

Session 3: Template Setup & Base Drawing Creation

Main Content

The Power of Templates in Civil 3D

Templates (.dwt files) are the unsung heroes of Civil 3D productivity. A well-designed template ensures that every project starts with the correct settings, styles, layers, and standards already in place. Think of templates as your project's DNA—they define what every drawing in your project will inherit.

Benefits of Proper Template Usage:

- **Consistency:** Every drawing looks and behaves the same way
- **Efficiency:** Spend time designing, not configuring settings
- **Quality Control:** Enforce company standards automatically
- **Reduced Errors:** Correct settings from the start
- **Team Coordination:** Everyone uses the same standards
- **Client Satisfaction:** Deliverables have consistent appearance

Understanding Civil 3D Template Components

A Civil 3D template contains much more than AutoCAD templates:

1. Drawing Settings

- Units (US Survey Feet vs. International Feet)
- Coordinate system zone
- Object layer assignments
- Abbreviations for labels
- Ambient settings (temperature, pressure, etc.)

2. Object Styles

- Surface styles (existing, proposed, contours)
- Alignment styles (centerline, right-of-way, easement)
- Profile styles (existing ground, proposed, design profiles)
- Corridor styles
- Pipe network styles
- Grading styles

3. Label Styles

- Surface labels (spot elevations, contours, slopes)
- Alignment labels (station, offset, geometry points)
- Profile labels (grade, stations, vertical curves)
- Pipe network labels (structure labels, pipe labels)

4. Table Styles

- Curve tables
- Line tables
- Surface elevation tables
- Volume tables

5. Layer Structure

- Standardized layer naming (C-ROAD, C-TOPO, C-PROP, etc.)
- Layer colors, linetypes, linewidths
- Layer states for different views

6. Blocks and Symbols

- North arrows
- Standard detail symbols
- Benchmark symbols
- Utility symbols

Creating a Custom Civil 3D Template

Step 1: Start from a Standard Template

Don't build from scratch—start with Autodesk's templates and customize:

- Civil 3D (Imperial) NCS.dwt (for US projects)
- Civil 3D (Metric) NCS.dwt (for metric projects)

Location: Typically in `C:\Program Files\Autodesk\AutoCAD [Version]\Template\`

Step 2: Configure Drawing Settings

Command: `SETTINGS` or `DRAWINGSETTINGS`

Units and Zone Tab:

- Drawing Units: US Survey Feet (or appropriate for your region)
- Angular Units: Degrees
- Coordinate System: Select appropriate State Plane or UTM zone
- Imperial/Metric: Set correctly

Object Layers Tab:

Review and customize layer assignments for Civil 3D objects:

- Surface layers
- Alignment layers
- Profile layers
- Corridor layers
- Pipe network layers

Abbreviations Tab:

Set standard abbreviations used in labels:

- STA = Station
- ELEV = Elevation
- PROP = Proposed
- EXIST = Existing
- MAX = Maximum
- MIN = Minimum

Step 3: Set Up Layers

Command: `LAYER` or `LA`

Follow a layer naming standard. Common standards:

- **NCS (National CAD Standard):** C-[Discipline Code]-[Minor Code]
- **AIA Standard:** A-[Discipline]-[Description]

Example Civil 3D layer structure:

```
C-TOP0-MAJR (Existing major contours - Brown)
C-TOP0-MINR (Existing minor contours - Brown)
C-ROAD-CNTR (Road centerlines - Red)
C-ROAD-CURB (Curbs - Magenta)
C-PROP-MAJR (Proposed major contours - Red)
C-PROP-MINR (Proposed minor contours - Red)
C-BLDG (Buildings - Cyan)
C-PROP-BLDG (Proposed buildings - Red)
C-PKNG (Parking areas - Green)
C-ANNO-DIMS (Dimensions - Green)
C-ANNO-TEXT (General text - Green)
```

Layer Properties to Set:

- Color: Follow consistent color scheme
- Linetype: Continuous, Dashed, Hidden, etc.
- Lineweight: 0.00mm to 1.00mm typically
- Plot: Yes/No
- Description: Brief description of layer purpose

Step 4: Create Object Styles

Access: Toolspace > Settings tab > Expand object type > Right-click Styles > New

Key styles to customize:

Surface Styles:

- Existing Ground Surface:

- Display: Brown contours
- Major interval: 5' or 10' (depending on project scale)
- Minor interval: 1' or 2'
- Triangulation: Display or not (typically off for final drawings)

• Proposed Surface:

- Display: Red contours
- Major/minor intervals matching existing
- Triangulation: Off for presentation

Alignment Styles:

- **Centerline:** Continuous red line, linewidth 0.30mm
- **Right-of-Way:** Dashed magenta line
- **Easement:** Dotted yellow line

Profile Styles:

- **Existing Ground Profile:** Brown continuous line
- **Design Profile:** Red continuous line, heavier weight
- **Finished Ground Profile:** Red continuous line

Step 5: Create Label Styles

Access: Settings tab > Surface > Label Styles > [Label Type] > Right-click > New

Essential label styles:

Surface Spot Elevation Labels:

- Text height: 0.08" (for 1"=20' scale, adjust for others)
- Marker: Small circle or X
- Format: Show elevation to 0.01'
- Layer: C-ANNO-ELEV

Alignment Station Labels:

- Text height: Scale-dependent
- Format: 0+00.00 or 0+00 (depending on preference)
- Tick mark style: Perpendicular to alignment
- Layer: C-ANNO-ALGN

Contour Labels:

- Major contour: Text height 0.08", bold
- Minor contour: Typically not labeled
- Format: Show elevation as whole number for major contours

Step 6: Configure Table Styles

Access: Settings tab > Table Styles > Right-click > New

Curve Table Style:

- Include: Delta, Radius, Length, Tangent
- Text height: 0.07"
- Column widths: Auto-adjust or set manually
- Border style: Simple grid

Step 7: Add Standard Blocks

Insert commonly used blocks:

- North arrow (with multiple scale options)
- Detail callout symbols
- Benchmark symbols (with attribute for elevation)
- Section cut lines
- Match line symbols

Command: `INSERT` or `BLOCK`

Save blocks in the template, organized by layer.

Step 8: Set Drawing Aids and Display Settings

Command: `OPTIONS` (or `OP`)

Display Tab:

- Set screen colors (black or white background)
- Crosshair size
- Display resolution for curves

Drafting Tab:

- AutoSnap settings
- Object snap options
- Aperture size

Selection Tab:

- Pickbox size
- Grips settings

Step 9: Configure Plot Styles

Attach a plot style table (.ctb or .stb):

- Color-dependent (.ctb): Traditional AutoCAD approach
- Named (.stb): More flexible, object-based

Common choice: `monochrome.ctb` (all objects plot black) or custom firm standard CTB

Set in: Page Setup Manager > Modify > Plot style table

Step 10: Save as Template

Command: `SAVEAS`

File type: `AutoCAD Drawing Template (*.dwt)`

Location: Save to:

1. Autodesk template folder for universal access
2. Firm network location for team access
3. Project `04_Design/Standards/` folder for project-specific template

File name: `CompanyName_Civil3D_Imperial.dwt` (or similar descriptive name)

Include:

- Template description
- Measurement: Imperial or Metric

Best Practices for Template Management**1. Version Control:**

- Date your templates: `CompanyName_Civil3D_Imperial_2024-01.dwt`
- Document changes in a text file
- Archive old versions

2. Multiple Templates:

Create specialized templates for different project types:

- `Company_SiteDesign.dwt` (subdivisions, commercial sites)
- `Company_Roadway.dwt` (road projects with alignment-focused styles)
- `Company_LandDevelopment.dwt` (grading-heavy projects)

3. Template Testing:

- Create test drawings from template
- Verify all styles work correctly
- Check Data Shortcuts compatibility
- Have multiple users test

4. Documentation:

Create a template guide documenting:

- What's included in the template
- When to use each template
- How to customize for specific projects

- Layer naming conventions
- Style naming conventions

5. Regular Updates:

- Review templates quarterly or annually
- Incorporate lessons learned from projects
- Update to match evolving standards
- Communicate changes to team

Base Drawing Creation

Once your template is ready, you'll create your BASE-XREF.dwg file:

Purpose of BASE-XREF:

- Contains non-changing site context
- Property boundaries
- Existing features to remain
- Nearby roads and structures
- Reference information

What BASE-XREF Should NOT Contain:

- Civil 3D objects (surfaces, alignments, etc.)
- Design elements
- Anything that will change during design

Creating BASE-XREF.dwg:

1. Start from Template:

- File > New
- Select your custom template
- File > Save As > Name it BASE-XREF.dwg
- Save to 04_Design/Base/

2. Import Site Context:

- Property boundary (from survey or legal description)
- Existing buildings to remain
- Adjacent properties and features
- Easements and right-of-way

3. Add Reference Information:

- Project north arrow (if different from true north)
- Site address or location
- Benchmark locations
- Section township range (if applicable)

4. Clean Up and Organize:

- Purge unused objects: PURGE > All
- Audit drawing: AUDIT > Yes to fix errors
- Check layers are correct
- Freeze layers you don't want displayed by default

5. Document the Base File:

- Add text note with coordinate system

- Note any assumptions or data sources
- Date the base file

Using BASE-XREF in Other Drawings:

- XREF or EXTERNALREFERENCES command
- Attach (not overlay) BASE-XREF.dwg
- Use relative paths when possible
- Set to display but not plot (if needed)

Case Study: Developing Firm-Wide Templates

Firm Overview

Firm: Riverside Engineering Associates (REA)

Size: 25 employees, 8 Civil 3D users

Location: Colorado

Challenge: Inconsistent drawing standards across projects

Timeline: 6-week template development initiative

The Problem

Riverside Engineering Associates had been using Civil 3D for three years, but each designer was essentially working in their own world. Some used Autodesk's default templates. Others had created personal templates. A few worked with no template at all, configuring settings for each drawing.

The results were predictable but painful:

- Client reviews questioned why different sheets looked different
- Senior reviewers spent hours reformatting drawings
- New employees had steep learning curves
- Data Shortcuts failed mysteriously (due to incompatible settings)
- Projects took longer than necessary

The firm principal decided enough was enough. He tasked the CAD Manager, Maria, with leading a template standardization initiative. The goal: Create firm-wide templates that everyone would use, ensuring consistency and efficiency.

Phase 1: Assessment and Planning (Week 1)

Maria's Approach:

1. Survey Current State:

- Interviewed all 8 Civil 3D users
- Reviewed drawings from the last 10 projects
- Identified common issues and inconsistencies

1. Research Best Practices:

- Attended Autodesk webinar on template creation
- Reviewed National CAD Standard (NCS)
- Studied templates from peer firms (via industry contacts)

2. Define Requirements:

- Support both State Plane Colorado North and South zones
- Follow NCS layer naming (client requirement from state projects)
- Include styles for residential, commercial, and roadway projects
- Work with firm's existing CAD standards (colors, fonts, title blocks)

3. Get Buy-In:

- Presented proposal to management
- Held kickoff meeting with all users
- Emphasized benefits and requested input

Phase 2: Template Development (Weeks 2-4)

Week 2: Base Configuration

Maria started with Autodesk's Civil 3D (Imperial) NCS.dwt :

- Set drawing units to US Survey Feet
- Configured coordinate system defaults (would be changed per project)
- Set up Object Layers following NCS standard
- Configured abbreviations

Week 3: Styles Creation

Maria created three categories of styles:

1. Surface Styles:

- REA-Surface-Existing (Brown, 2' minor/10' major contours)
- REA-Surface-Proposed (Red, matching intervals)
- REA-Surface-Nodisp (No display, for calculations)

2. Alignment Styles:

- REA-Centerline (Red, 0.35mm weight)
- REA-ROW (Dashed magenta)
- REA-Easement (Dotted yellow)

3. Profile Styles:

- REA-Profile-EG (Brown existing ground)
- REA-Profile-FG (Red finished ground)

Label Styles: Created comprehensive label styles for:

- Surface spot elevations (multiple scales: 1"=20', 1"=30', 1"=40', 1"=50')
- Contour labels
- Alignment geometry labels
- Station offset labels
- Profile grade labels

Table Styles:

- Curve tables
- Line tables
- Surface analysis tables

All styles followed naming convention: REA-[ObjectType]-[Variation]

Week 3: Layers and Blocks

- Established complete layer structure following NCS
- Created layer states:
 - REA-DesignView (design work layers on)
 - REA-PresentationView (only finished elements visible)
 - REA-ConstructionView (construction-relevant layers)
- Added standard blocks:
 - North arrows (5 sizes for different scales)

- Benchmark symbol with attributes
- Detail callouts
- Section cut symbols

Week 4: Specialized Templates

Maria created three specialized templates:

1. REA-SiteDesign.dwt:

- Focused on site grading and utilities
- Includes pond and parking lot styles
- Residential and commercial label styles

2. REA-Roadway.dwt:

- Alignment and corridor-focused
- Includes assembly library
- Profile view styles optimized for plan/profile sheets

3. REA-Utility.dwt:

- Pipe network styles for storm, sanitary, water
- Structure labels and tables
- Utility-specific annotation

Each template started from the same base but included specialized styles.

Phase 3: Testing and Rollout (Weeks 5-6)

Week 5: Beta Testing

Maria selected three ongoing projects to test the templates:

- Small residential project (used REA-SiteDesign.dwt)
- Road reconstruction project (used REA-Roadway.dwt)
- Commercial development (used REA-SiteDesign.dwt)

Three different designers used the templates and provided feedback:

- "The styles are comprehensive, but I can't find what I need quickly" - Designer 1
- "Love the layer states, saves a ton of time" - Designer 2
- "Some label styles need adjustment for our typical scales" - Designer 3

Adjustments Made:

- Created a style guide PDF showing preview images of each style
- Organized styles in Settings tab using better descriptions
- Added more scale-specific label styles
- Fixed minor label formatting issues

Week 6: Training and Deployment

Maria conducted training:

- 2-hour hands-on workshop for all users
- Demonstrated how to start projects from templates
- Showed how to import styles from template if needed
- Provided quick reference guide

Deployment:

- Saved templates to firm network location: S:\Standards\Civil3D\Templates\
- Added templates to Civil 3D template search path (via Options)

- Updated project kickoff checklist to require template use
- Created template troubleshooting guide

The Results (6 Months Later)

Quantifiable Improvements:

- **Setup time reduced by 75%:** What took 2-3 hours per project now takes 30 minutes
- **Consistency achieved:** All projects now have uniform appearance
- **Review time cut in half:** Senior reviewers spend less time on formatting, more on design review
- **Data Shortcuts reliability:** Zero Data Shortcuts errors since template implementation
- **Client satisfaction:** State agency client specifically commented on improved consistency

Qualitative Feedback:

- "I can jump between projects without confusion" - Designer
- "Onboarding new staff is so much easier" - Department Manager
- "We look more professional" - Firm Principal

Return on Investment:

The 160 hours invested in template development saved an estimated:

- 3 hours per project × 40 projects per year = 120 hours annually
- Plus reduced errors and rework (estimated 80 additional hours annually)
- **Total annual savings: 200 hours (\$15,000-\$20,000)**
- **ROI achieved in first year**

Key Success Factors

- Leadership Support:** Principal backed the initiative with time and resources
- User Input:** Designers had input into template design, creating buy-in
- Thorough Testing:** Beta testing identified issues before full rollout
- Comprehensive Training:** Users learned how to use templates effectively
- Documentation:** Quick reference guides supported adoption
- Flexibility:** Three specialized templates met different project needs without overcomplicating

Lessons Learned

- Start Simple:** Version 1 doesn't have to be perfect; you can refine over time
- Name Carefully:** Good naming conventions make styles findable
- Create Style Guides:** Visual reference guides help users choose correct styles
- Plan for Updates:** Establish a process for template revisions
- Mandate Use:** Make template use non-optional for consistency
- Celebrate Wins:** Share success stories to reinforce value

Maria's Advice

"The hardest part was getting started and committing the time upfront. But six months later, I can confidently say this was the highest-impact initiative I've led in my five years as CAD Manager. If you're still using inconsistent templates—or no template at all—stop reading and start planning your template development project today."

Quick Reference: Template Checklist

Starting a New Template

- [] Start from Autodesk standard template (Civil 3D Imperial NCS or Metric NCS)

- [] Save immediately with descriptive name: [CompanyName]_[ProjectType]_[Date].dwt
- [] Save to firm network standards location
- [] Open Drawing Settings (SETTINGS command)

Drawing Settings Configuration

- [] **Units and Zone Tab:**
- [] Set Drawing Units (US Survey Feet or appropriate)
- [] Set Angular Units (Degrees)
- [] Set default Coordinate System zone
- [] Set Imperial/Metric correctly
- [] **Object Layers Tab:**
- [] Review and customize layer assignments for Civil 3D objects
- [] Ensure consistency with firm layer standards
- [] **Abbreviations Tab:**
- [] Configure standard abbreviations (STA, ELEV, PROP, EXIST, etc.)
- [] **Ambient Settings Tab:**
- [] Set temperature, pressure if relevant for your region

Layer Setup

- [] Open Layer Properties Manager (LAYER or LA)
- [] Establish layer naming convention (NCS, AIA, or firm standard)
- [] Create standard layers:
 - [] Existing contours (C-TOPO-MAJR, C-TOPO-MINR)
 - [] Proposed contours (C-PROP-MAJR, C-PROP-MINR)
 - [] Alignments (C-ROAD-CNTR, C-ROAD)
 - [] Structures (C-BLDG, C-STRUC)
 - [] Utilities (C-UTIL-WATR, C-UTIL-SSWR, C-UTIL-STRM)
 - [] Annotation (C-ANNO-TEXT, C-ANNO-DIMS)
 - [] Xref layers (G-ANNO-NPLT for non-plotting)
- [] Set layer properties:
 - [] Colors (consistent color scheme)
 - [] Linetypes
 - [] Lineweights
 - [] Plot/No Plot settings
 - [] Descriptions
- [] Create Layer States:
 - [] Design view
 - [] Presentation view
 - [] Construction view

Object Styles Creation

- [] **Surface Styles** (Settings > Surface > Surface Styles):
 - [] Existing surface style (brown contours)
 - [] Proposed surface style (red contours)
 - [] No-display style (for calculations)
 - [] Set contour intervals (major/minor)

- [] Set display layers
- [] **Alignment Styles** (Settings > Alignment > Alignment Styles):
 - [] Centerline style (red, continuous)
 - [] Right-of-way style (dashed magenta)
 - [] Easement style (dotted yellow)
- [] Set lineweights and colors
- [] **Profile Styles** (Settings > Profile > Profile Styles):
 - [] Existing ground profile (brown)
 - [] Design profile (red, heavier weight)
 - [] Finished ground profile
- [] **Corridor Styles** (Settings > Corridor > Corridor Styles):
 - [] Standard corridor display
 - [] Set feature line displays
- [] **Pipe Network Styles** (Settings > Pipe Network > Pipe/Structure Styles):
 - [] Storm pipe style
 - [] Sanitary pipe style
 - [] Water pipe style
 - [] Structure styles

Label Styles Creation

- [] **Surface Labels** (Settings > Surface > Label Styles):
 - [] Spot elevation labels (multiple scales)
 - [] Contour labels (major contours)
 - [] Slope labels
- [] **Alignment Labels** (Settings > Alignment > Label Styles):
 - [] Station labels
 - [] Geometry point labels
 - [] Station offset labels
 - [] Curve labels
- [] **Profile Labels** (Settings > Profile > Label Styles):
 - [] Grade labels
 - [] Station elevation labels
 - [] Vertical curve labels
- [] **Pipe Network Labels** (Settings > Pipe Network > Label Styles):
 - [] Pipe labels (length, slope, size)
 - [] Structure labels (rim, invert, type)
- [] Verify all labels:
 - [] Text height appropriate for scale
 - [] Correct layers assigned
 - [] Format displays as intended

Table Styles

- [] **Curve Tables** (Settings > Table Styles):
 - [] Include Delta, Radius, Length, Tangent
 - [] Set text heights

- [] Configure column widths
- [] **Line Tables:**
- [] Include bearing, distance, endpoints
- [] **Surface Analysis Tables:**
- [] Volume tables
- [] Elevation tables

Blocks and Symbols

- [] Insert standard blocks:
- [] North arrow (multiple scale variations)
- [] Detail callout symbols
- [] Benchmark symbol (with elevation attribute)
- [] Section cut symbols
- [] Match line symbols
- [] Title block (if not in sheet template)
- [] Organize blocks by layer
- [] Verify blocks scale correctly

Drawing Aids and Display

- [] Open Options (`OPTIONS` or `OP`)
- [] **Display Tab:**
- [] Set background color preference
- [] Set crosshair size
- [] Set display resolution
- [] **Drafting Tab:**
- [] Configure AutoSnap settings
- [] Set object snap options
- [] Set aperture size
- [] **Selection Tab:**
- [] Set pickbox size
- [] Configure grips

Plot Styles

- [] Attach plot style table (CTB or STB):
- [] Monochrome.ctb (common choice)
- [] Or firm custom plot style
- [] Test plot to verify appearance

Quality Control Checks

- [] Create test surface and verify display
- [] Create test alignment and verify labels
- [] Create test profile and verify appearance
- [] Check all layer assignments
- [] Verify label text heights at typical scales
- [] Test Data Shortcuts creation
- [] Purge unused objects (`PURGE > All`)

- [] Audit drawing (AUDIT > Yes)
- [] Save drawing

Saving the Template

- [] File > Save As
- [] File type: AutoCAD Drawing Template (*.dwt)
- [] Save locations:
 - [] Firm network standards folder
 - [] Autodesk template folder (optional)
 - [] Project standards folder (if project-specific)
- [] Enter template description in dialog
- [] Set measurement (Imperial or Metric)
- [] Click Save

Documentation

- [] Create template usage guide:
- [] What's included
- [] When to use this template
- [] Style naming conventions
- [] Layer structure explanation
- [] Create style preview guide (visual reference)
- [] Document version number and date
- [] Note any project-specific customizations needed

Deployment

- [] Test template with real project
- [] Have multiple users test
- [] Gather feedback and refine
- [] Conduct team training
- [] Update firm standards documentation
- [] Establish template update process
- [] Set template as default in Civil 3D options (if appropriate)

Ongoing Maintenance

- [] Review template quarterly or annually
- [] Incorporate lessons learned
- [] Update version number when modified
- [] Document all changes
- [] Communicate updates to team
- [] Archive old template versions

Cheat Sheet: Essential Template Settings

Quick Access Commands

Command	Function
SETTINGS	Open Drawing Settings
LAYER or LA	Layer Properties Manager
PURGE	Remove unused objects
AUDIT	Fix drawing errors
SAVEAS	Save as template (select .dwt type)
OPTIONS	AutoCAD Options dialog
STANDARDS	CAD Standards checker

Drawing Settings Quick Reference

Path: Manage tab > Settings > Drawing Settings

Or Command: SETTINGS

Key Tabs:

1. Units and Zone:

- Drawing Units (US Survey Feet, International Feet, Meters)
- Coordinate System selection
- Angular Units

1. Object Layers:

- Where Civil 3D objects are created
- Customize to match firm standards

2. Abbreviations:

- Used in label styles
- Customize for consistency

Layer Naming Conventions (NCS Standard)

Layer Name	Purpose	Color	Linetype
C-TOPO-MAJR	Existing major contours	Brown (30)	Continuous
C-TOPO-MINR	Existing minor contours	Brown (30)	Continuous
C-PROP-MAJR	Proposed major contours	Red (1)	Continuous
C-PROP-MINR	Proposed minor contours	Red (1)	Continuous
C-ROAD-CNTR	Road centerlines	Red (1)	Center
C-ROAD-CURB	Curbs and gutters	Magenta (6)	Continuous
C-BLDG	Existing buildings	Cyan (4)	Continuous
C-PROP-BLDG	Proposed buildings	Red (1)	Continuous
C-STRUC	Structures	White (7)	Continuous
C-PKNG	Parking areas	Green (3)	Continuous
C-UTIL-WATR	Water lines	Blue (5)	Dashed
C-UTIL-SSWR	Sanitary sewer	Green (3)	Phantom
C-UTIL-STRM	Storm drain	Cyan (4)	Dashed
C-ANNO-TEXT	General text/labels	Green (3)	Continuous
C-ANNO-DIMS	Dimensions	Green (3)	Continuous
C-ANNO-SYMB	Symbols	Yellow (2)	Continuous

Civil 3D Object Styles Path

Location: Toolspace > Settings Tab > Expand object category

Common Paths:

- Surface Styles: `Settings > Surface > Surface Styles`
- Alignment Styles: `Settings > Alignment > Alignment Styles`
- Profile Styles: `Settings > Profile > Profile Styles`
- Corridor Styles: `Settings > Corridor > Corridor Styles`

To Create New Style:

- Right-click on style category > New

To Edit Style:

- Right-click on style name > Edit

To Copy Style:

- Right-click on style > Copy (then edit the copy)

Essential Style Settings

Surface Style Components:

- **Display Tab:** What displays (contours, triangulation, border, etc.)
- **Contours Tab:** Major/minor intervals, smoothing
- **Display Tab > Layer Column:** Assign display components to layers

Alignment Style Components:

- **Display Tab:** Centerline display properties
- **Design Tab:** Curve and spiral design criteria
- **Layer assignment:** What layer alignment displays on

Label Style Components:

- **General Tab:** Label visibility, orientation, forced insertion
- **Layout Tab:** Text components, format, height
- **Dragged State Tab:** Behavior when label is dragged

Template File Organization

Recommended Template Structure:

```

Firm_Standards/
  Civil3D_Templates/
    Company_General_Imperial.dwt (Master template)
    Company_SiteDesign.dwt (Site-specific)
    Company_Roadway.dwt (Road projects)
    Company.Utility.dwt (Utility-heavy projects)
    _Archive/
      Company_General_Imperial_2023-06.dwt
      Company_General_Imperial_2024-01.dwt
    Documentation/
      Template_Usage_Guide.pdf
      Style_Preview_Guide.pdf
      Template_Changelog.txt

```

Style Naming Convention

Format: [CompanyAbbrev]-[ObjectType]-[Variation]

Examples:

- REA-Surface-Existing
- REA-Surface-Proposed
- REA-Alignment-Centerline
- REA-Alignment-ROW
- REA-Label-SpotElev-20Scale
- REA-Label-SpotElev-40Scale

Benefits:

- Company prefix prevents conflicts when importing styles

- Object type makes styles easy to find
- Variation describes specific use

Text Height Guidelines (by Scale)

Scale	Text Height (for 1/8" final text)
1"=10'	0.104" ($10/12 \times 0.125$)
1"=20'	0.208" ($20/12 \times 0.125$)
1"=30'	0.313" ($30/12 \times 0.125$)
1"=40'	0.417" ($40/12 \times 0.125$)
1"=50'	0.521" ($50/12 \times 0.125$)
1"=100'	1.042" ($100/12 \times 0.125$)

Calculation: (Scale factor / 12) × Desired final text height

Pro Tip: Create label styles for each common scale used in your projects.

Plot Style Table Quick Reference

Color-Dependent (.ctb):

- Maps AutoCAD colors to plot properties
- Traditional method
- Common file: `monochrome.ctb` (all colors plot black)

Named (.stb):

- Plot styles assigned by name, not color
- More flexible
- Allows same color to plot differently in different contexts

Setting Plot Style:

1. Open drawing
2. `File > Page Setup Manager`
3. Select page setup > Modify
4. Plot style table dropdown > Select .ctb or .stb
5. OK

Common Template Issues and Fixes

Issue: Data Shortcuts don't work between drawings

Fix: Verify coordinate system and units match exactly in all drawings

Issue: Styles don't display as expected

Fix: Check layer assignments in style's Display tab

Issue: Labels are too large/small

Fix: Adjust text height in label style, or create scale-specific label styles

Issue: Template is slow to open

Fix: Purge unused objects, audit drawing, remove unnecessary blocks

Issue: Team members' drawings don't match template

Fix: Ensure everyone uses `File > New` (not starting from scratch)

Importing Styles from Another Drawing

If you need to bring styles into an existing drawing:

1. Method 1: Design tab Method

- `Home tab > Tools panel > Drawing Templates dropdown`
- `Import Styles from Drawing`
- Select source drawing or template
- Check styles to import
- OK

2. Method 2: Toolspace Method

- Toolspace > Settings tab
- Right-click drawing name > `Manage Drawing Settings`
- `Object Layers tab > Import`
- Browse to template
- Select settings to import

Template Testing Checklist

- [] Create test surface - verify style displays
- [] Create test alignment - verify style and labels
- [] Create test profile - verify display
- [] Create test corridor - verify display
- [] Test Data Shortcut creation
- [] Plot to PDF - verify appearance
- [] Have another user test the template
- [] Test on actual project (small scale first)
- [] Gather feedback
- [] Refine and re-test

Pro Tips

1. **Start with Autodesk templates** - don't build from scratch
2. **Copy and modify** - Find a style close to what you need, copy it, rename it, modify it
3. **Use descriptions** - Add descriptions to styles so users know when to use them
4. **Create style preview guides** - Visual reference showing what each style looks like
5. **Version your templates** - Include date in filename
6. **Test thoroughly** - A bad template is worse than no template
7. **Train your team** - A great template is useless if no one knows how to use it
8. **Plan for updates** - Templates evolve; have a process for revisions

Video Script: “Templates: Your Productivity Secret Weapon”

[INTRO - 0:00-0:30]

[On screen: Side-by-side comparison of two designers: one configuring settings, one already designing]

Instructor (energetic, conversational):

"Picture two Civil 3D designers starting new projects on Monday morning.

Designer A opens a blank drawing and spends the next two hours setting up layers, creating styles, configuring label formats, and fixing text heights. By 10 AM, they're finally ready to start actual design work.

Designer B opens their firm's standard template. Everything is already configured. Layers, styles, labels—all done. They start designing at 8:05 AM.

By Friday, Designer B has finished the project. Designer A is still catching up.

The difference? Templates. And today, I'm going to show you how to create Civil 3D templates that transform your productivity."

[HOOK - 0:30-1:10]

[On screen: Statistics and case study results]

"Let me share a story. A 25-person engineering firm in Colorado was struggling with inconsistent drawings. Every designer had their own way of working. Projects looked different. Clients were confused. Reviews took forever.

They invested six weeks developing firm-wide Civil 3D templates. The result? They saved 200 hours in the first year alone. That's \$15,000 to \$20,000 in labor costs recovered. They achieved ROI in twelve months.

But here's the best part: Their drawings became consistent. Client satisfaction went up. New staff on-boarding became easier. And Data Shortcuts, which used to fail mysteriously, started working reliably.

All from templates.

[On screen: Session agenda]

In this session, I'm going to walk you through creating a professional Civil 3D template from start to finish. You'll learn:

- What components make up a Civil 3D template
- How to configure drawing settings
- How to create object and label styles
- How to set up layers and blocks
- And how to deploy templates across your team

Let's dive in."

[MAIN CONTENT - 1:10-6:00]

[On screen: Template components diagram]

"First, let's understand what's in a Civil 3D template. It's way more than an AutoCAD template.

A Civil 3D template includes:

1. Drawing settings - units, coordinate systems, object layer assignments
2. Object styles - how surfaces, alignments, profiles, corridors display

3. Label styles - how elevations, stations, grades are labeled
4. Table styles - curve tables, line tables, quantity tables
5. Layers - your complete layer structure
6. Blocks and symbols - north arrows, detail callouts, benchmark symbols

All of this configured once, used on every project.

[Screen recording: Creating a template]

Here's how to create one:

Step 1: Start from an Autodesk Template

Don't build from scratch. Open Civil 3D, go to File > New, and select 'Civil 3D Imperial NCS' template. This gives you a solid foundation following the National CAD Standard.

Step 2: Configure Drawing Settings

Type SETTINGS or go to the Manage tab. In the Units and Zone tab, set your drawing units—US Survey Feet for most US projects. Set your default coordinate system zone. Configure your abbreviations tab—these show up in labels throughout your project.

Step 3: Set Up Your Layers

Type LA or LAYER to open the Layer Properties Manager. Follow a consistent standard—I recommend NCS. Create layers like C-TOPO-MAJR for existing major contours, C-PROP-MAJR for proposed major contours, C-ROAD-CNTR for road centerlines.

Set colors, linetypes, linewidths. Brown for existing, red for proposed is a common convention.

Pro tip: Create Layer States for different views—design view, presentation view, construction view. This lets you quickly toggle which layers display.

Step 4: Create Object Styles

Go to Toolspace, Settings tab. Expand Surface, right-click Surface Styles, New.

Create an Existing Ground Surface style:

- Display tab: Brown contours
- Contours tab: Set major interval to 5 or 10 feet, minor interval to 1 or 2 feet
- Assign display components to appropriate layers

Repeat for Proposed Surface style using red contours.

Do the same for Alignment styles, Profile styles, Corridor styles. Each style controls how that object type displays.

Step 5: Create Label Styles

Label styles control how text and markers display. Create spot elevation labels, contour labels, station labels, geometry labels.

Key setting: Text height. This needs to be scale-dependent. For a 1"=20' scale, if you want 1/8" text on the final plot, your text height should be 0.208". Formula: (scale factor divided by 12) times desired final text height.

Create label styles for each scale you commonly use: 1"=20', 1"=30', 1"=40', etc.

Step 6: Add Standard Blocks

Insert blocks you use on every project: north arrows, benchmark symbols, detail callouts. Save them in the template on appropriate layers.

Step 7: Set Plot Styles

Attach a plot style table—typically monochrome.ctb which makes everything plot black. Set this in Page Setup Manager.

Step 8: Test and Refine

Before saving as a template, test it. Create a test surface. Create a test alignment. Do the styles display correctly? Are labels the right size?

Purge unused objects: type PURGE, select All. Audit the drawing: type AUDIT, answer Yes to fix errors.

Step 9: Save as Template

File > Save As. Change file type to ‘AutoCAD Drawing Template’. Name it descriptively: Company-Name_Civil3D_Imperial_2024-03.dwt

Save to your firm’s network standards location so everyone can access it.

[On screen: Case study recap]

Remember that Colorado firm? They created three specialized templates: one for site design, one for roadway projects, one for utility-heavy projects. Each started from the same base but included specialized styles for that project type.

They tested with real projects, gathered feedback, refined, then rolled out with training. The key was making template use mandatory—not optional. Within a month, it became second nature.”

[CALL TO ACTION - 6:00-6:45]

[On screen: Checklist graphic]

“Here’s your homework: If your firm doesn’t have standardized templates, start developing one this week. Block out time—it’s an investment that pays off exponentially.

Use the Quick Reference checklist that comes with this session. It walks through every step:

- Drawing settings
- Layers
- Styles
- Labels
- Testing
- Deployment

If you already have templates, when’s the last time you reviewed them? Templates should evolve. Schedule quarterly reviews to incorporate lessons learned.

[On screen: Base drawing creation preview]

And once your template is ready, you’ll create your BASE-XREF drawing—your project’s foundation. Put property boundaries, site context, anything that doesn’t change during design. Save it in your 04_Design/Base folder. Then Xref it into every other design file.

This separation is key: templates give you settings and styles, BASE-XREF gives you project-specific context.”

[OUTRO - 6:45-7:00]

[On screen: Next session preview]

“In Session 4, we’re importing survey data and creating existing surfaces. You’ll learn how to process raw survey data, set up coordinate systems, and create surfaces that are clean and reliable.

Your template is ready. Your base file is set. Now let’s bring in real site data. See you in Session 4!”

[End card with course website and downloadable resources]

Production Notes:

- Include screen recordings of actual template creation
- Show before/after examples of drawings with and without templates
- Include text overlays for key commands and settings
- Add visual callouts for important settings
- Include download link for sample template in description
- Show case study results graphically