INDOT CAD Standards Manual

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Indiana Department of Transportation
Offices of Standards and Policy

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1. Introduction

The guidelines presented within this document provide information regarding the preparation and final appearance of plans produced for INDOT road, bridge, and traffic projects using Bentley's MicroStation and InRoads software programs. It is intended to be used as a guide and reference for CAD users in an attempt to attain a high level of consistency among plans. It is not intended to be a "how-to" guide for using these software packages. Throughout this document, it is assumed that the user has a working knowledge of the software and has some experience using it to produce the engineering drawings required for a complete set of construction plans.

For current versions of the user files mentioned throughout this guide, as well as additional information, please browse to the INDOT CAD Support website (http://in.gov/indot/3084.htm). For best results, it is highly recommended that users work in the same versions or newer of the CAD software as is currently installed on the INDOT system. Information regarding currently installed versions is available on the Current Versions webpage (http://www.in.gov/indot/3088.htm).

2. ProjectWise Information

INDOT has chosen Bentley ProjectWise for its project management software program. All in-house design projects reside in the secure managed ProjectWise environment. Information regarding navigation in ProjectWise is available in the following documents:

INDOT Plans Production—Plans, Plotting, ProjectWise, available for download on CAD Support web site.

INDOT Plans Production—Plans, Plotting, ProjectWise, available in ProjectWise.

DOTWise Project Creator Quick Start Guide—ITAP and Project Creator Interface, available in ProjectWise.

Throughout this manual, links are provided to resource files residing in the ProjectWise environment as well as on the World Wide Web for users not currently operating within the ProjectWise environment. For information regarding ProjectWise and to apply for an account, users should contact CAD Support.

3. MicroStation Information

3.1 MicroStation

INDOT has selected MicroStation and InRoads for its Department-wide computer-aided drafting and design package used to generate most contract plans. This document provides the Department's CAD resources and expectation for plan development (e.g., cell library, levels, and text styles). Consistently using the established set of levels, styles, and reference files will allow various users within the Department to work on the same set of plans without interfering with each other's design work. By integrating or linking MicroStation with other software packages (e.g., InRoads, SignCAD, and various

external databases), the designer can complete the design and layout of a project as well as calculate the quantities necessary to produce a complete set of construction plans. For specific information related to InRoads, please refer to the *INDOT Plans Production—Plans, Plotting, ProjectWise* document mentioned previously.

3.2 Configuration Files

CAD Support at INDOT has created a CAD environment (for use with MicroStation and InRoads) which contains a basic configuration along with necessary resource files for the preparation of roadway and structure plans. This environment is available to users for download at CAD Support V8i Downloads. All necessary files may be downloaded and installed as separate items in order to accommodate different networking configurations outside of INDOT.

> *When beginning any project the designer/drafter is responsible for verifying that the latest configuration files, resource files, design libraries, and cell libraries are installed on their systems.*

3.3 Resource Files

It is the intent, at INDOT, to keep the resource files, including .pcf and standard configuration files, that come packaged with MicroStation, InRoads, DesCartes, etc… , as close to "out of the box" as possible. This is done in order to make implementation of INDOT's CAD Standards as straightforward as possible.

INDOT CAD resource files are available on the CAD Support V8i Downloads web page, along with their related configuration variable information. Those files necessary for preparation of INDOT production plans are as follows:

- Seed files: Contain initial configuration, including appropriate working units for INDOT drawing files. See section 4.5 for available seed files and settings.
- *IN_Units.def*: Units definition files for selecting the proper working units.
- *IN_Sheetsizes.def*: Definition file containing the settings for recommended sheet model sizes.
- Design library files:
    - *IN_Symbology.dgnlib*: Contains all level symbology including line styles as well as all text and dimension styles used in the INDOT environment. See section 4.1 for level definitions and section 4.2 for custom line styles. See sections 4.6 and 4.7 for text and dimension styles.
- Template drawing files: Contain borders used on INDOT plan sheets. See section 4.4 for more information.
- Cell library files: Contain cells to be inserted into INDOT base files and plan sheet files. See section 3.5 for cell libraries available.
- Plotting files: Contain pen tables, design scripts, and settings files for use with the ProjectWise InterPlot Organizer.

- InRoads resource files: Contain the INDOT-configured .xin file and borders required for use with InRoads Plan and Profile Generator and Cross Section creation tools.

3.4 Design Library Files

Design library (.dgnlib) files are files containing predefined settings for key design elements, including text styles, dimension styles, layers, custom line styles, etc. When an element is placed in a design file, MicroStation accesses the .dgnlib file for that element's predefined properties or settings. Once placed, these elements become part of the active design file. If changes are later made to the .dgnlib file, those changes are not automatically updated in the drawing file. All or part of the settings can be updated from a revised .dgnlib file by executing the key-in command "dgnlib update (all, dimstyles, levels, etc.)". It is also possible to update settings for individual elements (text styles, dimension styles, levels, etc.) by opening up each element's Settings toolbox and choosing Update from Library from the appropriate menu.

3.5 Cell Library Files

Currently there are several cell libraries available for use in the preparation of INDOT plans. The current cell libraries are located in DOTWise\Documents\INDOTWorkspace\Managed\Workspace\Standards\cell\ in ProjectWise. They, along with a catalog of cells, are available from CAD Support V8i Downloads/Cell Libraries. See Table 3.5-1 for descriptions of INDOT cell libraries available.

Cell Library Filename	***Description***
IN_County.cel	Indiana county outlines for use on an INDOT Title Sheet
IN_DetailsEng.cel	Typical sections and detail drawings, US Customary units
IN_DetailsMet.cel	Typical sections and detail drawings, SI units
IN_InRoads.cel	Plan symbols for use with InRoads
IN_Lighting.cel	Cells used on traffic lighting plans
IN_Patterns.cel	Cells used for pattern fills
IN_PvmtMarkings.cel	Cells used on traffic plans
IN_ScaleBars.cel	INDOT specific scale bars
IN_Signals.cel	Cells used on traffic signals plans
IN_SignalsLegend.cel	Cells used in the legend on traffic signals plans
IN_Signs.cel	Cells used on traffic signs plans
IN_Survey.cel	Cell versions of INDOT standard survey forms
IN_Symbols.cel	Cells used at various times throughout the plans production process, including the north arrow symbol (NORTH.cel) and symbols for centerline, propertyline, and flowline
IN_TablesLegendsNotes.cel	Cells used to construct tables, legends, and notes on INDOT plan sheets
IN_TablesLegendsNotesTraffic.cel	Cells used to construct tables, legends, and notes on INDOT traffic plan sheets

Table 3.5-1 INDOT Cell Libraries

4. INDOT CAD Standards

4.1 Levels / Symbology

In the future, levels within drawing files will be critical for accurate quantity takeoff calculations prior to letting and asset inventory and maintenance applications after construction is completed. Levels and filters have been defined with these applications in mind. Definitions are stored in the *IN_Symbology.dgnlib* file for each department discipline within INDOT. In subsequent versions of the CAD Workspace, many more levels will be named according to specific Pay Items found in INDOT project contracts and their use should be reserved for items directly related to these Pay Items.

In addition to the name, level properties defined include color, line style, and weight. Each drawing object placed in a design file should be assigned to an appropriate level according to its function within the project. INDOT CAD level names are comprised of two category prefixes and a brief specific description. See Appendix A for level prefixes available and their intended use on INDOT plans. As long as the object's properties are set to "ByLevel", the object will take on the predefined symbologies associated with that level.

In order to assist the user in narrowing his/her focus to a particular discipline or type of plan sheet, a number of Filter Groups have also been defined. The Filter tool, located on the Attributes toolbar, allows users to define the group of levels viewed within the Level Manager or Level Display dialogs.

For most projects, the levels defined in the design library file will suffice throughout the plan preparation process. There will, however, likely still be unique situations that may require levels that do not already exist. For these situations, users should follow the naming conventions established in Appendix A.

4.2 Line Styles / Line Weights

Various line styles and weights are typically used to differentiate between elements of objects and to focus attention on key elements within a drawing. Regardless of the line style or weight chosen, all elements must be clearly visible and text must be easily read when the drawing is printed at its full size as well as when it is scaled for smaller printed formats. Users are discouraged from using line styles numbered 1-7 in design models, as their behavior is somewhat unpredictable on printed plans. Bentley recommends that users assign custom line styles to objects for more control of their appearance. Consequently INDOT has defined a number of custom line styles for use on INDOT plans. These definitions are also stored in *IN_Symbology.dgnlib*. See Appendix B for samples of INDOT custom line styles along with their intended uses. The appearance of lines on plans must be consistent with these samples. Users are discouraged from defining their own custom line styles. In the event that a new line style is needed, users should contact CAD Support for assistance.

4.3 Naming conventions

The following prefixes should be used when naming models and cells related to the various disciplines. File and level naming conventions differ slightly from these. See section 4.1 for level naming conventions and section 4.8 for file naming conventions.

Bridges	BR_	Signs and Lighting	SL_
Design	DS_	Signs	SN_
Lighting	LG_	Standards	ST_
Planning	PL_	Survey	SV_
Road	RD_	Traffic	TR_
Signals	SG_	Pavement Marking	PM_

4.4 INDOT Border / Sheet Models

A series of template sheet models has been developed for use when preparing INDOT Plans. Each of these sheet models contains the required INDOT sheet border, as well as additional pre-formatted text and commonly used symbols. These sheet models are designed to be imported into the working dgn file with a scale factor of 1.0 and placed at the origin (0, 0). The user should then edit text as needed and delete any items not needed. See the *Indiana Design Manual (IDM)* section 14-3.03 for appropriate sizing of plan sheets. Users should also be aware that unless they are operating within the INDOT ProjectWise managed workspace, some extra information may be visible and a certain amount of specialized functionality set up for these sheets may be diminished. Table 4.4-1 and Table 4.4-2 list the sheet models available from the following files located in the DOTWise\Documents\Template Documents\DGN\ folder in ProjectWise or downloaded from CAD Support V8i Downloads/Sheet Files.

Ltr_sheets.dgn: For use with projects using letter size (8.5” x 11”) paper.

D Size_sheets.dgn: For use with projects using “D” Size (24” x 36”) paper.

In general, a north arrow should be placed on every plan view. Where it is needed but not already provided, the north arrow symbol (*NORTH* from the IN_Symbols.cel library file) should be inserted on a sheet model. The north arrow should appear the same size on all D-size sheets on which it is placed, and should be approximately 3 in. from arrowhead tip to tail. Placing *NORTH.cel* using a scale of 1.0 will result in the correct sizing of the symbol. When placed on 8 ½” x 11” sheets, *NORTH.cel* should be scaled by 0.5.

Name	***Description***
Ltr. Detail	8.5” x 11” Detail Border – Portrait
Ltr. Detour Sheet Signing	8.5” x 11” Recommended Detour Signing Sheet
Ltr. Landscape Detail	8.5” x 11” Detail Border – Landscape
Ltr. Strip Map Sheet	8.5” x 11” Strip Map Sheet
Ltr. Title Sheet	8.5” x 11” Title Sheet

Table 4.4-1 Sheet Names and Descriptions of Models in Ltr_Size Sheets.dgn

Name	*Description/Intended Use*
BR_Detail Sheet	Detail Sheet for bridge plans—used for structure details, traffic maintenance details, soil borings, layout, general plan, approach details, and plan and profile sheets
BR_Index Sheet	Bridge Plan Index Sheet
BR_Quantities Sheet	Bridge Plan Bridge Summary Sheet
BR_Title Sheet	Bridge Plan Title Sheet
BR_Title Sheet Rehab	Bridge Rehab Plan Title Sheet
BR_Title Sheet ROW	Bridge Right-Of-Way Plan Title Sheet
LG_Highway Data Sheet	Lighting Plan Highway Data Sheet—used on road plans, bridge plans, and separate lighting plans)
LG_Index Sheet	Lighting Plan Index and General Notes Sheet
PL_Layout Sheet	Planning Layout Sheet
RD_Detail Sheet	Detail Sheet for road plans—used for roadway details, traffic maintenance details, and plan and profile sheets.
RD_Index Sheet	Road Plan Index and General Notes Sheet
RD_Pavement Marking Sheet	Pavement Marking Sheet—used for traffic-work details on road plans and bridge plans
RD_Pipe Material Sheet	Pipe Material Sheet—used for road plans and bridge plans
RD_Plat Sheet	Plat Sheet—used for survey route sheets on road plans
RD_Soil Boring Sheet	Soil Boring Sheet—used for road plans and bridge plans
RD_Summary Sheet	Road Summary Sheet—used for road plans and bridge plans
RD_Title Sheet	Road Plan Title Sheet
RD_Title Sheet ROW	Road Right-Of-Way Plan Title Sheet
SG_Detail Sheet EIT	Detail Sheet (EIT)—used for plan and detail sheets on signalization plans
SG_Detail Sheet PE	Detail Sheet (PE)—used for plan and detail sheets on signalization plans
SG_Title Sheet	Signals Plan Title Sheet
SL_Plan Sheet	Plan Sheet—used for lighting and signing plan, layout, and details on traffic-signs plans, lighting plans, road plans, and bridge plans
SL_Title Sheet	Signs and Lighting Plan Title Sheet
SN_Index Sheet	Signs Plan Index and General Notes Sheet
SN_Panel Sign and Post Summary Sheet	Sign and Post Summary Sheet—used for panel-sign information on traffic-signs plans, road plans, and bridge plans
SN_Sheet Sign and Post Summary Sheet	Sign and Post Summary Sheet—used for sheet-sign information on traffic-signs plans, road plans, and bridge plans
SV_Reference Point Box Sheet	Survey Reference Point Box Sheet
SV_Section Corner Reference Card Sheet	Survey Section Corner Reference Card Sheet

Table 4.4-2 Sheet Names and Descriptions of Models in D Size_Sheets.dgn

4.5 Seed Files, Working Units, and Drawing Scales

The working units and a global origin have been defined in each seed file according to its intended use. The Department has set the global origin to x=0, y=0 and z=0 in all of the INDOT seed files. The following drawing seed files are available for download from CAD Support V8i Downloads and are located in DOTWise\Documents\Template Documents\Seed\MicroStation\ in ProjectWise. Users should note that these seed files are slightly different from those provided for use with InRoads.

- *INDOT_US_seed.dgn*: Used for base-drawing files and detail drawings in US Customary units. Working Units are set to Feet (‘) and Inches (“).
- *INDOT_US_SVFT_Seed.dgn*: Used for survey base drawing files and exhibits in US Customary units. Working Units are set to Survey Feet (‘) and Inches (“).
- *INDOT_SI_seed.dgn*: Only used for legacy projects in SI units. Working Units are set to Meters (m) and Millimeters (mm).

All objects shall be drawn at actual size in the design model. Scaling should only be applied when the model is referenced into the sheet model. This reference scale then determines the annotation scale to be used for the referenced design model. See Table 4.5-1 for the standard scales allowed on INDOT plans. See IDM *section 14-3.05 for recommended drawing scales to be used on each type of plan sheet.*

Drawing Scale (Anno. Scale)	***True Scale (Ref. Scale)***	***Drawing Scale (Anno. Scale)***	***True Scale (Ref. Scale)***
1/32 in. = 1 ft	1 : 384	1 in. = 10 ft	1 : 120
1/16 in. = 1 ft	1 : 192	1 in. = 20 ft	1 : 240
3/32 in. = 1 ft	1 : 128	1 in. = 30 ft	1 : 360
1/8 in. = 1 ft	1 : 96	1 in. = 40 ft	1 : 480
3/16 in. = 1 ft	1 : 64	1 in. = 50 ft	1 : 600
1/4 in. = 1 ft	1 : 48	1 in. = 60 ft	1 : 720
3/8 in. = 1 ft	1 : 32	1 in. = 100 ft	1 : 1200
1/2 in. = 1 ft	1 : 24	1 in. = 200 ft	1 : 2400
3/4 in. = 1 ft	1 : 16	1 in. = 300 ft	1 : 3600
1 in. = 1 ft	1 : 12	1 in. = 400 ft	1 : 4800
1 1/2 in. = 1 ft	1 : 8	1 in. = 500 ft	1 : 6000
3 in. = 1 ft	1 : 4	1 in. = 600 ft	1 : 7200
6 in. = 1 ft	1 : 2	1 in. = 1000 ft	1 : 12000
12 in. = 1 ft	1 : 1	1 in. = 2000 ft	1 : 24000

Table 4.5-1 Standard Scales Used on Plans

4.6 Text Styles

One of the most noticeable and most common drafting issues is inconsistency in the appearance of text from plan to plan and even from sheet to sheet within a set of plans. MicroStation allows for the definition of named text styles, which simplifies the placement and standardizes the appearance of text. When placing text, selecting a text style automatically adjusts the active text settings. When a set of named text styles are used, it is not necessary to manually change font, text height, text width, line spacing or other properties independently. It is only necessary to identify the scale and turn on the Annotation Scale lock when a drawing is started. INDOT text styles are defined in the design library file *IN_Symbology.dgnlib*. See Table 4.6-1 for specific INDOT text style settings. Sizes given in this table indicate the appearance of the text on plans printed with no scaling.

Text shall have a consistent appearance throughout the entire plan and must be consistent with the text styles described in this document. In general, text in text callouts, dimensions, and notes shall be in upper and lower case with appropriate capitalization. In all cases, grammar and spelling must be correct according to Standard English practice. When using a combination of upper and lower case text, apply either Sentence Case, also called First Capital, or Title Case as follows:

- Use Sentence Case for sentences and phrases involving design statements or construction directions. In these statements, only the first word of the statement and proper names are capitalized.

- Title Case may be applied to other text callouts which serve only to label elements in a drawing. In these labels, all major words are capitalized. Conjunctions, articles, and short prepositions are not considered major words; however, all words of four letters or more are capitalized.

Each drawing view, detail, or section on a sheet must have a title. These view titles should be brief and shown in all capital letters using 18 Point Text style on D-size plan sheets and 14 Point Text style on 8 ½" x 11" plan sheets. Title text may be placed either in the design model or on the sheet model, so long as it is placed in the same manner throughout the plans.

Avoid abbreviations on plans. When an abbreviation must be used, use only those accepted throughout the construction industry. See Appendix C for acceptable abbreviations and their appropriate punctuation. Drafters and designers should spell out words not listed in Appendix C.

In general, leadered text callouts should be placed in the design model with the objects they are referencing. Legend or numbered keynote callouts with leaders and sheet or general notes should be placed on the sheet model with no scaling. Left justify notes and double-space between items. Place text on an appropriate text level according to its function within the drawing.

Lettering and dimensioning shall be placed so they may be read from either the bottom of the sheet or the right side of the sheet.

Text Style Name	*Font*	*Height (in.)*	*Width (in.)*	*Notes/Guidelines for Use*
Text Styles for D-Size Plan Sheets				
10 Point Text	Tahoma	0.10	0.10	May be used for table data.
10 Point Text (Existing Elevations)	Tahoma	0.10	0.08	(Italic, Color 222) Use for existing-grade elevations on grid of plan and profile view.
10 Point Text (Survey Text)	Arial Narrow	0.10	0.10	(Color 225) Use for selected survey text.
12 Point Text	Tahoma	0.12	0.12	Use for text callouts, dimensions, and notes. *Minimum size for text placed on D-size plans* other than text specified under 10 Point Text.
14 Point Text	Tahoma	0.14	0.14	Use for selected text on title block, view subtitles, and column headings in tables.
14 Point Text (Property Owners)	Bookman Old Style	0.14	0.14	Use for parcel-owner text only.
18 Point Text	Tahoma	0.18	0.18	Use for detail and section titles, and table titles on detail sheets.
30 Point Text	Tahoma	0.30	0.30	Use for selected text on title sheet of plans.
Text Styles for Ltr-Size Plan Sheets				
6 Point Text	Tahoma	0.06	0.06	May be used for table data, existing-grade elevations on grid of plan and profile view, and selected survey text.
7 Point Text	Tahoma	0.07	0.07	Use for selected text on title block., column headings in tables, and parcel-owner text.
7 Point Text (Survey Text)	Arial Narrow	0.07	0.07	(Color 222) Use for selected survey text.
9 Point Text	Tahoma	0.09	0.09	Use for text callouts, dimensions, notes, column headings in tables, and parcel-owner text. *Minimum size for all text placed on letter-size plans*, other than text specified under 6 Point Text.
12 Point Text	Tahoma	0.12	0.12	Use for selected text on title sheet of plans.
14 Point Text	Tahoma	0.14	0.14	Use for detail and section titles, and table titles on detail sheets.

NOTES:

1. All styles are set to 0.65 (exact) line spacing.
2. All styles are Center-Center justified initially.
3. All styles are non-bold and non-italic, or non-slanted, and should remain so unless indicated otherwise above.

Table 4.6-1 INDOT Text Styles and Settings

4.7 Dimension Styles

Another feature in MicroStation which simplifies the placement of, and promotes uniformity in the appearance of dimensions is the ability to define settings for dimension styles. As with text styles, INDOT dimension styles are defined in the design library file *IN_Symbology.dgnlib*.

All dimensions should be placed in the design model and associated with their related objects. Dimensions should report dynamic values rather than static values. This will pose no problem if the object has been drawn to its actual size in the design model. Dimensions are placed on an appropriate text/dimension level when they are placed using the INDOT dimension styles. See Table 4.7-1 for the dimension styles that are provided for use on INDOT plans. Dimensions and notes placed on D-size plan sheets shall utilize 12 Point Text style , whereas those placed on letter-size plan sheets shall utilize 9 Point Text style. Their appearance must be consistent with the styles described in Table 4.7-1.

Dimension Style Name	***Text Style***	***Units***	***Notes / Settings***
Dimension Styles for D-Size Plan Sheets			
Arch	12 Point Text	MU label-SU label, round to nearest 1/16	Arrow terminator, no text frame
Engr Arrow	12 Point Text	MU label, round to nearest 0.01	Arrow terminator, no text frame
Engr Arrow Line	12 Point Text	MU label, round to nearest 0.01	Arrow terminator, line text frame
Engr Circle	12 Point Text	MU label, round to nearest 0.01	Circle terminator, no text frame
Engr None	12 Point Text	MU label, round to nearest 0.01	No terminator, no text frame
Dimension Styles for Ltr-Size Plan Sheets			
Arch Ltr	9 Point Text	MU label-SU label, round to nearest 1/16	Arrow terminator, no text frame
Engr Arrow Ltr	9 Point Text	MU label, round to nearest 0.01	Arrow terminator, no text frame
Engr Arrow Line Ltr	9 Point Text	MU label, round to nearest 0.01	Arrow terminator, line text frame
Engr Circle Ltr	9 Point Text	MU label, round to nearest 0.01	Circle terminator, no text frame
Engr None Ltr	9 Point Text	MU label, round to nearest 0.01	No terminator, no text frame

NOTES:

1. All styles are set to use Working Units.
2. All styles are set to Dynamic Justify text notes.
3. All arrowhead terminators are filled, and have width = 1.2 and height = 0.4584.

Table 4.7-1 INDOT Dimension Styles and Settings

All dimensioning should be performed using US Customary units. The accuracy of plan dimensions should be consistent with data upon which they are based. See *IDM* 14-3.06 for guidance regarding accuracy of dimensions for various elements.

In general, use the unit method of feet and inches on all plans unless the unit method of decimals is called for below. Feet and inches may be shown either with unit abbreviations (4 ft 3 in.) or with punctuation (4'-3"), as long as they are shown as such consistently throughout the plans. When using unit abbreviations, provide a space between the value and the abbreviation. When using punctuation units, there should be a hyphen to separate the major and minor units, and no spaces in the dimension. The *Arch* dimension styles defined in the design library utilize punctuation according to these conventions.

The unit method of decimals (decimal-feet) should be used for the following:

- stations
- elevations
- percent grades
- areas
- latitude and longitude
- curve data
- length of project where called out in miles

When using the unit method of decimals, use unit abbreviations rather than punctuation. Place a space between the value and the abbreviation (e.g. 75.42 ft). For a value less than 1, place a zero before the decimal point for clarity (e.g. 0.72 ft). The *Engr* dimension styles defined in the design library have been defined accordingly.

When a leader is necessary to connect dimension text to its extension lines or to attach a text note to an element, use a segmented line rather than a curved or spline leader along with an appropriate terminator. All arrowhead terminators should be filled and clearly visible on the plans.

4.8 MicroStation Drawing Names

The use of standard plan sheet names can eliminate numerous common problems. See Table 4.8-1 through Table 4.8-3 for names of typical drawing files created in MicroStation. For a complete discussion of the naming of base drawings and plan sheet drawing files created in InRoads, see the *INDOT Plans Production* document on the CAD Support web site or in ProjectWise. See *IDM* section 14-3.07 for guidelines concerning the organization of plans sheets for various projects.

Description	*Drawing File Name*	*Examples*
Road Project		
Title Sheet	Sht Title.dgn	
Drawing Index and General Notes	Sht Index.dgn	
Typical Cross Sections	Sht Typical *nn*.dgn	Sht Typical 07.dgn
Survey Route (Plat No. 1)	Sht Plat1 *nn*.dgn	Sht Plat1.dgn Sht Plat1 05.dgn
Survey Route Plat with Aerial Photography (Plat No. 3)	Sht Plat3 *nn*.dgn	Sht Plat3.dgn Sht Plat3 05.dgn
Geometric Tie-Up	Sht Geometric Tie *nn*.dgn	Sht Geometric Tie.dgn Sht Geometric Tie 01.dgn
Traffic Maintenance Details	Sht MOT *nn*.dgn	Sht MOT 02.dgn
Plan and Profile	Sht PlanProfile_*scale*_*nn*.dgn	Sht PlanProfile_50_01.dgn
Superelevation-Transition Diagram	Sht Super nn.dgn	Sht Super.dgn Sht Super 01.dgn
Details		
Construction Details	Sht Const Detail_*scale*_*nn*.dgn	Sht Const Detail_30_01.dgn
Intersection Details	Sht Intersection_*scale*_*nn*.dgn	Sht Intersection_30_01.dgn
Spot Elevation Details	Sht Spot Elev *nn*.dgn	Sht Spot Elev.dgn Sht Spot Elev 01.dgn
Channel Details	Sht Channel *nn*.dgn	Sht Channel 01.dgn
Geometric Details	Sht Geom Detail *nn*.dgn	
Right-of-Way Details	Sht ROW Detail *nn*.dgn	Sht ROW Detail.dgn Sht ROW Detail 01.dgn
Grading Plan	Sht Grading_*scale*_*nn*.dgn	Sht Grading_30_01.dgn
Drainage Details	Sht Drainage *nn*.dgn	Sht Drainage 01.dgn
Erosion and Sediment Control Details (plan view)	Sht TEC_*scale*_*nn*.dgn	Sht TEC_30_01.dgn
Retaining Wall Details	Sht Retaining Wall *nn*.dgn	Sht Retaining Wall.dgn Sht Retaining Wall 01.dgn
Wetland Mitigation Details	Sht Mitigation_*scale*_*nn*.dgn	Sht Mitigation_30_01.dgn
Traffic-Work Details		
Signs (if separate traffic-sign plans are not required)	Sht Signs *nn*.dgn	Sht Signs.dgn Sht Signs 01.dgn
Signals	Sht Signal_*scale*_*nn*.dgn	Sht Signal_30_02.dgn
Lighting (if separate lighting plans are not required)	Sht Lighting *nn*.dgn	Sht Lighting.dgn Sht Lighting 01.dgn
Pavement Markings	Sht Pvmt Markings_*scale*_*nn*.dgn	Sht Pvmt Markings_30_03.dgn
Road Summary Sheet	Sht Road Summary.dgn	

NOTE: *nn* is used to denote the drawing number for drawings with multiple sheets (01, 02, etc.).

Table 4.8-1 Typical Drawing File Names for Road Plan Sheets

Description	*Drawing File Name*	*Examples*
Bridge Project		
Title Sheet	Sht Title.dgn	
Index	Sht Index.dgn	
Typical Cross Sections	Sht Typical Cross Sections.dgn	
Traffic Maintenance Details	Sht MOT *nn*.dgn	Sht MOT 02.dgn
Temporary Runaround Details	Sht Runaround_*scale*_*nn*.dgn	Sht Runaround_50_02.dgn
Road Plan and Profile	Sht PlanProfile_*scale*_*nn*.dgn	Sht PlanProfile_50_01.dgn
Superelevation-Transition Diagram	Sht Super nn.dgn	Sht Super.dgn Sht Super 01.dgn
Roadway Details (see Road Plan sheets)		
Traffic-Work Details (see Road Plan sheets)		
Soil Borings	Sht Borings TB *nn*.dgn	Sht Borings TB 01.dgn
Channel Change Layout	Sht Channel *nn*.dgn	Sht Channel 01.dgn
Layout	Sht Layout_*scale*_*nn*.dgn	Sht Layout_30_01.dgn
General Plan	Sht General Plan.dgn	
Structure Details	Sht Structure.dgn	
Abutment/Bent/Pier Details	Sht End Bent Details *nn*.dgn Sht Pier No *x nn*.dgn	Sht End Bent Details 02.dgn Sht Pier No 2 and 3 01.dgn
Framing Plan	Sht Framing Plan.dgn	
Structural Steel Details or Precast-Concrete Beam Details	Sht Beam Details *nn*.dgn	Sht Beam Details 01.dgn
Bearing Details	Sht Bearings.dgn	
Superstructure/Floor Details	Sht Superstructure *nn*.dgn	Sht Superstructure 02.dgn
Railing Details	Sht Railing Details.dgn	
Screeds	Sht Screed *nn*.dgn	Sht Screed 02.dgn
Reinforced-Concrete Bridge Approach Details	Sht Approach Slab Details *nn*.dgn	Sht Approach Slab Details 02.dgn
Bridge Summary	Sht Bridge Summary.dgn	
Road Summary	Sht Road Summary. dgn	
Pipe Materials	Sht Materials.dgn	
Cross Sections	Sht Xsec_*scale*_*nn*.dgn	Sht Xsec_50_03.dgn

NOTE: *nn* is used to denote the drawing number for drawings with multiple sheets (01, 02, etc.).

Table 4.8-2 Typical Drawing File Names for Bridge Plan Sheets

Description	*Drawing File Name*	*Examples*
Traffic-Signs Project		
Title Sheet	Sht Title.dgn	
Index and General Notes	Sht Index.dgn	
Signing Plan	Sht Signing Plan.dgn	Sht Signing Plan01.dgn
Sign Layout	Sht Sign Layout.dgn	Sht Panel Sign Layout 01.dgn / Sht Sheet Sign Layout 01.dgn
Cross Sections	Sht Sign Cross Sections.dgn	
Sign Summary	Sht Panel Sign & Post Summary.dgn Sht Sheet Sign & Post Summary.dgn	Sht Panel Sign & Post Summary 01.dgn Sht Sheet Sign & Post Summary01.dgn
Footing Details	Sht Signal Footing Details.dgn	
Structural Details	Sht Structural Details.dgn	
Signalization Project		
Title Sheet	Sht Title.dgn	
Index and General Notes	Sht Index.dgn	
Signal Plan	Sht Signal Plan.dgn	Sht US 41 & SR 57 Signal Plan.dgn
Signal Details	Sht Signal Details.dgn	
Lighting Project		
Title Sheet	Sht Title.dgn	
Index and General Notes	Sht Index.dgn	
Lighting Plan	Sht Lighting Plan.dgn	
Cross Sections	Sht Lighting Cross Sections.dgn	
Lighting Details	Sht Lighting Details.dgn	

NOTE: *nn* is used to denote the drawing number for drawings with multiple sheets (01, 02, etc.).

Table 4.8-3 Typical Drawing File Names for Traffic Plan Sheets

4.9 CAD Standards Resources

When you have questions or need assistance:

INDOT CAD Support
Email: indotcadsupport@indot.in.gov
or through INDOT Sharepoint: http://sharepoint.indot.in.gov/cadsite/default.aspx
Web site: http://in.gov/indot/3084.htm

CAD Support Publications:

DOTWise Project Creator, available in ProjectWise
INDOT New User 2A, available in ProjectWise
INDOT Plans Production, available in ProjectWise
INDOT Plans Production, available for download from the CAD Support web site

INDOT CAD Peer Group
Email: indotcadsupport@indot.in.gov for a current list of CAD Peer Group members.

Indiana Design Manual
http://www.in.gov/indot/design_manual/index.htm

INDOT Land & Aerial Survey Office
Web site: http://www.in.gov/indot/2715.htm

Land & Aerial Survey Office Publications:

Photogrammetric Mapping Specifications & Services Manual, available for download from the Land & Aerial Survey Office web site

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Appendix A Standard Prefixes for INDOT CAD Levels

INDOT CAD level names are comprised of two category prefixes and a brief specific description.

Example:

P_RDWY_Guardrail

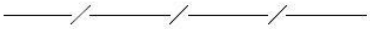
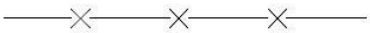
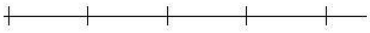
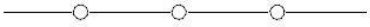
P_	First Position Prefix, indicates that the level contains information related to Proposed work
RDWY_	Second Position Prefix, indicates that the level contains information related to Roadway Features
Guardrail	Brief Description, indicates that the level contains linework specifically related to Guardrail. Do not use "Miscellaneous" or other generalities.

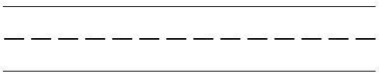
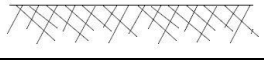
Level Prefix	***Meaning and Intended Use***	
First Position Prefixes		
CG_	CoGo Points	2- and 3-dimensional points
G_	Ground Surface	Graphical elements of DTM surface generated within InRoads
P_	Proposed	Elements related to proposed work
PP_	Plans Production	Graphical elements, grid lines, and text related to plan and profile generated within InRoads
PROF_	Profile	Elements related to profile features
RW_	Right of Way	Elements used to define land division boundaries
S_	Survey	Elements related to surveyed or existing topographical objects
ST_	Standard Drawings	Elements used to represent and annotate standard drawings *For use on Standard Drawings only*
XS_	Cross Section	Elements used to represent and annotate features on cross sections generated within InRoads

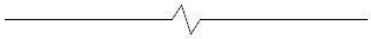
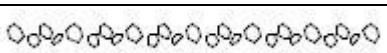
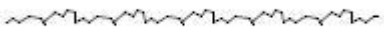
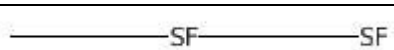
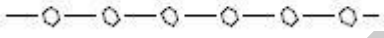
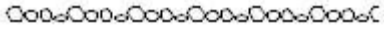
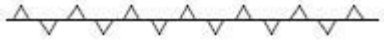
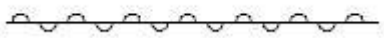
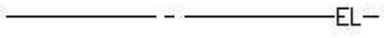
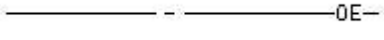
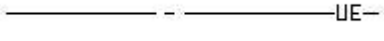
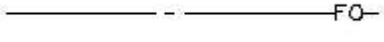
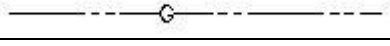
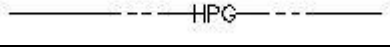
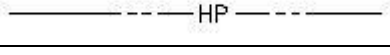
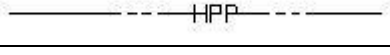
NOTE: Second Position Prefixes shown in table continued on next page.

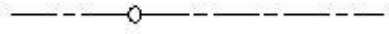
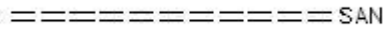
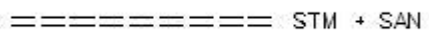
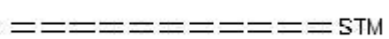
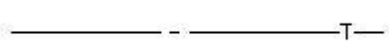
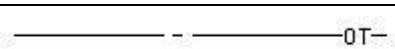
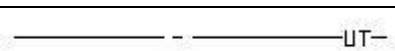
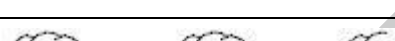
Level Prefix	***Meaning and Intended Use***	
Second Position Prefixes		
ALG	Alignment	Graphical elements used to define horizontal and vertical alignments generated within InRoads
_BR_	Bridge Features	Elements related to proposed bridge location, superstructure, piers, railings, etc.
CTRL	Survey Control	Graphical elements showing located survey markers and control points *For Survey Dept use only*
_DR_	Drainage Features	Elements showing natural and constructed drainage structures
_E_	Existing Feature	
_EW_	Earthworks Features	Elements related to proposed earthworks boundaries and calculations
_G_	Graphical Feature	Graphical elements, grid lines, and text related to plan and profile generated within InRoads
_HY_	Hydraulics Features	Elements related to hydrology
PROP	Property Features	Graphical elements showing located buildings, attached property objects, plants, and signs
RDWY	Roadway Features	Elements related to proposed roadway location, pavement, shoulders, curbs, sidewalks, traffic islands and defined safety regions
_RW_	Right of Way	Graphical elements showing land division boundaries
SURF	Surface Features	Graphical elements of DTM surface generated within InRoads
_TC_	Template Component	Graphical elements used to represent new-construction features on cross sections generated within InRoads
TOPO	Topographical Features	Graphical elements showing located topographic features *For Survey Dept use only*
TRAF	Traffic Features	Elements related to maintenance of traffic
UTIL	Utility Features	Graphical elements showing located utility lines and structures *For Survey Dept use only*

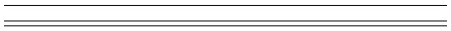
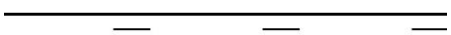
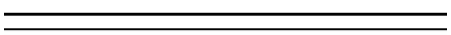
Appendix B INDOT Custom Line styles

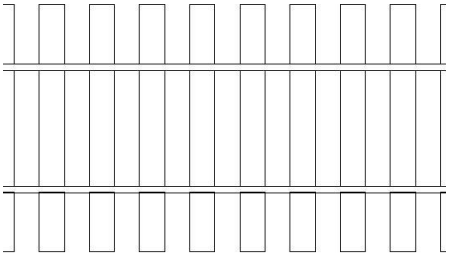
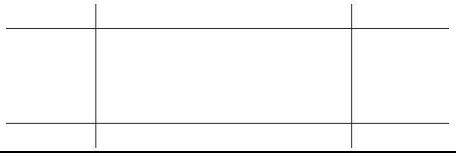
Line style Name	*Sample*	*Intended Use*	*Notes*
align		proposed alignment showing cardinal points	
becity		existing boundary line – city limits	For Survey Dept use only
becounty		boundary line, county border	For Survey Dept use only
befbd		fence, existing, wood board	For Survey Dept use only
befbw		fence, existing, barbed wire	For Survey Dept use only
befconc		fence, existing, concrete	For Survey Dept use only
befield		edge of field	For Survey Dept use only
befiron		fence, existing, wrought iron	For Survey Dept use only
befpcket		fence, existing, picket fence	For Survey Dept use only
befrail		fence, existing, railroad tie	For Survey Dept use only
befsw		fence, existing, smooth wire	For Survey Dept use only
beparks		boundary line, cemetery, national forest	For Survey Dept use only
beprprty		right of way, existing	For Survey Dept use only
bestate		boundary line, state border	For Survey Dept use only
betwnshp		boundary line, township limit	
bpcl		construction limits	
bppl		property line, existing	For Survey Dept use only
bprw		right-of-way limit	For Survey Dept use only
bprwb		begin lmited-access right of way	
bprwbe		begin and end limited-access right of way	

Line style Name	*Sample*	*Intended Use*	*Notes*
bprwe		end lmited-access right of way	
bprwn		no symbol limited-access right of way	
bprwplat		right of way for plat drawing	
bprwplatn		right of way for plat drawing, no circles	
cloud		revision cloud	
cloud invert		revision cloud	
conduit – wiring		conduit wiring, traffic signal detail	For Survey Dept use only
defl		water flow line, existing	For Survey Dept use only
depipe		drainage pipe, existing	For Survey Dept use only
dpfl		flowline, proposed	
excont		major contours, existing ground	
existing		existing features	For Survey Dept use only
Existingx2		existing features, exaggerated	
gdrlal		guardrail, aluminum	For Survey Dept use only
gdrlbm		guardrail, beam	For Survey Dept use only
gdrlcb		guardrail, cable	For Survey Dept use only
gdrlot		guardrail, other	For Survey Dept use only
gdrlwd		guardrail, wooden	For Survey Dept use only
ge		guardrail, existing	For Survey Dept use only
gp		guardrail, proposed	
ground line		ground line for section or profile details	
Handrail		handrail	
hedge		hedges	May also be used for coffer dams

Line style Name	*Sample*	*Intended Use*	*Notes*
lbreak		object break line	
lcent		centerline	
reproperty		real estate property line	For Real Estate Dept use only
repropertyc		real estate property line	For Real Estate Dept use only
riprap		riprap	
rock		rock outcrop	For Survey Dept use only
silt fence		silt fence	
stonfc		stone face	For Survey Dept use only
stonwl		stone wall	For Survey Dept use only
treeconif		woods line, coniferous	For Survey Dept use only
treedecid		woods line, deciduous	For Survey Dept use only
ucabtv		cable tv line	For Survey Dept use only
ucabtv_Over		cable tv, overhead wire	
ucabtv_Under		cable tv, underground cable	
uelec		electrical line	For Survey Dept use only
uelec_Over		electrical overhead wire	
uelec_Under		electrical underground cable	
ufibopt		fiber optic underground cable	
ugas		natural gas pipe	
uhpg		high pressure gas pipe	For Survey Dept use only
uhpl		utility, high pressure line, unknown	For Survey Dept use only
uhpp		utility, high pressure, propane	For Survey Dept use only

Line style Name	*Sample*	*Intended Use*	*Notes*
uother		other type of utility	For Survey Dept use only
usan		sanitary sewer pipe	For Survey Dept use only
ustmsn		sanitary/storm sewer pipe	For Survey Dept use only
ustorm		storm sewer pipe	For Survey Dept use only
utele		telephone line	For Survey Dept use only
Utele_over		telephone, overhead wire	
Utele_under		telephone, underground cable	
uwater		water pipe	For Survey Dept use only
wooded		woods/brush line	For Survey Dept use only
wtredg		water edge	For Survey Dept use only
xe		cross section, existing	
xp		cross section, proposed	
Crosshatch 1’		crosshatch, 1-ft wide lines	True Scale LS
Crosshatch 4”		crosshatch, 4-in. wide lines	True Scale LS
Crosshatch 8”		crosshatch, 8-in. wide lines	True Scale LS
cl 4 lane undiv		double yellow, 4-in. gap	True Scale LS
cl left pass		centerline striping, left pass	True Scale LS
cl no passing		centerline striping, no passing	True Scale LS
cl passing		centerline striping, full passing	True Scale LS

Line style Name	*Sample*	*Intended Use*	*Notes*
cl right pass		centerline striping, right pass	True Scale LS
crosswalk		crosswalk striping	True Scale LS
curb & gutter – 4		curb and gutter, 4-in. height, proposed	True Scale LS
curb & gutter – 6		curb and gutter, 6-in. height, proposed	True Scale LS
curb & gutter – 8		curb and gutter, 8-in. height, proposed	True Scale LS
curb – 4		curb, 4-in. height, proposed	True Scale LS
curb – 6		curb, 6-in. height, proposed	True Scale LS
curb – 8		curb, 8-in. height, proposed	True Scale LS
ex. c & g – 4		curb and gutter, 4-in. height, existing	True Scale LS
ex. c & g – 6		curb and gutter, 6-in. height, existing	True Scale LS
ex. c & g – 8		curb and gutter, 8-in. height, existing	True Scale LS
ex. curb – 4		curb, 4-in. height, existing	True Scale LS
ex. curb – 6		curb, 6-in. height, existing	True Scale LS
ex. curb – 8		curb, 8-in. height, existing	True Scale LS
exagerated left pass		centerline striping, left pass	True Scale LS
exagerated no passing		centerline striping, no passing	True Scale LS
exagerated right pass		centerline striping, right pass	True Scale LS

Line style Name	*Sample*	*Intended Use*	*Notes*
MOT barrels 100		mot barrels	True Scale LS
MOT barrels 50		mot barrels	True Scale LS
RPM 40ft		rpms at every skip	True Scale LS
RPM 80ft		rpms at alternate skips	True Scale LS
skips		base line style for centerline line styles	True Scale LS
stop line		stop line	True Scale LS
striping		solid stripe, 4 in.	True Scale LS
suicide		offset double yellow for suicide lane	True Scale LS
rr2		railroad tracks, existing, for 1" = 2' depiction	
rr20		railroad tracks, existing, for 1" = 20' depiction	
rr50		railroad tracks, existing, for 1" = 50' depiction	For Survey Dept use only
rr100		railroad tracks, existing, for 1" = 100' depiction	For Survey Dept use only
rr2000		railroad tracks, existing, for 1" = 2000' depiction	

Appendix C Abbreviations For Use on Plans

&	And
@	At
Δ	Delta or Deflection Angle
=	Equals
	Fish
||	Parallel
%	Percent
⊥	Perpendicular
Ø	Phase or Diameter
℉	Begin L.A. R/W
℉	End L.A. R/W
A.A.D.T.	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
Ab.	Abrupt
Abut.	Abutment
Ac	Acres
A.C.	Aluminum Cap/Asphalt Cement
A.C.L.	Access Control Line
Add. Exc.	Additional Excavation
Adj.	Adjusted
Aggr.	Aggregate
Ah.	Ahead
Alum.	Aluminum
A.P.	Anchor Plate
App. Exist. R/W	Apparent Existing Right-of-Way
App. P. L.	Apparent Property Line
Appl.	Application
Appr.	Approach
Approx.	Approximate
Art.	Article
Asph.	Asphalt
ASTM	American Society for Testing Materials
Ave.	Avenue
Avg.	Average
AWG	America Wire Gauge
Az.	Azimuth
B.	Barn
B.E.	Bridge End
Beg.	Begin
B.I.P.	Boiler Iron Pipe
Bit.	Bituminous or Bitumen
Bk.	Back or Bank
℄	Baseline (ST_BOUNDLINE in IN_Symbols.cel)
Bldg.	Building
Blk	Block
Blktp.	Blacktop
Blvd.	Boulevard
Bm.	Beam
B.M.	Bench Mark
Bndry.	Boundary
Bot.	Bottom
Br.	Bridge
Brg.	Bearing
Brk.	Brick
Br. S.	Bridge Seat
B.S.	Backsight
B. Spk.	Boat Spike
B.S.T.	Bituminous Surface Treatment
Bur.	Buried
Calc.	Calculated
C.A.P.	Corrugated Aluminum Pipe
C.A.T.	Crash Cushion/Attenuating Terminal Guard Rail End Treatment
Cb.	Curb
C.B.	Catch Basin
Cb.In.	Curb Inlet
Cb.L.	Curb Line
C.B.W.	Concrete Block Wall
C.C.	Corn Crib
C-C	Center to Center
Cdtn.	Condition
Cem.	Cemetery
C.G.M.P.	Corrugated Galvanized Metal Pipe
Ch.	Channel or Chain
Chan. Chg.	Channel Change
Chd.	Chord
C.I.	Cast Iron
C.I.P.	Cast Iron Pipe
Cir.	Circle
℄	Centerline (ST_CENTERLINE in IN_Symbols.cel)
Cl.	Class or Clearance
Clr.	Clear
C.L.	Corporation or City Limits

C.L.T.F.	Chain Link Type Fence
C.M.B.	Concrete Median Barrier
C.M.P.	Corrugated Metal Pipe
Co.	County or Company
C.O.	Clean Out
Col.	Column
Comp.	Compacted or Composite
Conc.	Concrete
Conc. P.	Concrete Pipe
Conn.	Connection
Const.	Construction or Construct
Cont.	Continuous
Cor.	Corner
Corr.	Corrugated
Cov.	Cover
C.P.	Catch Point
Cr.	Crushed or Creek
Crs.	Course
C. Stn.	Crushed Stone
Ct.	Court
Ctr.	Center
Cu.	Cubic
Cul.	Culvert
Cyd	Cubic Yards
C.Z.	Clear Zone or Construction Zone
D	Distribution of Traffic
Dbl.	Double
Defl.	Deflection
Desc.	Description
Dest.	Destroyed
Det.	Detour or Detail
Detc.	Detector
D.H.	Drill Hole
D.H.V.	Design Hourly Volume
Dia.	Diameter
Diaph.	Diaphragm
Dim.	Dimension
Dist.	Distance or District
Dn.	Down
Dp.	Deep
D.S.	Downstream
Dr.	Drain or Drive
Dt.	Ditch
Drwg.	Drawing
E	East
Ea.	Each
E.B.	Eastbound
E.B. L.	Eastbound Lane
E.F.	Each Face
E.G.	Edge of Gutter
Elec.	Electric
El.	Elevation
E.M.	Edge of Metal (surface)
Emb.	Embankment
E.P.	Edge of Pavement
Eq.	Equation
Esmt.	Easement
E.T.L.	Edge of Traveled Lane
E.T.W.	Edge of Traveled Way
Exc.	Excavation
Exist.	Existing
Exp.	Expansion
Ext.	Extension
Fa.	Face
F.A.	Federal Aid
F.B.C.P.C.S.	Fully Bituminous Coated Perforated Corrugated Steel
F.Div.	Field Division
Fdn.	Foundation
Fe.	Fence
Fert.	Fertilizer
F-F	Face to Face
F.F.	Front Face
F.F.T.F.	Farm Field Type Fence
F. Hyd.	Fire Hydrant
Fig.	Figure
Fin.	Finish
Fix.	Fixed
Fl.	Flush
℄	Flow Line (ST_FLOWLINE in IN_Symbols.cel)
Flg.	Flange
F.O.	Fiber Optic
F.P.	Fence Post
F.R.	Frontage Road
F.S.	Far Side or Foot of Slope
F.T.	Farm Tile
ft	Feet
Ftg.	Footing
Fut.	Future
Fwy.	Freeway
G.	Garage
Galv.	Galvanized
G.B.A.	Gravel Barrel Array Impact Attenuator
G.B.E.S._ _	Grated Box End Section (Pipes)

Gdr.	Girder
Geod.	Geodetic
G.L.	Gas Line
G.P.	Guy Pole
G.P.S.	Global Positioning System
G.R.	Guard Rail
Grav.	Gravel
G.R.E.A.T. __	GREAT Unit (Bays)
G.R.E.T.	Guard Rail End Treatment
G.R.T.	Guardrail Transition
Grnd.	Ground
Gr.Sep.	Grade Separation
G.S.	Gravel Surfacing
G.S.P.	Galvanized Steel Pipe
Gut.	Gutter
G.V.	Gas Valve
H.H.	Hand Hole
Hdw.	Headwall
H.I.	Height of Instrument
H.	House
Horiz.	Horizontal
H.P.S.V.	High Pressure Sodium Vapor
H.S.	High Strength
Ht.	Height
H.W.	High Water
H.W.L.	High Water Line
Hwy.	Highway
I	Interstate
I.C.	Incidental Construction
I.D.	Inside Diameter
I.F.	Inside Face
IMSA	International Municipal Signal Association
in.	Inches
In to In	Inside to Inside
Inc.	Incorporated
Incl.	Included
Inlt.	Inlet
Instr.	Instrument
Inters.	Intersection
Intch.	Interchange
Inv.	Invert
I.P.	Iron Pipe
I.P.B.	Iron Pipe Buried Below Plow Depth
I.P.F.	Iron Pin Flush
I.P.L.	Iron Pin Lightly Buried
I.P.N.F.	Iron Pin Not Found
Jct.	Junction
Jt.	Joint
L	Length of Curve, Liter or Loop
L.A.	Limited Access
L.A.R/W.	Limited Access Right of Way
Lb	Pounds
L.C.	Long Chord
L_C	Length of Circular Curve
L.D.	Loop Detector
Leng.	Length or Lengthen
Ln.	Lane
LRFD	Load Resistance Factor Design
L.S.	Land Surveyor
L.S.R.	Local Service Road
Lt.	Left
Lt. P.	Light Pole
L.W.	Low Water
Mac.	Macadam
Matl.	Material
Max.	Maximum
Mbox.	Mailbox
Mdwl.	Mudwall
Meas.	Measured
Med.	Median
Mh.	Manhole
Mi	Miles
Min.	Minimum, Mineral or Minute
Misc.	Miscellaneous
Mkr.	Marker
ML.	Mainline
Mncpl.	Municipal
M.O.	Mid Ordinate
Mom.	Moment
Mon.	Monument
M.P.C.	Mid-Point of Curve
N	North
N.B.	Northbound
N.B.L.	Northbound Lane
N.C.	Normal Crown
N.E.	Northeast
Neg.	Negative
NEMA	National Electrical Manufacturers Association
N.E.P.L.	No Evidence of Property Line
N.F.	Near Face
N.G.	Natural Gas
N.G.S.	National Geodetic Survey
Nl.	Nail

Nly.	Northerly
No. or #	Number
N.S.	Near Side
N.W.	Northwest
O.C.	On Centers or Overhead Crossing
O.D.	Outside Diameter
O.F.	Outside Face
Off.	Offset
Oh.	Overhang or Overhead
O-O	Out to Out
O.P.O.C.	Offset Point on Curve
O.P.O.S.T.	Offset Point of Semi-Tangent
O.P.O.T.	Offset Point on Tangent
Out.	Outlet
Oz	Ounces
P	Power Cable or Pipe
P. or Pg.	Page
P.B.	Pull Box
P.C.	Point of Curve (Beginning of Curve)
P.C.C.	Point of Compound Curve or Portland Cement Concrete
Ped.	Pedestrian
Pen.	Penetration
Perf.	Perforated
P.G.	Profile Grade
P.I.	Point of Intersection
ℙ	Plate (ST_PROPLINE in IN_Symbols.cel)
ℙ	Property Line (ST_PROPLINE in IN_Symbols.cel)
Plas.	Plastic
P.M.P.	Perforated Metal Pipe
P.O.C.	Point on Curve
Pos.	Positive
P.O.S.T.	Point on Semi-Tangent
P.O.T.	Point on Tangent
P.O.V.C.	Point on Vertical Curve
Pp.	Pages
P.P.B.	Pedestrian Push Button
P.R.C.	Point of Reverse Curve
Prest.	Prestressed
Priv.	Private
Proc.	Processing
Proj.	Project or Projected
Prot.	Protect, Protector or Protection
P.S.D.	Paved Side Ditch
Pt.	Point
P.T.	Point of Tangent (End of Curve)
Pub.	Public
Pv.C.	Polyvinyl Chloride
P.V.C.	Point of Vertical Curve
P.V.I.	Point of Vertical Intersection
Pvm't.	Pavement
P.V.T.	Point of Vertical Tangent
Pwp.	Powerpole
Pwr.	Power (Lines)
Q	Peak Discharge (Water)
R.	Range or River
Rad. or R.	Radius
R.C.	Rapid Curing, Reinforced Concrete or Remove Crown
R.C.P.	Reinforced Concrete Pipe
Rd.	Road
Rdl.	Radial
Rd. N.	Road Nail
Rd NF.	Road Nail Flush
Rd NL.	Road Nail Lightly Buried
Rdwy.	Roadway
Rec.	Record or Recommended
Ref.	Reference
Reinf.	Reinforcement, Reinforcing, Reinforced
Req'd.	Required
Ret.	Retaining
Rev.	Revised
R.M.	Reference Monument
R.P.	Reference Point
R.P.M.	Raised Pavement Marker
R.R.	Railroad
R.R. Spk.	Railroad Spike
Rt.	Right or Route
Rte.	Route
R/W	Right-of-Way
R/W Mkr.	Right-of-Way Marker
Rwy.	Railway
S	South
S.	Shed
San.	Sanitary Sewer
S.B.	Southbound
S.B.L.	Southbound Lane
Sched.	Schedule
Sdwk.	Sidewalk
S.E.	Southeast
SE	Superelevation
Sec.	Section or Second

Sec. Line	Section Line
Ser. Rd.	Service Road
S.G.	Subgrade
Sht.	Sheet
Shldr.	Shoulder
Sig.	Signal
S.L.D.	Sea Level Datum
Sly.	Southerly
Spa.	Spaces, Spacing
Spec. Prov.	Special Provision
Spk.	Spike
Spl.	Special or Splice
Sq.	Square
Sft	Square Feet
Sq. in.	Square Inches
S.R.	State Road or State Route
S.S.	Stainless Steel
St.	Street
Sta.	Station
Std.	Standard
Std. Spec.	Standard Specifications
Stiff.	Stiffener
Stk.	Staked or Stake
Stl.	Steel
Str.	Structure, Structural
Subd.	Subdivision
Subgr.	Subgrade
Substr.	Substructure
Supstr.	Superstructure
Surf.	Surface or Surfacing
Surv.	Survey
S.W.	Southwest or Sidewalk
Sym.	Symmetrical
T.	Tangent Length or Township (as T-6-N)
T	Ton
Tan.	Tangent
T.B.	Test Boring
T.B.M.	Temporary Bench Mark
Tbr.	Timber
Tel.	Telephone
Tel.C.	Telephone Cable
Tgp.	Telegraph Pole
Tfp.	Telephone Pole
Temp.	Temperature or Temporary
T.O.	Top of Opening
T.O.B.	Top of Bank
T.O.P.	Top of Pipe
T.O.S.	Top of Slope
Topog.	Topographic
T.P.	Turning Point
Trans.	Transmission Line or Transition
Trav.	Traverse
T.T.	Transmission Tower
Twp.	Township (as Center Township)
T.W.L.T.L.	Two-Way Left-Turn Lane
Typ.	Typical
U.	Unit
Ug.	Underground
Uncl.	Unclassified
U'pass.	Underpass
U.S.	Upstream
U.S.C. & G.S.	U.S. Coast & Geodetic Survey
U.S.Co.E.	U.S. Corps of Engineers
U.S.F.S.	U.S. Forest Service
U.S.G.S.	U.S. Geological Survey
U.S.P.L.S.	U.S. Public Land Survey
V	Design Speed or Velocity
V.C.	Vertical Curve
Veh.	Vehicle, Vehicular
Vert.	Vertical
W	West, Wide Flange Beam or Water
W/	With
W.B.	Westbound
W.B.L.	Westbound Lane
Wd.	Wood
W.L.	Water Line
Wly.	Westerly
W.P.	Working Point
Wt.	Weight
W.T.	Water Table
W.V.	Water Valve
W.W.	Wing Wall or Woven Wire
Xing.	Crossing
Xsec.	Cross Section