

# ***Preparing 3D Design Deliverables for AMG Using Civil 3D***

***Examine concepts in Civil 3D producing output files for Automated Machine Guidance  
(AMG)***

***FDOT State Kit for AutoCAD Civil 3D 2014***



***Bruce Dana / Mike Racca***

***Florida Department of Transportation (ECSSO)***

***Email: [Bruce.Dana@dot.state.fl.us](mailto:Bruce.Dana@dot.state.fl.us)***

***Email: [Mike.Racca@dot.state.fl.us](mailto:Mike.Racca@dot.state.fl.us)***



**Florida Department of  
TRANSPORTATION**

**Engineering/CADD Systems Office**

## *Preparing 3D Design Deliverables for AMG Using Civil 3D*

This topic is not focused on modeling concepts in Civil 3D, but focusing on producing the specific output files used by contractors for Automated Machine Guidance (AMG); specifically the geometrics files, CAD files, existing and proposed features, and the surface model files.

### *Software Prerequisites:*

- The most current/latest version of the FDOT Civil 3D State kit should be installed.

## *Preparing 3D Design Deliverables for AMG Using Civil 3D*

### **Session Objectives:**

- **What information is required for AMG operators?** - Basic requirements for AMG operations.
- **Visualization tools to inspect your surface model** - Explore different visualization tools and Civil 3D Object styles.
- **How models are prepared and exported to AMG operators** – Examine how Alignment data, Proposed, Existing and Finished graded surfaces are exported to LandXML.
- **Batch File** – Demonstrate FDOT batch utility that automatically copies and renames proper files and places them in a newly created 3ddeliverable folder in the project directory.

## *Preparing 3D Design Deliverables for AMG Using Civil 3D*

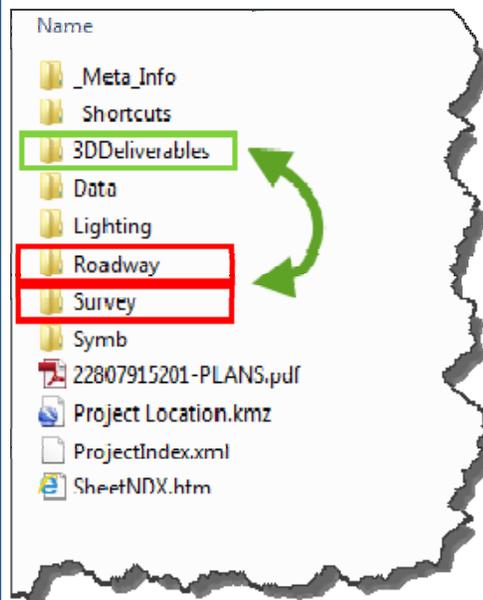
- What information is required for AMG operators? - Basic requirements for AMG operations.
- **Contract Plans**
  - Multiple DWG Files – See CPCH for names and content. A PDF of the Contract Plans (created for AutoCAD plotting) is to be Signed and Sealed using Digital Signature.
- **Existing Planimetrics (2D and 3D)**
  - TOPORD.DWG – 2D & 3D existing topography
  - DREXRD.DWG – 2D & 3D existing drainage
  - UTEXRD.DWG – 2D & 3D existing utilities
- **3D Existing Surface(s)**
  - GDTMRD.DWG – 3D existing surfaces triangles
  - LandXML of the existing (Ground) surface

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- What information is required for AMG operators? - Basic requirements for AMG operations.
- **Alignments**
  - ALGNRD.DWG – 2D file of Alignments and stationing and LandXML file of the alignment data.
- **2D Proposed Planimetrics**
  - DSGNRD.DWG – 2D proposed roadway design
  - DRPRRD.DWG – 2D proposed drainage design
  - PDPLRD.DWG – 2D proposed pond design
- **3D Proposed Surface(s)**
  - AMGMRD.DWG – 3D proposed roadway model top surface (3D break lines can be together or in separate files).
  - LandXML of the Proposed (Top) surface.
- **3D Proposed Break Lines**
  - AMGMRD.DWG – 3D proposed roadway break lines

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Files are copied and renamed from their original folder into the 3DDeliverables folder in the project directory.



| 3D DELIVERABLES SUPPORTING AMG FROM CIVIL 3D PROJECTS                              |   |
|--|---|
| File Name<br>(put in .\3DDeliverables)   | Description   |
| Alignments and Profiles  |   |
| AMG-ALGNXX.xml   | All alignments extracted from the .\Roadway\ALGNRD file                   |
| AMG-ALGNXX.xml   | All Profiles extracted from the .\Roadway\DSPFRD or .\Roadway\CORRRD file |
| 2D Proposed Planimetrics Design  |   |
| AMG-2DSGNXX.dwg  | 2D proposed Roadway design extracted from the .\Roadway\DSGNRD file       |
| AMG-2DRPRXX.dwg  | 2D proposed Drainage design extracted from the .\Roadway\DRPRRD file      |
| AMG-2PDPLXX.dwg  | 2D proposed Pond design extracted from the .\Roadway\PDPLRD file          |
| 2D Existing Survey (Note these are being considered to merge into one survey file) |   |
| AMG-2TOPOXX.dwg  | 2D proposed existing Topography extracted from the .\Survey\TOPORD file   |
| AMG-2DREXXX.dwg  | 2D proposed existing Drainage extracted from the .\Survey\DREXRD file     |
| AMG-2UTEXXX.dwg  | 2D proposed existing Utilities extracted from the .\Survey\UTEXRD file    |
| 3D Existing Survey Surface   |   |
| AMG-3SURFACEEXXX.xml   | 3D existing terrain to be exported from the .\Survey\GDTMRD file          |
| 3D Proposed Surface  |   |
| AMG-3SURFACEPRXX.xml   | 3D proposed finish terrain to be exported from the .\Roadway\AMGMRD file  |
| 3D Proposed Break Lines  |   |
| AMG-3DSGNXX.dwg  | 3D proposed Roadway design extracted from the .\Roadway\DSGNRD file       |

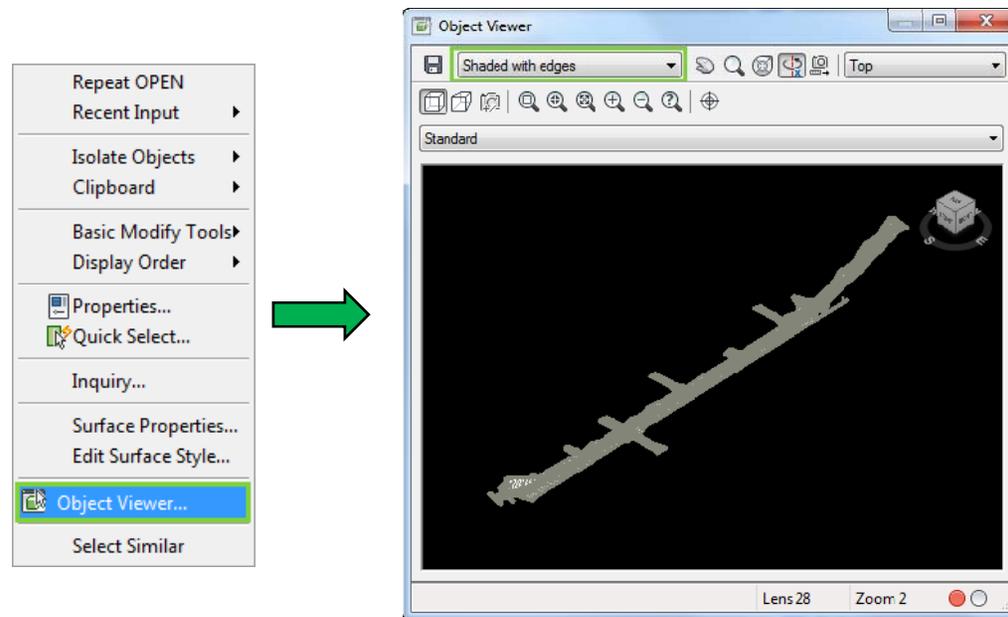
NOTE: All .xml files shall be LandXML ver 1.2 or newer

## *Preparing 3D Design Deliverables for AMG Using Civil 3D*

- Visualization tools to inspect your surface model - Explore different visualization tools and Civil 3D Object styles.
- **Object Viewer** - Use to manually rotate surface for visual inspection.
- **Visual Styles** – Apply styles to Civil 3D objects for visual inspection
  - **Tin View** - Triangle Irregular network surface style
  - **Contours** - Display major and minor elevations style
  - **Slope Arrows** – Examine areas where flow of water may be a problem
  - **Watershed Analysis** – Use to trace the path that water would take across a surface.
  - **Elevation Surface Analysis (Elevation Banding)** – Used to add bands of color indicating ranges of Elevation.

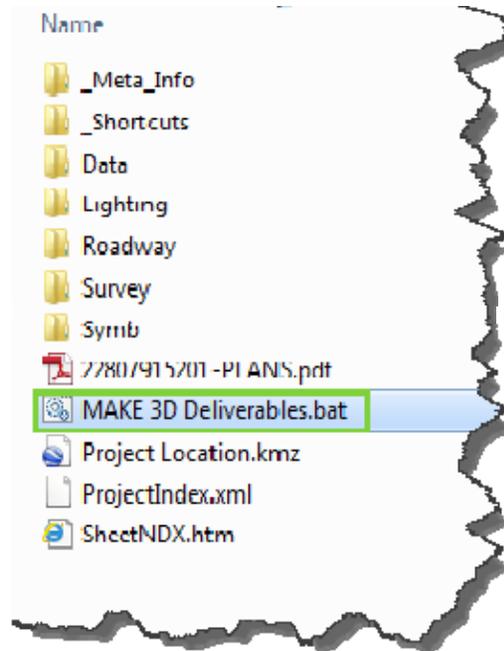
## Preparing 3D Design Deliverables for AMG Using Civil 3D

- **Visualization tools to inspect your surface model** - Explore different visualization tools and Civil 3D Object styles.
- **Object Viewer** - Use to manually rotate surface for visual inspection.
  1. Select surface and right-click. Choose Object viewer from short-cut menu.
  2. Choose a visual style from the pull-down menu. Use you mouse to manually rotate objects in the Object Viewer dialog box.



## Preparing 3D Design Deliverables for AMG Using Civil 3D

- **Batch File** – Demonstrate FDOT batch utility that automatically copies, renames files proper files and places in a newly created 3DDeliverable folder in the project directory.



```
CLS
echo off
echo *****
echo **
echo **      MAKE 3D DELIVERABLES      **
echo **
echo *****
pause
md 3DDeliverables
rem copy the DWG files to the 3D delivery folder
copy .\roadway\ALGNRD*.DWG .\3DDeliverables
copy .\roadway\DSGNRD*.DWG .\3DDeliverables
copy .\roadway\DRPRRD*.DWG .\3DDeliverables
copy .\roadway\PDPLRD*.DWG .\3DDeliverables
copy .\roadway\AMGMRD*.DWG .\3DDeliverables
copy .\roadway\CORRRD*.DWG .\3DDeliverables
copy .\survey\TOPORD*.DWG .\3DDeliverables
copy .\survey\DREXRD*.DWG .\3DDeliverables
copy .\survey\UTEXRD*.DWG .\3DDeliverables
copy .\survey\GDTMRD*.DWG .\3DDeliverables
cd 3DDeliverables
md LANDXML.
rem copy existing XML files to the LandXML subfolder
copy ..\survey\LANDXML\*.XML .\LANDXML
copy ..\roadway\LANDXML\*.XML .\LANDXML
cd.
rem rename the files to the proposed CPCI file names
ren ALGNRD01.DWG AMG-ALGNO1.DWG
ren DSGNRD01.DWG AMG-2DSGN01.DWG
ren DRPRRD01.DWG AMG-2DRPR01.DWG
ren PDPLRD01.DWG AMG-2PDPL01.DWG
ren TOPORD01.DWG AMG-2TOPO01.DWG
ren DREXRD01.DWG AMG-2DREX01.DWG
ren UTEXRD01.DWG AMG-2UTEX01.DWG
ren GDTMRD01.DWG AMG-3SURFACEEX01.DWG
ren AMGMRD01.DWG AMG-3SURFACEPR01.DWG
ren CORRRD01.DWG AMG-3CORRIDOREPR01.DWG
cls
```

## Preparing 3D Design Deliverables for AMG Using Civil 3D

Thank You!

Are there any questions?

Are there any comments to improve your experience?

Email us:

Bruce.Dana@dot.state.fl.us

Mike.Racca@dot.state.fl.us

The Civil 3D FDOT State kit is available for download at:

<http://www.dot.state.fl.us/ecso/downloads/software/FDOT2014CADDSoftware.shtm>

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