

SECTION 311000

SITE CLEARING

PART 1- GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing, and abandoning site utilities in place.
7. Temporary erosion- and sedimentation-control measures.

B. Related Sections:

1. Division 01 Section "Temporary Facilities and Controls" for temporary utility services, construction and support facilities, security and protection facilities, and temporary erosion- and sedimentation-control measures.

1.3 DEFINITIONS

- A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- B. Soil: Friable clay loam surface soil containing 4% to 12% organic matter. Soil shall be screened and free of subsoil, clay lumps, stones, rocks, weeds, roots, construction debris and other unsuitable materials as determined and approved by the Project Representative. Soil should be screened with nothing larger than a 2-inch screen.
- C. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- D. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably

free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.

- E. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.
- F. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.
- G. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.
- H. Construction Fencing: Construction fencing shall be chain link unless otherwise agreed upon and all construction work, parking of vehicles, storage of materials, or related activities shall occur within this boundary fencing.
- I. Tree Protection Barricade: Wood rail fencing constructed of 4"x4" posts at 8 feet maximum on center, and three 2"x4" (or better) wood rails; lined with at least one (1) 4-foot tall snow fence (or similar approved construction barrier fencing) which meets existing grade and encircles the entire area. Standard height of top rail shall be eight (8) feet; for variations, refer to Tree Protection Diagram.
- J. Temporary Path: A zone within the specified protected zone of a tree to enable temporary movement of equipment.
- K. Protected Zone: At a minimum, one and a half the distance of plant crown drip line outward from the trunk along undisturbed grade.
- L. DBH: Tree trunk diameter at breast height.
- M. Compaction: Change in soil conditions prior to construction by heavy equipment or concentrated foot traffic.
- N. Damages: Damages to campus woody plants shall include any of the prohibited practices listed in Section 1.4 as determined solely by Owner.
- O. Alternatives: Alternatives refer to any pre-arranged Campus Facilities approved variation to working within the protected zone.

1.4 PLANT PROTECTION

- A. Damage to WMU-owned trees, shrubs, and other plant material due to contractor negligence or accident shall be repaired only by the staff of WMU Landscape Services Department, or their designated contractor. Landscape Services shall remove and replace any trees, shrubs, and other plant material determined to be excessively damaged due to prohibited practices. The costs of all such repairs, removals, replacements, and an amount of value lost will be the liability of the contractor and billed accordingly.
- B. The following specific responsibilities are required of WMU Landscape Services Arborists:
 - 1. Tie-back of existing trees and shrubs.

2. Pruning/thinning of existing trees and shrubs.
 3. Root pruning and root protection of exposed roots.
 4. Watering of existing trees under stress.
 5. Removal or relocation that is not specified within the construction documents.
- C. The following specific responsibilities are required of the contractor when marked in the Construction Documents:
1. To protect the immediate portion of tree root zones, no construction equipment or materials; sand, soil, gravel, or any other materials shall be placed, parked, or stored on the surface of any unpaved areas within the radius of one and a half times the drip line (outermost reach of branches referred to as protected zone) of trees. No chemicals, rinsates, or petroleum products, shall be deposited within the protected zones of trees.
 2. Tree protection barricades shall be erected to define the protected zones (see Tree Protection Diagram). Failure to install barricades does not absolve contractor from "damage" assessment. All unpaved area within the zones of each tree in the construction site shall be fenced. The fencing shall be installed by WMU Landscape Services or contractor as specified prior to set-up for construction.
 3. Memorial garden or other gardens deemed of "special interest" by WMU staff to be protected during construction shall have protection barricades installed around the gardens by the Contractor. These barricades can be constructed of minimum 4-foot high snow fencing and metal U-channel posts. These garden protection areas must comply with all protection zone standards established in these construction documents for trees and other plantings.
 4. It is understood that the proximity of a tree to a worksite may require temporary access to a protected zone. A temporary path may be constructed in these cases with prior approval from the WMU Landscape Services Representative. The path shall be eight to ten-inches (8"-10") of wood chips as located by the WMU Landscape Services Arborist or designated representative and wood chips shall be removed immediately upon completion of work in an area. Soil aeration may be required during site restoration.
 5. To preserve viable root systems and maintain structural stability, it is required that the contractor bore or tunnel beneath the root systems of trees. Open-cut excavating is allowed only up to the distance from various size trees, as listed below. Contractor must bore or tunnel from trench to trench below the minimum depth indicated for the tree size. The surface area and subsoil directly adjacent to trees shall not be disturbed as follows:
 6. Open-Cut Trenching and Boring Specifications: Specifications are determined by tree size (diameter/inches), minimum undisturbed radius (measured from face of trunk), and a minimum depth of tunnel/bore and are listed below:

Open-Cut Trenching and Boring Specs

<u>Tree Size</u> <u>(diameter/inches)</u>	<u>Minimum Undisturbed Radius</u> <u>(measured from face of trunk)</u>	<u>Minimum Depth</u> <u>of Tunnel/Bore</u>
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less than 3"	3 feet	3 feet
3" through 8"	8 feet	3 feet
8" through 14"	14 feet	4 feet
larger than 14"	20 feet	4 feet

7. A pre-construction site walk-thru will be scheduled with the WMU Landscape Services Representative and contractor prior to any construction project. This meeting will include the construction site superintendent and a representative of WMU Landscape Services.
8. Care shall be taken not to damage trees, shrubs, vines and perennials within the protected zones. The WMU Landscape Services Department shall be contacted at least three (3) business days prior to the set-up for any construction to discuss problems of overhanging branches which may be damaged. The WMU Landscape Services Representative shall evaluate damage and establish proportional fines up to 100% of the value, regardless of the current disposition of the plant. The replacement value for shrubs, vines, and perennials shall be assessed at current market cost. The replacement value for trees shall be assessed at the current value schedule as follows:
 - a. 1"-3" caliper \$120/inch
 - b. 3"-6" DBH \$180/inch
 - c. 6"-9" DBH \$240/inch
 - d. 9"-12" DBH \$300/inch
 - e. 12"-15" DBH \$420/inch
 - f. 15" or more DBH \$600/inch
9. All excavation in the protected zone shall be backfilled only with clean, viable soil. If possible, native soil from the site should be returned, and if not possible, soil returned should match existing soil profile. No concrete, slurry, gravel, stone, sand, or other such materials shall be used for backfill. Flush backfilled excavations to settle material. Restoration shall be to original grade, unless otherwise specified.
10. Contractor shall immediately contact WMU Landscape Services Representative should protected plants be compromised in violation of agreed upon fencing and limits. Failure to communicate promptly could result in 100% damage assessment of fines.
11. In special cases, alternative plant protection options may be permitted. Alternatives allow for flexibility of requirements where approved specific measures can be implemented in lieu of the standard protection specifications. Measures may include thinning and root pruning; fertilization; aeration; boring and jacking; hand excavation; care and supervision by campus arborist; and seasonal schedule recommendations. Alternatives would be based on the specific requirements of the plant species in question, as determined by the WMU Landscape Services Arborist.

12. Prohibited Practices: Practices prohibited by the contractor include breaking of branches, scraping of bark, or unauthorized cutting; nailing or bolting into plants; use of plants as temporary support (cables), chaining, bolting, or cabling equipment to trees, unauthorized filling, excavating, trenching, or augering within protected zone, compacting/driving over the protected zone, storage of any materials or vehicles within the protected zone, dumping of construction waste or material (including liquids), unauthorized removal or relocation of woody plants, execution or pre-emption of WMU Landscape Services Arborist Responsibilities, removal of tree protection barricades or construction fencing prior to completion of project.

1.5 MATERIAL OWNERSHIP

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.6 SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
 1. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.
- B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.7 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at Project site.

1.8 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
 1. Do not proceed with work on adjoining property until directed by Architect.

- C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.
- D. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.
- E. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.
- F. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- G. Do not direct vehicle or equipment exhaust towards protection zones.
- H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.
- I. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Division 31 Section "Earth Moving."
 - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. Flag each tree trunk at 54 inches (1372 mm) above the ground.
- C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.
- B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

- A. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.
- B. During construction, the existing turf area within the tree protection zones must be maintained by the Contractor until Substantial Completion.
 1. A six-foot (6') diameter ring around the tree trunk should have a Glyphosate weed removal solution applied for weed control. The Glyphosate should be applied per the quantities and schedule on the manufacturer's written product label.
 2. The remaining area between the tree protection fencing and the Glyphosate weed controlled area should be mowed and maintained to a 4"-6" height with either a float weed-whip or push mower. Care should be given to not scalp the existing turf too short.
- C. During construction, any protected memorial gardens or "special interest" gardens should be maintained, watered, fertilized and weeded by the Contractor until Substantial Completion. Contractor is required to adopt any additional maintenance plans from WMU staff for individual gardens.

3.4 EXISTING UTILITIES

- A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.
 1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

- B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
 - 1. Arrange with utility companies to shut off indicated utilities.
 - 2. Owner will arrange to shut off indicated utilities when requested by Contractor.
- C. Locate, identify, and disconnect utilities indicated to be abandoned in place.
- D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Architect not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Architect's written permission.
- E. Excavate for and remove underground utilities indicated to be removed.
- F. Removal of underground utilities is included in Division 22, Division 23, Division 26, and Division 33 Sections.

3.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches (450 mm) below exposed subgrade.
 - 3. Use only hand methods for grubbing within protection zones.
 - 4. Remove trees, shrubs, and other vegetation and legally dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (200 mm), and compact each layer to a density equal to adjacent original ground.

1.2 SOD STRIPPING

- A. In most cases, sod stripping will not occur on WMU's campus. When applicable, stripping sod shall be under reasonably dry conditions. Secure approval of soil quantity in advance from Project Representative to begin sod stripping. Sod removal shall include the entire root system but not an excess amount of topsoil. Contractor shall haul the sod to a predetermined location, as directed for stockpiling.

3.6 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.

- B. Stripping topsoil shall be done under reasonably dry conditions. Stripping under wet conditions will not be allowed.
- C. Contractor shall strip available topsoil to its full depth from within the Contract limits, excluding areas in close proximity to trees designated to remain, unless otherwise specified or directed by Project Representative.
- D. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; trash, debris, weeds, roots, and other waste materials.
- B. Contractor shall stockpile topsoil in a storage pile on the Owner's property as directed by Project Representative. Storage piles shall be shaped to freely drain surface water. The stockpile shall be protected from soil and sediment erosion as required elsewhere in these Specifications. The stockpile shall be clearly separated from other debris.
- E. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
 - 1. Limit height of topsoil stockpiles to 72 inches (1800 mm).
 - 2. Do not stockpile topsoil within protection zones.
 - 3. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.7 SITE IMPROVEMENTS

- A. Salvage above-grade improvements as indicated and necessary to facilitate new construction. Store in protected area where will avoid damage.
- B. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- C. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
 - 2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

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- B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 311000

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