PART 1 - GENERAL

1.1 GENERAL

A. Prior to submitting a proposal, the Design-Build Project Proposers must carefully examine these instructions contained herein and satisfy themselves as to the conditions with which they (each Project Proposer) must comply and the conditions affecting award of the Proposal Agreement. These instructions form part of the Contract Documents and will have the same force as any other Contract Document.

B. Design-Build Project Proposers must be aware of the requirements of codes referenced in the instructions and in the Contract Documents. Project Proposers may access codes and laws through publications or through the internet

C. Proposals must be addressed as directed in the Division 1 for Invitation to Submit Proposal.

1.2 DESIGN-BUILD SCOPE

A. As a minimum the engineering design shall include, but not be limited to, the following documentation:
   1. Electrical.
      a. Load calculations.
      b. Utility coordination and coordinated site plans.
      c. Site lighting with photometrics.
      d. One-line diagram.
      e. Electrical and lighting floor plans.
      f. Coordination study with breaker settings.
      g. Fault analysis.
      h. Lighting control schematic.
      i. Panel schedules.
      j. Details.

1.3 REFERENCES

A. The publications listed below form a minimum part of this specification to the extent referenced. The current editions of the publications are referred to in the text by the basic designation only.
   1. ASTM A 880 - Criteria for Use in Evaluation of Testing Laboratories and Organizations for Examination and Inspection of Steel, Stainless Steel, and Related Alloys
   2. ASTM C 1077 Laboratories Testing Concrete and Concrete Aggregates for Use In Construction and Criteria for Laboratory Evaluation
   3. ASTM D 3666 (Rev. A) - Evaluating and Qualifying Agencies Testing and Inspecting Bituminous Paving Materials
   4. ASTM D 3740 - Evaluation of Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
   5. ASTM E 329 - Evaluation of Testing and Inspection Agencies as Used in Construction
   6. ASTM E 543 (Rev. A) - Determining the Qualification of Non-Destructive Testing Agencies

7. ASHRAE – American Society of Heating, Refrigeration, and Air Conditioning Engineers
8. AWS – American Welding Society
9. SMACNA – Sheet Metal and Air Conditioning Design Builders National association
10. ACI – American Concrete Institute
11. AABC – American Air Balance Council
12. IESNA – Illuminating Engineering Society of North America
13. NETA – International Electrical Test and Acceptance Association
14. IEEE – Institute of Electrical and Electronic Engineers
15. All other standards as referenced throughout this set of specification

1.4 REGULATORY REQUIREMENTS

A. General:
1. All applicable Federal, State and local requirements will govern the construction and completion of the Work; all must be current enforced editions.

B. Copies of Regulations:
1. Copies of the applicable regulations and codes, Federal and State to be retained at site to be available for reference by parties who have a reasonable need.

C. Enforcement:
1. References in the Agreement Documents to "code" or to "building code" not otherwise identified will mean the foregoing specified codes, together with the additions, changes, amendments and interpretations adopted by the enforcing agency, and in effect on the date the Agreement is executed.
2. Nothing on the Agreement Documents will be interpreted as requiring or permitting work that is contrary to these rules, regulations and codes.
3. Where other codes or standards are referenced in the Agreement Documents, the affected work must meet or exceed the applicable requirements of such codes and standards.
4. The code, specification or standard referred to will have full force and effect as though printed in the Agreement Documents, except as modified.
5. Where the Agreement Documents call for or describe materials, work quality or construction of a better quality, higher standard or larger size than is required by said laws, codes, rules and regulations, the provisions of the Agreement Documents will take precedence over said laws, codes, rules and regulations.

D. Other Applicable Laws and Regulations:
1. Applicable Federal and State laws, and the rules and regulations of governing utility districts and the various other authorities having jurisdiction over the construction and completion, including the latest rules and regulations of the State Labor Code, will apply to the Agreement throughout, and they will be deemed to be included in the Agreement the same as though printed in the Agreement Documents.
2. If laws, ordinances, rules, regulations or orders of public agency having jurisdiction require work to be inspected, tested or approved by some authority other than the Owner or Design-Builder, the Design-Builder must give required notices and make arrangements, deliver to the Owner’s

Representative the certificates of inspection, test, or approval of such public agency, and pay costs therefore unless otherwise provided in the Agreement Documents.

1.5 CONFLICTING REQUIREMENTS

A. General:
1. If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Owner's Representative for a decision before proceeding.

B. Minimum Quantity or Quality Levels:
1. The quantity or quality level shown or specified must be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Owner's Representative for a decision before proceeding.

1.6 COMPETENCE OF PROPOSERS

A. License: No Project Proposer may propose on work of a kind for which Project Proposer is not properly licensed, and any such proposal received will be rejected. The Proposal must contain the Design-Build Entity's Contractor's license number, date of expiration, and signature to a statement that representations of the Proposal with respect to Project Proposer's license are made under penalty of perjury.
1. If Project Proposer is a joint venture, each individual member within the joint venture submitting the Proposal will be subject to the above requirements with respect to Contractor's individual licensure. Additionally, the joint venture must have a valid license as a "Joint Venture" in the State where the project is located.

B. Design Consultant/Sub-Consultant Licenses: No Project Proposer may propose on work of a kind for which Project Proposer is not properly licensed by the appropriate License Boards, and any such Proposal received will be rejected. Proposals must contain registration numbers, dates of expiration, and signatures to a statement that representations of the proposal with respect to the professional and business licenses are made under penalty of perjury.

1.7 EXAMINATION OF PROPOSAL DOCUMENTS AND PROJECT SITE

A. Project Proposers Responsibility: Project Proposer must carefully examine the site of the Work and the Request for Proposal package. By submitting a Proposal, Project Proposer acknowledges that Project Proposer understands the character, quality and quantity of site conditions or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the General Contractor, as well as from information presented in the Request for Proposal and information available to the Project Proposer.

B. Site Investigations: Project Proposers must perform their own site investigations at their own expense. Damage to existing utilities must be repaired at the Project Proposer's expense. To avoid conflict with the work of other Project Proposers, as well as other contractors, arrangements for site investigations must be made through the Owner's Representative.

C. Responsibility for Utilities: Project Proposer will be responsible at its sole cost for any and all work, expense or special precautions caused or required by existing or proximity of existing utilities shown or indicated on or in the RFP documents and encountered in performing the Work, including, and without limitation thereon, repair of damage and performing hand or exploratory excavation required. Project Proposer is cautioned that such utilities may include communication cables or electrical cables (which may be high voltage), and ducts enclosing such cables, and when working or excavating in the vicinity thereof, special precautions to be observed at Project Proposers cost. All such cables and their enclosure ducts will be exposed by careful hand excavation so as not to damage ducts or cables, nor cause injury to persons. Suitable warning signs, barricades and safety devices must be erected, as necessary or required.

D. Failure by Project Proposer to acquaint itself with available information will not relieve Project Proposer from responsibility for properly estimating the difficulty or cost of successfully performing the Work.

1.8 PROPOSAL QUESTIONS

A. RFI's and Responses: Project Proposers are encouraged to submit questions. Questions must be submitted in writing, by email (preferred), delivery service, or mail to Owner's Representative.
   1. Written questions may be submitted at any time, but must be submitted no later than seven (7) calendar days at 4:00 PM prior to bid closing date. The Project Proposer must provide a minimum of three (3) business days for response by the Owner's Representative. No responses will be accepted within 72 hours of the bid closing date and time.
   2. To expedite responses, Project Proposers are requested to provide their questions via email, with questions detailed in an Excel spreadsheet with the following headings: Date, Subject, Specification Section/Paragraph or Drawing Sheet Number, Question (formatted sizes of cells unimportant – please make them legible).

B. Proposal Interviews: The Owner's Representative will conduct Proposal Interviews to confirm information provided in Project Proposals submitted by the Project Proposers. This may also be another opportunity for Owner's Representative to request additional clarification.

1.9 SUBMITTAL PROCEDURES

A. General:
   1. Submittals may be forwarded entirely via electronic means.
   2. Partial submittals are not acceptable, and will be considered non-responsive, and will be returned without review.
   3. Submittals not required by the Agreement Documents may not be reviewed and may be discarded.

4. The specific content and format requirements for the standard submittals are detailed herein and in the individual Specification Sections. The electronic form will be compiled in the most current form of Adobe Acrobat, Release 9.0 or better, or Bluebeam Revu, Release 10.0 or better. The electronic file will be bookmarked according to its Table of Contents, but will contain no less than the book marking identification in descending order of section, system, subsystem, equipment, component, etc., where applicable. The goal is to make the submittals both manageable and user friendly for the Owner's use.
5. Drawing submittals must be in Computer-Aided Design (CAD) format, AutoCAD 2013. or better, or Revit 2013 or better.
6. Prior to the implementation of the design work and prior to the formal submittal process, provide a list and cut sheets of all major mechanical and electrical equipment to the Owner's Representative for review and approval along with the preliminary system calculations that together will drive the mechanical and electrical design and layout.

B. Coordination:
1. Coordinate preparation and processing of submittals with performance of construction activities.
2. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
3. Coordinate multidiscipline design phase submittals and construction documents prepared the design professionals of record.
4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

C. Submittals Schedule:
1. Coordinate with Division 1 requirements for Project Management and Coordination for list of submittals and time requirements for scheduled performance of related construction activities.
2. Submit all Basis of Design submittals together for all disciplines and prior to the start of any construction activity. Subsequent Construction Document submittals can be submitted in phases prior to construction activity related to that phase.

D. Processing Time:
1. Allow enough time for submittal review, including time for resubmittals, per the following. Time for review will commence on receipt of submittal. No extension of the Agreement Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
2. Initial Review: Allow at least twenty (20) working days for initial review of each submittal. Allow an additional ten (10) days of time if coordination with subsequent submittals is required from the receipt of the subsequent submittal. Construction Manager will advise Design-Builder when a submittal being processed must be delayed for coordination.
3. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
4. Re-submittal Review: Allow ten (10) working days for review of each resubmittal.

E. Identification:
1. Place a permanent label or title block on each submittal for identification.
2. Indicate name of firm or entity that prepared each submittal on label or title block.
3. Provide a space on label or beside title block to record Design-Builder's review and approval markings and action taken by the Owner's Representative.
4. Include the following information on label for processing and recording action taken:
   a. Project name.
   b. Date.
   c. Name and address of Design-Builder.
   d. Name and address of subcontractor, including design professionals for design phase submittals.
   e. Name and address of supplier.
   f. Name of manufacturer.
   g. Submittal number or other unique identifier, including revision identifier. Submittal number must use Performance Specification Section number followed by a decimal point and then a sequential number (e.g., 236400.01). Resubmittals must include an alphabetic suffix after another decimal point (e.g., 236400.01.A).
   h. Number and title of appropriate Performance Specification Section.
   i. Drawing number and detail references, as appropriate.
   j. Location(s) where product is to be installed, as appropriate.
   k. Other necessary identification.

F. Deviations:
1. Highlight, encircle, or otherwise specifically identify deviations from the Agreement Documents on submittals.

G. Copies:
1. Action Submittals:
   a. General: Submit three (3) copies to Owner's Representative. The Owner's Representative will return two (2) copies.
   b. Samples: Submit three (3) full sets. The Owner's Representative will return two (2) sets.
   c. Operation and Maintenance Manuals: Submit two (2) copies to Owner's Representative.
   d. Project Record Documents: Submit two (2) copies to Owner's Representative.
   e. Demonstration and Training: Submit two (2) copies to Owner's Representative.

H. Transmittal:
1. Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form.
2. Transmittal Form: Include the following information:
   a. Project name.
   b. Date.
   c. Destination (To:).
   d. Source (From:).
   e. Names of subcontractor, manufacturer, and supplier.
   f. Category and type of submittal.

g. Submittal purpose and description.
h. Performance Specification Section number and title.
i. Drawing number and detail references, as appropriate.
j. Transmittal number, numbered consecutively.
k. Submittal and transmittal distribution record.
l. Remarks.
m. Signature of transmitter.

3. On an attached separate sheet, prepared on Design-Builder's letterhead, record relevant information, requests for data, revisions other than those requested on previous submittals, and deviations from requirements in the Agreement Documents, including minor variations and limitations. Include same label information as related submittal.

I. Resubmittals:
1. Make resubmittals in same form and number of copies as initial submittal.
2. Note date and content of previous submittal.
3. Note date and content of revision in label or title block and clearly indicate extent of revision.
4. Resubmit submittals until they are marked with the Owner's Representative's approval notation.

J. Distribution:
1. Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers and authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

K. Record Documents: Retain a final copy of all submittals as a Project Record Document.

1.10 SUBMITTAL CLASSIFICATIONS

A. General:
1. Submittals are classified as follows:
a. Project Proposal submittals. For requirements for these submittals, refer to the Proposal Requirements.
b. Basis of Design Submittals.
c. Construction Documents –Design Phase Submittals.
d. Construction Submittals.
e. Project Closeout Submittals.
f. LEED Submittals.
g. Commissioning Submittals.

1.11 CONSTRUCTION DOCUMENTS PHASE SUBMITTALS

A. General:
1. Submit these items during the period of preparation of the Construction Documents.
2. For the general requirements for these Submittals, refer to the Performance Criteria.
3. Organize these submittals in accordance with the Performance Specification, using the same title numbers and titles.

4. Submittals in this Phase are as follows:
   a. Action Submittals:
      1) Basis of Design. In addition to the Requirements indicated in the Performance Criteria, provide annotated Performance Criteria and Concept drawings.
      2) 50% Construction Documents.
      3) 100% Construction Documents.
   b. Information Submittals: Manufacturer's Certificates, Product Certifications.

1.12 CONSTRUCTION PHASE SUBMITTALS

A. General:
   1. Prepare and submit Submittals required for the project conditions and design by individual Performance Specification Sections.
   2. For the general requirements for these Submittals, refer to the Performance Criteria.
   3. Provide submittals to Owner's Representative for review and approval prior to fabrication, purchasing and installation.

B. Action Submittals:
   1. Action Submittals include Samples, Schedules, and Applications for Payment, Subcontracts List, and others as applicable to the Project.
   2. Mechanical/Electrical equipment and systems submittals for those systems to be commissioned for review by Commissioning Authority.
   3. Items submitted as substitutions or as "equal" to listed manufacturer(s).

C. Informational Submittals:
   1. Prepare and submit Informational Submittals required by Performance Specification Sections.
   2. Informational Submittals Include Quality Assurance Submittals, Schedules, Applications for Payment, Insurance Certificates and Bonds, Construction Photographs and Videotapes, and others as applicable to the Project.
   3. Design-Builder's subcontractor Design professionals of Record will review and stamp all construction submittals for conformance with the construction documents prepared and signed by the Registered Design Professionals.
   4. Shop drawings and equipment submittals not directly related to commissioning or required for review by commissioning authority.
   5. Retain copies of all submittals at job site trailer.
   6. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications must be signed by an officer or other individual authorized to sign documents on behalf of that entity.
   7. Test and Inspection Reports.

1.13 REQUIREMENTS FOR EACH SUBMITTAL CATEGORY

A. Product Schedule or List:
   1. As required in individual Performance Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
      a. Type of product. Include unique identifier for each product.
      b. Number and name of room or space.

c. Location within room or space.

B. Product Data:
1. Collect information into a single submittal for each element of construction and type of product or equipment.
2. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
3. Mark each copy of each submittal to show which products and options are applicable.
4. Include the following information, as applicable:
a. Manufacturer's written recommendations.
b. Manufacturer's product specifications.
c. Manufacturer's installation instructions.
d. Standard color charts.
e. Manufacturer's catalog cuts.
f. Wiring diagrams showing factory-installed wiring.
g. Printed performance curves.
h. Operational range diagrams.
i. Standard product operation and maintenance manuals.
j. Compliance with specified referenced standards.
k. Testing by recognized testing agency.
l. Application of testing agency labels and seals.
m. Notation of coordination requirements.
5. Submit Product Data before or concurrent with Samples for Initial Selection.

C. Manufacturer Certificates:
1. Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

D. Shop Drawings:
1. Prepare project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
2. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
a. Dimensions.
b. Identification of products.
c. Fabrication and installation drawings.
d. Roughing-in and setting diagrams.
e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
f. Shop work manufacturing instructions.
g. Templates and patterns.
h. Equipment schedules.
i. Design calculations.
j. Compliance with specified standards.
k. Notation of coordination requirements.
l. Notation of dimensions established by field measurement.
m. Relationship to adjoining construction clearly required.
n. Seal and signature of professional engineer if specified.

o. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at minimum 8-1/2 by 11 inches but no larger than 30” by 42”.

E. Samples:

1. Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
2. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
3. Identification: Attach label on unexposed side of Samples that includes the following:
   a. Generic description of Sample.
   b. Product name and name of manufacturer.
   c. Sample source.
   d. Number and title of appropriate Performance Specification Section.
4. Disposal: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
   a. If approved by Owner’s Representative, certain Samples may be incorporated into the Work. Such Samples must be in an undamaged condition at time of use.
   b. Samples not incorporated into the Work, or otherwise designated as Owner’s Representative's property, are the property of Design-Builder.
5. Samples for Verification:
   a. Submit full-size units or Samples of size required, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; and components used for independent testing and inspection.
   b. Number of Samples: Submit three sets of Samples. Owner’s Representative will retain one Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.
      1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
      2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

F. Subcontract List:
   1. Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
      a. Name, address, and telephone number of entity performing subcontract or supplying products.
      b. Number and title of related Specification Section(s) covered by subcontract.
      c. Drawing number and detail references, as appropriate, covered by subcontract.

G. Qualification Data:
   1. Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of project architects and owners, and other information specified.

H. Welding Certificates:
   1. Prepare written certification that welding procedures and personnel comply with requirements in the Agreement Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

I. Installer Certificates:
   1. Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Agreement Documents and, where required, is authorized by manufacturer for this specific Project.

J. Product Certificates:
   1. Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Agreement Documents.

K. Material Certificates:
   1. Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Agreement Documents.

L. Material Test Reports:
   1. Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Agreement Documents.

M. Product Test Reports:
   1. Prepare written reports indicating current product produced by manufacturer complies with requirements in the Agreement Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

N. Research/Evaluation Reports:
   1. Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

a. Name of evaluation organization.
b. Date of evaluation.
c. Time period when report is in effect.
d. Product and manufacturers' names.
e. Description of product.
f. Test procedures and results.
g. Limitations of use.

O. Schedule of Tests and Inspections:
1. Provide scope for each test and inspection and calendar schedule to the Owner's Representative. Provide minimum 72 hours' notice to Owner's Representative prior to each test and inspection. Owner's Representative may, at their discretion, witness such testing.

P. Preconstruction Test Reports:
1. Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with Performance Specifications in the Agreement Documents.

Q. Compatibility Test Reports:
1. Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

R. Field Test Reports:
1. Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Agreement Documents.

S. Maintenance Data:
1. Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment.

T. Design Data:
1. Prepare written and graphic information, including, but not limited to, performance and Design Requirements, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and Design Requirements and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

U. Manufacturer's Instructions:
1. Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
a. Preparation of substrates.
b. Required substrate tolerances.
c. Sequence of installation or erection.
d. Required installation tolerances.

e. Required adjustments.
f. Recommendations for cleaning and protection.

V. Manufacturer's Field Reports:
1. Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
a. Name, address, and telephone number of factory-authorized service representative making report.
b. Statement on condition of substrates and their acceptability for installation of product.
c. Statement that products at Project site comply with requirements.
d. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
e. Results of operational and other tests and a statement of whether observed performance complies with requirements.
f. Statement whether conditions, products, and installation will affect warranty.
g. Other required items required in individual Performance Specification Sections.

W. Construction Photographs and Digital Recordings (DVD's):
1. Provide record photographs and or digital videos of construction, particularly concealed Work.
2. Obtain and transfer copyright usage rights from photographer to the Owner for unlimited reproduction of photographic documentation.
3. Digital Images:
a. Provide images in uncompressed TIFF format or JPEG, produced by a digital camera with minimum sensor size of 4.0 megapixels, and at an image resolution of not less than 1600 by 1200 pixels.
b. Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software. Date and Time: Include date and time in filename for each image.
4. Digital Video Format:
a. Provide high-quality color recording in DVD format. Quality must be adequate to create photographic prints to be made from individual frames.
5. General:
a. Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted. Maintain key plan with each set of construction photographs that identifies each photographic location.
6. Periodic Construction Photographs: Take a minimum of 25 digital photographs weekly, with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

X. Regulatory Agency:
1. Submit licenses, permits, certifications, proof of fee payments for all regulatory agencies, including but not limited to Occupational Safety &

Health Administration (OSHA), Air Pollution Control District, Electric Utility, Gas Utility, Public Works Department, etc.

1.14 DESIGN-BUILDER'S REVIEW

A. General:
1. Review each submittal and check for coordination with other Work of the Agreement and for compliance with the Agreement Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Owner's Representative.

B. Approval Stamp:
1. Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Design-Builder's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Agreement Documents.
2. The Design-Builders' Subcontractor CA licensed design professionals must review and stamp all Construction submittals. Review for conformance to Construction Documents prepared by the registered design professionals of record for the Project.

1.15 OWNER'S REPRESENTATIVE ACTION

A. General:
1. Where action is required by Owner's Representative, Owner's Representative will not review submittals that do not bear Design-Builder's approval stamp and will return them without action.

B. Action Submittals:
1. Owner's Representative will review each submittal, make marks to indicate corrections or modifications required, and return it to the Design-Builder.

C. Informational Submittals:
1. Owner's Representative will review each submittal and may return it to the Design-Builder stamped appropriately with comments.

1.16 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) DESCRIPTION

A. Establish and maintain a Quality Assurance/Quality Control (QA/QC) program as described in this section and coordinate with the Commissioning program. The QA/QC program must cover construction operations on-site and off-site and must be keyed to the proposed construction sequence and serve as the foundation on which the Commissioning Plan will be built and executed for the mechanical and electrical systems.

B. The process of assuring quality and compliance will take place in two ways. QA/QC must implement a program to monitor, verify, and accept the work during the construction installation, especially the equipment and the system components. The QA/QC program will coordinate with the Commissioning of Work and dovetail the monitoring and requirements for systems and equipment identified under both programs. The Commissioning program will plan, monitor, verify, and accept the operation and the performance of the equipment and systems. In particular, the

operation and performance of the mechanical and electrical systems will only be available for verification and acceptance upon the successful execution of the QC/QA program with regard to their installation.

C. QA/QC REQUIREMENTS

D. QA/QC Program Requirements - The QA/QC program consists of a QA/QC Organization, a Quality Control (QC) Plan, conducting QA/QC meetings on site, performing submittal review, ensuring testing is performed, and preparing QC certifications and documentation necessary to provide materials, equipment, workmanship, fabrication, construction and operations which comply with the requirements of this Agreement. In addition this Section consists of the coordination of the QA/QC program with the Commissioning program.

1.17 QA/QC DEFINITIONS

A. Quality Assurance Services:
1. Activities, actions, and procedures performed at a level above Quality Control to assure the work performed has in effect a quality control procedure and process performed by those doing the Work to guard against defects and deficiencies and assure that proposed construction will comply with requirements. Includes submittals, certifications, and other actions to assure that the proposed products and services will meet the Agreement requirements. Services do not include Agreement enforcement activities performed by the Owner.

B. Quality Control Services:
1. Tests, inspections, procedures, and related actions at the level where the work is performed, during and after execution of the Work, to evaluate that actual products and completed construction comply with all Agreement requirements.

C. Mockups:
1. Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.

D. Laboratory Mockups:
1. Full-size, physical assemblies that are constructed at a testing facility to verify performance characteristics.

E. Preconstruction Testing:
1. Tests and inspections that are performed specifically for Design-Build Package #1 before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

F. Product Testing:
1. Tests and inspections that are performed by a Nationally Recognized Testing Laboratory (NRTL), a National Voluntary Laboratory Accreditation Program (NVLAP), or a testing agency qualified to conduct product testing

and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

G. Source Quality Control Testing:
1. Tests and inspections that are performed at the source, i.e., Plant, mill, factory, or shop.

H. Field Quality Control Testing:
1. Tests and inspections that are performed on-site for installation of the Work and for completed Work.

I. Testing Agency:
1. An entity engaged by the Owner's Representative to perform specific tests, inspections, or both. Testing laboratory will mean the same as testing agency. The testing agency will be under the control of the Owner's Representative at the Owner's discretion.

J. Installer/Applicator/Erector:
1. Design-Builder or another entity engaged by Design-Builder as an employee, Subcontractor, or Sub-subcontractor experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated whose work has resulted in construction with a record of successful in-service performance.
2. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades people of the corresponding generic name.

K. Experienced:
1. When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

L. Manufacturer Qualifications:
1. A firm experienced in manufacturing products or systems similar to those indicated and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

M. Fabricator Qualifications:
1. A firm experienced in producing products similar to those indicated and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

N. Professional Architect/Engineer Qualifications:
1. A professional Architect/Engineer who is legally qualified and licensed to practice in the State where the project is located and who is experienced in providing Architecture and Engineering services of the kind indicated. Architect/Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated in material, design, and extent.

O. Specialists:
1. Certain sections of the Specifications require that specific construction activities will be performed by entities that are recognized experts in those operations. Specialists must satisfy qualification requirements indicated and must be engaged for the activities indicated.
2. Requirement for specialists must not supersede building codes and regulations governing the Work.

P. Testing Agency Qualifications:
1. An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to America Society for Testing of Materials (ASTM) E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
2. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
3. NVLAP: A testing agency accredited according to National Institute of Standards and Technology's (NIST) NVLAP.

Q. Factory-Authorized Service Representative Qualifications:
1. An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated.

R. Preconstruction Testing:
1. Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods.

1.18 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) ON INSTALLATION

A. Monitoring - Monitor quality control over suppliers, manufacturers, products, services, site conditions and workmanship to produce work of the specified quality.

B. Compliance - Comply fully with manufacturers' instructions including each step in sequence and comply fully with the Agreement documents inclusive of the entirety of the intent of the Design Criteria.

C. Conflicts - Should manufacturers' instructions conflict with the Agreement Documents, request clarification from Owner's Representative before proceeding.

D. Standards:
1. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, code, or specified requirements indicate higher standards or more precise workmanship.
2. Perform Work by persons qualified to produce workmanship of specified quality.

E. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, code, or specified requirements indicate higher standards or more precise workmanship.

F. Coordination of all above-ceiling work is mandatory prior to any installation. Documentation of such coordination will be required prior to applicable installation taking place in the specific area concerned.

1.19 QA/QC SUBMITTALS

A. Quality Assurance/Quality Control (QA/QC) Plan: Submit a QA/QC Plan for the Owner's Representative's approval within thirty (30) days prior to commencement of construction.

B. Schedule of Tests and Inspections:
1. Prepare in tabular form and include the following, as applicable:
a. Specification Section number and title.
b. Description of test and inspection.
c. Identification of applicable standards.
d. Identification of test and inspection methods.
e. Number of tests and inspections required.
f. Time schedule or time span for tests and inspections.
g. Entity responsible for performing tests and inspections.
h. Requirements for obtaining samples.
i. Unique characteristics of each quality control service.

C. Reports:
1. Prepare and submit certified written reports that include the following:
a. Date of issue.
b. Name, address, and telephone number of testing agency.
c. Dates and locations of samples and tests or inspections.
d. Names of individuals making tests and inspections.
e. Description of the Work and test and inspection method.
f. Identification of product and Specification Section.
g. Complete test or inspection data.
h. Test and inspection results and an interpretation of test results.
i. Record of temperature and weather conditions at time of sample taken and testing and inspecting.
j. Comments or professional opinion on whether tested or inspected Work complies with the Agreement Document requirements.
k. Recommendations on retesting and reinspecting.

D. Permits, Licenses, and Certificates:
1. For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

E. Testing Agency Responsibilities:
1. Submit a certified written report of each test, inspection, and similar quality-assurance service to the Owner's Representative, with copy to Design-Builder. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Agreement Documents.

1.20 QA/QC PLAN

A. Requirements: Provide for approval by the Owner's Representative, a QA/QC Plan that covers both on-site and off-site Work, and includes the following:
   1. A chart showing the QA/QC organizational structure and its relationship to the production side of the organization.
   2. Names and qualifications, in resume format, for each person in the QA/QC organization.
   3. Duties, responsibilities and authorities of each person in the QA/QC organization.
   4. Documentation procedures, including proposed report formats for all reports required herein.
   5. A letter signed by an officer of the firm appointing the QA/QC Manager and stating that he/she is responsible for managing and implementing the QA/QC program as described herein, and that the QA/QC Manager reports to an officer of the firm, someone other than Design-Builder's Project Manager. Include in this letter the QA/QC Manager's authority to direct the stopping, removal and replacement of non-conforming Work.
   6. Procedures for reviewing, approving and managing submittals. Provide the name(s) of the person(s) in the QA/QC organization authorized to review and certify submittals prior to approval.
   7. A Testing Plan and Log that includes the tests required, referenced by the specification paragraph number requiring the test, test procedures, the frequency, schedule activity number and the person responsible for each test.
   8. Procedures to identify, record, track and complete rework items, including schedule activity numbers.
   9. A listing of outside organizations such as, architectural and consulting engineering firms that will be employed by Design-Builder and a description of the services and resumes of personnel these firms will provide.
   10. A list of the definable features of work. A definable feature of work is a task that is separate and distinct from other tasks and requires separate control requirements. As a minimum, unless otherwise approved by the Owner's Representative, consider each section of the specifications as a definable feature of work. However, there may be more than one definable feature of work in each section of the specifications.
   11. A personnel matrix showing, for each section of the specification, who will review and approve submittals, who will perform and document the various phases of control, and who will perform and document the testing.
   12. Provide procedures describing mandatory above ceiling coordination prior to the execution of any above ceiling work.

B. Preliminary Work Authorized Prior to Approval: The only work that is authorized to proceed prior to the approval of the QA/QC Plan is mobilization of storage and office trailers and surveying, the preparation of excavation shoring systems, and removal of hazardous materials. Design-Builder must not proceed on other activities without written approval from the Owner's Representative.

C. Approval: Approval of the QA/QC Plan is required before the start of construction. The Owner's Representative reserves the right to require changes in the QA/QC Plan and operations as necessary to ensure the specified quality of Work. The Owner's Representative reserves the right to interview any member of the QA/QC organization at any time in order to verify his/her submitted qualifications.

D. Notification of Changes: Submit written notification to the Owner's Representative of any proposed change, including changes in the QA/QC organization personnel, a minimum of seven (7) days prior to a proposed change. Design-Builder must receive Owner approval prior to implementing such proposed changes.

1.21 QA/QC PLAN MEETING

A. Prior to submission of the QA/QC Plan, meet with Owner's Representative to discuss the QA/QC Plan requirements of this Agreement. The purpose of this meeting is to develop a mutual understanding of the QA/QC Plan requirements prior to plan development and submission.

1.22 QA/QC COORDINATION AND MUTUAL UNDERSTANDING MEETING

A. After submission of the QA/QC Plan, but prior to the start of construction, meet with Owner's Representative to discuss the QA/QC program required by this Agreement. The purpose of this meeting is to develop a mutual understanding of the QA/QC details, including forms to be used for documentation, administration for on-site and off-site Work, and the coordination of Design-Builder's management, production and QA/QC personnel. As a minimum, Design-Builder's personnel required to attend must include the project manager, project superintendent, QA/QC Manager, and QA/QC specialists. Minutes of the meeting must be prepared by the QA/QC Manager and signed by both Design-Builder and Owner's Representative.

1.23 QA/QC DOCUMENTATION

A. Maintain current and complete records of on-site and off-site QA/QC program operations and activities.
   1. Design-Builder Daily Report.
   2. Design-Builder Quality Control Report: Reports are required for each day that Work is performed and for every seven (7) consecutive days of no-work and on the last day of a no-work period. Account for each day throughout the life of the Agreement. The reporting of Work must be identified by terminology and activity codes consistent with the construction schedule. Design-Builder Quality Control Reports must be prepared, signed and dated by the QA/QC Manager and must contain the following information:
      a. Identify the control phase (Preparatory, Initial, and Follow-up) and the definable feature of work.
      b. Results of the Preparatory Phase meetings held including the location of the definable feature of work and a list of personnel present at the meeting. Indicate in the report that for this definable feature of work, the drawings and specifications have been reviewed, submittals have been approved, materials comply with approved submittals, materials are stored properly, preliminary work was done correctly, the testing plan has been reviewed, and work methods and schedule have been discussed.
      c. Results of the Initial Phase meetings held including the location of the definable feature of work and a list of personnel present at the meeting. Indicate in the report that for this definable feature of work the preliminary work was done correctly, samples have been prepared and approved, the workmanship is satisfactory, test results are acceptable, work is in compliance with the Agreement

requirements, and the required testing has been performed and include a list of who performed the tests.

d. Results of the Follow-up Phase inspections held including the location of the definable feature of work. Indicate if the report for this definable feature of Work that the work complies with the Agreement requirements as approved in the Initial Phase, and that required testing has been performed and include a list of who performed the tests.

e. Results of the three Phases of Control for off-site work, if applicable, including actions taken.

f. List the rework items identified, but not corrected by close of business.

g. List the rework items corrected from the rework items list along with the corrective action taken.

h. Include a "remarks" section in this report which must contain pertinent information including directions received, quality control problem areas, deviations from the QA/QC Plan, construction deficiencies encountered, QA/QC meetings held, acknowledgement that as-built drawings have been updated, corrective direction given by the QC Organization and corrective action taken by Design-Builder.

i. Design-Builder Quality Control Report certification.

3. Reports from the QC Specialist(s): Reports are required for each day that Work is performed in their area of responsibility. QC specialist reports must include the same documentation requirements as Design-Builder Quality Control Report for their area of responsibility, QC specialist reports must be prepared, signed and dated by the QC specialists and must be attached to Design-Builder Quality Control Report prepared for the same day.

4. Testing Plan and Log: As tests are performed, the QA/QC Manager must record on the "Testing Plan and Log" the date the test was conducted, the date the test results were forwarded to IOR, remarks and acknowledgement that an accredited or approved testing laboratory was used. Attach a current updated copy of the "Testing Plan and Log" to the last daily Design-Builder Quality Control Report of each month.

5. Rework Items List: The QA/QC Manager must maintain a list of work that does not comply with the Agreement requirements, identifying what items need to be reworked, the date the item was originally discovered, and the date the item was corrected. Attach the current copy of the "Design-Builder Rework Items List" to the last daily Design-Builder Quality Control Report of each month. Design-Builder will be responsible for including on this list items needing rework including those identified by the Owner's Representative.

6. Record Drawings: The QA/QC Manager is required to review the Record Drawings to ensure that the drawings are kept current on a daily basis and marked to show precise locations of items, or any deviations, which have been made from the Construction Drawings. The QA/QC Manager, or QC Specialist assigned to an area of responsibility, must initial each deviation and each revision. Upon completion of Work, the QA/QC Manager must furnish a certificate attesting to the accuracy of the Record Drawings and verification by the IOR prior to submission to Owner's Representative.

7. Report Forms:

a. The reporting format must contain the following information:

1) Design-Builder Daily Report

2) Design-Builder Quality Control Report and Separate Continuation Sheets
3) Testing Plan and Log
4) Rework Items List
5) Construction Methods Form
6) QA/QC Manager's Preparatory Phase Check-off Report

b. Report forms must be transmitted via a method acceptable to Owner's Representative. All original documents, reports, completed forms, etc. must be forwarded to the Owner's Representative.

1.24 REPAIR AND PROTECTION

A. General:

1. Repair and protection are Design-Builder's responsibility, regardless of the assignment of responsibility for quality control services.
2. On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes. Protect construction exposed by or for quality control service activities.
3. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

1.25 OPERATION AND MAINTENANCE MANUALS (O&M) REQUIREMENTS

A. Standard Operation and Maintenance (O&M) Manuals.

1. The specific content and format requirements for the standard O&M manuals are de-tailed herein and in the individual Specifications. The O&M Manuals will be submitted in both hard copy and electronic form. The electronic form will be compiled in the most current form of Adobe Acrobat, Release 9.0 or better, or Bluebeam Revu, Release 10.0 or better. The electronic file will be bookmarked according to its Table of Contents, but will contain no less than the book marking identification in descending order of section, system, subsystem, equipment, component, etc., where applicable. The goal is to make the manuals both manageable and user friendly for the Owner's use.
2. Design-Builder Design Team Contribution. The Design-Builder will include, in the be-ginning of the each O&M manual, a separate section describing the systems, including:
   a. The Basis of Design narrative prepared by the Design-Builder, updated to as-built status by the Design-Builder.
   b. Simplified, professionally-drawn, single-line system diagrams on 8-1/2" x 11" or 11" x 17" sheets. These must include, but not limited to, systems and major pieces of equipment such as chillers, boilers, piping systems, electrical systems, ductwork systems and controls systems.
3. State Review and Approval. Prior to completion, the Owner's Representative will review the O&M Manuals, documentation, and redline as-builts to verify compliance with the Performance Criteria. The Owner's Representative will communicate deficiencies in the manuals to the Design-Builder. Upon a successful review of the corrections, the Owner's Representative recommends approval and acceptance of these sections of the O&M manuals. The Owner's Representative also reviews each

equipment warranty and verifies that all requirements to keep the warranty valid are clearly stated.

1.26 WARRANTIES

A. Warranties shall be provided for specific products, equipment and work as identified in Individual Specifications Sections.

B. Form of Warranty: Written warranties, except manufacturer's standard printed warranties, must be on the Design-Builder's, Subcontractor's, material supplier, or manufacturer's own letterhead, addressed to the Owner. All warranties must be submitted in duplicate, in a suitable format, and modified as approved to suit the conditions pertaining to the warranty.

C. Bind warranties in commercial quality 8-1/2" x 11" binders, with hardback, cleanable, plastic covers.

D. Label cover of each binder with typed or printed title "WARRANTIES", with title of Project, name, address, and telephone number of Design-Builder; and name of responsible principal.

E. Table of Contents: Neatly typed, in the sequence of the Table of Contents, with each item identified with the number and title of the specification section in which specified, and the name of Product or work item.

F. Separate each warranty with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

G. Obtain warranties, executed in duplicate by responsible subcontractor, suppliers, and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the date of final acceptance or occupancy by the Owner.

H. All warranties must be signed by both the General Design-Builder and the appropriate subcontractor.

I. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.

1.27 TRAINING AND DEMONSTRATION SUBMITTALS

A. Instruction Program:
1. Submit two copies of outline of instructional program for demonstration and training, including: the agenda for the training; a schedule of proposed dates and times; length of instruction time for each section of training, and instructors' names for each training module. Include learning objective and outline for each training module. Each training submittal must be provided a minimum of three weeks before the proposed training date.
2. At completion of training, submit two complete training manual(s) in both paper and electronic format for the Owner’s use. Electronic format to be word searchable.

B. Qualification Data:
   1. For facilitator, instructor, and videographer.

C. Attendance Record:
   1. For each training module, submit list of participants and length of instruction time.
   2. Complete the Training Record form included for each training session conducted. Submit to the Owner within seven (7) calendar days of each session being completed.

D. Evaluations:
   1. For each participant and for each training module, submit results and documentation of performance-based test.

E. Demonstration and Training Interactive DVDs:
   1. Submit two copies within seven (7) calendar days of end of each training module.
   2. Identification: On each copy, provide an applied label with the following information:
      a. Name of Project.
      b. Name and address of videographer.
      c. Name of Construction Manager.
      d. Name of Design-Builder.
      e. Date DVD was recorded.
      f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
   3. Transcript: Prepared on 8-1/2” by 11” paper, punched and bound in heavy-duty, 3-ring, vinyl-covered binders. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding DVD. Include name of Project and date of DVD on each page. Include copy of relevant DVD in plastic sleeve.

F. Training Planning, Agenda, and Record Forms:
   1. Forms follow on subsequent pages.
      a. Overall Staff Training and Orientation Plan (one page).
      b. Training and Orientation Agenda (two pages).
      c. Staff Training and Orientation Record (one page).

1.28 TRAINING QUALITY ASSURANCE

A. Facilitator Qualifications:
   1. A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications:
   1. A factory-authorized service representative experienced in operation and maintenance procedures and training.

C. Videographer Qualifications:
   1. A videographer who is experienced digitally recording construction projects.

D. Pre-Instruction Conference:
1. Conduct conference to review methods and procedures related to anticipated demonstration and training including, but not limited to, the following:
a. Inspect and discuss locations and other facilities required for instruction.
b. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
c. Review required content of instruction.
d. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.29 INSTRUCTION PROGRAM

A. Program Structure:
1. Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:
a. Motorized doors, including overhead coiling doors overhead coiling grilles and automatic entrance doors.
b. Equipment, including video screens, loading dock equipment, waste compactors, service equipment, and other equipment as applicable to project.
c. Fire-protection systems, including fire alarm, fire pumps, and fire-extinguishing systems.
d. Security systems.
e. Conveying systems.
f. Refrigeration systems, including chillers, cooling towers, condensers, pumps, thermal energy storage and distribution piping.
g. Steam plant systems, including boilers, deaerators, feedwater pumps, condensate return system
h. HVAC systems, including air-handling equipment, air distribution systems, and terminal equipment and devices.
i. EMCS, HVAC instrumentation and controls.
j. Electrical service and distribution, including transformers, switchboards, panelboards, uninterruptible power supplies, and motor controls.
k. Packaged engine generators, including transfer switches.
1) Black start generators
2) Emergency generators
l. Lighting equipment and controls.
m. Communication systems, including intercommunication, surveillance, clocks and programming, voice and data, and television equipment.
n. Power monitoring, control system and UPS
o. Other systems and equipment as applicable.

B. Training Modules:
1. Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master.

a. For each scene of the module define the Trade and Level of target participant. Some cross-over is expected.
b. Example Trades are: Controls, Electrical, Mechanical.
c. Example Levels: Operation, Maintenance, Trouble-shooting.

2. Emergency Operations shall include the following, as applicable:
   a. Instructions on meaning of warnings, trouble indications, and error messages.
   b. Instructions on stopping.
   c. Shutdown instructions for each type of emergency.
   d. Operating instructions for conditions outside of normal operating limits.
   e. Sequences for electric or electronic systems.
   f. Special operating instructions and procedures.
3. Normal Operations shall include the following, as applicable:
   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions.
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.
   g. Instructions on stopping.
   h. Normal shutdown instructions.
   i. Operating procedures for system, subsystem, or equipment failure.
   j. Seasonal and weekend operating instructions.
   k. Required sequences for electric or electronic systems.
   l. Special operating instructions and procedures.

4. Adjustments shall include the following:
   a. Alignments.
   b. Checking adjustments.
   c. Noise and vibration adjustments.
   d. Economy and efficiency adjustments.
5. Troubleshooting: Include the following:
   a. Diagnostic instructions.
   b. Test and inspection procedures.
6. Maintenance shall include the following:
   a. Inspection procedures.
   b. Types of cleaning agents to be used and methods of cleaning.
   c. List of cleaning agents and methods of cleaning detrimental to product.
   d. Procedures for routine cleaning.
   e. Procedures for preventive maintenance.
   f. Procedures for routine maintenance.
   g. Instruction on use of special tools.
7. Repairs shall include the following:
   a. Diagnosis instructions.
   b. Repair instructions.
   c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   d. Instructions for identifying parts and components.
   e. Review of spare parts needed for operation and maintenance.

1.30 PROJECT CLOSEOUT SUBMITTALS

A. General:
1. Comply with requirements specified in Sections 01 77 00 "Closeout Procedures", 01 78 23 "Operation and Maintenance Data", 01 78 39 "Project Record Documents", and 01 91 00 "General Commissioning Requirements".

1.31 LEED SUBMITTALS

A. General:
1. Comply with requirements specified in Section 01 35 70 "LEED Requirements."
2. Maintain full and complete organized LEED and commissioning submittals library.

B. Material Safety Data Sheets (MSDS) for LEED Certification:
1. Submit information necessary to show compliance with LEED certification requirements, which will be the limit of Owner's Representative review.
2. Owner's Representative will not review LEED submittals that do not include MSDS where applicable, and will return the entire submittal for resubmittal.

1.32 COMMISSIONING SUBMITTALS

A. General
1. Comply with all commissioning requirements.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints:
1. Maintain one set of blue or black-line white prints of the Construction Drawings and Shop Drawings.
2. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
   a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
   b. Accurately record information in an understandable drawing technique.
   c. Obtain and record data for modifications as soon as specific item of work is accomplished. Record and check the markup before enclosing concealed installations.
3. Content: Types of items requiring marking include, but are not limited to, the following:
   a. Dimensional changes to Drawings.
   b. Revisions to details shown on Drawings.
   c. Depths of foundations below first floor.
   d. Locations and depths of underground utilities.
   e. Revisions to routing of piping and conduits.
   f. Revisions to electrical circuitry.

g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Construction Change Directive.
k. Changes made following Owner's written orders.
l. Details not on the original Agreement Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

4. Mark the Construction Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Construction Drawings.
5. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
6. Mark important additional information that was either shown schematically or omitted from original Construction Drawings.
7. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record CAD Drawings:
1. Immediately before inspection for Certificate of Completion, review marked-up Record Prints with Construction Manager. When authorized, prepare a full set of corrected CAD Drawings of the Construction Drawings to reflect Record/As-built conditions.
2. Format: Same CAD program, version, and operating system as the original Construction Drawings. One set of Record (As-Built) CAD files must be locked for record purposes. The other set of Record (As-Built) CAD flies must be unlocked and completely manipulate-able for later use by the Owner for other project purposes.
3. Incorporate changes and additional information previously marked on Record Prints and Shop Drawings as applicable. Delete, redraw, and add details and notations where applicable. Scanned .TIFF, PDF or other non-manipulate-able files are not acceptable as electronic copies.

C. Newly Prepared Record Drawings:
1. Prepare new drawings instead of preparing Record Drawings where the Owner's Representative determines that neither the original Construction Drawings nor Shop Drawings are suitable to show actual installation.
2. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
3. Integrate newly prepared Record Drawings into Record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.

D. Format:
1. Identify and date each Record Drawing.
2. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
3. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the approved 100% Construction

Drawings set, with Record Drawing mark-ups/additions. Name each file with the sheet identification. Include identification in each CAD file.

4. Identification as follows:
   a. Project name.
   b. Date.
   c. Designation "DESIGN-BUILD RECORD DRAWINGS."

2.2 RECORD SPECIFICATIONS

A. Preparation:
1. Mark copy with the proprietary name and model number of products, materials, and equipment furnished. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
3. Note related Record Product Data and Record Drawings where applicable.

2.3 RECORD PRODUCT DATA

A. Preparation:
1. Mark Product Data to indicate the actual product installation where installation varies substantially from that required in Product Data submittal.
2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
3. Include significant changes in the product delivered to site and changes in manufacturer's written instructions for installation.
4. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. General:
1. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 VERIFICATION OF CONDITIONS

A. Prior to installing any portion of the Work, Design-Builder must inspect the work already in place to receive the work to be installed and arrange for correction of defects in the existing workmanship, material or conditions that may adversely affect work to be installed. Such inspections must include test applications of the materials to be installed as required to establish the correct condition of surfaces involved. Where the specifications require a material to be installed under the supervision or inspection of the material manufacturer or its representative, Design-Builder must ensure that the manufacturer or its representative also inspects the work in place and issues a letter of approval to the Owner’s Representative.

3.2 RECORDING AND MAINTENANCE

A. Recording:
1. Maintain one copy of each submittal during the construction period for Design-Build Record Document purposes. Post changes and modifications to Design-Build Record Documents as they occur; do not wait until the end of project.

B. Maintenance of Record Documents and Samples:
1. Store Record Documents and Samples in the field office apart from the Construction Documents used for construction. Do not use Design-Build Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Design-Build Record Documents for Owner's reference during normal working hours.

3.3 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Organization:
1. Include a Section in the directory for each of the following:
a. Master table of contents for directory.
b. List of contacts.
c. List of systems.
d. List of equipment.
e. Tables of contents.

B. List of Contacts
1. List systems/equipment contacts; list by system, alphabetically.

C. List of Systems and Subsystems:
1. List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

D. List of Equipment:
1. List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

E. Tables of Contents:
1. Include every table of contents for each emergency, operation and maintenance manual.

F. Identification:
1. In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Construction Documents. If no designation exists, assign a designation according to American Society of Heating Refrigerating & Air Conditioning Engineers (ASHRAE) Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

G. All documents to be word searchable, scanned images of text will not be acceptable.

3.4 MANUALS-GENERAL

A. Organization:
1. Unless otherwise required, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system.
2. Each manual must contain the following materials, in the order listed:
a. Title page.
b. Table of contents.
c. Manual contents.

B. Title Page:
1. Enclose title page in transparent plastic sleeve. Include the following information:
a. Subject matter included in manual.
b. Name and address.
c. Date of submittal.
d. Name, address, and telephone number of Design-Builder.
e. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents:
1. List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
2. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents:
1. Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
2. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf D-ring binders, in thickness necessary to accommodate contents, sized to hold 8-1/2” by 11” paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number (and volume count) for multiple-volume sets.
3. Dividers: Heavy-paper dividers with plastic-covered tabs for each Section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the Section on each divider, cross-referenced to Specification Section number and title of Project Manual.
4. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.

5. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
6. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
   a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
   b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

3.5 EMERGENCY MANUALS

A. Content:
   1. Organize manual into a separate section for each of the following:
      a. Type of emergency.
      b. Emergency instructions.
      c. Emergency procedures.

B. Type of Emergency:
   1. Where applicable for each type of emergency required below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
      a. Fire.
      b. Flood.
      c. Gas leak.
      d. Water leak.
      e. Power failure.
      f. Water outage.
      g. System, subsystem, or equipment failure.
      h. Chemical release or spill.

C. Emergency Instructions:
   1. Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of the Owner for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures:
   1. Include the following, as applicable:
      a. Instructions on stopping.
      b. Shutdown instructions for each type of emergency.
      c. Operating instructions for conditions outside normal operating limits.
      d. Required sequences for electric or electronic systems.
      e. Special operating instructions and procedures.

3.6 OPERATION MANUALS

A. Content:
   1. In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
      a. Contacts.
         1) List names,
         2) Addresses,

3) Phone numbers (direct contact, where possible)
4) Email addresses.

b. System, subsystem, and equipment descriptions.
c. Performance and design requirement if Design-Builder is delegated design responsibility.
d. Operating standards.
e. Operating procedures.
f. Operating logs.
g. Wiring diagrams.
h. Control diagrams.
i. Piped system diagrams.
j. Precautions against improper use.
k. License requirements including inspection and renewal dates.

B. Descriptions:
1. Include the following:
a. Product name and model number.
b. Manufacturer's name.
c. Equipment identification with serial number of each component.
d. Equipment function.
e. Operating characteristics.
f. Limiting conditions.
g. Performance curves.
h. Engineering data and tests.
i. Complete nomenclature and number of replacement parts.

C. Operating Procedures:
1. Include the following, as applicable:
a. Startup procedures.
b. Equipment or system break-in procedures.
c. Routine and normal operating instructions.
d. Regulation and control procedures.
e. Instructions on stopping.
f. Normal shutdown instructions.
g. Seasonal and weekend operating instructions.
h. Required sequences for electric or electronic systems.
i. Special operating instructions and procedures.

D. Systems and Equipment Controls:
1. Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems:
1. Diagram piping as installed, and identify color-coding where required for identification.

3.7 PRODUCT MAINTENANCE MANUAL

A. Content:
1. Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information:
1. List each product included in manual identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information:
1. Include the following, as applicable:
a. Product name and model number.
b. Manufacturer's name.
c. Color, pattern, and texture.
d. Material and chemical composition.
e. Reordering information for specially manufactured products.

D. Maintenance Procedures:
1. Include manufacturer's written recommendations and the following:
a. Inspection procedures.
b. Types of cleaning agents to be used and methods of cleaning.
c. List of cleaning agents and methods of cleaning detrimental to product.
d. Schedule for routine cleaning and maintenance.
e. Repair instructions.

E. Repair Materials and Sources:
1. Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds:
1. Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
2. Include procedures to follow and required notifications for warranty claims.

3.8 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

A. Content:
1. For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information:
1. List each system, subsystem, and piece of equipment included in manual identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Manufacturer’s Maintenance Documentation:
1. Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
a. Standard printed maintenance instructions and bulletins.

b. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
c. Identification and nomenclature of parts and components.
d. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures:
1. Include the following information and items that detail essential maintenance procedures:
a. Test and inspection instructions.
b. Troubleshooting guide.
c. Precautions against improper maintenance.
2. Disassembly; component removal, repair, and replacement; and reassembly instructions.
3. Aligning, adjusting, and checking instructions.
4. Demonstration and training videotape, if available.

E. Maintenance and Service Schedules:
1. Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
2. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
3. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information:
1. Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts:
1. Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds:
1. Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
2. Include procedures to follow and required notifications for warranty claims.

3.9 SUBMITTAL REQUIREMENTS

A. The Project Proposal is not transferable to another Project Proposer. The Project Proposal must be submitted in the same name style and manner as is used on Contractor’s license (or Joint Venture license as applicable). If a Project Proposal is submitted by an individual, name and postal address must be shown; if made by a firm or partnership, the name and postal address of the firm or partnership, and the signature of one or both partners must be shown; if made by a corporation, Project Proposal must show name of Owner’s Representative under the laws of which the corporation was chartered, name of the corporation and title of the person who signs on behalf of the corporation. Corporate seal must be used.

B. Enhancements: The Performance Criteria identified in the Request for Proposal are minimum functional and operational requirements. To demonstrate the best value for the Owner encourages Proposers to submit enhancements to the RFP. All enhancements must be uniquely identified in the Project Proposals with detailed explanations of their benefits to the Owner, including, but not limited to a narrative, affected RFP section references, new performance criteria, new concept drawings, quality descriptions, and/or life cycle cost/benefit analysis as applicable. Schedule enhancements must be accompanied by detailed schedule information complying with the schedule submittal requirements dictated by the RFP. The Owner retains the right to refuse any and all enhancements and upgrades proposed.

3.10 PRODUCT CERTIFICATIONS

A. Where specifically indicated by pertinent Specification Sections, submit proper certification by recognized producer or association. Certifications must attest to product's compliance with requirements of the Contract Documents.

3.11 SHOP DRAWINGS

A. Submittals must be made in electronic and hard copy form and include one reproducible transparency of each original and 3 prints of each transparency, name and location of Project, name of Design-Builder, work order and Agreement numbers and cross references to Agreement documents. Number shop drawings consecutively. Make drawings legible and complete in every respect. Electronic drawing submittals must be in consistent AutoCAD or Revit format.

B. If Shop Drawings show variations from Agreement requirements because of standard shop practice or other reason, make specific mention of such variations in letter of transmittal, as well as on drawings, in order that (if acceptable) suitable action may be taken for proper adjustment of the Design-Build Agreement. Unless specific changes have been noted and accepted, no deviations from the Contract Documents will be permitted.

C. Transparencies will be returned to Design-Builder for Design-Builder’s reproduction and use.

3.12 PRODUCT DATA/MATERIAL LISTS

A. Manufacturer's Standard Schematic Drawings:
   1. Modify drawings to delete information which is not applicable to Project.
   2. Supplement standard information to provide additional information applicable to Project.

B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data:
   1. Clearly mark each copy to identify pertinent materials, products or models.
   2. Show dimensions and clearances required.
   3. Show performance characteristics and capacities.
   4. Show wiring diagrams and controls.
   5. Include calculations when applicable.

C. Material Safety Data Sheets (MSDS): Include for materials which require manufacturer's warnings and application instructions listed on MSDS provided by the product manufacturer.

3.13 SAMPLES

A. Physical examples to illustrate materials, equipment or workmanship, and to establish standards by which completed work is judged.

B. Where size of samples is not specified, office samples should be of sufficient size and quantity to clearly illustrate:
1. Functional characteristics of product or material, with integrally related parts and attachment devices.
2. After review, samples may be used in construction of Project.

C. Field Samples and Mockups:
1. Erect at Project site at location acceptable to Owner's Representative, unless otherwise approved.
2. Construct each sample or mockup complete, including work of all trades required in finished work.
3. Within twenty (20) days after NTP, Design-Builder is required to provide Owner's Representative with a comprehensive list of all Mock-ups to be completed at the Project. Owner's Representative will review and approve this list.

3.14 SUBSTITUTIONS

A. Written acceptance from the Owner's Representative is required for implementation or utilization of any substitution.
1. The Design-Build Agreement is based on materials, equipment and methods described in Criteria Documents.
2. Owner's Representative will consider proposals for alternative materials, equipment and methods only when such proposals are accompanied by full and complete technical data and all other information required by Owner's Representative to evaluate proposed substitution.
3. Do not use alternative materials, equipment or methods unless such substitution has been specifically accepted for this work by Owner's Representative.

B. Coordination: Acceptance of substitution will not relieve Design-Builder from responsibility for compliance with all requirements of the Design Requirements and Performance Specifications, and Design-Builder will be responsible, at Design-Builder's own expense, for changes in other parts of Design-Builder's work or work of others which may be caused by acceptance of substitution.

C. Proposed substitutions must be submitted no more than 30 days after Notice to Proceed. All substitutions will be considered Action Submittals.

D. Submit separate request for each product and support each request with:
1. Product identification.
2. Manufacturer's representative name, address and contact information.
3. Manufacturer's literature.
4. Samples, as applicable.

5. Detailed comparison of proposed product with specified product.
6. Name, address, and scope of correctional facilities projects on which product has been used, and date of installation.
7. Data relating to changes in construction schedule, if any.
8. Data regarding difference in cost, if any, between specified item and proposed substitute item.
9. Historical reliability and maintenance data.
10. Life-cycle value compared to specified product.
11. Warranty comparison to specified product.

E. Substitute products will not be ordered without written acceptance of Owner's Representative.

F. Owner's Representative will determine acceptability of proposed substitutions (alternatives) and reserves the right to reject proposals due to insufficient information.

3.15 TECHNICAL PROPOSAL

A. Critical Success Factors (CSF) are those issues that the Owner considers essential to the success of this Project, and are the core essence of the Proposer's responsibility. It is essential that the Proposer be responsive to the Owner in both the development of the response to the RFP and in the design and construction of the requirements of this Design-Build Project.
1. Meet and/or exceed the minimum requirements of applicable Codes.
2. Utilize the full capabilities of BIM to maximize the efficiency of the design process.
3. Be consistent with the requirements of the Americans with Disabilities Act (ADA).
4. Create a Project that is energy and water efficient.
5. Thoroughly commission new systems to ensure efficient and reliable operation.
6. Systematically furnish all required warranties, operation and maintenance manuals, and record documents and successfully transition and train facility staff, closing out the Project with no defects.
7. Achieve a LEED Certification.

B. Proposed Design: Prepare written documents listed below to depict the Proposer's design in response to the Owner's requirements. The submittal requirements listed below are minimum requirements. Proposer may submit additional materials in the Project Proposal. Additional materials submitted by the Proposer may or may not be reviewed by the Owner at the Owner's sole discretion. Internet links to websites are not permitted. Design narrative may include diagrams, graphic illustrations, conceptual sketches and ideas, exhibits, and photographic images. Drawings format shall be 24" x 36" or 30" x 42". Floors plans, details, site plans, conceptual floor plans, etc. shall be no smaller than 1/8"=1'0" and no larger than 1/2"=1'0".
1. Provide individual technical approach plans, including backup documentation as appropriate, to identify the proposed types and operations of systems illustrating the best value for the Owner. Technical approach plans are to include:
a. Narrative(s) detailing the basic approach(es).
b. Conceptual layout(s) of building systems.

c. Proposed systems including a description of types, efficiencies, quantities and capacities.
d. Submit a Life Cycle Cost (LCC) analysis of proposed systems describing the Proposer's approach for evaluating alternatives and developing cost effective designs, systems and components as part of sustainable design. Life-cycle benefit analyses must be shown as present value amounts using a 5.5% discount rate, 20-year life cycle period, 3% energy costs escalation rate, 3% personnel/staff escalation rate and 2% maintenance cost escalation rate.
e. Approach to maintaining and servicing proposed systems.
f. Narrative(s) outlining the proven track record(s) of the proposed systems and vendors including tried and tested processes, systems and capabilities.

C. Sustainable Design
1. A self-rated LEED v4 valuation that identifies all achievable "yes" credits and potential "maybe" credits for achieving the minimum LEED certification as stipulated in the criteria documents. Consideration should be given to points potentially being lost during the design and construction process to achieve the minimum.
2. Identify key players who are responsible for designing, implementing and documenting each LEED credit attempted.
3. Identify the LEED Accredited Professional, their experience with LEED Certified projects and describe in detail the role this individual will play on the Design-Builder's Team.
4. Describe, through narrative, the approach that will be taken to achieve each of the LEED credits the Design-Builder is proposing. Provide RFP Document references for each credit. Provide additional drawings and/or materials necessary to describe the strategy. Provide additional Performance Criteria and Concept drawings required for achieving LEED credits if they are not provided in the RFP Performance Criteria.
5. Hard and soft calculations which demonstrate the level of energy efficiency, as well as a statement regarding the Proposers' experience in using such programs. Submit a Life Cycle Cost (LCC) analysis of proposed systems describing the Proposer's approach for evaluating alternatives and developing cost effective designs, systems and components as part of sustainable design. Life-cycle benefit analyses must be shown as present value amounts using a 5.5% discount rate, 20-year life cycle period, 3% energy costs escalation rate, 3% personnel/staff escalation rate and 2% maintenance cost escalation rate.
6. Describe the internal process the team will implement as well as the documentation that the team will propose to include as part of the final submittal for the USGBC.
7. Outlines and narratives for the following documents: Construction Waste Management Plan and an Indoor Air Quality Management Plan.

D. Enhancements
1. An enhancement is a demonstrated benefit to the Site Project that is beyond the minimum requirements established in the RFP.
2. RFP specifications and drawings are the minimum standards that must be implemented under this Site Project. All enhancements must be of high quality.

3. Compliance with State and Local mandated energy and water conservation codes and ordinances are the minimum requirements.
4. LEED certification is not considered an enhancement.
5. The RFP represents the minimum requirement of the Site Project and an item will not be considered an enhancement if it is utilized to meet an “or equal” requirement.
6. The Owner retains the right to refuse any enhancements or upgrades proposed.
7. For each enhancement, submit the following:
   a. A unique enhancement identification number.
   b. A narrative description of the enhancement.
   c. A list of benefits to the Owner.
   d. Affected RFP section references and changes (if applicable).
   e. New performance criteria (if applicable).
   f. New concept drawings (if applicable).
   g. A comparison between the RFP requirements and the proposed enhancement.
   h. Cost benefit analysis (if applicable).

3.16 OPERATION AND MAINTENANCE MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory:
   1. Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Emergency Manual:
   1. Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by the Owner staff for types of emergencies required.

C. Product Maintenance Manual:
   1. Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. Operation and Maintenance Manuals:
   1. Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
   2. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
   3. Prepare a separate manual for each system and subsystem, in the form of an instructional manual.
   4. Prepare a recommended general overall preventative maintenance manual and include a schedule.

E. Manufacturers' Data:
   1. Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using

appropriate references from the Construction Documents. Identify data applicable to the Work and delete references to information not applicable.

2. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. Drawings:

1. Prepare drawings supplementing manufacturer's printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
2. Do not use original Construction Documents as part of operation and maintenance manuals.
3. Comply with requirements of newly prepared Record/As-Built Drawings.

3.17 DEMONSTRATION AND TRAINING PREPARATION

A. General:

1. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.
2. Set up instructional equipment at instruction location.
3. Script training module video clips to focus on defined staff Trade and Level.

3.18 TRAINING INSTRUCTION

A. Facilitator:

1. Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Design-Builder and the Owner for number of participants, instruction times, and location.

B. Instructors:

1. Engage qualified instructors to instruct the Owner's staff to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

C. Scheduling:

1. Provide instruction at mutually agreed upon times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
2. Design-Builder must coordinate with the Owner to create as comprehensive an overall training schedule as possible to facilitate the limited numbers of Owner staff that must be trained in all aspects of the new building. Schedule training with the Owner with at least twenty-one (21) calendar days advance notice.

D. Evaluation:

1. At conclusion of each training module, assess and document each participant's mastery of module by use of an oral, written, or demonstration performance-based test, as applicable.

E. Cleanup:
1. Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

F. Post Video Editing:
1. Instructor to edit transcript so as to identify video clips that are targeted for different Operation and Maintenance (O&M) sections.

3.19 DEMONSTRATION AND TRAINING VIDEOINTERACTIVE DVD'S

A. General:
1. Engage a qualified videographer to record all demonstration and training video DVDs. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
2. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. DVD Format:
1. Provide high-quality color DVDs with hard plastic snap-case for each.
2. All videos are to be shot by the same videographer.

C. Cameras:
1. Provide cameras with a minimum resolution of 1080i High-definition at 30 frames per second.
2. Cameras to be mounted on fluid head tripods.

D. Camera Setup:
1. Two identical cameras are to be used.
2. Camera one is a medium to wide shot which includes the trainer and display materials, white board, charts, etc. Camera does minimal panning and zooming. Camera one is the default camera: All footage from camera one to be continuously usable. A lavaliere (lapel) microphone, should be connected to Camera one.
3. Camera two is a close-up camera capturing details of whiteboards, machinery and, controls, etc. Camera two is outfitted with a medium-length shotgun microphone for clean back-up sound on audio channel 1. Audio channel 2 on Camera two is outfitted with second microphone at director's station for scene descriptions and notes.
4. Both cameras shoot continuously to ease synchronization in editing.
5. Supplemental lighting may be required depending on room size/on-site or details being filmed.

E. Video Format:
1. Window Dubs: Provide minimum standard definition (SD) resolution, full color, on DVD, or suitable 2006 format.
2. Original Footage: High definition (HD) Digital video (DV) at full camera resolution.

F. Recording:
1. Mount camera one on tripod before starting recording. Display continuous running time.

2. Mount camera two on tripod before starting recording, unless otherwise necessary to show area of demonstration and training. Display continuous running time.
3. Shoot a slate at start of each session including Module, Trainer, Location, Date and Time.

G. Narration:
1. Describe scenes on video DVD by audio narration by microphone while video DVD is recorded, or by dubbing the sound after recording, whichever gives better results and clarity. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction.

H. Transcript:
1. Provide a typewritten transcript of the narration. Display images and running time captured from video DVD opposite the corresponding narration segment.
2. Transcripts to be generated from window dubs (raw video footage).
3. Raw transcript to be delivered to the trainer for marking of the video, tagging with the trade and level information and any content edits, for each video clip.
4. Trainer content edits to be incorporated into final transcript.

I. Video Editing Products & Organization:
1. Required Products:
   a. Clips edited and compressed for use with local-network training stations.
   b. Clips edited and compiled into DVDs & HD DVDs for alternate training methods. (Classroom, offsite, etc.)
   c. Edit video into clips per trainers edits of transcript. Name clips so as to facilitate compilation by trade and level. (Example: M16T05L03)
   d. A five second title card to appear at front of each clip identifying: Trade, Level, O&M section, instructor, facility, and date of recording.
2. Compile video clips by sequence, trade and level into the following movies. Provide menu for access by the following selections on DVDs & HD DVDs:
   a. Entire module in sequence.
   b. By Trade: Where more than one trade is identified in the module assemble the clips in sequence for that trade.
   c. By Level: Where more than one level is identified in the module, assemble the clips in sequence for that level.
   d. By O&M documentation section.

3.20 ELECTRONIC DOCUMENTATION LINKING

A. Hyperlink each training module video clip to the corresponding section of the narration and corresponding O&M document section.

3.21 SPECIAL TRAINING REQUIREMENTS FOR MECHANICAL EQUIPMENT

A. Training Responsibilities:
1. Require that the mechanical subcontractor be responsible for mechanical training coordination, scheduling and ultimately to ensure that training is completed.

a. Provide designated Owner personnel with a comprehensive training plan for mechanical equipment two months before the planned training.
b. Provide the Owner with comprehensive orientation and training in the understanding of the systems and the operation and maintenance of each piece of mechanical equipment including, but not limited to, chillers, boilers, pumps, air handling units, fans, terminal units and controls systems, etc.

2. Start training with classroom sessions followed by hands-on training on each piece of equipment, which must illustrate the various modes of operation, including startup, shutdown, fire/smoke alarm, power failure, etc.
3. If during demonstration the system fails to perform in accordance with the requirements of the O&M manual or sequence of operations, repair or adjust the system as necessary and repeat the demonstration.
4. Engage the appropriate trade or manufacturer's representative to provide the instructions on each major piece of equipment. This person may be the start-up technician for the piece of equipment, the installing Design-Builder or manufacturer's representative. Practical building operating expertise as well as in-depth knowledge of all modes of operation of the specific piece of equipment is required. More than one party may be required to execute the training.
5. The controls subcontractor must attend sessions other than the controls training, as requested, to discuss the interaction of the controls system as it relates to the equipment being discussed.
6. The training sessions must follow the outline in the Table of Contents of the operation and maintenance manual and illustrate whenever possible the use of the O&M manuals for reference.
7. Training must include:
   a. Use of the printed installation, operation and maintenance instruction material included in the O&M manuals. This material must be submitted and approved prior to being used in training.
   b. A review of the written O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training must include start-up, operation in all modes possible, shut-down, seasonal changeover and any emergency procedures.
   c. Discussion of relevant health and safety issues and concerns.
   d. Discussion of warranties and guarantees.
   e. Common troubleshooting problems and solutions.
   f. Explanatory information included in the O&M manuals and the location of all plans and manuals in the facility.
   g. Discussion of any peculiarities of equipment installation or operation.
   h. The format and training agenda in "The Commissioning Process," ASHRAE Guideline 2005 is recommended.
   i. Classroom sessions must include the use of overhead projections, slides, video/audio DVD material as might be appropriate.
   j. Hands-on training must include start-up, operation in all modes possible, including manual, shut-down and any emergency procedures and preventative maintenance for all pieces of equipment.

k. The mechanical Design-Builder must fully explain and demonstrate the operation, function and overrides of any local packaged controls, not controlled by the central control system.

l. Training must occur after functional testing is complete, unless approved otherwise by the Owner.

m. Require the mechanical Design-Builder to provide training on each piece of equipment according to the requirements identified in the Performance Specifications.

END OF SECTION