Smartraft® Operation & Maintenance Manual

1. General Information

1.1. General Description

This Manual is for use with the Smartraft® prefabricated modular foundation system and must be read in conjunction with all relevant system drawings.

1.2. Systems Information

The latest systems information for Smartraft® can be found on Smartraft® website at www.smartraft.co.uk. Further information requirements or queries can be requested from info@smartraft.co.uk. It is the responsibility of the user to ensure all system information used is up to date. Smartraft® reserve the right to continually improve and update our systems and information.

1.3. Training

To ensure the performance of the system, operatives must complete training on the installation, repair, maintenance and inspection of Smartraft®. This training is available by contacting us at info@smartraft.co.uk

1.4. Quality

It is the policy of Smartraft Ltd to maintain and review an effective and efficient Quality Management System planned and developed in conjunction with all management functions. Smartraft Limited are accredited to BS EN ISO 9001 (Appendix B)

1.5. Health & Safety

It is the policy of Arbus Limited to ensure that company activities are carried out in accordance with the requirements set out in the Health and Safety at Work etc. Act 1974. We accept our responsibilities towards all our employees and any other people who may be affected by our activities or omissions. This includes that work activities under our control are carried out in such a way as to eliminate / minimise the risk to the health, safety and welfare of our employees and any other persons who could be affected. Arbus Limited has an Integrated Management System certified to ISO 45001 which is applied to all areas of our business.

1.6. Environmental

Arbus Limited are committed to ensuring we operate in an environmentally sensitive manor. Arbus Limited has an Integrated Management System certified to ISO 14001 which is applied to all areas of our business.

1.7 System Testing

Sample anchor testing is carried out prior to delivery to site so no on-site anchor testing is required. Foundation load testing should be carried out in accordance with manufacturers specifications of the system being installed following installation.

3. Installation

This Installation Manual encompasses the work involved to install Smartraft® Pre-Fabricated Modular Foundation System. All relevant drawings and component information are located within the Appendix A.

3.1 Foundation Requirements

Full ground preparation requirements are located on SMA_ARR_007.

3.2 Minimum System Length

Smartraft® has been tested to show that a single 6m unit can comply to the lateral forces required for testing under EN-1317 requirements. Minimum run lengths for the Smartraft® system are limited also by the requirements of the Vehicle Restraint or Fencing system which is to be installed upon them. Individual Smartraft® units can also be used within a system installed otherwise as surface mounted, driven or concreted as a deviation and solution allowing for services, structures or other site-based complications.

3.3 Personal Protective Equipment

- Operatives will wear PPE suitable to the task at all times

3.4 Competency

All operatives will be fully experienced and qualified to carry out the various tasks required

- All operatives to have undertaken training in the use of the specialist work equipment and procedures the works demand
- The findings of the Risk and COSHH assessments, along with this Method Statement will be communicated to all employees carrying out the activities identified

3.5 Lifting

Smartraft® must be lifted into place by competent operatives under the guidance of a suitable lift plan. Smartraft® dimension information is provided upon delivery and can vary between units depending on their bespoke requirements.

Smartraft® should be lifted using the 4no pre-installed lifting eyes and an appropriate lifting cradle. Smartraft® should never be moved laterally when in contact with the ground or any other surface. Lateral movement must only be made when the Smartraft® unit is free from any restriction to that movement.

3.6 METHOD OF WORKS ACTIVITY

Ground preparation requirements are located on SMA_ARR_007
System information are located on SMA_ARR_009 or project specific drawings

- Hold Point – Ensure suitable ground investigation to the requirements of HSG 47 has taken place prior to breaking ground.
- Location of proposed barrier run to be marked out using marker spray
- If ground has not been prepared prior to installation team arriving, a trench is to be excavated for the length of the proposed installation to 1000mm width and 200mm depth and with an even bed.
- Smart Raft pre-fabricated foundations to be delivered to site using flatbed lorry and brought alongside the proposed fence-line.
- Operatives to remove the protective covers from the first Smart-Raft and attach 4no. lifting eyes into the lifting sockets.
- Hold point –Any lateral movement of the Smartraft must be completed with the block clear of the ground and/or other obstacles. DO NOT DRAG OR PULL SMARTRAFT BLOCKS ONCE IN SITUE.
- Smart-Raft to be lifted into place using a suitable excavator equipped with twin-brother chains attached to the 4no. lifting eyes on the Smart-Raft.
- Raft to be checked as level and stable prior to moving forwards. Should this not be the case the raft is to be removed and ground prepared prior to replacing. Tolerance +/- 20mm to the adjacent raft.
- Lifting eyes to be removed and protective covers replaced.
- Further Smart-Rafts to be lifted into place in the same way and slotted female to male with existing foundation pieces.
- Ground around the smart raft is to be made good using suitable tools.
- Where socketed posts are used, post lowered into position and securing pin installed into place
- Where surface mounted posts are used, new posts installed into pre-set anchor points as per manufacturer's instructions
- Beams will then be hung on the barrier posts and torqued to manufacturers specifications using hand tools.

3.7 REMOVAL FOR ACCESS

- Condition of Smartraft® blocks and lifting eyes to be inspected by competent operatives prior to movement.
- VRS System beams to be dropped and set aside. Post pins removed and set aside and posts removed and set aside
- Surface of Smartraft® to be cleared of debris prior to lift using a brush or similar
- Operatives to remove the protective covers from the first Smart-Raft and attach 4no. lifting eyes into the lifting sockets.
- **Hold point – Any lateral movement of the Smartraft must be completed with the block clear of the ground and/or other obstacles. DO NOT DRAG OR PULL SMARTRAFT BLOCKS ONCE IN SITUE.**
- Smartraft® to be lifted out of situe using suitable plant equipped with suitable lifting frame attached to the 4no. lifting eyes on the Smart-Raft and set aside for re-installation. Should Smartraft® units lock together male and female ends to be gently freed with a rubber mallet
- Protective covers to be replaced onto lifting eyes
- Access to be given to service provider as required

- Once works have been completed, ground is to be reprepared to original installation requirements and suitably levelled
- Operatives to remove the protective covers from the first Smart-Raft and attach 4no. lifting eyes into the lifting sockets.
- Smart-Raft to be lifted into place using suitable plant equipped with suitable lifting frame attached to the 4no. lifting eyes on the Smartraft®.
- Lifting eyes to be removed and protective covers replaced.
- Ground around the smart raft is to be made good using suitable tools.
- VRS system to be reinstalled by competent operatives to the manufacturers guidance

3.8 MODIFICATION

Smartraft® is not to be modified in any way without prior approval from Smartraft Ltd.

Where cutting is required to allow for immovable obstructions, testing must be completed on the posts situated either side of the cut with satisfactory results to the requirements of the system prior to approval.

It may be considered suitable to infill the Smartraft and surrounding excavation with concrete to ensure modifications have been suitably supported prior to testing.

Any repairs or modifications should not reduce any coverage for fixings or post sockets.

Where modifications are required, due to changes in overall design or the specification of the mounted system, Smartraft® to be consulted prior to manufacture and/or installation.

4 Inspection, Maintenance & Repair

4.1 Inspection

Smartraft® is to be inspected concurrent to the VRS system inspection regime to ensure the system is still in a serviceable condition. Smartraft® will also be inspected after any incident of vehicular strike or other similar damage to the associated barrier system. Further inspection information is located within Appendix C - Concrete Barrier Base Repairs

4.2 Maintenance & Repair of the Smartraft® system

Once in situ, Smartraft® does not require ongoing maintenance.
Smartraft® system should be inspected after any impact on the installed system upon it.

Where issues are identified with the Smartraft® system upon any inspection, it can be repaired by competent personnel using the methods outlined in Appendix C - Concrete Barrier Base Repairs. Where the damage is deemed beyond repair a replacement Smartraft® section should be installed.

4.3 Maintenance and repair of Hydrorock

Hydrorock can be installed in conjunction with Smartraft® to provide additional drainage and silt collection applications as required

Once in situ, Hydrorock® does not require ongoing maintenance.
Smartraft® system should be inspected after any impact on the installed system upon it.

Inspection, maintenance and repair of silt collection tray

Where a silt collection tray is installed an inspection plan is put in place based on the geographical conditions of the installation area, road usage and local knowledge. This inspection plan can be updated based on ongoing findings and system performance.
Silt collection trays should be inspected after any impact on the installed system upon them.

At suitable intervals determined by inspection, installation area, road usage and local knowledge, silt collection trays are to be emptied and geotextile membrane lining replaced.

Where silt collection trays are found to be damaged beyond practical use these are to be replaced.

Where crash damage is identified, repair methodology identified within section 4.2 to be used.

Further information on Hydrorock can be found at https://www.hydrorock.com/downloads/

4.4 Maintenance & Repair of the VRS System installed upon Smartraft®

Repairs should be carried out in accordance with the manufacturers specifications. In the instance of socketed posts, post retaining pins should be replaced in all impact damaged sites. Where the post retaining pin has been damaged during impact, it may need to be removed using a reciprocating saw by competent operatives prior to replacement.

In the instance of surface mounted posts, posts should be removed, anchor points inspected and new posts installed as per manufacturers instructions. Should the anchor posts be damaged this may result in the need for a replacement Smartraft® section.

5 Compliance

5.1 Mechanical resistance and stability

The construction works must be designed and built in such a way that the loadings that are liable to act on it during its constructions and use will not lead to any of the following:

(a) collapse of the whole or part of the work;

(b) major deformations to an inadmissible degree;

(c) damage to other parts of the construction works or to fittings or installed equipment as a result of major deformation of the load- bearing construction;

(d) damage by an event to an extent disproportionate to the original cause.

Specific installation guidance to prevent collapse or damage to the works and the system during installation can be found in section 3.

The system has been designed and tested to elements of EN1317 to ensure the system performs during an impact. The unit may see cracking, chipping and gouging. Following an impact, guidance is provided for units to be replaced.

5.2 Safety in case of fire

The construction works must be designed and built in such a way that in the event of an outbreak of fire:

(a) the load-bearing capacity of the construction can be assumed for a specific period of

time,

(b) the generation and spread of fire and smoke within the construction works are limited,

(c) the spread of the fire to neighbouring construction works is limited,

(d)occupants can leave the construction works or be rescued by other means,

(e) the safety of rescue teams is taken into consideration.

Materials in the system are made up of steel and concrete, whose structure will deteriorate following extended exposure to fire. Following an impact, guidance is provided for units to be replaced. In addition the structure should not have a significant fire risk associated with it.

5.3 Hygiene, health and the environment

The construction work must be designed and built in such a way that they will, throughout their life cycle, not be a threat to the hygiene or health and safety of the workers, occupants or neighbours, nor have an exceedingly high impact, over their entire life cycle, on the environment quality or on the climate during their construction, use and demolition, in particular as a result of any of the following:

(a) the giving-off of toxic gas,

(b) the emissions of dangerous substances, volatile organic compounds (VOC), greenhouse gases or dangerous particles into indoor or outdoor air

(c)the emission of dangerous radiation,

(d) the release of dangerous substances into ground water, marine waters, surface waters or soil,

(e)the release of dangerous substances into drinking water or substances which have an otherwise negative impact on drinking water CPR 305/2011 - Basic Requirements for Construction Works Version 2

(f) faulty discharge of waste water, emission of flue gases or faulty disposal of solid or liquid waste

(g) dampness in parts of the construction works or on surfaces within the construction works

The majority of points under this section do not apply, the only indirect point that could apply is in the instance of fire which is covered in “Safety in case of fire”.

5.4 Safety in use

The construction work must be designed and built in such a way that they do not present unacceptable risks of accidents or damage in service or in operation such as slipping, falling, collision, burns, electrocution, injury from explosion and burglaries. In particular construction works must be designed and built taking into consideration accessibility and use for disabled persons.

This installation manual provides specific installation guidance to reduce the risk of accidents during installation when followed correctly.

The system has been designed and tested to elements of EN1317 to ensure that it operates within the criteria set out within the standard.

5.5 Protection against noise

The construction works must be designed and built in such a way that noise perceived by the occupants or people nearby is kept down to a level that will not threaten their health and will allow them to sleep, rest and work in satisfactory conditions.

The installation of the Smartraft® system will generate an amount of noise. Each site will have specific site rules, which will ensure that nearby people are protected.

5.6 Energy economy and heat retention

The construction works and their heating, cooling, lighting and ventilation installations must be designed and built in such a way that the amount of energy they require in use shall be low, when account is taken of the occupants and of the climatic conditions of the location. Construction works must also be energy-efficient, using as little energy as possible during their construction and dismantling.

Not Applicable to Smartraft®.

5.7 Sustainable use of natural resources

The construction works must be designed, built and demolished in such a way that the use of natural resources is sustainable and in particular ensure the following:

(a) reuse or recyclability of the construction works, their materials and parts after demolition;

(b) durability of the construction works;

(c) use of environmentally compatible raw and secondary materials in the construction works.

The product/components used are recyclable to the degrees listed below and are designed to have a working life of 50 years in accordance with the Highways Agency requirements.