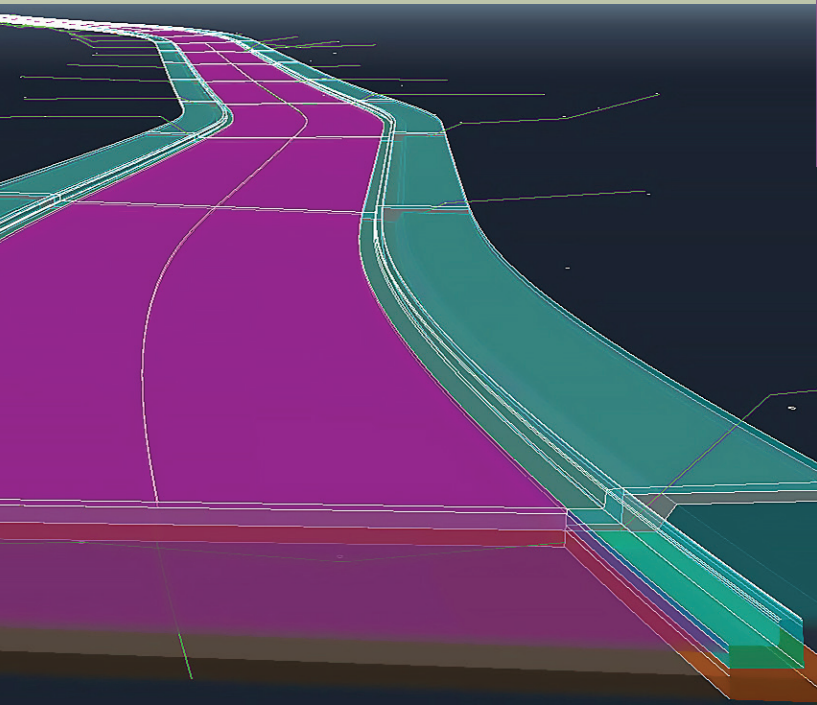# ROAD CEM™

Road CEM incorporates worksflows that a seasoned designer will be familiar with when developing conceptual and detailed designs of new roads and highways, road rehabilitation and reconstruction projects. ROAD CEM is a design solution developed specifically for designers to solve the challenges they face during roadway design.

Other design tools feature road design processes that can be overly complicated, unintuitive or inflexible. ROAD CEM offers simple, very straightforward features allowing designers to develop the plan, profile, and cross sections of even the most complex road layouts. From a pure road design perspective, ROAD CEM enhances the performance of AutoCAD® and AutoCAD® Civil 3D® platforms.

BENEFITS

ROAD CEM aims to assist designers tackling their most challenging roadway design projects through a straightforward approach that minimizes the learning curve. The software contains tools required to separate the project into multiple DWG files for the plan, profile, and cross-section views. It is an effective solution for handling large datasets and incorporates a unique and powerful method for cross section design and detailing. To facilitate the design of road reconstruction and rehabilitation projects, ROAD CEM includes dedicated functionality for tying into the existing roadway. As a final deliverable, it generates 3D models containing BIM-ready data required for collaboration and clash detection.

SOLUTIONS

- Minimize training time
- Model 3D terrain surfaces
- Design road rehabilitation projects with dedicated tools
- Design and detail cross sections and calculate MQTO
- Create BIM-ready 3D models

THE COMPLETE ROAD DESIGN SOFTWARE FOR TRANSPORTATION ENGINEERS TO:

Minimize training time

With ROAD CEM's intuitive workflows companies are assured that the time spent on training is minimal and every stakeholder has the potential to engage with the design.

Model 3D terrain surfaces

Working on plain-CAD applications, ROAD CEM offers a solution to model 3D surfaces by using point files, drawing objects or importing LandXML data.

#### Design rehabilitation projects with dedicated tools

Benefit from an impressive toolset specifically designed to carry out road reconstruction projects. Create best-fit alignments and profiles, calculate the existing superelevation, account for pavement milling and overlay, calculate quantities and generate a 3D BIM model.

Design and detail cross sections and calculate MQTO

Designing detailed cross sections often means compromise for engineers. In ROAD CEM, cross sections are a matter of actual design work (and not a result of 3D modeling) and MQTO (material quantity takeoff) calculations are just a click away.

Create BIM-ready 3D models

ROAD CEM generates a 3D model, compounded by 3D solid objects, ready for direct BIM usage, such as clash detection and 4D, 5D modeling.
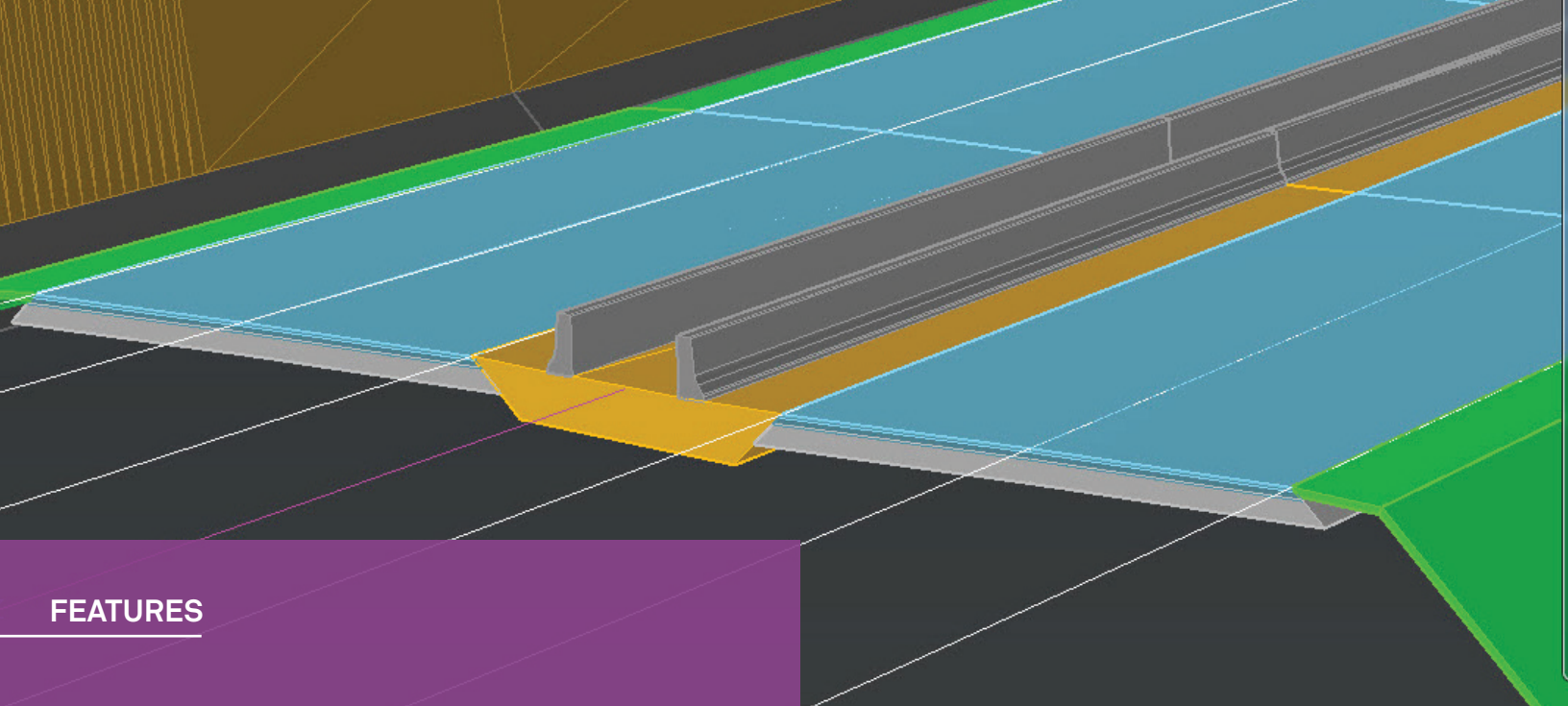
TRANSOFT SOLUTIONS

SURFACE MODELLING
Easy creation of 3D terrain surfaces

Define your surface DTM by using various drawing objects, such as points or breaklines, boundaries or voids. Advanced settings for surface definition helps filter out points on the wrong elevation or automatically limits the maximum length of triangle edges to fine tune the triangulation. ROAD CEM's terrain modelling tool is powered by the trusted Eagle Point Software, making it possible for DTM creation in basic Autodesk® AutoCAD® or Bricsys® BricsCAD® platforms.

PROFILE DESIGN
Automatic curve fitting and superelevation calculation

When designing profiles, ROAD CEM assists you by fitting vertical curves automatically, for both circular and parabolic curvature. Additionally, it offers an advanced superelevation calculation based on various national standards. This includes choosing from roadway types (planar or crowned), defining the axis of rotation, as well as handling highways with medians.

CROSS SECTION DESIGN
Unmatched flexibility

Designing cross sections can often be the most challenging part of road design. Current industry applications generate cross sections as a result of the 3D model. ROAD CEM takes a more intuitive workflow as it allows designers direct editing. Taking out the iterative work from cross sections, design engineers now have a way to be more effective and design visually. The 3D model can then be constructed based on the designed cross sections.

ALIGNMENT DESIGN
### *Various alignment design methods*

ROAD CEM does not only offer the PI-based alignment design approach (when curves or spiral curves are placed between tangents), but also provides other options. One such option, the Element-based approach, defines alignments by fixed arcs or tangents and floating tangent-spiral-arc combinations.

Best-fit approximation

Benefit from ROAD CEM's advanced best-fit alignment calculation. Armed with editing tools and an error analysis feature, you can be sure your best-fit approximated alignments are accurate and regression errors are minimized.

Rule-based design criteria

Classify your road according to the AASHTO Green Book (or other supported national standards) by selecting the road category, terrain type, maximum superelevation, design speed, and ROAD CEM automatically checks the design for horizontal and vertical curvature compliance.

TRANSOFT SOLUTIONS™
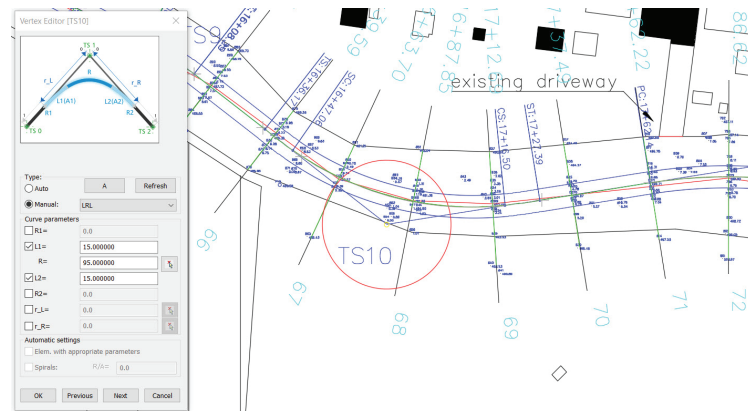
FEATURES *(cont.)*

SUB_BASE = 62.60 m2
BASE = 58.58 m2
BINDER_COURSE = 18.63 m2
SURFACE_COURSE = 13.74 m2
FILL = 771.69 m2
CUT = 227.91 m2
TOPSOIL = 9.28 m2
MEDIANBARRIER = 4.56 m2
PAVEDDITCH = 3.20 m2
MEDIANINFILL = 26.77 m2
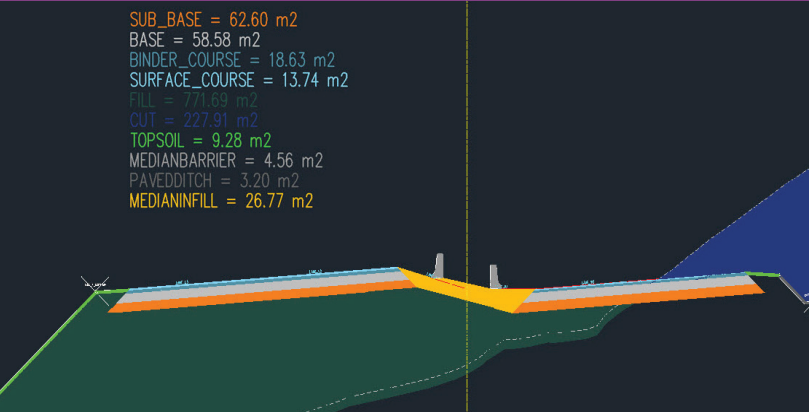
Benefit from predefined blocks

With ROAD CEM, users are not required to use overcomplicated specialized objects to model curbs, gutters, barriers, cantilever or retaining walls. Pre-drafted CAD blocks can be inserted for various cross section elements, offering a simple solution to every designer with basic CAD-skills and opening up an enourmous possiblity for cross section detailing.

REPORTING
Earthworks and other materials

Calculating earthworks accurately for custom cross section shapes and areas can often be cumbersome. ROAD CEM allows designers to assign materials to linear cross section objects (which along the road become 2D areas, such as geotextiles) or 2D cross section areas (which then become 3D volumes, such as excavated earthworks, pavement layers, and stripped topsoil layers). The software offers ways for engineers with basic CAD-skills to estimate quantities based on cross sections and account for items such as geotextiles, sub-cut or topsoil stripping.

Mass haul diagram

For earthworks, ROAD CEM can provide mass haul calculations, the estimated earthwork quantities along with information regarding average transportation distances and free hauls.

3D MODELLING
3D BIM-ready models for 4D and 5D design

ROAD CEM generates a 3D model with BIM-ready objects which can be used for 4D and 5D modelling. The model is constructed by 3D Solids with objects that can be used in various applications. With time and cost data assigned to them, they could provide valuable insights and support decisions made during the course of the project

Export longitudinal breaklines

In ROAD CEM, users can define characteristic points on cross sections. These points can then be created as a 3D swept object, incorporated from the plan, and profile views, the calculated superelevation data and the designed cross sections, resulting 3D longitudinal breaklines.

Export proposed road surface

Need to deliver the proposed surface or sub-surfaces of your designed road? Using ROAD CEM, you can extract the road's top surface by a single click or generate 3D longitudinal breaklines and create various surfaces for setting out by the surveyor or as input to Automated Machine Guidance (AMG) equipment.

ABOUT TRANSOFT SOLUTIONS

Transoft Solutions, Inc. develops innovative and easy to use software for transportation professionals. Since 1991, civil engineers and technologists, architects, and city planners across federal agencies, State DOTs, airport authorities, cities, ports, and infrastructure consultants have come to rely on Transoft's field-researched design solutions. Transoft engineers work closely with the world's leading agencies including AASHTO, ITE, TRB, TAC, Austroads, and CROW to develop highly specialized applications serving over 30,000 users across 120 countries.

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