FIB MODEL CODE 2020: TOWARDS A GENERAL CODE FOR NEW AND EXISTING CONCRETE STRUCTURES

TNO innovation for life

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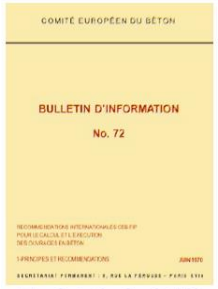
CONTENT

- MC2010 for Concrete Structures
  - What has been achieved?
- MC2020 for Concrete Structures
  - Aspiration and challenge
  - Scope
  - Content proposal
- Organization challenge for fib TG10.1 MC2020
  - Contributors
  - Interactions
  - Target timetable for development of MC2020

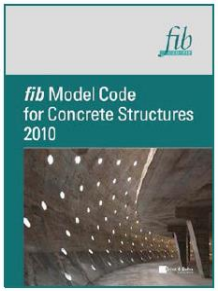
EVOLUTION OF FIB MODEL CODES FOR STRUCTURAL CONCRETE



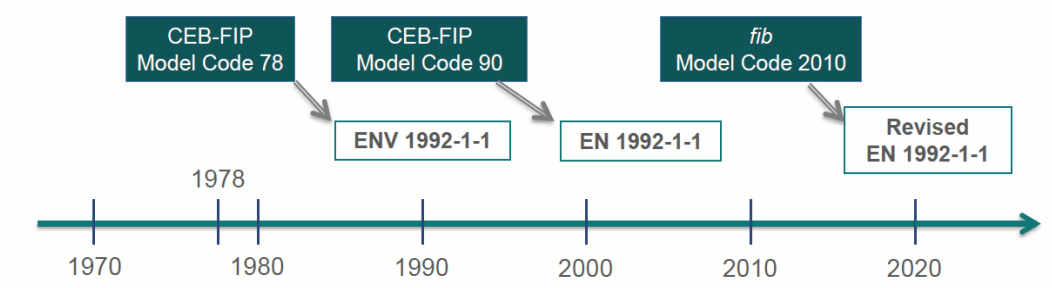
Model Code 1970

Model Code 1978

Model Code 1990



Model Code 2010



Also pronounced influence on Asian and African Model Codes

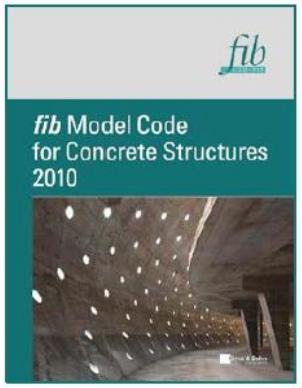
MC2010 FOR CONCRETE STRUCTURES

What has been achieved?

- A code, basically, for new and old structures
- Introduction of õconceptual designòto stimulate creativity
- Design with due regard to service life of structures
- First introduction of sustainability
- Improved safety formats for new and existing structures
- Improved constitutive relations for old and new types of concrete, with due attention to durability aspects
- Steel fibres and non-metallic reinforcement as new alternatives for reinforcing concrete structures
- Wide scope of loading types (static, fatigue, impact, explosion, seismic, fire, cryogenic)
- Scientifically based models, with simplified versions for lower level approximations (daily practice)
- Introduction of reliability concepts in numerical analysis
- Introduction of maintenance strategies for through-life care

MC2020 FOR CONCRETE STRUCTURES

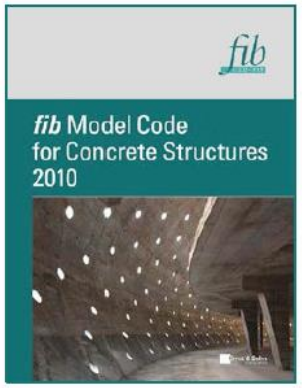
- ***Aspiration and challenge***
  - ***Single merged structural code based on sound and consistent basic principles***
  - ***Including worldwide knowledge with respect to materials and structural behaviour***
  - ***Recognizing the needs of engineering communities in different regions of the world***
  - ***Developing operational model code oriented towards practical needs***



Model Code 2010

MC2020 FOR CONCRETE STRUCTURES

- ***Aspiration and challenge***
  - ***Scope and basic principles:***
    - ***dealing with new and existing concrete structures, and removing constraints for novel types of materials***
    - ***reflecting the importance of sustainability and through-life management of structures***
    - ***implementing fundamental principles and a safety philosophy based on reliability concepts***
    - ***implementing consistent treatment of safety, serviceability, durability by performance based concepts***



Model Code 2010

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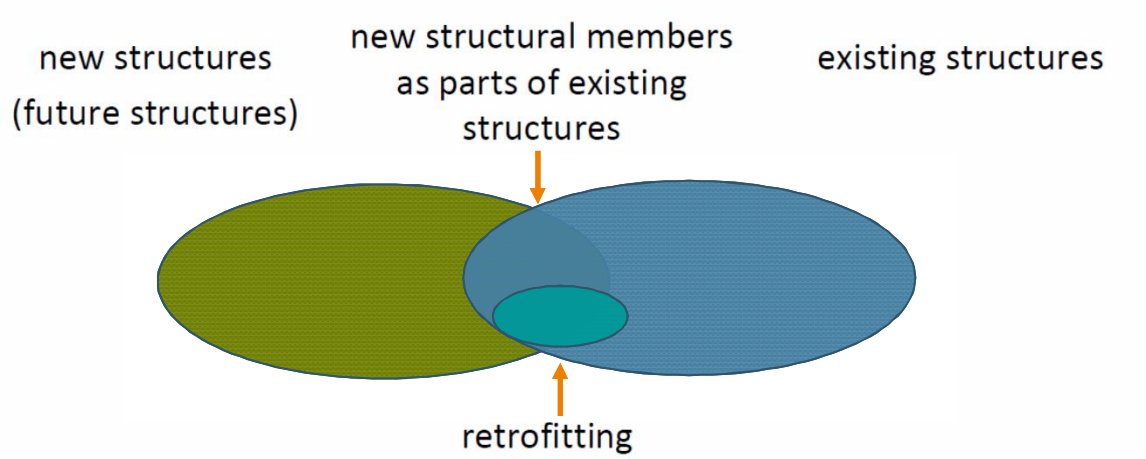
Scope



New structures and existing structures are not always easy to distinguish (overlap region is very important for engineer's activity)

MODEL CODE 2020: CONTENTS PROPOSAL

MC2010 Part I: General	MC2020 Part I: General
1. Scope	**1. Scope**
2. Terminology	**2. Terminology**
3. Basic principles Å **Performance-based approach principles** Å **Performance requirements for serviceability and structural safety** Å **Performance criteria for sustainability** Å **Life cycle quality management**	**3. Basic principles of design and assessment** Å **Sustainability perspective** Å **Through-life management framework** Å **Performance-based approach principles** Å Levels-of-Performance approach Å Reliability principles incl. uncertainty treatment Å Levels-of-Approximation approach Å **Performance requirements** Å Durable serviceability and structural safety incl. robustness and resiliancy implications, environmental performance, economic performance Å **Quality and Information Management**

MC2020 FOR CONCRETE STRUCTURES

- ***Basic principles of design and assessment : Sustainability perspective***
  - ***Design of concrete structures should be aimed at creating reliable structure with required durability, i.e. structure that meets specified demands for safety and serviceability for a defined number of years in a sustainable way***
  - ***Attention to resiliency of structures in areas and situations of higher risks***

1930

Van Nelle factory Rotterdam, The Netherlands

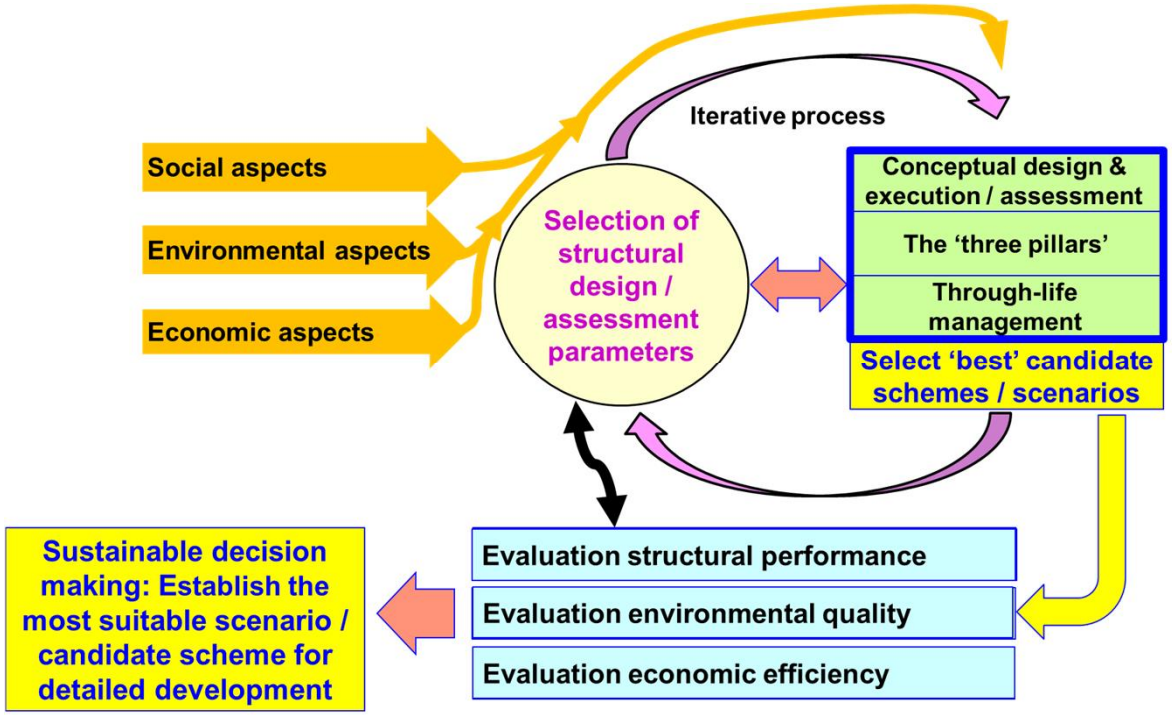
2016

MC2020 FOR CONCRETE STRUCTURES

- ***Basic principles of design and assessment : Sustainability perspective***
  - ***Concrete industry and concrete structures can make a significant contribution to 9 of the 17 UNSDG goals***
  - ***United Nations ï Resolution 70/1 (25 September 2015) Transforming our world: The 2030 Agenda for Sustainable Development***

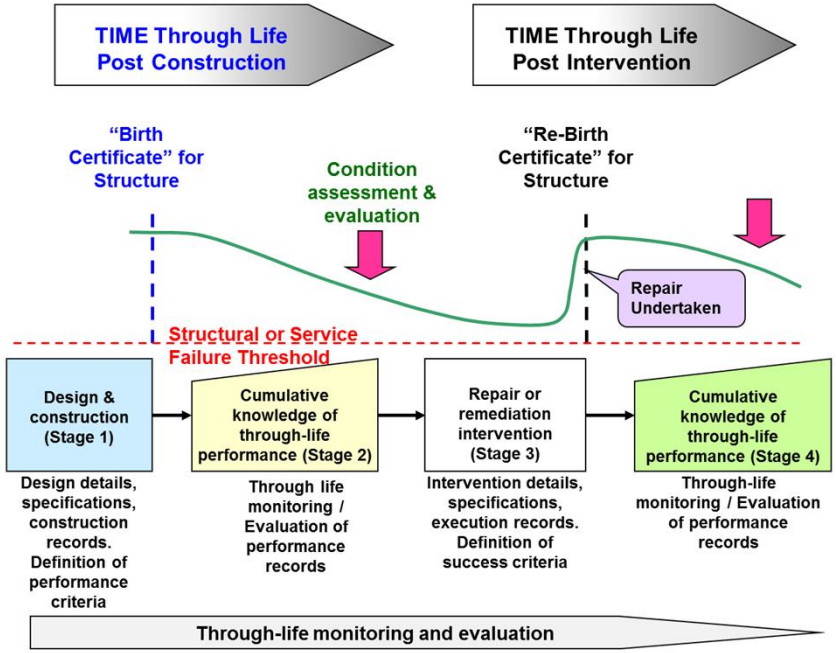
MC2020 FOR CONCRETE STRUCTURES

Basic principles of design and assessment : Sustainable Design - Process steps

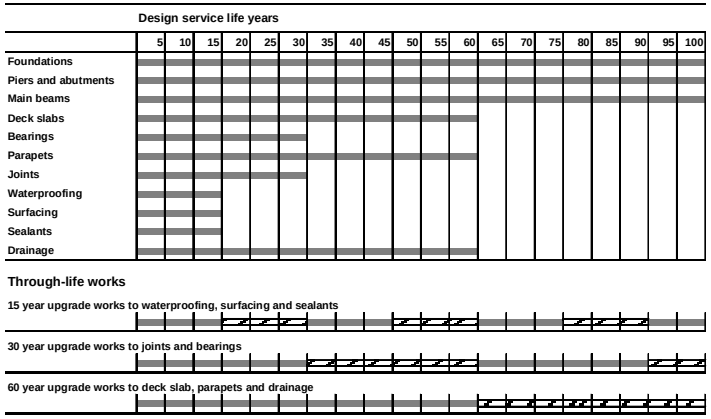


MC2020 FOR CONCRETE STRUCTURES

Basic principles of design and assessment : Through-life management framework



A design service life performance plan for elements of a bridge



MC2020 FOR CONCRETE STRUCTURES

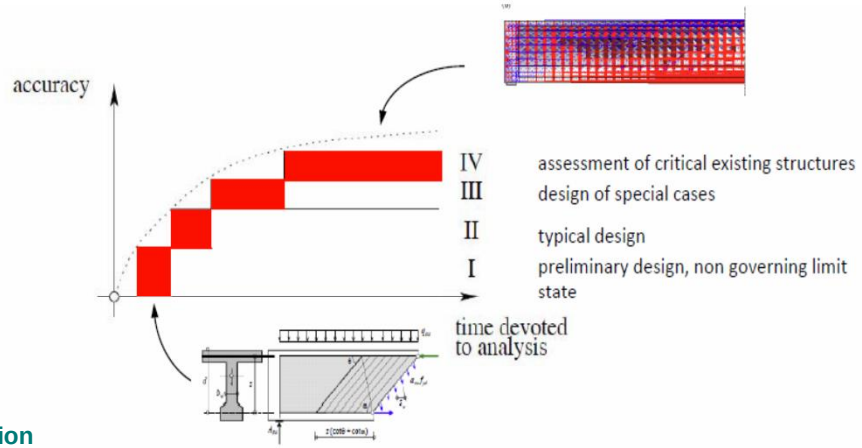
- ***Basic principles of design and assessment : Safety philosophy***
  - ***Reliability concepts extended and updated to cover new and existing structures, considering risk and reliability differentiation to distinguish between :***
    - ***new and existing structures - where different safety levels are adopted due to economics but with minimum levels due to human safety requirements***
    - ***countriesô regionsô specific economic conditions***

The target reliability values (ß) may be reduced in existing structures compared to the new ones

MC2020 FOR CONCRETE STRUCTURES

Basic principles of design and assessment : Levels of approximation approach

Provisions based on generalized models and level of approximation approach



Levels of approximation

IV System assessment of critical existing structures & design of special cases e.g. by FEM
III In-depth elemental evaluation of existing structures & design of special cases
II Typical elemental design & assessment
I Preliminary design & assessment, non governing limit state

MODEL CODE 2020: CONTENTS PROPOSAL

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MODEL CODE 2020: CONTENTS PROPOSAL

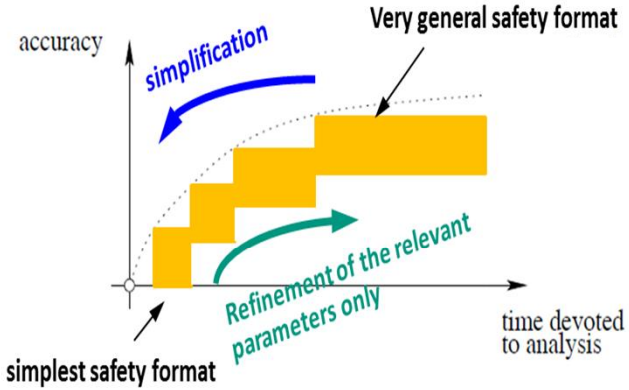
MC2010 Part I: General	MC2020 Part I: General

4. Principles of structural design
Å **Design situations, strategies and methods**
Å **Safety formats**
	4. Principles and processes
	Å **Design and assessment situations**
	Å **Design and assessment strategies**
	Å **Design and assessment methods**
	  Å Limit state design principles
	  Å Safety formats principles
	  Å Calibration principles
	Å **Formats for compliance check**
	  Å Probabilistic format
	  Å Partial factor format
	  Å Global resistance format
	  Å Deemed-to-satisfy approach
	  Å Design by avoidance
	Å **Principles of construction**
	Å **Principles of conservation**
	Å **Principles of dismantlement and reuse**

MC2020 FOR CONCRETE STRUCTURES

Basic principles of design and assessment : Formats for compliance check

- *Provisions based on reliability principles incl. uncertainty treatment*
- *Taking advantage of information acquired by testing and monitoring*



Formats for compliance evaluation

IV	Design by avoidance : Low likelihood of failure for particular limiting circumstances / concrete recipes, but not fool proof
II	Deemed-to-satisfy approach: Tabulated approach most widely used at present
III	Partial factor format: If calibrated, appropriate to standard structures
IV	Global resistance format : If calibrated, appropriate to NL-FEM evaluations
IV	Probabilistic design: Only realistic for special / monumental structures

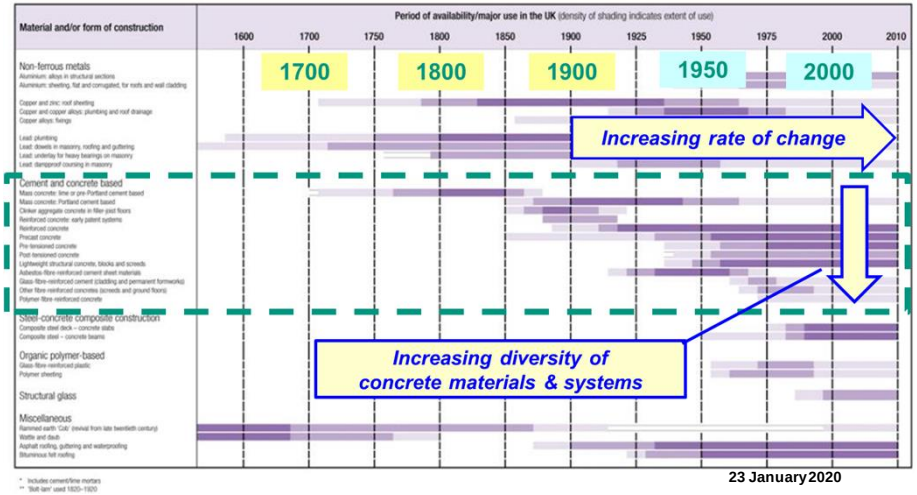
MODEL CODE 2020: CONTENTS PROPOSAL

MC2010 Part II: Design Input Data	MC2020 Part II: Design & Assessment Input Data
5. Materials Å **Input data for contemporary materials** Å concrete, Å reinforcing steel, Å prestressing steel, Å prestressing systems, Å non-metallic reinforcement, Å fibres/fibre reinforced concrete	**5. Materials** Å **Input data for contemporary and old materials** incl. Å concrete, Å reinforcing steel, Å prestressing steel, Å prestressing systems, Å non-metallic reinforcement, Å fibres/fibre reinforced concrete, Å ultra high performance concrete, Å protective materials & systems Å **Input data for other forms of construction** Å **Input data for material damage and deterioration**

MC2020 FOR CONCRETE STRUCTURES

Design & Assessment Input Data: Concrete

- *Scope definition and range of applicability:*
  - *conventional materials, old, novel and deteriorating materials incl. materials for interventions (repair mortars etc.)*
- *Assessment of concrete properties*
  - *assumptions for design and assessment*
- *Taking advantage of information acquired by testing and monitoring*
  - *tests methods to enable defined performance material design*
  - *evaluation framework*
  - *Provisions for quality control*



MC2020 FOR CONCRETE STRUCTURES

Design & Assessment Input Data: Concrete : ranges of Model Codes applicability

Criterion	MC 1990	MC 2010	MC 2020
concrete strength	20 … 60 (90) MPa	20 … 130 MPa	20 … 130 MPa
concrete type	normal strength	■ normal strength ■ high strength ■ lightweight (10 … 90 MPa) ■ self-compacting ■ green (eco-concrete) → concretes comply largely with the provisions of EC2 and EN 206, resp.	■ normal strength ■ high strength ■ lightweight (10 … 90 MPa) ■ self-compacting ■ green (eco-concrete) ■ UHPC (…. 250 MPa) ■ intervention materials ■ old concrete **desired**
concrete loads	different ranges of applicability, depending on the related load (static, impact etc.); temperature range: mainly 0 ° C < T < 80 ° C		
tailor-made concrete		reference to test standards or recommendations	

MC2020 FOR CONCRETE STRUCTURES

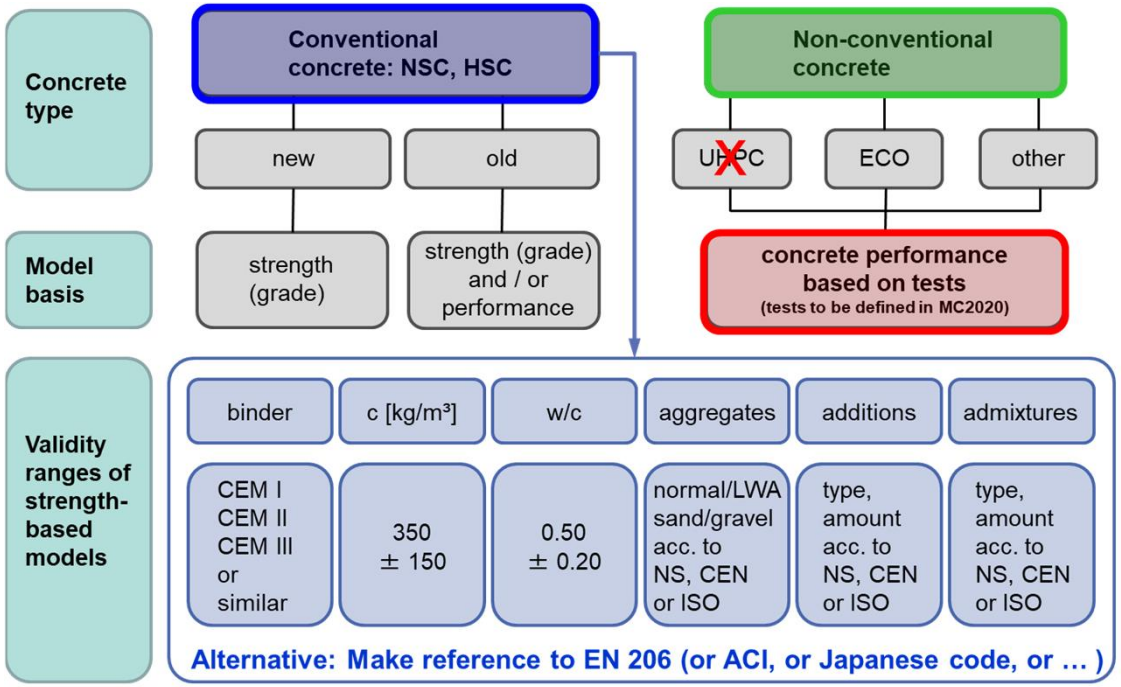
Design & Assessment Input Data: New concepts and approaches for Concrete

Summary of crucial points

- New types of green concretes, go beyond provisions of CEN
  (new binders, low binder content, new types of aggregate, …)
  models are not available
  conventional strength-based concepts / models cannot be applied!
  performance-based modelling is required (**testing is mandatory**)
- Complex aging effects, depending on the sustained stress level and environmental actions, have to be considered (re-design of existing structures)
- Models upgrading → improvement using today's better knowledge
  → improvement by integration with performance testing
  → interactions and coupled effects to be considered

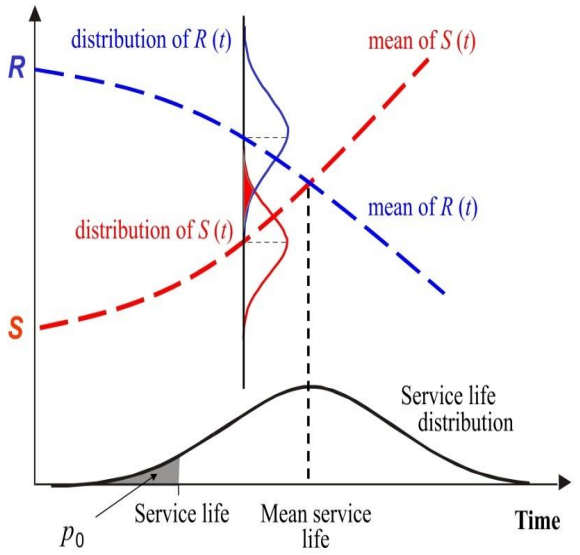
MC2020 FOR CONCRETE STRUCTURES

Design & Assessment Input Data: Classification of concrete with respect to modelling



MC2020 FOR CONCRETE STRUCTURES

- *Improved material & mechanical models for assessment of áactualô capacity*
  - *Performance-based design*
    - *Ability of a structure to fulfil the performance requirements for the designed service life at required probability level*
  - *Limit state concepts*
    - *Transition between the desired state and the adverse state*
  - *Incorporation of deterioration effects reducing structural resistance R(t)*
  - *Increase in load effect S(t) with time*
  - *Recognition of resistance effects not typically accounted for in design (e.g. compressive membrane action)*



Decrease in structural resistance R(t) with time & increase in the load effect S(t) with time

Benefit of unaccounted behaviours upon structural resistance and on actual service life (Illustrative only)

MC2020 FOR CONCRETE STRUCTURES

- ***Design & Assessment Input Data: Reinforcing steel***
  Prestressing steel
  Prestressing systems

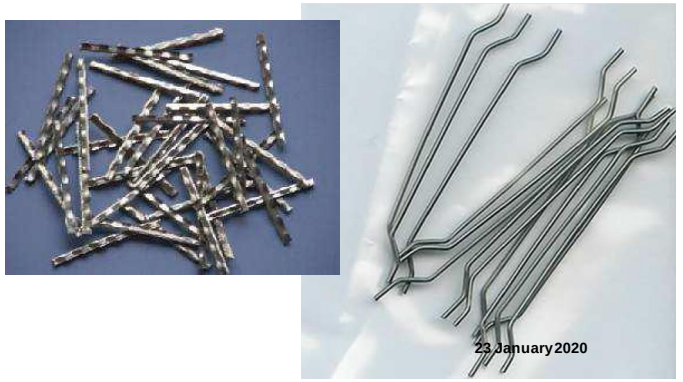
  - ***Scope definition and range of applicability:***
    - ***include old reinforcing materials and systems, corrosion resistant reinforcement***
  - ***Assessment of material and system properties***
    - ***effect of deterioration on the properties of reinforcing steel & prestressing steel***
    - ***behaviour of reinforcing steel after cooling***
    - ***time dependent losses for old materials***
  - ***Taking advantage of information acquired by testing and monitoring***
    - ***evaluation framework for assessment***
    - ***situ measuring techniques to determine present prestressing level***

MC2020 FOR CONCRETE STRUCTURES

- ***Design & Assessment Input Data: Non-metallic reinforcement***
  - ***Scope definition and range of applicability:***
    - ***include FRP rebars and externally applied reinforcement, include textile reinforcement***
  - ***Assessment of material properties***
    - ***properties related to durability of non-metallic reinforcement***
  - ***Design and execution guidance***
    - ***Include assumptions used for design incl. stochastic approach and treatment/determination of safety factors***

MC2020 FOR CONCRETE STRUCTURES

- ***Design & Assessment Input Data: Fibres/Fibre Reinforced Concrete***
  - ***Scope definition and range of applicability:***
    - ***include UHPFRC (consistent design recommendations for all FRCs)***
  - ***Assessment of properties of fibre reinforced concrete***
    - ***taking advantage of information acquired by testing and monitoring***
    - ***test methods for the determination of FRC properties***
    - ***durability of steel fibres in concrete***
    - ***constitutive laws incl. creep and fatigue***
  - ***Behaviour in shear without conventional reinforcement (incorporation in shear model for ordinary RC)***



MODEL CODE 2020: CONTENTS PROPOSAL

MC2010 Part II: Design Input Data	MC2020 Part II: Design & Assessment Input Data
6. Interface characteristics Å **Input data for contemporary materials** Å bond of embedded steel reinforcement Å bond of non-metallic reinforcement Å concrete to concrete Å concrete to steel	**6. Interface characteristics** Å **Input data for contemporary and old materials** Å bond of embedded steel reinforcement Å bond of prestressing rebars Å bond of embedded non-metallic reinforcement Å bond of externally bonded non-metallic reinforcement Å bond of externally bonded steel Å concrete to concrete Å concrete to steel Å **Input data for other forms of construction** Å **Input data for material damage and deterioration** Å bond of corroded steel reinforcement

MC2020 FOR CONCRETE STRUCTURES

- *Design & Assessment Input Data: Bond of embedded steel reinforcement*
  Bond of prestressing rebars
  Bond of non-metallic reinforcement

  - *Scope definition and range of applicability:*
    - *bond provisions for existing structures and structures under severe conditions*
      - *bond of old and of new materials, bond of post-installed rebars, bond of externally applied reinforcement*
      - *effect of deterioration on bond*
      - *bond in case of repair action*
      - *bond in seismic joints of existing and new structures*
      - *interaction of bond-corrosion-fatigue*
      - *long term performance*
  - *Performance specifications for laps and anchorages*
    - *attention for simplified provisions (level of approximation)*

MC2020 FOR CONCRETE STRUCTURES

- ***Design & Assessment Input Data: Concrete to concrete***
  Concrete to steel

  - ***Scope definition and range of applicability:***
    - ***include new material for interventions***
    - ***interaction of new concrete to old concrete***
    - ***include mechanical interlock not fulfilling current provisions***

MODEL CODE 2020: CONTENTS PROPOSAL

MC2010 Part III: Design	MC2020 Part III: Design & Assessment
7. Design procedure Å **Conceptual design** Å **Structural analysis and dimensioning** Å **Design verification** Å **Detailing incl. fastenings**	**7. Design and assessment procedures** Å **Conceptual approach to design and assessment** Å **Structural analysis and dimensioning** Å **Design, assessment & re-design verification incl.** Å verification assisted by models Å verifications assisted by numerical simulations Å verification assisted by monitoring and testing Å **Detailing incl. fastenings** Å **Verification of effectiveness of measures and interventions**

MC2020 FOR CONCRETE STRUCTURES

- ***Design & Assessment Procedures: Conceptual approach to design and assessment***

  - ***Scope definition :***
    - ***consider implications of conceptual approach for assessment,***
  - ***Treatment of sustainability and through-life care***
  - ***Strategies for design and assessment (incl. reasoning in applying surveys, testing and monitoring) and consequences of those for verification strategies***

MC2020 FOR CONCRETE STRUCTURES

Design & Assessment Procedures: Verifications

- *Verification is necessary for all the performance requirements*
- *Verification is necessary for entire period of service life.*
  - *Verification of limit states associated with durability should cover in adequate way design of both new and existing structures with damages.*
  - *In case of existing structures appropriate methods should be included for verification of performance requirements for remaining period of service life, such as methods considering deterioration of materials*
- *Verification methods are recommended, however other methods may be adopted if approved appropriate by authority / client.*

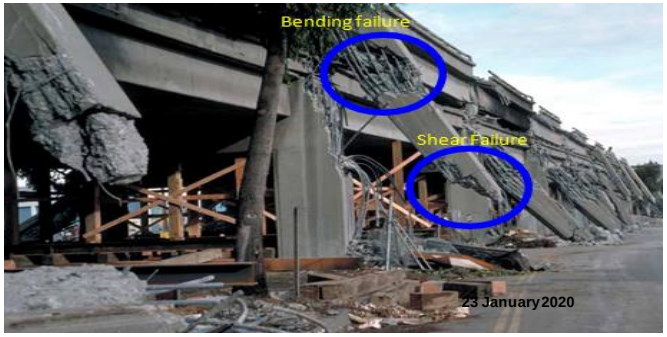
MC2020 FOR CONCRETE STRUCTURES

- ***Design and assessment procedures: Shear and Punching***
  - ***Improved models for shear and punching:***
    - ***Differentiation of shear level I-III models for different types of structures***
    - ***Shear capacity of circular cross-sections***
    - ***Influence of fatigue in shear and punching behaviour***
    - ***Implementation of compressive membrane action in punching resistance***
    - ***Influence of type of steel (A, B, C, D), plain or ribbed on shear behavior, old types of reinforcement, alternative types of concrete, deteriorated materials***
    - ***Effect of insufficient reinforcement***
    - ***Shear resistance models in presence of external prestressing***
  - ***Verification methods need to be generalized to accommodate not only steel reinforcement but also non-metallic reinforcement, steel fibre reinforcement as far as appropriate***

MC2020 FOR CONCRETE STRUCTURES

- ***Design and assessment procedures : Fatigue***
  Impact and explosion
  Seismic

  - ***Fatigue strength (life) of members subjected to shear: shear strength beam without shear reinforcement, shear strength of slab, shear strength of beam with shear reinforcement, effect of travelling loads, effect of moisture, effect of freeze thaw cycles***
  - ***Fatigue in combination with corrosion***
  - ***Fatigue for new materials***
  - ***Seismic design and assessment incl. seismic retrofitting***
  - ***Seismic resistance of precast concrete structures***
  - ***Design for resilience***



MC2020 FOR CONCRETE STRUCTURES

- ***Design and assessment procedures : Fire***
  Cryogenic conditions

  - ***Scope definition :***
    - ***Include non-metallic reinforcement and new cementitious materials***
    - ***Include post-fire assessment and repair after fire***

MC2020 FOR CONCRETE STRUCTURES

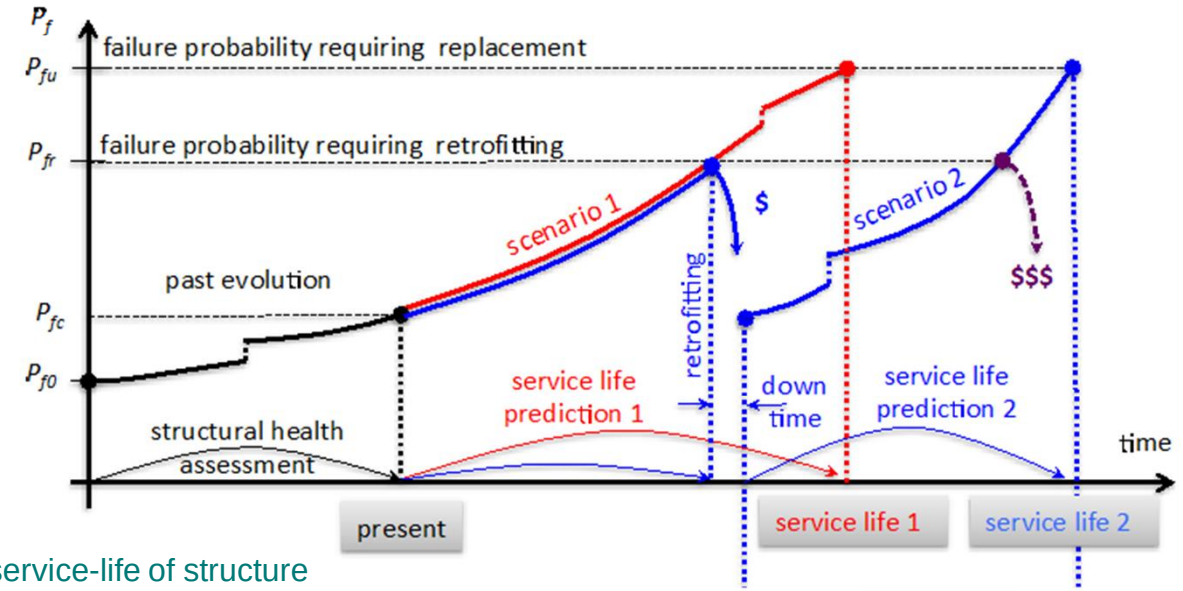
- ***Design and assessment procedures : Serviceability***

  - ***Scope definition :***
    - ***Include non-metallic reinforcement***
    - ***Include new cementitious materials***
    - ***Include members with externally applied reinforcement, jacket and external cable***
    - ***Include intervention cases (such as crack width formula for overlaying with cementitious material***

  - ***Verification of current models with ñreal fieldò data***
  - ***Reconsideration of the role of crack width with regard to durability***
  - ***Relationship between surface crack opening along the bars by effect of corrosion and percentage of area reduction in reinforcement***
  - ***Evolution of crack opening under fatigue with and without corrosion***

MC2010 FOR CONCRETE STRUCTURES

Design & Assessment Input Data: Durability and Service Life



- to achieve the intended design service-life of structure
- to facilitate an extension of life / change of use of structure
- to minimise through-life cost and environmental impacts

MC2020 FOR CONCRETE STRUCTURES

- *Design & Assessment Input Data: Durability and Service Life Prediction*
  - *Change approach from design by avoidance (proxi limit states criteria) to evaluation or design for (residual) life time (new limit state criteria)*
  - *Introduce of new limit state concept for existing structures with damages beyond limit state of new structures, which can be based on structural performance rather than material condition*
  - *Introduce propagation models (need for models or tests with reproducible results) including the effects of interventions Introduce evaluation of reliability and durability for deteriorating structures*
  - *Include updating of reliability and durability for deteriorating structures by use of information from in-situ testing and monitoring Include durability assessment after intervention / repair*

  - *Extension of models for durability to various forms of deterioration*
    - *carbonation-induced corrosion*
    - *chloride-induced corrosion*
    - *freeze-thaw attack*
    - *acid attack*
    - *sulphate attack*
    - *é .*

MC2020 FOR CONCRETE STRUCTURES

- ***Design and assessment procedures: Robustness***
  - ***Clear definition of the concept of robustness and its limitations***
  - ***Introduction of redundancy as a design criterion***
  - ***Difference between assessment and design***

MC2020 FOR CONCRETE STRUCTURES

- ***Design and assessment procedures: NL-FEM***

  - ***Improved compliance check formats for NL-FEM:***
    - ***Reliability of NL-FEM calculations***
    - ***Model uncertainties to be used in NLFEM based reliability analyses***
  - ***Extended scope of application: static and non-static (seismic, dynamic) conditions***
  - ***Refined models for analysis of damaged structures and account for progressive deterioration processes***
  - ***Numerical simulation for structures after intervention and/or with special structural details / special materials***

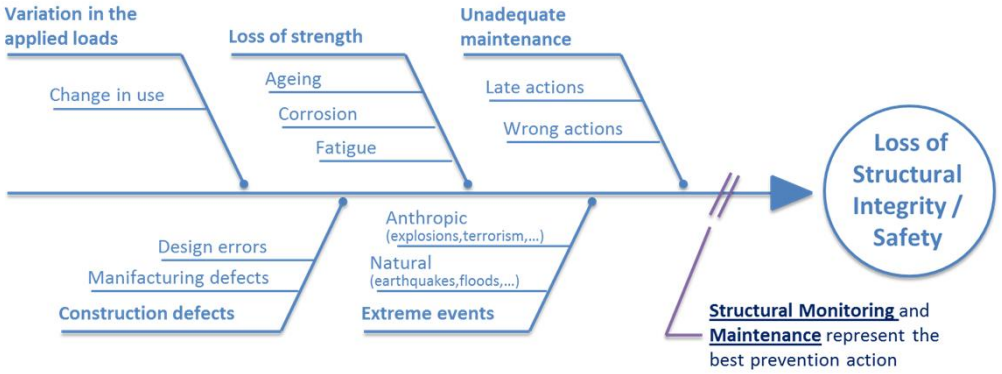
  - ***Consider development of tailor-made NLFEM programs***
  - ***Consider qualification of designer for NL FEM***

MC2020 FOR CONCRETE STRUCTURES

- ***Design and assessment procedures: Sustainability verification***
  - ***Scope:***
    - ***Impact on environment***
    - ***Impact on economy***
    - ***Impact on society***
  - ***Include effect of avoiding replacement or reduction of interventions***
  - ***Show concept to seek for best scenario for sustainability (saving resources and energy) through-life maintenance management***

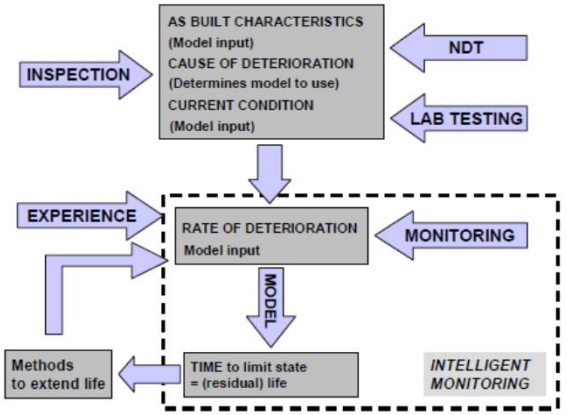
MC2020 FOR CONCRETE STRUCTURES

- ***Design and assessment procedures: Verification assisted by monitoring and testing***
  - ***Improve the quality and safety of any construction and extend its useful life***
  - ***Create an infrastructure risk-assessment and diagnostics solution to optimise maintenance.***
  - ***Monitor in real time the safety of any structure, from time of construction to end-of-life.***
  - ***Support the Civil Engineering community by supplying advanced diagnostics tools to increase their productivity and the quality of their work.***



MC2020 FOR CONCRETE STRUCTURES

- *Design and assessment procedures: Verification assisted by monitoring and testing*
  - *Monitoring of durability and performance*
    - *Locations for surveys, testing and monitoring activities*
    - *Condition survey and monitoring activities*
    - *Tools and techniques for surveys and monitoring*
    - *Gathering data for condition control purposes*
    - *General flow of condition survey process*
    - *Automated monitoring of concrete structures*
    - *Automated monitoring and updating of service life prediction*
  - *Data evaluation and incorporation of a priori knowledge*
  - *Consideration of past performance as evidence of suitability for future performance*
  - *Provisions for proof loading of structures*
  - *Monitoring systems related to service life*
  - *Improve the role of monitoring and enhance the value of information in the life-cycle management of concrete structures & decision making*



MC2020 FOR CONCRETE STRUCTURES

- ***Design and assessment procedures: Detailing***

  Fastenings

  - ***Improved background for detailing provisions and provide more rational detailing models***

  - ***Scope extension:***
    - ***structures after intervention and/or with special structural details / special materials***
    - ***detailing of connections between new concrete and old concrete***
    - ***behaviour and strength of badly detailed existing structures***
    - ***provisions for fastening not fulfilling current provisions***
    - ***fastening for external bonded reinforcement and overlay***

MC2020 FOR CONCRETE STRUCTURES

- *Design and assessment procedures: Effectiveness of measures and interventions*
  - *Consider adding new section (unless this aspects are covered by other sections)*

Remedy	Examples of Repair Strategies & Methods
Protection against ingress	For details refer to Table 1 in paper
Moisture control	
Concrete restoration	
Increased physical resistance	
Increased resistance to chemical attack	
Preserve or restore passivity	
Increase resistivity	
Cathodic control	
Cathodic protection / prevention	
Control of anodic areas	
Structural strengthening	
Adding new systems / devices for controlling structural response	

MODEL CODE 2020: CONTENTS PROPOSAL

MC2010 Part IV: Construction	MC2020 Part IV: Construction
8. Construction Å **New works** Å Execution management Å Reinforcing steel works Å Prestressing works Å Non-metallic reinforcement Å Falsework and formwork	**8. Construction** Å **New works** Å Execution management of new works Å Reinforcing steel works Å Prestressing works Å Non-metallic reinforcement Å **Works on existing structures** Å Execution management of works on existing structures Å Execution of interventions
MC2010 Part V: Conservation	**MC2020 Part V: Conservation**
9. Conservation Å **Provisions for condition assessment , evaluation, decision-making & interventions**	**9. Through-life management & care** Å **Use and conservation by through-life management** Å **Conservation by interventions (physical works)**
MC2010 Part VI: Dismantlement	**MC2020 Part VI: Dismantlement**
10. Dismantlement	**10. Dismantlement** **11. Recycle and reuse**

MC2020 FOR CONCRETE STRUCTURES

- ***Construction: New works***
  Works on existing structures

  - ***Scope***
    - ***include maintenance and interventions***
    - ***include post casting treatments***
    - ***include provision for FRC & UHPC, new cementitious materials***
    - ***consider implications of BIM and relation with Quality and Information Management***

  ÅReference to ISO Execution Standard as far as appropriate

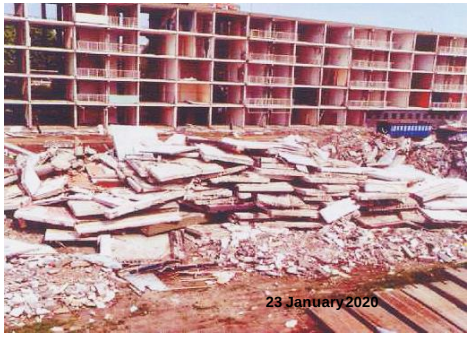
MC2020 FOR CONCRETE STRUCTURES

- *Through-life management & care*
  - *Scope*
    - *Cover conservation of new and existing structures as well as structures after interventions*
    - *Elaborate on decision making processes for management and interventions and on how to deal with the effect of (phased) execution of interventions on the structural behaviour and service life expectation*
    - *Design and construction of intervention should be referred in corresponding chapters for Design and Construction*

MC2020 FOR CONCRETE STRUCTURES

- ***Dismantlement : Dismantlement***
  Repurposing, reuse and recycle

  - ***Scope***
    - ***Include safety level / safety management for dismantling***
    - ***Elaborate structural aspects of dismantlement (dismantlement of parts, dismantlement of prestressed structures, repair of accidently cut tendons)***
    - ***Include reflective thinking approach / review of proposed dismantlement concept and approach***



ORGANIZATION CHALLENGE FOR *fib* MC2020

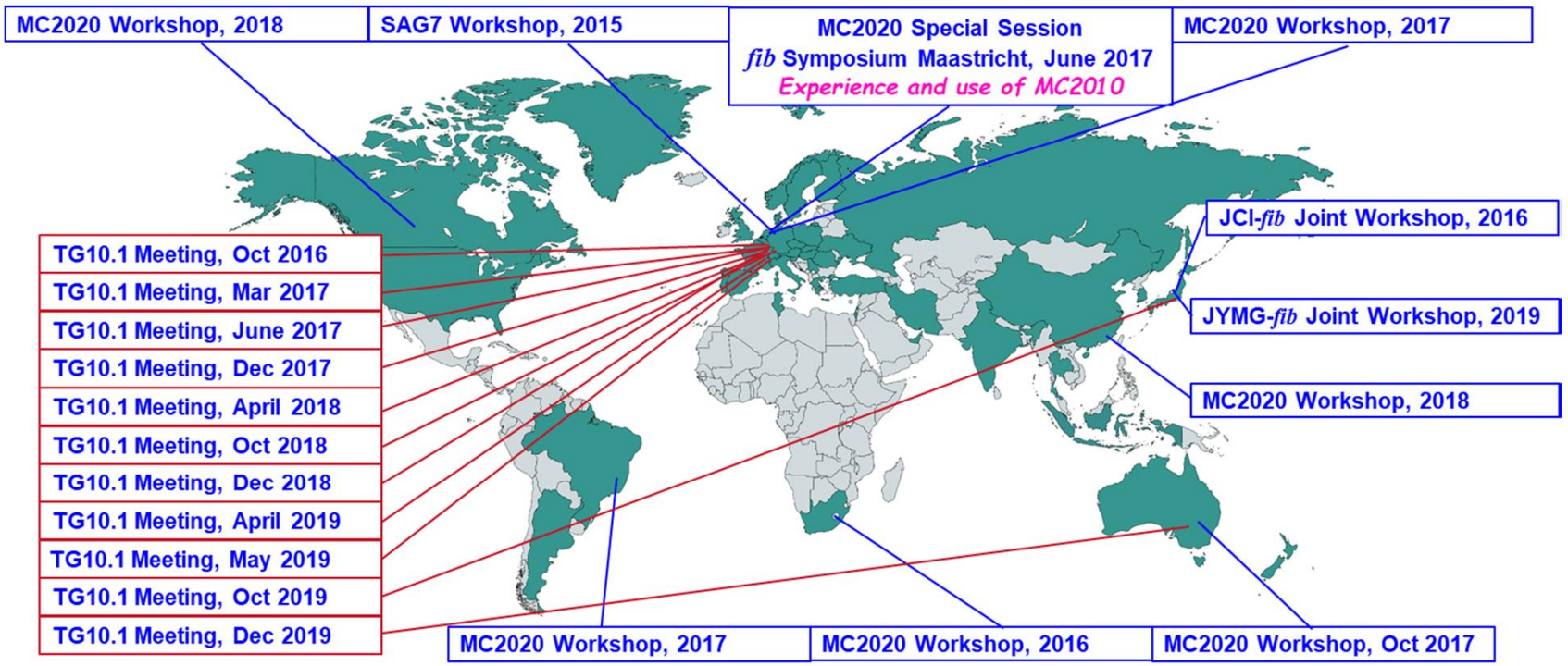
- ***Effective ways of working on MC2020***
  - ***Engage all COMs and TGs and involve all national fib groups****in preparing technical content for MC2020 / establish co-ordination mechanisms,*
  - *Seek improved ways of working, including* ***target (web-) workshops/meetings*** *and* ***joint events with international organisations*** *on specific issues,*
  - *Deliver (background) documents to enable* ***continuous dissemination of the up-to-date results to other bodies****, that wish to adapt the fib MC2020 concept and provide for timely feedback in the final stage of harmonization of MC2020,*
  - ***Seek improved ways for delivering MC2020*** *and* ***for maintaining / developing knowledge*** *through novel dissemination processes****.***

fib MC2020 CONTENTS REVIEW AND DISCUSSION

- ***Identification of the content***
- ***Identification of the contributors***
- ***Identification of the interactions***

AIM

- *Updating contents*
- *Formulating delivery plan*
- *Establishing liaisons & Action Groups*
- *Delivering draft provisions and background documents*
- *Creating consensus and harmonizing concepts*



ENCOURAGING GLOBAL INVOLVEMENT & CONTRIBUTIONS TO MC2020

TARGET TIMETABLE FOR DEVELOPMENT OF MC2020

- ***Step 1: Author drafts of MC2020 text passed to TG10.1 Technical Secretariat for harmonisation:***
  - *By mid- to late-2020, some contributions will be finished in early 2020*

- ***Step 2: Harmonisation by TG10.1 Technical Secretariat and Editorial Group to produce fib Bulletin of draft MC2020 - for Public Review:***
  - *Late-2020 to mid-2021 (perhaps for fib Symposium in Lisbon, June 2021)*

Update on the journey to *fib* MC2020

Introduction

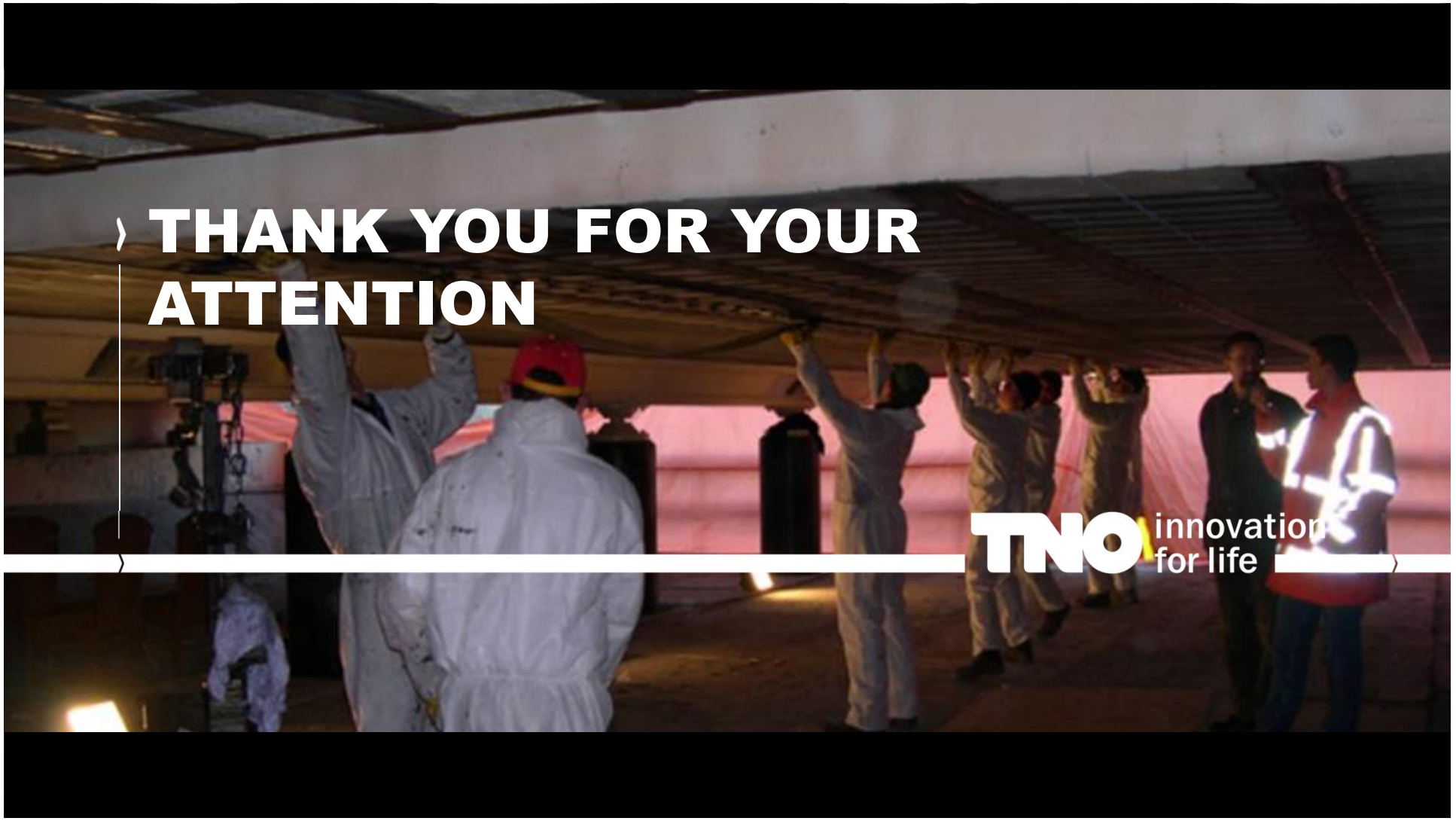
Discussions during 2014 and 2015 on potential ways of advancing the fib Model Code for Concrete Structures resulted in a workshop being held in The Hague (the Netherlands) in June 2015 and the formation of the fib MC2020 Core Group in December 2015. These activities established that there was a need for a single structural code dealing with both new and existing concrete structures; that is concerned with both the design of new structures and all the activities associated with the assessment, interventions and the through-life management of existing concrete structures.

In February 2016 the fib MC2020 Core Group presented a roadmap for advancing the fib Model Code for Concrete Structures which included a recommendation that fib Commission 10 should be established, with its main purpose being to have a permanent focus on steering development of the fib Model Code (and that of any other supporting Codes or Specifications which might be found to be required). This recommendation was endorsed by the following fib Technical Council (TC) meeting in Madrid in June 2016. Task Group 10.1 – Model Code 2020 was created at the first meeting of Commission 10 held in Lausanne in October 2016.

Since its inauguration TG10.1 has held six MC2020 project meetings in Lausanne, Switzerland (October 2016, 2 days); Delft, the Netherlands (March 2017, 2 days); Barcelona, Spain (December 2017, 2 days); Lausanne, Switzerland (April 2018, 2 days); Melbourne, Australia (October 2018, 1 day) and Karlsruhe, Germany (December 2018, 2 days).

Caption: New Year Greetings from some of the participants at the recent TG10.1 meeting in Karlsruhe, held on 7 & 8 December 2018, who were visiting the laboratory of the *Institut für Massivbau und Baustofftechnologie* at the *Karlsruher Institut für Technologie (KIT)*.

FUTURE UPDATES / REPORTS ON MC2020 PROGRESS CIRCULATED VIA VARIOUS ROUTES, WEBSITE, ETC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