



# Iowa DOT / AGC / ACEC Partnering Committee A-2 Contractual 3D Electronic Deliverables



# Mission Statement

Examine the issues and determine the changes that will be necessary to accomplish the DOT's initiatives to make the **3D electronic file the controlling document** and to the **move to a fully electronic deliverable**.

# Committee Members

Iowa DOT	ACEC	AGC / Contractors
Deanna Maifield	Ryan Wicks - Fehr Graham	Ron Otto - Iowa AGC
Mike Kennerly	Steve Hartman - Klinger and Associates	Greg Mulder - Iowa Concrete Paving Association/IRMCA
Thomas Hamski	Dan Smith - CH2M	Brian Jacob - Cramer and Associates
Annette Jeffers	Will Sharp - HDR	Andy Stone – United Contractors
Brian Smith		

# Finding / Recommendations

## 1. Best Practices

### Background

#### Reviewed:

- Kentucky DOT
- New York State DOT
- USDOT – FHWA
- Utah DOT
- Wisconsin DOT

#### Owners Moving Toward 3D Contractual Deliverables:

- Utah DOT
- Montana DOT
- Illinois Tollway Authority

# Finding / Recommendations

## 2. Liability Issues – 3D Contractual Deliverables

### Background

- Need Clear Understanding – Contractor and Engineer of Record (EOR)

### Recommendations

1. Implement Level of Development (LOD) Specification
  - Contractual 3D Model Level of Accuracy, Intended Uses, and Limitations
2. Provide Additional Guidance in Iowa DOT Design Manual

# 3D Model Contractual Deliverables Framework

## Level of Development

Element	LOD	Design Level of Accuracy		Authorized Uses	Deliverable Format	Limitations
		Horiz	Vert			
<b>Roadway Design</b>						
Grading Surface Files	300	0.1'	0.1'	Automated Machine Guidance (AMG) grading of typical areas. Excludes areas: ADA Sidewalks Curb Ramps, urban and rural entrances.	Land XML	3d data is intended for AMG Grading only and should not be used for quantity take-offs. Contractor shall verify existing field conditions, and advise Engineer if model adjustments are required.
Paving Surface Files	300	.02'	.02"	Automated Machine Guidance (AMG) paving of typical areas. Excludes areas: ADA Sidewalks, urban and rural entrances.	Land XML	3d data is intended for AMG Paving only and should not be used for quantity take-offs. Contractor shall verify existing field conditions, and advise Engineer if model adjustments are required.
3D line strings for grading and paving surface files.	300	.1'	.1'	Automated Machine Guidance (AMG) grading of typical areas. Excludes areas: ADA Sidewalks, urban and rural entrances.	3d DGN	3d data is intended to support AMG Paving and Grading of typical areas only. Contractor shall verify existing field conditions, and advise Engineer if model adjustments are required. 3d Data should not be used for quantity take-offs.

# Finding / Recommendations

## 3. Quality Control

### Background

- Requirements
- Responsibilities

### Recommendations

- 1 Independent QA/QC Reviews Not Needed
- 2 Provide 3D Contractual Deliverables at Contracts Submittal (Paper Plans OK for DM5)
- 3 Review Files in Contractual Deliverable Format (i.e. XML)
- 4 Add Guidelines to DOT Design Manual

# Finding / Recommendations

## 4. 3D model Data Format – Contractual Deliverables

### Background

- Initial Deliverables - Support AMG Grading and Paving
- Longer Term Vision – Complete 3D Model – Replaces Plans

### Recommendations

- 1 No Short Term Change to 3D Deliverables
- 2 Combined 3D Model – Mainline, Sideroads, Ramps
- 3 Deliverables Include Grading Models – Each Major Construction Stage (EOR Staging Plan)
- 4 Include Plan Sheet - Contractual Models with Level of Accuracy, Intended Uses, and Data Limitations
- 5 Increased Contractor Input for Complex Projects



# Finding / Recommendations

## 5. 3D Contractual Deliverables – Digital Verification

### Background

- Need Process to Sign and Seal 3D XML Files

### Recommendations

- 1 DOT Will Recommend Software for 3<sup>rd</sup> Party Verification of Digital PE Seal

# Finding / Recommendations

## 6. Post Letting Coordination – Engineer of Record and Contractor

### Background

- Process for Post Letting Coordination
- Many Issues Outside Engineer of Record Control
  - Utilities
  - Staged Construction Across Multiple Letting Packages

### Recommendations

- 1 Engineer of Record Be Available for Major Model Changes Throughout Construction
- 2 Utilize Process Similar to DOT RFI's for Model Changes
- 3 Minor Updates Handled By Contractor

# Next Steps

- Continued AGC / Iowa DOT / ACEC Coordination – 3D Contractual Deliverables
- Pilot Projects (Consultant Engineer of Record)