

10.0 Erosion Control

10.1 Control

Erosion and sediment control is required by permit for projects disturbing one acre of ground or more over the life of the project. ODOT policy is to include an erosion and sediment control plan (ESPCP) on every project with **any** significant ground disturbance. The design and contract documents may be produced by or through Region offices or consultants under contract to the Agency. The standards and processes are the same for Local government federal-aid projects administered through ODOT.

Erosion control contract documents are prepared under the responsible control of the Professional of Record - a Registered Engineer, Registered Landscape Architect, Certified Engineering Geologist, or other professional. Contract documents need to undergo the same qualified peer/QA/QC review as any other project documents.

The following items are normally required for projects:

- Plan sheets, including special project details;
- Special Provisions;
- Cost Estimate with bid items and quantities;
- Narrative.

Plan sheets

The erosion and sediment control plan sheets should use the Roadway base sheets whenever possible. This keeps plan graphic elements consistent and prevents reproducing work unnecessarily. It saves many of the steps of sheet setup detailed on the following pages.

Narrative

A narrative is a written statement which explains the erosion and sediment control decisions made for a project and the justifications for those decisions. The narrative contains information on site conditions, anticipated impacts related to erosion and sediment control, construction schedules, and other relevant items not apparent on the site plan. This information is critical for plan review and implementing the plan properly throughout construction.

10.2 Development

The drafter or designer assigned to the project should set up the erosion control drawings to include basic topographic features, grading limits, and intended erosion control features to develop hard copy or electronic files.

Reference

For additional information on erosion control, see ODOT's "Construction Project Pollution Control", 1997.

Reference

For additional information, refer to the Hydraulics Manual at www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/.

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Note: For information on seed files, see Section 2.6, Volume 1.

Tip

If other roadway plan sheets have already been created, it may be easier to copy the active file to a new active file for Erosion Control and modify as necessary. If this is the case, move on to step 5, 9, or 10 as appropriate.

Note: For file naming conventions, see Section 2.5, Volume 1.

Tip

Step 3 may have been completed as part of another section of the contract plans. If it has, use it here and go on to Step 4.

Note: For additional information about title block text, see Section 2.9, Volume 1.

Note: For information on signature blocks, see Section 2.9, Volume 1.

10.2.1 Sheet Setup

Set up the Erosion Control plan and detail sheets as described in steps 1–5 and then follow or use Steps 6 through 9 for plan sheets or Step 10 for detail and note sheets. General information to help you create the sheets follows the detailed steps.

Step 1 — Create an “Active File”

Create a new MicroStation™ file from the seed file named SEED3D.DGN found at:

Internal ODOT staff	http://SCDATA3\ODOT_space\standards\seed
External	ftp://ftp.odot.state.or.us/isb/appeng/Microstation/Version8/

and name it KEYNUF.GA1, where “KEYNU” represents your project key number assigned by ODOT (to be filled in by you), “F” represents that this file is part of the final contract plans, and “GA1” is the appropriate extension for the first file of the Erosion Control sheets. Subsequent files shall have extensions “GA2”, “GA3,” etc. This is your **active file**.

Step 2 — Add sheet borders

Enter ODOT’s proprietary software, “Plotypus,” to automatically place borders (*File/Plotypus*). “Plotypus” automatically creates the borders at a pre-designated location in the design file. Choose the intended scale and sheet size, placing up to ten borders per design file. See Appendix D, “A Quickguide To Plotypus,” for more information on placing borders.

Step 3 — Create the Project Title and “V” Number Reference File

Create a new MicroStation™ file from the seed file named SEEDV8.NAM found at:

Internal ODOT staff	http://SCDATA3\ODOT_space\standards\seed
External	ftp://ftp.odot.state.or.us/isb/appeng/Microstation/Version8/

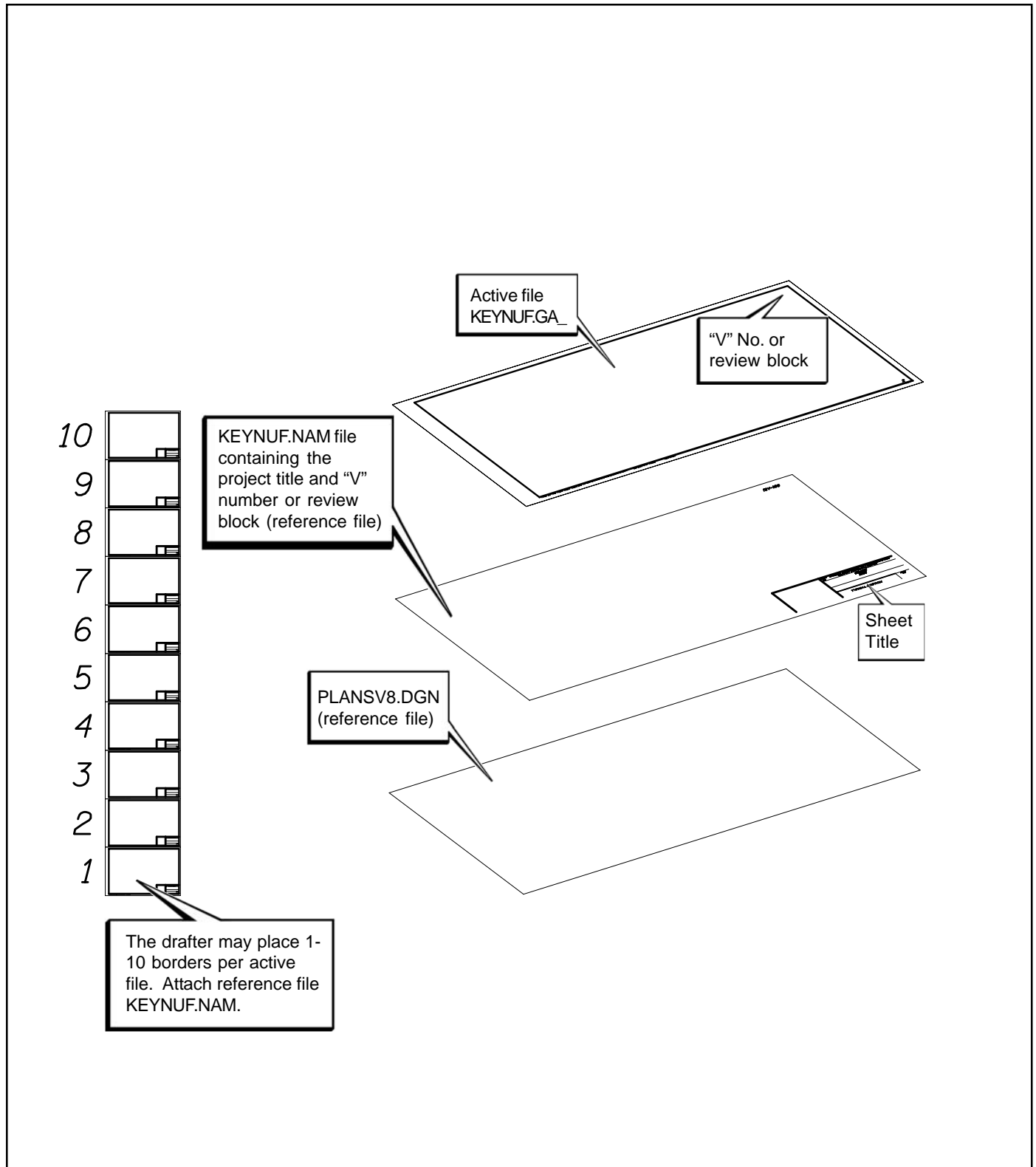
and name it KEYNUF.NAM, where “KEYNU” represents your project key number (to be filled in by you), “F” represents that this file is part of the final contract plans, and “NAM” represents that this generic file is for the project title information. For example, a new file name might be 01234F.NAM.

Title block text is provided in two scales within SEEDV8.NAM for convenient editing.

Edit the project title text in the appropriate place within the title block. When the contract plans are complete and ready to be advertised for bid, the “V” number will be added to this file in the upper right hand corner of each plan sheet. For

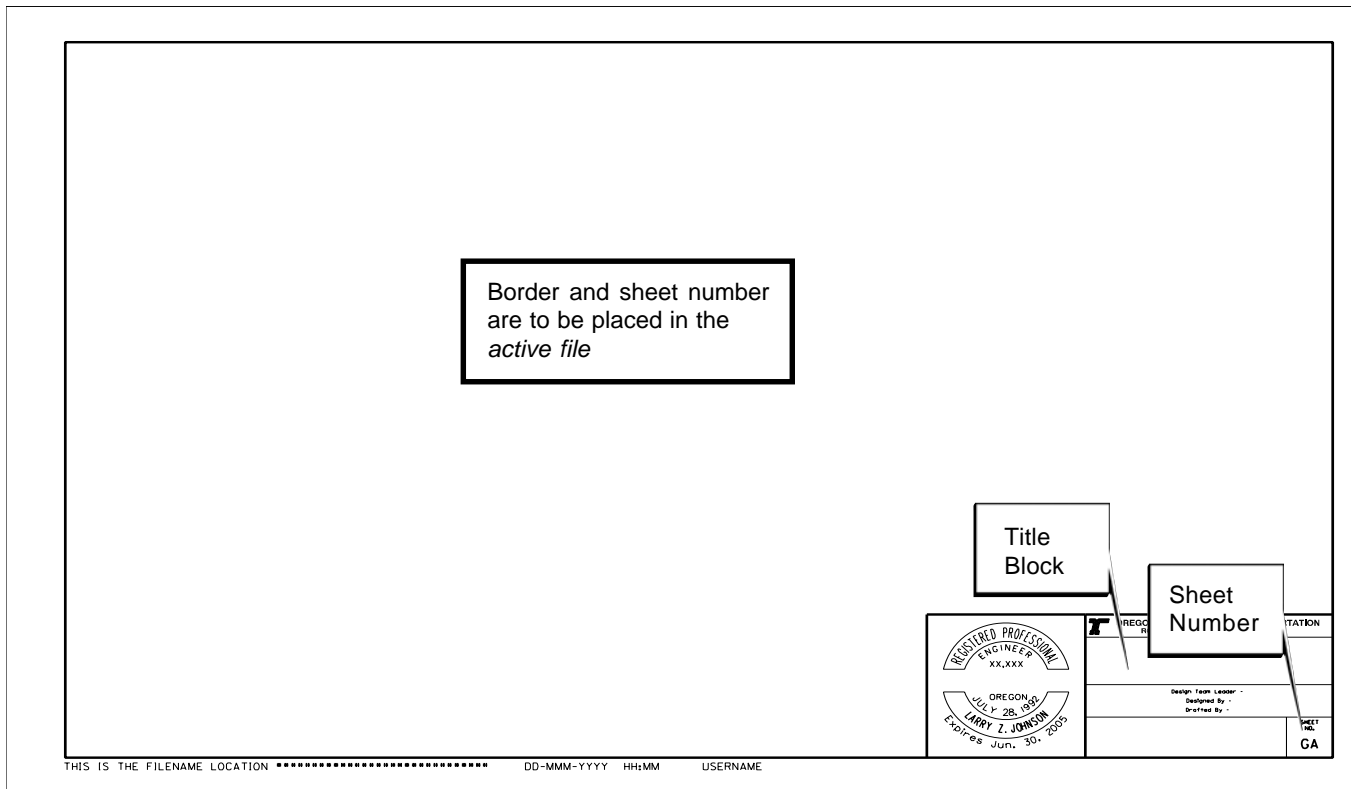
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Figure 10-1 Reference Files



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Figure 10-2 Sheet Titles - Erosion Control



10.2.1 Sheet Setup (Cont'd)

preliminary, advance and final review submittals, the appropriate block shall be placed here rather than the “V” number (from the cell library ODOT.cel).

Step 4 — Attach Reference Files

Open the new Erosion Control active file created in Step 1. Attach KEYNUFNAM as a reference file and assign a logical name as appropriate for your plan sheet.

Step 5 — Add Sheet Titles and Numbers

While in the *active file*, add either “EROSION CONTROL DETAILS” or “EROSION CONTROL PLAN”, as appropriate for the type of plan sheet you are creating, in the title block in the KEYNUFNAM reference file created in Step 3. See Figure 2-7 for a listing of the sheet titles and the levels on which they can be found.

While in the *active file*, add the appropriate sheet numbers, snapping to the point provided in the space. The active file should now have blank plan sheets with the title blocks filled in, as illustrated in Figure 10-2.

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Note: For information on creating clip boundaries, See Section 2.8, Volume 1.

Warning

Clip masking and rotated views should be avoided.

Note: For information on preparing the basemaps for use as reference files, See Basemaps, Section 2.7, Volume 1.

Note: For a detailed list of element attributes and levels, see the Roadway Unit Levels, Table 2-3, Volume 1.

Note: For Erosion Control Detail sheet examples, see Section 10, Volume 2.

10.2.1 Sheet Setup (Cont'd)

Step 6 — Add Professional of Record Stamp

While in the *active file*, add the Professional of Record's Stamp cell for the appropriate person signing the plans, snapping the cell to the point provided.

Step 7 — Sheet Information

The location, name and date of the *active file* are to appear in the lower left corner of the sheet as shown in Figure 10-2. For ODOT users, this will update automatically. Users outside ODOT must use an appropriate pen table.

10.2.2 Plan Sheet

Production of plan sheets for Erosion Control involves the same general procedures as follows:

Step 8 — Create Clip Boundaries

Copy the seed file, SEED3D.DGN, to a new file using the appropriate file naming convention. This file will be your clip boundaries reference file to be used in the creation of plan sheets. Attach the design base, topographic and right-of-way reference files. Open the new clip boundaries file and create sheet boundaries using multisided shapes that fit your sheet breakout and scale. Normally, 1"=100' scale (same as the roadway plan scale), this would be 1200 feet per single plan sheet.

Step 9 — Attach Clip Boundaries

Open the *active file* and attach the clip boundaries file you created in the previous step. Scale, move and rotate the clip boundaries reference file so it fits properly within the borders of the first open plan sheet. Place a fence, for the clip boundary, around the area you wish to show and clip the reference file objects. See Figure 10-3.

Step 10 — Attach Base Map

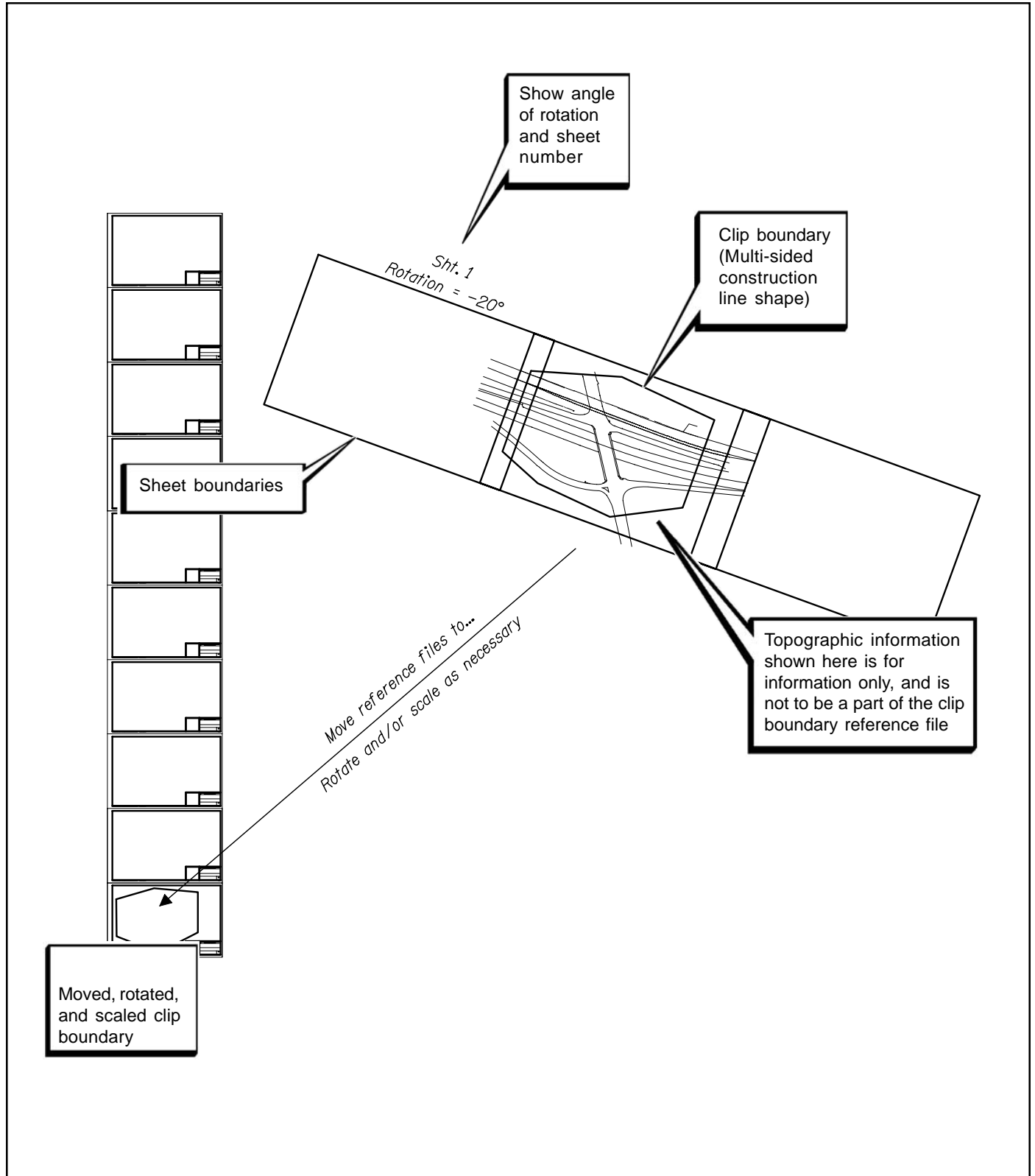
Attach the appropriate existing topographic base map, right-of-way file and design base as reference files. Scale, rotate, and move these reference files exactly as you did in Step 9. Erosion Control design features can either be added to a copy of the design base reference file at this time, and should be renamed KEYNUERO.DGN. See Figure 10-4.

Step 11 — Add Items

Add text and other project specific items as necessary. See the check list at the end of this section for a complete listing of required and suggested items.

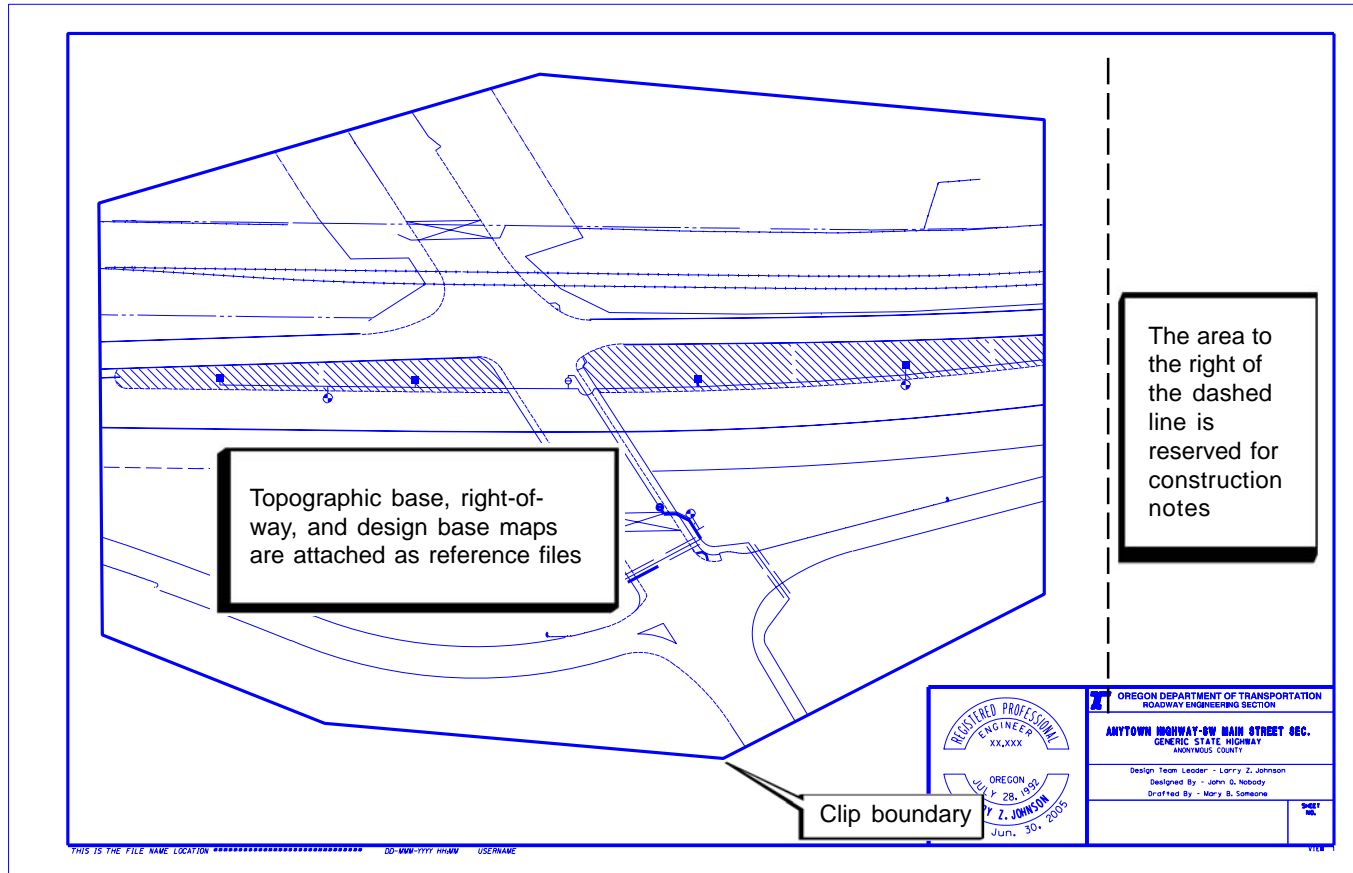
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Figure 10-3 Attach and Modify Reference Files



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Figure 10-4 Completed Attached Reference Files



10.2.2 Plan Sheet (Cont'd)

Standard drawings used will be identified by filling boxes in the standard drawing list included on the first sheet.

10.2.3 Detail Sheet

Building on Steps 1 through 7, creation of detail sheets involves the same general procedure as follows:

Step 12 — Add Items

Now that your *active file* is set up with plan sheet borders and titles as appropriate, you can import or create any project specific detail information in this file, following the standards for fonts, sizes, line weights, line codes, and colors as presented in Section 10 of Volume 2. Also, see Figure 10-5.

Standard details can be accessed from:

http://egov.oregon.gov/ODOT/HWY/ENGSERVICES/standard_drawings_home.shtm

Note: For information about the ODOT Menu, see Appendix “C”, Volume 1.

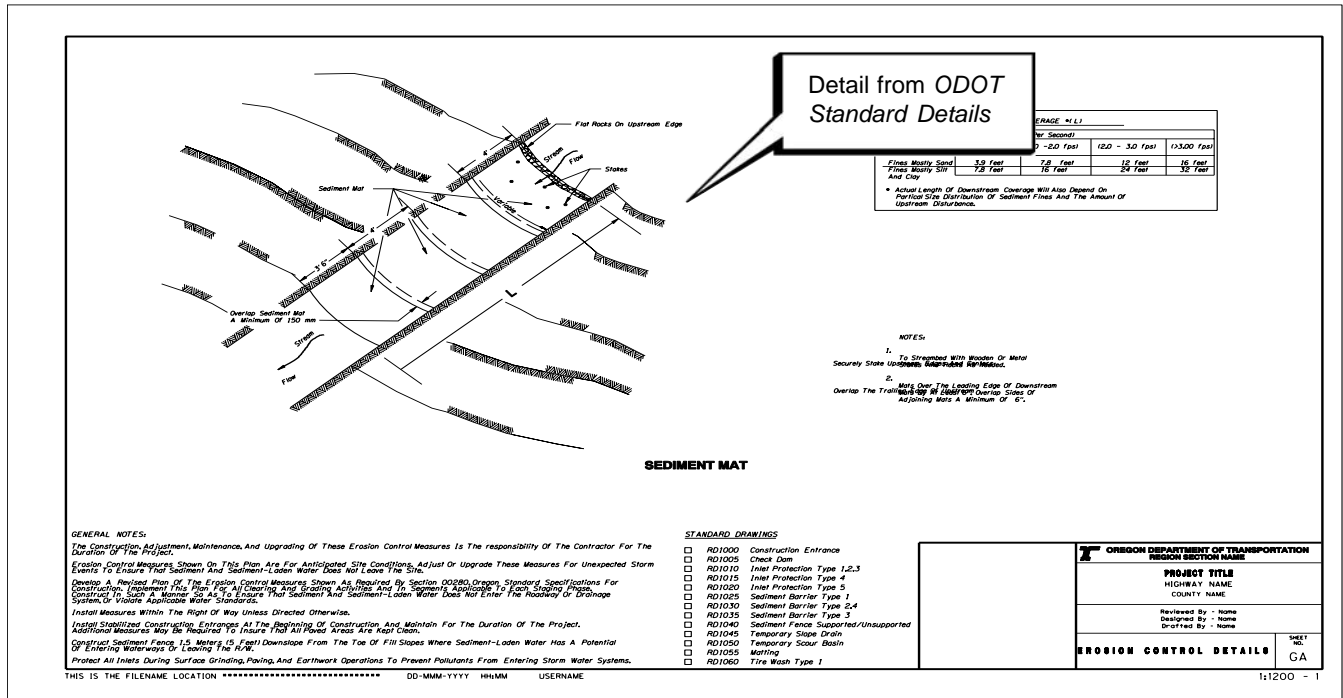
Note: For text standards within the contract plans, see Table 2-2, Volume 1.

Note: For an example of the Bid Item Quantity Estimate Sheet, see Table 10-1, Section 10, Volume 1.



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Figure 10-5 Detail and Note Sheet



10.2.3 Detail Sheet (Cont'd)

and can be copied and modified as needed to fit the project. Modified details must be approved by the Professional of Record prior to finalization of contract plans.

10.2.4 General Information

Standards Menu

The ODOT Menu should be used to produce the Erosion Control portion of the contract plans with the same general CAD standards as used for the Roadway portion of the contract plan set.

Cache File

ecV8_cache.dgn is a graphic library of Erosion Control elements and other contract plans elements that can be copied or used to set symbology. It is a quick means of access to an assortment of cells and general design guidance.

The erosion control “cache” can be found at:

- Internal ODOT staff http://SCDATA3\ODOT_space\standards\ref
- External <ftp://ftp.odot.state.or.us/isb/appeng/Microstation/Version8/>

Text

To Maintain consistency use the same standard ODOT text fonts and sizes for the Erosion Control plans that are generally used for the road construction portion of the contract plan set.

Note: For additional information on special provisions, see Section 17, Volume 1.

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Table 10-1 Sample Erosion Control Bid Item Quantity Estimate Sheet

EROSION CONTROL BID ITEM ESTIMATE						
PROJECT:			DATE:			
HIGHWAY:			MP:			
COUNTY:						
KEY NO.:			ESTIMATOR:			
CODE	ITEM	UNIT	QTY	UNIT COST	TOTAL	
X	Erosion Control	LS		\$ -		
	Check Dams	Each		\$ -		
	Construction Entrances	Each		\$ -		
	Biofilter Bags	Each		\$ -		
	Flow Spreader	ft		\$ -		
	Inlet Protection	Each		\$ -		
	Sediment Fence, Supported	ft		\$ -		
	Sediment Fence, Unsupported	ft		\$ -		
	Sediment Barrier	ft		\$ -		
	Sediment Mat	ft ²		\$ -		
	Plastic Sheeting	ft ²		\$ -		
	Sand Bags	Each		\$ -		
	Temporary Drainage Curbs	ft		\$ -		
	Temporary Slope Drains	ft		\$ -		
	Temporary Scour Holes	Each		\$ -		
	Temporary Sediment Traps	Each		\$ -		
	Turbidity Barrier	LS		\$ -		
	Diversion Dike/Swale	ft		\$ -		
	Tire Wash Facility	Each		\$ -		
	Temporary Mulching	ac		\$ -		
	Matting	ft ²		\$ -		
	Chemical Soil Stabilizer	ac		\$ -		
	Mulching	ac		\$ -		
	Temporary Seeding	ac		\$ -		
	Permanent Seeding	ac		\$ -		
	Seeding Mobilization*	Each		\$ -		
	<u>Anticipated Items:</u>					\$0
	Additional erosion control measures	LS				
				Total		\$0

* Use where major slopework will be finished in several stages.

10.2.4 General Information (Cont'd)

The Erosion Control Bid Item Quantity Estimate Sheet can be found on the Internet at:

<http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/>

Then click on “Manuals Procedures & Practices” under “Resources”.

Then click on “Erosion Control Manual” directory.

File name _EC Eng Est1.xls

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10.2.4 General Information (Cont'd)

Cost Estimate

The cost estimate contains the bid items, quantities, unit cost, and total item cost for all best management practice (BMP) items designed or included for the project. Bid item names and measurement units can be found in Section 00280 and 01030 in the Standard Specifications and on the ODOT Specifications internet web site under “Bid Item Lists”.

In addition to other specific BMP items used on the project, the estimate should include a lump sum item for “Erosion Control”. This is used to pay the Contractor for amending and monitoring the ESCP as required in Section 00280 of the Standard Specifications. An Anticipated Item can also be included for special work that may be needed during construction such as additional protection for sensitive environmental areas or additional treatment of surface waters.

10.3 Coordination With Specifications

The primary specifications for erosion and sediment control work are found in the ODOT *Oregon Standard Specifications For Construction* under the following sections:

- Section 00280-Erosion and Sediment Control
- Section 00290-Environmental Protection
- Section 01030-Seeding

Other Sections sometimes containing requirements are:

- Section 00160-Source of Materials
- Section 00310-Removal of Structures and Obstructions
- Section 00320-Clearing and Grubbing
- Section 00330-Earthwork
- Section 01040-Planting
- Section 01120-Irrigation Systems

These Specifications are typically modified for each project with Special Provisions. This is done using Special Provision “boilerplates”, or templates, modified according to processes described by the Specifications Unit. This is a link to the ODOT Specifications internet site for the boilerplates and guidelines:
<http://www.oregon.gov/ODOT/HWY/SPECS/>

After opening this page, look under “Overview” for the guidelines, and find the Part containing the Section boilerplate, such as Part 00200 for Section 00280. In modifying the specifications, try not to duplicate anything in the Standard Specifications or on the plans.

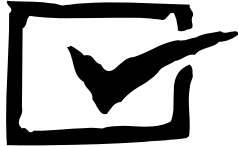
Ensure that plans, specifications, and the estimate are fully coordinated for the Advance Plans submittal.

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10.4 Checklist

Narrative

The narrative should discuss any of the following that apply:



- Project description - The nature and purpose of the land disturbing activity. This can be from the project prospectus
- Estimated total project area and area to be disturbed in acres
- Existing site conditions - The existing topography, vegetation, rainfall, drainage, and other critical information.
- Soils - Soils on the site with such information as soil name, mapping unit, erodibility, permeability, depth, texture and soil structure
- Receiving waters, including known wetland areas
- Adjacent Areas - Land uses and general state of development
- Off-site areas - Land-disturbing activities such as material sources
- Jurisdictions within the project limits
- Critical areas - Areas on the site which have potentially serious erosion problems (e.g., steep slopes, channels, underground springs, etc.).
- Erosion and sediment control measures - Methods which will be used to control erosion and sedimentation on the site
- Permanent stabilization - How the site will be stabilized after construction is completed
- The NPDES Permit to be used for the project
- Specific relevant requirements from other environmental permits such as Biological Opinion
- Information sources and/or contacts

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10.4 Checklist (Cont'd)

Plan Sheet

The Erosion Control Plan sheets in the contract documents should show the following information:

- Border, title block, sheet title, sheet number and “V” number
- ODOT logo
- Consultant firm’s name (in title block)
- Notes in the lower right corner (if necessary)
- Reference to standard drawings (if necessary)
- Professional of Record’s stamp (all sheets)
- Proposed erosion control items
- Erosion control construction notes and reference bubbles
- Existing contour lines, in dashed line pattern and labeled
- Proposed grading contour lines, in solid line pattern and labeled
- Cut and fill lines and topography outside cuts and fills and clearing limits
- Erosion control for major construction staging
- Alignment showing line labels and stationing
- Place names including roads and all waterways
- Right-of-Way and easement lines
- Storm water drainage system (culverts, pipes, inlets, and ditches)
- Natural drainage features (lakes, swales, rivers, streams, etc.)
- Boundaries of environmentally sensitive areas such as wetlands, no access areas, etc.
- Location and names of Best Management Practices (BMP) including aggregate construction entrances
- Arrows indicating drainage patterns and flow directions (optional)
- Specific construction notes (each plan sheet)
- General construction notes and Standard Drawing list (first sheet only)
- North Arrow on each plan sheet
- Legend of O.D.O.T. standard symbols actually used per plan sheet
- Existing structures near the project right-of-way

