# Concrete beam shear check

Design code: EN 1992-2004

## Materials

|  |  |  |  |
| --- | --- | --- | --- |
| Materials | Variable | Value | Unit |
| Section Label |  | 101 |  |
| Concrete strength | fck | 25 | MPa |
| Steel reinforcement yield strength | fywk | 500 | MPa |
| Safety factor for concrete | γc | 1.5 |  |
| Safety factor for steel | γs | 1.15 |  |
| Coefficient for long term effects and loading effects | αcc | 1.0 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Geometry | Variable | Value | Unit |
| Section height | h | 60.0 | cm |
| Section width | b | 20.0 | cm |
| Clear cover | rgeom | 2.6 | cm |
| Longitudinal tension rebar | As | 8.04 | cm² |

|  |  |  |  |
| --- | --- | --- | --- |
| Design forces | Variable | Value | Unit |
| Axial, positive for compression | NEd | 0 | kN |
| Shear | VEd,2 | 500 | kN |

## Limit checks

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Check | Unit | Valor | Min. | Max. | Ok? |
| Stirrup spacing along length | cm | 25.0 |  | 42.0 | ✔️ |
| Stirrup spacing along width | cm | 14.2 |  | 42.0 | ✔️ |
| Minimum shear reinforcement | cm²/m | 2.26 | 1.6 |  | ✔️ |

## Design checks

|  |  |  |  |
| --- | --- | --- | --- |
| Shear reinforcement strength | Variable | Value | Unit |
| Number of stirrups | ns | 1.0 |  |
| Stirrup diameter | db | 6.0 | mm |
| Stirrup spacing | s | 25.0 | cm |
| Effective height | d | 56.0 | cm |
| Minimum shear reinforcing | Asw,min | 1.6 | cm²/m |
| Required shear reinforcing | Asw,req | 22.82 | cm²/m |
| Defined shear reinforcing | Asw | 2.26 | cm²/m |
| Shear rebar strength | VRd,s | 49.57 | kN |

|  |  |  |  |
| --- | --- | --- | --- |
| Shear strength | Variable | Value | Unit |
| Longitudinal reinforcement ratio | ρl | 0.0072 |  |
| k value | k | 1.6 |  |
| Axial stress | σcd | 0.0 | MPa |
| Concrete strut angle | Θ | 45.0 | deg |
| Concrete strength | VRd,c | 0 | kN |
| Maximum shear strength | VRd,max | 453.6 | kN |
| Total shear strength | VRd | 49.57 | kN |
| Max shear check |  | ❌ |  |
| Demand Capacity Ratio | DCR | 10.09 | ❌ |