



InRoads Survey Data Processing Guidelines

Georgia Department of Transportation

Engineering Software Standards & Support

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Preface

Survey Data Processing consists of verifying, coordinating, formatting and processing full field survey data, field mapping enhancement data, additional survey data and existing right of way and property data. This data is then submitted to end users as planimetric MicroStation (.DGN) files, Topographic 3D Digital Terrain Model (.DTM) files and Geometry Project (.ALG) files in InRoads. The digital field/mapping data is used as a database in the development of highway project plans.

These Survey Data Processing Guidelines have been developed as part of the statewide GDOT implementation of MicroStation V8i and InRoads V8i. The intent of this document is to provide guidelines and standards for processing survey data in InRoads V8i. These guidelines must be followed in detail in order to conform to the current GDOT standards for producing the required survey data deliverables. Updates to this document will be made periodically when minor revisions, additional information, and/or enhancements are added.

If there is any approved deviation from the standard file and data naming/feature style conventions as prescribed by this document - a detailed description of the deviation(s) and approved reasons for the deviation(s) shall be documented and included with the project files in electronic format.

Contact Information

To submit any comments or questions regarding the information contained in this document, please contact the **Engineering Software Standards and Support** by email at the following address:

SolutionsCenter@dot.ga.gov

In the Email Subject Header, please reference the **InRoads Survey Data Processing Guidelines**

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Overview

These Guidelines cover the GDOT standards for processing Survey Data by utilizing the MicroStation V8i and InRoads V8i software(s). These procedures depict the Project Initialization Standards and Conventions to create an InRoads Survey Project to GDOT format and the processes to create/generate the files which are to be submitted as deliverables to the Design Engineer.

For detailed Survey Data Processing instructions please refer to the Training Manual:
Introduction to InRoads for Survey Data Processing Training Guide

Document Content

Below is a list of topics covered in this document:

- Project Initialization Standards
- Standard Conventions
- Surface and Property Data Information
- Survey Data Project Deliverables
- Additional Survey Enhancements
- Converting Projects from CAiCE to InRoads
- Appendix A
- Appendix B

Project Initialization Standards

1. Project Initialization Standards

Project Initialization Standards have been established in order to promote consistency and assist in the organization of project data. These standard project schemes help to ensure uniformity for all users who may work on the project.

This section covers the following topics:

- GDOT Standard Files (MicroStation and InRoads)
- Standard Project Structure
- Starting MicroStation V8i and InRoads V8i
- Overview of InRoads Interface
- InRoads Project Defaults
- Survey Default Preferences
- InRoads “Locks”
- Application and Variable Manager Add-Ins
- Initiating a Survey Project in InRoads

1.1 GDOT Standard Files –MicroStation and InRoads

In order to conform to current policy for plan deliverables – GDOT provides the requisite files needed to standardize InRoads and MicroStation to GDOT requirements. The first step in the development of an InRoads and MicroStation Project is to ensure that these standard files are being utilized. Instructions for downloading/installing the executables are included on the GDOT R.O.A.D.S. web page (see the links depicted below). These files are required for any Survey Data Projects generated for GDOT.

- **MicroStation Standard Files Location For Internal GDOT Users** – a server location has been established to map a drive (an N:\ Drive) in order to access the latest MicroStation Files. Once the internal user maps this N:\ drive to the following location – all of the standard MicroStation Files will be available through this mapped drive:
[TO BE DEVELOPED](#)
- **MicroStation Standard Files Location For External Users** - a MicroStation V8i (CaddALLV8i.exe) executable file is available and located in a download executable which can be accessed from the GDOT R.O.A.D.S. web page. This executable contains all of the GDOT MicroStation V8i standard files. This file can be downloaded from the following location:
[TO BE DEVELOPED](#)
- **InRoads Standard Files Location For Internal and External Users** - an InRoadsALL executable file (InRoadsALLV8i.exe) is available and located in a download executable which can be accessed from the GDOT R.O.A.D.S. web page. This executable contains all of the GDOT InRoads V8i standard files. This file can be downloaded from the following location:
[TO BE DEVELOPED](#)

The **InRoadsALLV8i.exe** file contains all of the standard GDOT files which are required to generate projects to GDOT standards. The user will perform the following steps to extract and set-up the GDOT Standard InRoads Files:

1. Close MicroStation V8i and InRoads V8i if they are still open.
2. Browse to the following web page:
[**TO BE DEVELOPED**](#)
3. Save the **InRoadsALLV8i.exe** file to the hard drive and then double click the file.
4. The self-extractor will download the GDOT InRoads Standard Files to the following locations:
 - a. **C:\InRoads Data\Standards**
 - GDOT 3D Working File.dgn
 - GDOT_Standard V8i.xin
 - GDOT_Standard V8i.itl
 - Project_Data_Sheet_MultipleAlign.docm
 - Photogrammetry_InRoads QA.docx
 - Survey Data Processing_InRoads QA.docx
 - Design Data_InRoads QA.docx
 - b. **C:\InRoads Data\Component Documentation**
 - GDOT Component Description Help Documentation
 - c. **C:\InRoads Data\Style Sheet Documentation**
 - GDOT Style Sheet Help Documentation
 - d. **C:\Program Files\Bentley\InRoads Group V8.11\XML Data\GDOT**
 - GDOT Style Sheets
5. For detailed instructions on downloading and installing **InRoadsALLV8i.exe** - please go to the following link [**TO BE DEVELOPED**](#) and click on the **Downloading and Running InRoadsALLV8i.pdf** document for installing these standard files.

1.2 Standard Project Structure

The standard File Structure for InRoads is a Project Folder (which is named for the PI # of the Project – *Example: 123456*) located as a sub-folder under **C:\InRoads Data** – *Example: C:\InRoads Data\123456*. The Project Files are then located in an **SDE** sub-folder under the PI # – *Example: C:\InRoads Data\123456\SDE* -- This Project Folder contains the individual InRoads Data Files. (See *Table 1.1*)

Table 1.1	
InRoads Project Structure	
InRoads Project Structure	C:\InRoads Data\PI Number\ SDE
InRoads Project Structure (Example)	C:\InRoads Data\123456\ SDE

Some examples of InRoads Data File Types are:

1. **.DTM** ----- (Digital Terrain Model File) – contains Surface data
2. **.FWD** ----- (Survey File) – contains Field Survey data
3. **.ALG**----- (Geometry File) – contains Geometric Point, Horizontal and Vertical data
4. **.IRD** ----- (Roadway Design File) – contains the Design Surface data
5. **.RWK**----- (Project File) – contains project data for InRoads files in ASCII format
6. **.ITL**----- (InRoads Template File) – contains InRoads Templates for cross-sections
7. **.SDB**----- (Drainage File) – contains the InRoads Storm and Sanitary data

Although InRoads consists of the above file types -- the “Survey Data” will usually consist of the following file types and will be located in the **C:\InRoads Data\PI Number\SDE** folder:

- 3D “Working” DGN file (**GDOT 3D Working File.dgn**)
- Processed DTM Surface file (**PI#_SDE.dtm**)
- Processed ALG Geometry File (**PI#_SDE.alg**)
- Processed FWD Survey File(s) (**PI#_A.fwd, PI#_B.fwd, PI#_XO.fwd, etc**)
- Processed Property DGN file (**PI#_PROP.dgn**)
- Processed Topographical DGN file (**PI#_TOPO.dgn**)
- Processed Utility DGN file (**PI#_UTLE.dgn**)

It is highly recommended to backup the Project Folder (which contains these individual data files) after each work session to your Group Account on the GDOT Server if you are a GDOT Employee (or to an appropriate Business Server if you are a GDOT Consultant).

1.3 Starting MicroStation V8i and InRoads V8i

The user will be working in both **MicroStation V8i** (the CADD Software) and **InRoads Suite V8i** (the Survey/Design Software). The **MicroStation CADD Software** is used for the viewing and manipulation of graphics derived from **InRoads**. The **InRoads Software** is the database in which the Surveying data is created and processed. The user will select the standard GDOT 3D “seed” file to use as the “seed” DGN in order to create the three dimensional “Working” DGN file. This “Working” DGN file is used to display the temporary and/or permanent graphics in **InRoads**.

This section details the following processes:

- Steps to Create a Survey “Working” DGN File
- Steps to Open an Existing Survey “Working” DGN File

The “Working” DGN file will be saved to the following folder location:

C:\InRoads Data\PI Number\SDE\Standards

(IF the *Standards* folder – does not yet exist – the user will need to create the folder).

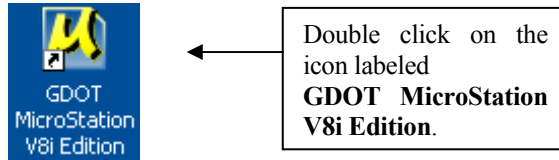
Table 1.2	
Standard Naming Convention of the “Working” DGN File	
Working DGN File Name	C:\InRoads Data\PI Number\SDE\Standards GDOT 3D Working File.dgn

The **MicroStation** software will open first before **InRoads**. After the **MicroStation** Splash Screen appears, the **MicroStation Manager** dialog (See *Figure 1-1*) will open so that a “Working” DGN file can be created or an existing “Working” DGN file can be opened. The **InRoads** software can then be initiated.

1.3.1 Steps to Create a Survey “Working” DGN File

The Survey “Working” DGN file will be created from the **GDOT_V8_3D.dgn** seed file. Following are the steps to create a Survey “Working” DGN File:

1. From the desktop, double-click on the **GDOT MicroStation V8i Edition** icon.



2. After the **MicroStation** Splash Screen appears, the **MicroStation Manager** dialog box will open. (See *Figure 1-1*).

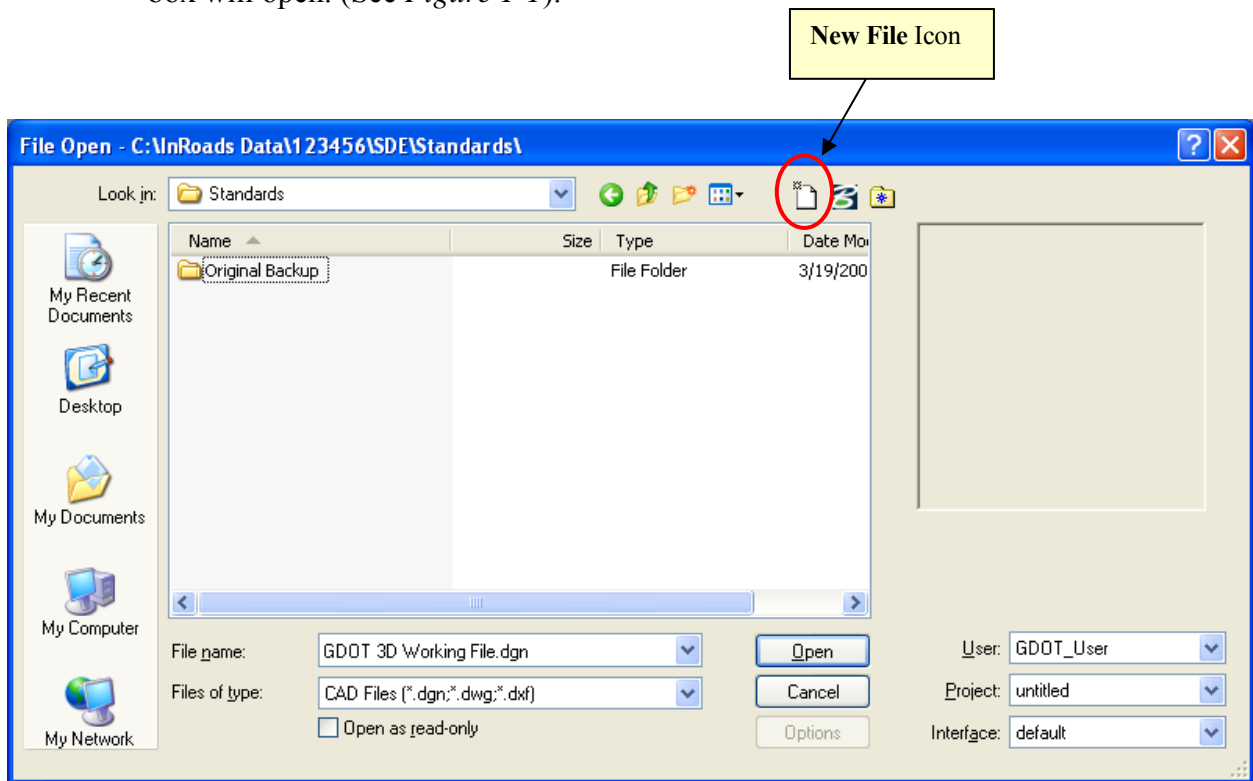




Figure 1-1 Starting MicroStation V8i and InRoads V8i

3. In the **MicroStation Manager** dialog box, click on the **New File** icon  (See *Figure 1-1*) depicted above. The **New File** command will be used to create the “Working” DGN file.
4. After the **New File**  command is selected, the **MicroStation New File** dialog box will open. (See *Figure 1-2*).

- Click in the **Save in:** Pulldown - and browse to the *C:\InRoads Data\PI Number\ SDE\Standards* location to save the new “Working” DGN file
- In the **File name:** Pulldown – enter *GDOT 3D Working File.dgn*
- In the **Save as type:** Pulldown – select *MicroStation DGN Files (*.dgn)*
- In the **Seed:** Field - ensure the seed file name is *GDOT_V8_3D.dgn*

The Seed File should already be entered in the field based on the current MicroStation configuration.

The inputs should now be similar to the screen capture depicted in *Figure 1-2* (as shown below).

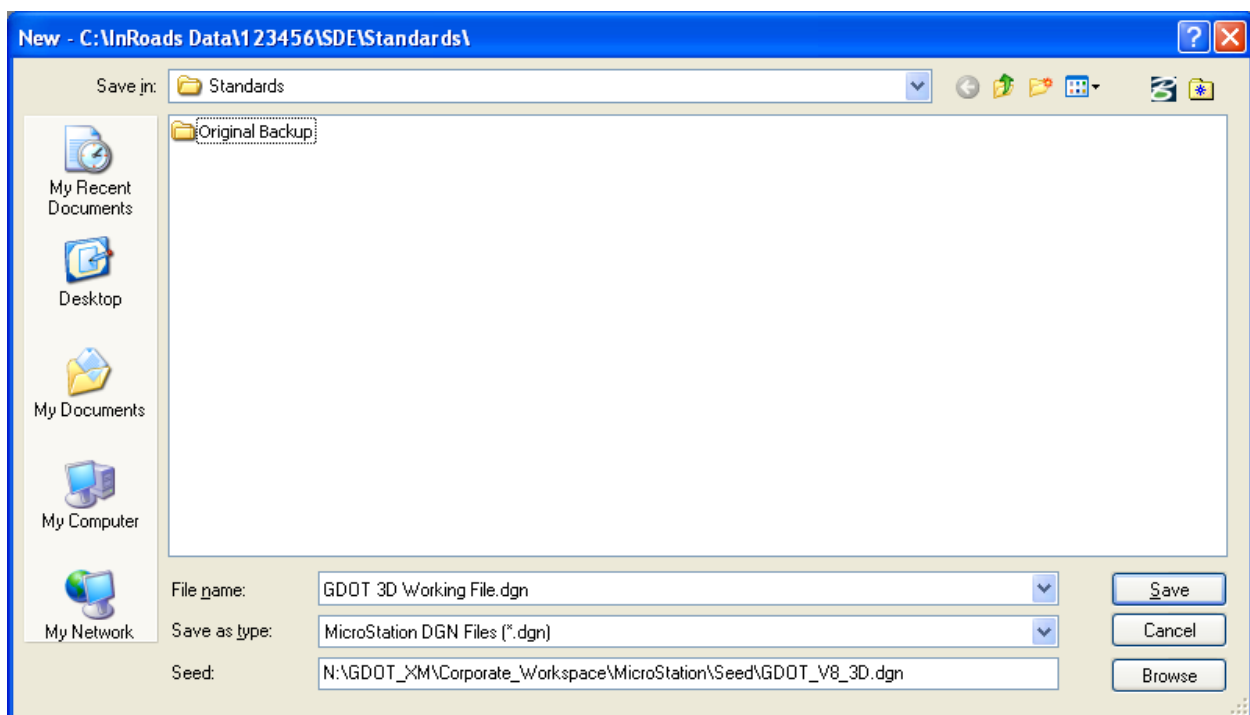
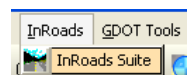


Figure 1-2 MicroStation New File Window

5. Click the **Save** command button and the **MicroStation Manager** dialog box will appear.
6. In the **MicroStation Manager** Dialog box – highlight the file just created (*GDOT 3D Working File.dgn*) and click the **Open** button.
7. The **MicroStation V8i** interface will then finish opening.
8. In the **Main MicroStation Pull-down Menu** – click on the InRoads pull-down:



9. Then select **InRoads Suite** — and the **InRoads V8i** interface will open. Once **InRoads** and **MicroStation** are up and running, the desktop should look similar to that of *Figure 1-3* and *Figure 1-4*.

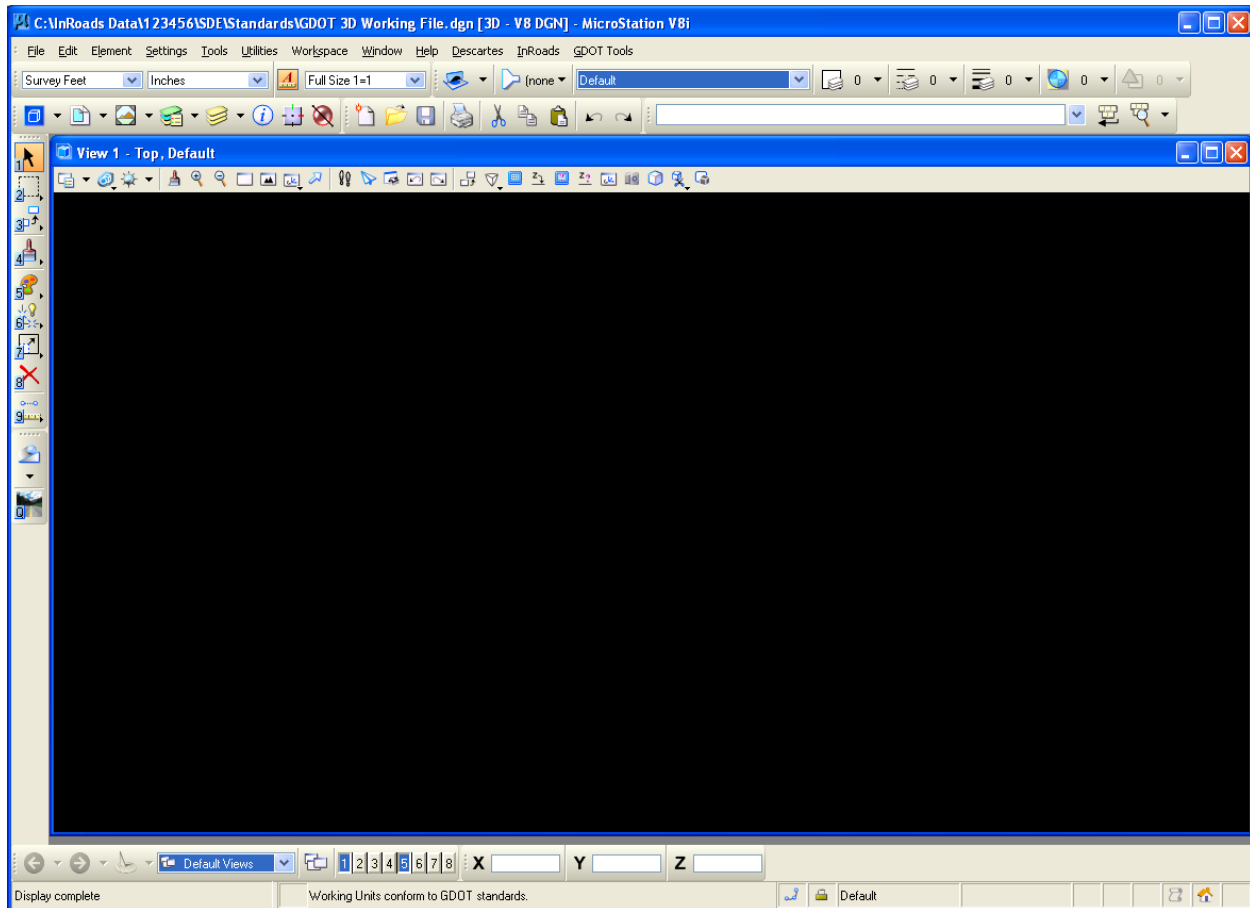


Figure 1-3 Main MicroStation V8i Window

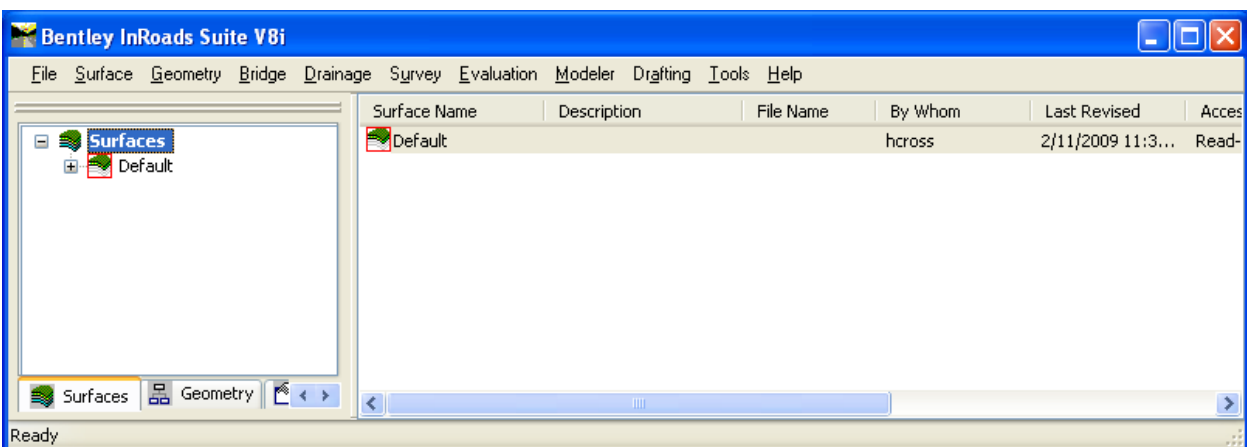
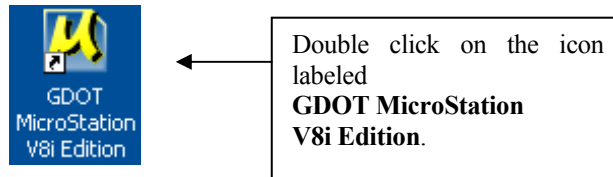


Figure 1-4 Main InRoads V8i Window

1.3.2 Steps to open an existing Survey “Working” DGN File

If the Survey “Working” DGN file has been created previously – use the following steps to open a Survey “Working” DGN File:

1. From the desktop, double-click on the **GDOT MicroStation V8i Edition** icon.



2. After the **MicroStation** Splash Screen appears, the **MicroStation Manager** dialog box will open. (See *Figure 1-5*).

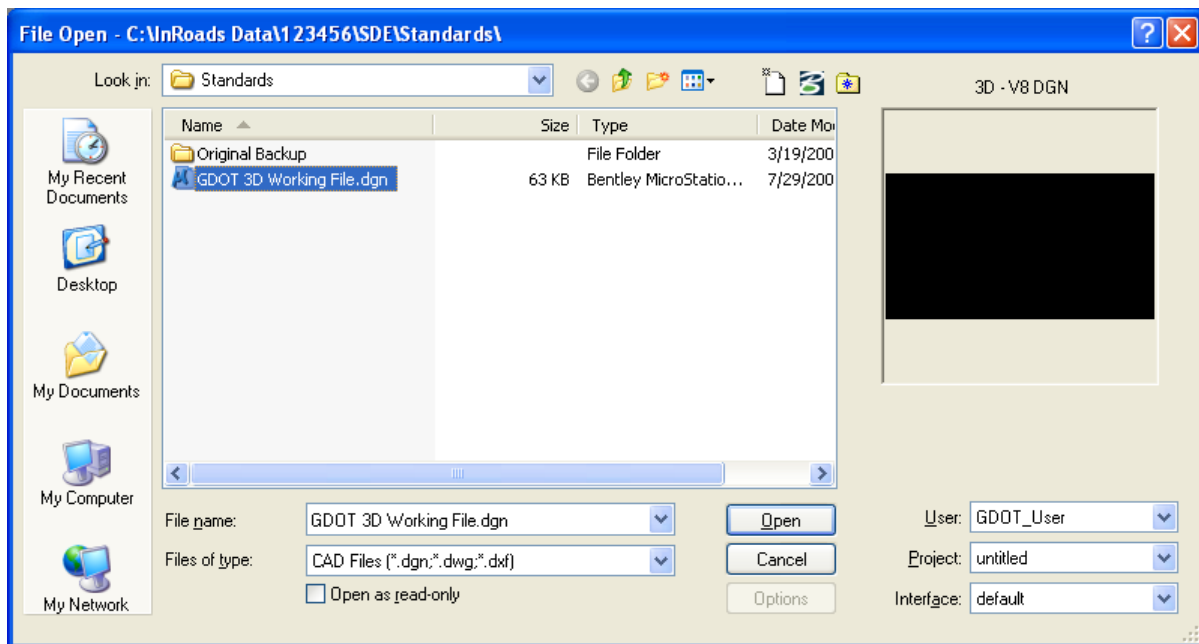


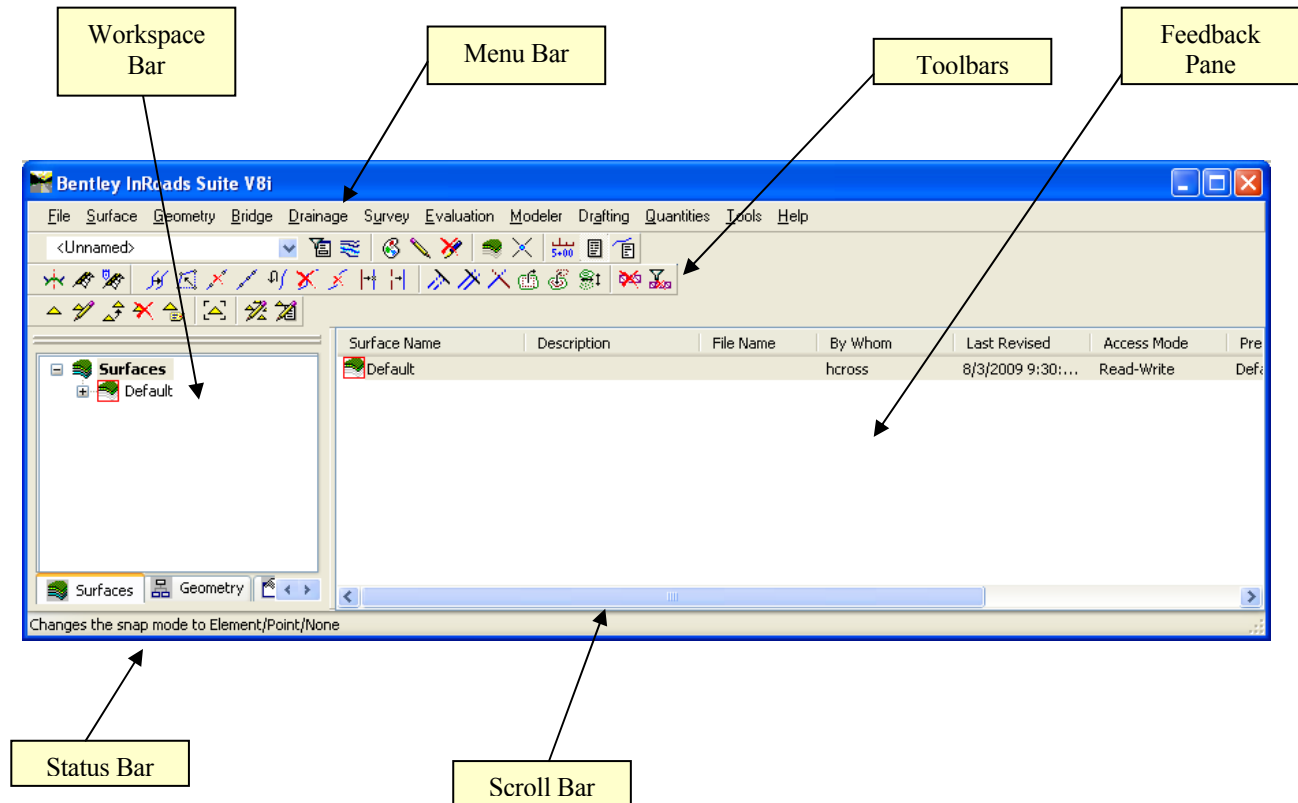
Figure 1-5 Starting MicroStation V8i and InRoads V8i

3. In the **MicroStation Manager** dialog box, browse to the *C:\InRoads Data\PI Number\ SDE\Standards* location and highlight the (*GDOT 3D Working File.dgn*) and click the **Open** button.
4. The MicroStation V8i interface will then finish opening. Then select *InRoads>>InRoads Suite* from the Main MicroStation Pull-down Menu. Once **InRoads** and **MicroStation** are up and running, the desktop should look similar to that of the previous screen captures depicted in *Figure 1-3* and *Figure 1-4*.

1.4 Overview of InRoads Interface

As mentioned previously - the user will be working in both the **InRoads Design Software** and the **MicroStation CADD Software**. The **InRoads Software** is the database in which the Surveying data is created and processed.

Shown below is a **diagram** which depicts the InRoads Explorer objects and a brief overview of the InRoads Explorer Interface:



- **Workspace Bar** – Contains all of the InRoads Project Data information
- **Menu Bar** – Contains the pull-down menus to access InRoads commands
- **Toolbars** – Contains default and customized toolbars to access InRoads commands
- **Feedback Pane** – Contains details of selected Project Data from the Workspace Bar
- **Scroll Bar** – Enables the user to view more of the InRoads Explorer Interface. (The Scroll Bar may not be visible if the InRoads Interface is already viewed to extents).
- **Status Bar** – Contains InRoads messages and prompts (Please note: InRoads may direct you to locate something graphically in MicroStation -- some of these prompts may display in the MicroStation Status Bar instead). It is very important that the user review both the InRoads and the MicroStation Status Bar for prompts and information.

1.5 InRoads Project Defaults

The **InRoads Project Defaults** setting allows you to define the “default folder locations” for projects. A **Project Default** configuration can then be saved for each project so that multiple projects can be accessed. This configuration allows you to easily navigate between projects. Once the Project Folder locations are saved in the Configuration, the projects can then be accessed by selecting the appropriate Project Configuration Name. The Project Defaults also contain the location for selecting the standard GDOT InRoads Preference File (**GDOT_Standard V8i.xin**).

The standard Project Default configuration for Survey projects will be **PI#_SDE**. Each Survey Project Default will consist of this naming structure in order to easily navigate between projects. (See *Table 1.3*)

Once the Project Default Location is set for a particular project – this will also be the default folder location whenever the InRoads commands of **File ► Save and **File ► Close** are used.

Table 1.3	
Project Defaults Configuration	
Project Default Structure	PI Number_SDE
Project Default Structure (Example)	123456_SDE

Following are the steps to create a **Survey Project Default Configuration** (Substitute the appropriate PI # as required):

1. Click **File ► Project Defaults** from the InRoads pull-down menu to access the **Set Project Defaults** dialog box.
2. Click **New** and enter **123456_SDE** in the **New Configuration** dialog box. Then click **OK**.
3. Under the **Default Preferences** section - Click in the **Preferences (*.xin):** field and then click the **Browse** button to navigate to the following file:
C:\InRoads Data\123456\SDE\Standards\GDOT_Standard V8i.xin file and click **Open**.
4. Under the **Default Directory Paths** Section - Click in the **Project Default Directory:** field and then click the **Browse** button to navigate to the folder:
C:\InRoads Data\123456\SDE. Next - click **Open**.
5. Under the **Default Directory Paths** Section – copy and paste the following text into each entry field shown below: **C:\InRoads Data\123456\SDE**

- Report Directory: - C:\InRoads Data\123456\ SDE \
 - Projects (*.rwk): - C:\InRoads Data\123456\ SDE \
 - Surfaces (*.dtm): - C:\InRoads Data\123456\ SDE \
 - Geometry Projects: (*.alg): - C:\InRoads Data\123456\ SDE \
 - Template Libraries: (*.itl): - C:\InRoads Data\123456\ SDE \
 - Roadway Design: (*.ird): - C:\InRoads Data\123456\ SDE \
 - Survey Data: (*.fwd): - C:\InRoads Data\123456\ SDE \
 - Drainage: (*.sdb): - C:\InRoads Data\123456\ SDE \
6. Under the **Default Directory Paths** Section - Click in the **Style Sheet (*.xsl):** field and then click the **Browse** button to navigate to the folder:
C:\Program Files\Bentley\InRoads Group V8.11\XML Data\GDOT. Next - click **Open**.

The **Project Defaults** should look similar to the screen capture depicted in *Figure 1-6* (as shown below).

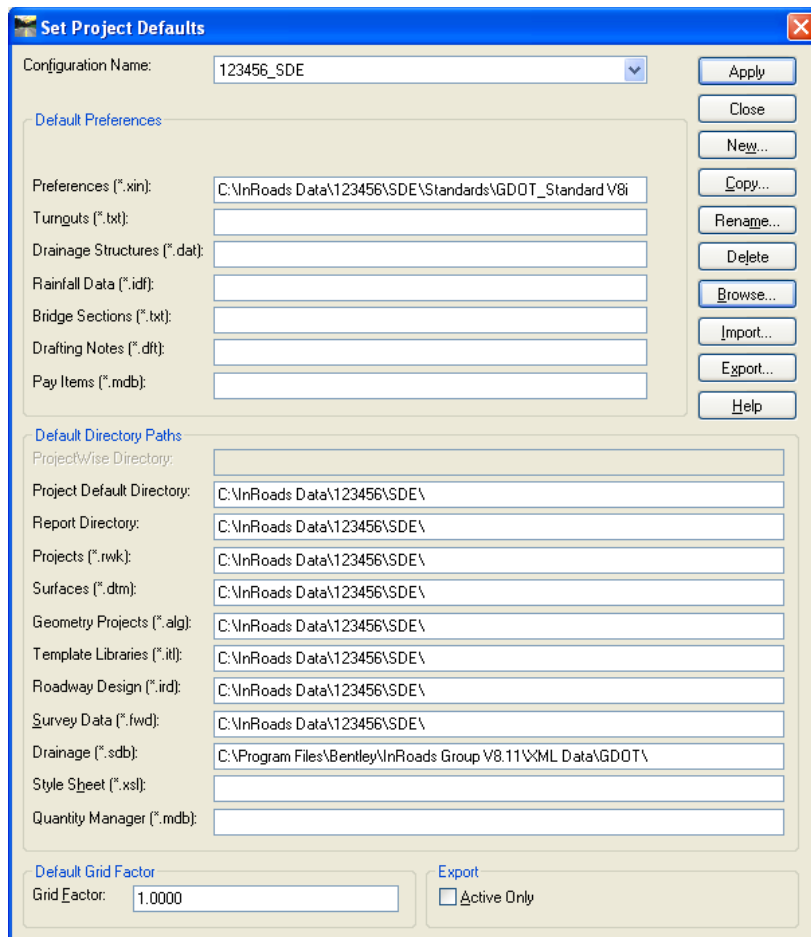


Figure 1-6 Project Defaults

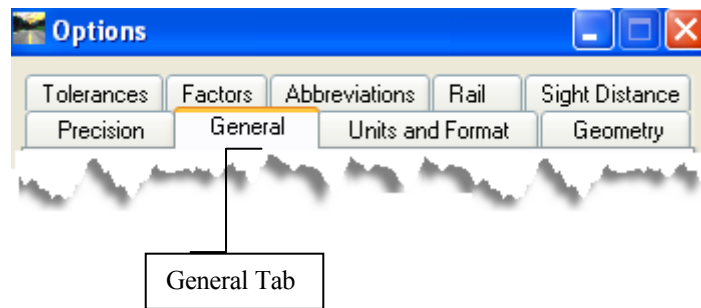
7. Click **Apply** and then click **Close**.

1.6 Survey Default Preferences

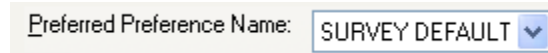
The **Survey Default** Preferences must be loaded in InRoads in order to conform to standards for the processing of Survey/Mapping Projects. This is a very important step to ensure that standards are followed for any Survey or Photogrammetric data that will be processed. The **Survey Default** Preference loads the Precision Settings, Tolerances, Units and Formats, Default Point and Alignment Numbering scheme(s), etc. Once the **Survey Default** Preference is loaded – the project will retain these settings each time the project is accessed.

Following are the steps to set the **Survey Default Preferences**:

1. Click **Tools ► Options** from the InRoads pull-down menu to access the **Options** dialog box.
2. In the **Options** dialog box - click on the **General Tab** and the **General Tab** dialog box will appear.

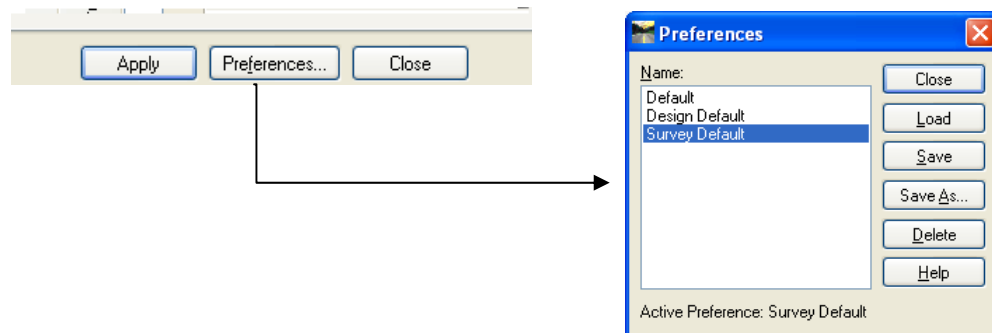


3. In the **General Tab** dialog box select the pull-down next to **Preferred Preference Name**:



Select **Survey Default** – to load the Survey Default Preference Settings.

4. In the **General Tab** dialog box click the command button named **Preferences...** (Located at the bottom of the dialog box) and the **Preferences** dialog box will open.



5. In the **Preferences** dialog box – select **Survey Default**. Then click **Load** and then click **Close**.
6. The **Survey Default** Preference should now correspond to the screen capture depicted in *Figure 1-7* (as shown below).

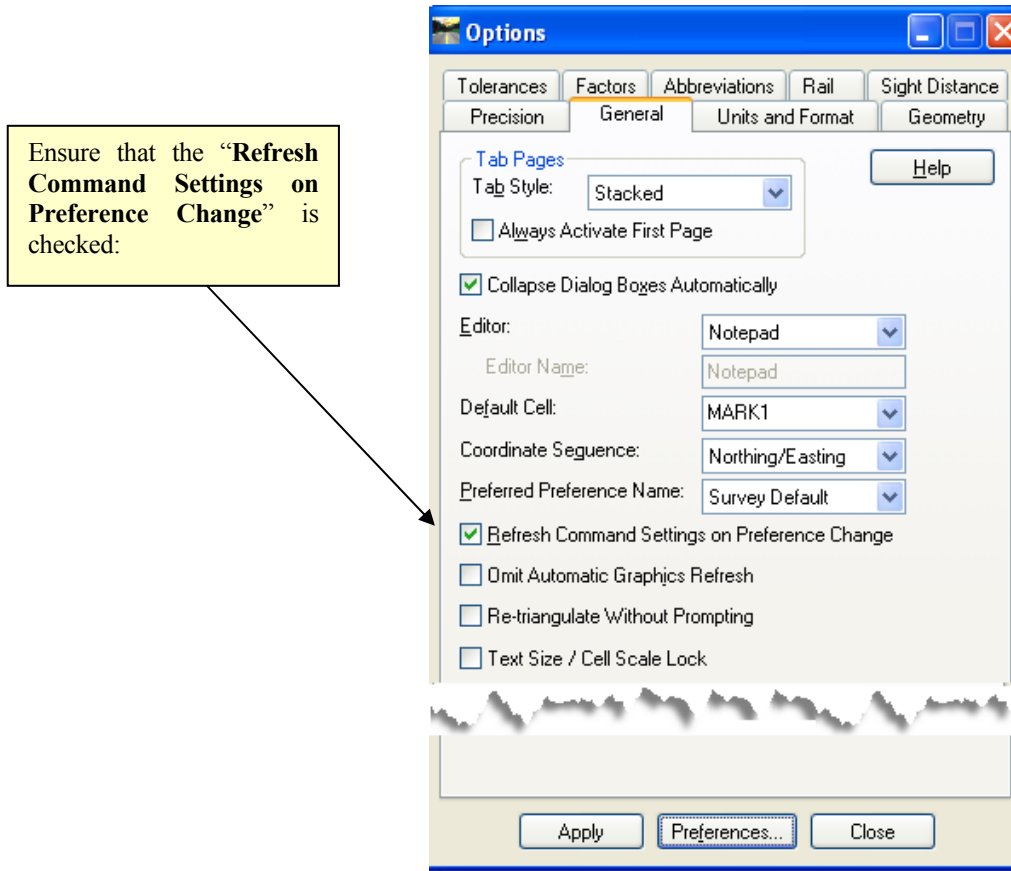


Figure 1-7 Survey Default Settings

7. Click **Apply** and then click **Close**.

The **Survey Default** Preference is now loaded. This Preference loads the appropriate data for ALL of the tabs in the Options dialog box. The individual tabs (Tolerances, Geometry, Units and Format, etc.) will automatically be configured for use in Survey calculations. The Point and Alignment Numbering scheme(s) are also automatically configured for the standard Survey conventions in the **Survey Default** Preference. These individual tab options will NOT need to change. Once the **Survey Default** Preference is loaded – the project will retain these settings each time the project is accessed on this computer. These settings are specific to this computer Profile/XIN file. If the Project is accessed on another computer – these settings may need to be re-applied in order to load the correct **Survey Default** Preference.













1.7 InRoads “Locks”

InRoads contains several “Locks” which are used by many InRoads commands to control different aspects of the selection and viewing of data as well as the reporting of data. There are basically two types of “Locks” – On/Off “Locks” and Switch “Locks”. (Switch “Locks” contain different modes but one mode is always active and the user can switch between modes). Both types of “Locks” can be changed by the user as the situation dictates during the course of the database generation. These locks affect many commands – so it is very important that the user understand the use of these locks. If an InRoads command does not function as expected when utilizing the Surface Viewing or Reporting commands -- a “Lock” may have been inadvertently turned on/off.

The following section contains a brief overview of some of the InRoads “Locks”. Only the “Locks” pertaining to the Survey aspect will be reviewed. As mentioned previously the “Locks” may be changed as situations dictate – but the settings depicted in the following section are applicable for most Survey Projects. It is a very important step to ensure that the “Locks” are set accordingly. (See *Table 1.4*)

Following are the steps to access the InRoads “Locks”:

Click **Tools ► Locks** from the InRoads pull-down menu. Each time a “Lock” is changed – the pull-down menu will close and the user must click on **Tools ► Locks** again to access the Locks pull-down.

InRoads Locks Settings	
Feature Filter 	Unchecked
Feature Highlight 	Unchecked
Style 	Unchecked
Pencil/Pen 	Set to Pencil
Delete Ink 	Unchecked
Locate 	Set to Features
Point Snap 	Checked
Element Snap 	Unchecked
Station 	Unchecked
Report 	Checked
Cogo Audit Trail 	Unchecked
Toolbar 	Checked

Following is a brief overview of the InRoads “Locks”:
(See *Table 1.5*)

Table 1.5
InRoads Locks Overview

Feature Filter

displays or obscures Surface Features based on a filter (also controls Survey Style Filter)

Feature Highlight

highlights the feature in plan view when selected from a list

Style

determines if a dialog box is displayed for a surface command or cross sections

Pencil/Pen

controls the redisplaying of Graphics

Delete Ink

allows redisplayed graphics to replace graphics in pen mode

Locate

controls if Locate Buttons snap to Graphics or Features

Point Snap

controls the ability to snap to points in Geometry Project

Element Snap

controls the ability to snap to elements in Geometry Project

Station

controls the Stationing as it pertains to Cross Sections

Report

controls if Report is displayed or not displayed in a dialog box

Cogo Audit Trail

controls the reporting of coordinate geometry results to a text file

Toolbar

displays or turns off the Locks Toolbar

1.8 Application and Variable Manager Add-Ins

InRoads contains several Application and Variable Manager “Add-Ins” which must be selected and added to the InRoads Program in order to access the standard GDOT customized menu applications/translators for Survey. Once the Application and Variable Manager Add-Ins are selected – the settings are written to registry keys in the user’s profile. This ensures that each time InRoads is accessed in the user profile -- these settings will already be available. These add-ins will only need to be added once and will then be accessible in all of the InRoads Modules and InRoads Projects.

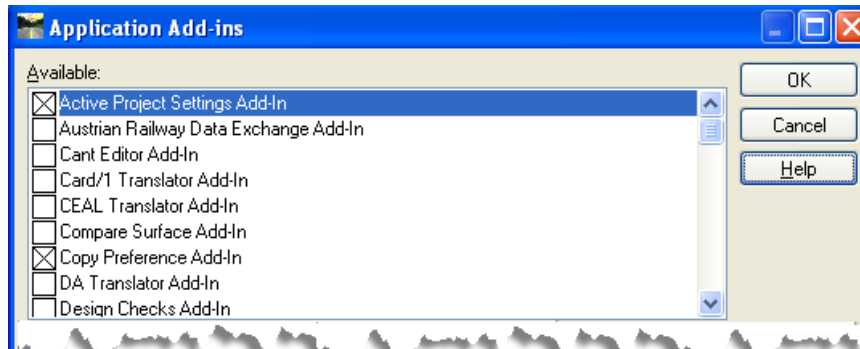
The “Application and Variable Manager Add-Ins” must be set accordingly in order to access the required GDOT Survey commands and translators.

This section details the following processes:

- Steps to select the Application Add-Ins
- Steps to select the Variable Manager Add-Ins

1.8.1 Steps to select the Application Add-Ins:

1. Click **Tools►Application Add-Ins** from the InRoads pull-down menu and the following dialog box will appear:



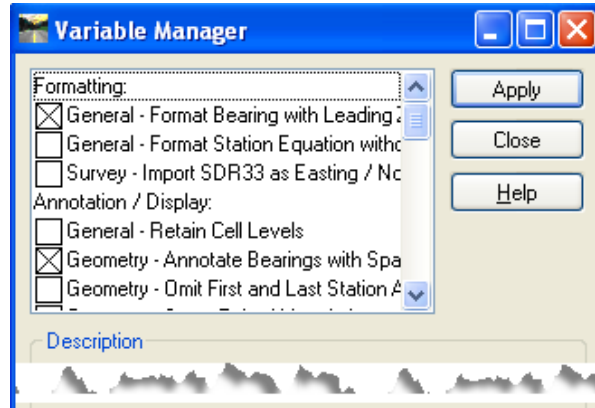
2. Select the following Application Add-Ins by clicking an by the appropriate Add-In:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Active Project Settings Add-In | <input checked="" type="checkbox"/> Lot Layout Add-In |
| <input checked="" type="checkbox"/> Copy Preference Add-In | <input checked="" type="checkbox"/> Multiple Horizontal Element Regression Analysis Add-In |
| <input checked="" type="checkbox"/> Display Superelevation in Plan Add-In | <input checked="" type="checkbox"/> Multiple Vertical Element Regression Analysis Add-In |
| <input checked="" type="checkbox"/> Global Scale Factors Add-In | <input checked="" type="checkbox"/> Named Symbology Tools Add-In |
| <input checked="" type="checkbox"/> Horizontal and Vertical Elements Add-In | <input checked="" type="checkbox"/> Remove User Data Add-In |
| <input checked="" type="checkbox"/> Hydrology and Hydraulics Add-In | <input checked="" type="checkbox"/> Traverse Edit Add-In |
| <input checked="" type="checkbox"/> Import AMSA Add-In | <input checked="" type="checkbox"/> Variable Manager Add-In |
| <input checked="" type="checkbox"/> Import SRV Add-In | |

3. Click **OK** to accept the settings and to close out of the dialog box.

1.8.2 Steps to select the Variable Manager Add-Ins:

1. Click **Tools ► Variable Manager** from the InRoads pull-down menu and the following dialog box will appear:



2. Select the following Variable Manager Add-Ins by clicking an by the appropriate Variable:

- General - Format Bearing with Leading Zero Option
- Geometry - Annotate Bearings with Spaces
- Geometry - Alphanumeric Names in Create/Edit Alignment by Cogo Points

3. Click **Apply** to accept the settings and then click **Close** to close out of the dialog box.

1.9 Starting a Survey Project in InRoads

After creating the Survey Project folder of **C:\InRoads Data\PI Number\SDE**, setting the Project Default Settings and the Survey Default Settings – the Surveyor/SDE will then copy the **Standards** folder (which is downloaded through the InRoadsALLV8i.exe executable) to the **C:\InRoads Data\PI Number\SDE** folder.

1.9.1 Copy the “Standards” folder which is downloaded from InRoadsALLV8i.exe

Important Step:

After installing InRoadsALLV8i.exe – the user will copy the **Standards** folder under **C:\InRoads Data** to the Project Location. The rest of the Standard Files will remain in the default install location.

Whenever a new Project is created – the Surveyor/SDE will download and install InRoadsALLV8i.exe. The files will be extracted to the Default Location(s). The Surveyor/SDE will then perform the following step:

- The user will copy the **C:\InRoads Data\Standards** Folder to the **InRoads Data\PI#\SDE** folder. (Example: **C:\InRoads Data\123456\SDE\Standards**).

Table 1.6		
Copy Standards Folder to Project Folder		
C:\InRoads Data\Standards	Copy To ►►	C:\InRoads Data\PI #\SDE

Standard Conventions

2. Standard Conventions

This section provides an overview of the GDOT standard Project, File and Object naming conventions. The standard Feature Types for DTM (Digital Terrain Model) data are discussed and the GDOT Preference File (.XIN) is reviewed. Feature Code Tables are also listed which provide the standard Feature Codes/Feature Styles to utilize for Photogrammetric and/or Field Survey Projects.

This section covers the following topics:

- Project, File and Object Naming Conventions
- Standard Surface Feature Object Names
- Standard Surface Feature Types
- Standard Geometry Object Names
- Standard File Information
- Standard Preference File (XIN) and GDOT Preferences
- GDOT Standard InRoads Photogrammetry Feature Codes
- GDOT Standard InRoads Field Survey Feature Codes
- GDOT Photogrammetry Code Conversion Table

2.1 Project, File and Object Naming Conventions

As mentioned previously in **Section One** - in order to ensure Project and File Naming consistency – standard Project, File and Object Naming conventions have been established.

This section details the following Standard Naming Conventions:

- Standard Project Naming Conventions
- Standard File Naming Conventions
- Standard Object Naming Conventions

**** Important Conventions regarding the ASC File Import:**

InRoads contains an **ASC to InRoads Translator** which converts the ASC file into a format that is usable for InRoads. The translator converts the .ASC file based on a format of **Point Number, Easting, Northing, Elevation and Feature Code**. After the ASC file is translated and imported into the Field Book, the data can then be imported into a Surface Project and/or Geometry Project.

***Please Note:**

Codes 1-10 are reserved as internal InRoads Codes. Therefore- the SMI Codes in the ASC file which are represented as F1 - F10 are automatically converted to codes 301 – 310 during the import process. This conversion is initiated during the translation of the ASC data and the correct Feature Styles represented by F1-F10 are associated with codes 301-310 during this translation process.

2.1.1 Standard Project Naming Conventions

The standard File Structure for InRoads is a Project Folder named for the PI Number of the project. A sub-folder – named **SDE** – will be located under this PI Number. This is the folder location where the core Survey File data is located. When submitting project deliverables to the Designer – submit the entire Project Folder (*Example: the PI Number Folder and the associated SDE sub-folder*). This will ensure that all of the applicable files are submitted to the end-user. (See *Table 2.1*)

Table 2.1	
Standard Project Naming Conventions	
InRoads Project Structure	C:\InRoads Data\PI Number\ SDE
InRoads Project Structure (Example)	C:\InRoads Data\123456\ SDE

2.1.2 Standard File Naming Conventions

InRoads contains several different file types but the Survey data will usually consist of file types pertaining to the .ASC (Survey ASCII File), .FWD (Survey Field Book), the .DTM (Digital Terrain Model), the .ALG (Geometry File) and the associated topographical .DGN (MicroStation Design File) deliverables. Following are the applicable file naming conventions (See *Table 2.2*)

Table 2.2	
Standard File Naming Conventions	
File Type	File Name
<ul style="list-style-type: none"> • 3D “Working” DGN file 	GDOT 3D Working File.dgn
<ul style="list-style-type: none"> • <u>ASC – Full Field Survey File</u> First (Original) Field Survey ASC Second Enhancement Field Survey ASC Third Enhancement Field Survey ASC, Etc. 	PI#A.asc PI#B.asc PI#C.asc, etc.
<ul style="list-style-type: none"> • <u>ASC – Mapping Enhancement File</u> Original Mapping Enhancement ASC First Mapping Enhancement ASC Second Mapping Enhancement ASC, Etc. 	PI#XO.asc PI#XA.asc PI#XB.asc, etc.
<ul style="list-style-type: none"> • <u>FWD – Full Field Survey File</u> First (Original) Field Survey File Second Enhancement Field Survey File Third Enhancement Field Survey File, Etc. 	PI#_ A.fwd PI#_ B.fwd PI#_ C.fwd, etc.
<ul style="list-style-type: none"> • <u>FWD – Mapping Enhancement File</u> Original Mapping Enhancement File First Mapping Enhancement File Second Mapping Enhancement File, Etc. 	PI#_ XO.fwd PI#_ XA.fwd PI#_ XB.fwd, etc.

Table 2.2	
Standard File Naming Conventions	
File Type	File Name
<ul style="list-style-type: none"> • ALG - Geometry File 	PI#_SDE.alg
<ul style="list-style-type: none"> • DTM - Processed DTM Surface File (All DTM's are incorporated into this one Existing DTM before submission) 	PI#_SDE.dtm
<ul style="list-style-type: none"> • <u>Intermediate DTM – Full Field Survey File</u> Note: (The First <u>Original</u> Field Survey File is obtained from the PI#A.asc and PI#_A.fwd files. These files are incorporated as PI#_SDE.dtm during initial DTM creation – therefore there is <u>no intermediate DTM</u> named PI#_A.dtm.) Second Enhancement Field Survey File Third Enhancement Field Survey File, Etc. 	← See Note: PI#_B.dtm PI#_C.dtm, etc.
<ul style="list-style-type: none"> • <u>Intermediate DTM – Mapping File</u> Original Mapping Enhancement DTM First Mapping Enhancement DTM Second Mapping Enhancement DTM, Etc. 	PI#_XO.dtm PI#_XA.dtm PI#_XB.dtm, etc.
<ul style="list-style-type: none"> • Processed DGN Files 	PI#_TOPO.dgn PI#_UTLE.dgn PI#_PROP.dgn
<ul style="list-style-type: none"> • Processed DGN PDF Plot Files 	PI#_TOPO.pdf PI#_UTLE.pdf PI#_PROP.pdf

2.1.3 Standard Object Naming Conventions

InRoads contains several different object types such as DTM Feature Points and Alignments, Cogo Points, Alignment Points and Alignments. Following are the applicable object naming conventions (See *Tables 2.3 – 2.5*).

Table 2.3 Example Standard Object Names		
Object Type	Object Name	Object Name Convention
Mapping Feature Points and Alignments	Example: TPBL224	Feature Code & Number
Field Feature Points and Alignments	Example: TOPO_E_TPBL224	Feature Code Style & Number
Cogo Points	Example: 1789 --- (No Prefix)	Point # only – No Prefix
Alignment Points	Example: 1790 --- (No Prefix)	Point # only – No Prefix
Alignments	Example: SV23--- (SV Prefix)	Prefix + Alignment #

Table 2.4 Example Exterior Boundary Naming Conventions		
Exterior Boundary Type	Feature Name	Feature Style
Mapping Exterior Boundary	MBOUNDARY	TOPO_E_TLIML
Full Field Survey Boundary	XBOUNDARY	TOPO_E_TLIML

Table 2.5 Point & Alignment Ranges to Use	
Points	Range 1-9999
Alignments	No Limitations for Alignments -- but must have the SV Prefix

2.2 Standard Surface Feature Object Names

Mapping and Field Data:

The .RAW AMSA (Automated Mapping System-Advanced) files are imported directly into InRoads through an internal Import AMSA Translator. The InRoads AMSA translator then parses the RAW file coordinate and point data directly into a DTM surface. (*The SDE will receive this data already imported into the DTM. This DTM Surface will be provided to the SDE as PI#_ Map.dtm*).

The .RAW ASC (Field Data Collector) files are imported directly into InRoads through an internal Import Survey Data Translator. The translator converts the .ASC file based on a format of **Point Number, Easting, Northing, Elevation and Feature Code**. After the ASC file is translated and imported into the Field Book, the data can then be imported into a Surface Project and/or Geometry Project. The processing and triangulating of the Surface Data/Geometry Data are discussed and demonstrated in the *Introduction to InRoads for Survey Data Processing Training Guide*.

The AMSA and ASC data are imported in as surface features into a surface. Each Feature object is assigned a hard coded unique naming scheme based on the Feature Style – **Example:** TPBL1, TPBL2, TPBL3, etc. for Mapping DTM data and TOPO_E_TPBL1, TOPO_E_TPBL2, TOPO_E_TPBL3, etc. for Field Survey DTM data. (See *Table 2.6*). The internal surface points are numbered consecutively in the particular Feature Object - Example: 1, 2, 3, etc. Each Feature can be made up of one or many points. The Feature Style is based on the associated numeric Feature Code and is assigned during the AMSA/ASC Import Translation process. The Feature Style determines if the Feature will be included in the triangulation process.

The Feature Type affects how the DTM triangles are formed. The Feature Type can be a breakline, random point, etc. and is determined based on a setting in the corresponding Feature Style. The attribute of the Surface Feature (whether it is 3D topographic or a 2D planimetric Feature) and the triangulation effect is also determined during the translation process.

The Standard Object Names for the Surface Features are determined by the Feature Code/Feature Style – this is an automated process so that the Standard Object Names are already defined for the user. (See *Table 2.6*)

Table 2.6 Example DTM Feature Object Names	
Mapping Feature Points and Alignments	Example: TPBL224
Field Feature Points and Alignments	Example: TOPO_E_TPBL224

2.3 Standard Surface Feature Types

InRoads contains five Feature Types: **Breakline**, **Random**, **Contour**, **Interior** and **Exterior**. These Feature Point Types are set according to the corresponding Feature Code/Feature Style in the standard GDOT Preferences file (**GDOT_Standard V8i.xin**). As mentioned previously, the Feature Point Type determines how DTM triangles are formed when the points are connected. When the data in the RAW file is imported during the AMSA and/or ASC translation process – the correct Feature Type is automatically assigned by the Feature Style and to the Feature Object which is imported into the Surface. Following are examples of the Feature Types: (See *Table 2.7*)

Table 2.7	
Example Surface Feature Types	
Feature Type	Description
Breakline	Linear connected points that represent discontinuities in a surface
Random	Randomly spaced points that are independent of other points
Contour	Connected points that form a linear segment based on elevation
Interior	Interior connected points that represent areas in a DTM that are undefined or obscured
Exterior	Exterior connected points that represent the outer limits of a DTM surface and can be used to trim extraneous triangulated data

2.4 Standard Geometry Object Names

As mentioned previously - the .RAW ASC (Field Data Collector) files are imported directly into InRoads through an internal Import Survey Data Translator. The translator converts the .ASC file based on a format of **Point Number, Easting, Northing, Elevation and Feature Code**. After the ASC file is translated and imported into the Field Book, the data can then be imported into a Surface Project and/or Geometry Project. The processing and triangulating of the Surface Data/Geometry Data are discussed and demonstrated in the *Introduction to InRoads for Survey Data Processing Training Guide*. The previous Section described the data which is imported into the DTM Surface. The following Section depicts the data which is imported into the Geometry project.

The survey data which is imported into the Geometry Project (.ALG) is survey that consists of Property data, Existing Right of Way, Alignment data, etc. Basically it is survey which is “Geometry related” and which will be used in the creation of the property, alignment and COGO database. This Geometry data will not be represented in the DTM. All other Survey Data will be imported into the Surface Project (.DTM) and will be represented as Surface Features. Please see the *Introduction to InRoads for Survey Data Processing Training Guide* which depicts the process to filter data to import into the Geometry Project (.ALG).

The following codes/styles (which are composed of data which will be used for the generation of Property and Alignment information) are included in the Survey Style Filter which is named **Property and Alignment Codes**. All Codes which are not listed in the table below – will be imported into the Surface Project (.DTM File).

Property and Alignment Codes Survey Style Filter	
PROP E RWM	Right-of-Way Marker Found
PROP E RWC	Right-of-Way Point Computed
PROP E RWU	Right-of-Way Utility Company
PROP E RWE	Right-of-Way Prescription Pt
PROP E POEL	Point on Easement Line
PROP E PCF	Property Corner Found
PROP E PPOL	Property Point on Line
PROP E PPC	Property Point Computed
PROP E APOT	Point in Tangent, Existing
PROP E APC	Point of Curvature, Existing
PROP E APOC	Point on Curve, Existing
PROP E APT	Point of Tangency, Existing
PROP E API	Point of Intersection
PROP E ACL	Alignment Centerline
PROP E BCOL	County Line
PROP E BCTL	City Limit Line
PROP E BLDL	Land District Line
PROP E BLLL	Land Lot Line
PROP E BSL	State Line

A. Geometry Object Names:

The Geometry Objects consist of Cogo Points, Alignment Points and Alignments. Existing Property Data is imported from the Field Survey ASC file. The SDE then utilizes deeds, plats, existing plans or tax maps if required to assist in the input of the Parcel and Alignment Data. The SDE will store property data by utilizing the existing Cogo Points imported from the ASC file and by storing additional Cogo Points, Alignment Points and Alignments computed/based off of deeds, plats, etc. as required.

Please Note:

The points/chains imported from the ASC file will contain No prefixes. The SDE will also store any computed points with No prefixes. Any computed Alignments will be stored with an **SV** prefix to represent a Survey stored Alignment.

*The reason that Survey (field collected and computed points) do not contain pre-pended prefixes is to reduce the possibility of duplicate points going back to the data collector and to ensure that duplicate points are not submitted to the Designer when additional enhancements are added during the life of the project. Designers will name their computed points and alignments with a pre-pended **DE** prefix in order to differentiate between Survey and Design points/alignments.

*Please note that it is a requirement for the SDE to pre-pend the **SV** Prefix to all computed Alignments. This includes Parcel Alignments, Existing Centerline Alignments, Existing R/W Alignments, etc.

- **Cogo Points** - These points will be stored with NO Prefix. Only the Point Number will be represented.
- **Alignment Points** - These points will be stored with NO Prefix. Only the Point Number will be represented.
- **Alignments** – The Alignments will always be stored with an **SV** prefix.

The above Naming Scheme is utilized in order to differentiate between Survey Data and Design Data. The Naming Scheme is also used to assist in adding Additional Survey Enhancement information to a database. This information can then be submitted to the Designer so that the Designer's Points and Alignments will not be overwritten when additional enhancements are added to the Designer's Geometry Project Database. (See *Table 2.8*)

Cogo Points	Example: 1789 --- (No Prefix)	Point # only – No Prefix
Alignment Points	Example: 1790 --- (No Prefix)	Point # only – No Prefix
Alignments	Example: SV23--- (SV Prefix)	SV Prefix + Alignment #

The following Table depicts the **Standard Alignment Descriptions** which are required for each Alignment stored in the Geometry Project. This Table depicts the **Alignment Type**, **Description Convention** and the **Description Example**. (See *Table 2.9*)

Table 2.9 Standard Alignment Descriptions		
Alignment Type	Description Convention	Description Example
Existing Centerlines	EXIST C/L (Roadway Name)	EXIST C/L SR 100
Existing Right-of-Way Left	EXIST R/W LT (Roadway Name)	EXIST R/W LT SR100
Existing Right-of-Way Right	EXIST R/W RT (Roadway Name)	EXIST R/W RT SR100
Land Lots	LAND LOT #	LAND LOT #102
Parcels	PAR # TM # (Owner Name) **	PAR 71 TM #49 ELLIS

** TM – Tax Map

B. Feature Styles to Utilize for Storing Points and Alignments:

The Standard Feature Styles to use when storing Points and Alignments for the Existing Centerline Alignments, Existing R/W, Property, etc. will be named according to the type of Point or Alignment which is to be stored. The following Table lists the applicable Feature Style(s) to utilize when storing the Point and Alignment data: (See *Table 2.10*)

Table 2.10		
Feature Styles For Points and Alignments		
Existing/Computed Points	PROP_E_ACL PROP_E_ACL-PC-PT PROP_E_APC PROP_E_API PROP_E_APOC PROP_E_APOT PROP_E_APT PROP_E_PCF	PROP_E_POEL PROP_E_PPC PROP_E_PPOL PROP_E_RWC PROP_E_RWE PROP_E_RWM PROP_E_RWRR PROP_E_RWU
Existing Centerline Alignment	PROP_E_ACL	
Existing R/W Alignment	PROP_E_RWE	
Existing Property (Parcel) Alignment	PROP_E_PAR	

C. Point and Alignment Numbering Ranges:

Point Numbers 1 – 9999 are reserved for survey collecting and survey data processing. Point numbering should be done consecutively and if more points are required the numbering should continue consecutively as needed. When additional survey data is gathered in the field, the point numbers should begin with the lowest number that has not already been submitted to design. Designer's Point numbering range begins at 10,000. Points 10,000 and above are reserved for Design. If the total number of survey points has reached the 9,999 point limit, the Survey Data Engineer should contact the Designer and obtain the next starting point number.

A gap in point numbering should only exist where the location survey points total less than 9,999. All other numbering gaps should be minimized. (See *Table 2.11*)

Table 2.11	
Point & Alignment Numbering Ranges	
Points	Range 1-9999
Alignments	No Limitations for Alignments -- but must have the SV Prefix

2.5 Standard File Information

Following is a brief overview of the most common file types the SDE will process and generate: (See *Table 2.12*)

Table 2.12
Standard File Information Overview

GDOT 3D Working File.dgn

This DGN file is created from the GDOT 3D “seed” file (**GDOT_V8_3D.dgn**) and is used to display the temporary and or/permanent graphics in InRoads.

.RAW

The .RAW file contains the Topographical Photogrammetry Data which is generated by AMSA. This .RAW data is imported directly into a .DTM Surface as Surface Features. The appropriate Surface Features are triangulated to form a TIN Model.

.ASC

The .ASC file is an ASCII format file and contains Field Survey Data collected utilizing Data Collectors in the field (Topography, Property, Drainage, etc). The .ASC file is imported into the InRoads .FWD file (Electronic Field Book).

.FWD

The .FWD file contains the imported Field Survey Data (.ASC File Data). Basically this file is an Electronic Field Book in which the .ASC File data is imported so that the survey data can be exported to the .DTM (Surface) and .ALG (Geometry) files.

.DTM

The .DTM file contains all of the Surface Features imported from the AMSA and/or ASC File(s). The appropriate Surface Features are triangulated in order to form an Existing Ground Surface (TIN Model) for use in Survey and Design.

.ALG

The .ALG (Geometry File) contains all of the “Geometry” related data imported from the FWD File(s). This data is utilized to create Property, Existing R/W and Existing Centerline Alignments for use in Survey and Design.

PI#_TOPO.dgn

This DGN file contains all of the Topographical and Drainage information generated from Mapping and Full Field Survey.

PI#_PROP.dgn

This DGN file contains all of the Property, Existing R/W, Existing Centerline, etc., information generated from Survey Processing and Field Survey Data.

PI#_UTLE.dgn

This DGN file contains all of the Utility information generated from Field Survey Data.

2.6 Standard Preferences

InRoads Standards for Survey Data Processing has been set up in a “Preference” file (also known as an XIN file). This preference file contains the Georgia Department of Transportation’s standards for Feature Codes, Feature Styles, Feature Filters, Dialog Box Settings, Linestyles, Lineweights, colors, and numerous other settings. The XIN file is basically a compilation of INI Files (Initialization files) which controls the standardization of the InRoads settings and display options. This preference file is critical for use in the InRoads Survey Process and for accurate Digital Terrain Model/ Geometry Objects creation. The XIN file is used in conjunction with MicroStation V8i’s ByLevel settings and configuration files to assist in the viewing of project data and in the generation of Topographical, Property and Utility DGN plan file deliverables.

The standard GDOT XIN file is named **GDOT_Standard V8i.xin** and is included in the **InRoadsALLV8i.exe** download.

After downloading and executing the **InRoadsALLV8i.exe** – a **Standards** folder is created directly under the C:\InRoads Data folder. The Surveyor/SDE will copy this **Standards** folder to the Project Folder: (See Example in *Table 2.13*).

Table 2.13	
Name and Location of the GDOT Standard XIN File	
GDOT Standard XIN File	C:\InRoadsData\123456\SDE\Standards\GDOT_Standard V8i.xin

NOTE: The XIN file contains Named Symbology and Feature Styles which correspond with the ByLevel Settings in MicroStation. Please note that if any modifications or additional Feature Styles/Named Symbology are added by the user to the XIN – the MicroStation Levels may not view with the correct Symbology for those modified Feature Styles. It is advisable to NOT add additional Named Symbology or Styles in order for the XIN file to be consistent with the current MicroStation Bylevel settings so that utilities for Plans Productions will function correctly.

2.6.1 *Standard Preference File (XIN) Details*

The XIN File contains the GDOT configuration settings for use in Design/Survey. These settings contain the current GDOT standards for plan development and processing of Design/Survey Data. Following are some of the Configuration Settings contained in the XIN:

- **Named Symbology** – This controls how elements such as points, lines, text, etc. appear in plan, cross section and profile views in MicroStation. The GDOT named symbology is also set to *ByLevel* which references the Level Settings for Symbology in the MicroStation DGNLIB. ByLevel controls the Symbology (weight, color, linestyle) and the Named Level on which the elements are located. The Named Symbology can also be set in the InRoads Named Symbology Manager by selecting each symbology (color, weight, linestyle, etc.) separately but GDOT uses the ByLevel Symbology to correspond with the DGNLIB Levels. (The Named Symbology determines “How” an element is viewed”).
- **Feature Styles** – InRoads contains Features which represent elements such as points, lines, arcs, spirals, etc. The Feature Style for each Geometry, Survey, DTM and Component element is used to determine how the elements view. The elements can be set to view in plan view, profile, cross section, DTM, etc. The Feature Style references the associated Named Symbology to view the element with the appropriate corresponding Symbology. The Feature Style determines “Where” the element is viewed.
- **Preferences** – When using commands in the InRoads dialog boxes – it is useful to set Preferences which can be loaded later without having to re-enter information into the dialog boxes. Preferences are basically entries in dialog boxes which can be saved and then selected to automatically configure the settings of a dialog box without manual re-entry.
- **Filters** – Filters are commands in dialog boxes which can be used to “filter” selections of data based on set criteria. This can include selection of Points, Alignments, Features or other entities by using a filter based on the entities’ Style, Name, etc.

These are some of the GDOT standards that have been configured for use in the XIN file. These settings are used to assist in the Survey/Design process to ensure that standards are consistent for development of GDOT project plans.

2.6.2 *GDOT Preferences*

As mentioned previously - Preferences are entries in dialog boxes which can be saved and then selected later to automatically configure the settings of a dialog box without manual re-entry. The following Table lists the GDOT Preferences available in the GDOT XIN file. These Preferences will be discussed in more detail in each of the applicable Sections of the Design Guidelines.

Preference Name	Dialog Name	Dialog Location	Description
10 Scale Work Sec 1x Vert Exg	Create Cross Section	Evaluation ► Cross Section ► Create Cross Section ► Preferences	X-Section Grid (10 Scale) for Earthwork and End-Area reports. For use on projects with small footprints. Most situations will require using the '50 Scale Work Sec 2x Vert Exg' Preference.
100h_10v Profile	Annotate Profile	Evaluation ► Profile ► Annotate Profile ► Preferences	Sets settings for 100' Scale Horizontal and 10' Scale Vertical viewing of existing and proposed Profile elevations on the Profile plan sheets. Use when annotating Profiles for Profile sheets using the '50 Scale Single Profile' Preference in the Plan and Profile Generator.
100h_10v_SHEETS	Create Profile	Evaluation ► Profile ► Create Profile ► Preferences	Loads grid settings, station formats, fonts and symbology for use in plotting a Profile at 100' Horizontal Scale and 10' Vertical Scale. This Preference is also referenced in the Plan & Profile Generator when generating 50 Scale Single Profile Sheets.
100h_10v_WORKING	Create Profile	Evaluation ► Profile ► Create Profile ► Preferences	Loads grid settings, station formats, fonts and symbology for use in plotting a Profile at 100' Horizontal Scale and 10' Vertical Scale. Same as 100h_10v_SHEETS except grid is not drawn. For use during temporary viewing of Profile during vertical alignment design.
20 Scale	Survey Options	Survey ► Fieldbook Data ► Survey Options ► Preferences	Sets Cell Scale, Text Scale, and Line Scale for viewing survey planimetrics for 20 Scale projects.
20 Scale Double Profile	Plan and Profile Generator	Drafting ► Plan and Profile Generator ► Preferences	Used for generating 20 Scale Double Profile Sheets.

Preference Name	Dialog Name	Dialog Location	Description
20 Scale Plan	Plan and Profile Generator	Drafting ► Plan and Profile Generator ► Preferences	To be developed.
20 Scale Plan & Profile	Plan and Profile Generator	Drafting ► Plan and Profile Generator ► Preferences	Used for generating 20 Scale Plan & Profile Sheets.
20 Scale Single Profile	Plan and Profile Generator	Drafting ► Plan and Profile Generator ► Preferences	Used for generating 20 Scale Single Profile Sheets.
20h_10v Profile	Annotate Profile	Evaluation ► Profile ► Annotate Profile ► Preferences	Sets settings for 20' Scale Horizontal and 10' Scale Vertical viewing of existing and proposed Profile elevations on the Profile plan sheets. Use when annotating Profile for Profile sheets using the '20 Scale Single Profile', '20 Scale Double Profile, and '20 Scale Plan & Profile' Preferences in the Plan and Profile Generator.
20h_5v_SHEETS	Create Profile	Evaluation ► Profile ► Create Profile ► Preferences	Loads grid settings, station formats, fonts and symbology for use in plotting a Profile at 20' Horizontal Scale and 5' Vertical Scale. This Preference is also referenced in the Plan & Profile Generator when generating 20 Scale Single Profile Sheets, 20 Scale Double Profile Sheets and 20 Scale Plan and Profile Sheets.
20h_5v_WORKING	Create Profile	Evaluation ► Profile ► Create Profile ► Preferences	Loads grid settings, station formats, fonts and symbology for use in plotting a Profile at 20' Horizontal Scale and 5' Vertical Scale. Same as the 20h_5v_SHEETS Preference except the grid is not drawn. For use during temporary viewing of Profile during vertical alignment design.
50 Scale	Survey Options	Survey ► Fieldbook Data ► Survey Options ► Preferences	Sets Cell Scale, Text Scale, and Line Scale for viewing survey planimetrics for 50 Scale projects.

Preference Name	Dialog Name	Dialog Location	Description
50 Scale Double Profile	Plan and Profile Generator	Drafting ► Plan and Profile Generator ► Preferences	Used for generating 50 Scale Double Profile Sheets.
50 Scale Plan	Plan and Profile Generator	Drafting ► Plan and Profile Generator ► Preferences	To be developed.
50 Scale Plan & Profile	Plan and Profile Generator	Drafting ► Plan and Profile Generator ► Preferences	Used for generating 50 Scale Plan & Profile Sheets.
50 Scale Single Profile	Plan and Profile Generator	Drafting ► Plan and Profile Generator ► Preferences	Used for generating 50 Scale Single Profile Sheets.
50 Scale Work Sec 2x Vert Exg	Create Cross Section	Evaluation ► Cross Section ► Create Cross Section ► Preferences	X-Section Grid (50 Scale) for Earthwork and End-Area reports. Most situations will require using this Preference.
50h_10v Profile	Annotate Profile	Evaluation ► Profile ► Annotate Profile ► Preferences	Sets settings for 50' Scale Horizontal and 10' Scale Vertical viewing of existing and proposed Profile elevations on the Profile plan sheets. Use when annotating Profile for Profile sheets using the '50 Scale Double Profile', and '50 Scale Plan & Profile' Preferences in the Plan and Profile Generator.
50h_10v_SHEETS	Create Profile	Evaluation ► Profile ► Create Profile ► Preferences	Loads grid settings, station formats, fonts and symbology for use in plotting a Profile at 50' Horizontal Scale and 10' Vertical Scale. This Preference is also referenced in the Plan & Profile Generator when generating 50 Scale Double Profile Sheets and 50 Scale Plan and Profile Sheets.

Preference Name	Dialog Name	Dialog Location	Description
50h_10v_WORKING	Create Profile	Evaluation ► Profile ► Create Profile ► Preferences	Loads grid settings, station formats, fonts and symbology for use in plotting a Profile at 50’ Horizontal Scale and 10’ Vertical Scale. Same as the 50h_10v_SHEETS Preference except the grid is not drawn. For use during temporary viewing of Profile during vertical alignment design.
ACL	View Stationing Curve Set Annotation	Geometry ► View Geometry ► Stationing ► Preferences Geometry ► View Geometry ► Curve Set Annotation ► Preferences	Loads settings for viewing Horizontal Alignment Stationing and Curve Data.
ACL Cogo Point Feature Styles	Geometry Selection Filter	Geometry ► View Geometry ► Horizontal Annotation ► Filter ► Preferences	For use by the Survey Data Engineer (SDE) when creating the ACL centerline alignment. The Preference is used in the Geometry Selection Filter when only points with the following Feature Styles are desired to be viewed. PROP_E_API,PROP_E_APT,PROP_E_APC,PROP_E_APOT,PROP_E_APOC
BEARING & DISTANCE	View Horizontal Annotation	Geometry ► View Geometry ► Horizontal Annotation ► Preferences	Loads settings into the View Horizontal Annotation dialog to label the bearing and distance when viewing existing property alignments. Although DISTANCE is part of the Preference name the distance is not labeled when viewing all other types of alignments. Feature Styles representing edge of pavements and Land Lot Lines do not label the bearing or the distance.

Preference Name	Dialog Name	Dialog Location	Description
BOGUS SURFACE	View Triangles / Surface Properties	Surface ► View Surface ► Triangles ► Preferences. Surface ► Surface Properties ► Advanced	Used for viewing surface triangles of 'Bogus' Surfaces (surfaces created by the designer for the temporary filling of obscured areas). The Bogus Surface Preference loads settings to view the surface as pink, easily distinguishing it as a Bogus Surface. The Bogus Surface Preference is used in both the View Triangles dialog and the Surface Properties dialog. The Surface Properties dialog ensures the pink surface is displayed when viewing existing ground Profiles and Cross Sections.
CONSTCL	View Stationing/ Curve Set Annotation	Geometry ► View Geometry ► Stationing ► Preferences Geometry ► View Geometry ► Curve Set Annotation ► Preferences	50 Scale settings for viewing Stationing and Curve Set Annotation for Mainline Construction Centerline Alignments.
CONSTCL 20 SCALE	View Stationing	Geometry ► View Geometry ► Stationing ► Preferences	20 Scale settings for viewing Stationing of Mainline Construction Centerline Alignments.
Default		Default Preference	Original Equipment Manufacturers default settings.
Design Default	Options	Tools ► Options ► Preferences	For use by Design. Loads proper point numbering and prefixes, precision, abbreviations, sight distance settings, factors, tolerances Units and formats for GDOT projects.

Preference Name	Dialog Name	Dialog Location	Description
DETCL	View Stationing/ Curve Set Annotation	Geometry ► View Geometry ► Stationing ► Preferences Geometry ► View Geometry ► Curve Set Annotation ► Preferences	50 Scale settings for viewing Stationing and Curve Set Annotation for Detour Centerline Alignments.
DETCL 20 Scale	View Stationing	Geometry ► View Geometry ► Stationing ► Preferences	20 Scale settings for viewing Stationing for Detour Centerline Alignments.
Ditch Flow Arrows	Annotate Feature	Surface ► View Surface ► Annotate Feature ► Preferences	Loads settings into the Annotate Feature dialog to place the 'Ditch Flow Arrow' cell on user selected features. The settings ensure the 'Ditch Flow Arrow' cell point in the direction of flow.
ENHANCEMENTS	View Triangles	Surface ► View Surface ► Triangles ► Preferences	For use by the SDE when viewing enhancements to obscured areas for inclusion into the Existing DTM.
EXISTING	View Triangles/ View Contours	Surface ► View Surface ► Triangles ► Preferences Surface ► View Surface ► Contours ► Preferences	For use when viewing the Existing DTM.
Existing Majors	Label Contours	Surface ► View Surface ► Label Contours ► Preferences	For use in labeling individual Major Contour Elevations of Existing ground surfaces.

Preference Name	Dialog Name	Dialog Location	Description
Existing Minors	Label Contours	Surface ► View Surface ► Label Contours ► Preferences	For use in labeling individual Minor Contour elevations of Existing ground surfaces.
FINISH	View Triangles/ View Contours	Surface ► View Surface ► Triangles ► Preferences Surface ► View Surface ► Contours ► Preferences	For use when viewing Final DTM Surfaces.
Finished Majors	Label Contours	Surface ► View Surface ► Label Contours ► Preferences	For use in labeling individual Major Contour Elevations of Finished Design Surfaces.
Finished Minors	Label Contours	Surface ► View Surface ► Label Contours ► Preferences	For use in labeling individual Minor Contour Elevations of Finished Design Surfaces.
GDOT	Display Template	Modeler ► Create Template ► Right mouse click over the Template to Display and select Display ► Preferences	Loads settings for viewing a component or template in MicroStation.
GDOT Earthwork Volumes	End-Area Volumes	Evaluation ► Volumes ► End-Area Volume ► Preferences	Loads settings for generating the GDOT Earthwork Volumes Report.

Preference Name	Dialog Name	Dialog Location	Description
GDOT Profiles	View Vertical Annotation	Geometry ► View Geometry ► Vertical Annotation	Settings for proper viewing of vertical curve data on the Profile Plan Sheets.
Narrow 10h 10v	Create Cross Section	Evaluation ► Cross Section ► Create Cross Section ► Preferences	Loads settings for creating Narrow Cross Section Sheets at a 10 Horizontal to 10 Vertical Scale. The Global Scale Factor must be set separately to 10.0000 for proper viewing.
NO BEARING & DISTANCE	View Horizontal Annotation	Geometry ► View Geometry ► Horizontal Annotation ► Preferences	Loads settings into the View Horizontal Annotation dialog to turn off labeling the bearing and distance when viewing alignments.
OEM_Default		Surface ► View Surface ► Triangles ► Preferences	Original Equipment Manufacturers default settings.
Prop.dgn Alignments	Geometry Selection Filter	Geometry ► View Geometry ► Horizontal Annotation ► Filter ► Preferences	For use by the SDE when creating the PI#_PROP.dgn file for delivery to the Design Office. The Preference filters the Feature Styles to the 13 Features Styles listed here: PROP_E_ACL,PROP_E_BCOL,PROP_E_BCTL,PROP_E_BGMD,PROP_E_BLDL,PROP_E_BLLL,PROP_E_BMISC,PROP_E_BSL,PROP_E_PAR,PROP_E_POEL,PROP_E_RWE,PROP_E_RWRR,PROP_E_RWU

Preference Name	Dialog Name	Dialog Location	Description
Prop.dgn Points	Geometry Selection Filter	Geometry ► View Geometry ► Horizontal Annotation ► Filter ► Preferences	For use by the SDE when creating the PI#_PROP.dgn file for delivery to the Design Office. The Preference filters the Feature Styles to the 22 Features Styles listed here: PROP_E_APC,PROP_E_API,PROP_E_APOC,PROP_E_APOT,PROP_E_APT,PROP_E_BCOL,PROP_E_BCTL,PROP_E_BGMD,PROP_E_BLDL,PROP_E_BLLL,PROP_E_BMISC,PROP_E_BSL,PROP_E_PAR,PROP_E_PCF,PROP_E_POEL,PROP_E_PPC,PROP_E_PPOL,PROP_E_RWC,PROP_E_RWE,PROP_E_RWM,PROP_E_RWRR,PROP_E_RWU
REQD.dgn Alignments	Geometry Selection Filter	Geometry ► View Geometry ► Horizontal Annotation ► Filter ► Preferences	For use in creating the PI#REQD.dgn file. The Preference filters the Feature Styles to the 4 Features Styles listed here: REQD_P_DWESMT,REQD_P_PESMT,REQD_P_REQD,REQD_P_TESMT
REQD.dgn Points	Geometry Selection Filter	Geometry ► View Geometry ► Horizontal Annotation ► Filter ► Preferences	For use in creating the PI#REQD.dgn file. The Preference filters the Feature Styles to the 5 Features Styles listed here: REQD_P_DWESMT,REQD_P_PESMT,REQD_P_REQD,REQD_P_TESMT,REQD_P_RWRM

Preference Name	Dialog Name	Dialog Location	Description
SIDECL	<p>View Stationing/</p> <p>Curve Set Annotation</p>	<p>Geometry ► View Geometry ► Stationing ► Preferences</p> <p>Geometry ► View Geometry ► Curve Set Annotation ► Preferences</p>	<p>50 Scale settings for viewing Stationing and Curve Set Annotation for Side Road Construction Centerline Alignments.</p>
SIDECL 20 SCALE	<p>View Stationing</p>	<p>Geometry ► View Geometry ► Stationing ► Preferences</p>	<p>20 Scale settings for viewing Stationing for Side Road Construction Centerline Alignments.</p>
Stakeout Survey Data	<p>Geometry Selection Filter</p>	<p>Tools ► XML Reports ► CTRL + Stakeout ► Filter ► Preferences</p>	<p>Used to create the Stakeout Report. The Preference filters the Feature Styles to the following 20 Feature Styles.</p> <p>PROP_E_PAR,PROP_E_RWE,PROP_E_RWM,PROP_E_RWC, PROP_E_RWU,PROP_E_POEL,PROP_E_PPC,PROP_E_PCF, TOPO_E_SNGSCM,TOPO_E_SLCM,TOPO_E_SLCD, TOPO_E_SDCD,TOPO_E_SBNCHMK,REQD_P_*, MAIN_P_CONSTCL,MAIN_P_SIDECL</p>
Surface Check MPCKGRD	<p>Geometry Selection Filter</p>	<p>Tools ► XML Reports ► Surface Check ► Filter ► Preferences</p>	<p>Used by the District Survey Party Chiefs and the Consultant Compliance Supervisor in the Office of Design Policy and Support to generate a GDOT Surface Check Report. The Surface Check MPCKGRD Preference is used to filter the Feature Styles for the First Check Points - Include: field to include only the Feature Style:</p> <p>TOPO_E_MPCKGRD</p>

Preference Name	Dialog Name	Dialog Location	Description
Surface Check MPCKPAV	Geometry Selection Filter	Tools ► XML Reports ► Surface Check ► Filter ► Preferences	Used by the District Survey Party Chiefs and the Consultant Compliance Supervisor in the Office of Design Policy and Support to generate a GDOT Surface Check Report. The Surface Check MPCKPAV Preference is used to filter Feature Styles for the Second Check Points - Include: field to include only the Feature Style: TOPO E MPCKPAV
Survey Default	Options	Tools ► Options ► Preferences	For use by Photogrammetry and Survey. Loads proper point numbering and prefixes, precision, abbreviations, sight distance settings, factors, tolerances Units and formats for GDOT projects.
Wide 10h 10v	Create Cross Section	Evaluation ► Cross Section ► Create Cross Section ► Preferences	Loads settings for creating Wide Cross Section sheets at a 10 Horizontal to 10 Vertical Scale. The Global Scale Factor must be set separately to 10.0000 for proper viewing.
XSEC TEXT – CL. EL. GROUND	Annotate Cross Section	Evaluation ► Cross Section ► Annotate Cross Section ► Preferences	Used for annotating the existing ground elevation on the Cross Sections at the centerline alignment.
XSEC TEXT – EL. DIAGONAL	Annotate Cross Section	Evaluation ► Cross Section ► Annotate Cross Section ► Preferences	Used for the annotation of proposed elevations in which the text must be viewed diagonally. (i.e. Roadway Profile.)
XSEC TEXT – EL. HORIZONTAL	Annotate Cross Section	Evaluation ► Cross Section ► Annotate Cross Section ► Preferences	Used for the annotation of proposed elevations in which the text must be viewed horizontally. (i.e. Roadway Ditches.)

Preference Name	Dialog Name	Dialog Location	Description
XSEC TEXT – EL. VERTICAL	Annotate Cross Section	Evaluation ► Cross Section ► Annotate Cross Section ► Preferences	Used for the annotation of proposed elevations in which the text must be viewed vertically.
XSEC TEXT - OFFSET	Annotate Cross Section	Evaluation ► Cross Section ► Annotate Cross Section ► Preferences	User for the annotation of offset distances as measured from the centerline. (i.e. Slopestakes/Construction Limits.)
XSEC TEXT – OFFSET/EL. VERTICAL	Annotate Cross Section	Evaluation ► Cross Section ► Annotate Cross Section ► Preferences	Used for the annotation of offset distances as measured from the centerline. The elevation at the offset is also placed. This form of annotation is not required on the final Cross Section plans. It is provided to be used 'as desired' during the design process.
XSEC TEXT – SLOPES %	Annotate Cross Section	Evaluation ► Cross Section ► Annotate Cross Section ► Preferences	Used for the annotation of slopes that require a percentage be used rather than a ratio (i.e. Pavement Cross Slopes).
XSEC TEXT – SLOPES x:y	Annotate Cross Section	Evaluation ► Cross Section ► Annotate Cross Section ► Preferences	Used for the annotation of slopes that require a ratio be used rather than a percentage (i.e. Ditch Slopes, Front Slopes, Back Slopes, etc.).

2.7 GDOT Standard InRoads Photogrammetric Feature Codes

The following spreadsheet contains the standard **Numeric AMSA Codes** and the associated **InRoads Alpha Codes** for use in Photogrammetry. The **Triangulate (Yes/No)** column is for informational use only. This column denotes the status of the Alpha Code and lists whether it is triangulated or not triangulated in the DTM Surface.

GDOT STANDARD PHOTOGRAMMETRY CODES

AMSA Code	Description	InRoads Alpha Code	Triangulate (Yes/No)
1	TERRAIN POINT ON BREAK LINE	TPBL	Y
2	RANDOM TERRAIN POINT	TRP	Y
27	EDGE OF ASPHALT PAVEMENT	TEAP	Y
28	EDGE OF ASPHALT SHOULDER	TEAS	Y
33	CURB & GUTTER, TOP	TCGT	Y
34	CURB & GUTTER, F/L	TCGF	Y
35	V-GUTTER	TVG	Y
57	DRAINAGE OBSCURE AREA	DOBSC	Y
96	WALL FACE, TOP	TWFT	Y
97	WALL FACE, BOTTOM	TWFB	Y
127	LIMIT LINE	TLIML	N
128	CONSTRUCTION BOUNDARY, ACTV	TCBA	Y
150	JOB LIMIT LINE	MJLL	N
151	DITCH FLOW LINE	MDITCHFL	Y
155	TOP OF RAIL ROAD RAIL	TRCRE	Y
157	SEW LINE	MSEWLINE	Y
159	OBSCURE AREA	MOBSC	Y

2.8 GDOT Standard InRoads Field Survey Feature Codes

The following spreadsheet is for informational use only so that the Designer will have a reference for the Field Survey Feature Codes if needed. The spreadsheet contains the standard **Numeric SMI Codes** and the associated **InRoads Alpha Codes** for use in Field Survey. The InRoads Feature Style is depicted for use by Survey Data Engineers and Designers. The **Point Type and Chain Type Triangulate (Yes/No)** column(s) are for informational use only. This column denotes the status of the Alpha Code and lists whether it is triangulated or not triangulated in the DTM Surface and whether it is a Point Type or a Chain Type.

SMI Code	Description	InRoads Alpha Code	InRoads Feature Style	Point Type Triangulate (Y/N)	Chain Type Triangulate (Y/N)	Group Code
Ground Elevations						
1	TERRAIN POINT ON BREAK LINE	TPBL	TOPO_E_TPBL		Y	4
2	RANDOM TERRAIN POINT	TRP	TOPO_E_TRP	Y		2
Property and Right-of-Way						
3	RIGHT-OF-WAY MARKER FOUND	RWM	PROP_E_RWM	N		1
4	RIGHT-OF-WAY POINT COMPUTED	RWC	PROP_E_RWC	N		1
5	RIGHT-OF-WAY UTILITY COMPANY	RWU	PROP_E_RWU	N		1
6	RIGHT-OF-WAY PRESCRIPTION PT	RWE	PROP_E_RWE		N	3
7	POINT ON EASEMENT LINE	POEL	PROP_E_POEL	N		1
8	PROPERTY CORNER FOUND	PCF	PROP_E_PCF	N		1
9	PROPERTY POINT ON LINE	PPOL	PROP_E_PPOL	N		1
10	PROPERTY POINT COMPUTED	PPC	PROP_E_PPC	N		1
Alignment						
15	POINT ON TANGENT, EXISTING	APOT	PROP_E_APOT	N		1
16	POINT OF CURVATURE, EXISTING	APC	PROP_E_APC	N		1
17	POINT ON CURVE, EXISTING	APOC	PROP_E_APOC	N		1
18	POINT OF TANGENCY, EXISTING	APT	PROP_E_APT	N		1
19	POINT OF INTERSECTION	API	PROP_E_API	N		1
20	ALIGNMENT CENTERLINE	ACL	PROP_E_ACL		N	3

SMI Code	Description	InRoads Alpha Code	InRoads Feature Style	Point Type Triangulate (Y/N)	Chain Type Triangulate (Y/N)	Group Code
Roadways						
24	EDGE OF DIRT ROAD	TEDR	TOPO_E_TEDR		Y	4
25	EDGE OF ASPHALT DRIVE	TEAD	TOPO_E_TEAD		Y	4
26	EDGE OF CONCRETE DRIVE	TECD	TOPO_E_TECD		Y	4
27	EDGE OF ASPHALT PAVEMENT	TEAP	TOPO_E_TEAP		Y	4
28	EDGE OF ASPHALT SHOULDER	TEAS	TOPO_E_TEAS		Y	4
29	EDGE OF CONCRETE PAVEMENT	TECP	TOPO_E_TECP		Y	4
30	EDGE SURFACE TREATMENT ROAD	TEST	TOPO_E_TEST		Y	4
31	CURB, ASPHALT	TAC	TOPO_E_TAC		Y	4
32	CURB, HEADER	THC	TOPO_E_THC		Y	4
33	CURB & GUTTER, TOP	TCGT	TOPO_E_TCGT		Y	4
34	CURB & GUTTER, F/L	TCGF	TOPO_E_TCGF		Y	4
35	V-GUTTER	TVG	TOPO_E_TVG		Y	4
36	BRIDGE APPROACH SLAB, EDGE	TBAS	TOPO_E_TBAS		Y	4
37	BRIDGE END, CENTER	TBRDGCEN	TOPO_E_TBRDGCEN		N	4
38	BRIDGE END, CORNER	TBRDGCOR	TOPO_E_TBRDGCOR		N	4
39	BRIDGE COLUMN, CENTER	TCOLC	TOPO_E_TCOLC	N		1
40	BRIDGE COLUMN, EDGE	TCOLE	TOPO_E_TCOLE	N		1
41	BRIDGE GUTTER LINE	TBGL	TOPO_E_TBGL		N	4
42	BRIDGE CENTERLINE	TBCL	TOPO_E_TBCL		N	4
43	ENDROLL	TENDROLL	TOPO_E_TENDROLL		Y	4
44	BRIDGE CAP	TBCAP	TOPO_E_TBCAP	N		2

SMI Code	Description	InRoads Alpha Code	InRoads Feature Style	Point Type Triangulate (Y/N)	Chain Type Triangulate (Y/N)	Group Code
Drainage						
45	SINGLE CATCH BASIN, Gutr F/L	DCB	TOPO_E_DCB	N		2
47	DOUBLE CATCH BASIN, Gutr F/L	DDCB	TOPO_E_DDCB	N		2
49	DROP INLET, TOP	DDI	TOPO_E_DDI	N		2
50	SPUR DIKE	DSPURDK	TOPO_E_DSPURDK		Y	4
51	TOP OF WATER ELEVATION	DWE	TOPO_E_DWE	N		2
52	STREAM CENTER, F/L	DSC	TOPO_E_DSC		Y	4
53	STREAM EDGE	DSE	TOPO_E_DSE		Y	4
54	STREAM BANK TOP	DSB	TOPO_E_DSB		Y	4
55	DAM, TOP	DDT	TOPO_E_DDT		Y	4
56	DAM, TOE	DADB	TOPO_E_DADB		Y	4
57	OBSCURED AREA	DOBSC	TOPO_E_DOBSC		Y	4
59	HEAD WALL, END	DHWE	TOPO_E_DHWE		N	3
60	CULVERT, WINGWALL END	DCWE	TOPO_E_DCWE		N	3
61	EDGE OF WATER	DEW	TOPO_E_DEW		N	3
62	SWAMP EDGE	DSWE	TOPO_E_DSWE		N	3
63	WETLAND BOUNDARY	DWB	TOPO_E_DWB		N	3

SMI Code	Description	InRoads Alpha Code	InRoads Feature Style	Point Type Triangulate (Y/N)	Chain Type Triangulate (Y/N)	Group Code
Utilities						
68	STRAIN POLE	USTRPOL	TOPO_E_USTRPOL	N		1
69	ELECTRICAL BOX	UELBOX	TOPO_E_UELBOX		N	3
70	OVERHEAD ELECTRICAL LINE	UOEL	TOPO_E_UOEL		N	3
71	OVERHEAD TELEPHONE LINE	UOTL	TOPO_E_UOTL		N	3
72	POWER POLE, CENTER	UPP	TOPO_E_UPP	N		1
73	LIGHT POLE, CENTER	ULP	TOPO_E_ULP	N		1
74	TELEPHONE POLE, CENTER	UTP	TOPO_E_UTP	N		1
75	TELEPHONE PEDESTAL, CENTER	UTPD	TOPO_E_UTPD	N		1
76	GUY POLE, CENTER	UGP	TOPO_E_UGP	N		1
77	POLE ANCHOR	UPGA	TOPO_E_UPGA	N		1
78	YARD LIGHT, ELECTRICAL	UYLE	TOPO_E_UYLE	N		1
79	YARD LIGHT, GAS	UYLG	TOPO_E_UYLG	N		1
80	WATER METER, CENTER	UWM	TOPO_E_UWM	N		1
81	WATER VALVE	UWV	TOPO_E_UWV	N		1
82	FIRE HYDRANT, CENTER	UFH	TOPO_E_UFH	N		1
83	MANHOLE STORM SEWER, TOP	UMHST	TOPO_E_UMHST	N		2
84	MANHOLE STORM SEWER, F/L	UMHSTF	TOPO_E_UMHSTF	N		2
85	MANHOLE, TELEPHONE, TOP	UMHT	TOPO_E_UMHT	N		2
86	MANHOLE, ELECTRICAL, TOP	UMHE	TOPO_E_UMHE	N		2
87	MANHOLE, SANITARY SEWER, TOP	UMHSS	TOPO_E_UMHSS	N		2
88	MANHOLE, SANITARY SEWER, F/L	UMHSSF	TOPO_E_UMHSSF	N		2
89	SANITARY SEWER LINE, CENTER	USSL	TOPO_E_USSL	N		1
90	GAS METER, CENTER	UGM	TOPO_E_UGM	N		1
91	GAS VALVE, CENTER	UNGV	TOPO_E_UNGV	N		1

SMI Code	Description	InRoads Alpha Code	InRoads Feature Style	Point Type Triangulate (Y/N)	Chain Type Triangulate (Y/N)	Group Code
Utilities						
92	GAS VENT PIPE	UNGVP	TOPO_E_UNGVP	N		1
93	GAS LINE MARKER	UNGLM	TOPO_E_UNGLM	N		1
General Topo						
95	WALL FACE	TWF	TOPO_E_TWF		N	3
96	WALL FACE, TOP	TWFT	TOPO_E_TWFT		Y	4
97	WALL FACE, BOTTOM	TWFB	TOPO_E_TWFB		Y	4
98	IRRIGATION PIVOT POINT	TIRRPVTP	TOPO_E_TIRRPVTP	N		1
99	IRRIGATION LIMITS	TIRRLMT	TOPO_E_TIRRLMT	N		1
100	SIGN, CENTER	TSC	TOPO_E_TSC	N		1
101	GASOLINE MONITORING WELL	TGMW	TOPO_E_TGMW	N		1
102	GASOLINE FILLER VALVE	TGFV	TOPO_E_TGFV	N		1
103	GASOLINE VENT PIPE	TGVP	TOPO_E_TGVP	N		1
104	GASOLINE PUMP	TGP	TOPO_E_TGP	N		1
105	GASOLINE STORAGE TANK, END	TGST	TOPO_E_TGST		N	3
106	GASOLINE PUMP ISLAND	TGPI	TOPO_E_TGPI		N	3
107	CANPOY	TCAN	TOPO_E_TCAN		N	3
108	BUILDING CORNER	TBLD	TOPO_E_TBLD		N	3
109	BUILDING ROOF LINE CORNER	TBLDRL	TOPO_E_TBLDRL		N	3
110	HOUSE CORNER	THCR	TOPO_E_THCR		N	3
111	HOUSE ROOF LINE CORNER	THRL	TOPO_E_THRL		N	3
112	MOBILE HOME CORNER	TMHCR	TOPO_E_TMHCR		N	3
113	MOBILE HOME ROOF LINE CORNER	TMHRL	TOPO_E_TMHRL		N	3
115	WOODS LINE	TWL	TOPO_E_TWL		N	3

SMI Code	Description	InRoads Alpha Code	InRoads Feature Style	Point Type Triangulate (Y/N)	Chain Type Triangulate (Y/N)	Group Code
General Topo						
116	CULTIVATION LINE	TCUL	TOPO_E_TCUL		N	3
117	FENCE, FIELD WIRE	TFFW	TOPO_E_TFFW		N	3
118	FENCE, BARB WIRE	TFBW	TOPO_E_TFBW		N	3
119	FENCE, WOOD	TFW	TOPO_E_TFW		N	3
120	RAILROAD, TOP OF RAIL	TRCR	TOPO_E_TRCR		N	4
121	RAILROAD, CENTERLINE	TRCL	TOPO_E_TRCL		N	3
122	CEMETERY LINE	TCEM	TOPO_E_TCEM		N	3
123	GRAVE	TGRV	TOPO_E_TGRV		N	3
124	GUARDRAIL	TGR	TOPO_E_TGR		N	3
125	SIGN, END	TSE	TOPO_E_TSE		N	3
126	SATELLITE DISH	TSATDSH	TOPO_E_TSATDSH	N		1
127	LIMIT LINE	TLIML	TOPO_E_TLIML		Y	4
128	CONSTRUCTION BOUNDARY, ACTV	TCBA	TOPO_E_TCBA		Y	4
129	CONSTRUCTION BOUNDARY, FIND	TCBF	TOPO_E_TCBF		Y	4
Boundaries						
130	COUNTY LINE	BCOL	PROP_E_BCOL		N	3
131	CITY LIMIT LINE	BCTL	PROP_E_BCTL		N	3
132	LAND DISTRICT LINE	BLDL	PROP_E_BLDL		N	3
133	LAND LOT LINE	BLLL	PROP_E_BLLL		N	3
134	STATE LINE	BSL	PROP_E_BSL		N	3

SMI Code	Description	InRoads Alpha Code	InRoads Feature Style	Point Type Triangulate (Y/N)	Chain Type Triangulate (Y/N)	Group Code
New Codes						
**152	HIGH WATER MARK	DHWM	TOPO_E_DHWM	N		2
**153	FLOOR ELEVATION	TFE	TOPO_E_TFE	N		2
**154	EDGE OF DIRT DRIVE	TEDD	TOPO_E_TEDD		Y	4
**156	GATE	TG	TOPO_E_TG		N	3
**158	UNCOVERED DECK	TUD	TOPO_E_TUD		N	3
160	MAP CHECK GROUND	MPCKGRD	TOPO_E_MPCKGRD	N		2
161	MAP CHECK PAVEMENT	MPCKPAV	TOPO_E_MPCKPAV	N		2
**162	VINYL (PVC) FENCE	TVF	TOPO_E_TVF		N	3
**163	FUEL TANK	TFT	TOPO_E_TFT		N	3
**164	PAVE DITCH	DPD	TOPO_E_DPD		Y	4
**165	BRICK COLUMN	TBC	TOPO_E_TBC		N	3
**166	SEPTIC TANK CENTER	DSTC	TOPO_E_DSTC	N		1
**167	STEPS	TS	TOPO_E_TS		N	3
**168	HISTORICAL MONUMENT	THM	TOPO_E_THM		N	3
**169	FLAG POLE	TFP	TOPO_E_TFP	N		1
**170	DRAIN LINES	DDL	TOPO_E_DDL		N	3
Surveyor Defined						
171	Surveyor Defined Value	XXA	TOPO_E_XXA		Y	4
172	Surveyor Defined Value	XXB	TOPO_E_XXB		Y	4
173	Surveyor Defined Value	XXC	TOPO_E_XXC		Y	4
174	Surveyor Defined Value	XXD	TOPO_E_XXD		Y	4
175	Surveyor Defined Value	XXE	TOPO_E_XXE		Y	4
176	Surveyor Defined Value	XXF	TOPO_E_XXF		Y	4
177	Surveyor Defined Value	XXG	TOPO_E_XXG		Y	4
178	Surveyor Defined Value	XXH	TOPO_E_XXH		N	3
179	Surveyor Defined Value	XXI	TOPO_E_XXI		N	3

SMI Code	Description	InRoads Alpha Code	InRoads Feature Style	Point Type Triangulate (Y/N)	Chain Type Triangulate (Y/N)	Group Code
Surveyor Defined						
180	Surveyor Defined Value	XXJ	TOPO_E_XXJ		N	3
181	Surveyor Defined Value	XXK	TOPO_E_XXK		N	3
182	Surveyor Defined Value	XXL	TOPO_E_XXL		N	3
183	Surveyor Defined Value	XXM	TOPO_E_XXM		N	3
184	Surveyor Defined Value	XXN	TOPO_E_XXN		N	3
185	Surveyor Defined Value	XXO	TOPO_E_XXO	Y		2
186	Surveyor Defined Value	XXP	TOPO_E_XXP	Y		2
187	Surveyor Defined Value	XXQ	TOPO_E_XXQ	Y		2
188	Surveyor Defined Value	XXR	TOPO_E_XXR	Y		2
189	Surveyor Defined Value	XXS	TOPO_E_XXS	Y		2
190	Surveyor Defined Value	XXT	TOPO_E_XXT	Y		2
191	Surveyor Defined Value	XXU	TOPO_E_XXU	Y		2
192	Surveyor Defined Value	XXV	TOPO_E_XXV	N		1
193	Surveyor Defined Value	XXW	TOPO_E_XXW	N		1
194	Surveyor Defined Value	XXX	TOPO_E_XXX	N		1
195	Surveyor Defined Value	XXY	TOPO_E_XXY	N		1
196	Surveyor Defined Value	XXZ	TOPO_E_XXZ	N		1
197	Surveyor Defined Value	XXZA	TOPO_E_XXZA	N		1
198	Surveyor Defined Value	XXZB	TOPO_E_XXZB	N		1
199	Surveyor Defined Value	XXZC	TOPO_E_XXZC	N		1

SMI Code	Description	InRoads Alpha Code	InRoads Feature Style	Point Type Triangulate (Y/N)	Chain Type Triangulate (Y/N)	Group Code
Dimension Codes: (Drainage)						
200	DRAINAGE PIPE, F/L, C	DPC	TOPO_E_DPC		N	4
201	DRAINAGE PIPE, F/L, M	DPM	TOPO_E_DPM		N	4
202	DRAINAGE PIPE, F/L, P	DPP	TOPO_E_DPP		N	4
**203	CULVERT END, F/L	DCEF	TOPO_E_DCEF		N	4
Dimension Codes (General Topo)						
210	SIDEWALK, CENTER	TSW	TOPO_E_TSW		N	3
211	FENCE, CHAIN LINK	TFCL	TOPO_E_TFCL		N	3
212	TREE, CENTER	TTRE	TOPO_E_TTRE	N		1
213	WELL	TWELL	TOPO_E_TWELL	N		1
Dimension Codes (Roadway)						
225	DIRT ROAD, C/L	TDR	TOPO_E_TDR		N	3
227	DIRT DRIVE, C/L	TDD	TOPO_E_TDD		N	3
235	MILE POST, RAILROAD	TMPR	TOPO_E_TMPR	N		1
236	KM POST, HIGHWAY	TKMP	TOPO_E_TKMP	N		1
237	MILE POST, HIGHWAY	TMPH	TOPO_E_TMPH	N		1
Survey control						
240	NGS CONTROL MONUMENT	SNGSCM	TOPO_E_SNGSCM	N		2
241	LOCATION CONTROL MONUMENT	SLCM	TOPO_E_SLCM	N		2
242	LOCATION CONTROL DELTA	SLCD	TOPO_E_SLCD	N		2
243	DISTRICT CONTROL DELTA	SDCD	TOPO_E_SDCD	N		2
244	CONTROL RE-SHOT FOR CHECK	SCCHK	TOPO_E_SCCHK	N		2
245	BENCHMARK	SBNCHMK	TOPO_E_SBNCHMK	N		2
250	MISCELLANEOUS	MISC	TOPO_E_MISC	N		2

****SMI # = For InRoads Use Only! Do NOT use in CAiCE.**

SMI Codes For InRoads

User Defined Codes

171-177 Group Code 4
178-184 Group Code 3
185-191 Group Code 2
192-199 Group Code 1

Group Codes

Code 1 2-D Point
Code 2 3-D Point
Code 3 2-D Chain
Code 4 3-D Chain

2.9 GDOT Photogrammetry Conversion Table -- CAiCE to InRoads

Several AMSA Feature Codes have been consolidated and/or updated to correspond to the InRoads Software Standards. The following spreadsheet contains the Photogrammetry Code Conversion Table which depicts the “old” CAiCE AMSA Code along with the “new” associated InRoads AMSA Code. **This table is for reference only ---**

Old AMSA Feature Code	Old CAiCE Feature Code	Converted >>>	New AMSA Feature Code	InRoads Alpha Code
150	BORDER	⇒	150	MJLL
151	DITCH	⇒	151	MDITCHFL
152	EPSHLD	⇒	27	TEAP
153	EP	⇒	28	TEAS
154	TOC	⇒	33	TCGT
155	BOC	⇒	34	TCGF
156	CL	⇒	1	TPBL
157	CLIP	⇒	157	MSEWLINE
158	RANDOM	⇒	2	TRP
159	OBSC	⇒	159	MOBSC
160	LAKE	⇒	159	MOBSC
161	RRCL	⇒	155	TRCRE
162	RIVERED	⇒	159	MOBSC
163	TOWALL	⇒	96	TWFT
164	BOWALL	⇒	97	TWFB
165	BREAKLIN	⇒	1	TPBL
166	CONSTRB	⇒	128	TCBA
5	PAVEROAD	⇒	27	TEAP
6	PAVESHLD	⇒	28	TEAS
8	CURBROAD	⇒	33	TCGT
35	CURBPARK	⇒	33	TCGT
43	DITCH	⇒	151	MDITCHFL
63	PVDDRAIN	⇒	35	TVG
241	TOC	⇒	33	TCGT
242	BOC	⇒	34	TCGF
243	BREAKLIN	⇒	1	TPBL
244	DEADIN	⇒	57	DOBSC
245	RANDOM	⇒	2	TRP
246	BORDER	⇒	127	TLIML

Surface and Property Data Information

3. Surface and Property Data Information

This section provides a brief overview of the requirements for the GDOT standard DTM Surface and Property Data generation.

This section covers the following topics:

- DTM Surface Information
- Property Data Information

3.1 DTM Surface Information

In order to generate DTM Surfaces to GDOT standard conventions – the following Surface information should be adhered and followed.

- a) The DTM Surface will contain all Surface data which is not property or alignment related (both triangulated and non-triangulated data). All Property Data, Existing Right of Way, Alignment Data, etc. will not be available in the DTM. The Geometry data will only be available in the Geometry Project (.ALG).
- b) Never save Surface Data to the “Default” Surface listed in the InRoads Explorer. Always create a new empty Surface to import the data and name the surface using the naming schemes depicted in the *Introduction to InRoads for Survey Data Processing Training Guide*. See also **Chapter 2 - Table 2.2** (Standard Naming Conventions listed in this document) for the standard Processed DTM and Intermediate DTM naming schemes.
- c) The Maximum Length of Surface triangles will be **300.00** feet in order to correspond to current GDOT DTM standards. This setting can be entered in the **Triangulate Surface** dialog box in InRoads.
- d) In order to view ALL Surface Feature Data – ensure the Feature Filter Lock is turned OFF. To accomplish this - remove the check mark from **Tools ► Locks ► Feature Filter** in InRoads. In order to view filtered Surface Feature Data – ensure the Feature Filter Lock is turned ON.
- e) During the processing of survey data, situations can occur where breaklines may overlap or breaklines may cross at mismatched elevations. If these segment crossings are not resolved, erroneous point and breakline data may affect the triangulation and accuracy of the DTM (Digital Terrain Model). These crossings need to be addressed and resolved prior to the final creation of the DTM Surface to ensure that an accurate Surface Model is generated.
- f) When using the **View Crossing Segments** command -- crossing segment points are represented by a **Yellow X**. Mismatched elevations are represented by a **Red O**. There are two main types of crossing segments: overlaps and mismatched elevations.
- g) When using the InRoads **Resolve Crossing Segments** command, the default delta tolerance for elevation differences (mismatched elevations) is 0.020. This is considered the standard GDOT default tolerance. Any mismatched elevations with a 0.020 tolerance or less are considered to be of minimum significance. Any mismatched elevations greater than a Delta Tolerance of 0.020 should be manually evaluated and resolved by using the InRoads **Edit Surface** Tools.

- h) An Exterior Boundary (a Limit Line with Feature Style of **TOPO_E_TLIML**) will be created to represent the bounds of the field data. This Exterior Boundary is also used in the trimming of extraneous triangles from the DTM Surface. During the creation of a DTM Surface, extraneous triangles (erroneous triangle data) will be generated which does not represent actual Surface data. A common situation where this occurs is at “T Intersections”. In order to remove these triangles (which represent inaccurate data) an Exterior Boundary is required.
- i) Verify that the DTM Surface contains no erroneous “Spikes” (errors in elevation or discontinuities of Features).
- j) Exterior Boundary Requirements:
- InRoads has a requirement that only **ONE Exterior Boundary** may be present in a DTM Surface Project.
 - The Exterior Boundary must be one continuous complex shape.
 - Ensure that the Exterior Boundary is a closed shape entity.
 - The Existing Feature Points on the exterior Boundary must be located on the Existing Surface in order for the Boundary to trim triangles correctly.
 - If there are Obscured Areas on the outside of the Surface data – the Exterior Boundary must not include these areas inside of the Exterior Boundary.
 - Interior Obscured Areas can be included inside the Exterior Boundary.
 - Verify that all extraneous triangles are trimmed
- k) Exterior Boundary Naming Conventions:
- For Mapping Projects – the Exterior Boundary Feature Name should be named **MBOUNDARY** and have the Feature Style of **TOPO_E_TLIML**.
 - For Full Field Survey Projects – the Exterior Boundary Feature Name should be named **XBOUNDARY** and have the Feature Style of **TOPO_E_TLIML**.
- l) Interior Boundary (Obscured Area) Requirements:
- InRoads may contain numerous **Interior Boundaries** (Obscured Areas) in a DTM Project.
 - The Interior Boundary must be one continuous complex shape.
 - Verify that all Interior Boundaries are closed shape entities
- m) Interior Boundary Naming Conventions:
- For Mapping Projects – the Interior Boundary Feature Name will be named the default name that is imported from the AMSA file and have the Feature Style of **TOPO_E_MOBSC**.
 - For Full Field Survey Projects – the Interior Boundary Feature Name will be named the default name that is imported from the ASC file and have the Feature Style of **TOPO_E_DOBSC**.

- n) Review the DTM Surface to ensure that there are no erroneous or “bad” data included in the DTM. This review will determine if there are any elevations that are incorrect or bad shots that were picked up. The DTM will be reviewed in a 3D environment as a “shaded model” to assist in the resolutions of any “spikes” or erroneous data.
- o) When viewing the DTM triangles and the MBOUNDARY and/or XBOUNDARY (the Topo Limit Line) at the same time – please be aware that if you use this combination and view the DTM as “Smooth” instead of “WireFrame” --- the Triangles will be intermixed with the color of white and green and will appear as a mottled color. If you view the DTM triangles in the “Smooth” mode – it is best NOT to view the MBOUNDARY at the same time. This will allow the triangles to view as the Existing Green color.
- p) The **PI#_SDE.dtm** is a “working surface” for the use of Survey Data Engineers. After submission to the Designer(s) – the Designer will re-name the surface to **123456_Exist.dtm**. The procedure of re-naming the Surface will be the responsibility of the Designer and will be described in the Design Guidelines and Tutorials.
- q) The **FWD File (Survey File)** will not be submitted to the Designer. The information contained in this file will be merged into the Surface (DTM) or applicable Geometry (ALG) files and will also be represented in the **PI#_TOPO, PI#_UTLE** and **PI#_PROP** DGN files.
- r) The SDE will submit the **PI#_SDE.dtm (Surface File), PI#_SDE.alg** (Geometry File), **PI#_TOPO.dgn, PI#_UTLE.dgn** and **PI#_PROP.dgn** files to the **Engineering Management / Operations Manager**. These Files will then be submitted to the Design Engineer.

3.2 Property Data Information

In order to generate and store Property Data and Existing Right of Way to GDOT standard conventions – the following Property information should be adhered and followed.

- **InRoads Property Information**

- a) Point Prefixes shall not be utilized by the Surveyor/SDE when storing points in InRoads. The Surveyor/SDE shall work in the point range of 1-9999. This is to eliminate problems with enhancements during the life of the project. If points beyond 9999 are needed, the SDE shall contact the Designer and request a range of points be set aside for the SDE to work in that the Designer will not use.
- b) All Alignments (for Parcels, Existing Centerlines, Existing R/W, etc.) stored in InRoads will have an **SV** Prefix pre-pended to the Alignment Name.
- c) **Important Point Information:** InRoads has different kinds of points. Alignment Points and COGO Points are two types of points to be aware of when working with alignments--- (whether it is a centerline alignment, a R/W alignment or a property alignment). Alignment points are nothing more than names assigned to coordinates in an alignment and do not exist in the COGO points buffer. In order to satisfy GDOT plan presentation requirements and prepare R/W tables and properly deliver enhanced survey data to the Designer -- Surveyors and Designers alike must ensure that all alignments have a corresponding COGO point stored. Some InRoads commands only assign Alignment Point names and must be converted to COGO points. Some don't assign alignment point names or store COGO points and must be assigned Alignment point names and then be converted to COGO points. As such we recommend that you adhere closely to the methods presented in the tutorials concerning centerlines, R/W and property.
- d) All Alignment Points must be converted to COGO Points in the InRoads Geometry Project. (See previous bullet above).
- e) Ensure that only ONE coincident COGO point is located at shared property corners. If this is not done - there may be issues when storing proposed Right of Way Alignments and creating Right of Way tables. It also reduces plan clarity.
- f) **In InRoads all terminology for chains (whether it be Parcel Chains, Existing R/W Chains, or actual Existing Centerline Chains) are always referred to as "Alignments".**

- **Parcel Data**

- a) All parcels must be stored clockwise and the alignments must close (first and last point number must be the same). The alignment should be a graphic representation of all corners of the parcel as defined in the deed or plat. Property corners and lines which lie within the "right-of-way take" should be located by field survey if possible. If they cannot be found, their position should be computed from the deed or plat. The positions of corners which do not lie within the "right-of-way take" can be determined by digitizing from a plat or tax map, or by computation.
- b) The alignment for the parcel must contain sufficient information to accurately locate all curved property lines. The beginning and the ending point of each curve should be equated to a point number and those numbers must be included in the parcel alignment.
- c) The District shall provide the official area in acreage for each parcel in the **Property Statistic Report (.XLS)**. This area, which is to be taken from the deed or plat, is to be used by the Designer. The area which can be computed from the parcel chain is **not the official area** and therefore is **not** to be used in design. If acreage is not provided on the deed or plat, the District shall be responsible for computing this area from a legal description.
- d) If a parcel is split by the proposed right-of-way, or if existing access to the parcel is eliminated, all available access to a public roadway for the remaining parcel(s) should be identified by the surveyor or the Survey Data Engineer and a comment about this access should be added as an explanatory note in the **Property DGN File (PI#_PROP.DGN)** (i.e. "access to County Road #77" - shown at the appropriate place in the file).

e) The following information for each parcel shall be provided in a **Property Statistic Report (.XLS)** File. The filename and location shall be provided to the designer. **No** printout of this file should be submitted.

- Land District/Section Number.
- Land Lot Number.
- Georgia Militia District (GMD).
- Block Number.
- Tax Map Number.
- Tax Map Parcel Number.
- Parcel Chain Number (This will be the Alignment Number for the parcel).
- Area in acres (as recorded in the deed or plat).
- Book and Page Number of where the deed is recorded.
- Book and Page Number of where the Plat is recorded.
- Property Owner's Name and Address.

NOTE: Parcels not described by this system will be described by the legal description contained in the deed.

f) Explanatory notes (**Parcel Alignment Number, Prescription R/W, Easements, etc.**) should be added to the **Property DGN File (PI#_PROP.DGN)**. Additional text must have the correct attributes and level as indicated by the state-wide attributes and level conventions.

- **Right-of-Way (deeded/prescriptive) and Easement**

- a) The District shall provide all information about existing right-of-ways for public roadways (including railroads) located within the limits of the project.
- b) The right-of-way data shall be chained into alignments.
- c) The following procedures should be followed for surveying deeded Right-of-Way:
 - Locate the centerline alignment of the road that was used to describe the deeded right-of-way coordinating at least two (2) points on all tangents and three (3) points on all curves. It is very important to determine if any widening has taken place since the deed centerline was established. If widening was not symmetrical, use available field evidence to establish the deed centerline.
 - All existing right-of-way markers should be coordinated.
 - All existing property corners which will be used to determine the property take will be coordinated either by field survey or by computation from a deed or plat. All property points not directly impacting the "**take**" can be digitized from the deed, plat, or tax map.
 - The **Property DGN File (PI#_PROP.DGN)** provided by the District **must** contain a notation which states that the "right-of-way is claimed by prescription".

- d) The following procedures should be followed in developing the Property/Right-of-Way database for roads with deeded right-of-way:
- The alignment of the existing road should be determined by using the tangent and curve points from the field survey. Degrees of curves should be computed by using the field points, and then compared to old plans, and then an appropriate degree assigned to the curve.
 - The Department's right-of-way should then be set to correspond with this alignment.
 - At this point the differences between the Department's right-of-way and the existing right-of-way markers and property information should be evaluated. Major discrepancies should receive further investigation.
 - When the District creates an alignment from the field survey file, all corners and boundaries which conflict with the right-of-way should be projected or terminated to conform precisely with the deeded right-of-way.
 - The parcel alignment should contain the newly created points which conform to the right-of-way. The alignment should **not** include any property points that conflict with this right-of-way. These conflicting points should be retained in the data file as part of the project records.
 - All existing right-of-way markers which conflict with the true position of the right-of-way are not to be used in any alignments but are to be retained in the data files as part of the project records.

- e) The following procedures should be followed for surveying a public roadway that does **not** have a deeded right-of-way:
- The surveyor will notify the Preconstruction Engineer in writing that the roadway does not have a deeded right-of-way.
 - Locate the centerline alignment of the road by coordinating at least two (2) points on all tangents and three (3) points on all curves.
 - Coordinate the limits of the area along the roadway which is maintained by the Department or by the local government (**e.g., back of ditch to back of ditch**). This area may be claimed by prescription if it meets the legal requirements.
 - The surveyor is to document on a tax map, or other drawing, all areas for which the Department or a local government does not have deeded title.
- f) The following procedures should be followed in developing the Property/Right-of-Way database for roads with **no** deeded right-of-way:
- The District shall create property alignments from the field survey file that include all property corners (field located, computed or digitized) which identify parcels.
 - The District shall create alignments from the field survey file that reflect the right-of-way that is considered to have been acquired by prescription* (possession).
 - The property and right-of-way alignments shall show the conflicts between the property lines and these limits of the "claimed" (prescriptive) right-of-way.
 - The **Property DGN File (PI#_PROP.DGN)** provided by the District **must** contain a notation which states that the "right-of-way is claimed by prescription".

- g) Easement right-of-ways for utility companies should be surveyed and chained.
- h) Explanatory notes should be added to the **Property DGN File (PI#_PROP.DGN)**. The text must have the correct attributes and level as indicated by the statewide attributes and level conventions.

* Prescriptive R/W is acquired by long uninterrupted use (in GA usually 7 years).

- **Boundary Lines**

- a) The District should provide the following types of boundary lines:
 - State
 - County
 - City
 - Land Lot
 - Public Lands
- b) The boundary lines shall be chained.
- c) Explanatory notes should be added to the **Property DGN File (PI#_PROP.DGN)**. The text must have the correct attributes and level as indicated by the statewide attributes and level conventions.

Survey Data Project Deliverables



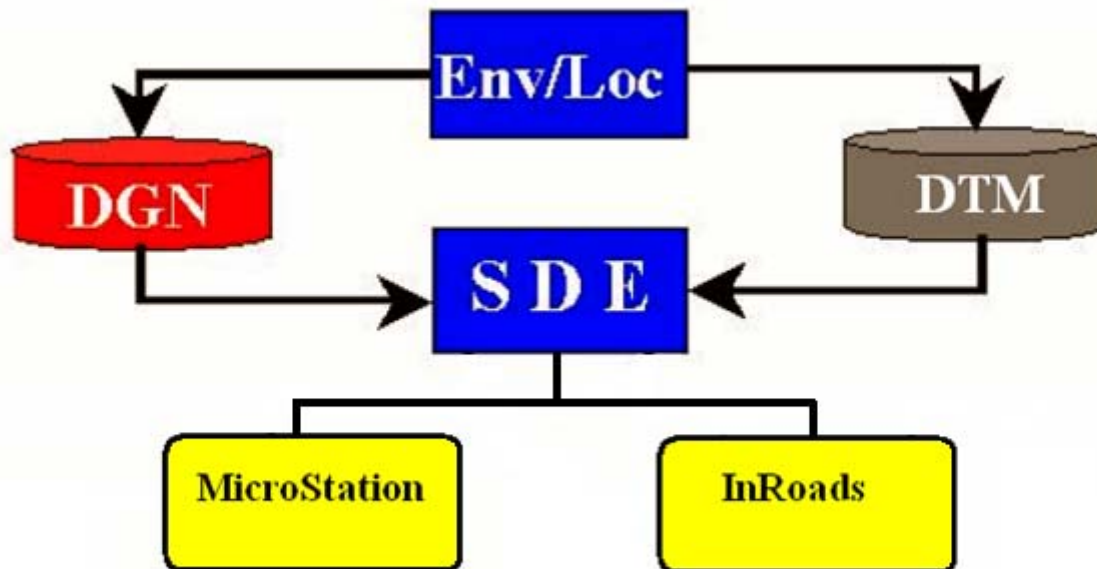
4. Survey Data Project Deliverables

This section provides an overview of the Survey Data Project Deliverables which will be submitted to the Office of Design Policy and Support/Location Bureau (**Engineering Management / Operations Manager**). This data will then be forwarded to the Designer.

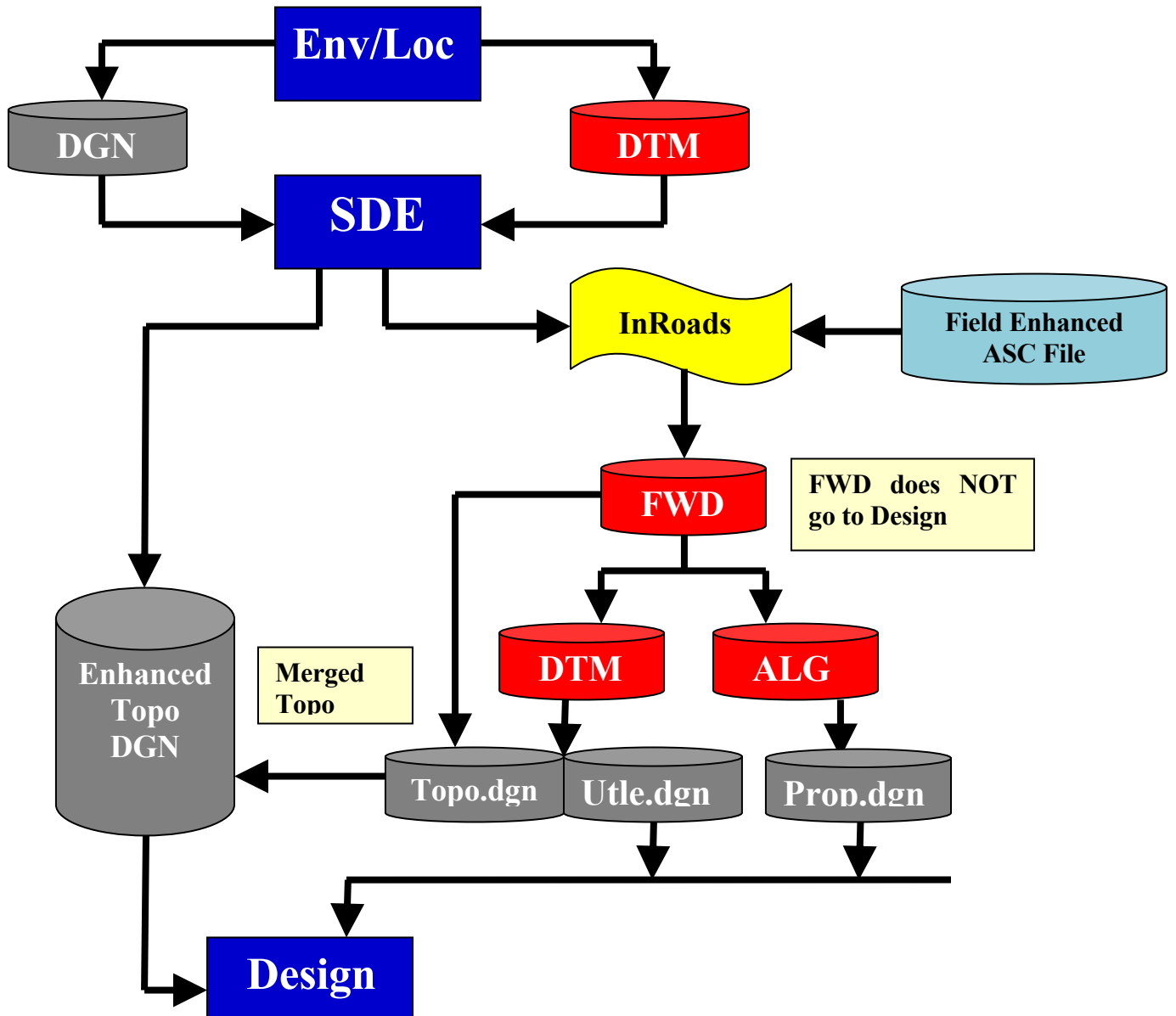
This section covers the following topics:

- Information on the Processing of Mapping and/or Full Field Survey Surface (DTM)
- Information on the Processing of the Geometry Project (ALG)
- Generation of the Topographical, Property and Utility DGN File(s)
- Listing of the SDE Project Deliverables

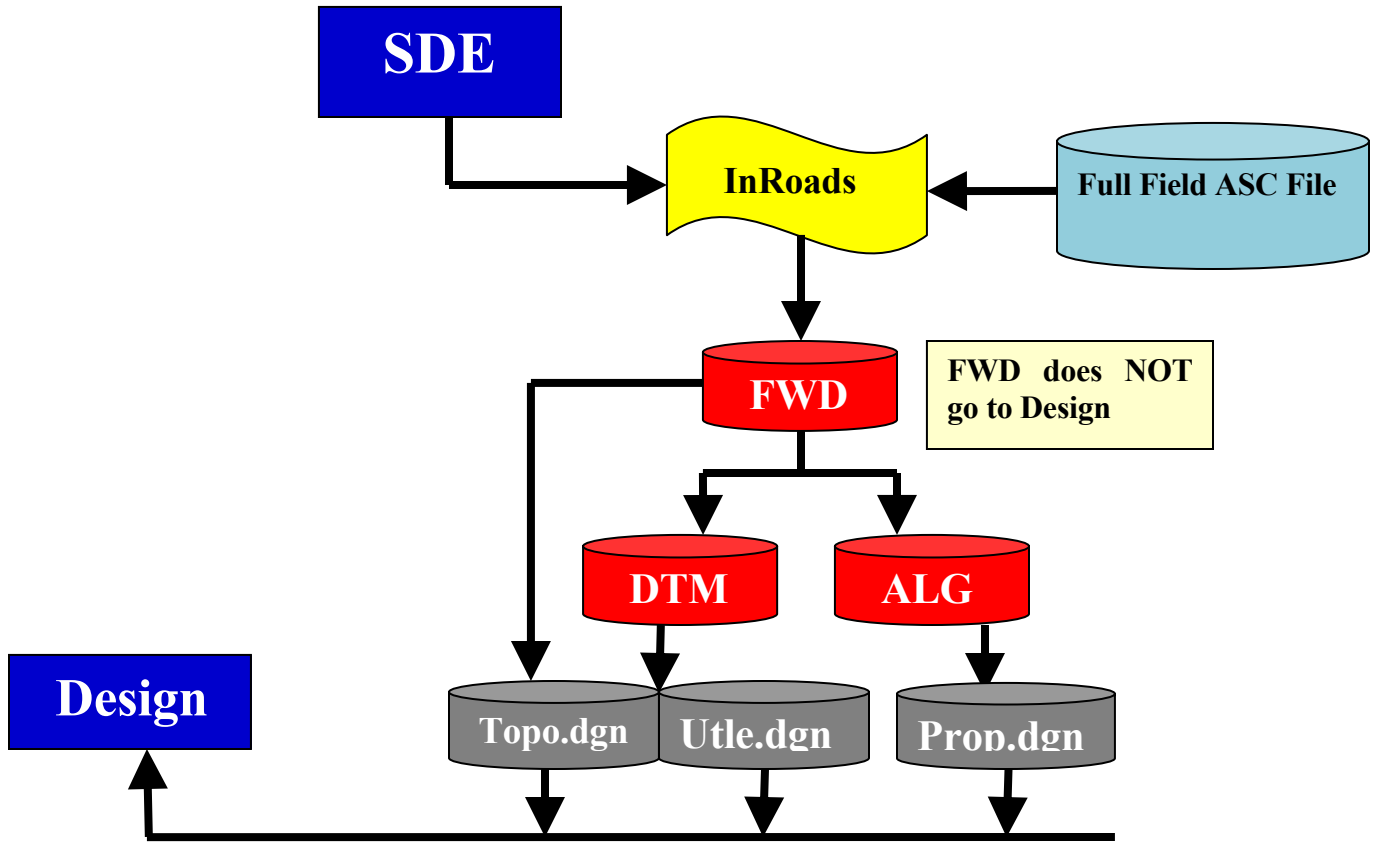
Mapping Process Overview



Mapping Enhancement Process



Full Field Survey Process



4.1 Processing of the Mapping and/or Full Field Survey Surface (DTM)

For detailed instructions regarding the generation and processing of the Survey Data and the creation of the DTM Surface – please refer to the “*Introduction to InRoads for Survey Data Processing*” Training Tutorial. Detailed information for the processing of the Survey Data for DTM Surfaces are listed and described in **Labs 1-9**.

Following are some Quality Assurance Verification Items to review in order to insure that an accurate DTM Model is created:

Survey Data:

- Make sure that all crossing segments and crossing overlaps are resolved
- Ensure that there is only one Exterior Boundary
- Verify that the Exterior Boundary Feature Style is XBOUNDARY for Full Field Survey and MBOUNDARY for Mapping Survey
- Ensure that the Exterior Boundary is a closed shape entity
- Verify that all Interior Boundaries are closed shape entities
- Check to ensure there are no erroneous (bad) point elevations
- Verify that Standard GDOT Naming Conventions and Feature Styles are used

DTM Surface Data:

- Make sure that the DTM is created using the “EXISTING” Preference
- Ensure that the Maximum Triangle Length of 300.00 is used.
- Verify that the DTM contains no erroneous “Spikes”
- Verify that all extraneous triangles are trimmed
- Ensure that all MOBSC Features (obscured areas) are obscured
- Make sure to compress the DTM Surface before submittal to the Designer

After the DTM Surface data has been verified and all errors corrected - the next step is the completion of the final processing of the DTM Surface. The DTM Surface will be re-triangulated and compressed (which will release memory slots that contain deleted data).

1. Save the InRoads Surface File

After re-triangulating and compressing the DTM Surface – the data will need to be saved. As mentioned previously, InRoads retains the data in temporary memory but does not save the data on the fly. Whenever a change has been made to an InRoads Surface Project – Save the project and its associated modifications or changes.

Select **File ► Save ► Surface** from the **InRoads Menu** and save to the following location:

C:\InRoads Data\PI#\SDE

Example - C:\InRoads Data\123456\SDE

Please Note: (The “Save As” dialog box may not appear because the Surface has already been saved initially).

2. **The PI#_SDE.dtm** Surface Project is now ready for submittal. This file will be sent to the Office of Design Policy and Support/Location Bureau (**Engineering Management / Operations Manager**). This data will then be forwarded to the Designer.

*This **.DTM** file replaces the CAiCE **.SRV** file format. The **.DTM** file contains all of the Features (random points, breaklines, border, obscured features, etc.) that used to be contained in the CAICE **.SRV** File.

4.2 Processing of the Geometry Project (.ALG)

For detailed instructions regarding the generation and processing of the Survey Data and the creation of the Geometry data and objects – please refer to the “*Introduction to InRoads for Survey Data Processing*” Training Tutorial. Detailed information for the processing of the Survey Data for Geometry Projects are listed and described in **Labs 10-15**.

Following are some Quality Assurance Verification Items to review in order to insure that an accurate Geometry Project is created:

Geometry Project:

- Point Prefixes shall not be utilized by the Surveyor/SDE when storing points in InRoads
- All Alignments (for Parcels, Existing Centerlines, Existing R/W, etc.) stored in InRoads will have an **SV** Prefix pre-pended to the Alignment Name
- The Surveyor/SDE shall work in the point range of 1-9999
- If points beyond 9999 are needed, the SDE shall contact the Designer and request a range of points be set aside for the SDE to work in that the Designer will not use.
- All Alignment Points **must be** converted to COGO Points in the InRoads Geometry Project.
- Ensure that only ONE coincident COGO point is located at shared property corners. If this is not done - there may be issues when storing proposed Right of Way Alignments and creating Right of Way Tables. It also reduces plan clarity.
- In InRoads all terminology for chains (whether it be Parcel Chains, Existing R/W Chains, or actual Existing Centerline Chains) are always referred to as “Alignments”.
- All parcels must be stored clockwise and the alignments must close (first and last point number must be the same).
- The beginning and the ending point of each curve should be equated to a point number and those numbers must be included in the parcel alignment.

When the **PI#_SDE.alg** Geometry Project is ready for submittal, the file will be sent to the Office of Design Policy and Support/Location Bureau (**Engineering Management / Operations Manager**). This data will then be forwarded to the Designer.

4.3 Generation of the Topographical, Property and Utility DGN File(s)

After the final processing of the DTM Surface and the generation of the Geometry Project (.ALG) - Topographical, Property and Utility DGN file(s) will be generated for submission to Design.

For detailed instructions regarding the generation and processing of these DGN files – please refer to the “*Introduction to InRoads for Survey Data Processing*” Training Tutorial. Detailed information for generating these DGN Files(s) are listed and described in **Labs 16-17**.

Table 4.1	
Standard DGN File Names	
Topographical DGN File Name	PI#_TOPO.dgn
Property DGN File Name	PI#_PROP.dgn
Utility DGN File Name	PI#_UTLE.dgn

Before submitting the DGN Files – perform the following steps in the [MicroStation Software] –

For each DGN File - “**Fit the Active View**” so that all the data appears in the MicroStation View Window.

1. Select **File ► Save As ►** from the [MicroStation Menu].

Save the DGN File (Example: *123456_TOPO.dgn*) to the path shown below -- under the folder **SDE** --

C:\InRoads Data\123456\SDE

2. In the [MicroStation Software] –

Select **File ► Compress ► Design** from the [MicroStation Menu].
(This will compress and reduce the size of the MicroStation file).

When all associated DGN files are ready, the **SDE** is instructed to contact the **Engineering Management / Operations Manager** and make copies available on **SDEcommon**. The **Engineering Management / Operations Manager** will keep all original copies and inform the designer where they may be acquired. The **SDE** is also instructed to obtain original copies from the **Engineering Management / Operations Manager** whenever enhancements are to be performed during the life of the project.

4.4 Listing of the SDE Project Deliverables

After the DTM Surface (.DTM) and Geometry Project (.ALG) have been processed and the DGN files have been created - the files will be sent to the Office of Design Policy and Support/Location Bureau (**Engineering Management / Operations Manager**). This data will then be forwarded to the Designer.

The Final Deliverables include the following:

- PI#_SDE.alg (InRoads Geometry file)
- PI#_SDE.dtm (InRoads Digital Terrain Model)
- PI#_TOPO.dgn (Existing Topo features)
- PI#_PROP.dgn (Existing Property Information)
- PI#_UTLE.dgn (Existing Utility features)
- PI#_PSR.xls or .psr or .mdb (Property Statistics Report)
- PI#_Misc.txt (Miscellaneous information SDE deems important. This file may not be included.)
- A Survey Data Processing Quality Assurance Checklist Document

PLEASE NOTE:

A **Survey Data Processing Quality Assurance Checklist** will be documented by the District SDE and/or Office of Design Policy and Support/Location Bureau and/or the Consultant Firm performing the Survey Data Processing work. This document lists several areas including the Survey Data, DTM Surface, Geometry Data and Final Deliverables which need to be verified before Project Submittal. This Document is a required Deliverable and will be submitted with the previously listed Deliverables.

The following page contains the example Survey Data Processing QA form which will be completed and submitted. The **Survey Data Processing Quality Assurance Checklist** is available for download from the following link:

[Link Location - TO BE DEVELOPED](#)

Georgia Department of Transportation



P.I. Number:	
County:	
Project Description:	
QA Reviewer:	
Phone Number:	

GDOT Survey Data Processing Quality Assurance Checklist

(Instructions: In the Verified Column pull down – enter YES, NO or N/A for the Verification QA Status)

CATEGORY	TASK	VERIFIED
Survey Data	All crossing segments and crossing overlaps are resolved	_____
	There is only one Exterior Boundary	_____
	The Exterior Boundary Feature Name is MBOUNDARY (for Mapping Projects)	_____
	The Exterior Boundary Feature Name is XBOUNDARY (for Full Field Projects)	_____
	The Exterior Boundary is a closed shape entity	_____
	All Interior Boundaries are closed shape entities	_____
	There are no erroneous (bad) point elevations	_____
	Standard GDOT Naming Conventions and Feature Styles used	_____
DTM Surface	The DTM is created using the “EXISTING” Preference	_____
	A Maximum Triangle Length of 300.00 is used	_____
	The DTM contains no erroneous ‘Spikes’	_____
	All extraneous triangles are trimmed	_____
	All MOBSC and/or DOBSC Features (obscured areas) are obscured	_____
	Compress the DTM Surface before Submittal to Design	_____
Geometry Project	All Alignments stored have the SV Prefix for the Alignment Name	_____
	All Survey Processing Points stored in InRoads have NO Prefix	_____
	All Alignment Points are converted to COGO points in the Geometry Project	_____
	All Parcels are stored clockwise and the alignments close	_____
	The beginning and ending point of each curve are equated to a point number	_____
	All Alignments in the Geometry Project contain Alignment Descriptions	_____
Final Deliverables	PI#_SDE.alg (InRoads Geometry file)	_____
	PI#_SDE.dtm (InRoads Digital Terrain Model)	_____
	PI#_TOPO.dgn, PI#_PROP.dgn, PI#_UTLE.dgn (DGN Files)	_____
	PI#_PSR.xls or .psr or .mdb (Property Statistics Report)	_____
	Survey Data Processing Quality Assurance Checklist	_____

Additional Survey Enhancements

5. Additional Survey Enhancements

During the life of a design project - Additional Survey Enhancements may need to be incorporated into the project and the new survey data re-submitted to the Designer in order for the Designer to update the design database. This section provides a brief summary of the processing/naming of Additional Survey Enhancements and the procedures to submit the processed data to the Designer.

- All location survey data and all requests for additional survey data should be submitted to the Engineering Management Section of the Office of Design Policy and Support/Location Bureau.

The processes for incorporating “Original” Enhancements to a Mapping Project are described in the “*Introduction to InRoads for Survey Data Processing*” Training Tutorial in **Labs 8-9**. These same methods and processes are also utilized for incorporating Additional Survey Enhancements in a project. The process for adding additional enhancements will utilize the same procedures (except for the FWD and DTM file naming conventions which adds different alpha character(s) for enhancement tracking purposes).

Depending on what type of enhancements are collected – the SDE will process the additional survey data and send the Designer the appropriate files as required. This could result in the SDE sending the Designer all of the updated files or just certain files depending on what data were collected. See examples below:

***For Example** – if only property enhancements were collected, then the SDE would send the Designer the new processed PI#_SDE.alg file and the associated enhanced data in the PI#_PROP.dgn file.

***For Example** – if only topographical enhancements were collected, then the SDE would send the Designer the new processed PI#_SDE.dtm file and the associated enhanced data in the PI#_TOPO.dgn file.

In most cases the following files (or a combination) of these files will be submitted to the Designer for use as Additional Survey Enhancements:

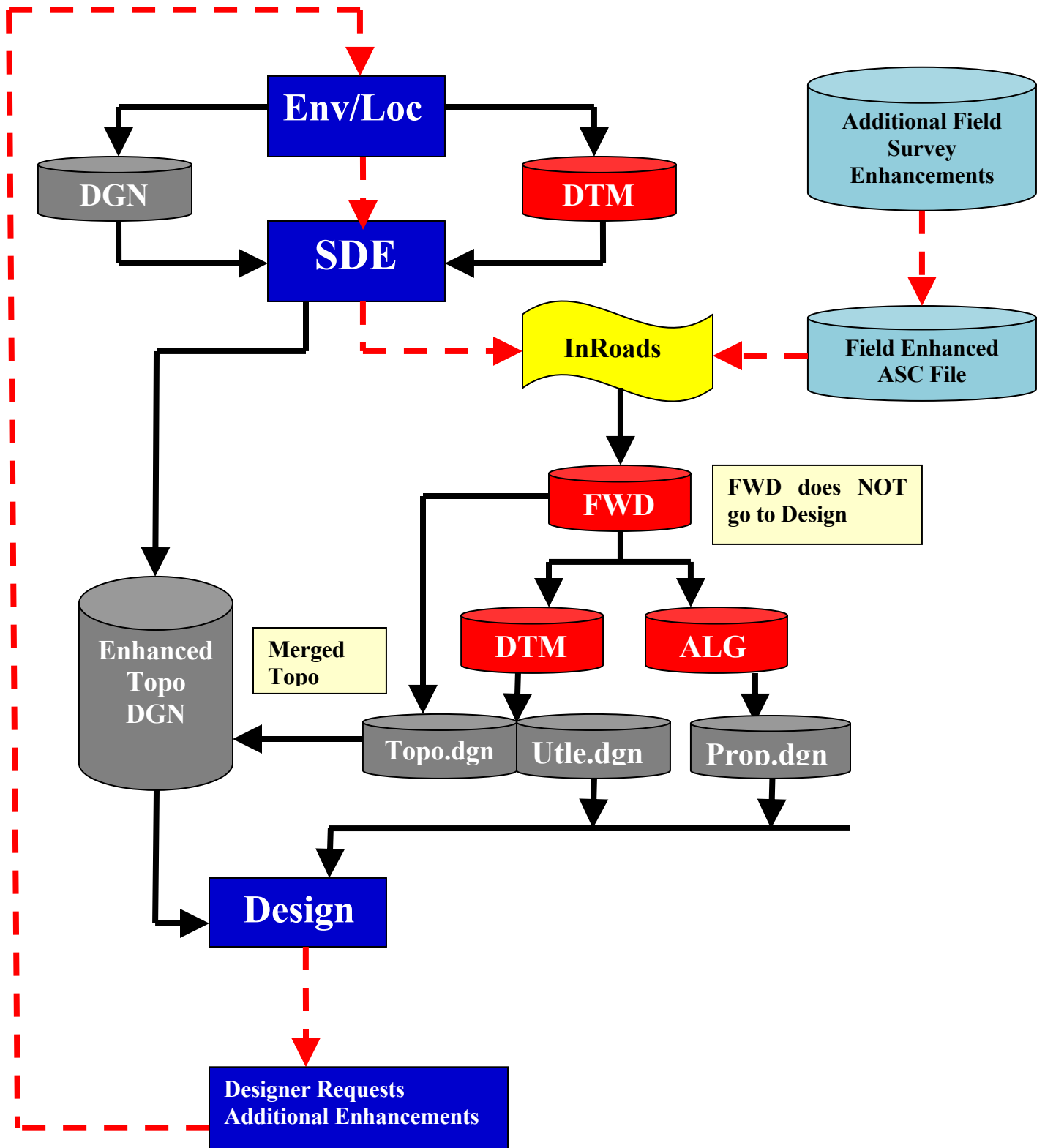
- **PI#_SDE.dtm**
- **PI#_SDE.alg**
- **PI#_TOPO. dgn** (if applicable)
- **PI#_PROP.dgn** (if applicable)
- **PI#_UTLE.dgn** (if applicable)

This section covers the following topics:

- Additional Enhancements to the Survey Field Book (FWD)
- Additional Enhancements to the Surface Project (DTM)
- Additional Enhancements to the Geometry Project (ALG)
- Additional Enhancements to the DGN Files (DGN)

Additional Survey Enhancement Process

(Red Dotted Line represents Additional Survey Enhancement Process Overview)



5.1 Additional Enhancements to the Survey Field Book (FWD)

The following section depicts an overview of the processing/naming methods utilized to add additional enhancements to the Survey Field Book (FWD) File.

When collecting the Additional Survey Data in the ASC files(s) the following naming scheme will be utilized: (See Table 5.1)

*Also each of the intermediate additional enhancement ASCII files should be retained in a backup folder for future project reference and record retention.

Table 5.1	
ASC File Naming Conventions (Enhancements)	
File Type	File Name
<ul style="list-style-type: none"> • <u>ASC – Full Field Survey File</u> First (Original) Field Survey ASC Second Enhancement Field Survey ASC Third Enhancement Field Survey ASC, Etc. 	PI#A.asc PI#B.asc PI#C.asc, etc.
<ul style="list-style-type: none"> • <u>ASC – Mapping Enhancement File</u> Original Mapping Enhancement ASC First Mapping Enhancement ASC Second Mapping Enhancement ASC, Etc. 	PI#XO.asc PI#XA.asc PI#XB.asc, etc.

When importing the Additional Survey Data in the Survey Field Books the following naming scheme will be utilized: (See Table 5.2)

*Also each of the intermediate additional enhancement Survey Field Book (FWD) files should be retained in a backup folder for future project reference and record retention. (The FWD files are **Never** submitted to the Designer).

Table 5.2	
Survey Field Book File Naming Conventions (Enhancements)	
File Type	File Name
<ul style="list-style-type: none"> • <u>FWD – Full Field Survey File</u> First (Original) Field Survey File Second Enhancement Field Survey File Third Enhancement Field Survey File, Etc. 	PI#_ A.fwd PI#_ B.fwd PI#_ C.fwd, etc.
<ul style="list-style-type: none"> • <u>FWD – Mapping Enhancement File</u> Original Mapping Enhancement File First Mapping Enhancement File Second Mapping Enhancement File, Etc. 	PI#_ XO.fwd PI#_ XA.fwd PI#_ XB.fwd, etc.

*****Please Note*****

This FWD File is never submitted to the Designer. The data from this Survey Field Book will be imported into InRoads where it will then be processed into the DTM Surface File and/or the ALG Geometry File.

For Detailed Step by Step instructions regarding the enhancements to the FWD File – please see the “Introduction to InRoads for Survey Data Processing” Training Tutorial Lab 8 – Section 8B. This Lab details the steps required to generate and process an Enhanced Survey Field Book (FWD).

5.2 Additional Enhancements to the Surface Project (DTM)

The following section depicts an overview of the processing/naming methods utilized to add additional enhancements to the Surface Project (DTM) File.

When incorporating/importing the Additional Survey Data in the DTM file(s) the following naming scheme will be utilized: (See Table 5.3)

*Also each of the intermediate additional enhancement DTM files should be retained in a backup folder for future project reference and record retention. (The intermediate DTM files are **Never** submitted to the Designer).

Table 5.3	
DTM File Naming Conventions (Enhancements)	
File Type	File Name
<ul style="list-style-type: none"> • <u>Intermediate DTM – Full Field Survey File</u> Note: (The First <u>Original</u> Field Survey File is obtained from the PI#A.asc and PI#_A.fwd files. These files are incorporated as PI#_SDE.dtm during initial DTM creation – therefore there is <u>no intermediate DTM</u> named PI#_A.dtm.) Second Enhancement Field Survey File Third Enhancement Field Survey File, Etc. 	<p style="text-align: center;">← See Note:</p> <p>PI#_ B.dtm PI#_ C.dtm, etc.</p>
<ul style="list-style-type: none"> • <u>Intermediate DTM – Mapping File</u> Original Mapping Enhancement DTM First Mapping Enhancement DTM Second Mapping Enhancement DTM, Etc. 	<p>PI#_ XO.dtm PI#_ XA.dtm PI#_ XB.dtm, etc.</p>

*****Please Note*****

- Resolve all Crossing Segments and Mismatched Elevations in the additional survey data.
- The intermediate DTM File(s) are never submitted to the Designer. The data from these file(s) are merged, incorporated and processed into the **PI#_SDE.dtm** file. This **PI#_SDE.dtm** file will be submitted to the Designer. It will be the Designer's responsibility to rename the DTM file to **PI#_Exist.dtm** and copy this file into InRoads.

For Detailed Step by Step instructions regarding the enhancements to the intermediate DTM File(s) and the incorporation/processing of the enhancement data into the original DTM (PI#_SDE.dtm) – please see the “*Introduction to InRoads for Survey Data Processing*” Training Tutorial Lab 8 – Section 8C. This Lab details the steps required to generate and process an Enhanced Survey Surface Project (DTM).

5.3 Additional Enhancements to the Geometry Project (ALG)

The following section depicts an overview of the processing/naming methods utilized to add additional enhancements to the Geometry Project (ALG) File.

When incorporating/importing the Additional Survey Data in the ALG file the following naming scheme will be utilized: (See Table 5.4)

Table 5.4	
ALG File Naming Convention (Enhancements)	
File Type	File Name
• ALG - Geometry File	PI#_SDE.alg

*****Please Note*****

- There are no intermediate ALG files. All of the enhanced Geometry data (Property, Existing R/W, etc.) are imported directly into the original Geometry File (**PI#_SDE.alg**).
- There should be no conflict in points as long as the Survey Data does not use any point numbers previously collected in the original survey. The SDE will need to submit to the Surveyor a range of points to utilize for additional survey enhancements so that there will be no conflict in point names.
- After the additional survey data is merged, incorporated and processed into the original Geometry File (**PI#_SDE.alg**) -- this **PI#_SDE.alg** file will be submitted to the Designer. It will be the Designer's responsibility to utilize the InRoads LandXML Utility to incorporate the data from the **PI#_SDE.alg** file into the Design **PI#_Design.alg** file.

For Detailed Step by Step instructions regarding enhancements to the Geometry File and the incorporation/processing of data into the original Geometry File (PI#_SDE.alg) – please see the “Introduction to InRoads for Survey Data Processing” Training Tutorial Lab 8 – Section 8D. This Lab details the steps required to add and process additional survey data to the Geometry Project.

5.4 Additional Enhancements to the DGN Files (DGN)

The following section depicts an overview of the processing/naming methods utilized to add additional enhancements to the DGN Files.

After the Survey Enhancements are added to the InRoads database(s) (Surface and/or Geometry databases), the enhanced data from both the DTM (the topographical/utilities aspect) and the Geometry (Property information) will need to be exported from InRoads.

- The TOPO DGN enhancements will be created in “intermediate” DGN files (as needed) and then merged into the original TOPO File which will then be submitted to the Designer. The Designer will then utilize this “new enhanced” TOPO DGN.
- A “new” UTLE DGN file which includes all of the utility data, etc. (Not just the new enhancement data) will be re-created from InRoads and then submitted to the Designer. The Designer will then utilize the new UTLE DGN file.
- A “new” PROP DGN file which includes all of the property data, etc. (Not just the new enhancement data) will be re-created from InRoads and then submitted to the Designer. The Designer will then utilize the new PROP DGN file.

5.4.1 TOPO Enhancements (Topographical DGN)

When incorporating the Additional Survey Data in the “Intermediate” TOPO DGN file, the following intermediate naming scheme will be utilized to correspond with MicroStation: (See Table 5.5)

Table 5.5	
Intermediate TOPO DGN Files (Enhancements)	
File Type	File Name
<ul style="list-style-type: none"> • <u>Intermediate TOPO (Full Field Survey)</u> First Enhancement DGN Second Enhancement DGN Third Enhancement DGN, Etc. 	P I#_XA.dgn PI#_XB.dgn PI#_XC.dgn, etc.
<ul style="list-style-type: none"> • <u>Intermediate TOPO (Mapping Enhancement)</u> First Mapping Enhancement DGN Second Mapping Enhancement DGN Third Mapping Enhancement DGN, Etc. 	PI#_XA.dgn PI#_XB.dgn PI#_XC.dgn

Process to create a “Merged” PI#_TOPO.dgn file:

1. The user will incorporate the Additional Survey Data into the InRoads FWD and DTM databases. (See **“Introduction to InRoads for Survey Data Processing” Training Tutorial Lab 8B – Section 8C** for detailed instructions on adding Additional Survey Data to the FWD/DTM in InRoads).
2. An intermediate TOPO DGN file -- Example (123456_XA.dgn, 123456_XB.dgn, etc.) will be created from the field enhanced DTM/FWD in InRoads. (See **“Introduction to InRoads for Survey Data Processing” Training Tutorial Lab 17 – Section 17B** for detailed instructions on creating an Intermediate TOPO DGN file).
3. Before merging the enhanced data into the “original” PI#_TOPO DGN – the user will need to go to the “original” PI#_TOPO.dgn and clip out any conflicting or outdated MicroStation information. This includes any obscured area boundaries that need to be deleted and any data that will be in conflict with the new topographical data.
4. The TOPO enhancement DGN file will then be merged with the “original” submitted PI#_TOPO.dgn file. This will ensure that all of the original Mapping Data is represented. (See **“Introduction to InRoads for Survey Data Processing” Training Tutorial Lab 17 – Section 17C** for detailed instructions on merging data into the PI#_TOPO.dgn file).
5. The merged and updated PI#_TOPO.dgn file is then submitted to the Designer. The Designer will then utilize the new enhanced PI#_TOPO.dgn file for use in project design. (See Table 5.6)

When incorporating the Additional Survey Data with the Original TOPO data in the merged TOPO DGN file, the following naming scheme will be utilized to correspond with MicroStation: (See Table 5.6)

Table 5.6	
Merged TOPO DGN File (Enhancements)	
File Type	File Name
• Merged TOPO DGN File	P I#_TOPO.dgn

5.4.2 UTLE Enhancements (Utility DGN)

When incorporating the Additional Survey Data in the UTLE DGN file, the following naming scheme will be utilized to correspond with MicroStation: (See Table 5.7)

Table 5.7	
UTLE DGN File (Enhancements)	
File Type	File Name
• UTLE DGN File	PI#_UTLE.dgn

*****Please Note*****

- There are no intermediate UTLE DGN files. All of the original and enhanced data for Utilities will be re-created from InRoads and then submitted to the Designer in a new **PI#_UTLE.dgn** file.
- The SDE will of course remove any obsolete InRoads utility data that has been replaced by new utility data as applicable. The Designer will then utilize the new **PI#_UTLE.dgn** file.
- (See “*Introduction to InRoads for Survey Data Processing*” **Training Tutorial Lab 17 – Section 17D**” for detailed instructions on creating the new UTLE DGN file).

5.4.3 PROP Enhancements (Property DGN)

When incorporating the Additional Survey Data in the PROP DGN file, the following naming scheme will be utilized to correspond with MicroStation: (See Table 5.8)

Table 5.8	
PROP DGN File (Enhancements)	
File Type	File Name
• PROP DGN File	PI#_PROP.dgn

*****Please Note*****

- There are no intermediate PROP DGN files. All of the original and enhanced data for property will be re-created from InRoads and then submitted to the Designer in a new **PI#_PROP.dgn** file.
- The SDE will of course remove any obsolete InRoads Property or Existing R/W data that has been replaced by new Property and/or Existing R/W data as applicable. The Designer will then utilize the new **PI#_PROP.dgn** file.
- (See **“Introduction to InRoads for Survey Data Processing” Training Tutorial Lab 16** for detailed instructions on creating the new PROP DGN file).

5.5 Overview of Additional Survey Enhancements

As mentioned previously – the SDE will submit all or a combination of the following files to the Designer when Additional Survey Enhancements are required.

- **PI#_SDE.dtm**
- **PI#_SDE.alg**
- **PI#_TOPO.dgn** (if applicable)
- **PI#_PROP.dgn** (if applicable)
- **PI#_UTLE.dgn** (if applicable)

Depending on the job and the file(s) required – the SDE will submit the updated file(s) following the format listed in this Document.

For Detailed Information regarding the procedures for incorporating Additional Survey Enhancements - please see the following:

SDE Training Lab - *Introduction to InRoads for Survey Data Processing:*

Training Tutorial Labs

Lab 8

Lab 9

Lab 16

Lab 17

6. Converting Projects from CAiCE to InRoads

This section provides a brief summary of the procedure to convert CAiCE Survey Projects to InRoads Survey Projects. A stand alone program has also been coded which will translate “old” CAiCE Codes to the new “InRoads” Codes.

This section covers the following topics:

- CAiCE to InRoads Conversion Criteria Overview
- Overview of CAiCE to InRoads Project Conversion
- Review of the InRoads ASC Converter

6.1 CAICE to InRoads Conversion Criteria Overview

The following section depicts an overview of the criteria of determining whether a CAiCE Project is a good candidate for conversion to an InRoads Project. There are several deciding factors which must be considered and discussed before converting a CAiCE Project.

It is critical that all parties involved in the decision to convert a CAiCE Project to an InRoads Project be aware of all the data, conversion processes and conversion time required. Following is an excerpt from a Design Policy Interdepartmental Correspondence which is dated April 13, 2010.

“The CAICE platform will continue to be maintained by the Department’s Engineering Software Group to support projects already under development with CAiCE. Projects with a database collected in CAiCE prior to May 1, 2010, may be converted to InRoads. A decision to convert from CAiCE to InRoads should be made mutually between the Project Manager, Design Phase Leader, and the Statewide Location Bureau Chief.”

The following section depicts some criteria to keep in mind when discussing possible CAiCE to InRoads Conversions:

- There is currently no automated direct process to convert a CAiCE Survey Project to an InRoads Survey Project. The only method at this time is to convert the RAW Photogrammetry Data and RAW Field Survey Data (using customized GDOT Conversion Programs) to an InRoads format. After processing this data – the Survey Data Engineer must manually re-create the Property/Parcel Alignments in InRoads which can be a very time-consuming process.
- There is also no automated direct process to convert CAiCE Design Data to an InRoads format. The Designer must manually re-input all the Horizontal Alignments, Vertical Alignments, Templates, Cross-Sections, and Required R/W Alignments from Reports and Plans generated from CAICE.
- There is also an InRoads Software learning curve for Surveyors, Survey Data Engineers and Designers. This in turn will extend the projected project schedule for completion.
- Manpower and productivity is also a consideration. Converting a CAiCE Project to InRoads will result in Survey Data Engineers and Designers having to basically start at the beginning of a Project. Although the Photogrammetry/Survey RAW data can be converted with minimal effort (and no additional Field Survey Work) – the time allotted for Survey Data Engineers and Designers to recreate the InRoads work can affect much of the Project Schedule.
- As mentioned in the Design Policy Excerpt in the paragraph above – Project Conversion is a mutual decision that must be determined and approved by all parties involved on a case by case basis.

6.2 Overview of CAiCE to InRoads Project Conversion

The following section depicts an overview of the methods used to convert a CAiCE Survey Project to an InRoads Survey Project.

Please Note:

ALL conversions of Photogrammetry data from CAiCE to InRoads will be performed by the Office of Design Policy and Support/Location Bureau. If the Project Manager, Design Phase Leader, and the Statewide Location Bureau Chief determine a need for project conversion – the Project Manager should contact the *Engineering Management/Operations Manager* of the Office of Design Policy and Support/Location Bureau for details. The Location Bureau will then contact the District Location Engineer and/or Survey Data Engineer for the conversion of the Field Survey Collected/Property input data from CAiCE to InRoads.

ALL conversions of the Field Survey Collected and Property input data from CAiCE to InRoads will be performed by the District SDE's.

It has been determined that the best method for converting CAiCE to InRoads projects is to utilize the “base” RAW AMSA and ASC Files (which contain the old CAiCE Feature Codes) for the conversion. Please note that any processing done in CAiCE will be lost when going back to the AMSA and/or ASC file. There are several reasons for utilizing the RAW AMSA and ASC Files instead of a direct CAiCE to InRoads Conversion:

Issues with direct CAiCE to InRoads Conversion:

- There are significant differences between CAiCE and InRoads as it pertains to the creation of Digital Terrain Models. Although the standard TIN (Triangulated Irregular Network) method is utilized – the format and naming conventions of the points and breaklines are considerably different from CAiCE. Therefore a direct DTM import from CAiCE to InRoads is not feasible.
- There has been a change in the ASC Feature codes for InRoads. The ASC codes have been updated and consolidated to correspond more closely with InRoads. CAiCE projects will contain the “old” CAiCE ASC codes. Therefore the importation of CAiCE projects into InRoads is not feasible because of the discrepancy in Feature Codes. The CAiCE codes will not import into InRoads correctly.

The conversion of the (CAiCE format) RAW ASC files will ensure an accurate translation of “old” CAiCE Survey data to “new” InRoads Survey data. This will entail rebuilding the DTM and resolving any crossing segments, etc. but it will also result in an accurate conversion method.

Please Note:

**The SDE will also have to reproduce the input of the entire Parcel (Property Data). This will basically entail that the SDE will have to manually input all of the property into InRoads based on the existing R/W and the associated deeds/plats in order to reproduce what was in CAiCE.

6.3 Review of the InRoads ASC Converter

There is a stand-alone program which has been coded for use in CAiCE Survey Data conversions.

- InRoads ASC Converter

This program will translate and convert the “old” format CAiCE Feature Codes to the “new” format InRoads Feature Codes/Feature Styles. The following section details the conversion program available to convert the CAiCE Survey Data to InRoads compatible data.

This stand-alone program converts the “old” CAiCE RAW ASC Feature Codes to the “new” InRoads RAW ASC Feature Codes. These converted files can then be imported directly into InRoads as RAW ASC files. The **InRoads ASC Converter** is included in the InRoadsALLV8i.exe download. (See **Section 1.1** for InRoadsALLV8i.exe download information).

The New ASC Codes which are used in the ASC Translation Table for the conversion is depicted in **Section 2.8 (GDOT Standard Field Survey Codes)**.

After conversion of the Codes from CAiCE to InRoads – the SDE will basically be starting a project over from the beginning. This process (including the building of the DTM and the input of the Property Data) is depicted in detail in the **SDE Training Labs - Introduction to InRoads for Survey Data Processing (Lab 1-17)**.

Following is information regarding the utilization of the **InRoads ASC Converter**:

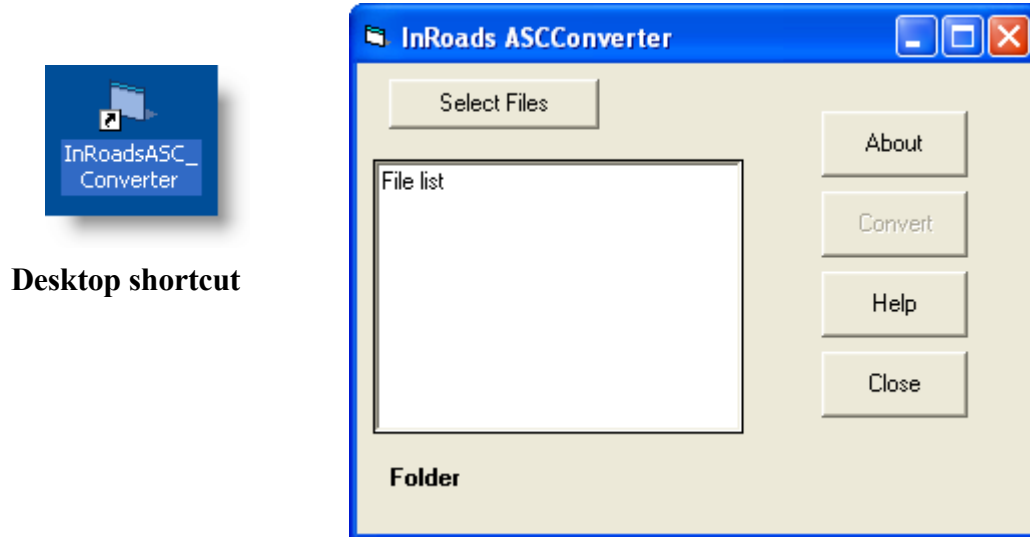


Figure 6-1 InRoads ASCConverter

DESCRIPTION

The InRoads ASCConverter program converts the numeric point codes in GDOT ASC survey files from the old CAiCE SMI codes to the new InRoads SMI codes. The user has the option to process ASC files individually or as a group by selecting multiple files. In either case, the source ASC file is NOT modified. The program will create a new file named *sourcefilename_NewCodes.asc* and the new file will be placed in the same folder as the source ASC file. To launch the program click the **InRoadsASC_Converter** shortcut located on the desktop (see below).

- | | |
|---------------------|---|
| Select Files | Opens folder browser allowing user to select files to be converted. |
| File list | Displays list of selected files. |
| Folder | Displays folder location of selected files. |
| Convert | Converts numeric point codes in selected ASC files. A report (InRoads_ASC_Converter.log) will be displayed showing the results of the conversion process and any errors that may have occurred. The Convert button is not activated until a file selection is made. |
| About | Displays information regarding the application and includes the version number. |
| Help | Displays the help file. |
| Close | Closes the program. |

Appendix



One Point on Chain Check



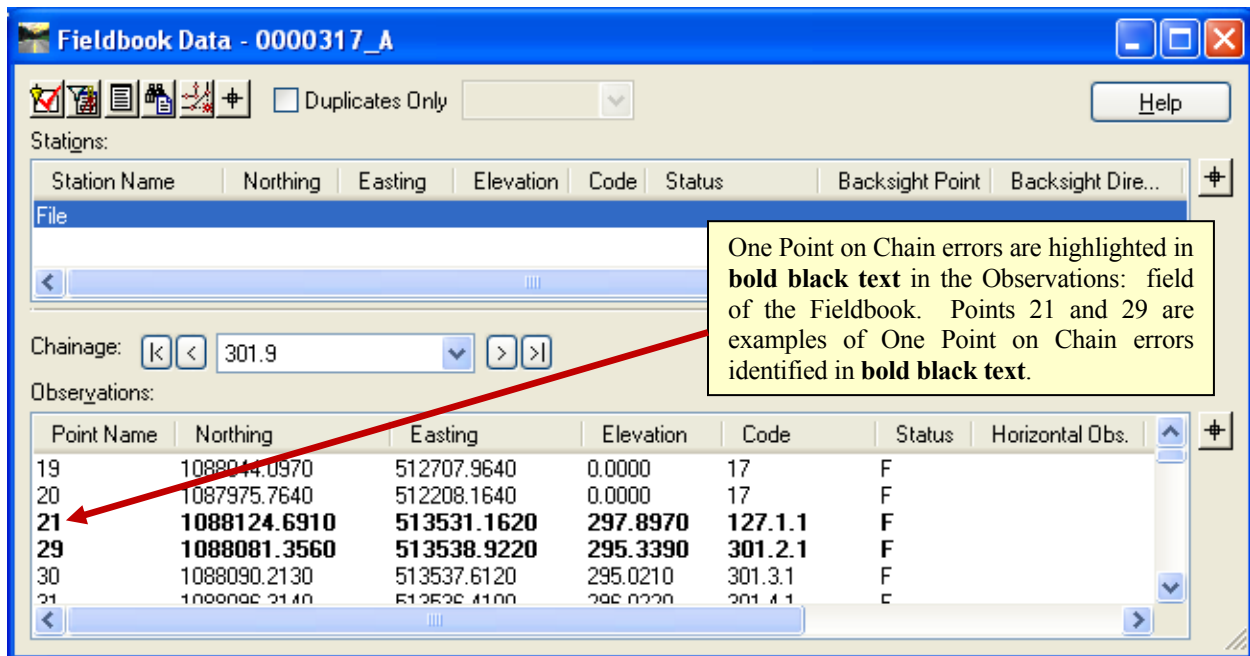
APPENDIX A ONE POINT ON CHAIN CHECK

General Information:

Prior to exporting field collected data from the InRoads Survey Field Book (FWD) to an InRoads Surface DTM file and an InRoads Geometry ALG file, the data should be reviewed for a one point on chain error. A one point on chain error occurs during field collection when an alignment code is entered into the data collector and then only one point is collected for that code. An alignment requires the collection of two or more points to be considered an alignment. Checking for a one point on chain error may be performed in the InRoads Survey FWD file.

Procedure to Check for a One Point on Chain Error

1. Create an InRoads Survey FWD file. For detailed instructions on creating an InRoads Survey FWD file, see Lab 2 of the *Introduction to InRoads-SDE* Training Material.
2. Load the field collected ASC file into the InRoads FWD. For detailed instructions describing the import process of field collected survey data, refer to Lab 2 of the *Introduction to InRoads-SDE* Training Material.
3. Open the InRoads Survey Field Book. This is accomplished in InRoads by selecting **Survey ► Fieldbook Data...**
4. Look for One Point on Chain errors. One Point on Chain errors are identified in the **Observations:** field of the InRoads Fieldbook in **bold black text** as shown here.



Fieldbook Data - 0000317_A

Stations:

Station Name	Northing	Easting	Elevation	Code	Status	Backsight Point	Backsight Dire...
File							

Chainage: [K] [<] 301.9 [>] [>|]

Observations:

Point Name	Northing	Easting	Elevation	Code	Status	Horizontal Obs.
19	1088044.0970	512707.9640	0.0000	17	F	
20	1087975.7640	512208.1640	0.0000	17	F	
21	1088124.6910	513531.1620	297.8970	127.1.1	F	
29	1088081.3560	513538.9220	295.3390	301.2.1	F	
30	1088090.2130	513537.6120	295.0210	301.3.1	F	
31	1088095.2140	513538.4100	295.0220	301.4.1	F	

One Point on Chain errors are highlighted in **bold black text** in the Observations: field of the Fieldbook. Points 21 and 29 are examples of One Point on Chain errors identified in **bold black text**.

5. One point on chain errors are to be resolved in the original field surveyed ASC file prior to continuing work in InRoads.
-

Appendix

B

Stakeout Report Style Sheet

APPENDIX B STAKEOUT REPORT STYLE SHEET

General Information:

Style Sheets are used by InRoads to present data in a particular Report Format. The Style Sheets are XSL files which can be saved in different extensions depending on the Style Sheet used. In order to write out the Stakeout Data from InRoads for upload into a data collector - the **GDOT Stakeout Report.xml** Style Sheet is required. This Stakeout Report is used to generate an ASC file which can be used to stakeout Right of Way.

Stakeout Report Style Sheet Process:

The **GDOT Stakeout Report.xml** Style Sheet is utilized to check for Duplicate Points and supply Point information to the Surveyor for use in staking out alignments and property. The Report lists the point name, easting and northing for all points with the Feature Styles listed below. When the report is saved as an ASC file, it may be used to upload the points (See Feature Styles listed below) directly into the surveyor's data collector for staking in the field.

NOTES:

- a) For Detailed Instructions on using the **GDOT Stakeout Report.xml** Style Sheet – please see the GDOT Style Sheet Help Files which are located in the following path:

C:\InRoads Data\Style Sheet Documentation

- b) Point Prefixes are stripped from the Points in the Report in order to facilitate upload and compatibility with the Data Collector.
- c) To access the Style Sheet – select the following from the InRoads pull-down menu:
Tools ► XML Reports ► CTRL + Stakeout
- d) The **GDOT Stakeout Report.xml** Style Sheet should be saved with an .ASC Extension.
- e) The Naming Convention for the **GDOT Stakeout Report** will be **PI#_STK.asc** (Example: 123456_STK.asc).
- f) Points with the following Feature Styles are obtained from the InRoads project database and are written to the ASC file for upload to the Data Collector.

- | | | |
|------------------|---------------|------------------|
| • PROP_E_PAR | • PROP_E_RWE | • PROP_E_RWM |
| • PROP_E_RWC | • PROP_E_RWU | • PROP_E_POEL |
| • PROP_E_PPC | • PROP_E_PCF | • TOPO_E_SNGSCM |
| • TOPO_E_SLCM | • TOPO_E_SLCD | • TOPO_E_SDGD |
| • TOPO_E_SBNCHMK | • REQD_P_* | • MAIN_P_CONSTCL |
| • MAIN_P_SIDECL | | |