REASON FOR UPDATE: Reviewed and Updated

ASSOCIATED DOCUMENTS: **OPI Ref:** OPI 81

1. PURPOSE

1.1 To provide a standard for 3D CAD design.

2. SCOPE

2.1 This document applies to all those involved with 3D CAD design.

3. RESPONSIBILITY

3.1 Mark Hetherington is responsible for updating and communicating the details within this procedure.

4. PROCEDURE

This document outlines the methods to be used to produce CAD models and drawings using Autodesk Inventor to the James Walker Standard

4.1) All new designs will be created in 3D. The 3D model shall be used to generate any 2D drawings.

4.2) All Designs are to be stored in the James Walker Vault (JW-Vault). Each company has its own area within the JW-Vault that contains the relevant Project file, Templates and folder structure. The templates and project file should be utilized when starting a new design and the design is to be saved in the appropriate area within the JW-Vault Folder structure.

4.3) The numbering format and revision index for new designs should follow that detailed in OPI254-James Walker 3D CAD Numbering Scheme

4.4) New 3D models will be created using the '3D Template.ipt' file found within each company area detailed in section 4.2. It is the responsibility of the CAD user to download the latest version of this file from the Vault.

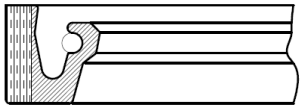
- The material library within this template has been populated with common James Walker materials and their associated densities. Only use materials within the template, if you require a material added please contact Mark Hetherington.
- The designer must ensure that where possible the models iProperties are populated. Some model iProperties are used within the title block of the 2D drawing (see table). A document detailing Inventor iProperties can be found in the 3D Design And Manufacturing area on the Lionshare.

Model iProperty	Drawing Title Block Property
Part Number	Drawing Number
Stock Number	CPN Number or Oracle Item Number (Finished Part Drgs only)

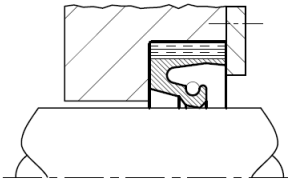
- Rename the features within the browser so that they reflect what they represent, they should not be left as Fillet1, Extrusion1, etc.
- Any profiles that are to be revolved must be sketched on the left-hand side of the origin/centerline (see notes on section views below). Any profiles that are to be extruded must be sketched on the origin/centerline.

4.5) New 2D drawings will be created using the '2D Template.dwg' found within each company area detailed in section 4.2. It is the responsibility of the CAD user to download the latest version of this file.

- This template has the James Walker 'style' associated to it; this style ensures that each drawing conforms to the ISO standards for technical product specification. Do not modify this template.
- The designer must ensure that where possible drawing iProperties are populated. The JWC 2D Template has an iLogic rule that runs when the drawing is first saved this prompts the user to enter key iProperties, you must ensure these are populated. If a value is not available enter a '-' (dash) or 0 (zero) where a numeric value is required.
- Where the shaft is in a vertical orientation show the section through the left hand side of the centre line showing projection lines running left to right (see example below).



Where the shaft is in a horizontal orientation show the section positioned above the centre line showing projection lines running top to bottom (see example below).



- All revisions must be detailed on the drawing.
- All design references must be stated on the drawing. Notes of a general nature should, wherever practicable, be grouped together and not distributed over the drawing. Notes relating to specific details should appear near the relevant feature, but not so near as to crowd the view.
- Do not underline notes. Where emphasis is required, larger characters should be used.
- Use capital lettering. Exceptions are units of measure where capitalization affects the meaning.
- All drawings must be checked before issue, the details are to be verified and countersigned by an authorised person. For Finished Part Drawings, custom designs, i.e. not produced from a standard design or macro must be reviewed and confirmed correct by the design authority for the part (usually the JW designer). For standard designs or macros then the authorized person can be the draughtsman (i.e. self-checking). For TA Sketches the drawing must be independently verified and countersigned by a technically authorized person (See QPD 06).
- If an iLogic macro is used to generate a profile as the basis of a non-standard design then the designer must ensure he replaces the 'macro generated' reference from the Designer name field on the title block with their own name.

4.6) Ensure that CAD drawings are stored in the appropriate folder within the JW-Vault.

- It is essential that every assembly, part and drawing is uniquely identified, this practice is enforced by the JW-Vault. This unique identifier can be used to name the top level assembly in a multi component project OR a single part within a single component project. If the project has multiple components and/or sub-assemblies then these must have a unique number to that used as the project/assembly number, this may be achieved by suffixing, for example -1,-2, etc, onto the project identifier. See OPI254-James Walker 3D CAD Numbering Scheme for examples.

4.7) When receiving CAD files from customers.

- All CAD files received from customers must be virus checked.
- All drawing files received, shall be accompanied by an electronic equivalent of a paper plot such as a PDF document. This is to ensure that the imported file appears as the sender intended when it is translated into our CAD system.

4.8) When issuing CAD files to customers.

- Drawings shall be sent in either PDF format or DWF format.
- Under exceptional circumstances CAD data may be supplied to a customer but users must protect our intellectual property by using tools such as 'Shrinkwrap' or by the use of a non-disclosure agreement. If the 'Shrinkwrap' tool is used any sketches must be removed as part of the process.

4.9) When producing images of parts or drawings for use in documentation such as training notes or presentations then the standard workspace colour scheme to be used shall be Millennium.

4.10) The process for translating AutoCAD DWG files into an Inventor part is captured in the document 'Importing DWG Files into Inventor' which is located in the 3D Design And Manufacturing area on Lionshare. You can use this to import a 2D seal profile into Inventor and use it to create a 3D part.