An Emergent Ontology for Digitally Modeling Existing Buildings: Examining Kyoto's Nishiki Market

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This project examines digital modeling strategies for existing buildings. In this context, it aims to question assumptions about the need for geometric accuracy and the efficacy of predefined ontologies. As a counterpoint to prevailing digital modeling strategies, this project proposes a digital modeling approach using a site-specific, emergent ontology. Nishiki Market, in Kyoto, Japan, is studied as a test case. The emergent-ontology modeling process is introduced with an initial minimal set of operations including basic fold and trim operations applicable to surfaces. As the model develops iteratively, new situations are encountered for which existing rules are insufficient. In response, the modelmaker's subjective judgment is invoked to introduce new operations, and ontological rules are allowed to expand. The emergent-ontology approach, when executed on the Nishiki Market test case, enables representation of specific architectural qualities, highlighting semantic distinctions between digitally modeled elements of real-world features. The modeling approach generated project-specific knowledge, informing disciplinary understanding. Ontological emergence enabled semantic relationships to be disclosed and newly constructed. This interpretive approach allows site-specific knowledge generation while challenging prevailing assumptions about accuracy and consistency in digital models of existing buildings.
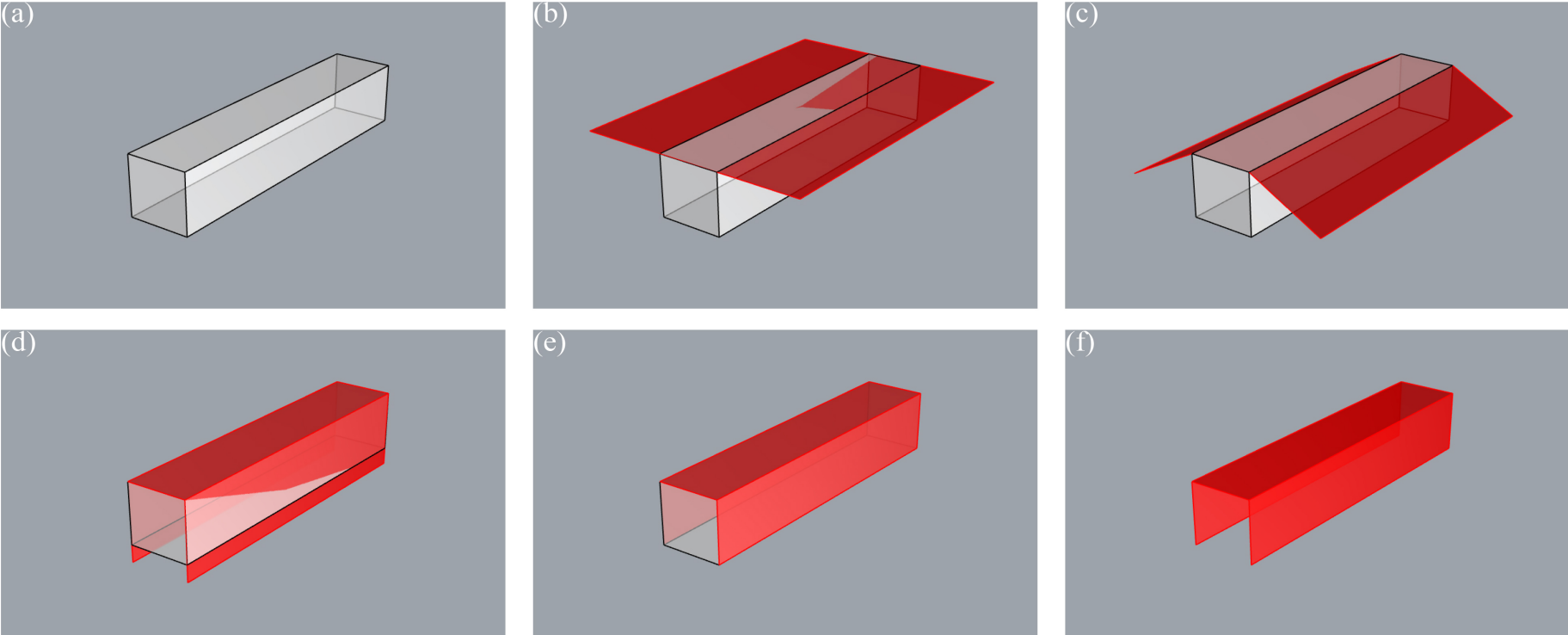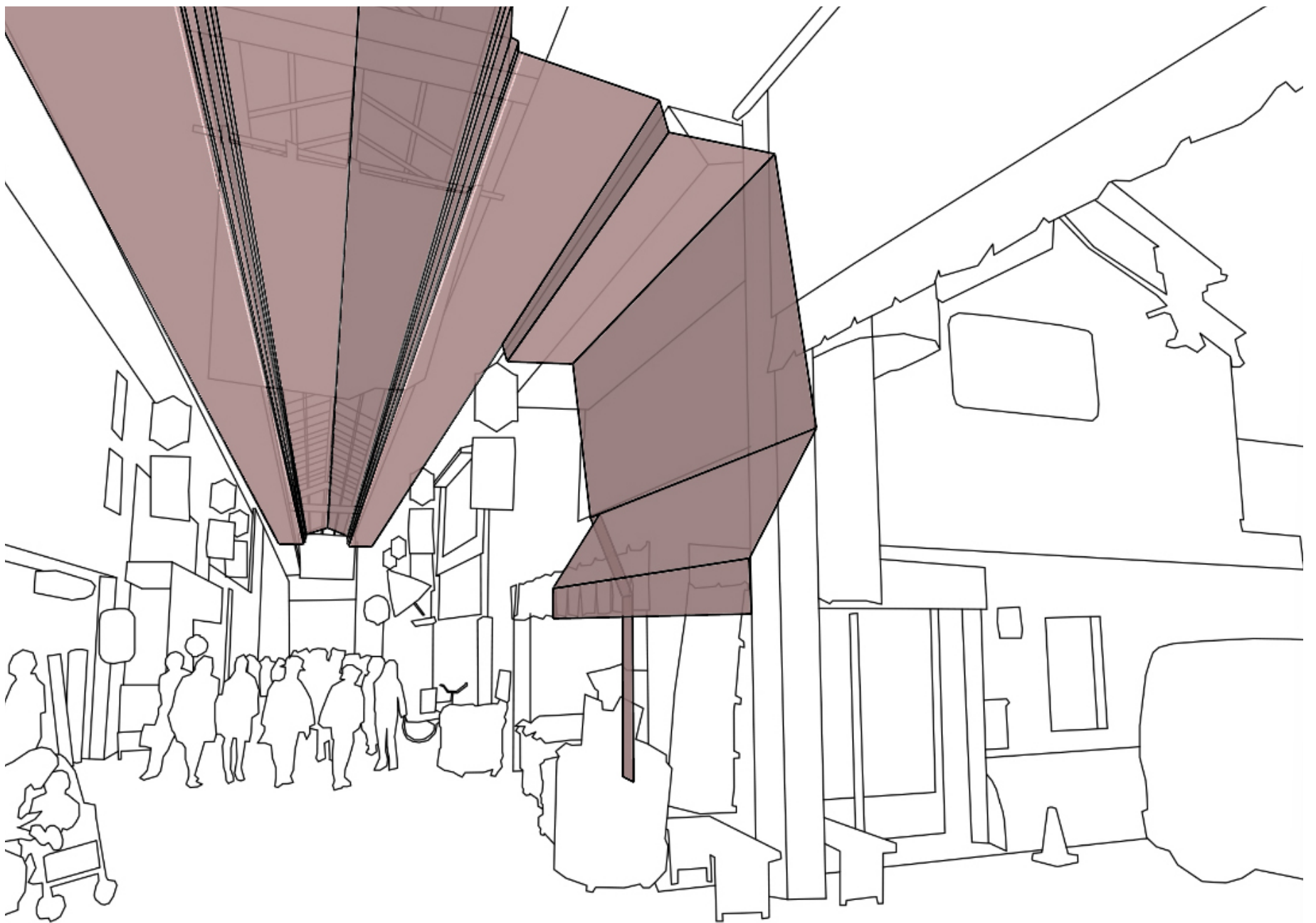
Figure 1. Digital modeling concept.

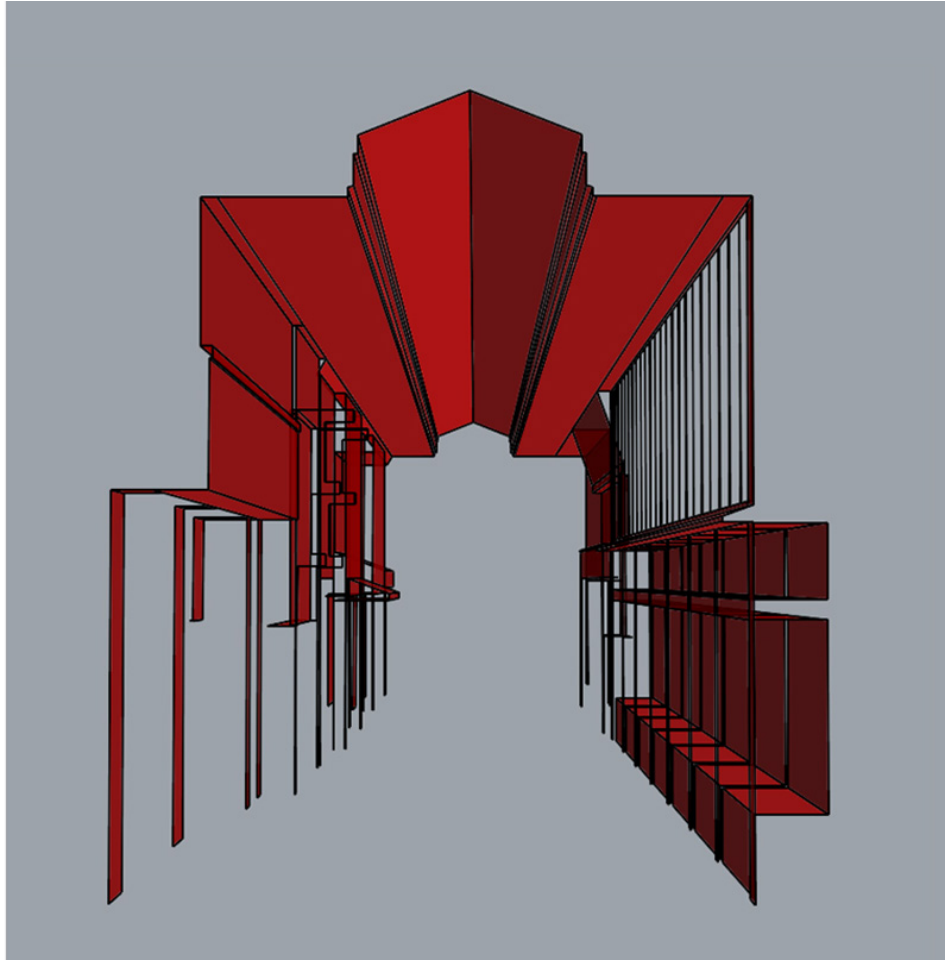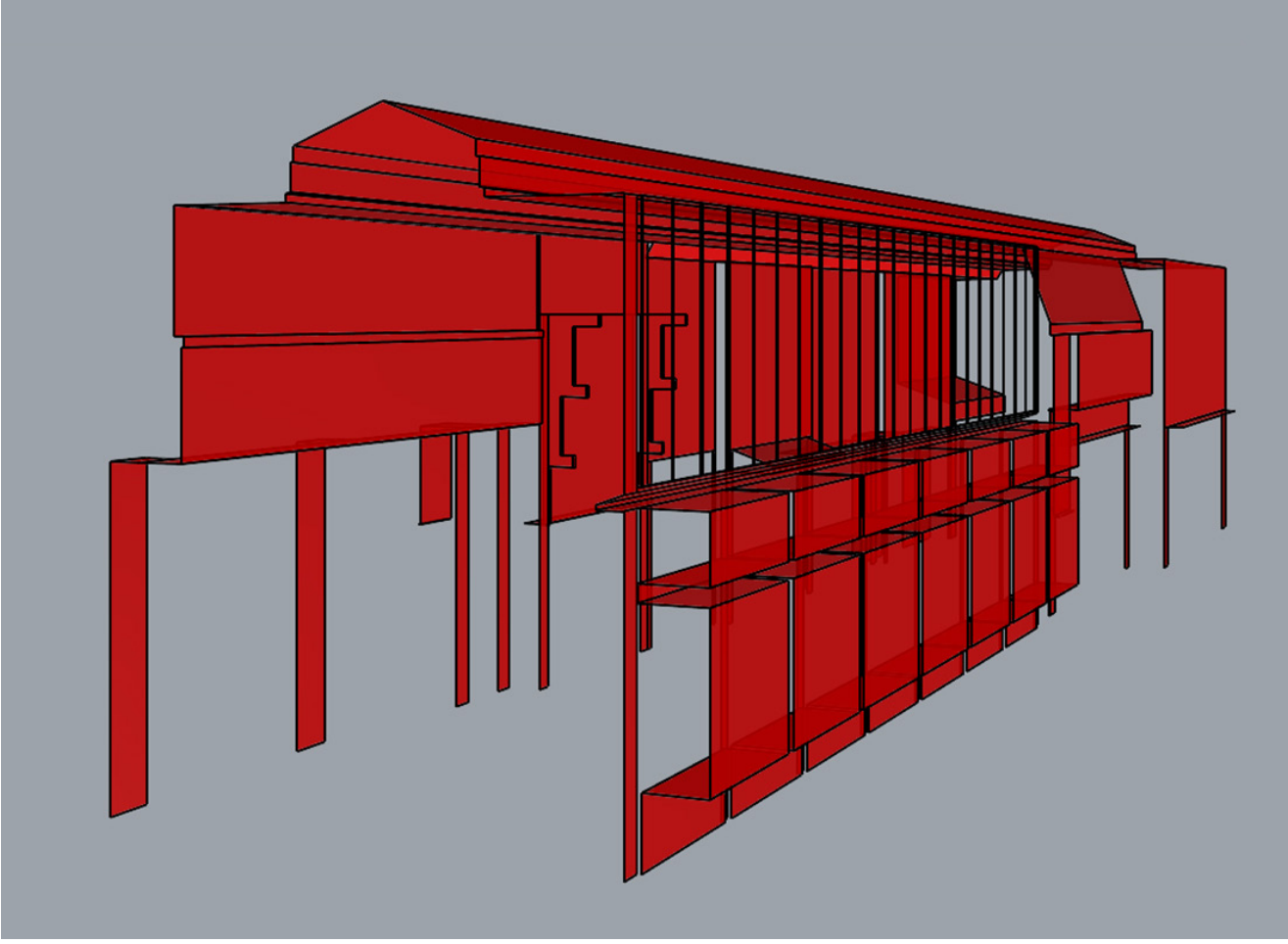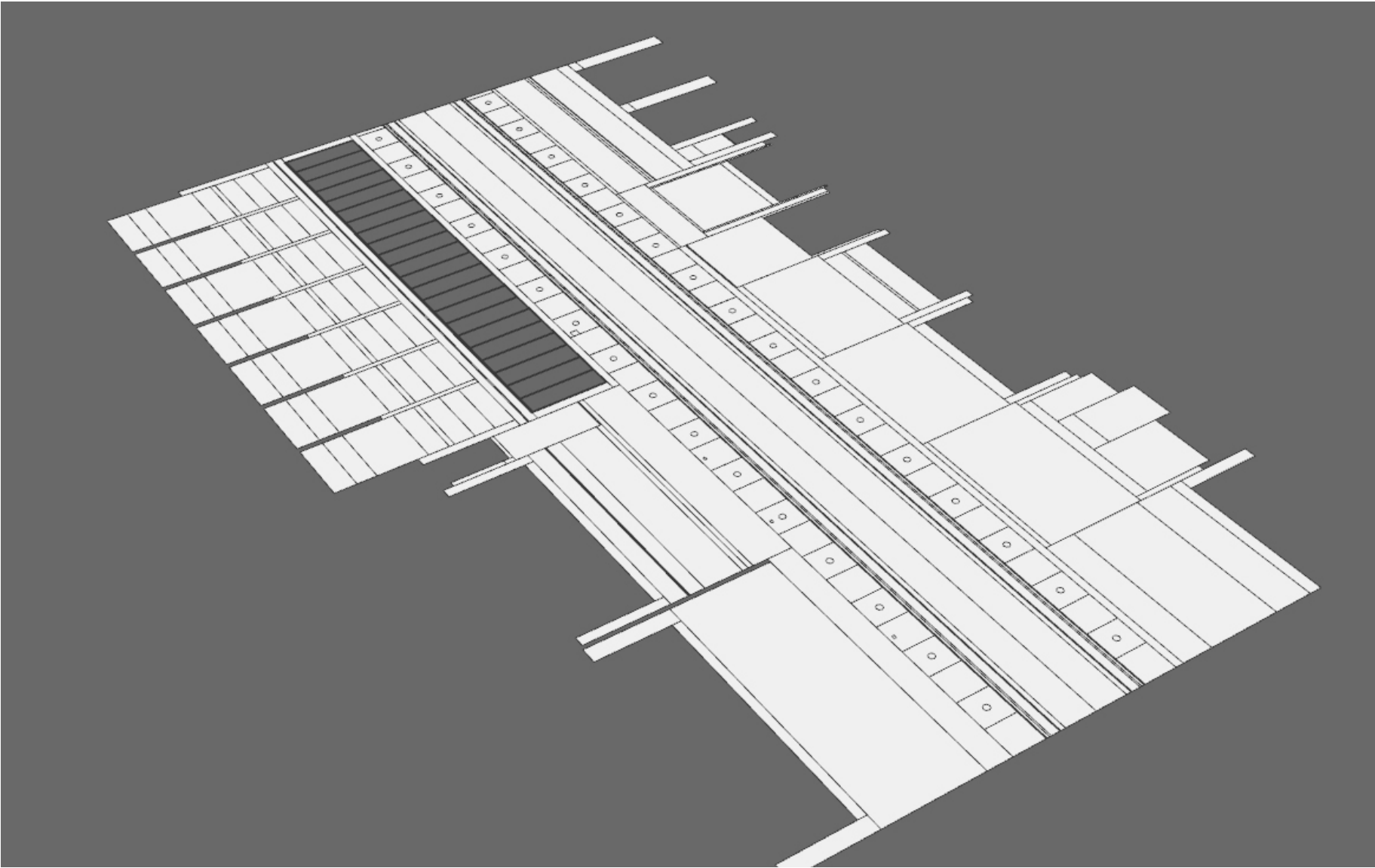Figure 2. Initial implementation of modeling rule (2).

Figure 3. Completed digital model of Nishiki Market.

Figure 4. Flattened model.