ASSET INFORMATION REQUIREMENTS MODELLING GUIDELINES AND STANDARDS

COMBINED SYSTEM DEVELOPMENT SERVICES FOR THE REDEVELOPMENT OF PORT MAINTENANCE INFORMATION SYSTEM (PMIS) FOR THE CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Version: 1.0

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Acronyms/ Abbreviation	Definition
2D	Two Dimension
3D	Three Dimension
3DSD	Three Dimension Spatial Data
3DVR	Three Dimension Virtual Reality
4D	BIM model developed by addition of Time dimension
4DMS	4D Model and Simulation
AB	As-Built Stage
AD	Alternative Design
AM	Asset Management
AIR	Asset Information Requirement
AIM	Asset Information Model
BEP	BIM Project Execution Plan
BIM	Building Information Modelling / Building Information Model
CAD	Computer Aid Design
CDE	Common Data Environment
CEDD	Civil Engineering and Development Department, HKSAR Government
CIC	Construction Industry Council, Hong Kong
CJ	Construction Joint
CSD	Combined Services Drawings
CT	Construction Stage
COBie	Construction Operation Building Information Exchange
CSWP	CAD Standard for Works Projects
DD	Detail Design Stage
EMSD	Electrical & Mechanical Services Department, HKSAR Government.
FM	Facility Management
GIS	Geographic Information System
HK80	Hong Kong 1980 Grid Coordinates System
HKIBIM	Hong Kong Institute of Building Information Modelling
HKPD	Hong Kong Principle Datum
IFC	Industrial Foundation Class
LOD	Level of Development
LOIN	Level of Information Need
LOD-G	Level of Graphics
LOD-I	Level of Information
PMIS	Port Maintenance Information System
PWD Code	Classification Codes used for PWD asset management purpose
O&M	Operation and Maintenance
QA	Quality Assurance
QC	Quality Control
QMS	Quality Management System
ROI	Return of Investment
SCC	Standard Condition of Contract
SOS	Scope of Services
UOM	Unit of Measure
WIP	Work In Progress

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1. INTRODUCTION

1.1 OVERVIEW AND OBJECTIVES

The Asset Information Requirements (AIR) Modeling Standards and Guidelines are developed for the handover of the asset information models (AIM) for all types of marine facilities that to be managed by the Port Works Division, Civil Engineering and Development Department (CEDD).

Building Information Modelling (BIM) may be adopted during the design and construction stages for coordination and documentation processes, without incorporation of the necessary information for asset management operation. Asset information should be incorporated into the as-built BIM models throughout the construction life cycle so that the asset information model could be handed over for asset management after the completion of construction.

This document aims to provide a standard for achieving the following goals for asset management:

- Standardize the asset components[1] and naming convention
- Specify the information requirement of an asset[2] to be delivered with the BIM model throughout the whole construction life cycle
- Specify the minimum modelling standard of the asset information model

1.2 HANDOVER PROCEDURES OF ASSET INFORMATION MODEL

The asset information model shall be developed from the as-built BIM model, and handed over to the client representative according to the standards and formats described in this document.

The project BIM manager is responsible to validate all the information before the submission of the asset information model.

The handover of the asset information model should be structured in the following folder structure:

	Folder	Description
	10_Admin	Store all documents for project history and BIM documentation, such as project execution plan, project specifications, etc
	20_Library	Store resources files for the BIM data, such as templates, library objects, families, assemblies, blocks, line style, font, images, etc

[1] Asset component refers to the each individual architectural/structural/civil/MEP element and fender component of the marine structure.

[2] Asset refers to marine structures, including breakwaters, seawalls, piers/landings, dophins, beacons, beaches, dredging areas and the armour rocks protective layer of the Cross-Harbour Tunnel, Eastern Harbour Tunnel Crossing and Western Harbour Crossing maintaining by PWD of CEDD.

	Folder	Description
	30_BIM	Store the Asset Information Model of all discipline, including raw editable format (native format), compress format (e.g. NWD), Open format (IFC) and COBIE[3] file
	40_O&M	Store all documents related to operation and maintenance process, such as catalogs, O&M manuals, specifications, test reports, etc
	90_Misc	Store all other documents that could not be classified

1.3 REFERENCE SOFTWARE

The standards and guidelines set in this document are based on the Autodesk Revit 2018, Autodesk COBie Extension 2018, and Autodesk Civil 3D 2018. However, it should not limit the project team to deliver the project with other BIM software.

Any software that complies with Industry Foundation Classes (IFC) format and delivers the asset information described in Section 3 with COBie format may be proposed for the project team's approval.

1.4 TERMINOLOGY

This AIR includes specific terms of the operation and maintenance in Port Works Divion (PWD) of CEDD. The following table lists the relationship between the PWD terminology against the commonly used BIM terminologies.

PWD Terminology	BIM software Terminology	Description
Asset model	Combined model / Asset Information Model	Combined BIM model of a marine facility created under this AIR.
Project/Facility Information	Project Type Parameters	Basic properties of the marine facility
(not used)	Object Family	A group of asset components/objects with similar properties
(not used)	Object Family Naming	The group name of a group of asset components/objects
Asset Component	Object Instant	An individual asset component
Asset ID	Object Instant Name	The unique ID of an individual asset component
Asset Information	Type Parameters	Asset information of a group of asset components with the same properties
Asset Information	Instant Parameters	Asset information of an individual asset component

[3] COBie is an international standard and specification for information exchange for the life-cycle capture and delivery of information needed by facility managers. COBie is a non-proprietary data format for the publication of a subset of BIM models information focused on delivering asset data/information for construction handover between lifecycles.

PWD Terminology	BIM software Terminology	Description
Asset Information	Family Reporting Parameters	Asset information of an individual asset component that is calculated/extracted from the geometrical appearance of the object instant

1.5 REFERENCE STANDARDS AND SPECIFICATION

This document specifies the requirements of the assets to be maintained by the Port Works Division of CEDD. The project team shall also refer to the latest version of the following standards and guidelines in delivering the BIM models for public works project, whenever applicable.

- Building Information Modelling Asset Management Standard and Guidelines, Electrical & Mechanical Services Department, HKSAR Government.
- ISO 19650-3:2020 Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 3: Operational phase of the assets
- Building Information Modelling Standards (General) version 2 - December 2020, the Hong Kong Construction Industry Council, HKSAR
- Production of BIM Object Guide - General Requirements, the Hong Kong Construction Industry Council, HKSAR
- BIM Harmonisation Guidelines for Works Departments (to be published in end 2021)

2. MODELLING STANDARD

This Section describes the minimum modelling standard for the asset information models being prepared throughout the construction life cycle to facilitate asset management.

2.1 ASSET MODEL MANAGEMENT

Depending on the size and complexity of the marine structure, the asset information model should be subdivided into disciplines and systems specified in this guideline. Each model file should be maintained at manageable file size, preferrably within 100Mb. All models must be geo-referenced to the Hong Kong 1980 Grid System (HK 1980 Grid) and Hong Kong Chart Datumn (HKCD).

All the subdivided models or subfolders should be avoided in order to keep folder structure tidy and neat. The segregation arrangement must be documented in table format and submitted with the asset information model.

Disciplinary models are combined into a single Asset Information Model for submission and importing to the PMIS system of PWD/CEDD. The AIM is stored by folder and submission date after auditing by the PWD/CEDD. The sub-folder structure of the 30_BIM folder shall be organized as follow:

30_BIM
+Structure No
+ Submission Date
+ Raw Editable format
+ IFC format
+ COBie

2.2 ASSET MODEL NAMING CONVENTION

All the BIM models should follow the naming convention to ensure effective communication and data exchange.

2.2.1 Asset Model Naming Convention

The asset information model should be named mainly according to the ISO19650 local annex in the CIC BIM standard. For example:

HSW00194-CCE-XX-SAKU-ZZ-CM.(file extension)

Field No.	1	2	3	4	5	6
Field Description.	Project Code	-Originator	-Volume	-Location	-Discipline	-Type
Max Character	8	3	3	4	2	2

Field 1: Up to 8 Characters Location Specifier. As there is an unique "Structure Number" defined by PWD for each the marine asset, "Structure Number" is used for the Location Code, for example NP114 for Wong Shek Pier, and HSW00194 for Kennedy Town New Praya Seawall No.1. The location code/structure number shall be obtained from PWD by making an email request.

Field 2: A unique identifier based on Agent Responsible Code (ARC) should be used to indicate the model's responsible authoring party. The ARC is updated from time to time to include new or updated codes. See CAD Standard for Works Projects – Agent Responsible Codes (https://www.devb.gov.hk/filemanager/en/content_203/CSWP_ARC_V3.09.00.pdf)

Field 3: It is recommended that no separate volumes shall be used for the asset information model of a single marine asset to be tranferred to the PMIS so the code "XX" meaning no Volume shall be adopted.
XX = No Volume/System Applicable

Field 4: Up to 4 Characters Location Specifier for the district code.

CEWS: Central & Western	EAST: Eastern	ISLANDS: ISLA
KWCI: Kowloon City	KWTS: Kwai Tsing	KWTO: Kwung Tong
NORT: North	SAKU: Sai Kung	SHTI: Shatin
SSPO: Sham Shui Po	SOUT: Southern	TAPO: Tai Po
TSWA: Tsuen Wan	TUMU: Tuen Mun	WACH: Wanchai
YTMO: Yau Tsim Mong	YULO: Yuen Long	

Field 5: Disciplinary Code

AR: Architecture	CV: Civil	FN: Fender System
SF: Site Formation	ST: Structural	ZZ[4]: All discipline

BS: Mechanical, Electrical, and Plumbing /HVAC
(Please refer to Appendix A for the discipline federation of each asset type)

Field 6: Indicator to describe the content of the file

CM: Combined Model	M2: Drawing	M3: 3D Disciplinary Model

2.2.2 Object Family Naming Convention

All family files should follow the requirement in the CIC BIM object modelling guide, for example
FBL-CBO-CCE-10Tone-SS (Ten Tons bollard surrounded by stainless steel collar)
SPI-SPI-CCE-RAK-SocketH (Pre-bored Socket-H Raking Pile)

Field No.	1	2	3	4	5
Field Description.	Category	-Functional Type	-Originator	-Description 1 (optional)	-Description 2 (optional)

Field 1 : 3 Characters as according to the CAT code requirement in BIM harmonisation standard
Field 2 : 3 Characters to describe the PWD Code of the object
Field 3: 3 Characters to describe the originator based on Agent Responsible Code (ARC) (https://www.devb.gov.hk/filemanager/en/content_203/CSWP_ARC_V3.09.00.pdf)
e.g CCE
Field 4: Extended description of the family, e.g. size, orientation, and finishing
Field 5: Extended description of the family, e.g. size, orientation, and finishing

[4] If the marine structure is in small scale and size with less complexity, for example, beacon, an AIM with "ALL" discipline could be submitted.

2.2.3 Material Naming Convention

The material must be assigned to the objects as an attribute/parameter. All material should be named with 4 fields, for example:

CCE_CONC_IS_C45_20 (In-Situ concrete C45/20)
CCE_STRS_S355 (Structural Steel with strength S355)

Field No.	1	2	3	4
Field Description.	Originator	_Material	_Nature (optional)	_Strength (optional)

Field 1: 3 Characters to describe the originator based on Agent Responsible Code (ARC)
(https://www.devb.gov.hk/filemanager/en/content_203/CSWP_ARC_V3.09.00.pdf)

Field 2: 4 to 6 Characters to describe the materials

CONC: Concrete	STRS: Structural Steel
STAS: Stainless Steel	ALUM: Aluminium
ROCK: Rock	SOIL: Soil
RUBR: Rubber	TIMB: Timber
PLST: Plastic	

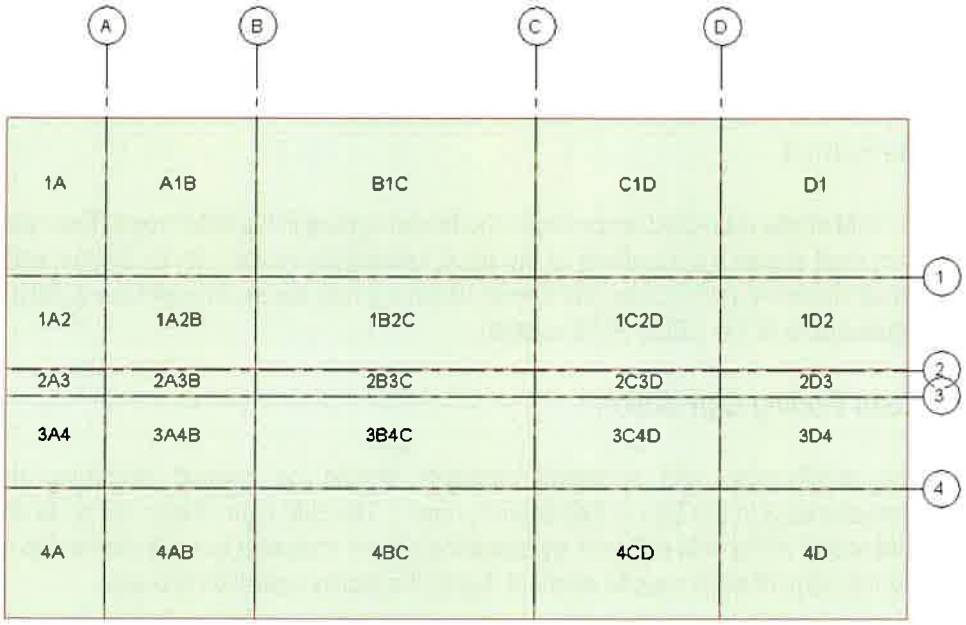
Field 3: Type of the material
IS: In-situ concrete PC: Precast Concrete

Field 4 : Strength, sub-type or model number of the material

C45/20 Concrete: C45_20	S355 Structural Steel: S355

2.2.4 Space ID Naming Convention

The space ID is defined with the project grid line. The space ID is used for the easy identification and locating of the asset components in the marine facilities on site. It should be created according to the following convention:



1. [Grid (Horizontal Grid at North)] [Grid (Vertical)]
2. [Grid (Vertical Grid at West)] [Grid (Horizontal Grid at South)]
3. [Grid (Horizontal Grid at South)] [Grid (Vertical Grid at East)]
4. [Grid (Horizontal Grid at North)] [Grid (Vertical)] [Grid (Horizontal Grid at South)]
5. [Grid (Horizontal Grid at North)] [Grid (Vertical Grid at West)] [Grid (Horizontal Grid at South)] [Grid (Vertical Grid at East)]
6. [Grid (Horizontal Grid at North)] [Grid (Vertical Grid at West)] [Grid (Vertical Grid at East)]
7. [Grid (Vertical Grid at West)] [Grid (Horizontal Grid at South)] [Grid (Vertical Grid at East)]

This space parameter is to indicate the location of specific marine structure

2.3 MODEL SETUP

2.3.1 Unit and Coordinates System

The asset information model shall be setup and modeled in meter for both linear and area measurements. All heights must be referring to the Hong Kong Chart Datum (HKCD). The origin and orientation of the project should be based on the project location and referenced to the Hong Kong 1980 Grid (HK1980 Grid). A reference North direction should be indicated in the model.

2.3.2 File Format

The BIM model is created according to the format agreed in the BIM Project Execution Plan. The BIM team shall ensure the handover of the asset information model with its original editable format, IFC format version 4, and COBie data format, which are fully compatible with the asset information model requirements of the CEDD PMIS system.

2.3.3 Color Coding Convention

The architectural and structural elements should be colored according to their physical characteristics in the BIM software environment. The BIM team shall color-code all elements in the BIM model in the BIM software by assigning proper materials to each element to support the easy identification of each specific element during the facility operation process.

If the assignment of the materials is not feasible, the BIM team shall follow the minimum color-coding requirements in the LOD master matrix in appendix A.

The BIM team should submit all the color settings configuration, (such as filtering, appearance profiler) and setup manual of all the adopted software of the original editable model and compressed model.

2.4 LEVEL OF INFORMATION NEED

Level of Information Need (LOIN) should be used to describe the geometrical informational and documentional requirements to support a specific purpose. The BIM model shall be gradually developed during the project lifecycle. The LOIN of each component of the final submitted Asset Information Model should be referred to sections 2.4.1 to 2.4.3 below and the *Appendix A: Level of Graphics (LOD-G) Requirement of* **all PWD/CEDD Components** and *Appendix B: LOD-I Requirement of all PWD/CEDD Components.*

2.4.1 Level of Graphics (LOD-G)

The Level of Graphics (LOD-G) refers to the graphical representation which deals with geometric representation, symbology, and visualisation. This is generally related to the deliverable which controls the graphical precision of the elements represented. The BIM teams shall refer to the LoD Specification in Section 2.6.2 of the CIC BIM Standard - General v2 (Dec 2020), and the LoD Specification of the CEDD in the communication of the geometric detail requirement of all elements. The geometric detail requirement of all model elements number from LoD 100 to 400 are extracted as follows:-

LOD-G	Description
100	The model element is graphically represented within the model by a **symbol** or generic representation or rough 3D shape.
200	The model element is graphically represented within the model as a **generic system, object, or assembly** with approximate quantities, assumed size, shape, location, and orientation. The assumed spaces required for access and maintenance shall be indicated.
300	The model element is graphically represented within the model as a **specific system, object or assembly** in terms of quantity, size, shape, location, and orientation. The model shall include details of the spaces required for handling installation, operation and maintenance, and the interface details for checking and coordination with other models / objects.
400	The model element is graphically represented within the model as a **specific system, object or assembly** in terms of size, shape, location, quantity, and orientation with **detailing for fabrication, assembly, and installation.**
500	Not Used.

2.4.2 Level of Infomation (LOD-I)

The Level of Information (LOD-I) identifies the properties to be attached to each type of object to meet the intended uses. Properties can include requirements, specifications, product definitions, object methods, parametric parameters, materials, generic or manufactured product criteria, etc. The LOD-I requirements of the as-built model and asset information model should be associated with this AIR.

2.4.3 Level of Documentation (DOC)

The Level of Documentation (DOC) refers to the kind of documentation to be associated with the uses to meet the identified requirements. Each task team should understand their deliverable requirements against a specific use. To suit the purpose of future maintenance for marine assets, the following documents, whenever available, shall be submitted together with AIM for futher transferred to the PMIS.

- As-built drawings
- Handover notes/memos
- Operation and Maintenance Manuals
- Test reports
- Design calculations
- Sounding
- Tenancy Agreement
- Assessment of non-schedule of rate items
- Materials submission/catalogue
- TGLA memo

2.5 MODELLING METHODOLOGY

The Asset Information Model should be developed by adding the asset information into the verified as-built BIM model. The as-built BIM model should be a field verified record of the construction stage working model in term of size, shape, location, quantity and orientation.

All the BIM models must be created from the library/object/category of the BIM software. Generic mass should not be used without obtaining permission from the client's project team.

All object components shall be modelled as according to the in *Geometrical Modeling Requirment of Asset components* in section 2.6. The minimum geometrical detail requirement for the components in the asset information models are shown in *Appendix A: Level of Graphics (LOD-G) Requirement of* **all PWD/CEDD Components**.

2.5.1 Customized Libraries

The geometry of the customized libraries should be created according to the geometrical requirement of the **Production of BIM Object Guide - General Requirements** published by the CIC[5], to support the production of 2D CAD drawings. Specific requirements to the geometrical details of each asset element are listed in *Appendix A: Level of Graphics (LOD-G) Requirement of* **all PWD/CEDD Components**.

The non-geometrical information of all libraries must be created according to *Asset Information for PMIS* in section 3 to ensure the direct export of COBie data for asset management purposes.

All the customized libraries should be named according to the *Object Family Naming* Convention in section 2.2.

The geometry and attributes of customized libraries must be created for the seamless export to IFC and COBie format. In-place and grouped families of Autodesk Revit should be always avoided.

All the customized libraries shall be submitted with the Asset Information Model according to the *HANDOVER PROCEDURES OF ASSET INFORMATION MODEL* requirement in section 1.2.

2.5.2 Space Requirement

A unified Space is mandatory for all disciplinary models at each marine facility. It should be created on the SPACE floor plan and associated with +0.00m of Chart Datum. All the spaces in the marine facility must be created with the built-in function of the BIM software in all disciplinary models once it is available.

The space component is essential for the requirement to export the Space elements in the COBie file. It is used to identify the location of asset components created in the area in the Portworks Maintenance Information System (PMIS) of the PWD of CEDD.

[5] https://www.bim.cic.hk/zh-hant/resources/publications_detail/6?page=6&sorting=seq&keyword=&back=%2fzh-hant%2fresources%2fpublications_ajax%3fpage%3d6%26sorting%3dseq%26keyword%3d

The project BIM team shall associate the spaces to all asset components according to the *ASSET INFORMATION REQUIREMENT* of section 3.3.

2.5.3 System Requirement

The building services (MEP) elements of the same system should be modelled as a connected system.

2.6 Geometrical Modeling Requirement of asset components

An asset component in the asset information model of the assets must be segregated or grouped into the unit size as defined in the following tables. The construction BIM team must re-organize the components to ensure the compliance of unit size requirement, before submission of the final Asset Information Model.

2.6.1 Unit Size of Structural Elements for Marine Structures

Component	PWD Code	Horizontal	Vertical
Access Structure	SAC	Per Unit	Per Unit
Anchor Blot/Post	SAB	Per Unit	Per Unit
Bagged Concrete	SBC	Per Unit	Per Unit
Berm Stone	SBS	Per Unit	Per Unit
Bracing (Horizontal and Vertical)	SBH SBV	Per Unit	Per Unit
Concrete Coping	SCC	Per Unit	Per Unit
Concrete Foundation (Beacon)	SCF	Per Unit	Per Unit
Concrete Structure (Beacon, Dolphin, vertical seawall and solid pier)	SCS	Per Unit	Per Unit
Corbel/ Concrete Bracket for pier	SCO	Per Unit	Per Unit
Gabion Wall	SGW	CJ to CJ	CJ to CJ
Landing Platform	SLP	Per unit	Per unit
Landing Staircase Structure	SLS	Per unit	Per unit
Landing Step	SLT	Per unit	Per unit
Leveling Stone	SLV	Per unit	Per unit
Pell Mell Rubble	SPM	Per unit	Per unit
Pile Cap	SPC	Per unit	Per unit

Component	PWD Code	Horizontal	Vertical
Pile Foundation	SPI	Per unit	Per unit
Precast Beam Slab Panel	SPP	CJ to CJ	CJ to CJ
Precast Concrete block (seawall block, solid pier concrete block, wave wall /barrier)	SBK	Per pre-casted unit	Per pre-casted unit
Ramp	SRP	Per grid	Per grid
Rock Armour for seawall and breakwater	SRA	Per Construction Bay of seawall and breakwater	Per Construction Bay of seawall and breakwater
Rock Fill	SRF	Per Construction Bay of the parent structure	Per Construction Bay of the parent structure
Slab/Pier Deck	SLA	Per grid	Per grid
Steel Structure (Beacon)	SSS	Per unit	Per unit
Structural Beam (Concrete, Steel andTie Beam)	SBM	Column to Column (Edge to Edge)	Per unit
Structural Column (Concrete and Steel column and Post)	SCL	Per unit	Floor to Soffit
Structural wall/ retaining wall	SWL	Per Construction Bay	Per Construction Bay
Wave Absorption Chamber	SWA	Per pre-casted unit	Per pre-casted unit

2.6.2 Unit Size of Fender System for Marine Structures

Component	PWD Code	Horizontal Unit	Vertical. Unit
Capping (Rubber or Timber)	FCA	Per unit	Per unit
Chain for Fender System	FCH	Per unit	Per unit
Eye Bolt for Fender System	FEB	Per unit	Per unit
Frontal Pad	FFP	Per unit	Per unit
Horizontal Fender (Plastic, timber, rubber)	FHF	Per unit	Per unit
Horizontal/ Inclined Waling System	FHW FIW	Per unit	Per unit
Rubber Buffer	FRB	Per unit	Per unit

Component	PWD Code	Horizontal Unit	Vertical. Unit
Steel Plate for Waling System	FSP	Per unit	Per unit
Steel Bracket	FBK	Per unit	Per unit
Step Block (Rubber, Timber)	FSB	Per unit	Per unit
Vertical Fender (Plastic, timber, rubber)	FVF	Per unit	Per unit

2.6.3 Unit Size of Civil Elements for Marine Structures

Component	PWD Code	Horizontal Unit	Vertical. Unit
Access/Cat Ladders	CAL	Per unit	Per unit
Barrier Bollard	CBB	Per unit	Per unit
Bathymetry (Proposed Profile or tunnel seabed level)	BAP	Per site boundary	Per site boundary
Bench	CBN	Per unit	Per unit
Mooring Bollard	CBO	Per unit	Per unit
Concrete Plinth	CCP	Per unit	Per unit
Fence	CFC	Post to Start of Post	Per Unit
Gate	CGT	Per unit	Per unit
Lifebuoy	CLB	Per unit	Per unit
Marine Notice Board	CMN	Per unit	Per unit
Mooring Eye	CME	Per unit	Per unit
Navigation Light	CNL	Per unit	Per unit
Pier Notice Board	CNB	Per unit	Per unit
Proposed Topography (Proposed Site formation)	TSF	Per site boundary	Per site boundary
Railing/ Handrail	CHR	Post to Start of Post	Per unit
Signage/ Information Plate (including landing/ structural no plate, pier)	CSG	Per unit	Per unit
Step Iron	CSI	Per unit	Per unit

Component	PWD Code	Horizontal Unit	Vertical. Unit
Tidal Gauge House	CGH	Per unit	Per unit
Tidal Gauge Tube	CTG	Per unit	Per unit

2.6.4 Unit Size of Architectural Elements for Marine Structures

Component	PWD Code	Horizontal Unit	Vertical. Unit
Architectural Roof	ARF	Per Space	Per Space
Blue Color Paint	ABP	Per Sign	Per Sign
Ceiling	ACE	Per Floor	Per unit
Finishes	AFS	Per type on the parent object	Per type on the parent object
Non-slip Yellow Nosing	AYN	Per strip	Per unit
Roof Gutter	AGT	CJ to CJ	CJ to CJ
Skylight / Glass Panel	ASK	Per unit	Per unit
Tactile Warning Strip	ATW	Per unit	Per unit

2.6.5 Unit Size of Site elements for Marine Structures

Component	PWD Code	Horizontal Unit	Vertical. Unit
Bathymetry (Existing Profile or tunnel seabed level)	BAE	Per site boundary	Per site boundary
Beach Finishes levels	BFL	Per site boundary	Per site boundary
Pavement (Carriage ways, footpath, cycle tracks)	PAV	CJ to CJ	CJ to CJ
Surrounding Building Mass	SUR	Per Building	Per Building
Topography (Existing Site formation)	TOP	Per site boundary	Per site boundary

2.6.6 Unit Size of MEP elements for Marine Structures

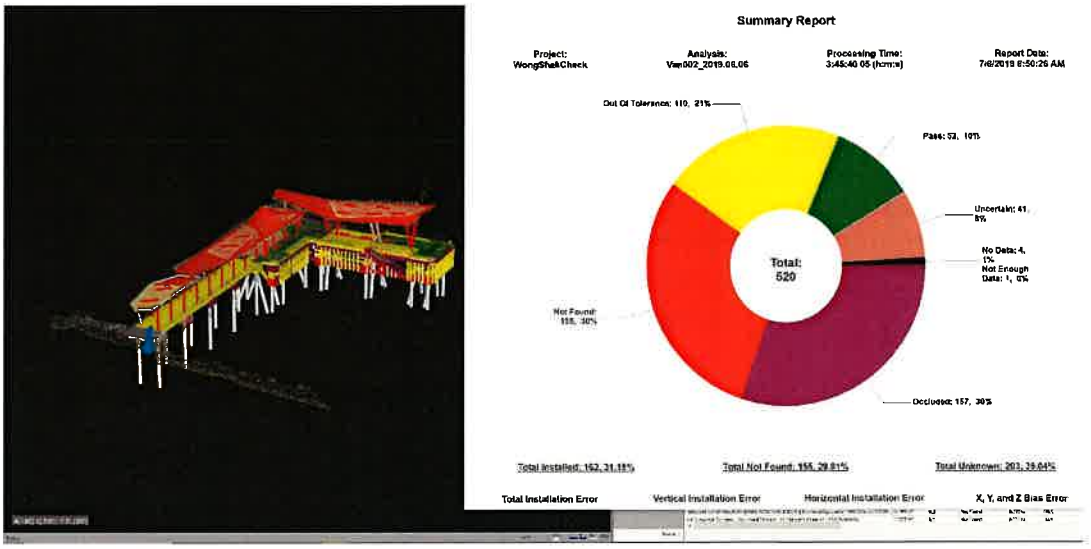
Component	PWD Code	Horizontal Unit	Vertical. Unit
Cable Drawpit	CDP	Per unit	Per unit
Cable Ducting	CDT	CJ to CJ	CJ to CJ
CCTV Camera	CAM	Per unit	Per unit
Corrision Monitoring Pit	CMP	Per unit	Per unit

Component	PWD Code	Horizontal Unit	Vertical. Unit
Corrosion Monitoring Terminal Box	CMB	Per unit	Per unit
Drainage Downpipe	DWP	Joint to Joint	Joint to Join
Earthing and Lightning	ETH	Per system	Per system
GovWiFi	GWF	Per unit	Per unit
ICCP Transformer Rectifier	TFR	Per unit	Per unit
Inspection manhole	IMH	Per unit	Per unit
Lighting	LGH	Per unit	Per unit
Pillar Box (including ICCP AC power supply pillar box, electric pillar box)	EPB	Per unit	Per unit
Sensors	SNR	Per unit	Per unit
Solar Panel	SOP	Per unit	Per unit

3. ASSET INFORMATION FOR PMIS

This Section describes the requirement of the non-geometrical information in the Asset Information Model. The Asset Information Model shall be developed from the field verified as-built BIM model.

The contractor is responsible to demonstrate the reliability and accuracy of the as-built BIM model with survey records, such as laser scanning or drone survey, before further conversion to the Asset Information Model. For example:



3.1 FORMAT

The asset information model shall be handed over with its original editable format and IFC format. The asset information should be further exported from the Asset Information Model in COBie format for the maintenance team to upload to the PMIS in the CEDD.

The COBie file must be directly extracted from the submitted Asset Information Model. All the non-graphical information of the asset components in the native format Asset Information Model exported IFC model and exported COBie spreadsheet must be always the same. An introduction of the COBie is provided in *Appendix D: Introduction to COBie*.

3.2 LANGUAGE

Other than the asset name (Chinese and English), all the information fields and values must be in English.

3.3 ASSET INFORMATION REQUIREMENT

Asset Information is required for all the site components, architectural components, structural components, civil components, site formation components, building services components, and fender systems components as listed in *Appendix B : Level of Information (LOD-I) Requirement of all PWD/CEDD* **Components**. This information shall be gradually developed and entered into the asset components during different project stages and checked regularly by the technical team of the PWD to ensure the compliance in data format and latest technology standard. All the asset information shall

be updated in the as-built verified model during the handover and commissioning stage of the project for the PWD team to validate the content and format against this Asset Information Requirement. The asset information of the final validated model (Asset Information Model) shall be exported to IFC and COBie format, which will be imported to the Portworks Maintenance Information System (PMIS) of the PWD/CEDD to support the asset management process.

The BIM teams of each project stage are fully responsible to prepare and validate all the attributes before the handover to another stage. All the specified asset information (LOD-I) for each component in the BIM model should be created using the specified Type and Instant parameters settings in the BIM modeling software. The BIM teams of each project stage shall ensure the accurate mapping between parameters of the asset components and COBie fields with the Revit BIM interoperability tools. The BIM team shall export the COBie files and submit them to the PWD team regularly for content validation. A general guide to export the attributes to COBie with the Revit 2018 COBie extension tools is provided in *Appendix C: Technical Guide for Revit Interoperability Tool*.

The required information includes the basic information of the project and asset, attributes information related to a component type, as well as geometry, location, and attribute information related to a particular component. This information shall be entered into designated fields of the BIM model before exported to the COBie spreadsheet.

The required fields (LOD-I) of each discipline are listed in sub-sections of section 3.3. The detailed requirement of information of each asset component is listed in *Appendix B : Level of Information (LOD-I) Requirement of all PWD/CEDD* **Components.**

3.3.1 Project and Facility Information

Project and facility information describes the basic properties of the asset/facility/project. These information should be entered at the Project Information of the BIM software.

Revit Field Name	Description	Revit Parameter Settings	Example
CEDD_FacilityName	Name of marine structure (English & Chinese)	Project Instance Parameter (Project Information)	Sai Kung Public Pier 西貢公眾碼頭
CEDD_FacilityType	Type of marine structure (e.g. piled pier, solid pier, landing, breakwater, rubble mound seawall, block work seawall, wave absorption seawall, dolphin, beacon)		Piled Pier
CEDD_ProjectName	Project Name & Contract No.		Contract 1434 - Sai Kung Promenade & Jetty Extensions
CEDD_MarineStructureNo	Marine Structure No.		NP073
CEDD_FacilityNature	Nature of marine structure (e.g. public/ government /licensed/ franchised)		Public
CEDD_ProjectDescription	Area of pier head/catwalk; Or Length of seawall/breakwater, etc.		787m² (pier head); 280m² (catwalk)
CEDD_FacilityDistrict	District		Sai Kung
CEDD_FacilityPhase	Improvement/Modification/ Extension works		Extension works
CEDD_YearOfConstruction	Year of Construction/Completion		1997
CEDD_DateOfHandover	Date of Handover (YYYY-MM-DD)		1997-11-28
CEDD_ManagementParty	Management Party		TD
CEDD_MaintenanceParty	Maintenance Party & Team		CEDD
CEDD_SuperstrMaintenanceParty	Superstructure Maintenance Party		ArchSD

3.3.2 Structural Components

Attributes of the components in the structural discipline include the locational, geometrical, and maintenance information of the components. These information shall be entered as Type, Instant, and Reporting (instant) parameters of the family objects in the BIM modeling software.

Revit Field Name	Description	Revit Parameter Settings	Example
CEDD_I_AssetID	Asset ID (Unique ID for the component)	Project Instance Parameter	MD-1B2C-SPI-C1
CEDD_I_SpaceID	Space ID (location of the component defined by grid)	Project Instance Parameter	1B2C
CEDD_I_TopLevel	Top Level of the structural component in HKCD	Family Reporting Parameter	+4.00
CEDD_I_BottomLevel	Top Level of the structural component in HKCD	Family Reporting Parameter	-1.00
CEDD_I_Length	Length of the structural component in meter	Family Reporting Parameter	5
CEDD_I_LastReplaceDate	Last Replacement Date or Installation Date (YYYY-MM-DD)	Project Instance Parameter	2019-11-17
CEDD_I_CrossSectionArea	Cross Section Area of the component in m^2	Reporting Parameter	0.09
OmniClass Number/ OmniClass Title	Classification number defined in the OmniClass tables	Project Type Parameters	23-13 29 11 11 13/ Foundation Piles
CEDD_T_AssetType	PWD Code of component type	Project Type Parameter	SPI
CEDD_T_DetailDescription	Detail Description of the type of component	Project Type Parameter	Pile Foundation
CEDD_T_Shape	The shape of the component type	Project Type Parameter	Cylindrical
CEDD_T_Material	Material of the structural component	Project Type Parameter	Concrete
CEDD_T_Grade	Material grade of the component type	Project Type Parameter	Grade 50/20
CEDD_T_FinishMaterial	Finished Material of the component type	Project Type Parameter	N/A
CEDD_T_Dimension	Nominal Dimension of the component type	Project Type Parameter	900mm dia
CEDD_T_ReferenceDrawing	Reference/standard drawing no of the component type	Project Type Parameter	1434_A_P_C_007
CEDD_T_MgtParty	Management Party of the component type	Project Type Parameter	TD
CEDD_T_MaintenanceParty	Maintenance Party of the component type	Project Type Parameter	CEDD

N/A – NOT APPLICABLE TO THE SELECTED EXAMPLE

3.3.3 Fender Components

Attributes of the components in the fender discipline include the locational, geometrical, and maintenance information of the components. These information shall be entered as Type, Instant, and Reporting (instant) parameters of the family objects in the BIM modeling software.

Revit Field Name	Description	Revit Parameter Settings	Example
CEDD_I_AssetID	Asset ID (Unique ID for the component)	Project Instance Parameter	XX-7A3C_UL-FVF-01
CEDD_I_SpaceID	Space ID (location of the component defined by the grid)	Project Instance Parameter	7A3C
CEDD_I_TopLevel	Top Level of the component in HKCD	Family Reporting Parameter	N/A
CEDD_I_BottomLevel	Top Level of the component in HKCD	Family Reporting Parameter	N/A
CEDD_I_Length	Length of the component in meter	Family Reporting Parameter	3.5
CEDD_I_LastReplaceDate	Last Replacement Date or Installation Date (YYYY-MM-DD)	Project Instance Parameter	2019-11-17
OmniClass Number/ OmniClass Title	Classification number defined in the OmniClass tables	Project Type Parameters	23-39 21 11 11 13 / Boat Fenders
CEDD_T_AssetType	PWD Code of component type	Project Type Parameter	FVF
CEDD_T_DetailDescription	Detail Description of the type of component	Project Type Parameter	Vertical Plastic Fender
CEDD_T_Shape	The shape of the component type	Project Type Parameter	Arch
CEDD_T_Material	Material of the component	Project Type Parameter	Plastic
CEDD_T_Dimension	Nominal Dimension of the component type	Project Type Parameter	250mm (H)
CEDD_T_ReferenceDrawing	Reference/standard drawing no of the component type	Project Type Parameter	1434_A_P_C_010
CEDD_T_MgtParty	Management Party of the component type	Project Type Parameter	TD
CEDD_T_MaintenanceParty	Maintenance Party of the component type	Project Type Parameter	CEDD

N/A – NOT APPLICABLE TO THE SELECTED EXAMPLE

3.3.4 Civil Components

Attributes of the components in the civil discipline include the locational, geometrical, and maintenance information of the components. These information shall be entered as Type, Instant, and Reporting (instant) parameters of the family objects in Revit or properties set attributes in the Civil 3D.

Revit Field Name	Description	Revit Parameter Settings	Example
CEDD_I_AssetID	Asset ID (Unique ID for the component)	Project Instance Parameter	MD-1B2C-CAL-01
CEDD_I_SpaceID	Space ID (location of the component defined by the grid)	Project Instance Parameter	1B2C
CEDD_I_TopLevel	Top Level of the component in HKCD	Family Reporting Parameter	4.00
CEDD_I_BottomLevel	Top Level of the component in HKCD	Family Reporting Parameter	2.00
CEDD_I_Length	Length of the component in meter	Family Reporting Parameter	2
CEDD_I_LastReplaceDate	Last Replacement Date or Installation Date (YYYY-MM-DD)	Project Instance Parameter	2019-11-17
OmniClass Number/ OmniClass Title	Classification number defined in the OmniClass tables	Project Type Parameters	23-27 71 17 / Travelling Ladder System
CEDD_T_AssetType	PWD Code of component type	Project Type Parameter	CAL
CEDD_T_DetailDescription	Detail Description of the type of component	Project Type Parameter	Access/Cat Ladder
CEDD_T_Material	Material of the component	Project Type Parameter	Stainless Steel
CEDD_T_Grade	Material Grade of the component	Project Type Parameter	Grade 1.4401
CEDD_T_FinishMaterial	Finished Material of the component type	Project Type Parameter	N/A
CEDD_T_Dimension	Nominal Dimension of the component type	Project Type Parameter	600mm wide
CEDD_T_ReferenceDrawing	Reference/standard drawing no of the component type	Project Type Parameter	1434_A_P_C_015
CEDD_T_MgtParty	Management Party of the component type	Project Type Parameter	TD
CEDD_T_MaintenanceParty	Maintenance Party of the component type	Project Type Parameter	CEDD

N/A – NOT APPLICABLE TO THE SELECTED EXAMPLE

3.3.5 Site Components

Attributes of the components in the Site discipline include the locational, geometrical, and maintenance information of the components. These information shall be entered as Type, Instant, and Reporting (instant) parameters of the family objects in Revit or properties set attributes in the Civil 3D.

Revit Field Name	Description	Revit Parameter Settings	Example
CEDD_I_AssetID	Asset ID (Unique ID for the component)	Project Instance Parameter	XX-XX-BFL-01
CEDD_I_SpaceID	Space ID (location of the component defined by the grid)	Project Instance Parameter	N/A
CEDD_I_TopLevel	Top/Highest Level of the component in HKCD	Project Instance Parameter	4.00
OmniClass Number/ OmniClass Title	Classification number defined in the OmniClass tables	Project Type Parameters	14-34 17 24 / Shoreline
CEDD_T_AssetType	PWD Code of component type	Project Type Parameter	BFL
CEDD_T_DetailDescription	Detail Description of the type of component	Project Type Parameter	Beach Finish Level
CEDD_T_FinishMaterial	Finished Material of the component type	Project Type Parameter	N/A
CEDD_T_ReferenceDrawing	Reference/standard drawing no of the component type	Project Type Parameter	1434_A_P_C_001
CEDD_T_MgtParty	Management Party of the component type	Project Type Parameter	LCSD
CEDD_T_MaintenanceParty	Maintenance Party of the component type	Project Type Parameter	ArchSD

N/A – NOT APPLICABLE TO THE SELECTED EXAMPLE

3.3.6 Architectural Components

Attributes of the components in the architectural discipline include the locational, geometrical, and maintenance information of the components. These information shall be entered as Type, Instant, and Reporting (instant) parameters of the family objects in BIM modeling software.

Revit Field Name	Description	Revit Parameter Settings	Example
CEDD_I_AssetID	Asset ID (Unique ID for the component)	Project Instance Parameter	RF-R01-ASK-01
CEDD_I_SpaceID	Space ID (location of the component defined by the grid)	Project Instance Parameter	1B2C
CEDD_I_LastReplaceDate	Last Replacement Date or Installation Date (YYYY-MM-DD)	Project Instance Parameter	2019-11-17
OmniClass Number/ OmniClass Title	Classification number defined in the OmniClass tables	Project Type Parameters	23-12 33 27 19 / Glazed Roof structure
CEDD_T_AssetType	PWD Code of component type	Project Type Parameter	ASK
CEDD_T_DetailDescription	Detail Description of the type of component	Project Type Parameter	Skyline
CEDD_T_Material	Material of the component	Project Type Parameter	Laminated tempered glass
CEDD_T_Dimension	Nominal Dimension of the component type	Project Type Parameter	1705mm(L) x 1870mm(W) x 8mm+1.52PVB+8mm thk
CEDD_T_ReferenceDrawing	Reference/standard drawing no of the component type	Project Type Parameter	1434_A_P_C_019
CEDD_T_MgtParty	Management Party of the component type	Project Type Parameter	TD
CEDD_T_MaintenanceParty	Maintenance Party of the component type	Project Type Parameter	ArchSD

N/A – NOT APPLICABLE TO THE SELECTED EXAMPLE

3.3.7 Building Services Components

Attributes of the components in the building services discipline include the locational, geometrical, and maintenance information of the components. These information shall be entered as Type, Instant, and Reporting (instant) parameters of the family objects in the BIM modeling software.

Revit Field Name	Description	Revit Parameter Settings	Example
CEDD_I_AssetID	Asset ID (Unique ID for the component)	Project Instant Parameter	MD-1B2C-CAM-01
CEDD_I_SpaceID	Space ID (location of the component defined by the grid)	Project Instant Parameter	1B2C
CEDD_I_TopLevel	Top Level of the component in HKCD	Family Reporting Parameter	N/A
CEDD_I_BottomLevel	Top Level of the component in HKCD	Family Reporting Parameter	N/A
CEDD_I_LastReplaceDate	Last Replacement Date or Installation Date (YYYY-MM-DD)	Project Instant Parameter	2019-11-17
OmniClass Number/ OmniClass Title	Classification number defined in the OmniClass tables	Project Type Parameters	23-29 11 11 13 / Visual light wavelength CCTV cameras
CEDD_T_AssetType	PWD Code of component type	Project Type Parameter	CAM
CEDD_T_DetailDescription	Detail Description of the type of component	Project Type Parameter	CCTV camera
CEDD_T_Material	Material of the structural component	Project Type Parameter	N/A
CEDD_T_Dimension	Nominal Dimension of the component type	Project Type Parameter	N/A
CEDD_T_ReferenceDrawing	Reference/standard drawing no of the component type	Project Type Parameter	1434_A_P_C_080
CEDD_T_MgtParty	Management Party of the component type	Project Type Parameter	TD
CEDD_T_MaintenanceParty	Maintenance Party of the component type	Project Type Parameter	CEDD
CEDD_T_Manufacturer	Manufacturer of the component type	Project Type Parameter	IFSEC

N/A – NOT APPLICABLE TO THE SELECTED EXAMPLE

The above information is required for all building services (BS) components as listed in Appendix B. The BIM team shall refer to the latest BIM-AM Standards and Guidelines published by the Electrical and Mechanical Services Department of the HKSAR Government for the information requirement of other MEP components.

3.4 COBIE FIELDS MAPPING REQUIREMENT

The BIM team of each stage is responsible to extract the asset information into COBie format and submitted to the technical team of PWD/CEDD to validate the format and content of the asset information upon request. The project information, asset information, family name, type name, component GUIDs, type, and instant parameters should be mapped into the standard COBie fields according to the mapping table shown in this section.

3.4.1 Contact Sheet

The Contact sheet describes the contact information of the modeling team. Information should be entered in the BIM interoperability add-on of the BIM modeling software. The following fields listed below are mandatory.

COBie Sheet	Field	Revit Field	Description	Information Type
Contact	Email	Email	Email address of the modeling team	N/A
Contact	Company	Company	Name of the main contractor/consultant	N/A
Contact	Phone	Phone	Phone contact of the modeling team	N/A
Contact	Category	Category	Design Consultant/Contractor	N/A

3.4.2 Facility Sheet

The Facility sheet describes the project and facility information. Information should be entered in the Project Information of the BIM modeling software. The following fields listed below are mandatory.

COBie Sheet	Field	Revit Field	Description	Information Type
Facility	Name	CEDD_FacilityName	Name of marine structure (English & Chinese)	Project Parameter
Facility	Category	CEDD_FacilityType	Type of marine structure (e.g. piled pier, solid pier, landing, breakwater, rubble mound seawall, block work seawall, wave absorption seawall, dolphin, beacon)	Project Parameter
Facility	ProjectName	CEDD_ProjectName	Project Name & Contract No.	Project Parameter
Facility	SiteName	CEDD_MarineStructureNo	Marine Structure No.	Project Parameter
Facility	Description	CEDD_FacilityNature	Nature of marine structure (e.g. public/ government /licensed/ franchised)	Project Parameter
Facility	ProjectDescription	CEDD_ProjectDescription	Area of pier head/catwalk; Or Length of seawall/breakwater, etc.	Project Parameter
Facility	SiteDescription	CEDD_FacilityDistrict	District	Project Parameter
Facility	Phase	CEDD_FacilityPhase	Improvement/Modification/ Extension works	Project Parameter

COBie Sheet	Field	Revit Field	Description	Information Type
Attribute	Name	CEDD_YearOfConstruction	Year of Construction/Completion	Project Parameter
Attribute	Name	CEDD_DateOfHandover	Date of Handover (YYYY-MM-DD)	Project Parameter
Attribute	Name	CEDD_ManagementParty	Management Party	Project Parameter
Attribute	Name	CEDD_MaintenanceParty	Maintenance Party & Team	Project Parameter
Attribute	Name	CEDD_SuperStrMaintenanceParty	Superstructure Maintenance Party	Project Parameter

3.4.3 Floor Sheet

The Floor sheet describes the reference levels used in the project. Information should be created with the floor levels with reference to the Hong Kong Chart Datum in the BIM modeling software. The following fields listed below are mandatory.

COBie Sheet	Field	Revit Field	Description	Information Type
Floor	Name	Floor Name	Name of the floor	System
Floor	Elevation	Floor Elevation	Elevation of the floor (e.g. +4.000 CD)	System

3.4.4 Space Sheet

The space sheet describes the grid zone used in the project. Information is created during the space creation process of the BIM modeling software. The following fields listed below are mandatory.

COBie Sheet	Field	Revit Field	Description	Information Type
Space	Name	Space Name	Name of the space defined in section 2.5.2	System
Space	ExtIdentifier	GUID of each space	Unique ID of each space	System

3.4.5 Type Sheet

The type sheet describes the family type used in the project. Information is created during the family creation and information updating process of the BIM modeling software. The following fields listed below are required if specified in Appendix A.

COBie Sheet	Field	Revit Field	Description	Information Type
Type	Name	FamilyName_TypeName	Family Name and Type name of the component type	System

COBie Sheet	Field	Revit Field	Description	Information Type
Type	Description	CEDD_T_DetailDescription	Detail Description of the type of component	Type Parameter
Type	Category	Omniclass No and OmniClass Title	Omniclass Classification of a Type of component	Type Parameter
Type	AssetType	CEDD_T_AssetType	PWD Code of component type	Type Parameter
Type	Manufacturer	CEDD_T_Manufacturer	Manufacturer of the component type	Type Parameter
Type	WarrantyGuarantorLabor	CEDD_T_MaintenanceParty	Maintenance Party of the component type	Type Parameter
Type	ExtIdentifier	GUID of each type	Unique ID of each component type	System
Type	Shape	CEDD_T_Shape	The shape of the component type	Type Parameter
Type	Size	CEDD_T_Dimension	Nominal Dimension of the component type	Type Parameter
Type	Finish	CEDD_T_FinishMaterial	Finished Material of the component type	Type Parameter
Type	Grade	CEDD_T_Grade	Material grade of the component type	Type Parameter
Type	Material	CEDD_T_Material	Material of the structural component	Type Parameter
Attribute	Name	CEDD_T_ReferenceDrawing	Reference/standard drawing no of the component type	Type Parameter
Attribute	Name	CEDD_T_MgtParty	Management Party of the component type	Type Parameter
Attribute	Name	CEDD_T_MaintenanceParty	Maintenance Party of the component type	Type Parameter

3.4.6 Component Sheet

The components sheet describes the objects created in the project. Information is created during the modeling and information updating process of the BIM modeling software. The following fields listed below are required if specified in Appendix A.

COBie Sheet	Field	Revit Field	Description	Information Type
Components	Name	CEDD_I_AssetID	Asset ID (Unique ID for the component)	Instant Parameter
Components	Space	CEDD_I_SpaceID	Space ID (location of the component defined by the grid)	Instant Parameter
Components	ExtIdentifier	GUID of each component	Unique ID of each component	System
Components	InstallationDate	CEDD_I_LastReplaceDate	Last Replacement Date or Installation Date (YYYY-MM-DD)	Instant Parameter
Components	AssetIdentifier	CEDD_I_AssetID	Asset ID (Unique ID for the component)	Instant Parameter

COBie Sheet	Field	Revit Field	Description	Information Type
Components	Area	CEDD_I_CrossSectionArea	Cross Section Area of the component in m^2	Reporting Parameter
Components	Length	CEDD_I_Length	Length of the structural component in meter	Reporting Parameter
Attribute	Name	CEDD_I_TopLevel	Top Level of the structural component in HKCD	Reporting Parameter
Attribute	Name	CEDD_I_BottomLevel	Top Level of the structural component in HKCD	Reporting Parameter

3.4.7 System Sheet

The system sheet describes the building services system created in the project. Information is created during the creation of the connected building services model and information updating process of the BIM modeling software. The following fields listed below are required for building services systems.

COBie Sheet	Field	Revit Field	Description	Information Type
System	Name	System Name	System ID (Unique ID for each system)	System
System	Description	System Description	Full Description of the system	System

4. ASSET UNIQUE ID CODING CONVENTION

Asset ID is a single unique identifier of each asset component in an asset facility (Marine Structure). The asset ID must be entered into the designated field ***CEDD_I_AssetID*** and exported to the designated COBie Field <COBie.Component.Name>.

An asset ID is composed of 4 fields, delimited by a hyphen (-), as follows:-

Field No.	1	2	3	4
Field Description	Level (Optional)	-Space_ID[6] (Optional)	-PWD Code	-Unique Identifier (Optional)

Field 1: 2 Characters to describe the floor level of asset component in an asset
FD: Foundation MD: Marine Deck RF: Roof Floor UD: Upper Deck

Field 2 : Up to 8 Characters to describe the space/location of the asset component, such as space ID/Grid ID, chainage, bay no. etc.
2 Characters to describe the sub_Location ID to represent relative level amongst a group of similar asset components
UL: Upper-Level ML: Mid Level LL: Lower Level

Field 3 : 3 Characters according to its PWD code

Field 4 : Unique Identifier to differentiate an asset component separately from its group according to the UOM, such as specific mark/ID and sequential no. Unless specified, the sequential no is ordered from "1" to "N", "Left" to "Right" in the direction towards the sea.

The asset ID may slightly vary according to the nature of the asset components. XX" will be used in the case that a certain field is not applicable. The following section describes the details.

4.1 Structural Elements

4.1.1 Floor, Slab and Roof at Pier

Field No.	1	2	3	4
Field Description	Level	-Space_ID	-PWD Code	-Unique Identifier (Not Applicable)

Field 1 : 2 Characters to describe the floor level of asset component in an asset
MD: Marine Deck RF: Roof Floor UD: Upper Deck

Field 2 : up to 8 Characters to represent the Space ID of the asset component
Refer to Section 2.5.2 Space Requirements

Field 3 : 3 Characters according to its PWD code
SLA: Structural Slab SPP: Precast Beam Slab Panel

Field 4 : XX: Not Applicable

For example:

- Structural Slab at Marine Deck at Grid <3B2C> MD-3B2C-SLA-XX

[6] See Section 2.2.4 for Space ID Naming convention

4.1.2 Pile, Pile Cap, Beam, Column, Wall with Specific ID at Pier

Field No.	1	2	3	4
Field Description	Level	-Space_ID (Not Applicable)	-PWD Code	-Unique Identifier

Field 1 : 2 Characters to describe the floor level of asset component in a facility
FD: Foundation MD: Marine Deck RF: Roof Floor
UD: Upper Deck

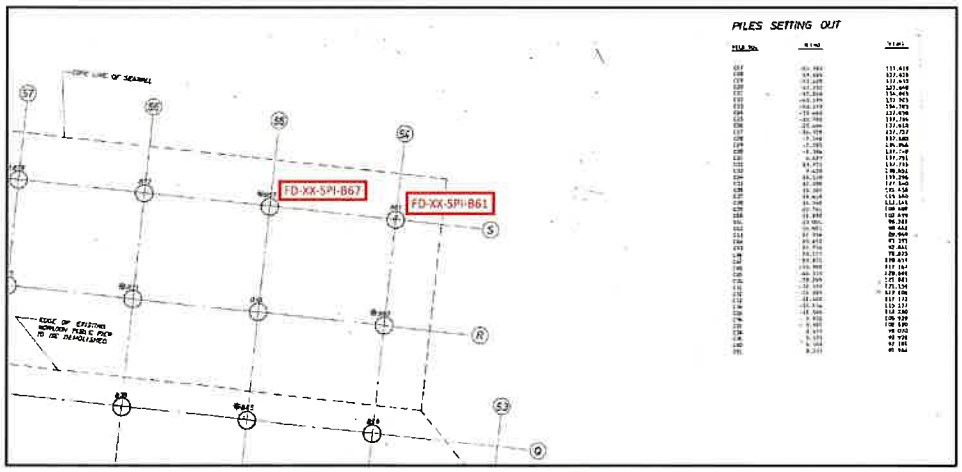
Field 2 : XX: Not Applicable

Field 3 : 3 Characters according to its PWD code
SCL: Structural Column SBM: Structural Beam SPI: Structural Pile
SPC: Pile Cap SWL: Structural Wall SPP: Precast Beam Slab Panel

Field 4 : Specific IDs, such as Beam Mark, Column Mark, Pie ID, etc.

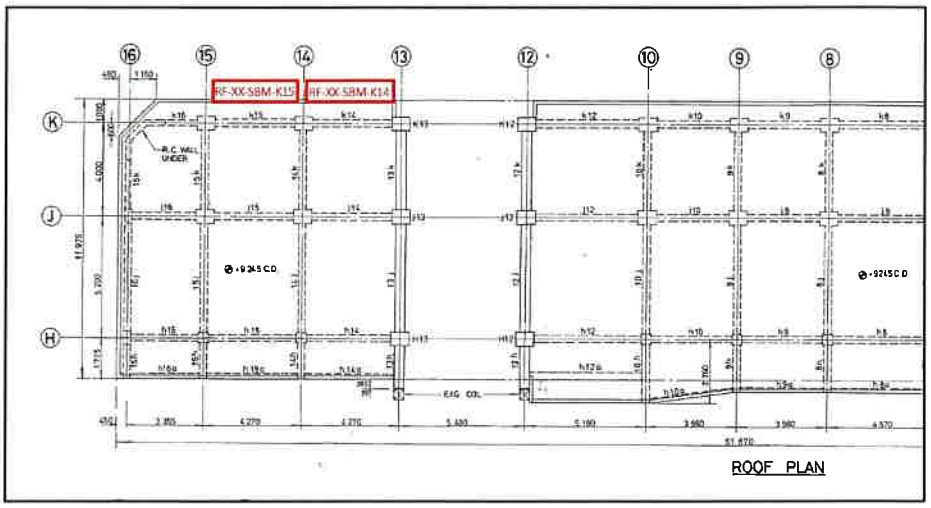
For example:

- Structural Pile with PILE ID <B61> at Foundation FD-XX-SPI-B61



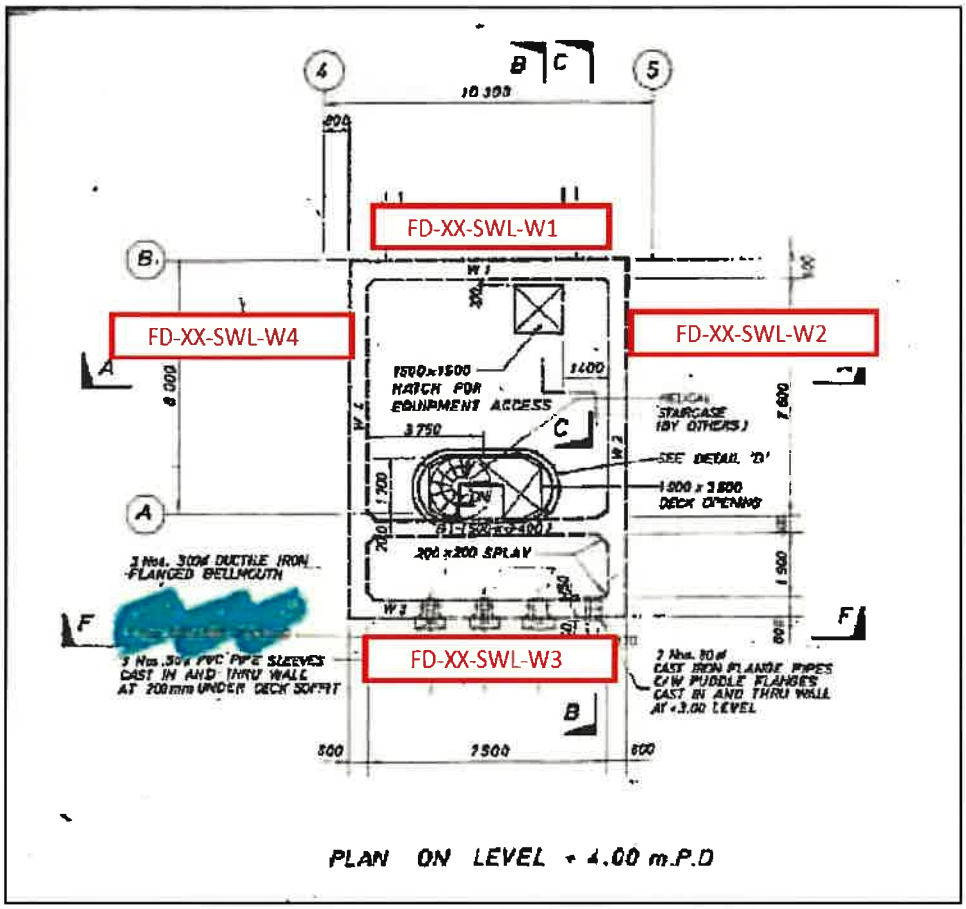
Part print of Drawing No. 91086/1111C
(Construction of Tsim Sha Tsui Cultural Center Promenade Deck, Piling Plan)

- Structural Beam with Beam Mark <K15> at Roof Level RF-XX-SBM-K15



Part print of Drawing No. P14908 B
(Construction of Cheung Chau Ferry Pier Extension, Framing Plan)

- Structural Wall with Wall ID <W1> at Foundation Level FD-XX-SWL-W1



Part print of Drawing No. 94384/051024FP/GA/001
(Construction of China-Hong Kong Terminal, Pumphouse B, General Arrangement)

4.1.3 Pile, Pile Cap, Beam, Column, Wall and Other Structural Elements without Specific ID at Pier

Field No.	1	2	3	4
Field Description	Level	-Space_ID	-PWD Code	-Unique Identifier (Optional)

Field 1 : 2 Characters to describe the floor level of asset component in an asset
FD: Foundation MD: Marine Deck RF: Roof Floor
UD: Upper Deck

Field 2 : Up to 8 Characters to represent Space ID/Grid ID of the asset component
Refer to Section 2.5.2 Space Requirements

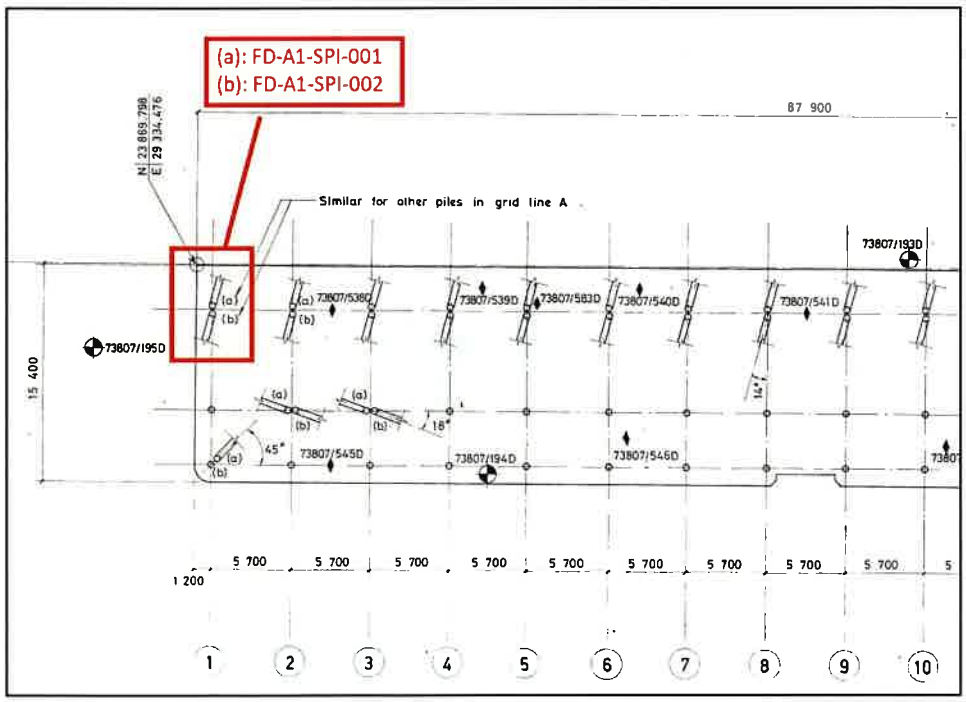
2 Characters to describe the sub_Location ID (Optional)
UL: Upper Level LL: Lower Level

Field 3 : 3 Characters according to its PWD code
SPC: Pile Cap SCL: Structural Column SBM: Structural Beam
SWL: Structural Wall SRP: ramp
SCO: Concrete Bracket SPI: Structural Pile
SBH: Horizontal Bracing Beam SBV: Vertical Bracing Beam

Field 4 : Sequential no, ordered from "001" to "N", counting from left to right with reference to an alignment direction towards the sea. "XX" will be used in case that this field is not applicable.

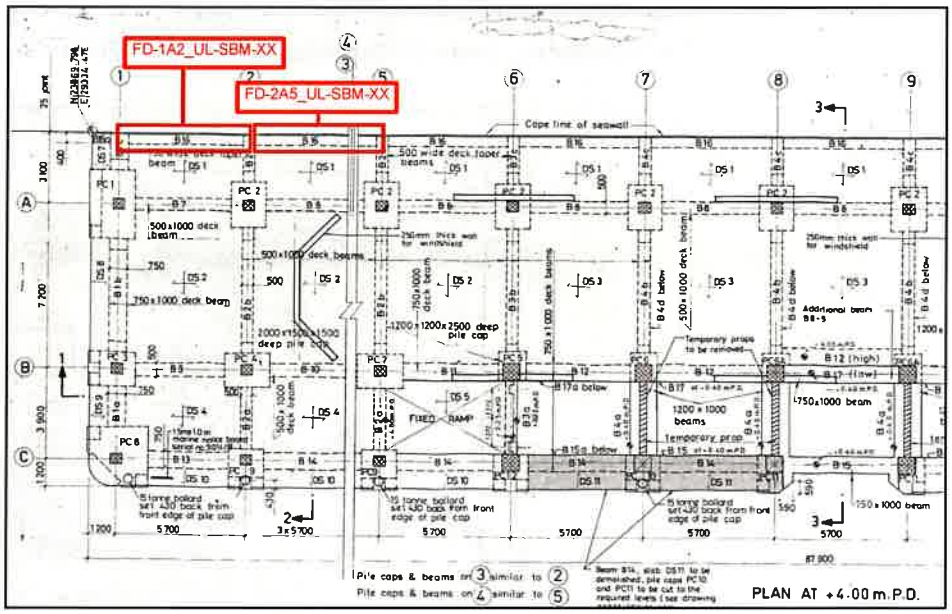
For example:

- Pile in Grid Zone <A1> at foundation FD-A1-SPI-001



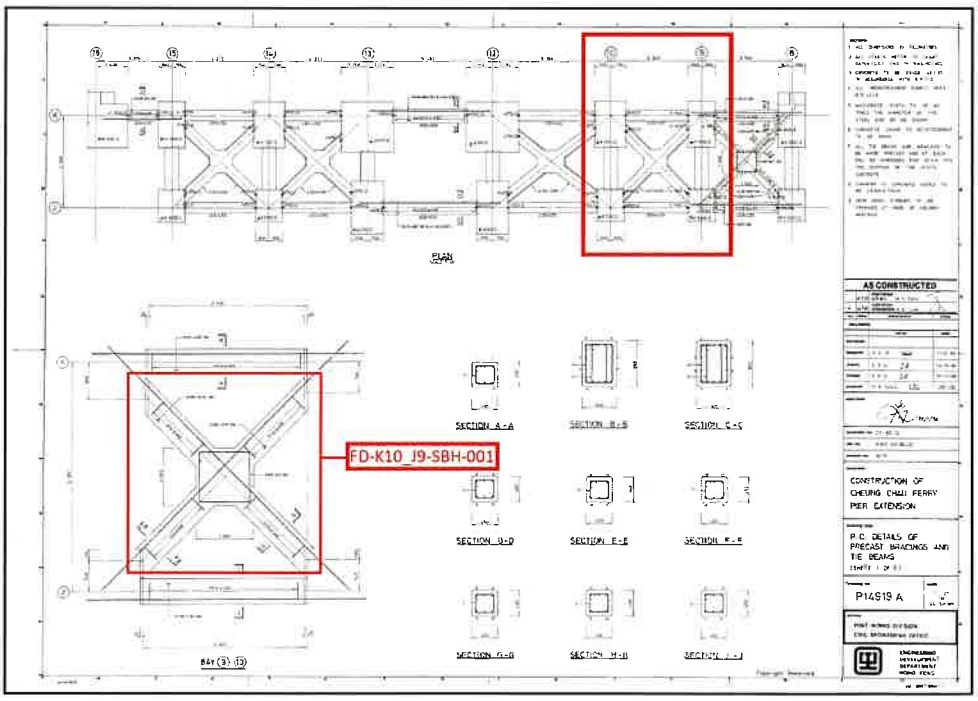
Part print of Drawing No. 73807/606/060E
(Construction of Construction of Tsuen Wan New Town Tsing Yi Development, Ferry Pier Substructure Piling Layout Plan)

- Structural Beam in Grid Zone <1A2> at upper foundation level FD-1A2_UL-SBM-XX



Part print of Drawing No. 73807/3TW83/002A
(Construction of Tsuen Wan New Town Tsing Yi Development, Tsing Yi Ferry Pier Existing Substructure)

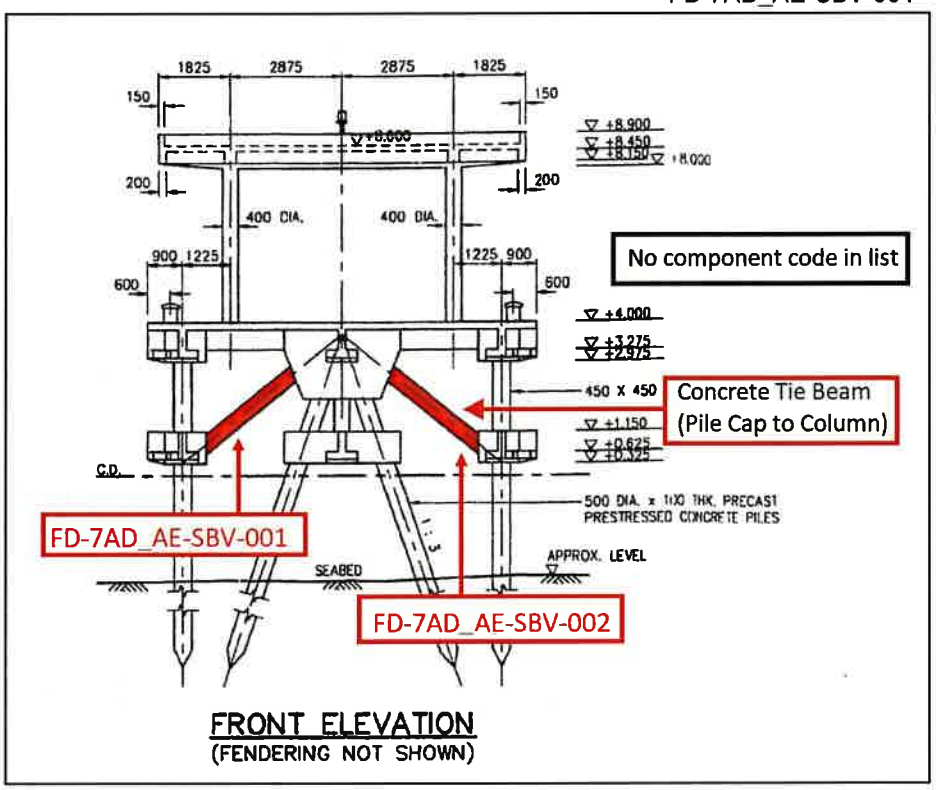
- Horizontal Bracing Beam at Grid Zone <K10_J9> at Foundation Level FD-K10_J9-SBH-001



Drawing No. P14919A
(Construction of Cheung Chau Ferry Pier Extension, R.C. Details of Precast Bracings and Tie Beams, Sheet 1 of 2)

- Concrete Bracket at Foundation Level at Grid Zone <7AA_AB>
  FD-7AA_AB-SCO-001

- Vertical Bracing Beam at Foundation Level at Grid Zone <7AD_AE>
  FD-7AD_AE-SBV-001



Part print of Drawing No. 1434/A/P/GA/001
(Construction of Sai Kung Pomenade and Jetty Extensions)

4.1.4 Concrete Structure and Precast Concrete Block at Solid Pier

Field No.	1	2	3	4
Field Description	Level (Not Applicable)	-Space_ID	-PWD Code	-Unique Identifier (Optional)

Field 1 : XX: Not Applicable

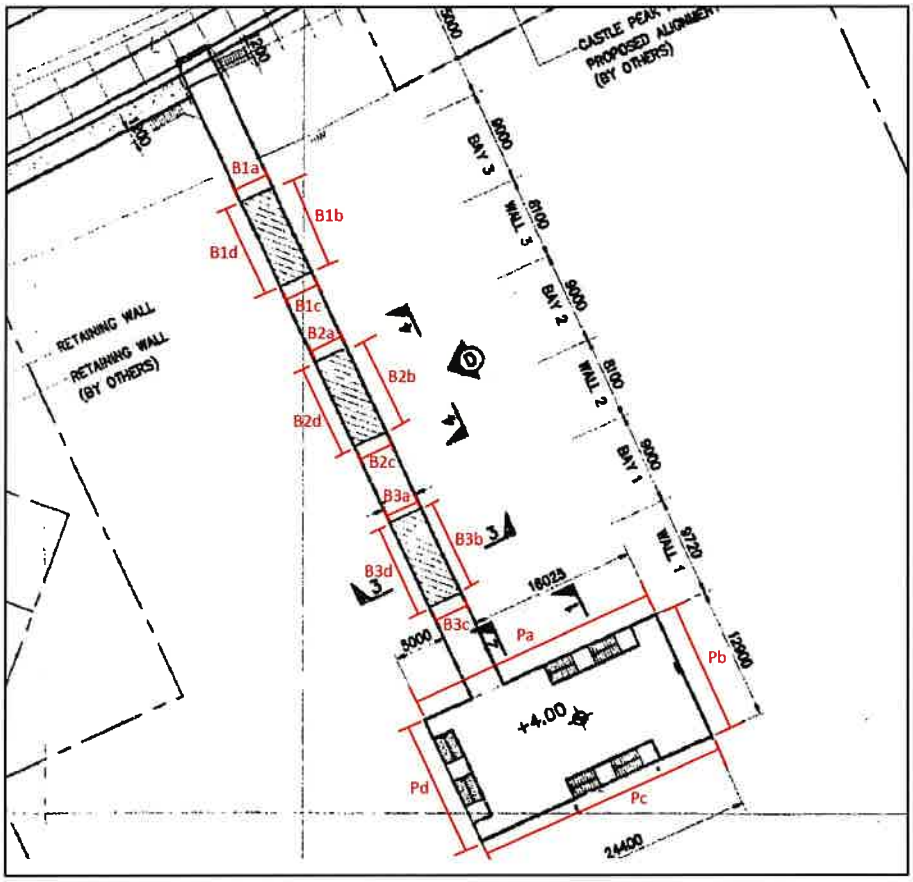
Field 2 : up to 4 Characters to describe the Bay number at catwalk counted from landside towards seaside or pier head with denotation of "a", "b", "c" & "d" for each face of the Bay or pier head counting at clockwise direction.

Field 3 : 3 Characters according to its PWD code
SBK: Precast Concrete Block SCS: Concrete Structure

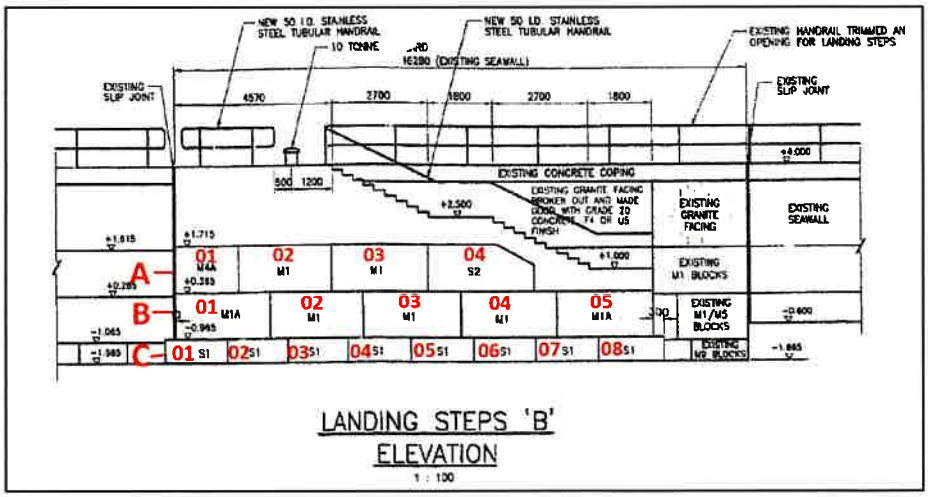
Field 4 : 3 Sequential Numbers of the concrete block, counting from the top with "A", "B" to "Z", and from left to the right with "01", "02" to "N". "XX" will be used in case that this field is not applicable.

For example:

- Concrete Block at Top Left of Bay No. B1a XX-B1a-SBK-A01
- Concrete Structure Facing the Side of Pd at Pier Head XX-Pd-SCS-XX



Part print of Drawing No. 90562_TW032_Z001A
(Construction of Pier at Angler's Beach, Sham Tsengt)



Part print of Drawing No. 1434/A/P/GA/03
(Construction of Sai Kung Promenade & Jetty Extensions)

4.1.5 Staircases and Landing Steps

Field No.	1	2	3	4
Field Description	Level (Not Applicable)	-Staircase_ID	-PWD Code	-Unique Identifier (Optional)

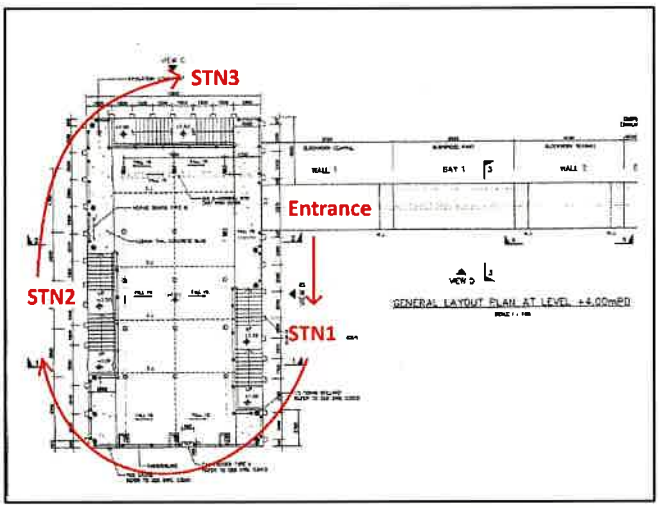
Field 1 : XX: Not Applicable

Field 2 : 4 Characters to descibe the staircase no, as assigned at pier or following current denotation for land cleaning works (e.g. STL1, STR1), otherwise counting in clockwise direction from entrance (e.g. STN1.....STNn).

2 Characters to describe the sub_Location ID (Optional)
UL: Upper Level ML: Middle Level LL: Lower Level
*ML should be omitted if there are only 2 platforms in the staircase

Field 3 : 3 Characters according to its PWD code
SLP: Landing Platform SLT: Landing Steps
SLS: Landing Structure

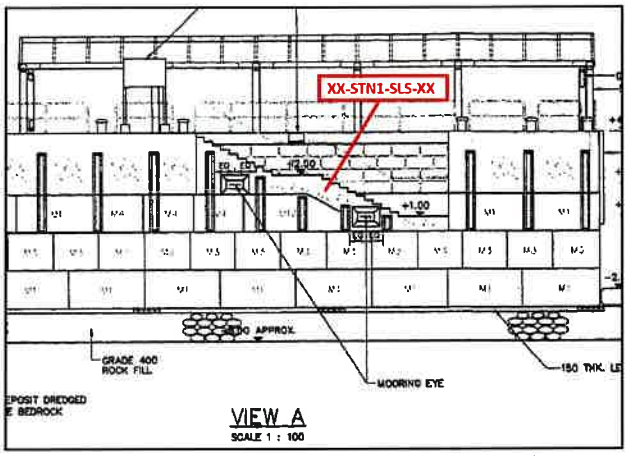
Field 4 : 2 Sequential numbers counting from the top with "01", "02" to "N". "XX" will be used in case that this field is not applicable.



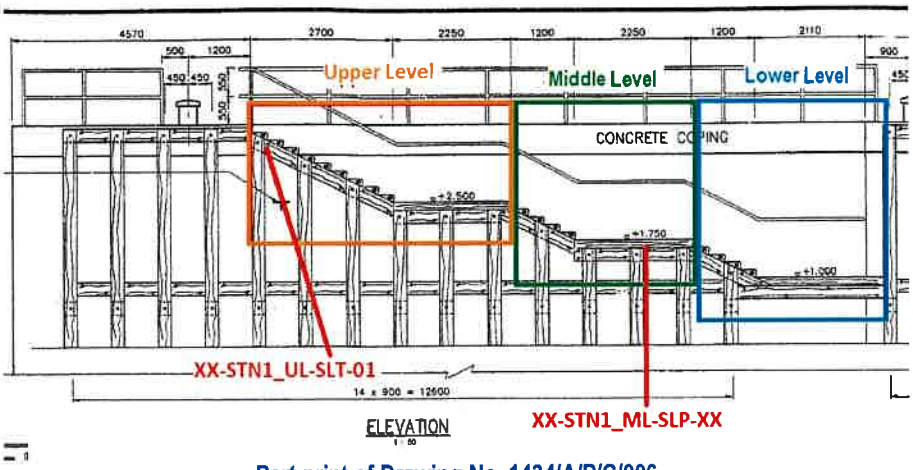
Part print of Drawing No. 90562_TW032_Z_002A
(Construction of Pier at Angler's Beach Sham Tseng)

For example:

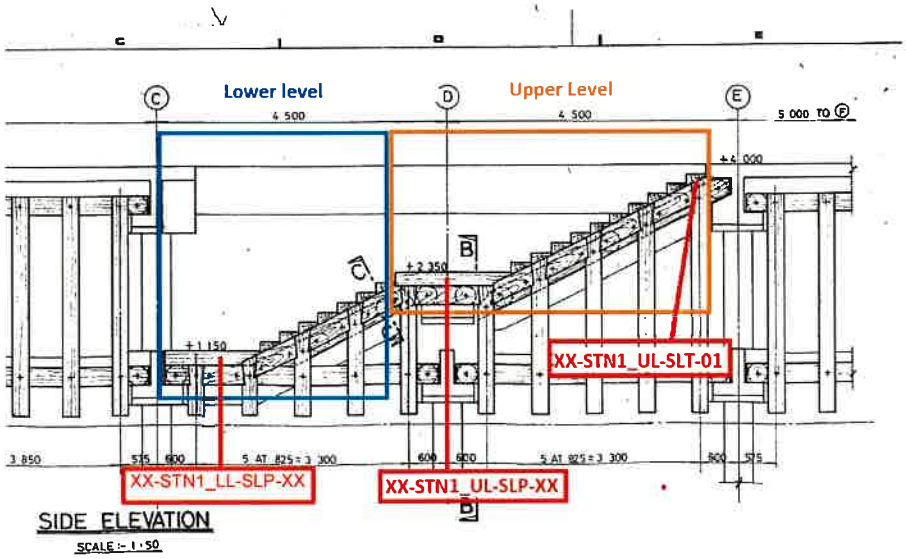
- Solid Concrete Landing Structure of a Staircase XX-STN1-SLS-XX
- Upper Landing Platform at Solid Concrete Landing of a Staircase XX-STN1_UL-SLP-XX
- First Landing Step at Upper Landing of a Staircase XX-STN1_UL-SLT-01
- Upper Landing platform of STL1 staircase XX-STL1_UL-SLP-XX
- Middle Landing platform of STL1 staircase XX-STL1_ML-SLP-XX



Part print of Drawing No. 90562_TW032_Z_004A
(Construction of Pier at Angler's Beach Sham Tseng)



Part print of Drawing No. 1434/A/P/C/006
(Construction of Sai Kung Promenade & Jetty Extensions)



Part print of Drawing No. P.W.O. 98/1225/81
(Construction of Pier and Seawall Extension at Sai Kung Town)

4.1.6 Structural Components at Seawall/Wave Wall/Gabion Wall/Breakwater

Field No.	1	2	3	4
Field Description	Level (Not Applicable)	-Space_ID	-PWD Code	-Unique Identifier (Optional)

Field 1 : XX: Not Applicable

Field 2 : (Seawall) 8 Characters to describe the start and end chainage, counting from the left corner of the seawall, facing to the landside; or up to 3 characters to represent Bay No. separated by slip joints.

(Breakwater) 8 Characters to represent start and end chainage, counting clockwise starting from the left point of breakwater adjoining land. For breakwaters not adjoining land, counting clockwise from leftside facing the sea.

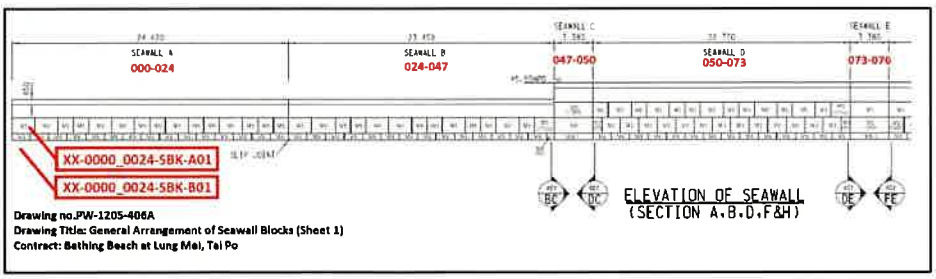
Field 3 : 3 Characters according to its PWD code

SRA: Rock Armour	SBC: Bagged Concrete	SBS: Berm Stone
SCC: Concrete Coping	SLV: Leveling Stone	SBK: Precast Concrete Block
SCS: Concrete Structure	SWA: Waving Absportion Chamber	
SPM: Pell Mell Rubble	SGW: Gabion Wall	
SRF: Rock Fill		

Field 4 : 3 Sequential Numbers counting from the top with "A", "B" to "Z", and from left to the right with "01", "02" to "N", facing the landside. "XX" will be used in case that this field is not applicable.

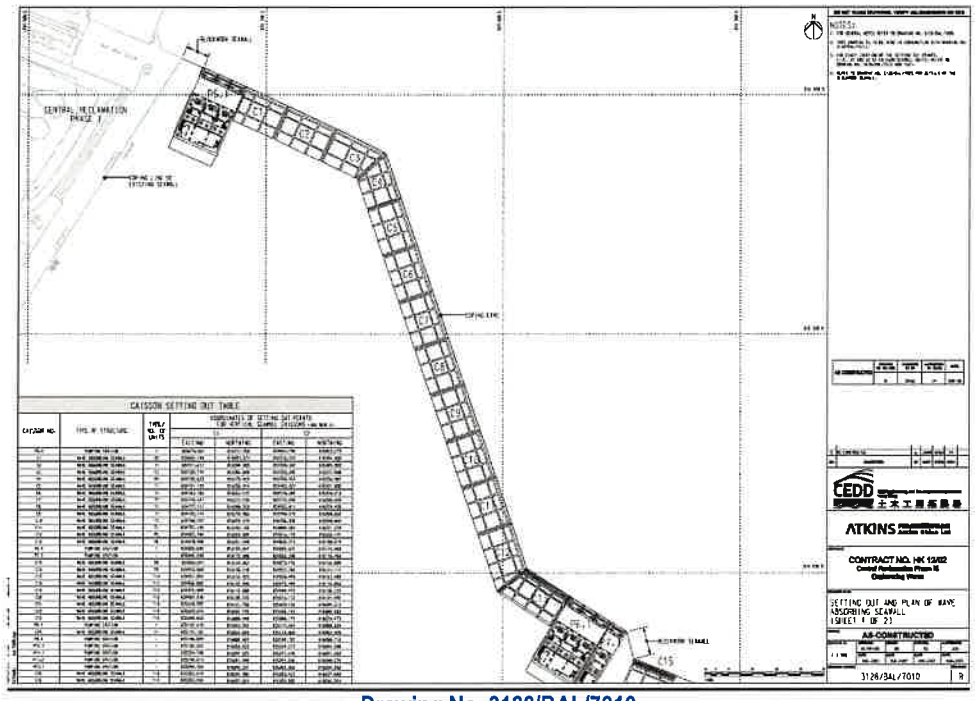
For example:

- Rock Armour of Seawall at chainage 0-24m — XX-0000_0024-SRA-XX
- Bagged Concrete at chainage 0-24m — XX-0000_0024-SBC-XX
- Berm Stone at chainage 0-24m — XX-0000_0024-SBS-XX
- Concrete Coping at Bay No. 1 — XX-B1-SCC-XX
- Levelling Stone at chainage 0-24m — XX-0000_0024-SLV-XX
- Top Left Precast Concrete Block at chainage 0-24m — XX-0000_0024-SBK-A01



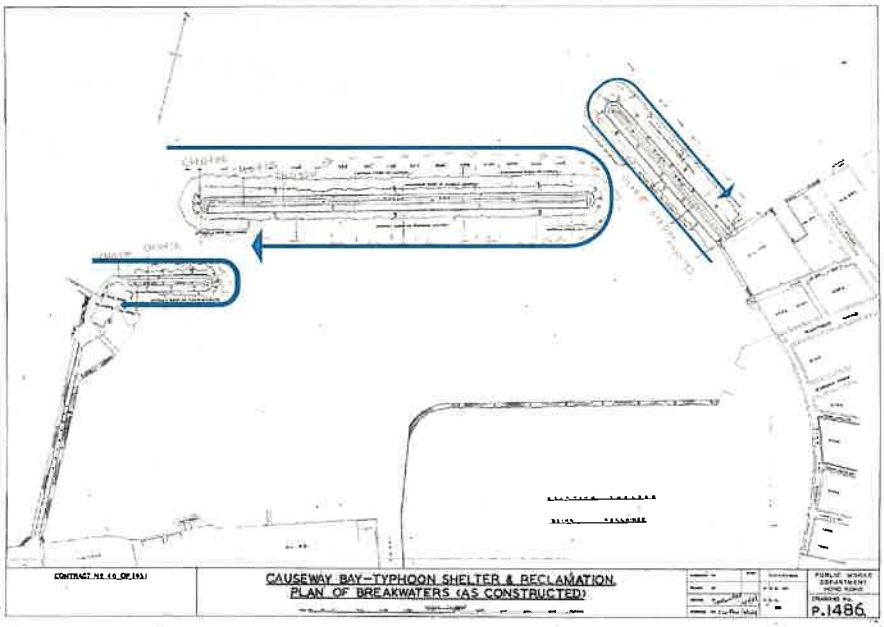
Part print of Drawing No. 1205-406A
(Bathing at Lung Mei, Tai Po, General Arrangement)

- Pell Mell Rubble at chainage 0-24m — XX-0000_0024-SPM-XX
- Wave Absorption Chamber at Bay No. C12 — XX-C12-SWA-XX



Drawing No. 3128/BAL/7010
(Setting Out and Plan of Wave Absorbaing Seawall)

- Rock Armour of Breakwater at chainage 10-20m XX-0010_0020-SRA-XX



(Causeway Bay-Typhoon Sheter & Reclamation, Plan of Breakwater)

4.1.7 Structural Components at Dolphin

Field No.	1	2	3	4
Field Description	Level (Not Applicable)	-Space_ID (Not Applicable)	-PWD Code	-Unique Identifier

Field 1 : XX: Not Applicable

Field 2 : XX: Not Applicable

Field 3 : 3 Characters according to its PWD code
SCS: Concrete structure SPI: Pile

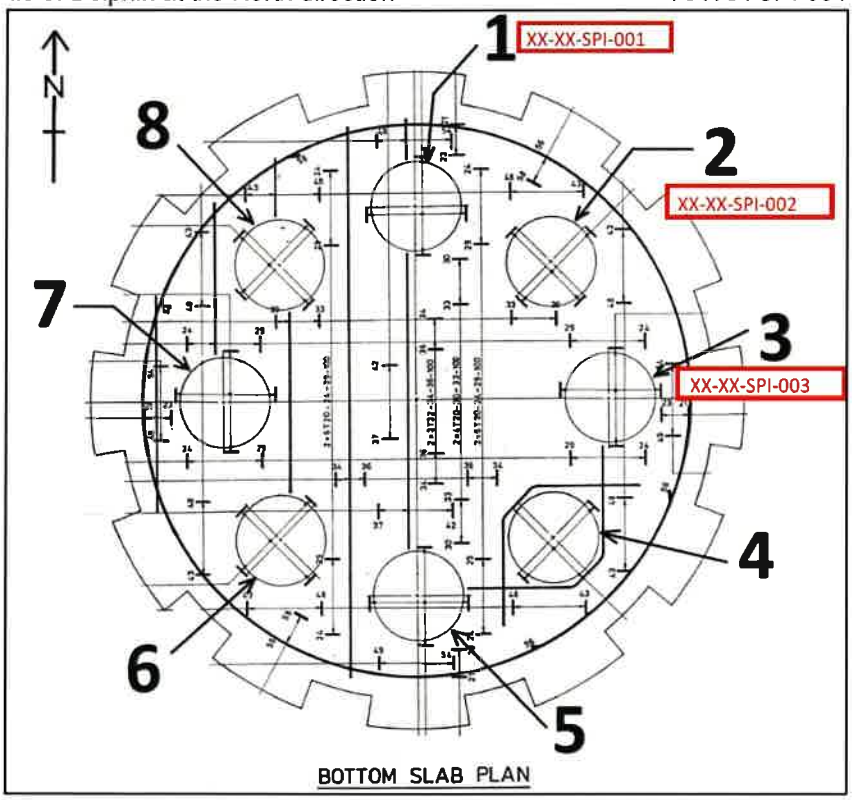
Field 4 : 2 Sequential Numbers to identify the asset component. "01" should be assigned to the single concrete structure. The pile number shall be counted clockwise starting from the north direction.

For example:

- Concrete Structure of Dolphin XX-XX-SCS-01

Asset ID sample of concrete structure at dolphin: SCS-01

- First Pile of Dolphin at the North direction XX-XX-SPI-001



Asset ID sample of pile at dolphin: SPI-001

4.1.8 Structure Components at Beacon

Field No.	1	2	3	4
Field Description	Level (Not Applicable)	-Space_ID (Not Applicable)	-PWD Code	-Unique Identifier

Field 1 : XX: Not Applicable

Field 2 : XX: Not Applicable

Field 3 : 3 Characters according to its PWD code

SAC: Access Structure
SCF: Concrete Foundation
SCS: Concrete Structure
SSS: Steel Structure
SAB: Anchor Bolts/Posts

Field 4 : 2 Sequential Numbers to identify the asset component, counting from the landside with "01", "02" to "N". "01" should be assigned to a single concrete or steel structure. Anchor posts should be counted clockwise starting from the north direction.

For example:

- Access Structure from Landside to Beacon XX-XX-SAC-01
- Concrete Foundation of Beacon XX-XX-SCF-01
- Concrete Structure of Beacon XX-XX-SCS-01
- Steel Structure of Beacon XX-XX-SSS-01
- First Anchor Post of Beacon at North Direction XX-XX-SAB-01
- For staircases at beacons, please refer to Section 4.1.5.

4.2 Architectural Elements

4.2.1 Architectural Roof & Reflected Ceiling

Field No.	1	2	3	4
Field Description	Level	-Space_ID (Optional)	-PWD Code	-Unique Identifier (Optional)

Field 1 : 2 Characters to describe the floor level of asset component in an asset
MD: Marine Deck RF: Roof Floor UD: Upper Deck

Field 2 : Up to 8 Characters to describe the space/location of the asset component, such as space ID. Refer to Section 2.5.2 Space Requirements. "XX" will be used in case that this field is not applicable.

Field 3 : 3 Characters according to its PWD code
ARF: Architectural Roof ACE: Ceiling

Field 4 : 3 Characters to differertiate an asset component separetely from its group as according to the UOM, such as sequential no or an assigned specific ID. Unless specified, the sequential no is ordered from "1" to "N", "Left" to "Right" in the direction towards the sea. "XX" will be used in case that this field is not applicable.

For example:

- Architectural Roof at Grid Zone <1A2C> RF-1A2C-ARF-XX
- Architectural Roof with Roof ID <Roof 1> RF-XX-ARF-R01
- Reflected Ceiling at Grid Zone <1A2C> RF-1A2C-ACE-XX
- Reflected Ceiling at Roof ID <Roof 1> RF-XX-ACE-R01

4.2.2 Skylights/Glass Panels, Finishes (Floor, Wall & Column) and Other Architectural Elements

Field No.	1	2	3	4
Field Description	Level	-Space_ID	-PWD Code	-Unique Identifier (Optional)

Field 1 : 2 Characters to describe the floor level of asset component in an asset
Follow its parent asset component
MD: Marine Deck RF: Roof Floor UD: Upper Deck

Field 2 : up to 8 Characters to describe the space/location of its parent asset component, such as space ID or an assigned specific ID.

Field 3 : 3 Characters according to its PWD code
ASK: Skylight/Glass Panel AFS: Finishes (Floor, Wall, Column)
ATW: Tactile Warning Strip ABP: Blue Color Paint
AYN: Non-slip Yellow Nosing AGT: Gutter

Field 4 : Up to 3 Characters to differentiate an asset component separetely from its group as according to the UOM, such as sequential no or an assigned specific ID. Unless specified, the sequential no. is counted from "01" to "N", at clockwise direction or "Left" to "Right" in the direction towards the sea. "XX" will be used in case that this field is not applicable.

For example:

- Second Skylights of Roof at Grid Zone <1A2B> RF-1A2B-ASK-02
- First Skylights at Roof ID <Roof 1> RF-R01-ASK-01
- Gutter of Roof at Grid Zone <1A2B> RF-1A2B-AGT-01
- Floor Finishing at Grid Zone <2A4C> MD-2A4C-AFS-01
- Blue Color Paint at Staircase No. STL1 XX-STL1-ABP-XX
- Tactile Warning Strip at Staircase No. STL1 XX-STL1-ATW-XX
- Non-slip Yellow Nosing at First Landing Step at Upper Landing of a Staircase XX-STN1_UL_01-AYN-XX

4.3 Fender System and Associated Waling System

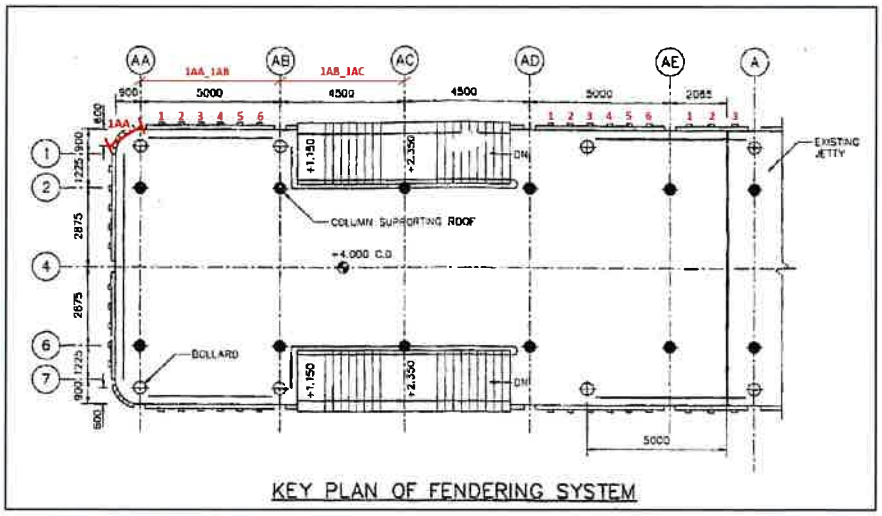
4.3.1 Fender and Wailing at Pier/Landing

Field No.	1	2	3	4
Field Description	Level (Not Applicable)	-Space_ID	-PWD Code	-Unique Identifier (Optional)

Field 1 : XX: Not Applicable

Field 2 : up to 8 Characters to represent the location of the parent asset component, such as Staircase no or fender system panel no. or Space ID.

2 Characters to describe the sub_Location ID (Optional)
UL: Upper Level ML: Middle Level LL: Lower Level
*M should be omitted if there are only 2 layers of wailing system in the staircase



Part print of Drawing No. 1434/A/P/C/021 to indicate the Panel no. and sequential no. fender (Construction of Sai Kung Promenade & Jetty Extensions)

Field 3 : 3 Characters according to its PWD code

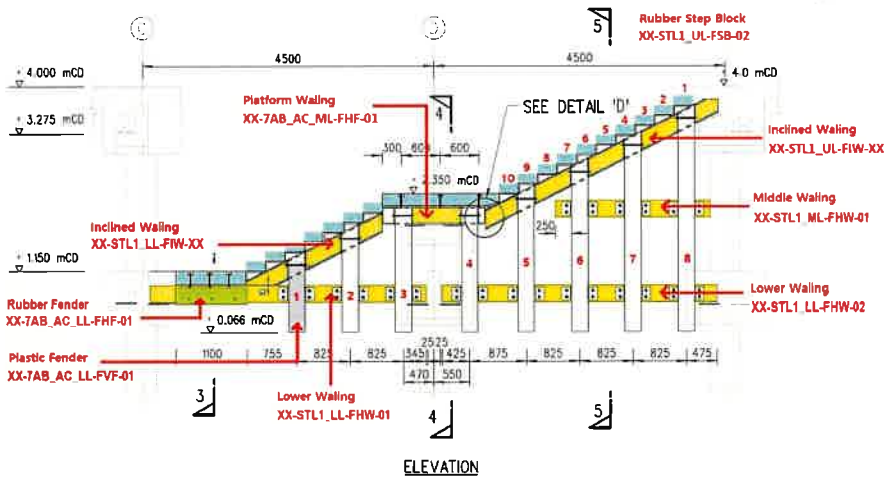
FBK: Steel Bracket	FCH: Chain for fender system	FEB: Eye Blot for fender system
FFP: Frontal Pad	FRB: Rubber Buffer	FCA: Capping
FVF: Vertical Fender	FHF: Horizontal Fender	FSP: Steel Plate for Waling sytem
FHW/FIW: Horizontal/Inclined Fender Waling System		FSB: Step Block

Field 4 : 2 Sequential Numbers to represent order of the component within a single panel of the fender system counting in clockwise direction, or a staircase structure counting from top to bottom. "XX" will be used in case that this field is not applicable.

For example:

- Upper Level Bracket of First Fender at Panel <7ABAC> XX-7ABAC_UL-FBK-01
- First Chain at Panel <7ABAC> XX-7ABAC-FCH-01
- First Eye Bolt at Panel <7ABAC> XX-7ABAC-FEB-01

- First Frontal Pad at Panel <7ABAC> XX-7ABAC-FFP-01
- First Rubber Buffer for Wailing System at Upper Level of Panel <7ABAC> XX-7ABAC_UL-FRB-01
- Steel Plate for Wailing System at Panel <7ABAC> XX-7ABAC-FSP-01
- First Vertical Fender at Upper Level at Panel <7ABAC> XX-7ABAC_UL-FVF-01
- First Horizontal Fender at Middle Level at Panel <7ABAC> XX-7ABAC_ML-FHF-01
- First Capping Fender at Panel <7ABAC> XX-7ABAC-FCA-01
- First Capping Fender at Middle Platform of Staircase No. STL1 XX-STL1_ML-FCA-01
- Second Step Block at Upper Landing of Staircase No. STL1 XX-STL1_UL-FSB-02
- Upper Inclined Wailing at Staircase No. STL1 XX-STL1_UL-FIW-XX
- Lower Inclined Wailing at Staircase No. STL1 XX-STL1_LL-FIW-XX
- First Lower Horizontal Wailing at staircase No. STL1 XX-STL1_LL-FHW-01



Sketch No. TS 2615 to indicate asset ID for plastic fender, rubber fender and rubber step block (Construction of Sai Kung Public Pier, Arrangement of Landing)

4.3.2 Fender and Waling at Dolphin

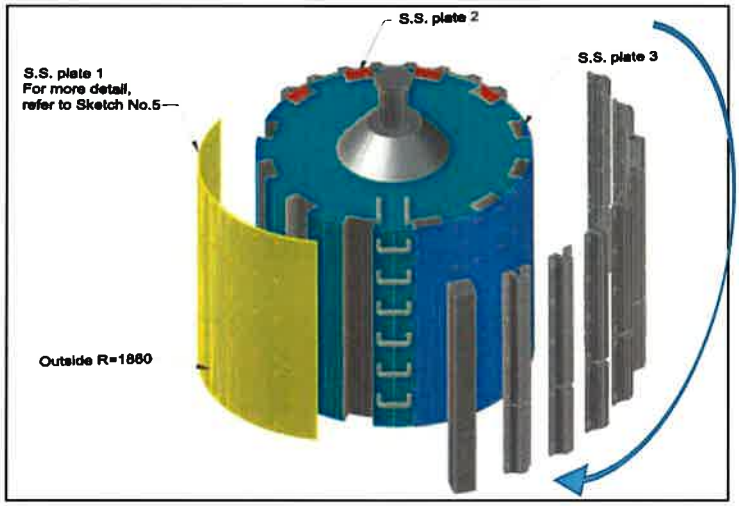
Field No.	1	2	3	4
Field Description	Level (Not Applicable)	-Space_ID (Optional)	-PWD Code	-Unique Identifier

Field 1 : XX: Not Applicable

Field 2 : up to 2 Characters to represent sub-level of the components
UL: Upper Level ML: Middle Level LL:Lower Level
XX: Not Applicable

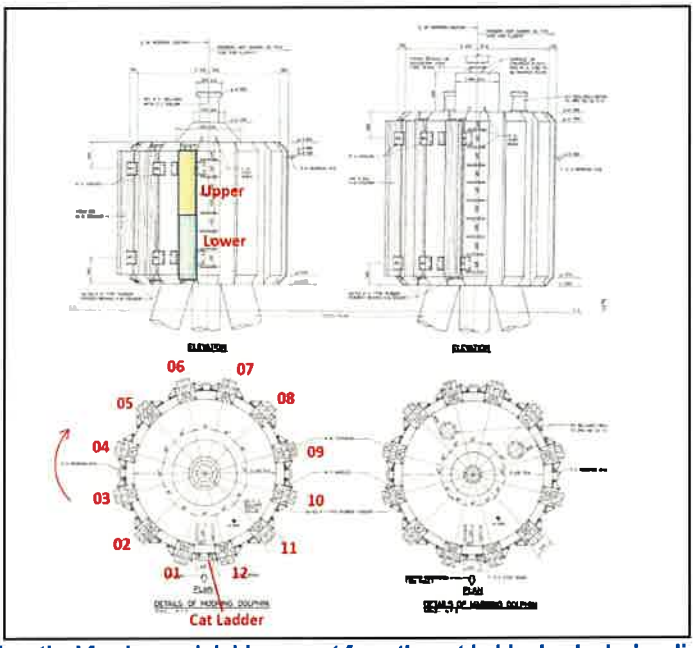
Field 3 : 3 Characters according to its PWD code
FBK: Steel Bracket FVF: Vertical Fender FHF: Horizontal Fender

Field 4 : 3 Sequential Numbers for horizontal fenders, counting from the top with "A", "B" to "Z", and in clockwise direction from the cat ladder with "01", "02" to "N".
2 Sequential Numbers for vertical fenders, counting from the cat ladder in clockwise direction with "01", "02" to "N".



Sequential no, the fender is counting from the Cat Ladder in clockwise direction

Numbering of horizontal fender on dolphin - count from the the top
Photo of Dolphin in Yau Ma Tei T/S; No.16 (KD035)



Numbering of vertical fender on dolphin - count from the cat ladder in clockwise direction
Part print of Drawing No. P16347A (Construction of Dolphins in the New Shau Kei Wan Typhoon Shelter, General Arrangement of Dolphins)

For example:

- Second Upper Level Steel Bracket XX-UL-FBK-02
- First Top Horizontal Fender XX-XX-FHF-A01
- First Upper Level Vertical Fender XX-UL-FVF-01

4.3.3 Fender System at Seawall

Field No.	1	2	3	4
Field Description	Level (Not Applicable)	-Space_ID (Optional)	-PWD Code	-Unique Identifier

Field 1 : XX: Not Applicable

Field 2 : 8 Characters to describe the start and end chainage of the parent asset component, counting from the left corner of the seawall, facing to the landside; or up to 3 characters to represent seawall Bay No. separated by slip joints.

2 Characters to represent sub-level of the components
UL: Upper Level ML: Middle Level LL:Lower Level
XX: Not Applicable

Field 3 : 3 Characters according to its PWD code
FVF: Vertical Fender FHF: Horizontal Fender

Field 4 : 3 Sequential Numbers, counting from left to right facing to the landside with "001", "002" to "N".

Numbering sequence for Fender at Seawall

For example:

- First Upper Level Horizontal Fender at Chainage 0-24m XX-0000_0024_UL-FHF-001
- 2nd Upper Level Vertical Fender at Bay No. 2 XX-B2_UL-FVF-002

4.4 Civil Elements

This standard convention is used to label civil asset component (facilities, furniture and other accessories) that scatter irregularly on all the marine structures (Piers, Dolphin, Beacon and Seawall and Breakwater) such as bollard, signage, etc

Field No.	1	2	3	4
Field Description	Level (Optional)	-Space_ID	-PWD Code	-Unique Identifier (Optional)

Field 1 : 2 Characters to describe the floor level of asset component in a facility
MD: Marine Deck RF: Roof Floor UD: Upper Deck

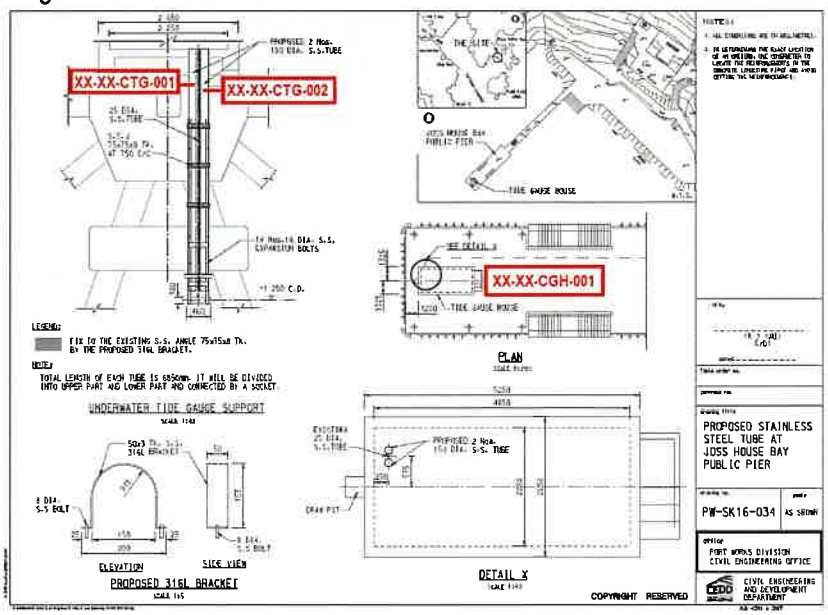
Field 2 : Up to 8 Characters to describe the space/location of the asset component, such as space ID, panel no or staircase no. Refer to Section 2.5.2 Space Requirements

Field 3 : 3 Characters according to its PWD code
CAL: Access/Cat Ladders CNB: Pier Notice Board CBN: Bench
CBO: Mooring Bollard CBB: Barrier Bollard CFC: Fence
CCP: Concrete Plinth CSG: Signage/Information Plate
CLB: Life Buoy CMN: Marine Notice Board CME: Mooring Eye
CNL: Navigation Light Post CHR: Railing/Handrail CTG: Tidal Gauge Tubes
CGH: Tidal Gauge House CGT: Gate CSI: Step Iron
BAP: Proposed Bathymetry /Tunnel Seabed Levels
TSF: Proposed Topograph/ Site Formation

Field 4 : 3 Characters to differertiate an asset component separetely from its group as according to the unit size, such as sequential no. or an assigned unique identifier. Unless specified, the sequential no. is ordered from "0011" to "N", "Left" to "Right" in the direction towards the sea. "001" should be assigned to a single asset component. "XX" will be used in case that this field is not applicable.

For example:

- Railing at Marine Deck at Grid Zone <1A2C> MD-1A2C-CHR-XX
- Tide Gauge Tube No. 001 XX-XX-CTG-001 / XX-XX-CGH-001



Asset ID samples of the tidal gauge house and S.S. tidal gauge tubes (The whole tidal gauge house is identified as a single asset component)

4.5 MEP Elements

This standard convention is used to label PWD/CEDD MEP asset component that scatter irregularly on all the marine structures (Piers, Dolphin, Beacon and Seawall and Breakwater).

Field No.	1	2	3	4
Field Description	Level (Optional)	-Space_ID	-PWD Code	-Unique Identifier (Optional)

Field 1 : 2 Characters to describe the floor level of asset component in a facility

MD: Marine Deck	RF: Roof Floor	UD: Upper Deck

Field 2 : Up to 8 Characters to describe the space/location of the asset component, such as space ID, panel no or staircase no. Refer to Section 2.5.2 Space Requirements

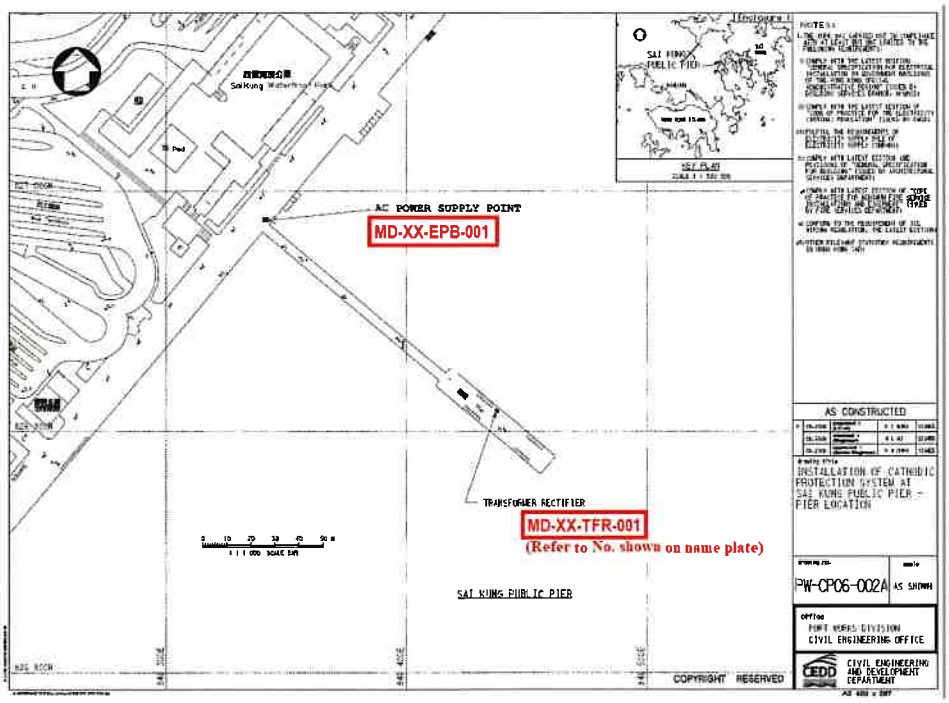
Field 3 : 3 Characters according to its PWD code

CAM: CCTV Camera	CDP: Cable Drawpit	CDT: Cable Ducting
CMP: Corrosion Monitoring Point	DWP: Drainage Downpipe	EPD: Pillar Box
ETH: Earthing and Lighting	GWF: Gov Wifi Access point	IMH: Inspection Manhole
LGT: Lighting	SNR: Sensors	SOP: Solar Panel
CMB: Corrosion Monitoring Terminal Box		

Field 4 : 3 Characters to differertiate an asset component separetely from its group as according to the unit size, such as sequential no. or an assigned unique identifier. Unless specified, the sequential no. is ordered from "0011" to "N", "Left" to "Right" in the direction towards the sea. "001" should be assigned to a single asset component. "XX" will be used in case that this field is not applicable.

For example:

- ICCP Pillar Box and Transformer Rectifier MD-XX-EPB-001



Asset ID samples of ICCP AC Power Supply Pillar Box and ICCP Transformer Rectifier

4.6 Surrounding Site Information

This standard convention is used to label existing surrounding site information

Field No.	1	2	3	4
Field Description	Level (Not Applicable)	-Space_ID (Optional)	-PWD Code	-Unique Identifier

Field 1 : XX: Not Applicable

Field 2 : Up to 8 Characters to describe the space/location of the asset component.
XX: Not applicable

Field 3 : 3 Characters according to its PWD code
BAE: Bathymetry (Existing Profile) BFL: Beach Finish level
TOP: Topography (Existing Site Formation) SUR: Surrounding Building/Mass
PAV: Pavement

Field 4 : up to 8 Characters of area label as an unique identifer, such as hydrographical survey record or drawing number

For example:

- Bathymetry Record <SP03339> XX-XX-BAE-SP03339
- Beach Finish Level Record <CE01243> XX-XX-BFL-CE01243

Appendix A: Level of Graphics (LOD-G) Requirement of all PWD/CEDD Components

No	Element	Discipline	PWD Code	Color	RGB	LOD-G	LOD-G Modelling Requirement
1	Pile Cap	Structural (ST)	SPC		128 x 128 x 128	300	Modelled to the design specified size and shape of the foundation with as-built location and orientation of the foundation element. The structure should include a. penetrations detail, b. Construction Joint and expansion Joint, c. location of sleeve penetrations
2	Pile Foundation	Structural (ST)	SPI		128 x 128 x 128	300	Modelled to the design specified size and shape of the foundation with the as-built location of the foundation element. The structure shall include: a. assumed bearing depth, b. foundation depth, c. pile cut-off depths, d. chambers, e. Finish and waterproofing
3	Concrete Foundation for Beacon	Structural (ST)	SCF		128 x 128 x 128	300	Modelled to the design specified size and shape of the foundation with as-built location and orientation of the foundation element. The structure should include a. penetrations detail, b. Construction Joint and expansion Joint, c. location of sleeve penetrations
4	Anchor Blot/Post	Structural (ST)	SAB		128 x 128 x 128	400	Modeled to design specified sizes and as-built locations of the structural members defined by structural grid and orientation, slope, and elevation. The structural should include a. All sloping surfaces included in model element, b. penetrations for MEP, c. shear reinforcement, d. finishes, camber, chamfer, e. assembly elements such as welds, coping, plates, bolts, washers, nuts.
5	Structural Beam (Concrete Beam, Steel Beam and Tie Beam)	Structural (ST)	SBM		128 x 128 x 128	400	Modelled to design specified sizes and as-built locations, orientation and elevation of the structural members defined by structural grid and orientation, slope and elevation. The structural should include a. All sloping surfaces included in model element, b. penetrations for MEP, c. shear reinforcement, d. finishes, camber, chamfer, e. assembly elements such as welds, coping, plates, bolts, washers, nuts. Reinforcement are excluded unless specified in PXP
6	Structural Column (Concrete Column, Steel Column and Post)	Structural (ST)	SCL		128 x 128 x 128	400	Modelled to design specified sizes and as-built locations, orientation and elevation of the structural members defined by structural grid and orientation, slope and elevation. The structural should include a. All sloping surfaces included in model element, b. penetrations for MEP, c. shear reinforcement, d. finishes, camber, chamfer, e. assembly elements such as welds, coping, plates, bolts, washers, nuts. Reinforcement are excluded unless specified in PXP

No	Element	Discipline	PWD Code	Color	RGB	LOD-G	LOD-G Modelling Requirement
7	Bracing (Horizontal/Vertical)	Structural (ST)	SBH /SBV		128 x 128 x 128	400	Modelled to design specified sizes and as-built locations, orientation and elevation of the structural members defined by structural grid and orientation, slope and elevation. The structural should include a. All sloping surfaces included in model element, b. penetrations for MEP, c. shear reinforcement, d. finishes, camber, chamfer, e. assembly elements such as weld, coping, plates, bolts, washers, nuts. Reinforcement are excluded unless specified in PXP
8	Slab/Pier Deck	Structural (ST)	SLA		128 x 128 x 128	400	Modelled to exact sizes and as-built locations and orientation of the structural members defined by structural grid and orientation, slope, and elevation. The structural should include a. All sloping surfaces included in model element, b. penetrations for MEP, c. construction joint, and expansion joint. Reinforcement are excluded unless specified in PXP
9	Precast Beam Slab Panel	Structural (ST)	SPP		128 x 128 x 128	400	Modelled to exact sizes and as-built locations and orientation of the structural members defined by structural grid and orientation, slope, and elevation. The structural should include: a. All sloping surfaces included in model element, b. penetrations for MEP, c. construction joint, and expansion joint. Reinforcement are excluded unless specified in PXP
10	Ramp	Structural (ST)	SRP		128 x 128 x 128	400	Modelled to exact sizes and as-built locations and orientation of the structural members defined by structural grid and orientation, slope, and elevation. The structural should include a. All sloping surfaces included in model element, b. penetrations for MEP, c. construction joint, and expansion joint. Reinforcement are excluded unless specified in PXP
11	Corbel/Concrete Bracket for Pier	Structural (ST)	SCO		128 x 128 x 128	400	Modelled to the design specified size and shape of the element with as-built location and orientation of the element. The structure should include a. penetrations detail, b. Construction Joint and expansion Joint, c. location of sleeve penetrations
12	Structural wall / retaining wall	Structural (ST)	SWL		128 x 128 x 128	400	Modelled to exact sizes and as-built locations and orientation of the structural members defined by structural grid and orientation, slope, and elevation. The structural should include a. All sloping surfaces included in model element, b. penetrations for MEP, c. construction joint, and expansion joint. Reinforcement are excluded unless specified in PXP
13	Concrete structure for Beacon, Dolphin, vertical seawall, and a solid pier	Structural (ST)	SCS		128 x 128 x 128	300	Modelled to exact sizes and as-built locations and orientation of the structural members defined by structural grid and orientation, slope, and elevation. The structural should include a. All sloping surfaces included in model element, b. penetrations for MEP, c. construction joint, and expansion joint. Reinforcement are excluded unless specified in PXP

No	Element	Discipline	PWD Code	Color	RGB	LOD-G	LOD-G Modelling Requirement
14	Steel structure for Beacon	Structural (ST)	SSS		128 x 128 x 128	400	Modelled to design specified sizes and as-built locations and orientation of the structural members defined by structural grid and orientation, slope, and elevation. The structural should include a. All sloping surfaces included in model element, b. penetrations for MEP, c. shear reinforcement, d. finishes, camber, chamfer, e. assembly elements such as welds, coping, plates, bolts, washers, nuts. Reinforcement are excluded unless specified in PXP
15	Access Structure	Structural (ST)	SAC		128 x 128 x 128	300	Modelled to exact sizes and as-built locations and orientation of the structural members defined by structural grid and orientation, slope, and elevation. The structural should include a. All sloping surfaces included in model element, b. penetrations for MEP, c. construction joint, and expansion joint. Reinforcement are excluded unless specified in PXP
16	Landing Platform	Structural (ST)	SLP		128 x 128 x 128	300	Modelled to exact sizes and as-built locations and orientation of the structural members defined by structural grid and orientation, slope, and elevation. The structural should include a. All sloping surfaces included in model element, b. penetrations for MEP, c. construction joint, and expansion joint. Reinforcement are excluded unless specified in PXP
17	Landing Staircase Structure	Structural (ST)	SLS		128 x 128 x 128	400	Modelled to exact sizes and as-built locations and orientation of the structural members defined by structural grid and orientation, slope, and elevation. The structural should include a. All sloping surfaces included in model element, b. penetrations for MEP, c. construction joint, and expansion joint. Reinforcement are excluded unless specified in PXP
18	Landing Step	Structural (ST)	SLT		128 x 128 x 128	400	Modelled to exact sizes and as-built locations and orientation of the structural members defined by structural grid and orientation, slope, and elevation. The structural should include a. All sloping surfaces included in model element, b. penetrations for MEP, c. construction joint, and expansion joint. Reinforcement are excluded unless specified in PXP
19	Concrete Coping	Structural (ST)	SCC		128 x 128 x 128	300	Modelled to specified sizes, as-built location, orientation, and elevation. The structure shall include a. All sloping surfaces included in model element, b. construction joint and expansion joint
20	Gabion Wall	Structural (ST)	SGW		128 x 128 x 128	300	Modelled to specified sizes, as-built location, orientation, and elevation. The structure shall include a. All sloping surfaces included in model element, b. construction joint and expansion joint. Object Details of less than 50mm are NOT required.

No	Element	Discipline	PWD Code	Color	RGB	LOD-G	LOD-G Modelling Requirement
21	Wave Absorption Chamber	Structural (ST)	SWA		128 x 128 x 128	300	Modelled to specified sizes, as-built location, orientation and elevation. The structure shall include: a. All sloping surfaces included in model element, b. construction joint and expansion joint. Object Details of less than 50mm is NOT required.
22	Precast Concrete Block (include seawall block, solid pier concrete block, wave wall/barrier)	Structural (ST)	SBK		128 x 128 x 128	300	Modelled to specified sizes, as-built location, orientation and elevation. The structure shall include: a. All sloping surfaces included in model element, b. construction joint and expansion joint
23	Rock Armour for seawall and breakwater	Structural (ST)	SRA		128 x 128 x 128	200	Modelled to as-built location and elevation, approximate size, shape and orientation
24	Rock Fill	Structural (ST)	SRF		128 x 128 x 128	200	Modelled to as-built location and elevation, approximate size, shape and orientation
25	Berm Stone	Structural (ST)	SBS		128 x 128 x 128	200	Modelled to as-built location and elevation, approximate size, shape and orientation
26	Bagged Concrete	Structural (ST)	SBC		128 x 128 x 128	200	Modelled to as-built location and elevation, approximate size, shape and orientation
27	Levelling Stone	Structural (ST)	SLV		128 x 128 x 128	200	Modelled to as-built location and elevation, approximate size, shape and orientation
28	Pell Mell Rubble	Structural (ST)	SPM		128 x 128 x 128	200	Modelled to as-built location and elevation, approximate size, shape and orientation
29	Bathymetry (Existing profile)	Site (SF)	BAE		140 x 200 x 247	300	Modelled as digital terrain model as according to surveyed profile.
30	Beach Finish levels	Site (SF)	BFL		230 x 200 x 40	300	Modelled as digital terrain model as according to surveyed profile.
31	Pavement (carriageways, footpath, cycle track)	Site (SF)	PAV		230 x 150 x 122	200/300	Modelled according to the as-built surveyed location, orientation and elevation. The objects shall include: a. location of kerbs (LoD200), b: beddings and paving, c. location and size of the gully and man-hole openings (LoD200), d. construction joint and expansion joint, e. Road markings (LoD200)
32	Surrounding Building/Mass	Site (SF)	SUR		192 x 192 x 192	200	Modelled to approximate size, shape, location and orientation of the nearby building (within 100m from the project/site boundary)
33	Topography (existing site formation)	Site (SF)	TOP		132 x 132 x 132	200/300	Modelled as digital terrain model (LoD 300) and generic blocks as according to surveyed topologies, including a. trees, planter, signage (LoD200)
34	CCTV Camera	MEP (BS)	CAM		204 x 204 x 0	200	Modelled to as-built location and elevation, approximate size, shape and orientation. Object Details of less than 50mm is NOT required.

No	Element	Discipline	PWD Code	Color	RGB	LOD-G	LOD-G Modelling Requirement
35	Cable Drawpit	MEP (BS)	CDP		95 x 95 x 95	300	Modelled to specified sizes, as-built location, orientation and elevation of the chamber. The structure shall include: a. specified location, size and shape of all openings
36	Cable Ducting	MEP (BS)	CDT		95 x 95 x 95	300	Modelled to specified sizes, as-built location, orientation and elevation of the chamber. The structure shall include: a. specified location, size and shape of all openings, b. construction joint and expansion joint
37	Corrosion Monitoring Terminal Box	MEP (BS)	CMB		95 x 95 x 95	300	Modelled to specified sizes, as-built location, orientation and elevation of the chamber. The structure shall include: a. specified location, size and shape of all openings. Object Details of less than 50mm is NOT required.
38	Corrosion Monitoring Pit	MEP (BS)	CMP		95 x 95 x 95	300	Modelled to specified sizes, as-built location, orientation and elevation of the chamber. The structure shall include: a. specified location, size and shape of all openings
39	Drainage Downpipe	MEP (BS)	DWP		192 x 192 x 192	300	Modelled to specified sizes, as-built location, orientation and elevation/profile of the pipe. Values, Fittings and bends should be included.
40	Pillar box (including ICCP AC power supply pillar box, electric pillar box)	MEP (BS)	EPB		51 x 153 x 51	300	Modelled to specified sizes, as-built location, orientation and elevation of the chamber. The structure shall include: a. specified location, size and shape of all openings, b. construction joint and expansion joint. Object Details of less than 50mm is NOT required.
41	Earthing and Lighting	MEP (BS)	ETH		255 x 255 x 0	200	Modelled to as-built location and elevation, approximate size, shape and orientation. Cables/Wires less than 50mm diameter is NOT required
42	GovWiFi	MEP (BS)	GWF		204 x 204 x 0	200	Modelled to as-built location and elevation, approximate size, shape and orientation. Cables/Wires less than 50mm diameter is NOT required
43	Inspection Manhole	MEP (BS)	IMH		95 x 95 x 95	300	Modelled to specified sizes, as-built location, orientation and elevation of the chamber. The structure shall include: a. specified location, size and shape of all openings
44	Lighting	MEP (BS)	LGH		255 x 255 x 0	200	Modelled to as-built location and elevation, approximate size, shape and orientation. Cables/Wires less than 50mm diameter is NOT required
45	Sensors	MEP (BS)	SNR		255 x 255 x 0	200	Modelled to as-built location and elevation, approximate size, shape and orientation. Cables/Wires less than 50mm diameter is NOT required
46	Solar Panel	MEP (BS)	SOP		51 x 153 x 51	200	Modelled to as-built location and elevation, approximate size, shape and orientation. Cables/Wires less than 50mm diameter is NOT required
47	ICCP transformer Rectifier	MEP (BS)	TFR		51 x 153 x 51	200	Modelled to as-built location and elevation, approximate size, shape and orientation. Cables/Wires less than 50mm diameter is NOT required
48	Step Block (Rubber or Timber)	Fender (FN)	FSB		0 x 0 x 204	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. The object shall include: a. specified location, size and shape of all openings

No	Element	Discipline	PWD Code	Color	RGB	LOD-G	LOD-G Modelling Requirement
49	Capping (Rubber or Timber)	Fender (FN)	FCA		0 x 0 x 204	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. The object shall include: a. specified location, size and shape of all openings
50	Rubber Buffer	Fender (FN)	FRB		0 x 0 x 204	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. The object shall include: a. specified location, size and shape of all openings, b. approximate size and location of connection and fixing details
51	Frontal Pad	Fender (FN)	FFP		0 x 0 x 204	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. The object shall include: a. specified location, size and shape of all openings
52	Horizontal Fender (plastic, timber, rubber)	Fender (FN)	FHF		0 x 0 x 204	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. The object shall include: a. specified location, size and shape of all openings
53	Vertical Fender (plastic, timber, rubber)	Fender (FN)	FVF		0 x 0 x 204	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. The object shall include: a. specified location, size and shape of all openings
54	Horizontal/Inclined fender wailing	Fender (FN)	FHW/FIW		0 x 0 x 204	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. The object shall include: a. specified location, size and shape of all openings
55	Steel Plate for Wailing system	Fender (FN)	FSP		255 x 0 x 0	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. The object shall include: a. specified location, size and shape of all openings, b. approximate size and location of connecting bolts and nuts
56	Steel Bracket	Fender (FN)	FBK		255 x 0 x 0	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. The object shall include: a. specified location, size and shape of all openings, b. approximate size and location of connecting bolts and nuts
57	Chain for Fender System	Fender (FN)	FCH		0 x 0 x 204	300	Modelled to as-built location and elevation, approximate size, shape and orientation (Single object family)
58	Eye blot for Fender System	Fender (FN)	FEB		0 x 0 x 204	300	Modelled to as-built location and elevation, approximate size, shape and orientation (Single object family). Object details of less than 20mm is not required
59	Bathymetry (Proposed profile or tunnel seabed levels)	Civil (CV)	BAP		230 x 200 x 40	300	Modelled as digital terrain model as according to design profile.
60	Access/Cat Ladder	Civil (CV)	CAL		51 x 153 x 51	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
61	Barrier Bollard	Civil (CV)	CBB		51 x 153 x 51	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
62	Bench	Civil (CV)	CBN		51 x 153 x 51	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required

No	Element	Discipline	PWD Code	Color	RGB	LOD-G	LOD-G Modelling Requirement
63	Mooring Bollard	Civil (CV)	CBO		51 x 153 x 51	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
64	Concrete Plinth	Civil (CV)	CCP		51 x 153 x 51	300	Modelled to specified sizes, location and elevation of the object. The object shall include: a. specified location, size and shape of all openings, b. approximate size and location of connecting bolts and nuts
65	Fence	Civil (CV)	CFC		192 x 192 x 192	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
66	Tidal Gauge House	Civil (CV)	CGH		51 x 153 x 51	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
67	Tidal Gauge Tubes	Civil (CV)	CTG		51 x 153 x 51	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
68	Gate	Civil (CV)	CGT		51 x 153 x 51	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
69	Railing/Handrail	Civil (CV)	CHR		51 x 153 x 51	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
70	Lifebuoy	Civil (CV)	CLB		51 x 153 x 51	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
71	Mooring eye	Civil (CV)	CME		51 x 153 x 51	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
72	Marine Notice Board	Civil (CV)	CMN		51 x 153 x 51	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
73	Pier Notice board	Civil (CV)	CNB		51 x 153 x 51	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
74	Navigation Light	Civil (CV)	CNL		51 x 153 x 51	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
75	Signage/information plate (including landing / structural no. plate, pier)	Civil (CV)	CSG		51 x 153 x 51	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
76	Step iron	Civil (CV)	CSI		51 x 153 x 51	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
77	Proposed Topography (Proposed site formation)	Civil (CV)	TSF		132 x 132 x 132	300	Modelled as digital terrain model (LoD 300) and generic blocks as according to design topologies
78	Blue color paint	Architecture (AR)	ABP		0 x 0 x 153	200	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required

No	Element	Discipline	PWD Code	Color	RGB	LOD-G	LOD-G Modelling Requirement
79	Ceiling	Architecture (AR)	ACE		(Material Color)	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
80	Finishes (Floor, Wall, Column)	Architecture (AR)	AFS		(Material Color)	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
81	Roof Gutter	Architecture (AR)	AGT		128 x 128 x 128	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
82	Architectural Roof	Architecture (AR)	ARF		(Material Color)	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
83	Skyline/glass panel	Architecture (AR)	ASK		0 x 176 x 140 (50% Transparency)	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 50mm is not required
84	Tactile warning strip	Architecture (AR)	ATW		255 x 255 x 0	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 10mm is not required
85	Non-slip Yellow nosing	Architecture (AR)	AYN		255 x 255 x 0	300	Modelled to design specified sizes, as-built location, orientation and elevation of the object. Object details of less than 10mm is not required

Appendix B : Level of Information (LOD-I) Requirement of all PWD/CEDD Components

This appendix listed all the listed the minimuim asset information requirement to individual PWD/CEDD asset components for the Portworks Maintenance Information System.

INSTANT PARAMETERS

No	Element	Discipline	PWD Code	CEDD_I_ AssetID	CEDD_I_ SpaceID	CEDD_I_ Length	CEDD_I_ TopLevel	CEDD_I_ BottomLevel	CEDD_I_ LastReplaceDate	CEDD_I_ CrossSectionArea
1	Pile Cap	Structural	SPC	FD-XX-SPC-001	(Space ID)	N/A	+1.150	N/A	YYYY-MM-DD	N/A
2	Pile Foundation	Structural	SPI	FD-1A-SPI-001	(Space ID)	21.906	+0.000	-21.906	YYYY-MM-DD	0.09
3	Concrete Foundation for Beacon	Structural	SCF	XX-XX-SCF-01	(Space ID)	N/A	+5.000	+2.500	YYYY-MM-DD	N/A
4	Anchor Blot/Post	Structural	SAB	XX-XX-SAB-01	(Space ID)	10	+4.000	-6.000	YYYY-MM-DD	N/A
5	Structural Beam (Concrete Beam, Steel Beam and Tie Beam)	Structural	SBM	FD-2A3B_UL-SBM-XX	(Space ID)	5	+3.600	+3.000	YYYY-MM-DD	0.12
6	Structural Column (Concrete Column, Steel Column and Post)	Structural	SCL	MD-3A4A-SCL-001	(Space ID)	4.26	+8.425	+4.165	YYYY-MM-DD	0.09
7	Bracing (Horizontal/Vertical)	Structural	SBH /SBV	FD-2A3B-SBH-001	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
8	Slab/Pier Deck	Structural	SLA	MD-2A3B-SLA-XX	(Space ID)	N/A	+4.000	N/A	YYYY-MM-DD	N/A
9	Precast Beam Slab Panel	Structural	SPP	MD-3B2C-SPP-XX	(Space ID)	N/A	+4.000	N/A	YYYY-MM-DD	0.09
10	Ramp	Structural	SRP	FD-1A-SRP-001	(Space ID)	N/A	+4.800	+4.000	YYYY-MM-DD	N/A
11	Corbel/Concrete Bracket for Pier	Structural	SCO	FD-1A-SCO-001	(Space ID)	N/A	+4.000	N/A	YYYY-MM-DD	N/A
12	Structural wall / retaining Wall	Structural	SWL	FD-1A2_UL-SBM-XX	(Space ID)	5.000	+5.000	+4.000	YYYY-MM-DD	N/A
13	Concrete structure for Beacon, Dolphin, vertical seawall and solid pier	Structural	SCS	XX-XX-SCS-01	(Space ID)	N/A	+4.000	N/A	YYYY-MM-DD	N/A
14	Steel structure for Beacon	Structural	SSS	XX-XX-SSS-01	(Space ID)	N/A	+4.000	N/A	YYYY-MM-DD	N/A
15	Access Structure	Structural	SAC	XX-XX-SAC-01	(Space ID)	N/A	+4.000	N/A	YYYY-MM-DD	N/A
16	Landing Platform	Structural	SLP	XX-STN1_UL-SLP-XX	(Space ID)	N/A	+4.000	N/A	YYYY-MM-DD	N/A
17	Landing Staircase Structure	Structural	SLS	XX-STN1-SLS-XX	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
18	Landing Step	Structural	SLT	XX-STN1_UL-SLT-01	(Space ID)	N/A	+2.000	N/A	YYYY-MM-DD	N/A
19	Concrete Coping	Structural	SCC	XX-B1-SCC-XX	(Space ID)	N/A	+4.000	N/A	YYYY-MM-DD	N/A
20	Gabion Wall	Structural	SGW	(Asset ID)	(Space ID)	5	+4.000	+3.000	YYYY-MM-DD	N/A
21	Wave Absorption Chamber	Structural	SWA	(Asset ID)	(Space ID)	4.490	+3.650	-3.200	YYYY-MM-DD	N/A

No	Element	Discipline	PWD Code	CEDD_I_ AssetID	CEDD_I_ SpaceID	CEDD_I_ Length	CEDD_I_ TopLevel	CEDD_I_ BottomLevel	CEDD_I_ LastReplaceDate	CEDD_I_ CrossSectionArea
22	Precast Concrete Block (include seawall block, solid pier concrete block, wave wall/barrier)	Structural	SBK	(Asset ID)	(Space ID)	N/A	-2.000	-3.350	YYYY-MM-DD	N/A
23	Rock Armour for seawall and breakwater	Structural	SRA	(Asset ID)	(Space ID)	N/A	-1.500	-6.000	YYYY-MM-DD	N/A
24	Rock Fill	Structural	SRF	(Asset ID)	(Space ID)	N/A	+0.800	+0.500	YYYY-MM-DD	N/A
25	Berm Stone	Structural	SBS	(Asset ID)	(Space ID)	N/A	-5.000	N/A	YYYY-MM-DD	N/A
26	Bagged Concrete	Structural	SBC	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
27	Levelling Stone	Structural	SLV	(Asset ID)	(Space ID)	N/A	-5.600	N/A	YYYY-MM-DD	N/A
28	Pell Mell Rubble	Structural	SPM	(Asset ID)	(Space ID)	N/A	+2.100	-6.000	YYYY-MM-DD	N/A
29	Bathymetry (Existing profile)	Site	BAE	(Asset ID)	(Space ID)	N/A	-2.000	N/A	N/A	N/A
30	Beach Finish levels	Site	BFL	(Asset ID)	(Space ID)	N/A	+2.000	N/A	N/A	N/A
31	Pavement (carriageways, footpath, cycle track)	Site	PAV	(Asset ID)	(Space ID)	N/A	+4.000	N/A	N/A	N/A
32	Surrounding Building/Mass	Site	SUR	(Asset ID)	(Space ID)	N/A	N/A	N/A	N/A	N/A
33	Topography (existing site formation)	Site	TOP	(Asset ID)	(Space ID)	N/A	+4.000	N/A	N/A	N/A
34	CCTV Camera	MEP	CAM	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
35	Cable Drawpit	MEP	CDP	(Asset ID)	(Space ID)	N/A	+4.000	+2.000	YYYY-MM-DD	N/A
36	Cable Ducting	MEP	CDT	(Asset ID)	(Space ID)	N/A	N/A	+2.050	YYYY-MM-DD	N/A
37	Corrosion Monitoring Terminal Box	MEP	CMB	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
38	Corrosion Monitoring Pit	MEP	CMP	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
39	Drainage Downpipe	MEP	DWP	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
40	Pillar-box (including ICCP AC power supply pillar box, electric pillar box)	MEP	EPB	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
41	Earthing and Lighting	MEP	ETH	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
42	GovWiFi	MEP	GWF	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
43	Inspection Manhole	MEP	IMH	(Asset ID)	(Space ID)	N/A	+4.000	+2.000	YYYY-MM-DD	N/A
44	Lighting	MEP	LGH	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
45	Sensors	MEP	SNR	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
46	Solar Panel	MEP	SOP	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
47	ICCP transformer Rectifier	MEP	TFR	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
48	Step Block (Rubber or Timber)	Fender	FSB	(Asset ID)	(Space ID)	N/A	+4.000	N/A	YYYY-MM-DD	N/A
49	Capping (Rubber or Timber)	Fender	FCA	(Asset ID)	(Space ID)	1.000	+4.000	N/A	YYYY-MM-DD	N/A
50	Rubber Buffer	Fender	FRB	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
51	Frontal Pad	Fender	FFP	(Asset ID)	(Space ID)	N/A	+4.240	+1.240	YYYY-MM-DD	N/A

No	Element	Discipline	PWD Code	CEDD_I_ AssetID	CEDD_I_ SpaceID	CEDD_I_ Length	CEDD_I_ TopLevel	CEDD_I_ BottomLevel	CEDD_I_ LastReplaceDate	CEDD_I_ CrossSectionArea
52	Horizontal Fender (plastic, timber, rubber)	Fender	FHF	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
53	Vertical Fender (plastic, timber, rubber)	Fender	FVF	(Asset ID)	(Space ID)	3.500	N/A	N/A	YYYY-MM-DD	N/A
54	Horizontal/Inclined fender wailing	Fender	FHW/FIW	(Asset ID)	(Space ID)	N/A	+2.360 (inclined)/ +3.500 (horizontal)	+0.940 (inclined)/ N/A (horizontal)	YYYY-MM-DD	N/A
55	Steel Plate for Wailing system	Fender	FSP	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
56	Steel Bracket	Fender	FBK	(Asset ID)	(Space ID)	N/A	+3.500	N/A	YYYY-MM-DD	N/A
57	Chain for Fender System	Fender	FCH	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
58	Eye bolt for Fender System	Fender	FEB	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
59	Bathymetry (Proposed profile or tunnel seabed levels)	Civil	BAP	(Asset ID)	(Space ID)	N/A	-2.000	N/A	N/A	N/A
60	Access/Cat Ladder	Civil	CAL	(Asset ID)	(Space ID)	2.000	+4.000	+2.000	YYYY-MM-DD	N/A
61	Barrier Bollard	Civil	CBB	(Asset ID)	(Space ID)	4.000	N/A	N/A	YYYY-MM-DD	N/A
62	Bench	Civil	CBN	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
63	Mooring Bollard	Civil	CBO	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
64	Concrete Plinth	Civil	CCP	(Asset ID)	(Space ID)	N/A	+4.300	+4.000	YYYY-MM-DD	N/A
65	Fence	Civil	CFC	(Asset ID)	(Space ID)	N/A	+6.000	+4.000	YYYY-MM-DD	N/A
66	Tidal Gauge House	Civil	CGH	(Asset ID)	(Space ID)	N/A	+6.000	+4.000	N/A	N/A
67	Tidal Gauge Tubes	Civil	CTG	(Asset ID)	(Space ID)	5.250	+4.000	-1.250	YYYY-MM-DD	N/A
68	Gate	Civil	CGT	(Asset ID)	(Space ID)	N/A	+6.000	+4.000	YYYY-MM-DD	N/A
69	Railing/Handrail	Civil	CHR	(Asset ID)	(Space ID)	N/A	+5.100	+4.000	YYYY-MM-DD	N/A
70	Lifebuoy	Civil	CLB	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
71	Mooring eye	Civil	CME	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
72	Marine Notice Board	Civil	CMN	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
73	Pier Notice board	Civil	CNB	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
74	Navigation Light	Civil	CNL	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
75	Signage/information plate (including landing / structural no. plate, pier)	Civil	CSG	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
76	Step iron	Civil	CSI	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
77	Proposed Topography (Proposed site formation)	Civil	TSF	(Asset ID)	(Space ID)	N/A	+4.000	N/A	N/A	N/A
78	Blue color paint	Archi	ABP	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A

No	Element	Discipline	PWD Code	CEDD_I_ AssetID	CEDD_I_ SpaceID	CEDD_I_ Length	CEDD_I_ TopLevel	CEDD_I_ BottomLevel	CEDD_I_ LastReplaceDate	CEDD_I_ CrossSectionArea
79	Ceiling	Archi	ACE	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
80	Finishes (Floor, Wall, Column)	Archi	AFS	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
81	Roof Gutter	Archi	AGT	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
82	Architectural Roof	Archi	ARF	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
83	Skyline/glass panel	Archi	ASK	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
84	Tactile warning strip	Archi	ATW	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A
85	Non-slip Yellow nosing	Archi	AYN	(Asset ID)	(Space ID)	N/A	N/A	N/A	YYYY-MM-DD	N/A

N/A – NOT APPLICABLE TO THE COMPONENT

TYPE PARAMETERS

No	Element	Discipline	PWD Code	OmniClass Classification	OmniClass Title	CEDD_T_ AssetType	CEDD_T_ DetailDescription	CEDD_T_ Shape	CEDD_T_ Material	CEDD_T_ Grade	CEDD_T_ FinishMaterial	CEDD_T_ Manufacturer	CEDD_T_ Dimension	CEDD_T_ ReferenceDrawing	CEDD_T_ MgtParty	CEDD_T_ MaintenanceParty
1	Pile Cap	Structural	SPC	23-13 29 11 11 21	Pile Caps	SPC	Pile Cap	Rectangular	PW_CONC_IS_C45_20	Grade 50/20	N/A	N/A	2400(W) x 2000(L) x 500mm (H)	1434_A_P_C_007	TD	CEDD
2	Pile Foundation	Structural	SPI	23-13 29 11 11 13	Foundation Piles	SPI	Pile Foundation	Cylindrical	PW_CONC_IS_C45_20	Grade 50/20	N/A	N/A	900mm dia.	1434_A_P_C_007	TD	CEDD
3	Concrete Foundation for Beacon	Structural	SCF	23-13 29 15 15	Strip Foundation Blocks	SCF	Concrete Foundation for Beacon	Rectangular/ Cylindrical	PW_CONC_IS_C45_20	Grade 50/20	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
4	Anchor Blot/Post	Structural	SAB			SAB	Anchor Blot/Post	Round/ Cylindrical	Steel rebar/ Reinforced concrete post	N/A	N/A	N/A	32mm dia./ 219mm dia.	1434_A_P_C_007	TD	CEDD
5	Structural Beam (Concrete Beam, Steel Beam and Tie Beam)	Structural	SBM	23-13 35 11 13 13	Beams	SBM	Structural Beam (Concrete Beam, Steel Beam and Tie Beam)	Rectangular/ H Section	Reinforced Concrete/ Steel	Grade 50/20; Grade S355	N/A	N/A	400mm(W) x 600mm (H); 305mm x 165mm x 46kg/m UB	1434_A_P_C_007	TD	CEDD
6	Structural Column (Concrete Column, Steel Column and Post)	Structural	SCL	23-13 35 11 13 11	Column	SCL	Structural Column (Concrete Column, Steel Column and Post)	Cylindrical/ H Section	Reinforced Concrete/ Steel	Grade 50/20; Grade S355	N/A	N/A	500mm dia.; 203mm x 203mm x 46kg/m UC	1434_A_P_C_007	TD	CEDD
7	Bracing (Horizontal/Vertical)	Structural	SBH /SBV			SBH /SBV	Bracing (Horizontal/Vertical)	Rectangular/ H Section	Reinforced Concrete/ Steel	Grade 50/20; Grade S355	N/A	N/A	400mm(W) x 600mm (H); 305mm x 165mm x 46kg/m UB	1434_A_P_C_007	TD	CEDD
8	Slab/Pier Deck	Structural	SLA	23-15 17 13 19	Precast Tile and Slab Flooring	SLA	Slab/Pier Deck	N/A	Reinforced Concrete	Grade 50/20	N/A	N/A	250mm thk.	1434_A_P_C_007	TD	CEDD
9	Precast Beam Slab Panel	Structural	SPP	23-12-31 15	Precast Structural Concrete	SPP	Precast Beam Slab Panel	N/A	Reinforced Concrete	Grade 50/20	N/A	N/A	250mm thk. slab & 600mm(H) beam	1434_A_P_C_007	TD	CEDD
10	Ramp	Structural	SRP	23-17 23 11	Ramps	SRP	Ramp	N/A	Concrete	Grade 30/20	N/A	N/A	1000mm (W)	1434_A_P_C_007	TD	CEDD
11	Corbel/Concrete Bracket for Pier	Structural	SCO	23-13 31 11	Structural Concrete	SCO	Corbel/Concrete Bracket for Pier	N/A	Reinforced Concrete	Grade 50/20	N/A	N/A	300mm(L) x 250mm(W)	1434_A_P_C_007	TD	CEDD
12	Structural wall / retaining Wall	Structural	SWL	23-13 35 21 11	Concrete structural wall	SWL	Structural wall / retaining Wall	N/A	Reinforced Concrete	Grade 50/20	N/A	N/A	200mm(W) x 1000mm(H)	1434_A_P_C_007	TD	CEDD
13	Concrete structure for Beacon, Dolphin, vertical seawall and solid pier	Structural	SCS	23-13 31 11	Structural Concrete	SCS	Concrete structure for Beacon, Dolphin, vertical seawall and solid pier	N/A	Reinforced Concrete	Grade 50/20	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
14	Steel structure for Beacon	Structural	SSS	23-39 21 11 11	Navigation components	SSS	Steel structure for Beacon	N/A	GMS	N/A	Paint	N/A	N/A	1434_A_P_C_007	TD	CEDD
15	Access Structure	Structural	SAC	23-13 35 23 11	Structural Concrete floor decks	SAC	Access Structure	N/A	Reinforced Concrete/ Steel	Grade 50/20; Grade S355	N/A	N/A	1800mm (W)	1434_A_P_C_007	TD	CEDD
16	Landing Platform	Structural	SLP	23-13 35 23 11	Structural Concrete floor decks	SLP	Landing Platform	N/A	Reinforced Concrete	Grade 50/20	N/A	N/A	1200mm(W)	1434_A_P_C_007	TD	CEDD
17	Landing Staircase Structure	Structural	SLS	23-13 31 11	Structural Concrete	SLS	Landing Staircase Structure	N/A	Reinforced Concrete	Grade 50/20	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
18	Landing Step	Structural	SLT	23-13 31 11	Structural Concrete	SLT	Landing Step	N/A	Reinforced Concrete	Grade 50/20	N/A	N/A	300mm tread x 150mm riser	1434_A_P_C_007	TD	CEDD
19	Concrete Coping	Structural	SCC	23-13 31 11	Structural Concrete	SCC	Concrete Coping	N/A	Reinforced Concrete	Grade 30/20	N/A	N/A	600mm(W)	1434_A_P_C_007	TD	CEDD
20	Gabion Wall	Structural	SGW	23-11 17 15	Gabions	SGW	Gabion Wall	Rectangular	N/A	N/A	N/A	N/A	1000mm(W) x 1500mm(L) x 1000mm(H)	1434_A_P_C_007	TD	CEDD
21	Wave Absorption Chamber	Structural	SWA			SWA	Wave Absorption Chamber	N/A	N/A	N/A	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
22	Precast Concrete Block (include seawall block, solid pier concrete block, wave wall/barrier)	Structural	SBK	23-13 31 15	Precast Structural Concrete	SBK	Precast Concrete Block (include seawall block, solid pier concrete block, wave wall/barrier)	Rectangular	Concrete	Grade 20/20	N/A	N/A	2025mm(W) x 2700mm(L) x 1350mm(H)	1434_A_P_C_007	TD	CEDD

No	Element	Discipline	PWD Code	OmniClass Classification	OmniClass Title	CEDD_T_ AssetType	CEDD_T_ DetailDescription	CEDD_T_ Shape	CEDD_T_ Material	CEDD_T_ Grade	CEDD_T_ FinishMaterial	CEDD_T_ Manufacturer	CEDD_T_ Dimension	CEDD_T_ ReferenceDrawing	CEDD_T_ MgtParty	CEDD_T_ MaintenanceParty
23	Rock Armour for seawall and breakwater	Structural	SRA	23-39 21 15 13	Seawalls	SRA	Rock Armour for seawall and breakwater	N/A	N/A	Type 1 to Type 7	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
24	Rock Fill	Structural	SRF			SRF	Rock Fill	N/A	N/A	Grade 200	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
25	Berm Stone	Structural	SBS			SBS	Berm Stone	N/A	N/A	1 tonne	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
26	Bagged Concrete	Structural	SBC			SBC	Bagged Concrete	N/A	N/A	N/A	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
27	Levellling Stone	Structural	SLV			SLV	Levellling Stone	N/A	N/A	N/A	N/A	N/A	150mm thk.	1434_A_P_C_007	TD	CEDD
28	Pell Mell Rubble	Structural	SPM			SPM	Pell Mell Rubble	N/A	N/A	N/A	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
29	Bathymetry (Exisiting profile)	Site	BAE	14-34 17 24	Shoreline	BAE	Bathymetry (Exisiting profile)	N/A	N/A	N/A	N/A	N/A	N/A	1434_A_P_C_007	N/A	N/A
30	Beach Finish levels	Site	BFL	14-34 17 24	Shoreline	BFL	Beach Finish levels	N/A	N/A	N/A	N/A	N/A	N/A	1434_A_P_C_007	LCSD	ArchSD
31	Pavement (carriageways, footpath, cycle track)	Site	PAV	11-51 45 00	Walkway	PAV	Pavement (carriageways, footpath, cycle track)	N/A	N/A	N/A	Concrete/ Bitumen/ Paving tiles	N/A	N/A	1434_A_P_C_007	HyD	HyD
32	Surrounding Building/Mass	Site	SUR	23-19 29 00	Complete Buildings	SUR	Surrounding Building/Mass	N/A	N/A	N/A	N/A	N/A	N/A	1434_A_P_C_007	TD	ArchSD
33	Topography (existing site formation)	Site	TOP	14-34 11 99	Other sloped topographical spaces	TOP	Topography (existing site formation)	N/A	N/A	N/A	N/A	N/A	N/A	1434_A_P_C_007	N/A	N/A
34	CCTV Camera	MEP	CAM	23-29 11 11 13	Visual light wavelength CCTV camera	CAM	CCTV Camera	N/A	N/A	N/A	N/A	IFSEC	N/A	1434_A_P_C_007	TD	CEDD
35	Cable Drawpit	MEP	CDP	23-13 31 15	Precast Structural Concrete	CDP	Cable Drawpit	N/A	Reinforced Concrete	N/A	N/A	N/A	750mm(W) x 900mm(L)	1434_A_P_C_007	TD	CEDD
36	Cable Ducting	MEP	CDT			CDT	Cable Ducting	N/A	uPVC	N/A	N/A	N/A	100mm dia.	1434_A_P_C_007	TD	CEDD
37	Corrosion Monitoring Terminal Box	MEP	CMB			CMB	Corrosion Monitoring Terminal Box	N/A	N/A	N/A	N/A	Cosasco	N/A	1434_A_P_C_007	TD	CEDD
38	Corrosion Monitoring Pit	MEP	CMP	23-13 31 15	Precast Structural Concrete	CMP	Corrosion Monitoring Pit	N/A	N/A	N/A	N/A	Cosasco	N/A	1434_A_P_C_007	TD	CEDD
39	Drainage Downpipe	MEP	DWP	23-13 41 39	Roof Drains	DWP	Drainage Downpipe	N/A	uPVC	N/A	N/A	Kembla	100mm dia.	1434_A_P_C_007	TD	CEDD
40	Pillar box (including ICCP AC power supply pillar box, electric pillar box)	MEP	EPB	23-13 31 15	Precast Structural Concrete	EPB	Pillar box (including ICCP AC power supply pillar box, electric pillar box)	N/A	N/A	N/A	N/A	Schneider Electric	1200mm(W) x 1800mm(L) x 1600mm(H)	1434_A_P_C_007	TD	CEDD
41	Earthing and Lightning	MEP	ETH	23-35 39 15	Lightning Protection	ETH	Earthing and Lighting	N/A	N/A	N/A	N/A	Schneider Electric	N/A	1434_A_P_C_007	TD	CEDD
42	GovWiFi	MEP	GWF			GWF	GovWiFi	N/A	N/A	N/A	N/A	CISCO	N/A	1434_A_P_C_007	TD	OGCIO
43	Inspection Manhole	MEP	IMH	23-13 31 15	Precast Structural Concrete	IMH	Inspection Manhole	N/A	Reinforced Concrete	N/A	N/A	N/A	750mm(W) x 900mm(L)	1434_A_P_C_007	TD	CEDD
44	Lighting	MEP	LGH	23-35 47 11	Lighting Fixture	LGH	Lighting	N/A	N/A	N/A	N/A	PHILIPS	N/A	1434_A_P_C_007	TD	CEDD
45	Sensors	MEP	SNR			SNR	Sensors	N/A	N/A	N/A	N/A	TOTO	N/A	1434_A_P_C_007	TD	CEDD
46	Solar Panel	MEP	SOP	23-19 25 11 19 15	Solar Panels	SOP	Solar Panel	N/A	N/A	N/A	N/A	SINOPOWER	1000mm(W) x 1650mm(L)	1434_A_P_C_007	TD	CEDD
47	ICCP transformer Rectifier	MEP	TFR	23-35 13 00	Transformers	TFR	ICCP transformer Rectifier	N/A	N/A	N/A	N/A	RS	1200mm(W) x 1800mm(L) x 1600mm(H)	1434_A_P_C_007	TD	CEDD
48	Step Block (Rubber or Timber)	Fender	FSB	23-39 21 11 11 13	Boat Fenders	FSB	Step Block (Rubber or Timber)	I/ Rectangular/ 2-step/ 3-step/ 4-step	Rubber/ Timber	N/A	N/A	N/A	400mm tread for I; 300mm tread x 150mm riser for 2-step/ 3-step/ 4-step	1434_A_P_C_007	TD	CEDD
49	Capping (Rubber or Timber)	Fender	FCA	23-39 21 11 11 13	Boat Fenders	FCA	Capping (Rubber or Timber)	Rectangular	Rubber/ Timber	N/A	N/A	N/A	250mm (W) x 150mm (H)	1434_A_P_C_007	TD	CEDD
50	Rubber Buffer	Fender	FRB	23-39 21 11 11 13	Boat Fenders	FRB	Rubber Buffer	Rectangular/ Cylindrical	Rubber	N/A	N/A	N/A	300mm x 300mm x 100mm thk.	1434_A_P_C_007	TD	CEDD
51	Frontal Pad	Fender	FFP	23-39 21 11 11 13	Boat Fenders	FFP	Frontal Pad	N/A	Rubber	N/A	N/A	N/A	3000mm (H)	1434_A_P_C_007	TD	CEDD
52	Horizontal Fender (plastic, timber, rubber)	Fender	FHF	23-39 21 11 11 13	Boat Fenders	FHF	Horizontal Fender (plastic, timber, rubber)	Arch/ Turtle/ D/ Rectangular/ Cylindrical	Rubber/ Timber/ Plastic	N/A	N/A	N/A	250mm (H) for Arch; 250mm x 250mm for Rectangular	1434_A_P_C_007	TD	CEDD

No	Element	Discipline	PWD Code	OmniClass Classification	OmniClass Title	CEDD_T_ AssetType	CEDD_T_ DetailDescription	CEDD_T_ Shape	CEDD_T_ Material	CEDD_T_ Grade	CEDD_T_ FinishMaterial	CEDD_T_ Manufacturer	CEDD_T_ Dimension	CEDD_T_ ReferenceDrawing	CEDD_T_ MgtParty	CEDD_T_ MaintenanceParty
53	Vertical Fender (plastic, timber, rubber)	Fender	FVF	23-39 21 11 11 13	Boat Fenders	FVF	Vertical Fender (plastic, timber, rubber)	Arch/ Turtle/ D/ Rectangular/ Cylindrical	Rubber/ Timber/ Plastic	N/A	N/A	N/A	250mm (H) for Arch; 250mm x 250mm for Rectangular	1434_A_P_C_007	TD	CEDD
54	Horizontal/Inclined fender wailing	Fender	FHW/FIW	23-39 21 11 11 13	Boat Fenders	FHW/FIW	Horizontal/Inclined fender wailing	H Section	GMS/ Mild Steel	Grade 50B	N/A	N/A	254mm x 254mm x 107kg/m	1434_A_P_C_007	TD	CEDD
55	Steel Plate for Wailing system	Fender	FSP	23-39 21 11 11 13	Boat Fenders	FSP	Steel Plate for Wailing system	N/A	GMS/ Stainless Steel	N/A	N/A	N/A	25mm thk./ 5mm thk.	1434_A_P_C_007	TD	CEDD
56	Steel Bracket	Fender	FBK	23-39 21 11 11 13	Boat Fenders	FBK	Steel Bracket	N/A	GMS	N/A	N/A	N/A	200mm x 150mm x 15mm thk.	1434_A_P_C_007	TD	CEDD
57	Chain for Fender System	Fender	FCH	23-39 21 11 11 13	Boat Fenders	FCH	Chain for Fender System	N/A	Stainless Steel	Grade 316	N/A	N/A	16mm dia.	1434_A_P_C_007	TD	CEDD
58	Eye bolt for Fender System	Fender	FEB	23-39 21 11 11 13	Boat Fenders	FEB	Eye bolt for Fender System	N/A	Stainless Steel	Grade 316	N/A	N/A	30mm dia.	1434_A_P_C_007	TD	CEDD
59	Bathymetry (Proposed profile or tunnel seabed levels)	Civil	BAP	14-34 17 24	Shoreline	BAP	Bathymetry (Proposed profile or tunnel seabed levels)	N/A	N/A	N/A	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
60	Access/Cat Ladder	Civil	CAL	23-17 23 15 11	Vertical Ladders	CAL	Access/Cat Ladder	N/A	Stainless Steel	Grade 1.4401	N/A	N/A	600mm wide	1434_A_P_C_007	TD	CEDD
61	Barrier Bollard	Civil	CBB			CBB	Barrier Bollard	N/A	Mild Steel	N/A	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
62	Bench	Civil	CBN	23-11 29 13 11	Exterior Benches	CBN	Bench	N/A	GMS/ Recycled Wood-plastic composite	N/A	N/A	N/A	1600mm (L) x 400mm (W)	1434_A_P_C_007	TD	CEDD
63	Mooring Bollard	Civil	CBO	23-39 21 11 11 11	Mooring Post	CBO	Mooring Bollard	N/A	Reinforced concrete & CI collar	Grade 20/20 concrete, 20mm thk. CI collar for 10 tonne; Grade 40/20 concrete, 25mm thk. CI collar for 20 tonne	Bitumen paint	N/A	400mm dia. (outter) & 300mm dia (inner) for 10 tonne; 600mm dia. (outter) & 400mm dia (inner) for 20 tonne	1434_A_P_C_007	TD	CEDD
64	Concrete Plinth	Civil	CCP	23-13 31 15	Precast Structural Concrete	CCP	Concrete Plinth	N/A	Concrete	Grade 30/20	N/A	N/A	1000mm(L) x 600mm (W) x 300mm (H)	1434_A_P_C_007	TD	CEDD
65	Fence	Civil	CFC	23-11 25 19	Fences	CFC	Fence	N/A	Mild Steel	N/A	N/A	N/A	2000mm (H)	1434_A_P_C_007	TD	CEDD
66	Tidal Gauge House	Civil	CGH	23-13 31 15	Precast Structural Concrete	CGH	Tidal Gauge House	N/A	Reinforced Concrete	N/A	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
67	Tidal Gauge Tubes	Civil	CTG	23-27 11 21 23	Level Sensors	CTG	Tidal Gauge Tubes	N/A	Stainless Steel/ Reinforced Concrete	N/A	N/A	N/A	150mm dia.	1434_A_P_C_007	TD	CEDD
68	Gate	Civil	CGT	23-11 25 11	Perimeter Entry Devices	CGT	Gate	N/A	GMS	N/A	N/A	N/A	2000mm (H)	1434_A_P_C_007	TD	CEDD
69	Railing/Handrail	Civil	CHR	23-17 25 11	Guardrails	CHR	Railing/Handrail	N/A	Stainless Steel/ GMS/ Fibreglass reinforced plastic	N/A	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
70	Lifebuoy	Civil	CLB			CLB	Lifebuoy	N/A	N/A	N/A	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
71	Mooring eye	Civil	CME	23-39 21 11 11 11	Mooring Post	CME	Mooring eye	N/A	Stainless Steel	Grade 1.4401	N/A	N/A	40mm dia.	1434_A_P_C_007	TD	CEDD
72	Marine Notice Board	Civil	CMN	23-19 11 17	Notice Board	CMN	Marine Notice Board	N/A	Aluminium	N/A	N/A	N/A	1000mm (L) x 1000mm (W)	1434_A_P_C_007	TD	CEDD
73	Pier Notice board	Civil	CNB	23-19 11 17	Notice Board	CNB	Pier Notice board	N/A	Stainless Steel	Grade 1.4401	N/A	N/A	2100mm (H)	1434_A_P_C_007	TD	CEDD
74	Navigation Light	Civil	CNL	23-39 21 17 13	Navigation Lights	CNL	Navigation Light	N/A	Mild Steel	N/A	Paint	N/A	4000mm (H)	1434_A_P_C_007	TD	CEDD
75	Signage/information plate (including landing / structural no. plate, pier)	Civil	CSG	23-19 11 11	Information Signs	CSG	Signage/information plate (including landing / structural no. plate, pier)	N/A	Stove Enamelled Aluminum/ Stainless Steel/ Clear acrylic plate with computer cut label	N/A	N/A	N/A	450mm (L) x 300mm(W) x 15mm thk.	1434_A_P_C_007	TD	CEDD
76	Step iron	Civil	CSI	23-39 21 11 11 11	Mooring Post	CSI	Step iron	N/A	Stainless Steel	Grade 1.4401	N/A	N/A	33mm dia.	1434_A_P_C_007	TD	CEDD
77	Proposed Topography (Proposed site formation)	Civil	TSF	14-34 11 99	Other sloped topographical spaces	TSF	Proposed Topography (Proposed site formation)	N/A	N/A	N/A	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD

No	Element	Discipline	PWD Code	OmniClass Classification	OmniClass Title	CEDD_T_ AssetType	CEDD_T_ DetailDescription	CEDD_T_ Shape	CEDD_T_ Material	CEDD_T_ Grade	CEDD_T_ FinishMaterial	CEDD_T_ Manufacturer	CEDD_T_ Dimension	CEDD_T_ ReferenceDrawing	CEDD_T_ MgtParty	CEDD_T_ MaintenanceParty
78	Blue color paint	Archi	ABP	23-19 11 11	Information Signs	ABP	Blue color paint	N/A	Paint (colour code 18D45 in accordance with BS5252 or equivalent)	N/A	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
79	Ceiling	Archi	ACE	23-15 13 21	Ceiling Panels	ACE	Ceiling	N/A	Aluminum	N/A	N/A	N/A	N/A	1434_A_P_C_007	TD	ArchSD/ CEDD
80	Finishes (Floor, Wall, Column)	Archi	AFS	23-13 13 13	Cement Admixtures	AFS	Finishes (Floor, Wall, Column)	N/A	Artificial Granite Tile/ Fire-rated mastic coating	N/A	N/A	N/A	250mm x 40mm x 13mm (if available, e.g. tiles)	1434_A_P_C_007	TD	CEDD
81	Roof Gutter	Archi	AGT	23-13 31 33	Roof Gutters	AGT	Roof Gutter	N/A	GMS	N/A	N/A	N/A	100mm	1434_A_P_C_007	TD	ArchSD/ CEDD
82	Architectural Roof	Archi	ARF	23-12 33 27	Roof Structures	ARF	Architectural Roof	N/A	Aluminum	N/A	N/A	N/A	N/A	1434_A_P_C_007	TD	ArchSD/ CEDD
83	Skyline/glass panel	Archi	ASK	23-12 33 27 19	Glazed Roof structure	ASK	Skyline/glass panel	N/A	Laminated tempered glass	N/A	N/A	N/A	1705mm(L) x 1870mm(W) x 8mm+1.52PVB+8 mm thk	1434_A_P_C_007	TD	ArchSD/ CEDD
84	Tactile warning strip	Archi	ATW	23-19 11 11	Information Signs	ATW	Tactile warning strip	N/A	Safe-Walka rubber tactile tile	N/A	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD
85	Non-slip Yellow nosing	Archi	AYN	23-19 11 11	Information Signs	AYN	Non-slip Yellow nosing	N/A	Anti-skid coloured surface dressing	N/A	N/A	N/A	N/A	1434_A_P_C_007	TD	CEDD

N/A – NOT APPLICABLE TO THE COMPONENT

Appendix C: Technical Guide for Revit Interoperability Tool

Except for system parameters, all of the attributes required in COBie requirement should be set up as parameters in the BIM modelling software according to this document. All the parameters could be directly exported to COBie. This section provides a general guide to export the attributes to COBie with the Revit 2018 COBie extension tools.

Download and Installation

The COBie extension for Revit 2018 is incorporated into the Revit Interoperability Tools and could be downloaded from the official website:

https://www.biminteroperabilitytools.com/cobieextensionrevit.php

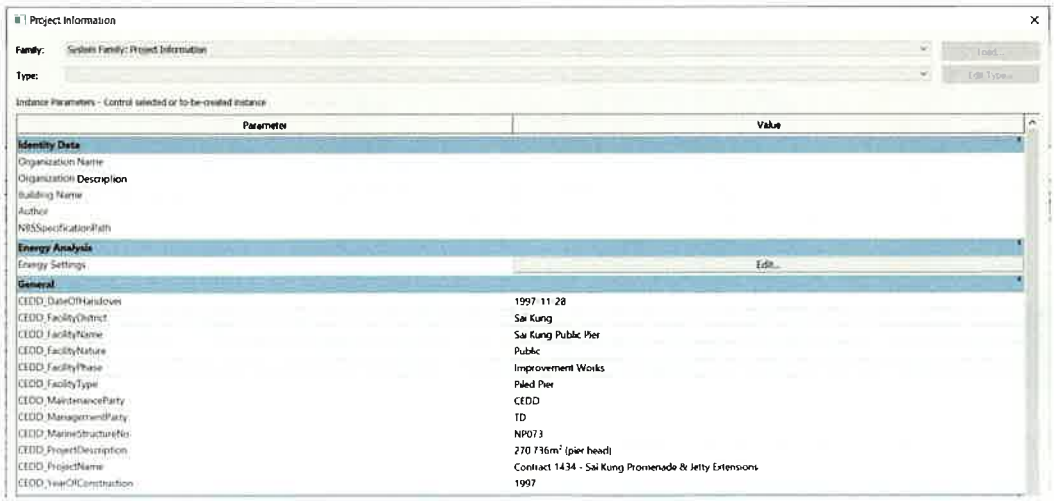
After installation completed, the tools will be shown on the standard Ribbon toolbar

Basic Setup

To begin to export the COBie data, users must set up all the units, coordinates, levels, and parameters according to the requirements listed in this AIR document.

1. Go to the Manage Ribbon, select the **Project Information** icon

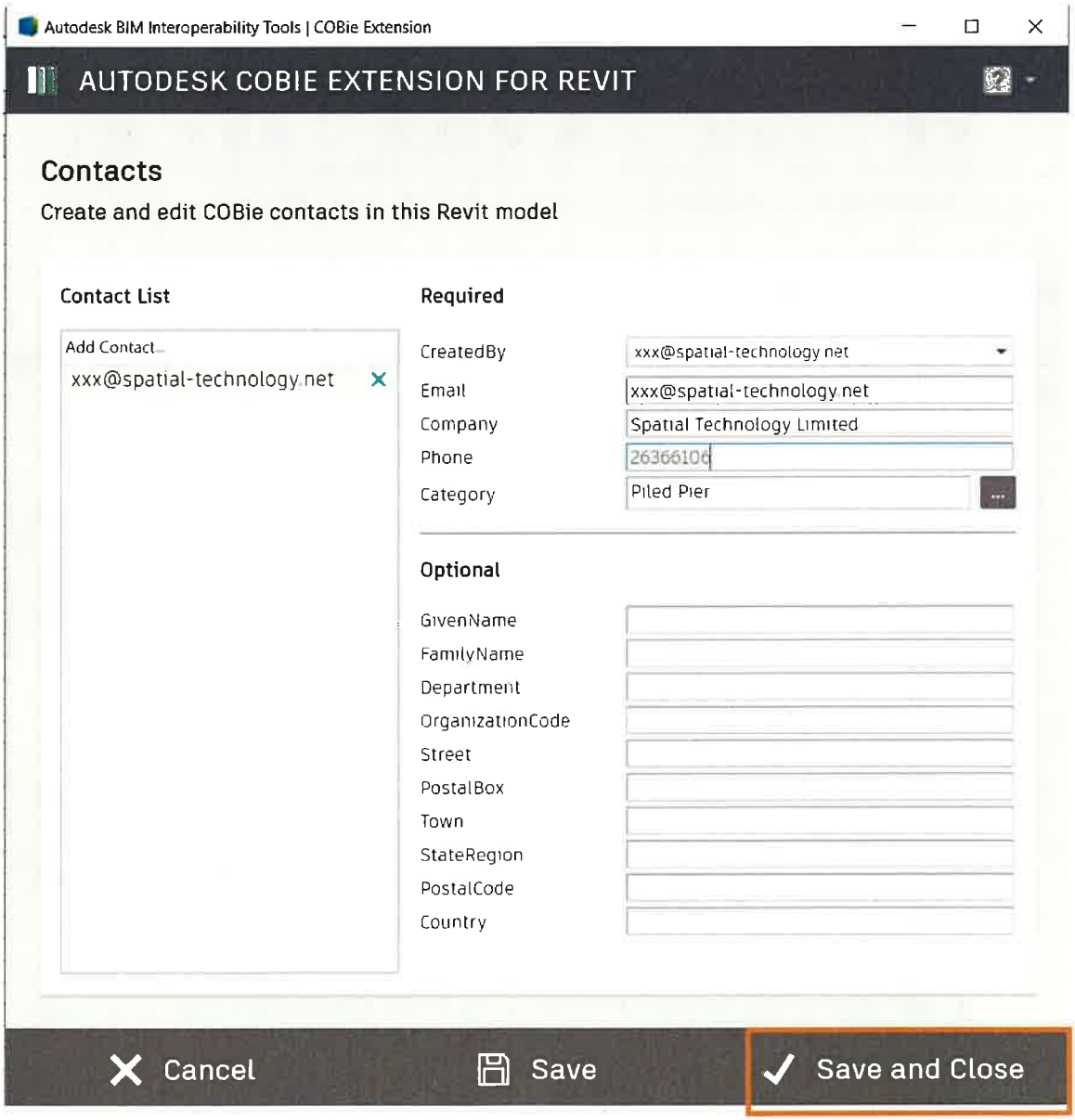
2. Update all information on the project



3. Press **OK** to complete

4. Go to the Revit Interoperability Tools Ribbon, click the **Contact** icon

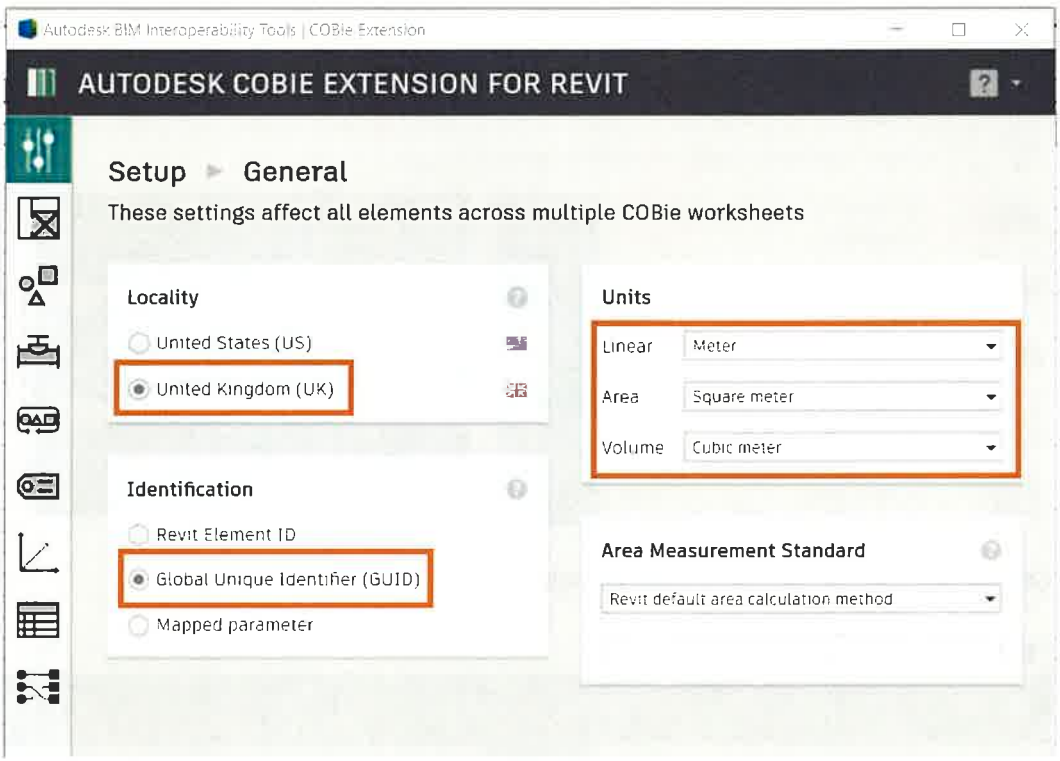
5. Enter the contact information of the modelling team and contact information of all maintenance parties. The field values of non-graphical attributes **CEDD_ManagementParty, CEDD_MaintenanceParty, CEDD_SuperstrMaintenanceParty, CEDD_T_Maunfacturer, CEDD_T_MgtParty**, and **CEDD_T_MaintenanceParty** must be matched with the values of the **Company** field in this area.



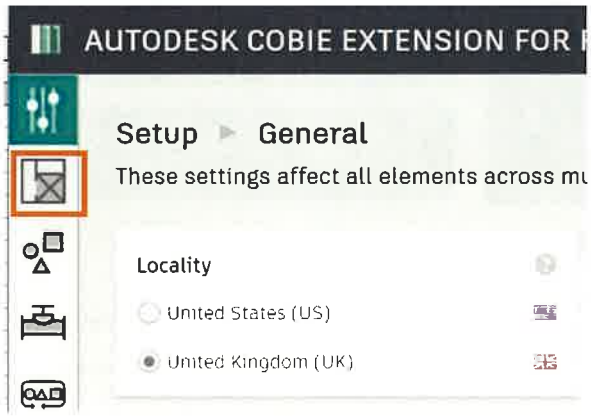
6. Press **Save and Close** when complete

7. Click the **Setup Project** icon from the BIM Interoperability Tools Ribbon

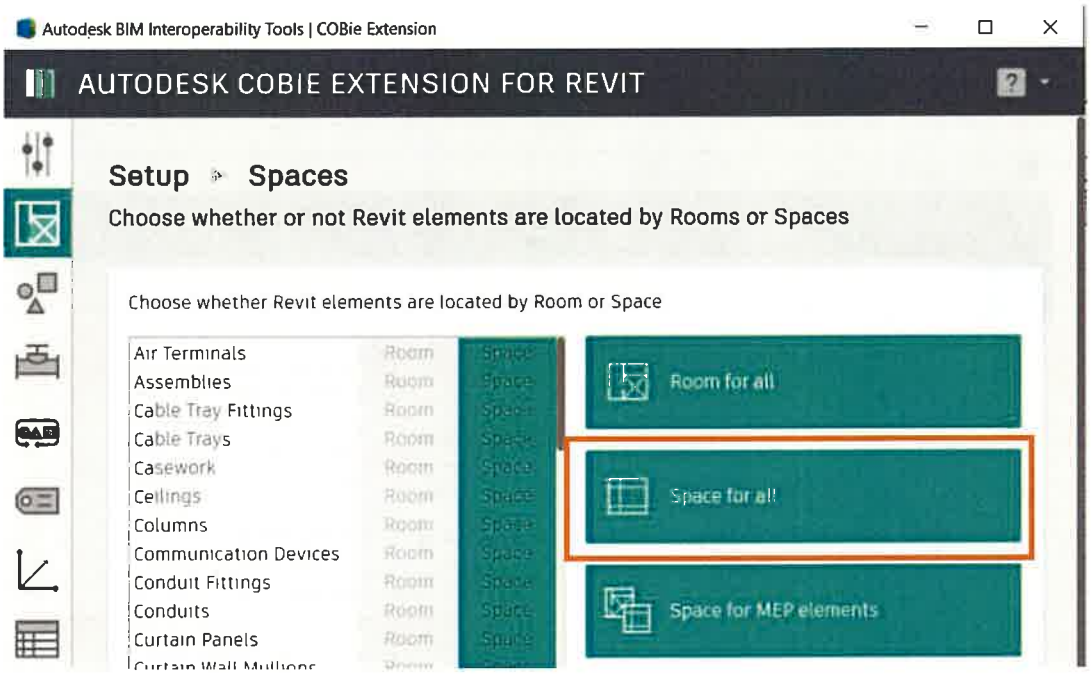
8. In the **Setup>General** page, update the highlighted settings



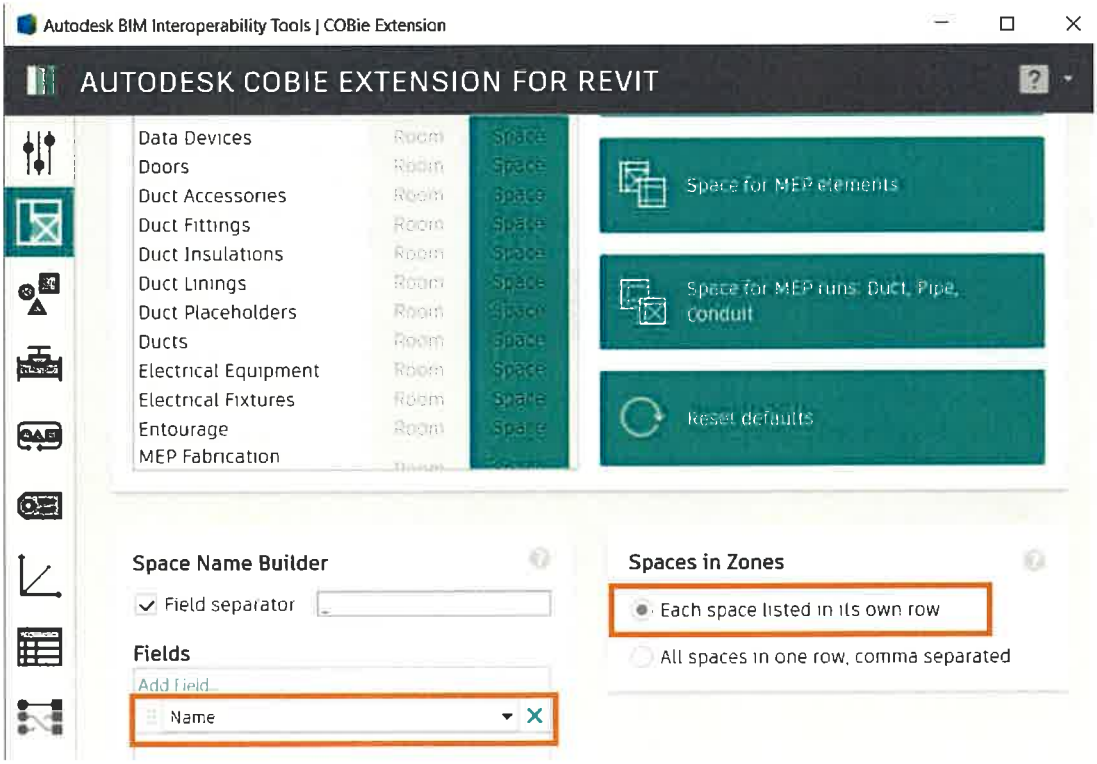
9. Go to the next page by clicking the highlighted icon



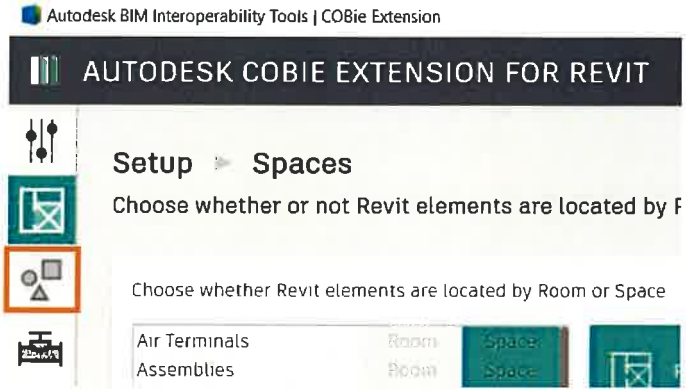
10. In the **Setup>Space** page, Use Space for all elements



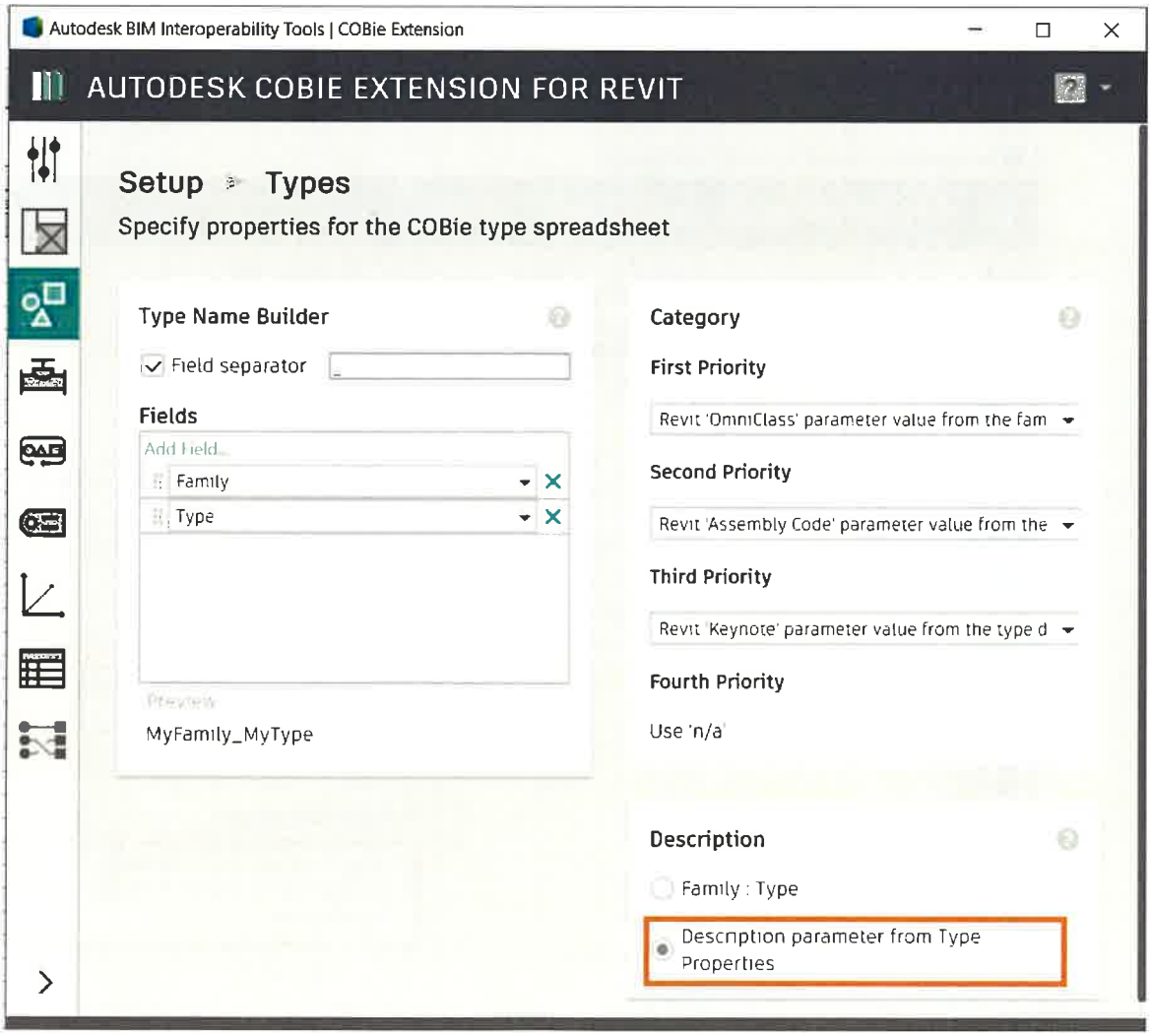
11. Scroll down the page, use the default settings as below



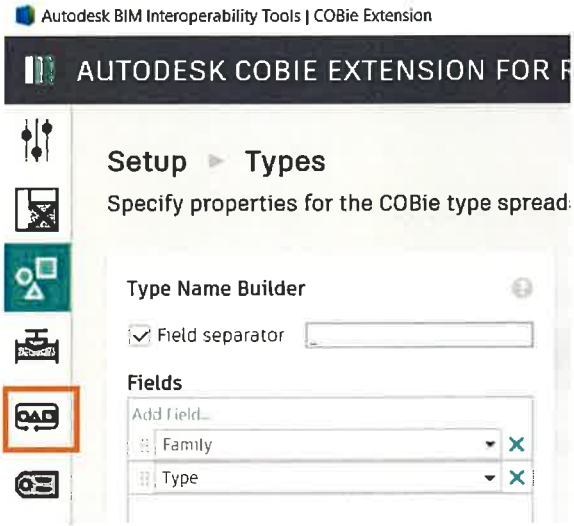
12. Go to the type page by pressing the highlighted icon



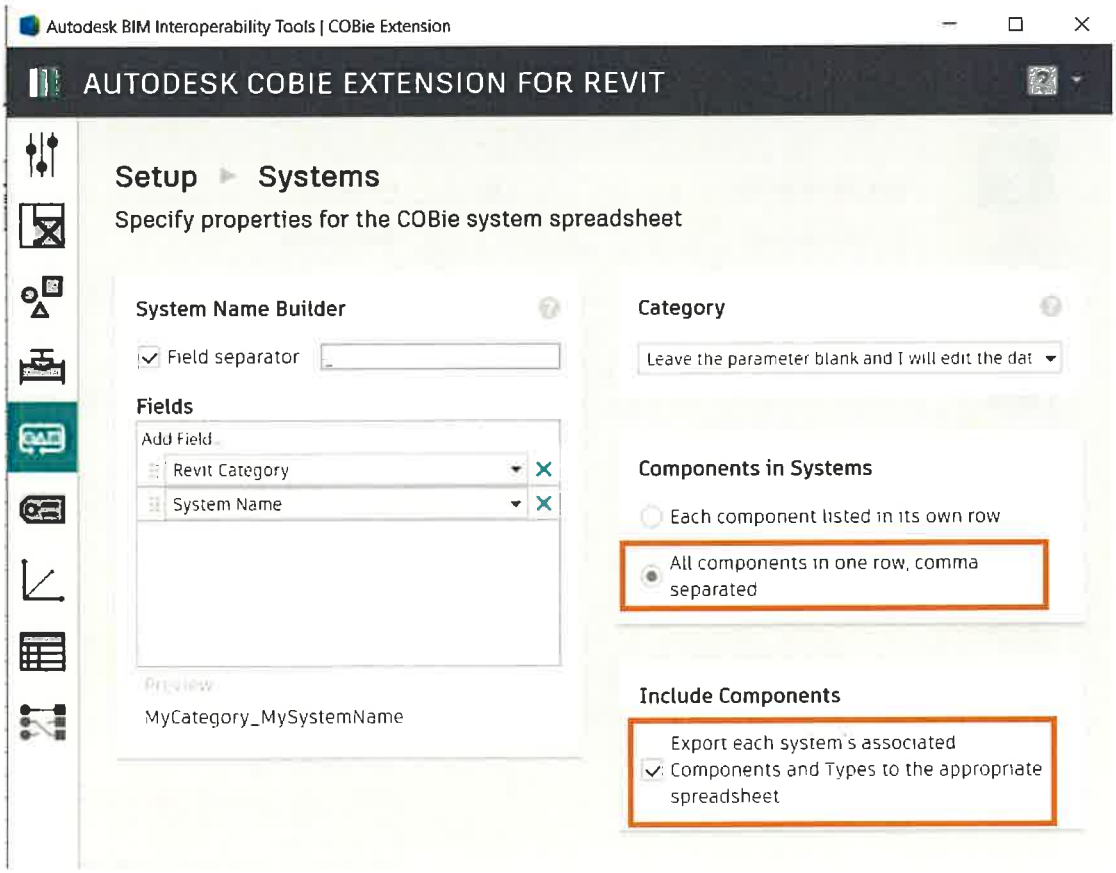
13. Update the settings according to the below screenshot



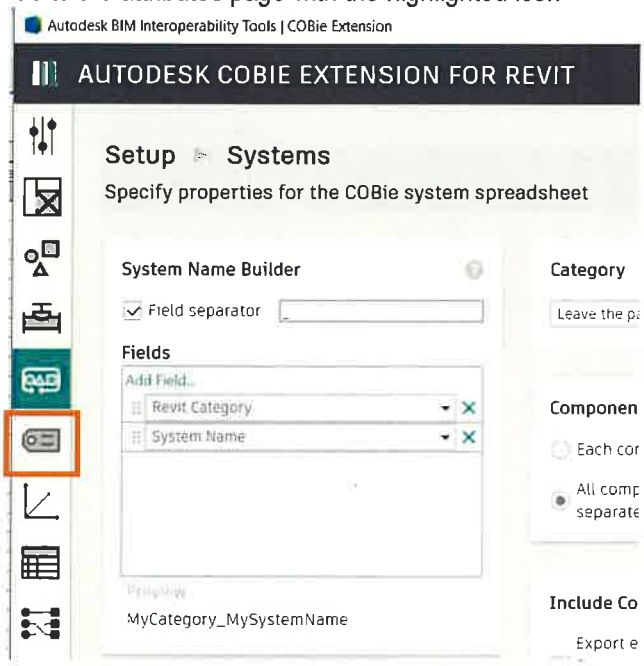
14. Ignore the components page, go to the system page by the highlighted icon



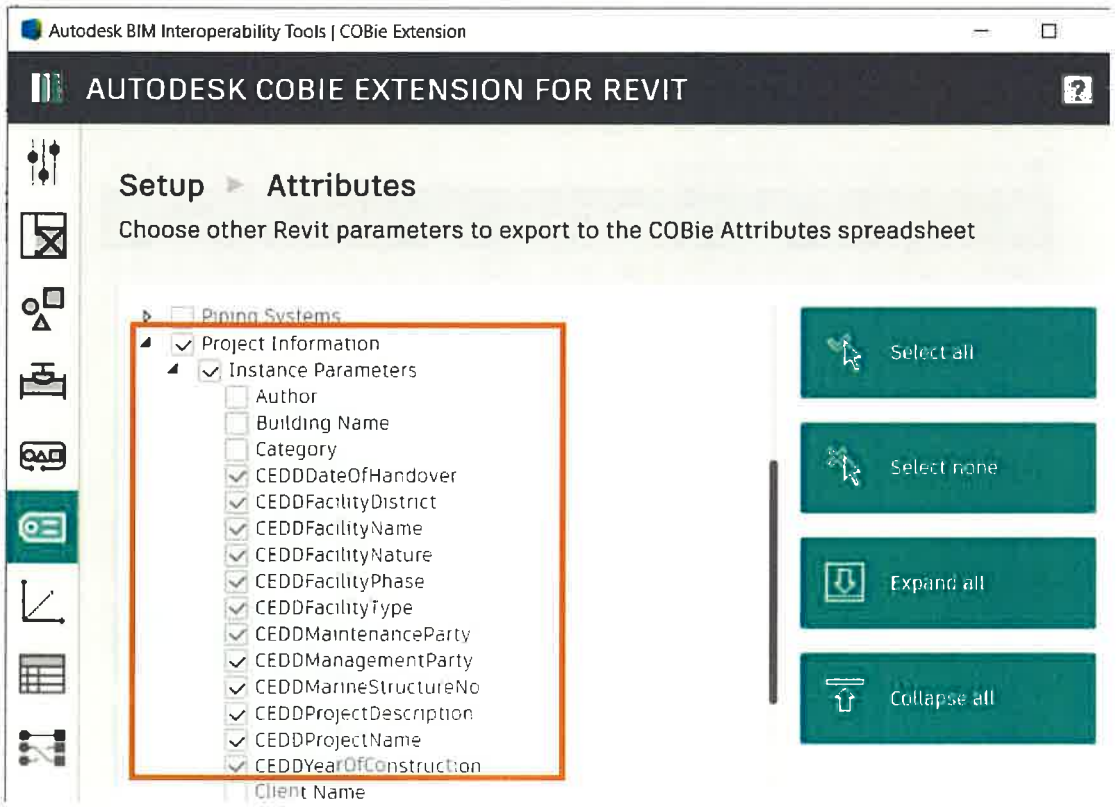
15. Update the default settings as below



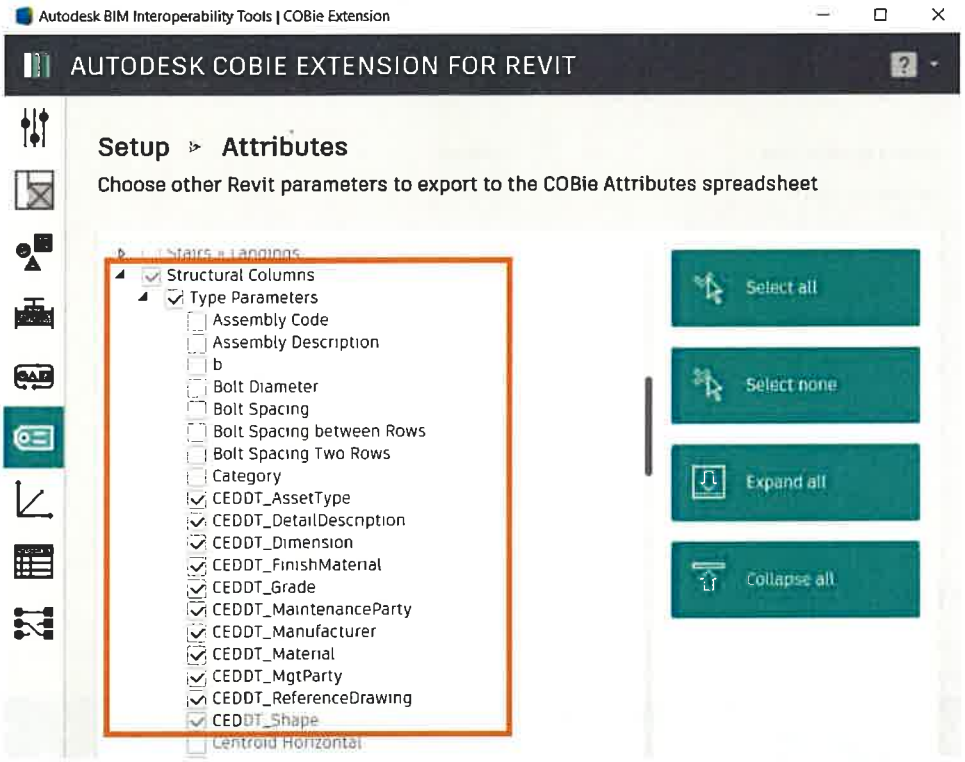
16. Go to the attributes page with the highlighted icon

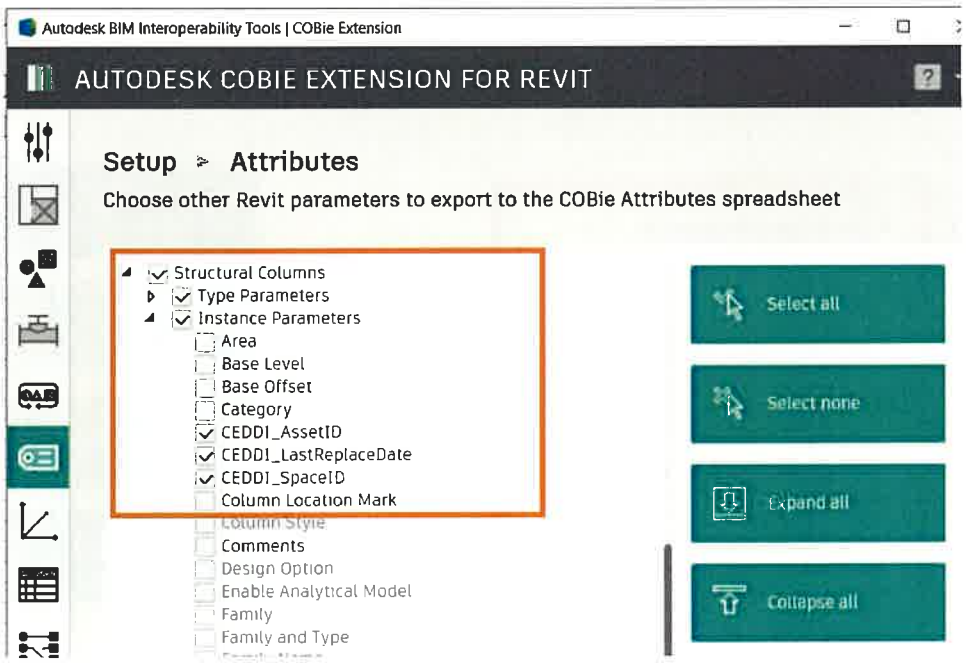


17. Go to the Project Information, Select all CEDD attributes under Instant parameters



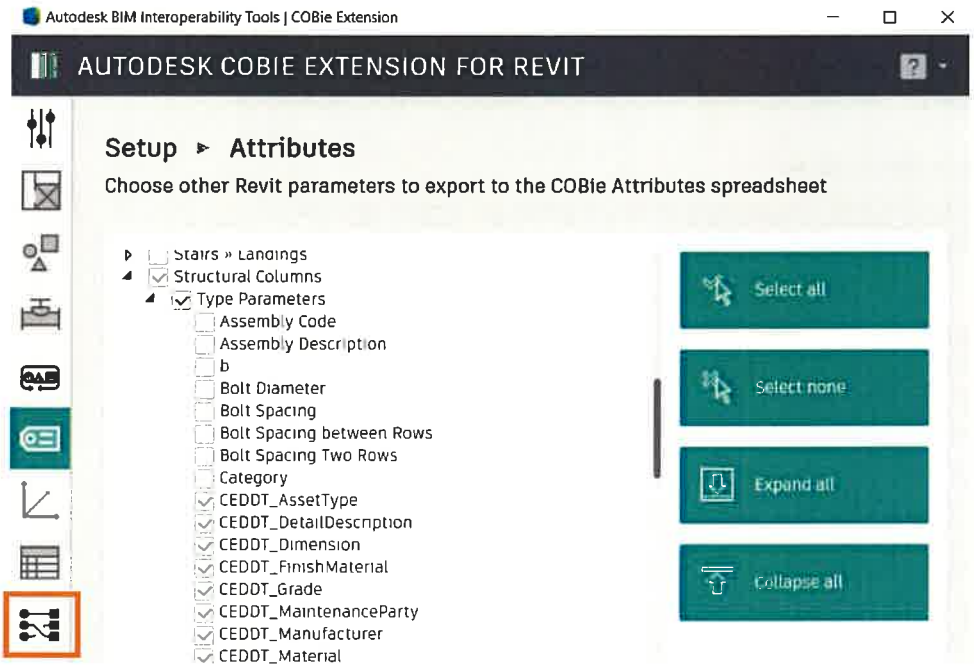
18. Depending on the Revit Categories Used in the project, the settings of each project may vary. The users shall select all the CEDD Type and Instant parameters for each category. An example for Structural Columns is shown below





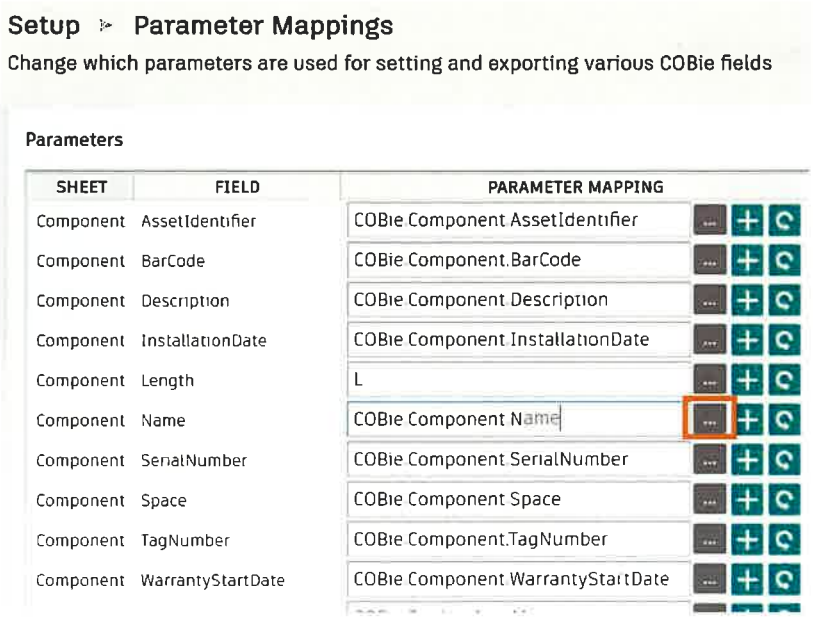
Note: Instant Parameters shall be missing if that Category is not used in the project

19. Ignore the Coordinates and Schedules page, go to the Parameter Mappings page with the last icon

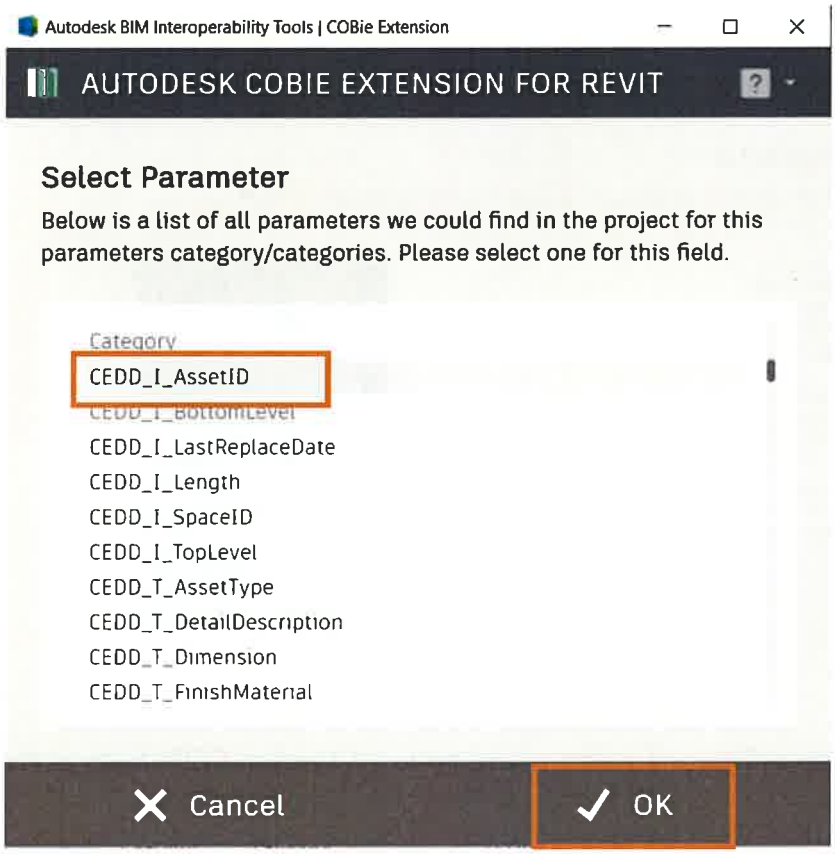


20. On this page, we map all Type and Instant parameters to the specified COBie fields as according to section 3.4 of this AIR

21. For example, in the Component Name row, select the Icon

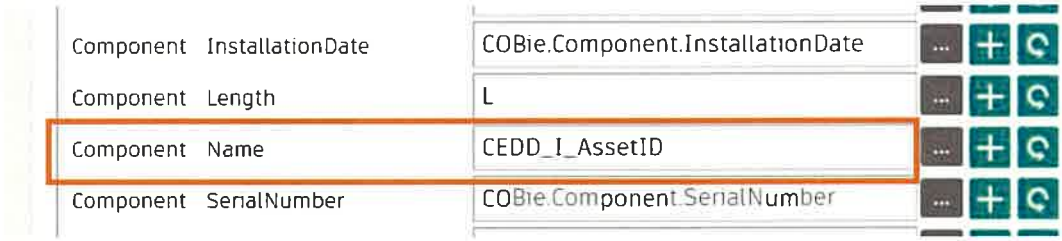


22. Select the required mapping field (**CEDD_I_AssetID**)

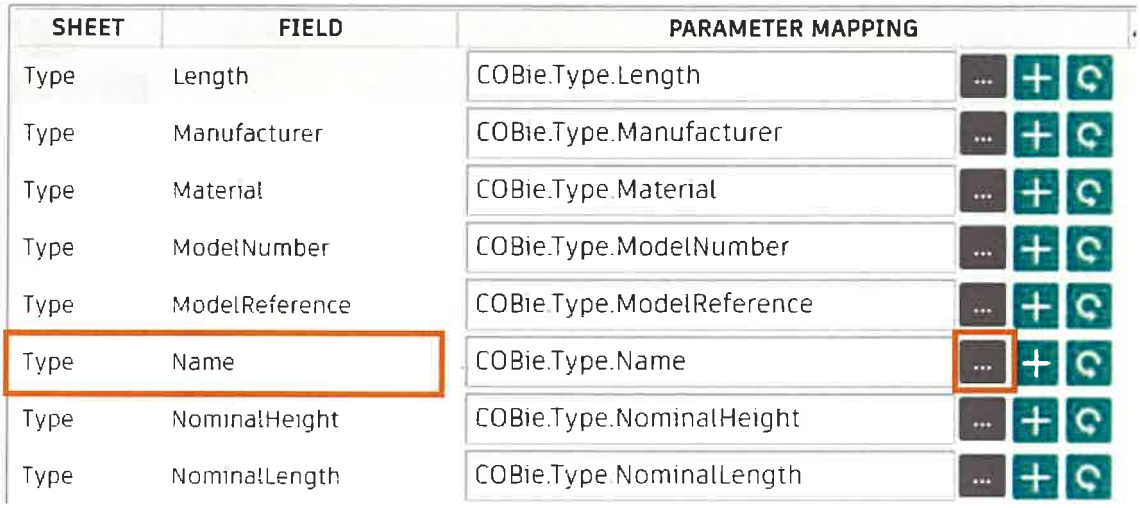


23. Press OK to continue

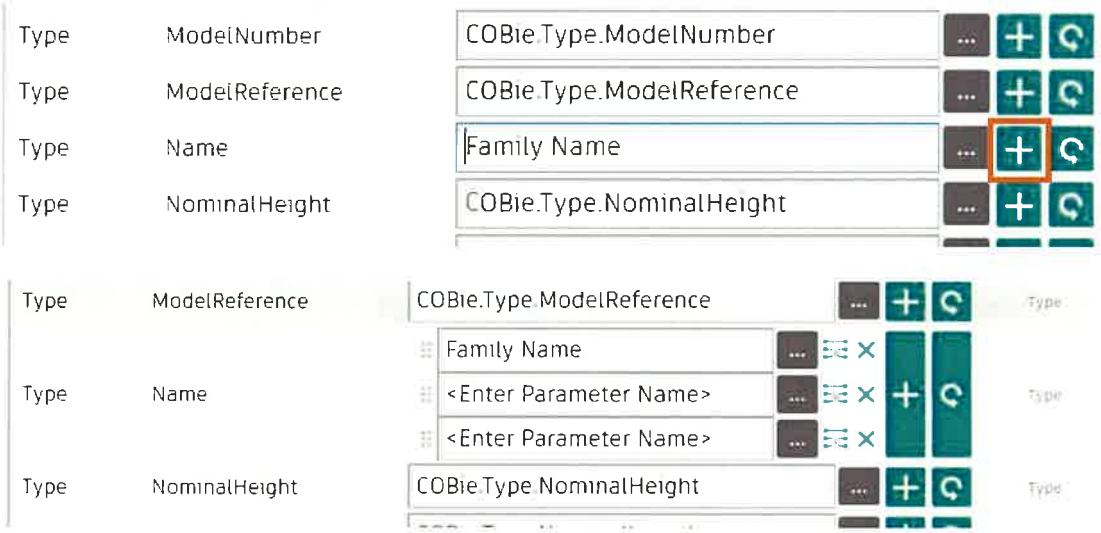
24. The mapping field will be updated



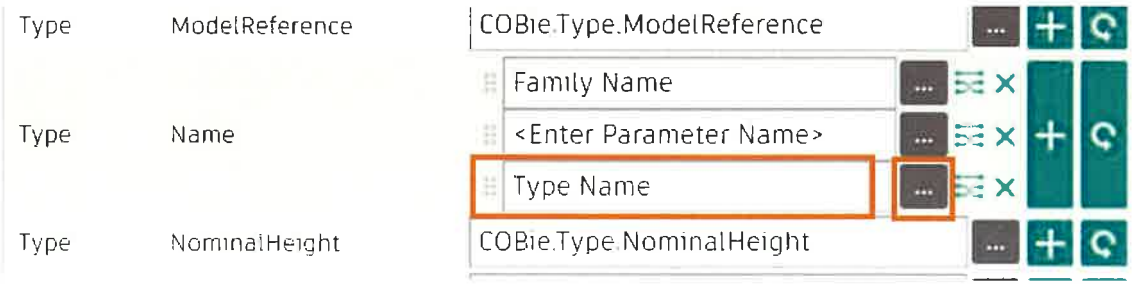
25. Continue to map another example Type Name, which composite two attributes
26. Scroll down the list to the Type Name, change the first field to Family name first



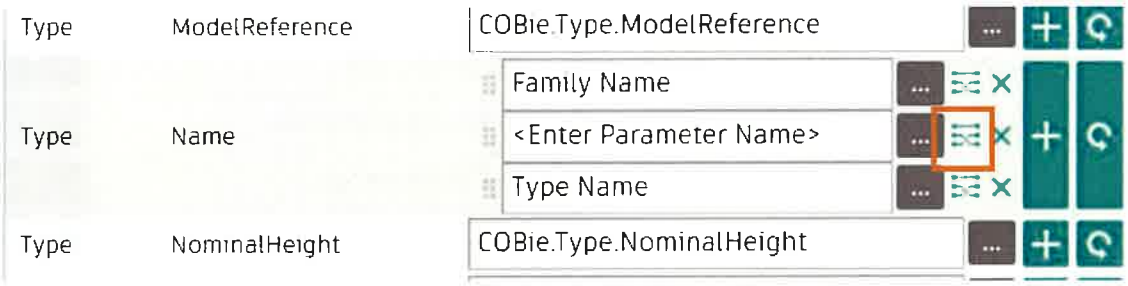
27. Press the add button twice to add two fields



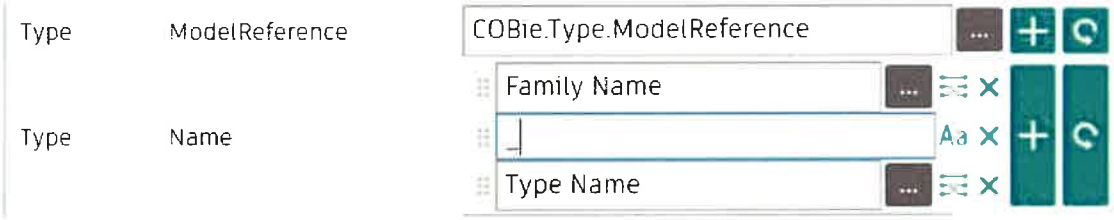
28. Change the mapping of the Last field to Type Name



29. Use the button to change the Parameter to Text



30. Enter "_" in the space

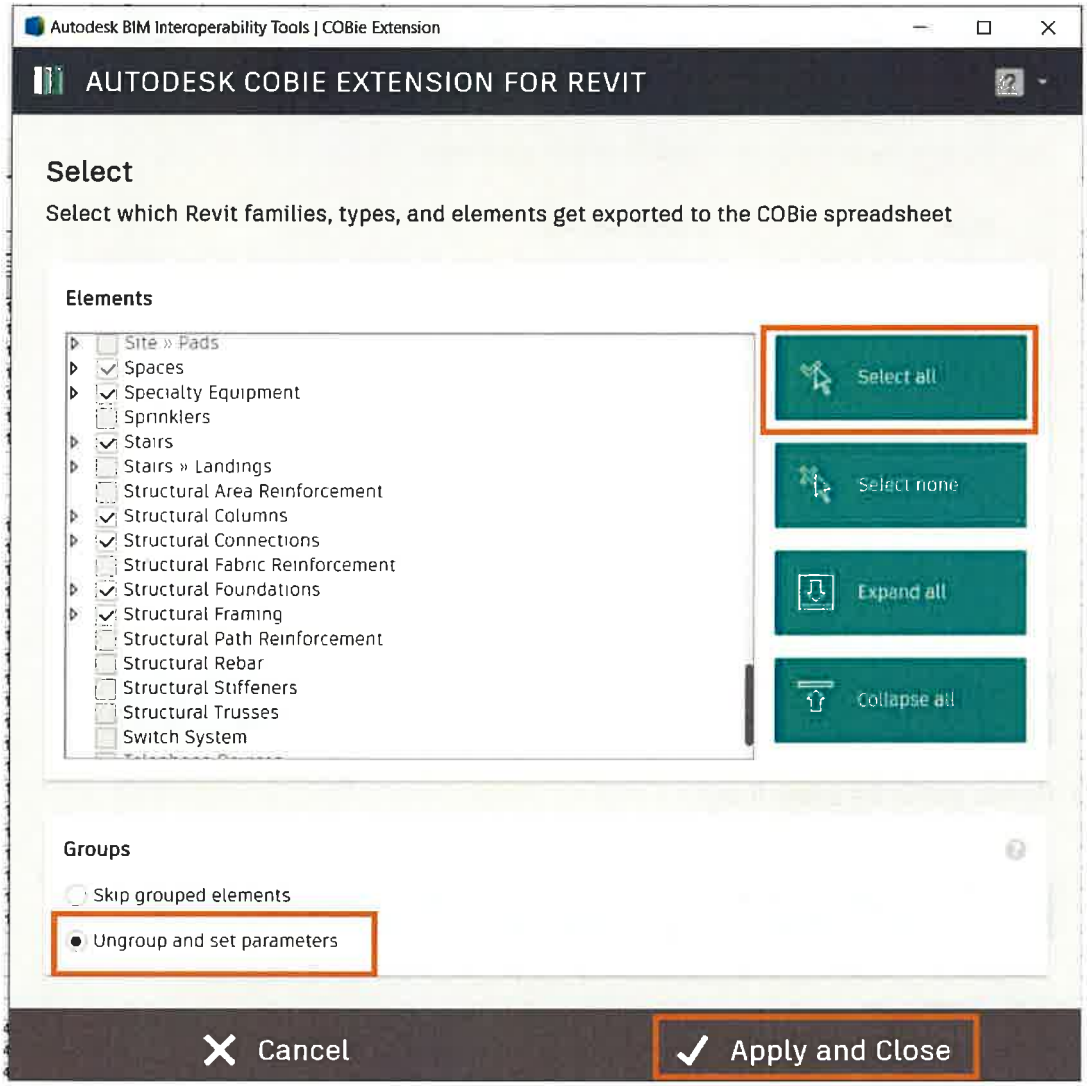


31. Continue to map all fields as required in section 3.4 of this AIR
    Noted that some attributes such as GUIDs (all sheets), Floor Name (Floor sheet), Space Name (space Sheet) are mapped automatically using the default settings

32. Press **Save and Close** when completed

33. Go to the **Select** Icon of the BIM Interoperability Tools

34. Use **Select All** to select the Revit Categories to be exported.
35. Select **Ungroup and Set Parameters**



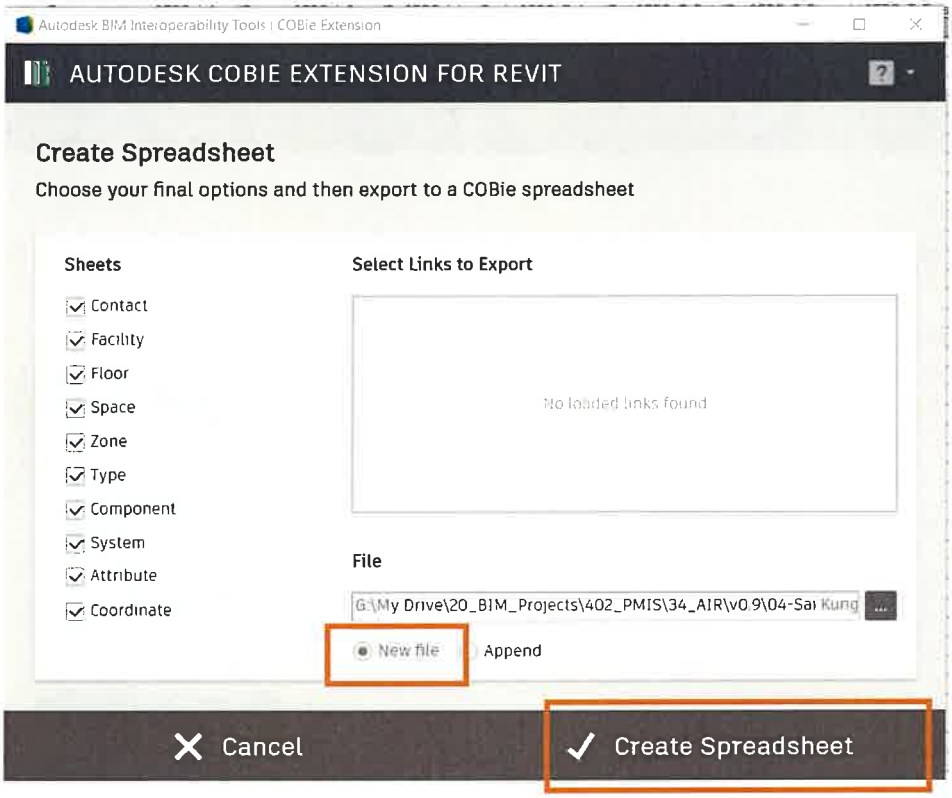
Note: Only the Categories Used in this project will be available for export

36. Press **Apply and Close**

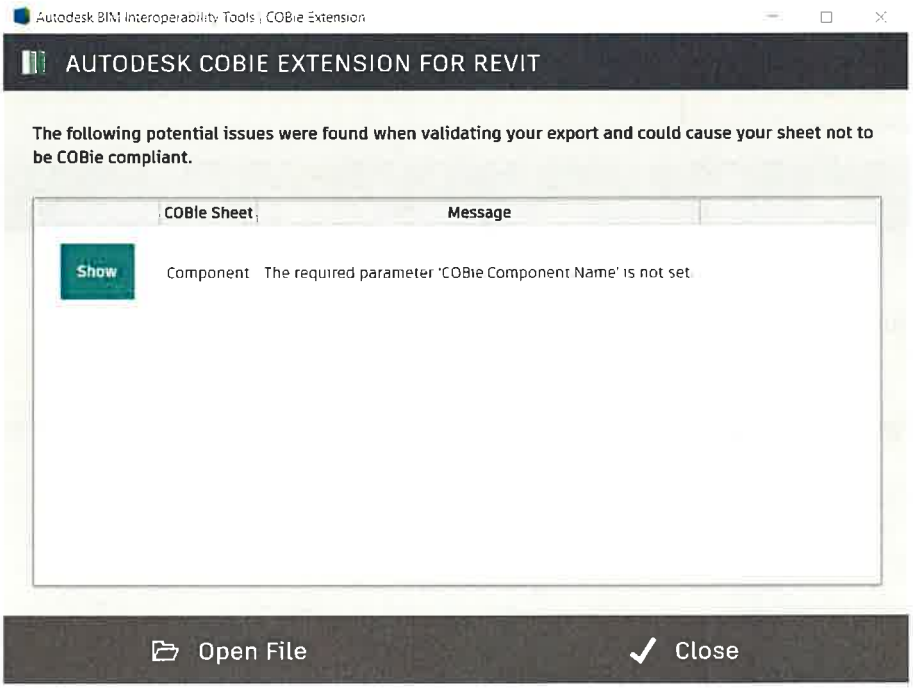
37. Click to the **Create SpreadSheet** Icon of the BIM Interoperability Tools to export the COBie sheet

38. Select all Sheets and specify the file path to export

39. Press **Create Spreadsheet** to export the COBie excel



40. Review and fix the errors, if any

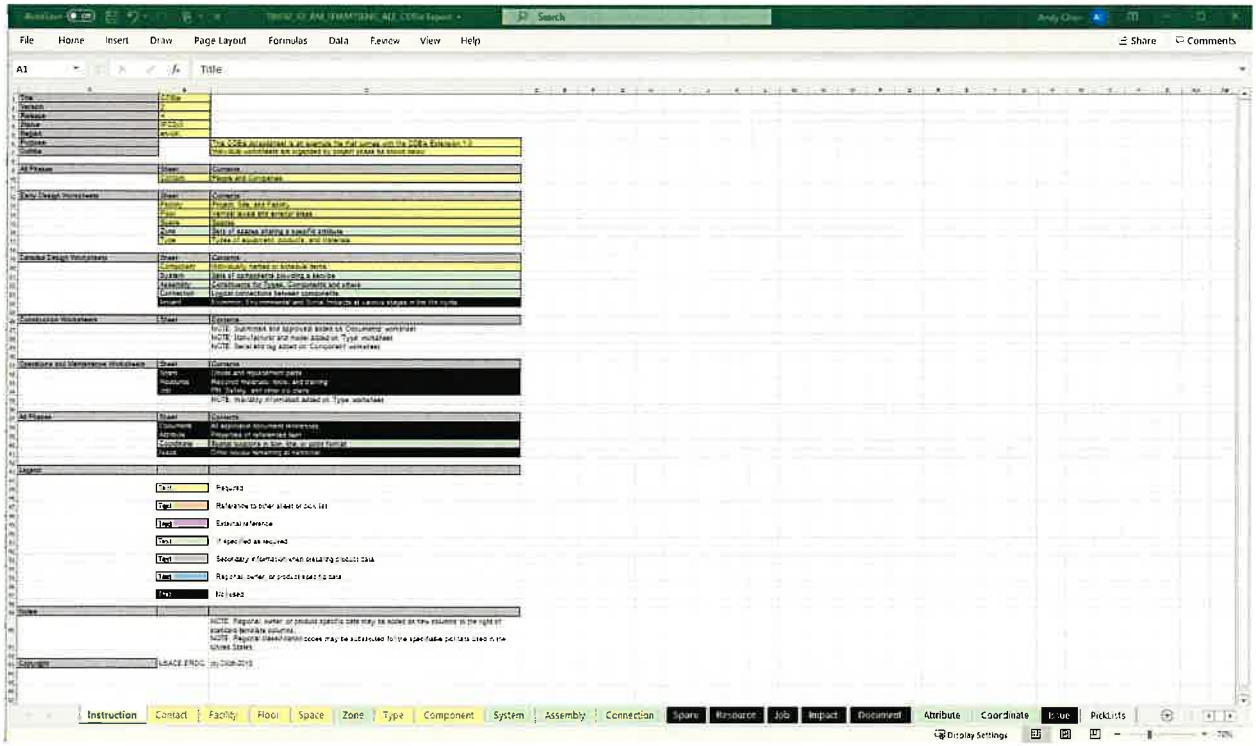


41. Repeat Step 37 when all errors are fixed

Appendix D: Introduction to COBie

Construction Operation Building Information Exchange format (COBie)[7] is a standard spreadsheet to handover asset information from the Asset Information Model (BIM model) to the Computerise Maintenance Management Software (CMMS). The standard of COBie is specified in the BS 1192-4:2014, Collaborative production of information Part 4: Fulfilling employer's information exchange requirements using COBie – Code of practice.

The COBie Spreadsheet includes 19 tables linked with each other using internal and external reference fields. Depending on the settings of CMMS, the asset information is linked with the AIM model with GUID or unique keys specified in the AIR. Depending on the organisation's selected CMMS, there are different standards to map the asset information fields into the COBie spreadsheets.



The Contact Sheet, Facility Sheet, Floor Sheet, Space Sheet, Type Sheet, Component Sheet, and System Sheet are required in the PWD/CEDD. The requirement is listed in section 3.4.

[7] For more information, visit https://www.thenbs.com/knowledge/what-is-cobie