



South Pole Site

SAT Tower & Blue buildings

Erik Nichols
March 11, 2021



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Initial Requirements

- SATs need support structures for mounts on the snow
 - Structural stability
 - Snow accumulation
 - Utilities
- Need work space
 - Towers have $\sim 58\text{m}^2$ space, though $\sim 1/3$ is compressor/utility room
 - Workstations
 - Space to integrate and commission SAT receivers

Site Layout: SATs + Blue building

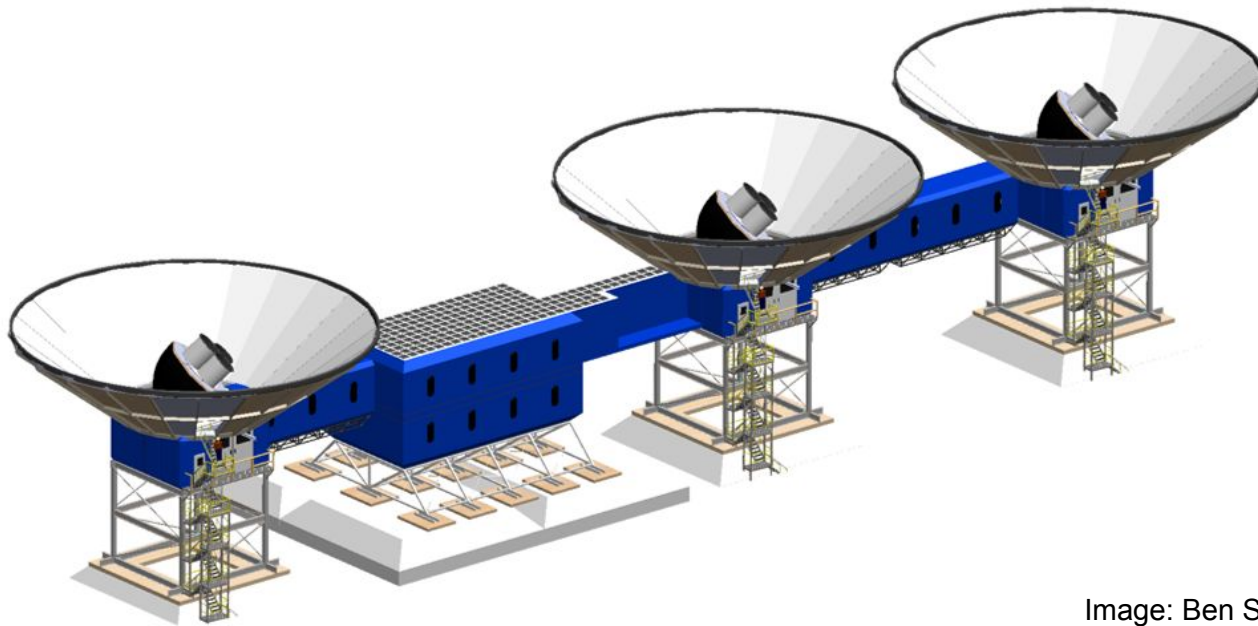
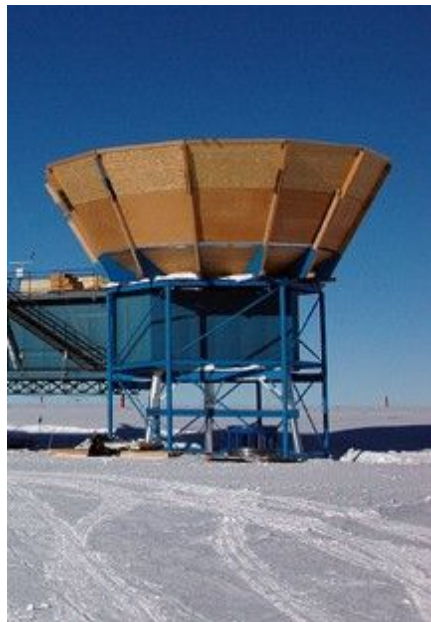


Image: Ben Schmitt

- 6 SATs at Pole = three SATs/SAT towers on each of two Blue buildings
- One new Blue building and one existing: Martin A. Pomerantz Observatory (MAPO). ($\sim 280\text{m}^2$ each)
 - Needs to be raised

SAT Tower



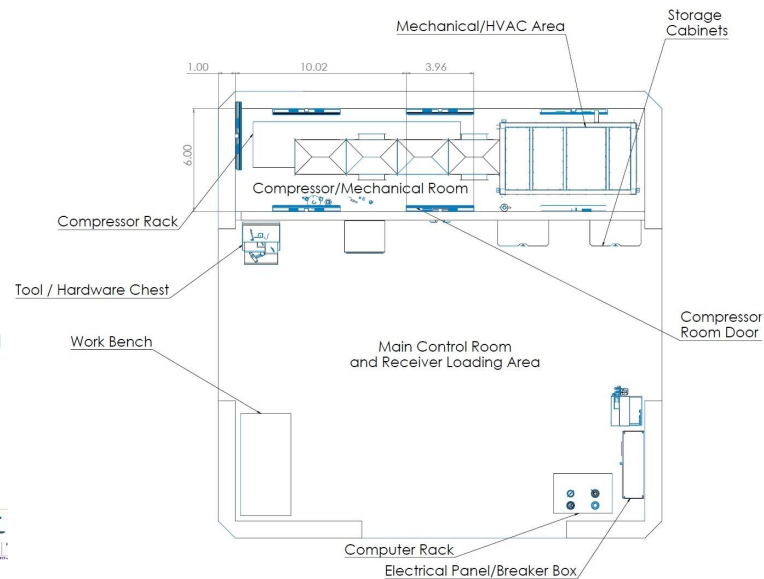
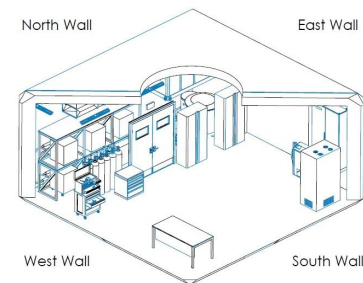
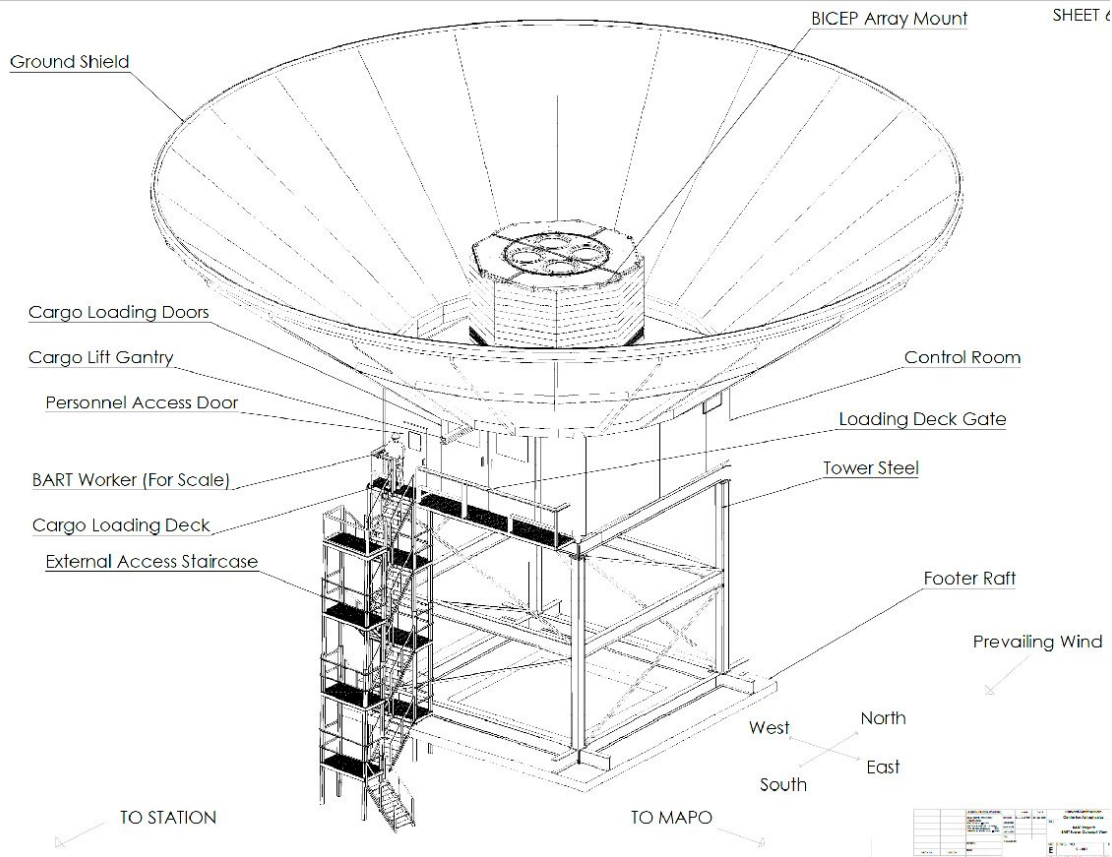
SPIREX/DASI tower (1995-96/1999-00) is existing and currently supports BICEP Array (BA). MAPO needs to be raised and the tower is not part of that project.

BICEP Array Replacement Tower (BART) is funded and being designed by the BA Collaboration. Intent of BART design is to also meet S4 requirements.



Image: Ben Schmitt

SAT Tower – BART Conceptual Design



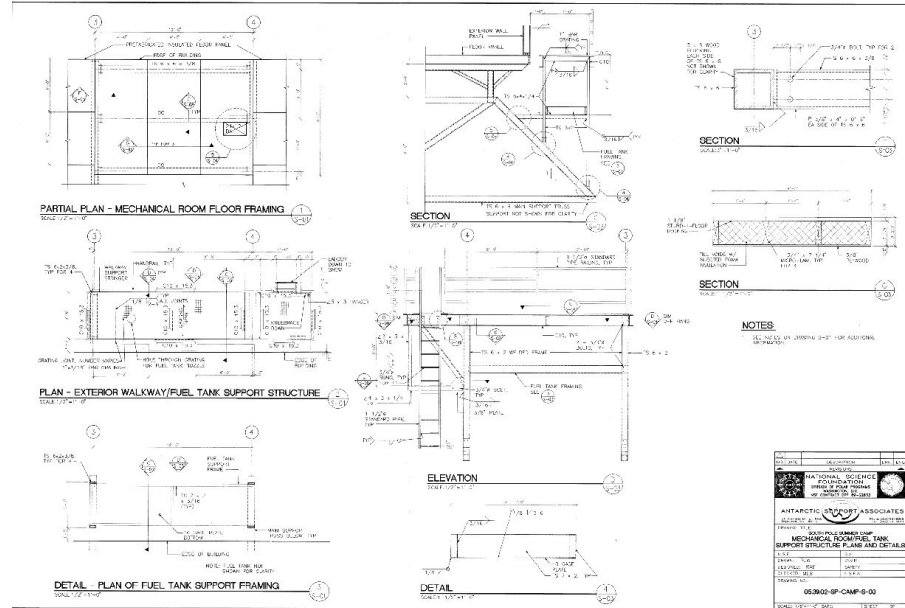
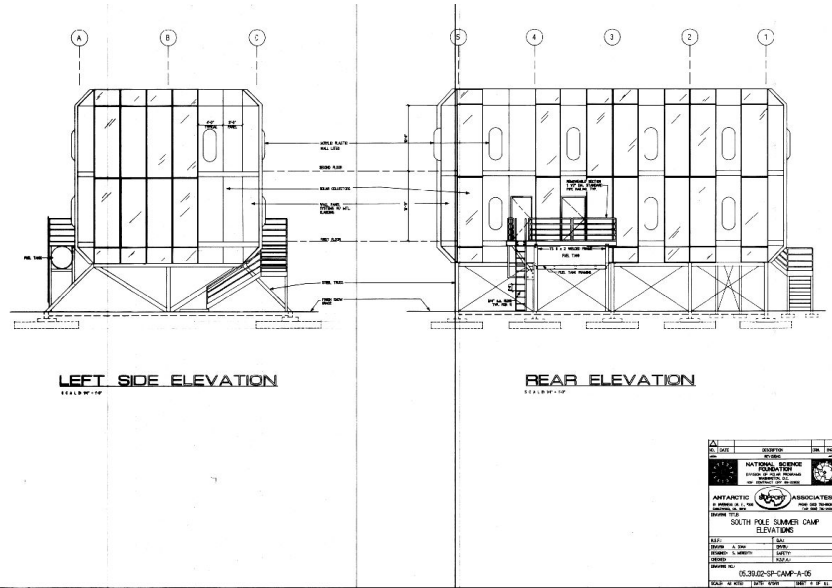
Blue buildings



MARTIN WOLF, ICECUBE/NSF

Four existing Blue buildings at Pole. Well-understood. Functional

Blue building



Design exists. Minimal added design costs.

Path to PBDR

- SAT tower: Finalize CMB-S4 requirements, verify BART requirements overlap/design verification; set baseline.
- Blue building: Finalize CMB-S4 requirements, determine additional design/upgrades, verify with NSF that MAPO will be available, set baseline.