State of Tennessee Office of the State Architect (TN OSA)

Building Information Modeling Standards (BIMs)

Version 1.1

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1. Introduction

1.1. Mission of the TN OSA BIM Standards

The mission of the State of Tennessee Office of the State Architect (TN OSA) BIM Standards is to utilize building information modeling (BIM) technology to create building projects with greater long term owner value through an enhanced design, construction and operations process.

1.2. Purpose and Application of the TN OSA BIM Standards

The State of Tennessee Office of the State Architect (TN OSA) has established these BIM Standards for the consistent development and management of BIM on state building projects. For projects designated by the State, or State Procurement Agency (SPA), to use BIM, these BIM Standards apply to Designers and their Consultants, and/or to Contractors and their Subcontractors, selected by the State of Tennessee Real Estate Asset Management (STREAM), the University of Tennessee (UT), and the Tennessee Board of Regents (TBR).

On State projects not designated to use BIM, the Designers and/or Contractors may voluntarily choose, on their own, to use BIM. The State encourages Designers and Contractors using BIM on projects where BIM is not a State requirement to adopt these BIM standards. Designers and Contractors using BIM on projects where BIM is not a State requirement may deliver BIMs instead of paper documents for the aspects of the project for which they have followed these BIM Standards.

Additional BIM requirements, deliverables, and exchanges may be identified for project delivery by the Owner.

1.3. Incremental BIM Adoption

BIM requires process change and every firm and owner implements that change in a series of steps.

The first step is typically the use of BIM to provide immediate three-dimensional visualization of the evolving design. This improves communication both within the Project Team and with the Owner. It has been shown to speed design decision-making, as owners are more confident they understand the options presented. 3D visualization also speeds issue resolution during both design and construction, because everyone can "see" the problem.

Another early step is the use of BIM to assist with drawing coordination, by extracting plan, sections and elevations from the model. This is followed by BIM-based spatial coordination, using interference checking software to ensure that building systems are coordinated. This technique can be used by both Designers and Contractors. Benefits include more accurate and constructible designs, fewer

field coordination issues and change orders, enhanced productivity during both design and construction, and reduced schedule overruns.

As Project Teams gain expertise with BIM techniques, they step up to eliminating redundant and diverging versions of project information by using the BIMs as the basis of calculations and analyses. Area and volume calculations, structural analysis and energy analysis can all be BIM-based. The advantage is that the time and effort required to prepare input for the analyses is greatly reduced and the potential for erroneous interpretation of the drawings is removed. In addition to improved accuracy of the analysis assumptions, this technique allows the Design team to explore more options and to optimize building performance through rapid analysis iterations.

Owners are interested in using BIM to obtain accurate inventories of space and equipment to support downstream operations and maintenance activities. This is the step when owner-specific space and equipment attributes are included in the BIMs.

To be usable downstream, the space and equipment types and attributes captured in the BIMs must align with the receiving facility management (FM) systems. It is the responsibility of the Design team to provide 1.) Space data for all spaces and the relationship of the spaces to the program 2.) Equipment data fields properly formatted to comply with downstream FM requirements and 3.) Equipment data typically found in schedule form in a computable format. The COBie standard assists owners in achieving this alignment.

These TN OSA BIM Standards comprehend all of these steps.

Looking to the future, and particularly to the increased use of alternative project delivery approaches such as Integrated Project Delivery, there are additional, powerful uses of BIM that involve the sharing of BIMs between Designer and Contractor. With this step, BIMs include sufficient detail to support quick and accurate cost estimating as well as construction phase optimization of schedules and logistics.

BIM is a relatively new technology and the industry can expect additional applications to evolve, as well as these Standards.

2. Obligation to Use BIM and General Principles

BIM shall be used as determined by the State or SPA and described below.

2.1. General Principles

2.1.1. These Tennessee OSA BIM Standards ("Standards"), do not change the contractual relationship between the parties to the contractual agreement into which these Standards are incorporated by reference (the "Agreement"), or shift the risks between those parties, unless otherwise expressly stated herein;

2.1.2. These Standards do not create contractual privity between or among any of the parties to the project that is at issue in the Agreement (the "Project"), other than privity of contract expressly created by the terms of the Agreement or any other contract relating to the Project, or otherwise created by law;

2.1.3. All parties to any contract relating to the Project are required to insert language that also incorporates these Standards by reference into all other contracts into which they enter on the Project, and requiring all other such contracts to also contain flow down clauses requiring the other parties to those contracts to also incorporate these Standards by reference into any other contracts into which they enter;

2.1.4. The contract drawings remain the governing documents. For projects designated to use BIM, it is the State's intention to require major contract drawings to be produced using BIM technology. Nothing in these Standards relieve the Designer of any of its obligations contained in the Owner/Designer Agreement;

2.1.5. Nothing in these Standards modify, amend, suspend or abrogate any express or implied warranty otherwise given by Designers to the Owner and by the Owner to Contractors relating to the sufficiency of the design of the Project;

2.1.6. These Standards do not consider any additions to, modifications of, or other contributions by the Contractor or any of its subcontractors to any BIM Models to be the performance of design services, and do not require or allow any person, entity, or authority to consider or define such as the performance of design services;

2.1.7. No party is entitled to rely on any Design or other Model to provide the level of detail required to accurately take off any quantities of any specific Project materials or components, unless otherwise expressly stated in the BIM Execution Plan;

2.1.8. Any and all dimensional tolerances contained in the Contract Documents defined in the Agreement shall apply to any Model generated or utilized under these Standards, unless otherwise expressly stated in the BIM Execution Plan;

2.1.9. The contents of any Design Model shall control to the extent that they conflict with the contents of any other Model;

2.1.10. All parties to any contract which relates to the Project are required to bring to the attention of the other party to those contracts, and to the attention of all other parties to any other contracts relating to the Project, any conflict between any Design Model and any other Model and any conflict between any Design Model and any other provision of any other contract relating to the Project of which that party becomes aware;

2.2. Ownership and Rights of Data

The Owner shall have ownership of and rights to all deliverables developed during the Project: BIMs, electronic CAD files, and COBie data. The Owner shall also have ownership of, and rights to, IFC models and data published by the Designer during design. Ownership does not extend to the working products nor to the native model during design nor to the intellectual property of the Designer.

2.3. Definitions

- **Architectural and Structural Proxy BIMs** - Simplified Architectural and Structural BIMs created by the Contractor that are sufficient for coordination purposes only.

- **As-Built BIMs**: Multiple Construction BIMs, delivered by the Contractor, and reviewed by the Designer, organized by building system and floor and registered spatially, that represent the final as-constructed building and components.

- **As-Built Drawings**: In the BIM context, As-Built Drawings are extracted from the coordinated Construction BIMs. These replace drawings that are prepared by the contractor and show, in red ink, on-site changes to the original construction documents, as described by the AIA Knowledge Resources Team.

- **Building Information Model (BIM):** Digital representation of the physical and functional characteristics of a building (Source: The National BIM Standard – United States Version 2).

- **Building Information Model (BIM) Execution Plan (BEP):** Plan that lays out how BIM will be implemented on the Project as a result of the decisions of the Project Team (The National BIM Standard – United States Version 2).

- **Building Information Model (BIM) Object:** A component, such as space or piece of equipment, within a BIM that has properties associated with the object (BIM Handbook, 2008).

- **Conformed Bid BIMs**: BIMs, organized by floor and discipline, updated by the Designer and the Designer's Consultants at the end of the bidding period to include all changes from Addenda and accepted alternates to the Design BIMs.

- **Construction BIMs**: BIMs generated by the Contractor, the Contractor's Subcontractors, and Major Suppliers, typically representing a single building system. BIM objects are accurate in terms of size, shape, location, quantity and orientation and may include fabrication, assembly, detailing and non-geometric information. Construction BIMs include facility management data required by the Owner.

- **Construction Operations Building information exchange (COBie):** Format for the exchange of information about building assets such as equipment, products, materials, and spaces.

- **Construction Operations Building information exchange (COBie) Worksheets:** Spreadsheet format of COBie.

- **Coordination BIM**: Composite BIM that includes multiple Construction BIMs, registered spatially, used for the purposes of interference checking (clash detection), visualization and 4D applications during construction.

- **Equipment Inventory:** Inventory of equipment types and their attributes delivered in COBie format. See Appendix D.

- **Equipment Object:** A piece of equipment within a BIM that has properties associated with it.

- **Design BIMs**: BIMs produced by the Designer and the Designer's consultants from which construction drawings at ¼" = 1'-0" scale and smaller scales are extracted by Designers and their Consultants.

- **Project Team:** The project Owner, parties in privity with the Owner, and additional parties not in privity with the Owner, who are contributing services and/or materials to the project.

- **Record BIMs:** Conformed Bid BIMs, modified by the Designer to reflect changes the Contractor noted in the As-Built drawings. Record BIMs are not normally required by these Standards.

- **Record Drawings:** Drawings prepared by the Architect to reflect on-site changes the Contractor noted in the As-Built drawings. They are often compiled as a set of on-site changes made for the owner per the owner-architect

agreement (AIA Knowledge Resources Team, Best Practices: Terminology: As-Built Drawings, Record Drawings, Measured Drawings 2007).

- **Space Inventory:** Inventory of spaces and their attributes delivered in COBie format. See Appendix C.

- **Space Object:** A space within a BIM that has properties associated with the space.

2.4. Risk Allocation

Each non-Owner party shall be responsible for any contribution that it makes to a BIM or that arises from that party's access to a BIM. Such responsibility includes any contribution or access to a BIM by a Project Team member in privity with that party and of a lower tier than that party.

2.5. Designer's Obligations

All BIMs shall be geometrically and dimensionally accurate in both 2D and 3D: plan, elevation, and section views.

The Designer shall extract all Construction Documents plans, sections, and elevations at ¼" = 1'-0" scale or smaller from the BIMs as well as schedules and any 3D views. The Designer represents that plans, sections, and elevations at ¼" = 1'-0" scale or smaller and the BIMs are equivalent. The Designer shall not modify these drawings after extraction.

For plans, sections, and elevations greater than ¼" = 1'-0" scale, the use of standard CAD details is acceptable provided that the elements shown in model act as the basis for these drawings.

The Designer shall not be responsible for any use of the BIM for quantity take-off or cost estimating by any other parties use.

3. BIM Standards for Designers

3.1. Disciplines Required to Produce BIMs

The following disciplines must produce BIMs:

- Architectural
- Structural
- Mechanical
- Plumbing
- Electrical
- Civil (3D geometry)
- Landscape (3D geometry)
- Communications
- Fire Protection

- Other specialties required by the SPA or Owner

The level of development required by the disciplines identified above is at the discretion of the Design team. The Designers should use their professional judgment in determining the level of development required to provide the normal and contractual information required at each phase in conjunction with the BIM Standards.

3.2. Compliance with IFC and COBie

The BIM authoring software shall be compliant with the Industry Foundation Classes (IFC) Coordination View (buildingSMART 2013) and should be able to export to the Construction-Operations Building information exchange (COBie) format, which is based on the IFC FM Handover View (East and Chipman 2011). The major BIM authoring software applications are IFC and COBie compliant. If unsure whether the BIM authoring software meets this requirement or how to export to IFC and COBie formats, contact the BIM authoring software vendor.

3.3. Open Standards and Collaboration

The Owner encourages the use of open standards and collaboration tools to facilitate interoperability among Designers, between Designers and Contractors, and between Designers and the Owner.

3.4. Well-Structured BIM

Parametric links shall be maintained within the models to ensure the automatic extraction of Plans, Sections, Elevations, Schedules, and 3D views. All drawings at ¼" = 1'-0" scale or smaller shall be representations of the BIM.

Use correct object and spatial classifications that support the IFC format, extraction of COBie data, and energy analysis if required.

3.5. BIM Content

The BIM content is the geometric, physical characteristics, and data needed to describe the design and construction work of the building project.

The Project Team shall identify the BIM content required to meet the project needs and the deliverable requirements at each design phase in the BIM Execution Plan.

3.6. BIM Use

The Designer and the Designer's Consultants shall use BIM authoring software to generate BIMs that include all of the geometry, physical characteristics, and data needed to describe the design and construction work of the Project. For engineering disciplines, model all pipes, conduits, or bundles 2" or greater in diameter.

3.7. BIM Software

The following 3D modeling software products appear to be compatible with these Standards as of July 24, 2015.

- Autodesk Revit
- Autodesk Revit Architecture
- Autodesk Revit Structure
- Autodesk Revit MEP
- Autodesk AutoCAD Architecture
- Autodesk AutoCAD MEP
- Autodesk AutoCAD Civil 3D
- Bentley AECOsim Building Designer
- Bentley InRoads
- Graphisoft ArchiCAD
- Graphisoft ArchiCAD MEP Modeler
- Tekla Structures
- Digital Project: Designer
- Nemetschek Vectorworks

Other products will be considered on request. It is the obligation of the Designer to ensure that the software products are correctly configured to produce the required deliverables.

3.7.1. BIM-based Analyses

The State of Tennessee's intent is to base all analyses on the BIM. During the Project, the BIMs developed by the Designer and the Designer's Consultants shall be used to:

3.7.1.1. Perform program validation

Designers shall use the Space Inventory produced in Section 3.7.1.4 to validate that the Design complies with the General Requirements of the Owner's Program.

3.7.1.2. Generate input for energy analysis

Energy modeling and analysis are part of Tennessee's High Performance Building program and are covered in other documents.

3.7.1.3. Identify and resolve interferences between disciplines

For the Design Development and Construction Documents phases, the Designer and the Designer's Consultants shall use

an automated interference checking application to identify and resolve interferences among all of the disciplines creating BIMs.

During these phases, the Designer shall submit a report summarizing the status of the 3D building systems coordination effort.

Description of the automated interference checking process shall be included in the BIM Execution Plan.

3.7.1.4. Generate space inventories

Spaces shall be named, classified, and assigned attributes per Appendix C. The space inventory shall be extracted into the COBie format at each design phase deliverable.

For UT and TBR projects, reference the U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, Postsecondary Education Facilities Inventory and Classification Manual (FICM) (NCES 2006).

For STREAM projects, based on OmniClass Table 13 - Spaces by Function (OCCS 2012), OmniClass Table 13 provides high-level categories for spatial functions as well as the ability to provide very detailed functional classification by adding additional digits. Thus, 13-11 21 00 is the classification for Meeting Spaces. Optionally, these can be further broken down:

- 13-11 21 11 Meeting Room
- 13-11 21 17 Conference Room
- 13-11 21 27 Community Room
- 13-11 21 41 Interview Room

The Architect shall select the level of classification appropriate for the project.

3.7.1.5. Generate equipment inventories

Equipment objects shall be named, classified, and assigned attributes per Appendix D or as required by the Owner. The equipment objects required to have information provided by Designers are limited to those that are normally scheduled. The State of Tennessee has provided a shared parameters file to assist Designers using Autodesk Revit software in creating this content. Any attributes not required to be provided by the Designers may be left blank but shall be included in the BIM

object properties. For example, design engineers are not required to provide in the BIM the refrigerant type for chillers. However, they are required to maintain a property called "RefrigerantType" in their BIM chiller objects. The equipment inventory shall be extracted into the COBie format.

3.8. BIM Deliverables

- At each design submission, the Designer shall export the BIMs from the native authoring software to the IFC format. See Section 3.8.1 for details of BIM deliverables at each phase.
- All plans, sections, and elevation drawings and CAD files at ¼" = 1'-0' or smaller scale, as well as schedules and 3D views, shall be extracted from the BIMs.
- For plans, sections, and elevations greater than ¼" = 1'-0" scale, the use of standard CAD details is acceptable provided that the elements shown in model act as the basis for these drawings.
- BIMs shall be used to perform all area and volume calculations.
- If the Project is using BIM and has an energy analysis requirement, then the BIMs shall be used as the basis for energy analysis. Energy Modeling and analysis are part of Tennessee's High Performance Building program and are covered in other documents.
- BIMs shall be used to produce space and equipment inventories in COBie format. See Appendices C and D for details of space and equipment inventory requirements.

3.8.1. BIM Deliverables by Phase

For each design phase BIM deliverable, BIMs in IFC format shall be submitted along with the required design deliverables for clarification. If applicable, site and landscape information may be submitted in 3D .DWG format, with all custom objects converted to native 3D AutoCAD objects.

3.8.1.1. Program Verification Phase

Submit BIM Execution Plan and resume of BIM Manager. See sections 3.11 and 3.12 of this document.

3.8.1.2. Schematic Documents Phase

For the approved design concept, all information needed to create schematic design documents shall be graphically or alphanumerically included in and derived from the BIMs. Drawings and 3D views shall be extracted from the BIMs. A massing BIM indicating siting and orientation shall be provided.

The Designer shall submit a space inventory in COBie format (COBie worksheets: Contact, Facility, Floor, and Space only).

3.8.1.3. Early Design Stage Presentation

If an Early Design Stage Presentation is required, all graphical information needed shall be derived from the BIM. Presentation may be enhanced using other software.

3.8.1.4. Design Development Phase

Information needed to create the design development documents shall be graphically or alphanumerically included in and derived from the BIMs. All ¼" = 1'-0" or smaller scale drawings - Plans, Sections, and Elevations – in addition to Schedules and 3D views shall be extracted from the BIMs. Details at scales larger than ¼" = 1'-0" are not required to be included in the BIMs. For plans, sections, and elevations greater than ¼" = 1'-0" scale, the use of standard CAD details is acceptable provided that the elements shown in model act as the basis for these drawings.

If applicable, the Designer shall use the BIM as the basis for energy analysis. Energy modeling and analysis are part of Tennessee's High Performance Building program and are covered in other documents.

The Designer and the Designer's Consultants shall identify and resolve interferences among all of the disciplines creating BIMs. The Designer shall submit a report summarizing the status of the 3D building systems coordination effort.

The BIM shall be partitioned by discipline and floor in IFC format only. If applicable, a site model in IFC or 3D .DWG format, with any custom objects converted to native AutoCAD objects shall be provided.

The Designer shall submit space and equipment inventories in COBie format (COBie worksheets: Contact, Facility, Floor, Space, Zone, Type, System, and Attribute). The equipment inventory shall identify the expected systems required to provide heating, cooling, electricity, water, fire protection, and other services. At this stage, the system information provided shall be name and classification. The specific components that comprise these systems are not required.

3.8.1.5. Construction Documents Phase

Information needed to create construction documents shall be graphically or alphanumerically included in and derived from the BIMs. All ¼" = 1'-0" or smaller scale drawings - Plans, Sections, and

Elevations – in addition to Schedules and 3D views shall be extracted from the BIMs. Details at scales larger than ¼" = 1'-0" are not required to be included in the BIMs. For plans, sections, and elevations greater than ¼" = 1'-0" scale, the use of standard CAD details is acceptable provided that the elements shown in model act as the basis for these drawings.

If applicable, the Designer shall use the BIM as the basis for energy analysis. Energy modeling and analysis are part of Tennessee's High Performance Building program and are covered in other documents.

The Designer and the Designer's Consultants shall identify and resolve interferences among all of the disciplines creating BIMs. The Designer shall submit a report summarizing the status of the 3D building systems coordination effort.

The BIM shall be partitioned by discipline and floor in IFC format only. If applicable, a site model in IFC or 3D .DWG format, with any custom objects converted to native AutoCAD objects shall be provided.

The Designer shall submit space and equipment inventories in COBie format (COBie worksheets: Contact, Facility, Floor, Space, Zone, Type, Component, System, and Attribute). The space and equipment inventories shall reflect the complete set of all spaces, scheduled products, and scheduled equipment assets as presented on the corresponding deliverable drawings. This list of spaces, products and equipment is expected to be complete. The attributes of spaces and equipment, requirements for which are listed in Appendices C & D, shall reflect the design intent.

3.8.1.6. Bid Phase

During the Bid phase, the Designer shall update the Construction Documents Phase BIMs with accepted alternates and addenda. The updated BIMs are the Conformed Bid BIMs. The Designer shall submit the Conformed Bid BIMs partitioned by building floor and discipline in IFC and native formats.

If required, a site and landscape model may be submitted in native and 3D .DWG formats, with all custom   objects converted to native 3D AutoCAD objects.

The Designer shall extract all Conformed Construction Drawings at ¼" = 1'-0" scale or smaller from the Conformed Bid BIMs. The Designer shall submit updated space and equipment inventories in COBie format (COBie worksheets: Contact, Facility, Floor, Space, Zone,

Type, Component, System, and Attribute) to include changes from Addenda and accepted alternates.

3.8.1.7. Construction Administration Phase

During Construction Administration, the Designer shall:

- Produce Change Orders based on the Conformed Bid BIM.
- Observe the progress of the the Contractor's construction BIM to verify that it meets the design intent and reflects what is being built.
- Shall review shop drawings from the Contractor.*

* Note: Where trade contractors are creating fabrication models in BIM, these may be substituted for 2D shop drawings. Where trade contractors are performing 3D BIM coordination, they may subsitute the coordination model in lieu of 2D coordination drawings.

3.8.1.8. Project Closeout Phase

At Project Closeout, the Designer shall review the As-Built BIMs as developed by the Contractor, to verify that the BIMs meet the original design intent as formally modified throughout the construction process. The Designer is not responsible for performing a detailed analysis of the As-Built BIMs.

3.9. Geo-referencing

The Designer and the Designer's Consultants are required to geo-reference BIMs, site plans and associated construction drawings to ensure interoperability with existing State of Tennessee Geographic Information Systems (GIS).

BIMs, site plans and associated construction drawings shall be registered to the Tennessee State Plane Coordinate System. Coordinates for any site may be requested from Office of Information Resources, GIS Services (OIR GIS). The Tennessee State Plane Coordinates are comprised of the North American Datum of 1983 (NAD83) and the North American Vertical Datum of 1988 (NAVD 88). The BIMs shall include a marker for the registration point and identify the rotation and origin of rotation from Project North to True North. Geo-referencing shall be maintained throughout the design of the project.

The BIMs shall also include a polyline of the building footprint of the lowest floor of the lowest enclosed area including basement. An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area, is not considered a building's lowest floor. For further clarification see FEMA's definition of lowest floor (FEMA 2012).

3.10. Existing Conditions

The Designer and the Designer's Consultants shall model any existing conditions that are needed to describe the design and construction work of the project. The Designer shall work with the Owner to determine the extent of the existing conditions necessary for the design. It is not normally required to model any spaces not within the scope of the project.

3.11. Staffing

The Designer shall identify a qualified BIM Manager for each project who is acceptable to the Owner. The BIM Manager is responsible for managing the BIM deliverables from all disciplines during the design of the building project.

The Designers' Consultants using BIM shall each identify a BIM Coordinator. The BIM Coordinator is responsible for managing the BIM deliverables of that specific discipline or firm.

The responsibilities of the BIM Manager and the BIM Coordinators shall be documented in the BIM Execution Plan.

3.12. BIM Execution Plan

The Designer and the Designer's Consultants along with the Designer's BIM Manager shall develop a BIM Execution Plan that identifies the protocols for the development and management of BIMs during the design phases.

Appendix A includes the minimum topics that shall be addressed in the Design Phase BIM Execution Plan. Special project types may require additional topics. Appendix A is available in MS Word format on request.

3.13. BIM Content

The BIM content is the geometric, physical characteristics, and data needed to describe the design and construction work of the building project.

The Project Team shall identify the BIM content required to meet the project needs and the deliverable requirements at each design phase in the BIM Execution Plan.

3.14. Collaboration

The Owner shall be provided access to the Designer's web-based collaboration system.

For projects with special IT security requirements, the Owner may provide a web-based collaboration system for the project.

The web-based collaboration system shall provide:

- Access to the Project Team which includes but is not limited to: the Owner, Designer, Designer's Consultants, and Contractors.
- Automated versioning of BIM files.

- Preservation of previous versions of BIM files.
- Access-controlled workspace or folders for each organization to upload their BIM files.
- Password protection

Detailed protocols associated with the use of the web-based collaboration system shall be documented in the BIM Execution Plan.

4. The BIM Process for Designers

1. Project awarded
2. Prime: Assign BIM Manager
3. Consultant(s): Assign BIM Coordinator
4. Develop BIM Execution Plan (BEP) (refer to BEP outline in Appendix A for required content)
5. Set up web-based Collaboration System
6. Finalize Program Verification
7. Prepare BIM Authoring Tool
   a. If using Revit
      i. Download & Install Necessary IFC & COBie add-ons and/or plugins necessary to export required IFC & COBie deliverables.
         1. IFC: http://sourceforge.net/projects/ifcexporter/
         2. COBie: http://www.caddmicrosystems.com/industry-solution/cobie-extension-revit
      ii. Download BIM Project Template From State Website - http://www.tn.gov/finance/OSA/bimStandards.shtml
      iii. Download the custom TN shared parameters file. Use to apply TN specific attributes to BIM object content.
      iv. Download the COBie extensions default settings .xml file from state website - http://www.tn.gov/finance/OSA/bimStandards.shtml
      v. Start new project using BIM project template
   b. If using other authoring software, contact software vendor for IFC and COBie tools and support.
   c. Download the COBie validator program from state website- http://www.tn.gov/finance/OSA/bimStandards.shtml
8. Develop Design BIMs
   a. Populate model with BIM object library content updated to contain TN required attributes
   b. Fill in the appropriate values for information required to be provided during the design phase (Refer to Appendix D)
   c. Perform required and proposed BIM based analyses as defined in BIM standards and BEP.
   d. Produce BIM and COBie deliverables as defined in Section 3 of the BIM standards.

e. Perform validation check on COBie file using the COBie Validator program before submitting to TN PM.
f. Modify/Update BIM to address COBie errors (If required)
g. Repeat steps 10-12 until errors have been addressed

9. During Bidding Phase:
   a. Update BIM and COBie files to reflect addenda and accepted alternatives
   b. Produce BIM and COBie deliverables as defined in Section 3 of the BIM standards.

10. During Construction Administration:
    a. Produce change orders from the conformed bid BIM
    b. Observe and verify the progress of construction BIM to comply with design intent
    c. Review Shop Drawings or fabrication BIMs from the Contractor

11. At Project Closeout:
    a. Review As-Built BIMs developed by contractor and delivered by the TN PM

5. BIM Requirements for Contractors

5.1. Trades Required to Produce BIMs

The Owner or the Owner's Representative has indicated in the list below the trades that shall produce BIMs:

☐	Structural Steel Fabrication
☐	Mechanical - HVAC
☐	Mechanical - HVAC Pipe
☐	Plumbing
☐	Electrical
☐	Fire Protection
☐	Fire Sprinkler
☐	Pneumatic Tube
☐	Building Automation Systems
☐	Communications
☐	Civil (3D geometry)
☐	Landscape (3D geometry)
☐	Other:_____

5.2. Obligation to Model Complete Building

If the Project has been designed in BIM, the Contractor shall choose whether to maintain all of the BIM, or any portions thereof, and as to any portions of the BIM the Contractor chooses not to maintain, the Contractor shall cause the trade contractors to recreate those portions of the Conformed Bid BIMs depicting building systems, including architecture.

If the Project has not been designed in BIM, the Contractor shall provide the Architectural and/or Structural Proxy BIMs, for coordination purposes only and shall create or shall cause the trade contractors to create models of all building systems indicated in Section 6.1

5.3. Compliance with IFC and COBie

The BIM authoring software shall be compliant with the Industry Foundation Classes (IFC) Coordination View and should be able to export to the Construction-Operations Building information exchange (COBie) format based on the IFC FM Handover View.

5.4. Open Standards and Collaboration

The Owner encourages the use of open standards and collaboration tools to facilitate interoperability among the Contractor and Subcontractors, between Contractors and Designers and between Contractors and the Owner.

5.5. BIM Use

Conformed Bid BIMs, if available, will be provided to the Contractor in IFC and native file formats, with the exception of site and landscape models, which may be provided in 3D AutoCAD format with no custom objects.

The Contractor shall indemnify the Designer for the Contractor's use of the BIMs. The Contractor and the Contractor's subcontractors and suppliers shall use BIM authoring software to update the Conformed Bid BIMs or generate new Construction BIMs that include all of the geometry and clearances needed to perform trade coordination. In addition, the models shall include the facility management information required by the Owner.

The Contractor and the Contractor's subcontractors and suppliers shall continuously update and maintain the Construction BIMs throughout construction

to reflect the current as-built conditions of the building. See Section 6.1 for the list of trades required to produce Construction BIMs.

If Conformed Bid BIMs have not been provided to the Contractor, the Contractor shall produce Architectural and/or Structural Proxy BIMs for coordination purposes only. The Contractor shall continuously update these Proxy BIMs to reflect the current as-constructed conditions of the building. See Section 7.6.1 for additional detail on BIM-based coordination.

During construction, the Contractor shall make available to the Owner the current Architectural Proxy, Structural Proxy and/or Construction BIMs in IFC format.

5.5.1. BIM-based Analyses

During the building project, the Construction BIMs shall be used to:

3.5.1.1.   Identify and resolve spatial interferences between trades and building systems prior to fabrication and field installation

3.5.1.2.   Generate equipment inventories

The Contractor and Subcontractors are encouraged, but not required to use Construction BIMs for:

3.5.1.3.   Logistical planning and layout

3.5.1.4.   4D scheduling, where 4D scheduling is a 3D geometric model linked to a schedule

5.5.2. BIM Deliverables and Work Products

3.5.2.1.   Coordinated Construction BIMs shall be used as the basis for Shop Drawings for those trades using BIM.

3.5.2.2.   Coordinated Construction BIMs shall be used to generate Coordination Drawings for those trades using BIM.

3.5.2.3.   Coordinated Construction BIMs shall be used to fabricate building components and systems for those trades using BIM.

3.5.2.4.   Coordinated Construction BIMs shall be used to install building components and systems for those trades using BIM.

3.5.2.5.   Coordinated Construction BIMs shall be used to produce equipment inventories which shall be delivered in COBie format. See Appendix D for details of the equipment types and their attributes required in the equipment inventory.

3.5.2.6. As-Built Drawings shall be extracted from the Coordinated Construction BIMs.

5.6. Geo-referencing

The Contractor is required to geo-reference all Construction BIMs, the Coordination BIM, As-Built BIMs, site plans, and As-Built Drawings to ensure interoperability with existing State of Tennessee Geographic Information Systems (GIS). See Section 7 for additional detail.

If geo-referencing was not established during the design of the project:

If BIMs are available from the Designer, geo-referencing should already be established. If the Contractor is creating the Architectural and/or Structural Proxy BIMs, the Contractor shall establish geo-referencing.

5.7. Staffing

The Contractor shall identify a qualified BIM Manager for each project who is acceptable to the Owner. The BIM Manager is responsible for managing the BIM deliverables from all Subcontractors and Major Suppliers during the construction of the building project.

Each party that is creating a Construction BIM shall identify a BIM Coordinator. The BIM Coordinator is responsible for managing the BIM deliverables of that specific subcontractor or supplier.

The responsibilities of the BIM Manager and the BIM Coordinators shall be documented in the BIM Execution Plan.

5.8. BIM Execution Plan

The Contractor and all parties providing Construction BIMs shall along with the Contractor's BIM Manager shall develop a BIM Execution Plan that identifies the protocols for the development and management of BIMs during the construction phase.

Appendix E includes the minimum topics that shall be addressed in the BIM Execution Plan for construction.

5.9. Collaboration

The Owner may designate a web-based collaboration system for use by the Contractor. If the Owner does not designate a web-based collaboration system for use by the Contractor, then the Contractor shall provide a web-based collaboration system for the sharing of individual and merged BIM files. The web-based collaboration system shall provide:

- Real-time access to the Project Team which includes but is not limited to the Owner, Designer, Designer's Consultants, Contractor, Subcontractors, and other users as required by the Owner.
- Automated versioning of BIMs.
- Maintenance of the previous versions of BIMs.
- Access-controlled workspace or folders for each organization to upload their BIMs.

The web-based collaboration system shall be password-protected. The Contractor shall ensure that the collaboration system conforms to any Information Technology (IT) or security requirements required by the Owner.

Detailed protocols associated with the use of the web-based collaboration system shall be documented in the BIM Execution Plan.

The Contractor shall provide on-site hardware and software to view individual and merged BIMs as well as clash detection results.

6. Details of the Requirements for Contractors

All required trades shall use intelligent, 3D modeling. The 3D modeling software shall be compliant with the Industry Foundation Class (IFC) Coordination View and shall be able to export to Construction-Operations Building information exchange (COBie) format based on the IFC FM Handover View.

6.1. Well-Structured BIM
- Parametric links shall be maintained within the models to ensure the automatic extraction of 3D views and all required drawings. All drawings shall be representations of the coordinated Construction BIM.
- Use the correct object types and attributes that support the IFC Coordination View and COBie extraction.

6.2. BIM Content
The BIM content is the geometry, physical characteristics, and data needed to describe the construction work of the building project.

The Project Team shall identify the BIM content required to meet the project needs and the deliverable requirements for construction in the BIM Execution Plan.

6.3. Georeferencing
BIMs and As-Built Drawings shall be registered to the respective Tennessee State Plane Coordinate System; shall utilize the North American Datum of 1983 (NAD83) and the North American Vertical Datum of 1988 (NAVD 88). The State's GIS are maintained by the Office of Information Resources, GIS Services

(OIR GIS).The BIMs shall include a marker for the registration point and identify the rotation and origin of rotation from Project North to True North.

The BIMs shall also include a polyline of the building footprint of the lowest floor of the lowest enclosed area including basement. An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area, is not considered a building's lowest floor (FEMA 2012).

6.4. Space Object Naming
The Contractor shall maintain the space object names, classifications, and designations that were developed during the design of the building, if the building was designed in BIM.

6.5. Equipment Object Naming
The Contractor shall maintain the equipment object types and attributes that were developed during the design of the building, if the building was designed in BIM.

Equipment objects shall be created, named, classified, and assigned attributes per the requirements in the Appendix D or as required by the Owner. The Contractor shall add any equipment objects that were not modeled by the Designer, but are required for Facility Management. The Contractor shall add equipment attribute data not available during design such as serial number.

The equipment inventory shall be extracted into the COBie format. See Appendix D for the COBie Worksheets required for the equipment inventory.

6.6. BIM Applications
At a minimum, BIM shall be used for the analyses indicated below.

6.6.1. Coordination

BIMs shall be used to identify and resolve spatial interferences between building systems and products prior to fabrication and field installation.

The Contractor shall include required clearances for maintenance and other access, code clearances, and other required clearances in the interference checking.

On a periodic basis, the Contractor shall schedule and manage on-site coordination meetings to resolve interferences. The Contractor shall publish and make available reports identifying the statuses of the interferences and the coordination progress.

The schedule and the detailed protocols of the BIM-based coordination process shall be included in the BIM Execution Plan.

6.6.2. Fabrication and Installation

Building components shall be fabricated and installed based on the coordinated Construction BIMs.

6.6.3. Equipment Inventory

An inventory of equipment designated in Appendix D shall be delivered in COBie format.

If the project required BIM in the design phase, the Contractor will receive a partially completed equipment inventory created by the Designer. This equipment inventory will contain specified equipment types and components and provide some of the required attributes.

6.7. BIM Requirements by Phase for Contractors
6.7.1. Coordination

Provide coordinated Construction BIMs in IFC format and interference reports upon request.

Extract the related Shop and Coordination Drawings from the coordinated Construction BIMs.

6.7.2. Construction

Fabricate and install building elements based on the coordinated Construction BIMs.

Update and maintain equipment inventory and documents in COBie format.

6.7.3. Closeout

Update all coordinated Construction BIMs to reflect as-built conditions. These are the As-Built BIMs. Extract all related As-Built Drawings and space and equipment inventories in COBie format from the As-Built BIMs.

If no Architectural and/or Structural Conformed Bid BIMs were provided by the Designer, the Contractor shall deliver updated Architectural and/or Structural Proxy BIMs.

The As-Built BIMs shall be partitioned by building floor and trade and delivered in IFC file format. Site and landscape information may be submitted in IFC or 3D .DWG file format, with all custom objects converted to native 3D AutoCAD objects.

Submit updated space and equipment inventories in COBie format.

Milestone	Deliverables
Coordination Phase	Shop Drawings shall be extracted from the coordinated Construction BIMs.
	Coordination Drawings shall be extracted from the coordinated Construction BIMs.
Closeout Phase	As-Built BIMs partitioned by discipline and floor in IFC format. Site and landscape information may be submitted in IFC or 3D .DWG file format, with all custom objects converted to native 3D AutoCAD objects.
	As-Built Drawings shall be extracted from the As-Built BIMs.
	Submit updated space and equipment inventories in COBie format (COBie Worksheets: Contact, Facility, Floor, Space, Zone, Type, Component, System, Document, and Attribute).

Table 6-1 – BIM Requirements by Phase for Contractors

7. The BIM Process for Contractors

The following description includes the recommended process for the development of and the management of BIMs by Contractors.

1. As early as feasible after project award, the Contractor shall assign a BIM Manager.
2. Develop the BIM Execution Plan.
3. Conduct a BIM Kickoff Meeting.
4. Set up the web-based collaboration system.
5. Develop the Construction BIMs.
6. Prior to fabrication and installation, identify and resolve spatial conflicts between building systems and products.

7. During construction:
    a. Fabricate and build from the coordinated Construction BIMs.
    b. Update the coordinated Construction BIMs to reflect changes to the building that include but are not limited to Requests for Proposal (RFPs), Change Orders, Requests for Information, Architects Supplemental Instructions (ASIs), and field changes.
    c. Extract all Coordination Drawings from the coordinated Construction BIMs.
    d. Use the coordinated Construction BIMs as the basis for generating the Shop Drawings.
    e. Update and maintain the space and equipment inventories in COBie format.
8. At project closeout,
    a. Provide As-Built BIMs partitioned by discipline and floor in IFC format. Site model may be provided in IFC or 3D .DWG format, with any custom (ARX) objects converted to native AutoCAD objects.
    b. Provide Architectural and/or Structural Proxy BIMs, if any, updated to reflect as-built conditions in IFC format.
    c. Provide the updated equipment inventory in COBie format.

References

buildingSMART (2013). "Coordination View Version 2.0" < http://www.buildingsmart-tech.org/specifications/ifc-view-definition/coordination-view-v2.0> (Nov. 21, 2012).

East, B. and Carrasquillo-Mangual, M. (2012). "The COBie Guide" <http://buildingsmartalliance.org/index.php/projects/cobieguide/> (Nov. 21, 2012).

East, B. and Chipman, T. (2011). "Facilities Management Handover." <http://buildingsmartalliance.org/docs/BSADOC_COBIE/index.htm > (Nov. 27, 2012).

(FEMA) Federal Emergency Management Agency (2012). "Lowest Floor." <http://www.fema.gov/national-flood-insurance-program-2/lowest-floor> (Dec. 28, 2012).

(OCCS) OCCS Development Committee Secretariat (2012). "OmniClass Table 13 – Spaces by Function" Release Date: 2012-05-16 < http://www.omniclass.org> (March 16, 2015)

(NCES) U.S. Department of Education, National Center for Education Statistics. (2006). *Postsecondary Education Facilities Inventory and Classification Manual (FICM)*, 2006 Edition (NCES 2006-160). U.S. Department of Education. Washington, DC.

(NIBS) National Institute of Building Sciences "Chapter 4.4 Design to Building Energy Analysis" *National BIM Standard- United States Version 2.* <http://www.nationalbimstandard.org/nbims-us-v2/pdf/NBIMS-US2_c4.4.pdf> (Feb. 21, 2013).

Appendices

Appendix A – BIM Execution Plan Outline - Designers

Project Information

- Identify project name, SBC number, location (address & geo-reference)
- Identify Owner
- Identify effective date or revision date of plan

Project Designer and Designer's Consultants Information

- Designer firm
    - Discipline
    - Firm name
    - Firm address
    - BIM Manager name
    - BIM Manager contact information
- All Consultants
    - Firm name
    - Firm address
    - BIM Coordinator name
    - BIM Coordinator contact information

BIM Goals and Objectives

- Identify owner's intended goals or end uses of the model
- Identify the Designer's and the Designer's Consultants use of the models during the project

Roles and Responsibilities

- Briefly describe each organization's responsibility for:
    - Model creation
    - Model quality
    - Model analysis
    - Model management
- Describe the roles of the BIM Manager and BIM Coordinators

Collaboration Plan

- Describe the collaboration system(s) you will use to exchange, merge and visualize models
- Describe the schedule for or frequency of model updates and interference checks
- Describe tools and process to be used for interference checking
- Describe process to be used to generate drawings from coordinated models

Software for Model Authoring

- Identify all software products to be used for model creation and the software version

Planned Models

- Identify model name and phase of delivery
- Detail contents of each model by phase – components and properties
- Identify authoring company
- Identify authoring tool(s)
- Identify analysis tools to be used and their modeling requirements
- Identify file formats required

Modeling Standards

- Common coordinate system
    - Units
    - File origin (X,Y,Z)
    - Geolocation
- Model partitions
- Naming
    - Files
    - Building level designators
    - Building area designators
    - Discipline designators
    - Layers (if applicable)
    - Properties required for:
        - COBie deliverables
        - Owner-requested analyses
        - Designer and the Designer's Consultants-initiated analyses
    - Units and values for properties (e.g.- cubic feet per minute, space use codes from FICM)
- Level of precision and dimensioning
- Any exclusions from models

Model Analysis Plan

- For each project phase, define:
    - Each analysis that will be performed
        - Software to be used
        - Model(s) to be analyzed
            - File format required
        - Responsible team member(s) for
            - Performing the analysis
            - Producing the required model(s)
    - Contents of COBie deliverable
        - Responsible Designer and Designer's Consultants team member(s)
    - Clash detection
        - Software to be used
        - Model(s) to be analyzed
            - File formats acceptable
            - Any object enablers required
        - Responsible team member(s) for
            - Performing the check
            - Producing the required model(s)
        - Process for resolving clashes

Project Deliverables

- Identify electronic models, drawings, renderings, analyses and reports to be delivered
- Identify all space and equipment types and attributes to be included in the COBie deliverables
- Describe process to be used to extract all deliverables from coordinated models
- Describe quality assurance and quality control measures to be implemented
- For Design-Assist projects only, address model sharing and the transition of model responsibilities to the Design-Assist contractor

Sign-Off

- Authorized signature from the Designer and the Designer's Consultants indicating agreement to comply with this BIM Execution Plan.

Appendix B – Tips for Preparing a BIM for Export for Energy Analysis

The following are general tips on preparing a BIM for export for use in external energy analysis software programs. gbXML and IFC are two formats currently supported for energy analysis. Refer to your particular BIM software application's help or resource manual for "how-to" Information related to these tips.

- Only include in the data exported for energy analysis the building elements necessary for energy analysis. This includes exterior walls, windows, doors, floors, ceilings, roofs, and volumetric heating and cooling zones. Make sure these elements are defined accurately: for example, do not use generic exterior walls for the analysis; the anticipated exterior wall construction should be used instead.

- Area calculations for zones should be set to calculate both area *AND* volume.

- All zones should be contained by bounding elements (wall, floor, ceiling, or roof). One hundred percent of the building volume should be contained within identified zones. Define the sliver space tolerance (if this option is available).

- Overall, keep the geometry of the energy model simple. A complex model may produce errors and will not yield a more accurate analysis.

Related Reference Documents

The following list of documents and/or websites provide additional information on best practices, tips, and data requirements for preparing BIMs for energy analysis.

- GSA BIM Guide: 05 - BIM Guide for Energy Performance Version 2.0 – March 2012
  http://www.gsa.gov/bim

- ERDC-CERL TR-11-41 Early Design Energy Analysis Using Building Information Modeling Technology:
  http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA552789

- IFC MVD Definition Diagram: Concept Design to Building Energy Analysis (BEA) – Exchange Requirements Model diagram
  http://www.blis-project.org/IAI-MVD/Snapshots/GSA-003_ERM_%28BEA%29_Design_to_BuildingEnergyAnalysis.pdf

- AECOO-1 Testbed Information Delivery Manual (IDM) for Building Performance and Energy Analysis (BPEA) Thread
  http://zeroemissiondesign.com/uploads/BPEA_IDM_FINAL.pdf

- National BIM Standard – United States Version 2, Chapter 4.4 - Design to Building Energy Analysis
  http://www.nationalbimstandard.org/nbims-us-v2/pdf/NBIMS-US2_c4.4.pdf

- Utilizing gbXML with AECOsim Building Designer – Building Performance Analysis Using Bentley Products
  http://ftp2.bentley.com/dist/collateral/docs/white_papers/WP_%20gbXML_LTR_v03.pdf

- Graphisoft ArchiCAD YouTube Channel – Search for "Energy Model" or "Energy Analysis"
  http://www.youtube.com/user/Archicad

- Mastering Autodesk Revit Architecture 2013 – Autodesk Official Training Guide

Appendix C – State of Tennessee Office of the State Architect (TN OSA) Space Inventory Requirements

The table below lists the required attributes of a space inventory and maps these attributes to their appropriate locations in a COBie file. BIM-authoring software may provide attributes that map to these COBie locations. If so, the built-in attributes can be used; otherwise, these attributes will need to be added. Ultimately, it is necessary to ensure this information appears in the correct location in the COBie file.

General Attributes		COBie Worksheet Location		
Placement Requirement	Attribute	Sheet	Column	Comments
Once Per Project	Building Name	Facility	Name	Owner's Building Number
Once Per Project	Facility Identification	Facility	ProjectName	State of TN Treasury Risk Management Building Number
Once Per Project	Region Code	Facility	SiteName	Optional. May be used to indicate campus or office complex
Each Floor	Floor Identification	Floor	Name	Floor Level
Each Space	Room Designator 1	Space	Name	Owner's Space naming standard. See below for format.
Each Space	FICM Use Code	Space	Category	For UT and TBR projects only. (See Note 1.)
Each Space	OmniClass Table 13 Code	Space	Category	STREAM only. (See Note 2.)
Each Space	Unique Space ID	Space	ExtIdentifier	Unique ID that should be generated by BIM-authoring software.
Each Space	Net Assignable Area (sf)	Space	NetArea	In SF (For UT and TBR, see FICM)

Notes:

1. For TBR and UT projects, reference the U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, Postsecondary Education Facilities Inventory and Classification Manual (FICM) (NCES 2006).

2. For STREAM projects, reference the current OmniClass Table 13 (http://www.omniclass.org/)
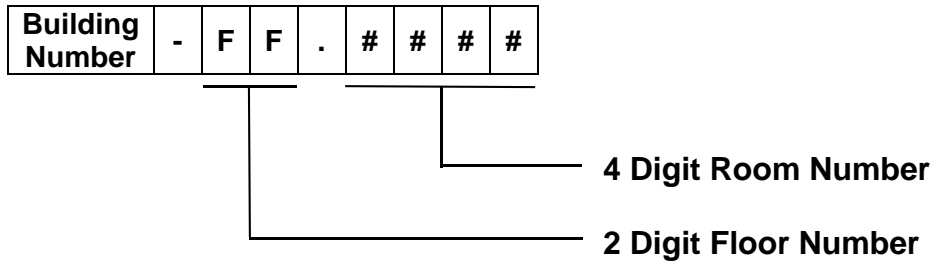
Space Name Format:

For example, Room 1223 on the 12th Floor in Building 100 shall have a Space Name as:

100-12.1223

The space inventory shall be submitted in COBie format. The table below lists the COBie Worksheets and the high-level information that shall be provided in each Worksheet for a space inventory.

COBie Worksheet	Required Content
Contact	One row for each discipline or organization that provides COBie information. Fields required to be completed include: Email, CreatedBy, CreatedOn, Category, Company, and Phone
Facility	One building per COBie file. Fields required to be completed include: Name, CreatedBy, CreatedOn, Category, ProjectName, SiteName, LinearUnits, AreaUnits, VolumeUnits, CurrencyUnit, AreaMeasurement, and Description
Floor	One row for each vertical level to include foundations, floors, roofs, and site. Fields required to be completed include: Name, CreatedBy, CreatedOn, Category, Elevation, and Height
Space	One row per functional space, per room. Multiple spaces in a room are possible. Fields required to be completed include: Name, CreatedBy, CreatedOn, Category, FloorName, Description, and NetArea
Zone (Optional)*	One row for each COBie.Space and COBie.Zone type. Fields required to be completed include:

COBie Worksheet	Required Content
	Name, CreatedBy, CreatedOn, Category, and SpaceNames

* The use of the zones on the project, and therefore the Zone worksheet, is at the discretion of the State of Tennessee Project Manager, in conjunction with the Project Team, and based on the project's scope.

Additional guidance on the COBie Worksheets can be found in The COBie Guide (East and Carrasquillo-Mangual 2012).

For UT and TBR projects, the Space category shall be entered a FICM Use Code. Below is the current listing of FICM Use Codes.

FICM Use Codes	
100 Classroom Facilities	110 Classroom Facilities
115 Classroom Service	200 Laboratories
210 Class Laboratory	215 Class Laboratory Service
220 Open Laboratory	225 Open Laboratory Service
250 Research/non-class Laboratory	255 Research/non-class Laboratory Service
300 Office Facilities	310 Office
315 Office Service	350 Conference Room
355 Conference Room Service	400 Study Facilities
410 Study Room	420 Stack
430 Open-Stack Study Room	440 Processing Room
455 Study Service	500 Special Use Facilities
510 Armory	515 Armory Service
520 Athletic or Physical Education	523 Athletic Facilities Spectator Seating
525 Athletic or Physical Education Service	530 Media Production
535 Media Production Service	540 Clinic
545 Clinic Service	550 Demonstration
555 Demonstration Service	560 Field Building
570 Animal Facilities	575 Animal Facilities Service
580 Greenhouse	585 Greenhouse Service
590 Other (All Purpose)	600 General Use Facilities
610 Assembly	615 Assembly Service
620 Exhibition	625 Exhibition Service
630 Food Facility	635 Food Facility Service
640 Day Care	645 Day Care Service
650 Lounge	655 Lounge Service
660 Merchandising	665 Merchandising Service
670 Recreation	675 Recreation Service
680 Meeting Room	685 Meeting Room Service
700 Support Facilities	710 Central Computer or Telecommunications
715 Central Computer or Telecommunications Service	720 Shop
725 Shop Service	730 Central Storage
735 Central Storage Service	740 Vehicle Storage
745 Vehicle Storage Service	750 Central Service
755 Central Service Support	760 Hazardous Materials Storage
770 Hazardous Waste Storage	775 Hazardous Waste Service

FICM Use Codes	
780 Unit Storage	800 Health Care Facilities
810 Patient Bedroom	815 Patient Bedroom Service
820 Patient Bath	830 Nurse Station
835 Nurse Station Service	840 Surgery
845 Surgery Service	850 Treatment/Examination Clinic
855 Treatment/Examination Clinic Service	860 Diagnostic Service Laboratory
865 Diagnostic Service Laboratory Support	870 Central Supplies
880 Public Waiting	890 Staff On-Call Facility
895 Staff On-Call Facility Service	900 Residential Facilities
910 Sleep/Study Without Toilet or Bath	919 Toilet or Bath
920 Sleep/Study With Toilet or Bath	935 Sleep/Study Service
950 Apartment	955 Apartment Service
970 House	000 Unclassified Facilities
050 Inactive Area	060 Alteration or Conversion Area
070 Unfinished Area	WWW Circulation Area
W01 Bridge/Tunnel	W02 Elevator
W03 Escalator	W04 Loading Dock
W05 Lobby	W06 Public Corridor
W07 Stairway	XXX Building Service Area
X01 Custodial Supply Closet	X02 Janitor Room
X03 Public Rest Room	X04 Trash Room
YYY Mechanical Area	Y01 Central Utility Plant
Y02 Fuel Room	Y03 Shaft
Y04 Utility/Mechanical Space	AAA01 Arenas - Open Air
AAA02 Baseball Fields	AAA03 Basketball Courts
AAA04 Bleachers	AAA05 Circuit Training Courses
AAA06 Climbing Walls	AAA07 Dugouts
AAA08 Field Light Poles	AAA09 Grass Playing Fields
AAA10 Hard Playing Surfaces	AAA11 Press Boxes
AAA12 Rope Course Elements	AAA13 Running Tracks
AAA14 Scoreboards	AAA15 Shooting Ranges
AAA16 Ski Lifts	AAA17 Softball Fields
AAA18 Stadiums	AAA19 Swimming Pools – Open Air
AAA20 Synthetic Fields	AAA21 Tennis Courts
AAA22 Volleyball Courts	AAA23 Other Miscellaneous and Not Defined Athletic – Outdoor

For STREAM projects, the Space category shall be entered as an OmniClass Table 13 code. Below is the current listing of the OmniClass Table 13 codes.

OmniClass Table 13	
13-11 00 00 Space Planning Types	13-11 11 00 Planned Work Space
13-11 13 00 Planned Building Service Space	13-11 15 00 Planned Amenity/Support Space
13-11 17 00 Planned Circulation Space	13-11 19 00 Planned Parking Space
13-13 00 00 Void Areas	13-13 11 00 Light Well
13-13 13 00 Air Shaft	13-13 15 00 Occupant Void Area
13-15 00 00 Wall Spaces	13-15 11 00 Exterior Wall Space
13-15 13 00 Interior Wall Space	13-17 00 00 Encroachment Spaces
13-17 11 00 Interior Encroachment	13-17 13 00 Perimeter Encroachment
13-21 00 00 Parking Spaces	13-21 11 00 Exterior Parking Spaces
13-21 11 11 Exterior Parking Circulation	13-21 11 13 Exterior Parking Access Control Point
13-21 11 15 Exterior Parking Stall	13-21 13 00 Interior Parking Spaces
13-21 13 11 Interior Parking Ramp and Circulation	13-21 13 13 Interior Parking Access Control Point
13-21 13 15 Interior Parking Stall	13-21 13 17 Interior Vehicle Service Space
13-23 00 00 Facility Service Spaces	13-23 11 00 Vertical Penetration

OmniClass Table 13	
13-23 11 11 Mechanical Circulation	13-23 11 11 11 Elevator Shaft
13-23 11 11 13 Elevator Pit	13-23 11 11 15 Elevator Cab
13-23 11 11 17 Elevator Machine Room	13-23 11 11 19 Dumbwaiter
13-23 11 11 21 Escalator	13-23 11 11 23 Freight Elevator
13-23 11 13 Stairway	13-23 11 13 11 Egress Stairway
13-23 11 13 13 Tenant Stairway	13-23 11 15 Monumental Stair
13-23 11 17 Ramp	13-23 11 19 Chimney
13-23 11 21 Chute	13-23 11 23 Service Riser Space
13-23 11 23 11 Power Distribution Riser	13-23 11 23 13 Information Signal Distribution Riser
13-23 11 23 15 Gas Distribution Riser	13-23 11 23 17 Liquid Distribution Riser
13-23 12 00 Horizontal Infrastructure/Service Space, Non-Occupied	13-23 12 11 Power Distribution Network
13-23 12 13 Information Signal Network	13-23 12 15 Gas Distribution Network
13-23 12 17 Liquid Distribution Spaces	13-23 13 00 Control Room
13-23 13 11 Fire Command Center	13-23 13 13 Guard Stations
13-23 15 00 Loading Dock	13-23 17 00 Restroom
13-23 17 11 Men's Restroom	13-23 17 13 Women's Restroom
13-23 17 15 Unisex Restroom	13-23 19 00 Utility Equipment Room
13-23 19 11 Refrigerant Machinery Room	13-23 19 13 Furnace Room
13-23 19 15 Incinerator Room	13-23 19 17 Fuel Room
13-23 19 19 Gas Room	13-23 19 21 Liquid Storage Room
13-23 19 23 Liquid Use, Dispensing and Mixing Room	13-23 19 25 Hydrogen Cutoff Room
13-23 19 27 Electrical Room	13-23 19 29 Switch Room
13-23 19 31 Telecommunications Room	13-23 19 33 Transformer Vault
13-23 21 00 Waste and Recycling Spaces	13-23 21 11 Hazardous Waste Storage
13-23 23 00 Building Service Support Spaces	13-23 23 11 Building Manager Office
13-23 23 13 Custodial Space	13-23 23 15 Shop Area
13-23 23 17 Access Chamber	13-23 23 19 Areaway
13-23 23 21 Service Space	13-23 23 23 Furred Space
13-23 23 25 Crawl Space	13-23 23 27 Attic Space
13-23 23 29 Plenum	13-23 25 00 Equipment Platform
13-23 27 00 Interstitial Space	13-23 29 00 Unimproved Shell
13-23 31 00 Alteration or Conversion Space	13-25 00 00 Circulation Spaces
13-25 11 00 Primary Circulation Spaces	13-25 11 11 Corridor
13-25 11 13 Aisle	13-25 11 15 Mall
13-25 11 17 Concourse	13-25 11 19 Breezeway
13-25 11 21 Moving Walkway	13-25 13 00 Transitional Circulation Spaces
13-25 13 11 Entry Vestibule	13-25 13 13 Entry Lobby
13-25 13 15 Box Lobby	13-25 13 17 Vestibule
13-25 13 19 Elevator Lobby	13-25 13 21 Freight Elevator Vestibule
13-25 13 23 Landing	13-25 13 25 Anteroom
13-25 13 27 Air Lock	13-25 13 29 Sally Port
13-25 13 31 Jet Way	13-25 15 00 Connector
13-25 17 00 External Circulation Spaces	13-25 19 00 Secondary Circulation Spaces
13-25 19 11 Door Set-Back	13-25 21 00 Restricted Spaces
13-25 23 00 Refuge Spaces	13-31 00 00 Education and Training Spaces
13-31 11 00 Breakout Space	13-31 13 00 Lecture and Classroom Spaces
13-31 13 11 Lecture Classroom	13-31 13 13 Classrooms (age 9 plus)
13-31 13 15 Classrooms (ages 5–8)	13-31 13 17 Lecture Hall (Fixed Seats)
13-31 13 19 Assembly Hall	13-31 13 21 Seminar Room
13-31 15 00 Class Laboratories	13-31 15 11 Open Class Laboratory
13-31 15 11 11 Physics Teaching Laboratory	13-31 15 11 13 Astronomy Teaching Laboratory
13-31 15 13 Research/non-class Class Laboratory	13-31 15 15 Laboratory Service Space

OmniClass Table 13	
13-31 17 00 Training Spaces	13-31 17 11 Computer Lab
13-31 17 13 Woodshop/Metalshop	13-31 17 15 Training Support Space
13-31 17 17 Religious Education Space	13-31 19 00 Study Spaces
13-31 19 13 Study Room	13-31 19 15 Study Service
13-33 00 00 Recreation Spaces	13-33 11 00 Athletic Recreation Spaces
13-33 11 11 Athletic Spectator Seating	13-33 11 11 11 Bleacher
13-33 11 13 Team Athletic Recreation Spaces	13-33 11 13 11 Baseball Field
13-33 11 13 13 Softball Fields	13-33 11 13 15 Dugouts
13-33 11 13 17 Grass Playing Fields	13-33 11 13 19 Synthetic Fields
13-33 11 13 21 Football Field	13-33 11 13 23 Soccer Field
13-33 11 13 25 Basketball Courts	13-33 11 13 27 Field Light Poles
13-33 11 13 29 Press Box	13-33 11 13 31 Scoreboards
13-33 11 15 Individual Athletic Recreation Spaces	13-33 11 15 11 Hard Playing Surfaces
13-33 11 15 13 Tennis Courts	13-33 11 15 15 Volleyball Court
13-33 11 15 17 Golf Course	13-33 11 15 19 Driving Range
13-33 11 15 21 Golf Course Support Space	13-33 11 15 23 Skating Rink
13-33 11 15 25 Boxing Ring	13-33 11 15 27 Wrestling Mat
13-33 11 15 29 Diving Board	13-33 11 15 31 Bowling Lane
13-33 11 15 33 Dart Throwing Area	13-33 11 15 35 Circuit Training Course Area
13-33 11 15 37 Running Tracks	13-33 11 15 39 Ski Lift Space
13-33 11 15 41 Exercise Space	13-33 11 15 43 Workout Station
13-33 11 15 45 Aerobic Studio	13-33 11 15 47 Climbing Wall
13-33 11 15 49 Ropes Course Elements	13-33 13 00 Swimming Pools
13-33 13 11 Outdoor Swimming Pool	13-33 13 13 Indoor Swimming Pool
13-33 13 13 11 Diving Tank	13-33 15 00 Non-Athletic Recreation Spaces
13-33 15 11 Park	13-33 15 13 Pleasure Garden
13-33 15 15 Indoor Firing Range	13-33 15 17 Outdoor Shooting Range
13-33 15 19 Recreational Deck	13-33 15 21 Playground
13-33 15 23 Game Room	13-33 15 25 Gambling Table
13-33 15 27 Amusement Ride	13-33 15 29 Parade Grounds
13-33 15 31 Computer-Aided Visual Environment	13-33 15 33 Hobby and Craft Center
13-33 15 35 Dance Floors	13-33 17 00 Wellness Spaces
13-33 17 11 Fitness Center	13-33 17 11 11 Exercise Room
13-33 17 11 13 Weight Room	13-35 00 00 Government Spaces
13-35 11 00 Judicial Spaces	13-35 11 11 Courtroom
13-35 11 11 11 Jury Box	13-35 11 11 13 Jury Room
13-35 11 11 15 Judge's Bench	13-35 11 11 17 Evidence Room
13-35 11 11 19 Jury Assembly Space	13-35 11 11 21 Witness Stand
13-35 11 13 Judge's Chambers	13-35 11 13 11 JCC–Judicial Chambers
13-35 11 13 13 Law Clerk Space	13-35 11 15 Robing Area/Room
13-35 11 19 Hearing Room	13-35 11 19 11 JHR–Judicial Hearing Room
13-35 13 00 Legislative Spaces	13-35 13 11 Council Chambers
13-35 13 13 Legislative Hearing Room	13-35 15 00 Military Spaces
13-35 15 11 Armory	13-35 15 13 Armory Service Space
13-37 00 00 Artistic Spaces	13-37 11 00 Performance Spaces
13-37 11 11 Outdoor Theater	13-37 11 13 General Performance Spaces
13-37 11 13 11 Acting Stage	13-37 11 13 13 Orchestra Pit
13-37 11 13 15 Performance Rehearsal Space	13-37 11 13 17 Soundstage
13-37 11 13 19 Performance Hall	13-37 11 13 21 Band Training Space
13-37 11 15 Audience Spaces	13-37 11 15 11 Pre-Function Lobby
13-37 11 15 13 Audience Seating Space	13-37 11 17 Supporting Performance Spaces
13-37 11 17 11 Projection Booth	13-37 11 17 13 Catwalk
13-37 11 17 15 Stage Wings	13-37 11 17 17 Motion Picture Screen Space
13-37 13 00 Display Spaces	13-37 13 11 Art Gallery
13-37 13 13 Exhibit Gallery	13-37 13 15 Sculpture Garden

OmniClass Table 13	
13-37 13 17 Ornamental Garden	13-37 13 19 Observation Deck
13-37 15 00 Creative Spaces	13-37 15 11 Recording Studio
13-37 15 13 Artist's Studio	13-37 15 15 Photo Lab
13-37 15 15 11 Motion Picture Exchange	13-37 15 17 Media Production
13-37 15 17 11 Media Production Support	13-37 15 17 13 Sound Lock
13-37 15 19 Zen Garden	13-41 00 00 Museum Spaces
13-41 11 00 Museum Gallery	13-45 00 00 Library Spaces
13-45 11 00 Library	13-45 11 11 Library Stack
13-47 00 00 Spiritual Spaces	13-47 11 00 Worship spaces
13-47 11 11 Meditation Chapel	13-47 11 13 Altar
13-47 11 15 Reflection Space	13-47 11 17 Blessing Space
13-47 11 19 Chapel	13-47 11 21 Mihrab
13-47 11 23 Shrine	13-47 11 25 Sanctuary
13-47 11 27 Confessional Space	13-47 11 29 Ark
13-47 11 31 Bimah	13-47 11 33 Tabernacle
13-47 11 35 Pulpit	13-47 11 37 Choir Loft
13-47 13 00 Ceremonial Spaces	13-47 13 11 Marriage Sanctuary
13-47 13 13 Baptistery	13-47 13 15 Circumcision Space
13-47 13 17 Cathedra	13-47 15 00 Procession Spaces
13-47 17 00 Death Spaces	13-47 17 11 Crypt
13-47 17 13 Morgue	13-47 17 13 11 Morgue Compartment
13-47 17 17 Grave Space	13-49 00 00 Environmentally Controlled Spaces
13-49 11 00 Anechoic Chamber	13-49 13 00 Hazard Containment
13-49 15 00 Clean Room	13-49 15 11 Clean Room Class 1
13-49 15 13 Clean Room Class 2	13-49 15 15 Clean Room Class 3
13-49 15 17 Clean Room Class 4	13-49 15 19 Clean Room Class 5
13-49 15 21 Clean Room Class 6	13-49 15 23 Clean Room Class 7
13-49 15 25 Clean Room Class 8	13-49 15 27 Clean Room Class 9
13-49 15 29 Clean Room Support Space	13-49 17 00 Temperature and Pressure Chamber
13-49 19 00 Data Center	13-49 19 11 Data Center Tier I
13-49 19 13 Data Center Tier II	13-49 19 15 Data Center Tier III
13-49 19 17 Data Center Tier IV	13-49 19 19 Data Center Support Space
13-49 21 00 Controlled Space Support	13-49 23 00 Miscellaneous Environmentally Controlled Spaces
13-49 23 11 Film Storage Vault	13-49 23 13 Computer Server Room
13-51 00 00 Healthcare Spaces	13-51 11 00 General Examination Spaces
13-51 11 11 Exam Room	13-51 11 13 Exam Room, Airborne Infection Isolation
13-51 11 15 Exam Room, Isolation	13-51 11 17 Exam Room, OB/Gyn
13-51 11 19 Exam Room, Pediatric	13-51 11 21 Exam Room, Protective Environment Isolation
13-51 11 23 Exam Room, Podiatry	13-51 11 25 Exam Room, Security
13-51 11 27 Height/Weight Screening Space	13-51 11 29 Holding Room, Secured
13-51 14 00 Inpatient Care Spaces	13-51 14 11 Anteroom, Inpatient Airborne Infection Isolation
13-51 14 13 Anteroom, Inpatient Protective Environment Isolation	13-51 14 17 Anteroom, Inpatient Isolation/Seclusion
13-51 14 19 Labor, Delivery, Recovery, Postpartum Room	13-51 14 21 Medical Information Computer System Room
13-51 14 23 Newborn Nursery	13-51 14 25 NICU Nursery
13-51 14 27 Nursery Transport Unit Alcove	13-51 14 29 Nursery, Airborne Infection Isolation
13-51 14 31 Nursery, Observation	13-51 14 33 Nursery, Special Care
13-51 14 35 Patient Room	13-51 14 35 11 Patient Room, Airborne Infection Isolation
13-51 14 35 13 Patient Room, Bariatric	13-51 14 35 15 Patient Room, Intensive Care

OmniClass Table 13	
13-51 14 35 17 Patient Room, Intensive Care, Airborne Infection Isolation	13-51 14 35 19 Patient Room, Intensive Care, Protective Environment Isolation
13-51 14 35 21 Patient Room, Isolation	13-51 14 35 23 Patient Room, Monitored
13-51 14 35 25 Patient Room, One-Bed	13-51 14 35 27 Patient Room, Protective Environment Isolation
13-51 14 35 29 Patient Room, Seclusion	13-51 14 35 31 Patient Room, Transitional, One-Bed
13-51 14 35 33 Patient Room, Two-Bed	13-51 17 00 Multi-Medical Service Support Spaces
13-51 17 11 Clean Linen Storage Room, Healthcare	13-51 17 13 Clean Supply Room, Healthcare
13-51 17 15 Clean Utility Room, Healthcare	13-51 17 17 Consultation Room, Patient
13-51 17 19 Mental Health Interview/Counseling Room	13-51 17 21 Equipment Storage Room, Healthcare
13-51 17 22 Medical Records Storage Room	13-51 17 23 Nurse Workspaces
13-51 17 23 11 Nurse Station	13-51 17 23 13 Nurse Station/Communication Center
13-51 17 23 15 Nurse Sub-Station	13-51 17 23 17 Nurse Triage Space
13-51 17 25 Soiled Utility Room, Healthcare	13-51 17 27 Soiled Utility/Supply Room, Healthcare
13-51 17 29 Mental Health Multipurpose Room w/Control Room	13-51 17 31 Resuscitation Cart Alcove
13-51 17 35 Mental Health Quiet Room	13-51 21 00 Diagnostic Imaging Spaces
13-51 21 11 Angiographic Procedure Room	13-51 21 13 Bone Densitometry Room
13-51 21 15 CT Scanning Room	13-51 21 17 CT Simulator Room
13-51 21 19 Cystoscopic Radiology Room	13-51 21 21 Head Radiographic Room
13-51 21 23 Mammography Room	13-51 21 25 Mobile Imaging System Alcove
13-51 21 27 MRI Scanning Room	13-51 21 29 MRI System Component Room
13-51 21 31 PET/CT Scanning Room	13-51 21 33 PET/CT Simulator Room
13-51 21 35 Radiographic Chest Room	13-51 21 37 Radiographic Room
13-51 21 39 Radiographic/Fluoroscopic Room	13-51 21 41 Radiographic/Tomographic Room
13-51 21 43 Radiology Computer Systems Room	13-51 21 45 Stereotactic Mammography Room
13-51 21 47 Ultrasound Room	13-51 21 49 Ultrasound/Optical Coherence Tomography Room
13-51 21 51 Whole Body Scanning Room	13-51 24 00 Diagnostic Imaging Support Spaces
13-51 24 11 Angiographic Control Room	13-51 24 13 Angiographic Instrument Room
13-51 24 15 Angiographic Procedure Control Area	13-51 24 17 Angiographic System Component Room
13-51 24 19 Silver Collection Area, Diagnostic Imaging	13-51 24 21 Computed Radiology Reader Area
13-51 24 23 Computer Image Processing Area, Diagnostic Imaging	13-51 24 24 X-Ray, Digital Image Storage Space
13-51 24 25 CT Control Area	13-51 24 27 CT Power and Equipment Room
13-51 24 29 Image Quality Control Room	13-51 24 31 Image Reading Room
13-51 24 32 X-Ray, Plane Film Storage Space	13-51 24 33 Mammography Processing Room
13-51 24 34 X-Ray Film, Daylight Processing Space	13-51 24 35 MRI Control Room
13-51 24 37 MRI Equipment Storage Room	13-51 24 39 MRI Viewing Room
13-51 24 41 PET/CT Control Room	13-51 24 43 Radiographic Control Room
13-51 24 45 Radiographic Darkroom	13-51 24 47 Tele-Radiology/Tele-Medicine Room
13-51 24 49 Viewing/Consultation Room, Diagnostic Imaging	13-51 24 51 X-Ray, Mobile C-Arm Alcove
13-51 27 00 Radiation Diagnostic and Therapy Spaces	13-51 27 11 Equipment Calibration Space, Radiation Diagnostic and Therapy
13-51 27 13 Health Physics Laboratory	13-51 27 15 Linear Accelerator Component Room, Healthcare

OmniClass Table 13	
13-51 27 17 Linear Accelerator Entrance Maze, Healthcare	13-51 27 19 Linear Accelerator Room, Healthcare
13-51 27 21 Linear Accelerator Control Room, Healthcare	13-51 27 23 Radioactive Waste Storage Room, Healthcare
13-51 27 25 Nuclear Medicine Dose Calibration Space	13-51 27 27 Nuclear Medicine Scanning Room
13-51 27 29 Nuclear Medicine Patient "Hot" Waiting Room	13-51 27 31 Patient Dose/Thyroid Uptake Room
13-51 27 33 Radiation Dosimetry Planning Room	13-51 27 35 Radiopharmacy
13-51 27 37 Radium Cart Holding Space	13-51 27 38 Radiation Therapy, Mold Fabrication Shop
13-51 27 39 Sealed Source Room	13-51 31 00 Heart and Lung Diagnostic and Treatment Spaces
13-51 31 11 Brachytherapy Room	13-51 31 13 Cardiac Catheter Instrument Room
13-51 31 15 Cardiac Catheter System Component Room	13-51 31 17 Cardiac Catheterization Control Room
13-51 31 19 Cardiac Catheterization Laboratory	13-51 31 21 Cardiac Electrophysiology Room
13-51 31 23 Cardiac Testing Room	13-51 31 25 Echocardiograph Room
13-51 31 27 EKG Testing Room	13-51 31 29 Extended Pulmonary Function Testing Laboratory
13-51 31 31 Microvascular Laboratory	13-51 31 33 Pacemaker ICD Interrogation Room
13-51 31 35 Pacemaker/Holter Monitor Room	13-51 31 37 Procedure Viewing Area
13-51 31 39 Pulmonary Function Testing Laboratory	13-51 31 40 Pulmonary Function Treadmill Room
13-51 31 41 Pulmonary Screening Room	13-51 31 43 Respiratory Inhalation Cubicle
13-51 31 45 Respiratory Therapy Clean-up Room	13-51 31 47 Spirometry Test Room
13-51 31 49 Stress Echocardiograph Room	13-51 31 51 Stress Testing Treadmill Room
13-51 31 53 Transesophageal Echocardiography Room	13-51 34 00 General Diagnostic Procedure and Treatment Spaces
13-51 34 11 Allergen Preparation Space	13-51 34 13 Allergy Injection Room
13-51 34 15 Allergy Skin Testing	13-51 34 17 Antepartum Testing (NST) Room
13-51 34 19 Biofeedback Treatment Control/Office	13-51 34 21 Biofeedback Treatment Room
13-51 34 23 Cast and Splint Room	13-51 34 25 Chemotherapy Treatment Room
13-51 34 27 Dermatology Cryotherapy Space	13-51 34 29 Dermatology Procedure Room
13-51 34 31 Dialysis Clean Equipment Preparation Room	13-51 34 33 Dialysis Soiled Equipment Processing
13-51 34 35 Dialysis Training Room	13-51 34 37 EEG Exam Room
13-51 34 39 EEG Instrument and Work Room	13-51 34 41 EEG/Sleep Study Monitoring Room
13-51 34 43 Electromyography Room	13-51 34 45 ENT Procedure Room
13-51 34 47 Evoked Potential Response Room	13-51 34 49 General Purpose Dirty Treatment Room
13-51 34 51 Immunization Room	13-51 34 53 Infectious Disease Decontamination Shower
13-51 34 55 Infectious Disease Decontamination Suite	13-51 34 57 Life Support Unit Room
13-51 34 61 OB/GYN Treatment Room	13-51 34 63 Patient Observation and Treatment Room
13-51 34 65 Pentamidine Treatment Room	13-51 34 67 Peritoneal Dialysis Exam Room
13-51 34 69 Peritoneal Dialysis Procedure Room	13-51 34 71 Phototherapy Treatment Room
13-51 34 73 Renal Dialysis Bed Station, Private	13-51 34 75 Renal Dialysis Room, Negative Pressure
13-51 34 77 Renal Dialysis, Chair Station, Cubicle	13-51 34 78 Renal Dialysis, Water Treatment Room
13-51 34 79 Sleep Study Room	13-51 34 81 Provider Trainee Observation Area, Healthcare
13-51 34 83 Treatment Cubicle, Healthcare	13-51 34 85 Treatment Room, Healthcare

OmniClass Table 13	
13-51 34 87 Neuropsychology Testing Laboratory	13-51 37 00 Eye and Ear Healthcare Spaces
13-51 37 11 Audiology Immittance Room	13-51 37 13 Audiometric Exam Booth
13-51 37 15 Audiometric Exam Suite	13-51 37 17 Audiometric Multi-Exam Suite
13-51 37 19 Audiology Electrophysiology Exam Room	13-51 37 20 Hearing Aid Testing Laboratory
13-51 37 21 Electroretinography Room	13-51 37 23 ENT Exam Room
13-51 37 25 Exam/Training Room, Low Vision	13-51 37 27 Eye Lane
13-51 37 29 Laser Treatment Room	13-51 37 31 Ophthalmology Procedure Room
13-51 37 33 Ophthalmology/Optometry Exam Room	13-51 37 35 Photography Room, Ophthalmology/Optometry
13-51 37 37 PRK/LASIK Treatment Room	13-51 37 39 Sinusoidal Vertical Axis Rotational Rest Room
13-51 37 41 Tilt Table Testing Room	13-51 37 43 Training Room, Low Vision, Polytrauma
13-51 37 45 Ultrasound/Optical Coherence Tomography Room	13-51 37 47 Vestibulography Room
13-51 37 49 Vision/Hearing Screening Room	13-51 37 51 Vision Screening Room
13-51 37 53 Vision Testing Station	13-51 37 55 Visual Fields Room
13-51 37 57 Eye, Contact Lens Fitting/Dispensing Space	13-51 37 59 Eyeglass Fitting and Dispensing Space
13-51 41 00 Endoscopy/Gastroenterology Spaces	13-51 41 11 Bronchoscopy Equipment Preparation Room
13-51 41 13 Bronchoscopy Procedure Room	13-51 41 15 Endoscope Clean-up, Sterilization, and Storage Room
13-51 41 17 Endoscopy Room	13-51 41 19 Gastroenterology Laboratory
13-51 41 21 Proctoscopy/Sigmoidoscopy Room	13-51 41 23 Urodynamics Treatment Room
13-51 44 00 Surgical Spaces	13-51 44 11 Anesthesia Workroom and Equipment Storage
13-51 44 13 Cardiac Operating Room	13-51 44 15 Cardiac Pump Room
13-51 44 17 Cesarean Birth Room	13-51 44 19 Cystoscopy Room
13-51 44 21 Equipment Storage Room, Surgical	13-51 44 23 Frozen Section Laboratory
13-51 44 25 General Operating Room	13-51 44 27 Nerve Block Induction Room
13-51 44 29 Neurosurgery Operating Room	13-51 44 31 Orthopedic Operating Room
13-51 44 33 Patient Holding Area, Surgical	13-51 44 35 Postanesthesia Recovery Cubicle
13-51 44 37 Postanesthesia Recovery Isolation Room	13-51 44 39 Postoperative Recovery Lounge
13-51 44 41 Preparation/Recovery Spaces, Surgical	13-51 44 41 11 Preparation/Recovery Cubicle, Surgical
13-51 44 41 13 Preparation/Recovery Room, Surgical	13-51 44 43 Procedure/Minor Operating Room
13-51 44 45 Scrub/Gowning Area	13-51 44 47 Sub-Sterile Room
13-51 44 50 Operating Room, Sterile Storage	13-51 44 51 Surgical Laser Treatment Room
13-51 44 53 Recovery Room, Surgical	13-51 44 55 Surgical Suite, Workroom and Supply Space
13-51 47 00 Clinical Laboratory Spaces	13-51 47 11 Automated Clinical Laboratory
13-51 47 13 Bioassay (Radioimmunoassay) Room	13-51 47 15 Blood Gas Laboratory
13-51 47 17 Blood Hemotherapeutics Room	13-51 47 19 Bone Dissection Laboratory
13-51 47 21 Clinical Chemistry Laboratory	13-51 47 23 Clinical Microbiology Laboratory
13-51 47 25 Cytology Laboratory	13-51 47 27 Cytology Screening and Histology Space
13-51 47 29 Dermatology Laboratory	13-51 47 31 Electron Microscope Suite
13-51 47 33 Electron Microscope System Room	13-51 47 35 Entomology Laboratory
13-51 47 37 Flow Cytometer Space	13-51 47 39 Fluorescence Microscope Room
13-51 47 41 General Clinical Laboratory Area	13-51 47 43 Hematology Laboratory, Coagulation
13-51 47 45 Hematology Laboratory, Routine	13-51 47 47 Histology Laboratory
13-51 47 49 Immunopathology Laboratory	13-51 47 51 Microbiology Biosafety Laboratory

OmniClass Table 13	
13-51 47 53 Microbiology Mycology Laboratory	13-51 47 55 Microbiology Mycobacteriology Laboratory
13-51 47 57 Moh's Laboratory	13-51 47 59 Mycology Laboratory
13-51 47 61 Nephrology Renal Study Space	13-51 47 63 Renal Studies Laboratory
13-51 47 65 Special Chemistry Laboratory	13-51 47 67 Urine Testing Alcove
13-51 47 69 Urinalysis Laboratory	13-51 47 71 Urology Laboratory
13-51 47 73 Medical Autopsy Room	13-51 51 00 Clinical Laboratory Support Spaces
13-51 51 11 Blood Bank Donor Station	13-51 51 13 Blood Bank Preparation Rom
13-51 51 15 Blood Bank Blood Product Storage Space	13-51 51 17 Blood Bank Storage and Transfusion Room
13-51 51 19 Blood Specimen Collection Room	13-51 51 21 Cell Bank Freezer, Ultra Low
13-51 51 23 Electron Microscope Automated Data Processing Room	13-51 51 25 Electron Microscope Cutting Room
13-51 51 27 Electron Microscope Dark Room	13-51 51 29 Electron Microscope Developing, Printing and Enlarging Room
13-51 51 31 Electron Microscope Finishing Room	13-51 51 33 Electron Microscope Preparation Room
13-51 51 35 Glassware Washing and Decontamination Room, Clinical Laboratory	13-51 51 37 Glassware Washing Room, Clinical Laboratory
13-51 51 39 Slides and Blocks Storage Room, Clinical Laboratory	13-51 51 41 Sterilization and Solution Preparation Room, Clinical Laboratory
13-51 51 43 Tissue Storage Area, Clinical Laboratory	13-51 51 45 Microbiology Media Preparation Laboratory
13-51 51 47 Specimen Accessioning, Processing and Distribution Room	13-51 51 49 Laboratory, Water
13-51 54 00 Pharmacy Spaces	13-51 54 11 Chemotherapy Agent Medication Preparation Room
13-51 54 13 Compound Sterile Preparation Space - High Risk	13-51 54 15 Compound Sterile Preparation Space - Low Risk
13-51 54 17 Compounding Area	13-51 54 19 Dialysate Preparation Room
13-51 54 21 IV Admixture Anteroom	13-51 54 23 IV Admixture Room
13-51 54 25 Medication Preparation Room	13-51 54 27 Methadone Dispensing Station
13-51 54 29 Oncology Drug Preparation Area	13-51 54 31 Pharmacy
13-51 54 32 Pharmacy, Dispensing Space	13-51 54 33 Pharmacy Manufacturing & Prepack Space
13-51 54 35 Prescription Receiving Station	13-51 54 37 Pharmacy, Bulk, Breakdown and Verification Area
13-51 54 39 Pharmacy, Controlled Substances and Secured Dispensing	13-51 57 00 Medical Services Logistic Spaces
13-51 57 11 Automatic Cart Wash Area, Healthcare	13-51 57 13 BSL3 Infectious Disease Suite, Autoclave Room
13-51 57 15 BSL3 Suite, Autoclave Room	13-51 57 17 Cart Assembly/Queue Area, Healthcare
13-51 57 19 Clean Cart Holding Area, Healthcare	13-51 57 20 Medical Material Cart Restocking Area
13-51 57 21 Clean Linen Preparation and Storage Area, Healthcare	13-51 57 23 Clean Supply Preparation and Assembly Area, Healthcare
13-51 57 25 Clean Supply Preparation Area, Healthcare	13-51 57 27 Equipment Processing and Clean Storage Room, Healthcare
13-51 57 29 Ethylene Oxide Gas Sterilizer Room	13-51 57 31 Instrument Sterilization Room
13-51 57 32 Central Sterile, Receiving and Decontamination	13-51 57 33 Manual Cart Wash Area, Healthcare
13-51 57 35 Soiled Cart Holding Area, Healthcare	13-51 57 37 Soiled Cart Receiving Area, Healthcare
13-51 57 39 Soiled Instrument and Equipment Receiving and Decontamination Room, Healthcare	13-51 57 41 Sterile Supply Preparation and Assembly Area, Healthcare
13-51 57 43 Biomedical Electronic Repair	13-51 61 00 Rehabilitation Spaces

OmniClass Table 13	
13-51 61 11 Amputee Training Area	13-51 61 13 Brace Shop Fitting Shop
13-51 61 15 Brace Shop , Adjustment/Modification Area	13-51 61 17 Brace Shop Welding Area
13-51 61 19 Computer Activities Room, Rehabilitation	13-51 61 21 Prosthesis Design and Manufacturing Room, Rehabilitation
13-51 61 23 Dynamic Alignment Room	13-51 61 25 Therapeutic Exercise Spaces
13-51 61 25 11 Therapeutic Exercise Area	13-51 61 25 13 Exercise/Therapy Gymnasium
13-51 61 25 15 Individual Therapeutic Exercise Area	13-51 61 25 17 Treatment/Exercise Area
13-51 61 27 Eye Fitting Studio	13-51 61 29 Facial/Body Fitting Studio
13-51 61 31 Fitting Room, Custom Fabrication	13-51 61 33 Fitting Room, Soft Goods Fabrication
13-51 61 35 Gait Lane	13-51 61 37 Gait Study Track
13-51 61 39 Hearing Aid Fabrication and Modification Room	13-51 61 41 Hubbard Tank - Full Immersion
13-51 61 43 Hubbard Tank - Partial Immersion	13-51 61 45 Hydrotherapy Area
13-51 61 47 Neurophysiology Rehabilitation Room	13-51 61 49 Occupational Therapy Room
13-51 61 50 Occupational Therapy, Daily Living Skills Training and Evaluation Room	13-51 61 51 Pediatric Developmental Therapy Space
13-51 61 53 Physical Therapy/Kinesiology Therapy Room	13-51 61 55 Posturography Exam Room
13-51 61 57 Prosthetic and Orthotic Dust Room	13-51 61 59 Prosthetic and Orthotic Fume Room
13-51 61 61 Prosthetic and Orthotic Work Station	13-51 61 63 Prosthetic and Orthotic, Maintenance Support Room
13-51 61 65 Rehabilitation Therapy Gym	13-51 61 67 Speech Pathology Individual Therapy Room
13-51 61 68 Speech Therapist, Exam and Treatment Space	13-51 61 69 Therapeutic Pool
13-51 61 71 Wheelchair Repair Workspace	13-51 61 73 Whirlpool
13-51 61 75 Rehabilitation Living Skills Training Apartment	13-51 64 00 Dental Spaces
13-51 64 11 Dental CS Suite	13-51 64 13 Dental Hygiene and Operatory Room
13-51 64 15 Dental Hygiene Room	13-51 64 17 Dental Porcelain Room
13-51 64 19 Dental Prosthetics Laboratory	13-51 64 21 Dental Screening Room
13-51 64 23 Dental Self Preparation Area	13-51 64 25 Dental Treatment t Room, Mini Laboratory
13-51 64 27 Dental Treatment Room	13-51 64 29 Dental Treatment Room, Conscious Sedation Support
13-51 64 31 Dental Treatment Room, Endodontics	13-51 64 33 Dental Treatment Room, Orthodontics
13-51 64 35 Dental Treatment Room, Pediatrics	13-51 64 37 Dental Treatment Room, Periodontics
13-51 64 39 Dental Treatment Room, Prosthodontics	13-51 64 41 Dental X-Ray Room
13-51 64 43 Instrument Preparation and Sterilization Room	13-51 64 45 Maxillo-Facial Laboratory
13-51 64 47 Maxillo-Facial Treatment Room	13-51 64 49 Oral Pathology Laboratory
13-51 64 51 Oral Surgery Residency Room	13-51 64 53 Oral Surgery Room
13-51 64 55 Panoramic Dental X-Ray Room	13-51 64 57 Dental X-Ray Support Room
13-51 67 00 Medical Research and Development Spaces	13-51 67 11 Research Animal Recovery Area
13-51 67 13 Barrier Suite, Procedure Laboratory	13-51 67 15 Biomedical Research BSL3 Suite Tissue Culture Room
13-51 67 17 Biomedical Research Tissue Culture Room	13-51 67 18 Laboratory, Research, Biochemistry
13-51 67 19 Biosafety Level 3 Laboratory	13-51 67 21 BSL3 Infectious Disease Suite, Procedure Laboratory
13-51 67 23 BSL3 Procedure Room	13-51 67 25 Environmental Suite Infectious Disease Procedure Laboratory

OmniClass Table 13	
13-51 67 27 Research Infectious Disease Animal Holding Area	13-51 67 29 Research Veterinary Radiography Control Room
13-51 67 31 Research and Development Machine Shop	13-51 67 33 Research Veterinary Radiography Procedure Room
13-51 67 35 Research Diagnostic Laboratory	13-51 67 37 Research NMR Room
13-51 67 39 Research Procedure Laboratory	13-51 67 41 Research Veterinary Surgical Suite, Animal Preparation Room
13-51 67 43 Research Veterinary BSL3 Infectious Disease Suite Holding Room	13-51 67 45 Research Veterinary Barrier Suite Holding Room
13-51 67 47 Research Veterinary Chemical/Radioisotope Suite Holding Room	13-51 67 49 Research Veterinary Environmental Suite Holding Room
13-51 67 51 Research Veterinary Quarantine Holding Room	13-51 67 53 Research Veterinary Surgery Room
13-51 91 00 Veterinary Spaces	13-51 91 11 Hospitalization Kennel
13-51 91 14 Infectious Disease Animal Holding Area	13-51 91 17 Veterinary Radiography Control Room
13-51 91 20 Veterinary Radiography Procedure Room	13-51 91 23 Veterinary Surgical Suite, Animal Preparation Room
13-51 91 26 Veterinary BSL3 Infectious Disease Suite Holding Room	13-51 91 29 Veterinary Barrier Suite Holding Room
13-51 91 32 Veterinary Examination and Treatment Room	13-51 91 35 Veterinary Quarantine Holding Room
13-51 91 38 Veterinary Surgery Room	13-51 91 41 Cage Wash Area
13-51 91 44 Veterinary Food Preparation Room	13-53 00 00 Laboratory Spaces
13-53 11 00 Chemistry Laboratories	13-53 13 00 Biosciences Laboratories
13-53 15 00 Physical Sciences Laboratories	13-53 15 11 Optical Physics Laboratory
13-53 15 13 Physics Research Laboratory	13-53 17 00 Astronomy Laboratories
13-53 17 11 Astronomy Research Laboratory	13-53 19 00 Earth and Environmental Sciences Laboratories
13-53 19 11 Geology Laboratory	13-53 19 13 Earth Sciences Research Laboratory
13-53 21 00 Forensics Laboratories	13-53 23 00 Psychology Laboratories
13-53 25 00 Bench Laboratories	13-53 27 00 Dry Laboratories
13-53 29 00 Integration Laboratories	13-53 31 00 Wet Laboratories
13-53 33 00 Laboratory Storage Spaces	13-53 35 00 Laboratory Support Spaces
13-55 00 00 Commerce Activity Spaces	13-55 11 00 Office Spaces
13-55 11 11 Office Service	13-55 11 13 Dedicated Enclosed Workstation
13-55 11 15 Shared Enclosed Workstation	13-55 11 17 Dedicated Open Workstation
13-55 11 19 Shared Open Workstation	13-55 11 21 Open Team Setting
13-55 11 23 General File and Storage	13-55 11 25 Shared Workstation File and Storage
13-55 11 27 Shared Equipment Station	13-55 11 29 Lookout Gallery
13-55 13 00 Banking Spaces	13-55 13 11 Bank Teller Space
13-55 13 13 Automatic Teller Machine Space	13-55 13 15 Vault
13-55 15 00 Trading Spaces	13-55 15 11 Trading Floor
13-55 17 00 Demonstration Spaces	13-55 19 00 Sales Spaces
13-55 19 11 Checkout Space	13-55 19 13 Display Space
13-55 19 15 Fitting Space	13-55 19 17 Vending Machine Area
13-55 19 19 Auction Room	13-55 19 21 Pet Shop Animal Space
13-55 21 00 Commercial Service and Repair Spaces	13-55 23 00 Commercial Support Spaces
13-55 27 00 Hotel, Motel, Hostel, and Dormitory Service Spaces	13-55 27 11 Dormitory
13-55 27 13 Hotel Residence Room	13-55 29 00 Commerce Activity Support Areas
13-55 29 11 Information Counter	13-55 29 13 Lobby Non-Circulation Space
13-55 29 15 Post Office Space	13-55 29 17 Mail Room Space
13-55 29 19 Box Lobby	13-55 29 21 Meeting Spaces
13-55 29 21 11 Conference Room	13-55 29 21 13 Press Conference Room

OmniClass Table 13	
13-55 29 21 15 Community Room	13-55 29 21 17 War Room
13-55 29 21 19 Meeting Equipment Room	13-55 29 23 Waiting Space
13-55 29 23 11 Reception Space	13-55 29 23 13 Waiting Room
13-55 29 23 15 Queuing Space	13-55 29 25 Business Support Space
13-57 00 00 Service Activity Spaces	13-57 11 00 Grooming Activity Spaces
13-57 11 11 Makeup Space	13-57 11 13 Haircutting Space
13-57 13 00 Food Service	13-57 13 11 Cooking Spaces
13-57 13 13 Kitchen Space	13-57 13 13 11 Food Preparation Space
13-57 13 13 13 Cooking Space	13-57 13 13 15 Dishwashing Station
13-57 13 15 Dining and Drinking Spaces	13-57 13 15 11 Dining Room
13-57 13 15 13 Banquet Hall	13-57 13 15 15 Food Court
13-57 13 15 17 Snack Bar	13-57 13 15 19 Salad Bar
13-57 13 15 21 Liquor Bar	13-57 13 15 23 Beverage Station
13-57 13 15 25 Table Bussing Station	13-57 13 15 27 Serving Station
13-57 13 15 29 Vending Perishable Product Space	13-57 13 15 31 Cafeteria Vending Space
13-57 13 15 33 Tray Return Space	13-57 13 15 35 Food Discard Station
13-57 13 17 Coffee stations	13-57 15 00 Child Care Spaces
13-57 15 11 Daycare sickroom	13-57 15 13 Child Day Care Space
13-57 15 15 Play Room	13-57 15 17 CLD–Child Care
13-57 17 00 Resting Spaces	13-57 17 11 Rest Area
13-57 17 13 Break Room	13-57 21 00 Laundry/Dry Cleaning Space
13-57 23 00 Smoking Space	13-59 00 00 Production, Fabrication, and Maintenance Spaces
13-59 11 00 Material Handling Area	13-59 13 00 Batching Space
13-59 15 00 Production Process	13-59 15 11 Workbench
13-59 15 13 Mock-up Space	13-59 17 00 Printing and Reproduction Spaces
13-59 19 00 Quality Control and Test Spaces	13-59 19 11 Product Inspection Space
13-59 19 13 Production Observation Space	13-59 21 00 Production Service and Repair Spaces
13-59 23 00 Production and In-Process Storage Spaces	13-59 25 00 Production Support Spaces
13-59 29 00 Greenhouse Spaces	13-59 29 11 Greenhouse Support Space
13-61 00 00 Protective Spaces	13-61 11 00 Animal Securing Spaces
13-61 11 11 Cage	13-61 11 13 Animal Stall
13-61 11 15 Kennel	13-61 11 17 Aquarium
13-61 13 00 Detention Spaces	13-61 13 11 Detention Cell
13-61 13 13 Holding Cell	13-61 13 15 Impound Lot
13-61 13 17 Dayroom	13-61 15 00 Spaces for Protection from the Elements
13-61 15 11 Park Shelter	13-61 15 13 Entry Porch
13-61 15 15 Covered Walkway	13-61 15 17 Canopy
13-61 15 19 Shielded Room	13-61 15 21 Containment Room
13-61 17 00 Spaces for Protection from Violence	13-61 17 11 Safe Room
13-61 17 13 Bunker	13-61 17 15 Bomb Shelter
13-63 00 00 Storage Spaces	13-63 11 00 Warehouse Spaces
13-63 11 11 High Bay Warehouse Space	13-63 11 13 General Warehouse Space
13-63 11 15 Warehouse Support Space	13-63 13 00 Non-Warehouse Storage Spaces
13-63 13 11 Storage Room	13-63 13 11 11 GNS–General Storage
13-63 13 13 Closet	13-63 13 15 Coat Check
13-63 13 17 Locker Room	13-63 13 19 Filing Space
13-63 13 21 Supply Room	13-63 13 23 Unit Storage
13-63 13 25 Consolidation/Containerization Point	13-63 13 27 Self Storage Space
13-63 13 29 Operational Storage (Misc)	13-63 13 31 Operational Hazardous/Flammable Storage
13-63 15 00 Moveable Storage Spaces	13-63 15 11 Vehicle Storage Compartment
13-63 15 13 Portable Bin	13-63 15 15 Vessel Hold

OmniClass Table 13	
13-63 17 00 Environmentally Controlled Storage Spaces	13-63 17 11 Refrigeration Compartment
13-63 17 13 Freezing Compartment	13-63 17 15 Humidity Controlled Storage Space
13-63 17 17 Vacuum Sealed Storage Compartment	13-63 19 00 Specialty Storage Spaces
13-63 19 11 Sanitary Storage Room	13-63 19 13 Soiled Storage Room Space
13-63 19 15 Sacristy	13-63 19 17 Vestry
13-63 19 19 Hazardous Material Storage Space	13-63 19 21 Book Stacks
13-63 19 23 Baggage Claim	13-63 19 25 Evidence Room
13-63 19 27 Vehicle Impound Lot	13-63 19 29 Operating Fuel Storage
13-65 00 00 Private Residential Spaces	13-65 11 00 On-call Room
13-65 13 00 Bathroom	13-65 13 11 Shower Space
13-65 13 13 Toilet Space	13-65 13 15 Ablution Room
13-65 13 17 Combination Toilet and Bathing Space	13-65 15 00 Mud Room
13-65 17 00 Laundry Room	13-65 19 00 Bedroom
13-65 19 11 Mental Health Resident Bedroom	13-65 19 13 Mental Health Resident Bedroom, Bariatric
13-65 21 00 Nursery	13-65 23 00 Kitchen
13-67 00 00 Alternate Workplace	13-67 11 00 Customer Site
13-67 13 00 Home Office	13-67 15 00 Rent-An-Office
13-67 17 00 No Fixed Location	13-67 19 00 Supplier Site
13-69 00 00 Building Associated Spaces	13-69 11 00 Roof
13-69 13 00 Roof Terrace	13-69 15 00 Penthouse
13-69 17 00 Antenna Farm	13-69 19 00 Heliport
13-69 21 00 Balcony	13-69 23 00 Deck
13-69 25 00 Pedestrian Travel Spaces	13-69 25 11 Sidewalk
13-69 25 13 Pedestrian Way	13-69 25 15 Pedestrian Bridge
13-69 25 17 Footpath	13-69 25 19 Trail
13-69 25 21 Gangway	

Appendix D – State of Tennessee Office of the State Architect (TN OSA) General and Equipment Inventory Requirements

Equipment Inventory

The following tables list the required equipment types, attributes, and naming standards for TN OSA.

Component Naming Standard Format:

TypeID	-	Type	-	Space Name	-	Number

Example: AHU-5000C-100-12.1223-001

Equipment types shall have specific equipment attributes as indicated in the tables below.

Table Legend

D: Required attribute value provided by the designer.
OP: Required attribute value may be provided by the designer. At a minimum, the designer must provide the attribute name even if no value is provided.
C: Required attribute value provided by the contractor.
U/C: Required attribute value updated by the contractor with as-installed information.

Note: A blank field means the indicated party is not responsible for providing the attribute.

State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES							
DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
HVAC	CHILLERS	CH	CH-TypeXX-Room#-No.	Power	TYPE	OP	C
				Capacity	TYPE	OP	C
				WaterFlow	TYPE	OP	C
				EnteringWaterTemp	TYPE	OP	C

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES			
				LeavingWaterTemp	TYPE	OP	C
				MotorController	TYPE	OP	C
				ChillerType	TYPE	OP	C
				RefrigerantType	TYPE	OP	C
				EnergyEfficiencyRatio(EER)	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				VariableSpeedDrive	TYPE	OP	C
				Frequency	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
HVAC	BOILERS	BLR	BLR-TypeXX-Room#-No.	FullLoadFuelConsumption	TYPE	OP	C
				ThermalEfficiency	TYPE	OP	C
				WaterFlow	TYPE	OP	C
				EnteringWaterTemp	TYPE	OP	C
				LeavingWaterTemp	TYPE	OP	C
				VentDiameter	TYPE	OP	C
				Passes	TYPE	OP	C
				FuelType	TYPE	OP	C
				OutputMedia	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
HVAC	AIR HANDLING UNITS	AHU	AHU-TypeXX-Room#-No.	FanFlow-Maximum	TYPE	OP	C
				FanFlow-Nominal	TYPE	OP	C

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				FanOutsideFlow	TYPE	OP	C
				FanMotorHorsepower	TYPE	OP	C
				FanMotorEfficiency	TYPE	OP	C
				FanBrakeHorsepower	TYPE	OP	C
				FanSpeed	TYPE	OP	C
				CoilFlow	TYPE	OP	C
				CoilCapacity	TYPE	OP	C
				EnteringAirTempDB	TYPE	OP	C
				EnteringAirTempWB	TYPE	OP	C
				LeavingAirTempDB	TYPE	OP	C
				EnteringWaterTemp	TYPE	OP	C
				LeavingWaterTemp	TYPE	OP	C
				CoilAirPressureDrop	TYPE	OP	C
				CoilWaterPressureDrop	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
HVAC	FAN COIL UNITS	COIL	COIL-TypeXX-Room#-No.	AirFlow	TYPE	OP	C
				FanSpeed	TYPE	OP	C
				ExitStaticPressure	TYPE	OP	C
				EnteringAirTempDB	TYPE	OP	C
				EnteringAirTempWB	TYPE	OP	C
				LeavingAirTempDB	TYPE	OP	C
				LeavingAirTempWB	TYPE	OP	C
				TotalCapacity	TYPE	OP	C
				SensibleCapacity	TYPE	OP	C
				EnteringWaterTemp	TYPE	OP	C
				LeavingWaterTemp	TYPE	OP	C
				ChilledWaterFlow	TYPE	OP	C
				CoolingCoilDeltaP	TYPE	OP	C
				CoolingRows	TYPE	OP	C
				FanMotorHorsepower	TYPE	OP	C

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				FanMotorEfficiency	TYPE	OP	C
				FanBrakeHorsepower	TYPE	OP	C
				Phase	TYPE	OP	C
				CabinetType	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
HVAC	PUMPS	HVACP	HVACP-TypeXX-Room#-No.	RatedFlow	TYPE	OP	C
				PumpMotorHorsepower	TYPE	OP	C
				PumpMotorEfficiency	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
HVAC	FANS	FAN	FAN-TypeXX-Room#-No.	FlowRate	TYPE	OP	C
				Pressure	TYPE	OP	C
				FanMotorHorsepower	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C

State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
				ElectricalPanelName	COMPONENT		
				ElectricalPanelCircuit	COMPONENT		
HVAC	COMPRESSORS	COMPR	COMPR-TypeXX-Room#-No.	RefrigerantType	TYPE	OP	C
				Capacity	TYPE	OP	C
				Speed	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
HVAC	VAV BOXES	VAV	VAV-TypeXX-Room#-No.	InletSize	TYPE	OP	C
				AirFlow-Minimum	TYPE	OP	C
				CoolingMaximumAirflow	TYPE	OP	C
				CoolingMinimumAirflow	TYPE	OP	C
				HeatingMaximumAirflow	TYPE	OP	C
				PressureDrop	TYPE	OP	C
				NCLevel-Discharge	TYPE	OP	C
				NCLevel-Radiated	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C

State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
HVAC	VALVES	HVACV	HVACV-TypeXX-Room#-No.	SpecificationSection	TYPE		C
				WarrantyDurationLabor	TYPE		C
				WarrantyDurationParts	TYPE		C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				OperatingPosition-Normal	COMPONENT		C
				OperatingPosition-Emergency	COMPONENT		C
				TagNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
HVAC	TRAPS	TRAP	TRAP-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
				InspectionFrequency	COMPONENT	OP	C
				MaintenanceFrequency	COMPONENT	OP	C
HVAC	STRAINERS	STN	STN-TypeXX-Room#-No.	InspectionFrequency	TYPE	OP	C
				MaintenanceFrequency	TYPE	OP	C
				SpecificationSection	TYPE		C
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT		C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
HVAC	MAKEUP AIR UNIT	MUA	MUA-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				Capacity	TYPE	D	U/C
				RefrigerantType	TYPE	D	U/C
				EnergyEfficiencyRatio(EER)	TYPE	D	U/C

State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				Current	TYPE	D	U/C
				Voltage	TYPE	D	U/C
				WaterFlow	TYPE	D	U/C
				EnteringWaterTemp	TYPE	D	U/C
				LeavingWaterTemp	TYPE	D	U/C
				CoilAirPressureDrop	TYPE		C
				CoilCapacity	TYPE	D	U/C
				CoilFlow	TYPE	D	U/C
				CoilWaterPressureDrop	TYPE	D	U/C
				FanFlow-Nominal	TYPE	D	U/C
				EnteringAirTempDB	TYPE	D	U/C
				EnteringAirTempWB	TYPE	D	U/C
				FanMotorHorsepower	TYPE	D	U/C
				FanSpeed	TYPE	D	U/C
				Frequency	TYPE	D	U/C
				LeavingAirTempDB	TYPE	D	U/C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
HVAC	SPLIT SYSTEM	SSYS	SSYS-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				Capacity	TYPE	D	U/C
				RefrigerantType	TYPE	D	U/C
				EnergyEfficiencyRatio(EER)	TYPE	D	U/C
				Current	TYPE	D	U/C
				Voltage	TYPE	D	U/C
				CoilAirPressureDrop	TYPE	D	U/C
				CoilCapacity	TYPE	D	U/C
				FanFlow-Nominal	TYPE	D	U/C
				FanMotorHorsepower	TYPE	D	U/C
				FanSpeed	TYPE	D	U/C
				Frequency	TYPE	D	U/C
				LeavingAirTempDB	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR

State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
HVAC	ROOFTOP PACKAGE UNIT	RTU	RTU-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				Capacity	TYPE	D	U/C
				RefrigerantType	TYPE	D	U/C
				EnergyEfficiencyRatio(EER)	TYPE	D	U/C
				Current	TYPE	D	U/C
				Voltage	TYPE	D	U/C
				CoilCapacity	TYPE	D	U/C
				CoilFlow	TYPE	D	U/C
				FanFlow-Nominal	TYPE	D	U/C
				FanOutsideFlow	TYPE		C
				FanMotorHorsepower	TYPE	D	U/C
				FanSpeed	TYPE	D	U/C
				Frequency	TYPE	D	U/C
				LeavingAirTempDB	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
HVAC	Heat Pump (Package / Split)	HP	HP-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				Capacity	TYPE	D	U/C
				RefrigerantType	TYPE	D	U/C
				EnergyEfficiencyRatio(EER)	TYPE	D	U/C
				Current	TYPE	D	U/C
				Voltage	TYPE	D	U/C
				CoilAirPressureDrop	TYPE	D	U/C
				CoilCapacity	TYPE	D	U/C

State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES							
DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				CoilFlow	TYPE	D	U/C
				CoilWaterPressureDrop	TYPE	D	U/C
				FanFlow-Nominal	TYPE	D	U/C
				FanOutsideFlow	TYPE		C
				EnteringAirTempDB	TYPE	D	U/C
				EnteringAirTempWB	TYPE	D	U/C
				EnteringWaterTemp	TYPE	D	U/C
				FanMotorHorsepower	TYPE	D	U/C
				Frequency	TYPE	D	U/C
				LeavingAirTempDB	TYPE	D	U/C
				LeavingWaterTemp	TYPE	D	U/C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
HVAC	WATER SOURCE HEAT PUMP	WSHP	WSHP-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				Capacity	TYPE	D	U/C
				RefrigerantType	TYPE	D	U/C
				EnergyEfficiencyRatio(EER)	TYPE	D	U/C
				Current	TYPE	D	U/C
				Voltage	TYPE	D	U/C
				CoilAirPressureDrop	TYPE	D	U/C
				CoilCapacity	TYPE	D	U/C
				CoilFlow	TYPE	D	U/C
				CoilWaterPressureDrop	TYPE	D	U/C
				FanFlow-Nominal	TYPE	D	U/C
				FanOutsideFlow	TYPE		C
				EnteringAirTempDB	TYPE	D	U/C
				EnteringAirTempWB	TYPE	D	U/C
				EnteringWaterTemp	TYPE	D	U/C
				FanMotorHorsepower	TYPE	D	U/C
				Frequency	TYPE	D	U/C
				LeavingAirTempDB	TYPE	D	U/C
				LeavingWaterTemp	TYPE	D	U/C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				SpatialPlacement	COMPONENT	OP	C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
HVAC	AIR DRYER	ADRY	ADRY-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				Capacity	TYPE	D	U/C
				Current	TYPE	D	U/C
				Voltage	TYPE	D	U/C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
HVAC	WATER HEATER	WHTR	WHTR-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				Capacity	TYPE	D	U/C
				Current	TYPE	D	U/C
				Voltage	TYPE	D	U/C
				EnteringWaterTemp	TYPE	D	U/C
				LeavingWaterTemp	TYPE	D	U/C
				FullLoadFuelConsumption	TYPE	D	U/C
				ThermalEfficiency	TYPE	D	U/C
				VentDiameter	TYPE	D	U/C
				FuelType	TYPE	D	U/C
				TemperatureRise	TYPE	D	U/C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
HVAC	AIR COMPRESSORS	ACOMP	ACOMP-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				Horsepower	TYPE	D	U/C
				Current	TYPE	D	U/C
				Voltage	TYPE	D	U/C
				SCFM-FlowRate	TYPE	D	U/C
				StorageInGallons	TYPE	D	U/C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
HVAC	**AIR COOLED CONDENSER**	**ACC**	**ACC-TypeXX-Room#-No.**	CoolingCapacity	TYPE	D	U/C
				RefrigerantType	TYPE	D	U/C
				Current	TYPE	D	U/C
				Voltage	TYPE	D	U/C
				Frequency	TYPE	D	U/C
				EnteringWaterTemp	TYPE	D	U/C
				FanSpeed	TYPE	D	U/C
				FanType	TYPE	D	U/C
				CompressorType	TYPE	D	U/C
				Fan Motor Power	TYPE	D	U/C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
HVAC	**COMPUTER ROOM AIR CONDITIONING UNIT**	**CRAC**	**CRAC-TypeXX-Room#-No.**	Capacity	TYPE	D	U/C
				RefrigerantType	TYPE	D	U/C
				Current	TYPE	D	U/C
				Voltage	TYPE	D	U/C
				Frequency	TYPE	D	U/C
				NumberOfFans	TYPE	D	U/C
				Phase	TYPE	D	U/C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				ElectricalPanelCircuit	COMPONENT		C
				ElectricalPanelName	COMPONENT		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
HVAC	COOLING TOWER	CTWR	CTWR-TypeXX-Room#-No.	Power	TYPE	D	U/C
				WaterFlow	TYPE	D	U/C
				EnteringWaterTemp	TYPE	D	U/C
				LeavingWaterTemp	TYPE	D	U/C
				Capacity	TYPE	D	U/C
				Current	TYPE	D	U/C
				Voltage	TYPE	D	U/C
				Frequency	TYPE	D	U/C
				RefrigerantType	TYPE	D	U/C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
PLUMBING	WATER TREATMENT ASSEMBLIES	WTRTASSY	WTRTASSY-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
	PLUMBING VALVES	PLBGV	PLBGV-TypeXX-Room#-No.	SpecificationSection	TYPE		C
				WarrantyDurationLabor	TYPE		C
				WarrantyDurationParts	TYPE		C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C

The table title "State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES" spans across the top of the table.

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT		C
	PLUMBING FIXTURES	PLBGFIXT	PLBGFIXT-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				NominalHeight	TYPE	D	U/C
				NominalLength	TYPE	D	U/C
				NominalWidth	TYPE	D	U/C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
PLUMBING	PLUMBING PUMPS	PLBGP	PLBGP-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				RatedFlow	TYPE	OP	C
				PumpMotorHorsepower	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				Head	TYPE	OP	C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
PLUMBING	GREASE TRAP	PLBGGT	PLBGGT-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				Capacity	TYPE	D	U/C
				Material	TYPE	D	U/C
				MaintenenceInterval	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C

State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				WarrantyStartDate	COMPONENT		C
FIRE SUPPRESSION	FIRE SUPPRESSION PUMPS	FSUPPRP	FSUPPRP-TypeXX-Room#-No.	Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				RatedFlow	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
				SpatialPlacement	COMPONENT		C
FIRE SUPPRESSION	FIRE SUPPRESSION VALVES	FSUPPRV	FSUPPRV-TypeXX-Room#-No.	SpecificationSection	TYPE		C
				WarrantyDurationLabor	TYPE		C
				WarrantyDurationParts	TYPE		C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				OperatingPosition-Normal	COMPONENT		C
				OperatingPosition-Emergency	COMPONENT		C
				TagNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT		C
FIRE SUPPRESSION	FIRE SUPPRESSION SPRINKLER HEADS	FSUPPRSH	FSUPPRSH-TypeXX-Room#-No.	HeadType	TYPE	D	U/C
				ThreadSize	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
FIRE SUPPRESSION	FIRE SUPPRESSION FIRE EXTINGUISHERS	FSUPPRFEXT	FSUPPRFEXT-TypeXX-Room#-No.	Capacity	TYPE	D	U/C
				Rating	TYPE	OP	C
				NominalHeight	TYPE	D	U/C
				NominalLength	TYPE	D	U/C
				NominalWidth	TYPE	D	U/C
				SpecificationSection	TYPE	D	

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR

State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
ELECTRICAL	LIGHT FIXTURES	LTG	LTG-TypeXX-Room#-No.	LampType	TYPE	D	U/C
				Current	TYPE	OP	C
				Voltage	TYPE	D	U/C
				Frequency	TYPE	OP	C
				NominalHeight	TYPE	D	U/C
				NominalLength	TYPE	D	U/C
				NominalWidth	TYPE	D	U/C
				LampCount	TYPE	D	U/C
				LampPower	TYPE	D	U/C
				Wattage	TYPE	D	U/C
				Ballast/Driver	TYPE	D	U/C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				Function	TYPE	D	U/C
				TagNumber	COMPONENT	D	U/C
				WarrantyStartDate	COMPONENT		C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
ELECTRICAL	DISTRIBUTION PANEL	DPNL	DPNL-TypeXX-Room#-No.	Phase	TYPE	D	U/C
				NumberOfWires	TYPE	OP	C
				NumberOfPoles	TYPE	D	U/C
				MainBusCurrent	TYPE	OP	C
				PredominantLoadType	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	D	U/C
				Frequency	TYPE	D	U/C
				AICRating	TYPE	D	U/C
				CurrentRating	TYPE	D	U/C
				MainBusCurrentRating	TYPE	D	U/C

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES			
				NominalHeight	TYPE	D	U/C
				NominalLength	TYPE	D	U/C
				NominalWidth	TYPE	D	U/C
				MountingType	TYPE	D	U/C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
ELECTRICAL	SWITCHGEAR	SWGR	SWGR-TypeXX-Room#-No.	ShortCircuitInterruptingRating	TYPE	OP	C
				EnclosureRating	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	D	U/C
				Frequency	TYPE	OP	C
				PeakLoad	TYPE	D	U/C
				RatedCapacity	TYPE	D	U/C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
ELECTRICAL	GENERATOR	GEN	GEN-TypeXX-Room#-No.	MaximumPowerOutput	TYPE	OP	C
				FuelType	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
ELECTRICAL	LIGHTING CONTROL SYSTEM	LTGCSYS	LTGCSYS-TypeXX-Room#-No.	Current	TYPE	D	U/C
				Voltage	TYPE	D	U/C
				Frequency	TYPE	D	U/C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				ElectricalPanelName	COMPONENT	D	U/C
				ElectricalPanelCircuit	COMPONENT	D	U/C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
ELECTRICAL	UNITERRUPTED POWER SUPPLY	UPS	UPS-TypeXX-Room#-No.	Current	TYPE	D	
				Voltage	TYPE	D	
				Frequency	TYPE	D	
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				Power	TYPE	D	U/C
				BatteryType	TYPE	D	U/C
				BatterySize	TYPE	D	U/C
				BatteryEffectiveLife	TYPE	D	U/C
				RatedFlow	TYPE	D	U/C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C

The table title: **State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES**

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
ELEVATOR SYSTEMS	ELEVATORS	ELEV	ELEV-TypeXX-Room#-No.	Current	TYPE	D	U/C
				Voltage	TYPE	D	U/C
				Frequency	TYPE	D	U/C
				Capacity	TYPE	D	U/C
				Speed	TYPE	OP	C
				StartingAmps	TYPE	OP	C
				AcceleratingAmps	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
BUILDING AUTOMATION SYSTEMS	CONTROL SENSORS	CTRLSNSR	CTRLSNSR-TypeXX-Room#-No.	Mounting	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
BUILDING AUTOMATION SYSTEMS	CONTROL CONTROLLERS	CTRLCONT	CTRLCONT-TypeXX-Room#-No.	Mounting	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C

State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				ModelNumber	TYPE		C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
BUILDING AUTOMATION SYSTEMS	BUILDING AUTOMATION SYSTEM	BAS	BAS-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				SoftwareVersion	TYPE		C
				CommunicationPlatform	TYPE	D	
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
ARCHITECTURAL	DOORS	DR	DR-TypeXX-Room#-No.	DoorWidth	TYPE	D	U/C
				DoorHeight	TYPE	D	U/C
				DoorThickness	TYPE	D	U/C
				DoorType	TYPE	D	U/C
				DoorMaterial	TYPE	D	U/C
				SpecificationSection	TYPE	D	
				Manufacturer	TYPE		C
				FireLabelClass	TYPE	D	U/C
				FireLabelRating	TYPE	D	U/C
				ModelNumber	TYPE		C
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				DoorFinish	COMPONENT	D	U/C
				GlazingType	COMPONENT	D	U/C
				HardwareSet	COMPONENT	D	U/C
				Pressurization	COMPONENT	OP	C
				EgressDoor	COMPONENT	OP	C
				FrameFinish	COMPONENT	D	U/C
				FrameMaterial	COMPONENT	D	U/C
				FrameType	COMPONENT	D	U/C
				TagNumber	COMPONENT	D	U/C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
SITE		SWTRP		Power	TYPE	OP	C

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR

State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
	SITE WATER PUMPS		SWTRP-TypeXX-Room#-No.	FlowRateMin	TYPE	OP	C
				FlowRateMax	TYPE	OP	C
				PressureHead	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
SITE	SITE VALVES	SV	SV-TypeXX-Room#-No.	SpecificationSection	TYPE		C
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				OperatingPosition-Normal	COMPONENT		C
				OperatingPosition-Emergency	COMPONENT		C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT		C
SITE	SITE WATER TANKS	SWTRTNK	SWTRTNK-TypeXX-Room#-No.	AccessType	TYPE	OP	C
				StorageType	TYPE	OP	C
				Capacity	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
SITE		SFSUPPRHYD		FlowRate	TYPE	OP	C
				PressureRating	TYPE	OP	C

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
	SITE FIRE SUPPRESSION HYDRANTS		**SFSUPPRHYD-TypeXX-Room#-No.**	BodyColor	TYPE	OP	C
				CapColor	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
SITE	**SITE FIRE SUPPRESSION VALVES**	**SFSUPPRV**	**SFSUPPRV-TypeXX-Room#-No.**	SpecificationSection	TYPE		C
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				OperatingPosition-Normal	COMPONENT		C
				OperatingPosition-Emergency	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
SITE	**SITE FIRE SUPPRESSION PUMPS**	**SFSUPPRP**	**SFSUPPRP-TypeXX-Room#-No.**	Power	TYPE	OP	C
				FlowRateMin	TYPE	OP	C
				FlowRateMax	TYPE	OP	C
				PressureHead	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
SITE	**WATER SUPPLY WELL PUMPS**	**WTRSPLYWP**	**WTRSPLYWP-TypeXX-Room#-No.**	Power	TYPE	OP	C
				FlowRateMin	TYPE	OP	C
				FlowRateMax	TYPE	OP	C

State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				PressureHead	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
SITE	**SEWER MANHOLES**	**SWRMH**	**SWRMH-TypeXX-Room#-No.**	NorthCoordinate(Y)	TYPE	OP	C
				EastCoordinate(X)	TYPE	OP	C
				Top	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				WarrantyStartDate	COMPONENT		C
				Inv.In	COMPONENT	OP	C
				Inv.Out	COMPONENT	OP	C
SITE	**SEWER PUMPS**	**SWRP**	**SWRP-TypeXX-Room#-No.**	RatedFlow	TYPE	OP	C
				ChurnPressure	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				ControllerType	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C

The table title: **State of Tennessee - EQUIPMENT NAMING STANDARDS AND ATTRIBUTES**

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				SpatialPlacement	COMPONENT	OP	C
SITE	SEWER TANKS	SWRTNK	SWRTNK-TypeXX-Room#-No.	AccessType	TYPE	OP	C
				StorageType	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				Capacity	TYPE	OP	C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
SITE	FUEL DISTRIBUTION PUMPS	FDP	FDP-TypeXX-Room#-No.	Service	TYPE	OP	C
				FlowRateMin	TYPE	OP	C
				FlowRateMax	TYPE	OP	C
				TotalHead	TYPE	OP	C
				RotationSpeed	TYPE	OP	C
				Power	TYPE	OP	C
				Phase	TYPE	OP	C
				Current	TYPE	OP	C
				Voltage	TYPE	OP	C
				Frequency	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
SITE	FUEL DISTRIBUTION TANKS	FDTNK	FDTNK-TypeXX-Room#-No.	AccessType	TYPE	OP	C
				Service	TYPE	OP	C
				FuelType	TYPE	OP	C
				Capacity	TYPE	OP	C
				SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C

DISCIPLINE/ SYSTEM	ASSET TYPE	TYPE ID	COMPONENT NAMING STANDARD	ATTRIBUTE	TYPE OR COMPONENT ATTRIBUTE	SPECIFIED BY THE DESIGNER	PRODUCT DATA PROVIDED/ AND OR UPDATED BY THE CONTRACTOR
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				DryWeight	TYPE	OP	C
				WetWeight	TYPE	OP	C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				SpatialPlacement	COMPONENT	OP	C
SITE	FUEL DISTRIBUTION SWITCHES	FDSW	FDSW-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				WarrantyStartDate	COMPONENT		C
SITE	SITE LIGHTING CONTROL SYSTEM	SLTGCSYS	SLTGCSYS-TypeXX-Room#-No.	SpecificationSection	TYPE	D	
				WarrantyDurationLabor	TYPE	OP	C
				WarrantyDurationParts	TYPE	OP	C
				Manufacturer	TYPE		C
				ModelNumber	TYPE		C
				Current	TYPE	D	U/C
				Voltage	TYPE	D	U/C
				Power	TYPE	D	U/C
				TagNumber	COMPONENT	D	U/C
				SerialNumber	COMPONENT		C
				WarrantyStartDate	COMPONENT		C
				ElectricalPanelName	COMPONENT		C
				ElectricalPanelCircuit	COMPONENT		C

The equipment inventory shall be submitted in COBie format. The table below lists the COBie Worksheets and the high-level information that shall be provided in each Worksheet for an equipment inventory.

Additional guidance on the COBie Worksheets can be found in The COBie Guide (East and Carrasquillo-Mangual 2012).

COBie Worksheet	Required Content
Contact	One row for each discipline or organization that provides COBie information. Fields required to be completed include: Email, CreatedBy, CreatedOn, Category, Company, and Phone
Facility	One building per COBie file. Fields required to be completed include: Name, CreatedBy, CreatedOn, Category, ProjectName, SiteName, LinearUnits, AreaUnits, VolumeUnits, CurrencyUnit, AreaMeasurement, and Description
Floor	One row for each vertical level to include foundations, floors, roofs, and site. Fields required to be completed include: Name, CreatedBy, CreatedOn, Category, Elevation, and Height
Space	One row per functional space, per room. Multiple spaces in a room are possible. Fields required to be completed include: Name, CreatedBy, CreatedOn, Category, FloorName, Description, GrossArea, and NetArea
Zone	One row for each COBie.Space and COBie.Zone type. Fields required to be completed include: Name, CreatedBy, CreatedOn, Category, and SpaceNames
Type	One row for each scheduled product type or tagged equipment type found in the BIMs. Fields required to be completed include: Name, CreatedBy, CreatedOn, Category, Description, AssetType, Manufacturer, ModelNumber, WarrantyGuarantorParts, WarrantyDurationParts, WarrantyGuarantorLabor, WarrantyDurationLabor, WarrantyDurationUnit, NominalLength, NominalWidth, and NomimnalHeight
Component	One row for each individually scheduled product or each instance of tagged equipment found in the BIMs. Fields required to be completed include: Name, CreatedBy, CreatedOn, TypeName, Space, Description, SerialNumber, InstallationDate, WarrantyStartDate, and TagNumber

COBie Worksheet	Required Content
System	One row for each Component identifying the related System. Fields required to be completed include: Name, CreatedBy, CreatedOn, Category, and ComponentNames
Document	One row for each associated deliverable document identifying the relevant equipment type or component. Fields required to be completed include: Name, CreatedBy, CreatedOn, Category, ApprovalBy, Stage, SheetName, RowName, Directory, and File
Attribute	One row for each required Space Attribute. One row for each required Type Attribute. One row for each required Component Attribute. Fields required to be completed include: Name, CreatedBy, CreatedOn, Category, SheetName, RowName, Value, and Unit

Document Naming Convention

In reference to the COBie Worksheet named "Document", these are the document types related to managed assets that should be listed in the Document Worksheet in the COBie deliverable. The naming convention for each document type is as follows.

SBCProjectNumber_DocumentAbbreviation_TypeID_Type

For example, product data documentation for Air Handling Unit (AHU) Type 500C on SBC Project 440006-01-2014 would have a naming convention of

440006-01-2014_PD_AHU_500C

Document Type	Document Abbreviation	Document Naming Convention
Product Data	PD	SBC Project No._PD_TypeID_Type

Operations & Maintenance Data	OM	SBC Project No._OM_TypeID_Type
Material Warranty	MW	SBC Project No._MW_TypeID_Type
Commissioning Data	CX	SBC Project No._CX_TypeID_Type
Certificates	CT	SBC Project No._CT_TypeID_Type
Spare Parts List	SP	SBC Project No._SP_TypeID_Type

Equipment category shall be entered as an OmniClass Table 23 code. Below are mappings of TN managed asset types to OmniClass Table 23 numbers.

Equipment Asset Mapping to OmniClass Table 23			
ASSET TYPE	TYPE ID	OmniClass Number	OmniClass Title
CHILLERS	CH	23-33 21 00	Chillers
BOILERS	BLR	23-33 11 00	Commercial Boilers
AIR HANDLING UNITS	AHU	23-33 25 00	Air Handling Units
FAN COIL UNITS	COIL	23-33 33 00	HVAC Fan Coil Units
PUMPS	HVACP	23-27 17 00	Pumps
FANS	FAN	23-33 31 19	Fans
COMPRESSORS	COMPR	23-27 21 00	Compressors
VAV BOXES	VAV	23-33 41 17 13	Variable Air Volume Terminal Units
VALVES	HVACV	23-27 31 00	Valves
TRAPS	TRAP	23-27 37 00	Liquid Traps
STRAINERS	STN	23-27 55 29	Liquid Strainers
MAKEUP AIR UNIT	MUA	23-33 39 15	Make Up Air Units
SPLIT SYSTEM	SSYS	23-33 39 21	Split System Air Conditioning Units
ROOFTOP PACKAGE UNIT	RTU	23-33 00 00	HVAC Specific Products and Equipment
Heat Pump (Package / Split)	HP	23-33 17 00	Heat Pumps
WATER SOURCE HEAT PUMP	WSHP	23-33 17 00	Heat Pumps
AIR DRYER	ADRY	23-33 47 00	Air Dryers
WATER HEATER	WHTR	23-31 29 00	Hot Water Heaters
AIR COMPRESSORS	ACOMP	23-27 21 00	Compressors
AIR COOLED CONDENSER	ACC	23-33 43 11	Air Cooled Condenser Units
COMPUTER ROOM AIR CONDITIONING UNIT	CRAC	23-33 39 00	Air Conditioning Equipment
COOLING TOWER	CTWR	23-33 23 00	Cooling Towers
WATER TREATMENT ASSEMBLIES	WTRTASSY	23-27 55 33 11	Water Treatment Package Units
PLUMBING VALVES	PLBGV	23-27 31 00	Valves

Equipment Asset Mapping to OmniClass Table 23			
ASSET TYPE	**TYPE ID**	**OmniClass Number**	**OmniClass Title**
PLUMBING FIXTURES	**PLBGFIXT**	23-31 00 00	Plumbing Specific Products and Equipment
PLUMBING PUMPS	**PLBGP**	23-27 17 00	Pumps
GREASE TRAP	**PLBGGT**	23-27 37 11	Grease Traps
FIRE SUPPRESSION PUMPS	**FSUPPRP**	23-27 17 00	Pumps
FIRE SUPPRESSION VALVES	**FSUPPRV**	23-27 31 00	Valves
FIRE SUPPRESSION SPRINKLER HEADS	**FSUPPRSH**	23-29 33 00	Fire Suppression System Components
FIRE SUPPRESSION FIRE EXTINGUISHERS	**FSUPPRFEXT**	23-29 25 19	Fire Extinguishers
LIGHT FIXTURES	**LTG**	23-35 47 11	Lighting Fixtures
DISTRIBUTION PANEL	**DPNL**	23-35 31 13	Distribution Panel Boards
SWITCHGEAR	**SWGR**	23-35 31 31	Switchgear
GENERATOR	**GEN**	23-35 11 00	Electrical Generators
LIGHTING CONTROL SYSTEM	**LTGCSYS**	23-27 15 21	Building Lighting Controls
UNITERRUPTED POWER SUPPLY	**UPS**	23-35 23 21	Uninterrupted Power Supply (UPS) Units
ELEVATORS	**ELEV**	23-23 11 11	Elevators
CONTROL SENSORS	**CTRLSNSR**	23-27 11 15 23	Flow Sensors
CONTROL CONTROLLERS	**CTRLCONT**	23-27 11 15 15	Flow Controllers
BUILDING AUTOMATION SYSTEM	**BAS**	23-27 13 13 13	Building Automated Systems
DOORS	**DR**	23-17 11 00	Doors
SITE WATER PUMPS	**SWTRP**	23-27 17 00	Pumps
SITE VALVES	**SV**	23-27 31 00	Valves
SITE WATER TANKS	**SWTRTNK**	23-27 29 19	Tanks
SITE FIRE SUPPRESSION HYDRANTS	**SFSUPPRHYD**	23-29 25 13	Fire Hydrants
SITE FIRE SUPPRESSION VALVES	**SFSUPPRV**	23-27 31 00	Valves
SITE FIRE SUPPRESSION PUMPS	**SFSUPPRP**	23-27 17 00	Pumps
WATER SUPPLY WELL PUMPS	**WTRSPLYWP**	23-27 17 00	Pumps
SEWER MANHOLES	**SWRMH**	23-39 29 11 13 11	Manhole (Goes in Prefab Concrete)
SEWER PUMPS	**SWRP**	23-27 17 00	Pumps
SEWER TANKS	**SWRTNK**	23-27 29 19	Tanks
FUEL DISTRIBUTION PUMPS	**FDP**	23-27 17 00	Pumps
FUEL DISTRIBUTION TANKS	**FDTNK**	23-27 29 19	Tanks
FUEL DISTRIBUTION SWITCHES	**FDSW**	23-35 37 00	Electrical Switches
SITE LIGHTING CONTROL SYSTEM	**SLTGCSYS**	23-27 15 21	Building Lighting Controls

Appendix E – BIM Execution Plan Outline - Contractors

Project Information

- Identify project name, SBC number, location (address & geo-reference)
- Identify Owner
- Identify effective date or revision date of plan

Project Construction Team Information

- Contractor firm
    - Firm name
    - Firm address
    - BIM Manager name
    - BIM Manager contact information
- Subcontractors and Major Suppliers
    - Firm name
    - Firm address
    - BIM Coordinator name
    - BIM Coordinator contact information

BIM Goals and Objectives

- Identify owner's intended goals or end uses of the BIM
- Identify Contractor, Subcontractors, and Major Suppliers members' uses of the BIMs during the project
- List of Construction BIMs to be delivered
- Organization responsible for each Construction BIM

Roles and Responsibilities

- Briefly describe each organization's responsibility for:
    - BIM creation
    - BIM quality
    - BIM analyses
    - BIM management
- Describe the roles of the BIM Manager and the BIM Coordinators

Collaboration Plan

- Describe the collaboration system(s) to be used to exchange, merge, identify interferences and visualize BIMs
- Describe the system(s) to be used to exchange other electronic documents such as meeting minutes, meeting agendas, and interference reports
- Describe the hardware and software to be provided for onsite viewing of Construction BIMs

Kickoff Meeting

- Identify the required and optional attendees
- Identify the meeting location and date
- Identity the agenda of the Kickoff Meeting.
    - Sample agenda could include:
        - BIM expectations
        - Project goals
        - BIM Coordination process

- BIM Coordination Meetings
- Other BIM analyses such as 4D Scheduling
- Review BIM Execution Plan
- Review modeling standards
- Review model content
- COBie deliverables and requirements
- BIM deliverables

BIM Coordination

- Describe the roles and responsibilities of required Project Team members for BIM Coordination
- Describe the schedule for or frequency of model updates and interference checks
- Describe tools to be used for BIM Coordination
- Define the clashes to be run (e.g. HVAC vs. Structure)
- Describe the process to identify and resolve interferences
- Describe the process for tracking action items from the meeting.
- Describe the process for tracking changes to the Construction BIMs
- Describe the process to be used to generate related Shop Drawings and Coordination Drawings from the coordinated Construction BIMs

BIM Coordination Meetings

- Identify the frequency of meetings
- Identify the required and optional attendees
- Identify the locations of the meetings

Software for Model Authoring

- Identify all software products to be used for BIM creation and the software version
- Identify all object enablers to be used for viewing BIMs
- Identify all software products to be used for BIM Coordination and interference reporting
- Identify software products that will be used to perform quality control on BIMs

Modeling Standards and Content

- Common coordinate system
    - Units
    - File origin (X,Y,Z)
    - Geolocation
- Modeling partitions
- File versioning
- Naming
    - Files
    - Building level designators
    - Building area designators
    - Discipline designators
    - Layers (if applicable)
    - Properties required for:
        - COBie deliverables
        - Owner-requested analyses
        - Construction-initiated analyses
    - Units and values for properties (e.g.- cubic feet per minute, space use codes from FICM)
- Level of precision and dimensioning
- Objects to be modeled per discipline or trade

- BIMs shall include clearances for access, maintenance, and code requirements
- Object properties to be included
- Any exclusions from the Construction BIMs

For Other Construction-phase Analyses,

- Each analysis that will be performed:
  - Software to be used
  - BIM(s) to be analyzed
    - File format required
  - Responsible team member(s) for
    - Performing the analysis
    - Producing the required BIM(s)

BIM Deliverables

- Identify electronic models, drawings, analyses and reports, to be delivered
- Identify all space and equipment types and attributes to be included in the COBie deliverables
- Describe process to be used to extract all deliverables from the coordinated, Construction BIMs
- Identify the file formats for all deliverables
- Describe quality assurance and quality control measures to be implemented

Sign-Off

- Authorized signature from the Contractor, Subcontractors, and Major Suppliers indicating agreement to comply with this BIM Execution Plan