

What comes first?

It is impossible to construct and divide a building without the service runs of pipes, ducts and conduit going through a wall or partition at some point.

However, holes in walls cause big problems. If mishandled penetrations can seriously compromise the structural, fire and/or acoustic performance of partitions. So what is the best method of build? Should the partitions be constructed first or should service runs be installed and the partitions built around them? Here, six industry experts give their opinions...



**Barry Austin - area technical support manager
British Gypsum**

It is always my recommendation to have the openings prepared prior to services installation, but to be able to do this accurately service layouts need to be overlaid over the partition drawings, which even in 2013 seems a radical move forward for some. An ideal situation would be where the partitioning contractor sets out the partitions with a timber sole. It benefits the contractor because it sets out all of the door openings at an earlier stage than normal in the programme, floor channels don't get crushed either. However, the biggest benefit is the services

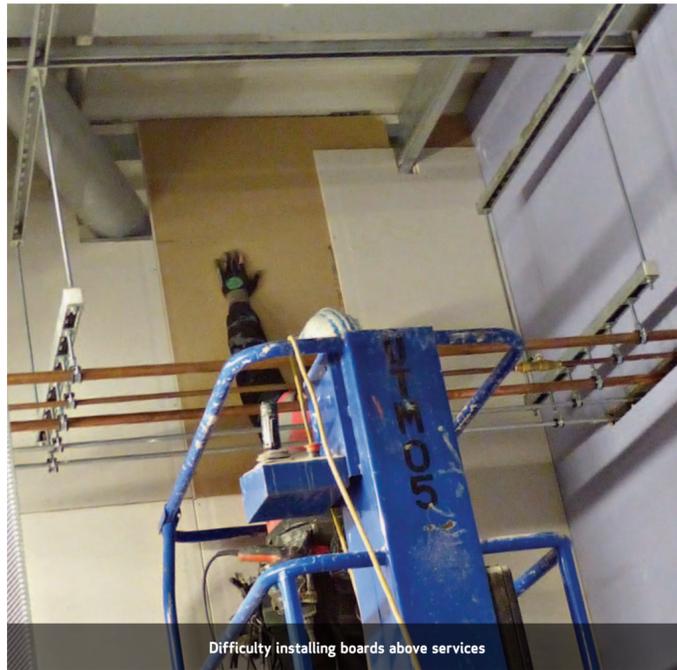
engineers use the timber as a setting out rod, marking on the timber exactly where the penetrations need to be formed. The partitioning fixer builds in the penetration at the same time he is building the partition, which could reduce costs and re-visits. Designers and contractors should be aware that the size of any damper opening must be based on fire test data from the relevant supplier of the dampers. It is vital that main contractors liaise with the service installers and drywall contractors, especially as modular service installation will undoubtedly become more common in the not too distant future.



**Niall Rowan - technical officer
Association for Specialist Fire Protection**

From a fire safety perspective, it does not matter whether the services are installed first and then the partitions afterwards or vice versa as long as the penetration seals are made good. Typically this would require framing out of any opening in the partition, although there are now some products that are capable of being used without lining the opening. The installer should be aware of the preparation needed in the opening for any penetrating service and the limitations of any penetration sealing product employed. Unless there is specific test evidence for the particular application in question, the use of PU aerosol foams is deprecated as these are usually only suitable for linear gaps eg

between the gap between the outside of a doorframe and the opening into which the doorframe is fixed. The ASFP will publish a code of practice for the installation of fire stopping products, including penetration seals, in 2013. The code places great emphasis on coordination and planning between trades to ensure the work is done in the most efficient way and to minimise subsequent damage by other trades after the fire stopping has been installed necessitating rework. It also includes guidance on inspection regimes for fire stopping installations. The ASFP recommends the use of installation contractors that hold third party certification for installing passive fire protection including fire stopping.



Difficulty installing boards above services



**Alex Double - director / consultant
AD Design Consultants (ADDC)**

The successful integration of services within partitions can only be achieved with good communication between all the relevant parties. In my experience, the best practice sequence of erecting a partition would be to install the partitions to first fix stage; form penetrations for the services; install electrical services inside the partitions; install fire dampers within the partition width; second fix the partitions; install mechanical and electrical services through the penetrations; and finally fire stop the penetrations. However in reality this is not always the case. On many construction sites, services are installed prior to the construction of the partitions making installation either very difficult or impossible. For example, if a service penetration is located over a door leg, it may not be possible to construct this element of the wall and unless additional

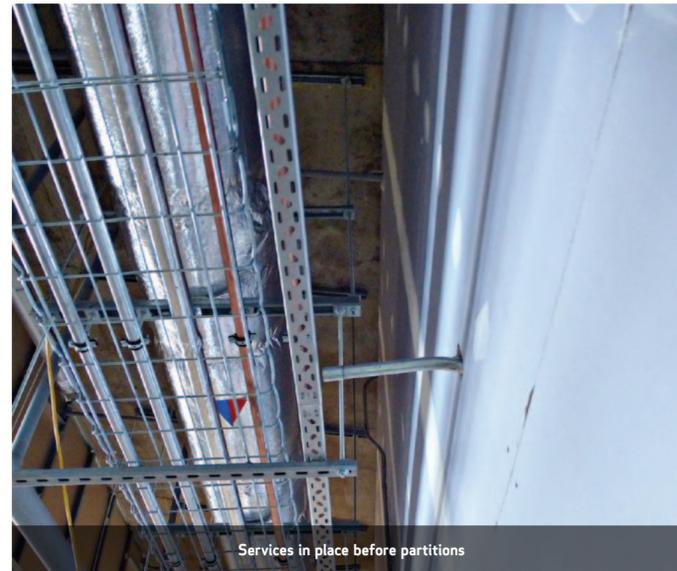
structural supports are allowed for, this will reduce the strength of the partition. The type and method of sealing penetrations needs to be given careful consideration to ensure performance requirements are met. The structural deflection of the slab will also have a bearing on the selection of the correct detailing for the services penetrations. If the services deflect with the slab, any deflection could damage the boarding and any associated fire/acoustic stopping. Best practice would be for the M&E contractor to provide drawings showing the size of all penetrations required for services and the precise locations. This will enable the partition contractor and the fire stopping contractor (if different) to co-ordinate with the M&E designers and to correctly design and to form openings within the walls to accommodate the services at first fix and second fix stage, thus eliminating the need to undo/redo works already constructed.



**Russell Mott - technical and safety officer
B&ES (previously known as HVCA)**

With consideration to both options it is B&ES' stance that in most circumstances building services benefit from being installed after partitioned walls. Whilst building services can be installed easier without partition walls being present, it is far more practical to work with the structure in place. Service runs can be installed neatly with reasonable scope for support and fittings, there is also flexibility when remedial work may be required due to design changes and/or variations to the systems being installed. However, consideration must be made when going through substrates to ensure satisfactory ratings are maintained with effective making good. Co-ordination of trades is essential and

accuracy will always be a key factor when matching up services/partitions. BIM (Building Information Modelling) may offer a far more flexible solution for the future. This is a good case for cooperation, good design, careful scheduling, and an opportunity to bring BIM to bear, which will clearly show the implications through clash detection and build sequencing. Cooperation between trades and manufacturers will consider the implication before someone is asked to cut a hole or take out a stud, good design can consider the correct use of intumescent fire solutions installed by specialist and competent operatives. And careful scheduling to ensure the health and safety of operatives working at height is considered.



Services in place before partitions



**Robert Candy - health and safety consultant
Cotswold Safety Solutions Ltd**

From a health and safety perspective, it's about planning the sequence of works to provide the safest environment for those involved in the installation. Within the Working at Height Regulations 2005 it is stated that all work at height must be properly planned and organised. I consider this to be more than just the choosing of appropriate equipment for access, or selecting the correct control measures for an individual application. It is about making common sense decisions when planning the sequence of works. Current practices often place

operatives in situations where, due to poor planning, they resort to poor safety practices, such as standing on guard rails, to carry out their work. Or, it requires specialist bespoke access solutions, which may be expensive or introduce time delays, to carry out the work. A top to bottom approach is often a simple solution to the problems that arise. When planning the sequence of works, scheduling the work at the highest point first and then working down would negate most issues. Although this may not be practical for all instances, using this as a rule of thumb could offer considerable risk reduction when working at height, as well as saving time and money.



**Steve Coley - managing director
Lakeside Ceilings and Partitions Ltd**

My recent experience is that main contractors are signing up to tighter and tighter programmes that mean the M&E will have made a start, so partitions are formed around the services. This is totally the wrong method of sequencing the fit out. The unfortunate fact is that while subcontractors push the boundaries of health

and safety working around the services, and we all agree to sequence of works and programmes that are not realistic we are not helping each other to make the industry any better. I very much agree with Barry Austin's suggestion of using a timber sole plate, and we will be recommending this method be used on all future projects.



Correctly prepared openings

PARTITIONS FIRST WITH PREPARED OPENINGS

ADVANTAGES

- The installers can erect the partition to the underside of the slab unhindered and in a safe manner.
- Deflection heads (if required) that allow the slab above to move as the floor is loaded with plant equipment and people, can be correctly incorporated in the design.
- The internal steel framework is positioned and a framed opening prepared in order to provide the fire and structural performance required.
- The opening will be properly designed and constructed to a maximum size that the fire rating will still meet the manufactures performance certification.

DISADVANTAGES

- Requires a coordinated approach.
- M&E layouts need to be agreed before partitioning is erected.

SERVICE RUNS FIRST

ADVANTAGES

- Service runs can be installed unhindered.

DISADVANTAGES

- Access to the space above the service runs can be difficult and even dangerous. Imagine installing studs and boards in a one metre high void four metres above the floor restricted by the corridor walls either side (this is a real example).
- Size of the aperture may be larger than permitted to ensure the performance of the partitioning is maintained.

CONCLUSION

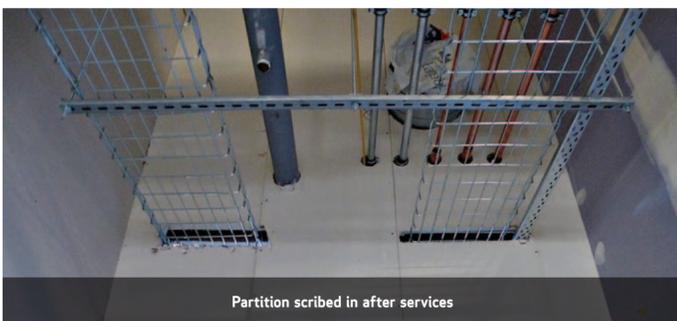


**Joe Cilia - technical manager
Association of Interior Specialists**

Either option seems to have its advantages for one trade or another. However, the general consensus seems to be whichever sequence takes place the emphasis must be on cooperation between trades. This will ensure the safety of both operatives and building occupiers, and that the performance of the partition can be maintained and documented evidence provided.

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tighter and tighter programmes that mean the M&E will have made a start, so partitions are formed around the services. This is totally the wrong method of sequencing the fit out."



Partition scribed in after services



Badly cut penetration



Example of bad service penetration