Port of Portland Documentation Standards

PART FOUR: BIM STANDARDS

PORT OF PORTLAND
DOCUMENTATION STANDARDS

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REQUIREMENTS FOR MODELING

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4.1 OVERVIEW

4.1.1 Goals and Uses

The port utilizes BIM to maintain its facilities and these standards and expectations ensure that a project's BIM files can be successful incorporated into the Port's Facility Management Revit files.

The purpose of the BIM Manual is to standardize information and improve electronic data sharing between disciplines at the Port and from consultants working for the Port.

The Port of Portland intends to use the Record Model primarily for inclusion into our Facility Management Models and the following:

- Basis for the Port's space and lease management
- Fire Life Safety Masterplan and other building navigation, accessibility, safety and security purposes.
- Providing asset maps and plans for operations personnel.
- Design input for future expansions and/or renovations made to the facility.

4.1.2 Owner Provided Resources

The Revit Standards & Library Model is the Port's provided template for use by architects and engineers wishing to do work for the Port of Portland. During the project's Technical Kick-off meeting, a Port BIM Specialist will go over the Revit resources for as-built conditions and the Port's Revit Standards & Library Model.

4.2 GENERAL REQUIREMENTS

4.2.1 Project Set Up

See the POP Documentation Deliverable Requirements, Section 1.4 for guidelines on folder structure, documentation delivery, etc.

4.2.2 Acceptable File Formats

The Port expects projects to continually upgrade to the current version of Revit throughout a project. Prior to any annual upgrade, timing should be coordinated with approval from the Port's BIM manager.

4.2.3 Custom Tools and Add-ins

Project teams are welcome to use custom tools and/or add-ins, as long as the submitted Revit file is fully compatible with out-of-the-box Revit.

4.3 MODEL STANDARDS

Modeling shall be used to convey information about the building and its components. Detailing can be used when only when necessary to convey information that cannot be shown through modeling. The decision to use detailing shall be made based on the level of information required for the intended use. All model elements shall have accurate dimensions, locations, and orientations as defined by the project's execution plan and/or LOD matrix.

4.3.1 File Naming and Submitted Files

Name all Model files per this standard:

FACILITY CODE -PROJECT NUMBER-DISCIPLINE ABV-TYPE ABV.rvt

Example:

PDX 121180-ARCH-INT.rvt

See the POP Graphic Standards, Section 1.4 for guidelines for discipline and model type abbreviations.

4.3.2 Model Organization and Condition

4.3.2.1 Geo-location

All models are required to share a common alignment point and be located according to the Port's survey. The Port will provide a survey file with the needed coordinates for establishing shared coordinates. A Project Survey Point and Base Point will be determined by the Port.

4.3.2.2 Existing Conditions

The project team is required to use Revit Phases to manage the modifications to existing conditions. The Port requires existing conditions to be maintained under two different classifications: "Existing Context" and "Existing Impacted".

- Existing Context: Elements classified as "Existing Context" are from the existing conditions provided by the Port. They remain unaltered through the completion of the project.
- Existing Impacted: Elements are classified as "Existing Impacted" when one of the following conditions is met.
    - Existing conditions are revised by field verification.
    - Existing Element remains but is impacted in some way by the project scope.

Any unaffected exiting conditions should be separate from content that is to be modified or demolished by project scope. Content brought in from an existing conditions model should be placed on an "Existing"

phase. Any existing content added by field-verification should be identified as such. This is to allow for their incorperation into the Port of Portland facility models.

4.3.2.3 Worksets

The Port requires that all submitted Revit models are workshared and using consistent workset naming. The general logic for workset naming/organization should be communicated in the POP Digital Delivery Plan with the BIM submission.

4.3.2.4 Phases

The Port requires that all submitted Revit models are using consistent phase mapping. The overall phase mapping for a project should be submitted in the POP Digital Delivery Plan with the BIM submission.

Phases and phase settings should be identical across all models in the project. If a model does not have scope in a phase, the phase should still be caried in the model to simplify the process of phase mapping.

Models should use default values for phase filters and phase graphic overrides unless an exception is given.

4.3.2.5 Links

Linking between disciplines should be pathed directly to the source model submitted. Avoid submitting duplicates of other discipline's models that are just for link purposes. It is imperative that all files are pathed to documents that match the Submitted Files list in the Digital Delivery Plan.

Remove any link that is not needed as part of the documentation or model context.

Avoid delivering models with references with status as Not Found. All linked DWG, Point Cloud Files, etc. used for context should be included in the discipline's subfolder "Links".

4.3.2.6 Revit Families (RFAs)

Prior to submitting to the Port for review remove all unused families, types, and other content as appropriate. The model should be cleared of number appended copies of Revit families.

4.3.2.7 Views

For final model submissions purge all working views that do not appear on record drawing sheets except for views used to set linked model

view properties (by linked view). Due diligence to purge views that are no longer useful or necessary for continued work.

4.3.2.8 Design Options

Any Design Options that are being used to control graphics or scope should remain in the model and be communicated with the Port's BIM Manager. Design Options that are intended for study purposes, are unused, or are obsolete should be removed prior to submission.

4.3.2.9 Warnings

The models should be submitted with no errors upon opening, and with a reasonable amount of errors based on model size. It's important to ensure that the submitted model can be opened and integrated into the Port of Portland's Facilities BIM environment without issue.

4.3.3 Documentation Models Warnings

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, Model Condition, completed. The models should be reestablished as similarly to the original working environment as possible.

Each discipline folder will have a "LINKS" subfolder. This folder is intended for any file needed by that specific discipline only. This may include an existing conditions model, DWG links, inserted images. This folder should not be used for static copies of other discipline's models.

4.3.4 Federated Model

Once the Documentation Models 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.

Models should be purged of all views and sheets to reduce file size. The Port may request specific views to be published in the Federated model.

4.4 DATA STANDARDS

4.4.1 Shared Parameters

The Port has shared parameters specially designed to help capture information that the is used for building operations. A shared parameter file will be supplied by the Port's BIM Specialist with the Port's Revit Standards & Library Model.

These shared parameters fall under the following parameter categories:

- Room & Area Data
- Titleblock

- Sheet
- Code, Fire Life Safety
- Emergency Response (FEC, AED, etc)
- MEP Asset Information

4.4.2 Room and Area Data

The Port requires specific spatial information for Rooms and Areas. The Port will assign all room numbers for a project, this needs to be coordinated with the BIM/CAD Manager.

Appendix: POP Spatial Data

4.5 ANNOTATION STANDARDS

All the following information is supplemental to the POP Graphic Standards, information below is specific to Revit.

4.5.1 Standard Symbols

More symbols are available in the Port's Revit Library and Standards.rvt than required by the Port's Graphic Standards. Below is the list of required Port symbols. Any others found in the Revit template are optional use.

See **Appendix:** Graphic Example Sheets, for guidance on required Port Revit families that should be utilized by the project team

4.5.1.1 North Arrow

This is a required Port RFA, available in the Port's Revit Library

4.5.1.2 Bar Scale

This is a required Port RFA, available in the Port's Revit Library

4.5.1.3 Key Plan

The Port will provide a base key plan RFA that can be used to create a project specific key plan that highlights the view boundaries needed. The Port does not maintain typical scope boxes, sectors, or view boundaries. Each project should generate sectors and scope boxes appropriate for the scope of the contract.

4.5.1.4 Reprographics Scale

This is a required Port RFA, available in the Port's Revit Library

4.5.1.5 Line Styles

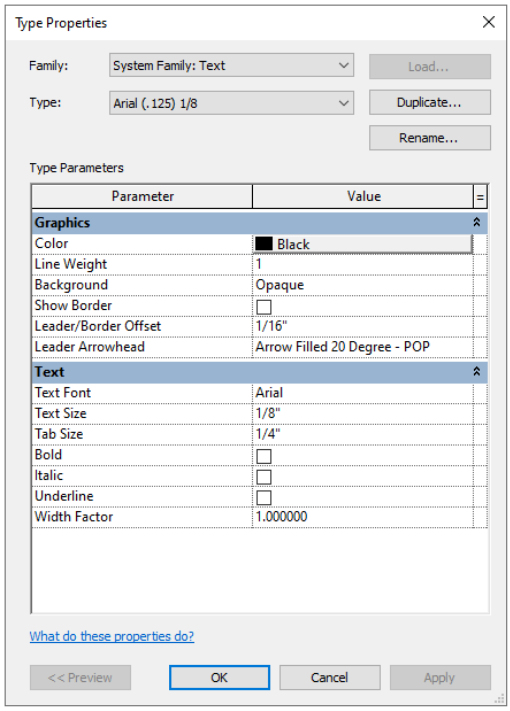
Standard Port Line Styles can be found in the Port's Revit Library and Standards.

4.5.2 Text and Legends

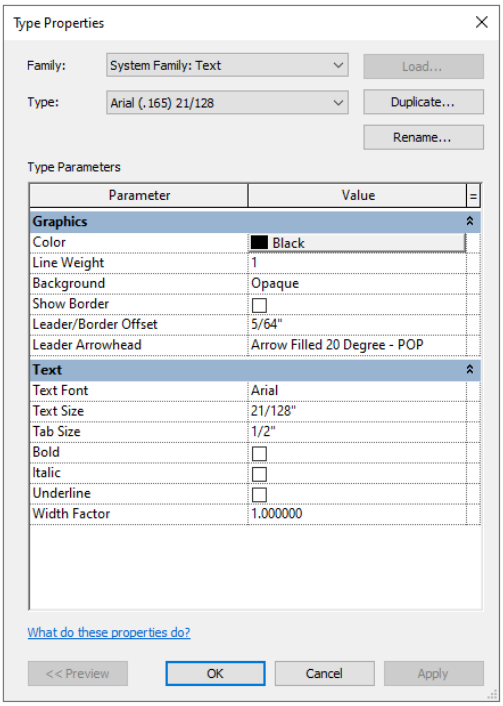
4.5.2.1 Text

The standard Port graphic standards for text have been incorporated into the Port's Revit Standards & Library Model. For documentation purposes the test settings should be set as follows:

Arial (.125) 1/8



Arial (.165) 21/128



4.5.2.2 Notes

Notes should appear on all sheets to which they apply. Legends should be utilized for sheet notes.

4.5.2.3 Keynotes

The Port's preference is that keynotes are managed using Revit Noteblocks or software generated schedules. Keynotes must be defined on the sheets they are tagged on. Under Schedule Properties/Filters ensure that all keynote legend schedules are "Filtered by Sheet"

4.5.2.4 Dimensions

Port accepted dimension types and styles can be found in the template. All Revit files should be set to below a 1/32" rounding.

4.5.2.5 Text Notes and Leaders

Port accepted text note and leader formatting can be found in the Port's Revit Standards & Library Model. The Leader Arrowhead should be set to the Port's Filled 20% Arrow.

4.5.3 View References and Titles

4.5.3.1 View Titles

The Port has a View title family in our Revit Standards & Library Model for view titles. View titles must be placed below their view on all plans, sections, elevations, details, and diagrams. Where more than one view is on a single sheet, the details should be numbered in a logical sequence consistent across all sheets in the project.

The Port accepts Revit's default settings for view titles.

4.5.3.2 Detail Callouts

The Port has a Callout head family in the that can be used for detail callouts.

4.5.3.3 Section Callouts

The Port has callout head and section tail families in the Revit Standards & Library Model that can be used for section callouts.

4.5.3.4 Matchlines

The view references should be automatically linked.

4.6 DRAWINGS AND TITLEBLOCK

4.6.1 Titleblock and Sheet Index

The Port's titleblock is available in the Revit Standards & Library Model. Shared Parameters are available from the Port for the required Titleblock information, see **Appendix** POP Titleblock Guide – Revit. Titleblock

4.6.2 Revisions Schedule

Required to use the Revision Manager to track all changes to documents.

4.6.3 Removing a Sheet or View

See **Appendix** Graphic Example Sheets - Revit

4.6.3.1 Removing a Sheet

The sheet needs to remain in the model, appear on the sheet index, and be printed with the record set. With the sheet and its views still present, the entire sheet should be crossed out and noted as no longer in contract.

4.6.3.2 Removing a View

The detail view should remain on the sheet after the scope is removed from the project, with the view crossed out and noted as no longer in contract.