

## 21M-100

## Digitally Signing Electronic Contract Documents

Design Manual Chapter 21 Automation Tools Instructions Originally Issued: 07-17-18 Revised: 10-31-22

Digital contract documents must be digitally signed (locked) with a verifiable digital certificate to ensure integrity of the contents of the digital files. By Iowa Administrative Code <u>193C.6.1(9)</u>:

"Secure electronic signature. An electronic signature as defined in or governed by Iowa Code chapter 554D meets the signature requirements of this rule if it is protected by a security procedure, as defined in Iowa Code section 554D.103(14), such as digital signature technology. It is the licensee's responsibility to ensure, prior to affixing an electronic signature to an engineering or land surveying document, that security procedures are adequate to (1) verify the signature is that of a specific person and (2) detect any changes that may be made or attempted after the signature of the specific person is affixed."

The Iowa DOT has chosen a private certificate authority to provide a digital certificate that meets the criteria of IAC 193C.6.1(9) and Iowa Code <u>554D.103(14)</u>. Any digital certificate used by the Engineer of Record or their representative needs to meet the Iowa code requirements. The Engineer of Record or their representative in their organization will lock the files with a digital signature after the Engineer of Record approves of the final content within the files. The Engineer of Record will apply their Engineering seal and signature for the digitally locked documents through Appendix A of the Special Provision for Digital Contract Files.

Files that will be digitally signed (locked) are specified in the Special Provisions for Digital Contract Files:

- LandXML files
  - Proposed Geometry file(s).
  - Proposed surface files of grading (subgrade embankment) and top of grade (top of pavement & side slope embankment).
- DGN files
  - Three dimensional line string lines of break lines of proposed surfaces.

The Engineer of Record should include the names of all locked digital files in Appendix A of the Special Provisions for Digital Contract Documents that was under their direct supervision. For example, if the Engineer of Record did not oversee the existing ground terrain model, the Engineer of Record will not sign for that file; however, it would still be provided to the customer for information only.

### **Digitally Signing (Locking) LandXML Files**

The utility to be used to digitally sign XML files can be accessed from the Office of Design folder (W:\Highway\Design\Office of Design\).

The utility is called FDOTXMLSigning.exe:

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Computer + (W)	DataStor (\\ntdfs) (₩:) → Highway → Design →	Office of Design 🔸		Search Office of Des	ign	P
Organize 🔻 Burn New fold	der					?
🔆 Favorites	Name	Date modified	Туре	Size		-
🧮 Desktop	퉬 Design Resources	5/17/2016 1:37 AM	File folder			
〕 Downloads	퉬 Print Servers	5/31/2016 11:00 AM	File folder			
🖳 Recent Places	_MicroStation V8 Tools	4/29/2009 7:59 AM	Shortcut	2 KB		
	AutomationNewsletter	2/25/2010 12:42 PM	Shortcut	1 KB		
🥽 Libraries 🔨 🔪	膨 Contract Modifications	5/18/2012 10:04 AM	Shortcut	2 KB		
Documents	🛞 Cost Estimating	1/26/2012 6:57 AM	Shortcut	1 KB		
🎝 Music	Delete RSC	1/18/2013 1:55 PM	Shortcut	2 KB		=
Pictures	DOT Employee Directory	5/31/2016 10:13 AM	Internet Shortcut	1 KB		
Videos	😿 FDOTXMLSigning.exe	6/7/2016 9:20 AM	Shortcut	2 KB		
	Porms 😥	2/17/2015 2:56 PM	Internet Shortcut	1 KB		
👰 Computer	🔁 IDMS	5/13/2009 8:35 AM	Shortcut	1 KB		
🚢 Local Disk (C:)	武 Kill Excel	1/22/2010 12:24 PM	Shortcut	1 KB		
🖵 thamski (\\ntdfs\HomeFolde	Kill MicroStation	11/12/2008 7:09 AM	Shortcut	1 KB		
🚽 u (\\dot.int.lan\atscore) (U:)	🔊 Kill MSforms Exd	1/8/2015 10:07 AM	Shortcut	2 KB		
(W)DataStor (\\ntdfs) (W:)	🔒 Lock Computer	1/13/2010 1:08 PM	Shortcut	3 KB		
🛒 atscore (\\dot.int.lan) (Z:)	💼 OpFin Menu Installation Instructions.doc	8/16/2002 2:17 PM	Microsoft Word 9	28 KB		
	📄 Printers	7/14/1997 1:27 PM	Shortcut	1 KB		
🗣 Network	🛃 ProjectWise Training	8/31/2012 8:12 AM	Shortcut	3 KB		
	📄 Safety Committee	1/12/2005 2:10 PM	Shortcut	1 KB		
	🖳 Service Survey.doc	10/26/2005 8:18 AM	Microsoft Word 9	56 KB		
	A Shall Latters	8/1/2011 12:22 DM	Internet Shortcut	1 KR		Ŧ
31 items						

External users can download the program from the <u>https://iowadot.gov/design/automation-tools</u> under the Programs zip file <u>link</u>.

- Cell libraries (ZIP file)
- Color tables (ZIP file)
- Configuration (ZIP file)
- Cost estimating (ZIP file)
- Dgnlib (ZIP file)
- Documentation (ZIP file)
- GeoPak (ZIP file)
- gINT (ZIP file)

- IowaRCS (ZIP file)
- Macros (ZIP file)
- Printing (ZIP file)
- Programs (ZIP file)
- Resource files (ZIP file)
- Seed files (ZIP file)
- Survey (ZIP file)

Upon opening the utility, it will remember the last digital certificate used to sign files. The first time you use it, you will have to select the correct digital certificate for signing files.

SFDOT XML Signing	
File Options Help	
Sign Verify Results I	og
Choose Certificate	Apply Signature Show Certificate
Use XML Spy compatib	ility mode.
Certficate Information	
📩 Issuer name	IdenTrust ACES CA 1
🔄 🔄 Subject name	Thomas M Hamski
Signing algorithm	sha256RSA
🖉 Valid Date	9/28/2015
🖉 Expire Date	9/27/2017
Service Provider	Microsoft Enhanced Cryptographic Provider v1.0
•	4
Ready	

#### Click the **Choose Certificate** button to select the appropriate certificate for signing.

👒 FDOT XML Signing							
File Options Help							
Sign Verify Results	Log						
Choose Certificate	Apply Signature Show Certificate						
Use XML Spy compatibility mode.							
Certficate Information							
📩 Issuer name	IdenTrust ACES CA 1						
Subject name	Thomas M Hamski						
Signing algorithm	sha256RSA						
🖉 Valid Date	9/28/2015						
🖉 Expire Date	9/27/2017						
Service Provider	Microsoft Enhanced Cryptographic Provider v1.0						
•	4 III						
Keady							

Digital Certificates

Select the digital certificate used for digital signature

Windows Certificate Store

Store Location: CurrentUser

Store Name: My

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Current Only

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X

Store location: Current User

Store name: My

Certificates: Your IdenTrust certificate

If your certificate is not visible in the dialog, refer to 21M-101 for instructions on exporting your certificate from Internet Explorer.

Certificates: Iden Trust ACES CA 1 Show PFX Digital Certificate File Select Show Save Password: Certficate Information 📩 Issuer name IdenTrust ACES CA 1 Subject name Thomas M Hamski sha256RSA Signing algorithm Valid Date 9/28/2015 Expire Date 9/27/2017 Service Provider Microsoft Enhanced Cryptographic Provider v1.0 ٠. 111 Þ

OK

Cancel

After selecting the appropriate certificate, an output folder must be selected. This is done by clicking on the Options menu and selecting Output Folder.

	😵 FDO	T XML Signing	1						
	File	Options Help							
	Sign	Output Folder							
	Name	Output Suffix	•	Subject					
	🔘 XN	1LFile4.xml	Thomas M Hamski	Iden Trust ACES CA 1					
	🔿 XN	1LFile3.xml	Thomas M Hamski	Iden Trust ACES CA 1					
	🔿 XN	1LFile2.xml	Thomas M Hamski	Iden Trust ACES CA 1					
	🔘 XN	1LFile1.xml	Thomas M Hamski	IdenTrust ACES CA 1					
	-			•					
	Output folder - W:\Highway\Design\AutomationSection\Personnel\Tho								
C	_		_						

Select the appropriate folder to place the signed XML files. This utility is not integrated with ProjectWise. All locations must be on either the local computer or a network drive location.



# To sign XML files *Click* on the **Apply Signature** button.

S FDOT XML Signing							
File Options Help							
Sign Verify Results	Log						
Choose Certificate	Apply Signature Show Certificate						
Use XML Spy compatib	vility mode.						
Certficate Information							
📩 İssuer name	Iden Trust ACES CA 1						
Subject name	Thomas M Hamski						
Signing algorithm	sha256RSA						
🔮 Valid Date	9/28/2015						
Expire Date	9/27/2017						
Service Provider	Microsoft Enhanced Cryptographic Provider v1.0						
Output folder - W:\Highway\Design\AutomationSection\Personnel\Tho,;;							

Select the files to be signed. Multiple files can be signed at once. The files to be signed must be outside of ProjectWise because the signing program is not ProjectWise integrated.

A Select XML File(s) to Sign				×
Personne	ThomasHamski      Working      Digital Certs      FDOT-DIGSIG      FDOT-DIGSIG	► <del>•</del> + <sub>7</sub>	Search FDOT-DIGSIG	Q
Organize 👻 New folde	r		:== ▼	
A 👉 Favorites	Name	<ul> <li>Date modified</li> </ul>	Туре	Size 🔺
C Desktop	XMLFile1_Signed.xml	5/16/2016 10:08 AM	XML Document	5
\rm Downloads	XMLFile2_Signed.xml	5/16/2016 10:08 AM	XML Document	5
📃 Recent Places	XMLFile3_Signed.xml	5/16/2016 10:08 AM	XML Document	5
	XMLFile4_Signed.xml	5/16/2016 10:08 AM	XML Document	5
4 📜 Libraries	46-1697-044_CoordinateGeometry_Signed.xml	9/29/2015 11:23 AM	XML Document	47
Documents	46-1697-044_CoordinateGeometry2.xml	10/10/2014 1:06 PM	XML Document	45
🖻 🌙 Music	46-1697-044 Subgrade_model_Signed.xml	10/6/2014 7:16 AM	XML Document	3,229 ≡
Pictures	XMLFile4.xml 4	9/23/2014 3:20 PM	XML Document	1
Videos	XMLFile3.xml	9/23/2014 3:19 PM	XML Document	1
	XMLFile2.xml	9/23/2014 3:19 PM	XML Document	1
⊿ 🖳 Computer	XMLFile1.xml	9/23/2014 3:18 PM	XML Document	1
🛛 🚰 Local Disk (C:)	40-1097-044_CoordinateGeometry.xml	7/7/2013 5:57 AM	XML Document	43
▷ 🖵 thamski (\\ntdfs\ <sup></sup>	46-1697-044_Subgrade_model.xml	7/7/2013 5:57 AM	XML Document	3,227
▷ 🖵 u (\\dot.int.lan\a	la Certificates	5/17/2016 1:51 PM	File folder	
▷ 🚽 (W)DataStor (\\n	J XMLSpy	5/17/2016 1:51 PM	File folder	*
Image:	< []			•
File na	me: "XMLFile4.xml" "XMLFile3.xml" "XMLFile2.xml" "XMLFile1.xml"	-	XML Files [*.xml]	•
		X	Open	Cancel

Enter your certificate's password.

Signing data with your private exchange key								
	An application is requesting access to a Protected item.							
	Password for: CryptoAPI Private Key							
	Remember password							
	OK Cancel Details							

The utility has now applied your digital certificate to the XML files.

S FDOT XML Signing	1000							
File Options Help								
Sign Verify Results Log								
Name	lssuer	Subject						
🖉 XMLFile4.xml	Thomas M Hamski	IdenTrust ACES CA 1						
🛇 XMLFile3.xml	Thomas M Hamski	IdenTrust ACES CA 1						
🛇 XMLFile2.xml	Thomas M Hamski	IdenTrust ACES CA 1						
🛇 XMLFile1 xml	Thomas M Hamski	IdenTrust ACES CA 1						
< >								
All XML files signed.								

#### **3D DGN Files**

MicroStation files can only be signed one at a time. Open the files to be signed one at a time and repeat the following steps.

🚮 Dr	awing		🚬 🛯 - 🖨	- 6	• • •	📌 🗎 🕻	<b>)</b>		0	C:\Users\tha	amski\One	eDrive - Iov	va Departr	ment of Tran	sportation	Desktop\PV
File	Home	View	Annotate	Attach	Analyze	Curves	con	straints	Utilities	Drawing	Aids	Content	Mesh	Collabo	orate H	lelp
	(x)	🔅 MDI	L Applications se Tool Boxes			0	► Play	Record	Stop			P		æ	*	
OLE	Named Expressions	👳 Con	nect to Browser	Display C	Convert Cap	oture 🐻	🔠 Oper	DynamicX	SMoc 🔭 🥜	VBA Manager	Commi	t Initialize	7	Signatures	Signature Cell	Coordinat System
	l	Jtilities			Image			Mac	ros	5	Des	ign History	/ G	Secu	irity	Geo
Explore	·						<b>-</b> ₽ ×	View	1 Default							
🔀 Fil	2						*		0) ±24	<b>⊥ ⊕ ⊝</b>	0	n 🔊 🗖	a mai lea			
📦 Ite	ms						*		<b>γ</b> τ   4		: <u>*</u> ; •	0014		3 <del>6</del> 4 ()		
Re	sources						*	8	Element S	election	_		<			c

Digital signatures in MicroStation are accessed from the **Drawing Workflow > Utilities Ribbon Tab > Signatures.** 

📕 Digital Signatures												<b>_ _ X</b>
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Hierarchy	Verified	Trusted	Current	Source	Scope	Refs	Certificate	Signer	Location	Date	Expiry	Purpose
Herato	Ventied	Trusted	Current	Source	Scope	Refs	Certificate	Signer	Location	Date	Expiry	Purpose
Click on Add File Si	anatur		on									

Click on Add File Signature button.

*Click* on the magnifying glass next to Certificate field.

Add File Sig	nature
Certificate	٩
Signer:	thamski
Location:	HDC18070
Purpose:	
Expiry:	YYYY/MM/DD
	Dependent Signature
	Include References
	OK Cancel

Select your IdenTrust certificate to apply to the file	Certificates								
and Click OK.	Issued To	Issued By	Expiration	Key?					
	🛤 Thomas M Hamsk	Iden Trust ACES CA 1	2017/09/27	R					
	1			View					
		<u>0</u> K	Cancel						

*Click* **OK** to apply the digital signature.

Add File Signature						
Cer	tificate:	Thomas M Hamski				
	Signer:	thamski				
Lo	ocation:	HDC18070				
P	urpose:					
	Expiry:	YYYY/MM/DD				
		Dependent Signature				
		Include References				
		OK Cancel				

You will be prompted to enter your digital certificate's password. *Click* **OK**.



Digital Signatures												_ 🗆 🗾
. 🖪 🔆 🗙 🖄 🖾 🖻												
archy	Verified	Trusted	Current	Source	Scope	Refs	Certificate	Signer	Location	Date	Expiry	Purpose
	Image: Second	<b>v</b>	<b>S</b>		4		Thomas	thamski	HDC18070	2016/06/08 09:12		
											_	

The Digital Signatures dialog will now show that the file has been digitally signed. Close the file.

Note: Do not save settings or modify the file in any way or the digital signature will be invalidated.

The file should now be set to read only. In windows Explorer right click on the file and select **Properties.** 

test signature.	dan	6/8/2016 9:14 AM	Bentlev N	licroStati
		Open with MicroStation V8i (SELECTseries 3) Print with MicroStation V8i (SELECTseries 3) Open with		
	۵	Scan for threats		
		Send to	+	
		Cut Copy		
		Create shortcut Delete		
		Rename Properties		

On the General tab under Attributes, check the **Read-only** check box and *Click* **OK.** 

1/2 test signature.dgn Properties								
General Secu	irity Custom Details Previous Versions							
J.	test signature.dgn							
Type of file:	Bentley MicroStation Design (.dgn)							
Opens with:	MicroStation V8i (SELEI Change							
Location:	W:\Highway\Design\AutomationSection\Personnel							
Size:	69.0 KB (70,656 bytes)							
Size on disk:	72.0 KB (73,728 bytes)							
Created:	Wednesday, October 15, 2014, 10:37:36 AM							
Modified:	Today, June 08, 2016, 9:14:13 AM							
Accessed:	Wednesday, October 15, 2014, 10:37:36 AM							
Attributes:	Read-only Hidden Advanced							
	OK Cancel Apply							

## **Chronology of Changes to Design Manual Section:**

## **021M-100 Digitally Signing Electronic Contract Documents**

10/31/2022

Revised

Updated page 8 for the location of the digital signature tool for ORD Connect.

7/17/2018 NEW

New.