Engineering Automation

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Agenda

Engineering Automation
3-D Surveying
3-D Design
Automated Construction
eConstruct
ProjectWise
Digital Signatures
Quality Assurance

Engineering Automation Section

It is the mission of this section to provide leadership in all aspects of engineering automation (survey, design, construction and supporting systems); to research new technology; to initiate, develop and implement new initiatives; and to provide training, technical support and guidance.

- **Engineering Automation Section**
  - **Geometronics Unit**
  - **Engineering Technology Advancement Unit**

3-D Surveying

When compared to traditional survey methods, 3-D surveying increases accuracy, producing a better product.`

- Increases efficiency
- Includes higher levels of detail
- Lessens coordinate distortion
- Produces reusable data
- Supports digital signature use
- Generates data to support 3-D design

3-D Design

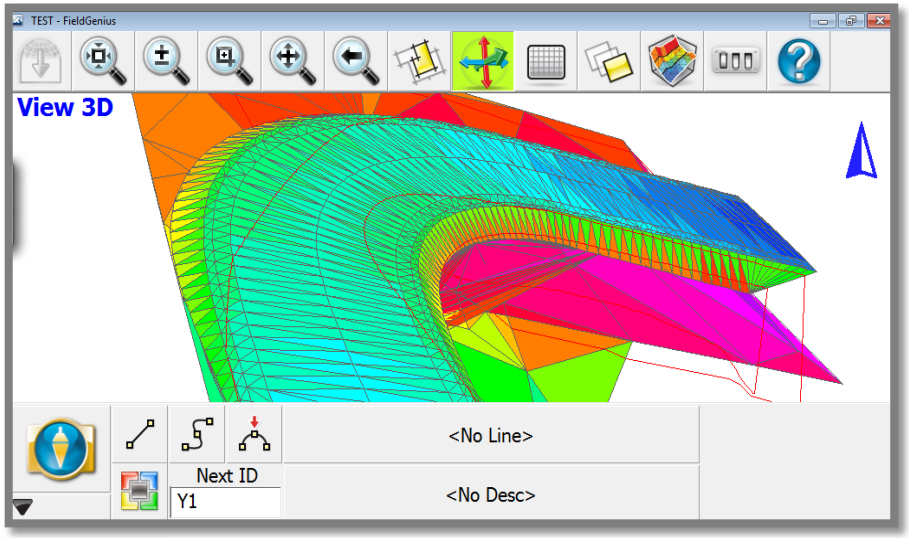
Use of 3-D design tools produce an all-encompassing, realistic visualization of a project site.

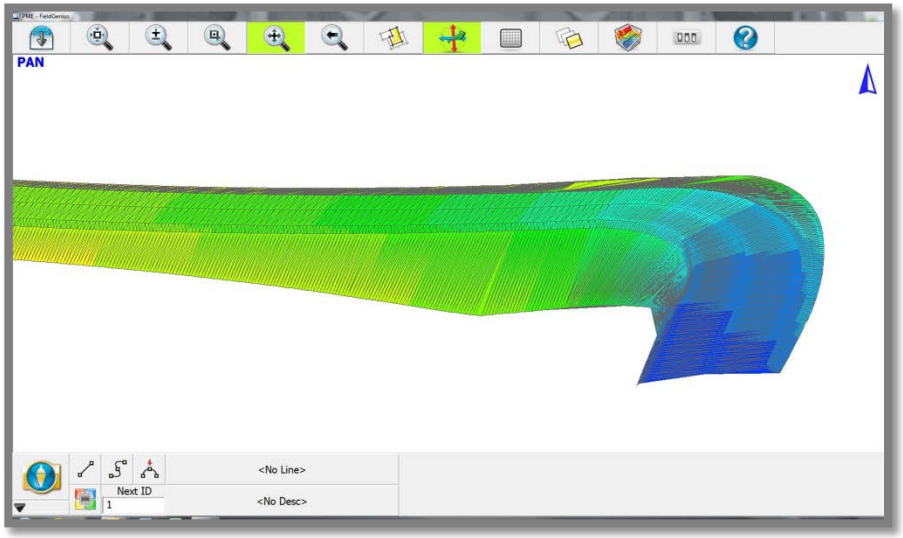
Easily conveys intent while detecting design conflicts

Aids in the identification of underground utility conflicts

Facilitates construction machine automation

Increases cost effectiveness





Automated Construction

Allows for remote construction site monitoring

Enables real-time tracking, monitoring and recording of construction equipment

Enables digital archiving, while reducing paper waste

Supporting System: ProjectWise

An engineering data management tool that provides a collaborative space for all team members to create, communicate and manage projects.

Enables communication between agency, consultants and contracting staff

Allows for access to construction documents from the field

Ensures project security through version controls and audit trail history

Supporting System: Digital Signatures

An industry-established business tool to provide added security, authentication and/or encryption to a digital document in the digital age.

System will be used by 750 – 1000 staff statewide

Enables full integration of digital engineering documents

Retains native file format and intelligent content

Saves time, resources and storage costs

Provides signer and document authentication

OSU Return on Investment Study

Independent, detailed cost-benefit study examining the ROI for automation technologies, individually as well as collectively.

Oregon State UNIVERSITY OSU

Examination of

- **Relevant technologies**
- **System boundaries**
- **Unit costs and benefits**

Phase I Areas of Study
ProjectWise
3-D Design
Digital Signatures
eConstruction
Automated Machine Guidance

Quality Assurance

QA services from Public Knowledge, LLC. have been procured to assist the Engineering Automation Section in identifying the tools and techniques used by other agencies to automate their systems.

3-D Design	eConstruct	Automated Construction	Supporting Systems

Early-stage and upcoming initiatives

Geospatial Positioning

This initiative would move the agency to a standard longitude/latitude-based positioning methodology.

Post-construction Survey

This initiative would institute post-construction surveys to capture as-built data for use during the lifecycle of the roadway.

Early-stage and upcoming initiatives

Vertical Clearance

This initiative will investigate the use of LiDAR to collect necessary data on state roadways.

Survey Drones

This initiative will implement the use of drones to collect photogrammetry, adding to the agency's suite of survey tools.

Thank you.