5.0 STANDARDS FOR STORM DRAINAGE SYSTEMS

5.0 STANDARDS FOR STORM DRAINAGE SYSTEMS

5.1 GENERAL

5.1.A Design Standards

Drainage facilities shall be designed in accordance with the current City of Kent Surface Water Design Manual (KSWDM).

5.1.B Specifications

Materials, construction, and testing are specified in Section 7-04 of the WSDOT Standard Specifications.

5.1.C Conflicts

Where technical conflicts may occur between this document and the KSWDM, these Standards shall govern.

5.2 EXTENT OF STORM DRAINAGE IMPROVEMENTS

The storm sewers shall be extended to the limits of the respective property being served in accordance with the Drainage Master Plan. The extension shall be of the size and profile grade necessary to be extended to other properties upstream in the future. In cases where the plan does not require future extension, the drainage system shall be extended as necessary to serve the affected property.

5.3 EASEMENTS AND RIGHTS-OF-WAY

Permanent on-site easements for access, maintenance, and construction are required in accordance with KSWDM Section 4.1 for all storm drain extensions located outside of public right-of-way.

Private improvements such as buildings, fences, garages, carports, retaining walls, utilities, signs, light standards, etc., are not allowed in public easements and rights-of-way. Where an encroachment occurs, the Developer shall remove and relocate the conflicting private improvement immediately upon direction from the Engineer.

Easements shall be accessible for construction equipment normally used for the operation and maintenance of the facility.

5.4 STORM WATER SYSTEM AND CULVERTS

5.4.A Pipe Bedding

Pipe bedding shall be placed under and all around the pipe meeting the requirements of gravel backfill for pipe zone bedding per Section 9-03.9(3) Crushed Surfacing Top Course of the WSDOT Standard Specifications, latest edition. It shall be compacted in layers around the pipe and to a sufficient

height above the pipe to adequately support and protect the pipe to 95 percent compaction ASTM D-1557.

5.4.B Access Roads

Access roads to each catch basin and manhole are required for maintenance. Access and/or maintenance roads (where required) shall be 15' wide and have a minimum inside turning radius of 45'. Access and/or maintenance roads will require an approved all-weather surface, and shall be designed to support an HS-20 vehicle load to support construction equipment and loads. The profile of an access road shall not exceed 15 percent. Access roads with running grades exceeding 5 percent will require a variance approval from the Engineer. Access roads with grades exceeding 12 percent shall be paved. Whenever an easement or right-of-way is fenced, a gate shall be installed matching the width of the easement and a City lock must be placed in "series".

All access roads longer than 150' from the nearest face of curb or edge of pavement of the connecting street shall have an approved hammerhead turnaround per Standard Plan 6-21 or shall be looped to connect back to a public street.

5.4.C Casings

Where a storm water line passes under or through a retaining wall or is attached to a bridge structure, the pipe shall be cased in steel pipe at least 4" larger than the largest outer diameter of the bell or joint of the storm water line. No pipe joints will be allowed within the casing, except on bridge structures or unless otherwise approved by the Engineer. The casing shall extend on either side of the wall a distance equal to the highest height of the retaining wall at the wall penetration, plus 4'. All voids within the casing shall be filled with blown sand except on bridge structures. Casing spacers shall be Cascade Waterworks Manufacturing Company stainless steel casing spacers or approved equal. The casing spacers shall be installed such that the storm water line is centered and restrained within the casing and spaced such that a uniform profile grade will be maintained within the casing.

5.4.D Storm Sewer Pipe Material

Unless otherwise approved by the City of Kent Sewer/Storm Drainage Department, all storm sewer pipes shall be solid wall PVC SDR 35, conforming to ASTM 3034 or 3035 specifications, PVC C900 ASTM D1784, or Class 50 epoxy-lined ductile iron pipe.

5.5 CATCH BASIN LOCATIONS AND JUNCTIONS

5.5.A Catch Basins

Catch basins, rather than inlets, shall be used to collect storm water from street surfaces, unless otherwise approved by the Engineer. See Standard Plans 5-1

and 5-2.

5.5.B Connections to Pipe Systems

No connections to pipe systems may be made without placing a catch basin or manhole on the mainline. All connections shall be made at catch basins or manholes.

5.5.C Manholes in Lieu of Catch Basins

Manholes may be used in lieu of catch basins if they do not collect surface water. Manholes must be used if invert elevations are different by more than 18". See Standard Plan 4-1.

5.5.D Control Structure Placement

A control structure shall be placed in a manhole downstream of detention systems utilizing pumps.

A control structure shall be placed at the last point before a privately maintained system flows into the public system.

5.5.E Roof and Yard Drains

Roof and yard drains, or other concentrated flow from adjacent property, shall not discharge over the surface of streets, sidewalks, pathways, or shoulders.

5.6 FRAMES, GRATES, AND COVERS

5.6.A Metal Castings for Drainage Structures

Metal castings for drainage structures shall not be dipped, painted, welded, plugged or repaired.

Castings and covers located within pedestrian access routes that are adjusted and/or installed shall have slip resistant surface per Section 6.5.B.

5.6.B Porosity in Metal Castings for Drainage Structures

Porosity in metal castings for drainage structures shall be considered a workmanship defect subject to rejection by the Inspector.

5.6.C Casting for Manhole Rings

Castings for manhole rings shall be gray-iron conforming to the requirements of AASHTO M 105, Grade 30B. Covers shall be ductile iron conforming to ASTM A 536, Grade 80-55-06. Manhole rings and covers shall meet the strength requirements of Federal Specification RR-F-621 E. All mating surfaces shall be machine finished to ensure a non-rocking fit.

5.6.D Manhole Rings and Covers Identification

All manhole rings and covers shall be identified as specified in Section 9-05.15 of the WSDOT Standard Specifications and Standard Plan B-30.70.

5.6.E Metal Frame Castings for Catch Basins and Inlets

1. Castings for metal frames for catch basins and inlets shall be cast steel, gray iron, or ductile iron as specified in Sections 9-06.8, 9-06.9, or 9-06.14 of the WSDOT Standard Specifications.

2. Castings for metal frames for catch basins, inlets, grates and solid metal covers shall meet the strength requirements of Federal Specification RR-F-621 E.

5.6.F Metal Grates and Covers for Catch Basins and Inlets

Castings for grates and solid metal covers for catch basins and inlets shall be cast steel or ductile iron as specified in Sections 9-06.8 or 9-06.14 of the WSDOT Standard Specifications. The foundry name and material designation shall be embossed on the top of the grate. The material shall be identified as "CS" for cast steel, and "DUC" or "DI" for ductile iron and shall be located near the manufacturer's name. See Standard Plans 5-4 through 5-9.

5.6.G Grate and Cover Seating

Grates and covers shall be seated properly to prevent rocking, including the replacement of existing covers with solid metal covers.

5.6.H Vaned Grates

Unless otherwise specified, vaned grates shall be used with standard frame in the traveled way, gutter, or shoulder. Vaned grates shall not be located within crosswalks. See Standard Plans 5-4 through 5-6.

5.6.I Rolled Curbs

Use rolled curb frame and grates along rolled curbs. See Standard Plan 5-12.

5.6.J Runoff Collection in Catch Basins

New catch basins that do not collect runoff shall use round solid locking covers. Existing catch basins, which no longer collect runoff, shall have their frame and grates replaced with new frames and solid covers. See Standard Plan 5-9.

5.6.K Locking Drain Covers and Grates

All storm drain covers and grates shall be locking. All control structures storm drain covers shall be locking regardless of their location.

5.6.L Fencing for Stormwater Facilities

See the KSWDM for fencing requirements and Standard Plans 5-22 and 5-23.

5.6.M Storm Drain Marker

The pavement or curb, adjacent to all catch basins and inlets within the project limits shall be marked with a standard pollution prevention storm drain marker. The wording and layout shall be per Standard Plan 5-37 and be placed so that it can be read from the sidewalk or shoulder of the road.

5.7 TELEVISION INSPECTION

All new storm drain extensions will be TV camera inspected by the City prior to acceptance.

Prior to TV camera inspection:

1. Storm drain lines and catch basins must be cleaned.

2. All construction must be completed and approved by the Inspector.

3. The casting and top grade rings do not have to be mudded in until after the finished grade is established.

4. The Developer shall bear all costs for correction of deficiencies found during TV inspection, including all costs for subsequent TV inspections to verify the correction of deficiencies.

5. The Developer shall schedule TV inspections no less than five (5) working days prior to being ready. If the system is not ready, the Developer shall notify the City no later than 24 hours prior to the scheduled time. If the Developer fails to notify the City that they are not ready within 24 hours of the scheduled time or the TV inspection crew shows up at the site and the system is not ready for testing, the Developer will be responsible for all costs of additional TV inspections to verify the system.

6. All costs for re-inspections including the Inspector's time to come back due to "not being ready" will be the responsibility of the Developer. Costs shall include labor at overtime rates, overhead, equipment, material and any other associated charges. The costs shall be based on the latest cost schedule prepared and approved annually by the Engineer.

7. Sags in storm drain lines identified during the TV inspection greater than 0.5" shall be repaired by the contractor by removal and re-laying of the pipe. Repaired sections of pipe shall be TV inspected for verification prior to final inspection at the cost of the Developer as described above.

5.8 EROSION CONTROL

All projects shall provide erosion control in accordance with the KSWDM.

The Washington State Department of Ecology requires coverage under the NPDES

Construction Stormwater General Permit when the disturbed area for the project exceeds one (1) acre. The NPDES permit requires that a stormwater pollution prevention plan (SWPPP) be developed for all projects covered. A Certified Erosion and Sediment Control Lead shall be required to be onsite during construction. See the Department of Ecology website at:

https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits

See the KSWDM for allowable erosion control best management practices.

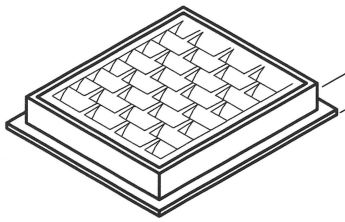
5.9 LOW IMPACT DEVELOPMENT TECHNOLOGIES

The City requires the use of Low Impact Development (LID) technologies per the current KSWDM. LID is a stormwater management and land development strategy applied at the parcel and subdivision scale that emphasizes conservation and use of existing natural site features integrated with engineered small scale hydrologic controls to more closely mimic pre-development functions. The goal of LID is to prevent measurable harm to streams, lakes, wetlands, and other natural aquatic systems from residential, commercial, and industrial development sites.

LID technologies include stormwater best management practices designed to reduce runoff from development using infiltration, evapotranspiration, or stormwater reuse. Examples of LID technologies include trees, preservation of native vegetation, porous pavement, bio-retention swales, infiltration systems, dry wells, cisterns, and rain gardens. LID technologies proposed within the public right of way shall be approved by Public Works Operations during the permit process before any civil construction permit is issued.

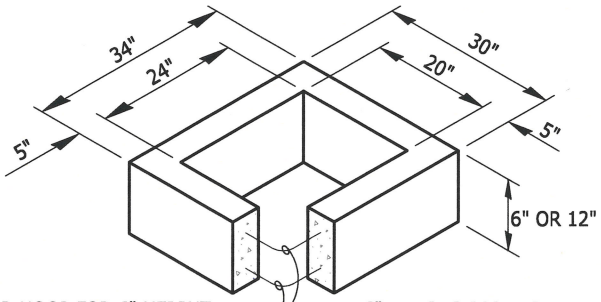
5.10 STORM DRAIN SYSTEM STANDARD PLANS

5-1	Catch Basin Type I
5-2	Catch Basin Type II
5-3	Misc. Details for Drainage Structures
5-4	20"x 24" Catch Basin Frame
5-5	20"x 24"Vaned Grate
5-6	20"x 24" Bi-Directional Vaned Grate
5-7a	Through-Curb Inlet Frame
5-7b	Through-Curb Inlet Installation
5-8	Not used
5-9	20"x 24" Solid Catch Basin Cover
5-10	Not used
5-11	Not used
5-12	15"x 22" Rolled Curb Frame and Grate
5-13	Beehive Grate
5-14	20"x 24" Rectangle Beehive Grate and Catch Basin Frame
5-15	Debris Cage
5-16	Extended Debris Cage
5-17	Catch Basin with Oil/Water Separator
5-18	Not used
5-19	Beveled End Pipe Section
5-20	Trash Screen
5-21a	Shear Gate Sheet 1 of 2



FRAME AND GRATE

SEE STANDARD PLANS 5-4 THRU 5-9 AND 5-12



ONE #3 BAR HOOP FOR 6" HEIGHT
TWO #3 BAR HOOPS FOR 12" HEIGHT

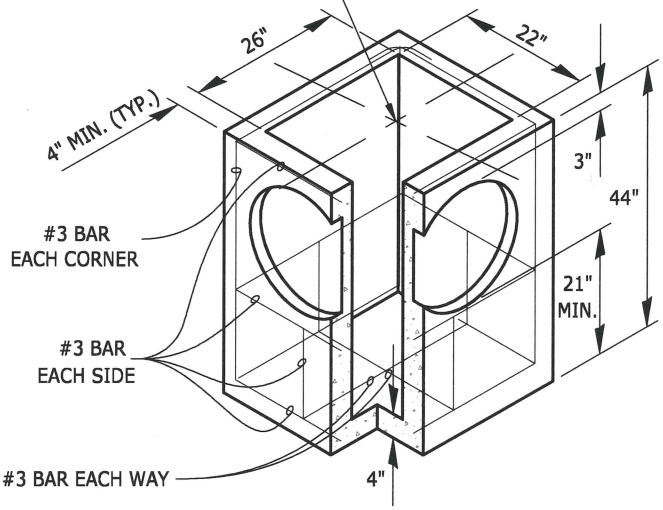
6" WEIGHS 200 LBS.
12" WEIGHS 580 LBS.

RECTANGULAR ADJUSTMENT SECTION

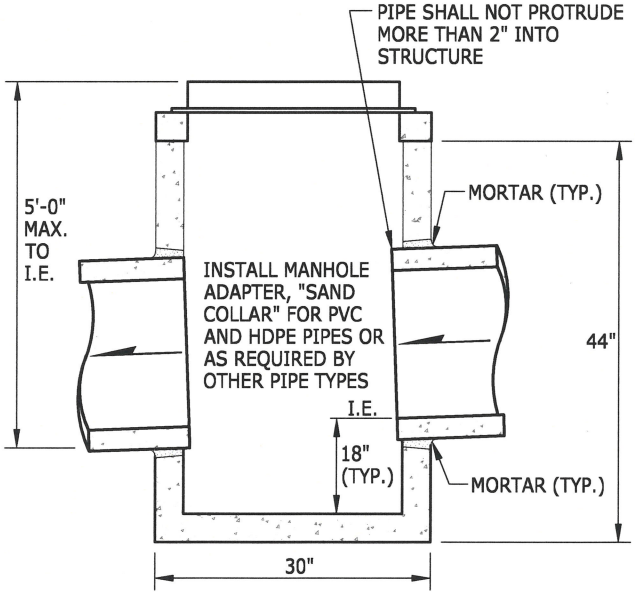
NOTES:

1. CATCH BASIN TO BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M 199, (ASTM C 478, & ASTM C 890) UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATE TO REBAR, WELDED WIRE FABRIC HAVING A MINIMUM AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO AASHTO M 221 (ASTM A 1064). WIRE FABRIC SHALL NOT BE PLACED IN THE KNOCKOUTS.
3. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. THE KNOCKOUT DIAMETER SHALL NOT EXCEED 20". KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM. PROVIDE A 1.5" MINIMUM GAP BETWEEN THE KNOCKOUT WALL AND THE OUTSIDE OF THE PIPE.
4. ALL JOINTS IN THE BRICKS, GRADE RINGS, RISERS AND CASTINGS SHALL BE SEATED IN MORTAR. PICK HOLES, CRACKS AND ANY OTHER JOINTS SHALL BE FINISH GROUTED TO PROVIDE A WATERTIGHT STRUCTURE.
5. THE MAXIMUM DEPTH FROM THE FINISHED GRADE TO THE LOWEST PIPE INVERT SHALL BE 5 FEET. DEPTHS GREATER THAN 5 FEET REQUIRE UPSIZING TO A TYPE II STRUCTURE.
6. NON-CEMENTITIOUS MATERIALS ARE NOT ALLOWED IN SETTING OF FRAMES TO FINAL FINISH GRADE.

STATION AND OFFSET POINT WHEN DESIGN AND LAYOUT PROVIDED BY THE CITY OF KENT, UNLESS OTHERWISE NOTED ON THE PLANS

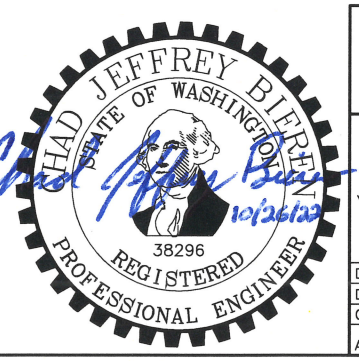


PRECAST BASE SECTION
(WEIGHS 2170 LBS.)



TYPICAL SECTION

PIPE ALLOWANCES	
PIPE MATERIAL	MAX. INSIDE DIAMETER
REINFORCED OR PLAIN CONCRETE	12"
ALL METAL PIPE	15"
SOLID WALL PVC (WSDOT STD. SPEC. 9-05.12(1))	15"



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KENT WASHINGTON

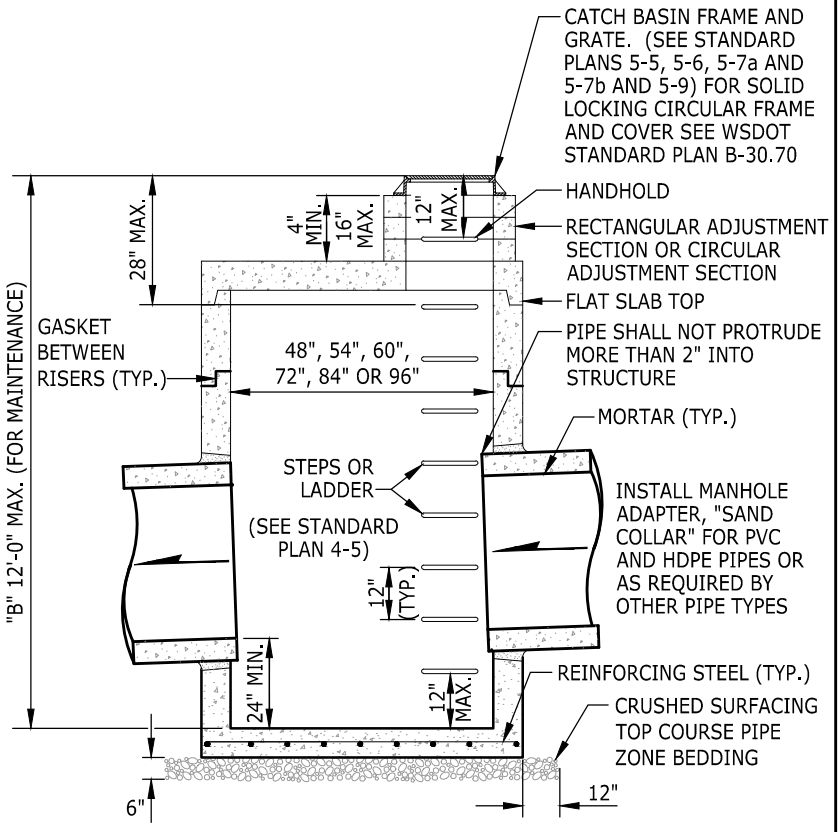
CITY OF KENT
ENGINEERING DEPARTMENT

CATCH BASIN TYPE I

DESIGNED	COK	SCALE NONE	STANDARD PLAN
DRAWN	COK		
CHECKED	COK	DATE 9/2020	5-1
APPROVED		ENGINEER	

NOTES:

1. CATCH BASINS TO BE CONSTRUCTED IN ACCORDANCE W/ AASHTO M 199, (ASTM C 478, AND ASTM C 890) UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT STD. SPECS.
2. HANDHOLDS IN RISER OR ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN CATCH BASIN SHALL HAVE 6" MIN. CLEARANCE. NO STEPS ARE REQ'D WHEN 'B' IS 4' OR LESS.
3. THE BOTTOM OF THE PRECAST CATCH BASIN MAY BE SLOPED TO FACILITATE CLEANING.
4. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM TO 2.5" MAXIMUM. PROVIDE A 1.5" MINIMUM GAP BETWEEN THE KNOCKOUT WALL AND THE OUTSIDE OF THE PIPE. AFTER THE PIPE IS INSTALLED, FILL THE GAP WITH JOINT MORTAR IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATION 9-04.3.
5. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI & BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MIN. CLEARANCE.
6. PICK HOLES, CRACKS AND ANY OTHER JOINTS SHALL BE FINISHED GROUTED TO PROVIDE A WATERTIGHT STRUCTURE.



① CORRUGATED POLYETHYLENE STORM SEWER PIPE (WSDOT STD. SPEC. 9-05.20)
② (WSDOT STD. SPEC. 9-05.12(1))
③ (WSDOT STD. SPEC. 9-05.12(2))

CATCH BASIN DIMENSIONS						
CATCH BASIN DIA.	WALL THICKNESS	BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS	BASE REINFORCING STEEL in²/ft. IN EACH DIRECTION	
					SEPARATE BASE	INTEGRAL BASE
48"	4"	6"	36"	8"	0.23	0.15
54"	4.5"	8"	42"	8"	0.19	0.19
60"	5"	8"	48"	8"	0.25	0.25
72"	6"	8"	60"	12"	0.35	0.24
84"	8"	12"	72"	12"	0.39	0.29
96"	8"	12"	84"	12"	0.39	0.29

PIPE ALLOWANCES					
CATCH BASIN DIAMETER	PIPE MATERIAL WITH MAXIMUM INSIDE DIAMETER				
	CONCRETE	ALL METAL	CPSSP ①	SOLID WALL PVC ②	PROFILE WALL PVC ③
48"	24"	30"	24"	27"	30"
54"	30"	36"	30"	27"	36"
60"	36"	42"	36"	36"	42"
72"	42"	54"	42"	36"	48"
84"	54"	60"	54"	36"	48"
96"	60"	72"	60"	36"	48"

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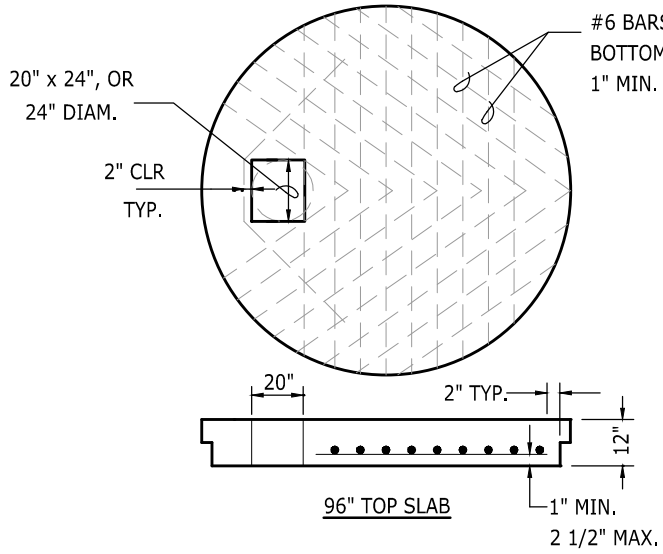
KENT WASHINGTON

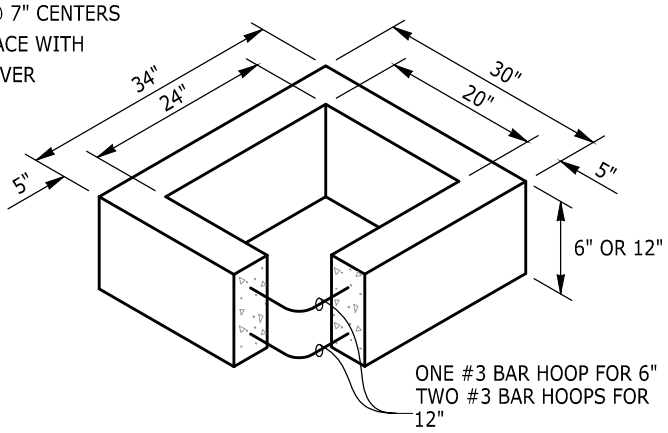
CITY OF KENT
ENGINEERING DEPARTMENT

CATCH BASIN TYPE II

DESIGNED	COK	SCALE NONE	STANDARD PLAN
DRAWN	COK		
CHECKED	COK	DATE 9/2020	5–2
APPROVED		ENGINEER	

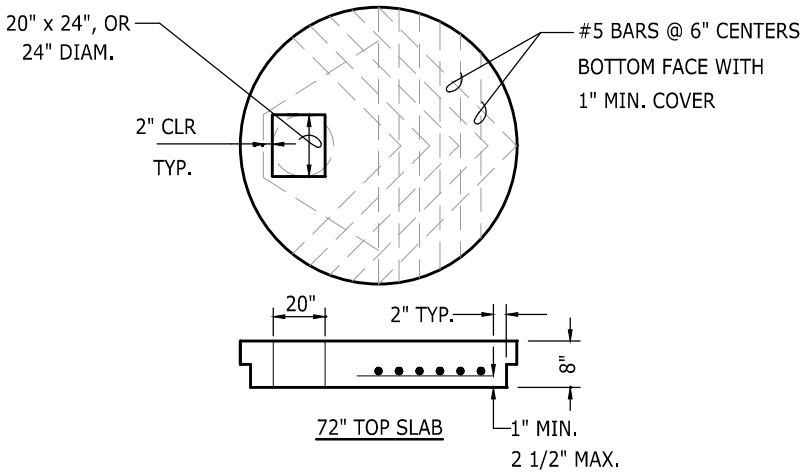


96" TOP SLAB

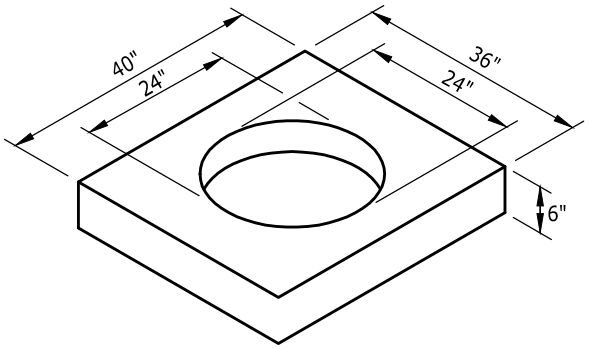


AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WIRE MESH HAVING A MINIMUM AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED FOR ADJUSTMENT SECTIONS.

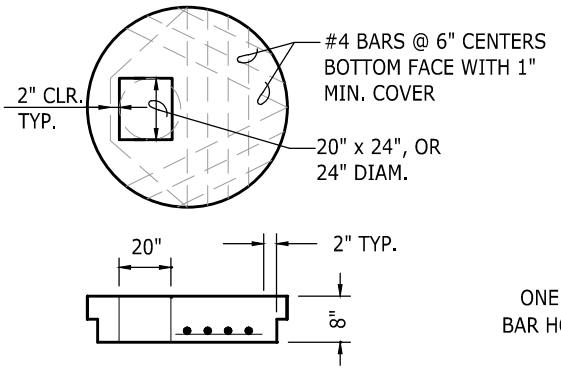
RECTANGULAR ADJUSTMENT SECTION



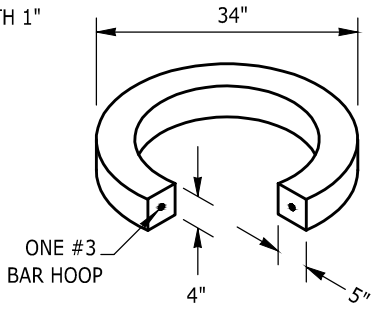
72" TOP SLAB



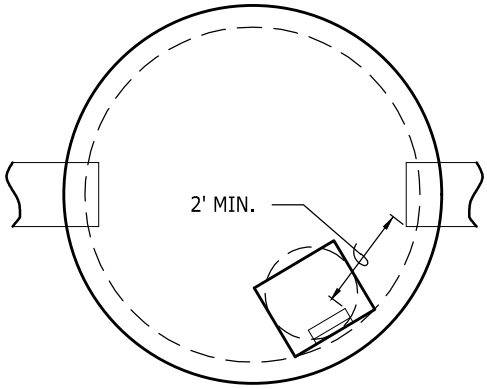
CONVERSION RISER



48" & 54" TOP SLAB



CIRCULAR ADJUSTMENT SECTION



TYPICAL ORIENTATION
FOR ACCESS AND STEPS

NOTES:

1. SLAB OPENING SHALL BE 24" X 20" FOR RECTANGULAR AND 24" DIAMETER FOR ROUND.
2. SEE STANDARD PLAN 4-5 FOR STEP, LADDER AND GRADE RING.
3. ONLY ONE STYLE OF CATCH BASIN STEPS MAY BE USED IN A CATCH BASIN. DO NOT MIX STYLES.

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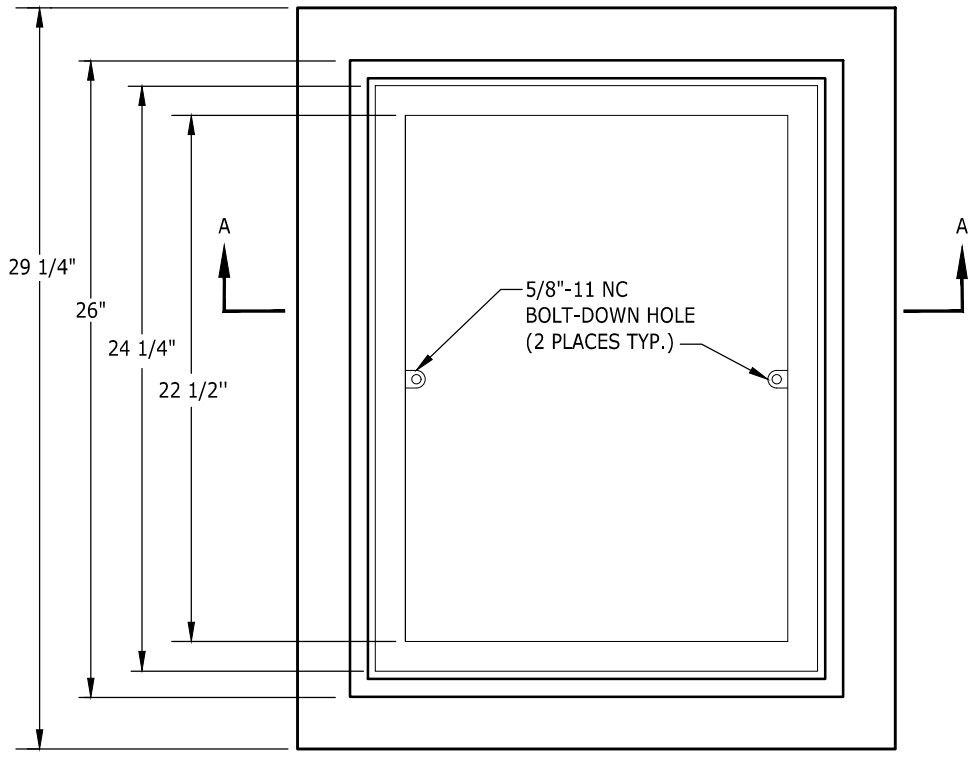
KENT WASHINGTON

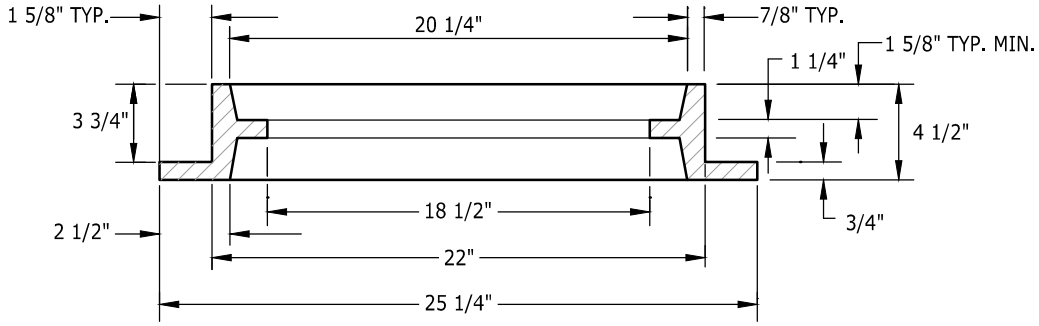
CITY OF KENT
ENGINEERING DEPARTMENT

MISC. DETAILS FOR DRAINAGE STRUCTURES

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–3
APPROVED ENGINEER		



TOP VIEW



SECTION A-A

NOTES:

1. MATERIAL USED FOR THE FRAME SHALL BE CAST IRON ONLY. (PER ASTM A48 CL30 H-20 LOADING).

2. TOP OF FRAME SHALL BE ADJUSTED EVEN WITH ROADWAY SECTION.

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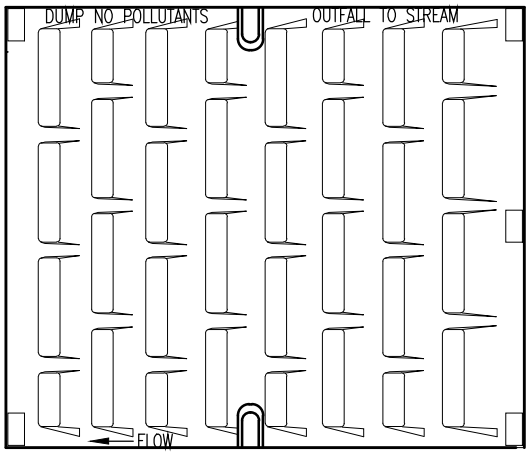
KENT WASHINGTON

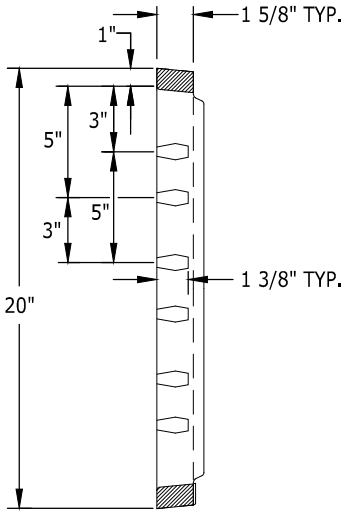
CITY OF KENT
ENGINEERING DEPARTMENT

20"X 24" CATCH BASIN FRAME

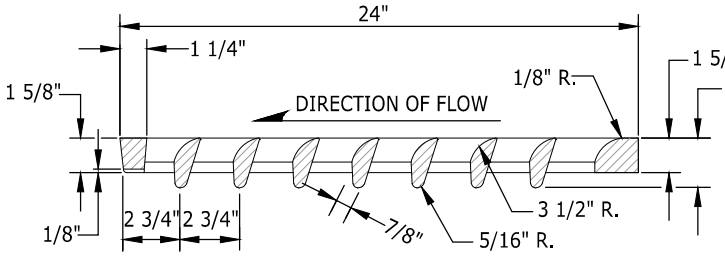
DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5-4
APPROVED ENGINEER		



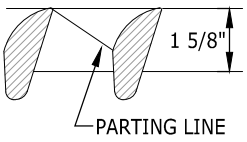
TOP VIEW



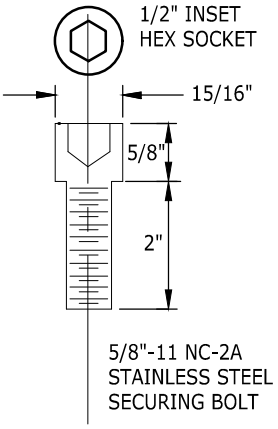
END VIEW



FRONT VIEW

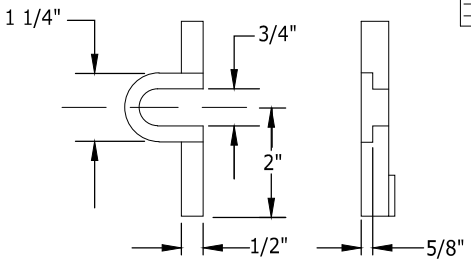


VANE DETAIL



NOTES:

1. PROVIDE FRAME SHOWN IN STANDARD PLAN 5-4.
2. PROVIDE 2-5/8" DIAMETER STAINLESS STEEL ALLEN TYPE BOLTS COUNTER SUNK FLUSH WITH COVER.
3. GRATE SHALL BE STAMPED "DUMP NO POLLUTANTS", "OUTFALL TO STREAM".
4. ALL LETTERING SHOWN SHALL BE 1/2" AND SHALL BE RECESSED UNLESS OTHERWISE INDICATED.
5. DUCTILE IRON ASTM A-536 GRADE 80-55-06 H-20 RATED.
6. GRATE SHALL BE LOCKING.
7. BI-DIRECTIONAL VANED GRATES ARE REQUIRED WHEN LOCATED IN A LOW-SPOT.



SLOT DETAIL

SLOT FORMED AND RECESSED FOR 5/8" - 11 NC x 2" S.S. SOCKET HEAD (ALLEN HEAD) CAP SCREW.

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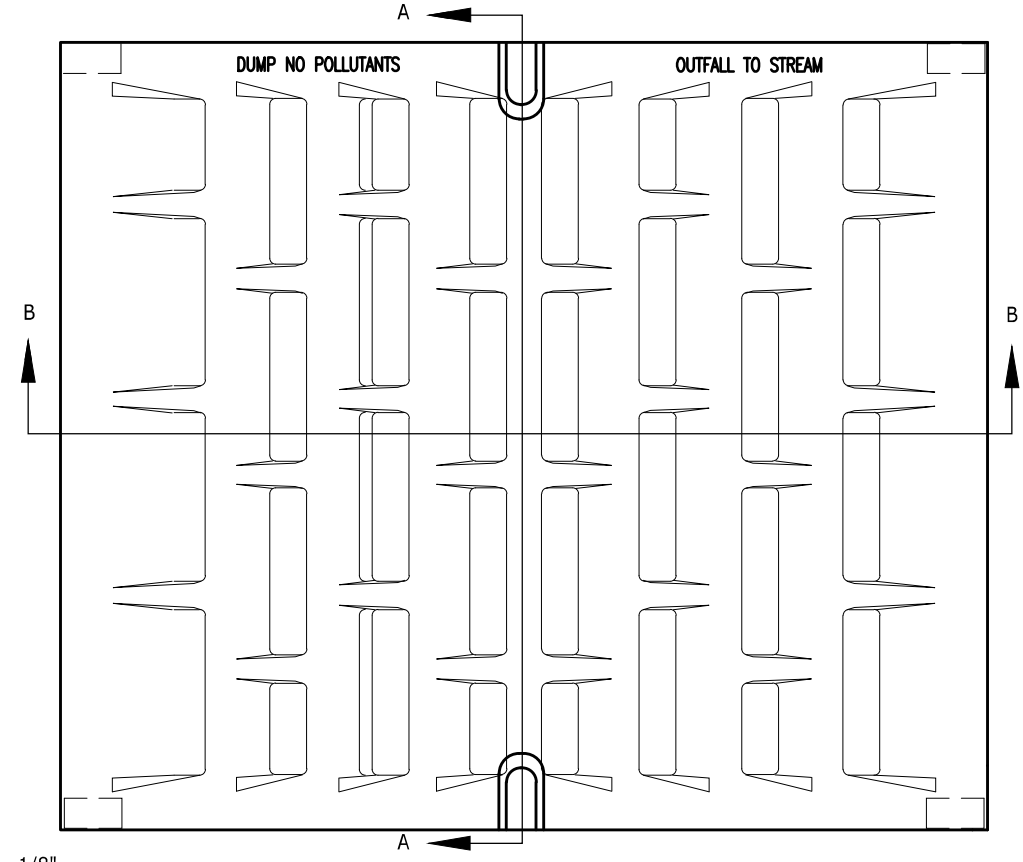
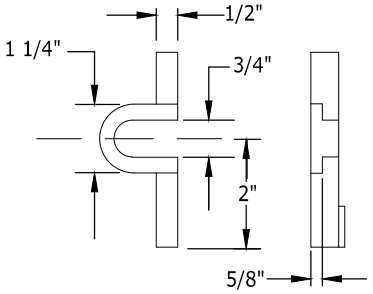
ENGINEERING DEPARTMENT

20" x 24" VANED GRATE

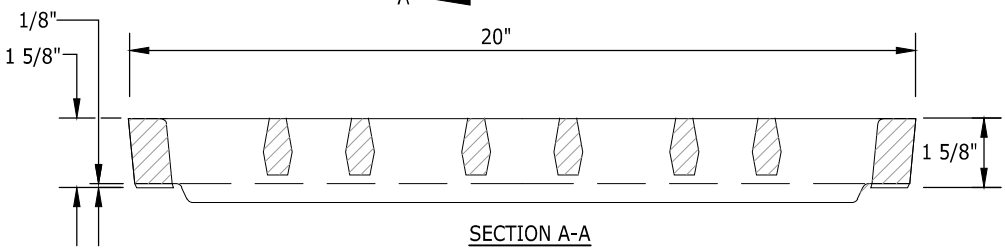
DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–5
APPROVED ENGINEER		



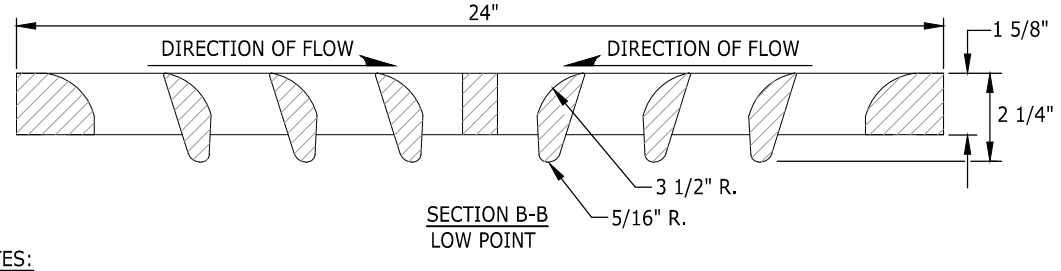


SLOT DETAIL

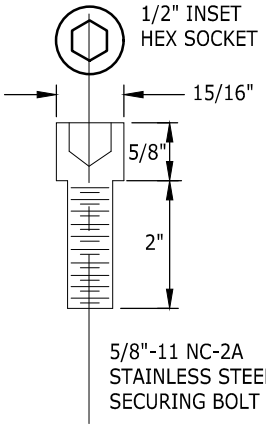
SLOT FORMED AND RECESSED FOR 5/8" - 11 NC x 2" S.S. SOCKET HEAD (ALLEN HEAD) CAP SCREW.



SECTION A-A



SECTION B-B
LOW POINT



5/8"-11 NC-2A
STAINLESS STEEL
SECURING BOLT

NOTES:

1. PROVIDE FRAME SHOWN ON STANDARD PLAN 5-4.
2. FOR THRU CURB INLETS AT LOW POINTS, USE BI-DIRECTIONAL VANED GRATE.
3. GRATE SHALL BE STAMPED "DUMP NO POLLUTANTS", "OUTFALL TO STREAM".
4. ALL LETTERING SHOWN SHALL BE 1/2" AND SHALL BE RECESSED.
5. DUCTILE IRON ASTM A-536 GRADE 80-55-06 H-20 RATED.
6. GRATE SHALL BE LOCKING.
7. PROVIDE 2-5/8" DIAMETER STAINLESS STEEL ALLEN TYPE BOLTS COUNTER SUNK FLUSH WITH COVER.

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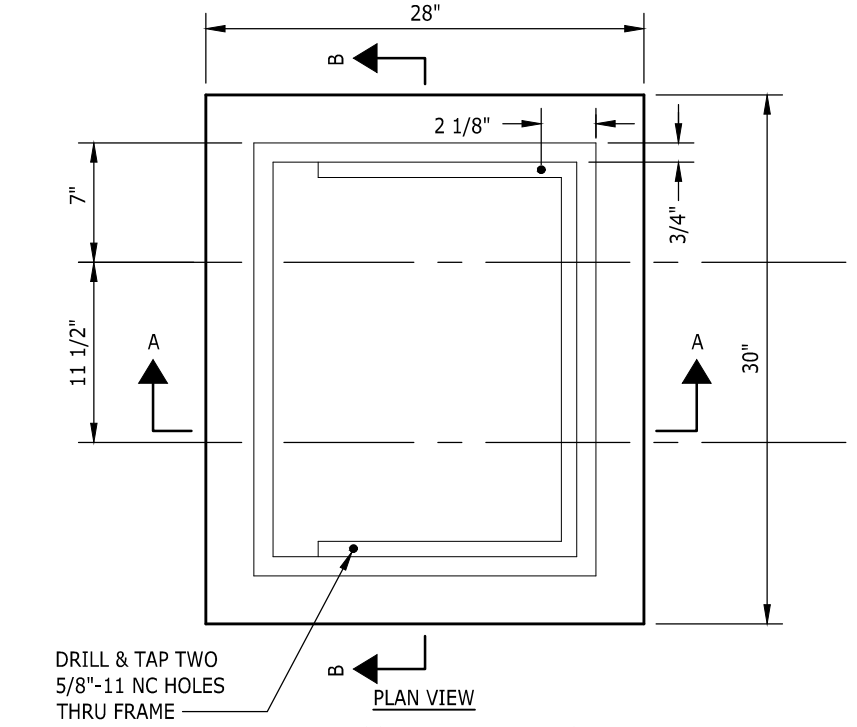
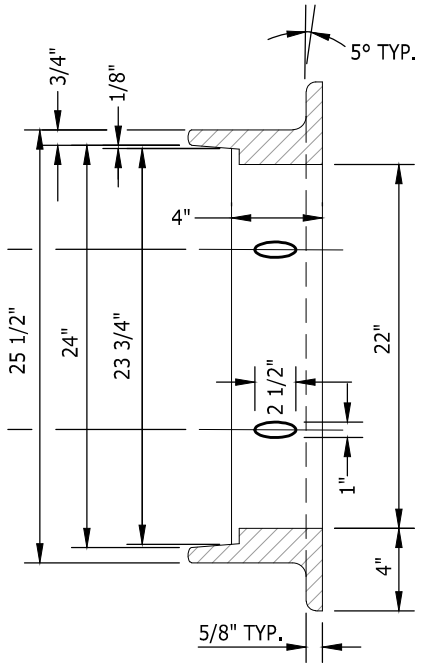
20"x24" BI-DIRECTIONAL VANED GRATE

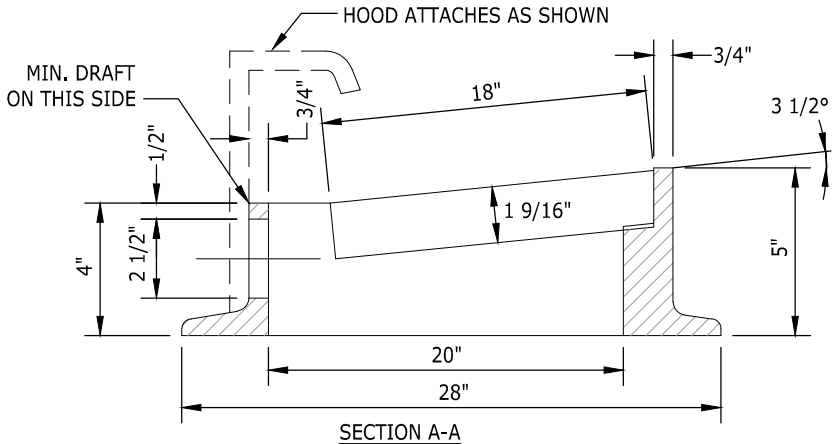
DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5-6
APPROVED ENGINEER		



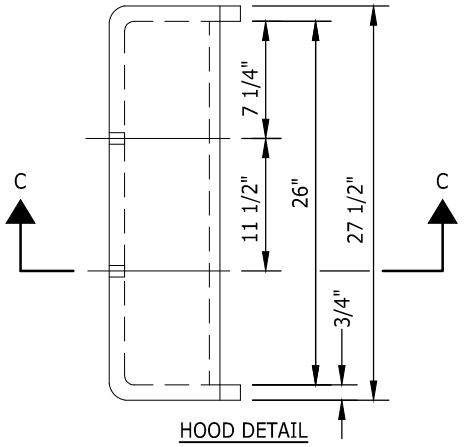
PLAN VIEW



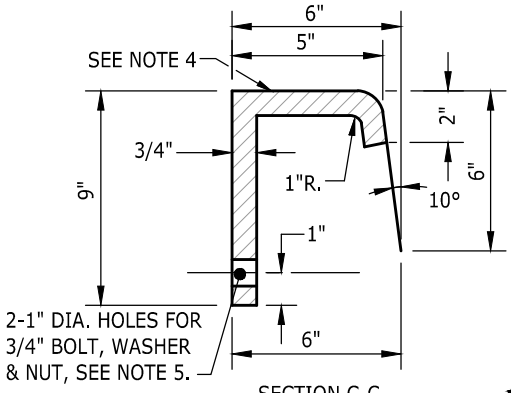
SECTION B-B



SECTION A-A



HOOD DETAIL



SECTION C-C

NOTES:

1. FRAME AND HOOD CAST IRON ASTM A48 CL30 H-20 LOADING.
2. USE 18"x24" VANED GRATE.
3. AT LOW POINTS, USE 18"x24" 2-WAY VANED GRATE.
4. HOOD SHALL BE NON-SLIP.
5. BOLT, WASHER AND NUT SHALL BE GALVANIZED OR CORROSION RESISTANT.
6. THRU-CURB FRAME LOCATIONS SHALL BE TWENTY-FIVE (25) FEET AWAY FROM ANY P.C. OR P.T. OF CURB RADII.

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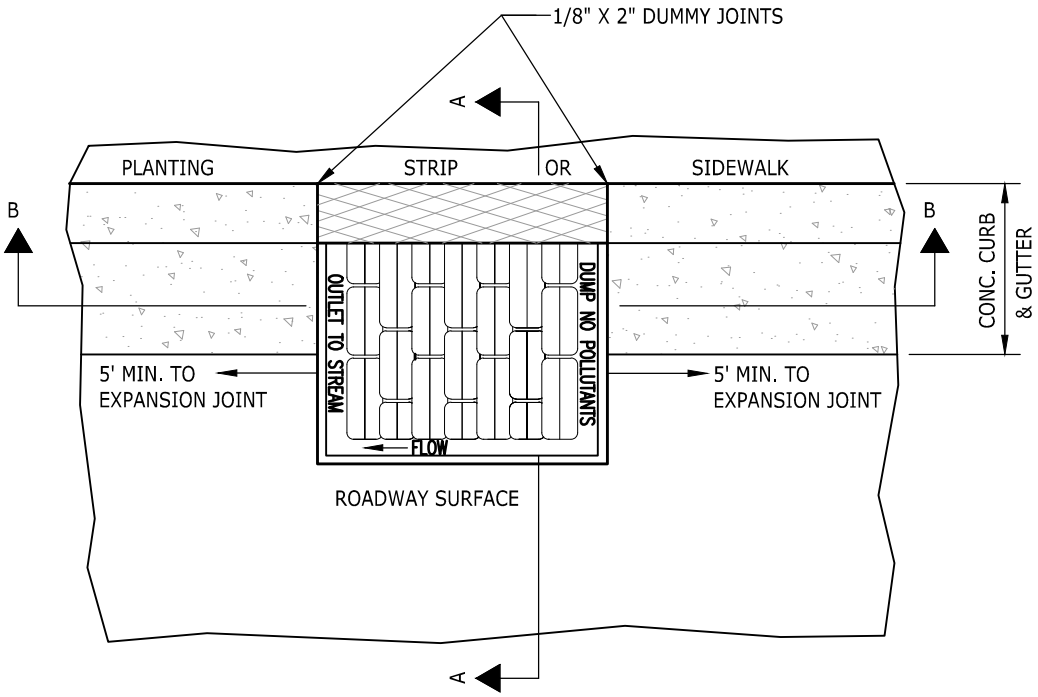
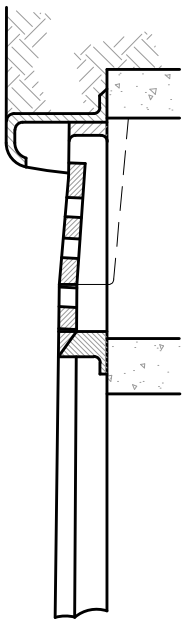
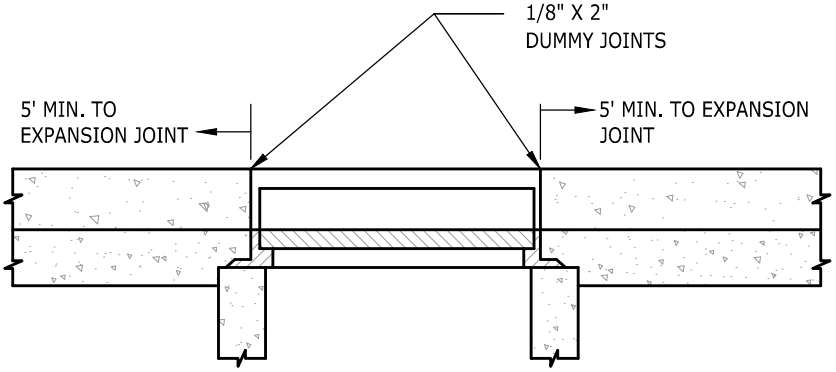
THROUGH–CURB INLET FRAME

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 2/2020	5–7a
APPROVED ENGINEER		





SECTION A-A



SECTION B-B

NOTES:

1. FOR INSTALLATIONS AT LOW POINTS USE 2-WAY VANED GRATE. OTHERWISE, USE STANDARD VANED GRATE.
2. CURB AND GUTTER 5' EITHER SIDE OF CATCH BASIN SHALL BE POURED AT THE TIME OF FRAME AND GRATE INSTALLATION.
3. THRU-CURB FRAME LOCATIONS SHALL BE TWENTY-FIVE (25) FEET AWAY FROM ANY P.C. OR P.T. OF CURB RADII.

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THROUGH–CURB INLET INSTALLATION

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–7b
APPROVED ENGINEER		

NOT USED

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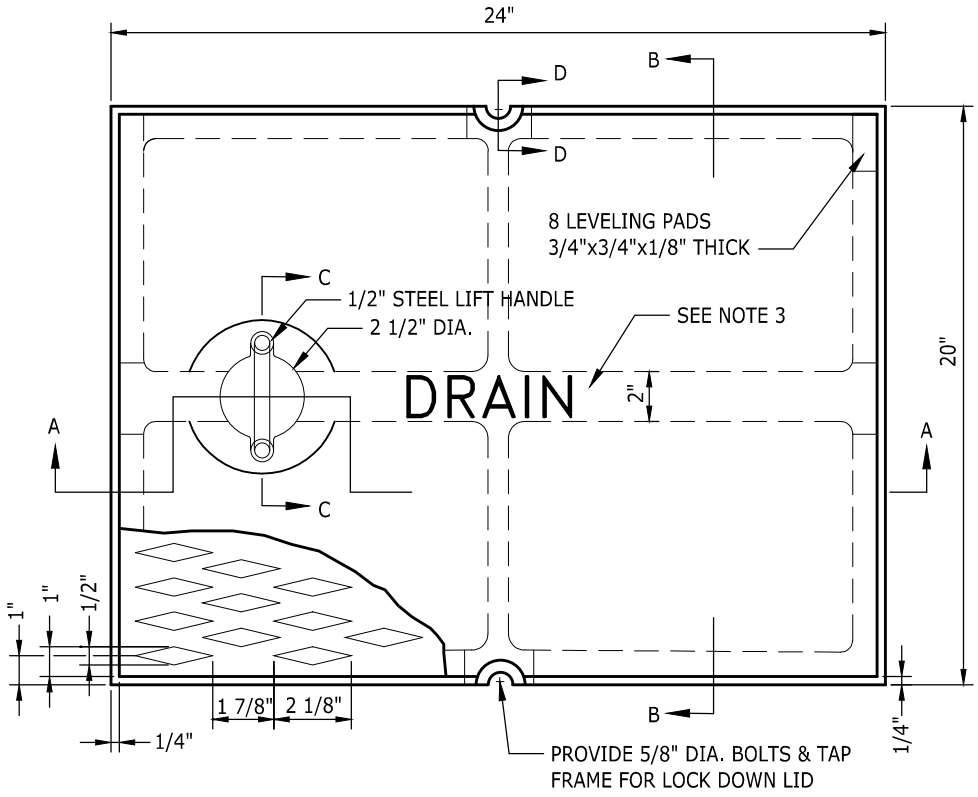
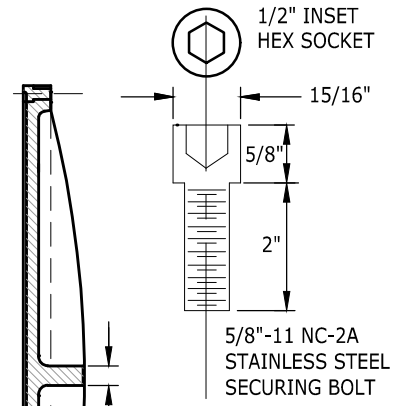
XXXX

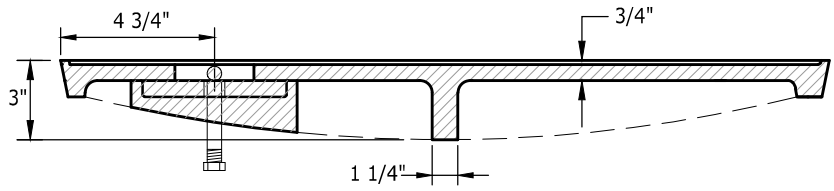
DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2020	5–8
APPROVED ENGINEER		



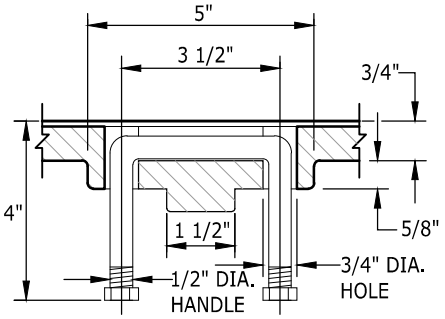
PLAN



SECTION B-B



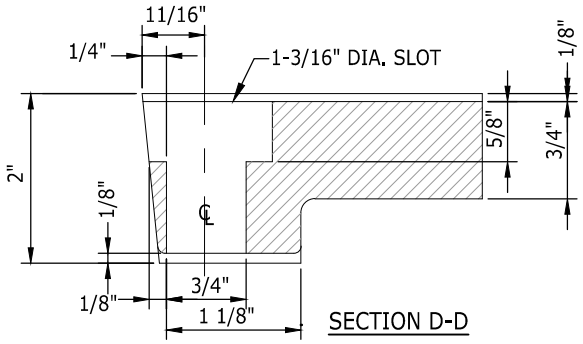
SECTION A-A



SECTION C-C

NOTES:

1. WHEN SPECIFIED ON THE APPROVED PLANS, THE SOLID METAL COVER FOR CATCH BASIN SHALL BE FURNISHED IN PLACE OF A 20"X24" GRATE.
2. RAISED DESIGNS OTHER THAN THE DIAMOND DESIGN SHOWN HEREON MAY BE USED IF APPROVED BY THE ENGINEER. COVERS IN WALKWAYS SHALL BE NON-SLIP.
3. CAST IN THE LETTERS "DRAIN" IN 2" RAISED LETTERS, 1/8" HIGH.
4. TO BE USED WITH FRAME SHOWN IN STANDARD PLAN 5-4.
5. PROVIDE 2-5/8" DIAMETER STAINLESS STEEL ALLEN TYPE BOLTS COUNTER SUNK FLUSH WITH COVER. (SEE STANDARD PLAN 5-4 FOR BOLT-DOWN CATCH BASIN FRAME).
6. FRAME: CAST IRON ASTM A48 CL30, COVER: DUCTILE IRON ASTM A 536 GR 80-55-06 H-20 RATED.



SECTION D-D

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ENGINEERING DEPARTMENT

20"x 24" SOLID CATCH BASIN COVER

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–9
APPROVED	ENGINEER	

NOT USED

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XXXX

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 2/2020	5–10
APPROVED ENGINEER		

NOT USED

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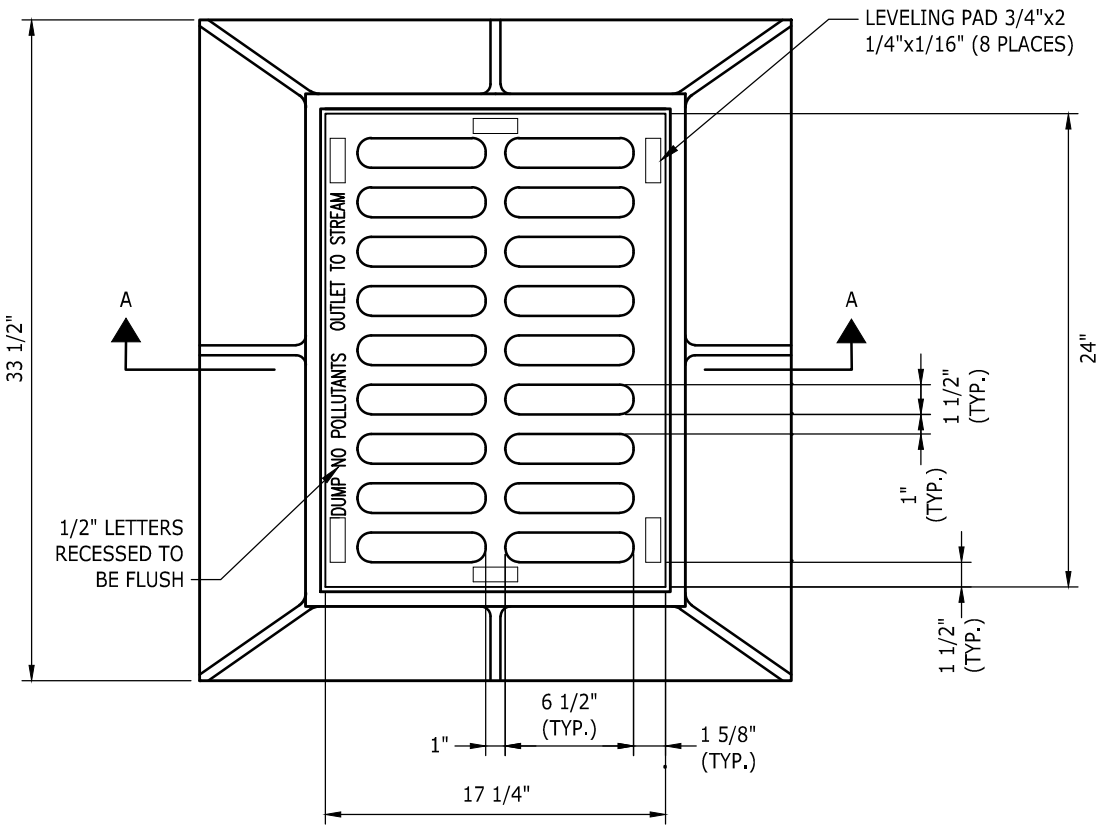
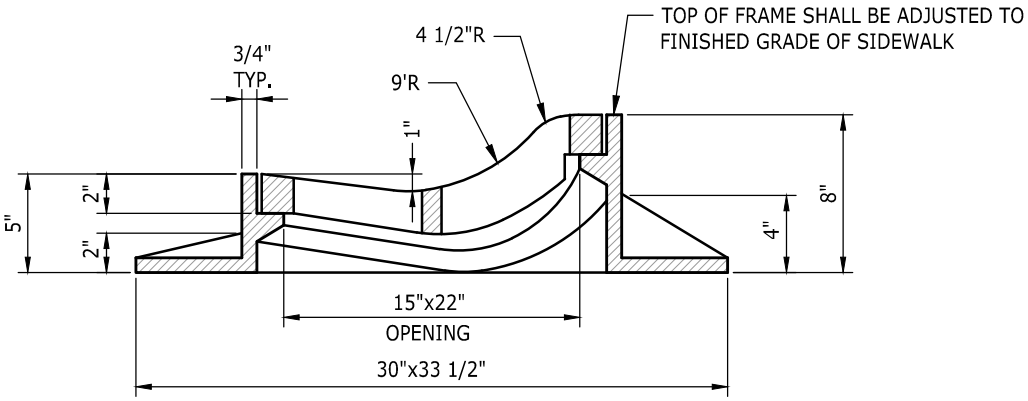
XXXX
XXXX

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 9/2020	5–11
APPROVED ENGINEER		



PLAN



SECTION A-A

NOTES:

1. MATERIAL USED FOR THE FRAME SHALL BE CAST IRON ONLY (PER ASTM A48 CL30 H-20 LOADING).
2. GRATE SHALL BE STAMPED "DUMP NO POLLUTANTS-OUTLET TO STREAM".

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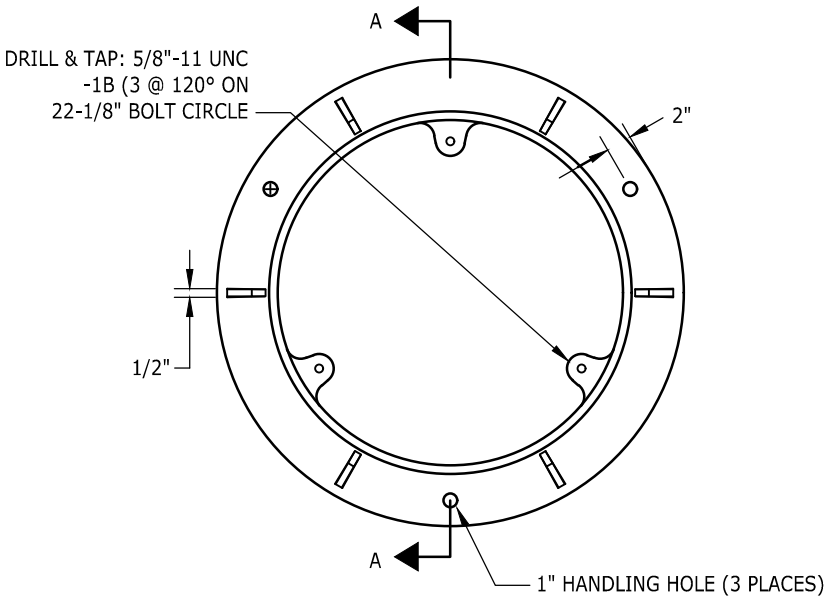
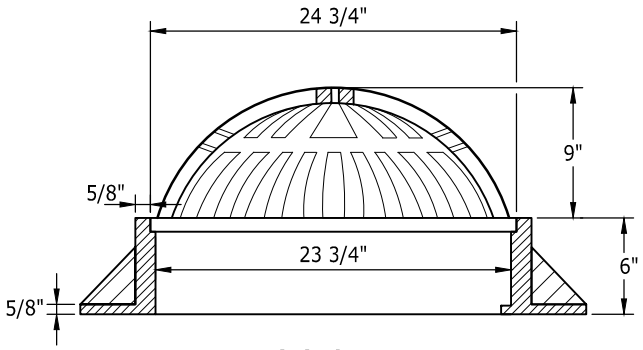
15"x 22" ROLLED CURB FRAME AND GRATE

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–12
APPROVED ENGINEER		



PLAN



SECTION B-B

MANHOLE RING AND LOCKING BEEHIVE GRATE

NOTES:

1. MATERIAL: CAST IRON ASTM A48, CL 30.
2. PROVIDE 2-5/8" LONG STAINLESS STEEL ALLEN TYPE BOLTS COUNTER SUNK FLUSH WITH COVER.

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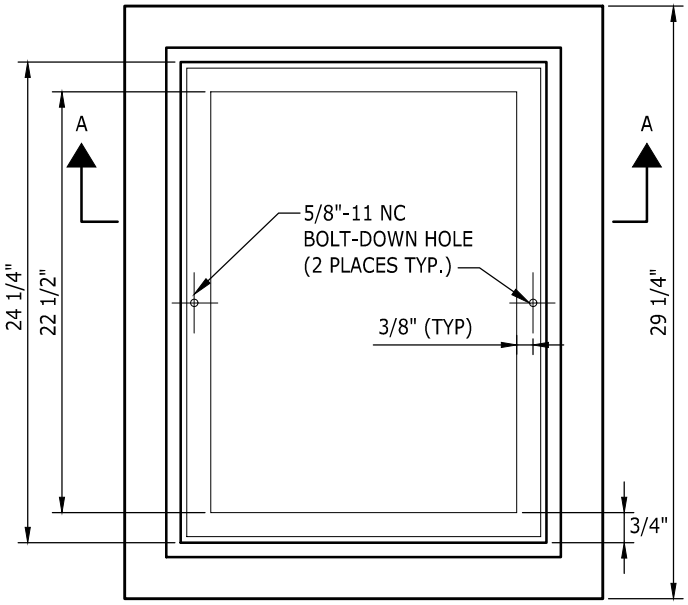
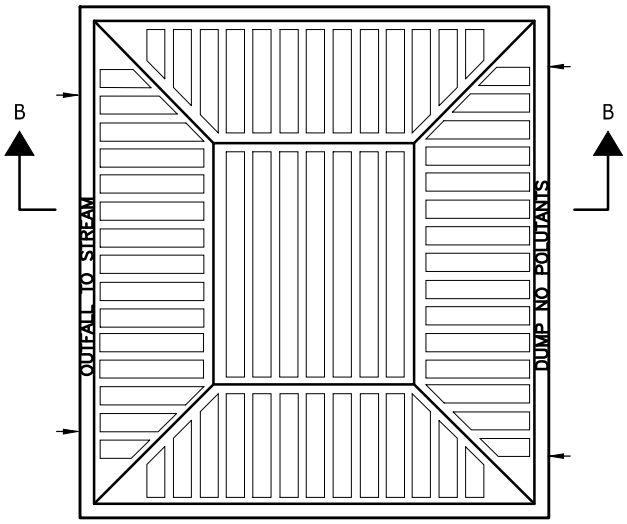
BEEHIVE GRATE

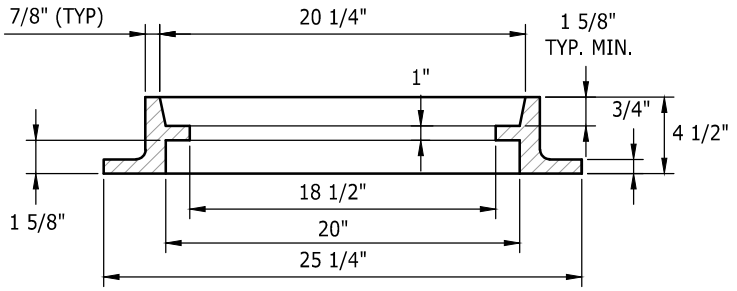
DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–13
APPROVED ENGINEER		



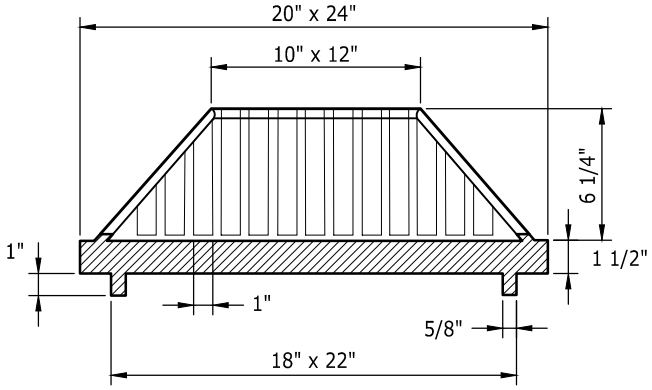
TOP VIEW



PLAN



SECTION A-A



SECTION B-B

LOCKING BEEHIVE GRATE

NOTES:

1. MATERIAL USED FOR THE FRAME SHALL BE CAST IRON ONLY. (PER ASTM A48 CL30 H-20 LOADING).
2. TOP OF FRAME SHALL BE ADJUSTED EVEN WITH ROADWAY SECTION.
3. MATERIAL: DUCTILE IRON ASTM A536, CL 80-55-06.
4. PROVIDE 2-5/8" LONG STAINLESS STEEL ALLEN TYPE BOLTS COUNTER SUNK FLUSH WITH COVER.

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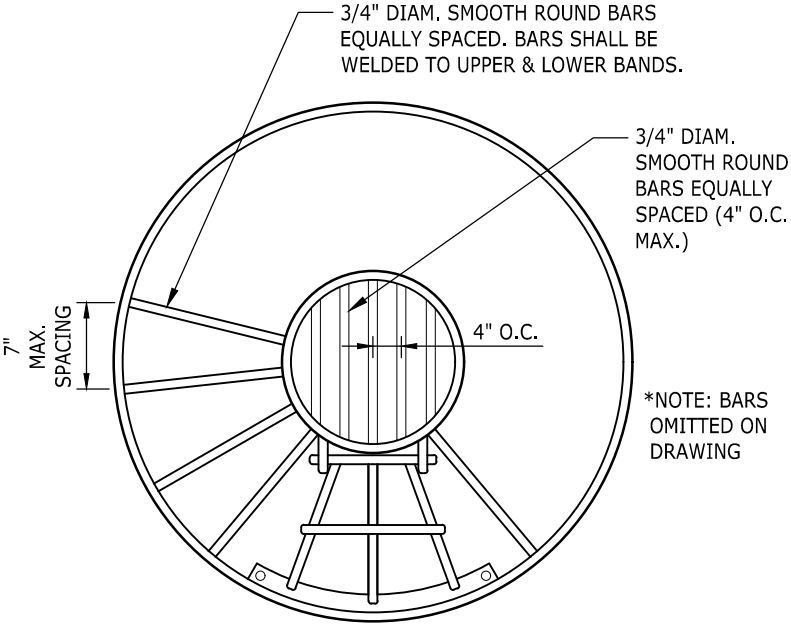
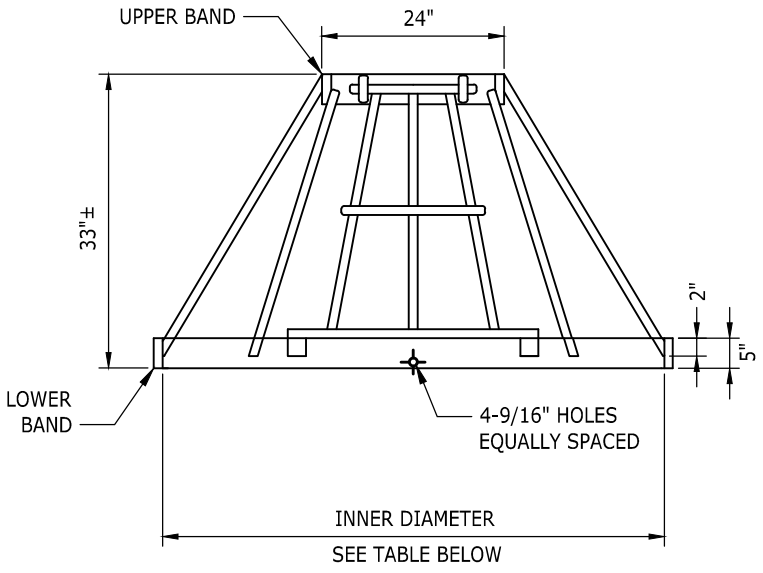
20"x 24" RECTANGLE BEEHIVE GRATE AND CATCH BASIN FRAME

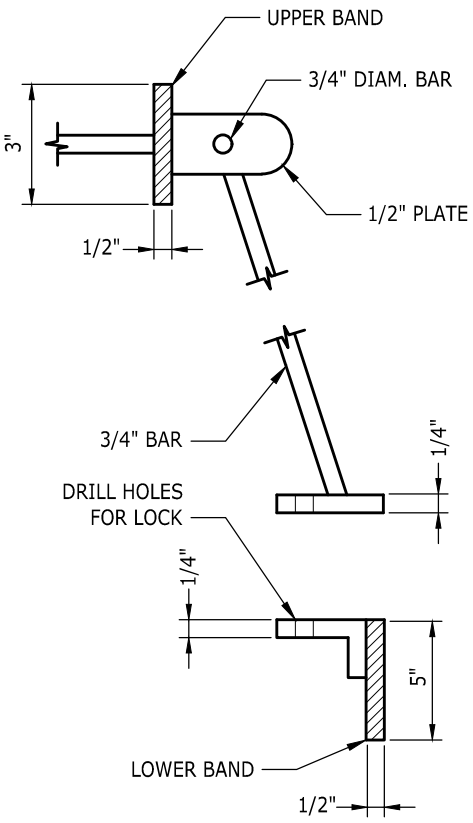
DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–14
APPROVED ENGINEER		



PLAN



ELEVATION



ENTRY GATE DETAIL

CB	INNER DIAM.
48"	58"
54"	65"
60"	72"
72"	86"
96"	114"

NOTES:

1. ALL STEEL IN PLATES, BARS AND BANDS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36.
2. DEBRIS CAGE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111 (ASTM A123).
3. ENTRY GATE SHALL BE LOCKABLE WITH A CITY OF KENT PADLOCK.

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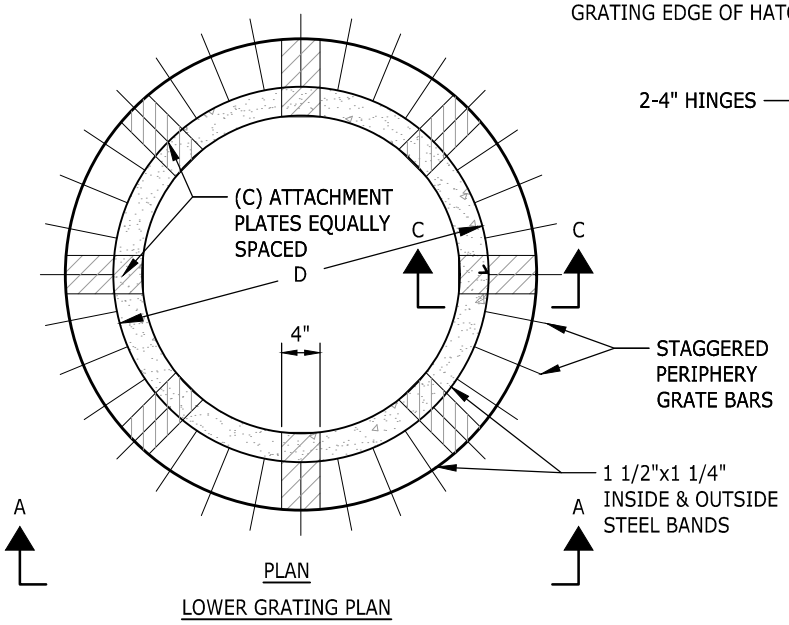
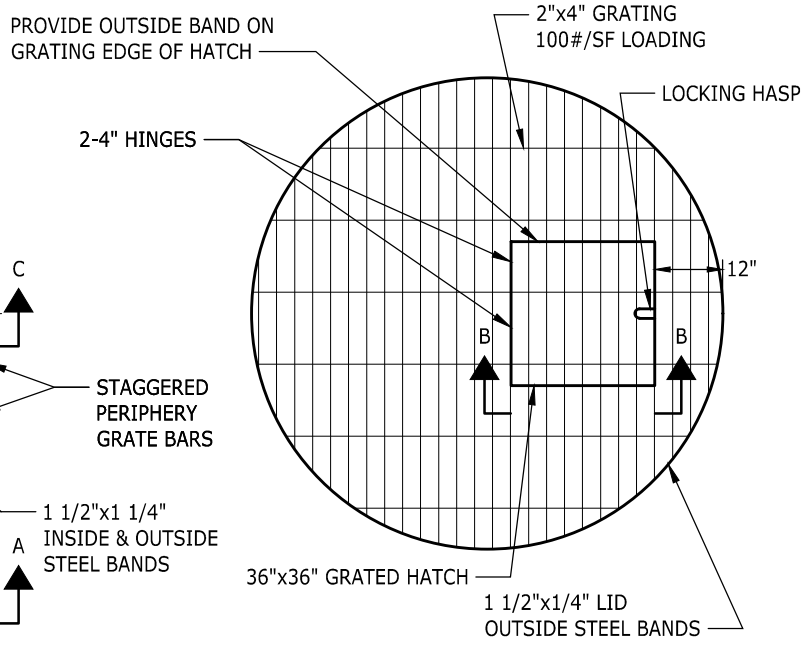
DEBRIS CAGE

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–15
APPROVED ENGINEER		

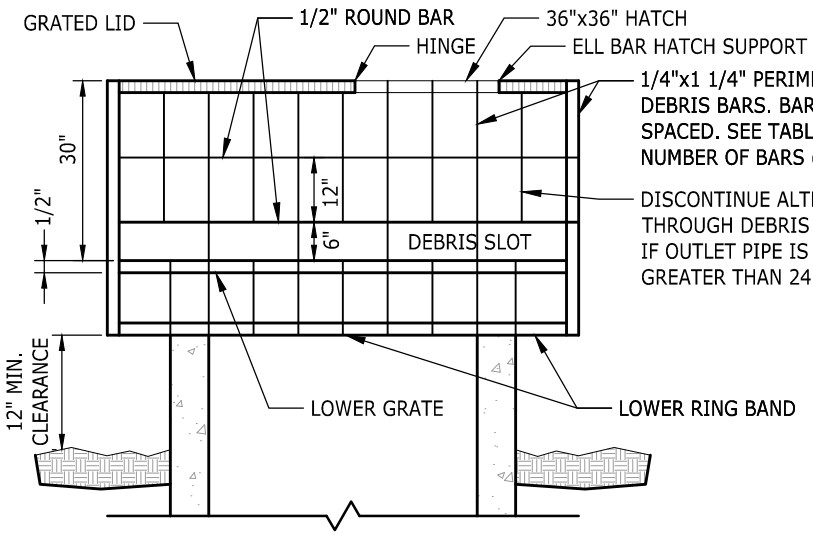


PLAN

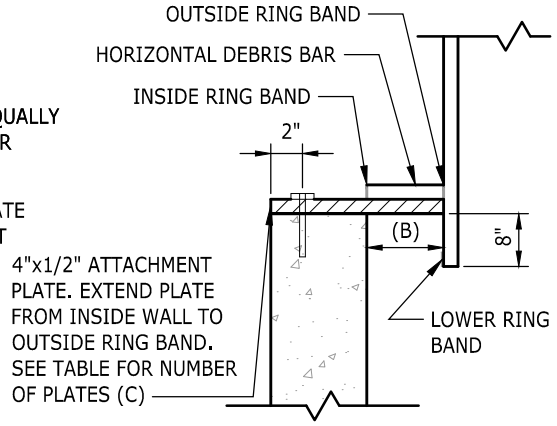
LOWER GRATING PLAN



GRATED LID

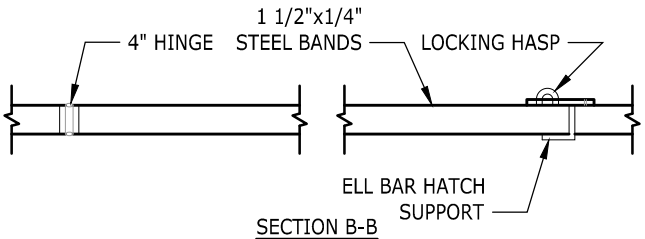


SECTION A-A



SECTION C-C

MANHOLE ATTACHMENT DETAIL



SECTION B-B

HATCH DETAIL

TABLE OF VARIABLES

CB DIA. INSIDE	NO. OF BARS (A)	(B)	NO. OF ATTACH-MENT PLATES (C)	(D)
48"	26	8"	4	60"
54"	29	8"	6	67"
60"	32	10"	6	74"
72"	39	12"	8	88"
96"	50	12"	8	116"

NOTES:

1. ALL PARTS OF THE CAGE SHALL BE GALVANIZED STEEL AND JOINTS WELDED. (PER WSDOT STD. SPECS. 9-05.16).
2. UNLESS INDICATED OTHERWISE, ALL BANDS AND BARS SHALL BE 1 1/2" x 1/4".
3. GRATED LID SHALL BE CONSTRUCTED TO WITHSTAND A 100 PSF LOADING.

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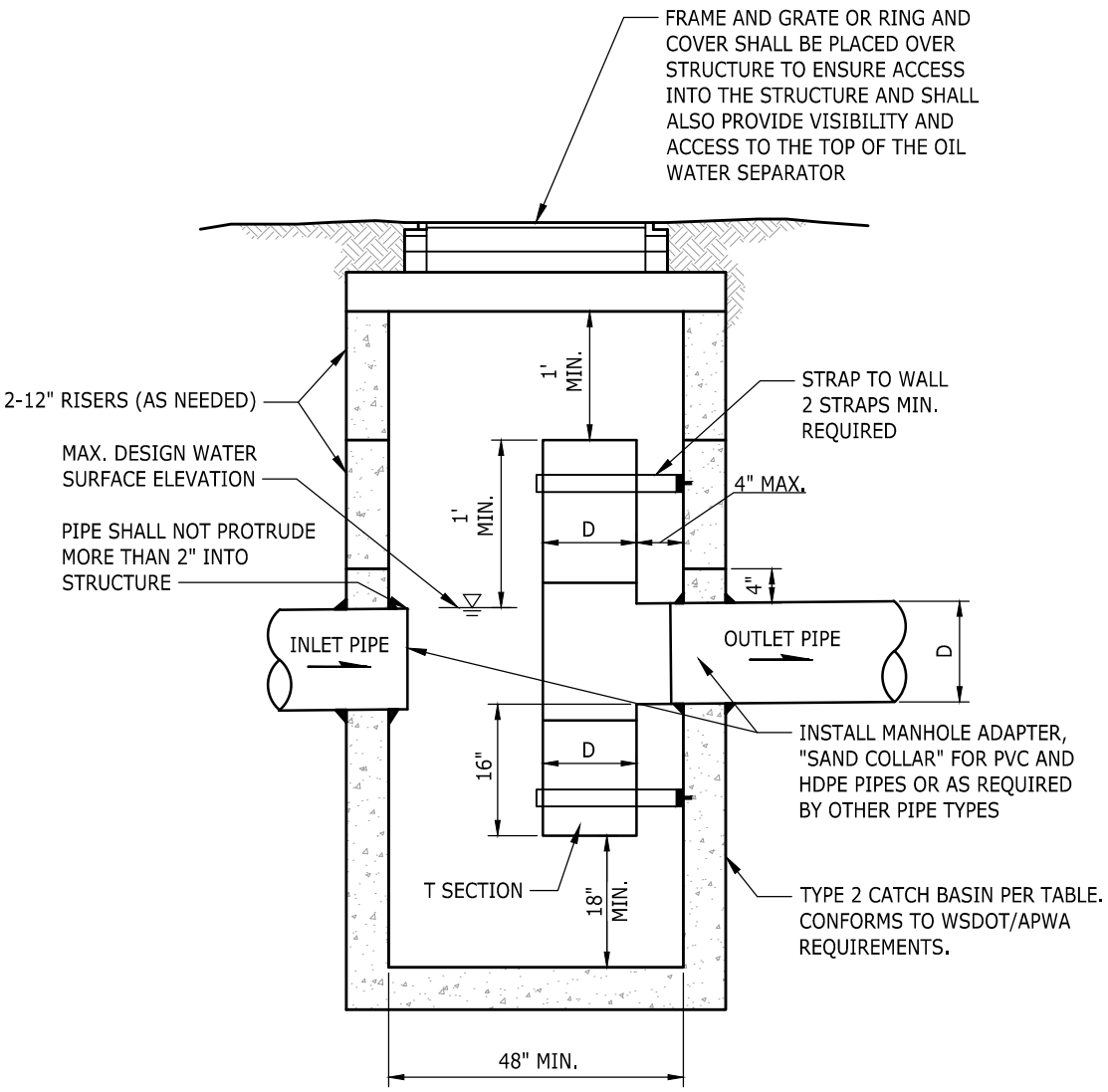
KENT WASHINGTON

CITY OF KENT
ENGINEERING DEPARTMENT

EXTENDED DEBRIS CAGE

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–16
APPROVED	ENGINEER	



NOTES:

1. MIN. OUTLET PIPE DIAMETER IS 12".
2. ALL METAL PARTS AND SURFACES MUST BE MADE OF CORROSION RESISTANT MATERIAL OR GALVANIZED.
3. DIMENSION "D" IS NOMINAL DIAMETER OF OUTLET PIPE.

OUTLET PIPE DIA.	STRUCTURE TYPE
≤ 12"	TYPE 2 CB-48"
≤ 18"	TYPE 2 CB-54"

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CITY OF KENT
ENGINEERING DEPARTMENT

CATCH BASIN WITH OIL/WATER SEPARATOR

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 9/2020	5–17
APPROVED ENGINEER		

NOT USED

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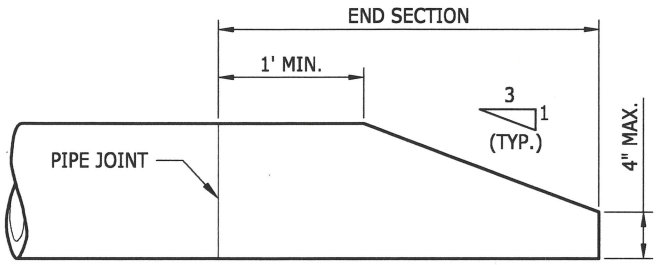
CITY OF KENT
ENGINEERING DEPARTMENT

XXXX
XXXX

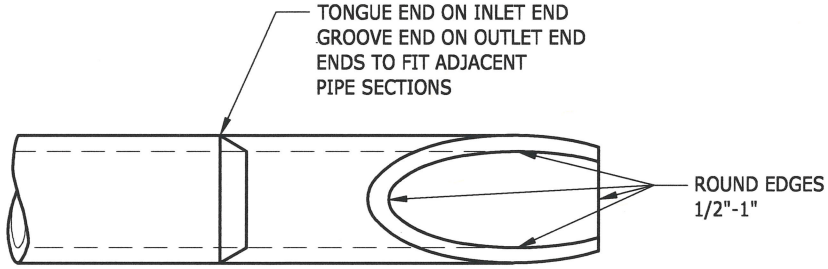
DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 2/2020	5–18
APPROVED ENGINEER		



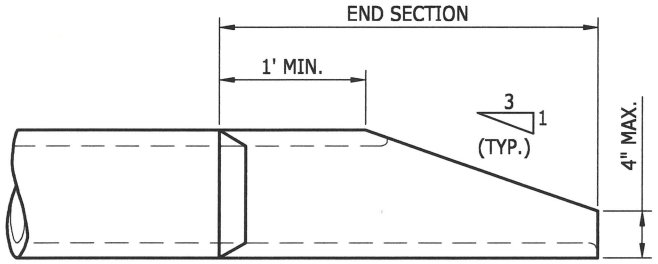
METAL PIPE

NOTES:

1. SIDE SLOPE SHALL BE WARPED TO MATCH THE BEVELED PIPE END. WHEN CULVERT IS ON SKEW, BEVELED END SHALL BE ROTATED TO CONFORM TO SLOPE. IF SLOPE DIFFERS FROM 3:1, PIPE SHALL BE BEVELED TO MATCH SLOPE.
2. BEVELED END PIPE SHALL BE PRECAST CONCRETE PIPE OR DUCTILE IRON ONLY. THE PIPE TYPE SHALL BE CONSISTENT THE ENTIRE LENGTH OF ANY REQUIRED CULVERT OR TO THE NEAREST STRUCTURE PRIOR TO THE BEVELED OUTFALL.

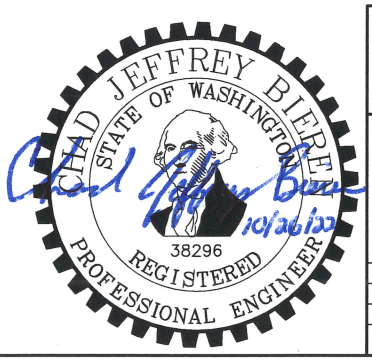


PLAN



ELEVATION

CONCRETE PIPE



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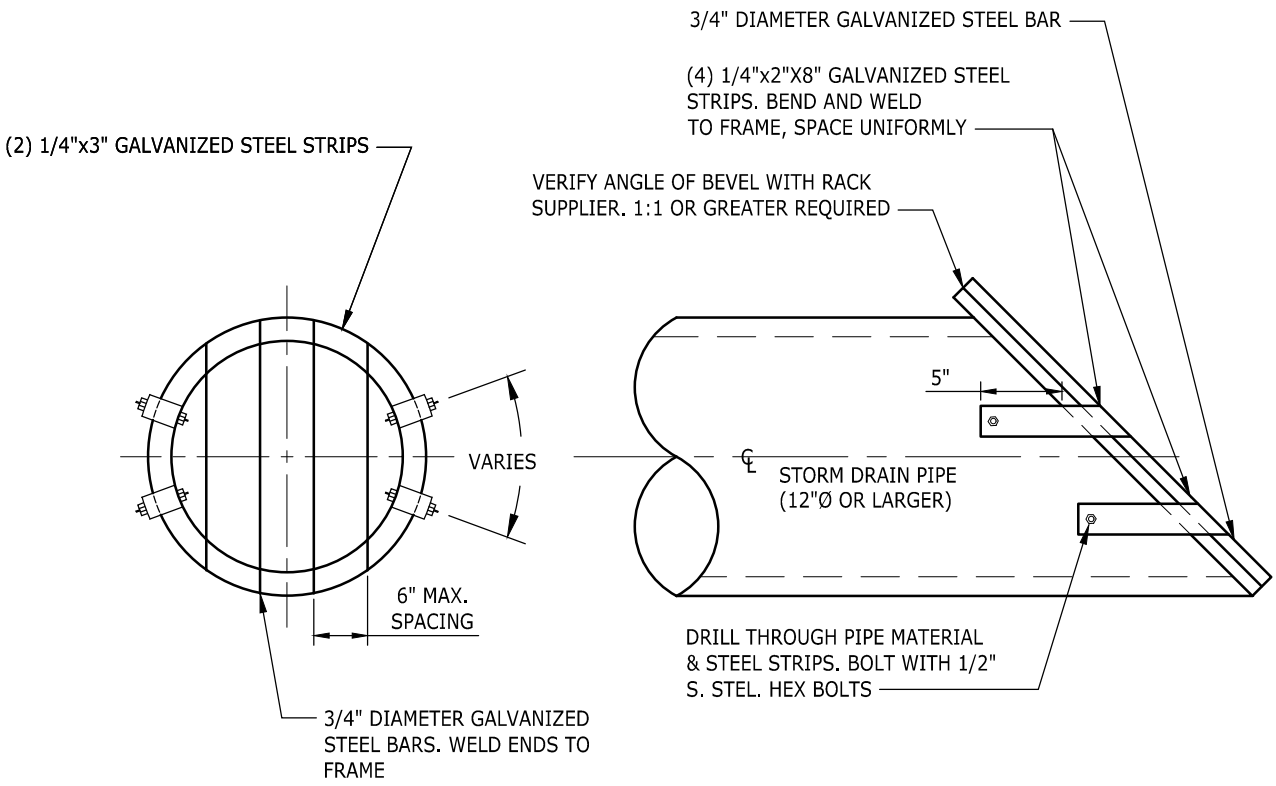
KENT WASHINGTON

CITY OF KENT
ENGINEERING DEPARTMENT

BEVELED END PIPE SECTION

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2021	5-19
APPROVED ENGINEER		



NOTES:

1. WELD AT ALL JOINTS.
2. SHOP DRAWINGS REQUIRED.
3. ALL STEEL IN PLATES, BARS AND BANDS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36.
4. DEBRIS CAGE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111 (ASTM A123).
5. GALVANIZING SHALL BE PER WSDOT STD. SPECIFICATION 9-05.16.

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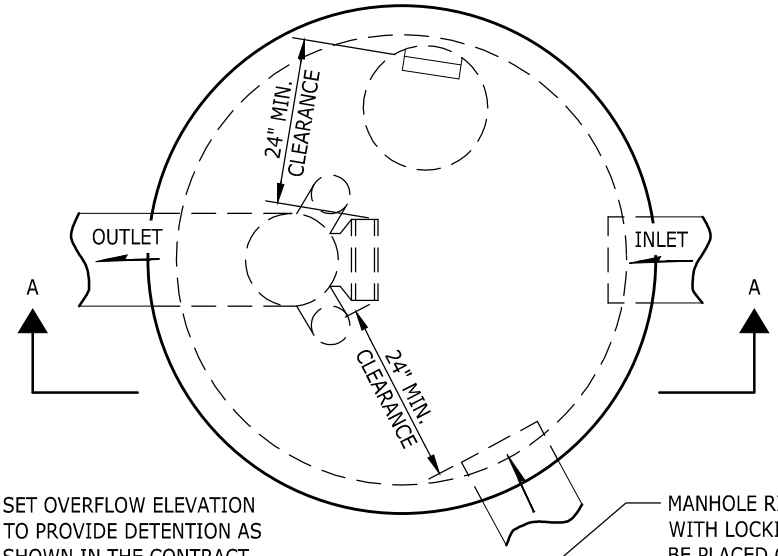
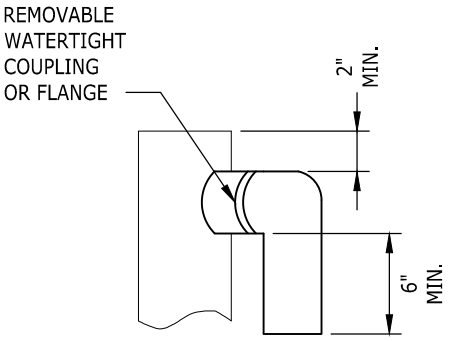
KENT WASHINGTON

CITY OF KENT
ENGINEERING DEPARTMENT

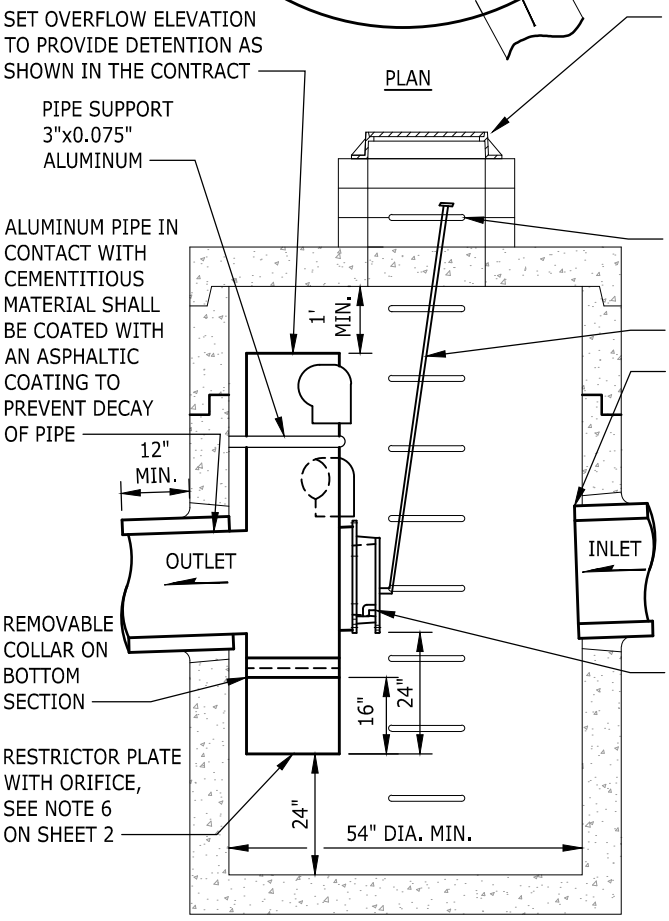
TRASH SCREEN

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–20
APPROVED ENGINEER		



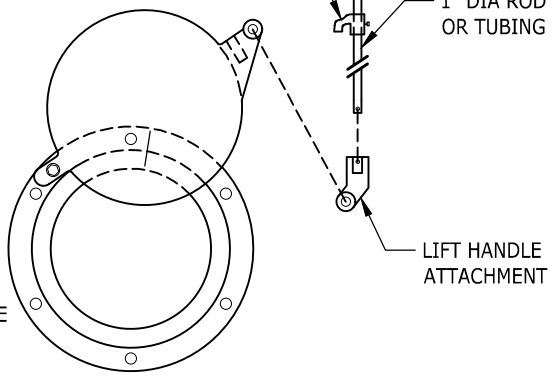


ELBOW DETAIL

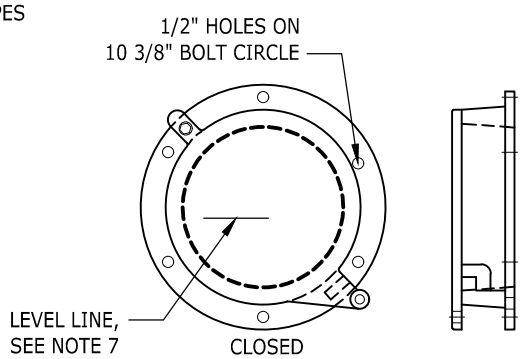


PLAN

SECTION A-A



MAXIMUM OPENING



CLOSED FRONT

SIDE

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KENT WASHINGTON

CITY OF KENT
ENGINEERING DEPARTMENT

SHEAR GATE
SHEET 1 OF 2

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 9/2020	5–21a
APPROVED ENGINEER		

NOTES:

1. THE PIPE SUPPORTS AND THE FLOW RESTRICTOR SHALL BE CONSTRUCTED OF THE SAME MATERIAL AND BE ANCHORED AT A MAXIMUM SPACING OF 36". ATTACH THE PIPE SUPPORTS TO THE MANHOLE WITH 5/8" STAINLESS STEEL EXPANSION BOLTS OR EMBED THE SUPPORTS INTO THE MANHOLE WALL 2".

2. THE VERTICAL RISER STEM OF THE FLOW RESTRICTOR SHALL BE THE SAME DIAMETER AS THE HORIZONTAL OUTLET PIPE WITH A MINIMUM DIAMETER OF 8".

3. THE FLOW RESTRICTOR SHALL BE FABRICATED FROM ONE OF THE FOLLOWING MATERIALS:
   0.060" CORRUGATED ALUMINUM ALLOY DRAIN PIPE
   0.060" ALUMINUM ALLOY FLAT SHEET, IN ACCORDANCE WITH ASTM B 209, 5052-H32 OR EPS

4. FRAME AND LADDER OR STEPS ARE TO BE OFFSET SO THAT: THE SHEAR GATE IS VISIBLE FROM THE TOP; THE CLIMB-DOWN SPACE IS CLEAR OF THE RISER AND GATE.

5. THE ORIFICE ELBOWS MAY BE LOCATED AS SHOWN., OR ALL PLACED ON ONE SIDE OF THE RISER TO ASSURE LADDER CLEARANCE. THE SIZE OF THE ELBOWS AND THEIR PLACEMENT SHALL BE SPECIFIED.

6. RESTRICTOR PLATE WITH ORIFICE AS SPECIFIED.THE OPENING IS TO BE CUT ROUND AND SMOOTH.

7. MATERIAL NOTES:
   A. THE SHEAR GATE SHALL BE MADE OF ALUMINUM ALLOY IN ACCORDANCE WITH ASTM B 26 AND ASTM B 275, DESIGNATION ZG32A; OR CAST IRON IN ACCORDANCE WITH ASTM A 48, CLASS 30B.
   B. THE LIFT HANDLE SHALL BE MADE OF A SIMILAR METAL TO THE GATE (TO PREVENT GALVANIC CORROSION), IT MAY BE OF SOLID ROD OR HOLLOW TUBING, WITH ADJUSTABLE HOOK AS REQUIRED, WITHIN 1 FOOT OF COVER.
   C. A NEOPRENE RUBBER GASKET IS REQUIRED BETWEEN THE RISER MOUNTING FLANGE AND THE GATE FLANGE.
   D. INSTALL THE GATE SO THAT THE LEVEL-LINE MARK IS LEVEL WHEN THE GATE IS CLOSED.
   E. THE MATING SURFACES OF THE LID AND THE BODY SHALL BE MACHINED FOR PROPER FIT.
   F. ALL SHEAR GATE BOLTS SHALL BE STAINLESS STEEL, WITH NYLON WASHERS.

8. THE SHEAR GATE MAXIMUM OPENING SHALL BE CONTROLLED BY LIMITED HINGE MOVEMENT, A STOP TAB, OR SOME OTHER DEVICE.

9. ALTERNATIVE SHEAR GATE DESIGNS ARE ACCEPTABLE IF MATERIAL SPECIFICATIONS ARE MET AND FLANGE BOLT PATTERN MATCHES.

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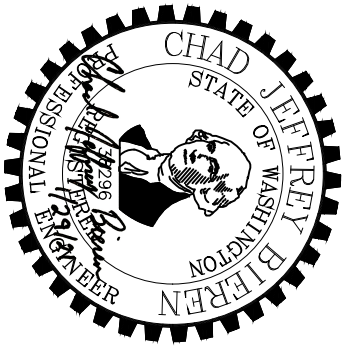
KENT WASHINGTON

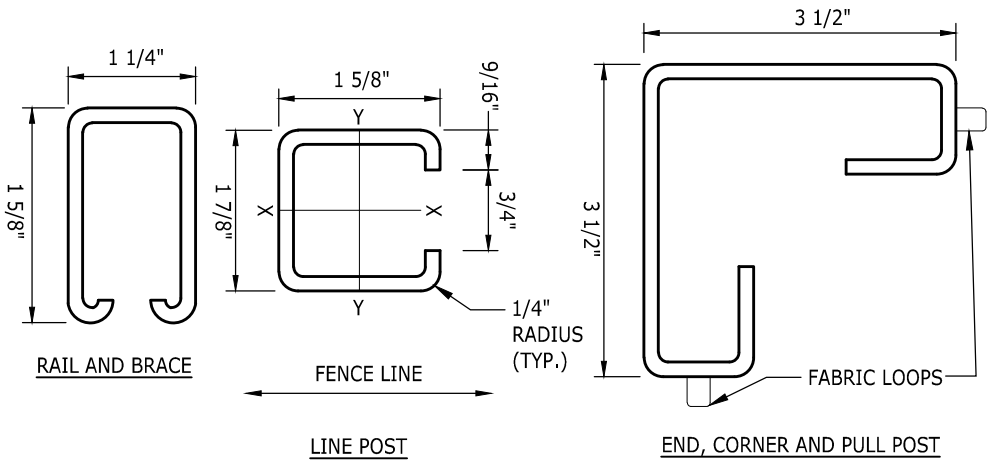
CITY OF KENT
ENGINEERING DEPARTMENT

SHEAR GATE
SHEET 2 OF 2

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5-21b
APPROVED ENGINEER		

TYPE	MEMBER																		
	TOP RAIL						LINE & BRACE POST						END, CORNER & PULL POST				GATE POST		ALL POSTS
	ROUND		HI-COLUMN		ROLL FORMED		ROUND		HI-COLUMN		ROLL FORMED		ROUND		ROLL FORMED		ROUND		
	1.0 PIPE (INCHES)	WEIGHT PER FOOT (POUNDS)	SIZE (INCHES)	WEIGHT PER FOOT (POUNDS)	SIZE (INCHES)	WEIGHT PER FOOT (POUNDS)	1.0 PIPE (INCHES)	WEIGHT PER FOOT (POUNDS)	SIZE (INCHES)	WEIGHT PER FOOT (POUNDS)	SIZE (INCHES)	WEIGHT PER FOOT (POUNDS)	1.0 PIPE (INCHES)	WEIGHT PER FOOT (POUNDS)	SIZE (INCHES)	WEIGHT PER FOOT (POUNDS)	SIZE (INCHES)	WEIGHT PER FOOT (POUNDS)	LENGTH
1	1 1/4	2.27	1 1/4 X 1 5/8	1.35	1 5/8 X 1 1/4	1.35	2	3.65	2 1/4	4.0	1 5/8 X 1 7/8	2.34	2 1/2	5.79	3 1/2 X 3 1/2	5.14	3 1/2	9.1	8'-8"

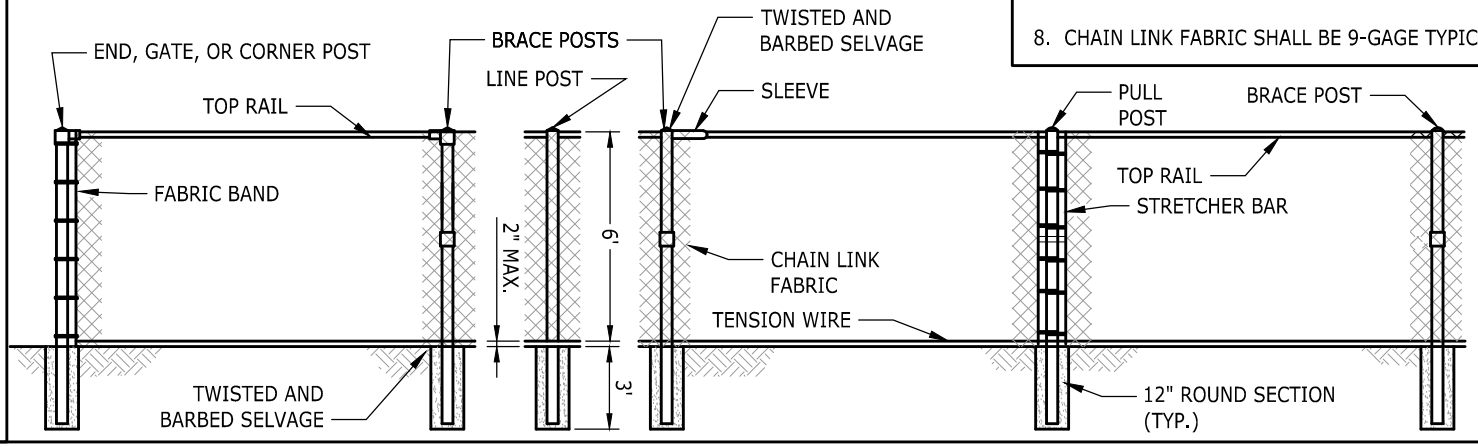




ROLL FORMED SECTIONS

NOTES:

1. INSTALLATION SHALL BE PER SECTION 8-12 AND 9-16 OF THE WSDOT STANDARD SPECIFICATIONS, EXCEPT WHERE MODIFIED HERE.
2. ALL CONCRETE POST BASES SHALL BE 12" MINIMUM DIAMETER.
3. ALL POSTS SHALL BE SPACED AT 10' MAXIMUM INTERVALS AND SET IN CONCRETE UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
4. BOTTOM TENSION WIRE SHALL BE PLACED WITHIN THE LIMITS OF THE FIRST FULL FABRIC WEAVE.
5. DETAILS ARE ILLUSTRATIVE AND SHALL NOT LIMIT HARDWARE DESIGN OR POST SELECTION OF ANY PARTICULAR FENCE TYPE.
6. COATING FOR POSTS, TOP RAIL, FITTINGS AND FABRIC SHALL BE VINYL OR POWDER COATED FROM THE FACTORY. COLOR SHALL BE COMPATIBLE WITH THE SURROUNDING ENVIRONMENT; GREEN FOR VEGETATED, OPEN OR GRASSY AREAS; BLACK FOR WOODED OR SHADED AREAS.
7. SEE STANDARD PLAN 5-23 FOR GATE DETAIL.
8. CHAIN LINK FABRIC SHALL BE 9-GAGE TYPICAL.



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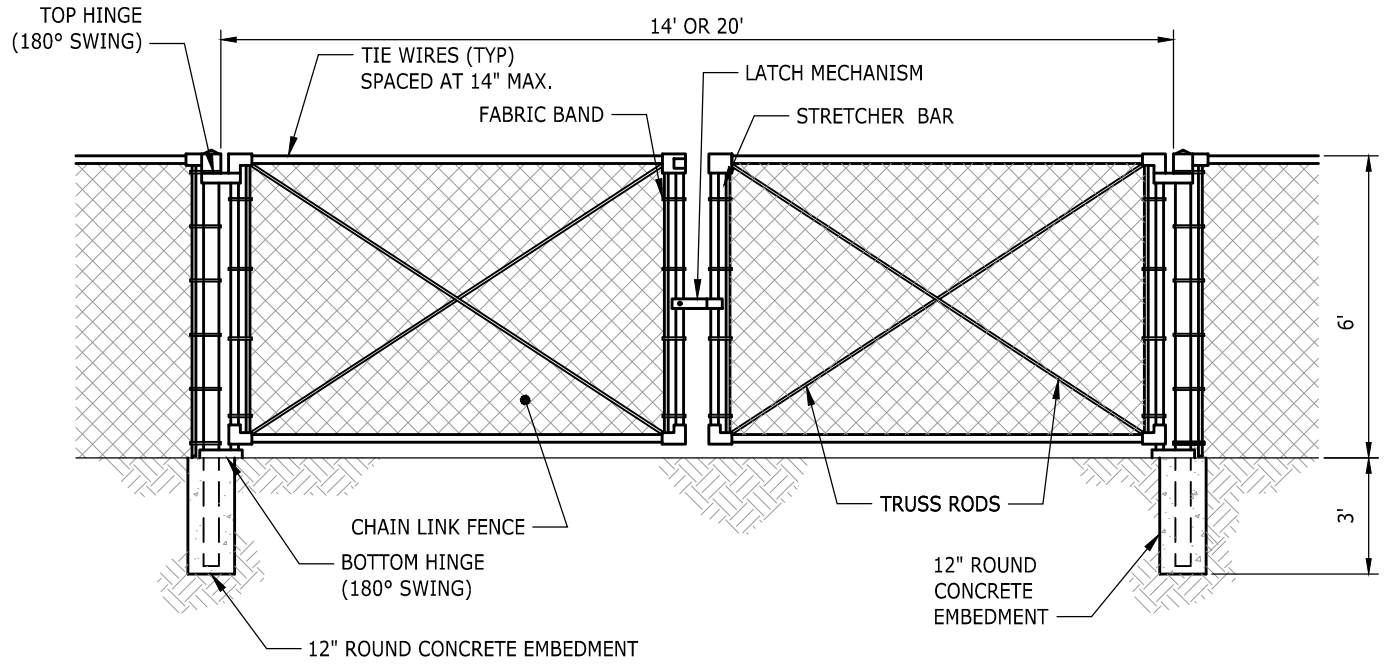
KENT WASHINGTON

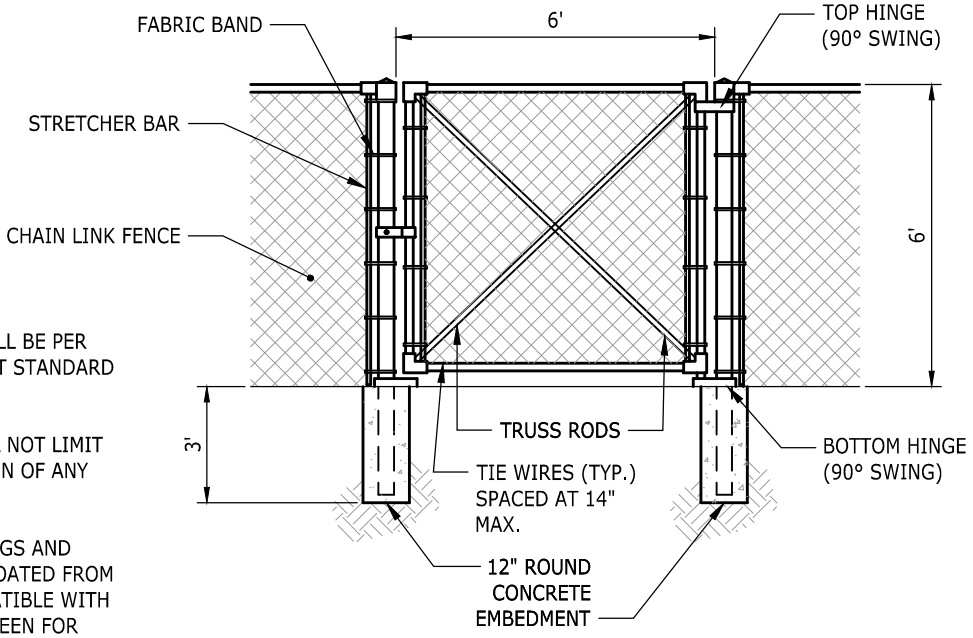
DESIGNED COK
DRAWN COK
CHECKED COK
APPROVED
DATE 12/2019
ENGINEER
SCALE NONE

CITY OF KENT
ENGINEERING DEPARTMENT

CHAIN LINK FENCE, TYPE 1 FOR PONDS ONLY

STANDARD PLAN 5-22





NOTES:

1. ALL MATERIAL AND INSTALLATION SHALL BE PER SECTION 8-12 AND 9-16 OF THE WSDOT STANDARD SPECIFICATIONS.

2. DETAILS ARE ILLUSTRATIVE AND SHALL NOT LIMIT HARDWARE DESIGN OR POST SELECTION OF ANY PARTICULAR FENCE TYPE.

3. COATING FOR POSTS, TOP RAIL, FITTINGS AND FABRIC SHALL BE VINYL OR POWDER COATED FROM THE FACTORY. COLOR SHALL BE COMPATIBLE WITH THE SURROUNDING ENVIRONMENT; GREEN FOR VEGETATED, OPEN OR GRASSY AREAS; BLACK FOR WOODED OR SHADED AREAS.

4. SEE STANDARD PLAN 5-22 FOR FENCE DETAIL.

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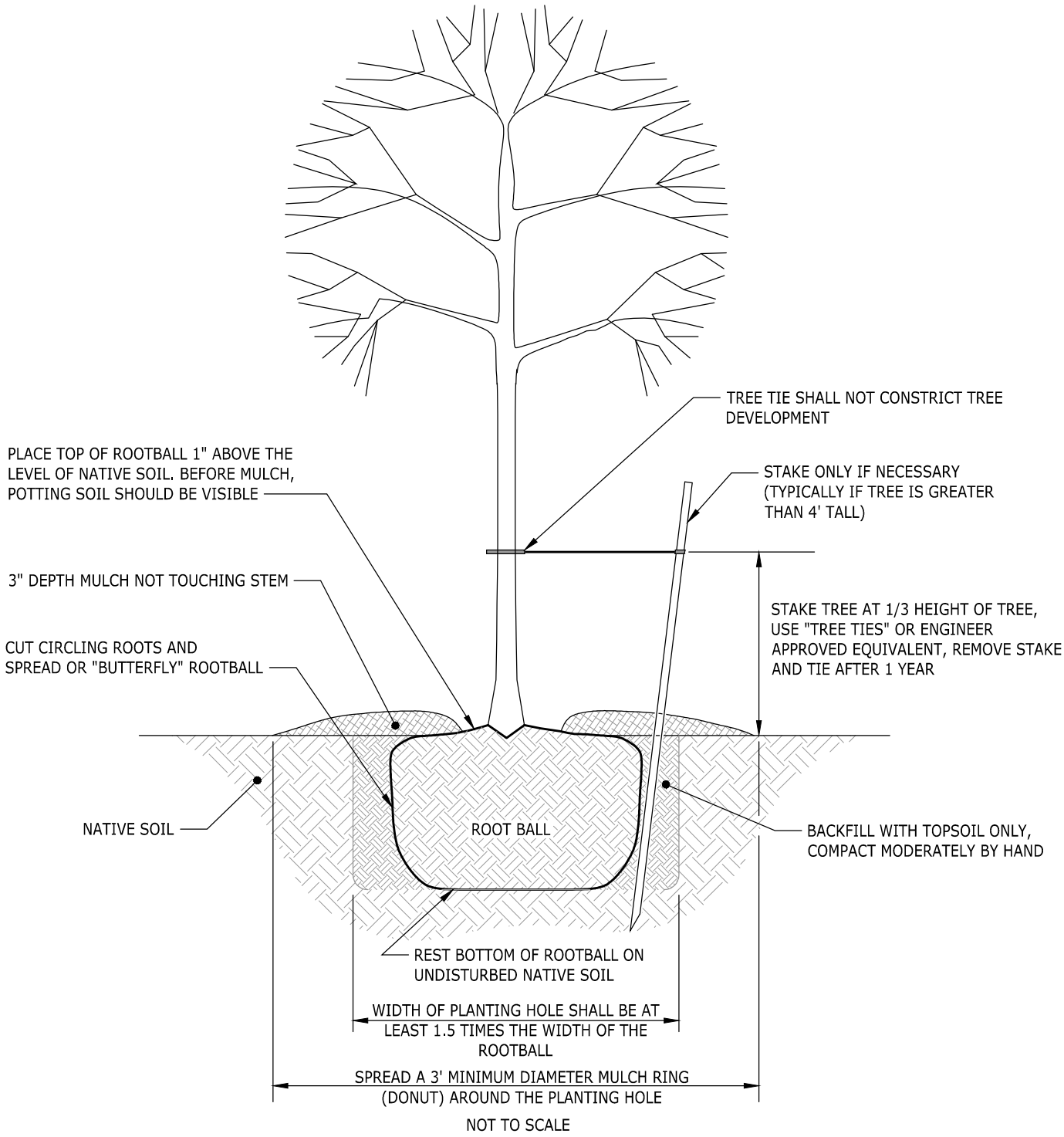
CITY OF KENT
ENGINEERING DEPARTMENT

DRIVEWAY AND WALK GATE FOR PONDS ONLY

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–23
APPROVED ENGINEER		



NOT TO SCALE

CHAD JEFFREY BIEREN
STATE OF WASHINGTON
37296
REGISTERED
PROFESSIONAL ENGINEER
1/29/20

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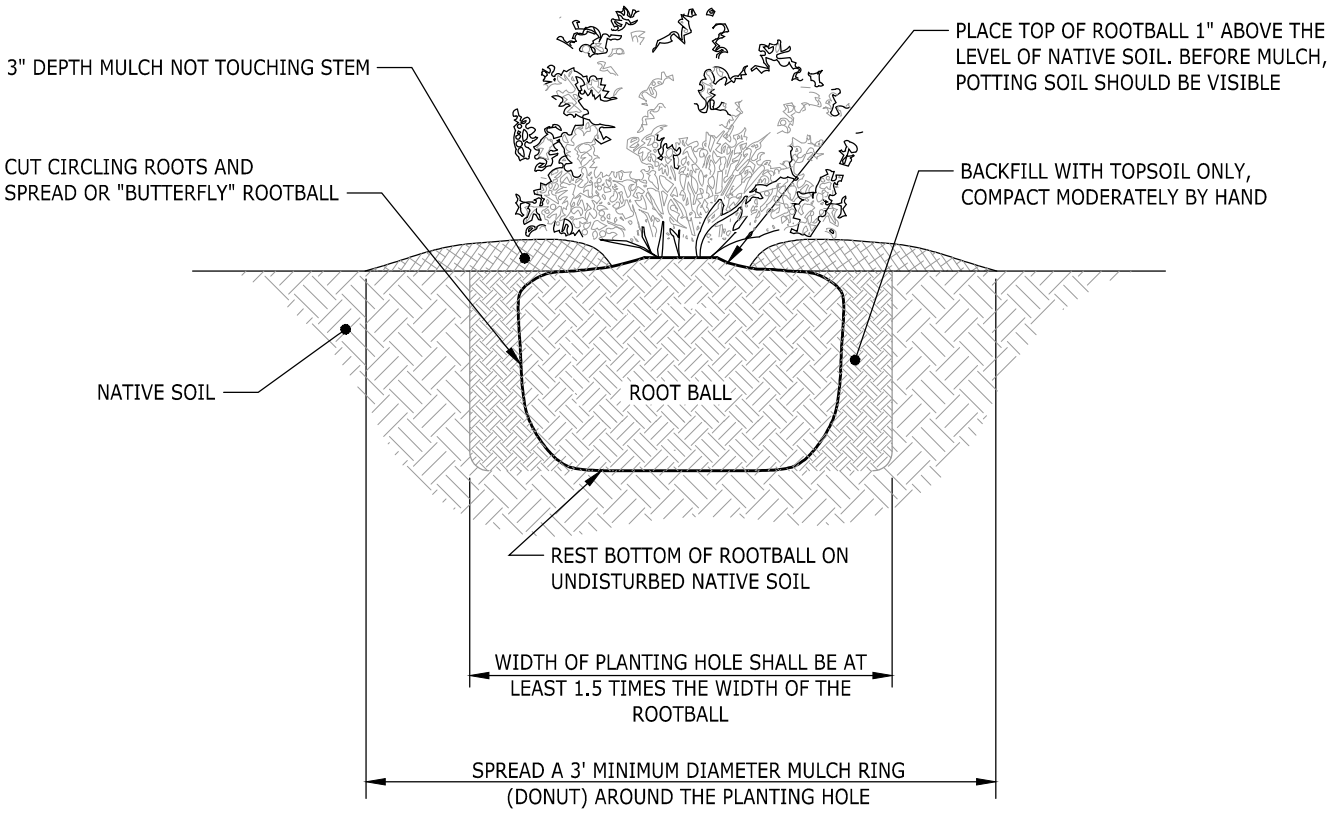
KENT WASHINGTON

CITY OF KENT
ENGINEERING DEPARTMENT

TREE PLANTING

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–24
APPROVED ENGINEER		



NOT TO SCALE

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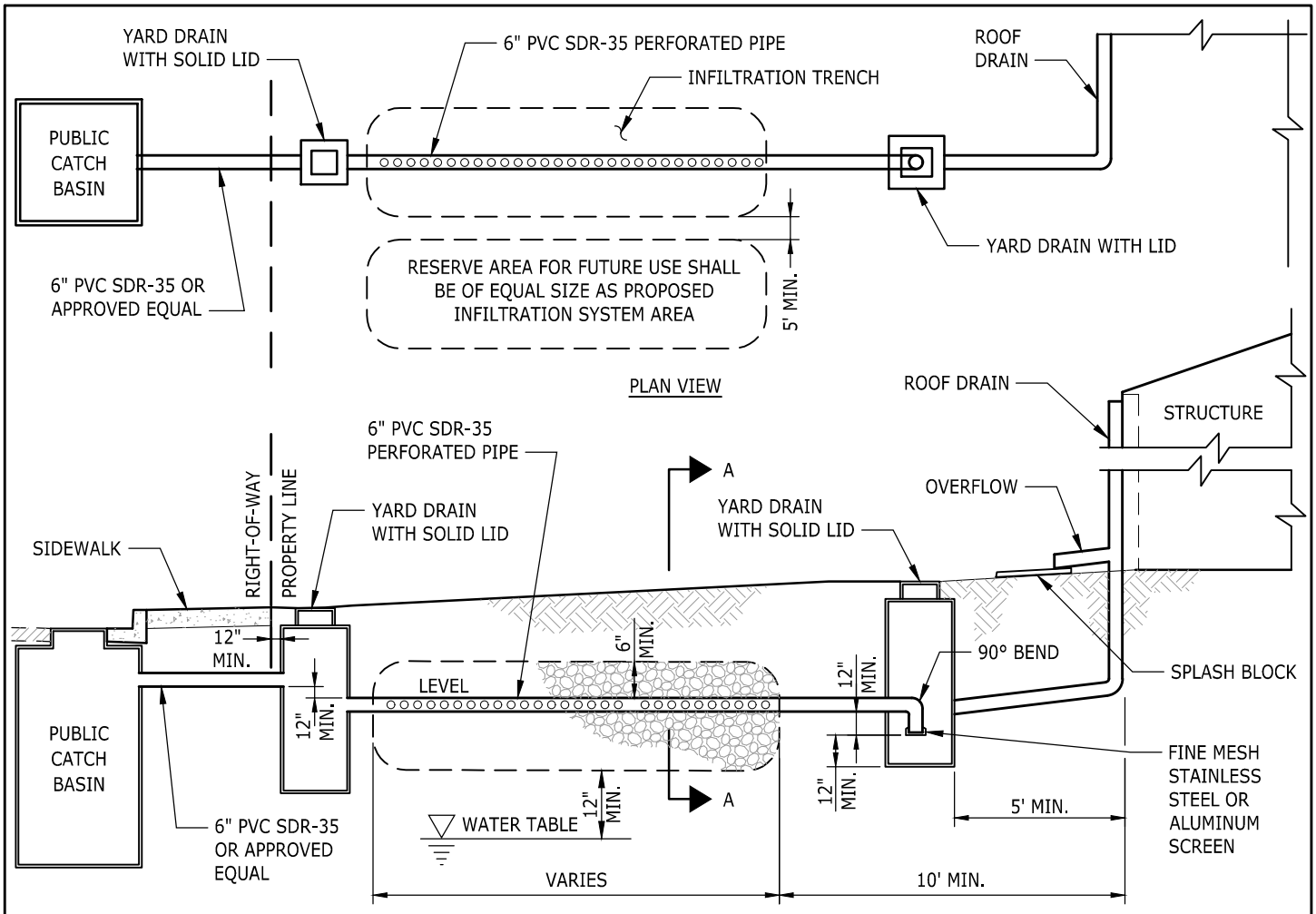
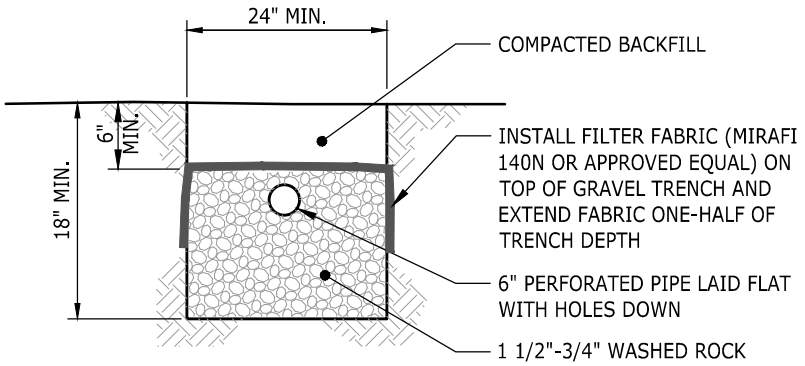
CITY OF KENT
ENGINEERING DEPARTMENT

SHRUB PLANTING

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–25
APPROVED ENGINEER		





SECTION A-A

NOTE:

DESIGN PER THE CURRENT VERSION OF THE KENT SURFACE WATER DESIGN MANUAL 1.2.3.2, AND THE KING COUNTY SURFACE WATER DESIGN MANUAL C.2.2.3.

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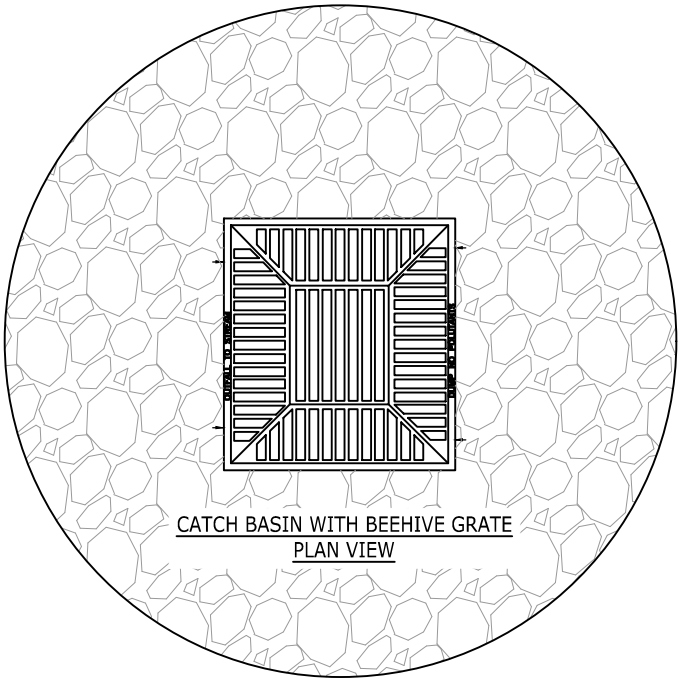
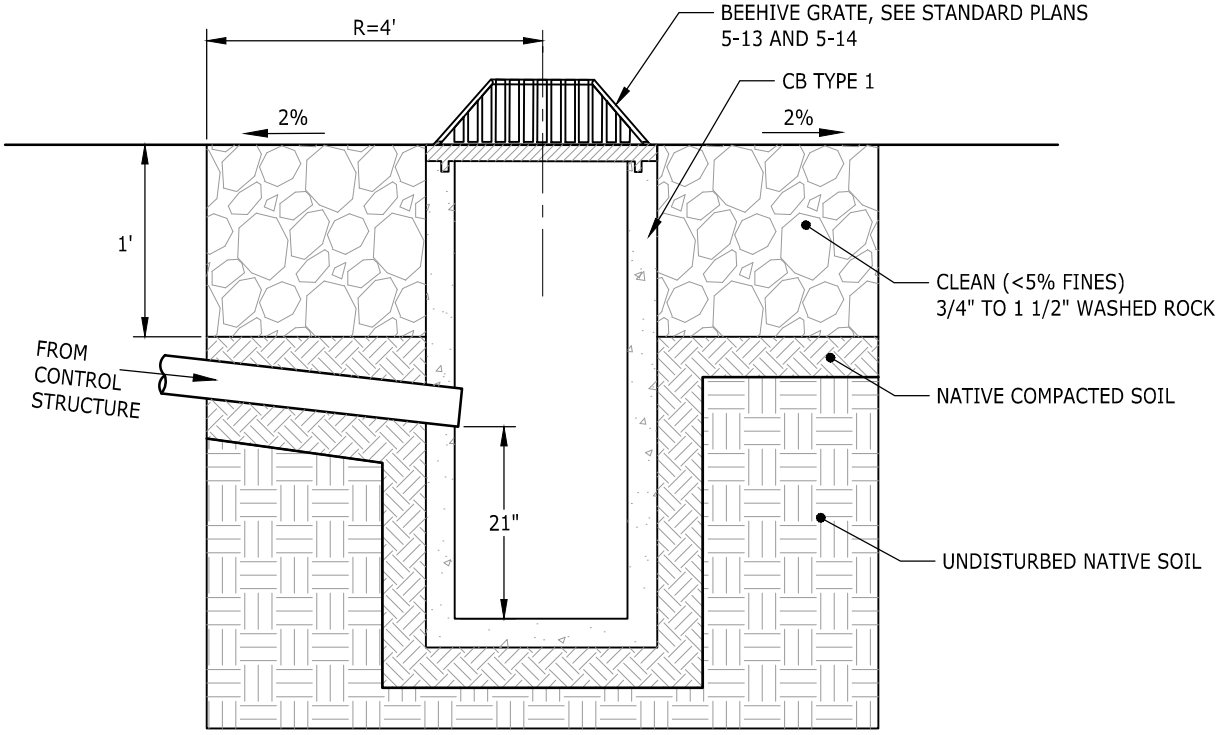
CITY OF KENT
ENGINEERING DEPARTMENT

TRENCH INFILTRATION SYSTEM

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–26
APPROVED ENGINEER		



CATCH BASIN WITH BEEHIVE GRATE
PLAN VIEW



CATCH BASIN WITH BEEHIVE GRATE
SECTION VIEW

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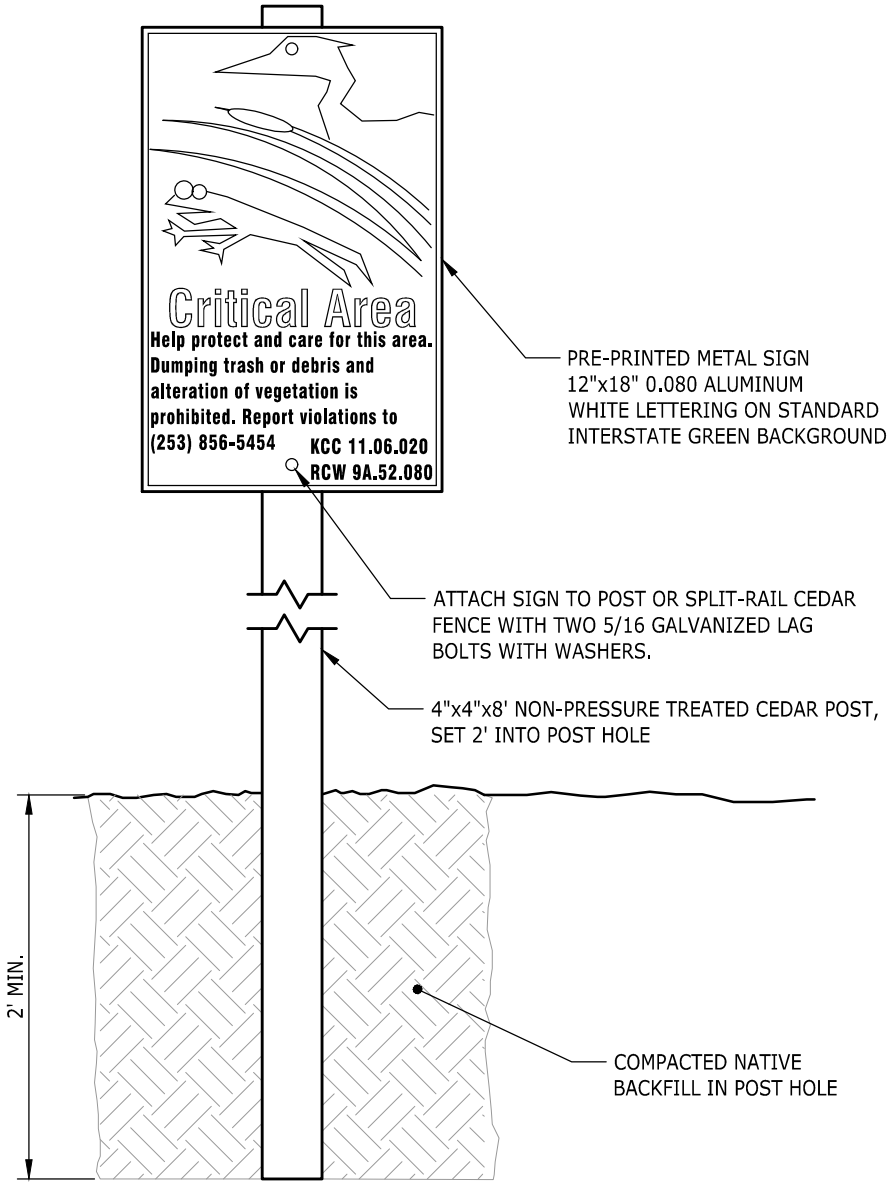
CHAD JEFFREY BIEREN
STATE OF WASHINGTON
37296
REGISTERED
1/29/20
PROFESSIONAL ENGINEER

KENT WASHINGTON

CITY OF KENT
ENGINEERING DEPARTMENT

FLOW SPREADER OPTION
CATCH BASIN WITH
BEEHIVE GRATE

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–27
APPROVED ENGINEER		



NOTES:

1. THE CRITICAL AREA SIGN SHALL BE POSTED AT THE BOUNDARY BETWEEN THE LOT AND THE CRITICAL AREA BUFFER.

2. ONE SIGN SHALL BE POSTED FOR EVERY RESIDENTIAL LOT AND ONE PER EVERY 100 FEET FOR ALL PUBLIC RIGHTS OF WAY, TRAILS, PARKING AREAS, PLAYGROUNDS AND ALL OTHER USES LOCATED ADJACENT TO CRITICAL AREAS AND ASSOCIATED BUFFERS AND SHALL BE STATIONED PER LOCATION, ON THE APPROVED PLANS TO THE PROPOSED DEVELOPMENT.

3. PRE-PRINTED METAL SIGN, AVAILABLE THROUGH: ZUMAR INDUSTRIES
PHONE: 1-800-426-7967
WEBSITE: WWW.ZUMAR.COM

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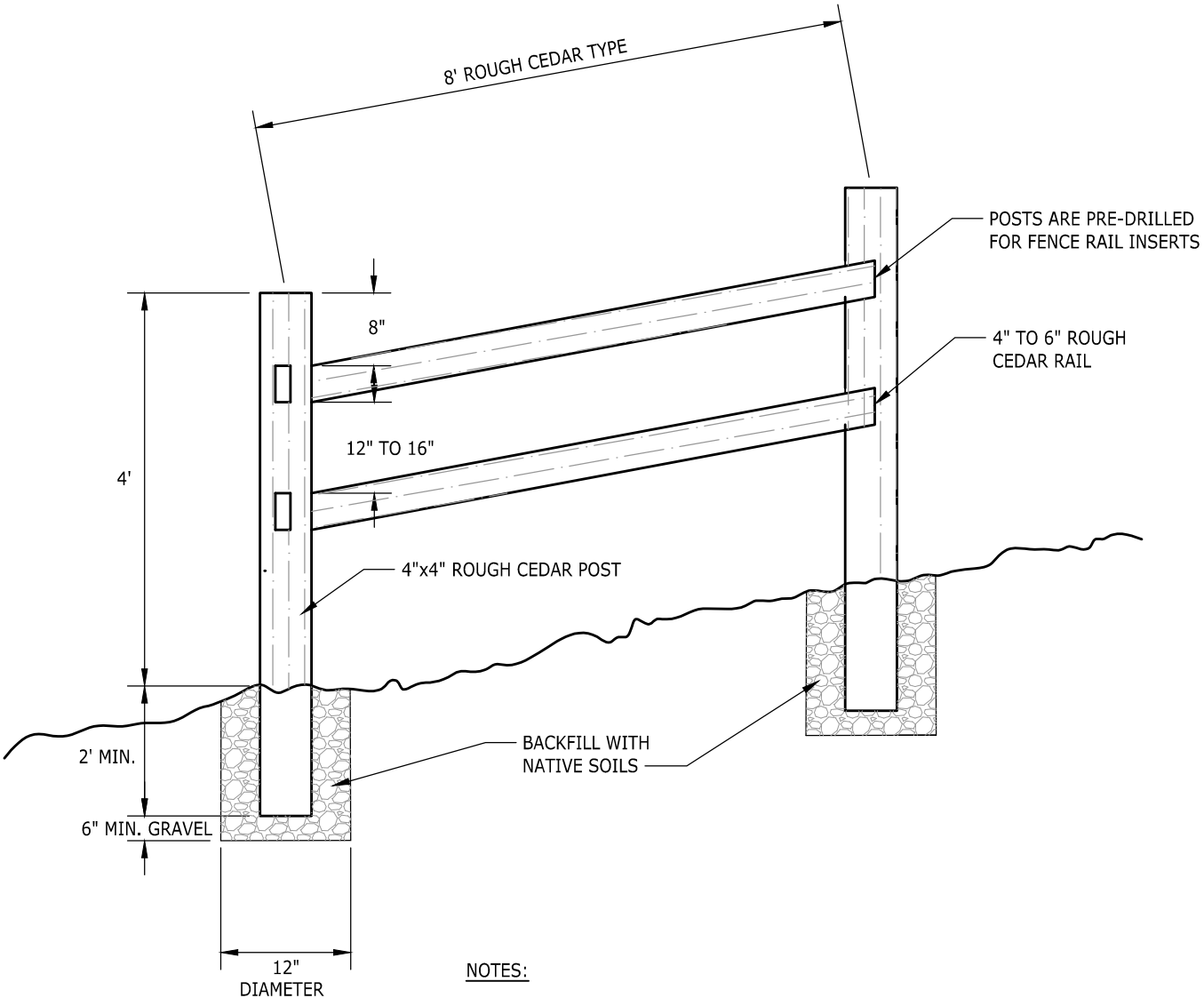
CRITICAL AREA SIGN

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 9/2020	5–28
APPROVED ENGINEER		



NOTES:

1. POSTS AND RAILINGS ARE PRECUT FOR ASSEMBLY.
2. FENCE AND POSTS ARE TO BE UNTREATED CEDAR MATERIALS.
3. FENCES SHALL BE PLACED AT THE APPROVED BUFFER EDGE OR AS DIRECTED BY THE CITY PLANNER OR THE CITY ENGINEER.

CHAD JEFFREY BIEREN
STATE OF WASHINGTON
37296
REGISTERED
PROFESSIONAL ENGINEER
1/29/21

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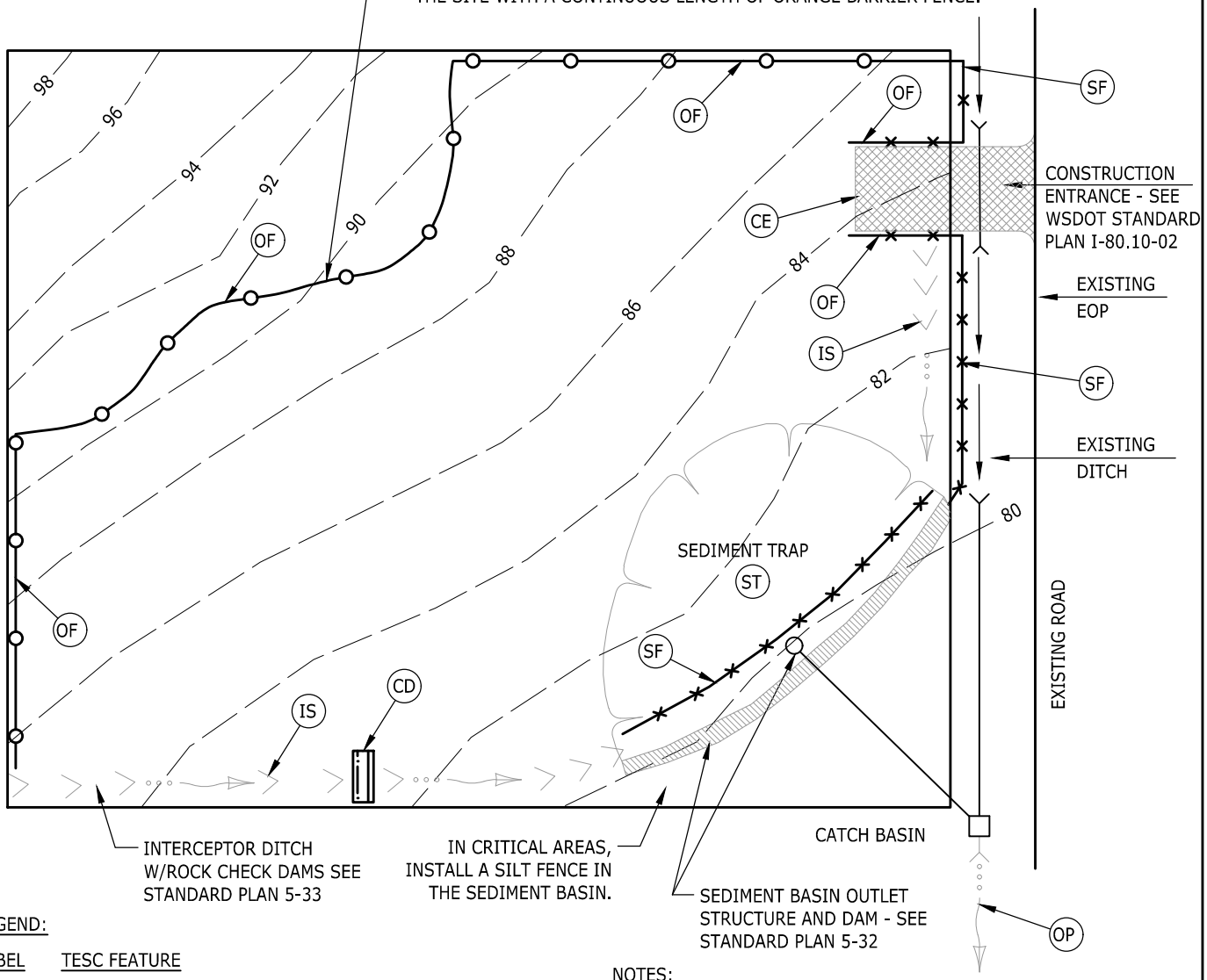
KENT WASHINGTON

CITY OF KENT
ENGINEERING DEPARTMENT

SPLIT RAIL FENCE

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 9/2020	5–29
APPROVED ENGINEER		

CLEARING LIMITS:
PRIOR TO ANY SITE CLEARING OR GRADING, THOSE AREAS THAT ARE TO REMAIN UNDISTURBED DURING PROJECT CONSTRUCTION SHALL BE DELINEATED.
MEASURES TO USE:
IN MOST CIRCUMSTANCES, MARK CLEARING LIMITS BY DELINEATING THE SITE WITH A CONTINUOUS LENGTH OF ORANGE BARRIER FENCE.



LEGEND:

LABEL	TESC FEATURE
IS	INTERCEPTOR SWALE OR DITCH
ST	SEDIMENT TRAP
CD	CHECK DAM
CE	STABILIZED CONSTRUCTION ENTRANCE
SF	SILT FENCE
OP	OUTLET PROTECTION
OF	ORANGE BARRIER FENCE

NOTES:

1. THIS IS A SAMPLE PLAN ONLY, INTENDING TO SHOW HOW TESC FEATURES MAY BE SHOWN ON A SITE PLAN. INDIVIDUAL PROJECT TESC PLANS SHOULD BE LAID OUT TO MEET PROJECT SPECIAL REQUIREMENTS.
2. TESC FEATURES ARE SHOWN IN THESE STD PLANS (5-32, 5-34) AND THE KSWDM.

CHAD JEFFREY BIEREN
STATE OF WASHINGTON
37296
REGISTERED
PROFESSIONAL ENGINEER
1/29/20

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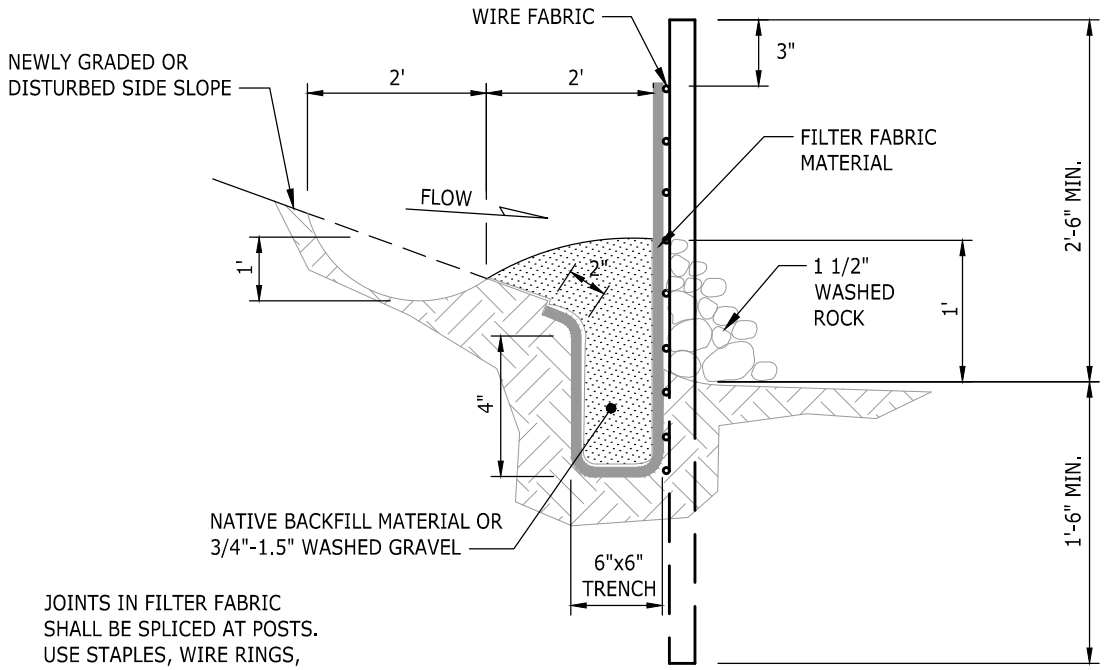
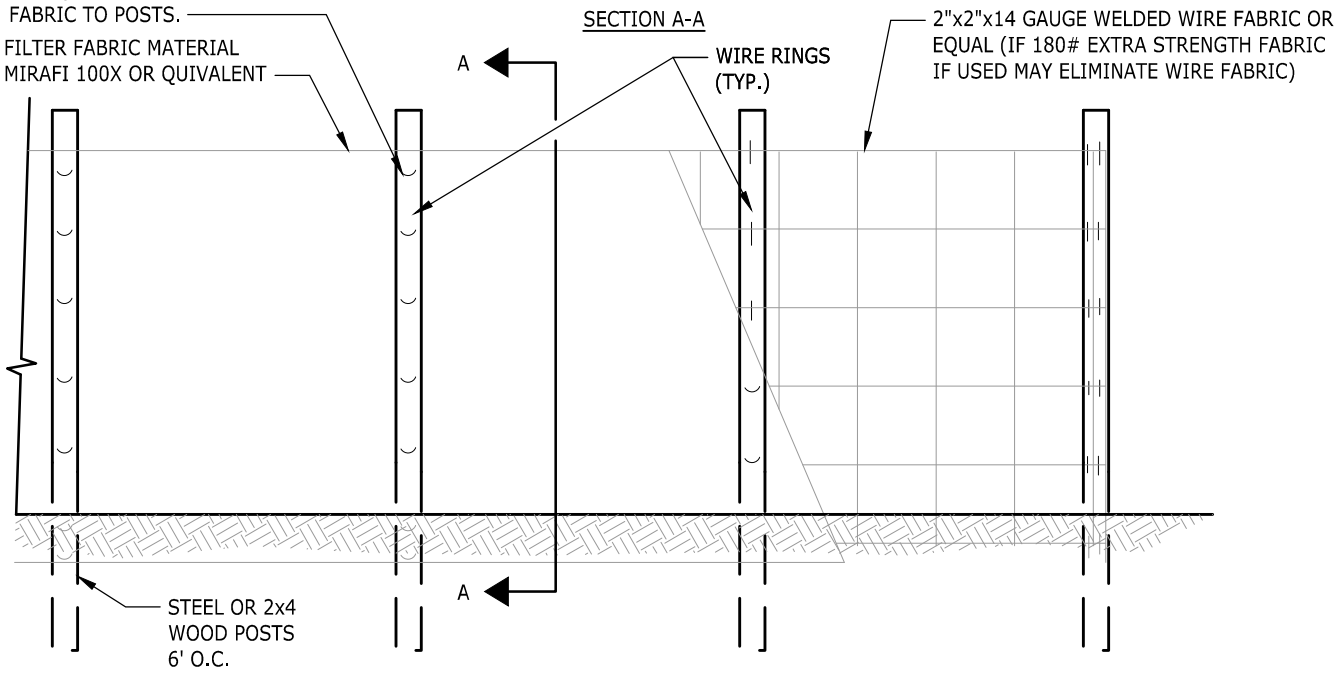
CITY OF KENT
ENGINEERING DEPARTMENT

SAMPLE TESC SITE PLAN 1 ACRE AND SMALLER

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–30
APPROVED ENGINEER		





ELEVATION

INSTALLATION NOTES:

1. FILTER FABRIC FENCE SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE AFTER THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED. THE NEWLY DISTURBED AREAS RESULTING FROM FILTER FABRIC REMOVAL SHALL BE IMMEDIATELY SEEDED AND MULCHED OR STABILIZED AS APPROVED BY THE ENGINEER.

2. FILTER FABRIC FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.

3. REMOVE SEDIMENT WHEN IT REACHES 1/3 FENCE HEIGHT.

4. INSTALL THE SILT FENCE FIRST. AFTER THE SILT FENCE HAS BEEN INSTALLED, CONSTRUCT BERM AND TRENCH.

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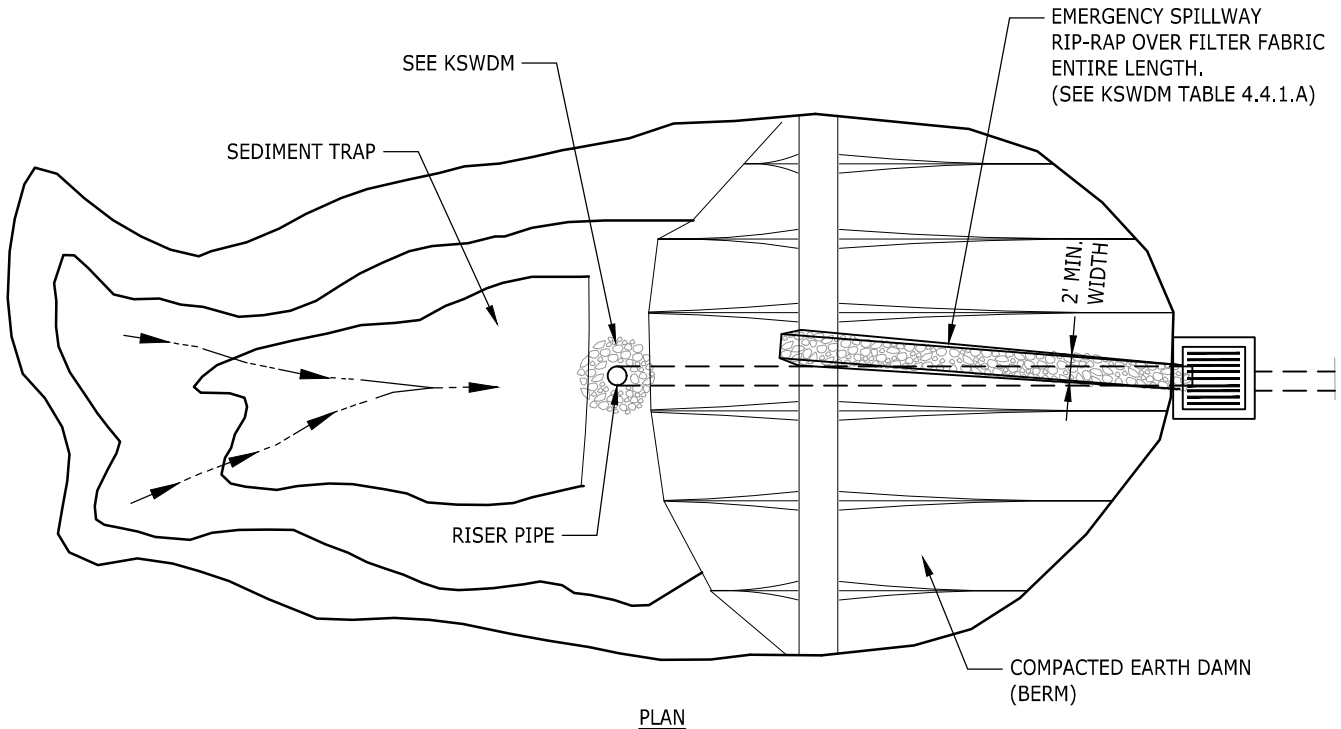
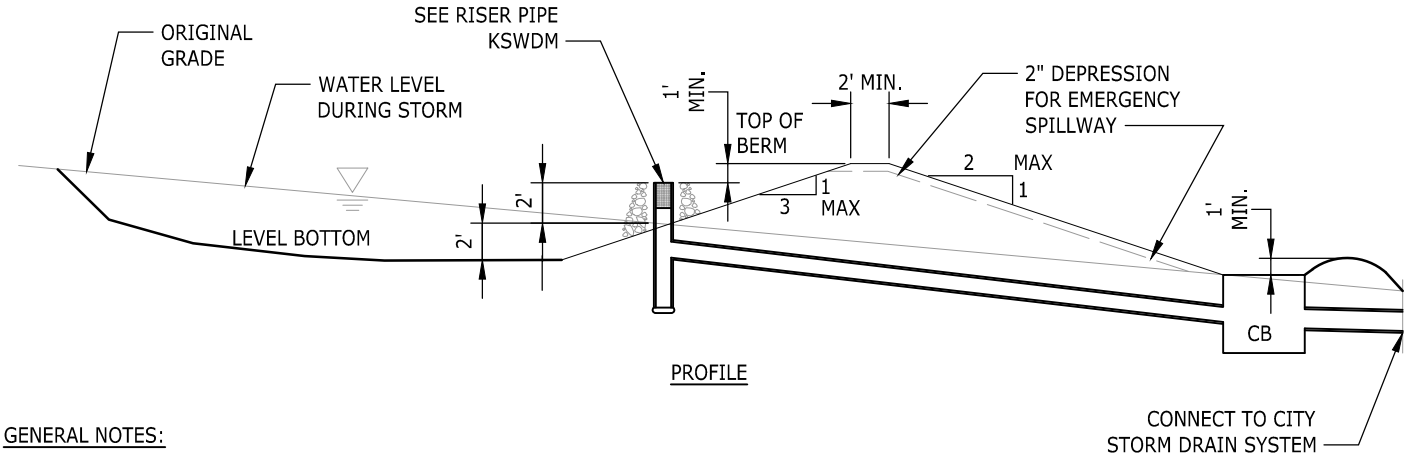
ENGINEERING DEPARTMENT

FILTER FABRIC FENCE

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–31
APPROVED ENGINEER		



PLAN



PROFILE

GENERAL NOTES:

1. SHAPE OF SEDIMENTATION POND MAY VARY TO FIT DRAINAGE AREA AND TERRAIN. MODIFY AS NECESSARY TO ENSURE SATISFACTORY TRAPPING OF SEDIMENT.

2. USE THE KENT SURFACE WATER DESIGN MANUAL TO DETERMINE THE TRAP GEOMETRY.

3. TO AID IN DETERMINING SEDIMENT DEPTH, ALL TRAPS SHALL HAVE A STAFF GAUGE WITH A PROMINENT MARK 1 FOOT ABOVE THE BOTTOM OF THE TRAP. CONTRACTOR SHALL RESTORE THE TRAP BACK TO ORIGINAL DEPTH AND SIZE WHEN THE SEDIMENT REACHES THIS LEVEL.

4. FOR USE ON SITES LESS THAN 1 ACRE IN SIZE.

5. TRAP MAY BE BERM OR BY PARTIAL OR COMPLETE EXCAVATION.

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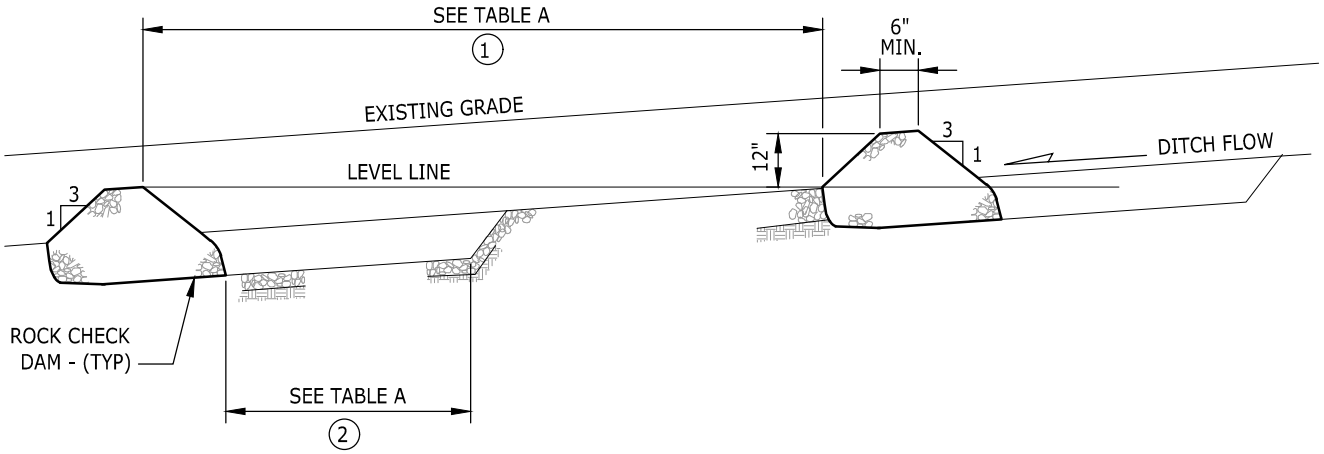
CITY OF KENT
ENGINEERING DEPARTMENT

TESC SEDIMENT TRAP EARTH BERM

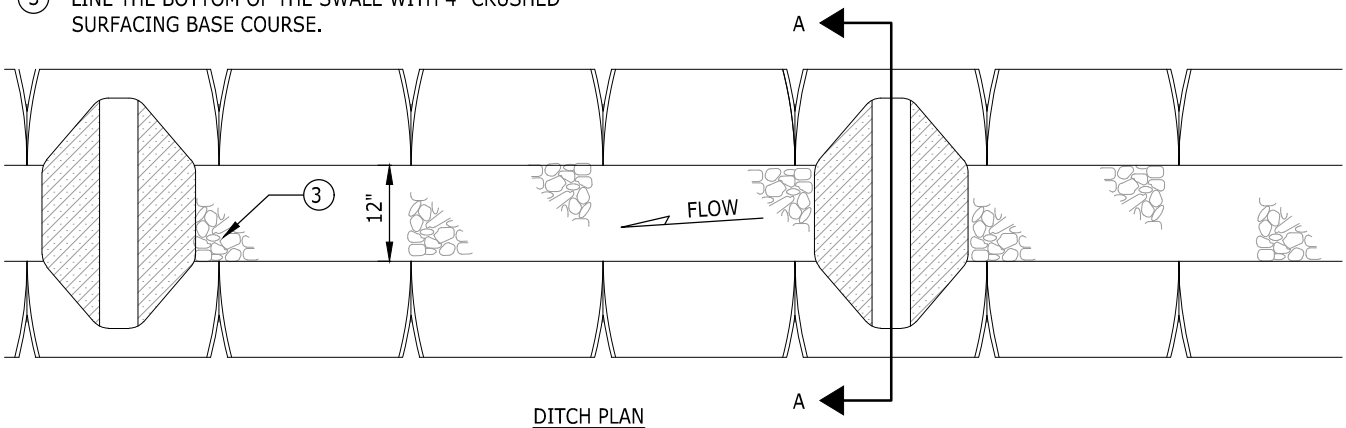
DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–32
APPROVED ENGINEER		



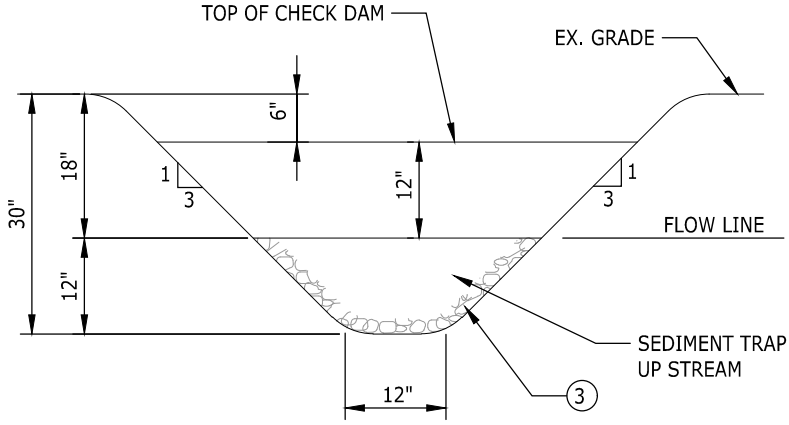
DITCH PROFILE

DETAIL NOTES:

1. DAM SPACING
2. SEDIMENT TRAP LENGTH
3. LINE THE BOTTOM OF THE SWALE WITH 4" CRUSHED SURFACING BASE COURSE.



DITCH PLAN



SECTION A-A

TABLE A

SLOPE FT/FT	1	2
1:100	100	10
1:50	50	10
1:25	25	5
1:20	20	4
1:15	15	3
1:10	10	2
1:5	5	0

GENERAL NOTES:

1. SUMP BEHIND ROCK CHECK DAM SHALL BE INSPECTED DAILY, AND CLEANED WHEN COLLECTED DEBRIS EXCEEDS 1/2 OF ITS DEPTH.

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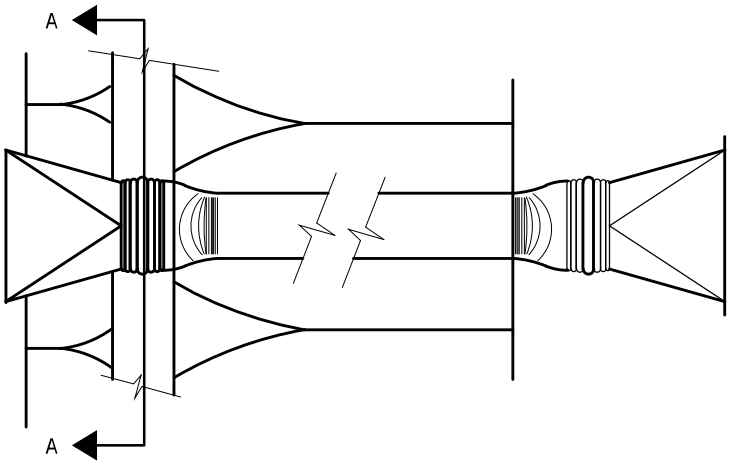
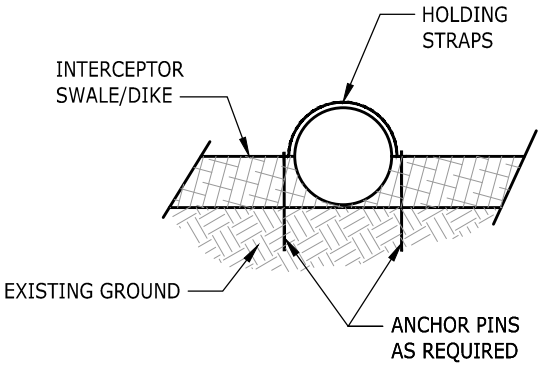
CITY OF KENT
ENGINEERING DEPARTMENT

TESC INTERCEPTOR DITCH WITH ROCK CHECK DAMS

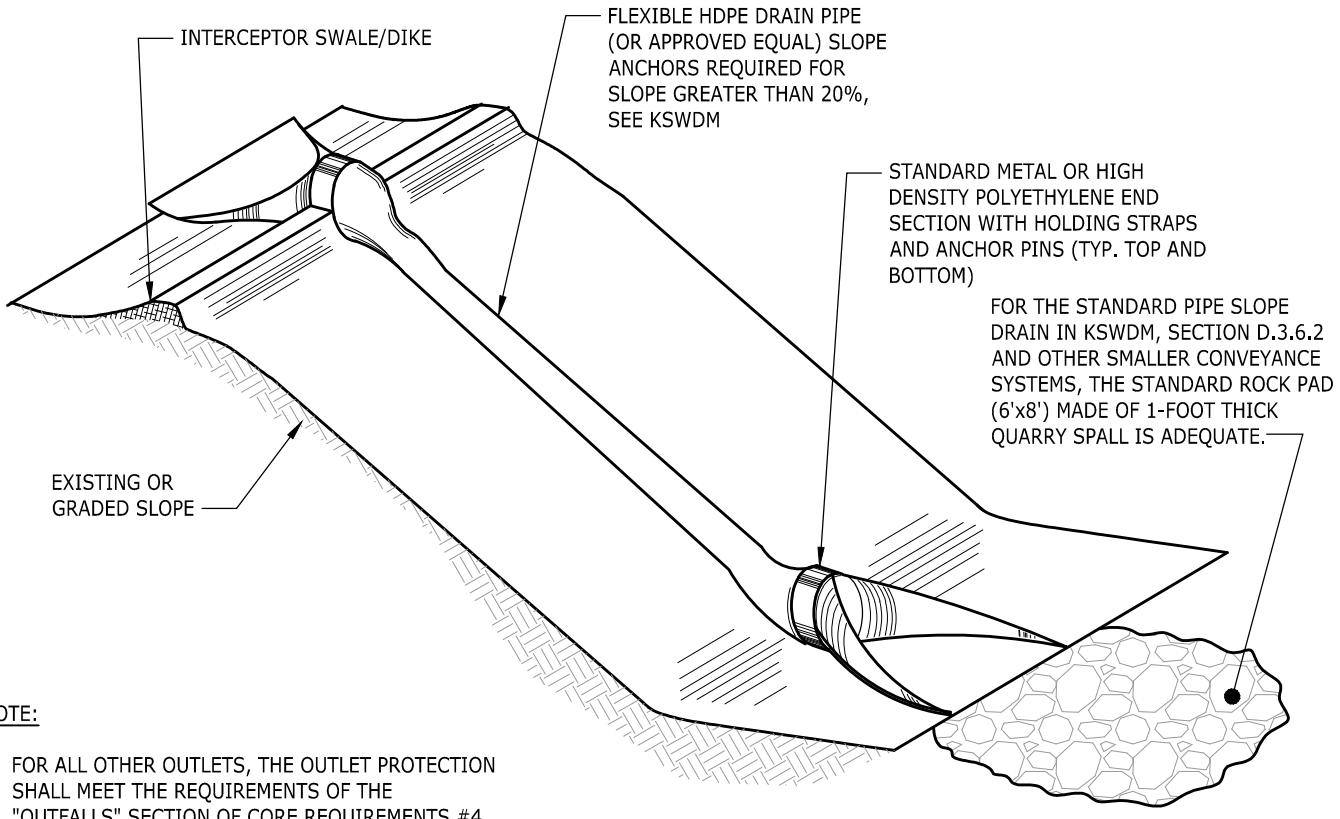
DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5-33
APPROVED ENGINEER		



PLAN



SECTION A-A



ISOMETRIC

NOTE:

1. FOR ALL OTHER OUTLETS, THE OUTLET PROTECTION SHALL MEET THE REQUIREMENTS OF THE "OUTFALLS" SECTION OF CORE REQUIREMENTS #4 AND SECTION 4.2.2. OF THE KSWDM.

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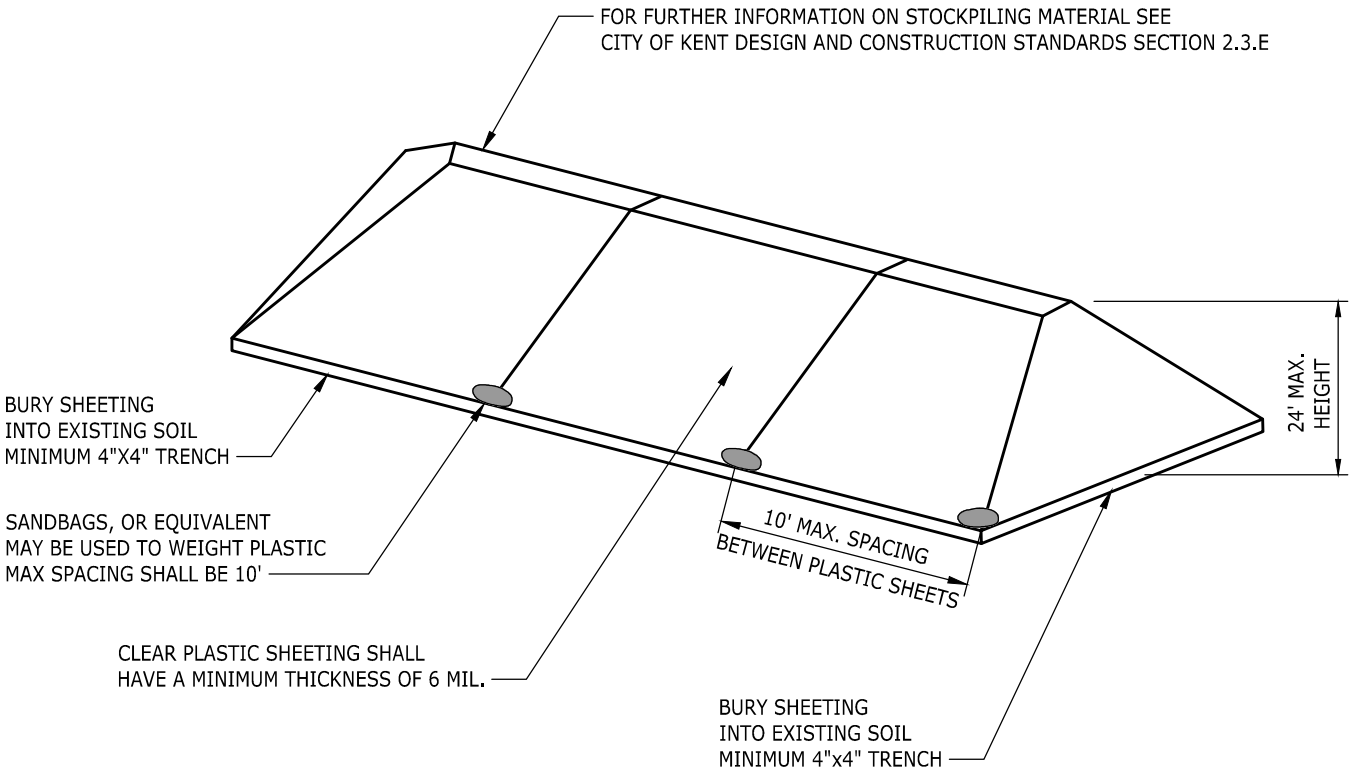
CITY OF KENT
ENGINEERING DEPARTMENT

TESC PIPE SLOPE DRAIN

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5-34
APPROVED ENGINEER		



NOTES:

1. PLASTIC SHEETING SHALL MEET ASTM D 4397 REQUIREMENTS.
2. MAXIMUM PERMITTED SLOPE SHALL BE 2H:1V.
3. SEAMS BETWEEN SHEETS MUST OVERLAP A MINIMUM OF 12" AND BE WEIGHTED OR TAPED.
4. TEMPORARY STOCKPILES SHALL NOT BLOCK THE SIGHT DISTANCES OF ANY INTERSECTION OR DRIVEWAY.

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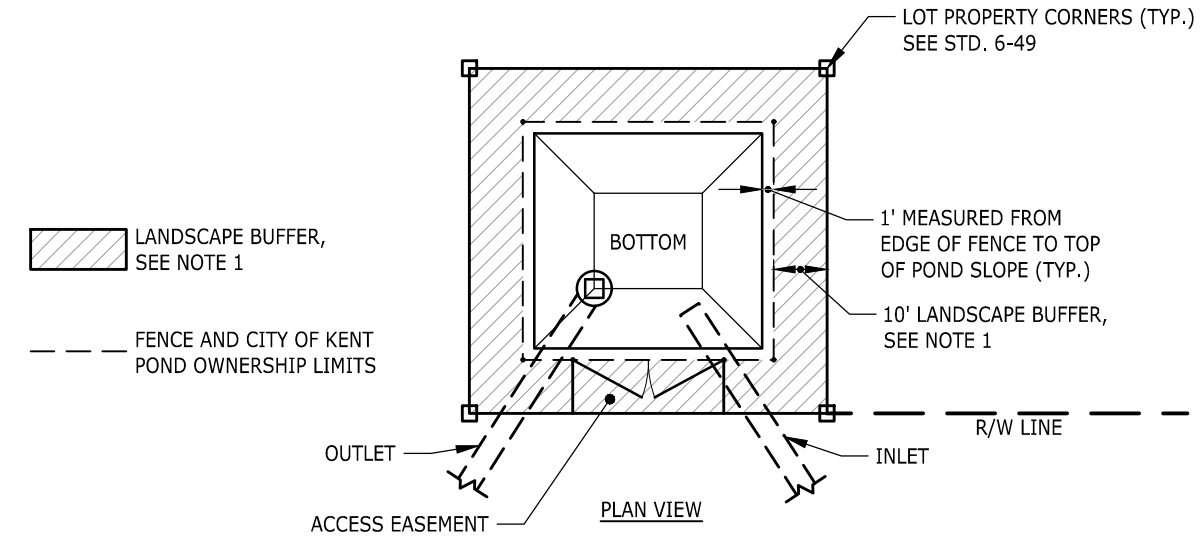
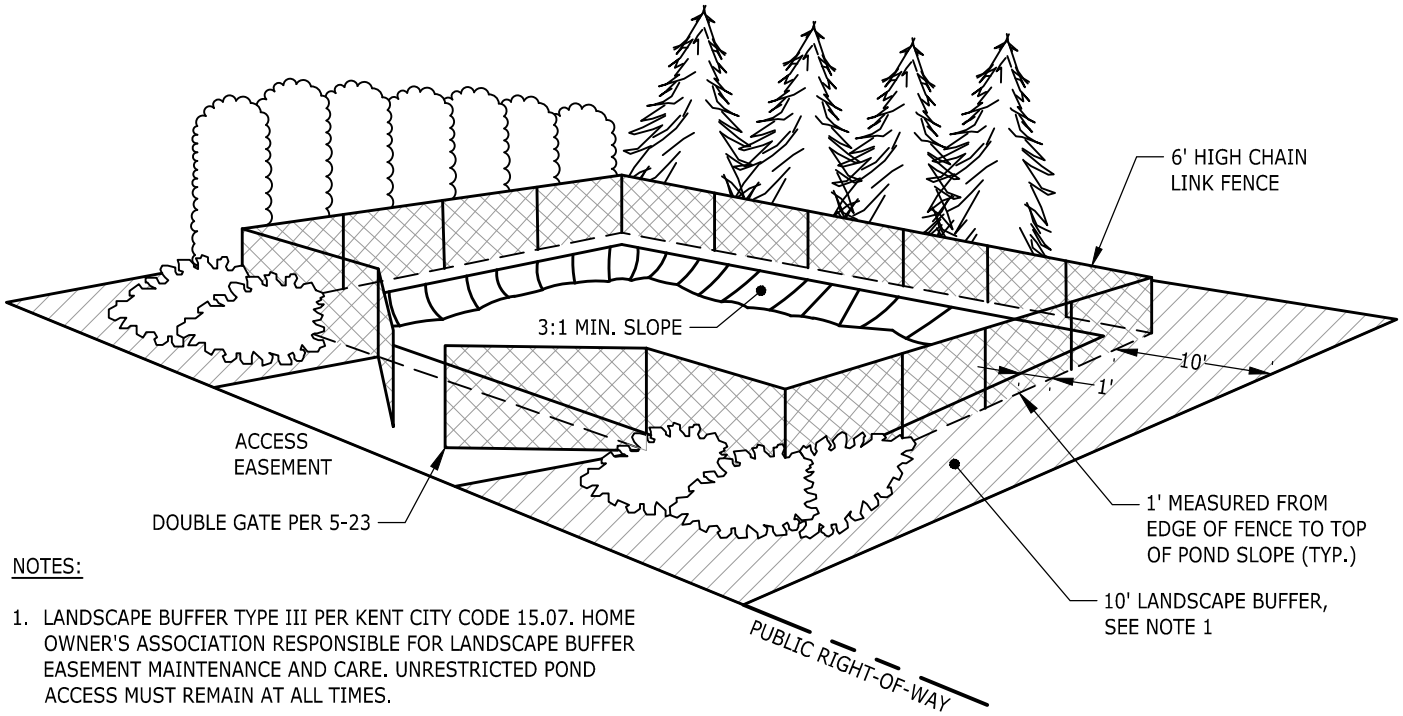
ENGINEERING DEPARTMENT

TEMPORARY STOCKPILING

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–35
APPROVED ENGINEER		





NOTES:

1. LANDSCAPE BUFFER TYPE III PER KENT CITY CODE 15.07. HOME OWNER'S ASSOCIATION RESPONSIBLE FOR LANDSCAPE BUFFER EASEMENT MAINTENANCE AND CARE. UNRESTRICTED POND ACCESS MUST REMAIN AT ALL TIMES.

2. THE PERIMETER OF ALL STORMWATER DETENTION PONDS SHALL BE LANDSCAPED TO A MINIMUM DEPTH OF 10' OF TYPE II LANDSCAPING. IF PERIMETER FENCING IS REQUIRED BASED ON PUBLIC WORKS STANDARDS, IT SHALL BE CONSTRUCTED OF VINYL-COATED CHAINLINK OR SOLID SCREEN FENCING. THE FENCING SHALL BE LOCATED BETWEEN THE POND AND THE LANDSCAPE AREA.

3. INSTALL STORMWATER SIGN PER KENT STANDARD PLAN 5-40.

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CITY OF KENT
ENGINEERING DEPARTMENT

POND ILLUSTRATION

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 9/2020	5–36
APPROVED ENGINEER		

PUBLIC CATCH BASIN MARKER

PRIVATE CATCH BASIN MARKER

NOTE:

1. CATCH BASIN MARKER SHALL BE AFFIXED WITH MANUFACTURER'S EPOXY IN DRY WEATHER, 40 DEGREES AND WARMER. IF CURB EXISTS, MARKER IS PLACED ON TOP OF CURB. IF RAISED EDGE PAVEMENT, MARKER PLACEMENT IS ON THE WEDGE. IF NEITHER EXIST, MARKER WILL BE PLACED ON SIDE LEAST EXPOSED TO TRAFFIC.

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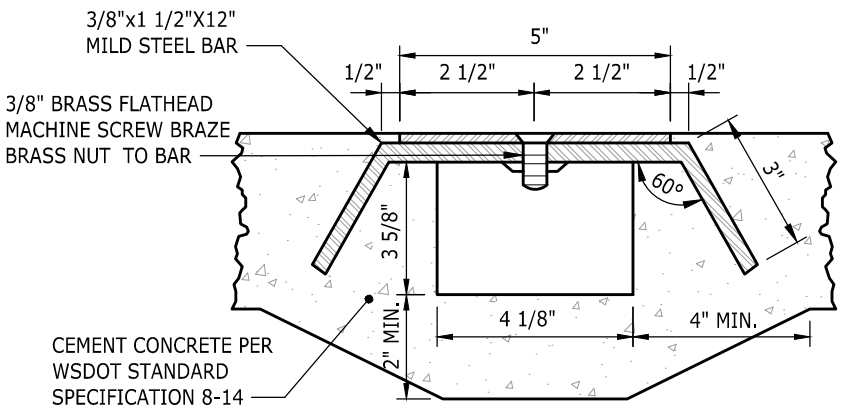
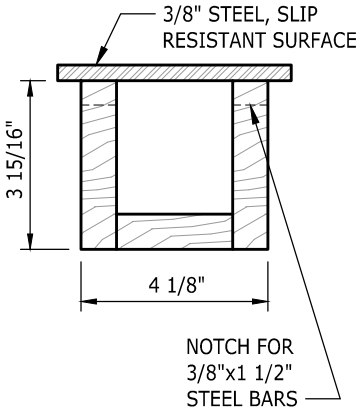
CITY OF KENT
ENGINEERING DEPARTMENT

STORM DRAIN MARKERS

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–37
APPROVED ENGINEER		

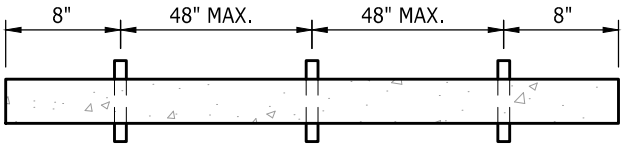


SECTION A-A



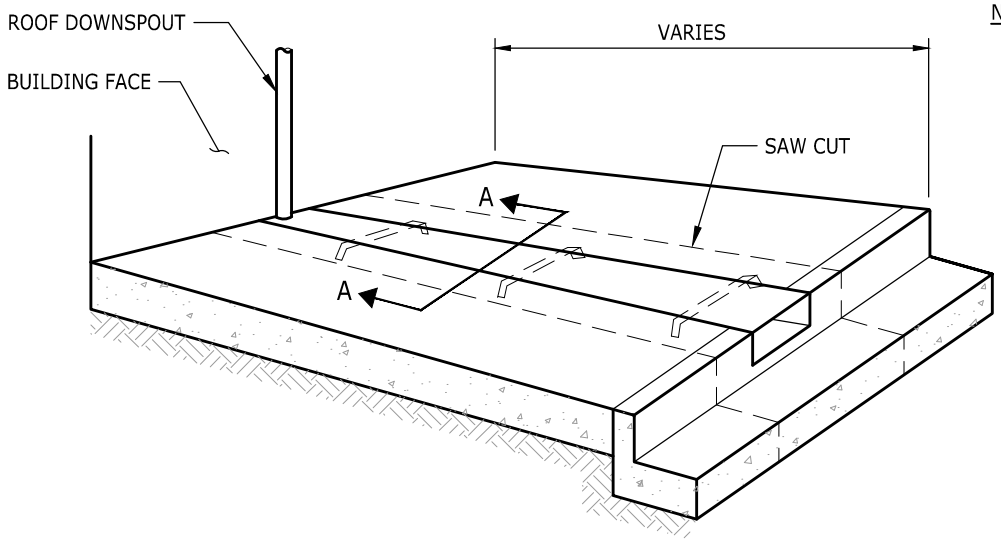
NOTE: FORMS TO BE REMOVED.

FORMING DETAIL



NOTE: FOR WALKS 6' AND LESS USE ONLY 2 BARS,
FOR WALKS 6' TO 10' USE 3 BARS,
FOR WALKS OVER 10' USE 4 BARS.

BAR SPACING



NOTES:

1. MATERIAL SHALL MEET REQUIREMENTS AS OUTLINED ON THIS PLAN AND AS FURTHER DESCRIBED IN THESE STANDARDS.
2. PROVIDE SPACE BETWEEN BUILDING AND PLATE FOR DOWNSPOUT
3. WHEN DRAIN IS PLACED IN EXISTING SIDEWALK, THE SIDEWALK SHALL BE SAW CUT.

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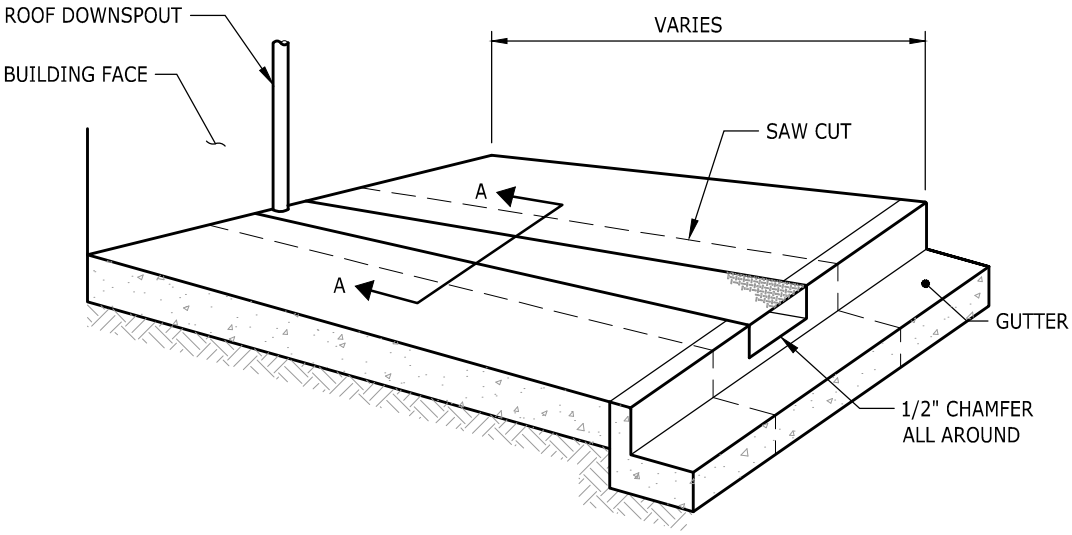
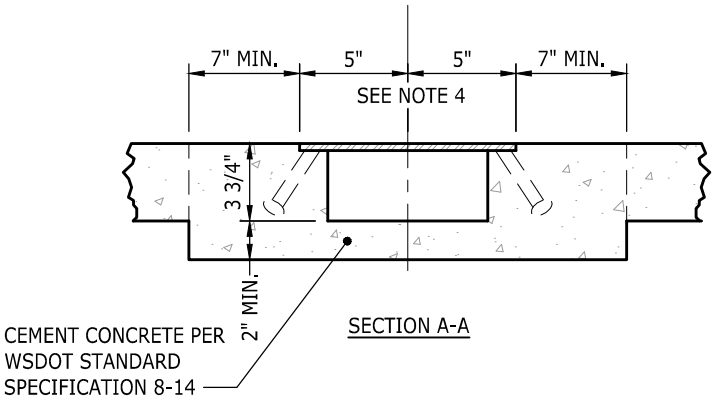
CITY OF KENT
ENGINEERING DEPARTMENT

SIDEWALK DRAIN FOR BUILDING DOWNSPOUT – TYPE 1

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–38
APPROVED ENGINEER		





SECTION A-A

NOTES:

1. MATERIAL SHALL MEET REQUIREMENTS AS OUTLINED ON THIS PLAN AND AS FURTHER DESCRIBED IN THESE SPECIFICATIONS.
2. PROVIDE SPACE BETWEEN BUILDING AND PLATE FOR DOWNSPOUT
3. WHEN DRAIN IS PLACED IN EXISTING SIDEWALK, THE SIDEWALK SHALL BE SAW CUT.
4. SEE KENT STANDARD PLAN 5-39b FOR STEEL PLATE DETAILS.

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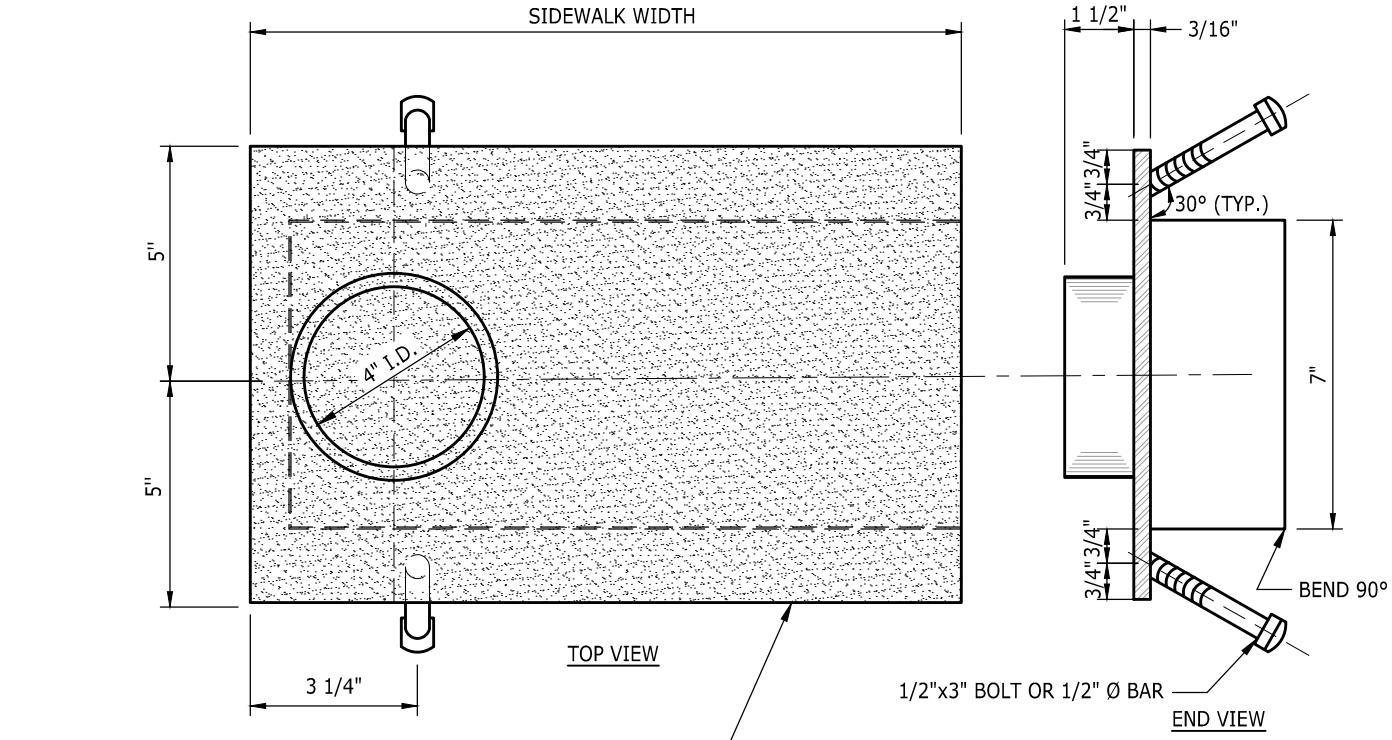
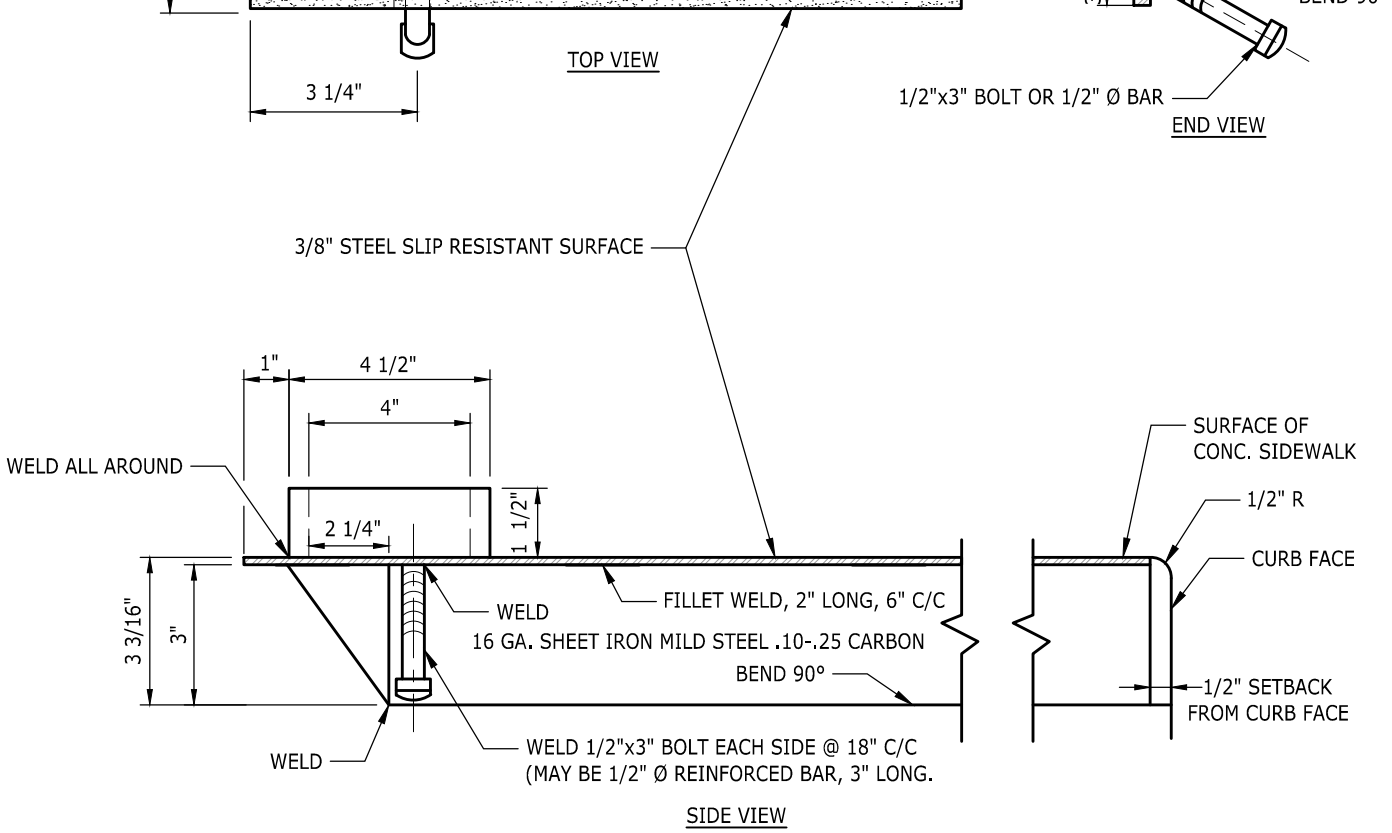
CITY OF KENT
ENGINEERING DEPARTMENT

SIDEWALK DRAIN FOR BUILDING DOWNSPOUT – TYPE 2
SHEET 1 OF 2

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–39a
APPROVED ENGINEER		





SIDE VIEW

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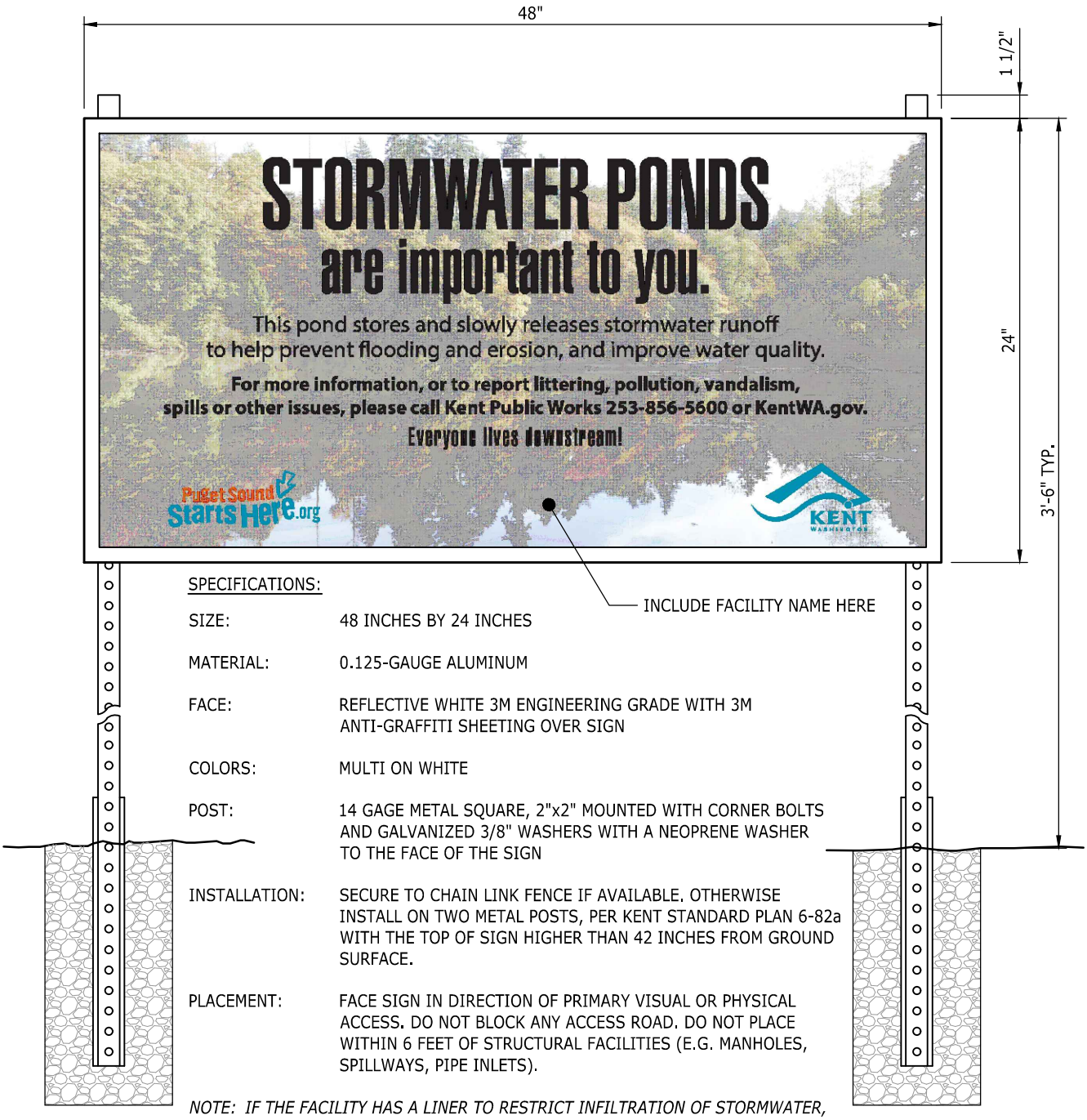
ENGINEERING DEPARTMENT

SIDEWALK DRAIN FOR BUILDING DOWNSPOUT – TYPE 2
SHEET 2 OF 2

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–39b
APPROVED ENGINEER		



SPECIFICATIONS:

SIZE:	48 INCHES BY 24 INCHES
MATERIAL:	0.125-GAUGE ALUMINUM
FACE:	REFLECTIVE WHITE 3M ENGINEERING GRADE WITH 3M ANTI-GRAFFITI SHEETING OVER SIGN
COLORS:	MULTI ON WHITE
POST:	14 GAGE METAL SQUARE, 2"x2" MOUNTED WITH CORNER BOLTS AND GALVANIZED 3/8" WASHERS WITH A NEOPRENE WASHER TO THE FACE OF THE SIGN
INSTALLATION:	SECURE TO CHAIN LINK FENCE IF AVAILABLE. OTHERWISE INSTALL ON TWO METAL POSTS, PER KENT STANDARD PLAN 6-82a WITH THE TOP OF SIGN HIGHER THAN 42 INCHES FROM GROUND SURFACE.
PLACEMENT:	FACE SIGN IN DIRECTION OF PRIMARY VISUAL OR PHYSICAL ACCESS. DO NOT BLOCK ANY ACCESS ROAD. DO NOT PLACE WITHIN 6 FEET OF STRUCTURAL FACILITIES (E.G. MANHOLES, SPILLWAYS, PIPE INLETS).

NOTE: IF THE FACILITY HAS A LINER TO RESTRICT INFILTRATION OF STORMWATER, THE FOLLOWING NOTE MUST BE ADDED TO THE FACE OF THE SIGN: "THIS FACILITY IS LINED TO PROTECT GROUNDWATER QUALITY." IN ADDITION, SPECIFIC INFORMATION ABOUT THE LINER MUST BE ADDED TO THE BACK OF THE SIGN AS SPECIFIED IN THE CURRENT SURFACE WATER DESIGN MANUAL SECTION 6.2.4.

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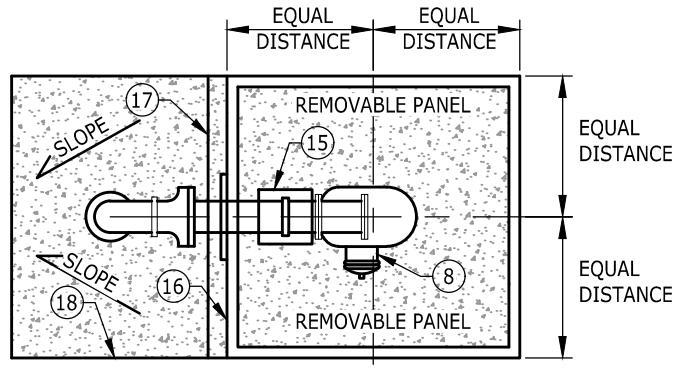
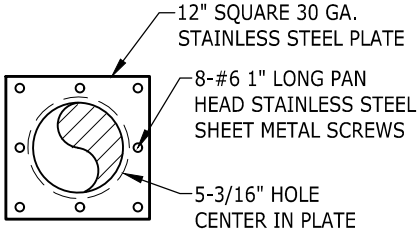
ENGINEERING DEPARTMENT

STORMWATER POND SIGN

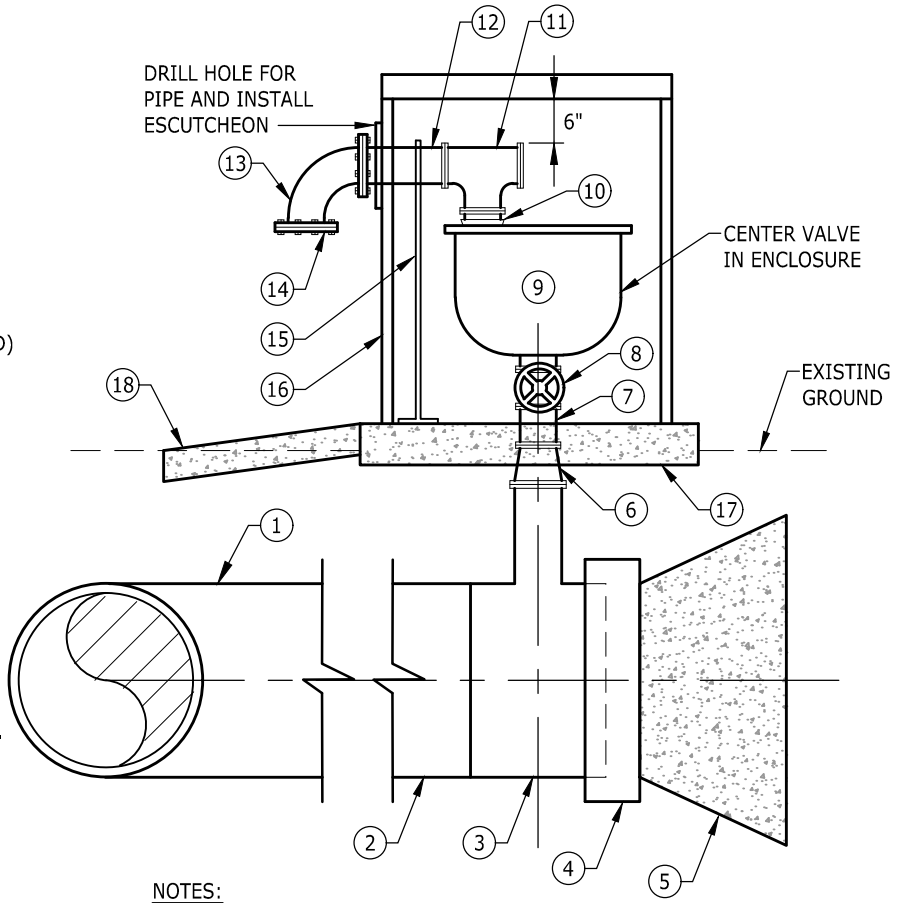
DESIGNED	COK	SCALE	NONE
DRAWN	COK		STANDARD PLAN
CHECKED	COK	DATE	12/2019
APPROVED		ENGINEER	5–40



PLAN VIEW



ESCUTCHEON DETAIL

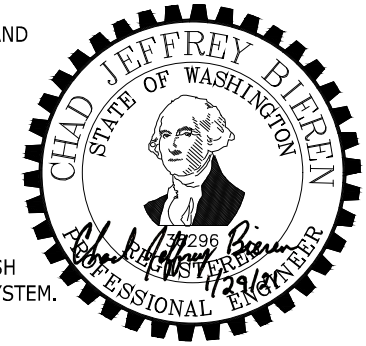


MATERIALS LEGEND:

1. 24"x24"x24" HDPE TEE 24" BRANCH SHALL BE A FLANGED CONNECTION.
2. LF 24" HDPE (FLANGE CONNECTION ON ONE END)
3. 24"x24"x5" HDPE BRANCH SADDLE TEE. 6" BRANCH SHALL BE A FLANGED CONNECTION
4. 24" HDPE CAP
5. CONCRETE BLOCKING
6. 6"x4" REDUCER (FL)
7. 4" D.I. (FLxPE) LENGTH TO FIT
8. 4" GATE VALVE (FLxMJ) WITH HANDWHEEL
9. APCO MODEL 149C 4" COMBINATION AIR VALVE. CENTER IN ENCLOSURE.
10. 4" ADAPTER (NPTxFL) LENGTH TO FIT
11. 4" TEE (FL) AND 4" BLIND FLANGE
12. 4" D.I. (FLxPE) LENGTH TO FIT
13. 4" 90° BEND (FLxMJ)
14. 1-4" OPEN FLANGE. INSTALL STAINLESS STEEL SCREEN BETWEEN FLANGES.
15. 1-4" PIPE STAND. SECURE TO PIPE AND ANCHOR TO CONCRETE BASE/PAD
16. SAFE-T-COVER ENCLOSURE: HYDROCOWL MODEL 800LU880-AL
17. 58" SQUARE x 6" DEPTH CONCRETE BASE/PAD
18. 58"x36"x4" DEPTH CONCRETE SPLASH PAD, SLOPE TO DRAIN TO STORM SYSTEM.

NOTES:

1. ALL 4" PIPE AND FITTINGS SHALL BE CL. 52 DUCTILE IRON.
2. ENCLOSURE AND CONCRETE BASE TO BE INSTALLED/ ASSEMBLED/CONSTRUCTED PER MANUFACTURER'S RECOMMENDATIONS.



NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL, SIGNED BY THE ENGINEER AND APPROVED FOR PUBLICATION IS KEPT ON FILE AT THE CITY OF KENT. A COPY MAY BE OBTAINED UPON REQUEST.

KENT WASHINGTON

CITY OF KENT
ENGINEERING DEPARTMENT

COMBINATION AIR VALVE AND ENCLOSURE

DESIGNED COK	SCALE NONE	STANDARD PLAN
DRAWN COK		
CHECKED COK	DATE 12/2019	5–41
APPROVED ENGINEER		