Project Brief: Rock Fountain Functional Modifications

Date: November 2026
Process: FDM printing in PETG
Starting files: Rhino or FBX format (to be provided)
Assembly: 5 pieces

1. Project Overview & Goals

Modify the existing CAD model of a rock-style tabletop fountain so it properly fits a pump, LED light strip, power plug, and power switch. The finished design must be optimized for reliable FDM printing in PETG on consumer-grade printers, with reduced supports, shorter print times, lower material use, and clean real-world fitment of components.
Primary goals:

- Seal the current base split and re-split the base in the opposite direction.
- Redesign the pump area: larger, simpler, shifted forward, tunnel removed, and deepen the entire base to ~50 mm water depth for full pump submersion.
- Create a separate slide-in hose adapter that fans the water into a thinner, wider waterfall.
- Accommodate lights, power plug, and switch with proper clearances and wire routing.
- Remove all dowel pins and fill matching holes on all 5 pieces.
- Reduce overhangs, undercuts, islands, and support requirements across all pieces while preserving the rock aesthetic.
- Fix modeling defects (e.g., unwanted holes).
- Iterate with test prints during development to verify component fit before final CAD is locked.

2. Overall Reference

Fully assembled fountain (current state). This sets the visual and functional context for all modifications.



Figure 1. Fully assembled rock fountain reference.

3. Detailed Change Requirements

3.1 Base Split Direction

Seal the existing split (shown in red). Re-split the base along the green line so the two halves join in the new orientation. The new joint must be clean, strong, and printable with minimal support.

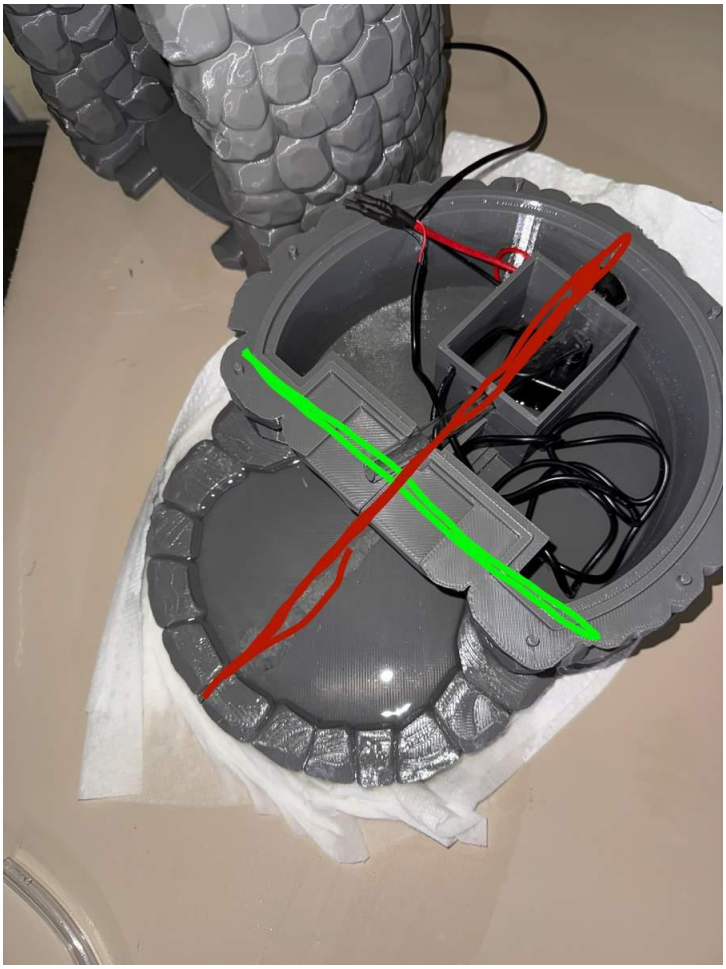


Figure 2. Current split (red) vs. desired split (green).

3.2 Power Cable Entry Clearance

Enlarge the cable entry area (circled in red) so the power switch and power jack wires have sufficient clearance and a clean path into the base without being pinched.



Figure 3. Power switch and jack wire entry (red circle).

3.3 Pump Area Redesign

Shift the pump housing forward toward the front wall. Remove the existing hose hole/tunnel. Open the compartment fully to the front wall so it becomes one larger, simpler volume. Deepen the entire base so the water reservoir is approximately 50 mm deep. This provides sufficient volume and submersion for the pump (approximately 27 mm tall) to remain fully submerged.

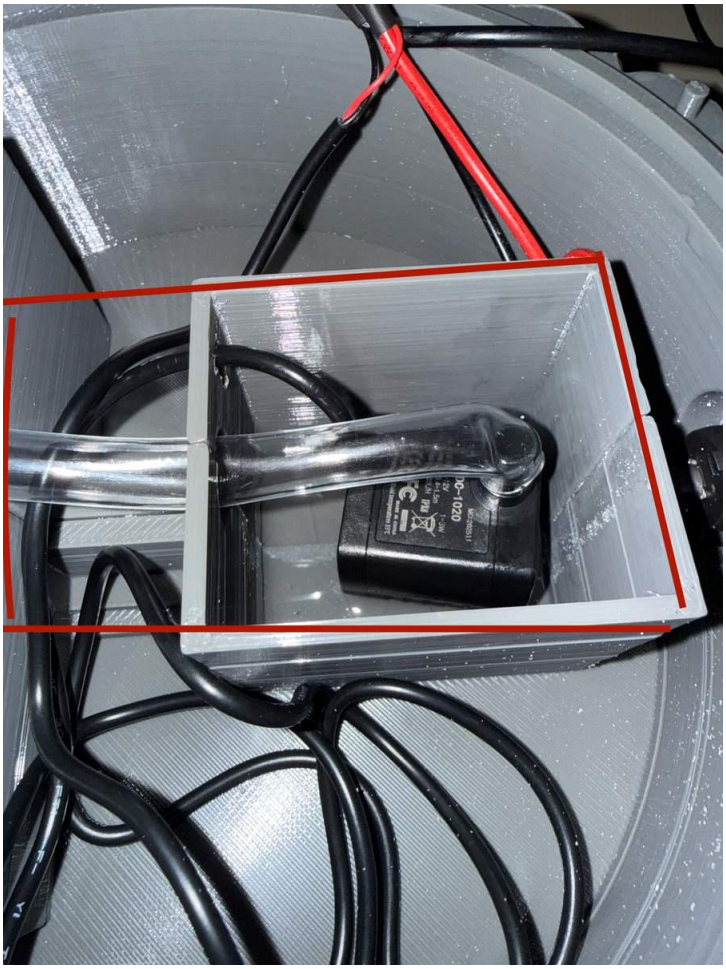


Figure 4. Current pump compartment.



Figure 5. Pump area to be enlarged and shifted (red outline).

3.4 Separate Slide-In Hose Adapter (Waterfall)

Create a separate printable adapter piece that the pump hose slides into. The adapter mounts in the marked zone and fans the water out into a thinner, wider waterfall instead of the current single stream. It must be a distinct part that slides into place.

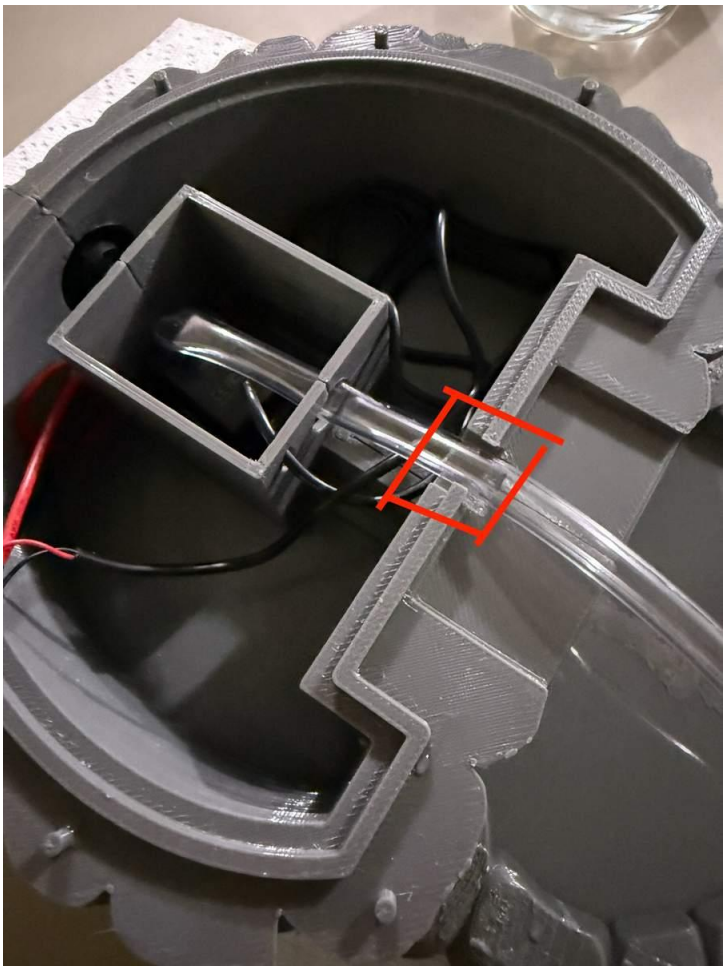


Figure 6. Internal hose path (red square marks adapter interface zone).



Figure 7. External view — red rectangle shows where the waterfall adapter fits on the assembled unit.

3.5 Remove Dowel Pins

Remove all dowel pins and fill the corresponding holes on every mating surface across the 5-piece assembly. Goal is to eliminate the pins to reduce print time and material. Alignment can rely on the new base split and other features.
Note: A close-up photo of example dowels on mating faces is available and will be provided separately if needed. Two typical pins are circled on the current parts.

3.6 Fix Unwanted Hole

Fill/remove the unwanted rectangular hole/slot (circled in red) and ensure the surrounding feature is solid and clean.



Figure 8. Unwanted hole to be fixed (red circle).

3.7 Overhang, Support, Undercut & Island Reduction

Reduce overhangs, undercuts, isolated islands, and support needs across all 5 pieces. Prioritize printability and material efficiency while preserving the rock aesthetic and function. The photo below is an example of problem areas on one piece. Designer should load the provided files and clean up all pieces accordingly.

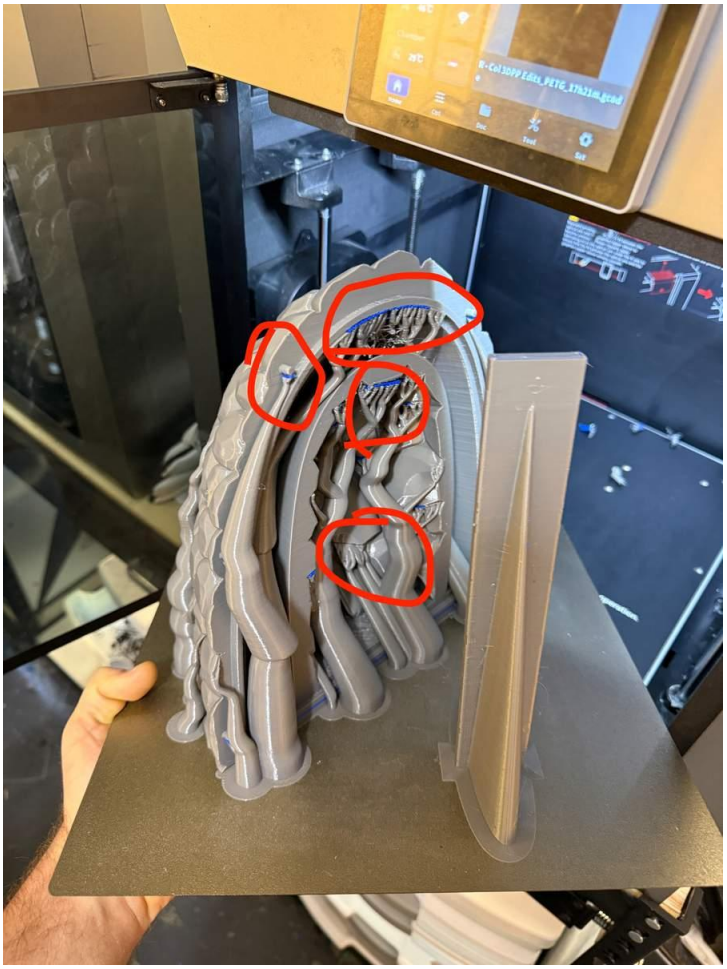


Figure 9. Example of support/overhang/island issues (red circles).

3.8 Light Strip Accommodation

Close the open gap (marked yellow) on both left and right sides. The sides must be solid; the opening creates support problems and is not needed for the light strip.

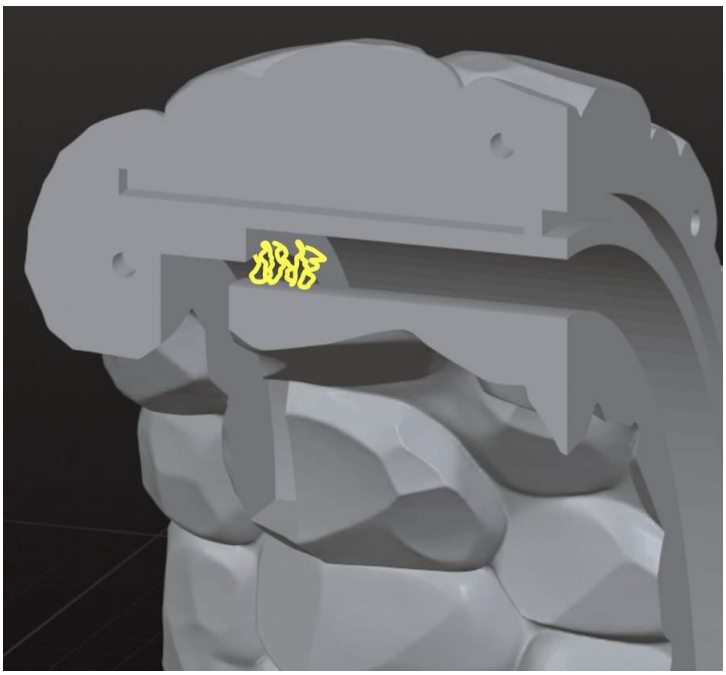


Figure 10. Gap to close (yellow) — make sides solid.

Left and right rock columns currently have mismatched internal levels. Raise the lower (red) zone up to the yellow level so the area is large enough for practical support removal.

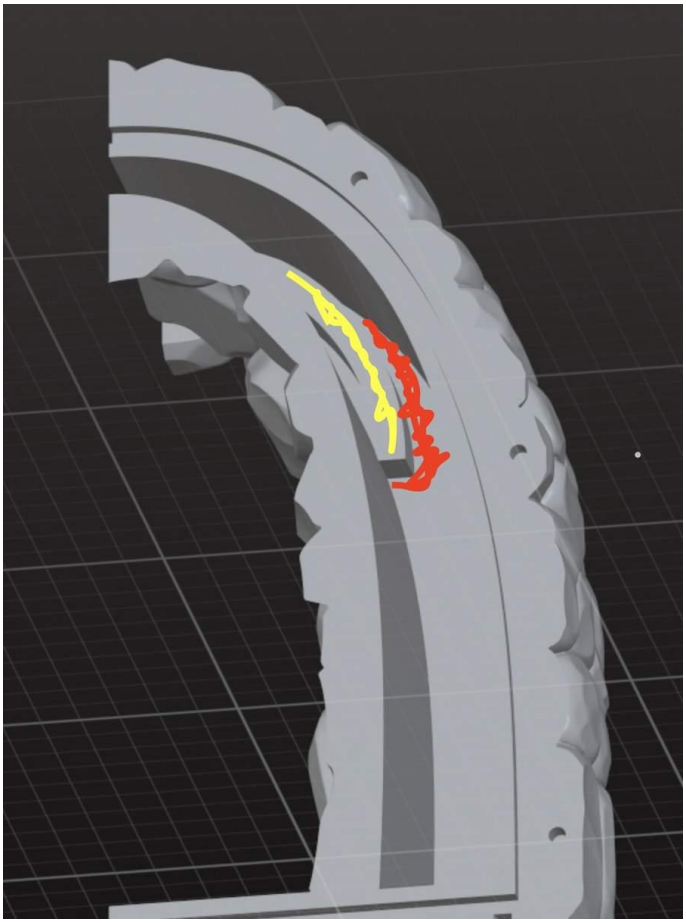


Figure 11. Light area column levels — raise red zone to yellow.

Add a wire exit port at the bottom of the light groove (marked red) so the light-strip wires can exit cleanly.

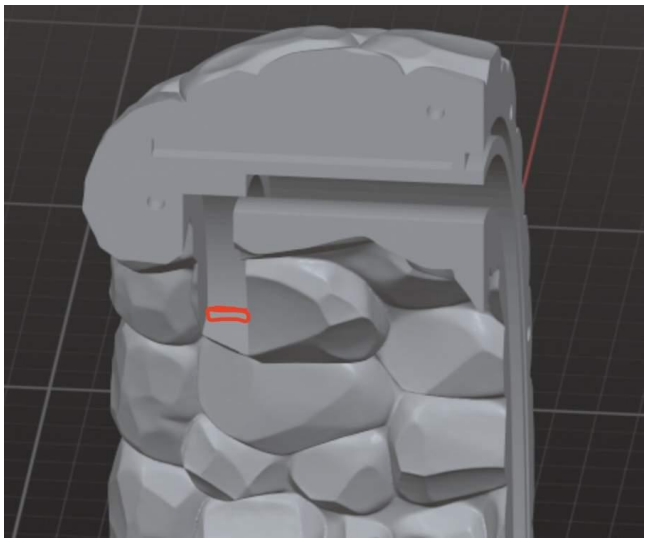


Figure 12. Location for light wire port (red oval).

4. Design Constraints (FDM / PETG)

Design to standard FDM guidelines. Key limits from the attached 3D Hubs reference chart:

- Supported / unsupported walls: 1 mm minimum
- Overhangs: 45° maximum without support
- Embossed / engraved details: 0.6 mm wide × 2 mm high
- Horizontal bridges: 10 mm
- Holes: Ø2 mm minimum
- Connecting / moving parts clearance: 0.2 mm
- Minimum features: 2 mm
- Dimensional tolerance: ±0.2 mm
- Pin diameter: 3 mm minimum

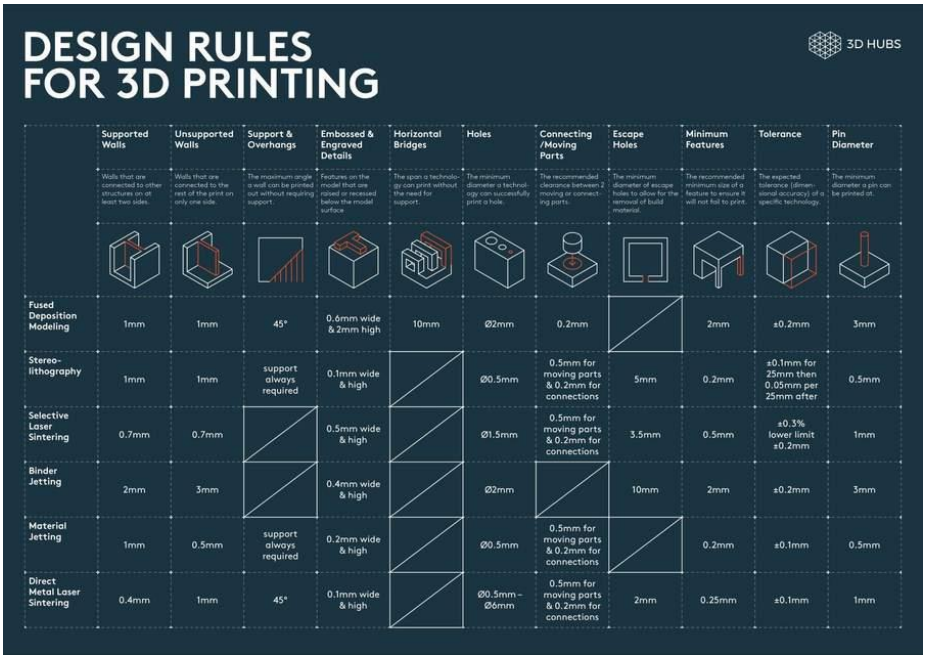


Figure 13. FDM design rules reference (3D Hubs).

5. Open Items (to be confirmed after designer selection)

- Light wire exit port diameter — size to be confirmed by measuring the actual light-strip wire. Designer to propose a clean port and verify with test print.
- Pump hose outer diameter (OD) — size to be confirmed by measuring the actual hose. The slide-in adapter must capture the hose securely while still allowing removal. Final clearance set via test print.

6. Pricing & Commercial Terms

We are seeking a fixed price (or a firm “will not exceed” maximum) for the complete project through final, approved CAD. Hourly billing is not preferred.

- Quote a single project price that covers all work required to deliver finished, approved CAD files that meet the requirements in this brief.
- The price covers design work and revisions driven by the client’s test prints. The designer is not responsible for performing or paying for the test prints themselves.
- Alternatively, provide a not-to-exceed (NTE) maximum cost. Any work beyond that maximum requires prior written approval.
- Clearly state what is included (number of revision rounds based on test-print feedback, file formats, communication expectations) and what would be considered out of scope.
- This protects both the client and the designer: the scope is defined, the cost is capped, and neither party is exposed to open-ended charges.

Please include your fixed price or NTE maximum in your proposal, along with an estimated timeline.

7. Deliverables

- Native CAD files (preferred format to be agreed; Rhino acceptable)
- Neutral STEP files
- Print-ready STL files (properly oriented, manifold, units in mm)
- Separate files for the 5 main pieces + the hose adapter
- Brief notes on any design decisions or recommended print orientation

8. Process & Collaboration

Test prints will be performed by the client (not the designer) during development to verify every component fit-up (pump, lights, power plug/switch, hose adapter, base joint, wire ports, and any other interfaces). The designer is not responsible for printing or for the cost of those prints. However, the designer must plan for the additional calendar time these test-print cycles will add to the project. CAD will not be considered final until the client’s physical test prints confirm proper fit, clearance, and function. Revision rounds based on those results are expected and should be included in the fixed price / NTE. Starting CAD files (Rhino or FBX) will be provided once a designer is selected. Designer is expected to have real FDM experience and to prioritize printability, strength, and material efficiency.

End of Project Brief