Asset Handover Management

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Introduction

Effective management of infrastructure assets is crucial for optimising outcomes and ensuring cost-effective operations over the asset's entire life. A critical part of this involves the **asset handover process**, which is the final task in managing construction projects or contracts. This process involves the transfer of assets and associated information from the party responsible for their creation, renewal, or validation (such as contractors, consultants or developers) to DoWH for ongoing management. Providing accurate and comprehensive information during handover is essential for a smooth transition and effective future asset management.

Purpose and Scope

The purpose of this article is to help to define the **asset data requirements and handover processes** for DoWH. It is recommended that, if it does not already exist, a formal Asset Handover Management Guideline document should be developed. This document can help to inform that document.

This article provides guidelines for parties involved in various asset activities to ensure consistent data standards and submission procedures are met.

This guidelines presented in this article applies to assets managed by DoWH and covers information requirements resulting from the following categories of asset activities:

- **New Capital Development**: Creation of new assets as part of DoWH capital works programmes.
- **Asset Renewals**: Work undertaken to restore an asset component (rehabilitation, refurbishment, and replacement).
- **Asset Disposal**: Decommissioning, deletion, or abandonment of assets.
- **New Land Development**: Vesting of new assets constructed as part of development or subdivision works.

Asset classes typically covered include, but are not limited to, those relevant to road networks and related infrastructure:

Assets currently in AWM:

- Network Change – Shortening or lengthening an existing route
- Structures (Bridges, Large Culverts)

To be Introduced in next phases:

- Pavements (Surface, Basecourse, Subbase)
- Structures general (Walls, Fences, Handrails)
- Drainage (Kerb & Channels, Pipes)
- Streetlighting
- Traffic Control (Signals, Roundabouts, Islands, Pedestrian Refuges)
- Paths
- Other special assets subject to vesting with DoWH.

Please note that this guide covers the asset data needs of DoWH only. Other entities may have their own requirements.

Principles of Asset Handover

Achieving a smooth and successful asset handover relies on adhering to key principles:

- **Clear Definition**: The approach to asset and operations transition at the end of a contract term should be clearly defined in the contract itself.
- **Consistency**: Implement a consistent and reliable procedure for every project handover. Organising the procedure in a checklist or systematic approach is recommended.
- **Early Planning**: Planning for asset handover should begin early in the project lifecycle, not just as an afterthought.
- **Effective Communication**: Maintain clear lines of communication with all involved parties throughout the project and handover phase. This would typically include the owner, designer and constructor.
- **Data Accuracy and Completeness**: Provide accurate and complete asset information to ensure the handover process goes smoothly and supports effective future management.
- **Whole-of-Life Value**: Contract management should ensure that handover criteria are met in a timely and robust manner to achieve value for money over the asset's whole life.

Asset Handover Process Overview

The asset handover process typically involves the steps specified below. More detailed information is provided in the last part of this article – *Detailed Asset Handover Process.*

1. **Project Management:** Early engagement with all stakeholders to understand what is being designed and built. Therefore, supply of data expectations can be set from the outset. As the project progresses and nears completion (e.g., practical completion), preparation for handover begins. This includes confirming testing and commissioning are complete, discussing and agreeing upon defect management procedures, and finalising compliance reporting.

2. **Data Preparation:** The party responsible for the work (contractor, consultant, developer) prepares the required asset information, including as-built plans, asset attribute data, and supporting documentation.

3. **Data Submission:** The prepared information is submitted to the DoWH Asset Management Branch.

    a. All required asset information (as-built plans, attribute data, documentation) should be submitted in digital format to minimise processing time and errors. This submission should be accompanied by certified softcopy (pdf) plans.

    b. The owner of the project is responsible for ensuring the required information is provided to DoWH.

4. **Data Review and Validation:** The DoWH Asset Management Branch will review and validate the submitted information against the required standards and specifications. This includes checking for accuracy, completeness, and compliance with DoWH standards.

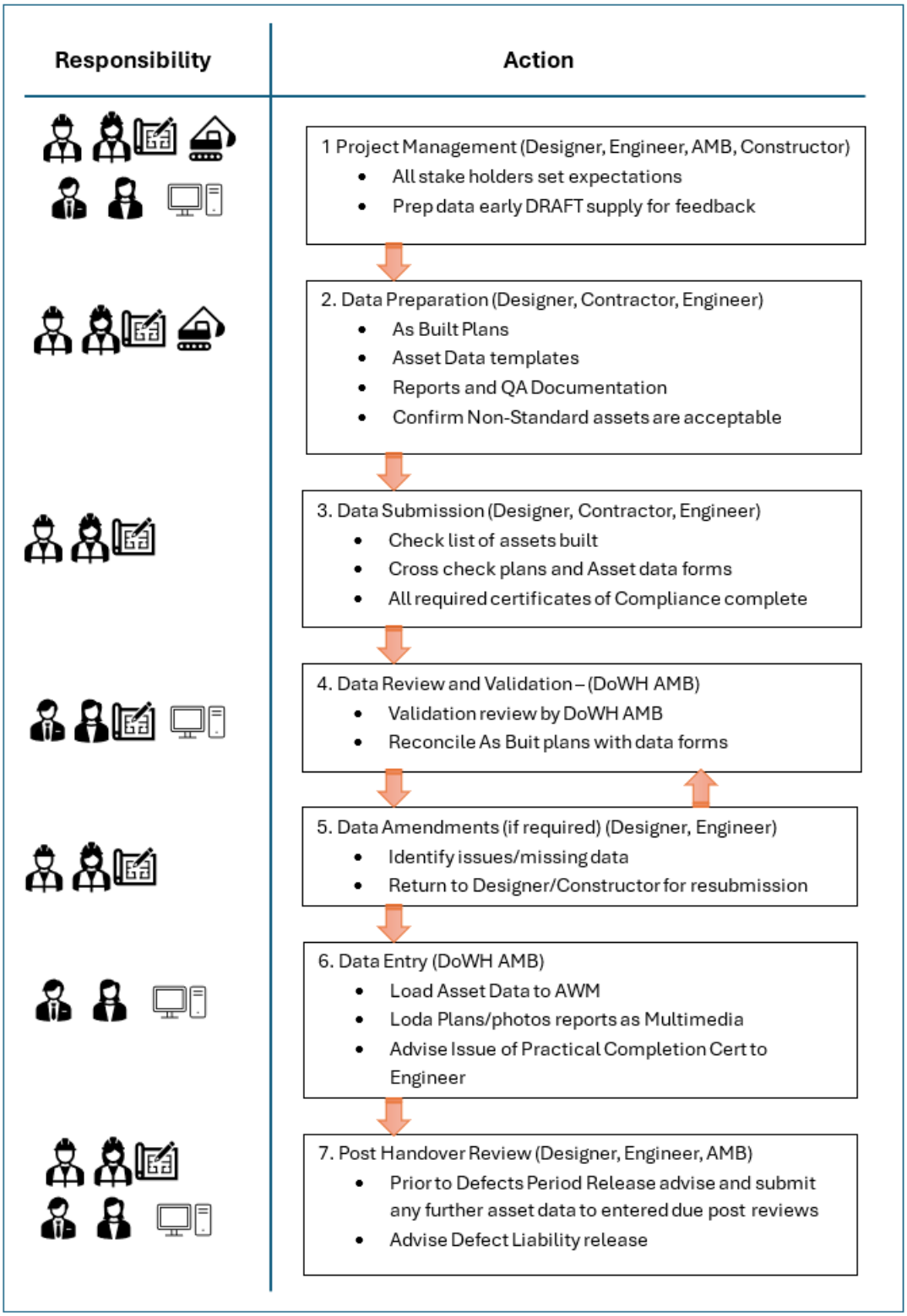
5. **Data Amendments (if required):** If the submitted information does not meet the required standards, it will be returned to the originator for correction and re-submission. Corrected information must clearly indicate it is an amendment.

6. **Data Entry:** Once the information is reviewed and accepted, the asset data is loaded into AWM, the DoWH road management system.

7. **Post Handover Review:** At the end of Defects Liability Period any new assets created, for example signs, guard rail as result of post safety reviews, will need to be captured and provided to DoWH Asset

Management Branch (AMB).

Note: Projects are not considered complete until the required as-built plans, attribute data, and documentation have been **received, checked, and approved** by DoWH.



Required Information and Data Standards

A comprehensive set of information is required for asset handover to DoWH. A more detail This typically includes:

As-Built Plans (Drawings)

- **Format**: Must be provided in **digital format** (e.g., DWG, DXF) as well as a certified softcopy (pdf). This certified soft copy shall be red line mark up stamped electronically stamped with **AS BUILT. These documents can be stored in AWM with the relevant asset record.** This process is described in this article ___.
- Construction Drawings: If there are minimal changes between the design drawings and what was constructed, then the construction drawings can be modified, or marked up, to an as-built status and verified.
- **Content**: Include general information such as drawing title, project / subdivision description, plan number, contract number, scale, date, north sign, and the words "As-built Plan". A locality plan showing the work area relative to main roads, suburb, house numbers, or lot numbers is required.
- **Asset Details**: Plans must clearly show details of **all new assets** and how they link to existing assets. Any existing assets affected by the work, or those incorrectly recorded in existing systems, must be included and shown correctly. Assets abandoned or removed must also be shown. Affected private roads within a subdivision or development must be included.
- **Spatial Data**: Assets should be represented digitally as points, lines, polylines, or polygons, with each line or polygon representing an asset with a single set of attributes. Assets must be plotted with **spatial coordinates**. Recommended Best practice would require road centrelines with chainages/displacements at maximum 20m intervals are required and referenced for data sheets.
- **Dimensions and Levels**: Show primary dimensions and levels (e.g., pavement width, layer depth, drainage invert levels). Typical cross-sections may be required for specific asset types like pavements, bridges, footpaths, and traffic controls.
- **Layers**: Each asset class should ideally have its own layer in the digital drawing.
- **Certification**: Best Practice would recommend Softcopy (pdf) plans must include a signed certification statement by a Chartered Professional Engineer or Registered Surveyor. Engineer certification is required for various activities.

Asset Attribute Data

- **Submission**: Asset attribute data must be provided together with the as-built plans. It should be submitted using the **specified forms or data collection templates** relevant to the asset class and activity type. These are contained in [Knowledge Owl Reference]
- **Content**: Required data includes asset definition, asset attributes such as size (length, width, area), material, install date, activity type and clarity on is the asset new, modified, moved or removed. Mandatory data fields must be completed.
- **Look-ups/Pick-list Values**: Utilise the provided look-up tables (pick-lists) for attribute data fields. If an attribute is not in the pick-list values, the constructor/designer should contact the Asset Management Branch to either request a new asset attribute value or enter 'Other' and provide a full description. This is where the principle of the asset handover should be followed with early engagement to ensure all asset being constructed are acceptable and meet current standards.
- **Replacement Assets**: If an asset is replaced, two sets of information are needed: one to delete the old asset and one to create the new asset

Other Required Documentation and Data

Documentation: It is best practice to include the following documents where available:

- Operation and maintenance manuals or asset owner manuals for all assets.
- Warranties and guarantees provided by suppliers.
- Relevant certificates, such as Electrical Certificates of Compliance (for lighting) or Compliance

Certificates/Safety Audit Reports (for bridges, structures).
- Rehabilitation design reports for road rehabilitation work.
- Project-specific documentation, not mentioned above and having an impact on the management of the asset over its life.

Spatial Location Information: This includes coordinates (X, Y, Z) for point assets and nodes, and details like road chainage (displacement) and offset from the road centreline. This information is crucial for locating assets within AWM.

Construction Plans: These may be required if the receiving authority does not already have them, primarily to clarify work shown on as-built plans.

Survey Office or Deposited Plans: Required when there are changes to property parcel boundaries, such as land acquisition for roads. Need to confirm what is this process for PNG.

Specific Project Data: Depending on the project type, this may include testing and commissioning data, defect management information, and compliance reporting or Maintenance Operating Procedures. Generally, for complex facility type assets e.g. mechanical and electrical plant.

Best Practices for a Smooth Handover

To facilitate a smooth and problem-free asset handover, consider the following best practices throughout the project lifecycle:

- **Plan Early**: Incorporate handover requirements into project planning from the outset. This would cover things such as non-standard assets not currently recognised within the asset database being built. Flow of information during the process.
- **Communicate**: Maintain clear and consistent communication with all stakeholders.
- **Document Management**: Implement a robust system for collecting, storing, and managing project documentation, including asset data and as-built information, as the work progresses.
- **Use Checklists**: Utilise project handover checklists to ensure all required steps are followed and information is collected systematically.
- **Thorough Inspections**: Conduct comprehensive final inspections, walk-throughs, and tests before handover.
- **Provide Instructions**: Furnish the receiving party (DoWH maintenance teams or asset managers) with clear instructions on operating and maintaining the new or renewed assets.
- **Stay Updated**: Ensure compliance with the latest DoWH standards, guidelines, and any relevant local codes or regulations throughout the project. Obtain the latest versions of required forms and specifications from DoWH.

By following the requirements and principles outlined in this guide, parties involved in asset activities can contribute to an efficient and effective handover process, supporting the long-term management of infrastructure assets by the Department of Works & Highways.

The purpose and importance of fulfilling these Information Requirements:

- They are essential for the ongoing efficient and cost-effective management of assets by the receiving entity.
- Accurate information enables robust planning and decision-making for future asset maintenance and operations.
- Providing accurate details helps ensure the handover process goes smoothly and drastically lowers the risk of handover and ongoing issues and disputes.
- It is necessary to ensure compliance with legal and contractual obligations.
- For roading assets, this information often forms the basis for inputs that drive the optimisation process in

asset management systems and provides data for designers selecting treatments.

Once assets are successfully handed over and the information is integrated into the asset management system, this data becomes fundamental for ongoing asset management processes. This includes updating the inventory, assessing condition, predicting performance, selecting appropriate treatments, developing and reviewing forward works programmes, managing risks, and planning maintenance activities.

Detailed Asset Handover Process

Asset Handover involves several key steps, primarily detailed in this article. The overall process is designed to ensure that the receiving entity PNG DoWH obtains all necessary information about new or modified assets for effective long-term management.

Here are the steps involved in the Asset Handover process, drawing upon the sources:

Preparation and Planning

- The handover should be planned early in the project lifecycle, not treated as an afterthought.
- A consistent and reliable procedure should be used, often codified in a checklist or template.
- The approach to asset transition, including defining quality standards and handover requirements, should be clearly defined, ideally in the contract.
- Early consultation with the receiving entity's asset management team is recommended, especially for complex projects like public transport assets.
- The project owner; Developer, Contractor, Consultant, is responsible for providing the required information.

Information Gathering and Preparation

This is a critical phase requiring the collection and organisation of various types of asset information.

- **Asset Attribute Data:** Collect data defining the characteristics of the asset, such as asset type, description, size (length, width, area), material, install date, and the activity type (new, renewal, etc.).
- For roading assets, this data is typically recorded on standardised Road Asset Data Templates, obtained from the receiving entity. Using specified pick-lists helps ensure data consistency.
- Attribute data is required for new, renewed (if substantial replacement), validated, and disposed assets. For disposal, information like asset ID, date of disposal, and reason is needed.
- **As-Built Plans and Drawings:** Prepare plans documenting the final constructed state of the assets. These must show all new assets and any existing assets that were changed, removed, or needed correction in the database.
- Include spatial information such as Northing/Easting coordinates (EPSG: 28355) , road chainage/displacement, and offset distances. For linear assets, polylines are used, and for polygon assets, polygons are used.
- Show typical cross sections for assets like pavements, bridges, footpaths, and walls, and longitudinal sections for carriageways.
- Separate plans might be needed for different asset classes if a single drawing would cause conflict or confusion.
- As-built plans must be certified by a Chartered Professional Engineer or Registered Surveyor.

- **Supporting Documentation:** Gather all necessary certificates (occupancy, inspection, compliance, electrical), builder and manufacturer warranties, permits, the construction contract, final drawings, operation and maintenance manuals, asset owner manuals, and supplier documentation (like guarantees).
    - Survey Office or Deposited Plans are required when property boundaries are changed, such as for land

acquisition.
    - Testing and commissioning data and defect management information are also important to prepare.
    - Compliance reports should be included.

Information Submission

- All asset information (attribute data, as-built plans, and required documentation) is typically required in digital format (e.g., DWG, DXF, MS Excel, PDF). A certified hardcopy of the as-built plan(s) is also needed.
- Submissions are usually made to the project manager or a specific team (e.g., Asset Quality Assurance Team, Asset Acceptance Team).

Review and Validation

- The receiving entity's relevant teams (e.g., Development Engineer, Project Engineer, Contract Engineer, QA Team, GIS Team, Asset Management Team) review the submitted information for accuracy, completeness, and compliance with standards.
- This review process takes time (e.g., typically 10 working days is set for review and response on submitted data). Setting a time on data review and validation response is crucial in ensuring the focus and resupply of data remains at the forefront of the process.
- A joint site inspection involving Project Engineer, QA Team, and Maintenance teams may be organised as part of the review and handover process.

Correction and Resubmission

- If errors or deficiencies are detected during the review, the information (as-built plans, attribute data, documentation) is returned to the originator (Contractor, Consultant, Developer) for correction and resubmission.
- Resubmissions must clearly indicate that they are amended versions.

Formal Acceptance and System Update

- Once the submitted information meets the required standards and is satisfactory to the receiving entity, it is formally accepted.
- The accepted asset data is then loaded into the asset management databases.

Certification of Practical Completion and Defect Period Responsibilities

Post-Handover Activities

- Any defects or safety issues identified during the handover process and inspections are addressed and completed.
- Updated asset information is provided to the maintenance teams who will then plan and organise future maintenance activities for the newly accepted assets.
- For clients/owners, instructions on how to operate and maintain the property/assets may be provided.