

'Ray tracing' is a tool for digital visualisation used in architectural design to map all the potential acoustic leaks throughout a building. By analysing a 3d model you can use ray tracing software to predict how sound would propagate in any given design. Each line speculatively models the way a sound wave reflects off the walls, floors and ceilings to produce an architectural ultrasound scan.

Here, ray tracing is not applied as a design tool but rather to understand the acoustic constitution of an existing building - the Syrian regime prison of Saydnaya, 25km North of Damascus. The prison, which is still in operation, has been the site of over 13,000 executions since the protests in 2011 began. Saydnaya is inaccessible to independent observers and Monitors. The memory of those few who were released is the only resource available from which to learn of and document the violations taking place there. However, the capacity of former detainees to see anything in Saydnaya was highly restricted as mostly they were kept in darkness, blindfolded or made to cover their eyes. The prisoners who were forced to live in these dark and silent conditions developed an acute sensitivity to sound.

The reflective surfaces of the prison gave the inmates the capacity to hear and feel across the entire surface of the prison. As they never saw beyond the four walls of their cell they used sound to produce an image of the prison in their minds eye. If released, vital information could be recovered from these earwitnesses - including the number of people incarcerated inside Saydnaya by calculating the amount of cell doors they heard being locked during the single daily meal time.

*We used to distinguish between the tools of the torture. Some of them sound like big hammer breaking down a wall, others were like whipping sound, like a belt or something, some like a really big tool tearing up a wall or something. So yes, every torture tool has a different sound. The loudest was the 'dulab', and the worst one, which shook the walls, was this 'pipe'. You could hear that on the third floor, because the walls were shaking from the echo.*

In Jamal's testimony he describes the sounds of the beatings not as violence perpetrated against humans or even bodies but rather perpetrated against architecture. He speaks as if the walls of the prison were the victims of the torture "breaking down a wall", "tearing up a wall" and "the worst one, which shook the walls". Listening to the former detainees of Saydnaya you feel they became continuous with the architectural fabric of the prison, that they were not only the subjects of violence perpetrated inside these walls but rather they were part of the vibration of the walls themselves. That the walls and floors became their tympanum and wherever in the prison a detainee was being beaten - they were also beating on the eardrum of all.

These ray traces give a very different image of incarceration - they show that the experience is not only being unable to leave ones cell, but that one cannot control the sounds that are coming in. In these drawings space is not defined by its separate architectural elements but rather as an environment composed of reflective surfaces. Visually it is just about possible to make out the shape of the stairs or the central cylindrical watchtower in the way the lines bounce off their surfaces and collide with the walls and floors around them. However these are not designed to allow us to see the space but rather to see the way in which a building sounds.

*Saydnaya (ray traces) 2017*