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**Invitation for Sealed Bids**

<b>Solicitation Name and Number</b>	Infrastructure Work for the former Austin Homes site C20006
<b>Responses Must Arrive No Later Than</b> (As KCDC's clocks indicate)	2:00 p.m. on March 10, 2020
<b>Deliver Responses to:</b>	Knoxville's Community Development Corporation Procurement Division 901 N. Broadway Knoxville, TN 37917  Procurement is behind the main office building.
<b>Electronic Copies</b>	Electronic copies are available on KCDC's webpage or by email at <a href="mailto:purchasinginfo@kcdc.org">purchasinginfo@kcdc.org</a> .
<b>Responses may be Emailed to KCDC</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Printed Responses Required</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Solicitation Meeting</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Solicitation Meeting is Mandatory</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Applicable
<b>Solicitation Meeting Date and Time</b>	February 25, 2020 at 10:00 a.m.
<b>Solicitation Meeting Location</b>	KCDC's Board Room at 901 N. Broadway in Knoxville. Come to the lobby and go up the stairs or ask the receptionist for access to the elevator.
<b>Solicitation Meeting Connection</b>	KCDC will host, if requested, an on-line meeting via Zoom. Email <a href="mailto:purchasinginfo@kcdc.org">purchasinginfo@kcdc.org</a> for the web link.
<b>Site Visit Schedule</b>	Following the solicitation meeting
<b>Questions About This Solicitation</b>	Submit questions to <a href="mailto:purchasinginfo@kcdc.org">purchasinginfo@kcdc.org</a> <b>KCDC will not accept questions via telephone.</b>
<b>Award Results</b>	KCDC posts the award decision to its web page at: <a href="http://www.kcdc.org/procurement/">http://www.kcdc.org/procurement/</a>
<b>Open Records/Public Access to Documents</b>	All document provided to KCDC are subject to the Tennessee Open Meetings Act (TCA 8-44-101) and open records requirements.
<b>Plans/Blueprints</b>	Blueprints/plans are available from Knoxville Blueprint and on KCDC's webpage.

**Check KCDC's webpage for addenda and changes before submitting your response**



### 1. Background and Intent

- a. Knoxville's Community Development Corporation (KCDC) is an independent governmental entity serving as the affordable/public housing and redevelopment agency for the City of Knoxville and for Knox County in Tennessee. KCDC's affordable housing property portfolio includes 20 sites with approximately 3,525 dwelling units. KCDC also oversees approximately 3,958 Section 8 Vouchers, 82 Moderate Rehabilitation units and 20 Redevelopment areas.
- b. To clarify terms, KCDC uses "supplier" as inclusive of various words describing interested parties often called "vendor," "bidders," "contractors" and "proposers."
- c. This solicitation is for infrastructure work at the former Austin Homes site which will eventually have apartments constructed on it. While the final name for the resulting apartments is not yet known, it is likely that one or more phases may be called "Bell Street Flats" or similar.
- d. KCDC is seeking sealed bids from qualified suppliers to provide grading, site preparation, and infrastructure improvements that support the future development of this entire site. This work includes clearing and grading, erosion control, site utility systems, site stormwater systems, roadways including signage and stripping, sidewalks, landscaping, and street lighting. See the drawings and specifications for details

### 2. Bonds

Bid, payment and performance bonds are required if the bid exceeds \$100,000 in value. The supplier will include all bonding costs in the base bid. Bonding requirements include:

- a. A bid **bond** from each supplier equivalent to five percent (5%) of the bid price. Such bid bond must accompany the bid. Bid bonds will not be returned until a contract is signed.
- b. Performance and payment **bonds** for 100% of the contract price.
- c. All bonding companies must be listed in the Federal Register, Department of the Treasury Fiscal Service, Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies; Notice. Companies licensed to do business in the State of Tennessee must issue all required bonds.

### 3. Changes after Award

It is possible that after award KCDC will need to revise the service needs or requirements specified in this document. KCDC reserves the right to make such changes after consultation with the supplier. Should additional costs arise, the supplier must document increased costs. KCDC reserves the right to accept or reject and negotiate these charges.

4. **Codes and Ordinances**

All work covered is to be done in full accord with national, state and local codes and ordinances and orders that are in effect at the time the work is performed.

5. **Contact Policy**

**Only** contact KCDC's Procurement Division about this solicitation from the issuance of this RFP until award. Information obtained from an unauthorized officer, agent, or employee will not affect the risks or obligations assumed by the proposer or relieve the proposer from fulfilling any of the conditions of the resulting award for the purpose of this project. Such contact can disqualify the proposer from the solicitation process.

6. **Contract Approval**

The resulting contract is subject to KCDC's Board approval which is currently anticipated in March.

7. **Contract Documents**

KCDC has posted a prototype of the standard contract and rider that will be used to its webpage. Please review these documents before submitting a bid.

8. **Damage**

The supplier is responsible for all damage to buildings, equipment, grounds, premises and all other types of potential damage resulting from the provision of the services requested herein.

9. **Employees**

Supplier will:

- a. Allow only personnel thoroughly trained and skilled to work on the job. Employees are not to be accompanied in their work area by acquaintances, family members, assistants or any person unless said person is an authorized employee of the supplier.
- b. Have sufficient personnel to complete the work in a timely manner.
- c. Provide adequate supervision and adequate discipline among his/her employees.
- d. Provide at least one employee on every job assignment with the ability to speak, read, write and understand English so owner's staff can communicate effectively with them.
- e. Employ the quantity and quality of supervision necessary for both effective and efficient management at all times.
- f. Ensure that employees have proper identification displayed while on the job site. Employees must wear a company uniform or have photo identification badges at all times.
- g. Employees parking vehicles (whether corporately or privately owned) must ensure that company identification is on the vehicles. This may be by placards on the vehicle's side, laminated paper with the company name placed on the dashboard or other means.

**10. Entrance to Sites**

Supplier employees are not to be on KCDC' premises unless they are working on the project. Acquaintances, family members, assistants, or any person not working on owner's behalf will not accompany employees on KCDC' sites.

**11. Equipment**

Supplier shall provide all necessary equipment, materials, supplies, et cetera needed for the work. Include the cost for such equipment, materials and supplies in the price quoted.

**12. Evaluation**

KCDC will evaluate this as a formal sealed bid and the award is to the "lowest and best." KCDC alone determines (using NIGP's definition and other relevant sources as appropriate) the supplier's "responsive" and "responsible" status prior to award. Responsible means a business with the financial and technical capacity to perform the requirements of the solicitation and subsequent contract. A responsive bid is one that fully conforms in all material respects to the solicitation document and all of its requirements, including all form and substance. KCDC reserves the right to request additional information to assist in the evaluation process; this includes references and business capacity information.

**13. General Instructions to Suppliers**

KCDC's General Instructions to Suppliers are at [www.kcdc.org](http://www.kcdc.org). Click on "Procurement" and the link to the instructions. The supplier's submittal means acceptance of the terms and conditions set forth in KCDC's "General Instructions to Suppliers."

For this solicitation the following paragraphs in the "General Instructions" document **do not** apply:

16, 23, 32b, 32e, 32f, 32g, 56, 63, 64.

**14. Insurance**

See Appendix 1. These insurances and levels are required and not optional. If you or your insurance agent have concerns or believe that some coverages are not necessary, email [purchasinginfo@kcdc.org](mailto:purchasinginfo@kcdc.org) detailing any requested changes before this solicitation's due date. The supplier will include all insurance costs in the base bid.

**15. Invoicing**

- a. KCDC will process pay applications once per month.
- b. Suppliers are required to submit invoices within 90 days following the delivery of the goods or services. KCDC may deny invoices submitted after the 90-day threshold.
- c. KCDC normally pays by electronic transfer (ACH) only. KCDC does not issue checks. Suppliers will need to set up their access to KCDC's Supplier Portal to track actual payments made.
- d. KCDC's purchases of goods are exempt from Tennessee sales and use tax pursuant to Tennessee Code Annotated 67-6-329(a) (4) and KCDC is generally exempt from the Federal Excise tax.

Suppliers are subject to Tennessee sales and use tax on all materials and supplies used in the performance of a contract, whether such materials and supplies are purchased by the supplier, produced by the supplier, or provided to the supplier by KCDC, pursuant to Tennessee Code Annotated 67-6-209. The supplier will pay all taxes incurred in the performance of an awarded contract.

**16. Licensure**

- a. Suppliers must possess and maintain proper licensure from the State of Tennessee and all other authorities having jurisdiction throughout the term of this award.
- b. In addition to any City or County licenses that may be required, all suppliers must be licensed as required by the State of Tennessee's "Contractor's Licensing Act of 1994."
- c. The Executive Director of the State Contractor Licensing Board says one of these licenses is required:
  - BC
  - BC-B
  - MU
  - MU-B (must cover at least 60% of the work)
  - Any electrical over \$25,000 would need to be subcontracted to a licensed CE
- d. Any subsequent rulings by the State Licensing Board automatically revise these specifications-irrespective of the timing of the notice from the State and irrespective of the status of this solicitation.
- e. Additional information is at <https://www.tn.gov/commerce/regboards/contractors.html>.

**17. Liquidated Damages**

Liquidated damages of \$300.00 per calendar day for each day beyond the scheduled completion date apply and are included in the award. This applies to both the infrastructure and the construction work. KCDC will consider explanatory information if it provides a valid reason for delays in schedule.

**18. Measurements and Drawings**

Complete responsibility for the final determination of dimensions lies with the supplier. The supplier shall verify all dimensions with the actual on-site conditions. Where the supplier's work is to join another trade, the supplier's shop drawings shall show actual dimensions and the method of joining the work of those trades.

**19. Permits**

The supplier shall obtain and pay for or cause its subcontractors to obtain and pay for all permits required to complete required work. In addition, supplier shall arrange, schedule and pay for or cause its subcontractors to arrange, schedule and pay for all required final inspections by state, local, or independent certified inspecting authorities necessary for issuance of all required owner utilization permits for the work.

## 20. **Representations**

By submitting a response, the supplier certifies:

- a. That the supplier is financially solvent and that it is experienced in and competent to perform the type of work, and/or to furnish the personnel, plans, materials, supplies, or equipment to be performed or furnished by it; and
- b. That the supplier is familiar with all federal, state, municipal and county laws, ordinances and regulations, which may in any way affect the work of those employed therein, including but not limited to any special acts relating to the work or to the project of which it is a part; and
- c. That the supplier carefully examined the plans, specifications and the worksite and that from its own investigations, has satisfied itself as to the nature and location of the work, the character, quality, quantity of surface and subsurface materials likely to be encountered, and character of equipment and other facilities needed for the performance of the work, the general and local conditions and all other materials which may in any way affect the work or its performance.

## 21. **Responsibilities**

At no expense to KCDC, the supplier will:

- a. Provide quality control for all services provided.
- b. Provide competent supervision.
- c. Provide competent workers.
- d. Take precautions necessary to protect persons or property against injury and/or damage and be responsible for any such damage or injury that occurs because of their fault or negligence.
- e. Perform work without unnecessary interference with the activities of KCDC or suppliers.

## 22. **Safety/OSHA Guideline Compliance**

- a. The supplier is responsible for providing and placing barricades, tarps, plastic, flag tape and other safety/traffic control equipment to protect the public, surrounding areas, equipment and vehicles.
- b. The safety of staff and the public is of prime concern to KCDC and all costs associated are the responsibility of the supplier.
- c. The supplier shall ensure that its employees exercise all necessary caution and discretion to avoid injury to persons or damage to property.
- d. The supplier will protect all buildings, appurtenances and furnishings from damage. The supplier shall, at his expenses, repair such damages (or replace the items) by approved methods to restore the damaged areas to their original condition.

- e. Supplier shall use caution signs as required by OSHA Regulation 1910.144 and 1910.145 at no cost to KCDC. Caution signs shall be on-site at commencement of contract.
- f. Supplier shall comply with all other OSHA and TOSHA safety standards that apply.

**23. Salvage of Materials**

All rights, title and other interest of KCDC in and to buildings, structures and other property to be removed is vested in the supplier. All salvage becomes the supplier's property but storage of such materials on site will not be permitted except for the duration of the contract. Personal property of third persons or occupants of buildings on the site shall not become the property of the supplier.

As appropriate, suppliers are encouraged to recycle/reuse salvage materials rather than depositing them in a landfill. Regardless, all applicable hazardous materials requirements must be met.

**24. Security**

The successful supplier is responsible for providing any necessary security to equipment, materials, personnel, tools and the site that are required for this job. KCDC is not responsible for damage or losses to equipment, materials, personnel, tools or the site.

**25. Site Examination**

- a. Suppliers are required to visit the site and become fully acquainted and familiar with conditions, as they exist and the required operations. The supplier shall make such investigations as necessary so that they may fully understand the scope of the work and related facilities and possible complexities when executing the work.
- b. The failure or omission of the supplier to receive or examine the solicitation document or any part of the specifications, or to visit the site(s) and acquaint themselves as to the nature and location of the work, the general and local conditions and all matters which may in any way affect performance shall not relieve the supplier of any obligation to perform as specified herein.

Supplier understands the intent and purpose hereof and its obligations hereunder and that it shall not make any claim for, or have any right to damages resulting from any misunderstanding or misinterpretation of the resulting agreement, or because of any lack of information.

- c. By submitting a response to this solicitation, each supplier is certifying that they have inspected the site and have read the solicitation and all appendices and addenda. The failure or omission of any supplier to receive or examine any form, instrument, or document shall in no way relieve the supplier from any obligation in respect to its bid.

**26. Smoking Policy**

KCDC's Smoke Free policy is applicable to you, your employees and subcontractors.

- a. The policy mandates:
  - No smoking on owner's property
  - No e-vape or similar usage on owner's property

- The Smoke Free policy applies in personal or corporate vehicles on owner’s property

b. Applicable definitions include:

- “Smoking” means inhaling, exhaling, burning or carrying any lighted or heated cigar, cigarette or pipe, or any other lighted or heated tobacco or plant product intended for inhalation, including hookahs and marijuana, whether natural or synthetic, in any manner or in any form. “Smoking” also includes the use of an electronic smoking device which creates an aerosol or vapor, in any manner or in any form.
- “Electronic Smoking Device” means any product containing or delivering nicotine or any other substance intended for human consumption that can be used by a person in any manner for the purpose of inhaling vapor or aerosol from the product. The term includes any such device, whether manufactured, distributed, marketed or sold as an e-cigarette, e-cigar, e-pipe, e-hookah or vape pen or under any other product name or descriptor.
- Property means all buildings, parking lots, streets, structures and **land** owned by owners. Should supplier staff be observed violating these requirements, KCDC’s Procurement Division will notify the supplier about the problem. Should there be recurrences, KCDC may ask the supplier to not send the employee to KCDC’s property. Repeated offenses may result in forfeiture of your awarded “contract.”

**27. Storm Water and Street Ordinances**

The City of Knoxville’s Storm Water and Street Ordinances apply to this solicitation. The successful supplier will comply with all aspects of the City’s ordinances. Compliance includes but is not limited to:

- a. Retaining all sediments on the project site using structural drainage controls. Drainage control costs are incidental to the work.
- b. Not discharging any construction or demolition related materials, wastes, spills, or residues from the project site to streets, drainage facilities, or adjacent properties by wind or runoff.
- c. Containing non-storm water runoff from equipment and vehicle washing and any other activity at the project site.
- d. Additional information about NPDES, BMPs and the Land Development Manual at <http://www.cityofknoxville.org/engineering/stormwater/npdes.asp>.
- e. The successful supplier is responsible for all work, remediation, repair and monetary penalties or fines arising out of a Notice of Violation of the City of Knoxville’s Storm Water and Street Ordinances. The supplier will be charged costs KCDC incurs to install structural drainage controls or remedy a Notice of Violation. KCDC shall also charge a \$50 fee per violation for related administrative costs.

- f. KCDC will prepare, submit and pay the permitting fees. Upon award, the successful supplier will be required to sign onto the permit and be responsible for implementing and maintaining all erosion control measures as required on the SWPPP.

**28. Subcontractors**

Subcontractors must:

- a. Be approved by KCDC prior to beginning work and not be changed without owner's permission.
- b. Carry the insurance coverages as outlined herein.
- c. Comply with the federal Davis Bacon requirements and submit certified payrolls.
- d. Not be on HUD's nor the State of Tennessee's debarment lists.

**29. Time for Completion**

Supplier will complete the entire project by August 31, 2021. Upon award, the successful supplier will work with KCDC to develop a satisfactory schedule that coordinates the sequencing of the work with the anticipated schedule for the building projects that will be in progress concurrent with the infrastructure work.

**30. Wage Compliance (Davis Bacon Requirements)**

The City of Knoxville will be providing funds to KCDC for this project. As a result, the City's prevailing wage requirements are applicable to this contract in lieu of Davis-Bacon requirements.

- a. The supplier agrees to comply with and to post the prevailing wage laws as provided in the "Prevailing Wage Act of 1975," Tennessee Code Annotated § Tennessee Code Annotated 12-4-401 et seq. For the purpose of this contract, the prevailing wage rates shall be the wage rates incorporated in these documents.

KCDC reserves the right to demand the payroll records of supplier at any time to monitor compliance with the wage rate/discrimination clause(s). Failure by supplier to provide KCDC with said records within ten working days of the written notice shall constitute a breach of this contract

- b. The supplier must display the attached wage rates and laws at the job site. Highway classification descriptions are found in the State of Tennessee Department of Labor & Workforce Development's document "Classification of Workers Under Tennessee's Prevailing Wage Law – Highway Construction Crafts." This document can be found at <http://www.state.tn.us/labor-wfd/ClassificationHighway9-13-2006.htm>
- c. The supplier and subcontractors shall submit certified payrolls to KCDC each week in which any work occurs. During construction, if the work of the supplier or subcontractor will be interrupted for a week or more, the supplier will place the following statement on the signature sheet of the payroll for the last week in which work occurred: "No additional work will be performed until further notice."

- d. In the event a work stoppage of a week or more occurs which is not anticipated, KCDC shall be furnished the following statement on the signature sheet of the payroll form for the week immediately after the week in which work was interrupted: "No work performed, and no work will be performed until further notice."
- e. When work has ceased in either case as stipulated above, the supplier or subcontractor shall note the following statement on the payroll for the week on which work is resumed: "Last previous work was performed the week ending \_\_\_\_\_."
- f. Fringe benefits are not required.
- g. KCDC has confirmed that suppliers may use the "Unskilled Laborer" rate of \$13.11 for asbestos removal workers for this job.
- h. For more information see <https://www.tn.gov/workforce/employees/labor-laws/labor-laws-redirect/wages-breaks/prevaling-wage.html>

**2020 HIGHWAY PREVAILING WAGE RATES**

		
CLASSIFICATION	CRAFT NUMBER	2020
Blaster	1	23.03
Bricklayer	2	16.60
Carpenter/Leadsperson	3	20.40
Class "A" Operators	4	22.29
Class "B" Operators	5	19.88
Class "C" Operators	6	20.66
Class "D" Operators	7	19.18
Concrete Finisher	8	18.38
Drill Operator (Caisson)	9	34.55
Electrician	10	32.85
Farm Tractor Operator (Power Broom)	11	15.72
Ironworkers Reinforcing	12	18.96
Ironworkers (Structural)	13	19.67
Large Crane Operator	14	23.80
Mechanic (Class I) Heavy Duty	15	24.99
Mechanic (Class II) Light Duty	16	22.14
Painter/Sandblaster	17	30.69
Skilled Laborer	18	17.85
Survey Instrument Operator	19	26.45
Sweeping Machine (Vacuum) Operator	20	18.27
Truck Driver (2 axles)	21	17.88
Truck Driver (3/4 axles)	22	17.36
Truck Driver (5 or more axles)	23	19.57
Unskilled Laborer	24	15.33
Worksite Traffic Coordinator	25	19.66

Effective 01/01/2020

31. **Weather**

KCDC provides allowances for excessive inclement weather since this solicitation calls for liquidated damages-provided the supplier exceeds the guaranteed number of days for completion.

a. **Extensions of Contract Time**

If the basis exists for an extension of time in accordance with this solicitation, then an extension of time based on weather may be granted only for the number of weather delay days in excess of the number of weather days listed as the Standard Baseline for that month.

b. **Standard Baseline for Average Climatic Range**

The Standard Baseline is the normal and anticipated number of calendar days for each month during which adverse weather will prevent activity. Suspension of activity for the number of days each month as listed in the Standard Baseline is to be included in the work and not eligible for an extension of the contract time. The baseline is:

Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
7.4	7.5	8.1	7.3	7.9	7.1	7.8	6.0	4.8	5.2	7.2	7.9

c. **Adverse Weather and Weather Delay Days**

1. Adverse weather is the occurrence of one or more of the following conditions which prevents only exterior activity or access to the site within a twenty-four hour period:
  - a. Precipitation (rain, snow or ice) in excess of one-tenth inch (0.10”) liquid measure.
  - b. Temperatures which do not rise above 32 degrees Fahrenheit by 10:00 a.m.
  - c. Standing snow in excess of one inch (1.00”).
2. Adverse weather may include, if appropriate, “dry-out” or “mud” days when all of the following are met:
  - a. For rain above the Standard Baseline.
  - b. Only if there is a hindrance to site access or site work, such as excavation, backfill and footings.
  - c. At a rate no greater than one make-up day for each day or consecutive days of rain beyond the Standard Baseline that total 1.0 inch or more, liquid measure, unless specifically recommended otherwise by the KCDC.
3. A weather delay day occurs only if adverse weather prevents work on the project for 50 percent or more of the supplier’s scheduled workday, including a weekend day or holiday if the supplier has scheduled construction activity that day.

d. Documentation and Submittals

1. Submit Daily Jobsite Work Log showing which and to what extent activities were affected by weather on a monthly basis.
2. Submit actual weather data to support a claim for the time extension obtained from nearest NOAA weather station or other independently verified source approved by the KCDC at the beginning of the project.
3. Maintain a rain gauge, thermometer and clock at the jobsite. Keep daily records of precipitation, temperature and the time of each occurrence throughout the project.
4. Use the Standard Baseline data provided in this section when documenting actual delays due to weather in excess of the average.
5. Organize claim documentation on calendar month periods and submit in accordance with the procedures for claims established by the KCDC.

e. Approval by KCDC

1. If the extension of the contract time is appropriate, it will occur in accordance with the provisions of this solicitation.
2. KCDC shall not incur extra costs for any extra time increase to the contract.

## Scope of Work

**AUSTIN HOMES - INFRASTRUCTURE IMPROVEMENTS  
TECHNICAL SPECIFICATIONS**

**Prepared For:**

**KNOXVILLE'S COMMUNITY DEVELOPMENT CORPORATION**

**Prepared By:**

**CIVIL & ENVIRONMENTAL CONSULTANTS, INC.  
KNOXVILLE, TN**

**CEC Project 194-594.0004**

**FEBRUARY 2020**



**Civil & Environmental Consultants, Inc.**

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## SECTION 01 10 00 - SUMMARY

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.02 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Austin Homes Infrastructure Improvements

- 1. Project Location: Intersection of Summit Hill Drive and Martin Luther King Boulevard

- B. Owner: Knoxville's Community Development Corporation

- C. Owner's Representative:

- 1. Partners Development

- 2. An Owner's Representative has been engaged by the Owner for this Project to serve as an advisor to the Owner and to provide assistance in administering the Contract for Construction between Owner and Contractor, according to a separate contract between Owner and Owner's Representative.

- D. Engineer: Civil & Environmental Consultants, Inc.

- E. The Work consists of the following:

The removal of existing storm drainage systems and utility infrastructure. The installation of approximately 77,000 square feet of roadway and associated curb and gutter, striping, and signage. The installation of approximately 37,000 square feet of sidewalk and the installation of approximately 3,700 linear feet of storm drainage piping, associated structures, and 6 water quality units. The installation of approximately 2,300 linear feet of gravity sanitary sewer and the installation of approximately 3,000 linear feet of water line. Mass grading of the entire site and installation and maintenance of erosion controls as well as the installation of right-of-way landscaping and site lighting.

- F. This project includes an allowance for the import of engineered fill material, the excavation and disposal of unsuitable onsite materials, and the installation of a geogrid system as described below. Contractor shall include these allowance quantities in the cost of the work.

- 1. 184,000 cubic yards (CY) of imported engineered fill
  - 2. 108,000 cubic yards (CY) of excavated unsuitable onsite material to be disposed offsite.
  - 3. 52,000 square yards (SY) of medium weight, high-density polyethylene (HDPE) geogrid.
  - 4. 53,600 tons of crusher run (2-ft thickness) to be installed in all areas where geogrid is to be installed.

#### 1.03 TYPE OF CONTRACTS

- A. The project will be constructed under a single prime contract.

- B. The Owner reserves the right to perform selected work under separate contracts.

#### 1.4 USE OF PREMISES

- A. General: Contractor shall have full use of the premises for construction operations during construction period. Contractor's use of the site will be limited to areas designated. Contractor's use of premises and the designated site is limited only by Owner's right to perform work or to retain other contractors on portions of the project. Contractor shall coordinate use of the site with the owner

#### 1.05 WORK UNDER OTHER CONTRACTS

- A. Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.
- B. Preceding Work: There is no proceeding work as part of this contract.
- C. Future Work: The Owner reserves the right to perform certain aspects of the work under separate contract, including but not limited to the following:
  - 1. Tree planting
  - 2. Miscellaneous utility work

#### 1.06 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "MasterFormat" numbering system.
  - 1. Section Identification: The Specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
  - 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
    - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

END OF SECTION 01 10 00

## SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

### PART 1 – GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General project coordination procedures.
2. Conservation.
3. Project meetings.

- B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Section 01 77 00 - Closeout Procedures for coordinating Contract closeout.

#### 1.03 PROJECT MANAGEMENT AND COORDINATION

- A. Coordination: Coordinate construction operations included indifferent Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Be fully responsible for coordinating actual installed location and interface of Work.
3. Make adequate provisions to accommodate items scheduled for later installation.

#### 1.04 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at the Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Owner's Representative of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including the Owner and Owner's Representative, within three days of the meeting.

- B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Owner's Representative but no later than 15 days after execution

of the Agreement. Hold the conference at Project site. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Owner's Representative, Contractor, Contractor's superintendent, major subcontractors, and other concerned parties shall attend the conference.
2. Agenda: Discuss items of significance that could affect progress, including the following:
  - a. Tentative construction schedule.
  - b. Phasing.
  - c. Critical work sequencing.
  - d. Designation of responsible personnel.
  - e. Procedures for processing field decisions and Change Orders.
  - f. Procedures for processing Applications for Payment.
  - g. Distribution of the Contract Documents.
  - h. Submittal schedule & procedures.
  - i. Preparation of Record Documents.
  - j. Use of the premises.
  - k. Responsibility for temporary facilities and controls.
  - l. Parking availability.
  - m. Office, work, and storage areas.
  - n. Equipment deliveries and priorities.
  - o. First aid.
  - p. Security.
  - q. Progress cleaning.
  - r. Working hours.

C. Progress Meetings: Conduct progress meetings monthly, at a minimum. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Owner, Owner's Representative, and Contractor, Contractor's superintendent, each subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
  - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how work behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
  - b. Submittals: Status of submittal log.
  - c. Requests for Information (RFI's): review status of RFI log.
  - d. Change Orders: review status of Change Orders, submitted and anticipated.
  - e. Pay Applications: on a monthly basis, review line item request.

- f. Review present and future needs of each entity present, including the following:
  - 1) Interface requirements.
  - 2) Sequence of operations.
  - 3) Deliveries.
  - 4) Off-site fabrication.
  - 5) Access.
  - 6) Site utilization.
  - 7) Temporary facilities and controls.
  - 8) Work hours.
  - 9) Hazards and risks.
  - 10) Progress cleaning.
  - 11) Quality and work standards.
  - 12) Documentation of information for payment requests.
  
- 3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
  - a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

## SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.

#### 1.03 USE CHARGES

- A. General: Cost for the installation of temporary facilities are not chargeable to Owner or Owner's Representative and shall be included in the Contract Sum. Usage fees shall be paid by the Contractor. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:
  - 1. Owner's construction forces.
  - 2. Owner's Representative.
  - 3. Testing agencies.
  - 4. Personnel of authorities having jurisdiction.
- B. Water Service: Water is available on site. Arrange for temporary connection, and pay applicable installation and usage fees and costs.
- C. Electric Power Service: Power is available on site. Arrange for temporary connection, and pay applicable installation and usage fees and costs.

#### 1.04 QUALITY ASSURANCE

- A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
  - 1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
  - 2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

#### 1.05 PROJECT CONDITIONS

- A. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
  - 1. Keep temporary services and facilities clean and neat.
  - 2. Relocate temporary services and facilities as required by progress of the Work.
- B. Maintain water for fire and pollution control as required by regulating agencies having jurisdiction.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Owner's Representative. Provide materials suitable for use intended.
- B. Water: Potable.

### 2.03 EQUIPMENT

- A. General: Provide equipment suitable for use intended.
- B. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.
  - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
- C. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- F. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.
- G. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

## PART 3 - EXECUTION

### 3.01 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required. Obtain approval of the location from the Owner's Representative prior to any installation.
- B. Do not remove until facilities are no longer needed.

### 3.02 TEMPORARY UTILITY INSTALLATION

- A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
  - 1. Arrange with the utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
  3. Obtain easements to bring temporary utilities to Project site where Owner's easements cannot be used for that purpose.
- B. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain an adequate supply. Provide covered waste containers for the disposal of used material.
  2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy.
  3. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel who handle materials that require wash up. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.
  4. Drinking-Water Facilities: Provide potable drinking water in dispensers with cups.
- D. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear.
- E. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.
1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
  2. Provide warning signs at power outlets other than 110 to 120 V.
  3. Provide metal conduit, tubing, or metallic cable for wiring exposed to possible damage. Provide rigid steel conduits for wiring exposed on grades, floors, decks, or other traffic areas.
  4. Provide metal conduit enclosures or boxes for wiring devices.
  5. Provide 4-gang outlets, spaced so 100-foot extension cord can reach each area for power hand tools and task lighting. Provide a separate 125-V ac, 20-A circuit for each outlet.

### 3.03 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:

1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access, and where approved by Owner's Representative.
  2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion.
- B. Dewatering Facilities and Drains: Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in accordance with SWPP Plans and that will not result in flooding Project or adjoining property nor endanger permanent Work or temporary facilities.
- C. Project Identification and Temporary Signs: Project signs will be provided by Owner's Representative. Do not permit installation of unauthorized signs.
1. No other free standing signs shall be allowed.
  2. Signage on trucks, job trailer, and material trailers shall be permitted.
- D. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Section 01700 - Execution Requirements for progress cleaning requirements.
- E. Field Office, Contractor:
1. Locate field office as approved by the Owner's Representative.
  2. Furnish and equip office.
- G. Lifts and Hoists: Provide facilities for hoisting materials and personnel. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

#### 3.04 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and filed SWPP Plan, and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near Project site.
- B. Stormwater Control: Provide controls as indicated on the Storm Water Pollution Prevention Plan (SWPPP).
- C. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from construction damage. Protect tree root systems from damage, flooding, and erosion.
- D. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting

structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.

- E. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
  - 1. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposure areas.
  - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
  - 3. Develop and supervise an overall fire-prevention and first-aid fire-protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

### 3.05 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended or no later than Substantial Completion. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  - 1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.
  - 3. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

END OF SECTION 01 50 00

## SECTION 01 60 00 - PRODUCT REQUIREMENTS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section includes the following administrative and procedural requirements: selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. Related Sections include the following:
  - 1. Section 01 77 00 - Closeout Procedures for submitting warranties for contract closeout.
  - 2. Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.

#### 1.03 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.
- D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
- E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

#### 1.04 SUBMITTALS

- A. Substitution Requests: Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Documentation: Show compliance with requirements for substitutions.
  - 2. Owner's Representative's Action: If necessary, will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Owner's Representative will

notify Contractor of acceptance or rejection of proposed substitution within 10 working days of receipt of request, or 5 working days of receipt of additional information or documentation, whichever is later.

- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.

#### 1.05 QUALITY ASSURANCE

- A. Compatibility of Options: If the Contractor is given the option of selecting between two or more products for use on the Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

#### 1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
- B. Storage: Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

#### 1.07 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents.
- B. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

### PART 2 - PRODUCTS

#### 2.01 PRODUCT OPTIONS

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged, and unless otherwise indicated, that are new at time of installation.

#### 2.02 COMPARABLE PRODUCTS

- A. Where products or manufacturers are specified by name, submit evidence of equivalence, in addition to other required submittals, to obtain approval of an unnamed product.

### PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

## SECTION 01 70 00 - EXECUTION REQUIREMENTS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. General installation of products.
  - 3. Progress cleaning.
  - 4. Protection of installed construction.
  - 5. Correction of the Work.

### PART 2 - PRODUCTS (Not Used)

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical utilities and other construction affecting the Work.
- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

#### 3.02 PREPARATION

- A. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
  - 1. Notify Development Manager not less than seven days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without Development Manager's written permission.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

### 3.03 FIELD ENGINEERING

- A. Identification: The Contractor is responsible for working within property boundaries and locating property lines as necessary to determine limits of the work.
- B. Benchmarks: Benchmarks will be established by the Owner's representative.

### 3.04 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Installed Work: Keep installed work clean. Clean installed surfaces using cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- D. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- E. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### 3.05 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

END OF SECTION 01 70 00

## SECTION 01 77 00 - CLOSEOUT PROCEDURES

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
1. Inspection procedures.
  2. Project record documents.

#### 1.03 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining the date of Substantial Completion, complete the following. List items below that are incomplete in request.
1. Advise the Owner of pending insurance changeover requirements.
  2. Submit specific warranties, final certifications, and similar documents.
  3. Obtain and submit releases permitting the Owner unrestricted use of the Work and access to services and utilities. Include certificate of completion, government releases, and similar releases.
  4. Prepare and submit Project Record Documents, damage or settlement surveys, and similar final record information.
  5. Terminate and remove temporary facilities from the Project site, along with mockups, construction tools, and similar elements.
  6. Submit changeover information related to the Owner's occupancy, use, operation, and maintenance.
  7. Complete final clean-up requirements.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of the request, the Owner's Representative will either proceed with inspection or notify the Contractor of unfulfilled requirements. The Owner's Representative will prepare the Certificate of Substantial Completion after inspection or will notify the Contractor of items, either on the Contractor's list or additional items identified, that must be completed or corrected before certificate will be issued.

#### 1.04 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
  2. Submit any additional documentation required by the Owner.

3. Submit copy of Owner's Representative's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Owner's Representative. The copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  4. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of a request, the Owner's Representative will either proceed with inspection or notify the Contractor of the unfulfilled requirements. The Owner's Representative will prepare a final Certificate for Payment after inspection or will notify the Contractor of construction that must be completed or corrected before the certificate will be issued.

#### 1.05 PROJECT RECORD DOCUMENTS

- A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for the Owner's Representative's reference during normal working hours.
- B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
1. Mark Record Prints to show the actual installation or cut-off where installation or cut-off varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
  2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
  3. Mark important additional information that was either shown schematically or omitted from the original Drawings.
  4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
  5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on the cover sheets.
- C. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections. Bind or file miscellaneous records and identify each for continued use and reference. Included, but not limited to:
1. Land fill tickets
  2. Certified payrolls
  3. Waiver of Liens
  4. Certification of employment and labor payroll documentation for employees hired from the housing development and/or within city limits.
  5. Certificates of Completion from City Building Officials.

## 1.06 WARRANTIES

- A. Submittal Time: Submit written warranties on the request of the Owner's Representative for designated portions of the Work where the commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

## PART 3 - EXECUTION

### 3.01 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning:
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
    - a. Clean the Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    - d. Remove tools, construction equipment, machinery, and surplus material from the Project site.
    - e. Leave Project clean and ready for occupancy.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01 77 00

## SECTION 310000 - EARTHWORK

### PART 1 - GENERAL

#### 1.01 SECTION INCLUDES

- A. Protection, modification, or installation of utilities as sitework progresses with particular attention to grade changes and necessary staging or phasing of work.
- B. Cutting, filling, and grading to required lines, dimensions, contours, and elevations for proposed improvements.
- C. Scarifying, compacting, drying, dewatering and removal of unsuitable material to ensure proper preparation of areas for fills or proposed improvements.

#### 1.02 RELATED SECTIONS

- A. Section 312300 – Excavation, Backfill, and Compaction for Structures.
- B. Section 312313 – Excavation, Backfill, and Compaction for Pavement.
- C. Section 321123 – Aggregate Materials
- D. Section 312513 – Slope Protection and Erosion Control
- E. The “Foundation Subsurface Preparation” as shown on the Construction Drawings and/or the Architectural-Structural drawings and/or the “Report of Subsurface Exploration”, whichever is more stringent if a conflict exists.
- F. Construction Drawings and Report of Subsurface Exploration.

#### 1.03 REFERENCE STANDARDS

- A. American Society for testing and Materials (ASTM) latest edition.
  - 1. D 698 Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>2</sup>) (600 kN.m/m<sup>2</sup>).
  - 2. (600 kN.m/m<sup>2</sup>).
  - 3. D 1556 Density and Unit Weight of Soil In Place by the Sand-Cone Method.
  - 4. D 1557 Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>2</sup>) (2,700 Kn.m/m<sup>2</sup>).
  - 5. D 2167 Density and Unit Weight of Soil In Place by the Rubber Balloon Method.
  - 6. D 2216 Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures.
  - 7. D 2487 Classification of Soils for Engineering Purposes.
  - 8. D 2922 Density of Soil and Soil-Aggregate In Place by Nuclear Methods (Shallow Depth).
  - 9. D 3017 Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
  - 10. D 4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- B. American Association of State Highway and Transportation Officials (AASHTO) latest edition.

1. T 88 Particle Size Analysis of Soils.

1.04 QUALITY ASSURANCE

- A. An independent testing laboratory, selected and paid for by Contractor, shall be retained to perform construction testing on site.
  - 1. The independent testing laboratory shall prepare test reports that indicate test location, elevation data, and test results. Owner, Civil Engineering Consultant, and Contractor shall be provided with copies of reports within 96 hours of time that test was performed. In event that test performed fails to meet Specifications, Owner and Contractor shall be notified immediately by the independent testing laboratory.
  - 2. Costs related to retesting due to failures shall be paid for by the Contractor at no additional expense to Owner. Contractor shall provide free access to site for testing activities.

1.05 SUBMITTALS

- A. Submit 100-pound sample of each type of off-site fill material that is to be used at the site in air tight container(s) for the independent testing laboratory or submit gradation and certification of aggregate material that is to be used at the site to the independent testing laboratory for review.
- B. Submit name of each material supplier and specific type and source of each material. Change in source throughout project requires approval of Engineer
- C. If fabrics or geogrids are to be used, design shall be submitted for approval to Engineer
- D. Submit Dewatering Plans upon request by Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Excavated and re-used material for subsoil fill as specified herein.
- B. Aggregate fill as specified in Section 321100.
- C. Imported fill material approved by Geotechnical Engineer and specified herein.

2.02 EQUIPMENT

- A. Transport off-site materials to project using well-maintained and operating vehicles. Once on site, transporting vehicles shall stay on designated haul roads and shall at no time endanger improvements by rutting, overloading, or pumping.

2.03 SOURCE QUALITY CONTROL

- A. In areas to receive pavement, California Bearing Ratio (CBR) or Limerock Bearing Ratio (LBR) test shall be performed for each type of material that is imported from off-site.

- B. Following tests shall be performed as part of construction testing requirements on each type of on-site or imported soil material used as compacted fill:
  - 1. Moisture and Density Relationship: ASTM D 698 (or ASTM D 1557).
  - 2. Mechanical Analysis: AASHTO T 88.
  - 3. Plasticity Index: ASTM D 4318.

## PART 3 - EXECUTION

### 3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Locate and identify existing utilities that are to remain and protect from damage.
- C. Notify utility companies to remove or relocate utilities that are in conflict with proposed improvements.
- D. Protect plant life, lawns, fences, existing structures, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- E. Protect bechmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by licensed land surveyor and replaced, as necessary, by same.
- F. Remove from site, material encountered in grading operations that, in opinion of the Geotechnical Engineer, is unsuitable or undesirable for backfilling, subgrade, or foundation purposes. Dispose of in a legal manner. Backfill areas with layers of suitable material and compact as specified herein.
- G. Prior to placing fill in low areas, such as previously existing creeks, ponds, or lakes, perform following procedures:
  - 1. Drain water out by gravity with ditch having flow line lower than lowest elevation in low area. If drainage cannot be performed by gravity ditch, use adequate pump to obtain the same results.
  - 2. After drainage of low area is complete, remove mulch, mud, debris, and other unsuitable material by using acceptable equipment and methods that will keep natural soils underlying low areas dry and undisturbed.
  - 3. If proposed for fill, muck, mud, and other materials removed from low areas shall be dried on-site by spreading in thin layers for observation by Geotechnical Engineer. Material shall be inspected and, if found to be suitable for use as fill material, shall be incorporated into lowest elevation of site filling operation, but not under building subgrade or within 10'-0" of perimeter of building subgrade, retaining wall subgrade or paving subgrade. If, after observation by Geotechnical Engineer, material is found to be unsuitable, unsuitable material shall be removed from site.
- H. Dewatering:
  - 1. General:
    - a. Design and provide dewatering system using accepted and professional methods consistent with current industry practice to eliminate water entering the excavation under hydrostatic head from the bottom and/or sides. Design system to prevent

differential hydrostatic head which would result in floating out soil particles in a manner termed as a “quick” or “boiling” condition. System shall not be dependent solely upon sumps and/or pumping water from within the excavation where differential head would result in a quick condition, which would continue to worsen the integrity of the excavation’s stability.

- b. Provide dewatering system of sufficient size and capacity to prevent ground and surface water flow into the excavation and to allow all Work to be installed in a dry condition.
  - c. Control, by acceptable means, all water regardless of source and be fully responsible for disposal of the water.
  - d. Confine discharge piping and/or ditches to available easement or to additional easement obtained by Contractor. Provide necessary permits and/or additional easement at no additional cost to Owner.
  - e. Control groundwater in a manner that preserves strength of foundation soils, does not cause instability or raveling of excavation slopes, and does not result in damage to existing structures. Where necessary to these purposes, lower water level in advance of excavation, utilizing wells, wellpoints, jet educators, or similar positive methods. The water level as measured by piezometers shall be maintained a minimum of 3 feet below prevailing excavation level.
  - f. Commence dewatering prior to any appearance of water in excavation and continue until Work is complete to the extent that no damage results from hydrostatic pressure, flotation, or other causes.
  - g. Open pumping with sumps and ditches shall be allowed, provided it does not result in boils, loss of fines, softening of the ground, or instability of slopes.
  - h. Install wells and/or wellpoints, if required, with suitable screens and filters, so that continuous pumping of fines does not occur. Arrange discharge to facilitate collection of samples by the Owner. During normal pumping, and upon development of well(s), levels of fine sand or silt in the discharge water shall not exceed 5 ppm. Install sand tester on discharge of each pump during testing to verify that levels are not exceeded.
  - i. Control grading around excavations to prevent surface water from flowing into excavation areas.
  - j. No additional payment will be made for any supplemental measures to control seepage, groundwater, or artesian head.
2. Design:
- a. Contractor shall designate and obtain the services of a qualified dewatering specialist to provide dewatering plan as may be necessary to complete the Work.
  - b. Contractor shall be responsible for the accuracy of the drawings, design data, and operational records required.
  - c. Contractor shall be solely responsible for the design, installation, operation, maintenance, and any failure of any component of the system.
3. Damages:
- a. Contractor shall be responsible for and shall repair without cost to the Owner any damage to work in place, or other contractor’s equipment, utilities, residences, highways, roads, railroads, private and municipal well systems, adjacent structures, natural resources, habitat, existing wells, and the excavation, including, damage to the bottom due to heave and including but not limited to, removal and pumping out of the excavated area that may result from Contractor’s negligence, inadequate or improper design and operation of the dewatering system, and any mechanical or electrical failure of the dewatering system.
  - b. Remove subgrade materials rendered unsuitable by excessive wetting and replace with approved backfill material at no additional cost to the Owner.
4. Maintaining Excavation in Dewatering Condition:

- a. Dewatering shall be a continuous operation. Interruptions due to power outages or any other reason will not be permitted.
  - b. Continuously maintain excavation in a dry condition with positive dewatering methods during preparation of subgrade, installation of pipe, and construction of structures until the critical period of construction and/or backfill is completed to prevent damage of subgrade support, piping, structure, side slopes, or adjacent facilities from flotation or other hydrostatic pressure imbalance.
  - c. Provide standby equipment on site, installed, wired, and available for immediate operation if required to maintain dewatering on a continuous basis in the event any part of the system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, perform such work as may be required to restore damaged structures and foundation soils at no additional cost to Owner.
  - d. System maintenance shall include but not be limited to 24-hour supervision by personnel skilled in the operation, maintenance, and replacement of system components and any other work required to maintain excavation in dewatered condition.
5. System Removal:
- a. Remove dewatering equipment from the site, including related temporary electrical service.
  - b. Wells shall be removed or cut off a minimum of 3 feet below final ground surface, capped, and abandoned in accordance with regulations by agencies having jurisdiction.

### 3.02 EXCAVATION FOR FILLING AND GRADING

- A. Classification of Excavation: Contractor acknowledges that site has been investigated to determine type, quantity, quality, and character of excavation work to be performed. Excavation shall be considered classified per Solicitation Document A.
- B. When performing grading operations during periods of wet weather, provide adequate dewatering, drainage and ground water management to control moisture of soils.
- C. Shore, brace, and drain excavations as necessary to maintain excavation as safe, secure, and free of water at all times.
- D. Excavated material containing rock or stone greater than 6-inches in largest dimension is unacceptable as fill within proposed building subgrade and paving subgrade.
- E. Rock or stone less than 6-inches in largest dimension is acceptable as fill to within 24-inches of surface of proposed subgrade when mixed with suitable material.
- F. Rock or stone less than 2-inches in largest dimension and mixed with suitable material is acceptable as fill within the upper 24-inches of proposed subgrade.
- G. If excavated on-site materials exhibit visual, olfactory, or other similar sensory evidence of environmental impact (i.e. staining, odor, unusual debris, etc.), discontinue excavation in the area and notify the Engineer.

### 3.03 FILLING AND SUBGRADE PREPARATION

- A. Fill areas to contours and elevations shown on Construction Drawings with unfrozen materials.
- B. Place fill in continuous lifts specified in Geotechnical Report.
- C. Refer to Section 312300 and Geotechnical Report for filling requirements for structures.
- D. Refer to Section 312313 and Geotechnical Report for filling requirements for pavements.
- E. Areas exposed by excavation or stripping and on which subgrade preparations are to be performed shall be scarified to minimum depth of 8-inches and compacted as per the geotechnical report included herein.
- F. Fill materials used in preparation of subgrade shall be placed as per the geotechnical report included herein.
- G. Material imported from off-site shall have CBR value equal to or above pavement design subgrade CBR value indicated in the geotechnical report.

### 3.04 MAINTENANCE OF SUBGRADE

- A. Verify finished subgrades to ensure proper elevation and conditions for construction above subgrade.
- B. Protect subgrade from excessive wheel loading during construction, including concrete trucks, dump trucks, and other construction equipment.
- C. Remove areas of finished subgrade found to have insufficient compaction density to depth necessary and replace in manner that will comply with compaction requirements by use of material equal to or better than best subgrade material on site. Surface of subgrade after compaction shall be hard, uniform, smooth, stable, and true to grade and cross-section.

### 3.05 BORROW AND SPOIL SITES

- A. Contractor shall be responsible for compliance with NPDES and local erosion control permitting requirements for any and all off-site, disturbed spoil and borrow areas. Upon completion of spoil and/or borrow operations, clean up spoil and/or borrow areas in a neat and reasonable manner to the satisfaction of property owner, Owner, and Civil Engineering Consultant.

### 3.06 RIP-RAP

- A. This work shall consist of furnishing and setting or placing rubble stone, crushed stone, concrete blocks, sacked sand-cement or machined rip-rap. Slope pavement shall consist of the construction of a reinforced concrete mat on prepared slopes. Construction shall be in reasonable close conformity to the lines, grades, dimensions, typical details and sizes shown on the drawings or as directed by the Engineer.
- B. All materials used in this construction, in addition to the general requirements of these Specifications, unless otherwise stipulated, shall conform to the following:

- C. Rip-rap and slope pavement shall conform to Subsection 709 of the Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction, 1981 or latest revisions.

### 3.07 FINISH GRADING

- A. Grade areas where finish grade elevations or contours are indicated on Construction Drawings, other than paved areas and buildings, including excavated areas, filled and transition areas, and landscaped areas. Graded areas shall be uniform and smooth, free from rock, debris, or irregular surface changes. Finished subgrade surface shall not be more than 0.10-feet above or below established finished subgrade elevation. Ground surfaces shall vary uniformly between indicated elevations. Grade finished ditches to allow for proper drainage without ponding and in manner that will minimize erosion potential.
- B. Correct settled and eroded areas within 1 year after date of completion at no additional expense to Owner. Bring grades to proper elevation. Replant or replace grass, shrubs, bushes, or other vegetation that appears dead, dying, or disturbed by construction activities. Refer to Section 312513 for slope protection and erosion control.

### 3.08 FIELD QUALITY CONTROL

- A. Field density tests for in-place materials shall be performed as part of construction testing requirements according to one of the following standards:
  - 1. Sand-Cone Method: ASTM D 1556.
  - 2. Balloon Method: ASTM D 2167.
  - 3. Nuclear Method: ASTM D 2922 (Method B-Direct Transmission).
- B. Perform density test as follows:
  - 1. Building Subgrade Areas, Including 10'-0" Outside of Exterior Building Lines: In cut areas, not less than 1 compaction test for every 2,500 sq. ft. In fill areas, same rate of testing for each 6-inch lift, measured loose.
  - 2. Areas of Construction Exclusive of Building Subgrade Areas: In cut areas, not less than 1 compaction test for every 10,000 sq. ft. In fill areas, same rate of testing for each 6-inch lift, measured loose.
- C. Corrective measures for non-complying compaction:
  - 1. Remove and recompact deficient areas until proper compaction is obtained at no additional expense to Owner.

END OF SECTION

## SECTION 31 10 00 - SITE CLEARING

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section includes the following:

1. Protecting existing trees and vegetation to remain.
2. Removing trees and other vegetation.
3. Clearing and grubbing.
4. Topsoil stripping.
5. Removing above-grade site improvements.

- B. Related Sections include the following:

1. Section 01 50 00 - "Facilities and Controls".

#### 1.03 DEFINITIONS

- A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of weeds, roots, and other deleterious materials.

#### 1.04 MATERIALS OWNERSHIP

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

#### 1.05 SUBMITTALS

- A. Record drawings according to Division 1 Section "Contract Closeout."

1. Identify and accurately locate capped utilities and other subsurface structural, electrical, and mechanical conditions.

#### 1.06 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

3. Maintain designated site access for vehicular and pedestrian traffic.
- B. Salvable Improvements: Carefully remove items indicated to be salvaged and store on the Owner's premises where indicated.
- C. Notify the utility locator service for the area where the Project is located before site clearing.
- D. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place and all appropriate inspections and certifications by the Engineer and City of Knoxville have been completed.

## PART 2 - PRODUCTS

### 2.01 SOIL MATERIALS

- A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 02300 Section "Earth Work."
  1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available onsite.

## PART 3 - EXECUTION

### 3.01 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Locate and clearly flag trees and vegetation, utilities, and features designated to remain or to be relocated.
- D. Protect existing site improvements to remain from damage during construction.
  1. Restore damaged improvements to their original condition, as acceptable to Owner.

### 3.02 TREE PROTECTION

- A. Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.
  1. Do not store construction materials, debris, or excavated material within drip line of remaining trees.
  2. Do not permit vehicles, equipment, or foot traffic within drip line of remaining trees.
- B. Do not excavate within drip line of trees, unless otherwise indicated.
- C. Where excavation is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

### 3.03 UTILITIES

- A. All public utilities to be located and marked. All utilities to be abandoned or removed shall be conducted in a manner that complies with the demolition drawing sheets, details, and notes.
- B. Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
  - 1. Notify Owner's Representative not less than two days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without Owner's Representative's written permission.

### 3.04 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, grass, and other vegetation, unless noted otherwise on Drawings. Removal includes digging out stumps and obstructions and grubbing roots.
  - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
  - 2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct work.
  - 3. Completely remove stumps, roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
  - 4. Use only hand methods for grubbing within drip line of remaining trees.
- B. Burning of debris on site shall not be permitted.
- C. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
  - 1. Place fill material in horizontal layers not exceeding 8-inch loose depth, and compact each layer to a density equal to adjacent original ground.

### 3.05 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
  - 1. Strip surface soil of unsuitable topsoil, including trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 1. Do not stockpile topsoil within drip line of remaining trees.
  - 2. Dispose of excess topsoil as specified for waste material disposal.
  - 3. Stockpile surplus topsoil and allow for re-spreading deeper topsoil.

3.06 DISPOSAL

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

END OF SECTION 31 10 00

## SECTION 321100-PAVING BASE COARSE

### PART 1 – GENERAL

#### 1.1 SECTION INCLUDES

- A. Construction of granular base for asphaltic concrete and Portland cement concrete paving.
- B. Construction of sand/shell base for asphaltic concrete and Portland cement concrete paving.
- C. Construction of full depth asphalt base for asphaltic concrete paving.
- D. Construction hot-mix sand asphalt base for asphaltic concrete paving.
- E. Construction of soil cement stabilized base for asphaltic concrete and Portland cement concrete paving.

#### 1.2 RELATED SECTIONS

- A. Section 310000 – Earthwork
- B. Section 312313 – Excavation, Backfill, and Compaction for Pavement
- C. Section 321123 – Aggregate Materials
- D. Section 321600 – Curbs and Sidewalks
- E. State Highway Department Standard Specifications
- F. Construction Drawings

#### 1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM) latest edition.
  - 1. D 698 Laboratory Compaction Characteristics of Soil Using Standard Effort. (12,400 ft-lbf/ft<sup>2</sup>) (600 kN.m/m<sup>2</sup>)
  - 2. D 1556 Density and Unit Weight of Soil In Place by the Sand-Cone Method.
  - 3. D 1557 Laboratory Compaction Characteristics of Soil Using Modified Effort. (56,000 ft-lbf/ft<sup>2</sup>) (2,700 kN.m/m<sup>2</sup>)
  - 4. D 2167 Density and Unit Weight of Soil In Place by the Rubber Balloon Method.
  - 5. D 2216 Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures.
  - 6. D 2487 Classification of Soils for Engineering Purposes.
  - 7. D 2922 Density of Soil and Soil-Aggregate In Place by Nuclear Methods (Shallow Depth)
  - 8. D 3017 Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

9. D 4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

B. American Association of State Highway and Transportation Official (AASHTO) latest edition.

1. T88 Particle Size Analysis of Soils

#### 1.4 QUALITY ASSURANCE

A. An independent testing laboratory selected and paid by Contractor, will be retained to perform construction testing of in-place base course for compliance with requirements for thickness, compaction, density, and tolerances. Paving base course tolerances shall be verified by rod and level readings on not more than 50-foot centers to be not more than 0.05 feet above design elevation which will allow for paving thickness as shown on Construction Drawings. Contractor shall provide instruments and suitable benchmark. Contractor shall also ensure that all inspections and testing required by the City of Knoxville are completed.

### PART 2 – PRODUCTS

#### 2.1. FILL MATERIALS

A. Submit materials certificate to the independent testing laboratory which is signed by materials producer and Contractor, certifying that materials comply with, or exceed, requirements specified herein.

#### 2.2. SOURCE QUALITY CONTROL

A. Following test will be performed on each type of material used as base course material:

1. Moisture and Density Relationship: ASTM D 698 (or ASTM D 1557).

2. Mechanical Analysis: AASHTO T 88.

3. Plasticity Index: ASTM D 4318.

4. Base material thickness: Perform 1 test for each 20,000 sq. ft. of in-place base material area.

5. Base material compaction: Perform 1 test in each lift for each 20,000 sq. ft. of in-place base material area.

6. Test each source of base material for compliance with state highway department specifications.

### PART 3 – EXECUTION

#### 3.1 EXAMINATION

A. Contractor shall verify to the Owner in writing that the subgrade has been inspected, tested, and gradients and elevations are correct, dry, and properly prepared in accordance with the requirements of applicable state highway department specifications section(s) referred to or noted on the Construction Drawings.

### 3.2 CONSTRUCTION

- A. Construction shall meet or exceed requirements of this Section and applicable state highway department specifications section(s) referred to or noted on the Construction Drawings which pertain to aggregate base course design, materials, preparation, and execution. Materials shall be as indicated on Construction Drawings and shall comply with state highway department specifications regarding source, quality, gradation, liquid limit, plasticity index, and mix proportioning.

### 3.3 FIELD QUALITY CONTROL

- A. Field density tests for in-place materials shall be performed in accordance with one of following standards:
  - 1. Sand-Cone Method: ASTM D 1556.
  - 2. Balloon Method: ASTM D 2167.
  - 3. Nuclear Method: ASTM D 2922 (Method B-Direct Transmission).
- B. The independent testing laboratory will prepare reports that indicate test location, elevation data, and test results. Owner and Contractor shall be provided with copies of the reports within 96 hours of the time the test was performed. In the event that the test results show failure to meet any of the Specifications; Owner and Contractor will be notified immediately by the independent testing laboratory.
- C. Costs related to retesting due to failures shall be paid for by Contractor at no additional expense to Owner. Contractor shall provide free access to the site for testing activities.

END OF SECTION 321100

## SECTION 321123-AGGREGATE MATERIALS

### PART 1 – GENERAL

#### 1.1 SECTION INCLUDES

- A. Aggregate materials for use as specified in other sections.

#### 1.2 RELATED SECTIONS

- A. Section 310000 – Earthwork
- B. Section 312300 – Excavation, Backfill, and Compaction for Structures
- C. Section 312313 – Excavation, Backfill, and Compaction for Pavement
- D. Section 312513 – Slope Protection and Erosion Control
- E. Construction Drawings and Report of Subsurface Exploration

#### 1.3 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM) latest edition.
  - 1. D 698 Laboratory Compaction Characteristics of Soil Using Standard Effort. (12,400 ft-lbf/ft<sup>2</sup>)(600 kN.m/m<sup>2</sup>)
  - 2. D 1556 Density and Unit Weight of Soil In Place by the Sand-Cone Method.
  - 3. D 1557 Laboratory Compaction Characteristics of Soil Using Modified Effort. (56,000 ft-lbf/ft<sup>2</sup> ) (2,700 kN.m/m<sup>2</sup>)
  - 4. D 2167 Density and Unit Weight of Soil In Place by the Rubber Balloon Method.
  - 5. D 2216 Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures.
  - 6. D 2487 Classification of Soils for Engineering Purposes.
  - 7. D 2922 Density of Soil and Soil-Aggregate In Place by Nuclear Methods (Shallow Depth)
  - 8. D 3017 Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
  - 9. D 4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- B. American Association of State Highway and Transportation Officials (AASHTO) latest edition.
  - 1. TT 88 Particle Size Analysis of Soils

#### 1.4 QUALITY ASSURANCE

- A. Tests and analysis of aggregate materials will be performed in accordance with ASTM and AASHTO procedures specified herein.

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## 1.5 SUBMITTALS

- A. Submit 100-pound sample of each aggregate or mixture that is to be incorporated into project in air-tight containers to the independent testing laboratory or submit gradation and certification of aggregate material that is to be incorporated into project to the Engineer for review.
- B. Submit name of each material supplier and specific type and source of each material. Any change in source requires approval of Engineer.

## PART 2 – PRODUCTS

### 2.0 MATERIALS

- A. Construction and materials shall meet or exceed requirements of this Section and applicable state highway department specifications section(s) referred to or noted on the Construction Drawings which pertain to paving base course design, materials, preparation, and execution. Materials shall be as indicated on Construction Drawings and shall comply with state highway department specifications regarding source, quality, gradation, liquid limit, plasticity index, and mix proportioning.

### 2.1 EQUIPMENT

- A. Transport off-site materials to project using well-maintained and operating vehicles. Once on site, transporting vehicles shall stay on designated haul roads and shall at no time endanger any improvements by rutting, overloading, or pumping.

## PART 3 – EXECUTION

### 3.1 STOCKPILING

- A. Stockpile on-site at locations indicated by Owner in such manner that there will be no standing water or mixing with other materials.

### 3.2 BORROW AND SPOIL SITES

- A. Upon completion of borrow and/or soil operations, clean up borrow and/or soil areas as indicated on Construction Drawings in neat and reasonable manner to satisfaction of property owner and Owner.

END OF SECTION 32 11 23

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## SECTION 32 12 16-ASPHALT CONCRETE PAVING

### PART 1- GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

#### 1.2 DESCRIPTION OF WORK

- A. Extent of Asphalt concrete paving work is shown on the drawings.
- B. Clearing, earthwork and prepared aggregate subbase is specified in earthwork sections.

#### 1.3 SUBMITTALS

- A. Material Certificates: Provide copies of materials certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.

#### 1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with "Standard Specifications for Road and Bridge Construction" by the Tennessee Department of Transportation, latest edition, and with local governing regulations if more stringent than herein specified.

#### 1.5 JOB CONDITIONS

- A. Weather Limitations: Apply prime and tack coats when ambient temperature is above 50 degrees F. (10 degrees C.), and when temperature has not been below 35 degrees F. (1 degree C.) for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.
- B. Construct asphalt concrete surface course when atmospheric temperature is above 40 degrees F. (4 degrees C.) and when base is dry. Base course may be placed when air temperature is above 30 degrees F. (-1 degree C.) and rising.
- C. Grade Control: Establish and maintain required grades and elevations.

### PART TWO – PRODUCTS

#### 2.0 MATERIALS

- A. General: Use locally available materials and gradations, which exhibit a satisfactory record of previous installations.
- B. Materials shall meet or exceed requirements of this Section and applicable state highway department specifications section(s) referred to or noted on the Construction Drawings which pertain to paving design, materials, preparation, and execution. Materials shall be as indicated on Construction Drawings and shall comply with state highway department specifications regarding source, quality, gradation, liquid limit, plasticity index, and mix proportioning.

### PART THREE – EXECUTION

### 3.1 SURFACE PREPARATION

- A. Remove loose material from compacted subbase surface immediately before applying herbicide treatment or prime coat.
- B. Proof roll prepared subbase surface to check for unstable areas and areas requiring additional compaction.
- C. Notify General Contractor of unsatisfactory conditions. Do not begin paving work until deficient subbase areas have been corrected and are ready to receive paving.
- D. Herbicide Treatment: Apply chemical weed control agent in strict compliance with manufacturer's recommended dosages and application instructions. Apply to compacted, dry subbase prior to application of prime coat.
- E. Prime Coat: Apply as indicated on Construction Drawings, over compacted subgrade. Apply material to penetrate and seal, but not flood surface. Cure and dry as long as necessary to obtain penetration and evaporation of volatile gases.
- F. Tack Coat: Apply to contact surfaces of previously constructed asphalt or Portland cement concrete and surfaces abutting or projecting into asphalt concrete pavement. Distribute at a rate indicated on Construction Drawings. Allow to dry until at proper condition to receive paving.
- G. Exercise care in applying bituminous materials to avoid smearing of adjoining concrete surfaces. Remove and clean damaged surfaces.

### 3.2 PLACING MIX

- A. General: Place asphalt concrete mixture on prepared surface, spread and strike-off. Spread mixture at minimum temperature of 225 degrees F. (107 degrees C.). Place inaccessible and small areas by hand. Place each course to required grade, cross-section, and compacted thickness.
- B. Paving Placing: Place in strips not less than 10' wide, unless otherwise acceptable to Architect. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete base course for a section before placing surface course.
- C. Joints: Make joints between old and new pavement, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density and smoothness as other sections of asphalt concrete course. Clean compact surfaces and apply tack coat.

### 3.3 ROLLING

- A. General: Begin rolling when mixture will bear roller weight without excessive displacement.
- B. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
- C. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced area by loosening and filling, if required, with hot material.
- D. Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.

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- E. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained maximum density.
- F. Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut out such areas and fill with fresh, hot asphalt concrete. Compact by rolling to maximum surface density and smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

### 3.4 TRAFFIC AND LANE MARKINGS

- A. Cleaning: Sweep and clean surface to eliminate loose material and dust.
- B. Striping Use chlorinated rubber base traffic lane-marking paint, factory-mixed, quick drying, and non-bleeding. Color: White
- C. Do not apply traffic and lane-marking paint until layout and placement has been verified by the Owner or Owner's Representative.
- D. Apply paint with mechanical equipment to produce uniform straight edges. Apply in 2 coats at manufacturer's recommended rates.

### 3.5 FIELD QUALITY CONTROL

- A. General: Test in-place asphalt concrete courses for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable paving as directed by Engineer.
- B. Thickness: In-place compacted thickness will not be acceptable if exceeding following allowable variation from required thickness:
  - Base course:  $\frac{1}{2}$ " , plus or minus
  - Surface course:  $\frac{1}{4}$ " , plus or minus.
- C. Surface smoothness: Test finished surface of each asphalt concrete course for smoothness, using 10' straightedge applied parallel with, and at the right angles to center line of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness.
  - Base Course Surface:  $\frac{1}{4}$ "
  - Wearing Course Surface:  $\frac{3}{16}$ "
  - Crowned Surfaces: Test with crowned template centered and at right angle to crown.
  - Maximum allowable variance from template:  $\frac{1}{4}$ ".
- D. Check surface areas at intervals as directed by Engineer.

END OF SECTION 32 12 16

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## SECTION 321600-CURBS AND SIDEWALKS

### PART 1 – GENERAL

#### 1.1 SECTION INCLUDES

- A. Preparation and placement of combination Portland cement concrete curb and gutter.
- B. Preparation and placement of Portland cement concrete curb.
- C. Preparation and placement of Portland cement concrete sidewalk.

#### 1.2 RELATED SECTIONS

- A. Section 310000 – Earthwork
- B. Section 321123 – Aggregate Material.
- C. Cast-in-place Concrete (See Architectural/Building Specifications).
- D. State Highway Department Standard Specifications.
- E. Construction Drawings.

#### 1.3 REFERENCE STANDARDS

- A. American Concrete Institute (ACI) latest edition.
  - 1. 304R Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.
  - 2. 308 Standard Practice for Curing Concrete.
- B. American Society for Testing and Materials (ASTM) latest edition.
  - 1. A615 Deformed and Plain Billet-Steel for Concrete Reinforcement.
  - 2. C33 Concrete Aggregates.
  - 3. C94 Ready-Mixed Concrete.
  - 4. C150 Portland Cement.
  - 5. C260 Air-Entraining Admixtures for Concrete.
  - 6. C309 Liquid Membrane-Forming Compounds for Curing Concrete.
  - 7. C494 Chemical Admixtures for Concrete.
  - 8. D1751 Performed Expansion Joint Fillers for Concrete Paving and Structural Construction. (Nonextruding and Resilient Bituminous Types)
- C. FS TT-C-800 – Curing Compound, Concrete, for New and Existing Surfaces.

#### 1.4 QUALITY ASSURANCE

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- A. Establish and maintain required lines and elevations.
- B. Check surface areas at intervals necessary to eliminate ponding areas. Remove and replace unacceptable work as directed by Owner.

#### 1.5 SUBMITTALS

- A. Submit materials certificate to the independent testing laboratory which is signed by materials producer and Contractor, certifying that materials comply with, or exceed, requirements specified herein.

#### 1.6 PROJECT CONDITIONS

- A. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize temporary striping, flagmen, barricades, warning signs, and warning lights as required.

### PART 2 – PRODUCTS

#### 2.1 MATERIALS

- A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. Forms shall be of depth equal to depth of curbing or sidewalk, and so designed as to permit secure fastening together at tops. Coat forms with nonstaining type of coating that will not discolor or deface surface of concrete.
- B. Reinforcing Bars: Deformed steel bars, ASTM A 615, Grade 40.
- C. Concrete Materials: Comply with requirements of Section 033000 for concrete materials, admixtures, bonding materials, curing materials, and others as required.
- D. Joint Fillers: Resilient premolded bituminous impregnated fiberboard units complying with ASTM D 1751, FS HH-F-341, Type II, Class A.
- E. Joint Sealers: Non-priming, pourable, self-leveling polyurethane. Acceptable sealants are Sonneborn “Sonolastic Paving Joint Sealant, Sonneborn “Sonomeric CT 1 Sealant”, Sonneborn “Sonomeric CT 2 Sealant, Mameco “Vulken 245”, or Woodmont Products “Chem-Caulk”.

#### 2.2 MIX DESIGN AND TESTING

- A. Concrete mix design and testing shall comply with requirements of Section 03300.
- B. Design mix to produce normal weight concrete consisting of Portland cement, aggregate, water-reducing admixture, air-entraining admixture, and water to produce following:
  - 1. Compressive Strength: 4,000 psi, minimum at 28 days, unless otherwise indicated on Construction Drawings.
  - 2. Slump Range: 2 to 5 inches at time of placement.
  - 3. Air Entrainment: 5 to 8 percent.

### PART 3 – EXECUTION

### 3.1 PREPARATION

- A. Proofroll prepared base material surface to check for unstable areas. Begin paving work only after unsuitable areas have been corrected and are ready to receive paving.
- B. Remove loose material from compacted base material surface to produce firm, smooth surface immediately before placing concrete.

### 3.2 INSTALLATION

#### A. Form Construction:

- 1. Set forms to required grades and lines, rigidly braced and secured.
- 2. Install sufficient quantity of forms to allow continuance of work and so that forms remain in place a minimum of 24 hours after concrete placement.
- 3. Check completed formwork for grade and alignment to following tolerances:
  - a. Top of forms not more than 1/8-inch in 10'-0".
  - b. Vertical face of longitudinal axis, not more than 1/4-inch in 10'-0".
- 4. Clean forms after each use and coat with form release agent as often as required to ensure separation from concrete without damage.

#### B. Concrete Placement:

- 1. Place concrete in accordance with requirements of Section 033000.
- 2. Do not place concrete until base material and forms have been checked for line and grade. Moisten base material if required to provide uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until set at required finish elevation and alignment.
- 3. Place Concrete using methods which prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Consolidate with care to prevent dislocation of reinforcing, dowel, and joint devices.
- 4. Deposit and spread concrete in continuous operation between transverse joints, as far as possible, if interrupted for more than 1/2 hour, place construction joint. Automatic machine may be used for curb and gutter placement. Machine placement shall be at required cross section, line, grade, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete as specified herein.

#### C. Joint Construction:

- 1. Contraction Joints: Construct concrete curb or combination concrete curb and gutter, where specified on Construction Drawings, in uniform sections of length specified on Construction Drawings. Form joints between sections either by steel templates, 1/8-inch in thickness, of length equal to width of curb and gutter, and with depth which will penetrate at least 2-inches below surface of curb and gutter; or with 3/4-inch thick performed expansion joint filler cut to exact cross section of curb and gutter; or by sawing to depth of at least 2-inches while concrete is between 4 and 24 hours old. If steel templates are used, they shall be left in

place until concrete has set enough to hold its shape, but shall be removed while forms are still in place.

2. Longitudinal Construction Joints: Tie concrete curb or combination concrete curb and gutter, where specified on Construction Drawings, to concrete pavement with ½-inch round deformed reinforcement bars of length and spacing shown on Construction Drawings.
3. Transverse Expansion Joints: Concrete curb, combination concrete curb and gutter, or concrete sidewalk shall have filler cut to exact cross section of curb, gutter, or sidewalk. Joints shall be similar to type of expansion joint used in adjacent pavement.

D. Joint Filler: Extend joint fillers full-width and depth of joint, and not less than ½-inch or more than 1-inch below finished surface where joint sealer is indicated. Furnish joint fillers in 1-piece lengths for full width being placed, wherever possible. Where more than 1 length is required, lace or clip joint filler sections together.

E. Joints Sealants: Seal joints with approved exterior pavement joint sealants. Install in accordance with manufacturer's recommendations.

### 3.3 INSTALLATION PROCEDURES

A. The area to receive imprinted concrete shall have the sup-grade prepared as required as for any concrete slab on grade.

B. The formwork shall be installed in accordance with the drawings. The slab thickness shall be consistent with that of ordinary concrete slabs under the same conditions.

C. Provide reinforcement as specified.

D. Control joints and/or expansion joints shall be provided in accordance with the drawings and the guidelines established by the American Concrete Institute. As with any concrete slab, imprinted concrete usually contains construction joints, control joints and expansion joints. The contractor shall advise and work with the architect/engineer to determine the best location for these joints to minimize the visibility of the joints and to minimize unsightly cracking.

E. The concrete shall be placed and screeded to finished grade, and floated to a uniform surface using standard finishing techniques.

F. While the concrete is still in its plastic stage of set, the imprinting tools shall be applied to the surface.

G. Cure and Seal, or approved equal shall be applied in accordance with the manufacturer's recommendations immediately after the completing the imprinting process for

H. After the initial curing period the surface of the slab shall be sealed.

### 3.4 BACKFILL

- A. After concrete has set sufficiently, spaces on either side of concrete curb, combination concrete curb and gutter, or concrete sidewalk shall be refilled to required elevation with suitable material compacted in accordance with geotechnical report.

### 3.5 CLEANING AND ADJUSTING

- A. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just prior to final inspection.

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- B. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials.

END OF SECTION 32 12 1

## SECTION 32 17 23-PAVEMENT MARKINGS

### PART 1 – GENERAL

#### 1.1 SECTION INCLUDES

- A. Preparation and application of painted pavement markings.
- B. Preparation and application of paint on curbs, guard posts, and light pole bases.

#### 1.2 RELATED SECTIONS

- A. Section 310000 – Earthwork.
- B. Section 321100 – Paving Base Course.
- C. Section 321600 – Curbs and Sidewalks.
- D. Construction Drawings.

#### 1.3 REFERENCE STANDARDS

- A. FS TTP-85E

#### 1.4 PROJECT CONDITIONS

- A. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize flagmen, barricades, warning signs, and warning lights as required.

### PART 2 – PRODUCTS

#### 2.1 MATERIALS

- A. Paint shall be non-bleeding, quick-drying, alkyd petroleum base paint suitable for traffic-bearing surface and shall meet FS TTP-85E and be mixed in accordance with manufacturer's instructions before application.
- B. Performed pavement markings shall be Stamark Intersection Grade Tape Series A420 as manufactured by 3M Traffic Control Materials Division, or approved equal.

### PART 3 – EXECUTION

#### 3.1 PREPARATION

- A. Sweep and Clean surface to eliminate loose material and dust.
- B. Where existing pavement markings are indicated on Construction Drawings to be removed or would interfere with adhesion of new paint, a motorized abrasive device shall be used to remove the markings. Equipment employed shall not damage existing paving or create surfaces hazardous to vehicle or pedestrian traffic. Within public rights-of way, method of marking removal shall be approved by appropriate governing authority.

#### 3.2 APPLICATION

- A. Apply two coats of paint at manufacturer's recommended rate, without addition of thinner, with maximum 100 square feet per gallon. Apply with mechanical equipment to produce uniform straight edges. At sidewalk curbs and crosswalks, use straightedge to ensure uniform, clean, and straight stripe.
- B. Install pavement markings according to manufacturer's recommended procedures for the specified material.
- C. Following items shall be painted with colors noted below:
  - 1. Pedestrian Crosswalks: White
  - 2. Exterior Sidewalk Curbs, Light Pole Bases, and Guard posts: as selected by Owner.
  - 3. Fire Lanes: Red or per local code.
  - 4. Lane Striping where separating traffic moving in opposite directions: Yellow
  - 5. Lane Striping where separating traffic moving in the same direction: White
  - 6. Handicap Symbols: Blue or per local code
  - 7. Parking Stall Striping: White, unless otherwise noted on Construction Drawings
  - 8. Associate Parking Area: White, unless otherwise noted on Construction Drawings

END OF SECTION 32 17 23

## SECTION 33 11 00 - WATER DISTRIBUTION

### PART 1 - GENERAL

#### 1.1 LOCAL UTILITY SPECIFICATIONS

- A. The Contractor shall contact the local authorities to determine if Standard Specifications for Water Distribution are available from the Local Utility District. If Local Utility District specifications are available, the Contractor shall utilize them in lieu of the following specification.

#### 1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.3 SUMMARY

- A. This Section includes water-distribution piping and specialties outside the building for the following:
  - 1. Water services.
  - 2. Fire-service mains.
  - 3. Combined water service and fire-service mains.
- B. Utility-furnished products include water meters that will be furnished to the site, ready for installation.

#### 1.4 DEFINITIONS

- A. Combined Water Service and Fire-Service Main: Exterior water piping for both domestic-water and fire-suppression piping.
- B. Fire-Service Main: Exterior fire-suppression-water piping.
- C. Water Service: Exterior domestic-water piping.
- D. The following are industry abbreviations for plastic materials:
  - 1. PVC: Polyvinyl chloride plastic.

#### 1.5 SUBMITTALS

- A. Product Data: For the following:
  - 1. Piping specialties.

2. Valves and accessories.
3. Water meters and accessories when not provided by the utility company.
4. Fire hydrants.

## 1.6 QUALITY ASSURANCE

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of piping and specialties and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."
- B. Regulatory Requirements:
  1. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
  2. Comply with standards of authorities having jurisdiction for potable-water-service piping, including materials, installation, testing, and disinfection.
  3. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.
- C. Piping materials shall bear label, stamp, or other markings of specified testing agency.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Preparation for Transport: Prepare valves, including fire hydrants, according to the following:
  1. Ensure that valves are dry and internally protected against rust and corrosion.
  2. Protect valves against damage to threaded ends and flange faces.
  3. Set valves in best position for handling. Set valves closed to prevent rattling.
- B. During Storage: Use precautions for valves, including fire hydrants, according to the following:
  1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
  2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
- C. Handling: Use sling to handle valves and fire hydrants if size requires handling by crane or lift. Rig valves to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.
- D. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.

- F. Protect flanges, fittings, and specialties from moisture and dirt.
- G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

## 1.8 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
  - 1. Notify Architect not less than two days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without Architect's written permission.

## 1.9 COORDINATION

- A. Coordinate connection to water main with utility company.

## PART 2 - PRODUCTS

### 2.1 PIPING MATERIALS

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.

### 2.2 COPPER TUBE AND FITTINGS

- A. Soft Copper Tube: ASTM B 88, Type K, water tube, annealed temper.
  - 1. Copper Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.
- B. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end. Furnish Class 300 flanges if required to match piping.
- C. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.

### 2.3 PVC PIPE AND FITTINGS

- A. PVC, AWWA Pipe: AWWA C900, Class 150, with bell end with gasket and spigot end.
  - 1. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

- a. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

## 2.4 JOINING MATERIALS

- A. Refer to Division 2 Section "Utility Materials" for commonly used joining materials.
- B. Transition Couplings:
  - 1. Underground Piping, NPS 1-1/2 and Smaller: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.
  - 2. Underground Piping, NPS 2 and Larger: AWWA C219, metal, sleeve-type coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.
- C. Brazing Filler Metals: AWS A5.8, BCuP Series.
- D. Soldering Flux: ASTM B 813, water-flushable type.
- E. Solder Filler Metal: ASTM B 32, lead-free type with 0.20 percent maximum lead content.
- F. Bonding Adhesive for Fiberglass Piping: As recommended by fiberglass piping manufacturer.
- G. Plastic Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

## 2.5 GATE VALVES

- A. AWWA, Cast-Iron Gate Valves:
  - 1. Nonrising-Stem, Resilient-Seated Gate Valves: AWWA C509, gray- or ductile-iron body and bonnet; with bronze or gray- or ductile-iron gate, resilient seats, bronze stem, and stem nut.
    - a. Minimum Working Pressure: 200 psig.
    - b. End Connections: Mechanical joint.
    - c. Interior Coating: Complying with AWWA C550.
- B. Bronze Gate Valves:
  - 1. OS&Y, Rising-Stem Gate Valves: UL 262, FM-approved bronze body and bonnet, outside screw and yoke, and bronze stem.
    - a. Minimum Working Pressure: 200 psig.
    - b. End Connections: Threaded.

## 2.6 GATE VALVE ACCESSORIES AND SPECIALTIES

- A. Tapping-Sleeve Assemblies: Comply with MSS SP-60. Include sleeve and valve compatible with drilling machine.
  - 1. Tapping Sleeve: Cast- or ductile-iron or stainless steel, two-piece bolted sleeve with flanged outlet for new branch connection. Include sleeve matching size and type of pipe material being tapped and with recessed flange for branch valve.
  - 2. Valve: AWWA, cast-iron, nonrising-stem, resilient-seated gate valve with one raised face flange mating tapping-sleeve flange.
- B. Valve Boxes: Comply with AWWA M44 for cast-iron valve boxes. Include top section, adjustable extension of length required for depth of burial of valve, plug with lettering "WATER," bottom section with base of size to fit over valve, and approximately 5-inch-diameter barrel.
  - 1. Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.

## 2.7 CHECK VALVES

- A. AWWA Check Valves:
  - 1. Check Valves: AWWA C508, swing-check type with 175-psig working-pressure rating and resilient seat. Include interior coating according to AWWA C550 and ends to match piping.

## 2.8 CORPORATION VALVES AND CURB VALVES

- A. Service-Saddle Assemblies: Comply with AWWA C800. Include saddle and valve compatible with tapping machine.
  - 1. Service Saddle: Copper alloy with seal and AWWA C800, threaded outlet for corporation valve.
  - 2. Corporation Valve: Bronze body and ground-key plug, with AWWA C800, threaded inlet and outlet matching service piping material.
- B. Curb Valves: Comply with AWWA C800. Include bronze body, ground-key plug or ball, and wide tee head, with inlet and outlet matching service piping material.
- C. Service Boxes for Curb Valves: Similar to AWWA M44 requirements for cast-iron valve boxes. Include cast-iron telescoping top section of length required for depth of burial of valve, plug with lettering "WATER," bottom section with base of size to fit over curb valve, and approximately 3-inch- diameter barrel.
  - 1. Shutoff Rods: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and slotted end matching curb valve.

## 2.9 CONCRETE VAULTS

- A. Description: Precast, reinforced-concrete vault, designed for A-16 load designation according to ASTM C 857 and made according to ASTM C 858.
- B. Ladder: ASTM A 36/A 36M, steel or polyethylene-encased steel steps.
- C. Manhole: ASTM A 48, Class No. 35 minimum tensile strength, gray-iron traffic frame and cover.
  - 1. Dimensions: Not smaller than 24-inch diameter, unless otherwise indicated.
- D. Drain: ASME A112.21.1M, cast-iron floor drain with outlet of size indicated. Include body anchor flange, light-duty cast-iron grate, bottom outlet, and integral or field-installed bronze ball or clapper-type backwater valve.

## 2.10 FREESTANDING FIRE HYDRANTS

- A. Fire hydrant type shall be as required by utility company.
- B. Dry-Barrel Fire Hydrants: AWWA C502, one NPS 4-1/2 and two NPS 2-1/2 outlets, 5-1/4-inch main valve, drain valve, and NPS 6 mechanical-joint inlet. Include interior coating according to AWWA C550. Hydrant shall have cast-iron body, compression-type valve opening against pressure and closing with pressure, and 150-psig minimum working-pressure design.
  - 1. Outlet Threads: NFPA 1963, with external hose thread used by local fire department. Include cast-iron caps with steel chains.
  - 2. Operating and Cap Nuts: Pentagon, 1-1/2 inches point to flat.
  - 3. Direction of Opening: Open hydrant valve by turning operating nut to left or counterclockwise.
  - 4. Exterior Finish: Red alkyd-gloss enamel paint, unless otherwise indicated.

## PART 3 - EXECUTION

### 3.1 EARTHWORK

- A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

### 3.2 PIPING APPLICATIONS

- A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.
- B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.
- C. Do not use flanges, unions, or keyed couplings for underground piping.

- D. Flanges, unions, keyed couplings, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.
- E. Underground Water-Service Piping: Use the following piping materials for each size range:
  - 1. NPS 3/4 to NPS 3: Soft copper tube, Type K; wrought-copper fittings; and brazed joints.
  - 2. NPS 6 and NPS 8: AWWA C900 Class 200 PVC push-on-joint pipe; mechanical-joint, ductile-iron fittings; and gasketed joints.

### 3.3 VALVE APPLICATIONS

- A. General Application: Use mechanical-joint-end valves for NPS 3 and larger underground installation. Use threaded- or flanged-end valves for installation in vaults. Use UL/FM, nonrising-stem gate valves for installation with indicator posts. Use corporation valves and curb valves with ends compatible with piping, for NPS 2 and smaller installation.
- B. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
  - 1. Underground Valves, NPS 3 and Larger: AWWA, cast-iron, nonrising-stem, resilient-seated gate valves with valve box.
  - 2. Underground Valves, NPS 4 and Larger, for Indicator Posts: UL/FM, cast-iron, nonrising-stem gate valves with indicator post.

### 3.4 JOINT CONSTRUCTION

- A. See Division 2 Section "Utility Materials" for basic piping joint construction.
- B. Make pipe joints according to the following:
  - 1. Copper Tubing Soldered Joints: ASTM B 828. Use flushable flux and lead-free solder.
  - 2. PVC Piping Gasketed Joints: Use joining materials according to AWWA C900. Construct joints with elastomeric seals and lubricant according to ASTM D 2774 or ASTM D 3139 and pipe manufacturer's written instructions.
  - 3. Dissimilar Materials Piping Joints: Use adapters compatible with both piping materials, with OD, and with system working pressure. Refer to Division 2 Section "Utility Materials" for joining piping of dissimilar metals.

### 3.5 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. See Division 2 Section "Utility Materials" for piping-system common requirements.

### 3.6 PIPING INSTALLATION

- A. Water-Main Connection: Tap water main according to requirements of water utility company and of size and in location indicated.
- B. Make connections larger than NPS 2 with tapping machine according to the following:
  - 1. Install tapping sleeve and tapping valve according to MSS SP-60.
  - 2. Install tapping sleeve on pipe to be tapped. Position flanged outlet for gate valve.
  - 3. Use tapping machine compatible with valve and tapping sleeve; cut hole in main. Remove tapping machine and connect water-service piping.
  - 4. Install gate valve onto tapping sleeve. Comply with MSS SP-60. Install valve with stem pointing up and with valve box.
- C. Make connections NPS 2 and smaller with drilling machine according to the following:
  - 1. Install service-saddle assemblies and corporation valves in size, quantity, and arrangement required by utility company standards.
  - 2. Install service-saddle assemblies on water-service pipe to be tapped. Position outlets for corporation valves.
  - 3. Use drilling machine compatible with service-saddle assemblies and corporation valves. Drill hole in main. Remove drilling machine and connect water-service piping.
  - 4. Install corporation valves into service-saddle assemblies.
  - 5. Install curb valve in water-service piping with head pointing up and with service box.
- D. Install copper tube and fittings according to CDA's "Copper Tube Handbook."
- E. Install PVC, AWWA pipe according to AWWA M23 and ASTM F 645.
- F. Bury piping with depth of cover over top at least 30 inches, with top at least 12 inches below level of maximum frost penetration, and according to the following:
  - 1. Under Driveways: With at least 36 inches cover over top.
- G. Install piping by tunneling, jacking, or combination of both, under streets and other obstructions that cannot be disturbed.

### 3.7 ANCHORAGE INSTALLATION

- A. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:
  - 1. Gasketed-Joint, PVC Water-Service Piping: According to AWWA M23.
- B. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

### 3.8 VALVE INSTALLATION

- A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.
- B. Corporation Valves and Curb Valves: Install each underground curb valve with head pointed up and with service box.

### 3.9 ROUGHING-IN FOR WATER METERS

- A. Rough-in piping and specialties for water-meter installation according to utility company's written instructions and requirements.

### 3.10 VAULT INSTALLATION

- A. Install precast concrete vaults according to ASTM C 891.
- B. Connect drain outlet to storm drainage piping. Refer to Division 2 Section "Storm Drainage."

### 3.11 FIRE HYDRANT INSTALLATION

- A. General: Install each fire hydrant with separate gate valve in supply pipe, anchor with restrained joints or thrust blocks, and support in upright position.
- B. AWWA-Type Fire Hydrants: Comply with AWWA M17.

### 3.12 GROUND HYDRANTS AND PEDESTAL DRINKING FOUNTAIN INSTALLATION

- A. Install ground hydrants and pedestal drinking fountains per manufacturer's recommendations.

### 3.13 FIELD QUALITY CONTROL

- A. Piping Tests: Conduct piping tests before joints are covered and after thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
- B. Hydrostatic Tests: Test at not less than 1-1/2 times working pressure for 2 hours.
  - 1. Increase pressure in 50-psig increments and inspect each joint between increments. Hold at test pressure for 1 hour; decrease to 0 psig. Slowly increase again to test pressure and hold for 1 more hour. Maximum allowable leakage is 2 quarts per hour per 100 joints. Remake leaking joints with new materials and repeat test until leakage is within allowed limits.
- C. Prepare reports of testing activities.

### 3.14 IDENTIFICATION

- A. Install continuous underground detectable warning tape during backfilling of trench for underground water-service piping. Locate below finished grade, directly over piping. See Division 2 Section "Earthwork" for underground warning tapes.

### 3.15 CLEANING

- A. Clean and disinfect water-distribution piping as follows:
  - 1. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
    - a. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in AWWA C651 or as required by the local utility company.
- B. Prepare reports of purging and disinfecting activities.

END OF SECTION 33 11 00

## SECTION 33 13 00 - DISINFECTION OF WATER DISTRIBUTION SYSTEMS

### PART 1 - GENERAL

#### 1.01 SECTION INCLUDES

- A. Disinfection of potable water distribution and transmission system.
- B. Testing and reporting results.

#### 1.02 RELATED SECTIONS

- A. Section 33 11 13 – Site Water Lines.
- B. Section 33 11 19 – Fire Water System.

#### 1.03 MEASUREMENT AND PAYMENT

- A. Disinfection:
  - 1. Basis of Payment: no separate payment, included in the other items of work.

#### 1.04 REFERENCES

- A. ANSI/AWWA B300 - Standard for Hypochlorites.
- B. ANSI/AWWA B301 - Standard for Liquid Chlorine.
- C. ANSI/AWWA B303 - Standard for Sodium Chlorite.
- D. ANSI/AWWA C651 - Standards for Disinfecting Water Mains.

#### 1.05 SUBMITTALS

- A. Test Reports: Indicate results comparative to specified requirements.
- B. Certificate: Certify that cleanliness of water distribution system meets or exceeds specified requirements.

#### 1.06 PROJECT RECORD DOCUMENTS

- A. Provide the following:
- B. Disinfection report; record:
  - 1. Type and form of disinfectant used.
  - 2. Date and time of disinfectant injection start and time of completion.
  - 3. Test locations.
  - 4. Initial and 24 hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
  - 5. Date and time of flushing start and completion.
  - 6. Disinfectant residual after flushing in ppm for each outlet tested.

- C. Bacteriological report; record:
  - 1. Date issued, project name, and testing laboratory name, address, and telephone number.
  - 2. Time and date of water sample collection.
  - 3. Name of person collecting samples.
  - 4. Test locations.
  - 5. Initial and 24 hour disinfectant residuals in ppm for each outlet used.
  - 6. Coliform bacteria test results for each outlet tested.
  - 7. Certification that water conforms, or fails to conform, to bacterial standards of the state.
  - 8. Bacteriologist's signature and authority.

#### 1.07 QUALITY ASSURANCE

- A. Perform Work in accordance with ANSI/AWWA C651.

#### 1.08 QUALIFICATIONS

- A. Testing Firm: Group specializing in examining potable water systems, approved by the State of Tennessee.

#### 1.09 REGULATORY REQUIREMENTS

- A. Conform to applicable code or regulation for performing the work of this section.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of water system.

### PART 2 - PRODUCTS

#### 2.01 DISINFECTION CHEMICALS

- A. Chemicals: ANSI/AWWA B300, Hypochlorite, ANSI/AWWA B301, Liquid Chlorine, and ANSI/AWWA B303, Sodium Chlorite.

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Verify that piping system has been cleaned, inspected and pressure tested.
- B. Perform scheduling and disinfection activity with startup, testing, adjusting and balancing, demonstrating procedures, including coordination with related systems.

#### 3.02 EXECUTION

- A. Provide and attach required equipment to perform the work of this Section.
- B. Inject treatment disinfectant into piping system.
- C. Maintain disinfectant in system for 24 hours.

- D. Flush, circulate and clean until required cleanliness is achieved; use municipal domestic water.

3.03 QUALITY CONTROL

- A. Provide analysis and testing of treated water under provisions of Section 01400.
- B. Test samples in accordance with ANSI/AWWA C651.

END OF SECTION 33 13 00

## SECTION 33 31 00

### SANITARY SEWERAGE

#### PART 1 - GENERAL

##### 1.1 LOCAL UTILITY SPECIFICATIONS

- A. The Contractor shall contact the local authorities to determine if Standard Specifications for Sanitary Sewerage are available from the Local Utility District. If Local Utility District specifications are available, the Contractor shall utilize them in lieu of the following specification.

##### 1.2 SUMMARY

- A. This Section includes gravity-flow, non-pressure and force-main, pressure sanitary sewerage outside the building, with the following components:
  - 1. Special fittings for expansion and deflection.
  - 2. Cleanouts.
  - 3. Precast concrete manholes.

##### 1.3 DEFINITIONS

- A. PVC: Polyvinyl chloride plastic.

##### 1.4 PERFORMANCE REQUIREMENTS

- A. Gravity-Flow, Non-pressure, Drainage-Piping Pressure Rating: 10-foot head of water.

##### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle manholes according to manufacturer's written rigging instructions.

##### 1.6 PROJECT CONDITIONS

- A. Interruption of Existing Sanitary Sewerage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Engineer no fewer than five days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without Engineer's written permission.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

### 2.2 PIPING MATERIALS

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, fitting, and joining materials.

### 2.3 PVC PIPE AND FITTINGS

- A. PVC Gravity Sewer Pipe and Fittings: ASTM D 3034, SDR 35, with bell-and-spigot ends for gasketed joints with ASTM F 477, elastomeric seals.

### 2.4 NONPRESSURE-TYPE PIPE COUPLINGS

- A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined and corrosion-resistant-metal tension band and tightening mechanism on each end.
- B. Sleeve Materials:
  1. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
  2. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
- C. Unshielded, Flexible Couplings: Elastomeric sleeve with corrosion-resistant-metal tension band and tightening mechanism on each end.

### 2.5 CLEANOUTS

- A. PVC Cleanouts: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

## 2.6 MANHOLES

- A. Standard Precast Concrete Manholes: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
1. Diameter: 48 inches minimum, unless otherwise indicated.
  2. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
  3. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
  4. Riser Sections: 4-inch minimum thickness, and of length to provide depth indicated.
  5. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
  6. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
  7. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.
  8. Steps: Individual FRP steps, wide enough to allow worker to place both feet on 1 step and designed to prevent lateral slippage off of step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of manhole to finished grade is less than 60 inches.
  9. Grade Rings: Reinforced-concrete rings, 6- to 9-inch total thickness, to match diameter of manhole frame and cover.
  10. Manhole Frames and Covers: Ferrous; 24-inch ID by 7- to 9-inch riser with 4-inch- minimum width flange and 26-inch- diameter cover. Include indented top design with lettering cast into cover, using wording equivalent to "SANITARY SEWER."
    - a. Material: ASTM A 48/A 48M, Class 35 gray iron, unless otherwise indicated.
    - b. Protective Coating: Foundry-applied, SSPC-Paint 16, coal-tar, epoxy-polyamide paint; 15-mil minimum thickness applied to all surfaces, unless otherwise indicated.

## 2.7 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318/318R, ACI 350R, and the following:
1. Cement: ASTM C 150, Type II.
  2. Fine Aggregate: ASTM C 33, sand.
  3. Coarse Aggregate: ASTM C 33, crushed gravel.
  4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.
1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
  2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

- C. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.
  - 1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
  - 2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

## PART 3 - EXECUTION

### 3.1 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Division 2 Section "Earthwork."

### 3.2 PIPING APPLICATIONS

- A. Gravity-Flow, Nonpressure Sewer Piping: Use the following pipe materials:
  - 1. PVC sewer pipe and fittings, gaskets, and gasketed joints conforming to ASTM D 3034 SDR 35.

### 3.3 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewerage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.
- C. Install manholes for changes in direction, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.
- D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed by tunneling, jacking, or combination of both.
- F. Install gravity-flow, nonpressure, drainage piping according to the following:
  - 1. Install piping pitched down in direction of flow, at minimum slope of 1 percent, unless otherwise indicated.
  - 2. Install piping below frost line.

3. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.

- G. Clear interior of piping and manholes of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

### 3.4 PIPE JOINT CONSTRUCTION

- A. Basic piping joint construction is specified in Division 2 Section "Piped Utilities - Basic Materials and Methods." Where specific joint construction is not indicated, follow piping manufacturer's written instructions.
- B. Join gravity-flow, nonpressure, drainage piping according to the following:
1. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasket joints.

### 3.5 MANHOLE INSTALLATION

- A. General: Install manholes complete with appurtenances and accessories indicated.
- B. Install precast concrete manhole sections with sealants according to ASTM C 891.
- C. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 2 inches above finished surface elsewhere, unless otherwise indicated.

### 3.6 CLEANOUT INSTALLATION

- A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use PVC pipe fittings in sewer pipes at branches for cleanouts and PVC pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
1. Use medium-duty, top-loading classification cleanouts in earth, unpaved foot-traffic and in paved foot-traffic areas.
  2. Use heavy-duty, top-loading classification cleanouts in vehicle-traffic service areas.
- B. Set cleanout frames and covers in asphalt pavement and earth in cast-in-place-concrete block, 24 by 24 by 6 inches deep. Set with tops flush with pavement and 1 inch above surrounding grade when in earth.
- C. Set cleanout frames and covers in concrete pavement with tops flush with pavement surface.

### 3.7 CONNECTIONS

- A. Connect nonpressure, gravity-flow drainage piping to building's sanitary building drains specified in Division 15 Section "Sanitary Waste and Vent Piping."
- B. Make connections to existing piping and underground manholes.
  - 1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping.
  - 2. Make branch connections into existing underground manholes by coring and installing a rubber boot as approved by the local utility provider.
  - 3. Protect existing piping and manholes to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

### 3.8 IDENTIFICATION

- A. Materials and their installation are specified in Division 2 Section "Earthwork." Arrange for installation of green warning tapes directly over piping and at outside edges of underground manholes.

### 3.9 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
  - 1. Submit separate report for each system inspection.
  - 2. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    - c. Crushed, broken, cracked, or otherwise damaged piping.
    - d. Infiltration: Water leakage into piping.
    - e. Exfiltration: Water leakage from or around piping.
  - 3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
  - 4. Reinspect and repeat procedure until results are satisfactory.
- B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
  - 1. Do not enclose, cover, or put into service before inspection and approval.
  - 2. Test completed piping systems according to requirements of authorities having jurisdiction.

3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
  4. Submit separate report for each test.
  5. Hydrostatic Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction and the following:
    - a. Allowable leakage is maximum of 50 gal./inch of nominal pipe size per mile of pipe, during 24-hour period.
    - b. Close openings in system and fill with water.
    - c. Purge air and refill with water.
    - d. Disconnect water supply.
    - e. Test and inspect joints for leaks.
    - f. Option: Test ductile-iron piping according to AWWA C600, "Hydrostatic Testing" Section. Use test pressure of at least 10 psig.
  6. Air Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction, UNI-B-6, and the following:
    - a. Option: Test plastic gravity sewer piping according to ASTM F 1417.
    - b. Option: Test concrete gravity sewer piping according to ASTM C 924.
  7. Manholes: Perform hydraulic test according to ASTM C 969.
- C. Leaks and loss in test pressure constitute defects that must be repaired.
- D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

### 3.10 CLEANING

- A. Clean interior of piping of dirt and superfluous material. Flush with potable water.

END OF SECTION

## SECTION 33 41 00-STORM SEWERS AND PIPE CULVERTS

### PART 1- GENERAL

#### 1.1 SECTION INCLUDES

- A. This work shall consist of the placing of precast concrete pipe, high density polyethylene (HDPE) corrugated pipe (with smooth waterway), and all fittings as called for on the drawings and in accordance with the Specifications including trench excavation, bedding, and backfill.
- B. Each pipe shall be clearly marked to show its class or gauge, date of manufacture, name of manufacturer, and mark of approval by an approved commercial testing laboratory prior to delivery.
- C. All pipe and special fitting shall be new materials, which have not been previously used and free of any defects or damage.
- D. Pipe sizes, class or gauge, and type of bituminous coating will be shown on the drawings. Size of the pipe is nominal inside diameter.
- E. All materials used in this construction, in addition to the general requirement of these Specifications, unless otherwise stipulated, shall conform to the following:
  - 1. Storm sewers and pipe culverts shall conform to Subsection 607 of the Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction, 1981 or latest revisions.
  - 2. HDPE pipe shall conform to AASHTO M252, M294, MP7 and shall be either AASHTO Type "S" or AASHTO Section 30 or ASTM D2321 and any details shown on the drawings or as recommended by the manufacturer.

#### 1.2 EXISTING UTILITIES

- A. All existing sewers, water lines, gas lines, underground conduits, telephone lines, electric lines or other utilities or structure in the vicinity of the work shall be carefully protected by the Contractor from damage at all times.

### PART 2 – EXECUTION

#### 3.0 TRENCHING AND BACKFILLING

- A. Protect all private roads and walks and maintain them during course of the work. Repair all damage at Contractor's expense.
- B. Erect construction fencing around all excavations before starting work.
- C. Provide and maintain guard lights at all barricades, railing, obstructions, in streets, roads, or sidewalks, and all trenches or adjacent to public walks or roads.
- D. Remove and replace at Contractor's expense all work damaged by failure to provide protection.
- E. Excavate trenches of sufficient width for proper installation of work. When depth of backfill over piping exceeds 10 feet, keep trench below level of top of pipe as narrow as practical.

- F. Perform trenching in accordance with OSHA and local safety regulations.
- G. Excavate all trenches to at least six inches below bottom elevation of pipe at all points. Grade trench bottom evenly. Lay piping in trenches on 6" bed of crushed stone with stone backfilled to 12" above top of pipe by hand.
- H. Trenches shall provide uniform bearing. Where rock is encountered, excavate 2' below the pipe and refill to pipe grade with gravel.
- I. Backfill trenches to grade only after piping has been inspected, tested, approved and location of pipe and appurtenances has been recorded. Tamp to 95% compaction. Under pavement, walks, and other surfacing, backfill shall be tamped solidly in layers not thicker than 6". Exclude all cinders and rubbish from trenches in which pipes are laid.
- J. If unstable soil conditions are encountered, erect adequate supports needed in an approved manner to adequately support the underground piping.

### 3.1 INSTALLATION

- A. The location of existing underground utilities are approximate locations only. Before beginning work determine the exact location of all existing utilities. The contractor shall pay for and repair all damages caused by failure to exactly locate and preserve any and all underground utilities. Connect to the public storm sewer system at a catch basin or other standard connection provided.
- B. Elevations shown on the drawings are to the invert of all gravity piping.
- C. Adjust inverts to keep tops of pipe inline where pipe size changes.
- D. Confirm elevation of existing storm drain connection point and grade storm drain at least 1/4" per foot unless otherwise indicated on drawings.
- E. All piping is shown diagrammatically on the drawing. Determine exact locations in the field. Coordinate exact locations with all trades before installation.
- F. Lay storm drainage piping to uniform grade. Make changes in directions of drain piping with long bends. No screwed joints are permitted in drainpipes, except as described herein.
- G. Provide and install cleanouts where shown on the drawings, at 100 feet intervals, and as required by local codes. Extend cleanouts through and terminate flush with the finished grade. Terminate with C.I. plugs.

### 3.2 FIELD QUALITY CONTROL

- A. Flush with water in sufficient volume to obtain free flow through each line. Remove all obstruction and correct all defects discovered. Remove all silt and trash from structures prior to final acceptance of work.

END OF SECTION 33 41 00

## SECTION 33 49 00-STORM DRAINAGE STRUCTURES

### PART 1- GENERAL

#### 1.1. SECTION INCLUDES

- A. This work shall consist of constructing the following drainage structures: manholes, catch basins, inlets and junction boxes. Construction shall be in reasonable close conformity to the lines, grades, dimension and sizes shown on the drawings or as directed by the Engineer.
- B. The height or depth of these drainage structures will vary with location, but unless otherwise shown on the drawings, shall be such that the frames will match the line and grades of the parking area, roadway surface or grasses areas and the invert will be at the designated elevations.
- C. Cast iron frames, grates, and covers shall be provided as specified on the drawings.
- D. Manholes, inlets, catch basins, and junction boxes shall conform to the Standard Detail Drawings of the Tennessee Department of Transportation unless otherwise noted on the drawings. Deviations from these drawings may be approved, by submitting a detailed drawing to the Engineer before construction begins.
- E. All materials used in this construction, in addition to the general requirements of these Specifications, unless otherwise stipulated, shall conform to the following:
  - 1. Drainage structures shall conform to Subsection 611 of the Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction, 2015 or latest revisions.

END OF SECTION 33 49 00

**Infrastructure Work for the former Austin Homes site C20006**  
**Solicitation Document A General Information and Cost**

**General Information about the Supplier**

**Sign Your Name to the Right of the Arrow** →

Your signature indicates you read and agree to "KCDC's General Instructions to Suppliers" ([www.kcdc.org](http://www.kcdc.org)) and that you are authorized to bind the supplier or are submitting the response on behalf of and at the direction of the suppliers' representative authorized to contractually bind the supplier. I represent that the supplier or its applicable representative(s) has reviewed the information contained in this Solicitation Package and that the information submitted is accurate.

**Printed Name and Title** →

**Company Name** →

**Street Address** →

**City/State/Zip** →

**Contact Person (Please Print Clearly)** →

**Telephone Number** →

**Cell Number** →

**Supplier's E-Mail Address (Please Print Clearly)** →

**Addenda**

Addenda are at [www.kcdc.org](http://www.kcdc.org). Click on "Procurement" and then on "Open Solicitations" to find addenda. Please check for addenda prior to submitting a proposal.

**Acknowledge addenda have been issued by checking below as appropriate:**

None     Addendum 1     Addendum 2     Addendum 3     Addendum 4     Addendum 5

**Statistical Information (Check all the apply)**

**This business is at least 51% owned and operated by a woman**      Yes  No

**This business qualifies as a small business by the State of Tennessee**      Yes  No   
*Total gross receipts of not more than \$10,000,000 average over a three-year period OR  
 employs no more than 99 persons on a full-time basis*

**This business qualifies as a Section 3 business by defined herein**      Yes  No

**This business is owned & operated by persons at least 51% of the following ethnic background:**

Asian/Pacific     Black     Hasidic Jew     Hispanic     Native Americans     White

**Prompt Payment Discount**

A prompt payment discount of \_\_\_\_\_% is offered for payment within \_\_\_\_ days of submission of an accurate and proper invoice.

**Insurance**

I have reviewed the insurance requirements and will comply with them without exception. Yes  No

**Infrastructure Work for the former Austin Homes site C20006**

**Solicitation Document A General Information and Cost**

Pursuant to and in compliance with the solicitation documents, the supplier signing Solicitation Document A, having thoroughly examined the work to be performed, agrees to perform the work for the following total bid amount for the above referenced project. The prices quoted cover all of the supplier’s expenses including, but not limited to, overhead, profit, insurance, subcontractors, supplies and bonding. The Base Bid shall include the cost for the allowances included in specification section 01 10 00 – Summary, Part 1.02 F. The Unit Prices quoted below will be used against the allowance quantities if the onsite conditions differ from the estimated quantities.

***Complete all “blanks”-even if the amount is \$0.00***

<b>Base Bid</b>	
<b>Total Project Cost</b>	<b>\$</b>

<b>Add Alternate</b>	
Alternate No. 1: All work associated with the boulevard extension as indicated on the plans.	\$

<b>Unit Prices</b>		
Description	Cost	Unit of Measure
Unit Price No. 1: Import and place engineered fill on site	\$	Cubic Yard
Unit Price No. 2: Excavate and dispose of unsuitable soils	\$	Cubic Yard
Unit Price No. 3: Geogrid material and installation	\$	Square Yard
Unit Price No. 4: Geogrid base stone	\$	Ton
Unit Price No. 5: Flowable fill at utility excavations	\$	Cubic Yard

Supplier: \_\_\_\_\_

**Conflict of Interest:**

1. No commissioner or officer of KCDC or other person whose duty it is to vote for, let out, overlook or in any manner superintend any of the work for KCDC has a direct interest in the award or the supplier providing goods or services.
2. No employee, officer or agent of the grantee or sub-grantee will participate in selection, or in the award or administration of an award supported by Federal funds if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when the employee, officer or agent, any member of his immediate family, his or her partner, or an organization, which employs, or is about to employ, any of the above, has a financial or other interest in the supplier selected for award.
3. The grantee's or sub-grantee's officers, employees or agents will neither solicit nor accept gratuities, favors or anything of monetary value from suppliers, potential suppliers, or parties to sub-agreements.
4. By submission of this form, the supplier is certifying that no conflicts of interest exist.

**Drug Free Workplace Requirements:**

5. Private employers with five or more employees desiring to contract for construction services attest that they have a drug free workplace program in effect in accordance with TCA 50-9-112.

**Eligibility:**

6. The supplier is eligible for employment on public contracts because no convictions or guilty pleas or pleas of nolo contendere to violations of the Sherman Anti-Trust Act, mail fraud or state criminal violations with an award from the State of Tennessee or any political subdivision thereof have occurred.

**General:**

7. Supplier fully understands the preparation and contents of the attached offer and of all pertinent circumstances respecting such offer.
8. Such offer is genuine and is not a sham offer.

**Iran Divestment Act:**

9. Concerning the Iran Divestment Act (TCA 12-12-101 et seq.), by submission of this bid/quote/quotes, each supplier and each person signing on behalf of any supplier certifies, and in the case of a joint bid/quote/quotes, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each supplier is not on the list created pursuant to § 12-12-106.

Supplier: \_\_\_\_\_

**Non-Collusion:**

10. Neither the said supplier nor any of its officers, partners, KCDC, agents, representatives, employees or parties interest, including this affiant, has in any way colluded conspired, connived or agreed, directly or indirectly, with any other responder, supplier, or person to submit a collusive or sham offer in connection with the award or agreement for which the attached offer has been submitted or to refrain from making an offer in connection with such award or agreement, or collusion or communication or conference with any other supplier, or, to fix any overhead, profit, or cost element of the offer price or the offer price of any other supplier, or to secure through any collusion, conspiracy, connivance, or unlawful agreement any advantage against KCDC or any person interested in the proposed award or agreement.
  
11. The price or prices quoted in the attached offer are fair, proper and not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the supplier or any of its agents, representatives, KCDC, employees, or parties in interest, including this affiant.

**Accuracy of Electronic Copies:**

12. If the supplier provides electronic copies of the bid/proposal/quote to KCDC, the supplier certifies that the information provided on paper and in the electronic format is identical unless specifically noted otherwise.

**No Contact/No Advocacy Affidavit**

13. After this solicitation is issued, any contact initiated by any supplier or proposer with any owner’s representative concerning this proposal is strictly prohibited-except for communication with the Procurement Division. My signature signifies that no unauthorized contact occurred.
  
14. To ensure the integrity of the review and evaluation process, respondents to this solicitation nor any firm representing them, may not lobby or advocate to owner’s staff or Board members. My signature signifies that no unauthorized advocacy occurred.

The undersigned hereby acknowledges receipt of these affidavits and certifies that the submittal in response to this solicitation is in full compliance with the listed requirements.

<b>Signed by</b> _____	
<b>Printed Name</b> _____	
<b>Title</b> _____	
<b>Subscribed and sworn to before me this date</b>	
<b>By (Notary Public)</b> _____	
<b>My Commission Expires on</b> _____	
<b>Notary Stamp</b>	



(b) The bidder, by signing its bid, hereby certifies to the best of his or her knowledge and belief as of December 23, 1989 that:

(1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of a contract resulting from this solicitation;

(2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the bidder shall complete and submit, with its bid, OMB standard form LLL, "Disclosure of Lobbying Activities;" and

(3) He or she will include the language of this certification in all subcontracts at any tier and require that all recipients of subcontract awards in excess of \$100,000 shall certify and disclose accordingly.

(c) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, United States Code. Any person who makes an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision, shall be subject to a civil penalty of not less than \$10,000, and not more than \$100,000, for each such failure.

(d) Indian tribes (except those chartered by States) and Indian organizations as defined in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450B) are exempt from the requirements of this provision.

#### 4. Organizational Conflicts of Interest Certification

The bidder certifies that to the best of its knowledge and belief and except as otherwise disclosed, he or she does not have any organizational conflict of interest which is defined as a situation in which the nature of work to be performed under this proposed contract and the bidder's organizational, financial, contractual, or other interests may, without some restriction on future activities:

- (a) Result in an unfair competitive advantage to the bidder; or,
- (b) Impair the bidder's objectivity in performing the contract work.

In the absence of any actual or apparent conflict, I hereby certify that to the best of my knowledge and belief, no actual or apparent conflict of interest exists with regard to my possible performance of this procurement.

#### 5. Bidder's Certification of Eligibility

(a) By the submission of this bid, the bidder certifies that to the best of its knowledge and belief, neither it, nor any person or firm which has an interest in the bidder's firm, nor any of the bidder's subcontractors, is ineligible to:

(1) Be awarded contracts by any agency of the United States Government, HUD, or the State in which this contract is to be performed; or,

(2) Participate in HUD programs pursuant to 24 CFR Part 24.

(b) The certification in paragraph (a) above is a material representation of fact upon which reliance was placed when making award. If it is later determined that the bidder knowingly rendered an erroneous certification, the contract may be terminated for default, and the bidder may be debarred or suspended from participation in HUD programs and other Federal contract programs.

#### 6. Minimum Bid Acceptance Period

(a) "Acceptance period," as used in this provision, means the number of calendar days available to the PHA/IHA for awarding a contract from the date specified in this solicitation for receipt of bids.

(b) This provision supersedes any language pertaining to the acceptance period that may appear elsewhere in this solicitation.

(c) The PHA/IHA requires a minimum acceptance period of 90 calendar days.

(d) In the space provided immediately below, bidders may specify a longer acceptance period than the PHA's/IHA's minimum requirement. The bidder allows the following acceptance period: calendar days.

(e) A bid allowing less than the PHA's/IHA's minimum acceptance period will be rejected.

(f) The bidder agrees to execute all that it has undertaken to do, in compliance with its bid, if that bid is accepted in writing within (1) the acceptance period stated in paragraph (c) above or (2) any longer acceptance period stated in paragraph (d) above.

#### 7. Small, Minority, Women-Owned Business Concern Representation

The bidder represents and certifies as part of its bid/ offer that it --

is,  is not a small business concern. "Small business concern," as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding, and qualified as a small business under the criteria and size standards in 13 CFR 121.

is,  is not a women-owned business enterprise. "Women-owned business enterprise," as used in this provision, means a business that is at least 51 percent owned by a woman or women who are U.S. citizens and who also control and operate the business.

is,  is not a minority business enterprise. "Minority business enterprise," as used in this provision, means a business which is at least 51 percent owned or controlled by one or more minority group members or, in the case of a publicly owned business, at least 51 percent of its voting stock is owned by one or more minority group members, and whose management and daily operations are controlled by one or more such individuals. For the purpose of this definition, minority group members are:

(Check the block applicable to you)

Black Americans

Asian Pacific Americans

Hispanic Americans

Asian Indian Americans

Native Americans

Hasidic Jewish Americans

**9. Certification of Eligibility Under the Davis-Bacon Act**

**Act** (applicable to construction contracts exceeding \$2,000)

(a) By the submission of this bid, the bidder certifies that neither it nor any person or firm who has an interest in the bidder's firm is a person or firm ineligible to be awarded contracts by the United States Government by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(b) No part of the contract resulting from this solicitation shall be subcontracted to any person or firm ineligible to be awarded contracts by the United States Government by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(c) The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 U.S.C. 1001.

**10. Certification of Nonsegregated Facilities** (applicable to contracts exceeding \$10,000)

(a) The bidder's attention is called to the clause entitled **Equal Employment Opportunity** of the General Conditions of the Contract for Construction.

(b) "Segregated facilities," as used in this provision, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin because of habit, local custom, or otherwise.

(c) By the submission of this bid, the bidder certifies that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The bidder agrees that a breach of this certification is a violation of the Equal Employment Opportunity clause in the contract.

(d) The bidder further agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) prior to entering into subcontracts which exceed \$10,000 and are not exempt from the requirements of the Equal Employment Opportunity clause, it will:

- (1) Obtain identical certifications from the proposed subcontractors;
- (2) Retain the certifications in its files; and
- (3) Forward the following notice to the proposed subcontractors (except if the proposed subcontractors have submitted identical certifications for specific time periods):

**Notice to Prospective Subcontractors of Requirement for Certifications of Nonsegregated Facilities**

A Certification of Nonsegregated Facilities must be submitted before the award of a subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Employment Opportunity clause of the prime contract. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

**Note:** The penalty for making false statements in bids is prescribed in 18 U.S.C. 1001.

**11. Clean Air and Water Certification** (applicable to contracts exceeding \$100,000)

The bidder certifies that:

**(a) Any facility to be used in the performance of this contract [ ] is, [ ] is not listed on the Environmental Protection Agency List of Violating Facilities:**

(b) The bidder will immediately notify the PHA/IHA Contracting Officer, before award, of the receipt of any communication from the Administrator, or a designee, of the Environmental Protection Agency, indicating that any facility that the bidder proposes to use for the performance of the contract is under consideration to be listed on the EPA List of Violating Facilities; and,

(c) The bidder will include a certification substantially the same as this certification, including this paragraph (c), in every nonexempt subcontract.

**12. Bidder's Signature**

The bidder hereby certifies that the information contained in these certifications and representations is accurate, complete, and current.

**(Signature and Date)** \_\_\_\_\_

**(Typed or Printed Name)** \_\_\_\_\_

**(Title)** \_\_\_\_\_

**(Company Name)** \_\_\_\_\_

**(Company Address)** \_\_\_\_\_

**Infrastructure Work for the former Austin Homes site C20006**  
**Solicitation Document D Good Faith Compliance Affidavit**

The supplier must demonstrate a good faith effort to utilize Minority Owned Businesses (MOB) and Woman Owned Businesses (WOB). To assist in this effort, KCDC posts the web links of organizations, which can provide suppliers with a list of minority and women owned businesses on its web site. These lists can be useful to the supplier in preparing a response to this solicitation.

**Place a checkmark in either Section One or Section Two of this form. Provide the information in Section One if you check that box.**

**Section One**  The following companies were asked for pricing for the attached bid. Provided the listed companies meet bid document requirements and their pricing is competitive, it is our intent to use the companies listed. Attached hereto or to be provided to KCDC within five calendar days of solicitation opening is our Form of Commitment/Statement of Effort (**failure to submit Form of Commitment/Statement of Effort timely is cause to reject the bid.**)

Company Name	Person	Product/Service	MOB	WOB

**Section Two**  MOB/WOB's were not contacted because sub-suppliers/contractors will not be needed to complete the contract and all work will be completed by the supplier. Other MOB/WOB's not shown above, will be considered during the duration of the contract in the event the supplier decides additional subcontractors or supplier will be used (to complete all or part of the contract).

Signed by	
Print Name and Title	
Subscribed and Sworn to before me on this date	
By	
Notary Public (stamp/signature)	
My Commission Expires on	

**Infrastructure Work for the former Austin Homes site C20006  
Solicitation Document E Form of Commitment: Minority Owned /Woman Owned Business**

**Place a checkmark in either Section One or Section Two of this form.**

**Section One** Does not apply - MOB/WOB subcontractors will not be used.  (Stop Here)

**Section Two** MOB/WOB Subcontractors will be used.  (Complete this page)

I, \_\_\_\_\_ do certify the supplier has or will enter into a formal agreement with the MOB/WOB enterprise for work listed in this schedule.

Supplier Name	M O B	W O B	Contact Person	Type of Supplies to be Provided	Type of Work to be Performed	Dollar Value of Supplies or Service

**COMPLETE THE FOLLOWING BOXES IF BOX ABOVE WAS NOT COMPLETED**

The following companies were listed on the Good Faith Compliance Affidavit submitted with my bid.

Company Name	Person	Product/Service	MOB	WOB

Explain why each of the above companies could not be used to provide the needed products or services.

Company Name	Reason

Above information submitted by \_\_\_\_\_

Printed/Typed Name and Title: \_\_\_\_\_

## Appendix A Insurance Requirements

**1. INSURANCE**

The Supplier shall maintain, at Supplier's sole expense, on a primary and non-contributory basis, at all times during the life of the contract insurance coverages, limits, and endorsements described herein. All insurance must be underwritten by insurers with an A.M. Best rating of A- :VI or better. Upon award, the Supplier shall provide Certificate(s) of Insurance and amendatory endorsements to KCDC evidencing said insurance coverages. **See paragraph "h" for exact naming of certificate holder and additional insured.**

The Supplier agrees the insurance requirements herein as well as KCDC's review or acknowledgement, is not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by the Supplier under this contract. KCDC's failure to require a Certificate of Insurance, acceptance of a non-conforming certificate, or allowing the Supplier to commence work shall not operate as a waiver of these minimum insurance requirements or the liabilities and obligations assumed by the Supplier under this contract.

- a. Commercial General Liability Insurance:** occurrence version general liability insurance with a minimum combined single limit of \$1,000,000 per occurrence with \$2,000,000 in the aggregate covering the following perils: bodily injury, personal injury, and broad form property damage including products/completed operations for one year after completion of the Project(s). Limits must apply separately to the work/location in this contract.

Such insurance shall contain or be endorsed to contain a provision that includes **KCDC, its officials, officers, employees, and volunteers** as additional insureds with respect to the Supplier's ongoing and completed operations, providing coverage at least as broad as CG 20 10 07 04 and 20 37 07 04 endorsements. The coverage shall contain no special limitations on the scope of its protection afforded to the listed insureds.

- b. Commercial Automobile Liability Insurance:** in an amount not less than \$1,000,000 (combined single limit) for all owned, hired, and non-owned vehicles utilized by Supplier in connection with the Project. Coverage is to include coverage for loading and unloading hazards.

Such insurance shall contain or be endorsed to contain a provision that includes **KCDC, its officials, officers, employees, and volunteers** as additional insureds.

- c. Workers' Compensation Insurance and Employers' Liability Insurance:** Workers' Compensation Insurance with statutory limits as required by the State of Tennessee or other applicable laws. Employers' Liability Insurance with a limit of not less than \$1,000,000.
- d. Environmental Impairment Liability:** Supplier shall maintain environmental impairment liability insurance with limits of not less than \$1,000,000 per occurrence.
- e. Pollution Liability Insurance:** Supplier shall maintain pollution liability coverage, ISO CG 0039, or equivalent. If the coverage is written on a claims-made form:

1. The "Retro Date" must be shown and must be before the date of the contract or the beginning of contract work.
2. Insurance must be maintained and evidence of insurance must be provided for at least five (5) years after completion of the contract work and acceptance by KCDC.
3. If coverage is cancelled or non-renewed and not replaced with another claims-made policy form with a "Retro Date" prior to the contract effective date, Supplier must purchase "extended reporting" coverage for a minimum of five (5) years after completion of contract work.

- f. Builder's Risk:** coverage shall be written on an All-Risk, Replacement Cost, and Completed Value Form basis in an amount at least equal to one-hundred percent (100%) of the projected completed value of the Work, as well as subsequent modifications of that sum due to Change Order(s). Supplier agrees to be responsible for reporting increases in the projected completed value of the work due to Change Order(s).

Coverage shall insure *without limitation* against the perils of fire and extended coverage and physical loss or damage including, but not limited to, theft, vandalism, malicious mischief, collapse, windstorm, testing and startup, temporary buildings, portions of the work stored off site, all portions of the work in transit, debris removal including demolition occasioned by enforcement of any applicable legal requirements and shall cover reasonable compensation for Architect's and Supplier's services and expenses required as a result of such insured loss. Insurance is to cover all property of Supplier (and its subcontractors), Owner and all certificate holders as their interest may appear. Coverage shall cover the completed value of the construction including without limitation, slab on grade, excavations, foundations, caissons, tenant finish work, and retaining walls around the perimeter of the project. Any exclusion of so-called underground damage to pipes, collapse of structure, or damage resulting from explosion or blasting shall be deleted. Such policy shall provide that any loss thereunder shall be payable to the Supplier, Owner, and others as their interests may appear and shall also have a replacement cost endorsement.

Coverage shall include soft costs resulting from damage or destruction to insured property on-site and while in transit including flood, earthquake and earth movement when such perils are required. Such insurance shall cover continuing expenses not directly involved in the direct cost of construction/renovation, including expense incurred upon money borrowed to finance construction or repair, continuing interest on mortgage loans, advertising, promotion, realty taxes and other assessments, the cost to the insured of additional commissions incurred upon re-negotiating leases, and other expenses incurred as a result of property loss or destruction by an insured peril.

**g. Other Insurance Requirements:**

1. Upon award, Supplier shall furnish KCDC with original Certificate(s) of Insurance and amendatory endorsements effecting coverage required by this section.

2. Provide a waiver of subrogation **for each required policy herein**. When required by the insurer, or should a policy condition not permit Supplier to enter into a pre-loss agreement to waive subrogation without an endorsement, the policy should be endorsed with a Waiver of Transfer of Rights of Recovery Against Others, or its equivalent. This waiver of subrogation requirement shall not apply to any policy which includes a condition specifically prohibiting such an endorsement, or voids coverage should supplier enter into such an agreement on a pre-loss basis.
3. A **minimum 30-day cancellation notice** for all insurances (by endorsement if necessary) is required.
4. Replace certificates, policies, and endorsements for any such insurance expiring prior to completion of services.
5. Maintain such insurance from the time services commence until services are completed or through such extended discovery/reporting/tail period as required. Failure to maintain or renew coverage or to provide evidence of renewal may be treated by KCDC as a material breach of contract.
6. Any deductibles and/or self-insured retentions greater than \$50,000 must be disclosed to and approved by KCDC prior to the commencement of services. Use of large deductibles and/or self-insured retentions will require proof of financial ability as determined by KCDC.
7. All policies must be written on an occurrence basis with the exception of Errors and Omissions Liability (E & O) / Professional Liability and Pollution Liability which may be claims made coverage.
8. Require all subcontractors to maintain during the term of the resulting contract commercial general liability insurance, automobile liability insurance, and workers' compensation insurance (unless subcontractor's employees are covered by Supplier's insurance) in the same manor and limits as specified for the Supplier. Employers' Liability Insurance with a limit of not less than \$500,000.

**h. Certificate Holder and Additional Insured:**

KCDC, its officials, officers, employees, and volunteers  
901 N Broadway  
Knoxville, TN 37917

- i. **Right to Revise or Reject:** KCDC reserves the right to revise any insurance requirement, including but not limited to, limits, coverages, and endorsements based on changes in scope of work/specifications, insurance market conditions affecting the availability or affordability of coverage.
- j. **No Representation of Coverage Adequacy:** The coverages, limits or endorsements required herein protect the primary interests of KCDC, and the Supplier agrees in no way should these coverages, limits or endorsements required be relied upon when assessing the extent or determining appropriate types and limits of coverage to protect the Supplier against any loss exposures, whether as a result of the project or otherwise.

<b>Certificate Holder &amp; Additional Insured</b>	KCDC, its officials, officers, employees, and volunteers 901 N Broadway Knoxville, TN 37917
<b>GL (Supplier &amp; Subcontractors)</b>	\$1M / \$2M
<b>Auto (Supplier &amp; Subcontractors)</b>	\$1M (owned, hired, & non-owned)
<b>WC (Supplier &amp; Subcontractors)</b>	Statutory limits
<b>Employers' Liability (Supplier)</b>	\$1M
<b>Employers' Liability (Subcontractors)</b>	\$500,000
<b>Pollution (Supplier)</b>	\$1M / \$2M with 3 year Discovery; with Retro Date at least equal to contract date
<b>Builder's Risk (Supplier)</b>	100% of projected completed value
<b>30-day cancellation (Supplier &amp; Subcontractors)</b>	Required– must indicate on COI
<b>Primary non-contributory (Supplier &amp; Subcontractors)</b>	Required – must indicate on COI
<b>Waiver of Subrogation (Supplier &amp; Subcontractors)</b>	Required all coverages – must indicate on COI

All limits indicated are minimums required.

**Solicitation Document F Envelope Coversheet for Infrastructure Work for the former Austin Homes site C20006**



State Law requires certain supplier license information on the front of your envelope. You are responsible for providing the correct information on the envelope front but KCDC provided this form as a guide to help you. Failure to supply this information may invalidate your bid. **Attach this completed page to the front of your bid envelope**

<b>Bid Due Date/Time</b>	03-10-20 at 2:00 p.m.		
<b>State of Tennessee Supplier's License Holder Name</b>			
<b>State of Tennessee Supplier's License Number</b>			
<b>Pertinent State of Tennessee Supplier's License Classification</b>			
<b>State of Tennessee Supplier's License Expiration Date</b>			
<b>Subcontractors to be used on this project</b> (If subcontract work is not required, write "none required")			
<b>Electrical Subcontractor Name on the State of Tennessee's Supplier's License</b>		<b>State of Tennessee Supplier License Number</b>	
<b>State of Tennessee Supplier License Classification(s)</b>		<b>Expiration Date of State Supplier's License</b>	
<b>HVAC Subcontractor Name on the State of Tennessee's Supplier's License</b>		<b>State of Tennessee Supplier License Number</b>	
<b>State of Tennessee Supplier License Classification(s)</b>		<b>Expiration Date of State Supplier's License</b>	
<b>Masonry Subcontractor Name on the State of Tennessee's Supplier's License</b>		<b>State of Tennessee Supplier License Number</b>	
<b>State of Tennessee Supplier License Classification(s)</b>		<b>Expiration Date of State Supplier's License</b>	
<b>Plumbing Subcontractor Name on the State of Tennessee's Supplier's License</b>		<b>State of Tennessee Supplier License Number</b>	
<b>State of Tennessee Supplier License Classification(s)</b>		<b>Expiration Date of State Supplier's License</b>	

**Advisements:**

1. KCDC will not consider notes changing the bid written on the bid envelope.
2. For the listed subcontractor types above, you may only list one firm.
3. State requirement information is at <https://www.tn.gov/commerce/regboards/contractors.html>