Wtca Update

Introduction to The Load Guide (TLG) - Part 1

by WTCA Staff

The Load Guide (TLG) is a helpful new tool for truss technicians to calculate proper roof and floor truss loading.

Building codes require that all necessary information be provided as part of the construction documents, including structural loading information, either by prescriptive methods or by providing engineering guidelines. Trusses and other structural building components (SBC) require a clear presentation of design loads and their application on the structure as detailed by the building designer. WTCA, in cooperation with the Truss Plate Institute (TPI), has created a Microsoft Excel® spreadsheet program, that is essentially a comprehensive **LOAD CALCULATOR,** intended to help with developing the proper loading for roof and floor structural building components.

We have called it the GUIDE TO GOOD PRACTICE FOR SPECIFYING & APPLYING LOADS TO STRUCTURAL BUILDING COMPONENTS (The Load Guide [**TLG**]). We have made this guide freely available for download from the WTCA web site (www.woodtruss.com/loads.php).

TLG is intended to be used by building designers (architects and engineers), building code officials, component manufacturers, truss designers and truss technicians, with the goal of helping everyone that uses it to more easily understand, define and specify all the loads that should be applied to the design of each structural building component used to resist these loads. It is purely a guide to be used, similar in concept to that of a calculator, and is not intended to replace engineering analysis nor engineering judgment.

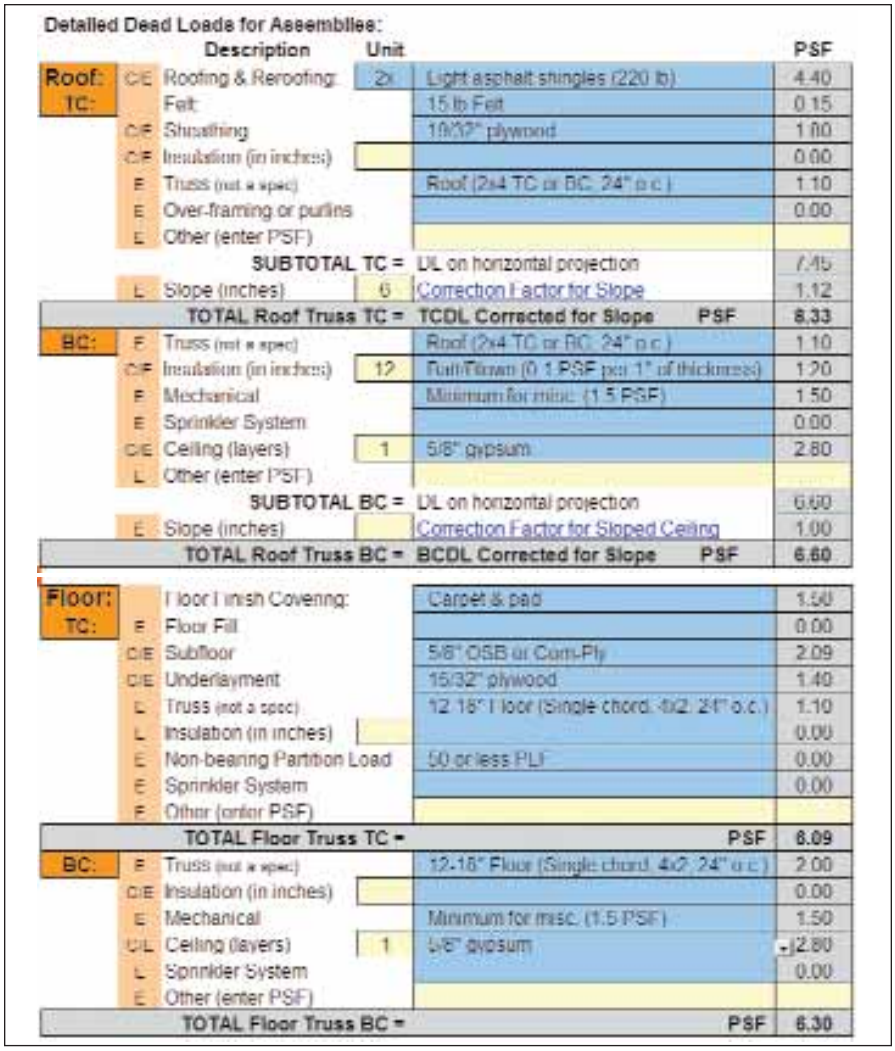
TLG provides summary sheets for roof truss and floor truss live and environmental loads and load design parameters, as well as a calculator for dead loads commonly used in light frame construction. These summary sheets are linked to commentary pages that include code interpretation, examples and discussion regarding application of loads. The 2003 International Building Code (IBC) and the International Residential Code (IRC), as well as SEI/ASCE 7-02, Minimum Design Loads for Buildings and Other Structures, are the basis for the discussions. Although local code variations may be mentioned, **TLG** does not include a discussion of all local amendments.

The positions, interpretations, comparisons and commentary included in **TLG** are intended to assist anyone using it with specifying and applying loads on trusses and structural building components. They are intended to aid in the consistent interpretation and application of loads, yet are not intended to supersede an architect or engineer's judgment and design specification for the loads that should be applied to a specific building.

To assist in the process of verifying that all load information is provided for review, some code jurisdictions have developed summary pages to consolidate specific loading information from the construction documents into one location. Generally, the content and format varies greatly. Our industry's approach with **TLG** has been to focus on what information is required to properly design a structural building component and place it into a form that is easy to use. Our forms follow:

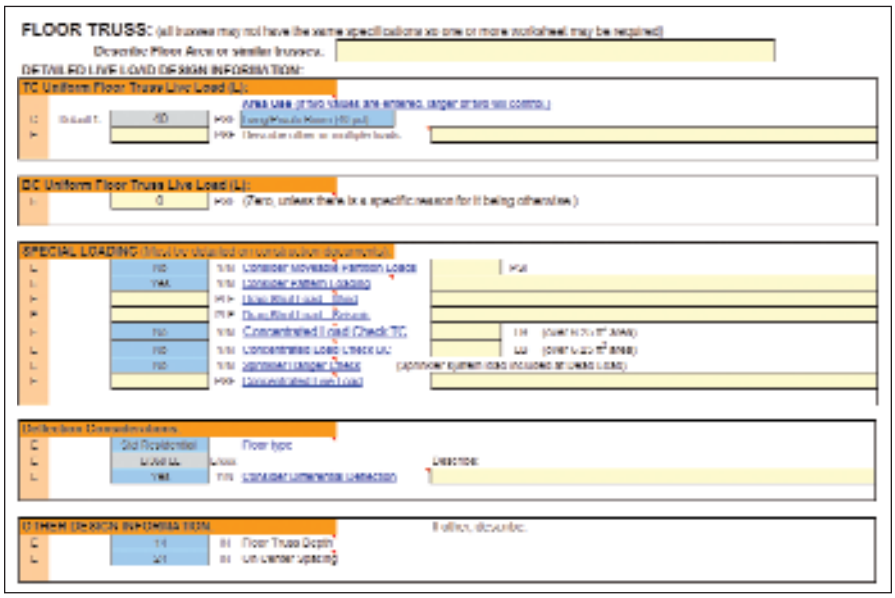
at a glance

- ❑ WTCA has created a spreadsheet program that is essentially a comprehensive CODE CALCULATOR.
- ❑ The goal of TLG has been to provide a standardized format that can be used:
  - To quickly and easily define the loads to be applied to trusses and structural building components.
  - By jurisdictions that require loading summary pages to be produced as part of the construction project submittal process.



Detailed Dead Loads for Assemblies:

		Description	Unit		PSF
Roof: TC:	C/E	Roofing & Reroofing:	2k	Light asphalt shingles (220 lb)	4.40
		Felt:		15 lb Felt	0.15
	C/E	Sheathing		19/32" plywood	1.80
	C/E	Insulation (in inches):			0.00
	E	Truss (not a spec)		Roof (2x4 TC or BC, 24" o.c.)	1.10
	E	Over-framing or purlins			0.00
	E	Other (enter PSF)			
		SUBTOTAL TC =		UL on horizontal projection	7.45
	L	Slope (inches)	6	Correction Factor for Slope	1.12
		TOTAL Roof Truss TC =		TCDL Corrected for Slope PSF	8.33
BC:	E	Truss (not a spec)		Roof (2x4 TC or BC, 24" o.c.)	1.10
	C/E	Insulation (in inches):	12	Batt/Blown (0.1 PSF per 1" of thickness)	1.20
	E	Mechanical		Minimum for misc. (1.5 PSF)	1.50
	E	Sprinkler System			0.00
	C/E	Ceiling (layers)	1	5/8" gypsum	2.80
	L	Other (enter PSF)			
		SUBTOTAL BC =		UL on horizontal projection	6.60
	E	Slope (inches)		Correction Factor for Sloped Ceiling	1.00
		TOTAL Roof Truss BC =		BCDL Corrected for Slope PSF	6.60
Floor: TC:		Floor Finish Covering:		Carpet & pad	1.50
	E	Floor Fill			0.00
	C/E	Subfloor		5/8" OSB or Com-Ply	2.09
	C/E	Underlayment		15/32" plywood	1.40
	L	Truss (not a spec)		12 16" I floor (Single chord, 4x2, 24" o.c.)	1.10
	L	Insulation (in inches)			0.00
	E	Non-bearing Partition Load		50 or less PLF	0.00
	E	Sprinkler System			0.00
	E	Other (enter PSF)			
		TOTAL Floor Truss TC =		PSF	6.09
BC:	E	Truss (not a spec)		12-16" Floor (Single chord, 4x2, 24" o.c.)	2.00
	C/E	Insulation (in inches)			0.00
	E	Mechanical		Minimum for misc. (1.5 PSF)	1.50
	C/L	Ceiling (layers)	1	5/8" gypsum	2.80
	L	Sprinkler System			0.00
	E	Other (enter PSF)			
		TOTAL Floor Truss BC =		PSF	6.30



FLOOR TRUSS: (all trusses may not have the same specifications as one or more worksheets may be required)

Describe Floor Area or similar trusses.

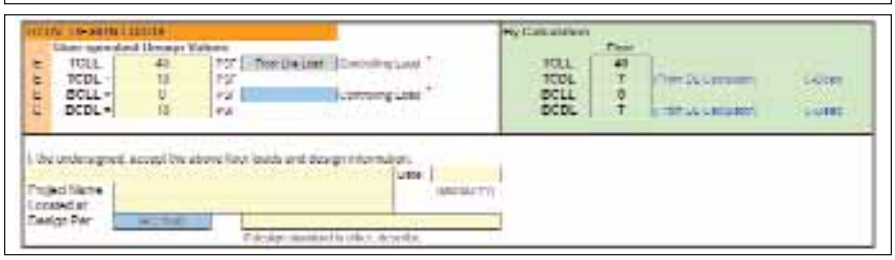
DETAILED LIVE LOAD DESIGN INFORMATION:

TC Uniform Floor Truss Live Load (L):

BC Uniform Floor Truss Live Load (L):

SPECIAL LOADING

OTHER DESIGN INFORMATION



Specifier Design Load Sign-off (typical for roofs and floors).

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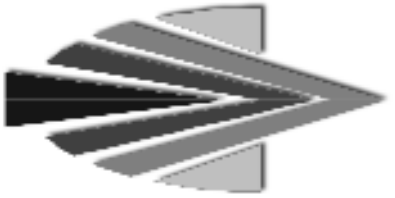

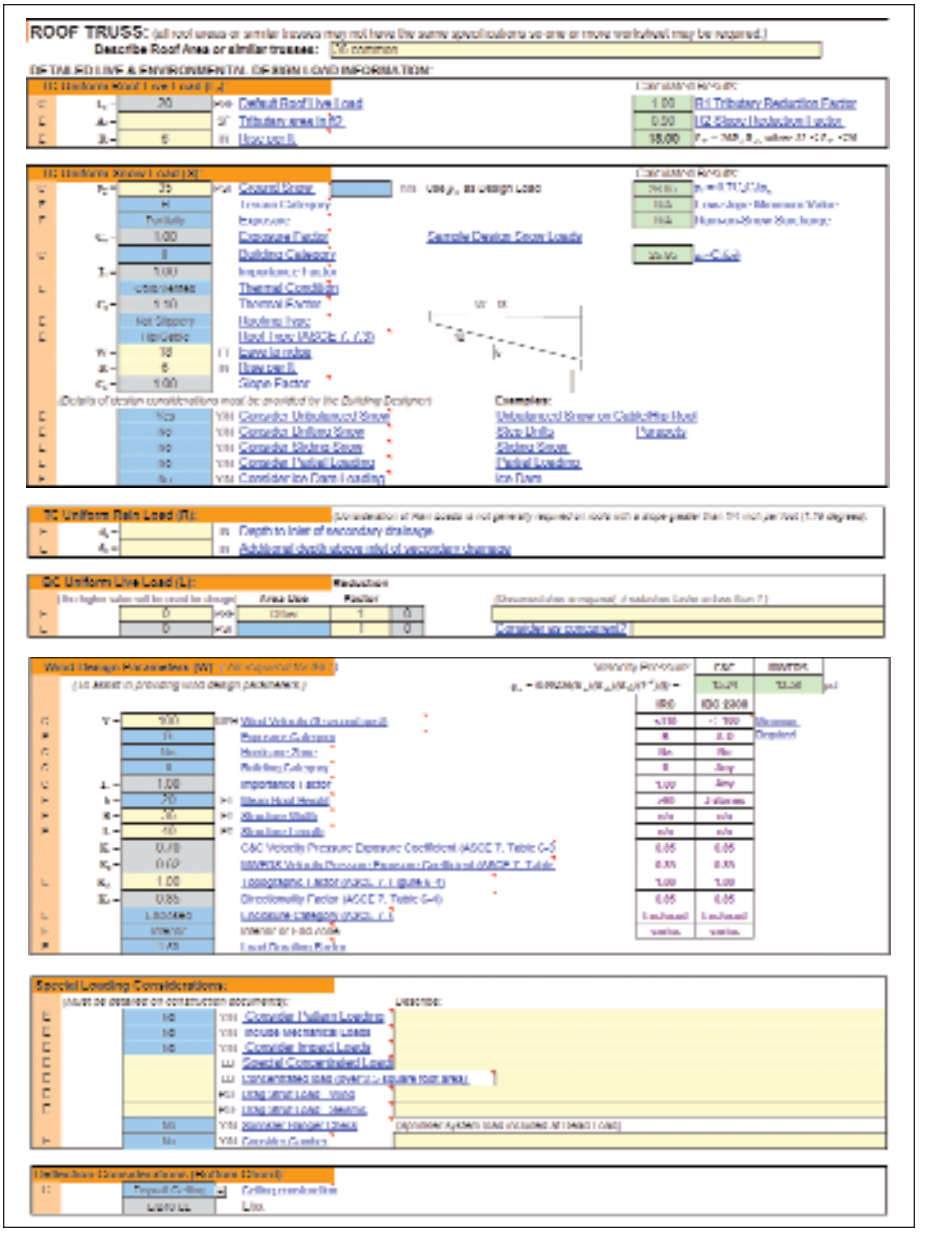

WTCA Update

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The goal of **TLG** has been to provide a standardized format:

- That can be used to quickly and easily define the loads to be applied to the specific roof or floor structural building component types created for a specific building.
- That can be used in jurisdictions that require loading summary pages to be produced as part of the project submittal process.
- That can be used by component manufacturers, Building Designers, Truss Designers and Building Officials to ensure that everyone involved in a project is talking the same code language.
- That can be used in the submittal process of any jurisdiction.
- That enhances uniformity of interpretation, so that the proper loads are applied to a structure, which will improve building safety. SBC

*Guide to Good Practice for Specifying & Applying Loads to Metal Plate Connected Wood Trusses (THE LOAD GUIDE **[TLG]**) is freely available for download from the WTCA web site (www.woodtruss.com/loads.php).*

As a point of comparison, the following are two examples of state forms that can easily be replaced by our industry standard TLG summary forms:

STRUCTURAL DESIGN

DESIGN LOADS:

Importance Factors: Wind (I_W) _____
Snow (I_S) _____
Seismic (I_E)

Live Loads: Roof _____ psf
Mezzanine _____ psf
Floor _____ psf

Snow Load: _____ psf

Wind Load: Basic Wind Speed _____ mph (ASCE-7-98)
Exposure Category _____
Wind Base Shears (for MWFRS) Vx = _____ Vy = _____

SEISMIC DESIGN CATEGORY A
Compliance with Section 1616.4 only? ☐ Yes ☐ No

SEISMIC DESIGN CATEGORY B, C, & D
Provide the following Seismic Design Parameters:
Seismic Use Group _____
Spectral Response Acceleration S_{MS} _____ %g S_{M1} _____ %g
Site Classification _____
Basic structural system (check one)
Bearing Wall Dual w/Special Moment Frame
_____ Building Frame _____ Dual w/Intermediate R/C or Special Steel
Moment Frame Inverted Pendulum
Seismic base shear V_X _____ V_Y _____
Analysis Procedure _____ Simplified _____ Equivalent Lateral Force
_____ Modal
Architectural, Mechanical, Components anchored? _____

LATERAL DESIGN CONTROL: Earthquake _____ Wind _____

SOIL BEARING CAPACITIES:
Field Test (provide copy of test report) _____ psf
Presumptive Bearing capacity _____ psf
Pile size, type, and capacity _____

SD-1

STRUCTURAL DESIGN WORKSHEET

- **Design loads** must be shown on construction documents:

Floor area use	live load shown
_____	_____PSF
	PSF
_____	_____PSF
_____	_____PSF

Are live load reductions used? _____

Building is in _____ county
Ground snow load P_g = _____ PSF (1608.2)
Snow load importance factor I_s = _____ (1608.3.3)
Snow load exposure factor C_e = _____ (1608.3.1)
Sloped roof/Flat roof factor C_s = _____ (1608.4)
Roof thermal factor C_t = _____ (1608.3.2)

Roof snow load from the above ground snow times adjustments is $PSF = P_g 0.7(I_s)(C_e)(C_t)(C_s)$

❑ Unbalanced or sliding or drifting snow locations and amounts are clearly shown on plans and calculations (1608.6 to 1608.9).

❑ Impact or concentrated load locations & amounts are shown on plans and in calculations (1607).

- **Wind** load resistance design method used? *ASCE 7* or *IBC 1609.6 Simplified for Low Rise*

Amount of openings on each side are: North East South West
Amount exterior wall on each side are: North East South West
Is building Open, Partially Enclosed, or Enclosed? _____ Worst case is _____% openings
Width of end zone = _____feet edge strip calculation =

Coefficients used

	Windward Wall		Leeward Wall		Windward Roof		Leeward Roof	
C_g MWFRS	End zone	Interior zone	End zone	Interior zone	End zone	Interior zone	End zone	Interior zone
Components & Cladding								

Wind load importance factor (I_w) _____ Building use is importance category _____

Exposure category: terrain is _____ North _____ K_z = _____
terrain is East K_z =
terrain is _____ South _____ K_z _____
terrain is _____ West _____ K_z = _____

Gust effect factor G = _____ Wind directionality factor K_d = _____

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