

EXHIBIT 7



MARICOPA
INTEGRATED
HEALTH SYSTEM

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MARICOPA COUNTY SPECIAL HEALTH CARE DISTRICT DBA MARICOPA INTEGRATED HEALTH SYSTEMS (MIHS)

JOB ORDER CONTRACTOR (JOC)
COMBINED GENERAL REQUIREMENTS

MARICOPA COUNTY, ARIZONA
CONTRACTS MANAGEMENT DEPARTMENT

90-16-086

Office of Contracts Management

Requesting Department Name, Integrated Health Systems

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DIVISION 01 - GENERAL REQUIREMENTS FOR JOB ORDER CONTRACTS

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¹ *** In the text indicates an item which the Architect on a particular Project may want to adjust for that Project
FMD/JOC/GR § _____
Project Title _____.

SECTION 01 00 00
SITE USE AND SECURITY REQUIREMENTS

PART 1 GENERAL

1.1 Construction Site

- 1.1.1** Safety and security must be maintained at all times, on the Construction Site and lay down areas. It is the Job Order Contractor's responsibility to coordinate construction activities that may affect MIHS operations or any surrounding business. A twenty-four (24) hour advance written notice shall be given to the Owner or Owner's Representative for any activities or conditions that may affect operations, personnel, or clients.
- 1.1.2** The Construction Site is the area to be enclosed within temporary construction fences erected by the Job Order Contractor to separate and secure the construction activities from the Public.
- 1.1.3** Access to Construction Site shall be provided in accordance with requirements in Section 01 50 00 – Temporary Facilities and Controls.
- 1.1.4** Internal security for remodeling shall be provided. ***
- 1.1.5** Job Order Contractor is responsible for hiring a private utility locator to identify all underground utilities in the site.

PART 2 FACILITY ENTRY/EXIT REQUIREMENTS

- 2.1** Access to MIHS Facilities must be maintained. ***
- 2.2** Weapons, drugs and alcohol cannot be brought onto MIHS property or the Construction Site.
- 2.3** Safety and security for all tools, equipment and stored or in-place materials on the site are the responsibility of the Job Order Contractor. The owner assumes no liability for loss or damage to tools or equipment.
- 2.4** Job Order Contractor must immediately report any major losses or major unexplained damages to equipment to the Owner or Owner's Representative.
- 2.5** Job Order Contractor and construction personnel shall not talk to or interact with the media for any reason without prior written approval for the Owner or Owner's Representative.
- 2.6** MIHS reserves the right to inspect lunch boxes, toolboxes, clothing and equipment of any and all construction personnel permitted into existing secured areas.
- 2.7** MIHS reserves the right to require immediate removal of any worker or employee from areas deemed to be considered secure in nature.
- 2.8** The work hours at the site will be agreed upon by the JOB ORDER CONTRACTOR and Owner.

PART 3 SITE LIGHTING

- 3.1** The Job Order Contractor shall provide adequate security lighting for the ground floor of the Construction Site throughout the evening and nighttime non-work hours. ***

PART 4 DISRUPTIONS TO ELECTRICAL SERVICE

- 4.1 Electrical service shall be provided in accordance with Section 01 50 00 – Temporary Facilities and Controls
- 4.2 The Owner or Owner’s Representative must have at least twenty-one (21) days advance written notice prior to the electricity being shut off to any area outside of the construction site. At the discretion of the Owner or Owner’s Representative, more notice may be required.
- 4.3 The length of time electricity is off is to be coordinated with the Owner or Owner’s Representative and kept to the absolute minimum.

PART 5 EXCAVATIONS

- 5.1 The Owner or Owner’s Representative must have a minimum of five (5) working days advance written notice prior to any excavation.
- 5.2 Prior to any excavation, the specific location of all known underground utilities shall be marked.
- 5.3 Job Order Contractor is responsible for the location of all known utilities, on-site and off-site in the location of any excavation.
- 5.4 The Job Order Contractor shall be fully aware of the location of all known shut-off valves, and switches prior to commencing excavation.
- 5.5 All excavations must be properly marked and barricaded during daylight hours and adequately illuminated, barricaded, and marked during the hours of darkness. All excavations within City rights of way must comply with requirements of the City in which the excavation is located.
- 5.6 Based on security and safety issues, more stringent controls may be implemented; however, the JOB ORDER CONTRACTOR will be advised prior to revisions to this Section.

END OF SECTION

SECTION 01 06 00
SPECIAL CONDITIONS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- 1.1.1** Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections, apply to this Section.

1.2 GOOD REPAIR

- 1.2.1** Definition: Good repair as defined in General Conditions shall be extended to include:

- 1.2.1.1** Site and Drainage Work
- 1.2.1.2** Trench Conditions
- 1.2.1.3** Landscaping Improvements
- 1.2.1.4** Environmental/Process Applications of Work

- 1.2.2** If in opinion of Owner, deterioration has taken place, the Owner or Owner's Representative shall notify the Job Order Contractor and his surety of said matter. If the Job Order Contractor does not proceed to remedy such matters called to his attention by written notice within five (5) days of notice, the Owner shall have sufficient cause to correct matters requiring repairs as the Owner deems best, and entire cost shall be paid by Job Order Contractor and surety.

1.3 SITE MAINTENANCE

- 1.3.1** Maintain in good repair temporary structures, fences, barricades and related items.
- 1.3.2** Keep site clean of debris, rubble and paper. Store and stockpile materials in an orderly manner and protect against damage.

1.4 DRAWINGS AND CONTRACT DOCUMENTS FOR CONTRACTOR USE

- 1.4.1** No Charge Documents: The Owner or Owner's Representative will furnish to Job Order Contractor Contract Documents upon request and as appropriate.

1.5 TESTING

- 1.5.1** The Owner will engage a qualified independent testing agency to perform quality-control testing normally required for Divisions 02, 03, 04 and 05. ***
 - 1.5.1.1** Payment of these services will be made by the Owner.
 - 1.5.1.2** Retesting of materials failing to meet the specified requirements shall be done at the Job Order Contractor's expense.
- 1.5.2** Other Testing: Unless specifically stated otherwise in individual sections of specifications or drawings, required testing, testing procedures, reports, certificates, and costs associated with all phases of securing required satisfactory test information which may be required by individual sections of specifications or drawings are the full responsibility of the Job Order Contractor. ***
- 1.5.3** Fuel costs for startup and testing of the emergency generator shall be included in the Job Order Contractor's construction cost. ***

1.6 START-UP AND DEMONSTRATION

- 1.6.1** Pre Start-up Period. Prior to start-up, observe the following procedures by sequence: ***

- 1.6.1.1** Insure by checklist submitted to Owner or Owner's Representative that all required written statements from manufacturers by individual sections of specifications are received and comply with Contract Documents.
- 1.6.1.2** Insure work is completed before start-up of any unit or system. Certify to Owner or Owner's Representative that specifically required services of respective equipment manufacturer's representative by individual sections of specifications have been performed in accordance with Contract Documents.
- 1.6.1.3** Definition of System. For this project, "system" is defined as the arrangement of items or components of equipment (either process, mechanical or electrical) which form a unit of operation. Separate start-up and demonstration by system.
- 1.6.1.4** Insure systems are tested hydraulically, mechanically, and electrically. Insure systems which require calibration, commissioning, and balancing are fully certified as complete in performance in accordance with Contract Documents. Insure required tagging, identification, and stenciling is complete.
- 1.6.1.5** Schedule start-up a minimum of thirty (30) days prior with written notice issued to, but not necessarily limited to, Owner or Owner's Representative and applicable control agencies. Provide a final notification of the exact date and time for startup a minimum of ten (10) days prior to the startup in accordance with 01 91 13.
- 1.6.1.6** Provide all labor, supervision, chemicals, equipment, vehicles or any other items necessary to start-up, operate, and demonstrate the system.

1.6.2 Start-Up and Demonstration Period.

- 1.6.2.1** Start-up, operate and demonstrate specified performance of each item of equipment and each system at full operation without interruption of equipment or system, or need of adjustment or repair per the plans and specifications.
- 1.6.2.2** During start-up with equipment in operation, provide knowledgeable personnel to instruct Owner's designated personnel on operation and maintenance of each system. This service shall be in addition to services provided by individual manufacturer's authorized representative(s) prescribed by individual sections of specifications. Instructions during this start-up period shall be overview in nature and not simply repeat previous operation and maintenance instructions.

1.6.3 Substantial Completion:

- 1.6.3.1** Completion of Paragraphs 1.6.1–1.6.3 above is required prior to Request for Substantial Completion.
- 1.6.3.2** See also Section 01 91 13 – General Commissioning Requirements for items to be completed prior to substantial completion.

1.7 REMOVAL OF EXISTING FACILITIES

- 1.7.1** All equipment, piping, etc. removed, and not specifically designated for reuse, shall become the property of the Job Order Contractor for salvage or disposal and shall be removed from the site by the Job Order Contractor. All other debris shall be hauled by Job Order Contractor and disposed of in an approved landfill and in accordance with Section 01 74 19 Construction Waste Management.

1.8 INSPECTION BY PUBLIC AGENCIES

- 1.8.1** Authorized representatives of the City, County and State of Arizona, shall have access to the work wherever it is in preparation or progress. The Job Order Contractor shall provide reasonable facilities for such access and inspection.

1.9 HAZARDOUS SUBSTANCES

- 1.9.1** The Job Order Contractor agrees that it shall not knowingly transport to, use, generate, dispose of, or install at the project site any Hazardous Substance, (as defined in Section 19.2.3), except in accordance with applicable Environmental Laws. Further, in performing the Work, the Job Order Contractor shall not knowingly cause any release of hazardous substances

into, or contamination of, the environment, including the soil, the atmosphere, any water course or ground water, except in accordance with applicable Environmental Laws.

- 1.9.2** In the event the Job Order Contractor encounters on the project site any Hazardous Substance, or what the Job Order Contractor reasonably believes to be a Hazardous Substance, which is being introduced to the Work, in violation of any applicable Environmental Laws, the Job Order Contractor shall immediately stop Work in the area affected and report the condition to the Owner or Owner's Representative if in fact a Hazardous Substance has been introduced and has not been rendered harmless.
- 1.9.3** The Owner or Owner's Representative may direct the Job Order Contractor to remediate and/or render harmless the Hazardous Substance in accordance with applicable permits then in existence, but the Job Order Contractor shall not be required to remediate and/or render harmless the Hazardous Substance absent such direction. If the Job Order Contractor is not so directed, Job Order Contractor shall not be required to resume Work in any area affected by the Hazardous Substance until such time as the Hazardous Substance has been remediated and/or rendered harmless.
- 1.9.4** For purposes of this Contract, the term "Hazardous Substance" shall mean and include, but shall not be limited to, any element, constituent, chemical, substance, compound or mixture, which are defined in or included under or regulated by any local, state, or federal law, rule, ordinance, by-law, or regulation pertaining to environmental Response, Compensation and Liability Act of 1980 (CERCLA), The Resource Conversation and Recovery Act (RCRA), The Toxic Substances Control Act (TSCA), The Clean Water Act (CWA), the Clean Air Act (CAA), The Occupational Safety and Health Act (OSHA), The Superfund Amendments and Reauthorization Act of 1986(SARA), or other state or environmental clean-up or disclosure statues including all state and local counterparts of such laws (all such laws, rules and regulations being referred to collectively as Environmental Laws). It is the JOB ORDER CONTRACTOR's responsibility to comply with the law in effect at the time its services are rendered and to comply with any amendments to those laws for all services rendered after the effective date of any such amendments.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01 11 00

SUMMARY OF WORK

1.1 WORK COVERED BY CONTRACT DOCUMENTS

1.1.1 Project: ***

1.1.2 Sustainable Design Requirements: ***

1.1.2.1 The building(s) on the site and the site-work adjacent to the building(s) are designed and shall be constructed as sustainable entities.

1.1.2.2 The requirements for sustainable/"green" construction are contained throughout the Contract Documents and in particular are specified in Section 01 81 13 – Sustainable Design Requirements.

1.1.3 BIM Model: If the Job Order Contractor maintains a BIM model, it shall be made available for reference by the Design Professional and Owner. The files shall be compatible with REVIT 2012 and NAVISWORKS. ***

1.1.4 Subcontractors shall review the Construction Documents in their entirety to ensure that all materials, services, labor and equipment required are included in their bid. Documents are arranged by discipline (e.g. electrical) only as a convenience. It shall not be assumed that work of a specified trade will be contained only within the specifications or drawings that are identified with a specific discipline. Subcontractors are hereby notified that the work of their trade may be contained on any or all of the documents. No additional cost(s) will be paid by the Owner for work that is construed to be performed by another trade because the work is specified or indicated on a document which is not specifically identified for their trade.

1.2 DEFINITIONS PERTAINING TO THE CONTRACT DOCUMENTS

1.2.1 Furnish: To purchase and deliver.

1.2.2 Install: To place into final position and connect.

1.2.3 Provide: To furnish and install.

1.2.4 "As shown", "as detailed", "as indicated" or words of similar import mean as indicated on the drawings

1.2.5 "As selected", "as approved" or words of similar import mean as selected by, as approved by, or as accepted by the Design Professional and Owner.

1.2.6 "Approved equal", "or equal" shall mean as approved and accepted by the Design Professional and Owner.

1.2.7 "Shall" means mandatory.

1.2.8 "As required" means as required by the contract documents.

1.2.9 "As necessary" means essential to the completion of the work.

1.2.10 "Concealed" means not visible in the finished work.

1.2.11 "Exposed" means visible in the finished work.

1.2.12 "Days" means calendar days, unless specifically indicated otherwise.

1.2.13 Substantial Completion: That stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. ***

1.3 WORK BY OWNER

1.3.1 Items noted 'NIC' (Not in Contract) will be furnished and installed by Owner.

1.3.2 Fixtures, Furnishings and Equipment (FFE) items to be provided by Owner include: ***

1.3.2.1 Technology Hardware and Software, including cabling, terminations and commissioning.

1.3.2.2 Furniture and Equipment throughout the building.

1.4 OWNER FURNISHED ITEMS ***

1.4.1 Products furnished to the site and paid for by Owner shall be as noted on Drawings.

1.4.2 Owner's Responsibilities:

1.4.2.1 Arrange for and deliver Owner reviewed Shop Drawings, Product Data, and Samples, to Job Order Contractor for Owner-Furnished Job Order Contractor Installed (OFCI) items.

1.4.2.2 Arrange and pay for product delivery to site.

1.4.2.3 On delivery, inspect products jointly with Job Order Contractor.

1.4.2.4 Submit claims for transportation damage and replace damaged, defective, or deficient items.

1.4.2.5 Arrange for Manufacturers' warranties, inspections and service.

1.4.3 Job Order Contractor's Responsibilities:

1.4.3.1 Job Order Contractor shall give Owner written notice a minimum of 30 calendar days in advance stating dates when Owner-furnished items must be received at the job site to insure Project completion in accordance with established schedule.

1.4.3.2 Review Owner-reviewed Shop Drawings, Product data, and Samples

1.4.3.3 For OFCI items, receive and unload products at site; inspect for completeness or damage, jointly with Owner.

1.4.3.4 For OFCI items, handle, store, assemble, install, connect and finish such products, including furnishing lubricants and fluids and procedures required to render product serviceable and operative.

1.4.3.5 Job Order Contractor is responsible for the coordination and interface of Owner-Furnished and Installed work with Work of this Contract to provide all required mechanical and electrical rough-ins, openings, supports, dimensions, etc., as required for a complete installation

1.5 JOB ORDER CONTRACTOR USE OF SITE

1.5.1 General: Job order Contractor shall have full use of the site within Contract Limit Lines indicated for construction operations during the construction period.

1.5.2 Use of site shall allow for:

1.5.2.1 Owner occupancy and usage of adjacent buildings.

1.5.2.2 Work by Other Contractors and Work by Owner.

1.5.3 Owner Operations:

1.5.3.1 At no time during the work shall Job Order Contractor place, or cause to be placed, materials or equipment, or other items, at a location which would impede or impair access to or from the present facilities for customers, employees or delivery personnel.

1.5.3.2 Job Order Contractor shall cooperate with the Owner in providing traffic control during course of construction in order to minimize inconvenience to Owner's customers. Job Order Contractor shall provide these traffic control service at no additional cost to Owner.

1.5.4 Emergency Building Exits During Construction: Provide protection of emergency exits for adjacent buildings as directed by and approved by Owner during the entire course of construction.

1.5.5 Time Restrictions for Performing Work:

1.5.5.1 Construction hours as directed by Owner. ***

1.5.5.2 Restrictions may be placed on certain types of work and areas of site activity depending on Owner needs.

1.5.6 Utility Outages and Shutdown: Non-emergency interruption of utility services to the existing building(s) is not permitted without advance written twenty-one (21) day minimum notice. Job Order Contractor shall schedule pre- activity meeting with affected stakeholders with written plan of shutdown activities, affected areas/systems. Include job hazard analysis, procedures, execution plan and activity durations.

1.6 PERMITS, FEES AND NOTICES

1.6.1 Plan check fees will be paid by the Owner.

1.6.2 The Job Order Contractor shall comply with and give notices required by laws, ordinances, rules, regulations and lawful orders of public authority bearing on the performance of the Work.

1.6.3 It is the responsibility of the Design Professional to make certain that the Contract Documents are in accordance with applicable laws, statutes, building codes and regulations. If the Job Order Contractor observes that any of the Contract Documents are at variance therewith in any respect, he shall promptly notify the Design Professional and Owner in writing, and any necessary changes shall be accomplished by appropriate Modification.

1.6.4 If the Job Order Contractor performs Work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Design Professional and Owner, the Job Order Contractor shall assume full responsibility therefor and shall bear attributable costs.

1.7 SPECIAL SITE CONDITIONS ***

1.7.1 The Job Order Contractor shall be solely and completely responsible for protecting the existing buildings from damage and/or injury due to this Work and shall repair at his expense and to the Design Professional's satisfaction, all areas damaged as a result of his Work.

1.7.2 Job Order Contractor shall make consideration of dust and debris. Means for maintaining operations shall be discussed with, an approved by the Owner prior to commencing work.

1.7.3 Job Order Contractor shall make consideration of providing a visual screen as part of, or in addition, the site fencing wherever, in the opinion of the Owner, additional privacy is needed for adjacent building patrons.

1.8 APPROVED APPLICATORS

1.8.1 Where specific instructions in the Specifications require that a particular product and/or material be applied and/or installed by an "approved applicator" it shall be the Job Order Contractor's responsibility to insure that any Subcontractor or Subsubcontractor used for such Work is in fact currently certified, or otherwise approved in writing, by the particular Manufacturer for this type of installation or application.

1.9 APPROVED MANUFACTURERS

1.9.1 Each Section of the Specifications may include a list of Manufacturers whose equipment is acceptable as to manufacture, subject to conformance with the Contract Documents. Careful checking must be made by the Job Order Contractor and the manufacturer or equipment supplier to verify that the equipment will meet all capacities, requirements, space allocations is suitable to the intended purpose, and will be installed in accordance with the Construction Schedule. ***

1.10 REFERENCE DATA

- 1.10.1** Reference data made available to the Job Order Contractor is for the Job Order Contractor's information only, and neither the Owner nor the Design Professional assume any responsibility for the Job Order Contractor's conclusions.
- 1.10.2** The Job Order Contractor shall establish and maintain all buildings and construction grades, lines, levels, and bench marks. This Work shall be performed by a licensed Civil Engineer or Surveyor under the employ of the Job Order Contractor, who shall certify to the Design Professional that he has performed this service.
- 1.10.3** The Job Order Contractor shall not remove any property line markers or monuments or data established by the Owner.

1.11 NO DISCRIMINATION

- 1.11.1** It is the desire of the Owner that the facilities and improvements constructed under this Contract meet or exceed the intent of applicable public law concerning prohibition of discrimination, and that no individual be discriminated against on the basis of disability in the full and equal enjoyment of the goods, services, facilities, privileges, advantages, or accommodations of this completed Project.
- 1.11.2** The designers and drafters of these Documents have intended to incorporate those Owner's intentions into these Documents.
- 1.11.3** The Owner hereby solicits those providing elements of this Project to bid and contract for the Project as required by these Documents, but at the time of submitting Shop Drawings, or sooner when appropriate, and without causing delay in the Project, to also submit proposals for improving the accessibility of the Project to physically or mentally impaired persons.

END OF SECTION

**SECTION 01 24 13
VALUE ENGINEERING PROCEDURES**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Administrative requirements for value engineering.

1.02 DEFINITIONS

- A. Value Engineering: 1) To effect economy in the cost of constructing a project, and; 2) Evaluating and bettering of materials and systems in terms of dollars and functional objectives.

1.03 ADMINISTRATIVE REQUIREMENTS FOR VALUE ENGINEERING OPTIONS

- A. Whenever a material or system is specified, the specified item shall be understood as establishing type, function, dimension, appearance, and quality desired. Other materials and systems will be accepted as value engineering options, provided sufficient information is submitted to allow the Design Professional to determine that proposed value engineering option materials and systems will meet the functional objectives of the specified materials and systems.
- B. Requests for approval of value engineering options:
1. Job Order Contractor shall request approval of each value engineering option, in writing, to the Design Professional.
 2. The request shall specifically state what specified materials and systems are being substituted and shall state what materials and systems are being proposed as value engineering options.
 3. Design Professional will approve or reject value-engineering options in writing, and in such form, as the Design Professional or Owner directs. Owner has final authority regarding approval of value engineering items.
 4. Value engineering options will not be considered if they are indicated or implied on submittals (shop drawings, product data or samples).
 5. Value engineering options are encouraged and will be treated confidential as proprietary to the Job Order Contractor making the value engineering option.
- C. Job Order Contractor shall provide descriptive brochures, drawings, samples and other data as is necessary to allow comparison to the specified materials and systems. Value engineering information and data shall be well-marked and identified as to types and kind of the items being proposed for value engineering option. Reference to catalogs will not be acceptable unless catalog is included with proposal.
- D. In proposing a value engineering option, the Job Order Contractor makes the following representations:
1. Proposed value engineering option has been fully investigated and determined to will meet the functional objectives of the specified materials and systems.
 2. Maintenance service and source of replacement parts, as applicable, is available.
 3. Cost data included on the value engineering option is complete. Claims for additional costs related to accepted value engineering options which may subsequently become apparent are to be waived.
 4. Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.
 5. Implementation of the value engineering option will not adversely affect other systems.
- E. Value engineering options which are accepted and require revisions to the Contract Documents shall have the cost of the modifications to the Contract Documents deducted from the savings proposed for the value engineering option. There will be a deductive Task Modification to the Task Order.

END

OF

SECTION

SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 Description

- 1.1.1 Furnish all work and services for furnishing, submitting, processing, and handling of requests for substitution and product options. Any substitution or option shall be in accord with provisions of Contract Documents.
- 1.1.2 Completely coordinate with work of other trades.
- 1.1.3 See appropriate sections of the Specifications for specific items.
- 1.1.4 Address submissions to Design Professional and Owner's Representative.

1.2 Product Selection-General

- 1.2.1 Base bids on materials, equipment and procedures specified.
- 1.2.2 Certain types of equipment and kinds of material are described in Specifications by means of trade names, catalog numbers and/or manufacturer's names. This is not intended to exclude from consideration other items which may be capable of accomplishing the purpose indicated. The words "or equal" allow submission under Section 01 33 00 of products considered to be capable of accomplishing the Specification criteria.
- 1.2.3 Prior Approvals for "or equal" products will be permitted in accordance with the submittal requirements of this Section.
- 1.2.4 Other types of equipment and kinds of material may be acceptable to Owner. A Substitution request (see 1.6 below) or Value Engineering request (see Section 01 24 13) will be required to initiate review of these items.
- 1.2.5 Listing of a manufacturer implies acceptance of them only as the supplier of a product which complies with specified item.
- 1.2.6 The Owner or Owner's Representative, and DP reserve the right to require substitute items to comply color- and pattern-wise with base specified items.

1.3 Job Order Contractor's Options

- 1.3.1 For products specified only by reference standards, any product meeting standards may be used.
- 1.3.2 For products specified by naming several products or manufacturers and "or equal", use any product or manufacturer named, or any product or manufacturer which meets all the Specification criteria. Job Order Contractor may request Prior written Approval of an "or equal" product or manufacturer in accordance with this Section.
- 1.3.3 For products specified by naming one manufacturer and product, and indicating product is proprietary, select the product and manufacturer named.

1.4 Requests for Approval Prior

- 1.4.1 Only written requests a minimum of twenty-one (21) days prior to shop drawing submittals with complete submittal data will be considered.
- 1.4.2 In making request for prior approval, or in using a prior approved item, Job Order Contractor acknowledges it:
 - 1.4.2.1 Has investigated proposed product or method, and has determined that it is equal or superior in all respects to that specified, and that it will perform the intended function and not impact adversely other systems.
 - 1.4.2.2 Will provide same guarantee for prior approved item as for product or method specified.

- 1.4.2.3 Will coordinate installation of accepted prior approval into Work, to include building modifications if necessary; making such changes as may be required for Work to be complete and timely in all respects.
- 1.4.2.4 Waives all claims for additional costs related to any requested and/or approved prior approval which may subsequently become apparent.
- 1.4.2.5 Shall pay for all Job Order Contractor requested modifications and/or revisions to the Drawings and/or Specifications at no expense to the Owner, including any resulting fees for added Design Professional services.
- 1.4.3 Job Order Contractor shall acknowledge acceptance of the foregoing provisions in request form.
- 1.4.4 If the request for prior approval requires any change to equipment, materials, and methods of construction, such must be specifically indicated, and approved by the DP and be agreed upon by Owner as part of the approval process.
- 1.4.5 Prior approval does not automatically mean equipment is approved. Final submittals and shop drawings shall be made as required by the specifications for final approval of all equipment and materials. Any changes required due to substitution are the Job Order Contractor's responsibility.

1.5 Submittal Data

- 1.5.1 Complete data substantiating compliance of proposed prior approval with Contract Documents. Job Order Contractor shall request approval of such substitution, in writing, to the Design Professional using Document 00 63 25 - Substitution Request form contained in the Project Manual. ***
- 1.5.2 For products:
 - 1.5.2.1 Products identification, including manufacturer's name.
 - 1.5.2.2 Manufacturer's literature, marked to indicate specific model, type, size, and options to be considered:
 - 1.5.2.2.1 Product description.
 - 1.5.2.2.2 Performance and test data.
 - 1.5.2.2.3 Reference standards.
 - 1.5.2.2.4 Difference in power demand, air quantities, etc.
 - 1.5.2.2.5 Dimensional differences from specified unit.
 - 1.5.2.3 Full size samples if requested. DP reserves the right to impound sample until physical units are installed on project for comparison purposes. Requester will pay all costs of furnishing and return of samples. DP is not responsible for loss of, or damage to, samples not under their direct control.
 - 1.5.2.4 Name and address of similar projects and name of Owner's Representative who can be contacted to discuss product, installation, and field performance data.
- 1.5.3 For construction methods:
 - 1.5.3.1 Detailed description of proposed method.
 - 1.5.3.2 Illustrate on drawings.
- 1.5.4 Itemized comparison of proposed prior approval to specified item.
- 1.5.5 Data relating to changes in construction schedule.
- 1.5.6 Relation to separate contracts.
- 1.5.7 Cost of proposed prior approval in comparison with product or method specified.
- 1.5.8 Any change to equipment, materials, and methods of construction must be specifically indicated.

1.6 Substitutions

- 1.6.1** A Substitution is defined as a minor change in the type of materials operation of equipment or method of manufacture or production of a specified item. Submission of an item considered to be “or equal” under the Specifications is not a Substitution and should be submitted as a Shop Drawing, Product Data, or Sample under Section 01 33 00.
- 1.6.2** Substitutions will be considered after Contract execution provided data as required in 1.5 above is received by Owner or Owner’s representative a minimum of twenty-one (21) days prior to show drawings submittals. A Substitution may be submitted as Value Engineering request, per Section 01-24-13, if significant costs savings may be realized.
- 1.6.3** Substitutions will also be allowed for non-availability of specified item due to strikes, lockouts, bankruptcy, discontinuance of production, proven shortage, or similar occurrences.
- 1.6.4** Notify Owner or Owner’s Representative, in writing with substantiating data as soon as non-availability becomes apparent, to avoid delay in construction. Only written requests made a minimum of twenty-one (21) days prior to shop drawing submittals with complete submittal data will be considered.
- 1.6.5** Forward submittal data as required for Prior Approvals in 1.5 above.

1.7 Rejection of Substitution or Optional Items

- 1.7.1** Substitutions and/or options will not be considered if:
 - 1.7.1.1** They are indicated or implied on shop drawings, or project data submittals, without a timely formal request having been submitted in accordance with this section.
 - 1.7.1.2** Request for substitution does not indicate specific item for which request is submitted. Acceptance of a manufacturer only will not be made.

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION (Not Used)

END OF SECTION

SECTION 01 26 13

REQUESTS FOR INTERPRETATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Administrative requirements for requests for information interpretation.

1.02 DEFINITIONS

A. Request For Information / Interpretation (RFI):

1. A document submitted by the Job Order Contractor to the Architect and Owner requesting clarification of a portion of the Contract Documents, hereinafter referred to as RFI.
2. A properly prepared request for information / interpretation shall include a detailed written statement that indicates the specific Drawings or Specification in need of clarification and the nature of the clarification requested. RFI shall indicate if cost and/or schedule may be impacted.
 - a. Drawings shall be identified by drawing number and location on the drawing sheet.
 - b. Specifications shall be identified by Section number, page and paragraph.
3. Requests for Information: Request made by Job Order Contractor concerning items not indicated on drawings or contained in Project Manual that is required to properly perform the work.
4. Requests for Interpretation: Request made by Job Order Contractor in accordance with Owner's Representative's third party obligations to the contract for construction.

B. Improper RFI's:

1. RFI's that are not properly prepared.
2. Hand-written RFI's are not acceptable.
3. Improper RFI's will be processed by the Design Professional after receiving corrected or clarified RFI forms. The Job Order Contractor will be notified by the Design Professional prior to the processing of improper RFI's.

C. Frivolous RFI's:

1. RFI's that request information that is clearly shown on the Contract Documents.
2. Frivolous RFI's may be returned unanswered or may be voided. The Job Order Contractor will be notified by the Design Professional prior to the processing of frivolous RFI's.

1.03 JOB ORDER CONTRACTOR'S REQUESTS FOR INFORMATION

A. RFI's shall be submitted on a form acceptable to the Owner. ***

1. Forms shall be completely filled in, and; shall be fully legible after photocopying or transmission by facsimile (fax).
2. RFI's shall be submitted in numerical order with no breaks in the consecutive numbering.
3. Each page of attachments to RFI's shall bear the RFI number and shall be consecutively numbered in chronological order.
4. Job Order Contractor's may use their own form which must include, at a minimum, the information required in Document 00 63 13.
5. RFI's may be submitted by E-Mail or via online project management system.
 - a. Address for E-Mail will be distributed by the Design Professional at the Pre-Construction Conference.
 - b. Digitally issued RFI's shall be prepared using a standard form. Requests issued without using the standard form will not be considered a formal RFI
 - c. An electronic version of Document 00 63 13 will be provided upon request.

- B. When the Job Order Contractor is unable to determine from the Contract Documents, the material, process or system to be installed, the Design Professional shall be requested to make a clarification of the indeterminate item.

1. Wherever possible, such clarification shall be requested at the next appropriate project meeting, with the response entered into the meeting minutes. When clarification at the meeting is not possible, either because of the urgency of the need, or the complexity of the item, Job Order Contractor shall prepare and submit an RFI to the Design Professional.
 2. RFI requesting clarification of an item required of a document, known to have been prepared by a consultant to the Design Professional, may be sent directly to the consultant with a simultaneous copy to the Design Professional, if this direct communication is approved by the Design Professional.
- C. Job Order Contractor shall endeavor to keep the number of RFI's to a minimum. In the event that the process becomes unwieldy, in the opinion of the Design Professional (and validated by Owner), because of the number and frequency of RFI's submitted, the Design Professional may request that the Owner require the Job Order Contractor to abandon the process and submit future requests as either submittals, substitutions or requests for change.
- D. RFI's shall be originated by the Job Order Contractor.
1. RFI's from subcontractors or material suppliers shall be submitted through, reviewed by, and signed by the Job Order Contractor prior to submittal to the Design Professional.
 2. RFI's from subcontractors or material suppliers sent directly to the Owner's Representative, Design Professional or the Design Professional's consultants shall not be accepted and will be returned unanswered.
- E. Job Order Contractor shall carefully study the Contract Documents to assure that the requested information is not available therein. RFI's which request information available in the Contract Documents will be deemed either "improper" or "frivolous" as noted above.
- F. In cases where RFI's are issued to request clarification of coordination issues, for example, pipe and duct routing, clearances, specific locations of work shown diagrammatically, and similar items, the Job Order Contractor shall fully lay out a suggested solution using drawings or sketches drawn to scale, and submit same with the RFI. RFI's which fail to include a suggested solution will be returned unanswered with a requirement that the Job Order Contractor submit a complete request.
- G. RFI's shall not be used for the following purposes:
1. To request approval of submittals
 2. To request approval of substitutions,
 3. To request changes which are known to entail additional cost or credit. (A Task Order Modification Request form shall be used.)
 4. To request different methods of performing work than those drawn and specified.
- H. In the event the Job Order Contractor believes that a clarification by the Design Professional results in additional cost or time, Job Order Contractor shall not proceed with the work indicated by the RFI until a Change Order (or Construction Change Directive, if applicable to project) is prepared and approved. RFI's shall not automatically justify a cost increase in the work or a change in the project schedule.
1. Answered RFI's shall not be construed as approval to perform extra work.
 2. Unanswered RFI's will be returned with a stamp or notation: Not Reviewed.
- I. Job Order Contractor shall prepare and maintain a log of RFI'S, and at any time requested by the Design Professional, Job Order Contractor shall furnish copies of the log showing outstanding RFI'S. Job Order Contractor shall note unanswered RFI's in the log.
- J. Job Order Contractor shall allow up to 7 days for review and response time for RFI'S, unless review is required of multiple consultants, then the review and response period shall be 10 working days.
1. The Design Professional will endeavor to respond in a timely fashion to RFI's.
 2. RFI shall state requested date/time for response, however, this requested date/time for response is not a guarantee that the RFI will be answered by that date/time if that date/time is too expeditious

1.04 DESIGN PROFESSIONAL'S RESPONSE TO RFI'S

- A. Design Professional will respond to RFI's on one of the following forms:

FMD/JOC/GR § _____
 Project Title _____.

1. Properly prepared RFI's:
 - a. Response directly upon Request for Information / Interpretation form.
 - b. Design Professional's Supplemental Instruction.
 - c. Request for Proposal.
2. Improper or Frivolous RFI's
 - a. Notification of Processing Fee(s).
 - b. Unanswered RFI's will be returned with a stamp or notation: Not Reviewed.
3. Answers to properly prepared RFI's may or may not be made directly upon the RFI form as deemed appropriate by the Design Professional.
4. Design Professional will reference the RFI number when appropriate for tracking purposes.

1.05. CONFIRMING RFI'S

- A. The Job Order Contractor shall provide confirming RFI's or other acceptable means of tracking verbal directives and their resolution, whether initiated by the Design Professional, Job Order Contractor or Owner.

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION (Not Used)

END OF SECTION

SECTION 01 26 63

TASK ORDER MODIFICATION PROCEDURE

PART 1 GENERAL

1.1 DESCRIPTION

1.1.1 Only such changes in the Work, in the Task Order Sum, in the Task Order Time of Completion, in the Contract or Task Order language, or any combination thereof, as are described in written Task Order Modifications signed by the Job Order Contractor, Owner or Owner's Representative and the DP and issued after execution of the Contract, in accordance with the provisions of this Section.

1.2 OWNER REQUESTED REVISIONS

1.2.1 If Owner requests a revision, Owner will submit a Proposed Task Order Modification to the Job Order Contractor.

1.2.2 Owner will review the proposed modification and issue to Job Order Contractor a Proposed Task Order Modification Order ("PTOMO").

1.2.3 Within fifteen (15) days the Job Order Contractor shall respond in writing to the PTOMO, in the form of a Task Order Modification detailing all costs and time and schedule impacts.

1.2.4 Job Order Contractor shall take no action until Owner has issued a written Task Order Modification.

1.3 PROCESSING CHANGES INITIATED BY THE OWNER

1.3.1 Should the Owner contemplate making a change in the work or a change in the Task Order Time of Completion, the Owner will issue a Potential Change Order (PCO) describing the modification and may include a proposal request ("P.R.") from Design Professional, if applicable.

1.3.1.1 Each PTOMO will be dated and will be numbered in sequence.

1.3.1.2 The PCO will describe the contemplated revision.

1.3.1.3 Upon receipt of a PCO the Job Order Contractor shall promptly respond with a Change Order Request advising the Owner or Owner's Representative as to credit or cost and time proposed for the described change. This is not an authorization to proceed with the change.

1.3.1.4 Upon agreement the Owner will issue a Task Modification to the Job Order Contractor. The Job Order Contractor shall immediately proceed with the modification.

1.3.2 If the Job Order Contractor disputes any aspect of the Task Modification and the Job Order Contractor wishes to make a claim for a portion of such change, the Job Order Contractor shall proceed with the Task Order Modification and shall notify the Owner and/or Owner's Representative as provided for in Contract for Construction Services. Job Order Contractor will track the labor and material used for the disputed work.

1.3.3 If the Job Order Contractor has been directed by the Owner or Owner's Representative to make the described Task Order Modification subject to later determination of cost or credit in accordance with the Contract for Construction Services, the Job Order Contractor shall:

1.3.3.1 Take such measures as needed to make the change.

1.3.3.2 Consult with the Owner and Owner's Representative and reach agreement on the most appropriate method for determining credit or cost or time or schedule impact for the modification, then submit a Task Order Modification Order Request.

1.3.4 If the Job Order Contractor has been directed by the Owner or Owner's Representative to promptly advise him as to credit or cost or time or schedule impact proposed for the described modification, the Job Order Contractor shall:

1.3.4.1 Analyze the described change and its impact on costs and time.

- 1.3.4.2 Secure the required information and forward it to the Owner or Owner's Representative for review as a Change Order Request.
- 1.3.4.3 Meet with the Owner or Owner's Representative as required to explain costs and, when appropriate, determine other acceptable ways to achieve the desired objective.
- 1.3.4.4 Alert pertinent personnel and subcontractors as to the impending change and, to the maximum extent possible, avoid such work as would increase the Owner's cost for making the change, advising the Owner or Owner's Representative in writing when such avoidance no longer is practicable.

1.4 PROCESSING CHANGES INITIATED BY THE JOB ORDER CONTRACTOR

- 1.4.1 Should the Job Order Contractor discover a discrepancy among the Contract Documents, a concealed condition or other cause for suggesting a Task Order Modification in the Work, a change in the Task Order Sum, or a change in the Task Order Time of Completion, he shall notify the Owner or Owner's Representative as required by Article 6 of the Contract for Construction Services.

1.5 PROCESSING JOB ORDER CONTRACTOR CHANGES

- 1.5.1 Job Order Contractor shall promptly provide a Change Order Request to the Owner or Owner's Representative. The Owner will assign a PCO number to the proposed change.
 - 1.5.1.1 State proposed modification to the Task Order Sum, and/or Time and Schedule if any.
 - 1.5.1.2 Clearly describe other modifications in the work, if required by the proposed modification, or desirable therewith, if any.
 - 1.5.1.3 Include full backup data such as subcontractor's proposal. At a minimum the subcontractor's supporting data shall provide a breakdown of labor, labor rates, materials, taxes, delivery costs, indirect costs, and overhead and profit as well as Time and Schedule impacts, including a schedule analysis.
 - 1.5.1.4 Submit this Change Order Request in single copy.
 - 1.5.1.5 Each Change Order Request will be dated and will be numbered in sequence
- 1.5.2 When cost or credit or time or schedule impact for the modification has been agreed between Owner and the Job Order Contractor, or the Owner has directed that cost or credit be determined in accordance with provisions of Article 7 of the Contract for Construction Services, the Owner or Owner's Representative will issue a "Task Order Modification" to the Job Order Contractor. No work shall be performed prior to issuance of a signed Task Order Modification.

1.6 LOGS

- 1.6.1 Maintain a Log of Change Order Requests and Task Order Modifications at the job site, accurately reflecting current status of all pertinent data.
- 1.6.2 Make the Log available to the DP, Owner or Owner's Representative for review upon request.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01 29 73

SCHEDULE OF VALUES

PART 1 GENERAL

1.1 DESCRIPTION

1.1.1 Work Included: Provide a detailed breakdown, of the agreed Task Order Sum showing values allocated to each of the various parts of the Work as directed by the Owner or Owner’s Representative, as specified herein and in other provisions of the Contract Documents.

1.1.2 Related Work

1.1.2.1 Schedule of Values is required under Article 9.1 of the General Conditions to the Job Order Contract.

1.1.2.2 Schedule of Values is required to be compatible with AIA Document G703, "Continuation Sheet" and accompany AIA Document G702, "Application and Certificate for Payment", as described in Section 01 29 76.

1.2 QUALITY ASSURANCE

1.2.1 Assure arithmetical accuracy of the sums described.

1.3 SUBMITTALS

1.3.1 Submit a proposed Schedule of Values to the Owner or Owner’s Representative for approval.

1.3.1.1 The Schedule of Values shall subdivide the work into component parts in sufficient detail to serve as the basis for progress payments during construction.

1.3.1.2 Meet with the Owner, or Owner’s Representative, and determine additional data, if any, required to be submitted.

1.3.1.3 Secure the Owner or Owner’s Representative's approval of the Schedule of Values prior to submitting first Application for Payment.

1.4 **Identifying Changes in the Schedule-of-Values.** Each change shall be listed separately in the Job Order Contractor’s Schedule-of-Values. Changes shall be listed by Potential Change Order number, by trade or subcontractor and include a line item for the Job Order Contractor’s mark-ups associated with the change.

Example:

A change occurs including three trades. The Owner issues a Potential Change Order Request #005. Another change occurs including two trades. The Owner issues Potential Change Order Request #006.

(Schedule-of Values)	Scheduled Value	Previously Paid	This Period.....
Electrical PCO #005	\$1,000.00	0.00	0.00
Mechanical PCO #005	\$1,500.00	0.00	0.00
Framing/Drywall PCO #005	\$1,000.00	0.00	0.00
JOC Markups PCO #005	\$388.72	0.00	0.00
Electrical PCO #006	\$1,000.00	0.00	0.00
Framing/Drywall PCO #006	\$500.00	0.00	0.00
JOC Markups PCO #006	\$166.59	0.00	0.00

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01 29 76

PROGRESS PAYMENT PROCEDURES

PART 1 GENERAL

1.1 DESCRIPTION

1.1.1 General

- 1.1.1.1** Furnish all Applications for Payment as indicated, in accordance with provisions of Article 8 of the Contract for Construction Services.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 GENERAL

- 3.1.1** On the first (1st) of the month or the next business day if the first (1st) is a legal holiday or weekend, the Job Order Contractor shall submit to the Project Manager an itemized Application for Payment for the work completed to that date. This application will be reviewed for content by the Program Manager. The Application for Payment shall be based on the accepted Schedule of Values, per Section 01 29 73.
- 3.1.2** Provide supporting data substantiating the Job Order Contractor's right to payment as the Owner or Owner's Representative may require. See 3.2 below for requirements.
- 3.1.3** Submit estimates of the cost of work to be completed during the current calendar month with the Application for Payment.
- 3.1.4** Submit Progress Photographs.
- 3.1.5** Submit Record Photographs.
- 3.1.6** Submit updated monthly Schedule.
- 3.1.7** Submit conditional and unconditional lien waivers from Job Order Contractor and subcontractors.
- 3.1.8** Submit documentation per the Contract for Construction Services for off-site stored materials.
- 3.1.9** Submit SBE forms per the Contract for Construction Services.
- 3.1.10** Comply with other Specification Sections which contain requirements related to the Job Order Contractor's Application for Payment.
- 3.1.11** Demonstrate as built project documents are up to date.

3.2 APPLICATIONS FOR PAYMENT ***

- 3.2.1** Submit the Application for Payment on AIA Document G702, "Application and Certificate for Payment" to the Owner's Representative. The Schedule of Values shall be submitted in a format similar to AIA Document G703, "Continuation Sheet."
- 3.2.2** Furnish electronically one (1) original Application for Payment with a schedule update in P6 format.
- 3.2.3** The Application for Payment will serve as a certification of the status of project.
- 3.2.4** The notarized Signature on the Application for Payment shall be that of a duly authorized agent of the Job Order Contractor.
- 3.2.5** Base Application for Payment upon 100 percent of value of work installed and materials and equipment suitably stored at site and materials and equipment suitably stored off-site in insured and/or a bonded warehouse.
- 3.2.6** Itemize Applications for Payment:

- 3.2.6.1** Submit Applications for Payment
- 3.2.6.2** Heading completed in full
- 3.2.6.3** Original contract sum
- 3.2.6.4** Change order summary completed
- 3.2.6.5** Net change by Change Order
- 3.2.6.6** Contract sum to date
- 3.2.6.7** Total completed and stored to date
- 3.2.6.8** Total earned, less retainage
- 3.2.6.9** Amount of previous payments
- 3.2.6.10** Current payment due
- 3.2.6.11** Balance to finish
- 3.2.6.12** Notarized section completed
- 3.2.6.13** Completed Schedule of Values as identified in 3.2.1 above

END OF SECTION

SECTION 01 31 19

PROJECT MEETINGS

PART 1 GENERAL

1.1 DESCRIPTION

- 1.1.1 Project Meetings are held to enable an orderly review of the Work as it progresses on a weekly basis. It also provides an opportunity for systematic discussion of cost, schedule, problems and solutions. The Owner's Representative shall schedule and conduct project meetings throughout the construction period. ***
- 1.1.2 The Job Order Contractor's relationship with his Subcontractors and materials suppliers, and discussions relative thereto, are the Job Order Contractor's responsibility and are not a part of project meetings content.
- 1.1.3 Persons designated by the Job Order Contractor to attend and participate in the project meetings shall have all required authority to commit the Job Order Contractor to solutions agreed upon in the project meetings.

1.2 SUBMITTALS

- 1.2.1 To the maximum extent possible, advise the Owner's Representative at least three (3) working days in advance of project meetings regarding all items to be added to the agenda.
- 1.2.2 The Job Order Contractor will compile minutes of each project meeting and will furnish a draft to the Project Manager for approval within 3 days of the meeting. Job Order Contractor shall distribute approved minutes to the identified distribution list within 5 days of the meeting.

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION

3.1 MEETING SCHEDULE

- 3.1.1 Project meetings will be held on a weekly basis or more frequently if required. Meeting dates and times will be coordinated in an effort to include all parties whose participation is essential.

3.2 MEETING LOCATION

- 3.2.1 To the maximum extent practicable, meetings will be held at the job site.

3.3 PROJECT MEETINGS

- 3.3.1 To the maximum extent practicable, assign the same person or persons to represent the Job Order Contractor at project meetings throughout progress of the Work. Subcontractors, materials suppliers, and others may be invited to attend those project meetings in which their aspects of the Work are involved.
- 3.3.2 Minimum Agenda:
 - 3.3.2.1 Review, revise as necessary, and approve minutes of previous meeting.
 - 3.3.2.2 Review site safety issues.
 - 3.3.2.3 Review progress of the Work since last meeting, including status of submittals for approval.
 - 3.3.2.4 Present and discuss Job Order Contractor's updated 3-week schedule.
 - 3.3.2.5 Identify problems which impede planned progress.
 - 3.3.2.6 Develop corrective measures and procedures to regain planned schedule.
 - 3.3.2.7 Discuss changes in the work.
 - 3.3.2.8 Review RFI, RFP, COR, and CO logs, and identify outstanding items.
 - 3.3.2.9 Complete other current and new business.

END OF SECTION

SECTION 01 32 16

CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

1.1.1 Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

1.2.1 General

1.2.1.1 This Section specifies administrative and procedural requirements for preparation and reporting of Job Order Contractor's preferred sequence of construction of the Work and other possible sequences of construction of the Work, for monitoring and reporting of actual performance of the Work, for incorporation of changes and unexpected events for determination of possible impact to the timely completion of the Work and for determination of means and method necessary for time completion of performance of the Work.

1.3 PROJECT SCHEDULE

1.3.1 Detailed Construction Schedule

1.3.1.1 The Job Order Contractor shall develop and maintain the overall Detailed Construction Schedule, (referred to hereafter as Schedule or Construction Schedule). The Schedule shall be computer generated in precedence format using the Critical Path Method (CPM). The Job Order Contractor shall perform its obligations in accordance with the sequence and time frame provided by the Schedule. The Job Order Contractor shall update the Schedule and shall modify and change the Schedule as may be required as provided by this Section and notify the Owner or Owner's Representative in writing of changes to the schedule. Any change made in the schedule at any time shall require an explanation in writing as to reasons for the change.

1.3.2 Purpose of the Schedule

1.3.2.1 Provide additional assurance by the Job Order Contractor of its adequate planning, scheduling, and reporting during the execution of the construction and related activities so they may be prosecuted in an orderly and expeditious manner, within the Contract time and the milestones stipulated herein.

1.3.2.2 Provide additional assurance by the Job Order Contractor of its coordination of the Work of the Contractors and the various Subcontractors and suppliers at all tiers.

1.3.2.3 Assist the Owner or Owner's Representative in monitoring the progress of the Work.

1.3.2.4 Assist the Owner or Owner's Representative in evaluation of the monthly progress payments requests.

1.3.2.5 Assist the Owner or Owner's Representative evaluating the potential impact of proposed changes to the Task Order.

1.3.2.6 Assist and be utilized by the Job Order Contractor in the coordination of its forces, subcontractors and vendors.

1.3.2.7 Assist in detecting problems for the purpose of taking timely corrective action and to provide a mechanism or tool for determining and monitoring such corrective actions.

1.3.3 General Requirements of Submitted Schedules

1.3.3.1 The Work shall proceed at a rate as will meet the specified Milestone Dates, Substantial Completion and Final Completion dates within the Contract Time. By execution of the Contract, the Job Order Contractor represents that he has analyzed the Work, the materials and methods involved, the systems of the building, availability of qualified mechanics and labor, restrictions of the site, constraints imposed, their own work load and capacity to perform the Work, and agrees that the specified times are reasonable considering the existing conditions prevailing in the locality of the Work, including weather conditions, and other factors, with reasonable allowance for variations from average or ideal conditions.

1.3.3.2 The Schedule shall clearly identify the activities illustrating accomplishment of the time(s) for completion of the Project set forth in the Contract. If the Schedule indicates earlier

completion time(s) than that set forth in Contract, the float between the Schedule and the Contract dates shall be considered to be part of the total float available.

- 1.3.3.3 In developing the Schedule, the Job Order Contractor shall be responsible for assuring that Subcontractor Work at all tiers, as well as Job Order Contractor's own Work, is included in the Schedule.
 - 1.3.3.4 The Schedule as developed shall show the sequence and interdependence of activities required for complete performance of the Work. The Job Order Contractor shall be responsible for assuring all Work sequences are logical and the Schedule shows a coordinated plan of the Work.
 - 1.3.3.5 Failure by the Job Order Contractor to include any element of Work required for performance of the Contract or failure to properly sequence the Work shall not excuse the Job Order Contractor from completing all Work within the Contract Time.
 - 1.3.3.6 Contractor shall include a total number of weather related days for the project within the final baseline construction schedule. If delay occurs due to weather related conditions, the Contractor shall submit a request for the number of days to the Owner for approval within 5 calendar days. Claims for delay due to weather will be deducted from the total number of days approved in the final baseline construction schedule.
- 1.3.4 Use of Float and Reasonable Limitations Upon Resources
- 1.3.4.1 Float time within the schedule is jointly owned. The Job Order Contractor shall limit its use of logic restraints based upon use of a resource such that it equally reserves float for the limited resources of the Owner, other entities under the Owner's control and other entities beyond the control of either the Job Order Contractor or Owner, and that the Job Order Contractor reserves float for the various types of unexpected events which may be anticipated on a construction project of this magnitude.
 - 1.3.4.2 The Job Order Contractor acknowledges and agrees that actual delays to specific activities that do not exceed available total float time of such activities will not have any effect upon Contract completion times and Job Order Contractor will take all actions necessary to maintain the overall schedule.
- 1.3.5 Requirement for Additional Resources
- 1.3.5.1 The Job Order Contractor shall provide adequate resources, including but not limited to manpower and construction equipment, to perform its obligations in a timely manner. The Job Order Contractor shall be required to provide additional resources for additional unanticipated Work or events which may be anticipated on a construction project of this magnitude.
 - 1.3.5.2 If the Job Order Contractor and Owner or Owner's Representative agree to a Task Order Modification, such agreement shall be construed as stating that the Job Order Contractor is capable of supplying additional resources as may be required to effectuate such Task Order Modification without the need to reduce the resources available for other Work on the project, without disruption of other Work on the project and without additional cost for provision of additional resources other than as may be included in the agreed Change Order
- 1.3.6 Entitlement to Extension of Time and Acceleration
- 1.3.6.1 Entitlement to extensions of time for performance as described in the Contract Documents will be granted only to the extent that time adjustments for the activity or activities affected by any condition or event which entitles the Job Order Contractor to a time extension exceed the total float along the current critical path of activities affected.
 - 1.3.6.2 If the Owner or Owner's Representative does not provide an extension of time at the request of the Job Order Contractor, the Job Order Contractor shall in a timely manner provide a Recovery Schedule and itemized estimate of costs to effectuate such or shall be deemed to waive its claim for additional compensation therefore.

PART 2 PRODUCTS

2.1 TECHNICAL REQUIREMENTS OF SUBMITTED SCHEDULES ***

- 2.1.1 Job Order Contractor shall plan, schedule, execute, and report on the Work using the Critical Path Method (CPM). The principles used herein shall be as set forth in the text CPM in Construction Management, current edition, McGraw Hill and the Associated General Contractors of America (AGC) publication "The Use of CPM in Construction, a Manual for General Contractors and the Construction Industry", except that in case of conflict, the provisions of these Contract Documents shall govern.
- 2.1.2 The Job Order Contractor shall be responsible for maintaining the Project's Schedule.
- 2.1.3 The Schedule shall be developed utilizing the Precedence Diagramming Method. Job Order Contractor shall use Microsoft Project or Primavera 6 software or some program acceptable to the

Owner with scheduling options set for retained logic, calculate start-to- start lag from actual start, schedule durations as interruptible, show open ends as critical and calculate the total float as the most critical.

- 2.1.4 Milestone Dates, including Notice to Proceed, Substantial Completion, and Final Completion must be adhered to and shall be clearly identified on the Schedule. Milestone Dates may not be changed without the written consent of the Owner or Owner's Representative. Final Completion and Substantial Completion shall be mandatory finish constrained dates.
- 2.1.5 The Schedule shall be developed utilizing activities of specified duration of whole days between one (1) and fifteen (15) work days. Working days are defined as on a five day per week calendar, less recognized holidays as provided by the Owner or Owner's Representative. Milestones or other zero duration activities shall not be permitted except to indicate milestones set forth in this Specification. Submissions including use of Expected Finish constraints to calculate durations shall not be permitted.
- 2.1.6 Exceptions to the requirements above for the purpose of improving the Owner or Owner's Representative's ability to monitor the Schedule and permitting the use of durations larger than fifteen (15) work days, multiple calendars, milestones or other zero duration activity, calculated durations, logic relationships other than finish to start or durations between activities (lags) may be permitted on a case by case basis at the sole discretion of the Owner or Owner's Representative.
- 2.1.7 The level of detail of the Schedule shall be a function of the complexity of the Work involved. The level of detail and total number of activities shall be subject to approval by the Owner or Owner's Representative. No construction activity shall have duration of longer than fifteen (15) work days without prior acceptance of the Owner or Owner's Representative. Non-construction activities (such as procurement and fabrication) may have durations in excess of fifteen (15) work days.
- 2.1.8 Normal weather conditions shall be considered and included in the planning and scheduling of all Work influenced by high or low ambient temperatures and/or precipitation to ensure completion of all Work within the Contract Time. Normal weather conditions shall be determined by an assessment of average historical climatic conditions based upon the preceding ten (10) year records published for the locality by the National Ocean and Atmospheric Administration (NOAA).
- 2.1.9 Activity descriptions shall be clear and concise. The beginning and end of each activity shall be readily verifiable. All activity starts and finishes, with the exception of Milestones, must be tied into the schedule by logical restraints.
- 2.1.10 Proposed duration assigned to each activity shall be the Job Order Contractor's best estimate of time required to complete the activity considering the scope and resources planned for the activity.
- 2.1.11 Responsibility for each activity shall be identified with a single performing organization.
- 2.1.12 Each activity shall be identified with codes including as a minimum:
 - 2.1.12.1 The party responsible for performance of the Work.
 - 2.1.12.2 Where Work is to be subcontracted, the subcontractor to be responsible for the Work,
 - 2.1.12.3 Building, Floor and Location of the Work.
- 2.1.13 For all major equipment and materials fabricated or supplied for this project, the Schedule shall show a sequence of activities including:
 - 2.1.13.1 Preparation of shop drawings and sample submissions.
 - 2.1.13.2 Review of shop drawings and samples.
 - 2.1.13.3 Shop fabrication and delivery.
 - 2.1.13.4 Erection or installation.
 - 2.1.13.5 Testing of equipment and materials.

PART 3 EXECUTION

3.1 PRESENTATION AND REVIEW CYCLE

- 3.1.1 Job Order Contractor's Representative Designation
 - 3.1.1.1 (3) working days after date of Notice to Proceed, Job Order Contractor shall designate the person in its employ preparing the Schedule and Schedule updates.
- 3.1.2 Initial Schedule Conference
 - 3.1.2.1 The Owner or Owner's Representative will schedule and conduct an initial schedule conference within five (5) working days of Notice to Proceed. Job Order Contractor shall be prepared to review and discuss the schedule and sequence of operations. The conference shall be attended by:

- 3.1.2.1.1 Job Order Contractor’s Project Manager, Superintendent, and any Scheduler employee.
- 3.1.2.1.2 Other Job Order Contractor key personnel, defined as any individual reporting to the Job Order Contractor’s Project Manager or Superintendent, and being in responsible charge of more than 20% of field efforts as defined by cost.
- 3.1.2.1.3 The Project Manager, Superintendent or person in responsible charge of each Subcontractor expected to perform more than 10% of field efforts as defined by cost.
- 3.1.2.1.4 A representative in responsible charge of the fabrication and delivery of materials for this project for each major supplier including each supplier of more than 10% of the total contract value as defined by cost.
- 3.1.2.1.5 Owner or Owner’s Representative.
- 3.1.2.2 Procedures will be reviewed by the Owner or Owner’s Representative for the following:
 - 3.1.2.2.1 Development of preliminary Schedule by Job Order Contractor.
 - 3.1.2.2.2 Procedures for updating and revisions.
 - 3.1.2.2.3 Data exchange and Communications.
 - 3.1.2.2.4 Procedures for assessing schedule impacts, schedule delays, and time extensions.
 - 3.1.2.1.5 Development of recovery schedules.
- 3.1.3 Preliminary Schedule
 - 3.1.3.1 Immediately after the Notice to Proceed, the Job Order Contractor shall submit for the Owner or Owner’s Representative’s review and acceptance a Preliminary Schedule.
 - 3.1.3.2 The Preliminary Schedule shall cover the following project phases and activities
 - 3.1.3.2.1 Proposed Procurement Activities to be accomplished during the first ninety (90) days of the Contract. Procurement activities shall include mobilization, key shop drawing and sample submittals, reviews and the fabrication and delivery of key and long-lead procurement elements. Indicate planned submittal dates and delivery dates for fabrication and delivery activities.
 - 3.1.3.2.2 Proposed Construction Activities to be accomplished during the first ninety (90) days of the Contract
 - 3.1.3.2.3 Summary Activities not included above which are necessary to properly indicate the approach to scheduling the remaining Work areas or phases of the Work. The Work for each phase or area must be represented by at least one summary activity such that they cumulatively indicate the entire Construction Schedule. Summary Activities may exceed the duration limitations listed above and may be connected by Start-to-Start and Finish- to-Finish logic relationships as well as Finish-to-Start logic relationships and such logic relationships may include durations between activities (lag.)
 - 3.1.3.2.4 The Preliminary Schedule shall otherwise conform to the requirements outlined in the “Technical Requirements for Job Order Contractor-submitted Schedules” in this specification section.
 - 3.1.3.3 The submission shall consist of:
 - 3.1.3.3.1 A Schedule in Scheduling Program File Backup Disk.
 - 3.1.3.3.2 A logic diagram of the entire Preliminary Schedule in electronic format.
 - 3.1.3.3.3 Time scaled logic diagrams of:
 - 3.1.3.3.3.1 The entire Preliminary Schedule.
 - 3.1.3.3.3.2 The first 90 days of the Preliminary Schedule.
 - 3.1.3.3.3.3 Time scaled diagrams shall be Adobe electronic format.
 - 3.1.3.3.4 Tabular listings of:
 - 3.1.3.3.4.1 All Procurement Activities grouped by Submissions, Review and Fabrications, then sorted by Early Start, then Total Float.
 - 3.1.3.3.4.2 All Construction Activities to be performed in the first ninety (90) days, sorted by Early Start, then Total Float.

- 3.1.3.3.4.3 All Summary Activities sorted by Early Start, then Total Float.
- 3.1.3.3.4.4 Tabulations shall include Activity ID, Description, Original Duration, Remaining Duration, Activity Codes, Early Dates, Late Dates, Total Float, Predecessors and Successors.

3.1.3.3.5 Electronic copies of all diagrams and tabulations shall be required.

3.1.3.3.6 Within seven (7) calendar days after receipt by the Owner or Owner's Representative of the Preliminary Schedule, the Owner or Owner's Representative will notify the Job Order Contractor of any concerns the Owner or Owner's Representative may have in regard to the Preliminary Schedule. The Job Order Contractor shall provide a response to the concerns of the Owner or Owner's Representative, to the satisfaction of the Owner or Owner's Representative, before the submittal of the Detailed Construction Schedule.

3.1.3.3.7 Upon the submittal of the changes to the Preliminary Schedule by the Job Order Contractor, final review and acceptance by the Owner or Owner's Representative will take place within seven (7) days. The Preliminary Schedule shall be updated on a monthly basis while the Baseline Schedule is being developed. The monthly updating of the Preliminary Schedule shall be consistent with the procedures and requirements described in the "Schedule Updating" section of this specification section.

3.1.4 Baseline Schedule

3.1.4.1 Within fifteen (15) days following Notice to Proceed, Job Order Contractor shall submit to the Owner or Owner's Representative a detailed Baseline Schedule in precedence format for the Job Order Contractor's construction Work scope.

3.1.4.2 The Baseline Schedule shall conform to the requirements outlined in the "Technical Requirements for Job Order Contractor-submitted Schedules" in this specification section.

3.1.4.3 The submission shall consist of:

3.1.4.3.1 A Scheduling Backup disk.

3.1.4.3.2 A logic diagram of the entire Baseline Schedule.

3.1.4.3.3 Time scaled logic diagrams of:

3.1.4.3.3.1 The entire Baseline Schedule.

3.1.4.3.3.2 Activities on the critical path and those having ten (10) days or less float relative to the critical path.

3.1.4.3.3.3 Diagrams shall have the critical path highlighted and activities for which responsibility is other than the Job Order Contractor highlighted in a different color and pattern.

3.1.4.3.3.4 Diagrams shall be in a format acceptable to the Owner.

3.1.4.3.4 Tabular listings of:

3.1.4.3.4.1 All Procurement Activities organized by Submissions, Review and Fabrications, then sorted by Early Start, then Total Float.

3.1.4.3.4.2 All Construction Activities sorted by Early Start, then Total Float.

3.1.4.3.4.3 Tabulations above shall include Activity ID, Description, Original Duration, Remaining Duration, Percent Complete, Cost Percent Complete, Activity Codes, Early Dates, Late Dates, Total Float, Predecessors, Successors and Assigned Cost. The column for Assigned Cost shall be totaled.

3.1.4.3.4.4 All activities in activity identification number order, listing the activity identification number, activity title, successor identification number, successor title, logic relationship type, lag, activity calendar number and reason for the logic relationship.

3.1.4.4 The Baseline Schedule shall be reviewed in the following manner:

3.1.4.4.1 Within fifteen (15) days after receipt by the Owner or Owner's Representative of the Baseline Schedule, the Owner or Owner's Representative shall notify the Job Order

Contractor of any concerns the Owner or Owner's Representative may have in regard to the Baseline Schedule.

- 3.1.4.4.2 If the Owner or Owner's Representative questions the Job Order Contractor's proposed activities, logic, duration, the Job Order Contractor, within seven (7) days after receipt of the Owner or Owner's Representative's request, provide a satisfactory revision to, or adequate justification for, these activities, logic, duration, to the satisfaction of the Owner or Owner's Representative.
- 3.1.4.4.3 The Owner or Owner's Representative and the Job Order Contractor shall meet within seven (7) days after receipt of the Job Order Contractor's response for a joint review, correction, or adjustment of the Job Order Contractor's proposed Baseline Schedule.
- 3.1.4.4.4 In the event the Job Order Contractor fails to define any element of Work, activity, or logic and the Owner or Owner's Representative review does not detect this omission or error, such omission or error, when discovered by the Job Order Contractor or Owner or Owner's Representative, shall be corrected by the Job Order Contractor at the next monthly Schedule Update (discussed hereinafter) and shall not affect the Contract Time.
- 3.1.4.4.5 Within seven (7) days after the joint review between the Job Order Contractor and Owner or Owner's Representative, the Job Order Contractor shall revise the Baseline Schedule in accordance with agreements reached during the joint review and re-submit it to the Owner or Owner's Representative.

3.1.4.5 Acceptance of Job Order Contractor's Baseline Schedule:

- 3.1.4.5.1 Upon the submittal of the changes to the Baseline Schedule by the Job Order Contractor, final review and acceptance by the Owner or Owner's Representative will take place within seven (7) days. Upon the Owner or Owner's Representative's acceptance of the changes to the Baseline Schedule, the Job Order Contractor shall sign on the face of the Baseline Schedule which shall then indicate the Job Order Contractor's acceptance and approval of the Baseline Schedule.
- 3.1.4.5.2 The electronic files for Accepted Baseline Schedule shall be saved as Project ID Number/Version "BASELINE" and not further modified. A copy of this file shall be renamed as Project ID Number/Version "UPDATE <date>" and used for subsequent updates and shall reference this file as its target. A copy of the "UPDATE" file shall be renamed as Project ID Number/Version "INTERIM <date>" and shall reference the most recent "UPDATE" file.
- 3.1.4.5.3 Acceptance by the Owner or Owner's Representative of the Job Order Contractor's accepted Baseline Schedule shall be a condition precedent to the making of any progress payments under the Contract after the first ninety (90) days of the Contract.
- 3.1.4.5.4 Upon acceptance of the Baseline Schedule by the Owner or Owner's Representative, the Baseline Schedule shall be used as a basis for determining progress payments. Monthly progress payments shall be based upon information developed at the monthly Schedule Update.
- 3.1.4.5.5 Acceptance by the Owner or Owner's Representative of the Job Order Contractor's Construction Schedule does not relieve the Job Order Contractor of any of Job Order Contractor's responsibility whatsoever for the accuracy or feasibility of the Construction Schedule, or of the Job Order Contractor's ability to meet the Contract completion date or Milestone Dates, nor does such acceptance acknowledge or admit the reasonableness of the activities, logic and duration of the Job Order Contractor's Construction Schedule.

3.2 USE OF SCHEDULE FOR PROJECT COORDINATION

3.2.1 Weekly Progress Meetings

- 3.2.1.1 Once each week at the progress meeting, the progress achieved by the Job Order Contractor during previous work week will be assessed. The Job Order Contractor shall update the most recent "INTERIM" Schedule with the Actual Start date of activities started in the past week, the Remaining Duration of those activities in progress and the Actual Finish date of activities completed during the past week. The Job Order Contractor shall submit a progress schedule in electronic tabular/bar-chart format indicating the information used to perform this update for the previous week and the activities scheduled for the succeeding three (3) weeks. A bar chart

directly derived from the most recent “INTERIM” Schedule shall be used to generate the four (4) week window. All activities shown in this short interval schedule will be identified by the same activity numbers and descriptions as shown in the Construction Schedule.

3.2.1.2 The Job Order Contractor shall mark on this computer generated bar-chart schedule the choice and timing of those activities it intends to actually perform during the upcoming three weeks. The Job Order Contractor may add further details to monitor this short interval Schedule.

3.2.1.3 A copy of this short interval schedule shall be submitted to the Owner or Owner’s Representative.

3.2.2 Minor Revisions to the Schedule for Unanticipated Events

3.2.2.1 If the Job Order Contractor and Owner or Owner’s Representative agree to a Task Order Modification, such agreement shall include an Impact Analysis and agreement on the acceptance for such impact (in part or whole by each party) and costs for mitigation thereof. In the event that such agreement is not part of the agreement for the price of the Task Order Modification, the Job Order Contractor shall treat such Task Order Modification as a directive for purposes of the schedule.

3.2.2.2 If the Job Order Contractor believes that any change to the Work identified through an accepted Project document may impact its Work, the Job Order Contractor shall perform an Impact Analysis upon a copy of the most recent “UPDATE” file and submit such to the Owner or Owner’s Representative, with a written explanation of the changes, as soon as practicable (not more than seven (7) days) after determination of such belief. The failure to so promptly notify the Owner or Owner’s Representative shall be deemed a waiver of any compensation or extension of time due to such cause. Where the parties are in disagreement over the responsibility of the delaying event, the Job Order Contractor shall use a description for such which is responsibility neutral.

3.2.2.3 As part of its Impact Analysis, the Job Order Contractor shall suggest means of mitigation including but limited to use of greater resources, modification or deletion from the logic network of selected restraints and selective overtime. If the Job Order Contractor believes that its efforts to mitigate such impact will entitle it to additional compensation, the Job Order Contractor shall submit an estimate of the unmitigated and mitigated impact and cost consequences of each. The failure to provide such a submittal in a timely manner shall be deemed a waiver of any additional compensation.

3.2.3 Monthly Schedule Update Meetings

3.2.3.1 On a monthly basis, the Job Order Contractor shall meet with the Owner or Owner’s Representative for the purpose of updating the Schedule. The Job Order Contractor shall submit its assessment of the Actual Start date of activities started since the last update, Remaining Duration of those activities in progress, Actual Finish date of activities completed and Cost Percent Complete of activities in progress or complete. The Owner or Owner’s Representative will either assent to the Job Order Contractor’s assessments or direct the Job Order Contractor to use other dates. The Owner or Owner’s Representative may request the Job Order Contractor to provide additional assurance of a Remaining Duration of Work in progress. If the Job Order Contractor does not agree to the direction of the Owner or Owner’s Representative, it shall so state in the log field of the activity and in comments to the Minutes of the meeting.

3.2.3.2 The information shall be entered to a copy of the most recent “UPDATE” file which will then be saved and not further modified.

3.2.3.3 Monthly Update Reports submission shall consist of:

3.2.3.3.1 An electronic Back up disc.

3.2.3.3.2 Electronic time scaled logic diagrams of:

3.2.3.3.2.1 The entire Baseline Schedule including indication of progress to date.

3.2.3.3.2.2 Activities not yet completed on the critical path and those having ten (10) days or less float relative to the critical path.

3.2.3.3.2.3 Diagrams shall have the critical path highlighted and activities for which responsibility is other than the Job Order Contractor highlighted in a

different color and pattern.

3.2.3.3.2.4 Diagrams shall be provided in an electronic format approved by the Owner.

3.2.3.3.3 Electronic tabular listings of:

3.2.3.3.3.1 All Procurement Activities organized by Submissions, Review and Fabrications, then sorted by Early Start, then Total Float.

3.2.3.3.3.2 All Construction Activities sorted by Early Start, then Total Float.

3.2.3.3.3.3 Tabulations above shall include Activity ID, Description, Original Duration, Remaining Duration, Activity Codes, Early Dates or Actual Dates, Late Dates (if applicable), Total Float, Predecessors and Successors.

3.2.3.4 If there have been any Minor Revisions to the Schedule for Unanticipated Events during the past reporting period, such shall be incorporated into a copy of most recent "UPDATE" file and rescheduled. This file will be renamed as Project ID Number/Version "REVISED <date>". The file will then be saved as the new "UPDATE" file and not further modified.

3.2.3.5 Minor Revision Reports submission shall consist of:

3.2.3.5.1 All reports required for an Update.

3.2.3.5.2 Those portions of the logic diagram required for the Baseline Schedule submission which have been modified with the modifications highlighted.

3.2.3.6 After updating and (if required) revising the schedule, it shall be copied to the next UPDATE file and to a new INTERIM file.

3.3 MAJOR REVISIONS TO THE SCHEDULE

3.3.1 In the event that, pursuant to a Task Order Modification, a Revised Baseline Schedule is adopted for the Work remaining on the project, such revised baseline Schedule shall be used as the target for further update to the project.

3.4 RECOVERY SCHEDULE

3.4.1 In the event that the Job Order Contractor determines that it can no longer perform according to the schedule, the Job Order Contractor shall prepare and submit a Recovery Schedule.

3.4.2 In the event that the Most Recent Update indicates that the project is more than ten (10) days behind schedule, or that a major subcontractor performing more than ten percent (10%) of the labor on the site leaves for any reason without completion of its Work, or that a specialty subcontractor employing proprietary means and methods leaves the site for any reason without completion of its Work, or the Job Order Contractor becomes aware of an anticipated delay of specially ordered materials or equipment calculated to delay the project more than ten (10) days behind schedule or the Job Order Contractor anticipates for any reason that the project is likely to be delayed more than ten (10) days behind schedule, and upon notice of such to and subsequent request of the Owner or Owner's Representative, the Job Order Contractor shall prepare and submit a Recovery Schedule.

3.4.3 The Recovery Schedule submittal may include, without limitation:

3.4.3.1 Revisions to the Original Durations of Activities not yet started, which are to individually be supported with a narrative of the actual productivity to date.

3.4.3.2 Revisions to the Calendar, including indicating Work on Saturdays, Sundays or holidays, subject to approval by the Owner or Owner's Representative.

3.4.3.3 Splitting of activities to indicate more precise coordination, which are to be individually supported with a narrative of how a portion of the previously indicated activity may now suffice for a successor activity.

3.4.3.4 Revisions to Logic Relationships, deleting restraints, as may be required.

- 3.4.4 The Recovery Schedule shall be prepared to indicate, where practicable, recovery within one month or within ten percent (10%) of the remaining duration until the mandated deadlines threatened.
- 3.4.5 Recovery Schedule Reports submission shall consist of:
 - 3.4.5.1 All reports required for an Update.
 - 3.4.5.2 The logic diagram required for the Baseline Schedule submission, highlighted, where practicable, to indicate where the Recovery Schedule differs from the Baseline Schedule. A narrative explanation shall be provided as to the reasons for the changes in the schedule.
- 3.4.6 Where the Recovery Schedule has been ordered by the Owner or Owner's Representative, it shall be submitted within five (5) working days. The Job Order Contractor and all parties under its control called to the Initial Schedule Conference shall be prepared to attend, upon forty-eight (48) hours' notice, a Recovery Schedule Meeting which may be called by the Owner or Owner's Representative within the next three (3) to seven (7) work days. The Owner or Owner's Representative may also request the Job Order Contractor's Surety to attend the Recovery Schedule Meeting.
 - 3.4.6.1 If a Recovery Schedule Meeting is called, the parties attending shall provide additional assurances to, or revise the proposed Recovery Schedule to the satisfaction of the Owner or Owner's Representative.
 - 3.4.6.2 Once approved by the Owner or Owner's Representative, the Recovery Schedule shall be treated as a Minor Revision to the Schedule or a Major Revision to the Schedule as may be directed by the Owner or Owner's Representative.
 - 3.4.6.3 Once approved by the Owner or Owner's Representative, failure by the JOB ORDER CONTRACTOR to strictly follow the Recovery Schedule until back on schedule shall be deemed a Material Breach of the Contract.

END OF SECTION

SECTION 01 33 00

*** SUBMITTALS ***

PART 1 GENERAL

1.01 CONSTRUCTION SCHEDULE

- A. In accordance with Section 01 32 16 and as specified herein.
- B. Based upon the Project Schedule, provide a separate submittal schedule indicating anticipated product and shop drawing submittal dates along with critical dates by which approvals must be provided. Schedule shall make accommodation for full review times and at least one resubmittal.

1.02 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

- A. In accordance with Section 01 33 23 and as specified herein.
- B. UL Assemblies:
 - 1. Job Order Contractor shall submit 3 copies of each UL Listed fire rated assembly that is to be used for the project for approval by the Design Professional, including; but not limited to:
 - a. Fire rated wall and ceiling construction, including shaft wall construction.
 - b. Fire rated roof construction.
 - c. Spray applied fire resistive materials
 - d. Fire rated penetrations (including dampers) through fire rated wall, ceiling and roof construction, including pipe, duct and expansion joint assemblies.
 - e. Fire rated openings, glazing and frames (interior and exterior doors and windows).
 - f. Other fire rated assemblies as noted on Drawings or as specified in the specifications.
 - 2. Copies shall be compiled into loose-leaf notebooks with tabbed dividers identifying the location of each UL assembly.
- C. Submit Shop Drawings and Samples for only those items specifically mentioned in the Specifications. Job Order Contractor shall be responsible for obtaining Shop Drawings required for the progress of the Work, even though such Shop Drawings may not require the Design Professional's review.
- D. Environmentally Sensitive Materials (Green Products):
 - 1. Specifications are based upon the use of environmentally sensitive materials.
 - 2. In some cases, manufacturer's standard products may contain materials that do not comply with specified requirements for the usage of environmentally sensitive materials and compliance with the specified requirements may not be possible.
 - 3. Job Order Contractor shall submit product data for any products that are proposed for use that failed to comply with specified requirements for the usage of environmentally sensitive materials.
 - 4. Design Professional and Owner reserve the right to disapprove the submittal (and subsequent usage) for a n d products that are proposed for use that fail to comply with specified requirements for the usage of environmentally sensitive materials.

1.03 QUALITY CONTROL SUBMITTALS

- A. Mockups: In coordination with submittal and prior to start of Work represented by mockup, construct full scale mockup(s) as indicated on Drawings and as required by the Owner
 - 1. General requirements:
 - a. Mockups shall provide a standard of workmanship.
 - b. Provide required structural support for mockups and include concrete slab with required footings as mock-up base.
 - c. Construct with all anchors, fasteners, sealants, and other components proposed for actual installation.

- d. Construct successive and/or modify mockups until standard is approved.
 - e. When accepted, sample panel shall be standard of comparison for remainder of Work and will function as a reference base for acceptance or rejection of final work.
 - f. Submit report describing tests, results, and any modifications made to correct deficiencies or to improve performance.
 - g. Mockups shall be reviewed by the Design Professional's contract administrator and Owner's Representative for joint acceptance. Do not proceed with installation of materials included on mockups on the building until mock-up has been inspected and accepted by Design Professional and Owner's Representative.
 - h. Upon acceptance of final work at completion of Project, if directed by Owner's Representative, remove sample panel from site and dispose of in a legal manner, in accordance with Waste Management Plan per Section 01 74 19.
- B. Field Samples: In addition to mockups described above, provide the field samples as specified in the various technical sections for review and joint acceptance by Design Professional and Owner's Representative.
- 1. Job Order Contractor shall provide field samples for all finishes (interior and exterior) that will remain exposed to view in the final work.
 - a. Field samples shall be constructed of actual materials to be used in the final work, including actual mix for concrete and other such materials.
 - b. Include testing for exterior components as specified in the various sections.
 - c. Field samples shall not be incorporated into the final work
 - 2. Size(s) of field samples shall be sufficient to show the characteristics of the finish.
 - 3. Approved field samples will serve as standard for approval of building construction.
 - 4. Construct in location where directed.
 - 5. Bracing and supports shall be adequate to support field samples throughout construction period.
 - 6. Modify field samples as directed by Design Professional to satisfy appearance and performance requirements.
 - 7. Obtain approval of field samples before commencing construction of exposed work.
 - 8. Upon acceptance of final work at completion of Project, remove sample panel from site and dispose of in a legal manner, in accordance with Waste Management Plan per Section 01 74 19, if directed by Owner's Representative.
- C. Equipment Lists: Following Job Order Contractor's review and approval, submit to the Design Professional and Owner's Representative 3 complete lists of major items of mechanical, plumbing and electrical equipment and materials. Submit all items at one time. Partial lists will not be acceptable. Submittals shall include the Manufacturer's Specifications, weights, space requirements, physical dimensions, rating of equipment and supplemental information requested by the Design Professional. Submit performance curves for pumps and fans. Where a submittal sheet describes items in addition to that item being submitted, delete such items. Clearly note equipment and materials which deviate from those shown or specified in size, weight, required clearances, and location of access. Modifications to the Work as shown or specified in submittals shall be indicated and shall be provided by the Job Order Contractor as a part of the Work.
- D. Manufacturer's Instructions: Where Specifications require Work to be furnished, installed or performed in accordance with a specified product Manufacturer's instructions, distribute copies of such instructions to concerned parties.

1.04 LEED SUBMITTALS ***

- A. Prior to start of construction: The following shall be submitted a minimum of 15 calendar days prior to the start of construction for review and acceptance.
 - 1. Erosion and Sedimentation Control Plan (SSp1)
 - 2. Construction IAQ Management Plan as specified in Section 01 50 00-Temporary Facilities and Control.
 - 3. Construction Waste Management Plan as specified in Section 01 74 19.
- B. Prior to installation of products: The following shall be submitted a minimum of 7 calendar days prior to the installation of the applicable product.

1. Product Form: Prior to installation of a product into the work, submit a completed form for each product which contributes to the points required for LEED™ Certification. Information contained on the Product Form shall be used to complete the information required for the LEED Submission.
- C. During the course of construction:
1. Submittals with applications for payment as specified in Section 01 29 76 – Progress Payment Procedures.
- D. Prior to Substantial Completion:
1. The Job Order Contractor shall complete required LEED-NC 2009 forms and supporting data required by LEED-OnLine as required for the “Construction Submittal” in accordance with Section 01 81 13. Provide required Project Data and calculation information for each respective credit template to document credit compliance using LEED-NC 2009 requirements.
 2. Requirements of IAQ management (during construction and before occupancy) shall be in accordance with Section 01 50 00 and 01 77 00.

END OF SECTION

SECTION 01 33 23

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 GENERAL

1.1 Description

1.1.1 General

1.1.1.1 Furnish all shop drawings, product data and samples as indicated, in accordance with Contract Documents.

1.1.1.2 Completely coordinate with work of all other trades.

1.1.1.3 See Sections of the Contract and Task Order for additional requirements.

1.1.2 See Specification Sections for items for which shop drawings, product data, and samples are required.

1.2 Submittal-General

1.2.1 Job Order Contractor shall be responsible for and make all submissions.

1.2.1.1 Transmit all items on an approved shop drawing transmittal form.

1.2.1.2 Identify each transmittal using the 6-digit specification number with a dash and an added number (i.e. metal handrails might be numbered 05 50 00-1. If returned for re-submission, second submission would be 05 50 00-1A) or other mutually agreed upon numbering system.**

1.2.1.3 After the second rejection, a meeting may be required by the Owner or Owner's Representative between the Job Order Contractor, Owner or Owner's Representative, and Design Professional (hereafter "DP") to review the submittal.

1.2.3. Job Order Contractor shall review all Subcontractor submittals prior to submission.

1.2.4. Provide written statement that the submittals are consistent with the Construction Documents or if not totally consistent, indicate all deviations. Unless such departures are accepted as indicated in Section 1.7.6 below, such departures will not be permitted.

1.2.5. Submittals without written statement will be returned and considered as not having been submitted.

1.2.6. By reviewing or submitting submittals and/or shop drawings, the Job Order Contractor thereby represents that it has determined and verified availability, field measurements, field construction criteria, materials, catalog numbers and similar data, or will do so, and that it has checked and coordinated each submittal and/or shop drawing with the requirements of the Construction Documents and other Job Order Contractor Construction Contract Documents.

1.2.7. If any specified material item or part is not available, the Job Order Contractor shall so indicate to the DP.

1.2.8 Make submittals sufficiently in advance of date required to allow the DP reasonable time, in accordance with the requirements of the Contract, for review and additional resubmission and review cycles if necessary.

1.2.9 Items not submitted in accordance with provisions of this Section will be returned, without action, for resubmission.

1.2.10 Submittals on items not approved for use by specifications, addenda or substitution request will be rejected.

1.2.11 Drawings transmitted to the Owner or Owner's Representative by other than the Job Order Contractor will be returned to the Job Order Contractor without action of any kind unless agreed to previously. Drawings will not be returned to subcontractors.

1.2.12 Provide Operation-Maintenance Manuals, and warranties in a separate transmittal. Refer to Section 01 91 13 for operation and maintenance manual requirements. Transmittal numbers for Operation-Maintenance Manuals shall be original number for Operation- Maintenance "O-M" or other mutually agreed to numbering system.

1.3 Submittal Schedule

- 1.3.1** Per the requirements of the Contract and the Task Order, submit an itemized schedule, indicating proposed submittal dates for all items.
 - 1.3.1.1** Include all shop drawings, data, samples and other items required to be submitted including operations and maintenance data.
 - 1.3.1.2** All items requiring DP action should be submitted, when possible during the first 25 percent of the construction period.
 - 1.3.1.3** No extension of time will be granted to the Job Order Contractor because of its failure to submit submittals or shop drawings in ample time to allow for review, possible resubmittals and approval.

1.4 Product List

- 1.4.1** Submit six (6) copies *** of a list of products, equipment and subcontractors proposed for use. Electronic submittals may be utilized in lieu of hard copies upon consent of Design Professional.
- 1.4.2** Tabulate by Specification Section.
- 1.4.3** Only items which have been specified, approved by addenda or substitution request may be used.
- 1.4.4** No partial Applications for Payment will be processed until this data and other submissions required by Contract Documents are received.
- 1.4.5** For products specified under reference standards, approved equal products, or products of optional manufacturers, include with listing of each product:
 - 1.4.5.1** Name and address of manufacturer.
 - 1.4.5.2** Trade name.
 - 1.4.5.3** Model or catalog designation.
 - 1.4.5.4** Manufacturer's data.
 - 1.4.5.4.1** Performance and test data.
 - 1.4.5.4.2** Reference standards.

1.5 Submittals–Shop Drawings

- 1.5.1** Identify drawings with manufacturer, item, use, type, project designation, specification section or drawing detail reference.
- 1.5.2** In the event hard copies are submitted, submit six (6) copies of each drawing, or as otherwise indicated in the specification section. Electronic submittals may be utilized in lieu of hard copies upon consent of Design Professional.
 - 1.5.2.1** Marks on drawings by Job Order Contractor shall not be in red. Any marks by Job Order Contractor shall be duplicated on all copies submitted.
 - 1.5.2.1** Submit drawings 24 x 36 inches, or 30 x 42 inches, unless size of items depicted makes such size impractical or as agreed to by the Owner or Owner's Representative, the DP and the Job Order Contractor .
 - 1.5.2.3** Allow clear space of approximately 40 square inches for stamping on right hand side.
- 1.5.3** Submit six (6) copies ***of standard items such as equipment brochures, catalog cuts of fixtures, or standard catalog items. Electronic submittals may be utilized in lieu of hard copies upon consent of Design Professional.
 - 1.5.3.1** Indicate exact item or model and all proposed options.
 - 1.5.3.2** Include scale details, sizes, dimensions, performance characteristics, capacities, wiring diagrams, controls and other pertinent data.

1.6 Submittals–Samples

- 1.6.1** The Job Order Contractor shall furnish product samples of all items requested or required by the specifications in accordance with Contract for Construction Manager at Risk Project.

- 1.6.1.1** Product samples shall be properly identified and submitted with such promptness as to cause no delay in Construction Work or in the work of any other contractor and to allow time for consideration by the DP and the Owner.
- 1.6.1.2** Job Order Contractor shall submit product samples to the DP and Owner for review and approval.
- 1.6.1.3** Any product or material substitutions must be submitted for DP's prior written approval, subject to Owner's review and written approval.
- 1.6.1.4** Each product sample must be accompanied by a letter of transmittal containing: (i) Date of submission; (ii) Name of Project; (iii) Location of Project; (iv) Branch of Construction Work (specification section number); (v) Project number; (vi) Name of submitting Job Order Contractor; and (vii) Name of Subcontractor.
- 1.6.1.5** The Job Order Contractor shall furnish to the DP a certificate stating that material or equipment submitted complies with the Construction Documents and the other Contract Documents. If a certificate originates with the manufacturer, the Job Order Contractor shall endorse it and submit it to the DP together with a statement of compliance in its own name.
- 1.6.2** Submit six (6) samples *** to address indicated with transmittal letters, or construction site, if required.
 - 1.6.2.1** Include brochures, shop drawings, and installation instructions with transmittal.
 - 1.6.2.2** Submit transmittal for site-built samples to address indicated.
- 1.6.3** DP, Owner or Owner's Representative may retain samples for comparison purposes until completion of Work.
 - 1.6.3.1** Samples will be returned or may be used in the Work unless the Specification Section specifically indicates otherwise.
 - 1.6.3.2** Remove samples when directed.
 - 1.6.3.3** Pay all costs of furnishing or constructing, and removing samples as specified within the Contract Documents.
 - 1.6.3.4** Unless the DP is requested at the time of submittal to return samples at the Job Order Contractor's expense, rejected samples will be destroyed.
- 1.6.4** Resubmit samples of rejected items.

1.7 Design Professional Review

- 1.7.1** Reproduce and distribute submittals that the DP reviews and stamps. The DP will review and stamp the submittal as follows, to indicate the action taken:
 - 1.7.1.1** REVIEWED: Where a submittal is marked "REVIEWED", that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
 - 1.7.1.2** FURNISH AS CORRECTED: When a submittal is marked "FURNISH AS CORRECTED", that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
 - 1.7.1.3** REJECTED Submit Specified Item: When a submittal is marked "REJECTED Submit Specified Item", information submitted is not in compliance with Contract Documents. Provide a written statement to the Job Order Contractor as to why the item is rejected. Job Order Contractor shall resubmit submittal as required by Contract Documents.
 - 1.7.1.4** REVISE AND RESUBMIT: When a submittal is marked "REVISE AND RESUBMIT", do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
 - 1.7.1.4.1** Do not permit submittals marked "REVISE AND RESUBMIT" to be used at the Project Site or elsewhere where Work is in progress.
- 1.7.2** Job Order Contractor shall retain one (1) copy of each "REVIEWED", or "FURNISH AS CORRECTED" submittal on file at the job-site.

- 1.7.3 Owner or Owner's Representative and DP shall retain one (1) copy of each "REVIEWED", or "FURNISH AS CORRECTED" submittal in the project file.
- 1.7.4 Job Order Contractor shall resubmit items stamped "REVISE AND RESUBMIT" or "REJECTED Submit Specified Item"; by DP.
 - 1.7.4.1 Provide a print of previous drawing with resubmission for comparison, if requested by the DP.
 - 1.7.4.2 Add letter suffix to previous transmittal number, to indicate resubmission.
 - 1.7.4.3 It shall be the Job Order Contractor's responsibility to assure that previously approved documents are destroyed when they are superseded by a resubmittal.
- 1.7.5 The DP shall review and approve Submittals, Shop Drawings, Product Data, Samples, substitutions, and other required submissions of the Job Order Contractor.
 - 1.7.5.1 Submissions shall be approved only if they are in conformance with the design of the Project and in full compliance with the Construction Documents.
 - 1.7.5.2 Submissions of Job Order Contractor shall be acted on and returned to Job Order Contractor within fourteen (14) days of receipt. If review and approval are not timely, the DP shall notify the Job Order Contractor or Job Order Contractor and the Owner in writing stating the reason for the delay.
 - 1.7.5.3 The DP's approval of a specific item or component shall not indicate approval of an assembly of which the item is a component.
 - 1.7.5.4 DP review does not relieve Job Order Contractor of the responsibility to provide all components, wiring, etc., required to make item operable or usable provided this information is indicated within the Contract Documents.
- 1.7.6 At Owner's option, items constituting a departure from Contract Documents that are in the interest of Owner and involve no change in Contract cost may be accepted. In the event of such acceptance, institute a Supplementary Instruction reflecting change.
- 1.7.7 Reviewed samples submitted or constructed and approved by DP constitute criterion for judging completed work. Finish work or items not equal to samples will be rejected.
- 1.7.8 Start of work which requires submittals, prior to return of submittals with DP or Owner's stamp indicating review is at Job Order Contractor's risk.

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION (Not Used)

END OF SECTION

SECTION 01 33 33

***** DEFERRED PERMIT - SUBMITTALS *****

PART 1 GENERAL

1.1 DESCRIPTION

1.1.1 Design deferred to the Contractor for completion of the design due to the complexity and associated Code impacts. Typical Deferred Submittals may include, but are not limited to Curtain Wall Systems, Stairs, Precast, Fire Alarm, and Fire Protection Systems.

1.1.2 On occasion, Design Professionals, with the consent of Owner's Representative, may provide for "deferred permit submittals" which will comply with the procedures and requirements of the permitting agency.

1.1.3 In the event of the AE having provided (with the Owner's consent) for deferred permit submittals, the costs of such shall be borne by the Job Order Contractor (except for the permitting cost which will be paid by the Owner).

1.2 The deferred permit submittals are as indicated on the drawings.

END OF SECTION

SECTION 01 35 43

ENVIRONMENTAL PROCEDURES (Sustainable Design Projects)

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Procedures for achieving the most environmentally conscious Work feasible within the limits of the Construction Schedule, Contract Sum, and available materials, equipment, and products.
 - 1. Participate in promoting efforts of Owner and Design Professional to create an energy-efficient and environmentally sensitive structure.
 - 2. Use recycled-content, toxic-free, and environmentally sensitive materials, equipment, and products.
 - 3. Use environmentally sensitive procedures.
 - a. Protect the environment, both on-site and off-site, during construction operations.
 - b. Prevent environmental pollution and damage.
 - c. Effect optimum control of solid wastes.
- B. Related Sections:
 - 1. Section 01 33 00 – Submittal Procedures: Submittals for "non-green" products.
 - 2. Section 01 60 00 – Product Requirements Product substitution procedures.
 - 3. Section 01 77 00 – Closeout Procedures: Cleaning and final submittals.

1.02 SUBSTITUTIONS

- A. Notify Owner when Job Order Contractor is aware of materials, equipment, or products that meet the aesthetic and programmatic intent of Contract Documents but are more environmentally sensitive than materials, equipment, or products specified or indicated in the Contract Documents.
- B. Substitution requirements of Section 01 60 00, apply except as follows:
 - 1. Prior to submitting detailed information required under Section 01 60 00, submit the following for initial review by Owner and Design Professional:
 - a. Product data including manufacturer's name, address, and phone number.
 - b. Description of the differences of the proposed substitution from specified product. Include description of environmental advantages of proposed substitution over specified product.
 - c. MSDS Sheets (for information only, not for verification of conformance under OSHA requirements.)
 - 2. Submit additional information as directed by Design Professional.

1.03 PRECONSTRUCTION MEETING

- A. After award of Contract and prior to the commencement of the Work, schedule and conduct meeting with Owner and Design Professional to discuss the proposed Solid Waste Management and Environmental Protection Plan and to develop a mutual understanding relative to details of environmental protection, recycling, and rebate programs.

1.04 SUBMITTALS

- A. Environmental Protection Plan:
 - 1. List of federal, state, and local laws, regulations, and permits concerning environmental protection, environmental pollution and damage, hazardous materials, construction waste, chemical waste, sanitary waste, sediment, water, air, and noise pollution that are applicable to the Job Order Contractor's proposed operations.
 - 2. List species of fish and wildlife (as applicable to this project) that require specific attention, along with measures for their protection.
 - 3. Procedures to be implemented to provide the required environmental protection and to comply with the applicable laws and regulations. Document existing conditions.
 - 4. Procedures for Recycling/Reuse Program, including:
 - a. Name, location, and phone number.

- b. Copy of permit or license for each facility.
- B. Environmental Cleaning Plan: Submit cleaning / housekeeping policies and environmental cleaning solution product data sheets.
 - 1. Provide written program for training and implementation.
 - 2. Provide written plan for integrating the Green Housekeeping program into the overall project Environmental Protection Plan
 - 3. Material Safety Data Sheets (MSDS) on chemicals approved for use within the building.
 - 4. Develop list of approved and prohibited chemicals and practices.

1.05 QUALITY ASSURANCE

- A. Regulatory requirements:
 - 1. Cleaning materials and methods shall meet federal mandates including Executive Order 13101 on Greening the Government through Waste Prevention, Recycling and Federal Acquisition and Section 23.703 of the Federal Acquisition Regulation which requires federal agencies to consider environmental factors when purchasing products and services.
 - 2. Comply with the CURRENT criteria of Green Seal standard GS-37 (see www.greenseal.org).

PART 2 PRODUCTS

2.01 MATERIALS

- A. Furnish environmentally responsible materials as defined above and as specified in the various specification sections of this Project Manual.
- B. Cleaning Materials:
 - 1. Utilize non-hazardous chemicals that have no or greatly reduced impacts upon the environment.
 - 2. Provide Green Seal approved ENVIRCARE chemical line, or approved equivalent, which consists of products that are non-hazardous and have a low environmental impact.
 - 3. Utilize concentrated cleaning products when available.

PART 3 EXECUTION

3.01 ENVIRONMENTAL GOALS IMPLEMENTATION

- A. Job Order Contractor shall designate an on-site party (or parties) responsible for overseeing the Environmental Goals for the project and instructing workers and subcontractors in the means and methods of achieving those goals.
- B. Distribution: The Job Order Contractor shall distribute copies of the Environmental Goals to the Job Site Foreman, each Subcontractor, the Owner, and the Design Professional.
- C. Meetings: Job Order Contractor shall discuss the implementation of the Environmental Goals at the following meetings:
 - 1. Pre-construction meeting.
 - 2. Regular job-site meetings.

3.02 ENVIRONMENTAL CONTROLS

- A. Protection of natural resources: Preserve the natural resources within the project boundaries and outside the limits of permanent work performed under this Contract in their existing condition or restore to an equivalent or improved condition as approved by Owner, upon completion of the Work.
 - 1. Confine construction activities to work area limits indicated on the Drawings.
 - a. Temporary construction: As specified in Section 01 50 00.
 - b. Disposal operations for demolished and waste materials that are not identified to be salvaged, recycled, or reused:
 - 1) Remove debris, rubbish, and other waste materials resulting from construction operations from site.
 - 2) No burning permitted.
 - 3) Transport materials with appropriate vehicles, and dispose off-site to areas that are approved for disposal by governing authorities having jurisdiction.
 - 4) Avoid spillage by covering and securing loads when hauling on or adjacent to public streets or highways. Remove spillage and sweep, wash, or otherwise clean project site, streets, or highways.
 - 5) Comply with applicable regulations.

2. Land resources: Prior to construction, identify land resources to be preserved within the Work area. Do not remove, cut, deface, injure, or destroy land resources, including trees, shrubs, vines, grasses, topsoil, and land forms without permission from Owner.
 - a. Earthwork: As specified in Section _____ *** —Earthwork and as follows:
 - 1) Erodible soils: Plan and conduct earthwork to minimize the duration of exposure of unprotected soils, except where the constructed feature obscures borrow areas, quarries, and waste material areas. Clear areas in reasonably sized increments only as needed to use the areas developed. Form earthwork to final grade as shown. Immediately protect side slopes and back slopes upon completion of rough grading.
 - 2) Erosion and sedimentation control devices: Construct or install temporary and permanent erosion and sedimentation control features as required. Provide "biofence" (www.biofence.com), or approved equivalent or hay bales, or other methods as required to provide silt control into adjacent washes, creeks, rivers, lakes and other wetlands as directed by Design Professional and/or Civil Engineer.
 - b. Tree and plant protection: Prior to start of construction, tag each tree and plant scheduled to remain with value as identified by Owner. In the event of damage to tree or plant, Owner may, at Owner's discretion, deduct the indicated value of the damaged tree or plant from the Contract Sum.
3. Air Resources: Prevent creation of dust, air pollution, and odors.
 - a. Use water sprinkling, temporary enclosures, and other appropriate methods to limit to lowest practical level dust and dirt rising and scattering in air.
 - 1) Dust mitigation shall be as required by local Environmental Health Department.
 - 2) Do not use water when it may create hazardous or other adverse conditions such as flooding and pollution.
 - b. Store volatile liquids, including fuels and solvents, in closed containers.
 - c. Properly maintain equipment to reduce gaseous pollutant emissions.
 - d. Interior final finishes: Schedule construction operations involving wet products prior to packaged dry products to the greatest extent possible, in accordance with approved Solid Waste Management and Environmental Protection Plan.
 - e. Temporary Ventilation: As specified in Section 01 50 00—Temporary Facilities and Controls, and as follows:
 - 1) Provide adequate ventilation during and after installation of interior wet products and interior final finishes.
 - 2) Provide adequate ventilation of packaged dry products prior to installation. Remove from packaging and ventilate in a secure, dry, well-ventilated space free from strong contaminant sources and residues. Provide a temperature range of 60 degrees F minimum to 90 degree F maximum continuously during the ventilation period. Do not ventilate within limits of Work unless otherwise approved by Design Professional.
 - 3) Preoccupancy ventilation: After final completion and prior to initial occupancy, provide adequate ventilation for minimum five days. Preoccupancy ventilation procedures:
 - a) Use supply air fans and ducts only.
 - b) Temporarily seal exhaust ducts.
 - c) Temporarily disable exhaust fans.
 - d) Provide exhaust through operable windows or temporary openings.
 - e) Provide temporary exhaust fans as required to pull exhaust air from deep interior locations. Stair towers may be used for exhausting air from the building during the temporary ventilation.
 - f) After preoccupancy ventilation and prior to final testing and balancing of HVAC system, replace air filters and make HVAC system fully operational.
 - g) Provide clean air filters.

3.03 INDOOR AIR QUALITY

- A. Verify ventilation requirements for indoor air quality. "Adequate" requirements for one material may not be "adequate" for another; for example, carpet can contain over 100 chemicals, including possible carcinogens, and may require more complex ventilation to accelerate off-gassing prior to installation. Materials/products that generally require temporary ventilation for off gassing include:
1. adhesives
 2. wood preservatives
 3. composite wood products
 4. plastics
 5. waterproofing
 6. insulation
 7. fireproofing
 8. sealants/caulking
 9. acoustical ceilings
 10. resilient flooring
 11. carpet
 12. painting
 13. sealers/coatings
 14. wall coverings
 15. manufactured casework
 16. furniture
- B For more information and information on current Federal activities for IAQ, contact: EPA Indoor Air Quality Information Clearing House, National Pesticides Telecommunication Network, National Institute for Occupational Safety and Health, The Department of Energy (DOE) Office of Conservation, and Renewable Energy.

END OF SECTION

SECTION 01 42 00

REFERENCES

1.01 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date of Contract Documents.
- C. Obtain copies of standards when required by Contract Documents.
- D. Should specified reference standards conflict with Contract Documents, request clarification from Design Professional/Engineer before proceeding.
- E. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.02 MARICOPA COUNTY DESIGN GUIDELINES AND STANDARDS

- A. The following list represents Maricopa County Departmental and User-specific Design Guidelines and Standards. Project teams must incorporate the requirements of these guidelines into their project approach. The information in these specific design guidelines takes precedence over the information of the Technical Design Standards unless directed otherwise by the FMD Project Manager.
- B. Discrepancies between MIHS Technical Design Standards and the specific departmental guidelines must be brought to the attention of the FMD Project Manager for review with O & M and user group staff.
- C. The FMD Project Manager will assist the Design Team in obtaining the latest versions of the following design guidelines:
 - 1. Maricopa County Green Government Program
 - 2. MCSO Cabling Standards
 - 3. Maricopa County Structured Cabling Standard
 - 4. Maricopa County Security System Requirements
 - 5. Maricopa County Superior Court – Court Facility Planning Guidelines
 - 6. Maricopa County Justice Court – Facility Planning Guidelines
 - 7. Maricopa County Locksmith Guidelines
 - 8. Maricopa County Ergonomics Guidelines
 - 9. MCSO Detention Facility Design Guidelines
 - 10. Maricopa County Commissioning Requirements
 - 11. Maricopa County Space Guidelines
 - 12. Maricopa County CAD Layering Standards
- D. Sustainable Design is a priority to MIHS. If a project is to be designed to achieve a minimum LEED Certification level as defined by the U.S. Green Building Council, unless specified otherwise by FMD shall be stated here ██████████
 - 1. MIHS may elevate desired LEED –Certification levels on certain projects.
 - 2. Credits that increase operating efficiencies and reduce Life Cycle Costs are strongly desired.
 - 3. Building Commissioning is required on all projects regardless of LEED. FMD will hire and additional commissioning agent under separate contract.
 - 4. Design shall incorporate lighting, motors, and HVAC equipment that are eligible for rebate or incentive programs from local utility companies such as APS or SRP.

1.03 SCHEDULE OF REFERENCES (telephone numbers, addresses, or URL's may not be current):

AA	Aluminum Association 900 19th St. N.W., Suite 300 Washington, DC 20006 www.aluminum.org	(202) 862-5100
AABC	Associated Air Balance Council 1518 K. Street, N.W. Washington, DC 20005 www.aabchq.com	(202) 737-0202
AACPA	Autoclaved Aerated Concrete Product Association 3701 C.R. 544 E Haines City, FL 33844 www.aacpa.org	(863) 419-2058
AAMA	American Architectural Manufacturers Association 1540 E. Dundee Rd., Suite 310 Palatine, IL 6067-8321 www.aamanet.org	(847) 303-5664
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, N.W., Suite 249 Washington, DC 20001 www.aashto.org	(202) 624-5800
ACI	American Concrete Institute P. O Box 9094 Farmington Hills, MI 48999-9094 www.aci-net.org	(248) 848-3700
ADC	Air Diffusion Council 230 North Michigan Avenue Chicago, IL 60601 www.flexibleduct.org	(312) 201-0101
AFPA	American Forest and Paper Association (Formerly: National Forest Products Association) 1111 19 th St., NW, Suite 800 Washington, DC 20036 www.afandpa.org	(202) 463-2700
AI	Asphalt Institute 2696 Research Park Dr P.O. Box 14052 Lexington, KY 40512-4052 www.asphaltinstitute.org	(606) 288-4960
AIA	American Institute of Architects 1735 New York Avenue, N.W. Washington, DC 20006-5292 www.aia.org	(202) 626-7300
AISC	American Institute of Steel Construction 1 E. Wacker Dr., Suite 3100 Chicago, IL 60601 www.aisc.org	(312) 670-2400
AISI	American Iron and Steel Institute 1101 17th Street, N.W., Suite 1300 Washington, DC 20036 www.steel.org	(202) 452-7133

AITC	American Institute of Timber Construction 7012 S. Revere Pky, Suite 140 Englewood, CO 80112 www.aitc-glulam.org	(303) 792-9559
AMCA	Air Movement and Control Association 30 West University Drive Arlington Heights, IL 60004 www.amca.org	(847) 394-0150
AMG	Arizona Masonry Guild 5225 N. Central Ave., Suite 400 Phoenix, AZ 85014 www.azmasonryguild.org	(602) 265-5999
ANSI	American National Standards Institute 11 West 42nd Street, 13 th Fl New York, NY 10036 www.ansi.org	(212) 642-4900
APA	Engineered Wood Association (Formerly: American Plywood Association) P.O. Box 11700 Tacoma, WA 98411 www.apawood.org	(253) 656-6600
API	American Petroleum Institute 1220 L Street, N.W. Washington, DC 20005 www.api.org	(202) 682-8000
AQMD	Air Quality Management District 21865 E. Copley Drive Diamond Bar, CA 91765 www.aqmd.gov	(909) 396-2000
ARI	Air-Conditioning and Refrigeration Institute 4301 N. Fairfax Dr., Suite 425 Arlington, VA 22203 www.ari.org	(703) 524-8800
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 1791 Tullie Circle, N.E. Atlanta, GA 30329 www.ashrae.org	(800) 527-4723 (404) 636-8400
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017 www.asme.org	(800) 843-2763 (973) 882-1167
ASTM	American Society for Testing and Materials 100 Barr Harbor Drive West Conshohocken, PA 19428 www.astm.org	(610) 832-9585
AWI	Architectural Woodwork Institute 1952 Isaac Newton Square West Reston, VA 20190 www.awinet.org	(703) 733-0600
AWPA	American Wood Preservers Association PO Box 5690 Granbury, TX 76049 www.awpa.com	(817) 326-6300

AWS	American Welding Society 8669 NW 36 St.,#130 Miami,FL 33166-6672 www.amweld.org	(800) 443-9353 (305) 443-9353
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	(303) 794-7711
BHMA	Builders Hardware Manufacturer's Association 355 Lexington Ave., 17th Floor New York, NY 10017	(212) 661-4261
BIA	Brick Institute of America 11490 Commerce Park Drive Reston, VA 22091 www.bia.org	(703) 620-0010
CDA	Copper Development Association 260 Madison Ave. New York, NY 10016 www.copper.org	(212) 251-7200
CFPC	Certified Forest Products Council 14780 SW Osprey Drive, Suite 285 Beaverton, OR 97007 www.certifiedwood.org	(503) 590-6600
CISCA	Ceilings and Interior Systems Construction Association 1500 Lincoln Highway, Suite 202 St. Charles, IL 60174 www.cisca.org	(630) 584-1919
CLFMI	Chain Link Fence Manufacturers Institute 9891 Broken Land Pkwy, Suite 300 Columbia, MD 21046 www.chainlinkinfo.org	(301) 596-2584
CRI	The Carpet and Rug Institute Box 2048 Dalton, GA 30722-2048 www.carpet-rug.com	(706) 278-3176
CRSI	Concrete Reinforcing Steel Institute 933 Plum Grove Road Schaumburg, IL 60173 www.crsi.org	(847) 517-1200
CSSB	Cedar Shingle and Shake Bureau(Formerly: Red Cedar Shingle and Handsplit Shake Bureau) 515 116th Avenue Bellevue, WA 98004	(425) 453-1323
DCAT	Development Center for Appropriate Technology P.O. Box 41144 Tucson, AZ 85717 www.dcat.net	(520) 624-6628
DHI	Door and Hardware Institute 14170 Newbrook Drive Chantilly, VA 20151 www.dhi.org	(703) 222-2010
DOE	U.S. Department of Energy 1000 Independence Ave., SW Washington, DC 20585 http://www.energy.gov	(800) 342-5363
EEBA	Energy and Environmental Building Association 10740 Lyndale Avenue South, 10W, Bloomington, MN 55420-5615 http://www.eeba.org/	(952) 881-1098

EBN	Environmental Building News 122 Birge St., Suite 30 Brattleboro, VT 05301 www.BuildingGreen.com	(802) 257-7300
EJMA	Expansion Joint Manufacturers Association 25 North Broadway Tarrytown, NY 10591 www.ejma.org	(914) 332-0040
EPA	U.S. Environmental Protection Agency 401 M St. WS, 6202J Washington, DC 20460 www.epa.gov	(202) 775-6650
FSC	Forest Stewardship Council - U.S. 1155 30th Street NW Suite 300 Washington, DC 2007 www.fscus.org	(877) 372-5646
FM	FM Global (Formerly: Factory Mutual System) 1151 Boston-Providence Turnpike P.O. Box 688 Norwood, MA 02062 www.factorymutual.com	(781) 762-4300
GA	Gypsum Association 125 S Franklin St Chicago, IL 60606 www.usg.com	(312) 606-4000
GANA	Glass Association of North America (Formerly: Flat Glass Marketing Association) 3310 SW Harrison St Topeka, KS 66611 www.glasswebsite.com/gana	(785) 266-7013
ICC	International Code Council <i>Headquarters</i> 5203 Leesburg Pike, Suite 600 Falls Church, VA 22041 <i>Los Angeles District Office</i> 5360 S. Workman Mill Road Whittier, CA 90601 http://www.iccsafe.org/	703-931-4533 800-284-4406
IEEE	Institute of Electrical and Electronics Engineers 3 Park Ave 17 th Floor New York, NY 10016 www.ieee.org	(212) 419-7900
ISRI	Institute of Scrap Recycling Industries 1325 G St. NW, Suite 1000 Washington, DC 20005-3104 www.isri.org	(202) 737-1770
MAG	Maricopa Association of Governments 302 N. 1 st Street, suite 300 Phoenix, AZ 85003 www.mag.maricopa.gov	(602) 254-6300
MBMA	Metal Building Manufacturer's Association 1300 Sumner Ave. Cleveland, OH 44115	(216) 241-7333
MIL	Military Specification Naval Publications and Forms Center 5801 Tabor Avenue Philadelphia, PA 19120	
ML/SFA	Metal Lath/Steel Framing Association	(312) 456-5590

	(A Division of the NAAMM) 8 South Michigan Ave., Suite 1000 Chicago, IL 60603	
NAAMM	National Association of Architectural Metal Manufacturers 8 South Michigan Ave, Suite 1000 Chicago, IL 60603 www.naamm.org	(312) 456-5590
NCMA	National Concrete Masonry Association 2302 Horse Pen Rd. Herndon, VA 22071 www.ncma.org	(703) 713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	(301) 977-3698
NEMA	National Electrical Manufacturers Association 1300 N 17 th Street, Suite 1847 Rosslyn, VA 22209 www.nema.org	(703) 841-3200
NFPA	National Fire Protection Association 1 Battery March Park Quincy, MA 02269 www.nfpa.org	(800) 344-3555 (617) 770-3000
NRCA	National Roofing Contractors Association 10255 W. Higgins Rd., Suite 600 Rosemont, IL 60018 www.roofonline.org	(847) 299-9070
NTMA	National Terrazzo and Mosaic Association 110 E Market St, Ste 200A Leesburg, VA 20176 www.ntma.com	(800) 323-9736 (703) 779-1022
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 www.portcement.org	(847) 966-6200
PCI	Precast/Prestressed Concrete Institute 209 W. Jackson Blvd Chicago, IL 60606 www.pci.org	(312) 786-0300
PDCA	Painting and Decorating Contractors of America 3913 Old Lee Hwy., Suite 33B Fairfax, VA 22030 www.pdca.com	(703) 359-0826
PS	Product Standard U. S. Department of Commerce Washington, DC 20203	
RIS	Redwood Inspection Service 405 Enfrente Rd Novato, CA 94949	(415) 382-0662
RCSHSB	Red Cedar Shingle and Handsplit Shake Bureau	Refer to CSSB
RFCI	Resilient Floor Covering Institute 966 Hungerford Dr., Suite 12B Rockville, MD 20850 www.buildernet.com/rfc	(301) 340-8580

SDI	Steel Deck Institute P.O. Box 25 Fox River Grove, IL 60021-0025 www.sdi.org	(847) 462-1930
SDI	Steel Door Institute 30200 Detroit Rd. Cleveland, OH 44145 www.steeldoor.org	(440) 899-0010
SIGMA	Sealed Insulating Glass Manufacturers Association 401 N. Michigan Ave Chicago, IL 60611 www.sigmaonline.org	(312) 664-6610
SJI	Steel Joist Institute 3127 10 th Ave Extension North Myrtle Beach, SC 29582 www.steeljoist.org	(843) 626-1995
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 20151 www.smacna.org	(703) 803-2980
SSPC	The Society for Protective Coatings (Formerly: Steel Structures Painting Council) 4516 Henry St., 6 th Floor Pittsburgh, PA 15222 www.sspc.org	(412) 281-2331
TCA	Tile Council of America, Inc. 100 Clemson Research Blvd Anderson, SC 29625 www.tileusa.com	(864) 646-8453
UL	Underwriters' Laboratories, Inc. 333 Pfingston Road Northbrook, IL 60062 www.ul.com	(800) 704-4050
USGBC	US Green Building Council 1825 I St. NW, Suite 400 Washington, DC 20006 www.usgbc.org	(202) 429-2081
WCLIB	West Coast Lumber Inspection Bureau Box 23145 Portland, OR 97281 www.wclib.org	(503) 639-0651
WDMA	Window and Door Manufacturing Association (Formerly: National Woodwork Manufacturers Association) 1400 E. Touhy Avenue, Suite 470 Des Plaines, IL 60018 www.wdma.com	(800) 223-2301
WWPA	Western Wood Products Association 522 S.W. 5th Ave., Ste 500 Portland, OR 97204 www.wwpa.org	(503) 224-3930

END OF SECTION

SECTION 01 42 15

TERMINOLOGY

PART 1 GENERAL

1.01 DESCRIPTION

- A. Work included: Terminology used on drawings and within specifications and the meanings intended. The following list is limited to those words which experience indicates are most often misused and sources of confusion. Words, which are consistently properly used and understood, are not included.

1.02 DEFINITIONS PERTAINING TO THE CONTRACT DOCUMENTS

- A. In accordance with Section 01 11 00, Exhibit A contains acronyms and definitions related to the Summary of Work. ***

1.03 COMMON ABBREVIATIONS (MIHS)

- A. FMD-Facilities Management Department
- B. IT-Information Technology
- C. JOC-Job Order Contracting
- D. MIHS-Maricopa Integrated Health Systems
- E. MCSO-Maricopa County Sheriff's Office
- F. O&M-Operations and Maintenance
- G. OET-Office of Enterprise Technology
- H. OMB-Office of Management and Budget
- I. D.P. or A.E.-Design Professional or Architect/Engineer
- J. P&D-Planning and Development Department
- K. MCDEQ-Maricopa County Department of Environmental Quality

1.04 TERM ("GREEN" BUILDING RELATED)

- A. **ADEQUATE VENTILATION:** Ventilation, including air circulation and air changes Required to cure materials, dissipate humidity, and prevent accumulation of dust fumes, vapors, or gases. See Section 01 81 13 - for requirements relating to Indoor Environmental Quality (EQ) Prerequisite No. 1 - Minimum IAQ Performance.
- B. **AIR BARRIER SYSTEM:** The assembly of components used in building construction to create a plane of air tightness throughout the building envelope and to control air leakage.
- C. **ADAPTIVE REUSE:** Renovation of a building or site to include elements that allow a particular use or uses to occupy a space that originally was intended for a different use.
- D. **ALTERNATIVE ENERGY:** Energy from a source other than the conventional fossil-fuel sources of oil, natural gas and coal (i.e., wind, running water, the sun). Also referred to as "alternative fuel."
- E. **BAKE-OUT:** Process by which a building is heated in an attempt to accelerate VOC emissions from furniture and materials.
- F. **BIODEGRADABLE:** Waste material composed primarily of constituent parts that occur naturally, are able to be decomposed by bacteria or fungi, and are absorbed into the ecosystem. Wood, for example, is biodegradable, while plastics are not.
- G. **BUILDING ENVELOPE:** The external elements walls, floor, ceiling, roof, windows and doors of a building that encloses conditioned space; the building shell.
- H. **BUILDING FOOTPRINT:** The area on a project site that is used by the building structure and is defined by perimeter of the building plan. Parking lots, landscape and other non- building facilities are not included in the building footprint.
- I. **BROWNFIELDS:** Abandoned, idled or underused industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination.

- J. CHAIN OF CUSTODY: A tracking procedure to document the status of a product from the point of harvest or extraction to the ultimate consumer end use. (*from LEED™ Reference Guide Version 2.0, June 2001, Pg. 188*)
- K. CHEMICAL WASTE: Includes petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals, and inorganic wastes.
- L. CLOSED-LOOP RECYCLING: When a used product is recycled into a similar product; a recycling system in which a particular mass of material (possibly after upgrading) is remanufactured into the same product (e.g., glass bottles into glass bottles).
- M. COMPOST: Process whereby organic wastes, including food wastes, paper and yard wastes, decompose naturally, resulting in a product rich in minerals and ideal for gardening and farming as a soil conditioner, mulch, resurfacing material or landfill cover.
- N. CONSTRUCTION [AND DEMOLITION] WASTE: Includes solid wastes, such as building materials, packaging, rubbish, debris, and rubble resulting from construction, remodeling, repair. [and demolition]operations.
1. Rubbish: Includes both combustible and noncombustible wastes, such as paper, boxes, glass, crockery, metal and lumber scrap, metal cans, and bones.
 2. Debris: Includes both combustible and noncombustible wastes, such as leaves and tree trimmings that result from construction or maintenance and repair work.
- O. CRADLE-TO-CRADLE: A term used in life-cycle analysis to describe a material or product that is recycled into a new product at the end of its defined life and disposal. Also refers to a system that handles a product from creation through disposal.
- P. DAYLIGHTING: Daylighting optimizes the use of natural light through design considerations to illuminate the interior of buildings during the day. Common daylighting strategies include the proper orientation and placement of windows, use of light wells, light shafts or tubes, skylights, clerestory windows, light shelves, reflective surfaces, and shading, and use of interior glazing to allow light into adjacent spaces.
- Q. DEVELOPMENT FOOTPRINT: The area on the project site that has been impacted by any development activity. Hardscape, access roads, parking lots, non-building facilities and building structure are all included in the development footprint.
- R. ENVIRONMENTAL FOOTPRINT: For an industrial setting, this is a company's environmental impact determined by the amount of depletable raw materials and nonrenewable resources it consumes to make its products, and the quantity of wastes and emissions that are generated in the process. Traditionally, for a company to grow, the footprint had to get larger. Today, finding ways to reduce the environmental footprint is a priority for leading companies.
- S. ENVIRONMENTALLY RESPONSIBLE MATERIALS:
1. Products made from environmentally attractive materials such as "salvaged products" and "products with post-consumer recycled content."
 2. Products that are green because of what isn't there, such as alternative to products made from PVC and polycarbonate.
 3. Products that reduce environmental impacts during construction, renovation, or demolition.
 4. Products that reduce environmental impacts of the building operation, such as equipment that conserves energy and products that prevent pollution or reduce waste.
 5. Products that contribute to a safe, healthy indoor environment such as products that remove indoor pollutants.
- T. ENVIRONMENTAL TOBACCO SMOKE: Secondhand tobacco smoke exposure. U. FLY ASH
1. A fine, glass-powder recovered from the gases of burning coal during the production of electricity. These micron- sized earth elements consist primarily of silica, alumina and iron. When mixed with lime and water the fly ash forms a cementitious compound with properties very similar to that of Portland cement. Because of this similarity, fly ash can be used to replace a portion of cement in the concrete, providing some distinct quality advantages. The concrete is denser resulting in a tighter, smoother surface with less bleeding. Fly Ash concrete offers a distinct architectural benefit with improved textural consistency and sharper detail.
 2. Fly ash with a low LOI (carbon content) is used as a substitute for Portland cement in concrete. Regulations vary from state to state, however, ASTM suggests that fly ash must not contain more than 6% unburned carbon to be used for its cementitious qualities.

Otherwise, concrete companies use it as a fine aggregate in concrete block. Others use it for filling old coal mines, seaside docking areas and as a lining for hazardous waste dumps.

- V. **GREEN BUILDING:** Green Building refers to the process of designing and constructing buildings in ways that minimize their negative ecological impacts. This includes concern for the full life cycle impacts of buildings from the acquisition of resources and materials, transportation, processing, manufacture, distribution, installation, use, maintenance, repair, and ultimate disposal. Green building usually also includes efforts to ensure energy efficiency, material and resource efficiency and healthy and safe indoor environment in terms of the toxicity of materials and indoor air quality.
- W. **GREEN DEVELOPMENT:** Green development is a development approach that benefits or has minimal negative impacts to the local and larger environment, uses resources efficiently (including community resources), and is sensitive to the existing local culture and community.
- X. **GREEN MATERIALS, PRODUCTS, AND SYSTEMS:** Green materials, products, and systems have many of the following characteristics: are durable, are low-maintenance, have low-embodied energy (energy required to acquire, transport, manufacture and install), are locally available, are made from recycled or renewable resources and can be recycled or renewed, have low toxicity, produce little pollution or waste, and have minimal negative ecological impacts.
- Y. **GREENFIELD:** Undeveloped land or land that has not been impacted by human activity.
- Z. **GREENWASH:** Disinformation disseminated by an organization so as to present an environmentally responsible public image.
- AA. **INDOOR AIR QUALITY (IAQ):** ASHRAE defines acceptable indoor air quality as air in which there are no known contaminants at harmful concentrations as determined by cognizant authorities and with which 80% or more people exposed do not express dissatisfaction.
- AB. **INTEGRATED WASTE MANAGEMENT:** The complementary use of a variety of practices to handle solid waste safely and effectively. Techniques include source reduction, recycling, composting, combustion and landfilling.
- AC. **LIFE CYCLE OF A PRODUCT:** All stages of a product's development, from extraction of fuel for power to production, marketing, use and disposal.
- AD. **LIFE CYCLE ANALYSIS (LCA):** The assessment of a product's full environmental costs, from raw material to final disposal, in terms of consumption of resources, energy and waste.
- AE. **MATERIAL SAFETY DATA SHEET (MSDS):** A standard formatted information sheet, prepared by a material manufacturer, describing the potential hazards, physical properties, and procedures for safe use of a material.
- AF. **OPEN-LOOP RECYCLING:** A recycling system in which a product made from one type of material is recycled into a different type of product (e.g., used newspapers into toilet paper). The product receiving recycled material itself may or may not be recycled.
- AG. **PASSIVE SOLAR DESIGN:** Passive solar design of buildings maximizes the use of the sun for heating during cool weather and minimizes solar gain from the sun in warm weather. Design features typically include south-facing orientation of windows for winter sun (in the northern hemisphere), general east-west orientation of the building, roof and overhangs that provide shade from the summer sun but allow the winter sun through the windows, and thermal mass in the interior to store heat or coolness and maintain more constant temperatures within the structure. Good insulation is typical also for most of the building envelope, to control heat loss and gain.
- AH. **POST-CONSUMER MATERIAL:** Any household or commercial product that has served its original, intended use.
- AI. **POST-CONSUMER RECYCLE CONTENT:** A product composition that contains some percentage of material that has been reclaimed from the same or another end use at the end of its former, useful life.
- AJ. **POST-INDUSTRIAL MATERIAL:** Industrial manufacturing scrap or waste; also called pre-consumer material.
- AK. **POST-INDUSTRIAL RECYCLE CONTENT:** A product composition that contains some percentage of manufacturing waste material that has been reclaimed from a process generating the same or a similar product. Also called pre-consumer recycle content.

- AL. RECLAMATION: Restoration of materials found in the waste stream to a beneficial use that may be other than the original use.
- AM. RECYCLE: A strategy to process material in order to extend the usable life of that material.
- AN. REDUCE: A strategy to use less of a material or to use it more efficiently.
- AO. RENEWABLE RESOURCES: A resource that can be replenished at a rate equal to or greater than its rate of depletion; i.e., solar, wind, geothermal and biomass resources.
- AP. RESOURCE CONSERVATION: Practices that protect, preserve or renew natural resources in a manner that will ensure their highest economic or social benefits.
- AQ. RETROFIT: The modification of an existing building or facility to include new systems or components.
- AR. REUSE:
1. A strategy to return a material to achieve use in the same or a related capacity.
 2. Using a product or component of municipal solid waste in its original form more than once.
- AS. SALVAGED MATERIALS: Construction materials recovered from existing building and reprocessed for reuse in other buildings. Common salvaged materials include structural beams and posts, flooring, doors, cabinetry, brick and decorative items. *(from LEED™ Reference Guide Version 2.0, June 2001, pg 188)*
- AT. SEDIMENT: Soil and other debris that has been eroded and transported by storm or well production runoff water.
- AU. SOLAR THERMAL WATER HEATING: Here the energy of the sun is used to provide or supplement a building's hot water supply. This can be both domestic hot water and for building heat, usually through radiant heat systems.
- AV. SOURCE REDUCTION.
1. The design, manufacture, purchase or use of materials to reduce the amount or toxicity of waste in an effort to reduce pollution and conserve resources (i.e., reusing items, minimizing the use of products containing hazardous compounds, extending the useful life of a product and reducing unneeded packaging).
 2. Practices that reduce the amount of any hazardous substance, pollutant or contaminant entering any waste stream or otherwise being released into the environment. Such practices also reduce the risk to public health and the environment associated with such releases. Term includes equipment or technology modifications, substitution of raw materials, and improvements in housekeeping, maintenance, training or inventory control.
- AW. TIPPING FEE:
1. Charge for the unloading or dumping of waste at a recycling facility, composting facility, landfill, transfer station or waste-to-energy facility.
 2. Fees charged by the landfill for dumping large volumes of disposable waste. The fee is usually quoted for one ton of waste.
- AX. TOTAL VOLATILE ORGANIC COMPOUNDS: The total mass, typically in milligrams per cubic meter, of the organic compounds collected in air.
- AY. VAPOR RETARDER: A layer of moisture resistant material usually which controls moisture diffusion (defined as less than 1 perm) to prevent moisture build up in the walls.
- AZ. VOLATILE ORGANIC COMPOUNDS (VOC): Any compound containing carbon and hydrogen or containing carbon and hydrogen in combination with other elements.
- BA. WASTE TO ENERGY: Burning of industrial waste to provide steam, heat or electricity. Sometimes referred to as waste-to-fuel process.

1.04 TERMS (ELECTICITY, HVAC AND VENTILATION RELATED)

- A. AIR CHANGES PER HOUR (ACH): An expression of ventilation rates - the number of Times in an hour that a home's entire air volume is exchanged with outside air.
- B. BATTERY POWER STORAGE SYSTEMS: Battery systems that are designed to store power in batteries that has been generated by solar photovoltaic, wind, micro- hydroelectric, or other site-based power generation systems.
- C. BLOWER DOOR: Diagnostic equipment consisting of a fan, removable panel and gauges, used to measure and locate air leaks.
- D. COMBUSTION EFFICIENCY: A measure of useful heat extracted from a fuel source by an operating heating appliance. For example a furnace with a combustion efficiency of 60 percent converts 60 percent of the fuels energy content into useful heat. The rest is lost as exhaust gases.
- E. CONDUCTION TRANSMISSION: of energy (heat /sound) through a material or from one material to another by direct contact. Materials with low rates of conductive heat transfer make good insulation.
- F. CONVECTION TRANSMISSION: of energy (heat /sound) from one place to another by movement of a fluid such as air or water.
- G. DEW POINT: The temperature at which a vapor begins to condense.
- H. EXFILTRATION: Uncontrolled leakage of conditioned air from inside the home to the outside.
- I. HEAT RECOVERY VENTILATION SYSTEM: A mechanical ventilation system that recovers energy from exhausted indoor air and transfers it to incoming air. This system usually incorporates an air-to-air heat exchanger which transfers the heat from exhaust air to the incoming air or vice versa.
- J. HUMIDISTAT: A humidity sensitive control device that signals the ventilation system to operate if the humidity goes above a preset limit.
- K. MICRO-HYDROELECTRIC SYSTEMS: Micro hydroelectric systems generate electricity by harnessing the flow of a stream or some other small scale flowing water source. Surplus electricity is often stored in a battery storage system for later use.
- L. PASSIVE VENTILATION: Passive ventilation relies typically on using both convective air flows that result from the tendency of warm air to rise and cool air to sink and taking advantage of prevailing winds. Many passive ventilation systems rely on the building users to control window and vents as dictated by site conditions and conditions within the building.
- M. RELATIVE HUMIDITY: The ratio expressed as a percentage of the amount of moisture air actually contains to the maximum amount it could contain at that temperature.
- N. SOLAR PHOTOVOLTAIC SYSTEMS: These systems harness the energy of the sun and convert it into electricity. This electricity can be used as either direct current (DC) power or alternating current (AC) power if an inverter is used. Surplus electricity is often stored in a battery storage system for later use.
- O. SOLAR THERMAL AIR HEATING: This uses the energy of the sun to heat air either for direct space heating or to heat the thermal mass of the building or heat storage systems (such as water tanks, rock pits).
- P. THERMAL BRIDGE: A thermally conductive material which penetrates or bypasses an insulation system;
- Q. THERMAL RESISTANCE: (R) An index of a material's resistance to heat flow.
- R. WIND POWER SYSTEMS: These convert the energy of the wind into electricity. Surplus electricity is

1.05 TERMS (WATER RELATED)

- A. GREYWATER SYSTEMS: Greywater systems take water used once for washing clothes or bodies and distribute that water for secondary use, typically for substrate irrigation of landscaping.
- B. WATER HARVESTING SYSTEMS: These systems collect rainwater for use after a rain event. Features in the system include catchment/storage systems such as gutters and cisterns, landscaping features (swales, basins, etc.) to direct the rainwater to plants and/or hold the water to slow the infiltration rate.

1.06 TERMS (UNITS RELATED)

- A. BTU: British Thermal Unit - The amount of energy that is required to raise 1 lb. of water up 1° F.
- B. BTUH: A rate of energy transfer - can be expressed as Btu's/hour.

- C. KILOWATT-HOUR (kWh): Standard unit for measuring electrical energy consumption- kilowatts X hours.
- D. PERM: A unit of water vapor transmission defined as 1 grain of water vapor per square foot per hour per inch of mercury pressure difference (1 inch mercury = 0.49 psi). Metric unit of measure is $\text{ng/m}^2 \text{ s Pa}$. 1 perm = 55 $\text{ng/m}^2 \text{ s Pa}$.
- E. PH: A measure of acidity/alkalinity of aqueous mixtures. A measure of pH 7 is neutral, lower is more acidic, higher is more alkaline.
- F. PSI: Pounds per square inch.
- G R A: unit of measurement of resistance to heat flow in $\text{hr. ft}^2 \text{ }^\circ \text{ F/BTU.in}$.
- H. RSI: A unit of measurement of resistance to heat flow in $\text{m}^2 \text{ }^\circ \text{ C/W}$ per 25 mm. $R = 0.176 \text{ RSI}$
- I. U-VALUE: Overall thermal conductance. U value is equal to the inverse of the sum of the R-values in a system ($U = 1 / R \text{ total}$).

1.07 TERMS (GENERAL)

- A. ACCESS DOOR: Small doors not included in door schedules which are typically a prefabricated assembly including frame and door.
- B. ACCESS PANEL: A section of finish which can be opened.
- C. ACOUSTICAL SEALANT: Non-hardening caulking or sponge tape used to seal partitions to structural ceiling, walls and floor to reduce sound transmissions.
- D. ANCHOR BOLT: A bolt that is embedded in masonry or cast-in-place in concrete.
- E. AS-BUILT DRAWING: A drawing or print marked by the Job Order Contractor to show actual conditions as constructed. For Architect's drawing, see RECORD DRAWING.
- F. BACKING: A continuous material behind entire area of finish, as opposed to intermittent or edge support.
- G. BATT INSULATION: Roll type insulation for installation between studs or joists, either pressed fit or stapled. See also BLANKET INSULATION.
- H. BLANKET INSULATION: Roll type insulation for installation over suspended ceiling or on plane wall surfaces. Either laid loose or secured with stick clips. See also BATT INSULATION.
- I. BUILDING PAPER: Sheathing paper or felt.
- J. CAULK, CAULKING: Non-elastomeric fillers and joints subject to little movement, generally indoors.
- K. CASING BEAD: Plaster stop.
- L. CEMENT PLASTER: Portland cement plasters used at interior spaces.
- M. COLD JOINT: Use to describe a joint where the material on one side of the joint is to be set or hard before the other side is installed and no particular bonding is expected.
- N. CONTROL JOINT: A joint to limit cracking, or a joint which is necessary to the construction process but continuity or bonding is required.
- O. DAMPPROOFING: A coating intended to resist vapor transmission and dampness, but not designed to resist a head of water.
- P. DELETE: Something to be taken out by intention. See also OMIT.
- Q. DOWNSPOUT: A rain water conduit made of sheet metal or plastic. See also LEADER.
- R. ELASTOMERIC: A material which is inherently rubbery, typically used to describe sealant, flashing, membrane, etc.
- S. EXPANSION BOLT: Single unit bolt with integral anchoring device, such as Wej-it or Kwik Bolt.
- T. EXPANSION JOINT: A joint designed for structural movement, both expansive and contractive.
- U. EXPANSION SHIELD: Use for devices that receive a separate screw or bolt and also note type of screw or bolt.
- V. FURRED CEILING: Any ceiling not directly attached to the floor or roof framing above except

- suspended acoustical ceiling.
- W. FURRING: Any ceiling not directly attached to the floor or roof framing above except suspended acoustical ceiling.
 - X. FURRING CHANNEL: Cold rolled steel channel. For hat-shaped 25 gauge steel channels see METAL FURRING.
 - Y. GLAZED OPENING: Used at interior partitions.
 - Z. GROOVE: A long, narrow indentation. In wood, use only when parallel to the grain. See also RABBET.
 - AA. GROUT: Any cementitious material used to fill, level or set other materials.
 - AB. GYPSUM BOARD: Wall and ceiling finish material. Abbreviation is GYP.BD.
 - AC. HANDRAIL: Single rail. For protective barricade type rails see RAILING.
 - AD. HANGER: Any suspended structural member by which other members are attached.
 - AE. HARDWOOD: No specific species. Wood from broadleaved evergreen or deciduous trees. See also WOOD for softwood.
 - AF. HEAVYGAUGE FRAMING: Weldable load bearing metal studs and joists.
 - AG. HOISTWAY: Use for elevators and dumbwaiters.
 - AH. HOISTWAY BEAM: Beams supporting guiderails between multiple hoistways.
 - AI. JOINT BACKER: Material behind sealant which establishes depth of sealant. Generally shown on drawings but not noted.
 - AJ. JOINT FILLER: Material which fills entire joint. May also be used with sealant.
 - AK. LEADER: A rain water conduit made of pipe or tubing. See also DOWNSPOUT.
 - AL. LIGHTGAUGE FRAMING: 20 and 25 gauge non-loadbearing interior framing assemblies. For weldable loadbearing assemblies see HEAVYGAUGE FRAMING.
 - AM. LIGHTWEIGHT AGGREGATE CONCRETE: Concrete of lightweight aggregates not designed to provide insulation.
 - AN. METAL FRAME: Pressed metal frames used with doors and panel or glazed openings.
 - AO. METAL FURRING: Hat-shaped, 25 gauge steel channels used to furr out walls and for furring ceilings. For cold rolled steel channels see FURRING CHANNEL.
 - AP. OMIT: To leave out by intention. See also DELETE.
 - AQ. PANELING: Sheet or board material for interior use.
 - AR. PANELS: Sheet material, with some sort of joint or trim for exterior or interior use.
 - AS. PARTITION: Non-loadbearing vertical panel subdividing interior spaces, either rated or non-rated. For loadbearing see WALL.
 - AT. PATCH: Replacement or repair of material or finish to match existing conditions.
 - AU. PLASTER: Specifications shall define type, i.e., gypsum plaster, Keenes Cement, etc.
 - AV. PROVIDE: Denotes "Furnish and Install."
 - AW. RABBET: Groove at edge of member only.
 - AX. RAILING: Multiple railed barrier. See also HANDRAILS.
 - AY. RECORD DRAWING: Drawings revised to include construction changes. See "AS- BUILT DRAWING" for drawings prepared by the Job Order Contractor.
 - AZ. REFINISH: To put a finish back into its original condition.
 - BA. RELOCATE: To move from one location and install in another location.
 - BB. REPLACE: To provide a substitute or equivalent for.
 - BC. RUNNER CHANNEL: 1-1/2 inch cold rolled steel channel.

- BD. SCREED: Metal or wood strip placed at intervals to gauge thickness of applied materials.
- BE. SCRIBE STRIP: Strip to make tight closure to adjoining surfaces.
- BF. SEALANT: Elastomeric materials at joints subject to movement or weather penetration at outdoors or indoors. If purpose is acoustical use ACOUSTICAL SEALER.
- BG. SEAMLESS FLOORING: Sheet material with joints field welded or sealed, or field installed materials finished to provide a homogenous flooring material.
- BH. SECTION:
1. Drawing showing cut through an object.
 2. Subdivision of a Division of the specifications as defined by the CSI MasterFormat.
- BI. SELF-EDGE: Application to edge of plywood or particleboard of plastic laminate of same pattern as face surface.
- BJ. SERVICE SINK: Wall or floor mounted sink.
- BK. SHEET: Thin construction material.
- BL. SHEET FLOORING: Resilient flooring installed in lengths, generally wall to wall with joints depending upon manufactured widths of roll material.
- BM. SHEET METAL: General term on drawings with specifications defining particulars.
- BN. SOUND DEADENING BOARD: High density wallboard, wood fiber or gypsum, not suitable for painting or finishing.
- BO. STAGGER: To offset building elements in a horizontal or vertical plane as stagger studs, stagger joints.
- BP. STOCK: Raw material, i.e. 2x4 stock.
- BQ. STUD: Upright framing member of wood or metal.
- BR. SUBFLOORING: Usually of different grade and thickness than used for wall or roof sheathing.
- BS. THRU: Short version of THROUGH on drawings only.
- BT. TOE BOARD: Raised protective edge at balconies, landings, etc. (OSHA requirement).
- BU. TOE SPACE: Recess at base of cabinets.
- BV. TYPICAL: Representative example, characteristic of a kind.
- BW. UNDERLAYMENT: A smooth, hard sheet material, placed over rougher substrates to achieve a surface suitable for the application of such finishes as resilient tile.
- BX. WAINSCOT: Finish on the lower part of a partition when it differs from that of the upper wall.
- BY. WALL: Vertical panel enclosing a building or that serves as an occupancy separation. Generally loadbearing.
- BZ. WATERPROOFING: Designed to resist a head of water.
- CA. WOOD: Used to describe solid stock softwoods. See also HARDWOOD.

SECTION 01 45 00

***** QUALITY CONTROL *****

PART 1 GENERAL

1.1 Description

1.1.1 Provide and maintain an effective Job Order Contractor Quality Control (JOCQC) program and perform sufficient and adequate inspections and testing of all items of Work, including those of Subcontractors, to ensure compliance with Contract Documents. Including, but not limited to, the surveillance and tests specified in the technical sections of the Specifications. Furnish appropriate facilities, instruments, and testing devices required for performance of the quality control function. Controls must be adequate to cover construction operations and be scheduled with the construction sequence.

1.1.2 The individual selected by the Job Order Contractor to manage the Job Order Contractor Quality Control Program must be approved by the Owner or Owner's Representative following an approved resume indicating the experience of the proposed manager.

1.2 Control of On-Site Construction

1.2.1 Perform inspections prior to beginning work on any definable feature of Work. The JOCQC Manager shall monitor and review the Contract requirements; check to assure that materials, products, and equipment have been tested, submitted, and approved; check to assure that provisions have been made for required control testing; examine the Work area to ascertain that preliminary Work has been completed; physically examine materials and equipment to assure that they conform to shop drawing data and that the materials and equipment are on hand.

1.2.2 Perform initial inspections as soon as Work commences on a representative portion of a particular feature of Workmanship; monitor and review control testing for compliance with Contract requirements.

1.2.3 Perform follow-up inspections on a regular basis to assure continuing compliance with Contract requirements until completion of that particular Work.

1.3 Control of Off-Site Operations

1.3.1 Perform factory quality control inspections for items fabricated or assembled off-site as opposed to "off-the-shelf" items as required in the specifications. The JOCQC representative at the job site shall receive the item and note any damage incurred during shipment. The Job Order Contractor shall be responsible for protecting and maintaining the item in good condition throughout the period of on-site storage and during erection or installation. Although any item found to be faulty may be rejected before it is used, final acceptance of an item by the Owner is based on its satisfactory incorporation into the Work and acceptance of the completed project.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01 45 29

***** TESTING LABORATORY SERVICES *****

PART 1: GENERAL

1.1 DESCRIPTION

- 1.1.1 The Job Order Contractor shall cooperate with the Owner or Owner's Representative, DP, and the approved testing laboratory and all others responsible for testing and inspecting the Work.
- 1.1.2 The provisions of other testing and inspecting, as specified, will be furnished as directed by this Section and/or in the Specifications. .
- 1.1.3 Where no other testing requirements are described, but the Owner decides that testing is required, the Owner may direct that such testing be performed under current standards for testing. Payment for such testing will be made as described in this Section.
- 1.1.4 All services of the testing laboratory will be paid for as further described in this Section.

1.2 QUALITY ASSURANCE

- 1.2.1 The Owner has selected the testing laboratory in accordance with the applicable ASTM Section.
- 1.2.2 Codes and Standards: Testing, when and where required, will be in accordance with pertinent codes and regulations and with selected standards of the American Society for Testing and Materials (ASTM).

1.3 PRODUCT HANDLING

- 1.3.1 The testing laboratory will promptly process and distribute required copies of test reports and related instructions to ensure necessary retesting and replacement of materials with the least possible delay.
 - 1.3.1.1 Retests of all work shall be specifically indicated by the term "Retest" and shall be sufficiently descriptive to designate the date, location, and original test information indicating why the original was not in compliance with documents.
 - 1.3.1.2 The Laboratory shall send all test reports to the Owner, or Owner's Representative, Job Order Contractor, and DP.

PART 2: PRODUCTS

2.1 PAYMENT FOR TESTING

- 2.1.1 Initial Services
 - 2.1.1.1 The Owner or Owner's Representative will pay for testing services as specified in each Division of the Specifications as applicable.
 - 2.1.1.2 When initial tests indicate non-compliance with the Contract Documents, the costs of initial tests associated with that non-compliance will be paid by the Owner.
- 2.1.2 Retesting: When initial tests indicate non-compliance with the Contract Documents, all subsequent retesting occasioned by the non-compliance shall be performed by the same testing agency and the costs thereof will be paid by the Job Order Contractor.

2.2 CODE COMPLIANCE TESTING

- 2.2.1 Inspections and tests required by codes or ordinances, or by a plan approval authority, and which are made by a legally constituted authority, shall be the responsibility of, and shall be paid for by, the Job Order Contractor unless otherwise provided in the Contract Documents.

2.3 JOB ORDER CONTRACTOR'S CONVENIENCE TESTING

2.3.1 Inspecting and testing performed exclusively for the Job Order Contractor's convenience shall be the sole responsibility of the Job Order Contractor and at the sole expense of the Job Order Contractor.

PART 3: EXECUTION

3.1 COOPERATION WITH TESTING LABORATORY

3.1.1 Representatives of the testing laboratory shall have access to the Work at all times. The Job Order Contractor shall accommodate such access in order that the laboratory may properly perform its function.

3.2 TAKING SPECIMENS

3.2.1 Specimens and samples for testing, unless otherwise provided in the Contract Documents, will be taken by the testing personnel. Sampling equipment and personnel will be provided by the testing laboratory. Deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

3.3 SCHEDULES FOR TESTING

3.3.1 Establishing the schedule

3.3.1.1 By advance discussion with the testing laboratory, the Owner or Owner's Representative, Job Order Contractor and testing laboratory shall determine the time required for the laboratory to perform its tests and to issue each of its findings.

3.3.1.2 Job Order Contractor shall provide for required time within the construction schedule.

3.3.1.3 Job Order Contractor shall provide twenty-four (24) hours' notice to the testing laboratory of required tests.

3.3.2 Revising the schedule: When changes of construction schedule are necessary during construction, coordinate such changes of schedule with the testing laboratory as required.

3.3.3 Adherence to schedule: When the testing laboratory is ready to test according to notification by the Job Order Contractor, but is prevented from testing or taking specimens due to incompleteness of the Work or weather, all extra charges for testing attributable to the delay will be paid by the Job Order Contractor and shall not be borne by the Owner.

3.4 ALTERNATIVE AND ADDITIONAL INSPECTION PROCEDURE

3.4.1 Owner or Owner's Representative and DP, subject to the Owner's approval, shall have the right, to require alternative and/or additional inspection or testing procedures other than as specified when, in the Owner or Owner's Representative and DP's judgment, other inspections or testing services are required to demonstrate compliance with the Contract requirements. Costs of such alternative and/or additional inspections or testing services will be borne by the Owner if products are found to comply; otherwise, costs shall be borne by the Job Order Contractor.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 DESCRIPTION

- 1.1.1** All labor, material, equipment and services necessary to furnish, erect and maintain temporary facilities and controls and perform temporary work required in the performance of the Contract shall be provided by Job Order Contractor.
- 1.1.2** Maintenance and Removal: Job Order Contractor shall maintain temporary facilities and controls in a clean, proper, safe operating and sanitary condition for the duration of the Contract. Upon completion of the Contract, Job Order Contractor shall remove all temporary facilities and controls from the premises.
- 1.1.3** Job Order Contractor's and construction personnel shall not use any utilities, toilet/hand wash facilities, offices or any other resources in existing MIHS facilities, except with written permission of the Owner or Owner's Representative.

1.2 UTILITIES

- 1.2.1** Existing Utilities: Intentionally left blank. ***
- 1.2.2** Electric power as required for the Job Order Contractor's use, shall be provided and paid for by the Owner. Disruptions to Electrical Services shall be in accordance with Section 01 00 00 - Site Use and Security Requirements.
- 1.2.3** Fuel for power and/or heating required for the Job Order Contractor's use, shall be provided by and paid for by the Owner.
- 1.2.4** The Job Order Contractor will provide an extended warranty or guarantee period on any permanent systems which are used during the construction period, such warranty to commence on date of substantial completion.
- 1.2.5** All equipment and devices used as Temporary Utilities shall comply with all applicable codes and ordinances.
- 1.2.6** The Job Order Contractor will make all arrangements for an adequate supply of clean water for construction purposes.
- 1.2.7** The Owner will pay for all water used and any applicable sewer service charges.
- 1.2.8** The Job Order Contractor will supply and pay for adequate cool, pure drinking water with individual drinking cups or sanitary bubbler fountain for the use of employees on the project. The quality of the drinking water shall meet the standards for public water supplies.

1.3 TOILET/HAND WASH FACILITIES

- 1.3.1** The Job Order Contractor will provide and pay for temporary toilet facilities for use of all workmen and enforce their use by all personnel.
 - 1.3.1.1** Provide facilities complying with local and State sanitary laws and OSHA regulations.
 - 1.3.1.2** Maintain in clean, sanitary condition.
 - 1.3.1.3** Provide adequate supplies of toilet paper.
- 1.3.2** The Job Order Contractor will provide hand wash facilities.

1.4 ACCESSIBILITY OF VALVES & CONTROLS

1.4.1 No equipment that has to be operated or maintained, such as valves, traps, controls, unions, motors, etc., shall be placed in an inaccessible location.

1.5 FIRE PROTECTION

1.5.1 Provide adequate fire extinguishers on the premises during the course of construction, of the type and sizes recommended by the NFPA and the Uniform Fire Code to control fires resulting from the particular work being performed and instruct employees in their use. Place extinguishers in the immediate vicinity of the work being performed, ready for instant use. In the use of especially hazardous types of equipment, such as acetylene torches, welding equipment, tar pots, kettles, etc., no work shall be commenced or equipment used unless fire extinguishers of approved type and capacity are placed in the working area available for immediate use by the workman using the above-mentioned equipment.

1.5.2 Provide at least one (1) operational standpipe to each level during construction as required by Code.

1.6 TEMPORARY ENCLOSURES, BARRIERS AND FENCES

1.6.1 Provide and maintain all fences, barricades, lights, shoring and other protective structures or devices necessary for the safety of workmen, equipment, the public and property as required by State or municipal laws and regulations, local ordinances, laws and other requirements of MIHS, State, and other authorities having jurisdiction with regard to safety precautions, operation and fire hazards.

1.6.2 Provide and maintain pumping facilities, including power, for keeping the site, excavations and structure free from accumulations of water at all times, whether from underground seepage, rainfall, drainage or broken line.

1.6.3 Provide 6-foot high woven wire temporary fencing around the construction area as indicated in the drawings and acceptable to the Owner or Owner's Representative. The approval of the fence and its exact location will be made by the Owner or Owner's Representative. Fencing shall be erected and secured in a manner to withstand the forces to which it may be subjected. Locate gates for access to the areas as required. Close and lock all gates after normal working hours. A duplicate set of keys to all gate locks shall be furnished by the Job Order Contractor to the Owner or Owner's Representative. The fencing shall remain in place until its removal is approved by Owner

1.7 SCAFFOLD, STAGING, ETC.

1.7.1 The work under each Section of these Specifications shall include providing, installing, and maintaining all scaffold, staging, trestles, and planking necessary for the work under each Section in strict conformity with applicable laws, ordinances, and maintenance of same so as not to interfere with or obstruct the work of other trades. Additionally, the work under each Section of these Specifications shall include providing all forms of protection necessary to preserve the work of other trades free from damage. These provisions shall be considered as though repeated under each separate Section of the Specifications.

1.8 TREE AND PLANT PROTECTION

1.8.1 Existing or newly planted vegetation, shrubs, trees, sidewalks, paving, etc., if present on the site, shall, unless directly affected by the Work of this Contract, be protected against damage of any kind. No diesel or gasoline engine shall be left running under trees. No vehicle shall be allowed to pass over the feeder root system within the drip line unless approved by the Owner. Work, storage and traffic areas shall be restricted to those areas immediately adjacent to the construction site as outlined in the contract documents. Damage of any kind caused by the Work of this Contract shall be repaired or replaced before final acceptance of the Project. The Job Order Contractor shall provide water and protection barricades as required to maintain all trees, plants, shrubs, existing site improvements, etc., designated to remain.

1.9 TRAFFIC CONTROL

1.9.1 The Job Order Contractor shall be responsible to provide all barricades, signs, lights, off-duty police officers, fences, security instruments, flagmen, and all other traffic control devices and personnel necessary to properly mark and control the construction area for the safe and efficient movement of traffic. The Job Order Contractor will be responsible to maintain all traffic control devices during construction and will be responsible for the removal of all traffic control devices upon completion of the work as accepted by the DP.

- 1.9.2 All traffic controls measures shall conform to Section 401 of the MAG Uniform Standard Specifications for Public Works Construction 1998, revised 2008, City of Phoenix Traffic Barricade Manual, 2007 and the Manual of Uniform Traffic Control Devices. ***
- 1.9.3 Whenever construction operations create a condition hazardous to the public in the opinion of the Job Order Contractor or the Owner or Owner's Representative, the Job Order Contractor shall furnish such flagmen and guards as necessary to provide adequate warning to the public of any dangerous conditions.
- 1.9.4 Safety devices, flagmen and guards, while on duty shall conform to the applicable City, County and State requirements. The Job Order Contractor will be responsible to immediately inform the Owner or Owner's Representative of hazardous conditions.

1.10 NOISE, DEBRIS AND DUST CONTROL

- 1.10.1 Job Order Contractor shall develop and implement a Dust Control Plan as required under Maricopa County Air Pollution Rules and Regulations.
- 1.10.2 All subcontractors engaged in dust-generating operations (land clearing, maintenance, land cleanup, earthmoving, weed abatement, excavating, construction, demolition, bulk material handling, storage/transporting operations, etc.) at a site that is subject to a Maricopa County dust control permit **Must Register** Maricopa County Air Quality Department (MCAQD) and pay an annual fee. For more information, visit the MCAQD website at <http://www.maricopa.gov/aq/divisions/compliance/dust/Default.aspx>.
- 1.10.3 Exercise all possible care to control excessive noise and emissions during the construction.
- 1.10.4 All debris, etc., shall be removed from all pipe, pipe chases or other such remote and hidden spaces prior to closing of said space.
- 1.10.5 Comply with regulatory requirements of ADEQ, MAG and in accordance with the Erosion and Sedimentation Control plan.
- 1.10.6 Prevent polluting the air with dust and particulate matter to meet LEED Sustainable Sites Prerequisite No. 1 in accordance with the Erosion and Sedimentation Control (ESC) plan. ***

1.11 DEMOLITION OF EXISTING STRUCTURES, ETC.

- 1.11.1 All structures, equipment, and other items owned by MIHS which are scheduled for removal shall remain the property of the Owner unless otherwise noted in the contract documents. The manner of dismantling, moving, storing or disposal shall be reviewed by the Owner or Owner's Representative, prior to commencement of said activities, with the costs being borne by the Job Order Contractor in the event of disposal. ***

1.12 FIELD OFFICE, STORAGE ENCLOSURES

- 1.12.1 Provide suitable temporary office facilities complete with telephone and furnishings, required for the Job Order Contractor's administration of the Work in such locations as approved by the Owner or Owner's Representative. Office space shall be kept clean by the Job Order Contractor.
- 1.12.2 The Job Order Contractor shall provide all storage enclosures required for his operations.
- 1.12.3 The Job Order Contractor shall furnish and install temporary enclosures, doors and transparent plastic windows required to attempt to protect building from damage due to vandalism, or the elements.

1.13 STAGING AREAS

- 1.13.1 The Job Order Contractor shall be responsible for meeting and conferring with the Owner or Owner's Representative to determine the areas and limits of all staging areas that will occur outside of the Site.
- 1.13.2 After the staging limit areas have been determined, the Job Order Contractor shall prepare and submit to the Owner or Owner's Representative a detailed drawing of the fenced areas including all traffic control devices if required.

- 1.13.3 MIHS will provide thirty (30) days' notice of any changes to this agreement, up to and including request to vacate property. Relocation costs shall be the responsibility of the Owner.
- 1.13.4 Job Order Contractor may use area to temporarily store construction materials and park trailers, construction equipment and employee vehicles. The Job Order Contractor shall not store petroleum products, hazardous or toxic substances or flammable materials, or use the area for storage of disabled or wrecked vehicles or for vehicle maintenance.

1.14 TEMPORARY FENCES AND BARRICADES

- 1.14.1 The Job Order Contractor will furnish, install and maintain all necessary temporary fences, barricades, trench and hole covers, warning lights and all other safety devices necessary to protect the public and prevent damage to property.
- 1.14.2 The entire construction and staging areas shall be fenced to control the limits of access of personnel, equipment, storage and delivery of materials.

1.15 PROJECT SIGNS

- 1.15.1 Job Order Contractor and subcontractor signage, except for those specifically required by Regulatory Agencies and/or safety measures, is prohibited unless approved by the owner prior to installation.
- 1.15.2 Job Order Contractor shall provide and install a project information sign (to be coordinated with Design Professional), before beginning construction to inform the public about the project. Project sign shall include the names of all agencies participating in the project. Sign shall be constructed in accordance with the "Project Sign Information" drawing provided in this section. The sign shall be installed at the location approved by the Owner or Owner's Representative. The Job Order Contractor shall maintain the sign as necessary, and update the information as requested by the Owner or Owner's Representative. Updates to sign will be at the cost of the Owner.

1.16 ACCESS TO PROJECT SITE

- 1.16.1 Authorized representatives of the City, County, State of Arizona and Owner shall have ready access to project at all times, after checking in with the Job Order Contractor and attending safety orientation as required by the Job Order Contractor.
- 1.16.2 Facility Entry/Exit Requirements shall be in accordance with provisions of Section 01 00 00 - Site Use and Security Requirements.

1.17 TEMPORARY HEATING AND VENTILATING ***

- A. Prior to operation of permanent equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place.
 - 1. If air handlers are used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 must be used at each return air grills, as determined by ASHRAE 52.2.1999. Verify with Mechanical Engineer prior to implementation.
 - 2. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.
- B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- C. Also see requirements for "Construction IAQ Management Plan" as specified elsewhere in this Section.

1.18 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual specification Sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, elevators, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic from landscaped areas.

1.19 PROTECTION OF EXISTING FACILITIES

In the event that that the Project involves nearby existing MIHS facilities, Job Order Contractor shall provide appropriate protection for such facilities. If such facilities are to be used by Job Order Contractor, Owner shall approve in writing the Job Order Contractor's protection plan concerning such use.

1.20 CONSTRUCTION IAQ MANAGEMENT PLAN (LEED EQ Credit No. 3.1)

- A. Job Order Contractor shall reduce indoor air quality problems resulting from the construction process, to help sustain the comfort and well-being of construction works and building occupants.
- B. Job Order Contractor shall develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and preoccupancy phases of the building as follows:
 - 1. During construction meet or exceed the recommended Control Measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd Edition 2007, ANSI/SMACNA 008-2008 (Chapter 3).
 - 2. Protect stored on-site or installed absorptive materials from moisture damage
 - 3. If permanently installed air handlers are used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 shall be used at each return air grille, as determined by ASHRAE 52.2-1999 (with errata but without addenda). Replace all filtration media immediately prior to occupancy.
- C. Refer to Section 01 77 00 for Construction IAQ Management Plan – Before Occupancy (LEED EQ Credit No. 3.2).
- D. Submittals:
 - 1. Contractor shall submit a completed LEED-NC 2009 form with supporting data for LEED EQ Credit No. 3.1 to Design Professional, to be included with the comprehensive construction submittal. The following project data and calculation information is required to document credit compliance using LEED-NC 2009 credit templates
 - 2. Provide the following in accordance with the requirements of LEED Submittals in accordance with applicable requirements of Section 01 33 00 – Submittal Procedures. Verify these requirements with LEED-OnLine and include any additional submittals required for EQ Credit No. 3.1 as per LEED-OnLine.
 - a. Submit copy of the Construction IAQ Management Plan highlighting the 5 requirements of SMACNA IAQ Guideline for Occupied Buildings under Construction, 1995, Chapter 3 prior to start of construction.
 - b. Provide confirmation if permanently installed air handling equipment was used during construction prior to substantial completion.
 - c. Provide photographs (digital format preferable), acceptable to Design Professional, documenting construction IAQ management measures such as protection of ducts and on-site stored or installed absorptive materials prior to substantial completion.
 - d. Prior to substantial completion provide cut sheets of filtration media used during construction and installed immediately prior to occupancy with MERV values highlighted. Include list outlining all filtration media (manufacturer, model number, MERV rating, location of installed filter and confirm that each was replaced prior to final occupancy.
 - e. Provide a narrative describing any special circumstances or non-standard approaches taken by project.

PART2 PRODUCTS (Not Used)

PART3 EXECUTION (Not Used)

END OF SECTION

SECTION 01 57 13

*****TEMPORARY EROSION AND SEDIMENT CONTROL *****

PART 1: GENERAL

1.01 SUMMARY

A. LEED™ Certification:

1. Job Order Contractor shall ensure that the work provided under this section will provide the construction activity pollution prevention required by the US Green Building Council (USGBC) LEED (Leadership in Energy & Environmental Design) "Sustainable Sites" Prerequisite. Achievement of this prerequisite requires the creation and implementation of an Erosion and Sedimentation Control (ESC) Plan for all construction activities associated with the project. The ESC Plan shall conform to the erosion and sedimentation requirements of the 2003 EPA Construction General Permit, OR local erosion and sedimentation control standards and codes, whichever is more stringent. The Plan shall describe measures implemented to accomplish the following objectives:
 - a. Prevent loss of soil during construction by Stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
 - b. Prevent sedimentation of storm sewer or receiving streams.
 - c. Prevent polluting the air with dust and particulate matter.
2. The Construction General Permit (CGP) outlines the provisions necessary to comply with Phase I and Phase II of the National Pollutant Discharge Elimination System (NP-DES) program. While the CGP only applies to construction sites greater than 1 acre, the requirements are applied to all projects for the purposes of this prerequisite. Information on the EPA CGP is available at <http://cfpub.epa.gov/npdes/stormwater/cgp.cfm>.

1.02 SUBMITTALS - LEED

- A. Submit documentation to the Design Professional regarding erosion and sedimentation control procedures followed, including; but not limited to; memos, letters, drawings, sketches and photographs.

PART 2: PRODUCTS

2.01 MATERIALS

- A. In accordance with Civil Drawings and Specifications

PART 3: EXECUTION

3.01 EXECUTION

- A. In accordance with Civil Drawings and Specifications

END OF SECTION

SECTION 01 60 00

***** PRODUCT REQUIREMENTS *****

PART 1: GENERAL

1.01 DELIVERY, STORAGE AND HANDLING

- A. In accordance with Section 01 66 00 and as follows:
 - 1. Deliver manufactured materials in the original packages, containers or bundles, with the seals unbroken, identified by the name and mark of the Manufacturer.
 - 2. Deliver fabrications in as large assemblies as practicable. Fabrications specified to be shop-primed or shop-finished shall be packaged or crated as required to preserve such priming or finish intact and free from abrasion.
 - 3. Store materials in a manner to properly protect from damage. Materials or equipment damaged by handling, weather, dirt or other cause will not be acceptable.
 - 4. Store materials so as to cause no obstructions. Store off sidewalks, roadways and underground services. The Job Order Contractor shall be responsible for protecting materials and equipment furnished under the Contract.
 - 5. When a room in the Project is used as a shop or store room, the Job Order Contractor shall be responsible for all repairs, patching or cleaning necessary due to such use. Location of such storage space shall be subject to approval of the Design Professional.
- B. Packaging shall be minimized whenever possible but shall not be reduced so as to cause damage to materials or products. Packaging shall be recycled in accordance with the requirements of Section 01 74 19 - Construction Waste Management.

1.02 SUBSTITUTIONS AND PRODUCT OPTIONS

- A. Whenever a product is specified by using a proprietary name or the name of a particular Manufacturer or Vendor, the specific item mentioned shall be understood as establishing type, function, dimension, appearance, and quality desired.
- B. Other manufacturers' products will be accepted provided sufficient information is submitted with prior approval to allow the Design Professional to determine that products proposed are equivalent to those named.
- C. Substitutions (Prior Approvals and requests for approval after award of a contract): In accordance with Section 01 25 00 – Substitution Procedures.

1.03 RECYCLED CONTENT

- A. LEED™ Certification: Job Order Contractor shall ensure that the work provided will include recycled content materials to achieve Materials & Resources Credit 4.1 and 4.2 and Innovation in Design Credit 1.2 as outlined in Section 01 81 13.
 - 1. Credit 4.1 (one point) requires that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project.
 - 2. Credit 4.2 (one point) requires that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes and additional 10% beyond MR Credit 4.1 (total of 20% based on cost) of the total value of the materials in the project.
 - 3. Credit IDc1.2 (one point) requires that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes an additional 10% beyond MR Credit 4. 2 (total of 30% based on cost) of the total value of the materials in the project.
- B. Submittals In accordance with Section 01 81 13 – Special Procedures – LEED Certification.

C. Materials Containing Recycled Content:

1. Concrete and cementitious materials containing fly ash as specified in Section 03 05 05:
 - a. Section 03 30 00 - Cast-In Place Concrete
 - b. Section 04 05 15 - Mortar and Masonry Grout
 - c. Section 04 22 00 - Concrete Masonry Units
 - d. Section 09 24 00 - Portland Cement Plaster (Stucco).
2. Materials containing recycled steel:
 - a. Section 03 20 00 – Concrete Reinforcement
 - b. Section 05 10 00 – Structural Metal Framing
 - c. Section 05 31 00 – Steel Deck
 - d. Section 05 41 00 – Load Bearing Metal Stud System
 - e. Section 05 50 00 – Metal Fabrications
 - f. Section 07 60 00 – Flashing and Sheet Metal
 - g. Section 08 11 13 – Steel Doors and Frames
 - h. Section 09 22 16 – Metal Support Assemblies.
3. Other materials as specified throughout the Project Manual. (The following are examples)
 - a. Section 06 10 53 – Miscellaneous Carpentry
 - b. Section 06 40 00 – Architectural Woodwork
 - c. Section 07 53 16 – Single Ply Membrane Roofing
 - d. Section 08 41 13 - Aluminum Entrances and Storefronts
 - e. Section 08 44 00 – Glazed Aluminum Curtain Walls
 - f. Section 09 29 00 - Gypsum Board
 - g. Section 09 30 00 - Tile
 - h. Section 09 65 16 – Resilient Flooring
 - i. Section 09 51 00 – Acoustical Ceilings
 - j. Section 09 68 00 – Carpet Tile
 - k. Section 09 91 00 – Paint.
4. Other materials as recommended by Job Order Contractor to achieve requirements specified in Section 01 81 13.
5. Mechanical and electrical components shall not be included in the calculations for this Credit.

1.04 REGIONAL MATERIALS

- A. LEED™ Certification: Job Order Contractor shall ensure that the work provided will include regional Materials to achieve Materials & Resources Credit 5.1 [and 5.2], and Innovation in Design Credit 1.2 as outlined in Section 01 81 13.
 1. Credit 5.1 (one point) requires that 10% of building materials (based on cost) have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project.
 - a. Mechanical, electrical and plumbing components and specialty items such as elevators and equipment shall not be included in this calculation.
 - b. Only include materials permanently installed in the project.
 - c. Furniture may be included, providing it is included consistently in MR Credits 3-7.
 2. Credit 5.2 (one point) is to be achieved which requires that an additional 10% of the building materials beyond MR Credit 5.1 (total of 20% based on cost) have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project.
 3. Credit IDc1.3 (one point) requires that an additional 10% of the building materials beyond MR Credit 5.2 (total of 30% based on cost) have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project.
- B. Submittals: In accordance with Section 01 81 13 – Special Procedures – LEED Certification
- C. Regional Materials
 1. Earthwork and site utilities as specified in Section 31 01 00 - Earthwork.
 2. Concrete and cementitious materials as specified in:
 - a. Section 03 30 00 – Cast-In Place Concrete
 - b. Section 04 05 15 – Mortar and Masonry Grout
 - c. Section 04 22 00 – Concrete Masonry Units
 - d. Section 09 24 00 – Portland Cement Plaster (Stucco).

3. Materials containing steel components that are locally fabricated:
 - a. Section 03 20 00 – Concrete Reinforcement
 - b. Section 05 10 00 – Structural Metal Framing
 - c. Section 05 31 00 – Steel Deck
 - d. Section 05 41 00 – Heavy-Gauge Metal Stud System
 - e. Section 05 50 00 – Load-Bearing Metal Stud System
 - f. Section 07 60 00 – Flashing and Sheet Metal
 - g. Section 08 11 13 – Steel Doors and Frames
 - h. Section 09 22 16 – Metal Support Assemblies.
4. Other materials as specified throughout the Project Manual. (The following are examples)
 - a. Section 06 10 53 – Miscellaneous Carpentry
 - b. Section 06 40 00 – Architectural Woodwork
 - c. Section 07 53 16 – Single Ply Membrane Roofing
 - d. Section 08 41 13 – Aluminum Entrances and Storefronts
 - e. Section 08 44 00 – Glazed Aluminum Curtain Walls
 - f. Section 09 29 00 – Gypsum Board
 - g. Section 09 30 00 – Tile
 - h. Section 09 51 00 - Acoustical Ceilings
 - i. Section 09 65 16 – Resilient Sheet Flooring
 - j. Section 09 68 00 - Carpet
 - k. Section 09 91 00 - Paint.
5. Other materials as recommended by Job Order Contractor to achieve requirements specified in Section 01 81 13.
6. Mechanical and electrical components shall not be included in the calculations for this Credit.

1.05 FSC WOOD

- A. In accordance with Section 06 05 13 – FSC Certified Wood.

1.06 LOW-EMITTING MATERIALS

- A. LEED™ Certification: Job Order Contractor shall ensure that the work provided under this section will provide Low-Emitting Materials to achieve Indoor Environmental Quality Credit 4.1, 4.2, 4.3, and 4.4.
 1. Credit EQc 4.1 requires that adhesives and sealants used on the interior of the building (defined as inside of the weatherproofing systems and applied on-site) shall comply with the requirements of the following reference standards:
 - a. Adhesives, Sealants and Sealant Primer: South Coast Air Quality Management District (SCAQMD) Rule #1168. Job Order Contractor shall comply with VOC limits as required by LEED OnLine to achieve this credit.
 - b. Aerosol Adhesives: Green Seal Standard for Commercial Adhesives GS-36 requirements in effect on October 19, 2000. Job Order Contractor shall comply with VOC limits as required by LEED OnLine to achieve this credit.
 - c. Materials that must comply with these requirements include, but are not limited to:
 - 1) Adhesives specified in various sections of the specifications.
 - 2) Sealants as specified in Section 07 92 00
 2. Credit EQc 4.2 requires that paints and coatings used on the interior of the building (defined as inside of the weatherproofing systems and applied on-site) shall comply with the requirements of the following criteria:
 - a. Architectural paints, coatings and primers applied to interior walls and ceilings: Do not exceed the VOC content limits established in Green Seal Standard GS-11, Paint, First Edition, May 20, 1993. Job Order Contractor shall comply with VOC limits as required by LEED OnLine to achieve this credit.
 - b. Anti-corrosive and anti-rust paints applied to interior ferrous metal substrate: Do not exceed the VOC content limit of 250 g/L established in Green Seal Standard GC-03, anti-Corrosive Paints, Second Edition, January 7, 1997. Job Order Contractor shall comply with VOC limits as required by LEED OnLine to achieve this credit.
 - c. Clear wood finishes, floor coatings, stains, sealers and shellacs applied to interior elements:

Do not exceed the VOC content limits established in South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coating, rules in effect on January 1, 2004. Job Order Contractor shall comply with VOC limits as required by LEED OnLine to achieve this credit.

- d. Materials that must comply with these requirements include, but are not limited to:
 - 1) Primers for steel specified in Sections 05 20 00 and 05 50 00.
 - 2) Stains and sealers specified in Section 06 40 00
 - 3) Game line paints for athletic flooring specified in Sections 09 64 66 and 09 65 66.
 - 4) Interior paints as specified in Section 09 91 00.
 - 5) Other clear wood finishes, floor coatings, sealers and stains specified elsewhere in the Project Manual.
3. Credit EQc 4.3 requires that:
 - a. Carpet installed in the building interior shall meet the testing and product requirements of the Carpet and Rug Institute's Green Label Plus program.
 - b. Carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute Green Label program.
 - c. Carpet adhesive shall meet the requirements of EQ Credit 4.1. Job Order Contractor shall comply with VOC limits as required by LEED OnLine to achieve this credit.
 - d. All hard surface flooring must meet the requirements of the FloorScore standard (current as of the date of this rating system, or more stringent version) as shown with testing by an independent third-party. Mineral-based finish flooring products such as tile, masonry, terrazzo, and cut stone without integral organic-based coatings and sealants and unfinished/untreated solid wood flooring qualify for credit without any IAQ testing requirements. However, associated site-applied adhesives, grouts, finishes and sealers must be compliant for a mineral-based or unfinished/untreated solid wood flooring system to qualify for credit.
 - e. Concrete, wood, bamboo and cork floor finishes such as sealer, stain and finish must meet the requirements of South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January 1, 2004.
 - f. Tile setting adhesives and grout must meet South Coast Air Quality Management District (SCAQMD) Rule 1168. VOC limits correspond to an effective date of July 1, 2005 and rule amendment date of January 7, 2005.
4. Credit EQc 4.4 requires that wood and agrifiber products used on the interior of the building (defined as inside of the weatherproofing systems and applied on-site) must contain no added urea-formaldehyde resins and that laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies shall contain no added urea-formaldehyde resins.
 - a. Materials that must comply with these requirements include, but are not limited to:
 - 1) Composite wood products applied on-site inside the building weatherproofing systems such as sheathing, doors, and other structural and non-structural applications.
 - 2) Wood doors as specified in Section 08 14 00.

B. Submittals: In accordance with Section 01 81 13– Special Procedures – LEED Certification.

END OF SECTION

SECTION 01 70 00

CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 DESCRIPTION

1.1.1 General

1.1.1.1 Complete project closeout as indicated in accordance with the provisions of the Contract Documents.

1.2 SUBSTANTIAL COMPLETION AND FINAL INSPECTION

1.2.1 Substantial Completion will not be certified until all Tests, Training, and Demonstrations specified have been executed, and the provisions of the Contract for Construction Manager at Risk and requirements established by individual Specification Sections have been successfully completed.

1.2.2 The Final Application for Payment will not be accepted and processed until the Owner or Owner's Representative is satisfied that the Work is satisfactorily completed, including "punch list" items and Commissioning Issues List; and that all manuals, documents, warranties, guarantees, and Record Documents, as required by the Specifications, have been received and accepted by the Owner or Owner's Representative. The executed AIA Documents G706 entitled "Contractor's Affidavit-Payment of Debts/Claims" (or equivalent) and G707 entitled "Consent of Surety to Final Payment (or equivalent)" shall accompany final Application for Payment.

1.3 FINAL ADJUSTMENT AND TESTS

1.3.1 Tests: When the Job Order Contractor is satisfied that all systems and equipment meet performance and operational requirements directed by applicable codes, safety standards and these specifications, the Job Order Contractor shall arrange a demonstration and test of all mechanical, electrical and other operable equipment furnished for operating efficiency and for conformance to all specified requirements and to all applicable regulations of any governing agency. Equipment shall be tested under operating conditions; where possible, all safety devices shall be tested under simulated emergency conditions. Where test results indicate a need for final adjustments, Job Order Contractor shall make such adjustments and retest until test results indicate compliance.

1.3.2 All tests shall be scheduled through the Owner or Owner's Representative, and shall be witnessed by the Owner or Owner's Representative and DP. The Job Order Contractor shall notify the Owner or Owner's Representative and Design Professional of any scheduled tests at least seven (7) working days in advance

1.3.3 Testing shall be in accordance with written procedures as described or developed by the Owner, the DP or the Commissioning Authority.

1.3.4 Certificate of Occupancy: All required certificates of inspection, tests, or final approvals shall be secured by the Job Order Contractor from the governing authority. Promptly deliver the Certificate of Occupancy to the Owner or Owner's Representative.

1.4 WARRANTIES AND BONDS

1.4.1 Job Order Contractor's warranty will commence for all portions of the Construction Work upon Substantial Completion of the entire Construction Work, unless stated otherwise in the Contract.

1.4.2 Job Order Contractor shall provide written warranties, guarantees, and bonds in favor of the Owner, as required by respective sections of these Specifications, and arrange to commence at the date of Substantial Completion of the project or date of installation of warranted item(s), whichever is later.

1.4.3 During the period of any warranty or guarantee, the Job Order Contractor shall provide services within a reasonable time following a request by the Owner to do so in accordance with the Job Order Contractor Contract. When the complete breakdown of a system or a piece of equipment occurs, the service shall be performed promptly. The service shall be provided during normal working hours, unless otherwise specified herein. Should the listed service agency fail to perform the service in a reasonable amount of time, the Job Order Contractor shall provide the service through any other

agency that will comply.

1.5 EXTRA MATERIAL INVENTORY

1.5.1 Upon Substantial Completion of the Contract Work, provide the Owner with extra materials (i.e., spare parts, etc.) as identified in respective sections of the Specifications. Deliver to the Owner when and as directed by the Owner or Owner's Representative, providing a written detailed inventory including a signed receipt from the Owner or Owner's Representative.

1.6 MAINTENANCE AND OPERATION MANUALS

1.6.1 Job Order Contractor shall review the Operation and Maintenance Manuals required in the Specifications and provide two (2) hard copies and four (4) CD Disk sets of final information reflecting any changes from the initial submittal.

1.7 PROJECT RECORD DOCUMENTS

1.7.1 The Job Order Contractor shall provide a complete set of Project As-Built Documents, as defined in Section 01 78 39.

1.7.2 The set of Project As-Built Documents shall be maintained at the job site and readily available for inspection by the Owner or Owner's Representative, and DP. All changes shall be legibly marked and kept current.

1.7.3 Upon Substantial Completion of the project Work, submit one (1) copy of the As-Built hardcopies and one (1) copy of as-builts electronically as PDF's to the Design Professional for review, approval and incorporation into the electronic record documents. The electronic file shall be full color scans (if applicable) of As-Built hardcopies. If available, supply auto-cad and BIM models. ***

1.8 PROJECT DIRECTORY

1.8.1 Provide a hardcopy list and a Microsoft Excel 2007 compatible spreadsheet of all known major material/equipment suppliers and subcontractors, identified by name, address, telephone number, and contact person. Excel file shall be submitted on archival quality media as specified by the Owner. ***

1.9 DEMONSTRATIONS AND TRAINING

See Section 01 79 00 (Equipment Demonstration and Owner Personnel Instruction).

1.10 PROJECT CLOSEOUT SUBMITTALS

1.10.1 At the time of Substantial Completion, the Job Order Contractor shall deliver to the Owner or Owner's Representative, the following items as described previously in this section:

- 1.10.1.1 Project Directory
- 1.10.1.2 As-Built Drawings
- 1.10.1.3 Maintenance and Operation Manuals
- 1.10.1.4 Extra Material Inventory
- 1.10.1.5 Warranties and Bonds
- 1.10.1.6 Certificate of Occupancy
- 1.10.1.7 Record photographs
- 1.10.1.8 Owner Training.

1.11 POST CONSTRUCTION INSPECTION

1.11.1 Two (2) months prior to expiration of the warranty period, the DP will make visual inspection of the Project in company of the Owner or Owner's Representative, and Job Order Contractor to determine whether correction of Work is required.

1.11.2 The DP will promptly notify Job Order Contractor of any observed deficiencies.

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION (Not Used)

END OF SECTION

SECTION 01 71 23

***** FIELD ENGINEERING ****

PART 1 GENERAL

1.1 RELATED DOCUMENTS

1.1.1 Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

1.2.1 This Section describes requirements for verifying, establishing and maintaining construction grades, lines, levels and monuments as indicated within the contract documents.

1.3 GENERAL

1.3.1 The Job Order Contractor shall, before commencing Work, verify all grades, lines, levels and dimensions indicated and report any errors or inconsistencies to the Owner or Owner's Representative. The Job Order Contractor shall not proceed until such errors or inconsistencies are corrected or meet Owner or Owner's Representative's modified requirements.

1.3.2 Provide construction staking and surveying from base lines, grades, and benchmarks shown on the plans. Under no circumstances will the Job Order Contractor be granted a time extension to this contract due to the lack of construction survey information. Any discrepancies in design of base lines and grades revealed in construction operations shall be brought to the Owner or Owner's Representative's attention immediately for correction or clarification.

1.3.3 The Job Order Contractor shall establish and maintain all construction grades, lines, levels and bench marks and shall be responsible for the accuracy and protection of the same. This work shall be accomplished by a licensed civil engineer or surveyor. Protect all temporary bench marks and maintain them in place for the duration of the Contract or until such time as their removal does not affect completion of the Project.

1.3.4 Do not remove any property line markers or monuments or data established by the Owner. If such are damaged or removed, the Job Order Contractor shall bear cost of replacement.

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION (Not Used)

END OF SECTION

SECTION 01 73 29

CUTTING AND PATCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cutting, fitting and patching, including attendant excavation and backfill required to complete Work, and for:
 - 1. Making several parts fit together properly.
 - 2. Uncovering portions of Work to provide for installation of ill-timed Work.
 - 3. Removing and replacing defective and non-conforming Work.
 - 4. Removing samples of installed Work required for testing, as directed by Design Professional.
 - 5. Providing routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
 - 6. Attaching new materials to existing remodeling areas, or removing existing materials / assemblies / finishes.

1.02 SUBMITTALS

- A. In advance of executing any cutting or alterations, submit written request to Design Professional and Owner requesting consent to proceed with cutting which affects:
 - 1. Work of Owner or other trades.
 - 2. Structural value or integrity of any element of Project.
 - 3. Areas of existing building outside the described limit of work as may be required for connecting to existing utilities.
 - 4. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.
 - 5. Efficiency, operational life, maintenance or safety of operational elements.
 - 6. Visual qualities of sight-exposed elements.
- B. Include in Request
 - 1. Identification of Project.
 - 2. Description of affected Work including affected drawings and specifications.
 - 3. Necessity for cutting, alteration or excavation.
 - 4. Effect on Work of Owner or other trades, or structural or weatherproof integrity of Project
 - 5. Description of proposed Work:
 - a. Scope of cutting, patching, alteration, or excavation.
 - b. Trades which will execute Work.
 - c. Products proposed to be used.
 - d. Extent of refinishing to be done.
 - 6. Alternatives to cutting and patching.
 - 7. Cost proposal, when applicable.
 - 8. Written permission of trades whose Work will be affected.
 - 9. If structure is to be affected, include engineer's sealed approval.
- C. Submit advanced written notice to Design Professional designating reasonable time Work will be uncovered to provide for observation.

1.03 PAYMENT FOR COSTS

- A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of Design Professional and Engineer to be paid by Job Order Contractor.
- B. Cost of Work done on written instructions of Design Professional, other than defective or nonconforming Work, will be paid by Owner on approval of written Change Order. Provide C.O.R. prior to proceeding with cutting and patching.

PART 2 PRODUCTS

FMD/JOC/GR § _____
Project Title _____.

2.01 MATERIALS

- A. Provide for replacement of Work removed. Comply with Contract Documents for type of Work standards and Specification requirements for each specific product involved.
- B. If preexisting facilities are affected, replace or repair with identical (or approved) materials and workmanship.

PART 3 EXECUTION

3.01 INSPECTION

- A. Inspect existing conditions of Work, including elements subject to movement or damage during cutting and patching, and excavating and backfilling. After uncovering Work, inspect conditions affecting installation of new products and verify procedures with Design Professional.
- B. Report unsatisfactory or questionable conditions in writing to Design Professional. Do not proceed with Work until further instructions are received.

3.02 PREPARATION

- A. Provide shoring, bracing and supports as required to maintain structural integrity of Work. B. Provide devices and methods to protect other portions of Work from damage, including elements which may be exposed by cutting and patching Work. Maintain excavations free from water.

3.03 ERECTION, INSTALLATION AND APPLICATION

- A. Performance:
 - 1. Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
 - 2. Execute cutting and demolition by methods which prevent damage to other Work to provide proper surfaces to receive installation of repairs and new Work.
 - 3. Execute excavating and backfilling by methods which prevent damage to other Work and settlement as specified in Section 31 01 00. ***
- B. Employ original installer or fabricator to perform cutting and patching for:
 - 1. Weather-exposed surfaces and moisture-resistant elements such as roofing, sheet metal, sealants and waterproofing.
 - 2. Sight-exposed finished surfaces.
- C. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes as shown on Drawings and as specified.
- D. Fit Work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces. Conform to fire code requirements for penetrations and maintain integrity of fire walls and ceilings.
- E. Restore Work which has been cut or removed. Install new products to provide completed Work in accordance with requirements of Contract Documents and as required to match surrounding areas and surfaces.
- F. Refinish entire surfaces as necessary to provide an even, matching finish as follows:
 - 1. Painted Walls or Ceilings: To nearest intersection with another finish or corner.
 - 2. Where Applied Finishes Occur (i.e wallcovering, tile, wood paneling): To nearest intersection of finish without damage to adjacent material. Where match of pattern, grain, texture, or similar finish cannot be made, refinish area to intersection with other finish or corner.
 - 3. Manufactured or Shop Fabricated Materials: Replace entire affected surface or material.

END OF SECTION

SECTION 01 74 00

***** CLEANING *****

PART 1 GENERAL

1.1 DESCRIPTION

1.1.1 General

- 1.1.1.1 Furnish all labor, materials, tools, equipment, and services for clean up as required in conjunction with Work performed, in accordance with provisions of Contract Documents.
- 1.1.1.2 Coordinate with Work of all other trades.
- 1.1.1.3 Although such Work is not specifically indicated, furnish and install supplementary or miscellaneous items, appurtenances, and devices incidental to or necessary for a complete clean up.

1.1.2 Fire Protection

- 1.1.2.1 Store volatile waste in covered metal containers.
- 1.1.2.2 Remove volatile waste from premises daily.

PART 2 PRODUCTS

2.1 CLEANING MATERIALS

- 2.1.1 Use materials recommended by manufacturers of surfaces to be cleaned.
- 2.1.2 Use cleaning materials only on surfaces recommended by cleaning material manufacturer or by the manufacturer of surface to be cleaned.

PART 3 EXECUTION

3.1 GENERAL

- 3.1.1 Clean all items installed under this Contract and any affected preexisting facilities.
 - 3.1.1.1 Leave free of stains, damage, or other defects prior to final acceptance.
 - 3.1.1.2 Include washing; sweeping and polishing of all finished wall surfaces, floors, windows, hardware, mirrors, lighting fixtures and equipment items.
 - 3.1.1.3 Replace damaged or defaced items not acceptable to Owner or Owner's Representative, to Owner's or Owner's Representative's satisfaction at no additional expense to Owner.
- 3.1.2 See Specification Sections for additional cleaning requirements. ***

3.2 DURING CONSTRUCTION

- 3.2.1 Each Contractor must:
 - 3.2.1.1 Clean up all waste materials, rubbish, and debris resulting from Contractor's operations daily.
 - 3.2.1.2 Oversee cleaning and ensure that the construction site is maintained free from accumulations of debris.
 - 3.2.1.3 At reasonable intervals, minimum once a week, clean up entire site of excess debris and dispose of debris off-site.
 - 3.2.1.4 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from interior and exterior surfaces of fixtures, hardware, and equipment.

- 3.2.1.5 Repair, patch, and touch-up marred surfaces to match adjacent finishes damaged by Job Order Contractor's operations.
- 3.2.1.6 Comply with additional requirements defined in specifications.
- 3.2.1.7 Vacuum interior areas when ready for painting.
- 3.2.1.8 Schedule cleaning operations so that contaminants resulting from cleaning do not fall on wet painted surfaces.
- 3.2.1.9 Should the Job Order Contractor fail to keep the Site free from debris, trash and construction wastes as required, after written request by the Owner or Owner's Representative, then the Owner, after twenty-four (24) hours, shall have the authority to provide clean-up services and deduct said services from the Job Order Contractor's Contract.

3.3 FINAL CLEANING

- 3.3.1 At completion of construction, just prior to acceptance or occupancy, perform final cleaning.
- 3.3.2 Use cleaning products that meet the Green Seal GS-37 standard, if applicable, OR if GS-37 is not applicable (e.g., for products such as carpet cleaners, floor finishes or strippers), use products that comply with the California Code of Regulations maximum allowable VOC levels, or equivalents.
- 3.3.3 Use Vacuum cleaners that meet the requirements of the Carpet & Rug Institute "Green Label" Testing Program–Vacuum Cleaner Criteria and are capable of capturing 96% of particulates 0.3 microns in size
- 3.3.4 Use experienced workmen or professional cleaners for final cleaning.
- 3.3.5 Remove dirt, stains, labels, and foreign materials.
- 3.3.6 Repair and touch-up marred areas.
- 3.3.7 Broom clean paved surfaces; rake clean other surfaces of grounds; vacuum and mop floors.

END OF SECTION

SECTION 01 74 19

*** CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL ***

PART 1 GENERAL

1.01 SUMMARY

- A. The Owner has established that this Project shall minimize the creation of construction demolition waste on the job site.
 - 1. Factors that contribute to waste such as over packaging, improper storage, ordering error, poor planning, breakage, mishandling, and contamination, shall be minimized.
 - 2. Of the inevitable waste that is generated, as many of the waste materials as economically feasible shall be reused, salvaged, or recycled.
 - 3. Waste disposal in landfills shall be minimized.
- B. LEED™ Certification: Job Order Contractor shall ensure that the work provided under this section will provide Construction Waste Management to achieve Materials & Resources Credit 2, options 1 and 2 and Innovation & Design Process Credit 1.2.
 - 1. Credit MRc2 , option1 (one point) requires recycling and/or salvaging at least 50% of non-hazardous construction and demolition. Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or commingled.
 - 2. Credit MRc2, option 2 (one point) requires recycling and/or salvaging of an additional 25% beyond MR Credit 2, option1 (75% total) of non-hazardous construction and demolition debris.
 - 3. Credit IDc1.2, exemplary performance (one points) requires recycling and/or salvaging of an additional 20 % beyond MR Credit 2, option 2 (95% total) of non- hazardous construction and demolition debris.
 - 4. Excavated soil and land-clearing debris does not contribute to this credit.
 - 5. Calculations can be done by weight or volume, but must be consistent throughout.

1.02 DEFINITIONS

- A. Construction Waste: Debris that is either the result of demolition, or is discarded material generated in the construction process. (Note that for LEED documentation excavated soil, land clearing debris, and hazardous waste are excluded from consideration in the calculations.)
- B. Diversion from the waste stream: For the purposes of LEED MR Credit 2–Construction Waste Management, waste is considered diverted if it is transported to a recycling facility. The weight of crushed asphalt and concrete may be tallied as diverted material if it is used in another project, including as fill; note that an inert landfill is not currently considered to be a diversion.
- C. Recycling Facility: A business that specializes in collecting, sorting, handling, processing, distributing or remanufacturing waste materials into products or materials that can be used by others. A materials recovery facility (MRF) is a type of recycling facility that typically sorts and stockpiles co-mingled recyclables for pick-up and reuse by others.
- D. Co-Mingled Recyclables: Recyclable materials that are collected together in a single bin or dumpster and which are sorted into separate materials offsite, typically by an MRF.
- E. Recovery Rate: The percentage of co-mingled recyclables that is actually recovered, sorted and made available for reuse. Recovery rates (also called diversion rates) differ among MRFs.
- F. Contamination: A load of waste material may be rejected due to contamination by containing too much foreign matter including moisture. Each recycling facility sets its own standards and conditions for accepting collected waste materials. Contaminated recyclables typically become trash and end up being dumped in the land fill.

1.03 SUBMITTALS

- A. Construction Waste Management Plan: Within 15 days from date of Notice To Proceed submit a draft of the Plan for review by the Owner's LEED consultant and approval by the Owner. Utilize the plan template furnished by the LEED Consultant or a comparable plan template with elements congruent with this Section. Submit the completed, approved plan prior to or concurrent with the first payment application. The approved Plan establishes the approved Construction Waste Management Program and

will identify the following items:

1. Responsible Parties: Identify Personnel who will manage the program, research diversion options, educate on-site personnel, collect and coordinate data, prepare monthly reports, and compile the final report including the LEED-Online template.
 2. Materials Diverted: Identify the types of waste created on the project which may include Asphalt, Concrete, Masonry, Metal, Wood Pallets, Plastics, Glass, Cardboard, and Paper, Gypsum Wallboard, Carpet and Pad Paint and Salvaged items.
 3. Method of Diversion: Identify who the hauler will be and requirements for "Condition of Material" for example whether wood must be free of nails. For reusable materials identify the location and method of removing the materials from the site.
 4. Space and collection requirements: Determine number and type of collection bins required and storage areas needed for the separate materials to be collected, and prepare a site plan showing the layout. Plan the layout to optimize vehicular and pedestrian access, to encourage compliance with the program goals, and to discourage contamination of recyclables.
 5. Signage: Describe signage for the collection areas to maximize effectiveness of program.
 6. Training of Subcontractors.
 7. Method of evaluating progress and identifying non-compliance issues.
 8. Determine government requirements applicable to waste management, especially for hazardous waste
- B. Diversion Rate Reports: At project meetings each month, present a one page overview report on the program's progress to help the project team assess whether the CWM Program is on track. Progress Reports will contain the following information:
1. Current rate of diversion as a percentage of the total waste
 2. Projections estimating future diversions
 3. Upcoming tasks requiring team collaboration
 4. Possible opportunities for reuse of materials
- C. LEED Closeout Submittals: Upon substantial completion of the Project, Contractor shall:
1. Provide Final Waste Diversion Rate
 2. Upload to LEED Online narrative summary of measures used to recycle construction waste
 3. Upload to LEED Online the types of waste diverted, the amount and method of removal for all waste.
 4. Narrative of insights gained for managing future CWM Programs

1.04 MEETINGS

- A. Refer to Meetings in Section 01 81 13 - LEED Requirements for details regarding training and orientation for both the Contractor and Subcontractors.

1.05 SUBMITTALS – LEED

- A. The Contractor shall submit a completed LEED-NC 2009 form and supporting documentation for LEED MRc2.1, MRc2.2 and IDc1.2 to the Design Professional to be included with the comprehensive "Construction Submittal." The following project data and calculation information is required to document credit compliance using LEED-CI version 2.0 credit templates:
1. Complete the construction waste calculation tables in the submittal template. The following info will be required to complete these tables: general description of each type/category of waste generated; location of receiving agent (recycler/landfill) for water; quantity of waste diverted (by category) in tons, or cubic yards.
 2. Provide a narrative describing the project's construction waste management approach. The narrative shall include the project's Construction Waste Management Plan. Provide additional comments or notes to describe special circumstances or considerations regarding the project's credit approach.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PLAN IMPLEMENTATION

FMD/JOC/GR § _____

Project Title _____.

- A. Plan Distribution: The Contractor shall provide copies of the Waste Management Plan to the Job Site Foreman, each Subcontractor, the Owner, and the Design Professional.
- B. Instruction: The Contractor shall provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the Project.
- C. Meetings: Contractor shall conduct Construction Waste Management meetings. Meetings shall include subcontractors affected by the Waste Management Plan. At a minimum, waste management goals and issues shall be discussed at the following meetings:
 - 1. Pre-bid meetings.
 - 2. Pre-construction meeting.
 - 3. Regularly scheduled job-site meetings.
- D. Separation facilities: The Contractor shall designate a specific area or areas to facilitate separation of materials for potential reuse, salvage, recycling, and return. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid commingling of materials. Bins shall be protected during non-working hours from off-site contamination.
- E. Materials Handling Procedures: Materials to be recycled shall be protected from contamination, and shall be handled, stored and transported in a manner that meets the requirements set by the designated facilities for acceptance.
 - 1. Clean contaminated materials prior to placing in collection containers.
 - 2. Deliver materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to recycling process.
 - 3. Arrange for collection by or delivery to the appropriate recycling or reuse facility.
- F. Hazardous wastes: Hazardous wastes shall be separated, stored and disposed of according to local regulations.
- G. Food Wastes: Food wastes (including packaging and wrappers) shall be properly disposed of immediately and shall be removed daily to minimize or eliminate the attraction of animals.

3.02 WASTE MANAGEMENT OPERATIONS

- A. The following waste categories, at a minimum, shall be separated and diverted from landfill. Appropriately sized, separate collection bins or containers, labeled (in both English and Spanish) for the particular waste categories identified below, shall be provided as follows:
 - 1. Wood:
 - a. Clean dimensional wood, palette wood
 - b. Plywood, OSB, and particleboard
 - 2. Concrete, Bricks and Concrete Masonry Units (CMU). Materials in this category shall be crushed on-site and reused as aggregate when feasible
 - 3. Asphaltic Concrete
 - 4. Cardboard, paper, packaging
 - 5. Cement fiber products (shingles, panels, siding)
 - 6. Asphalt roofing shingles
 - 7. Metals
 - a. Ferrous
 - b. Aluminum
 - c. Other\non-ferrous
 - 8. Gypsum Drywall (unpainted). (This is may be used on site as compost)
 - 9. Paint
 - 10. Rigid Foam
 - 11. Glass
 - 12. Plastics (#1 and #2)
 - a. Polyethylene terephthalate (PET) (#1)

- b. High-density polyethylene (HDPE) (#2)
13. Carpet and Pad
 14. Acoustical ceiling tiles
 15. Beverage containers
 16. Insulation
 17. Others as appropriate.
- B. Recycling/Reuse Centers: Implement a recycling/reuse program that includes separate collection of Reusable building materials, including (but not necessarily limited to) lumber, structural steel, miscellaneous hardware and plumbing and electrical fixtures. The following is a partial list for contractor’s information only. For more information, contact the Integrated Solid Waste Management Office, Arizona Department of Environmental Quality.
1. Reusable Building Materials
 - a. Stardust Bldg Supplies, Inc. (non-profit), 1720 West Broadway Road, Mesa, AZ; (480) 668-0566.
 - b. Salvage Depot, 6516 NW Grand Ave, Phoenix, AZ 85031; (602) 931- 4115.
 - c. Habitat for Humanity, (800) HABITAT.
 2. Asphalt: For information on recycling/reuse of asphalt, contact the Asphalt Recycling and Reclaiming Association (410) 267-0023.
 3. Concrete and other paving materials
 - a. (occasionally) Western Block Co., 4021 S. 19th Ave, Phoenix, AZ; (602) 243-9275
 - b. (occasionally) United Metro Materials, 3640 S. 19th Ave, Phoenix, AZ; (602) 262-1466
 4. Metals
 - a. National Metals Co., 320 S. 19th Ave., Phoenix, AZ; (602) 258-8074
 - b. Phoenix Metals Trading, 610 S. 19th Ave., Phoenix, AZ; (602) 257-4660
 - c. Davis Salvage Co , 3337 E Washington St, Phoenix, AZ 85034; (602) 267-7208
 5. Wood (lumber)
 - a. UE Recycling, 3330 W. Broadway, Phoenix, AZ; (602) 268-8849
 - b. (occasionally) Stone Container, 6902 W. Northern, Glendale, AZ; (602) 264-4655
 - c. Wood Recycling, Inc. (www.woodrecycling.com)
 6. Wood (trees, etc.)
 - a. Wood Industries Co., Phoenix, AZ; (602) 237-3131
 - b. Wood Recycling, Inc. (www.woodrecycling.com)
 7. Office paper: Arizona Pacific Pulp & Paper, 302 S 28th St, Phoenix, AZ 85034; (602) 220-9200.
 8. Plastic and mixed paper: Arizona Center for the Blind and Visually Impaired Recycling Center (non-profit) 302 S 28th St, Phoenix, AZ 85034; (602)267-8740.
 9. Cardboard, Newsprint and some plastics: Weyerhaeuser Co, 301 S 30th St, Phoenix, AZ 85034; (602) 225-0560.
 10. Plastics Only:
 - a. Plastic Recovery Industries Inc. 2101 NW Grand Ave, Phoenix, AZ (602) 340-0040
 - b. National Environmental Waste, 4330 N. 39th Ave, Phoenix, AZ (602) 415-8229
 - c. (information) Vinyl Environmental Resource Center of the Vinyl Institute; (800) 969-8469
 - d. (information) American Plastics Council (800) 2-HELP-90.
 11. Plastic “peanut” packing materials:
 - a. Mail Boxes Etc, 2303 N 44th St, Phoenix, AZ 85008; (602) 840-3020
 - b. (information) The Association of Foam Packaging Recyclers (202) 974-5351.
 12. Mixed Office (Jobsite) Recyclables: Curbside Recycling, 3027 E. Madison, Phoenix, AZ; (602) 225-0020.
 13. Rechargeable batteries: Milwaukee Electric Tool Corp, 405 E Watkins, Phoenix, AZ 85004; (602) 256-7210.

14. Glass bottles: BIRP, 619 S 3rd St, Phoenix, AZ 85004; (602) 253-6920.
15. Used Paint and Used Paint Cans:
 - a. Green Paint Company (800) 527-8866.
 - b. (public and private agencies only) Major Paint Company (310) 542-7701.
 - c. (paint cans only - information) Steel Can Recycling Institute (SCRI); (800) 937-1226
16. Fluorescent and HID lamps and ballasts.
 - a. AERC.com, Inc., Hayward, CA (800) 628-3675, www.aercrecycling.com
 - b. Ecolights Northwest, Seattle, WA (206) 343-1247, www.ecolights.com
 - c. Environmental Light Recyclers, Inc., Fort Worth, TX (800) 755-4117.
 - d. Full Circle Recyclers, Bronx, NY (800) 775-1516, www.fcrecyclers.com
 - e. HTR-Group, Lake Ozark, MO (888) 537-4874, www.htr-group.com
 - f. Institution Recycling Network, Concord, NH (603) 229-1962, www.ir-network.com.
 - g. Northeast Lamp Recycling, Inc., East Windsor, CT (860) 292-1992
 - h. Onyx special Services, Port Washington, WI (800) 556-5267, www.superiorserv.com.

END OF SECTION

SECTION 01 77 00

*** CLOSEOUT PROCEDURES - IAQ ***

PART 1 GENERAL

1.01 CONSTRUCTION IAQ MANAGEMENT PLAN (LEED EQ Credit No. 3.2)

- A. Flush-out (Option 1): In conjunction with the Design Professional and the Mechanical Engineer, develop and implement an Indoor Air Quality (IAQ) Management Plan for pre- occupancy phase **per one of the following**:
1. After construction ends, prior to occupancy and with all interior finishes installed, perform a building flush-out by supplying a total air volume of 14,000 cu. ft. of outdoor air per sq. ft. of floor area while maintaining an internal temperature of at least 60 degrees F and relative humidity no higher than 60%.
 2. If occupancy is desired prior to completion of the flush-out, the space may be occupied following delivery of a minimum of 3,500 cu. ft. of outdoor air per square foot of floor area to the space. Once a space is occupied, it shall be ventilated as a minimum rate of 0.30 cfm / sq.ft. of outside air or the design minimum outside air rate determined by EQ Prerequisite 1, whichever is greater. During each day of the flush-out period, ventilation shall begin a minimum of 3 hours prior to occupancy and continue during occupancy. Those conditions shall be maintained until a total of 14,000 cu. ft./sq. ft. of outside air has been delivered to the space.
- B. Air Quality Testing (Option 2):
1. Conduct baseline indoor-air-quality testing, after construction ends and prior to occupancy, using testing protocols consistent with the EPA's "Compendium of Methods for the Determination of Air Pollutants in Indoor Air," and as additionally detailed in the USGBC's "Green Building Design and Construction Reference Guide."
 2. Demonstrate that the contaminant maximum concentrations listed below are not exceeded:
 - a. Formaldehyde: 27 ppb.
 - b. Particulates (PM10): 50 micrograms/cu. m.
 - c. Total Volatile Organic Compounds (TVOC): 500 micrograms/cu. m.
 - d. 4-Phenylcyclohexene (4-PH): 6.5 micrograms/cu. m.
 - e. Carbon Monoxide: 9 ppm and no greater than 2 ppm above outdoor levels.
 3. For each sampling point where the maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting noncomplying building areas, take samples from same locations as in the first test.
 4. Air-sample testing shall be conducted as follows:
 - a. All measurements shall be conducted prior to occupancy but during normal occupied hours, and with building ventilation system starting at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the duration of the air testing.
 - b. Building shall have all interior finishes installed including, but not limited to, millwork, doors, paint, carpet, and acoustic tiles. Non-fixed furnishings such as workstations and partitions are encouraged, but not required, to be in place for the testing.

- c. Number of sampling locations varies depending on the size of building and number of ventilation systems. For each portion of building served by a separate ventilation system, the number of sampling points shall not be less than one per 25,000 sq. ft. or for each contiguous floor area, whichever is larger, and shall include areas with the least ventilation and greatest presumed source strength.
 - d. Air samples shall be collected between 3 and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum four- hour period.
- C. The Job Order Contractor shall submit a completed LEED-NC 2009 form and supporting documentation for LEED EQc3.2 to the Design Professional to be included with the comprehensive “Construction Submittal.” (see Section 01 81 13). The following project data and calculation information is required to document credit compliance:
- 1. Confirmation regarding the approach taken by the project (pre-occupancy flush-out, flush-out with early occupancy; IQ testing.)
 - 2. A copy of the Project’s IAQ Report (if applicable).
 - 3. A narrative describing the project’s specific flush-out procedures and/or IAQ testing process and results.

END OF SECTION

SECTION 01 78 36

WARRANTIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

- A. Provide written warranties, guarantees, bonds or service contracts for products and installations, for the period(s) indicated.
- B. Provide manufacturer's warranties or guarantees for products.
 - 1. Where manufacturer's standard warranties or guarantees expire before expiration date required by Contract Documents, obtain and pay for warranty or guarantee extensions, at no additional cost to Owner.
- C. Provide all warranties, guarantees, bonds or service contracts prior to final acceptance.
- D. Provide Owner or Owner's Representative a copy of each warranty, guarantee, bond or service contract issued. Submit with each of the foregoing an information sheet for Owner's personnel which includes:
 - 1. Effective dates or period.
 - 2. Proper procedures in the event of failure.
 - 3. Instances which might affect the validity of warranties, bonds or service contracts.
 - 4. Identify of contract persons in the event of claims.
- E. Submit all warranties, guarantees, bonds or service contracts identified by specification section and equipment identification used in operating and maintenance data.
- F. In the event of a warranty-work-notice to the Job Order Contractor, requiring work to be done, Job Order Contractor will coordinate with Subcontractors and Suppliers to accomplish the work.

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. Technical Specifications: Divisions 02 through 48.
- B. Execution and Closeout Requirements: Section 01 70 00 - (especially ¶ 1.81 therein).
- C. Project Record Documents: Section 01 78 39.
- D. Equipment Demonstration and Owner Personnel Instruction: Section 01 79 00.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END

OF

SECTION

SECTION 01 78 39
***** PROJECT AS-BUILT AND RECORD DOCUMENTS *****

PART 1 GENERAL

1.1 Description

1.1.1 Work Included:

- 1.1.1.1 Throughout progress of the Work of this Contract, the Job Order Contractor shall timely maintain an accurate record of all changes in the Construction Documents (drawing and specifications) per Contract, and as described in Part 3.1 below.
- 1.1.1.2 For the purpose of this Section, the updated set of Construction Documents (drawing and specifications) per Paragraph 1.1.1.1 above shall be known as the Project As-Built Documents.
- 1.1.1.3 As-Built Drawings are produced by the Job Order Contractor and shall refer to all changes recorded on the As-Built Drawings, as defined in relevant sections of the Contract.
- 1.1.1.4 Record Drawings and Specifications as defined in Section 2.1.2 are produced by the Design Professional.

1.1.2 Related Work described elsewhere:

- 1.1.2.1 Shop Drawings, Project Data, and Samples: Section 01 33 23.
- 1.1.2.2 Progress Payment Procedures: Section 01 29 76 ***
- 1.1.2.3 Execution and Closeout Requirements: Section 01 70 00.

1.2 Quality Assurance

- 1.2.1 General. Maintenance of the Project As-Built Documents shall be the responsibility of one person on the Job Order Contractor's staff as approved in advance by the Owner or Owner's Representative.
- 1.2.2 Accuracy of Records: Thoroughly coordinate all changes within the Project As- Built Documents, making adequate and proper entries in red ink on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to properly show the change. The Project As-Built Documents shall reflect all changes due to Addenda issued at bidding time and Change Order items during construction, whether added or deleted. The Change Order and Addenda items shall be properly referenced by number. Accuracy of records shall be such that future searches for items shown in the Contract Documents may reasonably rely on information obtained from the approved Project Record Documents.
- 1.2.3 Timing of Entries: Make all entries within three days following completion of change.
- 1.2.4 The DP, and the Owner or Owner's Representative shall examine the Project As- Built Documents at selected intervals to assure Job Order Contractor compliance for updating entries. Should the Job Order Contractor fail to satisfy the requirements of this Section, the Owner may withhold the Job Order Contractor's monthly Application for Payment until said requirements are satisfied.

1.3 Submittals

- 1.3.1 General: The DP and the Owner or Owner's Representative's approval of the current status of Project As-Built Documents will be a prerequisite to the DP and Owner's or Owner's Representative's acceptance of Job Order Contractor's Progress Payment Applications and final Application for Payment under the Contract.
- 1.3.2 Final Submittal. Prior to submitting final Application for Payment, submit the final Project As-Built

Documents required by Contract to the DP and secure DP's approval.

1.4 As Built Documents

- 1.4.1 Use all means necessary to maintain the job set of Project As-Built Documents completely protected from deterioration and from loss and damage until completion of the Work and transfer of the recorded data to the final Record Documents. In the event of loss of recorded data, use all means necessary to secure the data to the Owner's or Owner's Representative's approval; such means shall include, if necessary in the opinion of the Owner or Owner's Representative, removal and replacement of concealing materials and, in such case, all replacements shall be to the standards originally specified in the Contract Documents.

PART 2 PRODUCTS

2.1 As-Built Drawings ***

- 2.1.1 The DP will provide the Job Order Contractor with a set of reproducible drawings, of the Construction Documents, at Job Order Contractor's expense. Seals and signatures of Registrants shall be completely removed and/or permanently obscured. The DP will furnish the Job Order Contractor one set of the REVIT model and AutoCAD Drawings bound with all external reference of the Construction Drawings for use in recording information.
 - 2.1.2.1 Seals and signatures of Registrants shall be completely removed and/or permanently obscured.
 - 2.1.2.2 DP makes no representations as to the accuracy or completeness of CAD Drawings as they relate to the Contract Drawings
 - 2.1.2.3 The Contact Drawings are available in REVIT and AutoCAD for Microsoft Windows XP. As Built Drawings prepared by the Job Order Contractor shall be in the same software version.
 - 2.1.2.4 Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
- 2.1.2 Final Record Documents:
 - 2.1.2.1 Upon Substantial Completion of the Work, submit the job set of Project As-Built Documents to the DP for review.
 - 2.1.2.2 Record Drawings: Upon DP's approval of the Project As-Built Documents, the DP shall prepare a full set of corrected drawings of the Contract Drawings, CAD Drawings, Shop Drawings, and RFI's. These corrected drawings shall be called the "Record Drawings."
 - 2.1.2.2.1 DP shall incorporate changes and additional information previously marked on As Built Drawings. Erase, redraw, and add details and notations where applicable.
 - 2.1.2.2.2 DP shall organize into unbound sets matching As-Built Drawings.
 - 2.1.2.2.3 DP shall prepare Record Drawings in AutoCAD and REVIT for the project per the requirements of the Design Professional Contract.
 - 2.1.2.2.4 Seals and signatures of the registrant Design Professional shall not be placed on Record Drawings and Specifications.
 - 2.1.2.2.5 Record Documents shall be free of revision clouds.
 - 2.1.2.3 Record Specifications: Submit one copy of Project Specifications, including addenda and contract modifications. Where Owner selects one of several alternates specified or installation varies from that indicated, mark copy to indicate the actual product installed. Bind in volumes as appropriate.
 - 2.1.2.3.1 Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 2.1.2.3.2 Note related Change Orders and Record Drawings.
 - 2.1.2.3.3 In addition to the requirements of 2.1.3.3, submit the Record Specifications in

Adobe Acrobat format on electronic media formatted for Windows XP. Also submit one set of back-up media.

2.1.2.2.4 Seals and signatures of the registrant Design Professional shall not be placed on Record Drawings and Specifications.

2.1.2.2.5 Record Documents shall be free of revision clouds.

2.1.2.4 Miscellaneous Record Submittals: Bind or file miscellaneous records with identification labels clearly visible.

PART 3 EXECUTION

3.1 Maintenance of Job Set

3.1.1 Identification. Immediately upon receipt of the job set described in 2.1.1 above, identify each of the Documents with the title "AS-BUILT DRAWINGS–JOB SET".

3.1.2 Preservation

3.1.2.1 Considering the Contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set to the approval of the Owner or Owner's Representative.

3.1.2.2 Do not use the job set for any purpose except entry of new data and review by the DP and Owner or Owner's Representative, until start of transfer of data to final Record Drawings.

3.1.2.3 Maintain the job set at the site of Work as designated by the Owner or Owner's Representative.

3.1.3 Making entries on As-Built Drawings. Using an erasable colored pencil (not ink or indelible pencil), clearly describe the change by note and by graphic lines, as required. Date all entries and incorporate entry from Subcontractor following completion of change. Call attention to the entry by a "cloud" around the area or areas affected. In the event of overlapping changes, different colors may be used for each of the changes.

3.1.4 Making Entries on other Project Documents

3.1.4.1 Where changes are caused by directives issued by the DP, or Owner, or Owner's Representative clearly indicate the change by note in ink, colored pencil, or rubber stamp.

3.1.4.2 Where changes are caused by Job Order Contractor -originated proposals approved by the Owner or Owner's Representative, or DP, including inadvertent errors by the Job Order Contractor, which have been accepted by the Owner, clearly indicate the change by note in erasable colored pencil.

3.1.4.3 Make entries in the pertinent Project Documents as approved by the Owner or Owner's Representative.

3.1.5 Conversion of schematic layouts:

3.1.5.1 In most cases on the Drawings, arrangement of conduits and circuits, piping, ducts, and other similar items, is shown schematically and is not intended to portray precise physical layout. Final physical arrangement is as determined by the Job Order Contractor, subject to the DP's approval. However, design of future modifications of the facility may require accurate information as to the final physical arrangement of items which are shown only schematically on the Drawings.

3.1.5.2 Information contained in the As-Built Drawings shall include, but not be limited to:

3.1.5.2.1 Actual installation where actual installation varies from original drawings

3.1.5.2.2 Location of underground pipes, conduits, ducts, cables and similar work, dimensioned horizontally to permanent points of reference and located vertically

by indicating depth of burial. Dimensions shall be accurate within +6 inches.

3.1.5.2.3 Location of plumbing piping, sprinkler piping, control valves, heating and air conditioning equipment, mechanical piping, ductwork, major conduit runs, power, control and alarm wiring, etc., dimensioned horizontally to permanent points of reference. Dimensions shall be accurate within 6 inches.

3.1.5.2.4 Modifications made to accommodate field conditions.

3.1.5.2.5 Location of mechanical and electrical control devices and shut-off valves.

3.1.5.2.6 Final circuiting of electrical fixtures and equipment.

3.1.5.2.7 Record and check the markup before enclosing concealed installations.

3.1.5.2.8 Change Order numbers and similar identification where applicable.

3.1.5.3 The DP may waive the requirements for conversion of schematic data where, in the DP's judgment, such conversion serves no beneficial purpose. However, no such waivers are effective unless specifically issued in writing by the DP.

3.1.6 Timing of entries. Be alert to changes in the Work from how it is shown in the Contract Documents. Promptly, within three days following completion of the change, make the entry or entries required.

3.1.7 Accuracy of entries. Use all means necessary, including the proper tools and necessary labor for measurement, to determine actual locations of the installed items.

3.2 Final Project As-Built Documents

3.2.1 The purpose of the final Project As-Built Documents is to provide factual information regarding all aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination.

3.2.3 The Owner shall not authorize final payment to the Job Order Contractor until all Final Project As-Built Documents have been submitted and approved by the Owner and DP.

3.3 Record Drawings

3.3.1 Upon approval of the Project As-Built Documents, the DP shall prepare Record Drawings.

END OF SECTION

SECTION 01 78 43

*** SPARE PARTS AND MAINTENANCE MATERIALS ***

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- 1.1.1 Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections (General Requirements), apply to this Section.

1.2 DESCRIPTION

1.2.1 General:

- 1.2.1.1 This Section describes methods for documenting spare parts and maintenance materials as indicated, in accordance with the provisions of the Contract Documents.
- 1.2.1.2 See Specification Sections for items required.

1.3 SUBMITTALS (SEE SECTION 01 33 23)

- 1.3.1 Spare parts and tools.
- 1.3.2 Maintenance.
- 1.3.3 Extra materials (attic stock).

PART 2 PRODUCTS

2.1 SPARE PARTS AND TOOLS

- 2.1.1 Package in clearly identified boxes, as follows:
 - 2.1.1.1 Indicate manufacturer's name, part name and stock number.
 - 2.1.1.2 Indicate what the piece of equipment part or tool is for.
 - 2.1.1.3 Indicate name, address, and phone number of closest supplier.

2.2 MAINTENANCE MATERIALS

- 2.2.1 Package in clearly identified boxes.
 - 2.2.1.1 Indicate trade name and stock number.
 - 2.2.1.2 Indicate which item material is to be used with.
 - 2.2.1.3 Indicate name, address, and phone number of closest supplier.

2.3 EXTRA MATERIALS (ATTIC STOCK)

- 2.3.1 Package in clearly identified container, or install where indicated.
 - 2.3.1.1 Indicate trade name, stock number, size, color, etc.
 - 2.3.1.2 Indicate where product is to be used.
 - 2.3.1.3 Indicate name, address, and phone number of closest supplier.
- 2.3.2 Coordinate extra stock for specific items per the instruction of the Owner or Owner's Representative.

PART 3 EXECUTION

3.1 DELIVERY

- 3.1.1 Deliver to Owner at time of substantial completion, unless Owner requests earlier delivery.
- 3.1.2 Extra stock materials are not to be used for completion of punch list items.

END OF SECTION

SECTION 01 79 00

***** EQUIPMENT DEMONSTRATION AND OWNER PERSONNEL INSTRUCTION *****

PART 1 GENERAL

1.1 RELATED DOCUMENTS

1.1.1 Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

1.2.1 Provide demonstrations and instructions for all equipment and systems for which operating and maintenance data is required. See individual sections.

1.3 QUALITY ASSURANCE

1.3.1 Instructors Member(s) of installers' staff and authorized representative(s) of component, assembly, or system manufacturer(s). See individual sections for additional requirements.

1.4 SUBMITTALS

1.4.1 Schedule of Demonstrations. Submit to Owner or Owner's Representative for approval at least two (2) weeks prior to first demonstration. The schedule shall be approved by the Owner, (taking into account the availability of personnel to be trained).

1.4.2 List of instructors and schedule of instruction. Submit to Owner or Owner's Representative for approval at least two (2) weeks prior to first instruction period.

1.5 JOB CONDITIONS

1.5.1 Complete demonstrations prior to Substantial Completion. Coordinate with procedures for Substantial Completion to provide separate demonstrations.

1.5.2 Complete all instruction prior to Final Completion.

PART 2: PRODUCTS (Not Used)

PART 3: EXECUTION

3.1 PREPARATION

3.1.1 Do not begin demonstrations until the component, assembly or system being demonstrated has been tested as specified and is in satisfactory operating condition. The Owner may elect to videotape any and/or all demonstrations.

3.1.2 Do not begin instruction until demonstration is complete.

3.1.3 Assemble instructional aids.

3.1.4 Have operating and maintenance manuals available for use during instruction per the requirements of Section 01 93 13.

3.2 DEMONSTRATION

3.2.1 Operate satisfactorily, in presence of Owner or Owner's Representative, and Design Professional, each system and item of equipment, including accessories.

3.2.2 Replace defective work or material.

3.2.3 Repeat demonstration until defects are eliminated.

3.3 INSTRUCTION

3.3.1 Instruct Owner's personnel in operation and maintenance of equipment and systems.

3.3.1.1 Provide all necessary instruction to satisfaction of Owner.

3.3.2 Explain use of operating and maintenance manuals.

3.3.3 Tour building areas involved and identify:

3.3.3.1 Maintenance points and access.

3.3.3.2 Control locations and equipment.

3.3.4 Explain operating sequences.

3.3.4.1 Identify location and show operation of all necessary parts used to start, stop and adjust systems.

3.3.4.2 Explain use of flow diagrams, operating sequence diagrams.

3.3.4.3 Demonstrate operation through complete control cycle and full range of operation in all modes, including testing and adjusting relevant to operation.

3.3.5 Explain use of control equipment, including temperature settings, switch modes, available adjustments, ring of gauges and functions that must be serviced only by authorized factory representatives.

3.3.6 Explain troubleshooting procedures.

3.3.6.1 Demonstrate commonly occurring problems.

3.3.6.2 Note procedures that must be performed by factory personnel

3.3.7 Explain maintenance procedures and requirements.

3.3.7.1 Point out items requiring periodic maintenance.

3.3.7.2 Demonstrate typical preventive maintenance procedures and recommended typical maintenance intervals.

3.3.7.3 Demonstrate other commonly occurring maintenance procedures not part of preventive maintenance program.

3.3.7.4 Identify maintenance materials to be used.

3.3.8 Furnish all tools required.

3.3.9 For each trade or system involved in Equipment Demonstration and Owner Personnel Instruction, provide sixteen (16) working-time hours allowance for call- back training and/or consultation. The sixteen (16) hours are to be considered actual on-site training time regardless of the number of experts and/or technicians required. If and when needed, these additional training sessions will be scheduled by the Owner.

3.3.10 Document attendance at all training sessions

3.3.11 Record all training sessions on digital video, per Owner's requirements. ***

END OF SECTION

SECTION 01 81 13

*** SUSTAINABLE DESIGN REQUIREMENTS ***

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Procedures required of the Job Order Contractor to ensure that construction procedures and documentation required for US Green Building Council (USGBC) / Green Building Certification Institute (GBCI) LEED Certification are provided.

1.02 DEFINITIONS

- A. LEED Green Building Rating System:
 - 1. "LEED": Leadership in Energy and Environmental Design.
 - 2. "USGBC": US Green Building Council. See Section 01 42 00 - References.
 - 3. "GBCI": Green Building Certification Institute.
- B. Prerequisite: Requirements which must be met in order to achieve LEED™ Certification. Non-compliance with any prerequisite may be cause for failure of Certification and is not acceptable.

1.03 SYSTEM DESCRIPTION

- A. LEED™ Certification:
 - 1. The LEED Green Building Rating System™ is a voluntary, consensus-based, market-driven building rating system based on existing proven technology. It evaluates environmental performance from a whole building perspective over a building's life cycle, providing a definitive standard for what constitutes a "green building".
 - 2. The development of LEED Green Building Rating System™ was initiated by the USGBC Membership, representing all segments of the building industry and has been open to public scrutiny.
 - 3. In 2008, the review of the submittals for building certification was changed to the GBCI.
 - 4. LEED™ is a measurement system designed for rating new and existing commercial, institutional, and residential buildings. It is based on accepted energy and environmental principles and strikes a balance between known established practices and emerging concepts. It is a performance-oriented system where credits are earned for satisfying criterion designed to address specific environmental impacts inherent in the design, construction and O&M of buildings. Different levels of green building certification are awarded based on the total credits earned. The system is designed to be comprehensive in scope, yet simple in operation.
 - 5. There are a total of 110 points available in the LEED-NC v3 (2009) rating system.
 - a. 40 points are required for a building to be LEED Certified.
 - b. 50 points: "Silver Level" rating.
 - c. 60 points: "Gold Level" rating.
 - d. 80 points: "Platinum Level" rating
 - 6. The Owner of this project intends to achieve a Silver Level rating, however, achievement of a higher rating may be possible.
 - 7. Some prerequisites/credits are related to the design of the project (or are not applicable to the project) and are not related to materials and workmanship during the course of construction and therefore are not included in the requirements for this specification section, including:
 - a. Sustainable Sites Credit No. 1 - Site Selection.
 - b. Sustainable Sites Credit No. 2 – Development Density & Community Connectivity
 - c. Sustainable Sites Credit No. 3 - Brownfield Redevelopment: (Not applicable)
 - d. Sustainable Sites Credit No. 4.1 - Alternative Transportation, Public Transportation Access.
 - e. Sustainable Sites Credit No. 4.4 - Alternative Transportation, Parking Capacity.
 - f. Sustainable Sites Credit No. 5.1 – Protect or Restore Habitat.
 - g. Sustainable Sites Credit No. 5.2 – Site Development, Maximize Open Space.
 - h. Sustainable Sites Credit No. 7.1 – Heat Island Effect, Non-Roof.
 - i. Sustainable Sites Credit No. 8.0 - Light Pollution Reduction. (Not applicable)
 - j. Water Efficiency Credit No. 1.2 – Water Efficient Landscaping, No Potable Use or No

- Irrigation. (Not applicable)
- k. Energy and Atmosphere Credit No. 4 – Enhanced Refrigerant Management. (Not applicable)
- l. Energy and Atmosphere Credit No. 5 - Measurement and Verification. (TBD)
- m. Energy and Atmosphere Credit No. 6 - Green Power. (TBD)
- n. Materials and Resources Prerequisite - Storage and Collection of Recyclables.
- o. Materials and Resources Credit No. 1.1 - Building Reuse. (Not applicable)
- p. Materials and Resources Credit No. 1.2 - Building Reuse. (Not applicable)
- q. Materials and Resources Credit No. 3 – Materials Reuse. (Not applicable)
- r. Materials and Resources Credit No. 6 – Rapidly Renewable Materials. (Not applicable)
- s. Indoor Environmental Quality (EQ) Prerequisite No. 2 –Environmental Tobacco Smoke (ETS) control: Zero exposure of nonsmokers to ETS will be provided by prohibition of smoking in the building.
- t. Indoor Environmental Quality (EQ) Credit No. 2 - Increased Ventilation. (Not applicable)
- u. Indoor Environmental Quality (EQ) Credit No. 7.2 - Thermal Comfort, Verification.
- v. Indoor Environmental Quality (EQ) Credit Nos. 8.1 and 8.2 – Daylighting & Views. (TBD)
- w. Innovation and Design Process Credit No. 1.1. Exemplary Performance - Materials and Resources Credit No. 2 – Construction Waste Management -95% (in accordance with Section 01 74 19).
- x. Innovation and Design Process Credit No. 1.2. Exemplary Performance – Materials and Resources Credit No. 4 – Recycled Content – 30% (in accordance with Section 01 60 00).
- y. Innovation and Design Process Credit No. 1.3. Exemplary Performance – Materials and Resources Credit No. 5 – Regional Materials – 30% (in accordance with Section 01 60 00).
- z. Innovation and Design Process Credit No. 1.4. Educational Display.
- aa. Innovation and Design Process Credit No. 1.5. (TBD).
- ab. Innovation and Design Process Credit No. 2 - LEED™ Accredited Professional.
- ac. Regional Priority Credit No 1.1 – SSc2 – Community Connectivity.
- ad. Regional Priority Credit No 1.2 – WEc3 – Water Use Reduction (30%).
- ae. Regional Priority Credit No 1.3 – SSc4.4 – Parking Capacity.
- af. Regional Priority Credit No 1.4 – SSc7.1 – Heat Island Effect – Non-roof.

B. LEED Prerequisites: Job Order Contractor shall provide construction procedures and documentation required to ensure US Green Building Council (USGBC) / Green Building Certification Institute (GBCI) LEED Certification can be achieved for each of the following prerequisites.

1. Sustainable Sites Prerequisite – Construction Activity Pollution Prevention: In accordance with requirements of Section 01 57 13 - Erosion and Sedimentation Control and Civil Engineering drawings and specifications.
2. Water Efficiency Prerequisite No. 1 - Water Use Reduction. This project is designed with numerous innovative water usage reduction technologies as indicated on the Drawings and as specified in the applicable sections of the Civil and Plumbing specifications. To achieve this prerequisite it is the intent of the design to employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting Energy Policy Act of 1992 fixture performance requirements. Note that this 20% aggregate is exceeded to achieve the requirements for Water Efficiency Credits 3.1 and 3.2.
3. Energy and Atmosphere Prerequisite 1 - Fundamental Commissioning of the Building Energy Systems: In accordance with Section 01 91 00 - Commissioning.
4. Energy and Atmosphere Prerequisite No. 2 - Minimum Energy Performance: This project is designed with numerous technologies to minimize energy usage as indicated on the Drawings and as specified in the applicable sections of the specifications. **Job Order Contractor** shall be aware that it is the intent of the design to demonstrate a 10% improvement in the proposed building performance rating compared with the baseline building performance rating required by ASHRAE/IESNA 90.1-2007 or the local energy code, whichever is more stringent. Note that this 10% is exceeded to achieve the requirements for Energy and Atmosphere Credit 1.
5. Energy and Atmosphere Prerequisite No. 3 – Fundamental Refrigerant Management: This project is designed to have zero use of CFC-based refrigerant in new base building HVAC&R systems as indicated on the Drawings and as specified. Job Order Contractor shall be aware that NO SUBSTITUTION will be allowed for equipment using CFC-based refrigerant.

6. Indoor Environmental Quality (EQ) Prerequisite No. 1 - Minimum IAQ Performance. This project is designed with numerous technologies to establish minimum indoor air quality (IAQ) performance to enhance indoor air quality in the buildings, as indicated on the Drawings and as specified in the applicable sections of the specifications. Job Order Contractor shall be aware that it is the intent of the design to meet (or exceed as may be required to achieve additional points) the minimum requirements of Sections 4 through 7 of voluntary consensus standard ASHRAE 62.1-2004, Ventilation for Acceptable Indoor Air Quality.
- C. LEED Credits: Job Order Contractor shall provide construction procedures and documentation required to ensure US Green Building Council (USGBC) / Green Building Certification Institute (GBCI) LEED Certification can be achieved for each of the following credits, unless noted "not applicable to this project."
1. Sustainable Sites Credit No. 4.2 - Alternative Transportation, Bicycle Storage and Changing Room: In accordance with Section 12 93 13 – Bicycle Racks, Division 22 (Plumbing) and as indicated on Drawings.
 2. Sustainable Sites Credit No. 4.3 - Alternative Transportation, Low-Emitting & Fuel Efficient Vehicles.
 - a. In accordance with Pavement Markings and Signage as indicated on Drawings.
 - b. In accordance with Section 10 14 00 – Signage.
 3. Sustainable Sites Credit No. 7.2 – Heat Island Effect – Roof: In accordance with Section 07 52 16.
 4. Water Efficiency Credit No. 1.1 - Water Efficient Landscaping: Reduce by 50%: In accordance with Landscape Drawings and Specifications.
 5. Water Efficiency Credit No. 2 - Innovative Wastewater Technologies. (TBD)
 6. Water Efficiency Credit No. 3 - Water Use Reduction. This project is designed with numerous innovative water usage reduction technologies as indicated on the Drawings and as specified in the applicable sections of the Civil and Plumbing specifications. Job Order Contractor shall be aware that it is the intent of the design to employ strategies that in aggregate use a minimum of 30% (40% if possible) less water than the water use baseline calculated for the building (not including irrigation) after meeting Energy Policy Act of 1992 fixture performance requirements. If possible, water use reduction up to 40% should be achieved.
 7. Energy and Atmosphere Credit No. 1 - Optimize Energy Performance: This project is designed with numerous technologies to minimize energy usage as indicated on the Drawings and as specified in the applicable sections of the specifications. Job Order Contractor shall be aware that it is the intent of the design to reduce design energy cost compared to energy cost budget for regulated energy components described in the requirements of ASHRAE/IESNA 90.1-2007 by a minimum of 22% as demonstrated by a whole building simulation. If possible, energy savings up to 48% should be achieved.
 8. Energy and Atmosphere Credit No. 2 – On-Site Renewable Energy. In accordance with Section 48 14 00 – Solar Energy Electrical Power Generation Equipment. It is anticipated that up to 5% of the building annual energy cost will be provided.
 9. Energy and Atmosphere Credit No. 3 – Enhanced Commissioning: In accordance with Section 01 91 00 – Commissioning.
 10. Materials and Resources Credit No. 2 - Construction Waste Management: In accordance with Section 01 74 19 - Construction Waste Management and Disposal.
 11. Materials and Resources Credit No. 4 – Recycled Content: In accordance with Section 01 60 00 – Product Requirements.
 12. Materials and Resources Credit No. 5 – Regional Materials: In accordance with Section 01 60 00 – Product Requirements.
 13. Materials and Resources Credit No. 7 - Certified Wood: In accordance with Section 06 05 13 - FSC Certified Wood
 14. Indoor Environmental Quality (EQ) Credit No. 1 – Outdoor Air Delivery Monitoring: In accordance with Mechanical Drawings and Specifications.
 15. Indoor Environmental Quality (EQ) Credit No. 3.1 - Construction IAQ Management Plan, During Construction: In accordance with construction IAQ management plan as specified in Section 01 50 00 – Temporary Facilities and Controls.
 16. Indoor Environmental Quality (EQ) Credit No. 3.2 - Construction IAQ Management Plan, Before

Occupancy: In accordance with Section 01 77 00– Closeout Procedures.

17. Indoor Environmental Quality (EQ) Credit No. 4.1, 4.2, 4.3 and 4.4 - Low Emitting Materials: In accordance with Section 01 60 00– Product Requirements.
18. Indoor Environmental Quality (EQ) Credit No. 5 - Indoor Chemical and Pollutant Source Control: (TBD)
 - a. This credit requires that permanent entryway systems be provided which is at least 10 feet long in the primary direction of travel to capture dirt and particulates entering the building at regularly used exterior entrances.
 - b. Where hazardous gases or chemicals may be present or used (including garages, housekeeping/laundry areas and copying/printing room), exhaust each space sufficiently to create negative pressure with respect to adjacent spaces with the doors to the room closed. For each of these spaces, provide self-closing doors and deck to deck partitions or a hard lid ceiling. The exhaust rate shall be at least 0.5 cfm/sq.ft., with no air re-circulation. The pressure differential with the surrounding spaces shall be at least 5 Pa (0.02 inches of water gauge) on average and 1 Pa (0.004 inches of water) at a minimum when the doors to the rooms are closed.
 - c. In mechanically ventilated building, provide regularly occupied areas of the building with air filtration media prior to occupancy that provide a Minimum Efficiency Reporting Value (MERV) of 13 or better. Filtration shall be applied to process both return and outside air that is to be delivered as supply air.
 - d. Provide containment (i.e. a closed container for storage for off-site disposal in regulatory compliant storage area, preferably outside the building) for appropriate disposal of hazardous liquid wastes in places where water and chemical concentrate mixing occurs (e.g., housekeeping, janitorial and science laboratories).
19. Indoor Environmental Quality (EQ) Credit No. 6.1 - Controllability of Systems, Lighting: Provide lighting controls as indicated on Drawings and as specified in Division 26. (TBD)
20. Indoor Environmental Quality (EQ) Credit No. 7.1 - Thermal Comfort: Comply with ASHRAE Standard 55-2004, Thermal Comfort Conditions for Human Occupancy in accordance with Mechanical Drawings and Specifications.

1.04 SUBSTITUTIONS

- A. In accordance with Section 01 35 43.

1.05 PRECONSTRUCTION MEETING

- A. In accordance with Section 01 35 43.

1.06 SUBMITTALS

- A. LEED™ Submittal Documentation:

1. Upon completion of the Project, the Owner will be making a submission to the GBCI for certification. This submission will require documentation provided by the Job Order Contractor.
2. Throughout the Project Manual, various submission requirements are specified that shall be collected and compiled into a separate file by the Job Order Contractor prior to, during, and after the course of construction.
3. The documentation shall be neatly organized and tabbed according to the listing outlined under “System Description” specified herein and as identified in the each specification section.
4. LEED-Online:
 - a. At the time of Project Registration during the design phase of the project, the project team identified a Project Administrator, who has assigned design team members to each applicable LEED prerequisite/credit.
 - b. Upon execution of Contract, the Job Order Contractor will be invited to participate in the LEED-Online process. Job Order Contractor shall accept the assignments and shall cooperate and participate in the preparation of the LEED Templates at no additional cost to the Owner.
 - c. Once each prerequisite/credit is completed, the responsible team member shall upload the data required for that prerequisite/credit’s form on LEED-Online. The Project Administrator will track

the status of all attempted credits in "Credit Scorecard & Status" and submit the project for review at the appropriate time. The Project Administrator will provide familiarization assistance to the Job Order Contractor, however, the Job Order Contractor will be responsible for the training of Job Order Contractor's personnel in the usage of LEED-Online.

- d. Credits marked as "Construction" will be submitted and reviewed by USGBC/GBCI after the substantial completion of construction. The USGBC/GBCI will review and mark each credit as either "Credit Achieved" or "Credit Denied". Project submittals will be reviewed and project teams may be contacted for clarification or a short explanation of the rationale for claiming the credit and meeting the credit intent.
 - e. Should clarification be required of a prerequisite or credit assigned to the Job Order Contractor, the Job Order Contractor shall provide the required response to that clarification request by GBCI.
 - f. The design/construct team will receive a ruling on every credit that is submitted, with a brief explanation of why any credits were denied. The certification review process will be documented in the LEED-Online exclusively.
 - g. Appeals: If a Prerequisite assigned to the Job Order Contractor be denied, the Job Order Contractor shall appeal the denial at no additional cost to Owner. The appeal process shall be completed so that the prerequisite is attained.
- B. Fundamental Commissioning of the Building Energy Systems- Energy and Atmosphere Prerequisite: Provide submittals in accordance with Section 01 91 13 – Commissioning General Requirements.
- C. Construction Waste Management - Materials and Resources Credit 2: Provide submittals as specified in Section 01 74 19 - Construction Waste Management and Disposal.
- D. Recycled Content:
1. Materials and Resources Credit 4.1: Provide the following.
 - a. Product data submittals, in accordance with the requirements of Section 01 33 00– Submittals and as specified in the various specification sections, highlighting recycled content (as defined in Section 01 60 00) materials.
 - b. Provide spreadsheet of all materials used on the project highlighting recycled content materials. Include the percentage of post-consumer and post-industrial recycled content for recycled content materials, the costs of all materials for the project, and calculations demonstrating that sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project.
 2. Materials and Resources Credit 4.2: Provide the following.
 - a. The submittals required for Credit 4.1.
 - b. Provide spreadsheet of all materials used on the project highlighting recycled content materials. Include the percentage of post-consumer and post-industrial recycled content for recycled content materials, the costs of all materials for the project, and calculations demonstrating that sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes an additional 10% beyond MR Credit 4.1 (total of 20% based on cost) of the total value of the materials in the project.
 3. Innovation and Design Process Credit 1.2: Provide submittals listed for MRc4.1 and 4.2 showing that 30% total (based on cost) of the materials provide recycled content as stipulated above.
 4. Mechanical, electrical and plumbing components and specialty items such as elevators shall not be included in calculations for this credit. Only include materials permanently install in the project.
- E. Regional Materials:
1. Materials and Resources Credit 5.1: Provide the following.
 - a. Product data submittals, in accordance with the requirements of Section 01 33 00– Submittals and as specified in the various specification sections, highlighting regional (as defined in Section 01 60 00) materials.
 - 1) Location of the manufacturer must be verified by a product cut sheet or letter from the manufacturer.
 - 2) Manufacturer information shall state the location of extraction, harvest or recovery

of all components used in the material or product.

- b. Provide spreadsheet of all materials used on the project highlighting regional materials. Include the location of the material manufacturer, the distance from the manufacturer to the project site, the costs of all materials for the project, and calculations demonstrating that 10% of building materials (based on cost) have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project.
 2. Materials and Resources Credit 5.2: Provide the following.
 - a. The submittals required for Credit 5.1.
 - b. Provide spreadsheet of all materials used on the project highlighting regional materials. Include the location of the material manufacturer, the distance from the manufacturer to the project site, the costs of all materials for the project, and calculations demonstrating that an additional 10% of the building materials beyond MR Credit 5.1 (total of 20% based on cost) have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project.
 3. Innovation and Design Process Credit 1.3: Provide submittals listed for MRc5.1 and 4.5 showing that 30% total (based on cost) of the materials provide regional materials as stipulated above.
 4. Mechanical, electrical and plumbing components and specialty items such as elevators shall not be included in calculations for this credit. Only include materials permanently install in the project.
- F. Low Emitting Materials -
1. Indoor Environmental Quality Credit 4.1: Provide the following
 - a. Provide a cut sheet and / or material safety datasheet (MSDS) for all adhesives used, with VOC levels highlighted. No other information contained on MSDS sheet shall be reviewed.
 - b. Provide in accordance with Section 01 60 00– Product Requirements.
 2. Indoor Environmental Quality Credit 4.2: Provide the following
 - a. Provide a cut sheet and / or material safety datasheet (MSDS) for all coating applied on-site in the building, with VOC levels highlighted. No other information contained on MSDS sheet shall be reviewed.
 - b. Provide in accordance with Section 01 60 00– Product Requirements.
 3. Indoor Environmental Quality Credit 4.3: Provide the following
 - a. Provide a cut sheet and / or material safety datasheet (MSDS) for all carpet systems used in the building, with VOC levels highlighted. No other information contained on MSDS sheet shall be reviewed.
 - b. Provide product data for all hard surface flooring showing compliance with requirements of the FloorScore standard (current as of the date of this rating system, or more stringent version) as shown with testing by an independent third-party.
 - c. Provide product data for concrete, wood, bamboo and cork floor finishes such as sealer, stain and finish showing compliance with requirements of South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January 1, 2004.
 - d. Provide product data for tile setting adhesives and grout showing compliance with South Coast Air Quality Management District (SCAQMD) Rule 1168. VOC limits correspond to an effective date of July 1, 2005 and rule amendment date of January 7, 2005.
 - e. Provide in accordance with Section 01 60 00– Product Requirements.
 4. Indoor Environmental Quality Credit 4.4: Provide the following
 - a. Provide a cut sheet and / or material safety datasheet (MSDS) for all composite wood products used in the building, with VOC levels highlighted. No other information contained on MSDS sheet shall be reviewed.
 - b. Provide in accordance with Section 01 60 00 - Product Requirements.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01 91 13

*** GENERAL COMMISSIONING REQUIREMENTS ***

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Owner's Project Requirements and Basis of Design documentation are included by reference for information only.

1.02 SUMMARY

- A. This section describes the scope of the formal commissioning process and the general requirements for the building systems outlined herein.
- B. Related Sections
 - 1. Division 22, Section 220800, Commissioning of DHW Systems
 - 2. Division 23, Section 230800, Commissioning of HVAC Systems
 - 3. Division 26, Section 260800, Commissioning of Emergency Power and Lighting Control Systems

1.03 REFERENCES

- A. USGBC:
 - 1. LEED – NC 3.0: EA Prerequisite 1, Fundamental Commissioning.
 - 2. LEED – NC 3.0: Credit 3, Enhanced Commissioning.

1.04 DEFINITIONS

- A. Basis of Design (BOD): The documentation of design criteria and assumptions for systems, components, and methods chosen to meet the Owner's Project Requirements and applicable regulatory requirements, standards, and guidelines. The document includes narrative descriptions of the systems to be commissioned. The BOD is prepared by the Design Professionals.
- B. Building Automation System (BAS): The automated building system providing control and user interaction with select building systems, such as the HVAC, domestic hot water and lighting systems.
- C. Commissioning Authority (CxA): An independent agent hired directly by the Owner and not otherwise associated with the Design Professional(s) or the Construction Manager at Risk. The CxA assists the Construction Manager at Risk with coordinating commissioning activities and witnesses the activities on behalf of the Owner.
- D. Commissioning Issue (Cx Issue): A condition that affects, prevents or inhibits commissioning, and must be resolved to complete the commissioning process.
- E. Commissioning Issues List (Cx Issues List): A log maintained by the CxA listing all Deficiencies and Cx Issues documented during the commissioning process. All issues require action, correction and closure.
- F. Commissioning Report (Cx Report): The final report issued at the conclusion of the commissioning process. The report will include an executive summary abbreviating the outcome of the commissioning process and identifying all outstanding issues. The report also contains all commissioning documentation collected throughout all phases of the project.
- G. Commissioning Plan (Cx Plan): A document that outlines the organization, coordination, and requirements of the commissioning process in more detail.
- H. Commissioning Coordinator (CxC): Individual within the Job Order Contractor firm who plans, schedules, directs and coordinates all the Trade Sub-Contractor's commissioning activities, and serves as the CxA's single point of contact for all administrative, documentation and coordination functions.
- I. Deferred Testing: Testing performed at a later time, due to partial occupancy, equipment, load, seasonal requirements, design or other site conditions that disallow the test from being performed prior to substantial completion.

- J. Deficiency: A condition in the installation or function of a component, piece of equipment or system that is not in compliance with the Contract Documents. A Deficiency will be considered a Cx Issue and documented on the Cx Issues List.
- K. Design Professional (DP): Architects, engineers and other consultants involved in the design of the over project scope.
- L. Functional Performance Test (FPT): A test of the dynamic function, operation and control of the equipment and systems to verify system performance to the fullest extent. Systems are tested under various operating modes and control sequences including failure modes. The FPTs are performed using manual (direct observation) or monitoring methods. The FPTs can include sequence of operation tests, performance verification tests, trend analysis and integrated systems tests.
- M. Installation Verification (IV): Field verification and documentation of proper installation of system equipment, assemblies and components prior to Startup. IV process is complete when systems are ready for Startup. IV's are organized and documented under the System Readiness Checklist (SRC) forms.
- N. Job Order Contractor: The contractor directly contracted to the Owner with overall responsibility for the project and all commissioning activities described herein.
- O. Monitoring: The recording of parameters (flow, current, status, pressure, etc) of equipment operation, which shall be completed using data-loggers or the Trending capabilities of BAS or control systems.
- P. Owner's Project Requirements (OPR): A document describing the operational and functional requirements of a project, the expectations of how the facility will be used and operated, and the equipment and system expectations and requirements, as defined by the Owner. This document provides an explanation of the ideas, concepts, goals, success criteria, and supporting information for the project.
- Q. Percent Sampling: Witnessing the Startup or testing of a selected fraction of the total number of identical or near-identical pieces of equipment such as VAV boxes.
- R. Pre-Functional Checks & Tests (PFCs): These are various checks and tests performed on a piece of equipment or system just before, during, or after the initial Startup and operation. They are performed to confirm that the equipment and individual components were installed correctly and are working properly. Examples include checking fan rotation, sensor calibration, actuator testing, and spot temperature, pressure and electrical measurements. They also include system specific tests such as pipe system pressure tests, duct leakage tests, mechanical system test and balance and electrical equipment NETA testing. They are organized under the System Readiness Checklist (SRC) forms and must be completed prior to FPTs.
- S. Startup: Initial starting or activating of equipment usually performed by the Trade Sub- Contractor or the Manufacturer's authorized representative.
- T. Systems Manual: The CxA will complete a LEED Systems Manual for the systems and equipment commissioned, with assistance provided by the CxC and Trade Sub- Contractors. The Systems Manual will provide the operating staff the information needed to understand and optimally operate the commissioned systems and includes the final BOD, single line diagrams, as-built controls drawings and sequences of operation and O&M manuals.
- U. System Readiness Checklist (SRC): A summary checklist, typically one page per equipment, covering the necessary commissioning tasks and required documentation to verify that a system is ready for FPTs, or system operation if no FPTs are performed. The tasks covered in the SRC include IV, Startup and PFC, and the Trade Sub-Contractor completed forms for these tasks are attached to the equipment specific SRC. The SRC must be completed and signed by the Job Order Contractor prior to conducting the FPTs.
- V. TAB: Testing, Adjusting, and Balancing work on the air and water systems to ensure design flow conditions are met. Performed by the TAB Trade Sub-Contractor.
- W. Trade Sub-Contractor: Typically a subcontractor to the Job Order Contractor who provides and installs specific building components and systems and/or provides certain services.
- X. Trending: Monitoring using the Building Automation System (BAS) or a control system, to aid in functional testing and to verify system operation and performance under actual operating conditions.
- Y. Warranty Phase: The phase of the project immediately after the initiation of the building equipment warranty which spans the entire length of the equipment warranty.

1.05 SYSTEMS TO BE COMMISSIONED

- A. This specification section is applicable to the following systems and equipment to be commissioned in this project:
 - 1. All equipment and controls of the HVAC systems (does not include any process refrigeration equipment).
 - 2. Building Automation System / HVAC system controls
 - 3. Lighting controls
 - 4. Domestic hot water heating systems
 - 5. Emergency Power Systems, including:
 - a. Emergency Generators with a fuel oil system and storage tank
 - b. Paralleling Switchgear
 - c. Automatic Transfer Switches (ATS's)
 - d. Uninterruptable Power Supply (UPS) equipment

1.06 SUMMARY DESCRIPTION OF COMMISSIONING

- A. Commissioning is a quality assurance process for achieving, verifying and documenting that building systems are installed and perform functionally as intended according to the OPR, BOD, and the requirements of the Contract Documents.
- B. Commissioning during the construction phase is intended to achieve the following specific objectives:
 - 1. Commissioning review of the Trade Sub-Contractor submittals for systems to be commissioned, concurrent with the Design Professional's review.
 - 2. Finalize the commissioning specific details within the Cx Plan.
 - 3. Verify that applicable equipment and systems are installed according to the manufacturer's recommendations and to industry-accepted minimum standards and that they receive the required operational checkout and testing by the Trade Sub- Contractors.
 - 4. Verify and document proper performance of equipment and systems.
 - 5. Verify that operation and maintenance documentation is provided by the Trade Sub- Contractors and is complete.
 - 6. Develop a systems manual (for energy-related systems per LEED) that provides future operating staff the information necessary to optimally operate the commissioned systems.
 - 7. Verify that the Owner's facilities and operations personnel are trained according to Contract Document requirements.
- C. The commissioning process does not take away from or reduce the responsibility of the Job Order Contractor to provide a finished and fully functioning building. The Job Order Contractor has overall responsibility to assure that all systems are properly tested and commissioned, and that all required commissioning documents are completed and provided to the Owner.
- D. The Project will meet the Commissioning Requirements of LEED-NC v3.0, Energy & Atmosphere, Prerequisite 1 (Fundamental Commissioning) and Credit 3 (Enhanced Commissioning). The Job Order Contractor, Trade Sub-Contractors, and suppliers are responsible to ensure all requirements for commissioning are met in their respective work.

1.07 GENERAL COMMISSIONING PROCESS

- A. Unless otherwise noted in the trade specific commissioning specification sections, the general commissioning process is as follows. See the trade specific commissioning specification sections for additional details on the commissioning process.
- B. Submittal Reviews by the CxA (concurrent with the Design Professional reviews)
 - 1. The Job Order Contractor shall include the CxA on the distribution of the Trade Sub-Contractor issued submittals to the Design Professionals, for the systems to be commissioned. The CxA will provide review comments to the Design Professionals.
- C. Cx Plan and Form Development
 - 1. The CxA prepares a Cx Plan that provides guidance in the execution of the commissioning process during construction.

2. The CxA develops the SRC and FPT forms and provides them to the JOB ORDER CONTRACTOR and Trade Sub-Contractors for review and comment.

D. System Readiness Activities

1. The Trade Sub-Contractors shall perform IV, Startup and PFC activities. The Trade Sub-Contractors and the CxC shall document completion of these activities on the SRC forms and attach the completed IV, Startup, and PFC forms to the SRC.
2. The CxA will perform various observation inspections during the installation phase and back-checks of the completed IV. The CxA will also witness a percent sampling of the Startups and PFCs, including TAB procedures and back-checks after PFCs are completed.
 - a. The Trade Sub-Contractor shall resolve any PFC results deemed unacceptable by the CxA. The Trade Sub-Contractor shall execute a new sample of the PFCs, witnessed by the CxA per their discretion. The CxA shall deem the PFCs acceptable after resolution of all issues and any witnessed sampling results in no issues.

E. Functional Testing

1. Once the c Job Order Contractor Completes the SRC forms, the Trade Sub-Contractors execute all FPTs and the CxA witness a sample as defined in the Cx Plan. The FPTs may be achieved by any combination of manual testing, monitoring or trending.
 - a. Any witnessed sampling of the FPTs that do not pass shall require the Trade Sub-Contractor to resolve the issue for all equipment and a new sample of the FPTs shall be executed and witnessed by the CxA. The CxA shall deem the FPTs acceptable after resolution of all issues and any witnessed sampling of tests has passed.
2. The Cx Plan will define any deferred testing.

F. Deficiencies and Commissioning Issues

1. Throughout the process, the CxA records Cx Issues on the Cx Issues List and distributes the list to the team. The Job Order Contractor and Trade Sub-Contractors shall correct Cx Issues and retest the system(s) without delay at no additional cost to the Owner. The CxA will verify the completion of the issues and make all amendments to the issues list.

G. O&M Manuals, Training Verification and Final Documentation

1. The CxA will verify the Trade Sub-Contractors provides complete operation and maintenance (O&M) manual documentation to the Owner.
2. The Job Order Contractor shall submit to the CxA and Owner a training schedule and specific training agendas (for each training class), for review prior to conducting any training. The CxA will also verify completion of the training by receiving a copy of the training class sign-in sheets and any training materials / handouts, provided by the Job Order Contractor.
3. The CxA will develop the Systems Manual (per LEED requirements) with assistance from the Job Order Contractor and Trade Sub-Contractors. The systems to be included are the HVAC systems and controls, lighting controls, domestic hot water systems and controls, and any renewable energy systems (none in project).
4. The CxA will complete the Final Construction Phase Commissioning Report and documentation for the Owner with assistance from the Job Order Contractor and Trade Sub- Contractors.

H. Post-Occupancy Warranty Phase Commissioning

1. The CxA will report any identified performance issues, warranty items or problems to the CxC via a Warranty Phase Cx Issues List for correction by the Job Order Contractor and Trade Sub-Contractors during or prior to the end of the warranty period.
2. The CxA will review trend data during the Warranty Phase and will report any identified issues.
3. No later than 90 days prior to the expiration of the first 12 month warranty period of building occupancy, the CxA will return to the facility to interview facility O&M staff, walk the facility and review systems operation and trend data where applicable. Key representatives from the Job Order Contractor and Trade Sub-Contractors shall attend a site walk- through and meeting, as determined by the CxA.

1.08 GENERAL COMMISSIONING PROCESS

- A. The Commissioning Team is responsible for performing the process and achieving successful commissioning results. The Commissioning Team is comprised of the following:
 - 1. Owner's Representatives
 - 2. Design Professionals (DP).
 - 3. Commissioning Authority (CxA).
 - 4. Construction Manager at Risk (Job Order Contractor)
 - 5. Job Order Contractor's Commissioning Coordinator (CxC)
 - 6. Trade Sub-Contractors responsible for specific types of systems being commissioned:
 - a. Mechanical Contractor
 - b. Electrical Contractor
 - c. HVAC Controls Contractor
 - d. Testing and Balance (TAB) Contractor
 - e. Plumbing Contractor

1.09 RESPONSIBILITIES

- A. General:
 - 1. The Commissioning Team and all others involved in the commissioning process shall follow the Cx Plan, attend the commissioning kickoff meeting, and attend additional commissioning meetings as necessary.
- B. Commissioning Authority (CxA)
 - 1. The primary role of the CxA is to oversee, organize and lead the commissioning team and assist the Job Order Contractor and Trade Sub-Contractors in executing the commissioning process.
 - a. Prepare the Cx Plan and develop the SRC and FPT forms.
 - b. Work with the Job Order Contractor to schedule commissioning activities.
 - c. Lead commissioning team meetings, prepare meeting agendas and distribute meeting minutes.
 - d. Observe on a sampling basis the system and equipment installation, start-up, checkout, and testing for compliance with the OPR, BOD, and Contract Documents; and review completion of commissioning documentation.
 - e. Sample witness the execution of the FPTs by the Trade Sub-Contractors. The CxA will witness one (1) re-test of any commissioned equipment or system.
 - f. Be the authority on commissioning test results and other commissioning program elements completion. Prepare, maintain and distribute the Cx Issues List.
 - g. Review and comment on training agendas and verify that training is completed and O&M manuals are delivered.
 - h. Lead the effort in developing the Systems Manual for energy-related systems in accordance with LEED requirements.
 - i. Assemble the commissioning documents and prepare the Commissioning Report.
 - 2. The CxA is not responsible for:
 - a. Design concept or design criteria
 - b. Review for code compliance
 - c. Inspector of record services
 - d. Design and construction scheduling
 - e. Cost estimating
 - f. Construction management
 - g. Providing tools and test equipment used for commissioning.
 - h. Scheduling startup and testing
 - i. Coordinating the work of Trade Contractors and any special testing agents
 - j. Performing startup and testing
- C. Construction Manager at Risk:
 - 1. The Job Order Contractor is responsible for performing all commissioning tasks, including tasks assigned to Trade Sub-Contractors and ensures that all Trade Sub-Contractors execute their commissioning responsibilities according to the Contract Documents, Cx Plan, and schedule.
 - a. Include the cost for commissioning in the project cost.

- b. Assign a CxC for the duration of the project with responsibilities outlined herein.
 - 1) The CxC shall have at least five years' experience within the disciplines of construction.
 - 2) The Job Order Contractor shall submit the name of the person(s) assigned as the CxC to the CxA within a month of contract award.
 - c. Schedule and coordinate the commissioning meetings with the CxA.
 - d. Plan, schedule, coordinate and facilitate the commissioning work performed by the Trade Sub-Contractors. Provide sufficient lead time of at least 10 days to notify the CxA in advance of commissioning activities. Update the master construction schedule periodically with commissioning progress and activities.
 - e. Review, comment and accept the Cx Plan prepared by the CxA.
 - f. Furnish continual updates of any construction related documents such as change orders, submittals, shop drawings, ASIs and RFIs to the CxA. Electronic files are acceptable.
 - 1) The CxC shall ensure the issuance of the requested submittals for review by the CxA when also issued to the Design Team.
 - g. Obtain and review the Trade Sub-Contractor IV, Startup and PFC forms prior to use.
 - h. Using IV, Startup, PFC, SRC and FPT forms, document and certify the completion of all work and all systems are installed, operational, and functionally tested.
 - i. Organize all Trade Sub-Contractor-completed Cx forms to be submitted to the CxA for review.
 - j. Evaluate deficiencies identified on the Cx Issues List. The CxA will track the issues according to the responsible entity. Collaborate with Trade Sub-Contractors and recommend corrective action. Assure resolution of all Cx Issues.
 - k. Prepare a training schedule along with the Trade Sub-Contractor training agendas and submit to CxA and Owner for review. Execute training of Owner's personnel per approved training schedule and agendas.
 - 1. Prepare O&M Manuals in accordance with the Contract Documents.
 - m. Assist the CxA in developing the Systems Manual.
- D. Trade Sub-Contractors:
- 1. See the trade specific commissioning specification sections for the Trade Sub-Contractor responsibilities.

PART 2 –PRODUCTS

2.01 TEST EQUIPMENT

- A. The responsible Trade Sub-Contractor shall furnish all standard testing equipment required to perform Startup, PFCs and FPTs.
- B. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerance specified in the Contract Documents. If not otherwise specified, the following minimum requirements apply:
 - 1. All equipment shall be calibrated according to the manufacturer's recommended intervals (or within one year if not otherwise specified) and recalibrated when dropped or damaged.
 - 2. Calibration tags shall be affixed to or certificates readily available for all test equipment.

PART 3 – EXECUTION

3.01 SCHEDULING AND COORDINATION

- A. The CxA will provide an initial list of commissioning milestones and deliverables to the CxC for scheduling purposes.
- B. The JOB ORDER CONTRACTOR shall integrate all commissioning activities, milestones and deliverables into the master construction schedule with assistance and input from the CxA.
- C. The CxC shall provide sufficient notice to the CxA and Owner for scheduling and coordinating commissioning activities. A minimum 10 days' notice shall be provided to the CxA for witnessing equipment Startups, PFCs, and FPTs.
- D. The Commissioning Team shall address scheduling problems and make necessary modifications in a timely manner in order to expedite the commissioning process.

3.02 MEETINGS

- A. When commissioning team member attendance is required, as determined by the CxA and CxC, be punctual and attentive during the meeting.
 - 1. The CxA will conduct a commissioning kick-off meeting, usually within 60 days of the commencement of construction. All team members involved in the commissioning process shall attend the kick-off meeting.
 - 2. The CxA will plan other commissioning meetings as deemed necessary as construction progresses. These meetings will cover planning and coordination, and Cx Issues resolution.
 - 3. The frequency of meetings will vary through construction, but generally increase during Startup and commissioning activities.
- B. The CxA will write and distribute meeting minutes documenting the meeting discussion, conclusions, and actions for each team member.

3.03 COMMISSIONING ISSUES, BACK-CHECKS AND RE-TESTING

- A. All Deficiencies and Cx Issues shall be corrected promptly. The responsible party shall correct the issue and inform the CxC and CxA of the resolution and completion date. The CxA will record completion on the Cx Issues List after a successful back-check or verification.
 - 1. For all Cx Issues identified during the pre-functional system readiness activities, the CxA will back-check and verify the completion of the issues where appropriate.
 - 2. For all Cx Issues identified during FPT, the Trade Sub-Contractor shall retest to verify the resolution of the issue and to complete the FPT.
 - 3. Where sampling is used for witnessing PFCs and FPTs, the results shall be deemed acceptable once all noted issues are resolved and any new sample set of tests or checks have passed. The CxA will witness one (1) re-test for each equipment and will perform one (1) back-check verification of any completed system readiness issue. The Owner may back-charge the Job Order Contractor for any additional fees from the CxA, resulting from any re-testing or repeated system readiness issues list back-checks beyond the first re-test or back-check.

3.04 COMMISSIONING ACCEPTANCE, CLOSEOUT AND REPORTING

- A. Completion of the System Readiness Checks (which include installation verification, startups and pre-functional checks) shall be accomplished as a prerequisite for substantial completion. Completion of all functional performance testing, training, delivery of O&M manuals, and correcting all Cx Issues including any re-testing shall be completed prior to final acceptance of commissioning by the Owner.
- B. After completion of the commissioning activities and following review of the completed commissioning documents that includes the draft Cx Report executive summary, all test results and the latest Cx Issues List with all remaining Cx Issues and deficiencies, the Owner will provide a formal written acceptance of the project construction phase commissioning. At that point, the CxA will transfer any remaining construction phase Cx Issues or seasonal/deferred testing to the warranty phase and will be tracked by the CxA as part of the LEED Post-Occupancy Warranty Phase Commissioning.
- C. Upon completion of all commissioning activities, the CxA will prepare and submit to the Owner a Final Cx Report detailing all completed commissioning activities and documentation. The CxC shall support this effort by providing all Job Order Contractor and Trade Sub- Contractor commissioning documentation.
- D. The Final Cx Report will include the Owner's written acceptance of construction phase commissioning.

END OF SECTION