

**SECTION 01 45 00**

**QUALITY CONTROL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Quality Assurance - Control of Installation.
- B. Uncovering of Work.
- C. Correction of Work.
- D. Nonconforming Work.
- E. Owner's Right to Stop the Work.
- F. Owner's Right to Carry Out the Work.
- G. Tolerances.
- H. Inspection and Testing Laboratory Services.
- I. Manufacturers' Field Services and Reports.
- J. Safety Precautions and Programs.
- K. [City of Las Vegas Special Inspector or Third Party Special Inspector.]
- L. [Clark County Special Inspector or Third Party Inspector.]

**1.02 REFERENCES**

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Unless otherwise specified, reference to such standards or codes is solely for implementation of the technical portions of such standards and codes.
- C. Wherever references are made in the Contract Documents to standards or codes in accordance with which work is to be performed or tested, the edition or revision of the standards or codes current on the date for receiving bids shall apply, unless otherwise expressly set forth.
- D. The contractual relationship, duties, and responsibilities of the parties in Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

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#### 1.03 QUALITY ASSURANCE - CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce Work of specified quality.
- B. Comply with manufacturers' instructions including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Owner before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

#### PART 2 PRODUCTS

Not Used.

#### PART 3 EXECUTION

##### 3.01 UNCOVERING OF WORK

- A. If a portion of the Work is covered contrary to Owner's request or to requirements specifically expressed in the Contract Documents, this Work shall, if required in writing by Owner, be uncovered for Owner's observation and be replaced at Contractor's expense without change in the Contract Time or additional cost to the Owner.
- B. If a portion of the Work has been covered which Owner has not specifically requested to observe prior to its being covered, Owner may request to see such Work and it shall be uncovered by Contractor.
  - 1. If such Work is in accordance with Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be charged to Owner.
  - 2. If such Work is not in accordance with Contract Documents, Contractor shall pay such costs unless the condition was caused by Owner or a separate contractor in which event Owner shall be responsible for payment of such costs.

##### 3.02 CORRECTION OF WORK

- A. Promptly correct Work rejected by Owner or failing to conform to Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed, or completed. Contractor shall bear cost of correcting such rejected Work, including additional testing and inspections and compensation for additional services and expenses made necessary thereby.

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- B. If within one year after the commencement of warranties or by terms of an applicable special warranty required by Contract Documents, any of the Work is found to be not in accordance with Contract Documents, Contractor shall correct it promptly after receipt of written notice from Owner to do so unless Owner has previously given Contractor a written acceptance of such condition.
  - 1. This period of one year shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work.
  - 2. This obligation shall survive acceptance of the Work under the Contract and the actual performance of the Work.
  - 3. Owner shall give notice promptly after discovery of the condition.
  - 4. This period of one year shall not limit the Owner's rights with respect to latent defects, gross mistakes, or fraud.
- C. Remove from the site, portions of the Work which are not in accordance with Contract Documents and are neither corrected by Contractor nor accepted by Owner.
- D. If Contractor fails to correct nonconforming Work within a reasonable time, Owner may correct it.
  - 1. If Contractor does not proceed with correction of such nonconforming Work within a reasonable time fixed by written notice from Owner, Owner may remove it and store the salvageable materials or equipment at Contractor's expense.
  - 2. If Contractor does not pay costs of such removal and storage within 10 days after written notice, Owner may upon 10 additional days' written notice sell such materials and equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by Contractor, including compensation for Owner's services and expenses made necessary thereby.
  - 3. If such proceeds of sale do not cover costs that Contractor should have borne, the Contract Sum shall be reduced by the deficiency.
  - 4. If payments then or thereafter due Contractor are not sufficient to cover such amount, Contractor shall pay the difference to Owner.
- E. Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of Owner or separate contractors caused by Contractor's correction or removal of Work which is not in accordance with Contract Documents.

#### 3.03 NONCONFORMING WORK

- A. If Owner prefers to accept Work that is not in accordance with Contract Documents, Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.
- B. Owner will have authority to reject Work that does not conform to Contract Documents.
  - 1. Whenever Owner considers it necessary or advisable for implementation of the intent of Contract Documents, Owner will have authority to require additional

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inspection or testing of the Work, whether or not such Work is fabricated, installed, or completed.

2. However, neither this authority of Owner nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of Owner to Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons performing portions of the Work.

#### 3.04 OWNER'S RIGHT TO STOP THE WORK

- A. If Contractor fails to correct Work which is not in accordance with Contract Documents or persistently fails to carry out Work in accordance with Contract Documents, Owner, by written order signed personally or by an agent specifically so empowered by Owner in writing, may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated.
- B. Right of Owner to stop the Work shall not give rise to a duty on the part of Owner to exercise this right for the benefit of Contractor or any other person or entity.

#### 3.05 OWNER'S RIGHT TO CARRY OUT THE WORK

- A. If Contractor defaults or neglects to carry out the Work in accordance with Contract Documents and fails within a 7-day period after receipt of written notice from Owner to commence and continue correction of such default or neglect with diligence and promptness, Owner may after such 7-day period give Contractor a second written notice to correct such deficiencies within a second seven-day period.
- B. If Contractor within such second 7-day period after the receipt of such second notice fails to commence and continue to correct any deficiencies, Owner may, without prejudice to other remedies Owner may have, correct such deficiencies.
  1. In such case an appropriate Change Order shall be issued deducting from payments, then or thereafter, services and expense made necessary by such default, neglect or failure.
  2. If payments then or thereafter due Contractor are not sufficient to cover such amounts, Contractor shall pay the difference to Owner.

#### 3.06 TOLERANCES

- A. Monitor tolerance control of installed products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Owner before proceeding.
- C. Adjust products to appropriate dimensions; position before securing Products in place.

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#### 3.07 INSPECTION AND TESTING LABORATORY SERVICES

- A. Contractor will appoint, employ, and pay for specified services of an independent firm to perform inspecting and testing.
- B. The independent firm will perform inspections, tests, and other services specified in individual specification sections and as required by Owner.
- C. Inspecting, testing, and source quality control may occur on or off the project site. Perform off-site inspecting or testing as required by Owner.
- D. Reports will be submitted by the independent firm to and Contractor indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- E. Cooperate with independent firm. Furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
  - 1. Notify Owner and independent firm 48 hours prior to expected time of operations requiring services.
  - 2. Make arrangements with independent firms and pay for additional samples and tests required for Contractor's use.
- F. Testing or inspecting does not relieve Contractor of responsibility to perform Work to Contract requirements.
- G. Retesting required because of non-conformance to specified requirements shall be paid by Contractor.

#### 3.08 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. When specified in individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, and start-up of equipment as applicable and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- C. Notify Owner 7 days prior to the arrival of all manufacturers' field service representatives and provide name of individual and firm they represent.

#### 3.09 SAFETY PRECAUTIONS AND PROGRAMS

- A. Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.
- B. Take reasonable precautions for safety of, and provide reasonable protection to prevent damage, injury, or loss to:

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1. Employees on the Work and other persons who may be affected thereby.
  2. The Work and materials and equipment to be incorporated therein, whether in storage on- or off-site, under care, custody, or control of Contractor or Contractor's Subcontractors or Sub-subcontractors.
  3. Other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.
- C. Give notices and comply with applicable laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury, or loss.
- D. Erect and maintain, as required by existing conditions and performance of Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying Owners and users of adjacent sites and utilities.
- E. When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, exercise utmost care and carry on such activities under supervision of properly qualified personnel.
- F. Promptly remedy damage and loss (other than damage or loss insured under property insurance required by Contract Documents) to property caused in whole or in part by Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which Contractor is responsible, except damage or loss attributable to acts or omissions of Owner or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of Contractor.
- G. Designate a responsible member of Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be Contractor's superintendent unless otherwise designated by Contractor in writing to Owner.
- H. Do not load or permit any part of the construction or site to be loaded so as to endanger its safety.
- I. Emergencies: In an emergency affecting safety of persons or property, Contractor shall act, at Contractor's discretion, to prevent threatened damage, injury or loss.
- 3.10 CITY OF LAS VEGAS SPECIAL INSPECTOR OR THIRD PARTY SPECIAL INSPECTOR
- A. City of Las Vegas requires special inspections of portions of the Work as specified in Chapter 17 of the 2006 edition of the *International Building Code*, including but not limited to:
1. Foundation work.
  2. Structural concrete and steel work.
  3. Masonry work.

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4. Fireproofing application.
  5. Soils and grading.
- B. Special inspection by City of Las Vegas will consist of a Special Inspector assigned by City of Las Vegas. This inspector shall be on-site when any work under the special inspection provisions of the City is undertaken.
  - C. This inspector shall be employed by the Owner from an approved City of Las Vegas Building Department List. Contractor shall establish the construction sequence, schedule, and duration of the work requiring special inspections by the City.
  - D. Provide temporary facilities for the City Inspector as specified in Section 01 51 00, during those times when the inspector is on-site on a full-time or permanent basis.
  - E. Owner will include in agreement with the City, a requirement that copies of all inspection reports provided by the Special Inspector be provided to Owner, Contractor, and Owner.
  - F. At project completion and prior to final payment to Contractor, the Third Party Inspector or materials testing laboratory shall provide a QAA (Quality Assurance Associate) report that has been reviewed and approved by the City of Las Vegas Building Department. This approved report shall be given to Owner.

#### 3.11 CLARK COUNTY SPECIAL INSPECTOR OR THIRD PARTY INSPECTOR

- A. Clark County requires special inspections of portions of the Work as specified in Chapter 17 of the 2006 edition of the *International Building Code*, including but not limited to:
  1. Foundation work.
  2. Structural concrete and steel work.
  3. Masonry work.
  4. Fireproofing application.
  5. Soils and grading.
- B. Special inspection will consist of a Special Inspector approved by Clark County. This inspector shall be on-site when any work under the special inspection provisions of the County is undertaken.
- C. This inspector shall be employed by the Owner from an approved County Building Department List. Contractor shall establish the construction sequence, schedule, and duration of the work requiring special inspections by the County.
- D. Provide temporary facilities for the County Inspector as specified in Section 01 51 00, during those times when the inspector is on-site on a full-time or permanent basis.
- E. Owner will include in agreement with the County, a requirement that copies of all inspection reports provided by the Special Inspector be provided Contractor and Owner.

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- F. At project completion and prior to final payment to Contractor, the Third Party Inspector or materials testing laboratory shall provide a QAA (Quality Assurance Associate) report that has been reviewed and approved by the Clark County Building Department. This approved report shall be given to Owner.

END OF SECTION

## SECTION 01 45 29

### TESTING LABORATORY SERVICES

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Owner will employ and pay for service of an independent testing laboratory to perform specified inspecting, testing and third party special inspections. Retesting of failed tests shall be at Contractor's expense.
- B. Employment of testing laboratory in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- C. Section Includes:
  - 1. Owner Responsibilities
  - 2. Laboratory Responsibilities.
  - 3. Laboratory Reports.
  - 4. Limits on Testing Laboratory Authority.
  - 5. Contractor Responsibilities.
  - 6. Schedule of Inspections and Tests.

##### 1.02 REFERENCES

- A. ASTM C802 - Practice for Conducting Inter-laboratory Test Program to Determine the Precision of Test Methods for Construction Materials.
- B. ASTM C1021 - Practice for Laboratories Engaged in the Testing of Building Sealants.
- C. ASTM C1077 - Practice for Laboratories Testing Concrete and Concrete Aggregate for Use in Construction and Criteria for Laboratory Evaluation.
- D. ASTM C1093 - Practice for Accreditation of Testing Agencies for Unit Masonry.
- E. ASTM D290 - Practice for Bituminous Mixing Plant Inspection.
- F. ASTM D3740 - Practice for Evaluation of Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- G. ASTM D4561 - Practice for Quality Control Systems for an Inspection and Testing Agency for Bituminous Paving Materials.
- H. ASTM E329 - Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
- I. ASTM E543 - Practice for Agencies Performing Nondestructive Testing.
- J. ASTM E548 - Guide for General Criteria Used for Evaluating Laboratory Competence.

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### TESTING LABORATORY SERVICES

#### 1.03 QUALITY ASSURANCE

- A. Comply with ASTM C802, ASTM C1021, ASTM C1077, ASTM C1093, ASTM D290, ASTM D3740, ASTM D4561, ASTM E329, ASTM E543, and ASTM E548.
- B. Laboratory: Authorized to operate in State in which Project is located.
- C. Testing Equipment: Calibrated at reasonable intervals with devices of accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

#### 1.04 LABORATORY RESPONSIBILITIES

- A. Test samples of mixes submitted by Contractor.
- B. Provide qualified personnel at site. Cooperate with Owner and Contractor in performance of services.
- C. Perform specified inspecting, sampling, and testing of Products in accordance with specified standards.
- D. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- E. Promptly notify Owner and Contractor of observed irregularities or non-conforming Work or Products.
- F. Perform additional inspections and tests as required by Owner.
- G. Attend preconstruction meetings and progress meetings as required.

#### 1.05 LABORATORY REPORTS

- A. After each inspection and test, promptly submit a copy of laboratory report to Owner and Engineer.
- B. Include:
  - 1. Date issued.
  - 2. Project title and number.
  - 3. Name of inspector.
  - 4. Date and time of sampling or inspection.
  - 5. Identification of product and specifications section.
  - 6. Location in the project.
  - 7. Type of inspection or test.
  - 8. Date of test.
  - 9. Results of test.
  - 10. Conformance with Contract Documents.
- C. When requested by Owner, provide interpretation of test results.

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### TESTING LABORATORY SERVICES

#### 1.06 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the Work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the Work.

#### 1.07 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
- B. Cooperate with laboratory personnel and provide access to the Work and to manufacturers' facilities.
- C. Provide incidental labor and facilities:
  - 1. To provide access to Work to be tested.
  - 2. To obtain and handle samples at the site or at source of Products to be tested.
  - 3. To facilitate tests and inspection.
  - 4. To provide storage and curing of test samples.
- D. Notify Owner and laboratory 24 hours prior to expected time for operations requiring inspecting and testing services.

#### PART 2 PRODUCTS

Not Used.

#### PART 3 EXECUTION

##### 3.01 SCHEDULE OF INSPECTIONS AND TESTS

- A. Comply with inspection and testing requirements specified in the individual specification sections.

END OF SECTION

## SECTION 01 51 00

### TEMPORARY UTILITIES

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Arrange for, develop, and maintain all utilities in work areas to meet the requirements of the Contract Documents, at no additional cost to the Owner unless otherwise specified in the Contract Documents.
- B. Section Includes:
  - 1. Temporary Electricity.
  - 2. Temporary Lighting for Construction Purposes.
  - 3. Temporary Heat/Air Conditioning.
  - 4. Temporary Ventilation.
  - 5. Temporary Telephone Service.
  - 6. Temporary Water Service.
  - 7. Temporary Sanitary Facilities.
  - 8. Removal of Utilities, Facilities, and Controls.
  - 9. Protection of Property (Fire Prevention).

##### 1.02 TEMPORARY ELECTRICITY

- A. Cost: By Contractor. Provide and pay for power service required from utility service.
- B. Provide temporary electric feeder from electrical service. Do not disrupt Owner's need for continuous service.
- C. Complement existing power service capacity and characteristics as required.
- D. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.
- E. Provide meter, main service disconnect, and overcurrent protection at convenient location.
- F. Permanent convenience receptacles may not be used during construction.
- G. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.
  - 1. Provide 20 ampere duplex outlets, single phase circuits for power tools.
  - 2. Provide 20 ampere, single phase branch circuits for lighting.

##### 1.03 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Provide and maintain lighting for construction operations to achieve a minimum lighting level of 25 foot-candles.
- B. Provide and maintain lighting level of 0.25 foot-candles for exterior staging and storage areas after dark for security.

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### TEMPORARY UTILITIES

- C. Provide and maintain lighting of 1.0 foot-candles for interior work areas after dark for security purposes.
- D. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- E. Maintain lighting and provide routine repairs.

#### 1.04 TEMPORARY HEAT/AIR CONDITIONING

- A. Provide and pay for heat and air conditioning as needed to maintain specified conditions for construction operations.
- B. Prior to operation of permanent equipment for temporary cooling and heating purposes, verify that installation is approved for operation, equipment is lubricated, and filters are in place. Provide and pay for operations, maintenance, and regular replacement of filters and worn or consumed parts.
- C. Maintain minimum ambient temperature of 60 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

#### 1.05 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- B. Use existing ventilation equipment. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

#### 1.06 TEMPORARY TELEPHONE SERVICE

- A. Provide, maintain, and pay for telephone service to Contractor's field office at time of project mobilization.
- B. Provide, maintain, and pay for facsimile service with a dedicated telephone line to the field office at time of project mobilization.

#### 1.07 TEMPORARY WATER SERVICE

- A. Provide, maintain, and pay for suitable quality service required for construction operations.
- B. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

#### 1.08 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures.

## SECTION 01 51 00

### TEMPORARY UTILITIES

- B. Existing facility use is not permitted.

#### 1.09 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, and materials prior to the inspection for Final Completion.
- B. Remove underground installations to a minimum depth of 5 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

#### 1.10 PROTECTION OF PROPERTY (FIRE PREVENTION)

- A. Comply with all federal, state, and local laws and regulations pertaining to burning, fire prevention, and control within or adjacent to the project. Take necessary precautions to avoid and eliminate fire hazards.
- B. Tarpaulins used for any purpose during construction shall be made of material resistant to fire, water, and weather and shall bear UL labels. Lighting of fires on premises is strictly forbidden.
- C. Provide portable fire extinguishers compatible with the hazard of each work area and shall instruct personnel in their location and use.
- D. Wherever welding and burning are conducted, protect flammable materials and provide a fire watch during burning and welding operation to ensure that protective measures are taken and no fires result from such operation. Fire watch shall have fire extinguisher equipment readily available and the know-how for proper use.

#### PART 2 PRODUCTS

Not Used.

#### PART 3 EXECUTION

Not Used.

END OF SECTION

## SECTION 01 52 13

### FIELD OFFICES AND SHEDS

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Use of existing facilities.
- B. Contractor's field office and facilities.
- C. Storage areas and sheds.
- D. Construction of temporary facilities.
- E. Installation, maintenance, and removal.

##### 1.02 USE OF EXISTING FACILITIES

- A. Unless Owner provides written authorization, existing facilities shall not be used for field offices or for storage.

#### PART 2 PRODUCTS

##### 2.01 CONTRACTOR'S FIELD OFFICE AND FACILITIES [PROVIDE FOR PROJECTS COSTING OVER \$1,000,000]

- A. Provide office space and facilities to meet Contractor's and Owner's needs and to provide space for project meetings.
  - 1. Contractor's office space shall have racks and files for Contract Documents, submittals, and project record documents.
  - 2. Provide a separate office with windows to be used by Owner. [NOT NECESSARY ON ALL PROJECTS, VERIFY WITH OWNER.]
- B. Telephone: As specified in Section 01 51 00.
- C. Furnishings in Meeting Area: Conference table and chairs to seat at least 6 people.
- D. Other Furnishings:
  - 1. Contractor's option for Contractor's area.
  - 2. Provide 2 desks (each 2-foot by 4-foot minimum), 2 file cabinets, and 2 stools in Owner's area. [NOT NECESSARY ON ALL PROJECTS, VERIFY WITH OWNER.]
- E. Equipment: 6 adjustable band protective helmets for visitors, one 10-inch outdoor weather thermometer, rain gauge, and wind gauge.
- F. Heating, Cooling, and Ventilation: Automatic equipment to maintain 70 degrees F heating and 76 degrees F cooling.

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### FIELD OFFICES AND SHEDS

#### 2.02 STORAGE AREAS AND SHEDS

- A. Size based on storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and for inspection of products.
- B. Heating and ventilation as needed to maintain Products in accordance with Contract Documents and manufacturers' recommendations.
- C. Provide adequate lighting for maintenance and for inspection of Products.

#### 2.03 CONSTRUCTION OF TEMPORARY FACILITIES

- A. Portable or mobile buildings or buildings constructed with floors raised above ground shall be securely fixed to foundations, with steps and landings at entrance doors.
- B. Construction of Temporary Facilities:
  - 1. Structurally sound, secure, weather tight enclosures for office and storage spaces.
  - 2. Maintain during progress of Work.
  - 3. Remove at completion of Work.
- C. Exterior Materials: Weather resistant, finished in one color as acceptable to Owner.
- D. Lighting for Office: 50 foot-candles at desk top height, exterior lighting at entrance doors.
- E. Fire Extinguisher: Appropriate type fire extinguisher at each office and each storage area.

### PART 3 EXECUTION

#### 3.01 INSTALLATION, MAINTENANCE, AND REMOVAL

- A. Fill and grade sites for temporary structures to provide drainage away from buildings.
- B. Install office spaces ready for occupancy 15 days after date fixed in Notice to Proceed.
- C. Maintain approach walks free of mud and water.
- D. At completion of Work, remove buildings, foundations, utility services, and debris. Restore areas.
- E. Provide periodic cleaning and maintenance for office and storage areas.

END OF SECTION

## SECTION 01 55 00

### VEHICULAR ACCESS AND PARKING

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Access Roads.
- B. Parking Areas.

#### PART 2 – PRODUCTS

Not Used

#### PART 3 – EXECUTION

##### 1.01 ACCESS ROADS

- A. None

#### PART 4 - PARKING AREAS

- A. Owner will provide 3 parking spaces for Contractor.
- B. Maintain vehicular access to and through parking areas, access by emergency vehicles, and Owner's operations.
- C. All other parking by Contractor will be off-site near Shadow and Desert Ln. UMC Shuttle service is available to bring Contractor's personnel to the UMC Campus from off-site parking.

END OF SECTION

## SECTION 01 55 26

### TRAFFIC CONTROL

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Provide work zone traffic control devices conforming to the requirements of the latest revision of the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD) as well as the *Nevada Work Zone Traffic Control Handbook*, unless otherwise indicated on the Drawings or by the Specifications.
- B. Section Includes:
  - 1. Signs, signals, and devices.
  - 2. Traffic signs and signals.
  - 3. Removal.

##### 1.02 REFERENCES

- A. *Manual on Uniform Traffic Control Devices*, 1988, published by the U.S. Department of Transportation, Federal Highway Administration, and revisions thereto.
- B. *Nevada Work Zone Traffic Control Handbook*, published by the Nevada Department of Transportation, current latest edition.
- C. *Uniform Standard Specifications for Public Works' Construction, Off-Site Improvements, Clark County Area, Nevada*, most recent edition.

#### PART 2 PRODUCTS

##### 2.01 SIGNS, SIGNALS, AND DEVICES

- A. Provide post mounted and wall mounted traffic control and information signs as specified in the Uniform Standard Specifications and in Section 01 58 13.
- B. Traffic barricades, cones and drums, flares, and lights: As approved by local jurisdictions.
- C. Flagger Equipment: As required by local jurisdictions.

#### PART 3 EXECUTION

##### 3.01 TRAFFIC SIGNS AND SIGNALS

- A. Install at approaches to site. On-site, install at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
- B. Relocate as Work progresses to maintain effective traffic control.
- C. Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.

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### TRAFFIC CONTROL

- D. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.
- E. Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.
- F. Confine construction traffic to designated haul routes.
- G. Provide traffic control at critical areas of haul routes to regulate traffic and to minimize interference with public traffic.

#### 3.02 REMOVAL

- A. Remove equipment and devices when no longer required.
- B. Repair damage caused by installation.
- C. Remove post settings to a depth of 2 feet and restore area.

END OF SECTION

## SECTION 01 57 00

### TEMPORARY CONTROLS

#### PART 1 – GENERAL

##### 1.01 SUMMARY

- A. Provide and maintain methods, equipment, and temporary construction, as necessary to provide control over environmental conditions at construction site and related areas under Contractor's control.
- B. Remove physical evidence of temporary facilities upon completion of Work.
- C. Section Includes:
  - 1. Water Control.
  - 2. Dust Control.
  - 3. Noise Control.
  - 4. Pest Control.
  - 5. Pollution Control.
  - 6. Exterior and Interior Enclosures.
  - 7. Indoor Air Quality Control.

##### 1.02 REFERENCES

- A. Air Pollution Regulations: Clark County Department of Air Quality Management *Air Pollution Control Regulations and Section 94 Handbook*, Southern Nevada Health District, most recent edition.

#### PART 2 – PRODUCTS (Not Used).

#### PART 3 – EXECUTION

##### 3.01 WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment. Protect site from puddling or running water.
- B. Plan and execute construction by methods to control surface drainage from cuts, fills, borrow, and waste disposal areas. Minimize amount of bare soil exposed at one time.
- C. Take measures necessary to control surface water and prevent damage to Project, site, and adjoining properties.
- D. Prevent erosion and sedimentation. Provide water barriers as required to protect site from soil erosion. Provide temporary measures such as berms, dikes, and drains to prevent water flow.
- E. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

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### TEMPORARY CONTROLS

- F. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

#### 3.02 DUST CONTROL

- A. Perform construction operations so as not to discharge into the atmosphere from any source whatever smoke, dust, or other air contaminants in violation of the laws, rules, and regulations of all federal, state, and local air and water pollution requirements including but not limited to:
  - 1. Nevada Revised Statute 445: Air quality Regulation.
  - 2. Registering with the Clark County Department of Air Quality Management, any equipment requiring operating permits by said Department.
  - 3. Adhering to all Clark County Department of Air Quality Management Regulations.
- B. Provide positive methods and application of dust control materials as necessary to minimize dust from construction operations.
- C. For projects located in Clark County, Nevada, provide positive means to prevent airborne dust from dispersing into atmosphere.
  - 1. Contact the Clark County Department of Air Quality Management regarding special considerations concerning air quality requirements in Clark County, including the dust control regulations and permit procedures effective as of January 1, 2001.
  - 2. Comply with rules, regulations, special stipulations, and laws pertaining to air quality.
- D. Adhere to the latest edition of the *District Board of Health of Clark County Air Pollution Control Regulations and the Section 94 Handbook* as published by the Southern Nevada Health District, most recent edition.
  - 1. If a Dust Control Permit is required, obtain an approved Dust Control Permit and, if applicable, an approved Dust Mitigation Plan prior to commencing construction.
  - 2. The cost of the Dust Control Permit and, if applicable, a Dust Mitigation Plan shall be considered as included in the price paid for other items of Work and no separate payment will be made for dust control measures.
  - 3. No time extension shall be granted for time lost due to the suspension of the Work for any violation of the Air Pollution Control Regulations.
- E. Specific Control Measures and Best Management Practices are outlined in the Section 94 Handbook, most recent edition.
  - 1. Determine the applicability of any and all Control Measures to ensure compliance with the latest edition of the Air Pollution Control Regulations and the Section 94 Handbook.
  - 2. Conduct the work to control fugitive dust and employ the necessary control measures to maintain disturbed soil 24 hours per day, 7 days per week for the duration of the project, as required by the Air Pollution Control Regulations.

## SECTION 01 57 00

### TEMPORARY CONTROLS

- F. Comply with all mitigation requirements for dust control and indemnify the Owner against any and all liability arising out of this responsibility and for any and all Clark County Department of Air Quality Management-imposed fines that may be assessed for violating the Dust Control Permit or Air Pollution Control Regulations.
- G. Obtain Owner's approval of a designated area for storage of materials and equipment during the term of the Contract. Provide effective dust control measures in the designated area during the Contract, including application of Best Available Control Measures (BACM) as necessary to minimize fugitive dust from the site. Measures to be used include one or a combination of the following methods:
  - 1. Maintain sufficiently damp soil conditions to prevent visible fugitive dust emissions.
  - 2. Develop and maintain soil surface crust by water application or other appropriate methods.
  - 3. Cover soil with clean gravel to treat with a dust suppressant.
- H. Continue to provide control measures described above beyond the Contract completion time.
  - 1. Conduct daily inspections for at least 6 months after project completion, maintaining records for that time period.
  - 2. Inspections shall be for crusted or damp soil conditions, dust suppressant application, water application, cleanup measures, and so forth.

#### 3.03 NOISE CONTROL

- A. Provide methods, means, and facilities to minimize noise produced by construction operations including but not limited to radios.

#### 3.04 PEST CONTROL

- A. Provide methods, means, and facilities to prevent pests, insects, and rodents from accessing or invading the site and/or damaging the Work.

#### 3.05 POLLUTION CONTROL

- A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

#### 3.06 EXTERIOR AND INTERIOR ENCLOSURES

- A. Provide temporary weather tight closure of exterior openings, including temporary roofing to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized person. Provide access doors with self-closing hardware and locks.

## SECTION 01 57 00

### TEMPORARY CONTROLS

- B. Provide temporary partitions and/or ceilings as indicated and/or required below under Indoor Air Quality Control to:
  - 1. Separate work areas from Owner-occupied areas.
  - 2. Prevent penetration of dust and moisture into Owner-occupied areas.
  - 3. Prevent damage to existing materials and equipment.

#### 3.07 INDOOR AIR QUALITY CONTROL

- A. Installation of Temporary Vapor and Particulate Barriers:
  - 1. Construct a 6-mil (minimum) plastic barrier secured to floor and ceiling in a manner that essentially creates an airtight barrier between construction zone and occupied zone.
  - 2. Continue barrier into the open return air plenum when such a system is in place. If the area does not use an open return air plenum, then a barrier in the plenum cavity above the drop ceiling is usually not necessary.
  - 3. Thoroughly investigate all pollutant pathways and temporarily seal with a barrier to prevent pollutant migration.
- B. Negative Pressure Differential:
  - 1. Adjust the existing air system to effectively create a negative pressure differential between the construction zone and the occupied zone.
  - 2. This could be achieved by shutting down the A/C system servicing the construction area during the entire remodel process.
  - 3. If A/C in the construction zone cannot be shut down because it is also servicing the occupied zones, implement a means to provide a negative differential by acquiring the expertise of a mechanical subcontractor, at no additional cost to Owner.
  - 4. Task the subcontractor to modify existing supply and return air values so that the construction zone has a negative pressure differential as compared to the occupied zones.
  - 5. Pressure differential shall be configured to prevent odors and particles from migrating to occupied portions of the building via various voids in the building system.
  - 6. Negative pressure may also be achieved by installing and using temporary exhaust fans, installed in the construction zone and vented to the outdoors. This method is the least energy efficient and shall be approved by Owner prior to implementation.
  - 7. Provide negative pressure differential prior to beginning demolition and construction activity.
- C. Chemical Use and Submittal Review:
  - 1. Carefully select all chemical solvents, adhesives, paints, lacquers, and so forth intended for use during remodel projects.
  - 2. At no additional cost to Owner, provide for the review of Material Safety Data and Product Data information by a qualified environmental consultant or safety

## SECTION 01 57 00

### TEMPORARY CONTROLS

professional, acceptable to Owner, trained to recognize chemicals that may off gas long after the project's completion and pose a subsequent health risk to occupants.

3. Avoid the misuse and subsequent migration of odors associated with chemicals used in construction by carefully selecting environmentally safe chemicals.

#### D. HVAC System Protection and Cleaning:

1. Protect HVAC against contamination by drywall dust, demolition dust, paint and texture overspray, and similar sources by implementing effective engineering controls acceptable to Owner.
2. If construction activities cause contamination of the HVAC system with foreign matter, Contractor shall provide for completely cleaning the entire system by a duct cleaning organization certified by the National Air Duct Cleaners Association (NADCA) and replace controls damaged by the lack of adequate protection.

END OF SECTION

## SECTION 01 57 23

### TEMPORARY STORM WATER POLLUTION CONTROL

#### PART 1 – GENERAL

##### 1.01 SUMMARY

- A. Provide and maintain methods, equipment, and temporary construction as necessary to manage the quality of storm water runoff from construction sites and related areas under contractor's control.
- B. Stabilize surface of site on completion of construction activities.

##### 1.02 REFERENCES

- A. United States Clean Water Act (as amended in 1990); with authorization of Nevada Department of Environmental Protection (NDEP) as designated permitting authority.
- B. United States Environmental Protection Agency (USEPA) regulations 40 CFR 122.26(b)(14) established requirements for discharge of storm water runoff from construction sites to Municipal Storm Sewers or Waters of the United States. Nevada Revised Statutes (NRS) 445A.300 through 445A.730 establish the authority of Nevada Division of Environmental Protection (NDEP) to enforce the appropriate laws and regulations by the issuance of discharge permits. Examples of activities that require a permit include clearing, grading, excavating, road building, and building construction.
- C. All information and forms pertaining to Nevada's Storm Water Permitting Program can be found on the following website: <http://ndep.nv.gov/bwpc/storm01.htm>

#### PART 2 – PRODUCTS

Not Used.

#### PART 3 – EXECUTION

##### 3.01 STORMWATER QUALITY CONTROL

Develop Storm Water Pollution Prevention Plan (SWPPP), which must be on-site during construction, with the following key elements:

1. Identify responsible party. Violations of the permit requirements will be the responsibility of the Contractor, including all fines and penalties levied for non-compliance with the terms and conditions of the Notice of Intent and Storm Water Pollution Prevention Plan.
2. Describe the construction activities and their impacts on storm water quality.
3. Create a Location/Site Map, to include;
  - a. Water flow across and leaving the construction site.
  - b. Existing condition.

## SECTION 01 57 23

### TEMPORARY STORM WATER POLLUTION CONTROL

- c. Best Management Practice (BMP) installations, designed for a 2-year, 24-hour storm event and installed around the site boundaries.
- D. Submit Notice of Intent 2 days before start of construction to the NDEP.
- E. Pay a fee of \$200.00 to NDEP for permit application processing.
- F. Maintain records and retain them for at least 3 years.
- G. Inspect the site by qualified personnel, and modify the SWPPP based on inspection findings.
- H. Manage pollution control measures to avoid interference with the effective functioning of the public storm sewer systems and to prevent flooding.
- I. Issue a Notice of Termination to DNEP at the completion of construction.

END OF SECTION

**SECTION 01 55 00**

**VEHICULAR ACCESS AND PARKING**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Access Roads.
- B. Parking Areas.

**PART 2 – PRODUCTS**

Not Used

**PART 3 – EXECUTION**

**1.01 ACCESS ROADS**

- A. None

**PART 4 - PARKING AREAS**

- A. Owner will provide 3 parking spaces for Contractor.
- B. Maintain vehicular access to and through parking areas, access by emergency vehicles, and Owner's operations.
- C. All other parking by Contractor will be off-site near Shadow and Pinto Lane. UMC Shuttle service is available to bring Contractor's personnel to the UMC Campus from off-site parking.

**END OF SECTION**

## SECTION 01 58 13

### TEMPORARY PROJECT SIGNAGE

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Project Construction Signs.

##### 1.02 SUBMITTALS

- A. Submittals: Comply with Section 01 33 00.
- B. Submit for review and approval by Owner's representative, drawings and specifications for Project Construction Signs, Dedication Plaques and Project Identification Monument Signs.
  - 1. Show content, layout, lettering, color, foundation, structure, sizes, and grades of members.

##### 1.03 PROHIBITION AGAINST OTHER SIGNS

No other sign(s) shall be allowed without permission of the Owner's representative; except those required by this section or by law.

#### PART 2 PRODUCTS

- 2.01 Project Construction Sign(s): see attachments for manufacture and installation of required sign(s).

#### PART 3 EXECUTION

##### 3.01 PROJECT CONSTRUCTION SIGN (S)

- A. Project Construction Sign(s); The Contractor shall provide; install at a location(s) designated by the Owner's representative; maintain thru the construction period; remove at the completion of construction and properly dispose, off-site; a standard design, project construction sign(s) as shown in the drawings and installation details attached to this Section. Project construction sign(s) are required on all Clark County construction and renovation projects.
- B. No other Project Construction Sign(s) will be permitted. The Contractor will be permitted an allowance per required project construction sign, as shown, on the bid schedule that will provide for all of the cost related to the project construction sign, including but not limited to the following: ordering, pick-up and delivery, installation, maintenance, removal and disposal.
- C. The Contractor shall have the Project Construction Sign(s) constructed and installed within ten (10) calendar days of the Notice To Proceed.
- D. The Contractor shall have the Project Construction Sign(s), framing, supports and foundations removed from the project site at the completion of the Project, within seven (7) calendar days after notification by the Owner's Representative.

## SECTION 01 60 00

### PRODUCT REQUIREMENTS

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

- A. Transportation and Handling.
- B. Storage and Protection.

##### 1.02 TRANSPORTATION AND HANDLING

- A. Transport, handle, receive, and unload Products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure that:
  - 1. Products comply with requirements.
  - 2. Quantities are correct.
  - 3. Products are undamaged.
- C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, and/or damage.

##### 1.03 STORAGE AND PROTECTION

- A. Materials and equipment required for performance of the Work:
  - 1. Store and protect in a secure place in accordance with manufacturer's instructions, with seals and labels intact and legible.
  - 2. Deliver from storage to construction site according to Contract Documents.
- B. Store sensitive Products in weather tight climate controlled enclosures. Store materials and equipment subject to degradation by exposure in a suitable enclosure provided by Contractor.
- C. For exterior storage of fabricated Products, place on sloped supports, above ground.
- D. Cover Products subject to deterioration with impervious sheet covering. Prevent mixing with foreign matter.
- E. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- F. Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.
- G. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

**SECTION 01 60 00**

**PRODUCT REQUIREMENTS**

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

## SECTION 01 61 00

### COMMON PRODUCT REQUIREMENTS

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

- A. Indoor Air Quality (IAQ) Requirements.
- B. Carcinogenic and Toxic Materials.
- C. Emission Rate Test Methods.
- D. Dry Materials.
- E. Emission Rate Standards.

##### 1.02 REFERENCES

- A. National Ambient Air Quality Standard (U.S. EPA, Code of Federal Regulations, Title 40, Part 50).
- B. Industrial Workplace Standard (Reference: American Conference of Governmental Industrial Hygienists, 6500 Glenway, Building D-7, Cincinnati, OH 45211-4438).
- C. International Agency for Research on Cancer list of Chemical Carcinogens.
- D. Carcinogen List of the National Toxicology Program.
- E. Reproductive Toxin List of the Catalog of Teratogenic Agents.
- F. U.S. Environmental Protection Agency (EPA-600/8-89-074).

##### 1.03 INDOOR AIR QUALITY (IAQ) REQUIREMENTS

- A. Interior construction materials, finishes, and furnishing including partitions, partition coverings, flooring, floor coverings, wall covering, ceiling tiles, adhesives, sealants, glazes, paints, and similar materials shall be designed, manufactured, handled, and installed in such a manner to produce the least harmful or annoying effects on the occupants of the building.
- B. Make written notification of these requirements to all appropriate suppliers of these materials to ensure that compliance is obtained from the manufacturers.
- C. All materials shall emit the lowest, yet technologically achievable, emissions of particles and chemical vapors.
  - 1. As a minimum, materials shall meet emission rate standards set forth below.
  - 2. All emission rate calculations shall assume 900 ft<sup>3</sup> (25.49 m<sup>3</sup>) to be the work station volume for determination of Product loading.

## SECTION 01 61 00

### COMMON PRODUCT REQUIREMENTS

#### 1.04 EMISSION RATE STANDARDS

- A. Formaldehyde Emission Rate Standard: Product emission rate measured in mg/m<sup>2</sup>/hr shall not result in an indoor air concentration level of formaldehyde greater than 0.1 ppm at the anticipated loading (m<sup>2</sup>/m<sup>3</sup> within the building) within 30 days of installation.
- B. Total Volatile Organic Content (VOC) Emission Rate Standard: Product emission rate measured in mg/m<sup>2</sup>/hr shall not result in an indoor air concentration level greater than 0.5 mg/m<sup>3</sup> of the total volatile organic compounds at the anticipated loading (m<sup>2</sup>/m<sup>3</sup> within the building) within 30 days of installation.
- C. 4 Phenyl Cyclohexene (4-PC) Emission Rate Standard: Product emission rate measured in mg/m<sup>2</sup>/hr shall not result in an indoor air concentration level of 4-PC greater than 0.1 ppb at the anticipated loading (m<sup>2</sup>/m<sup>3</sup> within the building) within 30 days of installation.
- D. Regulated Pollutant Standard: Any pollutant regulated as a primary or secondary outdoor air pollutant shall meet an emission rate that will not generate an air concentration greater than that promulgated by the National Ambient Air Quality Standard.
- E. Otherwise Unmentioned Pollutant Standard: Any pollutant not specified above shall meet an emission rate standard that will not produce an air concentration level greater than 1/10 the Threshold Limit Value (TLV) Industrial Workplace Standard at the anticipated loading (m<sup>2</sup>/m<sup>3</sup> within the building) within 30 days of installation.

#### PART 2 – PRODUCTS

##### 2.01 CARCINOGENIC AND TOXIC MATERIALS

- A. For all interior design materials, furnishings, and finishes, disclose in writing to Owner prior to installation of such materials, furnishings, and finishes any detectable amounts of substances emitted into the indoor air which are listed on any of the following.
  - 1. International Agency for Research on Cancer List of Chemical Carcinogens, or
  - 2. Carcinogen List of the National Toxicology Program, or
  - 3. Reproductive Toxin List of the Catalog of Teratogenic Agents.

##### 2.02 DRY MATERIALS

- A. "Dry" Materials:
  - 1. Do not install "dry" furnishing and finishing materials, such as carpet, acoustical panels, textiles, and so forth, until "wet" materials (adhesives, sealants, glazes, caulks, paint, and so forth) have been applied and allowed to dry to the extent feasible and in accordance with good building practices.
  - 2. Choose drying times so that pollutant emission rates as specified for IAQ are achieved prior to installation of the "dry" furnishing and finishing materials.

**SECTION 01 61 00**

**COMMON PRODUCT REQUIREMENTS**

- B. Pre-Conditioning: All dry furnishing and finishing materials shall be allowed to "air out" or pre-condition prior to installation in the building.

**2.03 EMISSION RATE TEST METHODS**

- A. All emission rate testing specified shall be completed according to the dynamic environmental chamber technology as prescribed by the U.S. EPA.
- B. Make data available to Owner for review and approval.

**PART 3 – EXECUTION**

Not Used

**END OF SECTION**

## SECTION 01 71 23

### FIELD ENGINEERING

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

- A. Survey Record Documents.
- B. Examination and Survey Reference Points.
- C. Survey Requirements.

##### 1.02 QUALITY ASSURANCE

- A. Employ a Land Surveyor registered in the state of Nevada to perform survey work of this section.

##### 1.03 SUBMITTALS FOR INFORMATION

- A. Submit name, address, and telephone number of Surveyor before starting survey work.

##### 1.04 SURVEY RECORD DOCUMENTS

- A. Maintain a complete and accurate log of control and survey work as it progresses.
- B. On completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work when required by Owner.
- C. Submit Record Documents under provisions of Section 01 78 39.

#### PART 2 – PRODUCTS

Not Used

#### PART 3 – EXECUTION

##### 3.01 EXAMINATION

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Owner of any discrepancies discovered.

##### 3.02 SURVEY REFERENCE POINTS

- A. Locate and protect survey control and reference points.
- B. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

## SECTION 01 71 23

### FIELD ENGINEERING

- C. Promptly report to the Owner the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- D. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Owner.

#### 3.03 SURVEY REQUIREMENTS

- A. Provide field engineering services. Use recognized engineering survey practices.
- B. Establish a minimum of two permanent bench marks in widely separate locations on site, referenced to established control points. Record locations, with horizontal and vertical data, on Project Record Documents.
- C. Establish elevations, line, and levels. Locate and lay out by instrumentation and similar appropriate means:
  - 1. Site improvements including pavements, stakes for grading, fill, and topsoil placement, utility locations, slopes, and invert elevations.
  - 2. Grid or axis for structures.
  - 3. Building foundation, column locations, ground floor elevations, and existing structure where new work connects.
- D. Periodically verify layouts by same means.

END OF SECTION

## SECTION 01 71 33

### PROTECTION OF ADJACENT CONSTRUCTION

#### PART 1 – GENERAL

##### 1.01 SUMMARY

- A. Protect existing utilities and improvements not designated for removal.
- B. Restore damaged or temporarily relocated utilities and improvements to condition equal to or better than condition prior to such damage or temporary relocation in accordance with Contract Documents.
- C. Verify exact locations and depths of utilities shown and make exploratory excavations of utilities that may interfere with Work.
  - 1. Perform exploratory excavations as soon as practicable after award of Contract and in sufficient time in advance of construction to avoid possible delays to Contractor's Work.
  - 2. When exploratory excavations show utility location as shown to be in error, notify Owner.
- D. Number of exploratory excavations shall be sufficient to determine alignment and grade of existing utilities.

##### 1.02 REFERENCES

- A. Standard Specifications: *Uniform Standard Specifications for Public Works' Construction, Off-Site Improvements, Clark County Area, Nevada*, most recent edition.
  - 1. Comply with referenced sections and subsections of Standard Specifications.
  - 2. Contractual, measurement, and payment provisions of Standard Specifications do not apply.

#### PART 2 – PRODUCTS

Not Used

#### PART 3 – EXECUTION

##### 3.01 CONSTRUCTION INTERFERENCES

- A. Contractor's responsibilities regarding existing utilities and construction interferences shall be in accordance with Subsection 105.06 of the Standard Specifications, with the following additional provisions.
- B. Construction interferences include:
  - 1. Utility or service connections within limits of excavation or over-excavation required for Work under Contract.
  - 2. Utility or service connections located in space required by Work under Contract.

## SECTION 01 71 33

### PROTECTION OF ADJACENT CONSTRUCTION

3. Utility or service connections required to be disturbed or removed to permit construction as specified under Contract.
  - a. Disturb or remove only with approval of Owner and following notification to owner of interfering utility or service connection.
  - b. Promptly reconstruct removed or disturbed utility or service connections in original or other authorized location in condition at least as good as prior to such removal or disturbance, subject to inspection of owner of same.
- C. Contractor's responsibility to remove or replace shall apply even in event damage or destruction occurs after backfilling. Notify owner of utility or service connection immediately after damage or destruction occurs or is discovered.
- D. During performance of Work, owner of utility affected by Work shall have right to enter when necessary upon any portion of Work for purpose of maintaining service and of making changes in or repairs to said utility.
- E. Contractor shall not be held responsible for failure to complete Work on time to extent that such delay was caused by failure of owner or of agency having jurisdiction over utility or service connection to authorize or otherwise provide for its removal, relocation, protection, support, repair, maintenance, or replacement.
- F. Exercise extreme care so as not to damage existing utilities and/or new and existing facilities that do not physically constitute construction interference.
  1. Use equipment of such weights throughout construction operations that existing buried utilities and/or new and existing facilities are not damaged by excessive loadings thereon.
  2. Be responsible for costs of repair and/or replacement of new or existing facilities damaged by operations, as determined by Owner.
- G. Prior to trenching, contact "CALL BEFORE YOU DIG" 1-800-227-2600 to determine location of existing utilities.
  1. Repairs to be made shall include appropriate warranties for that portion of utility deemed damaged.
  2. Costs for repair of damaged utilities: Responsibility of Contractor.
- H. Contractor acknowledges that utility companies may not be members of USA System and, therefore, not automatically contacted by referenced telephone number.
  1. Be aware of utility company facilities not reported by USA System, and bear damages stemming from repair or delay costs or other expenses resulting from unanticipated discovery of underground utilities.
  2. Notify the following utilities at least two working days in advance of commencement of Work at site to examine construction site and mark location of utilities' respective facilities. Verify that each utility has responsibly responded to notification.

## SECTION 01 71 33

### PROTECTION OF ADJACENT CONSTRUCTION

- a. NV ENERGY - Engineering Dept., phone 367-5232.
  - b. SOUTHWEST GAS CORPORATION - Line Locator Dispatcher, phone 365-2269.
  - c. EMBARQ TELEPHONE COMPANY - Cable Locator, phone 385-3651.
  - d. AT&T COMMUNICATIONS - Supervisor of Operations, phone 736-6676.
  - e. SOUTHERN NEVADA WATER SYSTEM - Location Supt., phone 565-9763.
  - f. CITY OF LAS VEGAS - Electrical Dept., phone 386-6333; Traffic Engineering Dept., phone 386-6327; Sanitation Division, phone 457-1233.
  - g. COX COMMUNICATIONS (CABLE TV) - phone 385-3339.
  - h. LAS VEGAS VALLEY WATER DISTRICT - Engineering Dept., phone 258-3118.
  - i. KERN RIVER GAS TRANSMISSION COMPANY - phone 399-1612.
3. If above telephone numbers are changed, Contractor is not relieved of responsibility for notifying various utilities.

#### 3.02 OVERHEAD POWER LINE SAFETY LAW

- A. Overhead Power Line Safety Law: The Nevada Legislature enacted NRS 455.200 to 455.250 requiring utilities be notified and give consent before Work is performed near overhead power lines.
- B. Call NV Energy at 593-6111 prior to working with hand tools or operating equipment near overhead power lines.
- C. If necessary, additional conditions may be required by NV Energy before consent to do the Work is given; these could include:
  1. Reasonable limits on the time, place, and manner of the Work.
  2. Placing barriers to prevent contact with the lines.
  3. Temporarily disconnecting the power to the lines.
- D. Work to be done by NV Energy as a result of these conditions shall be started within 5 working days of:
  1. Receiving notice of Work planned near an overhead line, or
  2. Executing an agreement on payment for preventative work needed to meet these conditions.
- E. Penalties of up to \$1,000 per day could be imposed for violation of this law. Contact Scott Paris at 227-2671 with questions regarding this law.
- F. Contractor performing the Work in the vicinity of the overhead line carrying high voltage shall pay actual expenses incurred by the public utility in carrying out the preventative measures required.

## SECTION 01 71 33

### PROTECTION OF ADJACENT CONSTRUCTION

#### 3.03 PROTECTION OF STREET OR ROADWAY MARKERS

- A. Do not destroy, remove, or otherwise disturb existing survey markers or other existing street or roadway markers without proper authorization.
- B. Do not start pavement breaking or excavation until survey or other permanent marker points that will be disturbed by construction operations have been properly referenced for easy and accurate restoration.
- C. Survey markers or points disturbed by Contractor without proper authorization shall be accurately restored at Contractor's expense after street or roadway resurfacing has been completed.

#### 3.04 RESTORATION OF PAVEMENT

- A. Replace paved areas, including asphaltic concrete berms cut or damaged during construction, with similar materials and of equal thickness to match existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in Contract Documents or in requirements of agency issuing permit.
- B. Temporary and permanent pavement shall conform to requirements of owner of affected pavement.
- C. Neatly saw cut in straight lines pavements which are subject to partial removal.
- D. Comply with Subsection 208.03.05 of the Standard Specifications.

END OF SECTION

## SECTION 01 73 29

### CUTTING AND PATCHING

#### PART 1 – GENERAL

##### 1.01 SECTIONS INCLUDES

- A. Cutting, fitting, and patching required to complete the Work or to make its parts fit together properly.

##### 1.02 SUBMITTALS

- A. Submit written request in advance of cutting or alteration which affects:

1. Structural integrity of any element of Project.
2. Integrity of weather exposed or moisture resistant element.
3. Efficiency, maintenance, or safety of any operational element.
4. Visual qualities of sight exposed elements.
5. Work of Owner or separate contractor.

- B. Include in request:

1. Identification of Project.
2. Location and description of affected Work.
3. Necessity for cutting or alteration.
4. Description of proposed Work and Products to be used.
5. Alternatives to cutting and patching.
6. Effect on work of Owner or separate contractor.
7. Written permission of affected separate contractor.
8. Date and time Work will be executed.

##### 1.03 REQUIREMENTS AND LIMITATIONS

- A. Do not damage or endanger a portion of the Work or fully or partially completed construction of Owner or separate contractors by cutting, patching, excavation, or otherwise altering such construction.
- B. Do not cut or otherwise alter such construction by Owner or a separate contractor except with written consent of Owner and of such separate contractor.
  1. Such consent will not be unreasonably withheld.
  2. Do not unreasonably withhold from Owner or a separate contractor, Contractor's consent to cutting or otherwise altering the Work.

#### PART 2 – PRODUCTS

##### 2.01 MATERIALS

- A. Primary Products: Those required for original installation.

## SECTION 01 73 29

### CUTTING AND PATCHING

#### PART 3 – EXECUTION

##### 3.01 EXAMINATION

- A. Examine existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.
- B. After uncovering existing Work, assess conditions affecting performance of Work.
- C. Beginning of cutting or patching means acceptance of existing conditions.

##### 3.02 PREPARATION

- A. Provide protection from elements for areas that may be exposed by uncovering Work.
- B. Provide temporary supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project.
- C. Maintain excavations free of water.

##### 3.03 CUTTING

- A. Execute cutting and fitting including excavation and fill to complete the Work.
- B. Uncover Work to install improperly sequenced Work.
- C. Remove and replace defective or non-conforming Work.
- D. Remove samples of installed Work for testing when requested.
- E. Provide openings in the Work for penetration of mechanical and electrical Work.
- F. Employ original installer to perform cutting for weather exposed and moisture resistant elements and sight-exposed surfaces.
- G. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

##### 3.04 PATCHING

- A. Execute patching to complement adjacent Work.
- B. Fit Products together to integrate with other Work.
- C. Execute Work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.
- D. Employ original installer to perform patching for weather exposed and moisture resistant elements and sight exposed surfaces.

## SECTION 01 73 29

### CUTTING AND PATCHING

- E. Restore Work with new Products in accordance with requirements of Contract Documents.
- F. Fit Work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- G. At penetrations of walls, partitions, ceiling, or floor construction completely seal voids with fire-rated material to full thickness of penetrated element.
- H. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

END OF SECTION

## SECTION 01 74 00

### CLEANING AND WASTE MANAGEMENT

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

- A. Owner's right to clean up.
- B. Progress cleaning and waste removal.
- C. Final cleaning.

##### 1.02 OWNER'S RIGHT TO CLEAN UP

- A. If Contractor fails to clean up as provided in Contract Documents, Owner may do so and the cost thereof shall be charged to Contractor.
- B. If a dispute arises among Contractor, separate contractors, and Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish as described in Contract Documents, Owner may clean up and allocate the cost amount to those responsible as Owner determines to be just.

#### PART 2 – PRODUCTS

Not Used

#### PART 3 – EXECUTION

##### 3.01 PROGRESS CLEANING AND WASTE REMOVAL

- A. At all times, keep the Work area in a neat, clean, orderly, and safe condition.
  - 1. Keep Work area free from accumulation of waste materials, debris, and/or rubbish caused by operations under the Contract Documents.
  - 2. Upon completion of any portion of the Work, promptly remove equipment, construction debris, temporary structures, and surplus materials not to be used at or near the same location during later stages of Work.
- B. Remove debris and rubbish from pipe chases, plenum, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space. Provide temporary screens or other means of preventing trash and debris from getting into floor and roof drains during the course of construction.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and rubbish from site weekly and dispose off-site.

## SECTION 01 74 00

### CLEANING AND WASTE MANAGEMENT

- E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.
- F. If Contractor fails to comply with the foregoing, the same may be accomplished by Owner at Contractor's expense.

#### 3.02 FINAL CLEANING

- A. At completion of the Work, remove from and about the Project waste materials, rubbish, tools, construction equipment, machinery, and surplus materials.
- B. Upon completion of the Work and before final payment is made:
  - 1. Satisfactorily dispose of all plant, buildings, rubbish, unused materials, and other equipment and materials belonging to Contractor or used in the performance of the Work.
  - 2. Leave the premises and Work site in a neat, clean, and safe condition.
- C. Execute final cleaning prior to final Project assessment.
- D. Clean interior and exterior glass; remove temporary labels, stains, and foreign substances from surfaces exposed to view; polish transparent and glossy surfaces; and vacuum carpeted and soft surfaces.
- E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- F. Replace filters of operating equipment.
- G. Clean debris from roofs, gutters, downspouts, and drainage systems.
- H. Clean site. Sweep paved areas. Rake clean landscaped surfaces.
- I. Remove waste and surplus materials, rubbish, and construction facilities from the site.
- J. If Contractor fails to comply with the above, the same may be accomplished by Owner at Contractor's expense.

END OF SECTION

## SECTION 01 75 00

### STARTING AND ADJUSTING

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

- A. Contractor's use of systems.
- B. Owner's use of systems.
- C. Starting systems.
- D. Testing, adjusting, and balancing.
- E. Demonstration of Products.
- F. Instruction of Owner's Personnel.

##### 1.02 QUALITY ASSURANCE

- A. Independent testing and balancing firm shall be a member in good standing of the Associated Air Balance Council (AABC).
- B. Technicians performing the testing and balancing shall be certified by the AABC.

##### 1.03 CONTRACTOR'S USE OF SYSTEMS

- A. Contractor shall not use permanently installed equipment without approval by Owner in writing.
- B. Where Contractor's written request is granted for the use of certain equipment, Contractor shall properly use and maintain the equipment, and upon completion of its use, recondition such equipment to the satisfaction of Owner and at no additional cost to Owner.

##### 1.04 OWNER'S USE OF SYSTEMS

- A. If Owner desires to continue the operation of certain systems prior to Substantial Completion, Owner will furnish an operator for such equipment.
- B. Such operator's services shall be performed under the complete direction and control of Contractor's employee for all purposes other than the payment of such operator's wages, workers' compensation, or other benefits which will be paid directly or indirectly by Owner.

#### PART 2 – PRODUCTS

Not Used

## SECTION 01 75 00

### STARTING AND ADJUSTING

#### PART 3 – EXECUTION

##### 3.01 STARTING SYSTEMS

- A. Coordinate the schedule for start up of various equipment and systems, including providing required fuel; notify Owner 7 days prior to start up of each item.
- B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions that may cause damage.
  - 1. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
  - 2. Verify that wiring and support components for equipment are complete and tested.
- C. Execute start-up under supervision of applicable manufacturer's representative and Contractor's personnel in accordance with manufacturers' instructions. When specified in individual sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up and to supervise placing equipment or system in operation.
- D. Submit a written report in accordance with Section 01 45 00 that equipment or system has been properly installed and is functioning correctly.

##### 3.02 TESTING, ADJUSTING, AND BALANCING

- A. Contractor shall appoint, employ, and pay for services of an independent firm to perform testing, adjusting, and balancing as specified in Section 23 05 93.
- B. At the recommendation of the Testing, Adjusting, and Balancing firm, Contractor shall change, replace, and/or modify belt driven equipment and belt/gear drive equipment, and provide balancing devices and/or flow measuring devices as required, at no additional cost to Owner.
- C. Reports will be submitted by the independent firm to Owner indicating observations and results of tests and indicating compliance or non-compliance with the requirements of the Contract Documents.

##### 3.03 DEMONSTRATION AND INSTRUCTION OF OWNER'S PERSONNEL

- A. Demonstrate operation and maintenance of Products to Owner's personnel prior to date of Substantial Completion.
- B. Demonstrate start up, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed time and at designated location acceptable to Owner and Contractor.

## SECTION 01 75 00

### STARTING AND ADJUSTING

- C. Use Operation and Maintenance Manuals as basis for instruction. Review contents of manual with Owner's personnel 2 weeks prior to date of Substantial Completion in detail to explain all aspects of operation and maintenance. Instruction of Owner's personnel shall be by a qualified manufacturers' representative who is knowledgeable about the Project.
- D. Prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.
- E. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- F. Before final inspection, instruct Owner's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems at agreed upon times.
- G. For equipment or systems requiring seasonal operation, perform demonstrations and training for other seasons within 6 months.

END OF SECTION

## SECTION 01 76 00

### PROTECTING INSTALLED CONSTRUCTION

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

- A. Protection of the Work.

#### PART 2 – PRODUCTS

Not Used

#### PART 3 – EXECUTION

##### 3.01 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 prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, 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.

END OF SECTION

## SECTION 01 77 00

### CLOSEOUT PROCEDURES

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

- A. Closeout Submittals and Procedures.
- B. Substantial Completion.
- C. Final Completion.

##### 1.02 CLOSEOUT SUBMITTALS AND PROCEDURES

- A. The events for the Closeout of the Contract for Construction include, but are not limited to, the following.
  - 1. Submit to Owner the Operation and Maintenance Manuals as specified in Section 01 78 23 after approval by Owner.
  - 2. Submit to Owner the Maintenance Materials and Tools as specified in Section 01 78 23.
  - 3. Adjust operating products and equipment to ensure smooth and unhindered operation as specified in Section 01 75 00.
  - 4. Systems start up as specified in Section 01 75 00.
  - 5. Training of Owner's Personnel as specified in Section 01 75 00.
  - 6. Removal of temporary protection (fences, barricades, etc.).
  - 7. Certificate of Occupancy.
  - 8. Contractor's preparation of Punch List.
  - 9. Contractor's Certificate of Substantial Completion.
  - 10. Final Cleaning as specified in Section 01 74 00.
  - 11. Inspection prior to Substantial Completion Inspection.
  - 12. Inspection for Substantial Completion.
  - 13. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and Work is complete in accordance with Contract Documents and ready for Owner's review.
  - 14. Provide submittals to Owner that are required by governing or other authorities, including completion of the Service Order Form and Equipment Input Form specified in Division 23.
  - 15. Submit to Owner Project Record Documents including complete set of approved submittals as specified in Section 01 78 39.
  - 16. Submit final Application for Payment identifying total adjusted Contract Sum, previous payment, and sum remaining due as specified in Section 01 29 00.
  - 17. Submit keys to Owner with spreadsheet listing quantities, types and keyways.
  - 18. Acceptance of Project by Governing Board.
  - 19. Submit Application for Payment of Retention as specified in Section 01 29 00.
  - 20. Submit warranty matrix.

## SECTION 01 77 00

### CLOSEOUT PROCEDURES

#### 1.03 SUBSTANTIAL COMPLETION

A. Substantial Completion is the stage in the progress of Work completion when the Work, or designated portion thereof, meets the following criteria:

1. The Work, or portion in question, is 95 percent complete as determined by Owner, when measured against the dollar value of the entire Work, or portion in question.
2. The entire Work, or portion in question, can be occupied and used for its intended purpose as determined by Owner.
3. The remaining items of the Work contained in the Punch List for the entire Work, or the portion in question, can be completed within 60 calendar days, as determined by Owner, of the date of Substantial Completion for the Work, or the portion in question.
4. The entire Work, or portion in question, has received a Certificate of Occupancy from the governing authority.

B. Substantial Completion Procedures:

1. Contractor shall prepare and submit to Owner a Punch List which is a comprehensive list of items to be completed or corrected.
  - a. Upon receipt of Contractor's Punch List, Owner will make an inspection to determine whether the Work or designated portion thereof is substantially complete.
  - b. If Owner's inspection discloses any item not included on the Punch List, Contractor will add it to the Punch List.
  - c. Contractor shall proceed promptly to complete and correct items on the Punch List. Failure to include an item on such list does not alter the responsibility of Contractor to complete all Work in accordance with Contract Documents.
2. Whenever any portion of the Work performed by Contractor is in a condition suitable for use, as determined by Owner, Owner may initiate a Certificate of Substantial Completion for that portion and Owner may take possession of or use such portion.
  - a. Such use by Owner shall in no case be construed as constituting final acceptance and shall neither relieve Contractor of any of Contractor's responsibilities under Contract Documents, nor act as a waiver by Owner of any of the conditions thereof, provided that Contractor shall not be liable for the cost of repairs, rework or renewals which may be required due to ordinary wear and tear resulting from such use.
  - b. However, if such use increases the cost or delays the completion of remaining portions of Work, Contractor shall be entitled to an equitable adjustment.

C. Certificate of Substantial Completion: When the Work or designated portion thereof is substantially complete, as determined by Owner, Owner will prepare a Certificate of Substantial Completion, and submit it to Contractor for written acceptance, which:

1. Shall indicate the date of Substantial Completion.

## SECTION 01 77 00

### CLOSEOUT PROCEDURES

2. Shall establish responsibilities of Owner and Contractor for security, maintenance, heat, utilities, damage to the Work, and insurance.
3. Shall fix the time within which Contractor shall finish all items on the Punch List accompanying the Certificate.

#### 1.04 FINAL COMPLETION

- A. Final Completion is the stage in the progress of Work completion when the Work is complete as determined by Owner. The date of final acceptance of the Project by Owner shall be the date upon which the Governing Body issues a Memo of Final Completion.
- B. If, after Substantial Completion of the Work, Final Completion thereof is materially delayed through no fault of Contractor or by issuance of Change Orders affecting final completion, Owner shall, upon application by Contractor, and without terminating the Contract for Construction, make payment of the balance due for that portion of the Work fully completed and accepted.
- C. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in Contract Documents, and if bonds and a written Consent of Surety have been furnished, Contractor shall submit to Owner an Application for Payment for that portion of the Work fully completed and accepted. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

#### PART 2 – PRODUCTS

Not Used

#### PART 3 – EXECUTION

Not Used

END OF SECTION

## SECTION 01 78 23

### OPERATION AND MAINTENANCE DATA

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

- A. Submittal procedures.
- B. Maintenance Materials, Tools, Spare Parts, and Extra Stock.
- C. Format of manuals.
- D. Content of manuals.
- E. Materials and Finishes Manuals.
- F. Equipment and Systems Manuals.

##### 1.02 SUBMITTAL PROCEDURES FOR MANUALS

- A. Submit 2 copies of preliminary draft or proposed formats and outlines of contents before start of Work. Owner will review draft and return one copy with comments.
- B. For equipment or component parts of equipment put into service during construction and operated by Owner, submit documents within 10 days after acceptance.
- C. Submit 1 copy of completed volumes 15 calendar days prior to demonstrations and training of Owner's personnel. This copy will be reviewed and returned with Owner's comments after demonstrations and training of Owner's personnel. Revise content of all document sets as required prior to final submission.
- D. Submit 3 sets of revised final volumes in final form within 10 days prior to Inspection for Substantial Completion.

##### 1.03 MAINTENANCE MATERIALS, TOOLS, SPARE PARTS, AND EXTRA STOCK

- A. Provide products, spare parts, maintenance, and extra materials in quantities specified in individual specification sections.
- B. Deliver to Project Site and place in location as directed. Obtain receipt prior to final payment.

##### 1.04 FORMAT OF MANUALS

- A. Prepare data in the form of an instructional manual.
- B. Binders:
  - 1. Commercial quality, 8-1/2-inch by 11-inch, three D side ring binders with durable plastic covers; 2-inch maximum ring size.

## SECTION 01 78 23

### OPERATION AND MAINTENANCE DATA

2. When multiple binders are used, correlate data into related consistent groupings.
- C. Cover:
  1. Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS.
  2. Identify title of Project.
  3. Identify subject matter of contents.
- D. Provide tabbed indexes for each separate product and system, with typed description of product and major component parts of equipment.
- E. Provide list of Preventive Maintenance (PM) items at front of binder. Cross-reference PM items list to text, tab, page, and paragraph.
- F. Text: Manufacturer's printed data or typewritten data on 20-pound paper.

#### 1.05 CONTENTS OF MANUALS

- A. Arrange content by systems under section numbers and sequence of Table of Contents of the Project Manual.
- B. Table of Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, in three parts as follows:
  1. Part 1: Directory, listing names, addresses, and telephone numbers of Owner, Owner's Consultant, Contractor, Subcontractors, and major equipment suppliers.
  2. Part 2: Operation and Maintenance Instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
    - a. Significant design criteria.
    - b. List of equipment.
    - c. Parts list for each component.
    - d. Operating instructions.
    - e. Maintenance instructions for equipment and systems.
    - f. Maintenance instructions for (special) finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
  3. Part 3: Project Documents and certificates, including the following.
    - a. Shop drawing and product data.
    - b. Air and water balance reports.
    - c. Certificates.
    - d. Photocopies of warranties and bonds.

## SECTION 01 78 23

### OPERATION AND MAINTENANCE DATA

- C. **Typed Text:** As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- D. **Drawings:** Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- E. **For Each Product or System:** List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- F. **Product Data:** Mark each sheet to clearly identify specific products and component parts and data applicable to installation. Delete inapplicable information.

#### 1.06 MATERIALS AND FINISHES MANUAL

- A. **Building Products, Applied Materials, and Finishes:** Include product data with catalog number, size, composition, color, and texture designations. Provide information for re-ordering custom manufactured products.
- B. **Instructions for Care and Maintenance:** Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. **Moisture Protection and Weather Exposed Products:** Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. **Additional Requirements:** As specified in individual Product specification sections.
- E. Provide a listing in Table of Contents for design data with tabbed fly sheet and space for insertion of data.

#### 1.07 EQUIPMENT AND SYSTEMS MANUALS

- A. **Each Item of Equipment and Each System:** Include description of unit or system and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves with engineering data and tests, and complete nomenclature and model number of replaceable parts.
- B. **Panelboard Circuit-Directories:** Provide electrical service characteristics, controls, and communications by label machine.
- C. Include color-coded wiring diagrams as installed.
- D. **Operating Procedures:** Include start-up, break-in and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

## SECTION 01 78 23

### OPERATION AND MAINTENANCE DATA

- E. Maintenance Requirements:
  - 1. Include routine procedures and guide for troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
  - 2. Provide servicing and lubrication schedule, and list of lubricants required.
  - 3. Include manufacturer's printed operation and maintenance instructions.
- F. Include sequence of operation by controls manufacturer.
- G. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- H. Provide control diagrams by controls manufacturer as installed.
- I. Provide Contractor's coordination drawings with color-coded piping diagrams as installed.
- J. Provide charts of valve tag numbers with location and function of each valve, keyed to flow and control diagrams.
- K. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- L. Include test and balancing reports.
- M. Additional Requirements: As specified in individual Product specification sections.
- N. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

#### PART 2 – PRODUCTS

Not Used

#### PART 3 – EXECUTION

Not Used

END OF SECTION

## SECTION 01 78 36

### WARRANTIES

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

- A. Warranties.
- B. Contractor's one-year warranty.
- C. Product and services warranties.
- D. Form of submittals.
- E. Preparation of submittals.
- F. Time of submittals.

##### 1.02 WARRANTIES

- A. Warranties required by Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.
- B. Submit 3 sets of volumes containing written warranties and related documents required by Contract Documents.
- C. Submit Warranty Spreadsheet listing each warranted item, reference specification number, serial number, warranty start/end/length, supplier/manufacturer/contact information, sub-contractor contact information and whether or not warranty meets or exceeds specification. Sample of spreadsheet is provided at the end of this Section.
- D. If, within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established herein, or by terms of an applicable special warranty required by Contract Documents, any of the Work is found to be not in accordance with the requirements of Contract Documents, Contractor shall correct it promptly after receipt of written notice from Owner to do so unless Owner has previously given Contractor a written acceptance of such condition.
  - 1. This period of one year shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work.
  - 2. This obligation shall survive acceptance of the Work under the Contract and termination of the Contract.
  - 3. Owner will give such notice promptly after discovery of the condition.
- E. Nothing contained in the Section shall be construed to establish a period of limitation with respect to other obligations within Contract Documents.

## SECTION 01 78 36

### WARRANTIES

- F. Establishment of the time period of one year as described herein relates only to the specific obligation of Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with Contract Documents may be sought to be enforced, not to the time within which proceedings may be commenced to establish Contractor's liability with respect to Contractor's obligations other than specifically to correct the Work.

#### 1.03 CONTRACTOR'S ONE-YEAR WARRANTY

- A. Unless otherwise provided elsewhere in the Contract, all materials and equipment incorporated into any Work covered by the Contract shall be new and where not specified, of the most suitable grade of their respective kinds for their intended use and all workmanship shall be in accordance with construction practices acceptable to Owner.
- B. Unless otherwise provided in the Contract, Contractor warrants all equipment, materials, and labor furnished or performed under this Contract against defects in design, materials, and workmanship (unless furnished by Owner), for a period of 12 months (unless longer guarantees or warranties are provided for elsewhere in Contract Documents in which case the longer periods of time shall prevail) from and after final acceptance under the Contract, regardless of whether the same were furnished or performed by Contractor or by any of Contractor's subcontractors of any tier. Upon receipt of written notice from Owner of any defect in any such equipment, materials, or labor during the applicable warranty period, due to defective design, materials, or workmanship, the affected item or parts thereof shall be redesigned, repaired, or replaced by Contractor at a time acceptable to Owner.
- C. Contractor shall perform such tests as Owner may require to verify that such redesign, repairs, and replacements comply with the requirements of this Contract. All costs incidental to such redesign, repair, replacement, and testing, including the removal necessary to gain access shall be borne by Contractor.
- D. Contractor warrants such redesigned, repaired, or replaced work against defective design, materials, and workmanship for a period of 12 months from and after date of acceptance thereof.
  - 1. Contractor shall notify Owner in writing the status of a warranty work order within seven (7) days of receipt of a warranty correction.
  - 2. Should Contractor fail to promptly make the necessary redesign, repair, replacement, and tests, Owner may perform or cause to be performed the same at Contractor's expense.
  - 3. Contractor shall employ professional third party M.E.P. and chemical treatment consultants to document that mechanical, electrical and plumbing systems are functioning per Contract Documents.
  - 4. Contractor and Contractor's surety or sureties shall be liable for the satisfaction and full performance of the warranties as set forth herein. Any warranty work orders not completed within seven (7) days may be forwarded to Surety Company.

## SECTION 01 78 36

### WARRANTIES

5. Owner reserves the right to schedule weekly warranty work sessions during the one (1) year correction period, where Contractor, third party M.E.P., chemical treatment consultant and Johnson Control, Inc. shall attend.
6. Contractor shall furnish and update a comprehensive warranty work order log weekly throughout the one (1) year warranty period.

#### 1.04 PRODUCT AND SERVICES WARRANTIES

- A. Contractor warrants to Owner that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and the Work will conform to the requirements of Contract Documents.
- B. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective.
- C. The Contract warranty excludes remedy for damage or defect caused by abuse, modifications not executed by Contractor, improper or insufficient maintenance, improper operation, or evidence as to the kind and quality of materials and equipment.

#### PART 2 – PRODUCTS

##### 2.01 FORM OF SUBMITTALS

- A. Bind in commercial quality 8-1/2-inch three D side ring binders with durable plastic covers.
- B. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address, and telephone number of Contractor and equipment supplier; and name of responsible company principal.
- C. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of Product or Work item.
- D. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer with name, address, and telephone number of responsible principal.

#### PART 3 – EXECUTION

##### 3.01 PREPARATION OF SUBMITTALS

- A. Obtain warranties and bonds, notarized and executed in duplicate by responsible Subcontractors, suppliers, and manufacturers within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave

## SECTION 01 78 36

### WARRANTIES

date of beginning of time of warranty until the date of Substantial Completion is determined.

- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Prepare Warranty Matrix Spreadsheet from Owner's template.

## SECTION 01 78 36

### WARRANTIES

#### 3.02 TIME OF SUBMITTALS

- A. For equipment or component parts of equipment put into service during construction with Owner permission, submit documents within 10 days after acceptance.
- B. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
- C. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

END OF SECTION

## SECTION 01 78 39

### PROJECT RECORD DOCUMENTS

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

- A. Working copy of Contract Documents.
- B. Record Documents Requirements and Preparation.

##### 1.02 SUBMITTALS

- A. Submit Project Record Documents to Owner as specified below.

#### PART 2 – PRODUCTS

##### 2.01 WORKING COPY OF CONTRACT DOCUMENTS

- A. Working copy of Contract Documents is for use by Contractor and Owner. Protect from damage and repair if damaged.
- B. Use working copy to record actual conditions and changes during the course of the Work.
- C. Working copy set shall be separate from the set Contractor may provide for use by Subcontractors.
- D. Store the Working Copy of the Contract Documents separate from documents used for construction.

##### 2.02 RECORD DOCUMENTS REQUIREMENTS

- A. For the entire course of Contractor's work, maintain on Site one set of the following Record Documents:
  - 1. Drawings.
  - 2. Specifications (Bid Requirements, General Requirements, Technical Requirements).
  - 3. Addenda.
  - 4. Modifications (Supplemental Instructions, Change Orders, Construction Change Directive).
  - 5. Reviewed Shop Drawings, Product Data, and Samples.
  - 6. Manufacturers' instructions for assembly, installation, and adjusting.

#### PART 3 – EXECUTION

##### 3.01 RECORD DOCUMENTS PREPARATION

- A. Store Record Documents separate from documents used for construction.
- B. Record information in the Record Documents concurrent with construction progress.

## SECTION 01 78 39

### PROJECT RECORD DOCUMENTS

- C. Ensure entries are complete and accurate, enabling future reference by Owner.
- D. Specifications: Legibly mark and record at each Product section description of actual products installed, including the following:
  - 1. Manufacturer's name and product model number.
  - 2. Product substitutions or alternates used.
  - 3. Changes made by Addenda and modifications.
- E. Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
  - 1. Measured depths of foundations in relation to finish first floor datum.
  - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
  - 4. Field changes of dimension and detail.
  - 5. Details not on original Contract Drawings. Show number of all air handling units, VAV boxes, and fan coil units on the Record Drawings.
- F. Record Drawings and Specifications:
  - 1. Progress Records: During construction, keep a marked-up, up-to-date set of Drawings showing as-built conditions on the site as an accurate record of all deviations between Work as shown and Work as installed. As-builts will be reviewed/checked at weekly progress meetings.
  - 2. Final Records:
    - a. Upon completion of the Project, obtain from Owner a complete set of Contract Drawings. Expenses for reproduction shall be at no additional cost to Owner.
    - b. Incorporate on transparencies all changes noted on record set in black ink.
    - c. Work shall be performed by an experienced, competent technician.
    - d. Identify documents as "RECORD DRAWINGS."
  - 3. Record Drawings are required for this project and will be turned over to Owner prior to final payment.
  - 4. Owner requests "RECORD DRAWINGS" of electronic files in dwg and pdf format on CDs.
- G. Documents and Samples at the Site:
  - 1. Maintain at the site for Owner, one progress record copy of Drawings, Specifications, Addenda, Change Orders, and other Modifications in good order and marked currently to record changes and selection made during construction; additionally, maintain approved Shop Drawings, Product Data, Samples, and similar required submittals.
  - 2. These shall be available to Owner and delivered to Owner upon completion of the Work.

END OF SECTION

## SECTION 01 91 00

### COMMISSIONING

#### I. GENERAL

- A. The basic purpose of the commissioning process is to provide documented confirmation during Design and Construction that building systems design function in compliance with criteria set forth in the RPM Guidelines and Contract Documents to satisfy **Owner's** operational needs.
- B. The **Commissioning Authority** will provide:
  - 1. **Owner** with an unbiased, objective view of the system's installation, operational and performance. This is intended to provide **Owner** with a high level of assurance that mechanical and electrical systems have been installed in the prescribed manner and operate within the performance guidelines established by the Contract Documents.
  - 2. The **General Contractor** for construction of the facility with independent 3<sup>rd</sup> party documentation of construction completion for **Owner's** acceptance.
- C. This process is not to take away or reduce the responsibility of the system designers (**Architect/Engineer**) or installing contractors to provide a finished product. Commissioning is intended to enhance the quality of system installation, start-up and aid in the orderly transfer of systems to beneficial use by **Owner**.
- D. The **Commissioning Authority** will work closely with the construction team, cooperating and coordinating commissioning activities, especially Functional Performance Testing and Verification.

#### II. WORK DESCRIPTION

- A. General
  - 1. The Commissioning process is a joint team effort to ensure that all mechanical equipment, controls and systems function together properly to meet the design intent of the **Architect/Engineer** and to document system performance parameters for fine-tuning of control sequences and operation procedures.
- B. Commissioning Team
  - 1. The commissioning team shall be made up of the:
    - a. **Commissioning Authority**
    - b. Representative of **Owner**.
    - c. Design Consultants (**Architect/Engineer**).
    - d. Construction Trades including major equipment suppliers.
  - 2. The trades represented on the commissioning team will include:
    - a. **General Contractor**
    - b. Mechanical Contractor
    - c. Electrical Contractor
    - d. Building Management System Contractor

## SECTION 01 91 00

### COMMISSIONING

- e. Fire Alarm System Contractor
  - f. Test, Adjust and Balancing Agency
3. The lead tradesman for each trade who will actually perform or supervise the commissioning work is to be designated as the representative to the commissioning team.
  4. Responsibility for various steps of the commissioning process will be divided among the members of the commissioning team, as described in this section.

### III. DEFINITIONS

#### A. Definition of Terms:

1. **Installation Verification:** This initial portion of the Commissioning Process includes observations and punch-lists recorded and performed by the **Architect/Engineer** to ensure that all equipment is installed in accordance with the Specifications and Drawings.
2. **Pre-functional Testing:** This portion of the Commissioning Process involves primarily the test and balance and equipment startup personnel to ensure that individual pieces of equipment are capable of performing in accordance with the Specifications, Drawings and manufacturers' requirements. This documented with pre-functional checklist provided and completed by the **General Contractor**.
3. **Functional Performance testing:** This portion of the Commissioning Process involves dynamic tests that ensure that all mechanical, electrical and climate control systems function in accordance with design intent. The tests are dynamic and on-line and test the systems through all possible modes of operation.
4. **System Component or System Element:** A single piece of mechanical equipment such as a pump, fan, chiller boiler, coil, etc. that when combined together through piping or ductwork will comprise a "System".
5. **System:** A combination of system components that allow the manufacture or distribution of conditioned air or water from one location to another.

### IV. QUALIFICATIONS

- A. It is the intent of **Owner** to utilize and independent 3<sup>rd</sup> party who shall be contracted directly to **Owner** or through the **Architect/Engineer** as determined on a project-by-project basis.
- B. Experience
  1. The **Commissioning Authority** shall have a minimum of 2 years of contracted professional services experience specifically for mechanical, electrical, climate control and life safety system commissioning.

## SECTION 01 91 00

### COMMISSIONING

2. All Commissioning shall be under the supervision of a Nevada Professional Engineer employed in the local office, who will stamp the final commissioning report.
3. The **Commissioning Authority** shall be full member of the Building Commissioning Association.

#### V. COMMISSIONING RESPONSIBILITIES

- A. **Commissioning Authority** Responsibilities: The **Commissioning Authority** shall systematically test and document the functionality of the building environmental systems to insure that the performance meets the design intent and **Owner's** operational needs.

The following is a brief listing of the scope of work:

1. General Tasks:
  - a. Coordinate and manage the commissioning activities.
  - b. Schedule, agenda and attendees of commissioning process.
  - c. Coordinate directly with each Sub-Contractor with respect to their responsibility and contractual obligations as it relates to commissioning.
  - d. Obtain, assemble and submit commissioning documentation.
  - e. Attend periodic on-site commissioning activities.
2. Commissioning Documentation Development Tasks:
  - a. Develop the commissioning plan and schedule.
  - b. Incorporate detailed pre-functional check-off sheets and functional performance test procedures.
  - c. Coordinate locations of all required test ports required for testing and commissioning of the systems. Conduct and coordinate the installation verification inspections with the **Architect/Engineer**.
  - d. Prepare and submit the Commissioning Report.
  - e. Assemble and submit the final Commissioning Report.
3. Pre-Functional Testing Tasks:
  - a. Be present during portions of the Contractor start-up activities and pre-functional testing to assist and witness the execution of start-up.
  - b. Monitor the performance of the Test, Adjust and Balance Agency.
4. Functional Performance Testing Tasks:
  - a. Direct the functional performance testing. Provide testing of all systems to provide complete confidence in the systems. The tests will include the interaction between individual components', sub-systems and complete building systems under both normal and emergency power conditions.
  - b. Enforce system compliance and recommend modifications to the system design that will correct or enhance the system performance.
  - c. Coordinate **Owner's** witnessing of the tests.
  - d. Review the accuracy and calibration of any instrumentation utilized for the functional performance testing.
  - e. Track commissioning deficiencies until correction.

## SECTION 01 91 00

### COMMISSIONING

- f. Participate in the solutions of design concerns as discovered during the commissioning process or warranty period.
5. Life Safety Testing Tasks:
    - a. Test and clarify the duct smoke detectors are installed and performing within the manufacturers requirements. Provide testing sheets for each detector.
    - b. Test and certify the fire smoke/smoke dampers are installed and performing according to the design intent.
    - c. Test and certify the operation of the emergency generator.
- B. **Architect/Engineer** Responsibilities:
1. Provide a **Design Intent Document**. This document differs from traditional specifications in that it provides a more narrative description of the system or issue and “frames” the issues or building component with clear and useful background information. In general, specifications detail what is to be done on a component level, while design intent documentation explains why something is done and, in general terms, how design and operating objectives will be accomplished with an explanation of the ideas, concepts and criteria that are considered to be important to the project. It should cover the following:
    - a. General system description
    - b. Objectives and functional use of the system, equipment or facility
    - c. General quality of materials and construction
    - d. Applicable codes and standards
    - e. Occupancy requirements
    - f. Indoor environmental quality and conditions criteria
    - g. Outdoor conditions
    - h. Performance criteria
    - i. Energy performance
    - j. Ventilation strategies
    - k. Primary load and design assumptions
    - l. Diversity used in sizing
    - m. Equipment maintainability
    - n. Budget considerations and limitations
    - o. Restrictions and limitations of system or facility
  2. Provide the observations and checklists for the Installation Verification.
  3. Additional calculation and investigation of design adjustments needs by the **Architect/Engineer** as defined by the **Commissioning Authority**.
  4. Participate in the resolution of potential design concerns as discovered during the commissioning process and warranty period.
- C. **General Contractor** Responsibilities:
1. The **General Contractor** shall be responsible for the Pre-functional Testing, a start-up procedure performed prior to balancing.

## SECTION 01 91 00

### COMMISSIONING

2. The **General Contractor** shall be responsible for providing any technical personnel required for physical operation, testing and simulation of control sequences for each piece of controlled equipment as required by the **Commissioning Authority** during the Functional Performance Testing. This shall include chiller service personnel, boiler service personnel, the temperature control engineering and technical start-up crew, mechanical contracting service personnel for miscellaneous mechanical equipment and balancing agency personnel. To the extent possible, these personnel will be scheduled.
3. Additional calibration and adjustment of the mechanical equipment included in each mechanical system for proper operation under actual operation as defined by the **Commissioning Authority**.
4. Additional testing, calibration, adjustment, turning and minor adjustments to the temperature control system sequences for proper operation under actual operation as defined by the **Commissioning Authority**.

#### VI. SUBMITTALS

- A. Preliminary Commissioning Plan: Provide a complete preliminary commissioning plan including the following sections:
  1. Executive Summary: Provide a description of the Commissioning Manual
  2. Commissioning Team: Provide a listing of all commissioning team member including the names, addresses, and office/fax/cell phone number of **Owner D&C Representative**, **Commissioning Authority**, architect, mechanical engineer, electrical engineer, **General Contractor**, mechanical contractor, electrical contractor, control contractor, fire alarm system contractor and test & balance agency.
  3. System Overview: Provide a listing of all design parameters including design weather data and all mechanical system equipment data.
  4. Overview of Testing Program Procedures: Provide a detailed description of the testing plan and procedures that will be implemented during the commissioning process.
  5. Record Document- Sequences of Operation: Provide a detailed sequence of operation that is utilized for testing purposes. The final commissioning report shall describe any modifications to the engineer specified sequences of operation.
  6. Pre-Functional Testing Checklists: Provide pre-functional testing checklist forms to the contracting team for each individual piece of mechanical equipment. The forms shall describe all events required to fully start-up a piece of equipment.
  7. Functional Testing Procedures: Provide complete and detailed functional performance testing procedures required to fully test the entire system.
  8. Deficiencies and Issues log: Provide a blank log as an example.

## SECTION 01 91 00

### COMMISSIONING

9. Daily Log: Provide a blank log as an example.
10. Miscellaneous Data: Location for project correspondence.

#### VII. MEETINGS

- A. Scope Meetings: During Design and Contract Documents Phases, a commissioning scoping meeting involving all members of the commissioning team shall be held at a time and place designated by **Owner**. The purpose of the meeting will be to familiarize all parties with the requirements of the commissioning process and to ensure that the responsibilities of each party are clearly understood.
- B. Progress Meetings: During the construction portion of the project, the **Commissioning Authority** shall conduct monthly commissioning meetings during the initial 75% of the project construction. During the final 25% of the project construction, the **Commissioning Authority** shall conduct weekly meetings.

#### VIII. COMMISSIONING PROCESS

- A. General Requirements:
  1. All systems and system components shall be tested in presence of **Commissioning Authority** (and the Engineer if desired by the **Architect/Engineer**) to demonstrate compliance with specified requirements
  2. The **General Contractor** shall notify the **Commissioning Authority** fourteen (14) days prior to scheduled Functional Performance Tests, of the scheduled completion date of the Installation Verification and Pre-functional Testing.
  3. All elements of systems shall be tested to demonstrate that the total systems satisfy all requirements of these Specifications. Testing shall be accomplished on hierarchical basis. Test each piece of equipment for proper operation, followed by each subsystem, followed by entire system, followed by any inter-ties to the other major systems.
  4. All special testing materials and equipment shall be provided by **General Contractor**. This includes, but is not limited to proprietary equipment hand-held control parameter/setpoint adjustment tools and water/air flow balancing readout and adjustment tools.
- B. Test Procedure Development and Test Documentation:
  1. Within sixty (60) days prior to start-up of the mechanical system, the **Commissioning Authority** shall prepare and submit to the **Owner** D&C Representative and **Architect/Engineer** for review, descriptions of the test procedures which the **General Contractor** will perform to demonstrate conformance of completed mechanical systems to the Plans and Specifications.
  2. The decision of the **Commissioning Authority** and **Architect/Engineer** upon acceptability of test procedures shall be final. In the event of irresolvable conflict

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### COMMISSIONING

between decision of **Commissioning Authority** and **Architect/Engineer**, the **Architect/Engineer's** decision shall have precedence. However, in no case shall such decision excuse the **General Contractor** from fulfilling the requirements of commissioning as described in this Section.

#### C. Installation Verification Recommendations:

1. All systems and system components shall be checked and verified that they have been installed according to the Drawings and Specifications and that all connections have been made correctly.
2. Each system of interactive system components shall be observed and verified that it is ready to function as specified.
3. Verification of complete and proper installation shall be completed prior to starting Component Performance Tests.
4. The Installation Verification shall be documented in a checklist format for each system/piece of equipment. Each checklist shall be dated and initialed by the **Architect/Engineer**.

#### D. Pre-Functional Testing Requirements:

1. Each system component shall be checked for proper installation, shall be adjusted, and shall be calibrated to verify that it is ready to perform as specified.
2. All system components shall be checked to verify that they have been installed properly and that all connections have been made correctly. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence or other conditions which may cause damage.
3. Verify that test, meter readings and specific electrical characteristics agree with those required by equipment or system manufacturer.
4. All discrete elements and sub-systems of system components shall be adjusted and shall be checked for proper operation. Verify wiring and support components for equipment are complete and tested.
5. Verification of complete and proper installation shall be complete prior to starting Functional Performance Tests.
6. The Pre-functional Tests shall be documented in a checklist format for each system and each piece of equipment. Each checklist shall be dated and initialed by the **General Contractor**.

#### E. Functional Performance Testing requirements:

1. A Functional Performance Test shall be performed on each complete system. Each function shall be demonstrated to satisfaction of the **Commissioning Authority** on a paragraph-by-paragraph basis of the written test procedure, developed to

## SECTION 01 91 00

### COMMISSIONING

demonstrate conformance to requirements of contract Specifications and the Design Intent Document.

2. Each Functional Performance Test shall be witnessed and signed off by the **Commissioning Authority** and **General Contractor** (and **Owner** D&C Representative and **Architect/Engineer** if requested) upon satisfactory completion.
3. The Functional Performance Testing program shall be conducted in accordance with prior approved procedures and shall be documented as required hereinafter.
4. The **Commissioning Authority** shall notify **Owner**, the contracting team, the **Architect/Engineer** at least two (2) weeks prior to date of scheduled Functional Performance Tests. The schedule of the Functional Performance Tests shall be based on the construction completion schedule. Further communication to the **Owner**, **Architect/Engineer** concerning the Functional Performance Testing schedule and changes to that schedule due to construction delays or coordination conflicts shall not be required unless the noted parties have expressed an interest in writing in attending the testing.
5. Required Functional Testing:
  - a. Mechanical System Tasks: Verify that the total HVAC mechanical system is performing to provide conditions through all possible modes of operation as outlined in the Design Intent Document (provided by the **Architect/Engineer**) and the Contract Documents. The Functional Performance Testing procedures shall statistically represent all operating characteristics of all mechanical equipment and systems which shall include as applicable: chilled water/cooling systems, heating water/heating systems, air handling systems, terminal units, exhaust systems and domestic hot water heating systems.
  - b. Electrical System Tasks: Verify that all low voltage electrical systems are performing to provide conditions through all possible mode of operation as outlined in the Design Intent Document (provided by **Architect/Engineer**) and Contract Documents. The Functional Performance Testing Procedures shall statistically represent all operating characteristics of the systems which shall include as applicable: Power distribution circuiting review, lighting systems, data systems, clock/intercom systems, MATV systems and fire alarm systems.
  - c. Climate Control System Tasks: Verify that the building automation system control system is performing to provide conditions through all possible modes and sequences of operation as outlined in the Design Intent Document (provided by **Architect/Engineer**) and Contract Documents. The Functional Performance Testing procedures shall address all operating characteristics of a statistical representation of control system equipment, sequences and instrumentations calibration.
  - d. Life Safety System Tasks: Test and certify the duct smoke detectors are installed and performing within manufacturers requirements. Test and certify the fire/smoke dampers are installed and performing according to the design intent.

## IX. COMMISSIONING REPORTS

### A. Documentation- General:

## SECTION 01 91 00

### COMMISSIONING

1. The **Commissioning Authority** shall record and maintain detailed testing data. The data record shall be comprehensive and concise.
  2. All data must be recorded as soon as possible during the course of the testing.
  3. All documentation shall have the date, time and names of persons participating in the inspection and testing.
  4. All test instruments shall be documented for valid calibration.
  5. The recording work sheets, inspection checklists and performance testing plans must all be approved by the **Architect/Engineer** and **Commissioning Authority** prior to the start of Functional Performance Testing.
- B. Daily Commissioning Report Logs:
1. The **Commissioning Authority** shall provide daily report logs to be included in the final report.
  2. The daily logs shall record the **Commissioning Authority** personnel and event summaries of meetings, conversations, tests, failures, solutions, procedures and successes.
- C. Functional Performance Test plans, Tables and Checklists:
1. The **Commissioning Authority** shall prepare detailed test plans with associated checklists to organize and document the Functional performance Testing.
  2. A separate pre-functional checklist is required for each of the equipment/systems to be completed by the contractor prior to functional testing.
  3. Provide testing tables for large quantities of repetitive test events.
- D. Final Report:
1. The Commissioning Agent shall prepare and submit to **Owner** D&C Representative a final report in paper and electronic form after completion of the commissioning.
  2. The report shall verify performance of HVAC equipment and systems and include all daily reports, deficiencies and issues logs, completed functional testing forms, completed pre-functional testing checklists and miscellaneous documentation relating to the commissioning process.
  3. Document any field modifications to the testing process and why these modifications were made.

END OF SECTION

# SUBSTITUTION REQUEST

PROJECT: \_\_\_\_\_ REQUEST NO: \_\_\_\_\_  
TO: \_\_\_\_\_ FROM: \_\_\_\_\_  
\_\_\_\_\_ DATE: \_\_\_\_\_  
\_\_\_\_\_ PROJECT NO: \_\_\_\_\_

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Specification Section & Title: \_\_\_\_\_ Page: \_\_\_\_\_ Article/Paragraph: \_\_\_\_\_

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## PROPOSED SUBSTITUTION:

Manufacturer: \_\_\_\_\_ Address: \_\_\_\_\_ Phone No: \_\_\_\_\_

Trade Name: \_\_\_\_\_ Model No: \_\_\_\_\_

Installer: \_\_\_\_\_ Address: \_\_\_\_\_ Phone No: \_\_\_\_\_

History:  New product  2-5 years old  6-10 years old  More than 10 years old

Differences between proposed substitution and specified products: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Point-by-Point comparative data attached – **REQUIRED!**

Reason for not providing specified item: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Similar Installation:

Project: \_\_\_\_\_ Architect: \_\_\_\_\_ Phone No: \_\_\_\_\_

Address: \_\_\_\_\_ Owner: \_\_\_\_\_ Phone No: \_\_\_\_\_

Date Installed: \_\_\_\_\_

Proposed substitution affects other parts of the Work:  No  Yes; explain: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Savings to Owner for accepting substitution: \_\_\_\_\_ (\$ \_\_\_\_\_ )

Proposed substitution changes Contract Time:  No  Yes; Add/Deduct: \_\_\_\_\_ days.

Support Data Attached:  Product Data  Drawings  Tests  Report  Samples

Other: \_\_\_\_\_

**Undersigned Certifies:**

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable is available.
- Proposed substitution will not affect or delay Progress Schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution, which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including architectural or engineering design, detailing, and construction costs caused by the requested substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: \_\_\_\_\_

Signature: \_\_\_\_\_

Firm: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone No: \_\_\_\_\_

Fax No: \_\_\_\_\_

Attachments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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**ARCHITECT'S REVIEW AND ACTION:**

- Substitution Approved - Make submittals in accordance with Specification Section 01 30 00.
- Substitution Approved As Noted - Make submittals in accordance with Specification Section 01 30 00.
- Substitution Rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: \_\_\_\_\_

Date: \_\_\_\_\_

Additional Comments by: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Incomplete form and attachments will result in rejection of request.**

