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# Chapter 6 –Environmental Division

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# Chapter 6

## 6.1 Noise Section

### 6.1.1 Introduction

The noise section will use Location and Design files as references for the noise files. The noise section will develop and submit several files to be stored in Falcon. The files may include a file with barriers only (**nUPC#**), a working file (**nUPC#work**) and others.

The files should be created using an appropriate seed file (metric or english), and referencing the appropriate design files. The **nUPC** files can then be referenced back into the design file by L&D staff, for incorporation into the plans.

### 6.1.2 Procedures

The noise section CADD files will use the features shown in the table below. Preliminary noise abatement designs should be submitted to L&D staff for review of potential conflicts, such as right of way, utilities, drainage, or sight distance conflicts. The L&D staff may modify the barrier design to avoid such conflicts; however they must send the revised barrier back to the noise staff to evaluate for barrier effectiveness. There may be several iterations of this process.

The L&D staff is responsible for developing barrier plans and profiles that meet their specifications for inclusion into the construction plan set. If a noise study is completed by the Noise Abatement Section's On-Call consultant, the on-call consultant will submit the barrier plan and profile. L&D staff will advise the noise staff if any changes are made to the files, so the noise staff may evaluate the proposed changes to determine if this alters the results of the noise study.

The **nUPC (barrier)** file should contain only the noise barriers under consideration, to be included in the construction plans. The file prepared by noise staff may contain only line segments, L&D staff may modify to use chains, arcs, curve segments, or other elements to depict the barrier.

| Symbol       | Description        | Weight | Color     | Level |
|--------------|--------------------|--------|-----------|-------|
| Line - Solid | Barrier Segments   | 2      | 5 Magenta | 30    |
| Text         | Barrier Annotation | 2      | 5 Magenta | 30    |

For the **nUPC work file**, identify all objects to be exported to the **Traffic Noise Model (TNM)**, such as existing roadways, build roadways for each alternative, noise sensitive receptor sites, potential barrier locations, terrain features, ground zones, tree zones, etc. This file is a working file. The graphics for the **noise report** may be generated from **nUPCwork**, but will **not** likely contain all objects created in the work file. The noise staff may choose to name the levels as appropriate, especially for multiple alternative analyses.

***For details on how to setup the work file, contact the VDOT Noise Abatement Staff.***

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## 6.2 Natural Resource Section

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### 6.2.1 Introduction

In an effort to produce consistent construction plans, the Natural Resource Section has adopted CADD Standards. The CADD Standards will apply to all construction plans designed for and by the Natural Resource Section.

The Natural Resource Section will use the level structures contained in this manual. The designed level structure supports our construction plans and provides consistency throughout our design process. The Natural Resource Section views this as a section of a complete CADD Manual and the complete manual offers guidelines and procedures that shall be followed.

### 6.2.2 File Names

Assigning file names to CADD design files is to be done with consistency to make future searches for the files a simpler task. The following naming convention shall be used on all CADD files:

#### **DIVISION+ UPC# + SHEET NUMBER + EXTENSION**

EXAMPLE:

e53008003.dgn ( design file for sheet 3 UPC# 53008 division e)

e5043503a.dgn (design file for sheet 3a UPC# 50435 division e)

NOTE: It is desirable that **File Names** use only eleven characters, with a three-character extension, however there can be exceptions to this.

### 6.2.3 Design File Sheet Numbering

In accordance with sheet numbering standards as specified in the [Road Design Manual](#), each type of drawing has a specific sheet number or number range, which must be used. The following is a list of these sheet-numbering standards for stand-alone projects. You will have to confer with the Road Designer for sheet numbers for associated projects:

| Sheet Name           | Sheet Number |
|----------------------|--------------|
| Title Sheet          | 001          |
| Location Sheet       | 01a          |
| Index of Files Sheet | 01b          |

| Sheet Name       | Sheet Number                    |
|------------------|---------------------------------|
| Typical Sections | 002 (1st Typical Sheet)         |
| Typical Sections | 02* (Additional Typical Sheets) |
| General Notes    | 02*                             |
| Details          | 02*                             |
| Plan Sheets      | 003                             |
| Profiles         | 03a                             |

\* ALPHA LETTER TO BE ASSIGNED BY DESIGNER

## 6.2.4 Seed Files

All design files must be created from a seed file. A separate and specific seed file has been developed for each type of design file. For example, there is a different seed file for plan sheets, general notes sheets, typical section sheets, etc. These seed files have several operating parameters set specific to that sheets purpose and scale. Some of the parameters are as follows:

- Working units:
  - Imperial -- FT, TH, 1000, 1
  - Metric -- M, M, 1, 1000
- Global origin set to lower left (GO=0,0)
- Coordinate readout: Master Units to 4 decimal accuracy
- Angles: DD.DDDD, Conventional to 4 decimal accuracy
- All levels are turned (ON=1-63)
- Data read-out is set to master units with a minimum of two decimal places displayed
- View control delays are turned off
- All fast displays are turned off
- Text node display is turned off

- Appropriate cell library is attached

See [Chapter 3 MicroStation Seed Files](#) for available standard VDOT Seed Files.

## 6.2.5 Cell Library

The [wetland cell library](#) is located on the Central Office Cadd Server under \\coapp52\proj\land\_sup.

**NO CADD STANDARDS, CELLS, TEXT SIZES, FONTS, ETC., ARE TO BE REVISED BY ANYONE OUTSIDE THE SUPPORT GROUPS OF THE RESPECTIVE DIVISIONS.**

**NOTE: This library is not complete.**

**Table 6-1 Partial Cell Library**

Envir95.cel

| Cell Name              | Cell Description                    |
|------------------------|-------------------------------------|
| <a href="#">BOULDR</a> | Boulder with Footer                 |
| <a href="#">CLAS1</a>  | Erosion Control Stone Class I       |
| <a href="#">CLAS1A</a> | Erosion Control Stone Class IA      |
| <a href="#">CLAS2</a>  | Rip Rap Approximately Class II Size |
| <a href="#">EARTH</a>  | Pattern for Earth                   |
| <a href="#">FASCIN</a> | Brush Fascine                       |
| <a href="#">GABION</a> | Gabion 6 x 3                        |
| <a href="#">GRND2</a>  | Second Pattern for Ground           |
| <a href="#">GROUND</a> | Pattern for Ground                  |
| <a href="#">LGVNLT</a> | Log Vein Left                       |
| <a href="#">LGVNRT</a> | Log Vein Right                      |
| <a href="#">LIVSTK</a> | Live Stake                          |

| Cell Name               | Cell Description              |
|-------------------------|-------------------------------|
| <a href="#">LOG</a>     | Log for Toe Protection        |
| <a href="#">LOGXVN</a>  | Log Cross Vein                |
| <a href="#">PERMIT</a>  | Permit Sketch Border          |
| <a href="#">PLA</a>     | Plan Sheet                    |
| <a href="#">RCKXVN</a>  | Rock Cross Vein               |
| <a href="#">RIFFLE</a>  | Riffle                        |
| <a href="#">RKNLT</a>   | Rock Vein Left                |
| <a href="#">RKNRT</a>   | Rock Vein Right               |
| <a href="#">ROOTWD</a>  | Root Wad                      |
| <a href="#">RVNCMB</a>  | Root Wad Log Vein Combo       |
| <a href="#">SBAR1</a>   | Scale Bar for 100 Scale Plans |
| <a href="#">SBAR25</a>  | Scale Bar for 25 Scale Plans  |
| <a href="#">SBAR50</a>  | Scale Bar for 50 Scale Plans  |
| <a href="#">SHRUB</a>   | Herbaceous Shrub              |
| <a href="#">SHRUBL</a>  | Shrub for Linear Patterning   |
| <a href="#">SOIL</a>    | Soil Sand Pattern             |
| <a href="#">STIPPLE</a> | Dot for Stippling             |
| <a href="#">TERM</a>    | Line Terminator               |
| <a href="#">TREE1</a>   | Typical Tree                  |

## 6.2.6 Patterns

The patterns used to show mitigation components shall be readable when plotted at ½ size.

Patterns and/or fills will be placed in a reference file. The **filename** for this reference file will be **Division + (UPC) # pat.dgn**.

## 6.2.7 Mitigation Survey

Wetland Mitigation Sites, Wetland Banks, Stream Restoration and Stream Relocation Sites that require survey shall be in accordance with [Chapter 2 Survey](#) and [Appendix B Survey Standards](#).

## 6.2.8 Standard Levels for Wetland Mitigation, Stream Restoration/Compensation

Wetland Mitigation, Stream Restoration/Compensation Sites and Relocations that require plans shall be in accordance with the following CADD Levels and Standards:

**Table 6-2 Design Projects**

| Levels  | Description   |
|---------|---|
| Level 1 | Survey Control WT=8, LC=0                           |
| Level 2 | Traverse/Construction Baseline WT=8, LC=0           |
| Level 3 | Not Assigned  |
| Level 4 | Proposed Thalweg CO=1, LC=Thalweg, WT=5             |
| Level 5 | Proposed Edge of Water CO=29, LC=WA, WT=5           |
| Level 6 | Not Assigned  |
| Level 7 | Proposed Bankfull CO=22, LC=Bankfull, WT=5          |
| Level 8 | Top of Bank CO=24, LC=TOBL: Left; TOBR: Right, WT=4 |
| Level 9 | Proposed Index Contours (Major) CO=10, LC=0, WT=3   |



| Levels        | Description   |
|---------------|---|
| Level 10      | Proposed Interior Contours (Minor) CO=20, LC=0, WT=1  |
| Level 11      | Proposed Rock Structures (Cells)  |
| Level 12      | Proposed Wood Structures (Cells)  |
| Level 13      | Proposed Habitat Structures CO=10, LC=0, WT=3 and/or Cells                                    |
| Level 14      | Proposed Miscellaneous Structures CO=10, LC=0, WT=3 and/or cells                              |
| Level 15      | Proposed Streambank Stabilization Measures CO=11, LC=0, WT=3 and/or cells                     |
| Level 16      | Proposed Riprap (cells)   |
| Level 17      | Proposed Plantings CO=11, LC=0, WT=3 and/or cells   |
| Level 18      | Miscellaneous Grading Items CO=19, LC=0, WT=3 and/or cells                                    |
| Level 19      | Construction Limits (See standard survey info)  |
| Level 20      | Right of Way WT = 6, LC = 0; Temp. Easements WT = 6, LC = 6<br>Perm. Easements WT = 6, LC = 4 |
| Level 21 - 25 | Not Assigned  |
| Level 26      | Limits of Disturbance CO=26, LC=LOD, WT=4   |
| Level 27      | Wetland Delineation Line CO=20, LC=WL, WT=4   |
| Level 28      | Wetland Hydrologic Control Feature WT=4   |
| Level 29      | Water Quality Permit Limits CO=4, LC=WQPL, WT=4   |
| Levels 30     | Symbols, Legend and Project Notes   |
| Level 31 – 59 | Annotation for Levels 1 - 29  |

| Levels        | Description              |
|---------------|--------------------------|
| Levels 60     | Sheet, North Arrow, etc. |
| Level 61 - 63 | Not Assigned             |

**Note:** The line weights assigned may be adjusted due to the complexity of the design.

## 6.2.9 Standard Text Sizes

**Table 6-3 Text Sizes**

| Text Size | Scale     | Text Size | Weight |
|-----------|-----------|-----------|--------|
| A         | 1" = 100' | 16'       | 5      |
|           | 1" = 50'  | 8'        | 5      |
|           | 1" = 25'  | 4'        | 5      |
| B         | 1" = 100' | 12'       | 5      |
|           | 1" = 50'  | 6'        | 5      |
|           | 1" = 25'  | 3'        | 5      |
| C         | 1" = 100' | 16'       | 7      |
|           | 1" = 50'  | 8'        | 7      |
|           | 1" = 25'  | 4'        | 7      |
| D         | 1" = 100' | 12'       | 7      |
|           | 1" = 50'  | 6'        | 7      |
|           | 1" = 25'  | 3'        | 7      |

NOTE: Text Size for other scales may be computed by dividing the desired drawing scale by 100 and multiplying the value for 1" = 100'.

EXAMPLE: For a desired scale of 1" = 10' for type A text

Compute:  $10/100 = 0.10$

$0.10 \times 16 = 1.6'$

| SCALE    | Text Size | Weight |
|----------|-----------|--------|
| 1" = 10' | 1.6'      | 5      |