# FORCE PROTECTION IN BASRA

Soldiers from the Royal Engineers are helping protect British security forces in battle-zones such as Afghanistan and Iraq, where one of their key roles is Force Protection engineering. Major Sean Matten, recently returned from a six-month tour of duty in Iraq, writes about the threats faced by the front-line forces. He also outlines the different solutions used by 21 Engineer Regiment to keep their colleagues as safe as possible.

Even in our relatively brief time in southern Iraq – supporting 4 Mechanised Brigade and Multi-National Division (South East) – the region saw rapid change. There was extreme violence in the summer of 2007 which reduced markedly as British forces withdrew from the city of Basra to their sole base at Basra International Airport, referred to as the Contingency Operating Base (COB).

These forces were mainly focused on training the newly formed 14 Iraqi Infantry Division, with its responsibility for the security of Basra province, as well as conducting patrols to maintain the security of the British base.

## UNDER ATTACK

Rocket and mortar attacks against the COB increased during January and February 2008 to a rate of two or three a day. Then, in late March, the situation took a further dramatic shift as a successful Iraqi-inspired manoeuvre, to remove militia forces from the city of Basra, resulted in far greater freedom of movement for British forces, including a return of troops back into the city itself to act as mentors to the Iraqi Army formations and units based there.

Against this backdrop, 21 Engineer Regiment spent the majority of its time building structures to protect troops and equipment in static locations. In an inhospitable environment, considerable effort was taken to find affordable, robust and sometimes novel solutions to threats ranging from the frequent rocket and mortar attacks, to the infiltration of civilians into the secure camps established in the Basra region.

## PROTECTIVE BARRIERS

The threat to British forces was considerable. The COB was routinely subjected to various kinds of attack, from 60mm mortars to 240mm rockets containing up to 25 kilos of high-explosive. Blast and fragmentation protection was therefore vital for all buildings

**A member of 21 Engineer Regiment and an Iraqi contractor emplace the last section of a 12 km Security Barrier around the Contingency Operating Base, Basra International Airport** © Cpl Paul Fitzell

and essential equipment, such as aircraft. Suicide car bombs at camp entrances remained a serious risk, as did COB infiltration by insurgents to steal or possibly even lay explosive devices. Once British troops returned to the city of Basra, the need to provide them with protection against blast, fragmentation, and small arms fire became a high priority.

In a combat zone, a wide range of factors have to be taken into account in developing a varied array of Force Protection solutions (see box titled 'A Delicate Balance').

Thousands of kilometres of HESCO Bastion (essentially, larger and more flexible sandbags – see below for description) have been used in both Iraq and Afghanistan to provide Force Protection for troops. HESCO has delivered approximately 90% of Force Protection capability in Iraq since 2003. However, with the advent of the US concrete wall designs, there has been a noticeable drop in its use. It is no longer the default setting and there has been a marked increase in the use of other options. For example, the construction of a 12 kilometre security wall consisting of T-Wall sections built around the COB in Basra by my squadron probably led to a drop in the regiment's use of HESCO Bastion to 40% of total Force Protection employed during our six month tour.

## HESCO

Invented by a UK company of the same name in the early 1990s as a flood defence system, HESCO Bastion has subsequently become a much more efficient and effective replacement for the ubiquitous sandbag. This concertina packed gabion system has been employed by almost all western military forces in order to provide Force Protection from Bosnia to Afghanistan. It comes in a wide variety of sizes and can be stacked up to three tiers high, thus offering an extremely versatile and effective barrier system from small arms fire, rocket propelled grenades, artillery rounds and car bombs.

The default answer to Force Protection engineering in Iraq appears to be to use HESCO Bastion gabions. Made of a steel gabion cage with a polypropylene geo-textile inner membrane, they are a vital part of the military engineer's toolbox since Balkan campaigns during the early 1990s. There is a military saying that you "join the Royal Engineers, travel the world, meet new and interesting people and then surround them in HESCO". It is omnipresent in every modern battlefield. It is flexible, and offers superb protection from horizontal blast and fragmentation if filled correctly with effective spoil. Hundreds of metres of HESCO can be delivered with very little transport needed; four trucks of flatpacked material, with the addition of locally won fill, would cover a hundred metres. It is easy to store and its ease of assembly makes it ideal for short-notice tasks. In addition, it only requires a front-loading piece of plant like a JCB to fill it with locally-sourced spoil.

**Force protection of the aircraft fuel dump at Basra International Airport using HESCO Bastion gabions** © Major Sean Matten

There are potential disadvantages with HESCO, particularly if it is used in a semi-permanent structure for three years or more. The wrong type of fill can severely limit the timescale of its effectiveness. And whilst sharp sand should ideally be used, most of Basra province is built on silt and clay. Local fill could reduce longevity of the structure; so where possible we used Iraqi contractors to import more effective fill.

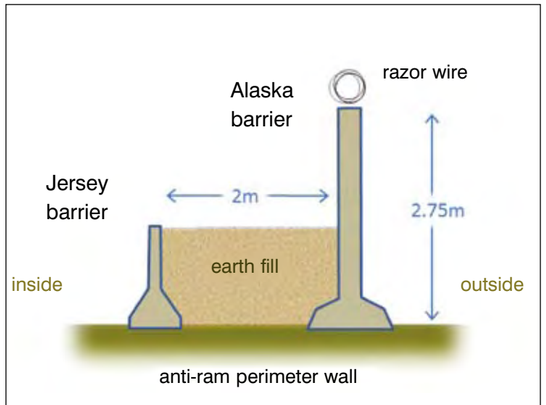
Natural elements can bring further problems: rain can result in subsidence and failure, particularly if the wrong fill or poorly-prepared foundations are used; and strong sunlight degrades the membrane. HESCO is also difficult to repair when damaged by munitions – or by bored soldiers who tend to explore the membrane's qualities by poking it with sharp objects, after which the fill usually falls out.

## ALASKA BARRIERS

Royal Engineers in Iraq used two main types of concrete wall sections for Force Protection, both based on US designs and both used extensively for numerous projects.

Alaska barriers are the largest of a family of pre-cast reinforced concrete wall units widely used in Iraq and Afghanistan. At 16 tonnes, 10 feet high, 12 feet wide and 5 feet at the base, this very strong design was used to compartmentalise buildings for good blast and fragmentation protection. Only very large explosions, like a car bomb, would result in complete destruction of an Alaska barrier, and this protective capability – combined with their mobility, recyclability and easy emplacement with just a crane – made the use of Alaska barriers highly desirable.

However, only two can be carried on a 40 foot flat bed truck, and this was compounded by the inability of Iraqi contractors to deliver the quality or quantity required, so virtually all Alaska barriers were made in Kuwait, increasing unit cost. Furthermore, manufacture took at least two or three weeks, which ruled them out for the short-notice




**Potential options for utilising Alaska barriers as perimeter walls** © MOD

## A DELICATE BALANCE

Several, often competing, factors had to be weighed up when deciding how to counter the threat to British forces.

Uppermost in this delicate question of balance is the UK Government's pledge to reduce the level of British combat troops in Iraq, coupled to the desire not to be seen to establish permanent bases in southern Iraq. This gave a political imperative to all Force Protection decisions.

More prosaically – and something shared by commercial and military projects – finance and time are influential factors that place constraints on whatever the ideal solution might be for a particular construction task. In a military arena, the pace of operational requirements dictates what's possible, while the ultimate prospect of withdrawal means that all but routine financial decisions are scrutinised at every level.

Similarly, limited resources and logistical bottlenecks are challenging in what is a far from ideal environment. Where possible, materials were resourced within Iraq (also helping to develop the local economy), but quality and consistency sometimes demanded outside supply, bringing its own problems in terms of cost, timescales and logistics, as well as requiring convoys that introduce an additional military risk.

Last, but certainly not least, the intelligence of the enemy must never be underestimated. Militias and insurgent groups in southern Iraq are among the most resourceful and dynamic in the world, and we knew that they would quickly adapt to whatever defensive innovations we were able to deploy. Monitoring and analysing the type, direction and scope of attacks to stay one step ahead of their weapons developments – and flexibly adapt to new conditions – was an imperative capability we had to develop.

tasks that comprised most of the Regiment's activity. The lack of space on resupply convoys meant only 20-30 wall units could be delivered each week, restricting their use for particularly sensitive protection tasks. By the end of our tour of duty I would say that around 15% of Force Protection were using these, but they are an expensive option.

## T-WALLS

T-Walls, the other well-used concrete sections, were used predominantly as a security barrier, though occasionally also employed for blast and fragmentation protection. Each unit – weighing in at six tonnes and measuring 12-13 feet tall, five feet wide and four feet at the base – has a rebate which allowed the sections to be linked tightly together and to build around corners.

T-Walls share the Alaska barriers' advantage of flexible emplacement and the ability to be recycled but, logistically, six to eight T-Wall sections can travel on a 40 foot trailer (rather than two Alaska barriers), and the technical specification meant Iraqi contractors could both manufacture them to a reasonable standard and deliver them direct to the COB without the need for UK military convoy protection. Hardwearing, these assets were found to be effective as security walls and were used extensively for protection around the living accommodation within the COB to prevent infiltration. T-Walls also offered some degree of protection against blast and fragmentation; their presence foiled several rocket attacks, and they were also easily replaced if damaged.

On the downside, T-Walls were designed for use on flat and solid foundations and are susceptible to toppling in high winds. Southern Iraq's largely clay base caused considerable problems and we had to first create road-like foundations in dried salt-marsh environments for the security walls to sit on, adding considerable time and expense.

**Damage to a T-Wall barrier caused by a 120mm Rocket fired at Basra International Airport by Iraqi insurgents** © Major Sean Matten

**Iraqi contractors delivering T-Wall sections to site** © MOD

*...the use of both generic designs and improvisation for a mix of temporary and permanent structures ensured that those providing security in a hostile environment were themselves less exposed...*

Like Alaska barriers T-Walls were very expensive, so could only be used for projects with high security requirements, unless recycled units were available.

## GOLD PLATED

Permanent reinforced concrete structures offer the very best protection against rocket attack. In late 2006, it was decided that large scale protective structures, such as dining facilities, were to be built. The sheer scale of these projects necessitated the use of separate contractors and resulted in long timescales (at least 12 months) and high costs. The concrete was batched on site and the contractor only relied on raw materials such as sand sourced from Iraq, with the steel frames manufactured in Kuwait and brought into Iraq on convoys. The resulting structures represented a 'gold plated' solution but intermediate solutions had to be developed while they were built.

With most accommodation within the COB and outlying camps comprising of either tents or of portacabin-style temporary buildings – and little by way of incorporated protection (the mortar and rocket threat had not existed when most camps were built in 2003) – other, often improvised, methods of Force Protection became a high priority when the regularity of attacks picked up in 2007-08. High density concrete blocks were used in their hundreds of thousands, together with many sandbags and much sheet steel, in order to make life in the COB as safe as practically possible.

Concrete blocks were purchased in Kuwait and strenuous efforts exerted to allocate extra convoys for the extra lift required. For some portacabin areas – particularly large dining rooms, where concrete blocks were too heavy – sheet steel partitions were manufactured in the Regiment's workshop and emplaced at night so as not to disturb the vital task of providing food.

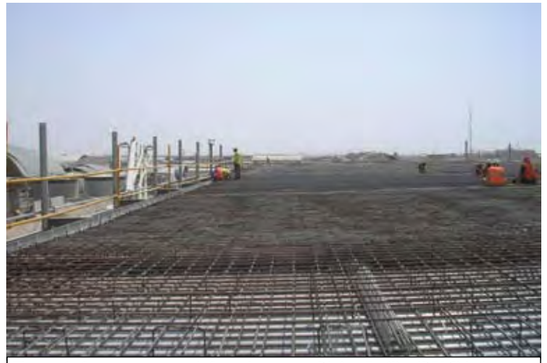
The use of sandbags, steel, and high density concrete blocks was labour intensive, with large numbers of locals helping to build many structures and, while not offering a 100% solution, it provided protection where there was none before – and ensured that when several bed spaces were struck by rockets, the resulting injuries were minor.

## WORK TO BE DONE

The challenges of Force Protection encountered in southern Iraq were considerable, but the use of both generic designs and improvisation for a mix of temporary and permanent structures ensured that those providing security in a hostile environment were themselves less exposed to the inherent risks and threats.

There is room for improvement however. More research is being conducted to develop effective Force Protection structures that have a light logistical burden, can be erected rapidly in rough terrain, and are not prohibitively expensive. Planning for camp infrastructure should, where possible, allow for subsequent increases in Force Protection needs and for the approach to be changed if the political and social agendas change, such as when the commitment moves from a short term to a long term horizon.

**BIOGRAPHY – Major Sean Matten**
Major Matten was commissioned into the Corps of Royal Engineers in 1994. During his career he has served in armoured, air support and explosive ordnance disposal units, and acted as a staff officer in several headquarters. He has deployed operationally to Bosnia Herzegovina, Iraq and Afghanistan. He took command of 7 Headquarters and Support Squadron, 21 Engineer Regiment in July 2007 and deployed the squadron to Iraq from November 2007 until June 2008. He is currently studying a distance learning MSc in Security and Risk Management from the University of Leicester.



**The roof of a permanent reinforced concrete Dining Facility (DFAC) being constructed on the COB by KBR (UK)** © MOD

**Prefabricated wall sections of a permanent dining facility being moved into place. Virtually all fabrication was conducted within Basra International Airport** © MOD

**Force protected accommodation in Basra utilising a mixture of HESCO Bastion and Alaska barriers** © MOD