Abstract

This Request for Proposal outlines an opportunity to reduce the risk factors of upper extremity, work-related musculoskeletal disorders (WMSDs) in reinforcing ironwork at the Ironworkers Local Union 721.

Ironwork is a physically demanding profession. Ironworkers at Local 721 are often required to work at many different heights, spaces, and contortions in order to safely secure reinforcing bars \[A2\]. Consequently, reinforcing ironworkers at Local 721 we interviewed estimated approximately 62.5% of their working hours are dedicated to the reinforcement of steel bars (tying). This involves the use of repetitive motions when tying rebars, and remaining in prolonged periods of awkward postures. These are risk factors associated with the development and aggravation of musculoskeletal disorders (MSDs) \[1\]. Another MSD risk factor stems from their need to transport heavy rebars across work sites. This activity places a strain on their bodies \[A2\].

Musculoskeletal disorders can have a detrimental impact on one’s quality of life. The effects of MSDs can range from decreased sleep quality to difficulty performing simple tasks such as dressing and bathing \[2\].

Challenges identified by researchers, such as “high task variability, highly irregular work periods, constantly evolving work environments, and high worker mobility,” make it difficult to design to mitigate MSD risk factors in Ironwork \[3\].

From conferring with and researching the stakeholders, we found the main objectives for design include: reducing risk factors of upper extremity WMSDs, safety, ease of adaptation, and maintaining or increasing the productivity of rod workers. Current reference designs do not adequately address the opportunity when compared to the outlined requirements.

1 “Working in confined spaces... kneeling down all day...” - Alex Piedrasanta
3 “When apprentices come on site... they want to be extra strong... [they] will get hurt” - Alex Piedrasanta