GROUNDWORKS
ALUMINIUM WALERS
User Guide

GENERATION
HIRE & SALE

ALTRAD

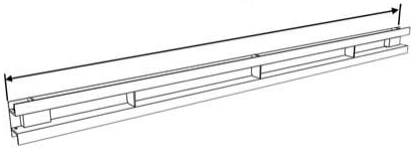
LW/10.22

Alloy Walers

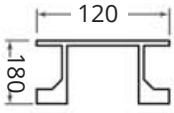
This guide is intended to provide basic information for users of the Generation Waler System, and to draw the clients attention to the practical aspects of handling, assembly, installation and use which need to be considered in compiling a safe system of work. In particular, the clients attention is drawn to the size and weights of the components and the need for planning the lifting operations involved. All major components of the system have lifting points for safe slinging. The hydraulic waling system for trench support. It is not intended for any other purposes. Always avoid laterally loading the struts - either by hanging or propping from them or accidentally sbiking them with site plant. It is assumed that clients are familiar with general safe practices applicable to this type of work.

Identification, Sizes, Weights & Safe Working Loads

Standard Rail



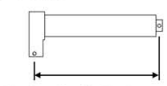
Aluminium Waler Rail

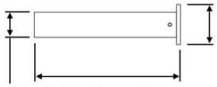


Code	Rail Size (mm)	Width (mm)	SWL (kN/m)	Cylinders Required	Weight (kg)
086120	2000	180	58.0	2	21.00
086125	2500	180	24.0	2	26.00
086130	3000	180	16.0	2	31.00
086140	4000	180	8.2	2	41.00
086150	5000	180	4.9	3	52.00

FoS x3 FoS = Factor of Safety

Struts


Hydraulic Cylinder


Cylinder Oversleeve

Strut Accessories

Restraint Chain : Length 2.0m, Weight 4.0kg, capacity 500 kg.

Lifting Chain: Weight 24 kg, 7mm Grade 80 4 Leg Chain Sling 4m ELL c/w safety hooks and shortening clutches. (refer to lifting chain user information for further details).

Installation Kit: Comprising Single Acting Pump, Weight 18 kg empty, 43 kg full, 2 way bridle, Hose Extensions, Lock off valve spanner.

Typical Strut Arrangements

Code	Waler Cylinder	Min Length (m)	Max Length (m)	SWL (kN)	Weight (kg)
086190	Type A	0.530	0.820	80	10
086191	Type B	0.780	1.310	80	16
086192	Type C	1.260	2.010	80	23
086101	1m Waler Cylinder Extensions to achieve 2.750 width			80	18

* Length dimension has a tolerance of +/- 14mm. Dimensions are internal i.e. from sheet to sheet. For practical installations the hydraulic rams should be extended by at least 50mm to allow for retraction and withdrawal of the frame after use.

Waler End Bearer

Code	Min Length (m)	Max Length (m)	Description	Weight (kg)
086102	0.530	0.820	Waler End Bearer	13.5
086103	0.780	1.310	Waler End Bearer	20
086104	1.260	2.010	Waler End Bearer	30

Stacking & Handling

Suitable firm level dry areas should be made available on site for stacking and pre-assembly work. Suitable lifting equipment of adequate capacity should be provided for off-loading, pre-assembly of frames, installation and dismantling. Slinging should always be carried out by suitably experienced and competent personnel.

Rails

Rails should be stacked on 4" x 3" timbers in rows of 5 No., max 4 No. rows high..

Struts

Ensure the Rams are fully retracted.

Struts Type A & B

Stack on Pallets in rows of 5 No. in opposite directions, maximum 4 No. rows high.

Struts Type C

Stack on 4" x 3" timbers in rows of 5 No., maximum 4 No. rows high.

Use of Pump & Hydraulic Fluid

It is important to maintain an adequate level of fluid in the tank to avoid pumping air into the rams. The fluid level in the pump should be checked after each ram has been pressurised.

Shoring Fluid

Only Generation UK shoring fluid should be used with Powershore. The pump is normally supplied with a full tank of pre-mixed fluid. If the fluid is separately supplied 'neat' in 5 litre containers, it should be poured into the pump and cold clean water added according to the prevailing temperature conditions. Protective gloves should always be worn when handling shoring fluid.

Temp Range (°C)	Shoring Fluid (Litres)	Water (Litres)
Above 0	5	20
-6 ro 0	10	20
-10 to -7	15	15
-10 and below	Neat Only	-

Note: A shoring fluid safety data sheet is available on request from Altrad Generation.

- **It Is Important To Use Packing Between The Trench Sheets, Waler End Unit And The Waler Rails Prior To Pressurizing The Struts.**

Equipment Assembly & Usage

Always ensure that the sides of the trench to be supported are parallel with the sheets driven vertically, before installing Powershore Frames.

Frame Assembly

Place two rails on firm level ground, spaced apart by a little more than the strut length. Place two or three struts, dependent on rail length, in position in one rail, and fix with the hinge pins. Arrange the strut feet to allow or prevent folding as required. Bring the second rail into position and insert the hinge pins. The frame is now ready for installation. Make up as many frames as possible in advance of excavation to ensure that they are ready when required during the dig.

Frame Assembly When Folding of Frame is Required

It is sometimes necessary to pass one frame through another for installation or removal, and to make this easier, the frame can be folded. This is done by arranging the strut feet after which the rails can be moved to pivot around the hinge pins and form a lozenge shape. It is vital that, once the frame is in position, it is made absolutely square again before the rams are pressurised. For normal placement, the non-folded rigid arrangement is usually easier to handle.

Typical Sequence of Frame and Sheet Installation

Excavate to first frame level. Place the assembled waler frame next to the trench. With the pump valve open, connect the bridle hoses to the cylinders. Attach 4 way chain sling to lifting eyes on waler rails. Lower the waler frame into the trench to the required level. It is the customers responsibility to ensure that the frame is kept level at all times. Place four trench sheets in the

Equipment Assembly & Usage

trench, one for each corner of the waler and drive with excavator bucket as far as possible. To make placing of the remaining sheets easier, packers may be placed between Waler Rails and the four sheets.

With the ram "lock-off' valve open (max 2 turns) and the pump valve closed, expand the cylinders to a pressure of 1500 p.s.i. Check the pump gauge to ensure that pressure remains stable. Close the ram "lock-off' valve, open the pump valve and remove the hoses. The restraint chains should now be connected between the waler rails and the top of the trench sheets.

Disconnect chain sling and place or drive the remaining sheets. Excavate to lower frame or formation level, and push sheets down to give "toe-in" required. Further frames can be installed by passing folded frames through, or lowering the first frame down and placing extra frames above. In all cases restraint chains must be connected between all frames and between the top frame and the top of the sheets.

Note:

1. This method requires operatives working in the excavation and the contractor must ensure safe working conditions at all times.

2. The restraint chains are intended as a back-up to prevent a frame falling in the unlikely event of hydraulic failure of a strut. The chains should NOT be relied upon as a means of suspension of the frames during installation or removal. Always fit at least two chains per waler rail.

- **It Is The Customers Responsibility To Ensure That Frames Are Level And Bearing Fully Against The Sheets.**

Removal of Frames

Backfill to the underside of the lowest frame and carry out any compaction required. Ensure frame is securely packed or supported from below. Connect a 4 way lifting chain sling. Connect bridle and pressurise system to 1500 p.s.i. Open lock-off" valves (max 2 turns). Pressure may now be gradually released using the pump valve. Remove restraint chains and lift waler from trench. Ensure the frame is as level as possible with the struts square to the rails to avoid damage to the cylinder.

The best way to fully retract the struts is to suspend the frame on the 4 leg chain sling, connect both cylinders to the pump via the 2 way bridle and open the "lock-off" valves. The inclination of the chains provides sufficient horizontal force to retract the struts.

Note: 1. This method requires operatives working in the excavation and the contractor must ensure safe working conditions at all times.

Points to Watch

Over Extension of Powershore Rams

The Rams are marked with warning tape to show when the extension is at its maximum. If this position is passed, fluid will discharge from a small safety vent, and it will not be possible to achieve the working pressure. To retract the ram into its correct working range, release all pressure at the pump, and close the rams down by hand. If the strut supplied has not achieved the required dimension, then packers or an extra strut extension must be added.

Air in the System

Occasionally air may get into the system causing either springiness in the ram or a lack of prime in the pump. If this occurs the following steps should be taken:

To restore prime to the pump, disconnect the handle from the piston rod by undoing the wing nuts and removing the pin, open the pump valve, fold the handle over the front of the pump and manually work the piston rod up and down as fast as possible. When prime is restored, a considerable increase in resistance will be felt. The handle can now be reconnected and normal pumping continued.

To ensure that the ram is air free:

• Purge Air from the Hoses: Either connect the hose end to the male coupler on the bucket top, if it is of that type, or depress the nipple in the hose end, and in both cases pump until fluid flows freely through the hose, then

• Purge Air from the Ram: Attach the purged hose to the ram and fully extend. Stand the ram on end with the valve block at the top. Release the pressure at the pump valve and push the ram closed. All air should now be purged.

Do's & Don'ts

Do:

- Make sure lifting equipment and plant of adequate capacity are available for assembly and installation.
- Always use lifting chains to lift the frames during installation and removal.
- Ensure that all lock-off valves are open prior to pumping (max 2 turns).
- Always pump from outside the excavation - use extension hoses for lower frames.
- Ensure that pressure is being held in the rams before closing the lock-off valves.
- Use restraint chains between each frame as well as to the top of the sheets (2 No. per waling rail).
- Install frames as level as possible with the struts square to the rails.
- Release the pump pressure after closing the lock-off vales to ease removal of the hoses.
- Clip the loose hose end back on to the pump to keep the coupler dirt free.
- Lift frames as level as possible with the struts square to the rails to avoid damage to the cylinders.
- Use packing between the Trench Sheets, Walers where required.
- Always install the Struts at the reduced centres when using the Waler End Units.
- Refer to a Generation Groundworks representative or engineer for any queries.

Don't:

- Use damaged or bent Struts, Walers or Waler End Units
- Enter the excavation until pressure is held in the rams.
- Leave a gap equal to or greater than one sheet width.
- Lift a frame until pressure has been released.
- Over pressurise the system as this can result in damage to the rails.
- Attempt to disconnect a hose until the lock-off valve has been fully closed, and pressure has been released at the pump.
- Pressurise a frame with a gap behind the rails at the ram position. A packer MUST be inserted to fill the gap first.
- Release ram pressure by depressing or striking the coupler nipple.
- Use restraint chains as a means of suspension during frame installation or removal.
- Use restraint chains for any other purpose - in particular DO NOT use for lifting.
- Lift frames which are not level as this may damage the cylinders.

GROUNDWORKS BRANCHES NATIONWIDE

Groundworks Numbers:
UK: **087 0870 8484**
IRL: **00353 1 601 1500**

SCAN ME TO FIND

YOUR LOCAL BRANCH

GENERATION HIRE & SALE

ALTRAD

Generation UK Ltd.
Generation Head Office, Trinity Street, Off Tat Bank Road, Oldbury, West Midlands, B69 4LA - United Kingdom
Tel. 0121 543 2950 - Fax. 0121 543 2953 - groundworks.enquiries@altradgeneration.com
www.altradgeneration.com