RIVO FIX – FULL ENGINEERING & CAD CONFIGURATOR MANUAL

1. SYSTEM ARCHITECTURE
RIVO Fix is a modular aluminum structural system used for engineering infrastructure.
It functions as a load-distributing frame composed of vertical posts, horizontal beams, and node connectors.

2. MECHANICAL MODEL
The frame behaves as a statically determinate beam-column structure.
Primary checks include bending, shear, and deflection.
Bending moment: M = F * L
Stress: σ = M / W
Deflection: f = (F * L^3) / (3 * E * I)

3. COORDINATE SYSTEM
Global axes:
X – width
Y – height
Z – depth
Front view: XY plane (PRIMARY)
Side view: YZ plane (SECONDARY)

4. FRAME GENERATION ALGORITHM
Step 1 – Input dimensions (W, H, D).
Step 2 – Calculate post count: N = floor(W / S) + 1.
Step 3 – Place vertical profiles.
Step 4 – Add horizontal beams.
Step 5 – Insert connection nodes.
Step 6 – Validate stability.

5. INSTALLATION LOGIC
Installation frames support up to 400 kg.
Load distributed to vertical supports and base anchors.
Ensure water pressure ≤ 6 bar.

6. CAD REQUIREMENTS
Front view must be dominant.
Side view synchronized.
Dimensions required:
- Total width
- Total height
- Depth
- Center distances
- Axis lines
DXF Layers:
PROFILE, CONNECTORS, DIMENSIONS, AXIS, EQUIPMENT

7. VALIDATION RULES
- Max deflection L/200
- Node integrity
- Base anchoring mandatory
- Tele-support required if height > 2400 mm

8. OPTIMIZATION LOGIC
Minimize profile waste by calculating optimal cutting patterns.
Ensure structural redundancy without over-engineering.

9. EXPORT MODULE
Generate PDF (A3), DXF (layered), and optional IFC schema.
Each profile must be parametric entity.

10. EXTENDED ENGINEERING SPECIFICATION

Detailed structural modeling, connection stiffness evaluation, load path analysis, dynamic stability considerations, CAD parametric constraints, node classification logic, and automated BOM generation rules for configurator integration.

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