A look at things (impartially, of course) from a rigging point of view . . .

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In a recent conversation with a structural engineer, I commented that it sometimes seems expected that riggers are able to walk into a venue, look up and instantly decide if the roof is strong enough to hang a show. The structural engineer's reply was: "Well, a structural engineer can't, so how can you expect it of anyone else?"

This decision may seem easy; the beams may be huge, the show very light, but are the beams that size for some other reason? Admittedly, sometimes you don't need an engineer, you can take a number of decisions based on the information that should be available from the venue or that you've already researched. The golden rule remains, you need to know the weight of what you want to lift and how that relates to where and how you attach it to the supporting structure.

The structure may appear to be substantial enough, but two factors exist. A) is it really strong enough? (that is to say, how close to the wind are we sailing?) and B) How would the rigger demonstrate that due diligence had been exercised if ever required to do so?

"But the beams are really big," is often a response. Was the venue provided with those beams to hang shows off or are they needed to hold the roof up so the snow doesn't come in? Is the span equally large? What are the foundations like? Are you able to assess the capacity of the steelwork as an individual beam, never mind the capacity of the bigger structure?

Let's suppose the beams are massive, with short spans supporting a concrete slab. How does the rigger calculate the load the beams are already carrying, before subtracting this from the capacity of the beam configuration (if known)?

Has the dynamic effect been considered? This is usually taken as an extra 25% of the load being lifted at a typical 4 or 5 metres per minute provided by electric chain hoists. The figure will be a lot higher using faster speeds; this dynamic effect is created every time a lift is stopped or started.

Another example, a FOH lighting bridge supported by a roof truss - perhaps perfect for an advance lighting truss to be hung or a line array. Let's assume it was designed to carry its own weight plus its design load of lighting equipment, and an allowance for a number of people in accordance with the standards for structural steelwork in buildings. Now you arrive and add two 5kN loads four metres either side of centre. Who said you could? Are you prepared to take that responsibility because it looks like it should be strong enough?

Consider another situation. You do a 'recce' at a venue and ask where the rigging points are. You're told, "everyone uses those points up there". You duly rig to those points in the possibly mistaken belief you are 'covered' because you have been advised by the venue.

To be sure, and to comply with LOLER, you need the venue to provide you with documentary evidence of the points' load capacity to assure you they have been inspected before you hang anything. "Nobody does that!" you may say. Far-fetched? Too much hassle? You decide: the next person that asks may be acting for the prosecution . . .

Experience in hotel and conference venues shows that although the installed system may have been designed specifically for hanging lighting, contractors servicing productions in these venues very often don't have the information they should. Hotels often have either permanently rigged bars for lighting or sound to be hung from. Some have hanging points such as eyebolts or a channel fixing system. In either case these will have been designed to a brief envisaged by someone who may or may not have an understanding of the needs of events or productions. Even more often, they are used by people who don't know what that brief was and hang what they want to hang in the manner they devise. To provide a useful attachment point, an eyebolt may have an 'SWL' significantly greater than the allowable load on the structure that supports it and be marked as such; users may take that marking as the allowable load. For example, to hang a truss using a short roundsling with an appropriate shackle - say a 2-tonne alloy bow shackle - you'll need a 20mm eye. To obtain that size an M16 eyebolt is often required. This will typically be marked 'SWL 0.8t'. The supporting structure is often unlikely to be able to support this load, particularly when fitted to a 'channel' system. The eyebolts and fittings fit, but they are totally reliant on the strength of the channel and what supports the channel. Users may research the channel system product and discover that the fitting has an allowable vertical load of 9kN (10kN is approximately a 1-tonne force), and using an 800kg eyebolt surmise that they can hang a chain block for a lighting truss or line array, lifting perhaps 300kg. However, the allowable load could actually be as little as 75kg. What holds up the channel? A quick look above the ceiling may be interesting. It is not unusual to find long unsupported lengths of channel, fixings being lengths of M10 allthread into timber joists, wedge anchors and the like.

One of the golden rules of any lifting operation is 'know the load to be lifted', to allow the correct equipment to be selected. What is less usually done is a check on the supporting structure. The failure of one rigging point on a lighting bar may cause a progressive failure - potentially very dangerous to anyone beneath during set-up, event or breakdown. It is not unusual for alloy bars and trusses supporting lighting, sound and AV equipment to interconnect and lend support to each other; a complicated loading situation. Common sense dictates that the more supports used, the shorter the spans, thus the lower the individual loads are on the structure. The practical upshot is that there are perhaps three contractors all using the same structure, not always co-ordinating or even being on site at the same time. The venue has a duty to provide information and to an extent 'police' the use of their facility. The user (employer and employees) has a duty to work safely and to ensure that the loadings are within the design; it's no different to an electrician working out loads per phase. The difference is that in most electrical installations there are circuit breakers. Gravity doesn't trip breakers.