

Civil 3D Metadata Sheet for WisDOT Project

(An editable version of this document can be found in the Metadata folder of the WisDOT Civil 3D Project Template.)

To		County	
Date		Highway	
Project ID		Limits	
Project Type		Desc	

Prepared by:

Name		Phone	
Office/Firm		Email	

Geodetic reference information

See included form [DT1773](#) for geodetic reference information. This form is typically filled in by the responsible party for field survey per work order contract language.

Field Control data

Folder location and filename (ex. ProjID\BaseData\Survey\XxxYyy.dwg)	Civil 3D point names

Existing surface(s)

Folder location and filename(s) (ex. ProjID\BaseData\Surf-Ex.dwg)	Surface names

Existing topography – general

Folder location and filename(s) (ex. ProjID\BaseData\Topo-Ex.dwg)	Description of file contents

Existing topography – utilities

Folder location and filename(s) (ex. ProjID\BaseData\Uti-Ex.dwg)	Description of file contents

Reference alignments (alignment objects not used as a reference line or corridor baseline need not be listed)

Folder location and filenames (ex. ProjID\Design\AliProfs\XxxYyy.dwg)	Alignment name(s) in file used as reference line or corridor baseline	Describe alignment report file names (ex. ProjID\Metadata\<Ali Name>-AliDesc.csv)

Reference profiles

Folder location and filenames (ex. ProjID\Design\AliProfs\XxxYyy.dwg)	Alignment used as reference line or corridor baseline	Profile(s) used for reference line or corridor baseline

Superelevation transition reports

Folder location and filenames (ex. ProjID\Metadata\<Ali Name>-AliDesc.csv))

Right-of-Way monumentation - points

Folder location and filename (ex. ProjID\RW\XxxYyy.dwg)	Civil 3D point names	File containing point attribute data (ex. ProjID\Metadata\RW-MonPoints.xlsx)

Right-of-Way monumentation - alignments

Folder location and filename (ex. ProjID\RW\XxxYyy.dwg)	Right-of-way alignment names	Describe alignment report file names (ex. ProjID\Metadata\<Ali Name>-AliDesc.csv)

Right-of-Way - parcels

Folder location and filename (ex. ProjID\RW\XxxYyy.dwg)	Right-of-way parcel site names	Closure reports. See FDM 12-10 Attachment 1.7. (ex. ProjID\Metadata\<Plat Sheet>.docx)

Proposed Cross Sections

Folder location and filenames (ex. ProjID\SheetsPlan\09####-xs.dwg)	Section view group name	Alignment and station range

Slope Stake Reports

Folder location and filenames (ex. ProjID\Metadata\09####-slp-stk.csv)	Cross section file information extracted from. (ex. ProjID\SheetsPlan\09####-xs.dwg)

ELECTRONIC DATA CHECKLIST

(An editable version of this document can be found in the Metadata folder of the WisDOT Civil 3D Project Template.)

Wisconsin Department of Transportation

Date		County	
Project ID		Highway	
Project Type		Limits	
		Desc	

Reviewed by:

Name	
Office	
Phone	
Email	

Note: This checklist does not certify that the electronic data received matches the information that is shown on the paper plan submitted as part of the PS&E, nor does it verify that the design is valid and follows design standards set in the Facilities Development Manual. This form in no way releases the consultant from responsibilities related to the constructability and validity of the design, it simply confirms the data was received and verified to be in the correct formats.

Control points

- Civil 3D points provided.
- WisDOT standard feature codes and/or layers were used.
- Meta-data sheet provided an accurate account of point data received.
- Coordinates of data match that defined on meta-data sheet provided by consultant.
- Tie sheet documentation provided in electronic format.

Reference line information

- Civil 3D alignment objects provided in DWG file.
- WisDOT standard feature codes and/or layers were used.
- Reference lines appear correct (i.e. no kinks in chains, chain crossings, etc.).
- Reference lines data matches that which is outlined on meta-data sheet including:
 - Begin and ending stations are correct.
 - All station equations represented correctly.
- Field monumented project control necessary to establish reference lines was provided.
- For each alignment, a report of the alignment/reference line details was included.
- Coordinates of data match that defined on meta-data sheet provided by consultant.

Design profile information

- Civil 3D profile objects in same file as associated alignment provided in DWG file.
- Profile stationing matches that of the profile's active alignment as noted on the meta-data sheet.
- Profiles appear correct (i.e. no kinks in profile, profile crossings, etc.).

Superelevation information

- Appropriate Civil 3D alignments have superelevation assigned.

ROW monumentation information

- Point information received.
 - Civil 3D points provided in DWG file.
 - WisDOT standard feature codes and/or layers used.
 - Points match descriptions given on meta-data sheet.
 - Point numbers match those identified on the plat (also required).

- Coordinates of data match that defined on meta-data sheet provided by consultant.
- Alignment information received.
 - Civil 3D alignment objects provided in DWG file.
 - WisDOT standard layers used.
- Parcel information received.
 - Parcel objects representing original and taking areas provided in DWG file.
 - Parcel segments appear correct (i.e. no kinks in chains, chain crossings, etc.).
 - Parcels match closure report given on meta-data sheet.
 - Coordinates of data match that defined on meta-data sheet provided by consultant.
- Proposed surface data – Datum, Base Course, Top, and any special proposed surfaces
 - WisDOT standard layers were used.
 - A valid AutoCAD Civil 3D surface was provided (shaded triangles in 3D view appear correct) and no surface busts or spikes were found.
 - Surface in coordinate space specified on meta-data sheet provided by the consultant.
 - Minimum and maximum X, Y, Z values appear valid.
 - Coordinates of data match that defined on meta-data sheet provided by consultant.
- Existing Surface Data
 - WisDOT standard feature codes and/or layers were used.
 - Civil 3D surface object was provided (shaded triangles in 3D view appear correct) and no surface busts or spikes were found.
 - Surface in coordinate space specified on meta-data sheet provided by the consultant.
 - Minimum and maximum X, Y, Z values appear valid.
 - Coordinates of data match that defined on meta-data sheet provided by consultant.
- Existing topographic data – utilities
 - WisDOT standard feature codes and/or layers were used - verified with spot check.
 - Coordinates of data match those defined on meta-data sheet provided by consultant.
 - Items listed for file were verified.
- Existing topographic data – general
 - WisDOT standard feature codes and/or layers were used – verified with spot check.
 - Coordinates of data match those defined on meta-data sheet provided by consultant.
 - Items listed for file were verified.
- Other survey data
 - WisDOT standard feature codes and/or layers were used.
 - Data received imported into AutoCAD Civil 3D as the correct data types.
 - Coordinates of data match those defined on meta-data sheet provided by consultant.
- AutoCAD 3D DWG file specifications
 - Graphics parameters have been spot checked. Layer, color, weight and line types conform to the specifications defined in Chapter 15 of the FDM.
 - WisDOT custom line types were used and all non-WisDOT line types were converted to individual elements.
 - Block information was spot checked and found to conform to the standard symbols defined in Chapter 15 of the FDM.
 - Text information was spot checked and found to conform to the text size and font specifications defined in Chapter 15 of the FDM.
 - A check of x-reference files was made. Any x-reference files attached were also provided as part of the electronic data submitted.
 - A check of data shortcuts was made. Any files with data shortcut objects were also provided as part of the electronic data submitted.
 - Graphical data is coordinate correct and drawn at a 1 to 1 scale.

The following report can be generated in Civil 3D after installing the WisDOT customizations found at <http://www.dot.wisconsin.gov/business/engrserv/roadway-design-civil3d.htm>

The command to run the report is located in:
 Toolbox...WisDOT Reports...Alignment Reports...Describe Alignment.

Describe Alignment Report

Wisconsin DOT Report

Created by DOTXXX
 Created on 11/20/2013

Alignment: 12
 Description:
 Layer: P_ALI

Tangent	N	43427	E	297683.4	Z	Station	330+00
	Distance	2182.262'	Bearing	N 0° 9' 35.8 E"			
Tangent	N	47260.13	E	298224	Z	Station	369+45.69
	Distance	7369.247'	Bearing	N 35° 43' 21.17 E"			
Tangent	N	54878.56	E	303065.4	Z	Station	460+64.1
	Distance	2455.896'	Bearing	N 0° 44' 21.02 E"			
Arc							
	PC N	45609.25	E	297689.5		Station	351+82.26
	CC N	45601.32	E	300530.6			
	PI N	46520.4	E	297692		Station	360+93.42
	TAN	911.156'					
	DB	N 89° 50' 24.2 E"					
	DA	N 54° 16' 38.83 E"					
	LChord	1735.259'	Bearing	N 17° 56' 28.49 E"			
	External	6462.263'					
	Middle	135.722'					
	Radius	2841.105'					
	DEG	S 64° 27' 11.44 E"					
	DELTA	35° 33'		1763.430'			
	PT N	47260.13	E	298224		Station	369+45.69
Arc							
	PC N	53242.88	E	302526.6		Station	443+14.94
	CC N	54915.52	E	300200.8			
	PI N	53975.83	E	303053.7		Station	452+17.74
	TAN	902.806'					
	DB	N 54° 16' 38.83 E"					
	DA	N 89° 15' 38.98 E"					
	LChord	1722.122'	Bearing	N 18° 13' 51.1 E"			
	External	6666.469'					
	Middle	132.466'					
	Radius	2864.784'					
	DEG	S 65° 24' 29.73 E"					
	DELTA	34° 59'		1749.166'			
	PT N	54878.56	E	303065.4		Station	460+64.1

Alignment Length = 15520.00'

The following report can be generated in Civil 3D after installing the WisDOT customizations found at <http://www.dot.wisconsin.gov/business/engrserv/roadway-design-civil3d.htm>

The command to run the report is located in:

Toolbox...WisDOT Reports...Other Reports...Slope Stake.

Slopestake Report

Wisconsin DOT Report

Created by DOTXXX
Created on 11/20/2013

Surface: 12-Begin-WoodAveE-Datum

Alignment: 12

Start Station = 330+00(1)

End Station = 486+98.64(2)

Sample Line Group = SLG-3

Station	Offset	Plan Elev	Field Elev	C/F	Point Type	Slope
385+78.64(2)	-64	1137.69				6.00:1.0
	-35.14	1134.64				.00:1.0
	28.25	1136.7				.00:1.0
	28.25	1137.08				4.24:1.0
	49.26	1134.25				5.23:1.0
	53.56	1135.07				
=====						
386+78.64(2)	-64	1138.15				8.71:1.0
	-59.78	1138.63				6.00:1.0
	-59.77	1138.63				7.95:1.0
	-59.67	1138.65				.00:1.0
	38.1	1138.31				.00:1.0
	38.1	1139				
=====						

CORRESPONDENCE/MEMORANDUM**State of Wisconsin**

Date: February 29, 2012
To: Consultant Designers of WisDOT Roadway Projects
WisDOT staff Managing Consultant-led Design Projects
From: Jerry H. Zogg, P.E.
Chief Roadway Standards Engineer
Subject: Civil 3D Specific Design Deliverable Requirements

Wisconsin Department of Transportation will implement Civil 3D specific design project deliverable requirements. These requirements will apply to all roadway projects designed for WisDOT, except for local program projects.

The intent of Civil 3D specific deliverable requirements is to mandate the use of AutoCAD Civil 3D software in the development of WisDOT roadway designs, and to include the delivery requirements of both of the following as part of a finished design project submittal:

- The entire Civil 3D project data set.
- Automated Machine Guidance (AMG) 3D surface models, on appropriate projects.

Detailed language concerning the above deliverable requirements will be shared at a later date.

Implementation planning is currently underway, and our goal is a state-wide implementation of these requirements by mid-year 2014. Our goal is that all project solicitations beginning in mid-year 2014 will include the Civil 3D specific delivery requirements. The timeline of the planning and implementation process will look as follows:

- February 2012 - announce intention of C3D Requirements Implementation
- July 2012 - share draft FDM language regarding requirements, and other guidance language
- July 2012 - Finalize implementation planning and schedule
- September 2012 - Conduct regional seminars to discuss implementation activities leading up to mid-year 2014 effective date
- Mid-year 2014 - Civil 3D specific requirements go in to effect on all WisDOT project solicitations, except for local program projects

WisDOT project staff may elect to add Civil 3D specific delivery requirements to individual projects prior to the statewide implementation date. Early implementation of these requirements on an individual project basis will be done sparingly since it creates additional challenges for both WisDOT staff and consultants who aren't presently using Civil 3D. WisDOT project management staff considering early an implementation of these requirements for a project must obtain BPD approval, contact Jerry Zogg (jerry.zogg@dot.wi.gov) for details.

At the current time, WisDOT is not extending the Civil 3D specific design project deliverable requirements to local program projects. However, some local governments are already using Civil 3D, and others are evaluating it. WisDOT encourages local governments to consider the implementation of Civil 3D, and wants to provide local governments the opportunity to participate in the Civil 3D implementation activities over the next 2 years. In addition, WisDOT will be gathering information from local governments on their current status with using design software.

Why Is WisDOT Requiring Usage of Civil 3D?

WisDOT is not requiring the use of Civil 3D because of its desire to receive Automated Machine Guidance (AMG) 3D surface models. WisDOT is aware that there are several roadway design software packages which can successfully produce AMG 3D surface models for the contractor's use in earthwork, base, and paving construction.

WisDOT's primary focus for the initial implementation of Civil 3D, over the next 2 years, will be the successful creation AMG 3D surface models. WisDOT wants to take full advantage of both the cost savings and construction quality benefits from the contractor's use of AMG 3D surface models.

During this time period, WisDOT will also have a secondary focus on transitioning from AMG 3D surface models to more fully developed Roadway Models. The Roadway Models will include additional information that will initially

increase engineering efficiencies in design and construction. Over time, WisDOT will expand the use of the Roadway Models in the other functional areas of operations, maintenance, and planning.

WisDOT is looking to maximize our utilization of Roadway Models in the near term and in the future. To do so, it has become apparent that we need to mandate the use of Civil 3D so we will have the ability to:

- Easily use and modify the design data without the risk of error in intelligent design data transfer between software systems
- Easily extract intelligent information from the design data

During the past several years, WisDOT has monitored design software development and observed a trend of increased individualization of design software packages. Each software has its own workflow, each contains unique design software objects, and each uses a proprietary data format. All these factors combine to make sharing of intelligent design data between design software systems a complex, time consuming, and unreliable task. WisDOT has discussed this trend with software developers, and we've monitored efforts to increase data transferability such as TransXML, but nothing we have seen or heard leads us to believe intelligent design data transfer will get easier. In fact, we expect the opposite will happen. We expect the degree of difficulty and risk of error in intelligent design data transfer between different design software will grow as developers continue to add deeper and more complex functionality to their systems.

How has WisDOT Coordinated with ACEC on Requiring Civil 3D?

In the fall of 2011, WisDOT shared the information above and our corresponding intentions of maximizing utilization of complex roadway models with ACEC membership. ACEC asked whether we could achieve our goals without requiring the use of Civil 3D in the development of our designs. In other words, could WisDOT develop a non-proprietary performance specification that will meet our needs?

WisDOT proposed a testing plan to answer this question. After reviewing WisDOT's draft performance specification requirements, ACEC concurred with WisDOT's perception that the testing plan would not be successful. Correspondingly, a performance specification will not allow WisDOT to maximize the full potential utility of roadway models in the future.

As a result, WisDOT reached consensus with ACEC on WisDOT's need to require the use of Civil 3D.

What is WisDOT Doing to Help Consultants Transition to Civil 3D?

As our consultants prepare for a transition to Civil 3D, WisDOT is doing several things to help.

First, WisDOT makes available all our Civil 3D user training material. This material is captured in video format, and is currently made available through the internet at <http://www.dot.wisconsin.gov/business/engrserv/trainingcivil3d/index.htm>.

We are pleased with the success we've had in training our staff using this video based method, and as time passes we will be expanding our video training content to include more advanced subjects. Some of the upcoming additions will include a revamping of our basic Civil 3D content, and providing a complete workflow exercise series that teaches plans production workflows for maximizing efficiencies while creating all WisDOT plan sheets in Civil 3D. We are committed to continue developing and distributing our training in video format, and we are committed to continue making this material available to the public.

In addition, WisDOT will continue our longstanding practice of openly sharing our standards and customization for the software we use. For those of you who have been using our Civil 3D 2010 content, in March 2012 we will release an update of our standards package for use in Civil 3D 2012. This content is found on the WisDOT internet site <http://www.dot.wisconsin.gov/business/engrserv/roadway-design-files.htm>

And finally, we are exploring alternatives for starting a statewide Civil 3D Transportation Designer user group. We'd like this user group to meet at a regular frequency, and to be a forum for sharing ideas and best practices in using Civil 3D for transportation engineering solutions. We'll continue to share information regarding this effort as it develops beginning with the seminars in September.

Questions regarding implementation of Civil 3D specific design deliverables, related content in this message should be sent to dotcaesupport@dot.wi.gov

MicroStation/CAiCE Metadata Sheet for WisDOT Project

To		County	
Date		Highway	
Project ID		Limits	
Project Type		Desc	

Prepared by:

Name		Phone	
Office/Firm		Email	

Geodetic reference information

See included form DT1773 for geodetic reference information. This form is typically filled in by the responsible party for field survey per work order contract language.

Field Control Data

Filenames	Name of Points in File	Description of Points or Name of ASCII file containing Point Descriptions

Reference Line Data

Filenames	Name of Chain in File	Description of Chains (Mainline, side road, First Street, etc.) Must include the begin station of the alignment and any information on station equation in the format of BK:AH.

Report on Alignment Details

Name of Report File	Alignment Information Contained in Report File

Profile Information

Filenames	Name of Profile(s) in File	Active Alignment <Name of Chain Associated with Profile>

Superelevation Line Information

Filenames	Names of Lines	Description of Super Lines for Chains used. Description of which superelevation design tables were used.

Right-of-Way Monumentation - Points

Filenames	Name of Points in File	Description of Points or Name of ASCII file containing Point Descriptions

Right-of-Way Monumentation - Chains

Filenames	Names of Chains in File	Description of Chains

Existing Cross Section Data

Filename(s)	Station Range of Cross Sections	Name of Surface for data contained in file

Proposed Cross Section Data

Filename(s)	Station Range of Cross Sections	Name of Surface for data contained in file

Subgrade Surface Cross Section Data

Filename(s)	Station Range of Cross Sections	Name of Surface for data contained in file

Slope Staking Report

Filename – Associated Chain	Cross section file information extracted from. If an SOE file listed above contains information represented in the report, name it here (this would normally be an SOE storing FINGRND information).

DTM Data

Zip Filename	Description of Contents of ZIP File

Existing Topo Information - Utilities

Filenames	Description of File Contents

Existing Topo Information - Other

Filenames	Description of File Contents

Other Survey Data

Filenames	Description of File Contents

Graphical Data

Filenames	Description of DGN/DWG Contents including Reference File Attachments

 (Authorized Representative Signature) (Date)

 (Print Name)

 (Title)

Survey Point Attributes

PN	Point Name
XC	Easting
YC	Northing
ZN	Zone`
JN	Job Number
AT	Point Attribute
GM	Point Geometry
FC	Feature Code
AN	Annotation (0-No, 1-Yes)
DS	Description
CM	Comments
CT	Control Point
IM	TiffFilename

Survey Chain Attributes

CN	Chain Name
ST	Station
ZN	Zone
JN	Job Number
AT	Chain Attribute
FC	Feature Code
DS	Chain Description
CP	Chain Points

Geometry Lines

GL	Line Name
XC	X (Starting)
YC	Y (Starting)
ZC	Z (Starting)
XE	Ex (Ending)
YE	Ey (Ending)
ZE	Ez (Ending)
LV	Level
SY	Feature Code
AN	Annotation (0=No, 1=Yes)
TY	Type
DS	Description

Annotated Survey Points Attributes

APN	Point Name
EL	Current Elevation On
EO	Elevation Leader On
DC	Description On
DO	Description Leader On
CM	Comment On
CO	Comment Leader On
NM	Name On
NO	Name Leader On
PO	Position On
CL	Cell On
EZ	Esize (E = Elevation)
ER	Erotation
EX	EDeltaX
EY	EDeltaY
EJ	Ejust
DZ	Dsize (D = Description)
DR	Drotation
DX	DDeltaX
DY	DDeltaY
DJ	Djust
CZ	Csize (C = Comment)
CR	Crotation
CX	CDeltaX
CY	CDeltaY
CJ	Cjust
NZ	Nsize (N = Name)
NR	Nrotation
NX	NdeltaX
NY	NdeltaY
NJ	Njust
PZ	Psize (P = Position)
RO	Cell Rotation
CS	Cell Scale

Geometry Curves

GV	Curve Name
XC	X
YC	Y
ZC	Z
ST	Start Angle
SW	Sweep Angle
RT	Rotation Angle
PM	Primary Radius
SC	Secondary Radius
SY	Feature Code
LV	Level
AN	Annotation (0=No, 1=Yes)
DS	Description

Annotated Geometry Curves

AGV	Curve Name
LN	Location
RT	Rotation
BX	Draw Box
NM	Name
DL	Delta
DG	Degree of Curve
TN	Tangent Length
LN	Length
Ee	e
RD	Radius
CR	Chord
DB	Direction Back
DA	Direction Ahead

Geometry Text

GT	Text Name
PS	Position
RT	Rotation
SZ	Size
LV	Level
CO	Color
TX	Text

Geometry Chains

GC	Chain Name
LV	Level
ST	Start Station
SY	Feature Code
AL	Alignment (0=No, 1=Yes)
LT	Chain List
DS	Description
AN	Annotations (0=No, 1=Yes)

Annotated Geometry Chains

ACN	Chain Name
DB	Dimension Bearing
DD	Dimension Distances
PC	Pattern Chains (0=No, =Yes)
ME	Major Even
MT	Major Tics
ML	Major Labels
MS	Major Left
MR	Major Rotation
MO	Major Offset
MH	Major Short
NE	Minor Even
NT	Minor Tics
NL	Minor Labels
NS	Minor Left
NR	Minor Rotation
NO	Minor Offset
NH	Minor Short

Vertical Profiles

VPN	Vertical Profile Name
FE	Feature Code
ZN	Zone
TY	Profile Type
DS	Description
VPI	VPI Number
NVP	Number of VPI
ST	VPI Station Value
EL	VPI Elevation
LB	VPI Length Back
LA	VPI Length Ahead
TY	VPI Type

Geometry Spirals

GS	Spiral Name
XC	Xstart
YC	Ystart
ZC	Zstart
D1	D1
D2	D2
LG	Length
OF	Offset
DR	Direction
DB	Direction Back
LV	Level
Sy	Feature Code
An	Annotation (0=No, =Yes)
Ds	Description

Annotated Geometry Spirals

AGS	Spiral Name
LN	Location
RT	Rotation
BX	Draw Box
NM	Name
Ls	Ls
Th	thetaS
Pp	p
Kk	k
Kp	kp
Xc	Xc
Yc	Yc
LT	Long Tangent
ST	Short Tangent
LC	Long Chord

ELECTRONIC DATA CONFIRMATION

Wisconsin Department of Transportation

Date	County
To:	Highway
Project ID	Road
Project Type	Section

Note: This checklist does not certify that the electronic data received matches the information that is shown on the paper plan submitted as part of the PS&E, nor does it verify that the design is valid and follows design standards set in the Facilities Development Manual. This form in no way releases the consultant from responsibilities related to the constructability and validity of the design, it simply confirms the data was received and verified to be in the correct formats.

 Control Points

- Points read into CAiCE as valid points.
- WisDOT standard feature codes and/or layers were used.
- Meta-data sheet provided an accurate account of point data received.
- Coordinates of data match that defined on meta-data sheet provided by consultant.
- Hard copy tie sheet noting locations was provided.
- SDMS Format Submitted**
 - SDMS header information is complete and accurate.
 - SDMS file header information corresponds to the information provided on the meta-data sheet.
 - Coordinates of data match that defined in SDMS header.

 Reference Line Information

- Information read into CAiCE as valid geometry chains.
- WisDOT standard feature codes and/or layers were used.
- Reference lines appear correct (i.e. no kinks in chains, chain crossings, etc.).
- Reference lines data matches that which is outlined on meta-data sheet including:
 - Begin and ending station s are correct.
 - All station equations represented correctly.
- Field monumented project control necessary to establish reference lines was provided.
- For each alignment, a report of the alignment/reference line details was included.
- Coordinates of data match that defined on meta-data sheet provided by consultant.
- SDMS File Submitted**
 - SDMS header information is complete and accurate.
 - SDMS file header information corresponds to the information provided on the meta-data sheet.
 - Coordinates of data match that defined in SDMS header.

 Design Profile Information

- Profiles read in as valid CAiCE profiles.
- Profile stationing matches that of the profile's active alignment as noted on the meta-data sheet.
- Profiles appear correct (i.e. no kinks in profile, profile crossings, etc.).

- SDMS File Submitted**
 - SDMS header information is complete and accurate.
 - SDMS file header information corresponds to the information provided on the meta-data sheet.
 - SDMS file contains measurement data OR raw data file included.

- Superelevation Information
CAiCE only
 - Lines read into CAiCE as valid superelevation lines. Description fields of lines have been randomly checked to verify that they have the following format:
 PRL1 152.97 -0.020 -0.020 50.0 50.0 End NC -0.020 -0.020
 <Chain> <Sta> <Super Lt> <Super Rt> <Length Lt> <Length Rt> <Transition type> <Shld Super Lt> <Shld Super Rt>
 - Lines, when viewed on top of alignment chain referenced on meta-data sheet, appear in correct location.
 - The creation of an SPL for at least one set of superelevation lines was completed and the validity of the lines was checked by loading the information pertaining to the lines into the spreadsheet using the CAiCE command **GEOMETRY ⇒ GEOMETRY CHAINS ⇒ EDIT SUPERELEVATION FOR ALIGNMENT.**

- ROW Monumentation Information
 - Point information received.
 - Points read into CAiCE as valid points.
 - WisDOT standard feature codes and/or layers were used.
 - Points match descriptions given on meta-data sheet.
 - Point numbers match those identified on the plat (also required).
 - Coordinates of data match that defined on meta-data sheet provided by consultant.
 - Chain information received.
 - Chain information reads in as valid chains.
 - Chains appear correct (i.e. no kinks in chains, chain crossings, etc.).
 - Chains match description given on meta-data sheet.
 - Coordinates of data match that defined on meta-data sheet provided by consultant.
 - SDMS File Submitted**
 - SDMS header information is complete and accurate.
 - SDMS file header information corresponds to the information provided on the meta-data sheet.
 - Coordinates of data match that defined in SDMS header.

- Cross Section Data-EXIST Surface
 - Data read into CAiCE as a valid cross section file.
 - Surface(s) at all stations are continuous (no gaps in surface).
 - Station range of cross section file(s) matches that shown on meta-data sheet.
 - Reference alignment for cross section file is part of the digital data sent and is clearly identified on meta-data sheet submitted by the consultant.
 - When viewing cross sections in plan view, geographic location follows the reference alignment specified on meta-data sheet.
 - Cross section format received was a CAiCE EAR.
 - Surface name EXIST used.
 - SDMS File Submitted**
 - SDMS header information is complete and accurate.
 - SDMS file header information corresponds to the information provided on the meta-data sheet.

Proposed Cross Section Data for SUBGRADE and FINISHED GROUND

- Cross Section Data-SUBGRADE Surface
- Data read into CAiCE as a valid cross section file.
 - Surface(s) at all stations are continuous (no gaps in surface).
 - Station range of cross section file(s) matches that shown on meta-data sheet.
 - Reference alignment for cross section file is part of the digital data sent and is clearly identified on meta-data sheet submitted by the consultant.
 - When viewing cross sections in plan view, geographic location follows the reference alignment specified on meta-data sheet.
 - Cross section format received was a CAiCE EAR.
 - Surface name SUBG used.
 - SDMS File Submitted**
 - SDMS header information is complete and accurate.
 - SDMS file header information corresponds to the information provided on the meta-data sheet.
- Cross Section Data-FINISHED GROUND Surface
- Data read into CAiCE as a valid cross section file.
 - Surface(s) at all stations are continuous (no gaps in surface).
 - Station range of cross section file(s) matches that shown on meta-data sheet.
 - Reference alignment for cross section file is part of the digital data sent and is clearly identified on meta-data sheet submitted by the consultant.
 - When viewing cross sections in plan view, geographic location follows the reference alignment specified on meta-data sheet.
 - Cross section format received was a CAiCE EAR.
 - Surface name FINGRND used.
 - SDMS File Submitted**
 - SDMS header information is complete and accurate.
 - SDMS file header information corresponds to the information provided on the meta-data sheet.
- Existing Topographic Data – Utilities
- WisDOT standard feature codes and/or layers were used - verified with spot check.
 - Coordinates of data match those defined on meta-data sheet provided by consultant.
 - MicroStation DGN File Submitted**
 - Items listed for file were verified.
 - SDMS File Submitted**
 - SDMS header information is complete and accurate.
 - SDMS file header information corresponds to the information provided on the meta-data sheet.
 - Coordinates of data match those defined in SDMS header.
 - Point connectivity for all discontinuities provided in file using FG or OD only.
- Existing Topographic Data – Other
- WisDOT standard feature codes and/or layers were used – verified with spot check.
 - Coordinates of data match those defined on meta-data sheet provided by consultant.
 - MicroStation DGN File Submitted**
 - Items listed for file were verified.
 - SDMS File Submitted**
 - SDMS header information is complete and accurate.
 - SDMS file header information corresponds to the information provided on the meta-data sheet.
 - Coordinates of data match those defined in SDMS header.

- Point connectivity for all discontinuities provided in file using FG or OD only.

- Other Survey Data
 - WisDOT standard feature codes and/or layers were used.
 - Data received imported into CAiCE as the correct data types.
 - Coordinates of data match those defined on meta-data sheet provided by consultant.
 - SDMS File Submitted**
 - SDMS header information is complete and accurate.
 - SDMS file header information corresponds to the information provided on the meta-data sheet.
 - Coordinates of data match those defined in SDMS header.
 - Point connectivity for all discontinuities provided in file using FG or OD only.

- 2D MicroStation DGN File
 - Other approved format: _____.
 - File parameters have been checked and the working units and global origin settings conform to the CADD standards outlined in Chapter 15 of the FDM.
 - Graphics parameters have been spot checked. Level, color, weight and line codes conform to the specifications defined in Chapter 15 of the FDM.
 - WisDOT custom line styles were used and all non-WisDOT line styles were converted to individual elements.
 - Cell information was spot checked and found to conform to the standard symbols defined in Chapter 15 of the FDM. No shared cells were found.
 - Text information was spot checked and found to conform to the text size and font specifications defined in Chapter 15 of the FDM.
 - A check of reference files was made. Any reference files attached were also provided as part of the electronic data submitted.
 - Graphical data is coordinate correct and drawn at a 1 to 1 scale.

(Name of Preparer) (Date)

(Print Name)

(Title)

>>>> Describe Chains <<<< [Tue Apr 18 15:04:57 2000]

CHAIN PRL1

List CL1,PRL7 ,STA ,32+32.000 ,C ,CUR1,C ,CUR2,CL3

Layer 1

Feature PRL

CL1 N 358026.5000 E 2474968.1058 Z -99999.900 STA 10+00.000
 Distance 600.000' Bearing N 17ø00'00.0" W

PRL7 N 358600.2829 E 2474792.6828 Z 0.000 STA 16+00.000

*** Station Equation *** AHEAD STA 32+32.000

Distance 0.000' Bearing N 0ø00'00.0" E

CURVE CUR1

PC N 358600.2829 E 2474792.6828 STA 32+32.000

CC N 359717.0605 E 2478445.4979

PI N 359460.9571 E 2474529.5482 STA 41+32.000

TAN 900.000'

DB N 17ø00'00.0" W

DA N 9ø30'58.9" E

LChord Distance 1752.024' Bearing N 3ø44'30.5" W

External Distance 104.597

Radius 3819.719'

DEG 1ø30'00.0"

DELTA 26ø30'58.9"

LENGTH 1767.757'

PT N 360348.5717 E 2474678.3446 STA 49+99.757

CURVE CUR1

Distance 100.000' Bearing N 9ø30'58.9" E

CL3 N 361304.0000 E 2474323.0000 Z 0.000 STA 60+80.712

CHAIN LENGTH 3448.712'

CAiCE Slope Stake Report Example at one station

STATION	Offset	Plan Elev	Field Elev	C/F	Point Type	Slope
=====	=====	=====	=====	===	=====	=====
10+00.000	-47.12	0.00			SS	
	-44.12	660.64		C	SI	1:4.0
	-37.83	659.07			DTCH	1:6.0
	-29.83	660.40			SHLD	0.02 %
	0.00	661.00			CL	0.02 %
	29.83	660.40			SHLD	1:6.0
	37.83	659.07			DTCH	1:4.0
	54.22	663.17		C	SI	
	57.22	663.06			SS	

Project Archive

Introduction

Once electronic project data has been submitted, it is then the responsibility of the Department to store the data in a project directory in the CADDs Filing Cabinet where it can later be checked out for use by Department personnel working on that project.

Upon receipt of electronic project data from consultants, the following procedure should be followed to validate and archive the data. The procedures outlined here are performed by assigned personnel in the appropriate region.

Step 1. WisDOT region personnel create a directory on the user machine defining the project. This directory should follow the standard CAiCE project directory structure of: c:\users\p\d<district #>\<WisDOT Project ID Number>

Step 2. Copy data from the CD provided by the consultant to the <WisDOT Project ID Number> directory created in Step 1. Change the attributes of all files so they are not Read-Only.

Step 3. Execute CAiCE and create a new project under the WisDOT Project ID Number directory. The name of the CAiCE project should relate to the highway name of the project (for example CTHG).

Step 4. Import the consultant's data into CAiCE.

A CAiCE TugBoat will be provided to help the user through importing data into CAiCE so that it may be confirmed. CAiCE TugBoats are programs that provide a step-by-step guide for the end user to follow to complete a task. The import commands to execute do not need to be memorized by the end user. Each menu selection on the TugBoat executes the necessary CAiCE commands, or in some cases outside programs, to complete a process. The TugBoat for electronic project data import is shown below.

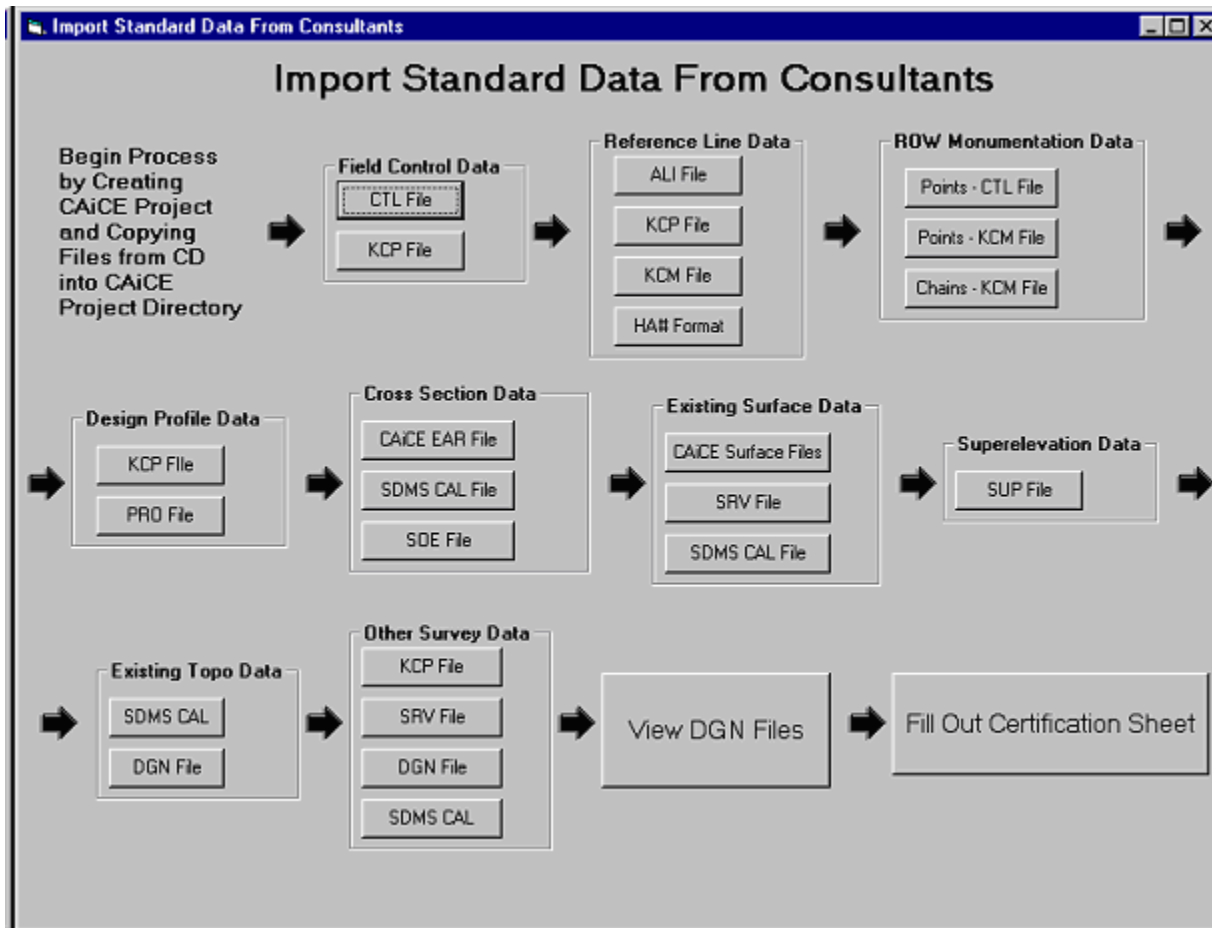


Figure 1: Electronic Project Data Import TugBoat

Each possible step in data import is laid out in this TugBoat, though not all data types will be part of each project. If the data type specified in the TugBoat is not pertinent to your project, simply skip that step and go onto the next.

For Existing and Proposed Cross Section information, digital information related to the cross section alignment must be provided in SDMS ALI format. The cross section alignment information is imported into CAiCE in the same way that other Reference Line data is imported into CAiCE. Cross section alignment information must be imported into the project before importing the cross section information.

For data provided in an SDMS Calculated File (CAL) format with RTO or COM task, data will be imported into the project database. To do this, a segment in the project must be created, and the CAL file renamed so that it follows the necessary naming convention <project name><segment name>.CAL. Import the data into the newly created segment using the Project Manager (**FILE=>PROJECT MANAGER**). Highlight the newly created segment and select the menu option **SEGMENT=>IMPORT**. Select the CAL file to be imported and press OK.

When it is necessary to use the Database Explorer to import data, the functionality found under the Read Selection tab is used. The SQL Query field should be filled in with a statement such as *SELECT * FROM [Type of Geometry Data Received - Project Dependent]*

The *Type of Geometry Data Received* will be either Geometry Chain or Point or Geometry Profile, depending on the file being imported.

Graphical Information contained in a MicroStation DGN file must be verified by opening the file in MicroStation. Verify that there was no loss of coordinate accuracy, and that proper names and feature codes were given to the data in all categories. Point connectivity must be verified for all survey chain information. Also, when providing MicroStation DGN files, compliance with WisDOT CADD standards outlined in Chapter 15 of the Facilities Development Manual should be verified.

Step 5. Fill out the confirmation checklist ([Attachment 43.2](#)) and send it to the consultant notifying them that the data sent was acceptable.

Step 6. Export data from CAiCE into files to be archived. This process involves writing out information and storing the various files in the CADD Filing Cabinet. As part of the data export, a metadata document must be filled out. The metadata document contains information on the contents of each file checked into CADD Filing Cabinet. Pertinent information, such as 'Alignment PRL1 is the reference line chain and Alignment SR1 is the side road chain representing Smith Road' should be in this metadata document so that anyone accessing these files at a later date can more easily interpret what the data is. An EXCEL spreadsheet template will be distributed with CAiCE so that metadata provided for each project will be consistent. A copy of this document is given in [Attachment 43.1](#).

A CAiCE TugBoat will be provided to step the user through exporting data from CAiCE and archiving in the CADD Filing Cabinet. The CAiCE TugBoat for exporting data is shown below.

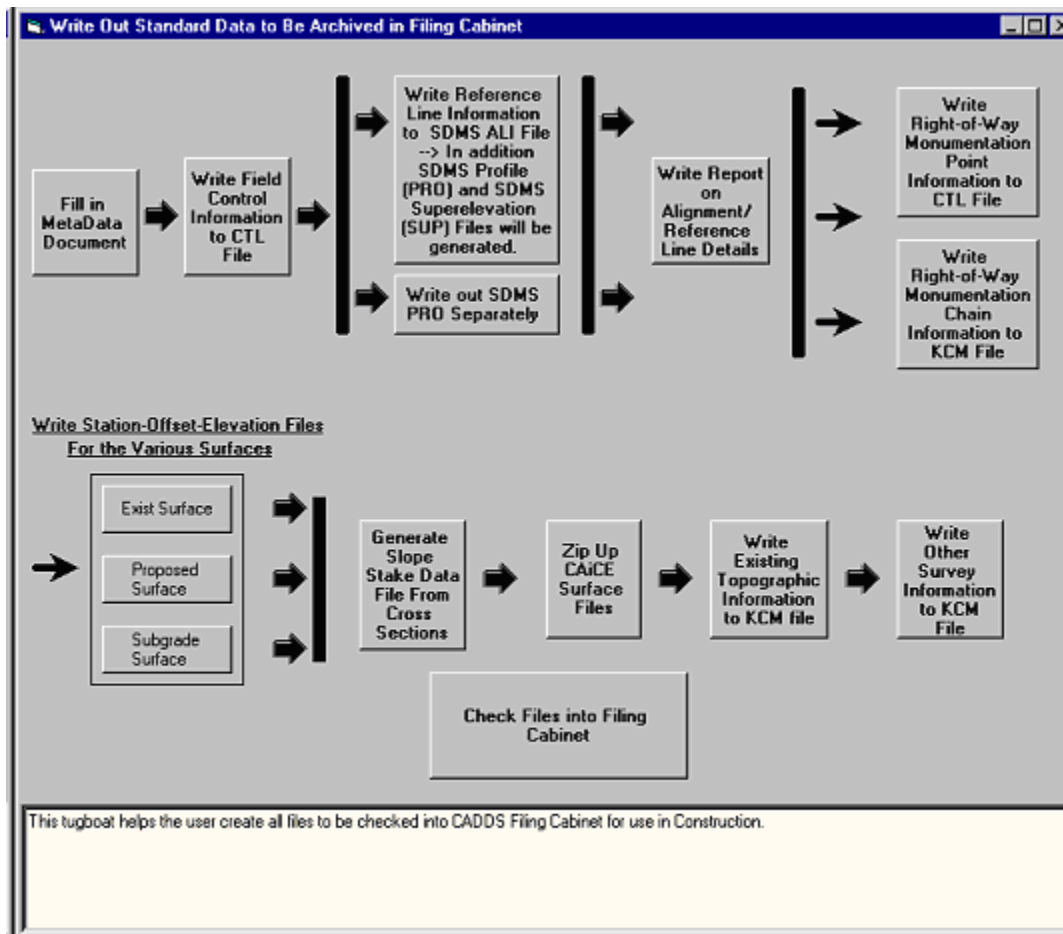


Figure 2: Electronic Project Data Export TugBoat

Each possible step in data export is laid out in this TugBoat, though not all data types will be part of each project. If the data type specified in the TugBoat is not pertinent to your project, simply skip that step and go on

to the next. As with the data import TugBoat, the different steps in the data export TugBoat actually execute a command in CAiCE or an external program. The different files that are created and archived are explained in more detail.

Files to be Archived

Field Control Files: All field control information will be saved in SDMS Control (CTL) file format. If the digital information provided to WisDOT by the consultant is already in this format and was verified as a valid SDMS CTL file, then the original file may be archived.

Reference Line Information: All reference line information will be saved in SDMS Alignment (ALI) file format. One alignment file should be created for each alignment archived. The root name of the file will be the name of the alignment contained in the file (CAiCE geometry chain name).

Report on Alignment/Reference Line Details: A report which gives alignment/reference line details must be archived so it can be added to the Plan Information Packet which is given to contractors for Contract Staking. One report must be created for EACH alignment/reference line. The format of this report is shown in Attachment 43.4.

Right-of-Way Monumentation Information: All Right-of-Way Monumentation point information will be saved in SDMS Control (CTL) file format. If the digital information provided to WisDOT by the consultant is already in this format and was verified as a valid SDMS CTL file, then the original file may be archived.

All Right-of-Way Monumentation chain information will be saved to a CAiCE KCM file.

Design Profile Information: All Design Profile information will be saved as an SDMS Profile (PRO) file. If the digital information provided to WisDOT by the consultant is already in this format and was verified as a valid SDMS PRO file, then the original file may be archived.

Existing and Proposed Cross Sections: Existing Cross Section information will be saved to a Generic Station-Offset-Elevation file. To maintain consistency, this file must be named EX<AlignmentName>.SOE

Proposed Cross Section information will be saved to a Generic Station-Offset-Elevation file. To maintain consistency, this file must be named PR<AlignmentName>.SOE

Subgrade surface information will be saved to a Generic Station-Offset-Elevation file. To maintain consistency, this file must be named SG<AlignmentName>.SOE

Note: If more than one file is created for any of the three surfaces named above, the convention for file naming should be altered such that a sequence number follows the <Alignment Name> portion of the filename.

Slope Staking Data File: A slope stake data file must be archived so it can be added to the Plan Information Packet which is given to contractors for contract staking. These files can be provided by consultants or they can be generated by WisDOT staff using the related cross section data files. The format of the file is shown in Attachment 43.5.

Existing Digital Terrain Modeling Surface Data: The full set of CAiCE surface files should be zipped up and archived.

Superelevation Information: All Superelevation information will be saved as an SDMS Superelevation (SUP) file. If the digital information provided to WisDOT by the consultant is already in this format and was verified as a valid SDMS SUP file, then the original file may be archived.

Existing Topographic Data - Utilities: A CAiCE KCM file will be created that contains existing topographic data categorized as a utility.

Existing Topographic Data - Other: A CAiCE KCM file will be created that contains existing topographic data not categorized as a utility.

Other Survey Data: A CAiCE KCM file will be created that contains other survey data as needed.

Graphical Information: This can be stored in MicroStation DGN file format, as received by the consultant.

Step 7. Define project in CADDSS Filing Cabinet if it does not yet exist.

Step 8. Check files created in Step 6 into CADDSS Filing Cabinet. Upon check-in, define the file type: X for ASCII (all SDMS files), 0 for binary and 1 for DGN. A description of the file should also be entered. This description is limited to 81 characters. When files are checked in, the program will ask if you want to zip the files, and a response of Yes should be given on all files except images.