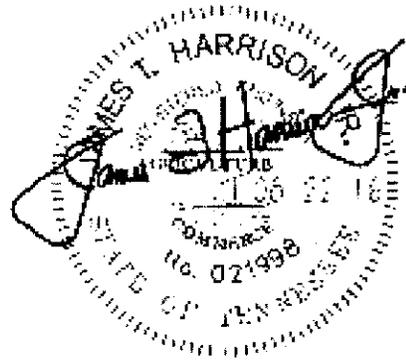
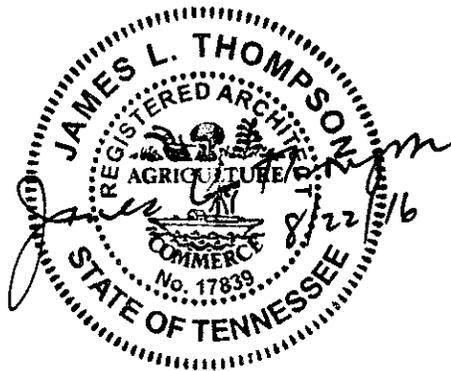


**Project Manual**  
**Driveway Repairs**  
at  
**SABINE HILL STATE HISTORIC SITE**  
Elizabethton, Tennessee

August 22, 2016

Tennessee Historical Commission  
Major Maintenance Work Program



Prepared by:

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Centric Project #02031.68

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## **PART 1 - GENERAL**

### 1.01 SCOPE OF THE WORK

- A. The Sabine Hill State Historic Site is a nationally important historic site. As such, the Contractor, his/her subcontractors and vendors shall take the utmost care to protect the structures and its grounds. The Contractor shall also take all necessary precautions to protect all historic building materials to eliminate damage to those materials.
1. See also Item 1.08 of this document.
- B. Requirements of the Work are contained in the Contract Documents and include cross references herein to published information, which is not necessarily bound therein.
- C. The Work of this Contract shall include the furnishing of labor, equipment, materials, tools, construction equipment and machinery, storage, transportation, insurance, taxes, superintendence, coordination and miscellaneous services required for the construction and completion of the Work, whether temporary or permanent and whether or not incorporated into the Work. All work shall be performed in strict accordance with the Contract Documents.
- D. The Contractor shall take all necessary precautions as identified by authorities having jurisdiction for protecting its workers and the public.
- E. General Verbal Summary: Without force and effect on requirements of the Contract Documents, the description of the Work of the Contract can be summarized as follows:
1. Remove the existing gravel section of the driveway and broken concrete curbs shown on the drawings. Excavate to depth indicated. Install new reinforced concrete driveway with heavy broom finish and new concrete curbs as identified. See attached civil drawings and specifications dated August 9, 2016.
  2. Grade either side of the driveway as needed in the area of work for a smooth transition. All holes to either side of the driveway in the area of work with compacted topsoil, seed and straw
  3. Remove any remaining excess gravel as identified in the documents.
- E. The general requirements of the Work are contained in the attached Specification sections.

## 1.02 OWNER'S AND SITE REPRESENTATIVES

### A. Owner's Representative

1. The Owner's Representative for this project will be the Tennessee Historical Commission's Director of Historic Site's, or his designated representative. The Owner's Representative, or his designated representative, is responsible for the administration of this contract including responses to Contractor questions and other issues requiring resolution during the course of the project.
2. The Designer will be responsible for monitoring the progress of the Work with respect to the Contractor's care and protection of the historic structures during the course of the Contractor's operations and use of portions of the site or the site's facilities.
3. The Tennessee Historical Commission, in coordination with and approval from the Designer, is the authority for the Secretary of the Interior's standards, interpretations, applications, and field adjustments.

### B. Historic Site Representative

1. The Historic Site Representative will be a single person designated at the site to represent the site for the duration of the project.
2. The Historic Site Representative will be responsible for monitoring the progress of the Work with respect to the Contractor's care and protection of the historic structures during the course of the Contractor's operations as well as Contractor's access to and use of portions of the site or the site's facilities.
3. The Historic Site Representative will coordinate site interpretation and activities with the needs of the Contractor for access to various parts of the site during the course of the project.
4. The Historic Site Representative will be responsible for communicating any questions or issues arising during the course of the Project.

F. Site will make available electricity and water to the Contractor for the completion of the Work.

G. Contractor shall be responsible for installation/maintenance of his own telephone communications for use of Contractor and subcontractors.

## 1.03 CONTRACTOR USE OF PREMISES

A. Coordinate use of the premises with the Historic Site Representative. Access to site, site facilities, utilities, parking, materials storage, etc., shall be coordinated with the Historic Site Representative.

B. Do not unreasonably encumber the site during the execution of the Work of this Contract. Coordinate work schedule and use of premises (parking, utilities, etc.) with Historic Site Director. The site will NOT be open to the public.

- C. Contractor and his employees to wear appropriate clothing and act in an appropriate manner toward staff and visitors.
- D. Assume full responsibility for the protection and safekeeping of products stored on the premises.
- E. All tools shall be stored and used in a secure manner. Walkways and footpaths shall be clear of debris, rubble and tools when the Work is not underway and at the end of each work day.
- F. Site will make available electricity and water (from a well on site – Contractor to provide additional water as needed to perform the Scope of Work) to the Contractor for the completion of the Work.
- G. Contractor shall be responsible for installation/maintenance of his own telephone communications for use of Contractor and subcontractors.

#### .04 SITE INSPECTION

- A. The Contractor acknowledges that he has satisfied himself as to the nature and location of the Work, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads, uncertainties of weather, ground water table or similar physical conditions at the site, the conformation and condition of the ground, the character, quality and quantity of surface and substrate materials to be encountered, the character of equipment and facilities needed prior to and during the prosecution of the Work and all other matters which can in any way affect the Work of the cost thereof under this Contract.

#### 1.05 REQUIREMENTS FOR NEW AND EXISTING CONSTRUCTION

- A. Exercise the utmost care to protect all existing utility lines from damage during the progress of the Work.
- B. Any portion of the existing buildings or existing utility services not included as part of this Contract or any portion of the Work or site damaged because of failure to provide the protection required shall be removed and replaced with historically appropriate matching materials and construction at the Contractor's expense. This Work shall be accomplished subject to the Owner's Representative.
- C. **Any subsurface disturbance (digging or excavation) requires oversight by the State Department of Archaeology at State expense. The Contractor shall notify the Owner's Representative one week prior to any disturbance.**

1.06 REPLACEMENT AND REPAIR OF ANY STRUCTURES THAT HAVE BEEN DESTROYED IN THE PROGRESS OF THE WORK

- A. Because of the installation of the new items, it may become necessary to remove portions of the existing site improvements, equipment, and/or utility services. Unless specifically noted otherwise in this Project Manual, the Contractor shall be responsible for replacing, in a condition of identical appearance, construction, design, working order, and strength as its previous state any such portion of the existing site improvements and/or utility services so required to be disturbed. The replaced item shall meet the approval of the Director of Historic Sites or Owner's Representative before final approval of the Project is given.

1.07 OWNER OCCUPANCY

- A. The premises will NOT be occupied during the entire construction period, however limited operations may be conducted by site personnel.
- B. Cooperate with the Historic Site Representative in scheduling of operations to minimize conflict and to facilitate site usage.

1.08 HISTORICAL SIGNIFICANCE

- A. The Contractor is to be aware that the existing structures and sites are of significant historical importance and all work shall be performed with due care and awareness by the Contractor's personnel and subcontractors. No cutting or removal of existing materials or surfaces shall be performed that are not specifically detailed or called for as part of the Work. Conduct of the Contractor's personnel and subcontractors while on site shall respect the rights of the visiting public. The Owner's Representative retains the right to request the removal of any of the Contractor's personnel or subcontractors for any reason.

**PART 2 - PRODUCTS** (Not applicable).

**PART 3 - EXECUTION** (Not applicable).

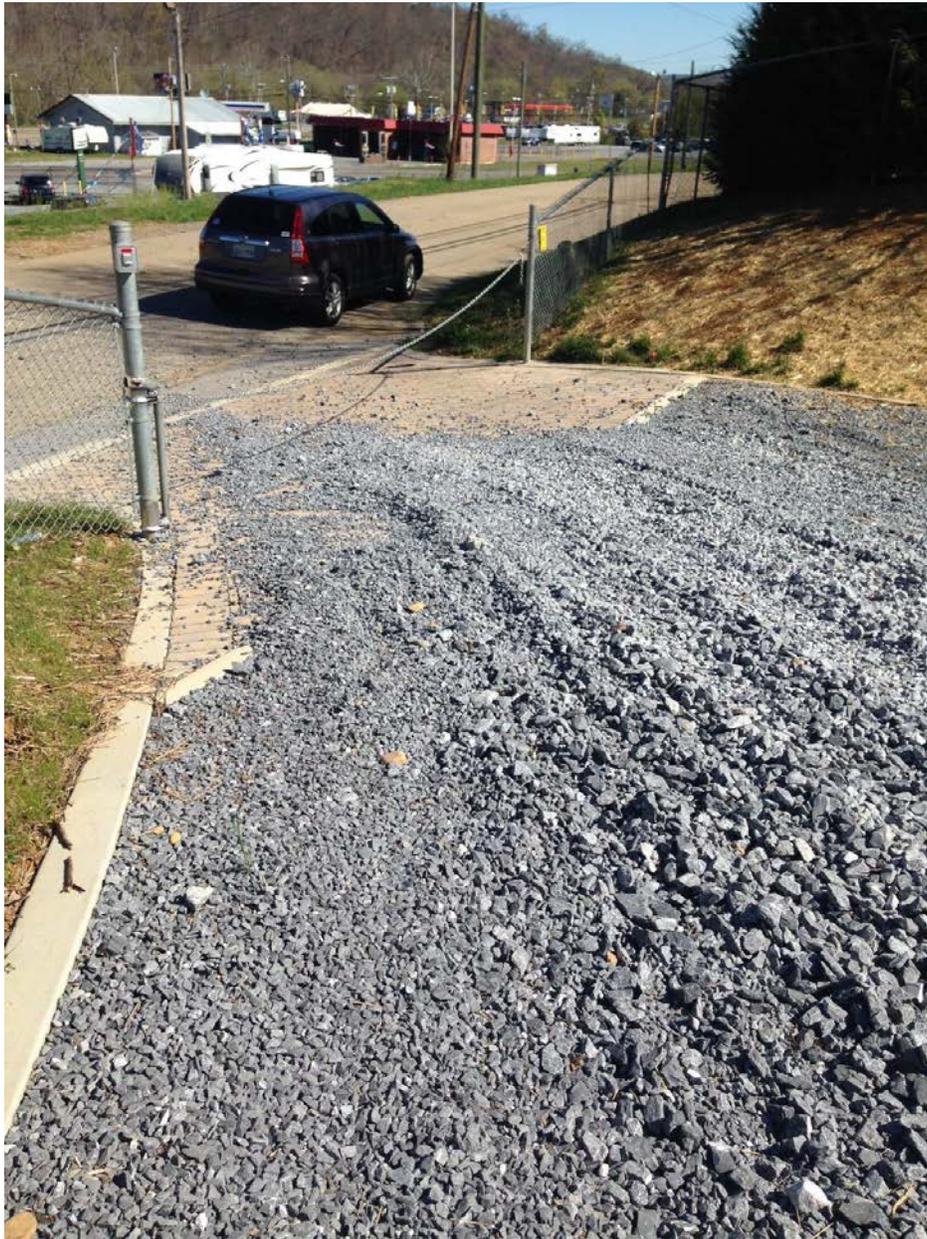


Illustration No. 1: Lower End of Driveway at Entry.

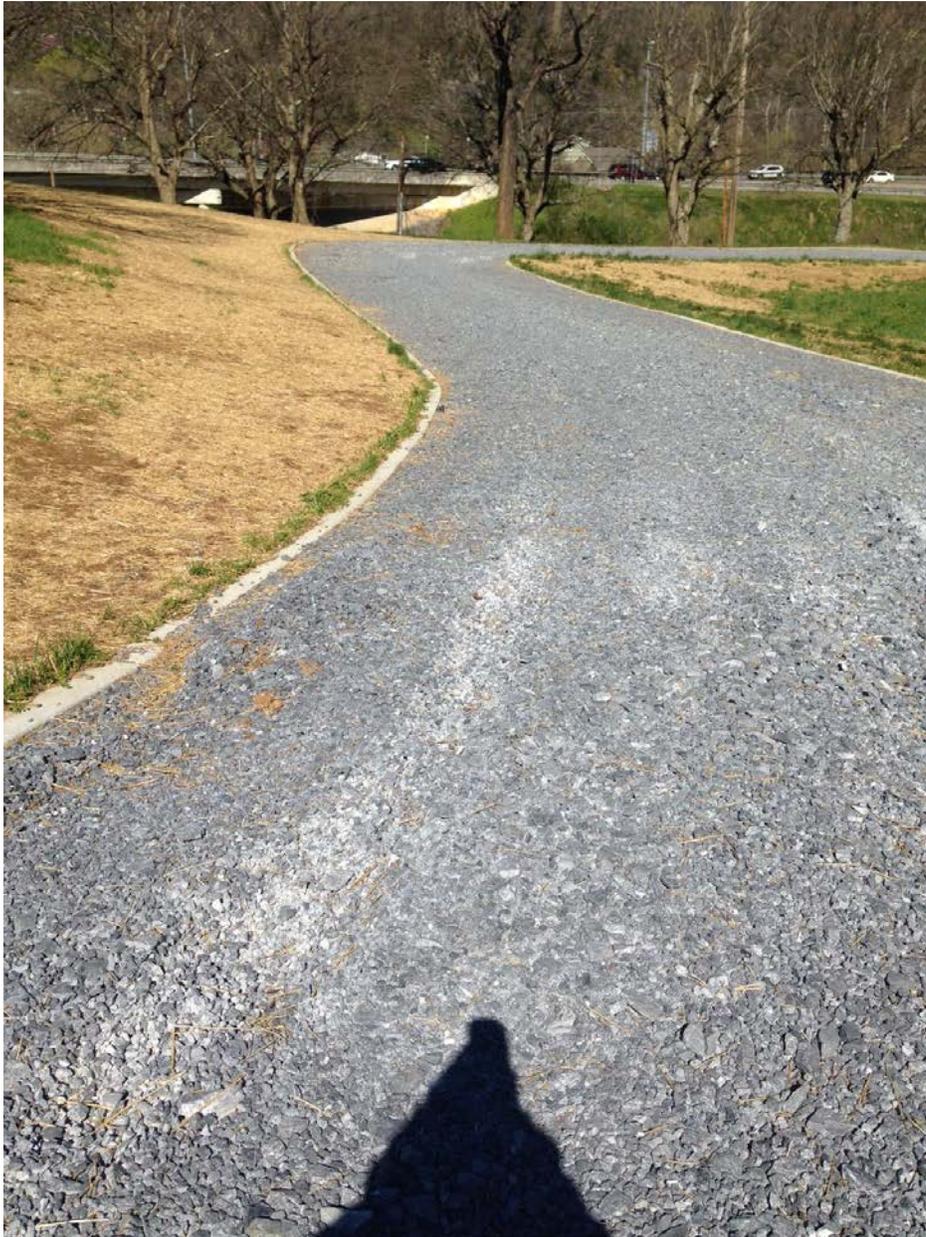


Illustration No. 2: Driveway Mid-Section.



Illustration No. 3: Upper End of Existing Driveway.



Illustration No. 4: Replace Typical Cracked Concrete Ribbon Curb.



Illustration No. 5: Replace Typical Cracked Concrete Ribbon Curb.

END OF SECTION 01 11 13

**PART 1 - GENERAL**

1.01 SCOPE

- A. The Department of the Interior's *Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* shall be considered as a part of this Contract.
- B. Copies of the *Standards and Guidelines* may be obtained from:

Tennessee Historical Commission  
2941 Lebanon Road  
Nashville, TN 37214  
615-532-1550

1.02 PROJECT CONTACTS

- A. Owner's Representative:

Dan Brown, Director of Historic Sites  
Tennessee Historical Commission  
2941 Lebanon Road  
Nashville, TN 37214  
615-770-1091

- B. Historic Site Representative:

Ms Jennifer Bauer  
Sycamore Shoals State Historic Area  
1651 West Elk Avenue  
Elizabethton, TN 37643  
423-543-5808 Ext. 102

- C. Designer:

Jim Thomson, AIA  
Centric Architecture  
35 Peabody Street  
Suite 305  
Nashville, TN 37201  
615-385-9600

**PART 2 - PRODUCTS** (Not applicable).

**PART 3 - EXECUTION** (Not applicable).

END OF SECTION 01 30 00

**PART 1 - GENERAL**

1.01 CODES AND REGULATIONS

- A. The following are Regulatory Requirements that are typically used for State building projects. Depending on the use of the building, other codes and regulations may also apply. This list is provided as a convenience to the Contractor and is not to be considered all inclusive of codes and regulations that may apply. The Contractor shall comply with all pertinent codes, standards, regulations and laws.
1. 2012 International Building Code (excluding Chapters 11 and Section 3411 – Accessibility for Existing Buildings)
  2. 2012 International Plumbing Code
  3. 2012 International Fuel Gas Code
  4. 2012 International Mechanical Code
  5. 2012 International Property Maintenance Code
  6. 2012 International Fire Code
  7. 2012 International Energy Conservation Code, except for the provisions of the International Energy Conservation Code, 2006 edition, shall apply to the following occupancy classifications: Group F-1, F-2, S-1 and S-
  8. 2012 International Fire Code
  9. 2012 International Existing Building Code (scope of work related to existing buildings)
  7. 2010 ADA Standards for Accessible Design
  8. 2011 Tennessee Elevator Code and its Supplements
  9. 2007 Edition of Boiler and Unfired Pressure Vessel Inspection Law, Rules and Regulations.
  10. Tennessee Chapter 0780-2-1, Electrical Installations.
  11. Tennessee Equitable Restroom Act Rules and Regulations.
- B. Other codes and regulations are listed below. This list is provided as a convenience to the Contractor and is not to be considered all inclusive of Codes and regulations that may apply. The Contractor shall comply with all pertinent codes, standards, regulations and laws.
1. The Secretary of Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. National Park Service, Department of the Interior. Rev. 1990.

**PART 2 - PRODUCTS** (Not applicable).

**PART 3 - EXECUTION** (Not applicable).

## **PART 1 - GENERAL**

### 1.01 DESCRIPTION OF REQUIREMENTS

- A. Specific administrative and procedural minimum actions are specified in this Section as extensions of provisions in the General Conditions and other Contract Documents. These requirements have been included for the special purposes as indicated. Nothing in this Section is intended to limit types and amounts of temporary work required and no omission from this Section will be recognized as an indication by the Owner's Representative that such temporary activity is NOT required for the successful completion of the Work and compliance with the requirements of the Contract Documents.

### 1.02 QUALITY ASSURANCE

- A. In addition to compliance with governing regulations and rules/recommendations of franchised utility companies, comply with specific requirements indicated and applicable local industry standards for construction work.

### 1.03 JOB CONDITIONS

- A. Establish and initiate use of each temporary facility at that time first reasonably required for proper performance of the Work. Terminate use and remove facilities at the earliest reasonable time, when no longer needed or when permanent facilities have, with authorized use, replaced the need.
- B. Install, operate, maintain and protect temporary facilities in a manner and at locations that will be safe, non-hazardous, sanitary and protective of persons and property and free of deleterious effects.

## **PART 2 - PRODUCTS**

### 2.01 TEMPORARY UTILITY SERVICES

- A. The site does have available electricity, but has limited available water from a well. The Contractor shall be responsible for providing any services needed by the Contractor. Comply with service companies' recommendations on materials and methods, or engage service companies to install services. Locate and relocate services (as necessary) to minimize interference with construction and site visitation operations.

- B. Materials shall be new and shall be adequate for the purposes intended and shall not create unsafe conditions nor violate requirements of applicable codes.
- C. Water: Non-potable water shall be acceptable for industrial, cleaning and fire fighting purposes only.
- D. Enclosures: Furnish, install and maintain for the duration of construction all required tarpaulins, barricades, warning signs, and other temporary construction necessary for proper completion of the Work in compliance with all pertinent safety and other regulations.
- E. Access Provisions
  - 1. Provide temporary access elements as reasonably required to perform the Work and facilitate its inspection during installation. Comply with reasonable requests of governing authorities performing inspections.
- F. Access Roads and Parking Areas
  - 1. Repair damage caused by construction activities to finish paving course after possibility of damage from construction operations has passed.
- G. Site Operations: The site will NOT be open to visitors during the Work. Contractor shall work with the site to provide safe access to the Site representative or their staff.

## 2.02 SECURITY/PROTECTION PROVISIONS

- A. The types of temporary security and protection provisions required include, but not by way of limitation:
  - 1. Barricades.
  - 2. Personnel security program (theft protection).
  - 3. Warning signs/lights.
  - 4. Environmental protection.
- B. Provide facilities and services as necessary to effectively protect project from losses and persons from injury during the course of construction.
- C. Fire Protection
  - 1. Smoking is prohibited in and within the immediate vicinity of all State-owned facilities.

### 2.03 TEMPORARY SUPPORT FACILITIES

- A. Provide all general services as may be reasonably required for proficient performance of the Work and accommodation of personnel at the site including Owner's Representative. Discontinue and remove temporary support facilities and make incidental similar use of permanent work of the Project only when and in manner authorized by the Owner's Representative and, if not otherwise indicated, immediately before the time of Substantial Completion. Locate temporary support facilities for the convenience of the users and for minimum interference with construction activities.

### 2.04 HISTORIC SITE PROVISIONS

- A. The site will make available the following facilities and services:
  - 1. Sites for construction facilities, staging and construction personnel parking. This area is to be limited so as to cause the least amount of disruption to the site. Closed storage for new materials or for materials to be reused will not be available.

## **PART 3 - EXECUTION**

### 3.01 REMOVAL

- A. Maintain all temporary facilities and controls as long as needed for the safe and proper completion of the Work. Remove all such temporary facilities and controls as rapidly as the progress of the Work will permit.

### 3.02 CLEANING DURING CONSTRUCTION

- A. Hazards Control
  - 1. Store volatile wastes in covered metal containers and remove from premises daily. Prevent accumulation of wastes, which create hazardous conditions. Provide adequate ventilation during use of volatile or noxious substances. Conduct cleaning and disposal operations to comply with local ordinances, state laws and anti-pollution laws.
    - a. Do not burn or bury rubbish and waste materials on project site.
    - b. Do not dispose of wastes into streams or waterways.

- B. Care shall be taken by all workmen not to mark, soil, or otherwise deface finished surfaces. In the event that any finished surface becomes defaced in any way by mechanics or workmen, the Contractor responsible shall clean and restore such surfaces to their original condition.
- C. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.
- D. Schedule cleaning operations so that dust and other contaminants resulting from the cleaning process will not fall on adjoining surfaces.
- E. Temporarily place waste materials, debris and rubbish in appropriate containers. Remove these materials from the site and legally dispose of at public or private dumping areas off property. Daily removal will not be required, but unsightly accumulation of waste, debris and rubbish is not acceptable. Sites are to be clean and free of debris at completion of the work at each respective site.

END OF SECTION 01 52 00

**PART 1 - GENERAL**

1.01 SCOPE

- A. At completion of the Work, complete the following to leave the Project clean and ready for acceptance or occupancy.
1. In preparation for Substantial Completion or occupancy, conduct Final Inspection of sight-exposed exterior surfaces.
  2. Remove grease, dust, dirt, stains, labels, shoeprints, and other foreign materials from sight-exposed exterior finished surfaces.
  3. Repair, patch and touch-up marred surfaces to specified finish to match adjacent surfaces.
  4. Broom clean paved surfaces; rake clean other surfaces of grounds affected by the Work.
  5. Recleaning will not be required after the work has been inspected unless later operations of the Contractor, in the opinion of the Owner's Representative makes recleaning of certain portions necessary.

**PART 2 - PRODUCTS** (Not applicable).

**PART 3 - EXECUTION** (Not applicable).

END OF SECTION 01 71 00

**PART 1 GENERAL**

1.01 WORK INCLUDED

- A. Removal and disposal of designated curbs and other structures.

1.02 RELATED WORK

- A. Section 31 23 00: Excavation and Fill

1.03 QUALITY ASSURANCE

- A. Contractor Qualifications: Minimum of 5 years experience in demolition of comparable structures.
- B. Requirements of Regulatory Agencies:
  - 1. Comply with requirements of local codes
  - 2. Comply with requirements of Wilson County and the applicable jurisdiction and Local Public Health Authority.
  - 3. Comply with local utility companies and/or utility districts.

1.04 SUBMITTALS

- A. Permit for transport and disposal of debris.
- B. Demolition procedures and operational sequence for review by Owner's Representative or Designer.

1.05 JOB CONDITIONS

- A. Protection:
  - 1. Erect barriers, fences, guard rails, enclosures, and/or shoring as needed to protect existing structures.
  - 2. Protect existing trees and plants from damage.
- B. MAINTAINING TRAFFIC
  - 1. Ensure minimum interference with roads, street, driveways, sidewalks, and adjacent facilities.
  - 2. Do not close or obstruct streets, sidewalks, alleys or passageways without permission from authorities having jurisdiction and affected property owners.
  - 3. If required by governing authorities, provide alternate routes around closed or obstructed traffic ways.

**PART 2 PRODUCTS**

(Not Applicable)

**PART 3 EXECUTION**

3.01 PREPARATION

- A. Prepare adjacent areas to prevent injury, movement or settlement of structures which are to remain.
- B. The contractor shall coordinate a meeting with the owner and the architect prior to any demolition work. At that meeting, the contractor shall review the exact limits of demolition with the owner to confirm the limits.

3.02 DEMOLITION

- A. Remove concrete curbs, etc. And dispose of as follows:
  - 1. Dispose of items which are not more than two feet below subgrade elevation.
  - 2. Break items more than two feet below existing or final subgrade elevation into sizes not to exceed twelve inches in maximum dimension and leave in place, unless it interferes with succeeding items of construction.

3.03 DEBRIS REMOVAL

- A. Promptly remove demolition debris from site.
  - 1. Do not store debris on site
- B. Obtain permission from applicable regulatory authority for disposal of debris to waste disposal site.

END OF SECTION

**PART 1 GENERAL**

1.01 RELATED WORK

- A. Section 31 23 00: Excavation and Fill
- B. Section 31 24 00: Backfilling and Finished Grade

1.02 QUALITY ASSURANCE

- A. The CONTRACTOR shall employ an independent testing agency to observe proof-rolling operations and make required test.
- B. Do not perform proof-rolling operations unless testing agency personnel are present.
- C. Neither proof-rolling operations or subsequent fill operations will be acceptable for payment unless testing agency personnel views proof-rolling.

**PART 2 PRODUCTS**

2.01 MATERIALS

- A. Vehicle: Loaded rubber tired dump truck having a single axle weight of approximately 30,000 lbs, or similar equipment.

**PART 3 EXECUTION**

3.01 PROOF-ROLLING

- A. Areas to proof-roll:
  - 1. Areas to be covered by construction.
  - 2. Areas to be covered with fill.
- B. Observation: Run vehicle at normal walking speed so that the testing agency personnel may observe the ground at all times. Run vehicle in two directions – 90 degrees to each other. Tires shall cover 100% of site. Testing personnel will conduct additional tests they deem necessary to determine existing conditions. Testing personnel will direct remedial actions they deem necessary.

3.02 REMEDIAL WORK

- A. Remedial work on virgin soil required by testing agency after viewing proof-rolling operations shall be determined by Owner's Representative or Designer.
- B. Remedial work due to trade contractor not obtaining required density or moisture content shall be corrected by trade contractor.
  - 1. Cost associated with re-testing by testing agency shall be the responsibility of the trade contractor

END OF SECTION

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Excavating and grading for:
  - 1. Driveway area

1.02 RELATED WORK

- A. Section 31 13 00: Proof Rolling
- B. Section 31 24 00: Backfilling and Finished Grading

1.03 QUALITY ASSURANCE

- A. Testing Laboratory and Soils Engineer:
  - 2. Have earth borrow fill and structural fill tested by an independent testing laboratory and approved by the owner's representative or Designer before moving it to the job site.
  - 3. Areas to be paved shall be proof-rolled to determine adequacy of soils compaction.
  - 4. Soils compaction testing of in-place soil, and filling compacted areas will be performed by Testing Laboratory in accordance with their requirements.

1.04 EXISTING CONDITIONS

- A. It is the contractor's responsibility to have all underground utilities identified prior to commencement of any construction. The contractor shall hire an underground locator for utility lines outside / beyond those marked by the utility companies.
- B. Do not interrupt existing utilities service to facilities occupied and used by the Owner or others, except when permitted in writing, by Owner's Representative or Designer.

1.05 PROTECTION

- A. Protect trees, shrubs and lawns, rock outcroppings and other features remaining as part of final landscaping.
- B. Protect benchmarks, existing structures, fences, roads, sidewalks, paving and curbs against damage from equipment and vehicular traffic.
- C. Protect aerial, surface, or underground utility lines and appurtenances that are to remain.
- D. Repair damage.
- E. Erosion control must be maintained. Refer to notes on grading plan.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Provide for surface drainage during the period of construction in a manner to avoid creating a nuisance to adjacent areas. Keep excavations free of water during the entire progress of work, regardless of the case, source, or nature of the water.
- B. Trees shall be left undisturbed.

1.07 SEDIMENT AND EROSION CONTROL

- A. Protect newly graded areas from erosion.
- B. Repair settlement and erosion that occurs prior to acceptance of work.
- C. Leave silt fences, etc. in place until a good stand of grass has been achieved and approved by owner's representative or Designer.
- D. Perform periodic maintenance on silt fences to remove sediment.

1.08 REFERENCE STANDARDS

- A. Determine soil's maximum dry density and optimum moisture in accordance with ASTM D698.

1.09 QUALITY ASSURANCE

- A. The contractor shall employ an independent testing agency to observe work and make tests required. The laboratory will:
  - 1. Observe proof rolling to determine adequacy of in-place soils and make recommendations as needed.
  - 2. Test in-place soil, filled areas and compacted areas.
  - 3. Verify quantities of materials removed where unit prices are involved.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Unclassified: All excavation (mass excavation, trench, footing, *unsuitable soil excavation*, etc.) on this project shall be considered unclassified unless otherwise noted by the owner or architect. No additional payment to be made for remedial work.
- B. Topsoil: Excavated material, graded free of roots, subsoil, debris, large weeds, toxic substances, and rocks greater than 2.0 inches.

PART 3 EXECUTION

3.01 PREPARATION

- A. Establish and identify required lines, levels, contours and datum.

- B. Maintain benchmarks, monuments, and other reference points. Re-establish if disturbed or destroyed, at no cost to Owner.
- C. Before start of grading, establish the location and extent of utilities in the work areas. Remove or relocate lines that are in the way of construction.
- D. Maintain, protect, reroute or extend as required existing utilities to remain which pass through the work area.
- E. Upon discovery of unknown utility or concealed conditions, discontinue affected work and notify the Architect.

### 3.02 REMOVAL OF TOP SOIL

- A. If it is determined during construction that topsoil outside the existing ribbon curbs is necessary, remove topsoil of horticultural value and stockpile in area to be determined by owner's representative.
- B. Do not permit topsoil to be mixed with subsoil.
- C. Do not strip topsoil when wet.
- D. Topsoil shall be considered property of the owner and shall not be removed from the site prior to completion of top soil placement and approval of the owner.

### 3.03 GENERAL SITE EXCAVATION

- A. All excavation on this project, including trenching for utilities and drainage, shall be considered unclassified.
- B. Do not excavate wet subsoil materials unless directed to do so by the owner's representative or Designer.
- C. Excavate subsoil required to allow placement of compacted backfill under paving and site structures, and to accommodate construction operations.
- D. Machine slope banks to angle of repose or less until shored.
- E. Remove lumped subsoil, boulders and rock.
- F. Completely remove stumps, roots over 2 inches in diameter, and similar on-grade and below-grade obstructions within the area to be covered by new construction and for a distance of 10 feet beyond area in all directions. In other areas disturbed by grading, remove such obstructions to a depth of 1 foot below subgrade.
- G. Correct unauthorized excavation, including areas over-excavated by error, at no extra cost to the Owner.
- H. Stockpile excavated material in designated area on site to a depth not exceeding 20 feet and protect from erosion. Remove excess material not being reused from site. Stockpile areas are to be identified during a pre-construction meeting of the job site.

- I. Control storm water drainage by properly draining the site during construction to promote complete and rapid runoff of surface water away from construction areas and avoid ponding of water in excavations. The contractor shall use a storm water sump pump with a filter fabric sock on the discharge pipe or other method approved by owner's representative. The contractor shall provide additional filtering methods as necessary to maintain sediment free discharge.
- J. Excavation pavement areas and other improvement areas shall be to a depth as specified by the plans that allows for placement of stone fill as required.
- K. All fill areas beneath pavement areas shall be compacted to 95% of the Standard Proctor maximum dry density (ASTM D-698) at  $\pm 3\%$  of the optimum moisture content.
- L. Sides of excavations shall be square and bottoms shall be level.

#### 3.04 PREPARATION OF NATURAL GROUND

- A. Proof-Roll in accordance with section 31 13 00. Owner's Representative or Designer is to identify any unstable areas.
- B. Unsuitable subgrades identified by the independent testing agency may attempt to be stabilized by scarifying, aerating and recompaction, if these procedures are approved by the owner's representative. Scarify at an effective depth of 12 inches and recompact to the density index specified in Section 31 24 00.
- C. If, after scarification, aeration and recompaction operations are completed, any exposed subgrades are determined by the independent testing agency as incapable of being stabilized in-place, perform remedial work as specified below.

#### 3.05 REMEDIAL WORK

- A. All remedial work shall be included as part of unclassified excavation. Contractor shall determine quantity of unsuitable material to be removed based on contractor's field review of the site. Contractor's determination of unsuitable excavation shall be included in base bid as part of unclassified excavation. **NO ADDITIONAL PAYMENT WILL BE MADE FOR REMEDIAL WORK.**
- B. If, after scarification, aeration and recompaction operations specified above are completed, any exposed subgrades determined by the independent testing agency as incapable of being stabilized in-place, undercut to a depth identified by the testing agency and backfill under the appropriate provisions of Section 31 24 00 for the location.
  - 1. Keep records of material quantities removed and replaced as specified in Division 1 and have materials verified by the independent testing agency.
- C. If required, excavate shallow temporary drainage ditches to facilitate removal of excess moisture from subgrade areas.
- D. Backfill and compaction of areas excavated under this Section is specified in Section 31 24 00.

#### 3.06 CLEAN-UP AND DISPOSAL OF DEBRIS

- A. Remove surplus materials and debris from site.

END OF SECTION

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Finish grade sub-soil.
- B. Cut out areas to receive stabilizing base course materials for driveway.
- C. This specification is provided for the site related filling, backfilling and finish grading only.

1.02 RELATED WORK

- A. Section 31 13 00: Proof Rolling
- B. Section 31 23 00: Excavation and Fill

1.03 PROTECTION

- A. Prevent damage to existing trees to remain, bench marks, pavement, and utility lines. Correct damage at no cost to the Owner.

1.04 QUALITY ASSURANCE

- A. CONTRACTOR shall employ a qualified independent testing laboratory to observe this work and make tests required. Testing lab will:
  - 1. Have borrowed fill and aggregate tested and approved by the owner's representative before it is moved to the project site.
  - 2. Observe proof-rolling of site to determine adequacy of in-place soils. If soils are not adequate to bear weights which will be imposed, Testing Lab will direct corrective action to be taken.
  - 3. Test in-place soil and filled and compacted areas. If these are not adequate to bare weights imposed, Testing Lab will advise the owner's representative of his recommendations. He will direct any corrective measures that are necessary.
  - 4. Submit a sample of appropriate quantity as determined by the testing party 10 days prior to use.

PART 2 PRODUCTS

2.01 FILL MATERIALS

- A. Topsoil: Friable loam free from subsoil, roots, grass, excessive amount of weeds, stones (larger than 2") and foreign matter; acidity range (pH) of 5.5 to 7.5; containing a minimum of 4 % and a maximum of 25% organic matter.
- B. Engineered fill: Predominantly low plastic clay soil, free from organic and inorganic debris, with maximum particle size of 4 inches and plasticity index less than 30. If a fine-grained silt or clay soil is used for fill, close moisture content control will be required to

achieve the recommended degree of compaction. This material may only be used in areas outside of the proposed building footprint.

PART 3 EXECUTION

3.01 BACKFILLING

- A. Examination: Verify if the fill materials to be reused are acceptable to the owner's representative. Remove from site if unacceptable.
- B. Preparation:
  - 1. Proof roll subgrade prior to fill placement as specified in Section 31 13 00, and repair unstable subgrades prior to placement.
  - 2. Prior to the placement of any fill in or near the proposed paved areas, the contractor shall run a 10-ton vibratory roller over proposed paved area.
- C. Backfilling:
  - 1. Backfill areas are to require elevations with unfrozen specified materials and compact to density equal to or greater than requirements specified below.
  - 2. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
  - 3. Place and compact materials in continuous layers not exceeding the following thickness in compacted depth:
    - a. Granular fill: 6 inches
    - b. Cohesive fill: 6 inches
  - 4. Maintain soil at optimum moisture content of backfill materials for structurally loaded areas to attain required compaction density. Landscaped areas may be at optimum moisture content to 3% above optimum.
- D. Slopes:
  - 1. Make grade changes gradual. Blend slope into level areas.
- E. Stockpile areas:
  - 1. Remove surplus backfill materials from the site *unless noted otherwise*.
  - 2. Leave areas completely free of excess materials.
- F. Field quality control:
  - 1. Field inspection and testing will be performed as defined in Division 1 of the specifications.

2. Test and analysis of fill materials will be in accordance with ASTM D698. Dense graded aggregate engineered fill, if utilized, will be tested in accordance with ASTM D1557.
3. Compaction testing will be performed in accordance with ASTM D698 or other method recommended by an Independent testing agency and acceptable to the Owner's Representative.
4. If test indicates the work of this Section does not meet specified requirements, remove, replace and retest materials at no cost to the Owner.
5. Proof roll compacted fill surfaces under areas to be paved under provisions of Section 31 13 00.

### 3.02 TOLERANCES

- A. Variation from true elevation is  $\pm 0.1$  feet for all areas across the site.

### 3.03 PROTECTION OF FINISHED WORK

- A. Recompact fills subjected to vehicular traffic.

### 3.30 SCHEDULE

- A. The paragraph below identify location, fill material to be used (identified from lower to upper fill material), compacted thickness of each fill, and compaction expressed as a percentage of maximum density and optimum moisture in comparison with soil proctor specified above.
- B. Concrete paving: Engineered fill to bottom of base course compacted to 98%

### 3.04 PLACING TOPSOIL

- A. Place topsoil in areas where seeding is to be performed. Place to the following minimum depths, up to finished grade elevations:
  1. 6 inches for seeded areas.
- B. Use topsoil in relatively dry state. Place during dry weather.
- C. Fine grade topsoil eliminating rough and low areas to ensure positive drainage. Maintain levels, profiles and contours of sub-grades.
- D. Remove stone, roots, grass, weeds, debris and other foreign material while spreading.
- E. Manually spread topsoil around trees and plants to prevent damage which may be caused by grading equipment.
- F. Lightly compact placed topsoil.
- G. Hand trim and rake topsoil to finished grade to seed placement.

3.05 CLEAN-UP

- A. Upon completion of work of this Section, clean up and leave area free of debris, excess material, and equipment.
- B. Any excess earth shall be removed from the site by the contractor who shall properly dispose of the material.

END OF SECTION

**PART 1 GENERAL**

1.01 SECTION INCLUDES:

The proposed improvements will disturb approximately 0.35 acres. Based on this information, coverage under a NPDES permit is not required unless requested by TDEC. If during construction, it is determined that 1 acre or more is to be disturbed or if specifically requested by TDEC, Contractor shall be responsible for preparing all required documents and obtaining the required permit(s). Contractor would then be responsible for meeting all permit requirements including inspection reports, etc.

Contractor shall be responsible for meeting all federal, state and local requirements, regulations and laws regarding storm water and pollution control, etc.

Contractor shall install, inspect, maintain and repair erosion control measures to prevent sediment runoff from the project site.

1.02 SYSTEM DESCRIPTION

- A. Systems of berms, dikes, dams, sediment basins, mulches, grasses, slope drains and other erosion control devices or methods to prevent sediment from flowing off the site.

1.03 QUALITY ASSURANCE

- A. In the event of conflict between these requirements and pollution control laws, rules or regulations of other Federal, State or Local agencies, the more restrictive law, rules, or regulations shall apply. The Contractor shall be responsible for assuring compliance to the extent that construction practices, construction operations, and construction work are involved.
- B. Authority of Designer:
  - 1. The Designer has the authority to direct the contractor to provide immediate temporary pollution control measures to minimize contamination of adjacent streams of other watercourses, lakes, ponds, or other areas of water impoundment.
- C. Methods and materials shall be approved by the Designer prior to the installation.

1.04 SCHEDULE

- A. Prior to the start of construction, the contractor shall submit schedules for accomplishment of temporary erosion control work. Work shall not be started until the erosion control schedules and methods of operations for the applicable construction have been accepted by the Designer.

**PART 2 PRODUCTS**

2.01 MATERIALS:

- A. Mulches: Mulches may be hay, straw, fiber mats, netting, bark, wood chips, or other suitable material reasonably clean and free of noxious weeds and deleterious materials.
- B. Other: All other materials shall meet commercial grade standards and shall be approved by the Designer before being incorporated into the project.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

- A. Provide control measures as required during the life of the contract to control water pollution, soil erosion, and siltation. Maintain control measures in good repair for the life of the contract.
- B. Construction Details: Temporary erosion and pollution control measures shall be used to correct conditions that develop during construction. Temporary silt fences shall be installed downgrade of all exposed earth.
  - 1. In the event that temporary erosion and pollution control measures are required due to the contractor's negligence, carelessness, or failure to install controls as a part of the work as scheduled or are ordered by the Designer, such work shall be performed by the Contractor at his/her own expense.
  - 2. The erosion control features installed by the Contractor shall be acceptably maintained by the Contractor during the construction period.
  - 3. Whenever construction equipment must cross watercourses at frequent intervals, and such crossings will adversely affect the sediment levels, temporary structures shall be provided.
  - 4. Pollutants such as fuels, lubricants, raw sewage, and other harmful materials shall not be discharged into or near rivers, streams, and impoundments or into natural or man-made channels leading thereto.

**3.02 CLEANING**

- A. At project completion, remove control measures from site unless Designer requires control measures to remain in place. Should the Designer require the extended use of control measures, Contractor shall maintain such control measures in good repair and remove control measures at Designer's direction.

END OF SECTION

**PART 1 GENERAL**

1.01 WORK INCLUDED

- A. Preparing subgrade to receive a base or pavement.
- B. Placing and compacting base material.

1.02 RELATED WORK

- A. Section 31 13 00: Proof Rolling
- B. Section 31 23 00: Excavation and Fill
- C. Section 31 24 00: Backfilling and Finished Grade
- D. Section 32 13 00: Rigid Paving

1.03 QUALITY ASSURANCE

- A. Perform work in accordance with Tennessee Department of Transportation Standard Specifications for Road and Bridge Construction, latest Edition.
- B. Qualifications of Asphaltic Concrete Producer: Use only materials which are furnished by a bulk asphaltic concrete producer regularly engaged in production of hot-mix, hot-laid asphaltic concrete.
- C. Owner will provide material testing and inspection for quality control during paving operations.

1.04 REFERENCE STANDARDS

- A. Gradation of stone materials will be performed in accordance with ASTM C136.

**PART 2 PRODUCTS**

2.01 MATERIALS

- A. Mineral aggregate base for pavement:
  - 1. Section 903.05, type A base, grading "D" Pug Mill Mix State Highway Specifications.

**PART 3 EXECUTION**

3.01 PREPARATION

- A. Verify compacted subgrade is dry and has been approved to receive the work of this section.
- B. Verify gradients and elevations of subgrade are correct.
- C. Field Quality Control
  - 1. Proof roll subgrades under provisions of Section 31 24 00.
  - 2. Remove materials identified by Independent Testing Agency Personnel and/or owner's representative/Designer. Backfill and compact such areas as specified in Section 31 24 00.

3.02 PLACING BASE COURSE

- A. Perform aggregate blending by approved stationary or travel plant methods. Mixing in stockpiles or on roadway will not be acceptable.
- B. Spread base material uniformly over the area to produce required lines, grades and cross-sections after compaction.
  - 1. Indicated thickness of 6 inches or less may be constructed in a single course.
  - 2. Spread and compact thickness greater than 6 inches in at least 2 courses.
- C. Level and contour surfaces to the elevations and gradients indicated.
- D. Compact each layer to at least 98% of the maximum dry density as determined by ASTM D 1557.
- E. Adjust moisture content to achieve near optimum moisture content prior to compaction. If excess water is apparent, scarify aggregate and aerate to reduce the moisture content.
- F. Use mechanical hand tamping equipment in areas inaccessible to compaction equipment.
- G. Conduct one density test, in accordance with ASTM D2167, for each 2500 sq. yds. of in-place material, but in no case, not less than one daily for each layer. Testing for base course in public right-of-ways shall be per TDOT requirements.

3.03 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch measured with a 10 ft straight edge.
- B. Scheduled compaction thickness: Within 1/4inch.
- C. Variation from true elevation: Within 1/2 inch.

3.04 FINISHING AND MAINENANCE

- A. Finish surfaces by rolling with a smooth steel wheel roller. Water the surface and spread loose stones prior to rolling.
- B. Repair soft, yielding areas that develop in the final rolling.
- C. Maintain final surface in smooth and uniform condition until base course is covered by subsequent pavement construction.
- D. Protect surface from silting or erosion until placement of final pavement construction.
- E. Where areas are disturbed by traffic, weather or other means, grade and recompact as necessary.

END OF SECTION

**PART 1 GENERAL**

1.01 WORK INCLUDED

- A. Formwork complete with required shoring, bracing and anchorage.
- B. Concrete reinforcing, complete with required supports, spacers and related accessories.
- C. Cast-in-place concrete.
- D. Construction, expansion and contraction joints.

1.02 RELATED WORK

- A. Section 31 23 00: Excavation and Fill

1.03 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301. Maintain copy at the job site.
- B. Obtain materials from the same source throughout.
- C. Do not place concrete when base surface temperature is less than 40°F or forecast to go below 40° for 24 hours, and when surfaces are wet or frozen.

1.04 REGULATORY REQUIREMENTS

- A. Comply with local codes and ordinances for concrete work on public right of way.

1.05 TESTS

- A. Testing and analysis will be performed in accordance with practices specified elsewhere in the specifications.
- B. Submit the proposed mix design of each type of concrete at least two weeks prior to commencement of concrete work.
  - 1. Base material proportions on ACI procedures.
  - 2. Show type of materials, slump range, air content, aggregate gradation and 28 day compressive strength.
- C. The Independent testing agency will take cylinders and perform slump and air entrainment tests in accordance with ACI 301.
  - 1. Four test cylinders will be taken for every 75 (or less) cubic yds of concrete placed each day.
  - 2. One slump test and air entrainment test will be taken for each set of cylinders taken.
- D. Verify results of tests for compliance with the Contract Documents.

1.06 SUBMITTALS

- A. Submit product data on joint filler, admixtures and curing compounds including properties, chemical composition and installation instructions.
- B. Submit shop drawings showing sizes and locations of reinforcing, splicing details and other pertinent installation details.
- C. Submit certification that concrete materials comply with referenced standards.
- D. Contractor shall provide two test panels of the driveway concrete for the owner and architect's approval prior to constructing the final improvements.

## **PART 2 PRODUCTS**

### 2.01 MATERIALS

- A. Concrete materials:
  - 1. Cement: ASTM C150 Type I Portland cement, Omaha Tan color.
  - 2. Aggregates: ASTM C33
  - 3. Water: Clean and not detrimental to concrete.
- B. Form materials:
  - 1. Forms: Wood or steel form material profiled to suit conditions.
  - 2. Joint filler: ASTM D994 bituminous type, ½ inch thick.
  - 3. Form release agent: Colorless mineral oil which will not stain concrete or absorb moisture.
  - 4. Fillets for chamfered corners: Wood or plastic strips sized to make a ¾ inch chamfered corner, maximum possible lengths.
- C. Reinforcement:
  - 1. Reinforcing steel: ASTM A615 Grade 60, deformed steel bars, uncoated finish.
  - 2. Welded wire fabric: ASTM A185 plain type in flat sheets, uncoated finish.
  - 3. Tie wire: Minimum 16 gauge steel.
  - 4. Dowels: ASTM A615 Grade 40 plain steel, uncoated finish.
- D. Admixtures:
  - 1. Air entrainment: ASTM C260
  - 2. Water reducing: ASTM C494 Type F high range.
  - 3. Accelerating: ASTM C494 Type C.
  - 4. Set-retarding: ASTM C494 Type B.
- E. Joint Sealer: ASTM D1190 hot poured elastic type.
- F. Curing compound: ASTM C309, Type 1-D, Class 2, 30% solids.

### 2.02 CONCRETE MIX

- A. Mix concrete in accordance with ASTM C94.
- B. Compressive strength:
  - 1. Curbs: 3500 psi at 28 days.
  - 2. Vehicular pavements: 4000 psi at 28 days.
- C. Accelerating Admixtures: Use in cold weather only when approved by the Architect. Use of admixtures will not relax cold weather placement requirements.
- D. Set Retarding Admixtures
  - 1. Use set-retarding admixtures in hot weather only when approved by the Architect
- E. Do not add calcium chloride to concrete.

## **PART 3 EXECUTION**

### 3.01 PREPARATION OF BASE

- A. Verify that the supporting base is properly prepared and compacted, and true to line and grade.
- B. Moisten base to minimize absorption of water from concrete.
- C. Notify the Architect a minimum of 24 hours prior to commencement of concreting operations.
- D. Frames of subsurface structures: Coat surfaces of new and existing frames with oil to prevent bonding with concrete.

- E. Notify the Owner's testing agency a minimum of 72 hours prior to commencement of concreting operations.

### 3.02 FORM WORK

- A. Form Setting:
  - 1. Place and secure forms to correct locations, dimensions and profiles.
  - 2. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
  - 3. Construct forms sufficiently tight to prevent mortar leakage. Lock form section to be free from ply or movement in any direction.
  - 4. Place joint fillers vertical in position, in straight lines. Secure to formwork during concrete placement.
  - 5. Provide chamfers at all exposed concrete edges.
  - 6. Apply form release agent to form surfaces in accordance with the manufacturer's printed instructions, before placing reinforcing and embedded items.
- B. Grade and Alignment:
  - 1. Check and correct the alignment and grade elevation of the forms immediately before placing the concrete.
  - 2. When any form has been disturbed or any grade has become unstable, reset and recheck the form.

### 3.03 REINFORCEMENT

- A. Ensure all reinforcing is clean, and free of rust, scale, oil, dirt or other materials which may reduce bonding.
- B. Have required bends made in the shop without heat.
- C. Place reinforcement in accordance with approved shop drawings.
- D. Interrupt reinforcement at expansion joints.
- E. Support reinforcing with pre-cast concrete blocks, metal chairs or other method approved by the Architect. Supporting with gravel, brick or wood blocks is not permitted.

### 3.04 GENERAL CONCRETE PLACEMENT

- A. Place concrete in accordance with ACI 301. When central or transit mixed concrete is use, place the mixture where it will require as little re-handling as possible.
- B. Keep forms and subgrade moist during concrete placement.
- C. Ensure reinforcement, embedded items and formed joints are not disturbed during concrete placement.
- D. Do not allow concrete to free fall more than 3 feet.
- E. Distribute and spread concrete as soon as possible. Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.
- F. Thoroughly work concrete with suitable tools to remove coarse aggregate from the surface and to place mortar against the form. Work concrete to produce a smooth finish, free of air pockets, water pockets and honeycombs.
- G. Consolidate concrete against and along the faces of all forms and along the full length and on both sides of all joint assemblies with a suitable mechanical vibrator. Do not permit the vibrator to come in contact with forms, joint assemblies or subgrade. Do not over vibrate concrete or use the vibrator to transport or flow concrete.
- H. Ensure positive drainage to all drains and away from all window sills and door openings, unless specifically noted otherwise.

### 3.05 PAVEMENTS

- A. Longitudinal lines: Sawed or preformed, 3/8 inch wide x 1-1/2 inch deep, at approximately 10 ft. o.c. with equal spacing between slabs and parallel to the direction of travel.
  - 1. Joint Face: Metal key-way type with metal or wood forms.
  - 2. Tie bars: 1/2 inch diameter bars at 48 inches o.c.
  - 3. Place joint sealant to a minimum depth of 1/2 inch with approved backer materials.
- B. Transverse contraction and construction joints: 3/8 inch wide x 1/2 inches deep, at approximately 10 ft. o.c. and perpendicular to the direction of travel.
  - 1. Joints may be saw-cut, formed by hand of pre-molded filler.
  - 2. Provide load transfer device consisting of 3/4 inch diameter smooth dowels at 12 inches o.c. Coat dowels with a thick film of heavy grease.
  - 3. Place joint sealant to a minimum depth of 1/2 inch with approved backer materials.
- C. Isolation Joints: Isolate objects abutting or adjacent to paved areas or rigid objects with pre-molded filler extended the full depth of the slab.
- D. Finishing:
  - 1. Finish concrete in the following sequence: Strike-off, consolidation, floating and removal of laitance.
  - 2. Provide heavy broom texture transverse to traffic flow direction.
  - 3. Round edges of each side of joints to an inch radius.
- E. Curing: Uniformly apply curing compound over the entire surface after finishing, initial set and removal of side forms, in accordance with the manufacturers printed instructions for the application.

### 3.06 CURBS

- A. Joints: Construct edges and joints as indicated.
  - 1. Expansion joints: Pre-molded joint filler at no more than 25 ft. o.c. Extend to within 1/4 inch of the surface.
  - 2. Contraction joints: Score joints at minimum spacing of 5 ft. o.c.
  - 3. Construct edges and joints as indicated.
- B. Install pre-molded joint filler where curbs adjoin adjacent structures.
- C. Match existing curbs and curb and gutter sections flush.
- D. Hand work curbs as necessary to match drainage structures flush.
- E. Finishing: Finish with a heavy broom texture.
- F. Curing: Uniformly apply curing compound over the entire surface after finishing, initial set and removal of side forms, in accordance with the manufacturer's printed instructions for the applications.

### 3.07 PROTECTION

- A. Protect installed items as follows in addition to any specific protection measures specified above.
  - 1. Immediately after placement, protect pavement from premature drying, excessive temperatures and from mechanical injury. Maintain environmental and barrier protection for seven days after placement.
  - 2. Maintain concrete with a minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

3. Protect concrete from paint and stains.

3.08 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed in accordance with practices specified elsewhere in the specifications.
- B. Maintain records of placed concrete items. Record:
  1. Date.
  2. Location of pour.
  3. Quantity.
  4. Air temperature.
  5. Test samples taken.

END OF SECTION

## **PART 1 - GENERAL**

### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract apply to this Section.

### 1.02 SUMMARY

- A. This Section includes the following:
  - 1. Seeding
  - 2. Topsoil

### 1.03 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and applicable Specification Sections.
- B. Certification of grass seed for each grass-seed mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

### 1.04 DELIVERY, STORAGE, AND HANDLING

- A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

### 1.05 PROJECT CONDITIONS

- A. Utilities: Determine location of above grade and underground utilities and perform work in a manner which will avoid damage. Hand excavate, as required.

### 1.06 WARRANTY

- A. Contractor shall reseed areas where a good stand of grass has not been achieved for a period of not less than one year.

### 1.07 LAWN MAINTENANCE

- A. Begin maintenance of lawns immediately after each area is seeded and continue until acceptable lawn is established.

## **PART 2 - PRODUCTS**

### 2.01 GRASS MATERIALS

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts' "Rules for Testing Seeds" for purity and germination tolerances.
  - 1. Seed Mixture: Provide seed of grass species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed as indicated.

### 2.02 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, 5 percent organic material minimum, free of stones 1 inch (25 mm) or larger in any dimension, and other extraneous materials harmful to plant growth.
  - 1. Topsoil Source: Import topsoil from off-site sources if not available on site. Obtain topsoil from naturally well-drained sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from bogs or marshes.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine areas to receive seeding for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. In planted and lawn areas where construction traffic and staging has caused soil compaction, loosen subgrade a minimum of 12" depth with a pull behind subsoiler.

#### **3.02 SEEDING NEW LAWNS**

- A. Sow seed with a spreader or a seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h). Evenly distribute seed by sowing equal quantities in 2 directions at right angles to each other.
  - 1. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.
- B. Sow seed at the following rates:
  - 1. Seeding Rate: 5 to 8 lb per 1000 sq. ft. (2.5 to 4 kg per 100 sq. m).
- C. Rake seed lightly into top 1/8 inch (3 mm) of topsoil, roll lightly, and water with fine spray.
- D. Protect seeded slopes exceeding 1:4 against erosion with erosion-control blankets installed and stapled according to manufacturer's recommendations.
- E. Protect seeded slopes exceeding 1:6 against erosion with jute or coir-fiber erosion-control mesh installed and stapled according to manufacturer's recommendations.
- F. Protect seeded areas with slopes less than 1:6 against erosion by spreading straw mulch after completion of seeding operations. Spread uniformly at a minimum rate of 2 tons per acre (45 kg per 100 sq. m) to form a continuous blanket 1-1/2 inches (38 mm) loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.
  - 1. Anchor straw mulch by crimping into topsoil by suitable mechanical equipment.
  - 2. Anchor straw mulch by spraying with asphalt-emulsion tackifier at the rate of 10 to 13 gal. per 1000 sq. ft. (41 to 53 L per 100 sq. m). Take precautions to prevent damage or staining of structures or other plantings adjacent to mulched areas. Immediately clean damaged or stained areas.
- G. Protect seeded areas against hot, dry weather or drying winds by applying peat mulch within 24 hours after completion of seeding operations. Soak and scatter uniformly to a depth of 3/16 inch (4.8 mm) thick and roll to a smooth surface.

#### **3.03 CLEANUP AND PROTECTION**

- A. During seeding, keep pavements clean and work area in an orderly condition.

#### **3.04 DISPOSAL OF SURPLUS AND WASTE MATERIALS**

- A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property.

#### **3.05 SEED MIXTURES SCHEDULE**

A. Sun and Partial Shade: Provide certified grass-seed blends or mixes, proportioned by weight, as follows:

Proportion	Name	Min. Pct. Germ.	Min. Pct. Pure Sd.	Max. Pct. Weed Sd.
60 pct.	Kentucky 31 Fescue hybrid blend (Poa pratensis)	80	85	0.50
30 pct.	Chewings red fescue (Festuca rubra variety)	85	98	0.50
10 pct.	Perennial rye grass (Lolium perenne)	90	98	0.50

**END OF SECTION 32 90 00**