

### *Sitting and structure design efficiency*

The foundation of any construction project is rooted in the concept and design stages. The concept stage, in fact, is one of the major steps in a project life cycle, as it has the largest impact on cost and performance. In designing environmentally optimal buildings, the objective is to minimize the total environmental impact associated with all life-cycle stages of the building project. In addition, buildings are much more complex products, composed of a multitude of materials and components each constituting various design variables to be decided at the design stage. A variation of every design variable may affect the environment during all the building's relevant life-cycle stages.

### *Energy efficiency*

Green buildings often include measures to reduce energy consumption – both the embodied energy required to extract, process, transport and install building materials and operating energy to provide services such as heating and power for equipment.

Embodied energy has assumed much greater importance – and may make up as much as 30% of the overall life cycle energy consumption. Studies such as the U.S. LCI Database Project show buildings built primarily with wood will have a lower embodied energy than those built primarily with brick, concrete, or steel.

To reduce operating energy use, designers use details that reduce air leakage through the building envelope. They also specify high-performance windows and extra insulation in walls, ceilings, and floors. Another strategy, passive solar building, is often implemented in low-energy homes. Designers orient windows and walls and place awnings, porches, and trees to shade windows and roofs during the summer while maximizing solar gain in the winter. In addition, effective window placement (daylighting) can provide more natural light and lessen the need for electric lighting during the day. Solar water heating further reduces energy costs.

Onsite generation of renewable energy through solar power, wind power, hydro power, or biomass can significantly reduce the environmental impact of the building. Power generation is generally the most expensive feature to add to a building.

### *Water efficiency*

Reducing water consumption and protecting water quality are key objectives in sustainable building. One critical issue of water consumption is that in many areas, the demands on the supplying aquifer exceed its ability to replenish itself. The protection and conservation of water throughout the life of a building may be accomplished by designing for dual plumbing. Waste-water may be minimized by utilizing water conserving fixtures.

As a result of the increased interest in green building concepts and practices, a number of organizations have developed standards, codes and rating systems that let government regulators, building professionals and consumers embrace green building with confidence.

УДК 811.111:359.211(410)

## **THE BRITISH ROYAL ARTILLERY**

Cherepovich A.I., gr.115012-12

Supervisor – Piskun O.V., senior teacher

### ***BACKGROUND***

The Royal Artillery comprises both Regular (full-time) and Reserve (part-time) units, located all around the UK and in Germany. They were originally formed in 1716 in Woolwich, in South-East London, which remained their Regimental home for almost 300 years.

Their home is now in Larkhill, on the southern edge of Salisbury Plain, which is a perfect setting for training and preparing soldiers, officers and equipment. The Regiment is unique in the British Army because of the emphasis they have always placed on their sub-units: their batteries. Batteries can deploy independently, move around between regiments and even perform different roles to one another within a single regiment.

Queen Elizabeth II is the Royal Artillery's Captain General. This means that the Royal Artillery answers directly to their reigning sovereign. They do this through the Master Gunner, St James's Park who is Her Majesty's chief advisor on artillery matters. The Royal Artillery is constantly changing and adapting to the requirements of a changing defense environment.

The Royal Artillery units introduce new, state-of-the-art equipment into their arsenal every year, and their soldiers and officers have to be intelligent, flexible and fit enough to cope with the demands of the modern battlefield.

The Royal Regiment of Artillery provides the battlefield fire support and air defense for the British Army in the field. Its various regiments are equipped for conventional fire-support using field guns, for area and point air defense using air defense missiles and for specialized artillery locating tasks. The Royal Artillery remains one of the largest organizations in the British Army with 15 Regiments included in its regular Order of Battle. Early 2011 personnel figures suggest that the Royal Artillery had a personnel figure of 7,710 officers and soldiers representing just over 100 % of its establishment strength. Of these Regiments, one is a Commando Regiment and another is an Air Assault Regiment. Either of these Regiments can be called upon to provide Maneuver Support Artillery to the AMF (Allied Command Europe Military Force).

#### *TRAINING*

Artillery recruits spend the first period of recruit training at the Army Training Regiment – Pirbright, the Army Training Regiment – Basingstoke or the Army Foundation College – Harrogate.

Artillery training is carried out at the Royal School of Artillery at Larkhill in Wiltshire. Intensive training is given in gunnery, air defense, surveillance or signals. Soldiers also undergo driver training on a variety of different vehicles. After training officers and gunners will be posted to the Royal Artillery units worldwide, but almost all of them will return to the Royal School of Artillery for frequent career and employment courses.

#### *THE FUTURE BATTLEFIELD*

The Royal Artillery is undergoing a transformation. As when gunpowder lifted the range of the bow and arrow to that of the cannon, currently modern technology both in space and on the ground is showing signs of yielding ever greater range and accuracy to the artillery. Greater ability to fix locations in depth and the ability to fire projectiles accurately over longer distances is transforming the horizons for modern artillery. Base bleed ammunition reduces drag by burning chemical compounds at the rear of the projectile and results in greatly increased range. Similarly, technology has discovered that there is an optimum relationship between projectile range, diameter and barrel length. Longer ranges had used to mean greater beaten zone or dispersion of the fall of shot. Micro technology now makes it possible for on-board computers and navigation systems to provide a long-range shell with a once only correction, which brings the round back onto a more precise route to the target. Rebarrelled British Artillery will enter the next decade capable of firing accurately to double their present range. Rocket artillery is reaching ever further towards the enemy rear areas. The next generation of rocket artillery rounds is looking beyond a range of 80 kms and designers are also looking at precision guided terminal sub-munitions. In addition, unmanned aerial vehicles are flying deeper into enemy territory and sending back ever more accurate target data which will be used by the artillery of the future. The manned aircraft could carry a man and deliver a weapons load with pinpoint accuracy (in the right conditions) far beyond the range of an artillery observer. This situation is about to be reversed, and there will probably be little support for sending a man where an artillery observation vehicle can go for a fraction of the cost and the same likelihood of striking the target. This is likely to happen within the next decade and the term Depth Battle will have real meaning for the Artillery. Once this happens they will have an increasingly important role in shaping the future battlefield. Attacking an enemy with ground troops in the field will be less costly if all his command and control headquarters up to 100 km behind the lines have already been identified and destroyed.