Information Delivery Manual (IDM) for Cast-in-Place Concrete

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This document provides a framework for enabling efficient interdisciplinary coordination and collaboration for exchanging information in both model and nonmodel forms. This report develops a process model that identifies the typical workflows during engineering design, planning, and site production of cast-in-place (CIP) reinforced concrete. It identifies what information and when it is to be shared between disciplines at different stages of CIP concrete projects. The process model relates the different disciplines that deliver the project, the different phases of the project, and the information exchanges that take place. This report is to be used by building information modeling (BIM) users and software developers as a framework for developing shareable model views for visualization and coordination of production and placement of reinforced concrete.

Keywords: building information modeling; exchange descriptions; information delivery manual; task description; work process flow chart.

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CHAPTER 1—INTRODUCTION AND SCOPE

1.1—Introduction

The National BIM Standard – United States™ (NBIMS-US™ 2013) defines standard and efficient terminology and semantics to be exchanged in building information models to support various business use cases throughout architecture, engineering, construction, and operations projects. The project committee responsible for developing the NBIMS-US™ is a committee of the buildingSMART (2013) alliance, a council of the National Institute of Building Sciences.

The NBIMS-US™ establishes the standard process to develop the NIBS standard. The process includes four phases.

1. *Program*—Defines information exchange requirements that may be standardized by developing process models and defining specifications and business rules for each exchange. An information exchange is the transfer of data in context between various entities along the cast-in-place (CIP) concrete supply chain (that is, from the architect to the structural engineer). In this phase, a process model that identifies the required tasks and where the information exchanges take place in the project lifecycle, as well as the entities such as engineers, reinforcing bar detailers who develop or use information, and software applications which are the senders and recipients of these exchanges is developed. The information exchanges are defined by exchange models that specify the functional requirements (content and format) of data exchanges to be implemented. When the process models and exchange models are combined, they form an information delivery manual (IDM). This IDM serves as the overall functional requirements specification for one or more exchanges.
2. *Design*—Develops exchange requirement models and generic model view definition (MVD).
3. *Construct*—Develops software implementation specifications for MVD and facilitates product testing and certification of information exchanges.
4. *Deploy*—Provides generic and product-specific building information modeling (BIM) guide, validates data exchange, and extends the complexity of information that can be included in the BIM data.

1.2—Scope

This report is intended to enable accurate and efficient creation, sharing, modification, and reuse of cast-in-place (CIP) concrete model information among various project entities throughout a project lifecycle. Specifically, a process model that identifies the typical workflows during engineering design, planning, and site production of concrete is developed. It identifies when information is shared between disciplines at different stages of projects. The tasks and information exchanges that make up the process model are defined.

CHAPTER 2—DEFINITIONS

building information modeling—processes and technology that use a digital representation of the physical and functional characteristics of a project.

exchange models—description of the information exchanged and the typical producer and receiver of that information.

information delivery manual—report identifying user requirements for one or more information exchanges.

model view definition—software specification of exchange requirements for one or more data exchanges.

CHAPTER 3—INFORMATION DELIVERY MANUAL OVERVIEW

3.1—Background

An information delivery manual (IDM) defines exchange requirements in the context of reference industry processes. IDMs are defined by end users and practicing professionals to support the process in which they are expert. The resulting IDM serves to define the exchange requirements for one or more building information modeling (BIM) transactions.

The IDM is focused on end-user exchange requirements supporting a given set of workflows. The exchange requirements are captured by developing a process model that defines the context of the workflows of interest. The process model identifies the sets of use case exchanges being addressed, the tasks involved in each phase of the project, and the exchange requirements that will enhance the workflow. The various components of the IDM capture the user needs and specification of the exchanges in a form that can serve as the functional requirements for the technical exchange specification, called a model view definition (MVD). Thus, the IDM is developed by users to specify what they need for a target workflow, to be translated later by the MVD into computer-implementable code.

This report defines the functional data exchange requirements and workflow scenarios for exchanges among all the entities involved in the cast-in-place (CIP) concrete supply chain during each phase of a project. There are a wide variety of CIP concrete elements used in construction projects, including different types of footings, beams, columns, walls, slabs, ramps, corbels, piles, and piers. These are mostly used as part of the structural system of facilities. The different elements are often designed and produced by separate business entities that include formwork design and