

Aegis Station Population Dossier – Revised

Title:

From Skyscrapers to Sky Cities: Right-Sizing the Aegis Station Population

Section 1: Introduction

Aegis Station isn't just a spacecraft—it's a city in orbit. This document presents a grounded estimate of the station's population capacity based not on cramped survival quarters, but on realistic architectural constraints and long-duration comfort.

Section 2: Structural Parameters (1g Version)

Parameter	Value
Number of Rings	3
Major Radius (R)	350 m
Tube Radius (r)	47 m (40 m habitat + 7 m utility)
Ring Circumference	~2,199 m
Cross-Sectional Area	~6,940 m ²
Pressurized Volume (per ring)	~15 million m ³
Total Volume (all rings)	~45 million m ³

Section 3: Usable Floor Area Estimate

- Approximate decks per ring: **10**
- Average deck width: **~31 m usable** within 40-meter habitat radius
- Total floor area per deck: **~68,000 m²**
- Floor area per ring: **~680,000 m²**
- **Total floor area across 3 rings: ~2,040,000 m²**

This corrected figure reflects realistic build-out potential within the station’s geometry and curvature constraints.

Section 4: Population Capacity by Living Standard

Living Standard	Area per Person	Total Capacity
ISS-style efficient	50 m ²	~40,000
Comfortable habitat	100 m²	~20,000
Luxury-class	150 m ²	~13,000

Recommended Planning Target:

- ~20,000 full-time residents
- Additional **5,000–10,000** transient occupants during tourist cycles, rotations, or peak operations
- **Peak station occupancy: ~30,000**

Section 5: Functional Zoning & Use

Zone/Function	Approx. Allocation
Residential Quarters	35–45%
Food & Life Support	15–20%
Medical & Safety	5%
Recreation & Green Space	10–15%
Transit & Logistics	10%
Commercial & Civic	10–15%
Margin/Flex Reserve	5–10%

Section 6: Comparative Perspective

While not as massive as originally estimated, Aegis Station still surpasses any existing or planned orbital platform:

- **Total floor area (~2 million m²)** rivals the size of dense Earth neighborhoods
- Pressurized volume exceeds that of any terrestrial building
- At comfortable population density, **Aegis Station is the first truly scalable orbital habitat**

Section 7: Design Philosophy

- Full artificial gravity (1g) supports normal physiology and lifestyle routines
- Generous spatial layout encourages psychological well-being
- Zoning supports real recreation, greenery, and privacy
- Strategic redundancy: each ring can operate semi-independently in emergencies

Section 8: Conclusion

Aegis Station is not just livable—it's livable **at scale**. With a target population of ~20,000 and infrastructure to support more, it stands as the blueprint for a functioning orbital civilization—not an experiment, but a foundation.