

QUARTZ ROAD

Quartz Road investigates the possibilities of incorporating piezoelectric into structures and walkways for the purpose of generating electricity in a collaborative and interactive way across the Mannheim site for BUGA '23. Inspired by the openness and fluidity of the site, Quartz Road encourages users to explore all areas of the site while creating energy along the way.

Piezoelectricity is an electric charge that accumulates in certain materials such as quartz in response to applied mechanical stress. With the site stretching to the size it is, we aimed to incorporate technology that could encourage exploration. For this reason, we incorporated rose quartz, in all the walkways and structures included in Quartz Road. This project avoided having a central attraction to encourage site exploration and allow for additions to the site in the future. Our site is developed much like a theme park, where you have to wander to discover all its aspects.

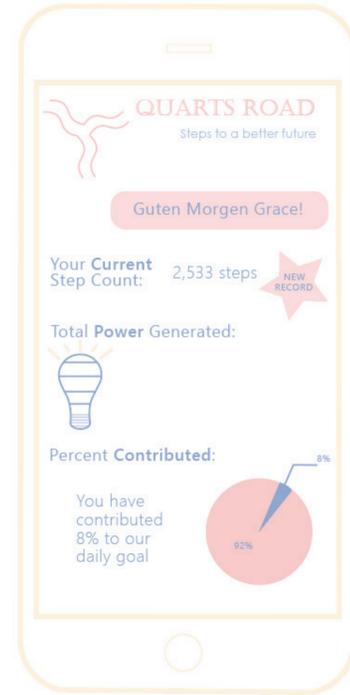




The proposed design incorporates three different types of attractions laced throughout the site with piezoelectric pathways interlacing through them, acting as a guide for its users. The three attractions consist of a piezoelectric pavilion shelter, a piezoelectric flower garden, and a piezoelectric sculpture. All three of the attractions will utilize the rain to generate piezoelectricity with their rose quartz materiality.

The amount of energy generated on the site will depend entirely on how engaged the community is. Without community interaction, the energy generated from rain alone amounts to around 0.6613MWH, but that is just the baseline. In reality, the electricity generated could be 10 times that amount if the community stays engaged.

In order for users to quantify their efforts, we created an app that tells users how much energy they've generated walking along the pathways. This gives the site an almost gamelike feel and allows the users to know they're contributing in a positive way. This interactive aspect could encourage permanence and make the site a community destination for other events like marathons.



With sustainability at the forefront of everyone's minds, knowing there is a site where you can go make an impact and help to generate electricity just by walking will attract a large audience. A lot of times, the things we do seem minimal and meaningless in the grand scheme of things. Being able to walk around and see how much electricity you're generating gives an actual tangible and conceivable number to the effort you're putting in. It's one thing to switch to metal straws, but being able to see how many plastic straws you've saved brings your efforts into a whole new light. Being able to quantify your efforts to help generate electricity is what will keep bringing users back to the site.

