26-1.01 InRoads Format [Rev. Aug. 2013, Oct. 2017]

INDOT adopted Microstation and InRoads as its standard drafting and design software applications, respectively, the CAD Support Team has developed standard resource files such as design templates (seed files) and survey-data processing (.xin) files. The most current INDOT *seed.dgn* and *survey.xin* files made available through the CAD Support Team shall be used.

INDOT has established a standard naming convention for all InRoads survey files to make the data more portable so that all users can easily recognize and use the files created by others. The conventions also provide information on file contents at a glance. Each InRoads survey file submitted to INDOT shall use the format and provide the content as described below.

DES#_SRxx Name.extension

Key:

DES#: designation number for project as provided by INDOT

SRxx: route number of project, for example: SR37, SR162, I64, US150

Name: descriptive name of information in file, for example: Topo, LCRS Plat

Extension: file extension name, for example, .xin, .dgn, .fwd

The files to be submitted to INDOT for each survey are as follows:

1. **Des #_SRxx Seed 2D.dgn**
2. **Des #_SRxx Seed 3D.dgn**
3. **Des #_SRxx Survey Fieldbook.dgn**
4. **Des #_SRxx Survey Book.docx**
5. **Des #_SRxx Survey Alignment.dgn**
6. **Des #_SRxx LCRS Plat.dgn**
7. **Des #_SRxx LCRS Plat.pdf**
8. **Des #_SRxx Survey Alignment.alg**
9. **Des #_SRxx Existing Terrain.dtm**
10. **Des #_SRxx Annotation Surface.dtm**

26-1.01(01) Minimum File Requirements [Rev. Aug. 2013, Oct. 2017]

Each file shall include, at a minimum, the data described below. The *DOTWise MicroStation, InRoads & ProjectWise for Survey and Design Manual* serves as INDOT's Plans Production and Survey guide and includes instructions for creating the required files. The manual available from the INDOT's CAD Support webpage, under Downloads & Information – V8I SS4 Downloads - Documents.

1. Des #_SRxx Seed 2D.dgn
   Sets the coordinate system for every InRoads based file in your project and contains a Default model in 2D. The creation of this file, together with the 3D file below, allows for any CAD files based on the created seed file to be instantly consumed by the ESRI ArcGIS Products and made available for a variety of other uses. With OpenRoads changes to document handling and civil information, files for both 2D and 3D will be created (DOTWise 6.3-1).

2. Des #_SRxx Seed 3D.dgn
   Sets the coordinate system for every InRoads based file in your project and contains a Default model in 3D. (DOTWise 6.3-1).

3. Des #_SRxx Survey Fieldbook.dgn. This file contains field book information for TOPO and Control Points in the OpenRoads format (survey field book) along with the existing terrain model. No alignments or civil geometry are created in this file. Alignments and civil geometry will be created as a 3D model. (DOTWise 6.3-3).

   This file includes centerline points, a partial list of fly stations (random control points), bench marks, and United States Public Land Survey (USPLS) subdivision corners, including corners of properties not within USPLS areas, necessary to describe acquisition parcels.

   a. Centerline Points. All centerline points of each survey line within the survey shall be included in this file.
      (1) The code for centerline points shall be “PSSA”.
      (2) Notes for each “PSSA” shall include location (e.g., POT, PC, POST, etc.) stationing, line letter, PI information (delta angle, degree of curve or radius length, tangent length, arc length, and external length), description of monument, and location of top of monument relative to ground surface or pavement surface.

   b. Fly station. All fly stations traversed through, during establishment or reestablishment of survey lines, shall be included in this file.

      The code for fly station shall be “FLY”. Notes for “FLY” shall include the description of the monument and location of top of monument relative to ground surface or pavement surface for each point.

   c. Bench Marks. Those used for survey data collection shall be included in this file.
      (1) Monuments shall be coded in accordance with the .xin and .dgnlib files provided by INDOT.
      (2) Bench mark notes shall include the name and description of each monument, a description of the structure that the monument is placed in or on, the station and offset from the survey line, and the survey-line letters.

Examples: TBM#1, Boat Spike in root of 21-in. oak tree, 125 ft left of Station 123+45, Line “A”. INDOT BM 19 V 1030, disc in north end of concrete headwall, 55 ft right of Station 35+25, Line “S-1-A”.

d. USPLS Corners. These, or corners of properties not within USPLS areas, necessary to describe acquisition parcels, shall be included in this file.

(1) Monuments shall be coded in accordance with the .xin and .dgnlib files provided by INDOT.

(2) Notes for monuments shall include the location of the corner.

Example for area within USPLS: “N ¼ Corner of Section 34, T2N, R2W”. Example for area not within USPLS: “NE Corner of Division “C” of the Vincennes Commons Lands”.

(3) Notes shall include a description and location of each monument relative to the ground surface or pavement surface.

4. Des #_SRxx Survey Book.docx. This file includes all supplemental survey information not found in other files. The .docx format is preferred. However, .doc or .pdf is also acceptable. It shall include the following:

a. front page notations, i.e., Des No., Route No., Terminal Points of Project, County, brief description of each line;

b. title page and completed Table of Contents;

c. dates of survey start and survey completion;

d. names of survey crew members;

e. Des number and page numbers at top of each page;

f. Surveyors Report, in accordance with IAC-865, as a minimum requirement;

g. start and end of each line shown with equations and cross references to other surveys;

h. control points labeled, with location (e.g., POT, PC, POST, etc.), stationing, line letters, location relative to surface (e.g. flush, 0.1’ below ground level, etc.), and coordinates shown;

i. alignment data shown and checked;

j. references shown and checked, if LCRS not prepared. If an LCRS was prepared, this information will be on the recorded LCRS;

k. source of bearings described;

l. utility ownerships within limits of survey, with mailing addresses, with a notation of utilities not within limits;

m. Underground Utility Reference Number placed on Utilities page;

n. high-water elevation and date, with source and date of information;

o. source of level datum;

p. bench-mark descriptions completed;

q. level notes for all bench marks used for survey;

r. legal flow-line elevations of county ditches; and

s. level equations with other surveys shown, and explained.

5. Des #_SRxx Survey Alignment.dgn. This file contains the survey alignment(s) in the OpenRoads format (civil data – linear elements). This file will be created as a 2D model. (DOTWise 6.3-7).

6. Des #_SRxx LCRS Plat.dgn. This file shall include multiple models of the following. DOTWise

a. The LCRS used to generate that for recording with the County Recorder. This shall be provided for design reference and use.

b. Survey control points and references, which include the following:

(1) description of point along alignment (e.g., POT, PC, POST, etc.);

(2) stationing of survey-line point (e.g., 123+45.67, etc.);

(3) line letter (e.g., “A”, “S-1-A”, etc.);

(4) description of monument (e.g., 5/8 in. rebar with cap stamped INDOT 0005, Mag Nail with washer stamped INDOT 0005, etc.);

(5) location of top of monument relative to ground surface (e.g., Flush with surface, 0.1 ft below ground surface, protruding 0.4 ft above ground surface, etc.);

(6) description of reference monument (e.g., Nail in Bottle Cap in 15-in. Maple, Nail in Bottle Cap in Corner Fence Post, X Cut in Concrete Headwall, etc.); and

(7) azimuth to nearest degree, and distance to nearest 0.01 ft, from control monument to reference monument.

c. USPLS corners, or corners within areas not part of the USPLS, and references, including, at a minimum, the following:

(1) descriptions of USPLS corners (e.g., W ¼ Corner of Section 24, T3N, R5W);

(2) descriptions of monuments not within USPLS areas (e.g., NE Corner of Division “C” of the Vincennes Commons Lands);

(3) description of monument (e.g., 9” x 6” stone with “S 24 W ¼” cut on side of stone);

(4) location of top of monument relative to ground surface (e.g., Flush with surface, 1.5 ft below ground surface, protruding 0.7 ft above ground surface, etc.);

(5) description of reference monument (e.g., Nail in Bottle Cap in 15-in. Maple, Nail in Bottle Cap in Corner Fence Post, X Cut in Concrete Headwall, etc); and

(6) Azimuth, to the nearest degree, and distance, to the nearest 0.01 ft, from control monument to reference monument.

7. Des #_SRxx LCRS Plat.pdf. This file is a copy of the Location Control Route Survey Plat (LCRS) as recorded in the County Recorder’s office, for the survey project. This copy shall have the seal and signature of the Licensed Land Surveyor in responsible charge, and all recording information placed on the LCRS by the County Recorder.

8. Des #_SRxx Survey Alignment.alg. InRoads Survey Alignments, Legacy format for annotation. (DOTWise 6.3-5). This file includes all alignments of the survey project.

a. In writing Survey to Geometry, in the “Project Name” box, enter “Survey Alignment“.

b. In creating alignment, in “Name” box, enter “A” for Line “A”, etc.

c. If there is an “S” line, under “Survey Alignment”, name alignment “S-1-A”, “S-SRxx-A”, etc.

d. For the description of each alignment, use the applicable route name (e.g., SR 1, CR 250 W, etc.).

e. The alignment shall have the correct stationing applied.

f. Save as “Des #_SRxx Survey Alignment.alg”

9. Des #_SRxx Existing Terrain.dtm
InRoads DTM of Survey terrain model, with applicable triangulation cleanup. This model will only contain the existing triangulated terrain and any features that are included in that triangulation. The model can be used with the native InRoads tools for 3D analysis as it will match the OpenRoads existing terrain. (DOTWise 6.3-5)

10. Des #_SRxx Annotation Surface.dtm
InRoads DTM of Survey processed features, Legacy format for annotation. This should not be used for any functions beyond the native annotation tools and should be created using the import process. (DOTWise 6.3-6)