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Design Rules of Thumb

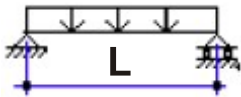


Scott Weiland has over 22 years experience in the design and construction industry

In the early stages of a project we are often asked how large structural elements will be before we have had a chance to perform the necessary computations. We have found the following rules of thumb to be useful in estimating the approximate depth of a structural member as well as reviewing the reasonableness of a design. We thought our readers might find these rules of thumb useful as well.



It is important to note however, that the depth of a member is influenced not only by the span but by such variables as spacing, loads and support conditions as well. The final member design should be based on computations performed by a licensed structural engineer.



| Structural Element | Structural Depth |
|--------------------------------|--------------------|
| Concrete | |
| Hollow Core Floor Slabs | L/30 to L/40 |
| Hollow Core Roof Slabs | L/40 to L/50 |
| Prestressed Floor Tees | L/25 to L/35 |
| Prestressed Roof Tees | L/35 to L/40 |
| Prestressed Beams | L/10 to L/20 |
| Two-Way Slab | Slab Perimeter/180 |
| Flat Slab w/ Drop Panels | L/33 |
| Stair Slab | L/26 |
| One-Way Slab - Simple Supt. | L/20 |
| One-Way Slab - One End Cont. | L/24 |
| One-Way Slab - Both Ends Cont. | L/28 |
| One-Way Slab - Cantilever | L/10 |
| Beams/Joists - Simple Supt. | L/16 |
| Beams/Joists - One End Cont. | L/18.5 |
| Beams/Joists - Both Ends Cont. | L/21 |
| Beams/Joists - Cantilever | L/8 |
| Tilt-Up Floor Slab | 5" Min. |
| Tilt-Up Wall Panel | H/48 |
| Column | H/14 |
| Cantilever Retaining Wall | H/10 to H/12 |
| Basement Retaining Wall | H/15 |

For complete article including a list of references, please visit our web site - www.ieiusa.com.

FIRST ISSUE

Welcome to the first issue of the IEI EXPRESSION. The intent of the Expression is to provide useful structural engineering information to our clients and friends in a format which can be easily retained and retrieved for future use. Please let us know if you would like to read an article about a particular structural issue that is of interest to you. Articles will also be available on our web site.

www.ieiusa.com

FEATURE PROJECT

We are proud to be a member of the Moma Architecture team in the development of a 41 acre site for St Francis High



CAFETERIA BUILDING

School in Alpharetta, Georgia. The campus consists of classroom, cafeteria and gymnasium buildings. The auditorium and library are currently under construction and the second gymnasium is in the design phase. St Francis is



a private, nonprofit, nondenominational school that has been providing high quality education to children since 1976. The school prides itself on its small teacher-pupil ratio.

| Structural Element | Structural Depth |
|----------------------------|---|
| Masonry | |
| Wall w/Nominal Reinforcing | H/20 |
| Wall w/Heavy Reinforcing | H/30 |
| Steel | |
| Floor Beam/Joist | L/20 |
| Composite Floor Beam | L/22 |
| Roof Beam/Joist | L/24 |
| Joist Girder | L/12 |
| Truss | L/12 |
| Space Frame | L/12 to L/20 |
| Wood | |
| Nominal Joist | L/24 |
| Nominal Scissor Truss | 3:12 Diff. Between Top & Bot. Chord or Bot. Chord Pitch 1/2 of Top Chord Pitch. |
| Nominal Flat Truss | L/14 |
| Timber Bowstring Truss | L/6 to L/8 |
| Timber Gable Truss | L/6 Min. |
| Timber Flat Truss | L/8 to L/10 |