

HMP Wandsworth Vaulted ceiling access scaffold case study

The London Division of VCUK were contracted to undertake a refurbishment of an existing Victorian accommodation block comprising of three wings springing from a central rotunda at HMP Wandsworth.

Part of the works required the London Division to undertake redecoration of the existing vaulted ceiling located over the atrium to each of the wings.

The problem

In the tender a traditional tube and fitting scaffold had been allowed for on all three of the wings as the means of access. The scaffold was designed to be sited on the level 2-association floor area and rise up 3 levels to a level that afforded access to the soffit of the vaulted ceiling and would run the length of the of the atrium approx. 20m.

The suitability of the scaffold access was reviewed during the construction period and was considered inappropriate due to the following reasons;

1. Some works to the lower levels would be prohibited by the scaffold thus affecting the programme
2. Access around the site would be more difficult due to the scaffold thus slowing down progress of other works.
3. The dismantle and erection process would take approx. 5 days impacting on the programme
4. A large portion of the scaffold is wasted, as all it does is provide support for a working platform that is 7m from its base.
5. High cost approx. £44,000 because of the support structure required to achieve the correct working platform height.
6. Manual handling issues – large volumes of scaffold components would be required to erect the access platform.
7. Risk of falling from height increased due to the duration of the erection process.
8. Conveying scaffold components through the building presented a risk in so far that a scaffold tube or board could strike a person, if segregation routes could not be determined.

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Photo 1: Atrium vaulted ceiling to one of the wings

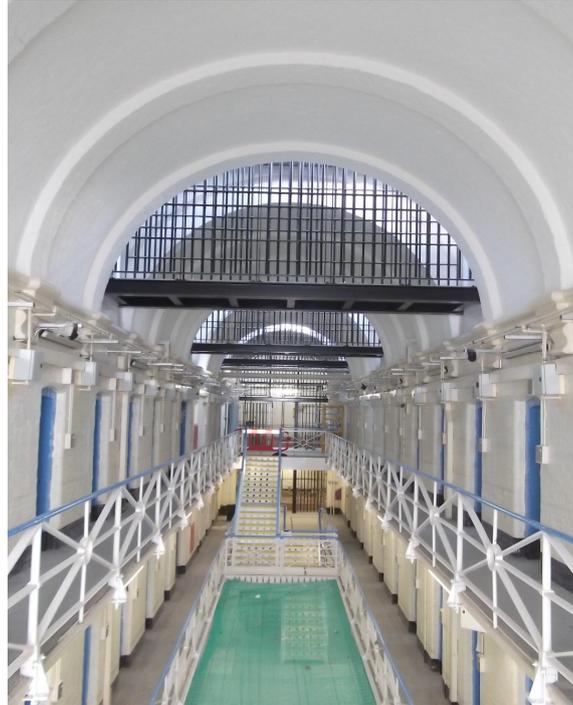


Photo 2: Atrium during the construction period



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The solution

An investigation was carried out to find an alternative means of access that would either mitigate or reduce the problems associated with the original tendered means of access.

The research uncovered a company called Aluminium Structures (work platforms) Ltd who specialised in providing bespoke lightweight moveable access solutions – the most notable to date is the one they have provided for Kier at Kings Cross for access to the main concourse vaulted roof.

Aluminium Structures were contacted and attended site to look at the problem and drew up a solution that afforded access to the vaulted ceiling from the walkways positioned below the vaulted ceiling and to either side of the atrium.

The access system was designed based upon the following criteria;

1. The system must be designed so that it can be built from the landings below vaulted ceiling
2. The working platform of the system must cover an individual segment of the vaulted ceiling (the vaulted ceiling has brick ribs dissecting it along its length meaning that the ceiling can be divided up into segments)
3. The system must be able to support the weight of two operatives and small tools
4. The system has to be mobile enough to allow it to be pushed along the landings to the next segment without the need for dismantling it. It also needs to take into consideration the M&E services and any other protrusions that occur along the sidewalls.
5. The system has to be designed so that it can slide underneath the bridges that cross through the vaulted ceiling without the need for it to be completely dismantled.
6. The system has to be designed so that it fits onto all three wings (this later changed to suite all wings including those on the main building – see notes below for reason for this)
7. The system has to allow safe access of the operatives onto it.
8. The system has to be easy to erect and dismantle in a safe manner without the need for fully trained scaffolder's
9. The system components have to be light enough to allow 1 or 2 men to easily handle them and transport them around the building.
10. The working platform must be at a height where it allows an operative to gain access to the apex of the vaulted ceiling without the need for a hop-up
11. system is to allow access to the springing section of the vaulted ceiling.

Notes

- ✓ Item 2: The working platform of the system must cover individual segments of the vaulted ceiling – this criteria was set to optimize the total working area of the scaffold platform without causing too much impact upon the landing area from which it was built from thus allowing trades to continue working along the landing either side of the scaffold.
- ✓ Item 6: VCUK had the option of hiring the access system or buying it. The option to buy it was put to the client, as it would allow the Establishments works department to use it to

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gain access for any future works, the client agreed with the stipulation that it must suite all wings throughout the establishment.

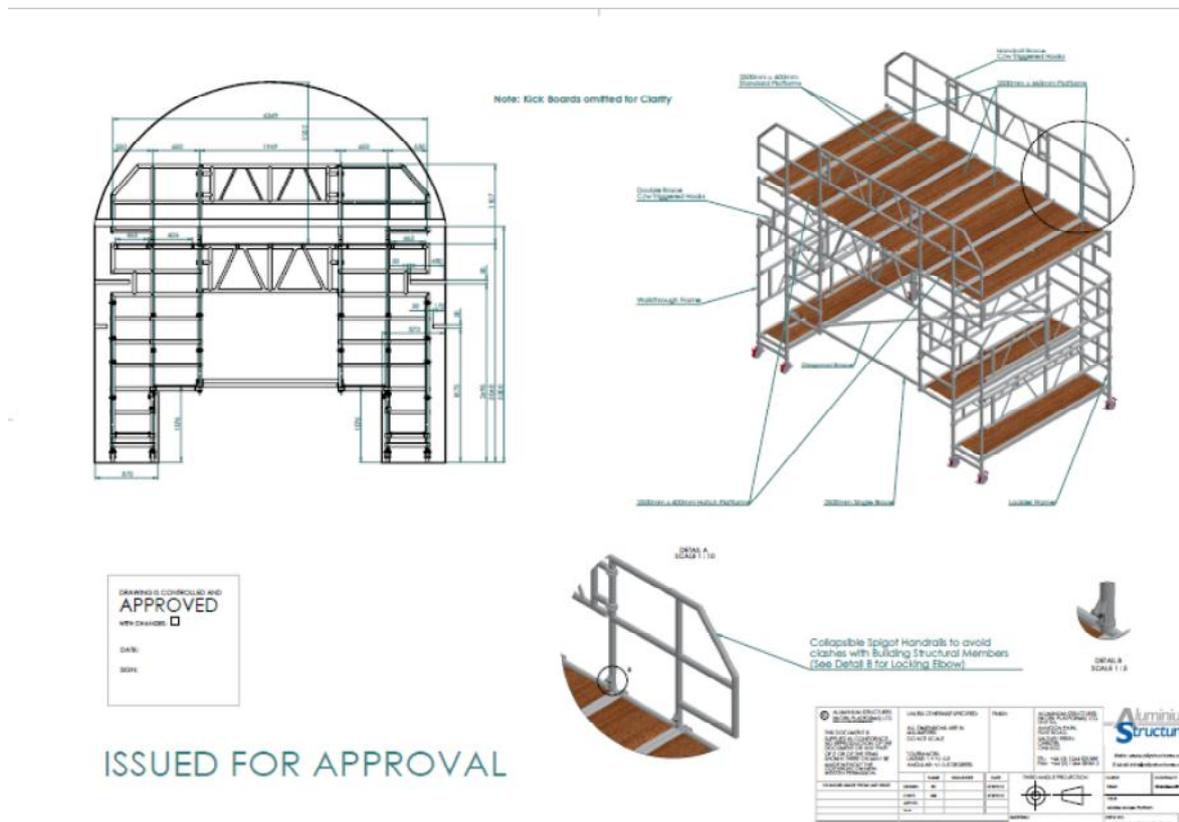
Drawing in figure 1 below details the final design of the scaffold which was signed off by site team and VCUK temporary works department.

The system was designed using lightweight aluminium tubing welded together to form demountable components which negated the need to have trained scaffolder's to erect and dismantle the system. The demountable sections also made it easy to manually transport the system to the required location without the risk of injury.

Castor wheels were placed on the outer legs of the access system with the inner leg being mounted on a 4m long rail which was used to avoid excessive point loading of the system on the cantilevered landings either side of the atrium. This allowed the system to be trolleyed along the landings from bay to bay without the need to dismantle it with the exception where it had to pass under the control and restraint bridges – shown in photo 1. The system design allowed the handrails to be removed independently to allow the tower to be trolleyed under the control and restraint bridges that bisected the vaulted ceiling at certain locations.

The total cost of the bespoke system was approx. £7,000 plus £2,000 for erection and dismantle charges compared with approx. £44,000 for the tendered solution meaning a total of £35,000 was saved along with time on the programme.

Figure 1: Final Access system solution for accessing the vaulted ceilings.



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Photo 3: Vaulted access scaffold designed Aluminium structures (work platforms) Ltd in use on one of the wings

Note: the inside leg of the scaffold tower landed on a 4m long rail which helped to spread the load of the system along the walkways.



Photo 4: Vaulted access scaffold shown spanning the atrium from the underside.



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