Groundforce
Specialist Construction Solutions

Groundforce Standard Solutions
Modular Aluminium Panel Box System (1.2m Depth)
No Groundwater

GROUND ENGINEERING AWARDS 2019
WINNER
Specialist Geotechnical Supplier of the Year

ISOQAR REGISTERED
UKAS MANAGEMENT SYSTEMS
0026

Certification Number 14419
ISO 9001
ISO 14001
ISO 45001

Design Complexity Risk:	0	
Groundforce Check Category:	1	
	**An additional check should be carried out on site by the contractor to assess the suitability of the design*	
Date / Number of Pages:	12/04/2023	21
Design Reference / Rev:	MIX-0W-LW-MAP-12	C01

Provided by:
YourSolution
Your Excavation, Your Solution
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Contents

Description:	Page:
CDM 2015 statement	3
Basis of Design	4 - 5
Equipment Specification	6
General Notes	7
Scheme Specific Notes	8
Residual Risk Items	9 – 10
Design Calculations	11 - 12
Drawing	13
Installation Guide	14 - 19
Liability statement	Appendix A
Internal Design Check Certificate - see note 5 below.	Appendix B

IMPORTANT PLEASE NOTE

1. The design calculations contained in this document have been prepared using Groundforce Shorco's specialist temporary works design software. The designs have been based on the basic assumptions listed, which the competent person must assess as having been satisfied. If any parameter exceeds these assumptions, then the user should obtain a site specific design by contacting Groundforce on 0800 000 345.
2. It is the contractor's responsibility to communicate the information contained within this design to all relevant parties including the site principal designer(s) and temporary works coordinators where appropriate. It is also the contractor's responsibility to ensure that this information is incorporated into site specific method statements and risk assessments.
3. Any significant residual risks remaining after the design process will be documented both on the relevant page of this design and also on the drawings. It is the contractor's responsibility to take steps to reduce these risks to an acceptable level.

Please ensure that this document is passed on to the site temporary works co-ordinator and or main contractor prior to commencing any excavation work.
If in doubt ASK!

CDM 2015 Statement

The key aim of the CDM 2015 regulations is to integrate health and safety into the management of the project. As a result, specific duties are imposed on the key parties involved in a construction project namely:

1. The client
2. The principal designer (on sites where there is, or is likely to be, more than one contractor at any time)
3. Designers (this includes Groundforce Shorco as appointed temporary works designers of the original solution and the person selecting the standard solution).
4. The principal contractor (on sites where there is, or is likely to be, more than one contractor at any time)
5. Contractors

As competent temporary works' designers operating within the CDM regulations, specifically regulation 9 and 10, along with regulation 8 – general duties, Groundforce Shorco undertake to:

1. Adopt a safety first approach to design work in accordance with recognised standards and codes of practice.
2. Eliminate hazards and reduce risks in their design process.
3. Communicate clear and concise information about design assumptions and residual risks to all relevant parties.

Under CDM, the designer is defined as anyone preparing or modifying a design. A design can consist of drawings, details or specifications relating to a structure. As such, a designer includes anyone who specifies a particular method of work, equipment or material. This person will assume the role and responsibilities of a designer under the CDM Regulations and must have the skills, knowledge and experience, necessary to fulfil the role. As a designer, they are duty bound to cooperate with other persons working on a project to enable them to fulfil their duties and maintain the health and safety of themselves and others. Based on the above definitions, it is clear that great care should be taken when specifying shoring equipment, and should only be done by those with a sufficient level of competence to fulfil the role of the designer.

It is the responsibility of the person selecting the standard solution to check that the site conditions match those assumed in the solution. In addition, as this person is effectively specifying the solution, they assume the role and responsibilities of the designer under CDM.

One responsibility imposed on the client under CDM is to ensure that a principal designer has been appointed on sites where there is, or is likely to be, more than one contractor at any time.

We have not been informed who the principal designer for this site is. A copy of this design should be passed on to the principal designer for consideration.

In addition to the requirements of the CDM 2015 regulations, the main contractor or principle contractor should appoint a temporary works' coordinator (TWC) and supervisor(s) (TWS) as recommended in BS 5975:2019. The duties of the TWC(s)' and TWS(s)' are specified in section 11 & 12 of the above standard.

A copy of this design should be passed on to the TWC and or the TWS for consideration.

Basis of Design

Excavation Details		
Duration of Excavation:	Less than 12 weeks	
Purpose of Excavation:	Modular Aluminium Panel Box System (1.2m Depth)	
Max. Excavation Depth:	1.20m*	
	** includes no allowance for overdig*	
Plan Dimensions:	External:	Varies (Refer to drawing ref: MIX-0W-LW-MAP-12 C01)
	Internal:	Varies (Refer to drawing ref: MIX-0W-LW-MAP-12 C01)
Clearance below struts:	Varies (please refer to the relevant drawing)	

Ground Conditions	
✓ **Suitable Ground**	**✗ Unsuitable Ground**
SELF-SUPPORTING GROUND	**NON-SELF SUPPRTING GROUND**
Dense Made Ground	Very Loose, Loose or Medium Dense Granular Material including Made Ground
Very Dense Sand	Silt
Dense or Very Dense Gravel	Very Soft, Soft Clay
Firm, Stiff or Very Stiff Clay	Peat
Rock	
GROUND MUST BE SELF-SUPPORTING **SHOULD THE GROUND CONDITIONS ENCOUNTERED DIFFER FROM THOSE PERMITTED, STOP WORK IMMEDIATELY AND INFORM THE TEMPORARY WORKS CO-ORDINATOR**	

Assumed soil parameters for purposes of design*						
Depth (m)	Soil Name	γ (kN/m³)	φ (kN/m²)	Ka	Kp	δ
0.0 to 1.2	MIXED GROUND (See Above)	18.0	32	0.31	3.25	0.00
No groundwater is permitted within the depth of the excavation						

**These simplified parameters are deemed to be conservative based on the above information and result in a safe solution.*

Basis of Design (continued)

Surcharges (one option per side)	
A uniform surcharge of 16kN/m² at ground level to allow for general site traffic and	
✓ Permitted	✗ Not Permitted
Excavators up to 30 tonne weight working near the excavation.	Plant exceeding 30 tonne (including cranes)
Live roads up to and including Principal (A) roads, site access or closed roads	Railways, motorways and trunk roads
Simple boundary wall no more than 1.0m high	Embankments, sloping ground (greater than 1 in 10), spoil heaps, stored material
	Buildings/structures

Unsuitable Site Conditions
Design is not valid if any of the following conditions exist on site:
▪ Adjacent watercourses ▪ Presence of groundwater ▪ Excavation duration exceeding 12 weeks

Specification of Support Equipment

Boxes	
Box Type:	Groundforce Modular Aluminium Panel (MAP) Box System

Box Properties	
Maximum Allowable Pressure:	Depends on configuration (see below)
Calculated Pressure:	11.5kN/m²

4-Sided Configuration (No Struts*) *(These allowable pressures assume that all four sides are fully paneled. If panels are omitted, refer to the table below*)*				
	990	**1600**	**2200**	**2800**
Maximum Allowable Pressure:	314.5kN/m²	121.0kN/m²	65.5kN/m²	39.1kN/m²

2-Sided Configuration					
	Distance From Lower Strut To Base	**Panel Type**			
		990 Panel	**1600 Panel**	**2200 Panel**	**2800 Panel**
Maximum Allowable Pressure:	900mm	45.6kN/m²	30.4kN/m²	Not suitable	Not suitable
	600mm	102.6kN/m²	68.5kN/m²	52.1kN/m²	39.1kN/m²
	300mm	145.0kN/m²	96.8kN/m²	65.5kN/m²	39.1kN/m²

General Notes

1. This design is only valid when used in conjunction with Groundforce Shorco & Piletec equipment.
2. This design is only valid for short-term (< 12 wks) temporary works' applications. Therefore total stress soil parameters have been used for cohesive materials in the temporary case.
3. The installation and use of the equipment is the responsibility of the Hirer. It is essential that appropriately trained personnel are employed to install and use this equipment in accordance with the design specifications and user guides and general good practice. Groundforce can provide an installation advisory service to assist you with installing the equipment. Alternatively we can provide on site 'toolbox training'. Detailed user guides have been provided with the equipment, if not please ask.
4. The contractor is responsible for:
    - Providing adequate lifting facilities to ensure the safe off-loading, installation and removal of the equipment. Equipment weights are listed on the scheme drawings and user guides.
    - Checking for the presence of underground and overhead services and dealing with accordingly.
    - Providing appropriate edge protection to the perimeter of the excavation and also suitable means of access / egress to and from the excavation.
5. Unless otherwise stated in the scheme specific notes, all structural information has been calculated as the "worst case" loading resulting from a stage-by-stage installation sequence analysis.
6. The temporary works scheme has been designed with reference to the following documents as considered appropriate for the specific design:
    - British Steel (Arcelor) Piling Handbook;
    - CIRIA Special Publication 95 (1993): The Design & Construction of Sheet-Piled Cofferdams.
    - CIRIA Report C760: Embedded Retaining Walls (replaces CIRIA C580)
    - BS 8002:2015 Code of Practice for Earth Retaining Structures
    - BS 6031:2009 Code of Practice for Earthworks
7. The structural resistance of the supporting equipment has been generally designed in accordance with the following standards as considered appropriate to the specific design:
    - BS 5950 Part1-2000: Structural Use of Steelwork in Building where applicable
    - Eurocode 3: Design of steel structures. BS EN 1993 (part 1)
    - BS EN 13331 (parts 1 & 2) 2002: Trench Lining Systems
8. Attention is drawn to current safety legislation particularly CDM 2015 regulations & BS 5975:2019 (see also page 2). Appropriate site specific risk assessments **must** be performed by the contractor. In addition, the excavation must be inspected by a competent person in accordance with statutory requirements. Any defects or signs of deterioration to the support system must be notified to us immediately and work stopped within the excavation.
9. Any installation method statement supplied by GFS will be non-site specific. This will not take into account health and safety matters which should be dealt with in the hirer's own safety method statement. In addition the method statement should be read in conjunction with the design brief, drawings and equipment installation instructions supplied by Groundforce. Any deviation from these instructions/recommendations should be notified to us for verification of the adequacy of the scheme.

Scheme Specific Notes
(to be read in conjunction with risk schedule)

1. This design is based on the MAP Box Shield system being installed in a self-supporting, pre-dug excavation.
2. This design includes allowance for the following surcharges – **one option per side**. (Note: If the surcharge is not listed below it has not been considered in this design and should therefore not be within the zone of influence):

   A uniform surcharge of 16kN/m² at ground level to allow for general site traffic and
   - Excavators up to 30 tonne weight working near the excavation.

     OR
   - Live roads up to and including Principal (A) roads, site access or closed roads

     OR
   - Simple boundary wall no more than 1.0m high.
3. In the interests of design economy, overdig has not been allowed for in the design calculations. The contractor must therefore ensure that the excavation process is controlled accordingly (see also the residual risk assessment sheet).
4. As soon as the formation level is exposed, it is recommended that blinding concrete should be placed immediately to prevent degradation of the base.
5. The contractor should use a suitable “Bond break” medium such as visqueen, between the concrete and box panels to aid extraction of equipment.
6. Box must be installed in a pre-dug excavation and ground must be self-supporting to depth.

Residual Risk Schedule

The followings items have been identified as potential residual risks remaining after the design process risk assessment. Based on the information that we have available, we have allocated each risk a rating number depending on its potential to cause a problem. Those with a rating of 2, 3 and 4 are highlighted on the scheme drawing. **A further site specific risk assessment must be carried out on these items to assess their importance and potential consequence and to determine a course of action or monitoring in order to mitigate the risk to an acceptable level**.

Residual Risk Item	Risk Rating
Site specific risk assessments	2
Size and weight of the equipment	2
Ground conditions	2
Surcharge	2
Accidental excavation (Overdig)	2
Unsupported ground at ends of trench	2
Working at Height & Access/Egress	2
Ground movement	2
Box Installation	2

Key to Risk Rating	
1	Unlikely to be a problem
2	Possible problem
3	Probable problem
4	Almost certain to be a problem

Notes on possible further mitigation action required at site level.

1. Site specific risk assessments: Site specific risk assessments must be performed by the contractor. In addition the excavation must be inspected by a competent person in accordance with statutory requirements. Any defects or signs of deterioration to the support system must be notified to Groundforce immediately and work stopped within the excavation.

2. Size and weight of the equipment: Ensure that this information is taken into account during the planning of any work to be carried out, including the provision of adequate lifting facilities to ensure the safe loading, installation and removal of the equipment.

3. Ground conditions: Should the ground conditions differ from those considered, excavation should stop immediately and a site specific temporary works design be obtained. Any immediate hazards should be made safe by backfilling if necessary. In addition if ground is found to be hard the Contractor is to take care when installing box as application of excessive force may result in box damages which may be chargeable. If ground contains cohesive material the Contractor is to take care when extracting box due to self-weight and suction effects inherent to cohesive material. Lifting capacity of onsite machinery is to be assessed prior to starting the extraction process.

4. Surcharge: A uniform surcharge of 16kN/m^2 has been applied at ground level to allow for any of the following surcharges ***(1 option per side)***:

    - Excavators up to 30 tonne weight working near the excavation.
      OR
    - Live roads up to and including Principal (A) roads, site access or closed roads
      OR
    - Simple boundary wall no more than 1.0m high.

    If plant exceeds weight limit of 30Te, or total surcharge loading is exceeded design stated values scheme needs to be reassessed.

    All spoil and excavated material should be moved to outside the zone of influence to avoid additional surcharging of the excavation.

5. Accidental excavation (Overdig): In the interests of design economy, overdig has not been allowed for in the design calculations. Specific control measures should be put in place to ensure that the dig is not allowed to progress beyond the indicated formation level.

Residual Risk Schedule

6. Unsupported ground at ends of excavation *(Applicable if Endsafe Closure Panels not utilised)*: The ends of the excavation should be battered back a safe angle on all faces to ensure stability of the unsupported ground. Alternatively, End Closure Panels could be utilised to close off the ends of the excavation. **Trench sheets should not be placed against the box struts.**

7. Working at Height & Access/Egress: Suitable edge protection and appropriate means of access and egress to and around the excavation. Groundforce's integrated EdgeSafe and LadderSafe products are recommended.

8. Ground movement: Monitor the ground surrounding the excavation for signs of movement (cracks, settlement etc.) and seek advice if necessary. Risk assess the impact of any ground movement on the integrity of any adjacent structures, roads and services.

9. Box Installation: The Groundforce MAP Box system must be installed in a pre-dug excavation. Ground must be self-supporting. Contractor is to risk assess operation prior to commencing excavation and reassess risk throughout the operation. Box must not be forced into the ground.

SUMMARY

INPUT

Excavation Depth	1.2 m
Surcharge	16.0 kN/m²
Active Water Depth	10.0 m
Passive Water Depth	10.0 m
Water Density	9.81 kN/m³
Min Fluid Density	5.0 kN/m³

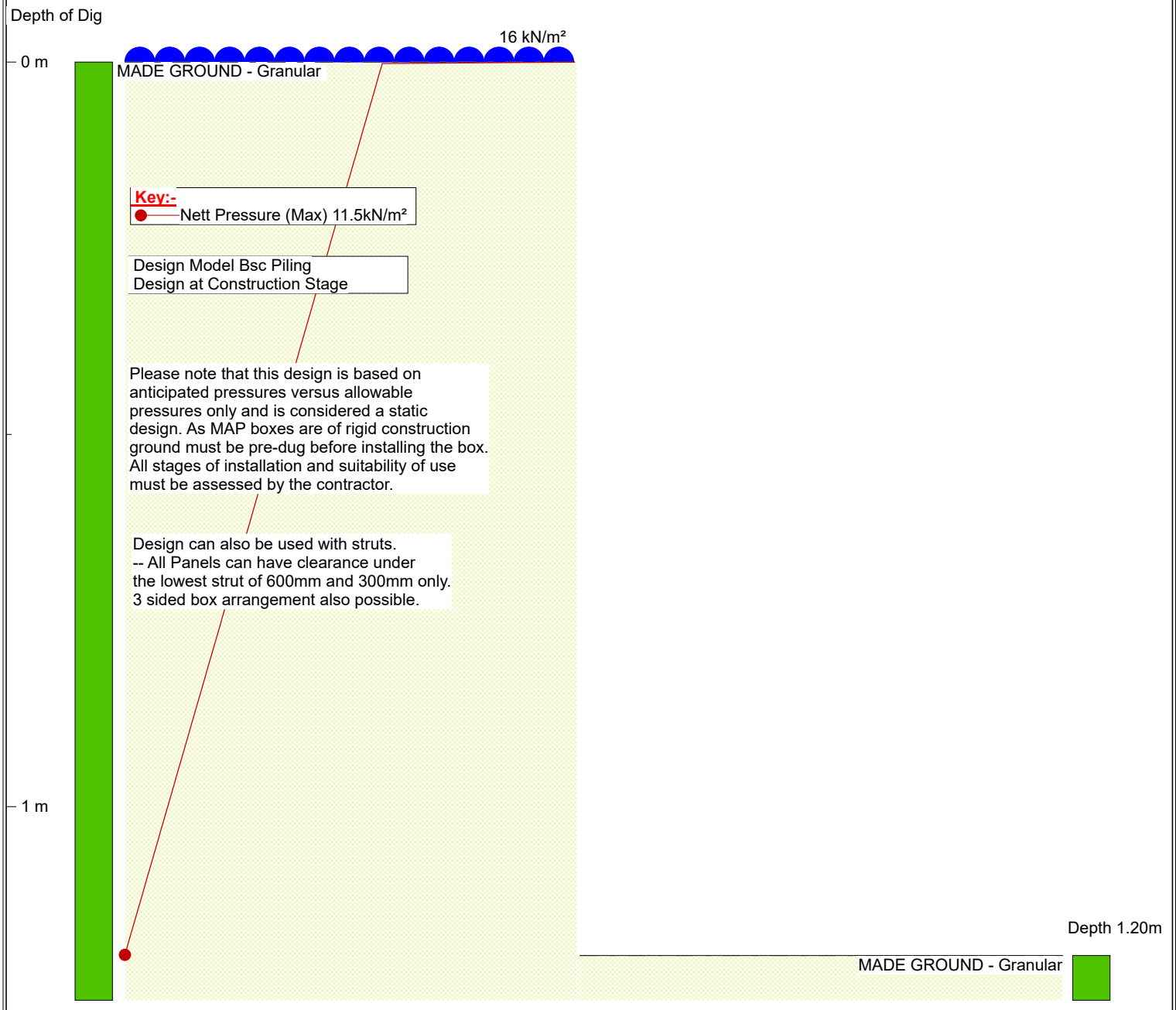
SOIL PROFILE

Depth (m)	Soil Name	y(kN/m³)	y'(kN/m³)	C(kN/m²)	Ø(°)	Ka	Kp	Kac	Kpc	delta
0.0	MADE GROUND - Granular	18.00	11.00	0.00	32.00	0.31	3.25	0.00	0.00	0.00

SOLUTION

BOX DEFINITION	
Box type:	

BOX PROPERTIES	Allowable	Calculated
Kicking Moment:	0.0 kNm	0.0 kNm
Bowing Moment:	0.0 kNm	0.0 kNm
Strut Force (+):	0.0 kN	0.0 kN
Strut Force (-):	0.0 kN	0.0 kN



Issued for Construction.

-- Design also applicable in cohesive ground with minimum strength of Soft to Firm (a minimum cohesion of 30kN/m²).
-- Please refer to the drawing for further information on ground conditions suitable for this design.
-- Groundwater not considered.
-- Maximum depth = 1.2m

Box Definition
Box type:

	Allowable	Actual
Kicking Moment:	0.0	0.0 kNm
Bowing Moment:	0.0	0.0 kNm
Strut Force (+):	0.0	0.0 kN
Strut Force (-):	0.0	0.0 kN

Pressure Model: BSC Piling
Support Type: No Earth Support

Box Strut Information

Groundforce
Software Licensed to:
SPTAYLOR

Title :MAP Box (1.2m Depth)

Contract :-
Contractor:-

Designer :SPT
Reference:MIX-0W-LW-MAP-12
Date:12/04/2023
Construction Stage Rev: 01

Groundforce Shorco
Excavation Support

1 CHECK GROUND CONDITIONS

The standard solution indicated on this drawing can be used in the following ground conditions. Should the ground conditions be unsuitable, please contact Groundforce for a site specific design.

✓ SUITABLE GROUND	✕ UNSUITABLE GROUND
Well Compacted Made Ground	Very Loose or Loose Made Ground
Road Construction	Silt
Medium Dense, Dense or Very Dense Sand	Very Loose or Loose Sand
Loose, Medium Dense, Dense or Very Dense Gravel	Very Loose Gravel
Soft-Firm, Firm, Stiff or Very Stiff Clay	Very Soft or Soft Clay
Rock	Peat

No groundwater is permitted within the depth of the excavation.

SHOULD THE GROUND CONDITIONS ENCOUNTERED DIFFER FROM THOSE PERMITTED, STOP WORK IMMEDIATELY AND INFORM THE TEMPORARY WORKS CO-ORDINATOR

2 CHECK SITE CONDITIONS & SURCHARGES

The standard solution indicated on this drawing is valid based on the below conditions. Should the site conditions and/or surcharges be unsuitable, please contact Groundforce for a site specific design.

✓ PERMITTED (within the zone of influence*)

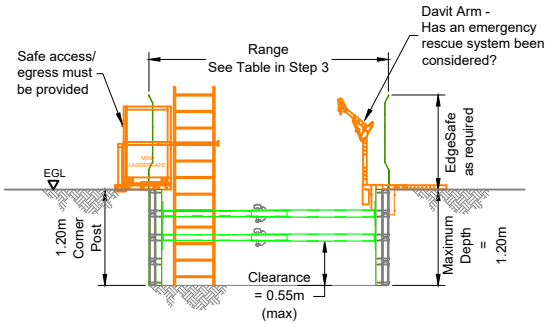
- Plant up to 30t (10kN/m²)
- Live roads up to and including Principal (A) roads, site access or closed roads
- Simple boundary walls less than 1.0m high

✕ NOT PERMITTED (within the zone of influence*)

- Plant exceeding 30t (including cranes)
- Railways, motorways and trunk roads
- Embankments, sloping ground (greater than 1 in 10), spoil heaps, stored material
- Buildings/structures

* The Zone of Influence is assumed to extend back from the edge of the excavation by a distance equal to 1.0 x dig depth (i.e. at 45° from formation level)

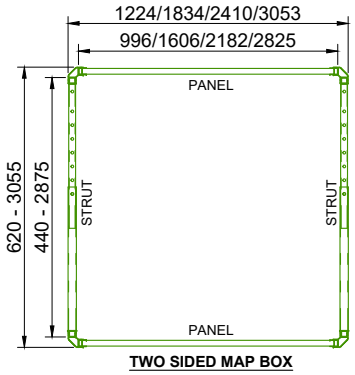
4 TYPICAL SECTION



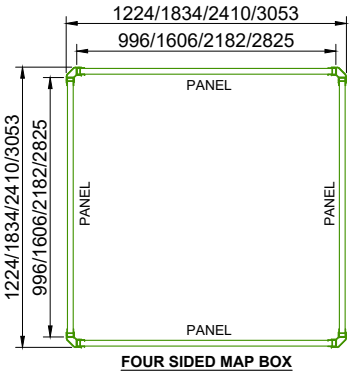
Maximum Allowable Dig Depth = 1.20m

IF YOU ARE IN ANY DOUBT...ASK!

3 EQUIPMENT



TWO SIDED MAP BOX



FOUR SIDED MAP BOX

TWO SIDED MAP BOX

FOUR SIDED MAP BOX

SPECIFICATION - POSTS	1200	1800
Post Height (mm)	1200	1800
Post Weight (kg)	15	21

SELECT SUITABLY SIZED PANELS, STRUTS AND POSTS TO FIT THE DIMENSIONS OF THE EXCAVATION

SPECIFICATION - STRUTS	Type 00	Type 0	Type 1	Type 2	Type 3	Type 4
Strut Length (mm)	390 - 490	590 - 690	680 - 1070	900 - 1410	1410 - 2325	1710 - 2825
Trench Width (mm)	620 - 720	820 - 920	910 - 1300	1130 - 1640	1640 - 2555	1940 - 3055
Strut Clearance Height (mm)	255 / 555 / 855*	255 / 555 / 855*	255 / 555 / 855*	255 / 555 / 855*	255 / 555 / 855*	255 / 555 / 855*
Strut Weight (kg)	12	14	20	24	36	44

SPECIFICATION - PANELS	990mm Panel	1600mm Panel	2200mm Panel	2800mm Panel
Panel Length (mm)	996	1606	2182	2825
Plate Thickness (mm)	63	63	63	63
External Box Length (mm)	1224	1834	2410	3053
Clearance Between Struts (mm)	1056	1656	2232	2875
Panel Height (mm)	600	600	600	600
Panel Weight (kg)	24	37	49	62

- 3 sided box arrangement also possible
- Maximum two number posts to be joined together to achieve overall box height.
- 1800mm posts to be used where 855mm strut clearance is required.

* Strut Clearance Height should not exceed 555mm when used in conjunction with 2200mm and 2800mm Panels

5 SELECT SUITABLE END SUPPORT

When struts are used, the ends of the excavation should be **battered back** to a safe angle of repose (to be determined by the contractor) to ensure the stability of the unsupported ground.

Alternatively, **Modular Aluminium Panels** (as above) can be used in lieu of struts to close-off the ends of the excavation to safely retain the ground and prevent loose material from being accidentally dislodged into the excavation.

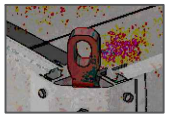
6 USE OF CHAIN ATTACHMENT POINTS

Lightweight boxes are equipped with only one type of chain attachment point.

Lifting points are much heavier duty constructions designed to take the full weight of the box including extraction forces when pulling them out of the ground. These points are located in the top of the box panels and are denoted by red paint.

Note:

1. Chain attachment points have been designed in accordance with BS EN 13331-1:2002 clause 7.4.
2. The chain attachment points are considered as part of the load. Therefore no certification is required for these points under LOLER.



Lifting point

RESIDUAL RISKS

1. **Site specific risk assessments** must be performed by the contractor. In addition the excavation must be inspected by a competent person in accordance with statutory requirements. Any defects or signs of deterioration to the support system must be notified to Groundforce immediately and work stopped within the excavation.
2. **Size and weight of the equipment**: Ensure that this information is taken into account during the planning of any work to be carried out, including the provision of adequate lifting facilities to ensure the safe loading/ unloading, installation and removal of the equipment.
3. **Ground conditions**: Should the ground conditions differ from those stipulated, excavation should stop immediately and a site specific temporary works design be obtained. Any immediate hazards should be made safe by backfilling if necessary.
4. **Surcharge**: Prior to commencing excavation, the competent person selecting the standard solution should ensure that no excessive surcharges are present.
5. **Accidental excavation (Overdig)**: Care should be taken during excavation to ensure that maximum allowable dig levels are not exceeded.
6. **Unsupported ground at ends of excavation**: Ground should be battered back to a safe angle of repose or suitable EndSafe panels should be used.
7. **Working at Height & Access/Egress**: Suitable edge protection and appropriate means of access and egress to and around the excavation. Groundforce's integrated EdgeSafe and LadderSafe products are recommended.
8. **Ground movement**: Monitor the ground surrounding the excavation for signs of movement (cracks, settlement etc.) and seek advice if necessary. Risk assess the impact of any ground movement on the integrity of any adjacent structures, roads and services.

Notes

1. This standard solution has been produced to enable a competent person (*someone who has sufficient training, skills, experience, knowledge and also the authority to carry out the task in hand*) to specify the shoring requirements for relatively small, shallow excavations in reasonable ground conditions so as to avoid having to produce a site specific design.
2. For the applicability of the standard solution, refer to the "Ground Conditions" and "Site Conditions & Surcharges" boxes opposite.
3. The excavation must be open for less than 12 weeks.
4. Should any of the above conditions not be met or there be a requirement to use alternative equipment, the TWC should obtain a site specific temporary works design by contacting Groundforce on 0800 000 345.
5. The installation of the equipment is the responsibility of the hirer. It is essential that appropriately trained personnel are employed to install this equipment in accordance with this drawing and specific Groundforce User Guides. Groundforce can provide an installation supervision service if required or alternatively provide 'toolbox training' for the site operatives.
6. Assumed Installation Method: Dig and Push (See Groundforce Installation & User Guides).
7. Removal is the reverse of the installation process ensuring material is backfilled and compacted in layers as extraction proceeds.
8. A general surcharge of 16kN/m² has been allowed for. This will account for most common site equipment. If abnormal surcharges are likely to be present, seek further advice from Groundforce.
9. The excavation support design does NOT allow for standard BS8002 overdig. The contractor MUST ensure the excavation process is controlled and monitored at all stages to avoid overdigging.
10. This design is not suitable for use with any other supplier's equipment and no liability shall be accepted by Groundforce for such use.

Scheme Title: _____

Scheme Number: _____

Location: _____

I certify that, to the best of my knowledge, the actual site and ground conditions do not conflict with the parameters of this Temporary Works Design

Signed: _____
Temporary Works Co-ordinator

Date: _____

Company: _____

! CO_2e FOR THIS HIRE

$kgCO_2e$ per kg of equipment per week
Steel = 0.0145, Aluminium = 0.0358
- *Raw Material Supply (A1), Transport (A2), Manufacturing (A3)*

\+ $kgCO_2e$ per kg of equipment per hire
= 0.015 - *Transport to and from site (A4)*

Groundforce Shorco

Standard Solutions

1.20m Deep
Mixed Ground
No Groundwater
MAP Box

Groundforce Shorco
Excavation Support

User Guide

Modular Aluminium Panel (MAP) Box

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 MAP Box. Non-standard applications should be approved by a suitably qualified engineer.

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

THIS USER GUIDE IS NOT CONTROLLED WHEN PRINTED

You can also access this User Guide to download as a pdf from the Groundforce Technical Library.

A video animation showing the MAP Box system is available to watch now on our YouTube channel.

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

Rev	Date	Comments	Initial
1.9	12/11/18	No. of pins per panel clarified	DSW

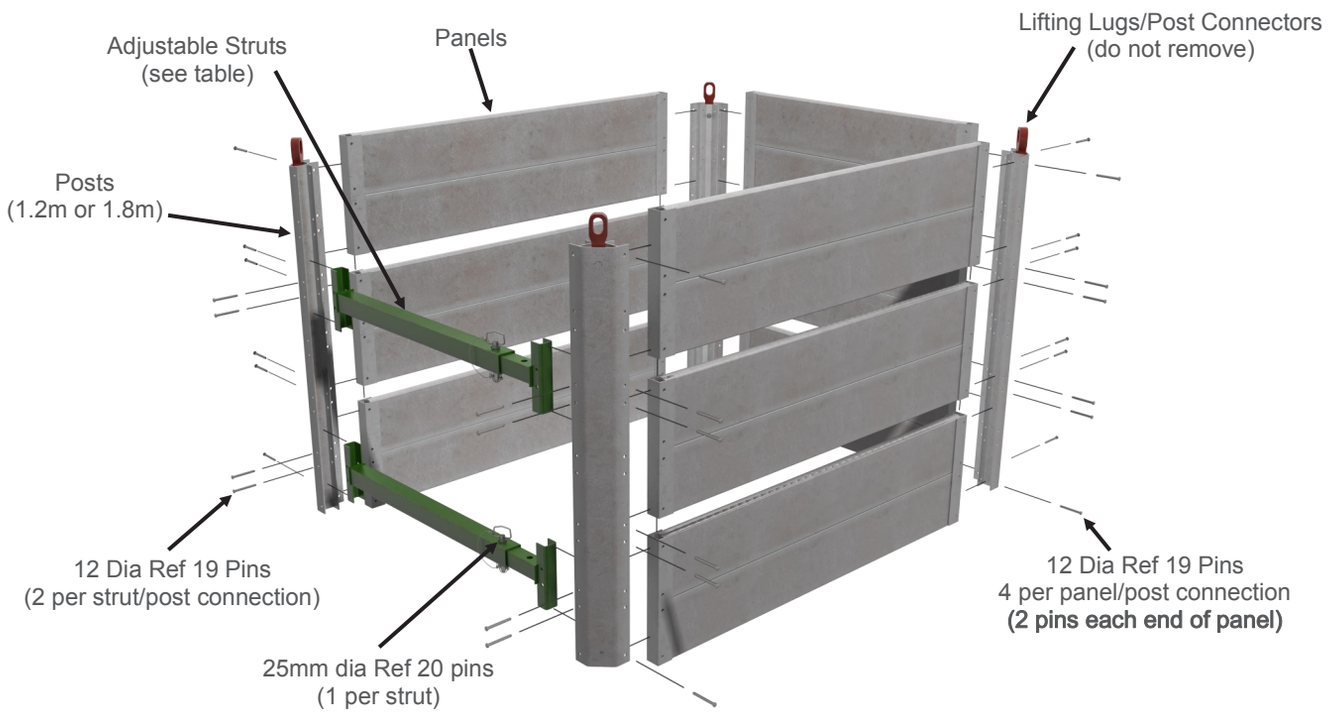
ISOQAR REGISTERED
UKAS MANAGEMENT SYSTEMS
0026
Certification Number 14419
ISO 9001
ISO 14001
OHSAS 18001

Introduction

The MAP Box is a lightweight modular box system that can be assembled by hand and handled by a 180 degree rubber tyred excavator. Using just three main components: panels, struts and corner posts, the system provides great versatility by allowing 2, 3, and 4 sided support as the job demands. Box weights start as low as 240kg for 2-sided configurations. The portability and ease of handling make the system ideal for emergency uses where rapid response and limited working space rule out heavier equipment.

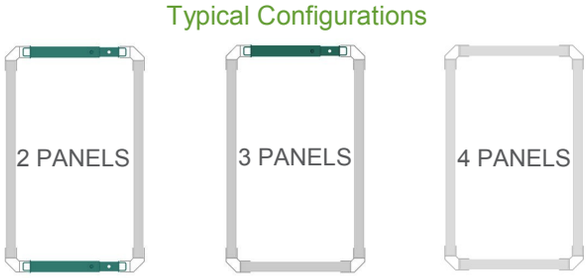
Note: MAP Boxes must be installed into a pre-dug excavation

Equipment Identification



Clearance Under Lower Strut (mm)	
Lowest Setting	255
Mid Setting	555
Highest Setting	855

Typical Configurations



Struts		
Type	Internal (mm)	External (mm)
1	680 - 1070	908 - 1298
2	900 - 1410	1128 - 1638
3	1410 - 2325	1638 - 2553
4	1710 - 2825	1938 - 3053

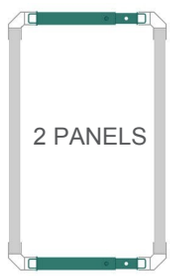
Panels				
Technical Specification (mm)	990 Panel	1600 Panel	2200 Panel	2800 Panel
Actual Panel Length	996	1606	2182	2825
External Box Dimension	1224	1834	2410	3053
Internal Box Dimension	1046	1656	2232	2875
Individual Panel Height	600	600	600	600
Panel Thickness	63	63	63	63

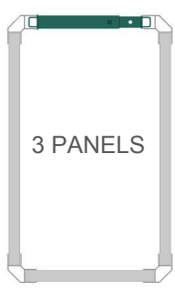
Typical Box Weights

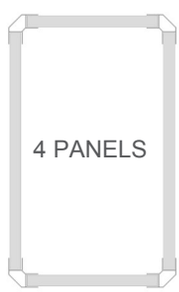
Box Type	Panel Type (mm)	Post Height (m)	Strut Type	Weight (kg)
2 PANEL CONFIGURATION	990	1.2	1	240
			2	256
			3	304
			4	336
		1.8	1	264
			2	280
			3	328
			4	360
	1600	1.2	1	292
			2	308
			3	356
			4	388
		1.8	1	316
			2	332
			3	380
			4	412
	2200	1.2	1	340
			2	356
			3	404
			4	436
		1.8	1	364
			2	380
			3	428
			4	460
	2800	1.2	1	392
			2	408
			3	456
			4	488
		1.8	1	416
			2	432
			3	480
			4	512

Box Type	Panel Type (mm)	Post Height (m)	Strut Type	Weight (kg)
3 PANEL CONFIGURATION	990	1.2	1	246
			2	302
			3	350
			4	406
		1.8	1	270
			2	326
			3	374
			4	360
	1600	1.2	1	324
			2	380
			3	428
			4	460
		1.8	1	348
			2	404
			3	452
			4	484
	2200	1.2	1	396
			2	452
			3	500
			4	532
		1.8	1	420
			2	476
			3	524
			4	556
	2800	1.2	1	474
			2	530
			3	578
			4	610
		1.8	1	498
			2	554
			3	602
			4	634

Box Type	Panel Type (mm)	Post Height (m)	Strut Type	Weight (kg)
4 PANEL CONFIG'N	990	1.2	-	256
		1.8	-	280
	1600	1.2	-	360
		1.8	-	384
	2200	1.2	-	456
		1.8	-	480
	2800	1.2	-	560
		1.8	-	584







Note: Weights given are for 2,3 and 4 panel boxes stacked 2 panels high. Site specific designs may vary.

Component Weights

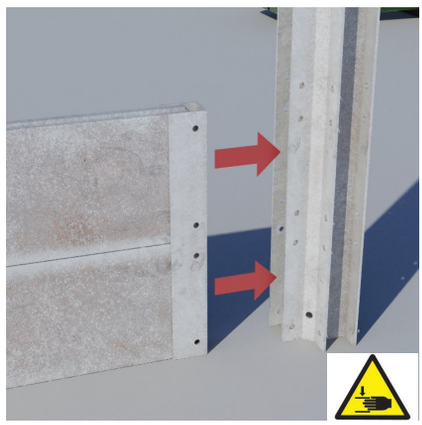
Component Description	Size (mm)	Weight (kg)
1200 Corner Post	1200	15
1800 Corner Post	1800	21
Strut Type 1 (inc ref 20 pin)	680 - 1070	20
Strut Type 2 (inc ref 20 pin)	900 - 1410	24
Strut Type 3 (inc ref 20 pin)	1410 - 2325	36
Strut Type 4 (inc ref 20 pin)	1710 - 2825	44
Panel Type 990	996 x 600	24
Panel Type 1600	1606 x 600	37
Panel Type 2200	2182 x 600	49
Panel Type 2800	2825 x 600	62

Assembly Instructions (two sided box)

Safety Note: Extreme care and adequate precautions must be taken to avoid trapping fingers during all stages of work.

1. Set out the equipment in a clear, level area in close proximity to the planned excavation.

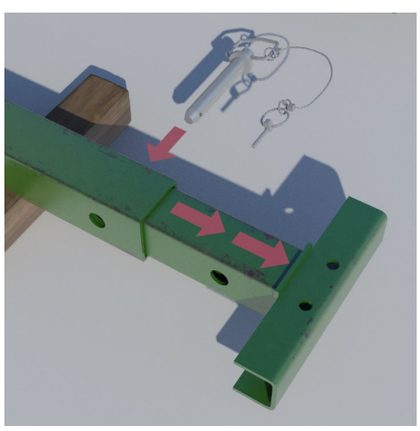
2. Begin assembly of the box by supporting a corner post in the upright position.



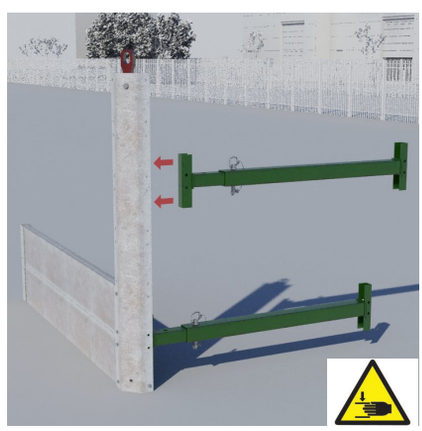
3. Slide a panel into one end of the post.

Safety note: Always work in pairs to ensure safe assembly

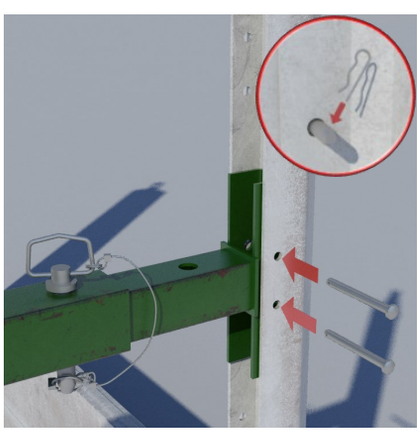
4. Insert two 12 dia pins from the 'outside in' and secure the post and panel with R-Clips. **Note: There are two pins each end of the panel. (four pins per panel in total)**



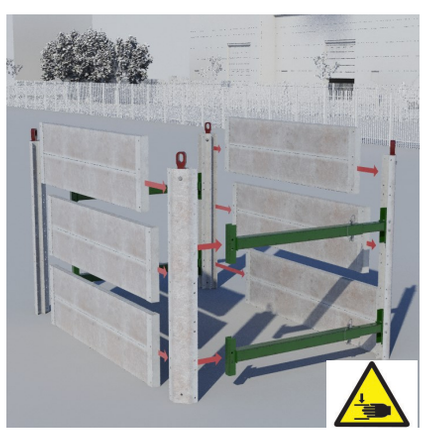
5. Extend the strut(s) to the required length and secure with the larger 25mm diameter pin. **Note:** For an open ended box, two struts are used instead of panels.



6. Lift the struts into position.



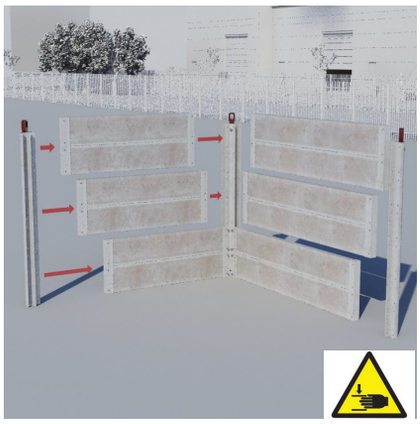
7. Insert two 12 dia pins from the 'outside in' and secure the struts with R-Clips.



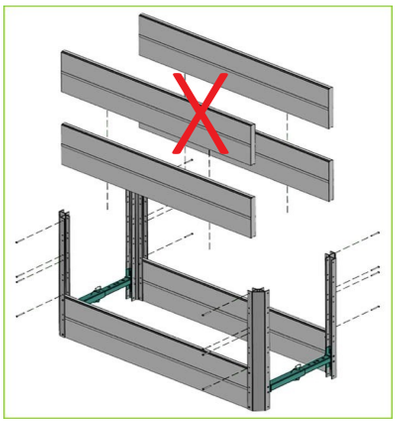
8. Assemble the remaining struts and panels as shown.

9. Image showing a fully assembled two sided box.

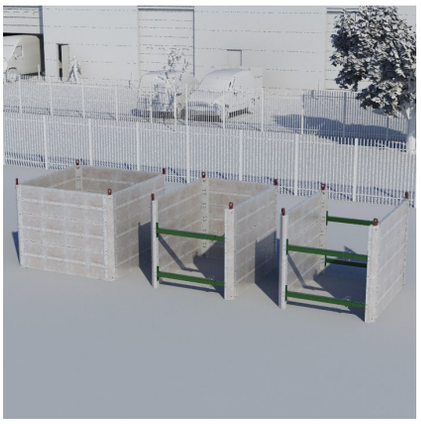
Assembly Instructions (three and four sided box)



1. Slide in further panels as required, securing to the post with 12mm dia pins. Add corner posts as required and continue sliding panels into place to achieve the required configuration/ height.



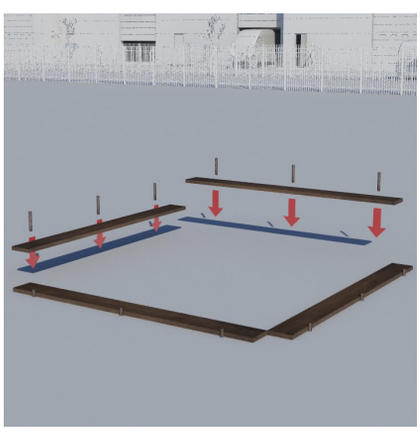
2. Do not build a complete box at ground level as this will mean subsequent panels/struts will have to be lifted in from above. (see note below)



3. Image showing typical 4, 3 and 2 sided box configurations.

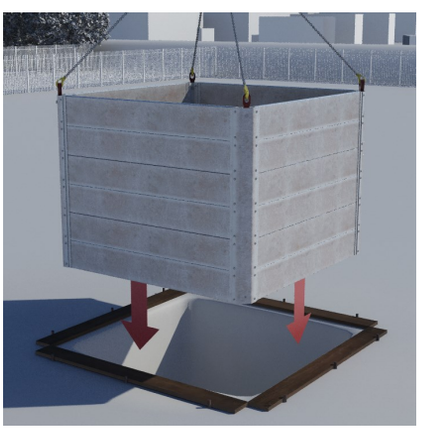
Note: To avoid the scenario in image 2 above: articulate the last corner post/panels outward before sliding in the final upper panels. In this way the box can be fully closed at ground level.

Excavation and Installation



1. MAP Boxes must be installed in a pre-dug excavation. Mark out the trench by staking down guide beams.

2. Excavate to the proportions of the MAP Box and to the required depth, plus an allowance of 100-150mm wider than the Box.



3. Attach a certified 4 leg lifting chain to the red lifting points. Lift and deposit the fully assembled box into the trench.

Note: At this point, If using stacked pairs, lift the top box onto the bottom box using a four leg chain.

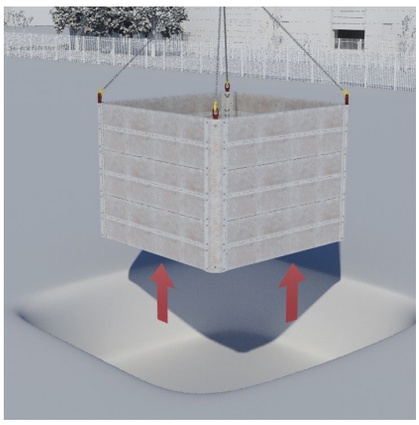
Ensure all corners are aligned with the post connectors and secure using 12mm dia Ref 19 pins.

Safety Note: Always provide a safe method of entry and egress. Never enter an unsupported trench.

4. Any voids between the sides of the box and excavation should be backfilled to form a level surface as necessary.

5. Install edge protection and ladder access as soon as possible to provide a safe working environment.

Extraction



1. Attach a certified 4 leg chain to ease the box out of the excavation, rocking the box from side to side as necessary.

2. Once the box has been lifted clear, reinstatement can then continue to ground level.

3. Disassembly is generally the reverse of assembly. Clean and stack all equipment ready for re-use or collection.

An EdgeSafe video animation with related SiteSafe solutions is available to watch now on our YouTube channel.

A video animation showing LadderSafe systems is available to watch now on our YouTube channel.

For details on Edge protection and LadderSafe Systems, refer to the relevant user guides which are available to download as a pdf from the Groundforce Technical Library

Do	Do Not
✓ Inspect all components at start of every shift	× Exit the box into an unsupported area
✓ Assess weights correctly and use adequate and appropriate lifting equipment	× Adjust the struts without laying the box down and removing the top plate
✓ Ensure all pins & clips are correctly fitted	× Snatch the chain during removal
✓ Use four panel connectors for upper box attachment	× Climb on the struts – always use a secured ladder
✓ Use only lifting or handling points for chain attachment	× Hang/store materials on the struts
✓ Provide support over the full height of the dig	× Excessively force the box into the ground
✓ Provide edge protection or handrail panels	× Permit personnel in the box during installation
✓ Keep personnel clear of excavator slewing zone	× Accidentally strike the struts
✓ Always use a banksman	× Drag the box by any means
✓ Locate underground services before excavating	× Fly the boxes above the base of the excavation unless approved by a competent person
✓ Store assembled boxes on firm, level ground	× Remove post connectors/lifting lugs from posts
✓ Take care to avoid trapping fingers at all stages of work	

Liability Statement

This design has been prepared by the Groundforce Shorco (GFS) technical department in accordance with their documented design procedure (a copy of which is available on request). Great care has been taken to provide a safe and workable solution in accordance with the principles set out in BS 5975:2019 section 13 and the Construction (Design and Management) Regulations 2015 as far as is reasonably possible.

The Hirer should note that they have a duty under CDM and BS 5975 to check the suitability of the design for the site conditions and proposed use.

The calculations and drawings given in support of the equipment usage is based solely on a set of standard assumptions. Therefore the stability of the suggested configurations is solely dependent on the validity and accuracy of these assumptions. It is essential therefore that the Hirer or their representative checks carefully the validity of the assumption within this document to ensure that the scheme is practical and workable.

Should there be any changes to the site conditions from those assumed in the design, the Hirer should first reassess the suitability of the design. Should the Hirer deem that the design is no longer suitable, it is recommended that they contact GFS immediately. If the Hirer fails to notify GFS of such changes which the Hirer knew or ought reasonably to have known, GFS take no further responsibility whatsoever for the continued use of the equipment.

Design & Check Certificate

This design has been prepared by the Groundforce Shorco (GFS) technical department based on the agreed design brief supplied in accordance with their documented design procedure (a copy of which is available on request). Great professional skill and care has been taken to provide a safe and workable solution in accordance with the principles set out in BS 5975:2019 and the Construction (Design and Management) Regulations 2015 as far as is reasonably possible.

The design has been checked internally by Groundforce Shorco in accordance with check **Category 1** as described in BS5975:2019. It is the responsibility of the temporary works coordinator to assess the required check category and ensure that the design has been checked accordingly.

The shoring temporary works scheme is described by the documents referenced below:

- ***Standard Solution Design Document: MIX-0W-LW-MAP-12 C01***
- ***Drawing(s): MIX-0W-LW-MAP-12 C01***

I certify that reasonable professional skill and care has been used in the design of the Temporary Works scheme identified and described by the above referenced drawings and other documents:

Signed:		Name: Steven Taylor-Costa *BSc (Hons) MEng (Hons) GMICE*
		Date: 12/04/23
Title / Position:		Principal Engineer (Development)

I certify that reasonable professional skill and care has been used in the checking of the Temporary Works scheme identified and described by the above referenced drawings and other documents.

Signed:		Name: Vicky Mastoridou *MEng MSc GMICE*
		Date: 12/04/23
Title / Position:		Development Manager

I certify that the staff who have completed the above design and check are competent to carry out their duties and that they have exercised reasonable professional skill, care and diligence under CDM 2015.

Signed:		Name: Oliver J. Smith *MEng (Hons) CEng MICE CMgr MCMI*
		Date: 12/04/23
Title / Position:		Head of UK Engineering Design

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