

RCB WALL DESIGN & SCHEDULE INTRODUCTION



FREE ONE MONTH TRIAL

- Email:
 - info@inducta.com.au
 - Subject: ACSE – Wall Design Intro

GOAL OF TODAY'S SESSION

- Provide an overview of the functionality
 - Detailed explanations in manual.
 - Won't discuss wall design theory.
- Become familiar with:
 - Keys terms
 - Calculation procedure
 - Modelling and design concepts
- Give you confidence to start using this powerful new feature.

GOAL OF THIS NEW FEATURE

- Automate repetitive calculations and design all walls quickly.
- Eliminate the need to transfer information to paper or other software.
- Provide adequate transparency in the calculations to give the engineer confidence in the design.

GOAL OF THIS NEW FEATURE

- Design walls quickly, in one place:
 - As a **column**
 - To the **simplified method**
 - Using **stress design**
- Provide tools to assist in deciding which design to use and to assist in group walls.
 - Do I need two layers of reinforcement, or can I use a single layer?
 - Can I use the simplified method, or do I need to design as column?
 - ...and more
- Fully consider all requirements of AS 3600 – 2018 Incl. AMDTs No. 1 & 2.
 - Section 5, Section 8, Section 10, Section 11, Section 14.
 - Allow you to adjust what clauses are considered in the design via customisable **Design Settings**.
- Display results:
 - In 3D
 - In Elevation
 - In Section
 - As text reports
 - As a final schedule

OLD WALL DESIGN

Wall Design AS3600 - 2009

Wall No to Show: Current Floor Only

Vertical Bars Size:

Horizontal Bars Size:

Max wall t for single layer:

Min. Horizontal reo ratio, crack control:

☐ Exclude Concrete

☐ Ignore Out-of plane buckling

☒ Out-of plane apply min M

Wall Design Strategy: 1

Concrete Cover, mm:

Factor k, Leff:

Slab Thickness, mm:

Steel Strength:

$\beta d = G/(G+Q)$:

Print N,Mx,My ☒ Slender ☐

Report Auto Open ☐

Show Top 10-Ast ☒

Wall Labels:

Fire Check Method:

FRP (min):

Exposed:

Safety Factor: 5.8
[LC4] n: 28 3.0% FAIL ?
Safety Factor: 5.9
[LC4] n: 30 3.2% FAIL ?
Safety Factor: 6.0
[LC4] n: 32 3.4% FAIL ?
Safety Factor: 6.0
[LC4] n: 34 3.6% FAIL ?
Safety Factor: 6.1
[LC4] n: 36 3.8% FAIL ?
*** Vertical Bars ***
bar = 20 mm
bar number (total) = 36N20 3.8% (in 2 Layers)
spacing = 90 mm
*** Horizontal Bars ***
bar number (total) = 18N20 (in 2 Layers)
spacing = 310 mm
Number of Walls Failed - Strength: 1
Number of Walls Failed - Fire: 16

4.0% Wall No: 350
4.0% Wall No: 356
4.0% Wall No: 341
4.0% Wall No: 352
4.0% Wall No: 354
3.9% Wall No: 353
3.9% Wall No: 345

Top-10 s - Shear
s: 310 Wall No: 342
s: 310 Wall No: 344
s: 310 Wall No: 349
s: 310 Wall No: 351
s: 0 Wall No: 0
s: 0 Wall No: 0
s: 0 Wall No: 0
s: 0 Wall No: 0
s: 0 Wall No: 0
s: 0 Wall No: 0

Number of Walls Failed - Strength: 1
Number of Walls Failed - Fire: 16

Fire Check Report Report Design Exit>>>

Design

Reports

Stress Design

Design Settings

Wall Schedule

Design Set: 289 Walls

Walls All Walls

Design Sets

DESIGN

Total Walls: 289
Visible: 289
Design Set: 289
Selected: 0

3D View Elevation

Overview

M, V, N, σ

Analysis Modified Design

Load Case

1, Dead Load

Scale

Results

Pass Fail

Fail Details

Design Results

Ast p nleg

Vertical Basic
Horizontal Critical Extra
Ties Boundary Extra
Stress Extra

Load Resisting Type

Vertical and Lateral

Vertical Only

Design View

- 3D or

- Elevation

Roof (42.2m)

Level 9 (39.4m)

Level 8 (36.6m)

Level 7 (33.8m)

Level 6 (31m)

Level 5 (28.2m)

Level 4 (25.4m)

Level 3 (22.6m)

Level 2 (19.8m)

Level 1 (17m)

Ground Floor (12.8m)

Bas 1 (9.8m)

Bas 2 (7m)

Bas 3 (3.5m)

Bas 4 (0m)

Design Settings #1 - Vertical and Lateral (assigned to 0 total, 0 in Design Set)

#1 - Vertical and Lateral

New Update

Apply Settings to Design Set

Apply Settings to Selection

AS 3600 - 2018 AMDTs No. 1 & No. 2

Section 2 - Design Procedures, Actions and Loads

Section 5 - Fire Resistance Periods (FRPs)

Section 8 - Strength of Beams in Shear

Section 10 - Design of Columns

Section 11 - Design of Walls

Section 12 - Design of Non-Flexural Members

Section 14 - Design for Earthquake Actions

Design Settings

ENVELOPE

LComb 1: 1.2G + 1.5Q

LComb 2: 1.0G + 1.0Q

LComb 3: 1.0G + 0.4Q

LComb 4: 1.0G + 0.3Q

LComb 5: G + 0.3Q + Ex + 0.3Ey

LComb 6: G + 0.3Q + Ex + 0.3Ey

LComb 7: G + 0.3Q - Ex + 0.3Ey

LComb 8: G + 0.3Q - Ex - 0.3Ey

LComb 9: G + 0.3Q + 0.3Ex + Ey

LComb 10: G + 0.3Q + 0.3Ex - Ey

LComb 11: G + 0.3Q - 0.3Ex + Ey

LComb 12: G + 0.3Q - 0.3Ex - Ey

LComb 13: G + 0.3Q + Sx + 0.3Sy

LComb 14: G + 0.3Q + Sx - 0.3Sy

LComb 15: G + 0.3Q - Sx + 0.3Sy

LComb 16: G + 0.3Q - Sx - 0.3Sy

LComb 17: G + 0.3Q + 0.3Sx + Sy

LComb 18: G + 0.3Q + 0.3Sx - Sy

LComb 19: G + 0.3Q - 0.3Sx + Sy

LComb 20: G + 0.3Q - 0.3Sx - Sy

#1 - Vertical and Lateral - Setting Details

Section Properties

Geometry

Height for H / L

total wall height

Ignore intersecting walls with L < 0.2Hw

Minimum Aspect Ratio

Concrete

Clear Cover, mm

Reinforcement

f_{sy}, MPa

Layers (Auto)

Max tw for single layer

Wall Design Strategy: 2 (350)

Ratio

Crack Control

Exposure Classification

Degree of Crack Control

Ties

f_{sy} f, MPa

Design Switches

Ductility for Design

Non Ductile, $\mu = 1$

Strength Design

as Column

Simplified Method

Site Sub-soil Class

Shallow Soil, Ce

Stress Design

Check Principal Compressive Stress Limit

Force

Design Axial Load

Static

β d = G/(G+Q)

Q / G

Axial Tension Check

For Eq actions: $\mu = 1.0$, Sp = 1.0

Ignore $\sigma_t < 1$ MPa

Stress Calculations

N gravity by Static, M gravity by Static

Fire Design [LComb: 3]

FRP (min)

90

Exposed

on two sides

Io fi = 0.5Lu for Table 5.6.4

Overwrite any moment with Mmin w/ single curvature

Shear Design

In-Plane as Wall

Ignore V* < 1 kN

In-Plane as Beam

Reversal of loads: Vuc = 0 kN

Out-of-Plane as Beam

Waive transv. spacing to Cl. 8.3.2.2

Earthquake Requirements

Load Comb. for Seismic Weights

1: 1.2G + 1.5Q

Non Ductile, $\mu = 1$

Boundary Elements

Critical Tension Zones

Minimum In-Plane Shear Capacity

Restraint of Vert. Reinf.

REPORT

All Walls

Detailed

EXIT >>>

Design Set: 1 Wall

Walls by Wall Number

Wall No: 240

DESIGN

Total Walls: 278
Design Set: 1

CHECK

- Capacity (User Reinforcement)
- Capacity (Simplified Method)
- Input Parameters
 - Wall thickness
 - Wall length
 - Wall height
 - Wall openings
 - Concrete strength
 - Steel strength
 - Clear cover
 - User reinforcement
 - Internal forces
 - Simplified Method Allowed

Quick Check Tree

Wall No: 240

[Internal forces]

LComb 1: 1.2G + 1.5Q

	N _x kN	V _x kN	V _y kN	H _x kNm	H _y kNm
FROM ANALYSIS	2,503	-460	71	1,430	70
USER MODIFIED	2,503	-460	71	1,430	70
USED IN DESIGN	2,503	-460	71	1,430	70

LComb 4: 1.0G + 0.3Q

	N _x kN	V _x kN	V _y kN	H _x kNm	H _y kNm
FROM ANALYSIS	1,627	-292	47	913	47
USER MODIFIED	1,627	-292	47	913	47
USED IN DESIGN	1,627	-292	47	913	47

Quick View Report

Report page 1 of 1 Walls per page: 10 < Back Next >

WALL REPORT

WALL No: 240 PASS

[DESIGN SUMMARY]

- [Wall Properties]
- [Reinforcement Summary]
- [Envelope]
- [Internal Forces]
- [Initial reinforcement]
- [Strength Summary]
- [Fire Summary]
- [Shear as Wall Summary]
- [Shear as Beam Summary]
- [Core Confinement Summary]
- [Restraint of Vertical Reinforcement Summary]
- [Full Detailed]
- [Settings]
- [Legend]

[AS 3600 - 2018 AMDTs No. 1 & No. 2]

- [Section 2 - Design Procedures, Actions and Loads] Not Performed
- [Section 5 - Fire Resistance Periods (FRPs)]
- [Section 8 - Strength of Beams in Shear]
- [Section 10 - Design of Columns]
- [Section 11 - Design of Walls]
- [Section 14 - Design for Earthquake Actions]

Wall Report



Wall No: 240

PASS

Basic

Vertical: N12 - 65 (2 layers)

Horizontal: N12 - 170 (2 layers)

Section View

Design Settings #1 - Vertical and Lateral (assigned to 1 total, 1 in Design Set)

#1 - Vertical and Lateral

New Update

Apply Settings to Design Set

Apply Settings to Selection

AS 3600 - 2018 AMDTs No. 1 & No. 2

- [Section 2 - Design Procedures, Actions and Loads]
- [Section 5 - Fire Resistance Periods (FRPs)]
- [Section 8 - Strength of Beams in Shear]
- [Section 10 - Design of Columns]
- [Section 11 - Design of Walls]
- [Section 14 - Design for Earthquake Actions]

#1 - Vertical and Lateral - Setting Details

Section Properties

Geometry

Height for H / L ☐ tw, mm 250

total wall height ☐ k (Auto to Cl. 11.4)

☒ Ignore intersecting walls with L < 0.2Hw Minimum Aspect Ratio 1

Concrete

Clear Cover, mm 30 ☐ f_c, MPa 40

Reinforcement

f_{sy}, MPa 500 ☐ Edit/Lock Min Max

Layers (Auto) ☐ Diam. Vert, mm 12

Max tw for single layer 200 ☐ Diam. Hzn, mm 12

Space Vert, mm 48 350

Space Hzn, mm 48 350

Wall Design Strategy: 1 Ratio 0.01 0.04

☒ Crack Control Exposure Classification A1 & A2 Degree of Crack Control Moderate

Ties

f_{ty}, MPa 500 ☐ Tie Diam, mm 10

☐ Tie Space, mm (not yet designed or)

Design Switches

Ductility for Design: Limited Ductile, $\mu = 2$ matches Analysis value.

Strength Design

☒ as Column ☐ Check Principal Compressive Stress Limit

☐ Simplified Method Site Sub-soil Class Shallow Soil, Ce

Force

Design Axial Load Static $\beta d = G/(G+Q)$ (Auto) Q/G (Auto)

☒ Axial Tension Check For Eq actions: $\mu = 1.0$, $S_p = 1.0$ Ignore $\sigma_t < 1$ MPa

Stress Calculations N gravity by Static, M gravity by Static

☐ Ignore M_{min} ☐ Ignore Out-of-Plane M, V

☐ Ignore M, V for Gravity Load ☐ Ignore Out-of-Plane Buckling

☐ Ignore M, V for Pin-Pin Walls

☒ Fire Design [LComb: 3] FRP (min) 30 ☒ $l_o/f_t = 0.5L_u$ for Table 5.6.4

Exposed on two sides ☐ Overwrite any moment with M_{min} w/ single curvature

☒ Shear Design

☒ In-Plane as Wall Ignore V* < 1 kN

☐ In-Plane as Beam ☐ Reversal of loads: V_{uc} = 0 kN

☒ Out-of-Plane as Beam ☐ Waive transv. spacing to Cl. 8.3.2.2

☒ Earthquake Requirements Load Comb. for Seismic Weights 4: 1.0G + 0.3Q

Limited Ductile, $\mu = 2$ ☒ Boundary Elements ☒ Critical Tension Zones

☒ Minimum In-Plane Shear Capacity

☒ Restraint of Vert. Reinf.

REPORT

☐ All Walls
☐ Detailed

EXIT >>>

Design

Reports

Stress Design

Design Settings

Wall Schedule

Design Set: 1 Wall

Walls by Wall Number

Wall No 230

DESIGN

Total Walls: 275

Stress Design Set: 1

Stress Analysis

Load Combination

1. 1.2G + 1.5Q

Tension

Compression

Vertical Stress

Horiz. Stress

Displacement

Reinforcement

Componental Stresses

Stress Analysis

RCB v2.2.12 - C:\Users\marko\Downloads\60A GWH - d.rcbx- Wall No:230

1

2

Stress View

In-Plane Principal Stresses in Compression

Wall No. 230

Bending thickness: 0.200 m

Bending Modulus of Elasticity: 357

Membrane thickness: 0.200 m

Membrane Modulus of Elasticity: 357

Poisson's ratio: 0.200

Load combination 1. 1.2G + 1.5Q

Analysis thickness: 0.200 m

Design thickness: 0.200 m

Angle2_min = 128.6

Angle2_max = 152.6

Sigma2_min = -174 kPa (tension)

Sigma2_max = 2,599 kPa (compression)

Compression: 2,228 kPa

#4 - Stress Design

New

Update

Apply Settings to Design Set

Apply Settings to Selection

AS 3600 - 2018 AMDTs No. 1 & No. 2

Section 2 - Design Procedures, Actions and Loads

Section 5 - Fire Resistance Periods (FRPs)

Section 8 - Strength of Beams in Shear

Section 10 - Design of Columns

Section 11 - Design of Walls

Section 12 - Design of Non-Flexural Members

Section 14 - Design for Earthquake Actions

Stress Design

Design Settings

ENVELOPE

☒ LComb 1: 1.2G + 1.5Q

☐ LComb 2: 1.0G+1.0Q

☐ LComb 3: 1.0G+ 0.4Q

☐ LComb 4: 1.0G+ 0.3Q

☐ LComb 5: G + 0.3Q + Ex + 0.3Ey

☐ LComb 6: G + 0.3Q + Ex - 0.3Ey

☐ LComb 7: G + 0.3Q - Ex + 0.3Ey

☐ LComb 8: G + 0.3Q - Ex - 0.3Ey

☐ LComb 9: G + 0.3Q + 0.3Ex + Ey

☐ LComb 10: G + 0.3Q + 0.3Ex - Ey

☐ LComb 11: G + 0.3Q - 0.3Ex + Ey

☐ LComb 12: G + 0.3Q - 0.3Ex - Ey

☒ LComb 13: G + 0.3Q + Sx + 0.3Sy

☒ LComb 14: G + 0.3Q + Sx - 0.3Sy

☒ LComb 15: G + 0.3Q - Sx + 0.3Sy

☒ LComb 16: G + 0.3Q - Sx - 0.3Sy

☒ LComb 17: G + 0.3Q + 0.3Sx + Sy

☒ LComb 18: G + 0.3Q + 0.3Sx - Sy

☒ LComb 19: G + 0.3Q - 0.3Sx + Sy

☒ LComb 20: G + 0.3Q - 0.3Sx - Sy

#4 - Stress Design - Setting Details

Section Properties

Geometry

Height for H / L

total wall height

Ignore intersecting walls with L < 0.2Hw

Minimum Aspect Ratio

Concrete

Clear Cover, mm

Reinforcement

Allowable Steel, MPa

Layers (Auto)

Max tw for single layer

Extra Reinforcement

Anchorage L, mm

Smooth Extra Bars

Crack Control

Service LComb.

2. 1.0G+1.0Q

Degree of Crack Control

Moderate

Ties

f_{sy} f, MPa

500

Tie Diam., mm

10

Tie Space, mm

(not designed or reqd.)

Design Switches

Ductility for Design

Non Ductile, $\mu = 1$

matches Analysis value.

Strength Design

as Column

Simplified Method

Site Sub-soil Class

Shallow Soil, Ce

Stress Design

Check Principal Compressive Stress Limit

Force

Design Axial Load

Static

$\beta d = G/(G+Q)$ (Auto)

Q/G (Auto)

Axial Tension Check

For Eq actions: $\mu = 1.0$, $S_p = 1.0$

Ignore $\sigma_t < 1$ MPa

Stress Calculations

N gravity by Static, M gravity by Static

Ignore M_{min}

Ignore Out-of-Plane M, V

Ignore M, V for Gravity Load

Ignore Out-of-Plane Buckling

Ignore M, V for Pin-Pin Walls

Fire Design [LComb: 3]

FRP (min)

90

Exposed

on two sides

$l_o/f_i = 0.5L_u$ for Table 5.6.4

Overwrite any moment with M_{min} w/ single curvature

Shear Design

In-Plane as Wall

Ignore V* < 1 kN

In-Plane as Beam

Reversal of loads: V_{uc} = 0 kN

Out-of-Plane as Beam

Waive transv. spacing to Cl. 8.3.2.2

Earthquake Requirements

Load Comb. for Seismic Weights

1: 1.2G + 1.5Q

Non Ductile, $\mu = 1$

Boundary Elements

Critical Tension Zones

Minimum In-Plane Shear Capacity

Restraint of Vert. Reinf.

REPORT

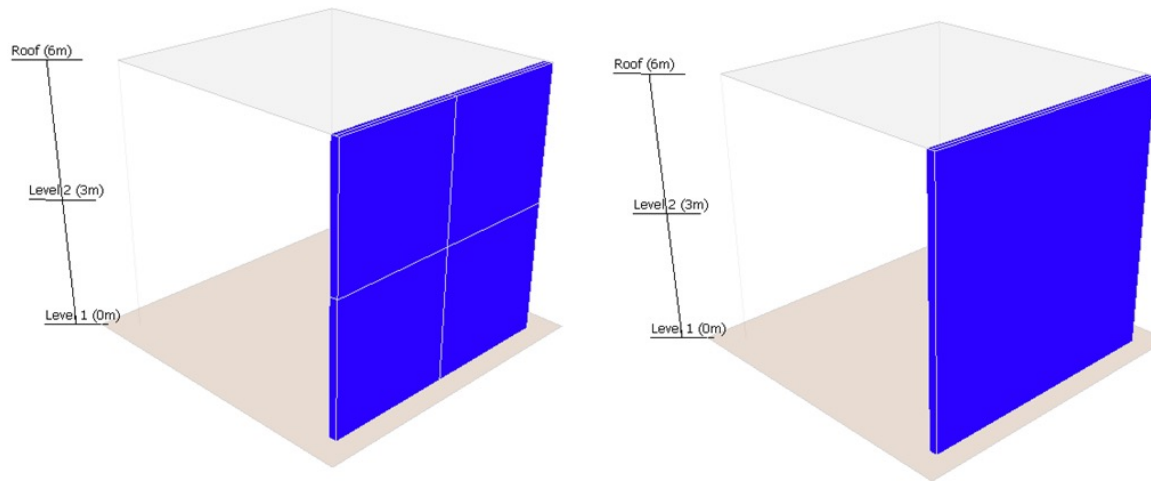
All Walls

Detailed

EXIT >>>

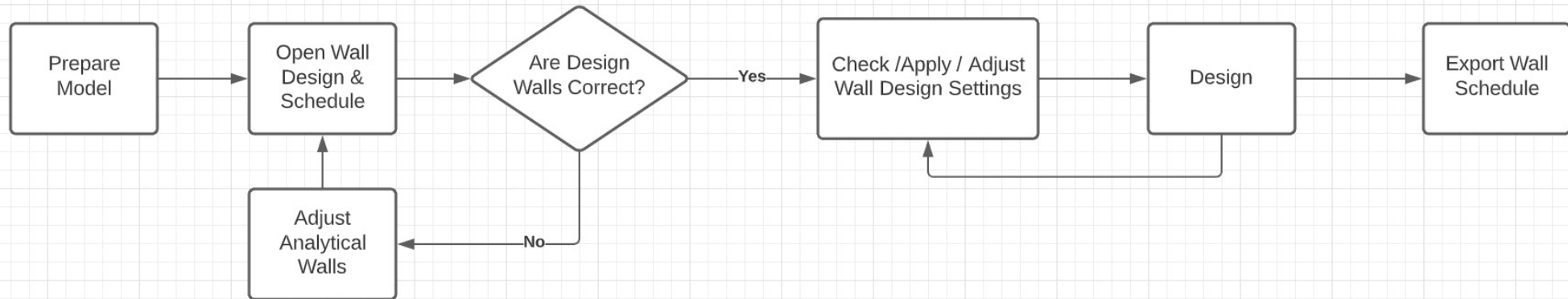
[illegible]

ANALYTICAL VS DESIGN WALLS



- **Analytical Wall:** the line element that was modelling in the RCB model. Spans floor to floor from start point to end point.
- **Design Wall:** Analytical walls that are imported into the wall design. Several analytical walls may be merged into a single design wall based on Merging Rules.

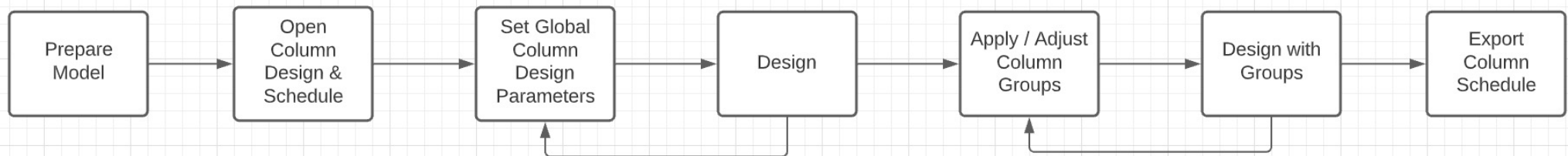
PROCESS – WALL DESIGN & SCHEDULE



Key Concepts / Definitions

- **Prepare Model:** elevations and walls that are imported into the Wall Design & Schedule are correct.
- **Analytical Wall:** the line element that was modelling in the RCB model. Spans floor to floor from start point to end point.
- **Design Wall:** Analytical walls that are imported into the wall design tool. Several analytical walls may be merged into a single design wall based on Merging Rules.
- **Design Setting:** A collection of wall design parameters that is applied to the design wall.
- **Design Set:** A collection of walls that are designed when “Design” button is pressed.

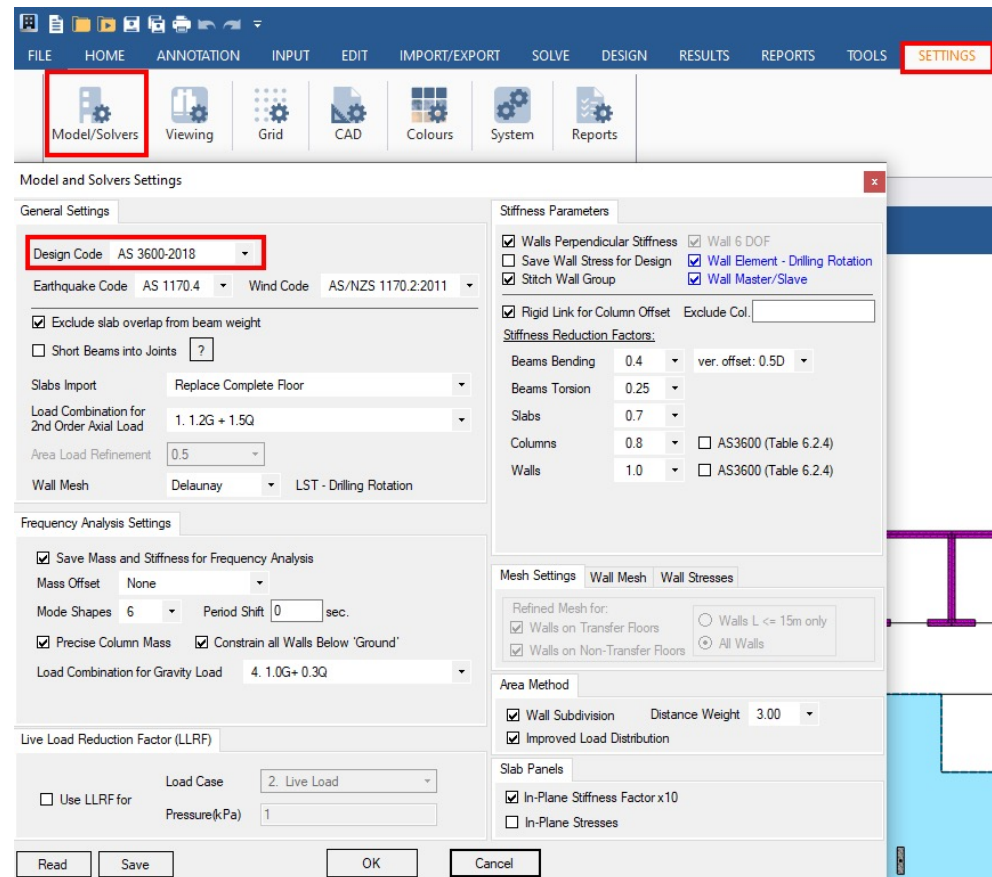
PROCESS – COLUMN DESIGN & SCHEDULE



- **Global Column Design Parameters:** a single set of design parameters applied to ALL columns
- **Column Group:** a collection of columns that will have a single set of design parameters applied to the columns (worst case or user defined) within the group.

PREPARE THE MODEL

- **AS 3600 – 2018 set:** wall design & schedule only for 2018 version of the code.



PREPARE THE MODEL

- **Set Load Case Nature:** needed for β_D , Q/G and seismic load checks, forces modified by ductility.
- Envelope Load Cases can be adjusted within wall design per design setting if desired.

RCB v2.2.12 - C:\Users\marko\Download

FILE HOME ANNOTATION **INPUT** EDIT IMPORT/EXPORT SOLVE DESIGN RESULTS REPORTS TOOLS SETTINGS HELP

Storey Heights Master/Slave Levels Titles Initial Settlements Soil Properties Material Properties Material per Level Slab Structure Load Cases Load Factors Lateral Loads Lateral Load Locations Spectral Curves Library In-plane Slab Actions Walls

[RCB] - Load Case Labels

LC	RCB Label	Load Case Nature
1	Dead Load	Dead
2	Live Load	Live
3	Ex	Seismic
4	Ey	Seismic
5	Sx	Seismic
6	Sy	Seismic
7	Wind X	Wind
8	Wind Y	Wind
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Self-weight automatically included in load case: 1

[RCB] - Load Combination Labels and Factors [AS3600 - 2018]

No	RCB Load Combination Label	Env.	Fire
1	1.2G + 1.5Q	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	1.0G+1.0Q	<input type="checkbox"/>	<input type="checkbox"/>
3	1.0G+ 0.4Q	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	1.0G+ 0.3Q	<input type="checkbox"/>	<input type="checkbox"/>
5	G + 0.3Q + Ex + 0.3Ey	<input type="checkbox"/>	<input type="checkbox"/>
6	G + 0.3Q + Ex - 0.3Ey	<input type="checkbox"/>	<input type="checkbox"/>
7	G + 0.3Q - Ex + 0.3Ey	<input type="checkbox"/>	<input type="checkbox"/>
8	G + 0.3Q - Ex - 0.3Ey	<input type="checkbox"/>	<input type="checkbox"/>
9	G + 0.3Q + 0.3Ex + Ey	<input type="checkbox"/>	<input type="checkbox"/>
10	G + 0.3Q + 0.3Ex - Ey	<input type="checkbox"/>	<input type="checkbox"/>
11	G + 0.3Q - 0.3Ex + Ey	<input type="checkbox"/>	<input type="checkbox"/>
12	G + 0.3Q - 0.3Ex - Ey	<input type="checkbox"/>	<input type="checkbox"/>
13	G + 0.3Q + Sx + 0.3Sy	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14	G + 0.3Q + Sx - 0.3Sy	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15	G + 0.3Q - Sx + 0.3Sy	<input checked="" type="checkbox"/>	<input type="checkbox"/>
16	G + 0.3Q - Sx - 0.3Sy	<input checked="" type="checkbox"/>	<input type="checkbox"/>
17	G + 0.3Q + 0.3Sx + Sy	<input checked="" type="checkbox"/>	<input type="checkbox"/>
18	G + 0.3Q + 0.3Sx - Sy	<input checked="" type="checkbox"/>	<input type="checkbox"/>
19	G + 0.3Q - 0.3Sx + Sy	<input checked="" type="checkbox"/>	<input type="checkbox"/>
20	G + 0.3Q - 0.3Sx - Sy	<input checked="" type="checkbox"/>	<input type="checkbox"/>

PREPARE THE MODEL

- Exclude walls that will not be in schedule: set “Include Design” property to “No”

The screenshot displays the INDUCTA software interface. On the left is a 'Visibility' panel with sections for 'Working Area', 'Text Size', 'Colouring Element', and 'Visibility'. The 'Working Area' section includes icons for Slabs, Beams, Walls, Columns, and Loads. The 'Visibility' section has checkboxes for 'Slabs Current', 'Beams Current', 'Columns Above', 'Walls Above', 'Slabs Below', 'Beams Below', 'Columns Below', 'Walls Below', 'Wide Beams', 'Piles', 'Bracings', 'Support Lines', and 'Tendons'. The main window shows a structural model of a building floor with walls, beams, and columns. A red box highlights the 'Wall Design' properties panel in the top left corner of the model area. This panel has a 'Yes' button (highlighted in blue) and a 'No' button (highlighted in orange). The 'No' button is selected. On the right side of the interface is a 'Level' panel showing 'Bas 1' and 'Bas 2'. Below this is a 'Load Case' dropdown set to '1: Dead Load (Auto Self Weight)'. A table titled 'Wall 114' lists various properties and their values. The 'Include Design' property is highlighted with a red box and set to 'No'.

Wall 114	Values
Label	
x1, m	19.5
y1, m	33.1
x2, m	63.8
y2, m	33.1
Thickness, m	0.2
In-plane Fixity	Pin Top and Btm
Out-of-plane Fixity	Pin Top and Btm
Type	1
Partial Fixity	100%
Footing	No
Door/Window	No
Include Design	No

PREPARE THE MODEL

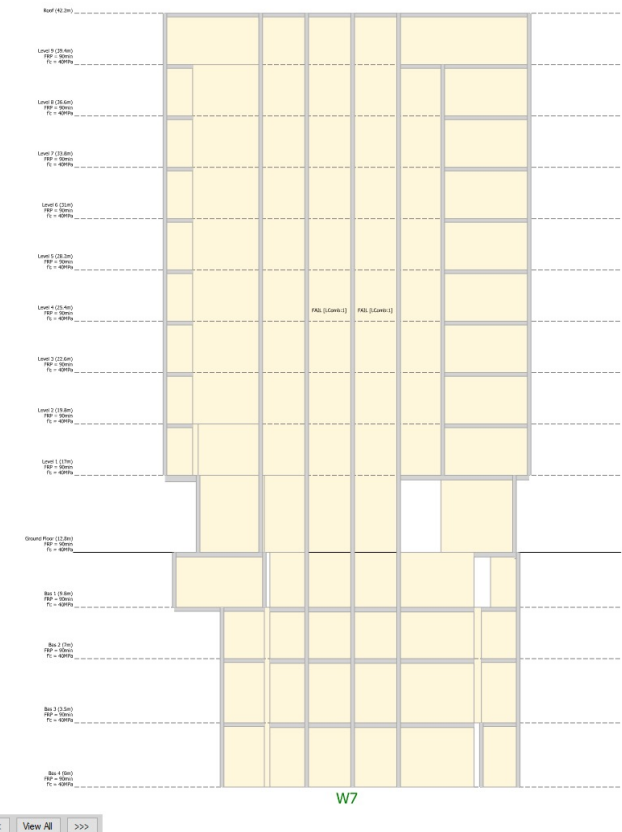
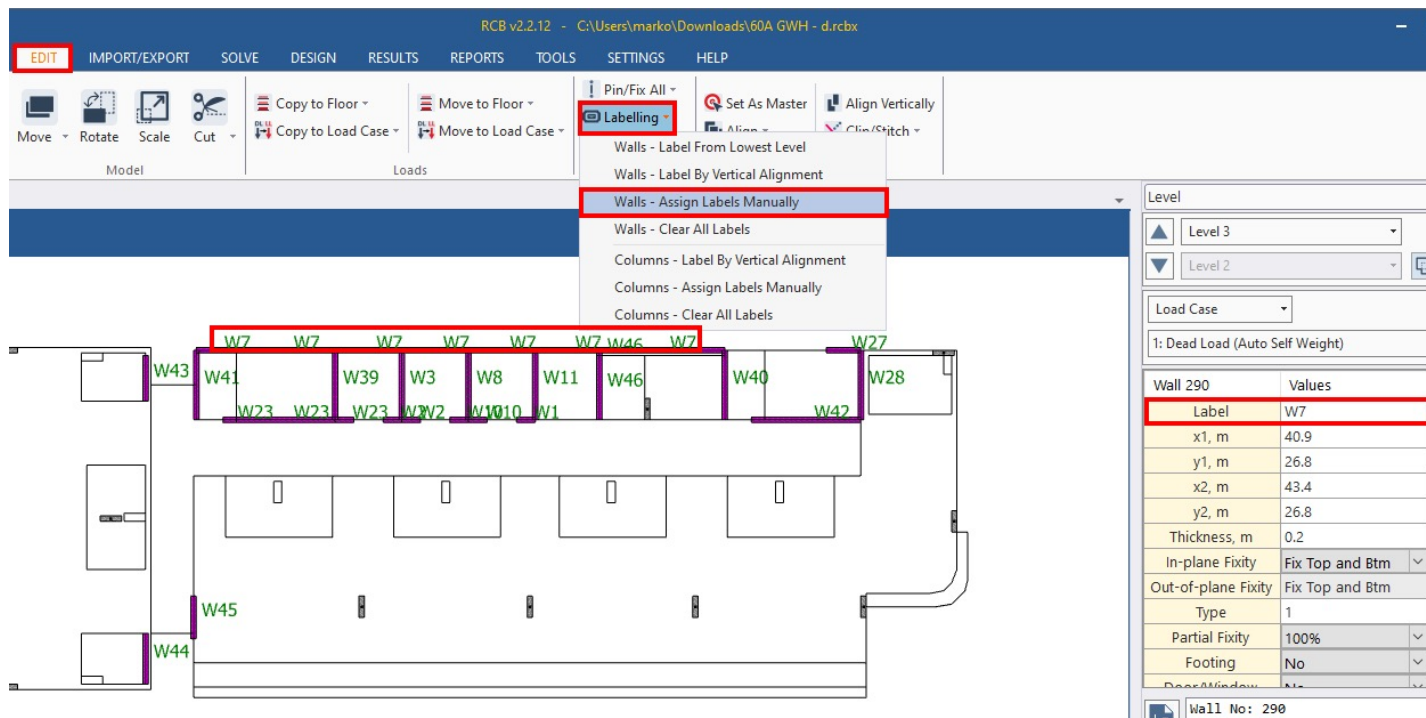
- **Set Wall Fixity:** default Design Settings will be applied to walls based on the fixity that is modelled.

The screenshot displays the INDUCTA software interface for Level 3. The 'Walls' tool is selected in the 'Colouring Element' toolbar. A 'Wall Fixity Type' dialog is open, showing 'F - F' and 'p - p' options. The 'In-plane Fixity' and 'Out-of-plane Fixity' are both set to 'Fix Top and Btm' in the properties panel.

Wall 90	Values
Label	W41
x1, m	30.7
y1, m	24.2
x2, m	30.7
y2, m	26.8
Thickness, m	0.2
In-plane Fixity	Fix Top and Btm
Out-of-plane Fixity	Fix Top and Btm
Type	1
Partial Fixity	100%
Footing	No
Door/Window	No
Include Design	Yes

PREPARE THE MODEL

- **Labels Walls:** Labels are used to create wall elevations. Edit > Labelling > Walls – Assign Labels Manually or Walls – Label by Vertical Alignment



PREPARE THE MODEL

- **Modelling of walls:** wall restraints
- Refer to following chapter in the user manual:
 - [[RCB](#) > [Design](#) > [Walls](#) > [Design and Schedule: AS 3600 - 2018](#) > [Model Preparation](#) > [Modelling Considerations](#) > [End Restraints](#)]
 - [[RCB](#) > [Design](#) > [Walls](#) > [Design and Schedule: AS 3600 - 2018](#) > [Model Preparation](#) > [Modelling Considerations](#) > [Shear Cores](#)]

Design

Reports

Stress Design

Design Settings

Wall Schedule

Design Set: 275 Walls

Walls All Walls

DESIGN

Total Walls: 275
Visible: 275
Design Set: 275
Selected: 3

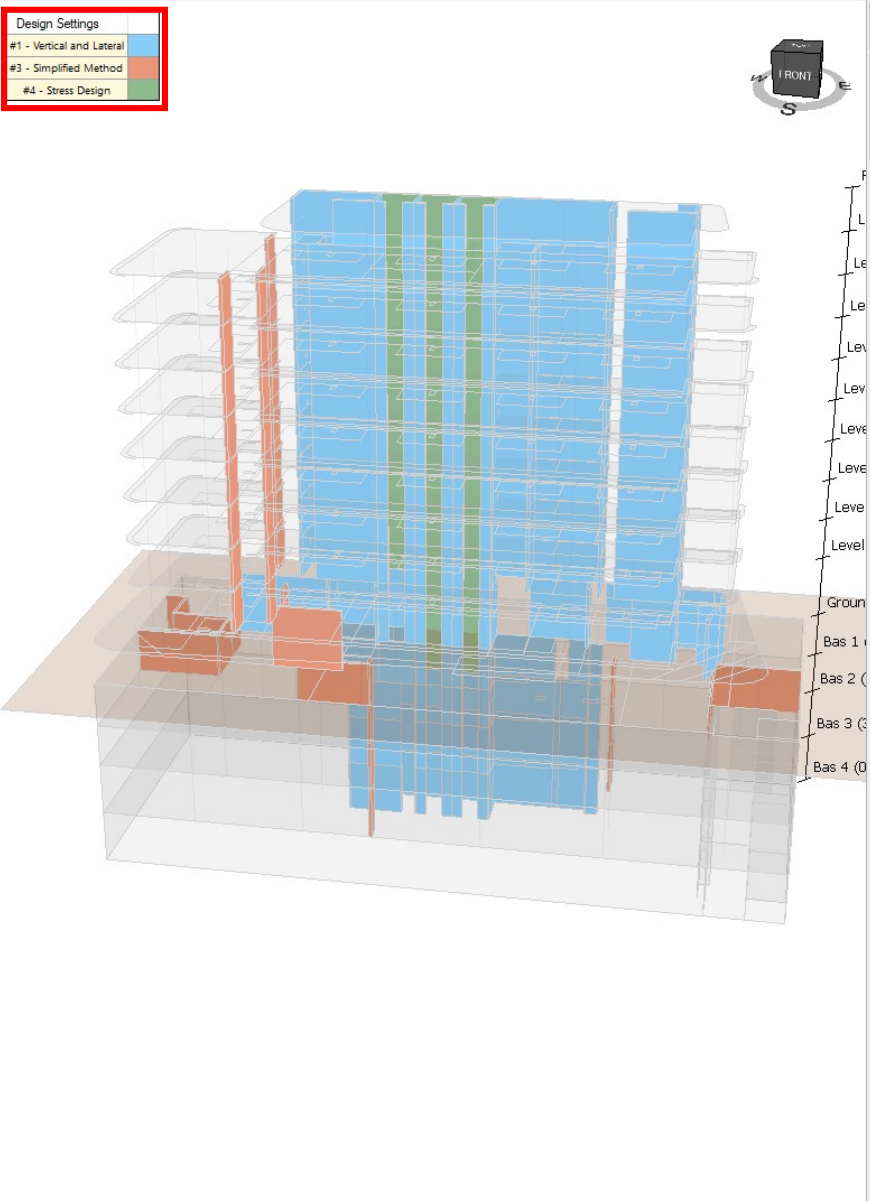
3D View Elevation

Overview

M, V, N, σ

Results

Design Results



Design Settings #1 - Vertical and Lateral (assigned to 229 total, 229 in Design Set)

#1 - Vertical and Lateral

AS 3600 - 2018 AMDTs No. 1 & No. 2

ENVELOPE

Section Properties

Geometry

Concrete

Reinforcement

Crack Control

Ties

Design Switches

Strength Design

Force

Fire Design

Shear Design

Earthquake Requirements

Design

Reports

Stress Design

Design Settings

Wall Schedule

Design Set: 275 Walls

Walls All Walls

DESIGN

Total Walls: 275
Visible: 275
Design Set: 275
Selected: 3

3D View Elevation

Overview

M, V, N, σ

Analysis Modified Design

Load Case

1. Dead Load

Scale

Results

Pass Fail

Fail Details

Design Results

Ast ☐ p ☐ nleg

Vertical ☐ Basic ☐ Critical Extra ☐ Boundary Extra ☐ Stress Extra

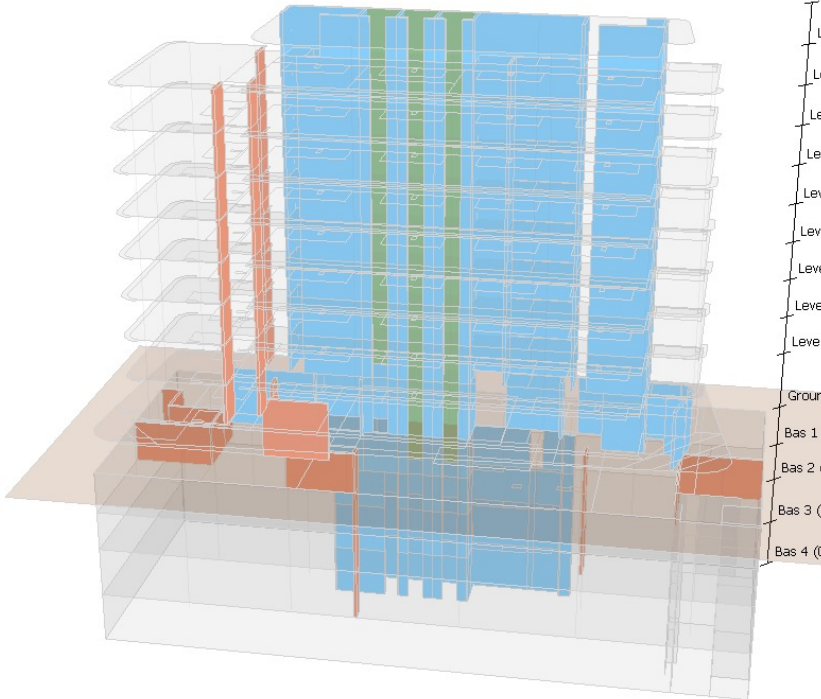
Horizontal ☐ Ties ☐

Design Settings

#1 - Vertical and Lateral

#3 - Simplified Method

#4 - Stress Design



Bas 1
Bas 2
Bas 3
Bas 4
Ground

Design Settings #3 - Simplified Method (assigned to 43 total, 43 in Design Set)

#3 - Simplified Method

New Update

Apply Settings to Design Set

Apply Settings to Selection

AS 3600 - 2018 AMDTs No. 1 & No. 2

Section 2 - Design Procedures, Actions and Loads

Section 5 - Fire Resistance Periods (FRPs)

Section 8 - Strength of Beams in Shear (applied if required)

Section 10 - Design of Columns

10.1 - Design as Column - Double Layer

10.1.2 - Minimum Bending Moment

10.3.1 (a) - Short Column Criteria for Braced Columns

10.4.2 - Moment Magnifier for Braced Columns

10.4.4 - Buckling Load

10.5.1 - Slenderness Criteria

10.5.2 - Radius Of Gyration

10.5.3 - Effective Height

10.6.2.1 - M-N Diagram

10.6.2.2 - Nuo, Squash Load

10.6.3 - Bending Moment Acting Separately

10.6.4 - Design for Biaxial Bending and Compression

10.7.1 (b) - Maximum Reinforcement Ratio

10.7.3 - Confinement (applied if required)

10.7.4 - Vertical Reinforcement Restraint Requirements

Section 11 - Design of Walls

Section 12 - Design of Non-Flexural Members

Section 14 - Design for Earthquake Actions

ENVELOPE

☒ LComb 1: 1.2G + 1.5Q

☐ LComb 2: 1.0G+1.0Q

☐ LComb 3: 1.0G+ 0.4Q

☐ LComb 4: 1.0G+ 0.3Q

☐ LComb 5: G + 0.3Q + Ex + 0.3Ey

☐ LComb 6: G + 0.3Q + Ex - 0.3Ey

☐ LComb 7: G + 0.3Q - Ex + 0.3Ey

☐ LComb 8: G + 0.3Q - Ex - 0.3Ey

☐ LComb 9: G + 0.3Q + 0.3Ex + Ey

☐ LComb 10: G + 0.3Q + 0.3Ex - Ey

☐ LComb 11: G + 0.3Q - 0.3Ex + Ey

☐ LComb 12: G + 0.3Q - 0.3Ex - Ey

☐ LComb 13: G + 0.3Q + Sx + 0.3Sy

☐ LComb 14: G + 0.3Q + Sx - 0.3Sy

☐ LComb 15: G + 0.3Q - Sx + 0.3Sy

☐ LComb 16: G + 0.3Q - Sx - 0.3Sy

☐ LComb 17: G + 0.3Q + 0.3Sx + Sy

☐ LComb 18: G + 0.3Q + 0.3Sx - Sy

☐ LComb 19: G + 0.3Q - 0.3Sx + Sy

☐ LComb 20: G + 0.3Q - 0.3Sx - Sy

#3 - Simplified Method - Setting Details

Section Properties

Geometry

Height for H / L

total wall height

Ignore intersecting walls with L < 0.2Hw

Minimum Aspect Ratio

Concrete

Clear Cover, mm

Reinforcement

f_{yk}, MPa

Layers (Auto)

Max tw for single layer

Wall Design Strategy: 2 (350)

Ratio

Crack Control

Exposure Classification

Degree of Crack Control

Ties

f_{yk}, MPa

Tie Diam., mm

Tie Space, mm

Design Switches

Ductility for Design

Non Ductile, $\mu = 1$

Strength Design

as Column

Simplified Method

Site Sub-soil Class

Shallow Soil, Ce

Stress Design

Check Principal Compressive Stress Limit

Force

Design Axial Load

Static

$\beta d = G/(G+Q)$

Q / G

Axial Tension Check

For Eq actions: $\mu = 1.0$, $S_p = 1.0$

Ignore $\sigma_t < 1$ MPa

Stress Calculations

N gravity by Static, M gravity by Static

Ignore Mmin

Ignore M, V for Gravity Load

Ignore M, V for Pin-Pin Walls

Ignore Out-of-Plane M, V

Ignore Out-of-Plane Buckling

Fire Design [LComb: 3]

FRP (min)

Exposed

on two sides

lo fi = 0.5Lu for Table 5.6.4

Overwrite any moment with Mmin w/ single curvature

Shear Design

In-Plane as Wall

Ignore V*

In-Plane as Beam

Reversal of loads: Vuc = 0 kN

Out-of-Plane as Beam

Waive transv. spacing to Cl. 8.3.2.2

Earthquake Requirements

Load Comb. for Seismic Weights

Non Ductile, $\mu = 1$

Boundary Elements

Critical Tension Zones

Minimum In-Plane Shear Capacity

Restraint of Vert. Reinf.

REPORT

All Walls

Detailed

EXIT >>>

Design

Reports

Stress Design

Design Settings

Wall Schedule

Design Set: 275 Walls

Walls All Walls

DESIGN

Total Walls: 275
Visible: 275
Design Set: 275
Selected: 3

3D View Elevation

Overview

M, V, N, σ

Load Case

1, Dead Load

Scale

Results

Pass | Fail

Fail Details

Design Results

Vertical Basic
Horizontal Critical Extra
Ties Boundary Extra
Stress Extra

Design Settings

#1 - Vertical and Lateral

#3 - Simplified Method

#4 - Stress Design

3D View

Elevation

Overview

M, V, N, σ

Load Case

1, Dead Load

Scale

Results

Pass | Fail

Fail Details

Design Results

Vertical Basic
Horizontal Critical Extra
Ties Boundary Extra
Stress Extra

Design Settings #4 - Stress Design (assigned to 3 total, 3 in Design Set)

#4 - Stress Design

New Update

Apply Settings to Design Set

Apply Settings to Selection

AS 3600 - 2018 AMDTs No. 1 & No. 2

Section 2 - Design Procedures, Actions and Loads

Section 5 - Fire Resistance Periods (FRPs)

Section 8 - Strength of Beams in Shear

Section 10 - Design of Columns

10.1 - Design as Column - Double Layer

10.1.2 - Minimum Bending Moment

10.3.1 (a) - Short Column Criteria for Braced Columns

10.4.2 - Moment Magnifier for Braced Columns

10.4.4 - Buckling Load

10.5.1 - Slenderness Criteria

10.5.2 - Radius Of Gyration

10.5.3 - Effective Height

10.6.2.1 - M-N Diagram

10.6.2.2 - Nuc. Squash Load

10.6.3 - Bending Moment Acting Separately

10.6.4 - Design for Biaxial Bending and Compression

10.7.1 (b) - Maximum Reinforcement Ratio

10.7.3 - Confinement

10.7.4 - Vertical Reinforcement Restraint Requirements

Section 11 - Design of Walls

Section 12 - Design of Non-Flexural Members

Section 14 - Design for Earthquake Actions

ENVELOPE

LComb 1: 1.2G + 1.5Q

LComb 2: 1.0G+1.0Q

LComb 3: 1.0G+ 0.4Q

LComb 4: 1.0G+ 0.3Q

LComb 5: G + 0.3Q + Ex + 0.3Ey

LComb 6: G + 0.3Q + Ex - 0.3Ey

LComb 7: G + 0.3Q - Ex + 0.3Ey

LComb 8: G + 0.3Q - Ex - 0.3Ey

LComb 9: G + 0.3Q + 0.3Ex + Ey

LComb 10: G + 0.3Q + 0.3Ex - Ey

LComb 11: G + 0.3Q - 0.3Ex + Ey

LComb 12: G + 0.3Q - 0.3Ex - Ey

LComb 13: G + 0.3Q + Sx + 0.3Sy

LComb 14: G + 0.3Q + Sx - 0.3Sy

LComb 15: G + 0.3Q - Sx + 0.3Sy

LComb 16: G + 0.3Q - Sx - 0.3Sy

LComb 17: G + 0.3Q + 0.3Sx + Sy

LComb 18: G + 0.3Q + 0.3Sx - Sy

LComb 19: G + 0.3Q - 0.3Sx + Sy

LComb 20: G + 0.3Q - 0.3Sx - Sy

#4 - Stress Design - Setting Details

Section Properties

Geometry

Height for H / L

total wall height

Ignore intersecting walls with L < 0.2Hw

Concrete

Clear Cover, mm

Reinforcement

Allowable Steel, MPa

Layers (Auto)

Max tw for single layer

Extra Reinforcement

Anchorage L, mm

Smooth Extra Bars

Crack Control

Service LComb

Ties

f_{ty} f, MPa

Design Switches

Ductility for Design

Strength Design

as Column

Simplified Method

Stress Design

Check Principal Compressive Stress Limit

Force

Design Axial Load

β d = G/(G+Q)

Axial Tension Check

For Eq actions: μ = 1.0, Sp = 1.0

Stress Calculations

Ignore Mmin

Ignore M, V for Gravity Load

Ignore M, V for Pin-Pin Walls

Fire Design [LComb: 3]

FRP (min)

Exposed

Shear Design

In-Plane as Wall

In-Plane as Beam

Out-of-Plane as Beam

Earthquake Requirements

Load Comb. for Seismic Weights

Non Ductile, μ = 1

Boundary Elements

Minimum In-Plane Shear Capacity

Restraint of Vert. Reinf.

REPORT

All Walls

Detailed

EXIT >>>

DESIGN SETS

- Subset of walls to show in the design view
- The walls that will be designed when “Design” is pressed.
- These walls will be designed with the Design Settings that have been applied to them.
- More than one Design setting can be present in a design set.

Wall Design, AS 3600 - 2018 AMDTs No. 1 & No. 2

Design Set: 163 Walls

Walls by Level

To Roof

From Level 1

DESIGN

Total Walls: 275
Visible: 275
Design Set: 163
Selected: 0

3D View Elevation

Overview

M, V, N, σ

Analysis Modified Design

Load Case

1. Dead Load

Scale

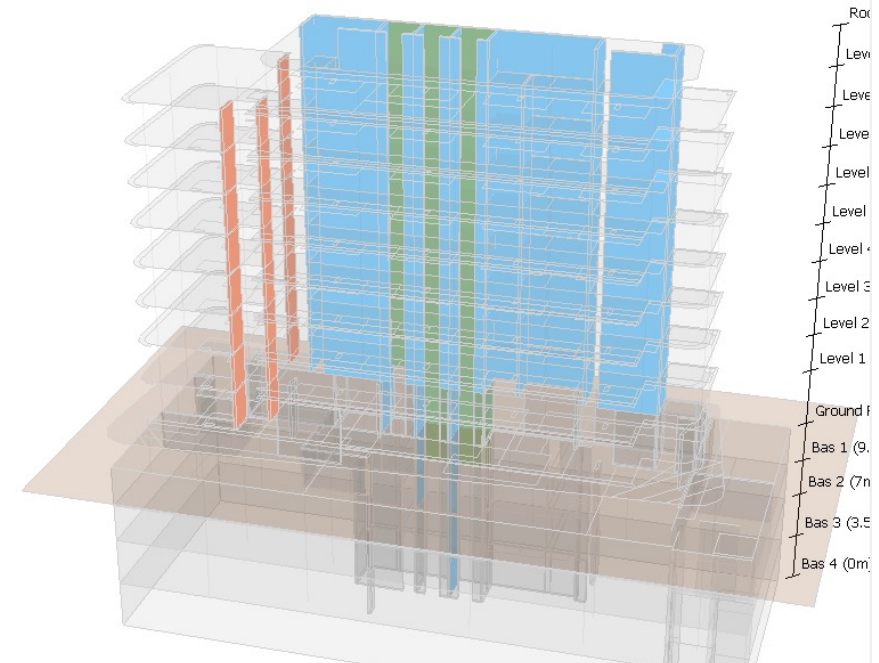
Results

Pass | Fail Fail Details

Design Results

Asst P

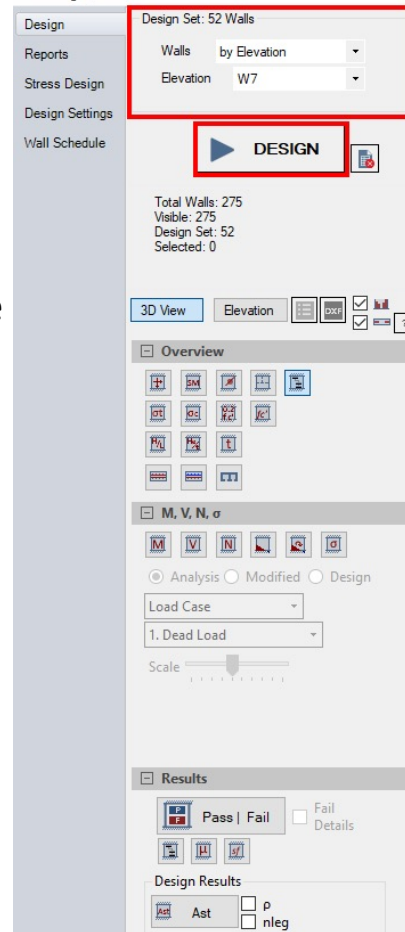
Design Settings	
#1 - Vertical and Lateral	
#3 - Simplified Method	
#4 - Stress Design	



DESIGNING THE WALLS

- When “Design” is pressed the design parameters from each Design Walls Design Settings are applied to it.
- It is then Designed.
- Only Walls in the active Design Set are designed.
- If other Design Walls have results and are not in this design set, their results will stay.

Wall Design, AS 3600 - 2018 AMDTs No. 1 & No. 2



Design Settings	
#1 - Vertical and Lateral	
#4 - Stress Design	

