

PRECAST CONCRETE L-WALL RETAINING ELEMENT

Heavy-Duty Earth Retention & Bulk Storage Engineering Specification

Document Ref:	TS-PC-RW-L30	Application Class:	Earth Retention, Material Bunkers, & Civils
Product Model:	PC-RW-L30 (Standard Cantilever L-Profile)	Design Standards:	BS EN 15258 / BS EN 1992 (Eurocode 2) / ACI 318

1. PRODUCT DESCRIPTION & APPLICATION

The **PC-RW-L30** is a high-performance, freestanding cantilever precast concrete L-wall unit engineered for rapid soil containment, earth embankment stabilization, civil infrastructure landscape grading, and open bulk material storage bunkers.

The structural design utilizes the weight of the retained material (backfill soil, gravel, grain, or minerals) resting upon the extended horizontal heel base plate to resist overturning and sliding moments, ensuring exceptional cantilever structural stability without requiring deep continuous piling foundations.

2. KEY STRUCTURAL DESIGN FEATURES

Based on the technical layout of the unit profile, the design implements key geometric and functional provisions:

- Tapered Cantilever Stem:** The vertical wall face features a gradual thickness reduction moving from the high-stress base-junction haunch up to the upper crest, optimizing concrete mass allocation.
- Integrated Base Fillet:** A dense internal corner corbel/haunch structure prevents stress concentration at the 90° critical junction between the stem and the heel plate.
- Threaded Lifting / Rigging Sockets:** Features pre-cast symmetrically positioned anchor inserts on both the horizontal heel slab (for primary off-loading) and the vertical stem (for positioning and final leveling).

3. NOMINAL DIMENSIONAL DATA

DIMENSION PARAMETER	STANDARD NOMINAL VALUE	ENGINEERING TOLERANCE
Total Height (Vertical Stem)	3000 mm	± 15 mm
Base Heel Length (Horizontal Footprint)	1600 mm	± 10 mm
Standard Profile Section Width	1000 mm / 1200 mm	± 5 mm
Base Slab Thickness (at Haunch)	250 mm	± 8 mm
Top Stem Thickness (Crest)	120 mm	± 5 mm
Estimated Dead Weight (per unit meter)	Approx. 2.1 Metric Tons	Calculated Symmetrical

4. MATERIAL MATRIX & LOADING CALCULATIONS

Concrete Specification: C40/50 Grade Self-Compacting Concrete (SCC) offering a high durability factor against chemical leaching and environmental weathering.

- **Internal Reinforcement Steel:** High-yield dual tension steel mesh cage matrices conforming to Eurocode specifications (Grade B500B / Fe 500D) structurally concentrated along the inner rear face of the vertical stem to absorb high bending moments.
- **Design Loading Assumptions:** Maximum horizontal backfill angle of 30°, surcharge traffic loading up to 10 kN/m², and fluid/dry earth density configurations optimized up to 19 kN/m³.

5. INSTALLATION MATRIX & GROUND PREPARATION

1. **Foundation Sub-Base:** Placement requires an engineered, well-compacted subgrade material (minimum 98% modified structural proctor test) topped with a 100mm to 150mm leveling pad of lean concrete or crushed aggregate dust.
2. **Interlocking Alignment:** Units are installed adjacently. Interlocking joints may be sealed using specialized mastic sealant bands or external elastomeric bitumen strips over the rear earth-facing joints to prevent subsoil loss.
3. **Backfilling Procedure:** Backfill must be placed in sequential layered lifts (maximum 200mm to 300mm per lift) using light mechanical compaction equipment behind the wall stem to prevent premature structural deflection during construction.