MONTANA
Department of Transportation

Project Development & Delivery – Design and Modeling Standards

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

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OVERVIEW

This document provides guidance for establishing consistent enterprise file and object naming conventions to support efficient project delivery, automation capabilities, collaboration, data management, and long-term information governance. The guidance includes a listing of common DWG file types. Requirements for external references (Xrefs) and Civil 3D data references are outlined, supported by schematics that illustrate accepted file relationships and dependencies. Together, these standards promote data consistency, improve model coordination, enhance searchability, and ensure project information remains organized throughout the project lifecycle.

REFERENCES

Project Content Management System (PCMS) Document Naming Standards

REVISIONS

11/13/2026	Revised for ADA compliance, to remove file type class TRV, to add file type class ABS, and to include minor language updates.

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:

Class	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 file 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
ABS	Control Abstract	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

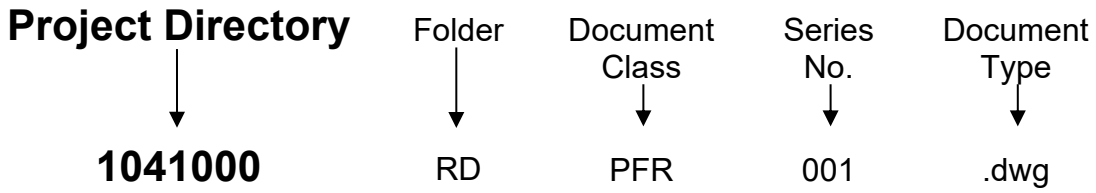
NAMING OF DESIGN FILES

Design files saved in Autodesk Forma are required to follow the naming conventions established for PCMS. Standardized naming practices enable teams to quickly identify, locate, and understand project information while reducing errors, duplication, and rework across shared environments for PCMS and Forma.

An example project file name will be used to review the file naming convention components – 1041000RDALN001.dwg.

PROJECT DIRECTORY

MDT uses a naming structure for all electronic project files. The file name tells which project directory and folder the file is associated with.

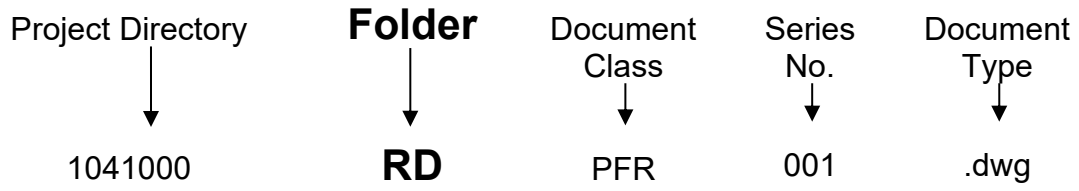


A **Project Directory** is comprised of **Project** (aka Control Number or UPN) and **Unit**.

A **Project Number** is comprised of three things: **Project, Agreement**, and **Unit**.

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

FOLDER



The work area creates and maintains the file and manages them in the appropriate folder for the work area. The available folders are shown below.

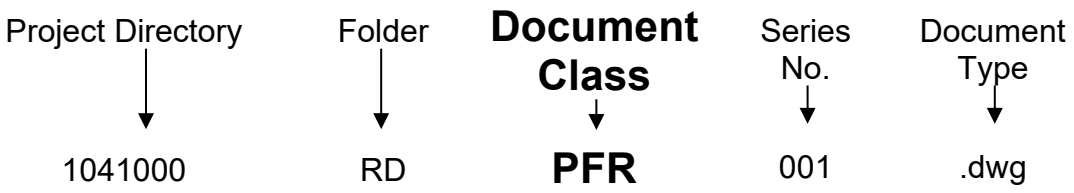
Sorted by Name

Alternative Contracting	AC
As-Builts	AB
Bridge	BR
Combined Survey	CS
Construction	CO
Consultant Design	CD
Contract Plans	CP
District Survey	DI
Eng Oversight	EO
Environmental	EN
Geotechnical	GT
Hydraulics	HY
Materials	MT
Matls Pav Ec	MA
MDT CIS Inclusive	CZ
PCMS Support	PS
Photogrammetry	PH
Planning	PL
Planning Project & Policy	PP
Research	RS
Right-Of-Way Design	RO
Right-Of-Way Utilities	UT
Road Design	RD
Safety Management	SF
Spec Stuff	SS
Surfacing Design	SD
Survey	SU
Traf Invest.	IN
Traffic Electrical	EL
Traffic Geometrics (Design)	GE
Traffic Operations	TO
Traffic Safety	SA
Traffic Signing	SI
Visualization	VI

Sorted by Abbreviation

AB	As-Builts
AC	Alternative Contracting
BR	Bridge
CD	Consultant Design
CO	Construction
CP	Contract Plans
CS	Combined Survey
CZ	MDT CIS Inclusive
DI	District Survey
EL	Traffic Electrical
EN	Environmental
EO	Eng Oversght
GE	Traffic Geometrics (Design)
GT	Geotechnical
HY	Hydraulics
IN	Traf Invest.
MA	Matls Pav Ec
MT	Materials
PH	Photogrammetry
PL	Planning
PP	Planning Project & Policy
PS	PCMS Support
RD	Road Design
RO	Right-Of-Way Design
RS	Research
SA	Traffic Safety
SD	Surfacing Design
SF	Safety Management
SI	Traffic Signing
SS	Spec Stuff
SU	Survey
TO	Traffic Operations
UT	Utilities
VI	Visualization

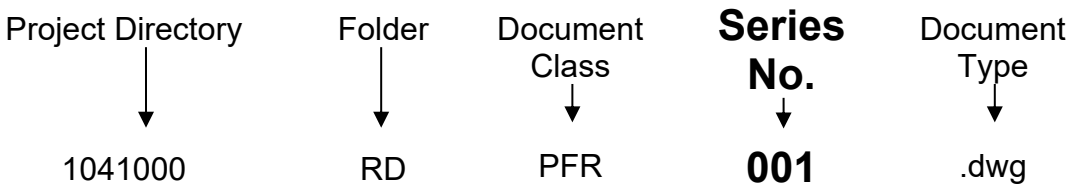
DOCUMENT CLASS



Document Class codes are used to categorize files. Document Class is a technique to broadly associate the file's purpose.

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

SERIES NUMBER



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

001 – 999

A01 – Z99

AA1 – ZZ9

AAA – ZZZ

EXAMPLES:

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

Photogrammetry includes consultant identification in its series numbering:

ZM1 – ZM9

ZF1 – ZF9

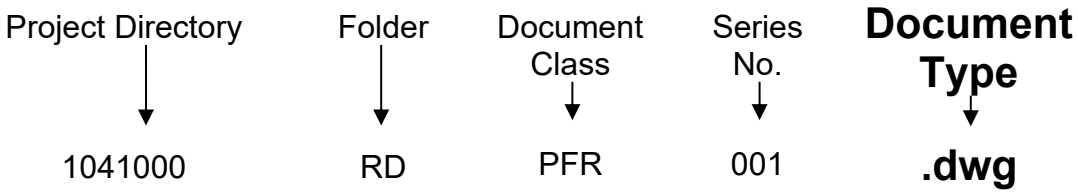
Z = Consultant Mapping

M=Consultant Metric Mapping

F = Feet Mapping

Road Design assigns incremental series numbers for every project and workgroup.

DOCUMENT TYPE



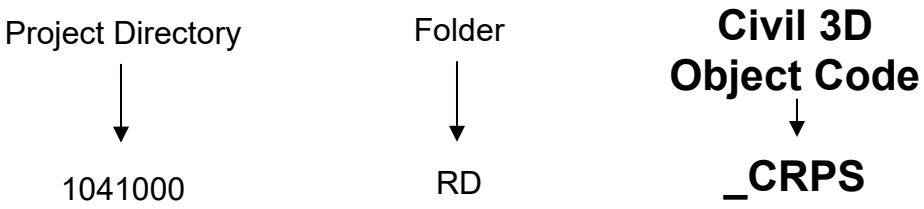
The Document Type is:

- based on the software associated with the file
- the default extension the software automatically gives a file

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.

An example Civil 3D corridor proposed surface name will be used to review the object naming convention components – 1041000_RD_CRPS_TOP.



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 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 AND RELATIONSHIPS

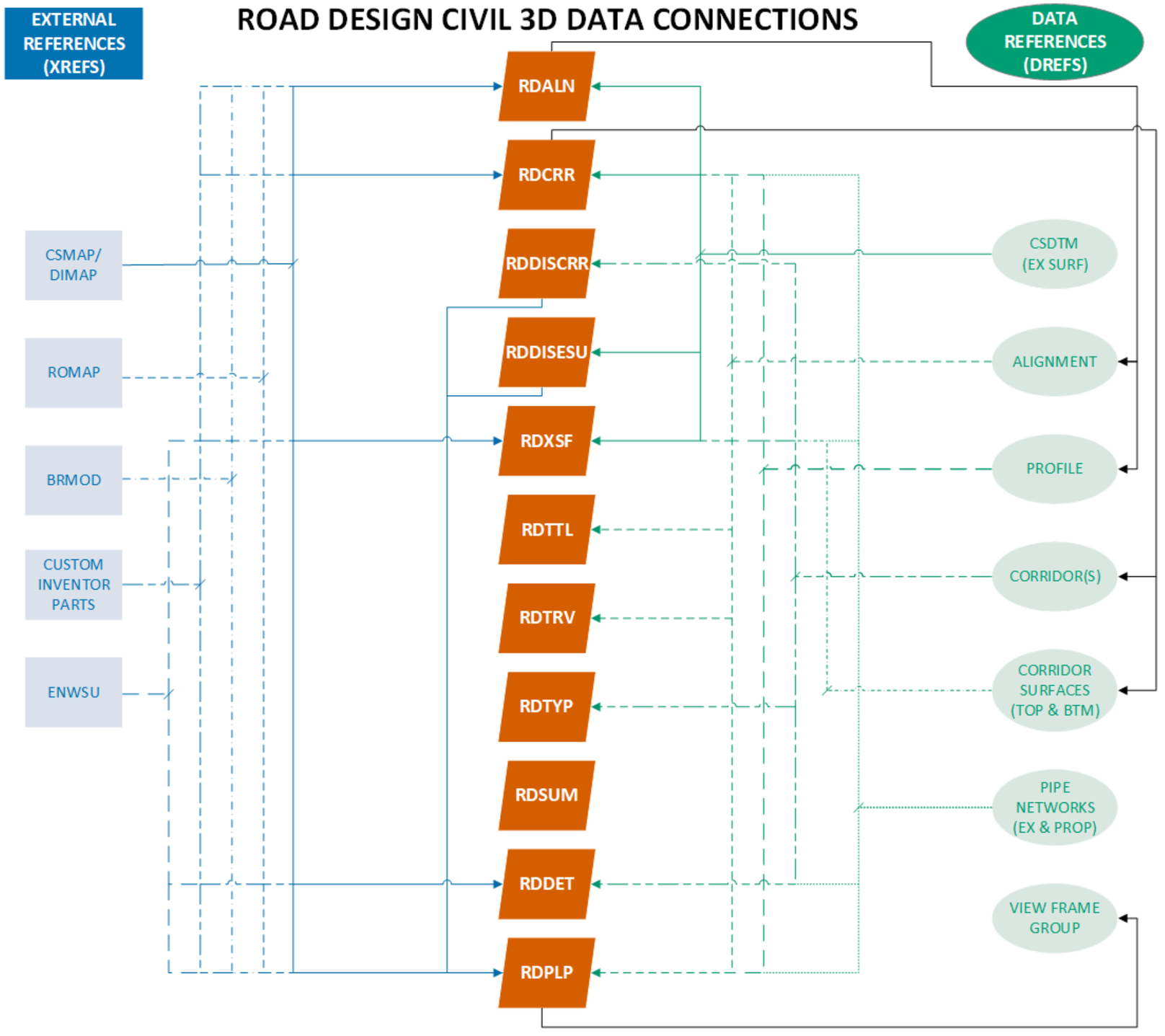
The following schematics show referencing relationships of MDT design files. These referencing relationships allow for successful application of procedures, the Autodesk Civil 3D workspace, and ancillary tools supported at MDT.

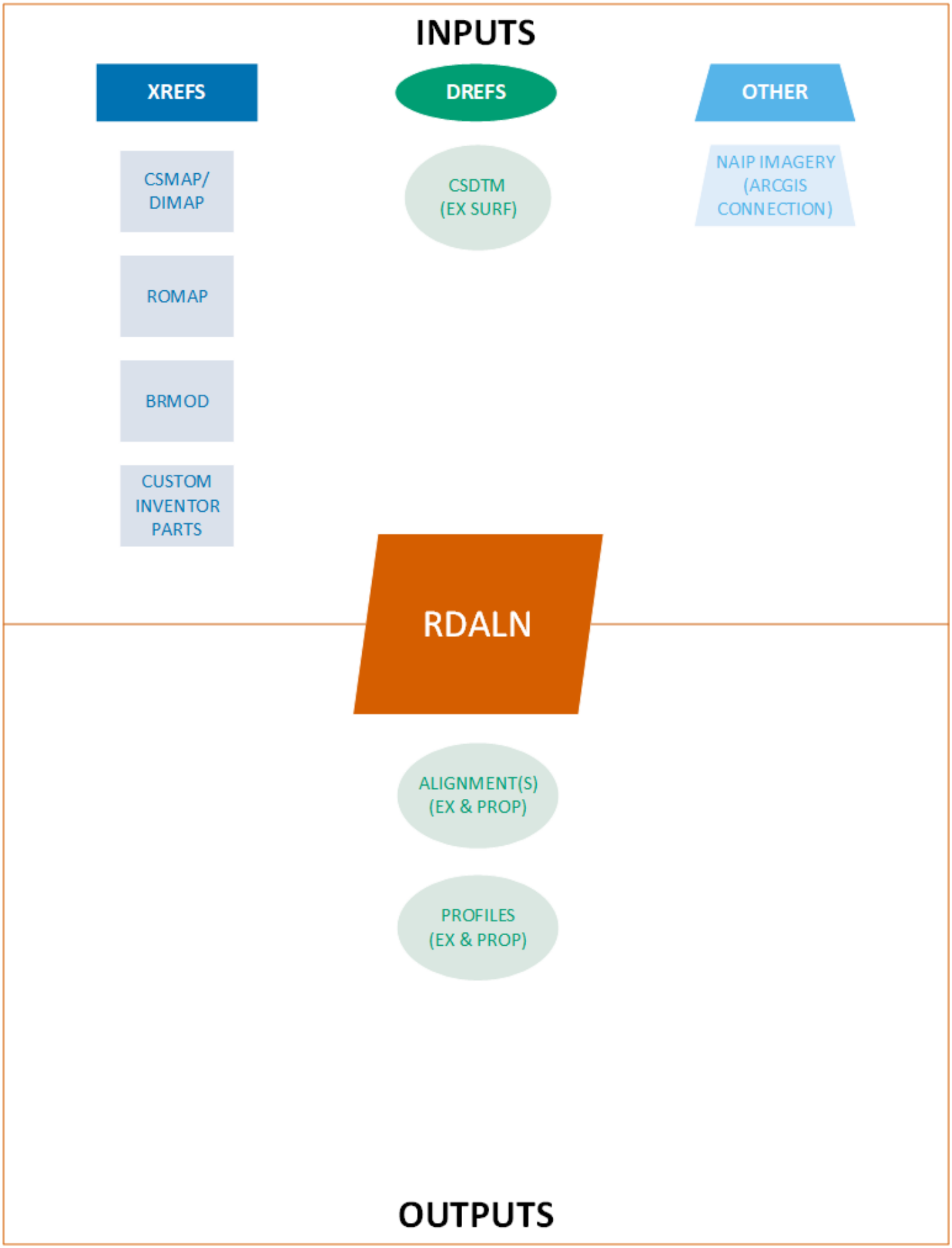
ROAD DESIGN/TRAFFIC SAFETY DATA CONNECTIONS

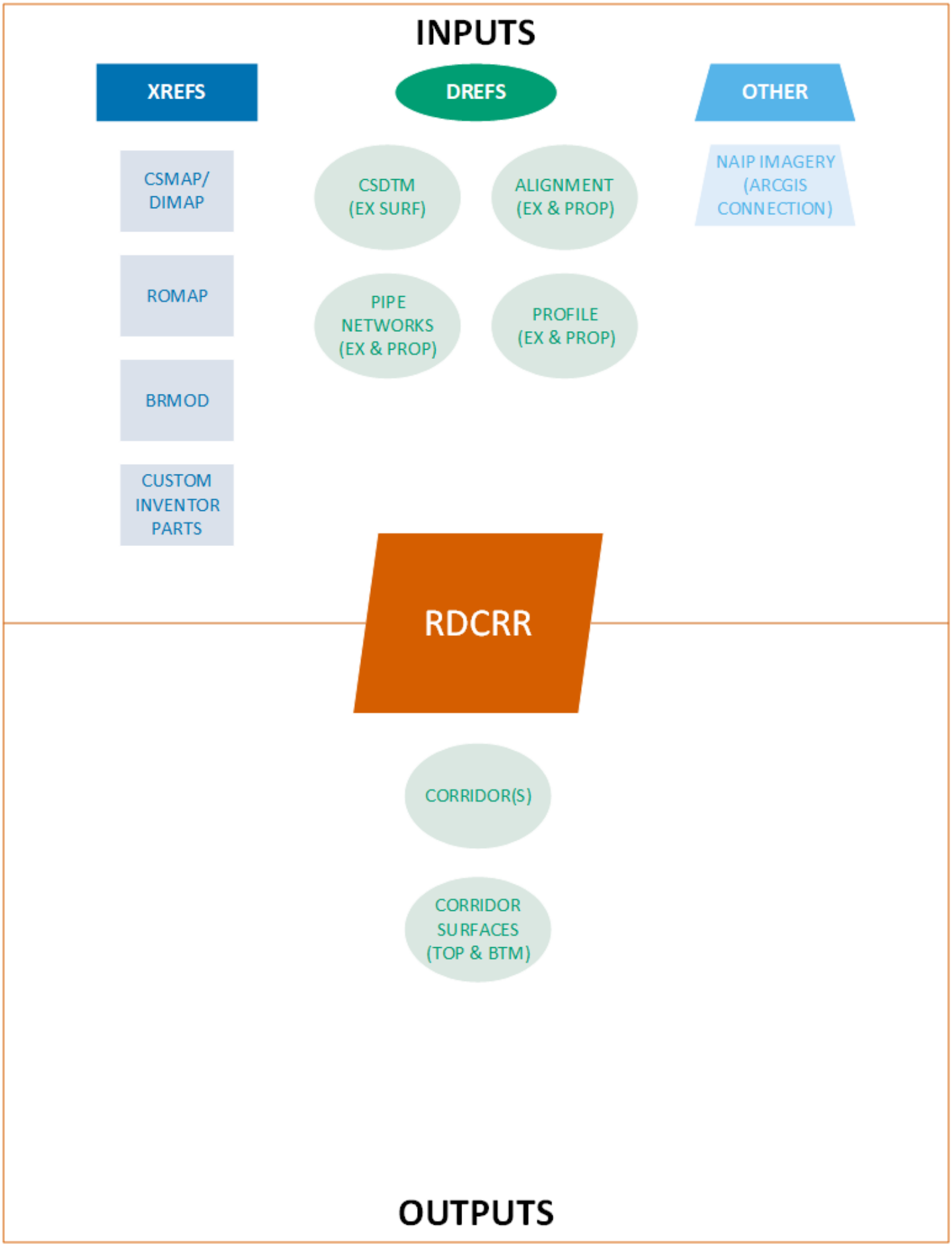
File name	Data Referenced (DREF) objects	XREF Files	Data Shortcuts Created	Other	Include in DST	Remarks
RDALN	CSDTM (Existing Surface) [3]	BRMOD CSMAP/DIMAP Custom Inventor parts ROMAP	Alignment(s) & Profiles [1]	NAIP imagery (ArcGIS Connection)	No	BRMOD may be a block representing a bridge during early stages of design.
RDCRR	CSDTM (Existing Surface) [3] Alignment & Profile [1 4] Pipe Networks [1]	BRMOD Custom Inventor parts CSMAP/DIMAP ROMAP	Corridor(s) Corridor Surface - Top and Bottom	NAIP imagery (ArcGIS Connection) or Online Maps	No	
RDDISCRR	Corridor(s) [5]	None	None	N/A	No	Corridor/code set styles set to PLP display preference.
RDDISESU	CSDTM (Existing Surface) [3]	None	None	N/A	No	Existing surface set to appropriate display style for PLP.
RDXSF	Corridors(s) [5] Corridor Surfaces - Top & Bottom CSDTM (Existing Surface) [3] Pipe Networks [1]	BRMOD Custom Inventor parts CSMAP/DIMAP ENWSU ROMAP	None	Survey Database as CSV [6]	Yes - its own DST	
RDTTL	Alignment [2]	None	None	QMG Excel Spreadsheet	Yes	Alignment used for centerline coordinate table. QMG used for approaches & wetland delineation tables.
RDTRV	Alignment [2]	None	None	NAIP Imagery (ArcGIS Connection) or Online Maps (UPN)SUCONXXX.csv	Yes	
RDTYP	Corridor(s) [5]	None	None	N/A	Yes	
RDSUM	None	None	None	QMG Excel Spreadsheet	Yes	
RDDET	Corridor(s) [5] Pipe Networks [1]	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 [1 4] Pipe Networks [1]	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	Viewframe group created for R/W to utilize in their plans.

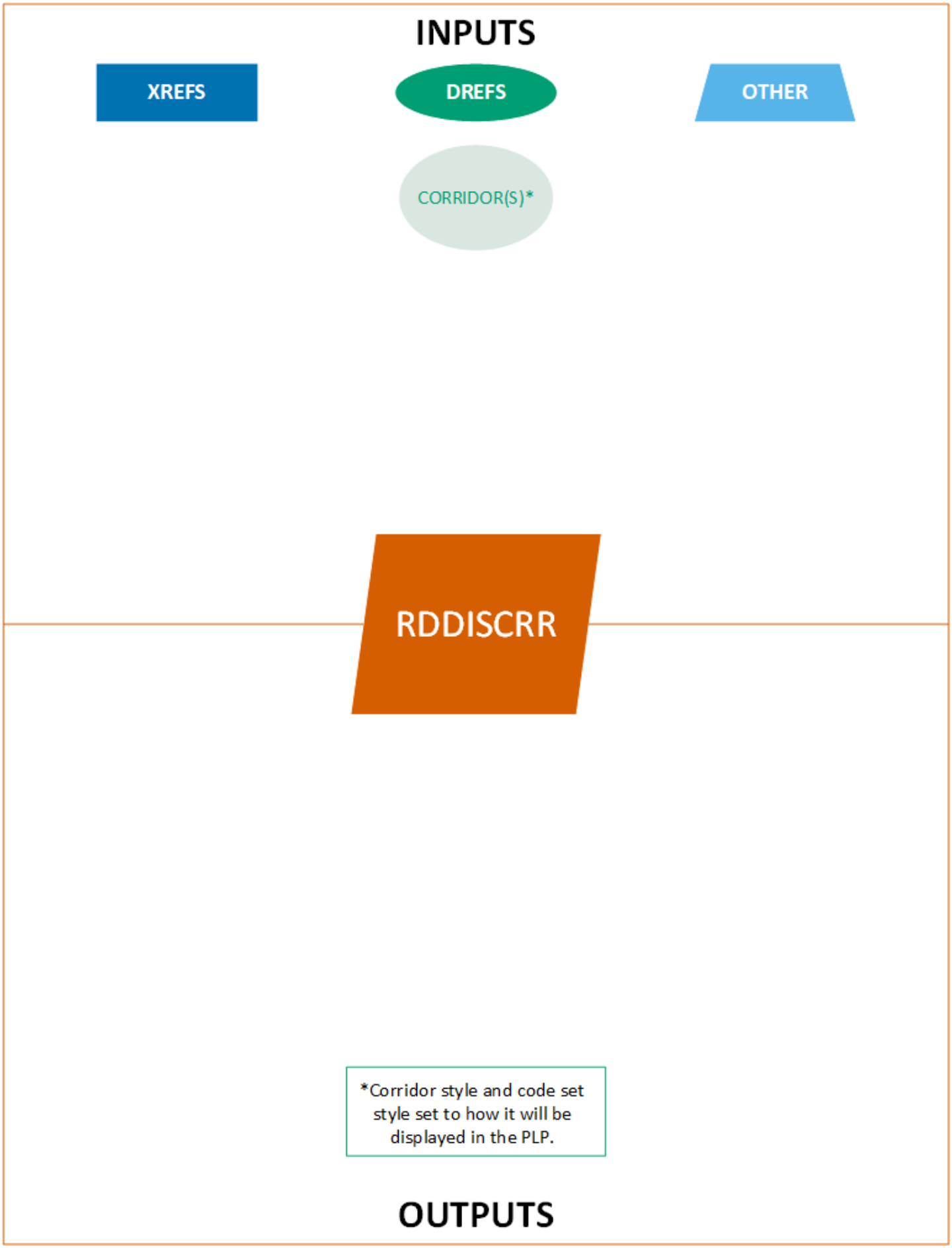
Notes:
1) Existing and Proposed **2)** Proposed only **3)** May include surfaces created from point clouds **4)** Creating a data reference to the profile will automatically bring in the alignment tied to it
5) Corridor DREFs automatically bring in the alignment and profile used to create the corridor **6)** Proposed workflow – otherwise XREF DIMAP file

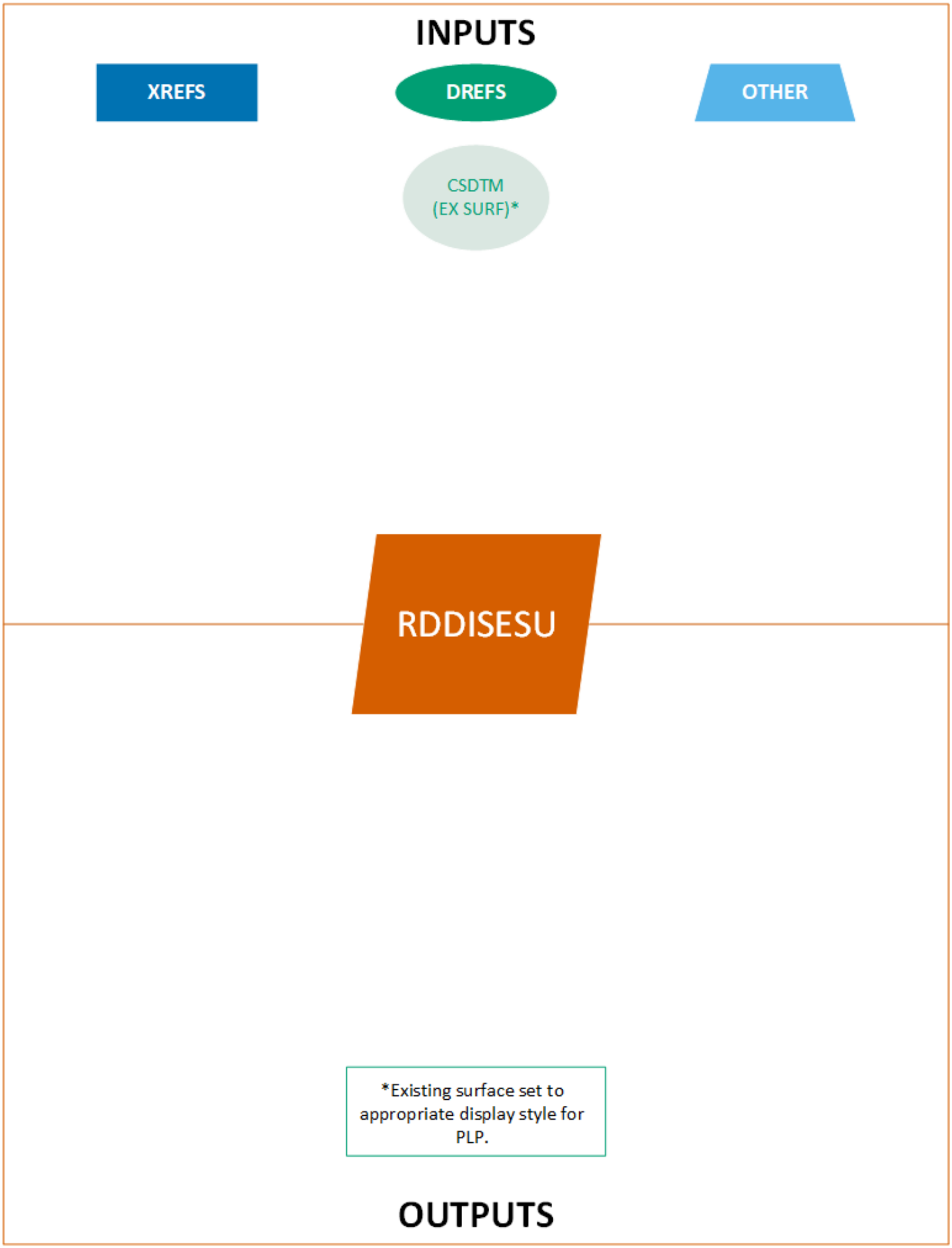
ROAD DESIGN CIVIL 3D DATA CONNECTIONS

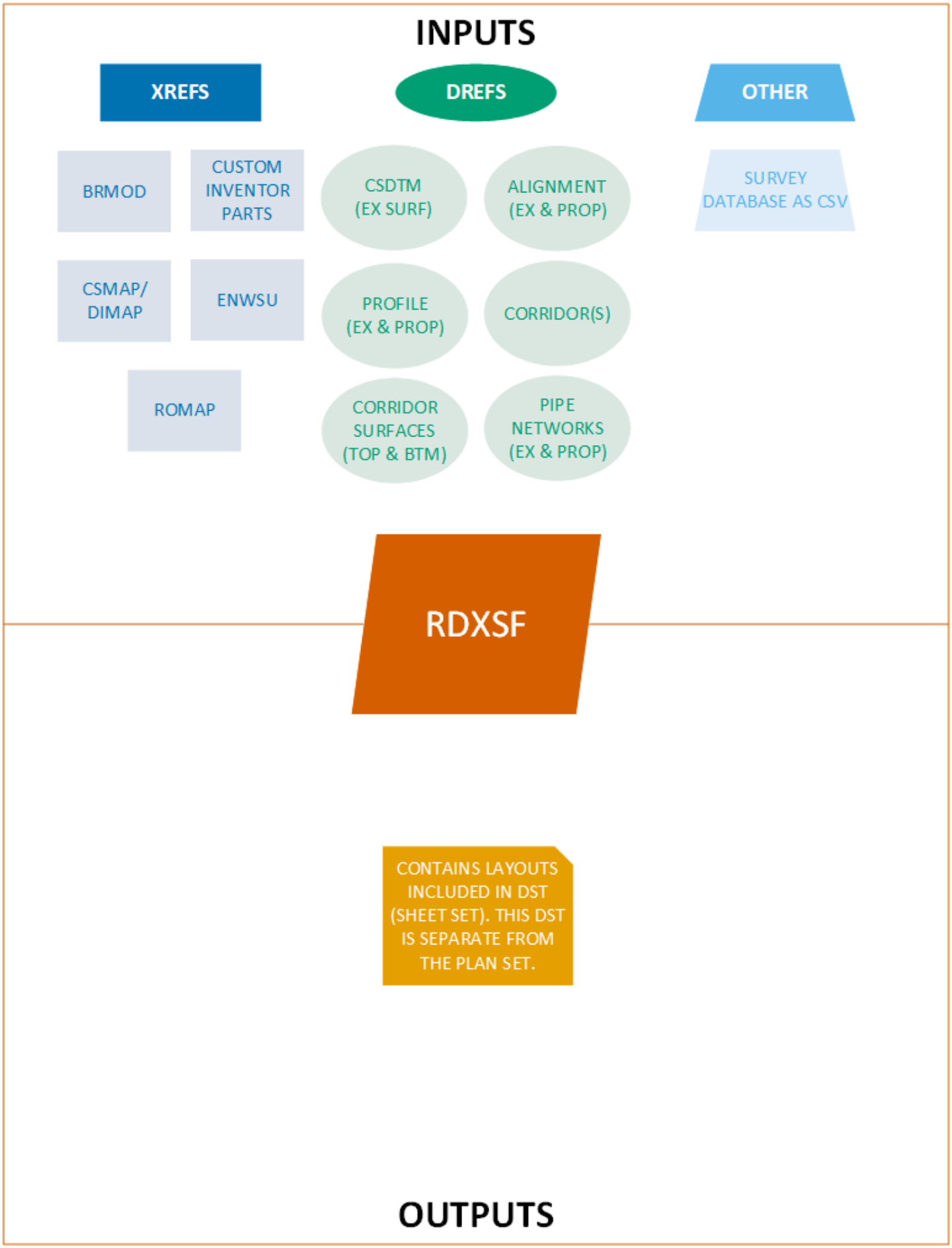


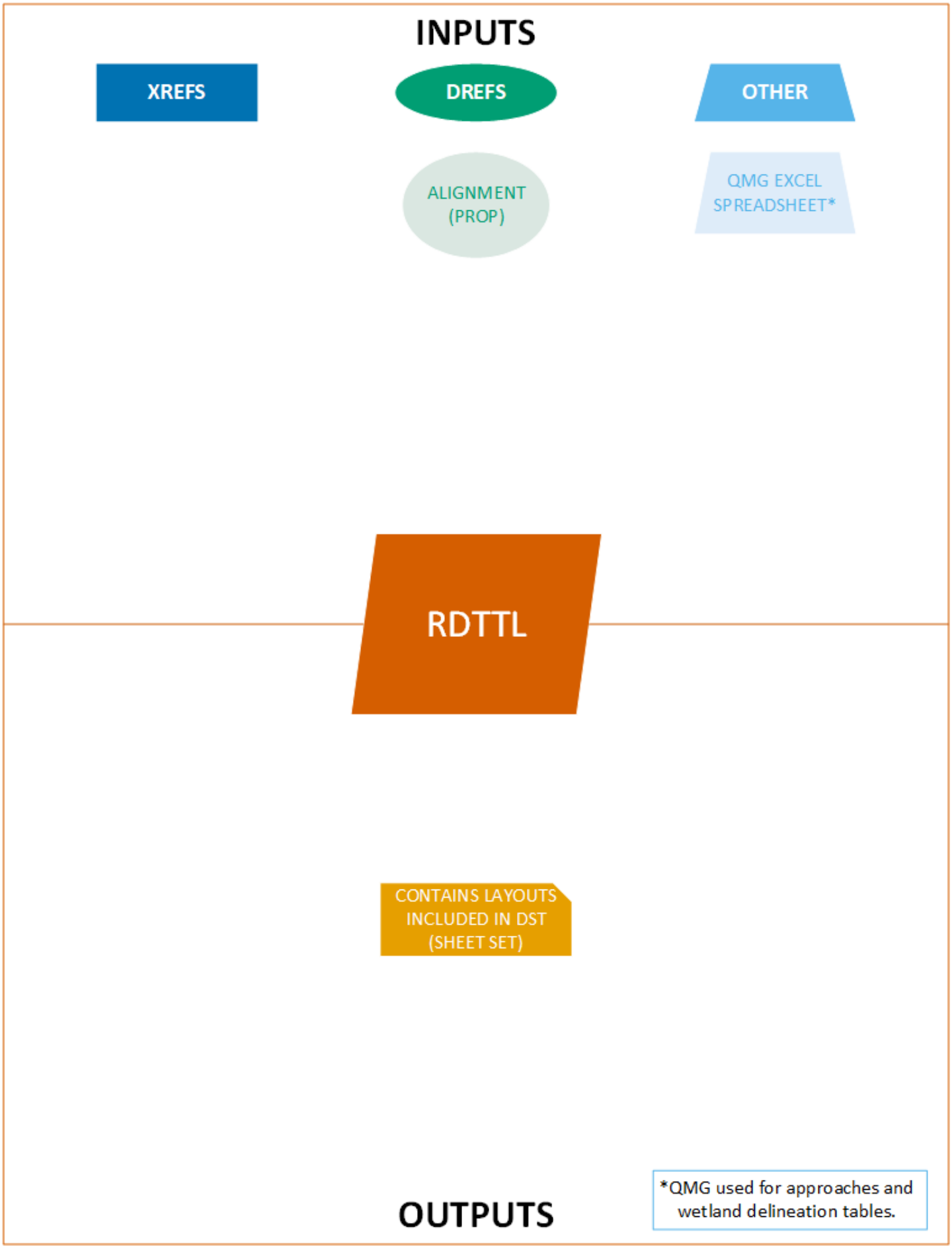

INPUTS
XREFS
DREFS
OTHER
CSMAP/
DIMAP
ROMAP
BRMOD
CUSTOM
INVENTOR
PARTS
CSDTM
(EX SURF)
NAIP IMAGERY
(ARCGIS
CONNECTION)
RDALN
ALIGNMENT(S)
(EX & PROP)
PROFILES
(EX & PROP)
OUTPUTS

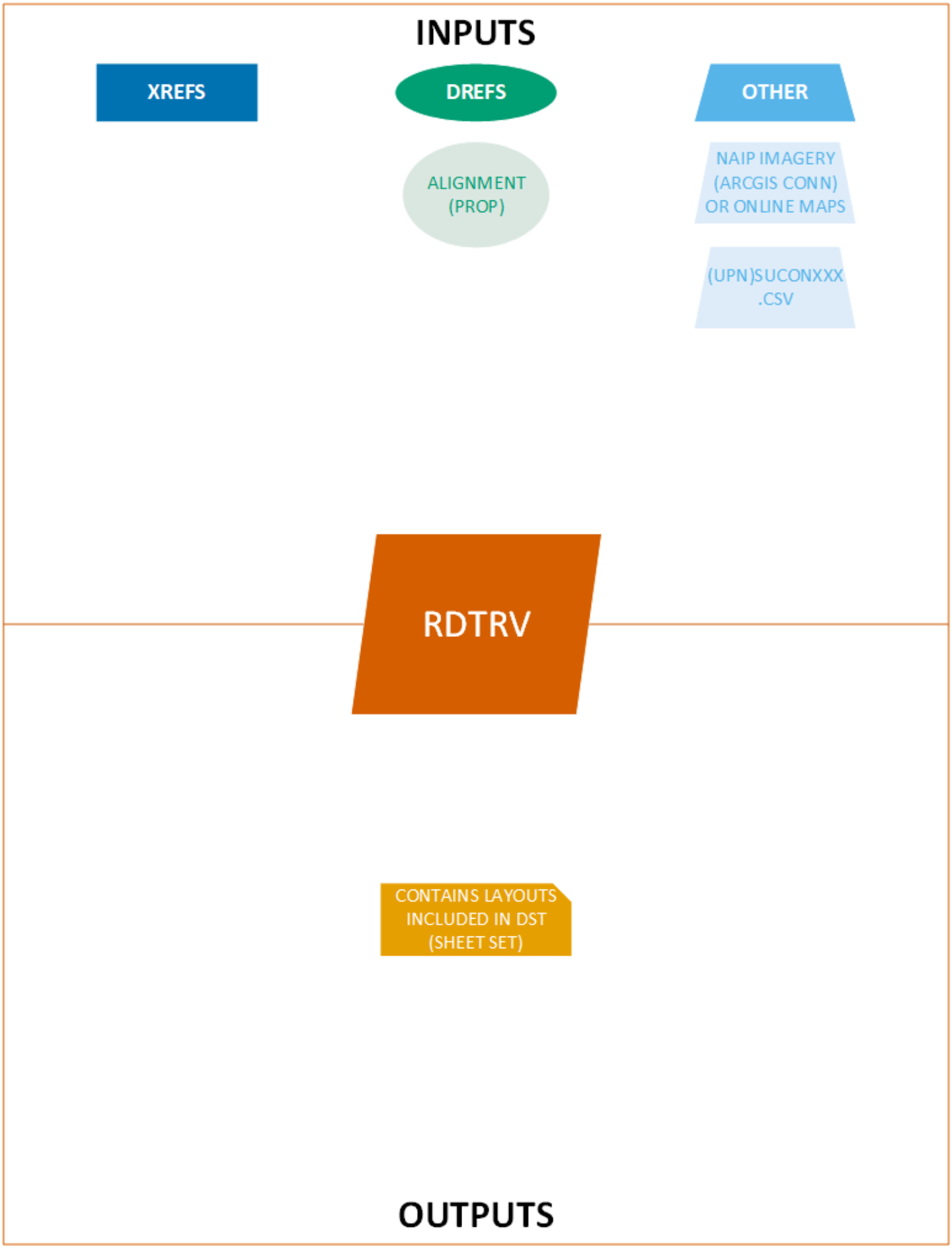

INPUTS
XREFS
DREFS
OTHER
CSMAP/ DIMAP
ROMAP
BRMOD
CUSTOM INVENTOR PARTS
CSDTM (EX SURF)
ALIGNMENT (EX & PROP)
PIPE NETWORKS (EX & PROP)
PROFILE (EX & PROP)
NAIP IMAGERY (ARCGIS CONNECTION)
RDCRR
CORRIDOR(S)
CORRIDOR SURFACES (TOP & BTM)
OUTPUTS

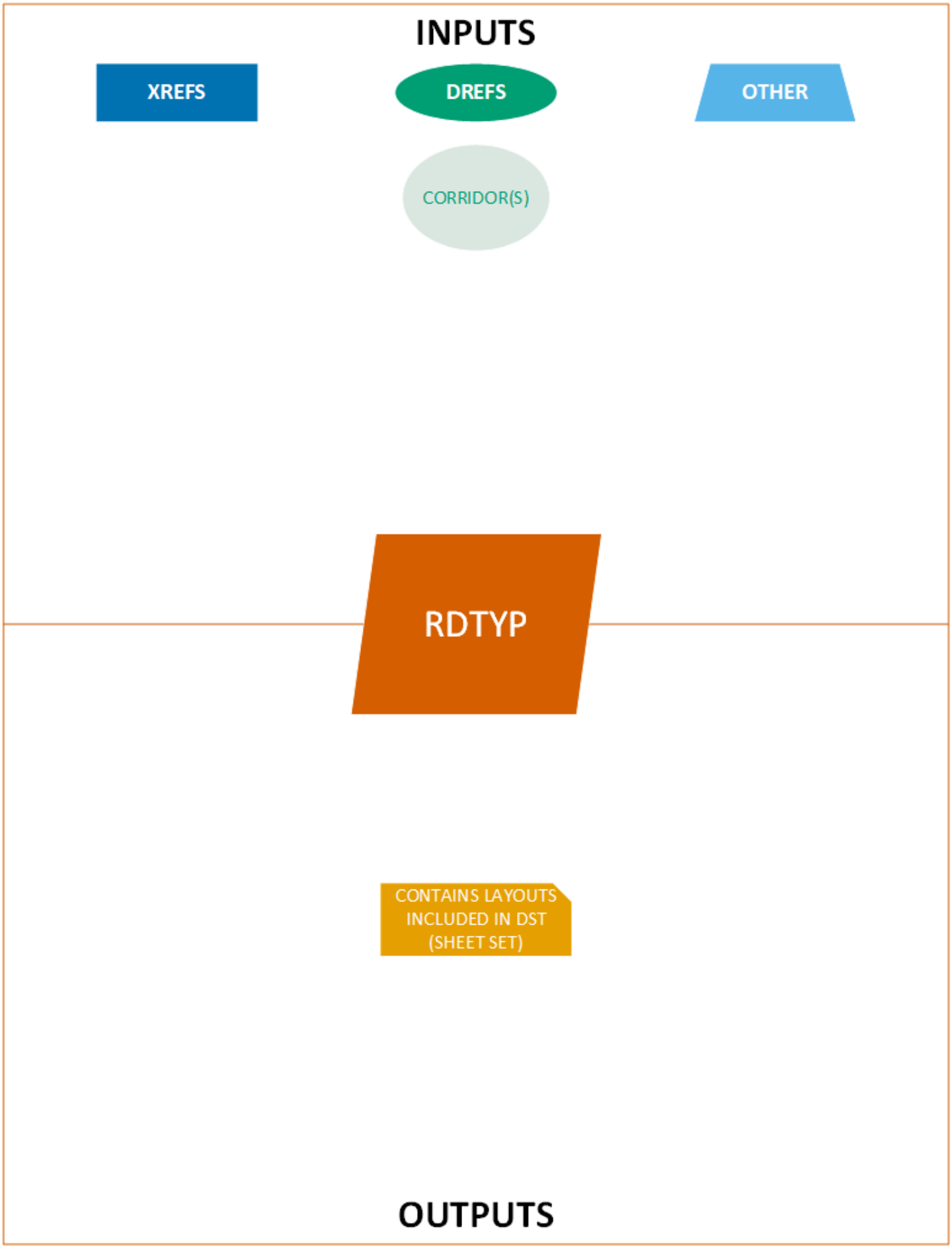

INPUTS
XREFS
DREFS
OTHER
CORRIDOR(S)*
RDDISCRR
*Corridor style and code set style set to how it will be displayed in the PLP.
OUTPUTS

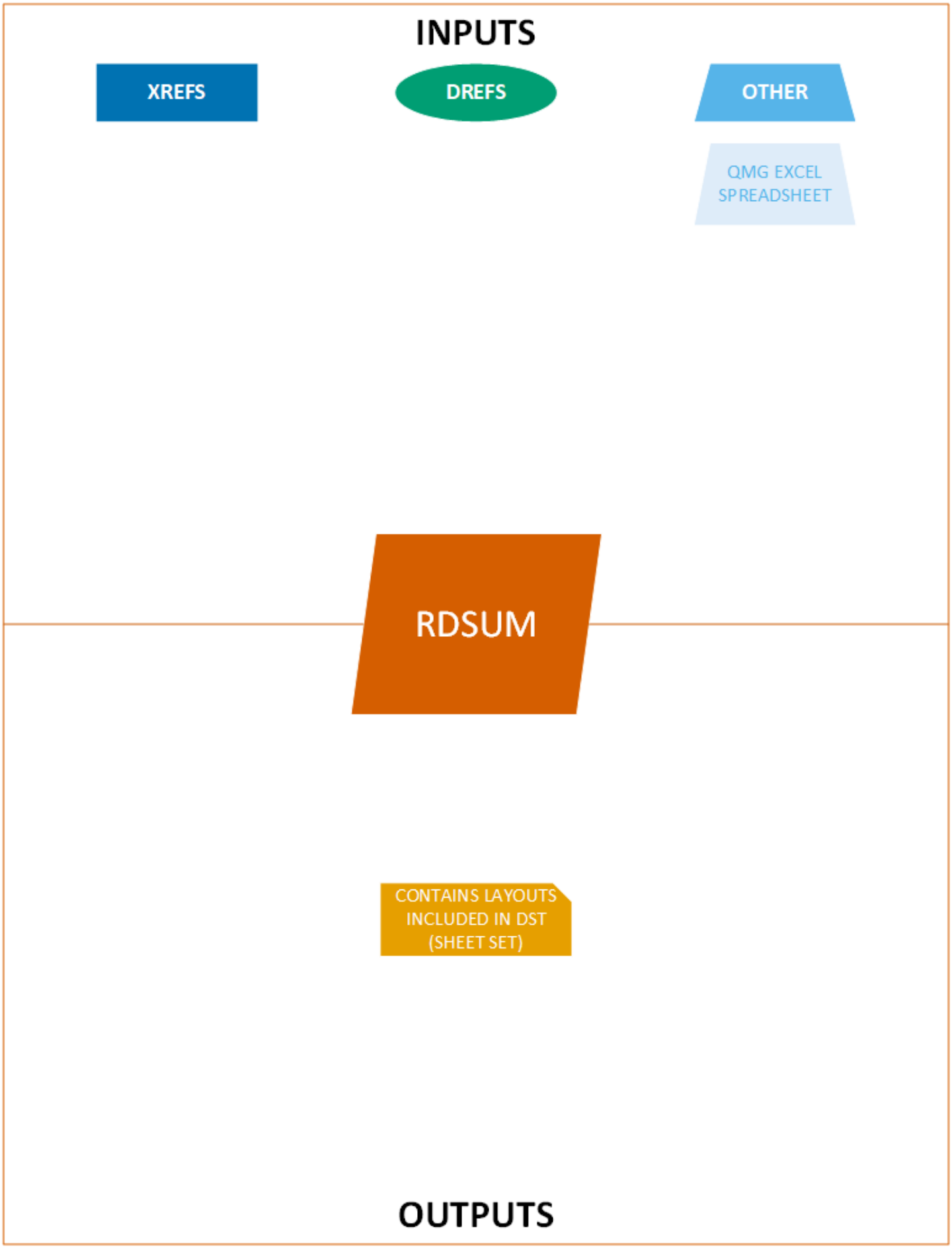

INPUTS
XREFS
DREFS
OTHER
CSDTM
(EX SURF)*
RDDISESU
*Existing surface set to appropriate display style for PLP.
OUTPUTS


INPUTS
XREFS
DREFS
OTHER
BRMOD
CUSTOM INVENTOR PARTS
CSDTM (EX SURF)
ALIGNMENT (EX & PROP)
SURVEY DATABASE AS CSV
CSMAP/ DIMAP
ENWSU
PROFILE (EX & PROP)
CORRIDOR(S)
ROMAP
CORRIDOR SURFACES (TOP & BTM)
PIPE NETWORKS (EX & PROP)
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
OTHER
ALIGNMENT (PROP)
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