOR NATIVE MATERIAL FOR TRENCH BACKFILL APPROVAL FORM.

NO.	REVISIONS	DATE	BY

DWG: D14.DWG



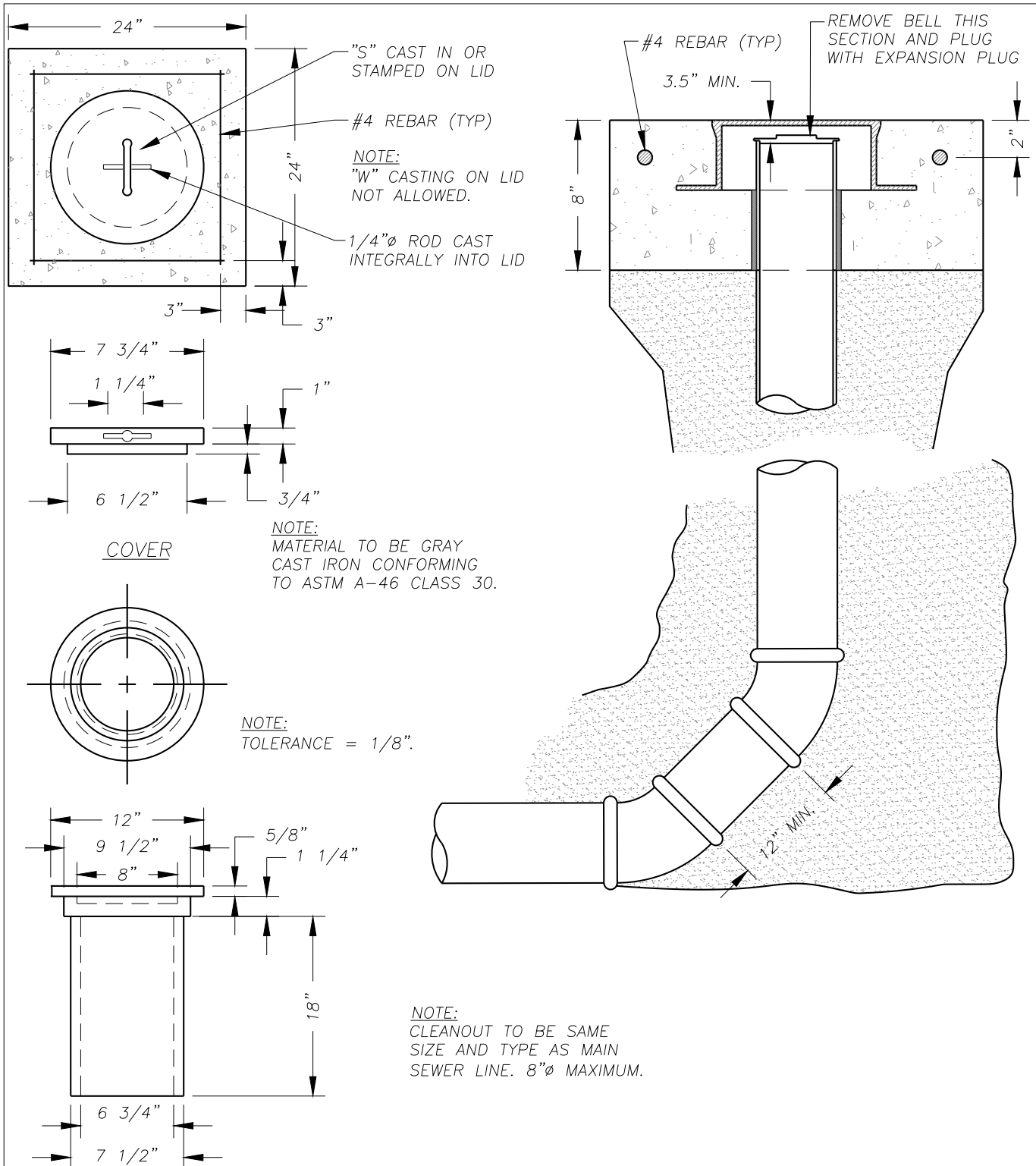
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PIPE BEDDING AND BACKFILL

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CAST IRON VALVE BOX AND COVER NO. 910

VALVE BOX SHALL BE FORT VANCOUVER PATTERN NO. 910 CAST IRON OR APPROVED EQUAL

NO.	REVISIONS	DATE	BY

DWG: D15.DWG



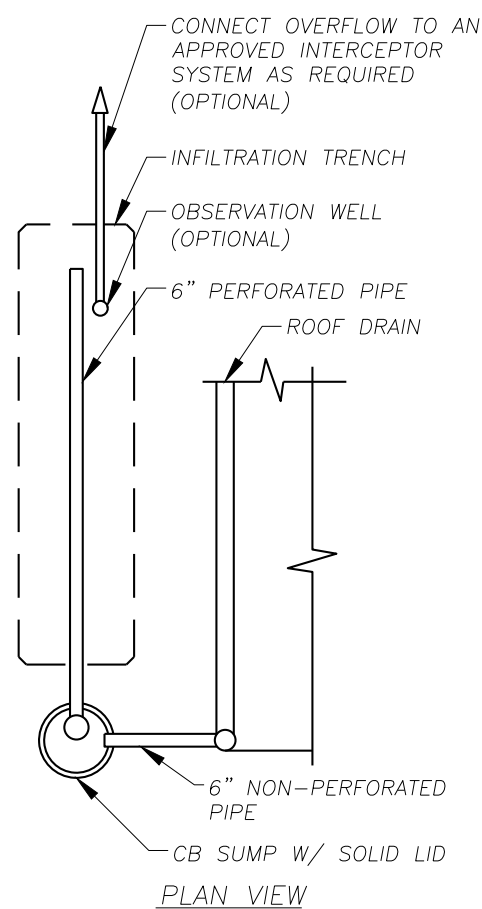
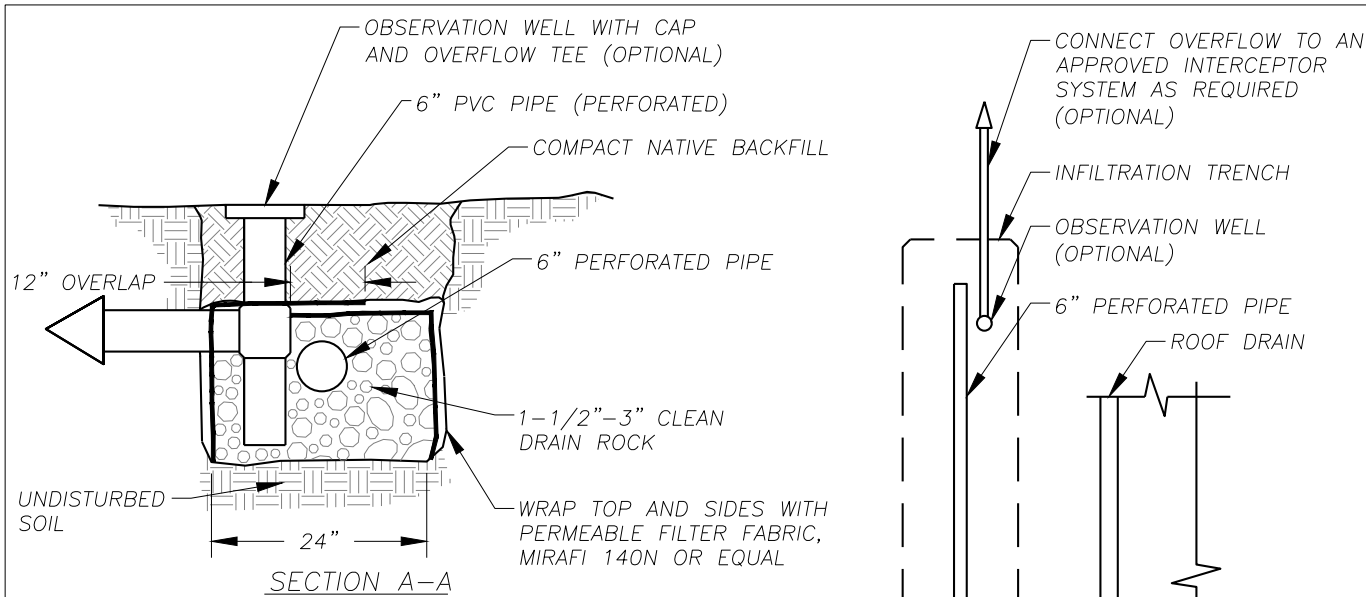
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SEWER CLEANOUT

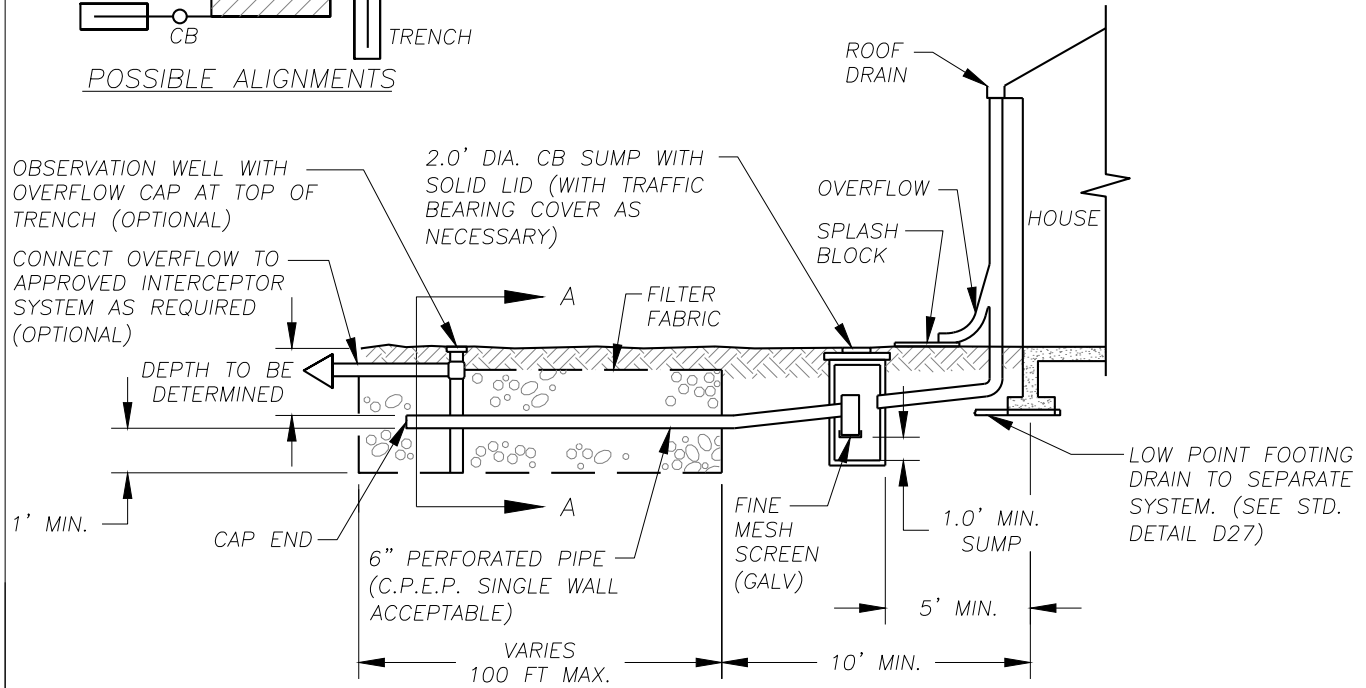
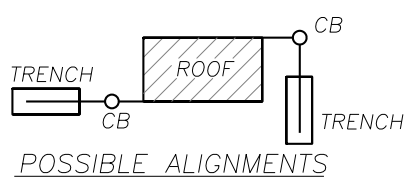
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 DESIGNED  
 DRAWN  
 DATE 01/30/15



- NOTE:**
1. TRENCH TO BE LOCATED 100' MIN. FROM SEPTIC DRAINFIELD (WHERE APPLICABLE).
  2. PER CCSWM BMP T5.10B.
  3. TRENCH TO BE LOCATED 10' MIN. FROM ANY PROPERTY LINE.
  4. TRENCH TO BE LOCATED 10' MIN. FROM BUILDING FOUNDATION.



NO.	REVISIONS	DATE	BY

DWG: D16.0.DWG

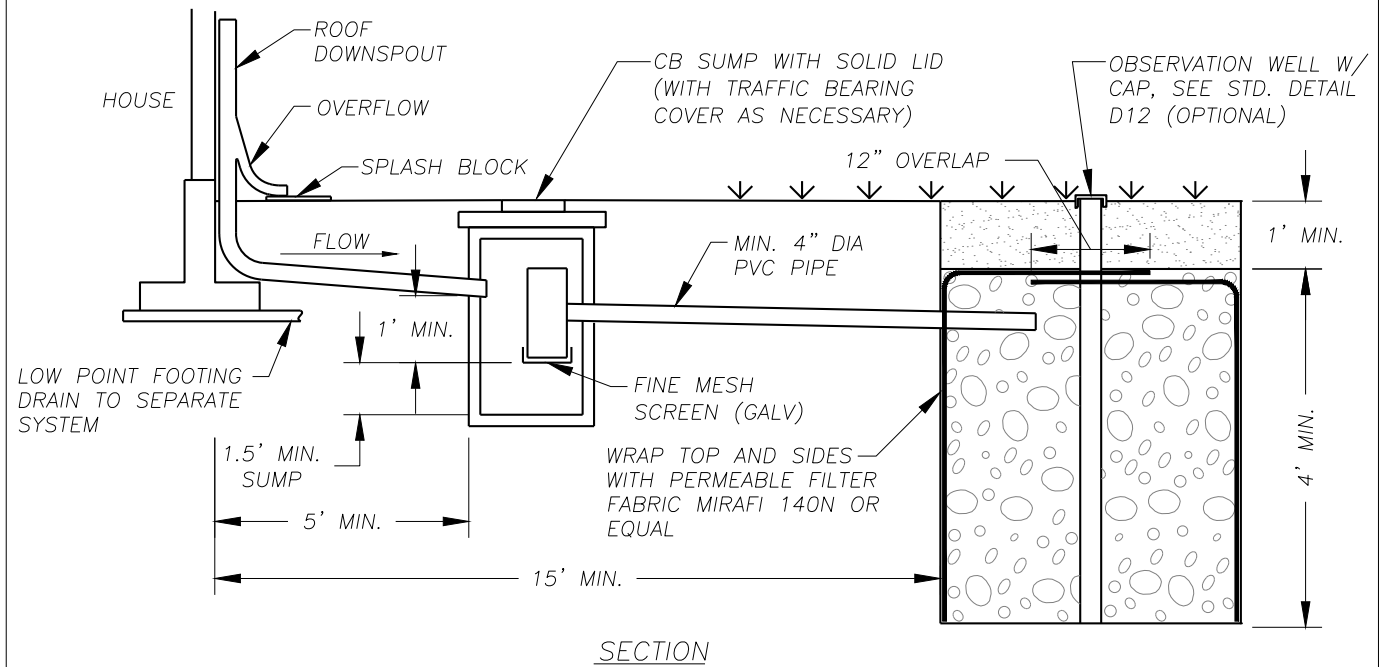
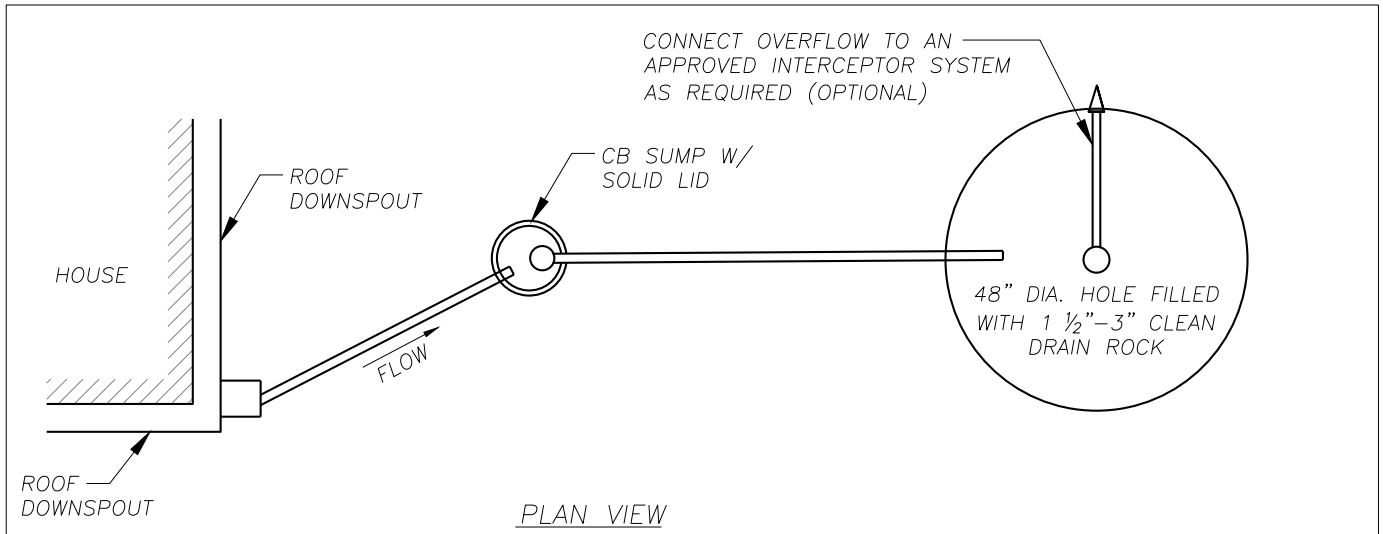
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TYPICAL DOWNSPOUT INFILTRATION SYSTEM  
 INFILTRATION TRENCH (SINGLE-FAMILY HOME)

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 COUNTY ENGINEER

01/07/16  
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STANDARD  
**D16.0**  
 DETAIL  
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 DRAWN  
 DATE 01/30/15



NOTE:

1. DRYWELL TO BE LOCATED 100' MIN. FROM SEPTIC DRAINFIELD (WHERE APPLICABLE).
2. PER CCSWM BMP T5.10A.

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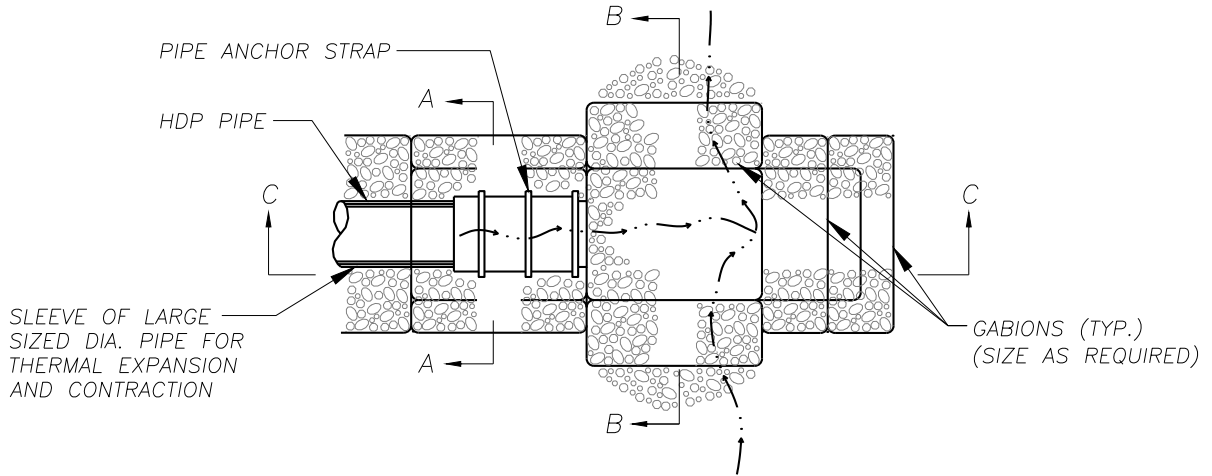
TYPICAL DOWNSPOUT INFILTRATION SYSTEM  
DRYWELL (SINGLE-FAMILY HOME)

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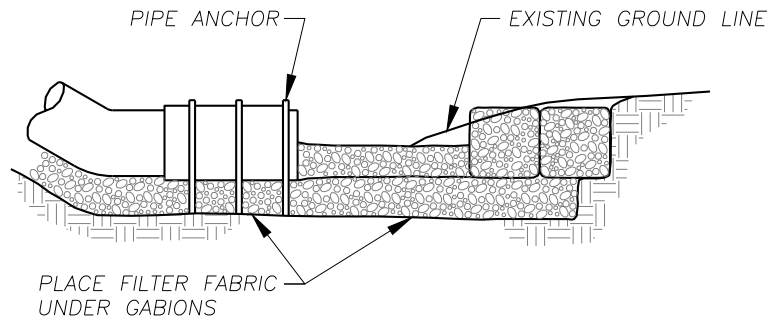
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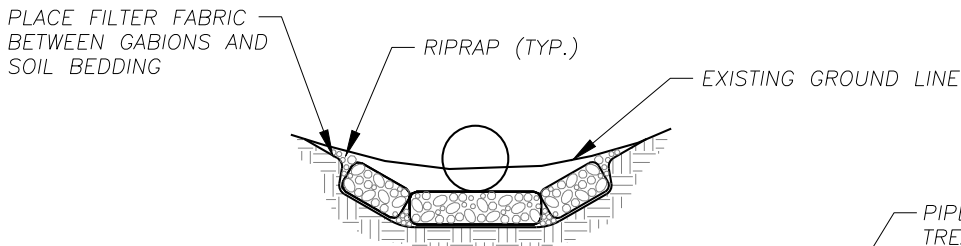




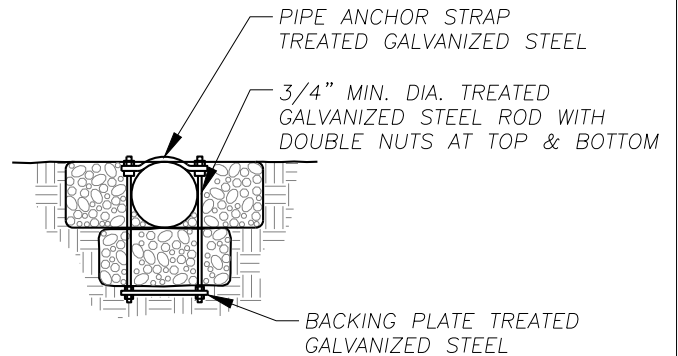
PLAN VIEW



SECTION C-C



SECTION A-A



SECTION B-B

NOTE:

1. GABION CRIBBING TO BE INSTALLED PER WSDOT SPECIFICATIONS 8-24.3(3) AND 9-27.3.
2. STONE FOR FILLING GABIONS SHALL CONFORM TO WSDOT SPECIFICATIONS 9-27.3(6).

NO.	REVISIONS	DATE	BY

DWG: D17.DWG



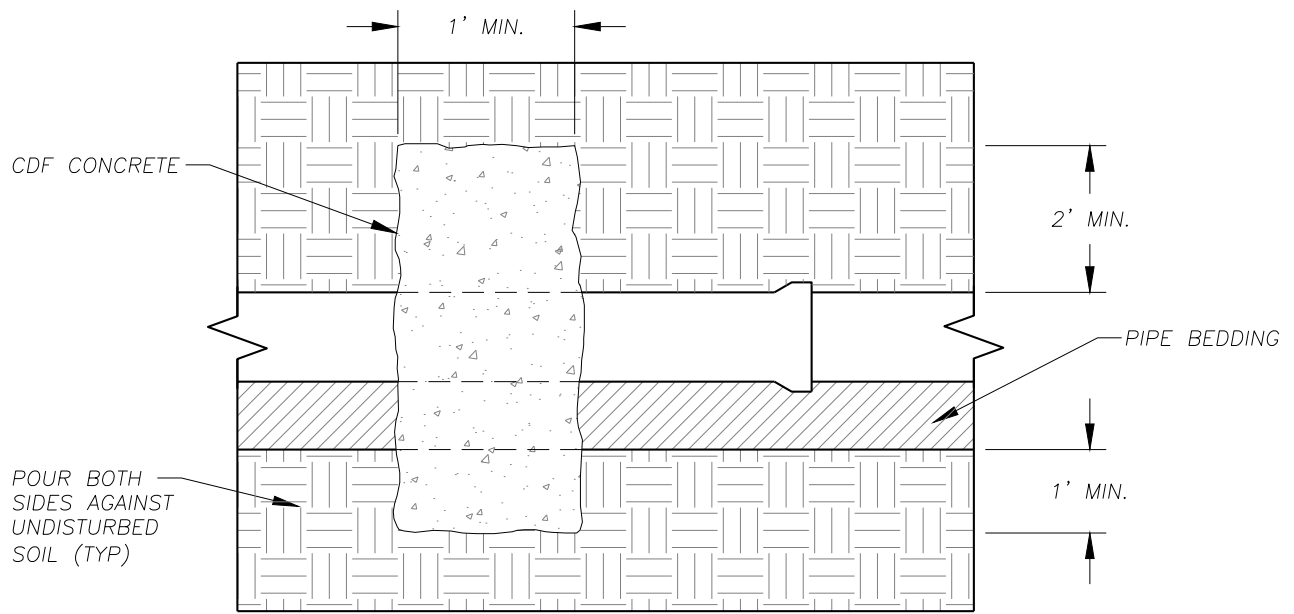
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GABION OUTFALL

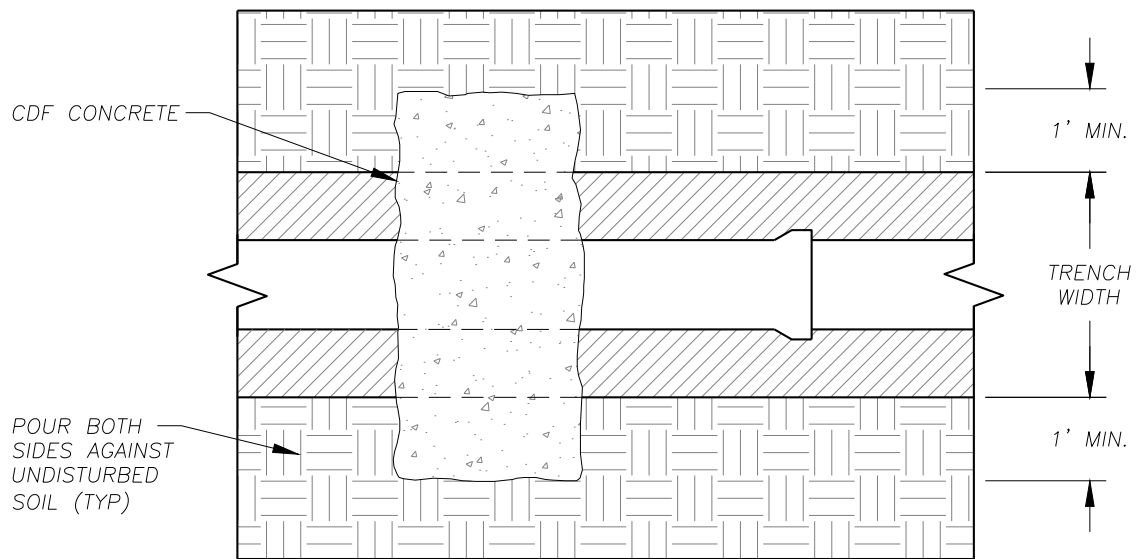
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SIDE VIEW



PLAN VIEW

NOTE:

1. TRENCH DAMS SHALL BE USED AS NEEDED TO PREVENT MIGRATION OF WATER INTO TRENCH BACKFILL.
2. ALTERNATE DESIGNS MAY BE ALLOWED.
3. TRENCH DAMS SHALL BE OF A MATERIAL WITH PERMEABILITY OF NO GREATER THAN  $1 \times 10^{-6}$  CM/S.

NO.	REVISIONS	DATE	BY

DWG: D18.DWG



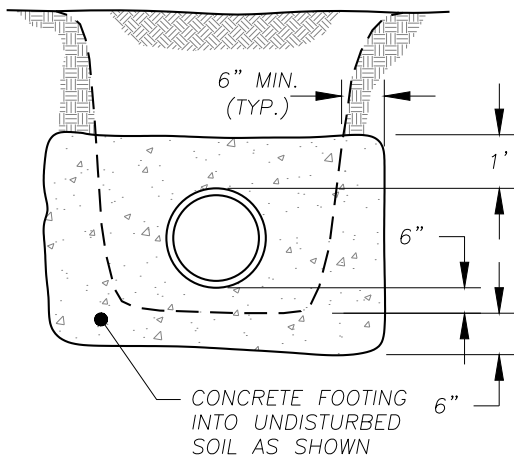
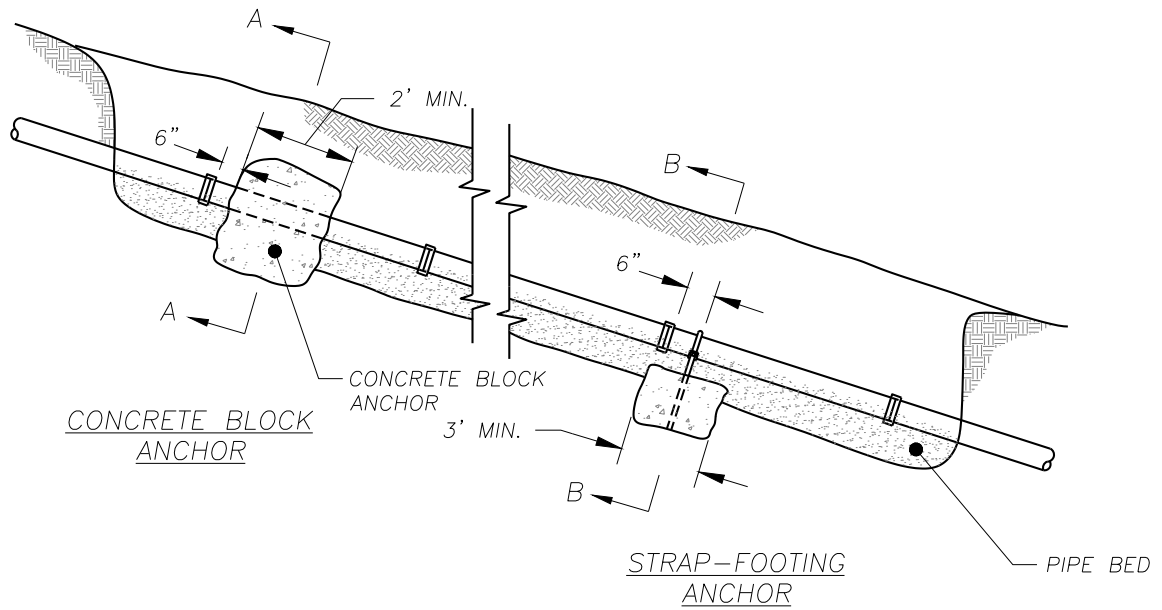
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TRENCH DAM

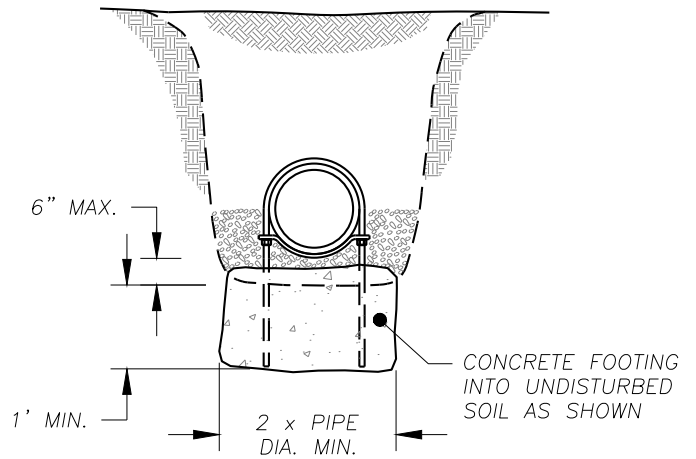
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SECTION A-A



SECTION B-B

NOTES:

1. FOR HDPP, PIPE MUST BE FREE TO SLIDE INSIDE A 4' LONG SECTION OF PIPE ONE SIZE DIAMETER LARGER.
2. ON SLOPES OF 15% OR GREATER, PIPE SHALL HAVE WATERTIGHT JOINTS.

NO.	REVISIONS	DATE	BY

DWG: D22.DWG

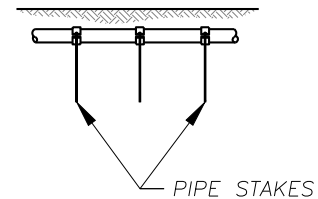
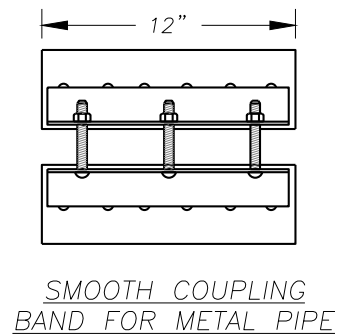
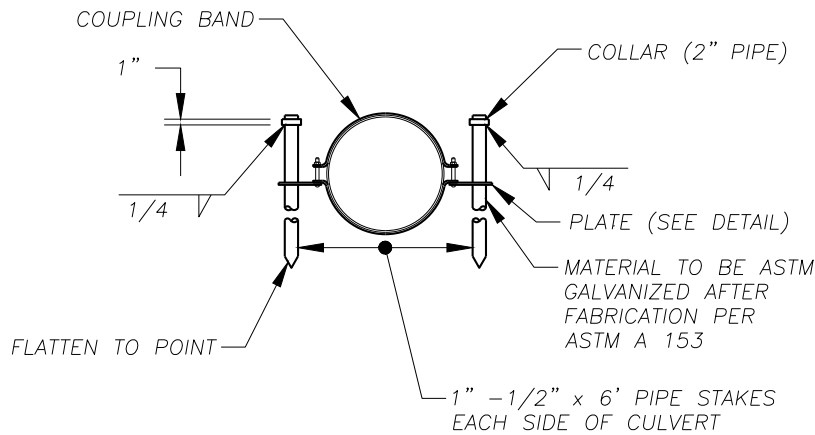
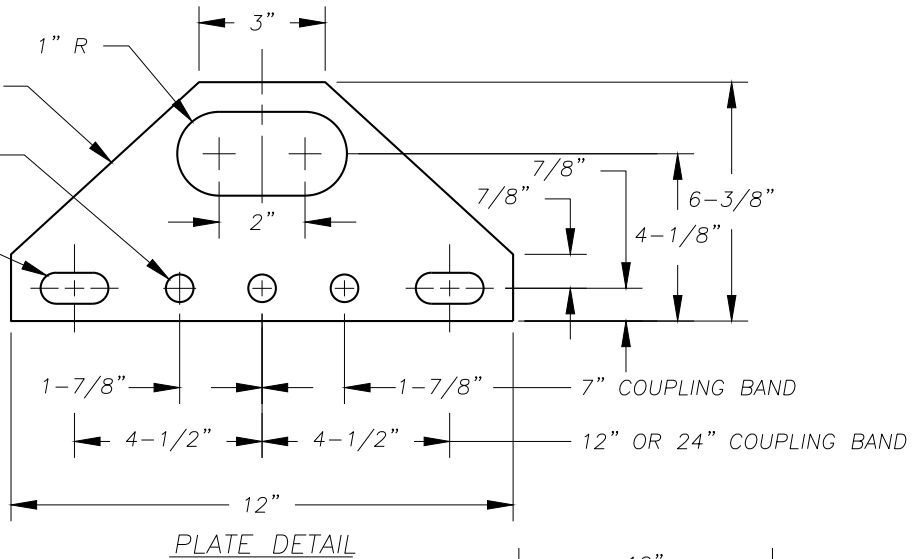


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PIPE ANCHOR		STANDARD <b>D22</b>
APPROVED <i>[Signature]</i> COUNTY ENGINEER		DETAIL
DATE 01/07/16		DESIGNED
DATE		DRAWN
DATE		DATE 01/30/15

MATERIAL TO BE ASTM A 36  
1/4" PLATE GALVANIZED AFTER  
FABRICATION PER ASTM A 123

SLOTS TO BE  
1-12/32" x 3/4"



ANCHOR ASSEMBLY - CORRUGATED  
METAL PIPE (OR EQUIVALENT)

NOTES:

1. PAYMENT FOR PIPE ANCHORS WHICH SHALL INCLUDE ALL PIPE STOKES AND HARDWARE SHALL BE CONSIDERED AS INCIDENTAL AND SHALL NOT BE INCLUDED IN THE PER LINEAR FOOT COST OF PIPE.
2. THE SMOOTH COUPLING BAND SHALL BE USED IN COMBINATION WITH CONCRETE PIPE.
3. CONCRETE PIPE WITHOUT BELL AND SPIGOT SHALL NOT BE INSTALLED ON GRADES IN EXCESS OF 20%.
4. THE FIRST ANCHOR SHALL BE INSTALLED ON THE FIRST SECTION OF THE LOWER END OF THE PIPE. AND REMAINING ANCHORS EVENLY SPACED THROUGHOUT THE INSTALLATION.
5. IF THE PIPE BEING INSTALLED HAS A MANHOLE OR CATCH BASIN ON THE LOWER END OF THE PIPE, THE FIRST PIPE ANCHOR MAY BE ELIMINATED.
6. WHEN C.M.P. IS USED, THE ANCHORS MAY BE ATTACHED TO THE COUPLING BONDS USED TO JOIN THE PIPE AS LONG AS THE SPECIFIED SPACING IS NOT EXCEEDED.
7. ALL PIPE ANCHORS SHALL BE SECURELY INSTALLED BEFORE BACKFILLING AROUND THE PIPE.

NO.	REVISIONS	DATE	BY

DWG: D23.DWG



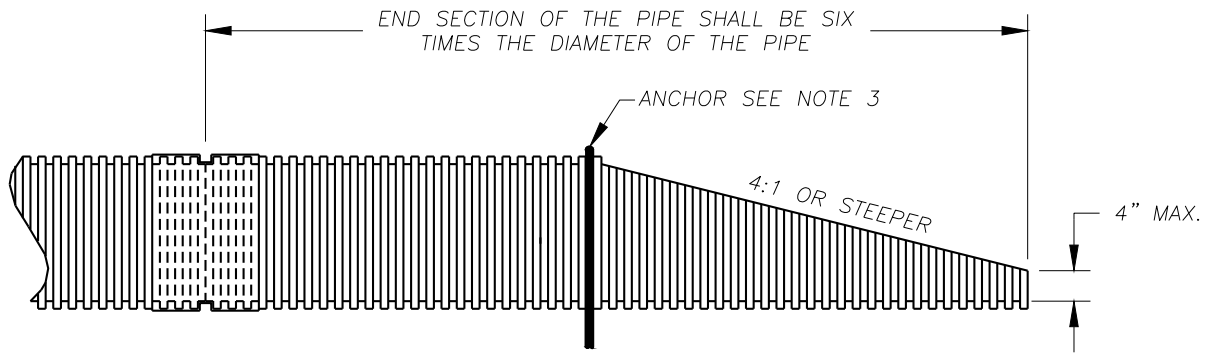
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WASHINGTON  
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CORRUGATED METAL PIPE  
COUPLING/ANCHOR

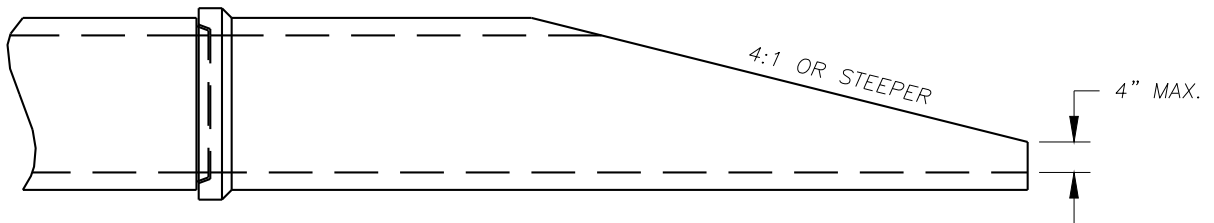
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APPROVED  
COUNTY ENGINEER

01/07/16  
DATE

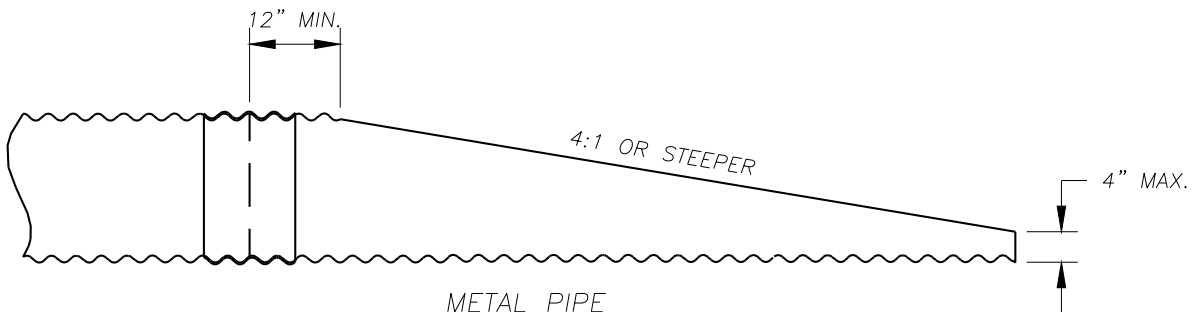
STANDARD  
**D23**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15



THERMOPLASTIC PIPE



CONCRETE PIPE



METAL PIPE

NOTES:

1. THE CULVERT ENDS SHALL BE BEVELED TO MATCH THE EMBANKMENT OR DITCH SLOPE, WITHOUT EXCEEDING THE LIMITS SHOWN ON THE PLAN.
2. FIELD CUT OF CULVERT ENDS IS PERMITTED, WHEN APPROVED BY THE ENGINEER. ALL FIELD CUT PIPE CULVERTS SHALL BE TREATED WITH TREATMENT SHOWN IN THE STANDARD SPECIFICATION OR GENERAL SPECIAL PROVISIONS.
3. THE END OF THERMOPLASTIC PIPE SHALL BE ANCHORED. SEE STD. DETAIL D22.
4. FOR PIPES 18" OR LARGER, TRASH SCREEN REQUIRED. SEE STD. DETAIL D25.

NO.	REVISIONS	DATE	BY

DWG: D24.DWG



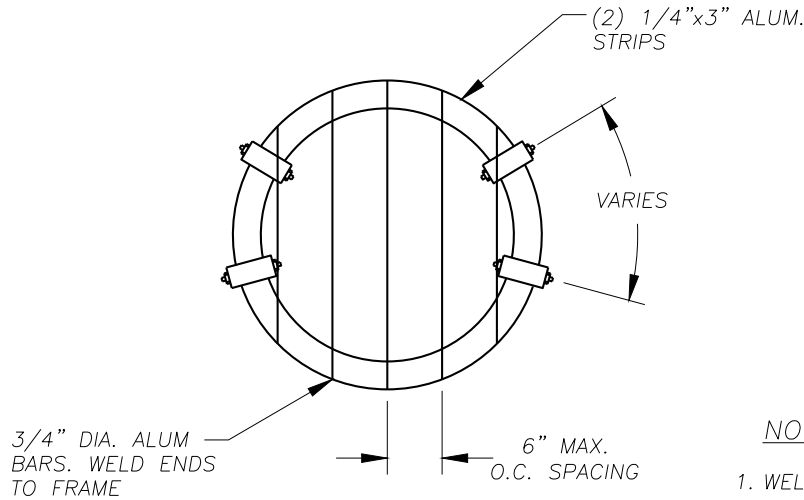
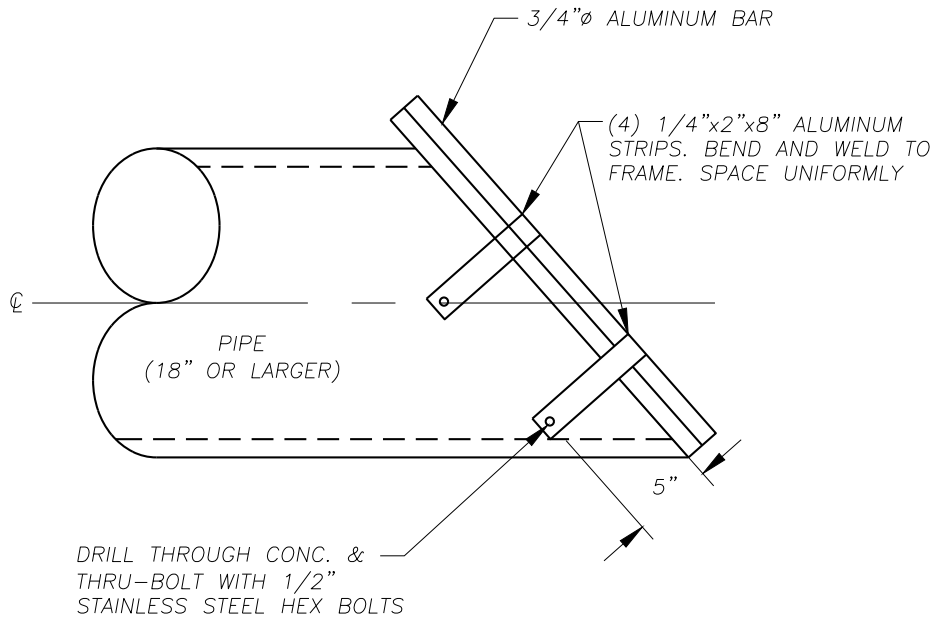
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BEVELED END SECTION

*[Signature]*  
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01/07/16  
DATE

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DETAIL  
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DATE 01/30/15



NOTES:

1. WELD AT ALL JOINTS.
2. SHOP DRAWING REQUIRED.
3. USE WITH PLASTIC PIPE REQUIRES MODIFICATION TO BE REVIEWED AND APPROVED BY COUNTY ENGINEER.

NO.	REVISIONS	DATE	BY

DWG: D25.DWG



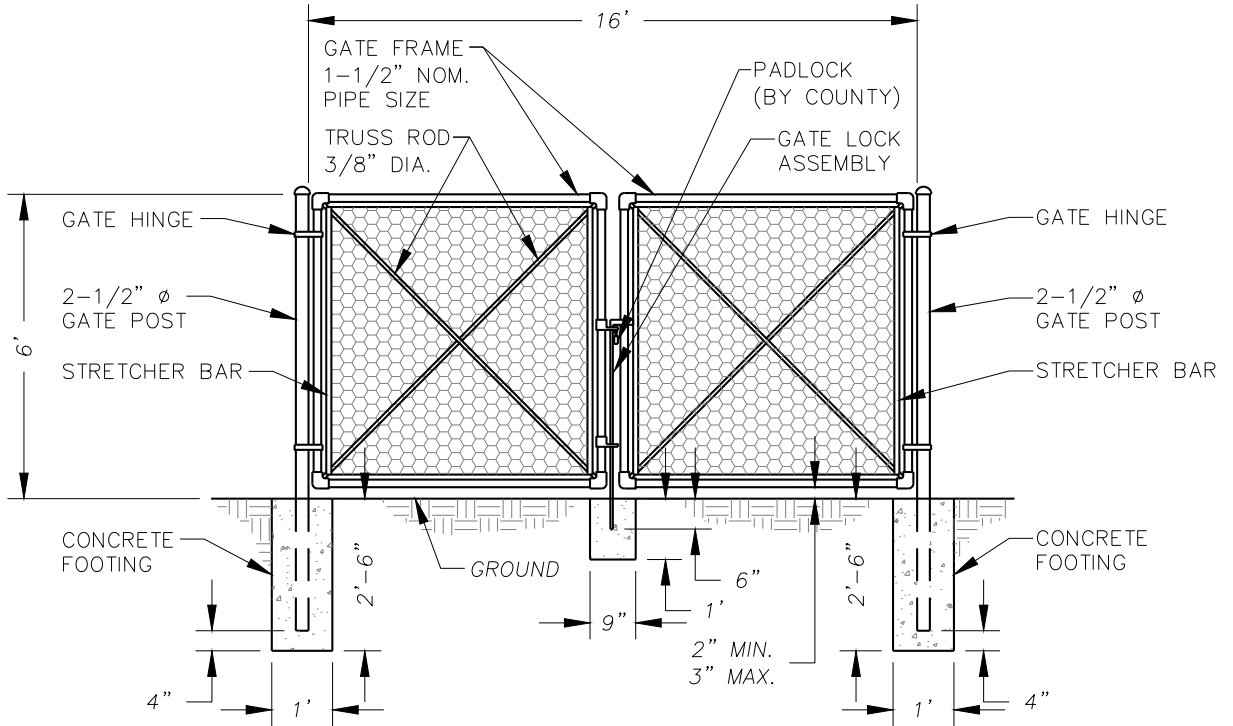
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TRASH SCREEN

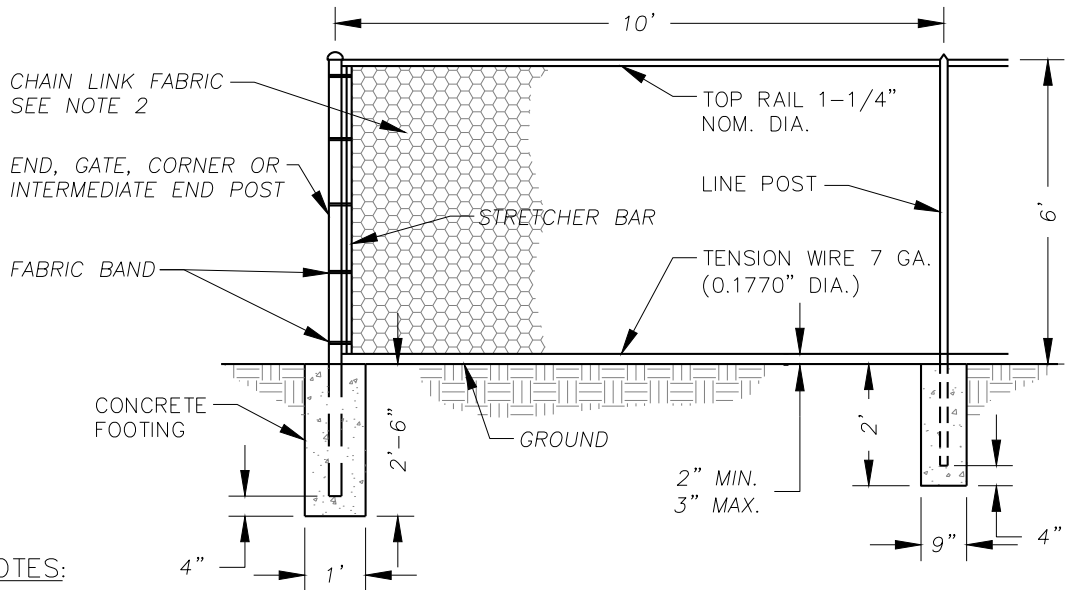
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COUNTY ENGINEER

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DATE

STANDARD  
**D25**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15



**NOT ALLOWED ADJACENT / ALONG ANY STREET, ONLY OFF-SITE FACILITY LOCATION CAN HAVE TOP RAIL.**



**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)B FOR TYPE 1 FENCE (9 GA) 2" DIAMOND. 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 CLARK COUNTY PRIOR TO CONSTRUCTION. THE COLOR SHALL BE BLACK.

NO.	REVISIONS	DATE	BY

DWG: D26.DWG



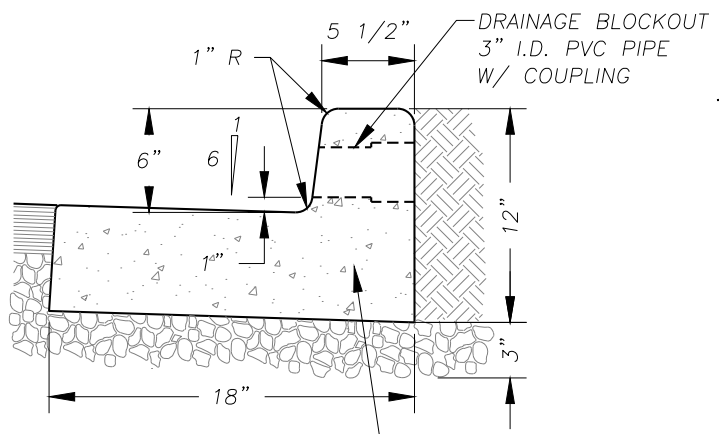
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CHAIN LINK FENCE FOR  
STORMWATER FACILITY

APPROVED  
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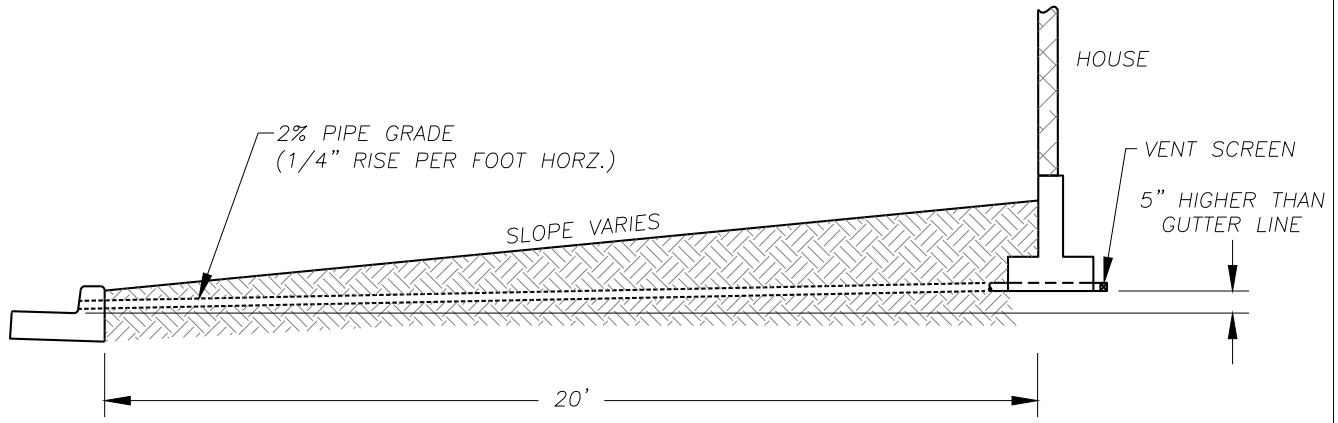
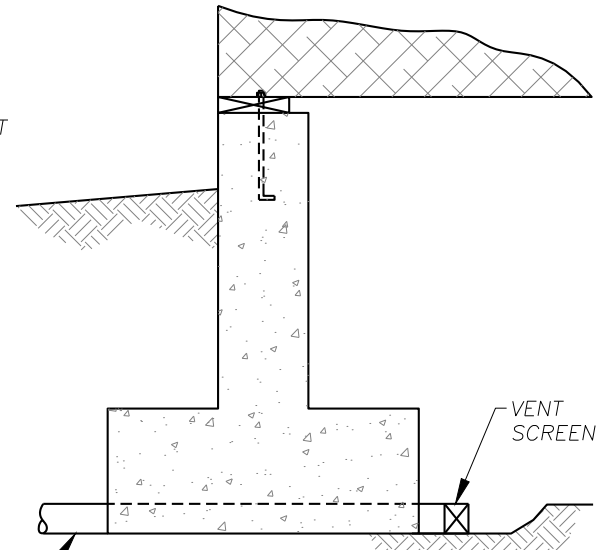
01/07/16  
DATE

STANDARD  
**D26**  
DETAIL  
DESIGNED  
DRAWN  
DATE 01/30/15



TYPE A-1/E-1 CURB - SEE STD. DETAIL F18

2" I.D. PVC PIPE FOR EXAMPLE ONLY



CCC 40.385:

ALL LOTS WITHIN THE URBAN GROWTH AREA MUST BE DESIGNED TO PROVIDE POSITIVE DRAINAGE FROM BOTTOM OF FOOTINGS TO AN APPROVED STORMWATER SYSTEM. POSITIVE DRAINAGE MAY BE ACCOMPLISHED BY SWALES, DRYWELLS, FRENCH DRAINS, LATERALS TO THE STREET, LATERALS BEHIND THE CURB OR WITHIN A PUBLIC UTILITY EASEMENT, AN APPROVED SYSTEM, IN THE SIDE OR REAR SETBACK, OR SOME OTHER METHOD ACCEPTABLE TO THE RESPONSIBLE OFFICIAL.

NO.	REVISIONS	DATE	BY

DWG: D27.DWG



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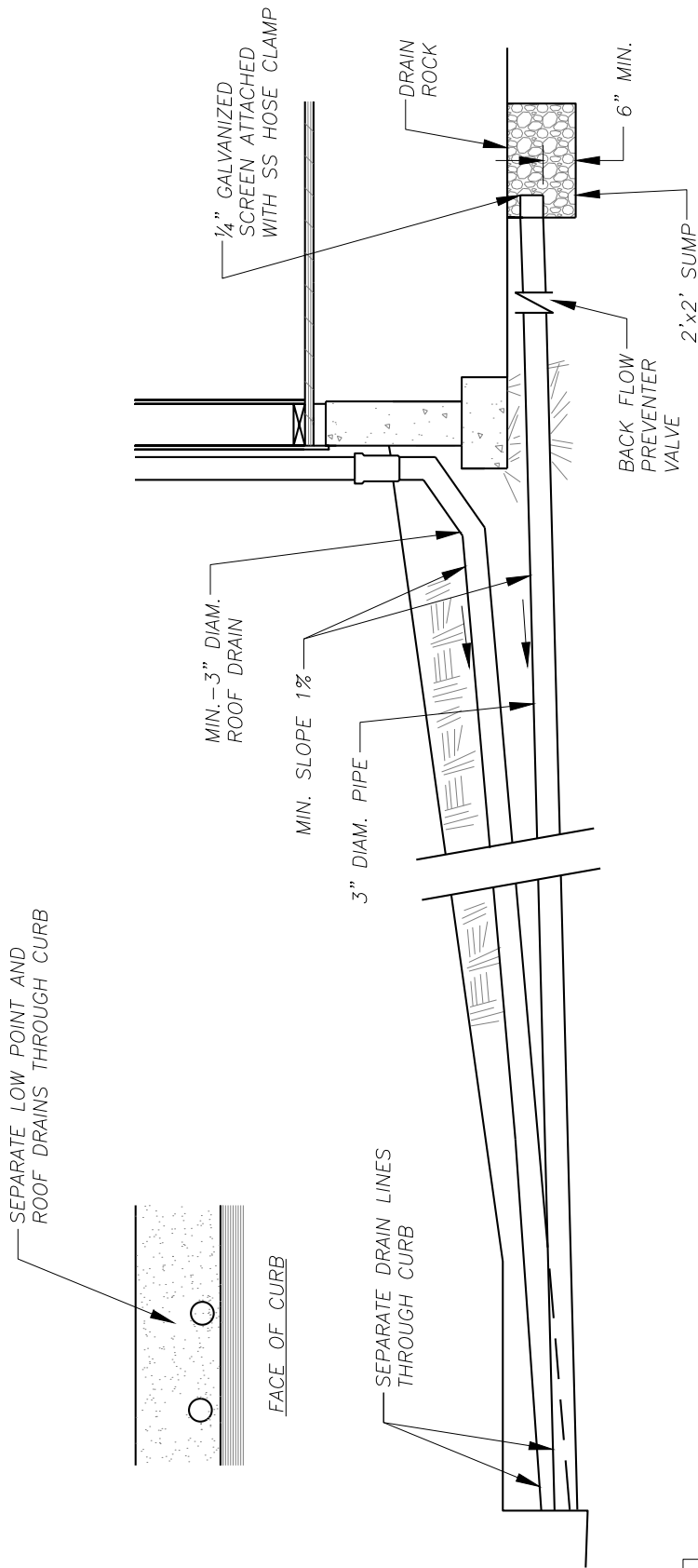
LOW POINT FOOTING DRAIN  
 (PREFERRED METHOD)

*[Signature]*  
 APPROVED  
 COUNTY ENGINEER

01/07/16  
 DATE

STANDARD  
**D27**  
 DETAIL  
 DESIGNED  
 DRAWN  
 DATE 01/30/15





NOTE:  
 ROOF DOWNSPOUT & LOW POINT CRAWL SPACE DRAIN LINE TO CURB  
 (ALL OTHER APPLICATIONS TO BE APPROVED BY ENGINEERING DEPARTMENT)

NO.	REVISIONS	DATE	BY

DWG: D27a.DWG



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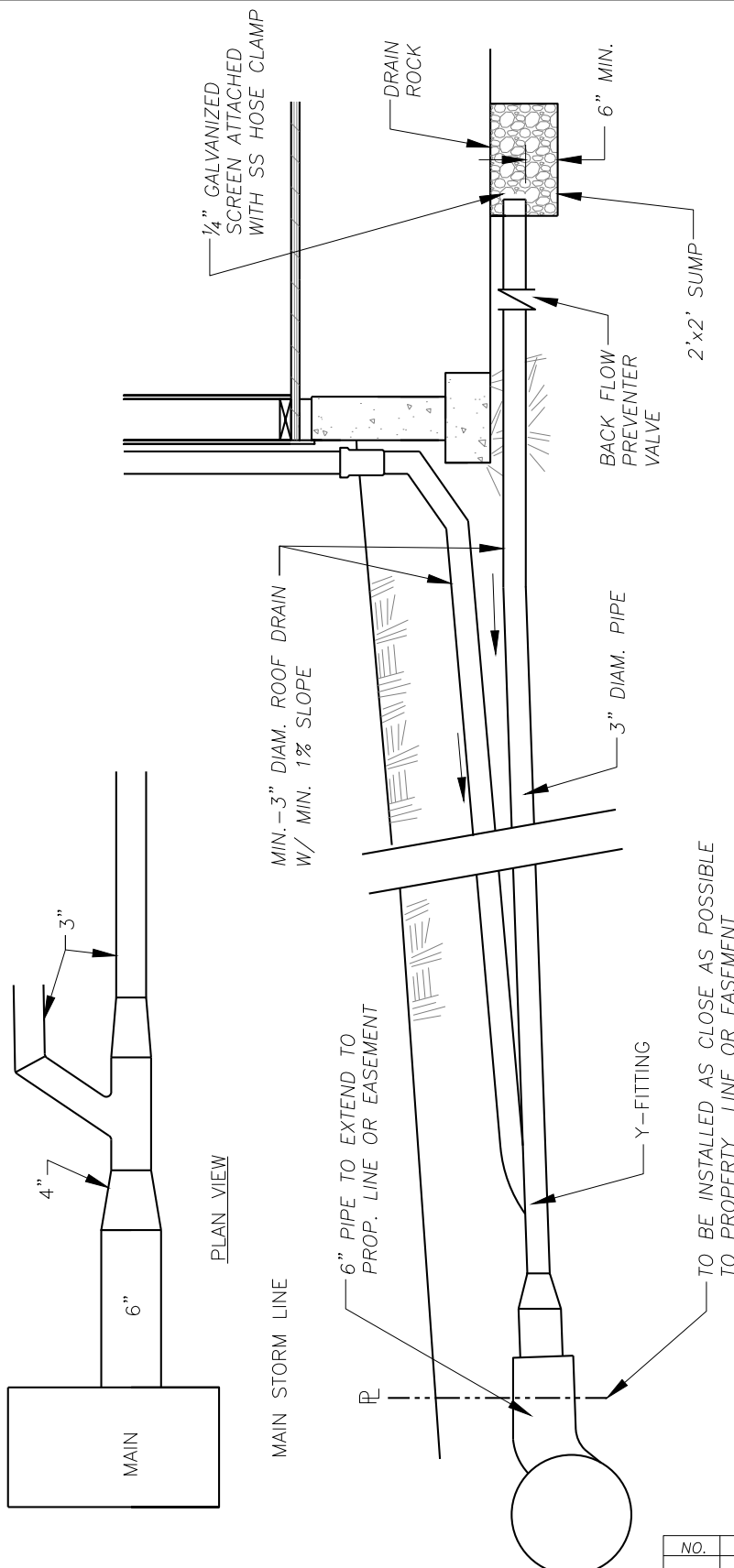
RESIDENTIAL DRAINAGE SYSTEMS  
 DRAIN LINE TO CURB

*[Signature]*  
 COUNTY ENGINEER

APPROVED

01/07/16  
 DATE

STANDARD  
**D27a**  
 DETAIL  
 DESIGNED  
 DRAWN  
 DATE 01/30/15



NOTE:  
 ROOF DOWNSPOUT & LOW POINT CRAWL SPACE DRAIN CONNECTION TO STORM DRAIN  
 (ALL OTHER APPLICATIONS TO BE APPROVED BY ENGINEERING DEPARTMENT)

NO.	REVISIONS	DATE	BY

DWG: D27b.DWG



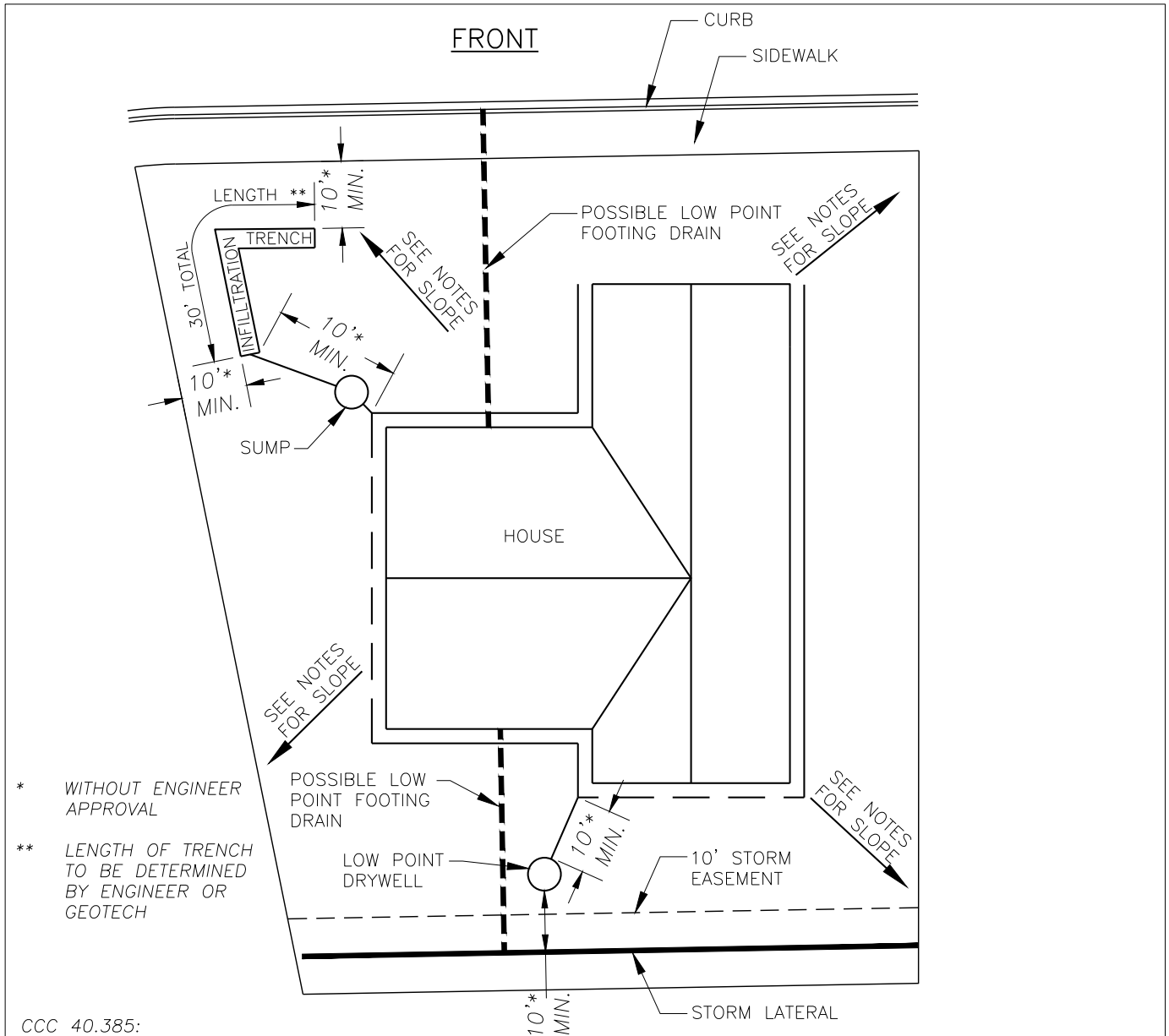
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RESIDENTIAL DRAINAGE SYSTEMS  
 DRAIN CONNECTION TO STORM DRAIN

*[Signature]*  
 APPROVED  
 COUNTY ENGINEER

01/07/16  
 DATE

STANDARD  
**D27b**  
 DETAIL  
 DESIGNED  
 DRAWN  
 DATE 01/30/15



- \* WITHOUT ENGINEER APPROVAL
- \*\* LENGTH OF TRENCH TO BE DETERMINED BY ENGINEER OR GEOTECH

CCC 40.385:

ALL LOTS WITHIN THE URBAN GROWTH AREA MUST BE DESIGNED TO PROVIDE POSITIVE DRAINAGE FROM BOTTOM OF FOOTINGS TO AN APPROVED STORMWATER SYSTEM. POSITIVE DRAINAGE MAY BE ACCOMPLISHED BY SWALES, DRYWELLS, FRENCH DRAINS, LATERALS TO THE STREET, LATERALS BEHIND THE CURB OR WITHIN A PUBLIC UTILITY EASEMENT, AN APPROVED SYSTEM, IN THE SIDE OR REAR SETBACK, OR SOME OTHER METHOD ACCEPTABLE TO THE RESPONSIBLE OFFICIAL.

**IRC R401.3 DRAINAGE.** SURFACE DRAINAGE SHALL BE DIVERTED TO A STORM SEWER CONVEYANCE OR OTHER APPROVED POINT OF COLLECTION THAT DOES NOT CREATE A HAZARD. LOTS SHALL BE GRADED TO DRAIN SURFACE WATER AWAY FROM FOUNDATION WALLS. THE GRADE SHALL FALL A MINIMUM OF 6 INCHES (152mm) WITHIN THE FIRST 10 FEET (3048mm).

**EXCEPTION:** WHERE LOT LINES, WALLS, SLOPES OR OTHER PHYSICAL BARRIERS PROHIBIT 6 INCHES (152mm) OF FALL WITHIN 10 FEET (3048mm), DRAINS OR SWALES SHALL BE CONSTRUCTED TO ENSURE DRAINAGE AWAY FROM THE STRUCTURE. IMPERVIOUS SURFACES WITHIN 10 FEET (3048mm) OF THE STRUCTURE. IMPERVIOUS SURFACES WITHIN 10 FEET (3048mm) OF THE BUILDING FOUNDATION SHALL BE SLOPED A MINIMUM OF 2 PERCENT AWAY FROM THE BUILDING.

PUMPS ARE **NOT** ALLOWED FOR LOW POINT DRAIN.

NO.	REVISIONS	DATE	BY

DWG: D27c.DWG



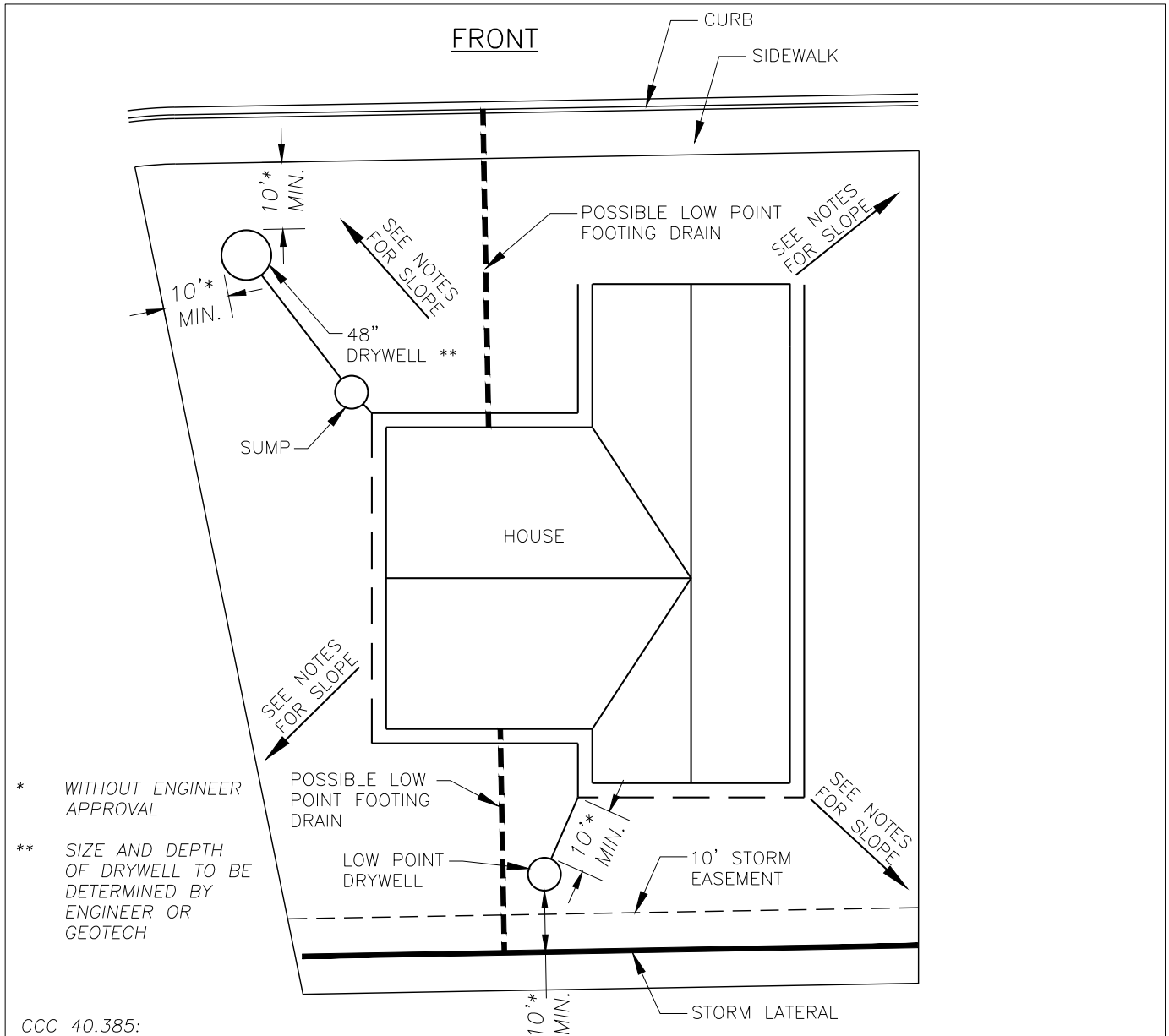
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EXAMPLE OF LOT SPECIFIC DRAINAGE REQUIREMENTS  
FROM APPROVED DEVELOPMENT PLAN

*[Signature]*  
APPROVED  
COUNTY ENGINEER

01/07/16  
DATE

STANDARD  
**D27c**  
DETAIL  
DESIGNED  
DRAWN  
DATE 05/23/08



- \* WITHOUT ENGINEER APPROVAL
- \*\* SIZE AND DEPTH OF DRYWELL TO BE DETERMINED BY ENGINEER OR GEOTECH

CCC 40.385:

ALL LOTS WITHIN THE URBAN GROWTH AREA MUST BE DESIGNED TO PROVIDE POSITIVE DRAINAGE FROM BOTTOM OF FOOTINGS TO AN APPROVED STORMWATER SYSTEM. POSITIVE DRAINAGE MAY BE ACCOMPLISHED BY SWALES, DRYWELLS, FRENCH DRAINS, LATERALS TO THE STREET, LATERALS BEHIND THE CURB OR WITHIN A PUBLIC UTILITY EASEMENT, AN APPROVED SYSTEM, IN THE SIDE OR REAR SETBACK, OR SOME OTHER METHOD ACCEPTABLE TO THE RESPONSIBLE OFFICIAL.

**IRC R401.3 DRAINAGE.** SURFACE DRAINAGE SHALL BE DIVERTED TO A STORM SEWER CONVEYANCE OR OTHER APPROVED POINT OF COLLECTION THAT DOES NOT CREATE A HAZARD. LOTS SHALL BE GRADED TO DRAIN SURFACE WATER AWAY FROM FOUNDATION WALLS. THE GRADE SHALL FALL A MINIMUM OF 6 INCHES (152mm) WITHIN THE FIRST 10 FEET (3048mm).

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PUMPS ARE **NOT** ALLOWED FOR LOW POINT DRAIN.

NO.	REVISIONS	DATE	BY

DWG: D27d.DWG



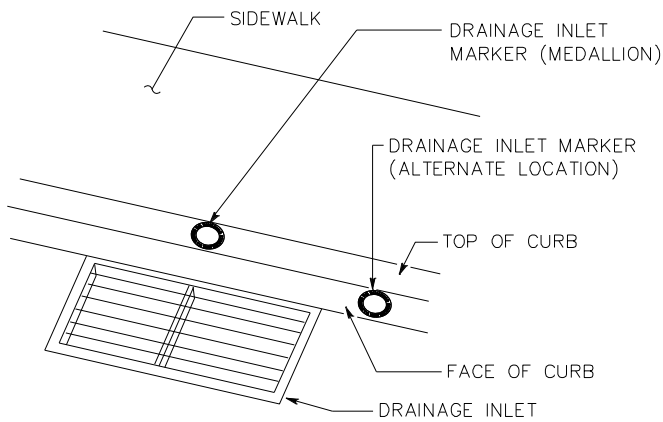
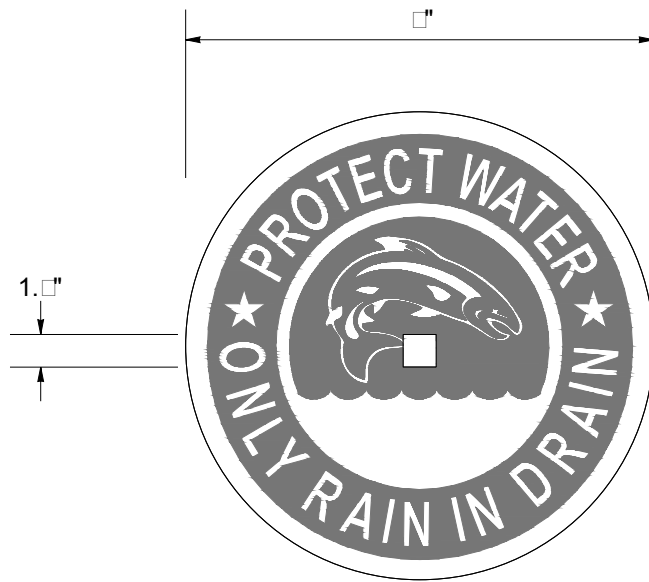
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EXAMPLE OF LOT SPECIFIC DRAINAGE REQUIREMENTS FROM APPROVED DEVELOPMENT PLAN

*[Signature]*  
 APPROVED  
 COUNTY ENGINEER

01/07/16  
 DATE

STANDARD  
**D27d**  
 DETAIL  
 DESIGNED  
 DRAWN  
 DATE 05/23/08



PERSPECTIVE  
DRAINAGE INLET MARKER  
(MEDALLION) ON DRAINAGE INLET  
INSTALLATION LOCATIONS



1. TAKE CORE DRILL (4") AND SCORE CONCRETE 1/8 - 1/4 INCH. (GENERATOR REQUIRED FOR POWER). USE WATER SPRAYER TO ASSIST CONCRETE CUTTING.
2. PLACE MEDALLION INTO GROVE.
3. TAKE HAND DRILL WITH 1/4 IN. DRILL BIT AND DRILL TO 3/4 IN. DEPTH.
4. PLACE RIVET INTO HOLE OF MEDALLION.
5. TAKE A 2-3 POUND HAND HELD Mallet AND DRIVE RIVET INTO HOLE.

## DRAINAGE INLET MARKERS

NO SCALE

NO.	REVISIONS	DATE	BY

DWG: D28.DWG



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### DRAINAGE INLET MEDALLION DETAIL

*[Signature]*  
 COUNTY ENGINEER

APPROVED

01/07/16  
 DATE

STANDARD

**D28**

DETAIL

DESIGNED  
 DRAWN  
 DATE 12/22/15