**PRELIMINARY MATERIALS TESTING OF CONCRETE CANVAS FOR USE IN LUNAR DUST MITIGATION APPLICATIONS.** D. Boll[1] and P. Suermann[2], Texas A&M University Department of Construction Science (Dakota.boll@tamu.edu), [2]Texas A&M University School of Architecture Interim Dean.

**Introduction:** NASA plans to return to the lunar surface in the coming years with the goal of re-establishing a manned presence and creating In-Situ Resource Utilization (ISRU) infrastructure from regolith-based materials. Upcoming missions will transport and prepare equipment prior to regolith processing and ISRU production. Alternatives for controlled landing surfaces available for early missions have not been proven viable prior to this research.

**Goal:** By using a material known as concrete canvas (8mm thickness), coated with polymer-based soil stabilizer, a flexible lunar landing pad option is available for use on early missions.

**Methodology:** With successful testing for tensile strength and puncture resistance, compared to published material specifications and conversions to support lunar applications, a pre-manufactured pad is capable of meeting early-mission needs. Lab tests consisting of three ASTM standards were used to determine material strength. A decision matrix was used to compare coated concrete canvas against two other published Lunar landing pad designs.

**Results:** The coated concrete canvas passed strength requirements calculated to meet Lunar needs. The design is considered to meet requirements for NASA TRL 4. The design incorporates future recyclability with the potential for use as lunar trackway and underlayment for ISRU produced infrastructure such as habitable spaces and reinforced landing areas. Further research on the material will be discussed.

**References:** [1] ASTM Compass (2015), 'ASTM D6685-01'. [2] ASTM Compass (2018a), 'ASTM D4885-18'. [3] ASTM Compass (2018b), 'ASTM D5494'. [4] ASTM Compass (2020), 'ASTM D6768'. [5] C. Clinton (2022) 'LSIC E&C Presentation'. [6] R. Creel (2017) 'Apollo Lessons Learned'. [7] Geotree (2019) 'Concrete Cloth Data Sheet'. [8] G. Heiken, D. Vaniman, and B. French (1991) 'Lunar Sourcebook'. [9] L. D. Jaffe (1971) *The Moon*, 337-345. [10] P. Metzger and G. Autrey (2022) 'The Cost of Lunar Landing Pads…'. [11] R. Mueller (2020) 'Lunar Landing & Launch Pads'. [12] NASA (2020a) 'CLPS'. [13] NASA (2020b) 'Artemis Plan'. [14] NASA (2020c) 'Global Exploration Roadmap'. [15] NASA (2021) 'STD-1008'. [16] N. Soderman (2012) 'Detailed Characterization of Shackleton Crater'. [17] I. Tzinis (2021) 'Technology Readiness Level'. [18] E. Wright (2012) 'Visualizing Shackleton Crater'.