



Structural code developments in Turkey

Atila ERENLER (Deputy DG-MoEU)

Prof. Dr. Ahmet YAKUT (METU)

Outline

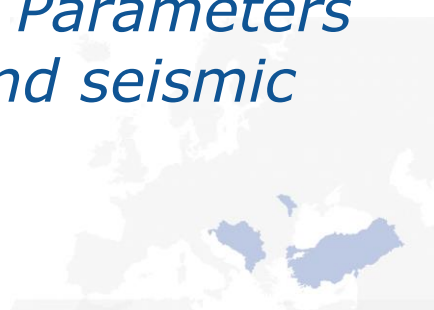
- *Management on technical regulations*
- *Initiatives for elaboration*
- *Regulations and current codes*
- *Ongoing code development activities*



Management on technical regulations

As the main authority, The Ministry of Environment and Urbanism (MoEU) is responsible in publishing and implementing the regulations on Construction Products (CPD-CPR 305/2011) ; drafting of legislation in the construction area, and also manages the national policy for introduction of design and construction codes, specifications etc. - drafting of construction policy,

Turkish Standardization Institute (TSE) adopts European Standards under the CPD/CPR - Structural Eurocodes, Harmonized ENs and Supporting ENs, including determination of the Nationally Determined Parameters in respect to specific geographic, climatic and seismic conditions.



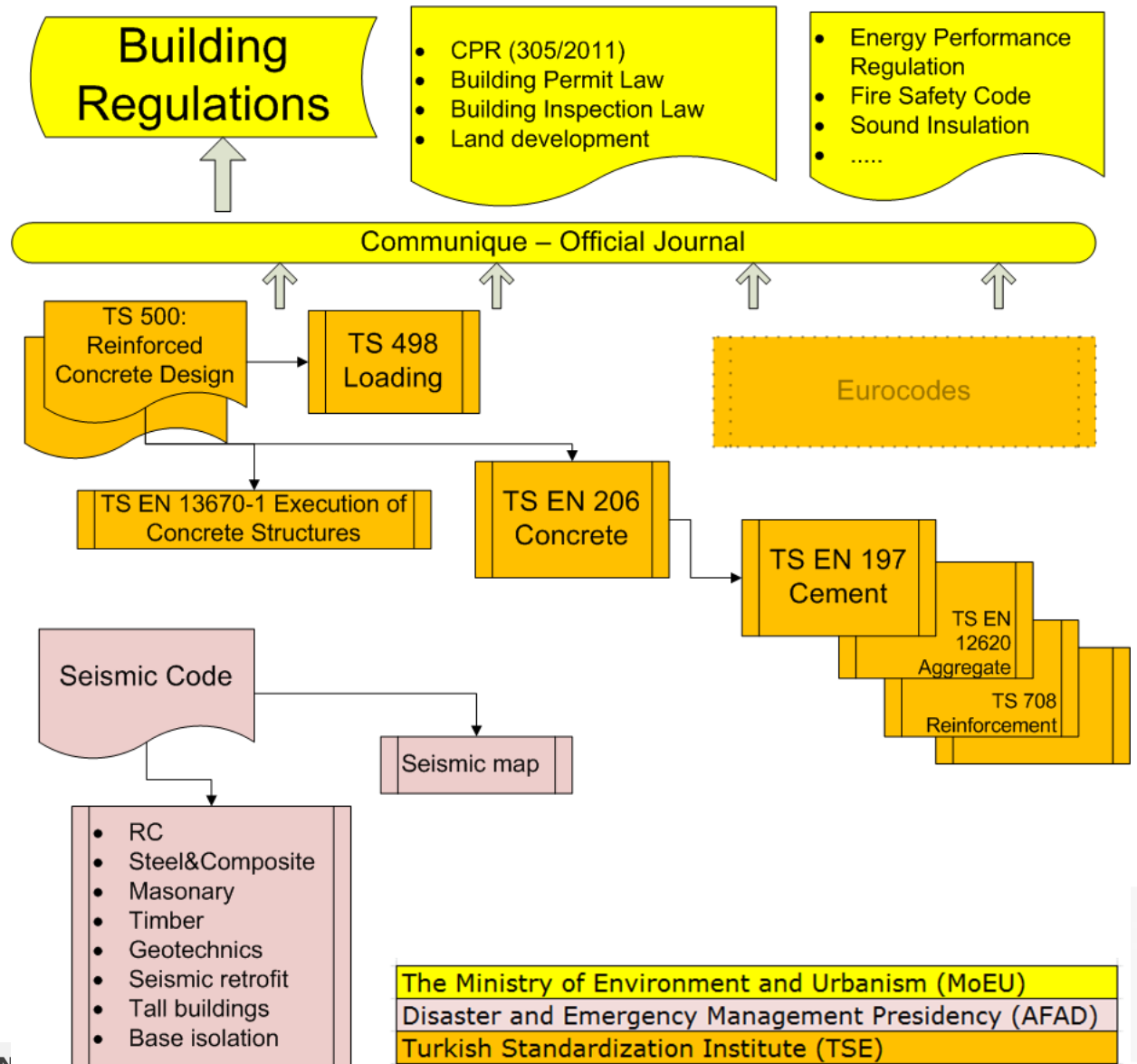
Management on technical regulations

The normative research studies and analysis for specifications for buildings to be built in seismic areas including seismic maps are carried out by Disaster and Emergency Management Presidency (AFAD)

A permanent technical committee (TCE) was created by AFAD in 2012 for maintenance, review and development of earthquake design code. The committee comprises academic researchers, design professionals and governmental decision makers.



Structure of regulatory system



Current Status in Turkey

- *Revisions of existing codes*
- *Development of new codes*
- *Ongoing work and future plans*



Code revision/development

- *Committee are formed by the responsible authority*
 - Academicians
 - Practicing engineers
 - Government representatives
- *Periodic committee meetings and a final workshop*
 - Feedback from all relevant organizations (governmental and non-governmental), engineering companies.
- *Official procedure to enact*



Current work in progress

- *TSE*
 - **Translation of EN's to Turkish by TSE**
- *Ministry of environment and Urbanization*
 - **Specifications for determination of high risk buildings under Urban renewal**
- *AFAD*
 - **Revision of parts of TEC 2007-AFAD**
 - **New parts for seismic code-AFAD**
- *KGM*
 - **Revision of Bridge Specification**



Revisions/Additions in progress

Revision and extension of TEC 2007

- **Revision of existing code**

- General rules
- Seismic actions
- Reinforced concrete buildings
- Steel buildings
- Masonry buildings
- Geotechnical aspects
- Assessment and rehabilitation

- **Addition of new parts**

- Prefabricated buildings
- Composite buildings
- Wooden buildings
- Seismic isolation and damper
- Tall buildings
- Approximate procedures for simple buildings



Revision and extension of TEC 2007

Part	Intention to make EN compatible	National Annex/NDP
Seismic actions	Partially	No
Reinforced concrete buildings	No	No
Masonry buildings	Partially	No
Geotechnical aspects	Mostly	No
Assessment/Rehabilitation	Partially	No
Prefabricated buildings	Partially	No
Steel and Composite buildings	Partially	No
Wooden buildings	Yes	No
Seismic isolation	Yes	No
Tall buildings	N/A	N/A



Ongoing works

The programme of earthquake code review and maintenance process benefits from some Eurocode approaches and includes:

*The development of new chapters or new parts of existing code looking in-depth at, for example, a new construction method and corresponding design methods or a new calculation procedure (**vertical approach**); or,*

*The incorporation of new performance requirements and design methods, in more than one of the existing chapters . These are efforts to achieve further harmonisation of the implementation of the existing code, implying extensive technical work and often including concerted actions between several Technical Committees (**horizontal approach**).*



A New proposal for elaboration of NDP's and NA's

*In order to accomplish the mission of providing a coordinated and comprehensive set of Eurocodes, an initiative from the technical committee (TCE) has proposed a **two stage-four years** programme for the elaboration of Nationally Determined Parameters and National Annexes to Eurocodes.*

The proposal includes establishment of a Steering Committee, Technical Committee, Subcommittees and working groups with a consultation group.



Composition & Duties

Steering Committee

A Steering Committee shall be established to oversee the Project implementation. The committee shall be appointed by TSE and shall be composed of four members;

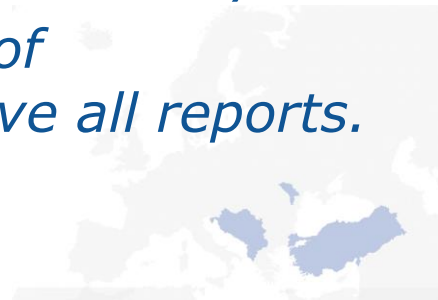
Shall perform such duties including the establishment and administration of standards development through the TSE Procedures.

Shall oversee all aspects of the transition and advise on the changes required to the strategy as it progresses.

Technical (Consensus) Committee

Steering Committee shall appoint the members and assign their interest categories for Eurocodes development activity.

Responsible for technical issues and coordination of subcommittees; Shall review, comment and approve all reports.



Composition & Duties

Subcommittees

Shall be established in alignment with 9 eurocodes (EC1990-...-EC1998)

Shall prepare NDP's and NA's

Working groups (2 horizontal)

WG1 Terminology and glossary

WG2 Regional snow maps

WG3 Regional wind velocity maps

WG4 Regional seismic map

WG5 Structural fire design

Consultation (Interest) Group

Interest Categories shall include Producer, User, Sectorial Association and General Interest.



Proposed Working Programme

EN Eurocode parts		The EN part was translated in		Definition of NDPs is finished for this EN part?			The EN part was published as National standard?	
		(Yes/No)	(Yes/No)	If "Yes"	If "No"		(Yes/No)	If "No"
				% of acc.recom . values	Progress of definition in %	% of recommende d NDPs		Envisaged date of publishing
EN 1990: Basis of structural design								
EN 1990	BASE + buildings	Yes	No		0%	0%	Yes	
EN 1990 / A1		Yes	No		0%	0%	Yes	
EN 1991: ACTION TO STRUCTURES								
EN 1991-1-1	ACTIONS loads	Yes	No		0%	0%	Yes	
EN 1991-1-2	fire	Yes	No		0%	0%	Yes	
EN 1991-1-3	snow	Yes	No		0%	0%	Yes	
EN 1991-1-4	wind	Yes	No		0%	0%	Yes	
EN 1991-1-5	temp	No	No		0%	0%	Yes	
EN 1991-1-6	exec	No	No		0%	0%	Yes	
EN 1991-1-7	accid	No	No		0%	0%	Yes	
EN 1991-2	traffic	No	No		0%	0%	Yes	
EN 1991-3	crane	No	No		0%	0%	Yes	
EN 1991-4	silo	No	No		0%	0%	Yes	
EN 1992: DESIGN OF CONCRETE STRUCTURES								
EN 1992-1-1	CONCRETE gen.	Yes	No		0%	0%	Yes	
EN 1992-1-2	fire	Yes	No		0%	0%	Yes	
EN 1992-2	bridge	No	No		0%	0%	Yes	
EN 1992-3	tanks	No	No		0%	0%	Yes	



Proposed Working Programme

EN Eurocode parts		The EN part was translated in	Definition of NDPs is finished for this EN part?				The EN part was published as National standard?	
			(Yes/No)	(Yes/No)	If "No"		(Yes/No)	If "No"
					% of acc.recom. values	Progress of definition in %		
EN 1993: DESIGN OF STEEL STRUCTURES								
EN 1993-1-1	STEEL general	Yes	No		0%	0%	Yes	
EN 1993-1-2	fire	Yes	No		0%	0%	Yes	
EN 1993-1-3	gauge	No	No		0%	0%	Yes	
EN 1993-1-4	stainless	No	No		0%	0%	Yes	
EN 1993-1-5	plane	No	No		0%	0%	Yes	
EN 1993-1-6	shell	No	No		0%	0%	Yes	
EN 1993-1-7	plates	No	No		0%	0%	Yes	
EN 1993-1-8	joints	No	No		0%	0%	Yes	
EN 1993-1-9	fatigue	No	No		0%	0%	Yes	
EN 1993-1-10	quality	No	No		0%	0%	Yes	
EN 1993-1-11	cable	No	No		0%	0%	Yes	
EN 1993-1-12	HS	No	No		0%	0%	Yes	
EN 1993-2	bridge	No	No		0%	0%	Yes	
EN 1993-3-1	tower	No	No		0%	0%	Yes	
EN 1993-3-2	chimney	No	No		0%	0%	Yes	
EN 1993-4-1	silos	No	No		0%	0%	Yes	
EN 1993-4-2	tanks	No	No		0%	0%	Yes	
EN 1993-4-3	pipes	No	No		0%	0%	Yes	
EN 1993-5	piling	No	No		0%	0%	Yes	
EN 1993-6	crane	No	No		0%	0%	Yes	



Proposed Working Programme

EN Eurocode parts		The EN part was translated in (Yes/No)	Definition of NDPs is finished for this EN part?				The EN part was published as National standard?		
			(Yes/No)	If "Yes"		If "No"		(Yes/No)	If "No" Envisaged date of publishing
				% of acc.recom. values	Progress of definition in %	% of recommended NDPs			
EN 1994: DESIGN OF COMPOSITE STEEL AND CONCRETE STRUCTURES									
EN 1994-1-1	COMPOSITE gen.	Yes	No		0%	0%	Yes		
EN 1994-1-2	fire	No	No		0%	0%	Yes		
EN 1994-2	bridge	No	No		0%	0%	Yes		
EN 1995: DESIGN OF TIMBER STRUCTURES									
EN 1995-1-1	TIMBER gen.	No	No		0%	0%	Yes		
EN 1995-1-2	fire	No	No		0%	0%	Yes		
EN 1995-2	bridge	No	No		0%	0%	Yes		
EN 1996: DESIGN OF MASONRY STRUCTURES									
EN 1996-1-1	MASONRY gen.	No	No		0%	0%	Yes		
EN 1996-1-2	fire	No	No		0%	0%	Yes		
EN 1996-2	material	No	No		0%	0%	Yes		
EN 1996-3	simple	No	No		0%	0%	Yes		
EN 1997: GEOTECHNICAL DESIGN									
EN 1997-1	GEOTECHNICS	No	No		0%	0%	Yes		
EN 1997-2	tests	No	No		0%	0%	Yes		
EN 1998: EARTHQUAKE RESISTANT DESIGN OF STRUCTURES									
EN 1998-1	EARTHQUAKE	Yes	No		0%	0%	Yes		
EN 1998-2	bridge	No	No		0%	0%	Yes		
EN 1998-3	repair	Yes	No		0%	0%	Yes		
EN 1998-4	silos etc	No	No		0%	0%	Yes		
EN 1998-5	foundations	Yes	No		0%	0%	Yes		
EN 1998-6	tower etc	No	No		0%	0%	Yes		
EN 1999: DESIGN OF ALUMINIUM STRUCTURES									
EN 1999-1-1	ALUMINIUM gen.	No	No		0%	0%	Yes		
EN 1999-1-2	fire	No	No		0%	0%	Yes		
EN 1999-1-3	fatigue	No	No		0%	0%	Yes		
EN 1999-1-4	trapeze	No	No		0%	0%	Yes		
EN 1999-1-5	shell	No	No		0%	0%	Yes		
	STAGE 1					STAGE 2			



Key requirements for the project

The background of the provisions, for example the basis of formulae, of the Eurocodes would be needed in some cases as gathered together and made available. Interpretation of some sections of the codes would be necessary.

The present versions of the Eurocodes require too much input from regulatory body.

It appears necessary to strengthen the capacity of the country to participate in CEN/TC's;

It is not easy and straightforward process for countries to adopt and use a new standardization system without generating confidence and developing familiarity.

The necessary resources to be provided by a partnership between government and industry shall be identified and, in the absence of an associated industry sector, 100% Government funding will be required.



Thank you

- *Participants*
 - **Atila Erenler (Ministry of Environment and Urbanisation)**
 - **Ahmet Yakut (Middle East Technical University)**

