

GRAND HAVEN MUSICAL FOUNTAIN WATER FEATURE



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BACKGROUND

The City of Grand Haven has sponsored a project to add a new water feature to the Grand Haven Musical Fountain, or GHMF; an addition in honor of the fountain's 60th anniversary.

The GHMF was established in 1962, founded by Dr. William Creason, the former mayor of Grand Haven. The fountain was designed by a local engineer, William Morris Booth II and built by volunteers, costing an estimated \$50,000. It was the largest musical fountain in the world at the time it was built, holding the title until 1988.



Dr. William Creason

The GHMF has had multiple upgrades over the years. A major upgrade in 1983 included a new Programmable Logic Controller (PLC) control system, new PC (TRS-80), and sound system upgrades.

The most recent upgrade was in 2017, when a senior project team from GVSU implemented two new features, coined the 'Wave' and the 'Helix', which helped inspire the design of the Doves, which will be unveiled at the 60th anniversary show.



The WAVE



The Helix



KEY SPECIFICATIONS

The designed feature follows these key specifications:

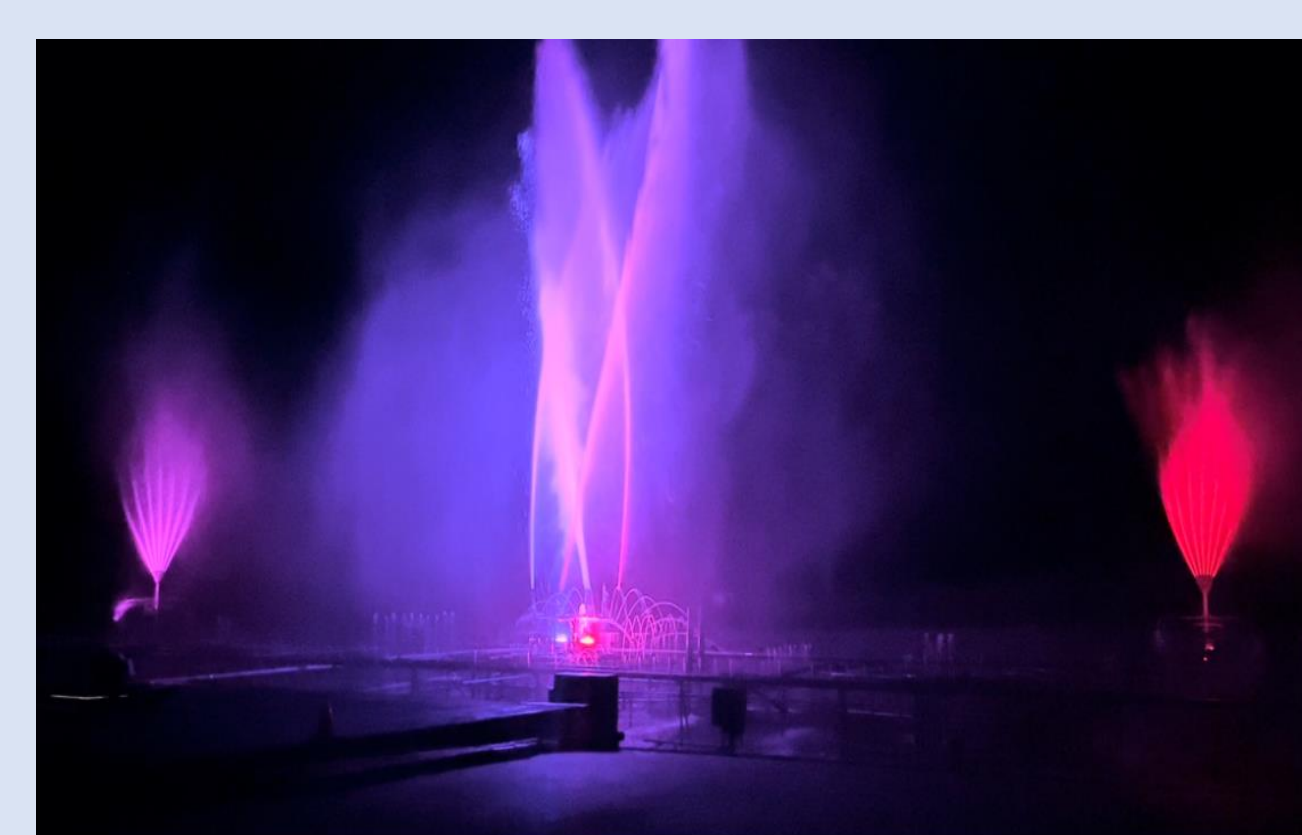
- Aesthetically pleasing
- Viewable from 1000 ft away
- Minimum height of 15 ft when in use
- Able to be winterized
- Minimal maintenance
- Output nozzle must have at least a 1/4" diameter
- Able to withstand 150 psi of water pressure
- Total cost of <= \$5000
- No additional pump/compressor required
- Will use existing legacy valve

THE 'DOVES'

The Dovetails, or commonly, 'Doves', are two identical features implemented symmetrically on the fountain.



Daytime - Rotating & Stationary



Under the Lights



The Doves

The Doves are both a stationary and rotational feature. The stationary shape of the Doves was inspired by the Peacock and the rotational method was inspired by the Helix. The Doves are composed of mainly stainless steel, which is corrosion-resistant, ideal for the harsh fountain environment. A pneumatic cylinder on each feature is used to hold the Dove in place while it is being used as a stationary feature. When it rotates, the pneumatic cylinder "catch" is released, allowing the feature to spin on a bearing which propels the feature with its own water streams that face downward, creating a unique and aesthetically pleasing visual to WOW the audience.

TESTING

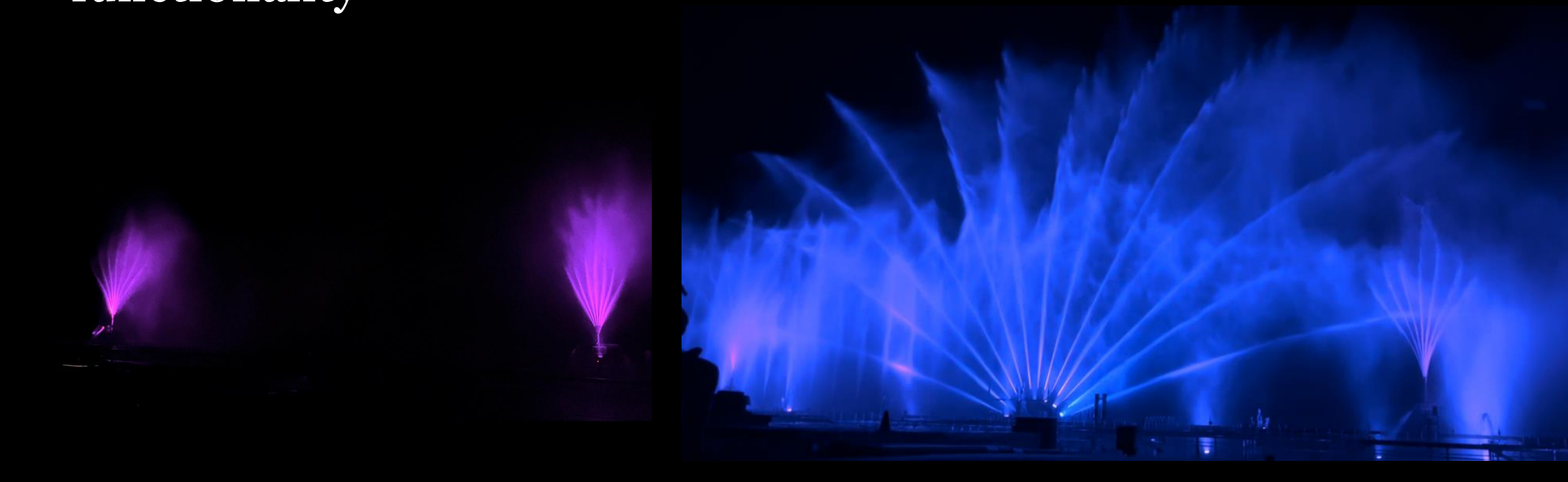
To ensure functionality and longevity in the fountain, a detailed testing plan was performed for requirements that required repeated tests.

Height: the height of the Doves was measured at different pressure levels (1-5), with 1-3 pumps on, and with other major features on

Symmetry: the RPM of each Dove was measured to ensure symmetry

Catch: the % of times the Dove was caught parallel to the back wave was measured

Lighting: night tests were conducted to confirm lighting functionality



FOUNTAIN FEATURES

The GHMF now contains 11 unique water features:

1. Bazookas
2. Ring Center Spouts
3. Rings (1,3,4 A & B)
4. Sweeps
5. Peacock
6. Helix
7. WAVE
8. Voice Spout
9. Candelabra
10. Front Curtain
11. Dovetails



FABRICATION



SCAN TO WATCH

Summary Video



Full Video

THANK YOU TO OUR SPONSORS!



SEE THE SHOW!



Watch the unveiling at the 60th anniversary party August 27th @9PM!