

What Is a Cofferdam?

A cofferdam is a temporary enclosure in or around a body of water that is constructed to allow dewatering, diversion or damming of an enclosed area. The primary purpose of a cofferdam is to create a dry environment for a project to proceed. They were first used in 1736. Today's cofferdams are typically conventional embankment dams of both earth- and rock-fill, although concrete or some sheet piling also may be used.



A Dam-It Dams Cofferdam creating a water barrier

Headquartered in Michigan, Dam-It Dams, Inc. – offer cofferdams that use on-site water to fill dual inner tubes, therefore, leaving very little or no environmental impact. The dam's chambers to slowly and evenly inflate, hence, forming a strong, stable cylindrical tube. While the inner tubes continue to fill, the dam unrolls in a controlled manner to create the cofferdam.



A Dam-It Dams Cofferdam unrolling as it fills with water

There are as many water-control applications for cofferdams as there are types of cofferdams. Dam-It Dams' patented, portable, water-filled Cofferdams offer effective and cost-efficient solutions for these major types of situations that are called the 3-Ds of water control:

Dewatering:

Dewatering, unwatering and water control are common terms used to describe the removal or drainage of ground or surface water, typically on a construction site. This technique is often required before subsurface excavation for such things as foundations, shoring, cellar space and repairs to existing water structures. As a result, a cost effective solution is necessary to keep the project moving. That's where we can help.

Diversion:

Diversion is the temporary (or sometimes permanent) re-routing of water. It may be required to initiate a project and/or allow a project to proceed.

Damming:

Damming is the process of creating a barrier that holds water back. The barrier may be needed to maintain water table levels, collect water for storage and prevent water from crossing established/safety thresholds.

Because Dam-It Dams' Cofferdams work with Mother Nature, not against her, they create effective water barriers that leave no – or only a minimal – footprint on the environment. Furthermore, our cofferdams are industrial strength and reusable to minimize additional investment costs.



A Cofferdam damming water at a work site

Types of coffer Dams

There are various types of cofferdams. They include:

- Cantilever Sheet Pile Cofferdam
- Braced Cofferdam
- Earth Embankment Cofferdam
- Rock fill Cofferdam
- Double Wall Cofferdam
- Cellular Cofferdam

A cofferdam (also coffer dam) is a temporary barrier in or around a body of water to allow dewatering, diversion or damming of an enclosed area. The major purposes of any cofferdam type are to hold back floodwaters or create a dry environment so a project can proceed.

As such, there are only a handful of structures that truly qualify as cofferdams (earthen berms and sandbags) since they all are intended to be temporary in nature.



A Dam-It Dams cofferdam holds back water to create a temporary barrier around a project site.

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Cantilever Sheet Piles

This cofferdam type is susceptible to large leakage and flood damage. Therefore, these are suitable for small head of water about 6 m. They can be constructed of wood, concrete and steel. Wooden sheet pile cofferdam is suitable for small head of water i.e. up to 3 m. Steel cofferdam is suitable up to 6 m head of water. Concrete cofferdam is suitable when headroom is limited. Bored and cast in place sheet piles are to be used to avoid noise and vibration. A typical sketch of cantilever sheet pile is shown in Fig.1 below.

Earth Embankment

This cofferdam type is suitable for high head of water and low water velocity. The side slopes of the embankment should be 1:3 to 1:4. The slope of the bank is covered by a riprap. A typical earth embankment cofferdam is shown in Fig.2. A successful cofferdam need not be completely watertight. Due to economical reasons, some seepage of water into the excavation is usually tolerated. The water collected is pumped out of the excavation. The embankment is provided with a minimum of free board of 1 m to prevent overtopping by waves. This cofferdam type requires large base area and is adopted when area of excavation is very large. Clayey soil is suitable for the construction in dry season. If constructed in wet season, sand fill is the best material.

Rock fill Embankment

This cofferdam type is made of rock fill. A typical section rock fill cofferdam is shown in Fig.3. This cofferdam type is better than the earth fill. These are very pervious and are usually provided with an impermeable membrane of soil to reduce seepage. The crest and upper part of impermeable membrane are provided with a rap to protect against the wave action. Steep slopes can be maintained at 1:1.5 or 1:1.25.

Double wall sheet piles

This type of cofferdam is suitable when it is required to exclude water over 12 m. This consists of two straight, parallel vertical wall of sheet piling tied to each other and the space between them filled with soil. Double wall sheet pile cofferdam higher than 2.5 m should be strutted. Sometimes an inside berm is provided. Consequently this helps to keep the phreatic surface within the berm. A sketch of double Wall cofferdam is given in Fig.4.

Cellular Cofferdams

A cellular cofferdam is constructed by driving sheet piles of special shapes to form a series of cells. The cells are interconnected to form a watertight wall. These are filled with soils and, as a result, provide stability against the lateral forces. There are two types of cellular cofferdams, namely diaphragm type and circular type.