

Readme for Advanced Road Design for Civil 3D V15.01

This readme contains important information regarding the installation and use of Advanced Road Design versions as described above.

This version of Advanced Road Design is available for multiple Civil 3D releases: Civil 3D 2011 to Civil 3D 2015.

Installation Instructions

You do not need to uninstall any previous versions of Advanced Road Design. This installation will install over the top of any previous ARD installation.

Licensing Changes

This version uses the Infralution Licensing.

For the ARD V15, release, all subscription customers will have received a new Serial Number for this version.

The V15 license key will activate any ARD V15 across all platforms (eg: ARD V15 on Civil 3D 2015 and ARD V15 on Civil 3D 2011 will both access the same license file).

If you haven't received your serial (license) key via email, please contact the Subscription Co-ordinator or email licensing@civilsurveysolutions.com.au. The license key is sent to the subscription manager at each organisation with active subscription.

New Features

Roads

- R- in the Alignment Description is no longer a requirement when creating a road object. If the *Create/Edit Road* command is used, than the software will assume a road object is being created. If the *Create String/Profile* command is used, than the software will default to creating a string object.
- When running *Auto Road Creation*, the user specifies which Alignments are going to be created as road objects.
- A new *Switch Road* command exists to turn strings into road objects and visa versa.
- The load speed of the *Design Data Form* has improved.
- A new command named *Intelligent Sections* has been developed and can be used instead of *Multi Section Batters*. This command is used for decision based batter control. It is planned to extend development of *Intelligent Sections* to be incorporated into the Template Editor to manage section creation within the template as well as for the batters/daylights
- Introduction of a section routine allowing for sections to be shown at any angle to multiple strings and string sections, using a line for the section control. This is currently in Beta stage and can be accessed using the command ARDUV7INDEXROAD.
- Design model output to a *Civil3D Corridor* has been improved. This allows designers to than export their design to programs such as 3ds Max for visualisation.
- Winrar is now an option for the backup for project files
- New 'Compliance Checking' report for driveways. This command will output the clearance check report for all driveways. If a clash is detected, than a symbol will be shown on the driveway in the drawing.

- The Vertical Grading Editor now includes a grid editor. The grid editor allows designers to view all VIP's in a table and quickly override information such as elevation, grade, or VC length. This interacts directly with the VGE window edits.
- New functionality in the VGE Grid Editor enables multiple IP's to have their chainage adjusted (+ or -) by a user defined amount.

Pipes

- Pipe hydrology improvements implemented to better account for pit inflow effects and pit bypass on pipe flows
- New functionality to include stormwater/drainage property/house connections
- New drainage offset lots tool and auto draw tools for drainage house connections (similar to the sewer tools for house connections)
- Drainage house connections included on drainage networks for checking compliance
- Symbol and layer control for drainage house connections included in the *Active Network Settings*
- Additional layer discrimination has been applied to enable turning on/off pit label text separate to pit circles.
- House connection Types are coming from the *House Connection* tab in the *Active Network Settings* – shared resource with the sewer house connections
- We have updated the default pit table families to include more pit types with updated inlet capacity data.
- Sewer manholes now support a user selected block to be inserted at the pit centroid – these display upon creation of a network
- For sewer network plotting, a tick box option has been included in the General Settings form to enable a fixed width 'solid' to display to represent sewer pits. Previously, the sewer pit width was read only from the Sewer Manhole family and type.

Resolved Issues

Roads

- *Model Builder Edits* - The start chainage value will no longer revert to zero when specifying an end chainage. This issue would occur when specifying a chainage region for a model edit.
- Duplicate 3d polylines generated when a Civil 3D Surface was created has been resolved.
- If plotting sections from a model when *Always Create Civil3D Surface* is ticked on, the software will now produce an ARD model for purpose of plotting.
- Stopped Layer Isolate from flagging alignment co-ordinate change
- Red X on Roads *Vertical Grading Editor* now acts as a 'Save and Exit' instead of prompting to cancel
- Issue with *Copy Codes* addressed – there was an issue with an AutoCAD routine to find chainage/offset for an alignment
- Prevent data corruption when *Layer Isolate* is used. This was causing the software to move string data to the deleted folder because isolated alignments are not visible to the software.
- Multi Object Setout was not listing user defined setout spacings for them to be applied to strings.
- split datum plotting for road profiles was not allowing datums to be set for different pages properly. Also, the split datum level was not reported on the profile plot.

Pipes

- House connections now update when a Pipe network VGE is opened – previously the house connection levels only updated when the software was initialised in a session
- Watercom DRAINS interface updated to accommodate new import/export method in DRAINS
- Cancel button on the Drainage *Vertical Grading Editor* now cancels edits made in that session
- The 3D and XML command outputs 3D polylines. The Pipe Invert and Pipe Obvert options were outputting the bottom outside pipe level and top outside pipe level respectively. This has been corrected and the 3D polylines will now match the inside pipe Invert Level and inside pipe Obvert level, as per the option details.
- Curved pipes are now accurately represented on cross sections and have correct length representation – these were showing the chord positions/lengths instead of the curve positions/lengths
- Crash on certain projects if the Pit Highlight Width in the Active Drawing Settings was set to anything but 0
- Potential issue running pipes if an old job read in did not have a return period of "1" set for the rainfall data. Checks for this case and adds this item if necessary
- On drainage VGE, IF the pipe was a box section, the Mannings capacity was being misreported.
- Mannings capacity for box sections was being incorrectly reported.

Changed/Enhanced Features

- The ARD Settings form will load much quicker than in previous versions.
- The Design Data form will load much quicker than in previous versions
- Clicking the X icon on the Vertical Grading Editor forms (both for Roads and Pipes) will result in a SAVE and EXIT. Previously a message would display for the user to choose whether to exit.

Known Issues

- Adding a curve to a service pipe that results in intersecting of a sewer or drainage network twice, will not register any intersections/clashes.
- The Cul-de-sac form is slow to open on 64bit machines, for first opening in a session
- The Active Network Settings form is slow to open on 64bit machines, for first opening in a session
- The update button that detects when alignment lengths have changed (Civil 3D version only) only displays upon first edit – after applying the update from the form, it will not display again in that session when any alignment used by ARD is edited
- In Advanced Road Design for BricsCAD, ensure MTFLAGS (for multi-threading), is turned OFF. Some users have experienced the software crashing when this system variable is turned on.
- When assigning Sewer Manhole symbols, it is possible to automatically assign the symbol from one Pit Type to the next selected Pit Type, if that second Pit Type did not already have a symbol actively defined. Once the symbol is set by the user, it does not get edited when toggling between Pit Types.
- If curved pipes are given a negative radius they will not update display on road long and cross sections, even if they are subsequently deleted. First, change the radius value on curved pipes to a positive value, then edit/delete as appropriate.

Readme for Advanced Road Design for Civil 3D

V14.03.2

This readme contains important information regarding the installation and use of Advanced Road Design versions as described above.

Installation Instructions

You do not need to uninstall any previous versions of Advanced Road Design. This installation will install over the top of any previous ARD installation.

Resolved Issues

Pipes

- Crossing pipes from multiple pipe networks were not displaying on road long sections

Readme for Advanced Road Design for Civil 3D

V14.03.1

This readme contains important information regarding the installation and use of Advanced Road Design versions as described above.

Installation Instructions

You do not need to uninstall any previous versions of Advanced Road Design. This installation will install over the top of any previous ARD installation.

Resolved Issues

Pipes

- Pipe networks were not displaying a width on the plotted long sections.

Readme for Advanced Road Design for Civil 3D V14.03

This readme contains important information regarding the installation and use of Advanced Road Design versions as described above.

Installation Instructions

You do not need to uninstall any previous versions of Advanced Road Design. This installation will install over the top of any previous ARD installation.

Licensing Changes

If upgrading from ARD V14.01, there are no license changes.

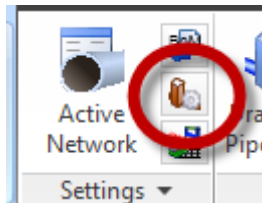
If upgrading from a previous version of ARD:

As of ARD V14.01, the Infralution Licensing system is now administers licenses for this product. You will have a V14 Serial Number for this version, supporting ARD V14 across all CAD platforms.

New Features

Pipes

Sewer Manhole Settings



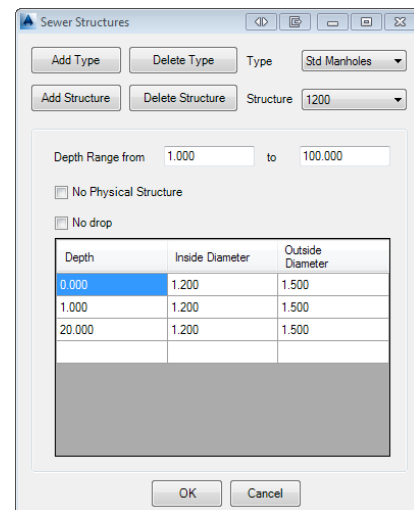
This command allows the designer to create a collection of sewer manhole pit types to apply to the sewer network.

Designers manage Types of pits, and within each Type individual

Structures can be created. A Structure is applied to a pit location.

For each manhole pit Structure, an inner and outer diameter can be specified, as well as a depth range to apply the manhole. The Inner Diameter value is used to calculate offsets for Pit Drop through each pit.

Previously, pit drop was only ever calculated at the pit centreline (where the pipes intersected).



Pit Structures can include 'null' pits (no physical structure) for bends. These do not display with any width on the long section output.

Tick 'No drop' to prevent any pit drop rules from applying when this Structure is selected (user can override this in the Pipe VGE window)

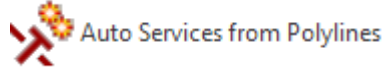
Plot Output Enhancements

At the time of plotting, reportable items have been enhanced in line with customer requests to include:

- Pit depths at the wall of pits (sewer)
- Maximum and minimum pit drop
- Freeboard level
- Pipe wall thickness
- Blank Row (so you can add your own data)

House connection labels can now be applied on the long section based on the elevation at the start of the house connection, rather than the elevation at the final drop to sewer.

Automated Service Network Creation from Polylines

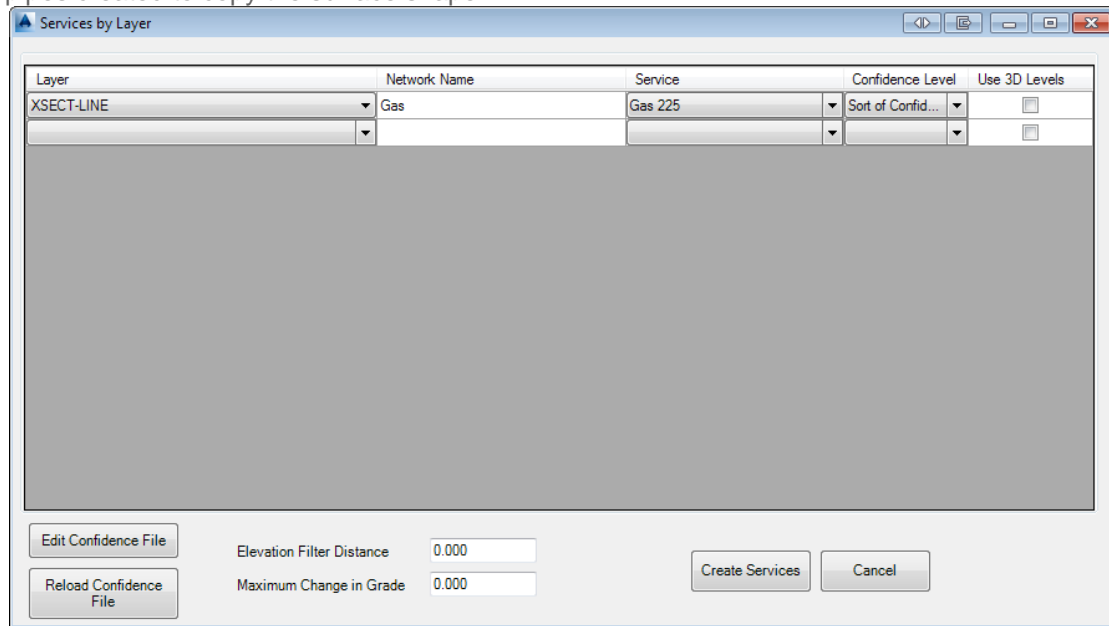


This command allows the designer to create all service obstructions in the one command, with the software scanning the drawing for all polylines on a particular layer and converting them into service obstruction networks.

- Service obstructions created with this method have the following controls for elevations:
- Apply the cover from the Service Type exactly – this will trace the contours of the surface to create the network of pipes and pits
 - Apply the cover from the Service Type at each pit – a pit will be formed at each vertex of the polyline, with the cover rule from the Service Type being applied at each pit
 - Use the elevations of the polyline – will read in the elevations off 3D polylines and use these to establish the pipe invert RL.

Included is the 'confidence' level, or pipe accuracy. The designer can set different pipe accuracies (eg: unproven (DBYD), proven, abandoned) as well as set the number of decimal places to show on the long section for this service.

Elevation and grade change controls allow the designer to rationalise the number of pits and pipes created to copy the surface shape.



Changed/Enhanced Features

Roads

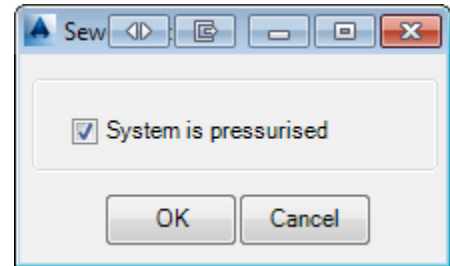
Vertical Grading Editor > Volume Optimiser

The Optimise Volumes button on the Vertical Grading Editor now supports optimisation over a selected chainage range. You can now 'keep' parts of your design and only move a chainage range of IP's to achieve a final net volume result.

Pipes

Sewer Networks – Pressurised Option

When creating or updating a sewer network, designers can now tick on to apply rules based on a pressurised system. In this case, downhill slopes will be ignored and the initial pipe layout will be designed based on minimum cover and minimum slope between pits.



House Connection Creation Improved

When creating house connections, designers can now make house connection networks from multiple polylines at once.

When each house connection is created, the plan distance to the nearest sewer pit (manhole) is checked and automatic assignment of a different house connection type is applied based on the distance (eg: you can change the drop, or slope, etc).

This will significantly speed up the house connection creation process.

Creating Service Pipe Networks

You can now create service pipe networks from service obstruction pipes that are not part of a network. Previously, you could only create service pipe networks at the time of converting polylines into service pipes.

Resolved Issues

Roads/All

- If users ticked on the option in the ARD Drawing Settings to 'Only Load Data when an ARD Command is Run', then no data would load even if a command was run. This is fixed.
- The Edit IP form would fall behind the Vertical Grading editor window in certain circumstances, preventing editing of the form. This has been resolved.
- An issue with knuckles not re-establishing correct connection to road code elevations after the Reset button was pressed on the Vertical Grading Editor window has been fixed.
- An issue with Copy Codes has been resolved – if Copy Codes was applied beyond extents of the string being referenced, and error could occur.
- An issue with circular references in Copy Codes has been resolved.
- A bug in the Civil 3D API has been overcome – with certain geometry configurations ARD is given incorrect chainage information.
- User defined spacings in Multi Object Setout would result in an error message – this has been fixed

Pipes

- When the Move Network command is used, the catchment polylines are now moved with the adjusted catchment locations
- An error with pipe classes was fixed
- Multi-barrel pipes now show correctly on the road long section – previously only one pipe would display
- An error with setting pipe backfill lengths has been fixed.
- An issue with plan production of pipe long sections has been fixed –when Plot to Layout was selected the layout tab only displayed upon selecting a different layout in the drawing

Known Issues

Roads/All

- The Export to Civil 3D Surfaces command does not apply surface boundaries correctly if there are loops – when this occurs, users are recommended to re-run the function and untick to apply the boundaries. Users can select and edit the polylines drawn by ARD and apply them as boundaries manually to the surface.
- The Create Driveway > Layer function may create the incorrect layer if the Road string has spaces in the name. In this case, please send the data to us via the Technical Support portal for review and rectification
- Looped strings (such as median islands) may report incorrect results when the Design Constraints – Design by Code method is used. Please report any such issues to technical support with the data to assist the developers in determining cases where the calculation is incorrect

Readme for Advanced Road Design V14.02

This readme contains important information regarding the installation and use of Advanced Road Design versions as described above.

This version of Advanced Road Design is available for multiple CAD platforms, including:

- ARD V14 for Civil 3D
 - o AutoCAD Civil 3D (2014, 2013, 2012 and 2011)
- ARD V14 for AutoCAD
 - o AutoCAD Civil 3D (2014, 2013, 2012 and 2011)
 - o AutoCAD Map 3D (2014, 2013, 2012 and 2011)
 - o AutoCAD (2014, 2013, 2012 and 2011)
- ARD V14 for BricsCAD
 - o Version 3.1x

Installation Instructions

You do not need to uninstall any previous versions of Advanced Road Design. This installation will install over the top of any previous ARD installation.

Licensing Changes

If upgrading from ARD V14.01, there are no license changes.

If upgrading from a previous version of ARD:

As of ARD V14.01, the Infralution Licensing system is now administers licenses for this product. You will have a V14 Serial Number for this version, supporting ARD V14 across all CAD platforms.

The V14 license key will activate any ARD V14 across all platforms (eg: ARD V14 on Civil 3D 2014 and ARD V14 on Civil 3D 2011 will both access the same license file).

If you haven't received your serial (license) key via email, please contact the Subscription Co-ordinator. The license key is sent to the subscription manager at each organisation with active subscription.

Important information – Data Backups

In the Settings, users can specify an automatic ARD data backup regime. It is strongly recommended that users go to Roads Tab > Settings Panel > Global Drawing Settings > Miscellaneous tab in the settings form and select the timing for auto backups and tick on if it is desired to create a data copy on startup of the project.

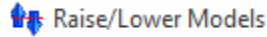
ARD 2013 and Earlier users:

If you currently use ARD 2013 or earlier versions, this version will result in a data format change – you will not be able to work with the data in an older version after opening. A copy of the AdvRoads-10 folder (which contains all the data) is made when ARD V14 detects an 'older' project, so you can go to this backup by opening the <Drawing Name>-Data folder using Windows Explorer.

New Features

Roads

Raise/Lower Models command

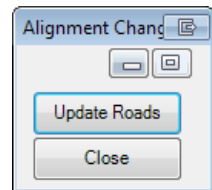


The *Raise/Lower Models* command allows users to raise or lower an entire road network or pipe network vertical design.

Road String updates following Alignment Editing

When an Alignment used by ARD is edited, a dialog box is displayed which allows the user to force an update of the ARD design. Sometimes this 'edit' in Civil 3D is nothing more than looking at the Alignment Properties, but it could also be a change to the alignment geometry.

Rather than try to update the Advanced Road Design data continuously whenever a change in the alignment is detected, a small form will display allowing the user to decide when to update Advanced Road Design to account for changes to the alignment. Running **Update Roads** will re-calculate the road or string and also any intersections that the road affects. This means that a user can continue to edit an Alignment and the software will only re-calculate when prompted by the user.

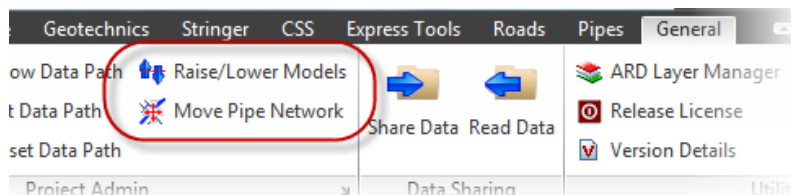


Pipes

Move Pipe Network command



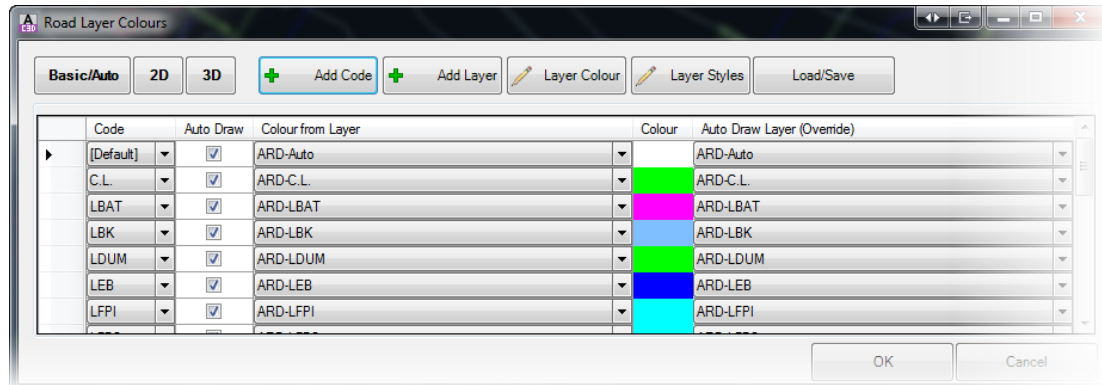
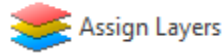
Advanced Road Design stores the coordinates of pipes and pits in a database file. This new command allows users to move their entire pipe network from one coordinate system to another.



Changed/Enhanced Features

Roads

New road layer linework control.

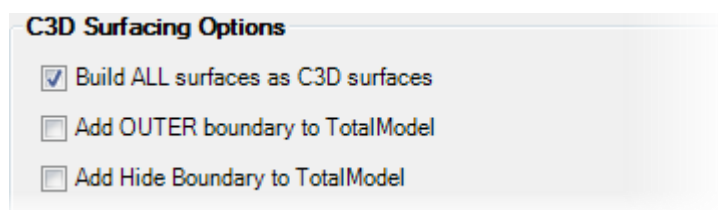


The *Assign Layers* command has been revamped. This command allows users to select the codes on a road that are to be displayed and also assign the colour and the AutoCAD Layer for each of these codes.

Users can setup a different configuration for auto draw lines, 2d polyline output, and also 3d polyline output.

Output Surfaces directly to a Civil3D Surface

Users now have the option in the *Active Drawing Settings* to output design surfaces as a Civil3D Surface. If this command is selected, ARD will not produce an ARD Quick Surface, instead, ARD will produce a Civil3D Surface. The creation speed of the Civil3D Surface is far quicker than in previous versions.



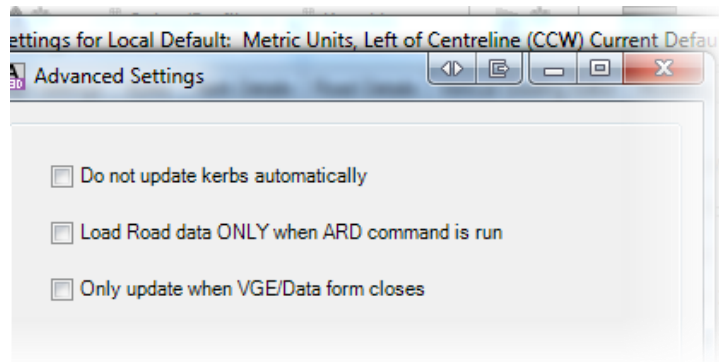
Performance Control

Users now have the ability control when ARD loads and updates certain information. These settings are controlled in the *Miscellaneous* section of the *Active Drawing Settings*. (Advanced Settings).

'Do Not Update Kerbs Automatically' - If this option is turned on, then ARD will NOT re-calculate kerb returns automatically. This will increase the speed of the software, however users will need to force an update of the kerb returns when changes are made at an intersection.

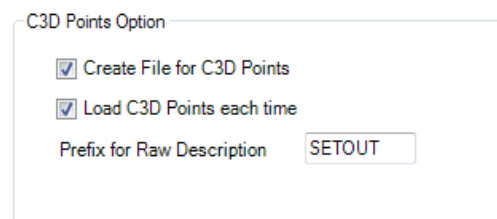
'Load Road data ONLY when ARD command is run' - If this option is turned on, ARD will only load a road design project when an ARD command is used. This means that when the DWG is loaded, no ARD road linework or ARD surfaces will be initially displayed.

'Only update when VGE/Data form closes' - If this option is turned on, then ARD will only update road data when the VGE or the Design Data Form is closed. This means that users can make design changes without the software automatically updating data.



Civil3D Points now included in Model Setout Routine

When outputting setout points, users now have the option to create Civil3D Points in the drawing. The benefits of using Civil3D Points for the display of setout points include the ability to use Civil3D Label Styles to control the display of the point and also the ability to generate a dynamic Civil3D Point Table.



- All points created from this form will have a suffix in the Raw Description containing the Code of the point (eg: C.L., LEB, REB) - use the option to assign a Raw Description Prefix to put static text before the Code
- There is no removal of previous points by the software before adding the points from the Create Setout command - if there are 'extra' points in the drawing these must be removed by the user before running the command.
- There is no check of what is a software generated point and what is otherwise a Civil 3D point - the decision to overwrite or renumber points is handled entirely by Civil 3D - the user is prompted when duplicate point numbers are detected to take an action.
- It is recommended to delete COGO points generated from the setout before redoing the SETOUT output
- The software will renumber points using the Start Point number assigned to each string, from the start of the string to the end of the string. If no Start Point number is assigned or it has already been used by a previous string, the numbering will be assigned based on the Order of strings in the setout. If no Order is specified, the order of numbering will be based alphabetically on the String object name.

Multi Object Setout Form

- There is now a number of decimals control on outputs
- There is a new option allowing users to select multiple strings in the list to turn the selected group off at once, or apply section plotting controls
- Removed the point number and order from the string edit form and fully implemented this control on the main form list

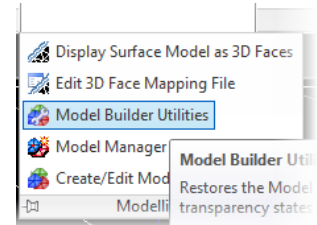
ARD Objects are now drawn using AutoCAD Blocks instead of AutoCAD Points

In V14.02, ARD Objects are now AutoCAD Blocks. That means that ARD objects such as the ARD dynamic surface and linework are now using AutoCAD Block entities.

Model Builder Utilities



Using these tools, users can reset drawing transparencies (when changed by Model Builder), close Model Builder forms, and toggle on/off 'Always on top' for Model Builder forms. These utilities were created to address issues that some user were experiencing when using Model Builder.



Pipes

Pipe Processing Speed Improvement - The processing of pipes for road display has been greatly improved for networks that contained 1000+ pipes.

The speed of pipe long section output has been improved.

Resolved Issues

Roads

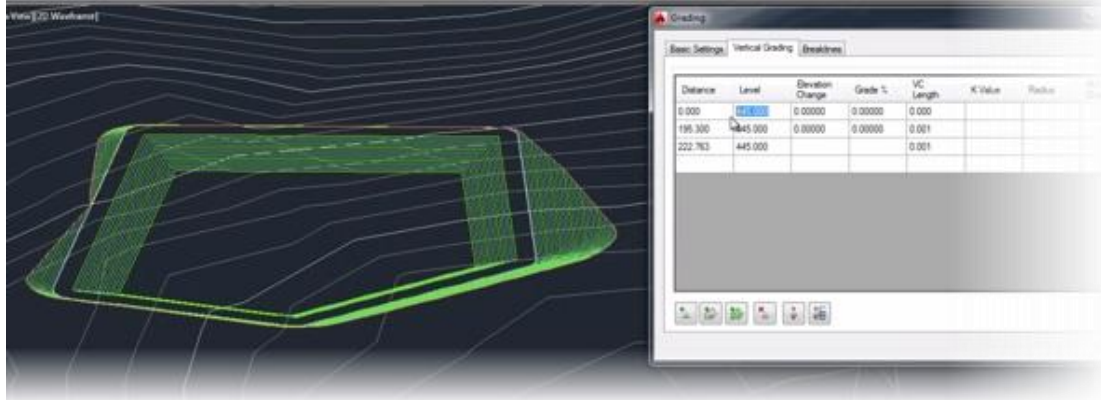
- -DATA folder creation.
 - ARD will now only create a - DATA folder when an ARD command has been run in the drawing.
 - A flag is set in the drawing to specify when the drawing file has been associated with an ARD project.
 - If the DWG is recognised as an ARD project, then ARD will create the -DATA folder.
 - If you want to turn this off for a particular drawing (perhaps for your drawing template), run the command - *arduv7RemoveARDRunFlag*
- When using the 'Specify' option for cul-de-sac creation, the coordinate specify option has been fixed.
- Issue displaying crossing pipes and pits in sections and profiles has been fixed
- Height difference issue has been fixed in road section plotting – cut/fill height text was not displaying
- VGE adjusted so that open cross section views update dynamically if affected by VC editing
- Multi Setout form – the reference point for bearing/distance and reference alignment for chainage/offset now work. A new radio button selection has been added for the user to pick their desired output.
- Grade Table has been fixed in the VC by Reference Line command
- The adding of extra Civil3D surfaces to cross section windows has been fixed
- The default text style and text height for CSS standard plot styles have been fixed.
- Alignment calculation routine has been re-written to improve speed and remove flickering that was experienced by some users depending on their variations applied.
- The 'Insufficient Points' message will now NOT display when rebuilding models where 'Total Model' does not exist. This message box would often be displayed on non-traditional road projects where only strings were used.
- IP's added in the Vertical Grading Editor are now include in design models, such as Total Model. Extra sampling included at the location of vertical curves has now been fixed. The extra sampling rate for vertical curves for design models can be set in the Selected Sections dialog.

Pipes

* Pipe vertical grading displayed black if pipes extended outside the sampled surface.

BricsCAD / AutoCAD Version Improvements

Grading



Built for rapid design of features such as building pads, retaining walls and detention basins, the dynamic grading tools automatically clean up internal overlapping corners and include radial and mitre options on external corners.

The surface and grading linework automatically updates as you edit your grading, so you get immediate feedback on the impact of your design changes, as you make them.

You can immediately review volume outputs after making design changes, enabling easy

volume checking and optimisation. Overlay surfaces or use the ARD Surface Modelling tools to create one total dynamic surface model incorporating all your land development components -- perfect for lot grading.

The grading tools support cross section templates and intelligent batter designs to address any site design requirements. As well, you can combine template and string based designs into the grading models to get the fine level of control you require.

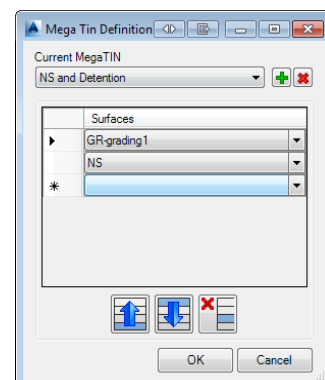
The quick elevation viewer makes it even easier to make changes to your grading string levels and see the results. You can use both the vertical grading design tools and the quick elevation viewer to make edits to the design -- change vertical IP positions along the grading, edit and add vertical curves, either in a grid view or using a graphical design long section display.

MegaTIN

This command can be used to quickly stack surfaces on top of each other. It is fast and efficient as it doesn't natively create extra triangulation.

Any number of surfaces can be added - the order they are added controls which surface elevations to use - when sampling the surface, the surface at the top of the list is used wherever it exists, then the second surface where it exists, and so on.

A MegaTIN works best when the surfaces have been designed to match each other (they share a level at their interface - at the inner surface boundary). The MegaTIN does not do any



'blending' of elevations from one surface to another - if there is an elevation discrepancy at the interface between surfaces this will represent as a vertical face.

Known Issues

Grading

- If you fillet a polyline being use as a grading (using the AutoCAD fillet command), ARD will no longer react to changes in the polyline
- Variable width offsets at bends in the polyline are not well supported – the radial curve component will adopt a continuous width through the bend.
- Grading on open polylines will not apply a boundary to the grading surface – this will need to be manually applied or the surface otherwise edited to remove the extra triangulation

Tables (BricsCAD Customers Only)

- There is a known bug in BricsCAD V13 relating to the creation of BricsCAD table objects. If you cannot create BricsCAD tables, there is an option to revert to standard CAD entity tables. Process is:

- Open the Active Drawing Settings > Styles Tab
- Tick on the option 'Draw Tables as Lines and Text'

Note: Users can edit the table output by opening the file ardtblestyles.txt in the ARD Settings folder – this table sets out the text font, text heights (and row heights) for the title, headings and data rows. Edit in Notepad as required:

Important information - .NET Framework 3.5.1

If you're experiencing issues running Advanced Road Design (i.e. you receive an '*Unknown command*' whilst running the software), ensure that Microsoft .NET Framework 3.5.1 is turned on. You can turn on Microsoft .NET Framework 3.5.1 by following these steps...

1. Type 'Windows Features' in the Windows Start menu
2. Run 'Turn Windows Features on or off'.
3. Ensure Microsoft .NET Framework 3.5.1 is ticked on.

