

BIM Model

Abbreviations

The department defines terms within this special provision as follows:

BIM = Building (Civil Infrastructure) Information Model

CIM = Civil Integrated Management

LOA = Level of Accuracy

LOD = Level of Development (2D/3D/4D/5D/xD)

AMG = Automated Machine Guidance

PMM = Project Modeling Matrix

RD = Radio Detection

GPR = Ground Penetrating Radar

SPAR = Subsurface Signal Location Coupled with GNSS Survey

EMI = Electromagnetic Induction

DWG = Autodesk Proprietary File Format for CAD Data

DGN = Bentley Proprietary File Format for CAD Data

XML = Non-Proprietary File Format for Exchanging Geometry-centric 3D Data

CSV = Comma Separated Value File Format for Microsoft Excel Spreadsheet for Survey Layout

GNSS = Global Navigation Satellite System is a satellite system used to pinpoint geographic locations worldwide with user's receivers

CD = Contract Documents

4D = 3D Model + Schedule

5D = 3D Model + Costs

General Content

By agreement with the contractor, the department will provide electronically stored BIM Model deliverables. These are provided for informational purposes only, and not as an end product or as a record document, to augment project Plans, Specifications, and Estimates (PS&E). Contractor and/or Department Construction staff will maintain and update as needed BIM Model project deliverables consisting of proposed comprehensive 3D model data and existing model data or portions of data which may include temporary and final states for the following when available:

- 1) Roadways
- 2) Topography
- 3) Grading
- 4) Drainage
- 5) Structures
- 6) Utilities, including abandoned utilities
- 7) FTMS
- 8) Signals
- 9) Signs
- 10) Lighting
- 11) Pavement markings
- 12) Landscaping
- 13) Wetlands and waterways
- 14) Railways
- 15) Geotechnical soil boring locations

- 16) Parcels
- 17) Fencing
- 18) Survey monumentation

Deliverables and Maintained Format

Contractor and/or the engineer will maintain and update the data or portions of the BIM model electronically consisting of electronic 2D/3D/4D files containing the following:

- 1) Features
- 2) Points
- 3) Reference lines
- 4) Breaklines
- 5) Area extents lines
- 6) Profiles

The Department will provide updated 3D model information from design (plans, specifications, and estimates-PS&E, addendums, and plan revisions). BIM models will include a composite model of all stages and a stage by stage model of all the separate stages of construction as indicated in the PS&E.

The Department will provide, for information only, an updated composite 2D and 3D file consisting of existing, proposed, and abandoned utilities when available. The files are generated from a variety of sources and formats including:

- 1) Plans, with or without line and grade
- 2) Surveys
- 3) Pot Holing Hydrovac Excavation
- 4) GPR/SPAR
- 5) As-builts
- 6) Digger's Hotline
- 7) Utility Providers.

All data included in project deliverables for Building (Civil Infrastructure) Information Model (BIM) and CAD data will be provided in electronic digital Autodesk Civil 3D/Autocad 2014 or in the latest software version for 2D/3D DWGs and LandXML 1.2 file formats. BIM model data will contain:

- 1) Features
- 2) Points
- 3) Mass points
- 4) Lines
- 5) Reference lines
- 6) Break lines
- 7) Area extents lines
- 8) Profiles
- 9) Civil 3D TIN surfaces
- 10) LandXML 1.2 surfaces

All data will be georeferenced to horizontal datum - **NAD-83 (GRS-1980) (year TBD)**, vertical datum - **NAVD-1988 (year TBD)**, and coordinate projection - Wisconsin County Coordinate System in U.S. survey feet. Specific datum/adjustment will be maintained for each WisDOT project to maintain accuracy and consistency. Horizontal and vertical datums will be provided on the Title Sheet of the WisDOT plan sets.

If you have any questions as to Project Datum/Adjustment, confirm with:
Thomas Lipsky, RLS, WisDOT SE Region Survey Data Coordinator
thomas.lipsky@dot.wi.gov at (262) 548-6737.

or

If you have any questions as to Model Content, confirm with:
Lance Parve, BIM Design-Construction Coordinator, WisDOT SE Freeways
lance.parve@dot.wi.gov at (414) 731-5375.

Delivery Schedule

The Department will provide the BIM model data to the contractor according to the following schedule dates:

- Existing Surface/Conditions elements (Surface-existing, Wetlands-located/surveyed, and R/W-existing) at the project PS&E Date;
- AMG Roadway elements (Roadways/Surfaces-Proposed) and Roadway features at the Ad Date
- Remaining LOD-CD elements according to the PMM before project LET date within 5 business days of a Contractor request submitted as follows: by email to **<Project Manager>@dot.wi.gov**.

BIM Model Disclaimer

The Department will provide the Contractor and Subcontractors with electronically stored BIM Model deliverables for informational purposes only and will not make this information a part of the project contract or record document. The Contractor and Subcontractors (“parties”) recognize that data, plans, specifications, estimates, reports, documents, or other information recorded on or transmitted as electronic media (including but not necessarily limited to “CAD, BIM, BIM, GIS or other electronic documents”) are subject to undetectable alteration, either intentional or unintentional, due to, among other causes, transmission, conversion, media degradation, software error, or human alteration. Accordingly, all such documents are provided to the parties for informational purposes only and not as an end product or as a record document. Any reliance thereon is deemed to be unreasonable and unenforceable. The signed and/or stamped hard copy of the Design Engineer’s plans, specifications and estimates or other project contract documents are the only true contract documents of record.

BIM MODEL REQUIREMENTS: PROJECT NAME/ID

ELEMENT / E-Existing; P-Proposed	FORMAT	LOA-CD	LOD-CD	TEMPORARY	STAGED
RE-Real Estate, ROW & Buildings					
ROW-E	DWG/DGN	0.02'+/-	2D	N/A	N/A
ROW-P	DWG/DGN	0.02'+/-	2D	N/A	N/A
Easements-E	DWG/DGN	0.02'+/-	2D	N/A	N/A
Easements-P	DWG/DGN	0.02'+/-	2D	N/A	N/A
Parcels & Excess Parcels-E/P	DWG/DGN	0.02'+/-	2D	N/A	N/A
Buildings-P	DWG/DGN	0.02'+/-	2D	N/A	N/A
Fences-E/P	DWG/DGN	0.02'+/-	2D	N/A	N/A
Orthophoto Image-E	DWG/DGN	0.02'+/-	2D	N/A	N/A
EN-Environmental Areas					
Erosion Control-P	DWG/DGN	0.50'+/-	2D	N/A	N/A
Wetlands Surveyed-E	DWG/DGN	0.50'+/-	2D	N/A	N/A
Hazmat-E	DWG/DGN	0.50'+/-	2D	N/A	N/A
EW-Earthworks/Non-roadway Surfaces					
Surfaces-E	DWG/DGN/XML	varies*	3D	3D	3D
Grading/Non-Road Surfaces-P	DWG/DGN/XML	0.06'+/-	3D	3D	3D
Cut/Fill Areas Isopachs-P	DWG/DGN	0.06'+/-	2D	N/A	N/A
Longitudinal Breaklines/Points-E	DWG/DGN/XML	varies*	3D	3D	3D
Longitudinal Breaklines/Points-P	DWG/DGN/XML	0.06'+/-	3D	3D	3D
Slope Intercepts-P	DWG/DGN	0.06'+/-	2D	N/A	N/A
Surface Limits-E	DWG/DGN	0.06'+/-	2D	N/A	N/A
Surface Limits-P	DWG/DGN	0.06'+/-	2D	N/A	N/A
RD-Roadways/Surfaces-Proposed					
Road Pavement-Top Surfaces-P	DWG/DGN/XML	0.02'+/-	3D	3D	3D
Road Pavement-Base Course Surfs-P	DWG/DGN/XML	0.06'+/-	3D	3D	3D
Road Pavement-Subgrade Surfs-P	DWG/DGN/XML	0.06'+/-	3D	3D	3D
Road Curb & Gutter-P	DWG/DGN/XML	0.02'+/-	3D	3D	3D
Road Barriers-P	DWG/DGN/XML	0.06'+/-	3D	3D	3D
Road Pavement Marking-E	DWG/DGN	0.10'+/-	2D	N/A	N/A
Road Pavement Marking-P	DWG/DGN	0.10'+/-	2D	2D	2D
Road Stationing-P	DWG/DGN	0.02'+/-	2D	N/A	N/A
Road Alignments/Reference Lines-P	DWG/DGN	0.02'+/-	2D	N/A	N/A
Road Superelev Transition Stations-P	CSV	0.02'+/-	2D	N/A	N/A
ST-Storm Sewer/Drainage – Proposed					
Inlets/MHs/OFs/Pipes/Culvs/Ponds-E	DWG/DGN	0.06'+/-	3D	3D	3D
Inlets/MHs/OFs/Pipes/Culvs/Ponds-P	DWG/DGN	0.06'+/-	3D	3D	3D

*Data accuracy varies for existing surfaces depending upon survey data collection method(s) including: total station, GNSS-GPS, and static-mobile LiDAR (ranging from 0.02'+/- to 0.15'+/-); and aerial LiDAR and aerial photogrammetry (ranging from 0.10'+/- to 0.40'+/-).

BR-Bridges-Proposed						
Stone Base	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Piles	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Footings	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Abutments	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Piers	DWG/DGN/XML	0.02'+/-	3D	3D	3D	
CI Beams	DWG/DGN/XML	0.02'+/-	3D	3D	3D	
Seats	DWG/DGN/XML	0.02'+/-	3D	3D	3D	
Deck Including Fillets	DWG/DGN/XML	0.02'+/-	3D	3D	3D	
Light Blisters	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Parapet Walls	DWG/DGN/XML	0.06'+/-	3D	N/A	N/A	
RW-Retaining Walls-Proposed						
MSE-Proposed						
Straps	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Footings	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Top	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Coping	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
CIP-Cast-in-Place-Proposed						
Stone	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Piles	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Top of Footings	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Face of Wall	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Coping	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
PAL-Pile & Lagging-Proposed						
CI Piles at Top & Bottom	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Face of Wall/Face of Piles	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Bottom of Wall	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Top of Wall/Coping	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Face of Piles	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
Top and Toe of Sheets	DWG/DGN/XML	0.06'+/-	3D	3D	3D	
SB-Sign Bridges-Proposed						
Footings	DWG/DGN/XML	0.06'+/-	3D	N/A	N/A	
Piles	DWG/DGN/XML	0.06'+/-	3D	N/A	N/A	
Structure	DWG/DGN/XML	0.06'+/-	3D	N/A	N/A	

Other Structures-Proposed					
NW-Noise Walls	DWG/DGN/XML	0.06'+/-	3D	3D	3D
TU-Tunnels-Utility	DWG/DGN/XML	0.02'+/-	3D	3D	3D
Structures-Existing					
BR-Bridges	DWG/DGN/XML	0.06'+/-	3D	N/A	N/A
RW-Retaining Walls	DWG/DGN/XML	0.06'+/-	3D	N/A	N/A
SB-Sign Bridges	DWG/DGN/XML	0.06'+/-	3D	N/A	N/A
TU-Tunnels	DWG/DGN/XML	0.06'+/-	3D	N/A	N/A
SF-Special Foundations-Proposed					
Drilled Shafts	DWG/DGN/XML	0.06'+/-	3D	3D	3D
Driven Piles	DWG/DGN/XML	0.06'+/-	3D	3D	3D
Bored Piles	DWG/DGN/XML	0.06'+/-	3D	3D	3D
Caissons	DWG/DGN/XML	0.06'+/-	3D	3D	3D
SF-Special Foundation Walls-Proposed					
Foundation Anchors	DWG/DGN/XML	0.06'+/-	3D	3D	3D
Underpinning	DWG/DGN/XML	0.06'+/-	3D	3D	3D
Pile Caps	DWG/DGN/XML	0.06'+/-	3D	3D	3D
Grade Beams	DWG/DGN/XML	0.06'+/-	3D	3D	3D
Tiebacks	DWG/DGN/XML	0.06'+/-	3D	3D	3D
LI-Lighting-Proposed					
Poles/Masts/Bases	DWG/DGN	0.06'+/-	3D	3D	3D
Conduit/Cabinets/Pull Boxes	DWG/DGN	0.06'+/-	3D	3D	3D
IT-ITS/FTMS Proposed					
DMS/CMS	DWG/DGN	0.06'+/-	2D	N/A	N/A
FTMS Fiber Optic lines	DWG/DGN	0.06'+/-	3D	N/A	N/A
FTMS Huts/Cabinets	DWG/DGN	0.06'+/-	3D	N/A	N/A
SN-Signs-Proposed					
Signs-Type 1	DWG/DGN	0.06'+/-	2D	N/A	N/A
Signs-Type 2	DWG/DGN	0.06'+/-	2D	N/A	N/A
SG-Signals-Proposed					
Poles/Heads/Bases	DWG/DGN	0.06'+/-	3D	3D	3D
Conduit/Pull Boxes	DWG/DGN	0.06'+/-	3D	3D	3D
WM-Water Main Proposed					
Pipes	DWG/DGN	0.06'+/-	3D	N/A	N/A
Hydrants/Valves/Fittings/ Standpipes	DWG/DGN	0.06'+/-	3D	N/A	N/A
SS-Sanitary Sewer-Proposed					
Pipes	DWG/DGN	0.06'+/-	3D	N/A	N/A
Manholes	DWG/DGN	0.06'+/-	3D	N/A	N/A

WU- Wet Utilities and WisDOT-maintained Utilities - Existing/Relocated/Abandoned *					
ST-Storm Sewer/Drainage	DWG/DGN	0.10'+/-**	3D	N/A	N/A
WM-Water Main	DWG/DGN	0.10'+/-**	3D	N/A	N/A
SS-Sanitary Sewer	DWG/DGN	0.10'+/-**	3D	N/A	N/A
LI-Lighting	DWG/DGN	1.5'+/- **	2D	N/A	N/A
IT-ITS/FTMS	DWG/DGN	1.5'+/- **	2D	N/A	N/A
TR-Traffic Control	DWG/DGN	1.5'+/- **	2D	N/A	N/A

**2D and 3D existing/proposed/abandoned utilities are approximate and other utilities may not be shown. 2D and 3D existing/proposed/abandoned utilities are generated from a variety of sources and formats including: from plans with line and grade, from plans without line and grade, from surveys, from Digger's Hotlining, from as-builts, from municipality records, from pot holing/hydrovac excavation, and from RD/EMI/GPR/SPAR) and are provided in the model, for purposes of information only, requiring confirmation from Digger's Hotline and Utility Providers.

DU-Dry Utilities and Other Utilities- Existing/Relocated/Abandoned *					
GS-Gas	DWG/DGN	1.5'+/- **	2D	N/A	N/A
SM-Steam	DWG/DGN	1.5'+/- **	2D	N/A	N/A
EL-Electrical	DWG/DGN	1.5'+/- **	2D	N/A	N/A
CO-Communications	DWG/DGN	1.5'+/- **	2D	N/A	N/A
FO-Fiber Optic	DWG/DGN	1.5'+/- **	2D	N/A	N/A
TE-Telephone/Data	DWG/DGN	1.5'+/- **	2D	N/A	N/A
CA-CATV/Data	DWG/DGN	1.5'+/- **	2D	N/A	N/A

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