

Connect-ive Solution (Sverige)

“Relief™ System” – Prefabricated Accommodation Creation Concept

Introduction

The Connect-ive Solutions introduces the “Relief™ System”, the rapid accommodation and infrastructure system.

Our “Relief™ System” is the solution offered for situations where there are either

(1) Existing substandard houses or

(2) A pressing need to establish a community of houses in an emergency or humanitarian situation.

Whatever your environment, whatever your specialization, the benefits and solutions of the “Relief™ System” are available to you.

Background/ Concept

The “Relief™ System” is based upon a revolutionary concept in prefabricated offsite construction technology designed to meet specific accommodation needs.

The components are easily erected or even disassembled, moved and reassembled. These temporary houses have a projected life expectancy of at least 25years.

This document describes the construction system, outlining the potential of the design, using our standardized range of components.

The “Relief™ System” units are supplied flat packed and are designed to be carried on a single road trailer. The modules are quickly assembled using interchangeable wall panels, providing wide-ranging combinations of both external and internal arrangements.

Within any society, the activities of a broad range of institutions, organizations and agencies generate requirements for accommodation for workers, refugees and the homeless particularly in areas of the world where the immediate infrastructure is

missing, damaged or is being developed. Connect-ive Solutions (Sverige) has responded to this situation by expanding the solution portfolio to include a unique concept called the “Relief™ System”, unique in it’s approach to the design detail solutions. The “Relief™ System” concept consists of high quality turnkey units that offer high quality, diverse and practical accommodation tailored to suit various situations and requirements.

The traditional solutions have been to offer tents, corrugated lean-to’s’ or converted shipping containers. The “Relief™ System” was designed from the start to address the following criteria,

- Ease of offsite manufacture and storage
- Ease of transportation and
- Ease of assembly
- Without heavy mechanical aids
- Creating a unified and cohesive concept and execution.
- But above all else, comfort for the inhabitants – *because these are homes.*

System

Using the “Relief™ System” component system, you’re using a system that is modular by component, not by room or function. It’s like using a shopping list when you’re in the warehouse, pick the parts that match the requirements and send them. The “Relief™ System” is,

- Simple
- Easy
- And requires little ground preparation

One of the key strengths of the “Relief™ System” is that it is designed, to be transported and operated with a minimum of technology or tools – manual labor can manage the process.

“Relief™ System” units can be erected manually by local manpower or by crews supplied by construction contractors. The modules do not require special tools, only an adjustable spanner and rubber hammer.

All “Relief™ System” variant components can be transported by air, land or sea.

Any variation or combination of "Relief™ System" can be delivered, that even includes water purification stations, energy sources, air-conditioning, fully fitted kitchens, furniture, etc.

Services such as, laundry and catering can be supplied with a "Relief™ System" solution as required.

The Quality and performance guarantee

Quality Assurance is a key word in the "Relief™ System" concept:

The process of construction and manufacture is done in a factory, which means consistent quality and dimensional control, achieved through a regulated environment. This means that unlike traditional construction, our system adheres to a set of predefined performance parameters, for example wind loading, water tightness, termite resistant, etc.

Layout and Structure

The system is based on flexible components. They are easy to handle and can be put together in various configurations. Living quarters, office areas, workshops, general stores, even schools, local hospitals and health stations can be established using the standard, basic elements.

Potential specifications can include the following, dependent upon local requirements.

Inner walls and ceilings are made of steel profiles with either plywood, chipboard or Gyproc cladding, all with Rockwool™ insulation.

The Roofs are made from color coated steel sheets on steel beams and are packed together with the walls for easy and quick erection on site. The main elements are connected together by a specially developed, simple and effective lock mechanism that is patent pending.

Further freedom of choice in facings, design and room sizes mean that for all intents and purposes the facility will resemble that of a more traditional permanent on-site construction.

Flexibility in financing.

The majority of administrators and co-coordinators have the need for flexibility in mobilized camp size. By offering a system that allows one to expand or reduce area in accordance with requirements one offers the administrator full flexibility in exploiting

available space and resource.

This makes it possible for the administrator to balance the delivery of space in accordance with requirements without an overt and heavy financial commitment. Perhaps even migrating units and components between sites as each localized situation warrants.

Pre-fabrication provides improved total economy, a greatly improved working environment, higher product quality and improved documentation.

Our aim is to meet all needs and standards through creative development, the working environment and quality.

Time, price and quality

Assembly-line production of the complete system is carried out indoors and under stable ambient temperature conditions. It goes without saying that the system conforms to approved production methods.

So in summary....

Durable, Versatile and Resilient

The modular nature and durability of our system makes it ideal for repeated use, you can increase or decrease settlement size as needed, whether the requirement is for shops, storage, office or low cost housing, our versatile "Relief™ System", can be packed flat and shipped by truck, ship or air, – always ready for easy assembly on site.

We can even supply the personnel to oversee initial construction, we offer installer training and provide all necessary equipment.

"Relief™ System" panels are light yet immensely strong, and combined with the other components create an enclosure which stands up to the harshest of environments - from -10C° to +45C°.

The "Relief™ System"

Time Effective. Resource Effective. Location and Layout Flexible.

We provide all the parts and sections needed to create rapidly mobilized settlements and communities, all completely plumbed, wired and ready for assembly with no need for mechanical or custom tools. Because all the parts are independent, you choose the floor layout, if a wall has a window, a door or not.

Above all, modular offers more choices and saves both time and money. What more could you ask for? Real-time savings. You have a need. You have a site. Select a plan. Assemble the components.

No modifications.

A solution – straight off the shelf. Means real cost savings.

Modular construction allows for a mixing and matching of materials and services that result in more building for the buck. Many designs. Truly modular means choices, choices and more choices. Unrestricted building footprints, (stack or stagger modules). Customize for the climate – heating or air conditioning units, just select and ship.

The design and build process can take on new dimensions with the custom modular construction. “Custom” is the key: endless building footprints and floor plan options. Connect-ive Solution (Sverige) brings access to a vast knowledge of accelerated construction techniques, which combine reliability and quality with comfortable environment.

The “Relief™ System”;

- Can be assembled in less than 8 hours with sufficient manpower
- Designed to occupy a minimum of space when stored and easy to be deployed.
- Accommodation for temporary / workers / laborers
- Could be used as shelter for victims of natural disasters, such as hurricanes, floods, tornados, fires and earthquakes – worldwide.
- Termite, water and rot resistant
- The ability to re-use the structure by dismantling and then shipping
- The ability to withstand extreme cold or heat,
- The ability to withstand up to 120 kph sustained winds
- Military applications, such as barracks, mess halls, mobile hospitals, field offices, etc. Response Shelters has a unique system that incorporates structural integrity and transportability with strength, flexibility and durability. Response Shelters feel confident in saying that the ‘Relief system™ is the only true solution that delivers buildings that are comprised of completely standardized and ‘off the shelf’ components, which can be transported and assembled without the use of cranes and can be truly flat packed. The system brings together products that have been tested over time and

incorporates them in a manner that is innovative and patent pending.
The installed facility is fully plumbed and wired and ready for connection to utilities.
Everything shipped is part of the finished installation.

A summary of the Performance Specifications

- System: Modularized floor, wall, ceiling, roof framed building fully erected, as shown on the accompanying drawings. (Optional: forklift and handling-pocket) Each unit has a pack, pre-wired 220 volt, 50Hz. single-phase power supply. Finishes and fixtures are optional and detailed below:
- Building dimensions: Multiples of the following Width: 1,2m x 2.4m
- Ceiling height: 2,15m min.
- Outside height: 2,40m min. (at 2,15m ceiling height).
- Floor (layers from below): hot dip galvanized steel covering, fiberglass insulation or Rockwool™, with vapor barrier, steel frame construction, water resistant chipboard (formaldehyde free), vinyl chloride welded seam flooring (optional).
- Optional flooring: antistatic cladding for special purposes, synthetic resin flooring for wet unit, aluminum or stainless steel tread plate etc.
- Walls (layers from the outside): pre-finished, steel frame construction, washable, white laminated (optional) chipboard interior (formaldehyde free).
- Optional inside cladding: wallpaper -or vinyl- covered gypsum board.
- Roof (layers from outside): hot dip galvanized steel sheets, PU sandwich ceiling panel with white painted and galvanized steel covering.
- Optional ceiling: painted wallpaper-covered gypsum board.
- Windows: aluminum frame, louver-glazed windows.
 - Basic sizes: c.c.a. 900 x 1200 mm one leaf with tilt and turn opening for office & living units, c.c.a. 600 x 450 mm one leaf with tilt opening for ablution units.
 - Optional: 1200 x 1800-mm double leaf with screen, vanishing blind, arctic insulation etc.
- Doors: steel framed and hot dip galvanized steel covered core for entrance door, fireproof insulated.
 - Optional, Interior doors: white laminated core with timber or steel frame. Hardware: Lockset on all doors except sanitary which shall have a privacy lockset.

- Optional: Heating & Cooling: Wall mounted baseboard electrical heaters with integral thermo-stat, Through-the-wall mounted, electrical room air conditioner or split cooling system.
 - Optional: Ventilation: through-the-wall air conditioning.
 - Lighting and Plugs: 1.2-m single incandescent ceiling fixtures 1x36W with wall switches, in the wet units same as above with ground fault protected circuit.
 - Optional: custom designed lighting system.
 - Power Supply: 220 Volt AC, single phase 50 Hertz. Optional: 380-Volt AC 50 Hertz, three phases (according to US codes). Main consumer box labeled and located for easy access. Sizing and numbering of conductors, breakers, panels etc. will be compatible with client electrical characteristics.
 - Optional: Sanitary installations: Fixtures: plastic shower stall with curtain, lavatory basin, toilet cabinet, water heater, exhaust fan etc. Sufficient hot-water heaters are included if specified.
 - Optional: Plumbing: exposed copper or plastic pipes and fittings (minimum 18-mm diameter) with lead free solder joints (at copper pipes), drain lines exposed polyvinyl chloride pipes, drain stub-out at short side of unit. All plumbing is exposed for easy of maintenance. Optional: Vented black/grey water drainpipes with 50-mm vent.
 - Insulation: The basic unit has an average U-value of 0,5 Watt/m² Kelvin with 70-mm insulation. The windows and doors have a U-value of 1,4 Watt/m² Kelvin.
 - Color: All units as client specification RAL 9010 or other.
 - Optional: other RAL coded colors.
 - Fire resistance: Classified as REI 30 (30 minutes)
 - Design Loads:
 - Wind Load: 35 m/s
 - Roof: 1,0 kN/m²
 - Floor: 2,0 kN/m²
 - Floor panel components, minimum footprint on the ground.
- *Labor levels permitting.

The "Relief™ System" is characterized by;

- Minimal site preparation for ease of siting
- Modules delivered in 'packed-flat' form for cost-effective transportation
- Factory production ensures highest possible quality
- Completely standardized – means if any thing doesn't get packed with a nasty surprise upon unpacking reveals parts missing, construction can continue.
- The buildings can be disassembled and moved, again and again.
- Completely flexible modular components from ground feet, pillars, floors, walls and roofs....
- "Multiple configurations, to suit multiple situations"
- The ground pads are made from rolled sheet steel; to act against excessive or higher than usual wind load, the pads can supply increased anchoring by being filled with concrete on-site, additionally we have found that by burying them in 30cm of soil the same advantage can be gained. Which means that they are still easy to transport when the site and components have been dismantled.
- Electrical wiring is contained within a wiring loom packet. Additionally sockets are available.
- Optional: Air-conditioning, heating and efficient insulation for optimum comfort.

Assembly

Upon arriving on site, the flat packed kits can be unloaded from the vehicles using only manual labor and carried to position (each unit part weighs in at no more than 90kg, so handling by 2 people is perfectly reasonable. Once the parts are unpacked and checked off against the shipping manifest, the work can begin.

1. Layout the ground pad in roughly the configuration that matched the floor plan.
2. Depending on the vulnerability of the site to wind, holes of about 30cm can be dug to anchor the foundations
3. Place the foundation pillars, using the various lengths to get a flat level for the floor sections
4. Maneuver the floor sections onto the pillars.
5. Clip the wall section into the floor section.
6. Using the included tools raise the ceiling and roof section into place.
7. . Erect the wall corners
8. Close the wall section connectors.

The erection is complete! In no more than 10 steps, it's that straight forward.

1. Move the furniture in.
2. Connect the generator
3. Connect the sanitary outlets

The amenity is operational!

Specification

Accommodation and Office Modules

The "Relief™ System" positively addresses these points,

- The fundamental requirement is that the modules must be made of sections that can each be carried manually.
- Every component is able to be lifted and moved by a maximum of four men. This is to permit removal from an aircraft or truck, re-location and assembly on-site where no mechanical handling devices, such as forklifts or cranes are unavailable.

Size:

- The accommodation is as specified 25m² or 37 1/2 m²
- The roof may be flat or sloping and can include a heat shield.

Wall Options:

The wall sections are able to accommodate options for;

- One door
- One Window
- One air-conditioning unit

- Or blank

Interchangeability.

- All wall panels must be replaceable and interchangeable.

Mobility

- Carried off in sections using manual labor.
- Lifted by manual labor and loaded onto transport
- Packed in robust re-useable pallets

Assembly

- The units will be easy to erect or assemble on a firm but unprepared site
- By unskilled labor
- Without mechanical aids
- Manufacturers pictorial instructions
- Optional: Leveling devices allow for a variation of up to 2.5m across the base area of the module.
- Optional: Multi-Language Instructional Video

Re-use:

- The modules can be disassembled, relocated and reassembled up to ten times without significant deterioration, dependent upon use or misuse during storage, transport and installed use.

Functional range and tolerance of;

- Outside temperature range from -10 to $+45^{\circ}\text{C}$
- Drought conditions
- Monsoon Rain
- Constant wind speed up to 120kph
- Roof load 1.0kN/m^2

Storage:

- Manufacturers own, the "Relief™ System" module components are able to be stored for 5 years without deterioration without limiting functional performance.

Fire rated:

- Class O inside, Class 3 outside.
- Allowance of components to suit American domestic standards

Standard lighting

- 2 nr. Power pockets.
- Fully manifested packing and shipping list.
- Mutual compatibility: not only are the modules standardised, they are comprised of completely standardized components, and every part is interchangeable.
- Dynamic in layout: the modules can be combined and laid out in any configuration.
- The "Relief™ System" Modules do not contain any hazardous materials
- The "Relief™ System" units are flat - packed during transportation.
- Color: can by any colour, as per clients specification.
- Identification: can by any marked or decal-ed, as per client's specification.