Building a World in Orbit

Construction & Deployment of Aegis Station

Modular. Redundant. Now scaled for full Earth gravity.

I. Overview

Aegis Station is deployed in **phases**, ring by ring, with core operations starting long before full completion. This modular approach spreads cost, reduces risk, and enables early returns on investment.

II. Assembly in Three Stages

Stage 1: Launch & LEO Assembly

- Ring segments and dry structures launched via heavy-lift vehicles
- Initial assembly in low Earth orbit (LEO) with robotic and crew support
- No water launched from Earth
- Rings are built independently to avoid interdependency bottlenecks

Stage 2: Transfer to Lunar Orbit

- Assembled ring modules transferred to lunar orbit by electric or hybrid tugs
- Central hub remains non-rotating
- Spin-up occurs **only after shielding is complete**

Stage 3: Shielding with Lunar Water

- Shielding begins immediately upon arrival in lunar orbit
- A fleet of **45 tankers** delivers **3.3 million tons** of lunar water directly into the outer hull of each ring
- Shielding and early deck operations can proceed in phases

III. Phased Ring Activation

Each ring is a **self-contained, fault-isolated** system:

- Independent power, life support, thermal control
- Physically and operationally isolated from other rings
- Supports phased crew arrival and testing

Ring A can:

- Begin spin-up to **1g** once shielding is sufficient
- Host initial operations and engineering crews
- Act as a pathfinder for Rings B and C

IV. Shielding Operations & Timeline (1g Configuration)

Parameter	Value
Per-ring shielding volume	~1.1 million tons
Total shielding volume	~3.3 million tons
Tanker payload	45 metric tons
Number of tankers	45
Daily delivery capacity	~2,025 tons/day
Full station fill time	~4.5 years

Shielding proceeds in parallel, with water injected through **five fill ports per ring**. Fill operations occur while the ring spins at operational velocity to maintain balance and minimize slosh risk.

V. Cost Breakdown (Phases 1–3, Updated)

Component	Estimated Cost
Launch + dry mass to LEO	~$300B

Tug transfers to lunar orbit	~$10–30B
Lunar water sourcing + fill	~$495B
Total Construction Phase	**~$805B**

Includes:

- Station dry mass (~120,000 tons)
- Shielding mass (~3.3 million tons)
- Orbital transfer, fill infrastructure, and cartridge-based delivery

VI. Operational Timeline (Illustrative)

Year	Milestone
1	Launch of dry modules begins
2	Ring A assembled in LEO
3	Ring A arrives in lunar orbit
4	Ring A begins shielding
5	Ring A operational at 1g
6	Ring B arrives, shielding begins
7–8	Ring C assembly and spin-up
9–10	Full station operational

VII. Why This Works

- Modular deployment reduces critical path complexity
- Rings deliver incremental value before full buildout
- Shielding is integrated into the structure—no external tanks
- Long-hauler and tanker fleets operate in their optimal domains
- The 1g spec supports long-term health and crew retention

VIII. Fleet Architecture

Long-Hauler Fleet

- Carries dry components from Earth to lunar orbit
- Assembled and tested in LEO
- Fully reusable, modular vehicles
- 5–10 haulers can maintain continuous delivery cycles

Lunar Tanker Fleet (Upgraded for 1g)

- Assembled in lunar orbit
- Each tanker lifts **45 tons** of water per trip
- Operates in closed loop: lunar surface → Aegis Station
- A fleet of **45 tankers** fills the station in ~4.5 years

IX. Logistics Flow (Updated)

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Earth Launches → LEO
                  ↓
     Long-Hauler Assembled & Deployed → LLO
                                        ↓
         Aegis Station Assembled (dry) in LLO
                                        ↓
        Tankers Assembled in LLO → Descend to Moon
                                        ↓
        Tankers lift water → Return to Station in LLO
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This high-efficiency path minimizes Earth lift cost, isolates risk domains, and maximizes throughput across the entire build sequence.