

Ready-mix and precast concrete plants

From the mix design to the erected element

Mixes solved by absolute volume, moisture-corrected batching, ASTM C94 delivery tickets, ACI 318 strength acceptance and precast from casting bed to erection – all posted to the accounts.

ASTM C94

Tickets and the 90-minute clock

ACI 318

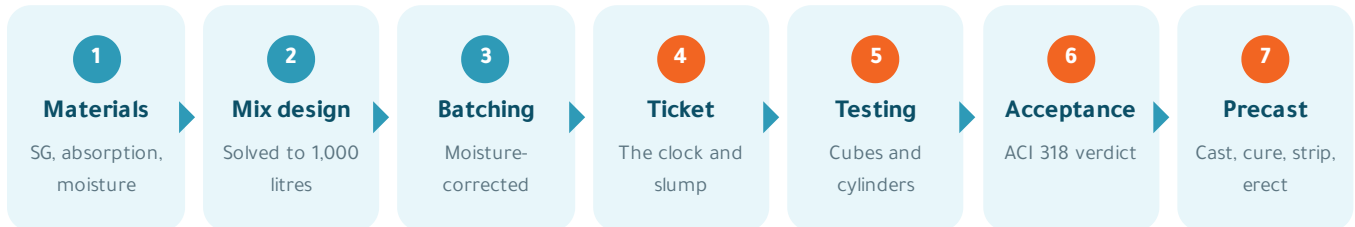
Statistical strength acceptance

Cubes and cylinders

150 mm cubes, 150 × 300 cylinders

Ready-mix and precast – in one module

They share mix designs, materials and cube testing, so VLUERP runs both together – with deliveries posted to the project cost ledger and invoiced with VAT.



Mixes that close to 1,000 L

Each mix is solved by absolute volume – mass ÷ specific gravity, plus air – with the durability floors for its exposure checked before approval.



Designed w/c at the mixer

Wet aggregate is scaled up by its free moisture and that water comes off the batch water, from today's moisture entry.



Concrete is perishable

The ticket runs a clock: 90 minutes or 300 revolutions, cut to 60 minutes once the ambient temperature passes 32 °C.



Precast strips to strength

Stripping at 50% of f_c' and prestress transfer at 70%, with the steam-curing envelope checked.

1,000

litres each mix closes to

90 min

ASTM C94 discharge limit

3.5

MPa single-test floor

0.80

cylinder-to-cube factor

The mix is solved – and the batch corrected

A mix design is solved by volume against the durability rules for its exposure, and every load is batched from today's aggregate moisture.



Mix design

- $\Sigma(\text{mass} \div \text{specific gravity}) + \text{air}$ must equal **1,000 litres**; the aggregate is solved until it closes.
- Water is set from the binder for the target water/cement ratio.
- Approval is blocked on a yield error or a breach of the exposure's max w/c, min binder or min grade.
- Mixes are versioned like recipes, with trial mixes and a version history.



Batching & tickets

- Aggregates scaled up by free moisture (moisture – absorption); that water comes off the batch water.
- Batched against target for every material, within the ASTM C94 tolerances.
- Slump and temperature checked on the ticket; water added on site is recorded against who authorised it.
- Deliveries consume stock at moving average and post to the project cost ledger.



A marine mix, checked by hand

In testing, the C40 marine mix closed at **1,000.000 litres** – 330 kg of cement at SG 3.15 is **104.762 L**, exactly as the model says – at a density of **2,432 kg/m³**. Its required average strength: $1.10 \times 40 + 5.0 = \mathbf{49.00 \text{ MPa}}$.

Today's moisture

Enter each aggregate's moisture daily; every batch uses it automatically.

Hot weather

Above 32 °C ambient the discharge limit drops to 60 minutes, per ACI 305.

Site water

Water added on site is recorded against whoever authorised it – or refused.

Strength judged – by the statistics

Cubes or cylinders are judged by ACI 318's rules on the plant's own history, and precast elements move from bed to yard to erection by strength.



Testing & acceptance

- Every average of 3 consecutive tests must reach f_c' , and no single test may fall more than 3.5 MPa below it.
- f_c' from the plant's own standard deviation, or ACI's flat margins with fewer than 15 tests.
- Specimens due to crush listed by age; cylinders converted at $0.80 \times \text{cube}$.



Precast

- Element types: net volume after voids, weight, rebar, prestress and drawing.
- Stripping refused below 50% of f_c' ; steam curing held to preset ≥ 3 h, rise/fall ≤ 20 °C/h, peak ≤ 70 °C.
- Serialised units inspected to ± 20 mm on length and ± 10 mm on section, then dispatched and erected.

Worked examples from testing

Check	What happened	Result
Hollowcore 12.0x1.2x0.265	Net volume after 45% voids; 7 strands $\times$ 140 kN	2.0988 m³ · 980 kN
ACI acceptance, 8 tests	A 30.4 MPa test (4.6 below) and a low run of three	Both flagged
Stripping	18 MPa reached against 22.5 MPa needed	Refused
Delivery ticket	Aggregate +3.4% against a $\pm 2\%$ tolerance	Flagged
Marine mix	Durability floors for its exposure	Enforced
Precast unit	Length out by 40 mm	Flagged

SBC is the code basis; the test register accepts 150 mm cubes and 150 $\times$ 300 mm cylinders and converts one to the other.

Every screen in the module – and what is on it

Read off the running application – the panels, columns and figures that are actually there.

12 **105**
screens functions

01 Dashboard - Daily output (m³) - Strength against fc' - Volume by mix (m³) - Delivered - Open orders - Avg cycle - Late loads - Returned - Specimens due	02 Concrete orders - Order - Customer - Project - Site - Mix - Ordered - Delivered - Loads - Value	03 Delivery tickets - Ticket - Batched - Mix - Volume - Truck - Slump °C - Elapsed - Cost
04 Mix designs - Grade - fc' - Exposure - w/c - Binder - Slump - Yield - Cost/m³ - Sells at	05 Testing - Sample - Type - Age - Cast - Due - Mix - fc' - Strength (MPa) - Enter results	06 Acceptance - Acceptance lines - Mean - Standard deviation - Required average fc'r - Below fc' - Shortfall - Average of 3 - Verdict - Test history
07 Precast - Run - Element - Bed - Mix - Units - Age - Stripping strength - Cost - Status	08 Yard - In the yard - Dispatched - Erected - Under repair - Serial - Mark - Location - Weight - Dispatch selected	09 Elements - Element - Type - Dimensions - Volume - Voids - Weight - Rebar - Prestress - Drawing
10 Plant & fleet - Batch plant - Type - Location - Capacity - Mixer - Store - Calibration - Status - Operator	11 Materials - Kind - Material - SG - Absorption - Moisture today - Max size - Price - Supplier - Save today's moisture	12 Settings - Durability by exposure - Exposure - Max water/cement - Min cementitious - Min grade - Save settings

Not a separate program – a complete business system

The trade module sits on top of a complete ERP: everything it does lands directly in the accounts, the stores and the reports – no double entry.



Accounting

Editable chart of accounts, automatic entries from every transaction, VAT and financial statements.



Financial dimensions

Cost centres, departments, business lines and sites – with statements per factory.



Inventory

Warehouses and bins, batches and serials, moving average, FIFO or standard cost.



Purchasing & sales

RFQs, purchase orders and receipts, quotations, invoices and ageing.



Maintenance & assets

Equipment register, preventive maintenance, work orders and depreciation.



Access & language

Roles and rights per module, audit trail, full Arabic and English interface.

Standards and regulations supported

ASTM C94

Ready-mixed concrete – delivery tickets

ACI 318

Strength acceptance and fc'r

ACI 305

Hot-weather concreting

SBC

Saudi Building Code – code basis

Discharge time, batching tolerances, test ages, durability floors, and stripping and transfer strengths are held in Settings for your engineer to set.

Bring your own mixes to the demo

Book a session and we will load your materials and mix designs, then batch a load, crush the cubes and run acceptance with you.

Request a demo

Website

www.vluerp.com

Demo request

www.vluerp.com/#demo

Email

hello@vluerp.com

1 Mix designer: the absolute-volume bar closing to 1,000 litres, with the durability checks live.

2 Delivery ticket: the clock as a timeline, batched against target, and the fresh results.

3 Acceptance: the ACI verdict and the strength chart with fc' and the single-test floor.

4 Precast yard: cast, cure, strip on strength, then dispatch and erection.

Switched on from Add-ons with a free seven-day trial, and it runs on the same general ledger.