

SECTION 01 1000 SUMMARY

PART 1 GENERAL

1.01 WORK BY OWNER

- A. Items noted NIC (Not in Contract) will be supplied and installed by Owner before Date of Substantial Completion. Some items include:
 - 1. Furnishings.
 - 2. Equipment.
 - 3. Artwork.
 - 4. Low Voltage Cabling, unless directed otherwise..
 - 5. Security Equipment.
- B. Owner will supply and install the following:
 - 1. See attached Responsibility Matrix.
- C. Owner will supply the following for installation by Construction Manager:
 - 1. See attached Responsibility Matrix.

1.02 OWNER OCCUPANCY

- A. Owner intends to continue to occupy adjacent portions of the existing building during the entire construction period.
- B. Owner intends to occupy the Project upon Substantial Completion.
- C. Owner intends to occupy a certain portion of the Project prior to the completion date for the conduct of normal operations.
- D. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- E. Schedule the Work to accommodate Owner occupancy.

1.03 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings.
- B. Arrange use of site and premises to allow:
 - 1. Owner occupancy.
 - 2. Work by Others.
 - 3. Work by Owner.
- C. Provide access to and from site as required by law and by Owner:
 - 1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
 - 2. Do not obstruct roadways, sidewalks, or other public ways without permit.
- D. Time Restrictions:
 - 1. Limit conduct of the hours of [7am - 4pm] at Hospital and In-Patient sites.
 - 2. Limit conduct of the hours of 6pm - 6am at Ambulatory and Administrative sites.
 - 3. Each project may have specific times that will be off limits to work, prior to start of construction, verify with the Planning, Design and Construction PM specific hours available for construction activities.
- E. Utility Outages and Shutdown:
 - 1. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without written notice to Owner and authorities having jurisdiction.
 - a. Coordinate with Spectrum Project Manager System Shutdown Request Form
 - 2. Limit shutdown of utility services to 2 hours at a time, arranged at in advance with Owner.
 - 3. Minimum notification required:
 - a. Chilled, condenser, domestic cold, domestic hot water require minimum 3 working day notice

- b. Electrical Services require minimum 10 working day notice,
 - c. Vacuum Systems require minimum 10 working day notice.
 - d. Fire Alarm, Suppression/Sprinkler, and Protection/Suppression require minimum 3 working day notice and approval of Security Supervisor.
 - e. HVAC, Natural Gas, SanitarySewer, and Steam systems require minimum 5 working day notice.
 - f. Medical Gases (Nitrogen, Oxygen, Nitrous Oxide) require minimum 10 working day notice.
4. Prevent accidental disruption of utility services to other facilities.

END OF SECTION 01 1000

**SECTION 01 2000
PRICE AND PAYMENT PROCEDURES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedures for preparation and submittal of applications for progress payments.

1.02 RELATED REQUIREMENTS

- A. Section 00 5000 - Contracting Forms and Supplements: Forms to be used.

1.03 SCHEDULE OF VALUES

- A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.
- B. Forms filled out by hand will not be accepted.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Contract Document. Refer to General Conditions, Article 13, Section 13.01..
- B. Conform with all requirements of Subsection 13.02 of the General Conditions.
- C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- D. Forms filled out by hand will not be accepted.
- E. Execute certification by signature of authorized officer.
- F. Submit one electronic and ____ zero hard-copies of each Application for Payment.

1.05 MODIFICATION PROCEDURES

- A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Owner will issue instructions directly to Contractor.
- B. For changes for which advance pricing is desired, Owner will request, and Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Construction Manager shall prepare and submit a fixed price quotation within 7 days.
 - 1. Architect will notify Owner in writing within 48 hours of anticipated cost changes to Architect Fees due to requested change orders.
 - 2. Architect's additional service fees to be based on Hourly Rate Schedule submitted with Bid Proposal.
- C. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
 - 1. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Owner. Refer to Section 12.01.C of the General Conditions.
 - 2. For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices. Refer to Section 12.02.B.2 of the General Conditions.
- D. Substantiation of Costs: Provide full information required for evaluation.
 - 1. Provide the following data:
 - a. Quantities of products, labor, and equipment.
 - b. Justification for any change in Contract Time.
 - c. Credit for deletions from Contract, similarly documented.
 - 2. Support each claim for additional costs with additional information:
 - a. Origin and date of claim.

- b. Dates and times work was performed, and by whom.
- E. Execution of Change Orders: Owner will issue Change Orders for signatures of parties as provided in the Terms and Conditions of the Contract.
- F. After execution of Change Order, promptly revise Sworn Statement and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- G. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
- H. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- B. Application for Final Payment will not be considered until the following have been accomplished:
 - 1. All closeout procedures specified in Section 01 7000.

END OF SECTION 01 2000

SECTION 01 2100 ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cash allowances.
- B. Contingency allowance.

1.02 CASH ALLOWANCES

- A. Costs Included in Cash Allowances: Cost of product to Construction Manager or subcontractor, less applicable trade discounts, less cost of delivery to site , less applicable taxes .
- B. Differences in costs will be adjusted by Change Order.

1.03 CONTINGENCY ALLOWANCE

- A. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Contingency Allowance.
- B. Funds will be drawn from the Contingency Allowance only by Change Order.
- C. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

1.04 ALLOWANCES SCHEDULE

- A. Allowances (if required) are detailed in Schedule of Values and Project Narrative.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2100

**SECTION 01 2200
UNIT PRICES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. List of unit prices, for use in preparing Bids.
- B. Measurement and payment criteria applicable to Work performed under a unit price payment method.

1.02 COSTS INCLUDED

- A. Unit Prices included on the Bid Form shall include full compensation for all required labor, materials, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; changes to fee and general requirements; overhead and profit.

1.03 UNIT QUANTITIES SPECIFIED

- A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.04 MEASUREMENT OF QUANTITIES

- A. Take all measurements and compute quantities. Measurements and quantities will be verified by Architect.
- B. Assist by providing necessary equipment, workers, and survey personnel as required.

1.05 PAYMENT

- A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.
- B. Payment will not be made for any of the following:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products placed beyond the lines and levels of the required Work.
 - 3. Products remaining on hand after completion of the Work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2200

**SECTION 01 2300
ALTERNATES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Description of Alternates.

1.02 ACCEPTANCE OF ALTERNATES

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option.
Accepted Alternates will be identified in the WAC Agreement.
- B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.
- C. Contractors may recommend voluntary alternates and identify them on the bid form.
- D. Alternates to include all labor, material, equipment costs, staffing costs, general requirements, fees, and overhead and profit.

1.03 SCHEDULE OF ALTERNATES

- A. See Bid Form Exhibits.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2300

**SECTION 01 2500
SUBSTITUTION PROCEDURES**

PART 1 GENERAL - NOT USED

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension that may subsequently become apparent.
- B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
- C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
- D. Limit each request to a single proposed substitution item.

3.02 RESOLUTION

3.03 ACCEPTANCE

END OF SECTION 01 2500

**SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Electronic document submittal service.
- B. Preconstruction meeting.
- C. Site mobilization meeting.
- D. Progress meetings.
- E. Construction progress schedule.
- F. Progress photographs.
- G. Submittals for review, information, and project closeout.
- H. Number of copies of submittals.
- I. Submittal procedures.

1.02 RELATED REQUIREMENTS

- A. Document 00 0102 - Project Information:

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

- A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
 - 1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Construction Manager's correction punchlist, and any other document any participant wishes to make part of the project record.
 - 2. Construction Manager and Architect are required to use this service.
 - 3. It is Construction Manager's responsibility to submit documents in allowable format.
 - 4. Subcontractors, suppliers, and Architect's consultants will be permitted to use the service at no extra charge.
 - 5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
 - 6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
 - 7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.
- B. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Construction Manager participating; further training is the responsibility of the user of the service.
- C. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

3.02 PRECONSTRUCTION MEETING

- A. Attendance Required:

1. Owner.
 2. Architect.
 3. Construction Manager.
 4. Major Subcontractors.
- B. Agenda:
1. Corewell Health has a standard Pre-Construction Meeting agenda that will be utilized for this meeting. Items include but are not limited to:
 - a. Execution of Owner-Construction Manager Agreement.
 - b. Submission of insurance certificates.
 - c. Distribution of Contract Documents.
 - d. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
 - e. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - f. Scheduling.
- C. Contractor to Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.03 SITE MOBILIZATION MEETING

- A. Attendance Required:
1. Construction Manager.
 2. Owner.
 3. Architect.
 4. Construction Manager's superintendent.
 5. Major subcontractors.
- B. Agenda:
1. Use of premises by Owner and Construction Manager.
 2. Owner's requirements.
 3. Construction facilities and controls provided by Owner.
 4. Temporary utilities provided by Owner.
 5. Survey and building layout.
 6. Security and housekeeping procedures.
 7. Schedules.
 8. Application for payment procedures.
 9. Procedures for testing.
 10. Procedures for maintaining record documents.
 11. Requirements for start-up of equipment.
 12. Inspection and acceptance of equipment put into service during construction period.
- C. Contractor to Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

- A. Attendance Required:
1. Construction Manager.
 2. Owner.
 3. Architect.
 4. Construction Manager's superintendent.
 5. Major subcontractors.
- B. Agenda:
1. Review minutes of previous meetings.

2. Project Safety
 3. Review of work progress.
 4. Field observations, problems, and decisions.
 5. Identification of problems that impede, or will impede, planned progress.
 6. Review of submittals schedule, submittal log, and status of submittals.
 7. Maintenance of progress schedule.
 8. Corrective measures to regain projected schedules.
 9. Planned progress during succeeding work period.
 10. Maintenance of quality and work standards.
 11. Effect of proposed changes on progress schedule and coordination.
 12. Maintenance of Record Drawings.
 13. Other business relating to work.
- C. Contractor to Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.05 CONSTRUCTION PROGRESS SCHEDULE

- A. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- B. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- C. Within 10 days after joint review, submit complete schedule.
- D. Submit updated schedule every 30 days with every pay application. Schedule to show project base line with percentage complete. Note date of building enclosure, other major milestones, and open for business date.

3.06 PROGRESS PHOTOGRAPHS

- A. Photography Type: Digital; electronic files.
- B. In addition to periodic, recurring views, take photographs of each of the following events:
 1. Pre-construction, document existing conditions prior to demolition or start of construction.
 2. Completion of site clearing.
 3. Excavations in progress.
 4. Foundations in progress and upon completion.
 5. Structural framing in progress and upon completion.
 6. Enclosure of building, upon completion.
 7. Final completion, minimum of ten (10) photos.
- C. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
 1. Delivery Medium: Via email.
 2. File Naming: Include project identification, date and time of view, and view identification.
 3. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.

3.07 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 1. Product data.
 2. Shop drawings.
 3. Samples for selection.
 4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

- C. Samples will be reviewed for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.
- E. Keep active and up to date submittal log at project site. Log to reviewed and approved at progress meetings.
- F. See also requirements from the General Conditions Section 11.02.E.

3.08 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 - 1. Design data.
 - 2. Certificates.
 - 3. Test reports.
 - 4. Inspection reports.
 - 5. Manufacturer's instructions.
 - 6. Manufacturer's field reports.
 - 7. Other types indicated.
- B. Submit for Architect's knowledge as contract administrator or for Owner.

3.09 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Submit Correction Punch List for Substantial Completion.
- B. Submit Final Correction Punch List for Substantial Completion.
- C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
 - 1. Project record documents.
 - 2. Operation and maintenance data.
 - 3. Warranties.
 - 4. Other types as indicated.
 - 5. Refer to General Conditions Section 14.03.C.
- D. Submit for Owner's benefit during and after project completion.

3.10 NUMBER OF COPIES OF SUBMITTALS

- A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
 - 1. After review, produce duplicates.
 - 2. Retained samples will not be returned to Construction Manager unless specifically so stated.

3.11 SUBMITTAL PROCEDURES

- A. General Requirements:
 - 1. Use a separate transmittal for each item.
 - 2. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
 - 3. Identify: Project; Construction Manager; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
 - 4. Apply Construction Manager's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
 - 5. Schedule submittals to expedite the Project, and coordinate submission of related items.

- a. For each submittal for review, allow 15 days excluding delivery time to and from the Construction Manager.
- 6. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
- 7. Provide space for Construction Manager and Architect review stamps.
- 8. When revised for resubmission, identify all changes made since previous submission.
- 9. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
- 10. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
- 11. Submittals not requested will not be recognized or processed.
- B. Product Data Procedures:
 - 1. Submit only information required by individual specification sections.
 - 2. Collect required information into a single submittal.
 - 3. Do not submit (Material) Safety Data Sheets for materials or products.
- C. Shop Drawing Procedures:
 - 1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
 - 2. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

3.12 SUBMITTAL REVIEW

- A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.
- B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.
- C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
- D. Architect's and consultants' actions on items submitted for review:
 - 1. Authorizing purchasing, fabrication, delivery, and installation:
 - a. "Approved", or language with same legal meaning.
 - b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
 - 1) At Construction Manager's option, submit corrected item, with review notations acknowledged and incorporated.
 - c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
 - 2. Not Authorizing fabrication, delivery, and installation:
- E. Architect's and consultants' actions on items submitted for information:
 - 1. Items for which no action was taken:
 - a. "Received" - to notify the Construction Manager that the submittal has been received for record only.
 - 2. Items for which action was taken:
 - a. "Reviewed" - no further action is required from Construction Manager.

END OF SECTION 01 3000

**SECTION 01 3523
OWNER SAFETY REQUIREMENTS**

PART 1 INTRODUCTION

1.01 INTRODUCTION

- A. The personal safety and health of each contractor, patient, family member, staff, and general public of our Organization is of primary importance. We believe that those individuals are our most important assets and that their safety in and around our facilities is our greatest responsibility. The prevention of occupationally induced injuries and illnesses is of such consequence that it will be given precedence over operating productivity whenever necessary. Leadership and Management will provide all mechanical and physical facilities required for the personal safety and health of each of its employees.
- B. To be successful, such a program must embody the proper attitude toward injury and illness prevention on the part of corporate management, supervisors, and employees. It also requires cooperation in all safety and health matters, not only between corporate management, supervisor and employees, but also between each employee and their fellow workers.
- C. Our concern for safety and health of all human beings is daily, even hourly. We expect every person who conducts the affairs of our organization, no matter what capacity they function in, to accept this concern and its responsibility. Contractors as well as employees are expected to use the safety equipment provided. Rules of conduct and rules of safety and health must be observed. Safety equipment cannot be abused, destroyed or ignored.
- D. Cooperation between Construction Manager's and Subcontractor's employees and management in the observance of these guidelines will ensure safe-working conditions, will help result in accident-free performance and will work to our mutual advantage. It will also assist in reducing workers' compensation costs (direct costs) and reduce jobsite down time, material loss and regulatory agency fines (indirect costs).
- E. Contractors are expected to take the authority to procure the necessary resources to execute the expectations of our organizations safety and health objectives. We will hold our contractor's managers, supervisors and employees accountable for meeting their responsibilities so that essential tasks will be performed.

1.02 COREWELL HEALTH FACILITIES SAFETY GOAL

- A. Safety is an essential component of construction work at Corewell Health. It is a key contractual responsibility for those managing and performing such work and an important determinant of overall project success. Corewell Health believes that effective contractor safety programs enhance projects by assisting contractors to systematically identify and evaluate anticipated hazards and establish controls in advance of actual work. While the obvious purpose of a contractor safety program is to reduce on-the-job injuries and illnesses to the greatest extent possible and to insure compliance with all workplace safety standards, the interactions developed through these programs can also bring collateral benefits in the form of improved quality, communication, documentation, and cost savings.

1.03 SCOPE OF DOCUMENT

- A. To establish guidelines and specific instructions for all contractors and staff working at Corewell Health, that they will abide by for the protection of patients, employees, the general public and contractors' personnel. These instructions apply to all construction and renovation projects, including data and telecom cabling installation. The contractor remains solely responsible for the safety of all persons and property, and must take whatever steps necessary or appropriate to assure that safety. This document provides contractors with Corewell Health specific requirements to incorporate into their safety programs and implement pursuant to their contracts for work to be performed at Corewell Health. This document is not designed to address every possible safety or health issue. No specific requirement given herein are intended to limit, replace or supersede application provisions of federal, state, and municipal safety laws.

PART 2 SAFETY MANAGEMENT SYSTEMS

2.01 CONTRACTOR PREQUALIFICATION

- A. Corewell Health has established requirements to contractor safety. Corewell Health requires an EMR of 1.0 or less and also evaluates other safety performance criteria.
 - 1. Information and prequalification forms can be obtained by submitting a request to Corewell Health Planning, Design and Construction Project Manager. The contractor is responsible to prequalify all subcontractors/trade contractors engaged on a project per their own written prequalification process.

2.02 CONTRACTOR SAFETY REPRESENTATIVE

- A. For all projects, a designated project safety representative (PSR) or project safety manager shall be on site at all times while work is being performed as defined by OSHA 1926. The minimum qualifications for the project safety representative or project safety manager are as follows:
- B. Project Safety Representative
 - 1. The designated project safety representative shall have completed an authorized 30 hour OSHA Construction Safety Course (MIOSHA Training Institute Level 1 construction certification is also acceptable) and have current CPR/First Aid Training from a nationally recognized program. Except in instances where the contract calls for a dedicated safety manager (see below), this employee may also function as a superintendent, foreman or crew leader on the Project.
 - 2. The general contractor/construction manager must identify their on-site project safety representative prior to the commencement of any work and provide evidence to Corewell Health this employee meets the minimum requirement listed above. No work is to be performed on site when a project safety representative is not present. The general contractor/construction manager shall provide notification to Corewell Health of any changes in the designation of a project safety representative .
 - 3. In addition to the general contractor's/construction manager's project safety representative , a project safety representative shall be assigned to each subcontractor/trade contractor crew requiring the supervision of a foreman or crew leader. This project safety representative will typically be an employee of the subcontractor/trade contractor. This employee may also function as the subcontractor/trade contractor's superintendent, foreman, or crew leader on the project.
- C. Project Safety Manager
 - 1. A dedicated, full-time project safety manager may be a contractual requirement on large projects or projects deemed by Corewell Health to be particularly high risk. This would be in lieu of a general contractor/construction manager's project safety representative . This person shall not have any other assigned duties. The following are the minimum qualifications and selection criteria for the project safety manager:
 - a. Training Requirements of:
 - 1) -Certified Safety Professional (CSP), Certified Industrial Hygienist (CIH), or
 - 2) -Have completed an authorized 30 hour OSHA Construction Safety Course (MIOSHA Training Institute Level I construction certification is also acceptable) and possess the additional training, years of experience, and skills necessary to thoroughly understand the health and safety hazards and controls for large construction projects, including the full scope of the specific work;
 - (a) Project Safety Manager candidates must be interviewed by Corewell Health's Construction Project Manager, and/or Sp the project team to confirm experience, training, and comfort with the project's expectations and requirements.
 - b. A detailed job description that outlines the responsibilities and authority for the project safety representative and/or project safety manager shall be made available upon request. The job description should include the following items, as applicable.
 - 1) Enforce compliance with project-specific safety plan

- 2) Project-specific orientation
- 3) Job hazard analyses (JHA's)
- 4) Accident investigation
- 5) Attendance at progress meetings
- 6) Documented safety inspections
2. Corewell Health reserves the right to request that the general contractor/construction manager replace any safety representative at any time during the project.
3. Invitation to bid will specify if Project Safety Manager is required.

2.03 MONTHLY SAFETY REPORTS

- A. The general contractor/construction manager shall prepare and submit a project-specific monthly safety report to the Corewell Health Project Manager with the monthly submission of the Pay Application. The form should be signed by the contractor project director/manager and contractor superintendent. This is in addition to the normal reporting and recordkeeping requirements on the project. The monthly safety report shall report current month data, year-to-date data, and project to-date data for the following items:
 1. Number of cases and rates for OSHA recordable incidents, lost work incidents, near misses and other incidents (including but not limited to first-aid only case, fire, and property damage). Near misses are defined as safety incidents with the potential for serious injury or fatality.
 2. Average daily number of employees and total hours worked by employees.
 3. Project safety activity counts for orientations completed, safety huddles/talks, safety inspections, disciplinary actions, and fire, spill or other emergencies.
 4. Number of OSHA recordable injuries broken into the category of falls, electrical, struck by, or struck against and the number of illnesses. More detail regarding the recordable incidents is also requested in a summary paragraph form.
 5. Number of MIOSHA Citations received on the project broken down by serious, repeat and willful. Near misses are defined as safety incidents with the potential for serious injury or fatality.

2.04 COMMUNICATION

- A. Contractor Orientation
 1. On Corewell Health projects, all workers are required to complete the Corewell Health Contractor Orientation.
 2. The general contractor/construction manager is required to develop a project-specific safety orientation for all workers, including subcontractors/trade contractors and other individuals performing work at the site. Orientation training shall address all components identified in the project-specific plan. The orientation must be completed prior to allowing workers to start on-site.
- B. Pre-Construction Safety Meeting
 1. Prior to starting work on any Corewell Health project, the general contractor/construction manager must lead a pre-construction safety meeting. The meeting shall include the general contractor/construction manager's field supervisory staff that will be primarily responsible for management of workers and crafts, supervisory personnel from major subcontractors/trade contractors, and the Corewell Health Construction Project Manager. The primary purpose of this meeting is to introduce the general contractor's/construction manager's supervisory personnel, subcontractors/trade contractors and the Corewell Health Project Manager to the general contractor's/construction manager's project-specific safety plan and to have the general contractor/construction manager demonstrate an understanding of the project conditions and safety requirements.
 2. A schedule for regular progress meetings shall be established at this meeting. Since safety is a critical part of this meeting, the project safety representative or project safety manager shall attend these meetings.
- C. Project Safety Communication

1. The general contractor/construction manager is required to implement a policy for ongoing safety communication during the project. It is essential to keep safety in the forefront by communicating the importance of safety on a regular basis. This may be accomplished through regular site safety assessments, the use of daily safety huddles, toolbox meetings, and/or other such initiatives.
- D. Corewell Health Daily Check In (DCI)
 1. At the request of Corewell Health's Facilities representative, the general contractor/construction manager may be required to participate in Corewell Health DCI meetings in order to address sensitive populations or areas on the hospital campuses. The DCI meetings are generally led by Corewell Health leadership and are attended by clinical staff from various departments throughout the hospital. At such meeting, the general contractor/construction manager may be asked to respond to safety and operational issues that arise on projects and may be expected to (1) provide brief description of their planned work; and (2) provide other information as may be appropriate for the project.

2.05 JOB SAFETY BOARD

- A. The general contractor/construction manager shall post and maintain a job safety board at the project site in a conspicuous location that is accessible to the subcontractors/trade contractors, workers and other personnel arriving at or entering the project site. The general contractor/construction manager shall notify all persons working on the project site of the location of the job safety board. At a minimum, the board shall provide the following information;
 1. Basic project information
 2. Corewell Health Safety Guidelines
 3. MIOSHA poster
 4. General contractor/Construction Manager names and contact numbers for key personnel and subcontractors/trade contractors
 5. Emergency procedures and contact numbers
 6. Location of project related safety data sheets
 7. Notices for upcoming job and safety meetings
 8. Location of accident report forms
 9. Monthly summary of recordable injuries/illnesses, lost time and total recordable rates, near miss incidents
 10. Location of first aid stations

2.06 COREWELL HEALTH CONSTRUCTION SITE BOARD

- A. If determined by Corewell Health's Construction Project Manager that an owners construction site board is required, one will be temporarily installed by the CPM at the project site either by means of fastening to wall surface, temporary door or by hanging on existing door. The sign will be provided by Corewell Health. The following information will be provided at these site boards.
 1. 100% Hard Hat & Safety Glass Area
 2. Notice of Commencement
 3. Interim Life Safety Measures (ILSM) Daily On-Site Check List
 4. Burn Permit (Issued Daily as required)
 5. Corewell Health issued Work Permit (All projects within existing or occupied facilities)
 6. Building Permit Site Card
 7. Infection Control Construction Permit
 8. Emergency Contact List and Negative Air Check Sheet

2.07 PROJECT SPECIFIC SAFETY PLAN OVERVIEW

- A. General contractors/construction managers must develop, communicate, and implement a written project-specific safety plan ("Plan"). The goal of the Plan is to assist general contractors/construction managers in meeting their responsibilities to provide a safe work environment and to aid in developing a program to eliminate accidents, injuries, and property damage.
- B. Although the specific elements of each Plan will vary by the work or services to be provided, project size, complexity, and location, at a minimum, the Plan must adequately address all requirements (if applicable to the general contractor's/construction manager's work). The Plan must also identify foreseeable project-specific hazards and list the general contractor's/construction manager's mitigation and control of such hazards. Such the Plan is meant to be a living document, general contractors/construction managers are to amend the Plan to address any new hazards that were not addressed in the initial Plan but later identified during the course of performing work at Corewell Health. This Plan is required to be followed by all subcontractor/trade contractors as well.
- C. Each plan should be signed by a site safety representative designated by Corewell Health to certify that it fully complies with all Corewell Health Construction Safety Requirements as referenced in this document. The Safety Plan Certification form should be used and included in the site specific project manual.
- D. The following list of elements of a project-specific safety plan is provided to assist the general contractor/construction manager. The Plan may include only elements that are necessary for the given project and do not need to comply with this particular format.
 - 1. Above Ceiling Permits (**Under Development**)
 - 2. Accountability Plan
 - 3. Asbestos
 - 4. Audits/Inspections
 - 5. Blood Borne Pathogens/Exposures
 - 6. Cell Phone Usage
 - 7. Confined Space Entry
 - 8. Containment Requirements
 - 9. Contractor Work Permits
 - 10. Control of Hazardous Energy Sources
 - 11. Crane Operations
 - 12. Dust Mitigation
 - 13. Electrical - Temporary
 - 14. Emergency Action Plan
 - 15. Emergency Shutoff/Systems Shutdown
 - 16. Equipment Safety
 - 17. Fall Protection
 - 18. Fire Prevention and Protection
 - 19. Fire Protection/Fire Alarm Systems
 - 20. Food and Drink
 - 21. Green Cleaning Policy
 - 22. Hazardous Communication Program (Right to Know) Safety Data Sheets (SDS)
 - 23. Hazardous Material Spill Response
 - 24. Hospital Approved Disinfectants
 - 25. Hot Work
 - 26. Housekeeping
 - 27. ID Badging
 - 28. Illness/Disease
 - 29. Infection Prevention
 - 30. Interim Life Safety Measures (ILSM)

31. Job Hazard Analysis (JHA)
32. Jobsite Inspections
33. Parking
34. Personal Protective Equipment (PPE)
35. Potentially Hazardous Exhaust Systems
36. Recordkeeping and Incident Reporting
37. Refrigerant Recovery, Recycling and Reclamation
38. Reportable Events
39. Rooftop Access
40. Safety Rules
41. Substance Abuse
42. Tobacco/Smoking
43. Tools
44. Utility Work
45. Visitors

PART 3 SPECTRUM HEALTH ADDITIONS FOR PROJECT-SPECIFIC SAFETY PLAN

3.01 ABOVE CEILING PERMITS (UNDER DEVELOPMENT)

- A. ~~Contractors working at Corewell Health must obtain an above ceiling permit from a facilities representative and the Facilities Department prior to accessing any ceiling in the hospital. If using containment or HEPA filtration for above ceiling work, contractors must ensure that containment units are flush with ceiling.~~

3.02 ACCOUNTABILITY PLAN

- A. The purpose of the accountability plan is to provide all contractors and its employee's guidelines for enforcement of safety rules, policies, procedures and directives from Corewell Health.
- B. Contractors and its employees will be subject to disciplinary action for violations of safety rules. Such action may include any one or more of the following depending on the severity of the violation:
 1. Employees shall be afforded instructive counseling and/or training to assure a clear understanding of the infraction and the proper conduct under Corewell Health guidelines. However, nothing in Corewell Health's policy or this safety manual will preclude the termination of a contractor and/or their employees for a safety violation. **This is not a progressive disciplinary system and any safety violation may lead to a contractor and/or their employee's termination without prior instruction or warning.**
 2. Verbal warning with documentation.
 3. Written warning outlining the nature of offense and necessary corrective action with documentation.
 4. Disciplinary suspension with documentation.
 5. Termination or Banishment from all Corewell Health project sites into the future.
- C. Contractors, including management and supervisory personnel, shall be subject to disciplinary action for the following reasons:
 1. Repeated safety rule violations by their on-site employees.
 2. Failure to provide adequate training prior to job assignment.
 3. Failure to report accidents and provide medical attention to their employees injured at work.
 4. Failure to control unsafe conditions or work practices reported by on-site employees or by site observations.
 5. Failure to adhere to Tobacco/Smoking and Substance Abuse policies.
 6. Failure to adhere to other policies and clauses reference in this section.

3.03 ASBESTOS

- A. Unless clearly prescribed as part of the work scope, the contractor must not disturb any asbestos-containing material, and must coordinate any asbestos work with the Corewell Health Project Manager and must follow Corewell Health's written Asbestos Handling Policy.
 - 1. When presumed asbestos containing material is found all work must be stopped and the material tested.
 - 2. All presumed asbestos containing material must be labeled. The Corewell Health Project Manager shall be contacted to schedule a certified abatement contractor to initiate testing. If testing the material shows that it contains asbestos, a certified abatement company will be hired to remove the asbestos if deemed appropriate.
 - 3. All work must meet State of Michigan asbestos guidelines.
 - 4. No asbestos will be stored on Corewell Health property.
 - 5. All records for asbestos activity and abatement must be provided to the Corewell Health Plant Operations Manager for the Hospital and retained for life.
 - 6. Floor tiles containing asbestos must not be sanded. Stripping of unwaxed or unfinished floor tiles that contain or are presumed to contain asbestos is prohibited.
 - 7. Limited damage to pipe covering can be repaired by a certified abatement contractor after isolation of the area.

3.04 AUDITS/INSPECTIONS

- A. The general contractor/construction manager shall conduct and document regular safety inspections (minimum of informal daily and formal weekly) of their work areas and those of their subcontractors/trade contractors. Documentation of inspections shall be readily available for review on the project site. The general contractor/construction manager will immediately correct any hazardous or otherwise noncompliant conditions identified and maintain documentation of the corrective action. In addition to the regular inspections indicated above, a documented audit conducted by Corewell Health facilities representatives shall be done at least once per month.
 - 1. Reference MIOSHA Job Safety Checklist (www.michigan.gov/lara) for documentation standards.

3.05 BLOOD BORNE PATHOGENS/EXPOSURES

- A. Biological hazards or containers that store biohazard items such as needles or sharps must be removed by Corewell Health personnel (or designated contracted service) only. If construction personnel find a biohazard container or biohazard material in a construction site, they must contact Corewell Health's Project Manager for proper handling and removal. It is expected that contractors will have a low risk of exposure to blood or body fluids during work at Corewell Health, but evaluation may be necessary for contractors selected to work in high risk/special care areas. In the unlikely event that a contractor is stuck with a needle or contaminated sharps, immediately contact Infection Control at (616) 391-1407.

3.06 CELL PHONE USAGE

- A. The general contractor/construction manager shall have a cell phone policy with an objective of prohibiting jobsite cell phone usage except as necessary for the performance of work tasks. At a minimum, the policy shall address the following:
 - 1. Cell phone policy should match Corewell Health's Policy.
 - 2. Cell phone for business use related to the project is acceptable.
 - 3. Designated "safe zones" for general use of cell phones by workers.
 - 4. A "No Walking While Talking" policy for work task related cell phone usage.
 - 5. When a cell phone is part of an operation requiring a Job Hazard Analysis, the use of the cell phone shall be specifically detailed in the analysis. The site cell phone policy shall be prominently posted on the Job Safety Board.

3.07 CONFINED SPACE ENTRY

- A. In the event that it's necessary to enter a confined space that does require a permit, only certified contractors who adhere to confined space standards are allowed to enter the confined space. Contractor must coordinate entry into confined spaces with Corewell Health's Project Manager and Corewell Health Plant Operations and must follow Corewell Health's written policy and CFR 1910.146 (MIOSHA Part 90) on Confined Space Entry. It is the contractor's obligation to ensure that his/her employees are provided with required information and training and that Plant Operations is informed of the permit space entry program used by the contractor prior to entry.
 - 1. A permit will be filled out by the contractor per CFR1910.146 (MIOSHA par 790) Appendix D-1, and reviewed by the aligned supervisor. This permit will be valid for one day. The permit shall be posted at the entrance to the confined space area throughout the duration of the entry.
 - 2. The contractor shall isolate all sources of energy in accordance with lockout/tag out procedures and ensure that no hazards are present to employees in the area and also isolate pipelines entering the space by acceptable means.
 - 3. The contractor shall verify that conditions in the confined space are acceptable for entry and required safety measures applicable to the confined space area (i.e., lockout, etc.) have been met.
 - 4. The contractor shall ensure safety equipment is available and used as applicable.
 - 5. The contractor shall ensure that conditions are tested to determine if acceptable entry conditions exist prior to entry. Monitoring must be completed during entry to ensure acceptable entry conditions are maintained. Atmospheric conditions shall be tested in accordance with permissible exposure levels.

3.08 CONTAINMENT REQUIREMENTS

- A. Contractor must use containments with separate ante rooms for work areas where required. Containments with HEPA filtration must be used in all patient care areas. Negative air must also be used and monitored when indicated. Mobile containment units must extend to existing ceiling and must be properly sealed.

3.09 CONTRACTOR WORK PERMITS

- A. All work performed by contractors must meet Corewell Health's indoor air quality standards, OSHA standards and NFPA life safety standards. Contractors are responsible to have a work permit to work anywhere in and around Corewell Health Hospital facilities.
 - 1. All work permits are to be signed out through Plant Operations.
 - 2. The work permit number shall be recorded on the work permit.
 - 3. Any items that will be borrowed must be logged on the Contractor Work Notification SharePoint site (i.e. caulking gun, Hilti products, fire extinguisher, etc.).
 - 4. Contractors must follow all indoor air quality isolation/tenting procedures.
 - 5. Contractors will be trained on the procedures to fill any wall penetrations and will be Hilti-certified or have filled penetrations inspected by a Hilti-certified contractor. Contractors must report any fire wall penetrations they did not make. Corewell Health policy regarding found penetrations missing sealants is "You find it, you fill it". Corewell Health utilizes Hilti fire caulk products. No other fire caulk products will be used without prior approval.
 - 6. Before any contractor will be issued a work permit, they must first attend Contractor Orientation (contractororientation@spectrumhealth.org).
 - 7. The contractor will remove all debris daily and keep the work area clean and orderly at all times.
 - 8. Any person pulling cables, adding piping, etc., will provide a marked up print of where the cabling or piping was installed. All low voltage cabling will be in a cable tray where a cable tray is provided. All piping will have shut-off valves and will be tagged identifying the area served.

9. Means of egress must be maintained at all times except when the contractor is in the immediate location where the work is being done. All projects shall have an Interim Life Safety Measures (ILSM) completed prior to any work. Any egress impairments will follow the ILSM plan.
10. If a contractor will be creating dust, they must contact FSS to schedule an impairment of the smoke detection system before work commences.
11. When finished with work, the contractor must return the permit and blueprints (if any) to Corewell Health Plant Operations.
12. All work access doors must be locked at all times.

3.10 CONTROL OF HAZARDOUS ENERGY SOURCES

- A. Contractors must have a documented lockout/tag out procedure and/or Control of Hazardous Energy Sources procedure on site and must coordinate any lockout/tag out process with Corewell Health's Project Manager and FSS and must follow Corewell Health's written policy on Control of Hazardous Energy Sources and 29 CFR 1910.147 (MIOSHA Part 85).

3.11 CRANE OPERATIONS

- A. Crane operations must be coordinated with the Corewell Health Project Manager. A Crane Safety Checklist must be completed prior to any crane use at Corewell Health facilities. Crane safety checklist can be obtained from the Corewell Health Project Manager.
- B. The general contractor/construction manager is responsible for identifying anticipated crane use in its plan and reviewing planned work in advance with the Corewell Health Project Manager. The general contractor/construction manager shall maintain documentation of equipment inspection on the project site and make it available upon request. All repairs and adjustments noted on inspections shall be corrected prior to equipment use. This applies to all power-operated equipment used in construction for hoisting, lowering, and/or horizontally moving suspended loads. If the crane or its associated rigging has sustained any damage, the crane and its associated rigging shall be fully re-inspected, and proof of the inspection and its results shall be maintained on the project site.
- C. Daily and pre-shift inspections shall be performed and documented by the crane operator or other properly trained representative designated by the general contractor/construction manager in accordance with the manufacturer's recommendations. All cranes must have load charts in cabs.
- D. All crane operators must possess an approved certification. Operators must be certified for the specific crane they are operating. No employees will be under a suspended load or inside the angle of a hoist line. No employees will stand or work near a cable, chain, or rope under tension unless the nature of the work requires it. Underground utilities at the location shall be identified and considered as well as ground compaction.
- E. Clear communication between the operator of the crane and the signal person shall be maintained at all times during hoisting operations. The method of communication should be detailed in the JHA for the hoisting operation. Only one signal person shall signal a crane at a time.
- F. A properly trained representative appointed by the general contractor/construction manager shall inspect and document all rigging equipment prior to each work shift. Any rigging equipment found to be defective or damaged shall be immediately removed from use and the project site. Chain slings shall not be used for lifting operations unless specifically designed for a unique application and approved by a properly trained inspector or rigging specialist. Tag lines should be used on all hoisted loads to control the load, unless it is determined that the tag lines would pose a greater risk to the safety of the load.
- G. It is important to check the weather conditions in your area several times a day. Establish a wind speed at which elevated work or crane operations are suspended; twenty-five mph is a commonly suggested limit.

- H. A plan addressing the hazards of the operation should be in place for all crane lifts. This should be accomplished through the use of the JHA. In addition to the JHA, a critical lift plan (Crane - Job Safety Analysis Form) will be required when any of the following conditions exist:
 - 1. The lift exceeds 50% of the rated capacity of the crane.
 - 2. The lift is in proximity of a high voltage line.
 - 3. The equipment being hoisted has a long-lead time (+6-8 weeks typically), which would cause business interruption if damage occurred.
 - 4. Two cranes are to be used.
- I. If a lift is to be performed over an occupied building, a registered structural engineer shall review and certify that the building can withstand the impact of the load being dropped on the building due to a crane or rigging failure. If the structural engineer cannot determine if the building can withstand the impact of a dropped load, or if the structural engineer determines that the building cannot withstand the impact of a dropped load, either the building areas that would be affected shall be evacuated during the lift, or the lift shall be scheduled when there will be no personnel in those areas of the building. The decision between evacuating the building or scheduling the lift for off-hours will be made by the Corewell Health Project Manager.

3.12 DUST MITIGATION

- A. All possible efforts must be made by contractors to limit the amount of dust created and released at all job sites and in surrounding areas. Dust from construction/demolition/renovation may contain germs, mold spores, microorganisms, and various other items that have the potential to cause life threatening illness in Corewell Health's immune compromised patients and therefore must be prevented.
- B. Dust mitigation activities include:
 - 1. Debris removal from site in clean covered bins. Wheels of bins to be wiped as it leaves project site to minimize dust tracking into non-project areas.
 - 2. Removal of debris from site at specified times or specific routes if deemed necessary in the ICRA.
 - 3. Use and regular replacement of adhesive walk off mats at entrances and exits to the job site.
 - 4. Wet mopping and/or HEPA vacuuming immediate area around entrance and exit of job site.
 - 5. Water misting work surfaces to control dust disturbance during work.
 - 6. All penetrations into the job site must be sealed (around piping and windows must be closed).
 - 7. All temporary partitions sealed to prevent dust escape
 - 8. Tools wiped down before removal from the job site.
 - 9. Planning ahead to limit number of entrances and exits from the job site.
 - 10. Negative air pressure maintenance in dust generating job sites.
 - 11. Changing of filter media on Negative Air Machines and return air grilles.
 - 12. Differential pressure must be continuously monitored when negative air pressure must be maintained.
 - 13. Particulate monitoring in dust generating job sites.
 - 14. Removal of dust from clothes before leaving the job site.
 - 15. For excessive dust generation areas, a sign must be posted to warn individuals of potential dust exposure.

3.13 ELECTRIC – TEMPORARY

- A. The general contractor/construction manager can reduce the safety risks associated with the performance of electrical work by developing, implementing, and enforcing an effective safety program that requires electrical work to be performed in accordance with the pertinent provisions of the National Electrical Code (most current version), ANSI and MIOSHA Standards, and all other rules, regulations and includes the following:

1. With the exception of temporary lighting, all 120 volt, single phase, 15 & 20 amp temporary power circuits shall have ground fault circuit interrupters.
2. Portable electric lighting used in moist or other hazardous locations such as drums, tanks, vessels, bins, bunkers, must meet rules, regulations and industry standards to qualify as non-explosive. Ordinary shop lighting and portable task lighting should have covers and guards installed.
3. Extension cords should be heavy-duty 3-wire type, but shall not be flat. Whenever possible, extension cords should be fastened or suspended above the finished floor or work platform in accordance with best practices, industry standards, rules and regulations.
4. Determine in advance if any energized equipment or electrical circuits in the work area pose a safety risk to those in the area. Electrical shutdowns with the potential to affect adjacent occupants, adjacent buildings must be reviewed and coordinated in advance with the Corewell Health Project Manager in order to make appropriate notifications and precautions. Equipment and conductor de-energization shall occur under Lockout/Tag out controls. If Lockout/Tag out cannot be implemented, work practices that conform to NFPA 70E should be followed.
5. Any electrical tools, equipment, or extension cords found defective (e.g., missing or broken ground pins, exposed internal conductors) shall immediately be rendered inoperative by cutting off the plug end or be immediately removed from the project site.

3.14 EMERGENCY ACTION PLAN

- A. The general contractor/construction manager shall develop reasonable preparations and contingencies for the various potential emergencies that can occur on the project site, including:
 1. Project site accidents and injuries
 2. Smoke and fire conditions
 3. Water damage or leaks
 4. Spills and releases of chemicals or other hazardous materials
 5. Structural or equipment failure or collapse
 6. Security threats, including public demonstrations, bomb threats, or the discovery of suspicious materials
 7. Severe weather conditions, including high winds
- B. Since many larger emergencies have potential impacts well beyond their immediate location, it is important for general contractors/construction managers to understand basic emergency response and evacuation procedures, local emergency resources, and follow-up actions. General contractor/construction managers are expected to devote significant efforts to ensuring that adequate preparations have been made for the range of foreseeable emergencies that might occur during their work at Corewell Health.
- C. The primary means to summon emergency response is by calling Corewell Health Facilities 1-HELP Call Center at (616) 391.4357. Callers should be prepared to give the building/project location. Security Services maintains Corewell Health's Material Safety Data Sheet vault.
 1. If restoration services are required, Corewell Health's preferred vendor is Belfor Property Restoration (1.800.856.3333)
 2. Notify Corewell Health Project Manager.
- D. Establish a communication plan in the event of an emergency situation to allow for immediate communication of the incident to the Corewell Health Project Manager after Corewell Health Security has been notified.
- E. Establish and identify a mustering point for all project staff during an emergency, identify severe weather shelters to be utilized for this project staff. Post all information on Job Site Safety Board.

3.15 EMERGENCY SHUTOFF/SYSTEM SHUTDOWN

- A. Contractor must immediately notify the Project Manager, Foreman and the Plant Operations Site Manager in the event there is a need for a system shutdown or emergency shutoff of utilities (Medical Gases, HVAC, Electrical, Steam, Domestic Water, Fire Protection, Tube System or Fire Alarm outage) requiring less than three (3) days' notice. Contractor must retain phone numbers and pagers of Corewell Health's Project Manager and Plant Operations Site Manager for that purpose. Plant Operations Site Manager will act as the coordinator between the contractors and the affected department within Corewell Health.

3.16 EQUIPMENT SAFETY

- A. If applicable, the general contractor/construction manager shall have a process in place for:
 - 1. Validating training and certification for workers using construction equipment such as cranes, hoists, aerial lifts, mass climbing devices, scaffolding, mobile equipment, personal protective equipment, and specialty equipment.
 - 2. Establishing the use of a tagging system for equipment requiring daily inspection (such as scaffolding, or cranes) providing workers verification of equipment inspection and approval or lack thereof.

3.17 FALL PROTECTION

- A. Protection against falls shall be implemented. Fall arresting systems including lifelines, body harnesses, and other like equipment can be used when fall hazards cannot be addressed by employing railings, temporary floors, nets, and other means. The general contractor/construction manager can reduce the safety risks associated with performance of elevated work by developing, implementing, and enforcing an effective fall protection safety program. This program must comply with rules, regulations and industry standards addressing fall protection, and includes establishing a fall protection rule not to exceed six (6) feet for the project and includes roofing operations, scaffolding, and steel erection.
- B. Monitors must be approved by a Corewell Health Project Manager in lieu of fall protection.
- C. The following fall protection equipment represents the minimum equipment requirements for all employees when working at heights equal to or greater than 6 feet:
 - 1. A full-body harness meeting the certification requirements of ANSI standard A10.14-1975; body belts are NOT acceptable.
 - 2. Lanyards and vertical life lines must have a minimum breaking strength of 5,000 pounds.
 - 3. Personal fall arrest systems when stopping a fall must limit the maximum arresting force on the worker to 1,800 pounds when used with a body harness.
- D. Fall protection equipment must be inspected before every use following these standards:
 - 1. Each full-body harness, safety line, and safety strap must be inspected for abrasion and kinks.
 - 2. All locking "D" rings must be inspected for cracks, wear or any other damage.
 - 3. All damaged equipment that is found to be damaged must be immediately removed from service and tagged as "defective".
 - 4. All equipment that has been subjected to in-service loading (i.e. prevented the fall of an employee) must be immediately removed from service, tagged as "defective" and not be used again for employee safeguarding.
 - 5. Any equipment that has been exposed to chemicals, run over sharp corners, used when frozen, left in freezing temperatures when wet, or exposed to sources of flame must be immediately removed from service and tagged as "defective".
- E. All fall protection equipment must be stored in a location free from chemicals, excessive heat and moisture.
- F. Education and training must be provided and attended by every contractor required to wear and use personal fall protection equipment.

- G. Only contractors that are able to demonstrate an ability to use and select the appropriate personal fall protection equipment will be permitted to perform any work activities that require the use of personal fall protection equipment on a Corewell Health site.
- H. Written certification records verifying compliance with training requirements must be maintained by each contractor.

3.18 FIRE PREVENTION AND PROTECTION

- A. The general contractor/construction manager shall address all emergency fire issues in the emergency action plan. The following shall also be addressed in order to prevent a fire situation:
 - 1. Project Site Fire Safety
 - a. All flammable liquids shall be stored in approved containers/cabinets and all storage and labeling shall comply with rules and industry standards.
 - b. Fuel may be stored indoors ONLY if specific project approval by the Corewell Health Project Manager has been granted.
 - c. All oily rags and oily cloths shall be taken off site at the end of each shift for proper disposal.
 - d. Temporary membrane construction enclosures and partitions, which are susceptible to burning, shall be protected from fire and shall be made of fire retardant material.
 - e. Smoking is prohibited at **ALL** Corewell Health Properties, including Hospitals, Owned, or Leased Ambulatory or Administrative Facilities, including parking lots, sidewalks, and yards. Violations of the Tobacco/Smoking policy are serious offenses, and will result in termination and banishment from Corewell Health Sites. See Tobacco/Smoking policy for more detail.

3.19 FIRE PROTECTION/FIRE ALARM SYSTEMS

- A. A water line shall be extended as required by code to supplement the fire extinguishers on site.
- B. A temporary fire department standpipe shall be installed as required by code.
- C. Protect fire alarm detection devices (smoke/heat detectors) and/or fire suppression equipment within the work area. Do not cover any detectors or fire suppression equipment to prevent false alarms. Remove smoke detectors and replace with heat detectors while construction activities are being performed. Replace temporary heat detectors with permanent smoke detectors at the completion of construction.

3.20 FOOD AND DRINK

- A. For protection of the contractors, food and drink shall not be consumed or stored in active construction sites unless there is a designated area to consume food and drink.

3.21 GREEN CLEANING POLICY

- A. Contractors performing cleaning services for Corewell Health in occupied or owned facilities must implement some form of green cleaning.
 - 1. The use of non-approved chemicals is strictly prohibited within the facility.
 - 2. A preventative approach will be taken to reduce dirt, dust, pollen and other particles from entering the building such as walk off matting, microfiber dusters, mops, rags and staff training.
 - 3. The responsible disposal of chemicals as indicated by Corewell Health management will be practiced.

3.22 HAZARD COMMUNICATION PROGRAM (RIGHT TO KNOW) – MATERIAL DATA SHEETS (MDS)

- A. The general contractor/construction manager is responsible for compiling and maintaining a master file of MDS for all hazardous chemicals and building materials used on Corewell Health projects in compliance with Part 602 - Asbestos Standards for Construction and Part 42 – Hazardous Communication and Corewell Health's Hazard Communication Program

- B. Right to Know policy. Such file should be submitted as part of the site specific safety plan. The general contractor/construction manager must also have a book containing all MDS at the project site. In general, each contractor and its employees in a Corewell Health facility must be trained on the substance of the laws, the hazardous properties of the chemicals with which they work with and the measures needed to protect themselves and others from these chemicals.

3.23 HAZARDOUS MATERIAL SPILL RESPONSE

- A. In the event of a hazardous material spill, contractors must immediately contact the Corewell Health Project Manager and Corewell Health Plant Operations to determine the appropriate course of action while maintaining a level of safety for building occupants and personnel responding to spills. Refer to Corewell Health Hazardous Material Spill Response Policy (Ref# 3075) for spill procedures.

3.24 HOSPITAL APPROVED DISINFECTANTS

- A. Only disinfectants that are hospital approved can be used. *Follow manufacturer's instructions for required contact time for each product. Contact Infection Control at (616) 391-1407 with any questions.

3.25 HOT WORK

- A. Hot work" is defined as a process or procedure that could result in a fire if not properly controlled. Common examples of hot work include welding, burning, cutting, brazing, grinding, and soldering. Hot work equipment may produce high voltages or utilize compressed gases and requires special awareness training to be used safely. The general contractor/construction manager shall control the hazards associated with hot work by developing, implementing, and enforcing an effective safety program that follows rules, regulations and industry standards in accordance with OSHA 29 CFR 1926 Subpart J and follows and uses the Hot Work permit that addresses all requirements
 1. Contractors must obtain "Welding Permit" from Corewell Health Plant Operations when required before any work is performed in occupied or existing spaces.
 2. The rules and procedures in the "Welding Permit" must be followed at all times.
 3. Upon completion of the job and proper securing of the area, the permit must be returned immediately to the Corewell Health Security Office at the end of each business day.
- B. All planned hot work shall be fully described during the permitting process, which shall be completed by Corewell Health Security Services before hot work begins. The general contractor/construction manager shall keep a copy of that permit on the project site at all times. Dedicated fire extinguishers, with a current inspection, must be maintained in the immediate access area of the hot work area at all times. These must be in addition to the required project site extinguishers.
- C. All compressed gas cylinders must be transported, handled and stored in accordance with OSHA 29 CFR 1926 Subpart J. The contractor must remove Acetylene gas and other flammable gases from the hospital at the end of every business day before leaving the job site.
- D. All compressed gas cylinders must be secured at all times.

3.26 TEMPORARY HEAT

- A. Temporary heating system plans and procedures should be submitted in advance and in writing to the Corewell Health Project Manager and Corewell Health Plant Operations. The duration of planned use, fuel handling procedures, safety procedures, type of heating system, and other essential or critical aspects of the plans and procedures will be documented. Corewell Health Project Manager MUST approve the plan prior to implementation.
- B. Except during actual use, LPG cylinders shall not be stored within a Corewell Health building.
- C. All fuel storage tanks must be kept at least 20 feet from any building or property line. All above ground fuel tanks shall be properly secured, grounded and labeled with contents. The tank shall also be placed in some type of containment which is capable of handling the liquid in the tank.
- D. Open fires and warming fires are prohibited on all Corewell Health property.

- E. Temporary weather-tight enclosures shall be made of fire retarding materials.

3.27 HOUSEKEEPING

- A. The general contractor/construction manager and all his subcontractors/trade contractors at all times shall keep the premises free from accumulation of waste materials or rubbish caused by their operations, provide a premises clean and free from fire hazards, and maintain neat and orderly work and materials stockpiles throughout the construction period; providing safe and convenient access and movement of workers and materials throughout the building and site and to prevent the spread of debris, dust or other contaminants into the air or surrounding areas at all times.
- B. Construction debris and rubbish as generated by the general contractor/construction manager's activity shall be removed by the general contractor/construction manager from the point of origin daily and not allowed to accumulate. It shall be deposited in a trash container provided by the general contractor/construction manager on the site until hauled away. Scrap materials for reuse in temporary work shall be segregated and properly stored, protected and covered as for new materials. The result of the above shall be the maintenance of a clean project, in keeping with the proximity of a healthcare facility and with a minimum of fire hazards. Corewell Health shall have the right to establish a clean-up routine with the full participation of the general contractor/construction manager(s).
- C. Construction debris removed from the upper levels of the site shall be deposited directly into a dumpster via an enclosed chute constructed and provided by the general contractor/construction manager.
- D. If the general contractor/construction manager fails to keep the premises clean and orderly, to the satisfaction of the Corewell Health standards, Corewell Health may, after 24 hours written notice to the general contractor/construction manager, cause the premises to be cleaned and organized. In such case, the general contractor/construction manager will be charged 100 percent of Corewell Health's cost expended in the clean-up.
- E. The general contractor/construction manager and all subcontractors/trade contractors in connection with their work shall cooperate with each other, use reasonable diligence and make every effort to avoid excessive dirt, rubbish and general refuse to minimize the extent of cleaning and removal thereof required hereunder of the general contractor/construction manager.
- F. The general contractor/construction manager shall remove from the premises and site all project signs, tools, scaffolding, surplus materials, temporary work and structures upon completion of the work, leaving the premises clean and acceptable to the general contractor/construction manager and to Corewell Health Plant Operations.
- G. All carts, buggies or containers containing debris shall be covered when leaving the project site or the building. Tires/wheels to be wiped clean upon exit of project site.

3.28 ID BADGING

- A. Contractor employees are required to participate in the Corewell Health contractor orientation program, which requires a current TB test prior to obtaining a badge or working on any construction or renovation project.
- B. Contractor must coordinate issuance of badges with Corewell Health Security. Contractor employees and subcontractors must wear their own badges at all times. Under no circumstances shall a person wear someone else's badge. Contractor employees must wear and display their badge on outer most clothing at approximately shoulder height at all times. There is a fee to replace lost badges.

3.29 ILLNESS/DISEASE

- A. A contractor will not be allowed to work on Corewell Health projects until evaluated by a physician if they have any of the following symptoms:
 - 1. Fever over 100 degrees Fahrenheit
 - 2. Diarrhea or Vomiting

3. Eye Infection
 4. Draining wound that cannot be covered
 5. Undiagnosed rash
- B. Please see Occupational Health Services Policy for additional information and exclusion criteria.
- C. Special Care Areas include surgical suites and procedural areas, labor and delivery, newborn nursery, neonatal special care units and oncology units.
- D. Additional precautions must be taken in special care areas to prevent illness in high risk populations. This includes but is not limited to:
1. Tools shall be wiped with hospital approved disinfectant before entering special care areas.
 2. Donning of hospital approved PPE in isolation rooms/areas and special care areas.
- E. Tools shall be wiped with hospital approved disinfectant or bagged for later disinfection before exiting contact isolation rooms.

3.30 INFECTION PREVENTION

- A. Due to the nature of the high risk patients that receive care at Corewell Health, it is important that all efforts are made to prevent the introduction and spread of infectious diseases in the facility.

3.31 INTERIM LIFE SAFETY MEASURES (ILSM)

- A. ILSM's are a series of 14 administrative actions as outlined by The Joint Commission (TJC) Life Safety Standard that are required to be implemented as appropriate to temporarily compensate for hazards posed by construction and renovation activities within the hospital buildings.
- B. ILSM's are required in and adjacent to all construction/renovation areas as assessed by the Fire Marshal and apply to all personnel including Corewell Health employees, health care providers, contractors/sub-contractors and consultants.
- C. ILSM's must be implemented as part of the pre-construction planning and infection control and risk assessment (ICRA) process at project startup, continuing until the hazard posed by the construction or renovation activity is removed. Contractors are responsible for monitoring projects for adherence to Life Safety Code requirements and implementation of ILSM's as appropriate.
- D. All ILSM deficiencies shall be corrected immediately. If the deficiency is unable to be corrected, the construction site shall be "Shut Down" until corrections are made.
1. Before the project begins, and when appropriate, the project will create a 1 Hour Rated Fire Separation between the construction area and occupied areas.
 2. Additional fire extinguishers are to be provided to the area where construction or renovation takes place. Fire extinguishers to be provided by Contractor.
 3. When a path of egress is affected, signage identifying alternate routes must be posted.
 4. Signage, maps or instructions must be posted at affected sites.
 5. If a sprinkler or fire alarm system will be shut down for greater than 4 hours in a 24-hour period, Corewell Health Security Services will notify the local fire department, the State Fire Marshal, and the insurance company. Corewell Health Security Services will initiate additional patrols in the affected areas.
 6. If egress exits are affected, daily rounds through the area by construction personnel must be conducted on 1st shift; 2nd and 3rd shifts must be rounded by Corewell Health Security Services. During these rounds, a general review of the area will be made for any hazards or unsafe conditions that may exist.
 7. On-going training must occur to aid in identifying Life Safety requirements.

3.32 JOB HAZARD ANALYSIS (JHA)

- A. For Work that is potentially hazardous in nature, such as work from heights, scaffold use, trenching operations, steel erection, electrical, crane operations, the general contractor/construction manager shall review and approve each JHA before permitting the work to begin. The JHA shall be a comprehensive evaluation of the work activity broken down into basic job steps, hazards identified for each step, and also contain hazard control measures for each hazard identified. The general contractor/construction manager shall keep all JHAs in a bound notebook in an easily accessible location for the length of the project. JHA's shall be updated as necessary as the work progresses throughout the project and conditions change. JHA's must be reviewed and documented with applicable employees prior to the start of work at each occurrence and when updates are made.

3.33 JOBSITE INSPECTIONS

- A. Corewell Health may contract with a third party safety consultant to conduct regular jobsite safety inspections at least once per month. Corewell Health has a pre-construction Risk Assessment (PCRA) policy, which includes an Infection Control Risk Assessment (ICRA) and an Interim Life Safety (ILSM) policy. Corewell Health, the general contractor/construction manager or its designated personnel are required to conduct daily and weekly job inspections to comply with those policies.
- B. Documentation of inspections shall be readily available for review on the project site. The general contractor/construction manager will immediately correct any hazardous or otherwise noncompliant conditions identified and maintain documentation of the corrective action.

3.34 PARKING

- A. All contractor and subcontractor employees must park their vehicles in approved designated areas coordinated with Corewell Health's Project Manager and Corewell Health Security. Contractors must not block public areas while loading and unloading materials and equipment. Corewell Health Security Services will issue Corewell Health parking violations in order to provide for the maximum availability of parking spaces and to protect against unsafe conditions.
- B. Parking violations may be issued for, but not limited to, the following:
 - 1. Parking in an unauthorized area
 - 2. Parking in a "No Parking" zone
 - 3. Parking in a 10 minute area longer than the allotted time limit
 - 4. Parking in a loading zone
 - 5. Parking in a Fire Lane
 - 6. Parking over the yellow line and occupying two or more spaces
 - 7. Staff who do not have a Corewell Health sticker displayed
 - 8. Parking in a "Handicapped" space without a permit

3.35 PERSONAL PROTECTIVE EQUIPMENT (PPE)

- A. Personal protective equipment (PPE) increases safety for individuals performing potentially hazardous tasks. All construction personnel are required to wear Personal Protective Equipment prescribed by all applicable MIOSHA Standards, regulatory rules, and good safety practices. Corewell Health employees who have a direct role in the execution of the project or need access to the project area must wear all required PPE's. PPE's to be provided for their use by contractor. All construction personnel must be protected from hazards in the workplace by using appropriate PPE, including but not limited to:
 - 1. Head protection (hard hats) are required 100% of the time on all designated construction sites and when there are potentials of falling objects, hair entanglement, burning, or electrical hazards. Hard hats are for protection against impact and penetration of falling objects. Hard hats must meet ANSI specifications. Hard Hats must be worn with the brim to the front and the knob to the back at all times.
 - 2. Safety glasses must be worn 100% of the time on all designated construction sites and face protection when there are potentials of hazards from flying objects or particles, chemicals, arcing, glare, or dust. Prescription glasses must have side shields attached.

3. High visibility clothing must be worn 100% of the time on all designated construction sites.
4. Protective footwear to protect from falling objects, chemicals, or stepping on sharp objects must be worn 100% of the time. High heels, open toed shoes, athletic or canvas- type shoes shall not be worn.
5. Protective gloves or clothing, when required, to protect against a hazard.
6. Harnesses and lanyards for fall protection as required in OSHA Construction Safety Standards.
7. Hearing protection for protection against the effects of noise exposure in accordance with the applicable OSHA Standard. Also, take appropriate measures to protect hospital occupants from noise pollution.
8. Respirators in accordance with the applicable OSHA Standard when such equipment is necessary to protect the health of the employee.
9. Infection Prevention required PPE if in designated isolation areas or special care areas.

3.36 POTENTIALLY HAZARDOUS EXHAUST SYSTEMS

- A. The Corewell Health Project Manager will determine if the work involves the interior of a potentially hazardous exhaust system using the same process as described under Rooftop Access in this section. Specific site investigations for most potentially hazardous exhaust systems are not necessary unless unusual circumstances exist. All personnel working on any potentially hazardous exhaust system shall wear personal protective equipment. The general contractor/construction manager shall arrange a site investigation under the following conditions: radioactive materials are used in the affected fume hoods or exhaust system, perchloric acid fume hood systems are involved, unusual circumstances or hazards were identified.

3.37 RECORDKEEPING AND INCIDENT REPORTING

- A. If emergency assistance is summoned to the project site, the general contractor/construction manager is responsible for immediately notifying the Corewell Health Project Manager. The same immediate notification is also required for any fire, medical, environmental, and other emergencies. The General Contractor/Construction Manager is responsible for directly notifying any regulatory agencies as required as well as arranging for any necessary follow-up repairs, abatement, or other corrective actions.
- B. In addition to the monthly reporting requirements, additional reporting for recordable incidents, MIOSHA citations, and fire, medical, environmental, and other emergencies is required to be submitted within 24 hours to the Corewell Health Project Manager. The Corewell Health Incident Form shall be used to document these incidents.

3.38 REFRIGERANT RECOVERY, RECYCLING AND RECLAMATION

- A. Contractors must follow guidelines in accordance with EPA standard 40 CFR 82.161.
 1. Refrigeration contractors must be EPA certified to perform maintenance on any appliance or equipment that contains refrigerant. All certification and training documentation must be maintained.
 2. Recovered and recycled refrigerant cannot be sold or used in appliances that are not owned by Corewell Health.
 3. All refrigerant recovery tanks shall be identified by refrigerant type.
 4. Disposable refrigerant cylinder (DOT 39's) will not be reused or given away for any purpose.
 5. CFC's, HCFC's shall not be knowingly vented or released during the repair, service, maintenance or disposal of appliances or industrial refrigeration equipment.

3.39 REPORTABLE EVENTS

- A. Reportable events such as spills, injuries, and OSHA reportable injuries must be reported to the Corewell Health's Project Manager as soon as they occur. All near misses must also be reported to the Corewell Health Project Manager as soon as they occur. Failure to follow this policy will result in the immediate dismissal from all Corewell Health facilities.

3.40 ROOFTOP ACCESS

- A. Prior to doing work on roofs, steps shall be taken to ensure that personnel are not exposed to chemical, biological or radiological materials. Workers are advised to remain a fixed distance (20 feet) from any Solid Red labeled exhaust. Notify the Corewell Health Project Manager to determine if the project site has a potentially hazardous exhaust system. If the project site is listed as having potentially hazardous exhaust, the Corewell Health Project Manager shall refer to the Roof Safety Plan, available through Facilities, to determine if the project site is in an area of the roof which will require fume hoods or other potentially hazardous exhaust systems to be shutdown. Work that is not within 20 feet of a Solid Red Labeled exhaust system and does not require workers to pass through a 20 foot radius of one may proceed with proper notification to the Corewell Health Project Manager. If work is required within 20 feet of a Solid Red labeled exhaust or if workers must pass through a 20 foot radius of a Solid Red labeled exhaust as shown on the Roof Safety Plan, the Corewell Health Project Manager shall notify facilities and schedule a shutdown.

3.41 SAFETY RULES

- A. ALL OF SPECTRUM'S SAFETY RULES MUST BE OBEYED. FAILURE TO DO SO BY ANY CONTRACTOR'S EMPLOYEE WILL RESULT IN DISCIPLINARY ACTION AND/OR REMOVING THAT PERSON FROM THE PREMISES.
 - 1. A good job is a clean job, and a clean job is the start of a safe job. So, keep your working area free from rubbish, dust and debris.
 - 2. Keep your mind on your work at all times. No horseplay on the job. Injury or removal from the job (or both) can be the result.
 - 3. Personal safety equipment must be worn as prescribed for each job such as: safety glasses for eye protection, hard hats at all times within the confines of the construction area, gloves when handling materials, and protective footwear is necessary for protection against foot injuries.
 - 4. Precautions are necessary to prevent sunburn and to protect against burns from hot materials.
 - 5. If any part of your body should come in contact with an acid or caustic substance, rush to the nearest water available and flush the affected part. Secure medical aid immediately by calling Corewell Health Security Services at (616)391-1425.
 - 6. Watch where you are walking. Don't run.
 - 7. The use of illegal drugs, alcohol, or being under the influence of the same, on the project shall be cause for permanent removal from all Corewell Health facilities.
 - 8. Workplace violence will not be tolerated; Corewell Health has a zero-tolerance policy regarding workplace violence.
 - 9. Do not distract the attention of fellow workers. Do not engage in any act which would endanger another employee.
 - 10. Coordinate with Corewell Health's Project Manager on the use of sanitation facilities. Defacing or damaging these facilities is forbidden.
 - 11. Hand washing sinks are not to be used for construction or renovation purposes.
 - 12. Do not use a compressor to blow dust or dirt from your clothes, hair, or hands.
 - 13. Never move an injured person unless it is absolutely necessary as further injury may result. Keep the injured person as comfortable as possible and utilize job site first-aid equipment until medical attention or an ambulance arrives.
 - 14. Know your emergency exit routes and follow Corewell Health's policies and procedures that apply to emergency response and routine drills.
 - 15. Know where firefighting equipment is located and be trained on how to use it.
 - 16. Lift correctly - with legs, not the back. If the load is too heavy - GET HELP. Stay fit. Control your weight. Do stretching exercises. Approximately twenty percent of all construction related injuries result from lifting materials.
 - 17. Nobody, but the operator, shall be allowed to ride on equipment unless proper seating is provided.

18. Do not use power tools and equipment until you have been properly instructed in the safe work methods and become authorized to use them.
19. Be sure that all guards are in place. Do not remove, displace, damage, or destroy any safety device or safeguard furnished or provided for use on the job, nor interfere with the use thereof.
20. Do not enter an area which has been barricaded.
21. Never oil, lubricate, or fuel equipment while it is running or in motion.
22. Use the "four and one" rule when using a ladder. One foot of base for every four feet of height.
23. All portable ladders in use shall be equipped with safety feet. Step ladders shall not be used as a straight ladder.
24. Use ladders according to related OSHA Standard, general ladder safety and manufactures' instructions.
25. Ladders must extend three feet above landing on roof for proper use.
26. Defective ladders must be properly tagged and removed from the project site.
27. Keep ladder bases free of debris, hoses, wires, materials, etc.
28. Build scaffolds according to manufacturers' recommendations and applicable OSHA Construction Safety Standards.
29. Scaffold planks shall be properly lapped, cleated or otherwise secured to prevent shifting.
30. Use only extension cords of the three-prong type. Use ground fault circuit interrupters at all times and when using tools in wet atmosphere (e.g. outdoors) or with any temporary power supply. Check the electrical grounding system daily.
31. Use approved fall protection procedures and comply with related OSHA Standards regarding fall protection.
32. Never throw anything "overboard." Someone passing below may be seriously injured.
33. Open flames are prohibited.
34. Know what emergency procedures have been established for your job site (location of emergency phone, first aid kit, stretcher location, fire extinguisher locations, evacuation plan, etc.). Call Corewell Health Security Services at (616)391-1425 from within the hospital facility to report emergency situations.

3.42 SUBSTANCE ABUSE

- A. Corewell Health is a drug and alcohol free workplace whereby its sole purpose is to ensure the safety of patients, employees, the general public and contractors' personnel and to promote productivity. This order applies to contractors, subcontractors and staff working on any Corewell Health projects. All contractors, subcontractors and associated staff are prohibited from using, possessing or being under the influence of illegal drugs, inhalants, alcohol, and prescription and over the counter drugs while working on any Corewell Health premises. We reserve the right to inspect our premises for these substances. In the event that such substances are found, we furthermore reserve the right to remove any and all individuals from the site and request full cooperation with any investigation into substance abuse. An investigation may include testing to detect the use of alcohol, drugs or inhalants.

3.43 TOBACCO/SMOKING POLICY

- A. All contractors and their personnel are prohibited from smoking or using tobacco products at all Corewell Health facilities and must abide by Corewell Health's Tobacco- Free Environment policy. This applies to all Contractor's employees or Contracted employees. Corewell Health has a zero tolerance for smoking or tobacco use on/in sites. Contractor's violating this policy will be terminated from the site and permanently banned from future Corewell Health projects.

3.44 TOOLS

- A. Tools must not be left unattended. Contractors must make every effort to keep tools and equipment concealed and out of reach of patients, public, or employees.

3.45 UTILITY WORK

- A. Utility shutdown or interruption must be coordinated with the Corewell Health's Project Manager and the Facilities Department before any work is scheduled.

3.46 VISITORS

- A. "Visitors" are individuals who do not have a direct role in the execution of the project work. Visitors require pre-approval for entry into the project site, and this entry will be defined as a "tour." Anyone without pre- approval or a direct role in the execution of the project work shall be denied access to the project site.
- B. Tour participants must be limited to those deemed to have a strategic purpose for entering the project site. Tour times will generally be limited to periods of no or low construction activity. Preplanning is required to identify and mitigate site hazards and designated tour areas. The General Contractor/Construction Manager will brief all tour participants on required PPE's. Visitors need to abide by all project-specific requirements and must stay with the designated tour leader.

END OF SECTION 01 3523

**SECTION 01 3533
INFECTION CONTROL PROCEDURES**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section includes policies and procedures required of the Contractor to prevent transmission of infectious agents, dust, particles and other airborne particulate to vulnerable patient populations, health care workers and visitors within the Hospital and clinical environments.

1.03 RELATED REQUIREMENTS:

- A. Document 01 3523 - Owner Safety Requirements
- B. Document 01 5000 - Temporary Facilities and Controls; for additional procedures and construction of temporary barriers.
- C. Division 15 Sections for cleaning heating, ventilation and air-conditioning systems and ductwork prior to operation.
- D. Corewell Health, Health Water Safety Management Plan

1.04 DEFINITIONS

- A. **Aspergillus:** A thermotolerant fungus that causes significant disease among immuno-compromised hosts that will disseminate to other organs including the skin and the brain. These fungi are ubiquitous, found in soil, water, dust and decaying material. Aspergillus have been cultured from unfiltered air, ventilation systems, contaminated dust dislodged during hospital renovation and construction, horizontal surfaces, food, and ornamental plants. Aspergillus spores are easily suspended in the air and survive for prolonged periods. Because of their size, they are easily inhaled, which can lead to invasive infection of both the upper and lower respiratory tracts in a susceptible host.
- B. **Biocide:** A physical or chemical agent that is capable of killing microorganisms.
- C. **Immunocompromised:** A condition where a patient's immune response is reduced or absent. Because defense mechanisms are limited in immunocompromised patients, they are susceptible to infections by microorganisms that are present everywhere, but do not cause disease in healthy people.
- D. **Hospital Acquired:** An infection that is acquired in a hospital or as a result of medical care.
- E. **Negative Pressure:** The relative air pressure difference between two areas in a healthcare and clinical facilities. A space that is at negative pressure has a lower pressure than adjacent areas, ensuring that any directional air movement is from the clean air environment into the contained area and preventing contaminated air from escaping into adjacent rooms or areas through doors, openings and cracks.
- F. **HEPA:** An acronym that stands for high efficiency particulate air. A HEPA filter is an air filter capable of capturing 99.97% of particles as small as .3 microns.
- G. **Multi-Stage Filtering:** Successive, filtering that prevents early loading of filters with contaminants and thereby delaying reduced airflow. Typical multi-stage filters might consist of a large particulate filter (10 microns), a smaller particulate filter (5 microns), an activated charcoal filter (odors) and a HEPA filter (.3 microns).
- H. **Negative Pressure Machine:** Freestanding, portable device that creates a negative air pressure within a space. It does so by removing air via flexible ductwork from the containment area. The units can also be placed remotely from the containment area and use ductwork to remove air from the controlled environment.

- I. Portable Air Scrubber: Freestanding, portable device that removes airborne contaminants by recirculating air through a HEPA filter. Portable air scrubbers can also serve as negative pressure machines by exhausting the recirculated air from the containment area.
- J. Containment: The process of isolating a contaminated area from the rest of the facility. Depending on the work to be done and the equipment required, airlocks, pass throughs, and equipment rooms may be necessary. Full containment always requires that negative pressure be maintained inside the containment area.
 - 1. Containment Requiring Activities include, but are not limited to the following:
 - a. Demolition and removal of walls, floors, ceilings and other building finish materials.
 - b. Demolition of plumbing, mechanical and electrical systems and equipment.
 - c. Finish operations such as sanding, painting and application of special surface coatings.
 - d. All routine construction activity that can generate dust.
 - e. Sitework operations.
 - 2. Source containment can also be used with localized negative pressure if a very small area is involved. A small piece of plastic sheet can be taped around the area to be removed. A small HEPA vacuum is used for this purpose by inserting the inlet nozzle inside this small containment to create a negative pressure and to vacuum up released particles.
- K. Containment Area: The construction activity area, adjacent staging and storage areas, passages for construction personnel to access the project site and delivery and removal of supplies and waste. It includes the entire volume of the project area including ceilings spaces above and adjacent to the construction area. Containment areas are determined by the Construction Project Manager, the Hospital's ICRA Committee, and as indicated on the Drawings.
- L. Pressure Differential: The difference in magnitude between a reference pressure and a variable pressure.
- M. Air changes per hour is equal to the air filtered (in cubic feet) in one hour divided by the containment area size (in cubic feet), or

$$\text{Air Changes per Hour (AC/H)} = \frac{\text{Cubic Feet of Air filtered in 1 Hour}}{\text{Containment Area Size in Cubic Feet}}$$
- N. Protection Area: The designated project limits, hospital and clinical areas adjacent to containment area, either occupied or used for passage and areas connected to construction areas by mechanical system intake, exhaust and ductwork. Protection areas are determined by the Construction Project Manager and the Hospital's Infection Control Committee as indicated on the Drawings.
- O. Minor Ceiling Access: Removal of one ceiling or access panels for visual observation in 50'-0", minor adjustments or other activities that do not disturb dust. All acoustical and access panels shall be closed immediately upon leaving the worksite.
- P. Major Ceiling Access: Removal of ceiling panels or systems that is not defined as "minor".
- Q. Thorough Cleaning (Construction Clean): Cleaning of surfaces that become exposed to dust shall be accomplished by the use of either a HEPA-filtered vacuum cleaner or a wet mop.
- R. Terminal Cleaning: Completed by Hospital Environmental Service Staff after construction complete and space turned over for occupancy.
- S. Infection Control Risk Assessment (ICRA): A broad, long-range involvement of a Hospital's infection control/epidemiology leadership and safety staff, to assess the risk to patients and the Hospital environment to airborne contamination.

1.05 POLICY

- A. The intent of this policy is to minimize Hospital Acquired Infections (HAI) in patients that may arise as a result of exposure to organisms released into the environment during construction and renovation activities. Controlling the dispersal of airborne or waterborne infectious agents concealed within building components is critical in all Corewell Health facilities.
- B. Patient Care Objectives: All construction and renovation activities shall be defined and managed in such a way that occupants' exposure to dust, moisture and their accompanying hazards is limited.
 - 1. Aspergillosis and related nosocomial fungal infections are caused through inhalation by immunocompromised patients of aspergillus spores, or other related spores, that can be present in the construction environment. The spores are known to be prolifically present in construction dust, debris and earthwork excavation dust. Outbreaks are associated with unfiltered air, contaminated ventilation systems at intake and exhaust ducts, and dust that is dislodged by renovation and construction. Control of construction dust, debris and excavation dust is imperative to help prevent outbreaks of aspergillosis or related nosocomial fungal infections in immunocompromised patients.
 - 2. Inhalation of aspergillus spores or other fungal spores by immunocompromised patients can lead to serious complications and death.
 - 3. Airborne contaminant control is critical in all areas. Contractor shall limit dissemination of airborne contaminants produced by construction-related activities, in order to provide protection of immunocompromised patients, other patients, staff, diagnostic operations and sensitive procedures and medical equipment from possible undesirable effects of exposure to such contaminants.
 - 4. Dust in ceilings and construction debris contains fungus spores. Construction activities causing disturbance of existing dust, or creating new dust, or other airborne contaminants, must be conducted in tight enclosures cutting off any flow of particles into patient areas.
 - 5. Ceilings and walls in protected areas and other areas within Hospital and clinical area as indicated on Drawings must be secure from airborne transmissions at all times. If access into the ceiling in occupied areas is required, procedures described within this Section shall be followed.
 - 6. Enclosed and wiped clean carts must be used when transporting construction debris and materials throughout the environment. The Construction Project Manager and Hospital ICRA Committee shall approve the transportation path and destination terminus prior to commencing the project.

1.06 PROCEDURES

- A. The Owner's Representative (CPM) in conjunction with the Hospital's ICRA Committee will:
 - 1. Determine the infection control project classification using the matrices located below.
 - 2. Coordinate the relocation of affected patients and pedestrian traffic routes to areas where there is less potential for exposure to airborne contaminants with the responsible departments.
 - 3. Coordinate the preparation of the project area, including the removal of medical supplies, waste, and equipment, prior to the commencement of project activities with the responsible departments.
- B. Infection Control Risk Assessment (ICRA) Guidelines
 - 1. STEP 1: Identify the Construction Project Activity Type (Types A-D) by selecting the appropriate construction activity type from the table below. Construction activity type is determined by the amount of dust that is generated, the duration of the activity and the involvement with HVAC systems.

Construction Project Activity by Type (A-D)	
Type A	Inspection and Non-Invasive Activities. Includes, but is not limited to: removal of ceiling tiles for visual inspection only, e.g., limited to 1

	tile per 50 square feet painting (but not sanding) Inspection of wallcovering, electrical trim work, minor plumbing, and activities that do not generate dust or require cutting of walls or access to ceilings other than for visual inspection.
Type B	Small scale, short duration activities which create minimal dust Includes, but is not limited to: installation of data, telephone and computer cabling access to chase spaces cutting of walls or ceiling where dust migration can be controlled
Type C	Work that generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies Includes, but is not limited to: sanding of walls for painting or wall covering removal of floorcoverings, ceiling tiles and casework new wall construction minor duct work or electrical work above ceilings major cabling activities any activity that cannot be completed within a single workshift.
Type D	Major demolition and construction projects. Includes, but is not limited to: activities which require consecutive work shifts new construction requires heavy demolition or removal of complete cabling system any activity that requires temporary partitions

- C. STEP 2: Identify the Patient Risk Group that will be affected by selecting the appropriate Patient Risk Group from the table below. The Patient Risk Groups defined are based on project location and occupancy. If more than one risk group will be affected, select the higher risk group. For all construction classes, patients must be removed from the room while work is performed.

Infrast ructur e (electr ical closet s, mech anical rooms) Office areas Public Areas Outpa tient Clinics	Burn Clinic Cardio logy Echoc ardiog raphy Endos copy Nucle ar Medici ne Physic al Thera py Radiat	Emerg ency Room Kitch en / Cafete ria Labor & Delive ry Labor atorie s (speci men) Medic al and	Any area caring for immu noco mpro mised patien ts Burn Unit Cardia c Cath Lab Centr al Sterile	Pati ent Risk Gro up	Low Risk	Mediu m Risk	High Risk	Critica l Risk
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Shell Space	ion Oncol ogy Radiol ogy/C T/MRI Respir atory Thera py Occup ational Thera py	Surgic al Units Newb orn Nurse ry Outpa tient Surge ry Pediat rics Pharm acy Post Anest hesia Care Unit Progr essive Care Inpati ent Rehab Servic es Rehab Unit Long Term Care Unit / Skilled Nursin g Facilit y (SNF)	Suppl y Dialysi s Intensi ve Care Units Interv ention al Radiol ogy Negati ve press ure isolati on rooms (includ ing Bronc hosco py Suites) Oncol ogy / BMT Opera ting rooms includi ng C- sectio n rooms Pediat ric Sedati on Sterile Proce ssing					
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1. Note: If an area requiring work is located within an area listed as a higher patient risk group it will be treated as if it is the higher patient risk group (e.g. a mechanical closet located within an operating room area.)

- D. STEP 3: Match the Patient Risk Group (Low (L), Medium (M), High (H), Critical Risk (X)) with the Construction Project Type (A, B, C, D) to find the Class of Precautions (I – V). Using the Construction Activity Type and the Patient Risk Group selected from the tables above, use the infection control matrix below to determine Construction Classification (Class). Construction Classification (Class) determines the procedures to be followed during construction and renovation projects.

Patient Risk Group / Construction Project Type Comparison				
Patient Risk Group	TYPE A	TYPE B	TYPE C	TYPE D
Low Risk Group	I	II	II	III
Medium Risk Group	I	II	III	IV
High Risk Group	I	III	IV	V
Critical Risk Group	III	IV	V	V

1. •Infection control permit and approval will be required when Class of Precautions III (Type C) and all Class of Precautions IV or V are necessary.
 2. •Environmental conditions that could affect human health, such as sewage, mold, asbestos, gray water and black water will require Class of Precautions IV for LOW and MEDIUM Risk Groups and Class of Precautions V for HIGH and HIGHEST Risk Groups.
 3. •*Type C [Medium Risk groups] and Type D [Low Risk Groups] work areas [Class III precautions] that cannot be sealed and completely isolated from occupied patient care spaces should be elevated to include negative air exhaust requirements as listed in Class IV Precautions.
- E. STEP 4: Description of Required Infection Control Precautions by Class. Implement the appropriate Construction Guideline based on the project classification selected from the Construction Activity matrix above (STEP 3). Construction Classification (Class) Guidelines are procedures to control release(s) of airborne contaminants resulting from construction, demolition, or renovation activities.

Construction Matrix	Before & During Construction Project
Class I	Perform noninvasive work activity as to not block or interrupt patient care
	Perform noninvasive work activity in a manner that does not create dust
	Immediately replace any displaced ceiling tile before leaving the area and/or at end of noninvasive work activity
	No particulate testing required
	Do not leave tools unattended in public areas
Class II	Perform only limited dust work and/or activities designed for basic facilities and engineering work
	Perform limited dust and invasive work following standing precautions procedures approved by the organization
	This Class of Precautions must never be used for construction or renovation activities
	Provide active means to prevent airborne dust from dispersing into atmosphere
	Seal unused doors with tape
	Block off and seal air vents with filter media
	Place dust mat at entrance and exit of work area
	No particulate testing required

	Do not leave tools unattended in public areas.
Class III (Type A, B)	Provide active means to prevent airborne dust dispersion into the occupied areas
	Means for controlling minimal dust dispersion may include hand-held HEPA vacuum devices, polyethylene plastic containment, or isolation of work area by closing room door (i.e., cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit)
	If work area is contained, then it must be neutrally to negatively pressurized at all times
	Document and maintain negative air pressure within worksite using HEPA equipment air filtration units
	Seal all doors with tape that will not leave residue.
	Cover and contain all trash and debris in the work area
	Nonporous/smooth and cleanable containers (with a hard lid) must be used to transport trash and debris from the construction areas. These containers must be damp-wiped cleaned and free of visible dust/debris before leaving the contained work area.
	Install an adhesive (dust collection) mat at entrance of contained work area based on facility policy. Adhesive mats must be changed routinely and when visibly soiled.
	Maintain clean surroundings when area is not contained by damp mopping or HEPA vacuuming surfaces
	Perform, maintain, and document particulate testing as identified
Class III (Type C, D)	Do not leave tools unattended in public areas
	Provide active means to prevent airborne dust dispersion into the occupied areas
	Means for controlling minimal dust dispersion may include hand-held HEPA vacuum devices, polyethylene plastic containment, or isolation of work area by closing room door (i.e., cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit)
	Remove or isolate return air diffusers to avoid dust from entering the HVAC system
	Remove or isolate the supply air diffusers to avoid positive pressurization of the space
	If work area is contained, then it must be neutrally to negatively pressurized at all times
	Document and maintain negative air pressure within worksite using HEPA equipment air filtration units
	Seal all doors with tape that will not leave residue.
	Cover and contain all trash and debris in the work area
	Nonporous/smooth and cleanable containers (with a hard lid) must be used to transport trash and debris from the construction areas. These containers must be damp-wiped cleaned and free of visible dust/debris before leaving the contained work area.

Class IV	Install an adhesive (dust collection) mat at entrance of contained work area based on facility policy.
	Adhesive mats must be changed routinely and when visibly soiled.
	Maintain clean surroundings when area is not contained by damp mopping or HEPA vacuuming surfaces
	Perform, maintain, and document particulate testing as identified
	Do not leave tools unattended in public areas
	Construct and complete critical barriers meeting NFPA 241 requirements including: Barriers must extend to the ceiling or, if ceiling tile is removed, to the deck above, and all penetrations through the barrier shall meet the appropriate fire rating requirements
	All (plastic or hard) barrier construction activities must be completed in a manner that prevents dust release. Plastic barriers must be effectively affixed to ground and ceiling and secure from movement or damage apply tape that will not leave a residue to seal gaps between barriers, ceiling, or floor
	Seal all penetrations in containment barriers, including floors and ceiling, using approved materials (UL schedule firestop if applicable for barrier type).
	Containment units or environmental containment units (ECUs) approved for Class IV precautions in small areas totally contained by the unit and that has HEPA-filtered exhaust air
	Remove or isolate return air diffusers to avoid dust entering the HVAC system
	Remove or isolate the supply air diffusers to avoid positive pressurization of the space
	Negative airflow pattern must be maintained from the entry point to the anteroom and into the construction area. The airflow must cascade from outside to inside the construction area. The entire construction area must remain negatively pressurized
	Document and maintain negative pressurization of the entire workspace by use of HEPA exhaust air systems directed outdoors. Exhaust discharged directly to the outdoors that is 25 feet or greater from entrances, air intakes and windows does not require HEPA-filtered air
	If exhaust is directed indoors, then the system must be HEPA filtered. Prior to start of work, HEPA filtration must be verified by particulate measurement as no less than 99.97% efficiency and must not alter or change airflow/pressure relationships in other areas Exhaust into shared or recirculating HVAC systems, or other shared exhaust systems (e.g., bathroom exhaust) is not acceptable
	Install device on exterior of work containment to continually monitor negative pressurization. To assure proper pressure is continuously maintained, it is recommended that the device(s) have a visual pressure indicator

Class V	Contain all trash and debris in the work area. Nonporous/smooth and cleanable containers (with a hard lid) must be used to transport trash and debris from the construction areas. These containers must be damp-wiped cleaned and free of visible dust/debris before leaving the contained work area
	Create an ante room, where applicable
	Worker clothing must be clean and free of visible dust before leaving the work area. HEPA vacuuming of clothing or use of cover suits is acceptable
	Workers must wear shoe covers prior to entry into the work area. Shoe covers must be changed prior to exiting the anteroom to the occupied space (non-work area). Damaged shoe covers must be immediately changed
	Install an adhesive (dust collection) mat at entrance of contained work area based on facility policy. Adhesive mats must be changed routinely and when visibly soiled
	Consider collection of particulate data during work to monitor and ensure that contaminants do not enter the occupied spaces. Routine collection of particulate samples may be used to verify HEPA filtration efficiencies
	Perform, maintain, and document particulate testing as identified
	Do not leave tools unattended in public areas
	Construct and complete critical barriers meeting NFPA 241 requirements including: Barriers must extend to the ceiling, or if ceiling tile is removed, to the deck above, and all penetrations through the barrier shall meet the appropriate fire rating requirements.
	All (plastic or hard) barrier construction activities must be completed in a manner that prevents dust release. Plastic barriers must be effectively affixed to ground and ceiling and secure from movement or damage. Apply tape that will not leave a residue to seal gaps between barriers, ceiling, or floor.
	Seal all penetrations in containment barriers, anteroom barriers, including floors and ceiling using approved materials (UL schedule firestop if applicable for barrier type). Construct anteroom large enough for equipment staging, cart cleaning, workers. The anteroom must be constructed adjacent to entrance of construction work area. Personnel will be required to wear disposable coveralls at all times during Class V work activities. Disposable coveralls must be removed before leaving the anteroom,
	Remove or isolate return air diffusers to avoid dust entering the HVAC system.
	Remove or isolate the supply air diffusers to avoid positive pressurization of the space.
	Negative airflow pattern must be maintained from the entry point to the anteroom and into the construction area. The airflow must cascade from outside to inside the construction area. The entire construction area must remain negatively pressurized.

	Document and maintain negative pressurization of the entire workspace using HEPA exhaust air systems directed outdoors. Exhaust discharged directly to the outdoors that is 25 feet or greater from entrances, air intakes and windows does not require HEPA-filtered air.
	If exhaust is directed indoors, then the system must be HEPA filtered. Prior to start of work, HEPA filtration must be verified by particulate measurement as no less than 99.97% efficiency and must not alter or change airflow/pressure relationships in other areas.
	Exhaust into shared or recirculating HVAC systems, or other shared exhaust systems (bathroom exhaust) is not acceptable.
	Install device on exterior of work containment to continually monitor negative pressurization. To assure proper pressure is continuously maintained, it is recommended that the device(s) have a visual pressure indicator.
	Contain all trash and debris in the work area. Nonporous/smooth and cleanable containers (with a hard lid) must be used to transport trash and debris from the construction areas. These containers must be damp-wiped cleaned and free of visible dust/debris before leaving the contained work area.
	Create an ante room, where applicable.
	Worker clothing must be clean and free of visible dust before leaving the work area anteroom.
	Workers must wear shoe covers prior to entry into the work area. Shoe covers must be changed prior to exiting the anteroom to the occupied space (non-work area). Damaged shoe covers must be immediately changed.
	Install an adhesive (dust collection) mat at entrance of contained work area based on facility policy. Adhesive mats must be changed routinely and when visibly soiled.
	Consider collection of particulate data during work to monitor and ensure that contaminants do not enter the occupied spaces. Routine collection of particulate samples may be used to verify HEPA filtration efficiencies.
	Perform, maintain, and document particulate testing as identified
	Do not leave tools unattended in public areas
Construction Matrix	Upon Completion of Construction Project
Class I, II, and III (type A & B)	WORK AREA CLEANING:
	Clean work areas including all environmental surfaces, high horizontal surfaces, and flooring materials
	Check all supply and return air registers for dust accumulation on upper surfaces as well as air diffuser surfaces
	Contain construction waste before transport in tightly covered containers
	HVAC SYSTEMS:

	Remove isolation of HVAC system in areas where work is being performed. Verify that HVAC systems are clean and operational Verify the HVAC systems meet original airflow and air exchange design specifications REMOVAL OF BARRIERS: Perform, maintain, and document particulate testing as identified All (plastic or hard) barrier removal activities must be completed in a manner that prevents dust release. Use the following precautions when removing hard barriers: Carefully remove screws and painter tape. If dust will be generated during screw removal, use hand-held HEPA vacuum. Drywall cutting is prohibited during removal process Clean all stud tracks with HEPA vacuum before removing outer hard barrier. Use a plastic barrier to enclose area if dust could be generated
Class III (Type C & D) IV, and V	<i>Class III (Type C Activities only), IV, and V precautions require inspection and documentation for downgraded ICRA precautions.</i> <i>.Construction areas must be inspected by an infection preventionist or designee and engineering representative for discontinuation or downgrading of ICRA precautions.</i> WORK AREA CLEANING: Clean work areas including all environmental surfaces, high horizontal surfaces and flooring materials. Wet mop and/or vacuum with HEPA filtered vacuum before leaving the work area Contain construction waste before transport in tightly covered containers. Check all supply and return air registers for dust accumulation on upper surfaces as well as air diffuser surfaces. REMOVAL OF CRITICAL BARRIERS: Critical barriers must remain in place during all work involving drywall removal, creation of dust and activities beyond simple touch-up work. The barrier may NOT be removed until a work area cleaning has been performed. Perform, maintain and document particulate testing as identified. All (plastic or hard) barrier removal activities must be completed in a manner that prevents dust release. Use the following precautions when removing hard barriers: Carefully remove screws and painter tape. If dust will be generated during screw removal, use hand-held HEPA vacuum. Drywall cutting is prohibited during removal process. Clean all stud tracks with HEPA vacuum before removing outer hard barrier. Use a plastic barrier to enclose area if dust could be generated. NEGATIVE AIR REQUIREMENTS:

	The use of negative air must be designed to remove contaminants from the work area.
	Negative air devices must remain operational at all times and in place for a period after completion of dust creating activities to remove contaminants from the work area and before removal of critical barriers.
	HVAC SYSTEMS:
	Upon removal of critical barriers, remove isolation of HVAC system in areas where work is being performed
	Upon removal of critical barriers, remove isolation of HVAC system in areas where work is being performed
	Verify the HVAC systems meets original airflow and air exchange design specifications

1.07 PERFORMANCE REQUIREMENTS

- A. Owner's Representative (CPM) Responsibilities:
 - 1. Determine that the Containment and Protection Areas are properly defined and adequately enclosed by the Contractor.
 - 2. Issue a Statement of Requirements in both graphic and written form to communicate the above, based upon an evaluation of the construction area and the impact of the project on patient care.
 - 3. Approve all enclosures constructed by the Contractor.
- B. Owner's Responsibilities:
 - 1. Assist Owner's Representative to determine the Containment and Protection Areas.
 - 2. Coordinate access to Infection Prevention.
- C. Contractor's Responsibilities:
 - 1. Comply with applicable codes and referenced controls using installation procedures and methods that satisfy code requirements and referenced infection control procedures.
 - 2. Determine specific means and methods of achieving and maintaining control of airborne contaminants during construction.
 - 3. Propose work plan and procedures for control of airborne contaminants.
 - 4. Submit Contractor's work plan for control of contamination for review in advance of performing any construction activities. Follow procedures established for product shop drawing submittals.
 - a. Owner's Representative and Architect shall review work Plan Submittal for general compliance.
 - b. Contractor shall possess a signed copy of the reviewed submittal prior to proceeding with the work.
 - 5. Conform to notification requirements in Quality Assurance Article.
 - 6. Provide and maintain all dustproof enclosures, measurement devices, warning signs and warning lighting to protect the patients, Hospital and clinical areas, staff and public. Contractor shall remain responsible for compliance with all contamination control requirements.
 - 7. Verify that all construction personnel have reviewed infection control procedures by using sign-in method. Provide a copy of attendees.

1.08 PRECONSTRUCTION CONFERENCE

- A. Pre-Construction Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to Infection Control Risk Assessment (ICRA) including, but not limited to, the following:
 - 1. Identify Infection Control Risk Assessment.
 - 2. Review infection control policy.

3. Review infection control procedures.
- B. Attendees shall include the Owner's Representative, the Hospital's Infection Control Coordinator, the Architect, the Construction Manager, the Contractor the major Subcontractors, and any other parties involved with the project.

1.09 SUBMITTALS

- A. Progress Schedule: Submit work and procedure schedules for temporary containment construction. Incorporate infection control milestones within the master project schedule.
- B. Work Plan: Submit drawings and construction details of temporary barriers, descriptions of procedures to be used to achieve and maintain control of construction- related airborne contaminants.
- C. Product Data: Include standard specifications, material descriptions, furnished specialties and accessories, rated capacities and capabilities of individual components for achieving containment.
- D. Special Reports:
 1. Provide written report of Infection Control procedures, including locations, exit routes, details of dust barriers, and means of creating negative pressure prior to commencing the project.
 2. Provide written report confirming specified air velocity whenever enclosure is erected or modified in designated Protection Area.
- E. All reports, work plans, and other supporting documentation should be submitted and reviewed by Hospital ICRA staff.

1.10 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency qualified for testing indicated.
- B. Testing: Owner will engage a qualified independent testing agency to test air quality and pressure for compliance with specified requirements for performance and test methods.

PART 2 - PRODUCTS

2.01 PRODUCTS, GENERAL

- A. Provide products and materials that comply with stated requirements for each type of products or materials specified.
- B. Products identified below are recommended as appropriate to the task at hand. Other manufacturers than those listed may be submitted for approval, but it is the Contractor's responsibility to provide effective documentation that adequately supports a substitute product or material.

2.02 INFECTION CONTROL PRODUCTS

- A. Adhesive-Faced Contamination Control Mats: Sanitary walk-off mat consisting of multi-layered, disposable, 2 mil, non-allergenic, non-odorous, polyethylene sheets with non-drying solid adhesive and anti-microbial germicide. Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 1. American Floor Mats; Clean Room Sticky Mats
 2. Controlled Environment Equipment Corporation; Cleanline® Medical Mats.
 3. Liberty Industries, Inc.; Tacky Mat® 800030
 4. Stickymat USA; Tacky Mat.
 5. Texwipe; CleanStep® Adhesive Contamination Control Mats
- B. Modular Temporary Enclosure Panels: Aluminum framed and faced height adjustable panels and accessories to create complete barriers for construction projects.
 1. "STARC Systems" www.stratcsystems.com
- C. Portable Enclosures: Construct a temporary enclosure whenever work is performed outside of the containment area. Provide an enclosure of polyethylene sheet described below, enclosing ladder and sealing off opening at the ceiling system, or provide a prefabricated enclosure unit.

1. Portable Pre-Fabricated Environmental Enclosure: A temporary enclosure for work in sterile or patient environment outside of the Containment Area. A heavy-duty vinyl enclosure and adjustable, spring-loaded top frame to accommodate variabilities in ceiling height; provide ceiling mechanism for snug fit that will not damage ceiling panels. Furnish with inspection window, pressure differential porthole for a HEPA-filtered vacuum device capable of 300-800 CFM and manometer.
 - a. Clean Work Booth, Inc. www.cleanworkbooth.com (This is the standard unit Corewell Health uses)
 - b. Fiberlock Technologies, Inc.; Kontrol Kube®.
 - c. Mintie Technologies, Inc.; ECU Ceiling Cavity™.
 - d. ZipWall LLC; Zipwall®.
- D. Polyethylene Sheet: Provide 6 mil, internally reinforced polyethylene laminate, fire- retardant sheet, NFPA-approved, sealed with fire-retardant tape at joints and penetrations above the ceiling.
 1. Reef Industries, Inc.; Griffolyn® Type 55 FR.
 2. Raven Industries; DURA-SKRIM® 2FR or 10FR.

2.03 ACCESSORIES

- A. Protective Clothing: The Owner will provide disposable paper jumpsuits or reusable, fabric coveralls, head, and shoe coverings for use by construction personnel outside or inside of the Containment Area.
- B. Respiratory Gear: Provide respiratory gear as required by OSHA regulation 29 CFR 1926 (Construction Safety Regulations).

2.04 EQUIPMENT

- A. Portable Air Scrubbers and Negative Air Machines:
 1. Product[s]: Multi-filtered, including 99.9% efficient HEPA filter, variable-speed motor, static pressure-monitored, equipped with electrical or mechanical lockout to prevent fan from operating without a HEPA filter, powered mechanical equipment utilized to create a dust-free environment. Subject to compliance with infection control requirements, provide one of the following:
 - a. Abatement Technologies, Inc.; HEPA-AIRE® Portable Air Scrubber.
 - b. Micro-Trap Inc.; Micro Trap™ 2000 Negative Air Filtration Unit.
 - c. Mintie Technologies, Inc.; 2000V Negative Air Machine.
 - d. Omnitec Design, Inc.; Omniaire OA2000V HEPA Negative Air Machine.
- B. Hospital may provide the HEPA-filtered vacuum for Contractor use during the project.
- C. HEPA-Filtered Vacuum Machine:
 1. Product[s]: Multi-stage, 99.9% efficient HEPA filtration system, grounded, interference suppressed, 110/120V or 220/240V motor, minimum 10-gallon, minimum 500-1000 CFM capacity, powered mechanical equipment utilized to negatively pressurize small temporary dust enclosures to create a dust-free environment or in use to clean surfaces or construction personnel. Subject to compliance with infection control requirements, provide one of the following:
 2. Festool; CT Dust Extractor, Cleantex CT 48 HEPA (12.7 gal).
 3. Nikro Industries, Inc.; HEPA Vacuum (Dry), Model PD15110 (15 gal).
 4. Dustless® Technologies; Dustless HEPA Vacuum (16-gal).
- D. Air Pressure Monitor:
 1. Product[s]: Differential switch/gauge to monitor differential pressure between the containment area and the protection area. Diaphragm type with dial and pointer in metal case, vent valves, black figures on white background and front recalibration adjustment with a range of plus/minus 0- to .50-inches water gauge and high-low adjustable set points. Subject to compliance with infection control requirements, provide a product comparable to the following:

- a. Abatement Technologies, Inc.; HEPA-CARE®
 - b. Dwyer Instruments, Inc.; Model #3000MR-0.
 - c. OMEGA; DPG300
2. Install the differential pressure switch/gauge in a NEMA-rated enclosure. Provide all necessary power wiring, transformers and relays to operate the system. Provide a switch that will enable activation of audio, visual, or both alarms that activates upon sensing pressure differences beyond the range set points. Provide a manual reset gauge after an alarm condition.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine containment area and protection area, with Owner Representative (CPM) and Infection present, for compliance with Infection Control requirements.
 1. For the record, prepare written report, endorsed by Owner Representative, listing conditions detrimental to Infection Control performance.
 2. Proceed with installation only after unsatisfactory conditions have been corrected.
 - a. Notify the Owner's Representative according to time line requirements identified previously before commencing work.

3.02 MONITORING

- A. Before commencing any demolition or construction in occupied areas, a complete review of all airborne contaminant control policies shall be conducted. A checklist shall be completed and signed by the Construction Project Manager, Infection Preventionist and the Contractor, confirming that the area is ready for work to begin.
- B. Owner will monitor conditions in the vicinity of project in Protection Areas. Such areas are identified by the Owner's Representative and as indicated on drawings. Whenever unsafe conditions are observed, Contractor will be notified to correct conditions immediately to avoid work stoppage.
 1. All work shall be stopped immediately whenever a hazardous containment control deficiency exists on the project.
 2. The Contractor shall take immediate action to correct all deficiencies.

3.03 PROTECTION

- A. Contractor shall install dust proof enclosures for work as directed above, as directed by the Owner's Representative, as indicated on the Drawings and when required to protect areas occupied by the Owner from dust, debris, and damage.
- B. Provide a temporary work surface to provide a safe working platform and protect the ceiling and the spaces below from falling objects and materials. Construction must be conducted in tight enclosures cutting off any flow of dust particles into patient areas.
 1. Airborne contaminant control requirements: Floor to structure, airtight enclosures, drywall barriers, using tape and foam padding to seal all joints and penetrations.
 2. Keep enclosure door closed at all times.
 3. Traffic between Containment Area and open areas shall be kept to a minimum.
 4. Transport materials and refuse into an area from an external site without violating patient care areas by transporting in covered containers.
 5. Provide negative pressure in construction area.
 6. Provide adequate forced ventilation of enclosed areas to cure installed materials, to prevent excessive humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases.
 7. Ductwork Dust Caps: Block off all existing ventilation ducts within the construction area. Method of capping ducts shall be dust-tight and withstand airflow pressures.
- C. Dust Proof Enclosures:

1. Full height, noncombustible construction with minimum 5/8" fire-rated gypsum board both sides with 3-1/2 inch R-11 insulation batts to reduce noise UL Approved design for any 1-hour rated enclosure if required by authorities with jurisdiction. Use tape to tightly seal top, bottom, penetrations and seams, to prevent spread of dust to occupied areas, including above ceiling. Secure all tape with spray adhesive. Dust proof enclosures adjacent to or in public areas shall be taped and painted on the side exposed to public view.
 2. Enclosure Doors: 4'-0" minimum width, unless shown otherwise, solid core wood with metal frame and hardware, closer and tightly weatherstripped to prevent flow of dust. Locate as indicated on drawing and swing out of the construction area. Keep enclosures locked outside of working hours. Coordinate with the Owner for access.
 3. Install disposable, multi-layered tacky floor mats on both sides of construction entrance prior to commencing demolition or construction. Remove old tacky surface as needed to prevent tracking, daily as minimum.
 4. Obtain Owner's approval of exact location and details of enclosure construction.
 5. Materials for enclosure shall be precut in unoccupied areas before delivering to project site. No explosive or pneumatic drive fasteners permitted, unless authorized by Owner.
 6. Provide entrance vestibules (antechambers) as described. Provide all floor mats inside vestibule. Sticky mat should be adjacent to door, with dry mat and then wet mat as you proceed into construction area.
- D. Enclosure outside of work area (including spaces above ceilings): Whenever work is necessary outside of the construction enclosures (containment area), the space where work is being done, including ladders, shall be contained within a full-height portable enclosure. At Contractor's option, a prefabricated unit may be used.
1. All work performed outside the construction enclosure shown on drawings, including all work in corridors and lobbies shall be performed outside of normal working hours and shall be scheduled in advance with Owner, except where specified otherwise.
 2. At no time shall any construction equipment or material be stored outside the construction enclosure.
 3. Any dust tracked outside of construction area shall be cleaned up immediately. Contractor shall have the necessary personnel and equipment (HEPA-filtered vacuum, dust and wet mops, brooms, and clean wiping cloths) to keep adjacent occupied areas clean at all times.
- E. Power and Lighting: Provide sufficient temporary lighting and power ventilating equipment to ensure proper workmanship and safety.
- F. Access Provisions: Provide ramps, stairs, ladders and similar temporary access elements as reasonably required to perform the work and facilitate its inspection during installation.
- G. Airborne dust generation of significant quantities of dust will not be tolerated. Clean the work area prior to starting work to minimize existing dust becoming airborne during construction. Provide drop cloths and dust partitions as necessary to contain dust and debris generated by the work.
- H. Demolition material, dust and dirt shall be removed in covered, tightly sealed, rubber tired, polyethylene dump carts. Containers shall be fitted with clean polyethylene covers, completely sealed at perimeter by wire tying or taping. Before leaving area, all containers shall be wiped clean with biocide to prevent tracking of dust. Provide debris chutes if required.
- I. If work is being performed above an accessible ceiling and if work must be performed while the space below is occupied, spray top of ceiling panels to be removed and surrounding affected panels, with fine detergent/water mist to settle dust prior to removal.

- J. A portable plastic fabric tunnel or a polyethylene enclosure for larger openings shall be used for each single ceiling access outside of the Containment Area. The enclosure's opening shall have a 3-foot overlap of polyethylene to decrease risk of airborne dust. The portable plastic fabric tunnel, or portable enclosure, shall remain in place until the ceiling is secured (all accesses closed). In patient care areas, the apparatus (tunnel or enclosure) shall be dismantled and access panels replaced or remodeling of access completed at the end of each day.
- K. If the contractor needs to crawl about pipes, ducts, or other building infrastructure to investigate a condition, the Contractor shall use additional procedures, (e.g. put on a mask, disposable coverall and disposable shoe covers) before going into the access. The surfaces that will be disturbed shall be vacuumed with a HEPA-filtered vacuum before proceeding. Afterwards the contractor shall strip off the coverall, and shoe covers carefully, turning the coverall "inside-out" and deposit the mask, coverall, and shoe covers into a plastic trash bag inside the enclosure. This plastic trash bag shall be secured (tied off) and discarded as directed by Owner's Representative and may not be discarded within any patient care area.
- L. Exercise caution when handling fluids, or piping systems, in the space above ceilings and other Hospital or clinical operations. When working with fluids, provide a watertight barrier beneath the work area to catch and retain all spillage before it reaches the ceiling below.
- M. Water leaks must be cleaned up and repaired as soon as possible, but within 48 hours to prevent mold proliferation in floor and wall coverings, ceiling panels and cabinetry in patient care areas. If cleanup and repair are delayed more than 48 hours after the water leak, the involved materials must be assumed to contain fungi and handled accordingly. Use of a moisture meter to detect water penetration of walls should be used whenever possible to guide decision-making. Moisture meter testing to be performed by Owner. If the wall or other component does not have less than 20% moisture content more than 48 hours after water penetration, it shall be removed.
- N. Contractor is responsible for determining when a dust proof enclosure is required to protect any adjoining area; however, the Contractor shall provide a dust proof enclosure where indicated and whenever requested by the Owner's Representative. Take all necessary precautions to protect the people and spaces below from injury or damage due to Contractor's operations.
- O. Notify department manager so that patient room doors near ceiling work will be kept closed while the work is in progress.

3.04 CONTAINMENT AREA

- A. Maintain levels of airborne contaminants within Containment Area and Protective Area limits as defined by the Owner's Representative and Infection Control Risk Manager.
- B. Portable Air Scrubbers and Negative air machines shall remove airflow from construction area at not less than 100 FPM at enclosure entrances with all doors fully open. As an alternative, provide adequate exhaust air volume to provide 6 air changes per hour.
- C. Dust Control: The Contractor shall take appropriate steps throughout the term of the Project to prevent airborne dust due to work under this contract. Water shall be applied wherever practical to settle and hold dust to a minimum, particularly during demolition and moving of materials. Care must be taken to prevent the accumulation of standing water or the saturation of any materials. No chemical palliatives shall be used without permission of the Owner's Representative.
 - 1. Spray surfaces with water during dust-producing interior demolition activities. Hard surface floors in work area, adjacent hallways and passage areas require vacuuming with HEPA-filtered vacuum cleaners and frequent wet-mopping during demolition and construction; protect adjacent carpeted areas with plastic and plywood and vacuum with HEPA-filtered vacuum cleaners.
 - 2. Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent airborne dust from dispersing into atmosphere.

3. Any dust tracked outside enclosure shall be removed immediately, using HEPA-filtered vacuum.
 4. All cleaning outside enclosure shall be by HEPA-filtered vacuum or other approved method.
- D. The following procedure shall be implemented when construction personnel are required to pass through a Protected Area to enter the Containment Area:
1. Provide airlock entry vestibules to dustproof enclosures when shown on Drawings or required by Owner's Representative.
 2. Construction personnel shall wear protective clothing when passing through the Protective Area or when directed by the Owner's Representative. The protective clothing shall be removed in the airlock vestibule prior to entering the Containment Area and stored for reuse.
 - a. When exiting the Containment Area the protective clothing shall again be worn when passing through the Protective Area.
- E. Construction Personnel: Instruct personnel to refrain from tracking dust into adjacent Hospital or clinical areas or opening windows or doors allowing airborne contaminants into the adjacent Hospital or clinical areas.
- F. Exterior Work: Direct exhaust from equipment away from building air intakes, maintain minimum distance equal to 25'-0"; assure that filters on building air intakes are operational and protected from excessive amounts of airborne contaminants.
- G. Any ceiling panels opened for investigation beyond sealed areas shall be replaced immediately when unattended or covered with an appropriate temporary barrier.
- H. Removal of construction barriers and ceiling protection shall be done carefully.

3.05 EQUIPMENT

- A. Connect portable air scrubbers and negative air machines to emergency power and run continuously.

3.06 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Testing Services: Testing and inspecting of completed phases of the work shall take place in successive stages, in areas of extent and using methods described in Quality Assurance article. Do not proceed with removal or construction of each enclosure for the next area until test results for previously completed phases of the work show compliance with requirements. Owner's Representative is satisfied that work is completed and clean up procedure has been performed.
- C. Repair or replace construction enclosures where test results indicate that it does not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of repaired or replaced work with specified requirements.

3.07 CLEANING

- A. Provide thorough cleaning of all surfaces that become exposed to dust each day. Thoroughly clean each temporary access when work is completed or at the end of each work shift, using approved methods.
- B. Provide a final thorough construction cleaning of area before turning space over to Owner for final cleaning.
- C. Final cleaning of construction (to medically clean standards) shall be performed by the Owner's own housekeeping forces.

3.08 ENFORCEMENT

- A. Failure to maintain containment areas will result in issuance of a written warning. If the situation is not corrected within (8) eight hours of receipt of warning, Owner will have cause to stop the work as provided in the General Conditions.
 - 1. Failure of Contractor to correct deficiencies in containment will result in corrective action taken by Owner and all costs deducted from the Contractor.
- B. The Owner's Representative will perform periodic inspections to determine compliance with infection control procedures. Written documentation shall be filed as part of the project documentation. Photographs may be taken to document work site conditions.

END OF SECTION 013533 01 3533

**SECTION 01 3553
SECURITY PROCEDURES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Security measures including formal security program, entry control, personnel identification, and miscellaneous restrictions.

1.02 RELATED REQUIREMENTS

- A. Section 01 3523 - Owner Safety Requirements.

1.03 SECURITY PROGRAM

- A. Protect Work , existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
- B. Initiate program in coordination with Owner's existing security system at project mobilization.
- C. Maintain program throughout construction period until Owner acceptance precludes the need for Construction Manager security.

1.04 ENTRY CONTROL

- A. Restrict entrance of persons and vehicles into Project site and existing facilities.
- B. Allow entrance only to authorized persons with proper identification.

1.05 PERSONNEL IDENTIFICATION

- A. Provide Corewell Health issued identification badge to each person authorized to enter premises.
- B. Badge To Include: Personal photograph, name, expiration date and employer.
- C. Maintain a list of accredited persons, submit copy to Owner on request.
- D. Require return of badges at expiration of their employment on the Work.
- E. Badge to be worn at all times on Project Site.
- F. There is a fee to replace lost badges.

1.06 RESTRICTIONS

- A. Do not allow cameras on site or photographs taken except by written approval of Owner.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 3553

**SECTION 01 4000
QUALITY REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Quality assurance.
- B. Testing and inspection agencies and services.
- C. Control of installation.
- D. Mock-ups.
- E. Tolerances.
- F. Defect Assessment.

1.02 RELATED REQUIREMENTS

- A. Document 00 3100 - Available Project Information: Soil investigation data.
- B. Section 01 2100 - Allowances: Allowance for payment of testing services.

1.03 QUALITY ASSURANCE

- A. Testing Agency Qualifications:
 - 1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.

1.04 TESTING AND INSPECTION AGENCIES AND SERVICES

- A. Owner will employ services of an independent testing agency to perform certain specified testing; payment for cost of services will be derived from allowance specified in Section 01 2100; see Section 01 2100 and applicable sections for description of services included in allowance.
- B. Owner will employ and pay for services of an independent testing agency to perform other specified testing.
- C. Employment of agency in no way relieves Construction Manager of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 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 Architect 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. Have work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

- A. Before installing portions of the Work where mock-ups are required, construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.
- B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.
- C. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.
- D. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- E. Architect will use accepted mock-ups as a comparison standard for the remaining Work.
- F. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

3.03 TOLERANCES

- A. Monitor fabrication and installation tolerance control of 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 Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

- A. Testing Agency Duties:
 - 1. Provide qualified personnel at site. Cooperate with Architect and Construction Manager in performance of services.
 - 2. Perform specified sampling and testing of products in accordance with specified standards.
 - 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 4. Promptly notify Architect and Construction Manager of observed irregularities or non-compliance of Work or products.
 - 5. Perform additional tests and inspections required by Architect.
 - 6. Submit reports of all tests/inspections specified.
- B. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Construction Manager.
 - 4. Agency has no authority to stop the Work.
- C. Construction Manager Responsibilities:
 - 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 - 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 - 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.

4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Construction Manager beyond specified requirements.
 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Construction Manager beyond specified requirements.
- D. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
 - E. Re-testing required because of non-compliance with specified requirements shall be paid for by Construction Manager.

3.05 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not complying with specified requirements.

END OF SECTION 01 4000

**SECTION 01 4100
REGULATORY REQUIREMENTS**

PART 1 GENERAL

1.01 SUMMARY OF REFERENCE STANDARDS

- A. Regulatory requirements applicable to this project are the following: (Verify with the Authority Having Jurisdiction the following codes. Notify owner of any changes)
- B. 29 CFR 1910 - Occupational Safety and Health Standards; current edition.
- C. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- D. All approved Building Codes and Regulations as adopted by the Authority Having Jurisdiction (AHJ)
- E. NFPA 101 Life Safety Code 2012 edition, for all CMS regulated buildings (I-2 Hospitals, Nursing Homes, or Ambulatory Surgical Centers) in addition to the Life Safety Code as adopted by the AHJ
- F. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- G. Building Code: Michigan Building code as adopted by the Authority Having Jurisdiction (AHJ).
- H. Plumbing Code: Michigan Plumbing Code as adopted by the Authority Having Jurisdiction (AHJ)..
- I. Mechanical Code: Michigan Mechanical Code as adopted by the Authority Having Jurisdiction (AHJ)..
- J. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- K. Energy Code: Michigan Energy Code as adopted by the Authority Having Jurisdiction (AHJ)..

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 4100

SECTION 01 4516
CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes requirements for contractor performance, including, but not limited to, the following:
 - 1. Construction Management Plan (CMP): The CMP is typically written by the construction manager or construction management professional that is responsible for managing construction. The CMP must include, but not limited to, the following:
 - a. Project Description
 - b. Team Alignment & Responsibilities
 - c. Construction Management Plan
 - d. QA / QC Management Plan (QMP).
 - e. Accident Prevention Program (APP).
 - f. Progress Control & Reporting
 - g. Environmental Compliance Oversight
 - h. Contractor Performance Evaluation (CPE). The CPE process is managed and conducted by the Corewell Health Construction Project Manager (CPM).
- B. Related Sections include pertinent Sections of these Specifications for the individual Specifications required.
- C. Corewell Health and the Planning, Design, & Construction (PDC) department value excellence, integrity, compassion, respect, and teamwork. Contractors shall uphold these core values through their behavior on Corewell Health projects. Each of these core values help to ensure a safe, high quality experience for patients, staff, and contractors. Contractors must strive for excellence in all they do; therefore, Corewell Health expects excellence, without exception, from all contractors, which includes, but not limited to, the following:
 - 1. Excellence - Take action, demonstrate accountability, always strive for the best high quality outcome in every situation on every project, and provide high quality, safe work.
- D. Corewell Health as an organization is committed to quality, health, and safety performance standards. This commitment is recognized by Corewell Health's Accreditation with The Joint Commission (formerly known as The Joint Commission on Healthcare Accreditation, or JCAHO), Commission on Accreditation of Rehabilitation (CARF), and Centers for Medicare & Medicaid Services (CMS) through Conditions for Coverage (CfC's) and Conditions of Participations (CoP's). Corewell Health as an organization is committed to delivering high quality and safe care in accordance with these requirements, which includes contractor quality control.
- E. Contractors must be prequalified before performing any work on Corewell Health facilities or grounds. Contractor performance evaluations will be utilized as a holistic tool to evaluate contractors against overall project performance and determine if they are eligible for requalification or disqualification. Corewell Health will recognize contractors that provide safe, quality projects as determined by this specification, and will disqualify contractors that do not.
- F. The primary purpose and goals of this specification are as follows:
 - 1. Drive cultural and behavioral habits in construction projects that help ensure high quality, safety, and overall performance on all Corewell Health construction projects.
 - 2. Measure, monitor, and hold contractors accountable.
 - 3. Recognize and reward contractors that consistently deliver a high level of quality, safety, and performance.

4. Reduce cost and schedule implications from poor quality, and safety and performance issues.
5. Provide a consistent, fair, and objective (i.e. free of bias or prejudice based on personal feelings or relationships) process for contractor performance evaluations and contractor appeals process.

1.03 DEFINITIONS

- A. Project Manager (PM): Corewell Health will assign a PM to each project that is initiated through the FPD&C department.
- B. Planning, Design & Construction (PDC).
- C. Submittal: Information sent by Contractor to convey information about systems, equipment, materials, products, testing reports, operation and maintenance manuals, and administrative matters for the Work.
- D. Trade Contractor Sponsor (TCS): The TCS is a Corewell Health facilities employee that is assigned to an individual trade contractor.
- E. Resident Project Representative (RPR): Corewell Health may assign an RPR to a project depending on size, complexity, and business objectives.
- F. Resubmittal: Submittal sent for review a second or further time.

1.04 SUBMITTAL PROCEDURES

- A. Submittals:
 1. Submittals are a critical part of contractor quality control and performance. Contractors will be evaluated on submittal management in accordance with the contract documents, submittal procedures, Section 01 3000 Administrative Requirements and this Specification.
- B. Delivery Method:
 1. Submittals must be delivered as electronic files.
 2. Where Submittals include information that is intended to be printed on sheets larger than 11 inches X 17 inches, or where scale or drawing size are critical for proper review, submit [2] paper copies for review.
 3. Electronic Files:
 - a. Unless indicated otherwise, submit 1 copy of each Submittal securely in PDF format.
 - b. Scanned Submittals shall be produced in such a way as to not compromise the graphic quality or accuracy of scale, where applicable; and text shall be searchable.
 - c. One copy of each Submittal will be reviewed and returned to the Contractor.
 - d. Submittals may be transmitted via electronic mail (e-mail) or on a CD or DVD. Submittals that are transmitted electronically may be returned electronically at the owner's discretion.
 - e. Electronic submittals must be complete, organized, and packaged into a single indexed file incorporating submittal requirements with hyperlinks that allow for navigation to each tab, section, article, or individual item.
- C. Coordination and Timing:
 1. Submittals as required per this Specification Section, and they must be submitted, reviewed, and approved by the CPM or RPR before any construction or production work begins.
 2. Contractor is responsible for all costs caused by lack of coordination or tardiness of Submittals.
 3. Incomplete and unorganized Submittals will be rejected.
- D. Processing Time: Allow [15] full working days for CPM or RPR to review each Submittal, including Resubmittals. Time for review shall commence on receipt of Submittals. No extension of the Contract Time will be authorized because of failure to transmit Submittals enough in advance, including Resubmittals. CPM or RPR will advise Contractor when a Submittal being processed must be delayed.

- E. Identification: Provide a separate cover sheet on each submittal.
 - 1. Indicate name of firm or entity that prepared Submittal.
 - 2. Provide space to record Contractor's review and approval markings, action taken by Engineer (where applicable), and CPM or RPR review, comments, and stamp.
 - 3. Include the following information:
 - a. Project name.
 - b. Date.
 - c. Name and address of Engineer.
 - d. Name and address of Contractor.
 - e. Name and address of Subcontractor(s).
 - f. Submittal number, including revision identifier.
 - g. Other necessary identification.
- F. Deviations: Not allowed. Deviations on submittals required per this specification are not allowed without written authorization from the CPM.
- G. Transmittal: Package each Submittal individually and appropriately for transmittal and handling. Transmit each Submittal using a transmittal form. CPM will reject Submittal(s) received from sources other than the responsible Contractor.
- H. Resubmittals: Make Resubmittals in same form and number of copies as initial Submittal.
 - 1. Note date and content of previous Submittal.
 - 2. Clearly identify additions and revisions.
 - 3. Resubmit Submittals until they are marked, "Reviewed, No Exceptions Noted" or "Reviewed With Corrections Noted."
- I. Distribution: Furnish copies of Submittals with mark indicating, "Reviewed, No Exceptions Noted" or "Reviewed With Corrections Noted," to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance, quality, and safety of construction activities. A transmittal must be provided with each distributed copy along with a signature/print sheet including date. The signature sheet must be included in the submittal to the CPM.
- J. Use for Construction: Unless otherwise indicated by CPM, use only Submittals with mark indicating, "Reviewed, No Exceptions Noted" or "Reviewed With Corrections Noted."

PART 2 PRODUCTS

2.01 ACTION SUBMITTALS

- A. Quality Management Plan (QMP):
 - 1. The contractor(s) is responsible for submitting and implementing an effective QMP.
 - 2. The QMP must be written with a project specific focus and must meet the QA/QC objectives and goals of the contract documents. To avoid potential conflicts and help to ensure a successful project, it is often in the contractor's best interest to include additional QA/QC objectives and goals that may not be specified in terms of means and methods to ensure a high quality deliverable.
 - 3. The QMP must include the Quality Management Section of Construction Management Core Competencies from the Construction Management Association of America (CMAA), excluding the design portion.
 - 4. A hard copy of the QMP must be maintained and available on-site, and upon request this binder shall be readily available at all times.
 - 5. All contractors or vendors that will be on-site must be trained on the content within the QMP and must sign and date a signature sheet that acknowledges this training; the signature sheet must be submitted to the CPM.
 - 6. The QMP must describe how the contractor(s) will maintain negative air pressure within the construction/project zone in accordance with the Public Health Code, Act 368 of 1978, which incorporates by reference the FGI Guidelines adopted for Health Care Facilities in the State of Michigan.

7. The QMP must include how the contractor will continuously monitor and measure infection control requirements in accordance with the contract documents, the owner's infection control risk assessment (ICRA) available from the CMP/RPR, and the FGI Guidelines adopted for Health Care Facilities in the State of Michigan.
 8. The QMP must include and describe a submittal log/process for actively tracking all submittals, including but not limited to, product submittals, shop drawings, test reports, warranty information or certificates, and O&M manuals. The submittal log shall include all applicable sections and documents required from the contract documents, and a method for ensuring that all reviews, comments, and approvals throughout the submittal process occur and are recorded.
- B. Safety and Health Management Program:
1. At Corewell Health safety is part of our culture for patient, employee, and visitor safety. Corewell Health is also very concerned with the safety of contractors working within our facilities. Contractors are responsible for providing a safe work environment and ensuring that their project site is safe in accordance with all applicable safety codes/laws and applicable Corewell Health policies.
 2. The safety objective for Corewell Health and contractors is zero accidents and injuries on construction projects on any **Spectrum** facility or grounds. Therefore, in accordance with MIOSHA Construction Safety Standards - Part 1. General Provisions, the prime contractor and all subcontractors must submit an electronic copy and hard-copy of their written Accident Prevention Program (APP) that addresses site-specific hazards to the CPM/RPR before any construction or production begins.
 - a. The APP template can be downloaded from MIOSHA's website. The APP submitted by the contractor(s) must be project specific, and must meet the requirements of MIOSHA.
 - b. A project specific and comprehensive APP can be submitted from the prime contractor; however, it must include applicable work categories or trades for all subcontractors, and all subcontractors must be trained in the APP content. In accordance with Part 1 from MIOSHA, employers/contractors are responsible for an effective APP. As an example, the prime contractor may write a project specific APP and attach subcontractor APP's to it as an appendix.
 - c. A hard copy of the APP must be maintained and available on-site, and upon request shall be readily available at all times.
 - d. All contractors or vendors that will be on-site must be trained on the content within the APP and must sign and date a signature sheet that acknowledges this training; signature sheet(s) must be submitted to the CPM.
 - e. The APP shall identify a designated on-site project safety representative (PSR). The PSR must be on-site at all times while work is being performed. The PSR can be the on-site superintendent or foreman from the prime contractor. The PSR must be 30-hour OSHA certified or have completed the MIOSHA level 1 certificate program through the MIOSHA Training Institute. Evidence of certification must be provided with the submission of the APP to the CPM. Refer to Section 01 3523 Part 2.02 for more detail for the PSR.

PART 3 EXECUTION

3.01 CONTRACTOR'S REVIEW AND APPROVAL

- A. Review each Submittal and check for compliance with the Contract Documents. Mark with approval stamp before submitting to CPM.
- B. Submittals that are not organized, do not meet the requirements of Part 1 & 2, and are not approved and stamped by the Contractor(s) will be rejected.

3.02 CONSTRUCTION PROJECT MANAGER (CPM) SUBMITTAL REVIEW

- A. Submittals: The CPM shall review Submittals, make marks to indicate corrections or modifications required, and return Submittal. The CPM shall stamp each Submittal with an action stamp to indicate action taken, as follows:

1. Reviewed, No Exceptions Noted.
2. Reviewed With Corrections Noted.
3. Revise and Resubmit. Corrections are provided by the CPM.
4. Rejected, Resubmit: Submittal as a whole is incomplete, unorganized, and not assembled correctly.

3.03 CONTRACTOR PERFORMANCE EVALUATION PROCESS

- A. The Corewell Health project management team shall lead the contractor performance evaluation process for the project.
- B. The contractor performance evaluations shall be maintained and managed by the Corewell Health facilities department including the project management team.
- C. The Corewell Health project management team, as assigned and determined at Corewell Health's sole discretion, shall complete a performance evaluation regarding the contractor.
- D. Upon completion of each contractor performance evaluation, the contractor shall be provided an electronic PDF copy of the evaluation.
- E. All evaluations with a final score of less than 75% will be reported to, and reviewed by, Corewell Health Leadership.
- F. All contractors and subcontractors shall be evaluated per the following:
 1. Projects with a duration of one year or less: Individual project contractor performance evaluations will be performed by the Corewell Health project management team at the substantial completion of each project.
 2. Contractors engaged in multiyear projects will be evaluated by the Corewell Health project management team as determined in the project kickoff meeting. For example, a two year project will be evaluated at 50% completion and at substantial completion, and longer duration projects may be evaluated at 33%, and 66% of completion, and at substantial completion. The purpose of performing the evaluation process is to identify deficiencies, and implement corrective actions as necessary throughout projects of longer duration.
 3. All evaluations will be performed utilizing a format and process to ensure consistency, objectiveness, and fairness in the evaluation.
 4. Contractor performance evaluations shall include:
 - a. See contractor performance evaluation form for reference.
 - b. The contractor performance evaluation shall be based on eight performance categories. Each category contains 5 questions that are scored on a scale of 1-5. 1- unacceptable, 2-poor, 3-average, 4-good, and 5-excellent. Each category is calculated for an average score, and each category is calculated based on a 100% scale.
 - c. The eight performance categories are listed below:
 - 1) Quality Management.
 - 2) Scheduling and Productivity Management.
 - 3) Safety Management.
 - 4) Infection Control Management.
 - 5) Project Management.
 - 6) Cost Management/Control.
 - 7) Contract Administration.
 - 8) Close-out Procedures.
 - 9) The average score and total score of each category shall be recorded in a scoring summary where the overall average score and total score are calculated based on the average. The total score for each category is calculated by multiplying the total score by the weighted percentage (%) for each category. As an example, quality management has a weight of 15%, so the total score is multiplied by the weight to achieve a final score. The final score of each category is then added together to get the aggregate total score for the evaluation.

5. Corewell Health has a specific scoring summary workbook for each contractor where all evaluations are documented and averaged on a summary page for Corewell Health reference. The most recent five evaluations are averaged and summarized as well as the cumulative total for all evaluations. This allows Corewell Health's facilities department leadership to review recent performance history, overall performance history and continuously evaluate each contractor to ensure the best performance from our contractors.
6. **CONTRACTOR RESPONSE PROCESS**
 - a. Upon receipt of a contractor performance evaluation score of less than 75% the contractor may respond to the Corewell Health Leadership with comments regarding the performance evaluation.
 - b. A meeting can be scheduled to review the performance evaluation with the underperforming contractor. Upon further review with Corewell Health Leadership and discussion with the contractor, the performance evaluation may be revisited and altered as necessary.

END OF SECTION 01 4516 01 4516

SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary sanitary facilities.
- C. Temporary Controls: Barriers, enclosures, and fencing.
- D. Security requirements.
- E. Waste removal facilities and services.
- F. Project identification sign.
- G. Field offices.

1.02 RELATED REQUIREMENTS

- A. Section 01 5500 - Vehicular Access and Parking.

1.03 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

1.04 TEMPORARY UTILITIES

- A. Contractor shall, at their expense; install, operate, protect, and maintain the respective temporary services as hereinafter specified, during the construction period of the entire project. These temporary services shall include water supply, electric, light, and power, and any other services as may be stipulated in the 00 7200 of the General Conditions, or 00 7300 Supplementary Conditions.
- B. Contractor shall pay all costs for the operation of temporary services herein specified, except that the Owner will pay all costs for steam, water, and power that are used from existing utility systems. Data, phone and all other technology costs for temporary offices shall be the responsibility of the contractor on new or renovation/remodel projects.
- C. Any part or parts of permanent service lines, ground, and buildings disturbed or damaged by the installation and/or removal of the temporary services shall be restored to their original condition by the responsible contractor.
- D. If the Contractor fails to carry out his responsibility in supplying temporary services, as set forth in the contract documents, he shall be held responsible for such failure, and Owner shall have the right to take such action as it deems proper for the protection and conduct of the work and shall deduct all cost involved from the amount due the Contractor.
- E. Contractor to engage appropriate local utility companies to install temporary services. Where utility companies provide only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company requirements. Coordinate with Owner.
 - 1. Arrange with utility company, and Owner if interruption of services is necessary, to make connections for temporary services.
 - 2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide mobile services.
 - 3. Obtain easements to bring temporary utilities to Project site where Owner's easement cannot be used for that purpose.
 - 4. Coordinate procedures, details and dates with Owner.
 - 5. Construction facilities and controls shall meet requirements of Authorities having Jurisdiction (AHJ).

- F. **Temporary Water Supply:** The Owner, within its facilities, will furnish water for construction purposes, without charge to the Contractors. Where Owner water is not available, the Contractor shall, at his own cost and expense; install, operate, protect and maintain a complete temporary water supply source and shall be responsible for payment of all water usage charges associate with the site operation up to the date of Substantial Completion.
1. The Contractor shall provide insulation and heat tape to prevent freezing of the construction site water supply.
 2. The Contractor shall extend piping and space outlets so that all areas of the project can reached with a 100 foot hose. Each sub-contractor is responsible for supplying all hose necessary to connect to Contractors distribution network.
- G. **Temporary Construction Light and Power:** The Contractor, at his own cost and expense; install, operate, protect and maintain a complete temporary construction light and power system as follows:
1. Complete installation of temporary lighting and power should be in strict accordance with NEMA, NECA and UL standards and the latest edition of the National Electrical Code.
 2. If available within the existing facilities, the Owner will furnish electric to Contractor free of charge for use on the construction site. Should power not be available from the Owner's facilities, the Contractors electrical sub-contractor shall be responsible for providing power from the public utility including all transformers, meters distribution equipment, panels, wire, conduit, disconnects, or other appurtenances required for a complete electrical distribution system. Where power is taken from the public utility, the Contractors electrical sub-contractor shall provide metering of power usage. The Contractor shall be responsible for payment of all electrical usage charges associate with the site operation up to the date of Substantial Completion.
 3. Provide main service disconnect and over-current protection at convenient locations.
 4. Provide temporary poles and temporary distribution wiring to the temporary power of each building, structure, and trailer. Make all connections.
 5. Provide receptacle outlets adequate for connection of power tools and equipment.
 6. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
 7. Provide warning signs at power outlets other than 110 to 120 volts.
 8. Provide metal conduit, tubing, or metallic cable for wiring exposed to possible damage. Provide rigid steel conduits for wiring exposed on grades, floors, decks, or other traffic areas.
 9. Provide metal conduit enclosures or boxes for wiring devices.
 10. Provide 4-gang outlets, spaced os 100-foot extension cord can reach each area for power hand tools and task lighting. Provide a separate 125 V ac, 20 Amp circuit for each outlet.
 11. Provide temporary lighting with local switching that provides adequate illumination for construction operations, traffic conditions and personal safety and security in surrounding areas.
 12. On the interior of the project, provide one 100 Watt incandescent lamp per 500 square feet area; uniformly distributed, for general lighting, or equivalent illumination.
- H. **Temporary Data, Telephone, and Other Telecommunications Technology:** The Contractor shall, at his own cost and expense; install, operate, protect and maintain a complete technology system for the project field office as detailed below:
1. Complete installation of a temporary system shall be in strict accordance with the latest edition of all applicable codes.
 2. If available within the Owners existing facilities, the Owner will provide access to its existing high speed internet service.
- I. **Temporary Heating:** The Contractor shall, at his own expense, install, operate, protect and maintain a complete Temporary Heating system for the project as detailed below.

1. Provide temporary heating units that have been tested and labeled UL, FM, or another recognized trade association related to the type of fuel being consumed. If liquid fuel is used, provide under-unit containment in the event of leakage. Provide adequate ventilation or direct vent the units to the outside.
2. Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity.
3. Maintain a minimum temperature of 50 degree F in permanently or temporary /semi-permanent enclosed portions of building for normal construction activities, and 65 degree F for finishing activities and areas where finished work has been installed. These building temperatures must be maintained for the duration of the construction activities regardless of the number of heating days during construction required to maintain the temperature constants, or the exterior weather conditions compared to "normal" or "average" weather patterns.
4. Should electrical service be required for temporary heaters, the Contractors electrical sub-contractor shall be responsible for providing necessary connections to the existing or temporary site power distribution system.
5. The Contractor shall be responsible for any electrical consumption charges incurred as a result of operating the temporary heaters.
6. Use of kerosene-burning space heaters, open flame heaters or fuel oil "salamanders" is FORBIDDEN.

1.05 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Maintain daily in clean and sanitary condition.
- C. At end of construction, return facilities to same or better condition as originally found.

1.06 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
 1. Barriers to be fire rated as required.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.07 FENCING

- A. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.08 INTERIOR ENCLOSURES

- A. Also see Section 01 3523 Owner Safety Requirements
- B. Also see Section 01 3533 Infection Control for Further Requirements
- C. Provide temporary partitions and ceilings as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.
 1. Temporary partitions and ceilings shall adhere to the following requirements:
 - a. Public Areas (corridors or spaces that front publicly accessed areas) shall deploy barriers that are clean, solid, and presentable, able to receive graphic stickers or paint, and comply with specifications below:
 - b. Private Areas (staff areas, mechanical or electrical spaces, or other areas where general public populations have no access) shall deploy any approved barrier per specifications below:

- D. Acceptable Materials:
 - 1. Modular extendable wall systems: "STARC Systems" Aluminum framed and skinned panels and all required accessories to complete system
 - 2. Steel Framing and gypsum board or plywood sheet materials with closed joints and sealed edges at intersections with existing surfaces. Paint surfaces exposed to public view.
 - 3. Polyethylene Sheet: 6 mil, internally reinforced sheet, per NFPA 241 Standard for Safeguarding Construction Sites. Provide all accessories to complete barrier, height adjustable supports, door or access points, HEPA filtration ports and others as required.
 - 4. Verify with Corewell Health PM for final material requirements.
 - 5. Maximum flame spread rating of 75 in accordance with ASTM E84.
- E. Enclosure Plans: Prepare and provide to owner for review a complete plan of temporary barricades and barriers, note materials and other information as required (fire ratings). Provide this plan as part of the pre-construction project meeting.

1.09 SECURITY

- A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
- B. Coordinate with Owner's security program.

1.10 VEHICULAR ACCESS AND PARKING - SEE SECTION 01 5500

- A. Coordinate access and haul routes with governing authorities and Owner.
- B. Provide and maintain access to fire hydrants, free of obstructions.
- C. Provide means of removing mud from vehicle wheels before entering streets.
- D. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.11 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site periodically.
- C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.12 PROJECT IDENTIFICATION

- A. Provide project identification sign of design and construction indicated on drawings.
- B. Erect on site at location indicated.
- C. No other signs are allowed without Owner permission except those required by law.

1.13 FIELD OFFICES

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.
- B. Provide space for Project meetings, with table and chairs to accommodate a minimum of 12 persons.

1.14 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 5000

**SECTION 01 5500
VEHICULAR ACCESS AND PARKING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Parking.
- B. Traffic signs and signals.
- C. Maintenance.
- D. Removal, repair.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Temporary Construction: Construction Manager's option.

PART 3 EXECUTION

3.01 PARKING

- A. The Owner does not provide parking or validation to construction personnel at any hospital site locations.
- B. Construction personnel are not allowed to park in patient/visitor areas without prior approval of Parking Services.
- C. Parking requests for construction personnel can be submitted to Parking Services. Coordinate temporary parking requests with the Planning, Design and Construction Project Manager. Contractor's submitting parking request will be responsible for all fees associated with the approved parking request.
- D. Temporary parking access for delivery or removal of supplies must be approved by Parking Services. Coordinate temporary parking access with Planning, Design and Construction Project Manager.
- E. For all out patient, off-site location, coordinate with Corewell Health Planning, Design and Construction Project Manager on designated areas of existing parking for temporary parking by construction personnel for the duration of the project.

3.02 TRAFFIC SIGNS AND SIGNALS

- A. At approaches to site and on site, install at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.

3.03 MAINTENANCE

- A. Maintain traffic and parking areas in a sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
- B. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

3.04 REMOVAL, REPAIR

- A. Remove temporary roads when permanent paving is usable.
- B. Repair damage caused by installation.

END OF SECTION 01 5500

SECTION 01 5719
TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Construction procedures to promote adequate indoor air quality after construction.
- B. Building flush-out after construction and before occupancy.
- C. Testing indoor air quality before commencement of construction; existing building areas only.
- D. Testing indoor air quality after completion of construction.

1.02 PROJECT GOALS

- A. Dust and Airborne Particulates: Prevent deposition of dust and other particulates in HVAC ducts and equipment.
 - 1. Cleaning of ductwork is not contemplated under this Contract.
 - 2. Construction Manager shall bear the cost of cleaning required due to failure to protect ducts and equipment from construction dust.
 - 3. Establish condition of existing ducts and equipment prior to start of alterations.
- B. Airborne Contaminants: Procedures and products have been specified to minimize indoor air pollutants.
 - 1. Furnish products meeting the specifications.
 - 2. Avoid construction practices that could result in contamination of installed products leading to indoor air pollution.

1.03 REFERENCE STANDARDS

- A. ASTM D5197 - Standard Test Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology); 2009.
- B. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers; California Department of Public Health; v1.1, 2010.
- C. EPA 600/4-90/010 - Compendium of Methods for the Determination of Air Pollutants in Indoor Air; April 1990.
- D. EPA 625/R-96/010b - Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air; Jan-99.
- E. SMACNA (OCC) - IAQ Guidelines for Occupied Buildings Under Construction; 2007.

1.04 DEFINITIONS

- A. Adsorptive Materials: Gypsum board, acoustical ceiling tile and panels, carpet and carpet tile, fabrics, fibrous insulation, and other similar products.
- B. Contaminants: Gases, vapors, regulated pollutants, airborne mold and mildew, and the like, as specified.
- C. Particulates: Dust, dirt, and other airborne solid matter.
- D. Wet Work: Concrete, plaster, coatings, and other products that emit water vapor or volatile organic compounds during installation, drying, or curing.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Also See Section 01 3523 - Owner Safety Requirements.
- C. Also See Section 01 3533 - Infection Control and Risk Assessment Procedures.
- D. Indoor Air Quality Management Plan: Describe, in detail, measures to be taken to promote adequate indoor air quality upon completion; use SMACNA (OCC) as a guide.
 - 1. Submit not less than 60 days before enclosure of building.

2. Identify potential sources of odor and dust.
 3. Identify construction activities likely to produce odor or dust.
 4. Identify areas of project potentially affected, especially occupied areas.
 5. Evaluate potential problems by severity and describe methods of control.
 6. Describe construction ventilation to be provided, including type and duration of ventilation, use of permanent HVAC systems, types of filters and schedule for replacement of filters.
 7. Describe cleaning and dust control procedures.
- E. Interior Finishes Installation Schedule: Identify each interior finish that either generates odors, moisture, or vapors or is susceptible to adsorption of odors and vapors, and indicate air handling zone, sequence of application, and curing times.
- F. Duct and Terminal Unit Inspection Report.
- G. Air Contaminant Test Plan: Identify:
1. Testing agency qualifications.
 2. Locations and scheduling of air sampling.
 3. Test procedures, in detail.
 4. Test instruments and apparatus.
 5. Sampling methods.
- H. Air Contaminant Test Reports: Show:
1. Location where each sample was taken, and time.
 2. Test values for each air sample; average the values of each set of 3.
 3. HVAC operating conditions.
 4. Certification of test equipment calibration.
 5. Other conditions or discrepancies that might have influenced results.

PART 3 EXECUTION

2.01 CONSTRUCTION PROCEDURES

- A. Prevent the absorption of moisture and humidity by adsorptive materials by:
1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
 2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
 3. Provide sufficient ventilation for drying within reasonable time frame.
- B. Begin construction ventilation when building is substantially enclosed.
- C. When working in a portion of an occupied building, prevent movement of air from construction area to occupied area.
- D. Do not store construction materials or waste in mechanical or electrical rooms.
- E. Prior to use of return air ductwork without intake filters clean up and remove dust and debris generated by construction activities.
1. Inspect duct intakes, return air grilles, and terminal units for dust.
 2. Clean plenum spaces, including top sides of lay-in ceilings, outsides of ducts, tops of pipes and conduit.
 3. Clean tops of doors and frames.
 4. Clean mechanical and electrical rooms, including tops of pipes, ducts, and conduit, equipment, and supports.
 5. Clean return plenums of air handling units.
 6. Remove intake filters last, after cleaning is complete.
- F. Do not perform dusty or dirty work after starting use of return air ducts without intake filters.
- G. Use other relevant recommendations of SMACNA (OCC) for avoiding unnecessary contamination due to construction procedures.

2.02 BUILDING FLUSH-OUT

- A. Construction Manager's Option: Either full continuous flush-out OR satisfactory air contaminant testing is required, not both.
- B. Perform building flush-out before occupancy.
- C. Do not start flush-out until:
 - 1. All construction is complete.
 - 2. HVAC systems have been tested, adjusted, and balanced for proper operation.
 - 3. Inspection of inside of return air ducts and terminal units confirms that cleaning is not necessary.
 - 4. New HVAC filtration media have been installed.
- D. Building Flush-Out: Operate all ventilation systems at normal flow rates with 100 percent outside air until a total air volume of 14,000 cubic feet per square foot of floor area has been supplied.
 - 1. Obtain Owner's concurrence that construction is complete enough before beginning flush-out.
 - 2. Maintain interior temperature of at least 60 degrees F and interior relative humidity no higher than 60 percent.
 - 3. If additional construction involving materials that produce particulates or any of the specified contaminants is conducted during flush-out, start flush-out over.
 - 4. If interior spaces must be occupied prior to completion of the flush-out, supply a minimum of 25 percent of the total air volume prior to occupancy, and:
 - a. Begin ventilation at least three hours prior to daily occupancy.
 - b. Continue ventilation during all occupied periods.
 - c. Provide minimum outside air volume of 0.30 cfm per square foot or design minimum outside air rate, whichever is greater.
- E. Install new HVAC filtration media after completion of flush-out and before occupancy or further testing.

2.03 AIR CONTAMINANT TESTING

- A. Construction Manager's Option: Either full continuous flush-out, or satisfactory air contaminant testing is required, not both.
- B. Perform air contaminant testing before starting construction, as base line for evaluation of post-construction testing.
- C. Perform air contaminant testing before occupancy.
- D. Do not start air contaminant testing until:
 - 1. All construction is complete, including interior finishes.
 - 2. HVAC systems have been tested, adjusted, and balanced for proper operation.
 - 3. New HVAC filtration media have been installed.
- E. Indoor Air Samples: Collect from spaces representative of occupied areas:
 - 1. Collect samples while operable windows and exterior doors are closed, HVAC system is running normally as if occupied, with design minimum outdoor air, but with the building unoccupied.
 - 2. Collect samples from spaces in each contiguous floor area in each air handler zone, but not less than one sample per 25,000 square feet; take samples from areas having the least ventilation and those having the greatest presumed source strength.
 - 3. Collect samples from height from 36 inches to 72 inches above floor.
 - 4. Collect samples from same locations on 3 consecutive days during normal business hours; average the results of each set of 3 samples.
 - 5. Exception: Areas with normal very high outside air ventilation rates, such as laboratories, do not need to be tested.

6. When retesting the same building areas, take samples from at least the same locations as in first test.
- F. Outdoor Air Samples: Collect samples at outside air intake of each air handler at the same time as indoor samples are taken.
- G. Analyze air samples and submit report.
- H. Volatile Organic Compounds Limits:
 1. Formaldehyde: Not more than 27 parts per billion.
 2. Total Volatile Organic Compounds (TVOCs): Not more than 500 micrograms per cubic meter.
 3. Chemicals Listed in CAL (CDPH SM) Table 4-1, other than Formaldehyde: Not more than allowable concentrations listed in Table 4-1.
- I. Air Contaminant Concentration Test Methods:
 1. Formaldehyde: ASTM D5197, EPA 625/R-96/010b Method TO-11A, or EPA 600/4-90/010 Method IP-6A.
 2. Particulates: EPA 600/4-90/010 Method IP-10.
 3. Total Volatile Organic Compounds (TVOC): EPA 625/R-96/010b Method TO-1, TO-15, or TO-17; or EPA 600/4-90/010 Method IP-1.
 4. Chemicals Listed in CAL (CDPH SM) Table 4-1, except Formaldehyde: ASTM D5197, or EPA 625/R-96/010b Method TO-1, TO-15, or TO-17.
 5. Carbon Monoxide: EPA 600/4-90/010 Method IP-3, plus measure outdoor air; measure in ppm; report both indoor and outdoor measurements.

END OF SECTION 01 5719

**SECTION 01 6000
PRODUCT REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations.
- F. Procedures for Owner-supplied products.
- G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

- A. Section 01 2500 - Substitution Procedures: Substitutions made during procurement and/or construction phases.
- B. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.
- C. Section 01 7419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.
- D. Section 22 0513 - Common Motor Requirements for Plumbing Equipment: Motors for plumbing equipment.
- E. Section 23 0513 - Common Motor Requirements for HVAC Equipment: Motors for HVAC equipment.

1.03 REFERENCE STANDARDS

- A. NEMA MG 00001 - Motors and Generators; 2024.

1.04 SUBMITTALS

- A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.
- B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.
- C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Construction Manager; remove from site.

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by Contract Documents.
- B. Use of products having any of the following characteristics is not permitted:
 - 1. Made using or containing CFC's or HCFC's.
 - 2. Containing lead, cadmium, or asbestos.
 - 3. Products containing these characteristics will be promptly removed from project at no cost to Owner.
- C. Where other criteria are met, Construction Manager shall give preference to products that:
 - 1. If used on interior, have lower emissions, as defined in Section 01 6116.
 - 2. If wet-applied, have lower VOC content, as defined in Section 01 6116.
- D. Motors: Refer to Section 21 0513 - Common Motor Requirements for Fire Suppression Equipment, NEMA MG 00001 Type. Specific motor type is specified in individual specification sections.
- E. Motors: Refer to Section 22 0513 - Common Motor Requirements for Plumbing Equipment, NEMA MG 00001 Type. Specific motor type is specified in individual specification sections.
- F. Motors: Refer to Section 23 0513 - Common Motor Requirements for HVAC Equipment, NEMA MG 00001 Type. Specific motor type is specified in individual specification sections.

2.03 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

- A. See Section 01 2500 - Substitution Procedures.

3.02 OWNER-SUPPLIED PRODUCTS

- A. Owner's Responsibilities:
 - 1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Construction Manager.
 - 2. Arrange and pay for product delivery to site.
 - 3. On delivery, inspect products jointly with Construction Manager.
 - 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 - 5. Arrange for manufacturers' warranties, inspections, and service.
- B. Construction Manager's Responsibilities:
 - 1. Review Owner reviewed shop drawings, product data, and samples.
 - 2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
 - 3. Handle, store, install and finish products.
 - 4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 7419.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- G. Comply with manufacturer's warranty conditions, if any.
- H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- I. Prevent contact with material that may cause corrosion, discoloration, or staining.
- J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION 01 6000

SECTION 01 6116
VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements for Indoor-Emissions-Restricted products.
- B. Requirements for VOC-Content-Restricted products.

1.02 RELATED REQUIREMENTS

- A. Section 01 3000 - Administrative Requirements: Submittal procedures.

1.03 DEFINITIONS

- A. Indoor-Emissions-Restricted Products: All products in the following product categories, whether specified or not:
 - 1. Interior paints and coatings applied on site.
 - 2. Interior adhesives and sealants applied on site, including flooring adhesives.
 - 3. Flooring.
 - 4. Composite wood.
 - 5. Products making up wall and ceiling assemblies.
 - 6. Thermal and acoustical insulation.
- B. VOC-Content-Restricted Products: All products in the following product categories, whether specified or not:
 - 1. Interior paints and coatings applied on site.
 - 2. Interior adhesives and sealants applied on site, including flooring adhesives.
- C. Interior of Building: Anywhere inside the exterior weather barrier.
- D. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- E. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.
- F. Inherently Non-Emitting Materials: Products composed wholly of minerals or metals, unless they include organic-based surface coatings, binders, or sealants; and specifically the following:
 - 1. Concrete.
 - 2. Clay brick.
 - 3. Metals that are plated, anodized, or powder-coated.
 - 4. Glass.
 - 5. Ceramics.
 - 6. Solid wood flooring that is unfinished and untreated.

1.04 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings; 2005 (Reapproved 2013).
- C. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board; 2007.
- D. SCAQMD 1113 - South Coast Air Quality Management District Rule No.1113; current edition.
- E. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.

- B. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.

1.06 QUALITY ASSURANCE

- A. VOC Content Test Method: 40 CFR 59, Subpart D (EPA Method 24), or ASTM D3960, unless otherwise indicated.
 - 1. Evidence of Compliance: Acceptable types of evidence are:
 - a. Report of laboratory testing performed in accordance with requirements.
- B. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 MATERIALS

- A. All Products: Comply with the most stringent of federal, State, and local requirements, or these specifications.
- B. VOC-Content-Restricted Products: VOC content not greater than required by the following:
 - 1. Adhesives, Including Flooring Adhesives: SCAQMD 1168 Rule.
 - 2. Joint Sealants: SCAQMD 1168 Rule.
 - 3. Paints and Coatings: Each color; most stringent of the following:
 - a. 40 CFR 59, Subpart D.
 - b. SCAQMD 1113 Rule.
 - c. CARB (SCM).

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Construction Manager.

END OF SECTION 01 6116

**SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Cutting and patching.
- C. Surveying for laying out the work.
- D. Cleaning and protection.
- E. Starting of systems and equipment.
- F. Closeout procedures, including Construction Manager's Correction Punch List, except payment procedures.
- G. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
 - 1. On request, submit documentation verifying accuracy of survey work.
 - 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
 - 3. Submit surveys and survey logs for the project record.
- C. Cutting and Patching: Submit written request in advance of cutting or alteration that 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.

1.04 QUALIFICATIONS

- A. For surveying work, employ a land surveyor registered in Michigan and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

1.05 PROJECT CONDITIONS

- A. Use of explosives is not permitted.
- B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- C. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
 - 1. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
 - 2. Follow all ICRA protocols as detailed in Section 01 3533.
- D. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

1. Indoors: Limit conduct of especially noisy interior work to times as specified and coordinated with Construction Project Manager..
 - a. Also see Section 01 1000 Project Summary.
- E. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- F. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

1.06 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Notify affected utility companies and comply with their requirements.
- C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean-up of work of separate sections.
- G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect of any discrepancies discovered.
- C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- F. Utilize recognized engineering survey practices.
- G. Establish elevations, lines 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; and _____.
 - 2. Grid or axis for structures.
 - 3. Building foundation, column locations, ground floor elevations, and _____.
- H. Periodically verify layouts by same means.
- I. Maintain a complete and accurate log of control and survey work as it progresses.

3.04 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. Perform whatever cutting and patching is necessary to:
 - 1. Complete the work.
 - 2. Fit products together to integrate with other work.
 - 3. Provide openings for penetration of mechanical, electrical, and other services.
 - 4. Match work that has been cut to adjacent work.
 - 5. Repair areas adjacent to cuts to required condition.
 - 6. Repair new work damaged by subsequent work.
 - 7. Remove samples of installed work for testing when requested.
 - 8. Remove and replace defective and non-complying work.

- C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- F. Restore work with new products in accordance with requirements of Contract Documents.
- G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.
- I. Patching:
 - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 - 2. Match color, texture, and appearance.
 - 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.06 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- 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 trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. 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.
- G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.08 SYSTEM STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

- D. Verify that wiring and support components for equipment are complete and tested.
- E. Execute start-up under supervision of applicable Construction Manager personnel and manufacturer's representative in accordance with manufacturers' instructions.
- F. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.09 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.10 FINAL CLEANING

- A. Use cleaning materials that are nonhazardous.
- B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- E. Clean filters of operating equipment.
- F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.
- G. Clean site; sweep paved areas, rake clean landscaped surfaces.
- H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.11 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
- B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Construction Manager's Correction Punch List for Construction Manager's Notice of Substantial Completion.
- C. Complete all required testing by Commissioning Authority. Remediate any issues that are identified by Commissioning Authority prior to Architect issuing Substantial Completion.
- D. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
- E. Submit written certification containing Construction Manager's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.
- F. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Construction Manager's comprehensive list of items identified to be completed or corrected and submit to Architect.
- G. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
- H. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.
- I. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

3.12 MAINTENANCE

- A. Provide service and maintenance of components indicated in specification sections.

- B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
- C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION 01 7000

SECTION 01 7419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

- A. Owner requires that this project generate the least amount of trash and waste possible.
- B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- D. Construction Manager Reporting Responsibilities: Submit periodic Waste Disposal Reports; report landfill disposal, incineration, recycling, salvage, and reuse regardless of to whom the cost or savings accrues; use the same units of measure on required reports.
- E. Methods of trash/waste disposal that are not acceptable are:
 - 1. Burning on the project site.
 - 2. Burying on the project site.
 - 3. Dumping or burying on other property, public or private.
 - 4. Other illegal dumping or burying.
- F. Regulatory Requirements: Construction Manager is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- I. Return: To give back reusable items or unused products to vendors for credit.
- J. Reuse: To reuse a construction waste material in some manner on the project site.
- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
 - 1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
 - 2. Submit Report on a form acceptable to Owner.
 - 3. Landfill Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
 - c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - 4. Incinerator Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards, of trash/waste material from the project delivered to incinerators.
 - c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - 5. Recycled and Salvaged Materials: Include the following information for each:
 - a. Identification of material, including those retrieved by installer for use on other projects.
 - b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
 - c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
 - 6. Material Reused on Project: Include the following information for each:
 - a. Identification of material and how it was used in the project.
 - b. Amount, in tons or cubic yards.
 - c. Include weight tickets as evidence of quantity.
 - 7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 3 EXECUTION

2.01 WASTE MANAGEMENT PROCEDURES

- A. See Section 01 3000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. See Section 01 5000 for additional requirements related to trash/waste collection and removal facilities and services.
- C. See Section 01 6000 for waste prevention requirements related to delivery, storage, and handling.

- D. See Section 01 7000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

2.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
- B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.
- C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
- D. Meetings: Discuss trash/waste management goals and issues at project meetings.
 - 1. Prebid meeting.
 - 2. Preconstruction meeting.
 - 3. Regular job-site meetings.
- E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
 - 1. Provide containers as required.
 - 2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
 - 3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
- F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
- G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.
- H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
- I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION 01 7419

**SECTION 01 7800
CLOSEOUT SUBMITTALS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project record documents.
- B. Operation and maintenance data.
- C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

- A. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- B. Individual Product Sections: Specific requirements for operation and maintenance data.
- C. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

- A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
- B. Operation and Maintenance Data:
 - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
 - 2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
 - 3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 - 4. Submit two sets of revised final documents in final form within 10 days after final inspection.
- C. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. 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.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed shop drawings, product data, and samples.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress. Record Drawings will be reviewed at each progress meeting to verify compliance with concurrent updating requirements.

- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Changes made by Addenda and modifications.
- F. Record 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.

3.02 OPERATION AND MAINTENANCE DATA

- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. 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.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
 - 1. Description of unit or system, and component parts.
 - 2. Identify function, normal operating characteristics, and limiting conditions.
 - 3. Include performance curves, with engineering data and tests.
 - 4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. 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.
- D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- E. Provide servicing and lubrication schedule, and list of lubricants required.
- F. Include manufacturer's printed operation and maintenance instructions.
- G. Include sequence of operation by controls manufacturer.

- H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- I. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

- A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
- B. Deliver the final operation and maintenance data to Commissioning Authority a minimum of 60 days prior to scheduled Owner training sessions.
- C. Where systems involve more than one specification section, provide separate tabbed divider for each system.
- D. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- E. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- F. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Construction Manager and subcontractors, with names of responsible parties.
- G. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- H. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- I. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
- J. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

3.06 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, 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 date of beginning of time of warranty until 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.

END OF SECTION 01 7800

**SECTION 01 7900
DEMONSTRATION AND TRAINING**

PART 1 GENERAL

1.01 SUMMARY

- A. Demonstration of products and systems to be commissioned and where indicated in specific specification sections.
- B. Training of Owner personnel in operation and maintenance is required for:
 - 1. All software-operated systems.
 - 2. HVAC systems and equipment.
 - 3. Electrical systems and equipment.
- C. Training of Owner personnel in care, cleaning, maintenance, and repair is required for:
 - 1. Finishes, including flooring, wall finishes, ceiling finishes.

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures; except:
 - 1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Provider.
 - 2. Submit one copy to the Commissioning Provider, not to be returned.
 - 3. Make commissioning submittals on time schedule specified by Commissioning Provider.
 - 4. Submittals indicated as "Draft" are intended for the use of the Commissioning Provider in preparation of overall Training Plan; submit in editable .rtf or .docx electronic format unless otherwise approved.
- B. Draft Training Plans: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
 - 1. Submit to Commissioning Provider for review and inclusion in overall training plan.
 - 2. Submit not less than four weeks prior to start of training.
 - 3. Revise and resubmit until acceptable.
 - 4. Provide an overall schedule showing all training sessions.
 - 5. Include at least the following for each training session:
 - a. Identification, date, time, and duration.
 - b. Description of products and/or systems to be covered.
 - c. Name of firm and person conducting training; include qualifications.
 - d. Intended audience, such as job description.
 - e. Objectives of training and suggested methods of ensuring adequate training.
 - f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
 - g. Media to be used, such as slides, hand-outs, etc.
 - h. Training equipment required, such as projector, projection screen, etc., to be provided by Construction Manager.
- C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
 - 1. Include applicable portion of O&M manuals.
 - 2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
 - 3. Provide one extra copy of each training manual to be included with operation and maintenance data.

1.03 QUALITY ASSURANCE

- A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
 - 1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.

2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 DEMONSTRATION - GENERAL

- A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.
- B. Demonstrations conducted during Functional Testing need not be repeated unless Owner personnel training is specified.
- C. Demonstration may be combined with Owner personnel training if applicable.
- D. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
 1. Perform demonstrations not less than two weeks prior to Substantial Completion.
 2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- E. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
 1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.02 TRAINING - GENERAL

- A. Commissioning Authority and Owner will review the Training Plan based on draft plans developed and submitted by Contractor.
- B. Conduct training on-site unless otherwise indicated.
- C. Owner will provide classroom and seating at no cost to Construction Manager.
- D. Do not start training until Functional Testing is complete, unless otherwise specified or approved by the Commissioning Provider.
- E. Provide training in minimum two hour segments.
- F. The Commissioning Provider is responsible for determining that the training was satisfactorily completed and will provide approval forms.
- G. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Construction Manager for personnel "show-up" time.
- H. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
 1. The location of the O&M manuals and procedures for use and preservation; backup copies.
 2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
 3. Typical uses of the O&M manuals.
- I. Product- and System-Specific Training:
 1. Review the applicable O&M manuals.
 2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
 3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
 4. Provide hands-on training on all operational modes possible and preventive maintenance.

5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
 6. Discuss common troubleshooting problems and solutions.
 7. Discuss any peculiarities of equipment installation or operation.
 8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
 9. Review recommended tools and spare parts inventory suggestions of manufacturers.
 10. Review spare parts and tools required to be furnished by Construction Manager.
 11. Review spare parts suppliers and sources and procurement procedures.
- J. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION 01 7900

SECTION 01 9113
GENERAL COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Commissioning is intended to achieve the following specific objectives; this section specifies the Construction Manager's responsibilities for commissioning:
 - 1. Verify that the work is installed in accordance with Contract Documents and the manufacturer's recommendations and instructions, and that it receives adequate operational checkout prior to startup: Startup reports and Prefunctional Checklists executed by Construction Manager are utilized to achieve this.
 - 2. Verify and document that functional performance is in accordance with Contract Documents: Functional Tests executed by Construction Manager and witnessed by the Commissioning Provider are utilized to achieve this.
 - 3. Verify that operation and maintenance manuals submitted to Owner are complete: Detailed operation and maintenance (O&M) data submittals by Construction Manager are utilized to achieve this.
 - 4. Verify that the Owner's operating personnel are adequately trained: Formal training conducted by Construction Manager is utilized to achieve this.
- B. The Commissioning Provider directs and coordinates all commissioning activities; this section describes some but not all of the Commissioning Provider's responsibilities.
- C. The Commissioning Provider is employed by Owner.
- D. The Engineer of Record shall provide clarification on design intent and compliance codes as required by Commissioning Authority. Commissioning Authority is not responsible for design concepts, design criteria, or compliance with codes.

1.02 SCOPE OF COMMISSIONING

- A. The following are to be commissioned:
- B. Building envelope:
 - 1. Air tightness.
 - 2. Roofing Systems.
 - 3. Window and Glazing Assemblies
 - 4. Wall and Cladding Systems
 - 5. Through Wall / Roof Penetrations.
- C. Plumbing Systems:
 - 1. Water heaters.
 - 2. Booster pumps.
 - 3. Medical gas systems.
 - 4. Landscape irrigation.
 - 5. Thermostatic mixing valves.
- D. HVAC System, including:
 - 1. Major and minor equipment items.
 - 2. Piping systems and equipment.
 - 3. Ductwork and accessories.
 - 4. Terminal units.
 - 5. Control system.
 - 6. Sound control devices.
 - 7. Vibration control devices.
 - 8. Variable frequency drives.
 - 9. Testing and Balance reports.
- E. Special Ventilation:

1. Fume hoods.
 2. Specialty fans.
 3. Egress pressurization.
- F. Electrical Systems:
1. Power quality.
 2. Emergency power systems.
 3. Lighting controls other than manual switches.
- G. Electronic Safety and Security:
1. Security system, including doors and hardware.
 2. Fire and smoke alarms.
- H. Communications:
1. Voice and data systems.
- I. Other equipment and systems explicitly identified elsewhere in Contract Documents as requiring commissioning.

1.03 RELATED REQUIREMENTS

- A. Section 01 7000 - Execution and Closeout Requirements: General startup requirements.
- B. Section 01 7800 - Closeout Submittals: Scope and procedures for operation and maintenance manuals and project record documents.
- C. Section 01 7900 - Demonstration and Training: Scope and procedures for Owner personnel training.
- D. Section 23 0800 - Commissioning of HVAC: HVAC control system testing; other requirements.

1.04 REFERENCE STANDARDS

- A. ANSI/RESNET/ICC 301 - Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units Using an Energy Rating Index; 2022.
- B. ANSI/RESNET/ICC 380 - Standard for Testing Airtightness of Building, Dwelling Unit, and Sleeping Unit Enclosures; Airtightness of Heating and Cooling Air Distribution Systems; and Airflow of Mechanical Ventilation Systems; 2022.
- C. ASTM E779 - Standard Test Method for Determining Air Leakage Rate by Fan Pressurization; 2019.
- D. ASTM E1827 - Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door; 2022.
- E. ASHRAE Guideline 0
- F. ASHRAE Guideline 1
- G. NEBB S110 - Whole Building Technical Commissioning of New Construction; 2019, with Errata (2022).

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

- A. Provide all standard testing equipment required to perform startup and initial checkout and required Functional Testing; unless otherwise noted such testing equipment will NOT become the property of Owner.
- B. Calibration Tolerances: Provide testing equipment of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified. If not otherwise noted, the following minimum requirements apply:
 1. Temperature Sensors and Digital Thermometers: Certified calibration within past year to accuracy of 0.5 degree F and resolution of plus/minus 0.1 degree F.
 2. Pressure Sensors: Accuracy of plus/minus 2.0 percent of the value range being measured (not full range of meter), calibrated within the last year.

3. Calibration: According to the manufacturer's recommended intervals and when dropped or damaged; affix calibration tags or keep certificates readily available for inspection.
- C. Equipment-Specific Tools: Where special testing equipment, tools and instruments are specific to a piece of equipment, are only available from the vendor, and are required in order to accomplish startup or Functional Testing, provide such equipment, tools, and instruments as part of the work at no extra cost to Owner; such equipment, tools, and instruments are to become the property of Owner.
- D. Dataloggers: Independent equipment and software for monitoring flows, currents, status, pressures, etc. of equipment.
 1. Dataloggers required for Functional Tests will be provided by the Commissioning Provider and will not become the property of Owner.

PART 3 EXECUTION

3.01 COMMISSIONING PLAN

- A. Construction Manager is responsible for compliance with the Commissioning Plan.
- B. Commissioning Plan: The commissioning schedule, procedures, and coordination requirements for all parties in the commissioning process.
- C. Commissioning Schedule:
 1. Submit anticipated dates of startup of each item of equipment and system to Commissioning Provider within 60 days after award of contract.
 2. Re-submit anticipated startup dates monthly, but not less than 4 weeks prior to startup.
 3. Prefunctional Checklists and Functional Tests are to be performed in sequence from components, to subsystems, to systems.
 4. Provide sufficient notice to Commissioning Provider for delivery of relevant Checklists and Functional Test procedures to avoid delay.
 5. Commissioning schedule to be incorporated into Master Project Schedule.

3.02 STARTUP PLANS AND REPORTS

- A. Startup Plans: For each item of equipment and system for which the manufacturer provides a startup plan, submit the plan not less than 8 weeks prior to startup.
- B. Startup Reports: For each item of equipment and system for which the manufacturer provides a startup checklist (or startup plan or field checkout sheet), document compliance by submitting the completed startup checklist prior to startup, signed and dated by responsible entity.
- C. Submit directly to the Commissioning Provider.

3.03 PREFUNCTIONAL CHECKLISTS

- A. A Prefunctional Checklist is required to be filled out for each item of equipment or other assembly specified to be commissioned.
 1. No sampling of identical or near-identical items is allowed.
 2. These checklists do not replace manufacturers' recommended startup checklists, regardless of apparent redundancy.
 3. Prefunctional Checklist forms will not be complete until after award of the contract; the following types of information will be gathered via the completed Checklist forms:
 - a. Certification by installing contractor that the unit is properly installed, started up, and operating and ready for Functional Testing.
 - b. Confirmation of receipt of each shop drawing and commissioning submittal specified, itemized by unit.
 - c. Manufacturer, model number, and relevant capacity information; list information "as specified," "as submitted," and "as installed."
 - d. Serial number of installed unit.

- e. List of inspections to be conducted to document proper installation prior to startup and Functional Testing; these will be primarily static inspections and procedures; for equipment and systems may include normal manufacturer's start-up checklist items and minor testing.
 - f. Sensor and actuator calibration information.
- B. Construction Manager is responsible for filling out Prefunctional Checklists, after completion of installation and before startup; witnessing by the Commissioning Provider is not required unless otherwise specified.
 - 1. Each line item without deficiency is to be witnessed, initialed, and dated by the actual witness; checklists are not complete until all line items are initialed and dated complete without deficiencies.
 - 2. Checklists with incomplete items may be submitted for approval provided the Construction Manager attests that incomplete items do not preclude the performance of safe and reliable Functional Testing; re-submission of the Checklist is required upon completion of remaining items.
 - 3. Individual Checklists may contain line items that are the responsibility of more than one installer; Construction Manager shall assign responsibility to appropriate installers or subcontractors, with identification recorded on the form.
 - 4. If any Checklist line item is not relevant, record reasons on the form.
 - 5. Construction Manager may independently perform startup inspections and/or tests, at Construction Manager's option.
 - 6. Regardless of these reporting requirements, Construction Manager is responsible for correct startup and operation.
 - 7. Submit completed Checklists to Commissioning Provider within 2 days of completion.
- C. Commissioning Provider is responsible for furnishing the Prefunctional Checklists to Construction Manager.
 - 1. Initial Drafts: Construction Manager is responsible for providing Manufacturer start-up sheets where so indicated in the Contract Documents.
 - 2. Provide all additional information requested by Commissioning Provider to aid in preparation of checklists, such as shop drawing submittals, manufacturers' startup checklists, and O&M data.
 - 3. When asked to review the proposed Checklists provided by Commissioning Authority, do so within 10 business days.
- D. Commissioning Provider Witnessing: Required for:
 - 1. Each piece of primary equipment, unless sampling of multiple similar units is allowed by the commissioning plan.
 - 2. A sampling of non-primary equipment, as allowed by the commissioning plan.
- E. Deficiencies: Correct deficiencies and re-inspect or re-test, as applicable, at no extra cost to Owner.
 - 1. If difficulty in correction would delay progress, report deficiency to the Commissioning Provider immediately.

3.04 SENSOR AND ACTUATOR CALIBRATION

- A. Calibrate all field-installed temperature, relative humidity, carbon monoxide, carbon dioxide, and pressure sensors and gages, and all actuators (dampers and valves) on this piece of equipment shall be calibrated. Sensors installed in the unit at the factory with calibration certification provided need not be field calibrated.
- B. Calibrate using the methods described below; alternate methods may be used, if approved by Commissioning Authority and Owner beforehand. See PART 2 for test instrument requirements. Record methods used on the relevant Prefunctional Checklist or other suitable forms, documenting initial, intermediate and final results.
- C. All Sensors:

1. Verify that sensor location is appropriate and away from potential causes of erratic operation.
 2. Verify that sensors with shielded cable are grounded only at one end.
 3. For sensor pairs that are used to determine a temperature or pressure difference, for temperature make sure they are reading within 0.2 degree F of each other, and for pressure, within tolerance equal to 2 percent of the reading, of each other.
 4. Tolerances for critical applications may be tighter.
- D. Sensors Without Transmitters - Standard Application:
1. Make a reading with a calibrated test instrument within 6 inches of the site sensor.
 2. Verify that the sensor reading, via the permanent thermostat, gage or building automation system, is within the tolerances in the table below of the instrument-measured value.
 3. If not, install offset, calibrate or replace sensor.
- E. Sensors With Transmitters - Standard Application.
1. Disconnect sensor.
 2. Connect a signal generator in place of sensor.
 3. Connect ammeter in series between transmitter and building automation system control panel.
 4. Using manufacturer's resistance-temperature data, simulate minimum desired temperature.
 5. Adjust transmitter potentiometer zero until 4 mA is read by the ammeter.
 6. Repeat for the maximum temperature matching 20 mA to the potentiometer span or maximum and verify at the building automation system.
 7. Record all values and recalibrate controller as necessary to conform with specified control ramps, reset schedules, proportional relationship, reset relationship and P/I reaction.
 8. Reconnect sensor.
 9. Make a reading with a calibrated test instrument within 6 inches of the site sensor.
 10. Verify that the sensor reading, via the permanent thermostat, gage or building automation system, is within the tolerances in the table below of the instrument-measured value.
 11. If not, replace sensor and repeat.
 12. For pressure sensors, perform a similar process with a suitable signal generator.
- F. Sensor Tolerances for Standard Applications: Plus/minus the following maximums:
1. Watthour, Voltage, Amperage: 1 percent of design.
 2. Pressure, Air, Water, Gas: 3 percent of design.
 3. Air Temperatures (Outside Air, Space Air, Duct Air): 0.4 degrees F.
 4. Relative Humidity: 4 percent of design.
 5. Barometric Pressure: 0.1 inch of Hg.
 6. Flow Rate, Air: 10 percent of design.
 7. Flow Rate, Water: 4 percent of design.
 8. AHU Wet Bulb and Dew Point: 2.0 degrees F.
- G. Critical Applications: For some applications more rigorous calibration techniques may be required for selected sensors. Describe any such methods used on an attached sheet.
- H. Valve/Damper Stroke Setup and Check:
1. For all valve/damper actuator positions checked, verify the actual position against the control system readout.
 2. Set pump/fan to normal operating mode.
 3. Command valve/damper closed; visually verify that valve/damper is closed and adjust output zero signal as required.
 4. Command valve/damper to open; verify position is full open and adjust output signal as required.
 5. Command valve/damper to a few intermediate positions.
 6. If actual valve/damper position does not reasonably correspond, replace actuator or add pilot positioner (for pneumatics).

- I. Isolation Valve or System Valve Leak Check: For valves not associated with coils.
 - 1. With full pressure in the system, command valve closed.
 - 2. Use an ultra-sonic flow meter to detect flow or leakage.

3.05 FUNCTIONAL TESTS

- A. A Functional Test is required for each item of equipment, system, or other assembly specified to be commissioned, unless sampling of multiple identical or near-identical units is allowed by the final test procedures.
- B. Construction Manager is responsible for execution of required Functional Tests, after completion of Prefunctional Checklist and before closeout.
- C. Commissioning Provider is responsible for witnessing and reporting results of Functional Tests, including preparation and completion of forms for that purpose.
- D. Construction Manager is responsible for correction of deficiencies and re-testing at no extra cost to Owner; if a deficiency is not corrected and re-tested immediately, the Commissioning Provider will document the deficiency and the Construction Manager's stated intentions regarding correction.
 - 1. Contractor is responsible for providing an OSHA approved access route to all equipment to be commissioned.
 - 2. Deficiencies are any condition in the installation or function of a component, piece of equipment or system that is not in compliance with Contract Documents or does not perform properly.
 - 3. When the deficiency has been corrected, the Construction Manager completes the form certifying that the item is ready to be re-tested and returns the form to the Commissioning Provider; the Commissioning Provider will reschedule the test, and the Construction Manager shall re-test.
 - 4. Identical or Near-Identical Items: If 10 percent, or three, whichever is greater, of identical or near-identical items fail to perform due to material or manufacturing defect, all items will be considered defective; provide a proposal for correction within 2 weeks after notification of defect, including provision for testing sample installations prior to replacement of all items.
 - 5. Construction Manager shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing after two failed tests have been performed.
 - 6. Construction Manager shall bear the cost of Owner and Commissioning Provider personnel time witnessing re-testing if the test failed due to failure to execute the relevant Prefunctional Checklist correctly; if the test failed for reasons that would not have been identified in the Prefunctional Checklist process, Construction Manager shall bear the cost of the second and subsequent re-tests.
- E. Functional Test Procedures:
 - 1. Some test procedures are included in Contract Documents; where Functional Test procedures are not included in Contract Documents, test procedures will be determined by the Commissioning Provider with input by and coordination with Construction Manager.
 - 2. Examples of Functional Testing:
 - a. Test the dynamic function and operation of equipment and systems (rather than just components) using manual (direct observation) or monitoring methods under full operation (e.g., the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure setpoint).
 - b. Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc.
 - c. Systems are run through all the HVAC control system's sequences of operation and components are verified to be responding as the sequence's state.
 - d. Traditional air or water test and balancing (TAB) is not Functional Testing; spot checking of TAB by demonstration to the Commissioning Provider is Functional Testing.

- F. Deferred Functional Tests: Some tests may need to be performed later, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design or other site conditions; performance of these tests remains the Construction Manager's responsibility regardless of timing. All testing to be completed within 12 month warranty period.

3.06 TEST PROCEDURES - GENERAL

- A. Provide skilled technicians to execute starting of equipment and to execute the Functional Tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.
- B. Provide all necessary materials and system modifications required to produce the flows, pressures, temperatures, and conditions necessary to execute the test according to the specified conditions. At completion of the test, return all affected equipment and systems to their pre-test condition.
- C. Sampling: Where Functional Testing of fewer than the total number of multiple identical or near-identical items is explicitly permitted, perform sampling as follows:
 - 1. Identical Units: Defined as units with same application and sequence of operation; only minor size or capacity difference.
 - 2. Sampling is not allowed for:
 - a. Major equipment.
 - b. Life-safety-critical equipment.
 - c. Prefunctional Checklist execution.
 - 3. XX = the percent of the group of identical equipment to be included in each sample; defined for specific type of equipment.
 - 4. YY = the percent of the sample that if failed will require another sample to be tested; defined for specific type of equipment.
 - 5. Randomly test at least XX percent of each group of identical equipment, but not less than three units. This constitutes the "first sample."
 - 6. If YY percent of the units in the first sample fail, test another XX percent of the remaining identical units.
 - 7. If YY percent of the units in the second sample fail, test all remaining identical units.
 - 8. If frequent failures occur, the Commissioning Provider may stop the testing and require Construction Manager to perform and document a checkout of the remaining units prior to continuing testing.
- D. Manual Testing: Use hand-held instruments, immediate control system readouts, or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the "observation").
- E. Simulating Conditions: Artificially create the necessary condition for the purpose of testing the response of a system; for example apply hot air to a space sensor using a hair dryer to see the response in a VAV box.
- F. Simulating Signals: Disconnect the sensor and use a signal generator to send an amperage, resistance or pressure to the transducer and control system to simulate the sensor value.
- G. Over-Writing Values: Change the sensor value known to the control system in the control system to see the response of the system; for example, change the outside air temperature value from 50 degrees F to 75 degrees F to verify economizer operation.
- H. Indirect Indicators: Remote indicators of a response or condition, such as a reading from a control system screen reporting a damper to be 100 percent closed, are considered indirect indicators.
- I. Monitoring: Record parameters (flow, current, status, pressure, etc.) of equipment operation using dataloggers or the trending capabilities of the relevant control systems; where monitoring of specific points is called for in Functional Test Procedures:

1. All points that are monitored by the relevant control system shall be trended by Construction Manager; at the Commissioning Provider's request, Construction Manager shall trend up to 20 percent more points than specified at no extra charge.
2. Other points will be monitored by the Commissioning Provider using dataloggers.
3. At the option of the Commissioning Provider, some control system monitoring may be replaced with datalogger monitoring.
4. Provide hard copies of monitored data in columnar format with time down left column and at least 5 columns of point values on same page.
5. Graphical output is desirable and is required for all output if the system can produce it.
6. Monitoring may be used to augment manual testing.

3.07 BUILDING ENVELOPE COMMISSIONING

- A. General: Comply with the following procedural requirements:
 1. NEBB S110 Whole Building Technical Commissioning of New Construction.
 2. ASTM E779 Standard Test Method for Determining Air Leakage Rate by Fan Pressurization.
 3. ASTM E1827 Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door.
 4. ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index.
 5. ANSI/RESNET/ICC 380 Standard for Testing Airtightness of Building Enclosures, Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems.
- B. Verify that the building envelope has been sufficiently completed for testing to commence.
- C. Conduct ongoing inspections as construction progresses to document satisfactory installation conditions related to thermal and moisture integrity of the building envelope that become concealed upon completion of construction.
- D. Submit a detailed narrative of proposed pressure test procedures prior to the test. Include a plan view showing proposed installation locations (personnel doors or other similar openings) for blower doors (or flexible ducts for trailer-mounted fans, if used).
- E. Avoid testing on days forecast to experience high winds, rain, or snow.
- F. Test the completed building and demonstrate that the air leakage rate of the building envelope does not exceed the specified requirements.
- G. Determine location and nature of undesirable air leakage pathways using methods specified in ASTM E1186-17 Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems.
- H. Deficiencies: Correct deficiencies and re-inspect or re-test, as applicable, at no extra cost to Owner.
 1. If difficulty in correction would delay progress, report deficiency to the Commissioning Provider immediately.

3.08 OPERATION AND MAINTENANCE MANUALS

- A. See Section 01 7800 - Closeout Submittals for additional requirements.
- B. Add design intent documentation furnished by Architect to manuals prior to submission to Owner.
- C. Submit manuals related to items that were commissioned to Commissioning Provider for review; make changes recommended by Commissioning Provider.
- D. Commissioning Provider will add commissioning records to manuals after submission to Owner.

END OF SECTION 01 9113