Date: April 6, 2018

To: Respondents
Ref: RFP: 18-RB-42530003-TSTC Drainage Improvements – Waco Campus Only
Subject: **ADDENDUM NO. 04**

This addendum amends, clarifies, amplifies, or further explains the above reference Request for Proposal (RFP). The information contained herein shall supersede and take precedence over the information contained in the RFP.

1. **How can obtain the RFP package or file?**
   **ANSWER:** *The RFP is posted on the ESBD and on TSTC website. To obtain the RFP pdf file please highlight the link below, right click and the file should come up. You will need to have a adobe or a pdf program that will be able to allow you to review the file.*

   http://www.tstc.edu/procurement/viewsolsws

2. **A large part of the specification seem to be for a Utility Project (Water/Wastewater). Why is this included?**
   The revised scope of service has been added to the RFP project for TSTC Drainage Improvements and is now posted to the ESBD and to the TSTC website. Please select Addendum 4 for the revised Agenda, Pre-bid sign in sheets, Revised Project Manual, and Revised Statement of Qualifications.

3. **Please send sign in sheet from the Pre-Bid meeting?**
   Sign in sheets along with the Agenda are posted under Addendum 4.

4. **Clarification of the specification.**
   The revised Project Manual, Revised Statement of Qualifications are attached –Addendum 4

5. **What do they do with concrete, soil and brush?**
   The soil and concrete from the TSTC Drainage Improvement project will be moved to TSTC's Old Sewer Plant yard at 103 15th St., Waco, Texas 76705. The location is adjacent to the project. The contractor will be responsible to remove the trees and shrubs from this project off campus to an approved landfill or will be responsible in getting written permission from a landowner it will be hauled to. If to a landowner the contractor will be responsible in supplying TSTC proof of written permission from land owner.

## End of Addendum No. 04

*Ratchel Brown*

Ratchel Brown, CTPM, CTCM
Sr. Buyer
Phone: (903) 923-3225
ratchel.brown@tstc.edu

Please acknowledge receipt of this addendum on "Acknowledgement of Addenda" on ***page 24*** of the RFP.

# TSTC Drainage Improvements Project
# Pre-Proposal Meeting
# March 29, 2018 10:00 a.m.

## Meeting Agenda

1. Introductions

2. Administrative Overview
   - Schedule
     - Last day to Submit Written Questions 11:00 a.m. Friday, April 6, 2018
       - All questions must be submitted to Ratchel, who will forward to the appropriate people for answers; time and date in Section 1.5 – Clarifications and Interpretations will be modified to match the time date shown in Section 1.4 – Key Events Schedule.
     - Final Addendum Published Tuesday, April 10, 2018
       - Addendums #1 and #2
       - Addendum #3 to be issued following meeting
       - All questions shall be submitted in writing to Ratchel Brown at ratchel.brown@tstc.edu.
       - Addendum will be issued through the TSTC Procurement website or the Electronic State Business Daily website.
     - Proposals Due 2:00 p.m. Friday, April 13, 2018
       - Ratchel Brown at TSTC in Marshall
     - Proposed Award Schedule (Tentative): April 13 – April 30, 2018
   - Sealed Offers include:
     - Attachments A, B, D, and G, including tables for qualifications and references

3. Technical Overview
   - Drainage Improvements – Base Bid: Areas 3 and 4 include the clearing, widening and grading of the existing channel downstream of Meyers Lane with a portion being concrete lined. Area 5 includes the removal of existing concrete, grading, and installation of new concrete rip rap at the confluence of the two drainage ditches along Carswell and Campus Drive.

Additive Alternate 1: Area 1 includes the removal and replacement of the concrete pilot channel.

Additive Alternate 2: Area 5 includes the removal of the existing concrete pilot channel, grading, and installation of concrete rip rap.

- ~~Abandonment & Demolition of Lyndale Lift Station~~
- Milestone, Contract Time and Liquidated Damages
  - Final Completion: As proposed by Offeror
  - Liquidated Damages, Final Completion: $500.00/day
- Contract Conditions
  - Walker Partners will perform one-time construction staking at no expense to Contractor. Any restaking shall be at the expense of the Contractor
  - Walker Partners will serve as the Owner's Resident Project Representative.
- Project Scope of Work
  - Drawings
    - C100
      - Base Bid – Sta. 0+00 to approximate Sta. 0+55
      - Add. Alt. #1 – Sta. 0+55 to End
      - General Notes – Tree Protection
    - C102 – Area 1 Typical Section
    - C300 – Keynote 10
    - C301 – Typical Sections
    - C401 – Existing CMP's
    - C403
      - Typical Section
      - Approved Soil Retention Blanket List
    - C500
      - Base Bid – Sta. 0+00 to approximate Sta. 1+00
      - Add. Alt. #2 – Sta. 1+00 to End
      - Sta. 3+85 – Ex. Culvert outfall
    - Concrete Reinforcement and Joint Detail
      - Construction joint spacing

- Project Manual
  - Reference Section 1.16 for Insurance Requirements
  - Qualifications and References Tables
    - See revised tables attached as part of Addendum #3.
  - General Conditions – Article 16.1.3
  - New Technical Specifications
    - See revised Technical Specs attached as part of Addendum #3.
  - Submittal Procedures (01 33 00)
  - Quality Requirements (01 40 00)
    - Part 1.6 – Testing and Inspection Services
    - Part 3.1 – Construction Material Lab Testing Matrix
  - Contractor must prepare and implement Stormwater Pollution Prevention Plan (SWPPP) (31 25 12)
  - Miscellaneous Concrete (32 13 13) 2.4.A.3
    - Concrete for rip rap must meet requirements of Class 'B' concrete.

- Other General Information
  - Contractor will be responsible for submitting a Criminal History Report for each individual in the company that will be working on this project.
  - Each employee of the Contractor must have a visible identification card on his/her person at all times will on the project site.
  - During the progress of work and on a daily basis, Contractor shall keep the project site free from accumulations of all waste material, rubbish, and other debris resulting from the work.
  - Concrete waste must be disposed of off-site
    - TSTC agreed to accept excavation and concrete spoils at the TSTC Farm which is less than 2 miles from the project site.

4. Previous Questions and Answers

- Addendum #1
  - The project site is located at TSTC Waco campus, but proposals will be received at the TSTC Marshall campus.
- Addendum #2
  - RFP package can be accessed on the TSTC Procurement website or the Electronic State Business Daily

5. Additional Questions and Answers

- Can trees and brush that is cleared from drainage channels be disposed at the TSTC Farm?
  - No, all trees, brush, logs, rubbish and all other objectional matter must be disposed of offsite. Trees and brush will not be allowed to be chipped and spread on site.

# DRAINAGE IMPROVEMENTS

# PROJECT SPECIFICATIONS

FEBRUARY 9, 2018

PROJECT NUMBER 1-03084

Clark W. Gauer, P.E. 02/09/2018

STATE OF TEXAS
CLARK W. GAUER
#80599
REGISTERED
PROFESSIONAL ENGINEER

Walker Partners
engineers ★ surveyors

T.B.P.E. Registration No. 8053

# SECTION 01 33 00 - SUBMITTAL PROCEDURES

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

A. Submittal procedures.

B. Construction progress schedules.

C. Proposed product list.

D. Product data.

E. Use of electronic CAD files of Project Drawings.

F. Shop Drawings.

G. Samples.

H. Design data.

I. Test reports.

J. Certificates.

K. Manufacturer's instructions.

L. Manufacturer's field reports.

M. Erection Drawings.

N. Contractor review.

O. Engineer review.

### 1.2 SUBMITTAL PROCEDURES

A. Submittals shall be directly from the Contractor. Submittals from others (i.e., suppliers or subcontractors) shall not be accepted.

B. Transmit each submittal on an Engineer accepted form.

C. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.

D. Identify Project, Contractor, subcontractor and supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.

E. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

F. Schedule submittals to expedite Project, and deliver to Engineer at business address. Coordinate submission of related items.

G. For each submittal for review, allow 15 days excluding delivery time to and from Contractor.

H. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of completed Work.

I. Allow space on submittals for Contractor and Engineer review stamps.

J. When revised for resubmission, identify changes made since previous submission.

K. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.

L. Submittals not requested will not be recognized or processed.

M. Incomplete Submittals: Engineer will not review. Complete submittals for each item are required. Delays resulting from incomplete submittals are not the responsibility of Engineer.

1.3 CONSTRUCTION PROGRESS SCHEDULES

A. Comply with Section 01 32 16 - Construction Progress Schedule (when required)

1.4 PROPOSED PRODUCT LIST

A. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalog designation, and reference standards.

1.5 PRODUCT DATA

A. Product Data: Action Submittal: Submit to Engineer for review for assessing conformance with information given and design concept expressed in Contract Documents.

B. Submit electronic submittals via email as PDF electronic files.

C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.6 ELECTRONIC CAD FILES OF PROJECT DRAWINGS

A. Electronic CAD Files of Project Drawings: May only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.

B. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:
1. Use of files is solely at receiver's risk. Engineer does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify Engineer of discrepancy and use information in hard-copy Drawings and Specifications.
2. CAD files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
3. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
4. Receiver shall not hold Engineer responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.
5. Receiver shall understand that even though Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
6. Receiver shall not hold Engineer responsible for such viruses or their consequences, and shall hold Engineer harmless against costs, losses, or damage caused by presence of computer virus in files or media.

1.7 SHOP DRAWINGS

A. Shop Drawings: Action Submittal: Submit to Engineer for assessing conformance with information given and design concept expressed in Contract Documents.

B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. When required by individual Specification Sections, provide Shop Drawings signed and sealed by a professional Engineer responsible for designing components shown on Shop Drawings.
1. Include signed and sealed calculations to support design.
2. Submit Shop Drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
3. Make revisions and provide additional information when required by authorities having jurisdiction.

D. Submit number of reproductions Contractor requires, plus two copies Engineer will retain.

E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.8 SAMPLES

A. Samples: Action Submittal: Submit to Engineer for assessing conformance with information given and design concept expressed in Contract Documents.

B. Samples for Selection as Specified in Product Sections:
1. Submit to Engineer for aesthetic, color, and finish selection.
2. Submit Samples of finishes, textures, and patterns for Architect/Engineer selection.

C. Submit Samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate Sample submittals for interfacing work.

D. Include identification on each Sample, with full Project information.

E. Submit number of Samples specified in individual Specification Sections; Engineer will retain one Sample.

F. Reviewed Samples that may be used in the Work are indicated in individual Specification Sections.

G. Samples will not be used for testing purposes unless specifically stated in Specification Section.

H. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.9 DESIGN DATA

A. Submit for Engineer's knowledge as contract administrator or for Owner.

B. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.10 TEST REPORTS

A. Informational Submittal: Submit reports for Engineer's knowledge as Contract administrator or for Owner.

B. Submit test reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.11 CERTIFICATES

A. Informational Submittal: When specified in Technical Specifications, submit certification by manufacturer, installation/application Subcontractor, or Contractor to Engineer, in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or product but must be acceptable to Architect/Engineer.

1.12 MANUFACTURER'S INSTRUCTIONS

A. Informational Submittal: When specified in Technical Specifications, submit manufacturer's installation instructions for Engineer's knowledge as Contract administrator or for Owner.

B. Submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, to Engineer for delivery to Owner in quantities specified for Product Data.

C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.13 MANUFACTURER'S FIELD REPORTS

A. Informational Submittal: Submit reports for Engineer's knowledge as Contract administrator or for Owner.

B. Submit report in duplicate within three days of observation to Engineer for information.

C. Submit reports for information for limited purposes of assessing conformance with information given and design concept expressed in Contract Documents.

1.14 ERECTION DRAWINGS

A. Informational Submittal: Submit Drawings for Engineer's benefit as Contract administrator or for Owner.

B. Submit Drawings for information assessing conformance with information given and design concept expressed in Contract Documents.

C. Data indicating inappropriate or unacceptable Work may be subject to action by Engineer or Owner.

1.15 CONTRACTOR REVIEW

A. Review for compliance with Contract Documents and approve submittals before transmitting to Engineer.

B. Contractor: Responsible for:
   1. Determination and verification of materials including manufacturer's catalog numbers.
   2. Determination and verification of field measurements and field construction criteria.
   3. Checking and coordinating information in submittal with requirements of Work and of Contract Documents.
   4. Determination of accuracy and completeness of dimensions and quantities.
   5. Confirmation and coordination of dimensions and field conditions at Site.

6. Construction means, techniques, sequences, and procedures.
7. Safety precautions.
8. Coordination and performance of Work of all trades.

C. Stamp, sign or initial, and date each submittal to certify compliance with requirements of Contract Documents.

D. Do not fabricate products or begin Work for which submittals are required until approved submittals have been received from Engineer.

1.16 ENGINEER REVIEW

A. Do not make "mass submittals" to Engineer. "Mass submittals" are defined as six or more submittals or items in one day or 15 or more submittals or items in one week. If "mass submittals" are received, Engineer's review time stated above will be extended as necessary to perform proper review. Engineer will review "mass submittals" based on priority determined by Engineer after consultation with Owner.

B. Informational submittals and other similar data are for Engineer's information, do not require Engineer's responsive action, and will not be reviewed or returned with comment.

C. Submittals made by Contractor that are not required by Contract Documents may be returned without action.

D. Submittal approval does not authorize changes to Contract requirements unless accompanied by Change Order, Field Order, or Work Change Directive.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 Section 31 10 10 – Clearing

A. Product Data: Submit Data for herbicide. Indicate compliance with applicable codes for environmental protection.

3.2 Section 31 23 16 – Excavation

A. Excavation Protection Plan: Describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan.

3.3 Section 31 25 12 – Storm Water Pollution Prevention

A. Submit one copy of the SWP3 to Engineer for record retention purposes only. Engineer will not review or approve the SWP3.

3.4 32 13 13 – Concrete Paving and Miscellaneous Concrete

A. Product Data:
1. Submit data on concrete materials, joint filler, joint sealer, admixtures, and curing compounds.
2. Joint Sealer: Manufacturer's Installation Instructions: Submit special procedures, surface preparation, and conditions requiring special attention.

B. Submit Concrete Mix Design for each class of concrete from a batch plant that is currently certified by the National Ready Mixed Concrete Association. The Mix Designer shall be a licensed professional engineer registered in the State of Texas or a TxDOT approved Mix Designer. Concrete mix design date shall be no older than 12 months from current date (unless approval by Engineer) from the local TxDOT District and shall identify mix ingredients and proportions, including admixtures.

C. Source Quality Control Submittals: Indicate results of shop factory tests and inspections.

3.5 Section 32 31 13 – Chain Link Fences and Gates

A. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, gates, and schedule of components.

B. Product Data: Submit data on fabric, posts, accessories, fittings and hardware.

3.6 Section 32 92 19 – Seeding

A. Product Data: Submit data for seed mix, fertilizer, mulch, stabilizer and other accessories.

3.7 Section 32 92 23 – Sodding

A. Product Data: Submit data for sod grass species, fertilizer, mulch, herbicide and other accessories.

B. Submit minimum 10 oz sample of topsoil proposed. Forward sample to approved testing laboratory in sealed containers to prevent contamination.

C. Test Reports: Indicate topsoil nutrient and pH levels with recommended soil supplements and application rates.

3.8 Section 33 01 30 – Frames, Grates, Rings, and Covers

A. Product Data: Submit manhole covers and riser rings construction, features, configuration, dimensions, and manufacturer.

B. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

3.9 Section 33 05 14 – Manholes and Structures

A. Shop Drawings: Indicate structure locations, elevations, piping, conduit, and invert sizes and elevations of penetrations.

B. Product Data: Submit manhole covers, component construction, features, configuration, dimensions and invert configuration.

C. Submit the following prior to start of testing:
   1. Test procedures
   2. List of test equipment
   3. Testing sequence schedule
   4. Provisions for disposal of flushing and test water
   5. Certification of test gauge calibration

D. Test Reports: Indicate results of manhole tests

END OF SECTION

# SECTION 01 40 00 - QUALITY REQUIREMENTS

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

A. Quality control.

B. Tolerances.

C. References.

D. Labeling.

E. Testing and inspection services.

F. Manufacturers' field services.

### 1.2 QUALITY CONTROL

A. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. When manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

D. Products, materials, and equipment may be subject to inspection by Engineer and Owner at place of manufacture or fabrication. Such inspections shall not relieve Contractor of complying with requirements of Contract Documents.

E. Supervise performance of Work in such manner and by such means to ensure that Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

F. Perform work in accordance with Texas Department of Transportation’s Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (latest Edition). Maintain one copy on site.

### 1.3 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current as of date for receiving Bids except where specific date is established by code.

C. Obtain copies of standards and maintain on Site when required by product Specification Sections.

D. When requirements of indicated reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.

E. Neither contractual relationships, duties, or responsibilities of parties in Contract nor those of Engineer shall be altered from Contract Documents by mention or inference in reference documents.

1.5 LABELING

A. Attach label from agency approved by authorities having jurisdiction for products, assemblies, and systems required to be labeled by applicable code.

B. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label:
1. Model number.
2. Serial number.
3. Performance characteristics.

C. Manufacturer's Nameplates, Trademarks, Logos, and Other Identifying Marks on Products: Not allowed on surfaces exposed to view in public areas, interior or exterior.

1.6 TESTING AND INSPECTION SERVICES

A. Owner will employ and pay for specified services of an independent firm to perform testing and inspection.

B. Independent testing firm will perform tests, inspections, and other services specified in individual Specification Sections and as required by Engineer. In the event of a conflict in the Contract Documents concerning sampling and testing frequency, the more stringent standard shall be enforced, unless otherwise approved by the Engineer.
1. Laboratory: Authorized to operate in State of Texas.
2. Laboratory Staff: Maintain full-time Professional Engineer on staff to review services.
3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.

C. Testing, inspections, and source quality control may occur on or off Project Site. Perform off-Site testing as required by Engineer or Owner.

D. Cooperate with independent testing firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
   1. Notify Engineer and independent testing firm 48 hours before expected time for operations requiring services.
   2. Make arrangements with independent testing firm and pay for additional Samples and tests required for Contractor's use.

E. Testing and employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work according to requirements of Contract Documents.

F. Retesting or re-inspection required because of nonconformance with specified or indicated requirements shall be performed by same independent testing firm on instructions from Engineer. Payment for retesting or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.

G. Independent Testing Firm Responsibilities:
   1. Test Samples of mixes submitted by Contractor.
   2. Provide qualified personnel at Site. Cooperate with Engineer and Contractor in performance of services.
   3. Perform indicated sampling and testing of products according to specified standards.
   4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   5. Promptly notify Engineer and Contractor of observed irregularities or nonconformance of Work or products.
   6. Perform additional tests required by Engineer.
   7. Attend preconstruction meetings and progress meetings.

H. Material Testing Reports: After each test, Independent Testing Firm shall promptly submit two copies of testing reports to Engineer, Contractor, and other entities as directed, indicating observations and results of tests and compliance or noncompliance with Contract Documents. At a minimum, include the following information in testing reports:
   1. Date issued.
   2. Project title and number.
   3. Name of inspector/testing technician.
   4. Date and time of sampling or inspection.
   5. Identification of product and Specification Section.
   6. Location in Project.
   7. Type of inspection or test.
   8. Date of test.
   9. Results of tests.
   10. Compliance or noncompliance with Contract Documents.
   11. Special observations, if any.

   Submit final report indicating correction of Work previously reported as noncompliant. Log all test results in an electronic spreadsheet for each test procedure and provide updated versions to Engineer at agreed upon time interval.

I. Limits on Independent Testing Firm:

1. Independent Testing Firm may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Independent Testing Firm may not approve or accept any portion of the Work.
3. Independent Testing Firm may not assume duties of Contractor.
4. Independent Testing Firm has no authority to stop the Work.

1.7 MANUFACTURER'S FIELD SERVICES

A. When specified in individual Specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe Site conditions, conditions of surfaces and installation, quality of workmanship, startup of equipment, testing, adjusting, and balancing of equipment as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Engineer 30 days in advance of required observations. Observer is subject to approval of Engineer.

C. Report observations and Site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.

D. Refer to Section 01 33 00 - Submittal Procedures, "Manufacturer's Field Reports" Article.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 Construction Material Lab Testing Matrix

| **Contractor or Owner Employed Inspection Services** | | |
|---|---|---|
| **Construction Operation / Standard Specification** | **Applicable Testing** | **Frequency of Testing** |
| Excavation<br><br>31 23 16 | Laboratory Material Tests: ASTM D698<br><br>Compaction Density Tests:<br><br>Minimum of 95% and less than 100% of maximum dry density | 1 per 5000 SF |
| | Compaction Moisture Tests:<br><br>ASTM D3017 | 1 per 5000 SF |

| Contractor or Owner Employed Inspection Services | | |
|---|---|---|
| **Construction Operation / Standard Specification** | **Applicable Testing** | **Frequency of Testing** |
| | Shall be no less than optimum moisture to no greater than 3 percentage points above optimum moisture | |
| Concrete<br><br>32 13 13 | 1. Strength Test Samples:<br>a. Sampling Procedures: ASTM C172<br>b. Cylinder Molding and Curing Procedures: ASTM C31, Cylinder Specimens, standard cured.<br>2. Field Testing:<br>a. Slump Test Method: ASTM C143<br>b. Air Content Test Method: ASTM C173<br>c. Temperature Test Method: ASTM C1064<br>3. Cylinder Compressive Strength Testing:<br>a. Test Method: ASTM C39 | Make 1 set (four cylinders) for each class of concrete placed.<br><br>Class A and C – Make one set per every 25 CY or less<br><br>Class P – Make one set for every 2500 SF or less<br><br>Measure Slump, Air Content and Temperature for each set of cylinders.<br><br>Average compressive strength of 3 consecutive test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.<br><br>Test one cylinder at 7 days. Test two cylinders at 28 days. Retain one cylinder for 28 days for testing when requested by Engineer. Dispose remaining cylinders when testing is not required. |

| **Contractor Inspection Services** | | | |
|---|---|---|---|
| Excavation<br><br>31 23 16 | | | Request visual inspection of bearing surfaces by Engineer before installing subsequent work. The Engineer shall be notified not less than three working days prior to the visual inspection. |

END OF SECTION

# SECTION 31 10 00 - CLEARING

## PART 1 GENERAL

### 1.1 SUMMARY

A. Section Includes:
1. Removing and disposing of surface debris, rubbish, and other objectionable materials.
2. Removing and disposing of designated building slabs, paving, curbs, driveways, miscellaneous stone, brick, concrete, sidewalks, drainage structures, headwalls, safety end treatments, manholes, inlets, and abandoned railroad tracks.
3. Removing and disposing of designated fencing and signage.
4. Removing and disposing of designated trees, shrubs, and other plant life.
5. Removing and disposing of designated abandoned water and wastewater utilities and septic tanks.
6. Herbicide treatment
7. Excavating topsoil.

### 1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Clearing:
1. Basis of Measurement: "Clearing," when included in the contract as a pay item, will be measured by the acre or by the linear foot (for the width of ROW and/or width of easement).
2. Basis of Payment: This item will be considered subsidiary to Section 31 23 16, "Excavation," unless included as a separate pay item in the contract. When included for payment, it shall be paid for at the unit price bid for "Clearing," which price shall be full compensation for all work herein specified, including the furnishing of all materials, equipment, tools, labor, hauling, legal disposal and incidentals necessary to complete the work. Herbicide shall be paid for herbicide application and furnishing equipment, material, labor, tools, re-treatment as necessary, and incidentals. Payment, when included as a contract pay item, will be made under the following:
a. Clearing (Method A) – Per Acre, Measured.
b. Clearing (Method B) – Per Linear Foot (width of ROW/width of easement), Plan Quantity.
c. Herbicide Treatment (Broadcast) – Per Lump Sum, Plan Quantity.
d. Herbicide Treatment (Basel Bark) – Per Lump Sum, Plan Quantity.
e. Herbicide Treatment (Cut-Stump) – Per Lump Sum, Plan Quantity.

### 1.3 QUALITY ASSURANCE

A. Conform to applicable code for environmental requirements, disposal of debris, burning debris on site, and use of herbicides.

B. Herbicide:
1. License Requirements: Possess either a commercial pesticide applicator license from the Texas Department of Agriculture, or a Texas Structural Pest Control Service License. Provide documentation of license before beginning work. Conduct on-site supervision of

all mixing, transporting, handling, spraying, and disposal of materials with licensed personnel.

2. Records: Document work in accordance with all Federal, State, and Local regulations. Submit a copy of the herbicide records on the next business day following application. Submit a final copy of all the herbicide application records upon completion of the work.

## PART 2 PRODUCTS

### 2.1 MATERIALS

A. Herbicide: Furnish herbicide materials in accordance with Section 15 of the 2017 TxDOT Herbicide Operations Manual.

B. Pathfinder II, Transline, & Capstone are applicable products that can be used in conjunction with each other, as shown in the drawings.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify existing plant life designated to remain is tagged or identified.

C. Identify spoils site for placing removed materials.

### 3.2 PREPARATION

A. Call Texas 811 service at 800-344-8377 not less than three working days before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

B. Prior to commencing this work, erosion control measures shall be in place.

### 3.3 PROTECTION

A. Locate, identify, and protect structures and utilities indicated to remain, from damage.

B. Areas within the construction limits or as indicated shall be cleared of all trees, stumps, brush, etc. as defined above; except trees or shrubs indicated for preservation which shall be carefully trimmed as directed, and shall be protected from scarring, barking or other injuries during construction operations. Exposed ends of pruned limbs or scarred bark shall be pruned, trimmed and treated with an approved asphaltic material within 24 hours of the pruning or injury.

C. Locate, protect, and maintain benchmarks, monuments, control points, and project engineering reference points. Re-establishment of disturbed or destroyed items shall be by a Registered Professional Land Surveyor (licensed in the state of Texas), at no additional cost to Owner.

D. Construction equipment shall not be operated within the drip line of trees, unless indicated. Construction materials shall not be stockpiled under the canopies of trees. No excavation or embankment shall be placed within the drip line of trees until tree wells are constructed.

3.4 CLEARING

A. Strip and remove from construction area all topsoil, organics, and vegetation to a minimum depth of 6 inches below the existing natural ground surface.

B. Remove trees and shrubs within the construction limits unless noted otherwise in the Drawings. Remove stumps, main root ball, and root system. Holes remaining after the removal of all obstructions, objectionable materials, trees, stumps, etc. shall be backfilled with Select Fill and compacted in accordance with Section 31 23 23.

C. Clear undergrowth and deadwood, without disturbing subsoil.

D. Apply herbicide to remaining stumps to inhibit growth.

3.5 REMOVAL

A. Remove surface debris, rock, and extracted trees, shrubs and other plant life from site, or as indicated on Drawings.

B. Remove designated building slabs, paving, curbs, driveways, miscellaneous stone, brick, concrete, sidewalks, drainage structures, headwalls, safety end treatments, manholes, inlets, and abandoned railroad tracks as indicated on Drawings. Neatly saw cut edges at right angle to surface.

C. Remove designated fencing and signage.

D. Remove abandoned water and wastewater utilities and septic tanks. Indicated removal termination point for underground utilities on Record Documents.

E. Continuously clean-up and remove waste materials from site. Do not allow materials to accumulate on site.

F. Do not burn or bury materials on site. Leave site in clean condition.

3.6 HERBICIDE TREATMENT

A. Season: Spray herbicide during active growing periods unless otherwise approved.

B. Equipment: Furnish all equipment.
   1. Broadcast application: furnish self-propelled equipment tractor mounted or pulled spray rigs with a low center of gravity that allows safe traverse on a maximum 3:1 slope.

Provide equipment capable of making uniform broadcast application calibrated at a rate between 20 and 40 gallons per acre (GPA).

2. Basel Bark and Cut Tree applications: Furnish sprayers with low volume spray tips (spray system 5500 adjustable spray tip X-1 or X-2, or approved equivalent).
3. Personal Protection Equipment: Follow the manufacturer's label requirements for personal protection of employees.

C. Work Methods: Apply approved herbicide in accordance with the manufacturer's label recommendations, as shown on the drawings or as approved. Add surfactant and blue dye marker at the manufacturer's recommended rate unless otherwise approved. Prepare herbicide solution to the rates shown on the drawing using procedures on the herbicide container label. Dispose of empty containers and unused chemical mixtures in accordance with the label directions and local, state, and federal regulations. Cease spraying operation immediately when wind or other environmental conditions cause off-target spray drift, leaves are wet, or rainfall is imminent. An inspection of the treated areas will be made not less than 14 days and no later than 30 days after the application. Re-treat areas in which the undesirable vegetation has not be controlled for no additional compensation. Repair and replace any damaged desirable vegetation or erosion as a result of negligent applications.

1. Broadcast application: spray undesirable vegetation by broadcasting with spray nozzels at the desired rate. Ensure nozzels spray consistent across the area being covered.
2. Basal Bark treatment: apply herbicide solution with a low-volume, low pressure sprayer which thoroughly wets the lower 12-15 in. of stems on all sides, including the root collar area, but not to the point of run-off. Perform application at any time throughout the year, except when the stumps are wet from rainfall or dew prevents spraying to the base of the plant.
3. Cut-stump treatment: cut plants parallel to the ground, not to exceed 2 in. above the ground line. Apply the herbicide solution with a low-volume, low-pressure sprayer which thoroughly wets the area adjacent to the cambium and bard around the entire circumference of the stump. Thoroughly wet the sides of the stump, but not to the point of run-off. Make the herbicide application within 1 hr. from the time each plant is cut. Dispose of removed materials and debris at appropriate off-site locations in accordance with local, state, and federal requirements.

D. Engineer reserves the right to pay a partial payment of 50% of the lump sum price bid after the initial application is performed. The final 50% of the lump sum price bid will be paid after the inspection and required re-treatments have been completed and accepted.

## 3.7 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be further excavated, relandscaped, regraded, or within the construction limits of a structure without mixing with foreign materials for use in finish grading.

B. Do not excavate wet topsoil.

C. Stockpile in area designated on site to a height which yields safe slope stability and protect from erosion. Remove excess topsoil not intended for reuse, from project.

END OF SECTION

# SECTION 31 23 16 - EXCAVATION

## PART 1 GENERAL

### 1.1 SUMMARY

A. Description: This item shall consist of excavating and properly utilizing or otherwise satisfactorily disposing of all excavated material, of whatever character, within the limits of the work indicated and the constructing, compacting, shaping and finishing of all earthwork on the entire project in accordance with the specification requirements herein outlined and in conformity with the required lines, grades and typical cross sections indicated or as directed by the Engineer. **All excavation shall be unclassified and shall include all materials encountered regardless of their nature or the manner in which they are removed.**

B. Section Includes:
   1. Soil compaction.
   2. Excavating for structures and foundations.
   3. Excavating for paving, roads, and parking areas.
   4. Excavating for slabs-on-grade.
   5. Excavating for site structures.

### 1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Excavating Soil Materials:
   1. Basis of Measurement: All accepted excavation will be measured by Method A, B, or C as follows:
      a. Method A: Measurement of the volume of excavation in cubic yards. The plan quantities for excavation will be used as the measurement for payment of this item.
      b. Method B: Measurement of the area in square yards of surface area excavated as indicated. The plan quantities will be used as the measurement for payment of this item.
      c. Method C: Measurement of the volume of excavation in cubic yards by the average end areas. Cross sectional areas shall be computed from the existing ground section to the established line of the subgrade as indicated for the limits of the right of way or other work limits shown, including parkway slopes and sidewalk areas.
   2. Basis of Payment: This item will be paid for at the contract unit price bid for "Excavation," as provided under measurement Method A, B, or C as included in the bid, which price shall be full compensation for all work herein specified, including subgrade preparation, unless specified otherwise and the furnishing of all materials, equipment, tools, labor and incidentals necessary to complete the work. Payment will be made under one of the following:
      a. Excavation (Method A) – Per Cubic Yard, Plan Quantity.
      b. Excavation (Method B) – Per Square Yard, Plan Quantity.
      c. Excavation (Method C) – Per Cubic Yard, Measured.

## PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 PREPARATION

A. Erosion control and tree protection measures shall be in place prior to commencing work.

B. Construction equipment shall not be operated within the drip line of trees, unless indicated.

C. Construction materials shall not be stockpiled under the canopies of trees. No excavation or embankment shall be placed within the drip line of trees until tree wells are constructed as indicated on the Drawings.

D. Call Texas 811 service at 800-344-8377 not less than three working days before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

E. Call Local Municipality(ies) not less than 2 weeks before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

F. Notify utility company(ies) to remove and relocate utilities as indicated on the Drawings.

G. Protect utilities indicated to remain from damage.

H. Protect plant life, lawns, rock outcroppings and other features remaining as portion of final landscaping.

I. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.2 EXCAVATION

A. All excavation shall be performed as specified herein and shall conform to the established alignment, grades and cross sections.

B. Suitable excavated "on-site" materials (Subsoil Type S3) may be utilized, insofar as practicable and when the material meets the criteria outlined in Section 31 05 13 in constructing required embankments and "fill" areas. The construction of all embankments and "fill" areas shall conform to Section 31 23 23.

C. Materials with a Plasticity Index (PI) greater than the surrounding materials or with a moisture content greater than 2 percent in excess of optimum shall be classified as unsuitable and must be manipulated to meet the above criteria before use or be removed.

D. Unsuitable excavated materials or excavation in excess of that needed for construction shall be known as "Waste" and shall become the property of the Contractor. It shall become his sole responsibility to dispose of this material off the limits of the right of way in an environmentally sound manner at a permitted disposal site.

E. Excavate subsoil to the final subgrade elevation(s) to accommodate structural foundations, slabs-on-grade, paving, site structures, and civil site facilities.

F. Grade top perimeter of excavation to prevent surface water from draining into excavation.

G. Trim excavation. Remove loose matter.

H. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd measured by volume. Remove larger material as specified in Section 31 23 23.

I. Notify Engineer of unexpected subsurface conditions.

J. Correct areas over excavated with Structural Fill as specified in Section 31 23 23.

K. Remove excess and unsuitable material from site.

L. Stockpile subsoil in area designated on site to depth not exceeding 8 feet and protect from erosion.

M. Repair or replace items indicated to remain damaged by excavation.

## 3.3 SUBGRADE PREPARATION FOR STRUCTURES AND PAVEMENTS

A. After final subgrade elevation has been achieved, the exposed subgrade soils (subsoils) shall be scarified to a minimum depth of 6 inches. Compaction of the subsoil shall be to a minimum of 95% and less than 100% of its maximum dry density when determined in accordance with ASTM D698, Method D, Standard Proctor. The subsoil shall be no less than its optimum moisture to no greater than 3 percentage points above its optimum moisture content at the time of testing. The moisture content shall be maintained until subsequent construction activities commence.

## 3.4 FIELD QUALITY CONTROL

A. Sections 01 40 00 - Quality Requirements.

B. Request inspection of excavation, subgrade preparation, and density controlled fill operations in accordance with Section 31 23 23.

## 3.5 PROTECTION

A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

C. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION

# SECTION 31 25 12 – STORM WATER POLLUTION PREVENTION

## PART 1 GENERAL

### 1.1 SUMMARY

A. Section Includes:
   1. Documentation to be prepared and signed by Contractor before conducting construction operations, in accordance with the Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit Number TXR 150000, latest issue date (the Construction General Permit).
   2. Implementation, maintenance inspection, and termination of storm water pollution prevention control measures including, but not limited to, erosion and sediment controls, storm water management plans, waste collection and disposal, off-site vehicle tracking, and other appropriate practices.
   3. Review of the Storm Water Pollution Prevention Plan (SWP3) implementation in a meeting with Engineer prior to start of construction.

### 1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Storm Water Pollution Prevention Plan:
   1. Basis of Measurement: Lump Sum.
   2. Basis of Payment: Payment for Storm Water Pollution Prevention Plan shall be made at the lump sum bid for "Storm Water Pollution Prevention Plan." Payment for all work prescribed under this item shall be full compensation for the Storm Water Pollution Prevention Plan including all preparation, submittals, notices, updates, and revisions.

B. Storm Water Pollution Prevention Plan Implementation:
   1. Basis of Measurement: Lump Sum.
   2. Basis of Payment: Includes all aspects of implementing the SWP3, from Notice of Intent through Notice of Termination.

### 1.3 REFERENCES

A. Construction General Permit (TPDES No. TXR 150000).

B. Clean Water Act.

### 1.4 QUALITY ASSURANCE

A. Perform Work in accordance with the SWP3 as per the submission of the Notice of Intent.

B. Maintain one copy of the SWP3 document on site.

## PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 SITE SPECIFIC STORM WATER POLLUTION PREVENTION PLAN (SWP3)

A. Fulfill all TPDES Construction General Permit (TXR 150000) requirements.

B. Contractor shall fulfill the role of Primary Operator as defined by the TPDES Construction General Permit (TXR 150000) for this project.

C. Prepare and submit all required documentation and pay all applicable fees to TCEQ required by the TPDES Construction General Permit (TXR 150000). This includes but is not limited to Notice of Intent, Site Notices, Notice of Termination, and Notification of MS4 Operator.

D. SWP3:
   1. Prepare a SWP3 following Part III of the TPDES Construction General Permit (TXR 150000).
   2. Update or revise the SWP3 as needed during the construction following Part III, Section E of the TPDES Construction General Permit (TXR 150000).
   3. Submit the SWP3 and any updates or revisions to the Engineer for review and address comments prior to commencing, or continuing, construction activities.
   4. Conduct inspections in accordance with TPDES Construction General Permit (TXR 150000).
   5. Maintain copies of SWP3, inspection reports, and other documentation as required by TPDES Construction General Permit (TXR 150000).

3.2 SWP3 IMPLEMENTATION

A. Implement SWP3 utilizing state of the art Best Management Practice controls as required by the Construction General Permit, the site specific SWP3, and local government.

B. Inspect and maintain controls throughout the course of construction per the Construction General Permit requirements.

C. Remove controls per the Construction General Permit requirements.

D. On-Site Waste Material Storage:
   1. Self-contain on-site waste material storage and satisfy appropriate location, state, and federal rules and regulations.
   2. Prepare list of waste material to be stored on-site. Update list as necessary to include up-to-date information. Keep a copy of updated list with the SWP3.
   3. Prepare description of controls to reduce pollutants generated from on-site storage. Include storage practices necessary to minimize exposure of materials to storm water, and spill prevention and response measures consistent with best management practices. Keep a copy of the description with the SWP3.

END OF SECTION

# SECTION 32 13 13 - MISCELLANEOUS CONCRETE

## PART 1 GENERAL

### 1.1 SUMMARY

A. Section Includes:
1. Aggregate base course.
2. For:
   a. Concrete curbs and gutters.
   b. Concrete curb ramps.
   c. Concrete sidewalks.
   d. Concrete driveways.
   e. Concrete fillets.
   f. Concrete valleys.
   g. Concrete flumes.
   h. Concrete pilot channels.
   i. Concrete inlets.
   j. Concrete headwalls, culverts and safety end treatments.
   k. Concrete manholes and manhole slabs
   l. Concrete thrust blocking, pads, utility encasement, surface replacement, pipe bollards and manhole inverts
3. Joint Sealer, joint backer rod, and accessories.

### 1.2 UNIT PRICE MEASUREMENT AND PAYMENT

A. Concrete Curb and Gutter (Standard or Laydown):
1. Basis of Measurement: Payment by linear foot.
2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
   a. Concrete Curb and Gutter (Standard) – Per Linear Foot, Measured.
   b. Concrete Curb and Gutter (Laydown) – Per Linear Foot, Measured.

B. Ribbon Curb:
1. Basis of Measurement: Payment by linear foot.
2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
   a. Ribbon Curb – Per Linear Foot, Measured.
   b. Ribbon Curb – Per Linear Foot, Plan Quantity.

C. Mountable Curb:
1. Basis of Measurement: Payment by linear foot.
2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
   a. Mountable Curb – Per Linear Foot, Measured.
   b. Mountable Curb – Per Linear Foot, Plan Quantity.

D. Curb Ramp:
   1. Basis of Measurement: Payment by each.
   2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
      a. Ribbon Curb – Per Each, Measured.

E. Concrete End Block:
   1. Basis of Measurement: Payment by linear foot or each.
   2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing
      a. Concrete End Block is paid for as 5 linear foot of Concrete Curb and Gutter.
      b. Concrete End Block – Per Each, Measured.

F. Concrete Curb Opening:
   1. Basis of Measurement: Payment by linear foot or each.
   2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing
      a. Concrete Curb Opening is paid for as 10 linear foot of Concrete Curb and Gutter.
      b. Concrete Curb Opening – Per Each, Measured.

G. Concrete Sidewalk:
   1. Basis of Measurement: Payment by square yard or linear foot (width shown on drawings)
   2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
      a. __- Inch Concrete Sidewalk – Per Square Yard, Measured.
      b. __- Inch Concrete Sidewalk – Per Linear Foot, Plan Quantity.

H. Concrete Driveways (Type 1, Type 2 or Type 3):
   1. Basis of Measurement: Payment by square yard or each.
   2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
      a. Concrete Driveway (Type 1)(Method A) – Per Square Yard, Measured.
      b. Concrete Driveway (Type 1)(Method B) – Per Square Yard, Plan Quantity.
      c. Concrete Driveway (Type 1)(Method C) – Per Each, Plan Quantity.
      d. Concrete Driveway (Type 2)(Method A) – Per Square Yard, Measured.
      e. Concrete Driveway (Type 2)(Method B) – Per Square Yard, Plan Quantity.
      f. Concrete Driveway (Type 2)(Method C) – Per Each, Plan Quantity.
      g. Concrete Driveway (Type 3)(Method A) – Per Square Yard, Measured.
      h. Concrete Driveway (Type 3)(Method B) – Per Square Yard, Plan Quantity.
      i. Concrete Driveway (Type 3)(Method C) – Per Each, Plan Quantity.

I. Concrete Fillet:
   1. Basis of Measurement: Payment by square yard or each.
   2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
      a. Concrete Fillet – Per Square Yard, Measured.
      b. Concrete Fillet – Per Each Foot, Plan Quantity.

J. Concrete Valley:
   1. Basis of Measurement: Payment by square yard or each.
   2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
      a. Concrete Valley – Per Square Yard, Measured.
      b. Concrete Valley – Per Each, Plan Quantity.

K. Concrete Overflow Flume:
   1. Basis of Measurement: Payment by square yard or linear foot (width shown on drawings.)
   2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
      a. Concrete Overflow Flume – Per Square Yard, Measured.
      b. Concrete Overflow Flume – Per Linear Foot, Measured.

L. Concrete Pilot Channel:
   1. Basis of Measurement: Payment by square yard or linear foot (width shown on drawings.)
   2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
      a. Concrete Pilot Channel – Per Square Yard, Measured.
      b. Concrete Pilot Channel – Per Linear Foot, Measured.

M. Inlets (Cast In Place):
   1. Basis of Measurement: Payment by each.
   2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
      a. Curb Inlet Type CO-Recessed – Per Each, Measured.
      b. Curb Inlet Type CO – Per Each, Measured.
      c. Drop Inlet – Per Each, Measured.
      d. Concave Gutter Inlet – Per Each, Measured.

N. Culvert (Cast In Place):
   1. Basis of Measurement: Payment by each.
   2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
      a. Culvert – Per Each, Measured.

O. Headwall and Energy Dissipaters:
   1. Basis of Measurement: Payment by each.
   2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
      a. Headwall and Energy Dissipaters – Per Each, Measured.

P. Safety End Treatment (Cast In Place):
1. Basis of Measurement: Payment by each.
2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
a. Concrete Safety End Treatment – Per Each, Measured.

Q. Manholes (Cast In Place):
1. Basis of Measurement: Payment by each.
2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
a. Manhole – Per Each, Measured.

R. 10’ x 10’ Manhole Slabs:
1. Basis of Measurement: Payment by each.
2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
a. 10’ x 10’ Manhole Slab – Per Each, Measured.

S. Pipe Bollards:
1. Basis of Measurement: Payment by each.
2. Basis of Payment: Includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
a. Pipe Bollard – Per Each, Measured.

T. Concrete Riprap:
1. Basis of Measurement: Payment by square yard.
2. Basis of Payment: includes forms, reinforcing, concrete, joints, accessories, placing, finishing, curing, and testing.
a. Concrete Riprap – Per Square Yard, Measured.

U. Thrust Blocking, Pads, Utility Encasement, Surface Replacement, and Manhole Inverts:
1. Basis of Measurement and Payment: Shall be considered subsidiary to the construction for which it pertains.

## 1.3 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301 - Specifications for Structural Concrete.

B. Conform to ACI 305 – Hot Weather Concreting, when concreting during hot weather, except as amended herein.

C. Conform to ACI 306.1 – Standard Specification for Cold Weather Concreting, when concreting during colder weather, except as amended herein.

D. Obtain cement and aggregate from same source throughout.

E. Batch Plant: Currently certified by the National Ready Mixed Concrete Association.

F. Mix Designer: Licensed professional engineer registered in the State of Texas or TxDOT approved mix designer.

1.4 QUALIFICATIONS

A. Installer: Company specializing in performing work of this section with minimum three years documented experience.

1.5 AMBIENT CONDITIONS

A. Provide ambient conditions control facilities for product storage and installation.

B. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

C. Maintain concrete temperature after installation at minimum 50 degrees F for minimum 7 days

D. Joint Sealer: Maintain temperature and humidity recommended by sealant manufacturer during installation.

1.6 COORDINATION

A. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 PRODUCTS

2.1 MISCELLANEOUS CONCRETE

A. Form Materials:
1. Form Materials: shall be made of wood, metal, or other approved material and shall be like new to new condition.
2. Joint Sealer: Shall be in accordance with this Section.

B. Reinforcement:
1. Reinforcing Steel:
a. Dowel Bars: Dowel bars shall be plain steel bars conforming to ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement, or ASTM A966 and shall be free from burring or other deformation restricting slippage in the concrete. Before delivery to the construction site each dowel bar shall be painted with one coat of paint conforming to MIL-DTL-24441/20A.SSPC Paint 5 or SSPC Paint 25. Metal or plastic collars (when indicated on Drawings) shall be full circular device supporting the dowel until the epoxy hardens.

The sleeves for dowel bars used in expansion joints shall be translucent of an approved design to cover 2 inches (minimum) of the dowel, with a closed end and with a suitable stop to hold the end of the bar at least 1½

inches from the closed end of the sleeve. Sleeves shall be of such design that they will not collapse during construction.

C. Concrete Materials:
1. Cement: ASTM C150 – Standard Specification for Portland Cement, **Type I – Normal** or **Type II – Moderate**.
2. Exposed Aggregate: Gravel washed natural mineral aggregate; furnished from single source.
   a. Minimum Size: 1/4 inch.
   b. Maximum Size: 1/2 inch.
   c. Color: As selected.
3. Normal Weight Aggregates: ASTM C33 furnished from a single source.
   a. Meet ASTM C33.
   b. Coarse Aggregate: Consisting of natural gravels, crushed gravels, crushed stone, or combination of these materials containing no more than 15% of flat, elongated particles (long dimension no more than 5 times short dimension). No more than 0.5% of coarse aggregate passing a 200 sieve.
   c. Fine Aggregate: Clean, sharp natural sand with no more than 4% of fine aggregate passing a 200 sieve.
4. Water: potable, less than 250 ppm of chlorides.

2.2 ADMIXTURES

A. General: Compatible with other admixtures and free from chlorides or other corrosive chemicals.

B. Air Entrainment:
1. ASTM C260, non-toxic after 30 days containing no chlorides.
2. Concrete with air-entrainment admixture shall maintain air percentage, as batched, within plus or minus 2% for the time required for placement.

C. High Range Water Reducing Admixture (Superplasticizer): ASTM C494/C494M.
1. Hold slump of 5” or greater for time required for placement.
2. Use Type F or Type G.
3. Manufacturers
   a. BASF Admixtures Inc.
   b. Euclid Chemical Co.
   c. WR Grace & Co.

D. Water Reducing Admixture: ASTM C494/C494M, Type A or Type D.
1. Manufacturers:
   a. BASF Admixtures Inc.
   b. Euclid Chemical Co.
   c. WR Grace & Co.

E. Silica Fume: Not Allowed.

F. Fly Ash: Type C or Type F

2.3 FABRICATION

A. Form standard hooks for 180 degree bends and 90 degree bends as indicated on the Drawings.

2.4 MIXES

A. Concrete Mix:

1. Mix and deliver concrete in accordance with ASTM C94 - Standard Specification for Chemical Admixtures for Concrete, Option a.
2. Select proportions for normal weight concrete in accordance with ACI 301 - Specifications for Structural Concrete, Method 1.
3. Provide concrete to the following criteria:

| Class of Concrete | Design Strength at 28 days (psi) | Max. w/cm Ratio | Placement Slump Range, in. | General Usage |
|---|---|---|---|---|
| A | 3,000 | 0.60 | As approved | Curb, gutter, curb & gutter, sidewalks, driveways, fillets, valleys, non-reinforced drilled shafts, pilot channels, flumes, safety end treatments, manhole slabs, surface replacement. |
| B | 2,000 | 0.60 | As approved | Riprap, small roadside signs, anchors, utility encasements. |
| C[1] | 3,600 | 0.45 | 4 to 5-1/2 | Culverts (except top slab of direct traffic culverts), headwalls, wing walls, retaining walls, inlets, manholes, manholes bases, energy dissipaters, reinforced drill shafts. |

1. Structural Concrete Classes.

4. Submit Concrete Mix Design for each class of concrete (above table) from a batch plant that is currently certified by the National Ready Mixed Concrete Association. The Mix Designer shall be a licensed professional engineer registered in the State of Texas or a TxDOT approved Mix Designer. Concrete mix design date shall be no older than 12 months from current date (unless approval by Engineer) from the local TxDOT District and shall identify mix ingredients and proportions, including admixtures.
5. Use accelerating admixtures in cold weather only when approved by the Engineer in writing. Use of admixtures will not relax cold weather placement requirements.
6. Use calcium chloride only when approved by the Engineer in writing.

7. Use set retarding admixtures during hot weather only when approved by the Engineer in writing.

2.5 ACCESSORIES

A. Curing Compound: ASTM C309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete, Type 2, Class B

B. Joint Sealers:
1. Manufacturers:
a. Sonneborne Building Products.
2. Products Description:
a. General Purpose Traffic Bearing Sealant (Sealant self-leveling); Polyurethane; ASTM C920 – Standard Specification for Elastomeric Joint Sealants, Grade P, Class 25, Use T,M; single component.
1) Type: Sonolastic SLI manufactured by Sonneborne.
2) Color: Colors as selected.
3) Applications: Use for exterior, pedestrian, and vehicular traffic bearing joints.

C. Premolded Joint Filler: Premolded resilient joint filler for expansion joints shall conform to the requirements of ASTM D1751 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types), and shall be punched to admit the dowels where called for on the plans. The filler for each joint shall be furnished in a single piece for the full depth and width required for the joint, unless otherwise specified by the Engineer. When the use of more than one piece is required for a joint, the abutting ends shall be fastened securely and held accurately to shape by stapling or other positive fastening means satisfactory to Engineer. Joint filler shall be compatible with joint sealant.

D. Bond Breaker:
1. Manufacturers:
a. Burke Co.
b. Nox-Crete Products Group;
c. Williams Distributors, Inc.

E. Bonding Agent: Two component modified epoxy resin.
1. Manufacturers:
a. BASF Building Systems, Inc.
b. Euclid Chemical Co.
c. Sika Chemical Corp.

F. Vapor Retarder: ASTM E1745 Class A; 10 mil thick clear polyethylene film type recommended for below grade application. Furnish joint tape recommended by manufacturer.

G. Non-Shrink Grout: ASTM C1107/C1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 4,000 psi in 24 hours and 7,000 psi in 7 days.
1. Manufacturers:

a. Euclid Chemical Company,
b. Master Builders
c. U.S. Grout Corp.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify compacted base or subgrade is dry and ready to support paving and imposed loads.
1. Proof roll subgrade with two perpendicular passes to identify soft spots.
2. Remove soft subgrade or base and replace with Flexible Base.

B. Verify gradients and elevations of underlying section are correct.

C. Verify requirements for concrete cover over reinforcement.

D. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

E.

3.2 PREPARATION

A. Moisten substrate to minimize absorption of water from fresh concrete.

B. Coat surfaces of manhole frames with oil to prevent bond with concrete paving.

C. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Remove laitance, coatings, and unsound materials.

D. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

E. Remove debris and ice from formwork, reinforcement, and concrete substrates.

F. Remove water from areas receiving concrete before concrete is placed.

G. Joints:
1. Locate expansion, control, contraction, and construction joints where shown.
2. If not shown, provide construction joints at a maximum spacing of 40 feet.
3. Vertical construction joints may not be greater than 20 feet from wall corners or intersections.
4. Contraction joints shall be sawing immediately upon initial set of concrete and as practicable.

3.3 INSTALLATION

A. Forms:

1. Place and secure forms and screeds to correct location, dimension, profile, and gradient.
2. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

B. Reinforcement:
1. Place reinforcing as indicated on Drawings.
2. Interrupt reinforcing at expansion joints.
3. Provide doweled joints as indicated on Drawings. Dowel bars or other load-transfer units of an approved type shall be placed across joints in the manner as shown on Drawings. They shall be of the dimensions and spacings as shown and held rigidly in the middle of the slab depth in the proper horizontal and vertical alignment of by an approved assembly device to be left permanently in place. The dowel or load-transfer and joint devices shall be rigid enough to permit complete assembly as a unit ready to be lifted and placed into position. A dowel expansion cap or sleeve shall be furnished for each dowel bar used with expansion joints. These caps shall be substantial enough to prevent collapse and shall be placed on the ends of the dowels as shown on Drawings. The caps or sleeves shall fit the dowel bar tightly and the closed end shall be watertight. The portion of each dowel painted with rust preventative paint, as required under paragraph 2.1(B) and shown on Drawings to receive a debonding lubricant, shall be thoroughly coated with asphalt MC-70, or an approved lubricant, to prevent the concrete from bonding to that portion of the dowel. If free-sliding plastic-coated or epoxy-coated steel dowels are used, a lubrication bond breaker shall be used except when approved pullout tests indicate it is not necessary. Where butt-type joints with dowels are designated, the exposed end of the dowel shall be oiled.
4. Repair damaged galvanizing and/or epoxy coating to match shop finish.
5. Install tie bars consisting of deformed bars in joints as shown on Drawings. Tie bars shall be placed at right angles to the centerline of the concrete slab and shall be spaced at intervals shown on Drawings. They shall be held in position parallel to the pavement surface and in the middle of the slab depth. When tie bars extend into an unpaved lane, they may be bent against the form at longitudinal construction joints, unless threaded bolt or other assembled tie bars are specified. These bars shall not be painted, greased, or enclosed in sleeves. When slip-form operations call for tie bars, two-piece hook bolts can be installed in the female side of the keyed joint provided the installation is made without distorting the keyed dimensions or causing edge slump. If a bent tie bar installation is used, the tie bars shall be inserted through the keyway liner only on the female side of the joint. In no case shall a bent tie bar installation for male keyways be permitted.

C. Placing Concrete:
1. Ensure reinforcing, inserts, embedded parts, and formed joints are not disturbed during concrete placement.
2. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.
3. Place concrete in accordance with ACI 301 and ACI 304R, except as modified herein.
4. Notify testing laboratory and Engineer minimum 24 hours prior to commencement of operations.
5. Discharge time: Not to exceed 90 minutes (from time batched at plant), unless otherwise approved by Engineer.

6. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints, and reinforcement supports are not disturbed during concrete placement.
7. Install vapor retarder under interior slabs on grade in accordance with ASTM E1643. Lap joints minimum 6 inches and seal watertight by adhesive applied between overlapping edges and ends.
8. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum **6** inches and seal watertight.
9. Separate slabs on grade from vertical surfaces with 2 inch thick joint filler.
10. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
11. Install joint device anchors. Maintain correct position to allow joint cover to be flush with floor and wall finish.
12. Install joint covers in longest practical length, when adjacent construction activity is complete.
13. Apply sealants in joint devices.
14. Deposit concrete at final position. Prevent segregation of mix.
15. Place concrete in continuous operation for each panel or section determined by predetermined joints.
16. Consolidate concrete.
17. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
18. Place concrete continuously between predetermined expansion, control, and construction joints.
19. Do not interrupt successive placement; do not permit cold joints to occur.
20. Place floor slabs in checkerboard or saw cut pattern.
21. Saw cut joints within 12 hours after placing. Use 3/16 inch thick blade, cut into 1/4 depth of slab thickness.
22. Screed floors and slabs on grade level, maintaining surface flatness of a maximum of 1/8 inch in 10 feet.
23. Cold Weather:
    a. Do not place when ambient temperature is below 40 degrees F.
    b. Maintain surface temperature above 40 degrees F at all times.
    c. Provide surface thermometers to monitor surface temperatures during curing.
    d. Conform to ACI 306.1 and ACI 301 requirements.
24. Hot Weather:
    a. Prepare, mix, place, cure, and protect per ACI 305R.
    b. Maintain concrete temperature below 90 degrees F at all times.
    c. Spray evaporation retardant on all exposed surfaces when temperature is greater than 90 degrees F.
    d. Ensure that admixtures do not produce flash set plastic shrinkage or cracking from heat of hydration.

D. Joints: Joints shall be constructed as shown on Drawings and in accordance with these requirements. All joints shall be constructed with their faces perpendicular to the surface of the pavement and finished or edged as shown on Drawings. Joints shall not vary more than ½-inch from their designated position and shall be true to line with not more than ¼-inch variation in 10 feet. The surface across the joint shall be tested with a 10-foot straightedge as the joints are finished and any irregularities in excess of ¼-inch shall be

corrected before the concrete has hardened. All joints shall be so prepared, finished, or cut to provide a groove of uniform width and depth as shown on Drawings.

1. Place expansion joints as indicated on Drawings. Premolded joint filler of the thickness as shown on Drawings shall extend for the full depth and width of the slab at the joint, except for space for sealant at the top of the slab. The filler shall be securely staked or fastened into position perpendicular to the proposed finished surface. A cap shall be provided to protect the top edge of the filler and to permit the concrete to be placed and finished. After the concrete has been placed and struck off, the cap shall be carefully withdrawn leaving the space for the premolded filler. The edges of the joint shall be finished and tooled while the concrete is still plastic. Any concrete bridging the joint space shall be removed for the full width and depth of the joint. Align curb, gutter, pavement, and sidewalk joints.
2. Place isolation joints between paving components and building or other structures as indicated on Drawings. Construct isolation joints identically to expansion joints as specified in (1), above. Isolation joints shall not be dowelled.
3. Provide construction joints as indicated on Drawings. Longitudinal construction joints shall be slip-formed or formed against side forms with or without keyways, as shown on Drawings. Transverse construction joints shall be installed at the end of each day's placing operations and at any other points within a paving lane when concrete placement is interrupted for more than 30 minutes or it appears that the concrete will obtain its initial set before fresh concrete arrives. The installation of the joint shall be located at a planned contraction or expansion joint. If placing of the concrete is stopped, the Contractor shall remove the excess concrete back to the previous planned joint.
4. Install contraction joints at the locations and spacing as shown on Drawings. Contraction joints shall be installed to the dimensions required by forming a groove or cleft in the top of the slab while the concrete is still plastic or by sawing a groove into the concrete surface after the concrete has hardened. When the groove is formed in plastic concrete the sides of the grooves shall be finished even and smooth with an edging tool. If an insert material is used, the installation and edge finish shall be according to the manufacturer's instructions. The groove shall be finished or cut clean so that spalling will be avoided at intersections with other joints. Groove or saw cut contraction joints ¼-inch wide at an optimum time as soon as possible after finishing. Cut ¼ of depth of slab into the slab. If contraction joint spacing is not indicated on Drawings, maximum contraction joint spacing shall be thirty (30) times the depth of the concrete paving.
5. Provide keyways as indicated on Drawings. Form keyways (only female keys permitted) in the plastic concrete by means of side forms or the use of keyway liners that are inserted during the slip-form operations. The keyway shall be formed to a tolerance of ¼ inch in any dimension and shall be of sufficient stiffness to support the upper keyway flange without distortion or slumping of the top of the flange. The dimensions of the keyway forms shall not vary more than plus or minus ¼ inch from the mid-depth of the pavement. Liners that remain in place permanently and become part of the keyed joint shall be made of galvanized, copper clad, or of similar rust-resistant material compatible with plastic and hardened concrete and shall not interfere with joint reservoir sawing and sealing.

E. Joint Sealant:
   1. Examination:
      a. Verify substrate surfaces and joint openings are ready to receive work.
      b. Verify joint backer rod and release tapes are compatible with sealant.

2. Preparation:
   a. Saw joints in accordance with Drawings.
   b. Immediately after sawing the joint, remove slurry and foreign matter from the joint and adjacent area by flushing with high-pressure water jet, and by use of other tools as necessary.
   c. Immediately before sealing, clean and prime joints. Upon completion of cleaning, the joints shall be blown out with compressed air, free of oil and water. The joint faces shall be surface dry when the sealant is applied.
   d. Perform preparation in accordance with ASTM C1193 - Standard Guide for Use of Joint Sealants.
   e. Protect elements surrounding Work of this section from damage or disfiguration.
3. Installation:
   a. Perform installation in accordance with ASTM C1193 - Standard Guide for Use of Joint Sealants.
   b. Apply joint sealant by means of pressure equipment that will force the sealing material to the bottom of the joint and completely fill the joint without spilling the material on the surface of the pavement. A backing material shall be placed as shown on Drawings and shall be nonreactive and nonadhesive to the concrete or the sealant material. Sealant that does not bond to the concrete surface of the joint walls, contains voids, or fails to set to a tack-free condition will be rejected and replaced by the Contractor at no additional cost. Before sealing the joints, the Contractor shall demonstrate that the equipment and procedures for preparing, mixing, and placing the sealant will produce a satisfactory joint seal. Any sealant spilled on the surface of the pavement, structures and/or adjacent areas shall be removed immediately.
   c. Surface bond area on each side not less than 75 percent of joint width.
   d. Install bond breaker where joint backing is not used.
   e. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
   f. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
   g. Tool joints as detailed on Drawings.
   h. Protect sealant until cured.

F. Finishing Schedule:
   1. Light broom.

G. Curing and Protection
   1. Immediately after placement, protect concrete (by applying curing compound or use of curing blankets) from premature drying, excessively hot or cold temperatures, and mechanical injury.
   2. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

## 3.4 TOLERANCES

A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.

B. Maximum Variation from True Position: 1/4 inch.

C. Maximum Variation in Thickness: 1/4 inch.

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements.

B. Inspect reinforcing placement for size, spacing, location, support.

C. Testing firm will take cylinders and perform slump and air entrainment tests.

D. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

E. Submit delivery tickets indicating actual materials delivered to Project site. Delivery tickets shall contain project description, date, time, class and quantity of mix, actual batch proportions, free moisture content of aggregate and quantity of water withheld.

3.6 PATCHING

A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.

B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.

C. Inject leaking cracks with injection epoxy equal to Sikadur 55 SLV.

D. Patch imperfections as directed by Engineer.

E. Provide a structurally sound surface finish, uniform in appearance acceptable to the Engineer.

F. Tie Holes:
1. Fill with non-shrink grout.
2. Match color of concrete.
3. Compact using steel hammer or steel tool to high density.
4. Cure with water.

3.7 PROTECTION

A. Immediately after placement, protect paving from premature drying, excessive hot or cold temperatures, and mechanical injury.

B. Do not permit vehicular traffic over paving for 14 days (minimum) after finishing.

3.8 DEFECTIVE CONCRETE

A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

B. Repair or replacement of defective concrete will be determined by Engineer.

C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

D. Repair all concrete damaged by construction

END OF SECTION

# SECTION 32 92 19 - SEEDING

## PART 1 GENERAL

### 1.1 SUMMARY

A. Description: This item shall consist of preparing a seed bed to the lines and grades indicated, sowing of seed, fertilizing, mulching with straw, asphalt, cellulose fiber and other management practices along and across such areas as are indicated or as directed by the Engineer.

B. Section Includes:
1. Fertilizing.
2. Seeding.
3. Hydroseeding.
4. Mulching.
5. Maintenance.

### 1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Seeding:
1. Measurement: Work and acceptable material for "Broadcast Seeding" or "Hydraulic Seeding" will be measured by the square yard (Method A), by the acre (Method B), or by the linear foot (Method C), complete in place, with a minimum of 80 percent coverage with no bare areas exceeding 16 square feet and a 1 1/2 inch stand of grass. Bare areas shall be reprepared and reseeded as required.
2. Payment: The work performed and materials furnished and measured will be paid for at the unit price bid for "Broadcast Seeding" or "Hydraulic Seeding" of the method specified, which price shall be full compensation for furnishing all materials, including all topsoil (if not included as a separate pay item), water, seed, fertilizer, maintenance, mulch and for performing all operations necessary to complete the work. When paid by the linear foot, seeding will be for the width of ROW and/or width of easement (temporary construction and permanent). Payment will be made under one of the following:
a. Broadcast Seeding (Method A) – Per Square Yard, Measured.
b. Broadcast Seeding (Method B) – Per Acre, Plan Quantity.
c. Broadcast Seeding (Method C) – Per Linear Foot, Plan Quantity.
d. Broadcast Seeding (Method A)(including __- inch topsoil) – Per Square Yard, Measured.
e. Broadcast Seeding (Method B)(including __- inch topsoil) – Per Acre, Plan Quantity.
f. Broadcast Seeding (Method C)(including __- inch topsoil) – Per Linear Foot, Plan Quantity.
g. Hydraulic Seeding (Method A) – per Square Yard, Measured.
h. Hydraulic Seeding(Method B) – Per Acre, Plan Quantity.
i. Hydraulic Seeding (Method C) – Per Linear Foot, Plan Quantity.
j. Hydraulic Seeding (Method A)(including __- inch topsoil) – Per Square Yard, Measured.

k. Hydraulic Seeding (Method B)(including __- inch topsoil) – Per Acre, Plan Quantity.
l. Hydraulic Seeding (Method C)(including __- inch topsoil) – Per Linear Foot, Plan Quantity.

1.3 DEFINITIONS

A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, Brome Grass, or vegetative species other than specified species to be established in given area.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Include maintenance instructions, cutting method and maximum grass height; and types, application frequency, and recommended coverage of fertilizer.

1.5 QUALITY ASSURANCE

A. Provide seed mixture in containers showing percentage of seed mix, germination percentage, inert matter percentage, weed percentage, year of production, net weight, date of packaging, and location of packaging.

1.6 QUALIFICATIONS

A. Seed Supplier: Company specializing in manufacturing Products specified in this section.

B. Installer: Company specializing in performing work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.8 MAINTENANCE SERVICE

A. Maintain seeded areas immediately after placement until grass is well established and exhibits vigorous growing condition.

PART 2 PRODUCTS

2.1 SEED

A. All seed must meet the requirements of the Texas Seed Law including the labeling requirements for showing pure live seed (PLS), name and type of seed. Seed furnished shall be

of the previous season's crop and the date of analysis shown on each bag shall be within nine months of the time of delivery to the project. Each variety of seed shall be furnished and delivered in separate bags or containers. A sample of each variety of seed shall be furnished for analysis and testing when directed by the Engineer. The amount of seed planted per acre shall be of the type specified below.

2.2 ACCESSORIES

A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable. Straw mulch shall be spread uniformly over the area indicated or as designated by the Engineer at the rate of 2 to 2 1/2 tons of straw per acre. The actual rate of application will be designated by the Engineer. Straw may be hand or machine placed and adequately secured.

B. Cellulose Fiber Mulch: Cellulose fiber mulch shall be spread uniformly over the area indicated or as designated by the Engineer at the rate of 45 to 80 lbs per 1000 square feet.

C. Fertilizer: All fertilizer shall be delivered in bags or containers clearly labeled showing the analysis. The fertilizer is subject to testing by the State Chemist in accordance with the Texas Fertilizer Law. A pelleted or granulated fertilizer shall be used with an analysis indicated below. The figures in the analysis represent the percent of nitrogen, phosphoric acid and potash nutrients, respectively, as determined by the methods of the Association of Official Agricultural Chemists. Fifty percent or greater of the Nitrogen required shall be in the form of Nitrate Nitrogen ($NO_3$). The remaining Nitrogen required may be in the form of Urea Nitrogen ($CO(NH_2)_2$).

In the event it is necessary to substitute a fertilizer of a different analysis, it shall be a pelleted or granulated fertilizer with a lower concentration. The total amount of nutrients furnished and applied per acre shall equal or exceed that specified for each nutrient.

Fertilizer shall be commercial grade; recommended for grass; of proportion necessary to eliminate deficiencies of topsoil to the following proportions: Nitrogen 15 percent, phosphoric acid 15 percent, soluble potash 15 percent.

D. Lime: ASTM C602 – Standard Specification for Agricultural Liming Material, Class T agricultural limestone containing a minimum 80 percent calcium carbonate equivalent.

E. Water: Clean, fresh and free of industrial wastes and other substances or matter capable of inhibiting vigorous growth of grass.

F. Herbicide: As specified in Section 31 10 10.

G. Stakes: Softwood lumber, chisel pointed.

H. String: Inorganic fiber.

2.3 SOURCE QUALITY CONTROL

A. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.

B. Provide recommendation for fertilizer and lime application rates for specified seed mix as result of testing.

C. Testing is not required when recent tests and certificates are available for imported topsoil. Submit these test results to testing laboratory. Indicate, by test results, information necessary to determine suitability.

D. Submit tickets indicating actual materials delivered to Project site.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify prepared soil base is ready to receive the Work of this section.

3.2 PREPARING SEED BED

A. After the designated areas have been rough graded to the lines, grades and typical sections indicated or as provided for in other items of this contract and any other soil area disturbed by the construction, a suitable seed bed shall be prepared. The seed bed shall consist of either 4 inches of approved topsoil or 4 inches of approved salvaged topsoil cultivated and rolled sufficiently to a state of good tilth which could prevent the seed from being covered too deep for optimum germination. The optimum depth for seeding shall be 1/4 inch. Water shall be applied as required to prepare the seed bed. Seeding shall be performed in accordance with the requirements hereinafter described.

3.3 FERTILIZING

A. Apply lime at application rate recommended by soil analysis. Work lime into top 6 inches of soil.

B. Apply fertilizer at application rate as indicated below:

| | | **Application Rate** |
|---|---|---|
| **Use** | **Type** | **Pound Per Acre** |
| Broadcast Seeding | Any | 400 |
| Hydraulic Seeding | Water Soluble | 653 |
| Sodding | Any | 300 |

C. Apply after smooth raking of topsoil and prior to roller compaction.

D. Do not apply fertilizer at same time or with same machine used to apply seed.

E. Mix fertilizer thoroughly into upper 2 inches of topsoil.

F. Lightly water soil to aid dissipation of fertilizer. Irrigate top level of soil uniformly.

3.4 BROADCAST SEEDING

A. The seed or seed mixture in the quantity specified shall be uniformly distributed over the prepared seed bed areas indicated or where directed. If the sowing of seed is by hand, rather than by mechanical methods, the seed shall be sown in two directions at right angles to each other. If mechanical equipment is used, all varieties of seed, as well as fertilizer, may be distributed at the same time, provided that each component is uniformly applied at the specified rate. After planting, the planted area shall be rolled with a corrugated roller of the "Culitpacker" type. All rolling of the slope areas shall be on the contour.

B. Seed Mixture and Rate of Application for Broadcast Seeding: From September 15 to March 1, seeding shall be with a combination of unhulled Bermuda Grass at a rate of 2 pounds per 1000 square feet and winter rye at a rate of 7 pounds per 1000 square feet that has a PLS = 0.83. From March 1 to September 15, seeding shall be with hulled Bermuda Grass at a rate of 2 pounds per 1000 square feet with a PLS = 0.83. Fertilizer shall be applied as specified herein.

C. Do not seed areas in excess of that which can be mulched on same day.

D. Do not sow immediately following rain, when ground is too dry, or when winds are over 12 mph.

E. Lightly roll seeded area with roller not exceeding 112 lbs/linear foot.

F. Immediately following seeding and rolling, apply mulch to thickness of 1/8 inch. Maintain clear of shrubs and trees.

G. The broadcast seeded areas shall immediately be watered with a minimum of 5 gallons of water per square yard or as needed and in the manner and quantity as directed by the Engineer. Water shall be applied at a minimum rate of 10 gallons per square yard weekly except when rainfall of 1/2 inch or greater occurs on the site, the water can be postponed for one week or as directed, until the grass is uniformly 1 1/2 inches in height.

3.5 HYDRAULIC SEEDING

A. The seed bed shall be prepared as specified above and hydraulic seeding equipment, which is capable of placing all materials in a single operation, shall be used.

March 1 to September 15: Hydraulic seeding mixture and minimum rate of application per 1000 square feet:

| **Hulled Bermuda Seed (PLS = 0.83)** | **Water Soluble Fertilizer** | **Cellulose Fiber Mulch** | **Soil Tackifier** |
|---|---|---|---|
| 1 lb. | 15 lbs. | 45.9 lbs. | 1.4 lbs. |

September 15 to March 1: Add 7 pounds per 1000 square feet of winter rye with a PLS = 0.83 to above mixture. Fertilizer shall be applied as specified herein.

B. Watering: Hydraulically planted seeded area shall be watered weekly, except when rainfall of 1/2 inch or greater occurs on the site, the watering can be postponed for one week, commencing after the tackifier has dried or until the grass is uniformly 1 1/2 inches in height.

The native grass seeded area shall be watered at a minimum rate of 5 gallons per square yard weekly commencing after the tackifier has dried or until the grass is uniformly 1 1/2 inches in height. The watering can be postponed for one week or as directed, when rainfall of 1 1/2 inches or greater occurs on the site.

3.6 SEED PROTECTION

A. Cover seeded slopes where grade is 3:1 (Horizontal:Vertical) or greater with soil retention blanket. Roll fabric onto slopes without stretching or pulling.

B. Lay fabric smoothly on surface, bury top end of each section in 6 inch deep excavated topsoil trench. Overlap edges and ends of adjacent rolls minimum 12 inches. Backfill trench and rake smooth, level with adjacent soil.

C. Secure outside edges and overlaps at 36 inch intervals with stakes.

D. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.

E. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches.

3.7 MAINTENANCE

A. Mow grass at regular intervals to maintain at maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at each mowing. Perform first mowing when seedlings are 40 percent higher than desired height.

B. Neatly trim edges and hand clip where necessary.

C. Immediately remove clippings after mowing and trimming. Do not let clippings lay in clumps.

D. Water to prevent grass and soil from drying out.

E. Lightly roll surface to remove minor depressions or irregularities.

F. Control growth of weeds. Apply herbicides. Remedy damage resulting from improper use of herbicides.

G. Immediately reseed areas showing bare spots.

H. Repair washouts or gullies.

I. Protect seeded areas with warning signs during maintenance period.

END OF SECTION

| TABLE 1 – GENERAL INFORMATION | | | | |
|---|---|---|---|---|
| **A. COMPANY DATA** | | | | |
| Organization Doing Business: | | | | |
| Business Address: | | | | |
| | | | | |
| Telephone Number: | | | | |
| Fax Number: | | | | |
| Form of Business: | Corporation | Partnership | Individual | Joint Venture |
| **IF A CORPORATION** | | | | |
| Date of Incorporation: | | | | |
| State Incorporated: | | | | |
| President's Name: | | | | |
| Vice President's Name: | | | | |
| | | | | |
| **IF A PARTNERSHIP** | | | | |
| Date of Organization: | | | | |
| Type | General | | Limited | |
| **IF AN INDIVIDUAL** | | | | |
| Name: | | | | |
| Business Address: | | | | |
| **IF A JOINT VENTURE** | | | | |
| Name of Manager: | | | | |
| Name of Firm: | | | | |
| Name of Individual Companies: | | | | |
| | | | | |
| | | | | |
| **B. BUSINESS INFORMATION** | | | | |
| Current Number of Full Time Employees: | | Past Year's Revenues: | | |
| Average Number of Projects Annually: | | Average Construction Cost of Project: | | |
| **C. DIVISION OF WORK BETWEEN CONTRACTOR AND SUBCONTRACTORS** | | | | |
| 1. List work that will be provided by Offeror (Prime Contractor) using its own resources. | | | | |
| | | | | |
| 2. List work that will be provided by Subcontractors on this project. | | | | |
| | | | | |

| TABLE 2 – CONSTRUCTION EXPERIENCE | | | |
|---|---|---|---|
| 1. Years of experience on drainage channel/concrete projects: | | | |
| As a General Contractor: | | Number of Total Projects: | |
| 2. Number of drainage channel/concrete projects completed in McLennan County in the past five (5) years? | | | |
| 3. Has this or a predecessor company ever defaulted on a project or failed to complete work award to it? | | | |
| 4. Has this or a predecessor company ever been released from a bid or proposal in the past ten (10) years? | | | |
| 5. Has this or a predecessor company ever been disqualified as a bidder or offeror on any project within the last five (5) years? | | | |
| 6. Is offering company currently involved in any litigation or contemplating any litigation? | | | |
| 7. Has this or a predecessor company ever refused to construct of refused to provide materials defined in Contract Documents on a project? | | | |
| 8. Are there any liens currently filed against the offeror by either subcontractor or material suppliers on previous projects? | | | |

| TABLE 3 – PROPOSED KEY PERSONNEL | |
|---|---|
| **PROJECT MANAGER** | |
| Name of Project Manager | |
| Years of Experience as PM | |
| Number of Similar Projects as PM with this company | |
| Number of Similar Projects with other companies (PM) | |
| Current Assignments | |
| % of time dedicated to this project | |
| **Reference Project** | |
| Project Name: | Reference Name: |
| Title: | Organization: |
| Telephone Number: | Email: |
| **PROJECT SUPERINTENDENT** | |
| Name of Superintendent | |
| Years of Experience as Superintendent | |
| Number of Similar Projects as Super with this company | |
| Number of Similar Project with other companies (Super) | |
| Current Assignments | |
| % of time dedicated to this project | |
| **Reference Project** | |
| Project Name: | Reference Name: |
| Title: | Organization: |
| Telephone Number: | Email: |

| TABLE 4 – SIMILAR PROJECTS COMPLETED WITHIN LAST 5 YEARS | | | | |
|---|---|---|---|---|
| **REFERENCE PROJECT 1** | | | | |
| Project Description | | | | |
| | | | | |
| Owner | Project Name | Contract Amount | Date Completed | % Change Orders |
| | | | | |
| Owner's Reference Information | | | | |
| Name | Title | Organization | Telephone | E-Mail |
| | | | | |
| Engineer's Reference Information | | | | |
| Name | Title | Company | Telephone | E-Mail |
| | | | | |
| **REFERENCE PROJECT 2** | | | | |
| Project Description | | | | |
| | | | | |
| Owner | Project Name | Contract Amount | Date Completed | % Change Orders |
| | | | | |
| Owner's Reference Information | | | | |
| Name | Title | Organization | Telephone | E-Mail |
| | | | | |
| Engineer's Reference Information | | | | |
| Name | Title | Company | Telephone | E-Mail |
| | | | | |
| **REFERENCE PROJECT 3** | | | | |
| Project Description | | | | |
| | | | | |
| Owner | Project Name | Contract Amount | Date Completed | % Change Orders |
| | | | | |
| Owner's Reference Information | | | | |
| Name | Title | Organization | Telephone | E-Mail |
| | | | | |
| Engineer's Reference Information | | | | |
| Name | Title | Company | Telephone | E-Mail |
| | | | | |

| TABLE 5 – SUBCONTRACTORS AND SUPPLIERS | | |
|---|---|---|
| **PROJECT SPECIFIC SUBCONTRACTORS (greater than 10% of work)** | | |
| Name | Work to be Provided | % of Contract |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| **Provide a list of major equipment or material suppliers for use on project.** | |
|---|---|
| Supplier Name | Material or Equipment Supplied |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

# Texas State Technical College
**Project Name: TSTC Drainage Improvements**
**RFP PRE-PROPOSAL/WALKTHROUGH MEETING**
**RFP: 18-RB-423530003**
**DATE: 03/29/18 at 10:00 A.M. CST**

## SIGN-IN SHEET
PRINT CLEARLY/LEGIBLE

DATE: TIME: WHERE:

| | REPRESENTATIVE NAMEM (print clearly) | COMPANY | PHONE NUMBER | EMAIL |
|---|---|---|---|---|
| 1 | Charlie Warwick | Hoover Construction | 512-756-3029 | Charliegwarwickeyahoo.com |
| 2 | LANNY Lindsey | HOOVER CONST. | 512-677-2444 | GLCONSTeVERizon.net |
| 3 | Ron Anderson | JRJ Enterprise L.L.C. | 254-214-0122 | rdanderson@windstream.net |
| 4 | Rusty Tatum | TTG Utilities, LP | 254-223-2981 | djames@ rtatum@ttgutilities.com |
| 5 | Elise Wells | TSTC | 254-857-3753 | elise.wells@tstc |
| 6 | W Kew Doc Ley | Hoover | | |
| 7 | Mike Ratliff | TSTC | 254-867-3703 | mike.ratliff@tstc.edu |
| 8 | CODY JOHNSTON | TSTC | 254-867-3794 | CODY.JOHNSTON@TSTC.EDU |
| 9 | JACOB HENSON | WALKER PARTNERS | 254-714-1402 | jhenson@walkerpartners.com |
| 10 | | | | |
| 11 | | | | |

CONDUCTED BY: Mike Ratliff PURCHASINGPERSONNEL: Elise Wells