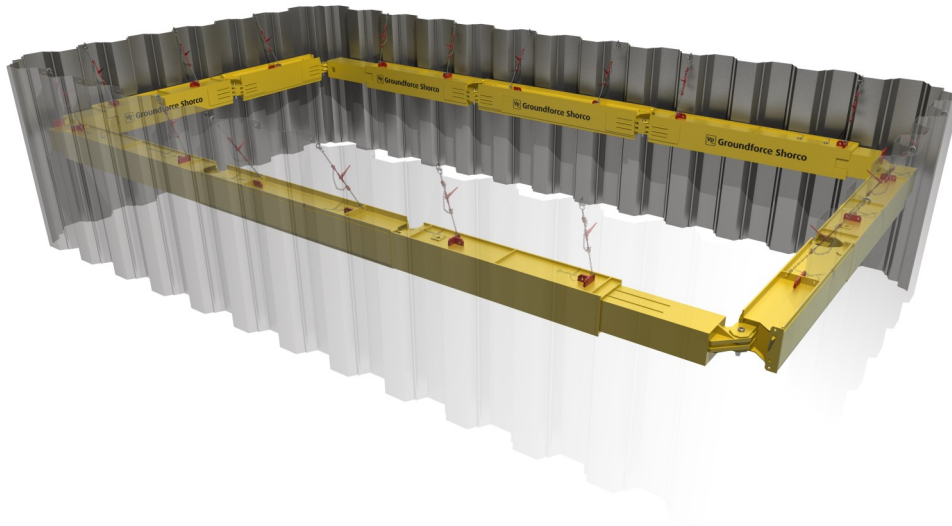




## Super Mega Brace MK2



### Important Notes

All excavation work must be thoroughly planned before work commences on site to identify hazards and assess risk.

These instructions form guidance for the Super Mega Brace MK2. Due to the high loadings used with this equipment, all applications should be approved by a suitably qualified engineer prior to installation.

The equipment used in this manual must not be modified in any way without the express permission of Groundforce

Ensure all personnel engaged in installation operations are properly briefed and adequately supervised by a competent person.

All hires for this equipment will usually be accompanied by a general arrangement or scheme specific drawing. This must be read in conjunction with these instructions.

**THIS USER GUIDE IS NOT CONTROLLED WHEN PRINTED**

IF IN ANY DOUBT SEEK FURTHER ADVICE:  
ON FREEPHONE - 0800 000 345



Certification Number 14419  
ISO 9001 • ISO 14001 • ISO 45001

| Rev | Date    | Comments                                               | Initial |
|-----|---------|--------------------------------------------------------|---------|
| 1.9 | 14/03/2 | Page 2 note added addressing issues with SMB & ladders | DSW     |

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### SAFETY

#### Common Symbols and Meanings

**Safety Note:** It is recommended that hand and eye protection are used when operating hydraulic equipment.

| PERSONAL PROTECTIVE EQUIPMENT (PPE)                                                 |                          |
|-------------------------------------------------------------------------------------|--------------------------|
|    | Use eye protection       |
|    | Use hearing protection   |
|    | Wear protective gloves   |
|   | Wear head protection     |
|  | Wear protective footwear |

| WARNING SYMBOLS                                                                     |                   |
|-------------------------------------------------------------------------------------|-------------------|
|  | General warning   |
|  | Crushing of hands |

#### Important Note:

When using the Groundforce Super Mega Brace along with the Premier LadderSafe Platform, the platform cantilever is insufficient for a conventional ladder to clear the Super Mega frame.

As an alternative, we recommend using the Dual Access Platform. When the Dual Access Platform clamps are centralised, sufficient overhang is provided to clear both the Super Mega Beam width plus the width of a standard Tuffsteel Ladder.

**Note:** The Dual Access Platform is available to [download as a pdf](#) from the Groundforce Technical Library.

### Introduction

The Super Mega Brace is a high load capacity modular hydraulic bracing system designed to support square, rectangular or multi-sided excavations ranging from 4.7m to 24+m in plan. Each leg comprises a length adjustable hydraulic unit, a series of modular fixed length extension pieces and a telescopic pinned rough adjuster unit. Connections between modular sections are made on site via a spliced connection with a single pin. The fixed length extensions can be connected and when combined with cross struts, form a continuous heavy duty waling beam. **Note:** Certain elements are colour coded in UGs and on the equipment. If the user has difficulty distinguishing colours, then they should refer to their supervisor.

### Equipment Specification

Each frame leg consists of a telescopic hydraulically operated ram section and a combination of fixed length extension pieces (1.5m, 3m, 5m, 6m, 9m and 12m) to suit the required leg length. Each component is easily identified as shown:

**Hydraulic Ram Section:** The hydraulic section has a 1500mm hydraulic stroke that allows fine adjustment of the overall leg length. (Working capacity 150Te)

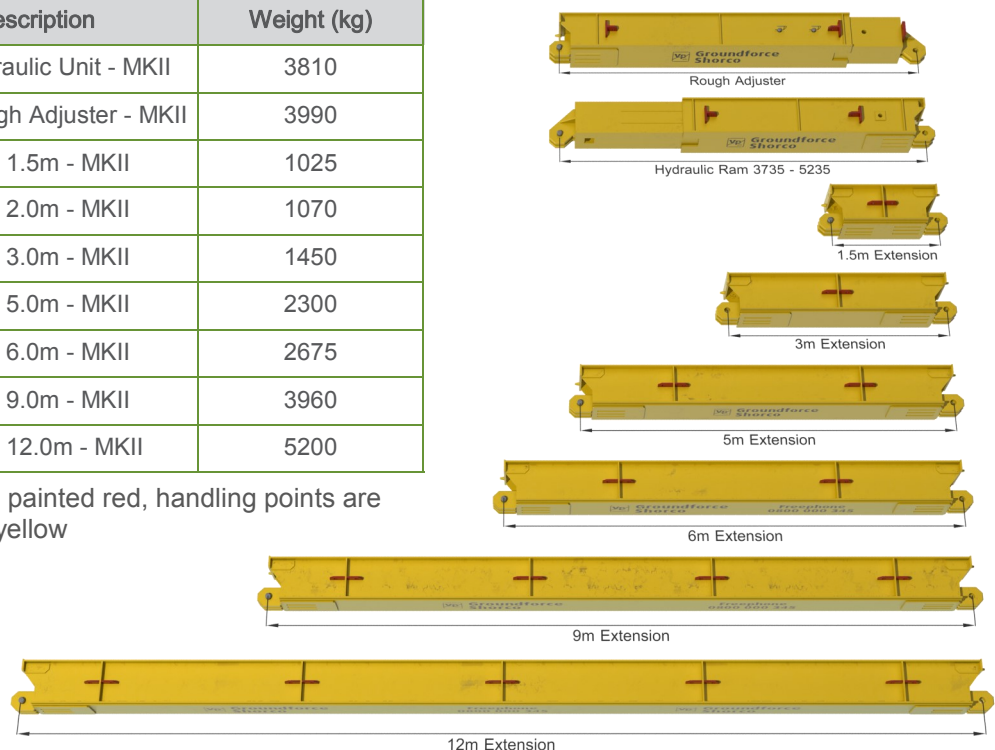
**Intermediate Extension Pieces:** The fixed length extension pieces are pinned together in the required combination to allow coarse adjustment of the overall length.

**Rough Adjuster Unit:** The Rough Adjuster Unit allows for the leg length to be incrementally adjusted at 500mm intervals by the placing off the 2No. EN19T 60mm diameter pins into the relevant restraint holes. The pin to pin range of the Rough Adjuster Unit is 4495mm - 6495mm. **Note:** 2 No. 60mmØ pins are required in the rough adjuster unit at all times.

**Note:** It is essential that any required frame leg is assembled in the correct component order as shown on the scheme arrangement drawing. If this information is unavailable please contact Groundforce Technical Services Department.

| Item Code | Description               | Weight (kg) |
|-----------|---------------------------|-------------|
| SMG.RAM2  | SMB Hydraulic Unit - MKII | 3810        |
| SMG.RA2   | SMB Rough Adjuster - MKII | 3990        |
| SMG.EX015 | SMB Extn 1.5m - MKII      | 1025        |
| SMG.EX2   | SMB Extn 2.0m - MKII      | 1070        |
| SMG.EX3   | SMB Extn 3.0m - MKII      | 1450        |
| SMG.EX5   | SMB Extn 5.0m - MKII      | 2300        |
| SMG.EX6   | SMB Extn 6.0m - MKII      | 2675        |
| SMG.EX9   | SMB Extn 9.0m - MKII      | 3960        |
| SMG.EX12  | SMB Extn 12.0m - MKII     | 5200        |

**Note:** Only lifting points are painted red, handling points are yellow



**Corner and Intermediate Connections:** The braces are joined together with 1No. 80mm diameter connector pin which is retained by a lifting handle at the top and a 10mm retaining bar at the bottom, both with 3mm R- Clips. **Note:** The Intermediate joints bolts (3 No. M30) at the back of the beam are solely used to support the joint during lifting and are not intended to resist forces other than self weight. These must therefore be removed once the frame is in position. Due to the weight of these components, they are often lifted individually and these bolts are not required.

### Notes on Lifting and Handling

**Safety Note:** Super Mega Brace components must be installed horizontally and in the correct position before the Ratchet Binders are fully installed and tensioned, therefore ensuring an even distribution of load across all chains. It is essential that the frame remains fully supported with either certified lifting equipment or by the base of the excavation until the equipment has been installed correctly.

**Super Mega Brace components are very heavy.** It is essential to have a detailed lifting and installation/removal plan in place prior to commencing work. Components must be lifted from the correct lifting points provided. All lifting equipment must have current test certificates and appropriate working load limit values. **Note:** The weight of an assembled brace is concentrated towards the end incorporating the hydraulic unit. The slinging positions should be adjusted by trial lifts until a near horizontal lift is achieved.

**Note:** Lifting points painted red must only be used when the equipment is elevated clear of the ground: designated yellow points are limited to manoeuvring and positioning of equipment.



**Safety Note:**

it is ultimately the responsibility of the user to provide a safe method of access to and egress from excavations.



- Always work from a detailed lifting plan
- Ensure adequate capacity of the lifting equipment
- Know the weight of the load
- Adjust slings so that braces are lifted horizontally
- Ensure the lift angle of chains is not exceeded
- Do not exceed the capacity of individual lifting points

- Use clear and precise hand signals
- Be aware of personnel in the vicinity
- Use tag lines to control load
- Ensure all lifting equipment has valid certification
- Do not use damaged lifting points
- Report damaged lifting points and equipment

### Hydraulic Ram Operation



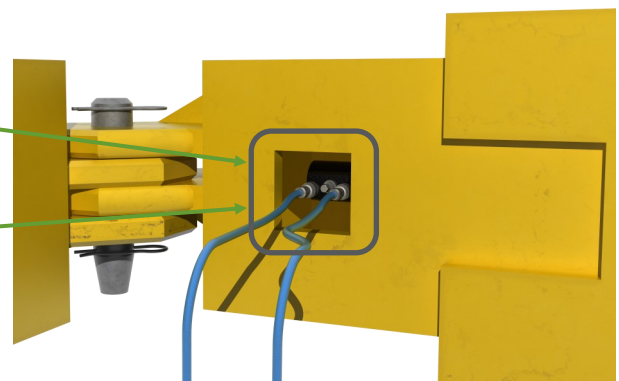
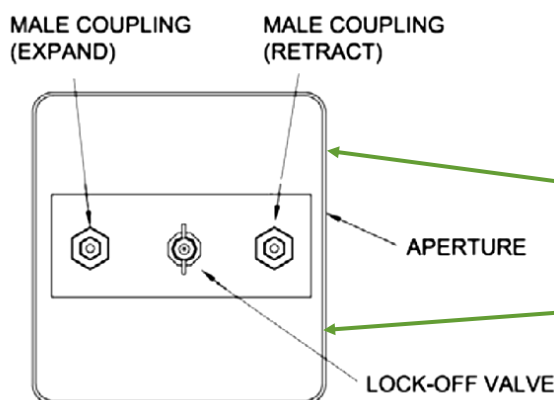
**Safety Notes:** Care and adequate precautions must be taken to prevent trapping fingers.



There are two pumping stages required for installation:-

1. Prior to installing the frame, individually extend the legs to the approximate excavation dimensions.
2. Once the frame has been lowered into the ground, extend the frame to bear against the trench sheets and finally pressurise each leg of the assembled frame to 1000psi (~70bar<sup>#</sup>) (refer to the design documentation for specific pre-load).

All Super Mega Brace systems will be supplied with a motorised pump (manual pump available). The following procedures outline the extension and retraction stages to be followed when installing the equipment leg by leg.



**Note:** It is essential that both pump hoses are connected to the ram couplings otherwise the hydraulic ram will not operate.

### Ram Extension

1. Ensure there is sufficient shoring fluid in the pump reservoir.
2. Ensure the hoses and couplings are clean and then connect both hydraulic hoses from the pump to the ram.
3. Open the lock off valve on the ram by rotating twice anticlockwise, If using a motorised pump – ensure the control level is set to neutral when opening the lock off valve.
4. Set the control valve on the pump to 'expand' and operate the pump to expand the leg to the required dimension. Carry out this operation for each leg in turn.
5. Reconnect the hoses to the first ram. The ram should then be pressurised to the specified pre-load, typically 1000psi to 1500psi (~70bar to ~103bar) as indicated on the pump pressure gauge. **Do not exceed 1500 PSI (~103bar)**
6. Close the ram lock off valve by turning fully clockwise - **Do not over tighten the lock-off valve.**
7. Disconnect the hydraulic hoses from the ram, and repeat the same procedure for all frame legs. **Ensure that all hose quick release fittings are clean prior to each re-connection.**

**Notes:** Pre-load is not a critical part of the structural capacity and governed by the limitations of the pumping equipment. The lock-off valve is fully closed when the lock nut is seated on the body of valve.



A Motorised Shoring Pump 3D animation is available to [watch now](#) on our YouTube channel.

### Ram Retraction

1. Ensure the frame is fully supported by packing the underside of the frame and checking that the Restraining Chains are in position.
2. Connect the hydraulic hoses from the pump to the ram, as per the procedure outlined above.
3. Open the lock-off valve on the ram 2-turns anticlockwise. If using the motorised pump – ensure the control lever is set to neutral when opening the lock off valve.
4. Set the pump control to 'retract' and operate the pump to retract the ram until the corner pin can be released.
5. Release the pin and pump in the ram so the leg is clear to lift out.
6. Repeat the same procedure for each leg.

### Lifting and Hanging Operations



#### Chains / Ratchet Binders

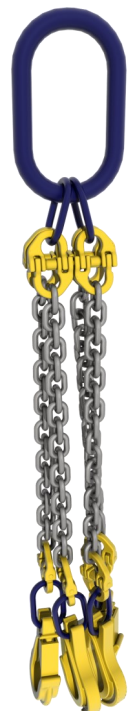
Providing there is at least 1.0m distance from the top of the sheets to the lifting points in the upper beams as shown left, Restraining Chains may be used in conjunction with Ratchet Binders to provide vertical restraint to the frame(s) if the frame is located near the top of the sheet piles and the scheme layout allows (specified by the design).

#### Lifting Chains

All lifting must only be carried out using certified 4-leg chains of adequate capacity. Groundforce are able to hire out suitable chains. The contractor should carry out a detailed risk assessment and lifting plan before any lifting operation takes place.

#### Notes on chain attachment points

The Super Mega Brace is fitted with both lifting eyes and Ratchet Binder attachment points. Due to the weight of the equipment it is recommended that only a single component is lifted at any one time. The red painted lifting eyes are to be used for slinging. **Note:** The central lifting eye is for lifting and the holes nearest the outer faces of the brace are for restraint by Ratchet Binders only. (see image on next page)



**Safety Note:** Restraining Chains act as a back up means of support in the unlikely event of hydraulic failure. It is essential that certified lifting chains are used to take the weight of equipment before depressurising the hydraulic rams. **Restraining Chains are not certified and must not be used for any lifting operations.**

### Gallows Brackets

All additional levels of frames will require the design and installation of Gallows Brackets as the weight of the individual components means that the usual practice of suspending frames from the brace above is no longer possible. In some cases all levels will need to be supported by Gallows Brackets, particularly when struts are incorporated into the design. (see Gallows Bracket examples below)



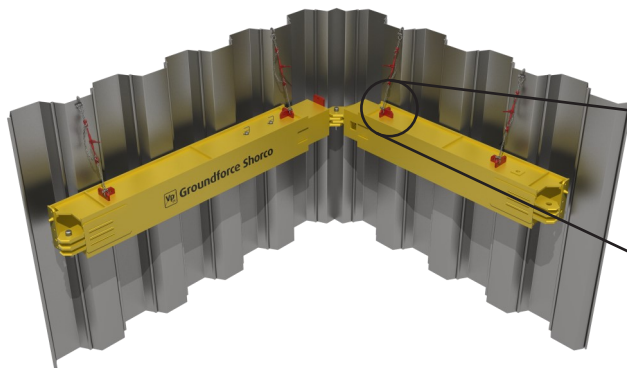
Bolted Gallows Brackets



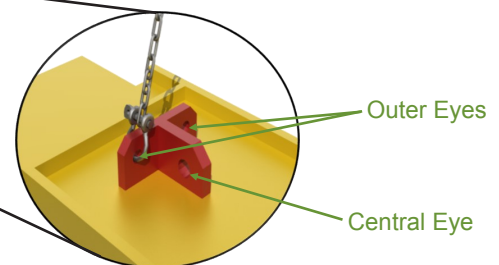
Welded Gallows Brackets



Universal Gallows Brackets



The central eye is for lifting purposes and the outer eyes are for the restraint chains.



### Installation of the Equipment

#### Important Note:

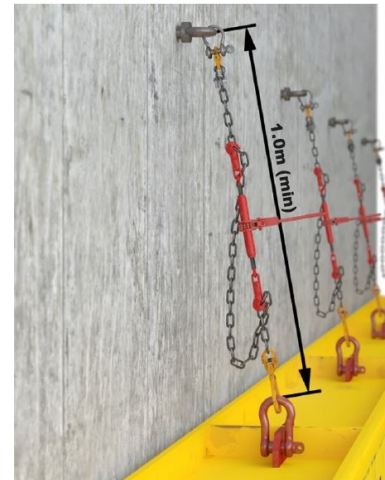
The method of shoring installation will vary depending on the ground conditions encountered and the plant used. Groundforce recommends the pre-driving of sheets where possible.

The contractor should undertake a detailed site safety risk assessment prior to undertaking any shoring work, paying particular attention to the weight of this equipment and ensuring adequate lifting facilities are available. Please contact the Technical Department for further advice

1. The heavy duty sheet piles should be pre-driven to full depth prior to excavating.
2. Excavate to either the underside of the frame position (if using chains to support the frame) or to the underside of the gallows brackets. If using gallows brackets, install them now in accordance with installation instructions.
3. Using a certified lifting chain, lift the brace components into the excavation and position at the correct location, either on the gallows brackets or on timber at the base of the excavation. Ensure the brace is horizontal and, if used, the rough adjuster is in the correct configuration and connect and evenly tension the chains using Ratchet Binders. It is recommended to start installing the brace at the non hydraulic end with the centre of the 80mm pinhole 490mm from the line of the sheet piles.
4. Connect all component together using the 80mmØ pins
5. Once all components are installed, on each leg in turn, connect both valves to the pump using hoses provided; open the lock-off valve and pump out the legs until the pin-holes line up with each other. If not already done, connect the legs using the corner pins provided and continue to pressurise the frame to the required pressure.
6. Attach an additional chain and Ratchet Binder to the end of the hydraulic unit if required. **Note:** There must be adequate support to all frames at all times - a minimum number of chains will be specified.
7. On each leg in turn, close the lock-off valve, depressurise the hoses and disconnect the hoses from the frame. **Note:** The final design should include detailed instruction.

### Installation of the Ratchet Binder

**Note:** In order to allow for correct use and adjustment of the Ratchet Binders, a minimum distance of 1.0m must be maintained from the top of the sheet hook attachment to the red lifting points on top of the beam, as shown right.



1. Connect the D-shackle at one end of the chain to the red hole in the lug; Ratchet Binders must be installed vertically as practical, and connect the hooked end to the sheet piles directly above the position on the red lug. **Note:** maintain the 1.0 min distance shown above.
2. Ensure the Ratchet Binder is full extended and then connect the hook at one end to the upper part of the chain. Lift up the lower part of the chain and position into the load binder to take out as much slack from the chain as possible.
3. Use the lever on the load binder to apply tension the chain and ensure it carries the weight of the equipment. Repeat for all ratchet load binders to ensure an even distribution of load.

| LEG REF. | OPERATING RANGE (m) |        | WEIGHT (kg) | LEG LENGTH BETWEEN SHEETED FACES (m) |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----------|---------------------|--------|-------------|--------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|          | MIN.                | MAX.   |             | 0                                    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 0        | 4.715               | 6.215  | 3810        |                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1.5      | 6.215               | 7.715  | 4835        |                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 3        | 7.715               | 9.215  | 5260        |                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 5        | 9.715               | 11.215 | 6110        |                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 6        | 10.715              | 12.215 | 6485        |                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 9        | 13.715              | 15.215 | 7500        |                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 12       | 16.715              | 18.215 | 9010        |                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|          |                     |        |             |                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0R       | 9.210               | 12.710 | 7800        |                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1.5R     | 10.710              | 14.210 | 8825        |                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 3R       | 12.210              | 15.710 | 9250        |                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 5R       | 14.210              | 17.710 | 10100       |                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 6R       | 15.210              | 18.710 | 10475       |                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 9R       | 18.210              | 21.710 | 11490       |                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 12R      | 21.210              | 24.710 | 13000       |                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

## Removal of the Equipment

**Note:** Depending on the capacity of the lifting equipment, it may be necessary to break down the components in the excavation.

1. Backfill to the underside of the lower frame.
2. Re-connect the hoses between the Motorised Pump and the legs to depressurise the lower frame, then remove the corner pin and R-Clip.
3. Continue depressurising to fully separate the legs, setting the pump lever to the 'ram in' position. Repeat this process for the remaining corners.



**Safety Notes:** Operatives must be positioned clear of the excavator slewing zone during this operation. **Never stand directly beneath any elevated equipment.**



4. Once the legs are disconnected, they can be lifted clear of the excavation. Take care to avoid striking the upper frames (if more than one frame is installed) when lifting through.

**Note:** To avoid causing unnecessary damage, do not attempt to force the frames out of the excavation without releasing the pressure.

5. Continue backfilling and compacting to the underside of the top frame.
6. Repeat steps 2 and 3 of the removal process; removing each leg separately.
7. Reinstatement can then continue to ground level.
8. Remove the edge protection and withdraw the trench sheets using appropriate equipment.

**Note:** All equipment should then be cleaned and stacked ready for re-use or collection

**Note:** Waste fluids should be disposed of safely with due regard to local regulations

| Do                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Do Not                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>✓ Have a lifting plan in place before installation</li> <li>✓ Visually check all safety critical parts as listed below prior to each use and replace if necessary: <ul style="list-style-type: none"> <li>• Lifting eyes, Handling points</li> <li>• Hydraulic couplings and Lock-off valve</li> <li>• Lifting equipment (e.g. chains and slings)</li> </ul> </li> <li>✓ Only use this equipment in temperature range –20°C to +40°C</li> <li>✓ Read and understand the scheme drawing (if supplied) before starting work</li> <li>✓ Read and understand the Motorised Shoring Pump user guide</li> <li>✓ Inspect all components at the start of every shift</li> <li>✓ Prepare a lifting plan, assess weights correctly and use appropriately certified lifting equipment during installation and removal</li> <li>✓ Only use the red painted points for lifting</li> <li>✓ Ensure all pins, clips and bolts are correctly fitted</li> <li>✓ Install the frame level, the correct way up and in accordance with the scheme drawing</li> <li>✓ Use only lifting points for chain attachment</li> <li>✓ Provide edge protection and ladder access/egress</li> <li>✓ Attach a minimum of four Restraining Chains; one in each corner or as indicated on the scheme drawing</li> <li>✓ Keep personnel clear of excavator slewing zone</li> <li>✓ Always use a banksman</li> <li>✓ Locate underground services before excavating</li> <li>✓ Take care to avoid trapping fingers at all stages of work</li> <li>✓ Store all equipment in a safe manner when not in use or when ready for collection. Ensure equipment stability and protection from damage, away from site activity</li> </ul> | <ul style="list-style-type: none"> <li>✗ Exceed the stated installation pressure</li> <li>✗ Use bolts other than those supplied by Groundforce for any connection</li> <li>✗ Over tighten lock off valves (light nip only)</li> <li>✗ Use pins and bolts other than those supplied by Groundforce</li> <li>✗ Use Shoring Fluid or Hydraulic Oil other than supplied by Groundforce</li> <li>✗ Install cross struts in positions other than specified on the scheme drawing</li> <li>✗ Allow excessive amounts of spoil to collect on top of the frame members</li> <li>✗ Use excessive force during installation/removal</li> <li>✗ De-pressurise frame components without adequate support (other than provided by the Restraining Chains) being in place</li> <li>✗ Drag the frame out of the ground without releasing the pressure</li> <li>✗ Stand directly under any elevated equipment</li> <li>✗ Strike the frame during excavation</li> <li>✗ Operate the motorised shoring pump from within the excavation</li> </ul> |

### EXCAVATION TRAINING AVAILABLE

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### Appreciation of Excavation Safety

The theoretical safety course is mapped to both EUSR and the National Occupational Standards and introduces the learner to the basics of working around excavations. Designed as an awareness course, particular emphasis is provided to key aspects of managing and/or overseeing excavation work. [Visit the course page](#) for more details.

The one day course can accommodate up to 20 delegates per day