



BIM Contract Language Construction Phase

1.0 REQUIREMENTS

The Contractor shall utilize BIM (Building Information Modeling) methodology throughout the duration of this project. All work and development involving BIM shall comply with the **CLIENT** BIM Standards Manual (BIM Manual).

- A. The Contractor shall provide at its own cost the software, hardware, personnel, and training as needed to comply with the BIM requirements and responsibilities defined herein and in the **CLIENT** BIM Standards Manual.
- B. The Contractor shall be responsible for achieving the following BIM uses, defined as mandatory for this Project:
- Phase Planning
 - Design Authoring
 - 3D Coordination
 - Quantity Takeoff
 - Record Modeling (As-Built)
 - Asset Management (data capture ONLY)

BIM uses as defined by Penn State College of Engineering
(https://www.bim.psu.edu/bim_uses/)

- C. The Contractor may, at its own discretion, select additional BIM uses to further benefit from a BIM methodology.
- D. The Contractor shall appoint a BIM Manager to act as follows:
- Lead the development of the BIM Execution Plan (BEP) and the adherence throughout the Project, by all Agents for which the Contractor is responsible. This includes but is not limited to the Contractor, Subcontractors, Construction Managers, etc.
 - Supervise the development of Models, integration and execution, so they support the BIM uses defined in this document.
 - Coordinate with the Airport's appointed representative, or Group, for all BIM-related concerns.
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CLIENT's BIM Standards Manual includes a BEP Template for use and reference. The BEP requires **CLIENT's** approval prior to taking any effect and be considered as a valid Project Document.

- E. The Contractor shall use the most current version of Autodesk's Revit, Navisworks and or Civil 3D software in use by **CLIENT** at the time of the acceptance of the Contractor's Proposal.
- F. The Contractor shall be responsible for the progressive development and update of a Federated Model throughout construction. The Federated Model will be comprised of the aggregate Discipline/Trade Models as needed. For project geometry and layout, the Model shall be the primary source of information (single coordinated database). For performance requirements, finishes, and additional product information the Contractor may refer to other contract documents.
- G. The Contractor is responsible for organizing inter-disciplinary coordination meetings, including all Disciplines/Trades, on the regular basis, to ensure delivery of coordinated clash-free BIM Models.
- H. The Contractor shall generate the quantity takeoffs from the BIM Model.
- I. The Contractor shall develop a 4D Model for Phase sequencing. The 4D Model shall be obtained by simulating Project milestones over the Federated Model. The simulation shall also include the Project's immediate surroundings (as a 2D background if no 3D model is available) to provide context. Simulation shall also reflect any potential obstruction to current Operations, including but not limited to People, Automobile, or Cargo traffic. The specific means and methods to accomplish this shall be defined by the Contractor on the BEP and must be approved by **CLIENT**.

- J. As owner and operator of its facilities, **CLIENT** is particularly interested in the record and tracking of certain critical systems, services, assets, and attributes. The Contractor shall be responsible for supervising the progressive incorporation of this information into each individual Model, by their respective author. A strategy for achieving this shall be detailed and scheduled in the BEP. A base list of critical systems, services, assets, and attributes can be found in the BIM Standards Manual.
- K. At the end of construction, the Contractor shall submit, for review and approval by **CLIENT**, an As-Built Model that captures the exact existing conditions based on field-verified shop drawings. It can be considered the final version of the Federated Model. The As-Built Model shall document all site conditions in accordance with the tolerances specified in the BIM Standards Manual; shall include elements that are accurate in terms of their quantity, size, shape, location, and orientation, all as field verified by the Contractor or assigned responsible.

2.0 DELIVERABLES

- A. Within 30 calendar days of the acceptance of the Contractor's Proposal, the Contractor shall prepare and submit to **CLIENT** a BIM Execution Plan. At a minimum, the BEP shall define:
- Project directory, roles, and responsibilities
 - Strategy for achieving each of the primary BIM uses defined herein, including but not limited to Workflows, Roles and responsibilities, partial and final deliverables, etc.
 - Any additional BIM use adopted by the Contractor and the strategy to achieve it.
 - Project Milestones and associated BIM milestones.
 - Model Development Specification (MDS), showing the Level of Development (LOD) to be achieved by each category for each milestone.
 - Critical system, services, assets, and attributes to be captured, based on the BIM Manual list but applied to this particular project.
- B. The Contractor shall submit for review (on a monthly basis) Federate Model update submissions, by posting files to the platform defined by **CLIENT**. The Contractor's appointed BIM Manager for the Project shall prepare a narrative explaining the progress made since the last submission, which shall include at a minimum:
- Progress made on the Completeness of each individual Model
 - Approximate percentage of target LOD, for the current phase, for each individual Model.
 - Updated list of critical assets and parameters that have been incorporated.
 - A brief summary of progress on 3D coordination made since the last submission.
- C. The Contractor shall develop, 90 days prior to any Construction work, a 4D simulation in video format *.avi, *.mp4, or approved equivalent. The simulation shall depict the Construction sequence by milestones (not necessary to represent individual Construction activities). The Contractor is also responsible for reviewing and resubmitting the simulation if the milestone schedule changes significantly (more than +/- 15 calendar days from the original submission).

- D. The Contractor shall submit a final As-Built Model at a minimum Level of Development (LOD) of 350, as defined in the American Institute of Architects (AIA) Document E203-2013, except where overruled by the **CLIENT** BIM Standards Manual. The Contractor shall ensure all field condition changes are accurately documented in the As-Built model. Non-geometric information (specifically systems, services, and asset data) shall also be captured using the Coding as defined in the BIM Standards Manual, where applicable.
- E. Before issuing the Certificate of Final Completion, the Contractor shall submit to **CLIENT** a final As-Built Model meeting the geometric and non-geometric requirements. **CLIENT** will have thirty (30) days to review the final model submission, and the Contractor shall have an additional thirty (30) days to incorporate all comments to the satisfaction of **CLIENT** to complete this requirement.