
RKALC
design with confidence
verify with clarity
AUSTRALIAN – DEVELOPED
STRUTCURAL ENGINEERING SOFTWARE

RKALC is an Australian-developed, cloud-based structural engineering platform that combines analysis, design, verification and practice-support tools within a single environment.

Established in 2020, RKALC was created with a clear objective: to streamline engineering calculations, improve transparency, and reduce the time spent navigating between disconnected software packages and spreadsheets.

Today, RKALC provides engineers with a growing suite of tools covering structural analysis, reinforced concrete, steel, timber, masonry, post-tensioning, shoring design, quantities, sustainability and engineering verification workflows. The platform supports engineers across all experience levels, from graduates developing engineering judgement through to experienced practitioners undertaking detailed design and independent review.

**Why RKALC?**

Australian-developed

Cloud-based

No installation

Transparent calculations

Verification focused

Continually updated

Suitable for consulting and education



**Cloud based**



**Transparent Calcs**



**Verified**

analysis

concrete

steel

timber

masonry

sustainability

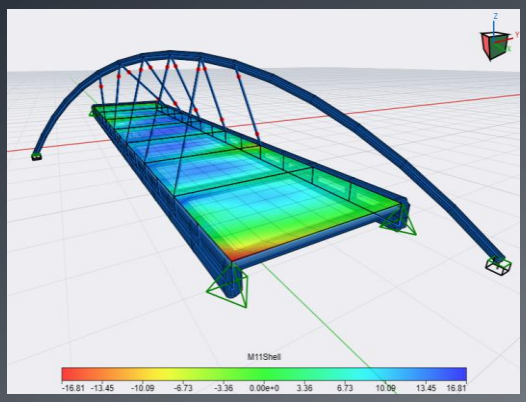
Underground

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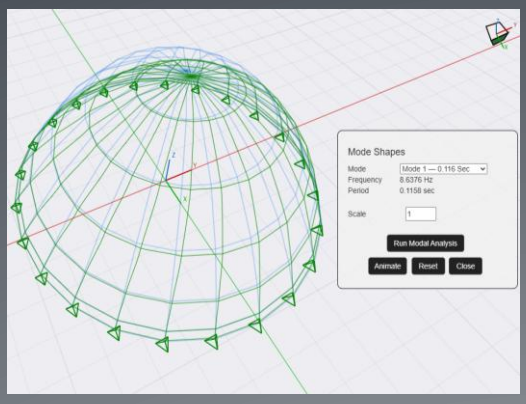
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# FEAKalc Structural Analysis and Design

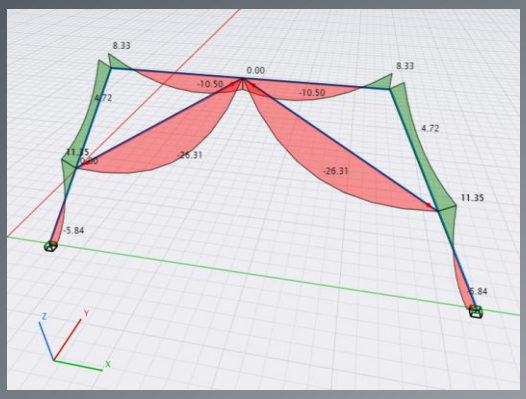
## Bridges




## Modal Analysis



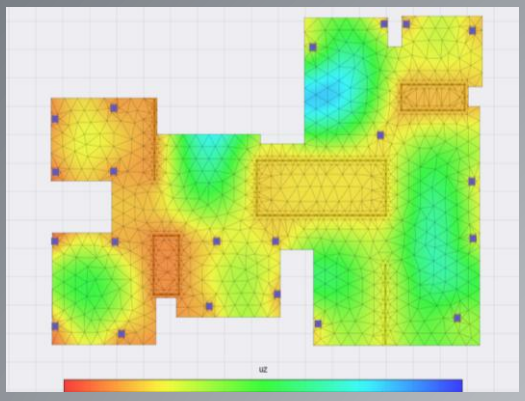

## Portal Frames



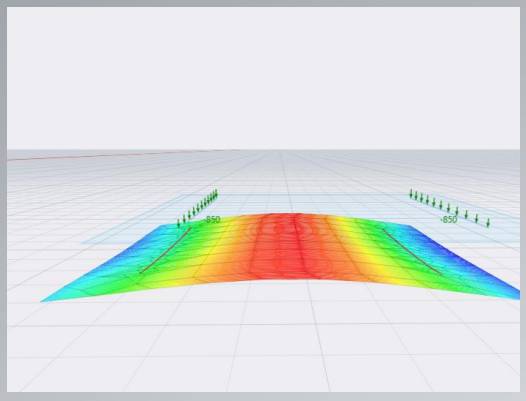

## Trusses



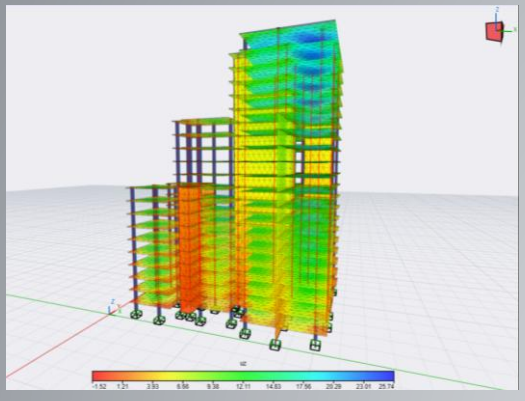
## Floor Plates



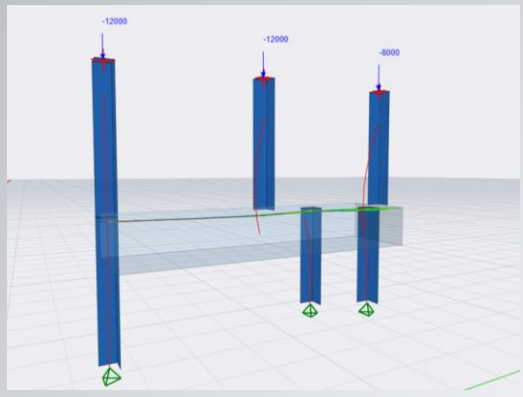

## Spring Support




## Full Buildings



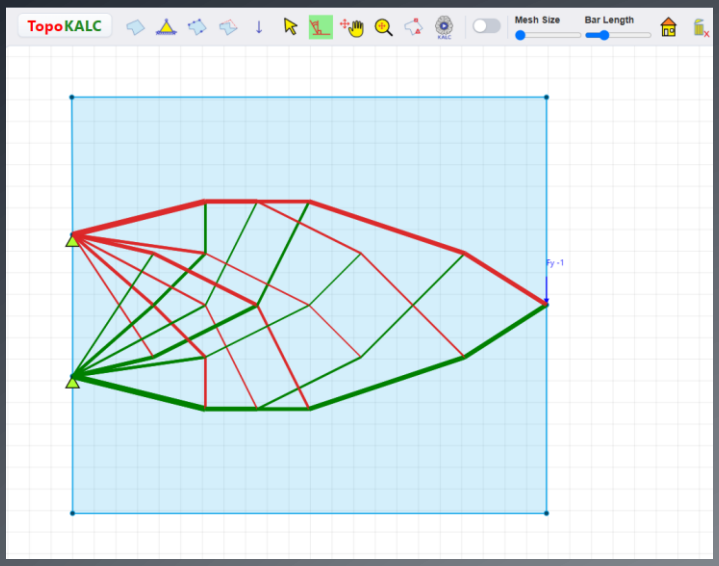
## Verifications




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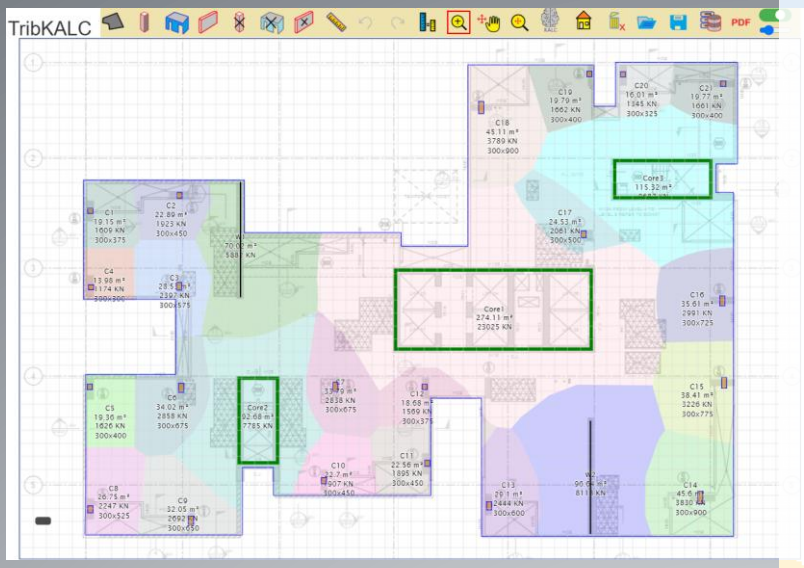


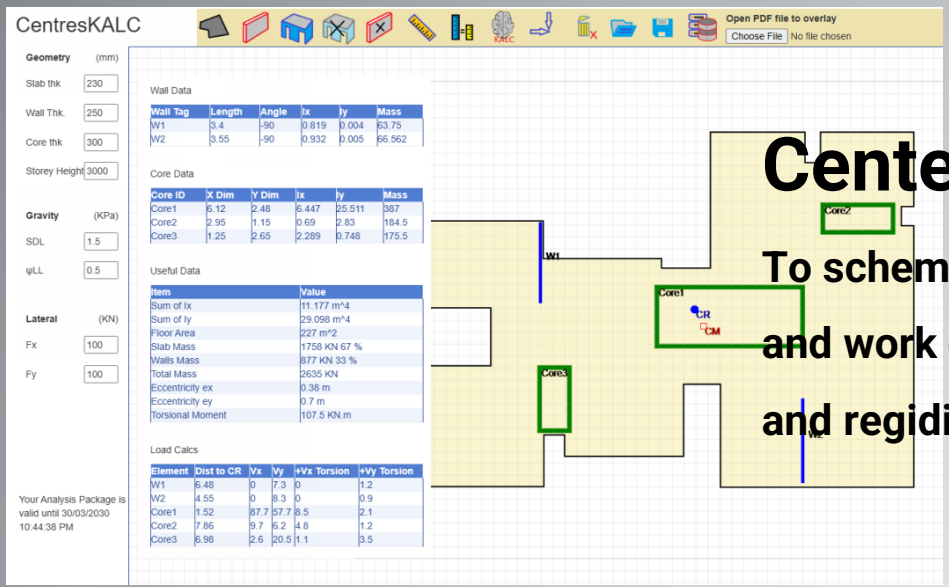

# TopoKALC

**Topology optimisation tool to find optimal load path**

# TribKALC

**Trusted by Industry, with over 2000 projects on RKALC cloud**




# CentersKALC

**To scheme lateral system and work centres of mass and regidity**

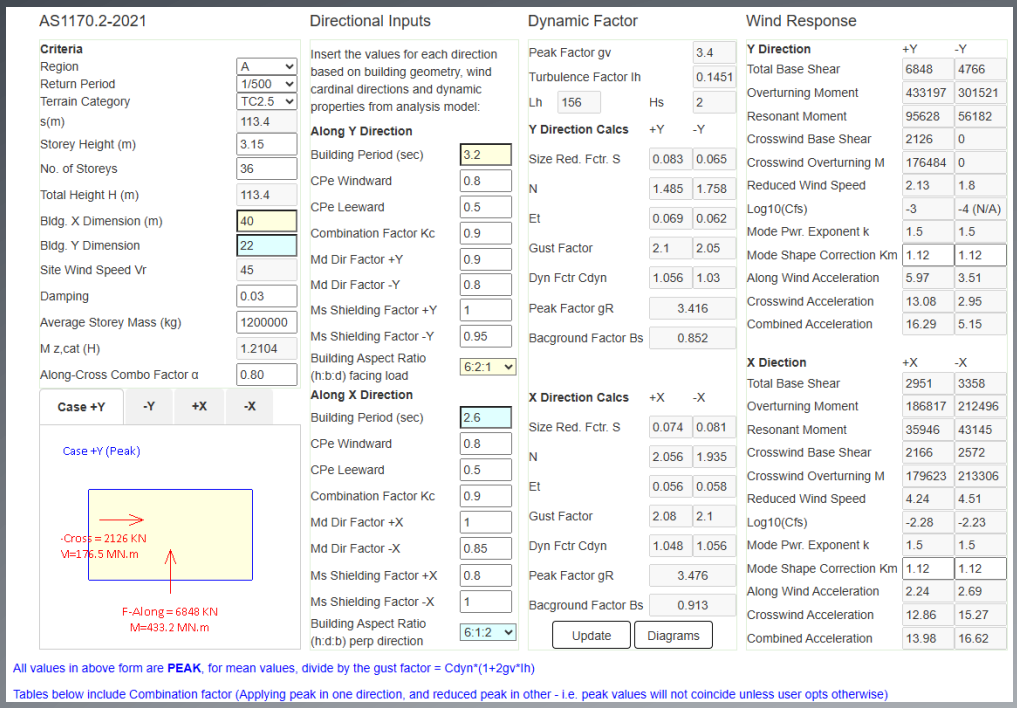
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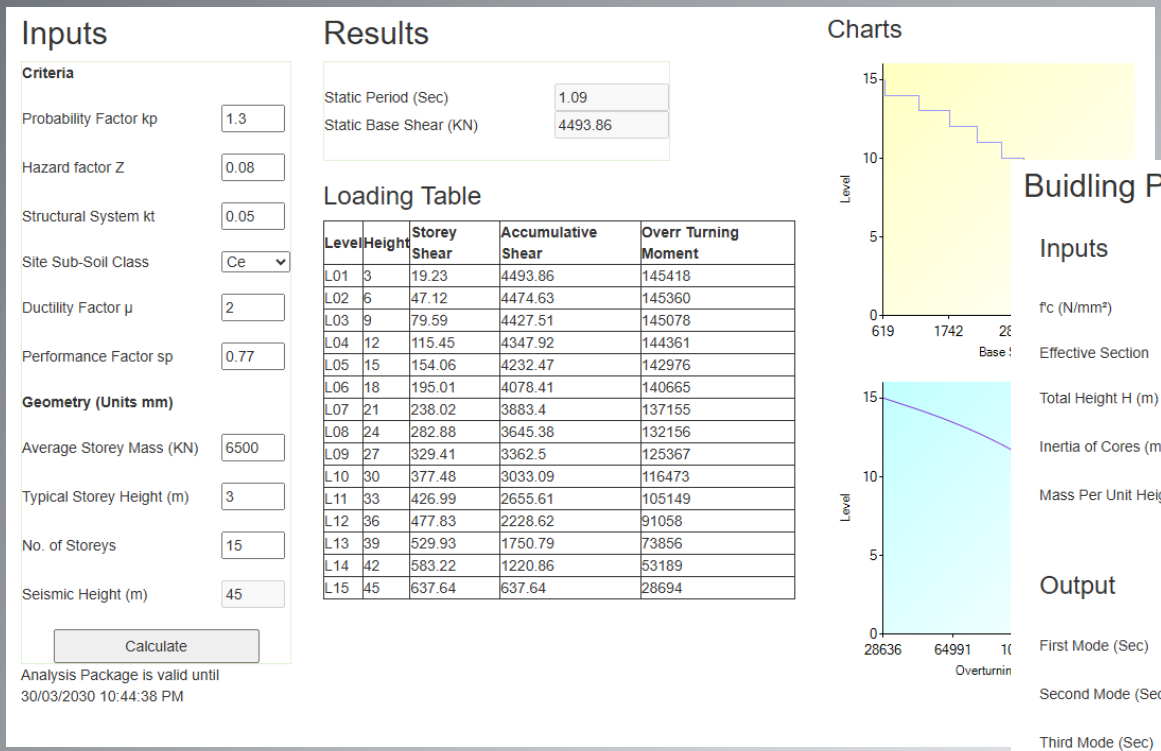
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# Wind and EQ Loading

**WindKALC Advanced**

To calculate Wind loads to AS1170.2 with cross wind and 18 load cases for ETABS



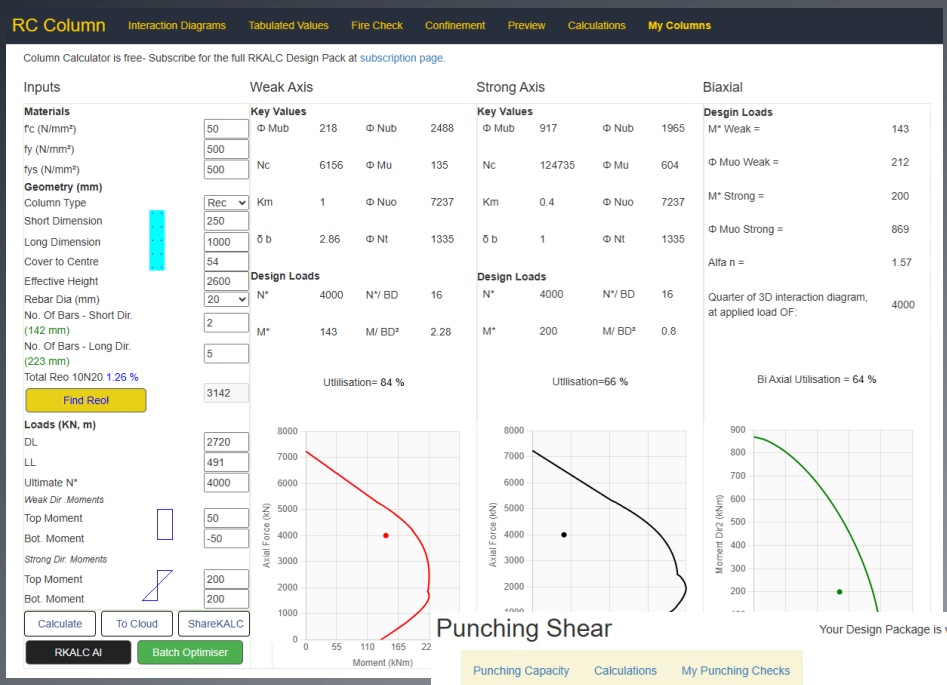

Static EQ loads & Building Period Calcs

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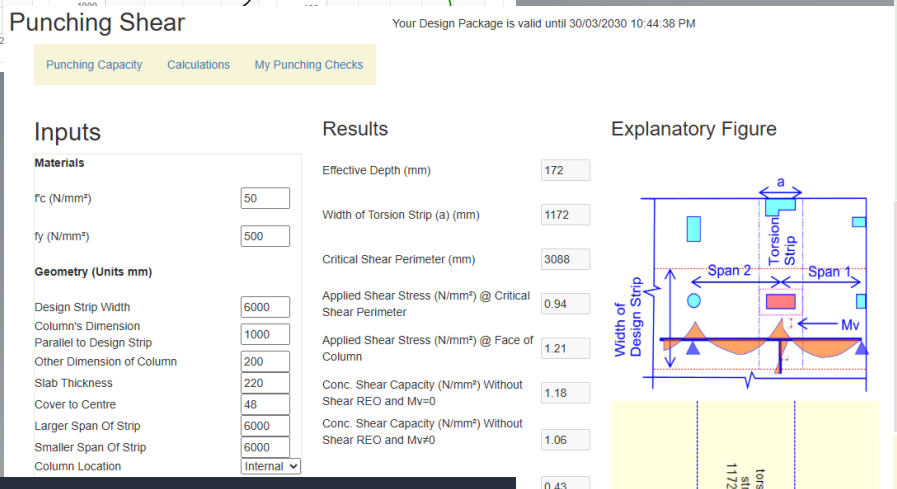
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# Concrete Calculators

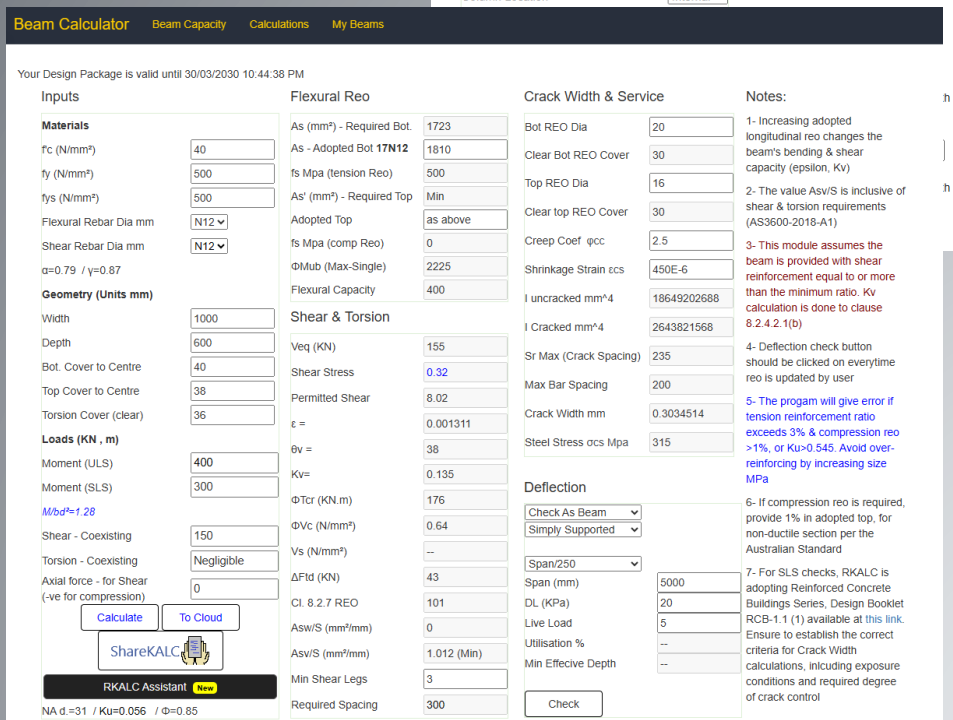



## RC Columns

Everyday tool for column designs including optimisation and batch solving




## Punching shear calcs



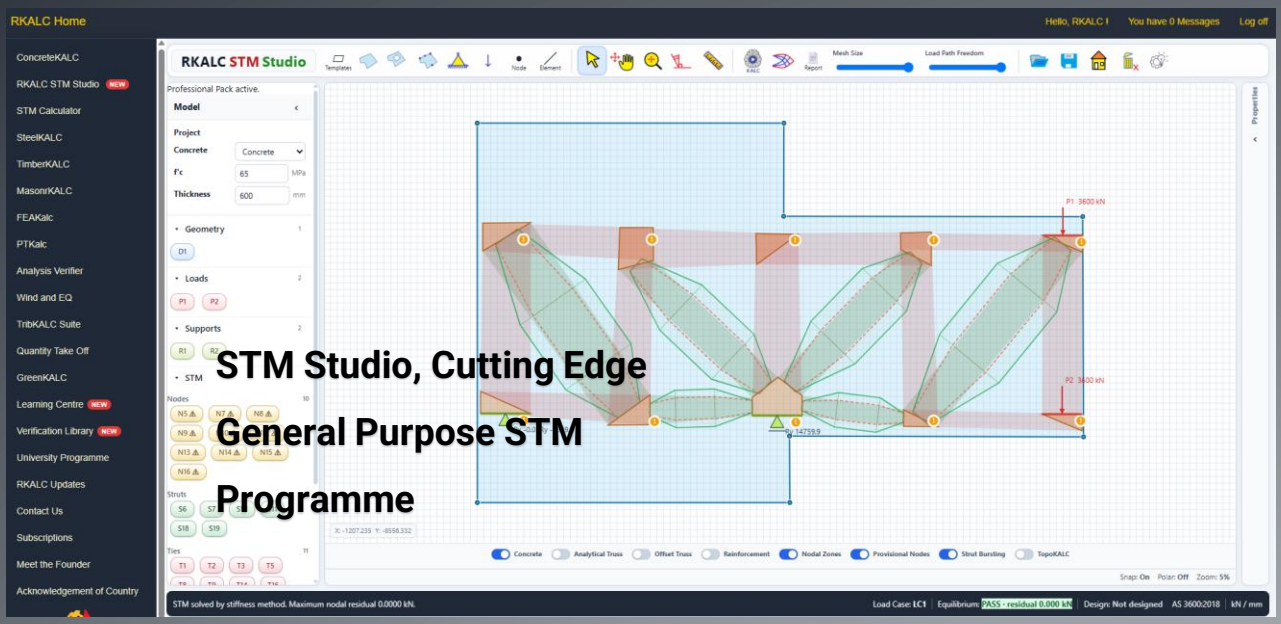

## RC Beam designs for flexure, shear, crack width and deflections

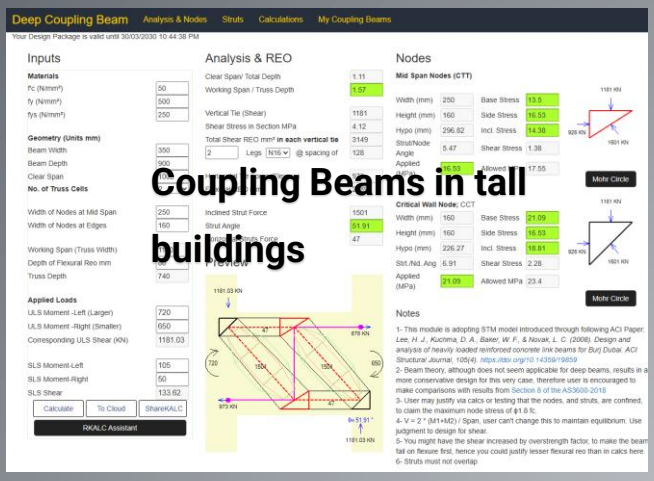
analysis concrete steel timber masonry sustainability Underground

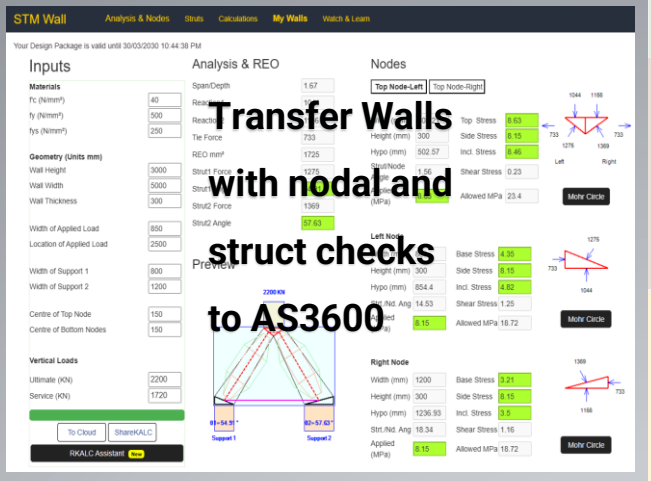
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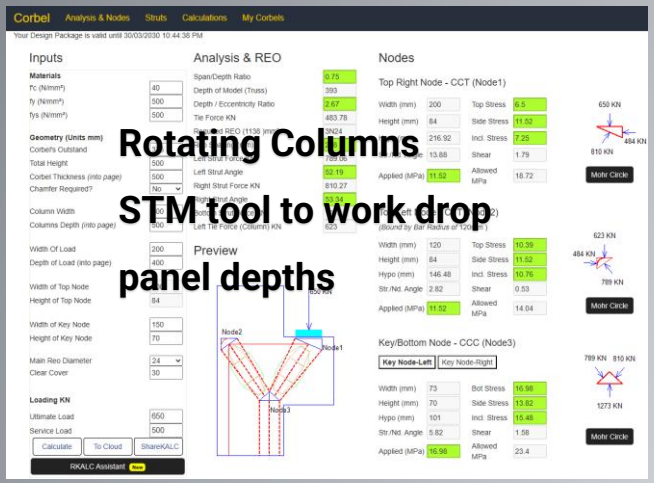
## STRUTCURAL ENGINEERING SOFTWARE

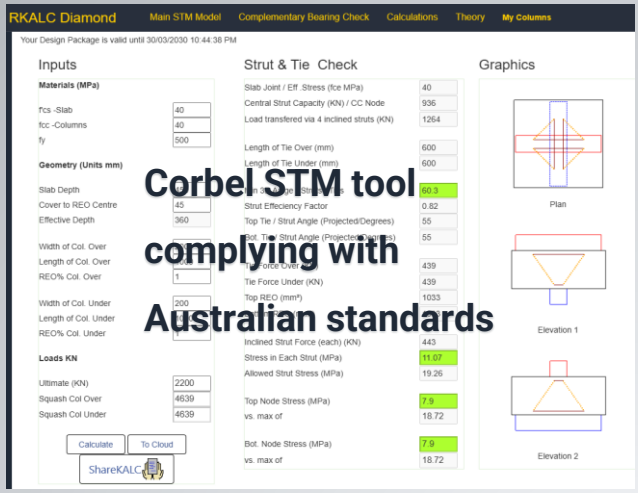
# Strut & Tie Calculators



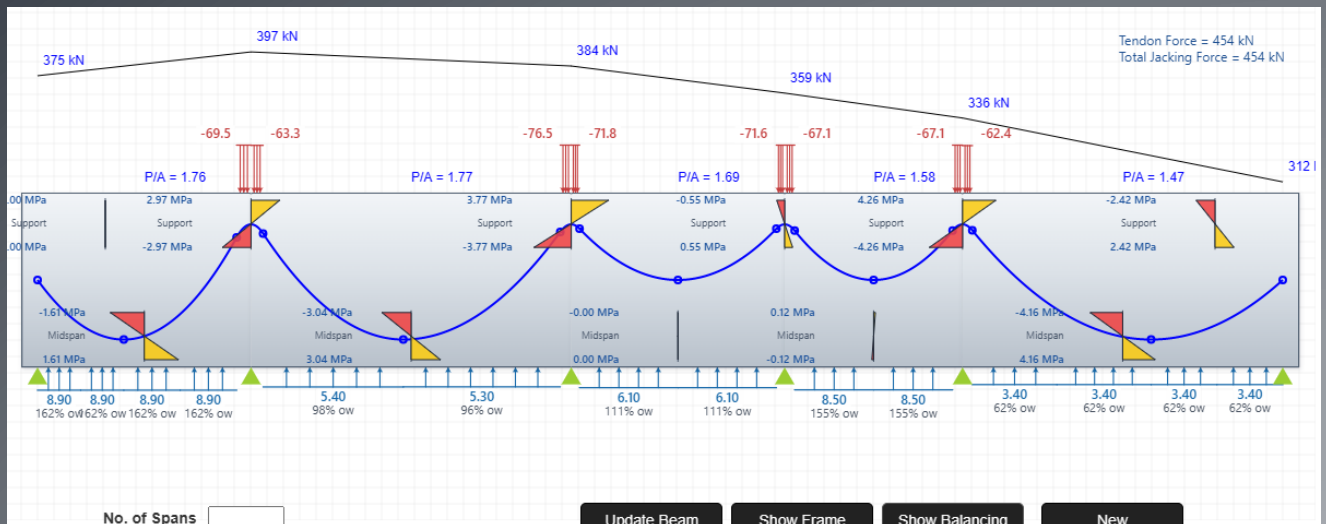




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# PTKalc

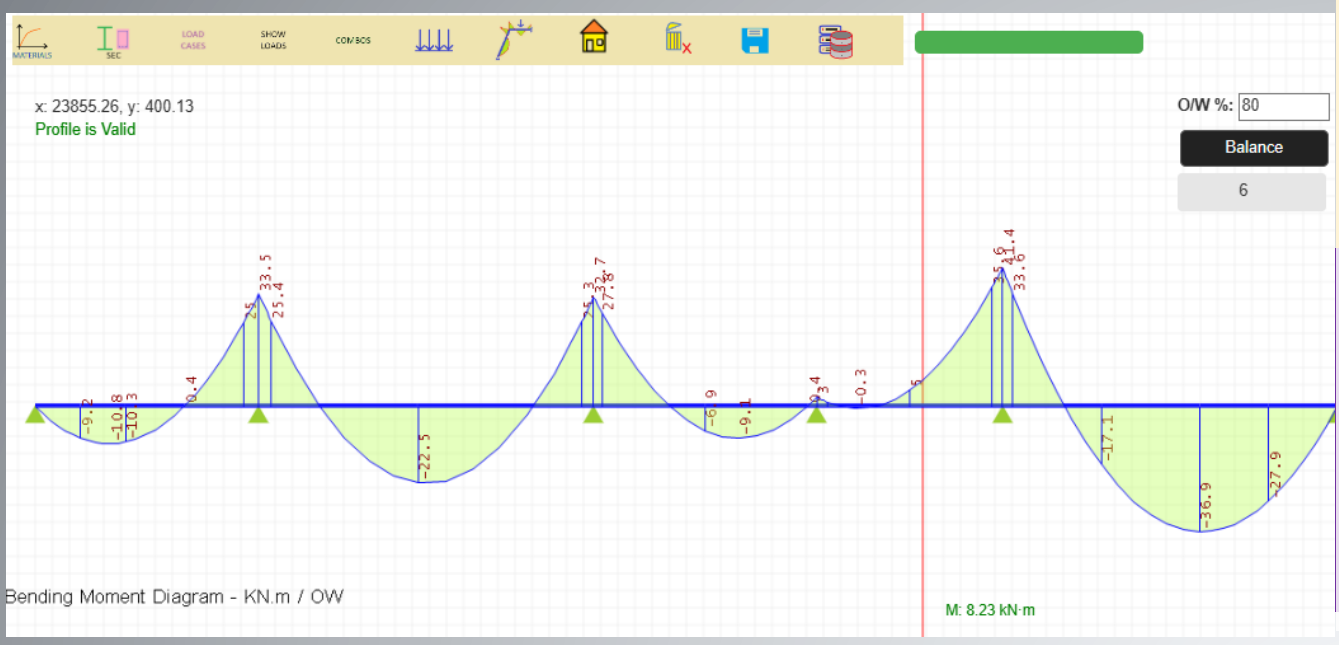
PTKalc is a fluid and practical web application specialising in the analysis and design of continuous and post-tensioned concrete beams in accordance with AS 3600-2018.




No. of Spans

Update Beam | Show Frame | Show Balancing | New

| Span ID. | Length | Section | Left Support | Right Support | Cols Under? | Cols Over? | Profile Type | ZL | Zc | Zr | C | Cantilever? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Span#1 | 6 | 1000x220 | Pin | Pin | ☐ | ☐ | Type1 | 110 | 35 | 180 | 2423 | ☐ |
| Span#2 | 9 | 1000x220 | Pin | Pin | ☐ | ☐ | Type2 | 180 | 35 | 180 | 4280 | |
| Span#3 | 6 | 1000x220 | Pin | Pin | ☐ | ☐ | Type2 | 180 | 110 | 180 | 3000 | |
| Span#4 | 5 | 1000x220 | Pin | Pin | ☐ | ☐ | Type2 | 180 | 110 | 180 | 2500 | |
| Span#5 | 9 | 1000x220 | Pin | | ☐ | ☐ | Type1 | 180 | 35 | 110 | 5300 | ☐ |




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# SteelKALC

To access section dimensions, properties, and the critical trifecta of compression, flexure, and shear capacities. It covers the entire library of UB, UC, WB, WC, Box sections, circular and PFC sections

## I Sections

Your Design Package is valid until 30/03/2030 10:44:38 PM

### Geometry

| | |
|---|---|
| Steel Grade | 300 |
| Section Family | UB |
| Section | 610UB125 |
| Length - Axis X (mm) | 6000 |
| Length - Axis Y (mm) | 4000 |



### Key Properties

| | | | |
|---|---|---|---|
| fy (N/mm²) | 280 | fu (N/mm²) | 440 |
| Class (X) | Compact | Class (Y) | Compact |
| Ze (X) | 3680000 | Ze (Y) | 514847 |

### Section Properties

| | | | |
|---|---|---|---|
| Depth | 612 | Width | 229 |
| tw | 11.9 | tf | 19.6 |
| Weight (kg/m) | 125.6 | Area | 16000 |
| Ix | 9.86E+08 | Iy | 3.93E+07 |
| Zx | 3222222 | Zy | 343231.4 |
| Sx | 3680000 | Sy | 536000 |
| rx | 248.2438 | ry | 49.56057 |
| Iw | 3.45E+12 | J | 1560000 |

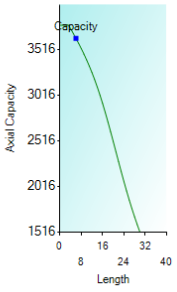
### Axis X

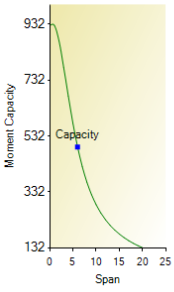
**Key Values**

| | | | | | |
|---|---|---|---|---|---|
| αs | 0.531 | αm | 1 | Moa | 823 |
| λ | 24.767 | ξ | 7.345 | αa | 10.358 |
| αc | 0.962 | Kf | 0.938 | η | 0.037 |
| λn | 24.767 | αb | 0 | Mb/Ms | 53 % |

**Capacities**

| | | | |
|---|---|---|---|
| ΦMsx (KN.m) | 927 | ΦNsx (KN) | 3780 |
| ΦMbx (KN.m) | 492 | ΦNcx (KN) | 3636 |
| ΦVweb (KN) | 1180 | | |



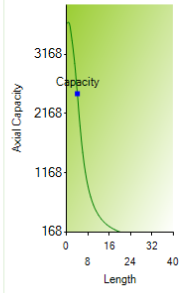

### Axis Y

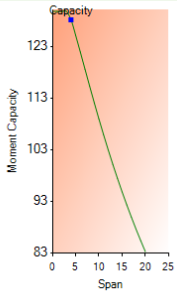
**Key Values**

| | | | | | |
|---|---|---|---|---|---|
| αs | 0.988 | αm | 1 | Moa | 1634 |
| λ | 82.705 | ξ | 1.226 | αa | 19.06 |
| αc | 0.662 | Kf | 0.938 | η | 0.226 |
| λn | 82.705 | αb | 0 | Mb/Ms | 99 % |

**Capacities**

| | | | |
|---|---|---|---|
| ΦMsy (KN.m) | 130 | ΦNsy (KN) | 3780 |
| ΦMby (KN.m) | 128 | ΦNcy (KN) | 2501 |




**Comprehensive tool to design composite beams**

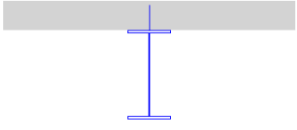
## Composite I Beam

### Geometry & Loading

| | |
|---|---|
| Steel Grade MPa | 300 |
| Section Family | UB |
| Section | 360UB50.7 |
| Span Le (mm) | 9000 |
| Super Imposed Dead Load KPa | 1.5 |
| Super Imposed Live Load KPa | 1.5 |
| TOTAL Construction Loading KPa | 4 |
| Restrained Le Construction (mm) | 3000 |
| Steel Section Pre-camber (mm) | 10 |

### Composite Inputs

| | | | |
|---|---|---|---|
| f'c (MPa) | 25 | Stud Dia | 19 |
| Slab Thk. | 120 | Stud Height | 100 |
| Eff. Width | 2600 | Stud Type | Headed |
| Beam Trib Width | 4000 | Stud fy | 410 |
| | | Double Studs? | No |



### Capacity Moments & Shears

Units = KN , m

| | | | |
|---|---|---|---|
| Const Line Load | 16 | ULS Line Load | 31.21 |
| Const Moment | 162 | ULS Moment | 316 |
| Const Shear | 72 | ULS Shear | 140 |

### Steel Material Properties

| | | | |
|---|---|---|---|
| fy (N/mm²) | 300 | fu (N/mm²) | 440 |
| Class | Compact | Ze (mm³) | 897000 |

### Steel Section Properties

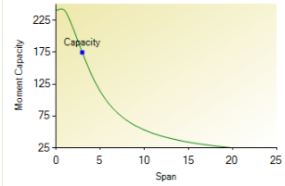
| | | | |
|---|---|---|---|
| Depth | 356 | Width | 171 |
| tw | 7.3 | tf | 11.5 |
| kg/m | 50.79 | Area | 6470 |
| Ix | 1.42E+08 | Iy | 9600000 |
| Zx | 797752.8 | Zy | 112280.7 |
| Sx | 897000 | Sy | 173000 |
| rx | 148.1467 | ry | 38.51975 |
| Iw | 2.85E+11 | J | 241000 |

### Steel Section Capacities

*To receive wet concrete and construction loads*

**Key Values**

| | | | |
|---|---|---|---|
| αs | 0.721 | ΦMsx (KN.m) | 242 |
| αm | 1 | | |
| Kf | 0.952 | ΦMbx (KN.m) | 175 |
| Moa | 415 | | |
| Mb/Ms | 72 % | ΦVweb (KN) | 449 |




### Composite Section Capacities

*Note: Section must work compositely to receive the applied loads, a ΦMbx enhancement of 181 % is required by the composite action*

| | |
|---|---|
| Steel Ny,d (KN) - Clause 3.5.4.2 | 1747 |
| Concrete Nc,d (KN) | 5304 |
| Depth of Plastic NA (mm from top) | 40 |
| *Neutral Axis in Slab* | |
| Stud Shear Capacity KN | 68.44 |
| Max Possible Stud Spacing (mm) | 480 |
| Min Possible Stud Spacing (mm) | 95 |
| **Full Composite Results** | β = 100% |
| Full Comp. Moment Capacity (KN.m) | 486 |
| Full Composite ΦMbx Enhancement | 278 % |
| Full Composite ΦMsx Enhancement | 201 % |
| Required Studs for 100% Comp. | 52 |
| *total 52 Studs centrally at spacing of 170 mm* | |
| **Minimum Composite Results** | β = 43 % |
| Min Comp Moment Capacity | 347 |
| Full Composite ΦMbx Enhancement | 198 % |
| Min Comp ΦMsx Enhancement | 144 % |
| Required Studs for Min Comp | 23 |
| *total 23 Studs centrally at spacing of 375 mm* | |
| Composite Sec Inertia ((mm^4) | 382E+6. |
| Deflection (Composite) (mm) | 17.38 |
| Deflection Ratio (Composite) | Span/518 |
| Vibration Frequency (Composite) | 4.59 Hz. |
| Deflection (Beam Only) (mm) | 63.72 |
| Deflection Ratio (Beam Only) | Span/141 |
| Vibration Frequency (Beam Only) | 2.8 Hz. |

*SLS line load applied = 24.51 KN/m for deflection & 13.77 KN/m for vibration. Deflections do not account for shrinkage or long term effects*

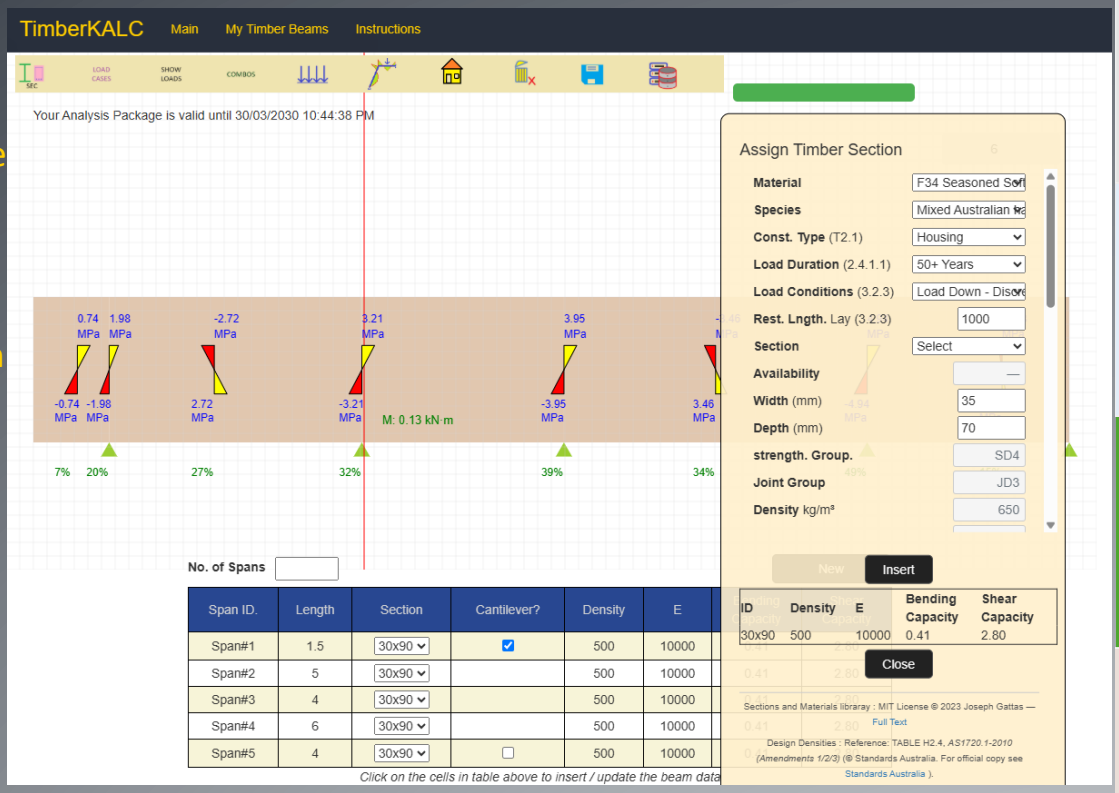
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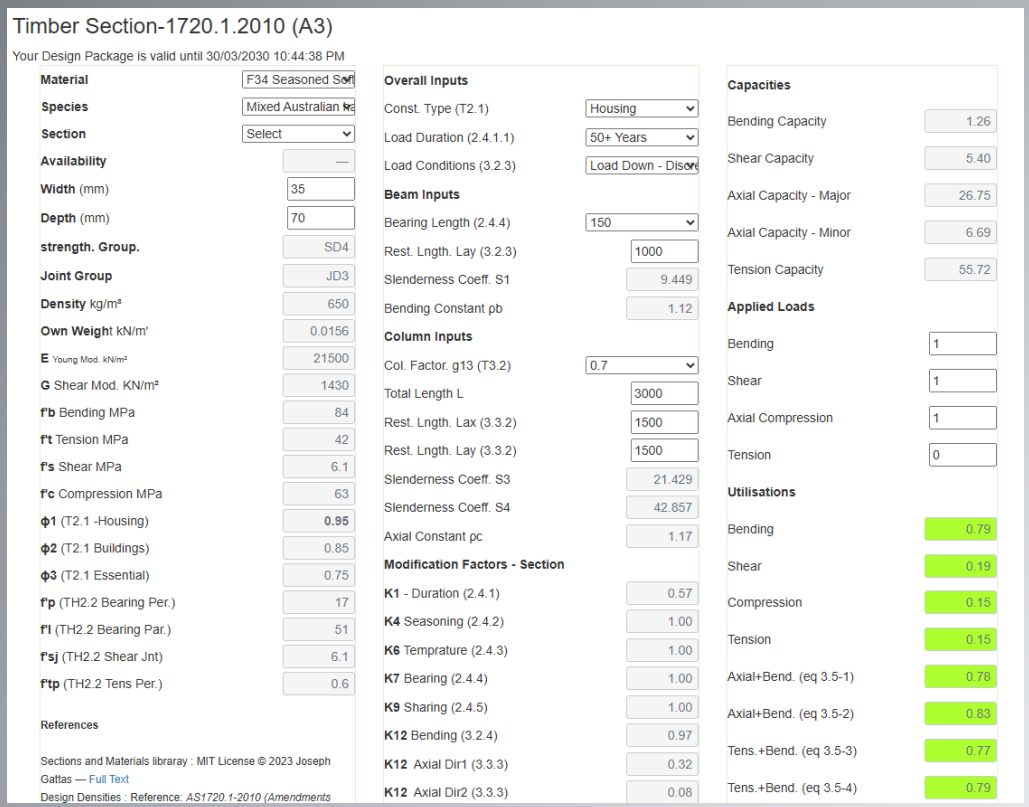
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# Timber

A next-generation, web-based tool for timber beam and column design in accordance with Australian Standard AS 1720.

TimberKALC automates the entire timber design process within a clean, browser-based interface.



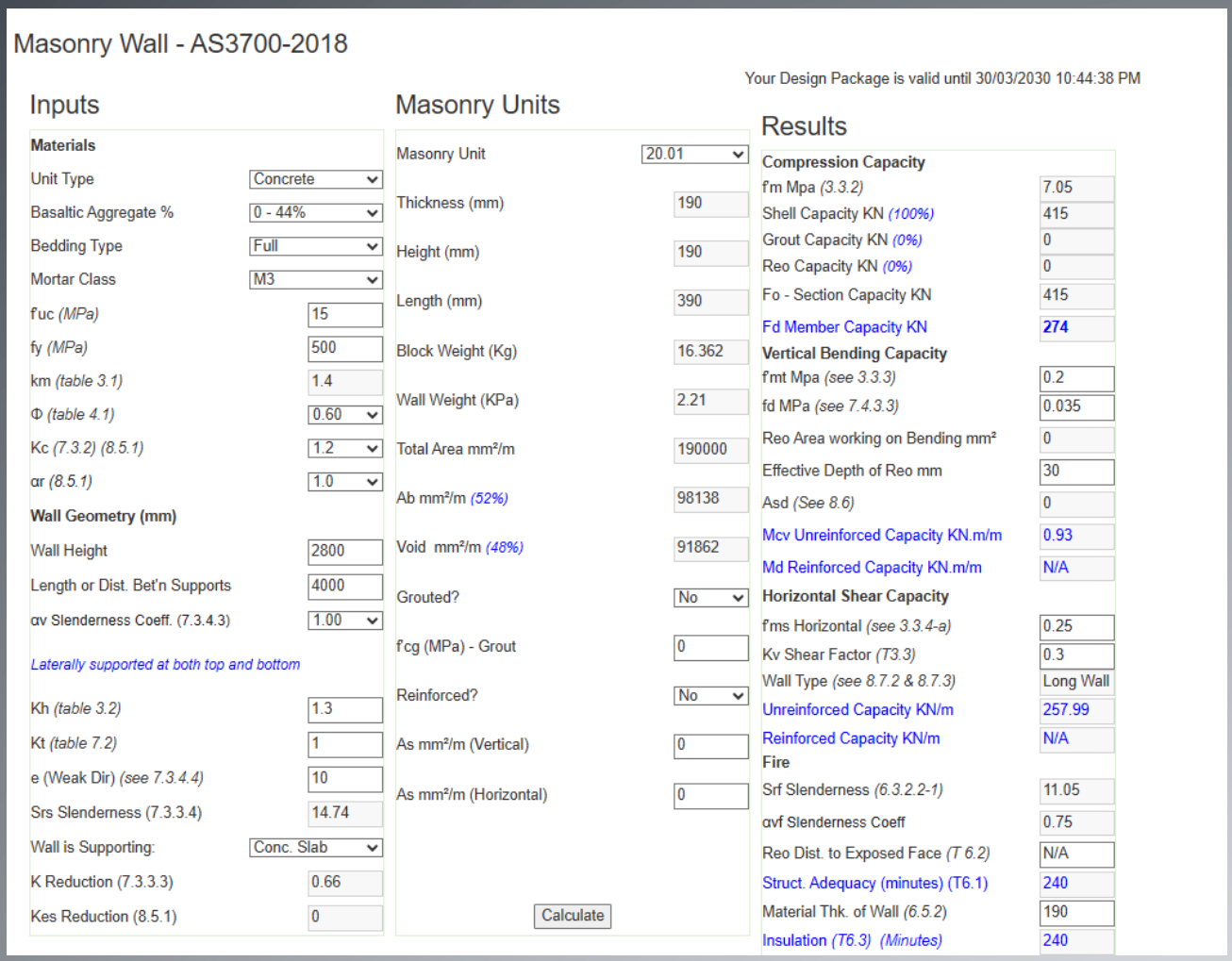




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# Masonry Wall

Masonry tool to design hollow or reinforced masonry walls to comply with AS3700



Masonry Wall - AS3700-2018

Your Design Package is valid until 30/03/2030 10:44:38 PM

**Inputs**

| Materials | |
|---|---|
| Unit Type | Concrete |
| Basaltic Aggregate % | 0 - 44% |
| Bedding Type | Full |
| Mortar Class | M3 |
| f'uc *(MPa)* | 15 |
| fy *(MPa)* | 500 |
| km *(table 3.1)* | 1.4 |
| Φ *(table 4.1)* | 0.60 |
| Kc *(7.3.2) (8.5.1)* | 1.2 |
| αr *(8.5.1)* | 1.0 |
| **Wall Geometry (mm)** | |
| Wall Height | 2800 |
| Length or Dist. Bet'n Supports | 4000 |
| αv Slenderness Coeff. (7.3.4.3) | 1.00 |
| *Laterally supported at both top and bottom* | |
| Kh *(table 3.2)* | 1.3 |
| Kt *(table 7.2)* | 1 |
| e (Weak Dir) *(see 7.3.4.4)* | 10 |
| Srs Slenderness (7.3.3.4) | 14.74 |
| Wall is Supporting: | Conc. Slab |
| K Reduction (7.3.3.3) | 0.66 |
| Kes Reduction (8.5.1) | 0 |

**Masonry Units**

| | |
|---|---|
| Masonry Unit | 20.01 |
| Thickness (mm) | 190 |
| Height (mm) | 190 |
| Length (mm) | 390 |
| Block Weight (Kg) | 16.362 |
| Wall Weight (KPa) | 2.21 |
| Total Area mm²/m | 190000 |
| Ab mm²/m *(52%)* | 98138 |
| Void mm²/m *(48%)* | 91862 |
| Grouted? | No |
| f'cg (MPa) - Grout | 0 |
| Reinforced? | No |
| As mm²/m (Vertical) | 0 |
| As mm²/m (Horizontal) | 0 |

Calculate

**Results**

| Compression Capacity | |
|---|---|
| f'm Mpa *(3.3.2)* | 7.05 |
| Shell Capacity KN *(100%)* | 415 |
| Grout Capacity KN *(0%)* | 0 |
| Reo Capacity KN *(0%)* | 0 |
| Fo - Section Capacity KN | 415 |
| Fd Member Capacity KN | 274 |
| **Vertical Bending Capacity** | |
| f'mt Mpa *(see 3.3.3)* | 0.2 |
| fd MPa *(see 7.4.3.3)* | 0.035 |
| Reo Area working on Bending mm² | 0 |
| Effective Depth of Reo mm | 30 |
| Asd *(See 8.6)* | 0 |
| Mcv Unreinforced Capacity KN.m/m | 0.93 |
| Md Reinforced Capacity KN.m/m | N/A |
| **Horizontal Shear Capacity** | |
| f'ms Horizontal *(see 3.3.4-a)* | 0.25 |
| Kv Shear Factor *(T3.3)* | 0.3 |
| Wall Type *(see 8.7.2 & 8.7.3)* | Long Wall |
| Unreinforced Capacity KN/m | 257.99 |
| Reinforced Capacity KN/m | N/A |
| **Fire** | |
| Srf Slenderness *(6.3.2.2-1)* | 11.05 |
| αvf Slenderness Coeff | 0.75 |
| Reo Dist. to Exposed Face *(T 6.2)* | N/A |
| Struct. Adequacy (minutes) (T6.1) | 240 |
| Material Thk. of Wall *(6.5.2)* | 190 |
| Insulation *(T6.3)* *(Minutes)* | 240 |

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## GreenKALC

At RKALC, we're known for practical, engineer-focused tools – and GreenKALC is no exception.
This powerful web application doesn't just estimate carbon emissions of your concrete structure (A1–A3 stages), it also sharpens your commercial edge.
With GreenKALC, you're not only boosting environmental awareness

### GreenKALC-Beta

**Project Info**

| Project Data | |
|---|---|
| Project Name | XX Street |
| Project # | 00 00 00 |
| Built-up Area m² | 8450 |
| Construction Cost | $240,000,000 |
| Rebar cost $/Ton | 2200 |
| PT Cost $/Ton | 7000 |
| Formwork Cost $/m² | 100 |
| Type of Project | Residential |
| Country | Australia |
| State | NSW |
| Region | Sydney |

**Superstructure Data**

Typ Floors | Other Floors

| Typ Floors | |
|---|---|
| Floor Area | 1000 |
| Slab System | PT |
| Slab Thk. | 220 |
| Reo Rate kg/m³ | 55 |
| PT Rate Kg/m² | 5.5 |
| Total Column Count | 23 |
| Total Columns Vol m³ | 50 |
| Col Reo Rate kg/m³ | 200 |
| Walls' Vol per Storey m³ | 140 |
| Wall Reo Rate kg/m³ | 120 |
| No of Typ. Floors | 42 |

**Substructure & Foundations**

| Footings | |
|---|---|
| Total Footings Vol. m³ | 1850 |
| Footings Rate kg/m³ | 150 |
| Excavation Vol m³ | 50000 |
| Shoring Piles Vol m³ | 1350 |
| Shoring Rate kg/m³ | 200 |
| Shotcrete Vol m³ | 150 |
| Shotcrete Rate kg/m³ | 35 |

**Choice of Concrete**

| | | | | | |
|---|---|---|---|---|---|
| **Typical Floors** | | | | | |
| Slab | User Data | 32 | MPa | | |
| Product | | | | | |
| Price | 350 | kgCo2/m³ | 450 | | |
| Columns | User Data | 32 | MPa | | |
| Product | | | | | |
| Price | 350 | kgCo2/m³ | 450 | | |
| Walls | User Data | 32 | MPa | | |
| Product | | | | | |
| Price | 350 | kgCo2/m³ | 450 | | |
| **Unique Floors** | | | | | |
| Slab | User Data | 32 | MPa | | |
| Product | | | | | |
| Price | 350 | kgCo2/m³ | 450 | | |
| Columns | User Data | 32 | MPa | | |
| Product | | | | | |
| Price | 350 | kgCo2/m³ | 450 | | |
| Walls | User Data | 32 | MPa | | |
| Product | | | | | |
| Price | 350 | kgCo2/m³ | 450 | | |
| **Substructure** | | | | | |
| Footings | User Data | 32 | MPa | | |
| Product | | | | | |
| Price | 350 | kgCo2/m³ | 450 | | |
| Shoring | User Data | 32 | MPa | | |
| Product | | | | | |
| Price | 350 | kgCo2/m³ | 450 | | |
| Shotcrete | User Data | 32 | MPa | | |
| Product | | | | | |
| Price | 350 | kgCo2/m³ | 450 | | |

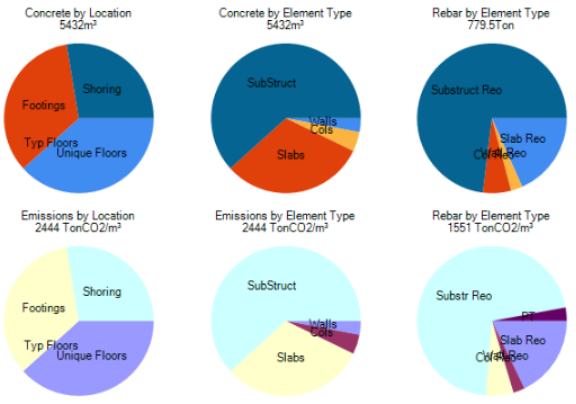
**Bill of Elements**

| Floor Id | Floor Area m² | Slab Type (PT/RC) | Slab Thk. (mm) | Slab MPa | REO Rate (Kg/m³) | PT Rate (Kg/m²) | No. of Cols | Col Vol. m³ | Col Rate kg/m³ | Col MPa | Wall Vol. m³ | Wall Rate kg/m³ | Wall MPa | No. Of Floors |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L1 | 1000 | PT | 200 | 32 | 50 | 5 | 22 | 20 | 200 | 32 | 18 | 120 | 32 | 1 |
| L2 | 1200 | PT | 200 | 32 | 50 | 5 | 22 | 20 | 200 | 32 | 18 | 120 | 32 | 2 |
| L3 | 1150 | PT | 200 | 32 | 50 | 5 | 40 | 20 | 200 | 32 | 18 | 120 | 32 | 1 |
| L4 | 800 | RC | 200 | 32 | 120 | 0 | 32 | 30 | 200 | 32 | 18 | 120 | 32 | 4 |
| L5 | 700 | RC | 200 | 32 | 120 | 0 | 28 | 30 | 200 | 32 | 18 | 120 | 32 | 1 |

*Click on the cells in table above to insert / update the data, analyse afterwards*

GreenKALC

**Building Metrics**




**Stats**

| | |
|---|---|
| Project's carbon emission per m² is | 289 kgCO2/m² |
| Concrete volume as cube | 17.58³ m³ |
| Concrete volume per square mater | 0.64 m³/m² |
| Steel weight per m³ in the project | 144 Kg/m³ |

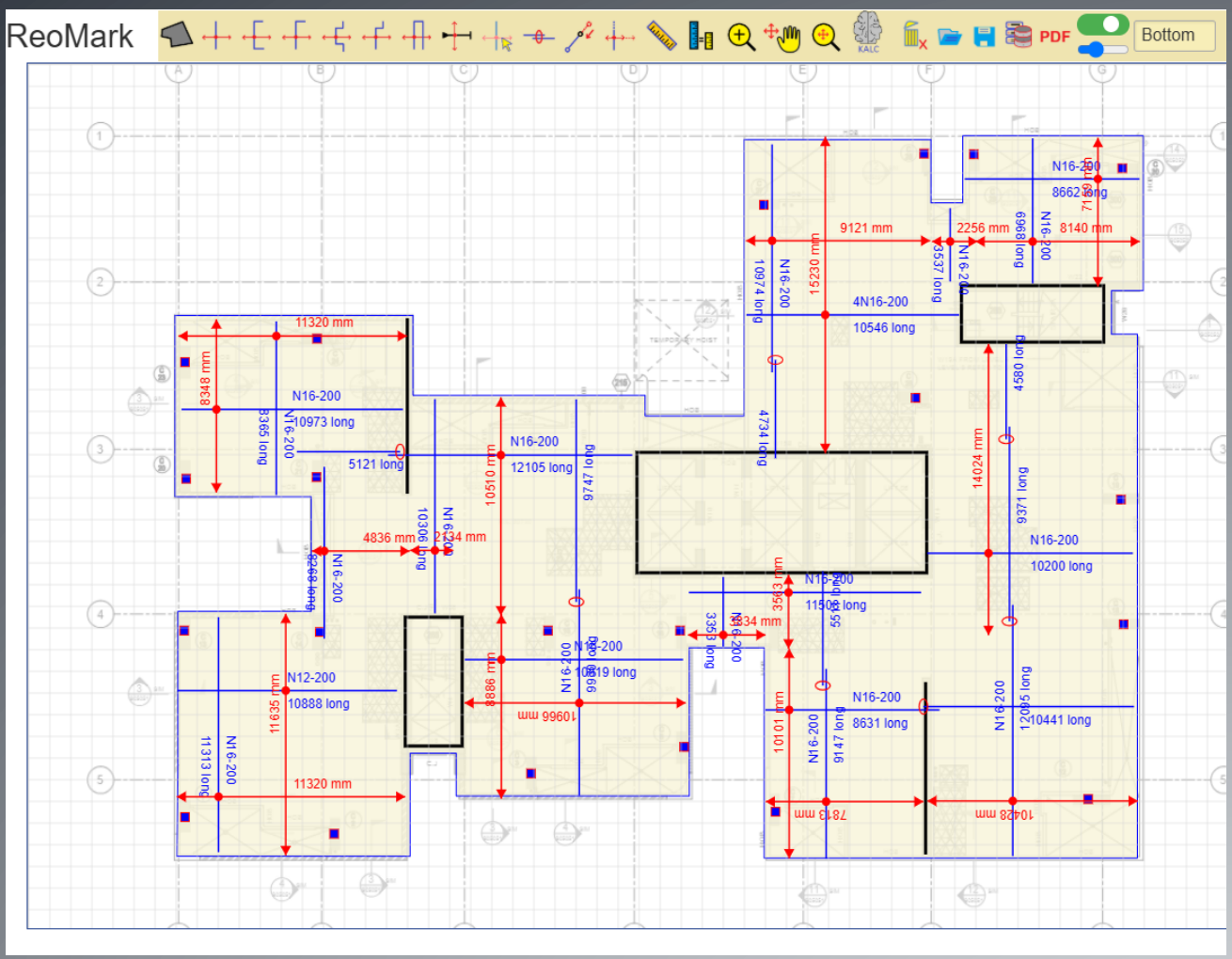
GreenKALC also can be used to estimate project costs and raises commercial awareness

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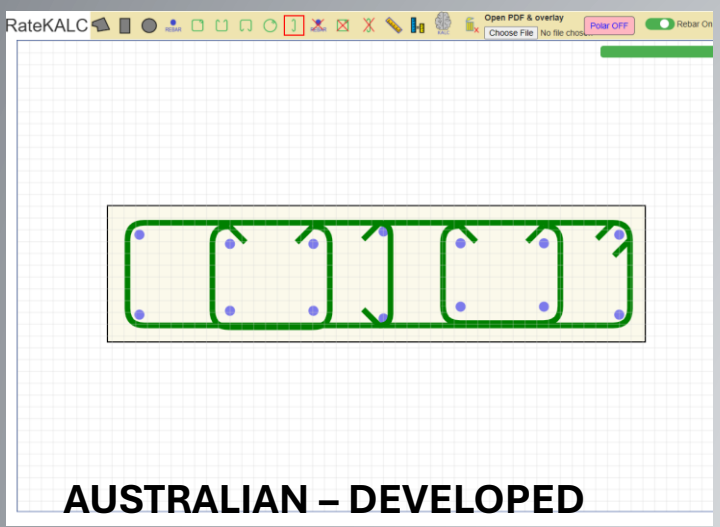
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## REO Mark

REO Mark is rapid markup tool for concrete slabs (reinforced and post-tensioned), it also serves as a quantity take-off tool with A1-A3 carbon emission calculations




## RateKALC to estimate concrete element reo rates




| Item | Result |
|---|---|
| Slab Area | 1216 m² |
| Concrete Volume | 280 m³ |
| **Total REO+PT Weight** | **33772 Kg** |
| ↳ Bottom | 16940.9 Kg |
| ↳ Top | 9532.0 Kg |
| ↳ Add. Top | 4170.1 Kg |
| ↳ Integrity | 2830.6 Kg |
| ↳ Shear | 298.5 Kg |
| Reo Rate (Exc. Rolling Margin) | 121 Kg/m³ |
| **PT Rate** | **0.00 Kg/m²** |
| Formwork Volume | 18.24 m³ |
| A1-A3 Concrete | 103 kgCo2e /m² |
| A1-A3 Rebar+PT | 55 kgCo2e /m² |
| A1-A3 Formwork | 10 kgCo2e /m² |
| **A1-A3 Total** | **168 kgCo2e /m²** |

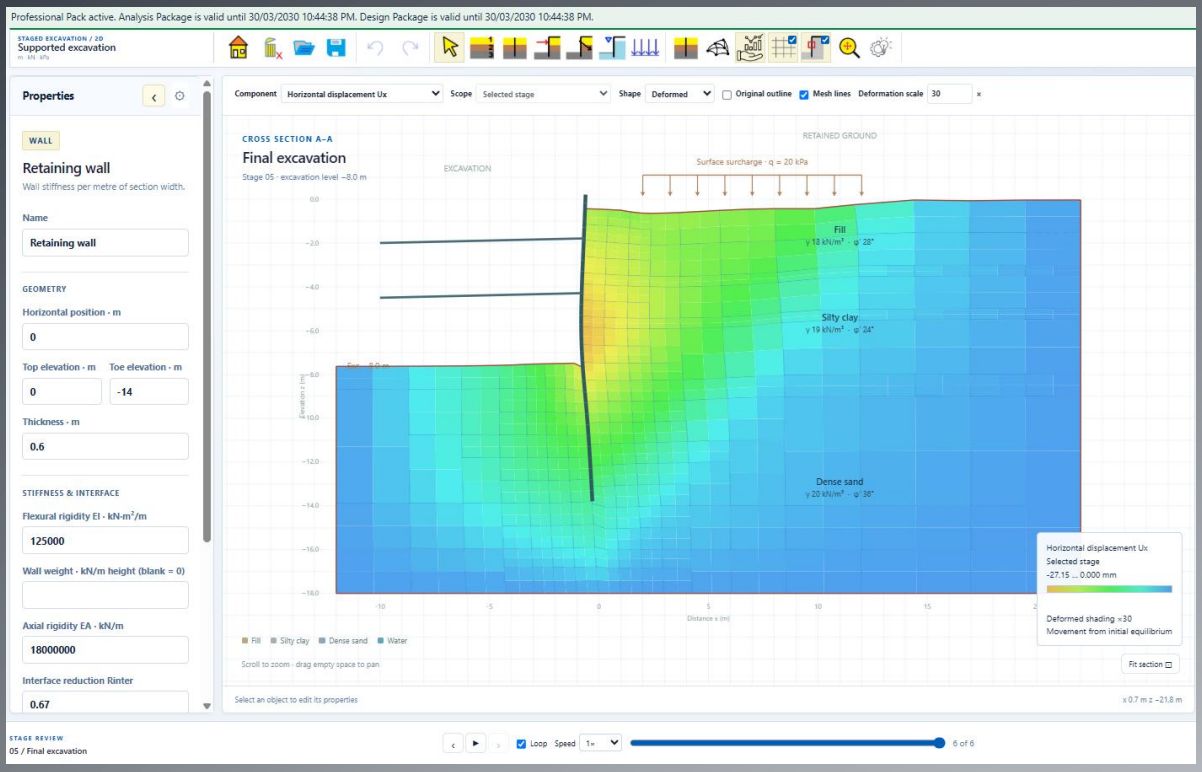
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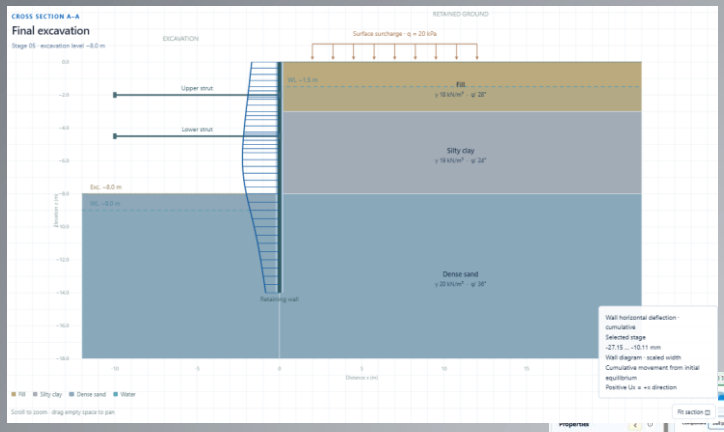
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analysis
concrete
steel
timber
masonry
sustainability
Underground

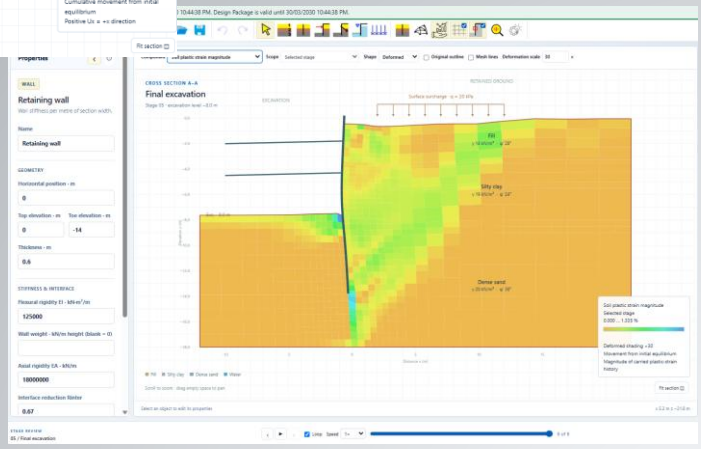
## ShoreKALC

ShoreKALC is our latest application, it provides modern and power solution for engineers designing shoring walls. It has been verified against world class packages such as DIANA and Plaxis 2D




**With Comprehensive calculation reports and detailed user manuals with verification benchmarks**




**Non-linear multi stage analysis using Mohr-Columb soil model**

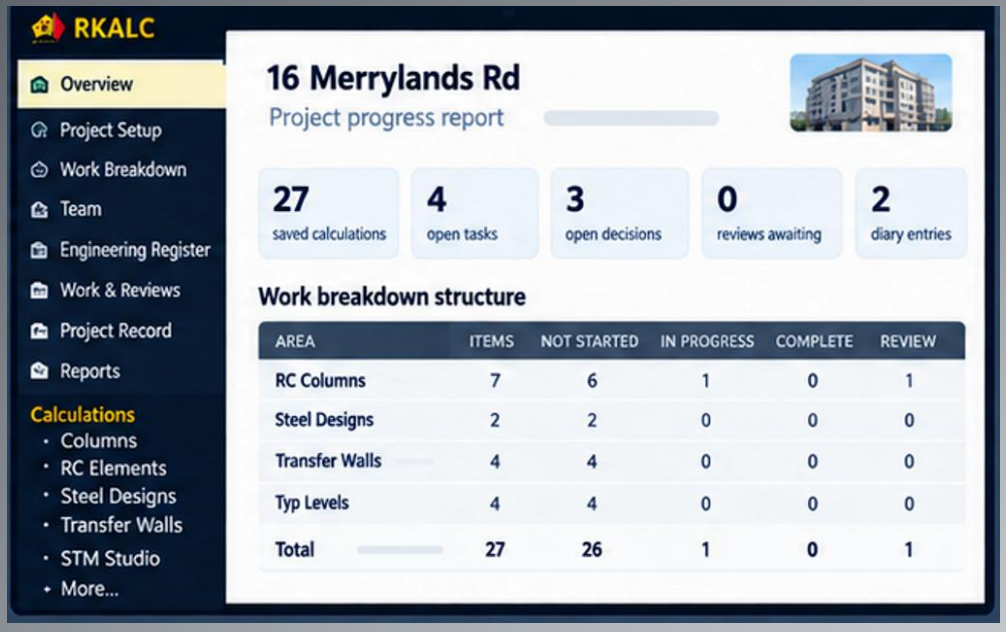
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# ProjectHub

Calculation management platform to house all of RKALC calculations for one project under one roof.








**Project leader**

- Plan and organise the project
- Assign work to team members
- Track progress and reviews



**Reviewers**

- Review and comment
- Track decisions and actions
- Maintain a complete record



**Team members**

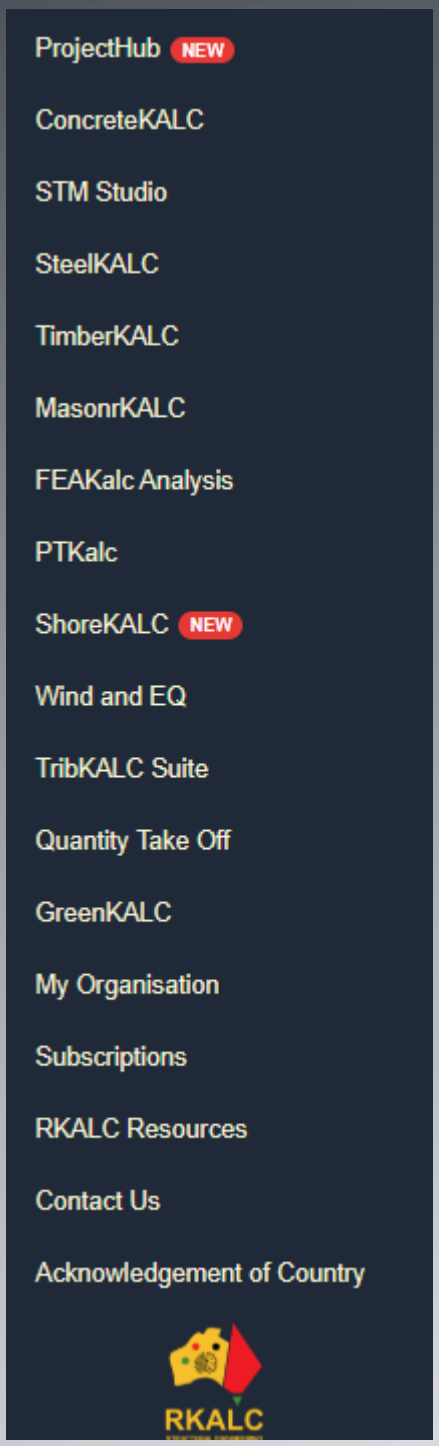
- Work in a shared environment
- Access the right tools and data
- Collaborate and keep a clear design history

Calculations Management

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RKALC is more than a collection of engineering calculators, it is a complete structural engineering ecosystem. Developed by experienced engineers who understand the industry's pain points, RKALC integrates design, analysis, verification and knowledge into a unified platform.




## Licensing

- Individual Licenses
- Team Licenses (contact us)
- Academic Access (contact us)

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