

## **SECTION 017320 – CUTTING AND PATCHING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and General Provisions of the Contract, including Special Requirements, General Conditions and other Division 1 Specifications Sections apply to this Section.

#### **1.2 SUMMARY**

- A. This section specifies administrative and procedural requirements for cutting and patching.
- B. Refer to the drawings and other sections of these specifications for specific requirements and limitations applicable to cutting and patching individual parts of the work including scopes of work involving multiple prime contractors and coordination by the Project Coordinator.
- C. Refer to Division 20, 23 and 26 for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.
- D. Refer to Division 2, Selective Structure Demolition for a related, but separate category of work which may or may not require cutting and patching as defined in this Section.

#### **1.3 SPECIAL REQUIREMENTS**

- A. Existing Facility: Each Contractor shall be responsible for all cutting, patching, and finishing of existing construction for the proper installation of all their respective equipment and materials to be installed in the existing facility of this Project except as indicated below. The cutting and patching applies to both installation of new equipment and removal of existing equipment and materials.
- B. The General Contractor shall provide the cutting and patching at the following areas for all Contracts and shall coordinate the total number of openings required:
  - 1. Openings extending through exterior walls.
  - 2. Openings extending through interior walls.
  - 3. Openings and penetrations through roof areas.
- C. All cutting shall be kept to an absolute minimum consistent with the requirements of the Project.

- D. No cutting shall be done which may affect the building structurally or architecturally including building systems without first securing the approval of the Professional. Cutting shall be accomplished in such a manner as not to cause damage to the building or leave unsightly surfaces that cannot be concealed by plates, escutcheons, or other construction. Where unsightly conditions are caused, the Contractor shall be required, at his own expense, to repair the damaged areas.
  - 1. Cutting of the construction excessively or carelessly done shall be repaired by the originating Contractor to match the original work and to the satisfaction of the Professional and the University who will make the final decision with respect to excessive or careless cutting work.
    - a. Where existing equipment is removed and new equipment is installed utilizing the existing opening, the applicable Contractor shall close up the unused portion of the opening.
    - b. Where existing equipment is removed, the Contractor shall patch and repair the existing partitions, floors, and ceilings including any existing openings that are no longer utilized by the removed equipment.
    - c. All patching shall match adjacent undisturbed areas perfectly and to the satisfaction of the Professional and the System.
    - d. Cutting and patching of the inner wythe of exterior walls where an opening does not extend through the outer wythe shall be by the Contractor. Where lintels are necessary, the Contractor shall refer to the Drawings for lintel sizes.
    - e. At new walls and partitions, the General Contractor shall build in sleeves and inserts located by the other trades. Sleeves and inserts shall be furnished by these other trades and installed by the General Contractor in accordance with the Contract Documents.
- E. Cutting: Cut and remove existing construction only to the extent required by new Work and as indicated. Use methods required to complete Work within limitations of governing regulations and as follows:
  - 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. To minimize disturbance of adjacent surfaces, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
    - a. All holes or openings for the passage of conduit to be provided in the existing concrete shall be bored.
  - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  - 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
  - 4. Maintain adequate ventilation when using cutting torches.

5. Cut concrete and masonry at junctures with construction to remain, using power driven masonry saw or hand tools; do not use power driven impact tools.
  6. Provide minimum ~~30-minute~~ three-hour fire-watch after completion of welding or cutting torch work.
- F. Patching: All elements of construction and surfaces shall be returned to the same physical condition(s) existing prior to the start of cutting operations. Contractor is responsible for maintaining rating of all walls, floors and ceiling in areas of cutting and patching.

#### 1.4 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary:
1. Permit installation or performance of other work
  2. For coordination of the work
  3. To uncover work for access or inspection
  4. To obtain samples for testing
  5. To permit alterations to be performed, or for
  6. Other similar purposes.

#### 1.5 SUBMITTALS

- A. When cutting and patching procedures are required to be approved prior to the work, the Contractor shall submit a plan for cutting and patching well in advance of the work. The submittal shall describe the procedures and request approval to proceed. The submittal shall include the following, as applicable:
1. A description of the limits of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.
  2. A description of the anticipated results in terms of changes to existing construction; include changes to structural elements and operating components, as well as changes in the building's appearance and other significant visual elements.
  3. A listing of products to be used and firms or entities that will perform work.
  4. Identify dates when cutting and patching is to be performed.
  5. Identify utilities that will be distributed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
  6. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.

7. Approval by the professional to proceed with cutting and patching does not waive the professional's right to later require complete removal and replacement of a part of the work found to be unsatisfactory.

## 1.6 QUALITY ASSURANCE

### A. Requirements for Structural Work:

1. Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
2. When cutting and patching structural elements, notify the professional of locations and details of cutting and await direction from the Professional before proceeding.
3. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:
  - a. Foundation construction
  - b. Structural concrete
  - c. Structural steel
  - d. Lintels
  - e. Structural decking
  - f. Stair systems
  - g. Miscellaneous structural metals
  - h. Exterior curtain wall construction
  - i. Equipment supports
  - j. Piping, ductwork, vessels and equipment

### B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended or result in increased maintenance or decreased operational life or safety. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:

1. Shoring, bracing, and sheeting; Contractors is responsible for all engineering required for shoring, bracing and structural support.
2. Primary operational systems and equipment
3. Air or smoke barriers
4. Water, moisture, or vapor barriers including interior vapor barriers in IT spaces
5. Membranes and flashings
6. Fire protection systems
7. Noise and vibration control elements and systems
8. Control systems
9. Communication systems
10. Conveying systems
11. Electrical wiring systems

- C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, continuity, or any other manner that results in reducing their capacity to perform as intended, or that result in increased maintenance or decreased operational life or safety. Miscellaneous elements include the following:
  - 1. Water, moisture, or vapor barriers.
  - 2. Membranes and flashings.
  - 3. Equipment supports.
  - 4. Exterior curtain-wall construction
  - 5. Piping, ductwork, vessels, and equipment.
  - 6. Noise- and vibration-control elements and systems.
- D. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the professional's opinion, reduce the building's aesthetic qualities or result in visual evidence of cutting and patching. Remove and replace work cut and patched in a visually unsatisfactory manner. Patching materials to remain exposed shall match adjacent surfaces as approved by the Architect.

#### 1.7 WARRANTY

- A. 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. Use materials that are identical to existing materials unless otherwise indicate or directed by the Professional.
- B. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect.
- C. Use materials whose installed performance will equal or surpass that of existing materials.

### PART 3 - EXECUTION

#### 3.1 INSPECTION

- A. Before cutting existing surfaces examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding if unsafe or unsatisfactory conditions are encountered.

#### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of work to be cut.

- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the project that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building but scheduled to be removed or relocated until provisions have been made to bypass them.

### 3.3 PERFORMANCE

- A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
  - 1. Except as otherwise indicate or otherwise approved by the Professional.
- B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.
  - 1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.
  - 4. Comply with requirements of applicable sections of Division 2 where cutting and patching requires excavating and backfilling.
  - 5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
  - 1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
  - 2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
  - a. Where patching occurs in a smooth painted surface, extend final paint coat over entire surface containing the patch after the patched area has received primer and second coat. The entire surface for walls shall be considered the area between wall corners/edges, the floor and ceiling. The entire surface for ceilings shall be considered the continuous area bounded by walls or soffits.
4. Patch, repair or re-hang existing ceilings as necessary to provide an even plane surface of uniform appearance.

#### 3.4 CLEANING

- A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION 017320