**Demonstration / Observation RIICWD601E - Manage civil works design processes** 

**Assessment Task – Demonstration / Observation**

**Student Instructions**

The assessment task is due on the date specified in your timetable. Any variations to this arrangement must be approved in writing by your assessor.

This assessment is to be completed in the classroom / simulation / workshop setting at HIC. The required submission should be done by completing the work within the scheduled period for unit in accordance with instructions given below.

The purpose of this task is to assess your knowledge, skills and performance to manage civil works design processes. The assessor will use the checklist provided at the end of this task to make an assessment decision. As you perform your tasks the assessor may ask you some questions to assess your underpinning knowledge.

In this task, you are required to demonstrate your skills and knowledge by working through a number of activities and completing and submitting the required documentation. You will be provided with Supporting Documentation to complete the tasks as required.

**Task Activities**

Your task is to manage civil works design processes on at least two occasions for two selected safe design case studies. When managing civil works design processes, you must manage civil works design processes on at least two occasions, including:

• communicating and collaborating with clients to resolve problems and meet job requirements • seeking advice from required personnel where the proposed design includes non-standard engineering requirements or new technology

• monitoring and supporting design processes

• creating a demonstrating model of the design

• confirming documentation requirements are met

Whilst managing civil works when performing this task, ensure you work with others to manage civil works design processes. Work with others (assessor / classmates) to manage civil works design processes, including: • using a range of communication techniques and equipment

• checking and confirming design documentation and reporting requirements

• organising work activities to meet task requirements

• communicating with others to receive and clarify work instructions

• communicating with others to coordinate work activities

**Case Study Occasion 1 (Annex 1)**

• risk assessments and management - A risk register has been developed as part of a risk assessment process undertaken during the project’s planning phase. The risk register ranks all identified risks according to the magnitude of their potential to impact the project. Some of the key risks identified in the record have been incorporated or addressed in this execution plan (Annex 1). Regular risk assessment sessions will be held during the project to ensure that the register is updated and monitored the mitigation and control measures applicable to the risks.

• Statutory compliance and environmental management - see the statement of applicable regulations, and draft Environmental Impact Statement

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• work health and safety - MRM are developing the current SMS into an integrated HSEC management system, which will be compatible with the requirement of AS/NZS 4801:2001 Occupational Health and Safety Management System. The HESC is scheduled for certification in 20XX. The construction operation will be incorporated into the integrated HSEC

• management system.

• Environmental requirements - Topsoil management, erosion and sediment control during construction, rehabilitation requirements for the realigned channel sections, flood protection levee, and rehabilitation monitoring will be contained in a site-specific Environmental Management Plan.

• Cultural and heritage management - There are several registered and recorded cultural significance sites in the project area’s vicinity. The Aboriginal Areas Protection Authority (AAPA) has issued authority certificates for all the open-cut project areas according to Sections 22 of the Northern Territory Aboriginal Sound Sites Act 1989.

• Quality management - The quality system used on the project will comply with AS/NZ ISO 9001:2000. A quality management plan will be developed for the project manager’s project in collaboration with the construction manager.

**Case Study Occasion 2 (Annex 2)**

• Risk assessments and management - Concerns were also raised about the risk of roadside trees through Hartley Valley.

• Statutory compliance and environmental management - The Office of Water commented on RMS statutory requirements as a road authority and public authority that exempts the need for approval or access licence regarding water management. However, the Office of Water requests that RMS demonstrates compliance with the NSW Office of Water Guidelines for Controlled Activities (2012).

• Work health and safety – Refer to 4.3.1. Road user concerns – safety improvements. • Management system - Feedback in written responses, Feedback from community meetings and references to the management plan

• Environmental requirements - The concept design’s planning approval process would be following the Environmental Planning and Assessment Act 1979 (EP&A Act). It is anticipated that RMS would be the responsible approval authority for any future environmental impact assessment under Part 5 of the EP&A Act. Refer to 4.5 and 4.5.1 environmental impacts.

• Cultural and heritage management - RMS acknowledges that there is a potential for Aboriginal heritage items, archaeological sites or other culturally essential locations to be disturbed as part of the development of the highway upgrade. In addition to several known Aboriginal sites within the vicinity of the future upgraded highway, there are potentially more sites yet to be identified. More detail about Aboriginal heritage investigations can be found in the Concept Report and the Aboriginal Archaeological Survey Assessment, which can be found on RMS’ website.

• Quality management – Refer to 4.4.3. Process – report quality.

Use the “NAPSPEC National BIM Guides (Annex 2-6). The NATSPEC National BIM Guide/s assist with is a suite of documents used to implement BIM on civil construction projects. Like other briefing documents, it outlines the scope of services required for the project. It allows the project team to formulate an adequate response.

***Note:*** *The National BIM Guide/s (Annex 2-6) are reference documents to be read in conjunction with the Project BIM Brief (Appendix 1). The guide is to assist clients and stakeholders in clarifying their BIM requirements in a nationally consistent approach. This document is a reference document that defines roles and responsibilities, collaboration procedures, approved software, modelling requirements, digital deliverables and documentation standards. It documents a range of possible uses for BIM on projects. Use the guides provided (Annex 1-6) to read and identify and interpret information from workplace procedures, documentation, legislation and regulations.*

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*When completing the Templates in the order noted reduces the tendency to get bogged down in detail before more fundamental issues resolved. In practice, all documents are interrelated, a certain amount of working backwards and forwards will be required during the BIM Management Plan development. The critical point is that the overall strategic considerations addressed before launching into detailed planning.*

*Even though each document targeted different groups, much of each is still relevant to all. As read in conjunction with each other, their content must be consistent. The responsibility for making sure of this and coordinating their development should fall to a single person, such as the Lead BIM Adviser or Lead Consultant/Manager.*

**Task Details**

**1.** Access, interpret and apply documentation needed for civil works design and confirm work activity is compliant and review designs, including analysing and confirming the following project documentation. Use reading skills to Identify and interpret information from workplace procedures, documentation, legislation and regulations (Annex 1 – 7 and Supporting Documents 1 – 43). Review the designs, including interpreting and confirming the following project documentation (Annex 1 - Case Study 1 and Annex 1 - Case Study 2).

Review the information in the case studies as follows:

• Plans and drawings (Annex 1 - Case Study 1 and Annex 1 - Case Study 2)

• Specifications (Annex 1 - Case Study 1 and Annex 1 - Case Study 2)

• Design briefs (Annex 1 - Case Study 1 and Annex 1 - Case Study 2)

• Engineering survey information (Annex 1 - Case Study 1 and Annex 1 - Case Study 2) • Hydrological, meteorological data geotechnical data (Annex 1 - Case Study 1 & Annex 1 - Case Study 2) • Cultural and heritage data (Annex 1 - Case Study 1 and Annex 1 - Case Study 2)

• Supporting design implementation (Annex 1 – 7 and Supporting Documents 1 – 43)

**2.** Meet with your client team (classmates / assessor) to complete the Project BIM Brief (PBB) (Appendix 1). This briefing document defines the client requirements and expectations for the two civil construction projects. You are to use Appendix 1 to identify client goals, objectives, and people’s responsibilities. To do this, complete a strategic definition by completing the Project BIM Brief (PBB) involving all key Project Stakeholders (classmates and / or assessor) within the client body.

Before meeting with the clients (classmates / assessor) locate and apply the required legislation, documentation (Annex 1-7 and Supporting Documents 1 – 43), policies and procedures outlined in the project quality plan (Annex 8). At the meeting, communicate and collaborate with the clients to interpret and apply scope design requirements of civil works, resolve problems and meet job requirements. It would help if you aimed to:

• Obtain, interpret, clarify and confirm work requirements

• Analyse client design criteria requirements for civil works to ensure required specifications included • Advise client on the potential environmental impact of proposed works and provide design options that meet environmental requirements

• Access, interpret and apply documentation needed for civil works design and confirm work activity is compliant

• Confirm required development and implementation factors addressed in civil works design criteria • Obtain and document client agreement on civil works design criteria

• Advise client of potential impacts of proposed works on local communities

Ensure when communicating orally, present information and assists using sector-specific vocabulary, use listening and questioning to clarify and confirm understanding. Also, use practical communication skills when participating in the meeting and demonstrate your ability to work with others to manage civil works design

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processes, including:

• using a range of communication techniques and equipment • checking and confirming design documentation and reporting requirements • organising work activities to meet task requirements

• communicating with others to receive and clarify work instructions • sharing with others to coordinate work activities

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**Appendix 1**

**Project BIM Brief (PBB)**

| Project name: |  |
| --- | --- |
| Project owner: |  |
| Project address/location |  |
| Brief project description: |  |
| Contract type/delivery  method: |  |
| Contractor engagement - indicative date: |  |

**PROJECT SCHEDULE**

Fill in the table below with any significant project milestones which occur during the project life cycle.

| Project phase/milestone | Estimated start date | Estimated completion date |
| --- | --- | --- |
| Pre-design |  |  |
| Concept design |  |  |
| Preliminary design |  |  |
| Developed design |  |  |
| Detailed design |  |  |
| Construction |  |  |
| Handover |  |  |
| Operation |  |  |

**KEY PROJECT CONTACTS**

List all the known vital stakeholders who will be involved in BIM on this project.

| Role | Discipline | Company name | Contact name | Contact details |
| --- | --- | --- | --- | --- |
| Client  representative | NA |  |  |  |
| Project  manager | NA |  |  |  |
| BIM manager(s) | NA |  |  |  |
| Lead consultant |  |  |  |  |
| Other project  roles |  |  |  |  |

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**PROJECT GOALS**

List client goals and expectations for the project. This table will assist in defining BIM uses required for the project in alignment with the project goals.

| Priority  (high/med/low) | Goal description - value added objectives | BIM Uses |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

**BIM USE COMPETENCY REQUIREMENTS**

The purpose of this table is to identify the potential value, experience and competencies required of responsible parties for the BIM enablement of the project.

| BIM  Use | Value to  project | Responsible parties | Value to  responsible  parties | Competencies required to implement |
| --- | --- | --- | --- | --- |
|  | High/med/low |  | High/med/low |  |
|  |  |  |  |  |
|  |  |  |  |  |

**CLIENT SPECIFIC REQUIREMENTS**

List any client-specific requirements, including any standards or protocols that might create a different workflow for the project team.

| Specific requirements |
| --- |
|  |
|  |

**ENVIRONMENTAL REQUIREMENTS**

Advise client on the potential environmental impacts of proposed works and provide at least one design option that meets environmental requirements

| Environmental requirements |
| --- |
| 1 |
| 2 |

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**IMPACTS TO LOCAL COMMUNITIES**

Advise client of two potential impacts of proposed works on local communities

| Impacts on local communities |
| --- |
| 1 |
| 2 |

**PROJECT DELIVERABLES**

This section lists the BIM deliverables for the project and the format in which the information will be delivered.

| BIM  Use | Approximate due date/stage | Format | Comments |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |

**REFERENCE DOCUMENTS & STANDARDS**

The following documents are listed for reference.

| Generic title | Applicable reference document/notes | Version |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

**Confirmation**

We, the clients, confirm the required development and implementation factors have been addressed in the civil works design criteria outlined above

| Client name | Client Signature | Date |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

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**3.** Prepare and complete the workplace report – “BIM Project Execution Plan” using civil construction sector specific vocabulary, grammatical structures and conventions as appropriate. You should base your report on Annex 1. Complete the draft report – “BIM Project Execution Plan.” (Appendix 2). The report provides the basis for the construction design and documentation. It will significantly influence the scope of BIM use.

You are the Design Manager. With your team listed below

• establish a platform for good communication and collaboration between relevant parties and a good design and production information flow.

• De-risk design problems by finding solutions before they materialise (you must make at least one improvement /amendment.

• Contribute to planning and coordination in a way that adds value to the processes. • Prepare, manage and secure all-party ownership of an integrated design programme.

At the meeting, demonstrate you are an excellent forward planner capable of managing project timescales. The requisite knowledge for ensuring the design process is following current legislation, standards and codes of practice. Seek advice from the required personnel (classmates / assessor):

• Client representative

• Project Manager/Lead

• Lead consultant

• Design BIM Manager

• Lead Designer

• Architect

• Civil & Structural Engineer

• Cost Consultant

• Civil Construction Lead

• Contract Administrator

• Health & Safety Advisor

• Client or Client Advisor

Meet with the team listed above to create a demonstrating model of the design (Appendix 2 based on case studies). Identify the project design options for civil works and determine the preferred design option. At the meeting, implement the requirements, procedures and techniques to manage civil works design processes related to case studies.

Kick the meeting off by defining the process of ascertaining if it is feasible to meet the brief’s requirements as provided (Appendix 1). When preparing the execution plan with your team and client representative listed above, you should complete the following sections:

Section 1: BIM Project Execution Plan Overview

1.1 Introduction

1.2 Instructions for Use

1.3 Project Development Requirements

1.4 Data Utilisation and Ownership

1.5 Applicability

1.6 Team Leads

Section 2: Project Information

2.1 Project and Title Information

2.2 Project Phases/Milestones

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Section 3: Project Contacts

3.1 Core Collaboration Team

Section 4: Project Goals /BIM Uses

4.1 Major BIM Goals/Objectives

4.2 BIM Uses

Section 5: Organisational Roles /Staffing

5.1 Design Team BIM Manager

5.2 Lead BIM Coordinators

5.3 Construction Team BIM Manager

Section 6: BIM Responsibilities

6.1 Design Team Responsibilities

6.2 Record Models

6.3 Project Team Responsibilities

When completing section 1 – 6, ensure you work collaboratively with your team. Establish collaborative practices and bring together many diverse disciplines as listed above, many of whom have worked together before. In your collaborative practice approach involves the coordination and integration of a great deal of complex information, procedures and systems as outlined in the case studies to:

• Prepare the planning application as part of the (Spatial Coordination stage, Technical Design stage and Handover stage)

• Identify innovative procedures for developing the design concept according to design requirements specified

• Investigate and analyse potential design concepts that meet design requirements • Collaborate with client to improve outcomes and resolve issues associated with a design concept

To initiate, monitor and support the design of civil works, you need to complete sections 7 and 8.

Section 7: Model Objectives and application

7.1 Programming/Pre-Design Phase

7.2 Schematic Design Phase

7.3 Design Development Phase

7.4 Construction Documents Phase

7.5 Review

7.6 Construction Phase

7.7 Project Closeout – Record Deliverables Phase

Section 8: Level of Development (LoD)

8.1 Level of Development Descriptions/Procedures

8.2 Model Detail & Level of Development (LOD) Chart

8.3 Construction & Record BIM

8.4 Understanding Level of Development

When completing sections 7 and 8, ensure you:

• Prepare functional specifications according to engineering standards and design specifications • Analyse and select resources, processes and systems required to develop the design

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• Coordinate design tasks to meet required outcomes and cost structure

• Develop and check design solution against engineering specifications

Complete section 9 – 11.

Section 9 BIM Information Exchanges and model sharing

9.1 Integrated Project Delivery (IPD) Methodology

9.2 Geo-Referenced Model

9.3 Collaboration & Model Sharing

9.4 Version Control

9.5 Efficient Project Work Flow

9.6 Model Description Document

Section 10: Quality Control

10.1 Overall Strategy for Quality Control

10.2 Quality Control Checks

10.3 Model Accuracy and Tolerances

10.4 Clash Detection/Coordination

10.5 Meeting Procedures

10.6 Model Delivery Schedule of Information Exchange for Submission and Approval

Section 11: Technology Platform and Software

11.1 Approved BIM Software for the projects

When completing section 9 -12, ensure you confirm documentation and amendment requirements are met, ensuring you:

• Establish documentation management process according to workplace requirements • Check and confirm supporting documentation required to implement the design meets workplace requirements

• Check and confirm the design is identified by design documentation and records specified by the client • Apply documentation control process specified by the client (Appendix 1) when making changes to the design

• Check and confirm design documentation for currency and accuracy, completing section 12 Amendment section

***Note:*** *Section 12 relates to amendments advised by the client. Ensure you have been incorporated amendments recommended by the client that meets legislative requirements (in section 12, identify at least one amendment required by the client representative and explain how it meets legislative requirements).*

*When preparing the execution plan, ensure you complete workplace reports using sector-specific vocabulary, grammatical structures and conventions.*

Ensure when communicating orally, present information and assists using sector-specific vocabulary, use listening and questioning to clarify and confirm understanding. Also, use practical communication skills when participating in the meeting and demonstrate your ability to work with others to manage civil works design processes, including:

• using a range of communication techniques and equipment

• checking and confirming design documentation and reporting requirements

• organising work activities to meet task requirements

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• communicating with others to receive and clarify work instructions • sharing with others to coordinate work activities

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**Appendix 2**

**BIM Project Execution Plan**

**Section 1: BIM Project Execution Plan Overview**

**1.1 Introduction**

BEP is a plan defining the goals of implementing BIM technology in a project. It describes how the constructed model will be applied, explains the implementation processes and the ways of information exchange. It also contains information on the entire project infrastructure required for a successful BIM implementation, i.e., the technologies we will apply, the team responsible for the implementation and the contracts to be fulfilled. In short, BIM Execution Plan focuses on delivering value by implementing BIM to the project.

You have to remember there is no universal BIM implementation method for every project. Each team should effectively design a well-adapted BEP implementation strategy. Therefore, only the team understanding the project’s goals, its characteristics, and the capabilities of its members can effectively implement BIM in the project. After establishing the plan, the team should follow and monitor progress according to the plan. Constant developing, updating, and correcting the plan at every stage of the project is essential to benefit from BIM implementation.

**1.2 Instructions for Use**

To successfully implement Building Information Modelling (BIM) on a project, the project team has developed this detailed BIM Project Execution Plan. The BIM Project Execution Plan defines for BIM on the project (e.g. design authoring, cost estimating, and design coordination) and a detailed design of the process for executing BIM throughout the project life cycle.

[INSERT ADDITIONAL INFORMATION HERE IF APPLICABLE. FOR EXAMPLE, BIM MISSION STATEMENT This is the location to provide additional BIM overview information. Additional detailed information can be included as an attachment to this document.

**1.3 Project Development Requirements**

Section 1: BIM Project Execution Plan Overview

1.1 Introduction

1.2 Instructions for Use

1.3 Project Development Requirements

1.4 Data Utilization and Ownership

1.5 Applicability

1.6 Team Leads

Section 2: Project Information

2.1 Project and Title Information

2.2 Project Phases/Milestones

Section 3: Project Contacts

3.1 Core Collaboration Team

Section 4: Project Goals /BIM Uses

4.1 Major BIM Goals/Objectives

4.2 BIM Uses

Section 5: Organisational Roles /Staffing

5.1 Design Team BIM Manager

5.2 Lead BIM Coordinators

5.3 Construction Team BIM Manager

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Section 6: BIM Responsibilities

6.1 Design Team Responsibilities

6.2 Record Models

6.3 Project Team Responsibilities

Section 7: Model Objectives and application

7.1 Programming/Pre-Design Phase

7.2 Schematic Design Phase

7.3 Design Development Phase

7.4 Construction Documents Phase

7.5 Review

7.6 Construction Phase

7.7 Project Closeout – Record Deliverables Phase

Section 8: Level of Development (LoD)

8.1 Level of Development Procedures

8.2 Model Detail & Level of Development (LOD) Chart

8.3 Construction & Record BIM

8.4 Understanding Level of Development

Section 9 BIM Information Exchanges and model sharing

9.1 Integrated Project Delivery (IPD) Methodology

9.2 Geo-Referenced Model

9.3 Collaboration & Model Sharing

9.4 Version Control

9.5 Efficient Project Work Flow

9.6 Model Description Document

Section 10: Quality Control

10.1 Overall Strategy for Quality Control

10.2 Quality Control Checks

10.3 Model Accuracy and Tolerances

10.4 Clash Detection/Coordination

10.5 Meeting Procedures

10.6 Model Delivery Schedule of Information Exchange for Submission and Approval

Section 11: Technology Platform and Software

11.1 Approved BIM Software for the projects

Section 12 amendments

**1.4 Team Leads**

• Design manager

• Client representative

• Project Manager/Lead

• Lead consultant

• Design BIM Manager

• Lead Designer

• Architect

• Civil & Structural Engineer

• Cost Consultant

• Civil Construction Lead

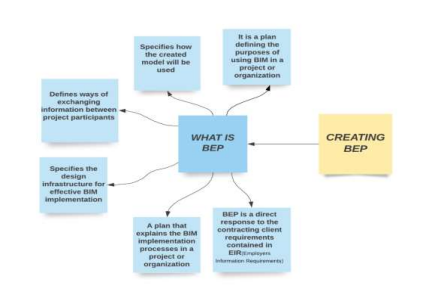
• Contract Administrator

• Health & Safety Advisor

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• Client or Client Advisor



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**Section 2: Project Information**

This section defines basic project reference information and determined project milestones. Note: Text shown in light grey is for illustrative purposes only; this and all information throughout this document should be used as a guide and is intended to be replaced /updated /completed with project-specific information as agreed upon by the University and Project Team.

**2.1 Project and Title Information**

| Project Owner: |  |
| --- | --- |
| Project Name: |  |
| Project Location and Address: |  |
| Contract  Type/Delivery  Method: |  |
| Brief Project  Description: |  |
| Additional Project Information |  |
| Project Numbers |  |

**2.2 Project Phases/Milestones**

Include BIM milestones, pre-design activities, major design reviews, stakeholder reviews, and other significant events during the project life-cycle.

| **PROJECT PHASE /**  **MILESTONE** | **ESTIMATED START DATE** | **ESTIMATED**  **COMPLETION DATE** | **PROJECT**  **STAKEHOLDERS**  **INVOLVED** |
| --- | --- | --- | --- |
| Preliminary Planning |  |  |  |
| Design Documents |  |  |  |
| Construction Documents |  |  |  |
| Construction |  |  |  |

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**Section 3: Project Contacts**

List of lead BIM contacts for each organisation on the project. Additional contacts can be included later in the document

**3.1 Core Collaboration Team**

| **ROLE** | **ORGANISATION** | **CONTACT NAME** | **E-MAIL** | **PHONE** |
| --- | --- | --- | --- | --- |
| Architect |  |  |  |  |
| Construction  Manager |  |  |  |  |
| Civil Engineer |  |  |  |  |
| Structural  Engineer |  |  |  |  |
| Mechanical  Engineer |  |  |  |  |
| Plumbing  Engineer |  |  |  |  |
| Project manager |  |  |  |  |
| Design Team BIM Manager |  |  |  |  |
| Lead BIM  Coordinator |  |  |  |  |
| Construction BIM Manager |  |  |  |  |
| Other Project  Role |  |  |  |  |

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Signatures (Required before project start)

(Add additional signatures lines as necessary for the project)

| Design Team BIM Manager: | Date: |
| --- | --- |
| Lead BIM Coordinator: | Date: |
| Construction Team BIM Manager: | Date: |
| Project Manager | Date: |
| BIM Manager (Assistant Director – Building Information Services): | Date: |

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**Section 4: Project Goals /BIM Uses**

This section describes how the BIM Model and Facility Data will be leveraged to maximise project value.

**4.1 Major BIM Goals/Objectives**

Primary BIM Goals and Objectives for this Project are to be determined by the project team and owner. The priorities shown here are suggested. Indicate “H, M, L” in the chart below.

| **Priority**  **(High/ Med/ Low)** | **Goal Description** | **Potential Bim Uses** |
| --- | --- | --- |
|  | Accurate documentation of building systems geometry and data to facilitate and automate O&M operations | Record modelling |
|  | Reduce and eliminate building system construction errors by digital modelling of building system geometries to detect conflicts or clashes. | 3D coordination |
|  | Provision of standardised 3D digital construction document models which facilitate audit, analysis, construction and renovation. | Design authoring |
|  | Utilise intelligent modelling software to achieve optimum, cost-efficient design solutions for building systems such as mechanical, electrical and structural. | Engineering analysis |
|  | Improved communication and cooperation between project participants to achieve LEED credits and obtain sustainability goals. | Sustainability (leed) evaluation |
|  | Improved visualisation and presentation of virtual designs to validate design goals such as aesthetics, layout, sightlines, security, etc | Design reviews |
|  | Efficient and accurate assessment of design performance parameters regarding spatial  requirements | Programming |
|  | A precise estimate of building systems costs and alternative schemes during the life-cycle of a project | Cost estimation |
|  | Enhanced efficiency and accuracy of existing conditions documentation by use of current software to create 3D models that can be queried for information | Existing conditions modelling |
|  | The utilisation of digital information to automate building component fabrication and field construction | Digital fabrication |
|  | The utilisation of the information model to provide detailed control points in assembly fabrication and field construction | 3d control and planning |
|  | Increased efficiency in building maintenance staff using information model data links to the owner’s  computerised maintenance management system (CMMS) | Building maintenance scheduling |
|  | Automated access to building asset information by linking the record information model to the owner’s computerised maintenance management system (CMMS). This would include linked access to building system operation routines, maintenance manuals, equipment specifications and fabrication documents. | Asset management |
|  | Use of the information model to track, analyse and report proposed and current space and related resources within the facility. | Space management / tracking |

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**4.2 BIM Uses**

Highlight and place an X next to the additional BIM Uses to be developed in the BIM model as selected by the project team. Additional items can be added and may be needed on the project.

| **PROGRAMMING** | | **DESIGN** | | **CONSTRUCTION** | | **OPERATE** | |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Existing Conditions Modelling |  | Existing Conditions Modelling |  | Existing Conditions Modelling |  | Existing Conditions  Modelling |
|  | Cost Estimation |  | Cost Estimation |  | Cost Estimation |  | Cost Estimation |
|  |  |  | Design Authoring |  |  |  |  |
|  | Programming |  |  |  |  |  |  |
|  | Site Analysis |  |  |  |  |  |  |
|  |  |  | Design Reviews |  |  |  |  |
|  | Code Validation |  | Code Validation |  |  |  |  |
|  | Project Site Survey |  | Ada Verification |  |  |  |  |
|  | Sustainability (LEED)  Evaluation |  | Sustainability (LEED)  Evaluation |  |  |  |  |
|  |  |  | Energy Analysis |  |  |  |  |
|  |  |  | Structural Analysis |  |  |  |  |
|  |  |  | Lighting Analysis |  |  |  |  |
|  |  |  | Mechanical Analysis |  |  |  |  |
|  |  |  | Other Eng. Analysis |  |  |  |  |
|  |  |  | 3d Coordination |  | 3d Coordination |  |  |
|  |  |  |  |  | Site Utilisation  Planning |  |  |
|  |  |  |  |  | Construction System Design |  |  |
|  |  |  |  |  | Digital Fabrication |  |  |
|  |  |  |  |  | 3d Control And  Planning |  |  |
|  |  |  |  |  | Record Modelling |  | Record Modelling |
|  |  |  |  |  |  |  | 2d Record Documents |
|  |  |  |  |  |  |  | COBie DELIVERABLES |
|  |  |  |  |  |  |  | Building Maintenance Scheduling |
|  |  |  |  |  |  |  | Building System Analysis (Commissioning) |
|  |  |  |  |  |  |  | Asset Management |

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|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  | Space Management/  Tracking |
|  |  |  |  |  |  |  | Disaster Planning |

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**Section 5: Organisational Roles /Staffing**

Describe in detail the responsibilities for the following organisational roles/staffing

**5.1 Design Team BIM Manager**

|  |
| --- |

**5.2 Lead BIM Coordinators**

|  |
| --- |

**5.3 Construction Team BIM Manager**

|  |
| --- |

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**Section 6: BIM Responsibilities**

Detail the responsibilities for the design team groups

**6.1 Design Team Responsibilities**

|  |
| --- |

**6.2 Record Models**

|  |
| --- |

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**6.3 Project Team Responsibilities**

| **ROLE** | **DESCRIPTION MANAGEMENT PLAN AND DEVELOPMENT** | **BIM**  **RESPONSIBILITY** |
| --- | --- | --- |
| Project Manager |  |  |
| Design Team Project  Manager |  |  |
| BIM Manager |  |  |
| Architecture |  |  |
| Structural |  |  |
| MEP |  |  |
| Interior Design |  |  |
| Sustainability and Energy |  |  |
| Commissioning |  |  |
| BIM Modelling Expertise by Software Application |  |  |
| Project Estimator |  |  |
| Contractor |  |  |
| Sub-Contractor and/or Fabricator (as appropriate) |  |  |

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**Section 7: Model Objectives and application**

Reference the BIM Standards document for specific requirements for each phase

**7.1 Programming/Pre-Design Phase**

| Objectives: |  |
| --- | --- |
| Model Roles: |  |
| Responsibilities: |  |

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**7.2 Schematic Design Phase**

| Objectives: |  |
| --- | --- |
| Model Roles: |  |
| Responsibilities: |  |

**7.3 Design Development Phase**

| Objectives: |  |
| --- | --- |
| Model Roles: |  |
| Responsibilities: |  |

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**7.4 Construction Documents Phase**

| Objectives: |  |
| --- | --- |
| Model Roles: |  |
| Responsibilities: |  |

**7.5 Review**

| Objectives: |  |
| --- | --- |
| Model Roles: |  |
| Responsibilities: |  |

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**7.6 Construction Phase**

| Objectives: |  |
| --- | --- |
| Model Roles: |  |
| Responsibilities: |  |

**7.7 Project Closeout – Record Deliverables Phase**

| Objectives: |  |
| --- | --- |
| Model Roles: |  |
| Responsibilities: |  |

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**Section 8: Level of Development (LoD)**

The LOD Level of Development classification created by BIM Forum – you can find detailed specification about it here – (LOD specification)

**8.1 Level of Development Descriptions/Procedures**

| LOD 100 |  |
| --- | --- |
| LOD 200 |  |
| LOD 300 |  |
| LOD400 |  |

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| LOD500 |  |
| --- | --- |

**8.2 Model Detail & Level of Development (LOD) Chart**

The chart below is used to define the LOD for the project and is based on section “8 Model Element Specifications” included in the USF BIM Guidelines and Standards

| **Model Name** | **Model Elements**  **(As Indicated in USF BIM Guidelines and**  **Standards)** | **Project Phase** | **Level of Development** |
| --- | --- | --- | --- |
| Civil Model | f1, f2 | Schematic Design | 100 |
| f1 – f3 | Design Development | 200 |
| f1 – f3 | Construction | 300/350 |
| f3 | Record /Deliverables | 350/500 |
| Structural Model | b1 | Schematic Design | 100 |
| b1 – b3, b5 | Design Development | 200 |
| b1 – b3, b5 | Construction | 300 |
| b2, b3, b5 | Record /Deliverables | 350/500 |
| Architectural Model | a1, a2, a4, a5 | Schematic Design | 100 |
| a1 – a7 | Design Development | 200 |
| a1 – a7 | Construction | 350/400 |
| a2- a4, a6 | Record /Deliverables | 350/500 |
| MEP Model | c1 – c5, d1 – d3, e1 – e5 | Design Development | 200 |
| c1 – c5, d1 – d3, e1 – e5 | Construction | 300/400 |
| c1, d1,e1 | Record /Deliverables | 350/400/500 |
| Construction/Record  Model(s) | Includes all of the above elements. | Construction | 350/400 |
|  | Includes all of the above elements | Record /Deliverables | 500 |

**8.3 Construction & Record BIM**

Detail the process relating to construction and record BIM

|  |
| --- |

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**8.4 Understanding Level of Development**

LOD descriptions identify the specific content requirements and associated authorised uses for each Model Element at each phase. The LOD for each stage guides each progressively detailed level of completeness. Each subsequent LOD builds on the previous level and includes all the characteristics of the last groups. These LOD’s described will be used to establish the required LOD for each Model Element at each phase of the project.

LOD 100 Conceptual:

| 1 |  |
| --- | --- |
| 2 |  |

LOD 200 Approximate:

| 1 |  |
| --- | --- |
| 2 |  |

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LOD 300 Precise:

| 1 |  |
| --- | --- |
| 2 |  |

LOD 350 Assemblies for Coordination:

| 1 |  |
| --- | --- |

LOD 400 Fabrication:

| 1 |  |
| --- | --- |
| 2 |  |

LOD 500 Record Documents (Record BIM):

| 1 |  |
| --- | --- |

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**Section 9: BIM Information Exchanges and model sharing**

Establish documentation management process according to workplace requirements. Use the below sections to complete h **BIM 360 Document Management processes** so that construction teams can **manage** blueprints, 2D plans, 3D **BIM** models, and other project **documents**. The module is designed to streamline your **document management** processes. You can consolidate all your sheets and designs and set up standard templates and workflows to maximise efficiency as per the below

A BIM-enabled project delivery process’s success depends on the level at which the entire Design/Construction Team can communicate and work collaboratively for the project’s duration. This section documents collaboration procedures for effectively managing this process.

**9.1 Integrated Project Delivery (IPD) Methodology**

IPD is a project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to optimise project results, increase value to the owner, reduce waste, and maximise efficiency through all phases of design, fabrication, and construction.

|  | Detail the project delivery approach used to implement the case study |
| --- | --- |
| Methodology 1  Conceptualisation |  |
| Methodology 2  Design |  |
| Methodology 3  Implementation |  |

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| Methodology 4  Construction |  |
| --- | --- |

**9.2 Geo-Referenced Model**

Determine the project BIM geo-reference points and ensuring All technical discipline models are properly referenced to the points creating a process model. For assistance, see https://www.buildingsmart.org/wp content/uploads/2020/02/User-Guide-for-Geo-referencing-in-IFC-v2.0.pdf User Guide for Geo-referencing in IFC "How to Setup Geo-referencing in a Building or Linear Infrastructure Model."

|  |
| --- |

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**9.3 Collaboration & Model Sharing**

BIM deliverables, the Project Team, will use a designated server to share and store information. During the design phase, BIM-related files utilised by the Design Team will be transmitted through the specific project site managed by the Design Teams BIM Manager. During the construction phase, BIM-related files may be shared utilising either the Construction Teams Managers, selected A/E site or the designated system. Provide an outline of the BIM track and BIM 360 Design collaboration & model sharing systems and how they will be used in your projects.

| BIM360 |  |
| --- | --- |
| BIM  track |  |

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**9.4 Version Control**

Explain the BIM 360 Team version control system

| BIM 360 Team |  |
| --- | --- |
| Describe the  easy steps to  version control |  |

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**9.5 Efficient Project Work Flow**

| Outline a typical workflow after uploading documents to BIM 360 Document Management model |
| --- |
|  |
| Outline efficient work processes so that each party shall make their design data available to the team in an approved and shared repository or exchange protocol |
|  |

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**9.6 Model Description Document**

A Model Description Document is a document issued with a model to describe what the BIM contains and identify any limitations of use.

Exchanging models is the very basis of the BIM process. All users need to understand the level to which they can rely on the models they receive. Models can contain far more information than traditional electronic deliverables. The issuer of a model must clearly define what it can be used for and make data available for others to use during the project's development.

| **Item** | **Details** |
| --- | --- |
| Project name |  |
| BEP reference and revision |  |
| Model authoring company |  |
| Discipline BIM Coordinator |  |
| Native file type and version |  |
| Issued file type and version |  |
| Issued date |  |
| Model status |  |
| Model name |  |
| Filename |  |
| Linked files |  |
| Inputs |  |
| Model purpose |  |
| Comments |  |

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**Section 10: Quality Control**

**10.1 Overall Strategy for Quality Control**

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| --- |

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**10.2 Quality Control Checks**

Owners are becoming more aware of the benefits of BIM, asking for more robust models and the inclusion of data for operations and maintenance. At the same time, the number of models it takes to create a project continues to grow. The proactive quality control (QC) process can ensure that your model meets your client’s BIM requirements.

We can support you in this process by carrying out a complete evaluation and validation of your model at required submittal milestones. As part of the QC process, we also use diagnostic tools and compliance checklists with one or more of the following objectives in mind:

• Visual checks to ensure there are no unintended model components;

• Interference checks to detect problems in the model where two building components are clashing; • Standards check to ensure that documentation standards have been followed (fonts, dimensions, line styles, levels, layers, etc.);

• Model integrity checks to ensure that a model has no-undefined, incorrectly defined, or duplicated elements; and

• Nomenclature checks to ease the communication and coordination among various stakeholders involved.

Such a process and our regular compliance checks can help you to ensure that your BIM deliverables are consistent with your Organisational, Asset, Project and Exchange Information requirements (OIR, AIR, PIR and EIR), verifying that your model’s geometry is submitted with the correct level of development (LOD), is in the right location, or does not have any uncoordinated clashes.

The following checks should be performed to ensure quality.

| **CHECKS** | **DEFINITION** | **RESPONSIBLE PARTY** | **SOFTWARE**  **PROGRAM(S)** | **FREQUENCY** |
| --- | --- | --- | --- | --- |
| VISUAL CHECK | Ensure there are no unintended model components and the design intent has been followed |  |  |  |
| INTERFERENCE CHECK | Detect problems in the BIM where two building components are clashing, including soft and hard |  |  |  |
| STANDARDS CHECK | Ensure that the **USF-BIM-EP**, **USF-BIM** and **USF-CAD** documents have been followed (Fonts, dimensions, line styles, levels/layers, etc.) |  |  |  |
| MODEL  INTEGRITY  CHECKS | Describe the QC validation process used to ensure that the Project Facility Data set has no-undefined, incorrectly defined or duplicated elements and the reporting process on non compliant elements and corrective action plans |  |  |  |

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**10.3 Model Accuracy and Tolerances**

Models should include all appropriate dimensioning as needed for design intent, analysis, and construction. Provide the following tolerances that apply to elements that require LOD 300 or higher.

| **PHASE** | **DISCIPLINE** | **TOLERANCE** |
| --- | --- | --- |
| EXISTING  CONDITIONS  MODEL | CIVIL |  |
| DESIGN DOCUMENT MODELS | CIVIL  ARCHITECTURAL  STRUCTURAL  MEPFP |  |
| AS‐BUILT MODELS | CIVIL INTERIORS  ENVELOPE  STRUCTURAL MEPFP |  |

**10.4 Clash Detection/Coordination**

Clash detection is a component of the Building Information Modelling (BIM) process. It is the realisation of conflicts or clashes, whether structural or MEP, through an automated and computerised approach. A ‘clash’ is the result of two elements in your design taking up the same space. In Building Information Modelling (BIM), Clash Detection is the technique of identifying if -- and where or how -- two parts of the building (e.g., plumbing, walls, etc.) are interfering with one another.

| What is a hard  clash, and what  does it comprise? |  |
| --- | --- |
| What is a soft  clash> Explain  your answer in  detail |  |
| What is a workflow clash, and what  does this involve? |  |

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| Provide three  reasons why  clashes occur | Clashes delay construction until stakeholders coordinate to fix the issue, which irreversibly impacts project cost and schedule. Clashes occur due to  1  2  3 |
| --- | --- |
| Explain how you can detect and  resolve clashes |  |
| What are the  benefits of clash  detection |  |

**10.5 Meeting Procedures**

There will be different types of Collaboration and model review meetings needed for the project, including general progress meetings, design coordination meetings, etc. The following table includes, but is not limited to, some of the potential meetings necessary for the project, meeting host(s), required attendees and required technology. We understand that these meeting may be actual, virtual and/ or a combination of both the following are examples of meetings that should be considered

| **MEETING TYPE** | **Host** | **PARTICIPANTS** | **Why is this meeting required** |
| --- | --- | --- | --- |
| Design Meeting |  |  |  |
| Design Presentations |  |  |  |
| Design Team  Coordination |  |  |  |
| Design4Maintenance |  |  |  |

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| COBie Data Meeting |  |  |  |
| --- | --- | --- | --- |
| Contractor / CM Team Coordination |  |  |  |
| Contractor Handover / Close‐out |  |  |  |

**10.6 Model Delivery Schedule of Information Exchange for Submission and Approval**

Document at least two information exchanges and file transfers that will occur on the project.

| **INFORMATION EXCHANGE** | **FILE**  **SENDER** | **FILE**  **RECEIVER** | **ONE-TIME or FREQUENCY** | **DUE**  **DATE or**  **START DATE** | **MODEL FILE** | **MODEL**  **SOFTWARE** | **NATIVE FILE**  **TYPE** | **FILE**  **EXCHANGE TYPE** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
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**Section 11: Technology Platform and Software**

**11.1 Approved BIM Software for the projects. Complete the table below**

| **BIM USE** | **DISCIPLINE**  **(if applicable)** | **SOFTWARE** | **VERSION** |
| --- | --- | --- | --- |
| DESIGN AUTHORING |  |  |  |
| Site Utilisation  Planning |  |  |  |
| Existing Conditions  Modelling |  |  |  |
| LEED Evaluation |  |  |  |
| Energy Analysis |  |  |  |
| Structural Analysis |  |  |  |
| 4D Modelling |  |  |  |
| Cost Estimation |  |  |  |
| 3D Coordination (Design) |  |  |  |
| Design Reviews |  |  |  |

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**Section 12 - Amendments recommended by the client (must be at least one recommendation made by the client representative)**

| **Plan**  **Clause**  **No.** | **Approved**  **Signature** | **Amendment** | **Explain how the amendment meets legislative requirements** |
| --- | --- | --- | --- |
| 1 |  |  |  |

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**4.** You will need to develop periodic test schedules to monitor design processes and performance and enable others to take any corrective action. The Periodic Table of BIM is your teams “at-a-glance guide” to the steps you need to take to ensure a successful BIM implementation.

Develop periodic test schedules using the occasional table Beams to complete the “TIDP Task Information Delivery plan” (Appendix 3). For a detailed description of the Periodic Table (Annex 7), see https://www.thenbs.com/periodic-table-of-bim.

When developing the Task information delivery plan (TIDP), ensure for “role” you:

• As the task team manager, compile the TIDP with milestones. These shall be used to convey the responsibility for delivery of each supplier’s information

• Align milestones within each TIDP with the design and construction programmes to produce the MIDP • For each deliverable, you use the TIPD to indicate the team member's responsibility or note that such responsibility has yet to be allocated.

• Use the TIPD to show how the responsibility for preparing project documents transfers from one team member to another.

• Use the TIPD to consider the required sequence of model preparation for any work packages used in the project.

• Identify and confirm as possible information management roles at the meeting.

• Define the roles and responsibilities of individual team members, as shall the schedule of responsibilities for deliverables of the overall team, bearing in mind that one person may deliver multiple roles. • Do not confuse the roles with the titles of the managers, which can differ from organization to organization, but the important factors are the ownership, responsibility and authority.

When developing the Task information delivery plan (TIDP), ensure for “volume” you:

• Break the project into several volumes were necessitated by technical limitations

• Ascertain, All members of the design team shall agree on volumes as fully as possible at the start of a project and publish them as a shared document. This document shall be reviewed at successive project stages and amended and re-published as necessary

You must prepare and implement plans outlined by the design project team (Appendix 2) to verify that completed physical work meets the client’s requirements. Your team (classmates / assessor) allocated to work on the project review to complete Appendix 3 and support design process include:

• Project Lead

• Lead Designer

• Architect

• Civil & Structural Engineer

• Cost Consultant

• Civil Construction Lead

• Contract Administrator

• Health & Safety Advisor

• Client or Client Advisor

Support design implementation of civil works, ensuring you prepare and implement plans from Appendix 1 and 2 and Annex 1 (case studies) that verifies completed physical work meets client requirements. Develop periodic test schedules for monitoring performance and to permit involved personnel to implement corrective action as required (Appendix 3).

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Ensure when working with others (classmate / assessor) to manage civil works design processes, you participate in the review, demonstrating your ability to:

• Use a range of communication techniques and equipment

• Check and confirm design documentation and reporting requirements

• Organise work activities to meet task requirements

• Communicate with others to receive and clarify work instructions

• Share with others to coordinate work activities

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**Appendix 3**

**TIPD**

| TIPD - TASK INFORMATION DELIVERY PLAN – CREATED INDIVIDUALLY BY EACH COMPANY | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **File information** | | | **File Name** | | | | | | | **Delivery Dates** | |
| **Deliverable Type** | **Format** | **Description** | **Project** | **Originator** | **Volume** | **Location** | **Type** | **Role** | **Number** | **Milestone 1** | **Milestone 2** |
| Models |  |  |  |  |  |  |  |  |  |  |  |
| Drawings |  |  |  |  |  |  |  |  |  |  |  |
| Specifications |  |  |  |  |  |  |  |  |  |  |  |
| Calculations |  |  |  |  |  |  |  |  |  |  |  |

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**5.** Seek feedback from the commissioning process to facilitate corrective actions or improvements and evaluate the design outcomes’ performance in the user’s environment using appropriate tools. To do this, conduct a final model review meeting that supports soft landings focusing on maintenance and functionality. Conduct a Post Review Meeting to allow key stakeholders to determine, understand, analyse and review the plans in Appendices 2 and 3 and other information outputs. The potential value of the post-review meeting ensures you:

• Eliminate costly and timely traditional construction mock-ups

• Apply different design options and alternatives that may be easily modelled and changed in real-time during design review base on end-users and owner feedbacks

• Create a shorter and more efficient design and design review process

• Evaluate the effectiveness of design in meeting civil works program criteria and owner’s needs • Enhance the health, safety and welfare performance projects (For instance, BIM can be used to analyse and compare fire-rated egress enclosures, automatic sprinkler system designs, and alternate stair layouts • Easily communicate the design to the owner, construction team and end-users

• Get instant feedback on meeting program requirements, owners needs and civil works or space aesthetics • Significantly increase coordination and communication between different parties. More likely to generate better decisions for design

Stakeholders (classmates / assessor) participating in the meeting include:

• Project Lead

• Lead Designer

• Architect

• Civil & Structural Engineer

• Cost Consultant

• Civil Construction Lead

• Contract Administrator

• Health & Safety Advisor

• Client or Client Advisor

At the meeting, review design of civil works and

• Review design and confirm it meets client requirements

• Incorporate amendments advised by the client and ensure the design meets legislative requirements as outlined in Appendix 2

• Review the design with the client present and obtain documented approval

Evaluate the community reaction to the design outcomes for the two projects (Annex 1). Feedback provided from community meetings includes:

• Case study for Occasion1 participants raised:

o strong opposition to the concept design and its inclusion on local environmental plans. o Concerns as they are not convinced that the upgrade to the highway is necessary. o Long term transport strategy may change the need for the concept design.

o Concerns resources wasted on the concept design.

o Questions raised over the accuracy of cost estimates regarding civil works and the concept design

o Concerns about the estimated travel time saving of 12 minutes

• Case study for the occasion, 2 participants raised:

o concerns about the availability of up-to-date crash data

o several issues about the service road, including the impact of vibration from traffic

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o Concerns the design has the potential for heavy traffic to use the service road if the highway is blocked and the quality of maintenance of the service road.

o Concerns relating to lowering the speed limit to 80 km/h. Participants requested that the speed limit kept to a minimum. Suggestions made that the concept design should include an 80 km/h speed limit.

o The concept design noted as being contrary to the recommendations of the 20XX independent review.

***Note:*** *When preparing the brief, ensure you complete workplace reports using sector-specific vocabulary, grammatical structures and conventions.*

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**Appendix 4**

**Model Review Meeting Minutes - Stage 1 to 7**

| Meeting Title | |  | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Location | |  | | | | | | | |
| Date | |  | | | | | | | |
| Start time | |  | | | | End time | |  | |
| Meeting called by [Facilitator Name] | |  | | | | | | | |
| **Attendees** | | **Name** | | **Initial** | **Company** | | | | **Role** |
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| **Introduction** | | | | | | | | | |
| Step 1 | Welcome to <company name> | | | | | |  | | |
| Step 2 | Introduce host | | | | | |  | | |
| Step 3 | Introduce chairperson | | | | | |  | | |
| Step 4 | Around table introductions | | | | | |  | | |
| **Project Introduction** | | | | | | | | | |
| <Project name> | | |  | | | | | | |
| <Client> | | |  | | | | | | |
| <Project description> | | |  | | | | | | |

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| **Project progress against MIDP & MPDT** | | | |
| --- | --- | --- | --- |
| Current work stage | | | ☐1 ☐2 ☐ 3 ☐4 ☐5 ☐ 6 ☐7 |
| Review against Master Information Delivery Plan and Model Production Delivery Table | | |  |
| Approximate percentage stage completion | | |  |
| Progress reports from task teams | | | |
| **Task Team** | | **Report – Provide a summary of stage 1 – 7 for each position listed from the PLQs** | |
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| **Plain Language Questions Plain Language Questions (PLQs)** are those questions required to be answered as part of each stage of a construction project review for future projects. The answers will enable critical decisions to be made, such as proceeding through stages. It is recommended that the PLQs provided here are included with those relating to other aspects of a project where a client wishes a security-minded approach taken | | | |
| ☐ Stage 01 - Brief | | | |
| 1/1 | What data and/or information excluded from exchanges with third parties (e.g.  Planning authorities and other statutory authorities)? | | |
| 1/2 | Are there measures in place for the handling, processing and storage of existing built asset? Information and survey data, including data or information relating to neighbouring built assets? | | |
| 1/3 | Are there suitable measures in place for the protection of personal and commercial data and/or information? | | |

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| 1/4 | Are there suitable measures in place for the protection of stakeholder data and/or  information, for example, property ownership along the route of an infrastructure project, environmental information etc |
| --- | --- |
| 1/5 | Is there appropriate management of information detailing: the security protection level or the classification level of a project, security risk, and potential mitigation measures? |
| 1/6 | Have high-risk positions been identified within the project team and appropriate measures taken about these positions? |
| 1/7 | Has the use and nature of purpose-specific and/or volume-specific Construction Operations Building Information Exchange (COBie) files been agreed? |
| ☐ Stage 02 - Concept Design | |
| 2/1 | Is there appropriate management of information detailing: the security protection level or the classification level of a project, security risk, and potential mitigation measures? |
| 2/2 | Do the models and accompanying data and information meet the requirements of the Project? |
| 2/3 | Can the designers show that the project can be delivered in a security-minded way? |
| 2/4 | Have the project/s been reviewed in light of the additional information generated during the Concept stage? |
| ☐ Stage 03 - Definition/Developed Design | |
| 3/1 | Is there appropriate management of information detailing: naming, category and  the functionality of areas, zones and assets; built asset usage (in whole or part); and sensitive performance criteria? |
| 3/2 | Where appropriate, have specialist sub-contractors have been utilised to provide  information and guidance about the requirements and logistics of sensitive assets  and systems? |

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|  |  |
| --- | --- |
| 3/3 | Do the models and accompanying data and information meet the requirements? |
| 3/4 | Have the project/s been reviewed in light of the additional information generated during the Definition stage? |
| ☐ Stage 04 - Design/Technical Design | |
| 4/1 | Is there appropriate management of information detailing sensitive asset and system selection (including name, manufacturer, model number, performance and description) and connectivity? |
| 4/2 | Is there appropriate management of data and information prepared by specialist subcontractors about sensitive assets and systems? |
| 4/3 | (For most sensitive assets) Is the appropriate protection of information relating to the handling of emergencies, including evacuation procedures and contingency  measures in place? |
| 4/4 | (For most sensitive assets) Is the appropriate protection of information relating to  maintenance and facilities management of the asset in place? |
| 4/5 | Do the models and accompanying data and information meet the requirements? |
| 4/6 | Have the project/s been reviewed in light of the additional information generated during the design stage? |
| ☐ Stage 05 – Civil Works/Construction | |
| 5/1 | How will the civil construction site be managed securely? |
| 5/2 | Do the models and accompanying data and information meet the requirements? |
| 5/3 | Have the project/s been reviewed in light of the additional information generated during the Build stage? |

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| 5/4 | Is the installation of sensitive assets and systems scheduled to prevent unauthorised access and limit the potential for damage or compromise? | | | | | | | |
| ☐ Stage 06 - Handover & Close Out | | | | | | | | |
| 6/1 | Do the models and accompanying data and information meet the requirements? | | | | | | | |
| 6/2 | Are measures being applied for the secure return, storage or destruction of asset  information? | | | | | | | |
| 6/3 | Does the transfer of asset information to the Asset Information Model and the  arrangements for access meet the requirements | | | | | | | |
| 6/4 | Have the project/s been reviewed in light of the additional information generated during the handover stage? | | | | | | | |
| ☐ Stage 07 - Operation and End of Life | | | | | | | | |
| 7/1 | What are security measures required if the built asset is significantly  modified or decommissioned, or there is a change of ownership, occupancy or use? | | | | | | | |
| Clash report and mitigation. You are required to report below on at least three clashes(hard clash, of clash, and a workflow clash) identified and agreed on a resolution  Lead designer to table clash report  Clashes assigned as either Actionable, Acceptable or Not a clash  Actionable clashes to be assigned an owner | | | | | | | | |
| **Reference** | | **Description** | **Type of clash** | **Resolution** | **Identified Start Date** | **Resolved**  **End Date** | **Owner** | **By when** |
|  | |  | ☐Actionable  ☐Acceptable  ☐Not a Clash |  |  |  |  |  |
|  | |  | ☐Actionable  ☐Acceptable  ☐Not a Clash |  |  |  |  |  |

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|  |  | ☐Actionable  ☐Acceptable  ☐Not a Clash |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |

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**Assessment Task: Demonstration / Observation**

| **Student’s name** |  |
| --- | --- |
| **Student ID** |  |
| **Assessor’s name** |  |

**Task:**

The learner must demonstrate the ability to manage civil works design processes on at least two occasions, including:

• communicating and collaborating with clients to resolve problems and meet job requirements • seeking advice from required personnel where proposed design includes non-standard engineering requirements or new technology

• monitoring and supporting design processes

• creating a demonstrating model of the design

• confirming documentation requirements are met

• reviewing designs, including interpreting and confirming the following project documentation: o plans and drawings

o specifications

o design briefs

o engineering survey information

o hydrological, meteorological data geotechnical data

o cultural and heritage data

• supporting design implementation

During the above, the learner must:

• locate and apply required legislation, documentation, policies and procedures

• implement the requirements, procedures and techniques to manage civil works design processes, including those relating to:

o risk assessments and management

o statutory compliance

o work health and safety

o environmental management

o cultural and heritage management

o quality management

• work with others to manage civil works design processes, including:

o using a range of communication techniques and equipment

o checking and confirming design documentation and reporting requirements

o organising work activities to meet task requirements

o communicating with others to receive and clarify work instructions

o communicating with others to coordinate work activities

**Outcomes**

| **Did the learner:** | **Satisfactory** |
| --- | --- |
| Interpret and scope design requirements of civil works? | ◻ Yes ◻ No |
| Identify project design options for civil works and determine preferred design option? | ◻ Yes ◻ No |

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| **Did the learner:** | **Satisfactory** |
| --- | --- |
| Initiate, monitor and support design of civil works? | ◻ Yes ◻ No |
| Prepare and maintain documentation? | ◻ Yes ◻ No |
| Review design of civil works? | ◻ Yes ◻ No |
| Support design implementation of civil works? | ◻ Yes ◻ No |
| Submitted the required documentation? | ◻ Yes ◻ No |

**Performance indicators**

| **In context of managing civil works design processes, is the learner competent in following:** | **Satisfactory** | |
| --- | --- | --- |
| **Occasion 1** | **Occasion 2** |
| **Interpret and scope design requirements of civil works** | | |
| Obtain, interpret, clarify and confirm work requirements | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Access, interpret and apply documentation required for civil works design and confirm work activity is compliant | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Analyse client design criteria requirements for civil works to confirm required specifications are included | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Advise client on potential environmental impact of proposed works and provide design options that meet environmental requirements | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Confirm required development and implementation factors are addressed in civil works design criteria | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Prepare functional specifications according to engineering standards and design specifications | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Obtain and document and client agreement on civil works design criteria | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| **Identify project design options for civil works and determine preferred design option** | | |
| Identify innovative procedures for developing the design concept according to design requirements | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Investigate and analyse potential design concepts that meet design requirements | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Collaborate with client to improve outcomes and resolve issues associated with design concept | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Advise client of potential impacts of proposed works on local communities | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| **Initiate, monitor and support design of civil works** | | |
| Analyse and select resources, processes and systems required to develop the design | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Coordinate design tasks to meet required outcomes and cost structure | ◻ Yes  ◻ No | ◻ Yes  ◻ No |

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| **In context of managing civil works design processes, is the learner competent in following:** | **Satisfactory** | |
| --- | --- | --- |
| **Occasion 1** | **Occasion 2** |
| Develop and check design solution against engineering specifications | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| **Prepare and maintain documentation** | | |
| Establish documentation management process according to workplace requirements | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Check and confirm supporting documentation required to implement the design meets workplace requirements | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Check and confirm design is identified by design documentation and records specified by client | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Apply documentation control process specified by client when making changes to design | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Check and confirm design documentation for currency and accuracy | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| **Review design of civil works** | | |
| Review design and confirm it meets client requirements | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Incorporate amendments advised by client and confirm design meets legislative requirements | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Review design with client and obtain documented approval | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| **Support design implementation of civil works** | | |
| Prepare and implement plans that verify completed physical work meets client requirements | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Develop periodic test schedules for monitoring performance and permit involved personnel to implement corrective action as required | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Seek feedback from commissioning process to facilitate corrective actions and design improvements | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Evaluate design outcome performance according to workplace requirements | ◻ Yes  ◻ No | ◻ Yes  ◻ No |
| Evaluate community response to design outcome and document according to workplace requirements | ◻ Yes  ◻ No | ◻ Yes  ◻ No |

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**Assessment Task Cover Sheet**

| **Student Name:** |  |
| --- | --- |
| **Student ID No:** |  |

| **Student’s Declaration:**  I certify that this is my own work based on my personal study and/or research. I also certify that I have not accessed any other student’s work, either electronically or written to complete this assignment. I have not copied in part or whole or otherwise plagiarised the work of other students. Further, I understand that the copying of practical reports and other work from students constitutes plagiarism. I confirm that if I am identified as cheating or plagiarising I will receive NYC. I understand that I will receive NYC, if my result is not satisfactory in any of the assessments tasks. I am also aware of my appeal rights. | | | |
| --- | --- | --- | --- |
| **Student Signature** |  | **Date** |  |

| **Assessor Report** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Assessment Task** | **Satisfactory** | | | **Not Satisfactory** | |
| Demonstration / Observation |  | | |  | |
| **Feedback:** | | | | | |
| **Assessor Signature** | |  | **Date** | |  |

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