Risk Management Through Camera-Based Remote Monitoring of an Excavator-Based Archaeological Fieldwork Project on a WW II Forced Labour Camp in Hanover, Germany

Daniela Kelm | Germany, Tabea Adam | Germany, Marleen de Kramer | Germany

In the summer of 2022, construction began on the “Opticum – Optics University Center and Campus”, the first stage of the new Science Park of the Leibniz University of Hanover. The site, now a vacant lot, previously housed a variety of functions, most notably a WW II camp housing workers from occupied countries conscripted for forced labour. To the east, the site abuts a satellite camp of the Neuengamme concentration camp (www.kz-gedaenkstaette-neuengamme.de/geschichte/kz-aussenlager/aussenlagerliste/hannover-stoecken-accumulatoren-fabrik/). Both camps, as well as a POW internment camp further west, supplied forced labour for the “Accumulatorenfabrik AG Hannover-Stöcken”, a factory producing batteries for submarines. The dark heritage of the site, which is poorly documented in the available archival material, gives it historical significance and made a preliminary archaeological investigation necessary.

Soon after work on the site commenced, we were forced to call a halt as the soil was discovered to be heavily contaminated with lead, cadmium, antimony, and hydrocarbons. The factory, known locally as AFA (the battery factory still exists, but is now part of Varta) or merely “Akku”, apparently discarded slag and other industrial waste on the site for decades. Work resumed in May 2023 with a new concept designed to minimise the health risk to the archaeology team. As they would normally have close and prolonged exposure to the soil, stringent health and safety measures had to be introduced – besides safety boots, other situationally-dependant personal protective equipment such as disposable gloves and overalls and high level particulate filtering masks is to be worn while working outdoors and soil contact is to be reduced to a minimum. This precludes much of the manual work normally involved in an archaeological excavation, or the close personal surveillance of the earthworks.

Instead, the team devised a new method for remote monitoring of the excavation. A wide-angle camera is mounted on the windscreen of the excavator, giving an elevated view of the shovel and the area to be cleared. The image is transmitted wirelessly to a screen in a portacabin situated outside the contaminated area, allowing the archaeological team to supervise the excavation in progress. They remain in close contact with the operator (whose cabin is sealed and climate controlled) through two-way radios, allowing them to give instructions and intervene when necessary. When items of potential archaeological interest are discovered, the earthworks are paused to minimise dust/airborne contaminants and the team can investigate in person using appropriate PPE. Documentation is mainly done through photography, both terrestrial and airborne, with individually surveyed photogrammetry points used to rectify and stitch together the imagery for further analysis. Objects of particular significance are collected and photographed – those needed by the ministry are labelled and double bagged, then stored away from work and break areas.

This approach may not be as fine-toothed as a conventional archaeological excavation, but allows the team to investigate the evolution and adaptive reuse of the site from forced labour camp to refugee camp for displaced persons to allotments for factory workers and their families. These changes can be documented primarily by tracing the remnants of foundations, and the network of pipes, sewage tanks, cables and other infrastructure that connect them. Aerial imaging from the war and post-war years and deposits of household rubbish help to date these finds. This abstract will be updated to reflect the experience gained in this ongoing project.