SECTION II

SECTION 01010

SUMMARY OF WORK

A. Project Identification:

FY2021 Zadie E. Kuehl Dog Park

B. Project Summary:

This project consists of constructing an asphalt pavement road, parking lot, and walking trail to connect to existing Zadie E. Kuehl Park. Work includes grading, installation of storm sewer structures, curb and gutter, fencing, asphalt pavement, concrete pad, ADA ramp, lighting, and other park amenities according to attached plans, City of Lakeland specifications, and ADA guidelines.

A general description of the work includes the following; however, this is not an exhaustive list:

The contractor is responsible for all utility locates in the area of work and for those that may be affected by the construction. Coordination with utility company will be required. The location and depth of all utilities shown on the Construction Plans is estimated. Contractor should use caution when excavating in these areas.

Temporary traffic control measures shall be used during all phases of construction. Access to the park shall be provided throughout the project.

All construction material shall be removed and properly disposed of in accordance with State and local regulations within the time limits of the project. Removal and hauling away of all construction debris including unsuitable soils shall be the responsibility of the Contractor.

Parking Lot and Walking Trail

- Construction area shall be fenced with temporary construction fencing to restrict access.
- Grading shall be restricted to the areas as shown in the plans.
- Asphalt surface shall be 1.5" compacted Mix No.1 TDOT 411.E surface course hot mix asphalt.
- Base asphalt shall be 2" compacted 307-BM, in place, and shall meet all current City of Lakeland specifications and attached plans.
- Furnish and install curb and gutter per City of Lakeland specifications.
- 24" Stormwater Reinforced Concrete Pipe shall be Class III per City of Lakeland specifications.
- Headwalls shall be concrete Type E with wingwalls per City of Lakeland specifications.
- Erosion control measures shall be installed and approved prior to commencing construction. Silt fence shall be used along all down slopes.
- Furnish and install electrical layout as specified in the plans. Coordination with utility company will be required.

- All other disturbed areas shall be graded and stabilized with Bermuda sod upon completion of construction. These areas shall be returned to a condition equal to that prior to construction.

Dog Park Area

- Furnish and install PVC pipe and dual water fountains as specified in the plans (or approved equal).
- Black Chain PVC fence and 24 terminal posts shall be installed as specified in the plans (or approved equal)
- Furnish and install two 8-foot wide maintenance gates and six 6-foot wide double wall gates as specified in the plans.
- Furnish and install 4" concrete pad per City of Lakeland specifications and must be ADA compliant.
- Five 6-foot thermoplastic covered heavy-gauge benches shall be furnished and installed as specified in plans (or approved equal).
- Two existing handicap parking spaces shall be removed and replaced with ADA compliant parking spot and ramp as specified in plans.

C. Particular project requirements.

1. Apply for, obtain, and pay for permits when required to perform the work.

2. Field-verify dimensions indicated on drawings (when applicable) before fabricating or ordering materials. Do not scale drawings.

3. Notify Owner of existing conditions differing from those indicated on the drawings. Verify the existence and location of underground utilities along the route of proposed work. Omission from, or inclusion of, locations on the drawings, is not to be considered as the nonexistence of, or the definite location of, existing underground utilities. Do not remove or alter existing utilities without prior written approval.

4. The Contract Documents are intended to provide the basis for proper completion of the work suitable for the intended use of the Owner. Anything not expressly set forth, but which is reasonably implied or necessary for proper performance of the project shall be included.

5. The Provisions are written in the imperative mode. Except where specifically intended otherwise, the subject of all imperative statements is the Contractor. For example, "furnish..." means "Contractor shall furnish..."

END OF SECTION

SECTION 01100

GENERAL CONSTRUCTION REQUIREMENTS

PART 1 - Description.

To establish uniform requirements for construction of water distribution facilities, sanitary sewerage collection facilities, storm sewer collection systems, streets, and associated appurtenances which will enable the construction to be performed in accordance with Local, State, and Federal laws.

1.01 Definitions.

A. For the purposes of these specifications, the words and phrases set out in the following articles shall have the meanings as follows:

1. "City" means the governing body of the city of Lakeland, TN.

2. "Contractor" means the individual, partnership, firm, or corporation contracting with the developer or the City which will be performing the work, or which will be performing the construction activities.

3. "Developer" means partnership, firm, or corporation developing property where construction will be performed.

4. "Engineer" means the consultant or City Engineer.

5. "Owner" means the individual, partnership, firm or corporation being the owner of record of property where construction will be performed.

6. "Underground facility" means any item of personal or public property buried or placed below ground for use in connection with the storage or conveyance of electronic, water, sewage, telephonic or telegraphic communications, cable television, electric energy, oil, gas, hazardous liquids, or other substances and including, but not limited to pipes, sewers, water, storm water, conduits, cables, valves, lines, wires, manholes, and attachments.

B. The following abbreviations shall have the designated meanings:

1. "APWA" means the American Public Works Association.

2. "ASTM" means the American Society for Testing and Materials.

3. "AWWA" means the American Water Works Association.

4. "AASHTO" means the American Association of State Highway & Transportation Officials.

C. Reference to a specific specification, i.e., AWWA C900, means the latest Edition of that specification.

PART 3 Execution

3.01 Scheduling and Construction Progress.

A. Prior to the start of any work, the Contractor shall submit in writing to the Engineer for review, a progress schedule that shall be followed as closely as possible. Progress scheduling using critical path method is approved and encouraged. Once work has started on a street, it must be pursued continuously until all work on that street is finished.

1. The Contractor shall schedule a preconstruction conference prior to the start of work. Persons attending shall include representatives of the Contractor, subcontractors, owner, developer, Engineer, and affected utilities.

B. Each successive phase of work will follow the preceding phase as closely as possible so that the time any one street is under construction is kept to a minimum.

C. In the event that the work is not being accomplished expeditiously or in accordance with the time period set forth in the progress schedule, or if the work on an excavation has ceased or is abandoned without due cause, the Engineer may give written notice to the Contractor and/or the surety company for the project.

3.02 Notification of Landowners, Residents, and Businesses

A. At least one (1) week prior to beginning construction operations Contractor shall notify in writing, all those directly affected by the Work, including the Fire, Ambulance, Police Departments, and the Engineer's Office. The notification shall include the following as a minimum:

1. Name, address, telephone number, and contact person for Developer, Developer's Contractor, Owner, and Engineer.

2. A brief description of the proposed Work.

3. Name and telephone number of Contractor's person to contact in emergency.

4. A map showing the Work area, the traffic control plan, and the planned access to be provided to the affected properties. The map should also show the property or business owners' access during construction, and access in case of an emergency for fire, ambulance, police, or other emergency service agency vehicles.

5. A schedule for start up and completion of the Work. Schedules shall be updated as needed as the work progresses.

6. Contractor shall notify property owner and occupant 24 hours in advance of any disruption of service or access.

3.03 Available Maintenance Personnel

The Contractor shall have personnel available to maintain the Work as required, 24 hours per day every day. Accordingly, the Contractor shall furnish the City, the Owner, the Engineer, and the Shelby County Sheriff's Office with the names, addresses, and telephone numbers of local employees or representatives who will be available to maintain the Contractor's work during non-working periods, evenings, nights, weekends, and holidays.

3.04 Utility Locates

A. It is the responsibility of the Contractor to obtain locates for buried facilities within the project area prior to the start of work as necessary and as required by law. The Contractor is responsible for any damage to buried utilities or damage or injury to persons or property resulting from Contractor's work in the vicinity of the utilities.

B. It is the responsibility of the Contractor to provide advance notice to all utility notification centers serving that area. The Contractor shall request the notification center to provide the nature, location, and elevation of the utility at each location and at whatever interval is necessary for the work. If the utility company cannot or will not provide the information, the Contractor shall obtain the information by whatever means are necessary. For each location that the utility is exposed, the Contractor shall locate the utility by tying it both horizontally and vertically by coordinates, to the datum established by the City.

C. At all utility crossings the Contractor shall locate the utility at a minimum of one point directly over the proposed line or appurtenance. When existing utilities that parallel the proposed line or appurtenance are exposed by excavation, the Contractor shall locate the utility by tying it both horizontally and vertically to the datum and include the information on the record drawings. At a minimum, the utility shall be tied horizontally and vertically at 300-foot (90 m) intervals.

D. If during the field location of the utilities, additional unforeseen utilities are discovered, the Contractor shall immediately notify the Engineer and proceed in accordance with approval of the Engineer. The utility must be located by the Contractor as specified above and include the information on the record drawings.

E. The Contractor must protect all existing utilities and improvements, public or private, located on the right-of-way, and other work areas, during the entire period of his work. Special care must be taken in backfilling and compacting under and around

such improvements. Any breakage or damage to underground facilities caused by trenching, backfilling, resurfacing, or any other activity associated with the work shall be the responsibility of the Contractor.

F. Whenever utility mains or services are crossed, the utility owner shall be notified and the crossing shall be constructed in accordance with the utility owner's requirements.

G. Before the Contractor begins his grading operations, he shall confer with the owners of any underground or overhead utilities which may be in or in close proximity to the grading areas, and shall arrange for the necessary disconnection of these utilities in accordance with the regulations of the utility companies concerned. The Contractor shall take such measures as the Engineer may direct in protecting these utilities properly throughout the period his grading operations are in progress. The party or parties owning or operating overhead or underground utilities shall perform the actual work of moving, repairing, reconditioning, or revising the utilities, except as otherwise specified in this Section. Whenever and wherever such operations are undertaken by the owners of utilities, the Contractor shall cooperate to the extent that ample protection of their work will be provided so that the entire work as contemplated may be expedited to the best interests of all concerned, as judged by the Engineer.

H. Protect and safeguard existing service lines and utilities structures, the locations of which have been made known to the Contractor by the owners of the utilities or by others, prior to excavation or construction of fills or embankments, from damage during grading operations. Any damage to such lines or structures shall be repaired at the Contractor's expense. The above provisions are applicable to all service lines or utilities structures, all or any portion of which protrude above the original ground or street surfaces, or lie beneath such surfaces in any grading area or any other area upon which the Contractor has encroached.

3.05 Protection of Existing Buildings and Structures

For collapse of adjacent buildings, sidewalks, structures, and underground or above ground utilities, the Contractor shall repair damage done to the owner's property or any other property, on or off the premises, by reason of his operations. The Contractor shall adequately brace walls during backfilling and compacting operations.

3.06 Construction Stakes – Alignment and Grades

A. All work shall be constructed in accordance with lines and grades shown on the drawings and as designated by the Engineer. These lines and grades may be modified by the Engineer as provided in the General Conditions.

B. The Contractor shall provide experienced personnel, materials, and equipment necessary to complete all survey, layout, and measurement work. The Contractor shall keep the Engineer informed a reasonable time in advance, of the times and places he wishes to do work so that initial control points may be designated.

3.07 Restoration of Street Surface, Street Signs, Curbs, Driveways, Sidewalks, Irrigation and Landscaping

A. Wherever existing improvements are removed, damaged or otherwise disturbed by Contractor's activities, Contractor shall replace or repair the improvements to conditions equal to or better than the condition prior to the start of work. Any crushed rock, sod, or natural vegetation disturbed by the Contractor shall be replaced, rebuilt or restored to conditions equal to or better than the condition prior to the start of work.

3.08 Temporary Utilities, Public Access and Safety

A. Contractor shall provide temporary water and sewer service to properties when permanent facilities will be out of service for eight (8) hours or longer, or when other circumstances make it necessary. Where service cannot be interrupted, such as sewer mains, Contractor shall provide plant and equipment to pump around the sections which are out of service.

B. Where the Engineer deems necessary, the Contractor shall provide access wherever possible to public and private property to prevent serious inconvenience to pedestrian and vehicular traffic. This shall not be construed to require the Contractor to provide such access at the times and locations where it will interfere with his construction progress. The Contractor shall furnish, place, and maintain sufficient flags, flares, barricades, signs, etc., along the location of his work in accordance with the Federal Highway Administration, "Manual on Uniform Traffic Control Devices." Flag persons shall be utilized if necessary to maintain safe traffic flow.

3.09 Erosion and Sediment Control

A. Erosion and sediment control shall be performed in accordance with rules and regulations adopted by the City of Lakeland and the Tennessee Department of Environment and Conservation.

3.10 City Permits

A. All necessary permits shall be obtained prior to the beginning of any construction project. Those permits may include: City of Lakeland/TDEC Permit to Construct, Street Cut Permits, Traffic Control Permits, Bonds, and Erosion and Sediment Control Permit, as well as any other appropriate permits required for the project by the City.

3.11 Punchlist and Final Closeout

A. Initial City Punchlist

1. The Contractor, Owner, Engineer, and City personnel will conduct an initial walkthrough and develop a list of deficiencies that will be presented to the Contractor by the Engineer.

2. The Contractor, Owner, and Engineer will conduct a walkthrough identifying items to be corrected. A final punch list will be developed by the Contractor and Engineer. The punch list will contain dates for completion of the various identified items.

3. All items on the list will be completed to the satisfaction of the City prior to acceptance of the project and start of the one-year warranty period.

3.12 Submittals

The Contractor shall submit for approval by the Engineer a minimum of five (5) copies of data required by specific sections of this specification.

3.13 Workmanship and Cleanup

A. All debris and rubbish caused by the operations of the Contractor shall be removed, and the areas occupied during his operations shall be left in a neat and presentable condition satisfactory to the Engineer. Construction cleanup and all backfill operations shall immediately follow installation of underground facilities. Cleanup shall be completed to allow local traffic on the street and access to driveways, parking lots, etc. During construction, all existing gutters, storm drains, runoff channels, etc. shall be kept clean of dirt, rubble, or debris which would impede the flow of storm sewer.

B. Excess, unsuitable, and waste materials from the project (including that from trench excavation, pavement removal, curbwalk removal, and grading operations), shall be suitably disposed of, offsite, by Contractor.

C. Excess material resulting from parkway and shoulder finishing and other final operations shall not be permitted to accumulate on the pavement surface and shall be removed concurrently with the finishing operations. Care shall be taken to prevent the entrance of this material into drainage structures or other waterways during the construction period. It shall be the responsibility of the Contractor to properly dispose of all excess material.

3.14 Design Mixes, Testing and Quality Assurance

A. The testing requirements and cost responsibilities of design mixes, testing requirements, and quality assurance testing are listed in each specific section of these specifications.

B. Unless specified by the contract documents, or addressed specifically within these

Standard Specifications, the Owner will be responsible for moisture/density/compaction testing only. If the initial moisture/density/compaction test fails to meet the minimum standards as established by these specifications, the Contractor shall pay for any and all additional tests until a moisture/density/compaction test meeting the minimum standards is obtained.

END OF SECTION

SECTION 01200

PROJECT COORDINATION

PART 1 – Description

1.01 SUMMARY

A. Contractor shall schedule a preconstruction conference (if required) to be held within twenty (20) days of the Notice of Award. Contractor's assigned supervisory personnel and subcontractors shall attend this conference. Contractor shall provide a work schedule at or prior to this meeting for review by all parties. A corrected schedule shall be provided within seven (7) days following the meetings.

B. Conduct all construction activities between the hours of 7:00 a.m. and 6:00 p.m., Monday through Friday, except in cases of emergencies. No work will be allowed on Saturdays without the Owner's permission, and no work, except for emergencies, will be allowed on Sundays or City of Lakeland Holidays. All pavement subgrade excavation shall be observed by the Owner Representative. The Owner's Representative shall determine the depth of the subgrade excavation prior to backfill.

C. Contractor shall obtain water for use during construction at his expense. If Contractor elects to obtain water from the public water utility, he will make all the arrangements, comply with their regulations, and pay all fees and charges.

1.02 COORDINATION WITH PUBLIC AND PRIVATE AGENCIES

A. If utility companies elect to repair or replace their lines in the project area, their crews will be permitted access to the area to accomplish their work.

B. Contractor is responsible for locating and protecting existing underground improvements. Contact all utility companies for location of their facilities. To contact all utility companies call the local underground number at least 48 hours prior to excavation for field locates.

C. Contractor shall have personnel available to maintain his work as required 24 hours per day every day. Contractor is responsible for housekeeping, dust and erosion control, and shall provide all equipment and personnel necessary to meet the requirements of this responsibility. Contractor shall provide Engineer with the name(s) and telephone number(s) of the person(s) designated to be available for after-hours contact. If this person cannot be contacted, Owner may use its equipment to correct problems. In this case, Contractor shall pay all costs incurred by Owner.

D. Do not utilize private property for any purpose without written permission from the property owner.

1.03 COORDINATION WITH OWNER AND ENGINEER

A. Construct all work in accordance with the lines and grades shown on the Drawings, and as designated by Engineer (when applicable). Engineer may modify these lines and grades as provided in the General Conditions. Where the Contract Documents specify survey work to be provided by Engineer, give Engineer a minimum of 24 hours notice.

B. Owner shall employ and pay for the services for an independent testing agency to perform tests as required by the Contract Documents. Notify Engineer a minimum of 24 hours in advance to request testing. Contractor shall be responsible for cost of re-tests required if the results of the original tests do not meet the minimum requirements.

C. Coordinate on-site staging areas, access and temporary facilities with Owner.

D. For additional information, contact Emily Harrell, PE, Lakeland City Engineer at 867-5418.

1.04 COORDINATION OF CONSTRUCTION

A. Contractor is responsible for coordinating work of all trades by preparation of schedules and progress reports, coordination of drawings and other work as necessary.

B. Schedule work to produce orderly, continuous progress and avoid delays due to lack of materials, subcontractor schedule, lack of available manpower, etc.

F. Contractor is responsible for ensuring that installed and/or completed work is complete and satisfactory prior to enclosing or covering. Call for required inspections in a timely manner and do not cover work that requires inspection.

END OF SECTION

SECTION 01340

SUBMITTALS

PART 1 - Description

1.01 Summary

A. Comply with Submittal format requirements as specified in the Contract Documents.

B. Provide, in a timely manner, the number of copies and types of submittals listed in individual sections of the Contract Documents. If not specified elsewhere, provide the following as a minimum:

1. Mix designs and certifications of compliance for Portland Cement Concrete, Cement Treated Base, Aggregate Base Course, Asphaltic paving material, and any other material or product used as part of this project as required in the Standard Specifications.

2. Closeout submittals.

C. Provide required resubmittals in the appropriate quantities if original submittals are not approved.

D. Samples and shop drawings shall be prepared specifically for this project. Shop drawings shall include dimensions and details, including adjacent construction and related work. Note any special coordination required. Note any deviations from requirements of the Contract Documents. Submittal data shall be properly labeled indicating specific service for which material or equipment is to be used, section and article number of specifications, project name, Contractor, etc. Data of a general nature will not be accepted.

E. Failure of Contractor to submit shop drawings in ample time for checking shall not entitle him to an extension of contract time.

END OF SECTION

SECTION 01505

TEMPORARY FACILITIES

PART 1 - Description

1.01 Summary

A. Provide temporary services and utilities, including utility costs:

1. Potable and non-potable water.
2. Lighting and power.
3. Toilet facilities.
4. Materials storage.
5. Heating.

B. Provide construction facilities, including utility costs;

1. Construction equipment.
2. Dewatering and pumping.

C. Provide security and protection requirements:

1. Fire extinguishers.
2. Site enclosure fence, barricades, warning signs, and lights.
3. Snow and ice removal, if applicable.

D. Provide personnel support facilities:

1. Sanitary facilities.
2. Drinking water.
3. Cleaning and trash removal.
4. First aid and Emergency Medical Services.
5. Trash removal.

END OF SECTION

SECTION 01551

TEMPORARY TRAFFIC CONTROLS

PART 1. Description

To establish uniform requirements for detours, signs and barricades, and traffic control plans associated with construction activities performed on or affecting City of Lakeland streets. The work in this article shall consist of furnishing, erecting, maintaining, relocating, and removing temporary traffic control devices at the locations specified on the drawings and as directed by the Engineer. All traffic control devices shall conform to the provision for construction signing as set forth in the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) latest edition.

PART 2 MATERIALS

2.01 Traffic Control Products

A. Sign Panels

1. Sign panels will be constructed of ¾" plywood conforming to plywood sign panels and barricades of the standard specification for road and bridge construction; or 6061-T6 or 5052-H38 aluminum alloy sheeting conforming to ASTM B209.

2. Wood sign panels will be backed with metal backing angles; except that backing is not required for those sign panels 48" x 60" or smaller.

3. Aluminum sign panels will be 0.125" thick and backed with metal backing angles; except that those sign panels 48" x 60" or smaller may be:

   i. 0.080" thick and backed with metal backing angles or 2 x 4 lumber; or,

   ii. Unbacked, 0.125" thick.

4. Special signs which are unique to the project, i.e., signs not shown on the plans or included in part VI of the MUTCD, and signs shown on the plans which contain a message that is unique to the project, will be furnished by the contractor, as specified on the plans, and erected by the Contractor. Posts and hardware for fixed special sign installations, and all equipment for portable special sign installations will be furnished by the contractor. Post lengths will be specified by the Engineer. Upon removal, the special sign panels, posts, hardware, and portable installation equipment will remain the property of the Contractor.

i. Special signs will be erected on fixed mountings unless portable mountings are authorized by the Engineer.

B. Barrels will be plastic conforming to the MUTCD, with 6" wide reflective stripes.

C. Temporary markings

1. Temporary reflective pavement markings will be paint, preformed tape, or raised pavement markers, and will be suitable for use on either Portland cement concrete or asphalt pavements. Minimum acceptable standards are as follows:

   i. Paint used for temporary markings will be commercially manufactured highway striping paint. The paint will be applied without dilution.

   ii. All painted stripes will be 4" wide, and will be reflectorized by dropping or spraying glass beads onto the wet paint.

   iii. The reflective beads will conform to AASHTO Specification M247, Type 1.

2. Temporary reflective pavement striping tape will be 4" wide, pressure-sensitive tape manufactured for use as pavement striping.

   i. Striping tape applied to finished pavement surfaces which will be returned to normal traffic use will be a removable type.

   ii. Striping tape applied to temporary pavement surfaces which will be obliterated may be a non-removable type.

   iii. Striping tape applied to the surface of intermediate lifts of asphalt pavement may be non-removable type, and may be let in place. If a removable type is used, it will be removed before placing the next lift.

3. Temporary retro-reflective raised pavement markers manufactured by Astro Optics of Schaumburg, Illinois, Model No. TPM, or Stimsonite Products of Niles, Illinois, Model No. 66, or an approved equal will be acceptable.

4. Temporary retro-reflective motorist guidance markers manufactured by Davidson Plastic Company of Ken, Washington, Model NO. TRPM, or TOM, or an approved equal will be acceptable.

PART 3 EXECUTION

3.01 Traffic Control Plans

A. A complete traffic control plan shall be submitted to the Engineer and the Lakeland City Engineering office at least one week prior to the start of construction.

1. Traffic will be permitted to use the street at all times, unless a detour is specifically permitted on the drawings or by the Engineer. Access to all abutting residences and properties shall be maintained to the maximum extent possible.
2. The Contractor shall construct and maintain temporary crossings, complete with flagmen, whenever necessary to expedite the work or to maintain traffic. The Contractor shall furnish not less than two flagmen at each location where loading or depositing of material requires the turning of the trucks on any highway or street and where the operation of construction equipment endangers traffic. Temporary crossings shall be of ample size to safely carry the load which comes upon them.
    i. The Contractor shall maintain the streets in a passable condition. The work shall be conducted so as to create a minimum of inconvenience to traffic.
    ii. Excavations which traverse a street shall be limited to one-half the width of the street at any one time, unless an emergency situation exists which requires that the entire width of the street be excavated. City Engineer's office approval is required prior to excavation traversing an entire street.
3. The Contractor shall furnish sufficient signs and barricades to facilitate the directing of traffic. Unless directed otherwise by the Engineer, all signs and barricades shall conform to:
    i. Within the "Manual on Uniform Traffic Control Devices (MUTCD), " latest edition.
4. The Contractor shall have a sufficient number of barricades and signs on hand prior to the start of the construction
    i. Each detour sign shall be reflectorized and shall be illuminated with two battery-powered blinkers with six-inch (6") amber lenses.
    ii. All barricades shall have blinker lights on each end.
    iii. It shall be the Contractor's responsibility to make necessary checks and inspections of all lights and barricades every day, including Sundays and holidays.
5. Temporary suspension of work does not relieve the Contractor of the responsibility outlined in the above requirements.

3.02 Permits

A. The Contractor shall obtain all necessary permits from the City Engineer's office for any closure of any street or portion thereof, as provided in the Lakeland Municipal Code. Along with the permit application, the Contractor shall provide a sketch showing traffic routing and traffic control devices to be used. The construction traffic control sketch shall be approved by the City Engineer's office before the permit is issued.

3.03 Street Closure

A. The City Engineer may permit the closing of streets to all traffic for a period of time prescribed by the office if, in the City Engineer's Opinion, it is necessary.

END OF SECTION

SECTION 01750

CONTRACT CLOSEOUT

PART I Description

1.01 **Summary**

A. Provide prerequisites to substantial completion.

1. Punch list.
2. Supporting documentation.
3. Warranties.
4. Certifications.

B. Provide prerequisites to final acceptance.

1. Final payment request with supporting affidavits.
2. Completed punch list.
3. Submit record documents: One set of drawings and project manual with all changes noted in red and Project Manual changes flagged with page tabs.
4. Final clean-up.
5. Removal of temporary facilities.

END OF SECTION

SECTION 01650

MEASUREMENT AND PAYMENT PROCEDURES

PART 1 – Description

All work completed under this Contract will be measured by the Engineering according to the bid items and to the construction drawings. Units of measurement and dimensions will be shown in these specifications.

1.01 Payment

A. Progress payments will be processed in accordance with the following schedule.

Cut-Off Date	Date of Submittal
August 13, 2020	August 20, 2020
September 10, 2020	September 17, 2020
October 8, 2020	October 15, 2020
November 12, 2020	November 19, 2020
December 10, 2020	December 17, 2020

Submit pay requests to the City by the dates of submittal listed above.

B. Owner will make progress payments as defined in Article 5 of the Agreement, on the forms provided by the Engineer.

C. If the Contractor elects to enter into a joint account agreement, two (2) pay requests and vouchers must be submitted. One pay request and voucher for the appropriate progress payment amount, the other for the retained amount.

1.02 Measurement of Quantities

Quantities shown on the bid schedule are estimated and are to be considered approximate. Actual constructed quantities will vary. The Contractor will be compensated only for those items and materials actually installed and approved as part of the project. No additional pay will be granted for items or materials not installed.

A. Payment will be made for the work completed and stored materials less retained amounts in accordance with provisions of the contract documents.

B. Payment amounts will be based on the scheduled values and mutually agreed upon percentage of completion for each item.

1.03 Bid Item Descriptions

The cost of all material and labor required to complete this project as specified and shown on the drawings, but not specifically included as a pay item, shall be included in the bid price of its related bid item. No extra pay shall be granted for items that are reasonably foreseen as necessary for the proper installation of an item.

PART 2 Execution

2.01 Measurement and Payment of Bid Items

A. Mobilization

1. Measurement of this item shall be paid by lump sum (LS) for mobilization. This item shall include all costs for mobilization, including mobilization of equipment to the project site and property owner notifications in accordance with these specifications. Payment shall be by the contract unit price per Lump Sum (LS).

B. Clearing & Grubbing

1. Measurement of this item shall be paid by lump sum (LS) for clearing and grubbing. This item shall include completing clearing and grubbing, and disposal of all debris resulting from clearing and grubbing as outlined in Plans and Specifications. Payment shall be made by the contract unit price per Lump Sum (LS).

C. Earthwork

1. Measurement of this item shall be paid by cubic yard (CY) for earthwork. This item shall include completing earthwork and grading as outlined in Plans and Specifications. Payment shall be made by the contract unit price per cubic yard (CY)

D. Furnish and Install Asphaltic Concrete Pavement (411-E)

1. Measurement of this item shall be by the tons (Ton) of hot-mix asphaltic concrete furnished and installed in place and approved. Measurements shall be made from the lines formed by the junction of new asphalt and old asphalt. Quantities shall be verified and paid by haul ticket. This item shall include furnishing and placement of new hot mix asphalt and compaction. New asphalt shall have a compacted thickness of no less than one and half inches (1.5") asphalt pavement after compaction. Payment shall be by the contract unit price per Ton (Ton) in place.

E. Furnish and Install Asphalt Binder (307-BM)

1. Measurement of this item shall be by the tons (Ton) of asphalt binder furnished and installed in place and approved. Measurements shall be made from the lines formed by the junction of new asphalt and old asphalt. Quantities shall be verified and paid by haul ticket. This item shall include furnishing and placement of new hot mix asphalt and compaction. New asphalt binder

shall have a compacted thickness of no less than two inches (2.0") on asphalt pavement after compaction. Payment shall be by the contract unit price per Ton (Ton) in place.

F. Furnish and Install Tack Coat

1. Measurement of this item shall be by the number of tons (Tons) of tack coat furnished and installed in place and approved. Quantities shall be verified and paid by haul ticket. This item shall include furnishing and placement of tack coat at a rate of 0.10 gal/SY. Payment shall be made by the contract unit price per Ton (Ton) in place.

G. Furnish and Install Prime Coat

1. Measurement of this item shall be by the number of tons (Tons) of prime coat furnished and installed in place and approved. Quantities shall be verified and paid by haul ticket. This item shall include furnishing and placement of prime coat at a rate of 0.3 gal/SY. Payment shall be made by the contract unit price per Ton (Ton) in place.

H. Furnish and Install Granular Base (303.01 Type A Grade D)

1. Measurement of this item shall be by the number of tons (Tons) of granular base furnished and installed in place and approved. Quantities shall be verified and paid by haul ticket. This item includes excavation, removal and disposal of existing base, furnishing and installing granular base, and compaction. Payment shall be by the contract unit price per tons (Ton) in place.

I. Furnish and Install Concrete Curb & Gutter

1. Measurement of this item shall be paid by lineal foot (LF) of new concrete curb and gutter constructed in place and approved. Measurement shall be made on the surface of the new curb and gutter. This item shall include saw cutting, excavation, compaction, forming, joint material, concrete, finishing, backfilling, and stabilization. Payment shall be made by the contract unit price per Lineal Foot (LF).

J. Furnish and Install Select Backfill (Sand)

1. Measurement of this item shall be by the number of cubic yards (CY) of select backfill furnished and installed in place and approved. Quantities shall be verified and paid by haul ticket. This item includes excavation, disposal of existing material, furnishing and installing granular backfill, and compaction. Payment shall be by the contract unit price per Cubic Yards (CY) in place.

K. Furnish and Install Silt Fencing

1. Measurement of this item shall be paid by lineal foot (LF) of silt fencing furnished and installed in place and approved. This item shall include silt fence, stakes and installation. Payment shall be made by the contract unit price per Lineal Foot (LF) in place.

L. Furnish and Install Type E Headwall

1. Measurement of this item shall be made for each (EA) Type E Headwall furnished, installed in place and approved. This item shall include pre-cast headwall, excavation, preparation of base, installation, foundation, backfilling, compacting, grading, and diversion of water. Payment shall be by the contract unit price per Each (EA) in place.

M. Furnish and Install Machined Rip Rap (Class A-1)

1. Measurement of this item shall be by the number of tons (Tons) of Class A-1 Rip Rap furnished and installed in place and approved. Quantities shall be verified and paid by haul ticket. This item includes excavation, disposal of existing material, geotextile, furnishing and installing granular material, and compaction. Payment shall be by the contract unit price per Ton (Ton) in place.

N. Furnish and Install 24" Reinforced Concrete Pipe (Class III)

1. Measurement of this item shall be paid by lineal foot (LF) of each size Class III reinforced concrete pipe furnished and installed in place and approved. This item shall include reinforced concrete pipe, excavation, backfill, compaction, bedding material, materials used in making joints and connections to other structures, and all other incidentals necessary to complete the work. Payment shall be made by the contract unit price per Lineal Foot (LF) in place.

O. Furnish and Install Seed with Mulch

1. Measurement of this item shall be paid by square yard (SY) of seed and mulch furnished and installed in place and approved. This item shall include topsoil, fine grading, furnishing and placing seed, mulch, fertilizer and watering. Payment shall be made by the contract unit price per Square Yard (SY) in place.

P. Furnish and Install Sod

1. Measurement of this item shall be paid by square yard (SY) of Bermuda sod furnished and installed in place and approved. This item shall include topsoil, fine grading, furnishing and placing sod, fertilizer and watering. Payment shall be made by the contract unit price per Square Yard (SY) in place.

Q. Furnish and Install 4" Class A Concrete Pad

1. Measurement of this item shall be paid by cubic yard (CY) of an ADA compliant concrete pad furnished and installed in place and approved . This item shall include concrete, rebar, and all

other materials needed to complete the work. Payment shall be made by the contract unit price per cubic yard (CY) in place.

R. Furnish and Install 1" PVC Potable Water Pipe

1. Measurement of this item shall be paid by lineal foot (LF) of 1" PVC Pipe furnished and installed in place and approved. This item shall include pipe, excavation, backfill, compaction, bedding material, required permitting, materials used in making joints and connections to other structures, and all other incidentals necessary to complete the work. Payment shall be made by the contract unit price per Lineal Foot (LF) in place.

S. Furnish and Install PVC Chain Link Fence

1. Measurement of this item shall be paid by the linear foot (LF) of fence in place and approved. This item shall include installation of PVC chain link fence and terminal posts, concrete, hardware, and all other material needed to complete the work. Payment shall be made by the contract unit price per Linear Foot (LF) in place and approved.

T. Furnish and Install River or Creek Stone Bed

1. Measurement of this item shall be paid by the ton (Ton) of river creek stone furnished and installed in placed and approved. The rive or creek stone bed shall be installed in placed according to plans. The item shall include furnishing, grading, and placement of the river creek stone bed. Payment shall be made by the contract unit price Ton (ton) in place.

U. Furnish and Install 8' Wide Maintenance Gates

1. Measurement of this item shall be paid for each (EA) maintenance gates furnished, installed in place, and approved. This item shall include installation of gates, hardware, and all other material needed to complete the work. Payment shall be made by the contract unit price per each (EA) in place and approved.

V. Furnish and Install Wall Gates

1. Measurement of this item shall be paid for each (EA) wall gates furnished, installed in place, and approved. This item shall include installation of wall gates, hardware, and all other material needed to complete the work. The existing fence material shall be reused if possible. Payment shall be made by the contract unit price per each (EA) in place and approved.

W. Furnish and Install Dual Water Fountains

1. Measurement of this item shall be paid for each (EA) dual water fountain furnished, installed in place, and approved. This item shall include installation of water fountain, hardware, piping, fittings, and all other materials needed to complete the work. Payment shall be made by the contract unit price per each (EA) in place and approved.

X. Furnish and Install Black Thermoplastic Benches

1. Measurement of this item shall be paid for each (EA) black thermoplastic covered heavy-gauge metal mesh bench with backrest furnished and installed in place and approved. This item shall include installation of benches mounting tab, and all other materials needed to complete the work. Payment shall be made by the contract unit price per each (EA) in place and approved.

Y. Furnish and Install Lighting Plan

1. Measurement of this item shall be paid by lump sum (LS) of lighting plan. This item shall include costs associated with the relocation of utilities as designated by the utility company, permitting, fixtures, wire, conduit, aluminum poles, bollards, and all other materials needed to complete the work. Item shall be paid by invoice from the utility company. Payment shall be by Lump Sum (LS) of work completed.

Z. Material/Density Testing

1. Measurement of this item shall be paid by lump sum (LS) for density testing. Contractor performing testing shall be approved by the Owner prior to performing work. Payment shall be made by invoice from Geotechnical Engineer of actual testing performed. This item includes but is not limited to density testing. Payment shall be made by the contract unit price per Lump Sum (LS) of work completed.

AA. Furnish and Install Parking Space Wheel Stops

1. Measurement of this item shall be paid for each (EA) parking space wheel stop furnished and installed. This item shall include installation of wheel stop, rebar, and any other material needed to complete the work. Payment shall be made by the contract unit price per each (EA) in place.

BB. Parking Lot Striping

1. Measurement of this item shall be paid by lump sum (LS) for parking lot stripping. This item shall include paint and any other materials needed to complete the work. Payment shall be made by the contract price per lump sum (LS).

CC. Furnish and Install Temporary Construction Fencing

1. Measurement of this item shall be paid by lineal foot (LF) of construction fencing furnished and installed in place and approved. This item shall include fence, stakes and installation. Payment shall be made by the contract unit price per Lineal Foot (LF) in place.

DD. Remove and Replace Handicap Parking Space and Ramp

1. Measurement of this item shall be paid by the lump sum (LS) for removal and replacement of handicap parking space and ramp. This item shall include the removal of two existing standard parking lots, installment of handicap parking space, ADA compliant ramp, stripping, and any other materials needed to complete the work. Payment shall be made by the contract unit price per lump sum (LS) in place.

EE. Furnish and Install Accessible Parking Sign

1. Measurement of this item shall be paid for each (EA) accessible parking sign furnished and install installed in place and approved. This item shall include sign, post, hardware, concrete, and any other material needed complete the work. Payment shall be made by the contract unit price per each (EA) in place.

END OF SECTION

SECTION 01810

SPECIAL PROVISIONS

PART 1 Description

1.01 SUMMARY

A. These "Special Provisions" supplement, clarify, or modify provisions of Specifications as they apply to this project.

B. Requirements of Special Provisions, General and Supplemental Conditions apply to work performed under all sections of this project.

C. Work of this contract shall include all work required to construct the entire Project as shown on the drawings and defined by the Specifications and other contract documents, unless specific exceptions are stated therein.

D. DISCREPANCY BETWEEN SPECIAL PROVISIONS, SPECIFICATIONS, AND PLANS. In the event of discrepancy between Special Provisions and other sections of the Specifications, the Special Provisions will take precedence over the Specifications, the General Conditions, and the Supplemental Conditions. The Specifications will take precedence over the Plans.

1.02 LABOR PRACTICES

A. EIGHT-HOUR WORK DAY

The Contractor's attention is directed to, Limitation on work hours; overtime; exceptions. a) No person shall require laborers, workmen, or mechanics to work more than eight hours in any one calendar day or forty hours in any one week upon any public works of the state, or any of its political subdivisions, except as hereafter authorized. An employee may agree to work more than eight hours per day or more than forty hours in any week provided the employee shall be paid at the rate of one and one-half times the regularly established hourly rate for all work in excess of forty hours in any one week.

1.03 BACKFILL OBSERVATION

No work shall be covered before the Project Representative or Engineer has approved the work. If any piping or appurtenance is covered without the approval of the Engineer or Project Representative, at the discretion of the Engineer, the Contractor will be required to

re-excavate to expose the covered materials. The cost of exposing those materials and then backfilling and compaction will be at the Contractor's expense, regardless of the condition of the pipe and/or the materials under question.

1.04 CONSTRUCTION WATER

The Contractor is responsible for supplying water for construction purposes. If the Contractor wishes to use existing fire hydrants for water, he shall make the proper arrangements with the owner of the hydrant. The Contractor will be responsible for compliance with that owner's requirements as well as the payment of any fees for its use. Construction water is considered incidental to this project and no separate payment will be made to the Contractor for this item. If the Contractor wishes to use water from a resident, he shall obtain written permission from that resident to do so.

1.05 SAFETY

In accordance with generally accepted construction practices, the Contractor will be solely and completely responsible for safety conditions at and adjacent to the job site, including the safety of all persons and property during the performance of the work. The Contractor shall comply with all federal, state, and local safety laws and regulations. This requirement shall apply continuously, and shall not be limited to normal working operations. The Engineer's construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site. This paragraph shall be applicable to the Contractor and all of the Contractor's subcontractors.

In addition, the Contractor shall provide barriers, fences, signs, lights, etc. as necessary to control access to the site.

Contractor shall provide Owner a written copy of their confined spaced program, proof of record-keeping protocol and inventory of appropriate equipment such as monitors for atmospheric hazards and rescue equipment. These documents shall be submitted at the preconstruction conference.

1.07 DUST CONTROL

The Contractor shall be responsible for dust and erosion control, and for minimizing dust and erosion to the Owner's satisfaction. Dust and erosion control shall be deemed to be incidental and shall not be a pay item.

1.08 DISPOSAL OF WASTE MATERIALS

Excess, unsuitable, and waste materials from this project (including that from trench

excavation, pavement removal, piping removal, and grading operations), shall be disposed of, offsite, by Contractor. Such disposal shall be considered incidental, and shall not be a pay item.

1.09 CODES AND STANDARDS

All materials and the completed installation shall comply with applicable standards promulgated pursuant to the State of Tennessee and City of Lakeland.

1.10 OPEN EXCAVATIONS

The Contractor shall completely backfill all excavations before stopping work for the day. No excavation (fenced or unfenced) shall be left open overnight, over a weekend, nor any period in which no work at that location is underway. The cost of reopening or re-excavation due to this provision will be borne by the Contractor.

1.11 CONSTRUCTION SURVEYING AND STAKING

In this project, lines and grades of replaced appurtenances shall match those existing. When new appurtenances such as drain lines, catch basins, curb, sidewalks, and new roadway crowns are to be installed, the Contractor will provide construction surveying and staking, unless otherwise noted.

1.12 CLEANING AND FINISHING

After completion of all work all debris and foreign material will be removed by the contractor. The project area, including staging areas, shall be clean and functional. This will include the restoration of any disturbed landscaping in the work area.

1.13 TRAFFIC CONTROL

A traffic control plan is required for repairs in areas affecting traffic. The Contractor is responsible for furnishing a traffic control plan to the City Engineer at least one week prior to the start of construction. Excavations which traverse a street shall be limited to one-half the width of the street at any one time, unless an emergency situation exists which requires the entire width of the street be excavated. The City Engineer's approval is required prior to traversing an entire street. The closure should not exceed forty-eight (48) hours and proper signage shall be installed detouring traffic and warning of construction.

END OF SECTION

SECTION 02115

EROSION AND SEDIMENT CONTROL

PART 1 - Description

This work shall consist of providing erosion and sediment control during and upon completion of construction as specified herein and as shown on the Construction Drawings.

1.01 General

A. The Contractor shall provide the Engineer a copy of the Storm Water Pollution Prevention Plan (SWPPP) as submitted to the Tennessee Department of Environment and Conservation.

B. All erosion and sediment control plans shall be developed as per regulations outlined by the Tennessee Department of Environment and Conservation.

C. All erosion and sediment control plans as outlined in the SWPPP shall be installed prior to any grading and land disturbance.

D. All control measures shall be checked, and repaired as necessary, twice weekly in dry periods and within 24 hours after any rainfall of 0.5 inches (minimum). During prolonged rainfall daily checking and repairing is necessary. Maintain records of checks and repairs.

E. A specific individual who is certified by a TDEC Certification Program or its equivalent shall be designated to be responsible for erosion and sediment control.

1.02 Related Sections

Section 02230 Clearing and Grubbing

Section 02315 Excavation, Embankment and Fill

Section 02335 Roadway Earthwork

Section 02340 Geotextiles

Section 02370 Storm Drain Outfall Protection

Section 02835 Topsoil, Seeding and Lawn Restoration

PART 2 – Materials

A. The Contractor shall submit the following to the Engineer for inspection and acceptance all materials used for this Section.

B. Silt Fence Materials shall be as follows:

1. Silt Fence-See Section 02340 Geotextiles.

2. Fence Post (for fabricated units): Steel posts will be a standard "T" and "U" sections weighting not less than 1.33 pounds per lineal foot with a minimum length 42 inches.

3. Wire Fence (for fabricated units): Wire fencing shall be minimum 14-1/4 gage welded wire fabric with a maximum six inch mesh opening or as approved by the Owner.

C. Stabilized Construction Entrance Materials shall be as follows:

1. Aggregate shall be in accordance with Tennessee Department of Transportation (TDOT) #1 or #2 stone specifications (1.5 to 3.5 inch stone), washed and well graded. Refer to Tennessee Department of Environment and Conservation (TDEC) specification Riprap for aggregate size tables.

2. Geotextile fabric shall meet the requirements of Section 02340 Geotextiles.

PART 3 - Execution

3.01 Silt Fencing

A. Silt fence shall be constructed by securely fastening silt fence fabric and wire reinforcement to steel posts using wire ties. The silt fence fabric panels shall be installed loosely with adjacent panels overlapped a minimum of 12 inches. The top edge of the fabric shall be reinforced or shall have a one inch tuck.

B. Accumulated silt and debris shall be removed by the Contractor behind the face of the silt fence when the silt deposits reach approximately one half the height of the fence. Clogged or damaged silt fence fabric or wire reinforcement shall be immediately replaced at no additional expense to the Owner.

C. Refer to Silt Fence details on the construction drawing for additional details and general notes.

3.02 Erosion Control During Construction

A. The Contractor shall take sufficient precautions during construction to minimize the run-off of polluting substances such as silt, clay, wastes, fuels, oils, bitumens, and calcium chloride into the water supplies and surface waters of the State. Special precautions shall be taken in the use of construction equipment to prevent operations which promote erosion.

B. Disposal of drainage shall be in an area approved by the Owner. The Contractor shall prevent the flow or seepage of drainage back into the drainage areas. Drainage shall not be disposed of until silt and other sedimentary materials have been removed. Particular care shall be taken to prevent the discharge of unsuitable drainage to a water supply or surface water body.

C. As a minimum, the following shall apply:

1. Approved silt fencing shall be provided as points where drainage from the worksite leaves the site, to reduce the sediment content of the water.

2. Drainage leaving the site shall flow to water courses in such a manner to prevent erosion.

D. Measures for control of erosion must be adequate to assure that turbidity in receiving water will not be increased more than 10 standard turbidity units (s.t.u.) or as otherwise required by the State or other controlling body, in waters used for public water supply or fish unless limits have been established for the particular water. In surface water used for other purposes, the turbidity increases must not exceed 25 s.t.u. unless otherwise permitted.

3.03 Stabilized Construction Entrance

A. Contractor shall install stabilized construction entrances in at least one main entry point to the construction site. Additional entrances shall be stabilized depending on the project size and use of entry points to the construction sites. Construct stabilized construction entrance as per dimensions shown on the construction.

B. Geotextile Engineering fabric shall be installed prior to placement of aggregate. Fabric shall not be required for work on single family residential lot.

C. Maintenance of stabilized construction entrance shall include periodic top dressing of entrance with additional stones as conditions demand to prevent tracking or flow of sediment onto public rights of way.

END OF SECTION

SECTION 02230

CLEARING AND GRUBBING

PART 1 - Description

This work shall consist of clearing, grubbing, scalping, removal of trees and stumps, and removing and disposing of all vegetation and debris within the limits of the work as described on the drawings, except such objects that are to remain or are to be removed in accordance with other sections of these specifications.

1.01 General

A. The Engineer shall exercise control over clearing and grubbing and shall designate all trees, shrubs, plants, and other objects to be removed. This work shall also include the preservation from injury or defacement of all vegetation and objects to remain. Paint required for cut or scarred surfaces of trees or shrubs selected for retention shall be a suitable asphaltum base paint.

B. Before the Contractor removes any tree or stump which the plans state is to be removed, the Engineer shall review the plan requirements with the Owner and Contractor and appropriately mark each tree or stump which is to be removed.

C. Only such trees and stumps which have been marked for removal by the Engineer shall be removed.

D. Limitations of areas of clearing and grubbing and earthwork operations shall be in accordance with the construction drawings

PART 2 – Materials (Not Used)

PART 3 - Execution

3.01 Clearing and Grubbing

A. All surface objects, brush, roots, and other protruding obstructions, not designated to remain, and all trees and stumps marked for removal, shall be cleared and/or grubbed, including mowing, as required, except for special treatment as follows:

1. In locations to be seeded, stumps shall be removed to a minimum of 150 mm (6 inches) below ground surface.

2. In unseeded areas to be rounded at the top of backslopes, stumps shall be cut off flush with or below the surface of the final slope line.

3. Except in areas to be excavated, stump holes and other holes from which obstructions are removed, shall be backfilled with suitable material and compacted in accordance with other divisions within these specifications.

4. Materials and debris may be removed from the construction site and properly disposed of at locations off the project outside the limits of view from the right-of-way with the witten permission of the property owner on whose property the materials and debris are placed. No burning of vegetation will be allowed. The Contractor shall make all necessary arrangements with property owners for obtaining suitable disposal locations.

5. Low hanging branches and unsound or unsightly branches on trees or shrubs designated to remain shall be removed as directed. Branches of trees extending over the roadbed shall be trimmed to give a clear height of 6 m (20 feet) above the roadbed surface.

3.02 Scalping

A. The Contractor shall scalp all areas where excavation or embankment is to be made Scalping shall include the removal of material such as roots, sod, grass, residue of agricultural crops, sawdust, and decayed vegetable matter from the surface of the ground.

B. Sod and incidental topsoil removed in the scalping operation shall be salvaged and stockpiled for use as specified elsewhere. The stockpiles of scalpings shall be made in such a manner and at such locations that they will be well drained and will not impound water.

C. The depth of scalping performed under this section is not intended to include topsoil.

END OF SECTION

SECTION 02315

EXCAVATION & EMBANKMENT FILL

PART 1 – Description

A. This work consists of excavating and disposal of unsuitable material from roadbed excavations; and building controlled embankments and the sloping, shaping and dressing of all slopes including preparation of the areas upon which they are to be constructed by the placing and compacting of material in holes, pits, and other depressions within the embankment area, all in conformity with the lines, grades ,and typical cross-sections shown on the Plans. Only approved materials shall be used in the construction of embankments.

PART 2 – Materials

All equipment for the satisfactory performance of excavation and hauling shall be on the project and approved by the Owner before the work will be permitted to begin.

2.01 Related Sections

Section 02335 Roadway Earthwork

PART 3 – Execution

3.01 General

A. Prior to beginning excavation all necessary Clearing and Grubbing and Removal of Structures and Obstructions shall have been completed in the area in accordance with Sections 02220 and 02230 of these Specifications. The removal of unsuitable material and/or undercutting ordered by the Owner will not be considered contract items and these two operations will be included in either excavation (unclassified) or embankment (unclassified) respectively. Unsuitable material above subgrade or from undercutting in cuts shall be disposed of as directed by the Owner at no additional cost to the Owner. Any imbalance of material quantities caused by these operations or change in actual shrinkage factor shall be the Contractor's responsibility. The Owner's decision on the suitability of material or the need for undercutting shall be final.

B. If approved by the Owner, gravel for undercut backfill or stabilization and Portland cement for stabilization will be used and paid for as separate items in the contract.

C. When ordered by the Owner, water used for dust control will be paid for as a contract item.

D. The Contractor shall provide for proper drainage of the project area to protect from ponding and erosion.

3.02 Excavation

A. Excavation (unclassified) shall consist of the removal of all suitable or unsuitable material in cut sections to the lines, grades, and cross-sections shown on the Plans. All slopes, ditches and berms shall be shall be neatly trimmed to the lines given. Excavation beyond given lines or to correct slides, regardless of the location, will be at the Contractor's expense, and the suitability of the material from slides for embankment construction will be determined by the Owner.

B. Surplus excavated material, if determined to be suitable by the Owner, may be used to widen embankments or to flatten slopes or may be deposited in such other places and for such other purposes on the right-of-way as the Owner may approve. No payment to the Contractor shall be made for the placement of surplus excavated material. Materials unsuitable for construction of embankment or use as backfill shall be removed to off-site waste disposal areas. The Contractor shall secure waste disposal areas and dispose of surplus and unsuitable materials in such areas. It is the Contractor's responsibility to obtain written permission from the owners of all property(s) to be used for waste disposal areas prior to removal of material to disposal sites. The Contractor shall dispose of all materials on the sites to the satisfaction of the property owner(s).

3.03 Embankments

A. Prior to beginning embankment operations all necessary Clearing and Grubbing and Removal of Structures and Obstructions shall have been completed in the area in accordance with Sections 02220 and 02230 of these Specifications. The removal of unsuitable material and/or undercutting ordered by the Owner will not be considered contract items and these two operations will be included in either excavation (unclassified) or embankment (unclassified) respectively. If there is insufficient suitable material from excavation on the project, it shall be the Contractor's responsibility to obtain the additional material off the project to complete embankments according to the lines, grades, and cross-sections on the Plans.

B. When ordered by the Owner, water used for dust control will be paid for as a contract item.

C. This work shall consist of constructing roadway or street embankments including the preparation of the area upon which they are to be constructed, the placing and compacting of approved materials where unsuitable material has been removed, and the placing and compaction of embankment material in holes, pits, and other depressions not filled in accordance with Sections 02220 and 02230. All work shall be in accordance with these Specifications and in conformity with the lines, grades, and cross-sections shown on the Plans. Only approved materials shall be used in the construction of embankments, which material shall come from excavation on the Project or from approved sources furnished by the Contractor.

D. Any area upon which an embankment is to be constructed shall be plowed or scarified, all cleavage planes destroyed, and the area rolled thoroughly with a sheeps-foot roller before embankment construction is begun in the area. An area upon which an embankment is to be constructed having a slope steeper than 3 to 1 shall be benched with steps of not less than eight (8) inches rise before any embankment materials are placed thereon. Benching shall be of sufficient width to permit the operation of placing and compacting equipment. Each successive benching cut shall begin at the intersection of the original ground line and the vertical side of the previous cut. Material thus cut out shall be recompacted along with new material at the Contractor's expense.

E. Embankment construction will not be permitted within fifty (50) feet of any structure or proposed structure until such structure is cured sufficiently to permit embankment formation against it. This requirement will be waived when an embankment or portion thereof is to form the foundation of a structure or part thereof. Embankment to be placed on both sides of a concrete wall, manhole, or box type structure shall be so constructed that the embankment is always approximately the same elevation on both sides of the structure. Embankments on only one side of abutments, wingwalls, or piers shall not be constructed until the superstructure is in place or final concrete design strength has been obtained.

F. Where embankment is to be constructed across ground that will not support earth moving equipment, the fill shall be started with a uniformly distributed layer of a thickness not greater than necessary to support the hauling equipment while placing subsequent layers. In the construction of such a lift the density requirement will be waived but the moisture content of the material used shall not exceed the optimum moisture content for that material. Maximum thickness and minimum density requirements will apply to all succeeding layers of embankment construction. Each succeeding layer of embankment is to be constructed with a compacted thickness not to exceed six (6) inches and shall be approved before material for the next succeeding layer is placed.

G. Embankments shall be so constructed that adequate surface drainage will be provided at all times. Roadway embankment materials shall be placed in horizontal layers not to exceed a depth which will produce a six (6) inch compacted layer. Each layer shall be compacted for the entire embankment width to a density no less than ninety-five (95) percent of maximum density as determined in accordance with the standard specification of compaction and density of soils, ASTM D-698. The moisture content of the embankment material shall be controlled in such a way that the material will be compacted with a moisture content ranging from two (2) percent below to two (2) percent above the optimum moisture content as determined from the above mentioned test and approved by the Owner. If the moisture content of the material in the embankment prior to compaction is greater than two (2) percent above the optimum moisture content, the material shall be aerated by disking, harrowing, plowing, or other means approved by the Owner, who shall be the sole judge as to when the required density has been obtained. For each layer of embankment material, the Contractor shall disk sufficiently to break down oversize clods, thoroughly mix any different materials, secure correct moisture content, ensure uniform density, and obtain proper compaction. Rolling with compacting equipment shall start longitudinally at the sides and proceed toward the center, overlapping on successive trips by at least one-half of the width of the tamping

roller. Tamping equipment shall be operated at a speed of no more than three (3) miles per hour.

H. The Contractor shall be responsible until final acceptance for the stability of all embankments and shall replace at this own expense any portion which in the opinion of the Owner has become displaced or damaged due to carelessness, negligence, or by rainfall and weathering.

I. The slopes of all embankments, ditches, channels, and such other appurtenances as may be indicated on the Plans shall be shaped and trimmed to the lines, grades, and cross-sections shown or as directed by the Owner. This work shall also include the satisfactory shaping of spoil banks, waste deposits, and any other areas deemed necessary by the Owner to prepare the project for final inspection and acceptance.

J. Water for dust control when ordered by the Owner, whether to comply with local air pollution ordinances, safety, or good construction practices, shall be readily available along with adequate distribution equipment.

END OF SECTION

SECTION 02335

ROADWAY EARTHWORK

PART 1 - Description

This section covers work for all excavations, embankments, grading, or removal of unsuitable material from roadbed excavations; sloping, shaping and dressing of all slopes for the construction and preparation of the graded road bed to receive the placement of a subbase or pavement material. Subgrade preparation shall also consist of the final grading of the roadbed in both cuts and fills to the density specified. .

1.01 Definitions

A. Unclassified Excavation Above Subgrade - Unclassified excavation above subgrade is defined as any material excavated above the subgrade elevation within the street right-of-way which is placed in fill or disposed of as directed by the Engineer, and any material taken from borrow pits and deposited as embankments or fill within the streets above the proposed subgrade elevation.

B. Optimum Moisture Content (OMC) - Optimum moisture content is defined by ASTM D698.

C. Undercutting - This work consist of the removal and disposal of unsatisfactory excavated material below grade in cut sections or below the subgrade elevation within the street paving width as directed by the engineer. Areas to have unclassified excavation may be designated on the plans if sufficient information is available. Undercut areas shall be backfilled with suitable material from imported borrow excavations, gravel backfill, or materials stabilized with gravel or soil cement as ordered by the Owner

D. Imported Borrow Excavation - Imported borrow excavation shall consist of excavation made from borrow areas inside or outside the project limits, and outside the normal grading limits for completion of embankments.

E. Subgrade - That part of the roadbed to receive the immediate construction of a base or pavement thereon.

F. Subbase - That part of the roadbed above the subgrade and below the base or pavement extending across the entire section of the roadway.

PART 2 - Materials (Not Used)

PART 3 - Execution

3.01 Excavation to Grade

A. Excavation shall be made to grade, dimensions, and cross sections as shown on the plans or as directed by the engineer. The top of the finished subgrade shall be of such smoothness that when tested with a ten foot (10') (3m) straight edge it shall not show any deviation in excess of one-half inch (1/2") (12.5mm) from true grade as established by grade hubs or pins. Any deviations in excess of these amounts shall be corrected by loosening, adding, or removing materials, reshaping, and recompacting by wetting and rolling.

B. Excavation shall be done in one process. All material above the subgrade shall be removed to the top elevations shown on the plans or specifications. When the excavation has been completed, the material at subgrade elevation shall be examined and inspected by the engineer. If the material at proper grade and depth meets or exceeds the requirements of material for subgrade course, as specified in these specifications and/or as determined by the Engineer, further excavation will not be required.

C. If subbase material (bound aggregate) is specified, it shall be installed and prepared as specified in Section 02710.

3.02 Subgrade Preparation

A. Excavation to the subgrade shall be cut approximately one inch (1/2") (13mm) above subgrade and the subgrade shall be scarified 12 inches (12") (304mm), the moisture adjusted to within ±2% of optimum moisture content and compacted to at least 95% of maximum density as determined by ASTM D698. The compacted subgrade shall extend one foot (1') (.3m) beyond the outside edges of the pavement base course or from rear face of the curb and gutter.

B. Undercutting below subgrade shall be performed where spongy, organic, or otherwise unsuitable material is encountered, which, in the opinion of the engineer, will not provide a suitable foundation for the subbase or pavement material. The unsuitable material shall be removed to the depth specified by the engineer and replaced with acceptable material or stabilized with gravel or Portland Cement, or undercut and backfilled with gravel as directed by the Owner, who shall be the sole judge as to the method to be used. Replacement material shall be moisture conditioned and compacted to a minimum of 95% maximum density, as determined by ASTM D698 and a moisture content of ± 2% of optimum.

3.03 Subgrade Protection.

A. During construction, the subgrade shall be kept shaped and drained. Ditches and drains along the subgrade shall be maintained so as to drain effectively at all times. Where ruts occur in the subgrade, it shall be brought to grade, reshaped, and recompacted prior to placing of subbase or pavement material. The storage or stockpiling of materials on the subgrade will not be permitted. No subbase course or pavement material shall be laid until the subgrade has been checked, proof-rolled, and approved by the Engineer. Under no circumstances shall subbase or pavement material be placed on a muddy subgrade.

3.04 Imported Borrow Excavation

A. Where fill is required for embankment, the fill shall be composed of clean earth, sand, or gravel, free from organic matter or other objectionable foreign material. The area to receive fill shall be stripped of all vegetation and other unsuitable material before fill placement is started. Slopes shall have surfaces broken up in such a manner that fill material will bond with existing surface as directed by the Engineer. The fill shall be placed in layers not to exceed ten inches (10")(254mm) inches in depth prior to compaction. The material in each layer shall be moistened to within ± 2% of optimum moisture content as directed by the Engineer and shall be rolled until at least 95% of maximum density as measured by ASTM D698. When borrow is required, it shall be taken from a source approved by the Engineer. Fill shall be defined as imported borrow excavation. Unless otherwise specified, the top twelve inches (12")(304mm) of the pavement subgrade in both cut and fill sections shall be compacted to 100% of maximum density.

3.05 Parkway and Shoulder Finish

A. Promptly after completion of curb and gutter construction, the areas between the curb and gutter and the property lines, shall be brought to a uniform, smooth grade, unless otherwise directed by the engineer. Hand raking may be required around trees and in areas where larger equipment cannot be used. Fill material placed in such areas shall be free from stones, sticks, or other materials which will be objectionable for seeding or sodding purposes. Backfill material shall be suitable for the growth of lawn grass. The backfill shall be compacted to a minimum of 90% of maximum dry density as measured by ASTM 698 -- however, finished grade shall be left one inch (1") (25mm) high to allow for settlement. The Contractor shall maintain the parkway area until final acceptance.

3.06 Soil Erosion Control

A. It shall be the responsibility of the Contractor to take such action as may be necessary to minimize water pollution due to blowing dust or soil erosion due to precipitation. All disturbed soils shall be covered with hydromulch according to the erosion control plan. If this method is used, care shall be taken to avoid development of mud holes and to avoid erosion. With the Engineer's approval, other methods of soil erosion control may be utilized, such as hygroscopic materials. Such materials shall not be used if they may have a deleterious effect on future work to be accomplished on the surface to which they are applied, if they may harm vegetation with which they come in contact, if they may contribute to corrosion of metals, or if they are dangerous or irritating to humans or to animals. Refer to sections 02115 and 02481 for details on erosion control and hydromuching.

3.07 Subgrade Proof Rolling

A. Before the placing of any type of pavement surfacing on the finished subgrade, such subgrade

shall be proof rolled with at least one pass of coverage for its full width and length with a self-propelled pneumatic roller single axle (min load) or other approved equipment by the City Engineer. Ground contact pressure of all tires shall be 85-90 psi (585-621 kPa). At the discretion of the Engineer, the specified ground pressure may be lowered and alternate equipment can be utilized. When the proof rolling shows an area to be unstable, such area shall be brought to satisfactory stability by additional compaction, reworking, or removal of unsuitable material and replacement with acceptable material.

B. Schedules for Proof Rolling.

1. All utilities, including laterals or service pipes located under the street or the curb, gutter must be in place before the Proof Rolling operation is performed.

2. Proof Rolling shall not take place more than 24 hours prior to the placing of the concrete for the curb, gutter, and/or bound aggregate base course or the hot mix asphalt street section.

3. The Owner, City representatives, and Engineer must be notified, and approval of the subgrade condition must be given, prior to the installation of any portion of the street section including curb and gutter.

END OF SECTION