Cement & Concrete Standards Update

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Cement and Concrete SA

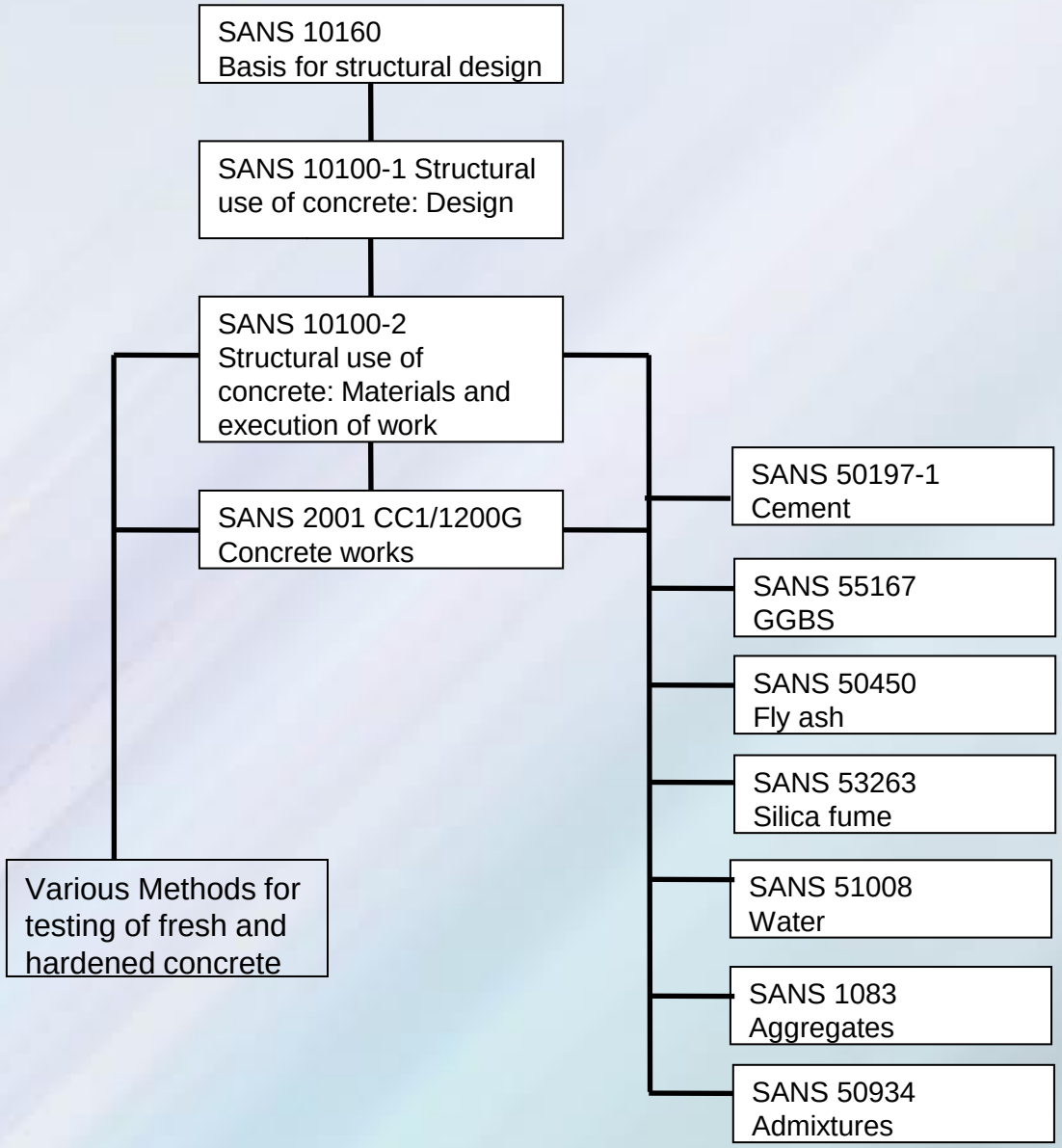
Introduction

- The way it was….
- Structural Design Codes
- Construction Specifications
- Material Specifications
- Test Methods
- Implications
- Conclusions

Why Standards and Specifications

- Control
- Protection
- Assessment

The way it was…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SANS 10100-2
Structural use of concrete: Materials and execution of work
SANS 2001 CC1/1200G
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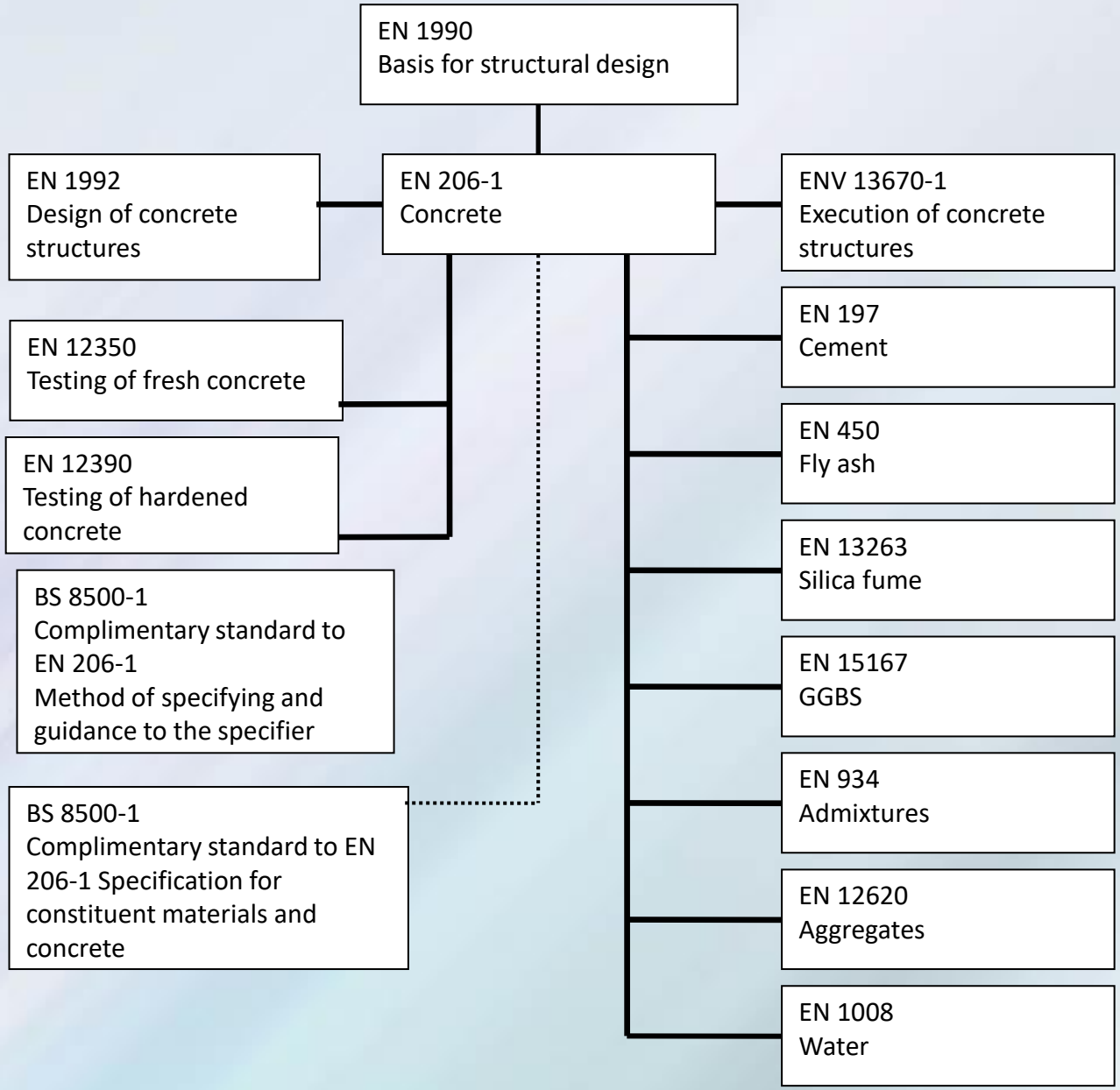
SANS 1083
Aggregates
SANS 50934
Admixtures

The need for Change….

In Europe…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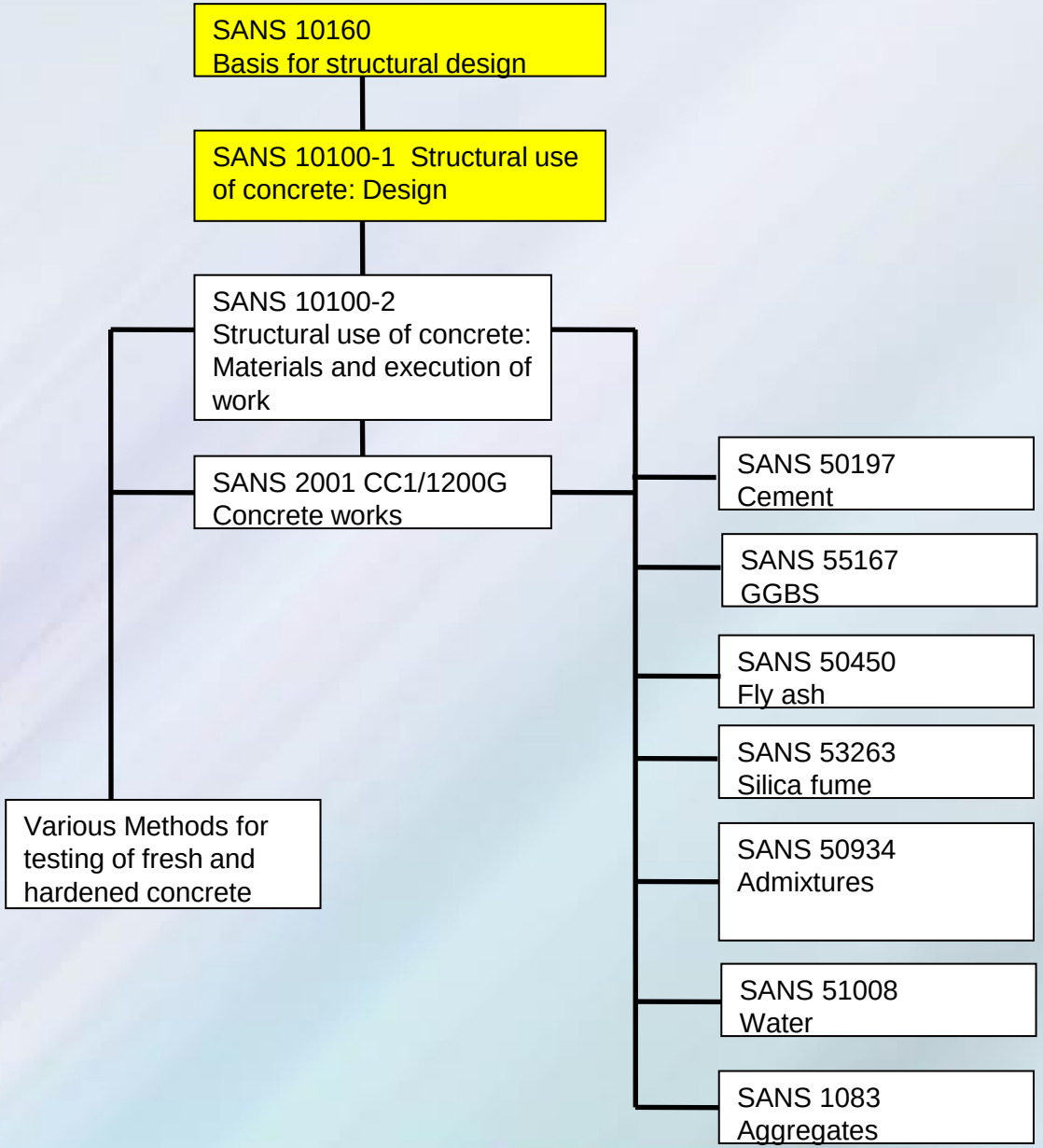
Structural Design Codes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Current Status

- **Loading Code and Basis of Design**
- **Concrete Water Retaining Code**
- **Concrete Design Code**

Loading Code

- Based on EN 1090
- Current SANS 10160
  - Part 1: 2019 Basis of Design
  - Part 2: 2011 Self weight and Imposed loads
  - Part 3: 2019 Wind Actions
  - Part 4: 2017 Seismic Actions
  - Part 5: 2021 Geotechnical design
  - Part 6: 2011 Action indused by cranes and machines
  - Part 7: 2011 Thermal Actions
  - Part 8: 2011 Actions for buildings

Water Retaining Code

- Used BS 8007 and EN 1992-1-3
- Draft standard completed in 2016
- Needs the design code
- Format issues

Structural Design Code

- Decision in 2007 to adopt EN 1992-1-1 with own set of nationally determined parameters
- Responsible process to be used

Structural Design Code Timeline

- WG formed in 2007
- Review of documents 2007 – 2010
- Choose nationally determined parameters 2011
- Main code SANS 51992-1-1
- National Annex SANS 51992-1-1
- Ready for public comment October 2023
- SABS system issues

Construction and Material Standards and Test Methods

Specifying Concrete

Traditionally

- Specify certain properties and actions
  - Aggregates
  - Concrete
  - Process
  - QC (strength)
- Largely prescriptive with some performance requirements

Traditionally (cont.)

- Changes to concrete to ensure durability
- Specify those properties which improve durability
- Move to prevent
  - Ingress of chlorides
  - Ingress of CO_2
  - Poor curing

Traditionally

- Design structurally and then

- Determine how to ensure durability

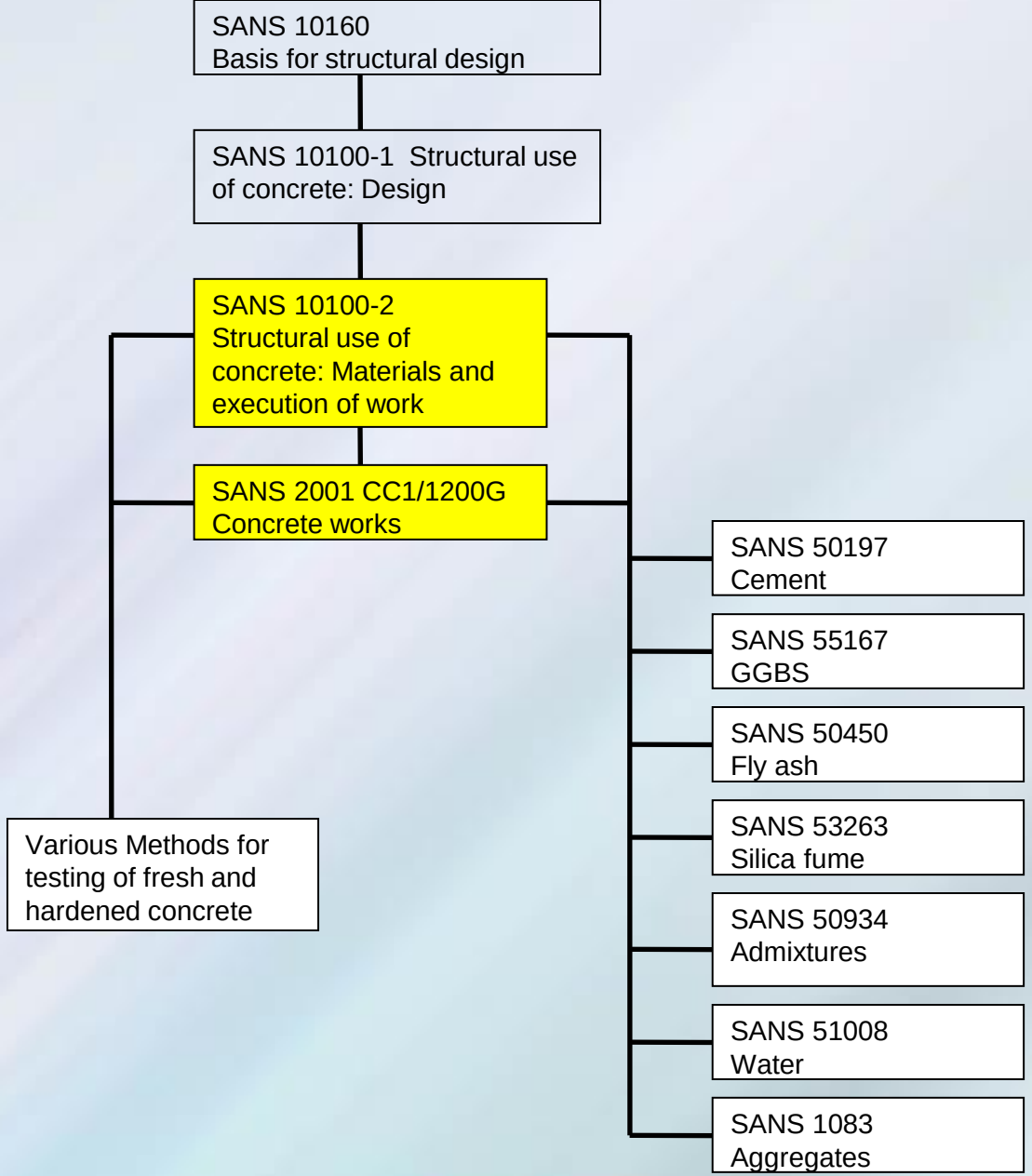
New philosophy

- Determine environment and required longevity
- Determine required durability
- Choose an approach to ensure durability and then

- Determine structural design

Changes to SA Concrete Standards and Specifications

Construction Specifications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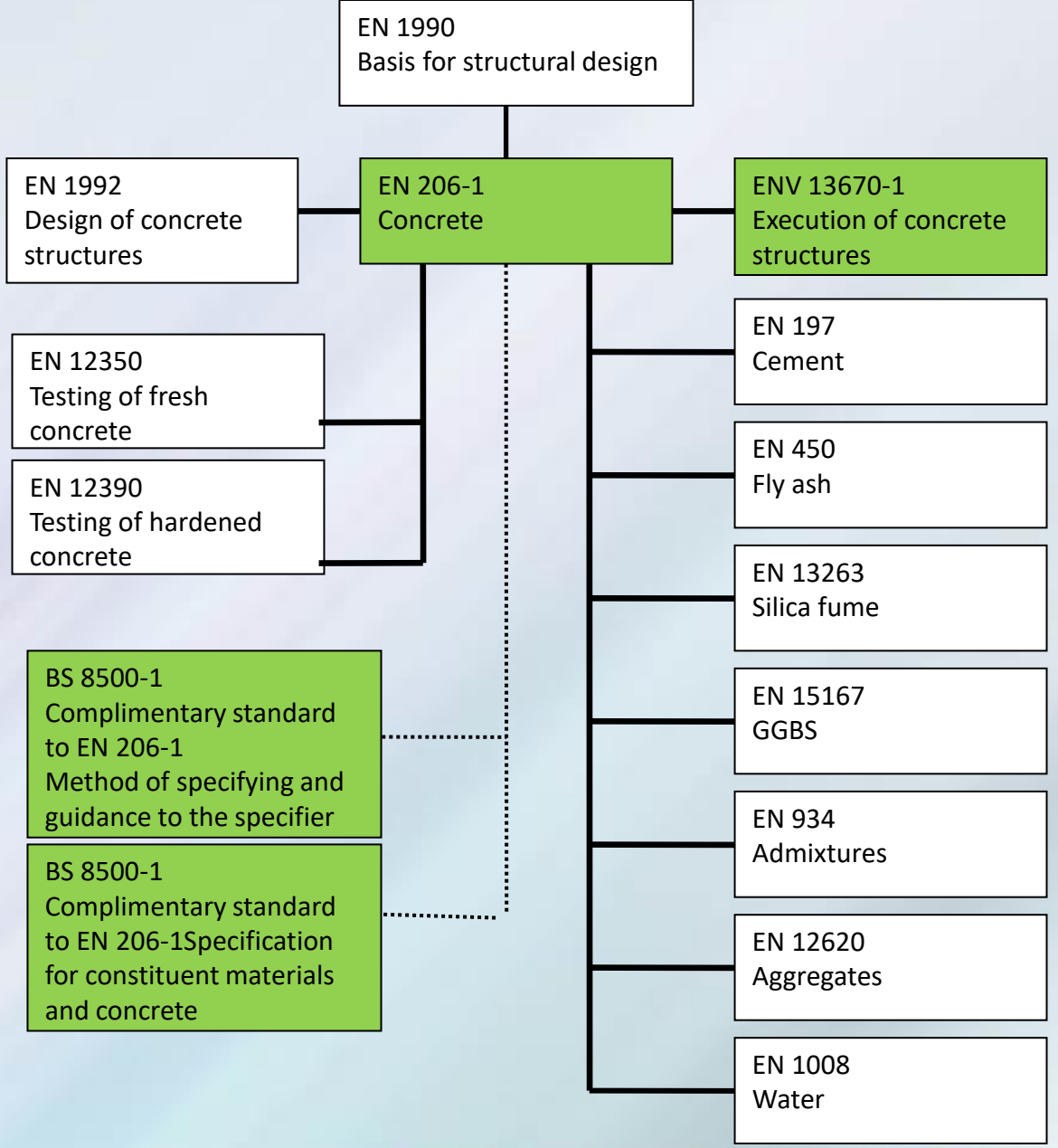
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Construction Specifications

- As can be seen, EN do not have an equivalent standard to SANS 10100-2 which is in effect a Code of Practice rather than a Specification
- EN has two Specifications, namely:
  - EN 206 Concrete
  - EN 13670 Execution of Concrete Structures

Construction Specifications

- As we are in the process of adopting EN 1992-1-1, it was agreed to adopt EN 206 and EN 13670 as SANS 50206 and SANS 53670
- It was intended to develop two guidance documents (Parts A and B)
  - Same numbering
  - Incorporating local material from 10100-2
  - Ensure compliance with EN 206 and EN 13670

Construction Specifications

Note:

Both SANS 50206 and SANS 53670 cannot be used as a specification as there is no reference to any other SANS documents. All references are to EN documents.

They were only adopted to create a SANS document to replace SANS 10100-2 and to relate to SANS 51992-1-1

Construction Specifications

Timing

- Drafts of Parts A and B have been available for some time by Mark Alexander and Erhard Kruger
- Working groups need to be re-established to finalise these two documents
- This will replace SANS 10100-2
- SANS 2001-CC1 will have to be rewritten to align with SANS 51992-1-1 and the National Annex and the new document

Construction Specifications

SANS 2001 CC1 vs SANS 1200

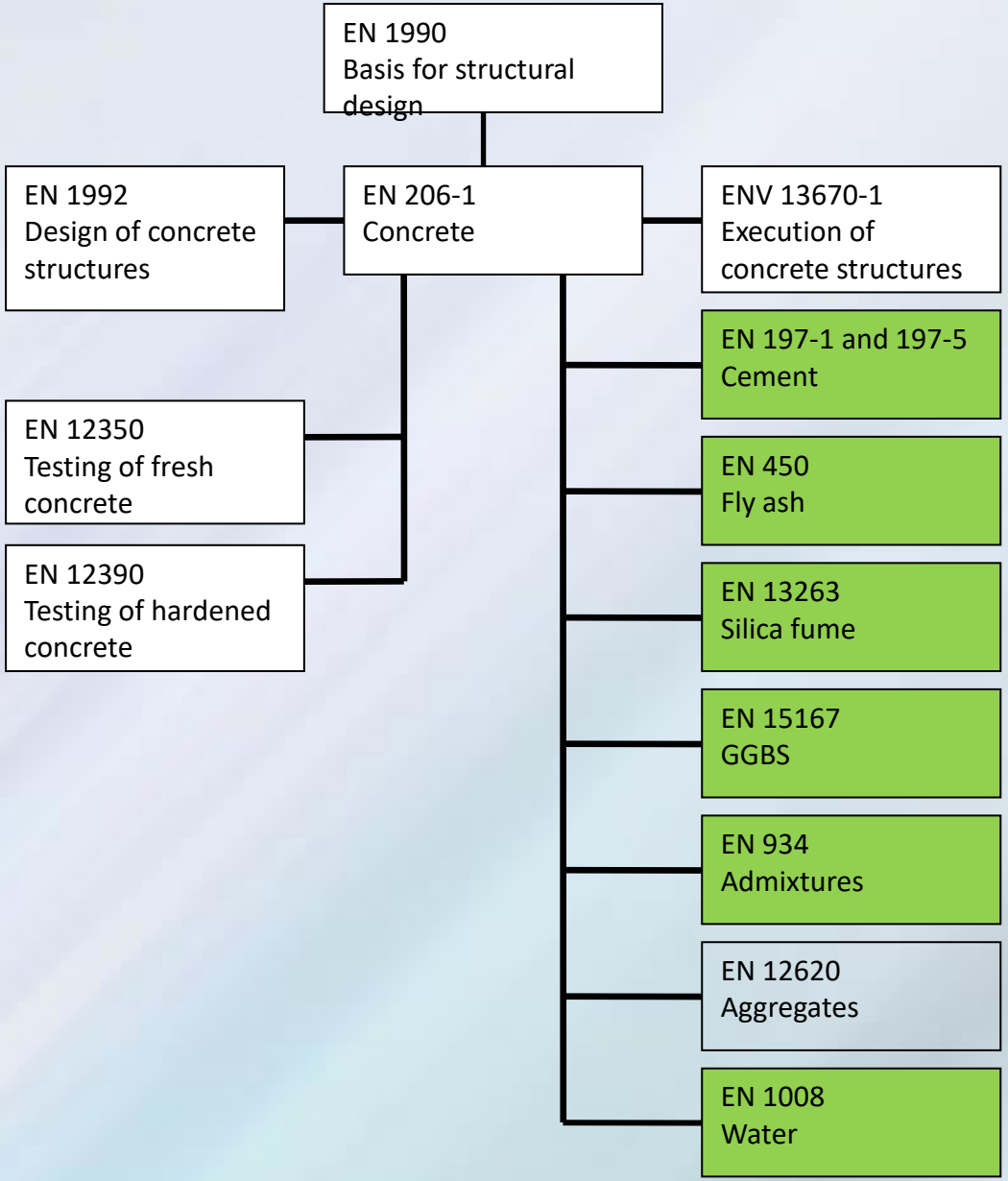
- Debate at SABS in 2012
- Agreed that SANS 2001 series will be completed, and SANS 1200 series withdrawn.
- Very few 1200 standards have been changed into 2001 standards.

Construction Specifications

SANS 2001 vs SANS 1200

- The issue:
  - 1200 series included measurement and payment items
  - Not part of SABS mandate
  - Cannot use some standards which include and some which don't "CESMM"
  - SANS 1200G has been withdrawn

Material Specifications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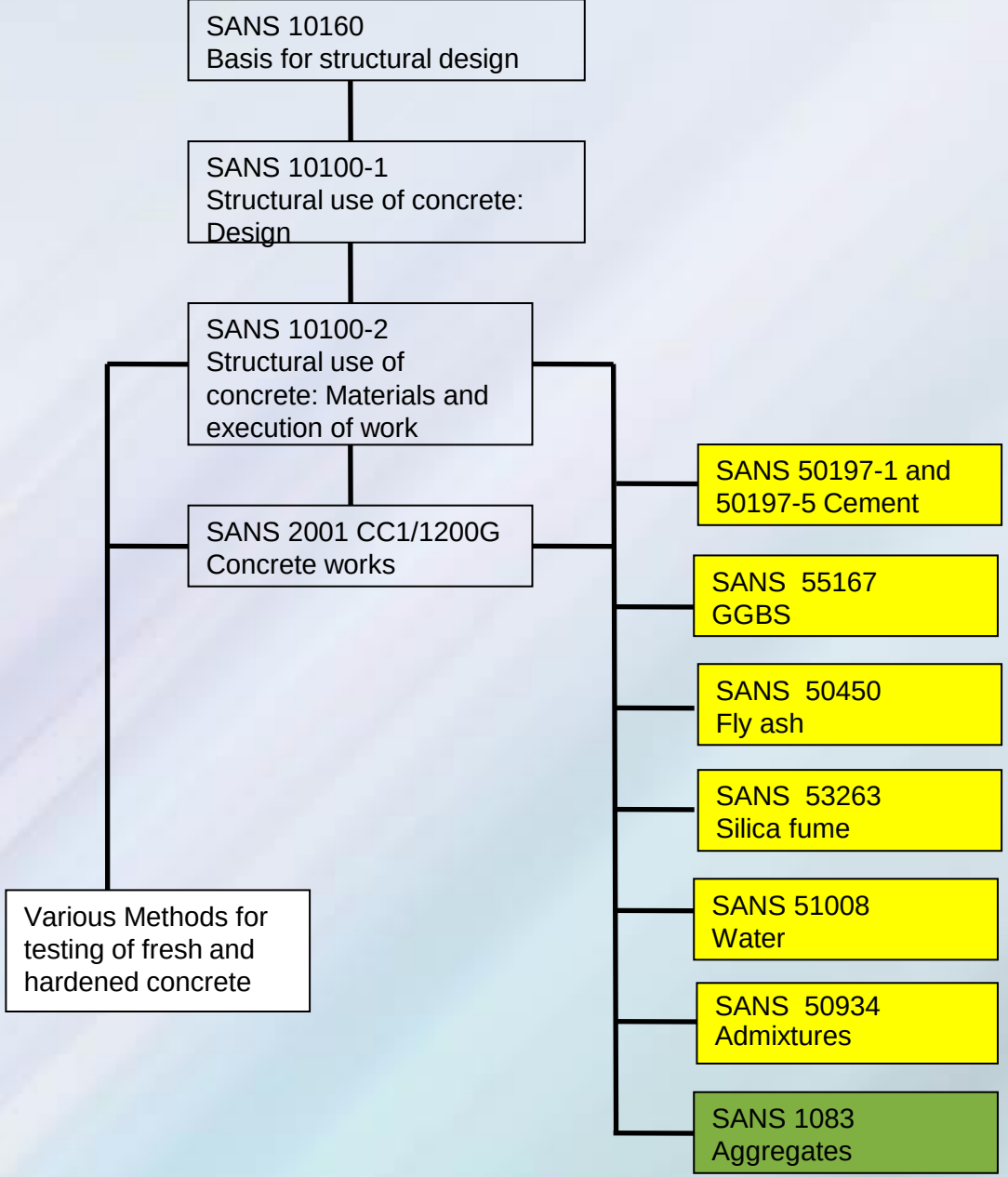
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Material Specifications

Cement SANS 50197-5

- Covers Limestone Calcined Clay Cements
- Allows another 5 cement types
- Not yet approved by the NRCS

New Extenders BS 8615-1 and -2

- Natural pozzolana and natural calcined pozzolana
- High reactivity natural calcined pozzolana
- Does not require approval

Material Specifications

Aggregates SANS 1083

- Currently only allows for natural materials for use in concrete
- Large number of grading requirements for all construction applications, asphalt, seals, layerworks
- Agreed that rationalisation was necessary and that other sources needed to be included.

Material Specifications

Aggregates SANS 1083

- Industry have agreed the following:
  - Need to include material from natural, manufactured and recycled sources.
  - New title “Aggregates for Construction”
  - Four Parts

Material Specifications

Aggregates SANS 1083

- Part 1: Aggregates for Concrete
- Part 2: Aggregates for Mortar and Plaster (replace SANS 1090)
- Part 3: Aggregates for Asphalt
- Part 4: Aggregates for Seals and Surfacings

Material Specifications

Aggregates SANS 1083

- Will only have mandatory requirements and lists of possible additional tests
- No interpretation of results
- Guidance documents on interpretation of results and when additional tests should be considered will be freely available on Industry websites

Material Specifications

Aggregates SANS 1083

- Hope to finalise by year end

Test Methods

Test Methods

No standard numbering method

Process underway to have a uniform numbering system

Move all methods for construction to SANS 3001 series

Test Methods

- 3001 BI Bitumen
- 3001 SO Soils
- 3001 GR Gravels
- 3001 AG Aggregates
- 3001 CO Concrete
- Etc

Test Methods

- **3001 CO1 Parts 1-13 Tests on Fresh Concrete**
- **3001 CO2 Parts 1-10 Tests on Hardened Concrete**
- **3001 CO3 Parts 1-5 Tests on Concrete Structures**

Test Methods

Process

- All CO1, CO2 and CO3 methods are sitting with SABS to process
- Intention is then to move on to updating those test methods on aggregates for concrete to 3001 series

Conclusions

Conclusions

- **Significant changes coming in terms of:**
  - **Structural design code including a Water retaining code**
  - **New documents to replace SANS 10100-2 giving guidance on specifying to the new design code**

Conclusions

- **Significant changes coming in terms of:**
  - **New concrete specification to support the new Structural design code**
  - **New cement specification**
  - **Revised test methods for testing concrete**

Conclusions

Exciting times ahead

Thank You

Questions????