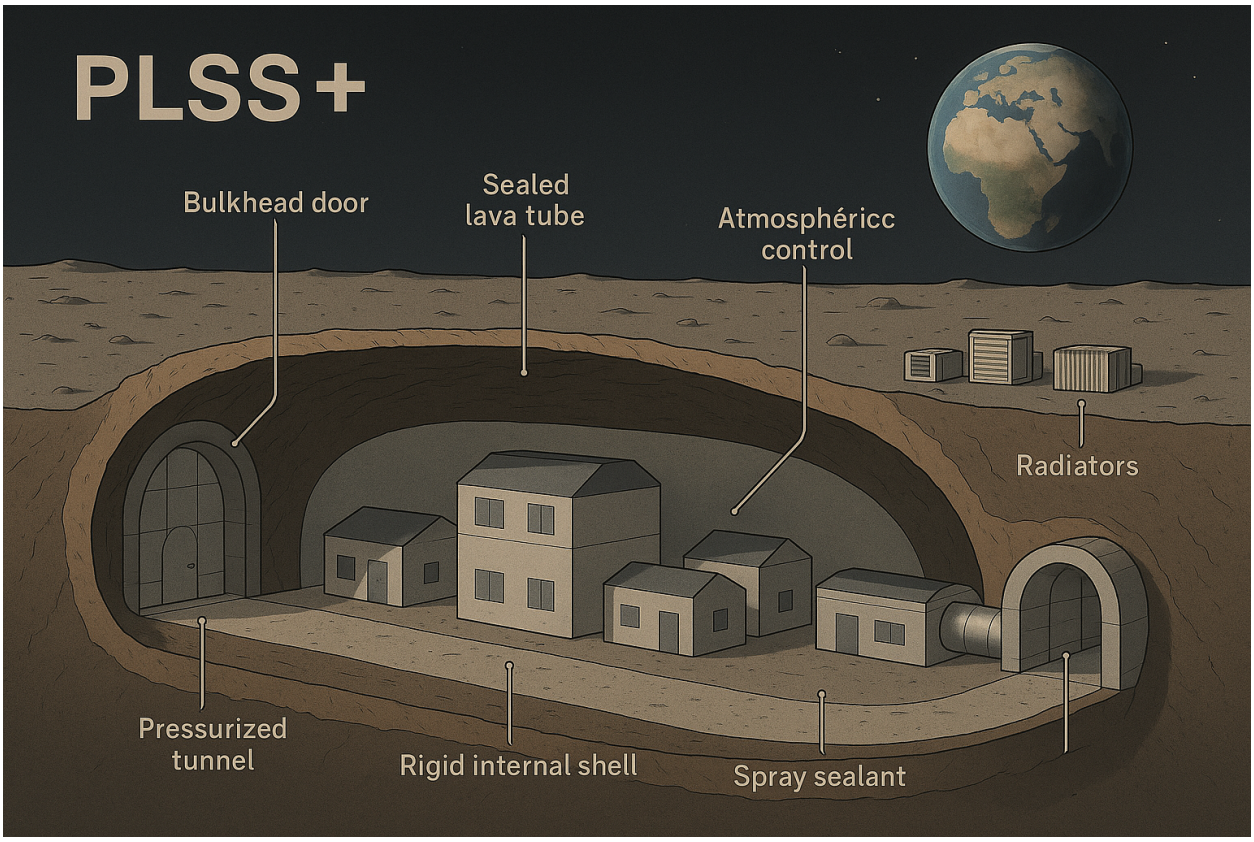

PLSS – Pressurized Lunar Subsurface Settlement

(Pronounced “plus”)
A modular, rigid-hull habitat system built into sealed lava tubes beneath the lunar surface. Designed to support medium-duration habitation for personnel engaged in surface operations, construction, and resource deployment.

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1. Purpose

- Provide a **safe, shielded, and pressurized environment** for rotating lunar crews.
- Serve as a **staging and recovery zone** between active EVA missions.
- Operate in support of **surface-based work**, while recognizing that long-term human health may require higher-gravity environments such as those available on orbital platforms like Aegis Station (0.5g artificial gravity).
- Complement orbital assets, not replace them, in the broader cislunar infrastructure.

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2. Environment

- Situated **within natural lava tubes**, leveraging:
  - **Radiation shielding** from overburden
  - **Thermal stability** via subsurface insulation
  - **Micrometeoroid protection** without the need for external shielding layers

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3. Structure

- **Rigid, prefabricated construction**—no inflatables.
- Configured as a mix of **single-family modules** and **multi-unit crew flats (2–6 occupancy)**.
- Reinforced bracing in unstable zones of the tube.
- **Bulkhead pressure doors** segment the system for safety and zoning.

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4. Life Support

- Robust **ECLSS modules**, with:
  - Internal **air revitalization**
  - Surface-mounted or buried **thermal radiators**
  - Modular **power systems** scaled to crew cycles
- Designed for redundancy and emergency isolation.

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5. Transit & Access

- **Pressurized tunnels** for intra-settlement movement when sealing is feasible.
- **Pressurized pods** operate in unsealed or mixed-pressure corridors for mission continuity.
- Vertical surface access via **shielded observation towers** or buried **access ports** with redundant locks.

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6. Scale & Footprint

- Optimized for lava tubes between **40–100 meters in diameter**.
- Modular base unit includes:
  - **6–12 residential units**
  - **Ops/control module**
  - Optional **equipment bay** or hydroponic node
- Designed for **incremental expansion** along tunnel axis.

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7. Operational Role

- Rotational habitation of **1–6 months** per crew.
- Primary support for:
    - **Water ice mining**
    - **Surface construction**
    - **ISRU research**
    - **Maintenance of surface infrastructure**
- Acknowledges that **lunar gravity (0.17g)** may not be sufficient for long-term human health, reinforcing the importance of complementary platforms like Aegis Station, which provides **0.5g artificial gravity** for longer-duration habitation.