

Description

Simple to assemble, four sided, aluminium hydraulic bracing frame system, designed to be used with steel trench sheets to brace small, shallow cofferdams for the safe installation of manholes and utilities. The legs range in length from 1.5m to 2.4m and can be installed by hand or using small excavators.

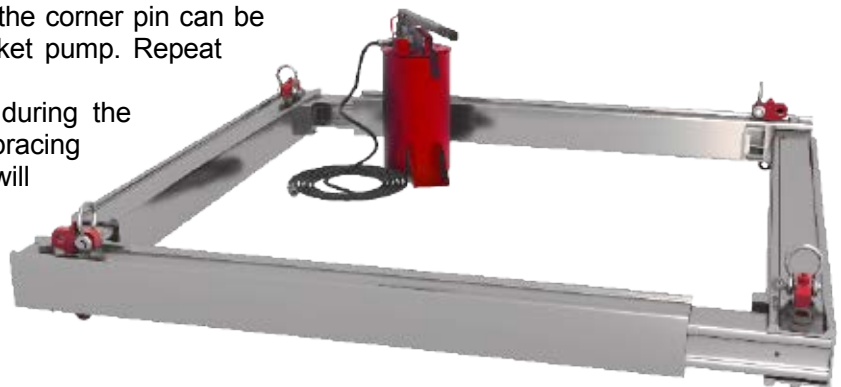
Fabricated from extruded Aluminium sections (6082TF material) the legs are assembled to form a frame using simple corner pin and retaining clip assemblies. Each leg contains a single acting hydraulic ram with 915mm of stroke. Connecting the rams (via hydraulic hoses) to an MGF hand operated hydraulic pump unit containing hydraulic shoring fluid allows the leg lengths to be quickly and easily adjusted to suit the excavation dimensions. Once the frames are fully assembled and located at the correct line and level, the rams are pre-loaded against the trench sheets using a hydraulic pump. Pre-loading of the legs ensures the frame cannot slip and minimises the extent of potential ground movements. Self sealing quick release valves and mechanical isolation valves ensure that the hydraulic ram pressure cannot be accidentally released once installed. Handling and restraining points are provided on each leg to assist assembly / removal and to allow the brace to be supported off MGF restraining chains attached to the trench sheets by hooks.

MGF can supply the systems with a full range of suitable handling and restraining chains, Edgesafe edge protection panels, Laddersafe access platforms and GRP or wooden ladders, Davitsafe retrieval / fall arrest systems, hydraulic pump installation kits (including bio-degradable shoring fluid and hydraulic hoses) and confined spaces regime equipment.

Manufactured and designed in accordance with BS EN 14653:2005 PARTS 1 and 2 Manually operated Shoring Systems for Groundwork Support and BS 5975 (2008) Code of Practice for Temporary Works Procedures and the Permissible Stress Design of Falsework.

Product Notes

1. Manhole brace should only be installed and removed by competent persons in accordance with a site specific detailed design & installation sequence and MGF installation guidelines.
2. Installation can be carried out by hand, assembling the frame, leg by leg, within the excavation or by lowering the assembled frame to the correct installation level, and once the frame is fully assembled, pre-loading each leg in turn to ensure that the frame is pressed firmly against the trench sheets and cannot slip. Max pre-load pressure of 100Bar (1500psi) must not be exceeded.
3. Restraining chains are hung off the trench sheets and attached to the legs to assist assembly / removal of the frame and ensure vertical support is provided at all times. All the supplied restraining chains should be installed (min. 2 per leg) and adjusted to ensure an even vertical load distribution. Restraining chains should never be used for lifting nor solely relied upon to suspend loads above personnel.
4. Ensure all hydraulic ram isolation valves are closed and all corner pins in place and secured using the retaining clips provided prior to commencing works.
5. Individual brace legs should be visually inspected for damage, excessive deflection or loss of ram pressure prior to entering the excavation.
6. Legs should always be installed square and plumb to the excavation walls ensuring contact with all the inward facing trench sheet pans. If this is not possible any gaps must be securely packed by using hardwood wedges prior to final pre-loading of the hydraulic rams.
7. Safe access/egress, edge protection (for personnel) and barrier protection (for plant) should always be considered.
8. Prior to removal of systems all hydraulic rams must be released and manually retracted to avoid the need for excessive extraction forces and to avoid damaging corner joints.
9. To manually retract the manhole brace leg ensure that there is sufficient packing beneath the frame, that the hanging chains are in position, and that there is no slack in the chains. Connect the hydraulic hose to the cylinder and open the lock-off valve (2 turns anticlockwise). Ensure the bucket pump is set to 'open' and manually retract the leg by hand until the corner pin can be released, fluid will return into the bucket pump. Repeat this procedure for each leg.
10. No matter how much care is taken during the installation and removal of hydraulic bracing systems some ground movement will occur in the areas immediately surrounding the excavation. Great care must be taken when specifying these systems for use adjacent to existing structures and services.



MGF GRP
Ladder - See
Section 7

MGF Laddersafe -
See Section 6

MGF Edgesafe - See
Section 6



MGF Aluminium
Utility Manhole
Brace

MGF Trench Sheets -
See Section 5



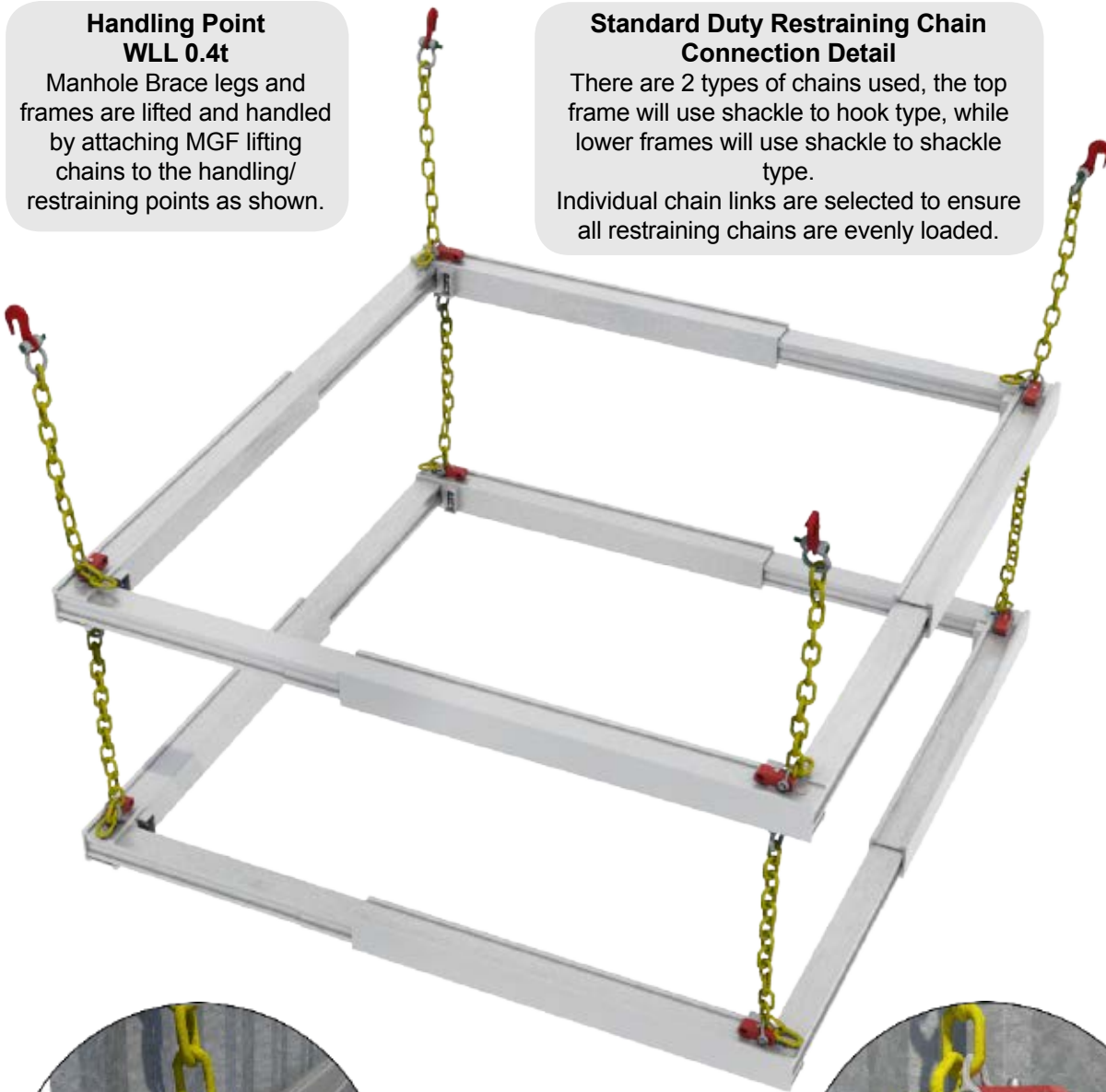
**Handling Point
WLL 0.4t**

Manhole Brace legs and frames are lifted and handled by attaching MGF lifting chains to the handling/restraining points as shown.



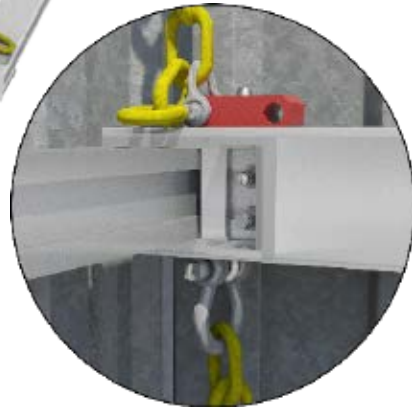
**Standard Duty Restraining Chain
Connection Detail**

There are 2 types of chains used, the top frame will use shackle to hook type, while lower frames will use shackle to shackle type. Individual chain links are selected to ensure all restraining chains are evenly loaded.



Leg Connection Detail

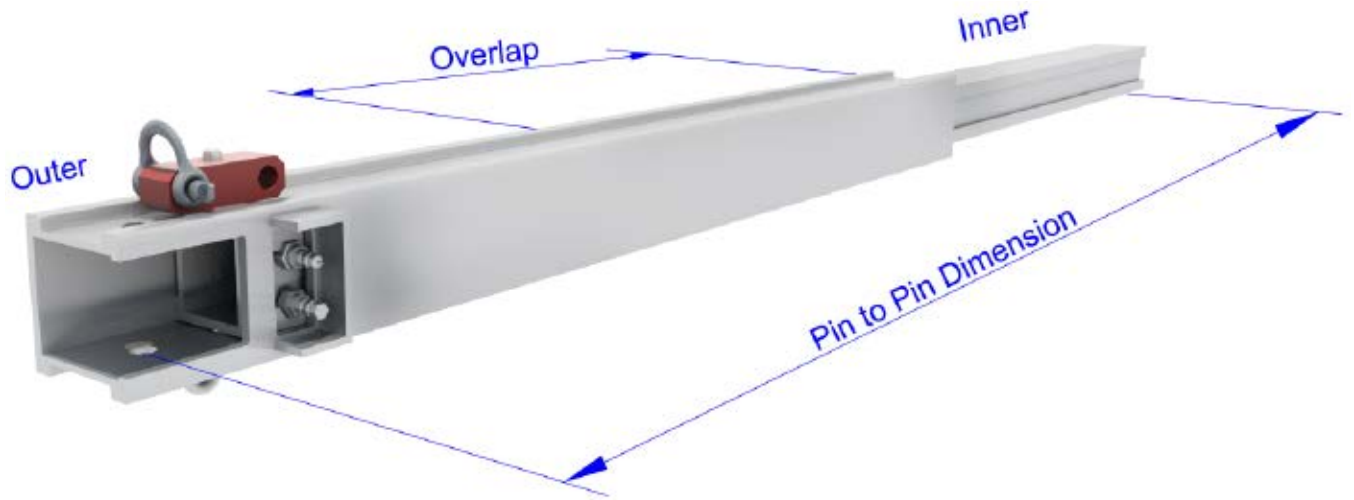
Manhole Brace legs are connected to each other using a pin and R-clip detail



Hydraulic Connection Detail

Legs are pumped out by attaching a hydraulic hose to the male QRV, and pressure is locked in and released via the lock-off valve

Aluminium Utility Manhole Brace



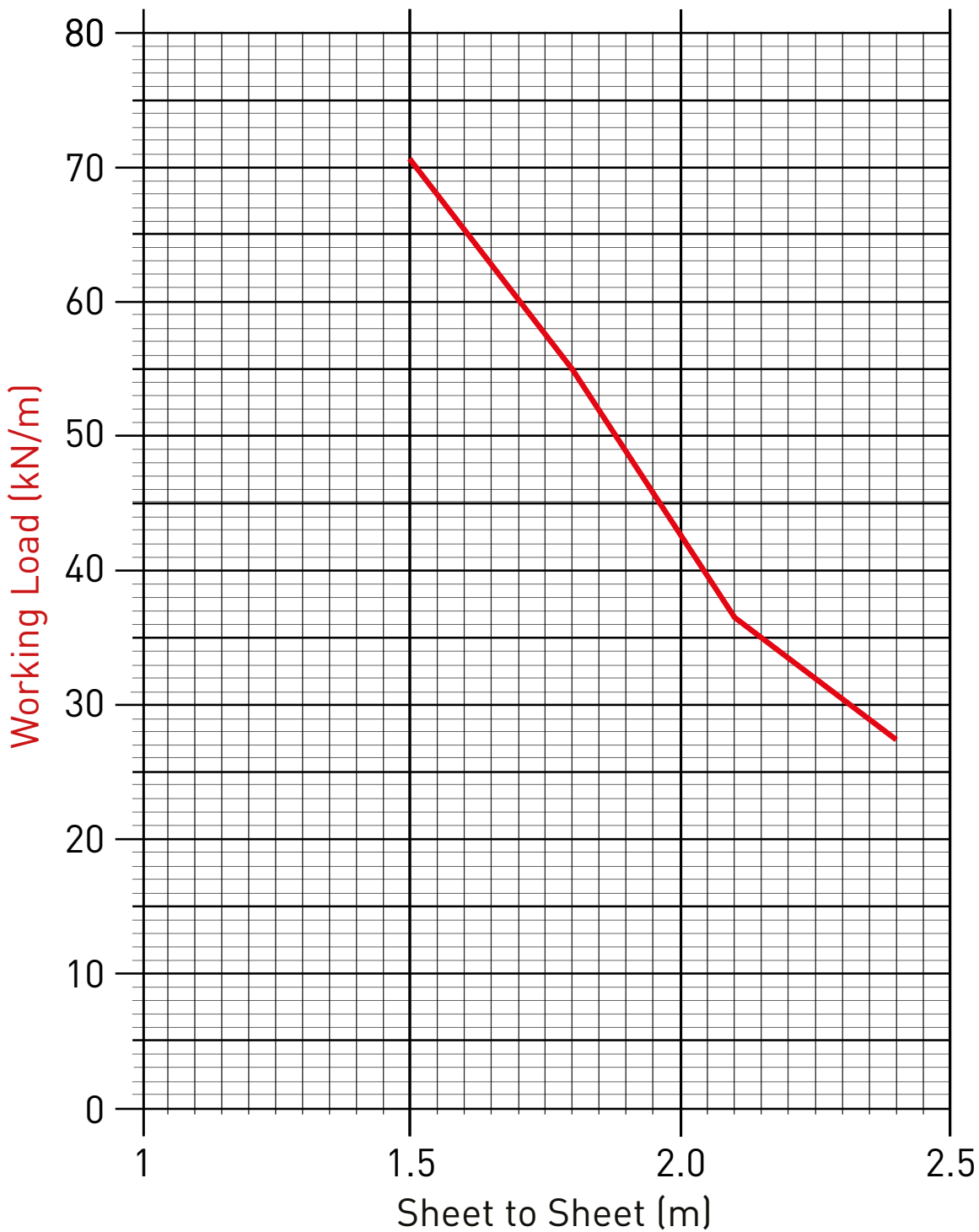
Manhole Brace legs comprise inner and outer sleeved bespoke aluminium box sections housing a single acting (SA) hydraulic ram to provide 915mm of leg adjustment.

Product Description	Product ID	Sheet to Sheet Dimension (m)		Hydraulic Ram SWL	Leg Weight (kg)
		Min.	Max.		
MGF Aluminium Utility Manhole Brace	7.209	1.5	2.4	SA 55kN	35

Hydraulic Cylinder	Single Acting
Material	Aluminium
Bore	50.8mm
Max .Working Pressure	270 Bar (4000 psi)
Test Pressure	270 Bar (4000 psi)
Approx. Working Stroke	915mm
Axial SWL	55kN
Min. FOS (by test)	2
Working Temp Range	-20°C* to +50°C
Approx. Pre-Load	15kN
Approx. Pre-Load Pressure	75 Bar (1100 psi)

* Winter mix required for shoring fluid at low temps

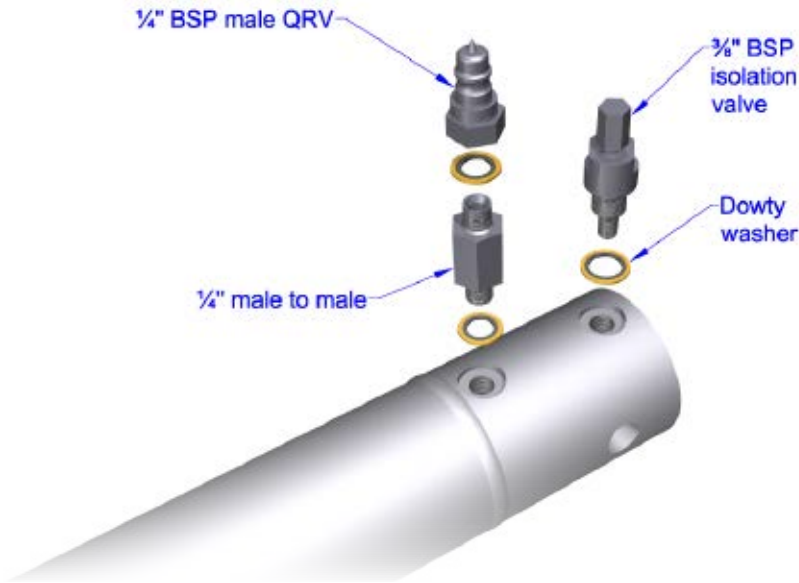
Safe Working Load for MGF Aluminium Utility Manhole Brace



Span (m)	Working Load (kN/m)
1.5	75.5
1.8	51.5
2.1	37.0
2.4	28.0

Min. factor of safety = 1.5 to yield
Approx max. deflection = 50mm

Single Acting Hydraulic Cylinder Connections



Shoring fluid is pumped into the full bore side of the piston through the male QRV. Single acting cylinders cannot be retracted using a pump unit and have to be physically closed whilst releasing the male QRV. Ensure isolation valve is closed to maintain pre-load pressure and before release/connection of QRV's.

Aluminium Utility Manhole Brace Pin

Pin	Φ20mm bar, 145mm long
Material Grade	080M40 (EN8)
Shear SWL	55kN
Weight	0.5kg



Manually Operated Hydraulic Pumps



The pump is used to extend the Aluminium Utility Manhole Brace single acting hydraulic rams. The pumps contain bio-degradable Houghto Safe SF25 shoring fluid. During the Summer months the shoring fluid is diluted with water at a ratio of 3 parts water to 1 part Houghto Safe SF25. In the Winter the mix ratio is 1:1. Maximum recommended installation pressure 1500 psi (100 Bar).

Product ID	1.602 (SA)
Capacity	20 litres
Shoring Fluid	Houghto Safe SF25
Installation Pressure	0-1500 psi (0-100 Bar)