



INSPECTION, MAINTENANCE & REPAIR OF WATERFRONT FACILITIES

TERMS OF REFERENCE

1. Background

Since the Report of WG 17 was published in 2004, considerable work has advanced the subject of inspection, maintenance and repair of maritime structures, including jetties/piers and wharves/quays. This report will update the previously well-received document to reflect advances in knowledge since its original publication. Note that the Report of WG 17 is itself an update of PTC II WG 17, 1990.

2. Objectives

The objectives of the Working Group (WG) will be to review, update and, where appropriate, expand or revise the document to reflect more recent references that are useful but not global in scope. In doing so, additional topics such as service life modelling, drone-based visual and laser inspection techniques, and the latest generation of non-destructive testing and repair technology will be added. In addition, various inspection types will be defined, with details of their purpose and scope of work clearly defined. Such inspection types will be defined by the Working Group, but may include:

- Routine Condition Assessment Inspections
- Baseline Inspections
- Repair Design Inspections
- Special Inspections (more in-depth, often conducted to define the “root cause” of observed deterioration)
- Post-Event Inspections

Post-Event Inspections are particularly important for waterfront structures. In the immediate aftermath of extreme events such as earthquakes, tsunamis, severe storms and vessel impact, there can be uncertainty whether significant damage has occurred to port infrastructure, and consequently whether full or limited operations can safely resume before investigation and repairs are undertaken.

Where impact is widespread, there is often limited availability of the required expertise (if not available in-house) to undertake assessments of the infrastructure, increasing the impact on operations.

The outcome of this report should be usable for maritime ports and terminals, inland waterway facilities and big ship marinas.

3. Earlier reports to be reviewed

Relevant PIANC reports that deal with this subject matter include:

- PIANC MarCom Report 153 – 2016: Recommendations for the Design and Assessment of Marine Oil & Petrochemical Terminals
- PIANC MarCom Report 162 – 2016: Recommendations for Increased Durability and Service Life of New Marine Concrete Infrastructure
- PIANC InCom Report 119 – 2013: Inventory of Inspection and Repair Techniques of Navigation Structures (Steel, Concrete, Masonry, Timber) Both Underwater and In-the-Dry
- PIANC InCom Report 129 – 2013: Waterway Infrastructure Asset Maintenance Management
- PIANC MarCom Report 31 – 1998: Life Cycle Management of Port Structures – General Principles
- PIANC MarCom Report 103 – 2008: Life Cycle Management of Port Structures – Recommended Practice for Implementation
- PIANC MarCom Report 112 – 2010: Mitigation of Tsunami Disasters in Ports
- PIANC MarCom Report 122 – 2014: Tsunami Disasters in Ports due to the Great East Japan Earthquake
- PIANC Report of WG 199 (in progress) - Structural Health Monitoring for Port and Waterway Structures
- PIANC Report of WG 182 (in progress) - Underwater Acoustic Imaging of Waterborne Transport Infrastructure
- PIANC Report of WG 215 (in progress) – Accidental Impacts from Ships on Fixed Structures

4. Matters to be investigated

The WG should consider the following issues and items:

- Guidance on inspection types, including purpose and scope
- Guidance on inspection frequencies
- Guidance on time-based as well as risk-based inspection methodologies

- Service life modeling
- Drone-based visual and digital inspection techniques
- Other new inspection techniques
- New repair/rehabilitation techniques, particularly methods focused on maintaining operations during repair activities
- Both freshwater and saltwater environments
- Defining the scope of work for various inspection purposes
- Non-structural topics such as utilities and ancillary improvements
- Inspection of other types of waterfront facilities besides jetties, including revetments, floating marina elements, boat ramps, etc.
- Concepts covered by ASCE Manual 130 – Waterfront Facilities Inspection and Assessment (2015)
- Concepts covered by soon-to-be-published ASCE Manual Protection and Rehabilitation of Waterfront Structures
- Specific guidance on how to prepare in advance for potential post-event inspections where technical experts may not be immediately available
- Guidance on minimum qualifications of inspection personnel for the various types of inspections covered

5. Method of approach

Review information published since the Report of WG 17 was published. Incorporate information either by repetition or by reference, as deemed appropriate by the working group.

It is anticipated the Working Group will complete its work within 3 years.

The table of contents, draft report and final report will be shared with InCom and RecCom to ensure that the outcome can be used for those facilities.

6. Suggested product of the Working Group

The suggested product of the WG report will be a comprehensive document that will replace the Report of WG 17.

7. Desirable disciplines of the members of the Working Group

To maximize the usefulness of the report, the WG should include:

- Port structural and foundation engineers
- Port coastal engineers
- Port mechanical engineers
- Engineer-divers
- Materials engineers (concrete and steel)

The working group is expected to attract members whom are also familiar with inland waterway facilities and big ship marinas.

8. Relevance to Countries in Transition

The contents of the report will be valuable for countries in transition, by defining globally accepted inspection frequencies and providing focus on the need for proactive inspection and maintenance.

9. Climate Change Considerations

Sea level rise considerations may place more importance on proactive maintenance of existing waterfront facilities.

10. Relevance to the 17 UN Sustainable Development Goals (SDGs)

Effective maintenance and repair of waterfront facilities can prevent the need to develop new facilities in greenfield areas.