



POLITECNICO
MILANO 1863

SEMINAR ANNOUNCEMENT

Room Fassò, Building 4A, Leonardo Campus
Department of Civil and Environmental Engineering

October 14th, 11:00÷12:00

***Bond and Development of Historical Steel Reinforcement
Types***

Prof. Lisa R. Feldman
University of Saskatchewan

Plain and Ransome (otherwise known as square twisted or Type 1 deformed) bars were used to reinforce concrete structures in the United States and Canada until approximately the mid-1950s. In Europe, plain bars were routinely used as reinforcement prior to the mid-1960s, while in the UK, they re-emerged for a few years in the mid-1970s, when industrial unrest caused a steel shortage. A significant portion of existing structures are reinforced with plain or Ransome bars, and it has been reported that approximately 70% of concrete structures in Italy are reinforced with plain bars. Although these bars are no longer used in new construction we must understand their behavior to renovate and rehabilitate existing structures effectively.

The mechanisms by which forces transfer between reinforcement and the surrounding concrete (i.e. bond) differs for plain, Ransome, and modern deformed bars will be presented. The results of an evaluation of provisions for the bond and development length of plain bars as included in historical ACI (American Concrete Institute) codes is then included. The provisions included in these codes were not developed from tests that effectively captured the stress state in the concrete surrounding the reinforcement in flexural members and so their appropriateness was questioned. A new, reliability-based equation for the development and splice length of plain bars was developed using a database of recent splice and beam-end specimens as will be presented. These provisions are contrasted with those that were similarly developed for Ransome bars.

Reference: Dr. **Giovanni Muciaccia** (giovanni.muciaccia@polimi.it)

Bio-sketch

Lisa R. Feldman, Ph.D., P.Eng., F.ACI, F.CSCE, is a Professor in the Department of Civil, Geological, and Environmental Engineering at the University of Saskatchewan, Canada. She is a member of ACI 318-B (Anchorage and Reinforcement – Building Code), past chair of ACI 408 (Bond and Development of Steel Reinforcement), and a steering committee member of ACI 562 (Evaluation, Repair, & Rehabilitation). She is a former member of the Canadian Highway Bridge Design Code, and is an Associate Editor for the TMS Journal.

