University of Kentucky
Procurement Services

REQUEST FOR PROPOSALS

UK-2564.0-17-25
HEB TC-043 Audiovisual Systems
ADDENDUM #5
06/24/2025

ATTENTION: This is not an order. Read all instructions, terms, and conditions carefully.

IMPORTANT: RFP AND ADDENDUM MUST BE RECEIVED BY: 07/01/2025 @ 3:00 P.M. LEXINGTON, KY TIME

Offeror should acknowledge receipt of this and any addendum as stated in the Request for Proposal.

ITEM #1: Revisions & Modifications to the Original Bid Documents

- Please see the enclosed additional documents from the project team. These documents were included in the original RFP posting and Addendum #4 but were incorrectly labeled. The following documents are enclosed:
    - Attachment F – HEB Percentage Markup
    - Attachment H – BIM General Requirements
    - Attachment I – Lean Construction Subcontract
    - Attachment N – Turner Subcontractor Onboarding

OFFICIAL APPROVAL
UNIVERSITY OF KENTUCKY

06/24/2025

Ken Scott
_____

Ken Scott, Purchasing Officer

SIGNATURE

_____

_____
Typed or Printed Name

University of Kentucky
Procurement Services
322 Peterson Service Building
Lexington, KY 40506-0005

ATTACHMENT "F"
Percentage Markup and Procedures Applicable to Work
Added to or Deleted from the Original Contract Requirements

LUMP SUM

Predetermined Lump Sum additions and/or omissions to the Agreement are to be based upon the estimated "Net Actual Cost", plus the following maximum %'s for Overhead and Profit. The percentages for Overhead and Profit will be negotiated and may vary according to the nature, extent and complexity of the work involved.

The total sum of Overhead and Profit for addiitions and/or omissions of the prime contractor and its sub tier contractors shall not exceed the maximum percentage for Overhead and Profit listed below. On proposals for decreases in the amount of the contract, the overhead and profit will be added to the "Net Actual Cost", thereby increasing the credit that would be deducted from the price of this agreement:

	LABOR & MATERIAL
Additions:	OH & P 10%
Omissions/Credits:	OH & P 10%

TIME AND MATERIAL

Contract Work, authorized by Turner in advance to be performed on a Time and Material Basis, is to be based upon the "Net Actual Cost" plus the following Percentages for Overhead and Profit:

	LABOR & MATERIAL
Additions:	OH & P 10%

GENERAL

1. Submission of estimates and costs shall be itemized in a form satisfactory to Turner to permit ready analysis and evaluation. On time and material work, daily reports (in duplicate and showing all field and shop labor expended and/or material delivered) shall be submitted to Turner. Invoices shall be submitted monthly.
2. No overhead and profit will be permitted on premium time.
3. Percentages shall apply to net differences in quantities for adds and deducts in any one change.
4. Percentages applied by sub-subcontractors shall not exceed those of this subcontractor.
5. Net Actual Cost
   - **A. Labor:**
     1. Wages of labor, including foremen, engaged in work and directly on the Subcontractor's payroll.
     2. Engineering and drafting performed at the Site with Turner's prior written approval.
     3. Fringe Benefits established by governing trade organizations.
     4. Federal Old Age Benefits, Federal and State Unemployment Taxes.
     5. Net actual premium paid for Public Liability, Workers' Compensation, Property Damage, and any other forms of insurance required by Turner.
   - **B. Material:**
     1. Net cost of construction materials and supplies (FOB Job Site, where applicable) including applicable Sales and/or Use taxes if allowed by contract, trade and cash discounts.
     2. Costs of a special nature, approved in advance by Turner, such as for riggers, labor, transportation, equipment rentals, royalties, permits, and other expenses of this general nature.
   - **C. Sublet Work:**
     1. Net cost to the Subcontractor of work sublet by him.
6. Percentages shall include the following overhead costs:
   - A. Supervision (Including Field) and executive expenses.
   - B. Small tools, scaffolding, blocking, shores, appliances, etc. and the expense of maintaining same.
   - C. Administrative expenses, clerical, etc., both at the Job Site and in the Subcontractor's Office.
   - D. Taxes and any bonds required to be paid by the Subcontractor, but not included under the aforementioned Net Actual Costs.
7. Percentage markup for overhead and profit for Sub Subcontractors shall be limited to the above listed percentages also.
8. Percentages shall include all profit.
9. The Subcontractor will be at risk if adherence to these procedures is not followed.

ATTACHMENT H
Project BIM Requirements

Building Information Modeling (BIM) is the development and use of a three-dimensional computer model to represent a virtual model of the facility and the process for constructing the facility. Once the model is developed, it can be used to simulate the construction process and to manage the operations of the facility. The Building Information Model can be created by combining many different three-dimensional models from the designers and contractors into a federated model. From this federated model, views and data appropriate to various users' needs can be extracted and analyzed to generate information so long that said need is feasible to be met given the format of the delivered composite model, to make decisions and to improve the process of delivering the building.

The Project shall utilize three-dimensional modeling for the coordination of all Sitework, Site Utilities, Architectural, Structural, Mechanical, Plumbing, Fire Protection, Electrical Systems, and Low Voltage Systems.

Virtual Design and Construction Techniques

1. Subcontractor agrees to participate in the use of digital/computer based three dimensional models and other related functionality, generally referred to as building information modeling (such models and functionality are referred to herein as BIM) as Turner may determine to be beneficial for use in facilitating coordination, sequencing, scheduling and/or production of as-built depictions of the Project and performance of the Work and as hereafter provided. The Subcontractor's costs of such participation are included in the Price unless explicitly outlined herein.

2. Subcontractor shall provide digital submissions of information describing its respective Work in a form and manner that Turner may require and that can be loaded into a federated model assembled by Turner.

3. Subcontractor's submissions shall be of sufficient detail to enable accurate and complete clash detection and shall be provided by Subcontractor at a point in time that is reasonably in advance of Subcontractor's shop drawing submittals and the subsequent on site construction of the Subcontractor's Work and such submissions shall contain such details and follow such procedures as Turner may require.

4. The digital format of such BIM submissions shall be as described herein (specifying the necessary digital formats, software requirements, etc.), which will be provided to subcontractor after execution of Agreement and prior to the start of coordination.

5. Subcontractor shall participate in BIM Coordination and review meetings as Turner may require and agrees that, as a result of the information exchanged at such meetings, both the digital submission and the Work depicted in the Subcontractor's digital submission may be required to be changed by Subcontractor to achieve coordination with other elements of the Project being provided by others. Such changes shall be accomplished at no increase in the Price or Time of Completion. Subcontractor acknowledges that such meetings will require attendance of personnel that are familiar with both the data entry aspects of the BIM as well as an understanding of the Work to be performed and its relation to other elements of the Project, and subcontractor therefore agrees that personnel conversant in both shall attend all such meetings.

6. Subcontractor agrees that neither the BIM nor the use of the BIM is in lieu of nor intended to relieve the Subcontractor of its responsibilities under the Subcontract, including to (i) coordinate its Work with the work of others involved in the Project and (ii) strictly comply with the other requirements of the Subcontract Agreement and the Contract Documents. It is expressly understood and agreed that, notwithstanding the requirement for submittals in connection with the BIM, traditional shop drawings and other submissions shall be required of Subcontractor as required by the Contract Documents and no party shall be liable to the other for any claim, dispute, controversy, cost, or expense arising solely out of the use of the BIM.

7. Turner does not waive any of its intellectual property rights and shall have the sole and exclusive

right to use the BIM and all submissions made by Subcontractor as it deems appropriate, whether during or after construction.

8. Subcontractor agrees that notwithstanding the fact that it may participate in the BIM process or receive information or materials from others in connection with the Project through the course of the use or development of the BIM, it shall not take any position that the receipt of such participation or information has or will, in any respect, operate to waive, release or otherwise invalidate any of its obligations or responsibilities under the Subcontract or any intellectual property rights (copyrights, trademarks/logos, patents, etc.) or secure information that may apply to such information or materials.

9. Subcontractor acknowledges and agrees that Turner shall incur no responsibility or liability with respect to the BIM or the use thereof, including those resulting from errors, omissions, or deficiencies in the BIM. In the event that Subcontractor provides deficient information or data that does not represent the Work it will be ultimately providing, that is corrupted, that contains a virus and/or that otherwise damages the BIM, Subcontractor shall bear all costs associated with reconstructing the BIM and to otherwise remediate such deficiencies or their effects.

10. In the event the Subcontractor discovers any error, inconsistency, or omission in its information or submissions, the information or submissions provided by others or any BIM, it shall promptly report the same to Turner via written notice, which shall contain all relevant specifics.

11. Subcontractor acknowledges that the BIM may require updating throughout the life of the Project to address any changes to the Work so that the BIM at the conclusion of the Project accurately depicts the Work as actually performed and installed. Subcontractor agrees to promptly update and provide revised submissions to Turner throughout the course of the Project so that the BIM at the conclusion of the Project accurately depicts the Work as actually performed and installed.

12. Subcontractors will be compensated for any additional modeling as a result of any additions to the scope of work that are approved by the Owner so long that the subcontractor includes the price required for the additional modeling associated with this increase in any document that includes but is not limited to any change order requests, RFIs, and Bulletins submitted to the Owner prior to final approval.

13. The foregoing process is in addition to the Subcontractor's obligations to make the traditional submissions and shall not relieve or lessen in any way the Subcontractor's obligations contained throughout this Agreement and the other Contract Documents.

Subcontractor Roles and Responsibilities – All Trades:

1. Owner/Architect may provide three-dimensional design models for use as backgrounds for coordination. Models may include basic architectural features, such as the floors, a rough approximation of ceilings chases, door openings, partitions exterior wall surfaces, window openings, roofs, elevator shafts, and stairs, and basic Structural features such as slabs and walls, steel framing – columns, beams, and major structural elements. Each Trade Contractor is ultimately responsible for coordinating to all information contained in the 2D contract drawings and specifications as related to their work. The models provide are used as diagrammatic representation only and is not to be relied upon for their accuracy, or as a reflection of the design, design intent, or representation of existing conditions.

2. Turner Construction Company will specify or make available a collaboration platform that will enable all project parties to upload and download their respective "in-progress shop models," manage electronic drawing files or models and other electronic documents used in the coordination process.

3. If three-dimensional design models or two-dimensional CAD files are posted on the collaboration site, it is recommended that each trade use these files as references to create their system models by sequence or geographic area dictated by Turner's representatives. The process is to create and upload system models to the collaboration site as frequently as required by Turner for other trades to use while modeling their systems.

4. Trade Contractor is not required nor encouraged to wait for the distribution of two-dimensional CAD files or three-dimensional background models by Turner to begin their engineering and drafting efforts. Each subcontractor shall proceed with the most haste using the two-dimensional contract documents to begin their engineering and drafting in order to meet the project schedule.

5. Each Trade Contractor is required to use parametric BIM authoring software. Owner project requirements may require specific authoring software such as Revit to be used by all Trades. All objects in the models must be three-dimensional solids, parametric components, or AEC (Architecture, Engineering, and Construction) objects. All files shall be purged prior to submission. All models should reflect the exact material properties and performance data.

6. The model origin shall be consistent with that which is provided by Turner prior to trade coordination. All trade subcontractor's drawing and model files shall be based on this origin point provided by Turner. The cost of any changes required by the Trade Contractor to their drawings or models due to the use of an unauthorized origin shall be borne by the trade contractor.

7. Each Trade Contractor is required to submit all models to Turner in their native Model authoring format, three-dimensional DWG, three-dimensional NWC, with necessary Object Enabler executable(s). The three-dimensional model shall be layered and constructed in a manner such that all elements of the model can be converted into a two-dimensional drawing for use in the field.

8. The three-dimensional models submitted by the Trade Contractor for overall coordination are required to be checked and coordinated with the structure and the Trade Contractor's own work prior to submittal.

9. Each Trade Contractor is to provide a list of minimum typical clearances and access requirements for all model components and coordinate necessary clearances/access within the model. The three-dimensional model is to include clearances for equipment included as a modeled volume such that clash detection and coordination can be accommodated relating to necessary clearances/access. All clearances modeled shall begin at the access points to all the way to the equipment.

10. Each Trade Contractor shall be prepared to attend daily coordination huddles and scheduled coordination meetings to resolve conflicts within the model.

11. Each Trade detailer/drafter shall have the capability to host and attend virtual meetings.

12. Penetrations through building systems shall be identified in the three-dimensional model by means of a modeled sleeve, and shall be identified on penetration and sleeve drawings in a PDF and DWG format to be submitted to Turner as per the coordination schedule.

13. Each Trade shall complete the drawings and model in a time frame capable of meeting the Project Schedule.

14. Each Trade may be asked to provide a three-dimensional mock-up of a specific portion of the project to be designated by Turner, prior to the pre-detailing meeting, in full detail in order to verify the compatibility of the file formats. Each Trade Contractor shall provide object enablers for its specific three-dimensional software if required.

15. Each Trade is responsible for providing their detailer/drafter with the appropriate modeling and coordination hardware/software to meet the requirements herein, including the ability to attend in-person coordination meetings so to be able to make live, real-time changes to the "Shop Model" in the meetings and in order to review the finalized, signed off coordinated models prior to and during the fabrication/installation process.

16. Each Trade is to submit the required number of color copies of their respective, As-Built two-dimensional drawings as required by the contract documents, for approval through the regular closeout process. This is required for each floor as well as each riser.

17. Each Trade is required to digitally submit their three-dimensional As-Built models. The final as-built will be submitted in their native model authoring format, three-dimensional solid object DWG,

three-dimensional NWC, IFC, and 2D DWG/PDF. Turner reserves the right to request additional file formats as the needs of the client or project require.

18. Each Trade is required to update and post any changes originating from RFI's, submittals and bulletins that have changed their respective work. Each Trade making changes shall post to the collaboration site and send out a corresponding notice indicating the changes and reasoning behind the change within 5 business days of receipt of the changes.

19. Each Trade is required to model in a format that a 3rd party individual can highlight and track progress of work by selecting individual items in each trade model. Each trade will make their best effort to organize and categorize the objects within their model files in a useful manner.

20. It is critical that Each Trade use a mandated file naming convention. Turner will provide the file naming convention to all involved contractors at the coordination kick-off meeting. Any files that do not follow the file naming convention will be deleted and removed from the server at any time without any notification.

Coordination Process – All Trades:

1. Turner will provide a BIM Coordinator to manage the BIM Coordination Meetings, Clash Detections and give direction for changes, scope of work per schedules and meeting schedules. Turner's BIM Coordinator will call meetings, as required, which this contractor and vendors must attend. Failure to attend will result in work by the absent contractor on sheets reviewed at meetings being declared improperly coordinated and will require the contractor to relocate work as shown by Turner, or to field run the work not coordinated. No extra compensation will be paid to any contractor for relocating any pipe, conduit, or other material that has been installed without proper coordination between all the contractors and the trades involved. If any improperly coordinated work, or work installed that is not in accordance with the approved coordination composites, necessitates additional work by other contractors, the cost of such additional work shall be assessed to the contractor responsible as determined by Turner. Errors in coordination will be resolved by the contractor at his own expense. Where agreements cannot be reached, Turner will furnish a resolution. The contractor will bear the expense of said resolution.

2. All work on the coordination drawings (including three-dimensional models) shall be performed by an experienced draftsperson in a clear legible manner utilizing standard industry conventions.

3. All trades shall be responsible for providing their coordination drawing files according to the established coordination schedule.

4. It is the responsibility of All Trades to supply a sufficient number of draftsperson so as not to delay the three-dimensional coordination process and shop drawing submittals.

5. Coordination drawings are not to be construed as and not to relieve each contractor from their shop drawing obligations required under the project specifications, and are distinctly separate from the requirements to provide final "As-Built" drawings.

6. All files exchanged by trade contractors will be in a file format that is readable by other trades' CAD system and Navisworks. Being 'readable' means the ability to open a file without any errors (such as proxy, xref resolution, geometry error, etc.) and with objects, layers, and other file properties remaining intact. In addition, all files shall be saved down to the lowest common version.

7. All Trades are responsible for providing three-dimensional solid models (not line, wireframe, or surface models) that represents the actual dimensions of the trade system elements and the equipment that will be installed.

8. Coordination will be expected to start as soon as contracts are awarded or letters of intent are sent (whichever comes first).

9. Each Trade Contractor will model in conformance with the design documents.

10. Turner may require that subcontractors divide their systems models by floors, zones, and/or areas as defined by Turner to better manage the coordination process in a manner that is most conducive to meeting the project's schedule and needs.

11. Each Trade must run the clash detection analysis for their respective trade system against the Architectural/Structural design models to ensure there are no conflicts between the architectural/ structure elements and their system(s). These analysis documents are to be shared with the BIM Coordinator for any major clash issues that cannot be resolved between the trades in working sessions.

12. Each Trade is required to run the clash detection analysis for their respective trade system against the other trade models in sequence to ensure that there are no conflicts between other trade elements and their system(s).

13. Each Trade is required to post to the collaboration site, updated drawings/models at least once a day, and prior to the clash detection analysis run by the BIM Coordinator. (Day and time to be determined). This will continue until the area is completely coordinated.

14. When the coordination models are uploaded, the BIM Coordinator and/or MEP Engineer will download and integrate all trade models into a consolidated model. The clash reports will be run for MEP systems in conflict with other trades and systems. A clash analysis report will be generated by the BIM Coordinator for major coordination issues that cannot be resolved between the active trades. The BIM Coordinator will create a Navisworks .NWD file showing the clash viewpoints. This Clash report & Navisworks .NWD file will be posted to the collaboration site by the BIM Coordinator and a corresponding notice sent by the BIM Coordinator to all parties involved that the report is ready.

15. Each Trade is required to review the clash detection report generated by the BIM Coordinator before the coordination meeting, and arrive at the meeting prepared to address the unresolved clashes in a constructive manner.

16. Each Trade is required to collaborate with each other trade through email, telephone, and in person to resolve basic clashes with the BIM Manager outside of the BIM Coordination Meetings with the BIM Coordinator. It is expected that these coordination meetings between trades be held to address difficult areas that require more effort between the multiple trades themselves. At these meetings, the resolution will be collectively agreed upon, and a trade will be identified as having to "move". This trade will adjust the respective model and repost it for the following coordination meeting. All trades are responsible to update and post the changes agreed upon at the meeting within 2 business days, or at Turner's discretion based on schedule requirements.

17. Each Trade is to submit the required number of copies of their respective, coordinated systems in a two-dimensional format as required by their contract, for approval through the regular submittal process. This is required for each floor as well as each riser. In addition to the development of three-dimensional coordination models, all trade subcontractors are responsible for producing a traditional two-dimensional coordination drawing after cleaning up resolved all clashes and collisions. In the preparation of the final composite two-dimensional coordination drawings, large scale details as well as cross and longitudinal sections developed at Coordination Meetings shall be made by the subcontractor as required to fully delineate all conditions. The final Coordination CAD drawing file will be circulated through all trades in preparation for a BIM sign-off meeting. This electronic coordination drawing files shall include all coordinated drawing information, fully dimensions (especially elevation dimensions), texts, and tags, etc. The fully coordinated overlay drawing will then be signed off and dated by each contractor at the sign-off meeting.

Change Management – All Trades:

1. Each Trade Contractor is responsible for incorporating the following changes into the model and drawings on a regular basis, but in no case later than 5 business days from the date of issuance. If changes are going to take longer than 5 business days then Each Trade Contractor is required to get an extension in writing from Turner within 5 business days from the date of issuance:
    a. RFIs, Bulletins and Owner approved changes.

b. Changes in the sequences of work
c. Field modifications
d. Shop drawing review comments or design modifications and field changes made by Trade Contractors
e. Changes requested by the Construction Manager
f. Clash Resolution

2. The process for quantifying and correcting clashes caused by a design change to a signed off and in-progress area is as follows:
    a. Trade(s) that have work directly affected by the bulletin documents will take the lead in drafting the revised three-dimensional layout, minimizing the clashes w/ other trades as much as possible. Revised layouts are to be drawn in an identifiable layer, labeled to match the respective bulletin.
    b. Once the work is drafted by the affected trade(s), these trades will work to coordinate clash resolutions amongst themselves while keeping the BIM Coordinator informed of their efforts.
    c. A clash report will be prepared by the BIM Coordinator w/ all latest posts when it is determined that clashes remain which could not be resolved by the trades themselves.
    d. A coordination meeting will be held if required to resolve remaining clashes. Actions will be assigned to the appropriate trades the fixes will be made in a timely manner.
    e. Once all new clashes resulting from the change are resolved, a sign-off meeting will be held with a new fully-coordinated overlay drawing to document the resolution of the clashes.

3. All revised three-dimensional model or two-dimensional drawing submittals shall have a written narrative to define changes from previous submittals. Typical drafting techniques such as 'clouds' or 'bubbles' are acceptable means of tracking changes on the 2D drawings. [Layer control shall be used to define changes in the three-dimensional model. All revisions shall be shown in both 2D and three-dimensional formats.]

Individual Subcontractor Roles and Responsibilities:

1. The **TC-013 Site Plumbing Contractor** will generate and provide, in a timely manner, a three-dimensional model of their underground Domestic Water, Fire Protection, Steam, and Chilled Water scope of work in addition to their contractually required two-dimensional documentation. This contractor shall also generate and provide, in a timely manner, a three-dimensional model of the TC-009 Site Electric contractor's underground installations, as well as the TC-014 Excavation contractor's Storm and Sanitary installations. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but is not limited to, concrete slabs, foundation and other structural walls, caissons and footings, grade beams, concrete columns, concrete beams, ramps, concrete stairs, concrete equipment pads and any other concrete scope items necessary for the successful coordination of other building trades. Any structural entities modeled shall have a level of intelligence associated with them including, at a minimum, the type, material, size, etc. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the concrete system in its entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, and 2D DWG/PDF.

2. The **TC-016 Structural Steel Contractor** will generate and provide, in a timely manner, a three-dimensional model of their structural scope of work in addition to their contractually required 2D documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but is not limited to, major structural members such as primary steel members (columns, beams, joists and trusses), secondary and miscellaneous steel connections including equipment support, steel stairs, kickers, bolts, clip angles, gusset plates, miscellaneous metals, railings, bracing, knife plates, etc. necessary for the successful coordination of other building trades. The fabrication level detailed model shall also include structural stair components, façade support angles, lintels, bracing, decks (metal, wood

and concrete, including penetrations and openings). Any structural entities modeled shall have a level of intelligence associated with them including, at a minimum, the type, material, size, etc. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the structural steel system in its entirety. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, and 2D DWG, and 2D PDF.

3. The **TC-020 Cast In Place Shafts and Decks Contractor** will generate and provide, in a timely manner, a three-dimensional model of their concrete scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but is not limited to, concrete slabs, foundation and other structural walls, caissons and footings, grade beams, concrete columns, concrete beams, ramps, concrete stairs, concrete equipment pads and any other concrete scope items necessary for the successful coordination of other building trades. Any structural entities modeled shall have a level of intelligence associated with them including, at a minimum, the type, material, size, etc. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the concrete system in its entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, and 2D DWG/PDF.

4. The **TC-001 Architectural Precast Concrete Contractor** will generate and provide, in a timely manner, a three-dimensional model of their concrete scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but is not limited to, precast concrete columns, beams, spandrel beams, tees, shear walls, miscellaneous walls, precast concrete stairs, precast concrete slabs, foundation and other structural and any other precast concrete scope items necessary for the successful coordination of other building trades. Any structural entities modeled shall have a level of intelligence associated with them including, at a minimum, the type, material, size, etc. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the concrete system in its entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, and 2D DWG/PDF.

5. The **TC-002 Curtainwall Contractor** will generate and provide, in a timely manner, a three-dimensional model of their scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but is not limited to, major Curtainwall elements such as frames, mullions, glass, windows, curtain walls, storefront systems, skylights, borrowed lites and windows leaves, metal panels, support framing, connections, embeds, etc. necessary for the successful coordination of other building trades. Curtainwall to be modeled like it is to be built, i.e. separate components/panelized for the purpose of time lining. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the curtainwall system in its entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, and 2D DWG, and 2D PDF.

6. The **TC-029 Drywall and Ceilings Contractor** will generate and provide, in a timely manner, a three-dimensional model of their scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but is not limited to, major Drywall elements such as head-of-wall conditions, king studs at door and interior glazing, hard lid ceilings and framing, acoustic ceiling framing systems, won-door framing and angle supports, soffit framing and lateral supports, exterior wall framing and supports, required bracing for metal stud systems, vertical and horizontal shafts, etc. necessary for the successful coordination

of other building trades. Exterior walls not included in Structural (including all wall layers, penetrations and openings. Walls to be modeled like they are built: pre-cast walls to be modeled as separate components and masonry walls to be split from floor to floor for the purpose of time lining. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the metal stud and drywall systems in their entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, 2D DWG, and 2D PDF.

7. The **TC-038 Laboratory Equipment Contractor/Vendor** will generate and provide, in a timely manner, a three-dimensional model of their scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but not limited to, casework systems, overhead service carriers, snorkels, structural elements (hangers, threaded rods, misc. attachment elements), fume hoods and bio-safety cabinets, wood laboratory casework. This contractor must play an active role in all the coordination meetings. Provide the structural elements early to allow coordination by other trades around the necessary hangers. All actual points of connection for other trades must be modeled and coordinated; fixture mounting openings must be designated and assigned for each service, as well as umbilical connections shown in the BIM. The model shall also include equipment pads, inertia pads, and access doors, and, under a separate layer, any items to be included in concrete pours (sleeves, boxouts, etc.) The model shall identify under separate drawing layer accessibility requirements for above listed items for code and maintenance purposes. This Contractor to work closely with the Ceilings Contractor, HVAC Contractor. Plumbing Contractor, Electrical Contractor and any other contractor to ensure overhead laboratory equipment specified is well coordinated with the work of others. Provide all access and services areas in greyscale as a solid object on a separate layer for coordination purposes. Final Shop drawings and approval of this contractor's work shall not precede modeling and collaboration with the BIM team. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of laboratory equipment in their entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, 2D DWG, and 2D PDF.

8. The **TC-023 Miscellaneous Steel Contractor** will generate and provide, in a timely manner, a three-dimensional model of their structural scope of work in addition to their contractually required 2D documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but is not limited to, secondary and miscellaneous steel connections including equipment support, steel stairs, kickers, bolts, clip angles, gusset plates, medical equipment supports, toilet partition supports, door supports, window washing system supports, ladders, miscellaneous metals, railings, bracing, knife plates, etc. necessary for the successful coordination of other building trades. The fabrication level detailed model shall also include lintels, bracing, decks (metal, wood and concrete, including penetrations and openings). Any structural entities modeled shall have a level of intelligence associated with them including, at a minimum, the type, material, size, etc. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the structural steel system in its entirety. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, and 2D DWG, and 2D PDF.

9. The **TC-025 HVAC Risers Contractor** will generate and provide, in a timely manner, a three-dimensional model of their scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but not limited to, HVAC piping, chilled water and condenser systems, process chilled water system, steam and condensate systems, heating hot water systems, fuel oil system including all associated piping, all equipment installed in the HVAC Risers Scope of work, AHU's, Built Up AHU's., pumps, tanks, valves, controls, heat exchangers, all valves (including valve stems and handles), gauges & control valves, insulation, hangers & seismic restraints, high & low point drains, motor starters, disconnects, VFD's,

boilers, cooling towers, chillers, heaters, etc. The HVAC Contractor shall also include in the three-dimensional model all concrete equipment pads, inertia bases, and access doors. The HVAC Risers Contractor shall identify under separate drawing layer access doors and accessibility requirements for above listed items for code and maintenance purposes. All items modeled should have a level of intelligence associated with them including, at a minimum, the material type, size, insulation, make and model number, equipment/valve tag, fire/penetration seals, etc. The mechanical rooms shall have a level of intelligence associated with them that include at a minimum material type, size, insulation, manufacturer, product numbers, serial numbers, maintenance schedules, operation and maintenance data, etc. Pipes larger than 3/4" outside diameter to be modeled. Turner and other contractors will use this rule for pipes pertaining to HVAC and mechanical systems and will supersede any other rule listed within the contract documents if they contradict with this statement. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the HVAC system in their entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, 2D DWG, and 2D PDF.

10. The **TC-025 Sheetmetal Risers Contractor** will generate and provide, in a timely manner, a three-dimensional model of their scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but not limited to, supply, return, exhaust and makeup air systems, chemical treatment systems, snow melting systems, all control/power panels, smoke dampers, sensors, valve and damper operators/actuators, duct work, equipment installed in the HVAC Risers Scope of work, Fans, AHU's, Built Up AHU's., air terminal boxes, sound attenuators, smoke & fire dampers, insulation, hangers & seismic restraints, diffusers, registers, louvers, grilles, motor starters, disconnects, VFD's, plenums, etc. The Sheetmetal Risers Contractor shall also include in the three-dimensional model all concrete equipment pads, inertia bases, and access doors for their Scope of Work. The HVAC Contractor shall identify under separate drawing layer access doors and accessibility requirements for above listed items for code and maintenance purposes. All division 23 and 25 systems will be modeled. All items modeled should have a level of intelligence associated with them including, at a minimum, the material type, size, insulation, make and model number, equipment/valve tag, fire/penetration seals, etc. The mechanical rooms shall have a level of intelligence associated with them that include at a minimum material type, size, insulation, manufacturer, product numbers, serial numbers, maintenance schedules, operation and maintenance data, etc. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the sheetmetal systems in their entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, 2D DWG, and 2D PDF. The sheetmetal Contractor is to compile and plot the required number of color copies of the two-dimensional, multi-trade, coordinated drawings required by the contract documents for approval through the regular submittal process, for each floor. This is required for each floor as well as each riser.

11. The **TC-026 Plumbing Risers Contractor** will generate and provide, in a timely manner, a three-dimensional model of their scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but not limited to, all piping systems, and equipment installed, underground systems, domestic cold water and hot water systems, storm/roof leaders, waste and vent systems, pumps, tanks, water heaters, makeup water systems, all control/power panels associated with the scope of work listed in this subparagraph, in wall carriers, in-wall plumbing equipment., all valves, gauges & control valves, insulation on piping, hangers & seismic restraints, clean-outs, drains, trap primers, rainwater/stormwater systems, natural gas, medical gas, medical vac, sewage ejectors, etc. The Plumbing Risers Contractor shall also include in the three-dimensional model all inertia bases, and access doors for their work. The Plumbing Risers Contractor shall identify under separate drawing layer access doors and accessibility requirements for above listed items for code and maintenance purposes. All items modeled should have a level of intelligence associated with them including, at a minimum, the material type, size, insulation, make and model number, equipment/valve tag,

fire/penetration seals, etc. All piping, power and controls associated with the mechanical systems will be modeled. Equipment will be modeled to its overall height, width and depth. Pipes will be modeled to the outside diameter of the pipe or pipe insulation (whichever is greater). All valves, cleanouts and accessories, pipe hangers, hanger assemblies and dunnage will be modeled. The mechanical rooms shall have a level of intelligence associated with them that include at a minimum material type, size, insulation, manufacturer, product numbers, serial numbers, maintenance schedules, operation and maintenance data, etc. Pipes larger than 3/4" outside diameter to be modeled.. Turner and other contractors will use this rule for pipes pertaining to plumbing and fire protection systems and will supersede any other rule listed within the contract documents if they contradict with this statement. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the plumbing systems in their entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, 2D DWG, and 2D PDF.

12. The **TC-028 Fire Protection System Contractor** will generate and provide, in a timely manner, a three-dimensional model of their scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but not limited to, all risers, main and branch piping, (including heads), pumps, controllers, ATS, and equipment installed in the Fire Suppression System Scope of work, pre-action systems, dry system, main fire suppression systems, hangers & seismic bracing, valve assemblies, drain valves, fire department valves, drains, control panels, fire extinguishers, fire department connections and supports, test headers, roof hydrants, etc. The Fire Suppression System Contractor shall also include in the three-dimensional model Concrete Equipment pads, inertia pads, and Access Doors. The Sprinkler Contractor shall identify under separate drawing layer Access doors and Accessibility requirements for above listed items for code and maintenance purposes. All items modeled should have a level of intelligence associated with them including, at a minimum, the material type, size, insulation, make and model number, equipment/valve tag, fire/penetration seals, etc. The mechanical rooms shall have a level of intelligence associated with them that include at a minimum material type, size, insulation, manufacturer, product numbers, serial numbers, maintenance schedules, operation and maintenance data, etc. Pipes larger than 3/4" outside diameter to be modeled. Turner and other contractors will use this rule for pipes pertaining to plumbing and fire protection systems and will supersede any other rule listed within the contract documents if they contradict with this statement. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the fire protection systems in their entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, 2D DWG, and 2D PDF.

13. The **TC-027 Electrical Risers Contractor** will generate and provide, in a timely manner, a three-dimensional model of their scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but not limited to, underground systems, all conduit systems, junction boxes, equipment installed in the Electrical Risers Scope of work, individual conduits 3/4" and over, conduit racks, panels, transformers, switch/paralleling gear, ATS's, generators, cable tray, data racks, starters, VFD's, hangers & seismic bracing, etc. for normal, emergency and isolated power systems. The Electrical Contractor shall also include in the three-dimensional model inertia pads, Light Fixtures, primary distribution (Main Electrical Rooms), secondary distribution to the panel boards (floor level M/E Rooms), junction boxes, lighting protection, Exit Signs, Fire Alarm, Speakers, AV Equipment, Recessed Electrical devices, and Access Doors. The Electrical Risers Contractor shall identify under separate drawing layer Access doors and Accessibility requirements for above listed items for code and maintenance purposes. All panel boards modeled should have a level of intelligence associated with them that accurately identifies at a minimum the panel schedule and equipment tag numbers. All items located within electrical/mechanical rooms and closets shall have a level of intelligence associated with them that includes, at a minimum, material type, size, manufacturer, product numbers, serial numbers,

maintenance schedules, operation and maintenance data, equipment tags, fire penetration/seals, etc. 3/4" and larger in outside diameter conduits to be modeled. Turner and other contractors will use this rule for conduits and will supersede any other rule listed within the contract documents if they contradict with this statement. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the electrical systems in their entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, 2D DWG, and 2D PDF.

14. The **TC-027 Technology and Low Voltage Risers Contractor** will generate and provide, in a timely manner, a three-dimensional model of their scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include all division 27 and 28 systems, but not limited to, all conduit systems, equipment installed in the Low Voltage Scope of work, VFD's, hangers & seismic bracing, individual Conduits 3/4" and over, conduits racks, panels, transformers, controls, cable tray, data racks, starters, VFD's , hangers & seismic bracing, etc. , main distribution equipment, hangers & seismic bracing, antennas access points, antenna enclosures, sleeves, risers, security cameras, access control, emergency communication systems, fire stop assemblies, etc. The Low Voltage Risers Contractor shall identify under separate drawing layer Access doors and Accessibility requirements for above listed items for code and maintenance purposes. All items located within technology rooms and closets shall have a level of intelligence associated with them that includes, at a minimum, material type, size, manufacturer, product numbers, serial numbers, maintenance schedules, operation and maintenance data, equipment tags, fire penetration/seals, etc. All cable trays shall be modeled. All fire stop assemblies shall be modeled. All wireless antennas/Aps, and antenna enclosures shall be modeled. All security cameras shall be modeled. All wall-mounted monitors shall be modeled. 3/4" and larger in outside diameter conduits to be modeled. Turner and other contractors will use this rule for conduits and will supersede any other rule listed within the contract documents if they contradict with this statement. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the technology and low voltage systems in their entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, 2D DWG, and 2D PDF.

15. The **TC-031 HVAC Interiors Contractor** will generate and provide, in a timely manner, a three-dimensional model of their scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but not limited to, HVAC piping, chilled water and condenser systems, process chilled water system, steam and condensate systems, heating hot water systems, all equipment installed in the HVAC Interiors Scope of work, AHU's, Built Up AHU's., pumps, tanks, valves, controls, heat exchangers, all valves (including valve stems and handles), gauges & control valves, insulation, hangers & seismic restraints, high & low point drains, motor starters, disconnects, VFD's, boilers, cooling towers, chillers, heaters, etc. The HVAC Interiors Contractor shall also include in the three-dimensional model all concrete equipment pads, inertia bases, and access doors. The HVAC Contractor shall identify under separate drawing layer access doors and accessibility requirements for above listed items for code and maintenance purposes. All items modeled should have a level of intelligence associated with them including, at a minimum, the material type, size, insulation, make and model number, equipment/valve tag, fire/penetration seals, etc. The mechanical rooms shall have a level of intelligence associated with them that include at a minimum material type, size, insulation, manufacturer, product numbers, serial numbers, maintenance schedules, operation and maintenance data, etc. Pipes larger than 3/4" outside diameter to be modeled. Turner and other contractors will use this rule for pipes pertaining to HVAC and mechanical systems and will supersede any other rule listed within the contract documents if they contradict with this statement. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the HVAC system in their entirety. The intent of this model is to show the systems in a true

representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, 2D DWG, and 2D PDF.

16. The **TC-031 Sheetmetal Interiors Contractor** will generate and provide, in a timely manner, a three-dimensional model of their scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but not limited to, supply, return, exhaust and makeup air systems, chemical treatment systems, snow melting systems, all control/power panels, smoke dampers, sensors, valve and damper operators/actuators, duct work, equipment installed in the HVAC Interiors Scope of work, Fans, AHU's, Built Up AHU's., air terminal boxes, sound attenuators, smoke & fire dampers, insulation, hangers & seismic restraints, diffusers, registers, louvers, grilles, motor starters, disconnects, VFD's, plenums, etc. The Sheetmetal Contractor shall also include in the three-dimensional model all concrete equipment pads, inertia bases, and access doors for their Scope of Work. The HVAC Contractor shall identify under separate drawing layer access doors and accessibility requirements for above listed items for code and maintenance purposes. All division 23 and 25 systems will be modeled. All items modeled should have a level of intelligence associated with them including, at a minimum, the material type, size, insulation, make and model number, equipment/valve tag, fire/penetration seals, etc. The mechanical rooms shall have a level of intelligence associated with them that include at a minimum material type, size, insulation, manufacturer, product numbers, serial numbers, maintenance schedules, operation and maintenance data, etc. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the sheetmetal systems in their entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, 2D DWG, and 2D PDF. The sheetmetal Contractor is to compile and plot the required number of color copies of the two-dimensional, multi-trade, coordinated drawings required by the contract documents for approval through the regular submittal process, for each floor. This is required for each floor as well as each riser.

17. The **TC-030 Plumbing Interiors Contractor** will generate and provide, in a timely manner, a three-dimensional model of their scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but not limited to, all piping systems, and equipment installed, underground systems, domestic cold water and hot water systems, storm/roof leaders, waste and vent systems, pumps, tanks, water heaters, makeup water systems, fuel oil system including all associated piping and tanks, all control/power panels associated with the scope of work listed in this subparagraph, in wall carriers, in-wall plumbing equipment., all valves, gauges & control valves, insulation on piping, hangers & seismic restraints, clean-outs, drains, trap primers, rainwater/stormwater systems, natural gas, medical gas, medical vac, sewage ejectors, etc. The Plumbing Interiors Contractor shall also include in the three-dimensional model all inertia bases, and access doors for their work. The Plumbing Interiors Contractor shall identify under separate drawing layer access doors and accessibility requirements for above listed items for code and maintenance purposes. All items modeled should have a level of intelligence associated with them including, at a minimum, the material type, size, insulation, make and model number, equipment/valve tag, fire/penetration seals, etc. All piping, power and controls associated with the mechanical systems will be modeled. Equipment will be modeled to its overall height, width and depth. Pipes will be modeled to the outside diameter of the pipe or pipe insulation (whichever is greater). All valves, cleanouts and accessories, pipe hangers, hanger assemblies and dunnage will be modeled. The mechanical rooms shall have a level of intelligence associated with them that include at a minimum material type, size, insulation, manufacturer, product numbers, serial numbers, maintenance schedules, operation and maintenance data, etc. Pipes larger than 3/4" outside diameter to be modeled.. Turner and other contractors will use this rule for pipes pertaining to plumbing and fire protection systems and will supersede any other rule listed within the contract documents if they contradict with this statement. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the plumbing systems in their entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model

authoring format, 3D solid object DWG, 3D NWC, IFC, 2D DWG, and 2D PDF.

18. The **TC-032 Electrical Interiors Contractor** will generate and provide, in a timely manner, a three-dimensional model of their scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but not limited to, underground systems, all conduit systems, junction boxes, equipment installed in the Electrical Scope of work, individual conduits 3/4" and over, conduit racks, panels, transformers, switch/paralleling gear, ATS's, generators, cable tray, data racks, starters, VFD's, hangers & seismic bracing, etc. for normal, emergency and isolated power systems. The Electrical Interiors Contractor shall also include in the three-dimensional model inertia pads, Light Fixtures, primary distribution (Main Electrical Rooms), secondary distribution to the panel boards (floor level M/E Rooms), junction boxes, lighting protection, Exit Signs, Fire Alarm, Speakers, AV Equipment, Recessed Electrical devices, and Access Doors. The Electrical Interiors Contractor shall identify under separate drawing layer Access doors and Accessibility requirements for above listed items for code and maintenance purposes. All panel boards modeled should have a level of intelligence associated with them that accurately identifies at a minimum the panel schedule and equipment tag numbers. All items located within electrical/mechanical rooms and closets shall have a level of intelligence associated with them that includes, at a minimum, material type, size, manufacturer, product numbers, serial numbers, maintenance schedules, operation and maintenance data, equipment tags, fire penetration/seals, etc. 1" and larger in outside diameter conduits to be modeled. Turner and other contractors will use this rule for conduits and will supersede any other rule listed within the contract documents if they contradict with this statement. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the electrical systems in their entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, 2D DWG, and 2D PDF.

19. The **TC-033 Technology and Low Voltage Interiors Contractor** will generate and provide, in a timely manner, a three-dimensional model of their scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include all division 27 and 28 systems, but not limited to, all conduit systems, equipment installed in the Low Voltage Interiors Scope of work, VFD's, hangers & seismic bracing, individual Conduits 3/4" and over, conduit racks, panels, transformers, controls, cable tray, data racks, starters, VFD's , hangers & seismic bracing, etc. , main distribution equipment, hangers & seismic bracing, antennas access points, antenna enclosures, sleeves, risers, security cameras, access control, emergency communication systems, fire stop assemblies, etc. The Low Voltage Interiors Contractor shall identify under separate drawing layer Access doors and Accessibility requirements for above listed items for code and maintenance purposes. All items located within technology rooms and closets shall have a level of intelligence associated with them that includes, at a minimum, material type, size, manufacturer, product numbers, serial numbers, maintenance schedules, operation and maintenance data, equipment tags, fire penetration/seals, etc. All cable trays shall be modeled. All fire stop assemblies shall be modeled. All wireless antennas/Aps, and antenna enclosures shall be modeled. All security cameras shall be modeled. All wall-mounted monitors shall be modeled. 1" and larger in outside diameter conduits to be modeled. Turner and other contractors will use this rule for conduits and will supersede any other rule listed within the contract documents if they contradict with this statement. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the technology and low voltage systems in their entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, 2D DWG, and 2D PDF.

20. The **TC-043 Audiovisual Systems Contractor** will generate and provide, in a timely manner, a three-dimensional model of their scope of work in addition to their contractually required two-dimensional documentation. **The three-dimensional model will represent an "as-fabricated" fully detailed level of information.** The fabrication level detailed model shall include, but not limited to, all support systems, monitors, projectors, projector screens, microphones, speakers,

sound masking devices, hangers & seismic restraints, etc. The model shall also include equipment pads, inertia pads, and access doors, and, under a separate layer, any items to be included in concrete pours (sleeves, boxouts, etc.) The model shall identify under separate drawing layer accessibility requirements for above listed items for code and maintenance purposes. All items modeled should have a level of intelligence associated with them including, at a minimum, the material type, size, make and model number, equipment tag, etc. Equipment will be modeled to its overall height, width and depth. These models shall be updated and maintained to reflect changes in the work as a result of coordination or design changes and shall be delivered at the end of the project as an as-built record model of the audiovisual system in their entirety. The intent of this model is to show the systems in a true representation of the actual condition at construction completion. The final as-built will be submitted in their native Model authoring format, 3D solid object DWG, 3D NWC, IFC, 2D DWG, and 2D PDF.

21. **Each Equipment Vendor/Contractor**, if not specifically indicated above, shall provide intelligent models of their Equipment. Provide the following items, including but not limited to:
    a. Models shall be dimensionally accurate
    b. All supply and return connections shall be indicated.
    c. Include connections to all systems
    d. All Skid, support structure, stands shall be Shown in exact configuration
    e. Housekeeping pad layout shall be accurately modeled
    f. Access Doors or panels
    g. Tanks
    h. Valves and valve clearances
    i. Gauges
    j. Power connections, and all raceway
    k. Flanges, blanks, inspection points
    l. Ladders, stairs and guardrails
    m. Exhaust or duct connections
    n. Power and/or control panels
    o. Pumps, filters
    p. Air/liquid separators
    q. Drain locations and piping
    r. Vents and vent lines
    s. Equipment enclosures
    t. No-fly-zones for equipment maintenance/ access (ie tube pull, coil pull, etc…)
    u. No-fly-zones for personnel access
    v. No-fly-zones for safety or code requirements
    w. All vibration isolation

ATTACHMENT "I"
Lean Construction
ATTACHMENT TO THE SUBCONTRACT AGREEMENT BETWEEN TURNER AND SUBCONTRACTOR

Lean focuses on maximizing customer value while eliminating waste through continuous improvement and respect for people. Turner expects that all subcontractors and suppliers will focus on continuous improvement of the construction process. Turner, subcontractors, and suppliers shall in good faith collaboratively participate in learning, planning, control processes, and strategies to achieve the goal of greatest productivity for the project; maximizing the value delivered to the customer. Maximizing value requires elimination of waste in all processes and implementing improvements at every opportunity. Subcontractors and suppliers will assign on-site leadership whose behaviors support collaboration with the project team.

Turner may utilize some or all of the approaches and tools listed below to reduce waste. Subcontractors and suppliers will coordinate with Turner in implementing these activities. The project team may research, develop, and implement other approaches and tools for the betterment of the project.

5S Methodology

5S is a system to optimize productivity and safety through maintaining an orderly workplace and using visual cues to achieve more consistent operational results.

1. **Sort** – Eliminate all unnecessary tools, parts, materials. Keep only essential items, eliminate what is not required, prioritize things per schedules/requirements and keeping them in easily accessible places.
2. **Straighten (Set in Order for Flow)** – Arrange the work, workers, equipment, parts, and instructions in such a way that work flows free of waste through value added tasks. Identify locations where items will be used and place those items close. Organize and communicate the location for items needed in the area.
3. **Shine (Systematic Cleaning)** – Clean the workspace, jobsite, and all equipment, and keep it clean, tidy and organized. At the end of each shift, clean the work area and be sure everything is restored to its place. Remove crates, pallets, dunnage, packing materials, etc., immediately – preferably before entering the building footprint. Create elevated workstations for ergonomic working and more efficient cleanup. Employ a 'Nothing Hits the Ground' mentality to keep the project clean and free of waste.
4. **Standardize –** Develop cleaning schedules and cleanliness standards to maintain the first 3S's. Employ visual management to reveal abnormalities and variations.
5. **Sustain –** Ensure disciplined adherence to rules and procedures to prevent backsliding.

Last Planner® System: Production System Planning

Subcontractors shall participate in weekly coordination meetings and shall provide updated weekly work plans on a weekly basis throughout the scheduled installation period. All subcontractors pledge to cooperate with each other and coordinate their work for the overall good of the project. Turner reserves the right to adjust and update the overall project schedule based on project conditions, actual performance of the work, and detailed schedule information obtained from subcontractors. This update is intended to be for the betterment of the project as a whole, not for advantage of the parts. At Turner's discretion, it may utilize The Last Planner® System (LPS) for developing additional coordination details over the life of the project—this process is part of the Bid Packages as described herein.

Overview: LPS provides principles to improve coordination and create flow between contract milestone dates in the contract (or master) schedule. When production planning becomes reliable and people fulfill their commitments, workflow, performance, and productivity are improved. Turner may require Subcontractor

Foremen, Superintendents and Project Manager to attend orientation and training sessions to prepare for the implementation of LPS. When utilizing LPS, project teams will develop a specific workflow for its completion, detailing requirements for plan submissions and meeting schedule.

Application: LPS differs from traditional construction methods because it decentralizes hierarchical decision-making. With LPS, those closest to the work (On Site Foremen/Field Supervisors—the "Last Planners") must have the authority to make decisions and plan the work.

The project will utilize six key procedures in the implementation of LPS. These steps require the input of the onsite Foremen/Field Supervisors for the subcontractors performing the work. As such, these leaders are required to participate in all the steps that are the LPS and be able to commit to perform work they know can be made ready for their crews and to collaborate with the team to ensure this work can be started and completed without interruption. The Last Planner for your crew must be involved before you mobilize to the project in order to attend these Phase Production Planning meetings.

Pull Planning – This represents the team's specific plan for how they intend to reach the milestone dates in the contract schedule. Pull plans must meet the contract schedule requirements, and teams must work together to achieve these project milestones. Turner requires team members to make and keep commitments based on their confidence that prerequisite work, design information, materials, labor, and equipment will be ready so they can start and complete installations meeting their commitments to reach milestones in the contract schedule.

Production Planning – This is simply the future weeks (typically six weeks) of the pull plans, updated with actual information weekly. Constraints preventing these activities in the next six weeks are identified and added to the constraint log. The Production Plan is prepared by Turner and distributed to the project team based upon the information collected in the pull-planning sessions and by actual weekly production results.

Constraint Log – The constraint log is maintained by Turner and used to aid the team in managing the Production Plan. A constraint is any information, material, equipment or resource needed to start and/or complete a specific task on the project, except prerequisite work. The constraint log is used to visualize and communicate information regarding constraints as well as to track and record commitments from individuals to remove the constraints.

Weekly Work Plans (WWP) –The WWP is a detailed day-by-day, one week production plan created by each trade foremen to plan the next week's work, based on the project's production plan. WWP's are due weekly at a time established by Turner for the work to be performed the following week. Turner will establish the format for WWP's and the method of delivery, typically in Microsoft Excel.

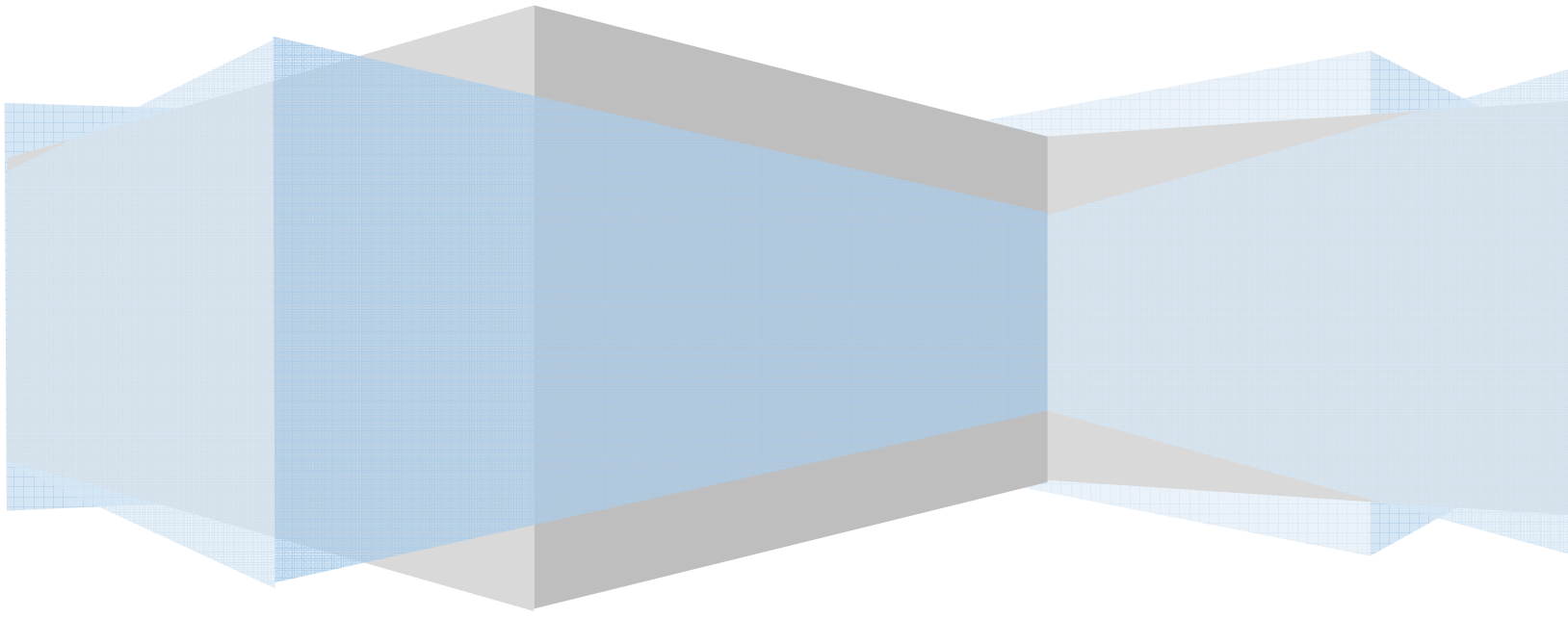
Percent Plan Complete (PPC) – PPC is a calculation of the team's planning reliability. This is done to identify trends preventing the reliability of commitments. The PPC represents the percentage of tasks completed as planned compared to the total number of tasks planned within the week.

Daily Production Huddle – Subcontractor foremen and Turner will meet for daily discussion with their peers from other trades and Turner field staff to assess the day's performance and discuss any new issues discovered. Turner's project superintendent will identify the time and place of the daily huddle.

ATTACHMENT N

Vertikal Subcontractor Navigation Guide

Version 001: March 2023



Contents

Introduction

Welcome to Turner's third-party onboarding platform, managed and secured by Vertikal RMS, Inc. Here are a few things to note before proceeding:

1. The term "Hiring Client" is the equivalent of the Turner Construction or SourceBlue Business Unit(s) (BU) where a company submits the Onboarding form and supporting documents to for review.
2. A user account must have a unique email address.
3. For confidentiality and security reasons, a sole proprietor with their social security number as their tax identification cannot use the Onboarding platform. Please contact the local BU for assistance.
4. Be prepared to upload a current W9 or country-specific tax form equivalent and other supporting documents. See a complete list of required documents below.
5. Register with your legal "Company Name" as shown on your company tax returns. DO NOT reference a "dba" name.
6. If a company requires more than one user account, email servicedesk@tcco.com to request additional user accounts. The email must include the following:
    - A copy of your W9 or country-specific tax equivalent form
    - The user's first and last name
    - User's telephone number; and
    - Unique email address not already in use
7. Although one hiring client is selected at registration as the primary Business Unit to receive the notification when your prequal is submitted, you can choose additional Business Units within the form. We suggest reaching out to the other selected hiring clients with notice of application submission, providing those Procurement departments the opportunity to review your application as well.

Please note if you have already completed Turner's onboarding process, you don't have to complete it again

Required Documents

Before starting the Onboarding process, gather the following documentation to expedite the completion of the application and be ready to upload where indicated:

• Copy of W9 form or country-specific tax equivalent • List of company license numbers • List of state/province sales tax numbers • List of state unemployment insurance numbers (if applicable) • List of current projects • List of recently completed projects • Current financial statement • Under-represented Business Enterprise (UBE) certification information • Bank information (upload a Line of Credit letter from the bank) • Dun and Bradstreet information • Surety information (upload a letter from Surety indicating per project and aggregate bonding limits) • Three supplier references • Three contractor references • Insurance policy information (upload a current sample certificate and additional insured endorsements forms)	• Copy of your Safety Program • Independent verification letter supporting your EMR (US entities only) with the effective date (MM/DD/YEAR) for the last three years* • Safety Data and/or OSHA 300 logs from the last three years* • EGS Program • Published environmental targets • Modern slavery and human trafficking statement and / or policy • Business Ethic Policy *Ontario companies, please provide: WISR, CAD7, and WISB Clearance Certificate *British Columbia companies, please provide: Worksafe BC Clearance Letter, WSBC Employer's Report, and Evidence of notices issued by WSBC & company response for the past 3 years

Create an Account

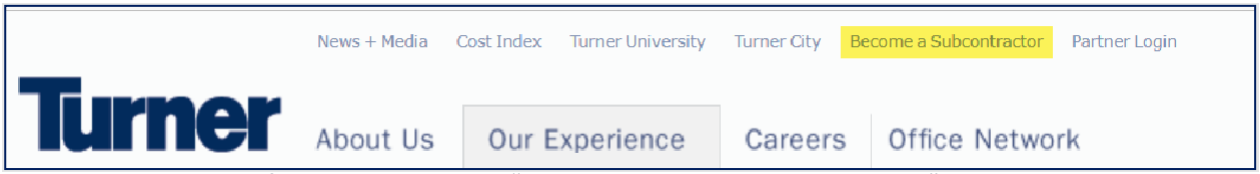
There are two ways a company can create a user account:

- By visiting www.turnerconstruction.com and completing the "Subcontractor ***Application*** Form" process; or
- By the link in a hiring client's email invitation to complete the "Subcontractor ***Registration*** Form" process.

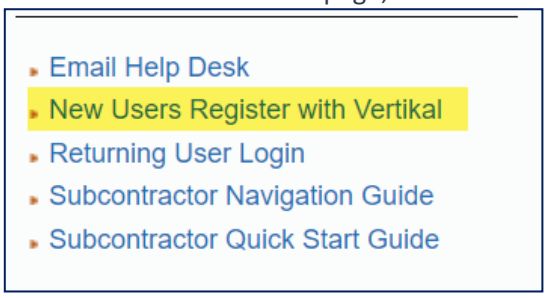
These methods have minor differences, but both follow the same processing guidelines. See below for additional information.

The "Subcontractor *Application* Form"

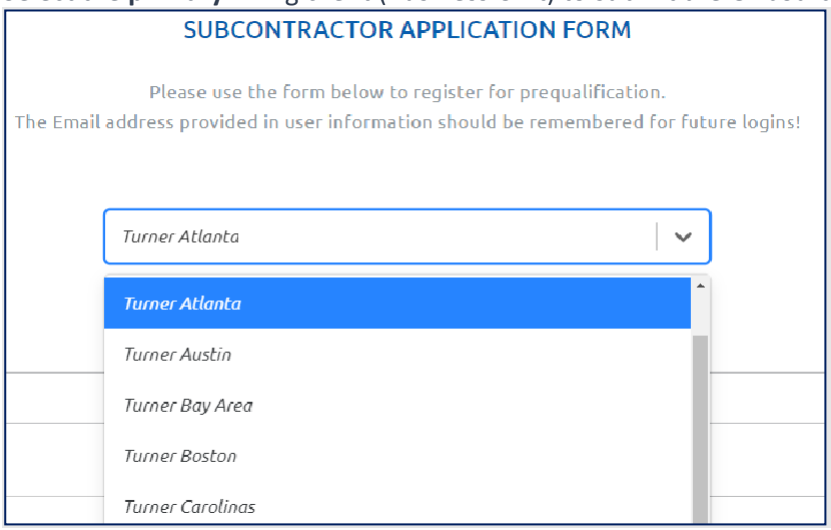
1. Go to turnerconstruction.com and click **Become a Subcontractor.**



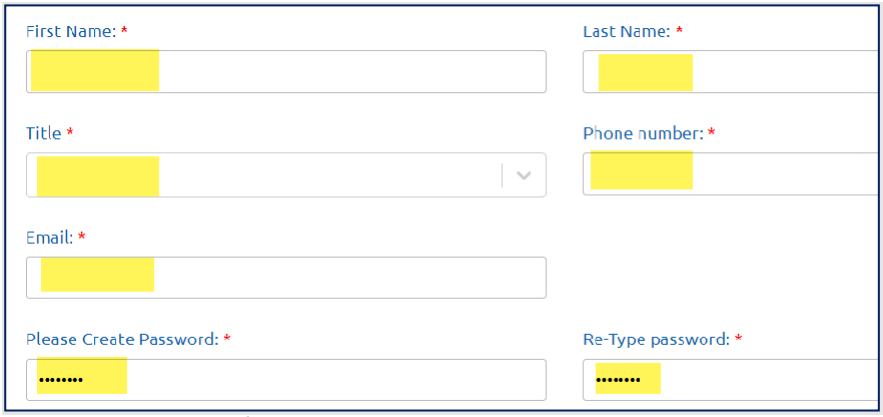
2. Scroll to the bottom of the page, and click "**New Users Register with Vertikal**."



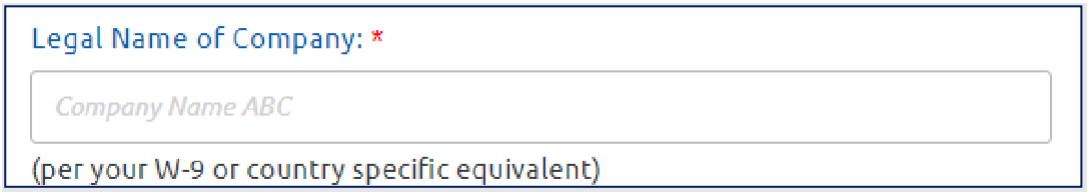
3. Select the **primary** hiring client (Business Unit) to submit the Onboarding form and documents to review.



4. Begin entering your user-specific information. This user will have access to the Onboarding form with this hiring client. If your title does not exist, select a title in the same job family.

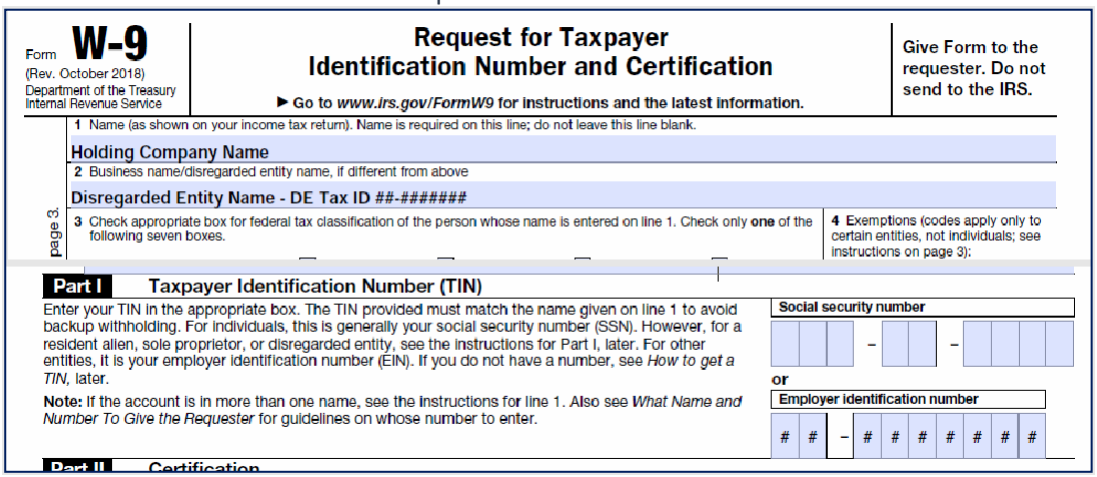


5. Enter your company's legal name as it appears on your W-9 or country-specific tax equivalent form. Refer to the information on page 2 for detailed instructions.

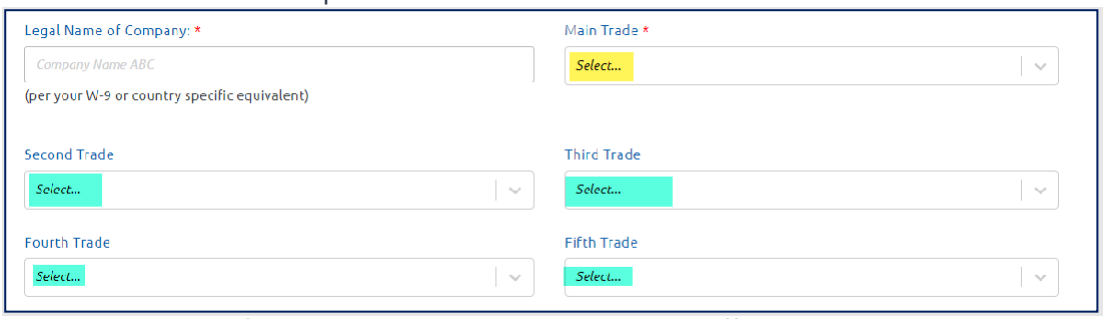


Note: For a disregarded entity company,

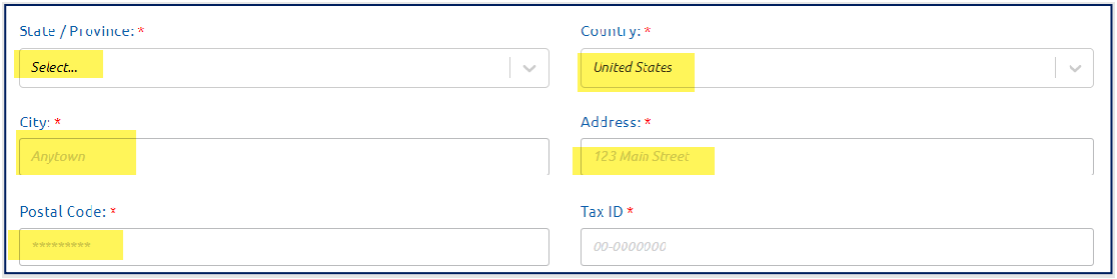
- Register with the disregarded entity name and tax identification number.
- One main disregarded entity branch office can register as the "headquarters office."
- Upload a W9 or country-specific tax equivalent form with the following:
  - The holding company's legal name on line 1 with their tax identification number listed on Part I; and
  - The disregarded entity's name, without reference to a "dba," on line 2 with their tax identification number. See the example below.



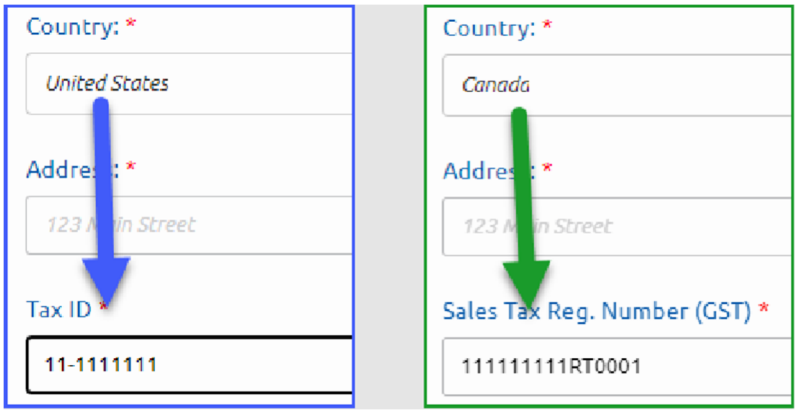
6. For the **Main Trade**, please select the most general description of your company's trade and up to four additional trades from the predefined list.



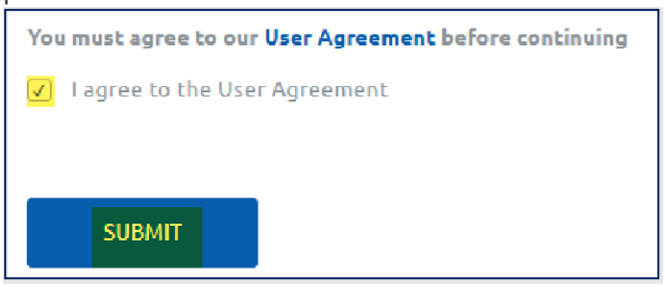
7. Enter your company's ***headquarters*** address, **not** a branch office. For international companies, ***FIRST*** change the **Country** before entering the **State/Province**.



8. For US companies, enter your nine-digit tax identification number without the dash "-". For Canadian companies, enter your fifteen-digit Sales Tax Registration Number (GST). The format must be **##########RT####**.



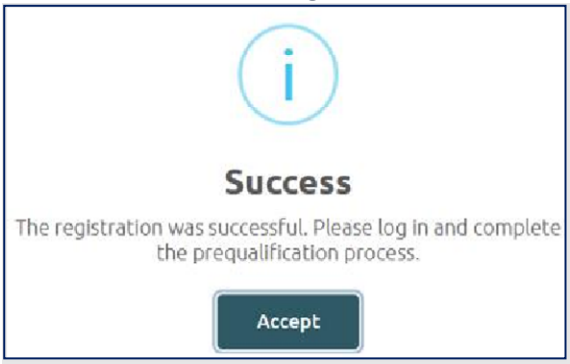
9. Please review Vertikal's user agreement, check the "**I agree to the User Agreement**" box, and click **Submit** to proceed.



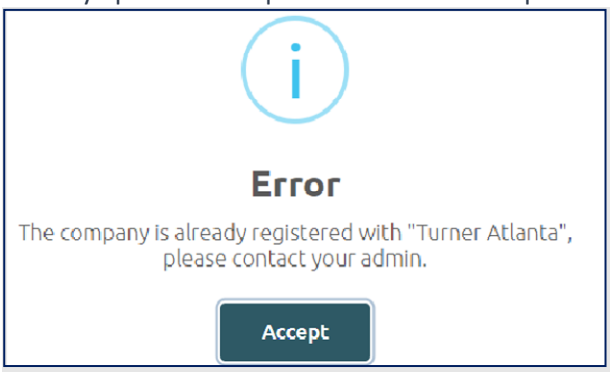
The "Subcontractor *Registration* Form"

Use the registration link in the email you received to access Turner's third-party Onboarding platform. Follow the guidelines outlined in the **Subcontractor Application Form** instructions. Because the hiring client sent you an invitation, item No 2 from the above does not apply.

With the successful registration, you will see the pop-up below. Click **Accept**, and you'll be redirected to your company's Subcontractor Onboarding Account.

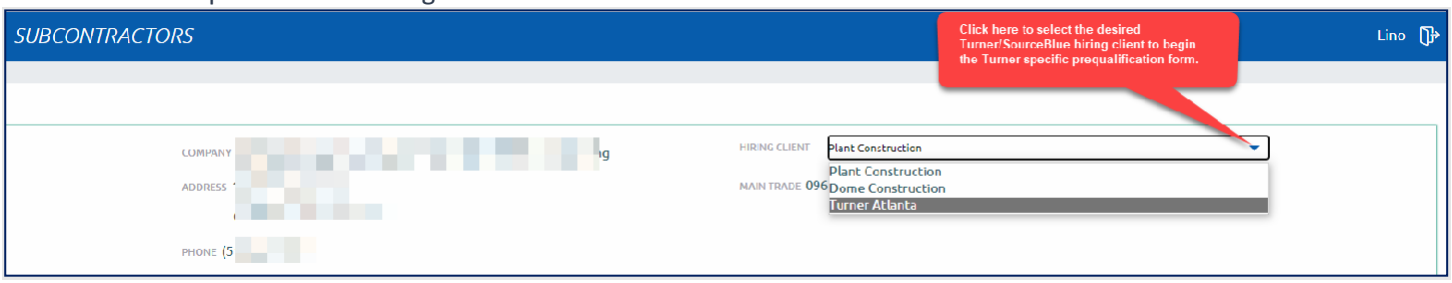


If registration is unsuccessful, the pop-up below will appear; email servicedesk@tcco.com with a copy of your W9 or country-specific tax equivalent form and request additional assistance.



Subcontractor Onboarding Account

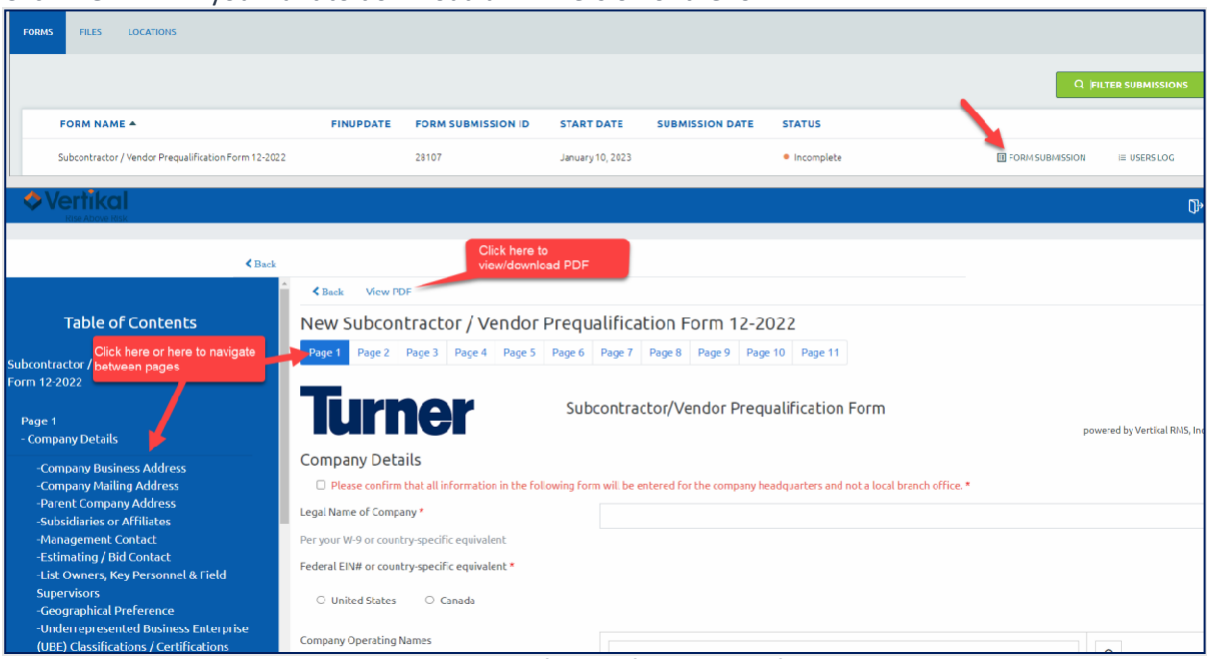
After completing the registration process successfully, you will be redirected to your company's Onboarding account. If your company already utilizes Vertikal's Onboarding platform with another general contractor ("Hiring Client"), click the arrow next to the Hiring Client to toggle and select the desired Turner/ SourceBlue hiring client to complete and submit Turner's specific-Onboarding form.



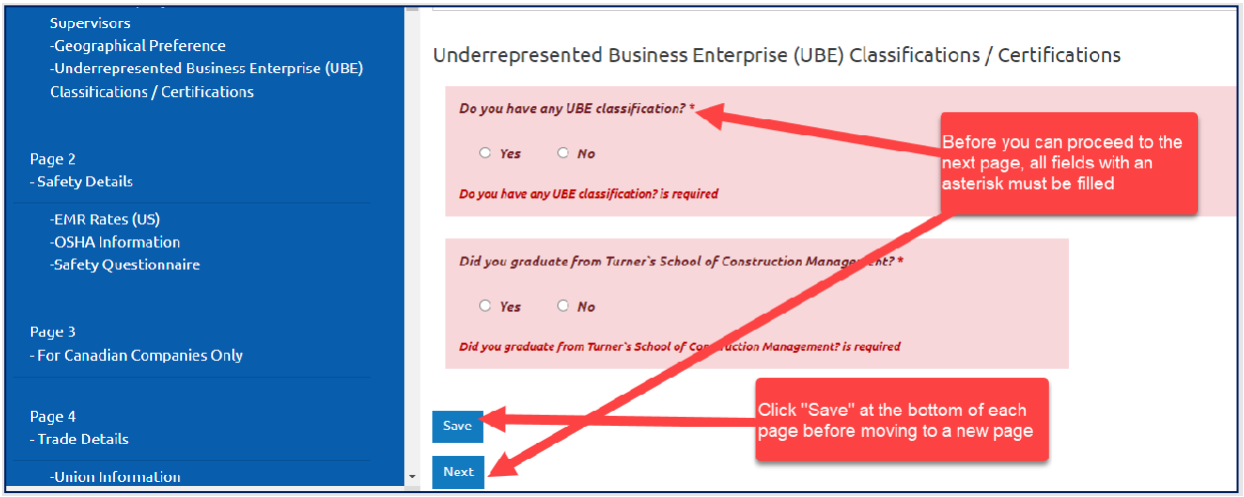
Complete the Onboarding Form

The system auto-saves your entries every two minutes. However, a best practice is to click **Save** at the end of each page before proceeding further.

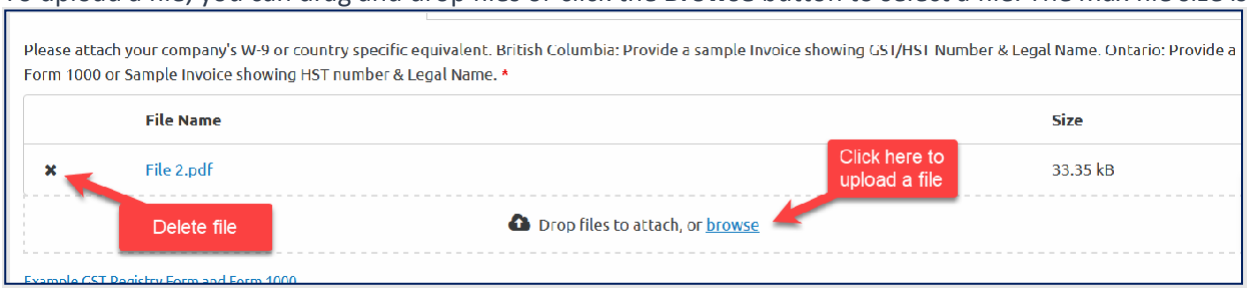
1. Click the **Form Submission** button of the most recent form with the status "**Incomplete**."
2. Start entering data into the form.
3. At the bottom of the page, click **Save** and **Next**.
4. Click **View PDF** if you want to download a PDF version of the form.



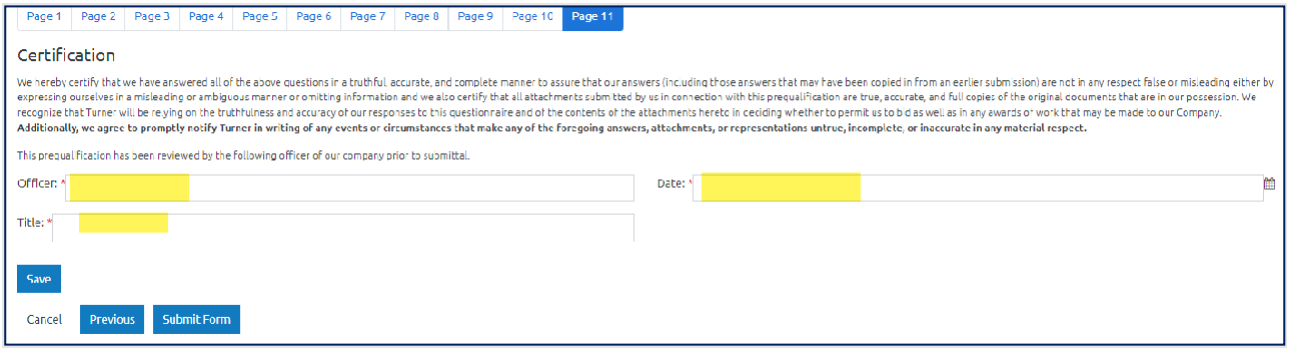
5. When clicking the **Next** button, the page will freeze if a required field is missed, or a document is not uploaded. Scroll up to review the missed required field or document to resolve and proceed to the next page.



6. To upload a file, you can drag and drop files or click the **Browse** button to select a file. The max file size is 30 MB.

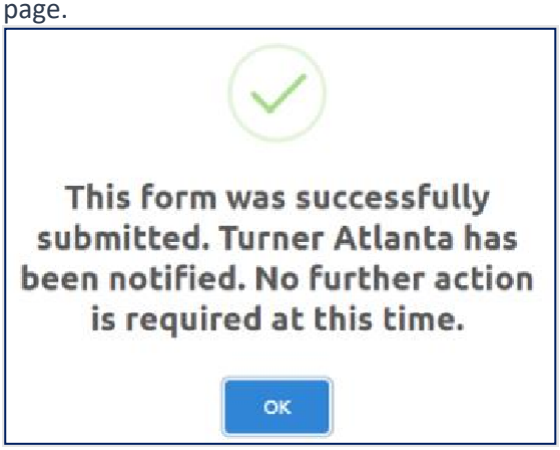


7. After completing all the required fields and uploading documents where indicated, complete the **Certification** section and click **Submit Form**.



Once submitted, the form and uploaded files are locked from further edits or deletions. If additional modifications are needed, the hiring client(s) can unlock the form for you to edit and resubmit.

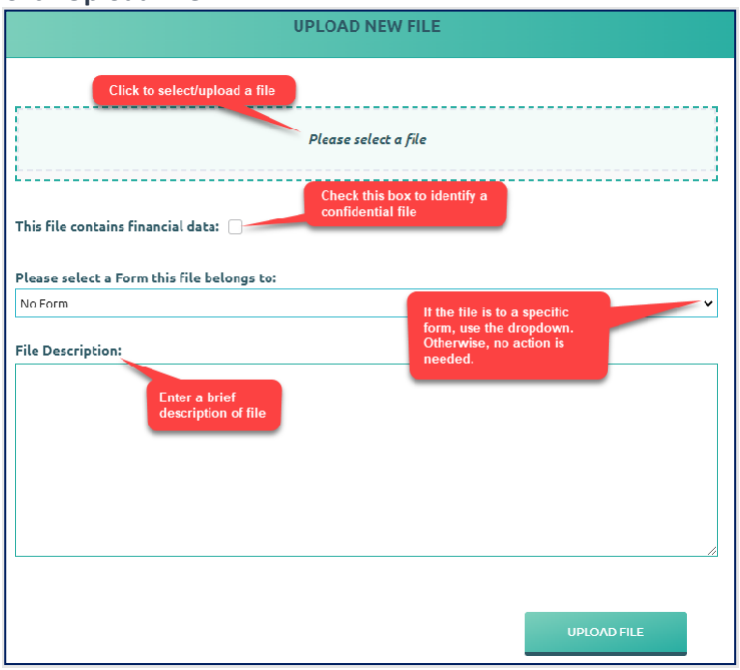
8. If the submission is successful, the below message will show. Click **OK** to exit the form and get back to the home page.



Upload / Download Files

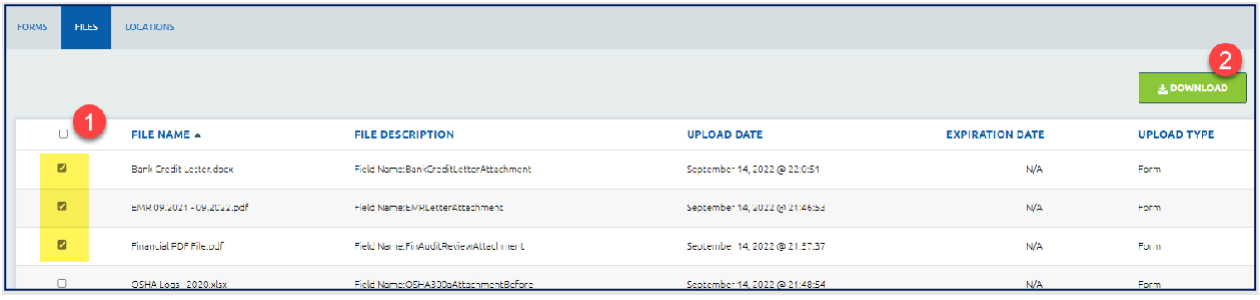
After submitting a form, you can upload additional files if needed.

1. Go to the **Files** tab.
2. Click the **Upload File** button.
3. Select the new file for upload.
4. Check the box if this is a financial file (Financial Statement) to restrict viewing to limited users in the Vertikal system.
5. If the file belongs to a specific Onboarding Form, select the form in the drop-down.
6. Add a brief file description, such as the file name.
7. Click **Upload File**.



To view or download files, use the following steps below:

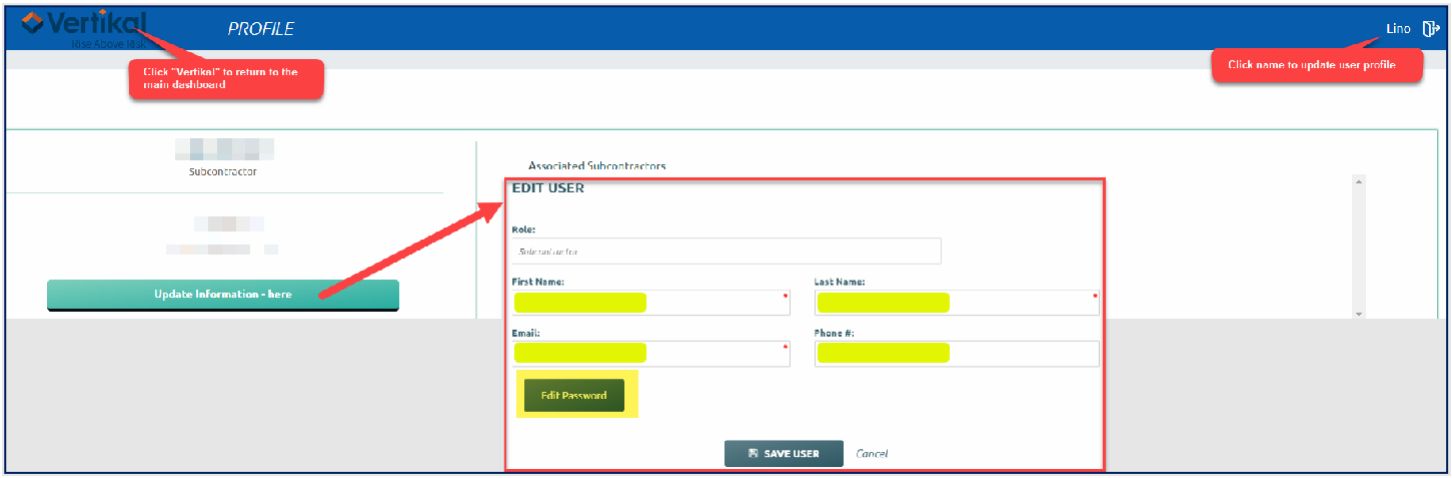
1. If you want to open one individually file, click **View.**
2. If you want to download multiple files at once, mark the files you wish to download and then click **Download**.



Change Your User Information

To change your user information, first, log into Vertikal. Click your name in the top right corner of the screen. And click the **Update Information – here** button.

To update your password, click **Edit Password**. Click **Save User** to save your changes and exit the window.
To return to the Main Page, click the Vertikal logo at the top left of the screen.



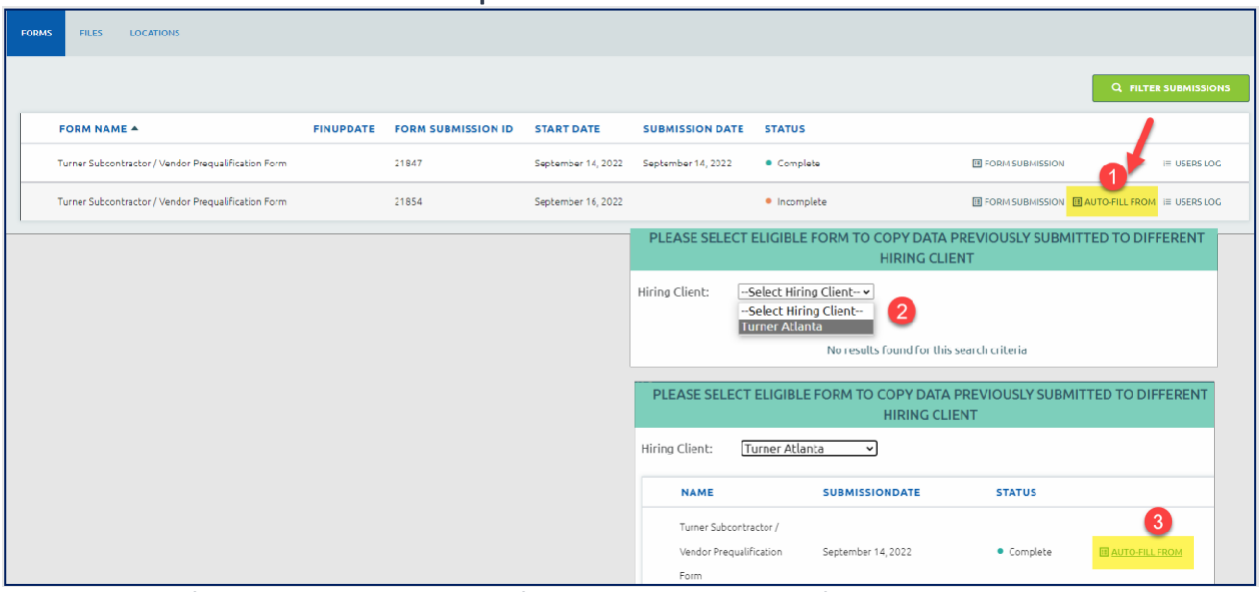
Onboarding Form Renewal – Auto-Fill From Option

The ***completed*** Onboarding form itself is valid for 24 months. In the "**Forms**" tab, if you only have a form with "**Complete**" status, **NO** action is needed on the prequal form.

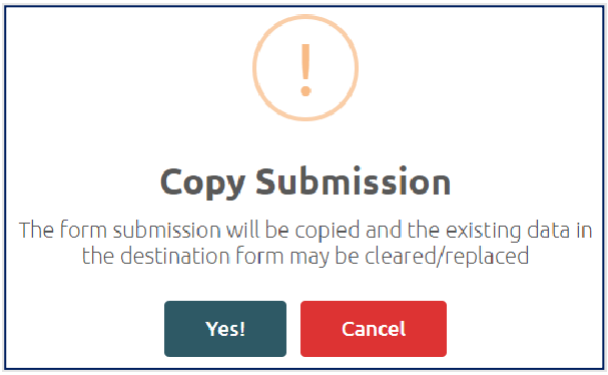
At the time of renewal, a system-generated email will be sent to all applicants' company staff with a user account. Click on the URL link in the renewal email to access the login page to begin the renewal process.

The **Auto-Fill Form** option will show automatically if the renewal is eligible to autofill specific fields in the new form. If the auto-fill option is unavailable, complete the form from the beginning.

1. Click **Auto-Fill Form.**
2. Select the **Turner** Hiring Client's Onboarding form from which you want to copy data.
3. Click **Auto-Fill From** on the current **Complete** form.

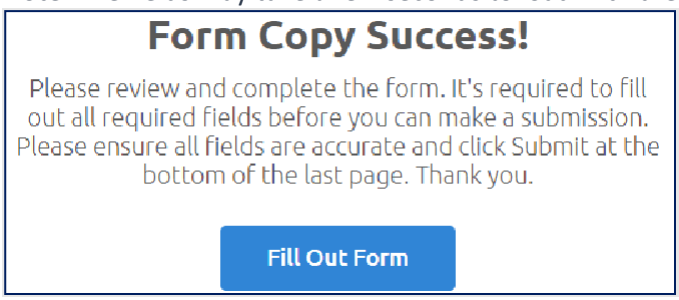


4. Click **Yes** to confirm you want to copy data from the selected source form.



5. Click **Fill Out Form** for the system to take you to the new form with eligible pre-filled data fields populated. Please review all auto-populated data to ensure no changes need to be made, complete any cleared field with updated information, and upload new files where applicable before submitting the renewal form for review.

   Note: The fields may take a few seconds to load with the copied data.



   CRITICAL: If you are not ready to complete the renewal form, the company name and tax id must be entered at the bare minimum, and click the SAVE button. Failure to enter/save new information clears the auto-filled fields. If the auto-filled areas cleared when you log back in, you can either perform the auto-fill form process again or complete the prequal from scratch.

Yearly Documentation Renewal

Information such as your company's financial statements, EMR, UBE certifications, etc., may require yearly renewal. At the time of renewal for these specific documents, an automated email from Vertikal will be sent as a reminder to all user accounts associated with your company with instructions to upload the renewal documents. Follow the instructions in the email to upload the updated file(s) to support renewal.

The hiring client will email your company for other files, such as OSHA logs if needed.

***** END *****