UNCW Randall Library Reno & Expansion – BIM Execution Plan

The 3D Coordination The purpose of this Execution Plan is to assist project team members in the development of goals, collaborative workflows, and the selection of BIM uses based on project deliverables and team characteristics. The proposed goals, dates, and procedures listed in the following documents are to be used to aid in communication and improve collaboration.

Project Information:

Project Client: UNCW
Project Name: UNCW Randall Library Renovation and Expansion
Project Location: Wilmington, NC
Project Number:
Architect: LSP3
Construction Manager: Balfour Beatty

Table of Articles

Attachment

PROJECT CONTACTS

General Contractor: Balfour Beatty			
Katherine Boumenot	BIM Manager (Lead)	kboumenot@balfourbeattyus.com	919.333.0889
Josh Taylor	Sr. Project Manager	jtaylor@balfourbeattyus.com	919.815.5232
Design Team: LSP3			
Mechanical			
Electrical			
Plumbing			
Fire Protection			

ARTICLE 1: GENERAL PROVISIONS

1.1 This Exhibit establishes the protocols for 3D Coordination on this Project by describing the coordination process and the expected level of detail for each Scope of Work as it pertains to Building Information Modeling. Where a provision in this Exhibit conflicts with a provision in the Agreement into which this Exhibit is incorporated, the provision in this Exhibit will prevail.

1.2 The 3D Coordination process might be considered a contract for space. The final result of the modeling, and to the extent the subcontractor has provided timely and accurate information, might be considered a reservation by Subcontractor of space for the components of its scope of work, including access space, etc. Subcontractors reserve space by timely and accurately modeling the components of their scope of work. If a conflict arises in the field during installation, the subcontractor(s) who did not properly, timely, or accurately reserve its space shall be responsible for moving its components at its own expense. The 3D Coordination process is only one aspect of Subcontractor's overall obligation to coordinate with other trades.

1.3 Time is of the essence of the Subcontract and this exhibit. Any failure by Subcontractor to provide the information or models or otherwise to perform its obligations hereunder shall be a material breach of the Subcontract. In the event of any such breach, Balfour Beatty may, upon 48 hours' notice to Subcontractor, supplement Subcontractor's work required hereunder at Subcontractor's expense and exercise any and all other remedies provided under the Subcontract or applicable law.

1.4 Definitions

A. **Building Information Model.** A Building Information Model is a digital representation of the physical and functional characteristics of the Project which encompasses building geometry, spatial relationships, geographic information, and quantities and properties of building components. In this Exhibit the Building Information Model is referred to as the "Model(s)". "Building Information Modeling" (BIM) refers to the methodology and technology used to create the Model. The following types of models will be used during the coordination effort:

1. **Design Models.** Design Models are provided by Balfour Beatty to the subcontractors that includes both the Architectural and Structural elements of the Project. This model will be created by the Architect and Engineer of Record. The Level of Detail of the Base Construction Model shall be established prior to the BIM Kickoff Meeting.
2. **Coordination Model.** The Coordination Model is the Model that will be reviewed by Balfour Beatty and its subcontractors on an ongoing basis until the time a "Sign-off Model" is completed. . This Model will include the design models and Subcontractor Model Elements that have been provided.
3. **Sign-off Model.** The Sign-off Model is the final Coordination Model which becomes the basis for construction on which shop drawings and field drawings are to be produced. This Model may consist of the entire Project or only an area or level of the Project.
4. **As-Built Model.** A Model that reflects the As-Built condition of the Project. This Model type will be used following coordination to represent the install condition of the Model Elements. It will include the Base Construction Model and all Subcontractor Model Elements.

B. **Clash Detection.** Clash Detection tools enable effective identification, inspection, and reporting of interference clashes in a 3D project model.

C. **Level of Detail.** The Level of Detail (LOD) describes the level of completeness to which a Model Element or Subcontractor Scope of Work is to be developed.

D. **Model Element.** A Model Element is a portion of the Building Information Model representing a component, system or assembly within a building. For the purposes of this Exhibit, Model Elements are represented by the different systems included in each Subcontractor's Scope of Work.

E. **Navisworks® Freedom.** Free viewer for files in the Navisworks® NWD and 3D DWF formats. Navisworks® Freedom is to be utilized by the Model Element Author to review clashes between Model Elements.

F. **Navisworks® Manage.** Used to create a single Model of the Project from the individual Model Elements developed by the Model Element Authors to provide a real- time project view for effective 3D Coordination and 4D planning. Navisworks® Manage provides the tools to optimize interoperability between all types of models, regardless of format or file size, and perform Clash Detection for coordination review.

G. **BIM360 – Glue.** Used to upload each Design and Construction models. Glue will be used with the combination of Navisworks add-in to see live models. Owner of each model shall be uploading their models constantly. Identify clashes early on.

H. **PROCORE – COORDINATION ISSUES – MODELS.** Procore is our documentation tool. We use Coordination issues tool in Procore to track and facilitate issues. Detailers and their project managers will be able to track and document issues through out the lifecycle of the job. We use this tool primarily to speed up the RFI process. Procore models is a mobile and web-based viewer. That will tie shop drawings to a model. Each sub-contractor that has access to Procore will have access to these tools.

ARTICLE 2: COORDINATION PROTOCOL

2.1 Kick-Off Meeting. After award, Balfour Beatty will call a meeting to discuss 3D Coordination protocol. All Subcontractors to be involved in the 3D Coordination effort will be required to attend. Attendees should include at least one Project Manager and one member of the 3D modeling team from each Subcontractor. This meeting is to, among other things, review the coordination requirements and schedule.

2.2 Training. Balfour Beatty may, at its discretion, provide basic coordination training for all coordination team members (if necessary); provided, however, complete, accurate, and timely modeling of Subcontractor's work shall be and shall remain the responsibility of Subcontractor.

2.3 Subcontractor Model Requirements. Subcontractor shall deliver a Model that is on-time, accurate, and representative of the actual elements that will be or are installed in the field. Any elements not included in the Subcontractor Model will become the Subcontractor's responsibility to coordinate in the field at no additional cost to Balfour Beatty, the Owner, or other subcontractors affected by the inaccurate or incomplete information.

A. **File Formats.** Subcontractor shall provide Balfour Beatty with a Model in a format acceptable to Navisworks®. Balfour Beatty would prefer to receive a RVT when possible, however all file types mentioned in Table 2.3.A are acceptable. Using BIM360 Glue as the file management tool.

Table 2.3.A. Acceptable Coordination File Formats.

Format	Extension
Navisworks	.nwd .nwf .nwc
AutoCAD	.dwg, .dxf,
Revit	.rvt (An .nwc must be accompanied by the Revit file)
IFC	.ifc
Tekla	.tek
Inventor	.ipt .iam. ipj

Note: Additional file formats may be supported. Balfour Beatty must approve any formats not listed above.

B. **Model Origin.** Balfour Beatty will provide Subcontractor with the design models (including structural and architectural elements) in the form of a Revit model. CAD backgrounds will also be provided. Subcontractor will be responsible for modeling their scope Model Elements on the base coordinate system set by Balfour Beatty in the Base Construction Model.

C. **Object Enablers.** Subcontractor to provide download location of all Object Enablers (OE) required for custom objects to be displayed correctly outside of the Subcontractor's authoring application software. The OE will be installed on Balfour Beatty and other coordination team member's computers in order to read the Subcontractor's DWG output file correctly. The OE 'translates' the custom objects into a language that other software applications understand.

D. **Level of Detail.** The Subcontractor's Model Elements shall include, at a minimum: all systems and components modeled to a Level of Detail consistent with objects represented by a 1/8" plan/elevation/section drawing. For additional information on the Level of Detail required for specific Scopes of Work see Articles 3 and 4.

E. **Model Clarity.** The Subcontractor's Model is to be organized so that Model Elements can be clearly identified by name and/or layer by the Project Team and Owner. Subcontractor to provide Balfour Beatty with their standard naming conventions and layer structure at Kick-Off meeting for approval.

F. **Internal Coordination.** The Subcontractor's Model Elements are to be internally coordinated prior to submitting to Balfour Beatty. Internal Coordination should include all elements of the Subcontractor's Scopes of Work, any existing work of the same Scopes of Work as the subcontractor's, or connections to other Scopes of Work by the Subcontractor.

G. **External Coordination.** The Subcontractor's Model Elements are to be externally coordinated prior to submitting to Balfour Beatty. External Coordination should include all elements of the Base Construction Model, adherence to any plenum / underground hierarchy diagrams on the project, and any available Trade / Subcontractor models of other Scopes of Work in provided Coordination Models. All subcontractors are expected to coordinate their scopes of work with the contract documents.

H. **Conflict Corrections.** The Model Element Authors will be responsible for correcting all assigned Model Element conflicts discovered during or after Balfour Beatty's review of submitted models or Coordination meetings prior to the following submittal deadline or coordination meeting.

I. **Sign-Off Model Elements.** Upon completion of Coordination, Subcontractor is to provide a model of the condition of their Scope of Work. Model Elements should be updated to include changes made by 1) Requests for Information, 2) design changes by Architect / Engineer, 3) Submittal comments and revisions on approved shop drawings, and 4) As-Built field modifications.

2.4 Model Management. The requirements for managing the Model include but are not limited to the duties set forth below in this Section 2.4. Balfour Beatty will facilitate the Coordination Process throughout the duration of the Project. Subcontractors will be responsible for management of their internal team members schedule and the quality of their models. Each Subcontractor shall also be responsible for communicating with other trades / subcontractors during the modeling process.

A. Initial Responsibilities. Balfour Beatty may establish protocols related to the 3D Modeling Coordination, including protocols for any of the following:

1. Model Coordinate System (Origin and Orientation) and units
2. Collaboration Site – See Collaboration Site 2.5.B.
3. Processes for transferring and accessing Model files
4. Naming convention for subcontractor file names
5. Typical Plenum Hierarchy Diagram
6. Coordination Schedule. A detailed schedule for 3D coordination will be coordinated with the overall project schedule.

B. Ongoing Responsibilities. Balfour Beatty's role in the 3D coordination process may include the following: :

1. Coordinate submission and exchange of Models
   a. Validate that the files are complete and usable and in compliance with applicable protocols
   b. Maintain record copy of each file received
2. Create Coordination Model
3. Perform Clash Detection between trades
4. Facilitate Coordination Meetings
5. Issue Requests for Information for conflicts requiring Design Team input
6. Publish Coordination Meeting models and reports for subcontractor review and resolution
7. Maintain an updated coordination schedule
8. Maintain Sign-Off Models and As-Built Models.

2.5 Coordination Procedures.

A. Coordination Submissions. Subcontractor is to issue their current Model by the scheduled submission deadlines as spelled out in the 3D Coordination Kick-off Meeting and as otherwise required by the Project Schedule or Balfour Beatty. The Subcontractor's model is to conform to the established coordinate system and units. The Subcontractor shall issue their models per the defined naming convention. Balfour Beatty will combine all Subcontractor Models with the Construction Base Model to create the Coordination Model. If the Coordination effort is consistently hampered by a Subcontractor not issuing their Model in the designated timeframe or not following coordinate or naming requirements, Balfour Beatty holds the right to request compensation for lost time from the Subcontractor for all affected Coordination team members.

B. Collaboration Site. All file transfers for coordination will be via the file sharing site provided by Balfour Beatty. The standard file sharing location for Balfour Beatty is Egnyte.com

Clash Detection. Prior to established deadlines or Coordination Meetings, Navisworks will be used to identify conflicts between trades. Additional issues and clashes may also be found while virtually walking the Project. Navisworks presents an opportunity to identify installation and constructability issues in the model that are not the result of geometry clashes between model elements. Subcontractors are responsible for performing internal and external coordination as defined in section 2.3 prior to submitting models to Balfour Beatty. If clashes and issues are repeatedly found that should have been resolved through the subcontractor's internal and external coordination requirements, Subcontractor shall compensate Balfour Beatty and all others affected for acceleration, additional, staff, and any other expense incurred because of Subcontractor's failure or refusal to provide accurate and timely models and information required.

C. **Clash Viewpoints.** Clashes and issues will be documented in the model and provided to all Coordination team members as a basis for tracking progress in the coordination process. These viewpoints will be provided after Balfour Beatty's review of subcontractor submissions or after scheduled Coordination Meetings. Clashes and issues will all receive a number, and a designation of which company is responsible for the resolution. If an RFI is issued in the process of resolving a clash or issue, the RFI# will also be noted. Subcontractors will resolve all documented clashes and issues in the reports prior to the following submittal deadline or Coordination meeting. The viewpoints will serve as a basis for tracking performance of the coordination process. If a Subcontractor is repeatedly unable to resolve their clashes and issues in the established timeframe, Subcontractor shall compensate Balfour Beatty and all others affected for acceleration, additional, staff, and any other expense incurred as a result of Subcontractor's failure or refusal to provide accurate and timely models and information required.

D. **Model and Report Distribution.** After reviewing the Coordination Model, clashes, and issues; Balfour Beatty will provide the Coordination Model and Clash Report to each Subcontractor via the Collaboration Site for their review and use in the External Coordination process or to make the required changes to their Model Elements after Coordination Meetings.

E. **External Coordination.** As Subcontractor models are added to the Coordination Model, the Subcontractor will use the Coordination Model and Clash Reports provided to coordinate their Scope of Work with all other Subcontractors' Scopes of Work in the model. Subcontractor shall communicate with the other trades / subcontractors to resolve clashes that do not require Balfour Beatty's involvement as a facilitator. Each subcontractor will make the necessary changes and upload their revised models to confirm that the conflicts have been resolved. Submission deadlines for these externally coordinated models shall be in accordance with the Coordination Schedule established by Balfour Beatty and as otherwise required by Balfour Beatty in the Coordination Schedule. Balfour Beatty will confirm that submitted models meet the internal and external coordination requirements defined here and in Section 2.3 prior to the scheduled Coordination Meeting. Should Balfour Beatty determine that a subcontractor is repeatedly unable to meet these requirements, Subcontractor shall compensate Balfour Beatty and all others affected for acceleration, additional, staff, and any other expense incurred as a result of Subcontractor's failure or refusal to provide accurate and timely models and information required.

F. **Coordination Meetings.** The Subcontractor shall be prepared to accommodate Coordination meetings to resolve model conflicts. The scheduled meetings will take place on the jobsite at a location and time to be determined by the Project Team and may consist of either recurring meetings or two-to-three-day work sessions. During each meeting the current Coordination Model will be reviewed by virtually walking the Project and discussing conflicts found using Clash Detection tools. Each conflict found will be discussed with all involved parties in order to determine the best solution, with Balfour Beatty acting as the facilitator for those discussions. Attendees should include at least one Model Element Author from each Subcontractor who clearly understands the defined Scope of Work and is able to make decisions about changes to the Scope of Work in the meeting. (Coordination Meetings may be conducted via Online Meeting depending on the location and accessibility of the jobsite by the Subcontractors. This will be determined by Balfour Beatty and will be based on the productivity of past online meetings.)

G. **Sign-Off Model.** After all conflicts have been corrected and/or Balfour Beatty and the Subcontractors agree that the area defined by the Coordination Model has been sufficiently coordinated, all parties will sign-off on the defined area using the 3D Coordination Sign-Off document (Attachment A). This final Coordination Model then becomes the Sign-Off Model for the defined area. Any unresolved clashes or issues in this area that require further review (due to delayed responses or expected contract document changes) should be noted in the document. The Subcontractor agrees to be responsible for locating their respective systems based on the Sign-Off Model. Any variation to this Sign-Off Model must be coordinated with Balfour Beatty. Components that are installed in conflict with the Sign-Off Model layout and create obstacles or additional work for other disciplines shall require one of the following: a) removal and reinstallation per model, or b) monetary compensation to the affected party.

H. **Model Revisions.** If the contract documents or the Subcontractor's Scope of Work are modified after the Sign-Off Model has been completed, the Subcontractor shall include costs within their Change Order to modify and re-coordinate the affected Model Elements in the modified areas. Substantial changes involving multiple trades may require additional Coordination Meetings, a new Sign-Off Model, and another Sign Off document. All coordination costs associated with the changes must be included in the Change Order for the changed Scope of Work. **Subcontractor must notify the Virtual Building Group of any changes to floors which have already been signed-off.**

I. **Shop Drawing Submittal.** Shop Drawing submittals to the engineer/architect shall be provided as required by the specifications and are to be based on the approved Sign-Off Model. These submittals are to be issued following the completion and sign-off of the Coordination Model for the designated area. In some instances, the coordinated Subcontractor Model may also be requested by the Design team for review.

J. **Field/Installation Documents.** Field/Installation documents are to be based on the approved Sign-Off Model and are to include any mark-ups from the approved shop drawing submittal. These drawings are to be dimensioned and labeled in order to accurately locate components in the field according to the coordinated Sign-Off Model.

K. **Installation.** After the Sign-Off Model has been completed and Subcontractor Shop Drawing and Materials Submittals have been approved, installation can commence in accordance with the project constructions schedule. Subcontractors shall be responsible for quality assurance that all components (materials and equipment) installed are being placed in the field in accordance with the Sign-Off Model and construction tolerances. Any deviation from the Sign-Off Model beyond construction tolerances that cause field coordination conflicts will be the financial responsibility of the Subcontractor to resolve (including other trades / Subcontractor's Scope of Work and costs). Furthermore, Subcontractors shall utilize established benchmarks (coordinated by field personnel) for the installation of all components.

2.6 Sign-Off Model. Upon completion of Coordination, the Subcontractor is to provide a Model per the requirements in Article 2.3.I. Balfour Beatty will continue to run Clash Detection tests on model conditions to insure proper installation of systems in relation to the design models and other Subcontractor systems. If conflicts are found, the Subcontractor will be notified immediately. Laser scanning and/or surveying equipment may also be used as a quality control mechanism to validate installation conforms with the record model submissions.

2.7 Model Ownership. All Models submitted to or by Balfour Beatty may be used as needed by the Owner and Project Team; however, only the original Model Author has the right to modify Model content. By submitting content for the Model, Balfour Beatty and/or the Subcontractor does not grant any ownership right in the content provided or in the software used to produce content. Although the intended use of the Model as outlined in this Exhibit is for the design, coordination, fabrication, and construction of the Project, these Models may also be used for other purposes such as 4D scheduling and facility maintenance by either Balfour Beatty or the Owner. Additional Model requirements for these purposes are not covered in this Exhibit and, if necessary, are to be discussed, outlined, and agreed upon by the Project Team separate from this document.

ARTICLE 3: LEVEL OF DETAIL

3.1 Level of Detail. In general, the Scope of Work is to create a technically accurate and highly detailed Model of the Project and its included systems.

3.2 Extent of Model. The Model Elements provided by the Subcontractor shall extend to five feet beyond the exterior walls of the building, unless the specific Scope of Work (i.e. Civil, Landscape, Irrigation, etc.) to be modeled is intended to be outside the building footprint. Vertically, the Model Elements shall extend from the lowest extent of the foundations up through (and including) the roof of the upper most floor. To the extent that the Scope of Work includes building systems, those systems will be included to the full horizontal and vertical extents of the model including all systems in the soffits and roof-top mounted items.

3.3 Model Content Requirements.

A. **Coordination Model Elements.** Coordination Model Elements are modeled as specific assemblies that are accurate in terms of size, shape, location, quantity, and orientation with complete fabrication, assembly, and detailing information. Non-geometric information may also be attached to Model Elements.

B. **Record Model Elements.** Record Model Elements are modeled as constructed assemblies actual and accurate in terms of size, shape, location, quantity, and orientation. Non-geometric information may also be attached to Model Elements

ARTICLE 4 MODEL ELEMENT SCOPE

4.1 Model Element Scope. The following sections define the specific Model Element Scope for each Scope of Work. The Model Elements defined below are the minimum requirements; Subcontractor to incorporate Model Elements beyond the scope below if he deems it necessary for proper coordination.

4.2 HVAC/Mechanical. Specific dimensional locations of HVAC/Mechanical Systems may not be included in the Construction Documents; to the extent that location can be determined from the Construction Documents, the Model Elements are to reflect that location.

A. **Duct and Associated Equipment.** All ducts, including joints and hangers, smoke dampers, fire dampers, diffusers, registers, grilles, air handling equipment, etc. are to be included. Ducts will be modeled to the outside face dimension; support mechanisms are to be modeled. Flexible systems smaller than 1” are not required to be modeled; however it is encouraged.

B. **Mechanical Equipment.** Equipment should be modeled to its overall height, width, and depth. All support mechanisms are to be modeled.

C. **Piping.** All piping, such as condensate, associated with the mechanical equipment will be modeled and should include fittings and connections, insulation, and support mechanisms. Piping smaller than 1" that does not require gravity slope may be excluded from the model. All valves and clean-outs are to be modeled and are to be specially identified to allow them to be readily found.

D. **Electrical Requirements.** Any electrical associated with HVAC will be modeled to the line side of disconnect.

E. **Maintenance / Clearance Access.** Maintenance access areas and all other code required clearance areas associated with Model Elements are to be modeled; this is to include all access doors in walls and ceilings. The access/code required clearance areas should be drawn to the full extent of the access location (ex. VAV access zones should be drawn to the ceiling/floor below to ensure clear and free access). Access elements are to be clearly identified in the Model and are to be assigned a unique CAD layer or object material.
F. **Penetrations / Sleeves.** Sleeves are to be modeled if penetrations through building systems such as cast- in-place concrete and CMU walls require a sleeve per the Specifications

4.3 Plumbing. Specific dimensional locations of Plumbing Systems may not be included in the Construction Documents; to the extent that location can be determined from the Construction Documents, the Model Elements are to reflect that location.

A. **Piping.** All plumbing piping requiring gravity slope as well as all specialty piping (i.e. medical gas) is to be modeled to the outside diameter of the pipe with any pipe insulation (on a separate CAD Layer/Model Object) clearly defined and should include fittings, connections, hangers, and slope. Piping smaller than 1" (not including insulation) that does not require gravity slope may be excluded from the model, however modeling such pipes is encouraged to reserve space. All valves and clean-outs are to be modeled and are to be specially identified to allow them to be readily found.
B. **Plumbing Equipment.** All plumbing equipment will be modeled to its overall height, width and depth. All support mechanisms are to be modeled.
C. **Maintenance / Clearance Access.** Maintenance access areas and all other code required clearance areas associated with Model Elements are to be modeled; this is to include all access doors in walls and ceilings. (Access elements are to be clearly identified in the Model and are to be assigned a unique CAD layer or object material.)
D. **Penetrations / Sleeves.** Sleeves are to be modeled if penetrations through building systems such as cast- in-place concrete and CMU walls require a sleeve per the Specifications.
E. **Gravity Slope Requirements.** Plumbing systems requiring gravity sloping are to be identified with object parameters or placed on separate layers.

4.4 Electrical. Specific dimensional locations of Electrical Systems may not be included in the Construction Documents; to the extent that location can be determined from the Construction Documents, the Model Elements are to reflect that location.

A. **Equipment.** All Electrical Equipment should be modeled to its overall height, width, and depth. This includes switch gears, transformers, generators, panels, etc. All support mechanisms are to be modeled. All power feeds to equipment will be modeled.
B. **Cable Tray and Conduit.** All Cable tray and gangs of conduit will be modeled as well as individual conduits 1" or larger. Electrician will be responsible for modeling all electrical associated with HVAC from the point the Mechanical Subcontractor stops (line side of disconnect). Flexible systems smaller than 1" are not required to be modeled.
C. **Light Fixtures.** All light fixtures are to be modeled to the overall height, width, and depth as specified.
D. **Maintenance / Clearance Access.** Maintenance access areas and all other code required clearance areas (including Light Fixtures) associated with Model Elements are to be modeled; this is to include all access doors in walls and ceilings. (Access elements are to be clearly identified in the Model and are to be assigned a unique CAD layer or object material.)
E. **Penetrations / Sleeves.** Sleeves are to be modeled if penetrations through building systems such as cast- in-place concrete and CMU walls require a sleeve per the Specifications.

4.5 Fire Protection. Specific dimensional locations of Fire Protection Systems may not be included in the Construction Documents; to the extent that location can be determined from the Construction Documents, the Model Elements are to reflect that location.

A. **Equipment.** All equipment, such as fire pumps, associated with the Fire Protection system will be modeled.
B. **Piping.** All Fire Protection piping, including fittings, connections, slopes, valves, and sprinkler heads is to be modeled. Support mechanisms are to be modeled. Temporary standpipe is also to be included as a Model Elements.

4.6 Maintenance / Clearance Access. Maintenance access areas and all other code required clearance areas associated with Model Elements are to be modeled; this is to include all access doors in walls and ceilings. (Access elements are to be clearly identified in the Model and are to be assigned a unique CAD layer or object material.)

A. **Penetrations / Sleeves.** Sleeves are to be modeled if penetrations through building systems such as cast- in-place concrete and CMU walls require a sleeve per the Specifications.

4.7 Steel. The structural steel fabricator will be expected to provide a 3D model of their Scope of Work, including all structural and miscellaneous steel in detail. This includes columns, beams, bolted connections, gusset plates, stairs, equipment supports, embeds, and other miscellaneous supports.

4.8 Miscellaneous Systems.

Attachment A

3D Coordination Sign-Off

UNCW Randall Library Renovation and Expansion

Statement of Coordination Completion:
Balfour Beatty and the Subcontractors listed below confirm that the Navisworks model dated MM,DD, YYYY for area(s) being finalized of the Project Name has been satisfactorily coordinated between all trades of the MEP systems and the Architectural & Structural elements. The design elements of this model are based on the current Construction Documents dated MM DD, YYYY.

Subcontractor agrees to prepare field drawings and install their respective components per the coordinated model. Any variations and/or conflicts in the field between coordinated elements will be reviewed by Balfour Beatty to determine fault. Components that are confirmed to be installed in conflict with the coordinated model layout and create obstacles or additional work for other disciplines shall require one of the following actions: a) removal and reinstallation per model, or b) monetary compensation to the affected party.

Changes occurring to the Construction Documents following sign-off will be treated on a case-by-case basis, but typically changes will be the responsibility of Subcontractor to coordinate with the signed-off model. Any changes made by Subcontractor should be reflected in their next Model submitted to Balfour Beatty. When necessary, Balfour Beatty will request revised models in order to coordinate the changes prior to install.

Balfour Beatty **General Contractor**	*Name*	*Date*
Subcontractor Project Manager **Plumbing, Mechanical Piping, HVAC**	*Name*	*Date*
Subcontractor Detailer **Plumbing, Mechanical Piping, HVAC**	*Name*	*Date*

Attachment B

3D Coordination Standards

UNCW Randall Library Renovation and Expansion

1. **File naming Conventions.** Each trade will upload their authoring file to follow the correct naming conventions.
    a. **(Company Name abbreviation – Project abbreviation – Trade Scope – Floor)**

Scope	File Name
Architectural, Whole Model	BBC-UNCW Library_ARCH
Structural, Whole Model	BBC-UNCW Library _STRUCT
Fire Protection, Level 01 (etc.)	***-UNCW Library -FIRE_01
Mechanical Piping, Level 01 (etc.)	***-UNCW Library -MECHP_01
Ductwork, Level 01 Level 01 (etc.)	***-UNCW Library -DUCT_01
Plumbing, Level 01 Level 01 (etc.)	***-UNCW Library -PLUMB _01
Electrical, Level 01 Level 01 (etc.)	***-UNCW Library -ELEC_01
Data/IT, Level 01 Level 01 (etc.)	***-UNCW Library -IT_01

2. Model hosting: Documents and models will be transferred via Balfour Beatty's Egnyte site. The respective BIM Coordinator from Balfour Beatty will provide an invite / access link to get to the relevant documents for the project. Each participant in the coordination process will need to set up their own username and password to gain access.

The established folder structure created on the site should be maintained throughout the course of the project and should not be changed or added to. This is vital to keeping a neat and organized website throughout the project.

Please note that Egnyte supports versioning, so it is unnecessary to append dates to the end of files. Simply upload the file with the same name and both versions will then be available.

Table 4.1 - File/Document Access and Distribution

Collaborative Site Address	**www.egnyte.com**
Username	**User Specific (set up by each user)**
Password	**User Specific (set up by each user)**

*Table 5.1 - Project Schedule * working*

Milestone	Scheduled Completion
BIM Kickoff Meeting	
Underground - Models Due	
Underground - Coordination Signoff	
Underground - Shop Drawings	
Level 01 - Models Due	
Level 01 - Coordination Signoff	
Level 01 - Shop Drawings	
Level 02 - Models Due	
Level 02 - Coordination Signoff	