

ALBERTA TRANSPORTATION DESIGN BULLETIN #108

IMPLEMENTATION OF AUTHENTICATION FOR ELECTRONIC SUBMISSION OF ENGINEERING DOCUMENTS

The authentication of engineering documents submitted by Consultants is currently addressed in the *Engineering Consultant Guidelines for Highway, Bridge and Water Projects Volume 1*, in the *Engineering Drafting Guidelines for Highway and Bridge Projects* and in the *Engineering Drawing Guidelines for Water Projects*.

The Department is gradually moving towards electronic submission of all documents. This Design Bulletin covers the use of APEGA digital seals for engineering documents submitted by Consultants to the Department. The Department will require the use of electronic submission of engineering documents with Digital Seals, as described herein and according to the implementation schedule listed in this bulletin.

1 Background

1.1 Definitions

The following definitions are provided in the Association of Professional Engineers and Geoscientists of Alberta (APEGA) professional practice standard, "Authenticating Professional Work Products, July 2019":

Term	Definition
Authentication	Authenticating a PWP means an APEGA licensed professional has completed or reviewed the work and accepts professional responsibility for the engineering or geoscience involved. Authentication can be physical (for original, physical PWPs) or digital (for electronic or digital PWPs).
Professional Work Product	A professional work product (PWP) is an output that requires authentication and validation. Defined in the General Regulation as "...plans, specifications, reports, or documents of a professional nature," a professional work product (PWP) is any output of professional services with technical information relied upon by others, internally or externally, to make a decision or to take action. A PWP can be physical (e.g., paper, plastic film), electronic (e.g., electronic document, image), or digital (e.g., software, modelling, simulation, or any other computer application that cannot be reproduced in a physical or electronic format).
Integrity (of a Professional Work Product)	The ability to verify that a PWP's information has not changed since authentication and that the way it is stored provides the stability and longevity to protect, keep, and retrieve the PWP and its authentication information.

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Signature	<p>Signatures are traceable and individualized permanent marks attached to stable information. All manuscript signatures, or electronic images of handwritten or manuscript signatures, must be in full. Initials are not acceptable.</p> <p>Physical Signature: An ink or “wet” signature, also referred to as a handwritten or manuscript signature.</p> <p>Digital Signature: A valid digital signature contains information specifying the signed product was created by a known sender (authentication), the sender cannot deny having sent the message (non-repudiation), and the message was not altered in transit (integrity). A digital signature can only be used by the holder of a digital certificate. It cannot be reproduced by anyone who does not have access to the protected digital certificate.</p>
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The following additional definitions are provided by the department to clarify the requirements of this Design Bulletin:

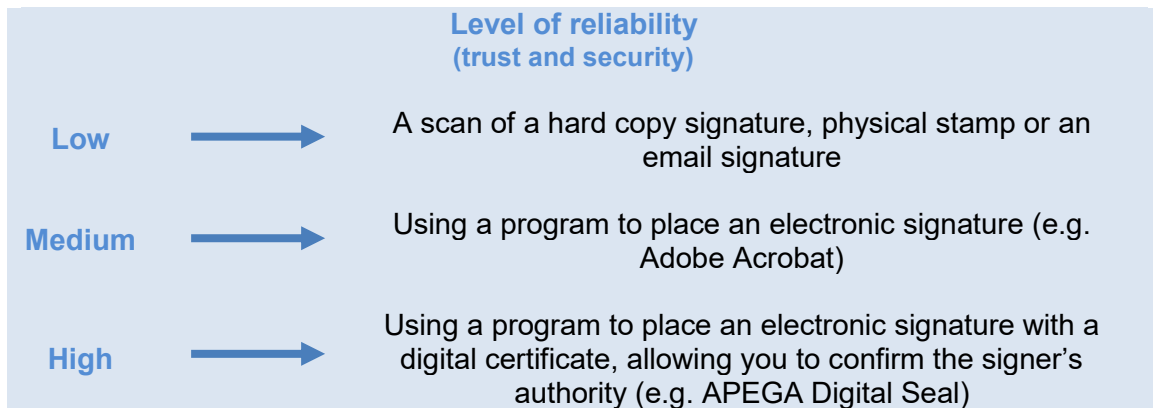
Term	Definition
Document reliability	Objective degree to which the reader can be sure of the identity of signers and of the integrity, authenticity and longevity of a document. When the document is a professional document, document reliability also relates to the professional affiliation of the signer.
Electronic signatures	Signatures in the electronic medium. They cover a vast array of use cases <u>and are of varying reliability</u> . Examples include: images (e.g. .jpeg) of a manuscript signature, the image of an engineering seal, and the recording of one's voice when making a purchase.
Digital seals	<i>Digital signatures</i> in which the professional association affiliation and corresponding right of practice is cryptographically asserted and controlled by the provincial regulator (e.g. APEGA).
Digital signing certificate	Cryptographically protected information in which the veracity of the certificate details is certified by a Certificate Authority. Digital signing certificates are used to apply digital signatures or seals to electronic documents.

1.2 What is Document Authentication

Authentication is the process of verifying that a sealed and signed document has not been modified or tampered with and represents the original content of the signing engineer. Digital document authentication is the same process applied for electronic documents that are signed using electronic signatures to authenticate the document.

There are many different methods to electronically authenticate a document, each with varying levels of reliability, trust and security. These methods include:

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For digital authentication of engineering documents, the Department will require Consultants to use a method with a high level of reliability (i.e. Digital Seal) in accordance with the implementation schedule listed below.

Moving to electronic submissions will be a learning experience for many Consultants and Consulting firms. There are many resources available to consultants to facilitate this learning experience:

Resource	Ideal For Learning
APEGA Professional Practice Standard	<ul style="list-style-type: none"> APEGA's "Authenticating Professional Work Products, July 2019"
Mydigitalseal.com	<ul style="list-style-type: none"> Digital Seals in general
Notarius Videos & Webinars https://notarius.com/en/help/ticket/?sq=webinar	<ul style="list-style-type: none"> How to apply the Digital Seal PDF/A-2 and PDF/A-3
Design Bulletin Webinars	<ul style="list-style-type: none"> Hands-on application of this Design Bulletin <p>Prerequisite: Notarius Videos or Webinar</p>

It is necessary to understand four technology procedures before attempting to prepare electronic submissions to the Department:

- Applying a digital seal to a professional document;
- Merging several PDF documents into one;
- Converting a document to PDF/A-2 format; and
- Converting a document to PDF/A-3 format and embedding documents in it.

These procedures are explained in the Notarius Videos & Webinars referred to in the above table.

Generally, Consultants will finalize their Professional Work Products in PDF/A-2 and authenticate such documents using their APEGA Digital Seal. However, there will be cases, where the Department requires the PDF/A-3 standard where additional Professional Work Products need to be embedded "inside" the PDF/A-3 file. Finally, there will also be cases

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where Consultants must include native CADD files in the PDF/A-3 files.

1.3 APEGA's Professional Practice Standard

APEGA has a Professional Practice Standard that governs the use of Digital Signatures for Professional Work Products. This practice is currently described in APEGA's document, "Authenticating Professional Work Products, July 2019". This practice standard may be updated in the future and it is the APEGA member's responsibility to ensure that they are satisfying the most current APEGA requirements.

In this Practice Standard, APEGA states that engineering documents can be prepared solely in electronic form provided the document includes the following content:

1. The image of the professional member's stamp;
2. The image of the professional member's hand-written signature;
3. The date on which the professional member stamped and signed it;
4. A digital signature/certificate obtained from APEGA [a.k.a. "Digital seal"].

Currently, Notarius is the only authorized provider of APEGA Digital Seals.

2 Consultant Use of Digital Authentication

All documents digitally authenticated shall meet the requirements of this Design Bulletin and the requirements laid out in the following documents:

- the *Engineering Consultant Guidelines for Highway, Bridge and Water Projects (Volume 1 and 2)*; and
- the *Engineering Drafting Guidelines for Highway and Bridge Projects* for roadway and bridge projects or the *Engineering Drawing Guidelines for Water Projects* for water projects.

In addition to the requirements of this Design Bulletin, digital authentication shall be completed in accordance with APEGA's Professional Practice Standard.

Unless stated otherwise in the Consulting Contract, Consultants shall not submit mylar drawings or hard copy engineering documents to the Department if they are providing electronic drawings or engineering documents that are digitally authenticated in accordance with this Design Bulletin.

Various means of submitting these electronic drawings or engineering documents exist: such as by email, on a DVD or USB stick, uploaded to an FTP site, uploaded to a project specific SharePoint site, uploaded to PMA, etc. The Consultant shall coordinate the submission of electronic drawings or engineering documents with the department's Project Manager for any given project.

As per APEGA requirements, drawings and engineering documents that are submitted to the department for review purposes only do not have to be authenticated. Only the final version of the drawings and engineering documents need to be authenticated. The final versions shall be

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submitted in accordance with the following sections.

The following sections outline the submission requirements for bridge projects, roadway projects, planning projects, and water projects. Most of the digital submissions require a “cover letter” be included in the PDF submissions. Sample cover letters are provided in the appendices. These cover letters clearly identify the responsibility that the Consultant is taking when authenticating the various PDF files. Project information on the sample cover letters may be modified, however, the text related to the authentication shall not be modified.

2.1 For Bridge Projects

2.1.1 When submitting detailed bridge design drawings (including the tender set “P-drawings” as well as the record set “C-drawings”) the Consultant shall follow the steps outlined below and submit the following three electronic files:

- One authenticated PDF/A-3 file containing a cover letter and all of the CADD files;
- One PDF/A-2 file containing the consolidated, unauthenticated drawings; and
- One authenticated PDF/A-3 file containing a cover letter and all of the individually authenticated PDF/A-2 drawing files.

Step	Action
CADD Files submission	
1	<p>Save all CADD files (MicroStation or AutoCad) using the following naming convention:</p> <p style="text-align: center;">“DWGNO-P.dgn” or “DWGNO-C.dgn”</p> <p>Where “DWGNO” represents the drawing number assigned in accordance with department practice. If using AutoCad, use file extension “dwg”.</p>
2	<p>Prepare a cover letter including the following content (refer to Appendix Fig. A-1):</p> <ul style="list-style-type: none"> - Contract, Bridge File and Consultant information; - List of drawing CADD files and drawing numbers; - Certification paragraph as per example provided in sample cover letter included in Appendix A.
3	<p>Prepare the submission by converting the cover letter prepared in Step 2 to a PDF/A-3 and adding all of the CADD files in “dgn” or “dwg” format (Step 1) into the PDF/A-3.</p>
4	<p>Finalize the submission by having a responsible member digitally authenticate the submission prepared in Step 3. Save this file using the following naming convention:</p> <p style="text-align: center;">“BFXXXXX-P-CADD-DATE.pdf” or “BFXXXXX-C-CADD-DATE.pdf”</p> <p>The “DATE” in the file name shall be formatted as YYYY-MM-DD.</p> <p>Notes:</p> <ul style="list-style-type: none"> - This file is to be digitally authenticated only by a responsible member who is validating that the digital CADD files included in this PDF/A-3 are unaltered from

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	<p>the files used to create the digitally authenticated PDF/A-2 drawings files (Step 5 to 9).</p> <ul style="list-style-type: none"> - The resulting file will be a self-contained, digitally sealed PDF/A-3 embedding all the necessary files.
Digitally Authenticated Drawing Submission	
5	Convert all CADD drawings from Step 1 to PDF/A-2 format in the full-size 22" x 34" format.
6	<p>Authenticate the drawings finalized in Step 5 as per the APEGA Professional Practice Standard by the responsible engineer(s) ("authenticated drawings"). Save each file using the following naming convention:</p> <p style="text-align: center;">"DWGNO-P-Auth.pdf" or "DWGNO-C-Auth.pdf"</p> <p>Where "DWGNO" represents the drawing number assigned in accordance with department practice.</p> <p>Important: Keep (do not overwrite or erase) the original PDF/A-2 files ("unauthenticated drawings") because you will need them in Step 10, below.</p> <p>Note:</p> <ul style="list-style-type: none"> - For Designer, Checker and Permit to Practice requirements, see the <i>Engineering Consultant Guidelines for Highway, Bridge and Water Projects Volume 1</i> and the <i>Engineering Drafting Guidelines for Highway and Bridge Projects</i>.
7	<p>Prepare a cover letter including the following content (refer to Appendix Fig. A-2):</p> <ul style="list-style-type: none"> - Contract, Bridge File and Consultant information; - List of drawings and drawing numbers; - Certification paragraph as per example provided in sample cover letter included in Appendix A
8	Prepare the submission by converting the cover letter prepared in Step 7 to a PDF/A-3 and adding all of the authenticated drawings (Step 6) into the PDF/A-3. PDF files of standard drawings that are referenced on the final design drawings should also be included in this PDF/A-3 document, but should not be authenticated by the Consultant.
9	<p>Finalize the submission by having the responsible member digitally authenticate the submission prepared in Step 8. Save this file using the following naming convention:</p> <p style="text-align: center;">"BFXXXXX-P-Auth-DATE.pdf" or "BFXXXXX-C-Auth-DATE.pdf"</p> <p>The "DATE" in the file name shall be formatted as YYYY-MM-DD.</p> <p>Notes:</p> <ul style="list-style-type: none"> - This file is to be digitally authenticated only by a responsible member who is validating that the digital CADD files included in this PDF/A-3 are unaltered from the files used to create the digitally authenticated PDF/A-2 drawings files (Step 5 to 9). - The resulting file will be a self-contained, digitally sealed PDF/A-3 embedding all the necessary files.
Unauthenticated Drawing Submission	
10	Consolidate all <i>unauthenticated drawings</i> (from Step 6) into one PDF/A-2 file. These files should not have any content in the sheet surround spaces allocated for the permit to

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	<p>practice seal, the design engineer and the check engineer. Once the files are consolidated, use a PDF program to place the following note in the permit to practice space on each individual drawing:</p> <p style="text-align: center;">“Not to be used for Tender or Construction. This consolidated set of drawings has been created from the digitally authenticated drawings. Date Created: YYYY – MM – DD”</p> <p>Standard drawings that are referenced on the final design drawings should also be included in this PDF document.</p> <p>Save this PDF/A-2 file using the following naming convention:</p> <p style="text-align: center;">“BFXXXXX-Consol-P-DATE.pdf” or “BFXXXXX-Consol-C-DATE.pdf”</p> <p>The “DATE” in the file name shall be formatted as YYYY-MM-DD.</p> <p>Note:</p> <ul style="list-style-type: none"> - This file is intended only for internal department use.
11	<p>Submit the following files to the department:</p> <ul style="list-style-type: none"> - One authenticated PDF/A-3 file containing: a cover letter and all of the CADD files; - One PDF/A-2 file containing: the consolidated, unauthenticated drawings; and - One authenticated PDF/A-3 file containing: a cover letter and all of the individually authenticated PDF/A-2 drawing files.

For very large projects, the size of these files may become very large. For these instances, the files may be split up. A similar file naming convention should be used, with “file 1” and “file 2” placed within the file name.

2.1.2 When submitting bridge detailed design notes the Consultant shall follow the steps outlined below:

Step	Action
1	<p>For each design component (e.g. one file for abutment, one file for pier, etc.), prepare a Design Notes document or a Check Notes document and save it as a PDF/A-2 file. Each document shall include the cover letter as shown on Appendix Fig. A-4.</p>
2	<p>Authenticate the Design Notes document(s) finalized at Step 1 per the APEGA Professional Standard by the responsible engineer(s) (“authenticated notes”). Save the PDF/A-2 using the following naming convention:</p> <p style="text-align: center;">“BFXXXXX-ABUT-Design-Notes.pdf” or “BFXXXXX-ABUT-Check-Notes.pdf”</p> <p>Notes:</p> <ul style="list-style-type: none"> - Each of these files is to be digitally authenticated by the professional engineer(s) taking responsibility for the Design or Check work. - In addition, each of these files is to be digitally authenticated by the responsible member signing the permit to practice. In some situations, there may be different

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	responsible members for different design components if the work is done in separate offices or by different Consultants.
3	Prepare a cover letter including the following content (refer to Appendix Fig. A-3): <ul style="list-style-type: none"> - Contract, Bridge File and Consultant information; - List of components and their designers and checkers; - Certification paragraph as per example provided in sample cover letter included in Appendix A.
4	Prepare the submission by converting the cover letter prepared in Step 3 to a PDF/A-3 and adding all authenticated Design Notes and Check Notes (Step 2) into the PDF/A-3 file.
5	Finalize the submission by having the responsible member digitally authenticate the submission prepared in Step 4. Save this file using the following naming convention: <p style="text-align: center;">“BFXXXXX-Design-Notes.pdf” or “BFXXXXX-Check-Notes.pdf”</p> <p>Notes:</p> <ul style="list-style-type: none"> - This file is to be digitally authenticated only one responsible member who is validating that the authenticated PDF/A-2 files included in this PDF/A-3 file constitute the complete Design and Check Notes for the project. - The resulting file will be a self-contained, digitally sealed PDF/A-3 embedding all the necessary files.
6	Submit the following files to the department: <ul style="list-style-type: none"> - One authenticated PDF/A-3 file containing: a cover letter and all of the individual authenticated PDF/A-2 design and check note files.

2.2 For Roadway Projects

2.2.1 When submitting detailed bridge design drawings (including the tender set “P-drawings” as well as the record set “C-drawings”) the Consultant shall follow the steps outlined below and submit the following three electronic files:

- One authenticated PDF/A-3 file containing a cover letter and all of the CADD files;
- One PDF/A-2 file containing the consolidated, unauthenticated drawings; and
- One authenticated PDF/A-3 file containing a cover letter and all of the individually authenticated PDF/A-2 drawing files.

Step	Action
CADD Files submission	
1	Save all CADD files (MicroStation) using the following naming convention: <p style="text-align: center;">“DWGNO-P.dgn” or “DWGNO-C.dgn”</p> <p>Where “DWGNO” represents the drawing number assigned in accordance with department practice.</p>

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2	<p>Prepare a cover letter including the following content (refer to Appendix Fig. B-1):</p> <ul style="list-style-type: none"> - Contract, Highway Control Section and Consultant information; - List of drawing CADD files and drawing numbers; - Certification paragraph as per example provided in sample cover letter included in Appendix B.
3	<p>Prepare the submission by converting the cover letter prepared in Step 2 to a PDF/A-3 and adding all of the CADD files (Step 1) into the PDF/A-3.</p>
4	<p>Finalize the submission by having a responsible member digitally authenticate the submission prepared in Step 3. Save this file using the following naming convention:</p> <p style="text-align: center;">“CON#-CADD-P.pdf” or “CON#-CADD-C.pdf”</p> <p>Where “CON#” represents the contract number of the project that the drawings were prepared for.</p> <p>Notes:</p> <ul style="list-style-type: none"> - This file is to be digitally authenticated only by a responsible member who is validating that the digital CADD files included in this PDF/A-3 are unaltered from the files used to create the digitally authenticated PDF/A-2 drawings files (Step 5 to 9). - The resulting file will be a self-contained, digitally sealed PDF/A-3 embedding all the necessary files.
Digitally Authenticated Drawing Submission	
5	<p>Convert all CADD drawings from Step 1 to PDF/A-2 format in the full-size 22” x 34” format.</p>
6	<p>Authenticate the drawings finalized in Step 5 as per the APEGA Professional Practice Standard by the responsible engineer(s) (“authenticated drawings”). Save each file using the following naming convention:</p> <p style="text-align: center;">“DWGNO-P-Auth.pdf” or “DWGNO-C-Auth.pdf”</p> <p>Where “DWGNO” represents the drawing number assigned in accordance with department practice.</p> <p>Important: Keep (do not overwrite or erase) the original PDF/A-2 files (“unauthenticated drawings”) because you will need them in Step 10, below.</p> <p>Note:</p> <ul style="list-style-type: none"> - For Designer, Checker and Permit to Practice requirements, see the <i>Engineering Consultant Guidelines for Highway, Bridge and Water Projects Volume 1</i> and the <i>Engineering Drafting Guidelines for Highway and Bridge Projects</i>.
7	<p>Prepare a cover letter including the following content (refer to Appendix Fig. B-2):</p> <ul style="list-style-type: none"> - Contract, Highway Control Section and Consultant information; - List of drawings and drawing numbers; - Certification paragraph as per example provided in sample cover letter included in Appendix B
8	<p>Prepare the submission by converting the cover letter prepared in Step 7 to a PDF/A-3 and adding all of the authenticated drawings (Step 6) into the PDF/A-3. PDF files of standard drawings that are referenced on the final design drawings should also be included in this PDF/A-3 document, but should not be authenticated by the Consultant.</p>

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9	<p>Finalize the submission by having the responsible member digitally authenticate the submission prepared in Step 8. Save this file using the following naming convention:</p> <p style="text-align: center;">“CON#-P-Auth-DATE.pdf” or “CON#-C-Auth-DATE.pdf”</p> <p>The “DATE” in the file name shall be formatted as YYYY-MM-DD.</p> <p>Notes:</p> <ul style="list-style-type: none"> - This file is to be digitally authenticated only by a responsible member who is validating that the digital CADD files included in this PDF/A-3 are unaltered from the files used to create the digitally authenticated PDF/A-2 drawings files (Step 5 to 9). - The resulting file will be a self-contained, digitally sealed PDF/A-3 embedding all the necessary files.
Unauthenticated Drawing Submission	
10	<p>Consolidate all <i>unauthenticated drawings</i> (from Step 6) into one PDF/A-2 file. These files should not have any content in the sheet surround spaces allocated for the permit to practice seal, the design engineer and the check engineer. Once the files are consolidated, use a PDF program to place the following note in the permit to practice space on each individual drawing:</p> <p style="text-align: center;">“Not to be used for Tender or Construction. This consolidated set of drawings has been created from the digitally authenticated drawings.</p> <p style="text-align: center;">Date Created: YYYY – MM – DD”</p> <p>Standard drawings that are referenced on the final design drawings should also be included in this PDF document.</p> <p>Save this PDF/A-2 file using the following naming convention:</p> <p style="text-align: center;">“CON#-Consol-P-DATE.pdf” or “CON#-Consol-C-DATE.pdf”</p> <p>The “DATE” in the file name shall be formatted as YYYY-MM-DD.</p> <p>Note:</p> <ul style="list-style-type: none"> - This file is intended only for internal department use.
11	<p>Submit the following files to the department:</p> <ul style="list-style-type: none"> - One authenticated PDF/A-3 file containing: a cover letter and all of the CADD files; - One PDF/A-2 file containing: the consolidated, unauthenticated drawings; and - One authenticated PDF/A-3 file containing: a cover letter and all of the individually authenticated PDF/A-2 drawing files.

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2.2.2 When submitting roadway design notes the Consultant shall follow the steps outlined below:

Step	Action
1	For each design component (e.g. one file for barriers, etc.), prepare a Design Notes document or a Check Notes document and save it as a PDF/A-2 file. Each document shall include the cover letter as shown on Appendix Fig. B-4.
2	<p>Authenticate the Design Notes document(s) finalized at Step 1 per the APEGA Professional Standard by the responsible engineer(s) (“authenticated notes”). Save the PDF/A-2 using the following naming convention:</p> <p style="text-align: center;">“CON#-ABUT-Design-Notes.pdf” or “CON#-ABUT-Check-Notes.pdf”</p> <p>Notes:</p> <ul style="list-style-type: none"> - Each of these files is to be digitally authenticated by the professional engineer(s) taking responsibility for the Design or Check work. - In addition, each of these files is to be digitally authenticated by the responsible member signing the permit to practice. In some situations, there may be different responsible members for different design components if the work is done in separate offices or by different Consultants.
3	<p>Prepare a cover letter including the following content (refer to Appendix Fig. B-3):</p> <ul style="list-style-type: none"> - Contract, Highway Control Section and Consultant information; - List of components and their designers and checkers; - Certification paragraph as per example provided in sample cover letter included in Appendix B.
4	Prepare the submission by converting the cover letter prepared in Step 3 to a PDF/A-3 and adding all authenticated Design Notes and Check Notes (Step 2) into the PDF/A-3 file.
5	<p>Finalize the submission by having the responsible member digitally authenticate the submission prepared in Step 4. Save this file using the following naming convention:</p> <p style="text-align: center;">“CON#-Design-Notes.pdf” or “CON#-Check-Notes.pdf”</p> <p>Notes:</p> <ul style="list-style-type: none"> - This file is to be digitally authenticated only one responsible member who is validating that the authenticated PDF/A-2 files included in this PDF/A-3 file constitute the complete Design and Check Notes for the project. - The resulting file will be a self-contained, digitally sealed PDF/A-3 embedding all the necessary files.
6	<p>Submit the following files to the department:</p> <ul style="list-style-type: none"> - One authenticated PDF/A-3 file containing: a cover letter and all of the individual authenticated PDF/A-2 design and check note files.

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2.3 For Planning Study Projects:

For Planning Study Projects, the Consultant shall follow the steps outlined below and submit the following two electronic files:

- One authenticated PDF/A-3 file containing the Planning Study Sign-off Sheet, the report, appendices and drawing files; and
- One ZIP file containing all of the CADD files.

Step	Action
Planning Report Submission	
1	<p>Convert final report, drawings and appendices to PDF/A-2 format. If any of the appendices are reports from other engineering consultants, ensure that they are authenticated as per the APEGA Professional Standard.</p> <p>The front page of the report should include a Planning Study Sign-off Sheet as per Appendix Fig C-2. The Consultant shall insert an electronic image of a signature onto this sheet. This step is not considered digital authentication as per APEGA's Professional Standard.</p>
2	Prepare a Planning Study Cover Sheet as per Appendix Fig C-1.
3	<p>Prepare the submission by converting the Planning Study Cover Sheet to a PDF/A-3 and adding into that file the following files:</p> <ul style="list-style-type: none"> - The report; - All appendices; and - All drawings.
4	<p>Finalize the submission by having the responsible engineer(s) digitally authenticate the submission prepared in Step 3. Save each file using the following naming convention:</p> <p style="text-align: center;">"Planning_Report_Descriptor-REPORT#-Auth.pdf"</p> <p>Where "Planning_Report_Descriptor" represents the name of the report (e.g. Functional Planning Report, Concept Planning Report, etc.).</p> <p>Where "REPORT#" represents the planning report number assigned in accordance with department practice.</p> <p>Note:</p> <ul style="list-style-type: none"> - The resulting file will be a self-contained, digitally sealed PDF/A-3 embedding all the necessary files.
Unauthenticated CADD Files Submission	
5	<p>Save all CADD files (MicroStation) using the following naming convention:</p> <p style="text-align: center;">"DWGNO.dgn"</p> <p>Where "DWGNO" represents the drawing number assigned in accordance with department practice.</p>
6	Zip all CADD files into one file and save that file using the following naming convention:

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	"REPORT#-CADD.zip"
7	<p>Submit the following files to the department:</p> <ul style="list-style-type: none"> - One authenticated PDF/A-3 file containing the Planning Study Sign-off Sheet, the report, appendices and drawing files; and - One ZIP file containing all of the CADD files.

2.4 For Water Projects:

2.4.1 When submitting detailed design drawings (including the tender set "P-drawings" as well as the record set "C-drawings") the Consultant shall follow the steps outlined below and submit the following two electronic files:

- One authenticated PDF/A-3 file containing a cover letter, all of the CADD files and all of the AutoCAD support files; and
- One authenticated PDF/A-3 file containing a cover letter and all of the individually authenticated PDF/A-2 drawing files.

Step	Action
CADD Files submission	
1	<p>Save all CADD files (AutoCAD) using the following naming convention:</p> <p style="text-align: center;">"DWGNO-P.dwg" or "DWGNO-C.dwg"</p> <p>Where "DWGNO" represents the drawing number assigned in accordance with department practice.</p>
2	<p>Prepare a cover letter including the following content (refer to Appendix Fig. D-1):</p> <ul style="list-style-type: none"> - Contract and Consultant information; - List of drawing CADD files and drawing numbers; - Certification paragraph as per example provided in sample cover letter included in Appendix D.
3	<p>Prepare the submission by converting the cover letter prepared in Step 2 to a PDF/A-3 and adding all of the CADD files (Step 1) and support files into the PDF/A-3.</p>
4	<p>Finalize the submission by having a responsible member digitally authenticate the submission prepared in Step 3. Save this file using the following naming convention:</p> <p style="text-align: center;">"CONXXXXX-CAD-P.pdf" or "CONXXXXX-CAD-C.pdf"</p> <p>Where "CONXXXXX" represents the contract number assigned in accordance with department practice.</p> <p>Notes:</p> <ul style="list-style-type: none"> - This file is to be digitally authenticated only by a responsible member who is validating that the digital CADD files included in this PDF/A-3 are unaltered from the files used to create the digitally authenticated PDF/A-2 drawings files (Step 5 to 9).

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	<ul style="list-style-type: none"> - The resulting file will be a self-contained, digitally sealed PDF/A-3 embedding all the necessary files.
Digitally Authenticated Drawing Submission	
5	Convert all CADD drawings from Step 1 to PDF/A-2 format in the full-size 22" x 34" format.
6	<p>Authenticate the drawings finalized in Step 5 as per the APEGA Professional Practice Standard by the responsible engineer(s) ("authenticated drawings"). Save each file using the following naming convention:</p> <p style="text-align: center;">"DWGNO-P-Auth.pdf" or "DWGNO-C-Auth.pdf"</p> <p>Where "DWGNO" represents the drawing number assigned in accordance with department practice.</p> <p>Note:</p> <ul style="list-style-type: none"> - For Designer, Checker and Permit to Practice requirements, see the <i>Engineering Consultant Guidelines for Highway, Bridge and Water Projects Volume 1</i> and the <i>Engineering Drawing Guidelines for Water Projects</i>.
7	<p>Prepare a cover letter including the following content (refer to Appendix Fig. D-2):</p> <ul style="list-style-type: none"> - Contract and Consultant information; - List of drawings and drawing numbers; - Certification paragraph as per example provided in sample cover letter included in Appendix D.
8	Prepare the submission by converting the cover letter prepared in Step 7 to a PDF/A-3 and adding all of the authenticated drawings (Step 6) into the PDF/A-3. PDF files of standard drawings that are referenced on the final design drawings should also be included in this PDF/A-3 document, but should not be authenticated by the Consultant.
9	<p>Finalize the submission by having the responsible member digitally authenticate the submission prepared in Step 8. Save this file using the following naming convention:</p> <p style="text-align: center;">"CONXXXXX-P-Auth-DATE.pdf" or "CONXXXXX-C-Auth-DATE.pdf"</p> <p>The "DATE" in the file name shall be formatted as YYYY-MM-DD.</p> <p>Notes:</p> <ul style="list-style-type: none"> - This file is to be digitally authenticated only by a responsible member who is validating that the digital CADD files included in this PDF/A-3 are unaltered from the files used to create the digitally authenticated PDF/A-2 drawings files (Step 5 to 9). - The resulting file will be a self-contained, digitally sealed PDF/A-3 embedding all the necessary files.
10	<p>Submit the following files to the department:</p> <ul style="list-style-type: none"> - One authenticated PDF/A-3 file containing a cover letter and all of the CADD files and AutoCAD support files; and - One authenticated PDF/A-3 file containing a cover letter and all of the individual authenticated PDF/A-2 drawing files and standard drawing files.

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2.5 Consultant Requirements for Components Designed and Supplied by Contractor (e.g. bearings, sign structures, MSE walls, water control gates, etc.):

Step	Action
1	<p>The Consultant shall assemble all of the Contractor's authenticated detailed design Record Drawings into one PDF/A-2 file. These drawings shall include the Contractor's design engineer stamp, check engineer stamp, and permit to practice seal on each individual drawing. Save this PDF/A-2 file using the following naming convention:</p> <p style="text-align: center;">"BFXXXXX-COMPONENT-Dwgs-DATE.pdf"</p> <p>"COMPONENT" shall be replaced with the name of the component (e.g. Bearings, Sign, MSE, etc.).</p> <p>Note: The Consultant is not authenticating this file, only assembling the authenticated drawings from the Contractor.</p>
2	<p>The Consultant shall assemble all of the Contractor's detailed design notes into one PDF/A-2 file. These design notes shall include the Contractor's design engineer stamp, check engineer stamp, and permit to practice seal. Save this PDF/A-2 file using the following naming convention:</p> <p style="text-align: center;">"BFXXXXX- COMPONENT-Design-Notes-DATE.pdf"</p> <p>"COMPONENT" shall be replaced with the name of the component (e.g. Bearings, Sign, MSE, etc.).</p> <p>Note: The Consultant is not authenticating this file, only assembling the authenticated design notes from the Contractor.</p>
3	<p>Prepare a cover letter including the following content (refer to Appendix Fig. E-1):</p> <ul style="list-style-type: none"> - Contract, Bridge File and Consultant information; - Certification paragraph as per example provided in sample cover letter included in Appendix E, and - Create a zone to apply the engineers stamp and permit to practice seal.
4	<p>Prepare the submission by converting the cover letter prepared in Step 3 to PDF/A-3 and adding the following files into that PDF/A-3 file:</p> <ul style="list-style-type: none"> - The drawing set prepared in Step 1; - The design notes set prepared in Step 2.
5	<p>Finalize the submission by having the Consultant's engineer(s) and responsible member digitally authenticate the submission prepared in Step 4. Save this file using the following naming convention:</p> <p style="text-align: center;">"BFXXXXX-COMPONENT-DATE.pdf"</p> <p>The "DATE" in the file name shall be formatted as YYYY-MM-DD.</p> <p>The Consultant is not authenticating the Contractor's design or drawings. The Consultant is only authenticating that the Consultant has reviewed the Contractor's design notes and drawings to determine that the Contractor's design meets the intent of the Consultant's</p>

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	<p>design; and that the Contractor's design meets all of the Department's design and construction requirements for this Project. The Consultant's engineer(s) completing the review must be competently familiar with the Consultant's design intent to carry out the review.</p> <p>Note: The resulting file will be a self-contained, digitally sealed PDF/A-3 embedding all the necessary files.</p>
6	<p>Submit the following files to the department:</p> <ul style="list-style-type: none"> - One authenticated PDF/A-3 file containing a cover letter, the Contractor drawings and design notes.

2.6 For Other Engineering Documents:

For any other engineering documents not listed above (e.g. reports, specifications, or other technical documents):

Step	Action
1	<p>Consolidate the final report, attachments and appendices into one PDF/A-2 file. If any of the appendices are reports from other engineering consultants, ensure that they are authenticated as per the APEGA Professional Standard.</p>
2	<p>Finalize the submission by having the responsible engineer(s) digitally authenticate the submission prepared in Step 1. Save each file using the following naming convention:</p> <p style="text-align: center;">"Report Descriptor-DATE.pdf"</p> <p>Where "Report Descriptor" represents the appropriate title for the report, in accordance with the department's practice.</p> <p>The APEGA engineer stamp(s) and APEGA Permit to Practice seal may be placed on the document in the same location where previously done for hard copy submissions (e.g. first page, cover letter, signature page, etc.)</p>
3	<p>Submit the following files to the department:</p> <ul style="list-style-type: none"> - One authenticated PDF/A-2 file containing the report, attachments and appendices.

3 Training

Currently, Notarius is the only APEGA-approved digital signature provider. As a result, the Department will coordinate some training seminars with Notarius. Dates and locations for this training will be communicated over the coming months.

4 Q & As

Question 1: Please clarify the terms electronic and digital?

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The terms digital and electronic are often used interchangeably. For this document, “Electronic Signature” is used at a very high level and includes all electronic documents with a signature, even those with very low levels of reliability such as a scan of signed stamp. The term “Digital Signature” is used with an electronic document that has a high level of reliability. The term “Digital Seal” is used to describe a digital signature which has a high level of reliability but is also validated by a professional association, in this case APEGA. Specific definitions are provided in Section 1.1 *Definitions*.

Question 2: How can you check if a document is properly digitally authenticated?

All PDF programs can be used to check what level of authentication has been applied to a document. An example of this is in Appendix F, using Adobe Acrobat. Figure F-1 shows what you would see when you open the PDF/A file in Adobe Acrobat. Here you can see the engineer’s stamp on the drawing. By clicking on the “signatures” button on the left of the screen, you get what you see in Figure F-2, which includes information such as you who authenticated it, when and whether it’s been modified after it was authenticated. By further clicking “Signature Details”, you can find out even more information about the authentication such as the Engineer’s member number and the issuing authority (i.e. APEGA).

Question 3: What’s the difference between a PDF, and PDF/A-2 and a PDF/A-3?

These are different types of PDF (Portable Document Format) files that each have their own unique characteristics.

Fundamentally, a PDF is a file created to an international standard (ISO 19005), which clearly specifies which elements of information must be included or excluded when saving a document in order to maximize its sustainability (i.e. its capacity to be successfully opened, read and authenticated). The “A” indicates that this format is intended for “Archiving” purposes, which means industry will ensure that all future versions of this file are backward compatible (i.e. old files will always be readable). The “PDF/A-2” standard allows digitally signed annotations to be added to an already digitally signed document.

The “PDF/A-3” has all of the same archiving properties of the “PDF/A-2”, and additionally supports embedding files into this PDF/A-3. The end effect of this is that it is sort of similar to a ZIP file, so you can include many different files and file formats in this one PDF/A-3 file. To open these embedded files, you would simply open the PDF/A-3 and then double-click on the embedded file. Appendix G shows an example of a PDF/A-3 with all of the embedded files listed. The advantage of using the PDF/A-3 is that you can digitally authenticate what you are sending through. This means that you’re not necessarily authenticating the individual embedded files, but you are authenticating the PDF/A-3 file. An example situation where this might come in useful is where you have several concrete test results and you want your Consultant engineer to review all of the results and then provide a stamped engineering letter

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stating that all of the concrete test results are good for their design. The engineer would not be stamping the actual test results, but they would include all of the results as separate files in PDF/A-3 as well as an authenticated cover letter stating the results meet the design requirements.

5 Implementation Schedule

Starting January 01, 2022, unless stated otherwise in their Contract, Consultants are required to submit all engineering documents to the Department only in electronic format with digital authentication in accordance with this Design Bulletin.

Before January 01, 2022, Consultants may choose to submit engineering documents using the current approach or submit in electronic format with digital authentication in accordance with this Design Bulletin.

Effective Date: Immediately. Questions on this bulletin may be directed to John Alexander (780) 415-1024.

Recommended by:

Approved by:

John Alexander, P.Eng.
Director
Bridge Engineering

Des Williamson, P.Eng.
Executive Director
Technical Standards Branch

6 Appendix A – Sample Documents for Bridge Submissions

Figure A-3: Sample Cover Letter for PDF/A-3 bridge design notes submission

Cover Letter - Design Notes

Contract: CONXXXX
 Bridge File: BFXXXXX
 Consultant: XYZ Engineering Ltd.

Date: YYYY-MM-DD

Component	Designer	Checker
Information Sheets	<i>Name</i>	<i>Name</i>
Piles		
Abutments		
Pier(s)		
Bearings & Girders		
Deck, Barriers, & Expansion Assemblies		
Lighting		

By applying the APEGA Permit to Practice seal on this cover sheet, [insert name of responsible member] is validating that the design and check notes contained within this PDF/A-3 file have been prepared in accordance with APEGA requirements.

APEGA Permit to Practice

PERMIT TO PRACTICE
 THE XYZ ENGINEERING LIMITED

Signature _____
 Date _____

PERMIT NUMBER: P-00000
The Association of Professional Engineers,
 and Geoscientists of Alberta

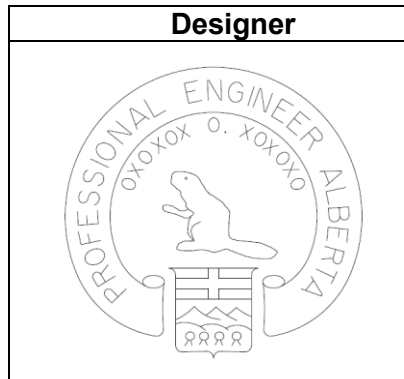
Figure A-4: Sample First Page for bridge design notes submission

Design Notes (or Check Notes)

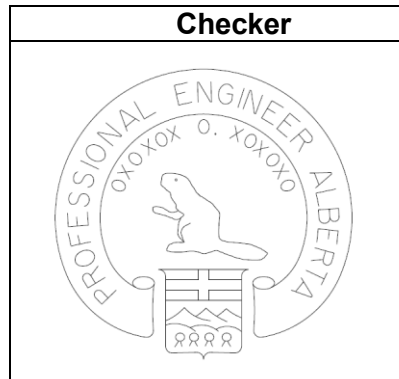
Contract: CONXXXX
Bridge File: BFXXXXX
Consultant: XYZ Engineering Ltd.
Component: Pier

Date: YYYY-MM-DD

The pages included in this file comprise the Design Notes (or the Check Notes) for the pier.



or



APEGA Permit to Practice

<p>PERMIT TO PRACTICE THE XYZ ENGINEERING LIMITED</p> <p>Signature _____</p> <p>Date _____</p> <p>PERMIT NUMBER: P-00000 The Association of Professional Engineers, and Geoscientists of Alberta</p>

7 Appendix B – Sample Documents for Roadway Submissions

8 Appendix C – Sample Documents for Planning Reports

Figure C-2: Sample Sign-off Sheet for Planning Studies


REPORT NO. XXXXX

**NAME OF PLANNING STUDY
(Description / Location of Planning Study)**

Consultant Name

(Signature of Consultant)

Date: _____



Accepted By:

_____ Name Title Branch	_____ Name Title Branch
Date: _____	Date: _____

9 Appendix D – Sample Documents for Water Project Submissions

Figure D-1: Sample Cover Letter for PDF/A-3 water project CADD drawing files submission

Cover Letter – Drawing CADD Files Submission

Contract: CONXXXX
Consultant: XYZ Engineering Ltd.

Date: YYYY-MM-DD

Drawing Name	Drawing Number
Key Plan and Drawing Index	XXXXX-P
Sheet 2	XXXXX-P
Sheet 3	XXXXX-P
Sheet 4	XXXXX-P

By applying the APEGA Permit to Practice seal on this cover sheet, [insert name of responsible member] is validating that the digital CADD files included in this PDF/A-3 (as listed in the table above) are unaltered from the files used to create the authenticated PDF/A-2 drawing files, which are also being submitted to the Department separately.

APEGA Permit to Practice

<p>PERMIT TO PRACTICE THE XYZ ENGINEERING LIMITED</p> <p>Signature _____</p> <p>Date _____</p> <p>PERMIT NUMBER: P-00000 The Association of Professional Engineers, and Geoscientists of Alberta</p>

Figure D-2: Sample Cover Letter for PDF/A-3 authenticated water project drawing submission

Cover Letter – Authenticated Drawing Submission

Contract: CON00XXXXX
Consultant: XYZ Engineering Ltd.

Drawing Name	Drawing Number
Key Plan and Drawing Index	XXXXX-P
Sheet 2	XXXXX-P
Sheet 3	XXXXX-P
Sheet 4	XXXXX-P

By applying the APEGA Permit to Practice seal on this cover sheet, [insert name of responsible member] is validating that the authenticated PDF/A-2 files and standard drawing PDF files contained within this PDF/A-3 file constitute the final design drawing set.

APEGA Permit to Practice

<p>PERMIT TO PRACTICE THE XYZ ENGINEERING LIMITED</p> <p>Signature _____</p> <p>Date _____</p> <p>PERMIT NUMBER: P-00000 The Association of Professional Engineers, and Geoscientists of Alberta</p>

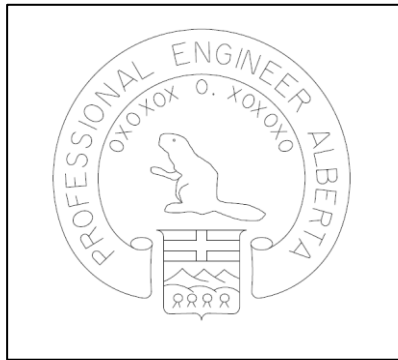
10 Appendix E – Sample Documents for Submissions of Components Designed and Supplied by Contractor

Figure E-1: Sample Cover Letter for PDF/A-3 submissions of components designed and supplied by Contractor

Cover Page – Components Designed and Supplied by Contractor

Contract: CONXXXX
Bridge File: BFXXXXX
Consultant: XYZ Engineering Ltd.
Component: MSE Wall

By applying the APEGA engineer stamp and APEGA Permit to Practice seal on this cover sheet, [insert engineers name] is validating that they have reviewed the Contractor's design and check notes and drawings included in this PDF/A-3 file and have determined that the Contractor's design meets the intent of the Consultant's original design; and that the Contractor's design meets all of the Department's design and construction requirements for this Project.



APEGA Permit to Practice

PERMIT TO PRACTICE THE XYZ ENGINEERING LIMITED Signature _____ Date _____ PERMIT NUMBER: P-00000 The Association of Professional Engineers, and Geoscientists of Alberta

11 Appendix F – Confirmation of Digital Authentication

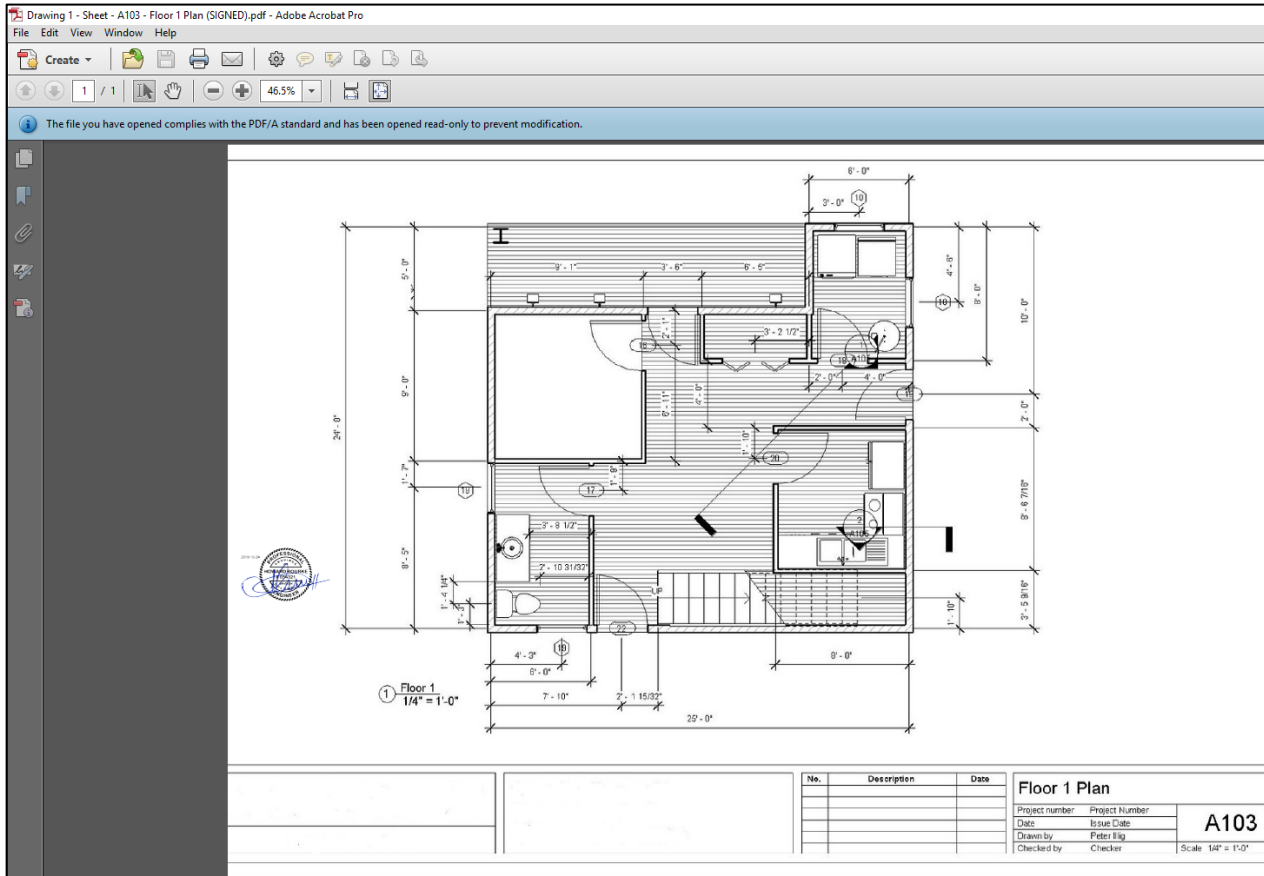


Figure F-1

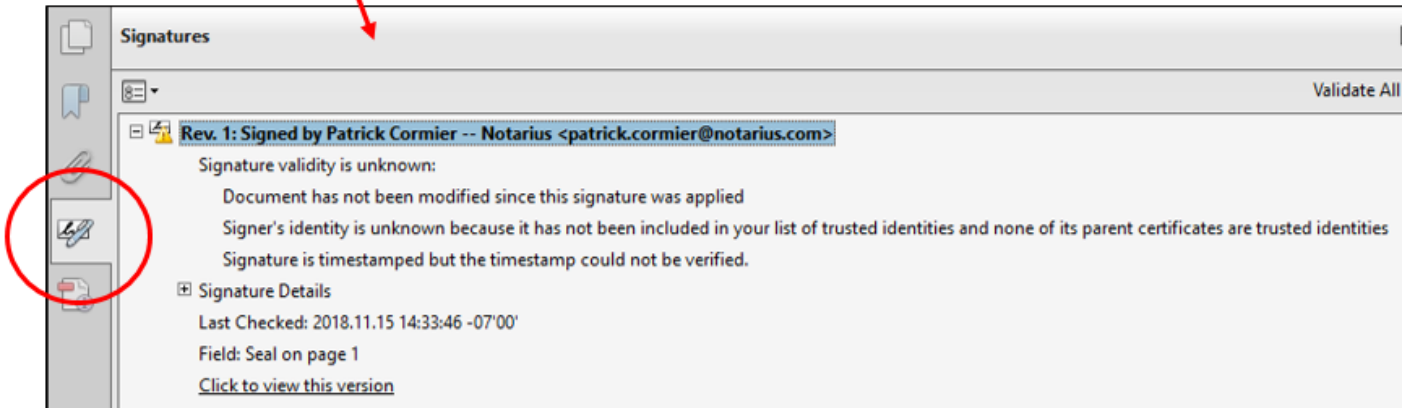
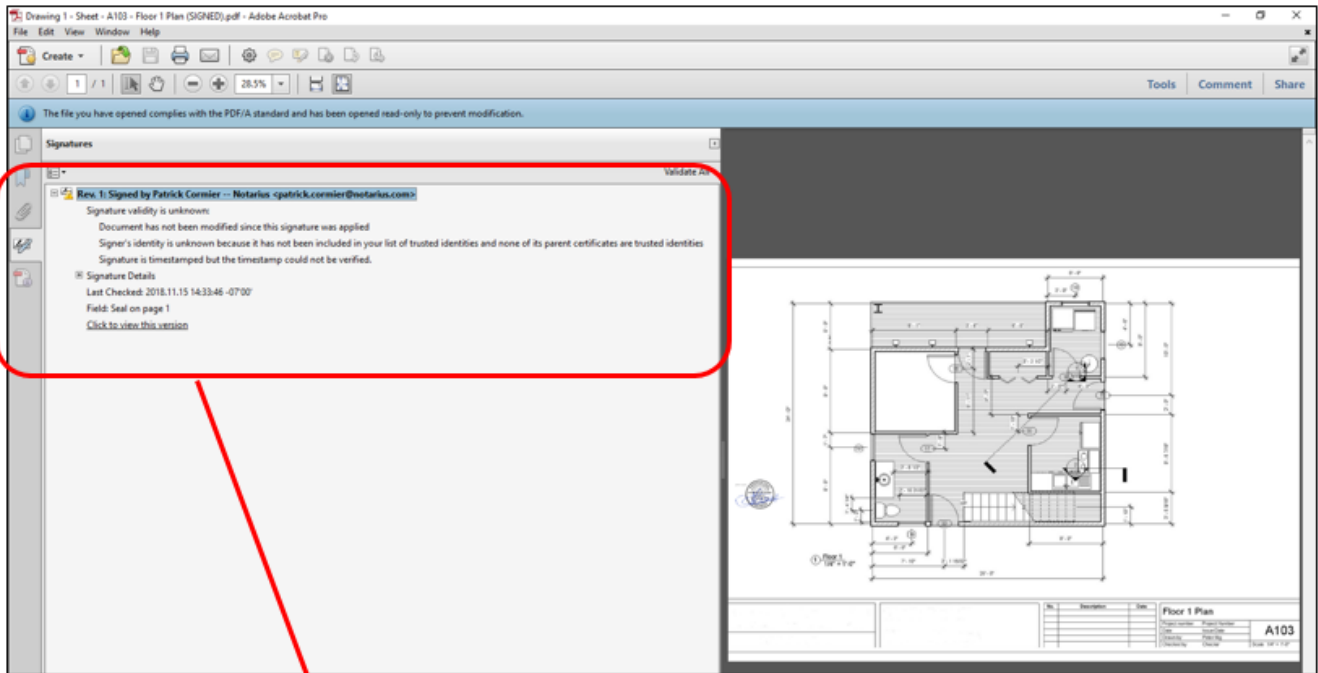


Figure F-2

12 Appendix G – Example of a PDF/A-3

The screenshot displays the Adobe Acrobat Pro interface. The title bar reads "Drawing 1 - Sheet - A103 - Floor 1 Plan (SIGNED).pdf - Adobe Acrobat Pro". The menu bar includes "File", "Edit", "View", "Window", and "Help". The toolbar contains various icons for file operations and navigation. The navigation pane shows "1 / 1" pages and a zoom level of "30%". A blue information bar states: "The file you have opened complies with the PDF/A standard and has been opened read-only to prevent modification." The "Attachments" pane is open, displaying a table of files:

Name	Description	Modified	Size
Drawing 2 - Sheet - A103 - Floo...	Drawing 2 - Sheet - A103 - Floor 1...	11/25/2014 6:25:44 PM	270 KB
Drawing 5 - Sheet - A103 - Floo...	Drawing 5 - Sheet - A103 - Floor 1...	11/25/2014 6:25:44 PM	270 KB
Drawing 9 - Sheet - A103 - Floo...	Drawing 9 - Sheet - A103 - Floor 1...	11/25/2014 6:25:44 PM	270 KB
Empty Powerpoint.pptx	Empty Powerpoint.pptx	10/24/2018 9:57:48 AM	32 KB
Empty Spreadsheet.xlsx	Empty Spreadsheet.xlsx	10/24/2018 9:57:14 AM	8 KB
Notes.txt	Notes.txt	10/24/2018 9:58:09 AM	1 KB