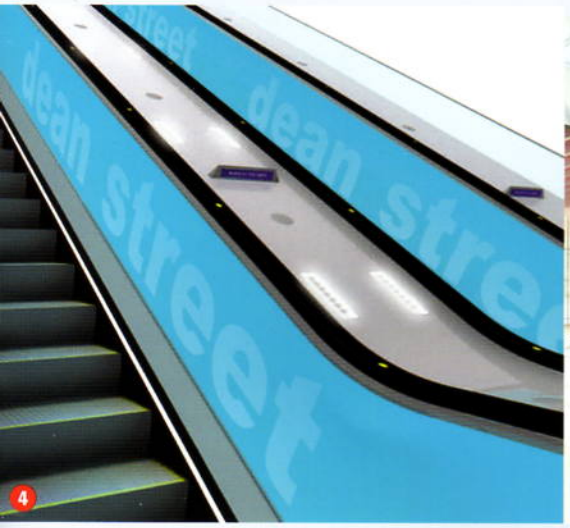

"Although widely used overseas, this is the first time that inclined lifts will be used on a UK rail/metro system," he says. The decision followed discussions with local communities and authorities, during which it was concluded that the PRM passenger routes first proposed were excessively long and could place passenger safety at risk. The design places the inclined lifts to the side of the escalator bank so that the crossover of passengers is kept to minimum. Designed to fit within the envelope of an escalator, so that any future requirement for an extra escalator is made possible, the lifts will follow the incline of the escalators of 30°.

DEALING WITH EMERGENCIES

Dual power supplies will be provided to prevent lift power failures, supported by a UPS battery drive that will move the lift to the nearest landing in case of total power loss. It will be possible for all lifts to be used for passenger evacuation under operator controls.

Dual power supplies will also be provided for all escalators, as recommended in BD2466 Guidance on the emergency use of lifts or escalators for evacuation and fire and rescue service operations. A system to allow continuous running of the escalator for this purpose is being reviewed. The guidance considers the implications and opportunities to improve safety in light of the evacuation of the World Trade Centre in 2001 and is therefore intended to improve safety by increasing redundancy and diversity of the vertical means of escape.

Fire fighter shafts, with lifts for emergency evacuation and movement of materials for maintenance purposes, will be provided at both ends of each station, with at least one lift having a capacity of 2000kgs. These lifts may also be used for the movement of PRMs if no other lifts are available.

Intermediate access shafts to the tunnels will be supplied with a fire fighter or evacuation lift; these will also be used for maintenance access to the tunnels as required.

WHOLE LIFE DESIGN

Rhys Vaughan Williams is committed to embedding whole life design in the project. "The escalator and lift systems will be designed around off the shelf components to the highest standards available, then enhanced to meet the high passenger volumes of a London sub surface railway. This will mean that the cost will be slightly higher than the standard unit, but it is proposed that both lifts and escalators procurement will include a reviewable 25 year maintenance contract to ensure that a full whole life design of 40 years will be achieved."

Following consultations with the major UK suppliers and other European Metro systems, Crossrail (CRL) has developed Technical Specifications for both Lifts and Escalators. The design concept is to use electric traction, Machine Room Less lift technology, together with a Heavy Duty 'Metro' unit for escalators, incorporating the latest efficient and sustainable designs to meet the requirements of the BREEAM Bespoke 2008 Assessor manual.

"All lifts, including the inclined lifts, will use Permanent Magnetic Synchronised Motors with a variable voltage gearless drive for efficiency. PRM Lift cars will have a clear entrance of 1100mm with two piece centre opening door drives and travel at 1m/s. The lifts and escalators are designed to meet BS EN 81-1, BS EN 115-1, respectively, and the CRL Technical Specifications, with additional requirements added in the course of supplier discussions."

The escalators will utilise efficient inverter geared drives. Dual motors will be used to give a balanced drive system to extend the machine life. The escalator units will utilise 'lubrication free' chains and sealed bearings to add to its sustainability and 'green' design.

"The preventative maintenance strategy allows for ongoing replacement of components and full refurbishment at planned interventions," says Alan Groves. "The objective is not only to manage costs but to minimise disruption, by carrying out the work during short overnight closure periods, with extended engineering periods planned by early or weekend closure of no more than one ticket hall at a time."

4 Illuminated blue panels for escalator showing station graphics

5 Impression of the Crossrail interchange at Paddington Station