

# Creating the Erosion Control Features DSN File

Design Manual  
Chapter 10  
Roadside Development  
and Erosion Control

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## Setup for the DSN File for R Sheets

Use the Copy Seed function to create the R Sheet DSN file using the OpenRoads 2D Design File seed (see Section [21C-54](#) for more on the Copy Seed program).

### For Projects using Survey Data

Attach the following items. Refer to Section [21A-50](#) for attaching references.

- DSN file containing Road Design linework elements. This will be created by Design or District Design.
- DSN file containing shading elements. This will be created by Design or District Design.
- Statewide LiDAR for your project location. Design and District Design will need to place a request to Photogrammetry if one does not already exist for the project. Photogrammetry will provide a clipped down LiDAR for the project location.
- Statewide NAIP or aerial imagery (RAS) for your project location. Photogrammetry will provide this.
- Photogrammetry DSN (PHO) if one is available. Photogrammetry will provide this.
- Survey DSN (SUR). Either Preliminary Survey or District Survey will provide this.

### For Projects with No Survey using As Builts

Attach the following items. Refer to Section [21A-50](#) for attaching references.

- DSN file containing Road Design linework elements. Either Design or District Design will create this.
- DSN file containing shading elements. Either Design or District Design will create this.
- Statewide LiDAR for your project location. Design and District Design will need to place a request to Photogrammetry if one does not already exist for the project. Photogrammetry will provide a clipped down LiDAR for the project location.
- Statewide NAIP or aerial imagery (RAS) for your project location. Photogrammetry will provide this.
- Photogrammetry DSN (PHO) if one is available. Photogrammetry will provide this.
- DSN containing the As Built PDFs if available. This is done by finding the As Builts in ERMS and manually placing them in the plan (see Section [21C-56](#) for attaching PDFs to a MicroStation file).

**Note:** Refer to Section [4A-2](#) for additional guidance for storm water drainage system information sources and documentation. Other files containing pertinent information may be provided by other sections.



To properly control the display for sheeting, create a `_PPP` and a `_BASIN` file.

## Erosion Control Design

### Determining Storm Water Detention Need

- Drainage basin limits (see Section [10C-2](#))
- Use the plan and profile sheets (see Section [1F-5b](#)) to locate the high spots that will determine the separation between the individual basins and the low spots of where the water will discharge.
  - Do this for the left, right, and median ditch grades if present.
  - Repeat this if necessary for intersecting sideroads.
  - Sketch lines using the crests and other plan sheet information to form each drainage basin.
  - Take into consideration existing and proposed roadway, median, and entrance culverts/pipes when determining how the water is being directed off the site through each basin.
  - Take into consideration proposed and existing dikes, entrances, and intersection roadways when determining how the water is being directed off the site through each basin.
  - [Sample Plan and Profile](#).
- Place flow arrows and outlet arrows following ditching where there will be concentrated water flow. These will start at the highest point and be drawn toward the outlet of each basin or a draining pipe/culvert into which it drains.
  - Place outlet arrows at locations where water will exit the basins in a concentrated flow.
  - Show sheet flow where water will exit the construction site in a nonconcentrated flow.

### Erosion Control Device Placement

Using the guidance in Section [10C-1](#), place erosion control measures in the following order:

1. Silt Basins
2. Rock Ditches
3. Rock Check Dams
4. Turf Reinforcement Mats (TRM's)
5. Silt Fence for Ditch Checks
6. Silt Fences
7. Temporary Sediment Control Basins
8. Slope Protection
  - 10 inch waddles
  - 12 inch waddles
  - 20 inch logs
9. Perimeter Protection
  - 10 inch waddles
  - 12 inch waddles
  - 20 inch logs
10. Inlet protection
  - 12 inch waddles
  - Inlet sediment bags, see Section [10C-4](#)

Vegetated buffers may be used with the guidance of Section [10C-3](#).

For urban and transitional areas, see Section [10C-5](#).

## Final Erosion Control Measures

Once all erosion control devices have been placed, contract Roadside Development for final quantities and locations for seeding, fertilizing, and mulching. See Section [10B-1](#) for more information regarding seeding, fertilizing, and mulching.

## R Sheet Creation

### Create the Erosion Control Device Placement Set of RR Sheets

These will show the erosion control device placement and drainage arrows. Follow the sequence below:

1. Place port shapes for sheeting using one of the following:
  - Use the existing sheet ports from the D, E, or F sheets if available.
  - Use the Plan and Profile sheeting tools (see Section [21B-4](#)) if a BPK or alignment is available.
  - Place them by hand if no other option is available.
2. Place scale blocks and north arrows if needed.
3. Run the Motif Builder tool from the D&C Manager (see Section [21B-2](#)).
4. Clip the sheets using the D&C Plan and Profile Sheeting Tool and Motifs (see Section [21B-4](#)).
5. Open the Erosion Control Device Placement set of sheets created and check for correct levels and sequencing.
6. Attach the CPN, see Section [21A-1](#).

The files below are used to create R Sheets:

#### Active File (**\_PPP**)

Ensure that all erosion control levels (dsnEc\*) are properly displayed.

#### Drainage Basins File (**\_BASIN**)

This reference will be turned off for the Erosion Control Device Placement set of R sheets.

#### Road Design Shading **SHD File**

Turn on shading for ditching or special ditching only.

#### Statewide LiDAR File

This reference will be turned off for the Erosion Control Device Placement set of R sheets.

#### Statewide NAIP or RAS File

Ensure the dsnRasterAttachment level is turned on.

#### Photogrammetry **PHO File**, Survey **SUR File** and Road Design Line Work **DSN File**

Ensure the levels displayed match the plan and profile sheets (D, E, and F).



Make sure all references are in the desired display sequence. Aerials need to be at the top of the sequence, followed by design shading, then PPP shading, SUR, PHO, and DSN linework, and lastly, PPP linework on the bottom.

[Sample R Sheet \(erosion control devices and drainage arrows\)](#)

### Create the Drainage Basins and Contours Set of RR Sheets

Follow the sequence below:

1. Open the PPP DSN.
2. Turn on/off levels for the basin and contour sheets.

3. Turn on/off references for the basin and contour sheets.
4. Run the Motif builder tool from the D&C Manager, see Section [21B-2](#).
5. Clip the second set of sheets using the D&C Plan and Profile Sheeting Tool and Motifs, see Section [21B-4](#).
6. Open the Drainage Basins and Contours set of R sheets and check for correct levels and sequencing.
7. Attach the CPN, see Section [21A-1](#).

The files below are used to create R Sheets:

**Active File (\_PPP)**

Ensure that all erosion control levels (dsnEc\*) are properly displayed.

**Drainage Basins File (\_BASIN)**

This reference will be turned off for the Drainage Basins and Contours set of R sheets.

**Road Design Shading SHD File**

Turn on shading for ditching or special ditching only.

**Statewide LiDAR File**

This reference will be turned off for the Drainage Basins and Contours set of R sheets.

**Statewide NAIP or RAS File**

Ensure the dsnRasterAttachment level is turned on.

**Photogrammetry PHO File, Survey SUR File and Road Design Line Work DSN File**

Ensure the levels displayed match the plan and profile sheets (D, E, and F).



For larger projects that do not have erosion control on all sheets, you will need to create a PPP location map sheet that shows what area each R series sheet is depicting. Use the Copy Seed function to create the location map sheet using the Typical Sheet (\*B01.SHT) seed (see Section [21C-54](#)).

[Sample R Sheet \(contours and drainage arrows\)](#)

## Tabulations

Use the Copy Seed function to create the RC tabulations file using the Excel Tabulation (C, CD, , J, RC, S, T) File (\*.xlsm) seed file, see Section [21C-54](#).

1. Open the created file. Select the RC sheets option when prompted for sheet type.
2. Fill out the CPN data on the ProjectInformation Tab.
3. Under the Add-ins ribbon, use the Add/Remove DE Sheet(s) droop down and select the correct revision date appropriate for your letting date.
4. Select the tabs corresponding to the erosion control measures placed.
5. Fill out the tabs and use the Build PrintSheet(s) tool under the Add-ins ribbon to place them in the PrintSheets tab.
6. Fill out the PPP (Tabulation [110-12](#)). Refer to the [Designer Info](#) for guidance.
7. Fill out the rest of the tabs for all erosion control measures being placed.

## Entering Totals into the [Project Scheduling System \(PSS\)](#)

For guidance, refer to Section [20J-81](#).

## **Notice of Intent (NOI)**

Refer to Section [10D-1](#) for guidance on filling out the NOI.

# Chronology of Changes to Design Manual Section:

## 010C-006 Creating the Erosion Control Feature DSN File

4/29/2019 Revised  
'CE' tabulation series has been changed to 'RC' series.

8/9/2018 NEW  
New.