ДГКС ASES | U-5
Kongres 2026
Congress 2026

doi: 10.67563/ASESCONF2026110R

Vlastimir Radonjanin[1], Mirjana Malešev[2]

BEFORE ANY INTERVENTION: THE CHALLENGE OF STRUCTURAL ASSESSMENT

Summary: Before any strengthening, repair, reconstruction or adaptation of an existing structure can begin, engineers face one of the most demanding tasks in practice: establishing its true condition. Structural assessment is far more than a routine inspection - it is an investigative process combining field observation, testing, material science, structural analysis and engineering judgement to interpret incomplete or hidden evidence. The reliability of every subsequent intervention depends directly on how accurately this initial step is performed. The paper discusses why structural assessment is inherently complex, what makes it demanding in practice, and why it represents the foundation of every informed engineering decision on existing structures, illustrated through practical examples from bridges, buildings and other engineering structures.

Keywords: structural assessment, structural diagnostics, existing structures, non-destructive testing, engineering judgement

PRE BILO KAKVE INTERVENCIJE: IZAZOV PROCENE STANJA KONSTRUKCIJA

Rezime: Pre nego što bilo kakvo ojačanje, sanacija, rekonstrukcija ili adaptacija postojeće konstrukcije mogu da otpočnu, inženjeri se suočavaju sa jednim od najzahtevnijih zadataka u praksi – utvrđivanjem njenog stvarnog stanja. Procena stanja konstrukcije daleko je više od rutinskog pregleda – to je istraživački proces koji objedinjuje terensko opažanje, ispitivanja, poznavanje materijala, proračunsku analizu i inženjersko rasuđivanje radi tumačenja nepotpunih ili skrivenih pokazatelja. Pouzdanost svake naredne intervencije direktno zavisi od toga koliko je precizno sproveden ovaj početni korak. Rad razmatra zašto je procena stanja po svojoj prirodi složena, šta je čini zahtevnom u praksi i zašto predstavlja temelj svake utemeljene inženjerske odluke na postojećim konstrukcijama, ilustrovano primerima sa mostova, industrijskih objekata i zgrada.

Ključne reči: procena stanja konstrukcija, dijagnostika konstrukcija, postojeće konstrukcije, ispitivanja bez razaranja, inženjersko rasuđivanje

[1] Institute for Testing, Assessment and Repair of Structures, Novi Sad, Serbia, radonjanin.vlastimir@gmail.com
[2] Institute for Testing, Assessment and Repair of Structures, Novi Sad, Serbia, malesev.mirjana@gmail.com

1. INTRODUCTION

No intervention on an existing structure, whether repair, strengthening, reconstruction, a change of use, or even a more detailed analysis, can begin before the true condition of that structure has been reliably established. This very step, structural assessment, represents the most critical and, in practice, the most demanding phase in the life cycle of any engineering structure. Unlike the design of new structures, where the engineer defines the input parameters, in the assessment of existing structures the engineer starts from the unknown: from a structure whose loading history is often incompletely documented, whose materials have deteriorated in ways that are not always visible, and whose actual behaviour under load can only be assessed indirectly.

Structural assessment is not a checklist, nor a routine inspection. It is an investigative process that requires a combination of field observation, testing, knowledge of material and structural behaviour, familiarity with different construction techniques, and, above all, engineering judgement capable of interpreting incomplete or concealed evidence. In practice, the success of every subsequent intervention, be it repair, strengthening, adaptation, or a restriction of use, depends directly on how reliably this initial, diagnostic step has been carried out. An incorrect or incomplete assessment inevitably propagates through all subsequent decisions, often with serious consequences for safety, durability and the economics of the intervention.

This paper aims to highlight the complexity of the process of assessing the condition of existing structures, to systematise the main sources of that complexity, and, through examples from the authors' own engineering practice, to show how decisions are made in real conditions on the basis of incomplete and often contradictory data. Particular emphasis is placed on the fact that structural assessment is not only a technical but also an intellectual challenge, one that requires experience that cannot be fully replaced by even the most modern equipment or the most advanced computational tools. It should be noted that this paper deals with complex assessments carried out after earthquakes, fires, floods, changes of load or use, or the appearance of major damage, in short, whenever a clear and responsible answer must be given regarding the condition of a structure and the possible engineering options. Accordingly, this paper does not discuss the routine and main inspections prescribed by structural regulations, carried out at specified time intervals, which have their own place in the continuous monitoring of structures.

2. WHAT DOES STRUCTURAL ASSESSMENT REALLY INVOLVE?

In professional practice, structural assessment is often reduced to a visual inspection and the drafting of a report on observed damage. Such an understanding is, however, considerably narrower than the actual content of this process. Structural assessment is, in essence, a combination of diagnostics, interpretation, prediction of future behaviour and, ultimately, an engineering decision on how to proceed with the structure.

A comprehensive structural assessment comprises a whole range of activities, the scope and sequence of which must be adapted to each individual structure. In their own practice, the authors of this paper have most often applied a general assessment methodology, developed in cooperation with Prof. Folić and Prof. Muravljov. In simplified form, this methodology comprises the following, interrelated activities:

- Review of existing design and technical documentation,
- Macroscopic inspection of the structure and its immediate surroundings,
- Detailed visual inspection of the structure, condition "survey",
- Non-destructive and destructive "in-situ" testing of the structure,
- Laboratory testing of material samples taken from the structure,
- Numerical modelling and structural analysis (based on the established, rather than assumed, condition),

- Other tests and measurements (load testing, geodetic scanning of underground structural parts, 3D laser scanning of above-ground parts, vibration measurement, geotechnical site investigation…)
- Analysis of all collected data on construction, service history, previous interventions, recorded damage, results of field and laboratory testing, and results of the structural check calculation... This phase is of particular importance, since it is here that engineering judgement and experience come into play, linking all previously obtained results and information into a single, consistent conclusion.
- Preparation of a structural condition assessment report, with a proposal of global repair measures, where applicable.

None of the above activities, taken in isolation, provides a complete and reliable picture of the condition of a structure. Visual inspection does not reveal internal deterioration; non-destructive tests provide indirect rather than direct indicators; destructive methods (such as extracting concrete cores) are local in character; while computational models depend directly on the quality of the input data, which must be provided precisely by field and laboratory investigations. Only by combining all sources of information, with a critical check of their mutual consistency and interrelation, the engineer can reach a decision in which there is genuine confidence. For this reason, structural assessment is rightly regarded as one of the most demanding disciplines in civil engineering, since it draws together knowledge from several different fields.

Since a process of assessment conceived in this way objectively takes a relatively long time and involves additional cost, many building owners try to shorten this phase, or request that the scope of field and laboratory investigation be reduced, wishing to reach a repair solution as quickly as possible, sometimes even without establishing the actual causes of the observed damage. However, even where the client or owner is prepared to accept the real risks arising from an incorrectly established diagnosis of the causes of damage or deterioration, a detailed inspection and testing of the structure must never be skipped! Ultimately, responsibility for everything that happens to the building and its structure in the future remains permanently linked to the findings of the structural assessment.

Although conclusions on the causes of damage and the condition of a structure are, almost without exception, based primarily on the engineer's own judgement and experience, the use of established recommendations and proven assessment methodologies, together with adherence to recognised classifications of damage and its causes, can help to:

- shorten the duration of the diagnostic process,
- avoid an incorrect assessment of the structure's condition, and
- increase the effectiveness of any subsequent repair or strengthening solutions.

3. WHY IS STRUCTURAL ASSESSMENT COMPLEX AND CHALLENGING?

The complexity of assessing the condition of existing structures, especially those that have been in service for a long time, arises from several interrelated sources of uncertainty. The key categories of challenges faced by an engineer during structural assessment, irrespective of structure type, building use, or the material of construction, are systematised below.

3.1. INCOMPLETENESS OF INFORMATION

An engineer assessing the condition of an existing structure rarely has a complete insight into its true condition. For a large number of older structures, no original design documentation exists, which directly increases the scope of field investigation required. Even where design or as-built documentation is available to some extent, planned field measurements and tests must still be carried out on the structure itself, in order to verify existing data or fill gaps in missing information.

A large part of a structure is, as a rule, not directly accessible for inspection, like foundations, the interior of cross-sections, connections covered by cladding or installations, and parts exposed to an aggressive environment without safe access. What is visible at the surface often does not faithfully reflect what is happening inside the cross-section, or in locations that cannot be inspected. The discrepancy between the assumed and the actual condition is one of the most frequent causes of incorrect assessment, and is revealed only once well-planned and sufficiently extensive field investigations have been carried out.

3.2. SPECIFIC NATURE OF THE MATERIALS USED

Each of the materials used in reinforced-concrete, prestressed, steel, timber, composite or masonry structures has its own specific character and “history” of installation, care, service and deterioration, which differs from structure to structure, and even from element to element within the same structure. The quality of the materials used, the construction technology employed at the time of building, and the service conditions to which the structure has been exposed all directly affect the actual material properties, which as a rule differ from the design and code values. For this reason, every structural assessment must be based on actually established, rather than assumed, material characteristics, which always requires an appropriate scope of testing.

3.3. AGEING, DETERIORATION AND ENVIRONMENTAL EFFECTS

Structures inevitably age over time, and the rate and nature of this ageing depend on the material, the structural system, and the environmental conditions. Carbonation of concrete and chloride contamination lead to reinforcement corrosion; changes in moisture further cause deterioration of timber and masonry structures; material fatigue endangers steel structures exposed to repeated loading; while an aggressive industrial or marine environment significantly accelerates all of the above processes. Deterioration is, as a rule, neither uniform nor linear in time, it accelerates once certain limit states are reached (for example, once carbonation reaches the reinforcement, or once the first cracks appear), so that an assessment based solely on the current condition, without understanding the deterioration mechanism and its dynamics, may significantly misjudge the remaining service life of the structure.

3.4. UNCERTAIN LOADING HISTORY

The actual loading history to which a structure has been exposed during its service life is rarely fully known or documented. Changes in building use, occasional overloading, unplanned alterations to the structural system, seismic events to which the structure has been exposed, as well as dynamic and vibration effects, are all factors that can leave a trace on the structure, a trace that is not always unambiguously recognisable at the time of inspection. Without reliable data on previous loading, the engineer is forced to draw part of the conclusions indirectly, on the basis of traces of damage, deformation or deterioration, which again calls for considerable experience and “forensic” ability on the part of the assessing engineer, or introduces an additional degree of uncertainty into the assessment process.

3.5. LIMITATIONS OF FIELD TESTING AND MEASUREMENT

Field investigations on the structure are an indispensable part of structural assessment, but they too have their limitations. A visual inspection of all parts of a structure is, as a rule, carried out from close range, and even when performed by a specialist experienced in the “forensic” inspection of structures, it provides only a starting point, and most often an insufficient basis for drawing final conclusions. In practice, numerous in-situ testing methods are therefore also used, which, according to their effect on the parent structure, are divided into NDT (Non-Destructive Testing), SDT (Semi-Destructive Testing) and DT (Destructive Testing). In recent years, equipment for NDT methods has been further improved, and an engineer carrying out a structural assessment has complete freedom to select different methods from each of the three groups listed, provided that the load-bearing capacity and stability of the structure are not compromised. Naturally, this presupposes that the engineer understands, both in principle and in practice, how each piece of equipment works, the quality of the data obtained, and, above all, is able to judge whether a given method might cause additional damage to the structure under investigation. A common feature of all NDT methods is that they provide indirect, rather than direct, indicators of the condition of the material and the structure, and that each has a limited range of application, either in terms of penetration depth or in terms of the type of defect it is able to detect. Semi-destructive (SDT) and destructive (DT) testing methods, on the other hand, provide more direct data, but are as a rule strongly local in character and limited in scope, so that their results must be generalised to the entire structure with caution.

For these reasons, no single testing method can be considered sufficient on its own; a reliable assessment in practice therefore requires the combination of several complementary methods, interpreted together with the visual inspection and the computational analysis of the structure's condition.

3.6. THE NEED FOR ENGINEERING JUDGEMENT

Data obtained through inspection and testing do not, in themselves, constitute a structural assessment. They represent input information that still has to be interpreted. It is not uncommon for two experienced engineers, starting from the same field and laboratory data, to arrive at different interpretations of a structure's condition and different recommendations for further action. This difference does not stem from a lack of expertise, but from the very nature of the problem: the assessment of an existing structure is always made under conditions of incomplete information, so that engineering judgement, grounded in experience with similar structures, remains an irreplaceable part of the process. Standards and guidelines may define the framework and methodology, but the final evaluation and the responsibility for the decision made, always rests with the engineer who interprets the data collected.

The extent to which the level of knowledge of a structure directly affects its structural calculation is best illustrated by EN 1998-3, which covers the “assessment and retrofitting of buildings for earthquake resistance”. This standard introduces the Knowledge Level (KL) of an existing structure, together with a Confidence Factor (CF) applied in the calculation of the load-bearing capacity. The CF values are 1.35 for KL1, 1.20 for KL2 and 1.00 for KL3. The Knowledge Level (KL) is determined on the basis of three independent sources of information, all of which must be assessed: the geometry of the structure, the details (reinforcement layout and connections), and the quality of the materials used. It follows that the time, money and expertise invested in understanding and defining an existing structure directly affect the results of the seismic retrofit calculation, and hence the rationality of the repair works. For example, the highest level of knowledge, KL3 (with CF = 1.00), requires original construction drawings, original material test reports, a comprehensive inspection, and extensive in-situ testing. This confirms the central thesis of this paper: the quality of the final decision does not depend solely on the computational model applied, but above all on how reliably the true condition of the structure has been established, something that cannot be compensated for by a computational factor, but only through direct field investigation.

4. EXAMPLES FROM PRACTICE

The theoretical framework of structural assessment is best understood through concrete examples from practice, in which the challenges described above, like incomplete information, material variability, deterioration, uncertain loading history and testing limitations, intertwine and jointly shape the final engineering decision. Several examples from the authors' own practice are presented below, with emphasis on the diagnostic dilemma faced by the authors and the key decision that resulted from it.

Example 1: The road bridge over the DTD canal has been in use for road traffic since 1961. The bridge is a prestressed-concrete, three-span continuous girder structure, with spans of 17 m + 41 m + 17 m. A visual inspection of the bridge from the outside gave no indication whatsoever of the critical condition of the structure.

Figure 1: General view of the road bridge over the DTD canal

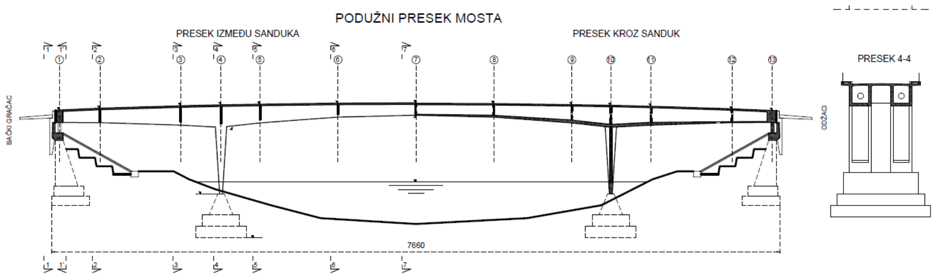

Figure 2: Longitudinal section and cross-section of the bridge

However, after entering the box girders through a narrow opening in the bottom slab and working our way through openings in the cross-diaphragms, we discovered that the bridge was, quite literally, one step away from total collapse! Based on this finding, traffic on the bridge was restricted immediately, and a repair design was prepared which included the complete replacement of the prestressing tendons.

Figure 3: Broken wires in the upper row of the prestressing tendon on axis B, damp stains and traces of rust around the openings used for the subsequent concreting of the tendon

The essence of the problem with this and similar bridges is that the most critical elements of the bridge structure, the prestressing tendons, remain effectively “hidden” inside the box girders for the structure's entire service life, meaning that routine inspections from the outside alone can lead to catastrophic consequences.

Example 2: After several months of searching, we found parts of old archival design documents, including the report of the technical acceptance commission, which cast an entirely different light on the structure of the railway bridge at Novi Beograd. This continuous, prestressed reinforced-concrete bridge carries 5 tracks and, until two years ago, when we carried out the condition assessment and repair, had been in service for 55 years. The bridge is 474 m long overall and 56 m wide.

Figure 4: General view of the railway bridge at Novi Beograd, from above and below

Some of the information we uncovered by reviewing the original documentation proved extremely valuable in assessing the bridge's condition and in making decisions during the preparation of the repair and strengthening design.

The bridge was built by three large contractors: G.P. „Rad“, G.P. „Mostogradnja“ and KMG „Trudbenik“. Different specified concrete grades and three different contractors contributed to a wide scatter in the results of concrete compressive strength testing, and ultimately to the assessment of very low concrete strength classes within the structure.

Even during construction, the bridge had problems with the calculated proof of load-bearing capacity, owing to the specified concrete quality not being achieved in certain track girders; consequently, immediately after construction, these girders were repaired by adding new prestressing tendons in the space between the two box girders. It is highly questionable whether, without this documentation, anyone would have entered that narrow space between the boxes and discovered this important structural fact.

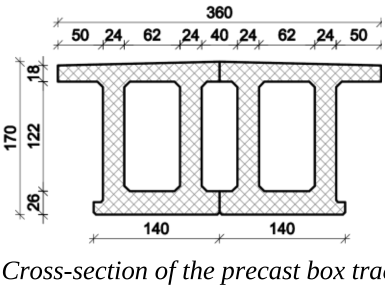

Figure 5: Cross-section of the precast box track girders

Once the as-designed condition is known, it becomes possible to identify what was changed during construction. The differences we discovered were as follows:

– In one bridge unit, in certain spans, cast-in-situ monolithic track girders were built instead of the precast track girders.
– In another bridge unit, over the 33 m span, at the locations of the intermediate passenger platforms, ribbed slabs were installed instead of the precast troughs.

– In a third bridge unit, in the zone of an existing staircase, precast solid slabs, supported on additional secondary girders, were installed instead of the precast troughs.

Example 3: On 6 April 2000, a fire broke out in the building of the Novi Sad Open University. The fire started on the 12th floor and very quickly spread in both vertical directions to the top six floors of the building (floors 8–13). As a result of the fire, the load-bearing structure of the building was damaged, and the façade, interior finishes and installations on the affected floors were partially or completely destroyed.

Figure 6: 11th floor affected by the fire

Figure 7: 9th floor affected by the fire

The search for documentation took a full five months. By the time we had almost completed the condition assessment and the structural check calculation, the most persistent member of our team managed to locate a large part of the original design documentation. In addition to all the characteristic fire damage to the concrete and reinforcement, on this building we identified, for the first time, another form of "hidden" damage. This was internal delamination, a crack within the interior of the cross-section, located at a depth of approximately 10 cm from the surface, which we subsequently detected regularly inside the fire-affected reinforced-concrete columns.

Figure 8: Crack within the concrete of RC columns affected by the fire

Example 4: The water tower in Beočin is a masterpiece of civil engineering, and even of architecture, in the field of reinforced-concrete structures from the late 19th century. For our team, this structure was a major challenge, since at the outset we had not a single piece of data on the structure available to us. We learned that it had been designed by the Hungarian engineer Szilárd Zielinski, and later discovered that he had also designed the water tower in Szeged as the subject of his doctoral thesis, the first reinforced-concrete structure ever built in Hungary.

Figure 9: The first water tower built of reinforced concrete in Hungary (1904, Szeged, Hungary)

Figure 10: Beočin water tower, Serbia, 1902, still in use

Figure 11: Digital twin

This comparison helped us understand the design concept the engineer had applied to these structures. During extensive investigations, which lasted almost a year, we discovered that flat steel bars had been used as stirrups, and we came across some of the earliest connectors used for lapping reinforcement bars.

Figure 12: Use of flat steel bars as stirrups in RC beams

Example 5: The remaining piers of the old bridge over the Danube in Novi Sad, presented a new challenge. Underwater cameras failed to produce usable results, so, in the middle of winter, we engaged professional divers, trained them for the task, and carried out an underwater survey of the massive piers and foundations.

Figure 13: Use of boats and barges to prepare for the inspection of the piers

Figure 14: Diver preparing to be lowered into the Danube

5. FROM DIAGNOSIS TO DECISION

Structural assessment is never an end in itself, it provides the basis for deciding how to proceed with a structure. Based on the established condition, the test results and the check calculation, the engineer chooses among several possible interventions:

– adaptation of the structure to new requirements and uses,
– repair of damaged or deteriorated structural elements,
– strengthening of the structure to increase load-bearing capacity and stability,
– restriction of the use of the structure, where repair or strengthening cannot currently be carried out or are not economically justified,
– establishment of a structural health monitoring system, where it is necessary to track the development of observed phenomena before a final decision is made,
– demolition of the structure, where this is technically and economically justified.

None of these decisions is universally “correct”, each depends on the reliability of the previously conducted assessment, the resources available, the importance of the structure, the acceptable level of risk, and, ultimately, the intentions of the owner. The owner's intentions play a significant role: if operations are soon to cease, or the use of the building is about to change, it may be reasonable to consider a cheaper, faster solution combined with more frequent monitoring, rather than an expensive, extensive repair, thereby knowingly accepting a shorter remaining design service life for the structure. Precisely for this reason, an inaccurate or incomplete assessment jeopardises not only the technical soundness of the chosen solution, but also its economic justification. In other words, a wrong diagnosis can lead just as easily to an excessively costly and unnecessary strengthening scheme as to a dangerous underestimation of the actual risk. The quality of the final decision on an intervention directly reflects the quality of the assessment that preceded it. The title of this paper, “Before Any Intervention: The Challenge of Structural Assessment,” points precisely to this inseparable link.

It should also be honestly acknowledged that, in practice, structural assessment is often perceived as a waste of time and money; few owners fully appreciate the value of extensive field and laboratory work, or of complex numerical models exploring numerous variants, which further complicates the delivery of a high-quality assessment under real-world conditions.

6. THE FUTURE OF STRUCTURAL ASSESSMENT

A significant and highly topical step forward in this field is the standard EN 1990-2:2026, *Eurocode: Basis of structural and geotechnical design, Part 2: Assessment of existing structures,* adopted by CEN/TC 250 on 18 March 2026 as part of the so-called second generation of Eurocodes. It is the first unified, pan-European normative framework devoted exclusively to the assessment of existing structures, developed over many years, from the 2015 report of the

European Commission's Joint Research Centre (JRC), through the technical specification CEN/TS 17440:2020, to the final normative standard. The standard formally confirms what practice has long recognised: structural assessment is a fundamentally different activity from the design of a new structure. In new design, material properties and geometry are merely assumed through statistical distributions, whereas in an existing structure they already exist and, in principle, can be established, albeit with real effort, cost and uncertainty arising from hidden details, limited testing scope and deterioration accumulated during service. For this reason, EN 1990-2 explicitly recognises the iterative nature of assessment: it allows the process to begin with a simpler analysis, which is then refined if the results are not satisfactory, as well as the possibility of graded conclusions, rather than a simple pass/fail verdict. The standard, however, deliberately does not cover material-specific rules (these remain within the material Eurocodes, e.g. EN 1992 for concrete), does not cover seismic assessment, which remains within the scope of EN 1998-3 with the previously discussed concept of knowledge levels and confidence factors, nor does it define when an assessment should be initiated or how its results should subsequently be used in asset management.

Technological development over the past decade has significantly expanded the possibilities for assessing the condition of existing structures, without changing the essence of the problem: it remains necessary to reliably interpret incomplete data about a real structure, and increasingly to do so in real time. Digital twins enable continuous comparison between the computational model and the actual behaviour of the structure; structural health monitoring (SHM) systems enable the continuous recording of deformations, displacements, vibrations and environmental effects; while artificial-intelligence-based methods are increasingly assisting in the automated detection of damage from images, video footage or sensor data. Advanced NDT methods,such as high-resolution ground-penetrating radar, infrared thermography, ultrasonic phased-array systems, real-time acoustic emission – enable more extensive and more reliable testing with fewer access constraints. Integration of structural condition data with BIM models, together with the potential to analyse large datasets (big data) collected through long-term monitoring, opens the way to a more systematic and more predictable management of the existing stock of structures.

Nevertheless, despite all these technological advances, one fundamental fact remains unchanged: tools change and improve, but the interpretation of the data collected still requires an experienced and responsible engineer who understands structural behaviour. Technology extends what we are able to measure, but it does not replace what we must interpret.

7. CONCLUSION

The assessment of existing structures represents the foundation of every responsible engineering intervention. It is not a first step carried out routinely and quickly, ahead of the “real” work of designing a repair or strengthening scheme; it is the process that determines whether all subsequent decisions will be based on the actual condition of the structure, or on assumptions that may later prove to be wrong. Incomplete available information, material variability, deterioration caused by ageing and environmental effects, uncertain loading history, and the inherent limitations of every testing method make structural assessment one of the most demanding tasks in civil engineering.

The practical examples presented in this paper confirm that a reliable structural assessment requires a combination of technical knowledge, experience, and a willingness to accept that a complete picture of a structure's condition can never be obtained. New technologies will continue to extend the limits of what we are able to measure and monitor, but the responsibility for interpretation and for the final decision remains with the engineer. For this reason, structural assessment should be recognised not as a formality preceding the “real” engineering work, but as its integral and most responsible part, because, as highlighted in the title of this paper, before any intervention stands the challenge of structural assessment.

Finally, it is worth highlighting one practical recommendation: ideally, the repair or strengthening design should be prepared by the same team of engineers who carried out the structural assessment, since, after the time spent in the field and analysing all the data collected on the structure, no one knows that structure better than they do.

REFERENCES

[1] EN 1990-2:2026 (Main), Eurocode - Basis of structural and geotechnical design - Part 2: Assessment of existing structures, published on 18 March 2026 (CEN/TC 250).

[2] SRPS EN 1998-3:2015, Eurocode 8: Design of structures for earthquake resistance - Part 3: Assessment and retrofitting of buildings.

[3] SRPS EN 1504-9:2010 Products and systems for the protection and repair of concrete structures - Part 9: General principles for the use of products and systems.

[4] Radonjanin V., Malešev M., Folić R., Sotakova D.: The Assessment of the High Building Structure Damaged in a Fire, The 7th International Scientific Conference, Kosice, Slovakia, 2002, pp. 67-74.

[5] Radonjanin V., Folić R., Malešev M.: Investigation, Evaluation and Repair of Reinforced Concrete Structures Damaged in Fire, Workshop "Extreme Loadings, Aging and Durability of Concrete Structures", Hydro-Quebec, McGill University, Montreal, 2004.

[6] Radonjanin V., Malešev M., Folić, R., Kolaković, S.: Investigation and assessment of river piers of the Franz Joseph bridge on the Danube in Novi Sad, 5th International Conference on bridges across the Danube "Bridges in Danube basin", Novi Sad, 2004, pp. 367-376.

[7] Radonjanin V., Malešev M.: Causes and manifestation of most frequent damage in masonry structures, 11th International Simposium of MASE, Ohrid, 2005, pp. 489-497.

[8] Radonjanin V., Malešev M., Folić R.: Assessment and repair of the bearing structure of a multi-storey parking garage, Journal of Building Appraisal, Volume 2, Issue 4, Palgrave Macmillan, London, UK, 2007, pp. 335-354.

[9] Malešev M., Radonjanin V.: Damage of the main city sewer after half century of service life and repair possibilities, International Conference "Structural Faults & Repair - 2010", Edinburgh, UK, 2010, pp. 12. (ISBN 0-947644-67-9)

[10] Radonjanin V., Malešev M., Lađinović Đ., Folić R.: Repair and Strengthening of Masonry Buildings Damaged by Earthquake Action, keynote lecture, 7th Scientific and Professional Conference "Condition Assessment, Maintenance and Repair of Structures and Settlements", 2011, pp. 13-24, (ISSN 978-86-904089-9-3)

[11] Radonjanin V., Malešev M., Folić R., Lukić I.: Assessment and Repair of the Bearing Structure of Gradiska Cultural Centre After Fire, Journal Technical Gazette, Vol. 21 No. 2, ISSN 1330-3651, 2014, pp. 435-445,

[12] Malešev M., Radonjanin V., Šupić S., Lukić I., Draganić S.: The assessment of RC structure of a compensation tanks in Novi Sad, International Conference "Civil Engineering – Science and Practice", GNP 2016, 978-86-82707-30-1, Montenegro, 2016, pp. 831 - 839.

[13] Malešev M., Radonjanin V.: Fire Damages of Reinforced Concrete Structures and Repair Possibilities, 1st International Conference on Construction Materials for Sustainable Future, Zadar, Croatia, keynote lecture, 2017, pp. 628-636.

[14] Radonjanin V, Malešev M., Šupić S., Lukić I., Draganić S., Rašeta A.: Assessment of Prestressed RC Structure of Road Bridge Over the Canal DTD on the Road Odžaci - Bački Gračac, Conference “Condition assessment, maintenance and rehabilitation of structures”, 978-86-88897-09-9, Vršac, 2017, pp. 165 - 174.

[15] Furgan S., Malešev M., Radonjanin V., Marinković M.: Characteristic Defects and Damages of Two RC Arch Bridges in Tripoli; iNDiS 14, Novi Sad, 2018, ISBN: 978-86-6022-105-8

[16] Malešev M., Radonjanin V., Bukvić O., Šupić S., Lukić I., Bulatović V.: Assessment of RC Structure as Part of the RTV Center in Novi Sad, Conference "Assessment, maintenance and rehabilitation of structures", 978-86-88897-12-9, Zlatibor, 2019, pp. 253 - 262.

[17] Radonjanin V., Malešev M., Lukić I., Šupić S.: Repair of RC structure of road-pedestrian bridge over Lepenica river in Kragujevac, Building Materials and Structures, 2021, 64 (3), pp. 215-222, DOI: 10.5937/GRMK2103215R

[18] Radonjanin V., Malešev M., Brujić Z., Lukić I., Šupić S., Pantić V.: An Engineering Challenge: Revitalizing a 120-Year-Old Concrete Water Tower, keynote lecture, Int. conference "Civil Engineering – Science and Practice", Kolašin, 2024, pp. 111-130.

[19] Lukić I., Malešev M., Radonjanin V., Šupić. S., Pantić V., Lukić L.: Assessment, rehabilitation and reconstruction of religious buildings in Vojvodina – Examples from practice, Conference "Condition assessment, maintenance and rehabilitation of structures", 2024, DOI: 10.46793/SGISXIII.04IL

[20] Pantić V., Šupić S., Malešev M. Radonjanin V., Lukić I.: Assessment of an Industrial Hall Structure – "Novkabel" Factory Complex in Novi Sad, Conference: "Condition Assessment, maintenance and rehabilitation of structures" 2026. DOI: 10.46793/SGIS26e.155P