ANNEX A

PUBLIC SELECTION BASED ON QUALIFICATIONS AND INTERVIEW FOR THE AWARDING OF NO. 1 EXPERIENCED GRANT LASTING 36 MONTHS FOR CONDUCTING RESEARCH PURSUANT TO ART. 22 OF LAW NO. 240/2010 AT THE DEPARTMENT OF ENGINEERING AND APPLIED SCIENCES (SC 08/B2 - STRUCTURAL MECHANICS - SSD ICAR/08 - STRUCTURAL MECHANICS) COFINANCED PRIN (CUP: F54I19000470001) TYPE B

announced with decree of the Chancellor Rep. no. 783/2019 of 02.12.2019 and posted on the official registry of the University on 09.12.2019

RESEARCH PROJECT
"Advanced structural diagnosis by monitoring and identification in infrastructural engineering"

Research structure: Department of Engineering and applied sciences
Duration of the grant: 36 months
Scientific Area: 08 - Civil engineering and architecture
Academic recruitment field: 08/B2 – Structural mechanics
Academic discipline: ICAR/08 - Structural mechanics
Scientific Director: Prof. Egidio Rizzi

The current research project proposes an innovative computational and experimental methodology for structural diagnosis with applications in infrastructural engineering. The research activities belong to the scientific field of Structural Mechanics.
The main goal of the present project is the proper evaluation, from a qualitative and quantitative standpoint, of the present structural behavior of strategic infrastructures (e.g. railway or road systems and bridges and, possibly, historical bridges), particularly with reference to structural bearing capacity, residual service life and safety margins with respect to structural collapse.
The project attains to the broader research field of Structural Health Monitoring (SHM), at present of a large interest in the scientific and engineering international community. Specific attention is devoted to the methodological topics of inverse analysis, parameter identification, model updating, structural monitoring and diagnosis, Data Driven Identification (DDI), Heterogenous Data Fusion (HDF) based on diverse input sources (e.g. displacement and acceleration measurements), employment of "smart sensors".
A timely and effective diagnostic investigation turns out nowadays to be of utmost relevance, particularly with respect to assessment, life-long monitoring and refurbishment of infrastructural heritage.
The project aims at developing an integrated approach between diagnostic procedures at the "local" and "global" scales of structural monitoring. The combination between two scale approaches appears to be fundamental for the assessment of local and global infrastructural safety, in serviceability states and under exceptional loading events, with reference to possible structural damages.
Among "local" approaches, mechanical characterization procedures will be taken into account, based on inverse analysis, for identification of mechanical constitutive parameters of materials and structural components. Otherwise, at the "global" monitoring scale, automated procedures for static and dynamic monitoring will be improved by innovative pervasive sensing techniques and remote monitoring (e.g. radar instruments, laser scanner, total station, photography and photogrammetry).
The proposed research work should be organised, with respect of a three year total duration, in three main stages: (a) investigation stage, devoted to the study of available methodologies and choice of case studies; (b) development and implementation stage, for theoretical, computational and experimental developments; (c) validation stage, aiming at analysis, verification, validation and publication of research results, possibly with further applications and future developments of current innovative methodologies