

# *How to Build & Install A Flexpipe*

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together for  
people,  
streams  
& fish.



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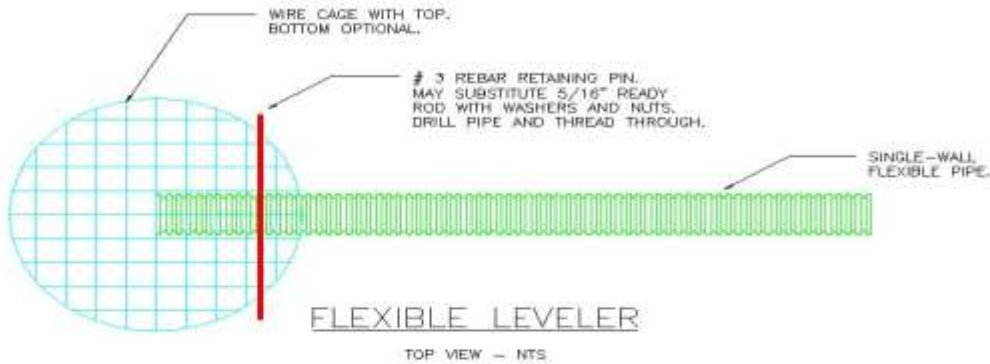
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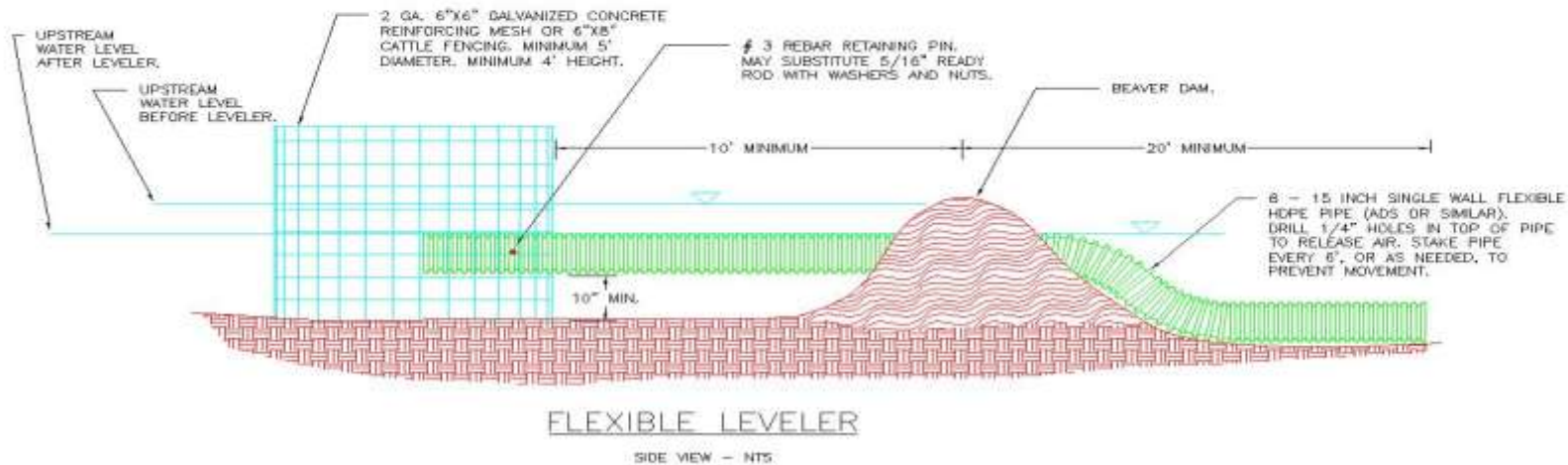
Snohomish County

# Flexpipe Plans



## CONSTRUCTION NOTES:

1. CONSTRUCT WIRE CAGE USING HOG RINGS FOR FASTENERS. OVERLAP ONE SECTION FOR CAGE WALL.
2. CUT OUT HOLE FOR FLEXIBLE PIPE IN CAGE WALL.
3. IF CAGE IS BUILT WITH NO BOTTOM, CUT OUT LOWER HORIZONTAL WIRE BETWEEN VERTICAL WIRES TO ALLOW CAGE TO SETTLE INTO STREAMBED.
4. REMOVE DAM AS NEEDED TO PLACE FLEXIBLE PIPE. REPLACE DAM AFTER LEVELER IS INSTALLED.
5. STAKE SINGLE-WALL HDPE PIPE EVERY 8 FT. TO PREVENT IT FROM FLOATING OR BEAVERS FROM MOVING IT. USE TWO T-POSTS AND WIRE BETWEEN THEM AND OVER THE TOP OF THE PIPE TO SECURE THE PIPE.
6. DRILL 3/8" HOLE IN CULVERT FOR REBAR TO ALLOW FOR FRICTION FIT. IF READY ROD IS USED, PLACE WASHERS NEXT TO PIPE AND SECURE WITH DOUBLE NUTS.
7. ONE (1) 16' SECTION OF FENCING WILL CONSTRUCT A CAGE WALL APPROXIMATELY 5' IN DIAMETER. AN ADDITIONAL SECTION IS NEEDED TO CONSTRUCT THE TOP AND BOTTOM OF EACH CAGE.
8. PIPE DIAMETER SHOULD BE SIZED TO PASS THE STREAM BASE FLOW.
9. FINAL LAYOUT OF THE PIPE SHOULD ALLOW FOR A SHALLOW GRADIENT TO FACILITATE FISH PASSAGE.



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**FLEXIBLE LEVELER**  
 SNOHOMISH COUNTY PUBLIC WORKS

Note: The naming of devices used to control beaverworks is extremely confusing, because there is no established naming convention used within the field (We're all still trying to figure things out). Other names are sometimes used for these contraptions. But I don't want to get hung up on terminology. Key is the use of single walled pipe (for a flexible installation) and a 5' diameter cage built with 6" by 6" or 6" by 8" mesh wire around the inlet.

# Tips on Construction

We use galvanized cattle panels (6" by 8" grid) for cage materials. Panels are 16' long and 52" tall. Each cage takes two sheets. One forms the sides, and the other is used for the top and bottom as shown in the photographs. Other materials of similar dimension could be used. We use these panels to allow for fish passage.





To hold the cage together, we use hog rings and a few saddle clamps



Use bolt cutters to trim ends of top and bottom panels

Bend the edges down on the end pieces to help hold the shape.



# Pipe guard is now ready for installation

Note opening for pipe insertion. This one is cut for a deep water installation. The inlet of the pipe needs to be at least 6" off the bottom to help keep sediment and debris from accumulating in the pipe.

Securing the pipe inside the cage with all thread rod is optional.





# A Few Tips on Site Preparation

Notch dam slightly below target pond levels, removing wood and debris that would interfere with the pipe installation. Make sure that the pond water is not released too rapidly to prevent downstream flooding.

Try to leave at least 24" of pond depth. A shallower pond may drive the beaver to abandon the dam, and build a new dam in the vicinity, thus defeating the installation.



A large pond may take several days of draw-down before you are ready to install a Flexpipe. Start draw-down early in the morning because beaver will try to repair that evening.

Once the site is ready and water levels have been lowered, the Flexpipe assembly can be brought in to be installed. We have found it is easier to bring the cage and pipe to the site unconnected (A) rather than assembled (B), and to then put the pieces together in the water after the water levels have stabilized. It makes placement easier. Note also that we use single walled pipe material.

A



B



Single walled pipe is much more flexible and easy to use





# Joining and Venting the Pipe



It is sometimes necessary to cut the 20' lengths into 10' length for ease of transport. Pipe sections are easy to join/rejoin with couplers.

Because the exposed inside rib will trap air, it is often helpful to drill vent holes between the cage and the dam. This reduces buoyancy.





# Anchoring the Pipe



Where the pipe passes thru the dam, install at least two pair of t-posts to anchor the pipe down. T-post are driven at an angle and tied together with wire. Note that this is the most critical part of pipe anchoring, and will be key to the success or failure of the installation. Beavers, when trying to plug the breach will inadvertently lift the pipe as they jam sticks under the pipe while trying to plug the leak if only secured with concrete blocks. Along the rest of the pipe, concrete blocks can be used to keep the pipe from floating/raising.





Note elevated pipe. This installation was a failure because the pipe was not anchored down securely in the section passing through the dam. Beaver, in their predicted repair of the dam breach, inadvertently lifted the pipe, thus defeating the effectiveness of the bypass installation.



# Typical Finished Installations



These sites have all been successful installations





Note the extreme activity at this cage. The cage was only 6' from the culvert (dam site). However, the culvert remained open and functioning. Road flooding has been eliminated.



***I hope that you have found the previous slides helpful. Good luck!***



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