

## EXHIBIT X – SUBMITTALS

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## EXHIBIT X – SUBMITTALS

### 1 GENERAL

#### 1.1 SUMMARY

Contractor shall submit design documents for all areas of Work to enable Owner to understand fully the proposed design. Such design submissions in the form of design reports, basis of designs or design intent memorandum, shall include a system description, process flow diagrams (PFDs) and piping and instrumentation diagrams (P&IDs), control and operation descriptions, schedules of major characteristics of system/equipment items, and such other information as is required to describe the systems fully.

Owner will review and comment on certain of the above design documents prepared by Contractor. The objective is to enable compliance with the Contract to be confirmed, particularly in respect of quality, operability, maintainability, and safety of the Work.

#### 2 SUBMITTAL REQUIREMENTS

Prepare submittals in accordance with the provisions of this Exhibit.

#### 2.1 REFERENCE STANDARDS

The following standards shall be used in the preparation of submittals.

##### American Society of Mechanical Engineers (ASME)

ASME Y14.1	Decimal Inch Drawing Sheet Size and Format
ASME Y14.2M	Line Conventions and Lettering
ASME Y14.3	Multiview and Sectional Drawings
ASME Y14.5M	Dimensioning and Tolerancing
ASME Y14.24	Types and Applications of Engineering Drawings
ASME Y14.34M	Associated Lists
ASME Y14.35M	Revision of Engineering Drawings and Associated Documents
ASME Y14.38	Abbreviations and Acronyms
ASME Y14.100	Engineering Drawing Practices

##### Institute of Electrical and Electronics Engineers (IEEE)

IEEE 315	Graphic Symbols for Electrical and Electronics Diagrams
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##### International Organization for Standardization (ISO)

ISO 216	Writing paper and certain classes of printed matter-Trimmed sizes- A & B series
ISO 24517	Document management -- Engineering document format using PDF -- Part 1: Use of PDF 1.6 (PDF/E-1)

##### LG&E/KU

Exhibit J-2	Specifications for Electronic Submittal of Vendor Documentation, Revision 8, Feb 2011
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Exhibit J-3                      Specifications for Electronic Submittal of Engineered Drawings,  
Revision 8, Feb 2011

## **2.2 GENERAL REQUIREMENTS**

Contractor shall prepare project specific drawings and documents. The use of standard drawings shall only be allowed when there is no deviation from the depicted information and the actual intended installation conditions.

Submittals and correspondence shall be in the English language.

Submittals shall use U.S. customary units. In addition to U.S. customary units, SI unit symbols may also be referenced at the Contractor's option.

Equipment drawings shall have the equipment name and number clearly displayed. Material drawings shall have the structure name and structure number (when applicable) clearly displayed.

Paper used for documentation shall be suitable for long term storage.

## **2.3 DRAWINGS**

### **2.3.1 Title Block**

Contractor shall use Owners standard drawing title block. References to other drawings shall reference the Owners drawing number scheme.

### **2.3.2 Drawing Sizes**

Drawing sizes shall comply with ASME Y14.1 or ISO 216, A series. Use of a drawing size other than listed here shall be as approved by the Owner.

Full size drawings should be ANSI D (22" x 34") or ISO A1 (594 x 841). The use of ANSI E or ISO A0 size shall be avoided.

### **2.3.3 Scale and Measurements**

Make drawings accurately to a scale, and sufficiently large to show all pertinent aspects of the item and its method of connection to the Work.

## **2.4 SUBMITTAL MEDIA**

Submit documents in the form of electronic files to the Owner's project ftp site.

Electronic files shall be provided in PDF format. PDF files shall be compatible with Acrobat 7.0 (PDF Version 1.6). The following restrictions apply to PDF files:

PDF Files must include:

- Embedded fonts
- Device independent color
- XMP for metadata

PDF files may not include:

- External content reference
- JavaScript not associated with 3D
- Dynamic (XFA based) forms

PDF files may include:

- JavaScript associated with 3D
- Embedded files
- Encryption
- Digital rights
- Digital signatures
- Transparency
- Layers

Selected submittals may be provided in paper copies with advance approval of Owner.

Equipment instruction books and operating manuals shall be provided in paper copies in addition to specified electronic format.

Final "As-built" drawings shall be provided in electronic files on CD media. Electronic files shall be in accordance with Exhibit J-2 and J-3.

## **2.5 QUALITY ASSURANCE**

Submittals shall be complete with respect to dimensions, design criteria, materials of construction, and other information specified to enable Owner to review the information effectively.

Information on all Contractor and subcontractor documents shall be checked and reviewed by the Contractor for accuracy before submitting.

Where standard drawings are furnished which cover a number of variations of the general class of equipment, each drawing shall be annotated to indicate exactly which parts of the drawing apply to the equipment being furnished. Use hatch marks to indicate variations which do not apply to the submittal. The use of "highlighting markers" will not be an acceptable means of annotating submittals.

## **2.6 SPECIFIC SUBMITTAL REQUIREMENTS**

The following paragraphs provide general requirements for specific types of submittals. Since the listing is general in nature, it is possible that some submittals listed below will NOT be required by this contract.

### **2.6.1 Document Index**

A document index listing all drawings and data to be submitted shall be included with the initial submittal. The document index shall be resubmitted as required to indicate revisions to the list. The list shall include the document number and title, if known, or the general document category (e.g., wiring diagrams) for each document.

### **2.6.2 General Arrangement Drawings**

The general arrangement (GA) drawings shall indicate at a minimum three perspective views of the subject matter, (plan view, elevation view, and side view). Additional views or sections shall be provided to clearly indicate the extents and features of the subject.

The GA drawings shall include the details of the Contractor's Work and that of all sub-vendors that the Contractor uses in the Work. The Contractor is responsible for consolidation of all information from their suppliers onto their GA drawings.

Pull spaces and maintenance removal zones shall be indicated on the GA drawings. The Contractor shall indicate any areas that require more than three feet of clearance around their equipment boundary on the GA drawings for access or maintenance requirements.

### **2.6.3 3D Models**

3D models shall be provided in AutoDesk Navisworks files.

### **2.6.4 Manufacturers' Literature**

Where contents of submitted literature from manufacturers include data not pertinent to the submittal, the Contractor shall clearly show which portions of the contents are being submitted for review by marking or crossing out all irrelevant material.

### **2.6.5 Schedules**

Contractor shall submit a baseline schedule of major work activities from mobilization to completion of the Work. In addition to Contractor's major work activities, all interactions with subcontractors shall be shown.

Contractor's schedule shall define and display the critical path. The critical path is the longest continuous chain of activities through the network schedule that establishes the minimum overall project duration and contains no float.

### **2.6.6 Dimensioned Outline Drawings**

Outline drawings shall depict graphically and dimensionally the configurations, profile, and limitations of parts and assemblies. Perspectives and reference points shall be indicated clearly for each view.

### **2.6.7 Performance Curves**

Performance curves of either the predicted or demonstrated type, as required, shall provide definitive, quantitative, and graphic performance data. The format and conventions used in defining performance variables and parameters shall be consistent with the codes and standards applicable to the equipment. Performance curves shall include major and minor graduations on the axis. The graph shall fill the entire page, one graph per page. The graph should use as much of the graph paper as possible, select the best scale as necessary to achieve this. The axes should extend beyond the first and last data points in both directions. All graphs should have a short, descriptive title at the top of each graph, detailing what is being measured. Each axis should be clearly labeled with titles and units. Intervals on the axis should be whole integer values such as 1, 2, 5, 10, not 3.25, 6.5, 1.5. Each curve shall be provided in both graphical and numerical format.

### **2.6.8 Wiring Diagrams**

Wiring, connection and interconnection diagrams shall show the electrical connections of an installation or its component devices and parts. Schematics and connection diagrams, such as one line and three line diagrams, may also be included in this category.

Drawings supplied under this category shall provide such detail as is necessary to make or trace the connections involved. The drawings may cover internal or external connections, or both.

### **2.6.9 Parts List**

A parts list or list of materials shall consist of all components or bulk materials used in the item to which the list applies. The list may be either integral to the design drawings or separate, and shall include sufficient descriptive data to facilitate procurement of equivalent parts or materials.

### **2.6.10 Cross Sectional Drawings**

Cross sectional drawings shall present a view of an object in a perspective that cuts away all or part of an object to show its shape and construction at the cutting plane. Cross section drawings shall be furnished by the Subcontractor where the construction or hidden features of an object cannot be shown clearly by outside views.

### **2.6.11 Fabrication Drawings**

Fabrication drawings shall provide, in detail appropriate to the nature or complexity of the items, configuration and dimensional data, required processes, procedures, sequences and materials required to fabricate the required items. The information shall be indicated directly on the drawing or by reference to other documents.

### **2.6.12 Shop Detail Drawings**

Detail drawings shall depict complete item requirements for the parts depicted on the drawings including, as applicable, configuration, dimensions, tolerances, materials, mandatory processes, surface finish, protective coatings and symbols.

### **2.6.13 Assembly Drawings**

Each assembly drawing shall show the relationship of parts, components, and assemblies to each other. Subordinate parts or components shall be called out on the field of the drawing, by part or finding numbers, and reference shall be made to related drawings and listed as required.

### **2.6.14 Erection Drawings**

Erection drawings shall show the procedures and operations sequences required for erection or assembly of individual items and/or of assembly of component parts of total items or facilities.

### **2.6.15 Calculations**

Records of design calculations shall be identifiable by subject (including structure system or component to which it applies), originator, reviewer, and dates. Calculations shall be sufficiently detailed (as to purpose, method, assumptions, design input, and units) so that a person technically qualified in the subject can review and understand the analysis and verify the adequacy of the results without recourse to the originator.

### **2.6.16 Manufacturing/Inspection and Test Sequence Diagram**

Manufacturing, inspection, and test activities shall be graphically defined in an activity-time diagram, (critical path method [CPM] network or other appropriate format) which shall clearly indicate the date, duration, and significance of major events within the scope of the appropriate procurement specification or contract.

### **2.6.17 Quality Assurance**

Contractor shall submit their ISO 9000 certification documents from an independent third party. The certificate should include the date that the certification expires.

### **2.6.18 Inspection/Test Procedures**

Inspection and test procedures shall be provided in a documented form that adequately defines the elements, prerequisites, acceptance, criteria, equipment, sequence responsibilities, and personnel qualifications for completion of the inspection and testing activities required by the Specification and/or Code for the items or services supplied.

### **2.6.19 Inspection/Test Data**

Inspection/Test Data shall be detailed quantitative and qualitative data which results from examination, observation, measurement or subjecting components, assemblies or systems to actual physical, chemical, environmental or operating conditions. Inspection/Test Data Report shall include, or include by reference: the applicable codes, standards, and specifications; the procedures and methods utilized; and the prerequisite qualifications of personnel and equipment required for the inspection/testing activities. Acceptance/rejection criteria shall be clearly indicated or referenced to the extent that knowledgeable individuals can review and interpret the data without recourse to the originator.

### **2.6.20 Statement or Certification of Compliance**

This documentation shall be in the form of written statements, signed by a member of the Contractor's or Manufacturer's organization who has the authorization to commit or obligate the organization in legal or contractual matters. Various compliance statements are required by the technical specifications in addition to other compliance statements specified elsewhere in the Contract Documents. Written, signed statements required by the technical specifications typically are described as shown below:

- Personnel Certifications – Written documents issued by a laboratory, school, or other organization recognized or authorized by a board or standards committee to determine the qualification of an individual to perform a particular task, test, or inspection. Certifications such as Welder's Certification per AWS D.1.1 or ASME Section IX, inspection per API 1104, X-ray, and other such certification statements are in this category.
- Equipment Certifications – Written documents, signed by an authorized representative of the manufacturer or fabricator, certifying that the item of equipment conforms with the specified requirements
- Test Data Certifications – Written documents or forms, signed by an authorized representative of the organization that conducted the test, attesting that the actual properties or results of the test comply with the specified requirements. Mill test reports, concrete cylinder breaks, metallurgical test results, and other such results or reports are in this category.

### **2.6.21 Other Certification Statements**

The content, format, and nature of other required certifications shall be determined by the applicable codes, standards, and specifications. Where this information is not readily available, it is the supplier's obligation to notify the Contractor in writing. The Contractor shall also propose his plans or procedures for providing such certifications, or state his rationale and technical justification for not providing the required certifications.

### **2.6.22 Receiving Instructions (Inspection and Test)**

Receiving instructions shall include, where appropriate, detailed requirements for receipt, inspection, unloading, unpacking, testing, marking, identification, documentation, and other requirements unique to the supplied equipment or materials.

### **2.6.23 Storage Instructions**

Storage instructions shall provide, in written form, the detailed requirements necessary to minimize the possibility of damage or deterioration of the items supplied. Special requirements, environments, or materials and equipment shall be adequately prescribed to assure the continuing integrity and performance of the items supplied. Storage instructions shall be provided prior to the time storage activities begin.

### 2.6.24 Handling and Lifting Instructions

Handling and lifting instructions shall provide written procedures for handling the supplied items and shall include (as appropriate) weights, sling locations, balance points, methods of attachments, maximum hoist line speeds, special fixtures and equipment, and other pertinent features considered necessary for safe handling. Handling and lifting instructions shall be provided prior to the time handling or lifting activities begin.

### 2.6.25 Piping and Instrumentation Diagrams

Piping and Instrumentation Diagrams shall include:

- System diagrams of all system piping
- Identification of all instruments, pressure switches, limit switches, temperature elements, etc.
- Identification of all piping interfaces between Contractor's and others responsibility.
- All equipment, valves, silencers, instruments, controls, vents, and drains
- Identification of all pipe size, materials, and class/standard
- Flow direction, Contractor's line designation, and line size
- All test and instrument connections
- Fail position of air operated valves
- Code breaks and terminal point interfaces
- Pressure setting of regulator and relief valves
- Freeze protection requirements including process line temperature range
- Legends and symbols

### 2.6.26 Lists

For the following commodity lists submit the information in Microsoft Excel or Microsoft Access.

#### EQUIPMENT LIST

- Tag number
- Description
- Nominal Rating or Size (gpm, gallons, etc.)
- Outline/assembly drawing(s)
- Data sheet (if applicable)
- Motor horsepower (if applicable)
- Manufacturer / model number
- Remarks

#### PIPELINE LIST

- Tag number
- Line Size
- Material



- Reference to associated piping & instrument (or flow) diagram
- Design pressure
- Design temperature
- Operating pressure
- Operating temperature
- Heat traced (yes/no)
- Insulation required (yes/no)
- Insulation material (if applicable)
- Insulation thickness (if applicable)
- Paint code (if applicable)
- Remarks

#### VALVE LIST

- Tag number
- Type (gate, globe, ball, etc.)
- Valve Size (nominal diameter)
- Reference to outline drawing number
- Material
- Valve Specification

#### PIPING SPECIALTY LIST

(Strainers, Filters, Hoses, Expansion Joints, etc., shipped loose, not applicable to skid mounted devices)

- Type (strainers, filters, hoses, expansion joints, etc.)
- Description
- Size (diameter)
- Connection type (flanged, butt welded, NPT threads, etc.)
- Connection device industry standard (e.g., ASME B16.5) (if applicable)
- Material
- Options
- Reference to associated line number
- Specialty length (end-to-end dimension)
- Manufacturer/Manufacturer model number
- Data sheet (if applicable)
- Remarks

#### PIPE SUPPORT LIST

- Tag number

- Type
- Reference to associated line number
- Supported pipe size (diameter)
- Hanger material
- Reference Drawing number(s)
- Piping support load

#### I/O LIST

- Tag number
- Tag name
- Service description
- Process range
- Process units
- Voltage level
- Signal range

#### INSTRUMENT LIST

- Tag number
- Tag name
- Service description
- Process range
- Process units
- Set Points
- Manufacturer
- Product model number

#### ELECTRICAL LOAD LIST

- Tag number
- Tag name
- Rated power
- Voltage level
- Startup current

### **3 SUBMITTAL PROCEDURE**

#### **3.1 COORDINATION OF SUBMITTALS**

##### **3.1.1 Number All Submittals**

All submittals shall include a document identification number and a revision level.

### 3.1.2 Master Document List

Maintain a Master Document List (MDL) for the duration of the Work, showing current status of all submittals. The MDL shall include the following fields: document number, description, revision level, date of revision, and submittal date.

The MDL shall include the Contractor's documents and all sub-suppliers documents that have been, or will be submitted to the Owner.

The first submittal of the MDL shall include all submittals the Contractor anticipates to submit during the duration of the Work, to the best of their knowledge. The MDL shall then be maintained current for the duration of the project.

Submit the MDL on a monthly basis, or when requested by the Owner.

### 3.1.3 Grouping of Submittals

Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for checking each item when it is received.

### 3.1.4 Purpose of Issue

All items issued for construction shall be marked "Issued for Construction" or "Issued for Use". Where required for submittal to a Governmental Authority, engineering documents issued for construction shall, to the extent required by such Governmental Authority, be reviewed and stamped by a Professional Engineer registered in the State of Kentucky in the applicable discipline.

## 3.2 SUBMITTAL PROCESS

Contractor will transmit each Submittal electronically.

Prepare a document transmittal form, with an assigned, unique submittal number, to each group of documents transmitted. Use a sufficient number of document transmittal forms so that items on a single transmittal form pertain to the same equipment item, specification, purchase order, subcontract or engineering discipline.

Mark each Subcontractor submittal indicating Contractor's code status (labeling review status and any conditions).

Maintain a submittal data base with sufficient information such that electronic searches can be conducted on submittal number, document number, document title, submittal issue date, vendor, Owner-reviewed documents, and document review status.

Submittals received and comments provided by Owner and Owner Engineer after 1:00 pm Eastern Time will be considered as submitted on the next Business Day.

## 3.3 SUBMITTAL REVIEW

Owner reserves the right to review and comment on all documents submitted by Contractor subcontractors and vendors throughout the Agreement period.

Owner shall within [REDACTED] of receipt of a submission (except as otherwise stated in the Agreement) provide comments to Contractor.

For documents requiring third party review (e.g., a Utility's (electric, water, gas, other), insurance underwriter's, or other governmental authority's review and/or approval), Owner shall provide the comments and / or approval within 28 calendar days of submittal of the documents from the Contractor or as soon thereafter as such comments are received from the third party.

### **3.4 SUBMITTAL REVISIONS**

When a submittal is revised, Contractor shall indicate the changes in the document. Drawings shall be revision clouded and labeled with the revision level change. Text documents shall have revision bars in the margin and bold and strikethrough marking in the text. All documents shall have a current revision level indicated on the document.

### **3.5 AS-BUILT DRAWINGS**

Six months prior to Substantial Completion, Contractor shall supply Owner an electronic list of all the final documents and drawings produced during the Contract period. Owner shall have the right of access and to make copies of the documents and drawings listed in this list.

All documents and drawings listed in Exhibit X-1 as "As-Built" shall be updated to incorporate all modifications made during manufacture, erection and commissioning period to reflect actual installed conditions. Final As-built documents shall be electronically submitted in accordance with Exhibit X-2 and Exhibit X-3 on CD media.

If any modifications are made during the Warranty Period in pursuance of Contractor's obligations, Contractor shall update the final Contract documents and drawings and supply final copies.

## **4 SUBMITTALS**

Refer to Exhibit X-1 – Submittal List