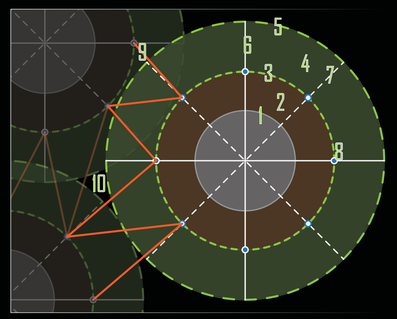
NOVUM

A Unified Architecture for Extreme Environments

Project 'Novum' is a study of how humans can most efficiently transform an unlivable and feral site into a habitable and expanding base. Focused on the development of a modular system of augmentable elements, 'Novum' creates a **Unified Architecture for Extreme Environments** of the Earth, the Moon, Mars, and beyond.

Grid Geometry



1 - PUC Structure
From SLS and Human dimensions

2 - Hatch Swing & Tunnel Connection Area
From Hatch and Connection Tunnel dimensions

3 - Closest Proximity to Connected PUC
Based on Hatch and Connection Tunnel dimensions

4 - PUC Connection Zone
Area where PUCs can connect to each other freely

5 - Farthest Proximity to Connected PUC
Based on maximum length of packaged Connection Tunnel

6 - Primary Connection Axis Grid
Shows the system's initial geometry

7 - Secondary Connection Axis Grid
Shows the system's alternate geometry when PUCs are stacked

8 - Connection Points
Where Connection Tunnels can begin to bend

9 - Connection Angles
To determine most extreme Connection Tunnel angles

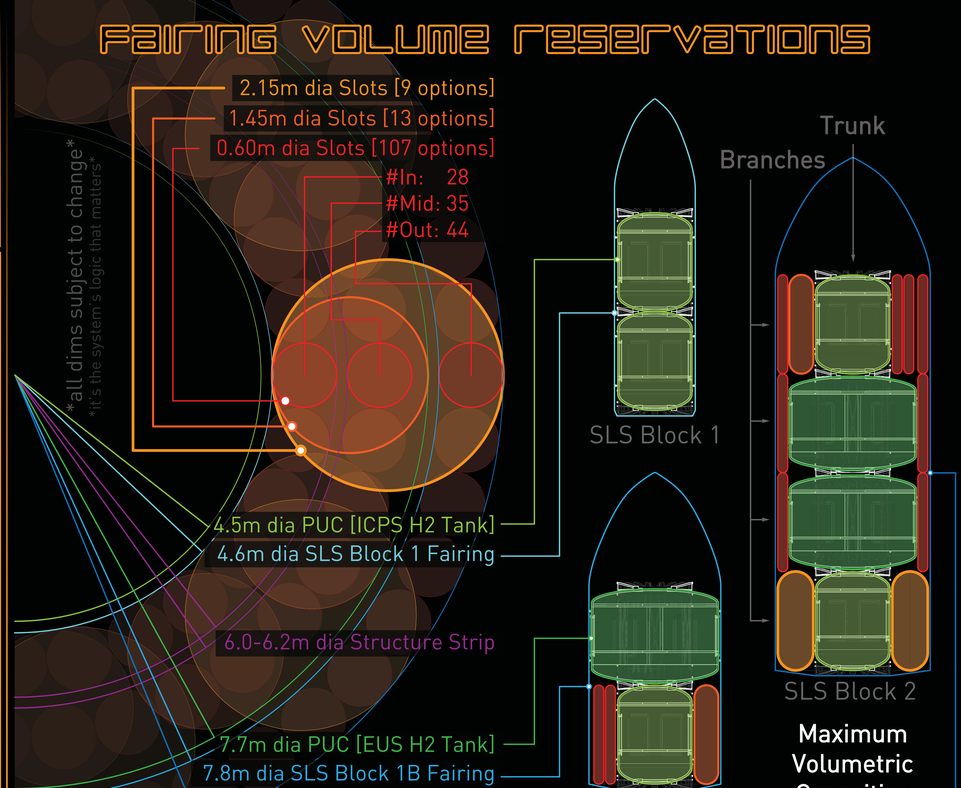
10 - Potential Dead Zones
Areas that could become inaccessible

PUC Hatch Number Study

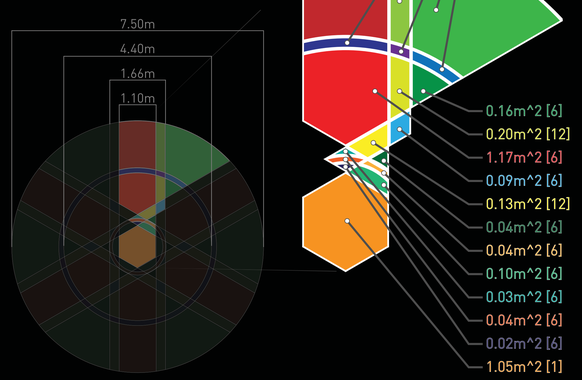
Based on 6m diameter elements

	2	3	4	5	6	7	8
Dead Zone Area for Close:	N/A	117 m^2	25 m^2	64 m^2	5 m^2	93 m^2	25 m^2
Dead Zone Area for Far:	N/A	263 m^2	55 m^2	142 m^2	11 m^2	208 m^2	55 m^2
Minimum Site Area:	316 m^2	654 m^2	382 m^2	600 m^2	273 m^2	629 m^2	382 m^2
Maximum Site Area:	714 m^2	1497 m^2	860 m^2	1349 m^2	614 m^2	1415 m^2	860 m^2
Direct Egress Loop Number:	Impossible	6	4	6	3	6	4
Angled Egress Loop Number:	24	5	3	3	3	3	3
CG & Balance Issues:	Medium	High	Minimal	High	Minimal	Definite	Minimal
Primary Grid Quality:	Poor	Above Average	Excellent	Poor & Limited	Excellent	Poor	Excellent
Secondary Grid Quality:	Very Poor	Below Average	Excellent	Poor & Limited	Excellent	Very Poor	Very Poor
Non-Direct Connection Angles (deg):	90.0	60.0	45.0, 90.0	36.0, 72.0	30.0, 60.0, 90.0	25.7, 51.4, 77.1	22.5, 45.0, 67.5, 90.0
Non-Direct Connection Distances (m):	10.67, 16.0	5.33, 10.67	3.12, 8.46, 10.67, 16.0	2.04, 7.37, 12.70	1.43, 5.33, 6.67, 10.67, 16.0	1.06, 4.02, 6.39, 8.29, 9.35, 13.63	0.81, 3.12, 6.15, 6.58, 8.46, 10.67, 11.92, 16.0
Expansion Possibilities:	Linear & Limited	Limited	Excellent	Chaotic	Excellent	Limited & Chaotic	Above Average

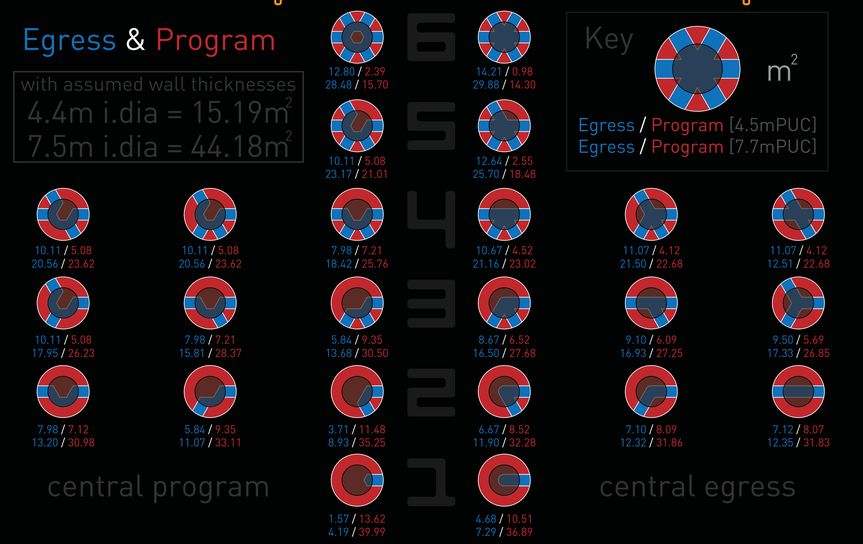
Fairing Volume Reservations



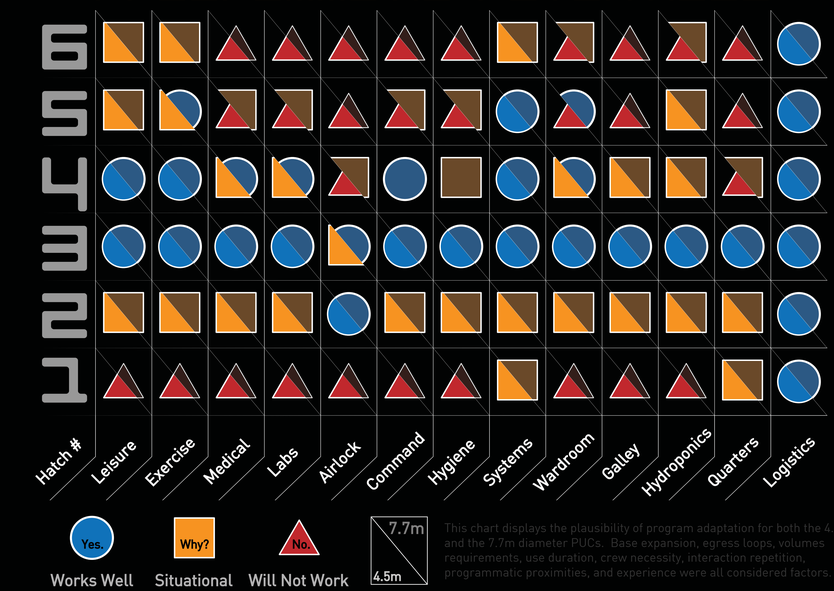
Interior Parcels



Static vs. Dynamic Interior Spaces

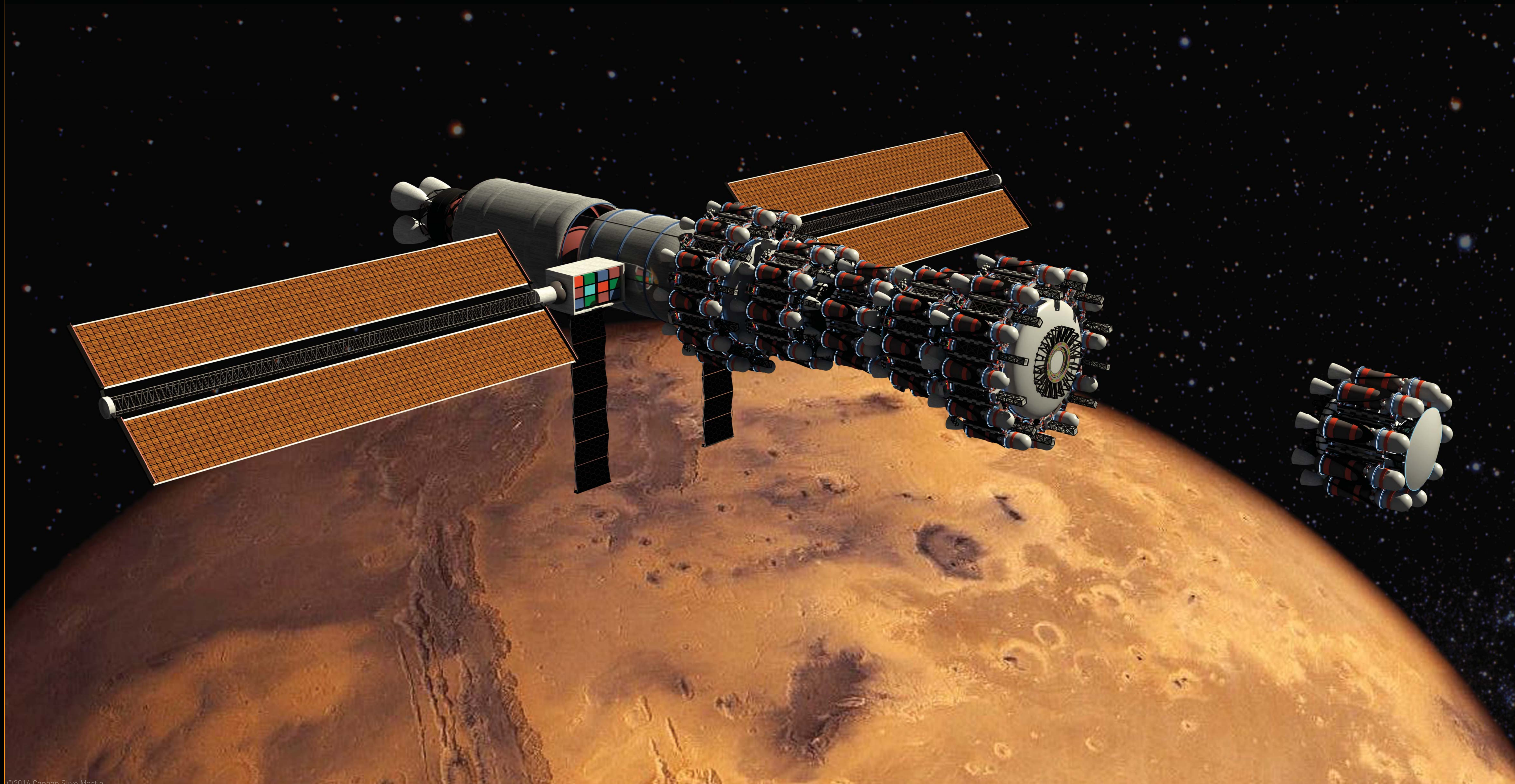


Programmatic Potentials

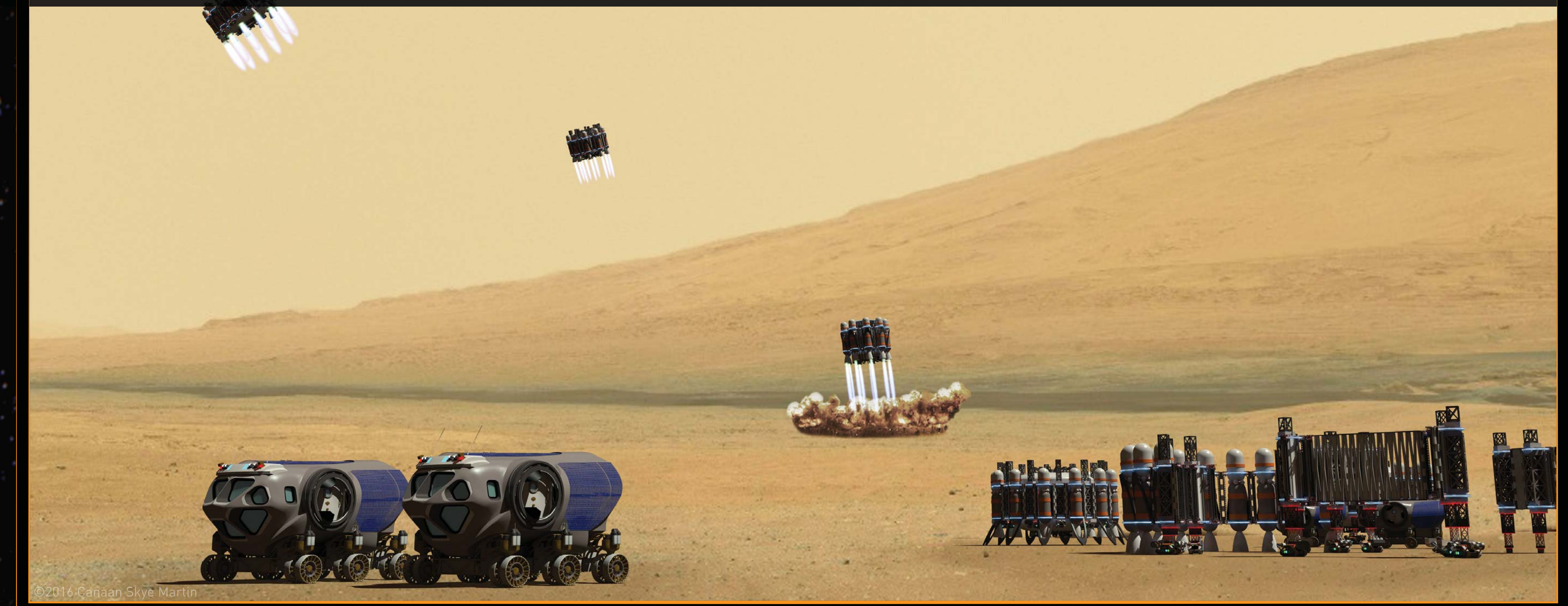


This chart displays the plausibility of program adaptation for both the 4.5m and the 7.7m diameter PUCs. Base expansion, egress loops, volumes requirements, use duration, crew necessity, interaction repetition, programmatic proximities, and experience were all considered factors.

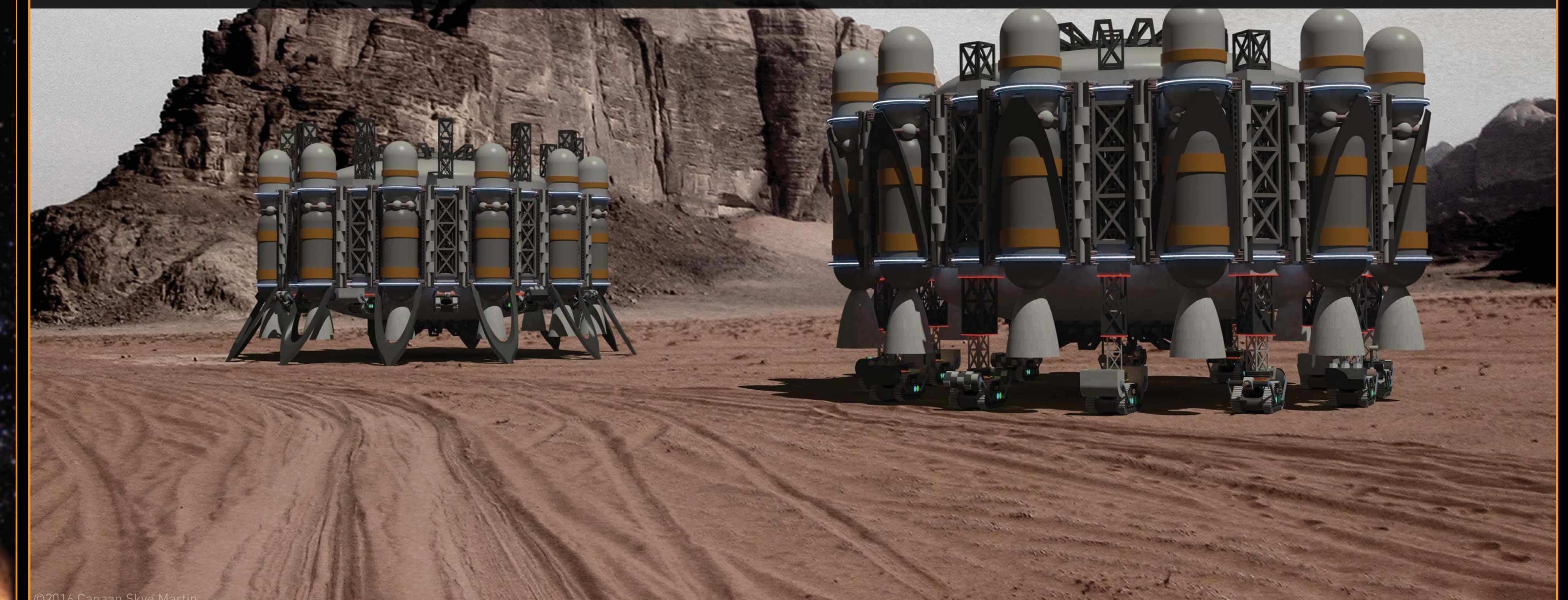
Microgravity Assembly, Transit, & Deployment



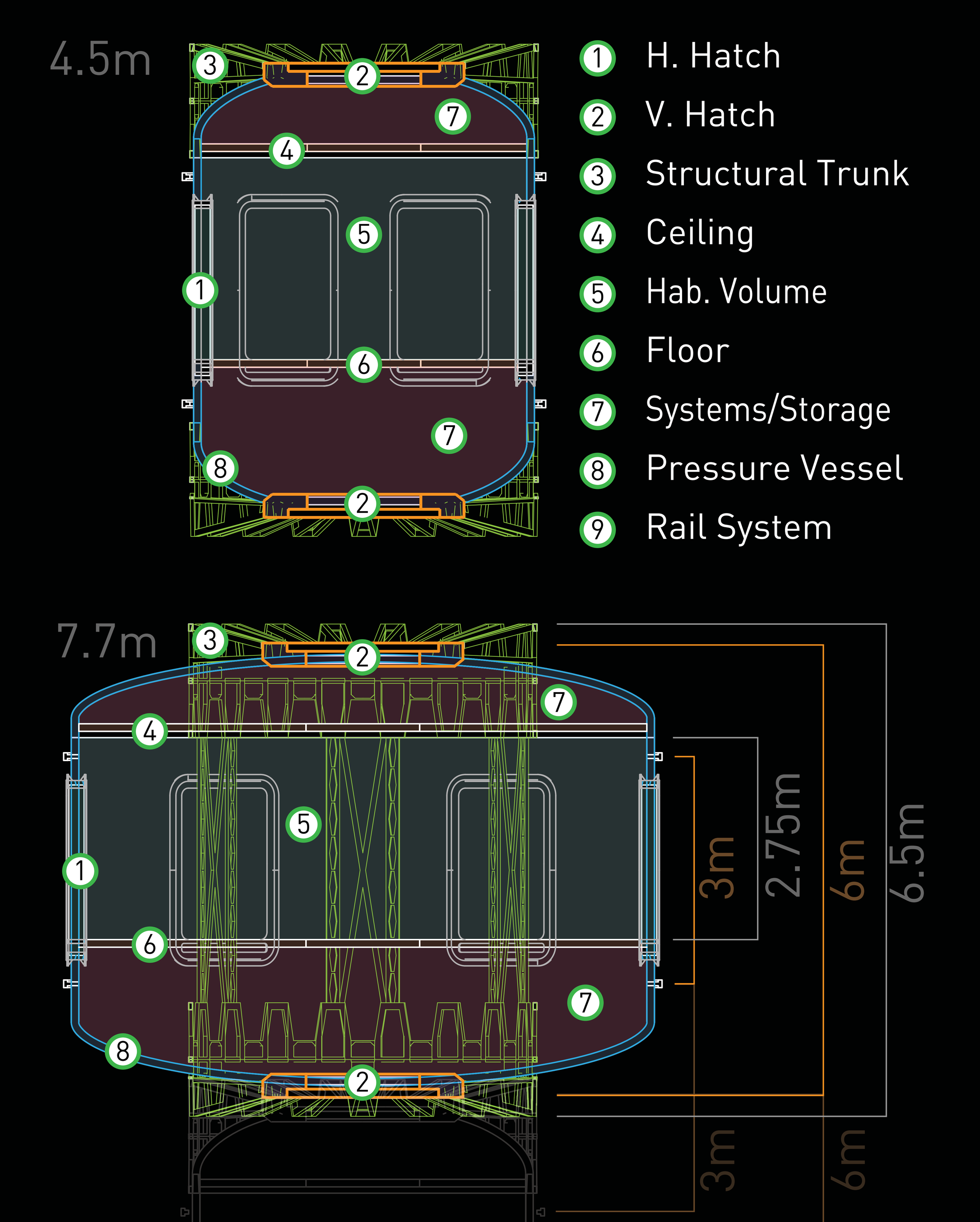
Landing Events



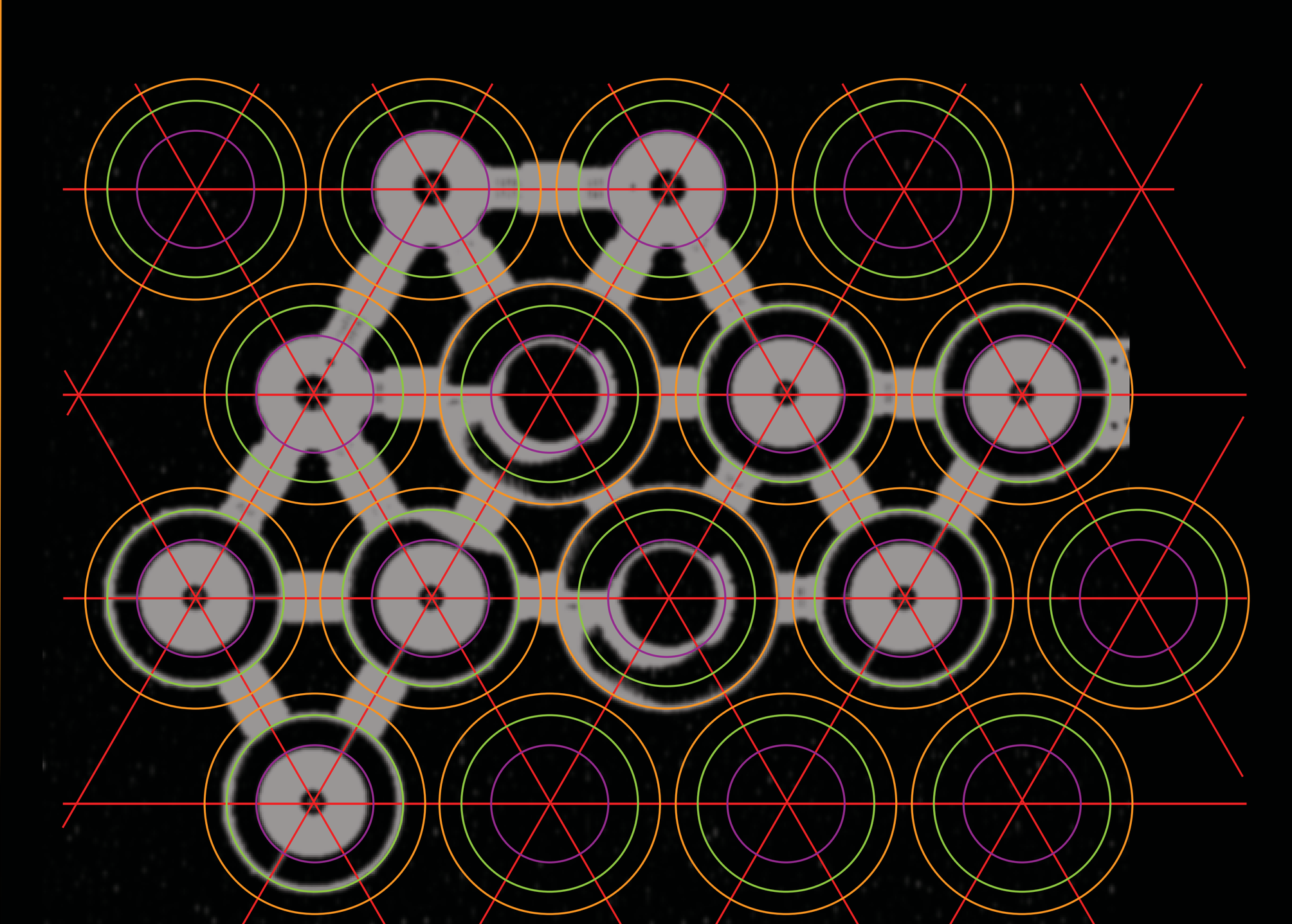
Landed & Moving



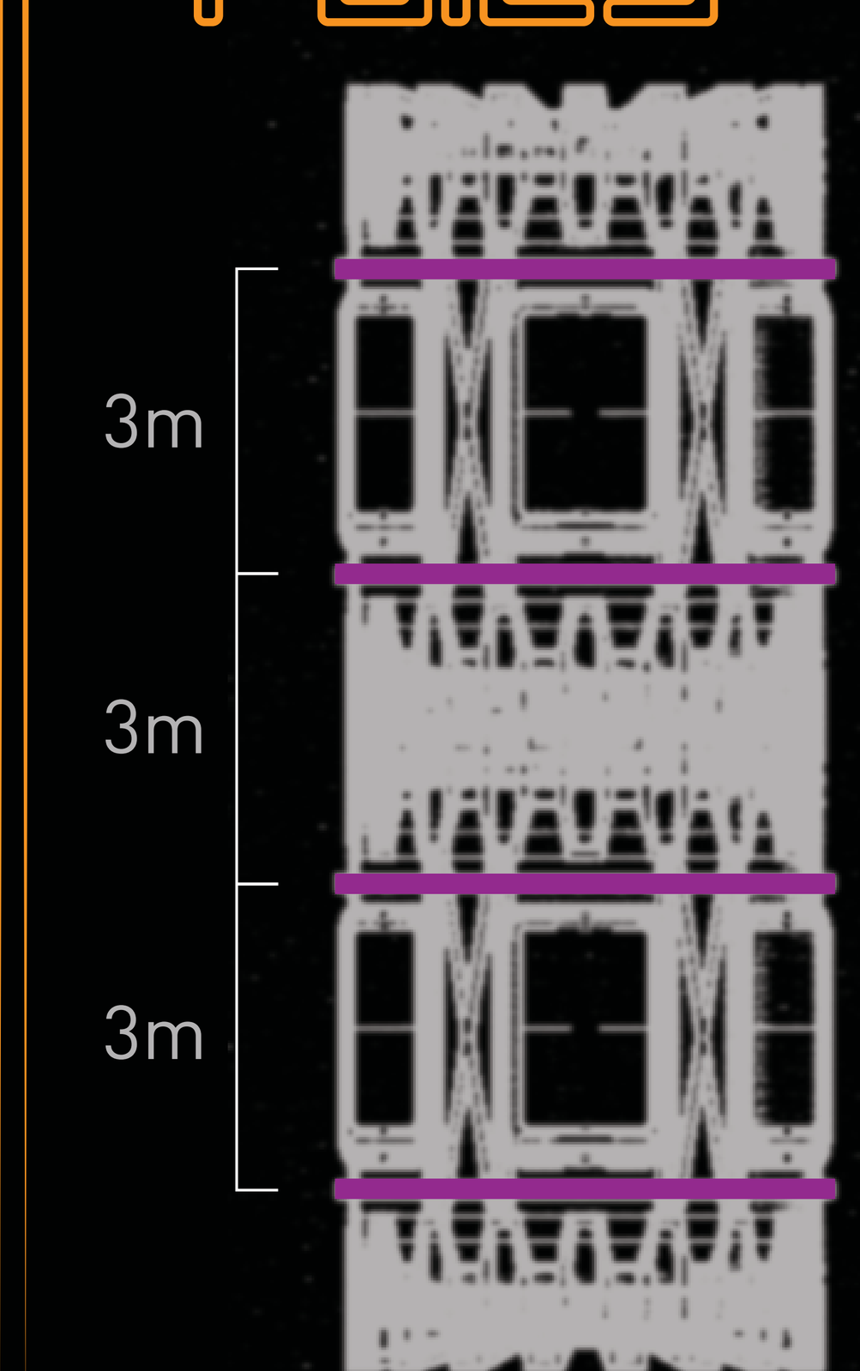
PUC Sections



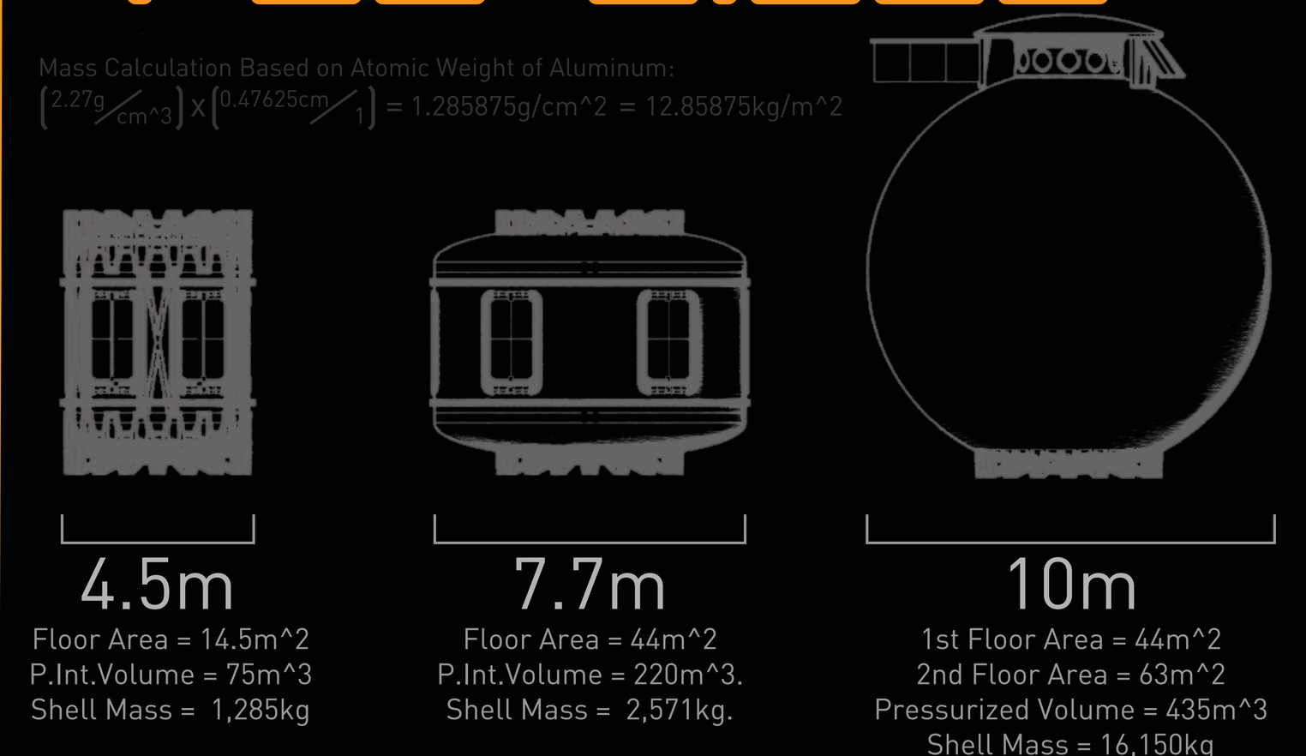
Growth Grid



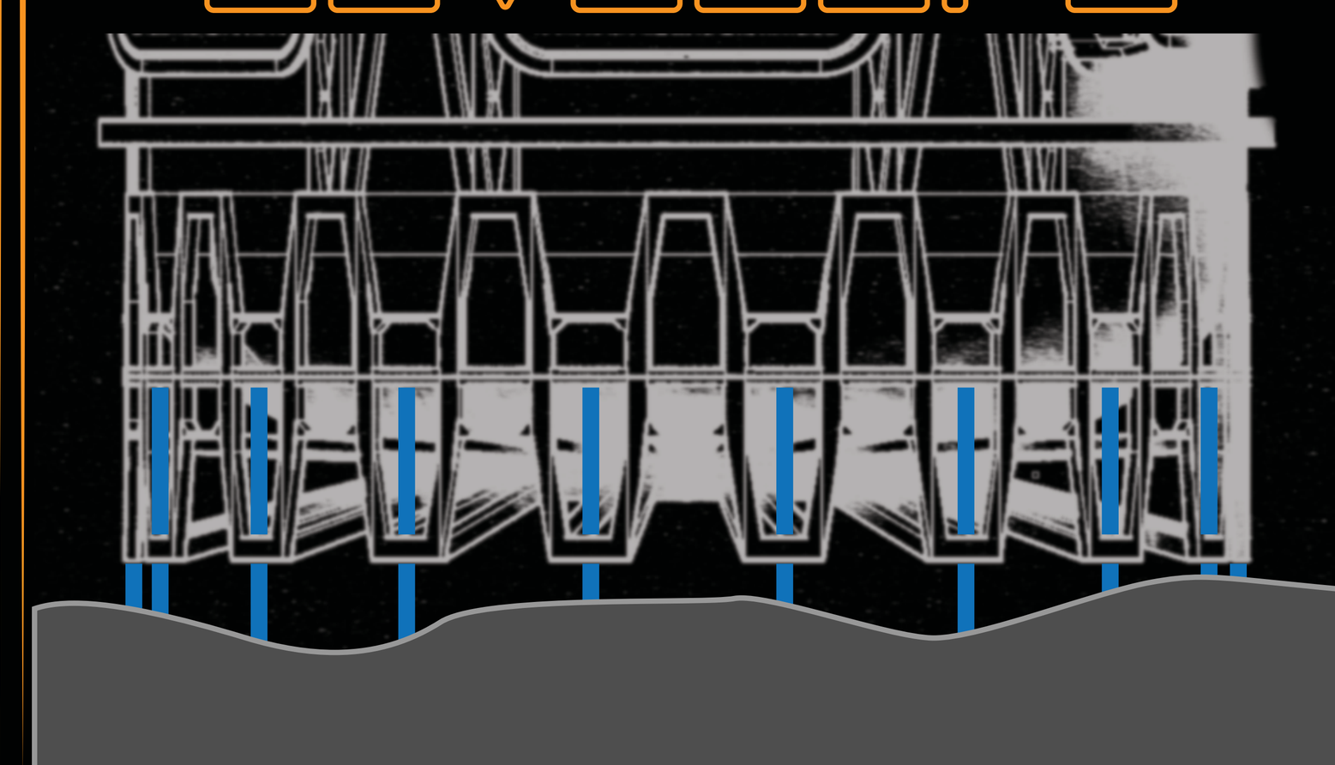
Rails



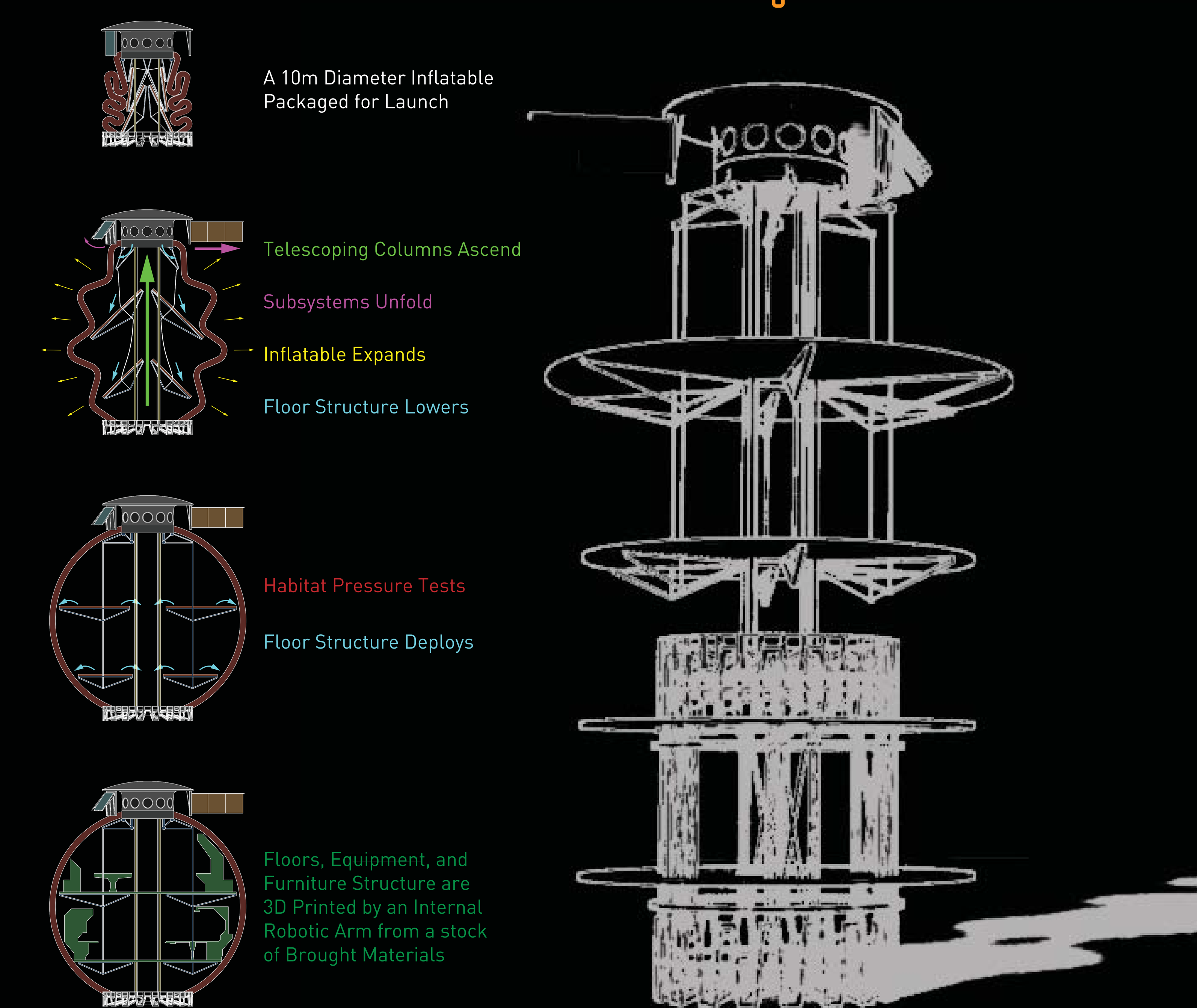
PUC Sizes



Levelers



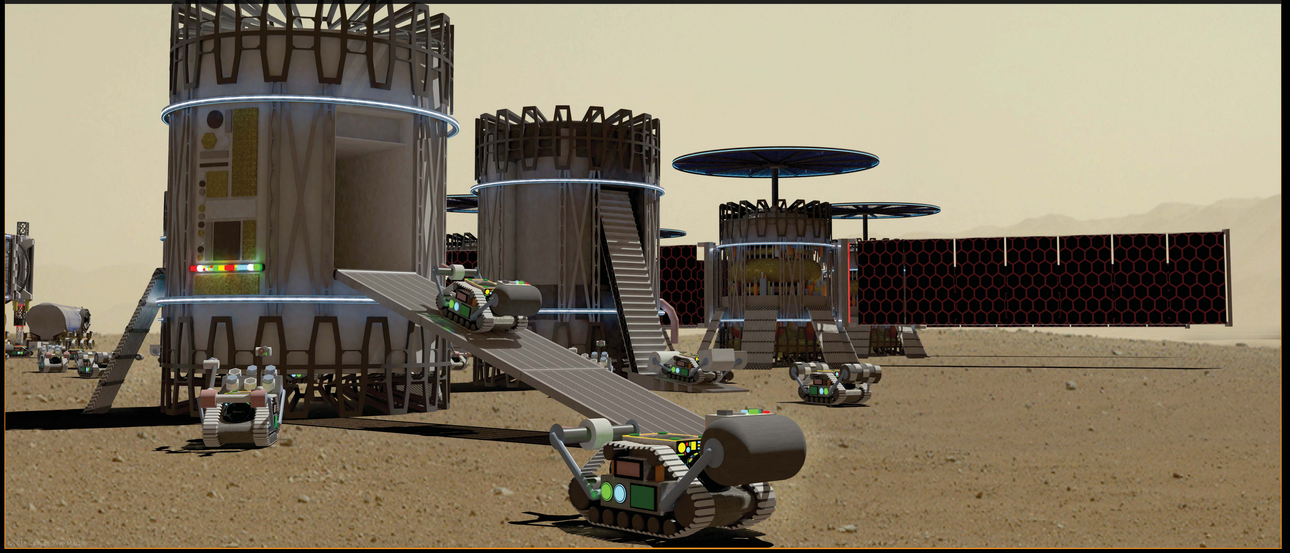
Inflation of Spaces



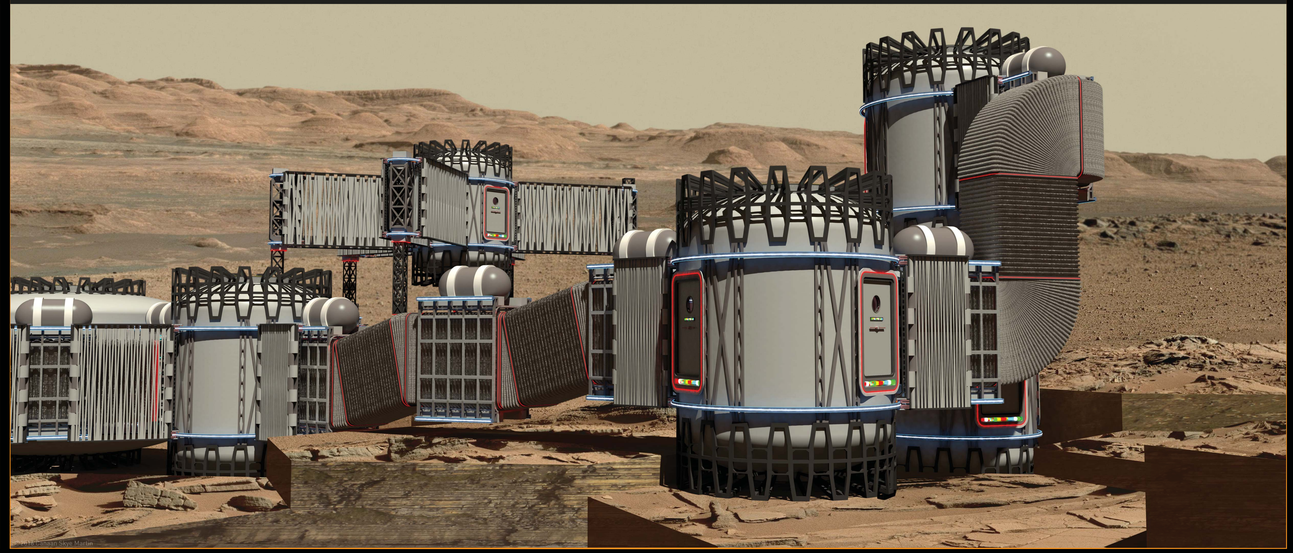
Feed Stock Holding

Tunnel Connection

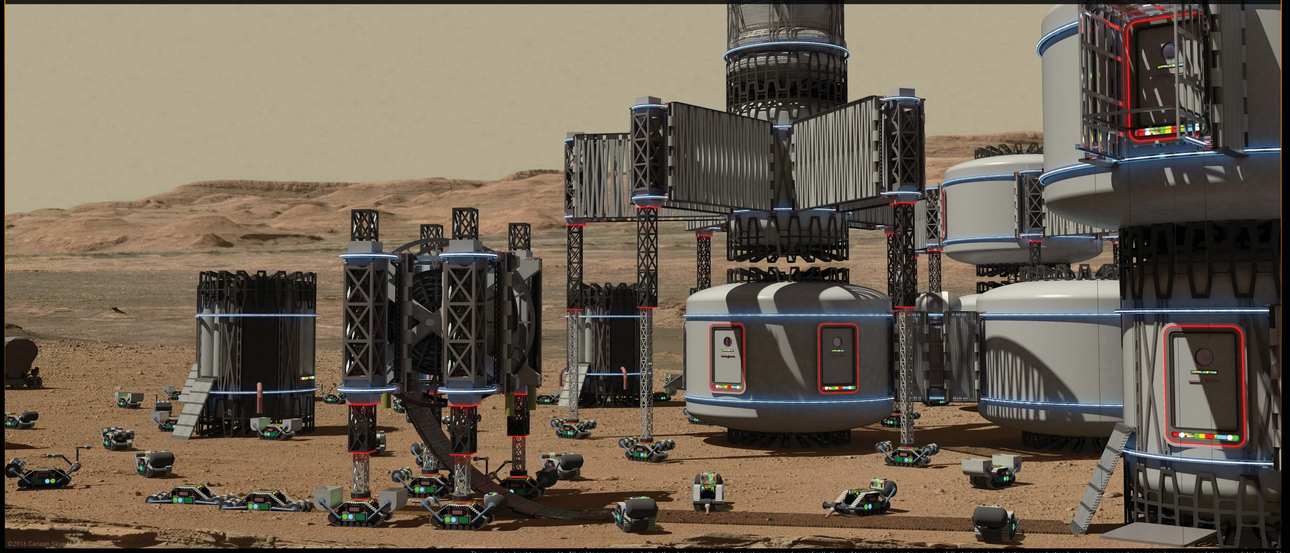
RASSOR Repair, ISRU Processing, & Power Production



Connection Tunnel Adaptation to Terrain Variations

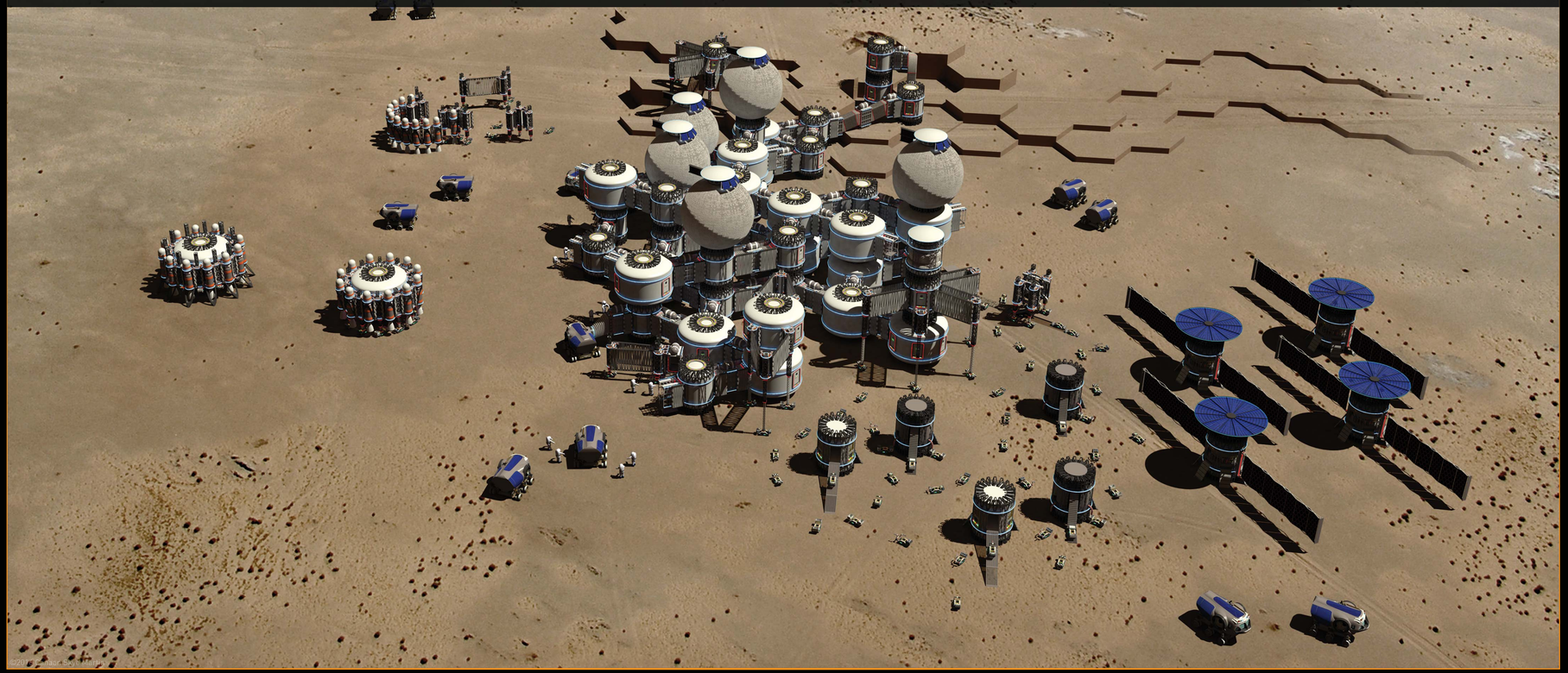


Systems Unrolling, ISRU 3D Printing, & Element Stacking

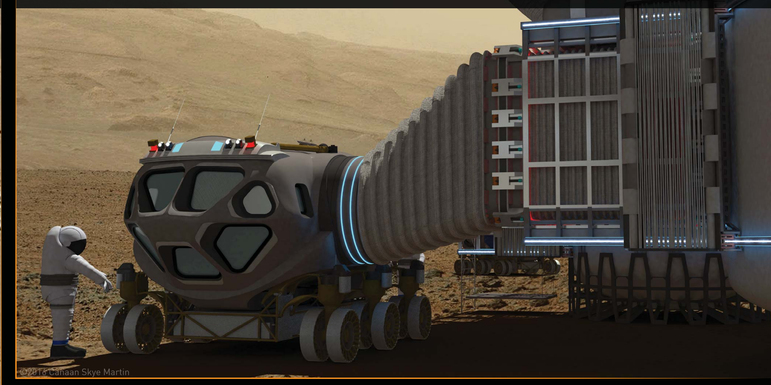


Pressurized Utility Capsule Movement over Terrain

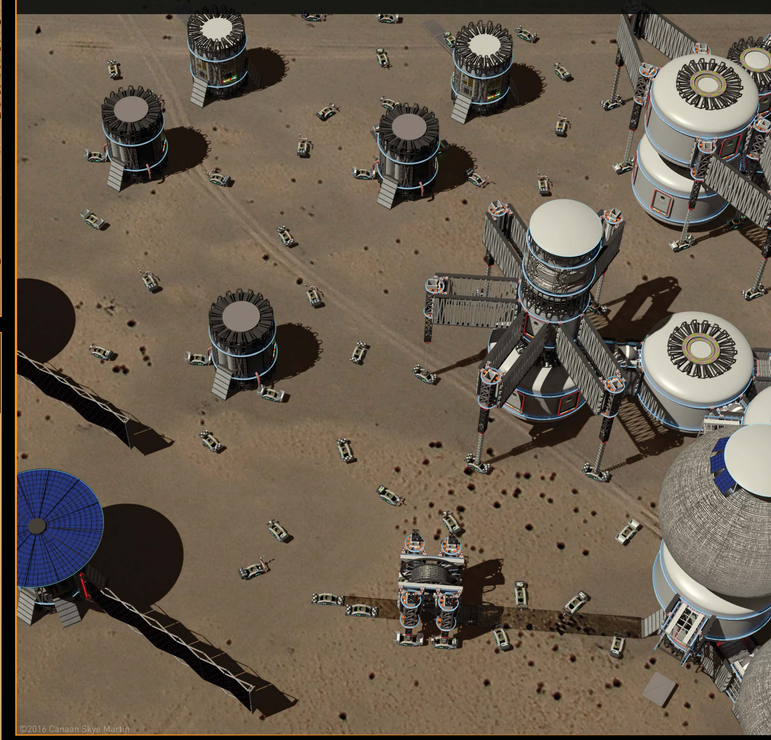
aerial view of thriving novum base



connection to m.m.s.e.v.



rassor business



expanded base operations perspective

novum base plan