

Design Exploration: Swiss Space Center

Task 2: Structure and Construction

Assignment 2A: Taking into account the spatial organization of the program defined in Task 1, develop a structural concept for your proposal. The structural concept should outline a clear structural logic on how to connect the different parts of the building together. The design exploration should be informed by the construction of conceptual physical (scale free) and/or digital models (using the CEM tool). Propose an appropriate construction technology and materials. Look for structural references supporting your ideas.

Submission 2A: Produce sketches, pictures of the conceptual physical models and/or diagrams of the conceptual digital models. Add pictures of relevant structural references.



Figure 1: Conceptual physical models by Peter Fischli & David Weiss

Assignment 2B: Refine your structural concept and make a first proposal for the actual structure of the building that incorporates the spatial organization of the program defined in Task 1. Build a physical model of your proposal (scale 1:200). The model should be consistent with the construction technology previously defined. Evaluate the kinematic stability of your physical model: fix support points and load the structure with external forces; if the model behaves like a mechanism, modify the geometry until you get a stable configuration. Once your structure is stable, evaluate its behavior according to the support and load condition previously defined. Guess which elements are in tension and which ones are in compression; mark the members respectively with a red and a blue marker pen. Develop a digital model of your structure (2D or 3D) and evaluate the inner forces using graphic statics.

Submission 2B: Document the tests conducted on the physical model and produce structural diagrams using the digital model.

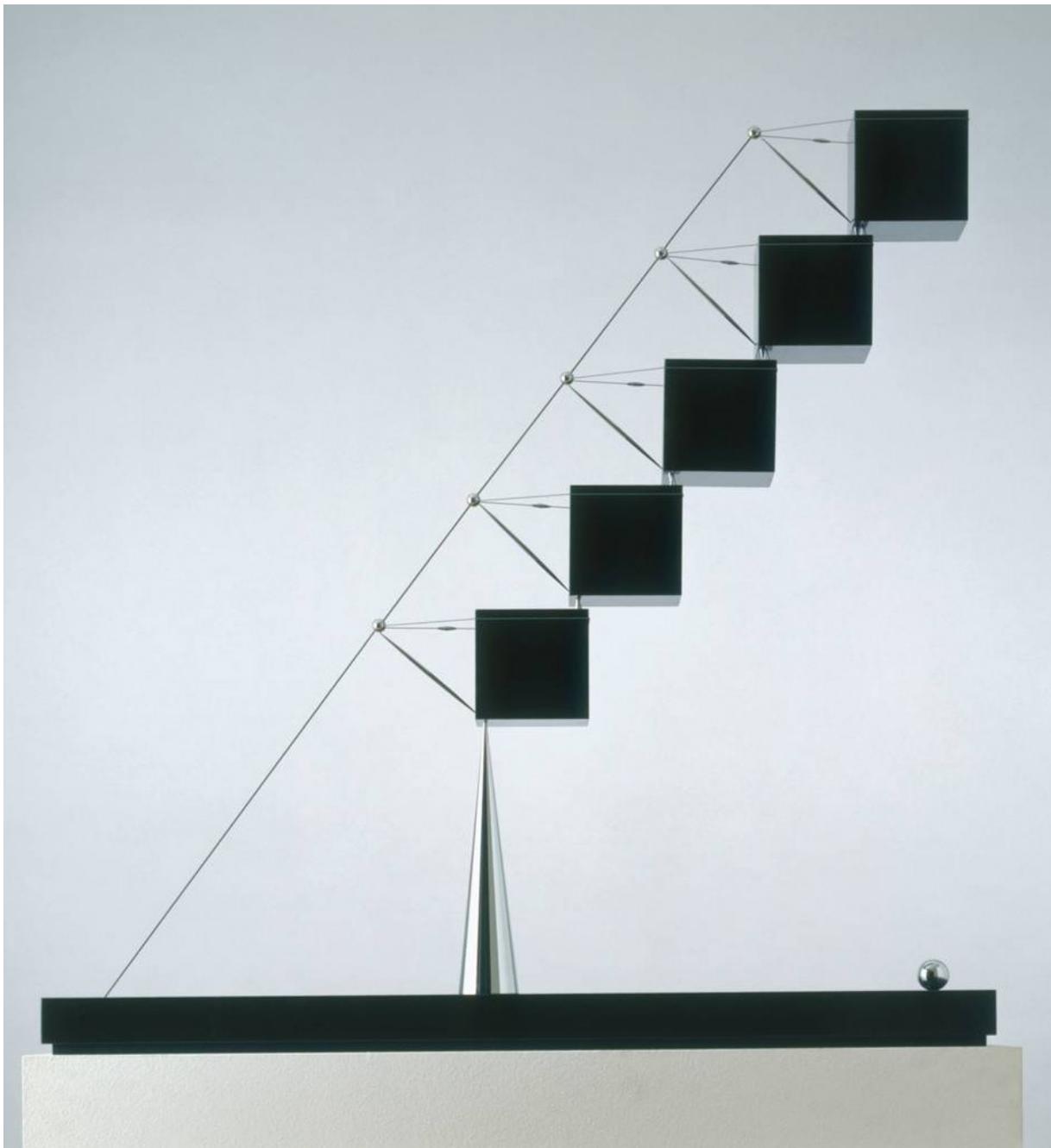


Figure 2: Structural model by Santiago Calatrava

Assignment 2C: Propose variations of your first proposal for the structure. Repeat the evaluation of the structural behavior with different support and load conditions (single or multiple punctual loading, horizontal and vertical loading).

Submission 2C: Produce pictures and diagrams showing at least three alternative proposals.

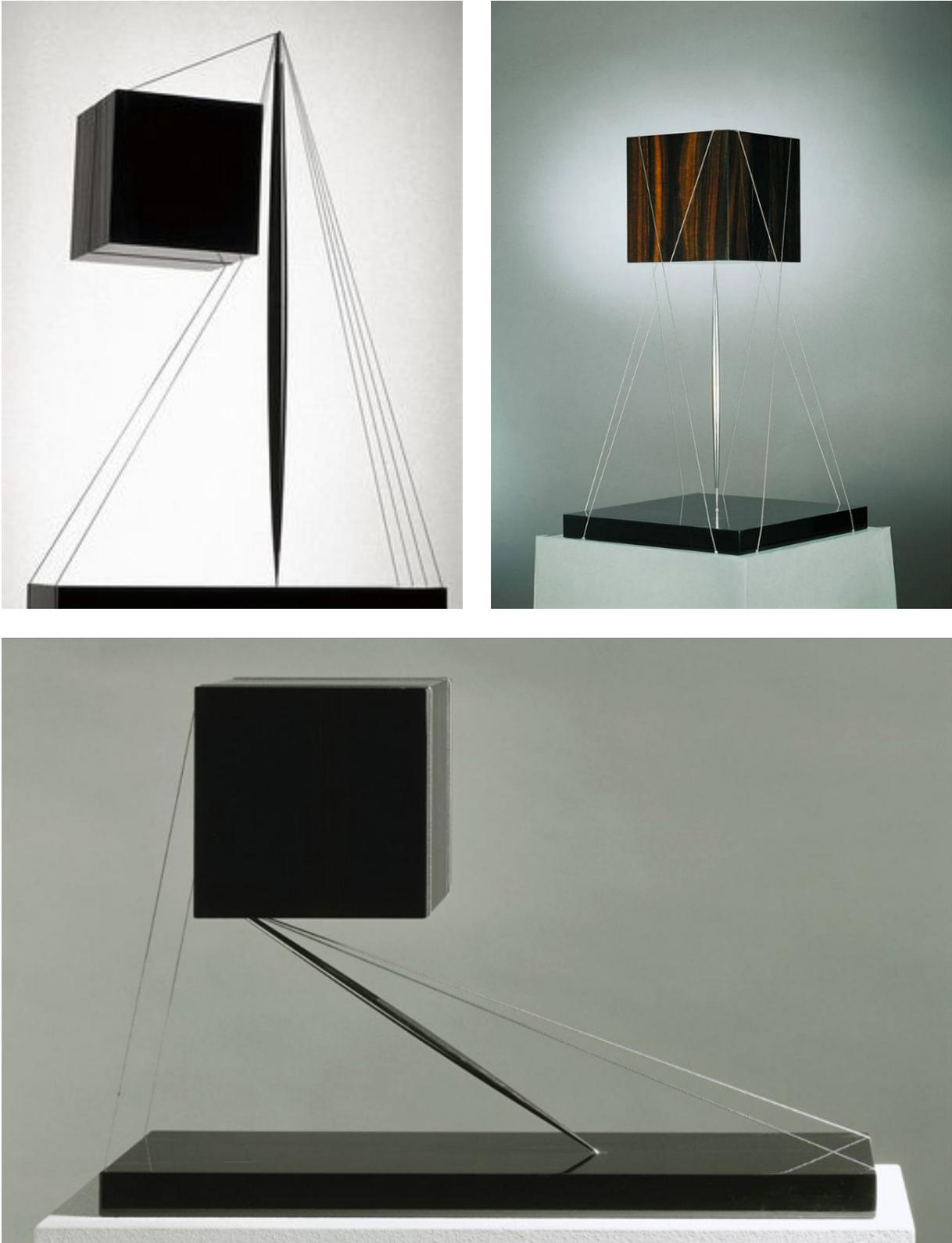


Figure 3: Structural variations by Santiago Calatrava