

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY OF WORK

A. Work Under This Contract

Note After the following paragraph, give a brief but overall description of the project

1. This Contract encompasses the furnishing of all labor, materials, services, equipment, and insurance to complete the following as shown on drawing and specified herein:
2. Any premium time necessary to complete this project as scheduled, shall be included in the Base Bid.
3. All pertinent requirements of the Invitation to Bidders, Instructions to Bidders, and General Conditions shall form a part of these specifications and the Contractor shall consult them in detail for instructions pertaining to the work in the following divisions.

B. Work Performed Under Separate Contracts

Note After the following paragraph list any work to be performed on this project but not by this Contractor, and any materials supplied by the Owner that are to be installed by this Contractor.

1. The following will be provided by the Owner or by others under separate contracts:

Note Include the following paragraph when new hardware is to be installed and when temporary keying is required for department rooms, mechanical space, storage rooms, etc.

a. Temporary and final keying (see Section 087100)

Note Use the following paragraphs if they apply or modify as necessary. Consult with staff Landscape Architects regarding site work issues.

- b. Tie-back, pruning, removal and/or transplanting of existing plantings
- c. Parking gate equipment and parking booth installation and wiring. Conduit installed by Contractor
- d. Departmental possessions - furniture, books, personal items, etc., shall be relocated by the Department or University as required.
- e. Smart Ball utility locators
- f. As-built Site Survey

- 1) The Contractor shall notify the Project Representative when new underground utility installation starts, or when existing utilities are

exposed, to allow the Project Representative to coordinate with IPF Facility Information Services for documentation.

- 2) The Project Representative shall coordinate with IPF Facility Information Services for an As-built Survey upon completion of exterior improvements and utilities.

Note Designer shall reserve materials to be provided by Owner with the Landscape Services Construction Coordinator at (517) 355-7750 prior to completion of bid documents. Modify documents to reflect each material's availability accordingly.

- 1. Verify quantities needed.*
- 2. Schedule approximate pick-up dates*
- 3. Obtain quote from Landscape Services and include cost in project budget*
2. Coordinate pick up of the following site-related, Owner-provided materials from Beaumont Supply at 4080 Beaumont Rd., Lansing, MI 48910, phone: 517-884-4881 (Hours of operation are 6:00am-4:00pm Monday – Friday excluding university holidays. Extended hours available with minimum 24 hour notice. Contractor is responsible for transporting materials to the jobsite)
 - a. Soil Erosion and Sedimentation Control (SESC) materials: (removed and retained by Owner at end of permit)
 - 1) Storm inlet filter bags
 - 2) Erosion eels
 - b. Recycled concrete aggregate for parking bituminous pavement base (see section 321216)
 - c. Topsoil, final grading, fertilizing, mulching, and seeding of construction site. (see Section 312300).
 - d. Site Appurtenances (see Section 324000):
 - 1) Barrier-free parking bollards, removable bollards, guard post bollards, Post and chain fence
 - 2) Parking meters and parking meter posts
 - 3) Parking and regulatory U-channel posts and signs
 - 4) Building address and wayfinding signs
 - 5) Benches, tables, litter receptacles and other site furniture
 - 6) Bike loops and bike loop regulatory signs

C. Pre-Ordered Products

1. The Contractor shall assume full responsibility for all pre-ordered products after their arrival at MSU. This includes transportation, handling, storage, start-up, warranty services, and installation in accordance with the General Conditions unless otherwise specified.

D. Work Sequence

Note If there is a specific start date include it here as paragraph number 1.

1. The Substantial construction completion date for this project is as specified in the Advertisement for Bids.

2. An interim completion date of: _____

Note Select one of the following two paragraphs and list the items that are exempt from the final completion date.

Shall be met for the following work:

Shall be met for all work except the following:

1.2 WORK RESTRICTIONS

A. Access Routes

1. All materials and equipment (new and demolition), including mechanical and electrical, shall be transported through a building via the designated building receiving area (usually the loading dock), and through main corridor to rooms or areas. Alternate routes may be used only with the approval of the Project Representative.

B. Owner Occupancy

1. Unless otherwise stated, University buildings will continue to function and remain occupied during the construction process.
2. On every project involving new construction, additions or alterations to existing facilities, M.S.U. requires the ability of a person with physical disabilities to independently get to, enter, and use the site, facility, building or element. In no way shall a site, building or facility be restricted to individuals with disabilities, due to alterations or construction, which would normally be made accessible to individuals with no disabilities. Alternate routes for all new and alterations of existing facilities shall incorporate the latest federal, state and local barrier free standards and include temporary access accommodations for individuals with disabilities.

C. Use of Site

1. There shall be a pre-construction site walk-thru with the Project Representative to

clarify and discuss limitations and concerns prior to construction.

2. Construction fence

- a. A construction fence shall be placed around the construction site as shown on the drawings and as approved by the Project Representative.
- b. The Contractor is responsible for installing and maintaining the construction fence and gates to restrict access by the public to the area under construction. The Contractor may be required to reposition the fence and/or gate(s) during the course of construction to accommodate the construction activities in order to minimize the inconvenience to the public.
- c. The fence shall be constructed of chain link fabric with a minimum height of 6', with metal or wood posts at not to exceed 8' spacing. Fence fabric shall be supported by either a top bar or tension cable. Gates (where specified) will be constructed of a suitable metal frame with chain link fabric with a height of not less than 6'. This fence shall be installed before work commences.
- d. Metal signs reading "Construction Area - Keep Out" must be attached to the fence at not more than 20' spacing and to the gate(s).
- e. Where any fence crosses an existing walk, drive, or road, a lighted MDOT Type 1 barricade or larger shall be attached to the inside of the fence facing on-coming pedestrian and/or vehicular traffic.
- f. No construction work, parking, storage of materials or related activities shall occur beyond this boundary fencing.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION

SECTION 012000 - PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 PROPOSAL QUOTATION REQUIREMENTS

Note On Minor and Major projects, create a project-specific "Proposal for General Construction" if there are alternates and/or unit price requirements. Attach the document to the specifications. On Purchase Order projects, the Contractor may use the standard form of the "Proposal for General Construction" available on the Capital Project Procedures website.

- A. Projects to be bid will be quoted as required by the front-end documents on the specification.

1.2 ALLOWANCES

Note The allowance method of bidding should be used with restraint. If allowances are used for work such as: testing and balancing, brick, soils and concrete testing, the value of the allowance should be stated here. If allowances are used, include area in proposal form for Contractor to indicate allowance amount included in their bid. Delete the example below if not needed.

- A. An allowance of _____ for soil compaction testing, as defined in section 310000 and elsewhere in this specification shall be included with the base bid.

1.3 UNIT PRICES

Note In general, unit prices are not used; however, unit prices may be requested wherever there is likelihood that additional new work or repairs are anticipated. This will eliminate the need to negotiate after the project is underway. A basic list is provided but should be customized for the specific project. Required unit prices shall be listed in the Proposal.

- A. Unit prices will be used to adjust the Lump Sum Bid for work that is added to or subtracted from the project. Unit prices quoted shall include all associated work items required to complete the task specified and shall include all labor fringes, overhead, profit, handling fee and any associated cost related to the work item. Unit prices must be reasonable and customary for the work specified. The successful bidder must be able to support and document the prices quoted as they relate to the quoted Base Bid. **ALL UNIT PRICES MUST BE PROVIDED FOR THE BASE BID TO BE CONSIDERED VALID.**

1.4 CONTRACT BREAKDOWNS

- A. Within twenty-four (24) hours after receipt of Bids, the apparent Low Bidder shall submit to the Architect/Engineer, the following:
1. A Schedule of Values (SOV), indicating the cost of each specified Division and/or Major Subdivision of the Bid. The approved SOV will be used as the basis for estimating partial payments to the Contractor when allowed per the front-end documents.
 - a. All contracts shall assign a minimum of 1% of the contract value for final completion and project closeout. This item must be identified as a separate line

item labeled *Closeout* on the SOV. Exceptions must be approved by the Construction Superintendent.

- b. Due to changes to Generally Accepted Accounting Practices, environmental remediation must be separately reported in the Owner's financial statements. Accordingly, all contracts shall carry remediation costs in separate lines clearly marked *remediation*. These titles should not be used in other line descriptions.
 - c. Construction Management contracts shall carry separate detail lines for at least the following lines:
 - i. Preconstruction Services
 - ii. Construction phase staffing
 - iii. General conditions
 - iv. Bonds and Insurance. Note that subcontractor bonds are not required to be separately listed.
 - v. Fee
 - vi. Closeout
2. Identify a Subcontractor for each Division and/or Major Subdivision for the Owner's approval. Once approved, no Subcontractors will be changed without the Owner's written consent. The List of Subcontractors will have indicated the MBE/WBE Contractors and their percentages of the Contract Price as specified in the "Cover Letter" or "Advertisement for Bids" of this project.
 3. A list of representatives authorized to perform Unifier functions on behalf of the Contractor using the [Unifier System - Vendor Information](http://ipf.msu.edu/index.cfm/capital-project-procedures/documents/unifier-system-vendor-information/) available at <http://ipf.msu.edu/index.cfm/capital-project-procedures/documents/unifier-system-vendor-information/>.

1.5 CONTRACT MODIFICATION PROCEDURES

A. Change Management Quotation Requirements

1. Quotations for changes in the Contract will be submitted via Unifier when requested, as outlined in Section 012000-1.5.B, Change Management Procedures. This section will not prohibit the Project Representative from requesting and receiving verbal quotations. It is intended that mutual cooperation will keep any changes to an absolute minimum. The Contractor shall promptly document any verbal request by initiating a Change Management or Change Request record in Unifier. The Contractor shall not engage in added work without proper authorization by the Owner. Any added work the Contractor engages in without authorization shall be at the Contractor's risk. In no event shall the failure of the Construction Representative to initiate a change constitute authorization for the Contractor to proceed with work.
2. The [Change Order Quotation Format Form](http://procedures.ipf.msu.edu/index.cfm/capital-project-delivery-procedures/) is available on the MSU [Capital Project Delivery Procedures](http://procedures.ipf.msu.edu/index.cfm/capital-project-delivery-procedures/) website (<http://procedures.ipf.msu.edu/index.cfm/capital-project-delivery-procedures/>). This Form shall be forwarded to each required Subcontractor, and is recommended as an outline of the information required by this Contract.

3. The Contractor will submit quotations through Unifier, including detailed breakdowns. Upon request, originals of any documents shall be provided to the Owner. The Project Representative will receive quotations from the Contractor only. Subcontractors will submit quotations through the Contractor. All Contractors will submit quotations with information and back-up data as indicated on the quotation form.

B. Change Management Procedures

1. Change Orders shall be issued as required to alter the Contract, (i.e. change the work scope, materials, dates, etc.), in accordance with the General Conditions of the Contract, and the following procedure:
 - a. The Contractor or the Project Representative shall initiate a Change Request in the Unifier Project Management System. Each Change Request will consist of only one change item of work.
 - b. Items brought up by the Department or Contractor shall be reviewed first with the Project Representative.
 - c. The Architect/Engineer will review the Change Request, and with the Project Representative, will determine the need for an item to be changed in the Contract by Change Order.
 - d. If the Change Request is approved, the Contractor will receive a request through Unifier to proceed with the work and/or provide pricing, as applicable. Provide a quotation for the item requiring change, unless the Change Request is submitted as a lump sum with a quotation attached
 - e. The Contractor will submit a quotation for each Change Request item in accordance with the applicable Unifier business process. Overhead and profit shall be applied consistent with the General Conditions.
 - f. The Project Representative and Architect/Engineer will evaluate the quotations and accept or reject each item quoted. A Change Order will be created within the Unifier system and will be issued through the MSU Purchasing Department to change the contract amount if required.
 - g. The Construction Supervisor or Director of Planning, Design and Construction has approval authority for the Contract Change.

1.6 CONTRACT PAYMENT PROCEDURES

- A. Payment application requirements
 1. Payment applications shall be submitted in Unifier, consistent with the contract documents.

PART 2 - PRODUCTS

Not Used

Building/Location –
Project Name
MSU Project #

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PART 3 - EXECUTION
Not Used

END OF SECTION

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS


PART 1 - GENERAL

1.1 PROJECT MANAGEMENT AND COORDINATION

A. Project Meetings

1. Project meetings may be called as deemed necessary by the Project Manager.

B. Project Scope Documentation

1. The Contractor shall use  PlanGrid for coordination of changes in the field, punch list items, and potential use for plan review comments.

C. Project Coordination

1. The Contractor is ultimately responsible for coordination to complete all work shown on drawings and specified herein independent of the location of the work on drawings and within the specifications. The arrangement of work within the specification into Divisions and Sections shall be considered as given for convenience of reference only and shall not be held to conform to jurisdictional rules which may prevail in any particular trade. It shall be the responsibility of the Contractor to so arrange or group items of work under a particular trade to conform to the prevailing customs of that trade and best interest of the Owner. Specific items of work will be performed by specific subcontractors or workmen when so specified herein or subsequently deemed necessary by the Project Representative to produce competent results.
2. The Contractor shall lay out the work and be responsible for all lines and measurements of the work. Before ordering material or executing work the Contractor shall obtain field measurements and prepare the work to fit conditions properly.
3. The Contractor will be held responsible for any error resulting from his/her failure to verify the figures shown on the drawing before laying out the work.
4. No extra charge will be allowed on account of slight variations between field dimensions and dimensions given on the drawings.

D. Mechanical and Electrical Coordination

1. Connection to Existing Equipment
 - a. The Contractor shall make arrangements with Planning, Design and Construction, through the Project Representative, before connecting to existing facilities. Unless otherwise noted, if interruption of service is required it shall be done at the convenience of the Owner.

1.2 CONSTRUCTION PROGRESS DOCUMENTATION

A. Construction Schedule Development/Coordination Responsibilities.

The Designer will choose the type of Construction Schedule (Critical path method) required on the project based on the following. Delete the sections not used.

Project budgets > \$1,000,000 - CPM

Project budgets \$250,000 to \$999,999 involving multiple trades - CPM

Projects with critical completion date, regardless of budget amount – CPM

Project budgets \$250,000 to \$999,999 involving 2-3 trades - Bar Chart or CPM

Purchase Order projects (<\$250,000) - Bar Chart or CPM delivered at kick-off meeting

1. The Critical Path Method (CPM) will be used to plan, schedule, execute and report status of work under this contract. It shall include and properly coordinate dates for performance of all divisions for each major portion of the Work, and including completion of off-site requirements and tasks if request by Project Representative.
 - a. Within fourteen (14) calendar days of the Letter of Intent or contract award, the Contractor shall develop a proposed Baseline schedule for the Work, and submit it to each subcontractor to incorporate their own work.
 - b. All subcontractors, both direct and indirect, shall, within seven (7) calendar days of receipt of the Contractor's Schedule, submit revisions, comments and feedback to the Contractors, which shall be incorporated into the proposed schedule.
 - c. Upon receipt of the schedule from the Subcontractors, the Contractor will incorporate Subcontractors information into the Baseline Construction Schedule with appropriate logic ties and Contract Milestones, and distribute to the Architect/Engineer and Owner within seven (7) calendar days. Thus the Contractor Schedule development will be completed within twenty-eight (28) calendar days from Letter of Intent or Contract, awaiting Owner approval.
 - d. After project schedule has been accepted by the Owner the Contractor within five days (5 days) schedule a meeting with all subcontractors to review and encourage schedule compliance.
2. **All Subcontractors shall cooperate with the General Contractor to prepare and maintain the Construction Schedule, which shall include, without limitation, the following information at the General Contractor request.**
 - a. Shop Drawing review and approval, product procurement, fabrication, shop inspection, and delivery dates including lead times. Note: A/E shall be given 14 days upon receipt of submittal to review and return submittal.
 - b. Each phase of the Work, including the Punch List, Project Closeout requirements, Contract Completion and Occupancy;
 - c. Milestone dates that are required by the Contract Documents and Progress Milestones. Milestones should typically be based on the critical path and not

exceed one (1) month between milestones.

- d. The critical path of the Work
 - e. Planned disruptions and shutdowns due to other operations, facilities and functions, if any.
3. Upon receipt of the proposed Construction Schedule, the Architect/Engineer (A/E) and Owner (or other designee of the Owner), shall review the Construction Schedule and submit a copy of the Construction Schedule with comments to the Contractor within seven (7) calendar days. Within five (5) calendar days of review of comments from the Owner, all requested changes shall be incorporated in to the baseline Construction Schedule and a printout and electronic copy shall be provided to the Owner. Thus, the Contractor Schedule development with Owner review and Contractor modifications/changes shall not exceed forty (40) calendar days from the Letter of Intent.
 4. **No progress payments will be made to the Contractor without a Baseline Construction Schedule approved by the Owner (or other designee of the Owner).**
 5. Unless otherwise specified in the Contract Documents or waived in writing by the Owner, the Contractor shall provide **monthly progress reports, at a minimum**, to the Architect/Engineer and the Owner, which shall include recommendations for adjusting the construction schedule to meet Milestone Completion dates and contract completion dates.
 6. An updated construction schedule shall be submitted each month to the Project Rep. The Project Rep shall review the submittal, provide comments as necessary. **No payment will be made without an updated construction schedule approved by the Project Representative.**
 7. When it is apparent to the contractor and A/E that critical path activities, scheduled Milestone completion dates, or contract completion dates will not be met, the Contractor shall submit to the Owner for review and approval, a plan to avoid or minimize any delay. Such a plan may include, without limitation, increasing the Contractor's workforce; increasing the number of working hours per shift, shifts per workday, workdays per week, the amount of construction equipment, and rescheduling of activities, or any combination thereof; to achieve maximum practical concurrency of work efforts and eliminate the cause of such delay. The Contractor agrees that such actions as described in this paragraph or other action deemed necessary by the Contractor will be taken promptly and without additional cost to the Owner.
 8. Any request for time extensions or damages due to delay will only be considered where it is proven by the Contractor, using acceptable scheduling techniques, that the project's contractual intermediate milestones or contract completion dates have been directly impacted by the alleged issue causing the delay. This does not preclude the Contractor's right to finish the Project early. It does explicitly establish the condition upon which the Contractor shall be entitled to request time extensions or delay damages.

B. Construction Schedule Technical Requirements

1. The Critical Path Method (CPM) shall be used to plan, schedule, execute and report the status of work under this contract. The CPM Construction Schedule shall be developed utilizing a Scheduling Software approved by Owner. It shall include and properly coordinate dates for performance of all divisions for each major portions of the work, including completion of off-site requirements and tasks.
2. The objective of the CPM Construction Schedule is to define and plan the reasonable timing and sequencing of all work, from Letter of Intent or Notice to Proceed to Final Contract Completion (along with interim Milestone Completion dates required by the contract) without exceeding the Contract Time limits. At a minimum, CPM activities shall be used for defining the following:
 - a. Permitting
 - b. Submittal/procurement/approval process (including shop drawing preparation)
 - c. Material and equipment fabrication and delivery
 - d. Construction/Installation
 - e. Trade coordination
 - f. Shutdowns
 - g. Owner performed work and Owner-provided items
 - h. Work of Other Contractors (indirect) hired by the Owner
 - i. Governing Agencies inspections
 - j. Punch list
 - k. Commissioning
 - l. Clean-up and project close-out
Contract Completion/Occupancy
3. The Construction Schedule level of detail shall be broken down to the extent individual activities do not combine (a) Subcontractor work; (b) distinct divisions of work; (c) work in separate facilities or areas; or (d) rough-in and finish items of work. Construction/Installation activities shall not exceed duration of fifteen (15) workdays and Owner review/approval activities are to include a reasonable time for review depending on the size and complexity of the submittal.
4. Preparation of the “Baseline” Construction Schedule shall commence following the issuance of a Letter of Intent, and shall be submitted to the Architect/Engineer and Owner (or other designee of the Owner) within twenty-eight (28) calendar days of issuance of the Letter of Intent. The Architect/Engineer and Owner will review and provide comments as it relates to the schedule. The Construction Schedule must involve input from all major subcontractors and be signed by the Contractor and all Primes/Subcontractors indicating their approval in the accuracy of the Baseline Construction Schedule and/or Schedule Updates. Submittal and approval of the Baseline Construction Schedule and/or Monthly Schedule Updates are required prior to the corresponding progress payment being released.
5. The Contractor will utilize “Retained Logic” as the method of calculating the Construction Schedule and Updated Schedules, which will be computer generated and

computer drawn.

6. The Construction Schedule requirement shall include but not be limited to (a) Baseline Schedule; (b) Monthly schedule updates, (c) Weekly 2 week look-ahead schedules.
7. The Contractor shall provide the current updated Construction Schedule for review and discussion at each regular progress meeting. In addition, the Contractor shall prepare a two-week look-ahead schedule for distribution at the progress meetings. This information shall be derived directly from the current Construction Schedule. The two-week look-ahead schedule shall include all activities scheduled to commence, continue or complete in the upcoming two weeks.
8. Each monthly schedule submittal will consist of one electronic file containing current schedule files or back-up, narrative, reports and plots discussed later in this section. Each monthly schedule shall be submitted using the Unifier Transmittal process. Each schedule submittal shall be uniquely identified as to which revision and/or update and will incorporate any Owner schedule review comments from previous schedule submissions. The date of the data shall be within two (2) calendar days of the Schedule submittal date.
9. The Construction Schedule shall meet the following criteria:
 - a. Activity descriptions shall be clear and concise
 - b. Activities shall be coded with sufficient detail to identify the activity as to phase, type of work, responsibilities, area of work, interface with other contracts, and any other coding necessary to accurately describe or sort the work activity.
 - c. Activity durations shall be sufficiently short to accurately disseminate an item of work with the maximum installation activity not to exceed fifteen (15) workdays.
 - d. Architect/Engineer and Owner review and approval activities will allow for sufficient time depending on the size, quantity of and complexity of the submission(s) (14 calendar days minimum).
 - e. Logic ties shall be shown on graphics at the discretion of the Owner. Logic ties shall be accurate and reasonable with no regard to preferential logic that would sequester float for any one party. Logic ties will be reasonable to the point that a true critical path is identifiable from the beginning of the project (Letter of Intent) to the Final Completion milestone. Constraint dates are to be used at a minimum with a description for their basis if used. No open-ended activities shall be allowed.
 - f. The Construction Schedule shall allow for and depict: recognized national holidays, proposed number of workdays per week for each activity (calendar), adherence to specific restrictions, constraints and contract completion milestones (interim and final) stipulated in the contract documents and work of separate Contractors.

- g. Contractually specified interim Completion Milestone dates shall be constrained to show negative float, if the early finish date of the last activity in that phase falls after the interim Milestone Completion date.
- 10. For all major equipment and materials fabricated or supplied for this project, the Construction Schedule shall show a sequence of activities including:
 - a. Preparation of submittal shop drawings, samples and O&M instructions.
 - b. Review of shop drawings, samples and O&M instructions by the Architect/Engineer (allow reasonable time for review depending on size and complexity of the submittal, minimum 14 calendar days).
 - c. Shop fabrication and delivery
 - d. Erection or installation
 - e. Testing of equipment and materials
 - f. Required dates of completion
 - g. Instruction of operating personnel
- 11. Baseline Construction Schedule and Periodic Schedule Monthly Update submittals shall include the following information:
 - a. Report content:
 - 1) Activity number
 - 2) Activity description
 - 3) Activity durations in work days (not to exceed 15 workdays)
 - 4) Remaining durations in work days
 - 5) Early and late start dates (Actual dates when progressed)
 - 6) Early and late finish dates (Actual dates when progressed)
 - 7) Percent complete
 - 8) Total float
 - 9) Free float
 - b. An electronic file of the schedule files with all current schedule information.
- 12. If a Construction Schedule revision is required as determined by the Owner, Contractor or Architect/Engineer, the Contractor must include a complete schedule submittal with reports accompanied with a detailed narrative report describing the basis for any and all changes proposed by the Contractor. The Contractor cannot make significant revision(s) to the schedule without written approval by the Owner.
- 13. Schedule float is not for the exclusive use of any one party and should be shared for the projects benefit. The Contractor's work shall proceed to the early start dates and the Owner shall have the right to reserve and apportion float time according to the needs of the project.
- 14. If any of the Project Contract Milestones fall behind more than five (5) workdays, the Contractor is required to develop a Time Recovery Plan and Schedule, which shall be monitored weekly by the Contractor. The Contractor shall detail within the next Construction Schedule submittal narrative, the reorganization means and methods instituted in the schedule recovery plan to get back to the contract completion date(s).

The recovery period should be achieved within the shortest reasonable time.

- a. If the recovery plan does not achieve its goal by the next pay request period, the Contractor will be required to develop another recovery plan until the Contract Completion Milestones are back on schedule.
 - b. If the recovery plan has sufficient regained compliance with the Project Milestone Dates, use of the Baseline Construction Schedule will be resumed.
15. Time Extensions/Adjustments will only be granted when the Contractor can accurately demonstrate through the use of the Construction Schedule and accepted scheduling techniques, the need for a time extension due to delays, change orders or impacts by others. Schedule fragments and/or critical path schedule analysis shall be developed and submitted with each change order or other request for time adjustment. Time extension requests shall be submitted within ten (10) days of the onset of the occurrence impacting the Construction Schedule. Failure to submit this information by the time stated above shall result in rejection of the request. Based primarily on information provided by the Contractor, the Owner will decide the extent of impact and respond within a reasonable time depending on the complexity of the analysis required.
- a. If the time extension request is approved, the impact period will then be incorporated into the Construction Schedule.
 - b. If the time extension request is rejected, no change to the project schedule will be permitted.
16. The Contractor shall coordinate its work with the Owner and other Subcontractors and shall cooperate with other Subcontractors by utilizing orderly progress toward completion in accordance with the work scheduled.

NOTE: Delete everything above related to CPM scheduling if only a simple bar chart schedule is required

1. A simple bar chart construction schedule shall be prepared by the Contractor an initially submitted to the Owner prior to or at the first Pre-Construction Meeting.
2. The Construction Schedule shall include without limitation, milestones, shop drawing submittals with time allowed for Owner approval, procurement and construction of all major items of work, depicted in weekly increments.
3. The Contractor shall submit updates to the Construction Schedule on no less than a monthly basis and shall submit updates with each Application for Payment, as required by paragraph 3.10 of the Conditions of the Contract.
4. The Contractor shall coordinate its work with the Owner and other Subcontractors and shall cooperate with other Subcontractors by utilizing orderly progress toward completion in accordance with the work scheduled.

1.3 MILESTONE SCHEDULE REQUIREMENTS

- A. The following Milestone Schedule dates for the listed work are provided as part of the contract requirements.

<u>MILESTONE ACTIVITY</u>	<u>START</u>	<u>COMPLETION</u>
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Note: Designer fills in activities and date information here

1.4 SUBMITTALS

A. Submittal Schedule

1. Concurrently with the development of the Contractor's Construction Schedule, the Contractor shall prepare a complete schedule of submittals. Submit the initial Submittal Schedule along with the Construction Schedule, at, or prior to, the Pre-Construction Conference.
 - a. Coordinate the Submittal Schedule with the list of subcontracts, Schedule of Values, and the list of products, as well as the Contractor's Construction Schedule.
 - b. Prepare the schedule in chronological order. Provide the following information:
 - Scheduled date for the first submittal
 - Related section number or specification number
 - Submittal category (Shop Drawing, Product Data, Calculations, Test Results or Samples.
 - Name of the subcontractor
 - Scheduled date for resubmittal
 - Scheduled date for completion of the A/E's review
2. Distribution: Following the Owner's response to the initial submittal, print and distribute copies to the Project representative, A/E, Owner, subcontractors, suppliers and other parties required to comply with the submittal dates indicated. Keep copies at the Project Site at all times.
 - a. When revisions are made, distribute to the same parties and post at the same locations. Delete parties for distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
3. Schedule Updating: Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting, or as requested by the Project Representative.

- B. Submittals are required for, but are not limited to, each of the following. The Contractor should refer to each of the following referenced sections for additional requirements of each submittal. All submittals are to be processed electronically using Unifier.

Note: The Designer should consult with the individual architectural, mechanical, and electrical designers to establish which submittals are necessary for the project. Add to or delete from

the list as necessary. The resulting list is intended to be a comprehensive list of all submittals required for the project.

1. GENERAL SUBMITTALS
Section 012000 for Contract Breakdowns
Section 017000 for FADE Log
2. AS-BUILT DRAWINGS
As-built Drawings are required as specified in Section 017000.
3. CERTIFICATES OF INSPECTION
Certificates of Inspection are required as specified in Section 017000.

Note The designer should list section number and name of any other section requiring certificates of inspection here, such as elevator, fire protection, and alarms.

220500 for Plumbing Permits and Inspection
223500 for Boiler Permits and Inspection
260500 for Electrical Permits and Inspection

4. OPERATION AND MAINTENANCE DATA
Operation and maintenance data is required as specified in Section 017000.
5. GUARANTEES
Guarantees are required as specified in Section 017000.

Note The designer should list any additional section number and section names requiring guarantees here. Check roofing, caulking, and elevator guarantees.

6. SAMPLES
Samples are required as specified in Section 013000 for the following items:

Note The designer should list here the section number and name of all items requiring samples, such as: 042000 brick, or 095113 acoustical tile.

7. SHOP DRAWINGS
Shop drawings are required as specified in Section 013000 for the following items:

Note The designer should list here the section number and name of all items requiring shop drawings, such as: 230913 controls and instrumentation, or 081113 steel doors and frames. Check other members of the design team to assure a complete list.

8. TEST AND BALANCE REPORTS
Test and balance reports are required as specified in TESTING, ADJUSTING, AND BALANCING FOR HVAC, Section 230593.

Note The designer should list here the section number and name of all items and/or sections requiring tests or balance reports. Typical are concrete tests, soil tests, and air or water

balance reports.

C. Shop Drawings and Samples

1. The Contractor shall review, stamp with their approval, and submit via the Unifier Submittal process to the Project Representative all Shop Drawings and Samples asked for in these specifications, or deemed necessary by the Architect/Engineer.
2. Work will not begin on any item requiring Shop Drawings or samples until the Contractor receives approval in writing from the Architect/Engineer. Any material or item, ordered or fabricated prior to final approval shall be at the Contractors' risk. No changes shall be made on the approved drawings or samples without the written consent of the Architect/Engineer. Each Shop Drawing or Sample shall be properly identified as to MSU project title and number, Contractor, item, etc., with cover sheet, stamp, tag, etc., so as not to be confused with any other. The Contractor shall direct specific attention with written explanation to any deviation from what is specified or shown on the drawing.

D. Shop Drawings

1. The Shop Drawing will be identified by job name, date, Contractor name and name of person reviewing for compliance with Contract Documents. Shop Drawings are drawings, diagrams, schedules and other data specifically prepared by the Contractor to illustrate some portion of the Work for which submittals are required by the Contract Documents. The purpose of their submittal is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.
2. The Contractor shall review for compliance with the Contract Documents, approve and submit to the Owner all Shop Drawings required by the Contract Documents. Submittal shall be with reasonable promptness and in such sequence as to cause no delay in the Work or in activities of the Owner or their separate Contractors. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Owner without action.
3. By approving and submitting Shop Drawings the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.
4. The Owner will review and approve or take other appropriate action on the Shop Drawings submitted by the Contractor only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. Review of Shop Drawings is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all

of which remain the responsibility of the Contractor as required by the Contract Documents. The Owner's review shall not constitute approval of safety precautions or, unless otherwise stated by the Owner, of any construction means, methods, techniques, sequences or procedures. The Owner's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

E. Samples

1. Samples shall be submitted as directed to provide a representative sample. Samples shall be physical examples, from the actual materials, to be used whenever practical. All packing and transportation charges on samples shall be paid by the Contractor.
2. A Submittal record shall be created in Unifier for each sample, indicating the manufacturer and specifications, and informing the Owner of the status of delivery of the physical sample. The physical sample will be retained by the Owner. The Submittal record will be returned to the Contractor with a review status by the Owner.
3. Approval of Samples shall be generally for quality, color, and finish, and shall not modify the requirements of any of the Contract Documents as to dimensions or design.

1.5 SPECIAL PROCEDURES

A. Hazardous Materials

1. If the Contractor suspects a material, preexisting or newly discovered, within the scope of this project to be a hazardous material such as, asbestos, lead, polychlorinated biphenyl or any other potentially hazardous material, that has not already been identified and/or in the scope of work for the Contractor to abate, notify the Project Representative immediately. Do not impact or disturb the material in question until it has been determined to either be non-hazardous, included in the original scope of work, or until other arrangements can be made with the project representative and the MSU Department of Environmental Health and Safety (EHS).
2. Due to the age of buildings on the Michigan State University campus, all coated surfaces shall be assumed to contain lead-based paint. This includes but is not limited to any type of paint, primer, coating, lacquer, or varnish on any building component. Proper precautions must be taken to ensure that workers and building occupants are not exposed to airborne lead concentrations at or above the OSHA Action Level (AL) of 30 ug/m³.
3. If work will be conducted on any coated surface at MSU, the contractor must submit to the Department of Environmental Health and Safety (EHS) and Infrastructure Planning and Facilities Project Representative current proof of appropriate detailed written lead work plan in accordance with 29 CFR § 1926.62 (Michigan Part 603). This submittal will include proof of training, written respirator program, and negative exposure assessments from projects with similar conditions at a minimum. Contractors performing work on campus must follow the provisions of the MSU Lead Management Program from EHS.

Building/Location –
Project Name
MSU Project #

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4. Any work that impacts Lead shall comply with the provisions of the MSU EHS Lead Management Plan.
5. Any work that impacts Asbestos shall comply with the provisions of the MSU EHS Asbestos Management Plan

B. Constructor Safety Requirements

1. MIOSHA regulations apply to all university projects. Each constructor is responsible for ensuring compliance with “all applicable requirements” that govern their work, including any additional regulations, interpretations, clarifications, and consensus standards incorporated therein by reference.
2. Each constructor shall submit two (2) copies of their company safety plan and two (2) copies of their site-specific safety plan to the PDC Project Representative.
3. The prime contractor shall conduct a regularly scheduled weekly site safety inspection and maintain adequate documentation. The MSU Contractor Safety Manager and the EAS Project Representative reserve the right to observe and/or participate. Each contractor and all tiers of subcontractors with active operations on-site shall be represented at the prime contractor’s weekly site safety inspection by a foreman or approved designee.
4. Contractor shall submit a report for any incident, including injury, illness, near-miss, or property damage occurring on this project within 72 hours of incident. Blank forms are available at <https://ehs.msu.edu/assets/docs/contractor/contractor-incident-report-form.pdf>.
5. Safety statistics shall be reported by the prime contractor on a monthly basis with each pay application. The safety statistic report must be received before any payment will be authorized.

1.6 Requests for Information

- A. Requests for Information (RFI’s) shall be processed within Unifier, using the RFI business process. Failure to complete the tasks within the Unifier time frames shall not be a basis for a delay claim.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 REGULATORY REQUIREMENTS

A. Applicable Codes, Standards, and Regulations

1. The following list of codes and regulations, establish the minimum requirements applied to work done at MSU. Where the specifications or plans, exceed the applicable code, the specifications and plans shall be followed.
 - a. NFPA National Fire Codes.
 - b. NFPA National Electrical Code.
 - c. ICC International Building Code.
 - d. ICC International Plumbing Code.
 - e. ICC International Mechanical Code.
 - f. State of Michigan Elevator Safety Act - Act 227, P.A. 1967.
 - g. State of Michigan Boiler Act - Act 290, P.A. 1965.
 - h. State of Michigan Construction Code Act - Act 230, P.A. 1972, as amended.
 - i. State of Michigan Occupational Safety and Health Act - Act 154, P.A. 1974, as amended.
 - j. Americans With Disabilities Act (ADA) Public Law 101-336.
 - k. Regulations of Air Pollution Control Commission State of Michigan, and the Federal Clean Air Act (42 U.S.C. 1857C - 8 © (1)).
 - l. Soil Erosion and Sedimentation Control - Act 451 of 1994, parts 31 and 91, as amended.
 - m. Environmental Impact Statement Executive Order 1974-4.
 - n. State Fire Safety Board's New Rules for Schools, Colleges, and Universities.
 - o. State of Michigan Safe Drinking Water Act, P.A. 339 of 1976, and Federal Water Pollution Control Act (33 U.S.G. 1319 ©).
 - p. State of Michigan Energy Code (Adopting ASHRAE 90 by reference).

1.2 REFERENCES

A. Abbreviations and Symbols

1. AIA - American Institute of Architects
2. ACI - American Concrete Institute
3. AISC - American Institute of Steel Construction
4. ANSI - American National Standards Institute
5. ASTM - American Society for Testing Materials
6. BOCA - Building Officials and Code Administrators
7. LEED - Leadership in Energy and Environmental Design
7. NFPA - National Fire Protection Association
8. OSHA - Occupational Safety and Health Act
9. SMACNA - Sheet Metal and Air Conditioning Contractors National Association
10. MDOT - Michigan Department of Transportation

11. USGBC - U.S. Green Building Council

1.3 QUALITY CONTROL

A. Testing Laboratory Services

1. All work (materials and installation procedure) shall be tested and inspected by an independent testing and inspection agency, approved by the Project Representative to provide the quality control requirements in accordance with these specifications. Results of these tests and inspections when performed in accordance with these specifications will not be disputed by either party. Failure of the Contractor to provide quality control in accordance with this specification may result in the replacement of the work at the Contractor's expense.

B. Contractor's Responsibilities

1. Submit the name of the proposed testing and inspection agency(s) to the Project Representative for review and approval prior to contracting for such services.
2. Employ and pay the cost of independent testing and inspection as required in this specification. Pay applications from the testing/inspection agency shall be reviewed by the Owner before the Contractor's pay request for testing/inspection services is approved.
3. Advise the testing and inspection agency sufficiently in advance of the work to be inspected in the field to allow time to schedule personnel and equipment to perform the required inspections. Failure of the work to be inspected shall be the sole responsibility of the Contractor regardless of the fault of the testing and inspection agency.
4. Furnish certificates to authenticate the type and or quality of products furnished for installation as required in these specifications.
5. Shall notify the Project Representative in a timely manner when and where testing is to take place to provide sufficient time for the Project Representative to be in attendance.

C. Testing & Inspection Agency Responsibilities

1. Perform all testing and inspection of the work in accordance with these specifications.
2. Furnish qualified personnel and sufficient equipment in a timely manner when required by the Contractor and/or Project Representative to perform all testing and inspection in accordance with these specifications.
3. Provide written reports (2 copies) in a timely manner of the work tested and inspected. The reports shall include complete material test results and for in-place material, a sketch showing the exact location where the test was taken on the project site.

4. The inspection and testing agency and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirements of the Contract Documents, nor to approve or accept any portion of the work.
5. Work will be checked by representatives of the testing agencies as it progresses, but failure to detect any defective work or product will not in any way prevent later rejection when such defect is discovered, nor will it obligate the Owner to final acceptance. When it appears that the work or product furnished is in non-conformance with the Contract Documents, the representative of the testing agency will direct the attention of the Project Representative and Contractor to such non-conformance.

Note: Designer shall edit following list as required for project scope

6. Quality control testing items shall include the following:
 - a. Soil densities
 - b. Proof roll
 - c. Concrete testing
 - d. Asphalt field testing (density and yield)
 - e. Bituminous mix design approval and batch plant verification
 - f. Asphalt plant mix verification
 - g. Verify pavement sections
 - h. Determine need for and extent of sub-grade undercutting and testing

D. Authority of the Project Representative

1. May order additional tests and inspection beyond those required, if in their opinion, the subject work may not meet specification. The costs for these tests and inspections shall be borne by the Contractor.
2. May terminate the testing and inspection agency. The Contractor shall then furnish to the Project Representative the name of an additional agency for approval.
3. May perform quality control tests and inspections.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1- GENERAL

1.1 TEMPORARY UTILITIES

A. General

1. The Contractor for the general construction work shall be responsible for all items specified in Section 015000. The Contractor shall install and maintain all items until project is finished and shall remove same and restore areas to their original conditions.

B. Temporary Electricity

1. The Contractor may use any permanent electrical outlets in the construction area.
2. Construction lighting shall be turned off during unoccupied periods, with the exception of lighting required for safety reasons such as path of egress.
3. Temporary service for heavy loads, or where no other service is available, will be provided by the general Contractor at the Contractor's expense. Power for temporary service connected to public utility company lines, (before an MSU service meter) will be paid for by the Contractor. Power for temporary service connected to the MSU power system, or after an MSU service meter, will be furnished by the Owner at no charge.
4. The contractor shall install temporary lighting within the construction area with an approximate 5.0 foot candle average lighting level.

C. Temporary Heat

1. All equipment and labor for temporary heat shall be furnished by the Contractor. Use of University utilities for temporary heat will be at the discretion of the Owner. The cost of natural gas or steam for heating new structures or other applications requiring temporary heat will be paid by the Contractor.

D. Temporary Telephone Service

1. If there is no University phone at the immediate work site, the Contractor shall provide a temporary job site telephone and/or provide the Job Superintendent with a phone activated paging device or cell phone.

E. Temporary Water

1. Each Contractor may use water for construction purposes from the nearest University source.

F. Temporary Sanitary Facilities

1. A toilet in the work area may be used by the Contractor's employees.
2. Where there is no toilet in the work area, an approved chemical type portable toilet will be provided by the Contractor.

1.2 VEHICULAR ACCESS AND PARKING

A. Parking Regulations

Note All projects that impact available parking should be reviewed with MSU Department of Police and Public Safety during design.

1. Unless otherwise directed, all non-University personnel working on the Campus of Michigan State University are required to park as Visitors. Between 7:00 a.m. and 6:00 p.m., Monday through Friday, Visitors may park only in metered parking spaces or gate controlled parking lots.
2. Commercial permits are available from the Department of Police and Public Safety (355-8440), which will allow parking in specific areas. The cost of a commercial permit is the responsibility of the Contractor.
3. Permits for one day parking in areas reserved for university employees are available to Contractors or their personnel from the Department of Police and Public Safety at the current rate, with a signed note from the Project Representative.
4. Parking permits are not required for vehicles south of Mount Hope Road.

Note The following paragraph may be used if site containment, as defined on the drawings, will be large enough to provide Contractor parking. CHOOSE 5 OR 6.

5. The Contractor will be responsible for developing and maintaining an adequate employee parking area within the construction fence. The minimum surface of such an area shall be gravel paving. MSU parking permits will not be required in the Contractor maintained lots. At the completion of the project, all temporary parking provisions will be removed and the site restored.

Note The following paragraph may be used when there is limited faculty/staff parking in the general vicinity of the construction site.

6. Remote parking for Contractor personnel is available in parking lot _____ at a cost of _____ per vehicle. Due to the limited number of faculty/staff parking spaces in the vicinity of the construction site, no general commercial permits will be issued.

1.3 TEMPORARY BARRIERS AND ENCLOSURES

A. General

Building/Location –
Project Name
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GENERAL REQUIREMENTS
TEMPORARY FACILITIES AND CONTROLS
PAGE 015000-3

1. The Contractor shall provide, install, and maintain necessary temporary barriers, warning signs, and other safety measures to protect the public, property, and plant growth.

2. The Contractor will be required to work within limitations imposed by the University Police and Public Safety Department with respect to vehicular and pedestrian traffic. When approved by the Owner, if it becomes necessary to occupy a traffic lane for **ANY** length of time, proper directional signs, flashers and barricades shall be provided at the Contractor's expense in accordance with the most recent edition of the Michigan Manual of Uniform Traffic Control Devices. The Contractor will replace if damaged or stolen, all barricades, flares, and night protection at Contractor's expense, all being considered as incidental to the work.
- B. Dust Control
1. Temporary Partitions
 - a. The Contractor shall construct necessary temporary partitions to isolate the new work from the existing building.
 - b. Unless noted otherwise, construct partitions of 2" x 4" wood studs, 16" on center and heavy mil, fire retardant plastic sheeting securely attached so as to keep dust, dirt, and debris from spreading beyond the work area.
 2. Return Air Openings
 - a. The Contractor shall block all return air openings in the work area so that dust will not carry into other areas of the building.
 3. Site Dust
 - a. The General Contractor shall be responsible for eliminating airborne dust in the work area and staging area by application of appropriate mitigation measures, as approved by the Owner.
- C. Security Measures
1. Temporary & Access Keying
 - a. The MSU Infrastructure Planning and Facilities Key Shop will furnish construction keys, and furnish and install construction cores for use during construction as deemed necessary by the Project Representative. The Contractor may pick up the construction keys at the Key Shop with the form, "Authorization for Construction Cores and Keys," completed and authorized by the Project Representative.
 - b. All construction keys and facility keys issued to a Contractor for a particular project will be returned to the Project Representative before final payment will be processed. If keys are not returned, the Contractor may be held responsible to pay for re-keying any and all affected facilities.

2. Campus Security and Access Control System

- a. When deemed necessary by the Project Representative, temporary security access cards will be issued to the Contractor for building exterior doors, rooms, and/or spaces that are secured by the Campus Security and Access Control System.
- b. On construction projects where the security system is active and armed during construction the Contractor will be assessed a false alarm fee for any unauthorized entry of a secure space and/or setting off an alarm by propping open secured doors/windows, cutting into the security wiring, removing security devices, or any other action causing an alarm.
- c. The false alarm fees shall be as follows:

First occurrence	No assessed fee
Second occurrence	\$500
Third and subsequent occurrences	\$1,000 each
- d. The breaches of security and associated fees shall be assessed by project to the Contractor, not by sub-contractor, vendor, supplier, etc.

D. Campus Woody Plant Protection

Note Coordinate all plant protection and site work limits with staff Landscape Architect.

1. Coordinate all plant protection and site work limits with the Project Representative. SITE WORK CANNOT COMMENCE WITHOUT A PRE-CONSTRUCTION WALK-THROUGH.

All Contractor employees engaged on the project site shall attend, or are expected to have attended, the Contractor Woody Plant Protection Seminar, hosted by MSU's Landscape Services (formerly Grounds Maintenance) Division. This seminar will be presented on an annual basis at a minimum. Coordinate with the Project Representative for times and locations of the seminar(s).

2. Work by Owner

- a. Tie-back of existing plantings. Pruning, thinning, and sealing of existing plantings. Root pruning and root protection of exposed roots. Watering of existing trees under stress. Salvaging of existing small trees, shrubs, and other plant growth that the Owner wishes to retain.

Note The following two paragraphs should be used only if the Owner is to be responsible for the installation of the tree protection barricades.

- b. Tree protection barricades will be provided by the Owner. Plant damage occurring within installed barricades does not absolve the Contractor from damage assessment.

- c. Work shall be performed by MSU Landscape Services Department unless otherwise arranged, as needed to provide either preventative or remedial care to plants on a construction site. Contractor shall immediately contact the Project Representative should “protected plants” be compromised in violation of agreed upon fencing locations and work limits. Failure to communicate promptly could result in 100% damage assessment of fines.

3. Protection of Plantings

- a. Protect existing trees and other vegetation indicated to remain in place. Prohibited practices include breaking of branches, scraping of bark, or unauthorized cutting; nailing or bolting into trees or plants; use of trees or plants as temporary support (i.e. for cables); unauthorized filling, excavating, trenching or auguring within the root zone; compaction/driving over the root zone; (see definitions below), storage of any materials or vehicles within the root zone; dumping of construction waste or materials (including liquids); unauthorized removal or relocation of woody plants; removal of tree protection barricades or construction fencing prior to completion of project.
- b. Compaction within the root zone is the increasing of the soil density caused by heavy equipment or concentrated foot traffic which significantly alters the soil conditions from that which was present prior to construction.
- c. The root zone of a tree is one and a half the distance of plant crown drip line outward from the stem, along undisturbed grade. Should placement of concrete be specified or authorized by the Owner within the root zone, a sulfur application will be applied by the Owner. The Contractor shall notify the Owner at least 48 hours prior to pouring concrete. Trees to receive sulfur shall be identified by Owner.

Note The following two paragraphs are to be used when the Contractor is responsible for the installation of the tree protection barricades.

- d. Tree protection barricades shall be wood rail fencing constructed of 4" x 4" x 11' posts, at 8' maximum o.c. and two 2" x 6" wood rails, lined with snow fence (or similar approved construction barrier fencing) which meets existing grade. Standard fence height shall be 8'; for variations see site drawings. Failure to install barricades as directed may halt work. Plant damage occurring within installed barricades does not absolve the Contractor from damage assessment.
- e. All tree protection shall be installed prior to the beginning of construction and continually maintained. Tree protection shall not come in contact with anything except the construction fence, when shown on the drawings.

4. Damage

- a. Damage to campus woody plants shall include any of the items indicated in paragraph 2.a above as determined solely by the Owner. The Owner shall evaluate damage and establish proportional fines up to 100% of the value shown below, regardless of the current disposition of the plant.
- b. 100% Value Schedule for Campus Trees

1" - 3" caliper	\$200/inch
3" - 6" DBH	\$290/inch
6" - 9" DBH	\$380/inch
9" - 12" DBH	\$480/inch
12" - 15" DBH	\$670/inch
15" DBH or greater	\$960/inch
- c. DBH is the tree trunk diameter at breast height.
- d. Replacement value for shrubs, vines, and perennials shall be assessed at three times the current market cost of the plant.
- e. Alternatives to the above protective measures, or any variations, must be approved by the staff Landscape Architect and the Project Representative. (Measures may include: thinning and root pruning, fertilization, aeration, boring & jacking, hand excavation, supervision by campus arborist, seasonal schedule recommendations.) Alternatives would be based on the specific requirements of the plant species in question, as determined by the staff Landscape Architect.

1.4 TEMPORARY CONTROLS

A. Soil Erosion and Sediment Control (SESC)

1. The Contractor shall comply with all Contract Documents, approved SESC plans, permit conditions and with Parts 31 and 91 of Public Act 451 of 1994. The Owner shall obtain a Soil Erosion and Sedimentation Control (SESC) permit from the appropriate Municipal (MEA) or County (CEA) Enforcing Agency. Permit Fees and MEA/CEA routine inspections will be paid for by the Owner.
2. Prior to beginning any earth change, the Contractor shall retain a DEQ Certified Storm Water Operator (CSWO) to provide the required SESC reports (which include the weekly and storm event reports as well as all follow up reports for both violations and storm event corrections) on the standard DEQ form. The Contractor shall provide the reports to the Owner on a weekly basis, and retain those reports for 3 years.
3. Prior to beginning any earth change, and during the life of the contract, the Contractor shall install and maintain all temporary SESC measures as shown on the Contract Documents, SESC plans, and as directed by the Owner, CSWO, DEQ, or MEA/CEA, until MSU officially takes over responsibility for the site.
4. Immediately prior to MSU taking responsibility for the site, the Contractor:
 - a. Will be required to clean all catch basins affected by the construction, both within

the Contract Limits and all surrounding roads and lawn areas when soil may have spread as the result of construction activities.

- b. Shall put all temporary SESC measures in satisfactory condition as determined by the CSWO.
5. All temporary SESC measures will remain in place and will become the property of the Owner when responsibility for maintaining the SESC measures becomes the Owner's responsibility.
6. The Contractor shall conduct all excavation, filling, grading and clean-up operations in a manner such that sediment generated by wind or water is not discharged off site or into any storm sewer, drainage ditch, river, lake, air or underground utility system. Stage the work per plan to minimize the area of exposed soil, thereby reducing the opportunity for soil erosion.
7. Water from trenches and other excavation shall be passed through an approved filtration bag to remove sediments from the water before it is released into the storm water drainage system.
8. If sediment extends beyond the project limits, the Contractor shall be responsible for cleanup and restoration of all surfaces and utility systems to the condition that existed prior to the Contract award.
9. All SESC measures shall be maintained daily.
10. Should violations (irrespective of a fine being assessed) be identified by the Owner, CSWO, MEA/CEA or DEQ, they shall be corrected within 24 hours of notification. The correction(s) shall be approved by the Owner, CSWO, MEA/CEA or DEQ. All subsequent inspections performed by the Owner, CSWO, MEA/CEA or DEQ as a result of the violation (and any other associated costs) will be paid by the Contractor. If identified violations are not corrected within 24 hours of written notice, the Owner shall have the right to make necessary repairs at the Contractor's expense, without being required to provide further notice to Contractor.
11. Fines assessed as a result of the violation for non-compliance of the SESC provisions, will be paid by the Contractor. If a "Stop Work" order for non-compliance is issued, a time extension request for that time period will **not** be granted. (Fines could be assessed up to and including \$25,000/DAY for each violation.)
12. Only one Seven Day Notice will be issued for violations of the SESC provisions. Should subsequent violations be identified, the contractor will be expected to make the satisfactory correction within 24 hours of notification. Should the corrections not be made, the Owner, without further notice to the Contractor, will correct the violation. The cost of the corrective action will be charged to the Contractor.

1.5 CONSTRUCTION DEBRIS CONTROL

- A. The Contractor shall provide and administer a system for disposal of construction debris, and shall be responsible for seeing that the site and the new building are at all times free of accumulated debris caused by the construction. For purposes of this paragraph, debris shall include ALL materials used in construction including construction roads and pads. Special attention should be given to materials that could leach into the ground, including but not limited to lime based materials, all chemicals, and any liquids except clean water.
- B. The Contractor shall comply with LEED Materials & Resources Credit 2, including documentation of the Construction Waste materials recycled, reused and sent to the landfill, using the Construction Waste Management form and process provided by the Owner in Unifier. This form shall be submitted monthly, and will be generated from completed payment applications. Negative reports are required.
- C. This shall include, but not be limited to, rubbish containers conveniently located throughout the site for the daily disposal of debris directly into them from each work location. Debris shall not be allowed to accumulate on the ground through-out the site overnight.
- D. All combustible debris shall be removed to a solid waste disposal site properly licensed under Act 87 of the Public Acts of 1965 of the State of Michigan.
- E. No burning of debris will be permitted on the Project site or elsewhere on the Owner's property.
- F. Should the Contractor not execute the work required in this section, the Owner reserves the right to perform the work by other forces and deduct the cost from the contract price.

1.6 CONFINED SPACES

- A. The workplace may contain permit confined spaces and entry is allowed only through compliance with a confined space program as defined by 29 CFR 1910.146. The contractor is responsible for assessing real or potential atmospheric hazards and other serious safety and health hazards in the confined space. MSU will make available records of known confined space hazards. The contractor shall provide all necessary equipment for confined space entry. If MSU personnel will be working in or near confined spaces occupied by the contractor, the contractor is required to coordinate activities with the Project Representative. The contractor will inform the Project Representative of procedures followed and hazards confronted or created during entry operations.

1.7 LOCK-OUT/TAG-OUT PROCEDURE

- A. The Contractor shall conform to Michigan State University Infrastructure Planning and Facilities lock-out/tag-out procedure. Copies are available from Planning, Design and Construction, Infrastructure Planning and Facilities Building, Michigan State University.

1.8 FM RED TAG PERMIT MONITORING SYSTEM

- A. When working on fire protection sprinkler systems the Contractor shall conform to the

Factory Mutual Red Tag Permit Monitoring System modified by notifying the Project Representative in lieu of the Emergency Organization, Public Fire Department, and Factory Mutual. Documentation is available from Factory Mutual, (781) 255-4359.

1.9 FM HOT WORK PERMIT SYSTEM

- A. For all hot work operations, the Contractor shall conform to the Factory Mutual Hot Work Permit System modified by notifying the Project Representative in lieu of the Fire Safety Supervisor and Factory Mutual. Documentation is available from Factory Mutual, (781) 255-4359.

1.10 HAZARDOUS SUBSTANCE SPILLS

- A. Releases of hazardous substances that pose a significant threat to health and safety, or that, by their very nature, require more than a routine response, are emergency situations. If a release of an emergency nature occurs, call 911 immediately. Provide all applicable information and stay on the phone until told to hang up. If a non-emergency release of a hazardous substance occurs, contact the MSU Infrastructure Planning and Facilities Project Representative immediately.

1.11 ROOF PROTECTION

- A. In the event a roof has to be used as a storage, work and/or walkway area, the following protective measures shall be employed.
 - 1. The size and location of the storage, work or walkway areas shall be approved by the MSU Infrastructure Planning and Facilities Project Representative.
 - 2. The storage, work or walkway area protection shall consist of a 1-inch layer of water resistant insulation such as EPS, and a layer of ½ inch plywood. Stagger the seams of the insulation and plywood; use plywood clips to prevent cupping.
 - 3. The perimeter of the area shall be lined with barricades and warning tape to ensure that all traffic will stay on the protected areas.

1.12 CRANE HOISTING

- A. Crane hoisting of equipment or materials over occupied spaces shall be performed at the convenience of the Owner, with arrangements made by the Project Representative.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 PRODUCT STORAGE AND HANDLING REQUIREMENTS

A. Storage and Protection

1. The Contractor shall be responsible for work, material, and equipment until finally inspected, tested, and accepted. The project shall be protected against theft, injury, and damage. Material and equipment received on the site shall be carefully stored until installation.

B. Staging Area

1. Should the Contractor require exterior staging or on-site storage of materials - the location of this area must be agreed upon prior to actual use of the space by the Project Representative and the Contractor. The area will not be within the drip-line of any tree or in plant beds, as per Section 015000.1.3.D.3.
2. If this exterior area is outside the fenced project site, the area shall be enclosed with a minimum 4' high welded wire fence, with metal fence T-posts not exceeding 8' on center. Fence fabric shall be supported by either a top bar or a tension cable.
3. The Contractor shall be responsible for the cost of placing and removing the fence.
4. Each designated area shall have only one access route from the road or drive.
5. The area is not to be used for employee parking, but may be utilized by the Contractors' vehicles and equipment necessary to service the project.
6. Any areas damaged as a result of the staging operation shall be repaired by the Contractor, at no additional cost to the Owner.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 017000 - EXECUTION REQUIREMENTS

PART 1- GENERAL

1.1 EXAMINATION

A. Pre-Bid Site Inspection

1. Each Bidder shall be held to have visited the site of the proposed work before submitting their proposal and to have familiarized themselves with all existing conditions affecting the execution of the work in this project. No allowance or extra consideration on behalf of the Contractor or Subcontractor will subsequently be made by reason of failure to observe the site conditions.

1.2 PREPARATION

A. Protection of Work and Property

1. Contractor shall protect existing and new work as required by this construction or as requested by the Project Representative.
2. Interior Protection
 - a. This will include, but not be limited to the wall, floor, and ceiling finishes to remain at the construction site, along the access route to the site, existing elevators, and other areas such as roofs and mechanical rooms where related work is specified or required.
3. Exterior Protection
 - a. The Contractor shall be responsible for any damage to existing facilities, including but not limited to the following: buildings, trees and shrubs, walks, roads, utility systems, terraces and steps, lights, and unreasonable turf damage as determined by the Project Representative. Damage shall be repaired by the Contractor in accordance with MSU's Construction Standards at no cost to the Owner.
 - b. No crawler cranes, bulldozers, or other equipment, fitted and running on steel treads, shall be permitted to traverse any walk, road, street, or other thoroughfare on the Campus of Michigan State University. Where it is necessary to unload such equipment on these thoroughfares, and when approved by the Project Representative, planking shall be provided to protect same. If this is not done, and damage is observed, the cost of replacing shall be the burden of the Contractor causing such damage.

Note: The following paragraphs are intended for work on the building exterior, i.e., roofing, masonry, etc. Edit and delete paragraphs as necessary. See also 015000-1.3D Campus Woody Plant Protection.

- c. Staging zones for materials and equipment shall be coordinated with Project Representative. They are to be placed on paved areas where possible. Set-up and storage areas shall be fenced with minimum 6-foot high pedestal-type chain link fencing. Locations shall be reviewed with the Department of Police and Public Safety and approved by the Project Representative.
- d. Crane hoist dates shall be coordinated with Project Representative for sufficient notice to building users. Project Representative shall direct the notice to the building users and coordinate with DPPS.
- e. Owner may provide temporary access-ways in turf or root zone areas, as determined in pre-construction walk-through. For heavy equipment on turf areas, Alturna mats or approved equal, must be utilized for travel and set-up zones.
- f. All electric, telephone, and steam vaults and water valves shall be protected and remain accessible at all times. Heavy equipment shall not be run over the top of vaults or valve boxes, nor shall materials be stored over them.
- g. Contractor shall provide lighted barricades if building entrances or pedestrian walks are closed after work hours or on the weekends.
- h. Tree pruning, plant tie-back, and vine removal shall be done by the Owner, as coordinated with the Project Representative, and as noted in Section 015000.1.3.D.2.a. Trees or other plant material shall not be used as anchor points for any lines or equipment.
- i. Plant protection as directed by the Project representative:
 - a. Minor work: Plants adjacent to, or below work zones are to be washed off daily. In no case shall masonry dust or other construction debris remain on plants for more than 24 hours.
 - b. Major work: Plants adjacent to, or below work zones are to be covered with breathable woven mesh tarp. Tarp shall be removed at the end of each day and debris disposed of. Debris and dust shall not be absorbed into soil.

Note In general the following Field Engineering sub-section is only needed on projects involving construction outside of a building.

B. Field Engineering

1. Quality Assurance

a. Surveyor

- 1. Engage a Registered Land Surveyor, registered in Michigan, to perform ALL project surveying, including construction layout, as outlined in Section 017000-1.2.B, "Field Engineering."

2. Submittals

- a. Project Record Documents
 - 1. Upon completion of Work requiring Field Engineering, submit a record of Work performed and record survey data as required in Section 017000-1.2.B.5.
 - 2. Upon completion of Work requiring Field Engineering, submit a certificate signed by the Registered Land Surveyor, certifying the location and elevation of improvements comply with the Contract Documents.
- 3. Control Points
 - a. The Owner will identify existing control points and property line corner stakes.
 - b. Verify layout information shown on the Drawings in relation to the property survey and existing benchmarks before proceeding to lay out the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.
 - c. If a discrepancy between the contract drawings and the existing site is found, contact the Project Representative for a resolution BEFORE any actual layout of the work is begun.
 - d. Do not change or relocate benchmarks or control points without prior written approval. Promptly report lost or destroyed reference points, or requirements to relocate reference points because of necessary changes in grades or locations.
 - e. Promptly replace lost or destroyed control points. Base replacements on the original survey control points.
 - f. Establish and maintain a minimum of two permanent benchmarks on the site, referenced to data established by survey control points.
 - g. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - h. 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 and other construction.
 - i. Prior to construction, verify the location and invert elevation at points of connection to existing utilities.
- 4. Benchmarks and Markers
 - a. Working from lines and levels established by the property survey, establish

benchmarks and markers to set lines and levels at each story of construction and elsewhere as needed to properly locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do no scale Drawings to determine dimensions.

- b. Advise entities engaged in construction activities of marked lines and levels provided for their use.
- c. As construction proceeds, check every major element for line, level, and plumb.

5. Registered Land Surveyor's Log

- a. Maintain a surveyor's log of control and other survey Work. Make this log available for reference.
- b. Record deviations from required lines and levels, and **immediately** advise the Project Representative when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.
- c. On completion of foundation walls, major site improvements, and other Work requiring field engineering, submit this log and associated Project Drawings to the Project Representative.

6. Existing Utilities

- a. Furnish information necessary to adjust, move or relocate existing structures, utility poles, lines, services or other appurtenances located in or affected by construction.

7. Site Improvements

- a. Locate and layout all site improvements including, but not limited to, pavements, structures, earthwork and utility locations and grades.

8. Structure Lines and Levels

- a. Locate and layout batter boards for structures, building foundations, column grids and locations, floor levels and control lines and levels required for mechanical and electrical Work.

1.3 EXECUTION

A. Cutting and Patching – Concrete and Masonry

- 1. The Contractor shall be responsible for any cutting, fitting, and patching that may be required to complete this project, except for core drilling required for mechanical and electrical installations, which shall be the responsibility of the Mechanical or Electrical

Contractor.

2. The Contractor shall not endanger any work of any other Contractors by cutting, excavating, or otherwise altering any other work and shall not cut or alter the work of any other Contractor except with the written consent of the Architect/Engineer.
3. No cutting of structural members of the building, likely to impair its strength, shall be done without written approval from the Architect/Engineer.
4. To avoid damage to hidden utilities and structural re-enforcement any cutting or core drilling over one inch in diameter, through concrete floors and slabs will be x-rayed/scanned by the contractor prior to cutting.
 - a. A qualified engineer will conduct an on-site assessment before any cutting or drilling of a pre-tensioned or post-tensioned component or other structural component of a building or structure commences. The assessment will be documented and provided to the person contracted to carry out the work.
 - b. If any load bearing member is cut, cored or removed all the requirements of 29 CFR 1926 Subpart T (LARA Part 20) shall apply. This will require notifications to the DEQ 10 working days before cutting begins. Emergency notifications are possible under specific conditions.
 - c. The responsible person for the project shall ensure substantial compliance with the requirements for exposure to Silica Dust. Substantial compliance will also be required for all other construction safety standards and published by the State of Michigan or Federal OSHA.
 - d. Work shall be conducted outside of the regular hours to avoid disturbing the building occupants. An exception to this rule will be granted only by the project manager and shall be in writing.
 - e. The MSU project representative or employee shall be responsible for locating all utilities in the area to be cut. This part of the job is mandatory and shall be given appropriate attention. Minimally the responsible person shall review all available prints and consider structural scanning. The MSU representative or employee shall take necessary steps to isolate and lock out any energy sources that may be jeopardized by the cut to protect worker safety and avoid equipment damage. In some cases, utilities will need to be cut and relocated to conduct the work. The responsible person shall take steps to notify repair persons in advance of the anticipated timing and scope of the repair project or the need for temporary services.
 - f. Responsible person shall inspect the area to ensure that no damage has occurred and that the area is cleaned to an acceptable level.
5. Cutting and Patching for Mechanical Work
 - a. The Mechanical Contractor shall be responsible for any core drilling required to

complete their work.

- b. The Mechanical Contractor shall be responsible for the accurate location of all openings necessary for the installation of the mechanical work. Any additional openings required to move their work due to an error in the initial layout and the repair of inaccurate openings, shall be made at the expense of the Mechanical Contractor.

6. Cutting and Patching for Electrical Work

- a. The Electrical Contractor shall be responsible for any core drilling required to complete their work.
- b. The Electrical Contractor shall be responsible for the accurate location of all openings necessary for the installation of the electrical work. Any additional openings required to move their work due to an error in the initial layout and the repair of inaccurate openings, shall be done at the expense of the Electrical Contractor.

B. Salvaging of Materials

- 1. Materials or equipment shown on drawing or specified herein to be removed, which are not to be reused or salvaged, shall become the property of the Contractor and will be removed from University property and disposed of legally.

Note Designer must denote items to be salvaged here and on the drawings. Remove those that do not apply.

- 2. Salvage the following items to the locations as directed:
 - a. Post and chain fencing
 - b. Catch basin and/or manhole frames and covers
 - c. Bike racks and loops
 - d. Waste cans
 - e. Street and area light fixtures
 - f. Face brick for repair
 - g. Paver brick
 - h. Limestone cap
- 3. Deliver all fire alarm equipment removed from the job to the IPF Storage Building 210, 1457 Recycling Drive, East Lansing, MI.
- 4. Deliver all Best key cylinders to be removed from the job to the Key Shop in the Infrastructure Planning and Facilities Building, 1147 Chestnut Road, East Lansing, MI.
- 5. Salvage of Brick and Stone

- a. Salvage brick and stone for patching areas shown on the drawings. All materials shall be carefully palletized and stored at the site. The Contractor shall take special care in handling stone to avoid chipping corners and scarring faces.

1.4 CLEANING UP

- A. Cleaning up shall be in accordance with the General Conditions of the Contract.
- B. No rubble, dust, or debris shall be allowed to accumulate or be transported throughout the building.
- C. A thorough final cleaning of all of the adjacent streets, as specified by the Project Representative, will be required before final payment is made.
- D. If the Contractor fails to clean up, the Owner may do so and the cost thereof shall be charged to the Contractor.

1.5 STARTING AND ADJUSTING

- A. Refer to each Division for requirements.

1.6 CLOSEOUT PROCEDURES

- A. In general, one or more walk-throughs will be performed with the Contractor and punch lists developed of items to be completed before the project can be closed out.

1.7 CLOSEOUT SUBMITTALS AND PROJECT DELIVERABLES

- A. Operation and Maintenance Data
 1. The Contractor shall provide operation and maintenance data as required in this specification, and submit the required information through use of the Unifier system.
 2. Submittals for equipment and systems shall contain the manufacturer's information on installation, balancing, operating, maintenance, lubrication, and repair instructions and parts list for each component.
 3. Please refer to MSU Document Submittal Standards at:
<http://ipf.msu.edu/construction/business-partners/standards-for-construction/index.html>
- B. As-Built Drawings
 1. Submission of all As-built Drawings called for in this specification shall precede request for final payment.
 2. The Contractor shall submit As-built Drawings in electronic (.pdf) format, that is not password protected, indicating any deviations from the Contract Drawings, including contract Change Orders. Upon request of the Owner, printed copies of the As-Built

drawings shall be provided as well.

3. Provide any Building Information Model (BIM) data developed for this Project to the Project Representative.

C. Facility Asset Data Exchange (FADE) Log

1. The Constructor shall furnish all information as indicated on the FADE log spreadsheet. The University's FADE procedure and requirements for asset tracking and populating the log can be found at the following web addresses:

FADE process during design phase:

<https://us.promapp.com/ipfmsu/Process/Minimode/Permalink/GkN4dmXiYTf9MzXAPt5ydu>

FADE process during construction:

<https://us.promapp.com/ipfmsu/Process/Minimode/Permalink/C3uQcSUvsfB7pLuXYgcL3P#>

Should the Owner change the FADE process change in form or content, the Constructor is not relieved of fully executing the work required to compile the information and complete the Log.

Note: Delete the following section D for all projects with budgets less than \$250,000.

D. Construction Safety Documentation

1. The Contractor shall provide written documentation of the following site safety information, as it pertains to the project only:
 - a. List of all lost time accidents.
 - b. Reportable incident rate (total hours worked).
 - c. Details of many MIOSHA site visits, including resulting citations, violations, or actions.

E. Certificates of Inspection

1. The Contractor shall provide a copy of all Certificates of Inspection called for in this specification. Refer to Section 013000 Part 1.4.B.

F. Construction Waste Management – LEED Documentation

1. The Contractor shall provide written documentation of the Construction Waste Management program, as required for LEED Materials & Resources Credit 2. A form for this purpose is provided within this specification. Refer to Section 024200, Construction Waste Management.

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G. Warranty

1. The Contractor shall provide a written guarantee stating that all work performed and material furnished is free from all defects in workmanship, and material for a period of one year, unless noted otherwise, after the equipment has been accepted by the Owner. Final payment or Certificate of Substantial Completion, whichever is issued first, shall constitute Owner acceptance.

Note: Add the following item if the project includes any of the following types of work:

2. Additional warranties are required for site concrete pavement (Section 321313), curb/gutter (Section 321613), bituminous pavement (Section 321216), and specific mechanical equipment (Division 23)

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION