**Section 01110**

**Summary of the Work**

{This Section is intended to be used to provide a very brief overview of the Work required under the Contract and is not to be used for a detailed discussion of the Work. It is not to be a repeat of what has already been stated in other documents such as the Request for Proposal, General Conditions, Supplementary Conditions, Scope of Work, and Agreement which all refer to the Work required under the Contract; it should serve only to be a brief overview of what has already been stated in greater detail.

In this Section there is the opportunity to explain the scope of the Work, the essence of the Contract, and Work not included that will be done by the University and/or materials that will be provided by the University.

This Section also is the place for information about possible future construction, the necessary interface between work that may have to be phased, and details regarding any particular sequencing that needs to occur in response to academic needs or other items of potential conflict.

Parts 2 “Products” and 3 “Execution” are usually not applicable to this Section.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

 (Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 general PROJECT DESCRIPTION

A. Project Location:

B. Consultant Identification:

C. The Work consists of

1.3 Work covered by Contract DocumentS

A. The Scope of the Construction Work includes, but is not necessarily limited to the following: {List the Work disciplines as applicable; the following are examples only}

1. Demolition

2. Infrastructure

3. General Construction

4. Landscaping

5. Fire Protection System

6. Mechanical System

7. Plumbing System

8. Electrical System

9. Telecommunication and Data System

1.4 WORK RESTRICTIONS

{This paragraph is intended to merely list, categorically, restrictions that will be enforced on the Project and reference General Requirements Section 01140 “Work Restrictions” for a detailed description of these restrictions.}

A. Work Restrictions: The following is a summary of the Work Restrictions which will be enforced on this project, detailed information is contained in Section 01140 “Work Restrictions”:

1. Vehicular access

2. Parking of vehicles

3. Coordination with occupants

4. Use of Project and premises

5. Etc.

1.5 Work by University

A. {Summarize any proposed work to be done by University or by Separate Contractors, and reference section(s) of the Contract Documents for details, if any.}

1.6 MATERIALS FURNISHED by University

A. {List products and materials to be supplied by University to be installed by Design Builder, and refer to the Contract Documents for details, if any.}

PART 2: PRODUCTS (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

PART 3: EXECUTION (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

END OF SECTION 01110

SECTION 01140

WORK RESTRICTIONS

{This Section provides a place to outline any work restrictions that will be enforced such as coordination of occupants (typically this is required with renovation and/or addition projects, but may also be required of stand alone projects to deal with construction noise or access around the site by faculty, students and staff, etc.).

Outline any coordination requirements essential to ease construction impacts on the academic calendar and other Facility activities. These coordination issues need to be included in the Construction Schedule and General Requirements Section “Construction Progress Documentation” should be referenced here.

It is recommended that paragraphs included in the standard Division 1 document on the use of the project and premises be included and/or modified to suit the needs of the project.

Part 2 “Products” is usually not applicable to this Section; however, Part 3 “Execution” may need to be used to discuss any specific Facility procedures for executing the requirements of this Section.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Add the words “Not Applicable” if this part is not used.}

1.2 COORDINATION WITH OCCUPANTS

1.2.1 {Clearly describe any project specific requirements for coordination with occupants of surrounding buildings, i.e. noise, access, storage, etc. If project is an addition or renovation coordinate with building occupants if partial occupancy is required.}

1.3 COORDINATION WITH ACADEMIC CALENDAR AND FACILITY ACTIVITIES

1.3.1 {Clearly describe any project specific requirements for coordination with the academic calendar, i.e., midterms, finals, special activities, etc.}

1.4 USE OF PROJECT AND PREMISES

* + 1. Use of the Project Site and premises thereon are strictly limited to the Work as defined within these Contract Documents and according to the requirements in the University Specifications of the Contract Documents.
		2. Design Builder’s use of the Project Site for work and storage is restricted to the areas designated in the Contract Documents. Use of areas outside the Project Site limits are strictly off-limits to Design Builder and shall not to be used for storage of vehicles, material or equipment of any kind unless approved by University.

1.4.3 Other Requirements. {Identify any other project specific requirements for use of the site, including areas available for storage both on and off site, signage, location of construction trailers, outdoor toilet facilities, construction equipment, and storage of materials which are specific to this project.}

PART 2: PRODUCTS (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

PART 3: EXECUTION (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

END OF SECTION 01140

SECTION 01150

PROJECT UTILITIES RESOURCES

{This section needs to be coordinated with the Facility utilities department. It will outline in detail what is available to the Design Builder and the requirements of use and access.

Part 2 “Products” is usually not applicable to this Section; however, Part 3 “Execution” may need to be used to discuss any specific Facility procedures for executing the requirements of this Section.}

# PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 ACCESS TO AVAILABLE UTILITIES

1.2.1

PART 2: PRODUCTS (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

PART 3: EXECUTION (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

END OF SECTION 01150

SECTION 01210

ALLOWANCES

{Although Allowances are described in the General Conditions, the discussion is limited to the materials and not the installation. This section is to provide summary and reference to the pertinent sections of the technical Performance Specifications, and to cover any special installation requirements.

If the allowance is a unit price, this section outlines to the Facility how the Design Builder is to provide verification of the expenditures.

Selection and purchase procedures that are required by the Facility should be outlined in this section. IT IS HIGHLY RECOMMENDED THAT THE FACILTY CONSIDER SPECIFYING IN THE PRICE PROPOSAL FORM A “CAP” NOT TO EXCEED CEILING FOR EACH ALLOWANCE; OR ESTABLISH A SUM OF ALL ALLOWANCES AS A NOT TO EXCEED “CAP” IN THE PRICE PROPOSAL FORM. CONTACT OFFICE OF THE PRESIDENT TO ASSIST IN MODIFYING THE PRICE PROPOSAL FORM}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 GENERAL

1.2.1 Included in the Contract Sum are all Allowances stated in the Contract Documents. Items covered by Allowances shall be supplied for such amounts and by such persons or firms as University's Representative may direct.

1.2.2 The following shall apply, unless otherwise provided in the Contract Documents:

1. Allowances shall cover the cost to Design Builder of materials and equipment delivered at the Project site and all required taxes, less applicable trade discounts.

2. Design Builder's costs required for storage on and off the Project site, security, loading and unloading, handling at the Project site, labor, installation costs, overhead, profit, and other expenses contemplated for stated Allowance amounts shall be included in the Contract Sum and not in the Allowances.

3. Unless otherwise provided herein, whenever costs are more than or less the Allowance, the Contract Sum shall be adjusted by Change Order based on the difference between actual costs and the Allowance.

1.3 SUMMARY OF ALLOWANCE ITEMS

1.3.1 This Section includes administrative and procedural requirements governing allowances.

1. Certain materials and equipment are specified in the Contract Documents by allowances. In some cases, these allowances include installation. Allowances have been established in lieu of addi­tional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.

1.3.2 Types of Allowances include the following:

1. Unit-Price Allowances.

1. Lump Sum allowances
2. Unit-Price Allowance – with not-to exceed Lump Sum
3. Lump Sum Allowance – with not-to exceed Lump Sum
4. Lump Sum – not-to-exceed

1.3.3 Related Sections include the following: {List here all related General Requirements sections including work associated with Allowances as defined in 3.3 below.}

1. (Not Applicable) {Add the words “Not Applicable” if not used.}

1.4 VERIFICATION OF EXPENDITURES

1.4.1 Design Builder shall provide all necessary backup information regarding expenditures, quantities, etc. associated with the Allowance as University’s Representative may require.

1.5 SELECTION AND PURCHASE

1.5.1 At the earliest practical date after award of the Contract, advise University’s Representative of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

1.5.2 At University’s Representative's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

1.5.3 Purchase products and systems selected by University’s Representative from the designated supplier.

1.6 UNUSED MATERIALS

1.6.1 Return unused materials purchased under an allowance to manufacturer or supplier for credit to University, after installation has been completed and accepted.

1. If requested by University’s Representative, prepare unused material for storage by University when it is not economically practical to return the material for credit. If directed by University’s Representative, deliver unused material to University's storage space. Otherwise, disposal of unused material is Design Builder's responsibility.

PART 2: PRODUCTS (Not Applicable) {Add the words “Not Applicable” if not used.}

PART 3: EXECUTION

3.1 EXAMINATION

3.1.1 Examine products covered by allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

3.2.1 Coordinate materials and their installation for each allowance with related materials and installation to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES {State allowance amount as Unit Price, Lump Sum, etc., what it is for and the division specified, if applicable. Below are examples only.

 3.3.1Allowance No. 1

{OPTIONAL ALLOWANCE; IF NOT USED, DELETE LANGUAGE}

3.3.1.1 The allowance(s) specified in this Allowance 1 is(are) the maximum amount(s) the Contractor will be entitled to by Change Order issued to define the adjustment below. If the computation results in an amount in excess of the allowance the Contractor agrees that it has included such amount in its bid and will not be entitled to any increase in excess of such maximum.

3.3.1.2 The Contract Sum will be adjusted by Change Order based on the assigned dollar value and the allowance below for each material:

{INSERT NAME OF MATERIAL AND DOLL AR VALUE FOR COMPONENT}:

.1 [Name of material]

 Assigned dollar value of $[dollar amount]

 Allowance of $[dollar amount]

e.g. Steel with an assigned dollar value of $1,000,000 and a allowance of $100,000

.2 Repeat as necessary

3.3.1.3 The Baseline Index Value for each material listed in Article 3.3.1.2 is the most recently published value for that material's component in the Engineering News Record Material Cost Index as of the Bid Deadline.

3.3.1.4 Adjustments to the Contract Sum due to changes in the cost of each material listed in Article 3.3.1.2 will be made as follows:

.1 Subtract the Baseline Index Value for the material from the corresponding number for the material from the Engineering News Record Material Cost Index for [month, year].

.2 Divide the number resulting from the operation described in
 3.3.1.4.1 by the Baseline Index Value for the material.

.3 Multiply the number resulting from the operation described in 3.3.1.4.2 by the assigned dollar value for the material.

.4 The University will issue a Unilateral Change Order adjusting the Contract Sum to reflect the number resulting from the operation described in 3.3.1.4.3 unless such number exceeds the Allowance in which event the University will issue a Unilateral Change Order to confirm that the Contract Sum includes the entire amount of the Allowance and nothing more.

3.3.1.5. The University does not represent or warrant that the assigned dollar values set forth in article 3.3.1.2 represent the actual cost of the listed materials; or that adjustments to the Contract Sum resulting from the methodology set forth in this Allowance will accurately reflect changes in the cost of any materials used in performing the Work.

3.3.1.6 If the Index for a material listed in article 3.3.1.2 is unavailable from Engineering News Record, the University may utilize a substitute index that reasonably represents any changes in the cost of the material during the applicable time period.

{INSERT OTHER ALLOWANCES AND DESCRIPTION}

3.3.2 Allowance No 2:

3.3.3 Allowance No 3: }

END OF SECTION 01210

SECTION 01220

ALTERNATES

{This section provides a place to summarize the Alternates and note that use of Alternates should be limited to unique circumstances and only with the concurrence and advice of OP}.

END OF SECTION 01220

SECTION 01230

VALUE ANALYSIS

{Typically with the Design/Bid/Build process, the Value Analysis phase would take place at various times during the development of the design. With Design/Build, the design process can, and often does, proceed concurrently with construction phase work and the value analysis can likewise take place even after construction has begun. The intent would be to help manage the value and benefit of making changes to the project as an ongoing process. Since value analysis can add benefit and provide cost savings to the University, it is important to add this to the process if the Facility feels the Project warrants it. If Value Analysis is elected by the Facility, make sure that it is stipulated in the Scope of Work exhibit. Coordinate the meeting aspects of this process with General Requirements Section “Project Meetings and Coordination.”

Describe in this section, in detail, the Facility’ process for value engineering as appropriate. What is the process by which the analysis will be conducted and from who’s perspective?}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 GENERAL

1.2.1 Definition. The process of “Value Analysis,” sometimes referred to as “value engineering,” is a formal process whereby all products, processes, methods, systems, etc. of the Project are reviewed with the goal of attempting to achieve the maximum cost/benefit, or “value,” for the dollars spent.

1.3 CRITERIA FOR VALUE ENGINEERING

1.3.1

PART 2: PRODUCTS (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

PART 3: EXECUTION (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

END OF SECTION 01230

SECTION 01250

PAYMENT PROCEDURES

{Administrative and procedural requirements governing the Design Builder's Applications for Payment are to be detailed in this section. The text included herein is typical; add, subtract or modify to fit special Facility or project needs. This section is only intended to supplement Article 9 of the General Conditions; be careful to avoid inclusion in this section of contradictory information.

It is important that it be clearly written, for it can cause immense frustration with all parties if monthly progress payments are withheld due to an improper submittal. This section should be covered in detail during the Pre-Construction Conference.

Require that the Design Builder submit the cost of each section, (including University Specifications), a breakdown of each line item over a predetermined amount, and separate out Change Orders from Schedule of Values.}

PART 1: GENERAL

 1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 GENERAL

1.2.1 Administrative and procedural requirements governing the Design Builder's Applications for Payment are to be detailed in this section.

1. Coordinate Schedule of Values and Applications for Payment with the Design Builder's Construction Contract Schedule, Submittal Schedule, and Expanded List of Subcontractors.

2. Comply with appropriate parts of Article 9 of the General Conditions.

3. Unless otherwise agreed in writing, Applications for Payment shall be submitted on University supplied forms as included in the Exhibits with these Contract Documents.

1.3 SCHEDULE OF VALUES

1.3.1 Coordination. Coordinate preparation of the Schedule of Values with preparation of the Design Builder's Construction Contract Schedule and as directed by the University’s Representative.

.1Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:

1. Design Builder's Contract Schedule.

2. Application for Payment form.

3. List of Subcontractors.

4. Schedule of Alternates (if any).

5. List of products (where/if appropriate).

6 List of principal supplier and fabricators.

1. Schedule of submittals.
2. Construction Cost Breakdown Sheet.
3. Submit the Schedule of Values to the University's Representative at the earliest feasible date, but in no case later than seven (7) days before the date scheduled for Submittal of the Initial Application for Payment.

1.3.2 Format and Content. Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values.

1. Include the following Project identification on the Schedule of Values:

1. Project name and location.

2. Name of the University's Representative.

3. Project Number.

4. Design Builder's name and address.

5. Date of Submittal.

2. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:

1. Generic name.

2. Performance Specification or University Specification section.

3. Name of Subcontractor.

4. Name of manufacturer or fabricator.

5. Name of supplier (if appropriate).

6 Change orders (number) that have affected value.

7. Dollar value. (Percentage of Contract Sum to the nearest one‑hundredth percent, adjusted to total 100 percent.)

3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Break principal subcontract amounts down into several line items.

4. Round amounts off to the nearest whole dollar; the total shall equal the Contract Sum.

5. For each part of the Work where an Application for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed, provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

1. Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing, if required.

6. Provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work. Each item in the Schedule of Values and Applications for Payment shall be complete including its total cost and proportionate share of general overhead and profit margin.

1. General Conditions Work Items, such as temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of Values.

7. Unit Cost Allowances. Show the line item value of unit cost allowances, as a product of the unit cost, multiplied by the measured quantity. Estimate quantities from the best indication in the Contract Documents.

8. Schedule of Values Updating. Update and resubmit the Schedule of Values prior to the next Application for Payment when Change Orders or contract directives result in a change in the Contract Sum.

1. Each Change Order shall become a new line item.

1.4. APPLICATIONS FOR PAYMENT

1.4.1 No portion of an Application for Payment which includes a request for payment of a Change Order not yet fully executed will be approved by University’s Representative.

1.4.2 Each Application for Payment shall be consistent with previous applications and payments as certified by the University's Representative and paid for by the University.

1. The Initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.

2. Entries shall match data on the Schedule of Values and the Design Builder’s Construction Contract Schedule. Use updated Contract Schedules if revisions have been made.

1.4.3 Payment Application Times. Unless otherwise agreed in writing, the date of each progress payment is indicated in the General Conditions. The period of Work covered by each Application for Payment shall be for the Work as indicated in the General Conditions.

1.4.4 Submittal. Submit three (3) executed copies of each Application for Payment to the University's Representative by means of ensuring receipt within 24 hours; one copy shall be complete, including waivers of lien and similar attachments, when required.

1. Transmit each copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to the University's Representative.

2. With each Application for Payment, submit waivers of mechanics lien from every entity who may lawfully be entitled to file a mechanics lien arising out of the Contract, and related to the Work covered by the payment.

1.4.5 Initial Application for Payment for Construction Work. Administrative actions and submittals that must precede or coincide with submittal of the Initial Application for Payment for Construction Work include the following:

1. List of Subcontractors.
2. List of principal suppliers and fabricators.
3. Schedule of Values.
4. Design Builder's updated Contract Schedule.
5. Schedule of principal products.
6. Schedule of Unit Prices.
7. Submittal Schedule (preliminary if not final).
8. Initial progress report.
9. Report of pre-construction meeting.
10. Certificates of insurance and insurance policies.
11. Data needed to acquire University's insurance.

1.4.6 Application for Payment at Substantial Completion. Following issuance of the Certification of Substantial Completion, submit an Application for Payment. This application shall reflect any certificates of Partial Substantial Completion issued previously for University occupancy of designated portions of the Work. Administrative actions and submittals that shall precede or coincide with this application include:

1. Occupancy permits and similar approvals.
2. Warranties (guarantees) and maintenance agreements.
3. Test/adjust/balance records.
4. Maintenance instructions.
5. Meter readings.
6. Start-up performance reports.
7. Change-over information for University's occupancy, use, operation and maintenance.
8. Final progress photographs (if any).
9. List of incomplete Work, recognized as exceptions to Certificate of Substantial Completion.
10. Final Cleaning.
11. Building Commissioning (if applicable).

1.4.7 Final Payment Application. Administrative actions and submittals which must precede or coincide with submittal of the final payment Application for Payment include the following:

1. Completion of Project closeout requirements.

2. Completion of items specified for completion after Substantial Completion.

3. Assurance that unsettled claims will be settled.

4. Assurance work not complete and accepted will be completed without undue delay.

5. Transmittal of required Project construction records to University.

6 Proof that taxes, fees and similar obligations have been paid.

7. Removal of temporary facilities and services.

 {Insert any campus or project specific requirements here.}

PART 2: PRODUCTS (Not Applicable) {Add the words “Not Applicable” if not used.}

PART 3: EXECUTION (Not Applicable) {Add the words “Not Applicable” if not used.)

END OF SECTION 01250

SECTION 01310

PROJECT MEETINGS AND COORDINATION

{This section covers the requirements of all meetings that are to be scheduled in conjunction with the Design Development, Construction Document and Construction Phases. This section needs to be coordinated with the Request for Proposal since much of this subject matter occurs there and should be referenced as such.

The information below is considered typical and general, if there are any special Facility or project requirements in addition to what is shown or what is stated elsewhere in the Contract Documents, add, delete or modify to meet this needs of the Project.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 PROJECT MEETINGS

1.2.1 General. Schedule and conduct meetings and conferences at project site, unless otherwise indicated. Attendees at the meeting shall be designated representative(s) of both parties to the Contract, unless otherwise agreed.

1.2.2 Design Progress Meetings. The University’s Representative will schedule regular weekly Design Progress Meetings to determine the progress of the development of the Design portion of the Work prior to allowing construction to commence.

1. Attendees shall be the University’s Representative and University’s Consultants (if any), Design Builder’s senior staff assigned to this project, the Design Professionals, and others as directed by the University’s Representative.

2. Agenda shall include items of significance that could affect the completion of the construction drawings and specifications, and have a major impact on the quality, cost and overall schedule for the Work.

3. Design Builder’s Design Professional shall be responsible for developing the meeting agendas, and documenting and distributing the meeting reports. Meeting agendas shall be approved by the University’s Representative prior to the meeting.

4. Review progress subsequent to the previous meeting. Determine whether each activity is on time, ahead of or behind schedule in relation to the approved Contract Schedule. Determine how design behind schedule will be expedited. Discuss whether revisions are needed to ensure that current and subsequent design activities will be completed with the Contract Time.

1.2.3 Pre-construction Conference. A Pre-construction Conference will be scheduled by University before the start of construction at a time convenient to University and Design Builder, but in no case later than fifteen (15) days after the effective date of the Construction Notice to Proceed. The purpose of the meeting is to review procedures and submittal requirements, and personnel responsibilities and assignments, plus other subjects as may be necessary. The Pre-construction Conference will be held at a location designated by University.

1. Attendees. Authorized representatives of University and its consultants; Design Builder and its Superintendent, major Subcontractors and other concerned parties as may be necessary. All participants shall be familiar with the Project and authorized to conclude matters relating to the Work.

2. Agenda. The agenda will include, but not necessarily be limited to, the following items for discussion:

1. Contract Schedule.

2. Phasing if required by the Project.

3. Critical Work Scheduling.

4. Designation of responsible personnel.

5. Procedures for processing field decisions and Change Orders.

6. Procedures for processing Applications for Payment.

7. Distribution of Contract Documents and Construction Documents.

8. Submittal procedures.

9. Preparation of Record Documents.

10. Use of Premises.

11. Responsibility for temporary facilities and controls.

12. Office, work and storage areas.

13. Equipment deliveries and priorities.

14. Security.

15. Progress cleaning.

16. Working hours.

17. Schedule of meetings for additional pre-construction issues, progress, coordination, dispute resolution, warranty, commissioning, etc.

1. Other items as may need to be discussed to expedite the Work.
2. Quality Control Plan.

1.2.4 Pre-mobilization Meeting. {If the Facility conducts pre-mobilization meetings state the requirements, time, attendees and location of such a meeting as appropriate. Or, add the words “Not Applicable.”}

1.2.5 Progress Meetings. Design Builder shall conduct Progress Meetings at intervals. Coordinate dates of Progress Meetings with preparation of payment requests.

1. Attendees. Authorized representatives of University and its consultants; Design Builder and its Superintendent, major Subcontractors, suppliers (as necessary), and other entities concerned with the project’s current progress or who are involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants shall be familiar with the Project and authorized to conclude matters relating to the Work.

2. Agenda. The agenda will include review, correction and/or approval of meeting notes from previous Progress Meeting, and review of other items of significance that could affect the progress of the Work. Include topics for discussion as appropriate to the status of the Project.

1. Contract Schedule. Review progress subsequent to the previous meeting. Determine whether each activity is on time, ahead of or behind schedule in relation to the approved Contract Schedule. Determine how construction behind schedule will be expedited. Discuss whether revisions are needed to ensure that current and subsequent construction activities will be completed with the Contract Time.

2. Administrative Issues. Review any administrative item that needs discussion and resolution so that work can continue in a timely manner.

3. Reporting. Distribute meeting notes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

1. Contract Schedule Update. Revise Contract Schedule as may be required due to revisions subsequent to each meeting and include the revised Contract Schedule with the report of each meeting.

1.2.6.Coordination Meetings. Design Builder shall conduct Coordination Meetings as necessary to coordinate the Work. The attendees at these meetings shall include the appropriate staff of Design Builder and of Design Builder’s subcontractors. University’s Representative shall be made aware in advance of these meetings and may be in attendance as required.

1.2.7 Dispute Resolution Meetings. As required by the General Conditions to this Contract or as may be modified elsewhere within the Contract Documents, the parties will meet in an attempt to resolve disputes. Times and locations of meetings will be established as appropriate.

1.2.8 Warranty Meetings. As solely determined by the University. {If meetings are required to address warranty issues, it might be wise to include this item and explain how meetings are to be conducted and who will be responsible, etc. Conducting a separate meeting to discuss warranty issues may not be necessary if the agenda at a Progress Meeting can accommodate these issues.}

1.2.9 Commissioning Meetings. (If meetings are required to address commissioning issues, include this item and explain how meetings are to be conducted and who will be responsible, etc. Use General Requirements Section “Commissioning” to describe commissioning performance, evaluation and procedures. Or add the words “Not Applicable.”}

1.2.10Partnering Meetings. This project will be subject to a “Partnering” process. Since partnering is not a contractual requirement the process and the occurrence and frequency of meetings will be decided by the parties to the Contract. Refer to Section 01350 “Partnering” for details. {Remove this paragraph if Partnering will not be done on this project and add the words “Not Applicable,” also remove General Requirements Section “Partnering.”}

1.3 PROJECT COORDINATION

1.3.1 Coordination. Coordinate design activities and construction operations included in the various Sections of the University Specifications and Performance Specifications to ensure efficient and orderly installation of each part of the Work, including those construction which that depend on each other for proper installation, connection and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

2. Coordinate installation of different components with other contractors on the project to ensure maximum accessibility for required maintenance, service and repair, and resolve differences or disputes between Subcontractors and their relationships with the Work.

3. Made adequate provisions to accommodate items schedule for later installation.

1.3.2 If necessary for the proper execution of the Work, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports and list of attendees at meetings.

1. Prepare similar memoranda for University and separate contractors if coordination of their Work is required.

1.3.3 Administrative Procedures. Coordinate scheduling and timing of required administrative procedures with other construction activities and the activities of other contractors to avoid conflicts and to ensure orderly progress of the Work

1.4 DESIGN COORDINATION

1.4.1 General. Review and approval by University’s Representative of the following submittals must occur prior to fabrication and delivery of materials. Design, coordination of the design, and any required Shop Drawings must be completed and approved.

1. Construction Documents must be completed and approved for the particular discipline prior to submissions of product data.

2. Construction Documents must be completed for mechanical, electrical and plumbing systems.

3. Shop Drawings of individual systems (if applicable) shall be made only after Construction Documents and construction coordination drawings have been reviewed and approved by University’s Representative.

1.4.2 Design Coordination. Coordinate design activities included under various sections of the Contract Documents to assure complete design and coordination with each part of the Work.

1.4.3 Administrative Procedures. Coordinate scheduling and timing of required administrative procedures with other design and construction activities to avoid delays and ensure orderly progress of the Work.

1. Such administrative activities include, but are not necessarily limited to:

1. Preparation and submittal of workplan(s) and schedules to University’s Representative for review and approval.

2. Design progress and coordination meetings with the University.

3. Design coordination meetings between design disciplines.

4. Agency reviews and approvals.

5. Progress meetings with installing contractors.

6. Delivery and processing of submittals.

7. Design Development and Construction Documents review and approval by University.

* + 1. Design Process. Design Builder shall follow the design process as outlined in the Contract Documents.
		2. Submittal Requirements. Submittals shall conform to the requirements as set forth in the Contract Documents.

PART 2: PRODUCTS (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

PART 3: EXECUTION (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

END OF SECTION 01310

SECTION 01320

# CONSTRUCTION PROGRESS DOCUMENTATION

{This section covers all the required construction documentation reports and the Progress Schedule.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

 (Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 MATERIAL AND SAFETY DATA SHEETS (MSDS)

1.2.1 Submit Material and Safety Data Sheets within thirty (30) days of the associated material being brought onto the Project Site or sooner as required by law. Material and Safety Data Sheets must be kept on the job site throughout the course of work.

1.3 SUBMITTAL SCHEDULE

1.3.1 Design Builder shall prepare a Submittal Schedule on Microsoft Excel (latest version for Windows).

1. The Submittal Schedule shall identify CSI specification division and section number, brief description of submittal, planned submit date, current forecast submit date, and actual submit date.
2. The planned submit date shall coincide with the Contract Schedule.
3. Format Submittal Schedule as directed by University’s Representative.

1.4 PROGRESS REPORTS

1.4.1 Submit updated Progress Schedule showing construction and related activities monthly clearly showing progress to date as outlined in Part 3 of this Section.

1.5 PROGRESS PHOTOS/VIDEOS

1.5.1 Maintain a daily photographic record of the progress of the Work as outlined in Part 3 of this Section. {If Facility also desires the progress to be recorded on video, so state.}

1.6 RECORD DOCUMENTATION

1.6.1 Maintain a set of Record Documents and required samples as stated in the Contract Documents which clearly reflect the Work as it was actually put in place.

1.6.2 Store Project Record Documents and Samples in Design Builder's field office separate from documents used for construction.

1.6.3 Maintain Record Documents in an orderly fashion, and in a clean, dry, legible condition.

1.6.4 Design Builder shall not use Record Documents for construction.

PART 2: PRODUCTS (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

PART 3: EXECUTION

3.1 EXECUTION OF PROGRESS REPORTS

3.1.1 Design Builder shall maintain an on-going record of the progress of the Work and submit monthly such report in bound form to University’s Representative.

1. Provide report in 8-1/2x11 format, spiral bound with appropriate cover acceptable to the University.

2. Include within Progress Report the following:

1. Project Title, number and names, addresses and phone numbers of University Representative and Design Builder’s Representative.

2. An executive summary of the work that has been performed during the past month, including any issues of which the University should be made aware. If project is running behind schedule, include a narrative indicating how Design Builder plans to bring the Work back on schedule.

3. A running total of all approved Change Orders as of the date of the Report.

4. A complete listing of all Requests for Information.

5. A complete listing of all Claims made to as of the date of the Report.

6. Original copies of the photographic record mounted on appropriate 8-1/2x11 paper.

7. Other information that may be necessary to represent the status of the Work.

3.2 EXECUTION OF RECORD DOCUMENTATION

3.2.1 Design Builder shall use a reproduction of the original, approved tracings of the Construction Drawings for recording the "As Built" condition of the Work.

3.2.2 Record the following kinds of information on the Record Drawings:

1. Locations of Work buried under or outside the building, such as plumbing and electrical lines and conduits. Provide horizontal and vertical dimensions from fixed points.

2. Actual numbering of each electrical circuit.

3. Locations of all HVAC, plumbing and electrical Work concealed inside the building; and other work that is changed by Design Builder from that shown on the Drawings.

4. Locations of all items which are enclosed including any wall blocking, and in addition all items not necessarily concealed, which vary from the locations shown on the Drawings.

5. Record all locations of underground Work, points of connection, valves, manholes, catch basins, capped stub outs, invert elevations, etc.

3.2.3 The following requirements for Record Drawings are in addition to those which may be specified elsewhere:

1. They shall be done carefully and neatly by a competent drafter, familiar with the Work involved, using methods acceptable to University's Representative.

2. They shall be kept up to date during the entire progress of the Work and made available to University's Representative at anytime.

3. Additional Drawings shall be provided as required to accurately describe changes.

4. Record all changes in size, location, and other features of installation shown on the Drawings.

5. Record sufficient information such that Work concealed in the building may be located with ease and accuracy. This may be accomplished by dimensioning or by stating the relationship to the spaces in the building near which the Work was installed. University's Representative's decision on what constitutes sufficient information shall be final.

* + 1. Shop Drawings: Provide final Shop Drawings which have been updated to show actual conditions, for Work specified in the individual Sections.

3.2.5 Specifications and Addenda:

1. Record the following:

1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.

2. Changes made by Addenda, Change Order, or Work Change Directive, and clarifications and interpretations made by Letter of Instruction.

END OF SECTION 01320

SECTION 01325

SCHEDULES

{This section covers the requirements related to scheduling of the Work. Add, delete or modify to accommodate any special Facility or Project needs.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 DEFINITIONS

 1.2.1 PROPOSED CONTRACT SCHEDULE

 The schedule submitted by Design Builder as called for by this section, or any subsequent Contract Schedule submittal called for by this section shall be considered a Proposed Contract Schedule until it has been reviewed and approved by the University, or the University’s Representative.

 1.2.2 CONTRACT SCHEDULE

The schedule submitted by Design Builder representing the sole work plan for accomplishing the Work. Once the submitted Proposed Contract Schedule is reviewed and accepted by University, or the University’s Representative, it shall be the base line schedule document that forms the basis of all measurements of Contract Time in the Contract Documents. The Contract Schedule may not be modified, other than as permitted pursuant to this Section.

 1.2.3 UPDATED pROGRESS SCHEDULE

A periodically submitted schedule reflecting current Work status of all Work Activities measured against the latest approved Contract Schedule.

1.2.4 RECOVERY SCHEDULE

A Proposed Contract Schedule produced by the Design Builder once the Updated Progress Schedule forecasts that the Design Builder will not finish the Work within the tolerances of the Contract Time called for by this section. Once the Recovery Schedule is reviewed and accepted by the University, or the University’s Representative, it will be considered the Contract Schedule and shall be the base line schedule document that forms the basis of all future measurements of Contract Time, unless modified thereafter in accordance with the provisions of this Section.

 1.2.5 AS-BUILT SCHEDULE

A separate schedule document maintained by the Design Builder that records the actual work activities, durations, and interdependencies to all other Work Activities.

 1.2.6 FLOAT/NEGATIVE FLOAT

Float for any Work Activity, will be calculated as the difference in Days between the Latest Finish Date and its Earliest Finish Date. Any calculated float which results in a “negative” number is considered Negative Float.

 1.2.7 CONSTRAINED WORK ACTIVITY

Shall be any earliest start or finish date; or latest start or finish date, of a Work Activity or Milestone date that is set and is not calculated in the Critical Path Method (CPM) forward or backward pass calculation. No Work Activities or Milestones on the Contract Schedule, or any other submitted schedule shall utilize Constrained Work Activities, unless expressly approved in writing by University, or the University’s Representative. The only exception is that the schedule start date may be set to reflect the Phase 1 Notice to Proceed date.

1.2.8 WORK ACTIVITY

Any individual task of work shown on a schedule submitted by Design Builder which requires time and resources (manpower, equipment, materials, etc.) to be completed in a continuous operation.

1.2.9 MILESTONE

An element of the schedule that reflects the planned point in time for the start, or finish, of one or more Work Activities.

1.2.10 LOOK AHEAD SCHEDULE

A schedule based on the Updated Progress Schedule which shows the current portion of the schedule. The current portion of the schedule should reflect three weeks both before and beyond the date the schedule is presented, or as reasonably requested by the University’s Representative.

 1.2.11 CHANGE ORDER FRAGNET SCHEDULE

A schedule submitted anytime a request is issued by the Design Builder for the adjustment in the Contract Time. A Change Order Fragnet Schedule shall be based on the applicable portion of the Contract Schedule which is claimed to be impacted, necessitating a extension of the Contract Time. All modifications to the Contract Schedule Work Activities, and associated information (including duration, logic, manpower, etc.), shall be clearly identified, but the Contract Schedule information shall be left for clear comparison. Change Order Fragnet Schedule shall have

starting and ending Work Activities, or Milestones, from the Contract Schedule which are unchanged, (same logic constraints, duration, and resources) and shall clearly identified.

1.2.12 CRITICAL WORK ACTIVITY

Work Activity, which, if delayed, will delay the scheduled completion of the Work (i.e. Work Activities which comprise the path of least total float). All other Work Activities are defined as non-critical and considered to have float.

* 1. REQUIREMENTS

1.3.1 GENERAL REQUIREMENTS

* + 1. The Design Builder’s personnel which prepares the schedules called for by this section shall be qualified and experienced in CPM scheduling with the specified products of this section and capable of fulfilling the requirements of this section. The Design Builder shall hire a Design Professional to prepare and maintain the Contract Schedule or, if qualified, the Design Builder may perform these services with its own organization. Design Builder shall provide documentation of the scheduling experience of each scheduler it plans to use on the Project, subject to the University’s Representative approval.
		2. The Contract Schedule shall become a Contract Document and shall be used by the University in review of request by the Design Builder for modification of the Contract Time in accordance with the Contract Documents. Responsibility for developing the Contract Schedule and monitoring of actual progress in relation to the Contract Time, rests solely with the Design Builder. Failure of the Design Builder to schedule any element of the Work, or any inaccuracy in the Contract Schedule, regardless whether or not the University has reviewed and approved such schedule, will not relieve the Design Builder of completing the Work within the Contract Time. The Design Builder warrants that the Contract Schedule is the Design Builder’s committed plan to complete the Work within the Contract Time. Design Builder assumes full responsibility for the execution of the Work. The University’s review of, and response to, schedule submissions shall not be construed as relieving the Design Builder of its complete and exclusive control over the means, methods, sequences and techniques for execution of the Work.
		3. Any schedule submitted by Design Builder that shows negative float will be rejected by the University.
		4. All costs for preparing, printing, mailing of any schedules called for by this section, or the Contract Documents, shall be part of the Contract Sum.
		5. All requirements of the Contract Schedule shall also apply to the Proposed Contract Schedule, the Recovery Schedule, Updated Progress Schedule, Change Order Fragnet Schedule, and As-Built Schedule.
		6. Acceptance of the Contract Schedule by the University, or the University’s Representative, will be a condition precedent to making any progress payment for Work performed. All Work Activities shall be of sufficient detail to provide identification of all components utilized in executing, monitoring and evaluating the progress of the Work.
		7. Work Activity descriptions shall briefly delineate the scope of work identified. Work Activities shall be discrete items of Work that must be accomplished under the Contract and constitute definable, recognizable items to be performed within the Project. All Work Activities shall have defined duration. All durations shall be in multiples of working days.
		8. All Work Activities shall have appropriate durations that allow measurement of their progress. In general, if a reasonable estimate of progress against a proposed Work Activity, can not be reasonably measured, a Work Activity shall be broken into multiple Work Activities such that monitoring of actual progress versus planned progress can be ascertained. All Work Activities shall be of sufficient detail to provide identification of all components utilized in executing, monitoring and evaluating the progress of the Work.

* + 1. Work Activities shall have duration of 14 working days or less. University’s Representative may approve use of longer Work Activity durations on non-construction activities, including the procurement and fabrication of materials and equipment, and review periods for submittals, or for Construction Work Activities, prior to a Notice to Proceed being issued for Phase 3.
		2. Work Activities shall include all Design Work and Construction Work deliverables, including all submittals called for in the Scope of Work: Work Activities shall include, the submittal and approval of permit applications (as necessary), samples of materials, shop drawings, working drawings, Quality Control Plan testing and inspections, safety and security plans, worksite control plans, utility company point-of-connection installations and applications. The dependency of design submittals to their corresponding construction phase as indicated in the Design/Construction Phases Exhibit shall be reflected in the Contract Schedule. In addition, Work Activities shall be included for procurement of materials and equipment potentially impacting the critical path, fabrication of special materials and equipment and their installation and testing, and delivery of University-furnished items. Work Activities of the University that may become Critical Work Activities of the Work shall be reflected, as well as Work Activities by utilities and other similarly involved third parties associated with the Work. The Contract Schedule shall include Work Activities or Milestones, but not be limited to the following: all design and pre-construction activities; specific Milestones for the start and completion for each stage of the Design Work; specific Milestone dates for requisite State and State agency information and reviews; submittal dates; production Milestones; early purchasing; key deliverables in Scope of Work; start of tenant programming (as applicable); Milestones for each Contract Phase; mobilization of personnel and equipment when required; sequence of operations; commissioning Work Activities; procurement of materials and equipment; and all contract close-out Work Activities such as Punch List period and Operation Manuals preparation and submission.
		3. The Critical Work Activities shall be identified, including critical paths for Contract interim, and final completion, Milestone dates.
		4. All Work Activities shall be coded as called for in the Execution section. All Work Activities shall be coded, at a minimum, to reflect to which Contract Phase they are associated. Any Work Activity that may be involved in multiple Phases, shall be broken into separate Work Activities to reflect each Phase in which such work occurs, thus allowing Work Activities to be grouped by Contract Phase.
		5. Design Builder shall not sequester float through strategies, including, but not limited to, extending Work Activity duration estimates to consume available float, using preferential logic, using extensive or insufficient crew/resource loading, use of float -suppression techniques, special lead/lag logic constraints (unless specifically requested in writing and approved by University’s Representative). Use of float time disclosed, or implied, by the use of alternate float suppression techniques shall not be for the exclusive use or benefit of either University or Design Builder. It is acknowledged that University-caused or Design Builder-caused time savings to Work Activities on, or near, the critical path will increase float, such increase in float shall not be for the exclusive use or benefit of either University or Design Builder.
		6. For all schedule submittals other than Look-Ahead Schedules (paper copy only), Design Builder shall submit both paper copy as instructed by University’s Representative and provide a electronic file copy on 3.5 inch, 1.44MB floppy disk clearly labeled as to each submittal description and date, and containing an exact copy of paper submittal. All file information shall be written to disk - utilizing the Primavera Project Planner back-up utility tools.

PART 2: PRODUCTS

2.1 SCHEDULING SOFTWARE

All Proposed Contract Schedules, the Recovery Schedules, Update Progress Schedules, Change Order Fragnet Schedules, and As-Built Schedules shall be prepared utilizing Primavera SureTrak Version (latest version for Windows), or Primavera Project Planner (latest version for Windows), or equal which is 100% compatible with Primavera.

PART 3: EXECUTION

3.1 submitTals

# 3.1.1 PROPOSED CONTRACT SCHEDULE

* + - 1. A Proposed Contract Schedule shall be submitted within 30 days after of the Phase 1 Notice to Proceed; and shall be based on University’s Preliminary Schedule in the Contract Documents.
			2. A Proposed Contract Schedule shall be submitted 45 days prior to required date for Phase 3 Construction Notice to Proceed.
			3. Any time that the University’s Representative determines that the Design Builder is not currently following the approved Contract Schedule, the Design Builder shall submit within 10 days of notification by the University’s Representative a Proposed Contract Schedule reflecting the Design Builder’s work plan for accomplishing the Work within the Contract Time.

# 3.1.2 MONTHLY STATUS REPORT/UPDATED PROGRESS SCHEDULE

1. Design Builder shall submit an Updated Progress Schedule with a draft Monthly Status Report on the 25th day of each month, along with Variance Report and Status Narrative (described below).

Design Builder shall review the draft Monthly Status Report with the University’s Representative upon submittal, the purpose of this joint review is to reach concurrence on the job status as shown in the draft Monthly Status Report.

Variance Reports shall be submitted based on the Updated Progress Schedule. The report shall include a description of all Work Activities completed during the preceding month, a description of progress made, and planned Work Activities listed as started but not completed on the Updated Progress Schedule, and shall report all Work Activities that have been delayed five (5) or more working days. The format of this report shall include:

a. Work Activity code and description.

b. Scheduled early start/finish dates.

c. Current anticipated early start/finish dates.

1. Working days remaining to complete unfinished Work Activities.
2. Percentage complete of started Work Activities.
3. Total float for each Work Activity

Status Narrative Report shall identify the Work actually completed and reflects the progress of all Work Activities within ten (10) working days of the critical path. The Status Narrative Report shall indicate forecasted progress in relation to interim and/or final completion Milestone dates as specified in the Contract Documents, in terms of calendar days behind or ahead. Specific requirements of the Status Narrative Report are as follows:

1. Actual completion dates for Work Activities completed during the report period.
2. Actual start dates for Work Activities started during the report period.
3. Estimated start dates for Work Activities scheduled to start during the month following the report period.
4. Changes in the duration(s) of any Work Activities and/or logic changes to Work Activities, or Work Activities done in a different sequence from the Contract Schedule.
5. Identification of the current critical path(s) to the interim and/or final completion milestones.
6. Work Activities proposed to be added to the Contract Schedule.
7. Identification of any University approved Change Order Fragnet Schedule the Design Builder proposes to incorporate into the Contract Schedule.
8. Shall identify any variances or changes in the direct labor hour allocation, the cause, and the Work Activities affected, and shall provide an explanation of proposed corrective action to meet the planned allocation called for in the Contract Schedule.

Within five (5) days of meeting with University’s Representative to review the draft Monthly Status Report, Design Builder shall submit Monthly Status Report reflecting any agreed modifications, if the parties disagree as to content, the items of disagreement shall be reflected in the Monthly Status Report. Any revisions agreed to by University’s Representative resulting in changes to the proposed work plan of the Design Builder to the Contract Schedule, shall make the revised Updated Progress Schedule a Proposed Contract Schedule, and upon review and approval by University or University’s Representative become the Contract Schedule.

# 3.1.3 RECOVERY SCHEDULE

* + - 1. If, at any time, it is determined by the University’s Representative that the progress of the Work, based on the Contract Schedule, reflects progress that would complete any critical interim and/or final Milestone dates later than 14 days called for in the Contract Documents, the Design Builder shall prepare and submit a Recovery Schedule within 14 days of notification by the University’s Representative, or such shorter time period as may be reasonably requested by University’s Representative. The Recovery Schedule shall address a new work plan to accomplish the Work within the Contract Time and shall include, and identify, additional concurrent operations, logic and sequence changes, additional manpower, additional shifts, or overtime work. Once reviewed and approved by the University’s Representative, the approved Recovery Schedule shall become the Contract Schedule.

3.1.4 CHANGE ORDER FRAGNET SCHEDULE

* + - 1. Any time that the Design Builder requests an extension of the Contract Time, in addition to other requirements in the Contract Documents, the Design Builder shall submit a Change Order Fragnet Schedule. Failure to submit a Change Order Fragnet Schedule within the notice requirements specified in the Contract Documents for requesting a change to the Contract Time shall forfeit the right of the Design Builder to an extension of the Contract Time.
			2. All other requirements of Proposed Contract Schedule shall apply to a Change Order Fragnet Schedule.

# 3.1.5 LOOK-AHEAD SCHEDULES

* + 1. Look-Ahead Schedules be submitted at each progress meeting of the Work as outlined in the Scope of Work, or as reasonably requested by the University’s Representative.
		2. Look Ahead Schedules shall be reflected on a time-scaled bar chart based on the Updated Progress Schedule, showing the comparison of planned work versus actual work, and indicating the percentage complete for all Work Activities scheduled within 4 weeks (or as requested by University’s Representative) of both before and after the date of report/progress meeting.

3.1.6 AS-BUILT SCHEDULE

* + - 1. The As-Built schedule shall be submitted with the Monthly Status Report and shall reflect information upon which the Design Builder and University’s Representative have agreed has been performed as the actual as-built portion/sequence of the Work.

3.1.7 SCHEDULE UPDATING

1. Design Builder shall review an update the Updated Progress Schedule and As-Built Schedule on a weekly basis.

3.2 SCHEDULE FORMAT/DATA

3.2.1 WORK ACTIVITY CODING {The Facility should supplement this section as warranted by the Project.}

The following activity codes and structure sequence shall be applied, at a minimum, for all Work Activities and Milestones: additional codes may be added/utilized by the Design Builder for its requirements:

Contract Phase.

Work/Bid Package.

Specification Group.

Responsibility/Subcontractor {Include University, University’s Representative; and third parties such as University consultant(s), Government or private agencies involved in design or permits for the project.}

Project Area. {Facility shall insert “dictionary” for physical areas it wants reported.}

Floor Area. {Facility shall insert “dictionary” for physical areas it wants reported.}

Change Order number.

Project Phase. {Facility shall insert “dictionary” for phases it wants reported.}

Cost Breakdown item.

3.2.2 RESOURCE LOADING

## 1. All Work Activities involving labor or major equipment shall be resource loaded, indicating what resources are required to complete the Work Activity. Labor shall be defined to reflect crew type and size, so that total manpower is identified.

3.2.3. COST LOADING {Facility shall delete when the project does not warrant this level of information/monitoring and add the words “Not Applicable.”}

Provide unit costs for all resources identified in the Resource Loading; and provide costs for materials for the Work Activity. Any other cost should be added in accordance with the Cost Breakdown on a prorated basis, such that when the schedule is grouped and totaled based on the Cost Breakdown that they match in cost per Cost Breakdown category.

3.2.4 SCHEDULE CALENDARS

All holidays and non-work periods shall be identified in the Contract Schedule’s calendar. Two calendars shall be used: a defined work week and a 24–hour, 7–day per week (for continuous events such as concrete curing).

### 3.2.5 REPORT FORMAT/DISTRIBUTION

1. The University’s Representative shall provide format/distribution requirements for printing the Contract Schedule, Proposed Contract Schedule, the Recovery Schedule, Update Progress Schedule, Change Order Fragnet Schedule, and As-Built Schedule, which the University’s Representative may revise during the Project, but will not change the information requirements contained in the schedule outlined in this section.

END OF SECTION 01325

SECTION 01330

SUBMITTAL PROCEDURES

{Include in this Section any requirement that the Facility may have for receiving and handling of submittals. The requirements for the submittals is covered in several other sections of the University Specifications and Performance Specifications, this Section is intended to clarify how all the submittals are to be handled.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 GENERAL

* + 1. Schedule of Submittals. Design Builder shall submit to University’s Representative a Submittal Schedule identifying all submittals requiring University review and approval for the current Phase within 30 days of Notice to Proceed for the applicable Phase.

1.2.2 Specific Requirements. Refer to other sections of the University Specifications for specific requirements of the Submittal Schedule.

1.2.3 Types of Submittals. Design Builder shall be required to submit to University’s Representative for review and approval, as appropriate, the following types of submittals, including others not listed as may be required by the University’s Representative or Scope of Work to properly review the Project.

1. Design Builder’s Workplan for the entire Work as required by the Agreement.

2. Design Development Drawings.

3. Construction Documents.

4. Coordination Plan

5. Shop Drawings including actual field measurements.

6. Product Data. One Submittal per Specification section.

7. Samples.

8. Test Reports.

1. Certifications.
2. Quality Control Plan

1.2.4 Design Builder Action. {Describe any requirement for actions taken by the Design Builder, or add the words “Not Applicable.”}

1.3 Submission and Review

1.3.1 Submit the required submittals to University’s Representative in a timely fashion to allow for adequate review and approval so that the Contract Schedule is not adversely impacted.

1.4 COORDINATION

1.4.1 Coordinate Submittals with the proper sequencing of the Work so that the Contract Schedule can be maintained and University has reasonable time to review and comment.

PART 2: PRODUCTS (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

PART 3: EXECUTION (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

END OF SECTION 01330

SECTION 01340

SPECIAL PROCEDURES

{In this section various types of issues and/or impacts to the Work are identified and special procedures are required in handling and notifying the Facility.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 SPECIAL PROJECT SITUATIONS

1.2.1 Hazardous Materials. Except as otherwise specified, in the event Design Builder encounters on the Project Site material reasonably believed to be asbestos, polychlorinated biphenyl (PCB), or other known hazardous materials, or materials presumed to be hazardous, which have not been rendered harmless, Design Builder shall immediately stop Construction Work in the area affected and promptly notify University and University’s Representative; follow-up such notification in writing. Construction Work in the affected area shall NOT resume until such hazardous material(s) have been rendered harmless and a written agreement between University and Design Builder to that effect has been executed.

 {The hazardous materials section should be coordinated with the department responsible for hazardous materials on Facility. The above paragraph does not state who has responsibility for testing and removal of the material, e.g. whether the Agreement assigns responsibility to the Design Builder for handling of hazardous materials on the site or to the Facility. This section needs should be coordinated with the General Conditions, the Agreement and these General Requirements.}

1.2.2 Traffic Routes. {Identify any special traffic issues in and around, to and through Facility, community issues with respect to traffic, EIR issues, Town/University agreements, etc. about which the Design Builder needs to know, or add the words “Not Applicable.”}

1.2.3 Student Issues. {Identify any student issues that may impact the Work or add the words “Not Applicable.”}

1.2.4 Site Access. {Identify any site issues with respect to pedestrian and/or vehicular traffic and refer to any routing plans that may be part of the Contract Documents or add the words “Not Applicable.”}

1.3 SPECIAL FACILITY TYPES

1.3.1 Security. {Identify any special security precautions that will be needed to protect the project during the Work or add the words “Not Applicable.”}

PART 2: PRODUCTS (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

PART 3: EXECUTION (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

END OF SECTION 01340

SECTION 01350

PARTNERING

{Partnering in some form is recommended. If it is to be a formal process then this section may be used to allow for a more detailed discussion and more prominent focus; if not, then delete this Section and use General Requirements Section “Project Meetings and Coordination,” paragraph 1.2 10.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 GENERAL

1.2.1 Definition. “Partnering” is the process by which the parties to the Contract meet and agree to the manner in which business is to be conducted above and beyond the requirements of the Contract.

1.2.2 Legal Status. The Partnering process shall have no legal status and Change Orders shall be submitted for any change throughout the execution of the Work. The Partnering process shall in no way modify or void the Contract, nor shall it be legally binding on either party.

1.3 PARTNERING PROCESS

1.3.1

PART 2: PRODUCTS (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

PART 3: EXECUTION (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

END OF SECTION 01350

Section 01420

ABBREVIATIONS, DEFINITIONS AND REFERENCES

This section is an extensive list of abbreviations, definitions and references, which are associated with the Work.

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 ABBREVIATIONS

1.2.1 The following abbreviations of organizations may be used in the Contract Documents and wherever the following terms are used, the intent and meaning shall be as follows:

AASHTO American Association of State Highway and Transportation Officials

ABMA American Boiler Manufacturers Association

ACI American Concrete Institute

AGA American Gas Association

AGMA American Gear Manufacturers Association

AInsA American Insurance Association formerly National Board of Fire Underwriters)

AISI American Iron and Steel Institute

AISC American Institute of Steel Construction

API American Petroleum Institute

AREA American Railway Engineering Association

ANSI American National Standards Institute (formerly United States of America Standards Institute)

APA American Plywood Association

API American Petroleum Institute

ASCE American Society of Civil Engineers

ASHRAE American Society of Heating, Refrigerating and Air Conditioning Engineers

ASME American Society of Mechanical Engineers

ASTM American Society for Testing and Materials

AWPA American Wood Preservers' Association

AWS American Welding Society

AWWA American Water Works Association

CBM Certified Ballast Manufacturers Association

CBR California Bearing Ratio

CSI Construction Specification Institute

CSS California Standard Specifications

CTI Ceramic Tile Institute of America

DFPA Douglas Fir Plywood Association

DOT Department of Transportation

ETL Electrical Testing Laboratories, Inc.

FCC Federal Communications Commission

FM Factory Mutual Engineering and Research

FS Federal Specification (General Services Administration)

IEEE Institute of Electrical and Electronic Engineers

IES Illuminating Engineering Society

IESNA Illuminating Engineering Society of North America

ISA Instrument Society of America

MSS Manufacturer's Standardization Society of the Valve and Fittings Industry

NEC National Electric Code (by NFPA)

NEMA National Electrical Manufacturers Association

NFPA National Fire Protection Association

OSHA Occupational Safety and‑Health Administration

SMACNA Sheet Metal and Air Conditioning Contractors National Association, Inc.

SSPC Steel Structures Painting Council

UBC Uniform Building Code with California Amendments

UFC Uniform Fire Code

UL Underwriters Laboratories

UMC Uniform Mechanical Code

UPC Uniform Plumbing Code

WIC Woodwork Institute of California

1.2.2 Additional abbreviations, used on the Drawings, shall be listed thereon.

1.3 SYMBOLS

1.3.1 Symbols and graphic symbols, used only on the Drawings, shall be shown thereon.

1.4 DEFINITIONS

* + 1. The following terms, when used on the Drawings or in the Specifications, shall have the following meanings:

TERM DEFINITION

ACCESS Unobstructed and continuous vehicular and pedestrian passage.

ADDENDUM (Addenda) Clarification of, or revisions, additions or deletions to the Contract Documents, issued during the Proposal Period.

APPROVAL The approval of The University's Representative or University, as called for by the Contract Documents.

AS DIRECTED As directed by The University's Representative.

AS REQUIRED As required by Applicable Code Requirements; by good building practice; by the condition prevailing; by the Contract Documents; by The University; or by the University's Representative.

AS SELECTED As selected by The University’s Representative.

BY OTHERS Work on the Project that is outside the scope of Work to be performed by Design Builder under the Contract, but that will be performed by The University, Separate Contractor, or other means.

CONCURRENT Designated work that may occur at the same time as other designated work as described in the Contract Documents.

CONSECUTIVE Designated work that may only begin upon substantial completion of previously completed work as described in the Contract Documents.

SPECIFICATIONS Shall mean University Specification, Performance Specification, Design Builder’s detailed specification, or standard specification. When any of these specifications shall conflict, the specification offering the highest performance or design standard to the University shall govern.

EQUAL Of same quality, appearance, and utility to that specified, as determined by The University's Representative. Design Builder bears the burden of proof of equality.

FURNISH Supply only, not install.

INSTALL Install or apply only, not furnish.

LETTER OF INSTRUCTION Clarification/Supplemental Instructions.

UNIVERSITY FURNISHED, To be furnished by the University at its cost and installed by

DESIGN BUILDER Design Builder as part of the Contract Sum and as part of

INSTALLED the Work.

PERFORMANCE The printed documents in the Exhibits defining the criteria of SPECIFICATIONS materials and workmanship required as a minimum under this

 contract.

PROJECT SITE Geographical location of the Project.

PROVIDE Furnish and install, including provision of all related work.

REASONABLY REQUIRED The term "reasonably required" shall include those items which may not be indicated or noted in these documents, but which can reasonably be assumed to be necessary to complete the work of a particular system.

SHOWN As indicated on the approved Shop Drawings or on the Exhibit Drawings.

SPECIFIED As written in the Contract Documents.

SUBMIT Submit to the University's Representative.

SUBMITTALS Detailed fabrication and setting drawings, deliverable as called for in the Contract Documents, samples, material lists, and manufacturer's equipment brochures setting forth in detail the Work as it is proposed by Design Builder.

SUPPLEMENTAL A written document prepared by the University's

INSTRUCTIONS Representative which clarifies or interprets the requirements of the Contract Documents or makes minor changes to the work which do not require a change in the Contract Sum and/or Time and which are not inconsistent with the intent of the documents. A supplemental instruction is prepared on the University's Representative's standard form.

UNIVERSITY General Requirements in the exhibits to the Contract

SPECIFICATIONS Documents.

1.4.2 Items marked "by The University" or "N.I.C." on the Drawings are not to be furnished or installed as part of the Contract.

1.4.3 "As permitted," "acceptable," "satisfactory," means by or to The University's Representative.

1.5 STANDARD SPECIFICATIONS

1.5.1 Standard Specifications, such as ASTM, ANSI, AASHTO, AWWA, AIS, Commercial Standards, Federal Specification, NEMA, UL, and the like, incorporated in the Contract Documents by reference, shall be those of the latest edition at the time of receiving bids, unless otherwise specified. Manufacturers, producers and their agents of materials required shall have such specifications available for their reference.

1.6 STANDARDS AND REFERENCES

1.6.1 In effect on Date of Advertisement for Prequalification. Any material specified by reference to the number, symbol or title of a specific standard such as commercial standard, a Federal Specification, a trade association standard or other similar standard, shall comply with the requirements in the latest revision thereof and any amendments or supplement thereto in effect on the date of Request for Proposals.

1.6.2 Incorporation into Specifications. The standards referred to except as modified in the Specification shall have full force and effect as though printed in these Specifications. These standards are not furnished to Proposers, since manufacturers and trades involved are assumed to be familiar with their requirements.

1.7 CALIFORNIA STANDARD SPECIFICATIONS

1.7.1 Wherever in these Specifications reference is made to the "California Standard Specifications," "CSS," or "Standard Specifications" reference shall be made to Specifications entitled State of California, Department of Transportation, Standard Specifications, July 1988, and which is incorporated herein and made a part hereof by reference thereto.

1.8 AVAILABILITY OF STANDARD SPECIFICATIONS

1.8.1 Where reference is made to standards or references which are published by various associations, institutes, corporations or government agencies, those specifications may be obtained from the publisher.

1.8.2 Names and addresses of those publishers are included below. Both names and addresses are subject to change, and are believed to be, but are not assured to be, accurate as of the date of the Contract Documents. Neither the University nor the University's Representative shall assume any responsibility for either errors or omissions in this list.

American Association of State Highway and Transportation Officials

444 North Capitol St., Suite 225

Washington, DC 20001

(202) 624-5800

American Concrete Institute

PO Box 19150

Detroit, MI 48219

(313) 532-2600

American Gas Association

1515 Wilson Blvd.

Arlington, VA 22209

(703) 841-8400

American Insurance Association

85 John Street

New York, NY 10038

(212) 669-0400

American Institute of Steel Construction

400 N. Michigan Ave., 8th Floor

Chicago, IL 60611

(312) 670-2400

American Iron and Steel Institute

1000 16th St., NW

Washington, DC 20036

(202) 452-7100

American National Standards Institute

655 15th Street, NW Suite 300

Washington, DC 20015

(202) 639-4090

American Plywood Association

PO Box 11700

Tacoma, WA 98411

(206) 565-6600

American Petroleum Institute

1220 L Street, NW

Washington, DC 20005

(202) 682-8000

American Society of Heating, Refrigerating and Air Conditioning Engineers

1791 Tullie Circle, NE

Atlanta, GA 30329

(404) 636-8400

American Society of Mechanical Engineers

345 East 47th St.

New York, NY 10017

(212) 705-7722

ASTM

1916 Race St.

Philadelphia, PA 19103

(215) 299-5400

American Wood-Preservers' Association

PO Box 849

Stevensville, MD 21666

(301) 643-4163

American Welding Society

PO Box 350140

550 Le Jeune Rd., NW

Miami, FL 33135

(305) 443-9353

American Water Works Association

6666 W. Quincy Ave.

Denver, CO 80235

(303) 794-7711

Certified Ballast Manufacturers Association

Hanna Building, Suite 772

1422 Euclid Avenue

Cleveland, OH 44115

(216) 241-0711

Ceramic Tile Institute

700 North Virgil Ave.

Los Angeles, CA 90029

(213) 660-1911

Department of Transportation

400 Seventh St., SW

Washington, DC 20590

(202) 426-4000

ETL Testing Laboratories, Inc.

PO Box 2040

Route 11, Industrial Park

Cortland, NY 13045

(607) 753-6711

Factory Mutual Engineering and Research

1151 Boston-Providence Turnpike

Norwood, MA 02062

(617) 762-4300

Federal Communications Commission

1919 M Street, NW

Washington, DC 20554

(202) 632-7000

Federal Specification (General Services Administration)

Specifications Unit (WFSIS)

7th and D Streets, SW

Washington, DC 20406

(202) 472-2205

Institute of Electrical and Electronic Engineers, Inc.

Illuminating Engineering Society of North America

345 E. 47th St.

New York, NY 10017

(212) 705-7926

Instrument Society of America

PO Box 12277

67 Alexander Drive

Research Triangle Park, NC 27709

(919) 549-8411

International Society of Aboriculture (ISA)

P.O. Box 908

303 West University

Urbana City, Illinois 61801

(217) 328-2032

Manufacturers Standardization Society of the Valve and Fittings Industry

127 Park Street, NE

Vienna, VA 22180

(703) 28}-6613

National Arborist Association (NAA)

P.O. Box 1094

Amherst, New Hampshire 30301

(603) 673-3311

National Electrical Manufacturers Association

2101 L St., NW Suite 300

Washington, DC 20037

(202) 457-8400

National Fire Protection Association

Batterymarch Park

Quincy, MA 02269

(617) 770-3000

Occupational Safety and Health Administration (U.S. Department of Labor)

Government Printing Office

Washington, DC 20402

(202) 783-3238

Sheet Metal and Air Conditioning Contractor’s National Association

PO Box 70

Merrifield, VA 22116

(703) 790-9890

Steel Structures Painting Council

4400 5th Ave.

Pittsburgh, PA 15213

(412) 578-3327

Underwriters Laboratories

333 Pfingsten Rd.

Northbrook, IL 60062

(847) 272-8800

University of California Division of Agriculture and Natural Resources

Davis, California 95616-8511

(916) 757-8930

Woodwork Institute of California

1833 Broadway

Fresno, CA 93773

(209) 233-9035

PART 2: PRODUCTS (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

PART 3: EXECUTION (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

END OF SECTION 01420

Section 01440

QUALITY CONTROL

{This section specifies the general requirements and responsibilities of the parties for inspection on the project. The Contract Documents call for the Design Builder to create a Quality Control Plan that will outline the requirements for testing and inspection for the Work, to assure the Work is done within the quality and requirements of the Contract Documents. See the Scope of Work for the delineation of testing and inspection responsibilities, including payment.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 QUALITY CONTROL PLAN

1.2.1 The Quality Control Plan shall address the procedures and methods the Design Builder will utilize to control the quality of Work. At a minimum the Quality Control Plan shall include:

1. An organizational structure description, including Quality Control supervision and inspection reporting structure. Delineate personnel training and qualification activities.

1. Plans and procedures for testing and inspections to verify attributes delineated in the Contract Documents, including those specified in invoked codes and standards. Include documents that identify individual inspection or testing points and acceptance criteria, and include provisions for recording results and the responsible inspection/test personnel. This documentation shall be traceable to the particular material, items, processes, or systems evaluated. Testing procedures shall also provide for University provided laboratory testing, including notification requirements.

3. Procedures for identifying and contractually invoking the applicable technical and quality requirements delineated in the specifications on vendors supplying materials, parts and services within the scope of this Agreement.

4. Plans and procedures for receiving, inspecting, and accepting material and items; These shall include examination of physical condition and compliance to purchasing requirements, including markings for class type and grade, and conformance of supplied documentation. These shall also include provisions for:

Identifying, controlling, and processing non-conforming items, including notification of the University Representative.

Inspection of materials for authenticity to preclude counterfeit parts for items and attributes of concern identified by University Representative.

Verifying for compliance and traceability, maintaining, and turnover to the University, certificates of conformance and mill certificates required by the Contract Documents or codes/standards invoked, for material received.

5. Plan or procedures for punchlist and acceptance of the Work. The Design Builder shall provide final certification of completion and compliance to the Contract Documents; and Inspection Acceptance from each Design Professional of Record, certifying that the Construction Work meets the requirements of the Contract Documents.

6. Provisions for identifying Defective Work. The Design Builder shall bring to the University’s Representative’s attention for consultation and possible relief (use as-is, repair, or modification), those cases where correction within the specified requirements may introduce a significant schedule penalty, personnel hazard, or compromise to the quality of other installed items, or otherwise is impractical.

1. Controls to assure that only the current and approved design documents are utilized in the Work. This includes provisions for removing superseded versions from the work area, except where explicitly and prominently marked for information only, such as to retain annotated installation data. The Design Builder work shall comply with the design documents. Field initiated design change shall be processed as provided in the Contract Documents, and shall not be implemented prior to written approval by University’s Representative.

8. Detailed formal procedures or instructions for the performance of special processes, such as welding and concrete placement. These procedures/instructions and personnel performing special processes shall be qualified and certified as required by codes and standards invoked by the Contract Documents.

9. Controls providing for periodic calibration of test and measurement equipment, including unique equipment identification and calibration tracking.

1. Design Builder shall maintain records documenting the implementation of the above activities, including tests, inspections, special process qualification and execution, vendor documentation, and Defective Work resolution. These records shall be indexed, protected, and retrievable for final turnover to the University.
2. The Design Builder shall perform other routine verification and inspection activities to assure the requirements of the Contract Documents are implemented and the completed Work will be acceptable. The frequency and depth of these routine inspections and verifications shall be responsive to identified defective Work, changes in work complexity or other conditions that may affect the quality of the Work.
3. Identify all test and inspections that Design Builder proposes to be conducted by the University.

1.3 DESIGN BUILDER'S RESPONSIBILITIES TESTING AND INSPECTION

1.3.1 Follow the approved Quality Control Plan at all times through the Construction Work.

1.3.2 Submit copies of product test reports to the University’s Representative.

1.3.3 Furnish incidental labor and facilities to provide University's Representative access to Work to be tested, obtain and handle samples at the Project site or at the source of the product to be tested, facilitate inspections and tests, and for storage and curing of test samples.

1.3.4 Provide written notice to University's Representative and {NUMBER E.G., 72} hours in advance of operations of testing and inspection to allow for University’s Representative the opportunity to observe the testing and inspection.

1.3.5 If Work and the associated testing and inspection is not performed when scheduled, Design Builder shall reimburse University for University's personnel and travel expenses incurred.

1.3.6 Design Builder shall personally supervise all work and inspect all materials as they arrive for compliance with the Contract Documents, and shall reject defective work and material without waiting for such rejection from others in authority.

1.4 TESTS AND INSPECTIONS BY UNIVERSITY

* + 1. University's Representative may make periodic on-site observations of construction as it progresses and upon completion, and may make off-site reviews of fabricated materials and equipment when such off-site reviews are specified in the Contract Documents at University Expense. Opportunity for observation, testing, and inspection by University’s Representative shall be afforded by the Design Builder throughout the progress of the Work.

1.5 ADDITIONAL TESTING AND INSPECTION

1.5.1 If the University or public authorities having jurisdiction determine that portions of the Construction Work require additional testing, inspection or approval beyond that required in the Construction Documents, such additional testing and inspection shall be carried out by Design Builder, or by entity directed by University. Design Builder will make arrangements for such inspections and testing; and shall give the University’s Representative timely notice of when and where tests and inspections are to be made so that University may observe such procedures. If such additional tests and/or inspections reveal Defective Work, the cost of such test and/or inspection and correction shall considered as part of the Contract Sum; otherwise the Contract Sum will be adjusted by Change Order for cost of testing and/or inspection.

1.6 TEST REPORTS

1.6.1 University's Testing Laboratory and Design/Builder's Testing Laboratory shall distribute copies of all reports as follows:

1. University's Representative: Four (4) copies.

2. The number of copies for Design/Builder and Subcontractors being tested will be determined upon commencement of Contract.

1.7 WORK COVERED PRIOR TO INSPECTION

1.7.1 If a portion of the Work is covered contrary to University's Representative's request or direction, or contrary to the requirements of the Contract Documents, it shall, if required in writing by University's Representative, be uncovered for University's Representative's observation and be replaced at Design Builder’s expense without adjustment of the Contract Time or the Contract Sum.

1.7.2 If a portion of the Work has been covered, which is not required by the Contract Documents to be observed or inspected prior to its being covered and which University's Representative has not specifically requested to observe prior to its being covered, University's Representative may request to see such Work and it shall be uncovered and replaced by Design Builder. If such Work is found to be in accordance with the Contract Documents, and additional cost and/or time have been incurred by Design Builder, such cost and/or time shall be added to the Contract Sum and/or Contract Time by Change Order. Where the Design Builder requests adjustment to either the Contract Time or Contract Sum, Design Builder shall document and show that such per the requirements of the Contract Documents.

1.8 FIELD MOCKUPS AND SAMPLES

1.8.1 {Add this item if there are any special requirements for field mockup and samples. Discuss whether Design Builder can or cannot use any field mockups (if reusable) or samples on the job. Or add the words “Not Applicable.”}

PART 2: PRODUCTS (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

PART 3: EXECUTION (Not Applicable) {Add the words “Not Applicable” if this part is not used.}

END OF SECTION 01440

Section 01510

TEMPORARY UTILITIES

{Earlier versions of Division 1 combined Temporary Facilities with Temporary Utilities. This new version separates the two to provide clarity and hopefully better communication and changes the name of “Temporary Facilities” to “Construction Facilities.” Edit as appropriate to fit the needs of the Facility and the Project. It is critical that this section be coordinated with the Facility department responsible for Facility utilities.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

1.1.1 Temporary Field Office, Construction Aids, and miscellaneous services and facilities are specified in General Requirements “Construction Facilities.”

1.2 GENERAL

 1.2.1(Not Applicable) {Insert the words "Not Applicable" if not used.

1.3 SUMMARY

1.3.1 This Section includes requirements for Temporary Utilities. Temporary Utilities include, but are not limited to, the following:

1. Electric power service.

2. Heating and cooling facilities.

3. Water service and distribution.

4. Sanitary facilities, including toilets, wash facilities, and drinking-water facilities.

5. Lighting.

6. Ventilation.

7. Communications service.

1.4 USE CHARGES

1.4.1 General. Cost or use charges for Temporary Utilities are not chargeable to University and shall be included in the Contract Sum. Costs for connections and removal of connections to the local water and power mains shall likewise be included in the Contract Sum. Allow other entities to use Temporary Utilities and without cost, including, but not limited to, the following:

1. University's construction forces.

2. Occupants of Project.

3. University’s Representative.

4. Testing agencies.

5. Personnel of authorities having jurisdiction.

1.4.2 Temporary Water and Electric Power Service. Use of water from University's existing water and electrical power system is allowable in such quantities and at such times as it is available. Costs of such use shall be paid by Design Builder at University’s rate.

1.5 QUALITY ASSURANCE

1.5.1 Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities,” and NFPA 241.

1. Trade Jurisdictions. Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.

2. Electric Service. Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

1.5.2 Tests and Inspections. Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

1.6.1 Temporary Utilities. At earliest feasible time, when acceptable to University, change over from use of temporary service to use of permanent service.

1.6.2 Conditions of Use. Keep temporary utilities in a safe and proper working order, and relocate as may be required by progress of the Work.

1.6.3 Protection. Protect temporary utilities as necessary to prevent damage or danger to property or persons.

1.7 INTERRUPTION OF BUILDING SERVICES

1.7.1 Obtain University's approval at least days {adjust number of days to meet particular Facility requirements} prior to any service shutdown or cutover. University may authorize overtime if the Work must be performed during overtime hours.

PART 2: PRODUCTS

2.1 EQUIPMENT

2.1.1 Self Contained Toilet Units. Single occupant units of chemical, aerated re-circulation, or combustion type; vented; fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material.

2.1.2 Drinking-Water Fixtures. Containerized, tap-dispenser bottled-water drinking-water units, including paper cup supply.

2.1.3 Heating Equipment. Unless University authorizes use of permanent heating system, provide vented, self contained, liquid propane gas or fuel oil heaters with individual space thermostatic control.

1. Use of gasoline burning space heaters, open flame heaters, or salamander type heating units is prohibited.

2. Heating Units. Listed and labeled, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use for type of fuel being consumed.

2.1.4 Electrical Outlets. Properly configured, NEMA-polarized outlets to prevent insertion of 110V to 120V plugs into higher-voltage outlets; equipped with ground-fault Circuit interrupters, reset button, and pilot light.

2.1.5 Power Distribution System Circuits. Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125V ac, 20A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3: EXECUTION

3.1 TEMPORARY UTILITY INSTALLATIONS

3.1.1 General. Engage University to connect to existing service. Arrange with University and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

3.1.2 Water Service. Use of University’s existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to University. At Substantial Completion, restore these facilities to condition existing before initial use.

3.1.3 Sanitary Facilities. Provide temporary toilets, wash facilities, and drinking water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities. The Design Builder cannot use existing restrooms. {Modify this last sentence if existing Facility Sanitary Facilities will be available to Design Builder.}

1. Disposable Supplies. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.

2. Toilets. Install self-contained toilet units. Shield Toilets to ensure privacy.

3. Wash Facilities. Install wash facilities supplied with potable water at convenient locations for personnel who handle materials that require wash up. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.

4. Drinking Water Facilities. Provide bottled water drinking units.

3.1.4 Temporary Heat and Ventilation. Provide temporary heat and ventilation as required to maintain adequate environmental conditions to meet specified minimum conditions for installation of materials; and to protect equipment, materials, and finishes from damage due to temperature or humidity. Provide adequate forced ventilation of enclosed areas to cure installed materials, to prevent excessive humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases.

3.1.5 Ventilation and Humidity Control. Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

3.1.6 Electric Power Service. Use of University's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to University. Provide all equipment, including metering, connections, transformers, and other materials necessary for extending the utility lines to where they will be used. Coordinate the installation with University's Representative.

3.1.7 Electric Distribution. Provide receptacle outlets adequate for connection of power tools and equipment.

1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length voltage ratio.

3.1.8 Lighting. Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.1.9 Telephone Service. Provide temporary telephone service throughout construction period for common-use facilities used by all personnel engaged in construction activities.

END OF SECTION 01510

Section 01520

# CONSTRUCTION FACILITIES

{As with General Requirements Section “Temporary Utilities,” this section has been separated out for clarity and communication and has been given the name “Construction Facilities.” It is recommended that the two be separated as provided, however, combining the two on smaller projects may be more appropriate. Anything that is temporary, which needs to be added to the Project requirements other than utilities, is appropriately located in this Section.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

1.1.1 Temporary Utilities are specified in General Requirements, Section “Temporary Utilities.”

1.2 NOT USED

{Insert the words “Not Applicable” if not used.}

1.3 GENERAL

1.3.1 Provide all labor, materials, equipment, tools, services and miscellaneous and incidental work to complete all temporary construction as specified.

1.3.2 Support facilities include, but are not limited to, the following:

.1 Field offices.

.2 Construction aids and miscellaneous services and facilities.

.3 Construction Fences.

.4 Construction Signs.

.5 Temporary Fire Protection.

1.4 USE CHARGES

1.4.1 General. Cost or use charges for Construction Facilities are not chargeable to University and shall be included in the Contract Sum. Allow other entities to use Construction Facilities without cost, including, but not limited to, the following:

.1 University's construction forces.

.2 Occupants of Project.

.3 University’s Representative.

.4 Testing agencies

.5 Personnel of authorities having jurisdiction.

1.5 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

1.5.1 The Drawings show, if applicable, existing above and below grade structures, drainage lines, storm drains, sewers, water, gas, electrical, hot water, and other utilities which are known to University.

1.5.2 Locate all known existing installations before proceeding with construction operations which may cause damage to such installations. Existing installations shall be kept in service where possible and damage to them shall be repaired with no adjustment of Contract Sum.

1.5.3 If any other structures or utilities are encountered, request University's Representative to provide direction on how to proceed with the Work.

1.5.4 If any structure or utility is damaged, take appropriate action to ensure the safety of persons and property.

PART 2: PRODUCTS

2.1 EQUIPMENT

2.1.1 General. Provide equipment suitable for use intended.

2.1.2 Field Offices. Prefabricated or Mobile units with lockable entrances, operable windows, and serviceable finishes; heated and air conditioned; on foundations adequate for normal loading. {This paragraph is rather general, if the Facility desires to be more specific, i.e. size, furnishings, etc. and inclusion of a facility to accommodate University’ Representative and Inspectors, it should be so indicated here.}

2.1.3 Fire Extinguishers. Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA recommended classes for exposures.

.1 Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

2.1.4 Fences. Install and maintain construction fence where indicated or as directed by University’s Representative. Provide gates in the sizes and locations as shown or required to properly perform the Work. Minimum required fence as follows:

.1. Mo. 11 gage, 2” mesh, 96” galvanized chain link fabric, with full height green fabric privacy screen.

.2 Galvanized steel posts and top rails; 2” line posts and top rails and 3-1/2” corner, fate and pull posts.

2.1.5 Construction Signs. Furnish and install the following Construction Signs:

.1 Project Identification. Furnish and install one project sign approximately 4’x8’ that will include names of principal participants. Sign will be designed by Design Builder and approved by University’s Representative. Relocate sign as the Progress of the Work requires, at the University’s Representative direction.

.2 Traffic and Warning Signs. Provide traffic and warning signs to facilitate control of personnel and vehicles. Use minimum necessary with a size of 2’x4’ maximum.

.3 Erection. Erect signs securely on wood posts and concrete footings. Maintain in good condition throughout the construction period and remove upon completion of the Work.

PART 3: EXECUTION

3.1 GENERAL

3.1.1 Provide Construction Facilities for the following:

1. Design Builder.

2. Subcontractors.

3. Inspectors.

3.1.2 Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

3.1.3 Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 SUPPORT FACILITIES INSTALLATION

3.2.1 General. Comply with the following:

.1 Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access and as shown in the Contract Documents.

.2 Provide incombustible construction for offices, shops, and sheds located within construction area. Comply with NFPA 241.

.3 Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to University.

3.2.2 Common-Use Field Office. Provide an insulated, weathertight, field office for use as a common facility by all personnel engaged in construction activities; of sufficient size to accommodate required office personnel and meetings at Project site. Keep office clean and orderly.

3.2.3 Storage and Fabrication Sheds. Provide sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility services. Sheds may be open shelters or fully enclosed spaces within building or elsewhere on-site.

3.3 PROTECTION FACILITIES INSTALLATION

3.3.1 Temporary Fire Protection. Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

.1 Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with appropriate signage mounted above.

1. Field Offices. Class A stored pressure water type extinguishers.

2. Other Locations. Class ABC dry chemical extinguishers or a combination of extinguishers of NFPA recommended classes for exposures.

3. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.

END OF SECTION 01520

Section 01530

TEMPORARY CONSTRUCTION

{This section is used to cover items that may be required to accommodate needs of the project such as “winterization” (weather protection), any construction that may be necessary that is not specified elsewhere, such as temporary walks, decks, ramps, site work, etc.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 GENERAL

1.2.1 Provide all labor, materials, equipment, tools, services and miscellaneous and incidental work to complete all temporary construction specified or as required to accomplish the Work.

PART 2: PRODUCTS (Not Applicable) {Insert the words “Not Applicable” if not used.}

PART 3: EXECUTION

3.1 INSTALLATION

3.1.1 Decks. {Describe as necessary.}

3.1.2 Ramps. {Describe as necessary.}

3.1.3 Turnarounds. {Describe as necessary.}

3.1.4 Winterization. {Describe as necessary.}

3.1.5 {Others, Describe as necessary.}

END OF SECTION 01530

Section 01560

TEMPORARY BARRIERS AND ENCLOSURES

{This section specifies temporary barriers and enclosures that may be required for the execution of the Work. It is not to be confused with General Requirements Section “Construction Facilities.”}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 SUMMARY

1.2.1 Security and protection facilities include, but are not limited to, the following:

1. Site enclosure fence.

2. Security enclosure and lockup.

3. Barricades, warning signs, and lights.

4. Temporary enclosures.

5. Temporary partitions.

6. Pollution Control.

7. Tree Protection.

PART 2: PRODUCTS

2.1 MATERIALS

2.1.1 General. Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by University’s Representative. Provide materials suitable for use intended.

2.1.2 Portable Fencing. {Design Builder fencing material shall be determined by the Design Builder OR Refer to General Requirements Section “Construction Facilities” for product requirements.}

* + 1. Lumber and Plywood.

2.1.4 Gypsum Board. Minimum 1/2 inch (12.7 mm) thick by 48 inches (1219 mm) wide by maximum available lengths; regular type panels with tapered edges. Comply with ASTM C 36.

2.1.5 Insulation. Unfaced mineral fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively.

2.1.6 Tarpaulins. Fire-resistive labeled with flame-spread rating of 15 or less.

PART 3: EXECUTION

* 1. GENERAL

3.1.1 Site Enclosure Fence. Before construction operations begin, install enclosure fence with lockable entrance gates. Locate within project limits or as approved by University’s Representative. Install in a manner that will prevent people, dogs, and other animals from easily entering site except by entrance gates.

1. Provide gates in sizes and at locations necessary to accommodate delivery vehicles and other construction operations.

2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide University with one set of keys.

3.1.2 Security Enclosure and Lockup. Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

3.1.3 Barricades, Warning Signs, and Lights. Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights. Coordinate the requirements of this paragraph with University’s Representative.

3.1.4 Temporary Enclosures. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

2. Vertical Openings. Close openings of 25 sq. ft. (2.3 sq. m.) or less with plywood or similar materials.

3. Horizontal Openings. Close openings in floor or roof decks and horizontal surfaces with load bearing, wood framed or other appropriate construction.

4. Install tarpaulins securely using fire-retardant treated wood framing and other materials.

5. Where temporary wood or plywood enclosure exceeds 100 sq. ft. in area, use fire­ retardant treated material for framing and main sheathing.

3.1.5 Temporary Partitions. Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

1. Construct dustproof partitions of not less than nominal 4-in. studs, 5/8 in. gypsum wallboard with joints taped on occupied side, and 1/2-in. fire retardant ply­wood on construction side.

2. Insulate partitions to provide noise protection to occupied areas.

3. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.

4. Protect air-handling equipment.

5. Weatherstrip openings.

3.1.6 Pollution Control. Comply with the requirements of the Environmental Protection Agency (EPA), local and regional agencies, and Facility requirements.

1. Maintain noise control within the legal requirements that may be set by the local community or the University.

2. Do not allow waste materials to contaminate local utility systems, surrounding areas, creeks, etc.

3.1.7 Tree Protection. Trees, whether within the project limits of not, shall be protected from damage. Provide protective barriers around existing trees to assure their safety in a manner acceptable to University’s Representative. Do not start construction activities until tree protection is in place and approved.

 {Note: The issue of protecting trees can become very problematic around construction sites. If the protection of trees is critical, be sure to coordinate this paragraph with Facility Landscape staff and consider making this a separate section entitled “Tree Protection.”}

END OF SECTION 01560

Section 01570

TEMPORARY CONTROLS

{This section is intended to provide specifications for the construction of temporary controls over environmental concerns and/or pests. If there are any special product or installation requirements then so state in the appropriate Parts of this section.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 EROSION AND SEDIMENT CONTROL

1.2.1 {Indicate any requirements as appropriate OR insert the words “Not Applicable.”}

1.3 PEST CONTROL

1.3.1 {Indicate any requirements as appropriate OR insert the words “Not Applicable.”}

PART 2: PRODUCTS (Not Applicable) {Insert the words “Not Applicable” if not used.}

PART 3: EXECUTION (Not Applicable) {Insert the words “Not Applicable” if not used.}

END OF SECTION 01570

Section 01580

PROJECT IDENTIFICATION AND INFORMATION

{Include in this section any signage that may be necessary for safety or project identification, or any limits that the Facility may impose. It is wise to be specific so that the necessary control is maintained. The example paragraphs prohibit Project Signs which display advertisements, but it is important to state the requirements of the Project Identification sign.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 GENERAL

1.2.1 Project Signs. The use of Design Builder or Subcontractor advertising signage is prohibited. Design Builder shall not display such advertising or job signs except as may be required for identification and deliveries.

1. A Project Identification Sign shall be installed on the project site as directed by University’s Representative.

1. Provide 4’x8’ flat plywood painted sign or other approved format. A detailed drawing of the proposed sign showing colors and layout shall be approved by University’s Representative.

1. Provide proper mounting system for sign as approved by University’s Representative.
2. Relocate sign as the progress of the Work requires, at the direction of the University’s Representative.

1.2.2 Field Office Signs. Signs identifying field office facilities shall be for identification only. Signage for such identification shall be approved by University’s Representative prior to installation.

1.2.3 Directional Signs. Directional signs shall be installed to direct vehicle and pedestrian traffic as necessary. Any such directional signage shall be approved by University’s Representative prior to installation.

1.2.4 Release of Information. Design Builder shall not release any public information, story, photograph, plan, drawings, etc. regarding the Project to anyone, including the press or other public communications media, without the express written approval by University’s Representative, and then only in the form as approved.

PART 2: PRODUCTS (Not Applicable) {Insert the words “Not Applicable” if not used.}

PART 3: EXECUTION (Not Applicable) {Insert the words “Not Applicable” if not used.}

END OF SECTION 01580

Section 01610

BASIC PRODUCT REQUIREMENTS

{This section provides for a discussion of the universal requirements of products, which are to be incorporated in the Work. It is intended to cover issues of concern, which may arise when Design Builder wishes to propose a product substitution, incorporate miscellaneous projects, or the use of used materials.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable)

1.2 DEFINITION

1.2.1 Product. A Product is defined as any materials and/or pieces of equipment, including, but not limited to, all accessories used in the installation of the Work.

1.3 GENERAL

1.3.1 Use of New and Used Products. All products installed in the Project during the execution of the Work shall be:

1. New.

1. Used products may be used only if formally approved by University’s Representative. {Delete if no used products will be allowed on the Project.}

2. In a condition acceptable to University’s Representative.

3. Suitable for its intended use.

 {Elaborate on any special requirements regarding the use of new or used products as necessary.}

1.3.2 Merchantability of Products. All Products installed in the Project during the execution of the Work shall be by manufacturers who warranty the quality and provide parts and services as may be necessary for the proper maintenance and operation of the Product or system in which the Product may be a part. {Elaborate on any special requirements that products be marketable.}

1.3.3 Country of Origin. {If the Facility or the Regents have boycotted any particular country for a particular reason, or if products are to be limited to US manufacturers, so state, OR insert the words “Not Applicable.”}

PART 2: PRODUCTS (Not Applicable) {Insert the words “Not Applicable” if not used.}

PART 3: EXECUTION (Not Applicable) {Insert the words “Not Applicable” if not used.}

END OF SECTION 01610

Section 01630

PRODUCT OPTIONS AND SUBSTITUTIONS

1.1 General Provisions Regarding Specification Of Products, Material or Equipment By Brand Or Trade Name.

1.1.1 Products, material or equipment specified by both brand or trade name and model number are approved for use, provided that Design Builder complies with all Contract requirements. Specification of a product, material or equipment by brand or trade name and model number is not a representation or warranty that the product, material or equipment can be used without modification, to meet the requirements of the plans and specifications; Design Builder shall, at its sole cost, modify such products, material, or equipment so that they comply with all requirements of the plans and specifications.

1.1.2 The first-named product, material or equipment specified by brand or trade name and model number is the basis for the Project design and the use of any item other than the first-named one may require modifications of that design. If Design Builder uses any product, material or equipment other than the first-named one, Design Builder shall, at its sole cost:

.1 Make all revisions and modifications to the design and construction of the Work necessitated by the use the product, material or equipment.

.2 Be responsible for all costs of any changes resulting from the use of the product, material or equipment including without limitation, costs or changes which affect other parts of the Work, the work of Separate Contractors, or any other property or operations of the University.

1.1.3. When a product, material or equipment specified by brand or trade name is followed by the words “or equal,” a substitution may be permitted if the substitution is equal to or superior to the first-named product, material or equipment in quality, utility and appearance and if the substitution complies with all other requirements of the plans and specifications.

1.1.4 A product, material or equipment specified by brand or trade name followed by the words “or equal, no known equal,” signifies that University does not have sufficient knowledge to specify a product, material or equipment, other than the one specified by brand or trade name, that is suitable for use on the Project. The use of the words "no known equal" is not intended to discourage substitution requests in accordance with the requirements specified herein.

1.1.5 When catalog numbers and specific brands or trade names not followed by the designation "or equal" are used in conjunction with a product, material or equipment required by the specifications, substitutions will not be allowed and the named product, material or equipment must be used.

1.1.6 Specification of a product, material or equipment by brand or trade name and model number is not a representation or warranty that the product, material or equipment is available; Design Builder should confirm, prior to submitting its Bid, the availability of any product, material or equipment specified by brand or trade name and model number.

1.2. Special Requirements For Products, Material Or Equipment, Other Than The First-Named Product, Material Or Equipment, Specified By Both Brand Or Trade Name And Model Number.

1.2.1 In addition to complying with all other submittal requirements of the Contract, submit within 70 days after the date of commencement specified in the Notice to Proceed, for review and approval by the University’s Representative, Design Builder prepared specifications and drawings, including design and engineering calculations, prepared by an appropriate licensed professional, depicting all revisions and modifications to the design and construction of the Work necessitated by the use of the product, material or equipment. If no revisions or modifications are necessary, submit within 70 days after the date of commencement specified in the Notice to Proceed, a written representation that no revisions or modifications to the design or construction of the Work are necessitated by the use of the product, material or equipment. Design Builder shall utilize the first-named product, material or equipment if Design Builder fails to make the appropriate required submittal pursuant to this paragraph within the 70-day period.

1.2.2 A product, material or equipment, other than the first-named product, material or equipment, specified by both brand or trade name and model number may be used if no revisions or modifications to the design or construction of the Work are necessitated by the use of the product, material or equipment. If such revisions or modifications are necessary, the product, material or equipment may be used only if the revisions or modifications are approved in writing by the University’s Representative. Design Builder has the burden of demonstrating, through the procedures specified herein, that any such revisions or modifications will not be detrimental to the quality, utility or appearance of the Project or any portion of the Project. The University’s Representative may refuse to approve any such proposed revisions or modifications where, in the reasonable opinion of the University’s Representative, Design Builder has failed to demonstrate, through the procedures specified herein, that the revisions or modifications are not detrimental to the quality, utility or appearance of the Project or any portion of the Project.

1.3. Special Requirements For Substitutions.

1.3.1 In addition to complying with all other submittal requirements of the Contract, submit written data demonstrating that the proposed substitution is equal to or superior to the first-named product, material or equipment in quality, utility and appearance and otherwise complies with all requirements of the plans and specifications, including:

.1 Complete technical data including drawings, performance specifications, samples, and test reports of the article proposed for substitution.

.2 Statement by Design Builder that the proposed substitution is in full compliance with the requirements of the Contract Documents and Applicable Code Requirements.

.3 List of Subcontractors, if any, that may be affected by the substitution.

.4 Design Builder prepared specifications and drawings, including design and engineering calculations, prepared by an appropriately licensed professional, depicting all revisions and modifications to the design and construction of the Work necessitated by the use of the substitution. If no revisions or modifications are necessary, submit a written representation that no revisions or modifications to the design or construction of the Work are necessitated by the use of the product, material or equipment.

1.3.2 At the request of and within the timeframes specified by the University’s Representative:

.1 Submit samples as deemed necessary by the University’s Representative to evaluate the proposed substitution.

.2 Submit proposed substitution to tests deemed necessary by the University’s Representative to evaluate the proposed substitution. Such tests shall be made by an independent Testing Laboratory and at the sole expense of Design Builder, after review and approval of the test procedures by University's Representative. If re-testing is deemed necessary by the University’s Representative to evaluate the proposed substitution, such re-testing shall be made by an independent Testing Laboratory at the sole expense of the Design Builder.

.3 Provide any additional information deemed necessary by the University’s Representative to evaluate the proposed substitution.

1.3.3 If University's Representative, in reviewing a proposed substitution, requires revisions or corrections to be made to previously accepted shop drawings and supplemental supporting data to be resubmitted, Design Builder shall do so within the time period specified by the University’s Representative. A proposed substitution may be rejected if Design Builder fails to submit such revisions, corrections, or supplemental supporting data within the specified time period.

1.3.4 Except for products, material or equipment designated in the Bidding Documents for evaluation of substitutions prior to award, requests for substitution, including the data required by Paragraph 1.3.1, must be submitted to the University’s Representative not later than 35 days after the date of commencement specified in the Notice to Proceed. No requests for substitutions of products, material or equipment subject to the 35-day deadline shall be considered unless the request and supporting data is submitted on or before the deadline, except those deemed, in University's Representative's sole opinion, to be necessary because (i) previously specified or approved manufactured products, material or equipment are no longer manufactured, (ii) of University initiated change orders, or (iii) it is in the best interest of University to accept such substitution.

1.3.5 If a product, material or equipment is designated in the Bidding Documents for evaluation of substitutions prior to award, then a request for substitution of the product, material or equipment, including the data required by Paragraph 1.3.1, must be submitted by the deadline specified in the Bidding Documents. Because of time constraints, only one submittal will be allowed for each such substitution request. Requests for substitutions of products, material or equipment designated for evaluation prior to award may not be made after the deadline specified in the Bidding Documents, and such requests be shall not be considered unless the request and supporting data is submitted on or before the deadline specified in the Bidding Documents. Notwithstanding the forgoing, the University may consider, after award of the Contract, requests for substitution of a product, material or equipment designated for evaluation prior to award where, in University's Representative's sole opinion, a substitution is necessary because (i) previously specified or approved manufactured products, material or equipment are no longer manufactured, (ii) of University initiated change orders, or (iii) it is in the best interest of University to accept such substitution.

1.3.6 In reviewing the supporting data submitted for substitutions, University's Representative will use, for purposes of comparison, all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Specifications. If more than 2 submissions of supporting data are required, the cost of reviewing the additional supporting data shall be at Design Builder's expense.

1.3.7 Design Builder has the burden of demonstrating, through the procedures specified herein, that its proposed substitution is equal to or superior to the first-named product, material or equipment in quality, utility and appearance and complies with all other requirements of the plans and specifications. If revisions or modifications to the design or construction of the work are necessitated by the use of the substitution, Design Builder also has the burden of demonstrating, through the procedures specified herein, that the use of the substitution will not be detrimental to the quality, utility or appearance of the Project or any portion of the Project.

1.3.8 The University’s Representative may refuse to approve any requested substitution where, in the reasonable opinion of the University’s Representative, Design Builder has failed to demonstrate, through the procedures specified herein, that the proposed substitution is equal to, or superior to, the first-named product, material or equipment, in quality, utility and appearance and that the proposed substitution complies with all other requirements of the plans and specifications.

1.3.9 University's Representative may reject any substitution not proposed in the manner and within the time limits prescribed herein.

* + 1. Substitutions are not allowed unless approved in writing by the University’s Representative. Any such approval shall not relieve Design Builder from the requirements of the Contract Documents.

* + 1. The 35-day and 70-day submittal periods do not excuse Design Builder from completing the Work within the Contract Time or excuse Design Builder from paying liquidated damages if Final Completion is delayed.
		2. If revisions or modifications to the design or construction of the Work are necessitated by the use of a substitution, the substitution may be used only if the revisions and modifications are approved in writing by the University’s Representative. The University’s Representative may refuse to approve any such proposed revisions or modifications where, in the reasonable opinion of the University’s Representative, Design Builder has failed to demonstrate, through the procedures specified herein, that the revisions or modifications are not detrimental to the quality, utility and appearance of the Project or any portion of the Project.

1.3.13. If a substitution request is finally rejected by the University Representative, Design Builder shall furnish and install:

.1 the first-named product, material, or equipment; or

.2 a product, material, or equipment, other than the first-named product, material or equipment, specified by both brand or trade name and model number, provided Design Builder complies with the submittal requirements (including deadlines) of specification section 01630-1.2

END OF SECTION 01630

Section 01640

UNIVERSITY FURNISHED PRODUCTS

{This section is to be used if the Facility will be providing materials to be incorporated in the Work for the Design Builder to install under the Contract.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 GENERAL

1.2.1 University will provide the materials listed herein as University Furnished Products and the Design Builder shall be required to incorporate same into the Work.

1.2.2 The University will be responsible for the delivery of University Furnished Products to the Project site unless otherwise agreed.

1.2.3 If University Furnished Products are found to be damaged or defective and it is determined that the Design Builder is not a fault, University will replace such University Furnished Products.

1.3 REQUIREMENTS FOR COORDINATING WITH OTHER WORK

1.3.1 Design Builder shall be bound by the same requirements, as set forth in the Contract Documents, for the installation and operation of University Furnished Products in the manner as if these Products were supplied by Design Builder.

1.4 INSTALLATION ACCESSORIES

1.4.1 Design Builder shall be responsible for accessory materials as required to install University Furnished Products.

PART 2: PRODUCTS

PART 3: EXECUTION

3.1 DELIVERY, STORAGE, AND HANDLING

3.1.1 Design Builder shall be responsible for the handling and installation of these products just as if they were provided by Design Builder according to the requirements of the Documents.

3.1.2

END OF SECTION 01640

Section 01650

PRODUCTS DELIVERY REQUIREMENTS

{Although CSI suggests separation of Product Delivery Requirements from Product Storage and Materials, this Section and General Requirements Section “Product Storage and Handling” can be combined into one Section.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable)

1.2 DELIVERY AND HANDLING

1.2.1 Deliver manufactured products in their original unbroken containers or bundles, clearly labeled with manufacturer’s name, brand, and product seal or model number.

1.2.2 Handle materials in a manner to avoid damage to products and their finishes.

1.2.3 Promptly remove damaged or defective products from the Project site and replace with no adjustment to the Contract Sum.

{Add additional requirements as appropriate or to be consistent with Facility practice.}

PART 2: PRODUCTS (Not Applicable) {Insert the words “Not Applicable” if not used.}

PART 3: EXECUTION (Not Applicable) {Insert the words “Not Applicable” if not used.}

END OF SECTION 01650

Section 01660

PRODUCTS STORAGE AND HANDLING

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 GENERAL

1.2.1 General Performance. Design Builder shall store and handle Products with seals and labels intact, legible, and in a manner that will prevent damage or deterioration.

1.2.2 Reference. Design Builder shall adhere to manufacturer’s instructions and specified standards for storage and handling, and periodically inspect to assure that they are maintained under specified conditions and are free from damage and/or deterioration.

1.2.3 Quality Assurance. Design Builder shall submit a storage and handling plan to University’s Representative for review and approval.

1.3 EXTERIOR STORAGE

1.3.1 Store Products above ground on blocking or skids to prevent soiling, staining and/or damage.

1.3.2 Cover Products, which may be subject to damage by the elements, with impervious protective sheet coverings. Provide adequate ventilation to prevent condensation.

1.3.3 Store sand, rock, or aggregate Products in a well-drained area on sold surfaces to prevent mixing with foreign matter.

1.4 PROTECTION AFTER INSPECTION

1.4.1 Maintain temperature and humidity conditions in interior spaces for the Work in accordance with manufacturer’s instructions for Products requiring protection.

1.4.2 Use appropriate protective materials and methods as necessary to prevent damage to installed products from traffic, constructions operations, and weather. Remove protective materials when no longer required.

PART 2: PRODUCTS (Not Applicable) {Insert the words “Not Applicable” if not used.}

PART 3: EXECUTION

3.1 SPECIFIC PRODUCT STORAGE REQUIREMENTS

3.1.1 Storage and Protection. To prevent damage and/or deterioration of products the following shall be required:

1. Materials shall be stored in their original packaging and all seals and labels shall be intact, legible and visible.

2. Products shall be neatly stacked, shall have supports appropriate for the stored materials, shall be arranged to permit access and inspection, and where required cover and ventilate.

3. Where required provide weather-tight, climate controlled enclosures.

4. Where exterior storage is acceptable to manufacturer and University, place on slopped supports, above ground. Provide loose granular materials on sold flat surfaces.

5. Periodically inspect to ensure against damage.

END OF SECTION 01660

Section 01710

Examination of existing conditions

{This Section describes the procedures for examining and documenting the existing conditions under which the Work is to be conducted; a clear recording of this data becomes even more critical with renovations and/or additions. This is something that the Design Builder shall be required to do and is subject to review and approval by the Facility.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 VERIFICATION OF EXISTING CONDITIONS

1.2.1 Visual Record. Prior to commencing with the Work, Design Builder and University will tour the Project Site together to examine and record damage to existing curbs, roads, paved parking areas, landscaping, and other improvements within the Project Limits, adjacent property and access routes. The Record of existing conditions shall be signed by all parties making the tour and shall serve as a basis for determination of subsequent damage due to Design Builder’s operations. Photographs and/or video taping may be used to serve as part of the Record. Any such damage not noted in the original survey, but subsequently discovered, shall be reported the University’s Representative in a timely manner.

1. The Record of conditions shall be the responsibility of the Design Builder. Conduct surveys and take photographs as may be required to accurately record the existing conditions.

2. This record shall and shall be signed by all parties making the tour. Any cracks, sags, or damage to the adjacent buildings and improvements not noted in the original survey, but subsequently discovered, shall be reported to University's Representative.

1.2.2 Subsurface Investigation. Design Builder shall examine any subsurface conditions that are inconsistent with the Geotechnical Report, and along with University’s Representative substantiate these findings by written documentation and photography.

PART 2: PRODUCTS (Not Applicable) {Insert the words “Not Applicable” if not used.}

PART 3: EXECUTION (Not Applicable) {Insert the words “Not Applicable” if not used.}

END OF SECTION 01710

SECTION 01720

PREPARATION

{This section covers the Design Builder’s responsibility for field engineering and its related documents.}

# PART 1: GENERAL

* 1. RELATED DOCUMENTS

(Not Applicable) {Insert the words “Not Applicable” if not used.}

* 1. FIELD ENGINEERING
		1. Layout of the Work. Design Builder shall employ, at its own expense, a Registered Civil Engineer or Licensed Land Surveyor approved by University’s Representative to lay out the Work of the Project, and to establish all reference points and elevations required for the proper execution of the Work.

1. Layout shall include a legal description of the site.

* + 1. University’s Representative reserves the right to check the location and elevation of such layout’s stakes or reference points, and any work which is not correctly located shall be rejected.
		2. Actual field conditions deviation from the Drawings shall be reported to Design Builder’s Design Professionals and copied to University’s Representative before proceeding with the Work. Design Builder shall bear the expense of corrective work.
		3. Before proceeding with the Work, locate general reference points, establish monuments, and take action as is necessary to prevent their destruction; then lay out all lines, elevations, and measurements for building(s), grading, paving, utilities, and other part of the Work as may be necessary.
		4. Establish permanent monuments on curbs, manholes, or pavements, or with concrete embedded steel pipe with lead plug and brass nail, as approved.
	1. PROTECTION OF ADJACENT CONSTRUCTION
		1. Locate all known existing installations before proceeding with construction operations which may cause damage to such installations. The existing installations shall be kept in service where possible and damage to them shall be repaired with no adjustment of Contract Sum.
		2. If any other structures or utilities are encountered, request University’s Representative to provide direction on how to proceed with the Work.
		3. If any structure or utility is damaged, take appropriate action to ensure the safety of persons and property.

PART 2: PRODUCTS (Not Applicable) {Insert the words “Not Applicable” if not used.}

PART 3: EXECUTION (Not Applicable) {Insert the words “Not Applicable” if not used.}

END OF SECTION 01720

Section 01730

EXECUTION

{The following example deals mainly with new construction. With remodeling, this section will become more extensive and focus on areas that will be disturbed by remodeling operations. Include mechanical and electrical cutting and patching requirements and coordinate with Performance Specification Divisions 15 and 16.

In addressing remodeling requirements, paragraphs that addresses “Removal, Repair and Re-installation,” and “Delivery of Salvaged Materials,” may be appropriate and should be added here under Part 1. Also if there are any issues that need to be addressed regarding University work, a paragraph that addresses “Accommodating University Installations” should be added with a very brief sentence about coordination.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 BASIC INSTALLATION REQUIREMENTS

1.2.1 Recheck measurements and dimensions before starting each installation. Before beginning any installation, make provisions to avoid interference.

* + 1. Provide clearance and headroom. Utilize spaces efficiently so that adequate accessibility is retained for maintenance, repairs, modifications and additions. Relocate installed work which does not provide adequate accessibility.

1. Arrange pipes, ducts, raceways and equipment to permit ready access to valves cocks, traps, starters, motors, control components.

2. Arrange raceways, wiring and equipment to permit ready access to switches, motors and control components. Doors and access panels shall be kept clear.

1.2.3 Offsets and changes in direction of pipes, ducts and raceways shall be made as required to maintain proper headroom and clearances whether or not indicated on the drawings. Provide all traps, vents, fittings, junction boxes, connectors, etc., as required to effect these offsets and changes in direction.

1.2.4 Precedence of Installation Requirements.

1. Descriptive specification.

2. Product listing, classification, or certification.

3. Manufacturers’ installation instructions.

4. Trade association or referenced standards.

5. Most common trade practice.

1.3 CUTTING AND PATCHING

1.3.1 Summary. This section includes administrative and procedural requirements for cutting and patching

1. University Specification Sections pertaining to “Coordination” and the following paragraphs on “Selective Demolition” pertain to Cutting and Patching. Refer to other Sections for specific requirements and limitations applicable to Cutting and Patching of individual parts of the Work.

1.3.2 Quality Assurance. Provide workmanship in a manner that will produce cutting and patching to match and conform to existing conditions.

1. Requirements for Structural Work. Do not cut structural elements in a manner that would change their load-carrying capacity or load deflection ratio.

2. Operational Limitations. Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.

3. Visual Requirements. Do not cut and patch operating elements or related components in a manner that would, in the University’s Representative’s opinion, reduce the building’s aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace construction cut and patched in a visually unsatisfactory manner.

1. Repair and patch in areas where finishes have been visually disturbed by cutting and patching to the nearest intersections.

{Add the following paragraph if there is a concern for the quality of a certain part of the Work. This is an example only. Add or subtract as appropriate to deal with issues of visual quality or workmanship. OR, retain the number and add the words “Not Applicable.”}

2. {If possible retain original installer or fabricator to cut and patch the exposed work listed below. If it is impossible to engage the original installer or fabricator, engage another recognized experience and specialized firm.

1. Processed concrete finishes.

2. Firestopping.

3. Acoustical ceilings.

4. Finished wood flooring.

5. Carpeting.}

1.3.3 Warranty. Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.

1.4 SELECTIVE DEMOLITION AND DISPOSAL

1.4.1 Definitions.

1. Remove. Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

2. Remove and Salvage. Detach items from existing constructions and deliver them to University ready for reuse.

3. Remove and Reinstall. Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

4. Existing to Remain. Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

PART 2: PRODUCTS

2.1 Cutting and Patching. Use only materials for cutting, fitting, and patching which comply with the applicable Specification Sections, and which match adjacent materials. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3: EXECUTION

3.1 INSPECTION

3.1.1 Before proceeding meet at the Project site with the parties involved with cutting and patching. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective actions before proceeding.

3.2 PREPARATION

3.2.1 Temporary Support. Provide temporary support of work to be cut.

3.2.2 Protection. Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

3.2.3 Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.2.4 Avoid cutting existing pipe, conduit, or duct work serving the building, but schedule to be removed or relocated until provisions have been made to bypass them.

END OF SECTION 01730

Section 01740

CLEANING

{The following example covers both “Progress” and “Final” cleaning, including protection of adjacent and surrounding surfaces while cleaning operations are taking place. Although most Facility examples include “Final Cleaning” as a separate section, including all cleaning issues under one Section better coordinates the process. Edit as necessary to address any special needs of the Project.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 PROGRESS CLEANING AND PROTECTION

1.2.1 During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Notice of Completion.

1.2.2 Clean and maintain completed construction as frequently as necessary through the remainder of the Construction Work. Adjust and lubricate operable components to ensure operability without damaging effects.

1.2.3 Keep construction site and surrounding area clean and clear of dirt, debris, waste, and other similar materials. Perform, cleaning and removal at frequent intervals as necessary, through the duration of the construction period.

1.2.4 If cleaning and protection is not performed to the satisfaction of the University's Representative, University reserves the right to have cleaning performed by others at the Design Builder's expense. The University’s Representative shall provide written notice to Design Builder to cure cleaning and protection deficiencies; if Design Builder has not correct ed such deficiencies within 48 hours from receipt of notice the University shall have the right to correct such cleaning and protection deficiencies and offset the expense from the Contract Sum by change order.

1.2.5 Limiting Exposures. Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

1.3 FINAL CLEANING

1.3.1 General. Provide final cleaning as required and employ experienced workers or professional cleaners for final cleaning. Clean each surface or unity of Work to the condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer’s instructions.

PART 2: PRODUCTS

2.1. MATERIALS

2.1.1 Cleaning Agents. Use cleaning materials, agents and procedures recommended by the manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property, or that might damage finished surfaces.

PART 3: EXECUTION

3.1. EXECUTION REQUIREMENTS

3.1.1 Final Cleaning Requirements for Certifications of Final Completion. Complete the following cleaning operations before requesting inspection for Certification of Final Completion of the entire Project.

1. Clean Project site, yard and grounds in areas disturbed by construction activities, including landscape development areas, of rubbish, waste materials, litter and foreign substances. Sweep paved areas broom clean. Remove petro-chemical spills, stains and other foreign deposits. Rake grounds that are neither planted nor paved, to a smooth even-textured surface.

2. Remove tools, construction equipment, machinery and surplus material from the Site.

3. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition free of stains, films and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces.

4. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, man-holes, attics and similar spaces.

5. Broom clean concrete floors in unoccupied spaces.

6. Vacuum clean carpet and similar soft surfaces, removing debris and excess nap. Shampoo if required.

7. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.

8. Remove labels that are not permanent labels, or not required to remain.

9. Touch-up and otherwise repair and restore marred exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored, or that show evidence or repair or restoration. Do not paint over “UL” or similar labels, including mechanical or electrical name plates.

10. Wipe surfaces of mechanical and electrical equipment, elevator equipment and similar equipment. Remove excess lubrication, paint and mortar droppings and other foreign substances.

11. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

12. Replace air disposable filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills. Clean exposed surfaces of diffusers, registers, and grills. Clean ducts, blowers, and coils if units were operated without filters during construction.

13. Clean laboratory equipment to a sanitary condition, ready and acceptable for its intended use.

14. Clean light fixtures, lamps, globes and reflectors to function with full efficiency. Replace burned out bulbs, and defective and noisy starters in fluorescent and high intensity discharge light fixtures.

15. Leave the Project clean and ready for occupancy.

3.1.2 Pest Control. Engage an experienced licensed exterminator to make a final inspection, and rid the Project of rodents. insects, and other pests. Comply with regulations of University and local authorities.

3.1.3 Removal of Protection. Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.

3.1.4 Compliance. Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from site and dispose in a lawful manner off Facility.

3.1.5 Extra Materials. Where extra materials of value remain after completion of associated construction have become the University’s property, dispose of these materials as directed.

END OF SECTION 01740

Section 01750

STARTING AND ADJUSTING

{The following Section should be coordinated with Divisions 15 and 16 of the Performance Specifications as well as with the Facility department whose responsibility it is to operate and maintain equipment of the project.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

1.1.1 Specification Division 15 “Mechanical,” and Division 16 “Electrical” are related to this Section.

1.2 LOG OF PROCEDURES AND RESULTS

1.2.1 Maintain log showing results of Starting and Adjustments and provide copy to University’s Representative.

{The operation of “Starting and Adjusting” should be logged including test results to assure that the required procedures have been followed. If any particular procedures are required over and above its corresponding Performance Specification Division 15 or 16, include here.}

1.3 GENERAL CHECK-OUT PROCEDURES

1.3.1 Follow manufacturer’s requirements and recommendations for Starting and Adjusting, including any University requirements that may be listed in the Contract and Construction Documents.

1.4 ENVIRONMENTAL AND OCCUPANCY LOADS

1.4.1 {State the requirements, if any, for adjustments to meet environmental requirements and occupancy loads. OR, retain the number and add the words “Not Applicable.”}

1.5 DURATION

1.5.1 {If there are any length of testing requirements that are not included in Performance Specification Divisions 15 or 16, state them here. OR, retain the number and add the words “Not Applicable.”}

1.6 BALANCING INSTRUCTIONS

1.6.1 {Note summary balancing instructions and coordinate with requirements of Performance Specification Divisions 15 and 16. OR, retain the number and add the words “Not Applicable.”}

PART 2: PRODUCTS (Not Applicable) {Insert the words “Not Applicable” if not used.}

PART 3: EXECUTION (Not Applicable) {Insert the words “Not Applicable” if not used.}

END OF SECTION 01750

Section 01760

PROTECTION OF INSTALLED CONSTRUCTION

{This Section is intended to address protection issues for products and finishes so that everything is included in one place.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 GENERAL

1.2.1 Protection from the Elements. Protect products and work in place from damage or deterioration due to sun, rain, freezing or other adverse environmental elements.

1.2.2 Protection from Vandalism. Secure Project to the extent necessary to prevent damage due to vandalism. If necessary to protect the Project, provide security system or security personnel.

1.2.3 Protection from Accidental Damage. Protect products and work in place to minimize the possibility of accidental damage occurring due to the moving of products or the actions of workers on the Project.

1.2.4 Other {Insert text OR retain the number and insert the words “Not Applicable.”}

PART 2: PRODUCTS (Not Applicable) {Insert the words “Not Applicable” if not used.}

PART 3: EXECUTION (Not Applicable) {Iinsert the words “Not Applicable” if not used.}

END OF SECTION 01760

## SECTION 01770

CLOSEOUT PROCEDURES

{This section provides for a discussion of the facility's Closeout Procedural requirements for the project and should communicate the "who," "how,” and “when,” for the process. The "what" and "what form” is to be included in General Requirements Section "Closeout Submittals." Although CSI suggests that the two be separated, on smaller projects it may be beneficial to combine the two sections and name it General Requirements Section "Closeout Procedures and Submittals.”}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 GENERAL PROCEDURES FOR CLOSEOUT

1.2.1 The procedures for Closeout are as follows:

1. Punch List. The Final Punch List shall be subject to review and inspection by University. Design Builder and University will conduct a Final Inspection walk through to verify that all Work required by the Final Punch List has been completed to the satisfaction of the University. In attendance at this shall be Design Builder with its appropriate subcontractors, and the University's Representative and Inspection personnel.

2. Coordination with University's Inspection. University will conduct a Final Inspection to verify that the Work has been done in accordance with the requirements of the Contract. Design Builder shall coordinate this inspection with the completion the Work including all Punch‑List items. Results of this inspection and review of Punch‑List items shall not relieve Design Builder from its responsibility of fulfilling the requirements of the Contract Documents.

3. Occupancy and Use Releases. {If there are any occupancy inspections required on this project, e.g. State Fire Marshal inspection, note here the procedures that will be followed in the process. OR retain the number and add the words “Not Used.”}

4. Security Change‑over. Prior to changing the security responsibilities from Design Builder to University, Design Builder shall meet with University and coordinate any security change‑over requirements. Design Builder's security personnel shall be in attendance at this meeting.

1.3 WARRANTIES

 1.3.1 General. This section specifies the general administrative and procedural requirement for warranties required by the Contract Documents, including manufacturer's standard guarantees on products, and special guarantees.

1. Guarantees for more than the period required by the General Conditions and specified in individual sections require a written guarantee by Design Builder and Subcontractor. Refer to individual section to verify if longer guarantees are required. See exhibits for Form of Guarantee.

2. Standard Product Guarantees. Preprinted written guarantees that are published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the University.

3. Special Guarantees are written warranties required Documents, either to extend time limits provided by standard guarantees or to provide greater rights for the University.

4. Guarantees from Subcontractors shall not limit Design Builder's warranties and guarantees to University. Whenever possible, Design Builder shall cause warranties of Subcontractors to be made directly to University. If such warranties are made to Design Builder, Design Builder shall assign such warranties to University prior to final payment.

* + 1. Disclaimers and Limitations. Manufacturer's disclaimers and limitations on product guarantee do not relieve the Design Builder of the requirements of guarantee required by the Contract Documents where the Work incorporates the products of any Manufacturer nor do such disclaimers excuse those suppliers, Manufacturers, and Subcontractors who are required to countersign special guarantees with the Design Builder.

1.3.3 Guarantee Requirements.

1. Starting Time. Guarantees shall begin at the Date of Final Acceptance unless specifically called for differently or arranged mutually differently in writing by the parties involved.

2. Related Damages and Losses. When correcting guaranteed Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of guaranteed work without cost to University.

3. Reinstatement of Guarantee. When Work covered by a guarantee has failed and been corrected by replacement or rebuilding, reinstate the guarantee by written endorsement. The reinstated guarantee shall be equal to duration of balance of the original guarantee.

4. Replacement Cost. Upon determination that Work covered by a guarantee has failed, promptly replace or rebuild the Work to an acceptable condition complying with the requirements of Contract Documents. The Design Builder is responsible for the cost of replacing or rebuilding detective Work regardless of whether the University has benefited from use for the Work through a portion of its anticipated useful service life.

5. University's Recourse. Written guarantees made to the University are in addition to implied guarantees, and shall not limit the duties, obligations, rights or remedies otherwise available under the law, nor shall guarantee periods be interpreted as limitations on time in which the University can enforce such other duties, obligations, rights or remedies, including but not limited to the Guarantee to Repair Period in the General Conditions.

.1 The University reserves the right to reject guarantees and to limit selections to products with guarantees which do not conflict with requirements of the Contract Documents.

.2 The University reserves the right to refuse to accept Work for the Project where a special guarantee, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented so that entities required to countersign such commitments are willing to do so.

.3 If a special guarantee is required to be executed by the Design Builder or the Design Builder and a Subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft for the University's Representative's approval prior to final execution.

1.4 RECORD DRAWINGS

1.4.1 General. Prior to Closeout all Record Drawings required by the Contract Documents shall be assembled and submitted as part of the Closeout Procedures.

1.5 OPERATING AND MAINTENANCE MANUALS AND DATA

1.5.1 General. Administrative and procedural requirements for Operating and Maintenance Manuals and Data including the following:

1. Preparation and submittal of Operating and Maintenance Manuals and Data for building operating systems or equipment.

2. Preparation and submittal of instruction manuals covering the care, preservation and maintenance of architectural products and finishes.

1.5.2 Related Work. The following related work specified elsewhere is included as part of the Closeout requirements.

1. Special operating and maintenance data requirements for specific pieces of equipment or building operating systems are included in the appropriate Specification Sections of Divisions 2 through 16.

1. General requirements for submittal of Record Documention are included in University Specification Section 01320 “Construction Progress Documentation."

3. Training of the University's operating personnel in operation and maintenance of building systems and equipment is covered in University Specification Section 01820.

1.5.3 Maintenance Manual Preparation. In preparation of Maintenance Manuals, use personnel thoroughly trained and experienced in operation and maintenance of the equipment or system involved.

1. Where written instructions are required, use personnel skilled in technical writing to the extent necessary for communication of essential data.

2. Where Drawings or diagrams are required, use competent draftsman capable of preparing professional, legible and understandable Drawings.

1.6 PHOTOGRAPHS

1.6.1 General. Prior to Closeout all photographs required by the Contract Documents shall be assembled and submitted with the Closeout Submittal Requirements.

1.7 TOOLS, SPARE PARTS, EXTRA STOCK

1.7.1 General. Prior to Closeout all Tools, Spare Parts, and Extra Stock required by the Contract Documents shall be assembled and submitted with the Closeout Submittal Requirements. Refer to each section of the Specifications for what and how many Tools. Spare Parts, and Extra Stock are required.

1.8 FINAL PAYMENT REQUEST

1.8.1 General. Prior to Closeout prepare the Design Builder's Final Payment Request shall be assembled and submitted with the Closeout Submittal Requirements.

1.9 LIST OF OUTSTANDING CLAIMS

1.9 General. Prior to Closeout a list of all Outstanding Claims shall be assemble and submitted with the Closeout Submittal Requirements. No Claims will be accepted by the University after Design Builder submits its required documents and materials for consideration of Project Closeout.

1.10 RESOLVED PUNCH‑LIST

1.10 General. Prior to Closeout the University's Final Punish‑List items, required corrected by Design Builder shall be corrected.

1.11 FINAL METER READINGS

1.11 General. Design Builder shall take and verify with University's Representative the Final Meter Reading.

1. 12 CONSENT OF SURETY AND FINAL CERTIFICATES

* 1. General. Prior to Closeout consent of Surety and Final Certificated required by the Contract Documents shall be assembled and submitted with the Closeout Submittal Requirements.

1.13 MAINTENANCE AGREEMENTS

1.13 General. Prior to Closeout all Maintenance Agreements required by the Contract Documents shall be assembled and submitted with the Closeout Submittal Requirements.

PART 2: PRODUCTS (Not Applicable) {Insert the words “Not Applicable” if not used.}

PART3: EXECUTION (Not Applicable) {Insert the words “Not Applicable” if not used.}

END OF SECTION 01770

**SECTION 01780**

**CLOSEOUT SUBMITTALS**

{This section describes the closeout requirements of the project and communicates the “what,” and in “what form” for the procedures and submittals.}

PART 1: GENERAL

* 1. RELATED DOCUMENTS

1.1.1 General Requirements Section Guarantees, “Warranties, Bonds, Service & Maintenance Contracts.”

* 1. GENERAL REQUIREMENTS FOR SUBMISSION

1.2.1 General. Include requirements.

1.3 RECORD DRAWINGS

1.3.1 General. Include with submittal.

1.4 SUBMITTAL FILES

1.4.1 General. Include with submittal.

1.5 OPERATING AND MAINTENANCE MANUALS AND DATA

1.5.1 Form of Submittal. Prepare data in the form of an instructional manual for use by University's personnel in the following format:

1. Size: 8‑1/2 inch x 11 inch.

2. Paper: 20‑pound, minimum, white, for typed pages.

3. Test: Manufacturers' printed or neatly typewritten data.

4. Drawings: Fold larger drawings to the size of the text pages and provide reinforced punched binder tab, which is bound with the text.

5. Provide fly‑leaf for each separate product or each piece of operating equipment with indexed tabs, and typed descriptions of products and major component parts of equipment.

6. On the Cover, identify each volume with typed or printed title, *"Operating and Maintenance Instructions”* including Title of Project and identity of general subject matter covered in the volume.

7. Provide commercial quality 3‑ring binders with durable and cleanable plastic covers. When multiple binders are used, correlate the data into related groups.

8. Quantity: Three (3) sets for each manual.

1.5.2 Contents of Manuals.

1. Include Table of Contents in each volume, neatly typewritten.

2. Identify Contractor, name of responsible principal, address, and phone number.

3. List each product included, indexed to the content of the volume.

4. List, with each product, the name, address, and telephone number of:

.1 Subcontractor or installer.

.2 Maintenance contractor, as appropriate.

.3 Identify area of responsibility of each of the previously mentioned parties.

.4 Nearest source of supply for parts and replacement.

5. Identify each product by product name and other identifying symbols as set forth in the contract documents.

1.5.3 Product Data. Include only those sheets which are pertinent to the specific product. Each sheet to:

1. Clearly identify the specific product or part installed.

2. Clearly identify the data applicable information.

1.5.4 Drawings. Supplement product data with drawings as necessary to clearly illustrate relations of component parts of equipment and systems, and control and flow diagrams.

 1. Coordinate drawings with information in project record documents to assure correct illustration of completed installation.

2. Do not use project record documents as maintenance drawings.

3. As required to supplement product data for the particular installation. Organize in a consistent format under separate headings for different procedures. Provide a logical sequence of instructions for each procedure.

1. Copy of each warranty, bond, and issued. Provide information sheet for the University's personnel, giving:

.1 Proper procedures in the event of failure.

.2 Circumstances which might affect the validity of warranties or bonds.

1.6 MATERIAL AND FINISHES MAINTENANCE MANUALS

1.6.1 Submittal. Provide Material and Finishes Maintenance Manuals with one section for architectural products, including applied materials and finishes, and a second for products designed for moisture protection and products exposed to the weather.

1. Refer to individual Specification Sections for additional requirements on care and maintenance of materials and finishes.

1.6.2 Architectural Products. Provide manufacturer's data and instructions on care and maintenance of architectural products, including applied materials and finishes.

1. Manufacturer's Data. Provide complete information on architectural products, including the following, as applicable:

.1 Manufacturer's catalog number.

 .2 Size.

 .3 Material composition.

 .4 Color.

 .5 Texture.

 .6 Reordering information for specially manufactured products.

2. Care and Maintenance Instructions. Provide information on care and maintenance, including manufacturer's recommendations for types of cleaning agents to be used and methods of cleaning. Provide information regarding cleaning agents and methods that could prove detrimental to the product. Include manufacturer's recommended schedule for cleaning and maintenance.

1.6.3 Moisture Protection and Weather Exposed Products. Provide complete manufacturers data with instructions on inspection, maintenance and repair of products exposed to the weather or designed for moisture‑protection purposes.

1. Manufacturer's Data. Provide manufacturer's data giving detailed information, including the following, as applicable:

.1 Applicable standards.

.2 Chemical composition.

.3 Installation details.

.4 Inspection procedures.

.5 Maintenance information.

.6 Repair procedures.

1.7 MANUALS FOR EQUIPMENT AND SYSTEMS

1.7.1 Submittal. Submit eight copies of the complete manual in its final form.

1.7.2 Content. Content, for each unit of mechanical equipment and each mechanical system, shall be as follows:

1. Description of unit or system, and component parts:

.1 Function, normal operating characteristics, and limiting conditions.

.2 Performance curves, engineering data, and tests.

.3 Complete nomenclature and commercial numbers of replaceable parts.

2. Operating procedures:

.1 Start‑up, break‑in, and normal operating instructions.

.2 Regulation, control, stopping, shut‑down, and emergency instructions.

.3 Summer and winter operating instructions.

.4 Special operating instructions.

3. Provide technical information regarding maintenance procedures:

.1 Routine operations.

.2 Guide to “trouble‑shooting."

.3 Disassembly, repair, and re-assembly.

.4 Alignment, adjusting, and checking.

4. Provide servicing and lubrication schedule, with list of lubricants required.

5. Provide manufacturer's printed operating and maintenance instructions.

6. Provide description of sequence of operation by control manufacturer.

7. Provide original manufacturer's parts list, illustrations, current prices, recommended quantities to be maintained in storage, assembly drawings, and diagrams required for maintenance.

.1 Predicted life of parts subject to wear.

.2 Items recommended to be stocked as spare parts.

8. Provide as‑installed control diagrams by controls manufacturer.

9. Provide design builder’s and subcontractors' coordination drawings and color coded piping diagrams, marked up "As‑built” as specified in Section 01770.

10. Provide chart of valve tag numbers with the location and function of each valve.

11. Provide other data as required by the various Specification Sections.

1.8 ELECTRICAL AND ELECTRONIC SYSTEM CONTENTS

1.8.1 Submit information and data for the following:

1. Description of system and components parts as appropriate.

.1 Function, normal operating characteristics, and limiting conditions.

.2 Performance curves, engineering data, and tests.

.3 Complete nomenclature and commercial numbers of replaceable parts.

2. Circuit directories of panel boards.

.1 Electrical service.

.2 Controls.

.3 Communications.

3. Color‑coded wiring diagrams, marked up “As‑built" as specified.

4. Operating Procedures:

.1 Routine and normal operating instructions.

.2 Sequences required.

.3 Special operating instructions.

5. Maintenance procedures:

.1 Routine operations.

 .2 Guide to "trouble‑shooting."

.3 Disassembly, repair, and re-assembly.

.4 Adjustment and checking.

6. Manufacturer's printed operating and maintenance instructions.

7. Original manufacturer's parts list, illustrations, current prices, recommended quantities to be maintained in storage, assembly drawings and diagram required for maintenance.

.1 Predicted life of parts subject to wear.

.2 Items recommended to be stocked as spare parts.

8. Other data as required in the individual sections.

.1 Prepare and include additional data as may be required for instruction of the University's personnel.

.2 Additional requirements for operating and maintenance data as specified in the individual sections.

.3 Provide complete information for products specified in the individual sections.

1.9 SUBMITTAL SCHEDULE FOR MANUALS

1.9.1Submit two copies of the preliminary draft of proposed formats and outlines of contents prior to preparation of data. University's Representative will review the draft and return one copy with comments.

1.9.2Submit one copy of the completed data in final form 15 days prior to Substantial Completion. A copy will be returned with comments at Substantial Completion. No final inspection will be made until the required data has been submitted and found to be satisfactory.

1.9.3Submit specified number of copies of approved data in final form ten days after final inspection.

1.10 PHOTOGRAPHS

1.10.1General. Include with submittal.

1.11 TOOLS, SPARE PARTS, EXTRA STOCK

1.11.1General. Include with submittal.

1.12 FINAL PAYMENT REQUEST

1.12.1General. Include with submittal.

1.13 LIST OF OUTSTANDING CLAIMS

1.13.1General. Include with submittal.

1.14 RESOLVED PUNCH‑LIST

1.14.1General. Include with submittal.

1.15 FINAL METER READINGS

1.15.1General. Include with submittal.

1.16 CONSENT OF SURETY AND FINAL CERTIFICATES

1.16.1General. Include with submittal.

1.17 MAINTENANCE AGREEMENTS

1.17.1General. Include with submittal.

PART 2: PRODUCTS (Not Applicable) {Insert the words “Not Applicable” if not used.}

PART 3: EXECUTION (Not Applicable) {Insert the words “Not Applicable” if not used.}

END OF SECTION 01780

SECTION 01790

GUARANTEES, WARRANTIES, BONDS, SERVICE & MAINTENANCE CONTRACTS

PART 1: GENERAL

1.1 Guarantees from Subcontractors shall not limit Design Builder's warranties and guarantees to University. Whenever possible, Design Builder shall cause warranties of Subcontractors to be made directly to University. If such warranties are made to Design Builder, Design Builder shall assign such warranties to University prior to final payment.

1.2 FORM OF GUARANTEE

1.2.1 Submit written guarantees, in the form contained at the end of this Section.

1.3 SUBMITTAL REQUIREMENTS

1.3.1 Assemble required guarantees, bonds, and service and maintenance contracts.

1.3.2 Number of original signed copies required: 2 each.

1.3.3 Table of Contents: Neatly typed and in orderly sequence. Provide complete information for each item as follows:

1. Product or Work item.

2. Firm name, address, and telephone number; and name of principal.

3. Scope.

4. Date of beginning of guarantee, bond, or service and maintenance contract.

5. Duration of guarantee, bond, or service and maintenance contract.

6. Design Builder's name, address, and telephone number; and name of principal.

7. Provide information for University's personnel.

 .1 Proper procedure in case of failure.

 .2 Circumstances which might affect the validity of guarantee or bond.

1.4. FORM OF SUBMITTALS

1.4.1 Prepare in duplicate packets.

* + 1. Format:
1. Size 8 1/2-inch x 11-inch sheets punched for 3-ring binder. Fold larger sheets to fit into binders.
2. Identify each packet on the cover with typed or printed title, “GUARANTEES AND BONDS,” and the following:

 .1 Title of Project.

.2 Name of Design Builder.

1.4.3 Binders: Commercial quality, 3-ring, with durable and cleanable plastic covers.

1.5 TIME OF SUBMITTALS

1.5.1 Within 10 days after date of Substantial Completion, prior to request for final payment.

1.5.2 For Work activities, where Final Completion is delayed materially beyond the date of Substantial Completion, provide updated submittal within 10 days after Final Completion, listing the date of Final Completion as the start of the Guarantee To Repair Period.

1.6 SUBMITTALS REQUIRED

* + 1. Submit guarantees, bonds, and service and maintenance contracts specified in the individual Sections.

PART 2: PRODUCTS (Not Applicable) {Insert the words “Not Applicable” if not used.}

PART3: EXECUTION (Not Applicable) {Insert the words “Not Applicable” if not used.}

## GUARANTEE

GUARANTEE FOR (the “Contract”), between

The Regents of the University of California (“University”) and

 (“Design Builder”).

,

hereby guarantees to University that all materials, furnishings and equipment which we have supplied and installed are new, unless otherwise specified, and that all Work is of good quality, free from faults and defects in engineering and design, materials, construction, manufacture and workmanship, and in conformance with the Contract Documents and Construction Documents and in conformance with all applicable codes and standards.

The undersigned further agrees that, if at any time within two years after the date of Substantial Completion the undersigned receives notice from University that the aforesaid portion of the Work is unsatisfactory, faulty, deficient, incomplete, or not in conformance with the requirements of the Contract, the undersigned will, within 10 days after receipt of such notice, correct, repair, or replace such portion of the Work, together with any other parts of the Work and any other property which is damaged or destroyed as a result of such defective portion of the Work or the correction, repair, or replacement thereof; and that it shall diligently and continuously prosecute such correction, repair, or replacement to completion.

In the event the undersigned fails to commence such correction, repair, or replacement within 10 days after such notice, or to diligently and continuously prosecute the same to completion, the undersigned, jointly and severally, do hereby authorize University to undertake such correction, repair, or replacement at the expense of the undersigned; and Design Builder will pay to University promptly upon demand all costs and expenses incurred by University in connection therewith. If we fail to fulfill the preceding obligations, and if the University brings action to enforce this warranty, we agree to pay the University's attorneys' fees and expenses incurred in connection therewith, and interest at the maximum rate allowed by law.  This warranty is in addition to, and not in substitution of, the rights and remedies available under the Contract Documents or pursuant to applicable law.  The warranty is for the benefit of the University.

### SUBCONTRACTOR

Date:

Signed:

Typed Name:

Name of Firm:

Contractor License Classification and Number:

Address:

Telephone Number:

### DESIGN BUILDER

Date:

Signed:

Typed Name:

Name of Firm:

END OF SECTION 01790

Section 01810

COMMISSIONING

{This Section on “Commissioning” is an example of a detailed specification on the process of making the building “work” as it was designed prior to occupancy. The University recommends that the Facility consider including this on complex projects, such as laboratories, hospitals, etc. This process adds cost to the project and requires the Facility to be ready to oversee the process. Because qualified Facility staff or consultants are needed to make Commissioning work satisfactorily; the Facility should consider making “Commissioning” an alternate so that the Facility can use it as a basis for determining the cost/benefit. On smaller or non-complex projects it may be considered overkill, and the Facility needs to decide whether the added cost is worth it, and/or to what degree the occupants might be able to deal with the regular problems of making the building work after occupancy.

The Section includes a prequalification section for prequalifying the Design Builder’s Test Engineer. If the Facility prefers to include the prequalification of the Design Builder’s Test Engineer as part of the Prequalification Documents during the prequalification and Proposal process remove it from this Section.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

1.1. Specification divisions 11, 14, 15 and 16 equipment and systems.

1.2 SCOPE OF THE WORK

1.2.1 The intent of this section is to require the Design Builder to provide qualified testing expertise to organize, schedule, coordinate and perform functional performance testing as outlined in the contract documents.

1.2.2 Provide the services of a Test Engineer (TE), acceptable to the University, who is qualified in planning and performing testing, and troubleshooting equipment and systems, as described in this Section.

1.3 GENERAL

1.3.1 Purpose. The purpose of the commissioning process is to provide the University assurance that systems have been installed in the prescribed manner and will operate within the performance guidelines. Commissioning is intended to enhance the quality of system start­up and aid in the orderly transfer of system to beneficial use by the University.

1.3.2 Design Builder’s Responsibility. The Design Builder verifies installation, provides scheduling and coordination of commissioning activities, performs training, starts up equipment, conducts functional performance testing, corrects deficiencies, performs re-tests, and provides documentation of the process.

1.3.3 University’s Commissioning Agent. The Commissioning Agent, hired directly by the University, provides the University an unbiased, objective view of the systems, installation, documentation, operation, and performance.

1.3.4 Commissioning Observation. Commissioning procedures and results will be observed by the University designated witnesses (Commissioning Agent and/or University staff). The Design Builder is expected to verify the functional readiness of systems to be tested prior to performing the tests in the presence of the University witness(es). A high rate of test failure will indicate that the Design Builder has not adequately verified the readiness of the systems.

1.4 QUALIFICATIONS OF DESIGN BUILDER’S TEST ENGINEER

1.4.1 The Test Engineer shall satisfy the following requirements:

1. Have extensive experience in startup and troubleshooting HVAC, refrigeration, hot water heating, chilled water, steam, plumbing, electrical, emergency power, fire alarm, life safety, laboratory and medical services systems of similar complexity to those contained in these documents.

2. Have excellent working knowledge of complex environmental, fire alarm, and electric power control and facility management systems; be capable of understanding control operating system and control code; be capable of trouble-shooting control code and recommending necessary modifications.

3. Be competent in system design and intent.

4. Be knowledgeable in test and balance of both air and hydronic systems.

5. Have excellent communication and writing skills, be highly organized, and be able to work well with both management and trades Design Builders.

1.4.2 A Bachelors degree in Mechanical Engineering and P.E. certification, with extensive practical field experience, is preferred; however, other technical training and experience with extensive practical field experience field will be considered.

1.4.3 The Design Builder shall submit the Test Engineer’s resume and sample documents in a timely fashion to the University's Representative for review and approval; include the following:

1. Education and technical training.

2. Present employment:

.1 Company name and address.

.2 Present title and job description.

.3 History of employment (include dates and positions held).

3. Relevant work experience:

.1 Job name.

.2 Position held.

.3 Work history (include dates and positions held).

4. Example of prior building commissioning project performed by the proposed TE.

.1 Submitted project shall be similar in commissioning scope and complexity.

.2 Include construction/commissioning schedule developed by proposed TE

.3 lnclude test procedures developed by proposed TE

.4 Include final report prepared by proposed TE.

1.4.4 To avoid potential conflicts of interest, the Test Engineer cannot be financially associated with any of the Design Builder’s Subcontractor’s or vendors performing the Work.

1.4.5 The University's Representative reserves the right to personally interview the Test Engineer candidate prior to accepting placement in the position. Final approval of the Test Engineer will be by the University's Representative.

1.5 RESPONSIBILITIES OF DESIGN BUILDER’S TEST ENGINEER

1.5.1 The Design Builder’s Test Engineer shall:

1. Review and approve all functional performance test results and documentation required by the contract documents; for all equipment and systems; as performed by Subcontractors, vendors and others.

2. Develop schedules for all testing; integrate testing into the master construction activity schedule; and coordinate all Subcontractor testing as required.

3. Develop test procedures and forms for documentation of all equipment's tests, system functional tests, and cross system functional tests. Test procedures shall be in accordance with equipment manufacturer's recommendations, where applicable. Test procedures shall fully describe system configuration and steps required for each test; appropriately documented so that another party can repeat the tests with virtually identical results.

4. Submit test procedure schedule, procedures, forms, and other documentation to the University's Representative for approval six months prior to starting any testing.

5. Coordinate directly with each Subcontractor on the project specific to their responsibilities and contractual obligations.

6. Provide qualified personnel for participation in commissioning tests, including seasonal testing required after the initial commissioning.

7. Provide engineering and technical expertise to oversee and direct the correction of deficiencies found during the commissioning process.

8. Observe the Start-up and initial testing of equipment by the Design Builder and Subcontractors; and then all final tests of equipment and systems.

9. Manage all cross system testing such as (but not limited to) HVAC, building automation, fire alarm, emergency power, life safety, elevators.

10. Note any inconsistencies or deficiencies in system operations and enforce system compliance or recommend modifications to system design which will enhance system performance.

11. Coordinate the required Design Builder's, and University's testing participation and approval procedures, after verifying that pretests have been satisfactorily conducted and final tests are ready to be performed.

12. In the event that a functional test fails, the cause of failure shall be determined and rectified as soon as possible, and then re-tested. If more than three functional tests of the same system(s) are required, the Design Builder shall reimburse all associated costs for the extraordinary participation of the University's Representatives and/or its University’s Commissioning Agent, as required by the particular test being performed.

13. Review operation and maintenance information and as‑built drawings provided by the various Subcontractors and vendors for verification, organization, and distribution.

14. Obtain all documentation from tests and assemble a final test report to be submitted to University's Representative for approval.

15. Oversee and/or provide training for the systems specified in the Specifications, with coordination by the Specification divisions 11, 14, 15 and 16 Design Builder or Subcontractors, whoever performed the Work.

1.6 UNIVERSITY’S COMMISSIONING AGENT

1.6.1 The University will appoint a staff engineer or hire a consultant to act as Commissioning Agent to work with the Test Engineer in the development and execution of the commissioning program.

1.6.2 The duties of the Commissioning Agent are:

1. Review the Design Builder's systems Start-up plans.

2. Review the Design Builder's equipment and component test procedures.

3. Review the Design Builder's systems and inter‑systems functional performance test procedures.

4. Witness, verify and approve satisfactory completion of equipment and component tests and systems and inter‑systems functional performance tests.

5. Review and approve specified documentation.

6. Coordinate testing, adjusting and balancing (TAB) work.

7. Coordinate participation of University personnel involved with equipment component and systems performance verification and participation required training.

8. When commissioning has been successfully completed, Testing Engineer shall make written recommendation that the University grant final acceptance related to commissioning all systems governed by this section.

1.6.3 The Commissioning Agent is expected to communicate as follows:

l. The Commissioning Agent will formally communicate with the Design Builder via approved project channels. It is expected, however, that informal communication and coordination will be conducted directly with the Test Engineer. As the University's commissioning representative, it is expected that the Commissioning Agent will communicate directly with Design Professionals, as may be appropriate.

2. The Commissioning Agent will keep the University advised regarding commissioning activities, progress, problems which may develop, solutions to problems, systems performance, and schedules.

1.7 COORDINATION

1.7.1 Coordination and Management. Provide overall coordination and management of the commissioning program as specified herein. The commissioning process will require cooperation of the Design Builder, Subcontractors, Vendors, Commissioning Agent, and University’s Representative and Facilities Personnel. The Commissioning team shall be comprised of the following:

1. Design Builder

.1 Design Builder’s Project Manager.

.2 Design Builder’s Design Professional – Architect.

.3 Design Builder’s Test Engineer.

.4 Design Builder’s Design Professional - Mechanical Engineer.

.5 Design Builder’s Design Professional - Electrical Engineer.

.6 Subcontractors as required by the Design Builder.

2. University:

.1 University’s Commissioning Agent.

.2 University’s Representative(s).

.3 University’s Facilities Personnel.

1.8 SUBMITTALS

1.8.1 General. Submit the following in accordance with Conditions of the Contract and University Specification Sections.

1.8.2 Commissioning Plan. Submit commissioning plan to the University's Representative for review and approval within 90 calendar days of Construction Notice to Proceed.

1.8.3 Commissioning Schedule. Submit commissioning schedule to the University's Representative for review and approval within 90 calendar days of Construction Notice to Proceed.

1.8.4 Start-up Plan. For each piece and equipment or system for which formal Start-up is specified elsewhere in the contract documents, submit to the University's Representative for review and approval. Obtain approval of the Start-up plan prior to beginning Start-up activities.

1. Start-up schedule.

2. Names of firm’s individuals required to participate.

3. Detailed Start-up procedures.

4. Start-up data forms.

1.8.5 Test Equipment Identification List. For each instrument, sorted according to intended use, submit to the University's Representative for review and approval:

1. Manufacturer.

2. Model Number.

3. Serial Number.

4. Calibration Certification.

5. Range.

6. Accuracy.

7. Resolution.

8. Intended Use.

1.8.6 Operations and Maintenance Manuals. Submit to University's Representative prior to the start of training.

1.8.7 Start-up Procedures. Submit Start-up procedures for equipment for which formal Start-up is specified elsewhere, to the University's Representative for review and approval. These procedures will be reviewed for technical depth, clarity of documentation, and completeness.

1.8.8 Start-up Data Forms. Submit Start-up data forms for equipment for which formal Start-up is specified elsewhere, to the University's Representative for review and approval.

1.8.9 Testing, Adjusting and Balancing (TAB) Data Forms. Review and submit TAB data forms to the University's Representative for review and approval.

1.8.10 Testing, Adjusting and Balancing (TAB) Procedures. Review and submit written TAB procedures to the University's Representative for review and approval.

1.8.11 Testing, Adjusting and Balancing (TAB) Report. Review and submit written TAB report to the University's Representative for review and approval.

1.8.12 Functional Performance Test (FPT) Procedures. Submit FPT procedures for equipment and systems specified to the University's Representative for review and approval.

1.8.13 Functional Performance Test (FPT) Data Forms. Submit FPT data forms for equipment and systems specified to the University's Representative for review and approval.

1. Identify each FPT test data form by a unique designator consisting of the applicable FPT procedure designator followed by a dash digit suffix to distinguish multiple repetitions of the same procedure.

2. Include space to record

.1 Description of the procedure.

.2 Whether the form is for a re-test of a failed procedure.

.3 Identification and location of the equipment being tested.

.4 Identification of instrumentation used, by serial number.

.5 Observed conditions at each step of the procedure.

.6 Acceptable Results.

.7 Date of the test.

.8 Names of technicians performing the procedure.

.9 Name and signature of the Test Engineer.

.10 Name and signature of the Commissioning Agent or University's designated witness. Signature of witness shall only indicate concurrence with reported results and observations. Acceptance of the results will be reported separately by the Commissioning Agent after review of the FPT data forms.

1.8.14 Functional Performance Test (FPT) Deficiency Report Forms. Submit FPT deficiency report forms to the University's Representative for review and approval. Include space to record:

1. Associated FPT test data form number.

2. Date of test.

3. Name of person reporting the deficiency.

4. Description of the observations associated with the failure of the test.

5. Cause of the failure, if apparent at the time of the test.

6. Date and description of corrective action taken.

7. Name and signature of person taking corrective action.

8. Schedule for re-test.

1.9 COMMISSIONING PLAN

1.9.1 Develop a commissioning plan to identify how commissioning activities will be integrated into general construction and trade activities. The plan is the key means for the Test Engineer to inform all parties as to how each system functions independently and with respect to other systems. The plan shall be updated regularly and redistributed to the commissioning team for review and comment. The intent of this plan is to evoke questions, expose issues, and resolve them with input from the entire commissioning team early in Construction Work. The commissioning plan shall identify how commissioning responsibilities are distributed.

1. Include an organizational chart showing lines of communication and authority of the Test Engineer relative to key Design Builder positions and to key Subcontractors.

2. Identify who will be responsible for producing the various procedures, reports, University's notifications and forms required.

3. Include the commissioning schedule.

4. Describe the test/acceptance procedure.

5. Identify which Subcontractors will participate in each of the tests.

6. Identify instrumentation required for each test.

7. Identify who will provide instrumentation for each test.

8. Operational Description. This shall include, for example, the design criteria, design intent, code requirements, specifics of the equipment to be provided, sequences of operation, operating priorities, protocols, etc.

1.10 SCHEDULE

1.10.1 Commissioning Schedule. Integrate functional performance testing and commissioning requirements into the Contract Schedule. Commissioning scheduling is the responsibility of the Design Builder.

1. Prior to the beginning of Start-up or functional performance testing activities, update the schedule of commissioning activities monthly.

2. Two weeks prior to the beginning of Start-up or functional performance testing activities, provide a detailed two week Look Ahead schedule. Thereafter, update the two week Look Ahead schedule weekly for the duration of commissioning for that construction phase. The two week Look Ahead schedule shall identify the date, time, beginning location, Design Builder personnel required, and anticipated duration for each Start-up or test activity.

1.10.2 Commissioning of systems shall proceed per the criteria established in the specific sections that follow, with activities to be performed on a timely bases. Commissioning of systems may proceed prior to final completion of systems, The Test Engineer must be available to respond promptly to avoid delay to the Contract Schedule or Contract Time.

1.10.3 Problems observed shall be addressed immediately, in terms of notification to responsible parties, and actions to correct deficiencies.

1.11 COORDINATION WITH UNIVERSITY'S REPRESENTATIVE’S WITNESS

1.11.1 The University's Representative will witness all Start-up and test activities specified. The University's Representative will designate witnesses and alternates for each activity.

1.11.2 Notify the University's Representative in writing of the date, time, location, and anticipated duration of Start-up and test activities as required in "Schedule" above.

1.11.3 Provide written timely notice to University's Representative of any changes in date, time, location, anticipated duration of Start-up and test activities. For the purpose of this paragraph, written notice shall be received by University's Representative a minimum of 72 hours in advance to be considered timely notice.

1.11.4 Design Builder shall reimburse the University's Representative for actual costs incurred by the University as the result of failure to provide timely notice per preceding paragraph of changes in date, time, location, anticipated duration of Start-up and test activities.

1.11.5 Obtain the signature of designated witness on all data forms. If the witness is unavailable at the schedule time and location of the activity, so note, and proceed per schedule without the witness.

1.12 COMMISSIONING MEETINGS

1.12.1 Initial commissioning meeting.

1. Within 60 days after the pre-construction meeting the Design Builder shall schedule a meeting to review commissioning requirements and schedules for the project.

2. Attendance is required of the following: Design Builder's Superintendent and Test Engineer, Mechanical Subcontractor, Electrical Subcontractor, Environmental Control System/Building Automation System Subcontractor, Design Professionals (Architect, Mechanical Engineer, and Electrical Engineer), University's Representative, Commissioning Agent, and others as may be appropriate.

3. The Commissioning Agent will preside and conduct the meeting; and will record, reproduce, and distribute copies of minutes within seven days thereafter to all meeting participants.

4. The purpose of the meeting is to introduce the key representatives of all parties directly involved with commissioning the building; to present and discuss the commissioning schedule; to identify construction completion requirements of the Subcontractors which are Critical Work Activities in regard to each scheduled commissioning activity; and to identify and resolve any uncertainties regarding process and responsibilities.

1.12.2 Commissioning progress meetings.

l. Attendance shall include the Test Engineer, Mechanical Subcontractor, Electrical Subcontractor, Environmental Control System/Building Automation System Subcontractor, University's Representative, Commissioning Agent, and others as may be appropriate.

2. The Commissioning Agent will preside and conduct the meetings; and will record, reproduce, and distribute copies of minutes within seven days thereafter to all meeting participants.

3. During the months prior to the beginning of Start-up or functional performance testing activities the Design Builder will hold monthly commissioning progress meetings. The primary discussion will be the commissioning schedule. Thereafter, the Contract Schedule shall be revised to reflect any changes in the commissioning program.

4. Two weeks prior to the beginning of Start-up or functional performance testing activities the Design Builder will begin weekly commissioning progress meetings; which will continue thereafter until commissioning is complete.

5. The University's Representative may require additional meetings if the commissioning process appears to be behind schedule or if there are coordination problems. The Test Engineer may also request, in writing, additional meetings.

PART 2 PRODUCTS

2.1 TEST EQUIPMENT

2.1.1 Provide industry standard test equipment required for performing the tests specified herein.

2.1.2 Instrumentation shall meet the following standards:

1. Be of sufficient quality and accuracy to test and measure system performance within the tolerances required to determine adequate performance.

2. Be calibrated on the manufacturer's recommended intervals with calibration tags permanently affixed to the instrument being used.

3. Be maintained in good repair and operating condition throughout the duration of use on this project.

4. Be re-calibrated/repaired if dropped or damaged in any way since last calibrated.

2.1.3 Immersion Temperature Measuring Instruments, Liquids.

1. Range: -40° F to 120° F

.1 Type: Glass partial stem immersion.

.2 Minimum accuracy: within 1/2 of scale division.

.3 Resolution: One degree Fahrenheit (1° F).

2. Range: 0CF to 220° F.

.1 Type: Glass partial stem immersion.

.2 Minimum accuracy: Within 1/2 of scale division.

.3 Resolution: One degree Fahrenheit (1° F).

2.1.4 Air Temperature Measuring Instruments:

1. Range: -40° F to 120° F

.1 Type: Glass partial stem immersion.

.2 Minimum accuracy: Within 1/2 of scale division.

.3 Resolution: One degree Fahrenheit (1° F).

2. Range. 0° F to 220° F

.1 Type: Glass partial stem immersion.

.2 Minimum accuracy: Within 1/2 of scale division.

.3 Resolution: One degree Fahrenheit ( 1° F).

2.1.5 Hydronic Pressure Measuring Instruments.

1. Range: Indicated pressure shall be in the middle half of the instrument range.

.1 Type: Minimum "Grade A" gauge with stainless steel, alloy steel, monel or bronze Bourdon tube.

.2 Minimum accuracy: Within +0.25% of full scale.

.3 Resolution: 0.5 PSI subdivisions on a 4.5" dial with a mirrored scale and knife-edge pointer.

2.1.6 Hydronic Differential Pressure Measuring Instruments.

1. Range: indicated pressure shall be in the middle half of the instrument range.

.1 Type: Dual inlet, minimum "Grade A" gauge with dual stainless steel, alloy steel, monel or bronze Bourdon tubes and a single pointer

.2 Minimum accuracy: Within +0.25% of full scale.

.3 Resolution: 0.5 PSI subdivisions on a 4.5" dial with a mirrored scale and knife-edge pointer.

2.1.7 Air Pressure Measuring Instruments.

1. Range: Indicated pressure shall be in the inclined portion of the scale.

.1 Type: Inclined/vertical manometer

.2 Resolution:

 .1 Air Velocity less than 1000 FPM; and 4000 FPM; 0.005 inch graduations.

.2 Air velocity between 1000 and 4000 FPM; 0.01 inch graduations.

.3 Air velocity greater than 4000 FPM; 0.1 inch graduations.

2.2 REPORTS

2.2.1 Testing, Adjusting and Balancing (TAB) Progress Reports. After TAB activities have begun, review and submit weekly TAB Progress Reports to the University's Representative. Identify

1. Systems or subsystems for which preliminary balancing is complete.

2. Systems or subsystems for which final balancing is complete.

3. Status of deficiencies and balancing problems encountered, including corrective actions taken.

4. Updated schedule of remaining TAB activities.

2.2.2 Installation Verification Audit. Prior to Start-up, submit to the University's Representative for review and approval a report of installation verification audit activities. Identify equipment and components verified, deficiencies noted, corrective action taken and the dates and initials of the persons making the entries.

2.2.3 Start-up Deficiency Report. Within five days following Start-up of each system or equipment, submit to the University's Representative Start-up Deficiency Report Forms. Identify systems and/or equipment started‑up, deficiencies noted, corrective action taken and the dates and initials of the persons making the entries.

2.2.4 Functional Performance Test Deficiency Reports. At the end of each day in which functional performance tests are conducted, submit to the University's Representative Functional Performance Test Deficiency Report Forms for tests for which acceptable results were not achieved during the day.

1. Identify tests for which acceptable results were not obtained by test number and description, and equipment identification and location. Briefly describe observations about the performance which were associated with failure to achieve acceptable results. Identify the cause of failure if such is apparent.

2. When corrections have been completed, update the Functional Performance Test Deficiency Report Forms. Identify corrective action taken and the dates and initials of the persons making the entries.

3. Identify the schedule for re-testing.

PART 3 EXECUTION

3.1 BASIS OF DESIGN DOCUMENTATION

3.1.1 Prepare a basis of design document that incorporate the effect of approved substitution request, change orders and responses to RFI's. Include updated project design criteria and operations descriptions for building systems if applicable.

3.1.2 The updated design criteria shall include (but not limited to) design conditions for each space as follows:

1. Indoor dry bulb temperature.

2. Indoor relative humidity.

3. Outdoor dry bulb temperature.

4. Outdoor wet bulb temperature.

5. Occupancy, hours and degree of activity.

6. Lighting and miscellaneous power.

7. Ventilation – re-circulation and outside air.

8. Internal loads.

9. Special loads.

10. Insulating R‑values for roof, wall, glass, etc.

11. Percentage of glass – fenestration.

12. Type of glass, including coatings and solar coefficients.

13. Building pressurization and infiltration.

14. Building mass.

15. Code requirements and impact on criteria.

16. Air quality design criteria, i.e. ASHRAE 62-89.

17. Noise criteria.

18. Fire and life safety.

19 Energy efficiency and cost.

20. Maintainability.

* + 1. The Basis of Design document may be merged into system operation and maintenance manuals if approved by University’s Representative. Review O&M Manuals as they relate to commissioning.

3.2 COMMISSIONING PROCEDURE

3.2.1 Sequence of Testing. Commissioning shall proceed from lower to higher levels of complexity. For each discrete subsystem or system, testing at the lower level shall be completed prior to starting the next higher level of tests. In general, the order of testing, from lowest to highest is:

1. Static tests (e.g. duct leakage tests).

2. Component functional performance tests (i.e. motors, actuators and sensors) and start-up.

3. Balancing.

4. System functional performance tests.

5. Intersystem functional performance tests.

6. Re-testing. Repeat at no additional cost to the University, the complete functional test procedure for each test for which acceptable results are not achieved. Repeat tests until acceptable results are achieved. Compensate University for direct costs incurred as the result of tests repeated to achieve acceptable results. Fill out a new functional performance test data form for each re-test.

3.2.2 Correction of Deficiencies

1. Correct functional performance test deficiencies promptly and schedule re-test.

2. Corrections during functional performance tests are generally prohibited to avoid consuming the time of personnel waiting for the test, but not involved in the making the correction. Exceptions will be allowed if the cause of the failure is obvious and corrective action can be completed in less than five minutes. If corrections are made under this exception, the failure shall be noted on the functional performance test data form. A new functional performance test data form, marked “re-test,” shall be initiated after the correction has been made. The entire functional performance test procedure shall be repeated.

3. University’s Witness. Witnesses will be designated by the University’s Representative to observe the commissioning process under the direction of the commissioning Agent. University’s witnesses shall provide no labor or materials in the commissioning process. The only function of the University’s witnesses shall be to observe and comment on the progress and results of commissioning.

4. Provide access to permit the University's witness to directly observe the performance of the equipment being tested.

5. Provide ladders, scaffolding, and staging as required to permit the University's witness to directly observe the performance of the equipment being tested.

6. Notify the University's Representative of commissioning schedule changes at least 48 hours in advance if University's witness will be involved.

3.2.3 Installation Verification

1. During construction, observe the Work of the Design Builder and Subcontractors to assure that all installations are being made in accordance with the intent of the contract documents.

2. Before system Start-up begins, conduct a final installation verification audit. The Design Builder shall be responsible for completion of all work including change orders and punch list items to the satisfaction of the University's Representative. The audit shall include, but not be limited to, a check of:

.1 Piping specialties including balance, control, and isolation valves.

.2 Ductwork specialty items including turning devices; balance, fire, smoke and control dampers; and access doors.

.3 Control sensor types and locations.

.4 Identification of piping, valves, starters, gauges, thermometers, etc.

.5 Documentation of preStart-up tests performed, including manufacturer's factory tests.

.6 Accessibility to equipment.

.7 If any work is found to be incomplete, inaccessible, incorrect, or non‑functional, make note of deficiencies and correct deficiencies before system Start-up work proceeds.

3.2.4 System Start-up

1. Develop a Start-up plan. Commence with system Start-up after approval has been given to the Start-up plan and the pre-Start-up inspection has been completed by the Test Engineer. The Test Engineer shall witness system Start-up and list all system and equipment deficiencies noted during Start-up. The Design Builder shall take corrective action on all system deficiencies noted and demonstrate to the Test Engineer suitable system operation. Notify University's Representative of Start-up activities schedule at least five working days in advance. University's Representative and Commissioning Agent will physically witness Start-up procedures. Test Engineer shall obtain signature of the University's Representative indicating successful Start-up.

3.2.5 Start-up Deficiency Lists

1. Prepare Start-up deficiency list forms to report deficiencies discovered in conjunction with system Start-up. Start-up deficiency forms shall indicate the system being started up; the location and identification of the deficient equipment/material; date of observation; initials of the observer; observed deficiency; date of correction; initials of person making the correction; and corrective action taken.

2. Issue Start-up Deficiency Report Forms to the Design Builder for corrective action, and to the University's Representative for follow‑up. The Design Builder shall advise the Test Engineer and University's Representative when all Start-up deficiency list items have been corrected.

3.2.6 Testing, Adjusting, and Balancing (TAB)

1. Review participate and coordinate air and hydronic balancing as required in Specifications. Advise the TAB firm when systems are complete and ready for balancing. Start TAB as early as possible following systems Start-ups and component functional performance tests, in order to be essentially complete prior to system functional performance tests. Coordinate TAB activities with other construction schedule activities.

2. Verify the accuracy of the TAB work prior to commencing any FTP activities which may be adversely affected by improper balancing.

3.3 FUNCTIONAL PERFORMANCE TEST PROCEDURES

3.3.1 Develop Start-up procedures and functional performance test procedures and documentation to used. Personnel experienced in the technical aspects of each system to be commissioned shall be engaged if necessary to augment the expertise of the Test Engineer. Include functional performance test procedures and functional performance test data sheets for each system based upon actual system configuration. Emphasis shall be placed on testing procedures which will conclusively determine actual system performance and compliance with the design.

3.3.2 Test procedures shall fully describe system configuration and steps required for each test; appropriately documented so that another party can repeat the tests with virtually identical results.

3.3.3 Acceptance test procedures must confirm the performance of systems to the extent of the design intent and applicable code under which the project was permitted. When a system is accepted, the Commissioning Agent must be assured that the system is complete, works as intended, is correctly documented, and that the University's staff are trained in the operation and maintenance of the system.

3.3.4 The majority of mechanical equipment requires integral safety devices to stop/prevent equipment operation unless minimum safety standards or conditions are met. This could include adequate oil pressure, proof-of-flow, non-freezing conditions, maximum head pressure, etc. Functional performance test procedures shall demonstrate the actual performance of safety shutoffs in a real or closely simulated conditions of failure.

3.3.5 Systems may include safety devices and components that control a variety of equipment operating as a system. Interlocks may be hard‑wired or installed via software. Functional performance test procedures shall demonstrate these interlocks.

3.3.6 Test Engineer shall inform Design Builder, appropriate Subcontractor(s) and vendor (s) before commissioning is started as to what the test and expected results will be. Whereas some test results and interpretations may not become evident until the actual tests are performed, all participants should have a reasonable understanding of the requirements. The commissioning plan must address the requirements and be distributed to all participants involved with that particular system.

3.4 REVIEW SOFTWARE DOCUMENTATION

3.4.1 Review Design Builder or its vendor provided detailed Building Energy Management (EMS) software documentation. This includes obtaining EMS program documentation, a review of the programming approach, interface with other systems (e.g. Iighting, fire alarm, security, clock, emergency generator monitoring, sump pumps, and utility metering), and a review of the specific software routines as applied to this project. Discrepancies in programming approaches will be resolved to provide the University with the most appropriate, simple and straightforward approach to software routines.

3.4.2 Provide copies of all of the preceding material, including electronic copies of all control system software, to the University's Representative so that University's technical staff can simulate system operation and troubleshoot the software.

3.5 TRAINING

3.5.1 Prepare and submit for approval a training plan as required by contract documents. Training plan shall include for each training session:

1. Dates, start and finish times, and locations.

2 Outline of the information to be presented.

3. Names and qualifications of presenters.

4. List of texts and other materials required to support training.

3.5.2 Obtain assistance from appropriate Subcontractors and vendors to provide training for the University's operations staff as specified in contract documents.

3.5.3 Provide videotape documentation of training of the University's staff for each system. Training will be in a classroom setting with the appropriate schematics, handouts and audio/visual training aids.

3.5.4 Catalog training video tapes and deliver to the University's Representative with the O&M Manuals in accordance with contract documents.

3.5.5 Host each training session.

3.5.6 Provide program overview and curriculum guidance.

3.5.7 Obtain signatures of attendees on a sign‑in list.

3.5.8 Equipment vendors provide training on the specifics of each system and philosophy, troubleshooting, and repair techniques as specified in the relevant sections of this specification.

3.5.9 Installation Subcontractors provide training on peculiarities specific to this project and job specific experience as specified in the relevant sections of this specification.

3.6 RECORD DRAWINGS

3.6.1 Review record documents to verify accuracy and completeness.

3.7 FUNCTIONAL COMPLETION

3.7.1 The Commissioning Agent will review Design Builder's records of completion of contract requirements. Upon receiving evidence of satisfactory completion of Functional Completion requirements, the Test Engineer will submit to the University's Representative a recommendation to accept Functional Completion.

3.8 EXCLUSIONS

3.8.1 The University's Representative and Commissioning Agent are not responsible for construction means, methods, job safety, or any management function related to commissioning on the job site.

3.8.2 The Design Builder shall provide all technician services requiring tools or the use of tools to test, adjust or otherwise bring equipment into a full operational state.

END OF SECTION 01810

Section 01820

DEMONSTRATION AND TRAINING

{The example below is considered to be minimal. Add to the statements to meet the needs of the Project and the Facility personnel who will be operating and maintaining each piece of equipment.}

 PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 INSTRUCTION AND EVALUATION OF UNIVERSITY’S PERSONNEL

1.2.1 Perform hands-on demonstrations and instruction for University’s designated personnel in the operation, adjustment and maintenance of products, equipment, and systems, as required and at agreed upon times.

1.2.2 Instruction Before Final Inspection. Before Final Inspection, and after work under this contract is completed, tested and prior to acceptance by the University; and not less than five (5) days after submittal of the Operation and Maintenance Data, operate all the systems for a period of three (3) 8-hour periods during which time a qualified factory trained representative familiar with the items installed shall instruct and supervise the University’s Personnel in the operation and maintenance of the equipment and systems. This instruction period is in addition and subsequent to any period of operation, testing and adjustment called for elsewhere in these specifications.

1.2.3 Instruction by Manufacturer’s Representatives. Any instructions from manufacturer's representatives required under other sections of this specification shall be conducted during this period. This instruction period shall be conducted after completion of all piping and equipment labeling required by the Contract.

1.2.4 Time of Instructions. Make all arrangements and notices for operation and instruction periods though the University’s Representative.

1.2.5 Seasonal Operation. For equipment requiring seasonal operation, perform demonstrations and instructions for each required season and at agreed upon times.

1.2.6 Evaluation. During and after demonstrations and instructions for University’s designated personnel, evaluate their ability to perform the necessary maintenance and operation functions required to properly operate and maintain each piece of equipment. Make sure that at the end of the training session, the University’s designated personnel are reasonably proficient in the operations and maintenance of products, systems, and equipment.

1.3 TRAINING TOOLS AND MATERIALS

1.3.1 Use operation and maintenance manuals as basis for instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance. For all systems requiring operation and maintenance training from factory representative, written authorization from the University is required. All systems of more than one manufacturer, a factory representative from each will be required.

1.3.2 Prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.

1.4 QUALIFICATIONS OF INSTRUCTORS

1.4.1 Instructions for the University’s Personnel. For instruction of the University’s operating and maintenance personnel, use experienced instructors thoroughly trained and experienced in the operation and maintenance of the building equipment or system involved.

PART 2: PRODUCTS (Not Applicable) {Insert the words “Not Applicable” if not used.}

PART 3: EXECUTION (Not Applicable) {Insert the words “Not Applicable” if not used.}

END OF SECTION 01820

SECTION 01830

1.1 Not Used (Section deleted and not currently in use.)

Section 01840

RECONSTRUCTION

{Use and complete this Section for reconstruction work only.}

PART 1: GENERAL

1.1 RELATED DOCUMENTS

(Not Applicable) {Insert the words "Not Applicable" if not used.}

1.2 RENOVATION AND RECONSTRUCTION OF EXISTING FACILITIES

1.3 HISTORIC PRESERVATION

1.3.1 {Insert and itemize all requirements related to historic preservation. OR, retain the number and add the words “Not Applicable.”}

1.4 SPECIAL MATCHING REQUIREMENTS

1.4.1 {Insert and itemize all requirements related to all special matching requirements. OR, retain the number and add the words “Not Applicable.”}

PART 2: PRODUCTS (Not Applicable){Insert the words “Not Applicable” if not used}

PART 3: EXECUTION (Not Applicable){Insert the words “Not Applicable” if not used}

END OF SECTION 01840