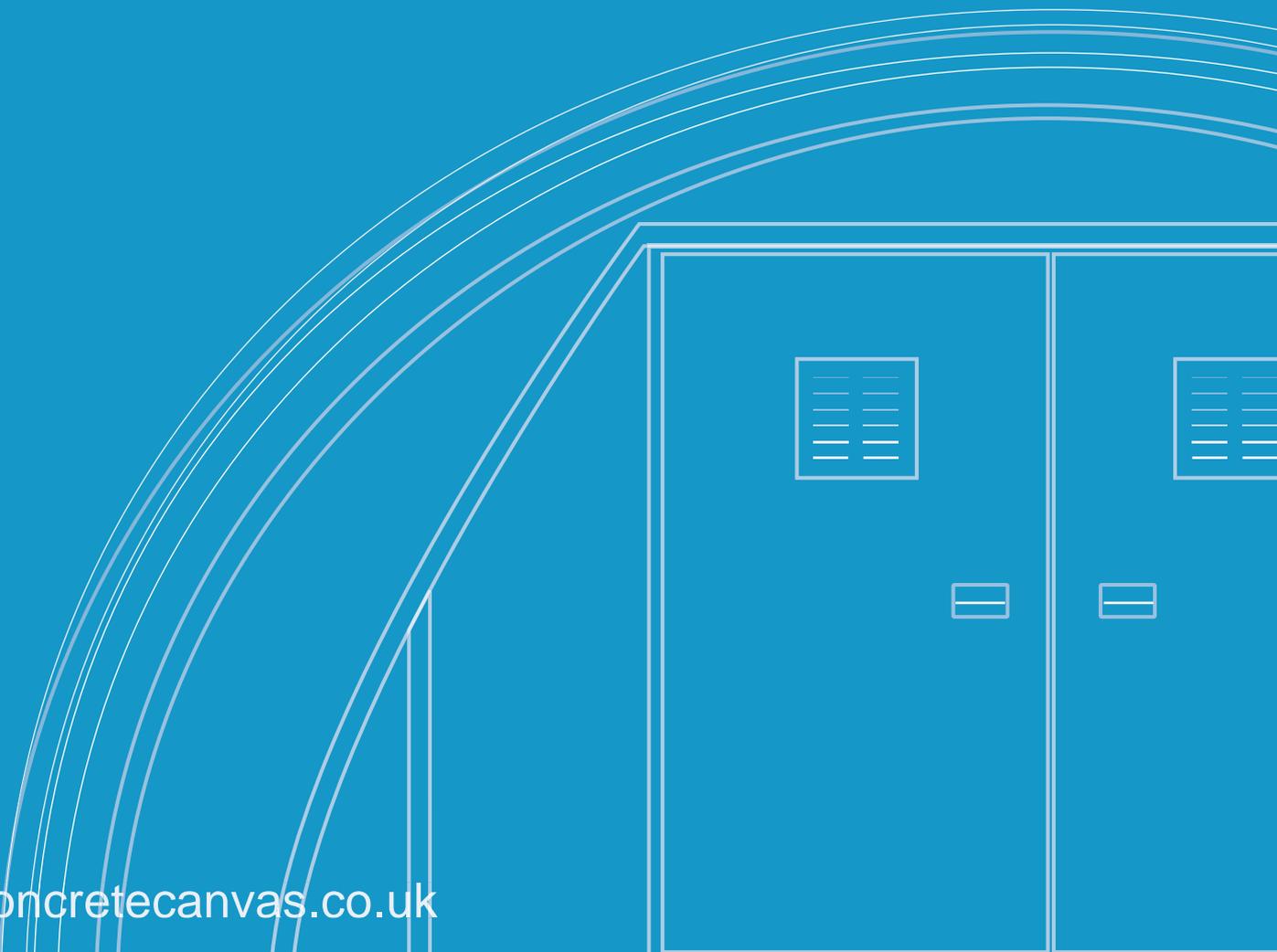




## CONCRETE CANVAS SHELTERS™



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## Concrete Canvas Shelters

Concrete Canvas Shelters are rapidly deployable hardened shelters that require only water and air for construction. Patents have been filed.

Concrete Canvas Shelters (CCS) have two major advantages over conventional tented shelter:

**Operational:** CCS enable a hardened structure from day one of an operation. They provide much better environmental protection, increased security and vastly improved medical capability.

**Financial:** CCS have a design life of over 10 years, whereas tents wear out rapidly and must then be replaced. CCS are a one stop solution, saving effort and cost over the lifetime of medium to long term operations.

The key to CCS is the use of inflation to create a surface that is optimised for compressive loading. This allows thin walled concrete structures to be formed which are both robust and lightweight. CCS consist of a revolutionary cement based composite fabric (Concrete Cloth) bonded to the outer surface of a plastic inner which forms a Nissen-Hut shaped structure once inflated.



## CCS Key Facts

### Rapid

A 25sqm CCS can be deployed by 2 people in less than 1 hour and is ready to use in only 24 hours.

### Force protection

The compressive structure of CCS has been modelled to be covered with sand or earth (berming) to provide protection and insulation.

### Insulating

CCS concrete shells have good thermal properties. When buried they provide excellent insulation and a very large thermal mass.

### Durable

CCS are far more durable than tenting with a minimum design life of 10 years.

### Sterile

The sealed plastic inner of a CCS, means it can be delivered sterile.

### Fire proof

Concrete Cloth is a ceramic and will not burn. Each shelter is lined with a flame retardant fibre reinforced polyethylene inner with a B1 (DIN 4102-01 05/98) fire rating.

### CBRN protection

CCS can be fitted with a combined forced air / inflation unit and decontamination module to provide full spectrum CBRN protection.

### Secure

The hard shell and lockable doors of a CCS provide a level of security not possible with soft skinned structures, protecting stores, equipment and personnel.

### Semi-permanent

CCS provide all the benefits of a permanent structure without the associated cost and time delays.

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## CCS Deployment



1

### Deliver

CCS are supplied folded in polyethylene, airtight, water and rot proof sacks within ISPM15 heat treated timber/ply panel crates.



2

### Inflate

An electric fan is activated which inflates the plastic inner to lift the structure until it is self supporting. The shelter is then pegged down with ground anchors around the base.



3

### Hydrate

The CCS is then hydrated by spraying with water. Water does not need to be potable but must not be sewage. Sea water may be used.



4

### Set

The Concrete Cloth cures in the shape of the inflated inner and 24 hours later the structure is ready to use. Access holes can be cut to allow the installation of services.

## Earth Berming



CCS structures have been modelled to withstand a very high distributed compressive load, enabling berming by sandbags, local fill material or snow. This gives the shelters excellent thermal properties and can provide protection against shrapnel, blasts and small arms fire. The above shows CCS buried using a cellular geo-textile product to provide force protection. The fill can then be capped using Concrete Cloth to prevent wash-out and further improve protection.

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## Size Variants

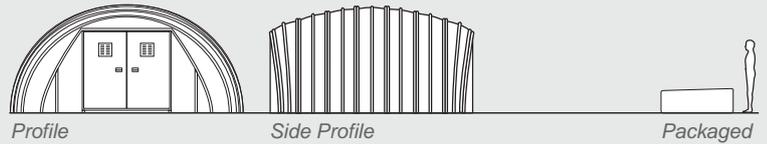
Concrete Canvas have developed two shelter variants, CCS25 and CCS54 (with 25sqm and 54sqm of floor space respectively). CCS structures have been designed to maximize their internal usable space. A standard CCS54 can accommodate up to 15 people according to Sphere Standards, Humanitarian and Disaster Response Charter. For longer term operations, CCS54 will accommodate 8 standard cots with free standing mosquito nets. The technology can be scaled up to provide even larger structures. Future product developments include shelters to be used for storage of vehicles and helicopters.

Pre-deployment dimensions				
Unit	Length (m)	Width (m)	Height (m)	Weight (kg)
CCS25	2.55	2.30	1.05	1800
CCS54	2.55	2.30	1.30	3100

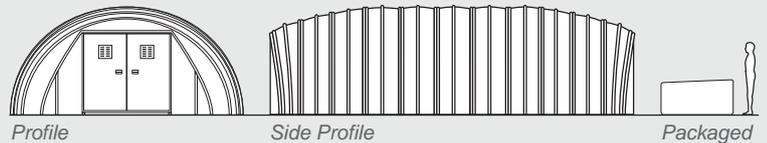
CCS25 NATO Stock Number : 5410-99-501-4836

Post-deployment dimensions				
Unit	Length (m)	Width (m)	Height (m)	Area (sqm)
CCS25	5.00	5.60	2.60	25.0
CCS54	10.00	5.60	2.80	54.0

CCS25



CCS54



## Flexibility

CCS structures are designed as part of a modular system; units can be easily linked together enabling the space to be tailored to the application. CCS are designed as generic structures with initial uses as accommodation, field offices and secure storage. Small openings for services can be cut or drilled in the Concrete Cloth shell. Larger openings for windows can be cut but require bolted frames to distribute the stress. CCS can be demolished using basic tools. The thin walled structure has a very low mass leaving little material for disposal.



Internal view of docked CCS54s

## Contact

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