



Fig. 5.1 Plan



Fig. 5.2 Entrance



Fig. 5.3 Display around the turntable

5. PRECEDENTS

One can learn from visiting institutions of the same or similar nature of the project one wants to design. For this purpose the following precedents will be reviewed for both positive and negative aspects:

National Railway Museum, York, England (visited December 2003);
Rail Transport Gallery, Cultra, Holywood, Northern Ireland (magazine review);
Musée Français du Chemin de Fer, Mulhouse, France (visited October 1993);
National Rail Museum, New Delhi, India (visited October 1998); and
James Hall Transport Museum, Johannesburg (visited March 2007)

5.1 National Railway Museum, York, England

This museum displays one of the largest collections of railway related items in the world. The locomotive and rolling stock display tracks in and around the museum are linked to the national rail network. It is housed in old workshop sheds of the London and North-Eastern Railway, the disused buildings, now named the 'Great Hall', 'Station Hall' and 'The Works', having been adapted for use as a museum, and thus having strong links with the past. The two entrances are modern structures that have been placed in front of the existing façades. The links between the halls are enclosed and covered, their walls being used for the display of the history of various British railway companies.

The new steel and glass entrances proclaim the functional nature of what is represented inside. The Great Hall is a historic masonry structure, now painted. The original roof has been replaced by a structure of triangular space-frame steel trusses, supported on the walls and new space-frame columns. Natural light is admitted through a very large window in the head wall. A mezzanine floor has been introduced in the Great Hall for the library and for smaller displays on e.g. signalling material and the history of ticketing and tickets. The Station Hall, too, is a Victorian red brick structure, but unpainted. Part of this hall's roof has been glazed to admit more natural light.

Once having entered, one passes the information/ticket-counter and gift shop. Then one is faced with the choice of entering the Great Hall or proceeding down the linking passage to the Station Hall. In the latter, locomotives and rolling stock are displayed on six parallel tracks, with platforms of generous width in between, giving the feel of a genuine station. The centre platform has been widened to accommodate a restaurant. On three tracks adjacent to the long rear wall locomotives and a number of carriages from various Royal trains are displayed. With no roof-glazing above it, it is very much darker in this area.



Fig. 5.4 The smooth, reflecting floor



Fig. 5.5 The 'Royal Trains' section



Fig. 5.6 A station scene come alive

Dimmed artificial lighting renders both the atmosphere of a station in the evening and enhances the opulence of royal splendour. It also helps in preserving these carriages and their furnishings, as exposure to natural or even too bright artificial light is reduced. This is a very successful part of the museum. The other three tracks display various passenger carriages and freight vans.

In the Great Hall the display of a wide and comprehensive variety of locomotives is centred on a working turntable. However, the display is very dense and feels cluttered – one does not get an overview easily. As I did not buy a guide (otherwise superfluous due to the excellent information boards provided with each display), I never realized that the entrance to The Works was hidden in a corner by this panoply of locomotives, and thus never saw the displays there: this makes one question the clarity of the lay-out with regard to finding one's way about unguided. The clutter is less of a problem than the inadequately marked routes. – The displays were placed on tracks embedded in an easy-to-clean, smooth, polished concrete. However, the reflection of light on this material made the display look unrealistic, more like model train locomotives standing on a kitchen table: the authenticity was compromised.

A very nice feature of the museum is an outside viewing balcony, overlooking a working and frequently-used railway line. This enables the visitor to the museum to relate the exhibits inside to the real world outside, and to discover similarities and differences. Facilities offered to visitors are, besides the exhibits, interactive learning centre, library, miniature train rides, restaurant, playground, picnic area and barbecue facilities. Rest-rooms are provided in adequate numbers and are spread over the terrain.

The issues raised are minor. The museum presents a very good collection, and includes exhibits on less prominent railway issues such as the history of ticketing, signalling and railway shipping. It appears to be well visited, and not only by railway enthusiasts, who consider this transport museum to be one of the best in the world.



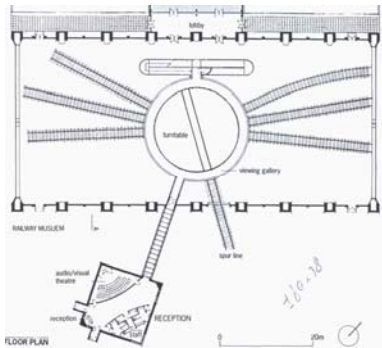


Fig. 5.10 Plan

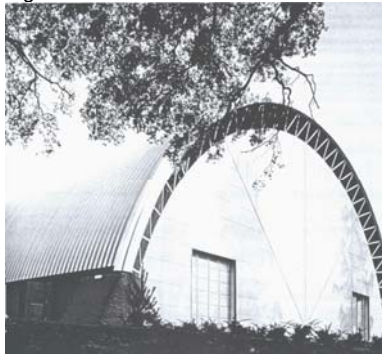


Fig. 5.11 Exterior view

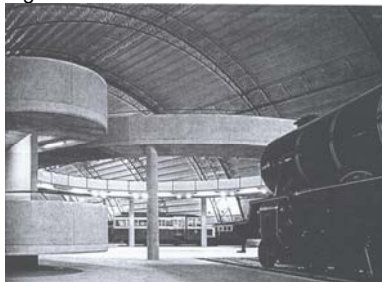


Fig. 5.12 Exhibition shed with foot-bridge and ramp

Fig. 5.7 Replica of oldest passenger train Fig. 5.8 Exhibits arranged as train ensembles Fig. 5.9 Glazed roof of Station Hall
5.2 Rail Transport Gallery, Cultra, Hollywood, Northern Ireland

This museum was reviewed by S. Greenberg in *The Architect's Journal* of 14 July 1993. – Designed by Ian Campbell and Associates and built in 1993, a large barrel vault shed reminiscent of Victorian times marks this museum, which centres its display on a turntable. The aluminium shed roof is supported on curved triangular space-frame trusses. The nine trusses were assembled in four sections on the ground and then hoisted into place. Due to the fitting of the turntable in the floor, it was impossible to counter the thrust forces of the arches with reinforcement ties embedded in the floor slab – a solution applied at London's St. Pancras station. The solution was found in the design of inclined reinforced concrete buttresses, surrounding the base of the museum, on which the trusses are anchored. These buttresses also accommodate the air-conditioning system's ducting. The walls of the shed are of blue engineering bricks. Limited natural light is admitted through a window seam touching and following the curve of the roof. The museum's area is 3,298 m² (including that of the separate entrance block), its cost of construction was £ 1,895,000, including preliminaries (£535.58/m²). Its tracks link to the rail network.

Further facilities provided are a 40-seater auditorium, lavatories and a staff room, located in the entrance building. The visitor passes through the entrance building, and crosses over a bridge, which accommodates the sloping terrain, enters the shed on a level above the display of the locomotives and rolling stock. This is supposed to recall an experience similar to that of standing on a foot-bridge, although I consider a first encounter with the exhibited locomotives on the same level more realistic to have. The bridge splits in the shed and encircles the turntable, before rejoining and leading down by means of a long ramp. However, the heavy reinforced concrete bridge structure impairs both the view of the display and the experience of the large vaulted space.

The entrance building is unusual in that it has two entrances, the reason for which is not adequately explained. The passage through to the connecting bridge is flanked by the auditorium on the one side and the public and staff facilities on the other.

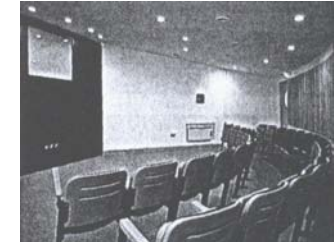
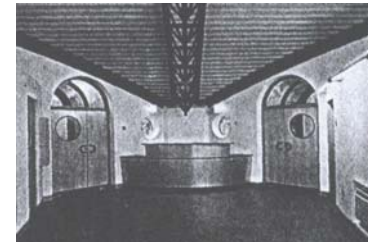
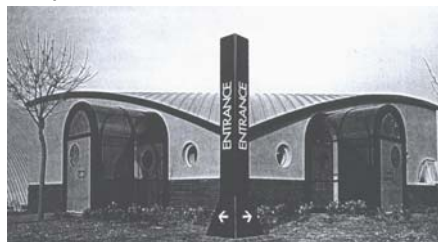


Fig. 5.13 Double entrance to museum

Fig. 5.14 Reception area

Fig. 5.15 Auditorium

5.3 Musée Français du Chemin de Fer, Mulhouse, France

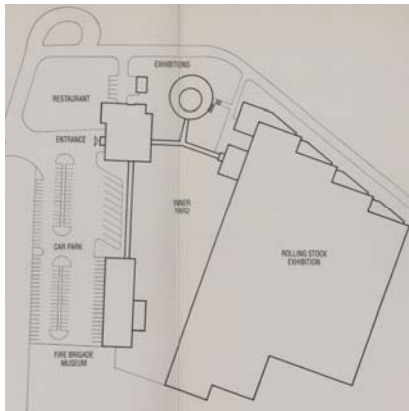


Fig. 5.16 Plan

This museum, also connected to the rail network, forms part of a larger complex, with a fire engine museum being located next door.

The main hall of the museum is constructed of off-shutter reinforced concrete, whereas the roof is supported on laminated timber beams. It is not a clear span, but has three bays, the spans being supported on two rows of columns. The roof is a stylized version of a saw-tooth shed: the beams are bent in shallow curves, giving a wave-like appearance, on which rest bent joists, curving upwards to form a glazed vertical opening between the upper and lower roof pitch, admitting natural light. The ceiling is very busy for a building displaying functional machines, and appears to be rather low, resulting from the combined optical effect of the downward swing of the beams and joists and their darker timber colour. Tall windows in the long walls admit more natural light. This saves on the electricity bill and is more sustainable. A mezzanine is used for the display of other railway related items.



Fig. 5.17 Exhibition hall

This museum, too, is entered by way of a separate entrance building where tickets and guides may be purchased and the toilet facilities are located. It also gives access to a restaurant. One then exits into an open courtyard where 'weather-resistant' displays are exhibited. Entering the main hall, near one of the corners, one is faced by rows of parallel tracks stretching away to the right. As one enters on the same level as the displays, their awe-inspiring size becomes immediately apparent. The aisles left between the rows of rolling stock display are of ample width, permitting the exhibition of smaller objects.

A very good variety of French locomotives and rolling stock, including luxuriously appointed carriages of the *Compagnie Internationale des Wagons-Lits*, is displayed on tracks embedded in gravel, with rails fixed to cross-ties, giving a more authentic effect than that discussed under the York museum.



Fig. 5.18 Naturally lit and stylized saw-tooth shed



Fig. 5.19 Windows for natural light

Fig. 5.20 The too low ceiling effect

Fig. 5.21 Display on gravel-embedded rails

5.4 National Rail Museum, New Delhi, India

This museum, once again, is connected to the national rail network. It is unusual in that its displays of locomotives and rolling stock are located outside. Only some items are (partially) protected by shelters, some of which are old platform sheds. One passes by these to the actual museum building, built in a large diameter circular shape, reminding one of a roundhouse. To this the entrance is attached, with the ticket and information counter, a small gift shop and toilet facilities. No restaurant facilities are provided, but picnics would be possible outside on the vast 'exhibition lawn'.

The outside display of rolling stock is an excellent representation of Indian railway history, covering vehicles of three gauges (broad, metre and narrow). Many of the maharajas' private saloon carriages are also on display, but unfortunately, due to a lack of a platform, the interiors cannot be seen into. The interior display covers aspects of signalling, Indian railway companies' development, and other railway-related topics.

The large outdoor area would require garden maintenance, but with low labour costs in India this would presumably be cheaper than building maintenance. However, due to the outside storage, many of the exhibits are deteriorating, showing peeling paint and rusting metal: what is being saved on building costs necessitates it being spent on increased exhibit maintenance – if this is performed at all. The brass piping and tubing on the locomotives has also disappeared, as the area cannot be effectively secured 24 hours a day. (This problem is also encountered in South Africa, where 'free-lance wealth redistributors' are as eager to help themselves to items commanding a good scrap metal price.) The steam locomotives are therefore of a rather depleted appearance.

Although the architecture is straight forward and cost-conscious, with no large exhibition shed being part of the complex, the museum's collection is well worth a visit, if one overlooks the condition of some of the displays.



Fig. 5.22 Entrance to the museum



Fig. 5.23 Exhibits sheltered by old station structures



Fig. 5.24 Deterioration evident on exhibits



Fig. 5.25 Exhibition lawn

Fig. 5.26 Largest engine: Garratt locomotive Fig. 5.27 Smallest engine: monorail locomotive

5.5 James Hall Transport Museum, Johannesburg

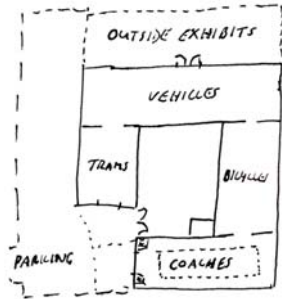


Fig. 5.28 Plan



Fig. 5.29 Entrance



Fig. 5.30 Naturally lit northern shed

This museum consists of four enclosed sheds placed around an inner courtyard. They abut on each other to permit passage from the one to the other, except at one corner where access to the courtyard is provided. Here, too, entrance and exit are located separately, the visitor progressing through the museum in an anti-clockwise direction. The southern shed contains a mezzanine floor surrounding a central well. Stairs lead up to this, but ramps for the disabled are lacking. An open shed placed next to the northern enclosed shed displays items of a larger nature, such as locomotives. The structure is very straight-forward and simple, consisting of steel columns supporting steel roof trusses, with infill walls of face brick to a height of about four metres. Above this, filling the space between the masonry and the ceiling, are panels of opaque polycarbonate, admitting filtered natural light to such an extent that only minimal artificial light sources are required on a clear day. This reduces operating costs, whilst not allowing the entrance of too intensive direct to cause damage to the exhibits. (On the northern side these panels have been painted blue, to reduce the quantity of light infall; possibly the panels should have been limited to the southern side only.) Due to the dry Highveld climate not necessitating the removal of display-damaging excessive humidity, no air-conditioning units have been installed. Louvre panels have been provided for ventilation on the mezzanine level of the southern shed, where smaller and light-weight exhibits and the administrative offices are located. The building finishes demand little maintenance which, together with the mentioned low artificial lighting requirements, assists in significantly reducing operating costs.

The choice of structure and materials makes for a low initial capital cost (relative to the European museums reviewed). The design is purely functional, yet through its simplicity a certain elegance is achieved, too.

The proportions of the sheds, the lofty height matching their width and length, coupled with the quality of light within, make for a pleasing space and atmosphere, and ample space for the displays. The exception is the shed containing the historic double-decker trams and buses, which are parked so densely that they can not be seen in full. The area of the open shed, surrounded by palisades (evidently only added since the crime epidemic commenced in South Africa) displays agricultural implements and locomotives, trucked in as the museum has no link to the rail network. However, the overhang of the shed roof is insufficient, as bleaching and other damage to the exhibits is evident where the sun reaches them. All brassware has been stolen off the locomotives, proving that the palisade fence does not adequately protect them against theft (unless the theft occurred before the erection of the fence). An old boat hulk placed in the open beyond the palisade seems to be totally ignored now and is rotting away. - The inside exhibits are in mint condition.

The entrance as such is ill-defined, using the roller-shutter door by which the exhibits are brought into the



Fig. 5.31 Mezzanine with central well



Fig. 5.32 Undefined reception area



Fig. 5.33 Congested tram and bus display area



Fig. 5.34 Deteriorating locomotives



Fig. 5.35 Suspended carriage



Fig. 5.36 Model tram club's lay-out

shed and looking very much the same as the exit. The entrance and exit being separate necessitates that an additional person must be employed to control that nobody enters or exists the museum uncontrolled, resulting in higher staff costs. The entrance area, once one has entered the museum, is ill-defined, and basically non-existent. There is no information stand or counter; post-cards for sale are displayed at the back of the shed far away from the staff member controlling the entrance; the old office desk for this staff member is tucked under the staircase leading to the mezzanine. Providing a simple, yet elegant counter would provide a more professional feel to the museum.

The interior courtyard may have been intended as a further display area, but is not fully utilized as such, possibly due to the exposure to the elements damaging the exhibits. It is now used as a picnic area, but is not pleasant to be in with its gravelled floor surface. A small kiosk is tucked away in one corner, behind which one finds the toilets. – There is insufficient parking space for buses, and their entrance from and egress to the street is difficult.

An innovative approach to exhibiting items is used for some old coaches and horse carriages: they are displayed over the central well of the mezzanine level, their wheels being fastened to two beams spaced apart to a corresponding width and laid across the central well. Also on the mezzanine level are the club facilities of the Johannesburg Model Tramway Club, their tram lay-out visible within a glass enclosure.

This museum, too, is well worth a visit. The displays offer a good insight into the development of transport in South Africa, with fairly well-documented displays and information boards. The selection of displayed objects is comprehensive, albeit a bit light on the railway side. Some identification plaques on exhibits are missing, but this would be the fault of staff and not of the architect.