

AquaDam®

“Water Controlling Water”™

User's Guide

(Includes Material Specifications)



Low-Impact, Environmentally Friendly Water-Filled Cofferdams for Stream Diversions, Flood Control, Haz-Mat Containment, and Dewatering Structures.

AquaDams® are flexible water-filled barriers that can be used as barriers or cofferdams to isolate work areas such as stream diversions and dewatering boat ramps, boat docks, and pond liners for repairs. They are more effective than sandbags and other water control devices.

Revised: 2026

Aqua Dam Inc.®
P.O. Box 144 / 121 A Main St. Scotia, CA 95565
(800) 682-9283
www.aquadam.net
email: dave@aquadam.net

Table of Contents

Introduction.....	3
About the Company	3
Patents	3
Concept	4
What Is A Cofferdam?	6
Applications	6
AquaDam® Height Selection and Size Criteria.....	7
Table 1: Standard AquaDam® Sizes and Recommended Use.....	7
Water Depth	7
Water Velocity	8
Installation Site	8
Weather / Spring Run-off	8
Other Site Criteria	8
Width of the River	8
Rough River Bed	8
Installation	9
Small AquaDams® (1' – 4' high)	9
Large AquaDams® (6' – 16' high).....	10
AquaDam® Installation Procedures	11
Step 1: Transport.....	11
Step 2: Starting Point	11
Step 3: Preparing the AquaDam® for Inflation	12
Step 4: Moving Rocks and Debris	13
Step 5: Restraining Ropes	13
Large AquaDams®	13
Standing Water Application	14
Step 6: Determine Height and Elevation	14
Step 7: Filling the AquaDam®	14
Manning the Ropes	15
Lateral Movement	16
How Lateral Movement Occurs	16
Connecting AquaDam® Sections Using Connection Collars	18
Figure 7: Connecting AquaDams® Sections Using Connection Collars	19
Figure 8: Two AquaDams® Connected Together	20
Maintenance Procedures	20
AquaDam® Removal Using Rerolling Brackets	21
Large AquaDam® Removal	22
Safety	23
Emergency Removal	23
Obstacles and Debris	23
Cold Weather	23
Walking on the AquaDam®	23
AquaDam® Material Specifications	24

Introduction

Aqua Dam Inc.® manufactures AquaDams®, a low impact water-filled option that is quickly deployed and is much less detrimental to the environment than a temporary earthen-filled cofferdam (barrier). The Clean Water Act demands the use of alternatives to fill discharges, where practical, to achieve best management practices. Site isolation is mandatory. Water-filled protective devices, such as AquaDams®, are the ideal tools for water management programs that protect the aquatic environment. The U.S. Army Corps of Engineers has and is presently approving the use of AquaDams® as a viable, environmentally acceptable method of diverting or containing water.

The following is an overview of Aqua Dam Inc.®: the various applications of AquaDams®; site and size requirements; equipment and manpower requirements; installation techniques; safety, maintenance, and removal.

About The Company

Aqua Dam Inc.® was incorporated in 2009. After 20 plus years of using the idea of "water controlling water", Aqua Dam, Inc.® developed new concepts for managing: water diversions, dewatering, flood control barriers, levee toppings, and water storage by using AquaDams®. Aqua Dam Inc.® offers observation services and free consulting services over the phone regarding the installation and implementation of a water-filled cofferdam. The most important features of AquaDams® are: the ease and speed at which they can be installed (especially in emergency situations), they consist almost entirely of on-site water and have a good chance of being reused.

Patents

Aqua Dam Inc.® uses patents on the design and utilization of multiple chambered AquaDams® that use water and air as the inflation media, and the technique used in connecting multiple AquaDams® together to achieve any necessary length.

US Patent No. 5059065

US Patent No. 5125767

US Patent No. 6481928

Several other patents are currently pending.

Concept

AquaDams® are portable dams meant for temporary use, which are filled with on-site water, and can be installed where needed to contain or divert the flow of water. AquaDams® consist of two basic components: two watertight inner polyethylene tubes (**which contain the water**), and an outer or "master" sleeve made of a heavy duty geotextile woven polypropylene (**which holds the two polyethylene inner tubes (A & B) in contact when filled with water**). The baffled outer sleeve and inner tubes combine to form an AquaDam® as shown in *Figure 1*, a cut away section illustrating the relationship between the inner and outer tubes of a typical filled AquaDam®.

Figure 1: A Typical Filled AquaDam®

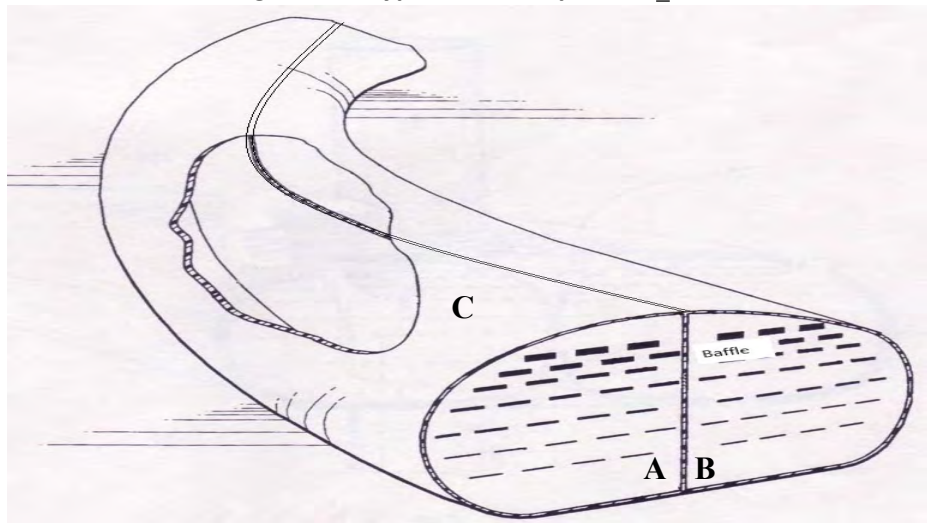


Figure 1: A cross section of a typical AquaDam®, illustrating the relationship between the two inner tubes which contain the water and the "master" sleeve that keeps the inner tubes parallel and in contact with each other.

Section between A and B illustrates the Baffle section of the AquaDam.

Section C is the outer or "master" sleeve made of very tough polypropylene woven geotextile fabric which confines the water-filled inner tubes, making the AquaDam® a solid wall of water. These two confined columns of water provide the mass, weight, and pressure that gives the AquaDam® its stability.

To install an AquaDam®, on-site water is pumped into the two inner tubes during the installation process. The durable woven outer sleeve confines the water-filled inner tubes. The counter friction/hydraulic pressure between the inner tube and the baffled outer sleeve, along with the mass and weight of the water creates pressure and stabilizes the AquaDam® when lateral water pressure is exerted against it. Due to the inherent flexibility of the materials used to confine the water, AquaDams® will conform to most surfaces, providing an excellent seal and keeping water seepage to a minimum.

AquaDams® come in a variety of sizes, ranging from 1 to 16 feet in height when filled. AquaDams® come in standard lengths from 50 to 500 feet, in 50 foot increments, and are available for immediate shipment. Any length or height can be fabricated: shorter, longer, or irregular lengths are available with notice. Using coupling collars, two or more AquaDams® can be joined together to form a continuous cofferdam of any length. AquaDams® are joined together by patented coupling collar connection. Large and small AquaDams® can be used in conjunction with each other, making the possible configurations almost endless. They can be used in a straight line, to form an arc, or to encircle an area.

AquaDams® are typically assembled in a factory and shipped as a roll ready for use at the job site. However, it is not unusual to assemble larger AquaDams® on site. A typical AquaDam® consists of the “master” sleeve and a pair of inner tubes rolled up on a wooden core, as shown below in *Figure 2*. In many instances, the core also plays an important part in the installation, re-rolling for future use, and transportation of AquaDams®.

Figure 2:

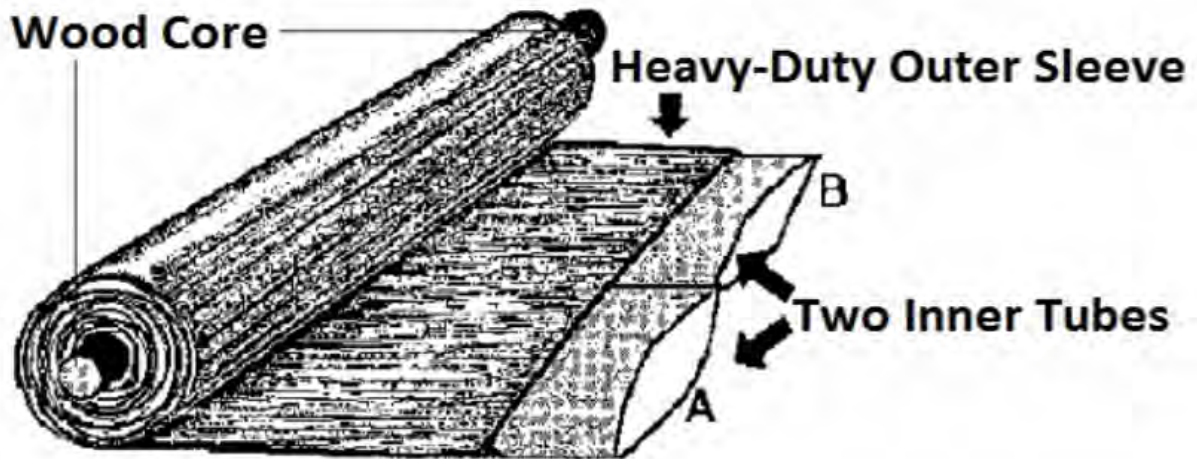


Figure 2: A typical factory assembled AquaDam® prior to being filled, showing the inner tubes and outer sleeve rolled up around the core. The AquaDams’® tubes (A & B) are left open for filling purposes. This open/starting end will be elevated up the stream bank (the starting point) which has to be higher than the elevation that the main body of the AquaDam® will achieve when fully filled. The other end is sealed and may have an attached coupling collar used for allowing a second AquaDam® to be connected.

What Is A Cofferddam?

Applications

AquaDams® can be used in a wide range of applications. Listed below are some of the more common applications of AquaDams®:

<p><u>Construction</u></p> <ul style="list-style-type: none"> • Work area isolation and dewatering • Water diversion in rivers and wetlands • Water containment • Boat ramp dewatering • Pond liner repair dewatering • Bridge pier repair • Pipeline crossings • Erosion control through diversion or containment of flowing water • Water intake structures for municipalities • Water discharge structures <p><u>Flood Control</u></p> <ul style="list-style-type: none"> • Residential • Municipal • Industrial • Commercial • Levees, levee toppings 	<p><u>Environmental</u></p> <ul style="list-style-type: none"> • Fish habitat improvement • Silt containment, sediment collection, or settling ponds • Hazardous material or chemical spills (containment) • Temporary foot causeway through environmentally sensitive areas • Wetlands management <p><u>WaterStorage</u></p> <ul style="list-style-type: none"> • Residential • Municipal • Industrial • Commercial
--	---

The old ways of earthen fill discharges and expensive sheet piling have been the traditional method of isolating submerged work areas. These methods are environmentally detrimental, time consuming, and expensive because of their reliance on heavy equipment.

Water-filled cofferdams eliminate the fill-discharge risk of construction sites. On-site water is pumped into an AquaDam®, which unrolls the unit due to the water pressure inside it. An AquaDam® can be installed in hours in most applications, without causing damage to the aquatic environment while isolating the work area. Environmentally friendly dewatering of the worksite can be achieved and your work can begin.

When used for perimeter flood control and augmenting levees, for example, AquaDams® are much more effective than sandbags. They can be installed much quicker, at a fraction of the cost, without all the foot traffic associated with labor-intensive sandbagging.

The amount of water that can be stored in a standard 4-FT AquaDam®, with a width of 9-FT and a length of 100-FT (filled to capacity), is about 21,000 gallons. AquaDams® are durable and long lasting. With proper installation and removal, AquaDams® can be stored and used more than once. Should a leak develop, patching tape is available. If necessary, replacement tubes are available for purchase.

AquaDam® Height Selection and Size Criteria

Appropriate AquaDam® height selection is determined by a number of factors: work site conditions, the water depth to be contained or diverted, and to a lesser degree, stream bed slope and water velocity. Accurate estimation of maximum water depth over the lifetime of the diversion project is very important. *Table 1* (below) lists standard sizes of AquaDams® and their maximum rated controllable mud/water depth. Customized AquaDams® can be made to preferred length or height in most cases.

<i>Table 1: Standard AquaDam® Heights and Maximum Controllable Mud / Water Depth</i>		
Filled Height	Filled Width	Maximum Controllable Mud /Water Depth
1' (0.3m)	2' (0.61m)	9" (23 cm)
1.5' (0.45m)	3' (0.9m)	14" (36 cm)
2' (0.61m)	4' (1.2m)	18" (46 cm)
2.5' (0.76m)	5' (1.5m)	24" (61 cm)
3' (0.9m)	7' (2.1m)	30" (76 cm)
4' (1.2m)	9' (2.7m)	38" (97 cm)
5' (1.5m)	11' (3.3m)	44" (112 cm)
6' (1.8m)	13' (4m)	54" (137 cm)
8' (2.4m)	17' (5.2m)	74" (188 cm)
10' (3m)	21' (6.4m)	88" (224 cm)
12' (3.7m)	25' (7.6m)	100" (254 cm)
14' (4.3m)	29' (8.8m)	110" (279 cm)
16' (4.8m)	33' (10m)	126" (320 cm)

This chart represents the maximum controllable mud/water depth to be controlled on flat surfaces. The slope and topography of the stream bed needs to be accounted for as well as water depths.

Mud/Water Depth

The height of mud/water to be controlled by the AquaDam® is the **most important** factor when selecting the proper size. A good rule of thumb is to overestimate water levels over the lifetime of the project. The importance of determining the maximum mud/water depths cannot be stressed enough. Buyer must verify the maximum mud/water prior to purchase. Too small of an AquaDam® will fail. The depth of water to be retained by an AquaDam® is often underestimated by the buyer, resulting in an AquaDam® that is too small for the projects requirements. This results in delays, increased costs, and potentially unsafe work conditions.

Water Velocity

When an AquaDam® is used to dam or divert flowing water, the water flow **must** be considered. During installation, the AquaDam® is being filled with water, causing it to unroll across the water channel. The AquaDam® will impede the flow causing the water to back up and increase in depth. If part of the flow is impeded, the water velocity around the end of the AquaDam® will increase. Head will build up on the upstream side as the water increases flow around the AquaDam® towards the downstream side during the installation. Depending on the substance of the river bed, some undercutting may occur around the end of the AquaDam® as it's being installed or after. This will result in an additional increase in the depth of water being retained and **must** be factored into the analysis. Installation in moving water requires control of the rate of unrolling of the AquaDam® and maintaining head in the AquaDam® keeping the unit above surrounding water level with ropes.

Installation Site

AquaDams® can be installed on top of most types of soils or fluvial materials, including: flat lying bed rock, mud, sand, gravel, small rocks, and vegetation. Select a site that is flat and devoid of: wire, rebar, sharp objects, garbage, glass or dead vegetation containing tree branches, rip-rap, or other obstructions. The slope of the river bed should also be relatively flat or inclined in the direction of the upstream or contained water. Make sure to check the installation path for holes, obstructions, or washed out areas that may cause problems during installation.

Weather / Spring Run-off

Local wet seasons and thunderstorms affect water levels in water systems and are important to understand during your construction project. Projects that have flexible construction dates should be coordinated with favorable weather conditions that avoid high water level events. The water depth controlled by an AquaDam® should never exceed the rated maximum controllable mud/water depth during the lifetime of the project.

Other Site Criteria

All of the previous factors are important considerations once the site has been selected. The following are additional factors that may influence the site selection:

Width of the River. A location on a wide, shallow river is easier for the cofferdam than a narrow river channel. Wide rivers will allow a diversion with only minor increases in water depth. A narrow river will quickly increase in water depth as the AquaDam® takes up available flow channel. The larger and wider the diversion channel, the less the water depth will increase.

Rough River Bed. An extremely rugged Alpine river bed (such as the Eagle River) with large angular boulders within the stream bed is a difficult area, since a good tight seal can only be accomplished through the removal of sand boulders by hand or heavy equipment. In the case of the Eagle River, the boulders were scraped into a line, and the AquaDam® was installed directly upstream so that the boulders would help support it. Using four ropes to restrain the AquaDam® from unrolling freely is also important in the installation.

Installation

Small AquaDams® (1' – 4' high)

Equipment List:

- We recommend our customers use at least two portable (gasoline powered) 3" Trash Pump -13HP, 370 GPM, Honda GX Engine, or equivalent; any water supply will work. Anything from fire hydrants to garden hoses is acceptable; it all depends on the speed at which you want to install the AquaDam®. ***Attention:** City mains water are chlorinated and pressurized, therefore, you may need a permit to use this water source. If this source is used, then an air bubble will form in the AquaDam® and will need to be released.
- Two sets of discharge and suction hoses, one set per pump; no fitting is required on the end of the discharge hoses.
- A roll of duct tape to secure and constrict the size of the fill tubes when coupling AquaDams® together.
- For safety reasons, each laborer should carry a utility knife.
- 2" x 6" boards, 2 feet and 4 feet long
- 1/2" Truckers Rope, footage dependent upon length of AquaDam system.

Aqua Dam Inc.® recommends a 5.5HP Honda gas powered 3" trash pumps which provide a maximum flow rate of 15,000 GPH, or equivalent. Using two of these you can fill: A one foot (1') high by 100' long AquaDam® in less than 15 minutes; a 2' high by 100' long AquaDam® in 30 minutes; a 3' high by 100' long AquaDam® in under an hour; and a 4' high by 100' long AquaDam® in under an hour and a half.

Man Power. Number of laborers needed is based on the size of the AquaDam® system that will be installed for the project. Its important to plan out the installation beforehand and discuss it with your work party. The number of AquaDam® units to be installed, their size, time constraints, and access to the installation sites may dictate the need for additional help.

Rock Removal. Someone will have to remove rocks by hand from the path of the AquaDam® to assure that a good seal is achieved. Part of the laborers will be needed to install the AquaDam® while other laborers will need to be part of the rock picking crew. Rocks should be picked out from directly in front of the AquaDam® as it is being installed. The rocks should be stacked on the work area side of the AquaDam® to provide additional support.

Large AquaDams® (6' – 16' high)

Equipment List:

- At least (4-6) 3" Trash Pump - 13HP, 370 GPM, Honda GX Engine, or equivalent are required; using larger or more pumps will fill the AquaDam® faster; the fill tubes can be opened to accommodate any size discharge hose.
 - One discharge and suction hose per pump; discharge hoses do not require fittings. No sharp edges on hoses entering AquaDam®. Hoses must be long enough to reach from the pump to the start of the fill tubes.
-
- A few rolls of duct tape for securing the fill tubes.
 - For safety reasons, each laborer should have a utility knife.
 - In moving water, restraining ropes need to be used to assist the installation; at the very least, each 100 foot AquaDam® that is installed requires 250 feet of ½ inch trucker rope. A four rope setup is strongly recommended on the installation of AquaDams® 6 feet high or larger in fast-moving rivers and streams.
 - Heavy operating equipment such as an excavator or a telehandler forklift, depending on the size of the AquaDam® system.

Manpower (for installation in non-moving water). Number of laborers needed is based on the size AquaDam® system that will be installed for the project. Ropes are usually not needed to restrain the AquaDam® from unrolling during the installation process, but can be used to pull the AquaDam® around using people or equipment on shore, if water depths are too great for a laborer to stand. Non-moving (static) water conditions requires less laborers.

Manpower (for installation in moving water). Number of laborers needed is based on the size AquaDam® system that will be installed for the project. Factors to consider: size and number of AquaDam® units to be installed, terrain above and below water, water's flow, water depths, and time constraints. Making suggestions is also recommended.

This guide assumes that all Federal, State, County, and City permits have been obtained from the appropriate government authorities. Aqua Dam Inc.® also recommends that the buyer (Prime Contractor, Company Supervisor, etc.) have an understanding of the necessary permits and what can or cannot be done within the water system, should the use of heavy equipment be necessary.

AquaDam® Installation Procedures

Installation can be broken down into three categories: moving dynamic water (rivers and streams), non-moving static water (lakes, ponds, non-pumped irrigation ditches), and dry land installation.

Step 1 – Transport

Transport the AquaDam® to the installation starting point.

Carrying ropes or straps are provided on larger AquaDams®. Just hook or tie the ropes or straps to a piece of heavy equipment for transportation. Unpack the AquaDam® by carefully removing the protective wrap from the outside after cutting the packing ropes and carrying straps with a utility knife.



Step 2 – Starting Point

The starting point or open end of the single closed-end (SCE) AquaDam® will have long fill-tubes protruding from the open end of the outer sleeve of the AquaDam® (usually 2' to 6' long). These are also for connecting one AquaDam® to another using a connection collar. The fill-tubes are not the start of the AquaDam's® length. The AquaDam® starts at the woven outside (usually black) sleeve that confines the two inner water tight tubes (see *Figure 1*). Position the end of the outer sleeve up the bank at least 1' higher than the main body of the AquaDam® when fully filled (3' high AquaDam® would have at least 4' in elevation up the bank. The bank slope will have to be calculated in, and the closed end will have to be higher than the water level inside the AquaDam® when filled too. The AquaDam® will only achieve its rated height at the lowest elevation along the AquaDam® system's path.).



If the bank is not tall enough to achieve its necessary starting height, a small amount of fill material can be placed at the waters edge to create a false bank or berm. This is the least expensive way to make a good starting point.



Step 3 – Preparing the AquaDam® for Filling

Insert a fill hose into each fill tube. Excess fill tube length can be cut off if not desired for future use. Wrap duct tape or tie rope tightly around the fill tubes to keep the fill hose from bucking out. The corners at the starting point of the AquaDam® can be tied to an anchor, such as, a tree or rock to prevent it from slipping down the bank slope. For smaller dams (3' and under), laborers are needed to stand in front of the AquaDam®. Roll the unit to the toe of the slope along the waters edge. Filling begins by pumping into both inside tubes at the same rate. The rolled portion of the AquaDam® will begin to unroll, and will push against the laborers legs. The laborers will wait for the water level inside the AquaDam® to rise above water level. When the height of the AquaDam® is great enough (several inches above surrounding waters), the laborers should take a step back. Then they must wait until the height builds up again before taking another step back. All laborers must step backwards as a unit and cooperate so that feet do not get caught under the AquaDam®. Water levels inside the AquaDam® must be kept at a level higher than the upstream water side of the AquaDam®. The water depth will increase as the unrolling AquaDam® begins to constrict (cut off) the available flow channel.



Step 4 – Moving Rocks and Debris

When installing an AquaDam®, you must not only remove rocks from its path to maximize formation of a good seal, you must also remove all other debris. Sharp, angular objects are often submerged along the proposed path of the AquaDam®. These obstructions cause a greater amount of seepage into the work area, with the possibility of causing damage to the AquaDam® as well. **Never take it for granted that your work area is free from debris! Always check first!**



This shopping cart was completely invisible during high tide.

Step 5 – Restraining Ropes

Large AquaDams®

AquaDams® that are 4' or more in height commonly require control ropes to restrain the AquaDam® during the installation process in flowing/moving water systems. Without these ropes, the pressure of the water, in the inner tubes will cause the AquaDam® to unroll before the proper head pressure inside the unit is achieved. Maintaining control and preventing the pressure from prematurely unrolling the AquaDam® is very important. The pressure of the water inside the AquaDam® has to withstand the pressure generated by the difference between the upstream and downstream water levels. In standing water, the pressure will be the same on both sides of the AquaDam® (until dewatering begins by pumping).



If ropes are to be used in the installation process, they should be placed under the AquaDam® before filling the unit. The ropes are attached to the base of the metal posts or trees, then run under the AquaDam®, over the top, and back to the starting point. They should be held in a manner that will allow the rope to be let out as the AquaDam® unrolls across the stream. The rope should be twice as long as the AquaDam® when filled, plus an extra 50 feet. Bending the rope around a heavy, round smooth anchor, such as a telephone pole or excavator adds leverage.

Standing Water Applications

Installation into standing water is much simpler than installation in live streams. The AquaDam® will unroll itself with a minimum number of laborers to assist in the installation. Ropes can be used to turn the AquaDam® in places where it is too deep for laborers to stand. Water level from one side of the AquaDam® to the other should remain equal, making it unnecessary to maintain dam height during installation. Laborers just need to guide it in the right direction.

Step 6 – Determine Height and Elevation

The rolled AquaDam® should start at the top of the riverbank or berm. The starting point or open end of the AquaDam® must be raised higher than the maximum height of the fully filled AquaDam® from the units lowest elevation of the path it's placed. Gravity keeps the water inside of the AquaDam® from flowing back out the elevated end.

Figure 3: Large AquaDam Installation Across a Flowing Stream.

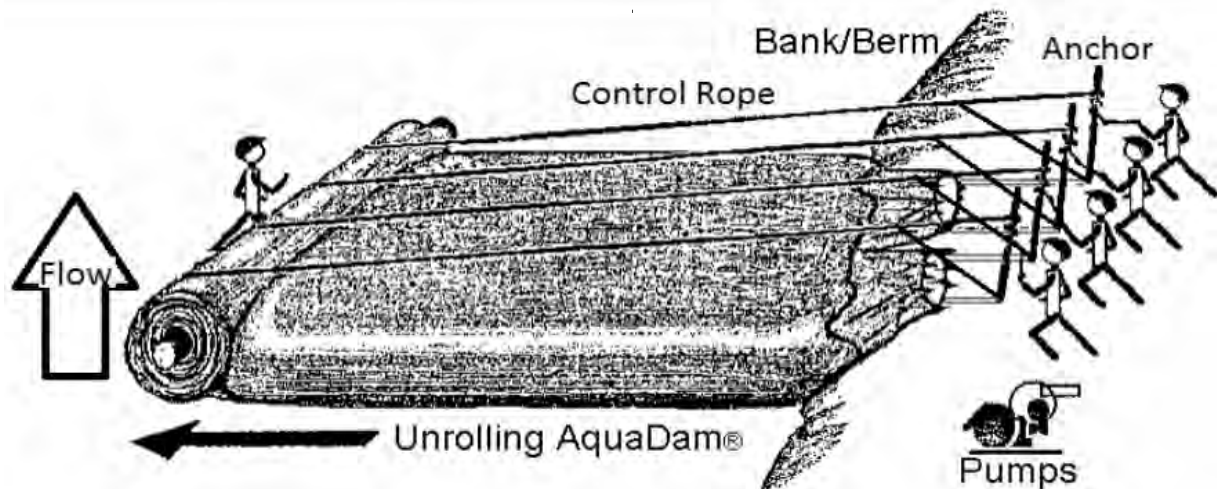


Figure 3. Shows the location of the ropes, posts, laborers and the filling AquaDam®.

Step 7 – Filling the AquaDam®

Figure 3 represents the most difficult installation scenario, such as a flowing stream where ropes must be used. The on-site conditions can change quickly in live streams because water depths will change from one side of the AquaDam® to the other. This difference in pressure will make the AquaDam® move downstream unless head pressure is maintained inside the AquaDam® during all phases of the installation. An AquaDam® that is unrolled too quickly and is not allowed to fill above the level of the surrounding water will move downstream with the water flow. The workers on the bank will slowly let the ropes out to allow the AquaDam® to unroll, maintaining head above the surrounding waters. Allow the AquaDam® to unroll 2' to 3' at a time, then wait for head pressure to build again, repeating this process until the AquaDam® system is filled.

Timing is everything. **Do not get in a hurry! Let your pumps work!** A requirement of using ropes is that the AquaDam® must be installed in a straight line. Turns can be made depending on site conditions and use of a deadman. Head pressure must be maintained inside the AquaDam® to prevent it from moving. Ropes tend to move to the outside of the unrolling AquaDam®. The worker at the end of the unrolling AquaDam® adjusts the ropes and keeps them in the center by slackening and moving one rope at a time while the other ropes maintain the necessary inside pressure to keep the AquaDam® from moving downstream. On-site rock that needs to be moved to assure a good seal should always be moved to the downstream side and used for support.

Figure 4:

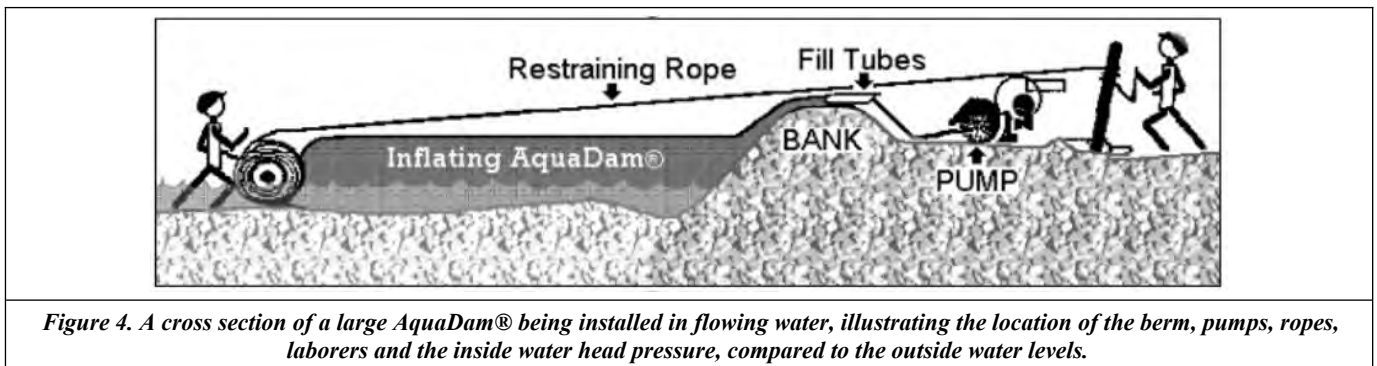


Figure 4. A cross section of a large AquaDam® being installed in flowing water, illustrating the location of the berm, pumps, ropes, laborers and the inside water head pressure, compared to the outside water levels.

Manning the Ropes

Once the ropes are manned, the pumps are primed and the AquaDam® is aimed in the proper direction (at a perpendicular angle to the slope of the starting bank), the pumps can be turned on and the fill process can begin. *Figure 5* shows a picture of restraining ropes used during installation of a large AquaDam® in a fast moving river. In some instances, a project demands that a larger AquaDam® should be used despite the low water level, because of the anticipated increase in water depth. The AquaDam® should be allowed to unroll at a rate of about 1 to 3 feet every time the ropes are slackened and maintain a 12 to 24 inch (or greater) head of water pressure inside the AquaDam®, compared to the upstream water depth, which will be increasing. Each foot of installed AquaDam® requires 2 feet of additional rope. The AquaDam® has to overcome imbalances of water head displacements happening in the river during the installation process. **Only experienced installation personnel should attempt to install large AquaDams® in moving water.**

Figure 5: Using Ropes to Install an AquaDam® in Flowing Water



Lateral Movement

An AquaDam® being installed in flowing water is vulnerable to moving downstream during the installation process. Maintaining internal head pressure is very important. A technique used to install large AquaDams® in flowing water is to install a shorter, sometimes smaller dam in a straight line using ropes (this is sometimes referred to as a “deadman”), and then place the bigger AquaDam® directly upstream, allowing it to rest against the smaller AquaDam®. In this fashion, the head pressure in the larger upstream AquaDam® can be lowered to allow it to turn around the end of the smaller AquaDam®, without it having to be kept in a straight line with ropes. Another technique can be used with fill material that is inside of a 1 meter sandbag to create the same effect.

How Lateral Movement Occurs

Lateral movement of an AquaDam® during installation occurs when there is insufficient head height inside the AquaDam® to overcome the force generated from the difference in water height between the upstream side of the AquaDam® and the downstream side. The difference in water depth must be compensated for by maintaining appropriate head height inside the AquaDam® during and after installation. Upstream water levels will rise rapidly as the flow channel is reduced during installation and should be monitored continuously by the crew in the water.

Sometimes lateral movement is hard to detect, but usually the following are indications:

- Visual lateral movement of the AquaDam®.
- The top seam of the AquaDam® is straight for some distance but appears bent in the middle.
- The AquaDam® is no longer pointed in the direction originally taken.

If lateral movement begins to take place or evidence of rolling can be detected, the steps should be taken to correct it. A minor change in water level could wash out the AquaDam® if the proper amount of head pressure is not maintained during installation. One step that can be taken to prevent lateral movement is to increase the internal water volume of the AquaDam which creates the internal pressure. All rocks moved for seepage control should be used to brace the AquaDam® during installation. Often, fill material has to be excavated from the channel. This should be placed behind the AquaDam® for controlled than what our Users Guide suggests.

AquaDams® should always be filled with the maximum amount of water possible. Always fill your AquaDam® to their recommended height, measured at the lowest point along the path of the AquaDam®.

Other solutions to moving or sliding are to install a smaller AquaDam® directly behind the main AquaDam® on the dewatering side. In standing water, if the work area has already been dewatered, stop dewatering and allow the bodies of water on either side of the AquaDam® to equalize.



Figure 6: Shoring-Up Cross Section

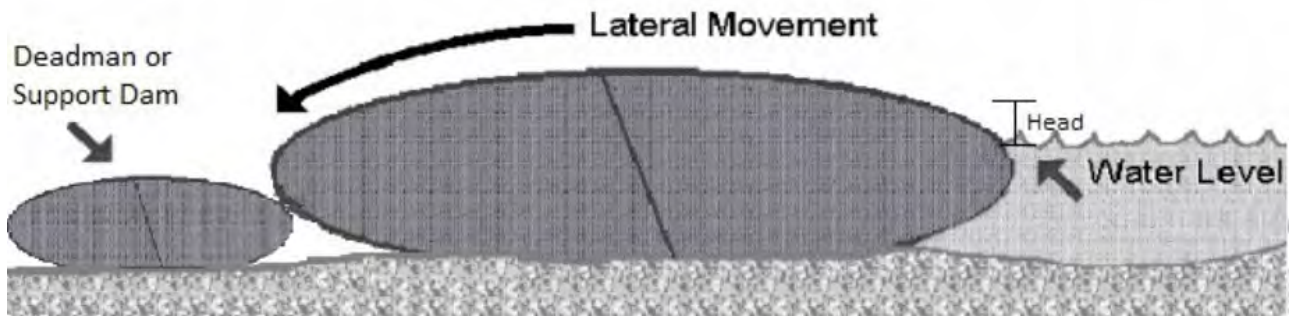


Figure 6. A cross section showing the placement of a support dam to shore up an AquaDam® that shows signs of lateral movement.

Connecting AquaDam® Sections Using Connection Collars

Step 1: Certain applications require two or more AquaDams® to be coupled together to form a longer, continuous water-filled cofferdam. The following illustrates how this is accomplished (the procedure assumes that the AquaDams® are being joined in a straight line end to end). The other end of the AquaDam is open and has the fill tubes that has been designed to fit snugly into the connection collar. Before a second AquaDam® can be attached, step one is to install an AquaDam® fitted with a connection collar. Fill this first dam to about 2/3 capacity before making a connection.



Step 2: Position the second AquaDam® directly in front and in line with the first partially filled AquaDam® and unroll about 10 feet of the new section, exposing the length of the fill tubes. (See *Figure 7 A*)

Step 3: Insert the fill tubes through the holes on the connection collar, the left fill tube through the left hole and the right fill tube through the right hole. This is done by working your way inside the connection collar, pushing the inner tube towards the hole and having a second person reach through the hole from the outside, grab the tube, and pull it through the hole (about 4 feet of fill tube should be pulled on top for a 4 foot high AquaDam®). Pull the outer tube of the AquaDam® being connected inside the connection and around the inner tubes as well. The new section should be totally enclosed by the connection collar, and the outer sleeve of the connecting AquaDam® being installed should be pulled up so as to be in contact with the end of the first, partially filled AquaDam®. Pull all excess material up on top through the holes. (See *Figure 7 C*)



Step 4: The 4'x8'x1/2" sheet of plywood described in the equipment list is for the pumps to sit on. When two AquaDams® are attached together, pumps are generally set on the previously filled AquaDam®, about 15 to 20 feet away from the connection point between the two AquaDams®. The plywood will prevent damage to the AquaDam®, but it is not necessary. (See Figure 7 D)



Step 5: At this point the new section is ready to be filled in the same manner as the first section. Follow all of the instructions previously presented to install the first AquaDam®.

Figure 8 is a drawing of two AquaDams®, one filled and the other ready to be filled.

Figure 7: Connecting AquaDams® Using Connection Collars

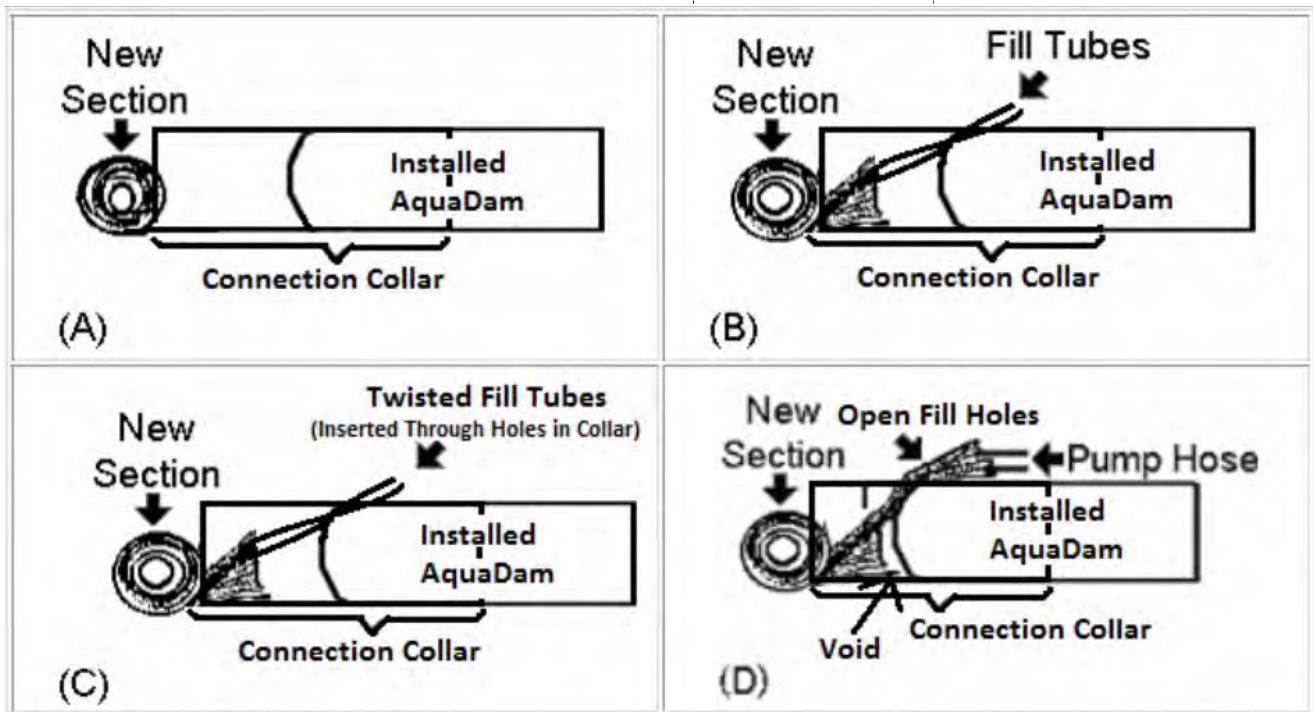


Figure 7, illustrates A, B, C, and D show the different steps taken in the process of joining two AquaDams® together using a collar.

Figure 8: Two AquaDams® Connected Together

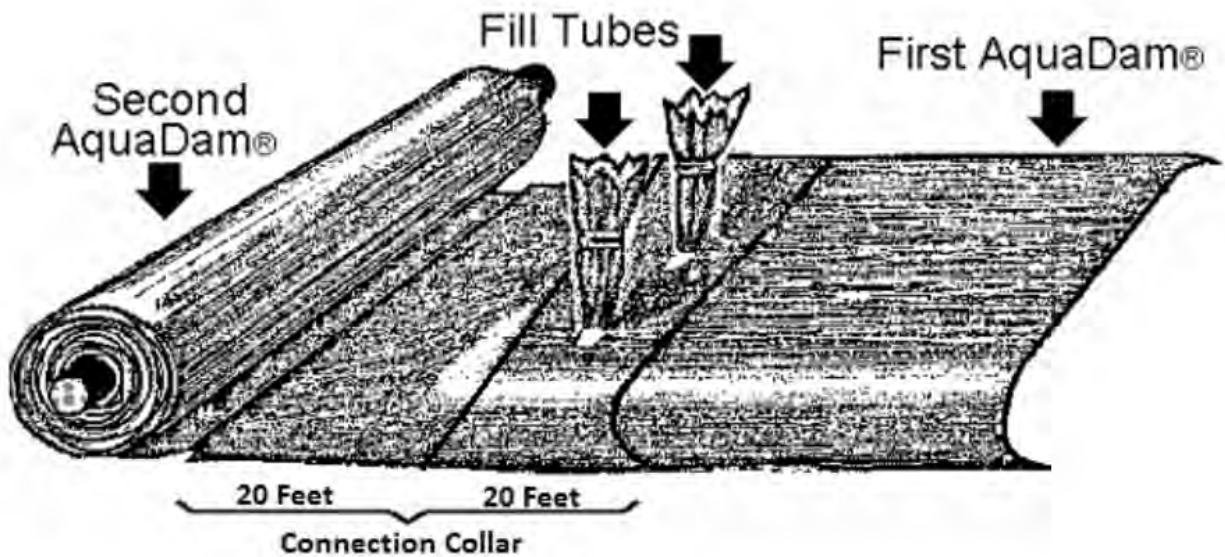


Figure 8: Two AquaDams® are joined together by a connection collar and ready to be filled. The two inner tubes stick out and up from the middle portion of the connection collar. These are the extra fill tubes located at the open end of each AquaDam®.

Step 6: After the second AquaDam® is filled, the fill hoses can be removed from the inner tubes. The fill tubes are re-wrapped in such a manner that the tubes will stand up by themselves. If possible, use duct tape to attach the two upright inner tubes to each other, making them even more stable and preventing water from leaking out. Gravity will keep the water from rising above the height of the fill tubes. The fill tubes must be elevated higher than the main body of the AquaDam®.

Maintenance Procedures

Installed AquaDams® are durable and will last a long time. Each installed section should be monitored regularly for leaks. The easiest way to deal with a leak without removing the AquaDam® is to pump more water into it. Small leaks can be patched with special repair tape. Patched damage will require periodic maintenance pumping.

There are four important observations that should be made on a regular basis:

- Leaks in the AquaDam®
- Seepage under the AquaDam®
- Inner fill tubes that have fallen over and are draining water
- Lateral movement of the AquaDam®



Hole on the AquaDam

Hole about to be Patched

Patched Hole

Most leaks are of such nature that they can be resolved simply by pumping additional water into the AquaDams® on a periodic basis. Identify which of the tubes is leaking, untie and unwrap the inner tube. Once this is done, insert the discharge hose from the water pump and fill it. Sometimes, a leak is large enough to require a patch. To repair such a leak, first identify and isolate the area around it. Then, using a sharp utility knife, cut a 'cross' or X through the master tube and pull the material apart to expose the leak, being careful not to further damage the inner tube. Then, using patch tape provided by Aqua Dam, Inc.® apply the patch to the inner tube. Once the leak is repaired, cover the 'cross' cut in the master tube with the same patch tape. In most cases, it is best to just add water on a regular basis, until the AquaDam® can be taken out of service and patched properly from the inside.

AquaDam® Removal Using Re-rolling Brackets

Re-rolling a small AquaDam® after use in a small stream. When two or more AquaDams® are connected together, the downstream AquaDam® is removed first by pumping out the inside water. You can also allow the fill tubes to drain the AquaDam® down to a level where the connection can be disassembled, allowing the water to escape freely once rewinding begins at the other end. This forces the water to the open-end and out.

Note: in some cases, it may be a better idea to hook the closed end to an excavator or other piece of equipment, lift it up, and simply let gravity drain the water out.



Large AquaDam® Removal

For larger AquaDams® that are too big to re-roll in place, equipment such as an excavator or telehandler forklift can be used to pull the AquaDam® from the lake (in standing water). Pump out or drain as much of the water as you can, and put a strap around the closed end of the AquaDam®. Place the strap as close to the end as possible or water will remain trapped inside. **Do not pull on the collar.** Very slowly lift up on the strap. The water should drain out the open end. Make sure that the fill tubes are draining, they might need to be pulled further off the bank. Go slowly so that you do not lift the water any higher than is necessary for it to drain. Pull the empty AquaDam® out of the water. Once this is done, it can now be blown up with air for inspection and re-rolling. After the AquaDam® has been inspected and any holes have been patched, make sure that the coupling collar is still in place. It is now time to re-roll the AquaDam® for storage and reuse. AquaDams® can be reused more than once, depending on the application. They can also be used on a one-time basis and be destroyed when they are removed if they become contaminated with a hazardous material. It is difficult to remove large AquaDams® used to block off flowing streams and rivers. Sometimes, there is no way to remove the AquaDam® and maintain the internal water pressure necessary to hold it in place at the same time.



As the AquaDam® is being emptied, it will be forced out of the way by the difference in water depth from the upstream side of the AquaDam® to the downstream side.

There are many applications where an AquaDam® can be saved and re-rolled for use at a later date. All smaller AquaDams® can be re-rolled. Re-rolling requires brackets to fit over the ends of the wooden beams that the AquaDams® come assembled on. A 3/4" drive ratchet can then be attached to the bracket. A 5' long section of pipe is slid over the handle of the ratchet (a cheater bar) to achieve maximum torque. Water can be pushed to the open end and out.

Safety

Emergency Removal

Laborers should stay out of harms way and be aware that standing at the end of the unrolling AquaDam® is dangerous. Laborers should stand clear whenever possible. The number of personnel in this position should be kept to a minimum. If the laborers are to let go of the ropes, this will cause the AquaDam® to unroll rapidly, where a laborer could be pinned underneath. That is why all laborers should carry utility knives, so that the AquaDam® can be slit open on the upstream side to relieve inside water pressure so that the AquaDam® will immediately drain, allowing it to move off of the trapped worker. The best way to do this is with a single long, lateral slice down the side of the AquaDam®. You must be standing on the upstream side. The downstream side is the direction that the AquaDam® and all of the water behind it will move in. It is very important that everyone works together!

Obstacles and Debris

The beds of rivers and streams are rough and can have holes and other obstacles that should be avoided in them. The easiest way to avoid them is to just go around. Removing something large that is silted into the riverbed will leave a large hole. This leaves you worse off than you were before. Going over this type of area will have more seepage, and it will also affect the height of the AquaDam®.

Cold Weather

In cold water, neoprene chest waders are highly recommended. All OSHA rules and guidelines should be followed closely. Personal Flotation Devices (PFDs) should be also used.

Walking on the AquaDam®

The woven geo-textile fabric that the master tube is made of is puncture and UVI resistant. Heavy foot traffic on top of the AquaDam® is okay. The only time you might curtail foot traffic is during cold weather, when ice occurs within the inner tubes, but they can still be walked on. The ice may cut the polyethylene when it cracks or breaks from foot traffic.



AquaDam Specifications

Inflated Dimensions	Controllable Mud/Water Depth*	Specifications of Inner and Outer Tubes	Volume Per Linear Length**	Dry Weight Per Linear Length
1'Hx2'W (0.3m tall)	9" (23cm)	Inner Tubing: 1 ply, 12mil, Polyethylene. Outer Sleeve: 1 ply, 6.2 oz woven Polypropylene	12gal/ft 149L/m	0.75 lbs/ft 1.1 kg/m
1.5'Hx3'W (0.45m tall)	14" (36 cm)	Inner Tubing: 1 ply, 12mil, Polyethylene. Outer Sleeve: 1 ply, 6.2 oz woven Polypropylene	25gal/ft 310L/m	0.95 lbs/ft 1.4 kg/m
2'Hx4'W (0.61m high)	18" (46cm)	Inner Tubing: 1 ply, 12mil, Polyethylene. Outer Sleeve: 1 ply, 6.2 oz woven Polypropylene	50gal/ft 621L/m	1.5 lbs/ft 2.2 kg/m
2.5'Hx5'W (0.76m tall)	24" (61 cm)	Inner Tubing: 1 ply, 12mil, Polyethylene. Outer Sleeve: 1 ply, 6.2 oz woven Polypropylene	88gal/ft 1,093L/m	1.85 lbs/ft 2.8 kg/m
3'Hx7'W (0.9m tall)	30" (76 cm)	Inner Tubing: 1 ply, 12mil, Polyethylene. Outer Sleeve: 1 ply, 6.2 oz woven Polypropylene	120gal/ft 1,490L/m	2.5 lbs/ft 3.7 kg/m
4'Hx9'W (1.2m tall)	38" (97 cm)	Inner Tubing: 1 ply, 12mil, Polyethylene. Outer Sleeve: 1 ply, 6.2 oz woven Polypropylene	210gal/ft 2,608L/m	4.3 lbs/ft 6.4 kg/m
5'Hx11'W (1.5m tall)	44" (112 cm)	Inner Tubing: 1 ply, 12mil, Polyethylene. Outer Sleeve: 2 ply, 6.2 oz woven Polypropylene	320gal/ft 3,974L/m	6.4 lbs/ft 9.5 kg/m
6'Hx13'W (1.8m tall)	54" (137 cm)	Inner Tubing: 1 ply, 12mil, Polyethylene. Outer Sleeve: 2 ply, 6.2 oz woven Polypropylene	450gal/ft 5,589L/m	8.5 lbs/ft 13 kg/m
8'Hx17'W (2.4m tall)	74" (188 cm)	Inner Tubing: 1 ply, 12mil, Polyethylene. Outer Sleeve: 3 ply, 6.2 oz woven Polypropylene	700gal/ft 8,694L/m	13 lbs/ft 19 kg/m
10'Hx21'W (3m tall)	88" (224 cm)	Inner Tubing: 2 ply, 8 mil, Polyethylene. Shroud: 1 Polypropylene 3.25oz woven shroud around both inner tubes. Outer Sleeve: 4 ply, 6.2 oz woven Polypropylene	1,000gal/ft 12,419L/m	25 lbs/ft 37 kg/m
12'Hx25'W (3.7m tall)	100" (254 cm)	Inner Tubing: 2 ply, 8 mil, Polyethylene. Shroud: 1 Polypropylene 3.25oz woven shroud around both inner tubes. Outer Sleeve: 6 ply, 6.2 oz woven Polypropylene	1,700gal/ft 21,113L/m	35 lbs/ft 52 kg/m
14'Hx29'W (4.3m tall)	110" (279 cm)	Inner Tubing: 2 ply, 6 mil, Polyethylene. Shroud: 2 Polypropylene woven shroud around both inner tubes. Outer Sleeve: 7 ply, 6.2 oz woven Polypropylene	2,500gal/ft 31,048L/m	47 lbs/ft 70 kg/m
16'Hx33'W (4.8m tall)	126" (320 cm)	Inner Tubing: 2 ply, 12 mil, Polyethylene. Shroud: 2 Polypropylene woven shroud around both inner tubes. Outer Sleeve: 9 ply, 6.2 oz woven Polypropylene	3,000gal/ft 37,258L/m	51 lbs/ft 76 kg/m

*This number is based on the friction of a rocky bottom. Slick mud, poly pond liners, and other slick surfaces may require the use of a taller primary AquaDam and/or a support dam installed behind the primary AquaDam.

** Volume is based on installation on flat ground. Slopes will reduce internal volume of an AquaDam.

Aqua Dam, Inc.
"Water Controlling Water"

www.aquadam.net

1.800.682.9283

+1.707.764.1999

dave@aquadam.net

Revised 2026