

Construction Workflows for DGNs in the 3_Construction Folders in ProjectWise

Introduction

All work performed during the Construction Phase of a project should be stored in the 3_Construction folders of the project in ProjectWise. While work is proceeding in 3_Construction, it is important that the documents stored in the 1_Design folder structure remain unchanged to preserve the contract plans for the creation of contract changes (comparisons and dispute resolutions) and the creation of as-constructed drawings. When the project milestone of Notice to Proceed is achieved, the files in the 1_Design folder structure will be finalized and made to be read-only. This will not impact your ability during construction to review DGN files or create new DGN drawings based upon the design or plans. You will be able to attach DGN files as read-only references to accomplish your construction tasks, even if those tasks require redesign or access to civil data.

The “**ODOT Construction User Manual for STIP Design Documents**”, stored in the [Documents\ PW Resources\PW Standards\](#) folder in ProjectWise, identifies three construction workflows involving creating and editing DGN files during a project’s Construction Phase. This document will show steps of using the CAD software and provide links to documentation about how to create three different categories of work products: REFERENCE, REPURPOSE DESIGN, and REVISED PLAN. Deciding which workflow to use in each situation will depend upon what the task is, if the underlying civil model requires changes, and the number of DGN files that will need to be altered.

REFERENCE (Cost Reduction Proposals, Minor Sketches or Exhibits, and New Work During Construction) – You should use this workflow 90% of the time or more to view project designs or sheets via a reference and create your own construction drawings from a new DGN file. Draw construction work on top of the other work in the new DGN file. Creating working cross sections is an example of the REFERENCE workflow. No files are copied, only referenced; they are viewed as a reference attachment to a new DGN file.

REPURPOSE DESIGN (Design Work Done During Construction Phase Based Upon the Previous Design to Create a New 3D Model) – You should use this workflow that repurposes a copy of a DGN file, infrequently. It may be necessary to copy and repurpose design work when you require changes to the original design 3D model, like changing the side slope in a certain area. A Surveyor may need to copy right of way monumentation work to complete it. This work may be performed by a Tech Center Surveyor, Construction personnel, or by a Region Designer supporting the construction work. One file is copied from its original location in the 1_Design folders; it is manually renamed and repurposed (edited) to hold changes. The copy retains all original reference attachments to necessary civil data that supports the design.

REVISED PLAN (Revised Plan Sheets) – Used infrequently and **only when Revised Plan Sheets are required** to be produced. Usually this involves copying and renaming several DGN files and changing reference paths **to** the DGN file that is the source for the sheets. More than one file is copied from its original location in the 1_Design folders; they are renamed and repurposed to hold changes. One of the changes is to the reference attachment path.

Workflows

REFERENCE (Cost Reduction Proposals, Minor Sketches or Exhibits, and New Work During Construction)

Use referencing 90% of the time or more. Construction will create new DGN files to view project designs or plan sheets via a reference and draw construction work on top of the other work in the new DGN file. During construction, there may be a need to add information to a plan to provide a sketch drawing for the field or contractor, such as the location of a proposed mailbox. In this scenario, the design work done by others (designer, drafter, contractor, or surveyor) can be used to create new construction drawings and sketches for payment support. Construction may toggle off level displays or mask unneeded information seen in referenced designs or sheets. New work by Construction is placed in the new DGN only.

Workflow Outline

Create new DGN files in: 3_Construction\Construction_Engineering, \Payment_Support, or \Construction_Survey folders. The new DGN files will be opened with CAD software and reference attachments will be made to read-only DGN files created by others during the Design or Construction Phases. The CE_K#####_XSEC_##.dgn file that may be created to display new cross sections will use this REFERENCE workflow.

Attach references to DGN files in: 1_Design\2_Plan_Sheets, 3_Base_Files, and 6_Civil_Data.

Also attach reference to DGN files in: 3_Construction\Construction_Engineering, \Construction_Submittal, \Construction_Survey, and \Payment_Support.

Create sketches or drawings that support payments.

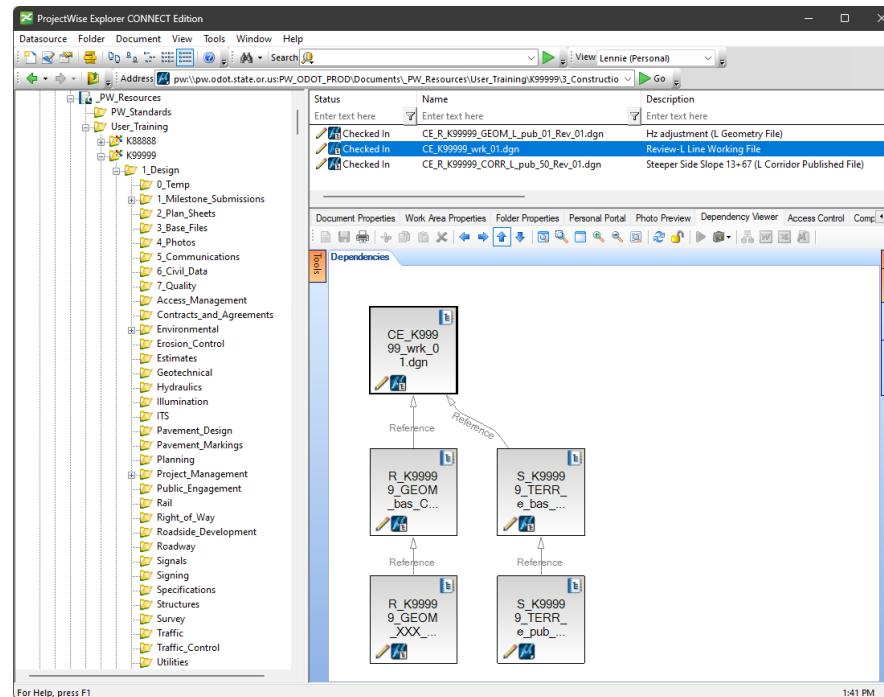
Reference Workflow Summary

No files are copied from their original location in ProjectWise; they are viewed as a reference attachment to a new DGN file.

Process Table for REFERENCE

REFERENCE Workflow Steps	3_Construction\ ProjectWise Folder	Document Name Example Links to Documentation	Document Description
1. Use PW>New Document and a 2D template to create a new DGN file for the construction work.	Construction_Engineering Construction_Survey Payment_Support	CE_K99999_wrk_01.dgn CS_K99999_wrk_01.dgn CP_K99999_BI057_SKCH_2025_05_15_01.dgn How to create new DGNs in ProjectWise	<Name> Working File <Name> Working File Bid Item <Bid Item Number> Payment Sketch <YYYY> <MM>
2. Open your DGN		How to Open DGNs and Access ODOT Standards	
3. Attach References		Container Files and Live Nesting	
4. Place Your Own Graphics		ODOT Ribbon Workflows Civil Annotations	
5. Save a PDF for Contractor or Field (Print)	Deliverables	CD_K#####_PDF_##.pdf Single Sheet Printing	<Description> Construction Sketch/Sheet

For more detail, please see the “**ODOT Construction User Manual for STIP Design Documents**”, stored in the [Documents_PW_Resources\PW_Standards\](#) folder in ProjectWise. The image below shows the ProjectWise Explorer with a working DGN in the Construction_Engineering folder highlighted. The new reference attachments are seen in the lower Dependency Viewer.



REPURPOSE DESIGN (Design Work Done During Construction Phase Based Upon the Previous Design to Create a New 3D Model)

Repurposing a copy of a DGN file may be necessary when you have changes to the original design content, like changing the side slope in a certain area. No matter who performs the work, new DGNs are created in the 3_Construction folders. If right of way monumentation was started in 1_Design and needs to be completed during construction, this is another reason to repurpose a copy of a DGN file.

The table below shows that the source "pub" or "base" DGN files are copied from the 1_Design area into the 3_Construction area and renamed, retaining the source name as part of the new name. Then, the repurposed DGN files are edited by a Construction Designer, Construction Surveyor, Tech Center Surveyor, or a Region Designer to make changes to graphics, features, geometries, corridors or terrains. Construction drawings can be produced directly from the repurposed DGN file.

Workflow Outline

Copy source DGN file from: 1_Design to 3_Construction. After renaming, open the repurposed DGN file. The repurposed and renamed copy still retains reference attachments to DGN files in: 1_Design\2_Plan_Sheets, 3_Base_Files, 6_Civil_Data, and Survey that support the design.

Edit the repurposed DGN files in: 3_Construction\Construction_Engineering or \Construction_Survey.

Create sketches or drawings that support payments or produce any deliverable.

Repurpose Design Workflow Summary

One file is copied from its original location in the 1_Design folders; it is manually renamed and repurposed to hold changes yet retains all original reference attachments to necessary civil data that supports the design. When the construction work can be accomplished by modifying a 2D plan, use the REFERENCE workflow. If the construction design work will be used to produce a revised plan sheet, use the REVISED PLAN workflow.

Process Table for REPURPOSE DESIGN

REPURPOSE DESIGN Workflow Steps	Source Example Name	Construction_Engineering Destination Example with New Name (manual edits in bold font)	New Document Description
1. Use PW>Copy To... to create a copy of the file that requires changes.	1_Design\Roadway\R_K99999_CO RR_L_pub_01.dgn	3_Construction\Construction_Engineering\CE_R_K99999_CORR_L_pub_01_Rev_01.dgn	Steeper Side Slope 13+67 (L Corridor Published File)
2. Open the CE named repurposed DGN		How to Open DGNs and Access ODOT Standards	
3. Edit the CE named repurposed DGN		For assistance in editing the design, see your civil CAD product training guide.	
4. Save a PDF for Contractor or Field (Print)		3_Construction\Deliverables\CD_K#####_PDF_###.pdf Single Sheet Printing	<Description> Construction Sketch/Sheet

REPURPOSE DESIGN Workflow Steps	Source Example Name	Construction_Survey Destination Example with New Name (manual edits in bold font)	New Document Description
1. Use PW>Copy To... to create a copy of the file that requires changes.	1_Design\Survey\S_K99999_ODGN_rwm_01.dgn	3_Construction\Construction_Survey\CS_S_K99999_ODGN_rwm_01_Rev_01.dgn	Edits to Monumentation (Project Monumentation)
2. Open the CS named repurposed DGN		How to Open DGNs and Access ODOT Standards	
3. Edit the CS named repurposed DGN		For assistance in editing the design, see your civil CAD product training guide.	
4. Save a PDF of Drawings		3_Construction\Construction_Survey\CS_K#####_CS_File_###.pdf Single Sheet Printing	Survey CS File (PDF)

For more detail, please see the “**ODOT Construction User Manual for STIP Design Documents**”, stored in the [Documents\PW_Resources\PW_Standards\](#) folder in ProjectWise. The image below shows the ProjectWise Explorer with a repurposed DGN in the Construction_Engineering folder highlighted. The original reference attachments are seen in the lower Dependency Viewer.

ProjectWise Explorer CONNECT Edition

Address: pwr\\pw.odot.state.or.us:PW_ODOT_PROD\Documents\User_Training\K99999_3_Construction

View: Lennie (Personal)

Status Name Description

Enter text here	Enter text here	Enter text here
Checked In	CE_R_K99999_GEOM_L_pub_01_Rev_01.dgn	Hz adjustment (L Geometry File)
Checked In	CE_K99999_wrk_01.dgn	Review-L Line Working File
Checked In	CE_R_K99999_CORR_L_pub_50_Rev_01.dgn	Steeper Side Slope 13+67 (L Corridor Published File)

Document Properties Work Area Properties Folder Properties Personal Portal Photo Preview Dependency Viewer Access Control Comp...

Dependencies

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graph TD; S1[S_K99999_9_TERR_e_bas...] -- Reference --> CE[CE_R_K99999_GEOM_L_pub_01_Rev_01.dgn]; S2[S_K99999_9_TERR_e_pub...] -- Reference --> CE; R[R_K99999_9_GEOM_XXX_] -- Reference --> CE;
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1 object(s) selected

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REVISED PLAN (Design Changes During Construction Phase that Require Revised Plan Sheets)

Used infrequently and only when revised plan sheets are required to be produced and the REFERENCE workflow does not suffice. This is considered a large change because this requires changes to the underlying design files and the plan sheet files. To complete a REVISED PLAN requires editing reference attachment paths in the revised plan sheet to the revised design.

A Project Delivery Designer will typically support the creation of revised plan sheets during construction by copying the necessary files from the 1_Design folder to the Construction_Engineering folder, renaming them, and then revising the copies of the "pub" or "base" files as needed. The plan sheet DGN will be copied from 2_Plan_Sheets into the Deliverables folder and renamed; it will typically be edited by a CADD technician to place and update revision blocks and notes. It is in the repurposed and renamed plan sheet DGN that the reference attachments to the design will need to be edited. A PDF of revised sheets is also created in the Deliverables folder. It is a best practice that Project Delivery notifies Construction when the PDF of the revised sheet has been delivered.

Workflow Outline

Copy source DGN files from: 1_Design to 3_Construction. Separately copy the design and the plan sheet DGN files. After renaming, open the repurposed DGN files. The repurposed and renamed copy of the Project Delivery Design DGN file will retain reference attachments to DGN files in: 1_Design\2_Plan_Sheets, 3_Base_Files, and 6_Civil_Data that support the design. The repurposed and renamed copy of the Plan Sheet DGN file will contain at least one reference attachment to the project design that will need to be changed to point to the revised design.

Edit the repurposed DGN files in: 3_Construction\Construction_Engineering (Design DGN) or \Deliverables (Plan Sheet DGN).

Edit the repurposed Plan Sheet DGN to change the reference attachment to point to the revised design.

Revised Plan Workflow Summary

More than one file is copied from its original location in the 1_Design folders; they are renamed and repurposed to hold changes. One of the changes is to the reference attachment path. Because of its complexity, this workflow is not recommended unless the other two workflows have been considered. For example, changes to a sheet may be performed in a new DGN that attaches the plan sheet with live nesting to display the contract plan. If masking and placing new graphics in the construction DGN is sufficient to create a revised plan, use the REFERENCE workflow.

Process Tables for REVISED PLAN

REPURPOSE DESIGN Workflow Steps	Source Example Name	Destination Example with New Name (manual edits in bold font)	New Document Description
1. Use PW>Copy To... to create a copy of the file that requires changes.	1_Design\Roadway\R_K99999_CO RR_L_pub_01.dgn	3_Construction\Construction_Engineering\CE_R_K99999_CORR_L_pub_01_Rev_01.dgn	Steeper Side Slope 13+67 (L Corridor Published File)
2. Open the CE named repurposed DGN		How to Open DGNs and Access ODOT Standards	
3. Edit the CE named repurposed DGN		For assistance in editing the design, see your civil CAD product training guide.	

REPURPOSE PLAN SHEET Workflow Steps	Source Example Name	Destination Example with New Name (manual edits in bold font)	New Document Description
1. Use PW>Copy To... to <u>create a copy of the plan sheet file</u> that requires changes.	1_Design\2_Plan_Sheets\R_K99999_pl_01.dgn	3_Construction\Deliverables\CD_R_K99999_pl_01_Rev_01.dgn	Revised: C03 (C01-C09 - Plan Sheets)
2. Open the CD named repurposed plan sheet DGN.		How to Open DGNs and Access ODOT Standards	
3. Edit the CD named repurposed plan sheet DGN to change the reference path to the revised design file.		Edit the design-type model containing the named boundaries for the sheet. Container Files and Live Nesting	
4. Edit the CD named repurposed plan sheet DGN to edit notes and place revision block.		Edit the sheet-type model of the affected sheet number. ODOT Ribbon Workflows	
5. Save a PDF of the revised sheet (Print) and Notify Construction.		3_Construction\Deliverables\CD_K99999_C03_RevPlan_01.dgn Single Sheet Printing Print Organizer for Multiple Sheet Printing	C03 Revised Plan Sheet

For more detail, please see the “**ODOT Construction User Manual for STIP Design Documents**”, stored in the [Documents\PW_Resources\PW_Standards](#) folder in ProjectWise. The image on the next page shows the ProjectWise Explorer with a revised plan DGN in the Deliverables folder highlighted. In the Dependency Viewer, the green rectangle with the gray curved arrow represents a new reference attachment to the repurposed design. A gray rectangle obscuring the original reference attachment indicates that the original reference is toggled off.

ProjectWise Explorer CONNECT Edition

Datasource Folder Document View Tools Window Help

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Status Name Description

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Checked in CD_R_K99999_pl_01_Rev_01.dgn Revised: C03 (C01-C09 - Plan Sheets)

Document Properties Work Area Properties Folder Properties Personal Portal Photo Preview Dependency Viewer Access Control Components

Dependencies

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graph TD; S_K99999_9_TERR_e_bas_01[S_K99999_9_TERR_e_bas_01.dgn] -- Reference --> R_K99999_9_OPNP_01[R_K99999_9_OPNP_01.dgn]; S_K99999_9_TERR_e_pub_01[S_K99999_9_TERR_e_pub_01.dgn] -- Reference --> R_K99999_9_GEOM_bas_C01[R_K99999_9_GEOM_bas_C01.dgn]; R_K99999_9_OPNP_01 -- Reference --> CD_R_K99999_pl_01_Rev_01[CD_R_K99999_pl_01_Rev_01.dgn]; R_K99999_9_LnkDoc_cad_01[R_K99999_9_LnkDoc_cad_01.dgn] -- Reference --> CD_R_K99999_pl_01_Rev_01; R_K99999_9_GEOM_bas_C01 -- Reference --> CD_R_K99999_pl_01_Rev_01; R_K99999_9_GEOM_bas_C01 -- Link Set Relation --> CE_R_K99999_GEOM_L_pub_01_Rev_01[CE_R_K99999_GEOM_L_pub_01_Rev_01.dgn];
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