SECTION OF METAL STRUCTURES
COMMITTEE FOR CIVIL ENGINEERING. POLISH ACADEMY OF SCIENCES

ACTION PLAN FOR 2020 - 2023

I. OBJECTIVES	
•	Inspiration for and initiation of research activities important from the scientific and technical points of view in the area of *metal and composite structures made of different structural materials as metal-glass, steel-concrete and steel-FRP composites*
•	Assisting in scientific careers of young researchers and doctoral candidates, organization of scientific workshops being the forum for presentations of ongoing research activities leading to PhD and DSc degrees in the field of SKM interest
•	Identification of actual research needs in the field of *metal and composite structures* and pointing out directions aiming at the elaboration of research grant applications involving partners associated with SKM from academia and industry.
•	Undertaking research and codification activities in the field of SKM interest that would be incorporated in higher level education carried out by civil engineering faculties of national technical universities.
•	Coordination of national expert's active participation in standardization bodies and committees at the national and European levels, e.g. Polish Committee for Standardization (PKN), European Committee for Standardization (CEN) and European Convention for Constructional Steelwork
•	Initiation of monograph publications directed towards the implementation of current research achievements and new building design codes related to steel and composite structures as well as to the coordination of general publications explaining scientific basis of design codes and
II. SCIENTIFIC ACTIVITIES	
1.	Basics of design of building structures, including metal and composite
•	Basic requirements (EN 1990-1)
•	Assessment of the technical condition (EN 1990-2: Assessment and retrofitting of existing structures)
•	Actions and loadings (EN 1991)
•	Reliability of steel structures
•	Design models of metal structure elements taking into account material properties, technological changes (loss of plasticity, aging, brittle cracking), fatigue and fire temperatures influences
2.	Experimental tests of elements, joints, connections and structures
•	Behavior of flat and spatial bar structures in the context of loss of local and general stability
•	Thin-walled construction elements, shell structures
•	Joints and connections of metal structures: including joints of large-size structures with large-size elements (e.g. 1.5 m high beams)
3.	Modelling of the behaviour of metal building structures
•	Modelling of the behaviour of steel structural elements of plane and spatial load bearing frameworks composed of hot rolled member products
•	Modelling of the behaviour of steel plate girders
•	Modelling of the behaviour of lightweight steel structures made of cold formed profiles and profiled sheeting
•	Modelling of the behaviour of joints, splices and connections between structural members as well as between members and their supports on the foundation or on the other supportive structure
4.	Theory and methods of safety estimation of building steel and composite structures
•	Load and resistance models in standard service and execution situations as well as in the robustness assessment with regard to disproportionate failure or progressive collapse in exceptional situations (fire, explosion, impact)
•	Load models and modelling of the behaviour of metal shell structures (tanks, silos, pipelines)
•	Load models and modelling of the behaviour of slender structures (towers, masts, chimneys)
•	Structural health monitoring of technical state and assurance of a durable reliability of building steelworks
5.	Typization in steel structures
•	Development of catalogs of typical bridge solutions
•	Parameterization of nodes and connections
•	Development of a catalog of steel and composite structure nodes
6.	The use of stainless steels and high-strength HSS steels (up to S960) in steel structures
•	Structural properties of steel
•	Limit state assessment methods
•	Applications in steel construction
•	Technological and corrosion problems
7.	Maintenance and evaluation of the technical state of existing structures including historic steel structures, their modernization and revitalization
III. MEETING SEMINAR PRENTATIONS	
1.	Seminar presentations of scientific investigations made within PhD and DSc studies
2.	Aspects of academic curriculum development in relation to teaching modules on metal structures
3.	Seminar presentations of results obtained within finished research projects or grants as well as of the scientific and innovative achievements in the field of SKM interest
4.	Informative presentations of current codification activities as well as of different aspects related to modernizations and exploitations of building metal structures.
5.	Promotional presentations of books newly published by members of SKM
6.	Information on scientific and technical conferences and symposia held at the national and international levels
7.	Minimum of 3 meetings a year organized in Warsaw but minimum of 2 meetings outside of Warsaw in the cadence
IV. ORGANIZATION OF CONFERENCES	
•	XIV International Conference on METAL STRUCTURES, ICMS'2021; Poznań
•	Preparation to XV Conference on METAL STRUCTURES, ICMS'2026; Wrocław
•	XII Scientific Conference JOINTS AND CONNECTIONS IN METAL AND COMPOSITE STRUCTURES, Rzeszów-Bezmiechowa, October 2023
•	XIII scientific conference "Composite structures". Zielona Góra. 2023
V. EXPECTED OUTCOMES OF SKM ACTIVITIES UNDERTAKEN	
•	"Designing selected special steel structures with examples of calculations ", collective work under the supervision of prof. Marian Giżejowski and prof. Jerzy Ziółko. The monograph will be published by Arkady in September 2021
•	"Designing selected steel shell structures with examples of calculations "- collective work under the supervision of prof. Marian Giżejowski and prof. Jerzy Ziółko. The monograph will be published by PWN next year
•	Preparation to monograph publication: Steel and steel-concrete composite joints: design guide with tables and charts (draft title).