

## SECTION 017300

### EXECUTION

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  1. Construction layout
  2. Field engineering and surveying
  3. Installation of the Work
  4. Cutting and patching
  5. Coordination of Owner installed products
  6. Progress cleaning
  7. Starting and adjusting
  8. Protection of installed construction
  9. Correction of the Work

##### 1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

##### 1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor
- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- C. Certified Surveys: Submit two (2) paper copies that are certified, sealed and signed by a Texas registered professional land surveyor. Also submit one copy of the survey in CAD format using surface coordinates and one copy of the survey in CAD format using grid coordinates. Coordinate with Owner for the reference coordinate system and CAD guidelines.
- D. Final Property Survey: Submit one (1) digital copy that is certified, sealed and signed by a Texas registered professional land surveyor showing the Work performed. Also submit one copy of the survey in CAD format using surface coordinates and one copy of the survey in CAD format using grid coordinates. Coordinate with Owner for the reference coordinate system and CAD guidelines.

##### 1.5 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
  1. Structural Elements: When cutting and patching structural elements, notify Design Professional of locations and details of cutting and await directions from the Design Professional before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
  2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety. Operational elements include the following:
    - a. Primary operational systems and equipment
    - b. Fire separation assemblies
    - c. Air or smoke barriers
    - d. Fire-suppression systems
    - e. Mechanical systems piping and ducts
    - f. Control systems
    - g. Communication systems
    - h. Conveying systems
    - i. Electrical wiring systems

- j. Operating systems of special construction
  - 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, which results in reducing their capacity to perform as intended, or that result in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
    - a. Water, moisture, or vapor barriers
    - b. Membranes and flashings
    - c. Exterior curtain-wall construction
    - d. Equipment supports
    - e. Piping, ductwork, vessels, and equipment
    - f. Noise- and vibration-control elements and systems
  - 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Design Professional's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
  - C. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
  - D. Manufacturer's Installation Instructions: Obtain and maintain onsite manufacturer's written recommendations and instructions for installation of products and equipment.
- 1.6 WARRANTY
- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. General: Comply with requirements specified in other Sections.
  - 1. For projects requiring compliance with sustainable design and construction practices and procedures, utilize products for patching that comply with requirements of Division 01 Section 018114, "Sustainable Design Requirements".
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Design Professional for the visual and functional performance of in-place materials.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work. Surveyor will perform a Locative Survey (Category 3) according to the standards set by the Texas Society of Professional Surveyors Manual of Practice.
  - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water service piping; underground electrical services, and other utilities.
  - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
  - 3. Collect and depict all utility infrastructure according to the Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data published by the American Society of Civil Engineers, publication number CI/ASCE 38-02. All utility data must have a quality level clearly associated, either via a geospatial database, CAD layering, plan symbols, and/or plan labels per the guidelines. Design Professional or Engineer will work with Owner to explain and detail costs and benefits so as to achieve the highest quality levels of subsurface utility engineering applicable to the Project and Work.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
  - a. Description of the Work
  - b. List of detrimental conditions, including substrates
  - c. List of unacceptable installation tolerances
  - d. Recommended corrections
2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Design Professional according to requirements in Division 01 Section 013100, "Project Management and Coordination".

### 3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Design Professional promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
  1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
  2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
  3. Inform installers of lines and levels to which they must comply.
  4. Check the location, level, and plumb of every major element as the Work progresses.
  5. Notify Design Professional when deviations from required lines and levels exceed allowable tolerances.
  6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Design Professional.

### 3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Owner and Design Professional. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Design Professional before proceeding.
  2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish, construct and maintain a minimum of two permanent benchmarks on Project site, referenced to Owner's established geographic coordinate system. Benchmarks will function as both horizontal and vertical benchmarks. A registered professional land surveyor must establish the new benchmarks to meet specifications of National Geodetic Survey (NGS) Class RT1 surveys per the latest version of the User Guidelines for Single Base Real Time GNSS Positioning publication. New and re-set benchmarks will comply with the guidelines specified by Appendix B of the Bench Mark Reset Procedures document published by the NGS agency.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
  2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
  3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Mapping As-built Conditions: Once inspected and approved by Owner, all underground utility locations will be mapped using GPS mapping equipment to decimeter precision or better, prior to backfill, to collect geospatial data on as-built conditions. Any work covered prior to mapping will be required to be uncovered at no cost or schedule impact to the project. Consult with Owner for guidelines on how to collect the geospatial data and what information needs to be recorded about each utility feature. This information will be incorporated into the project record drawings to indicate the horizontal and vertical location of facilities, easements and improvements, as built.

### 3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
  2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produces harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory-prepared and field-installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Design Professional.
  2. Allow for building movement, including thermal expansion and contraction.
  3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### 3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

- B. Temporary Support: Provide temporary support of work to be cut.
  - C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
  - D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements of Division 01 Section 011000, "Summary".
  - E. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned; bypass such services/systems before cutting to prevent interruption to occupied areas.
  - F. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
    - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
    - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
    - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
    - 4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
    - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
    - 6. Proceed with patching after construction operations requiring cutting are complete.
  - G. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
    - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
    - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
      - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
      - b. Restore damaged pipe covering to its original condition.
    - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
      - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
    - 4. Ceilings: Patch, repair, or re-hang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
    - 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather-tight condition.
  - H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.
- 3.7 OWNER-INSTALLED PRODUCTS
- A. Site Access: Provide access to Project site for Owner's construction personnel.
  - B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
    - 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
    - 2. Pre-installation Conferences: Include Owner's construction personnel at pre-installation conferences covering portions of the Work that are to receive Owner's work. Attend pre-installation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

### 3.8 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Do not hold waste materials more than seven (7) days during normal weather or three (3) days if the temperature is expected to rise above 80° F.
  - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
    - a. Utilize containers intended for holding waste materials of type to be stored.
  - 4. Coordinate progress cleaning for joint-use areas where more than one installer has worked.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Division 01 Section 015000, "Temporary Facilities and Controls" and Division 01 Section 017419, "Construction Waste Management and Disposal".
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction completed or in progress is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### 3.9 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Division 01 Section 019113, "General Commissioning Requirements".
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section 014000, "Quality Requirements".

### 3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

### 3.11 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

**END OF SECTION**