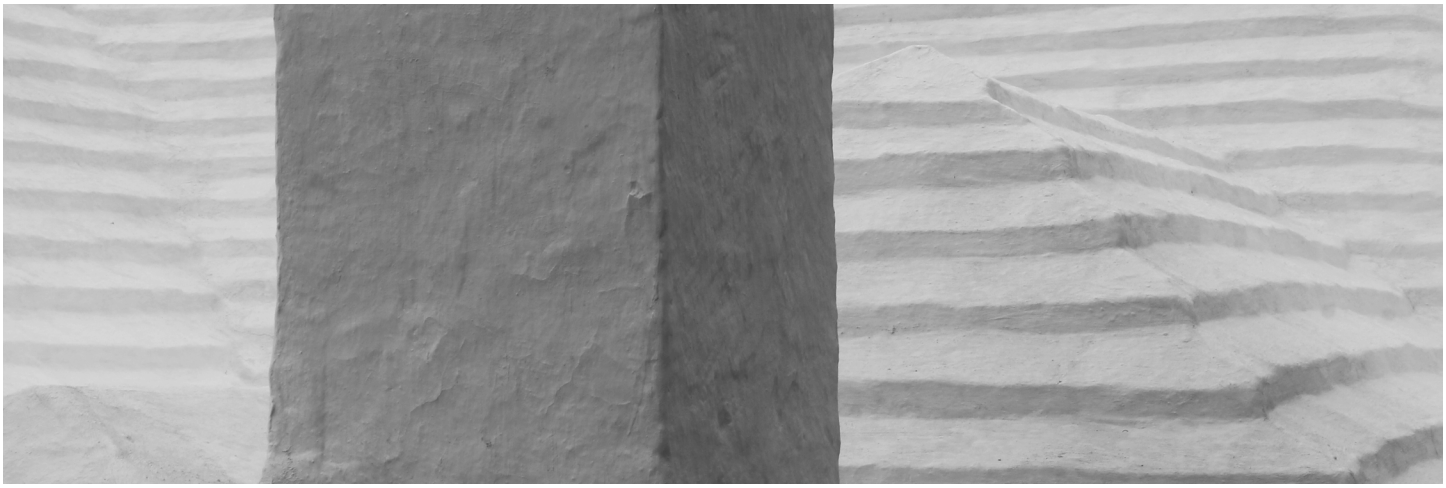
Mitchell House

3 Featherbed Alley
St. George's, Bermuda



Photogrammetric Report

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Figure 1. West Elevation, Model 02_ West&North (top; page 2).

Figure 2. Site Plan, Model 02_ West&North + Model 03_East&South (bottom; page 2).

Figure 3. North Elevation, Model 02_ West&North (below).

Model 02_West&North
65,612,275 points

Model 03_East&South
48,241,136 points

Site Plan (Total points)
113,853,411

In order to create more accurate exterior elevations and isometric views of Mitchell House, a photogrammetric study of the exterior was conducted. This study built a collection of data of the house's exterior founded in images, which translated into 3D point clouds, meshes, and texture-mapped surfaces. From this 3D data, conventional architectural illustrations were produced such as elevations (façade and top view) and isometric views. This methodology created the opportunity to generate floor plans, sections, and additional sets of isometric views from interior photogrammetry as well.

Mitchell House provided considerable challenges in conducting photogrammetric research. Roofs present challenges for terrestrial (versus aerial) photogrammetry in general, but Mitchell House's white-washed roof increased this challenge. Photogrammetry software relies on texture and pixel inconsistencies to stitch images together, and generate its three-dimensional point cloud. Exposure settings can be adjusted to account for the brightness of a white-washed roof such as Mitchell House. However, those settings (which it is preferable to remain consistent across the capture sequence) now must be altered to increasing degrees with high-constast shadows across the building. This is an issue since unique pixel collections will become illegible when adjusting to adjacent bright and dark scenes.

This brightness and contrast issue was addressed using a combination of piecemeal photogrammetry i.e. breaking the model into fragments, and monitoring and utilizing preferential weather (cloud cover with little or no precipitation) conditions. The first round of photogrammetric reconnaissance consisted of what might be consider “loose” photogrammetry, meaning, camera settings were allowed to act in full automation; this method is quicker, but more often results in less accurate models or registration failures [Figures 1-6].

The models following this initial capture process were done using full manual camera settings (the exception being the automatic stabilizer). *Ideal capture settings use a tripod and timer in a controlled lighting environment. Zoom remained consistent across capture batches, with minimal manual adjustments made to exposure, ISO, and F-stop if lighting conditions prompted such an adjustment. Exposure is adjusted before ISO, and finally the F-stop; flash is used in dark scenarios, but only if rough surfaces are being captured.

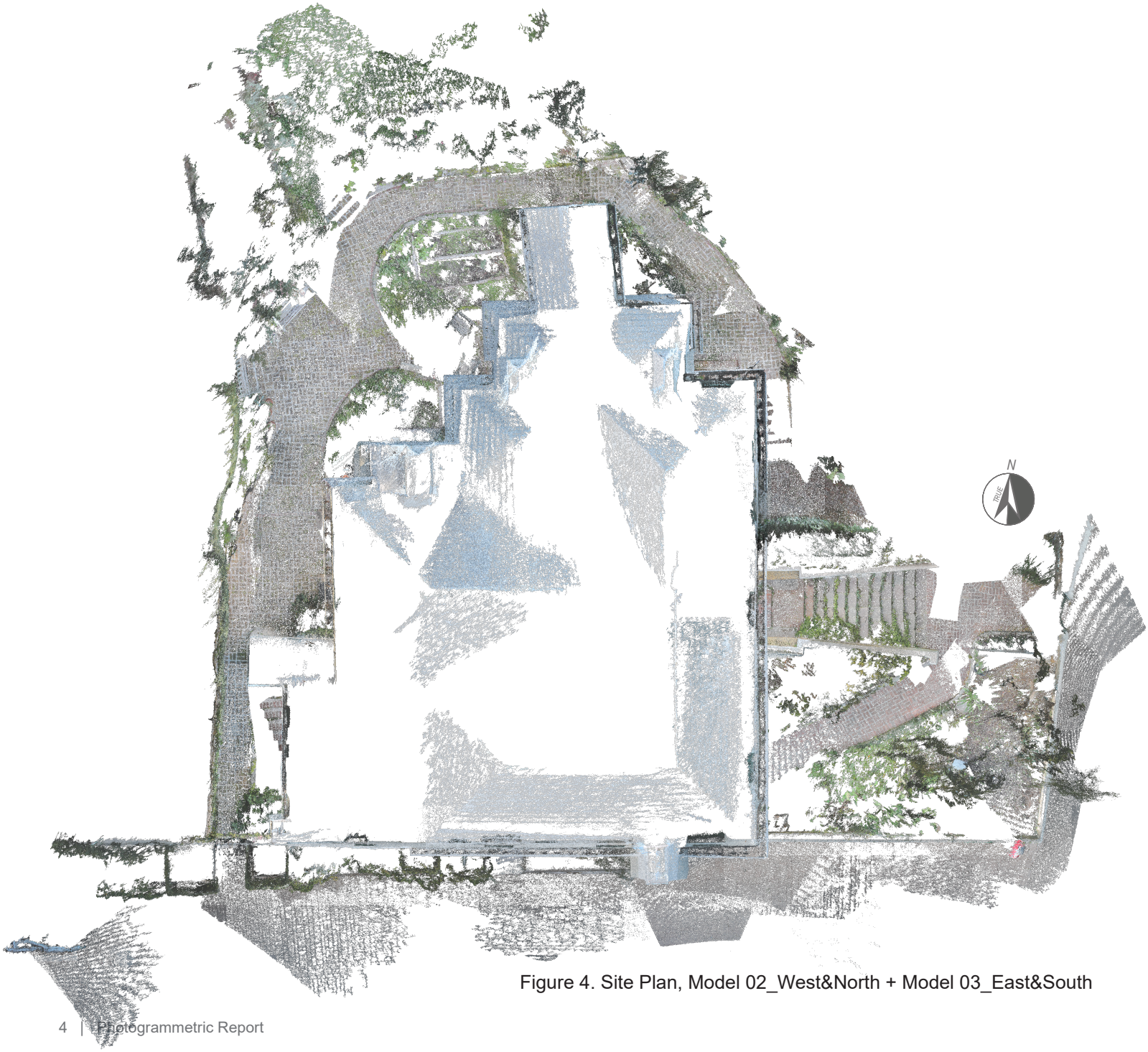


Figure 4. Site Plan, Model 02_West&North + Model 03_East&South

Figure 5. East Elevation, Model 03_East&South

Figure 6. South Elevation, Model 03_East&South

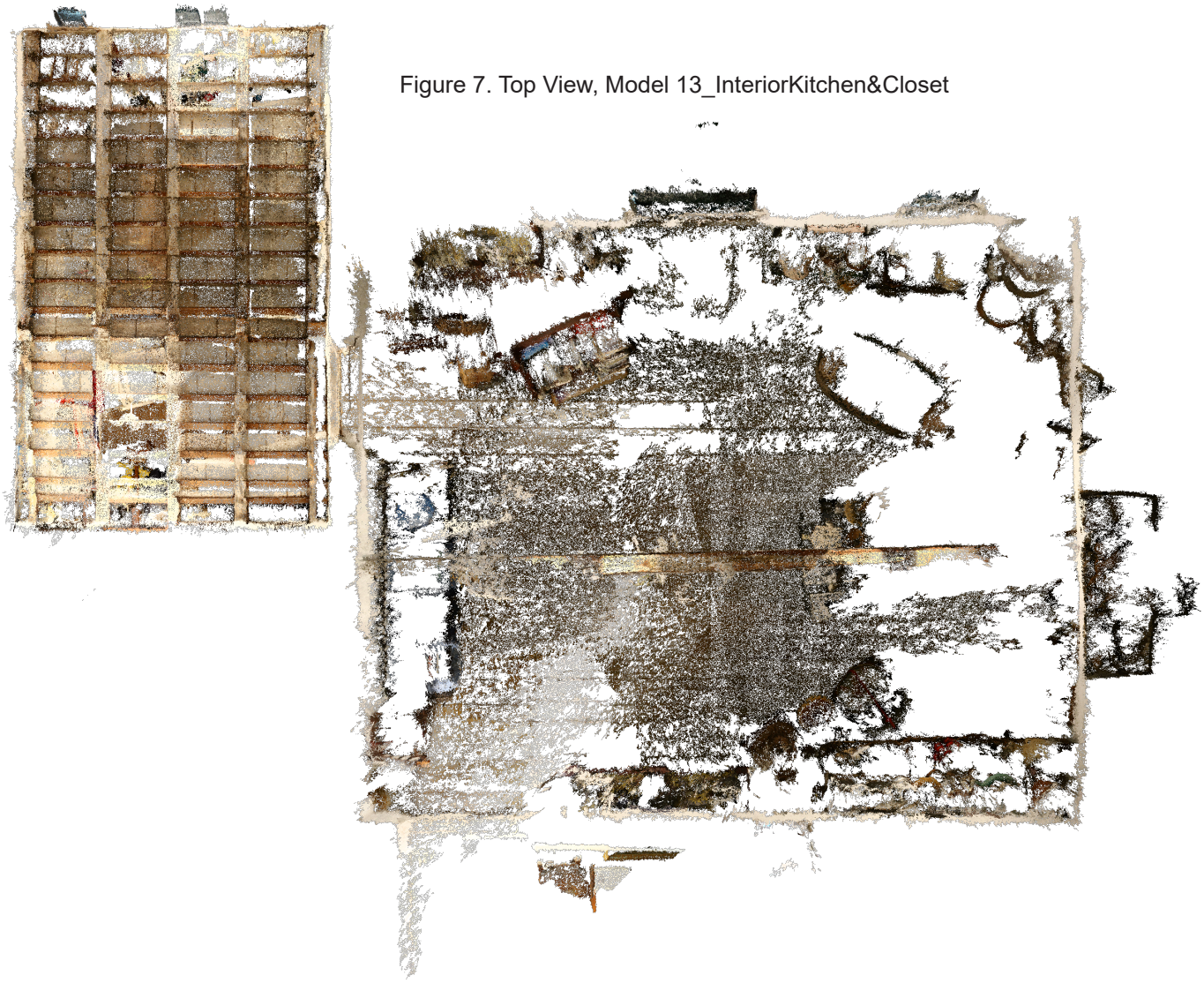
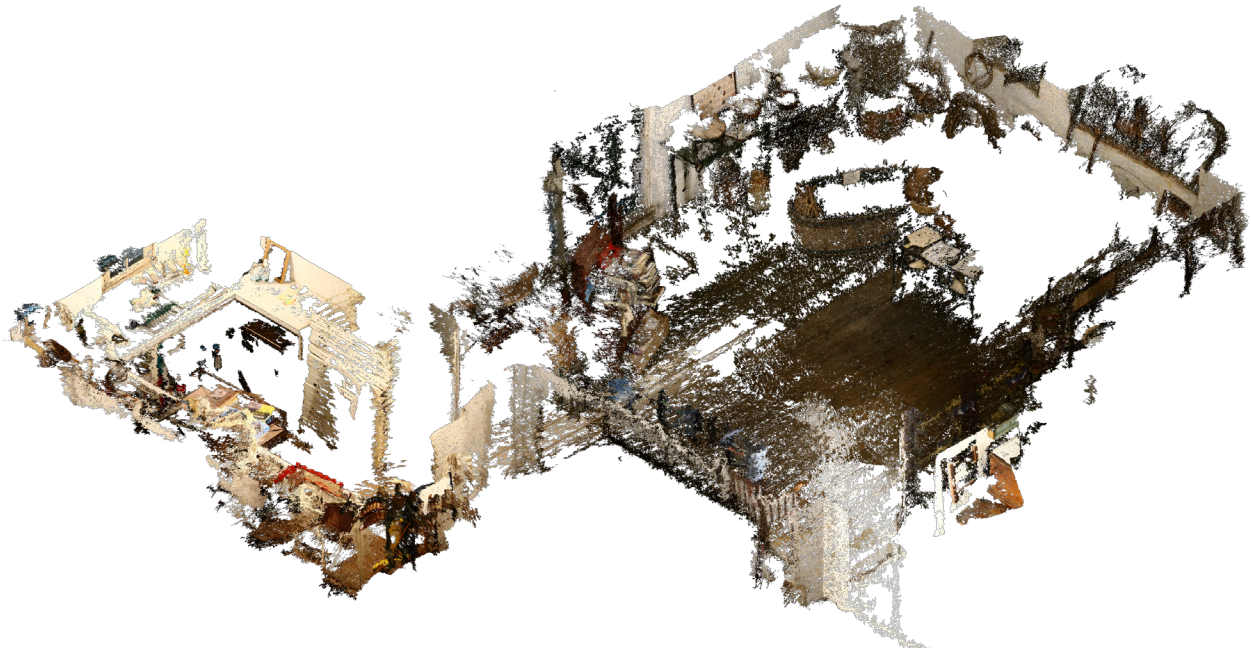


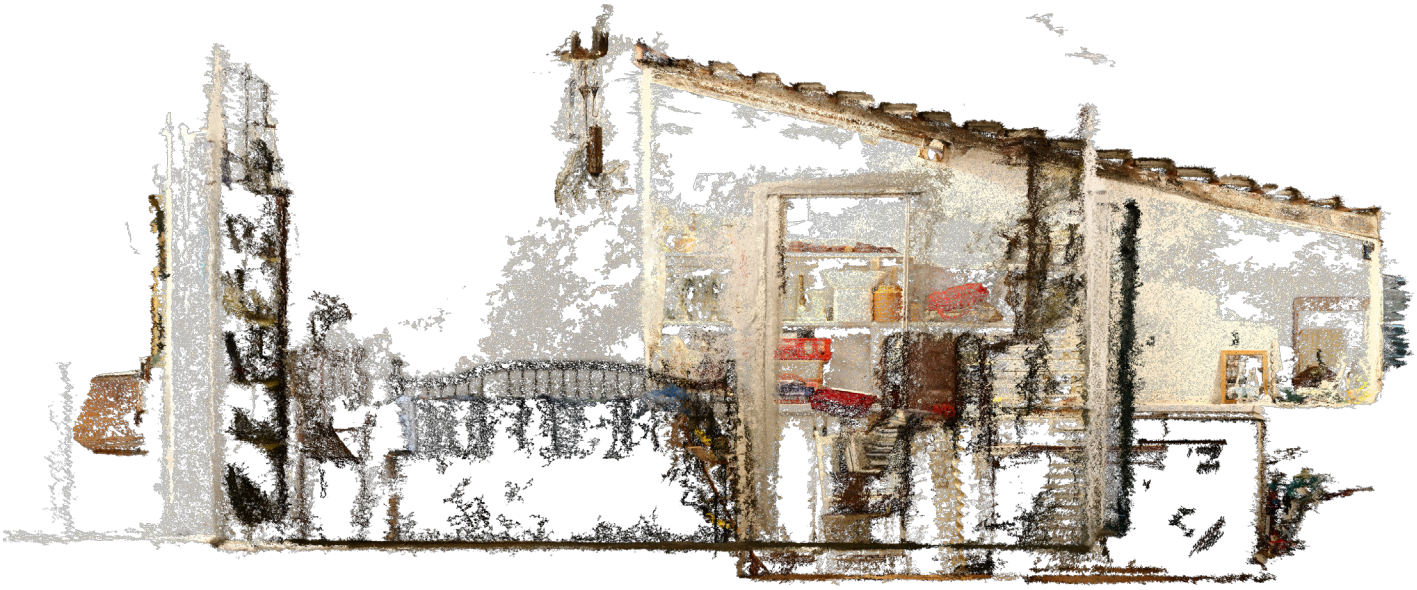
Figure 7. Top View, Model 13_InteriorKitchen&Closet

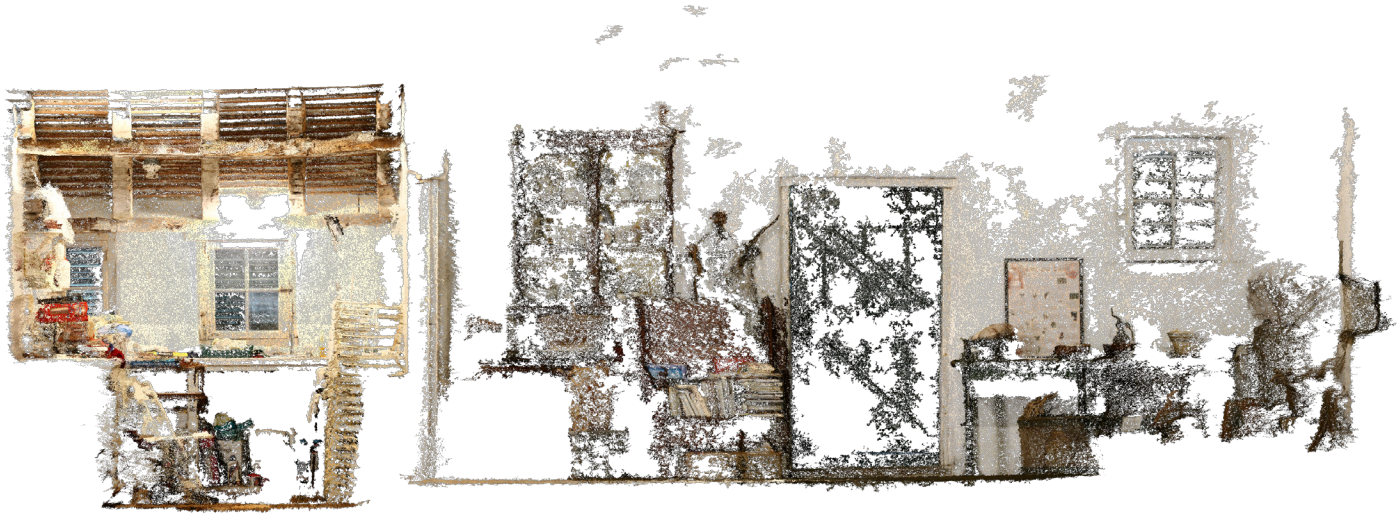
Figure 8. Southeast Isometric View, Model 13_InteriorKitchen&Closet

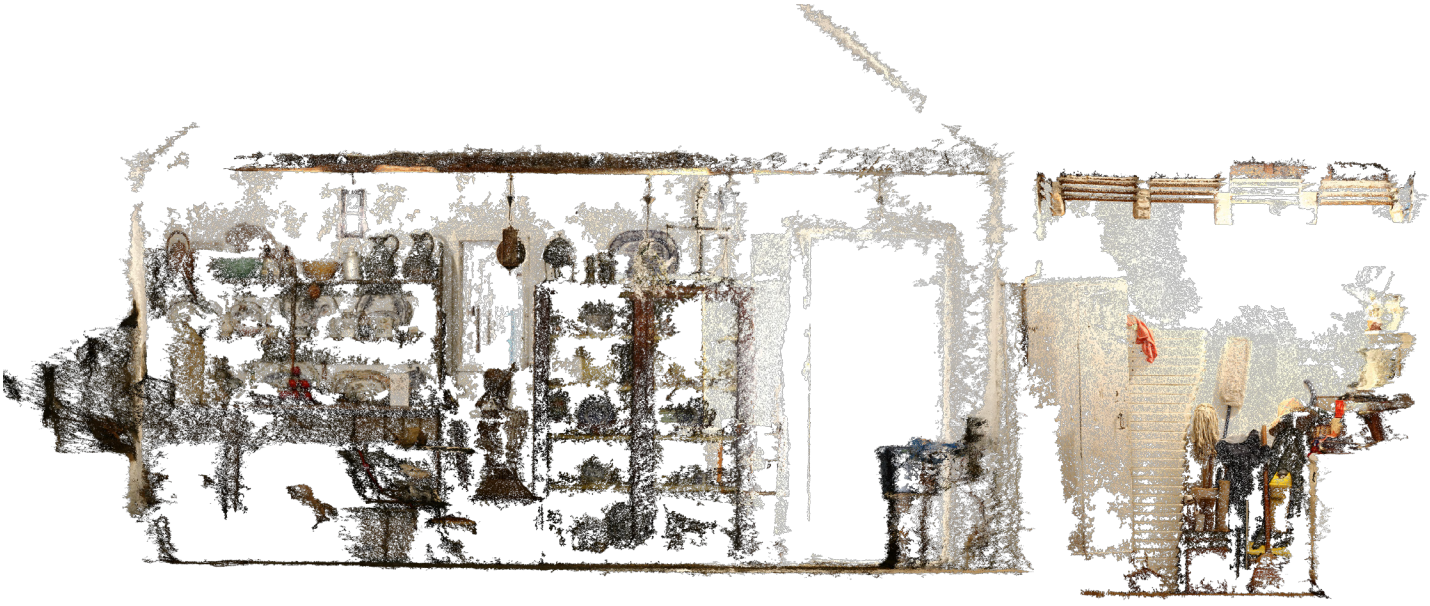
Figure 9. Southeast Section-Isometric View, Model 13_InteriorKitchen&Closet

Figure 10. Southeast Plan-Isometric View, Model 13_InteriorKitchen&Closet







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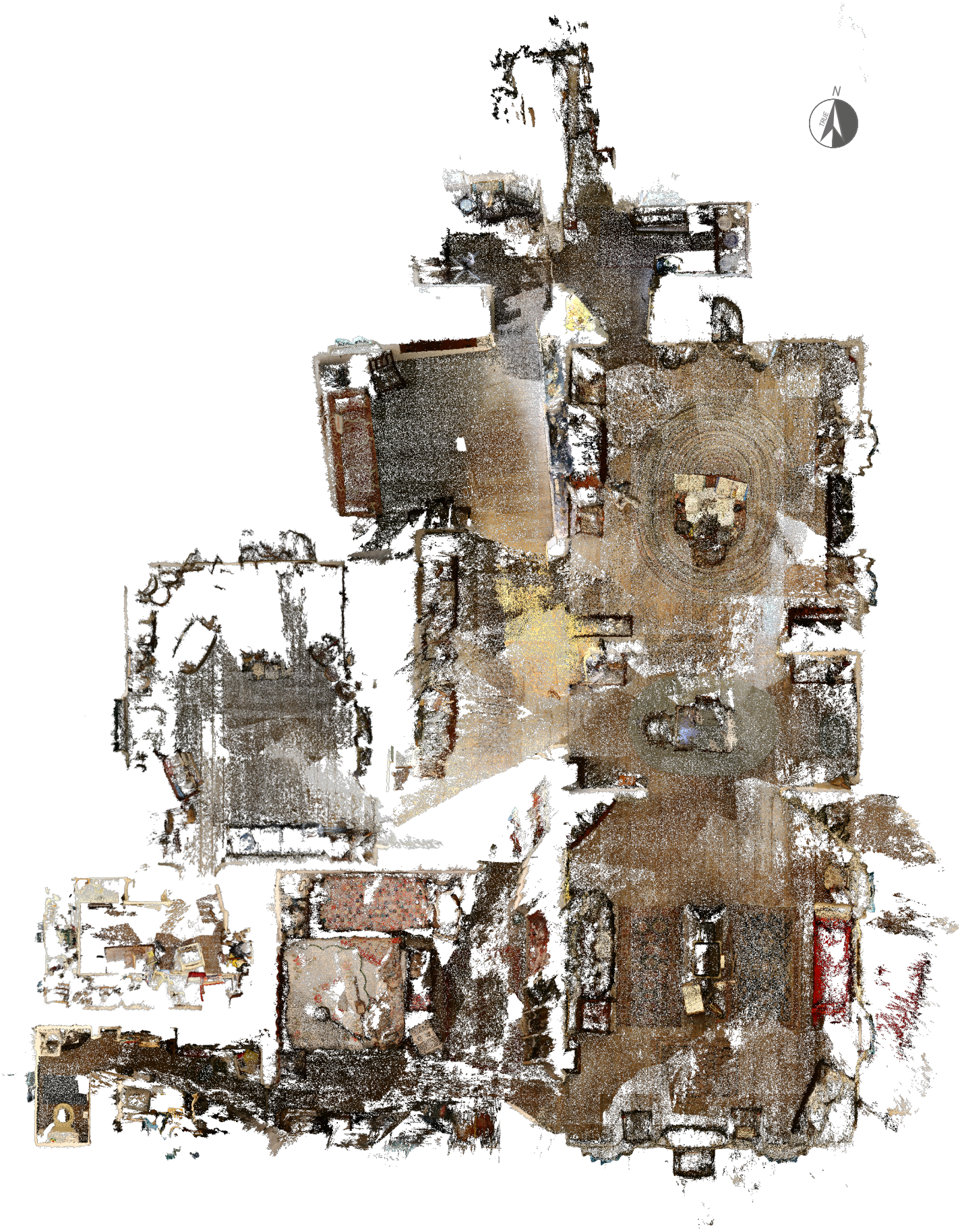
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