	Project details	Calculated by MM	Job no. G2
mpa The Concrete Centre	**G2.4 Actions: overall stability**	Checked by CIEG	Sheet no. 1/5
		Client TCC	Date Nov 2026

Example

For the building frame shown in Figure G2.4.1, identify the various load arrangements to check the overall stability against overturning. Assume that the structure is an office block and that the variable loads $q_{k,2}$ and $q_{k,3}$ may be treated as arising from one source.

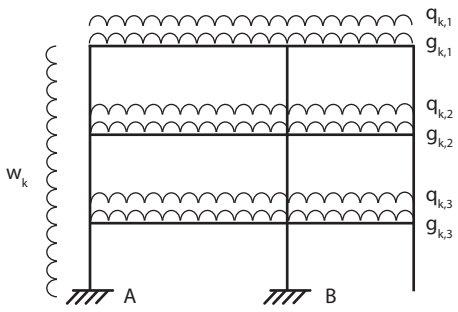


Figure G2.4.1: Frame configuration

General notes:

This calculation is intended to illustrate how to combine actions for the static equilibrium and uplift verification case VC2(a) and VC2(b) to Eurocode 0 while treating each of the office floor, roof and wind action as the leading variable action in turn. It also assesses whether the resulting effect of the action is favourable/stabilising or unfavourable/ destabilising. Notional horizontal forces and geometrical imperfections are not included for simplicity, although the structural effect of these should be assessed when considering the overall stability of any building. Snow loads are also ignored for simplicity.

This worked example is based on the versions of the codes of practice, guidance documents and publications as noted in the List of References. The user is responsible for ensuring that they use the latest version of the documents.

Abbreviations

General:	F.	Formula
	Fig.	Figure
	WE	Worked example
Codes of practice:	EC0-1	BS EN 1990-1:2023+A1:2026 [1]
	NA EC0-1	NA to BS EN 1990-1:2023+A1:2026 [2]
Guidance documents:	G2. How to	G2 - How to: Actions (2026) [3]

mpa The Concrete Centre	Project details **G2.4 Actions: overall stability**	Calculated by **MM**	Job no. **G2**
		Checked by **CIEG**	Sheet no. **2/5**
		Client **TCC**	Date **Nov 2026**

Notes:

For the overall stability of the building, EC0-1 F. (8.12) is used with the less favourable outcome for verification cases VC2(a) and VC2(b): static equilibrium and uplift.

EC0-1: Table A.1.3 & NA EC0-1: Table NA.3

(Alternatively, use How to look-up tables)

G2. How to: Table G2.8

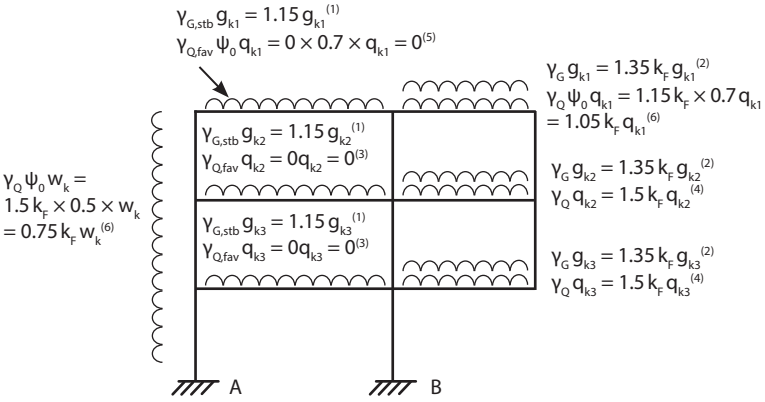
ψ_0 for wind action	=	0.5
ψ_0 for office load category B	=	0.7
ψ_0 for roof load category H (accessible for normal maintenance and repairs only)	=	0.7

NA EC0-1: Table NA.2
NA EC0-1: Table NA.2
NA EC0-1: Table NA.2

G2.4.1 Treating the floor imposed load as the leading variable action

i) Using verification case VC2(a)

EC0-1: Table A.1.3 & NA EC0-1: Table NA.3



Key:

(1) stabilising permanent load, same source*

(2) unfavourable permanent load

(3) leading variable load, favourable

(4) leading variable load, unfavourable

(5) accompanying variable load, favourable

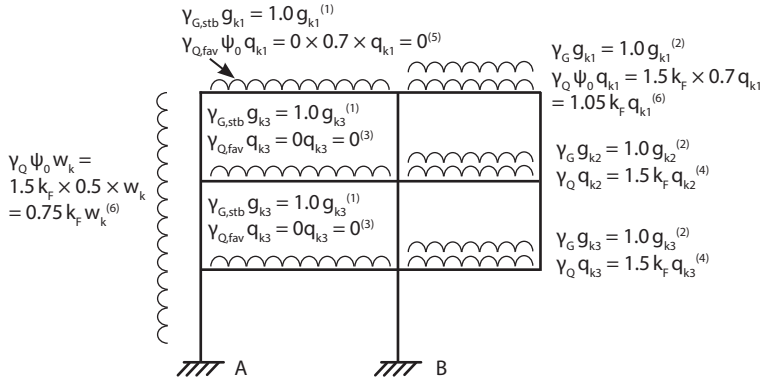
(6) accompanying variable load, unfavourable

Figure G2.4.2: Frame with office floor variable action as leading for VC2(a)

* Table NA.3 of NA EC0-1 distinguishes between a "stabilising" permanent action and a "favourable" permanent action and provides different values for the γ factor for each of the two actions. The notes to the same table define the two terms. A "stabilising" permanent action is an action that originates from a single source (i.e. same as the unfavourable permanent action), whereas a "favourable" permanent action is independent of the unfavourable permanent action.

ii) Using verification case VC2(b)

EC0-1: Table A.1.3 & NA EC0-1: Table NA.3



Key:

(1) stabilising permanent load, same source

(2) unfavourable permanent load

(3) leading variable load, favourable

(4) leading variable load, unfavourable

(5) accompanying variable load, favourable

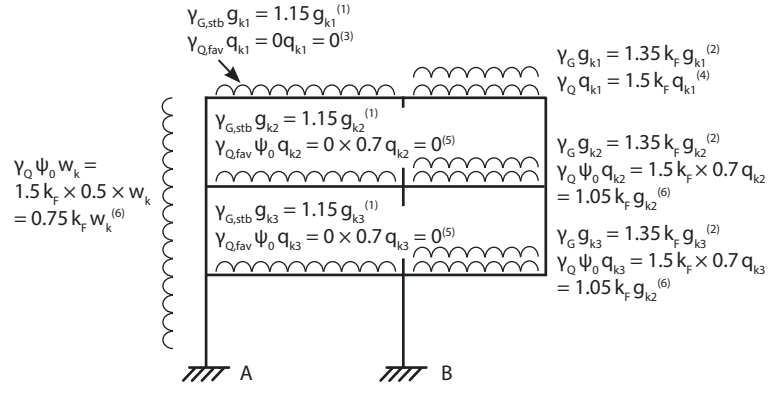
(6) accompanying variable load, unfavourable

Figure G2.4.3: Frame with office floor variable action as leading for VC2(b)

G2.4.2 Treating the roof imposed load as the leading variable action

i) Using verification case VC2(a)

EC0-1: Table A.1.3 & NA EC0-1: Table NA.3



Key:

(1) stabilising permanent load, same source

(2) unfavourable permanent load

(3) leading variable load, favourable

(4) leading variable load, unfavourable

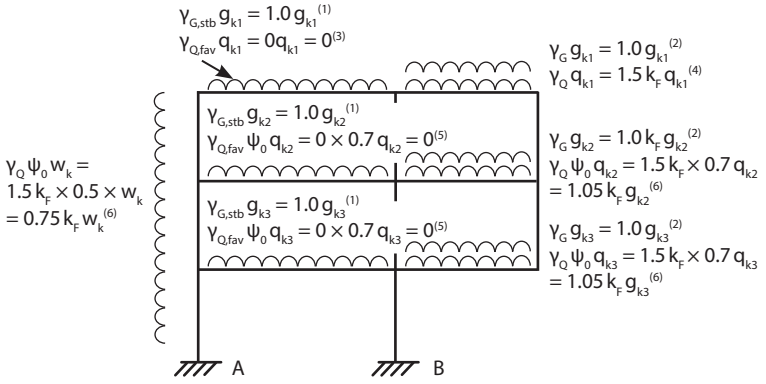
(5) accompanying variable load, favourable

(6) accompanying variable load, unfavourable

Figure G2.4.4: Frame with roof variable action as leading for VC2(a)

ii) Using verification case VC2(b)

EC0-1: Table A.1.3 & NA EC0-1: Table NA.3



Key:

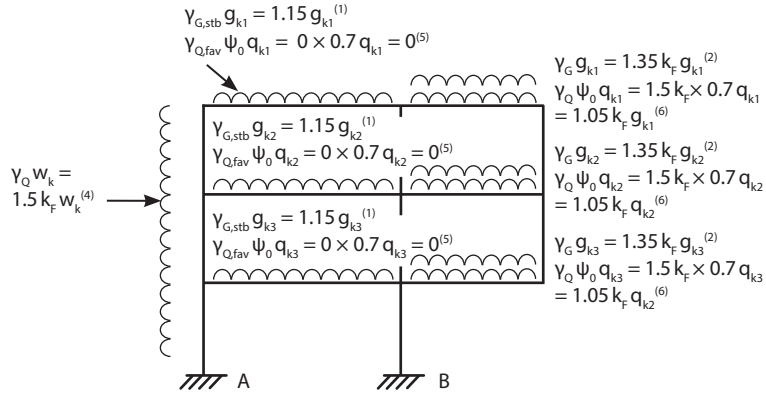
(1) stabilising permanent load, same source
(2) unfavourable permanent load
(3) leading variable load, favourable
(4) leading variable load, unfavourable
(5) accompanying variable load, favourable
(6) accompanying variable load, unfavourable

Figure G2.4.5: Frame with roof variable action as leading for VC2(b)

G2.4.3 Treating the wind imposed load as the leading variable action

i) Using verification case VC2(a)

EC0-1: Table A.1.3 & NA EC0-1: Table NA.3



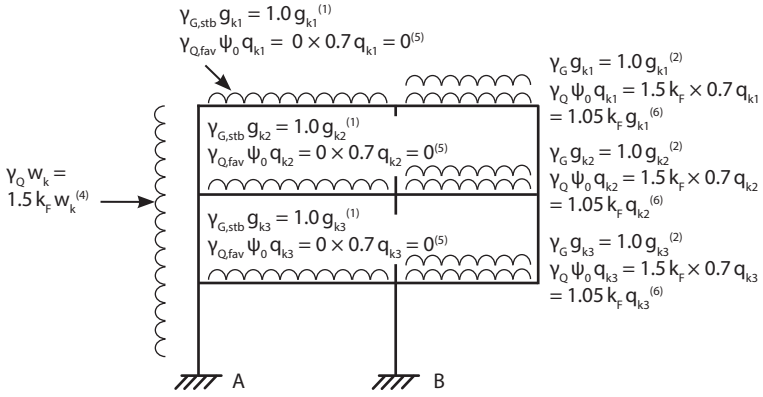
Key:

(1) stabilising permanent load, same source
(2) unfavourable permanent load
(3) leading variable load, favourable - N/A
(4) leading variable load, unfavourable
(5) accompanying variable load, favourable
(6) accompanying variable load, unfavourable

Figure G2.4.6: Frame with wind variable action as leading for VC2(a)

ii) Using verification case VC2(b)

EC0-1: Table A.1.3 & NA EC0-1: Table NA.3



Key:

(1) stabilising permanent load, same source

(2) unfavourable permanent load

(3) leading variable load, favourable – N/A

(4) leading variable load, unfavourable

(5) accompanying variable load, favourable

(6) accompanying variable load, unfavourable

Figure G2.4.7: Frame with wind variable action as leading for VC2(b)

List of references

[1] British Standards Institution. (2026) BS EN 1990-1:2023+A1:2026 Eurocode – Basis of structural and geotechnical design. Part 1: New structures. London, BSI.

[2] British Standards Institution. (2026) NA to BS EN 1990-1:2023+A1:2026 UK National Annex to Eurocode – Basis of structural and geotechnical design – Part 1: New structures. London, BSI.

[3] MPA The Concrete Centre. (2026) How to design concrete structures using Eurocode 2 (second generation). G2 – Actions. London, TCC.

Revision number	Revision date	Notes
1.0	Nov 2026	First publication

At the time of publication, work on the second generation of Eurocodes and supporting documents is ongoing. Where possible, this worked example has been developed based on the standards that have been published to date, but in some instances, the relevant documents have not yet been finalised and so anticipated values are included and clearly noted as such. Amendments are planned for all of the Eurocodes ahead of the March 2028 date of adoption and users are advised to ensure they are referring to the latest version of a standard or publication.

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