

Project: IFC for Ports & Harbours (IPH) Title: Project Summary	Author: Alex Bradley @17 th Sept 2017 Reviewed: @ Issued: @
Contact Details Alex Bradley – Cardiff University – BradleyA@Cardiff.ac.uk Nick Nisbet – AEC3 – nn@AEC3.com	Doc ID: OMI-RP-0002-V01 Date: 17/09/2017 Status: Draft

Background

The creation of standardized Infrastructure asset & project data throughout the lifecycle of a facility is a key factor for the effective and efficient planning, design, construction, operation & maintenance Infrastructure. A comprehensive neutral data exchange model capable of representing both the semantic and geometric aspects of a give project or asset is a requirement for the open data exchange and effective data utilization in the context of developing, operating & maintaining maritime infrastructure.

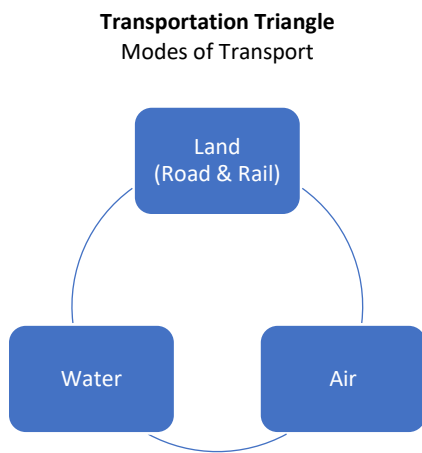


Figure 1 Transportation Triangle

Currently within the realms of transportation infrastructure the infrastructure room is engaged in the domains of road and rail transportation, with its common dependent of bridge engineering, in addition a separate BuildingSMART room has begun for airports, to address the unique place they sit between the buildings and infrastructure domain. These domains address two of the three major modes of transport for people, goods and services utilized in today’s economy.

This project will draw on the expert knowledge from the BuildingSMART international community and leading organizations in ports and harbour construction to provide a framework for open data standardization. This framework will include domain specific IFC schema extension, Model View Definition (MVD) development, software & model demonstration, documentation for the extensions and MVDs plus guidelines on use of the information. The project would align (and if requested

assist) its efforts with the outcomes from the overall architecture project and concurrent developments of the common definitions project. As shown in Figure 1 the project would need to draw from and align its efforts with the work of IFC Rail and Road, to achieve full integration.

Objectives

The IFC for Ports and Harbours Project is set to achieve:

- Define the use cases for the development, operation & maintenance of Ports & Harbours considering existing use cases developed during the Overall Architecture and other related initiatives.
- Set out the data exchange requirements for the use cases to be implemented within the Ports & Harbours project.
- Develop & document the IFC Infrastructure for Ports and Harbours data exchange standard to be known as IPH 1.0.
- Development of modelling guidelines, and a IPH IDM & MVD.



- Provide planning for Deployment of IPH 1.0 and highlight future developments for IPH vNext and Maritime Infrastructure.
- Develop (or extend existing) tool to view/edit IPH 1.0 models and create example models

In addition to these objectives the following is recognised:

- Integration of IFC Road, IFC Rail & IFC Buildings is a key component to the overall domain of Ports and Harbours and needs to be considered (for more information please see the *Scope of Work* section).
- Engagement with the common definitions project is important as the base definitions being developed under this project are important elements of Ports & Harbours projects.

Approach & Project Team

The IFC Ports & Harbours project will be executed according to the BuildingSMART International standards Process. The need has been identified by third party work between Cardiff University (CU), AEC3, China Communications Construction Company (CCCC) and Dalian University of Technology (China).

Three levels of project participation have been defined as follows:

The Project Team – Core Team

The Project Team will be comprised of a core team responsible for the delivery of the project with a Project Leader (CCCC) & a Project Investigator (CU) responsible for leading the project team, coordinating with the project steering committee of the Infrastructure Room, coordinate with the BuildingSMART Standard Committee Executive.

Current members:

- China Communications Construction Company
- Cardiff University
- AEC3
- Royal HaskoningDHV
- Waldeck Consulting
- Dalian University
- Gobar Consulting.

The Project Team – Extended Team

In addition, an extended project team will be employed to work on the delivery of key individual packages/specialist subjects.

Expert Panel

The IPH project will employ the process of an expert panel to provide international consensus. Members will provide a small amount of time to review and discuss the project outcomes and direction on a quarterly basis, acting as both international consensus external review.

Time Schedule

The project is expected to commence in November 2017 and Run for total of just over 2 years. The last few months of the project are set as contingency time to cover any unforeseen delays. Project milestones are spaced approximately 3-month intervals and encompass a review point for the expert panel.

Planning & mobilization: Q4 2018
Start: 31st January 2019
Finish: 29th May 2020

Scope

The scope of the work covers the semantic description of locations, assets and operations relating to the design, construction & operation of maritime facilities. The extent of maritime infrastructure and the constituent elements that form maritime facilities are depicted in Figure 2.

(please note Offshore wind turbines/platforms & subsea cables/pipelines are not included within this project but do form part of the maritime infrastructure domain).

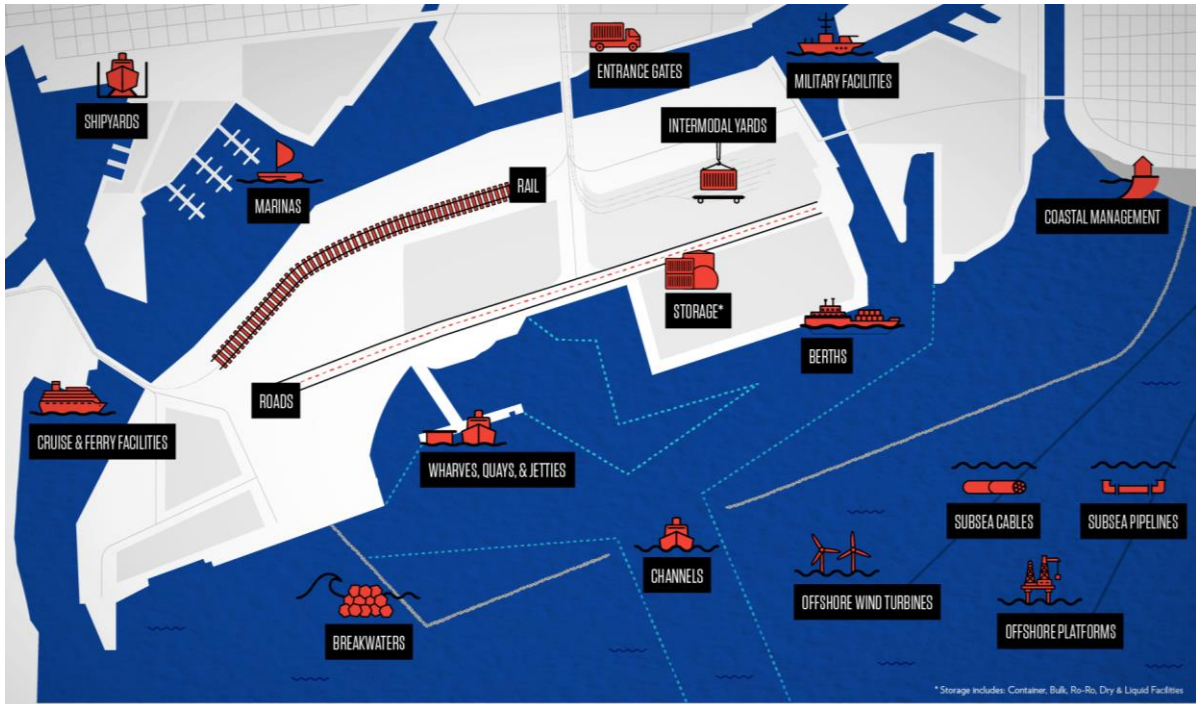


Figure 2: Harbour and port locations

Work Package Overview

WP0 – Project Execution Planning

Based on this project proposal presented to the Infrastructure room and feedback and comments for the BuildingSMART Infrastructure room and project steering committee a full project execution plan must be developed, providing finalised details of work packages, deliverables, work schedule, budget plan, project team and project organisation in terms of the responsibilities, reporting structure and governance.

WP1 – IFC Common Schema

To achieve the objective of engagement and contribution to the common schema project the IPH project proposes the following tasks to address the work that is required to create the common schema for infrastructure.

WP2 – Requirements Analysis and Existing Review

Analyse the requirements of the planning, design, construction, operation and maintenance of a port/harbour facility. Using example models, documentation and domain experts, typical user scenarios and use cases must be captured about the domain. Identification of the current content and favourable content of harbour models is required to finalize the scope of the delivered package. Existing data exchange standards



that are relevant to the domain need to be taken into consideration, plus engagements with concurrent projects that have an overlapping scope. The methods of the Information Delivery Manual (IDM) are used to analyse example projects, to create process maps and exchange requirements from identified user requirements or information exchanges. Providing a documented reasoning for the development of new locational, physical and process entities, and documenting the domain specific use.

WP3 – IFC Schema Extension and Modelling

The scope of the modelling is defined from the outcome of WP1. A model extension will be defined as a conceptual schema using the Unified Modelling Language (UML) as a graphical representation. The corresponding EXPRESS, XSD and OWL schemas are derived from the conceptual schema. The development will be staged and incrementally improved with feedback from an expert panel. The Extension will be modelled from the baseline of the newest release available of the IFC specification (published by BuildingSMART International).

WP4 – Documentation & Guidelines

Documentation of the main IFC extension via available tools (such as IFCDoc) and in line with BuildingSMART documentation standards and outcomes from the requirements analysis. Development of modelling guidelines to advise in the intended and recommended application of the ports and harbours extension.

WP5 – Software Deployment & Validation

Enhance the existing tools to read and write IFC Ports & Harbours data to the scope defined in the requirements analysis, for demonstration of project outcomes. Create sample datasets for demonstration and use during deployment phase. Develop IFC Ports & harbours 1.0 Deployment phase.

WP6 – Facilitate Expert Panels and Engagement in other Initiatives

Facilitate the expert panels, via online and/or in person meetings to validate work as it develops. This includes regular communication updates via communication platforms. In addition, this work package includes any coordination and engagements with other projects be that via expert panel participation or direct project development work. (EPR - Expert Panel Review).

WP7 – Project Management

Manage the development work of the project, including reporting to the steering committees according to the defined project governance. Author quarterly reports on project and inform stakeholders of developments. Engage with the infrastructure room project steering committee project representative. Maintenance of external & internal communication channels & repositories. Management support for meetings and additional communications.

Budget & Financing

The Project budget is currently ~ 500 kEUR for the entire duration. This covers man-ours and expenses of the project team. Contributions are in the form of cash value and in-kind time and resources. The majority of project team and expert panel time is expected to be covered by in-kind contribution to the project. Currently ~450kEUR is in-kind contribution and ~60kEUR in cash value.