Initial Data:-

length of the hall: $l := 36\ m$

bay distance: $l_f := 6\ m$

Span of the frames: $b := 17.3\ m$

The height of the side walls: $h := 8.05\ m$

Inclination of the roofs: $\beta := 13\ deg$

Number of purlins: $n_p := 5$

Distance of the side purlin and the theoretical frame: $l_{p.h.1} := 800\ mm = 0.8\ m$

Diameter of screws: $D_s := 5.5\ mm$

Characteristic value of permanent load: $g_k := 0.73\ \frac{kN}{m^2}$

Characteristic value of the snow load: $q_k := 1\ \frac{kN}{m^2}$

---

$g_{k.per} := g_k \cdot \cos(\beta) = 0.711\ \frac{kN}{m^2}$

$q_{k.per} := q_k \cdot (\cos(\beta))^2 = 0.949\ \frac{kN}{m^2}$

Safety factors of permanent load: $\gamma_{g.sup} := 1.35$ $\gamma_{g.inf} := 1.0$

$g_{d.inf} := g_{k.per} \cdot \gamma_{g.inf} = 0.711\ \frac{kN}{m^2}$

$g_{d.sup} := g_{k.per} \cdot \gamma_{g.sup} = 0.96\ \frac{kN}{m^2}$

Safety factor of variable loads: $\gamma_q := 1.5$

Combination factor for snow: $\psi_s := 0.5$

Combination factor for wind: $\psi_w := 0.6$

Height at the middle:

$h_{tot} := h + \frac{b}{2} \cdot \tan(\beta) = 10.047\ m$

If the wind is parallel to the ridge:

$e_{par} := min(b, 2 \cdot h_{tot}) = 17.3\ m$

If the wind is perpendicular to the ridge:

$e_{per} := min(l, 2 \cdot h_{tot}) = 20.094\ m$

Length of trapezoidal sheets supported by $n_p$ number of purlins:

$s := \frac{\frac{b}{2} + l_{p.h.1}}{\cos(\beta)} = 9.699\ m$

Distance between two purlins:

$l_p := \frac{s}{n_p - 1} = 2.425\ m$

Loads on the Trapezoidal Sheets:-

Wind Sucking, crosswind:

$$w_{1.k.F.cs} := -1.46\ \frac{kN}{m^2} \cdot 1\ m = -1.46\ \frac{kN}{m}$$

$$w_{1.k.G.cs} := -1.16\ \frac{kN}{m^2} \cdot 1\ m = -1.16\ \frac{kN}{m}$$

$$w_{1.k.H.cs} := -0.66\ \frac{kN}{m^2} \cdot 1\ m = -0.66\ \frac{kN}{m}$$

$$w_{1.k.I.cs} := -0.35\ \frac{kN}{m^2} \cdot 1\ m = -0.35\ \frac{kN}{m}$$

$$w_{1.k.J.cs} := 0.02\ \frac{kN}{m^2} \cdot 1\ m = 0.02\ \frac{kN}{m}$$

Wind pressure, crosswind:

$$w_{1.k.FGH.cp} := 0.01\ \frac{kN}{m^2} \cdot 1\ m = 0.01\ \frac{kN}{m}$$

$$w_{1.k.IJ.cp} := -0.32\ \frac{kN}{m^2} \cdot 1\ m = -0.32\ \frac{kN}{m}$$

Wind Sucking, longitudinal:

$$w_{1.k.F.ls} := -1.30\ \frac{kN}{m^2} \cdot 1\ m = -1.3\ \frac{kN}{m}$$

$$w_{1.k.G.ls} := -1.19\ \frac{kN}{m^2} \cdot 1\ m = -1.19\ \frac{kN}{m}$$

$$w_{1.k.H.ls} := -0.71\ \frac{kN}{m^2} \cdot 1\ m = -0.71\ \frac{kN}{m}$$

$$w_{1.k.I.ls} := -0.35\ \frac{kN}{m^2} \cdot 1\ m = -0.35\ \frac{kN}{m}$$

Total Design Load for the Trapezoidal Sheets in ULS:

Crosswind Pressure, zones F,G,H:

$$P_{d.c.p.FGH} := \gamma_q \cdot q_{k.per} \cdot 1\ m + \gamma_q \cdot \psi_w \cdot w_{1.k.FGH.cp} = 1.433\ \frac{kN}{m}$$

Crosswind Pressure, zones I,J:

$$P_{d.c.p.IJ} := \gamma_q \cdot q_{k.per} \cdot 1\ m + \gamma_q \cdot \psi_w \cdot w_{1.k.IJ.cp} = 1.136\ \frac{kN}{m}$$

Crosswind Suction, zone F:

$$P_{d.c.s.F} := \gamma_q \cdot w_{1.k.F.cs} = -2.19\ \frac{kN}{m}$$

Crosswind Suction, zone H:

$$P_{d..c.s.H} := \gamma_q \cdot w_{1.k.H.cs} = -0.99\ \frac{kN}{m}$$

Crosswind Suction, zone I:

$$P_{d.c.s.I} := \gamma_q \cdot w_{1.k.I.cs} = -0.525\ \frac{kN}{m}$$

Crosswind Suction, zone J:

$$P_{d.c.s.J} := \gamma_q \cdot w_{1.k.J.cs} = 0.03\ \frac{kN}{m}$$

Longitudinal Suction, zone F:

$$P_{d.l.s.F} := \gamma_q \cdot w_{1.k.F.ls} = -1.95\ \frac{kN}{m}$$

Longitudinal Suction, zone G:

$$P_{d.l.s.G} := \gamma_q \cdot w_{1.k.G.ls} = -1.785\ \frac{kN}{m}$$

Longitudinal Suction, zone I:

$$P_{d.l.s.I} := \gamma_q \cdot w_{1.k.I.ls} = -0.525\ \frac{kN}{m}$$

Total Load for the Trapezoidal Sheets in SLS:

Crosswind Pressure, zones F,G,H:

$$P_{k.c.p.FGH} := q_{k.per} \cdot 1\ m + \psi_w \cdot w_{1.k.FGH.cp} = 0.955\ \frac{kN}{m}$$

Crosswind Pressure, zones I,J:

$$P_{k.c.p.IJ} := q_{k.per} \cdot 1\ m + \psi_w \cdot w_{1.k.IJ.cp} = 0.757\ \frac{kN}{m}$$

Crosswind Suction, zone F:

$$P_{k.c.s.F} := w_{1.k.F.cs} = -1.46\ \frac{kN}{m}$$

Crosswind Suction, zone H:

$$P_{k.c.s.H} := w_{1.k.H.cs} = -0.66\ \frac{kN}{m}$$

Crosswind Suction, zone I:

$$P_{k.c.s.I} := w_{1.k.I.cs} = -0.35\ \frac{kN}{m}$$

Crosswind Suction, zone J:

$$P_{k.c.s.J} := w_{1.k.J.cs} = 0.02\ \frac{kN}{m}$$

Longitudinal Suction, zone F:

$$P_{k.l.s.F} := w_{1.k.F.ls} = -1.3\ \frac{kN}{m}$$

Longitudinal Suction, zone G:

$$P_{k.l.s.G} := w_{1.k.G.ls} = -1.19\ \frac{kN}{m}$$

Longitudinal Suction, zone I:

$$P_{k.l.s.I} := w_{1.k.I.ls} = -0.35\ \frac{kN}{m}$$

Loads on a Side Purlin:-

Wind Sucking (external), crosswind:

$$w_{10s.k.F.cs} := -0.96\ \frac{kN}{m^2} \cdot \frac{l_p}{2} = -1.164\ \frac{kN}{m}$$

$$w_{10s.k.G.cs} := -0.69\ \frac{kN}{m^2} \cdot \frac{l_p}{2} = -0.837\ \frac{kN}{m}$$

$$w_{10s.k.H.cs} := -0.34\ \frac{kN}{m^2} \cdot \frac{l_p}{2} = -0.412\ \frac{kN}{m}$$

$$w_{10s.k.I.cs} := -0.35\ \frac{kN}{m^2} \cdot \frac{l_p}{2} = -0.424\ \frac{kN}{m}$$

$$w_{10s.k.J.cs} := 0.05\ \frac{kN}{m^2} \cdot \frac{l_p}{2} = 0.061\ \frac{kN}{m}$$

Wind pressure (external), crosswind:

$$w_{10s.k.FGH.cp} := 0.01\ \frac{kN}{m^2} \cdot \frac{l_p}{2} = 0.012\ \frac{kN}{m}$$

$$w_{10s.k.IJ.cp} := -0.32\ \frac{kN}{m^2} \cdot \frac{l_p}{2} = -0.388\ \frac{kN}{m}$$

Wind Sucking, longitudinal:

$$w_{10s.k.F.ls} := -0.93\ \frac{kN}{m^2} \cdot \frac{l_p}{2} = -1.127\ \frac{kN}{m}$$

$$w_{10s.k.G.ls} := -0.77\ \frac{kN}{m^2} \cdot \frac{l_p}{2} = -0.933\ \frac{kN}{m}$$

$$w_{10s.k.H.ls} := -0.41\ \frac{kN}{m^2} \cdot \frac{l_p}{2} = -0.497\ \frac{kN}{m}$$

$$w_{10s.k.I.ls} := -0.35\ \frac{kN}{m^2} \cdot \frac{l_p}{2} = -0.424\ \frac{kN}{m}$$

Internal wind sucking:

$$w_{10s.k.int.s} := -0.18\ \frac{kN}{m^2} \cdot \frac{l_p}{2} = -0.218\ \frac{kN}{m}$$

Internal wind pressure:

$$w_{10s.k.int.p} := 0.12\ \frac{kN}{m^2} \cdot \frac{l_p}{2} = 0.145\ \frac{kN}{m}$$

Total Design Load on a Side Purlin in ULS:

Crosswind Pressure, zones F,G,H:

$$P_{d.c.p.FGH} := g_{d.sup} \cdot \frac{l_p}{2} + \gamma_q \cdot q_{k.per} \cdot \frac{l_p}{2} + \gamma_q \cdot \psi_w \cdot w_{10s.k.FGH.cp} + \gamma_q \cdot \psi_w \cdot w_{10s.k.int.s} = 2.705 \ \frac{kN}{m}$$

Crosswind Pressure, zones I,J:

$$P_{d.c.p.IJ} := g_{d.sup} \cdot \frac{l_p}{2} + \gamma_q \cdot q_{k.per} \cdot \frac{l_p}{2} + \gamma_q \cdot \psi_w \cdot w_{10s.k.IJ.cp} + \gamma_q \cdot \psi_w \cdot w_{10s.k.int.s} = 2.345 \ \frac{kN}{m}$$

Crosswind Suction, zone F:

$$P_{d.c.s.F} := g_{d.inf} \cdot \frac{l_p}{2} + \gamma_q \cdot w_{10s.k.F.cs} + \gamma_q \cdot w_{10s.k.int.p} = -0.665 \ \frac{kN}{m}$$

Crosswind Suction, zone G:

$$P_{d.c.s.G} := g_{d.inf} \cdot \frac{l_p}{2} + \gamma_q \cdot w_{10s.k.G.cs} + \gamma_q \cdot w_{10s.k.int.p} = -0.174 \ \frac{kN}{m}$$

Crosswind Suction, zone I:

$$P_{d..c.s.I} := g_{d.inf} \cdot \frac{l_p}{2} + \gamma_q \cdot w_{10s.k.I.cs} + \gamma_q \cdot w_{10s.k.int.p} = 0.444 \ \frac{kN}{m}$$

Longitudinal Suction, zone F:

$$P_{d.l.s.F} := g_{d.inf} \cdot \frac{l_p}{2} + \gamma_q \cdot w_{1.k.F.ls} + \gamma_q \cdot w_{10s.k.int.p} = -0.869 \ \frac{kN}{m}$$

Longitudinal Suction, zone H:

$$P_{d.l.s.H} := g_{d.inf} \cdot \frac{l_p}{2} + \gamma_q \cdot w_{1.k.H.ls} + \gamma_q \cdot w_{10s.k.int.p} = 0.016 \ \frac{kN}{m}$$

Longitudinal Suction, zone I:

$$P_{d.l.s.I} := g_{d.inf} \cdot \frac{l_p}{2} + \gamma_q \cdot w_{1.k.I.ls} + \gamma_q \cdot w_{10s.k.int.p} = 0.556 \ \frac{kN}{m}$$

Total Load on a Side Purlin in SLS:

Crosswind Pressure, zones F,G,H:

$$P_{k.c.p.FGH} := g_{k.per} \cdot \frac{l_p}{2} + q_{k.per} \cdot \frac{l_p}{2} + \psi_w \cdot w_{10s.k.FGH.cp} + \psi_w \cdot w_{10s.k.int.s} = 1.89 \ \frac{kN}{m}$$

Crosswind Pressure, zones I,J:

$$P_{k.c.p.IJ} := g_{k.per} \cdot \frac{l_p}{2} + q_{k.per} \cdot \frac{l_p}{2} + \psi_w \cdot w_{10s.k.IJ.cp} + \psi_w \cdot w_{10s.k.int.s} = 1.65 \ \frac{kN}{m}$$

Crosswind Suction, zone F:

$$P_{k.c.s.F} := g_{k.per} \cdot \frac{l_p}{2} + w_{10s.k.F.cs} + w_{10s.k.int.p} = -0.156 \ \frac{kN}{m}$$

Crosswind Suction, zone G:

$$P_{k.c.s.G} := g_{k.per} \cdot \frac{l_p}{2} + w_{10s.k.G.cs} + w_{10s.k.int.p} = 0.171 \ \frac{kN}{m}$$

Crosswind Suction, zone I:

$$P_{k.c.s.I} := g_{k.per} \cdot \frac{l_p}{2} + w_{10s.k.I.cs} + w_{10s.k.int.p} = 0.583 \ \frac{kN}{m}$$

Longitudinal Suction, zone F:

$$P_{k.l.s.F} := g_{k.per} \cdot \frac{l_p}{2} + w_{1.k.F.ls} + w_{10s.k.int.p} = -0.292 \ \frac{kN}{m}$$

Longitudinal Suction, zone H:

$$P_{k.l.s.H} := g_{k.per} \cdot \frac{l_p}{2} + w_{1.k.H.ls} + w_{10s.k.int.p} = 0.298 \ \frac{kN}{m}$$

Longitudinal Suction, zone I:

$$P_{k.l.s.I} := g_{k.per} \cdot \frac{l_p}{2} + w_{1.k.I.ls} + w_{10s.k.int.p} = 0.658 \ \frac{kN}{m}$$

Loads on a Critical Intermediate Purlin:-

Wind Sucking (external), crosswind:

$$w_{10i.k.FH.cs} := -0.96\ \frac{kN}{m^2}\left(\frac{l_p}{2}-\left(l_p-\frac{e_{per}}{10}\right)\right)+-0.34\ \frac{kN}{m^2}\cdot\left(\frac{l_p}{2}+\left(l_p-\frac{e_{per}}{10}\right)\right)=-1.319\ \frac{kN}{m}$$

$$w_{10i.k.GH.cs} := -0.69\ \frac{kN}{m^2}\cdot\left(\frac{l_p}{2}-\left(l_p-\frac{e_{per}}{10}\right)\right)+-0.34\ \frac{kN}{m^2}\cdot\left(\frac{l_p}{2}+\left(l_p-\frac{e_{per}}{10}\right)\right)=-1.103\ \frac{kN}{m}$$

$$w_{10i.k.I.cs} := -0.35\ \frac{kN}{m^2}\cdot l_p=-0.849\ \frac{kN}{m}$$

Wind pressure (external), crosswind

$$w_{10i.k.FGH.cp} := 0.01\ \frac{kN}{m^2}\cdot l_p=0.024\ \frac{kN}{m}$$

$$w_{10i.k.IJ.cp} := -0.32\ \frac{kN}{m^2}\cdot l_p=-0.776\ \frac{kN}{m}$$

Wind Sucking, longitudinal:

$$w_{10i.k.F.ls} := -0.93\ \frac{kN}{m^2}\cdot l_p=-2.255\ \frac{kN}{m}$$

$$w_{10i.k.G.ls} := -0.77\ \frac{kN}{m^2}\cdot l_p=-1.867\ \frac{kN}{m}$$

$$w_{10i.k.H.ls} := -0.41\ \frac{kN}{m^2}\cdot l_p=-0.994\ \frac{kN}{m}$$

$$w_{10i.k.I.ls} := -0.35\ \frac{kN}{m^2}\cdot l_p=-0.849\ \frac{kN}{m}$$

Internal wind sucking:

$$w_{10i.k.int.s} := -0.18\ \frac{kN}{m^2}\cdot l_p=-0.436\ \frac{kN}{m}$$

Internal wind pressure:

$$w_{10i.k.int.p} := 0.12\ \frac{kN}{m^2}\cdot l_p=0.291\ \frac{kN}{m}$$

Total Design Load on a Critical Intermediate Purlin in ULS:

Crosswind Pressure, zones F,G,H:

$$P_{d.c.p.FGH} := g_{d.sup} \cdot l_p + \gamma_q \cdot q_{k.per} \cdot l_p + \gamma_q \cdot \psi_w \cdot w_{10i.k.FGH.cp} + \gamma_q \cdot \psi_w \cdot w_{10i.k.int.s} = 5.41 \ \frac{kN}{m}$$

Crosswind Pressure, zones I,J:

$$P_{d.c.p.IJ} := g_{d.sup} \cdot l_p + \gamma_q \cdot q_{k.per} \cdot l_p + \gamma_q \cdot \psi_w \cdot w_{10i.k.IJ.cp} + \gamma_q \cdot \psi_w \cdot w_{10i.k.int.s} = 4.69 \ \frac{kN}{m}$$

Crosswind Suction, zone FH:

$$P_{d.c.s.F} := g_{d.inf} \cdot l_p + \gamma_q \cdot w_{10i.k.FH.cs} + \gamma_q \cdot w_{10i.k.int.p} = 0.183 \ \frac{kN}{m}$$

Crosswind Suction, zone GH:

$$P_{d.c.s.G} := g_{d.inf} \cdot l_p + \gamma_q \cdot w_{10i.k.GH.cs} + \gamma_q \cdot w_{10i.k.int.p} = 0.506 \ \frac{kN}{m}$$

Crosswind Suction, zone I:

$$P_{d..c.s.I} := g_{d.inf} \cdot l_p + \gamma_q \cdot w_{10i.k.I.cs} + \gamma_q \cdot w_{10i.k.int.p} = 0.888 \ \frac{kN}{m}$$

Longitudinal Suction, zone F:

$$P_{d.l.s.F} := g_{d.inf} \cdot l_p + \gamma_q \cdot w_{10i.k.F.ls} + \gamma_q \cdot w_{10i.k.int.p} = 1.221 \ \frac{kN}{m}$$

Longitudinal Suction, zone H:

$$P_{d.l.s.H} := g_{d.inf} \cdot l_p + \gamma_q \cdot w_{10i.k.H.ls} + \gamma_q \cdot w_{10i.k.int.p} = 0.67 \ \frac{kN}{m}$$

Longitudinal Suction, zone I:

$$P_{d.l.s.I} := g_{d.inf} \cdot l_p + \gamma_q \cdot w_{10i.k.I.ls} + \gamma_q \cdot w_{10i.k.int.p} = 0.888 \ \frac{kN}{m}$$

Total Load on a Critical Intermediate Purlin in SLS:

Crosswind Pressure, zones F,G,H:

$$P_{k.c.p.FGH} := g_{k.per} \cdot l_p + q_{k.per} \cdot l_p + \psi_w \cdot w_{10i.k.FGH.cp} + \psi_w \cdot w_{10i.k.int.s} = 3.779 \ \frac{kN}{m}$$

Crosswind Pressure, zones I,J:

$$P_{d.c.p.IJ} := g_{k.per} \cdot l_p + q_{k.per} \cdot l_p + \psi_w \cdot w_{10i.k.IJ.cp} + \psi_w \cdot w_{10i.k.int.s} = 3.299 \ \frac{kN}{m}$$

Crosswind Suction, zone FH:

$$P_{d.c.s.F} := g_{k.per} \cdot l_p + w_{10i.k.FH.cs} + w_{10i.k.int.p} = 0.697 \ \frac{kN}{m}$$

Crosswind Suction, zone GH:

$$P_{d.c.s.G} := g_{k.per} \cdot l_p + w_{10i.k.GH.cs} + w_{10i.k.int.p} = 0.912 \ \frac{kN}{m}$$

Crosswind Suction, zone I:

$$P_{d..c.s.I} := g_{k.per} \cdot l_p + w_{10i.k.I.cs} + w_{10i.k.int.p} = 1.167 \ \frac{kN}{m}$$

Longitudinal Suction, zone F:

$$P_{d.l.s.F} := g_{k.per} \cdot l_p + w_{10i.k.F.ls} + w_{10i.k.int.p} = -0.239 \ \frac{kN}{m}$$

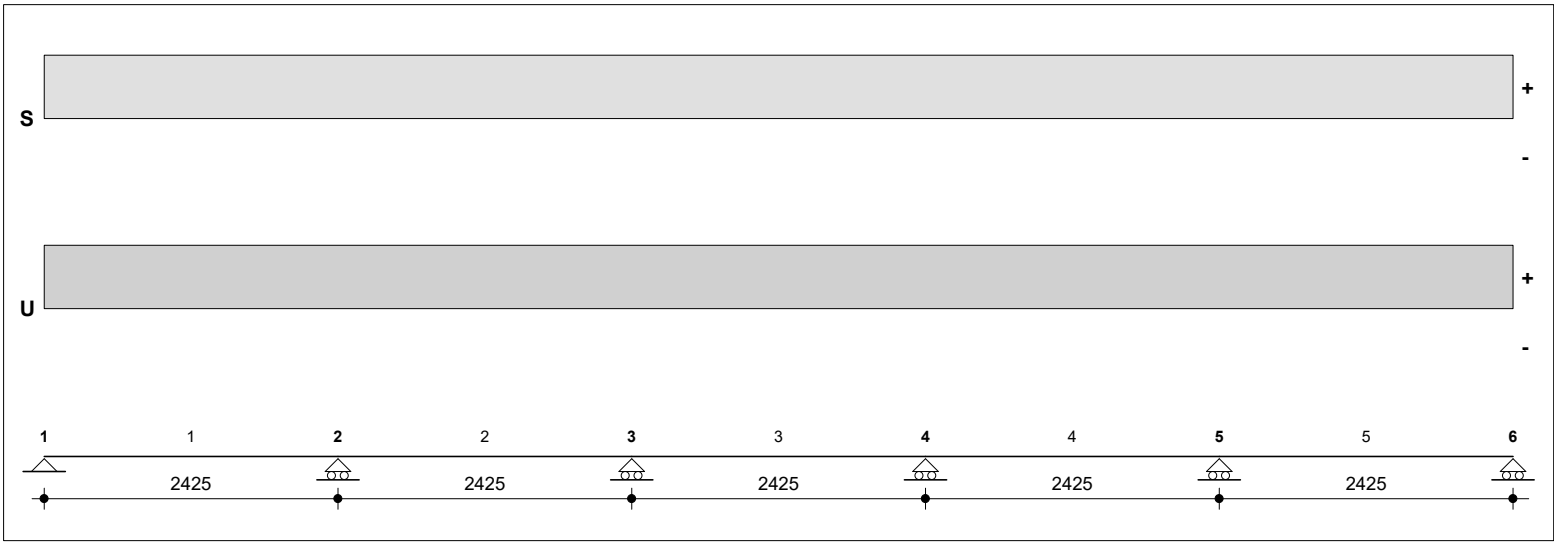
Longitudinal Suction, zone H:

$$P_{d.l.s.H} := g_{k.per} \cdot l_p + w_{10i.k.H.ls} + w_{10i.k.int.p} = 1.021 \ \frac{kN}{m}$$

Longitudinal Suction, zone I:

$$P_{d.l.s.I} := g_{k.per} \cdot l_p + w_{10i.k.I.ls} + w_{10i.k.int.p} = 1.167 \ \frac{kN}{m}$$

**Lindab StructuralDesigner 1.5.1 - Noname**




## General Settings

Product Group: Roof Sheeting

Country: Magyarország

## Structural Settings

Profile: TN-50 B

Default Static Model: Continuous

Flange Up: Narrow

Extra Sidelap: 1

## Parameters for Deflection Check

Limit for Span: L / 200

Limit for Cantilever: L / 150

## Results

**ULS: 78%**

**SLS: 38%**

## Geometry

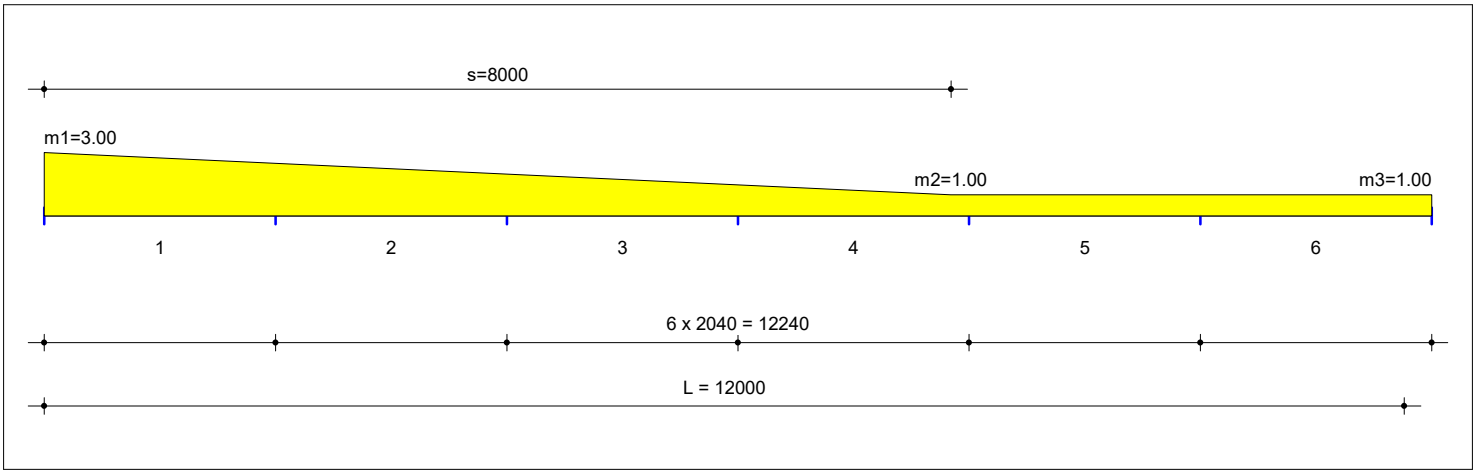
| No. | Supports | | | | | Spans | | | Hinges |
|---|---|---|---|---|---|---|---|---|---|
| | Position [mm] | Type | Width [mm] | L1 [mm] | L2 [mm] | Length [mm] | Thick. 1 [mm] | Thick. 2 [mm] | Position [mm] |
| 1 | 0 | H | 74 | - | - | 2425 | 0.5 | - | |
| 2 | 2425 | C | 74 | - | - | 2425 | 0.5 | - | |
| 3 | 4850 | C | 74 | - | - | 2425 | 0.5 | - | |
| 4 | 7275 | C | 74 | - | - | 2425 | 0.5 | - | |
| 5 | 9700 | C | 74 | - | - | 2425 | 0.5 | - | |
| 6 | 12125 | H | 74 | - | - | | | | |

## Loads

| No. | Type | Startp. | Endp. | Startint. | Endint. | Width | ULS/SLS |
|---|---|---|---|---|---|---|---|
| 1 | U | | | 1.43 | | | ULS |
| 2 | U | | | 0.96 | | | SLS |

# Snow pocket

Lindab StructuralDesigner 1.5.1 - Noname




Calc. width: 1020 mm (Double)

## Thicknesses [mm]

**Strip #1**

| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

**Strip #2**

| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

**Strip #3**

| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

**Strip #4**

| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

**Strip #5**

| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

**Strip #6**

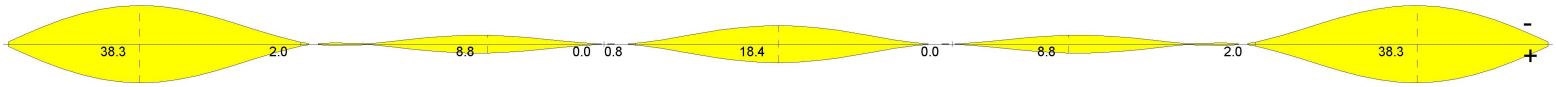
| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

Results (Single) ULS = 78% SLS = 38%

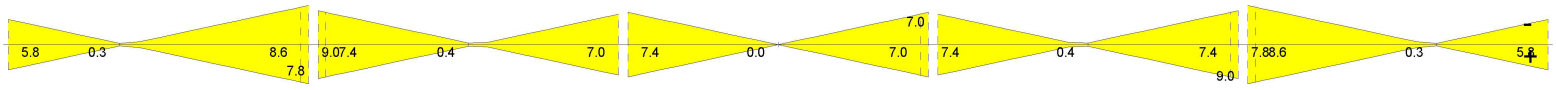
| # | SLS | ULS cross-section utilization | | |
|---|---|---|---|---|
| | deflection utilization [%] | shear force [%] | bending moment [%] | transverse force [%] |
| Support #1 | | 5.8 | 0.0 .. 3.2 | 62.2 |
| Span #1 | 2.0 .. 38.3 | 0.3 .. 8.6 | 5.1 .. 44.8 | |
| Support #2 | | 7.8 .. 9.0 | 52.6 .. 57.6 | 44.8 |
| Span #2 | 0.0 .. 8.8 | 0.4 .. 7.4 | 2.7 .. 46.5 | |
| Support #3 | | 7.0 .. 7.4 | 39.1 .. 43.2 | 38.6 |
| Span #3 | 0.8 .. 18.4 | 0.0 .. 7.0 | 1.5 .. 32.7 | |
| Support #4 | | 7.0 .. 7.4 | 39.1 .. 43.2 | 38.6 |
| Span #4 | 0.0 .. 8.8 | 0.4 .. 7.4 | 2.7 .. 46.5 | |
| Support #5 | | 7.8 .. 9.0 | 52.6 .. 57.6 | 44.8 |
| Span #5 | **2.0 .. 38.3** | 0.3 .. 8.6 | 5.1 .. 44.8 | |
| Support #6 | | 5.8 | 0.0 .. 3.2 | 62.2 |

| # | ULS cross-section utilization | |
|---|---|---|
| | NMV interaction [%] | NMR interaction [%] |
| Support #1 | 0.0 .. 3.2 | |
| Span #1 | 5.1 .. 44.8 | |
| Support #2 | 52.6 .. 57.6 | 78.0 .. 78.5 |
| Span #2 | 2.7 .. 46.5 | |
| Support #3 | 39.1 .. 43.2 | 62.1 .. 62.3 |
| Span #3 | 1.5 .. 32.7 | |
| Support #4 | 39.1 .. 43.2 | 62.1 .. 62.3 |
| Span #4 | 2.7 .. 46.5 | |
| Support #5 | 52.6 .. 57.6 | **78.0 .. 78.5** |
| Span #5 | 5.1 .. 44.8 | |
| Support #6 | 0.0 .. 3.2 | |

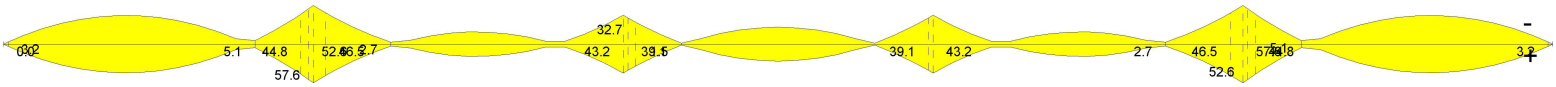
SLS - deflection utilization [%] Results (Single)




ULS cross-section utilization - shear force [%]

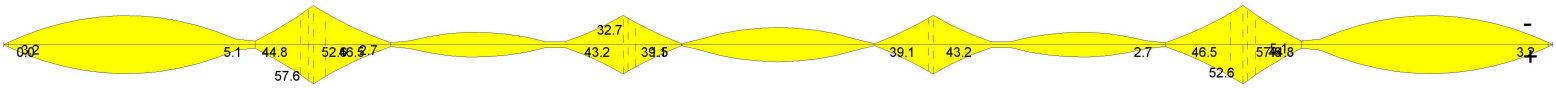



ULS cross-section utilization - bending moment [%]



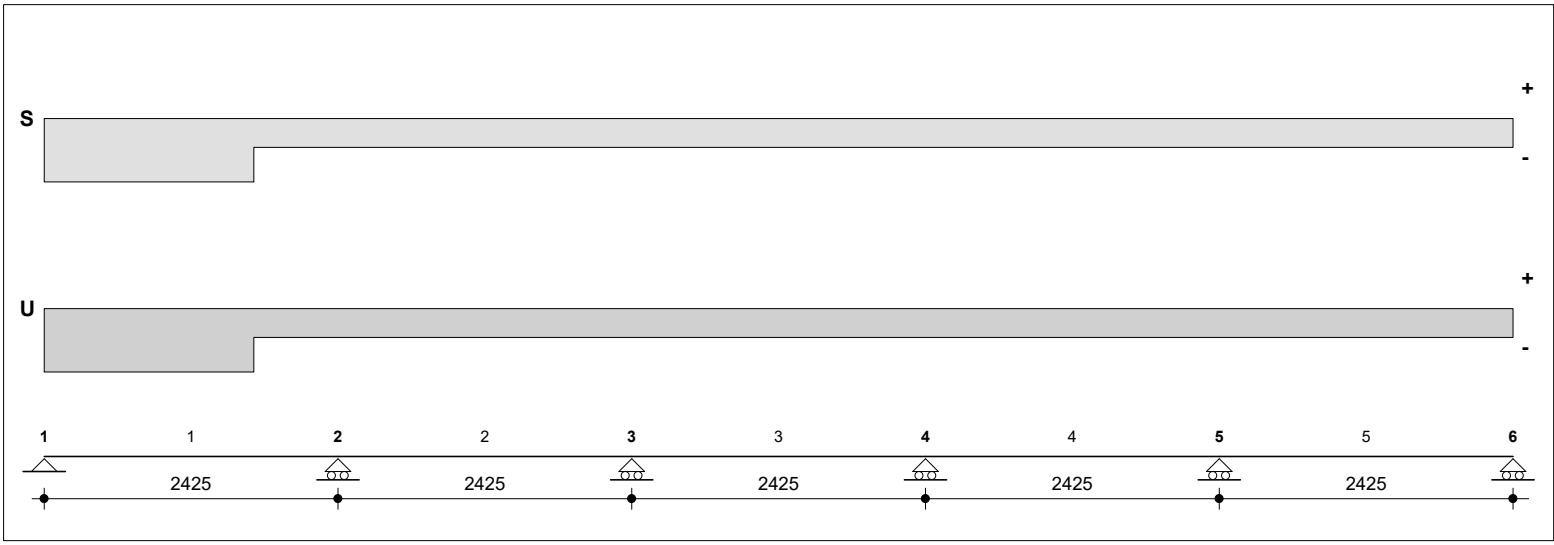

ULS cross-section utilization - transverse force [%]


ULS cross-section utilization - NMV interaction [%]




ULS cross-section utilization - NMR interaction [%]

**Lindab StructuralDesigner 1.5.1 - Noname**




## General Settings

Product Group: Roof Sheeting

Country: Magyarország

## Structural Settings

Profile: TN-50 B

Default Static Model: Continuous

Flange Up: Narrow

Extra Sidelap: 1

## Parameters for Deflection Check

Limit for Span: L / 200

Limit for Cantilever: L / 150

## Results

**ULS: 78%**

**SLS: 38%**

## Geometry

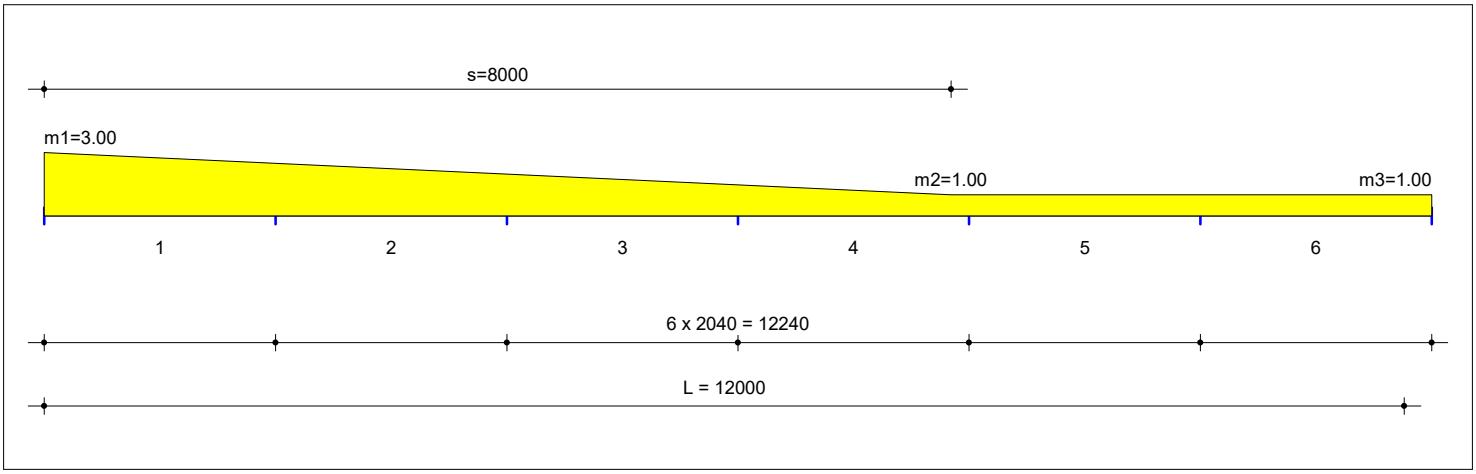
| No. | Supports | | | | | Spans | | | Hinges |
|---|---|---|---|---|---|---|---|---|---|
| | Position [mm] | Type | Width [mm] | L1 [mm] | L2 [mm] | Length [mm] | Thick. 1 [mm] | Thick. 2 [mm] | Position [mm] |
| 1 | 0 | H | 74 | - | - | 2425 | 0.5 | - | |
| 2 | 2425 | C | 74 | - | - | 2425 | 0.5 | - | |
| 3 | 4850 | C | 74 | - | - | 2425 | 0.5 | - | |
| 4 | 7275 | C | 74 | - | - | 2425 | 0.5 | - | |
| 5 | 9700 | C | 74 | - | - | 2425 | 0.5 | - | |
| 6 | 12125 | H | 74 | - | - | | | | |

## Loads

| No. | Type | Startp. | Endp. | Startint. | Endint. | Width | ULS/SLS |
|---|---|---|---|---|---|---|---|
| 1 | L | 0 | 1730 | -2.19 | -2.19 | | ULS |
| 2 | L | 1730 | 12125 | -0.99 | -0.99 | | ULS |
| 3 | L | 0 | 1730 | -1.46 | -1.46 | | SLS |
| 4 | L | 1730 | 12125 | -0.66 | -0.66 | | SLS |

# Snow pocket

Lindab StructuralDesigner 1.5.1 - Noname




Calc. width: 1020 mm (Double)

## Thicknesses [mm]

**Strip #1**

| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

**Strip #2**

| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

**Strip #3**

| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

**Strip #4**

| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

**Strip #5**

| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

**Strip #6**

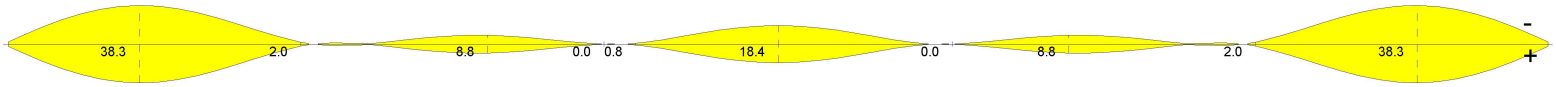
| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

Results (Single) ULS = 78% SLS = 38%

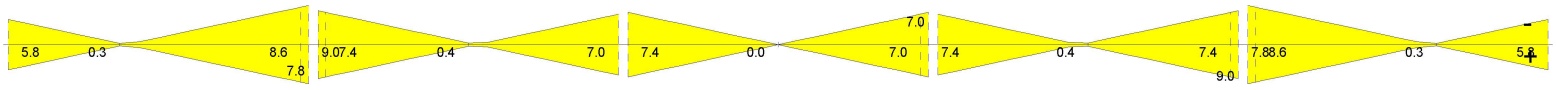
| # | SLS | ULS cross-section utilization | | |
|---|---|---|---|---|
| | deflection utilization [%] | shear force [%] | bending moment [%] | transverse force [%] |
| Support #1 | | 5.8 | 0.0 .. 3.2 | 62.2 |
| Span #1 | 2.0 .. 38.3 | 0.3 .. 8.6 | 5.1 .. 44.8 | |
| Support #2 | | 7.8 .. 9.0 | 52.6 .. 57.6 | 44.8 |
| Span #2 | 0.0 .. 8.8 | 0.4 .. 7.4 | 2.7 .. 46.5 | |
| Support #3 | | 7.0 .. 7.4 | 39.1 .. 43.2 | 38.6 |
| Span #3 | 0.8 .. 18.4 | 0.0 .. 7.0 | 1.5 .. 32.7 | |
| Support #4 | | 7.0 .. 7.4 | 39.1 .. 43.2 | 38.6 |
| Span #4 | 0.0 .. 8.8 | 0.4 .. 7.4 | 2.7 .. 46.5 | |
| Support #5 | | 7.8 .. 9.0 | 52.6 .. 57.6 | 44.8 |
| Span #5 | **2.0 .. 38.3** | 0.3 .. 8.6 | 5.1 .. 44.8 | |
| Support #6 | | 5.8 | 0.0 .. 3.2 | 62.2 |

| # | ULS cross-section utilization | |
|---|---|---|
| | NMV interaction [%] | NMR interaction [%] |
| Support #1 | 0.0 .. 3.2 | |
| Span #1 | 5.1 .. 44.8 | |
| Support #2 | 52.6 .. 57.6 | 78.0 .. 78.5 |
| Span #2 | 2.7 .. 46.5 | |
| Support #3 | 39.1 .. 43.2 | 62.1 .. 62.3 |
| Span #3 | 1.5 .. 32.7 | |
| Support #4 | 39.1 .. 43.2 | 62.1 .. 62.3 |
| Span #4 | 2.7 .. 46.5 | |
| Support #5 | 52.6 .. 57.6 | **78.0 .. 78.5** |
| Span #5 | 5.1 .. 44.8 | |
| Support #6 | 0.0 .. 3.2 | |

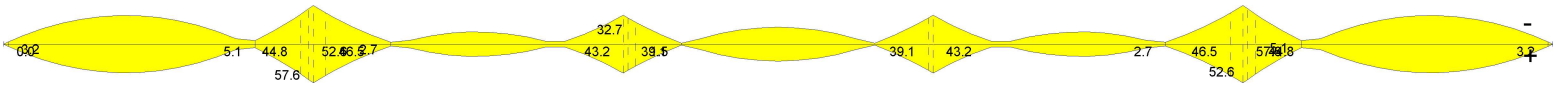
SLS - deflection utilization [%] Results (Single)




ULS cross-section utilization - shear force [%]

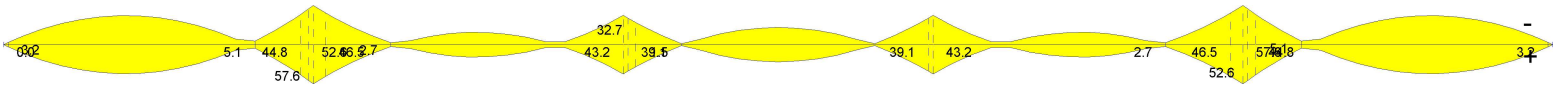



ULS cross-section utilization - bending moment [%]



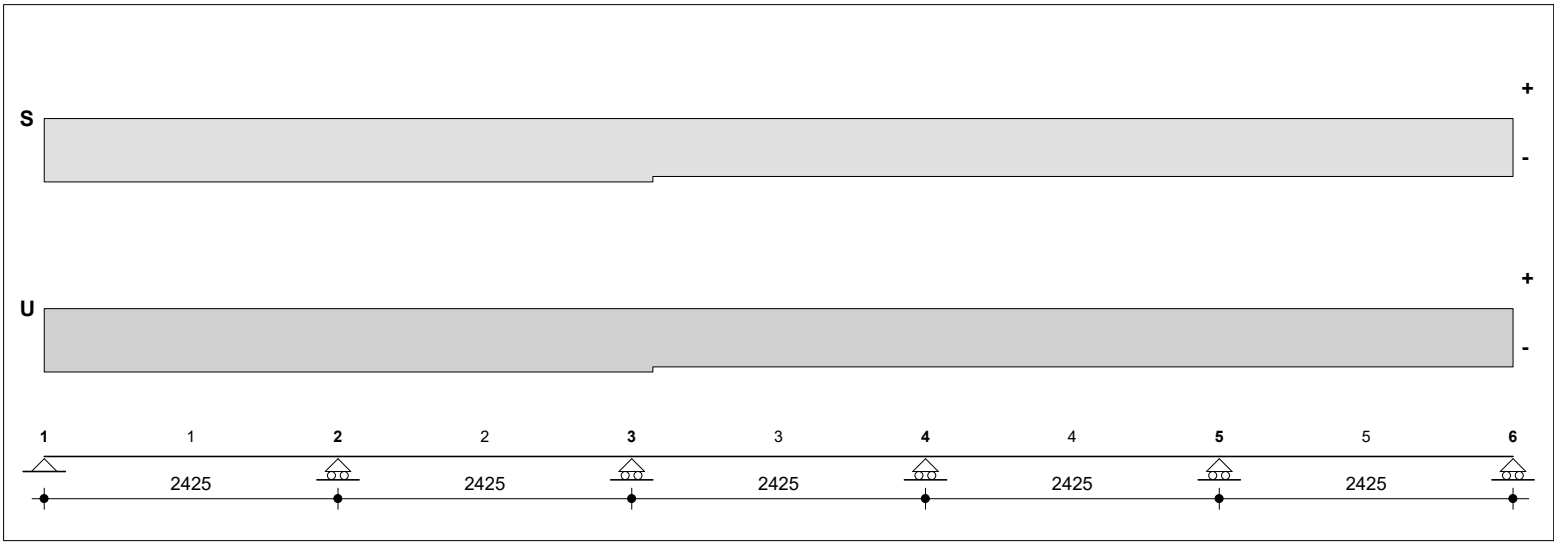

ULS cross-section utilization - transverse force [%]


ULS cross-section utilization - NMV interaction [%]




ULS cross-section utilization - NMR interaction [%]

**Lindab StructuralDesigner 1.5.1 - Noname**




## General Settings

Product Group: Roof Sheeting

Country: Magyarország

## Structural Settings

Profile: TN-50 B

Default Static Model: Continuous

Flange Up: Narrow

Extra Sidelap: 1

## Parameters for Deflection Check

Limit for Span: L / 200

Limit for Cantilever: L / 200

## Results

**ULS: 67%**

**SLS: 63%**

## Geometry

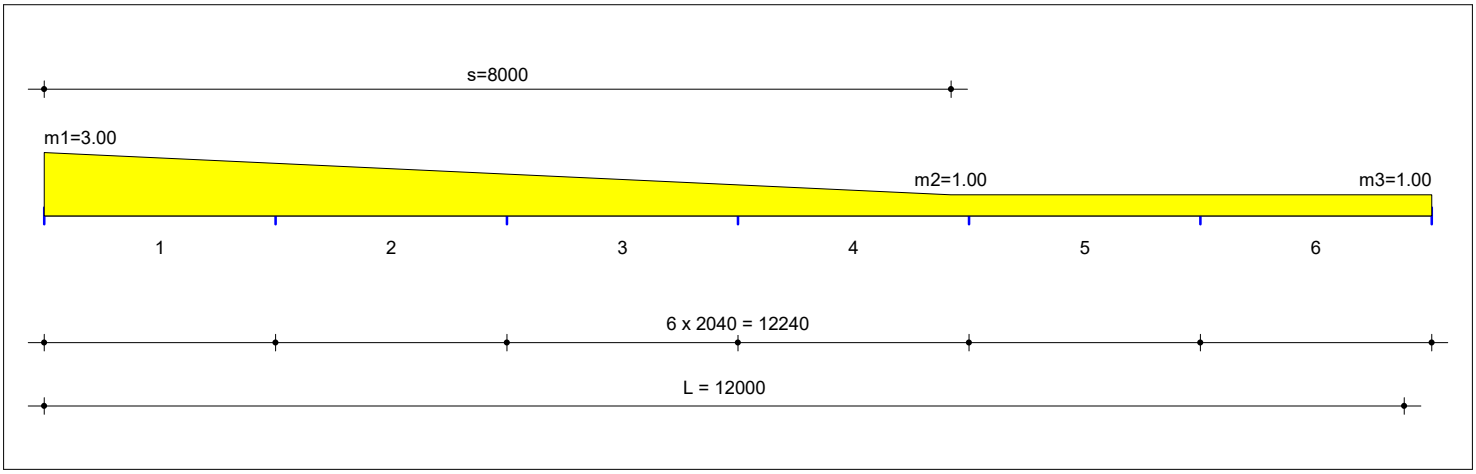
| No. | Supports | | | | | Spans | | | Hinges |
|---|---|---|---|---|---|---|---|---|---|
| | Position [mm] | Type | Width [mm] | L1 [mm] | L2 [mm] | Length [mm] | Thick. 1 [mm] | Thick. 2 [mm] | Position [mm] |
| 1 | 0 | H | 74 | - | - | 2425 | 0.5 | - | |
| 2 | 2425 | C | 74 | - | - | 2425 | 0.5 | - | |
| 3 | 4850 | C | 74 | - | - | 2425 | 0.5 | - | |
| 4 | 7275 | C | 74 | - | - | 2425 | 0.5 | - | |
| 5 | 9700 | C | 74 | - | - | 2425 | 0.5 | - | |
| 6 | 12125 | H | 74 | - | - | | | | |

## Loads

| No. | Type | Startp. | Endp. | Startint. | Endint. | Width | ULS/SLS |
|---|---|---|---|---|---|---|---|
| 1 | L | 0 | 5024 | -1.95 | -1.95 | | ULS |
| 2 | L | 5024 | 12125 | -1.79 | -1.79 | | ULS |
| 3 | L | 0 | 5024 | -1.30 | -1.30 | | SLS |
| 4 | L | 5024 | 12125 | -1.19 | -1.19 | | SLS |

# Snow pocket

Lindab StructuralDesigner 1.5.1 - Noname




Calc. width: 1020 mm (Double)

## Thicknesses [mm]

**Strip #1**

| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

**Strip #2**

| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

**Strip #3**

| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

**Strip #4**

| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

**Strip #5**

| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

**Strip #6**

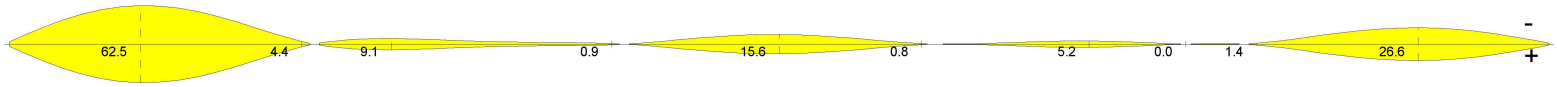
| Span | Thicknesses [mm] |
|---|---|
| 1 | 0.5 |
| 2 | 0.5 |
| 3 | 0.5 |
| 4 | 0.5 |

Results (Single) ULS = 67% SLS = 63%

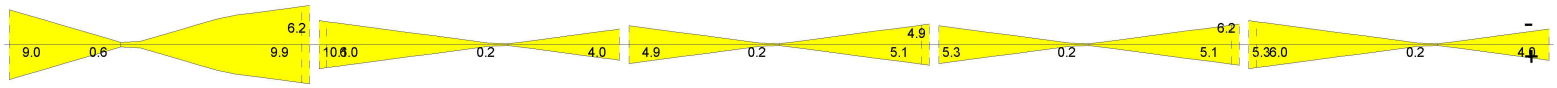
| # | SLS | ULS cross-section utilization | | |
|---|---|---|---|---|
| | deflection utilization [%] | shear force [%] | bending moment [%] | transverse force [%] |
| Support #1 | | 9.0 | 0.0 .. 5.0 | 0.0 |
| Span #1 | **4.4 .. 62.5** | 0.6 .. 9.9 | **0.5 .. 67.4** | |
| Support #2 | | 6.2 .. 10.1 | 57.8 .. 63.4 | 0.0 |
| Span #2 | 0.9 .. 9.1 | 0.2 .. 6.0 | 0.7 .. 54.5 | |
| Support #3 | | 4.0 .. 4.9 | 21.0 .. 23.7 | 0.0 |
| Span #3 | 0.8 .. 15.6 | 0.2 .. 5.1 | 1.2 .. 24.1 | |
| Support #4 | | 4.9 .. 5.3 | 28.7 .. 31.7 | 0.0 |
| Span #4 | 0.0 .. 5.2 | 0.2 .. 5.1 | 2.0 .. 32.0 | |
| Support #5 | | 5.3 .. 6.2 | 36.1 .. 39.6 | 0.0 |
| Span #5 | 1.4 .. 26.6 | 0.2 .. 6.0 | 3.2 .. 30.7 | |
| Support #6 | | 4.0 | 0.0 .. 2.2 | 0.0 |

| # | ULS cross-section utilization | |
|---|---|---|
| | NMV interaction [%] | NMR interaction [%] |
| Support #1 | 0.0 .. 5.0 | |
| Span #1 | 0.5 .. 67.4 | |
| Support #2 | 57.8 .. 63.4 | 57.8 .. 59.9 |
| Span #2 | 0.7 .. 54.5 | |
| Support #3 | 21.0 .. 23.7 | 21.0 .. 21.5 |
| Span #3 | 1.2 .. 24.1 | |
| Support #4 | 28.7 .. 31.7 | 28.7 .. 28.9 |
| Span #4 | 2.0 .. 32.0 | |
| Support #5 | 36.1 .. 39.6 | 36.1 .. 36.6 |
| Span #5 | 3.2 .. 30.7 | |
| Support #6 | 0.0 .. 2.2 | |

SLS - deflection utilization [%] Results (Single)



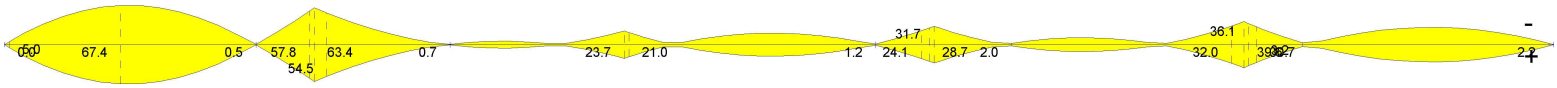

ULS cross-section utilization - shear force [%]




ULS cross-section utilization - bending moment [%]

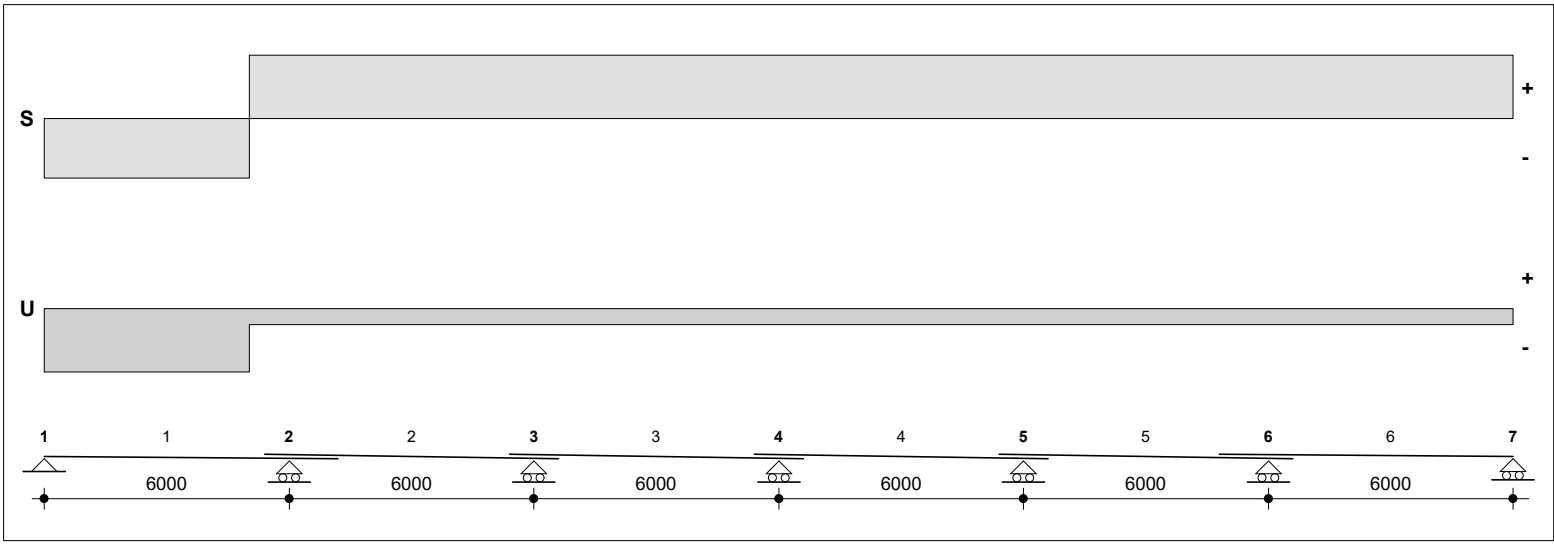

ULS cross-section utilization - transverse force [%]


ULS cross-section utilization - NMV interaction [%]




ULS cross-section utilization - NMR interaction [%]

**Lindab StructuralDesigner 1.5.1 - Noname**




## General Settings

Product Group: Z

Country: Magyarország

## Structural Settings

Profile: Z200

Default Static Model: Overlapped

Orientation: Strong

Screws: 5,5

Restraint: Top Flange: Continuous/Bottom Flange: Continuous

Sheeting / Restraint CC: TN-50 B 0.5

Screw CC: 1 trough

## Parameters for Deflection Check

Limit for Span: L / 200

Limit for Cantilever: L / 200

## Results

**ULS: 14%**

**SLS: 0%**

## Geometry

| No. | Supports | | | | | Spans | | | Hinges |
|---|---|---|---|---|---|---|---|---|---|
| | Position [mm] | Type | Width [mm] | L1 [mm] | L2 [mm] | Length [mm] | Thick. 1 [mm] | Thick. 2 [mm] | Position [mm] |
| 1 | 0 | H | 0 | - | - | 6000 | 2 | - | |
| 2 | 6000 | O | 0 | 600 | 1200 | 6000 | 2 | - | |
| 3 | 12000 | O | 0 | 600 | 600 | 6000 | 2 | - | |
| 4 | 18000 | O | 0 | 600 | 600 | 6000 | 2 | - | |
| 5 | 24000 | O | 0 | 600 | 600 | 6000 | 2 | - | |
| 6 | 30000 | O | 0 | 1200 | 600 | 6000 | 2 | - | |
| 7 | 36000 | H | 0 | - | - | | | | |

## Loads

| No. | Type | Startp. | Endp. | Startint. | Endint. | Width | ULS/SLS |
|---|---|---|---|---|---|---|---|
| 1 | L | 0 | 5024 | -0.67 | -0.67 | | ULS |
| 2 | L | 5024 | 36000 | -0.17 | -0.17 | | ULS |
| 3 | L | 0 | 5024 | -0.16 | -0.16 | | SLS |
| 4 | L | 5024 | 36000 | 0.17 | 0.17 | | SLS |

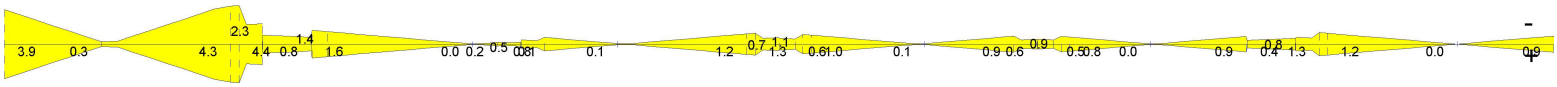
Results (Single) ULS = 14% SLS = 0%

| # | ULS cross-section utilization | | |
|---|---|---|---|
| | shear force [%] | bending moment [%] | NMV interaction [%] |
| Support #1 | 3.9 | 0.0 .. 0.0 | 0.0 .. 0.0 |
| Span #1 | 0.3 .. 4.3 | **0.4 .. 14.1** | 0.4 .. 14.1 |
| overlap end left | 4.4 | 7.6 | 7.6 |
| Support #2 | 0.8 .. 2.3 | 4.5 .. 7.5 | 4.5 .. 7.5 |
| overlap end right | 1.6 | 8.9 | 8.9 |
| Span #2 | 0.0 .. 1.4 | 0.0 .. 7.3 | 0.0 .. 7.3 |
| overlap end left | 0.2 | 0.2 | 0.2 |
| Support #3 | 0.1 .. 0.5 | 0.0 .. 0.3 | 0.0 .. 0.3 |
| overlap end right | 0.8 | 0.8 | 0.8 |
| Span #3 | 0.1 .. 1.2 | 0.2 .. 2.9 | 0.2 .. 2.9 |
| overlap end left | 1.3 | 2.8 | 2.8 |
| Support #4 | 0.6 .. 0.7 | 1.8 .. 2.5 | 1.8 .. 2.5 |
| overlap end right | 1.1 | 3.1 | 3.1 |
| Span #4 | 0.1 .. 1.0 | 0.2 .. 2.4 | 0.2 .. 2.4 |
| overlap end left | 0.9 | 1.6 | 1.6 |
| Support #5 | 0.5 .. 0.6 | 1.0 .. 1.6 | 1.0 .. 1.6 |
| overlap end right | 0.9 | 1.6 | 1.6 |
| Span #5 | 0.0 .. 0.8 | 0.0 .. 1.2 | 0.0 .. 1.2 |
| overlap end left | 0.9 | 1.6 | 1.6 |
| Support #6 | 0.4 .. 0.8 | 0.8 .. 2.7 | 0.8 .. 2.7 |
| overlap end right | 1.3 | 3.1 | 3.1 |
| Span #6 | 0.0 .. 1.2 | 0.1 .. 3.1 | 0.1 .. 3.1 |
| Support #7 | 0.9 | 0.0 .. 0.0 | 0.0 .. 0.0 |

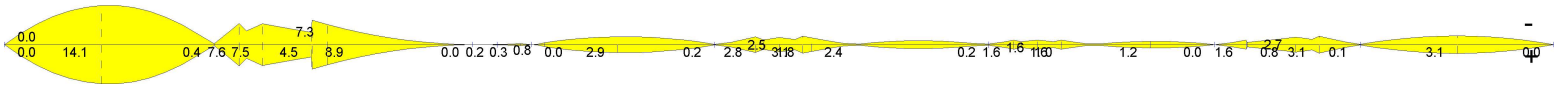
| # | ULS | |
|---|---|---|
| | screw/bolt resistance [kN] | screw/bolt number |
| Support #1 | -5.76 | 2 |
| Span #1 | | |
| overlap end left | 5.76 | 2 |
| Support #2 | -5.76 | 2 |
| overlap end right | -5.76 | 2 |
| Span #2 | | |
| overlap end left | 5.76 | 2 |
| Support #3 | -5.76 | 2 |

| # | ULS | |
|---|---|---|
| | screw/bolt resistance [kN] | screw/bolt number |
| overlap end right | -5.76 | 2 |
| Span #3 | | |
| overlap end left | 5.76 | 2 |
| Support #4 | -5.76 | 2 |
| overlap end right | -5.76 | 2 |
| Span #4 | | |
| overlap end left | 5.76 | 2 |
| Support #5 | -5.76 | 2 |
| overlap end right | -5.76 | 2 |
| Span #5 | | |
| overlap end left | 5.76 | 2 |
| Support #6 | -5.76 | 2 |
| overlap end right | -5.76 | 2 |
| Span #6 | | |
| Support #7 | -5.76 | 2 |

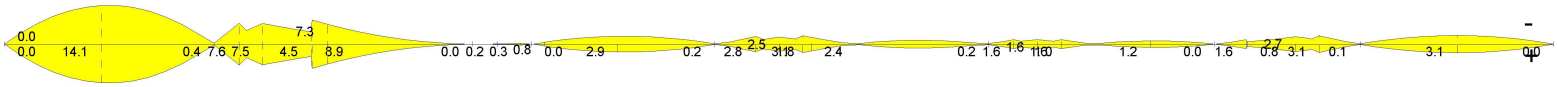
ULS cross-section utilization - shear force [%] Results (Single)



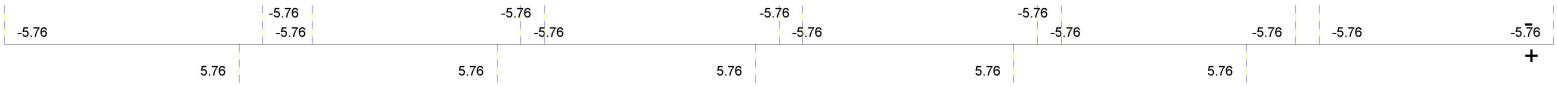

ULS cross-section utilization - bending moment [%]




ULS cross-section utilization - NMV interaction [%]




ULS - screw/bolt resistance [kN]




ULS - screw/bolt number