Safe Use/Installation Instructions
Hydraulic Waler Frames (Single Acting)

This describes the correct and safe method of assembly, how to put the waler frames together, and also how to use the single acting hydraulics, and how to secure the hanging chains. It also offers a guide on a correct method of installation, and how to leave an excavation safe.

The method of equipment installation described is only a suggestion, the ultimate safety and responsibility of installation is with the company/responsible person installing it.

Waler Frame Rail Type	Rail Length	Cylinder Range	W/Rail SWL
Aluminium Waler Rail (Set)	3mtr	500 to 820mm	32.9 kn/m/sq

Assumed excavation size 3.0Long x 650mm wide x 2mtr deep

In most trenching situations where sheets and waler frames are being used to support a trench there will almost certainly have been ground exploration carried out.
It is very important when carrying out a temporary works design that the designer has all the relevant information to calculate it as accurately as possible.
All this information needs to be given in writing, a minimum three or four days before the equipment is required. This design will calculate the exact pressures in the excavation, and the solution to carry out the works safely and efficiently, and in most cases will be checked by a temporary works designer employed by the main contractors. From this, a quote will be supplied by us for the exact quantity and cost of the equipment required.

Part 1
Putting the waler frame legs together, and getting them ready for installation.

(1) The waler rails will come delivered in single pieces (legs).
Set out the waler frame rails that have been supplied by the side of the excavation you are going to excavate. Please ensure you lift the rails correctly, on the hanging points, and use a suitable chain sling that has the correct safe working load for the four legs, and has a current report of thorough examination and conforms to LOLER, (the chain is normally supplied by the trench support company). Connect the waler frame rails together by removing the four hexagonal bolts that came attached to the waler cylinder rams, put the feet of the ram cylinders inside the C section of the aluminium rails, one at each end, ensuring the holes line up at both ends, then simply put the four hexagonal bolts through the rail and ram cylinder foot and re-attach the nyloc nuts onto the bolts, making sure they are securely fastened.
Waler frames up to 3.5 metres will come with two hydraulic waler cylinders, four metres and above will come with three hydraulic waler cylinders.

(2) You are now ready to attach the hydraulics, and pump out the waler frame cylinders (if required) roughly to the width of your trench, making sure you have the correct internal size you require.
Ensure you have shoring fluid in the bucket pump, **(only shoring fluid to be used in our pumps - no oil of any kind – oil in these pumps block all the in-line filters – and is chargeable)** only three quarters full – no more, as you must allow for expansion inside the pump. Attach one end of the single hose supplied to the female connector on the pump, then attach the other end of the single hose to the male connector on the hydraulic waler cylinder. You must ensure the quick release couplings are fitted properly, as the hydraulic circuit will not work if one connector is not connected properly (this is generally the cause of most hydraulic waler cylinders that will not pump out).

(3) Once you are happy everything is connected properly, make sure the lock off valves are in the open position – anti clockwise (13mm spanner or socket required – we will supply if requested) turn the lever on the pump to the right, and start pumping out the hydraulic cylinder to the required size.
When you reach the required size, turn the lock off valve clockwise to close, which will keep the pressure on the waler frame cylinders, do this with both cylinders.
The waler frame is now ready to be placed into the trench.
When placing the waler frame into the trench make sure you have enough clearance to allow easy passage.

Part 2

(1) There are many methods of carrying out this kind of excavation, and in normal circumstances there will be a method statement produced by the groundwork contractor detailing the method being used. This is a guide to one of the methods. Excavate approximately 1.0 mtr below ground level to the overall plan size.

(2) Attach four of the hanging chains supplied to the four corners of the waler frame. Place the already assembled waler frame into the trench. It is correct practice to ensure the hose is kept attached to the hydraulic waler cylinders at this stage to enable the frame to be pumped out when it goes deeper into the trench.

(3) The next stage is to place the trench sheets. We advise using a quick release shackle to place the trench sheets, and a driving cap for driving the sheets short distances, and a vibrating hammer for longer distances (only trench sheets 6mm or above). There are two methods of doing this; either place four trench sheets on the corners first, then the sides or place trench sheets in one of the four corners of the excavation, and continue down one side, and back up the other side. The excavator will push the trench sheets down as it is digging to the correct depth.

(4) When you have reached the correct depth for the waler frame, and the trench sheets are toed in to the correct depth, as per the (Temporary Works Design) attach the hanging chains, and pump out both of the hydraulic cylinder rams against the sides of the excavation. Remember to close the lock off valves on the ram cylinders, and ensure all the hanging chains are secured properly. The hanging chains are a safety system for the waler frame, and **must not** be used for lifting or pulling.

(5) It is the responsibility of the person in charge of the excavation to inspect it at regular intervals to ensure it is safe to work in, listening for signs of ground creeking, and ground movement, also paying close attention to any prescence of water in the excavation, and any tightness in the hanging chains – another sign of movement. The excavation must be inspected before the start of any work, and at regular intervals during the working period.
When the excavation is not being worked in, it must be fenced off at all times, and "Danger Deep Excavation" signs placed around the parimeter.

(6) It is common health and safety practice to have at least a half metre upstand above ground level around the excavation, in this case three metre sheets would be used.
We offer a complete fall prevention, safety barrier system, that clamps to any thickness of trench sheet, which is available from all our depots. It consists of a clamp, upright post that sits inside the clamp, and boards to place horizontally on the posts.

(7) In a situation where there would be two waler frames being used.
When the pipe at the bottom of the excavation has been installed and bedded in correctly, or the repair on the pipe carried out, you are ready to take one frame out of the excavation. Lift

the bottom frame up so it is directly below the top frame, release the lock off valves on the top frame cylinders, depressing the male quick release coupling, with the release tool (supplied) and this will release the pressure in the cylinders , allowing them to close, then simply lift the top frame out.

When you are returning the hydraulic waler rams please ensure they are all returned closed, as you will be charged if they are not, please also ensure when the trench sheets and waler rails are returned they do not have excess soil and concrete on them, as there will be a charge for cleaning them also.

Warning – Shock loads can be more than twice the static load, and can cause very serious damage or failure to the lifting or pulling equipment you are using – this could also cause death or serious injury to the people around the excavation. Always check the equipment you are using is safe and has a current report of thorough examination – if it doesn't – DO NOT USE IT !!!!!!

(8) When you are extracting the trench sheets we recommend using a trench sheet extractor, please ensure it has the correct safe working load for pulling. This will also stop any damage and ripping to the top of the trench sheets. The manhole frames and trench sheets should be progressively withdrawn as you are backfilling the excavation.

Current Safety Legislation

We recommend that users of any excavation support equipment are familiar with the following references and publications:

(i) HSE – Safety in Excavations – CIS8REV1
(ii) HSE – Health and Safety in Excavations - Be Safe and Shore – HSG 185
(iii) BS8002 (1994) – Earth Retaining Structures
(iv) CIRIA SP95 – The Design and Construction of Sheet Piled Cofferdams
(v) CIRIA Report 97 – Trenching Practice

Current Safety Legislation requires that the product users formulate a safe system of work to undertake the excavation, which may include a temporary works design. This information is intended to provide general guidance on the equipment needed, and the ground pressures that will be encountered when undertaking the excavation. It is in effect a solution – from this the equipment needed will be calculated. If ever there is a doubt about whether you need a temporary works design, think it can't happen to you, or think you know better, then remember this:

Four very experienced groundworkers were laying foul drains across a greenfield site. The trench was 4.5mtr deep and 2.2mtr wide, with vertical sides. The contractors were advised to provide shoring but they insisted that the ground, comprising of mudstone, was self-supporting and showed no sign of movement. The following day the trench side collapsed catastrophically, killing three of the workers and seriously injuring the fourth.
Moral to the story – No matter how much trenching experience you have, never take the ground and soil conditions for granted, they will surprise you ! – don't become a statistic!

For any further information you require, on technical support, lifting equipment, or advice on temporary works designs and equipment, contact:

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