ISHMII TASK FORCE ON STANDARDIZATION

Chairs: Zhishen Wu， Yi-Qing NI and J. Brownjohn

Contents

Part I: Introduction

Part II: ISHMII SHM Code Level 1

1. List of Members:

Chair : Z.S. Wu *(Japan & China)*

Co-chairs : Y.Q. Ni *(Hong Kong, China)* & J. Brownjohn *(UK)*

Key members:
F. Ansari *(USA)*
W. Habel *(Germany)*
H.N. Li *(China)*
J.T Kim *(South Korea)*
B. Shi *(China)*
L. Yin *(China)*
S. Alampalli (USA)
B. Glisic *(USA)*
H. Huang *(Japan)*
H. Li *(China)*
A. Mufti *(Canada)*
D. Thomson *(Canada)*
J. Zhang *(China)*
P. Furtner *(Austria)*
Y. Lei *(China)*
Y. Lu *(UK)*
J. Newhook *(Canada)*
H. Wenzel *(Austria)*
Y.F. Zhang *(China)*

Co-operating countries and regions (expected):

Austria, Canada, China *(Mainland, Hong Kong),* Germany, Japan, South Korea, USA

2. Background and significance:

- Governments and professional groups related to civil engineering write and publish standards and codes to protect the safety of critical infrastructure and surrounding populations.

- The standards and codes are developed to bridge the gap between research and practice.

3. Goals and tasks:

1) Develop international model codes (ISHMII code series) for SHM of infrastructure;
2) Establish the architecture of intelligent infrastructure;
3) Maintain the state-of-the-art and the state-of-practice knowledge database on SHM and intelligent infrastructure;
4) The exchange of information and harmonization on SHM documentations, specifications, and guidelines from different counties and regions.

4. Strategies:

ISHMII SHM Code Level I

General Principles, Definitions and Approaches

ISHMII SHM Code Level III

Guidelines for Different Major Structures or Major Sensing Technologies

ISHMII SHM Code Level III

Recommended SHM Guidelines/ Standards of Different Countries or Regions

Remarks:

The guide should be **sufficiently broad** and also **accessible** (i.e. intelligible) to a range of stakeholders in SHM from the structure operator to the academic expert.

Remarks:

- Bridge Structures
- Geotechnical Engineering
- Fiber Optic Sensors based SHM
- ...

5. Schedules:

2015 **Step 1: Preparation**

- ✓ Survey and state-of-art report on SHM standardization activities

2016-2019 **Step 2:** Development of **ISHMII SHM Code Level 1**

- ✓ Have finished the draft and under discussion
- ❑ Will be submitted to council for comments by Oct 2019
- ❑ Will be submitted officially for council approval by Dec 2019

Delayed due to some major revisions ----submitted in June 2021

- ❑ Publication-Dec. 2021

To be confirmed Arrange and Call for proposals

Step 3: Development of **ISHMII SHM Code Level 2**

- ❑ Form the team (leaders and members)

To be confirmed **Step 4:** Development of **ISHMII SHM Code Level 3**

- ❑ Schedule will be confirmed later

2021.3: Code draft to the members of ISHMII committee on STANDARDIZATION and related experts for review

2021.4-5: Receiving review reports

2021.5-6: Revisions

- Most revision comments have been accepted to revise the code
- Some contents have been moved to the Appendix
- The code is a model code like ACI code etc.

"This code is devised as a structural health monitoring (SHM) guideline for civil infrastructure with the aim to provide the general and comprehensive approaches for SHM technologies and systems" **(P1)**

ISHMII SHM Code Level 1 Contents:

Chapter 1 Introduction

Chapter 2 SHM system composition, function, strategy and design

Chapter 3 Sensors and instrument system

Chapter 4 Data acquisition and management systems

Chapter 5 Networking, communication, processing and control

Chapter 6 Data analysis, structural condition identification and diagnosis

Chapter 7 Structural performance evaluations, damage prognosis and health rating

Chapter 8 SHM system maintenance

Appendix A. SHMS for Some Major Structures

Appendix B. Case Examples of SHMS for Individual Structure or Structure Groups

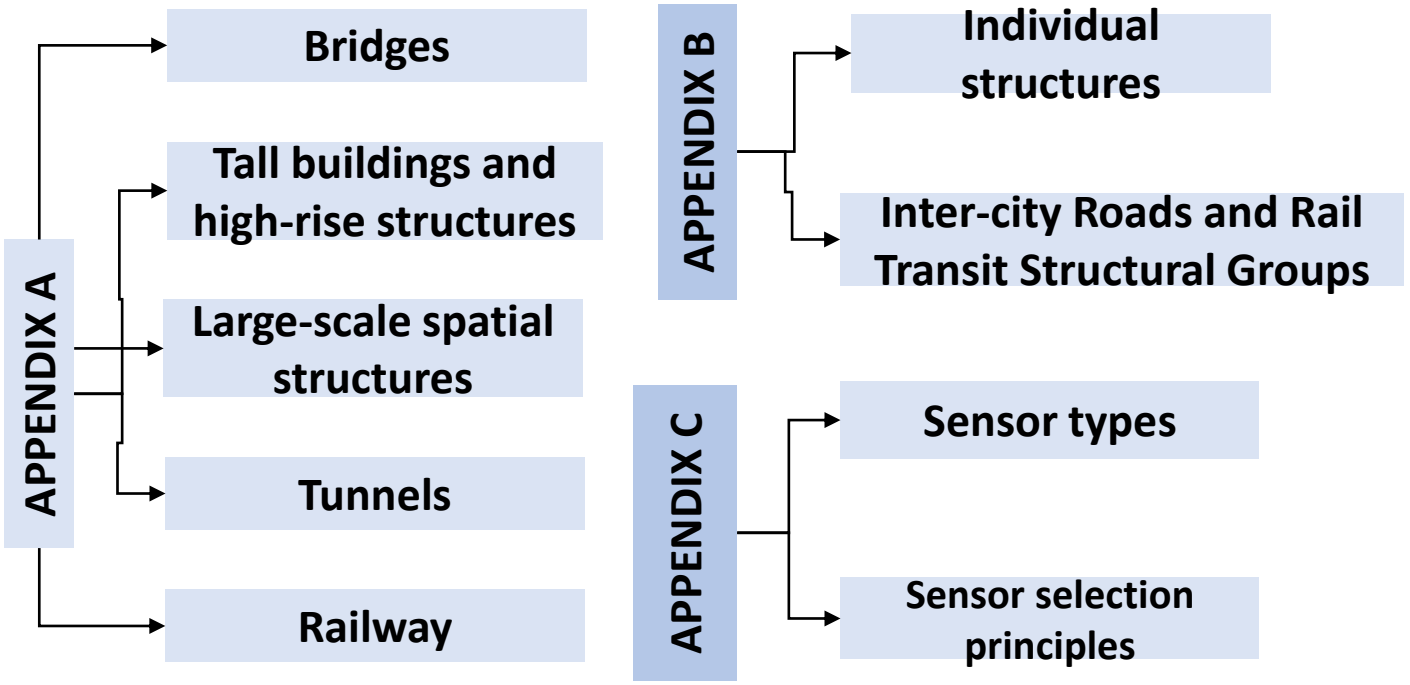
Appendix C. Sensors

Appendix D. Data Control System (DCS) Modules

ISHMII SHM Code Level 1 Features:

1. This code is **sufficiently broad** and also **accessible** (i.e. intelligible) to a range of stakeholders in SHM.
2. SHM system for **existing structures** and **newly built structures** (integrated life-cycle monitoring system).
3. SHM system for **single structure** and **structure groups**.
4. The capability and potentiality of SHM for **performance prediction** and **life-cycle maintenance**.
5. Traditional & **latest techniques**, i.e. new sensing technology, artificial intelligent enable technologies （machine learning & deep learning), big data management etc.

Appendix: call for practices



Thank You !

Welcome Revision Suggestions & Comments !