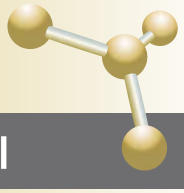

Neven POPOVAČKI

Diplomsko delo

ANALIZA INDUSTRIJSKE HALE S ŽERJAVOM NOSILNOSTI 160 KN

Mentor: prof. dr. Darko Dujmović, dipl. inž. grad.
Somentor: Ivan Lukačević, dipl. inž. grad.
Univerza v Zagrebu, Fakulteta za gradbeništvo

V okviru diplomskega dela je bil izdelan projekt večnamenske enoladijske industrijske hale tlorisnih dimenzij 66,0 m x 20,0 m. Višina zgornjega roba žerjavne proge je 6,9 m, nagib prečke okvirja je 10°. Na konstrukcijo delujejo: lastna teža jeklene konstrukcije, inštalacije 0,3 kN/m², veter referenčne hitrosti 25 m/s, sneg 0,75 kN/m² na tleh.

Predvidena je uporaba jekla kakovosti S 355 za vse glavne konstrukcijske elemente. Spoji so izvedeni v varjeni in vijačni izvedbi.

Statični preračun je izveden za nosilec žerjavne proge, glavni nosilni sistem (okvir) ter vodoravno in navpično stabilizacijo. Dimenzioniranje elementov konstrukcije je izvedeno v skladu s standardom Eurocode 3 za mejno stanje nosilnosti (MSN) in mejno stanje uporabnosti (MSU). Posebna pozornost je posvečena dokazu žerjavne proge, ki je izpostavljena pogostim spremembam napetosti in s tem utrujanju. Za dokaz utrujanja je uporabljen koncept $\Delta\sigma$ po Eurocode 3. Za glavni nosilni sistem so izbrane tri variante statičnega sistema, ki so vsaka zase preračunane in dimenzionirane.

Diploma thesis

ANALYSIS OF AN INDUSTRIAL SINGLE STOREY BUILDING WITH A CRANE WITH A BEARING CAPACITY OF 160 KN

Mentor: Prof. Darko Dujmović, PhD, MSc (Civil Eng.)
Co-Mentor: Ivan Lukačević, BSc (Civil Eng.)
University of Zagreb, Faculty of Civil Engineering

The assignment required the development of a project of an industrial multipurpose single storey building with a 66.0 m x 20.0 m floor plan. The height of the upper edge of the crane supporting structures is 6.9 m, and the beam of the frame is slanted at a 10° angle. Actions on the structure are: self-weight of the steel structure, installations 0.3 kN/m², the fundamental value of the basic wind velocity is 25 m/s, and the characteristic value of the snow load on the ground for a given location is 0.75 kN/m².

Steel grade S 355 is to be used for all of the main structural elements. Two types of joints are used: welded and bolted.

Static calculations have been made for the crane supporting structures, the main support system (frame) and also for the horizontal and vertical bracing systems. The dimensioning of structural elements was made in accordance with Eurocode 3 for the ultimate limit state and the serviceability limit state. Close attention has been paid to the verification of the crane supporting structures, which are frequently exposed to stress ranges with reference to fatigue. For the verification of fatigue, the $\Delta\sigma$ concept was used, also in accordance with Eurocode 3. Three variations of the static system were selected for the main support system, each of which was analysed and dimensioned separately.