

RECORDING AND MIXING STUDIOS FOR DIALOGUE, MUSIC AND SOUND EFFECTS IN MONO AND STEREO.

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This paper details the acoustics and construction of a Recording and Mixing Studio facility in London. The client owns a 4 storey building in Soho, which is a steel framed structure with glazed and brick walls. The property was originally designed as a light industrial factory unit and consequently has reasonable floor loadings. There are currently 3 dubbing theatres in the building, the first of which is in the basement. The studio detailed in this paper was constructed on the 2nd floor and represents the forth studio/dubbing theatre for this client.

The clients requirements for his studio can be summarised as follows:-

1. High acoustic isolation.
2. Studios with as large a floor area as possible.
3. As much headroom as possible, to help overcome the psychological effects of large floor areas with high aspect ratios.
4. The ability to work from either in studio video projectors, or external film projector.
5. Very low internal noise levels, so that voice work, foley effects etc. may be undertaken in the studio.
6. Full air-conditioning.
7. High aesthetic quality.
8. Separate voice booth with visual contact, and high values of acoustic separations.

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9. Second Voice Booth, which could operate totally independent of the studio with different programmes and materials, to an adjacent control area.

The above requirements may be easily satisfied in a site outside London, but in Soho with limited floor areas and restricted heights, this can be a major problem.

The solution to the acoustic isolation was :-

1. To seal all glazed windows (these could not be removed or blocked up).
2. To construct a decoration facade with mineral wool behind to the cavity.
3. To block up behind the decorative facade with heavy density concrete block.
4. Structurally decoupled the studio by 28mm of foamed closed cell neoprene, and mineral wool slabs.
5. High performance prefabricated studio construction. (The studio walls and roof, were constructed from prefabricated steel panels with mineral wool, and gyproc infill. The floor constructed from twin layers of 18mm timber with a laminated steel infill).
6. The outer barrier wall to the offices were constructed along stud partition principles, with double gyproc to each side. All cavities were filled with acoustic absorption. For the main studio and its associated voice booth, twin wall isolation was deemed to satisfy. Whereas for the separate voice booth, a three wall system was employed

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AIR-CONDITIONING

Being an existing building with a slab to slab height of 3.16m, which was further reduced by a crisscross matrix of beams at 2.675m, meant that every millimetre had to be utilised. Ducts could not be accepted within the studio for reasons of height and aesthetics. Therefore a plenumed cavity installation with many air tight compartments was employed. This had the advantage of allowing air, to circulate around the beams, and other obstacles with a minimum of space. The air-conditioning plant airhandler, was mounted externally to the studio with acoustically lined boxes, and secondary silencers to the supply plenums. From the supply plenums the air entered the studio through ventilation panels, which silences the air, as it passes along an acoustic labyrinth incorporated in the depth of the panel. A cross flow ventilation pattern was established by allowing the air to enter, and exit the studio through special perimeter recessed interstice that also provided feature lighting. The design level for the ventilation system was NC15.

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ACOUSTICS

With studios having such a high aspect ratio, and with the hindsight of previous experience. Proprietary acoustic ceilings were done away with, as they were found to be the cause of many early and other unwanted reflections. To overcome these problems and meet the high aesthetic requirements of the ceiling a stretched fabric of tented configuration was introduced. This in conjunction with the fabric finished walls, and carpeted floors, produced a very low and flat reverberation time.

As the studios were aimed towards future trends with stereo television and surround sound with Dolby SVA. Surround soundspeakers were introduced and mounted at high levels in the studio side walls, and behind the mixer. The radiation patterns of the speakers were selected, and positioned with angles that ensured an even spread of sound over the critical monitoring/listening areas.

To aid stereo imaging the studio layout was carefully considered, and all surfaces that could give unwanted reflections were either angled or absorption covered.

All speakers were hidden behind the fabric finishes, so as to help with stereo imaging, unfortunately, due to space and no acoustically transparent projector screens being available the central loudspeakers had to be mounted below the screen.