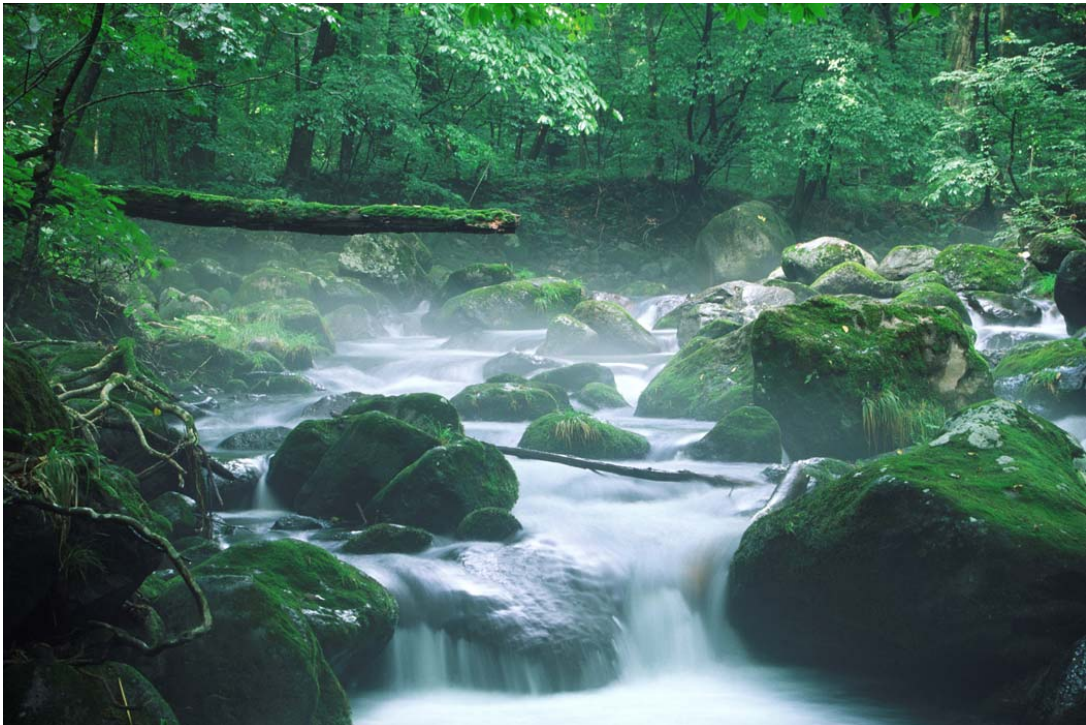


City of Port Orchard

STORMWATER OPERATION AND MAINTENANCE STANDARDS FOR DRAINAGE FACILITIES



Operation & Maintenance Manual

May 2014

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Drainage Facility Self-Inspection

How the Process Works:

Commercial and multifamily property owners and residential Homeowner's Associations (HOA's) within the City of Port Orchard are responsible for inspecting their drainage facilities as well as performing maintenance required to bring the facilities up to City of Port Orchard and Washington State Department of Ecology standards. This may be done by either in-house staff or a vendor.

A letter is sent to property owners every year requesting this self inspection. Property owner's may request a copy of your individual site plan showing your property's drainage facility components (if available). The instructions (this maintenance booklet) and an annual maintenance checklist form to be completed and submitted to the City of Port Orchard Public Works Department indicating that the inspection and maintenance have been completed are available at the City's website, www.cityofportorchard.us.

Property owners should return the completed, signed maintenance checklist by October 31, of each year (Indicating work was performed or maintenance was not required). The City of Port Orchard Public Works Department will perform random spot checks to evaluate the effectiveness of the program. Please schedule maintenance in a detention or wet pond area to occur after August 1 of each year to allow any migratory wildlife in the area the opportunity to migrate on.

Here are the specific steps in the process:

A. Facility Identification:

Look on the site plan of your property. Note the main facility type (pond, tank, vault, etc.,) on your property. To assist you in identifying components, refer to the definitions and sketches in this booklet. Check the appropriate column, "Yes" or "No", on the enclosed maintenance checklist, indicating whether the components for each facility type are on your property.

NOTE: Most systems have both retention/detention (R/D) and conveyance system components (a typically conveyance can contain a multiple, all or one of the following components; bioswale, ditch, pipe and catch basins).

B. Inspection:

Inspect all facilities/components checked "Yes" using in-house personnel or a vendor. Refer to this booklet, which describes the City of Port Orchard standard for each component and identifies defects with a defect number and description.

Report the inspection results on the enclosed maintenance checklist in the following manner:

- If the facility component already meets the standard, write “meets standard” in the space for that component.
- If the component has a defect, list the defect number from this booklet in the space for that component.

NOTE: If there is more than one component, list the component ID number (i.e., CB #3, CB#4, etc.) along with the defect number. You need only list components with defects in this case. Use the back sheet of the form or attach a separate sheet if necessary.

C. Maintenance Work:

If maintenance is required, have the work performed by in-house personnel or a vendor. On the maintenance checklist, check off that the work has been completed in the “Work Completed” column, and indicate the date completed.

D. Certification:

Provide the information indicated and sign under the certification section, certifying under penalty of perjury that the inspection has been performed, and either no maintenance needs were identified or the work was completed as indicated in the checklist.

E. Submittal:

Mail, email, or hand deliver the checklist to the City of Port Orchard Public Works Department (the address and email are at the end of the checklist). The Department of Public Works must receive the checklist by October 31st each year.

Be Safe!

Use caution when entering or working around catch basins and manholes, and conform to confined space entry laws. Most inspections can be performed above ground. If confined space entry is required, it is recommended that you contract with a qualified vendor with confined space entry experience.

Property owners are responsible for the safety of all persons, including in-house and vendor personnel, performing confined space entry on their property under Washington Administrative Code (WAC) 296-809, Confined Spaces. This responsibility may involve undergoing an assessment of the property to

determine whether a permit is required for confined space entry (the permit is a self-generated checklist used to determine that all conditions are safe for entry).

For information and assistance, contact Washington State Labor & Industries Consultation Program at (800) 423-7233. This agency also offers educational workshops of the confined space program. Information can be found at: <http://www.lni.wa.gov/Safety/TrainTools/Workshops/Available/ConfSpace/default.asp>

Tools of the Trade

Depending of the type of facility you have, some of the following tools may be of assistance in doing your own inspection:

Task	Tool
Opening Manhole Cover	<ul style="list-style-type: none"> • ½” Allen Wrench
Opening Stuck Lids/Grates	<ul style="list-style-type: none"> • Crow Bar/Long Bar • Hammer
Measuring Sediment Depths	<ul style="list-style-type: none"> • Measuring rod (an 8-foot length of aluminum conduit marked at 1-foot intervals works well for most systems) • Tape or Chalk
Measuring Storage Space/Sediment Depths	<ul style="list-style-type: none"> • Tape Measure (12ft)
Lifting Grates/Lids	<ul style="list-style-type: none"> • Manhole Cover Hook
Inspection from above ground	<ul style="list-style-type: none"> • Mirror on a long handle
Probing for catch basins/moving heavy objects	<ul style="list-style-type: none"> • Straight-pointed bar
General	<ul style="list-style-type: none"> • Flashlight (6 volt lantern or halogen recommended) • Flat Screwdriver • Phillips Screwdriver • Shovel • Trash Can • Vice Grips • 10” Wrench • 15” Wrench

Sediment Estimating-the Most Common Task

The most common defect encountered is excessive sediment level in a Type I or Type II Catch Basin. Please refer to this booklet for information on other defects.

Here is how to check the sediment level in a Type I or Type II Catch Basin:

A. Remove the manhole cover/grate: using a ½-inch Allen wrench and a catch basin grate hook or crow bar.

B. Identify the sump depth (water level): Using a probe or rod, identify the sump depth. This is done by inserting the rod through the water and sediment until it hits the bottom of the catch basin; water level will be visible for measurement upon removal.

NOTE: Under normal conditions, the water level should be even with the outlet pipe. A higher level indicates a blockage in the outlet. (Refer to the booklet for more information)

C. Identity the sediment level.

- 1) Put the probe or rod in through the water until it touches the top of the sediment. Mark it with relation to a stationary point in the catch basin with tape or chalk (position A).
- 2) Put the probe or rod in through the water and sediment until it touches the bottom of the catch basin, and mark the probe with relation to the same stationary point as in item 1 above (Position B).

The difference between the two marks is the **sediment depth**.

- 3) The water mark left on the rod is the “sump depth.” Measure the ratio of sediment depth to sump depth to determine the allowable amounts.

In Type I and Type II catch basins, the sediment must be removed if the sediment level exceeds one-third (1/3) of the sump depth (water level) in order to meet the City of Port Orchard and State standards.

Maintenance Components:

A. Type I Catch Basin (also referred to as Inlet) (See Figure A-1 in Appendix)

Definition: An underground concrete, water receiving, inlet, rectangular in shape (approximately 3' x 2' x 4' deep) with a slotted iron grate on top to inlet water or a solid rectangular cover. Water may also enter/exit through culverts visible in the side walls of the basin.

Defect and Number:

A.1 Trash & Debris (including Sediment) Blocking Water from Entering Basin: Trash or debris of more than $\frac{1}{2}$ cubic foot that is covering the catch basin grate or is blocking the inlet grate to basin by more than 20%.

Maintenance Necessary to bring to Standard: Remove all trash and debris from the front of the catch basin inlet. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to dispose of waste.

A.2 Trash & Debris (including Sediment): Trash and debris (in the basin) that exceeds one-third the depth from the bottom of the basin to invert of lowest pipe into or out of the basin. This is the most common maintenance requirement.

Maintenance Necessary to bring to Standard: Remove all trash and debris from the catch basin. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to dispose of waste.

A.3 Trash & Debris (including Sediment): Trash and debris in any inlet or outlet pipe blocking more than one-third of its height.

Maintenance Necessary to bring to Standard: Remove all trash and debris from inlet and outlet pipes. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to dispose of waste.

A.4 Settlement/Misalignment: Basin settles more than 1 inch or has rotated more than 2 inches out of alignment.

Maintenance Necessary to bring to Standard: Repair or replace basin to design standards.

- A.5 Structural Damage to Frame and/or Top Slab:** Top concrete slab has holes larger than 2 square inches or cracks wider than $\frac{1}{4}$ inch (intent is to make sure all material is running into the basin through the grate).

Maintenance Necessary to bring to Standard: Repair top slab so that it is free of holes and cracks.

- A.6 Frame Not Sitting Flush on Top Slab:** i.e., separation of more than $\frac{3}{4}$ inch of the frame from the top slab.

Maintenance Necessary to bring to Standard: Repair top slab so that it is free of holes and cracks.

- A.7 Cracks in Basin Walls/Bottom:** Cracks wider than $\frac{1}{2}$ inch, any evidence of soil particles or water entering the catch basin through cracks, or maintenance person judges that the structure is unsound.

Maintenance Necessary to bring to Standard: Repair or replace basin to design standards.

- A.8 Cracks in Basin Around Inlet/Outlet Culverts:** Cracks wider than $\frac{1}{2}$ inch at the joint of any inlet/outlet pipe or any evidence of soil particles or water entering the catch basin through cracks.

Maintenance Necessary to bring to Standard: Repair or replace basin to design standards.

- A.9 Fire Hazard:** Presence of chemicals such as natural gas, oil and gasoline.

Maintenance Necessary to bring to Standard: Remove flammable chemicals so that none are present. Call the Kitsap County Health District at 360-337-5672 for disposal information on how to dispose of waste.

- A.10 Pollution:** Presence of any chemical pollution.

Maintenance Necessary to bring to Standard: Remove contaminants so that none are present. Call the Kitsap County Health District at 360-337-5672 for disposal information on how to dispose of waste. Also contact the Port Orchard Stormwater Manager at 360-876-4991.

- A.11 Catch Basin Cover Not In Place:** Cover is missing or only partially in place. Any open catch basin requires maintenance.

Maintenance Necessary to bring to Standard: Repair catch basin cover so that it is closed.

A.12 Metal Grates – Safety Hazard: Grate with opening wider than 7/8 inch.

Maintenance Necessary to bring to Standard: Repair grate opening so that they meet design standards.

A.13 Metal Grates – Damaged or Missing: Grate is missing or has broken members.

Maintenance Necessary to bring to Standard: Repair or replace grate so that it is in place and meets design standards.

**B. Type II Catch Basin (also referred to as Manhole or Control Structure)
(See Figure A-2 in Appendix)**

Definition: A round underground concrete basin (4' - 8' diameter, 6' deep or deeper), may contain a FROP (Flow Restrictor /Oil Pollution Control device). These basins are also required when larger diameter culverts are used. Follow confined space entry procedures if entering this space.

Defect and Number:

B.1 Trash & Debris (including Sediment) Blocking Water from Entering Basin: Trash or debris of more than ½ cubic foot that is covering the catch basin grate or is blocking the inlet grate to basin by more than 20%.

Maintenance Necessary to bring to Standard: Remove all trash and debris from the front of the catch basin inlet. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to dispose of waste.

B.2 Trash & Debris (including Sediment): Trash and debris (in the basin) that exceeds one-third the depth from the bottom of the basin to invert of lowest pipe into or out of the basin. This is the most common maintenance requirement.

Maintenance Necessary to bring to Standard: Remove all trash and debris from the catch basin. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health

District at 360-337-5672 for disposal information on how to dispose of waste.

B.3 Trash & Debris (including Sediment): Distance between trash and debris build-up from the bottom of orifice plate is less than 1-1/2 feet.

Maintenance Necessary to bring to Standard: Remove all trash and debris from the catch basin. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to dispose of waste.

B.4 Structural Damage to Frame and/or Top Slab: Top concrete slab has holes larger than 2 square inches or cracks wider than 1/4 inch (intent is to make sure all material is running into the basin through the grate).

Maintenance Necessary to bring to Standard: Repair top slab so that it is free of holes and cracks.

B.5 Frame Not Sitting Flush on Top Slab: i.e. separation of more than 3/4 inch of the frame from the top slab.

Maintenance Necessary to bring to Standard: Repair top slab so that it is free of holes and cracks.

B.6 Cracks in Basin Walls/Bottom: Cracks wider than 1/2 inch and longer than 3 feet, any evidence of soil particles or water entering the catch basin through cracks, or maintenance person judges that the structure is unsound.

Maintenance Necessary to bring to Standard: Repair or replace basin to design standards.

B.7 Cracks in Basin Around Inlet/Outlet Culverts: Cracks wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles or water entering the catch basin through cracks. Connections to inlet/outlet/ pipe are not watertight and show signs of rust

Maintenance Necessary to bring to Standard: Repair or replace basin to design standards. Repair connection to pipe to become watertight.

B.8 Settlement/Misalignment: Basin settles more than 1 inch or has rotated more than 6 inches out of alignment.

Maintenance Necessary to bring to Standard: Repair or replace basin to design standards.

B.9 Fire Hazard: Presence of chemicals such as natural gas, oil and gasoline.

Maintenance Necessary to bring to Standard: Remove flammable chemicals so that none are present. Call the Kitsap County Health District at 360-337-5672 for disposal information on how to dispose of waste.

B.10 Pollution: Presence of any chemical pollution.

Maintenance Necessary to bring to Standard: Remove contaminants so that none are present. Call the Kitsap County Health District at 360-337-5672 for disposal information on how to dispose of waste. Also contact the Port Orchard Stormwater Manager at 360-876-4991.

B.11 Catch Basin Cover Not In Place: Cover is missing or only partially in place. Any open catch basin requires maintenance.

Maintenance Necessary to bring to Standard: Repair catch basin cover so that it is closed.

B.12 Metal Grates – Safety Hazard: Grate with opening wider than 7/8 inch.

Maintenance Necessary to bring to Standard: Repair grate opening so that they meet design standards.

B.13 Metal Grates – Damaged or Missing: Grate is missing or has broken members.

Maintenance Necessary to bring to Standard: Repair or replace grate so that it is in place and meets design standards.

B.14 Metal Grates – Trash and Debris: Trash or debris that is blocking more than 20% of the grate surface.

Maintenance Necessary to bring to Standard: Remove all trash and debris from grate.

B.15 Access Ladder – Unsafe: Ladder is unsafe due to missing rungs, misalignment, rust or cracks.

Maintenance Necessary to bring to Standard: Repair ladder so that it is in place and meets design standards and allows maintenance person safe access.

C. Flow Restrictor (T-Section) (See Figure A-3 in Appendix)

Definition: A facility such as a Flow Restrictor Oil Pollution (FROP) control device or a T-Section with a specifically sized orifice(s) to control stormwater release rates. The control device is usually located in a Type II Catch Basin/Control Manhole, typically designated on the site/storm drainage plan as “CS”, “CSCB” or “CSMH”. There may be a vertical culvert at the outlet (T-Section) with additional elbow orifice inlets

Defect and Number:

C.1 Trash & Debris (including Sediment): Distance between debris and bottom of orifice plate is less than 1-1/2 feet (18 inches).

Maintenance Necessary to bring to Standard: Remove all trash and debris from the catch basin sump. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to dispose of waste.

C.2 Structural Damage: Structure is not securely attached to manhole wall (outlet pipe structure should support at least 1,000 pounds of up or down pressure) and/or structure is not in an upright position (no more than 10% out of plum). Structure is usually secured with banding material.

Maintenance Necessary to bring to Standard: Repair structure to be securely attached to wall so that the outlet pipe can support 1,000 pounds of up or down pressure, ensure outlet pipe is in the correct position.

C.3 Structural Damage: Connections to outlet pipe are not watertight and show signs of rust or deteriorated grout.

Maintenance Necessary to bring to Standard: Repair connections to outlet pipe so that they are watertight, repair or replace structure so that it works as designed.

C.4 Structural Damage: Any holes, other than design holes, in the structure.

Maintenance Necessary to bring to Standard: Repair holes so that structure has no holes other than designed holes.

C.5 Cleanout Gate: Cleanout gate is not watertight or is missing.

Maintenance Necessary to bring to Standard: Repair or replace gate so that it is watertight and works as designed.

- C.6 Cleanout Gate:** Gate cannot be opened or moved up or down by maintenance person.

Maintenance Necessary to bring to Standard: Repair gate so that it can be opened and moved up and down easily and is watertight.

- C.7 Cleanout Gate:** Chain or rod leading to the gate is damaged or is missing (must be accessible from street level).

Maintenance Necessary to bring to Standard: Repair or replace chain or rod so that it is in place and works as designed.

- C.8 Cleanout Gate:** Gate is rusted over 50% of its surface area.

Maintenance Necessary to bring to Standard: Repair or replace gate to meet design standards.

- C.9 Orifice Plate:** Control device is not working properly due to missing, out of place or bent orifice plate, or secondary orifice elbows have become loosened from the structure.

Maintenance Necessary to bring to Standard: Repair or replace orifice plate so that it is in place and works as designed.

- C.10 Orifice Plate:** Any trash, debris, sediment or vegetation blocking the plate.

Maintenance Necessary to bring to Standard: Remove all obstructions so that the orifice plate works as designed. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to dispose of waste.

- C.11 Overflow Pipe:** Any trash or debris blocking (or having the potential of blocking) the overflow pipe. (Overflow pipe is at the top of the riser structure, FROP or T-Section device)

Maintenance Necessary to bring to Standard: Remove trash or debris so that the overflow pipe is free of obstructions and works as designed.

D. Debris Barrier

(See Figure A-4 in Appendix)

Definition: Metal trash rack, typically located on the inlet/outlet pipes.

Defect and Number:

D.1 Trash & Debris: Trash and debris that is plugging more than 20% of the opening in the barrier.

Maintenance Necessary to bring to Standard: Remove all trash and debris so that the barrier is clear to receive capacity flow.

D.2 Damaged / Missing Bars: Bars are missing or entire barrier is missing.

Maintenance Necessary to bring to Standard: Repair or replace bars according to design standards.

D.3 Damaged / Missing Bars: Bars are bent out of shape more than 3/4 inches.

Maintenance Necessary to bring to Standard: Repair or replace bars so that they are in place with no bends more than 3 inches.

D.4 Damaged Bars: Bars are loose and rust is causing 50% deterioration to any part of the barrier.

Maintenance Necessary to bring to Standard: Repair or replace barrier to meet design standards.

E. Energy Dissipater

Definition: A rock pad constructed at inlet/outlets to prevent erosion, or a constructed percolation trench to disperse outletting flows over a large area, or a catch basin used to slow fast flowing runoff. Catch basins may be a part of the dispersion trench, see Type I or Type II Catch Basins (Sections A and B) for maintenance requirements.

Defect and Number:

E.1 Rock Pad – Missing or Moved Rock: Only one layer of rock exists above native soil in an area of five square feet or larger, or any exposure of native soil.

Maintenance Necessary to bring to Standard: Replace rocks to design standards.

- E.2 Dispersion Trench – Pipe Plugged with sediment:** Accumulated sediment that exceeds 20% of the design depth.

Maintenance Necessary to bring to Standard: Clean / flush pipe so that it matches design.

- E.3 Dispersion Trench – Not Discharging Water Properly:** Visual evidence of water discharging at concentrated points along the trench (the normal condition is a “sheet flow” of water along trench). Intent is to prevent erosion damage.

Maintenance Necessary to bring to Standard: Rebuild trench to design standards.

- E.4 Dispersion Trench – Perforations Plugged:** Over ½ of the perforations in pipe are plugged with debris and sediment.

Maintenance Necessary to bring to Standard: Clean or replace perforations in pipe.

- E.5 Dispersion Trench – Water Flows Out Top of Distribution Catch Basin:** Maintenance person observes water flowing out of the catch basin top during any storm less than the design storm, or it is causing or appears likely to cause damage.

Maintenance Necessary to bring to Standard: Rebuild facility to design standards.

- E.6 Dispersion Trench – Receiving Area Over-saturated:** Water in receiving area is causing or has potential of causing landslide problems.

Maintenance Necessary to bring to Standard: Ensure that the engineer’s evaluation of outlet function and soil stability is satisfactory.

- E.7 Energy Dissipater – Needs Replacement:** Visible signs of pad erosion, or plugged dispersion trenches.

Maintenance Necessary to bring to Standard: Replace energy dissipater.

F. Pipe / Culvert

Definition: A conveyance culvert of varying diameter. May be constructed as concrete pipe (CP), reinforced concrete pipe (RCP), corrugated metal pipe (CMP), high density (smooth wall) polyethylene pipe (HDPP), ductile iron (DI), or corrugated high density polyethylene pipe (CPEP), or polyvinyl chloride pipe (PVC).

Defect and Number:

F.1 Sediment & Debris: Accumulated sediment or debris that exceeds 20% of the diameter of the pipe.

Maintenance Necessary to bring to Standard: Clean pipe of all sediment and debris.

F.2 Vegetation: Vegetation that reduces free movement of water through pipes.

Maintenance Necessary to bring to Standard: Remove vegetation so water flows freely through pipes.

F.3 Protective Coating Damage: Protective coating is visibly damaged, or rust is causing more than 50% deterioration to any part of the pipe.

Maintenance Necessary to bring to Standard: Repair or replace pipe.

F.4 Joint or Culvert Misalignment: Joints are visibly misaligned, or culverts alignment is disrupted.

Maintenance Necessary to bring to Standard: Realign or re-connect affected pipe.

F.5 Pipe Damaged: Any dents that decrease the cross sectional area of the pipe by more than 20%.

Maintenance Necessary to bring to Standard: Repair or replace pipe.

G. Ditch

(See Figure A-5 in Appendix)

Definition: A conveyance system. May be U-shaped, V-shaped or trapezoidal with a flat bottom (also referred to as a biofiltration swale). May be rock lined, earth lined or grass lined.

Defect and Number:

- G.1 Trash & Debris:** Trash and debris exceeding 1 cubic foot per 1,000 square feet of ditch / biofiltration swale and slopes.

Maintenance Necessary to bring to Standard: Clear trash and debris from ditch or biofiltration swale.

- G.2 Sediment:** Accumulated sediment that exceeds 20% of the design depth.

Maintenance Necessary to bring to Standard: Clean / flush ditch or biofiltration swale of all sediment and debris to allow it to convey its design flow capacity. Remove all sediment and restore to design depth.

- G.3 Vegetation:** Vegetation that reduces free movement of water through the ditch or biofiltration swale (vegetation taller than 8 inches or trees such as Alders).

Maintenance Necessary to bring to Standard: Remove vegetation so water flows freely through ditch or biofiltration swale unimpeded. Mow grass to allow for proper function within its intended capacity.

- G.4 Erosion Damage to Slopes:** Erosion damage over 2 inches deep where the cause of damage is still present, or where there is a potential for continued erosion.

Maintenance Necessary to bring to Standard: Stabilize slopes by using the appropriate erosion control measure(s), by rock reinforcement, planting of grass, or compaction.

- G.5 Check Dam Sedimentation:** Accumulated sediment that causes standing water behind the check dam.

Maintenance Necessary to bring to Standard: Replace check dam and remove sediment.

- G.6 Failure of Rock-Lined Ditch:** Erosion or failure of rock slopes within ditch line.

Maintenance Necessary to bring to Standard: Replace and/or repair rock lining to re-establish the ditch cross-section.

H. Fencing (includes gate)

Definition: A six-foot high cyclone fence, required by the City if pond side slopes are steeper than 3:1 to prohibit entry due to safety considerations.

Defect and Number:

H.1 Missing or Broken Parts: Any defect in the fence that permits easy entry into a facility.

Maintenance Necessary to bring to Standard: Repair or replace parts to provide adequate security.

H.2 Missing or Broken Parts: Parts broken or missing that can be easily seen by the public that is below the appearance standards of the neighborhood.

Maintenance Necessary to bring to Standard: Repair or replace parts to conform to the standards of the neighborhood.

H.3 Erosion: Erosion more than 4 inches high and 12-18 inches wide, permitting an opening under the fence.

Maintenance Necessary to bring to Standard: Fill in openings so that there are no openings under the fence that exceed 4 inches in height.

H.4 Wire Fences – Damaged Parts: Posts out of plumb more than 6 inches.

Maintenance Necessary to bring to Standard: Correct position so that posts are plumb to within 1-1/2 inches and meets design standards.

H.5 Wire Fences – Damaged Parts: Top rails bent more than 6 inches.

Maintenance Necessary to bring to Standard: Repair or replace top rails so that they are free of bends greater than 1 inch.

H.6 Wire Fences – Damaged Parts: Any part of the fence (including Posts, top rails and fabric) more than 1 foot out of design alignment.

Maintenance Necessary to bring to Standard: Align fence so it meets design standards.

H.7 Wire Fences – Damaged Parts: Missing or loose tension wire.

Maintenance Necessary to bring to Standard: Repair or replace tension wire so it is in place and holding the fabric.

- H.8 Wire Fences – Damaged Parts:** Extension arm missing, broken or bent out of shape more than 1-1/2 inches.

Maintenance Necessary to bring to Standard: Repair or replace extension arm so that it is in place with no bends greater than 3/4 inch.

- H.9 Wire Fences – Deteriorated paint or Protective Coating:** Part(s) having a rusting or scaling condition that has affected structural adequacy.

Maintenance Necessary to bring to Standard: Repair posts or parts so that they are structurally adequate with a uniform protective coating.

- H.10 Wire Fences – Damaged Parts:** Missing or loose barbed wire that is sagging more than 2-1/2 inches between posts.

Maintenance Necessary to bring to Standard: Repair or replace barbed wire so it is in place with less than 3/4 inch sag between posts.

- H.11 Wire Fences or Gates– Opening in Fabric:** Opening in fabric such that an 8-inch diameter ball could fit through (intent is to prevent a small child from entering).

Maintenance Necessary to bring to Standard: Repair fabric so that there are no openings in the fence.

- H.12 Gates– Damage or Missing Members:** Missing gate or locking device.

Maintenance Necessary to bring to Standard: Repair or replace gates and locking devices so that all are in place.

- H.13 Gates– Damage or Missing Members:** Broken or missing hinges, such that the gate cannot be easily opened and closed by the maintenance person.

Maintenance Necessary to bring to Standard: Repair or replace hinges so that they are intact and lubed, and gate is working freely.

- H.14 Gates– Damage or Missing Members:** Gate is out of plumb more than 6 inches and more than 1 foot out of design alignment.

Maintenance Necessary to bring to Standard: Align gate so it is vertical.

H.15 Gates– Damage or Missing Members: Missing stretcher bar, stretcher bands and ties.

Maintenance Necessary to bring to Standard: Repair or replace stretcher bar, bands and ties so that all are in place.

H.16 Signs– Warning: Missing, loose or vandalized warning signs.

Maintenance Necessary to bring to Standard: Repair, replace, or clean warning signs so that all are in place and readable.

I. Access Road

Definition: Minimum 12-foot wide surface, may be constructed of class “B” road material, AC pavement, fabric/rock sections. Used to access control manholes and other facility components.

Defect and Number:

I.1 Trash & Debris: Trash and debris exceeding 1 cubic foot per 1,000 square feet (i.e. trash and debris to fill one standard size garbage bag).

Maintenance Necessary to bring to Standard: Clear trash and debris from site.

I.2 Blocked Roadway/ Safety Hazard: Debris that could damage vehicle tires (glass and metal).

Maintenance Necessary to bring to Standard: Remove debris so that the roadway is free of debris that could damage tires.

I.3 Blocked Roadway/ Safety Hazard: Any obstruction or vegetation restricting the access to a road surface to less than 15 feet.

Maintenance Necessary to bring to Standard: Remove obstructions or vegetation to allow at least a 15-foot wide access.

I.4 Road Surface – Settlement, Potholes, Mush Spots, or Rut: Any surface defect that exceeds 6 inches in depth and 6 square feet in area. In general, any surface defect that hinders or prevents maintenance access.

Maintenance Necessary to bring to Standard: Repair road surface so it is uniformly smooth with no evidence of settlement, potholes, mush spots or ruts. Replace gravel surface as necessary to return to design standards.

- I.5 Road Surface – Vegetation in Right-of-way:** Weeds and brush growing in the road surface that are more than 6 inches high or less than 6 inches apart within a 400 square foot area.

Maintenance Necessary to bring to Standard: Remove or cut weeds and brush to 2 inches in height, and clear road surface to allow maintenance access.

- I.6 Shoulders and Ditches – Erosion Damage:** Erosion within 1 foot of the roadway of more than 8 inches wide and 6 inches deep.

Maintenance Necessary to bring to Standard: Repair shoulder so that it is free of erosion and match surrounding road.

**J. Other – Specific to Retention/Detention Ponds (including Infiltration)
(See Figures A-6 and A-7 in Appendix)**

Definition: A stormwater facility designed to store runoff while gradually releasing it at a pre-determined controlled rate to surface water or by evaporation, plant transpiration or infiltration into the soil designed so that no runoff entering the facility will be discharged as surface water. Please schedule maintenance in a detention or wet pond area to occur after August 1 of each year to allow any migratory wildlife in the area the opportunity to migrate on.

Defect and Number:

- J.1 Trash & Debris:** Trash and debris exceeding 1 cubic foot per 1,000 square feet (this is about equal to the amount of trash it would take to fill one standard size garbage bag), or there is visual evidence of dumping.

Maintenance Necessary to bring to Standard: Clear trash and debris from site.

- J.2 Poisonous Vegetation:** Any poisonous vegetation that may constitute a hazard to City personnel or the public. Examples of poisonous vegetation includes; tansy ragwort, poison oak, stinging nettles or devils club.

Maintenance Necessary to bring to Standard: Remove all poisonous vegetation so that none are present where City personnel or the public might normally be. Coordinate with the call the Kitsap County Health District at 360-337-5672.

- J.3 Pollution:** Oil, gasoline, or other contaminants that could: 1) cause damage to plant, animal, or marine life; 2) constitute a fire hazard; 3) be flushed downstream during rainstorms.

Maintenance Necessary to bring to Standard: Remove all contaminants so that none are present. Call the Kitsap County Health District at 360-337-5672 for waste disposal information. Also contact the Port Orchard Stormwater Manager at 360-876-4991 for a site consultation to eliminate the source of the pollution.

- J.4 Un-mowed Grass/Ground Cover (not including Infiltration, See J.17):** If a facility is located in a private residential area, mowing is needed when grass exceeds 18 inches in height. In other areas, the general policy is to make the pond site match adjacent ground cover and terrain as long as there is no interference with the function of the facility.

Maintenance Necessary to bring to Standard: Mow grass/ground cover to 4 inches in height.

- J.5 Rodent Holes:** Any evidence of rodent holes, if facility is acting as a dam or berm, or any evidence of water piping through the dam or berm via a rodent hole.

Maintenance Necessary to bring to Standard: Ensure that rodents are destroyed and dam or berm is repaired. Call the Kitsap County Health District at 360-337-5672.

- J.6 Insects:** When insects such as wasps and hornets interfere with maintenance activities.

Maintenance Necessary to bring to Standard: Ensure that insects are destroyed and removed from the site.

- J.7 Tree Growth:** Tree growth does not allow maintenance access or interferes with maintenance activity (i.e. Slope mowing, silt removal, vactoring, or equipment movement). If trees are not interfering with access, leave trees.

Maintenance Necessary to bring to Standard: Remove only trees that hinder maintenance activities. Trees should not be present on or adjacent to fill embankments that are designed to impound water more than 4 feet deep.

- J.8 Erosion Damage to Side Slopes of Pond:** Erosion damage over 2 inches deep where the cause of damage is still present, or where there is a potential for continued erosion.

Maintenance Necessary to bring to Standard: Stabilize slopes by using the appropriate erosion control measure(s); utilizing rock reinforcement, planting of grass, or compaction.

- J.9 Storage Volume – Sediment: (except Infiltration –See J.14 and J.16):** Accumulated sediment that exceeds 10% of the designed storm pond depth. Periodic sediment removal is critical to proper pond function.

Maintenance Necessary to bring to Standard: Clean out sediment to designed pond shape and depth, reseed pond if necessary to control erosion. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to dispose of waste.

- J.10 Pond Dikes – Settlement:** Any part of the dike which has settled 4 inches lower than the design elevation, or water is visibly piping through the berms. A licensed civil engineer should be consulted to determine the source of the settlement.

Maintenance Necessary to bring to Standard: Reconstruct dike to design elevation.

- J.11 Emergency Overflow/Spillway – Rock Missing, Erosion, or Obstruction:** Only one layer of rock exists above native soil in an area of five square feet or larger, or any exposure of native soil, or blockage by debris or vegetation.

Maintenance Necessary to bring to Standard: Replace rocks to design standards.

- J.12 Emergency Overflow/Spillway – Does Not Control Storm Flow:** Emergency overflow or spillway is not large enough to handle heavy rainstorms.

Maintenance Necessary to bring to Standard: Increase capacity (size) of emergency overflow or spillway so that there is no danger of flood damage to downstream private property or City roads. Re-evaluate design and enlarge storage, adjust control structure, etc.

- J.13 Gravel Filter Window –Sediment and Debris:** By visual inspection, little or no water flows through filter during heavy rainstorms.

Maintenance Necessary to bring to Standard: Replace gravel in filter window area.

- J.14 Settling Ponds – Sediment: (Infiltration Only):** A pond containing 6 inches or more of sediment.

Maintenance Necessary to bring to Standard: Remove sediment completely. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

- J.15 Vegetation (Infiltration Only):** Vegetation such as grass and weeds impedes the infiltration function, generally when the height exceeds 18 inches.

Maintenance Necessary to bring to Standard: Mow vegetation to 2 inches in height and remove clippings. Remove trees and bushes where they impact the infiltrating area of the pond.

- J.16 Storage Volume – Sediment: (Infiltration Only):** A percolation test of the facility indicates that the facility is only working at 90% of its designed capabilities, or water remains in the pond for more than 24 hours after the rain has stopped. Frequent sediment removal in infiltration facilities is important to insure proper function.

Maintenance Necessary to bring to Standard: Remove sediment and/or clean the facility so that the infiltration system works according to design. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

Note: Accumulated sediment that exceeds 0.25 inches per year may indicate excessive erosion is occurring upstream of the facility or that the conveyance systems are not being properly maintained. The contributing drainage area should be checked for erosion problems or inadequate maintenance of conveyance systems if excessive sedimentation is noted in an infiltration facility.

- J.17 Inlet/Outlet Pipes (Infiltration Only):** Inlet/outlet pipes clogged with sediment and/or debris.

Maintenance Necessary to bring to Standard: Remove sediment and debris so that the inlet and outlet piping are not clogged or blocked. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

- J.18 Pond Dike/Berm – Settlement:** Any part of the dike which has settled 4 inches lower than the design elevation, or inspector determines that the dike/berm is unsound.

Maintenance Necessary to bring to Standard: Repair dike/berm to design specifications.

J.19 Gravel Filter Window –Sediment and Debris(Infiltration Only):

By visual inspection, little or no water flows through filter during heavy rainstorms, the gravel window is clogged.

Maintenance Necessary to bring to Standard: Remove sediment and debris from the gravel window. Replace gravel if clogged. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

J.20 Liner (if applicable): Liner is visible and has more than three 1/4 –inch diameter holes in it.

Maintenance Necessary to bring to Standard: The liner will need to be re-paneled or replaced, liner is fully covered.

**K. Other – Specific to Retention/Detention Tanks
(See Figure A-8 in Appendix)**

Definition: A stormwater facility typically constructed of corrugated pipe, which provides underground storage of stormwater as part of a runoff quantity control system. Follow confined space entry procedures if entering this space.

Defect and Number:

K.1 Plugged Air Vents: One-half of the end area of the vent is blocked at any point with sediment and/or debris (Vents are located at the top of the storage tank).

Maintenance Necessary to bring to Standard: Remove sediment and debris so that there is no clogging or blockage in the vent.

K.2 Sediment and Debris: Accumulated sediment depth exceeding 10% of the storage depth or 1/2 length of the storage tank or any point depth exceeds 15% of the storage depth.

Maintenance Necessary to bring to Standard: Remove all sediment and debris from the storage area. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

K.3 Gaps between Tank/Pipe Section: Any cracks allowing material to enter into the facility.

Maintenance Necessary to bring to Standard: Seal all joints between tank/pipe sections.

K.4 Tank/Pipe – Structural Damage: Any part of the tank/pipe that is bent out of shape more than 10% of its design shape.

Maintenance Necessary to bring to Standard: Repair or replace tank/pipe to design standards.

K.5 Manhole Cover Not In Place: Cover is missing or only partially in place. Any open catch basin/manhole requires maintenance and a cover.

Maintenance Necessary to bring to Standard: Repair catch basin cover so that it is closed.

L. Other – Specific to Retention/Detention Vaults (See Figure A-9 in Appendix)

Definition: A stormwater facility typically constructed of concrete, which provides underground storage of stormwater as part of a runoff quantity control system. Follow confined space entry procedures if entering this space.

Defect and Number:

L.1 Sediment and Debris: Accumulated sediment depth exceeding 10% of the storage depth or $\frac{1}{2}$ length of the storage vault or any point depth exceeds 15% of the storage depth.

Maintenance Necessary to bring to Standard: Remove all sediment and debris from the storage area. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

L.2 Gaps between Vault/Pipe Section: Any cracks allowing material to enter into the facility.

Maintenance Necessary to bring to Standard: Seal all joints between vault/pipe sections.

L.3 Vault/Pipe – Structural Damage: Any part of the vault/pipe that is bent out of shape more than 10% of its design shape.

Maintenance Necessary to bring to Standard: Repair or replace vault/pipe to design standards.

M. Other – Specific to Wet Vaults
(See Figure A-10 in Appendix)

Definition: A stormwater facility typically constructed of concrete, which provides underground storage of stormwater as part of a runoff quantity control system. Follow confined space entry procedures if entering this space.

Defect and Number:

M.1 Trash and Debris – Vault, Pipe or Inlet/Outlet Pipe: Includes floatables and not-floatables.

Maintenance Necessary to bring to Standard: Remove trash and debris from vault.

M.2 Sediment: Accumulated sediment in the vault that exceeds the depth of the sediment storage area plus 6 inches.

Maintenance Necessary to bring to Standard: Remove all sediment from the storage area in the vault. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

M.3 Inlet/Outlet Pipe Damage: Any damage or broken pipe in need of repair.

Maintenance Necessary to bring to Standard: Repair and/or replace pipe.

M.4 Manhole/Access Cover: Cover cannot be opened or removed, especially by one person.

Maintenance Necessary to bring to Standard: Loosen cover and remove material or objects hindering removal.

M.5 Vault Structural Damage: Any cracks allowing material to enter into the facility. Major damages may warrant inspection by a qualified structural engineer.

Maintenance Necessary to bring to Standard: Seal all joints between vault/pipe sections, and vault is determined structurally sound.

M.6 Baffles: Baffles corroding, cracking, warping and/or showing signs of failure.

Maintenance Necessary to bring to Standard: Repair or replace baffles to specifications.

M.7 Access Ladder –Unsafe: Ladder is unsafe due to missing rungs, misalignment, rust or cracks.

Maintenance Necessary to bring to Standard: Repair ladder so that it is in place and meets design standards and allows maintenance person safe access.

N. Other – Specific to Biofiltration Swales/Biofilters (See Figure A-11 in Appendix)

Definition: A stormwater quality treatment facility, which provides filtration through vegetation. Includes, but are not limited to, grassed or vegetated swales and filter strips.

Defect and Number:

N.1 Sediment: Accumulated sediment depth of 2 inches at any spot, covering the vegetation, or otherwise interfere with the swale/biofilter operation. There should be no areas of standing water once inflow has ceased

Maintenance Necessary to bring to Standard: Remove all sediment and restore swale to its designed depth. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

N.2 Vegetation: Grass becomes excessively tall (greater than 8 inches), nuisance weeds and other vegetation start to take over, or grass has died.

Maintenance Necessary to bring to Standard: Mow vegetation and/or eradicate nuisance vegetation such that the flow is not impeded and allow to function as designed. Mow grass and vegetation to a height of 2 inches above the designed water depth. Remove clippings promptly and dispose of material to reduce pollution from entering receiving waters. If grass has died, replant or reseed as necessary.

N.3 Inlet/Outlet Pipes: Inlet/outlet pipes clogged with sediment and/or debris.

Maintenance Necessary to bring to Standard: Remove sediment and debris so that there is no clogging or blockage in the inlet and outlet piping. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

N.4 Trash and Debris: Trash and debris accumulated in swale.

Maintenance Necessary to bring to Standard: Remove all trash and debris from the swale.

N.5 Erosion/Scouring: The swale is eroded or scoured at the bottom due to flow channelization, or high flows.

Maintenance Necessary to bring to Standard: Re-grade and reseed swale to specification to eliminate channel flow. Reseed when bare spots are evident.

N.6 Ponding: When water ponds in the swale.

Maintenance Necessary to bring to Standard: Remove blockage or re-grade swale.

N.7 Roadside Ditches – Cleaning: Roadside ditch cleaning to remove only the amount of sediment necessary to restore needed hydraulic capacity leaving vegetative plants in place to the maximum extent possible.

Maintenance Necessary to bring to Standard: Remove sediment and restore the swale to its design depth. Reseed when bare spots are evident.

N.8 Road Surface – Vegetation in Right-of-way: Clean curb cuts when soil and vegetation buildup interferes with flow introduction.

Maintenance Necessary to bring to Standard: Remove all vegetation allowing for water to flow into and through the swale unimpeded.

O. Other – Specific to Wet Ponds
(See Figures A-12 Appendix)

Definition: A stormwater facility utilizing permanent pools of water to treat stormwater runoff. The primary treatment mechanism is settling of sediments, which results in a reduction in total suspended solids, including soil particles as

well as insoluble metals, which attach to the particles. Please schedule maintenance in a detention or wet pond area to occur after August 1 of each year to allow any migratory wildlife in the area the opportunity to migrate on.

Defect and Number:

O.1 Trash & Debris: Trash and debris exceeding 1 cubic foot per 1,000 square feet (this is about equal to the amount of trash it would take to fill one standard size garbage bag) of pond area.

Maintenance Necessary to bring to Standard: Clear trash and debris from pond.

O.2 Vegetation: Vegetation such as grass and weeds need to be mowed. Mowing is needed when grass exceeds 18 inches in height. In other areas, the general policy is to make the pond site match adjacent ground cover and terrain as long as there is no interference with the function of the facility. Mowed vegetation should be removed from areas where it could enter the pond, either when the pond water level rises or by rainfall runoff.

Maintenance Necessary to bring to Standard: Mow grass/ground cover to 4 inches in height. Remove trees and bushes where they are interfering with pond maintenance activities. Wetland plant species may require harvesting or special maintenance rather than mowing.

O.3 Inlet/Outlet Pipes: Inlet/outlet pipes clogged with sediment and/or debris.

Maintenance Necessary to bring to Standard: Remove sediment and debris so that the inlet and outlet piping are not clogged or blocked. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

O.4 Erosion Damage to Side Slopes of Pond: Erosion damage over 2 inches deep where the cause of damage is still present, or where there is a potential for continued erosion.

Maintenance Necessary to bring to Standard: Stabilize slopes by using the appropriate erosion control measure(s); utilizing rock reinforcement, planting of grass, or compaction.

O.5 Sediment: Accumulated sediment that exceeds 10% of the designed storm pond depth or that exceeds the depth of the sediment storage area plus 6 inches, usually within the first cell. Periodic sediment removal is critical to proper pond function.

Maintenance Necessary to bring to Standard: Clean out sediment to designed pond shape and depth, reseed pond if necessary to control erosion. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

O.6 Pollution: Oil, gasoline, or other contaminants prevalent and are visible.

Maintenance Necessary to bring to Standard: Remove all sediment from the pond bottom if contaminated, and skim contaminants from water surface. Call the Kitsap County Health District at 360-337-5672 for waste disposal information. Also contact the Port Orchard Stormwater Manager at 360-876-4991 for a site consultation to eliminate the source of the pollution.

O.7 Emergency Overflow/Spillway – Rock Missing, Erosion, or Obstruction: Only one layer of rock exists above native soil in an area of five square feet or larger, or any exposure of native soil, or blockage by debris or vegetation.

Maintenance Necessary to bring to Standard: Replace rocks to design standards and specifications.

O.8 Gravel Filter Window – Sediment and Debris: By visual inspection, little or no water flows through filter during heavy rainstorms.

Maintenance Necessary to bring to Standard: Replace gravel in filter window area. Remove sediment so that the window is free of sediment and debris and water flows freely. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

O.9 Pond Dike/Berm – Settlement: Any part of the dike which has settled 4 inches lower than the design elevation, or inspector determines that the dike/berm is unsound.

Maintenance Necessary to bring to Standard: Repair dike/berm to design specifications.

P. Other – Specific to Oil/Water Separators

Definition: A stormwater treatment facility used to remove suspended, floating or dispersed oil and greasy solids from runoff.

Defect and Number:

- P.1 Spill Control Oil/Water Separators:** Structure is not containing oil spills and is ejecting resident oil back into the stormwater system.

Maintenance Necessary to bring to Standard: Clean after each spill event so that the separator is retaining oil spills and is not ejecting oil into stormwater system. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

- P.2 API Oil/Water Separators:** Structure is not containing oil spills and is ejecting resident oil back into the stormwater system.

Maintenance Necessary to bring to Standard: Remove oil accumulations which exceed ½ inch in the first chamber or any visible oil in the second or third chamber. When the sediment level reaches 6 inches it should be removed. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

- P.3 Coalescing Plate Separators:** Structure is not containing oil spills and is ejecting resident oil back into the stormwater system.

Maintenance Necessary to bring to Standard: Remove oil accumulations which exceed ½ inch in the first chamber or any visible oil in the second or third chamber. When the sediment level reaches 6 inches it should be removed. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

**Q. Other – Specific to Infiltration (not including Ponds)
(See Figures A-13, A14 and A-15 in Appendix)**

Definition: A stormwater facility designed to store runoff while allowing it to penetrate into the native soil.

Defect and Number:

- Q.1 Plugged Air Vents:** One-half of the end area of the vent is blocked at any point with sediment and/or debris.

Maintenance Necessary to bring to Standard: Remove sediment and debris so that there is no clogging or blockage in the vent. If using a

vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

Q.2 Storage Area – Sediment (Infiltration Tanks and Vaults Only): Accumulated sediment that exceeds 6 inches in depth.

Maintenance Necessary to bring to Standard: Remove all sediment from the storage area in the vault. If using a vendor, ensure that the vendor properly disposes of waste. If not using a vendor, call the Kitsap County Health District at 360-337-5672 for disposal information on how to properly dispose of waste.

Q.3 Gaps between Vault/Pipe Section (Infiltration Tanks Only): Any cracks allowing material to enter into the facility.

Maintenance Necessary to bring to Standard: Seal all joints between tank/pipe sections.

Q.4 Tank/Pipe – Structural Damage (Infiltration Tanks Only): Any part of the tank/pipe that is bent out of shape more than 10% of its design shape.

Maintenance Necessary to bring to Standard: Repair or replace tank/pipe to design standards.

Catch basin Inserts- when sediment forms a cap over the insert media of the insert and/or unit, or insert is saturated with water and no longer has the capacity to absorb. Replace insert.

NOTES:

1. Sediment accumulations of more than 0.25 inches per year may indicate excessive erosion is occurring upstream of the facility or that the conveyance systems are not being properly maintained. The contributing drainage area should be checked for erosion problems or inadequate maintenance of conveyance systems if excessive sedimentation is noted in an infiltration facility.
2. In order to access the effectiveness of the infiltration function, inspection is recommended of downspouts, drains and catch basins during a storm. Also, evaluate adjacent properties for damage caused by system failure. Slow water dissipation or system backups and flooding may indicate that an infiltration system is not adequately performing.

Appendix A: List of Figures

Figure A-1: Type I Catch Basin

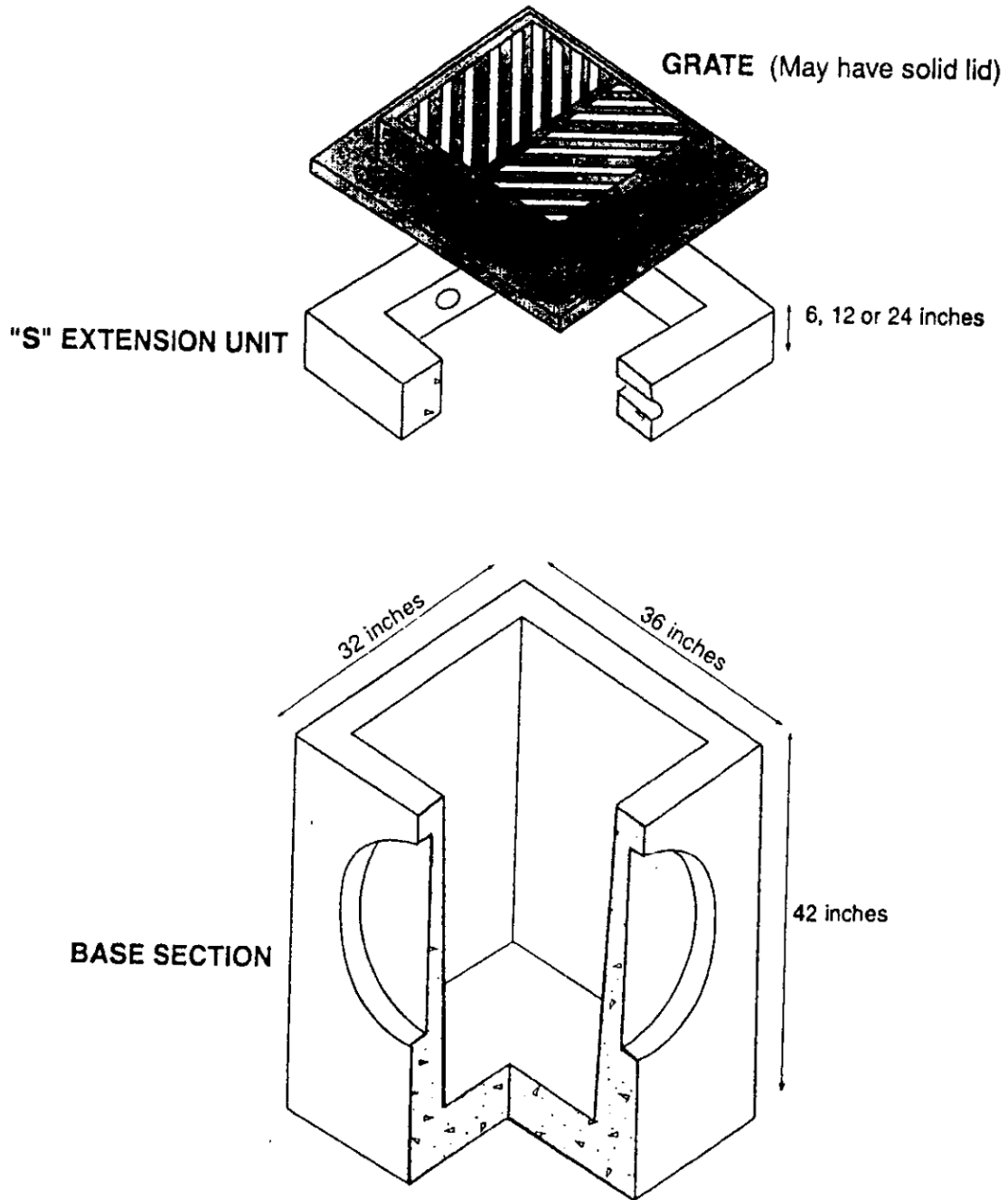
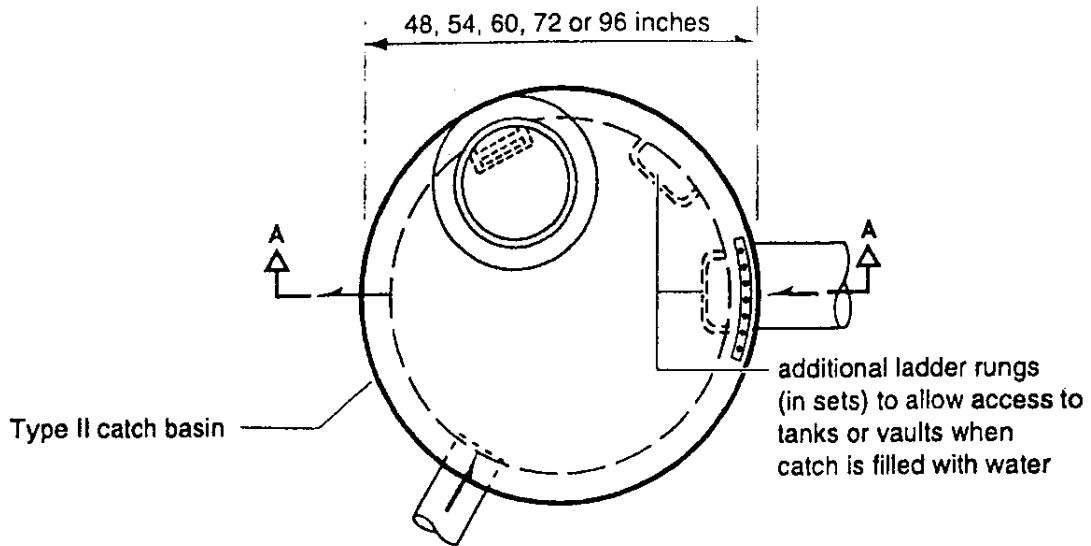
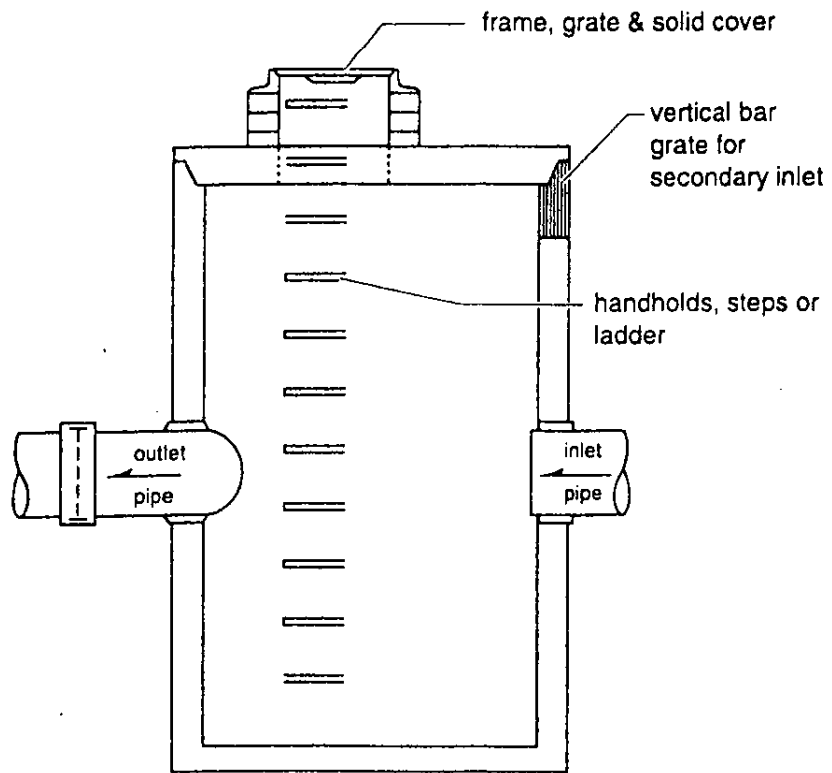


Figure A-2: Type II Catch Basin

(Round concrete structure)



PLAN VIEW
not to scale



SECTION A-A
not to scale

FIGURE A-3: Flow Restrictor (T-Section)

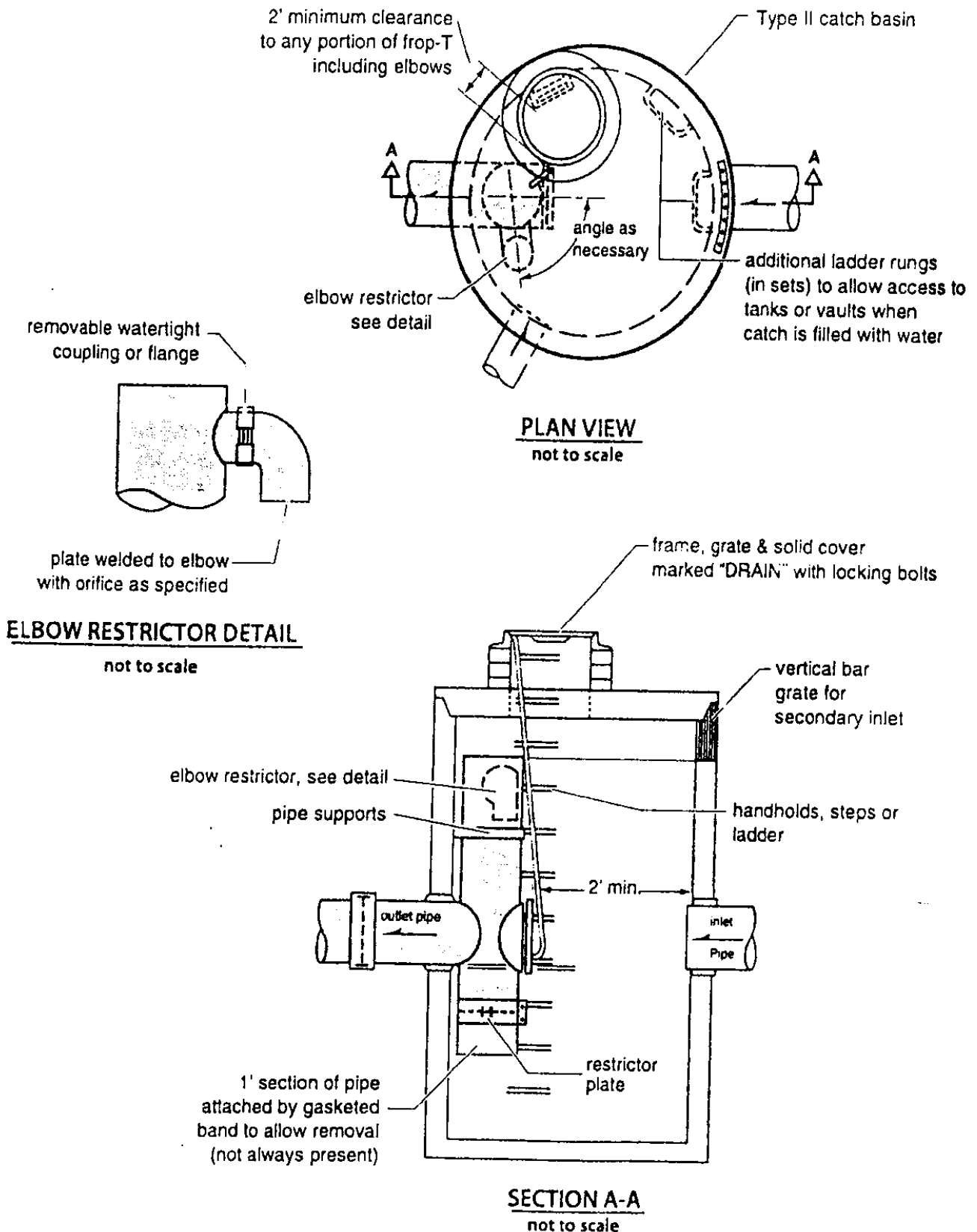
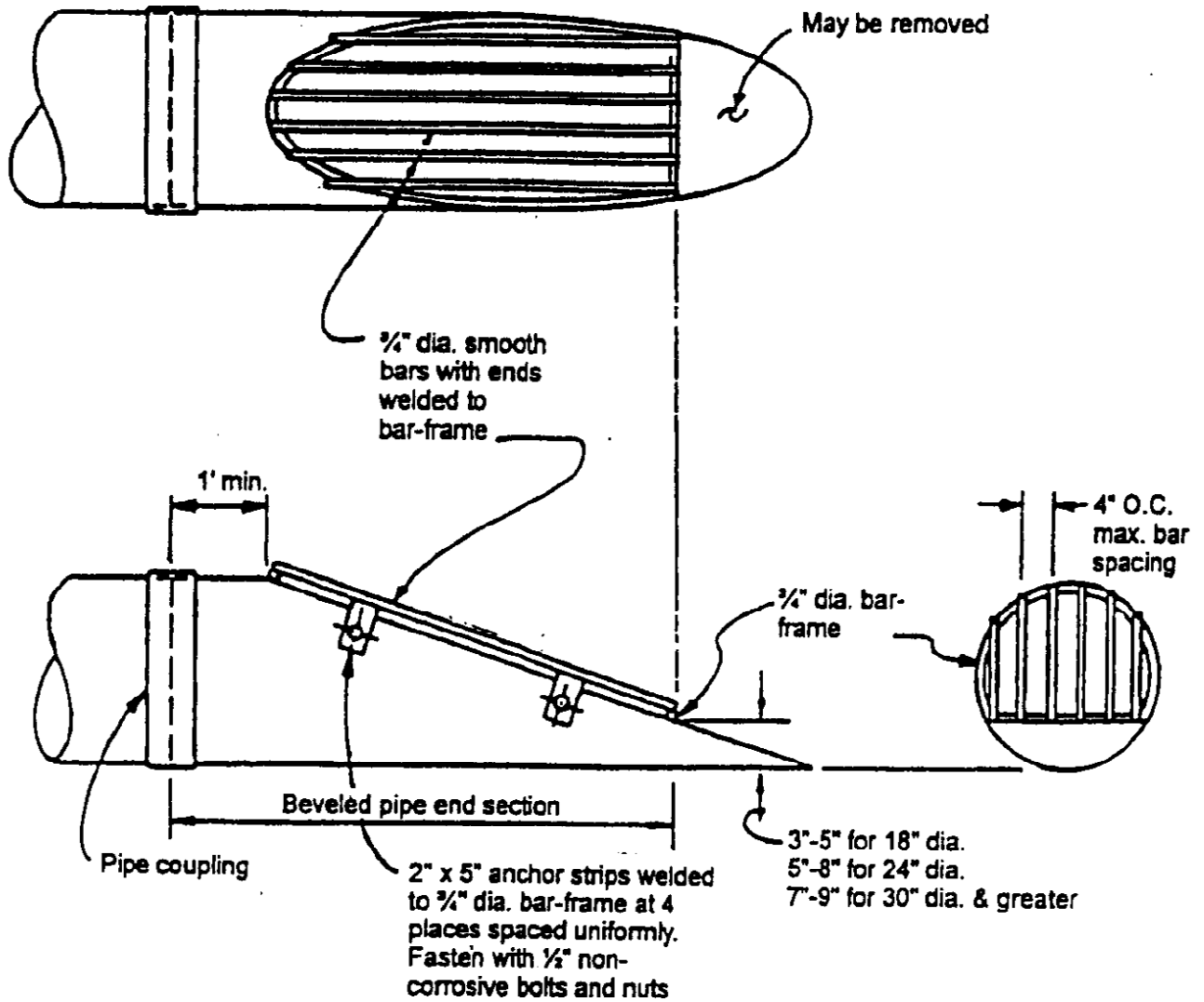


FIGURE A-4: Debris Barrier



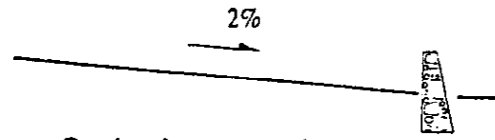
Notes:

1. CMP end-section shown.

FIGURE A-5: Ditches – Common Sections



Segmental (parabolic)



Curbed crowned street

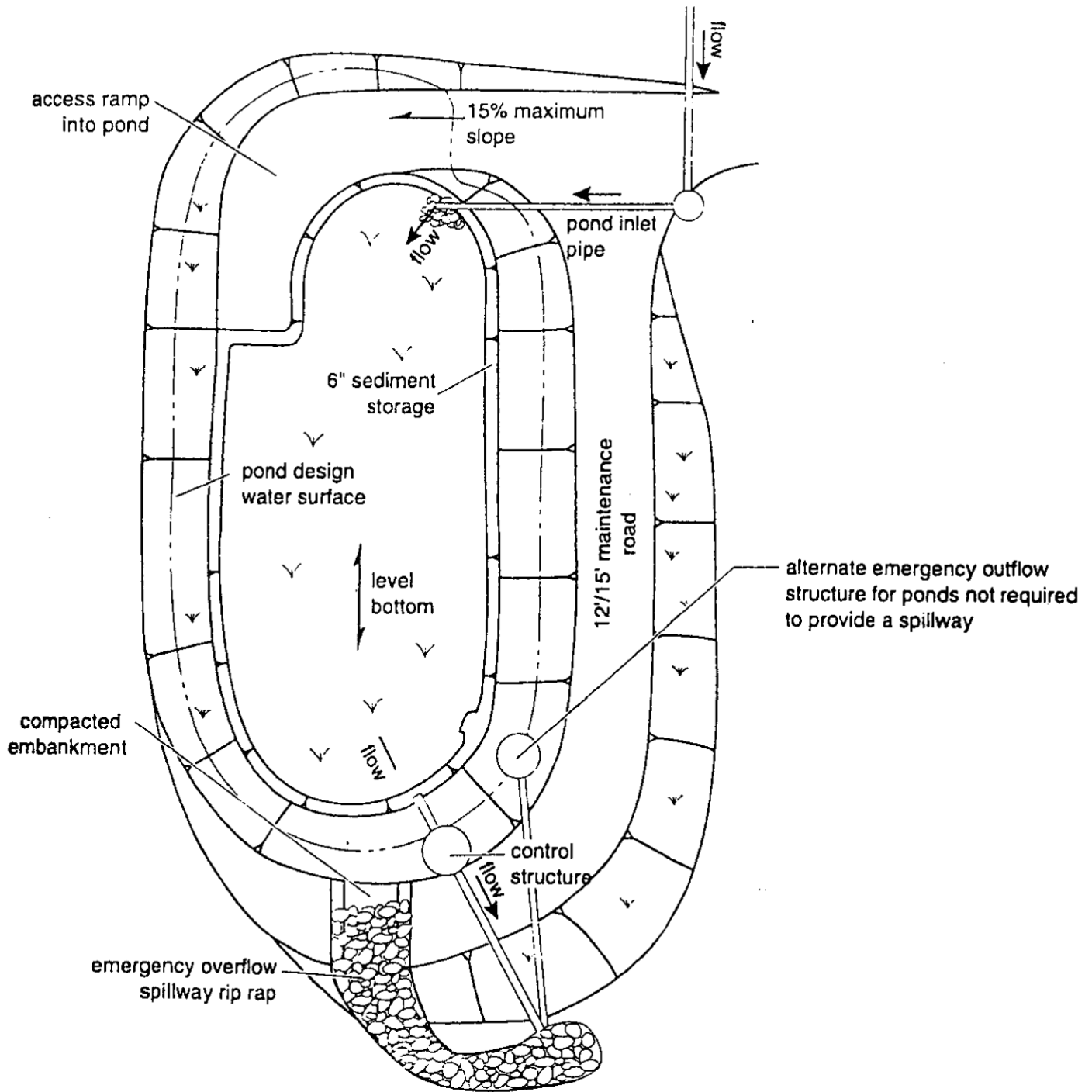


Trapezoidal



Isosceles triangular

FIGURE A-6: Typical Detention Pond



NOTE:

This detail is a schematic representation only. Actual configuration will vary depending on specific site constraints and applicable design criteria.

FIGURE A-7: Typical Infiltration Pond

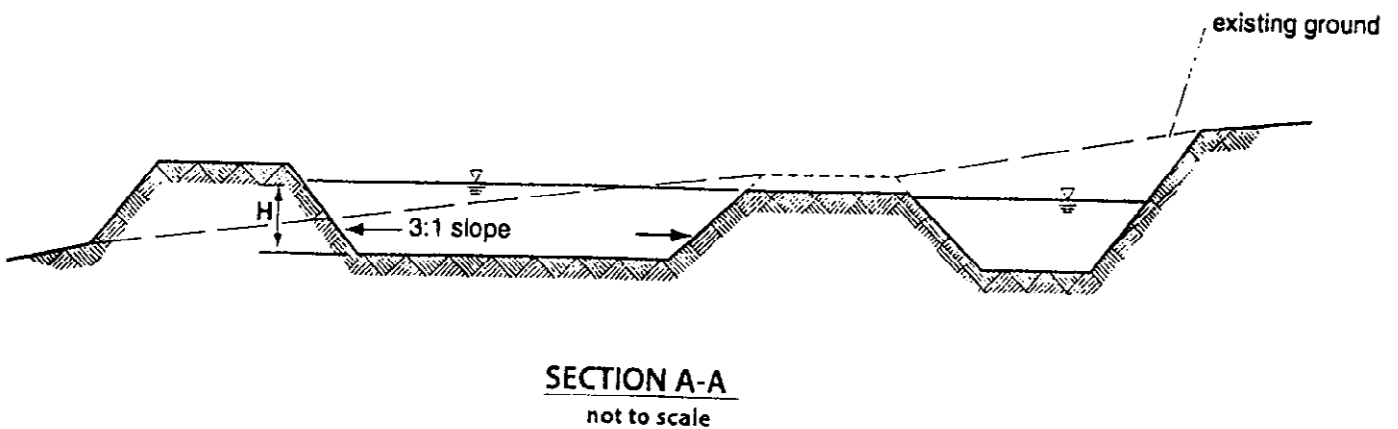
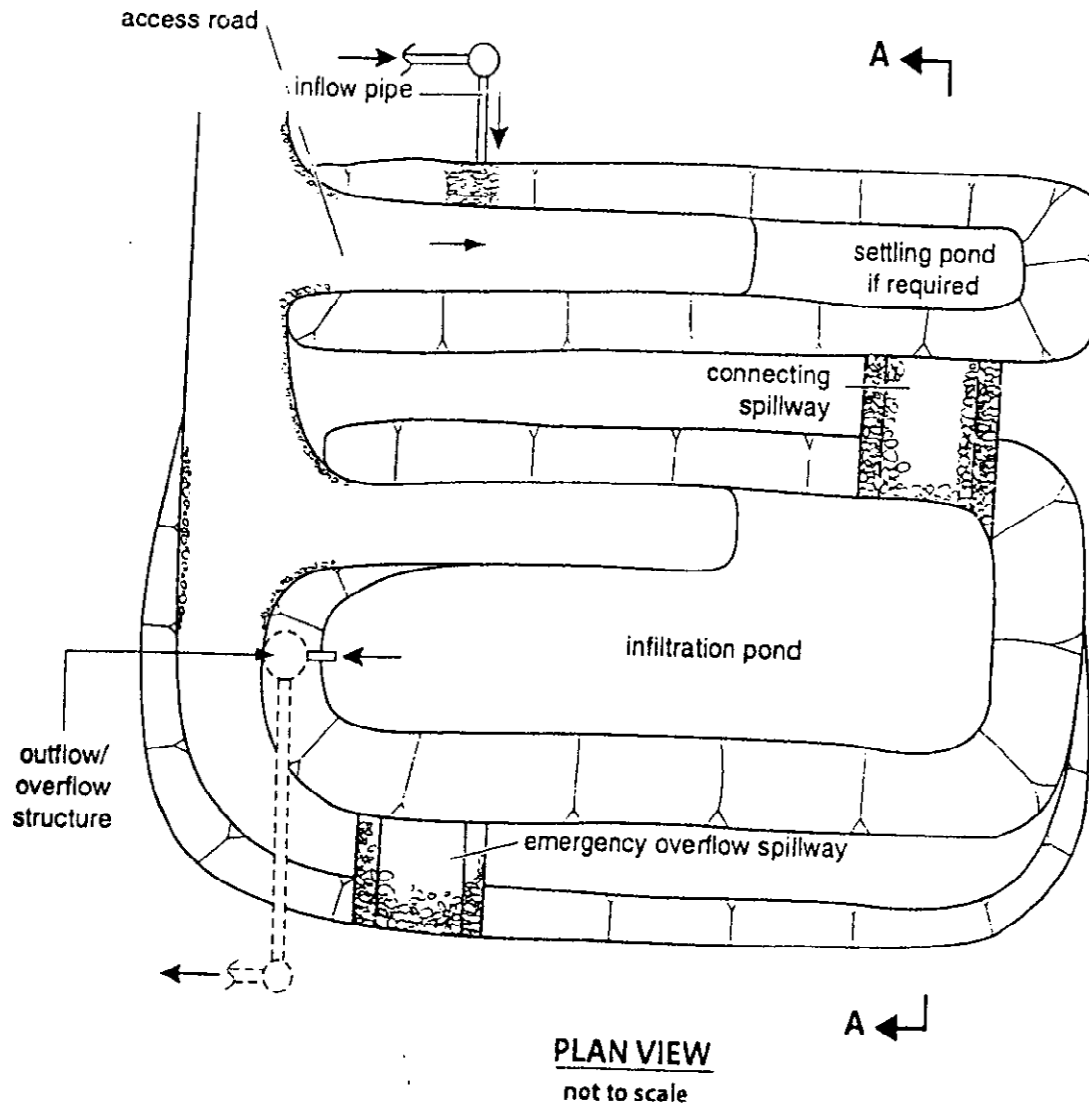
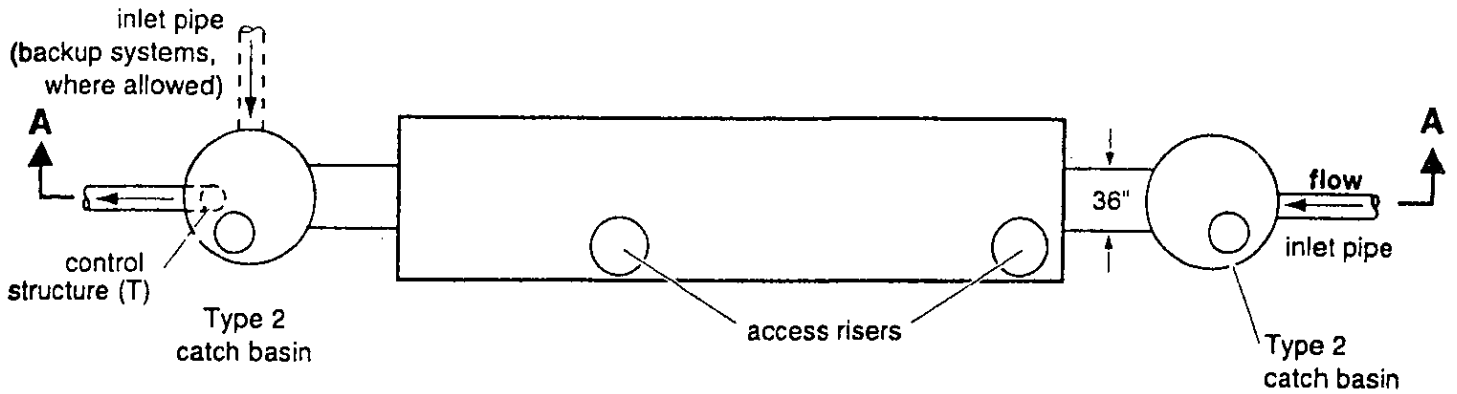


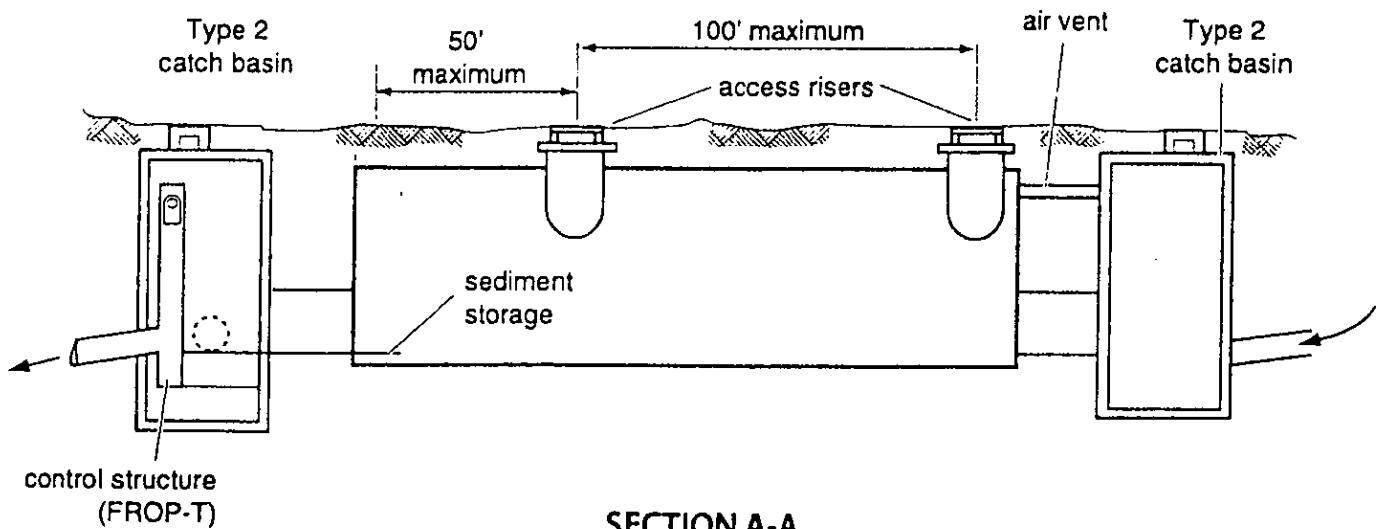
FIGURE A-8: Typical Detention Tank



PLAN VIEW

not to scale

"Flow through" system shown solid.
 Designs for "flow backup" system and
 parallel tanks shown dashed

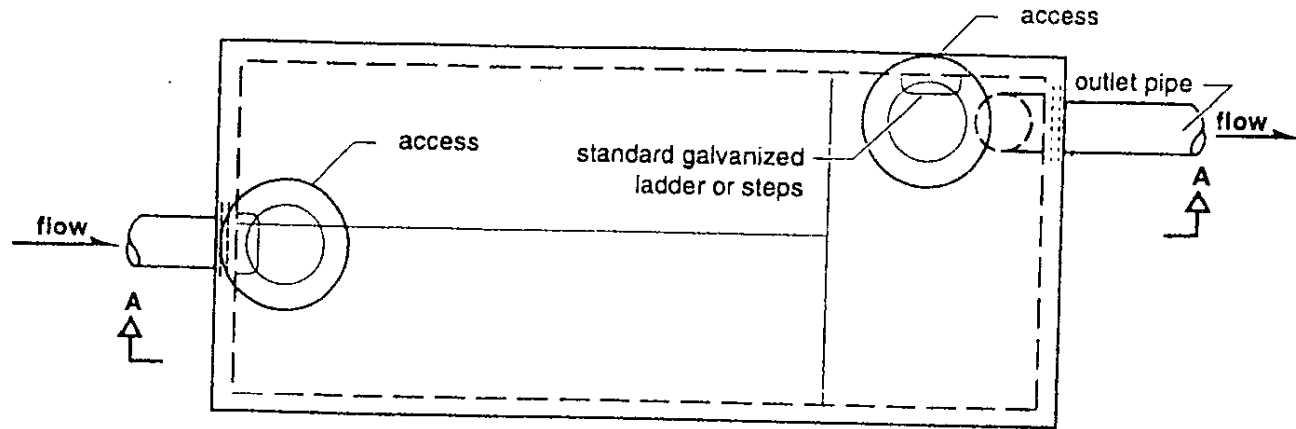


SECTION A-A

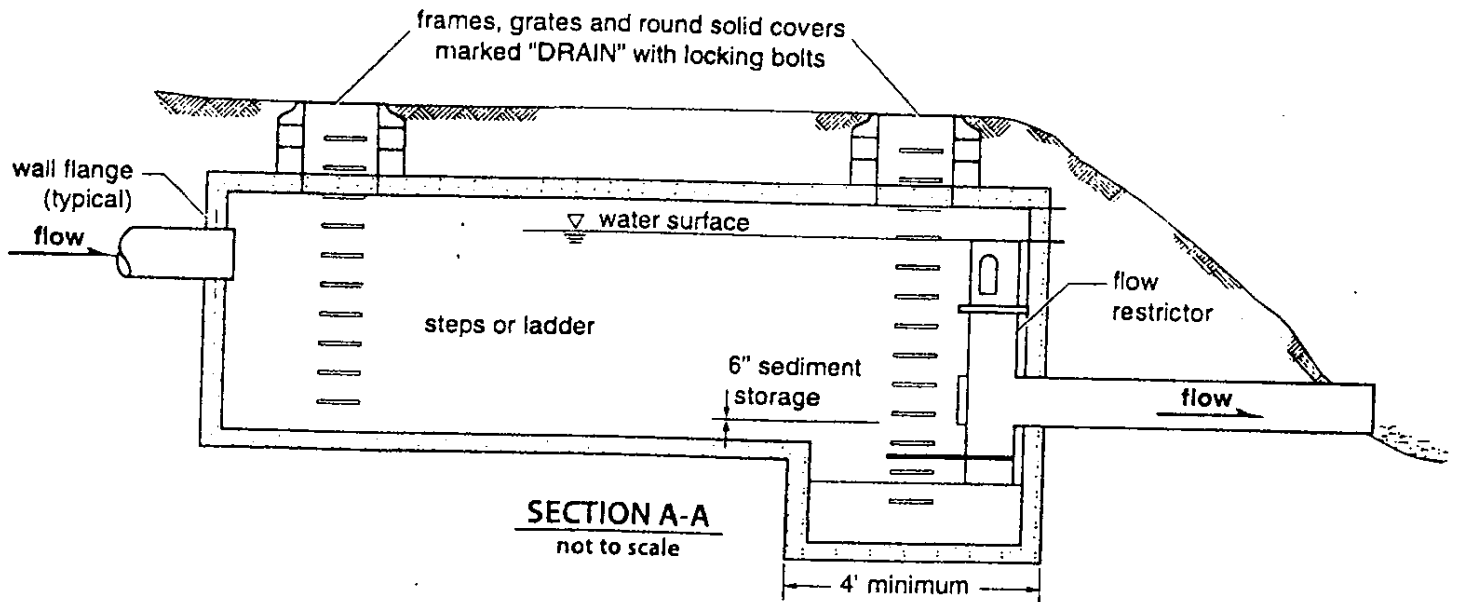
not to scale

"Flow through" system shown solid.

FIGURE A-9: Typical Detention Vault



PLAN VIEW
not to scale



SECTION A-A
not to scale

FIGURE A-10: Typical Wet Vault

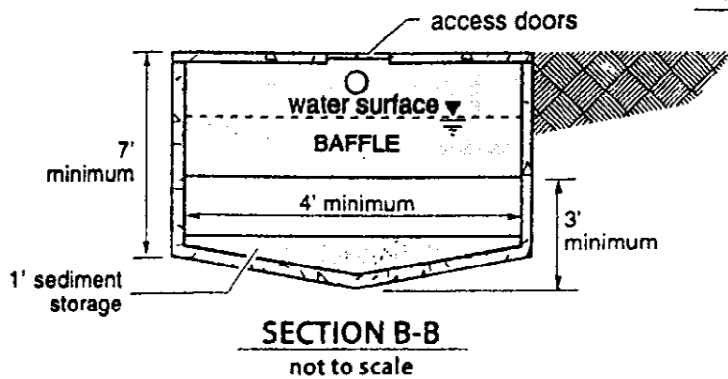
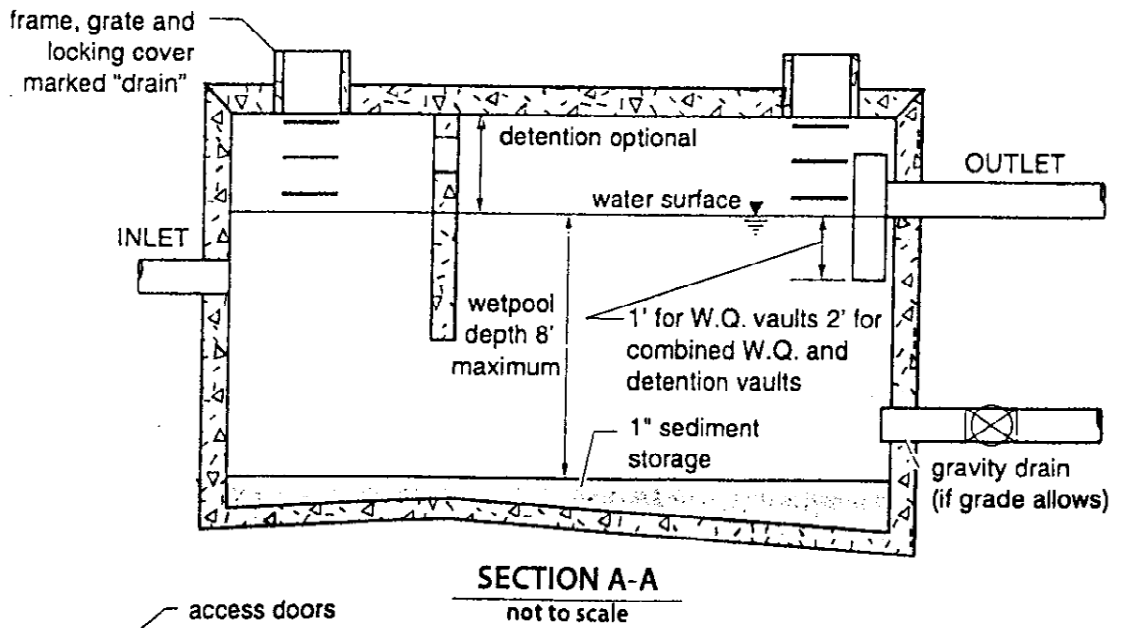
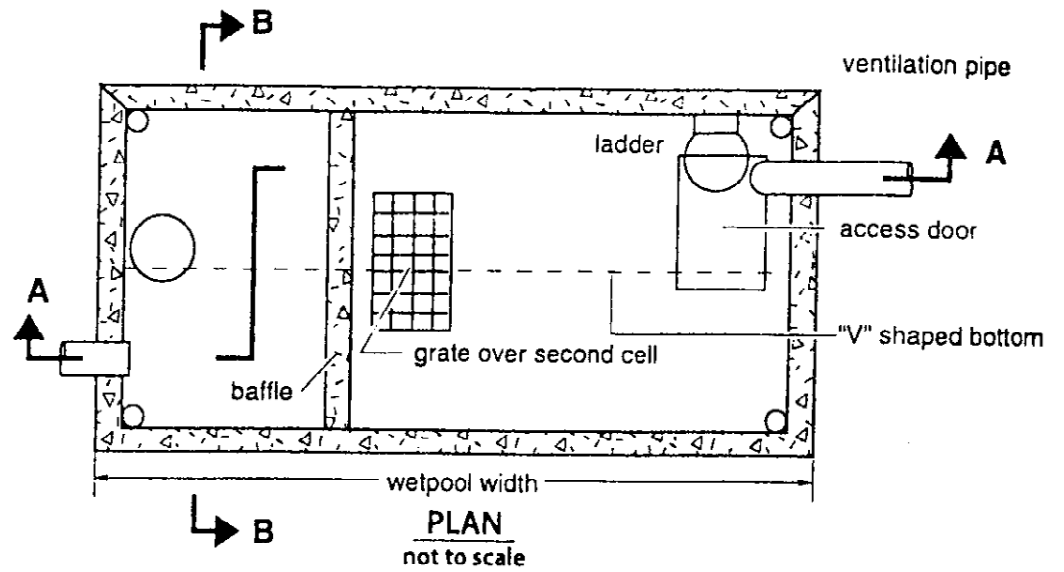
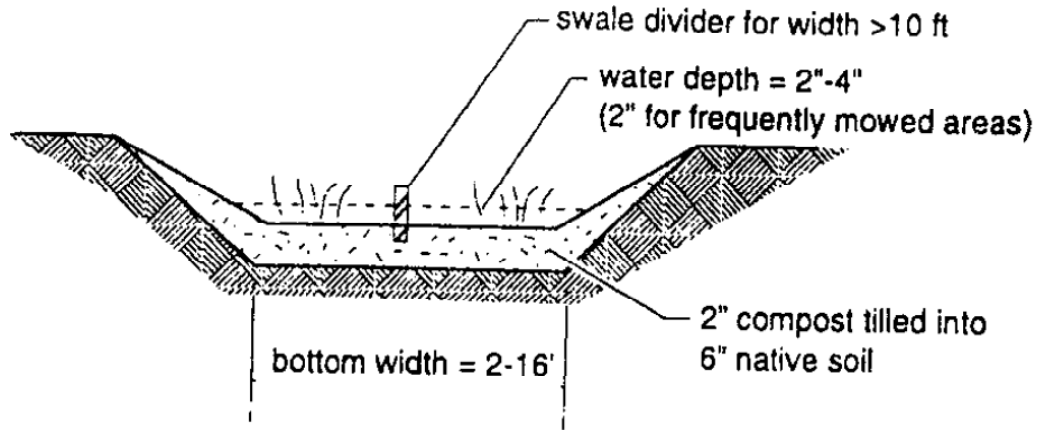
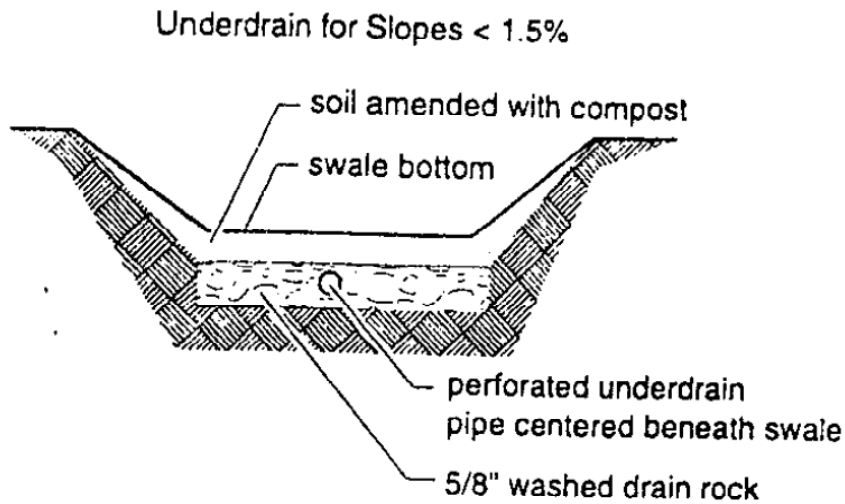


FIGURE A-11: Typical Biofiltration Swale



BIOSWALE SECTION

not to scale

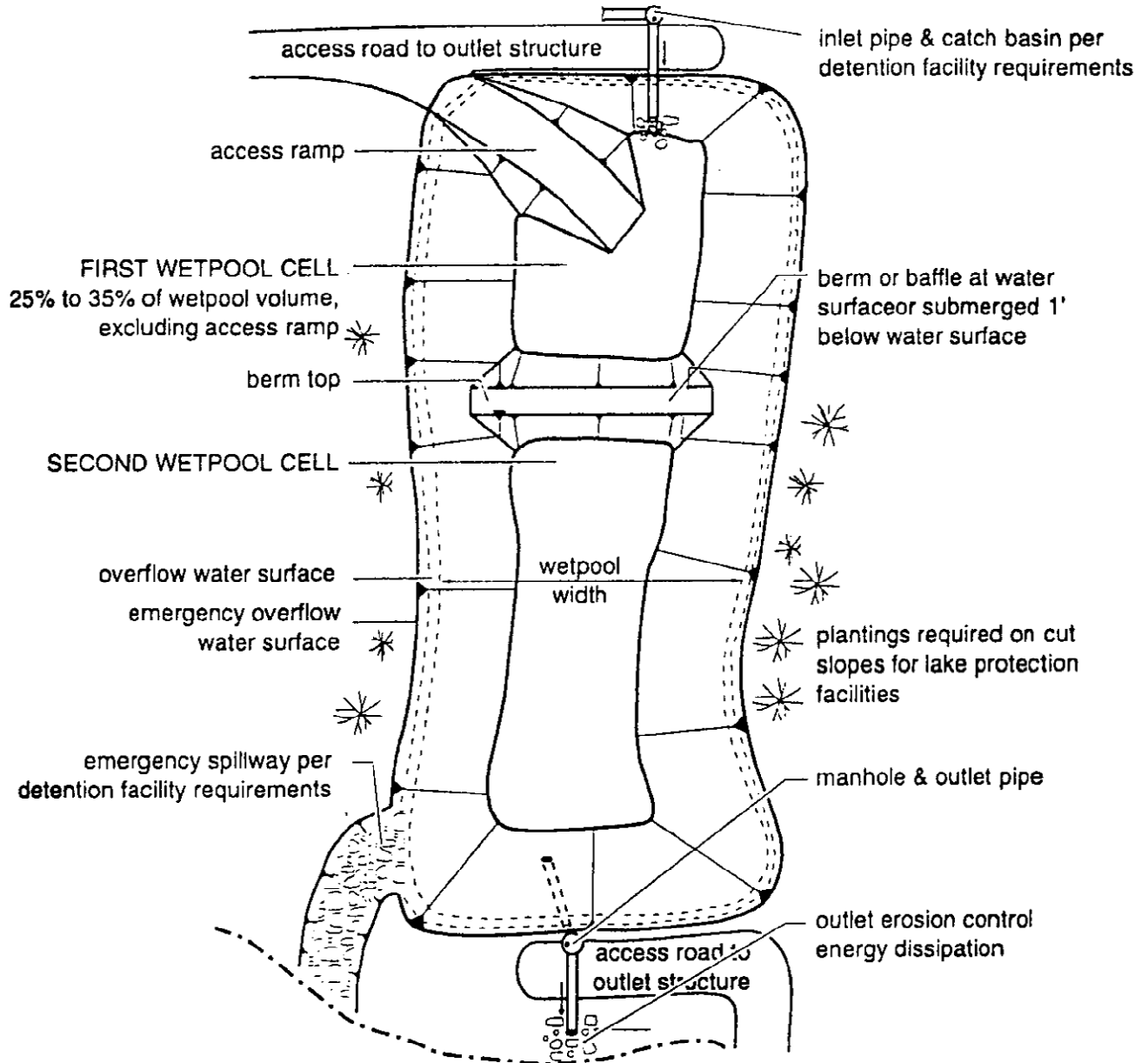


NOTE: Underdrain must infiltrate or drain freely to an acceptable discharge point.

BIOSWALE WITH UNDERDRAIN SECTION

not to scale

FIGURE A-12: Typical Wet Pond



PLAN VIEW

not to scale

FIGURE A-13: Typical Downspout Infiltration System

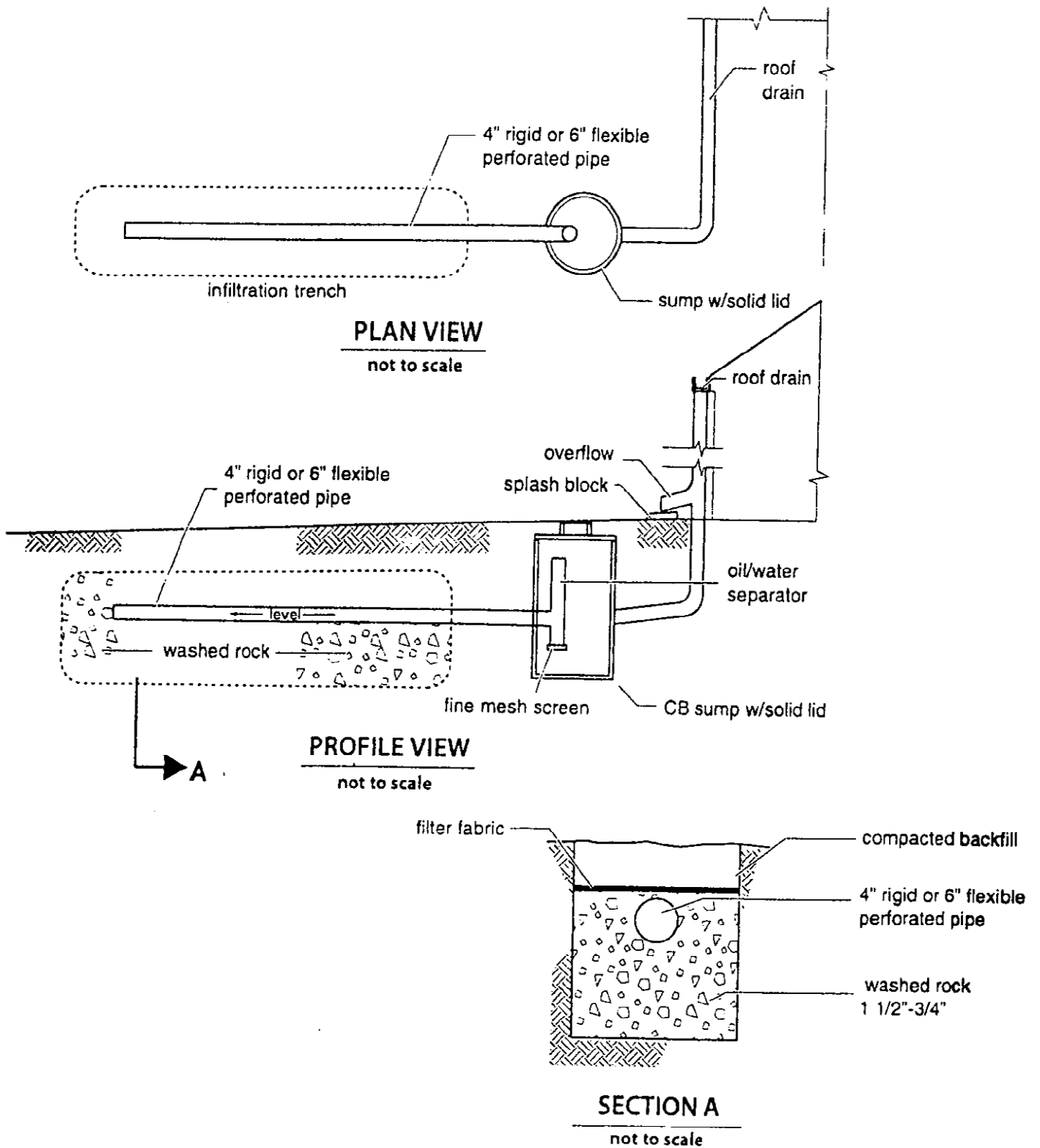


FIGURE A-14: Typical Small Infiltration System

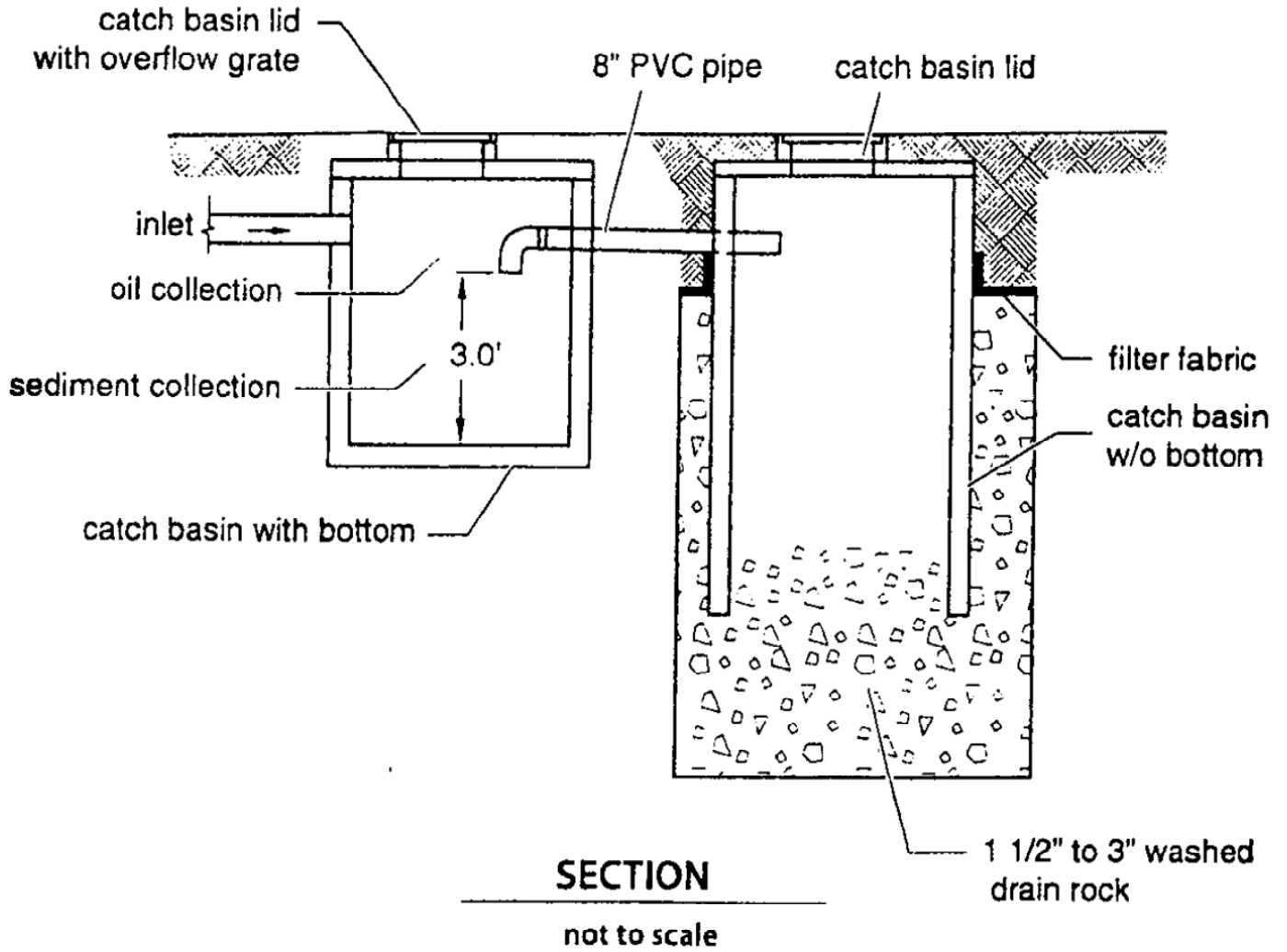
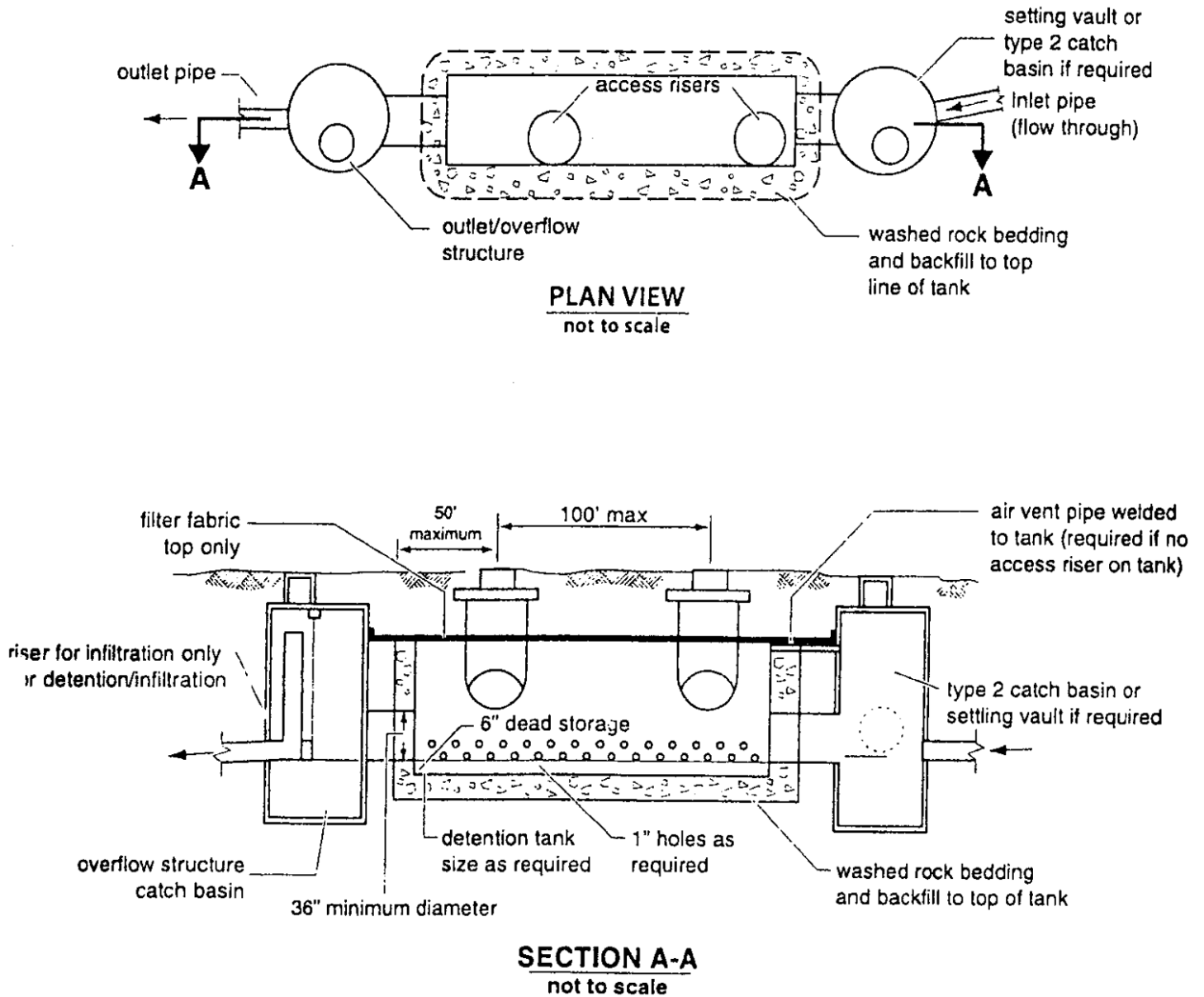


FIGURE A-15: Typical Infiltration Tank



SAMPLE COPY
COMMERCIAL DRAINAGE FACILITY
MAINTENANCE CHECKLIST

(Return to Port Orchard Public Works Department, 216 Prospect St, Port Orchard, WA 98366)

Property Name: Hidden Haven

Property Address: 1245 Haven Lane
 (Please note any name and address changes on Page 3 of this Checklist)

Property Owner or Managing Agent: Hidden Haven Homeowners Association Phone: (360) 874-0000

I-Checklist

Instructions for property owner/manager or maintenance vendor:

1. Refer to the enclosed Drainage Maintenance Standards booklet (see component definitions) and individual site plan (see stamped check box) to determine which facility type and components you have on your property. (On the site plan, "CB" refers to catch basin, "CI" to curb inlet, "MH" to manhole, and "CMH" to control manhole.)
2. Within the appropriate facility type section check "yes" or "no" indicating whether you have each facility component on your property (i.e. Type II catch basin, pipe, etc.).
3. Inspect each component for defects (refer to enclosed Drainage Maintenance Standards booklet and "Tips" sheet.)
4. In the "Meets Standard or Defects" column, list the applicable defect number (A-1, A-2, etc.) from the enclosed booklet or write "Meets Standard" if the component meets the standard **at the time of the inspection**. (NOTE: If there is more than one component for a facility type, list each component by its number on the site plan (CB-1, CB-2, etc.) along with the defect number. You need only list the components with defects in this case.) Use the back page of the form or add a separate sheet if necessary.
5. Perform maintenance on all defective facility components to bring them to the appropriate standard.
6. Check off that work has been completed and the date completed.

Facility Type	Component (See standards booklet)	Yes/No	"Meets Standard" Or Defect Number	Work Completed √	Date
Retention/Defention (R/D)					
1. R/D Pond (Including Infiltration) <i>Definition: Natural or manmade depression used to store runoff. May be enclosed by a fence. Fills when storm events occur. May not have visible inlet/outlet. May Drain by Infiltration only (soak into the soil)</i>	A. Type I Catch Basin (Inlet)	X	A.2	√	8-20-09
	B. Type II Catch Basin (Control Manhole)	X	B.3, B.11	√	8-20-09
	C. Flow Restrictor (located in Control Manhole)	X	C.2, C.7	√	8-20-09
	D. Debris Barrier	X	Meet Standard		
	E. Energy Dissipater		X		
	F. Pipe	X	Meet Standard		
	H. Fencing (Including Gate)	X	H.6	√	8-20-09
	I. Access Road	X	I.1	√	8-20-09
	J. Other- Specific to R/D Ponds	X	J.7, J.13	√	8-20-09
2. R/D Tank <i>Definition: Underground large-diameter pipe used to store runoff. Usually has access at both ends. Larger ones may have intermediate accesses through Type II catch basin(s)/manhole. Visible access may be through 36" diameter reducer.</i>	A. Type I Catch Basin (Inlet)				
	B. Type II Catch Basin (Control Manhole)				
	C. Flow Restrictor (located in Control Manhole)				
	D. Debris Barrier				
	E. Energy Dissipater				
	F. Pipe				
	G. Ditch				
	I. Access Road				
K. Other- Specific to R/D Tanks					


SAMPLE COPY

Facility Type	Component (See standards booklet)	Yes/No	"Meets Standard" Or Defect Number	Work Completed √	Date
Retention/Detention (R/D) - Continued					
3. R/D Vault <i>Definition: Underground runoff storage area. Concrete precast or poured in place. Usually, access in corners and is normally a large scale storage facility</i>	B. Type II Catch Basin (Control Manhole)				
	C. Flow Restrictor (located in Control Manhole)				
	D. Debris Barrier				
	E. Energy Dissipater				
	I. Access Road				
4. Conveyance <i>Definition: Culverts, pipes, ditches, catch basins, and manholes that pick up and convey runoff from buildings and parking areas to one of the above R/D facilities.</i>	A. Type I Catch Basin (Inlet)	X	A.2	√	8-20-09
	B. Type II Catch Basin (Control Manhole)		X		
	D. Debris Barrier		X		
	E. Energy Dissipater		X		
	F. Pipe	X	Meet Standard		
	G. Ditch		X		
Water Quality					
5. Wet Vault <i>Definition: Underground water storage area, concrete precast or poured in place, that removes pollutants from runoff through settling action. Usually has access in corners. Will always have standing water and usually has divider plates</i>	B. Type II Catch Basin (Control Manhole)				
	C. Flow Restrictor (located in Control Manhole)				
	D. Debris Barrier				
	E. Energy Dissipater				
	H. Fencing (Including Gate)				
	I. Access Road				
6. Bioswale <i>Definition: Broad open channel that is lined with grass vegetation, which acts as a filter to remove pollutants from runoff. Usually trapezoidal with flat bottom.</i>	G. Ditch		X		
	N. Other- Specific to Bioswales	X	N.2, N.4	√	8-20-09
7. Wet pond <i>Definition: Natural or manmade depression; may be enclosed by a fence. Similar to a retention/detention pond. Multicelled, with continually standing water. Removes pollutants from runoff through settling action. If a combined retention/detention and wet pond, water level will fluctuate during storm events.</i>	A. Type I Catch Basin (Inlet)				
	B. Type II Catch Basin (Control Manhole)				
	C. Flow Restrictor (located in Control Manhole)				
	D. Debris Barrier				
	E. Energy Dissipater				
	F. Pipe				
	H. Fencing (Including Gate)				
	I. Access Road				
8. Infiltration (not including ponds) <i>Definition: Underground perforated pipe, tank, or vault system that allows runoff to percolate back into surrounding soil. Some may have associated Type I Catch Basins, Type II Catch Basins (Manholes), or elements to facilitate inspection and cleaning. Many are enclosed without access and are only evaluated by looking for surrounding flooding or erosion problems; may be labeled as "drywell" or "rump".</i>	A. Type I Catch Basin (Inlet)				
	B. Type II Catch Basin (Control Manhole)				
	C. Flow Restrictor (located in Control Manhole)				
	D. Debris Barrier				
	E. Energy Dissipater				
	F. Pipe				
	G. Ditch				
I. Access Road					
O. Other- Specific to Infiltration					

SAMPLE COPY

II- Certification

I, the undersigned, do hereby certify under penalty of perjury, that the inspection has been performed, the materials have been furnished, the services rendered, and/or the labor performed as deemed necessary from the inspection to meet City of Port Orchard standards and as indicated above.

_____ Signature (Owner/Managing Agent)	<u>Maintenance, Inc.</u> Service Contractor Name
_____ Printed Name	 Representative's Signature
_____ Phone Number	<u>(360) 876-0000</u> Phone Number
_____ Date	<u>August 21, 2009</u> Date

PLEASE NOTE ANY CHANGES IN OWNERSHIP/MANAGING AGENT OR COMMENTS IN THE SPACE PROVIDED BELOW:

Mail all pages of this form to:

Please return by 1 September 2009

Public Works Department
City of Port Orchard
216 Prospect Street
Port Orchard, WA 98366

Or Fax to:

(360) 876-4980