PORT OF PORTLAND
DOCUMENTATION STANDARDS

PART ONE: DOCUMENTATION DELIVERABLE REQUIREMENTS

VERSION: 2023

REQUIREMENTS FOR PROJECT DOCUMENTATION SUBMISSION TO THE PORT OF PORTLAND

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1. OVERVIEW

1.1 Goals & Uses

This manual is a guide for consultants performing, or desiring to perform, engineering and/or architectural design and/or drafting services for the Port of Portland. Accurate documentation is of utmost importance for the Port of Portland as an owner operator of its facilities. The goal of the Drawing Deliverable Requirements is to guide project teams through the documentation submission process from early design to project closeout. The requirements outlined below and in our Graphic and BIM/CAD standard documents ensure successful integration of project data into the Port of Portland's Facility Management platforms; Enterprise Asset Management System (EAM), Computerized Maintenance Management System (CMMS), Geographic Information Systems (GIS), and other operational databases.

This manual should not be considered a substitute for good communication between the team members involved. Effective communication between the consultant's staff and the Port's engineering Project Manager, Project Engineer, the CAD/BIM manager, and the Project Analyst, will help ensure production of concise, accurate, and complete drawings on schedule.

1.2 Owner Provided Resources

The Port of Portland has documentation standards that all teams should use as a guide for executing a project

Port of Portland, Graphic Standards
Port of Portland, CAD Standards
Port of Portland, BIM Standards
Port of Portland, Asset Standards *(Coming Soon)*

All of these documents and appendix files are available on the Port of Portland website.

2. GENERAL REQUIREMENTS

2.1 Digital Delivery Plan

The Port of Portland will provide a template for a project's required information, **Appendix:** POP Digital Delivery Plan.xlsx. This workbook will be reviewed during the project's kick-off meetings and continually updated with project information and decisions, including any of the project's exceptions to the Port's documentation standards. The "Submission Checklist" sheet is intended to mirror the following sections in this document to help provide a checklist for a successful documentation submission. The workbook should be included with each CAD/BIM submission.

2.2 Project Identifiers and Information

Each project will need to obtain the Port's official titles and project identifiers to be utilized on all documentation.

2.2.1 Project Titles

Project Titles are developed by the Port Project Managers and then validated by the Port Engineer, Project Analyst, and Spec Writer to confirm it meets Port standards. Coordinate with the Port's Project Analyst to obtain your project's official project title.

2.2.2 Project Identifiers

The Port has multiple assigned identifiers: Design Number, Project Number, and Drawing Number. Refer to the POP Graphic Standards, Section 2 POP Project Identifiers for the format of each.

2.3 Port of Portland Project Roles and Responsibilities

Below are the Port's typical roles on a project, refer to contract documents for roles definitions on specific projects. Project Roles will also be discussed at Design Kick-off, Technical Kick-off and Pre-Construction meetings.

2.3.1 Project Manager (PM)

The Engineering Project Manager's (PM's) role is to ensure that the construction documents (CDs) are produced in accordance with the project scope, schedule and budget, and that they support the construction of the work, as well as the safe and efficient operation and maintenance of the project. The PM establishes the list of reviewers to ensure that all Port stakeholders have an opportunity to comment on and contribute toward the final CDs. The PM also focuses on resolution of any issues that are identified during the review process that are not easily resolved by the Project Engineer (PE) and consultant.

2.3.2 Project Engineer (PE)

The Project Engineer is the primary point of contact for consultants or vendors throughout the project lifecycle, for all technical or design-related items. The Project Engineer, in coordination with the Project Manager, facilitates answers to questions regarding project scope, operational impacts or limitations, and input from maintenance personnel, end-users, or other stakeholders. The Project Engineer is responsible for leading project reviews, as well as facilitating responses to construction submittals and requests for information.

2.3.3 Project Analyst (PA)

The Engineering Project Analyst primary role is to assist both the Port Project Manager and Port Project Engineer with the tracking and documentation of their assigned Port projects. This includes assigning key project identifiers, coordinating and setting up project reviews, providing QA/QC for project deliverables and ensuring projects fulfill their records and deliverables requirements. In addition, the Project Analyst is responsible for uploading documents to and maintaining the TRC Search Database which houses information related to all past Port projects, and is a key resource in understanding existing conditions. The Project Analyst attends selected project meetings to provide technical assistance to all personnel involved, including when appropriate, selected vendors and consultants.

2.3.4 Spec Writer

The Spec Writer works collaboratively with Port project managers and engineers, consultants, Contracts and Procurement (C&P), Legal, and TRC to plan, research, write, and publish the construction contract and specifications. In addition, the Spec Writer provides guidance on Port document standards and construction contracting protocol, alerts the design team to possibilities of contractual or practical risk or exposure, and assures quality and consistency of the project documents.

2.3.5 BIM or CAD Manager

The BIM and CAD managers can assist in compliance with the Port's Graphic Standards in various design authoring software. They will be responsible for reviewing all design and construction authoring files. In addition the BIM or CAD manager is responsible for archiving any submitted files to the appropriate Port network drives and ensuring the project's data is incorporated into the Port's Facility Management models.

2.4 Project Phases, Milestones & Deliverables

2.4.1 Pre-Drawing/Design

During the pre-drawing/design phase, the Project Engineer typically schedules a technical kickoff meeting with the consultant and representatives from Specifications, Digital Center, and CAD and/or BIM. During the meeting, design requirements for the project are discussed, including the POP Digital Delivery Plan and specific CAD/BIM standards and file compatibility.

2.4.2 Design Review/Development

The Port utilizes Bluebeam Revu sessions to conduct all design reviews. Deliverables during this phase consist of combined or multi-page PDFs. Refer to section 3 for submitted file requirements and processes and see

POP Graphic Standards for specific drawing requirements during this phase.

The consultant or the Port's CAD and/or BIM staff can request a digital design authoring file review at anytime. Typically this review is to ensure compatibility of software version or add-ins, template and drawing setup, coordinate system and other high level elements and ideally occurs very early in the process.

After a milestone review is completed, all comments will be reviewed during project progress meeting between the consultant and the Port's Project Engineering staff. A copy of the review documents with all comments will then be saved to the project SharePoint site. It is the expectation that all comments will be addressed prior to the next review milestone unless otherwise agreed upon.

The number and timeline for reviews will be determined at the beginning of the project in conjunction with the Port's Project Engineering staff and documented in the POP Digital Delivery Plan. Typical Port projects utilize a 30%, 60%, 100% review framework with final in-house review of drawings and specifications at the 100% milestone.

2.4.3 **Advertisement** (Bid)

The "bid-set" is the set of drawings and specifications that will be issued for advertisement. It is required that these be stamped and digitally signed by the architect or engineer of record and delivered to the Port. Drawings are to be delivered as individual page PDFs. See Section 3 Submission Process & Requirements for more information.

Addendum changes affecting drawings occur during the advertising/bidding period and may be done by text, reissuing the drawing, issuing a sketch, or by adding new drawings. See POP Graphic Standards for more addenda requirements.

2.4.4 **Pre-Construction** (Construction Set, As Bid, As Proposed, or As-Negotiated)

Immediately after the advertisement period has closed, all addenda changes issued will be incorporated into the construction drawing set. The construction drawing set is to be delivered to the Port as stamped and signed individual PDF pages and a combined multi-page PDF set along with all design authoring files and a PDF of the final specification manual. See POP Graphic Standards for drawing requirements and Section 3 Submission Process & Requirements for more information.

The construction drawing set and specifications are then distributed to the selected contractor by the Port.

2.4.5 Construction

Consultants are to provide construction support as defined in the contract. If a drawing is reissued, revised or added during construction, that drawing will need to be replotted as a full size PDF, appropriately stamped and signed, and submitted to the Port Project Engineer.

2.4.6 Record (As-Constructed)

The consultant will be responsible for developing the record drawings. The Port expects the drawings to include all changes made during the construction process. The drawings, along with the shop drawings and as-construct surveys (if applicable), shall stand alone as a complete record of the "as-built" condition. The consultant is to provide the Port with a multi-page PDF of the record drawings for review. After all corrections have been made and record drawings have been approved, provide individual page PDFs and a combined multi-page PDF along with the design authoring files. The Port will review the design authoring files to ensure completeness and compatibility of the delivered files. Review of the design authoring files will not take place until after the PDFs have been approved.

Do not stamp or sign the record drawings.

2.4.7 Deliverable Matrix

	Interim Design Review(s)	100 Design Review	Permit Set	Bid Set	As-Bid	Record Set
Signed PDF Submission: Individual Sheets			x	x	x	x (Not Signed)
PDF Submission: Multi-page PDFs	x	x			x	x
Spec Submission		x		x	x	
BIM/CAD Submission					x	x

3. SUBMITTING PDFs

All PDF files will be submitted electronically via the Project SharePoint site, in the appropriate folder. Once uploaded, notify the Project Engineer that the documents are ready for review. All PDFs will be unlocked and all text in PDFs shall be text-searchable, including all notes, labels, model areas, and titleblocks. See Port Graphic Standards for all standard expectations for drawing sets.

The Project Manager for the contractor/consultant team should ensure that all sections have been met prior to file submission of any PDF documents.

3.1 Bluebeam Reviews

Port will provide a Bluebeam session for reviewing documents. All team markups and responses should be included in the session. The Project Analyst will archive the documents from each completed review in the project's design SharePoint site.

3.2 Multi-page PDFs

Multi-page drawing sets should be ordered by sheet number, matching the order of the index. Sets should be bookmarked, page labels, and hyperlinked.

Standard naming convention:

EAN – XX% Review Drawings (Drawing #)

Example:
2022D014 – 60% Review Drawings (PDX 2023-501)

If Volumes will be used, add Vol 1, Vol 2, etc to the end of the name.

3.3 Individual Sheets

Individual sheet PDFs named according to POP standard naming convention (with a single space between each):

Drawing # (pg#) Disc. Sheet Number

Example:
PDX 2019-1 (1) GI1.01.pdf

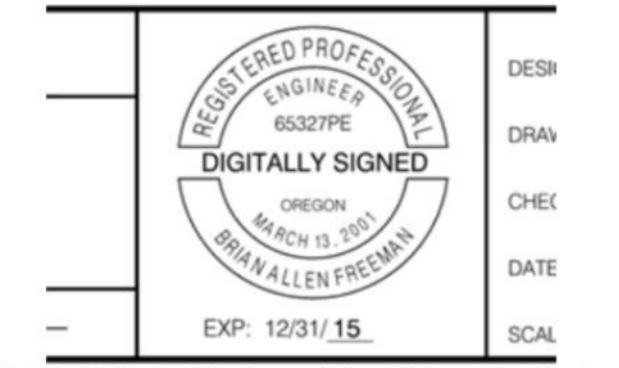
Digital Signature

When required, individual PDFs must be digitally stamped and signed in accordance with all applicable Oregon Statutes and Oregon Administrative Rules. The following provides guidance on submitting digitally signed documents for bid and final construction sets. Oregon Board of Examiners for Engineering and Land Surveying (OSBEELS) requires the digital signature of a Professional Engineer or Land Surveyor to be "independently verifiable by a Certificate Authority (3rd Party CA)."

Third party certificates are individually or organizationally purchased from a 3rd Party CA and require the individual and/or organization to fill out an application. The 3rd Party CA then verifies your information and then issues the digital signing certificate on a secure USB drive or other approved hardware. This process takes between 3-10 days. If you do not have to contact a 3rd Party CA nor have a USB or other hardware with your certificate on it, you are likely using a self-sign program which cannot be sufficiently validated for legal purposes. It is recommended that you use a 3rd Party CA that is an Adobe Approve Trust List (AATL) member and/or on the Microsoft Trusted Root Program list. See the end of this document for ODOT's list of 3rd Party Cas currently known to meet Oregon Law.

OSBEELS further specifies that "the registrant affixes a computer-generated image of a stamp that bears the phrase 'digitally signed' in lieu of and in the location designated for a hand-written signature…" In addition, the Port requires that the following notice be included below the signature block: "If electronic signature is broken or missing – this is not a legal drawing."

EXAMPLE:



If electronic signature is broken or missing - this is not a legal drawing

When considering whether your digital signature program meets the Port requirements, refer to the following:

State Board of Architect Examiners 806-010-0045
https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=266296

Oregon Administrative Rule (OAR) 820-025-0010
https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=254994

ODOT Engineering Automation Digital Signatures Documentation:
https://www.oregon.gov/ODOT/ETA/Pages/Digital-Signatures.aspx

ODOT's List of Digital Certificate Authority Vendors:
https://www.oregon.gov/ODOT/ETA/Documents_ETA/Digital-Cert-Auth-Vendors.pdf

4. SUBMITTING DESIGN AUTHORING FILES

All design authoring files must be submitted within the following folder structure:

Appendix: POP Digital Delivery Plan

All projects need to include a list of all files that are included in the submission, see the Port's Digital Delivery Plan for template. It is imperative that all linked files are pathed to documents that match the Submitted Files list.

The BIM/CAD Manager for the contractor/consultant team should ensure that all following sections have been met prior to file submission of any design authoring files.

4.1 CAD Files

The Port requires CAD files to be packaged using the eTransmit tool in AutoCAD. Files should be unbound and purged. Xrefs (external References) should be placed in a separate folder in the eTransmittal. Unloaded file references should not be included.
See POP CAD Standards Manual

4.1.1 File Naming

See POP CAD Standards for all naming conventions.

4.1.2 File Condition

The Port requires an AutoCAD .dwg file format that can be read by the Port's current version of AutoCAD, and all support files that create the drawing set including Civil 3D files for surveys, surfaces, plan and profiles, cross sections, etc. All ASCII files shall be comma delineated.

4.1.2.1 X-ref

Include all external references (Xrefs), images, custom line types, non-standard fonts, and .stb and .ctb files Files should be properly referenced to each other as needed. Remove any link that is not needed as part of the record documentation or graphical context. Avoid delivering CAD files with external references Status as Not Found.

Xrefs should not be bound or inserted into the drawing, but should be attached using AutoCAD's relative path or project name.

4.1.2.2 Purge

All drawings should be purged of unused blocks, line types, fonts, proxy graphics, or similar elements and audited, with layers in the correct state for publishing (frozen/thawed) prior to delivery to the Port.

4.2 Revit Files

All Revit models should be delivered via the Port's Autodesk B360/ACC site. This includes initiating models as cloud models and appropriately relinking models together within the B360/ACC Project Hub.

4.2.1 File Naming

See POP BIM Standards for all naming conventions.

4.2.2 Model Condition

See PART 4 - POP BIM Standards

4.2.2.1 Geolocation and Alignment

All models share a common alignment point, and are located according to the Port's survey.

4.2.2.2 Existing Conditions

Existing Conditions are managed by Revit Phasing and are classified as either "Existing Conditions" or "Existing Impacted"

4.2.2.3 Worksets

Worksets are consistent across all models.

4.2.2.4 Phases

Phases and Phase Graphic settings are consistent across all models.

4.2.2.5 Links

All necessary links are included in the submission and appear in the Su bmitted Files List. No references are listed as "Not Found"

4.2.2.6 Revit Families (RFAs)

Unused, duplicate, or number appended copies of Revit families have been purged from the model.

4.2.2.7 Views

Due diligence to purge views that are no longer useful or necessary for continued work. Purge all working and study views.

4.2.2.8 Design Options

Clear all Design Options besides the Primary Option. Design Options being used to control graphics or scope should remain.

4.2.2.9 Warnings

The model should be submitted with no errors upon opening, and with a reasonable amount of errors based on model size.

4.2.3 Documentation Model Submission

Each discipline/trade will upload all design authorship files needed to recreate the working models to the Port's BIM360/ACC. All items identified in the above section, 4.2.2 Model Condition, completed.

4.2.4 Federated Model Submission

Once the Documentation Models (4.2.3) submission has been complete, the Port requests a federated model for preview and coordination purposes also be uploaded in the BIM360/ACC hub. This model should have all discipline models linked in, so the content is visible in one model.

4.3 Navisworks

Submit all Navisworks files relevant to the coordination and construction of each design package.

NAVISWORKS FILE TYPE FORMAT	
ITEM	**DESCRIPTION**
NWC	Navisworks Cache Files This type of file contains all the original model geometry and data
NWF	Navisworks Federated Format This type of file contains links to the native files (NWC) and allows the creation of redlines, review markups, and comments. No model geometry is saved with this file format
NWD	Navisworks Design Format This type of file contains all model geometry data together with redlines, review markups and comments This type of file is a "snapshot" of the project and is used for sharing purposes

Standards for naming Navisworks files will follow the same abbreviation system for facilities and buildings.

4.4 Others

All files used to create the project drawings should be submitted in their original file format. The file formats listed below are some common examples, if a project has other file types discuss their submission with the Project Engineer and CAD/BIM Manager.

4.4.1 Point Cloud

Submit all point cloud files in Autodesk Recap (RCP) file format that are relevant to the work completed in the package being submitted for closeout.

4.4.2 Adobe

Submit any Adobe files that are relevant to the production of contract documents. Any artwork files used to create signage and wayfinding graphics should be submitted in their original authored file format.

5. SUBMITTING ASSET DATA

Coming Soon