

# **Business Advantages of Using 3D Technologies**

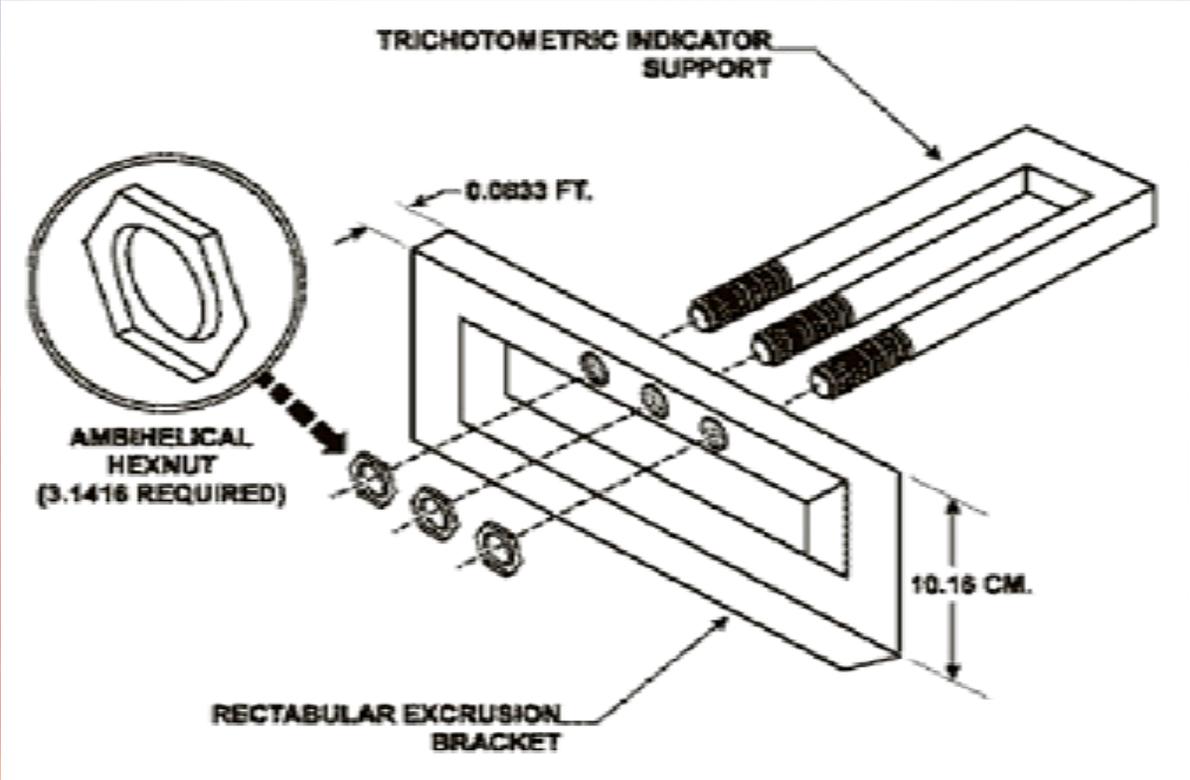


Dan Streett , PE & LS  
Offices of Design & Construction  
New York State DOT  
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# Three Dimensions - How Most Industries Operate

- Mechanical – Uses 3D Design for Proof of Concept Testing; and in Robotic Manufacturing.
- Plant Design – Virtual Factories are Created to Resolve Structural, Mechanical, Electrical and Plumbing Conflicts.
- Architectural – Similar to Plant Design, also Includes Automated Quantities, Asset Management & Object Intelligence.
- Bio-Engineering – Scans of Internal Organs Create 3D Images for Problem Assessment.
- Space & Aeronautical – Use Modeling of all Proposed Aircraft to Test Aerodynamics and for 3D Simulation of Operation.
- Civil/Transportation Industry – Last Engineering Discipline to Adopt 3D Model Surfaces (DTMs) and Solid Shapes.

# What is Wrong With 2D Paper?



PIN 8729.52 I-287 RECONSTRUCTION

EXISTING HALL AVE. BRIDGE  
(TO BE REMOVED)

PROPOSED RETAINING/NOISE WALL

FURNITURE WAREHOUSE  
(TO BE REMOVED)

PROPOSED LAKE STREET BRIDGE

I-287 WESTBOUND

I-287 EASTBOUND

I-287 WESTBOUND ENTRANCE RAMP  
(PROPOSED)

ICE RINK

60" DRAINAGE PIPE  
(PROPOSED)

MAIN STREET  
(LOCAL ROAD)

# 3D Use for Design Purposes

## 3D Use for Design Purposes

*3D Models Can Find Problems*

*Before You Get To The Field*

➤ Determine How Features Fit Together

➤ Identify Construction or Vehicle Conflicts

➤ Early Detection of Potential  
Underground Utility  
Drainage Conflicts

➤ Bridge Substructures

# Machine Navigation Systems

## *Utilizes 3D Models & Adds Value* *Machine Navigation is Transforming Earth Moving Jobs* *3D Models Can Automate Construction Operations*



Rough Grading w/GPS

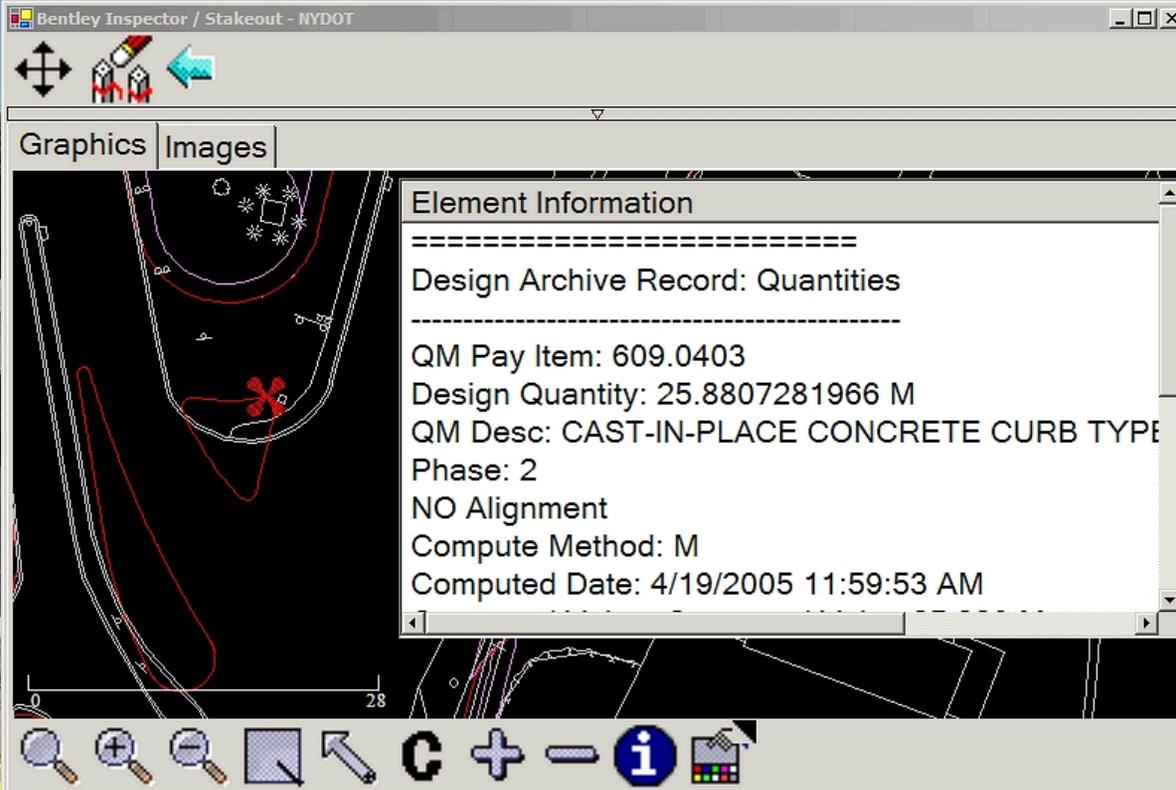
Fine Grading w/RTS

Trenching w/GPS



# 3D Benefits for Inspection

This stuff is amazing!



- ▶ Feature Identified Graphically
- ▶ Verify Feature Information
- ▶ Verify Position Instantly

- ▶ Calculate Quantities
- ▶ Approve Quantity for Payment
- ▶ Track Who & When Approved

## Other 3D Benefits During

## Construction Operations

*3D Models Can Test Theories Before Disrupting Traffic*

- Clearances for Heavy Equipment
- Travel Lane Widths for Staged Construction
- Clearances for Formwork/Phase/Bridge Replacements
- Complicated Drainage Installations – Check for Utility Structure Conflicts
- Real Time Tests of Field Changes to Demonstrate Immediate Effects or Conflicts

## 3D - Return on Investment (ROI)

*Estimated Savings of 4-6% of Total Project Cost by Use of 3D*

- ✓ Architectural Industry Has Determined - ROI in About 6-12 months, With Productivity Gains of 2% to 4%
- ✓ Eliminates Reverse Engineering - Contractors Pay \$50-120 K to Change Paper Data into Electronic Data
- ✓ Automated Stakeout & Inspection - Features Can Be Verified, Positioned, Quantified and Approved by Inspectors Instantly in the Field - Big Staff Time Savings
- ✓ Machine Guidance Systems - Estimated Dirt Savings:
  - 70% Savings on Equipment - Less Use - Field Correction
  - 80% Savings on Survey - Little or No Roadway Stakeout
  - 75% Savings on Labor - Less Hard Work & Adjustment
  - Potential 5-10% Savings on Dirt Rent
  - Big Safety Benefits - Less People on the Ground



**- Discussion -**

**- Questions -**

**- Comments -**