MONTANA
Department of Transportation

2023

Autodesk Civil 3D Naming Standards, File Types & Referencing Relationships

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OVERVIEW

This is an overview of MDT Civil 3D files and their referencing relationships supported by the MDT Autodesk Civil 3D workspace.

FILE TYPE OVERVIEW

FILE TYPES

A variety of files are developed during the life of a project to achieve a complete plan set deliverable. The following is a summary of the common dwg file types and intended contents of each. The Naming Standards section of this document includes a listing of additional project file types and details on MDT file naming standards.

MDT's common standard design, modeling, and survey project file types are listed below:

Document Class	Document Class Description	File Contents
ALN	Alignment, Profile, Superelevation	All civil alignments and associated profiles. Superelevation calculated
ARE	Area File	Area shapes for acquisition calculations
CMA	3D Contour Map File	For criteria only
CRR	Corridor File	3D Models
DET	Details	Project design areas requiring more detail than plans allow
DRG	Drainage Model	All proposed and existing drainage pipes and structures
ERO	Erosion Control	Erosion control BMPs, notes, & details
ERT	Erosion Control Title Sheet	Title sheet for erosion control
ESM	Existing Surface Model	Existing project topography
EXH	Exhibits	Plan view of right-of-way acquisition with areas shaded by parcel for deed exhibit
HPS	Hydraulic Proposed Surface Model	Proposed hydraulic grading
MAP	2D Strip Map File	All COGO visualization of alignments and profiles, line work for edge of pavement, sidewalk, curb, etc.
MAP	PH/DI (District) Map File	Surveyed existing features
OWN	Ownership	Right-of-way land ownership data and acquisition area values by parcel
PCF	Project Calculation	Working document for internal calculations
PLN	Plan & Plan	Plan view of project design
PLP	Plan & Profile	Plan and profile view of project design
PSM	Proposed Surface Model	Grading proposed surfaces
PVP	Pavement Preservation Plan	Plan set for pavement preservation projects
SUE	Utilities SUE Survey	Surveyed utility locations
SUM	Summary Frame	Summary of project quantities and locations
TRV	Traverse & Control	Control point diagram with point name/number, northing, easting, and elevation
TTL	Title Sheet, Table of Contents, & Notes	Title Sheet - project type, project location, and other pertinent project information
TYP	Typical Sections	Project typical sections showing surfacing section, surfacing quantities, roadway widths, and cut/fill slope rates
UMA	Utilities Mapping	All existing dry utilities
WSU	Wetland Survey	Surveyed wetland boundaries and hatching
XSF	Cross Section File	Cross sections and annotations

NAMING STANDARDS

OVERVIEW

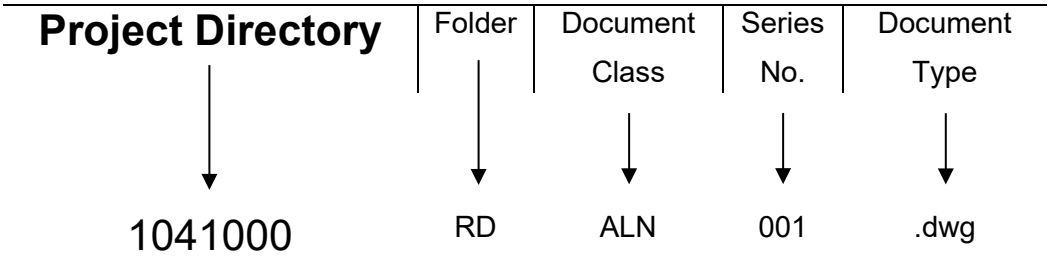
This document describes the details of the ACC – Autodesk Docs (BIM 360) document naming standards.

NAMING OF DESIGN FILES

1. Design files saved in ACC - Autodesk Docs (BIM 360) are required to follow the naming conventions established for PCMS. This is to ensure successful transfer of design files to PCMS at project closeout.

   ***Note: PCMS Phase 2 is currently under development and will include an enhancement to increase the flexibility of the naming standard.*

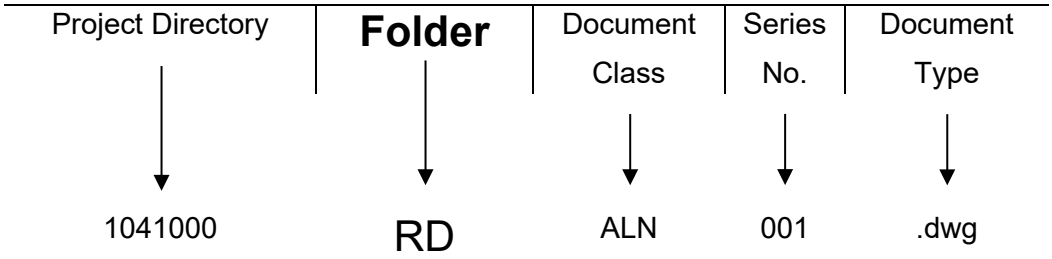
2. Project Directory – **1041000**RDALN001.dwg



Project Number + Unit

Project	Agreement	Unit	Project ID	Description/Location
1041	013	000	NH 62-2(13)21 F	NW of Sidney-N

3. Folder - 1041000**RD**ALN001.dwg



The work area creates and maintains the document and manages them in the appropriate folder for the work area. The available folders are shown on the following page.

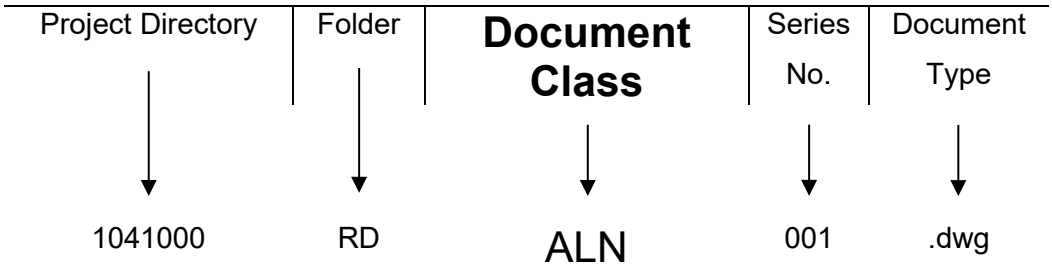
Sorted by Name

Alternative Contracting	AC
As-Builts	AB
Bridge	BR
Combined Survey	CS
Construction	CO
Consultant Design	CD
Contract Plans	CP
District Survey	DI
Environmental	EN
Geotechnical	GT
GIS	GS
Hydraulics	HY
Materials	MT
Photogrammetry	PH
Right-of-Way Design	RO
Road Design	RD
Surfacing Design	SD
Survey	SU
Traffic Electrical	EL
Traffic Geometrics Design	GE
Traffic Operations	TO
Traffic Safety	SA
Traffic Signing	SI
Utilities	UT
Visualization	VI

Sorted by Abbreviation

AB	As-Builts
AC	Alternative Contracting
BR	Bridge
CD	Consultant Design
CO	Construction
CP	Contract Plans
CS	Combined Survey
DI	District Survey
EL	Traffic Electrical
EN	Environmental
GE	Traffic Geometrics Design
GS	GIS
GT	Geotechnical
HY	Hydraulics
MT	Materials
PH	Photogrammetry
RD	Road Design
RO	Right-of-Way Design
SA	Traffic Safety
SD	Surfacing Design
SI	Traffic Signing
SU	Survey
TO	Traffic Operations
UT	Utilities
VI	Visualization

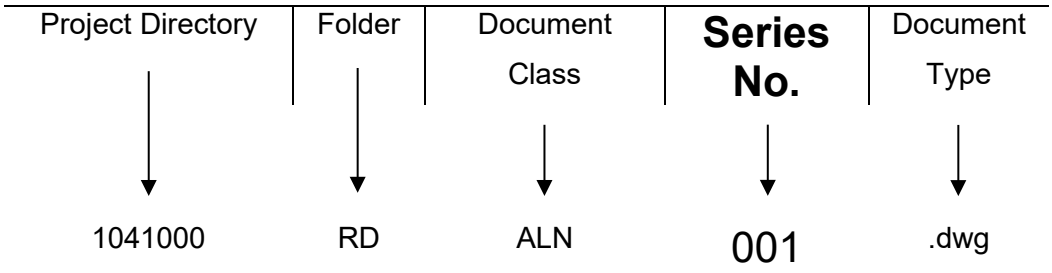
4. Document Class – 1041000RD**ALN**001.dwg



Document Class codes are used to categorize documents. The following class codes will be used for design files:

Code	Description	Code	Description	Code	Description
ABS	Control Abstract	ELD	Experimental Layout Design	PBC	Reinforced Precast Box Culvert
ALN	Alignment Information	ELE	Building Electrical Plans	PCF	Project Calculation File
ANC	Ancillary	EPL	Erection Plans	PLN	Plan and Plan File
ARC	Building Architectural Plans	EQU	Equation File	PLP	Plan and Profile File
ARE	Area	ERO	Erosion Control Plans	PSM	Proposed 3D Surface Model
ASU	Additional Survey	ERT	Erosion Control Title Sheet	PVP	Pavement Preservation Plans
BMB	Beam Details (Bulb-T)	ESM	Existing 3D Surface Model	SUE	Utilities SUE Survey File
BNT	Bent or Abutment	EXH	Exhibit Sheet	SUM	Summary Frames
CAD	Cadastral	EXP	Existing Plans	TRV	Traverse and Control
CAM	Camber Diagram	FPL	Footing Plan	TTL	Title Sheet
CGP	Contour Grading Plan	FXP	Fencing Plans	TYP	Typical Sections
CHC	Channel Change	FXT	Fencing Title Sheet	UMA	Utilities Mapping File
CHK	Check File	GEN	General Layout	WSU	Wetland Survey File
CLV	Culverts	GIR	Girder Details	XSF	Cross Sections File
CMA	Contour Map	HDS	Hydraulic Data Summary	PCF	Project Calculation File
CON	Control Survey	HPS	Hydraulic Proposed Surface Model	PLN	Plan and Plan File
COR	Core Logs	HSU	Hydraulic Survey	PLP	Plan and Profile File
CRR	Corridors File	JNT	Joint Details	PSM	Proposed 3D Surface Model
DET	Detail Sheets	LAY	Cross Section Layout	PVP	Pavement Preservation Plans
DIA	Diaphragm Details	LOC	Project Location Maps	SUE	Utilities SUE Survey File
DIS	2D Display File	LSD	Landscaping Detail Sheet	SUM	Summary Frames
DRG	Drainage Model	LSP	Landscaping Plan Sheet	TRV	Traverse and Control
DSD	Drilled Shaft Details	MAP	Map File	TTL	Title Sheet
DST	Autodesk Sheet Set	MAS	Mass Diagram	TYP	Typical Sections
DTM	Digital Terrain	MDE	Miscellaneous Details	UMA	Utilities Mapping File
DTP	Digital Terrain/Planimetric	MEC	Building Mechanical Plans	WSU	Wetland Survey File
ECF	Existing Culvert File	OHW	Ordinary High Water Mark Survey	XSF	Cross Sections File
EJD	Expansion Joint Detail	OWN	Ownership Sheet		

5. Series No. – 1041000RDALN**001**.dwg



Each work area decides what 3-digit alpha-numeric combination to use for their document classes.

001 – 999
A01 – Z99
AA1 – ZZ9
AAA – ZZZ

Examples:

Consultant documents use an X, Y, & Z in series numbering.

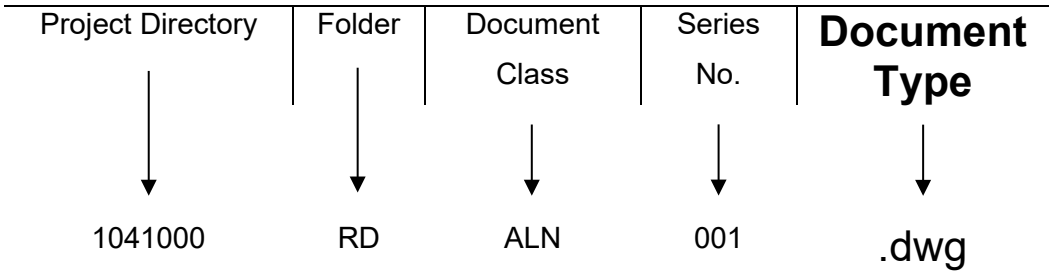
X01 – X99	Y01 – Y99	Z01 – Z99
XX1 – XX9	YY1 – YY9	ZZ1 – ZZ9
XXX	YYY	ZZZ

Environmental assigns incremental Series numbers for every project, workgroup, and class.

Class	Series
FXS	001, 002, 003, etc.
OMT	001, 002, 003, etc.

Road Design assigns incremental Series numbers for every project, workgroup, and class.

6. Document Type – 1041000RDALN001.**dwg**



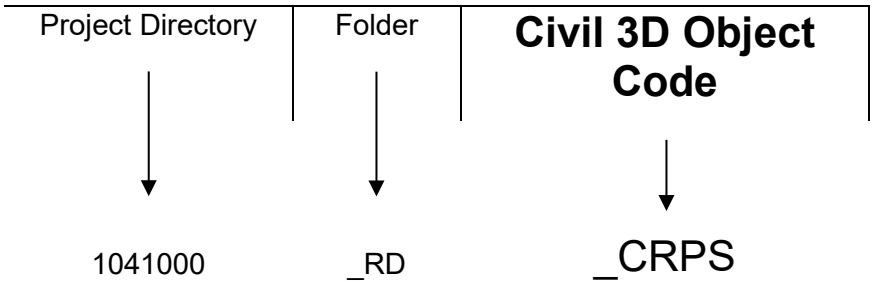
Only design files and other types of files that supplement and support design files will be stored in ACC – Autodesk Docs (BIM 360). Some examples of document types are:

Drawing files (.dwg)
Template files (.dwt)
Sheet Set files (.dst)
Image files (.tif, .shp)
Survey/Terrain files (.xml)
Excel QMG files (.xlsm)

NAMING OF CIVIL 3D OBJECTS

Civil 3D objects shall be named using the Project Directory Number followed by the Folder then the Civil 3D Object Code.

7. Civil 3D Corridor Proposed Surface – 1041000_RD_**CRPS_TOP**



Additional Examples:

Proposed Alignment object name = 1041000_RD_PA_descriptor

(Example: 104100_RD_PA_MAINLINE)

Proposed Surface for Grading Model = 104100_RD_PS_descriptor

(Example: 104100_RD_PS_BASIN A)

Civil 3D Object codes are used to organize Civil 3D objects in the design drawing's Prospector tab of the Toolspace and Data References located in the Data Shortcuts. The following Civil 3D Object codes will be used for design files:

Code	Description
ES	Existing Surface
PS	Proposed Surface
EA	Existing Alignments
PA	Proposed Alignments
EP	Existing Profiles
PP	Proposed Profiles
ED	Existing Drainage Network
PD	Proposed Drainage Network
CR	Corridor

FILE REFERENCING RELATIONSHIPS

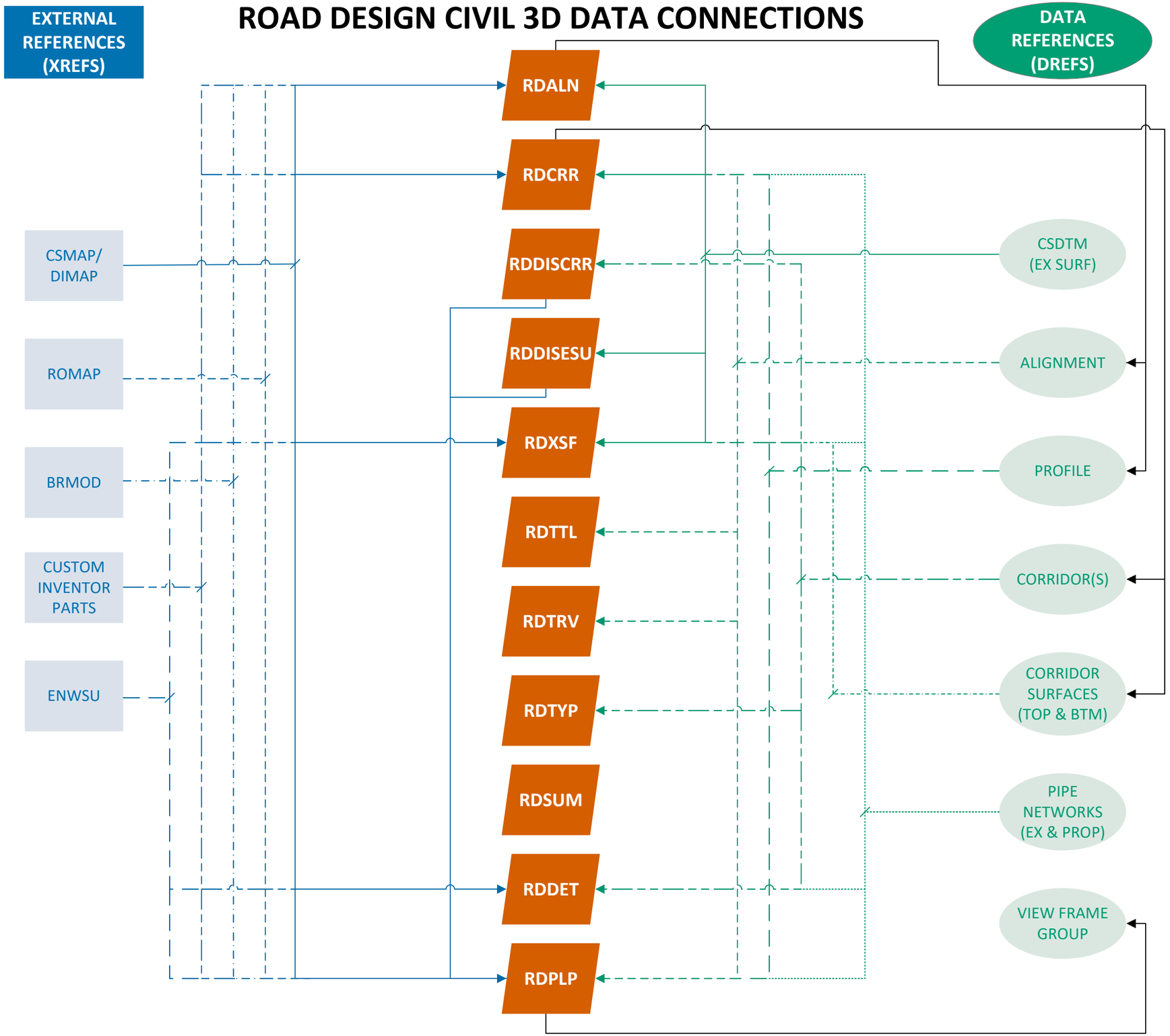
The following schematics show referencing relationships of MDT design files. These referencing relationships allow for successful application of procedures, the Autodesk Civil 3D workspace, and ancillary tools supported at MDT.

ROAD DESIGN/TRAFFIC SAFETY DATA CONNECTIONS

File Name	Data Connections					
	Data Referenced (DREF) objects	XREFed files	Data Shortcuts Created	Other	Included in .DST?	Remarks
RDALN	CSDTM (Existing Surface)*	BRMOD CSMAP/DIMAP Custom Inventor parts ROMAP	Alignment(s) & Profiles θ	NAIP imagery (ArcGIS Connection)	No	BRMOD may be a block representing a bridge during early stages of design.
RDCRR	CSDTM (Existing Surface)* Alignment & Profile θ** Pipe Networks θ	BRMOD Custom Inventor parts CSMAP/DIMAP ROMAP	Corridor(s) Corridor Surfaces - Top and Bottom	NAIP imagery (ArcGIS Connection) or Online Maps	No	
RDDISCRR	Corridor(s)***	None	None	N/A	No	Corridor style and code set style set to how it will be displayed in the PLP.
RDDISESU	CSDTM (Existing Surface)*	None	None	N/A	No	Existing surface set to appropriate display style for PLP.
RDXSF	Corridor(s)*** Corridor Surfaces - Top and Bottom CSDTM (Existing Surface)* Pipe Networks θ	BRMOD Custom Inventor parts CSMAP/DIMAP ENWSU ROMAP	None	Survey Database as CSV****	Yes, its own DST	
RDTTL	Alignment Δ	None	None	QMG Excel Spreadsheet	Yes	Alignment used for centerline coordinate table. QMG used for approaches and wetland delineation tables.
RDTRV	Alignment Δ	None	None	NAIP imagery (ArcGIS Connection) or Online Maps (UPN)SUCONXXX.csv	Yes	
RDTYP	Corridor(s)***	None	None	N/A	Yes	
RDSUM	None	None	None	QMG Excel Spreadsheet	Yes	
RDDET	Corridor(s)*** Pipe Networks θ	CSMAP/DIMAP Custom Inventor parts ENWSU ROMAP	None	NAIP imagery (ArcGIS Connection) or Online Maps	Yes	These data connections assume approach or intersection details; however, connections will vary depending on the subject of the detail.
RDPLP	Alignment & Profile θ** Pipe Networks θ	BRMOD CSMAP/DIMAP Custom Inventor parts ENWSU RDDISCRR RDDISESU ROMAP	View Frame Group	NAIP imagery (ArcGIS Connection) (UPN)GTBHL001.csv (if not in DIMAP)	Yes	View frame group created for R/W to utilize in their plans.

θ Existing and Proposed
Δ Proposed only
* May include surfaces created from point clouds.
** Creating a data reference to the profile will automatically bring in the alignment tied to it.
*** Corridor DREFs automatically bring in the alignment and profile used to create the corridor.
**** Proposed workflow - otherwise XREF DIMAP file.

ROAD DESIGN CIVIL 3D DATA CONNECTIONS



INPUTS

XREFS

- CSMAP/ DIMAP
- ROMAP
- BRMOD
- CUSTOM INVENTOR PARTS

DREFS

- CSDTM (EX SURF)

OTHER

- NAIP IMAGERY (ARCGIS CONNECTION)

RDALN

- ALIGNMENT(S) (EX & PROP)
- PROFILES (EX & PROP)

OUTPUTS

INPUTS

XREFS

- CSMAP/ DIMAP
- ROMAP
- BRMOD
- CUSTOM INVENTOR PARTS

DREFS

- CSDTM (EX SURF)
- ALIGNMENT (EX & PROP)
- PIPE NETWORKS (EX & PROP)
- PROFILE (EX & PROP)

OTHER

- NAIP IMAGERY (ARCGIS CONNECTION)

RDCRR

- CORRIDOR(S)
- CORRIDOR SURFACES (TOP & BTM)

OUTPUTS

INPUTS

XREFS

DREFS

OTHER

CORRIDOR(S)*

RDDISCRR

*Corridor style and code set style set to how it will be displayed in the PLP.

OUTPUTS

INPUTS

XREFS

DREFS

OTHER

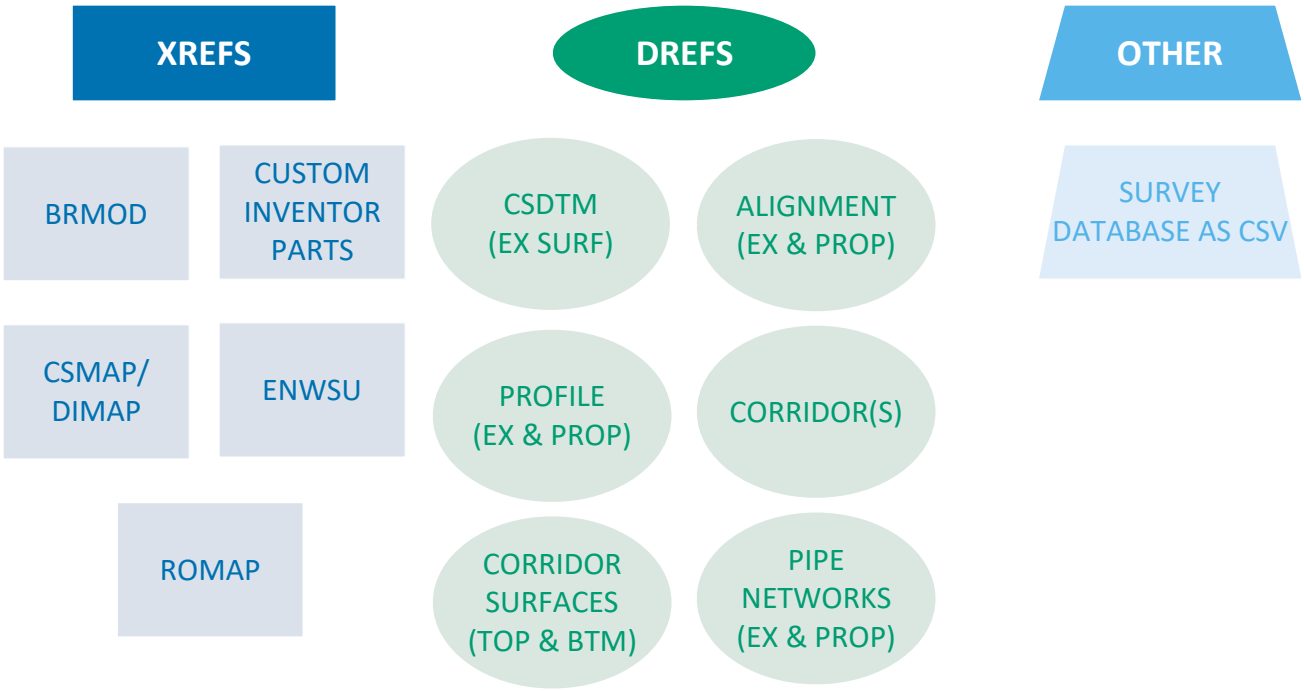
CSDTM
(EX SURF)*

RDDISESU

*Existing surface set to appropriate display style for PLP.

OUTPUTS

INPUTS



RDXSF

CONTAINS LAYOUTS INCLUDED IN DST (SHEET SET). THIS DST IS SEPARATE FROM THE PLAN SET.

OUTPUTS

INPUTS

XREFS

DREFS

OTHER

ALIGNMENT (PROP)

QMG EXCEL SPREADSHEET*

RDTTL

CONTAINS LAYOUTS INCLUDED IN DST (SHEET SET)

OUTPUTS

*QMG used for approaches and wetland delineation tables.

INPUTS

XREFS

DREFS

ALIGNMENT (PROP)

OTHER

NAIP IMAGERY (ARCGIS CONN) OR ONLINE MAPS

(UPN)SUCONXXX .CSV

RDTRV

CONTAINS LAYOUTS INCLUDED IN DST (SHEET SET)

OUTPUTS

INPUTS

XREFS

DREFS

OTHER

CORRIDOR(S)

RDTYP

CONTAINS LAYOUTS INCLUDED IN DST (SHEET SET)

OUTPUTS

INPUTS

XREFS

DREFS

OTHER

QMG EXCEL SPREADSHEET

RDSUM

CONTAINS LAYOUTS INCLUDED IN DST (SHEET SET)

OUTPUTS

INPUTS

XREFS

- CSMAP/ DIMAP
- ROMAP
- CUSTOM INVENTOR PARTS
- ENWSU

DREFS

- CORRIDOR(S)
- PIPE NETWORKS (EX & PROP)

OTHER

- NAIP IMAGERY (ARCGIS CONN) OR ONLINE MAPS

RDDET

CONTAINS LAYOUTS INCLUDED IN DST (SHEET SET)

These data connections assume approach or intersection details; however, connections will vary depending on the subject of the detail.

OUTPUTS

INPUTS

XREFS

- CSMAP/ DIMAP
- RDDISCRR
- ROMAP
- RDDISESU
- CUSTOM INVENTOR PARTS
- BRMOD
- ENWSU

DREFS

- ALIGNMENT (EX & PROP)
- PROFILE (EX & PROP)
- PIPE NETWORKS (EX & PROP)

OTHER

- NAIP IMAGERY (ARCGIS CONNECTION)
- (UPN)GTBHL001.CSV (IF NOT IN DIMAP)

RDPLP

- VIEW FRAME GROUP*
- CONTAINS LAYOUTS INCLUDED IN DST (SHEET SET)

*View Frame group created for R/W to utilize in their plans.

OUTPUTS