

## Appraisal of the acoustics of the Jacobs Wells Baths building - Stephen Goldsmith

I worked on sound for the open day at the Jacob's Wells Baths on Saturday 2/12/2016.

This is an overview of some of the sound (sound proofing and acoustic) properties of the building which I think are both unusual and advantageous.

The swimming pool venue is quiet. At present you can hear very low level traffic going past - I suspect that this sound proofing can be improved by a couple of small repairs (fix missing chunk of sound proof ceiling, look at a couple of air vents in the wall to the left of the venue as you walk in)

Reasons why it is so quiet/well soundproofed are:

1. The building only has the one road going past the front, it is cut into a steep hill - other roads are much higher up and sound is blocked by houses.
2. The height of the former swimming pool would necessitate that the walls be thick.
3. The layout of the building means that the doorway into the swimming pool (normally along with the windows this is the weakest point in a building from a soundproofing perspective) is acoustically isolated from the road by the reception, corridor and south studio room (what is known as an 'air gap'). Contemporary cinemas and sound studios are built with similar layouts for their sound proofing qualities. The present doors into the pool offer very little sound proofing in themselves. If they were upgraded the venue would become even more quiet.
4. The original Victorian roof has had a vaulted ceiling built more recently (intended to stop sound from leaking out from the dance centre that was using it, but it also stops sound from getting in).  
There is a small hole in one corner which is compromising the sound proofing a bit at present, not hard to patch that up. I haven't been up a ladder to inspect it, but the hole does mean I could see some of the structural elements. It appears to be some kind of aggregate (probably plaster with a probable render coat fastened via wooden battens to a layer of slatted timber) obviously get a second opinion on it this but I couldn't see any asbestos - which means if this is structurally sound it could be an asset.  
The usage of (heavy) aggregate material in ceilings for sound proofing purposes was a common feature in film sound stages. I have read posts from film sound recordists in my guild where they complain that this feature has been lost in some contemporary sound stages.  
You can also see that this false ceiling was put in for sound proofing purposes when you look at the windows - they are double glazed with a large air gap between glass in the order of 12 inches. Again, putting substantial air gaps between glass is standard practice when building something for sound proofing.
5. There are no windows other than the sound proofed ones in the roof (normally the windows are one of the weakest points in terms of sound-proofing in a building). Here we have natural light with minimal compromise in sound proofing - as someone who has spent most of my career working in soundproof studios with no windows (the standard cheaper option) believe me that this feature is an asset!
6. I haven't heard how this space reacts to rain, but I think that the Grade Two listing of the

building means that this acoustic ceiling is structurally isolated from the original Victorian vaulted ceiling. This double ceiling will help to stop the mechanical sound of rain hitting the roof from coming through. This is a big plus for anything where (near) silence is important.

My background is that of film audio. So possible uses for a naturally quiet large venue that come to mind are usage as a sound stage, location to build film sets, pop up cinema/screening room, further work would need to be taken to dampen down the sound for usage as a grading room or sound studios so I suspect that is not likely unless someone was expanding and could get a long lease.

Other positives for film work:

- It has high vaulted ceiling with rigging for lighting in place - a big plus
- Has a loading bay and ramp for access (getting gear in and out).

The floor is boomy and space has a naturally lively acoustic (like a church) but the alcoves to the side already have curtain rail in place - hanging thicker curtains would make an immediate improvement - acoustic and aesthetic. It wouldn't be hard to dampen down the echo in the room if required, but for the moment I would leave as is - the size of the venue and its high vaulted ceiling give it a pleasant acoustic already. I didn't run any tests on the space, but from playing music in it I found that the frequency response seemed pretty smooth - a client wouldn't need to spend large amounts of money worrying about putting in false walls/ceilings etc to tame an unmusical sound, just dampen it down to taste - a much less costly exercise.

The floor sound could be dampened as there is access to it from below - but I would also leave as is, unless something came up which justified the expense.

Two other issues may require some modification:

- a hole in the soundproofing vaulted ceiling (where you can see its structure) - I suggest a repair would help the sound proofing
- investigate the vent in the wall below (there is a similar one in the wall opposite - see if it is a weak point in sound transmission, if so baffle or block depending on if it is in use.

The main asset at present, from a sound perspective, is the size and sound proofing of the venue. Also the fact that overall acoustic (echo) is pleasant. It is unusual to have such a large soundproof space, especially one which wasn't custom-built for this purpose.

It is worth thinking along the lines of things that either require near silence sound isolation, or things that are noisy which would be a nuisance to the outside world.

I hope this is of use. Do feel free to contact me via this email address if you have further questions.

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