

# NTG Technical Records

## Part 1 - Requirements for Technical Records Management

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2021.01	22nd February 2021	Spiros Lambrinidis	Format and clarifications from V2019.01

Acronyms	Full Form
AIS / ASNEX	Asset Information System / Asset Systems Nexus
APRO	<a href="#">Agency Purchase Requisitions Online</a> (Tender Lodgement System by CAPS)
CAD	Computer Aided Design
CAPS	<a href="#">Contract And Procurement Services</a>
IP	Intellectual Property
NT	Northern Territory
NTG	<a href="#">Northern Territory Government</a>
OLE	<a href="#">Object Linking &amp; Embedding</a>
XREF	External Reference (Externally linked CAD object ie: image, text or vector data)
PWC	<a href="#">PowerWater Corporation</a>

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FOR FURTHER INFORMATION, PLEASE CONTACT / EMAIL:  
 TECHNICAL RECORDS: TECHNICALRECORDS@NT.GOV.AU  
 DEPARTMENT OF INFRASTRUCTURE, PLANNING AND LOGISTICS  
 3RD FLOOR HIGHWAY HOUSE  
 TELEPHONE: (08) 892 47351

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**Important Note:** This is a major review and update. Please Read through this whole document thoroughly and carefully. Sections have been added, removed, shifted, amended and clarified, from the previous revisions. If you have any questions, please contact Technical Records for assistance.

Doc ID	Version	Issued	Page
<i>NTG Technical Records - Part 1 - Requirements for Technical Records Management</i>	2021.01	February 2021	2 of 24

# Contents

<b>1. Overview and Function</b> .....	<b>5</b>
<b>2. Drawing Requirements and Procedures</b> .....	<b>6</b>
2.1. General Requirements.....	6
2.2. NTG Drawing Numbers .....	6
2.2.1. Consultant Drawing numbers Request Forms;.....	6
2.2.1.1. Drawing Number Request Criteria by Discipline.....	7
<b>3. NTG Design - Specific Discipline Requirements (All Stages)</b> .....	<b>8</b>
3.1.1. NTG Design and Specifications .....	8
3.1.2. Civil / Road Design.....	8
3.1.3. Environmental Management.....	8
3.1.4. Building Minimum Design Standards.....	8
3.1.4.1. Mechanical Services .....	8
3.1.4.2. Electrical Services .....	8
3.1.4.3. Hydraulic Services.....	8
3.1.4.4. Top End Health Services - Royal Darwin Hospital.....	8
3.1.5. PowerWater Corporation .....	9
<b>4. NTG Standard Title Blocks and Sheets</b> .....	<b>9</b>
4.1. Cad Drawing Sheets & NTG Title Blocks .....	9
4.1.1. NTG AutoCAD Title Blocks .....	9
4.1.2. Revit and Other BIM Software .....	9
4.2. NTG Title Block Requirements:.....	10
4.2.1. Mandatory Requirements; .....	10
4.3. Status Stamps.....	11
4.4. Use of NTG Civil Standard Drawings.....	12
4.5. Drawing Deliverables for NTG Tenders .....	12
4.6. Drawing Amendment / Revision Requirements: .....	13
4.6.1. Design Contracts - The Design Phase.....	13
4.6.2. Design and Construct Contracts - The Construction Phase.....	13
<b>5. Mandatory File Formats</b> .....	<b>14</b>
5.1. Native File Formats.....	14
5.2. CAD Data Compression – eTransmit.....	14
5.2.1. eTransmit / Zip Autocad files when the following occurs; .....	14
5.2.2. Exporting DWG files from non-AutoCAD and other BIM Software.....	16
<b>6. Drawing Transmittal Requirements to Technical Records</b> .....	<b>17</b>
6.1. Mandatory Drawing Transmittals at Project Stages .....	17
<b>7. Automated Drawing Reminder Process</b> .....	<b>18</b>
<b>8. DATA Archiving: Drawings and Other Project Documents</b> .....	<b>19</b>

Doc ID	Version	Issued	Page
NTG Technical Drawings Part 1 - Requirements for Technical Records Management	2021.01	February 2021	3 of 24

Additional CAD Data.....	19
8.1. Native CAD File Formats.....	19
8.2. Other Documents, (NTG Staff Only).....	19
<b>9. Tender / PDF Contract Drawing Text Errors.....</b>	<b>19</b>
9.1. Autocad SHX Fonts .....	21
<b>10. File Transfer / Submission Options .....</b>	<b>21</b>
10.1. Technical Records File Transfer Methods: Consultants & Contractors.....	21
10.2. Technical Records File Transfer Methods: NTG Staff.....	22
10.3. Physical Media Types.....	22
10.4. USB Thumb Drives .....	22
10.5. File System Formats.....	22
10.6. Virus Scanning .....	22
<b>11. Have Non-Conforming Drawings that are worth Archiving? .....</b>	<b>23</b>
11.1. New NTG Data Numbers.....	23
11.2. Technical Records Links .....	23
<b>12. Part 3 Building CADD Manual, (Coming Soon). .....</b>	<b>23</b>
<b>13. Revision Log .....</b>	<b>24</b>

Doc ID	Version	Issued	Page
<i>NTG Technical Records - Part 1 - Requirements for Technical Records Management</i>	2021.01	February 2021	4 of 24

# 1. Overview and Function

Technical Records is an All of Government System. It holds information owned by the 31 Departments within Government, and is chartered with the responsibility of the issuance of NTG Drawing Numbers, Tender Numbers and receiving Construction / Technical related drawings and documents for archiving, for all NTG Assets.

To ensure that drawings are available for future use or reference, it is necessary to provide these drawings and files at the various stages as set out within this manual. These stages typically are at, Cancellation or Shelving, Design, Tender and at Handover / Practical Completion, (As Constructed).

This document covers the NTG Procurement and Technical Records Archiving requirements. Technical Records do not issue drafting specifications or instruct Consultants on drafting techniques. This falls within the Department of Infrastructure, Planning and Logistics, (DIPL), Client Liaison Managers and DIPL Discipline Managers, like Civil (Roads), Architectural (Building Design), Mechanical, Hydraulic and Electrical.

Regardless of who procures drawings for the Northern Territory Government, (NTG), if you are commissioned to produce any type of Technical Drawing for the NTG, where those drawings are required for;

- Concept;
- Design;
- Documentation;
- Design and Documentation;
- Design, Documentation and Construction;
- Construction;
- As Constructed Drawings.

This Document clarifies and outlines the Technical Records requirements for preparing consistent and acceptable new NTG project drawings for archiving. It describes the processes and guidelines to be followed by Design Consultants, and by Departmental NTG staff, in relation to technical drawings for all Northern Territory Government projects.

The drawing sheets, title blocks and their associated files, must comply with the requirements as set out within this document. <https://dipl.nt.gov.au/industry/technical-standards-guidelines-and-specifications/technical-records>At any stage of the technical documentation process, Technical Records can be contacted via;

Email: [technicalrecords@nt.gov.au](mailto:technicalrecords@nt.gov.au)

Phone: [\(08\) 8924 7371 \(Spiros Lambrinidis\)](tel:(08)89247371) or [\(08\) 8924 7351 \(Tony McLean\)](tel:(08)89247351)

Web: <https://nt.gov.au/technical-records>

Doc ID	Version	Issued	Page
<i>NTG Technical Records - Part 1 - Requirements for Technical Records Management</i>	2021.01	February 2021	5 of 24

## 2. Drawing Requirements and Procedures

### 2.1. General Requirements

- All drawings prepared for NT Government Projects, **MUST** have an official and unique NTG Drawing Number. These numbers can be obtained from the [Technical Records Website](#).
- By default, the NTG retains and owns the Intellectual Property, (IP), Rights on ALL NTG Drawings and their associated CAD files that are procured by the NTG unless otherwise stated within your NTG Contract. This requirement must extend to all third party Consultants engaged to provide drawings for the NTG. (Please inform and confirm with all stakeholders).
- The drawing files stored within the Technical Records archive, are mostly PDF and DWG, (Computer Aided Design), native files which were prepared for NTG Projects. Technical Records requires the submittal of all related documents in an electronic format for archiving. Hardcopy and paper drawings are not acceptable unless previously approved. (**Very** rare circumstances.)
- A Schedule of Drawings must be completed for all drawings produced by the Design Consultant for your NTG Project Manager. A Microsoft Word.docx will be supplied when the NTG Drawing Numbers are issued and when the Drawing Titles are finalised. This document must be populated with the correct details and supplied to your NTG Project Manager.
- All drawings produced for NTG Projects, must be clearly readable when scaled down and printed to an **A3** size sheet, especially **text**. Adjust your drawing templates to take this into account.

### 2.2. NTG Drawing Numbers

This process starts when an NTG engaged Design Consultant requests new drawing numbers from the Technical Records [website](#). Once the form has been received, the NTG drawing numbers are ordered by the NTG Project Manager. The PM will check and verify the information received before creating the new NTG Drawing numbers through their internal form.

The new NTG Drawing Numbers are then system generated and emailed to the Design Consultant and the Project Manager via the automated system, using the email addresses provided. Ensure that all email addresses entered into the online form are accurate. This ensures the proper functioning and transmittal of the numbers and their associated attachments.

#### 2.2.1. Consultant Drawing numbers Request Forms;

When you require new NTG Drawing numbers, navigate to the Request forms section of the NTG Technical Records website.

#### Request forms

##### Request for drawing number

Use the forms below to submit requests for NTG drawing numbers:

- [request for drawing number - building](#)
- [request for drawing number - road](#)
- [request for drawing number - DIPL/PWC project](#)

If you are unsure, [get help choosing which form to use](#).

Choose from the available drawing number request options.

**Note:** For all [PowerWater](#) Corporation or [Territory Generation](#) drawing requests, please contact their relevant Project Officers. Technical Records does **not** provide **PWC** Drawing Numbers or drawing files outside of **PWC** control.

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	6 of 24

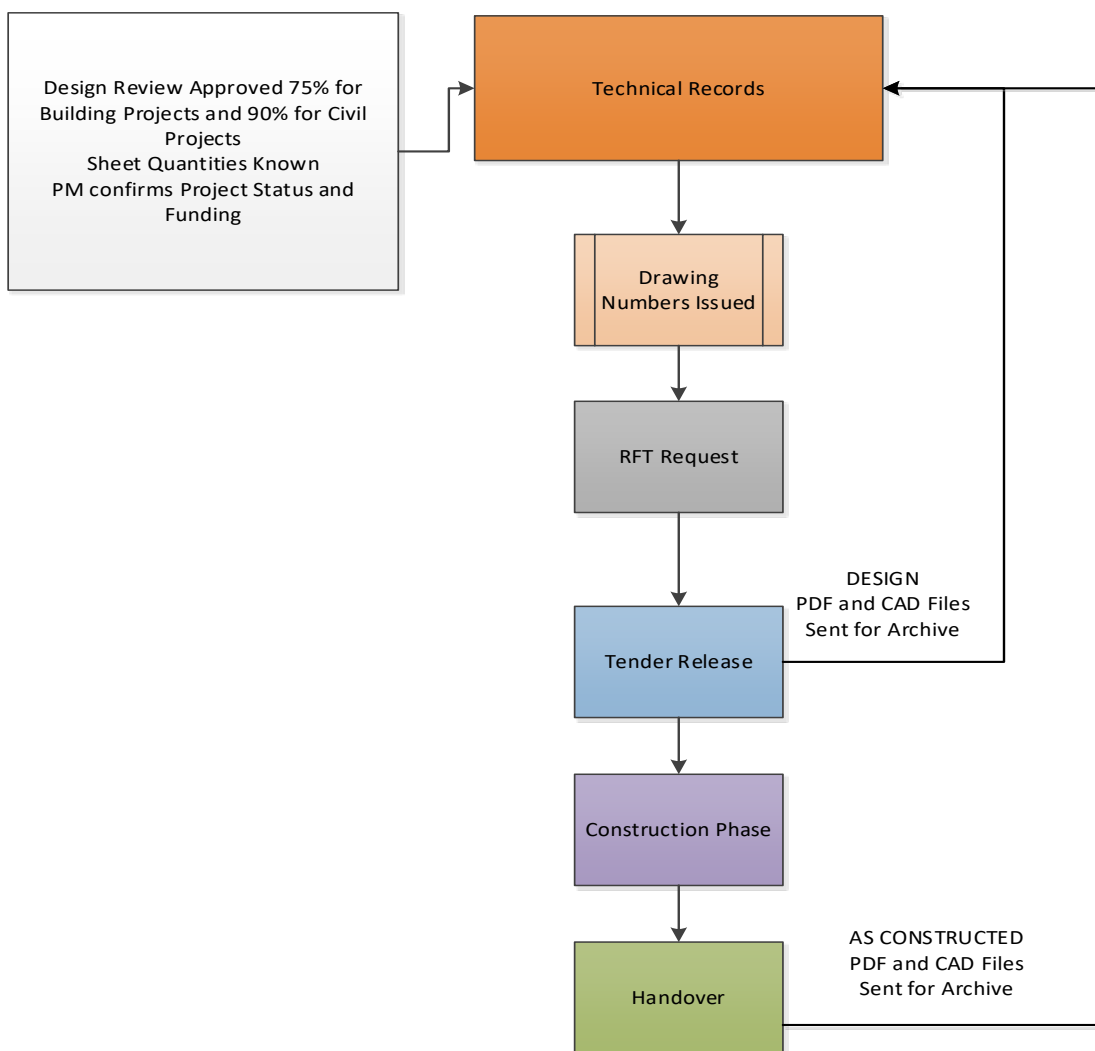
### 2.2.1.1. Drawing Number Request Criteria by Discipline

- Project Manager confirms the project status and funding,
- The Design is greater than **75%** review for Building Projects and **90%** Review for Civil Projects,
- Sheet quantities are known (from the Design Consultant) + an additional number of drawing numbers that may be required for any unforeseen circumstances such as additions to the drawing set.

**Note:** All NTG Drawing Numbers that were generated for your project, must be accounted for, and acquitted by the end of each project. The Technical Records system will send out periodic, automated, system generated reminders, for any drawings not received by Technical Records for archiving.

To acquit any unused drawing numbers, it is a simple process of replying to your reminder email, informing Technical Records of your unused drawing numbers. We will then remove the unused numbers from within the system and the automated drawing reminders will cease.

TYPICAL DRAWING NUMBER REQUEST PROCESS TECHNICAL RECORDS



OVERVIEW OF THE DOCUMENT NUMBER REQUEST PROCESS, (FIG 1.0).

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	7 of 24

## 3. NTG Design - Specific Discipline Requirements (All Stages).

### 3.1.1. NTG Design and Specifications

#### Specification Services:

The infrastructure master specifications cover the construction and maintenance of major building works such as schools and hospitals through to smaller works such as housing and office fit-outs. The Specification Services unit maintains a series of master specifications which are used in the preparation of contract documents for the construction and maintenance of government infrastructure throughout the Northern Territory.

Follow [this link](#) to download Specifications and supplementary documentation, required for NTG Projects.

### 3.1.2. Civil / Road Design

#### Road Design Standards:

Civil design & documentation shall be in accordance with the requirements as set out within the, "[NTG Technical Drawings Part 2 - Civil CADD Manual](#)". These standards set out the requirements for road design on Northern Territory controlled roads and civil infrastructure. Road surfacing standards can also be downloaded from [here](#).

Further information, tools, downloads can be obtained from the NTG Technical Standards, Guidelines and Specifications: Road Design & Standards [Website](#).

Current Civil Standard drawings can be downloaded from [here](#).

### 3.1.3. Environmental Management

Environment Services provides assistance to clients on all matters regarding environmental management. You can access required information from the Environmental Management [Website](#). Standard Specifications for Environmental Management can be downloaded from there.

### 3.1.4. Building Minimum Design Standards

Currently under development, Building Design Part 3 CAD Design Manual, is soon to be released.

The below specific disciplines, minimum design standards, can be downloaded / reviewed from [this link](#).

#### 3.1.4.1. Mechanical Services

Mechanical design & documentation shall be in accordance with the requirements as set out within the, "Mechanical Services - HVAC System Design Guidelines", document.

#### 3.1.4.2. Electrical Services

Electrical design & documentation shall be in accordance with the requirements as set out within the, "Electrical Services - Design", document.

#### 3.1.4.3. Hydraulic Services

Hydraulic design & documentation shall be in accordance with the requirements as set out within the, "Hydraulic Services - Design", document.

#### 3.1.4.4. Top End Health Services - Royal Darwin Hospital

Royal Darwin Hospital also requires minimum & unique design requirements. All Design & Documentation shall be in accordance with the requirements as set out within the, "Top End Health Services - Royal Darwin Hospital - Design Guidelines", document.

Doc ID	Version	Issued	Page
<i>NTG Technical Records - Part 1 - Requirements for Technical Records Management</i>	2021.01	February 2021	8 of 24



### 3.1.5. PowerWater Corporation

**Note:** Where [PowerWater](#) drawings are part of a Tender / Project, they may differ to the requirements of this document. They are unique, in that they may be issued at Tender with Alpha revision numbers. PWC “Zero” revision drawings are usually approved and signed off at the **Construction Issue** stage by the responsible PWC Project Officer. Any revisions and changes to **PowerWater** drawings **must** be approved by **PWC** and **signed** off before any of their work is conducted on site. Unsigned PWC drawings should not be used for carrying out any NTG / PWC Project works.

For further information, refer to the PWC specific requirements on their [website](#).

## 4. NTG Standard Title Blocks and Sheets

### 4.1. Cad Drawing Sheets & NTG Title Blocks

The NT Government has developed standard electronic drawing sheets in **A1** and **A3** sizes, with both Portrait and Landscape Titleblocks. These have been produced using Autodesk’s, AutoCAD software. [Digital copies](#) are available via the NT Governments, [Technical Records](#) website, [email request](#), or as provided by the Principal’s Representative. No other drawing sheets are to be used or submitted.

#### 4.1.1. NTG AutoCAD Title Blocks

The current version of the Technical Records, [“ntg-title-block-autocad.zip”](#), shall be used for all NTG Project Drawings. This is a mandatory requirement. When drawings are prepared outside of AutoCAD, the Titleblocks must match the style and provide the exact same information as depicted within the DWG Titleblock Template. Always check to see whether your Company is using the latest NTG - DWG Titleblock in your drawings, provided as an attachment at the time you received your allocated NTG drawing numbers. A recent update to the AutoCAD Titleblocks, has enabled better functionality. The changes are noted within the cad file.

**Generally:** NTG Titleblocks should be incorporated into your Project Drawings by the **25%** Design Phase. All known Titleblock fields must be populated, including the NTG Project & NTG Asset number if it exists.

At the 25% stage, NTG Drawing numbers are not mandatory. Refer to Section 2.2.1.1.

#### 4.1.2. Revit and Other BIM Software

It is understood that many Consultants are using Revit and/or other types of BIM software. Therefore to ensure consistency, we will require that the Title Blocks remain consistent with the currently provided DWG title block file, and to maintain the NTG Titleblock information required for Archiving.

NTG Title Blocks can be replicated for use within REVIT or other BIM software provided;

- They appear the same as the official NTG Title Block,
- All the Fields are included and functional allowing for adequate characters,
- The NTG Logo Is present.

Technical Records has created a complementary [Revit 2019](#) NTG Title Block which can be downloaded from the [Technical Records website](#). The Titleblock Family is supplied as a courtesy and is not a mandatory requirement for use in your NTG Projects. It is also provided as an attachment when you receive your new NTG drawing numbers confirmation email.

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	9 of 24

## 4.2. NTG Title Block Requirements:

### 4.2.1. Mandatory Requirements;

- Use the current depiction of the NTG Title Block supplied **at the time** of receiving your allocated Drawing Numbers.
- NTG Drawings require information as tabled below;

#### Building Format: B = Building

Title Block Field	Format Example	Description	Source
NTG DRAWING No.	B21-1234	Use <a href="#">Form</a> on Website	<a href="#">Technical Records</a>
NTG Project No.	TED123456	1 Location in Title Block	NTG Project Manager
AMENDMENTS	Alpha or Numeric 1 Character	2 Locations in Title Block	Drafter
NTG ASSET No.	00123B1A	Obtain from Project Manager	ASNEX AIS
SHEET SIZE	A1 or A3	Defines Print / Sheet Size	Drafter

#### Road Format: R = Road

Title Block Field	Format Example	Description	Source
NTG DRAWING No.	R21-1234	Use <a href="#">Form</a> on Website	<a href="#">Technical Records</a>
NTG Project No.	FRD123456	1 Location in Title Block	NTG Project Manager
AMENDMENTS	Alpha or Numeric, 1 Character	2 Locations in Title Block	Drafter
NTG ASSET No.	R0001, BD026	Obtain from Project Manager	ASNEX / AIS
SHEET SIZE	A1 or A3	Defines Print / Sheet Size	Drafter

#### Example of Title Block Left Hand Side;

0	CONTRACT DRAWING	30/07/20	SDL	DIPL		
No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY		
	AMENDMENTS				Plot Date: <input type="text"/>	

#### Example of Title Block Right Hand Side;

DRAWN SDL DATE: 30/07/2020	CHECKED TMc DATE: 30/07/2020		PROJECT REGION:		PROJECT LOCATION:		NTG PROJECT TITLE	
DESIGNED SDL DATE: 30/07/2020	CHECKED - DATE: 30/07/2020		SHEET TITLE 1		SHEET TITLE 2			
DESIGN PROJECT LEADER TMc DATE: 30/07/2020	NTG PROJECT MANAGER - DATE: 30/07/2020		NTG PROJECT No. TED12345	NTG ASSET No. 012345	SHEET No. 01 OF 999	NTG DRAWING No. B20-12345	AMENDMENT 0	SHEET SIZE A3
			Ver. Jan'2020					

All CAD drawing file sheets submitted to the Technical records must be clearly labelled with the following information:

- **Project Name, including Region, Location, Job description and Drawing Title; formatted across Five Lines.**

Line 1 – **Project Region:** This should be the Region's title (ie: Darwin, Katherine, Alice Springs... etc) and should not be confused with a suburb's title (ie: Casuarina, Palmerston, Parap.. etc). Contact your Project Manager if you are unsure of the correct details to enter into the Titleblock.

Line 2 – **Project Location:** This should be the identifiable location of the project, (ie: Howard Springs Primary School, Marrara Sports Complex, or Jabiru Area School – Secondary Science Building). This may include a suburb name.

Line 3 – **NTG Project Title:** This should be used to specify the type / scope of works, (ie: Ticket Office Refurbishment, Proposed New Construction).

Lines 4-5 - **Sheet Title Line(s):** These should include the type of drawings shown on that particular sheet, (ie: Ground Floor Plan, Joinery Details - Kitchen). The status of the Drawing or Amendment Description is not to be placed in these fields.

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	10 of 24

- **NTG Project Number**

This is the NT Governments specific Project Number, The general convention of three (3) letters followed by up to five (5) digits. This can be obtained through the NT Government Principal's Representative / Project Manager. This is **not** to be confused with the Consultants file or project numbers, nor is to be confused with an NTG Tender number. These types of numbers must **not** be placed into this field.

- **NTG Drawing Number**

The NTG Drawing Number is the unique NTG identifier for each drawing. This will be created & provided by Technical Records. The unique identifier once created is allocated and cannot be changed. It is the responsibility of the Requestor, (Design consultant), to notify Technical Records if the number is no longer required, as the system will track the number once issued until it is returned. Consultants are **not** to use their own numbers in this field. New NTG Drawing numbers can be requested from the Technical Records Website under, "**Request forms**". Ensure that there are no spaces before or after the dash.

- **Sheet Number and Sheet Quantity**

The NTG Titleblock has been formatted for traditional sheet numbering, and be preceded by the initials of the disciplines and counts. For example, Architectural – **A**, Electrical – **E**, Structural – **S**, Civil – **C**, Mechanical – **M**, Hydraulic – **H** (eg: A01 of 3, S04 of 11). The specific sheet numbering formats are set by the heads of the Building and Civil Design sections as set out in their NTG Guidelines, Parts 2 and 3.

- **Date / Designer / Drafter Name**

The initials of the Designer / Drafter along with the month and year drawn, are to be included in their allocated spaces.

- **Amendments**

Amendments are identified in two (2) locations on the drawing sheet: adjacent to the Drawing Number, and in a detailed Amendment table on the bottom left. Amendments in the table should include an accurate description, the initials of the person who approved the amendments, the company name and the amendments made.

1. **Concept / Design:** Amendments prior to "Tender" are listed alphabetically starting at **A** (ie: A, B, C, ...)
2. **Tender Release:** Amendment Description shall be, "**CONTRACT DRAWING**", and Amendment Number shall be **0, (zero)**.
3. **Post Tender Construction:** Amendments shall be numeric starting at **1**, (ie 1, 2, 3, ...)

**Note:** An, "**AS CONSTRUCTED**", status drawing should not be labelled as Amendment "**0**". The numbering should reflect the next sequenced number after zero.

### 4.3. Status Stamps

These have been commonly used to indicate the Amendment Phase of the drawings. (Eg: "Construction Issue", "Tender Issue", etc.). This practice will no longer be accepted as the Amendment Description in the lower left corner is to be used to indicate Amendment Status.

- No other Status stamps are to be used when submitting drawings for Tender.

As plans pass through each Amendment Stage their status will change. When the Project & plans are deemed complete and ready for storage, the drawing is to be stamped, "As Constructed". Below is an example of an [AutoCAD, DWG Stamp](#), which can be downloaded from the Technical Records [Website](#).

**AS CONSTRUCTED**

- All prior amendment stages can be described within the Amendment Description Field.
- There are to be no Status Stamps placed within any drawings amended as, "Contract Drawing."
- Please note that this is the only status stamp to appear on the drawings. It must appear on all the drawings associated with the final, "As Constructed" drawings submission.

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	11 of 24

## 4.4. Use of NTG Civil Standard Drawings

### Conditions of Use:

Projects involving the use of NTG standard drawings, such as, standard house types or Civil Standards, do not require new drawings or numbers, **unless** there are official design changes / modifications to those standard drawings. You **must** take out new NTG Drawing numbers when modifying any Standard Drawings for Tender. This would usually be required for project specific requirements that would require modifications to the standard drawings. Contact Technical records if you need clarification.

Do **NOT** alter / modify Civil Standard drawings unless approved by the [NTG Civil Design](#) group.

## 4.5. Drawing Deliverables for NTG Tenders

For any given project, if you are engaged to provide Contract Drawings, (not including cancelled / shelved projects), there will be a **Contract** issued set of drawings submitted to Technical Records for archiving by the Design Consultant and or the Project Manager.

These are;

1. Tender / Contract Set, (Contract Drawings, issued for Tender, Amendment '0'). The status of, "Contract Drawing", can be used for all stages / revisions up until practical completion. Both **.PDF & .DWG** files must be transmitted to Technical Records.
2. If a Project is cancelled before being transmitted to Technical Records and those drawings have been procured and produced for that Project, then those drawings **must** be submitted to Technical Records for archiving. This includes suspended or shelved projects. Please inform Technical Records of all the details so we can archive appropriately.
3. Unless contracted otherwise, in all cases, drawings shall comply with the provisions of **AS1100**, and the latest edition of the, "Standard specification for Small Building Works", which can be downloaded from the Technical Specifications, Buildings [website](#).

**Important Note:** For archiving, transmittals of multi-sheet, pdf and dwg, files will **not** be accepted. The PDF and CAD file / zip, (eTransmitted dwg files), submitted to Technical records, must each be individual, separated files: each drawing file uniquely named as per its corresponding and reserved NTG Drawing number, (eg. "B21-12345.pdf", "B21-12345.dwg", 'B21-12345.zip"), and be also accompanied with its corresponding CAD, (DWG/DGN) file, including any dependent external references. Please include a transmittal report of the files sent to Technical Records with your submission.

On completion of a successful transfer of data, media and relevant plotted output become the property of the NT Government Department that the works were procured for. This includes all data transferred for the duration of the Contract.

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	12 of 24

## 4.6. Drawing Amendment / Revision Requirements:

During the Design phase of a Project, the Alpha sequenced characters may be displayed, until the 100% Design Review is completed. Then these will be replaced with one entry, “**0**”, “**CONTRACT DRAWING**”. This is what will be issued at the Tender / Procurement phase.

Set out below are **three examples** of the LHS Amendment Title Block in various stages of drawing issue.

### 1: Design Phase Pre Tender

C	Final Design			
B	Initial Design			
A	Concept Design			
No	Description	Date	Initial	Company
Amendments				

### 2: Tender Release / APRO Lodgement

0	Contract Drawing				At Tender
No	Description	Date	Initial	Company	

### 3: Post Tender / As Constructed

3	As Constructed				At Handover
2	Amended ....				
1	Changed ....				
0	Contract Drawing				Tender
No	Description	Date	Initial	Company	

- At the **Design** Stage: Amendments **prior** to Tender Issue shall be listed alphabetically, starting at “**A**”, (ie: A, B, C ...), upon each revision.
- At **Tender** Release: the Amendment Description shall be “**CONTRACT DRAWING**”, Amendment Number shall switch to numerical and start at, “**0**”, (zero).
- At **Construction** Stage: any Amendments, if any, shall be sequentially numerical, starting at, “**1**”, (ie 1, 2, 3 ...)
- **Note:** Revisions to drawings made during the Tender stage may incorporate addendums prior to the awarding of the Tender. This happens regularly and is expected. Tender issue Drawings can be higher than a zero revision before award. It's only the initial Tender Issue / Contract drawing which should be issued as **Zero, (0)**. (**NTG Project Drawings Only**).
- As Constructed Drawings **MUST** be issued with the next, sequential, **numeric** revision / amendment number, and this is to be added to **all** NTG drawing sheets associated with the Project.

#### 4.6.1. Design Contracts - The Design Phase

The same general principles apply to Design only services / contracts. Guidelines & Requirements for Project Design drawings, can be accessed as outlined in Section 3 of this document.

#### 4.6.2. Design and Construct Contracts - The Construction Phase.

During the Construction phase of a Design and Construct Project, it is critical for Technical Records to receive the approved and finalised, “Contract” or “For Construction”, set of Drawings, in both PDF and CAD files that were approved for the Works to proceed.

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	13 of 24

These drawings, as all drawings produced for NTG projects, shall comply with the requirements of this document and their respective NTG Design Sections.

During the construction phase, while not necessary, we will accept any approved amended and revised set of drawings to maintain a historical log of changes during the Works.

**Note: The most important set of drawings we need for final archiving are the, "As Constructed" set!**

## 5. Mandatory File Formats

The main formats accepted as a **mandatory** deliverable by the NT Government are as follows; **PDF** and **CAD** (.DWG & DGN). Other formats may be submitted as a Contractual requirement. Refer to your specific project deliverables in your Contract.

### 5.1. Native File Formats

- PDF
- DWG
- DGN (Discipline Specific)

**.DWG** is a commercial [computer-aided design \(CAD\)](#) and [drafting](#) software application such as [Autodesk](#). It is used across a wide range of industries, by architects, project managers, engineers, designers, and many other professionals. DWG is a universal CAD format that can be read and inserted into other CAD programs. The DWG file may be submitted as a compressed **.ZIP** file when there is a requirement to include external image attachments and other dependent links inside the DWG that cannot be embedded.

- The file extension for this type of file is ".dwg"

**.PDF** (Portable Document Format) is a file format that has captured all the elements of a printed document as an electronic image that you can view, navigate, print, or forward to someone else. It is used by the NTG to provide an image of the files without the need to obtain expensive CAD software when sharing or displaying drawings.

- The file extension for this type of file is ".pdf"

In future, as the industry evolves further into dedicated BIM software environments and deliverables, other CAD and BIM file types, may be a mandatory deliverable. Currently, **BIM** files can still be a required deliverable and accepted due to your specific contractual requirements. Contact Technical Records if you are intending to submit these file types.

### 5.2. CAD Data Compression – eTransmit

**ONLY to be used if native formats cannot be achieved due to dependent, externally referenced image or cad files.**

#### 5.2.1. eTransmit / Zip Autocad files when the following occurs;

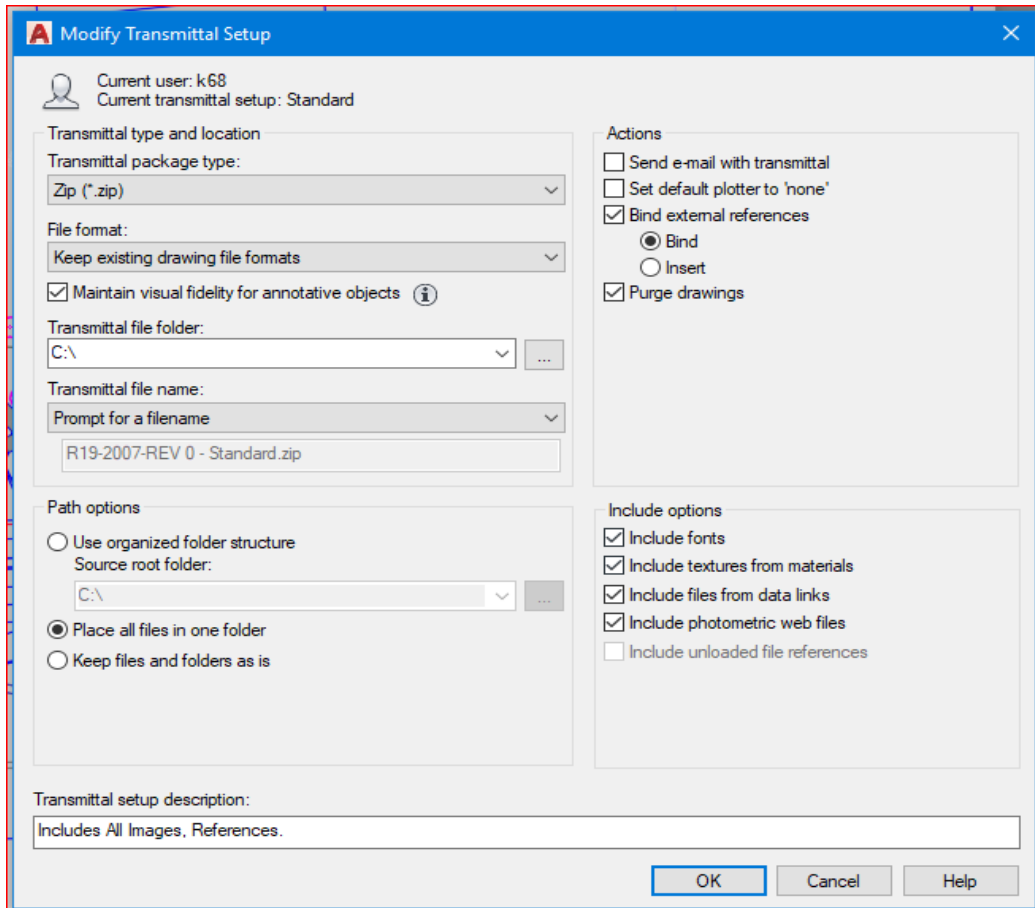
1. An image file is externally referenced (xRef as a background to the drafting area. Large images such as Aerial Photos can be externally referenced, (xRef), but **must** be eTransmitted, (zipped), to maintain the complete content of the cad file.
2. Image attachments must be **no larger than ~5mb**, due to some image attachments being greater than 1 GB! (Georeferenced images usually have this issue). In such cases, please modify your image files to bring their sizes down to an acceptable file size for archiving.) Please contact [Technical Records](#) to resolve any file size issues.
3. There are documents other than CAD formats externally referenced, (xRef).

Ensure that all relative paths are maintained when preparing for an eTransmit output. Use the eTransmit function. Do not use a compression program, like Winzip or Winrar to combine your drawings, images and other references unless the software you're using does not have the eTransmit capability. Revit, for example, cannot combine image references and dwg files when exporting from inside the program. In this case, the zip file will have to be created manually, ensuring that all dependent files are included.

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	14 of 24

**Note:** a raster file of any size can be embedded from within AutoCAD if there is no requirement to rotate or scale it. An example is a Company Logo or a small location of works raster image, which should be embedded when creating the drawings inside AutoCAD.

**Autodesk eTransmit** - When you select a set of drawing files in a transmittal package, it automatically includes all related dependent files such as Xref's and font files. AutoCAD users may use eTransmit to include and combine all related and dependent files into a ".zip" file for transmittal to Technical Records. Please ensure in the "Transmittal setup" that the actions of, "Bind external references" and "Purge drawings", are set as default as per the image below;

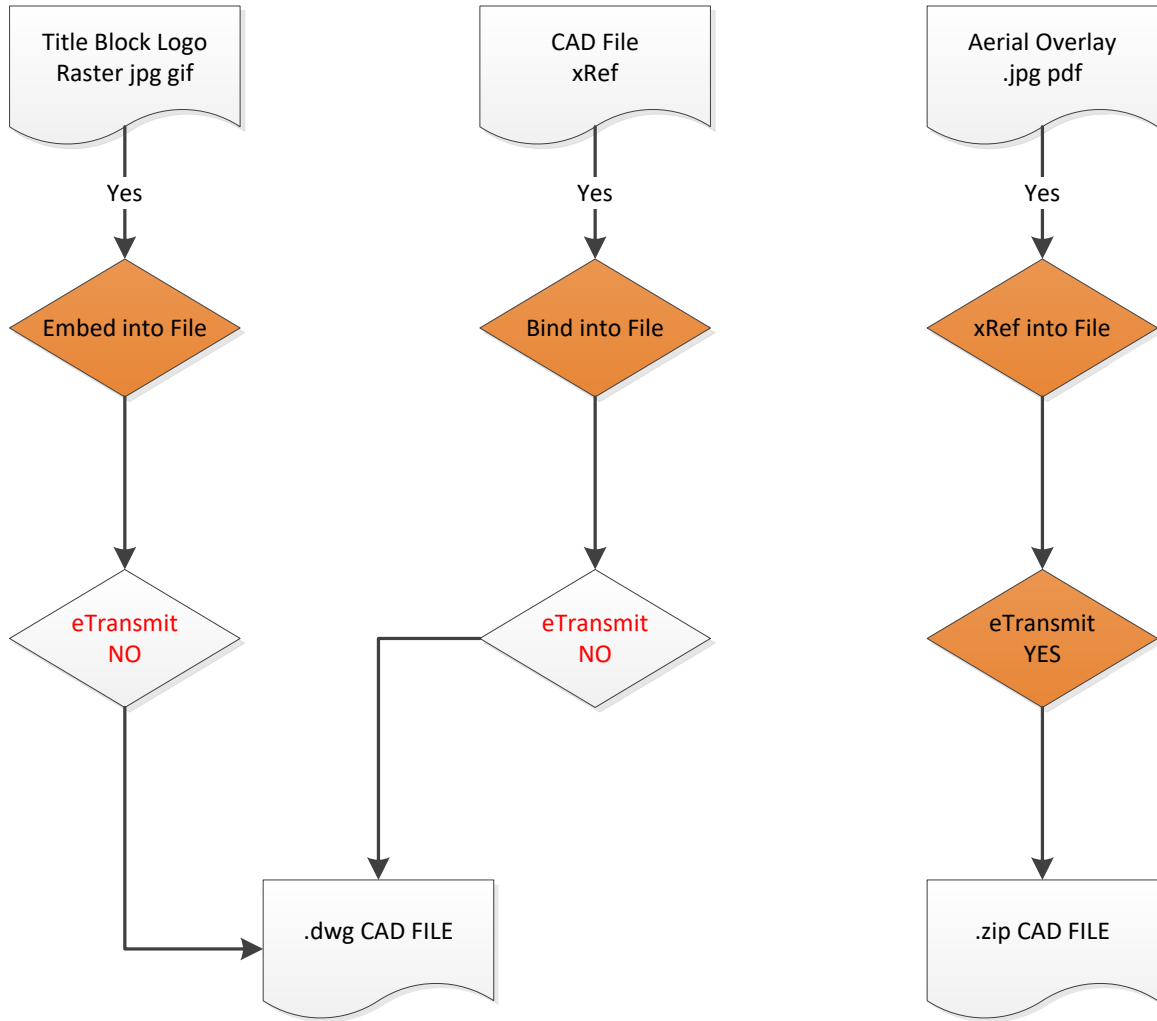


ENSURE THAT ALL THE ATTACHED EXTERNAL REFERENCES ARE BOUND, PURGED AND ALL FONTS INCLUDED. (FIG 1.1).

**Note:** Ensure that all bound external references inside the DWG file retain their visibility / layer settings before submitting to Technical Records for archiving. (Refer to AutoCAD's, "Visretain", system settings.)

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	15 of 24

# eTransmit



*ETRANSMIT DECISION PROCESS, (FIG 1.2).*

The Rule is, if it can be embedded and bound into the CAD file, it is required to keep the complete file in its native dwg format. External cad links must be inserted, (bound) into the dwg file. Images, should be inserted as an OLE, unless it is not practical to do so.

## 5.2.2. Exporting DWG files from non-AutoCAD and other BIM Software

Where you do not have a .dwg eTransmit function within your CAD software;

- a. When exporting .dwg cad files from non-AutoCAD software and there are no referenced images, pdf's or other attachments created, provide **1 individual** .dwg cad file for **each** NTG Drawing Number, **named** as per its **NTG Drawing Number**. (eg. B21-12345.dwg)
- b. When there are multiple referenced files created, ie, raster or vector files, in addition to the .dwg file, all the related files must be combined together into one individual .zip file. The .zip file must be named as per its official NTG Drawing Number. One drawing number, one zip file. (eg. B21-12345.zip)
- c. Transmitted zip files must **not** be password protected or locked.

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	16 of 24



## 6. Drawing Transmittal Requirements to Technical Records

Generally, the following applies to all drawing transmittals to Technical Records;

### Generally;

- One PDF and one DWG, for every NTG Drawing Number Issued.
- Files to be in their native formats.
- Be rotated as text right way up.
- Use the current depiction of NTG Titleblock as provided with your NTG created drawing numbers.
- Official NTG Drawing Numbers inserted. All Titleblock fields populated.
- NTG Project Number field is **mandatory** – Do **not** use any other numbering system. (Confirm the correct details with your NTG Project Manager).
- Provide single files, with matching Drawing Numbers eg B21-XXXX.xxx - One Drawing Number > one PDF file and one DWG file or an “eTransmitted” zip file, when there are dependent image references inside the cad file.
- PDF and DWG files must match when printed.
- Large raster images, eg: Aerial Photos can be xRef: drawings must be, eTransmitted, (Refer 5.2.1). (zip file).

### Acrobat .PDF

- Portable Document Format (PDF)
- Do not substitute fonts in the print settings.
- Single PDF files. Do not submit as multipage pdf's. - One Drawing Number > one PDF and one DWG cad file.
- Title Blocks to be submitted in **landscape** orientation, text to be horizontal and right way up.
- Be created in its correct sheet paper size, A1->A1, A3->A3. Not reduced.

### AutoCAD .DWG

- PURGE drawings of any unwanted xRef, layers and fonts.
- Provide DWG's with all dependent cad xRef **bound** inside the file.
- Company Logos and non-rotated Images, e.g.: PDF, JPG to be **OLE embedded** into the DWG file.
- If eTransmit is used, include all entities and combine into one file eg B21-XXXX.zip - One Drawing Number > one PDF file and one DWG file.
- Title Blocks to be submitted in **landscape** page orientation, text to be horizontal and right way up.

### 6.1. Mandatory Drawing Transmittals at Project Stages

Provide Drawings to Technical Records at the following stages;

#### Tender Stage: 100% Design

At this stage all drawings shall be updated to Amendment (0), “**CONTRACT DRAWING**”.

Contract Drawings are used for the NTG Tender & procurement process;

- Contract Drawing: **PDF**, -> sent directly to your **Project Manager**, and;
- Contract Drawing: **DWG** -> sent directly to **Technical Records**.

#### Practical Completion / Handover Stage: As Constructed

- As Constructed Drawing: **PDF**, sent directly to your **Project Manager**, and Technical Records and;
- As Constructed Drawing: **DWG**, sent directly to **Technical Records**.

**Note:** All, “As Constructed”, drawings are to be delivered to your NTG Project Manager at Handover. Ensure a copy is **also** sent to Technical Records to finalise your documentation obligations. Files, (if not too large), can be sent to [technicalrecords@nt.gov.au](mailto:technicalrecords@nt.gov.au) or if your organisation has set up a shared FTP folder with Technical Records, (contact us for this option), you can deposit the files into there. Contact Technical Records to discuss alternative options if required.

- All Project Drawings to be updated and include the next sequential revision / amendment **number**.
- Add Note in the amendment description box - “**As Constructed**” – Must Appear.
- Drawings without changes, shall be upwards revised & described as, “**As Constructed – No Changes**”.
- Electronic stamped drawing, “**AS CONSTRUCTED**”, See Section 4.3

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	17 of 24

## 7. Automated Drawing Reminder Process

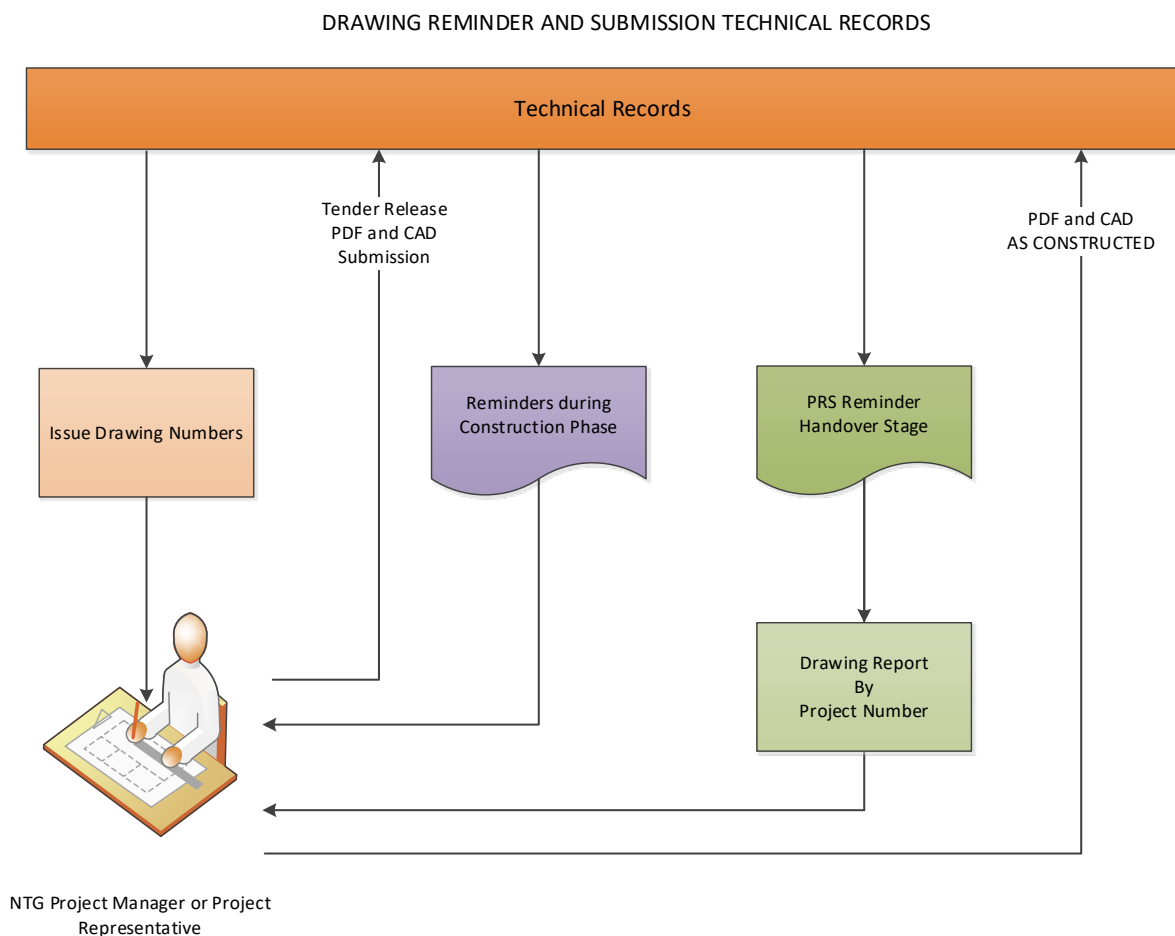
During the Lifecycle of a project, Technical Records has an automated system drawing reminder process to ensure that all NTG Drawing Numbers taken out, are acquitted. The system generated emails are sent to the “Requestor”, the person who requested the new drawing numbers. **This is the person who is responsible for the production of the drawings.** The Drafter, Design Consultant, Builder etc.

The assigned Requestor of NTG Drawing numbers must always be maintained with a current status. If there is a change in responsibility of the drawings, a change in person within your organisation, Technical Records must be notified as soon as possible so we can update the details within our system. We recommend a stable email address be used within the Requestor email field to avoid undeliverable emails when a person leaves your organisation.

Any unused drawing numbers must be listed and sent to Technical Records so that we can acquit those numbers from the records management system.

### To acquit drawing numbers;

- Automated Reminders begin 120 days from the issuance of the new and official NTG Drawing Numbers.
- There are periodic reminders emailed to the **Requestor**, (Design Consultant).
- **All** drawing numbers are to be acquitted, even if they are unused.
- Simply reply to your drawing reminder emails and advise Technical Records of which Drawing Numbers were **not** used. We will take care of the rest. If in doubt, please don't hesitate to contact us so we can assist you.



OVERVIEW OF THE REMINDER PROCESS (FIG 1.3)

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	18 of 24

## 8. DATA Archiving: Drawings and Other Project Documents

### Additional CAD Data

Technical Records can store other CAD file types in addition to the mandatory deliverables where contractually obligated. They are to be submitted with a specific file naming convention for storage against an NTG Project Number.

**This is for non DWG, CAD related files submitted for archiving**

- These files will not be audited for their content.
- Files to be submitted with a specific naming convention.

**Table 1.1 DATA File Naming (Examples)**

Format	File Types	Naming Convention
Native	Data-*.rvt	DATA-TED12345-North Building.rvt
Archive	Data-*.rvt.zip	DATA-TED12345-North Building.rvt.zip
Archive	Data-*.12d.zip	DATA-RCD45678-Smith Street.12d.zip

### 8.1. Native CAD File Formats

Table showing status of file formats currently stored.

**Table 1.2 Native File formats**

File Extensions	Stored
.dwg (Current supported versions >2014+)	Yes
.rvt (Revit 2014+ Release)	as DATA
.4dw (12d Model)	as DATA

### 8.2. Other Documents, (NTG Staff Only).

Additionally Technical Records stores some, “as advertised”, Tender Specifications, RFT / RFQ where they may have drawings. These are only available to internal NTG staff upon request. Contact Technical Records if you require these files.

## 9. Tender / PDF Contract Drawing Text Errors

It is greatly important for the Design Consultant & Project Manager to check the drawings for both drafting and textual errors. Due to Contractual obligations, Drawing Numbers and Drawing Titles, **must** be accurate, and they must match the Schedule of Contract Drawings inside the RFT/RFQ document. Tenders may be considerably delayed until these issues are rectified.

Sometimes there are graphical / font errors that can emerge from inside PDF drawings. Due to the contractual nature of these drawings, this will cause a Tender to be delayed until corrected. A font error can occur within the created PDF Drawings and is displayed with a box character in lieu of a text or number. See figure below;

NORTHERN TROPICAL REGION NORTHERN REGION - STANDARD DESIGN 3 BEDROOM TROPICAL BLOCKWORK HOUSE HYDRAULIC NOTES AND LEGEND					
NTG PROJECT No. -	NTG ASSET No. -	SHEET No. 01 of 00	NTG DRAWING No. B16-110	AMENDMENT 0	SHEET SIZE A1

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	19 of 24

## What may cause this boxed PDF missing text error?

There are known problems with some Windows True Type Fonts, such as the, "Arial Narrow", True Type font, which is most commonly used. The problem appears to surface when there are different versions of the same font family when combining PDF documents, created from other sources. When these different versions clash, then this error can happen. We discourage the use of this particular font due culprit of this display error.

We have found more consistent results creating PDF's, when the below PDF creation options are applied from within your PDF writers settings;

- Embed **ALL** Fonts, and;
- **NOT** substituting fonts.

### Please ensure that your PDF creation options utilise these settings.

**Known Issues, (AutoCAD):** When publishing a drawing to PDF or printing with AutoCAD 2017+, that contains text in the, 'Helvetica Neue' font, the dimensional or annotation text is changed to a box or rectangle characters in the output. There are also several fonts no longer supported in Windows 10, such as the, 'Dotum' family of fonts. Drawings using these fonts, may produce the same error in a PDF output.

#### **Causes:**

This is a known issue with the 'Helvetica Neue' system font. Other affected fonts include, (but are not limited to), 'Gautami', 'Dotum', 'Gulim', and 'Gungsuh'. Please avoid using these font types.

#### **Solution:**

1. Edit the PDF Options in the Batch Publish dialog window.
  2. **Uncheck**, "Keep TrueType Fonts" or select "Convert all text to geometry."
- Alternatively, change the text to a different font or use AutoCAD 2016 or earlier to publish the drawing.

When this issue arises, we cannot endorse and have to return the Tender drawings until the Drawings are corrected and display properly. We recommend that the Design Consultant review their processes and recreate the faulty PDF's.

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	20 of 24

## 9.1. Autocad SHX Fonts

There are recurring issues, when using SHX type fonts within AutoCAD drawings. We are encouraging the move away from SHX and to utilise True Type Fonts instead. There is a display conversion problem that manifests inside plotted PDF files that may result in the creation of red outline boxes to appear around all SHX text. The PDF software will recognise the SHX fonts as PDF comment boxes. See example below;



IF POSSIBLE, USE A TRUE TYPE FONT IN LIEU OF AN SHX STYLE FONT TO AVOID THIS PROBLEM. (FIG 1.4).

\* **Note:** To avoid these issues, on the command line in AutoCAD, enter “**EPDFSHX**” and change the value to 0 (zero). In AutoCAD 2017+, the command, “**PDFSHX**” maps to “**EPDFSHX**”, (either may be typed in). For AutoCAD 2016, the core AutoCAD 2016 Service Pack 1 must be installed in order to have and use the “**EPDFSHX**” variable.

## 10. File Transfer / Submission Options

### 10.1. Technical Records File Transfer Methods: Consultants & Contractors.

- Large Submissions, (WingFTP). To access this service, send an email request to [Technical Records](#).
- After the files have been uploaded, an email is to be sent to technical records notifying that files have been transferred. Please be aware, that multiple FTP accounts exist between different NTG Departments & Agencies. You must use the correct login details as provided to you by Technical Records.
- Electronic Mail (e-mail): Attachments are to be encoded using MIME. Your Internet Service or email provider may limit the size of your outgoing email attachments. Small Submission Email less than 20MB: Send to: [TechnicalRecords@nt.gov.au](mailto:TechnicalRecords@nt.gov.au)
- Documents larger than 20 Mb are to be transmitted via the FTP (File transfer Protocol) site set up by Technical Records, (WingFTP). The login address for this site is at <http://ftp-doi.nt.gov.au>. Access to this file sharing facility is arranged by contacting Technical Records via email, [technicalrecords@nt.gov.au](mailto:technicalrecords@nt.gov.au). This site is for the transfer of large data documents between external consultants and Technical Records only and is not to be used as a storage device.

**Note:** Electronic transfers through the use of external Dropbox's (or similar commercial products) are **not** accepted. These type of file sharing sites are restricted for NTG Users.

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	21 of 24

## 10.2. Technical Records File Transfer Methods: NTG Staff

**Email:** [Technical Records](#). (Smaller file submissions)

**Internal NTG LAN:** <\\prod.main.ntgov\ntg\DCI\DEN\planroom> or,

**Internal DIPL:** <T:\> DIPL File Transfer Drive.

*(Note: All posted Links in this section are for internal NT Government use only. Please send email notification to Technical Records after upload).*

Please be aware of sensitive / restricted assets when uploading to the Transfer drive. We recommend uploading to the [planroom](#) folders for added security.

## 10.3. Physical Media Types

This type of media is not a preferred method for transmittal. Electronic file transfer is preferred. If physical media is the only option, then you must comply with the information as set out below;

## 10.4. USB Thumb Drives

Drawing files should not be supplied on this type of media unless prior approval has been given. Should it be necessary to do so, when all else fails, contact Technical Records first. See also our FTP file sharing services. (Section 10)

## 10.5. File System Formats

This must be detailed on an accompanying CAD Data Transmission Record. NTG have Microsoft Windows 10 as a default operating system. It is the Consultant's responsibility to supply data in a media format appropriate to the Departments systems.

## 10.6. Virus Scanning

All electronics files included as an attachment from emails shall be scanned prior to transmission and shall be free of any virus, malware, spam and other operating system exploits.

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	22 of 24

# 11. Have Non-Conforming Drawings that are worth Archiving?

## 11.1. New NTG Data Numbers

Drawings that have been procured outside the control of DIPL, other NTG Agencies, drawings for purchased Assets, etc, may now be handed over to Technical Records for Archiving. Technical Records has introduced a new, "Data" number system, where we can compile various forms of data into one zip file.

Design / Working Drawings, Hand sketches, Shelved Projects, PDF, DWG, RVT, 12D, and all other CAD files, Instruction / Operation / Warranty manuals, can all be allocated a new Data number and archived. These files can then be searched, retrieved and used for future NT Government Projects.

In some cases, NTG contracts may require the delivery of BIM files. This new format will facilitate the ability to archive the files for future uses. Contact Technical Records for more information.

Please be aware, that drawing files can be sent to Technical Records at **any** time. If you discover important drawings that we may not have in our archive, (usually depicted without the typical, B\* or R\* series of numbering), then let us know. We will be happy to have a look, and archive for future use for all

## 11.2. Technical Records Links

[Click here to access the External Technical Records Website](#) (Outside NTG)

[Click here to access the Internal Technical Records Website](#) (Inside NTG)

[Click here to Issue New Drawings Numbers](#) (For NTG Project Manager Use Only)

[Click here to Create a New Tender Number](#) (For NTG Project Manager Use Only)

# 12. Part 3 Building CADD Manual, (Coming Soon).

From the prior manual revision, **2019.01**, it was found that some information was not related to the function of Technical Records, these include;

- Text Sizes (detailed),
- PDF's Using Colours, (line work),
- CAD File Versions, Fonts, Layers, Colours, Linetypes, Hatching, Embedded Images,
- Concept / Design Drawings, (architectural),
- Revit or other BIM Model Files as deliverables,
- Consultant Specific Title Block fields / format (eg. Sheet Numbers),
- Consultant Logos,
- Drawing Index Sheet.

Currently under development, the Building Design Part 3 CAD Design Manual will soon be released. This manual will outline the NTG's CAD model & plotted drawing requirements.

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	23 of 24

## 13. Revision Log

Version	Amendment Description	Date Amended	Revised by
2019.01	Clarifications, ADR Removed, DATA added.	12/03/2019	Supervisor Technical Records
2021.01	<p>New Document format, removal of all drafting standards, minimum text height removed; now the responsibility of the NTG Discipline Design Managers or as referenced in the Small Building Works.</p> <p>Clarified Requirements Throughout.</p> <p>5.2.2 Added / clarified submission of eTransmitted cad files with external references from non-AutoCAD software.</p> <p>11 Non-Conforming NTG Drawings Section Added.</p>	22/02/2021	Supervisor Technical Records

Doc ID	Version	Issued	Page
NTG Technical Records - Part 1 - Requirements for Technical Records Management	2021.01	February 2021	24 of 24