Verification example Flush Moment End-Plate

Type of connection: Flush Moment End-Plate connection

Unit system: Metric

Designed acc. to: AISC 360-10 - Design Guide 16 – LRFD

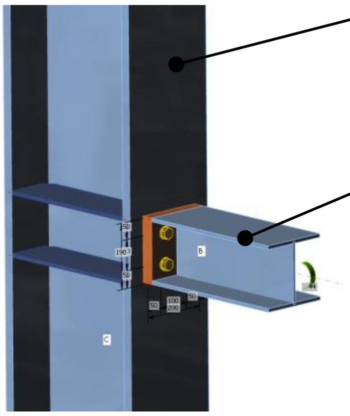
Investigated: Bolts, End-plate

Materials: Steel A36, Bolts A490M

Geometry:

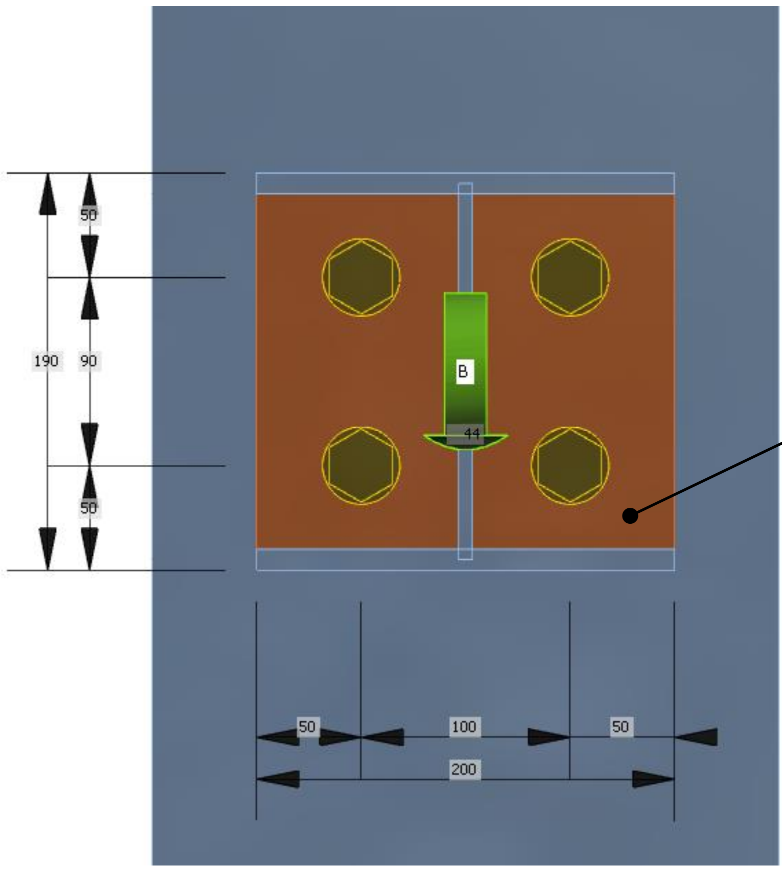
Profile:

HEB 500



Profile:

HEA 200



End-Plate thickness:

t_p = 35mm

Bolts:

M20 – A490M

Applied forces:

M = 44 kNm

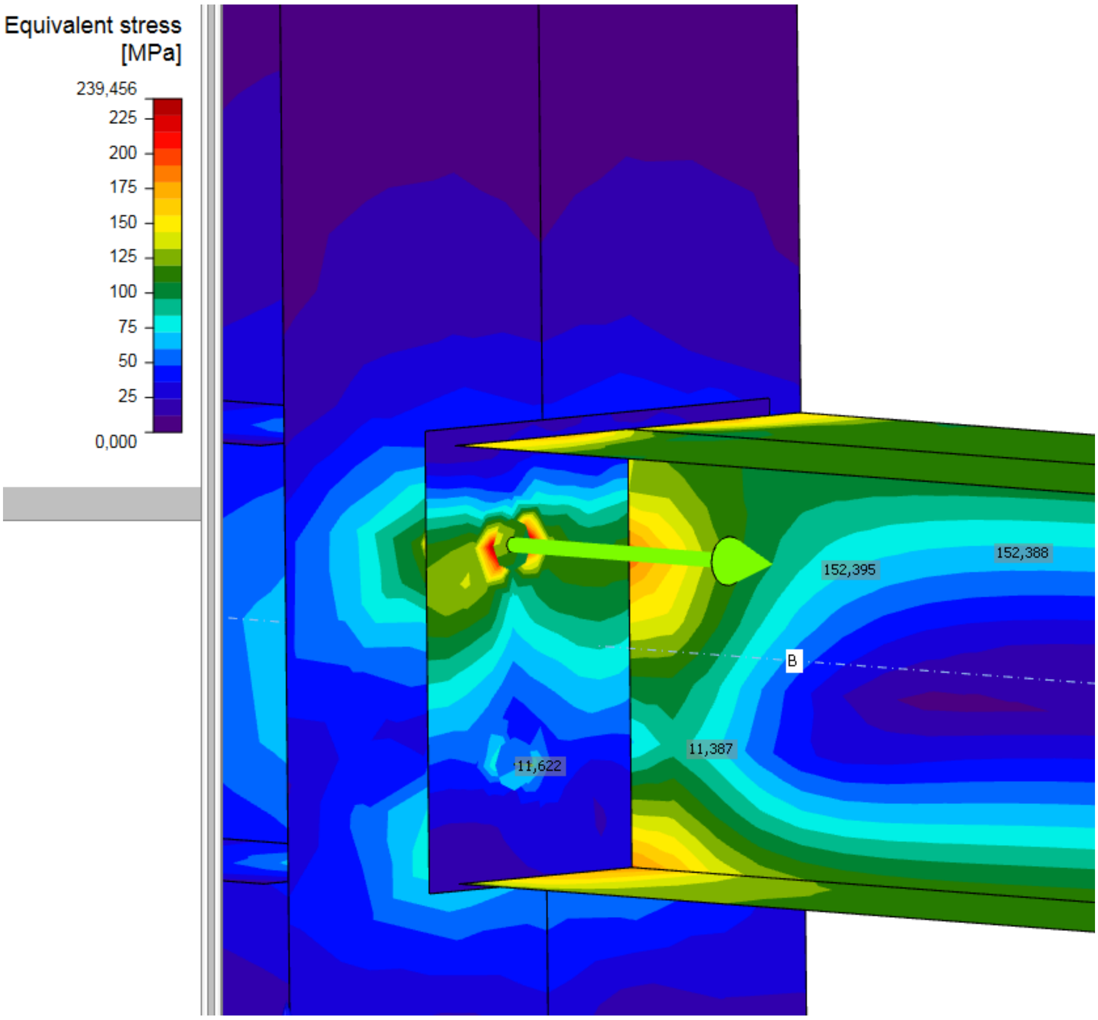
V = 0 kN

N = 0 kN

Procedure:

For the purpose of verification, it is considered that design is determined by bolt rupture with no prying actions. Therefore the design procedure (acc. DG16) is used.

IDEA StatiCa Connection – results

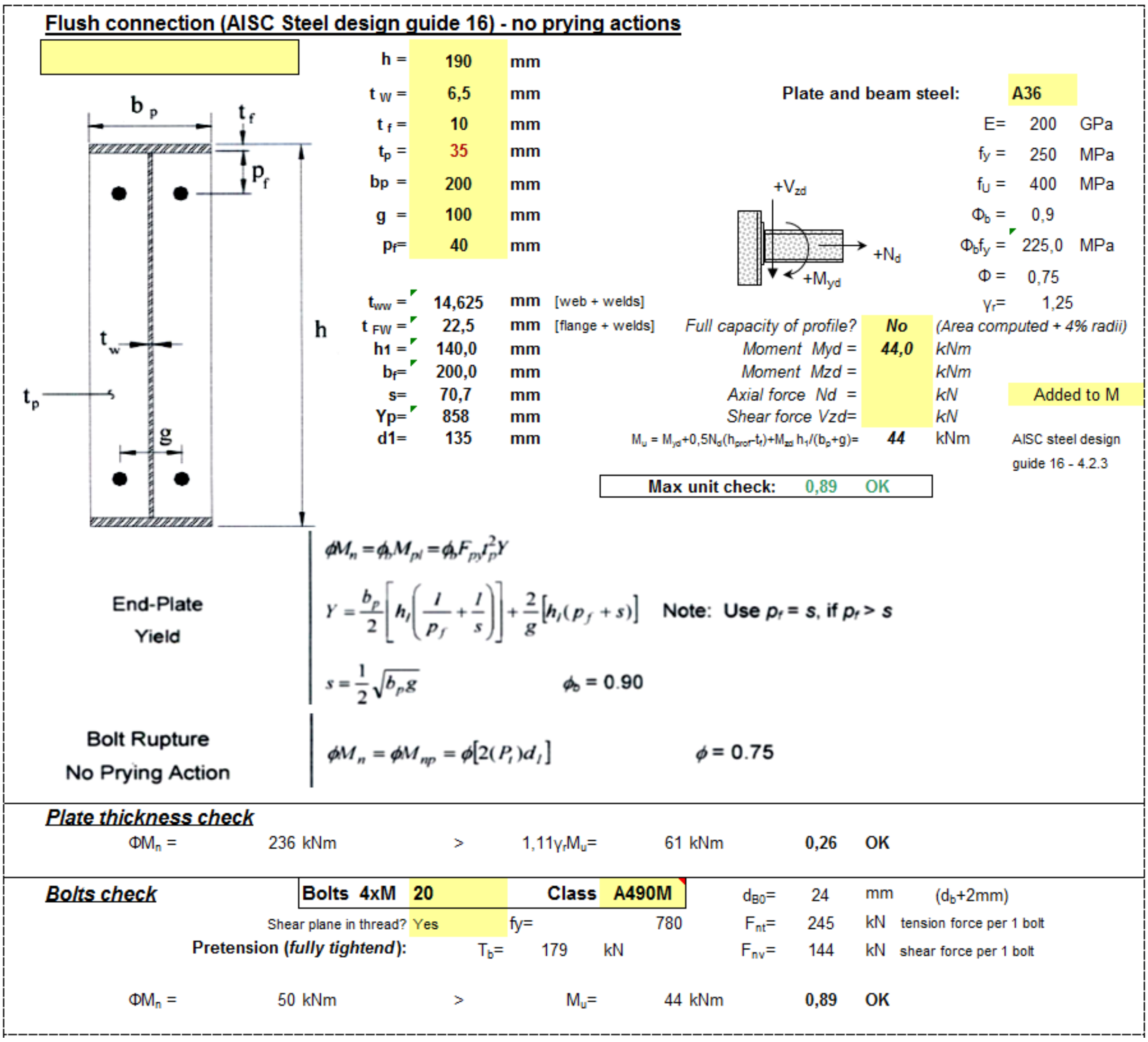


The tension force in upper bolt is **Ft = 152.4 kN**

The ultimate tensile strength of M20 – A490M is **Fnt = 183.8 kN** *acc. Table J3-2 and Eq. J3-1*

The unit check: 152.4/183.8 = **0.83 = 83%**

AISC 360-10 and Design Guide 16 – results



The resulting force in one bolt is: **Ft =** M_u / (2 d_1) = 44 kNm / (2 x 0.135m) = **163 kN**

The unit check: **89%**

Comparison:

The results show that the force computed using CBFEM by IDEA StatiCa is slightly lower than using standard approach in AISC Design Guide. The difference is around 6-7%

The check of end-plate is hardly comparable, since the IDEA StatiCa is based on FEM analysis. However in both cases the thickness of the end-plate is satisfactory and doesn't determine the check of connection.