

SECTION 01 7300 - 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. Interruption of Existing Facilities
6. Coordination of Work
7. General Safety and Protection
8. Quiet Work Practices
9. Coordination of Owner-installed products.
10. Progress cleaning.
11. Starting and adjusting.
12. Protection of installed construction.
13. **[delete if Asset Tagging is done outside the construction contract]** Asset Tagging

- B. Related Requirements:

1. Section 011000 "Summary" for limits on use of Project site.
2. Section 013300 "Submittal Procedures" for submitting surveys.
3. Section 015050 "Construction Fencing / Covered Walkways / Tree Protection" for fencing requirements.
4. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
5. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.
6. Section 078413 "Penetration Firestopping" for patching penetrations in fire-rated construction.

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 **[delete if Asset Tagging is done outside the construction contract]** ACTION SUBMITTALS

- A. New Equipment Template

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For **[land surveyor]** **[professional engineer]**.
- B. Certificates: Submit certificate signed by **[land surveyor]** **[professional engineer]** certifying that location and elevation of improvements comply with requirements.
- C. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:

1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
3. Products: List products to be used for patching and firms or entities that will perform patching work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

- D. Quiet Work Practices Plan
- E. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- F. Certified Surveys: Submit two copies signed by land surveyor.
- G. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.
- H. **[delete if Asset Tagging is done outside the construction contract]** Asset Tagging:
 1. **[delete if no demolished or salvaged equipment]**: Existing Equipment Inventory List

1.6 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 Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
 - a. <Insert list of structural elements>.
 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 results 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. Fire-detection and -alarm systems.
 - i. Conveying systems.
 - j. Electrical wiring systems.
 - k. Operating systems of special construction.
 - l. <Insert operating system>.
 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results 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. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
 - h. <Insert miscellaneous element>.
 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 Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

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, use products for patching that comply with requirements in Section 018113.13 "Sustainable Design Requirements - LEED for New Construction and Major Renovations,"
- 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 Architect 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 sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 - 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.
- 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. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.

4. Recommended corrections.

- D. 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 [**local utility**] [**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 Contractor, submit a request for information to Architect according to requirements in 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 Architect[**and Construction Manager**] 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 limits on use of Project site.
 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 4. Inform installers of lines and levels to which they must comply.
 5. Check the location, level and plumb, of every major element as the Work progresses.
 6. Notify Architect[**and Construction Manager**] when deviations from required lines and levels exceed allowable tolerances.
 7. 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 Architect[**and Construction Manager**].

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 Architect[**or Construction Manager**]. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect[**and Construction Manager**] before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 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. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- E. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 - 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 - 2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

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.
 4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces.
- 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. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

Construction Equipment: All construction equipment used on the Northwestern University campuses is required to have Tier 4 Final emissions control technology.

- G. 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.
- H. 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 Architect.
 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.
- I. 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.
- J. 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. 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.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. 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.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- F. 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.
- G. 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 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.
- H. 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 rehang 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 weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. 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 INTERRUPTION OF EXISTING FACILITIES

- A. Contractor shall be responsible for the notification of applicable utility companies and/or Owner for required utility shut-offs required to perform their Work.
- B. Contractor is to exercise care to avoid damaging active known utilities not scheduled to be relocated or demolished. Contractor is required to repair at no additional cost any damage to active known utilities resulting from the Contractor's operation.
- C. Portions of Contractor's Work which may involve alterations in existing structures must be coordinated through Owner so that all labor and materials as required for the proper completion of the Work are available on either a straight time or an overtime basis to guarantee continuance of regular building functions in the areas involved.
- D. Contractor must notify Owner verbally and in writing not less than ten (10) working days prior to any interruption of existing utilities or services. It is essential that utilities that serve surrounding campus facilities are not interrupted without prior coordination and notice.
- E. Utility shutdowns shall be planned and executed to minimize disruption to Owner's operations. Contractor shall include in its bid such additional costs as after hours and/or weekend work to minimize the disruption of Owner operations.

3.8 COORDINATION OF WORK

- A. Contractor shall be responsible for coordinating various portions of its Work with that to be performed by other Contractors, Subcontractors, or separate contractors, so that no part of the Work will be left in an unfinished or incomplete condition as a result of any disagreement between Contractor and any other Subcontractor or another Contractor as to where the work of one begins and ends with relation to the work of the others.
- B. Contractor shall submit to Owner's project manager, weekly, an accurate manpower count of its work force along with a brief description of the work performed and where it is located.
- C. Contractor shall assume all responsibility for any additional loading requirements due to Contractor's equipment location. Contractor is cautioned that there are existing utilities, piping,

and structures in the construction zone that may be sensitive to loading. Contractor will submit to the Architect through Owner, all load calculations stamped by a structural engineer licensed in the State of Illinois. Contractor shall submit design drawings and calculation for any earth or structure retention.

- D. Progress meetings will be conducted by the Contractor with Owner and/or the Architect, and appropriate Subcontractors on a regular basis to review job progress, update construction schedules, establish priorities, and/or in general coordinate project activities. Such meetings shall be included in the Contract Sum.
- E. Contractor is responsible for coordination of work between trades. Where the locations or position of any device is not dimensioned on the drawings or if there are conflicts between drawings, Contractor shall request clarification and direction from Architect. (Example: A light switch is shown approximately four feet from the nearest perpendicular wall on the architectural drawing but shown approximately 6 feet from the nearest perpendicular wall on the electrical drawing. Request direction from Architect.)

3.9 GENERAL SAFETY AND PROTECTION

- A. Safe execution of the Work is the responsibility of the Contractor. Contractor will be responsible for compliance with all OSHA and local requirements relative to this Work that are in effect or enacted during the prosecution of this Work.
- B. Contractor is responsible for furnishing and maintaining general building, and any existing fire alarm and protection systems throughout the duration of construction. Said protection shall be in compliance with all applicable local, state and federal regulations.
- C. Contractor is responsible for compliance with the Northwestern University Risk Management Facility Safety Program. This includes submission of inspection forms required from the Northwestern University Risk Management Facility Safety website.
- D. Contractor is responsible for securing or removing from open floor all materials subject to possible wind damage or being blown off the building and/or building site. Contractor will maintain adequate monitoring of its Work and material, and provide personnel to monitor as necessary.
- E. Temporary barricades will be provided by Contractor as required to enclose or segregate areas of the Work in which extensive noisy and/or dirt-producing operations are being performed. Partitions shall be so located as to prevent unauthorized traffic into or through areas where construction and/or demolition is in progress, and shall be so arranged and constructed as to provide ample working space around any area where Work is to be performed. Contractor must exercise care when working in said areas so as not to cause any unnecessary disruption to the adjacent building functions and comply with all OSHA requirements pertaining to personnel within as well as around the area.
- F. The use of any mechanical equipment, such as cranes, bulldozers, front-end loaders, derricks, etc., is subject to Owner's approval, providing the use of such equipment meets all codes and regulations including but not limited to OSHA. This includes maintaining the proper decibel level for machinery operation. Contractor shall obtain all necessary permits and approvals for use of equipment on-site and transporting to and from site.
- G. The Contractor is responsible for providing and maintaining temporary construction fencing with full height dust barriers around the entire perimeter of the construction site. The Contractor is not permitted to alter or move this fence without written approval from the Owner.

- H. Powder actuated tools are permitted only if approved in advance in writing by Owner's project manager.
- I. Contractor shall coordinate with Owner regarding afterhours access to construction site, employing triple locks at the entry gate(s) to facilitate Contractor, Northwestern University and **[Evanston] [Chicago]** Fire Department access.

3.10 QUIET WORK PRACTICES

- A. The project is situated among academic teaching and performance spaces / buildings that include instructional and research space. Noise and vibration negatively impacts and or disrupts these important activities. Noise, for the purpose of this document, is defined as any sound that is disruptive to Owner's operations and academic activities.
- B. The Contractor shall develop, and submit a "Quiet Work Practices Plan" that identifies potential sources of noise and vibration and describes how these will be managed to minimize their impact on the surrounding spaces / buildings. The quiet work practices shall employ equipment (such as silenced compressors), techniques (such as noise control blankets), and planning (such as organizing work at a distance from adjacent spaces / buildings), to minimize noise and vibration. The Plan shall be broken down to address the following:
 - 1. Source and source controls: List of equipment to be used, with noise levels at operator position and/or at 1 m. and identify strategies and methods for reducing noise levels and durations (e.g. sound barriers, screens, enclosures, or tents around activities and/or equipment (such as generators, concrete pumps, etc.) using noise reducing materials (such as Sound Seal Barrier and Quilted Fiberglass Absorber Composites)).
 - 2. Contractor shall assess all equipment and employ alternative equipment whenever possible. For example, a 4-inch grinder is less noisy than a 9-inch grinder; smaller horsepower cut-off saws produce less noise, etc.
 - 3. Locate noisy activities further away from the neighboring spaces / buildings.
 - 4. Contractor shall use modern equipment which has better engine insulation and mufflers. Also, Contractor shall properly maintain equipment to keep sound levels at a minimum.
 - 5. All jackhammers and pavement breakers shall be fitted with manufacturer's approved exhaust mufflers. All jackhammers and pavement breakers used at the construction site shall be enclosed with shields, acoustical barrier enclosures, or noise barriers.
 - 6. Electric or hydraulic powered equipment is usually quieter than a diesel-powered machine. Use alternate equipment. For example, electric tower cranes are quieter than diesel powered mobile cranes.
 - 7. The local power grid shall be used wherever feasible to limit generator noise. No generators larger than 25 KVA shall be used and, where a generator is necessary, it shall have a maximum noise muffling capacity.
 - 8. Powder actuated tools are permitted only if approved in advance in writing by Owner. Contractor should plan to employ drilled and/or embedded anchors.
- C. Path controls: Move equipment farther away from the receiver; enclose especially noisy activities or stationary equipment; erect noise barriers or curtains; restrict the movement of equipment into and through the construction site; configure site to minimize back-up alarm noise. For example, construction site access should be designed such that delivery trucks move through the site in a circular manner without the need to back up.
- D. Noise Coordinator: Contractor shall designate one person as Noise Coordinator, whose responsibilities shall be to manage the Quiet Work Practices Plan and to coordinate with foreman and superintendents and Owner with regard to noise mitigation and scheduling.

- E. Planning: Noise that is unexpected and/or unplanned is generally perceived as most disruptive and must be avoided. Also, noise of a prolonged duration can be disruptive. Accordingly, activities that will generate prolonged noise durations should be broken up into reasonable durations. Communication is essential, as planned noise is more tolerable than unplanned/unexpected noise. Contractor is required to give Owner verbal and written notice of all planned activities that will generate prolonged noise durations.
- F. Training: The Noise Coordinator shall develop and implement a training program to sensitize employees and Subcontractor's employees to the need for and methods of quiet work practices. Quiet work practices shall be an agenda item at Contractor's coordination meetings, foreman meetings, etc. The Contractor's Noise Coordinator shall coordinate with Owner throughout the Project so that noisy work planning takes into account the activities in neighboring spaces / buildings. At times, there will be time restrictions on noisy work. Contractor should take advantage of times when there are no classes scheduled, such as holidays, spring break, and winter break.
- G. Notification signs: Contractor shall post signs to remind employees to follow quiet work practices.
- H. Monitoring: The Noise Coordinator shall check that equipment brought onto site complies with the Quiet Work Practices Plan and this requirement. This could be done by obtaining information available from suppliers or by noise assessments.
- I. Back-up alarms: It is recognized that back-up alarms are a disruptive but necessary feature on construction trucks, dozers, etc. To minimize the noise, Contractor shall employ ambient-sensitive self-adjusting backup alarms that increase or decrease their volume based on background noise levels, or, manually adjustable alarms, set to the lowest setting, as appropriate for the activity. Contractor's bid shall include replacement of existing alarms, where necessary, with appropriate alarms to meet the intent of this document. Do not allow vehicles with non-compliant back-up alarms on the site.

3.11 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. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.12 **[delete if Asset Tagging is done outside the construction contract]** ASSET TAGGING

- A. **[delete if no assets were removed during demolition]** Existing Assets
 - 1. Inventory existing equipment that is identified for demolition or salvage. Provide a list of these items, including room number, equipment name, make, model, serial number and asset tag, if it exists.

B. New Assets

1. Provide **[Edit this to conform to the way asset tagging is procured]** and install asset tags for all equipment listed in the Northwestern University Asset Tag Checklist. **[include the Asset Tag Checklist as an Attachment to this specification section]**
 - a. Locate asset tags on the equipment in a location that is easily identified and viewed from the floor. Clean the label location prior to adhesion.
 - b. Use White tags where the tags may be visible to the public, faculty, staff or students. Use Yellow tags elsewhere.
 - c. **[Delete if Asset Tags are provided by NU]** Provide custom Northwestern University asset tags as manufactured by

Facilities Survey Inc. (FSI)

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2. Document all equipment information on the Northwestern University New Equipment Template. **[include the NU New Equipment Template as an Attachment to this specification section]**

3.13 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 days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Construction Vehicles: All vehicles and construction equipment shall be thoroughly cleaned and washed down, at areas designated by the Contractor, prior to leaving the project site. Contractor shall promptly remove and clean all dirt and debris from public roadways and sidewalks resulting from its operations. Should Contractor fail to take immediate action in this regard, Owner upon written notice to Contractor, will do such work and charge Contractor's account.

- D. 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.
- E. 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.
- F. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- G. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- H. 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 Section 017419 "Construction Waste Management and Disposal."
- I. 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.
- J. 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.
- K. 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.

3.14 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in 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 Section 014000 "Quality Requirements."

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3.15 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.

END OF SECTION 01 7300

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