

Pump House Machinery VR Implementation

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Sponsor: Friends of Pump House | **Sponsor adviser:** Mac Wood

Background

The Byrd Park Pump House was constructed between 1881-1883 to serve as the waterworks for the City of Richmond. The downstairs contained a water-powered pumping station, while the upstairs featured a large open-air pavilion that hosted lavish events and dances until the mid-1920's. After its closure in 1924, all the machinery within was sold as scrap metal. The Friends of Pump House is a non-profit organization that works to preserve, protect, and restore the Pump House. The organization tasked VCU with recreating the original machinery to understand the scale and importance of the pump house machinery. Previous student teams researched the layout of the pumphouse and period-accurate machinery to create a detailed 3D pump model and a preliminary AR implementation.

Achievements

The current student team built off pre-existing assets to create an educational aid for use by Friends of Pump House. An interactive aid usable for both remote and on-site at the Pump House was to help generate interest in the restoration of the Pump House, as well as raise awareness of the Pump House's historical significance.

Project Design - Virtual Reality

Features:

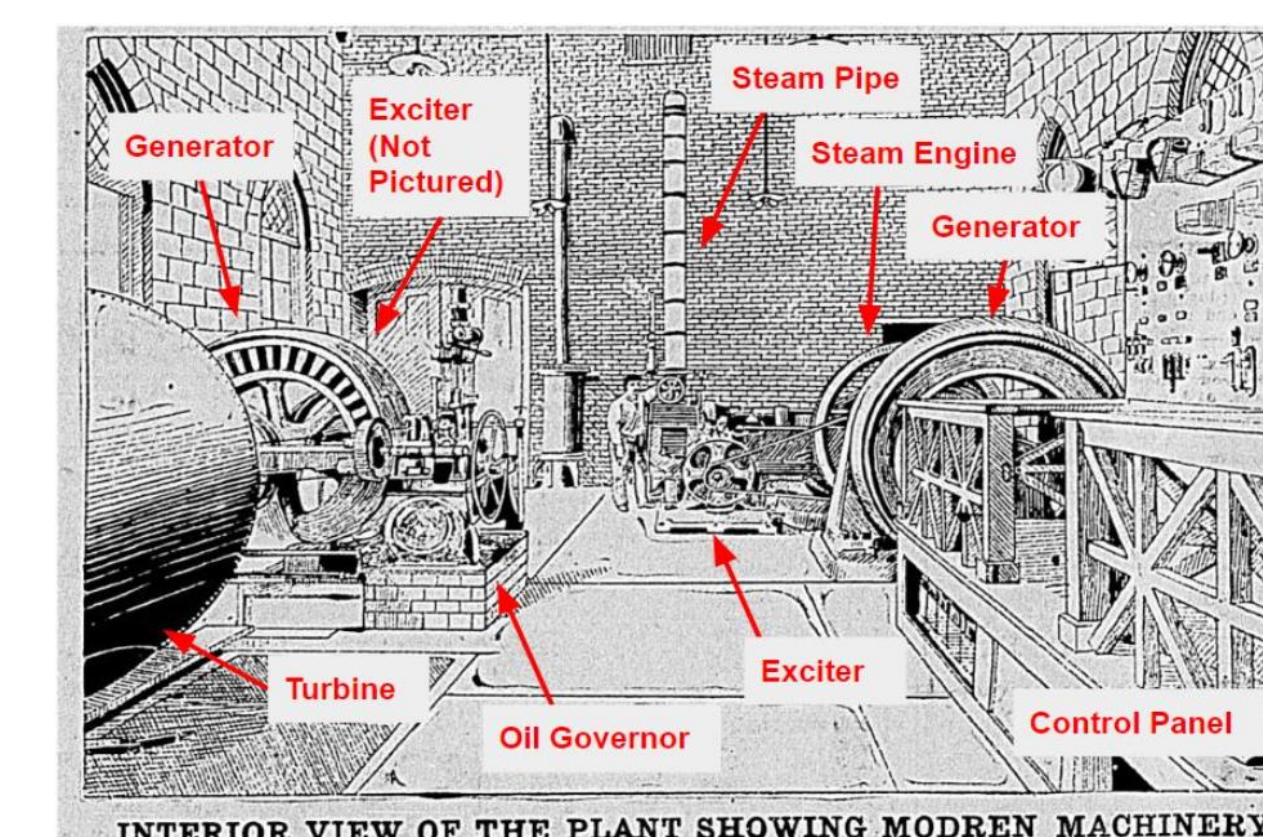
- Fully engaged/ Immersive: Can move and explore the pumphouse without being at the location
- Interactable: Interact with the different machinery
- Audiovisual Experience: Hear what the pumphouse sounded like

Audience/Use

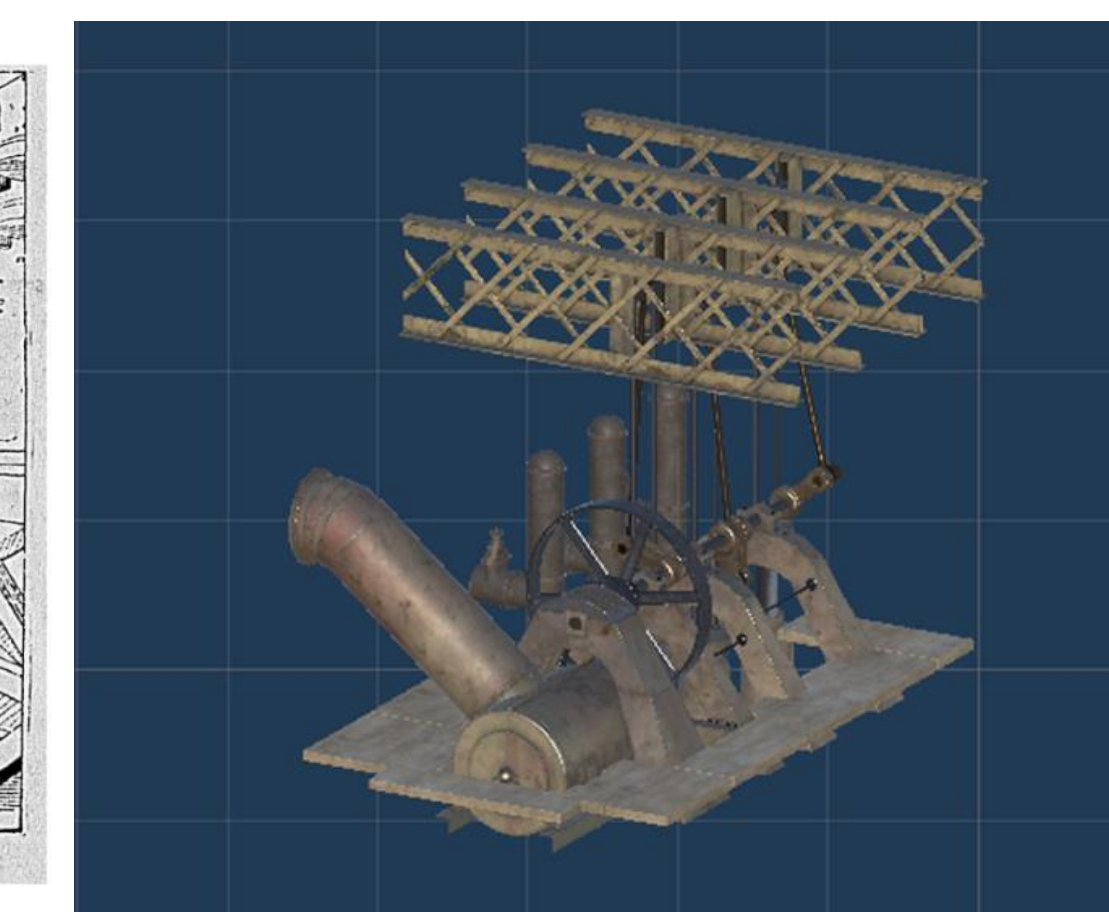
- Schools: Could be used to teach students about the Pump House
- Kids: Would be more interested in the new technology.
- Educational Video Aid
- Accessible from Home and People with disability
- Generate Funding: Could be shown to potential donors without them being physically present at the pumphouse.

Asset Development

From MNE-504 and MULT-603, we have access to in-depth research about the Pump House and 3D models of the machinery. Future artists will design and implement models of Generator, Hydroelectric Generator, Switchboard, Boiler, Leffel Turbine. These 3D objects will replace place-holders used in our Virtual Reality (VR) application.



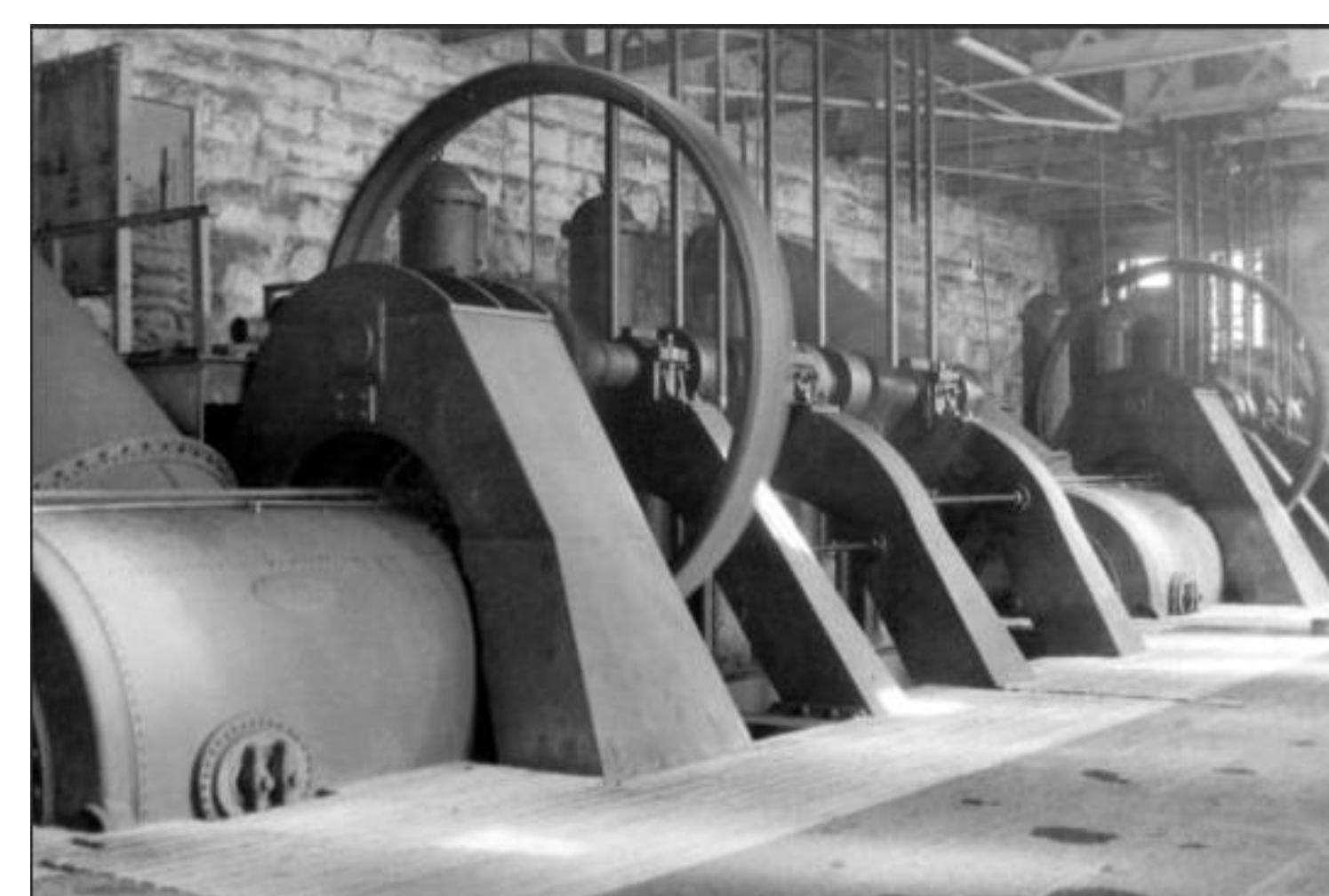
Map of the Hydroelectric Machinery



3D Model of Water Pump

VR Application

Developed using Unity, deployed via Meta Quest VR Headset



Original Water Pumps



VR Simulation of Water Pump Room

Future Adaptation

Possible enhancements to our current application:

- Working with artists to enhance the quality of our 3D models.
- Exporting project to IOS or Android tablet for in-hand experience.
- Altering Unity project for augmented reality deployment on XR headset
- Extension of Hydroelectric and Boiler room.