Introducing RISAFloor ES
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INTRODUCING RISA FLOOR ES

ES = Elevated Slab Design

What's the Difference in Floor Types?

[Diagram showing floor plan creation options: Label: Floor Plan 1, Floor Type: Concrete Floor Slab, Beam Supported Floor, Floor Creation Options: Original Floor]
INTRODUCING RISAFLOOR ES

ES = Elevated Slab Design

- Two-Way Slab Design based ACI 318-11, ACI 318-08
  ACI Defines Two-Way Slab: “slab system reinforced for flexure in more than one direction, with or without beams between supports.”

- Design using Equivalent Frame Method

- Automated or manual design strips based on support lines

- Punching Shear Checks

RISAFLOOR ES BUILDING MODELS

- Multi-story Concrete Buildings
- Podium Style Building
- Concrete & Steel
- Concrete & Masonry
- Concrete & Wood or CFS
- Single Story Concrete Slab
- One-Way Slab with T or L Beams
SLABS

- Any shape or size or thickness
- Customize the material properties
- Openings anywhere within the slab
- Beams not required!

SLABS

- Automatic FEM model
- Cracked Section Analysis
- Deflection, Shear and Moment Contours
DESIGN STRIPS

Design Strip = Region of Reinforcement Design

Step 1: Layout the Support Lines
Step 2: Generate Design Strips
Step 3: Review and Modify Design Strip Area's

EQUIVALENT FRAME METHOD

ACI 13.5.1 Design Procedures
ACI 13.7.2- Equivalent Frame
DESIGN

Auto Design Strips Generation

DESIGN

Design Strips

Design Cut

Internally Broken into Design Cuts
EQUIVALENT FRAME METHOD

How are the Strip Widths calculated?

\[ w_{\text{tot}} = \min \left( \frac{l_{\text{strip}}}{2} - \frac{l_{\text{h}}}{2}, \frac{l_{\text{strip}}}{2} - \frac{l_{\text{h}}}{2}, \frac{l_{\text{strip}}}{4} \right) + \min \left( \frac{l_{\text{strip}}}{2} - \frac{l_{\text{h}}}{2}, \frac{l_{\text{strip}}}{2} - \frac{l_{\text{h}}}{2}, \frac{l_{\text{strip}}}{4} \right) \]

(Noted in the Help file)

DESIGN

➢ To optimize reinforcement ➢ Design Strips bound by the lines of zero shear.
DESIGN RESULTS - CUTS

Area of Steel Required

Step 1 (Analysis): Calculate the area steel required by analysis.

Step 2 (Min Flex): Check ACI 10.5.1 Min reinforcement for flexure.

Step 3 (4/3): Check ACI 10.5.3 4/3*As required by analysis.

DESIGN RESULTS - DETAIL REPORT

Top Reinforcement

Step 1: Find the required length by analysis - Zero Moment location

Step 2: Calculate the development length ACI 12.2.2 & 12.10.3.

Step 3: Add Step 1 + Step 2 and check the minimum extensions ACI Fig 13.3.8.
DESIGN RESULTS - DETAIL REPORT

Bottom Reinforcement
Considered Continuous across the span

DEFLECTION

Slab Point Deflection
- Based on FEM results
- Requires Service Checkbox turned on in LC
- Deflection Results based on Plate Corner Points
DEFLECTION

Slab Strip Deflection
- Based on Support Lines
- Calculated for each Load Category defined in Slab Design Rules
- Results shown in Detail Report and Spreadsheet

PUNCHING SHEAR

ACI 11.11 requires:
- One-way Shear
- Two-way action Shear aka Punching Shear \( \rightarrow \) Governs

Shear Caps - ACI 13.2.6