

Exhibit A

Primary Responses

				Numeric	
#	Item	Unit of Measure	Quantity Required	Unit Price	Total Cost
#0-1	Mobilization (Note: This Item may not exceed 5% of the Grand Total Bid Amount)	LS	1		-
#0-2	SWPPP Preparation	LS	1		-
#0-3	Utilization of DCTA Flagger near Rail ROW and RWPCR course registration (see appendix in project manual)	LS	1		-
#0-4	ROW Preperation	LS	1		-
#0-5	Site Demolition (Concrete Pavement, Curb and Gutter, Signage)	LS	1		-
#0-6	Tree Removal (including stump removal and haul off)	EA	20		-
#0-7	Traffic Control	MO	8		-
#0-8	Erosion Control	LF	6000		-
#0-9	Misc. Fence Repair	LS	1		-
#0-10	Construction Staking and Survey	LS	1		-
#0-11	Temporay Irrigation	LS	1		-
#0-12	Tree Protection Fencing (installation and removal)	LS	1		-
#0-13	12' Wide Concrete Trail (Including Jointing and existing tie-ins)	SF	33800		-
#0-14	Trail Regulatory Signs (Furnish and Install)	EA	1		-
#0-15	Barrier Free Ramp w/ Detectable Warning Strips	EA	1		-
#0-16	Thermoplastic Intersection Markings (Crossing Bars + Stop Bar)	LS	1		-
#0-17	Trail Grading (Excavation and finish grading)	CY	3123		-
#0-18	Turf Grass (Sod disturbed areas) (3' Trail Offset)	SF	18600		-
#0-19	Trail Distance Markers (Marker every 1/4 mile)	EA	3		-
#0-20	Decorative Pavement (accent bands)	SF	1076		-
#0-21	6' Metal Benches	EA	1		-

#0-22	CIP Retaining Walls (Intergral w/ sidewalk)	LF	110		-
#0-23	Concrete Under-Crossing Trail System (including slab, walls, structural excavation and backfill, and any required saw joints and expansion joints)	LF	400		-
#0-24	Metal Bridge Pedestrian Railings (48" height)	LF	400		-
#0-25	Low Overhead Clearance Signs	EA	2		-
#0-26	3" Caliper Tree Plantings (Mulched, Staked, Installed with Soil as Specified)	EA	16		-
#0-27	2" Caliper Median Tree Plantings (Mulched, Staked, Installed with Soil as Specified)	EA	34		-
#0-28	2" Caliper Evergreen Screening Tree Plantings (Mulched, Staked, Installed with Soil as Specified)	EA	63		-
#0-29	Hydro-Mulch (native seed)	SF	57708		-
#0-30	12" Concrete Landscape Edge	LF	600		-
#0-31	Plant Soil Mix for Planting Backfill	CY	350		-
#0-32	Ground Preparation for hydromulch application (Strip Existing Ground & Install 4" Plant Soil Mix)	SY	6412		-
#0-33	Ground Hardwood Mulch (3" Depth for Tree Plantings)	CY	250		-
#0-34	Permanent Landscape Irrigation System	LS	1		-

Basket Total	\$ 0.00
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Grand Total	\$ 0.00
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REQUEST FOR BIDS

RFB # 25-115-C

HEBRON PARKWAY SCREENING, TRAIL, AND LANDSCAPE IMPROVEMENTS

Bids due by Wednesday, August 13, 2025

Issued on July 19, 2025

SPECIFICATIONS
RFB #25-115-C
Hebron Parkway Screening, Trail, and Landscape Improvements

The City of Lewisville is accepting competitive sealed bids for screening, trail, and landscape improvements of Hebron Parkway.

GENERAL PROVISIONS

- **The contractor is to submit with their bid all additional documents that require a signature that are allocated within these specifications. These documents can be found in the Files section of Bonfire, listed as “Required Documents”.**
- Before work begins, a pre-construction meeting will be arranged wherein the contractor and representative(s) of the City will discuss procedures for the work to be completed.
- The contractor is responsible for supplying all equipment, labor, material, and supervision, as required for successfully completing services.
- The contractor shall designate a full-time superintendent who shall be always on the job site when work is being performed. The City’s representative will communicate only with the superintendent. The contractor may replace the designated superintendent after written notification to the City.
- The contractor hereby agrees to commence work within ten (10) working days of receipt of notice to proceed and complete the service within a reasonable amount of time after receipt of the notice to proceed, subject to extensions of time as provided by general and special conditions.
- The City will be responsible for notifying the public of the agreed upon start date and scope of work at least seventy-two (72) hours prior to the start of work.
- The contractor will provide a list of names and twenty-four (24) hour emergency phone numbers for all key personnel related to the project.
- The City may request a replacement of the designated superintendent after written notification to the contractor.
- Work hours shall be limited to the period between 7:00 A.M. and 5:00 P.M., Monday through Friday. The contractor will curtail any operation defined in an Ozone Action Day, issued by TCEQ. No work will be allowed on Saturdays without a written request to, and approval from, the City at least forty-eight (48) hours in advance. No work will be allowed on Sundays or holidays (listed below). Night work will not be allowed without a written request to, and approval from, the City at least forty-eight (48) hours in advance.

New Years Day
Martin Luther King's Birthday
Memorial Day
Juneteenth
Independence Day
Labor Day
Thanksgiving
Day After Thanksgiving
Christmas Eve
Christmas Day

- The City of Lewisville Scope of Work, in combination with Federal and State Americans with Disabilities Act (ADA) Design Standards, shall govern all work performed in the City of Lewisville. If a conflict arises, the inspector in charge of the project shall determine which specifications will be used. The contractor's field supervisor shall be required to obtain a copy of both, at the contractor's expense.
- A pay request may be submitted for payment of completed work. This pay request shall be itemized to reflect the completed quantities per bid item. A measurement of completed quantities will be conducted prior to the submittal of each pay request. The contractor's field supervisor and the City's representative shall conduct this measurement.
- Only items in the bid are pay items. All costs in connection with the proper and successful completion of work, including furnishing all materials, equipment, supplies, and appurtenances; providing all construction plans, equipment, and tools; and performing all necessary labor and supervision to fully complete the work, shall be included in the unit and lump sum prices bid. All work not specifically set forth as a pay item shall be considered a subsidiary obligation of the contractor, and all costs in connection therewith shall be included in the prices bid.
- The City may terminate the contract if the contractor consistently fails to perform the work in accordance with the contract documents including, but not limited to, failure to supply sufficient skilled workers, suitable materials, equipment, or otherwise violates in any substantial way any provisions of the contract documents. The City may, after giving the contractor seven (7) days written notice and to the extent permitted by law and regulations, terminate the services of the contractor from the site and take possession of the work.

Environmental Requirements

- Contractor shall follow all TECQ requirements and guidelines.

SCOPE OF WORK

Refer to the Specifications starting on page seven of this document.

PROJECT LOCATIONS

All project locations will be within the city limits of the City of Lewisville, Texas.

INSURANCE AND BONDS

Insurance and bonds shall be supplied by the awarded contractor within ten (10) days of notification of award, as detailed in the Insurance Requirements and the Bond Requirements and Retainage documents. Insurance and bonds must be approved by the City prior to the commencement of work and shall remain in effect throughout the entire duration of this project.

STORMWATER MANAGEMENT PLAN

Under the Authority of the Clean Water Act, the Environmental Protection Agency (EPA), and the City of Lewisville has endeavored to reduce and improve stormwater quality per the direction of the Texas Commission of Environmental Quality (TCEQ). The City of Lewisville has developed a Stormwater Management Plan. By signing this contract vendors accept to follow this Plan. Follow this link for a copy of the Stormwater Management Plan:

<https://www.cityoflewisville.com/about-us/city-departments/public-services/storm-water>

TERMINATION OF CONTRACT

Should the Contractor, in the opinion of the City, fail to faithfully comply with the intent of the Contract as executed or render an unsatisfactory performance of the work pertinent to the contract, this Contract may be promptly terminated, in whole or in part, by the City with seven (7) days written notice. In such event, nothing contained herein shall be construed or interpreted as to prevent the City from immediately entering another contract with another contractor for an unabated continuance of this service. Monies owed to the Contractor for services rendered to the date of termination shall not constitute a prolonging of the contract.

REQUEST FOR BIDS

Bids are to be submitted based on the specifications contained herein.

The preparation of response to this RFB will be at the total expense of the proposer. There is no expressed or implied obligation for the City of Lewisville to reimburse responders for any expense incurred in the preparation response to this request.

The City reserves the right to reject any and all responses, to consider alternatives, to waive any formalities and irregularities, and to re-solicit this RFB. In addition, during the evaluation period, the City may, where it may serve the City's best interest, request additional information or clarifications from responders, or allow corrections of errors or omissions.

The RFB will be available to interested parties at <https://cityoflewisville.bonfirehub.com/portal> or may be picked up in person at the Purchasing office.

Bids may be uploaded to Bonfire or sealed RFBs, one (1) original and one (1) PDF copy on a flash drive may be delivered to the City of Lewisville Purchasing Division office at the address below, in a sealed envelope or box, clearly marked:

RFB: 25-115-C
Hebron Parkway Screening, Trail, and Landscape Improvements

Delivery address:
City of Lewisville
Finance Administration - Purchasing Division
Attn: Janine Carpenter, Senior Buyer
151 W. Church Street
Lewisville, TX 75057

All questions pertaining to this bid must be submitted in writing via Bonfire. No verbal clarification will be given.

No telephone, email, or fax bids will be accepted. Bids may be accepted if delivered in person or by U.S. Postal Service, Federal Express, UPS, etc. or uploaded to Bonfire. The City is not responsible for missing, lost, or late delivery. Any RFB responses received after the time set for opening will be returned to the proposer unopened.

Specifications, RFB bid forms, and instructions to bidders are attached hereto. The preparation of the bid will be at the total expense of the proposer. There is no expressed or implied obligation for the City of Lewisville to reimburse responding proposers for any expense incurred in the preparation of bids in response to this request.

Alternate bids will also be considered, provided the alternatives are clearly explained. All deviations from the specifications must be clearly identified and explained.

Each bidder shall guarantee and honor its response to these specifications for a period of ninety (90) days, or until the City enters a contract with one of the bidders, whichever occurs first.

All forms requiring either a signature or requested information are to be returned with your bid. In addition, the language contained in the attached form entitled Purchase Order Terms and Conditions is made part of this request for bid through reference herein.

The information contained herein is believed to be accurate and up to date but is not intended to be an expressed or implied warranty.

The City of Lewisville reserves the right to retain all bids submitted. Submission of a bid indicates the firm's acceptance of the conditions contained in this request for bids, unless clearly and specifically noted in the bid submitted and confirmed in the contract between the City of Lewisville and the selected vendor.

The City reserves the right to reject any and all bids, to consider alternatives, to waive any formalities and irregularities, and to re-solicit bids. In addition, during the evaluation period, the City may, where it may serve the City's best interest, request additional information or clarifications from proposers, or allow corrections of errors or omissions.

All parties submitting bids are expected to comply with federal, state, and local laws and regulations relative to the preparation of bids and the services to be provided. Specifically, the services to be provided are expected to be in compliance with the Americans with Disabilities Act (ADA), as well as with federal and state confidentiality laws. All bids that are submitted will be presumed to be in compliance with all applicable laws.

MISCELLANEOUS

All forms requiring either a signature or information to be filled in **must** be returned with your bid. In addition, the language contained in the attached form entitled Purchase Order Terms and Conditions is made part of this request for bid through reference herein.

PROPOSAL

City of Lewisville
Purchasing Office
151 West Church Street
P.O. Box 299002
Lewisville, Texas 75029-9002

RFB #25-115-C HEBRON PARKWAY SCREENING, TRAIL, AND LANDSCAPE IMPROVEMENTS

Proposal of

(hereinafter called Bidder), a corporation organized and existing under the laws of the State of _____, a partnership, or an individual doing business as _____

(Strike out inapplicable terms).

To the City of Lewisville, Texas (Owner)

The undersigned Bidder, in response to the Notice to Bidders for the construction of the above project and in conformity with the bidding documents; having examined the plans, specifications, related documents and the site of the proposed work; being familiar with all of the conditions relating to the construction of the proposed project, including the availability of materials and labor, hereby proposes to furnish all labor, materials, supplies, equipment, staking, testing, traffic control, superintendence, etc., for the construction of the project in accordance with the plans, specifications, and contract documents at the unit prices proposed herein.

The undersigned Bidder proposes, acknowledges and agrees to construct the entire project as shown on the plans, fully in accordance with the requirements of the plans, specifications, and the contract documents for the prices included in this Proposal and fully understands and agrees that the various items of material, labor and construction not specifically enumerated and provided for herein are considered subsidiary to the several items for which direct payment is specifically provided. Further, the undersigned agrees that one such subsidiary item is the protection, adjustment, maintenance, repair or replacement of all underground lines and services, whether shown on the plans or not, all to the full satisfaction of the City Engineer in a timely manner.

The undersigned Bidder agrees to begin work under the contract on or before the date specified in the written Notice to Proceed, and to fully complete the project within **210 calendar days**. It is specifically stated and understood that the entire construction including clean up shall be completed within the above stated time.

Proposal: Hebron Parkway Screening, Trail, and Landscape Improvements

The undersigned Bidder has contacted, within 72 hours prior to bid opening, the Office of the City Engineer (972) 219-3490, and has determined that all Addenda are as follows:

Addendum No. 1 dated

(Signature)

Addendum No. 2 dated

(Signature)

Addendum No. 3 dated

(Signature)

The undersigned Bidder acknowledges that the Owner reserves the right to waive any informality and to reject any or all proposals.

The undersigned Bidder acknowledges and agrees that this Proposal shall be good and may not be withdrawn for 90 days from the date of bid opening.

The undersigned Bidder has shown unit prices and amounts and agrees that in the case of discrepancy, the unit prices shown in figures shall stand and that the amounts and total will be adjusted to correspond to the unit prices shown.

The undersigned Bidder agrees to execute the Agreement and furnish the required Performance Bond and Payment Bond within fifteen calendar days from the date of award of a contract by the City; and agrees that any delay in furnishing the signed Agreement and Bonds will result in liquidated damages being applied in accordance with Item 108.8.1. of the Standard Specifications.

The undersigned Bidder has attached and made a part of this Proposal a bid security in conformance with Item 102.5. of the Standard Specifications and in accordance with the Notice to Bidders.

A 5% contingency line item will be included with the resulting contract and purchase order for this project. The contingency shall be used at the City's discretion and only upon written approval from the City. The amount listed as a contingency is not an obligation for payment from the City. Any unused contingency is retained by the City and is not payable to the Contractor.

Submitted:

(Signature)

(Name - Typed or Printed)

(Title)

(Seal, if corporation)

(Firm Name)

(Address)

(City/County/State/Zip Code)

(Telephone Number/Include Area Code)

(Date)

(Attest)

CONTRACTOR'S QUALIFICATIONS

ALL BIDDERS ARE NOTIFIED THAT THE FOLLOWING QUALIFICATION STATEMENT MUST BE COMPLETED AND SUBMITTED WITH THE BID OR PROPOSAL.

The contractor shall show they have experience with similar projects that require working in confined areas in close proximity to many physical features (fences, utility poles, guy lines, gas lines and meters, sewer manholes, cleanouts, etc.) which requires the contractor to plan work efforts and equipment needs with these limitations in mind. The contractor shall submit a list of Public Works Projects successfully completed within the last five (5) years, including the names of supervisors and type of equipment used to perform this work.

BIDDER'S QUALIFICATION STATEMENT

Project: _____

Contractor: _____

Name: _____ Title: _____

Address: _____

Phone: _____ Email: _____

Type of Business:

☐ Sole Proprietor ☐ Partnership ☐ Corporation ☐ Joint Venture Other _____

State and Date of Incorporation, Partnership, Ownership, Etc. _____

Principal Office Address: _____

Principal Office Contact & Phone: _____

Insurance:

Insurance Agency Name: _____

Insurance Agency Address: _____

Contact Name: _____ Phone: _____

Liability Insurance Provided and Limits of Coverage: _____

Workers Compensation Insurance Provider: _____

Surety Bonding Company (Performance & Payment: _____

Total Number of Employees to be Associated with this Job:

_____ Managerial _____ Administrative _____ Professional

_____ Skilled _____ Semi-Skilled _____ Other

Percentage of Work to be Done by Bidder's Employees (Based on Dollars Bid): _____

Type(s) of Work to be Done by Bidder's Employees (Examples: Concrete Paving, Structural Concrete, Water Lines, Sanitary Sewer Lines, Storm Pipe, Storm Inlets, Excavation, Lime, Bridge Fencing, etc.)

Access to Tools and Equipment: Percent Owned: _____ Percent Rented: _____

Number of Years in Business as a Contractor on Above Types of Work: _____

Sub-Contractor Information (use additional sheets, if needed.):

Name: _____ Phone: _____

Address: _____

Type of Work _____

List the most current completed projects like the type of work bid (use additional sheets, if necessary.)

Project: _____

Owner/Agency: _____

Year Built: _____ Contract Price: _____

Equipment Used: _____

Contact Name: _____ Title: _____

Email: _____ Phone: _____

Project: _____

Owner/Agency: _____

Year Built: _____ Contract Price: _____

Equipment Used: _____

Contact Name: _____ Title: _____

Email: _____ Phone: _____

Project: _____

Owner/Agency: _____

Year Built: _____ Contract Price: _____

Equipment Used: _____

Contact Name: _____ Title: _____

Email: _____ Phone: _____

Trade References (attach additional sheets if needed):

Company: _____ Contact: _____

Address: _____

Email: _____ Phone: _____

Company: _____ Contact: _____

Address: _____

Email: _____ Phone: _____

Company: _____ Contact: _____

Address: _____

Email: _____ Phone: _____

Bank References (attach additional sheets if needed):

Institution: _____ Contact Name: _____

Address: _____ Phone: _____

Financial statements are not required as part of this bid package, however a balance sheet and income statement from the previous fiscal year shall be required from the apparent low bidder to be reviewed and approved by the Finance Director prior to contract award.

Claims and Suits (If the answer to any of the questions is yes, please attach details):

Has your organization ever failed to complete any work awarded to it? ☐ Yes ☐ No

Are there any judgments, claims, arbitration proceedings, or suits pending or outstanding against your organization or its officers? ☐ Yes ☐ No

Has your organization filed any lawsuits or requested arbitration regarding construction contracts within the last five years? ☐ Yes ☐ No

Within the last five (5) years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract?
☐ Yes ☐ No

PROPOSED SUBCONTRACT BREAKDOWN

1.	Subcontractor	_____
	Address	_____
	Phone #	_____
	Description of Work	_____
2.	Subcontractor	_____
	Address	_____
	Phone #	_____
	Description of Work	_____
3.	Subcontractor	_____
	Address	_____
	Phone #	_____
	Description of Work	_____
4.	Subcontractor	_____
	Address	_____
	Phone #	_____
	Description of Work	_____

Reference is made to Item 21 on Page SS-11

LIST OF SUPPLIERS

1.	Item Supplied	_____
	Supplier	_____
	Address	_____
	Phone #	_____
2.	Item Supplied	_____
	Supplier	_____
	Address	_____
	Phone #	_____
3.	Item Supplied	_____
	Supplier	_____
	Address	_____
	Phone #	_____
4.	Item Supplied	_____
	Supplier	_____
	Address	_____
	Phone #	_____

PERFORMANCE BOND

STATE OF TEXAS
COUNTY OF DENTON

KNOW ALL MEN BY THESE PRESENTS: That _____ of the City of _____, County of _____, and State of _____, as Principal, and _____ authorized under the laws of the State of Texas to act as Surety on bonds for Principal, are held and firmly bound unto the City of Lewisville (Owner), in the penal sum of _____ Dollars (\$_____) for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents:

WHEREAS, the Principal has entered into a certain written contract (Contract) with the Owner, dated the ____ day of _____, 20____ to construct:

RFB #25-115-C Hebron Parkway Screening, Trail, and Landscape Improvements

which Contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall faithfully perform said Contract and shall in all respects duly and faithfully observe and perform all and singular the covenants, conditions and agreements in and by said Contract agreed and covenanted by the Principal to be observed and performed, and according to the true intent and meaning of said Contract and the Plans and Specifications hereto annexed, then this obligation shall be void; otherwise to remain in full force and effect;

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Chapter 2253 of the Texas Government Code as amended and all liabilities on this bond shall be determined in accordance with the provisions of said Chapter to the same extent as if it were copied at length herein.

Surety, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract, or to the work performed thereunder, or the plans, specifications, or drawings accompanying the same, shall in anyway affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract, or to the work to be performed thereunder.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20__.

Principal

Surety

By:

By

Title:

Title

Address:

Address:

The name and address of the Resident Agent of Surety is:

Bond Number _____

PAYMENT BOND

**STATE OF TEXAS
COUNTY OF DENTON**

KNOW ALL MEN BY THESE PRESENTS: That _____ of the City of _____, County of _____, and State of _____, as Principal, and _____ authorized under the laws of the State of Texas to act as Surety on bonds for Principal, are held and firmly bound unto the City of Lewisville (Owner), in the penal sum of _____ Dollars (\$_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents:

WHEREAS, the Principal has entered into a certain written contract (Contract) with the Owner, dated the _____ day of _____, 20____ to construct:

RFB #25-115-C Hebron Parkway Screening, Trail, and Landscape Improvements

which Contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall pay all claimants supplying labor and material to him or a subcontractor in the prosecution of the work provided for in said Contract, then, this obligation shall be void; otherwise to remain in full force and effect;

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Chapter 2253 of the Texas Government Code as amended and all liabilities on this bond shall be determined in accordance with the provisions of said Chapter to the same extent as if it were copied at length herein.

Surety, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract, or to the work performed thereunder, or the plans, specifications or drawings accompanying the same, shall in anyway affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract, or to the work to be performed thereunder.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20____.

Principal	Surety
By:	By
Title:	Title
Address:	Address:

The name and address of the Resident Agent of Surety is:

MAINTENANCE BOND

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS:

That we, _____
(hereinafter called **Principal**), and _____, a corporation
organized under the laws of the State of _____ and authorized to do a surety business in the State
of Texas, (hereinafter called **Surety**), are held and firmly bound unto the City of Lewisville, Texas
(hereinafter called the **City**) in the full and just sum of _____,
lawful money of the United States of America, for the payment of which sum, well and truly to be made,
we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally,
firmly by these presents.

WHEREAS, said **Principal** has performed _____
improvements, which have been or are about to be completed and accepted by the **City** for the project
known as:

RFB #25-115-C Hebron Parkway Screening, Trail, and Landscape Improvements

AND WHEREAS, it is required that the **Principal** should guarantee the project from
defects caused by faulty or defective materials, workmanship, or design for a period of two years from
and after the date of acceptance of the completed project by the **City**.

NOW, THEREFORE, if the **Principal** shall for a period of two years from and after the date
of acceptance of the completed project by the **City** replace any and all defects arising in said work
whether resulting from faulty or defective materials, workmanship, or design, then the above
obligation shall be null and void; otherwise the obligation shall remain in full force and effect for two
years from the date of acceptance of the completed project by the **City**.

The **City** shall notify the **Principal** in writing of any defects for which the **Principal**
is responsible and shall specify in said notice a reasonable time within which the **Principal** shall
have to correct said defects. If the **Principal** fails to correct said defects within the time specified in said
notice,

the **City**, in its discretion, may permit the **Surety** to correct said defects. If the **City** allows the **Surety** to correct said defects, the **Surety** shall have sixty (60) days thereafter within which to take such action as it deems necessary to insure performance of the **Principal's** obligation.

If such defects are not corrected after the time period specified in the notice or after the expiration of the sixty (60) day time period, whichever is applicable, the **City** shall have the right to correct the defects, and the **Principal** and **Surety**, jointly and severally, shall pay all costs and expenses incurred by the **City** in correcting the defects, including, but not limited to, the engineer, legal and other costs, together with any damages either direct or consequential, which the **City** sustains, or may sustain, on account of the **Principal's** failure to correct the defects. In addition, the **City** shall have the right to contract for the correction of said defects and, upon acceptance of a bid in accordance with the **City's** normal bidding process, the **Principal** and **Surety** shall become immediately liable for the amount of the bid. In the event that the **City** commences legal proceedings for the collection thereof, interest shall accrue on said amount at the rate of six (6) percent per annum, beginning at the commencement of said legal proceedings.

If the City commences suit for collection of any sums due hereunder, the **Principal** and **Surety**, jointly and severally, agree to pay all costs and expenses incurred by the **City**, including, but not limited to, attorney's fees.

IN WITNESS WHEREOF, the parties have caused this instrument to be signed and sealed by their respective authorized officers this _____ day of _____ 20__.

Principal: _____

Surety: _____

By: _____

By: _____

_____, *Attorney-in-Fact*

Address: _____

Address: _____

Witness as to Principal

**CITY OF LEWISVILLE
PURCHASING DIVISION**

BOND REQUIREMENTS AND RETAINAGE

BONDS

The successful bidder will be required to furnish the following bonds from a surety licensed to do business in the State of Texas. These bonds, along with proper insurance papers, will be incorporated as part of the final contract documents and will remain in effect until the completion and acceptance of the project. Maintenance bonds shall be in effect based on their stated term after final acceptance of the project:

Project amount \$10,001 to \$24,999 – a payment bond at the project amount and a maintenance bond for one year from the date of final payment.

Project amount \$25,000 to \$99,999 – a payment bond at the project amount and a maintenance bond for two years from the date of the final payment.

Project amount \$100,000 and greater – a bid bond equal to five percent (5%) of the project amount is to be included with the sealed bid; a payment bond and performance bond at the project amount and a maintenance bond for two years from the date of the final payment.

RETAINAGE

Retainage will be based on the following: Fifteen percent (15%) retainage for contracts up to \$25,000; ten percent (10%) retainage for contracts more than \$25,000 and less than \$400,000; five percent (5%) retainage for contracts in excess of \$400,000.

**CITY OF LEWISVILLE
PURCHASING DIVISION**

INSTRUCTIONS TO BIDDERS

INSTRUCTIONS: These instructions apply to all bids and become a part of the terms and conditions of any bid submitted.

BIDS must not be faxed, but are to be submitted to the City in one of the following manners:

- A. **Electronic Receipt:** Bidders are encouraged to submit bids to the City through Bonfire. The City is a member of this electronic bidding platform and the submittal of bids to the City is at no cost to the bidder. The internet site is www.gobonfire.com.

or

- B. **Paper Bid Receipt:** Paper bids may be submitted to the City. Bidders are to submit the original and one PDF copy of the bid on a flash drive in a sealed envelope to the Purchasing Division prior to response due date/time. The sealed envelope is to be marked on the outside with the bidder's name, address, the bid invitation number, and closing date recorded on the bottom left corner of the envelope.

Address to:

City of Lewisville
Finance Administration - Purchasing Division
151 W. Church St.
Lewisville, Texas 75057

Sealed bids must be submitted in sufficient time as to be received and time stamped at the above location on or before the published bid date and time shown on the bid invitation. Bids received after submission deadline shall be returned unopened and will be considered void and unacceptable. The City of Lewisville is not responsible for lateness of mail carrier, etc.

BID: The bidder should quote its lowest and best price, F.O.B. destination on each item bid. If delivery and shipping quantities affect unit bid price, multiple bids may be made so as to indicate "price break" quantities in order for the City to determine maximum economic benefits. Pricing for paper bids shall be entered on the Bid Sheet in ink or typewritten. Totals shall be entered in the "Total Price" column of the Bid Sheet. In all cases of discrepancy between unit price and extended price, the unit price will be presumed to be correct.

MAKE-MODEL Items must be the best and latest model available of the type specified. If the bid invitation indicates a specific brand of product, the brand listed is deemed to be descriptive and not restrictive and is used to indicate the type and quality level desired for comparison purposes. Bidders may offer an approved equal to the brand listed, unless otherwise noted. The City shall make the final determination as to the brand offered being an approved equal to the brand listed. A Complete catalog or brochure showing in detail the item offered must accompany the bid.

SPLIT-AWARD: Bidders may furnish pricing for all or any portion of the bid invitation. Unless the bidder specifies otherwise in his bid, the City may award the contract for any item or group of items shown on the bid invitation.

BID FORMS: Bids submitted on other than City forms, whether electronic or paper, or with different terms or provisions may not be considered as responsive bids.

Bids must be held firm for ninety (90) days to allow for evaluation unless otherwise noted in the bid document.

F.O.B./DAMAGE: Quotations shall be bid F.O.B. Inside Delivery, Municipal Facility, Lewisville, Texas, and shall include all delivery and packaging costs. The City of Lewisville assumes no liability for goods delivered in damaged or unacceptable condition. The successful bidder shall handle all claims with carriers, and in case of damaged goods, shall ship replacement goods immediately upon notification by the City of damage.

INVOICES: Invoices must be submitted by the successful bidder in duplicate to the City of Lewisville Accounts Payable, P O Box 299002, Lewisville, TX 75029-9002 or may be emailed to: accountspayable_col@cityoflewisville.com.

TAXES: The City of Lewisville is exempt from Federal Manufacturer's Excise, and State Sales taxes. TAX MUST NOT BE INCLUDED IN BID. Tax exemption certificates will be executed by the City and furnished upon request.

PRICING: Bids should be firm. If the bidder, however, believes it necessary to base its price on price adjustment, such a bid may be considered, but only as an alternate bid.

PAYMENT TERMS: Payment terms are net 30 days after the goods are provided or services are completed, as required, or a correct invoice is received, whichever is later.

DELIVERY PROMISE - PENALTIES: Bids MUST show the number of calendar days required to place the materials in the possession of the City. DO NOT quote shipping dates. Consistent failure of a bidder to meet his delivery promises without valid reason may be cause for removal from the Bidder's List. When Delivery delays can be foreseen, the bidder shall give prior notice to the Purchasing Division which shall have the right to extend the delivery due date if reasons for delay appear acceptable. Default in promised delivery, without acceptable reasons, or failure to meet specifications, authorizes the Purchasing Division to purchase the goods elsewhere, and charge any increase in cost and handling to the defaulting bidder.

PACKAGING: Unless otherwise indicated, items will be new, unused, and in first class condition in containers suitable for damage-free delivery and storage.

CORRESPONDENCE: The bid number must appear on ALL correspondence, inquiries, etc. pertaining to the bid.

DELIVERY TIMES: Deliveries will be acceptable only during normal working hours at the designated City Municipal Facility.

PATENT RIGHTS: The Vendor agrees to indemnify and hold the City harmless from any and all claims involving patent right infringement or copyrights on goods supplied.

EVALUATION: Response to the specification in this bid is of primary importance in determining the lowest responsible bid.

BID AWARD: Bids will be awarded either on Lowest Responsible Bid or Best Value. The Criteria used to determine Best Value is as follows:

- Purchase Price
- The reputation of the bidder and of the bidder's goods and service
- The quality of the bidder's goods or services
- The extent to which the goods or services meet the municipality's needs.
- The bidder's past relationship with the municipality.
- The impact on the ability of the city to comply with laws and rules relating to contracting with historically underutilized businesses and non-profit organizations employing persons with disabilities.

The total long-term cost to the city to acquire the bidders good or services (Life Cycle Costing).

Any other relevant factors that a private business would consider in selecting a bidder.

FUNDING: The City of Lewisville is a home-rule municipal government operated and funded on an October 1 to September 30 Fiscal Year; accordingly, the City reserves the right to terminate, without liability to the City any contract for which funding is not available.

RESERVATIONS: The City expressly reserves the right to:

- A. Waive as an informality, minor deviations from specifications.
- B. Waive any defect, irregularity or informality in any bid or bidding procedure.
- C. Reject or cancel any or all bids.
- D. Reissue a bid invitation.
- E. Extend the bid opening time and date.
- F. Procure any item by other means.
- G. Increase or decrease the quantity specified in the bid invitation, unless the Bidder specifies otherwise.
- H. Consider and accept an alternate bid as provided herein when most advantageous
- I. to the City.

ASSIGNMENT: The successful bidder shall not sell, assign, transfer or convey this contract in whole or in part, without the prior written consent of the City.

AUDIT: The City of Lewisville reserves the right to audit the records and performance of the successful bidder during the term of the contract and for three years after the contract is completed.

PROTESTS: All protests regarding the bid solicitation process must be submitted in writing to the City Purchasing Manager within five (5) working days following the opening of bids. This includes all protests relating to advertising of bid notices, deadlines, bid opening, and all other related procedures under the Local Government Code, as well as any protests relating to alleged improprieties with the bidding process.

This limitation does not include protests relating to staff recommendations as to award of this bid. Protests relating to staff recommendations may be directed to the City Council by contacting the City Secretary.

Failure to Protest within the time allotted shall constitute a waiver of any protest.

ALTERING BIDS: Bid cannot be altered or amended after submission deadline. Any interlineation, or alteration made before opening time for sealed bids must be initialed by the signer of the bid, guaranteeing authenticity.

CHANGE ORDERS: No oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All change orders to the contract will be made in writing by the City of Lewisville.

ADDENDA: Any interpretations, corrections or changes to this Invitation for Bid and Specifications will be made by ADDENDA. Sole authority to issue addenda shall be vested in the City of Lewisville. Bidders shall acknowledge receipt of all addenda on bid form.

MINIMUM STANDARDS FOR RESPONSIBLE PROSPECTIVE BIDDERS: A prospective bidder must affirmatively demonstrate bidder's responsibility. A prospective bidder must meet the following requirements:

- Have adequate financial resources, or the ability to obtain such resources as required;
- Be able to comply with the required or proposed delivery schedule;
- Have a satisfactory record of performance;
- Have a satisfactory record of integrity and ethics;
- Be otherwise qualified and eligible to receive an award; and
- The City of Lewisville may request representation and other information sufficient to determine bidder's ability to meet these minimum standards listed above.

BIDDER SHALL PROVIDE with this bid response, all documentation required. Failure to provide this information may result in rejection of bid.

SUCCESSFUL BIDDER SHALL defend, indemnify and save harmless the City of Lewisville and all its officers, agents and employees and all entities, their officers, agents and employees who are participating in this contract from all suits, actions, or other claims of any character,

name and description brought for or on account of any injuries or damages received or sustained by any person, persons, or property on account of any negligent act or fault of the successful bidder, or of any agent, employee, subcontractor or supplier in the execution of, or performance under, any contract which may result from bid award. Successful bidder shall pay any judgment with cost which may be obtained against the City of Lewisville and participating entities growing out of such injury or damages.

TERMINATION FOR DEFAULT: The City of Lewisville reserves the right to enforce the performance of this contract in any manner prescribed by law or deemed to be in the best interest of the City in the event of breach or default of this contract. The City reserves the right to terminate the contract immediately in the event the successful bidder fails to 1) meet delivery schedules, or 2) otherwise perform in accordance with these specifications. Breach of contract or default authorizes the City to award to another bidder. Purchase elsewhere and charge the full increase in cost and handling to the defaulting successful bidder.

TESTING: Testing may be performed at the request of the City without expense to the City.

REMEDIES: The successful bidder and City of Lewisville agree that each party have all rights, duties, and remedies available as stated in the Uniform Commercial Code.

VENUE: This agreement will be governed and construed according to the laws of the State of Texas. This agreement is performable in Denton County, Texas.

SILENCE OF SPECIFICATION: The apparent silence of these specifications as to any detail or to the omission from it of a detailed description concerning any point shall be regarded as meaning that only the best commercial products and practices are to prevail. All interpretations of the specifications in this bid shall be made on the basis of this statement.

DEVIATIONS from specifications and alternate bids must be clearly shown on the bid form with complete information attached to form. They may or may not be considered.

NO EMPLOYEE of the City of Lewisville who has a financial interest in a prospective vendor shall participate in submitting a bid or proposal to conduct work for the City.

NO EMPLOYEE of the City of Lewisville shall receive any compensation for or as a result of a contract for goods or services purchased by the City if that employee was in a position to influence the City with respect to the contract.

ELIGIBLE BIDDER: Bidders are limited to those persons or firms who are qualified and engaged in a full-time business and can assume liabilities for any performance or warranty service required.

REJECTED ITEM(S): Item(s) that are rejected for failure to meet prescribed minimum specifications shall be returned to the supplier at no cost to the City of Lewisville.

INDEMNITY: The City of Lewisville will not accept a contract that contains any provision causing the City of Lewisville to indemnify the vendor for any reason.

VENDOR AGREEMENT: Any vendor agreements (service, maintenance, etc.) to be signed by the City of Lewisville must be submitted with your bid.

EXHIBIT A

PURCHASE ORDER TERMS & CONDITIONS

Seller and Buyer agree to comply with the following terms and conditions. These Terms and Conditions along with the purchase order shall constitute a contract between the Seller and Buyer upon the Seller issuing an invoice and/or providing any of the goods and services described in the purchase order. In the event of a conflict between these Terms and Conditions and a separate written agreement between the Seller and Buyer, the terms of the separate written agreement shall prevail.

1. SELLER TO PACKAGE GOODS: Seller will package goods in accordance with good commercial practice. Each shipping container shall be clearly and permanently packed as follows: (a) Seller's name and address; (b) Consignee's name, address and purchase order or purchase order release number and the supply agreement number if applicable; (c) Container number and total number of containers, e.g. box 1 of 4 boxes; and (d) the number of the container bearing the packing slip. Seller shall bear cost of packaging unless otherwise provided. Goods shall be suitably packed to secure lowest transportation costs and to conform with requirements of common carriers and any applicable specifications. Buyer's count or weight shall be final and conclusive on shipments not accompanied by packing lists.

2. SHIPMENT UNDER RESERVATION PROHIBITED: Seller is not authorized to ship the goods under reservation and no tender of a bill of lading will operate as a tender of goods.

3. TITLE AND RISK OF LOSS: The title and risk of loss of the goods shall not pass to Buyer until Buyer actually receives and takes possession of the goods at the point or points of delivery.

4. DELIVERY TERMS AND TRANSPORTATION CHARGES: F.O.B. Inside Delivery, Municipal Facility, Lewisville, Texas, and shall include all delivery and packaging costs. The Buyer assumes no liability for goods delivered in damaged or unacceptable condition. The Seller shall handle all claims with carriers, and in case of damaged goods, shall ship replacement goods immediately upon notification by Seller of damage.

5. NO REPLACEMENT OF DEFECTIVE TENDER: Every tender or delivery of goods must fully comply with all provisions of this contract as to time of delivery, quality and the like. If a tender is made which does not fully conform, this shall constitute a breach and Seller shall not have the right to substitute a conforming tender provided, where the time for performance has not yet expired, the Seller may notify Buyer of his intention to cure and may then make a conforming tender within the contract time but not afterward.

6. PLACE OF DELIVERY: The place of delivery shall be that set forth on the purchase order. Any change thereto shall be effected by modification as provided for in Clause 20, "Modifications", hereof. The terms of this contract are "no arrival, no sale".

7. INVOICES AND PAYMENTS: (a) Seller shall submit separate invoices on each purchase order after each delivery. Invoices shall indicate the purchase order number, shall be itemized and transportation charges, if any, shall be listed separately. A copy of the bill of lading, and the freight weigh bill when applicable, should be attached to the invoice. Mail to: City of Lewisville Accounts Payable, PO Box 299002 Lewisville, Texas 75029-9002. Payments shall be made thirty days after the goods are delivered to the Buyer, or a correct invoice is received, whichever is later. Suppliers should keep the Accounts Payable Office advised of any changes in remittance addresses. (b) Buyer's obligation is payable only and solely from funds available for the purpose of the purchase. Lack of funds shall render this contract null and void to the extent funds are not available and any delivered but unpaid for goods will be returned to Seller by Buyer. (c) Do not include Federal Excise, State or City Sales Tax. Buyer shall furnish tax exemption certificate, if required.

8. GRATUITIES: The Buyer may, by written notice to the Seller, cancel this contract without liability to Seller if it is determined by Buyer that gratuities, in the form of entertainment, gifts, or otherwise, were offered or given by the Seller, or any agent, or representative of the Seller, to any officer or employee of the City of Lewisville with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending or the making or any determinations with respect to the performing of such a contract. In the event this contract is cancelled by Buyer pursuant to this provision, Buyer shall be entitled, in addition to any other rights and remedies, to recover or withhold the amount of the cost incurred by Seller in providing such gratuities.

9. SPECIAL TOOLS AND TEST EQUIPMENT: If the price stated on the face hereof includes the cost of any special tooling or special test equipment fabricated or required by Seller for the purpose of filling this order, such special tooling equipment and any process sheets related thereto shall become the property of the Buyer and to the extent feasible shall be identified by the Seller as such.

10. WARRANTY PRICE: (a) The price to be paid by the Buyer shall be that contained in Seller's bid which Seller warrants to be no higher than Seller's current prices on orders by others for products of the kind and specification covered by this contract for similar quantities under similar or like conditions and methods of purchase. In the event Seller breaches this warranty, the prices of the items shall be reduced to the Seller's current prices on orders by others, or in the alternative, Buyer may cancel this contract without liability to Seller for breach or Seller's actual expense. (b) The Seller warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for commission, percentage, brokerage, or contingent fee excepting bona fide employees of bona fide established commercial or selling agencies maintained by the Seller for the purpose of securing business. For breach of violation of this warranty, the Buyer shall have the right in addition to any other right or rights to cancel this contract without liability and to deduct from the contract price, or otherwise recover the full amount of such commission, percentage, brokerage or contingent fee.

11. WARRANTY PRODUCTS: Seller shall not limit or exclude any implied warranties and any attempt to do so shall render this contract voidable at the option of the Buyer. Seller warrants that the goods furnished will conform to the specifications, drawings and descriptions listed in the bid invitation and to the sample(s) furnished by Seller, if any. In the event of a conflict between the specifications, drawings and descriptions, the specifications shall govern.

12. SAFETY WARRANTY: Seller warrants that the product sold to Buyer shall conform to the standards promulgated by the U. S. Department of Labor under the Occupational Safety and Health Act of 1970. In the event the product does not conform to OSHA standards, Buyer may return the product for correction or replacement at the Seller's expense. In the event Seller fails to make the appropriate correction within a reasonable time, correction made by Buyer will be at Seller's expense.

13. NO WARRANTY BY BUYER AGAINST INFRINGEMENTS: As part of this contract for sale Seller agrees to ascertain whether goods manufactured in accordance with the specifications attached to this contract will give rise to the rightful claim of any third person by way of infringement or the like. Buyer makes no warranty that the production of goods according to the specification will not give rise to such a claim, and in no event shall Buyer be liable to Seller for indemnification in the event that Seller is sued on the grounds of infringement or the like. If seller is of the opinion that an infringement or the like will result, he will notify Buyer to this effect in writing within two weeks after the signing of this contract. If Buyer does not receive notice and is subsequently held liable for the infringement of the like, Seller will save Buyer harmless. If Seller in good faith ascertains that production of the goods in accordance with the specifications will result in infringement or the like, this contract shall be null and void except that Buyer will pay Seller the reasonable cost of his search as to infringements.

14. RIGHT OF INSPECTION: Buyer shall have the right to inspect the goods at delivery before accepting them.

15. CANCELLATION: Buyer shall have the right to cancel for default all or any part of the undelivered portion of this order if Seller breaches any of the terms hereof including warranties of Seller or if the Seller becomes insolvent or commits acts of bankruptcy. Such right of cancellation is in addition to and not in lieu of any other remedies which Buyer may have in law or equity.

16. TERMINATION: The performance of work under this order may be terminated in whole or in part by the Buyer in accordance with this provision. Termination of work hereunder shall be effected by the delivery to the Seller of a "Notice of Termination" specifying the extent to which performance of work under the order is terminated and the date upon which such termination becomes effective. Such right of termination is in addition to and not in lieu of rights of Buyer set forth in Clause 15, herein.

17. FORCE MAJEURE: If by reason of Force Majeure, either party hereto shall be rendered unable wholly or in part to carry out its obligations under this contract then such party shall give notice and full particulars of Force Majeure in writing to the other party within a reasonable time after occurrence of the event or cause relied upon, and the

obligation of the party giving such notice, so far as it is affected by such Force Majeure, shall be suspended during the continuance of the inability then claimed, except as hereinafter provided, but for no longer period, and such party shall endeavor to remove or overcome such inability with all reasonable dispatch. The term Force Majeure as employed herein, shall mean acts of God, strikes, lockouts, or other industrial disturbances, act of public enemy, orders of any kind of government of the United States or the State of Texas or any civil military authority, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, hurricanes, storms, floods, washouts, droughts, arrests, restraint of government and people, civil disturbances, explosions, breakage or accidents to machinery, pipelines or canals, or other causes not reasonably within the control of the party claiming such inability.

18.ASSIGNMENT DELEGATION: No right or interest in this contract shall be assigned or delegation of any obligation made by Seller without the written permission of the Buyer. Any attempted assignment or delegation by Seller shall be wholly void and totally ineffective for all purposes unless made in conformity with this paragraph.

19.WAIVER: No claim or right arising out of a breach of this contract can be discharged in whole or in part by a waiver or renunciation of the claim or right unless the waiver or renunciation is supported by consideration and is in writing signed by the aggrieved.

20.MODIFICATIONS: This contract may be modified or rescinded only by a writing signed by both of the parties or their duly authorized agents. This shall include any change orders.

21.INTERPRETATION PAROLE EVIDENCE: This writing is intended by the parties as a final expression of their agreement and is intended also as a complete and exclusive statement of the terms of their agreement. No course of prior dealings between the parties and no usage of the trade shall be relevant to supplement or explain any term used in this contract. Acceptance or acquiescence in a course of performance rendered under this contract shall not be relevant to determine the meaning of this contract even though the accepting or acquiescing party has knowledge of the performance and opportunity for objection. Whenever a term defined by the Uniform Commercial Code is used in this contract, the definition contained in the Code is to control.

22.APPLICABLE LAW: This contract shall be governed by the Uniform Commercial Code. Wherever the term "Uniform Commercial Code" is used, it shall be construed as meaning the Uniform Commercial Code as adopted in the State of Texas as effective and in force on the date of this contract.

23.ADVERTISING: Seller shall not advertise or publish, without Buyer's prior consent, the fact that Buyer has entered into this contract, except to the extent necessary to comply with proper requests for information from an authorized representative of the federal, state or local government.

24.RIGHT TO ASSURANCE: Whenever one party to this contract in good faith has reason to question the other party's intent to perform he may demand that the other party give written assurance of his intent to perform. In the event that a demand is made and no assurance is given within five (5) days, the demanding party may treat this failure as an anticipatory repudiation of the contract.

25.VENUE: Both parties agree that venue for any litigation arising from this contract shall lie in Denton County, Texas.

26.DISCLOSURE: Pursuant to Chapter 176 of the Texas Local Government Code, a person or agent of a person who contracts or seeks to contract with the City of Lewisville must complete a conflict of interest questionnaire if the person or agent has an affiliation or business relationship that might cause a conflict of interest with the City. The conflict of interest questionnaire, which is available online at ethics.state.tx.us, must be filed with the City Secretary of the City of Lewisville no later than the seventh business day after the person or agent begins contract discussions or negotiations with the City of Lewisville or submits to the City of Lewisville an application, response to a request for proposal or bid, correspondence, or another writing related to a potential agreement with the City of Lewisville. An updated conflict of interest questionnaire must be filed in accordance with Chapter 176 of the Local Government Code

Seller should consult with legal counsel if you have questions regarding its compliance with the requirements of Chapter 176. It is the responsibility of each person or agent who is contracting or seeking to contract with the City of Lewisville to comply with the filing requirements of Chapter 176.

27. INDEPENDENT CONTRACTOR: Seller shall be considered an independent contractor and not an agent, servant, employee, or representative of Buyer in the performance of the work. No term or provision herein or act of the Seller shall be construed as changing that status.

28. TERMINATION FOR DEFAULT: Buyer reserves the right to enforce the performance of any Purchase Order in any manner prescribed by law or deemed to be in the best interest of Buyer in the event of breach or default. The Buyer reserves the right to terminate any purchase order and/or agreement with the Seller in the event the Seller fails to: (a) meet delivery schedules, or (b) otherwise perform in accordance with these terms and conditions.

29. PROTESTS: All protests regarding the solicitation process must be submitted in written form to the Purchasing Manager within five (5) working days following the opening of bids/proposals. This includes all protests relating to legal advertisements, deadlines, bid/proposal openings, and all other related procedures under the Local Government Code

Post-award protests must be submitted in written form to the City Manager within five (5) working days after award. The protest must include, at a minimum, the name of protester, bid/proposal number or description of goods or services, and a statement of grounds for protest.

30. INDEMNIFICATION: SELLER AGREES TO DEFEND, INDEMNIFY AND HOLD BUYER, ITS OFFICERS, AGENTS AND EMPLOYEES, HARMLESS AGAINST ANY AND ALL CLAIMS, LAWSUITS, JUDGMENTS, COSTS AND EXPENSES FOR PERSONAL INJURY (INCLUDING DEATH), PROPERTY DAMAGE OR OTHER HARM FOR WHICH RECOVERY OF DAMAGES IS SOUGHT, SUFFERED BY ANY PERSON OR PERSONS, THAT MAY ARISE OUT OF OR BE OCCASIONED BY SELLER'S BREACH OF ANY OF THESE TERMS AND CONDITIONS OR BY ANY NEGLIGENT OR STRICTLY LIABLE ACT OR OMISSION, INTENTIONAL TORT, INTELLECTUAL PROPERTY INFRINGEMENT, OR FAILURE TO PAY A SUBCONTRACTOR OR SUPPLIER COMMITTED BY SELLER, ITS OFFICERS, AGENTS, EMPLOYEES OR SUBCONTRACTORS, IN THE PERFORMANCE OF THIS CONTRACT; EXCEPT THAT THE INDEMNITY PROVIDED FOR IN THIS PARAGRAPH SHALL NOT APPLY TO ANY LIABILITY RESULTING FROM THE SOLE NEGLIGENCE OR FAULT OF BUYER, ITS OFFICERS, AGENTS, EMPLOYEES OR SEPARATE CONTRACTORS, AND IN THE EVENT OF JOINT AND CONCURRING NEGLIGENCE OR FAULT OF THE SELLER AND BUYER, RESPONSIBILITY AND INDEMNITY, IF ANY, SHALL BE APPORTIONED IN ACCORDANCE WITH THE LAW OF THE STATE OF TEXAS, WITHOUT WAIVING ANY GOVERNMENTAL IMMUNITY AVAILABLE TO BUYER UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW. THE PROVISIONS OF THIS PARAGRAPH ARE SOLELY FOR THE BENEFIT OF THE PARTIES HERETO AND NOT INTENDED TO CREATE OR GRANT ANY RIGHTS, CONTRACTUAL OR OTHERWISE, TO ANY OTHER PERSON OR ENTITY.

31. SEVERABILITY: In case any one or more of the provisions contained in these Terms and Conditions shall for any reason be held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision thereof, and these Terms and Conditions shall be construed as if such invalid, illegal, or unenforceable provision had never been contained herein.

32. IMMIGRATION REFORM AND CONTROL ACT (8 U.S.C 1324a): The Buyer supports the Immigration Reform and Control Act (IRCA), which is a comprehensive scheme prohibiting the employment of unauthorized aliens in the United States. The Seller and its subcontractors shall at all times during the term of the contract with the Buyer comply with the requirements of IRCA and shall notify the Buyer within fifteen (15) working days of receiving notice of a violation of IRCA. The Seller also warrants that it has not had an IRCA violation within the last five (5) years. The Buyer may terminate a contract with the Seller if the Buyer determines that (a) the Seller or its subcontractors have been untruthful regarding IRCA violations in the preceding five (5) years or (b) the Seller or its subcontractors fail to timely notify the Buyer of an IRCA violation.

33. ADA COMPLIANCE: All goods and services provided to the Buyer must be compliant with the Americans with Disabilities Act and any amendments thereto (the "ADA") and all regulations promulgated pursuant to the ADA. Seller will be required to certify compliance, if required under the law or otherwise required by the Buyer.

34. PROTECTION OF RESIDENT WORKERS: The Buyer actively supports the Immigration and Nationality Act (INA), which includes provisions addressing employment eligibility, employment verification, and nondiscrimination. Under the INA, employers may hire only persons who may legally work in the United States (i.e., citizens and nationals of the U.S.) and aliens authorized to work in the U.S. The employer must verify the identity and employment eligibility of anyone to be hired, which includes completing the Employment Eligibility Verification Form (I-9). The Seller shall establish appropriate procedures and controls so no services under the contract will be performed by any worker who is not legally eligible to perform such services or employment. The Buyer reserves the right to audit Seller's employment records to verify the existence of a completed Employment Eligibility Verification Form (I-9) for every worker performing services under the contract. The audit will be at the Buyer's expense.

35. TEXAS GOVERNMENT CODE CHAPTER 2252. Pursuant to Texas Government Code Chapter 2252, Subchapter F, Consultant affirms, by entering into this Agreement, that it is not identified on a list created by the Texas Comptroller of Public Accounts as a company known to have contracts with or provide supplies or services to Iran, Sudan, or a foreign terrorist organization.

36. TEXAS GOVERNMENT CODE CHAPTER 2271. Pursuant to Texas Government Code Chapter 2271, Consultant affirms that execution of this Agreement serves as written verification that Consultant: (1) does not boycott Israel, as defined by Texas Government Code Section 808.001; and (2) will not boycott Israel during the term of the Agreement. This section shall not apply if Consultant employs fewer than ten (10) full-time employees, or if the funds to be paid wholly or partly from public funds of the City under this Agreement are less than \$100,000.00.

37. TEXAS GOVERNMENT CODE CHAPTER 2274. Pursuant to Texas Government Code Chapter 2274, Consultant verifies the following:

- A. Consultant: (1) does not boycott energy companies, as defined by Texas Government Code Section 809.001; and (2) will not boycott energy companies during the term of this Agreement.
- B. Consultant: (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association, as those terms are defined in that chapter; and (ii) will not discriminate during the term of this Agreement against a firearm entity or firearm trade association.

This section shall not apply if Consultant employs fewer than ten (10) full-time employees, if the funds to be paid wholly or partly from public funds of the City under this Agreement are less than \$100,000.00, or if this Agreement is otherwise exempted from the requirements of Texas Government Code Chapter 2274.

**CITY OF LEWISVILLE
PURCHASING DIVISION**

ADDITIONAL TERMS

ANTI-LOBBYING PROVISION

During the period between proposal / sealed bid submission date and the contract award, proposers, including their agents and representatives, shall not directly discuss or promote their proposal with any member of the City of Lewisville City Council or City staff except during City-Sponsored inquiries, briefings, interviews, or presentations, unless requested by the City.

This provision is not meant to preclude offerors from discussing other matters with City Council members or City staff. This policy is intended to create a level playing field for all potential offerors, assure that contract decisions are made in public, and to protect the integrity of the RFP / Bid Evaluation process. Violation of this provision may result in rejection of the offeror's proposal.

LAWS AND ORDINANCES

Laws and Ordinances: The Contractor shall always observe and comply with all Federal, State and local laws, ordinances and regulations which in any manner affect the Contract or the work and shall indemnify and save harmless the City against any claim arising from the violation of any such laws, ordinances and regulations whether by the Contractor or his employees.

PROTECTION OF RESIDENT WORKERS

Protection of Resident Workers: The City of Lewisville actively supports the Immigration and Nationality Act (INA) which includes provisions addressing employment eligibility, employment verification, and nondiscrimination. Under the INA, employers may hire only persons who may legally work in the United States (i.e., citizens and nationals of the U.S.) and aliens authorized to work in the U.S. The employer must verify the identity and employment eligibility of anyone to be hired, which includes completing the Employment Eligibility Verification Form (I-9). The Contractor and its Subcontractors shall establish appropriate procedures and controls so no services or products under the Contract Documents will be performed or manufactured by any worker who is not legally eligible to perform such services or employment. The City reserves the right to audit Contractor's or Subcontractor's employment records to verify the existence of a completed Employment Eligibility Verification Form (I-9) for every worker performing services or manufacturing products under the Contract Documents. The audit will be at the City's expense.

IMMIGRATION REFORM AND CONTROL ACT

Immigration Reform and Control Act (8 U.S.C. §1324a): The City of Lewisville supports the Immigration Reform and Control Act (IRCA) which is a comprehensive scheme prohibiting the employment of unauthorized aliens in the United States. The Contractor shall submit a declaration signed under penalty of perjury of the laws of the State of Texas stating that it has not been found in violation of IRCA by the United States Attorney General or Secretary of Homeland Security in the preceding five (5) years. The Contractor shall ensure that its Subcontractors submit a declaration signed under penalty of perjury of the laws of the State of

Texas stating that they have not been found in violation of IRCA by the United States Attorney General or Secretary of Homeland Security in the preceding five (5) years. The Contractor and its Subcontractors shall at all times during the term of the contract with the City comply with the requirements of IRCA and shall notify the City within fifteen (15) working days of receiving notice of a violation of IRCA. The City may terminate a contract with the Contractor if the City determines that (a) the Contractor or its Subcontractors have been untruthful regarding IRCA violations in the preceding five (5) years; (b) if the Contractor fails to ensure that its Subcontractors submit the aforementioned declaration; or (c) the Contractor or its Subcontractors fail to timely notify the City of an IRCA violation.

Contractor Name

Authorized Signature

Date

**CITY OF LEWISVILLE
PURCHASING DIVISION**

STATE RECIPROCAL REQUIREMENT

The City of Lewisville, as a governmental agency of the State of Texas, may not award a contract for general construction, improvements, services or public works projects or purchases of supplies, materials, or equipment to a non-resident bidder unless the non-resident's bid is lower than the lowest bid submitted by a responsible Texas resident bidder by the same amount that a Texas resident bidder would be required to underbid a non-resident bidder to obtain a comparable contract in the state in which the non-resident's principal place of business is located (Section 2252.002 of the Government Code). Bidder shall answer all the following questions by encircling the appropriate response or completing the blank provided.

1. Where is your principal place of business? _____
2. Only if your principal place of business is not in the state of Texas, please indicate:
 - A. In which state is your principal place of business located? _____
 - B. Does that state favor resident bidders (bidders in your state) by some dollar increment or percentage? ☐ YES ☐ NO
 - C. If "YES", what is that dollar increment or percentage? _____

NON-COLLUSION STATEMENT

The undersigned affirms that they are duly authorized to execute this contract, that this company, corporation, firms, partnership or individual has not prepared this bid in collusion with any other Bidder, and that the contents of this bid as to prices, terms or conditions of said bid have not been communicated by the undersigned nor by any employer or agent to any other person engaged in this type of business prior to the official opening of this bid.

Vendor:			
Address:			
City, State, Zip:			
Phone:			
Email:			
Bidder (Print Name):			
Bidder Signature:			
Job Title:			
Signature of company official authorizing this bid:			
Company Official (Print name):			
Job Title:			

Lewisville 2025 - Sustainability

Lewisville City Council unanimously adopted the Lewisville 2025 plan on July 14, 2014. The plan was developed after more than a year of public input and discussion that garnered hundreds of ideas and suggestions. That input was studied extensively by the Lewisville 2025 Steering Committee, City staff and professional consultants and formulated into the Lewisville 2025 plan. The plan provides a clear shared vision for the kind of community Lewisville wants to be when it turns 100 years old in 2025: a place that people choose to live, work and visit.

Lewisville 2025 identifies nine “Big Moves” to guide the community’s efforts toward being a thriving, desirable community. One of these Big Moves is sustainability. Lewisville defines sustainability in this way:

Limited resources, such as land, water, energy, clean air, natural assets, and public funds are used efficiently to provide a desirable quality of life and business climate today without reducing Lewisville’s ability to provide the desired quality of life and business climate for success of future generations.

The Purchasing Division’s goal is to support and encourage sustainable management practices through the purchase and use of materials, products and services that demonstrate environmental stewardship as well as fiscal and social responsibility. To that end, Lewisville will consider environmental factors such as but not limited to, recycled content, product life cycle, waste reduction, energy efficiency, toxicity, water consumption, and human health impacts when making purchasing recommendations. To assist City staff with evaluating these factors, prospective vendors may be required to provide specific information about their products and services that addresses environmental impacts.

Does Product or Service?	Yes	No	Details
Reduce energy consumption			
Reduce toxicity, including emissions			
Reduce waste			
Contain recyclable materials			
Reduce water consumption			
List other environmental impacts			

Attach supporting documentation if needed

VENDOR SUPPLEMENTAL INFORMATION

The following information is required for contract development.

1. In what state was your business formed? _____
2. Provide the following information for the person authorized to execute contracts on behalf of your organization:

Name _____ Title _____
Email Address _____ Telephone No. _____
Mailing Address _____ City _____ State _____ Zip _____

3. Provide the following information for the contact person authorized to implement this contract on behalf of your organization:

Name _____ Title _____
Email Address _____ Telephone No. _____
Mailing Address _____ City _____ State _____ Zip _____

4. Provide the following information for the person authorized to receive notices and communications regarding this contract on behalf of your organization:

Name _____ Title _____
Email Address _____ Telephone No. _____
*Physical Business Address _____ City _____ State _____ Zip _____

**Notices and communications will be mailed to this physical address*

5. Select and complete one of the following:

- a. ☐ **Sole Proprietorship**
- i. Legal name of Sole Proprietor: _____
- ii. Physical business address: _____
City _____ State _____ Zip _____
- b. ☐ **General Partnership**
- i. Legal name of Partnership: _____
- ii. Physical business address: _____
City _____ State _____ Zip _____

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

VENDOR SUPPLEMENTAL INFORMATION

- c. ☐ **Limited Partnership**
- i. Legal name of Limited Partnership: _____
- ii. General Partner(s):
- If a legal entity, name of the entity: _____
 - If an individual, name of the individual: _____
- iii. Physical business address: _____
- City _____ State _____ Zip _____
- d. ☐ **Corporation**
- i. Legal name of Corporation: _____
- ii. Physical business address _____
- City _____ State _____ Zip _____
- e. ☐ **Limited Liability Company**
- i. Legal name of Limited Liability Company: _____
- ii. Physical business address _____
- City _____ State _____ Zip _____
- f. ☐ **Other Entity (not listed)**
- i. Legal name and type of Company: _____
- ii. Physical business address _____
- City _____ State _____ Zip _____

6. Does your business have 10 or more full-time employees? ☐ No ☐ Yes

7. a. Are you a publicly traded business? ☐ No ☐ Yes – where traded: _____

b. Are you a wholly owned subsidiary of a publicly traded business? ☐ No ☐ Yes – which publicly traded business: _____

8. a. Is your business registered with the Texas Secretary of State? ☐ No ☐ Yes

b. If yes, please provide records or screenshot(s) from the Texas Secretary of State's website reflecting the name or names for which your business has been registered.

In signing this form, I acknowledge that I have read the above and state that the information contained therein is true and correct.

Signature: _____ Date: _____

Print Name: _____ Print Title: _____

CITY OF LEWISVILLE
PURCHASING DIVISION

EXCEPTIONS

Bid _____

On the lines below, please list any exceptions taken to this bid invitation

ITEM #	DESCRIPTION

Signature: _____

Company: _____

Date: _____

No exceptions taken to this bid invitation.

Signature: _____

Company: _____

Date: _____



REQUEST FOR BIDS

RFB # 25-115-C

HEBRON PARKWAY SCREENING, TRAIL, AND LANDSCAPE IMPROVEMENTS

Bids due by Wednesday, August 13, 2025

Issued on July 19, 2025

SPECIFICATIONS
RFB #25-115-C
Hebron Parkway Screening, Trail, and Landscape Improvements

The City of Lewisville is accepting competitive sealed bids for screening, trail, and landscape improvements of Hebron Parkway.

GENERAL PROVISIONS

- **The contractor is to submit with their bid all additional documents that require a signature that are allocated within these specifications. These documents can be found in the Files section of Bonfire, listed as “Required Documents”.**
- Before work begins, a pre-construction meeting will be arranged wherein the contractor and representative(s) of the City will discuss procedures for the work to be completed.
- The contractor is responsible for supplying all equipment, labor, material, and supervision, as required for successfully completing services.
- The contractor shall designate a full-time superintendent who shall be always on the job site when work is being performed. The City’s representative will communicate only with the superintendent. The contractor may replace the designated superintendent after written notification to the City.
- The contractor hereby agrees to commence work within ten (10) working days of receipt of notice to proceed and complete the service within a reasonable amount of time after receipt of the notice to proceed, subject to extensions of time as provided by general and special conditions.
- The City will be responsible for notifying the public of the agreed upon start date and scope of work at least seventy-two (72) hours prior to the start of work.
- The contractor will provide a list of names and twenty-four (24) hour emergency phone numbers for all key personnel related to the project.
- The City may request a replacement of the designated superintendent after written notification to the contractor.
- Work hours shall be limited to the period between 7:00 A.M. and 5:00 P.M., Monday through Friday. The contractor will curtail any operation defined in an Ozone Action Day, issued by TCEQ. No work will be allowed on Saturdays without a written request to, and approval from, the City at least forty-eight (48) hours in advance. No work will be allowed on Sundays or holidays (listed below). Night work will not be allowed without a written request to, and approval from, the City at least forty-eight (48) hours in advance.

New Years Day
Martin Luther King's Birthday
Memorial Day
Juneteenth
Independence Day
Labor Day
Thanksgiving
Day After Thanksgiving
Christmas Eve
Christmas Day

- The City of Lewisville Scope of Work, in combination with Federal and State Americans with Disabilities Act (ADA) Design Standards, shall govern all work performed in the City of Lewisville. If a conflict arises, the inspector in charge of the project shall determine which specifications will be used. The contractor's field supervisor shall be required to obtain a copy of both, at the contractor's expense.
- A pay request may be submitted for payment of completed work. This pay request shall be itemized to reflect the completed quantities per bid item. A measurement of completed quantities will be conducted prior to the submittal of each pay request. The contractor's field supervisor and the City's representative shall conduct this measurement.
- Only items in the bid are pay items. All costs in connection with the proper and successful completion of work, including furnishing all materials, equipment, supplies, and appurtenances; providing all construction plans, equipment, and tools; and performing all necessary labor and supervision to fully complete the work, shall be included in the unit and lump sum prices bid. All work not specifically set forth as a pay item shall be considered a subsidiary obligation of the contractor, and all costs in connection therewith shall be included in the prices bid.
- The City may terminate the contract if the contractor consistently fails to perform the work in accordance with the contract documents including, but not limited to, failure to supply sufficient skilled workers, suitable materials, equipment, or otherwise violates in any substantial way any provisions of the contract documents. The City may, after giving the contractor seven (7) days written notice and to the extent permitted by law and regulations, terminate the services of the contractor from the site and take possession of the work.

Environmental Requirements

- Contractor shall follow all TECQ requirements and guidelines.

SCOPE OF WORK

Refer to the Specifications starting on page seven of this document.

PROJECT LOCATIONS

All project locations will be within the city limits of the City of Lewisville, Texas.

INSURANCE AND BONDS

Insurance and bonds shall be supplied by the awarded contractor within ten (10) days of notification of award, as detailed in the Insurance Requirements and the Bond Requirements and Retainage documents. Insurance and bonds must be approved by the City prior to the commencement of work and shall remain in effect throughout the entire duration of this project.

STORMWATER MANAGEMENT PLAN

Under the Authority of the Clean Water Act, the Environmental Protection Agency (EPA), and the City of Lewisville has endeavored to reduce and improve stormwater quality per the direction of the Texas Commission of Environmental Quality (TCEQ). The City of Lewisville has developed a Stormwater Management Plan. By signing this contract vendors accept to follow this Plan. Follow this link for a copy of the Stormwater Management Plan:

<https://www.cityoflewisville.com/about-us/city-departments/public-services/storm-water>

TERMINATION OF CONTRACT

Should the Contractor, in the opinion of the City, fail to faithfully comply with the intent of the Contract as executed or render an unsatisfactory performance of the work pertinent to the contract, this Contract may be promptly terminated, in whole or in part, by the City with seven (7) days written notice. In such event, nothing contained herein shall be construed or interpreted as to prevent the City from immediately entering another contract with another contractor for an unabated continuance of this service. Monies owed to the Contractor for services rendered to the date of termination shall not constitute a prolonging of the contract.

REQUEST FOR BIDS

Bids are to be submitted based on the specifications contained herein.

The preparation of response to this RFB will be at the total expense of the proposer. There is no expressed or implied obligation for the City of Lewisville to reimburse responders for any expense incurred in the preparation response to this request.

The City reserves the right to reject any and all responses, to consider alternatives, to waive any formalities and irregularities, and to re-solicit this RFB. In addition, during the evaluation period, the City may, where it may serve the City's best interest, request additional information or clarifications from responders, or allow corrections of errors or omissions.

The RFB will be available to interested parties at <https://cityoflewisville.bonfirehub.com/portal> or may be picked up in person at the Purchasing office.

Bids may be uploaded to Bonfire or sealed RFBs, one (1) original and one (1) PDF copy on a flash drive may be delivered to the City of Lewisville Purchasing Division office at the address below, in a sealed envelope or box, clearly marked:

RFB: 25-115-C
Hebron Parkway Screening, Trail, and Landscape Improvements

Delivery address:
City of Lewisville
Finance Administration - Purchasing Division
Attn: Janine Carpenter, Senior Buyer
151 W. Church Street
Lewisville, TX 75057

All questions pertaining to this bid must be submitted in writing via Bonfire. No verbal clarification will be given.

No telephone, email, or fax bids will be accepted. Bids may be accepted if delivered in person or by U.S. Postal Service, Federal Express, UPS, etc. or uploaded to Bonfire. The City is not responsible for missing, lost, or late delivery. Any RFB responses received after the time set for opening will be returned to the proposer unopened.

Specifications, RFB bid forms, and instructions to bidders are attached hereto. The preparation of the bid will be at the total expense of the proposer. There is no expressed or implied obligation for the City of Lewisville to reimburse responding proposers for any expense incurred in the preparation of bids in response to this request.

Alternate bids will also be considered, provided the alternatives are clearly explained. All deviations from the specifications must be clearly identified and explained.

Each bidder shall guarantee and honor its response to these specifications for a period of ninety (90) days, or until the City enters a contract with one of the bidders, whichever occurs first.

All forms requiring either a signature or requested information are to be returned with your bid. In addition, the language contained in the attached form entitled Purchase Order Terms and Conditions is made part of this request for bid through reference herein.

The information contained herein is believed to be accurate and up to date but is not intended to be an expressed or implied warranty.

The City of Lewisville reserves the right to retain all bids submitted. Submission of a bid indicates the firm's acceptance of the conditions contained in this request for bids, unless clearly and specifically noted in the bid submitted and confirmed in the contract between the City of Lewisville and the selected vendor.

The City reserves the right to reject any and all bids, to consider alternatives, to waive any formalities and irregularities, and to re-solicit bids. In addition, during the evaluation period, the City may, where it may serve the City's best interest, request additional information or clarifications from proposers, or allow corrections of errors or omissions.

All parties submitting bids are expected to comply with federal, state, and local laws and regulations relative to the preparation of bids and the services to be provided. Specifically, the services to be provided are expected to be in compliance with the Americans with Disabilities Act (ADA), as well as with federal and state confidentiality laws. All bids that are submitted will be presumed to be in compliance with all applicable laws.

MISCELLANEOUS

All forms requiring either a signature or information to be filled in **must** be returned with your bid. In addition, the language contained in the attached form entitled Purchase Order Terms and Conditions is made part of this request for bid through reference herein.

**ISSUED FOR BID
SPECIFICATIONS AND CONTRACT DOCUMENTS
FOR THE CONSTRUCTION OF**

HEBRON PARKWAY SCREENING, TRAIL, AND LANDSCAPE IMPROVEMENTS



PARKS + RECREATION DEPARTMENT



FREESE AND NICHOLS, INC.
4055 International Plaza, Suite 200
Fort Worth, TX 76109
(817) 735-7300
Texas Registered Engineering Firm F-2144

July 2025

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Roadway Worker Protection Course Request.....	Appendix

The Engineer's seal and signature applies to all specifications, details, and other engineering work herein not specifically selected by sealed and signature below:

The Engineer's seal and signature applies to all specifications, details, and other engineering work herein for the following Bid Items:

Structural

FNI - 03 10 00 Concrete Formwork

FNI - 03 20 00 Reinforcing Steel

FNI - 03 30 00 Cast-In-Place Concrete

FNI - 31 23 10 Structural Excavation and Backfill



04/19/2025

Signature: _____

Date: _____

The Architect's seal and signature applies to all specifications, details, and other work herein for the following Bid Item Schedules:

General, Hardscape, Erosion Control & Landscape Planting

FNI - 02 41 00 Demolition

FNI - 03 35 19 through FNI - 31 25 00

FNI - 32 91 90 through FNI - 32 93 00



Matthew L. Milano

04/29/2025

Signature: _____

Date: _____

NCTCOG SPECIFICATIONS

The City of Lewisville, Texas has adopted the 2017 Edition of the *Public Works Construction Standards - North Central Texas* as amended and published by the North Central Texas Council of Governments (the "NCTCOG Specifications"). The NCTCOG Specifications apply to this Project, except as noted herein. In the case of a contradiction between the NCTCOG Specifications and these Contract Documents, the information in these Contract Documents shall control.

Bidders are specifically directed to become thoroughly familiar with the NCTCOG Specifications prior to submitting a bid. The Specifications may be purchased from:

North Central Texas Council of Governments
616 Six Flags Drive
P.O. Box 5888
Arlington, Texas 76005-5888
817/461-3300 (Metro)

Unless otherwise specifically noted on the Plans, or in these Specifications, all applicable sections of the NCTCOG Specifications are in effect. In this case of a contradiction between the NCTCOG Specifications and these Contract Documents, the information in these Contract Documents shall control.

STANDARD SPECIFICATIONS

The Standard Specifications for this project are the "Public Works Construction Standards" as published under the authority of the North Central Texas Council of Governments.

A. Special Provisions to the General Provisions of the Standard Specifications:

1. Technical specifications (Special Specifications), if included, in the Contract document package shall supersede the standard specifications.
2. Prospective bidders may make written request to the City Engineer for clarification and alterations in the plans, specifications, and form of contract. Such request must be received by the City Engineer no later than 2:00 p.m. on the Thursday first preceding the Thursday on which the bids are to be opened. The City Engineer will be the sole judge as to the necessity to an addendum or letter of clarification. Oral statements shall in no way be considered as part of the contract and will not be considered as binding.
3. Five (5) sets of the contract documents, exclusive of the "Public Works Construction Standards" referenced above will be furnished without charge to the CONTRACTOR for construction purposes. Additional copies may be obtained from the City at actual reproduction cost.
4. **Item 102.4. Preparation of Proposal:** Sentence 4 shall be changed to read: "In the cases of discrepancy between unit prices and amounts, the unit price shown in figures shall stand and the amount and total will be adjusted to correspond to the unit price shown".
5. **Item 103.3.1.1. Performance Bonds:** Paragraph (a) Performance Bond. The last sentence of this paragraph is hereby deleted and replaced with: This Bond shall provide for the repair and/or replacement of all defects due to faulty materials and workmanship that appears within a period of two years from the date of acceptance of the improvements project by the Lewisville City Council.
6. **Item 103.3.3. Sureties: The following applies to Surety Bonds:**

Texas Government Code Title 10, Chapter 2253

“(d) A bond required by this section must be executed by corporate surety in accordance with Chapter 3503, Texas Insurance Code.”

Texas Insurance Code Section 3503.005. Additional Requirements for Certain Bonds

“(a) A bond that is made, given, tendered, or filed under Chapter 53, Property Code, or Chapter 2253, Government Code, may be executed only by a surety company that is authorized to write surety bonds in this state. If the amount of the bond exceeds \$100,000, the surety company must also:

- (1) hold a certificate of authority from the United States secretary of the treasury to qualify as a surety on obligations permitted or required under federal law; or

- (2) have obtained reinsurance for any liability in excess of \$100,000 from a reinsurer that:
 - (A) is an authorized reinsurer in this state; and
 - (B) holds a certificate of authority from the United States secretary of the treasury to qualify as a surety or reinsurer on obligations permitted or required under federal law.

“(b) To determine whether the surety on the bond or the reinsurer holds a certificate of authority from the United States secretary of the treasury, a party may conclusively rely on the list published in the Federal Register by the United States Department of the Treasury, covering the date on which the bond was executed, of the companies holding certificates of authority as acceptable sureties on federal bonds and as acceptable reinsuring companies. A purchaser, insurer of title, or lender acquiring or insuring an interest in or title to real property may also conclusively rely on, and is protected by, a statement on a recorded bond or a sworn, recorded statement by the surety that refers to the specific recorded bond and states that, at the time the bond was executed, the surety complied with Subsection (a)(1) or (2).”

7. **Item 103.4. Insurance:** delete and replace with the following:

Vendor shall procure and maintain for the duration of the contract, insurance against claims for injuries to persons or damages to property, which may arise from or in connection with the performance of the work hereunder by the vendor, his agents, representatives, employees or subcontractors. The cost of such insurance shall be included in the Vendor’s bid.

A. MINIMUM SCOPE OF INSURANCE

Coverage shall be at least as broad as:

1. Insurance Services Office Commercial General Liability coverage “occurrence” form CG 00 01 (10 01). **“Claims Made” form is unacceptable.**
2. Workers’ Compensation insurance as required by the Labor Code of the State of Texas, including Employers’ Liability Insurance.
3. Automobile Liability – as required by the State of Texas, covering all owned, hired, or non-owned vehicles. Automobile Liability is only required if vehicle(s) will be used under this contract. Coverage not required for delivery services.

B. MINIMUM LIMITS OF INSURANCE

Vendor shall maintain throughout contract limits not less than:

1. Commercial General Liability: \$500,000 per occurrence/\$1,000,000 aggregate for bodily injury, personal injury and property damage. Policy will include coverage for:
 - a. Premises – Operations
 - b. Broad Form Contractual Liability

- c. Products and Completed Operations
- d. Use of Contractors and Subcontractors
- e. Personal Injury
- f. Broad Form Property Damage
- g. If applicable, Explosion Collapse and Underground (XCU) Coverage, Fire Damage, and Medical Expenses.

NOTE: The aggregate loss limit applies to each project.

- 2. Workers' Compensation and Employer's Liability: Workers' Compensation Statutory limits as required by the Labor Code of the State of Texas and Employer's Liability minimum limits of \$500,000 per injury, \$500,000 per occurrence, and \$500,000 per occupational disease.
- 3. Automobile Liability - \$500,000 Combined Single Limit. Limits can only be reduced if approved by the HR Director or designee.
- 4. Builders' Risk Insurance (as applicable) – Completed value form, insurance carried must equal the completed value of the structure.

C. DEDUCTIBLES AND SELF-INSURED RETENTIONS

Any deductible or self-insured retentions must be declared to and approved by the City.

D. OTHER INSURANCE PROVISIONS

The policies are to contain, or be endorsed to contain the following provisions:

- 1. General Liability and Automobile Liability Coverages
 - a. The City, its officers, officials, employees, boards/commissions and volunteers are to be added as "Additional Insured" as respects liability arising out of activities performed by or on behalf of the vendor, products and completed operations of the vendor, premises owned, occupied or used by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the City, its officers, officials, employees or volunteers. It is understood that the business auto policy under "Who is an Insured" automatically provides liability coverage in favor

of the City. The coverage shall include defense of claims against the City as additional insured.

- b.** The vendor's insurance coverage shall be primary and non-contributory insurance as respects the City, its officers, officials, employees and volunteers. Any insurance or self-insurance maintained by the City, its officers, officials, employees or volunteers shall be excess of the vendor's insurance and shall not contribute with it.
 - c.** Any failure to comply with reporting provisions of the policy shall not affect coverage provided to the City, its officers, officials, and employees, Boards and Commissions or volunteers.
 - d.** The vendor's insurance shall apply separately to each insured against whose claim is made or suit is brought, except to the limits of the insured's liability.
- 2.** Waiver of Subrogation – All coverages
Each insurance policy required by this exhibit shall waive all rights of subrogation against the City, its officers, officials, employees, and volunteers for losses arising from work performed by the vendor for the City.
- 3.** Notice of Cancellation - All Coverages
Each insurance policy required by this exhibit shall be endorsed to state that coverage shall not be suspended, voided, canceled or non-renewed by either party, reduced in coverage or in limits except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given the City, or ten (10) days prior written notice for non-payment of premium.

E. ACCEPTABILITY OF INSURERS

The City prefers that Insurance be placed with insurers with an A.M. Best's rating of no less than **A-:VI, or, A or better** by Standard and Poors.

F. VERIFICATION OF COVERAGE

Contractor shall furnish the City with certificates of insurance affecting coverage required. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. Certificates of Insurance must be provided on forms approved by the Texas Department of Insurance. City will not accept Memorandums of Insurance or Binders as proof of insurance. The City reserves the right to require complete, certified copies of all required insurance policies at any time.

G. HOLD HARMLESS AND INDEMNIFICATION

THE CONSULTANT/CONTRACTOR AGREES TO DEFEND, INDEMNIFY AND HOLD THE CITY, ITS OFFICERS, AGENTS AND EMPLOYEES, HARMLESS

AGAINST ANY AND ALL CLAIMS, LAWSUITS, JUDGMENTS, COSTS AND EXPENSES FOR PERSONAL INJURY (INCLUDING DEATH), PROPERTY DAMAGE OR OTHER HARM FOR WHICH RECOVERY OF DAMAGES IS SOUGHT, SUFFERED BY ANY PERSON OR PERSONS, THAT MAY ARISE OUT OF OR BE OCCASIONED BY CONSULTANT'S/CONTRACTOR'S BREACH OF ANY OF THESE TERMS AND CONDITIONS OR BY ANY NEGLIGENT OR STRICTLY LIABLE ACT OR OMISSION OR INTENTIONAL TORT, INTELLECTUAL PROPERTY INFRINGEMENT, OR FAILURE TO PAY A SUBCONTRACTOR OR SUPPLIER COMMITTED BY, CONSULTANT/CONTRACTOR, ITS OFFICERS, AGENTS, EMPLOYEES OR SUBCONTRACTORS, IN THE PERFORMANCE OF THIS AGREEMENT; EXCEPT THAT THE INDEMNITY PROVIDED FOR IN THE PARAGRAPH SHALL NOT APPLY TO ANY LIABILITY RESULTING FROM THE SOLE NEGLIGENCE OR FAULT OF THE CITY, ITS OFFICERS, AGENTS, EMPLOYEES OR SEPARATE CONTRACTORS, AND IN THE EVENT OF JOINT AND CONCURRING NEGLIGENCE OR FAULT OF THE CONSULTANT/CONTRACTOR AND THE CITY, RESPONSIBILITY AND INDEMNITY, IF ANY, SHALL BE APPORTIONED IN ACCORDANCE WITH THE LAW OF THE STATE OF TEXAS, WITHOUT WAIVING ANY GOVERNMENTAL IMMUNITY AVAILABLE TO THE CITY UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW AND THE CITY'S REASONABLE ATTORNEY'S FEES SHALL BE REIMBURSED IN PROPORTION TO THE CONSULTANT'S LIABILITY. THE PROVISIONS OF THIS PARAGRAPH ARE SOLELY FOR THE BENEFIT OF THE PARTIES HERETO AND NOT INTENDED TO CREATE OR GRANT ANY RIGHTS, CONTRACTUAL OR OTHERWISE, TO ANY OTHER PERSON OR ENTITY.

H. PROOF OF INSURANCE

Contractor is required to submit proof of insurance on a form acceptable to the City of Lewisville. Certificates of Insurance similar to the ACCORD form are acceptable. City will not accept Memorandums of Insurance or Binders as proof of insurance. City, at its own discretion, may require a copy of any policy presented to the City.

I. STATE REQUIREMENTS FOR WORKERS COMPENSATION INSURANCE

As required by: 28 Tex.Admin.code §110.110(c)(7):

A. Definitions:

Certificate of coverage ("certificate")- A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a coverage agreement (DWC-81, DWC-82, DWC-83, or DWC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.

Duration of the project - includes the time from the beginning of the work on the project until the contractor's/person's work on the project has been completed and accepted by the governmental entity.

Persons providing services on the project ("subcontractor" in §406.096) - includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the project. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

B. The contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all employees of the contractor providing services on the project, for the duration of the project.

C. The Contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.

D. If the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project, the contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended.

E. The contractor shall obtain from each person providing services on a project, and provide to the governmental entity:

(1) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project; and

(2) no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.

F. The contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.

G. The contractor shall notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the contractor knew or should have known, of any

change that materially affects the provision of coverage of any person providing services on the project.

H. The contractor shall post on each project site a notice, in the text, form and manner prescribed by the Texas Department of Insurance, Division of Workers' Compensation, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.

I. The contractor shall contractually require each person with whom it contracts to provide services on a project, to:

(1) provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all of its employees providing services on the project, for the duration of the project;

(2) provide to the contractor, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the project, for the duration of the project;

(3) provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(4) obtain from each other person with whom it contracts, and provide to the contractor:

(a) a certificate of coverage, prior to the other person beginning work on the project; and

(b) a new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(5) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(6) notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

(7) contractually require each person with whom it contracts, to perform as required by paragraphs (1) - (7), with the certificates of coverage to be provided to the person for whom they are providing services.

J. By signing this contract or providing or causing to be provided a certificate of coverage, the contractor is representing to the governmental entity that all employees of the contractor who will provide services on the project will be covered by workers'

compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.

K. The contractor's failure to comply with any of these provisions is a breach of contract by the contractor which entitles the governmental entity to declare the contract void if the contractor does not remedy the breach within ten days after receipt of notice of breach from the governmental entity.

9. **Item 105.1.1. Priority of Contract Documents** is revised as follows: Insert the words "addenda (last over first)" between "Proposal" and "Special Provision".
10. **Item 105.1.3. Contract Drawings and Specifications:** Obtaining copies of NCTCOG Public Works Construction Standards is the responsibility of the CONTRACTOR.
11. **Item 105.2.2. Special Warranty:** The first sentence of this paragraph is hereby deleted and replaced with:
"If within two years after the final acceptance of the work by the OWNER, as evidenced by the final certificate of acceptance or within a longer or shorter period of time as may be prescribed by law or by the terms of any other special warranty on designated equipment, any of the work is found to be defective or not in accordance with the contract documents, the CONTRACTOR shall correct it promptly after receipt of a written notice from the OWNER to do so".

12. **Special Provision to Item 105.3. Shop Drawings, Product Data and Samples:** add the following:
"Review of Shop Drawings by the CITY and/or ENGINEER shall be for the sole purpose of determining the sufficiency of said drawings or schedules to result in finished improvements in conformance with the plans and specifications, and shall not relieve the CONTRACTOR of his duty as an independent contractor. It being understood and agreed that the Engineer does not assume any duty to pass upon the propriety or adequacy of such drawings or schedules or any means or methods reflected thereby in relation to the safety of either person or property during the contractor's performance hereunder."
13. **Special Provision to Item 105.4. "Construction Stakes":** Add the following:
The CONTRACTOR will furnish and set all lines, grades, benchmarks, centerlines and measurements necessary to the proper performance and control of the work contracted for under these specifications and plans.
14. **Item 105.6 Supervision by Contractor:** The CONTRACTOR shall designate a **full-time superintendent who shall be on the job site at all times during construction including times when work is being performed by subcontractors.** The OWNER'S Representative will communicate only with the superintendent. The CONTRACTOR may replace the designated superintendent by written notification to the OWNER.
15. **Special Provision to Item 105.7.1. Authority of the Engineer:** add the following:
"The Engineer shall make periodic visits to the site to familiarize himself generally with the progress of the executed work and to determine if such work generally meets the essential performance and design features and the technical and functional engineering requirements of the Contract Documents; provided and except, however, that the Engineer shall not be responsible for making any detailed, exhaustive, comprehensive or continuous on-site inspection of the quality or quantity of the work or be in any way responsible, directly or indirectly, for the construction means, methods, techniques, sequences, quality, procedures, programs, safety precautions or lack of same incident thereto or in connection therewith. Notwithstanding any other provision of this agreement or any other Contract Document, the Engineer shall not be in any way responsible or liable for any acts, errors, omissions or negligence of the CONTRACTOR, any subcontractor or any of the CONTRACTOR'S or sub-contractor's agents, or employees or any other person, firm or corporation performing or attempting to perform any of the work."
16. **Item 106.5: Samples and Tests of Materials:** Delete the first and last paragraphs on Item 106.5 and replace with the following:
"The CONTRACTOR shall engage the services of an acceptable testing laboratory company to perform all required testing services. The CONTRACTOR (not the OWNER) shall pay all costs for these services, including any retesting after failure to pass tests. The CONTRACTOR shall obtain OWNER'S acceptance of the testing laboratory before having the services performed."

Written reports of tests and engineering data furnished by CONTRACTOR for OWNER'S review shall be submitted as specified in Item 105.3, "Shop Drawings, Product Data and Samples" and as modified by the Special Specifications.

17. **Special Provisions to Item 107.2. Indemnification:** delete Item 107.2. in its entirety and substitute the following:

"The CONTRACTOR and his sureties shall indemnify, defend and save harmless the OWNER and all of their officers, agents and employees, Engineer and all of its officers and employees from all suits, actions or claims of any character, name and description brought for or on account of any injuries, including death or damages received or sustained by any person, persons or property on account of the operations of the CONTRACTOR, his agents, employees or subcontractors; or on account of any negligent act or fault of the CONTRACTOR, his agents, employees or subcontractors in the execution of said contract; or on account of the failure of the CONTRACTOR to provide the necessary barricades, warning lights or signs; and shall be required to pay any judgment, with cost, which may be obtained against the OWNER or Engineer growing out of such injury, including death or damage."

18. **Item 107.11. Supervision and Construction Procedures:** The CONTRACTOR'S attention is drawn to paragraphs 1 and 4 of this item and paragraphs 1 and 3 of Item 105.6.

19. **Item 107.24. Project Clean-Up:** All objectionable surplus and waste material due to construction shall be removed from the site at the CONTRACTOR'S expense.

20. **Item 108.1. Progress Schedule:** add the following paragraph:

"The CONTRACTOR shall submit to the OWNER a construction schedule setting out items of construction, road closings, detours, utility interruptions, limits, times and actual dates. If the schedule is acceptable to the OWNER, the OWNER will approve it; if the schedule is unacceptable, it will be returned to the CONTRACTOR for revision and resubmittal. If the CONTRACTOR wants to deviate from the approved schedule, he must submit a revised schedule to the OWNER for consideration. The entire work shall be prosecuted in a continuous manner in accordance with the approved schedule. Proposed stockpile locations must be approved by the OWNER prior to depositing material. The CONTRACTOR shall update this schedule on a monthly basis."

21. **Item 108.5. Subcontracts:** add the following paragraph:

"The CONTRACTOR shall perform with his own organization and with the assistance of workmen under his immediate superintendence, work of a value not less than 50 percent of the value of all work embraced in the contract exclusive of items not commonly found in contract for similar work and exclusive of items that require highly specialized knowledge, craftsman and/or equipment not ordinarily available in the organization of CONTRACTORS performing work of the character embraced in the contract". For the purpose of evaluating the percentage of work performed by subcontractors, the cost of all equipment, supplies, and materials used or installed on the project by subcontractors shall be considered as part of the work of subcontractors. This will apply even if the contractor supplies and pays for some or all equipment, supplies, or materials used by subcontractors.

22. **Item 108.8. Delays; Extension of Time; Liquidated Damages:** Delete the first paragraph of Section 108.8. and replace with the following:

“The CONTRACTOR hereby agrees that no work will be performed on CITY holidays or on Sundays. In addition, he agrees that work will be performed between 7:00 a.m. and sunset on weekdays and between 8:00 a.m. and 6:00 p.m. on Saturdays. The only exception to the preceding will be the performance of work in response to emergency situations and/or when directed to work by the OWNER. Also, the CONTRACTOR hereby concurs that the preceding has been taken into account in setting the contract time.” The CONTRACTOR will be responsible for reimbursing the City of Lewisville for overtime charges for construction inspection services on Saturdays, Sundays and all City holidays. The overtime charges will be based on the top of range overtime rate for an Engineering Construction Inspector plus eighteen percent (18%) per hour and a minimum of four (4) hours will be charged for each occurrence of such service. The overtime charges will be billed on a monthly basis. Failure to pay for these services will result in delaying the final acceptance and payment.

“The CONTRACTOR shall be entitled to an extension of working time under this contract only when claim for such extension is submitted to the OWNER in writing by the CONTRACTOR within seven days from and after the time when any alleged cause of delay shall occur; and then only when such time is approved by the OWNER. In adjusting the working time for the completion of the project, the OWNER will consider delays due to acts of God, or the public enemy, acts of the OWNER, fires, floods, epidemics and quarantine restrictions. The OWNER may, but is not obligated to, take into account any unforeseeable causes of delay which the OWNER considers beyond the control and without the fault or negligence of the CONTRACTOR. It is anticipated that during the course of the contract, inclement weather (rain or freezing temperatures) will hinder or prevent work. The contract time has been established assuming that up to 20% of the contract days will be inclement weather days, during which no work can be performed. No extension of time will be granted for such inclement weather days. The OWNER may grant an extension of time for inclement weather days beyond 20% of the contract time, but is under no obligation to do so.”

23. **Item 109.3. Payment for Extra Work:** Replace the first sentence of 109.3.1. General; with the following:

“No work shall be undertaken which requires extra payment without having executed a change order or field change approved by the CONTRACTOR and the OWNER, except when specifically ordered to do so in writing.”

24. **Item 109.5. Monthly Estimate, Partial Payments, Retainage, Final Inspection, Acceptance and Final Payment**

Delete from the first paragraph of 109.5.1: "The monthly estimate may include acceptable non-perishable materials delivered to the work; such payment shall be allowed on same percentage basis of the net invoice value as provided hereinafter."

Add in its place, the following:

The OWNER will pay for materials on hand only under the following conditions:

- a. The CONTRACTOR shall provide proof of payment for the materials.
 - b. The materials shall be secured in a manner acceptable to the OWNER.
 - c. Payment will not be made for small items, and other items not easily measured.
 - d. No payment will be made for small quantities of material on hand (less than 0.5 percent of the contract amount).
 - e. No payment for materials on hand will be made for items such as paint, mastics, cement, and other similar materials.
25. Delays associated with delivery of materials of appurtenances by the manufactures will not be considered for any extension of contract time. It shall be the sole responsibility of the CONTRACTOR to insure that the materials are manufactured and delivered on time.

26. Construction Staking

Payment for “Surveying and Construction Staking” includes all survey work required for construction of the project. The CONTRACTOR shall offset alignment control and benchmarks as required to ensure that they are protected during construction.

The CONTRACTOR shall submit all survey information to the City Engineer and the City will determine if any adjustments to proposed improvements are required. The City will issue revisions as required. Survey work includes survey required for any grade changes, as well as all construction staking, including setting stakes for pavement cross slopes and staking the location of all improvements within the project plans.

The amount bid for this work shall be paid over the duration of the project with the amount paid on each monthly progress estimate determined by the percent complete on all other bid items.

B. Special Provisions to the Materials and Construction Methods of the Standard Specifications:

Only items in the Proposal are Pay Items. Other specification items will be complied with; however, their measurement and payment provisions are hereby deleted.

The price bid shall cover all work required by the Contract Documents. All costs in connection with the proper and successful completion of the work, including furnishing all materials, equipment, supplies, and appurtenances; providing all construction plant, equipment, and tools; and performing all necessary labor and supervision to fully complete the work, shall be included in the unit and lump sum prices bid. All work not specifically set forth as a pay item in the Proposal shall be considered a subsidiary obligation of the CONTRACTOR and all costs in connection therewith shall be included in the prices bid.

Work that is subsidiary to pay items includes, but is not limited to the following: protection, adjustment, maintenance, repair or replacement of all underground public or franchise utilities and services, whether shown on the plans or not; cutting and removing and plugging existing utilities, as required; crushed stone base, embedment sand; trench dewatering; installation of temporary orange polyethylene construction fencing in construction areas as required; repair and replacement of landscape irrigation systems damaged during construction by a licensed irrigator; topsoil and sodding in areas outside of pay limits; placement of sod in all remaining disturbed areas after contract time has expired; concrete and/or asphalt pavement replacement (in areas outside of pay limits damaged by contractor); protection against flooding; removal of waste material from the site; replacement of property markers or monuments disturbed; sawcut and removal of existing pavement; replacement of damaged fences; clean up; additional traffic control not in plans including message boards; temporary asphalt pavement; miscellaneous grading; all other work required to complete the project and restore the areas of construction to their preconstruction condition and all required construction testing of all the of the components of the project.

CONTRACTOR TO FURNISH COST BREAKDOWN

The CONTRACTOR shall furnish the City with a breakdown of any lump sum bid suitable for use in the preparation of progress estimates of the job to make partial payments on that lump sum item. Such a breakdown shall be in sufficient detail so as to permit its use in a manner satisfactory to the City. The breakdown shall not be unbalanced. Progress payments for materials on hand and equipment delivered will be based on invoices. The City will not recommend approval of a progress estimate for payment until a satisfactory cost breakdown of the project has been submitted by the CONTRACTOR.

Water for Construction

All water required for the project will be at the CONTRACTOR'S expense. The CONTRACTOR shall obtain a temporary fire hydrant water meter (\$1250.00 deposit will be reimbursed when the project is accepted by the City) from the OWNER and meter all water used for the project.

Prevailing Wage Rate Determination

The General Services Commission has adopted the Federal Davis-Bacon wage rates for our use.



General Services Commission

1711 San Jacinto - P.O. Box 13047

Austin, Texas 78711-3047

Web Site: www.gsc.state.tx.us

(512) 463-3035

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Dionicio Vidal Flores, P.E.
Barbara Rusing
Gene Shull
EXECUTIVE DIRECTOR
Tom Treadway

Prevailing Wage Rate Determination Information

The following information from Chapter 2258 Texas Government Code Title 10 should be included in your bid specification documents and contract documents:

2258.021. Duty of Governmental Entity to Pay Prevailing Wage Rates

- (a) The state or any political subdivision of the state shall pay a worker employed by it or on behalf of it:
 - (1) not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the work is performed; and
 - (2) not less than the general prevailing rate of per diem wages for legal holiday and overtime work.
- (b) Subsection (a) does not apply to maintenance work.
- (c) A worker is employed on a public work for the purposes of this section if the worker is employed by a contractor or subcontractor in the execution of a contract for the public work with the state, a political subdivision of the state, or any officer or public body of the state or a political subdivision of the state.

2258.023. Prevailing Wage Rates to be Paid by Contractor and Subcontractor; Penalty

- (a) The contractor who is awarded a contract by a public body or a subcontractor of the contractor shall pay not less than the rates determined under Section 2258.022 to a worker employed by it in the execution of the contract.
- (b) A contractor or subcontractor who violates this section **shall** pay to the state or a political subdivision of the state on whose behalf the contract is made, \$60 for each worker employed for each calendar day or part of the day that the worker is paid less than the wage rates stipulated in the contract. A public body awarding a contract shall specify this penalty in the contract.
Note: This penalty applies even if the contractor or subcontractor and the worker come to an agreement on the underpaid wages (see Attorney General Opinion DM-469).
- (c) A contractor or subcontractor does not violate this section if a public body awarding a contract does not determine the prevailing wage rates and specify the rates in the contract as provided by Section 2258.022.
- (d) The public body shall use any money collected under this section to offset the costs incurred in the administration of this chapter.
- (e) A municipality is entitled to collect a penalty under this section only if the municipality has a population of more than 10,000.

2258.051. Duty of Public Body to Hear Complaints and Withhold Payment

- (a) A public body awarding a contract, and an agent or officer of the public body, shall:
 - (1) take cognizance of complaints of all violations of this chapter committed in the execution of the contract; and
 - (2) withhold money forfeited or required to be withheld under this chapter from the payments to the contractor under the contract, except that the public body may not withhold money from other than the final payment without determination by the public body that there is good cause to believe that the contractor has violated this chapter.

END OF SECTION

**TECHNICAL SPECIFICATIONS
FOR CONSTRUCTION OF
HEBRON PARKWAY
SCREENING, TRAIL, &
LANDSCAPE IMPROVEMENTS**

LEW23694



By:



OCTOBER 10, 2024

02 41 00 DEMOLITION

PART 1 - GENERAL

1.1 WORK OF THIS SECTION

- A. The Drawings, Standard General Conditions of Contract, Supplementary Conditions and NTCOG 4th edition, apply to work of this Section.

1.2 DESCRIPTION

- A. Refer to Drawings for items to be demolished.

1.3 REQUIREMENTS

- A. Standards: Unless they are modified or exceeded by the requirements of this Section, conform to applicable parts of ANSI A10.6 "Safety Requirements for Demolition."
- B. Schedule: Perform Work as required by the Progress Schedule for the Project.

1.4 PROTECTION

- A. General:
 - 1. Construction of temporary barricades, walks, passage-ways, and other items that are necessary to protect persons and property from hazard or damage due to construction operations, and as required by applicable regulations.
 - 2. Design and construct such protective barriers and devices to have sufficient strength and of such materials as will accomplish their protective function.
- B. Site: Unless specified or directed otherwise, carefully protect existing walks, lawns, other buildings, and other work on site, whether specifically indicated on the Drawings or not.
- C. Trees and Shrubs: Protect trees and shrubs that are to remain in place from foliage, trunk and root damage that may result from construction operations. Do not park vehicles or equipment, nor store materials beneath the dripline of existing trees. Place plastic construction fencing at drip of trees to protect root zones.
- D. Streets and Sidewalks: Protect streets, sidewalks, curbs, and other improvements not designated for demolition, as necessary to prevent damage to them. Repair any damage caused by Contractor operations.
- E. Persons: Provide warning signs, hazard and service lights, and other devices as necessary for the protection of persons from injury due to construction operations and as required by applicable regulations.

- F. Remaining Structure: Take precautions not to damage existing structures which are to remain. Any damage caused by demolition operations is to be repaired by the Contractor without cost to the Owner.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 UTILITIES

- A. Make arrangements and pay the costs for disconnecting, capping, and removing services to the satisfaction of the utility companies and the Owner. Make necessary modifications to existing irrigation lines.

3.2 METHOD

- A. General: Keep noise, dust and debris to a minimum.
- B. Workmanship: Demolition of portions of structures that will remain shall be done carefully so that exterior surfaces can be renovated or restored to original use as easily as possible.

3.3 SCRAP MATERIALS

- A. Material and debris resulting from demolition operations is the property of the Contractor and shall be disposed of properly at a licensed municipal land fill, or as otherwise approved by the Owner. No sale of surplus materials shall be conducted on the Site.

3.4 BACKFILL

- A. Subgrade areas may not be used for disposal of surplus material without specific written approval and then, only if placed by approved methods.

3.5 ABOVE GRADE STRUCTURES

- A. Demolition to the level of existing grade.

3.6 ON-GRADE STRUCTURES

- A. Remove slabs, walks, and paving completely.

3.7 BELOW GRADE STRUCTURES

- A. Remove all portions to level of existing grade. Break all subgrade slabs sufficiently to prevent trapping of water either above or below them.

END OF SECTION

03 10 00 CONCRETE FORMWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Drawings, Standard General Conditions of Contract, Supplementary Conditions and NTCOG 4th edition apply to Work of this Section.

1.2 DESCRIPTION

- A. Scope: Furnish all material, labor, tools, equipment and related items required to provide forms for cast-in-place concrete.
- B. Related Work Specified Elsewhere:
 - 1. Section 03 20 00 "Reinforcing Steel."
 - 2. Section 03 30 00 "Cast-In-Place Concrete."

1.3 QUALITY ASSURANCE

- A. The following publications of the American Concrete Institute (ACI), latest edition shall apply to the extent applicable in each reference thereto:
 - 1. ACI 347, Recommended Practice for Concrete Formwork.
- B. Design Criteria:
 - 1. Design formwork for loads and lateral pressures outlined in ACI 347, wind loads as specified by controlling local building code, and such other loads to which the form may be subjected. Comply with the requirements of State and Federal safety standards.
 - 2. Details of formwork shall comply with ACI 347.
 - 3. Do not use earth cuts as forms for vertical surfaces, unless indicated on the Drawings.
- C. Tolerances: Construct formwork to ensure that the concrete surfaces will comply with tolerances set forth in ACI 301.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Plywood used for forms shall be Exterior-Type APA Class I as graded by the American Plywood Association.
- B. Steel forms shall be free of dents and other defects which would make them susceptible to leakage or disfigurement of the finished concrete surface.

- C. Form oil shall be a non-staining paraffin-base oil having a specific gravity of between 0.8 and 0.9.
- D. Release agent used shall be non-staining.
- E. Form accessories to be partially or wholly embedded in the concrete, such as ties and hangers, shall be a commercially manufactured type. Non-fabricated wire is not acceptable. The portion remaining within the concrete shall leave no metal within 1 inch of the surface when the concrete is exposed to view. Spreader cones on the ties shall not exceed 7/8 inch diameter. Design form ties to prevent seepage of water along the tie.

PART 3 - EXECUTION

3.1 FORM CONSTRUCTION

- A. Forms shall be tight to prevent leakage of grout or cement paste. Forms shall be at least 6 inches tall.
- B. Provide positive means of adjustment (wedges or jacks) of shores and struts. Take up all settlement during concrete placing operations. Brace forms against lateral deflections.
- C. All curvilinear formwork will be curved smoothly to avoid segmental tangents over curved edges.

3.2 PREPARATION OF FORM SURFACES

- A. Plywood and other wood surfaces not subject to shrinkage shall be sealed against absorption of moisture from the concrete by either:
 - 1. A field applied form oil or sealer, or
 - 2. A factory applied non-absorptive liner.
- B. When forms are coated to prevent bond with concrete, it shall be done prior to erecting forms. Do not allow excess coating material to stand in puddles in the forms or allowed to come in contact with the surfaces to which fresh concrete is to be bonded.
- C. Clean form surfaces before use and re-use.
- D. Assemble forms so they may be readily removed without damage to concrete surfaces.

3.3 REMOVAL OF FORMS

- A. The shores and supports shall remain in place until the concrete has reached its specified 28-day strength, unless otherwise permitted.

- B. Whenever the formwork is removed during the curing period, cure the exposed concrete by one of the methods specified in Section 03 30 00 "Cast-In-Place Concrete."
- C. Remove form ties as soon as possible after form removal, not to exceed 2 working days.

3.4 REMOVAL STRENGTH

- A. When formwork removal is based on the concrete reaching its specified 28 day strength, the concrete shall be presumed to have reached this strength when either of the following conditions is met:
 - 1. When test cylinders, field cured under the most unfavorable conditions prevailing for any portion of the concrete represented, have reached the required strength. Except for the field curing and age at test, the cylinders shall be molded and tested as specified in Section 03 30 00 "Cast-In-Place Concrete."
 - 2. When the concrete has been cured as specified in Section 03 30 00 "Cast-In-Place Concrete" for the same length of time as the age at test of laboratory-cured cylinders which have reached the required strength. The length of time the concrete has been cured in the field shall be determined by the cumulative number of days or fractions thereof, not necessarily consecutive, during which time the temperature of the air in contact with the concrete is above 50 degrees and the concrete has been damp or sealed from evaporation and loss of moisture.

END OF SECTION

03 20 00 REINFORCING STEEL

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install all concrete reinforcement as indicated on the Drawings and specified herein.

1.2 RELATED WORK

- A. Section 03 10 00 "Concrete Formwork."
- B. Section 03 30 00 "Cast-in-Place Concrete."

1.3 REFERENCES

- A. American Concrete Institute (ACI): ACI 315, Manual of Standard Practice for Detailing Reinforced Concrete Structures.
- B. Concrete Reinforcing Steel Institute (CRSI): Manual of Standard Practice.

1.4 SUBMITTALS

- A. Shop Drawings: Submit Shop Drawings for fabrication, bending, and placement of concrete reinforcement. Comply with the ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement.
- B. Submit mill test certificates of supplied reinforcement indicating physical and chemical analysis.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Reinforcing Steel Bars: Domestic deformed type, ASTM A615, Grade 60.
- B. Galvanized Reinforcing Steel Bars: ASTM A615, Grade 60, galvanized in accordance with ASTM A767.
- C. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded

wire fabric in place. Use wire bar type supports complying with CRSI recommendations. Wood, brick, and other devices will not be acceptable.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with the specified codes and standards, approved Shop Drawings and Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports, and as herein specified.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, grease and other materials which reduce or destroy bond with concrete.
- C. Accurately form bar reinforcement to dimensions indicated. Bend stirrup and tie bars around a pin of diameter not less than two times bar diameter. Bend other bars around a pin of diameter not less than six times bar diameter. Bend bars cold. Do not straighten or rebend in a manner that will injure material. After fabrication bundle and tag with identifying metal tags securely wired in place.
- D. Accurately position and secure metal reinforcement against displacement with annealed iron wire ties, suitable clips at intersections, metal supports, chairs, and hangers.
- E. Avoid splices of bar reinforcement at points of maximum stress. All splices shall conform to the requirements of ACI 318, but shall in no case be less than 36 bar diameters unless otherwise noted on the Drawings. Stagger splices of adjacent bars and provide corner bars corresponding in size and number to adjacent bars.

END OF SECTION

03 30 00 CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Furnishing and placing cast-in-place concrete including finishing and curing.
- B. Furnishing concrete for drilled piers.
- C. Control, expansion and contraction joint devices associated with concrete Work, including preformed joint filler.
- D. Grouting anchor bolts and under base plates.

1.2 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

- A. Section 03 10 00 "Concrete Formwork": Placement of joint device in formwork.

1.3 REFERENCES

- A. The American Association of State Highway and Transportation Officials (AASHTO):
 - 1. AASHTO M33 - Preformed Expansion Joint Filler for Concrete (Bituminous Type) (ASTM D994).
- B. American Concrete Institute (ACI):
 - 1. ACI 214 - Evaluation of Strength Test Results of Concrete.
 - 2. ACI 301 - Structural Concrete for Buildings.
 - 3. ACI 305.1 - Hot Weather Concreting.
 - 4. ACI 306.1 - Cold Weather Concreting.
 - 5. ACI 308 - Standard Practice for Curing Concrete.
 - 6. ACI 311 - Guide for Concrete Inspection.
 - 7. ACI 318 - Building Code Requirements for Reinforced Concrete.
- C. ASTM International (ASTM):
 - 1. ASTM C33 - Concrete Aggregates.
 - 2. ASTM C94 - Ready-Mixed Concrete.
 - 3. ASTM C150 - Portland Cement.
 - 4. ASTM C260 - Air Entraining Admixtures for Concrete.
 - 5. ASTM C494 - Chemicals Admixtures for Concrete.
 - 6. ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

1.4 SUBMITTALS

- A. Product Data: Submit data on joint devices, attachment accessories, admixtures, and floor hardener/sealer, waterstop, curing compounds, grout.
- B. Samples: Submit two, 4-inch long samples of expansion/contraction joint and construction joint material (joint filler).
- C. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent Work.
- D. Concrete Mix Design:
 - 1. Submit laboratory trial mix tests or historical tests in accordance with ACI 301.
 - a. Determine or certify proportions of ingredients for mix by independent testing laboratory in accordance with ACI 301 to provide characteristics listed on Drawings for each class of concrete.
 - b. Determine required average strength for above the specified compressive strength in accordance with ACI 301; evaluate compressive strength results of field concrete in accordance with ACI 214.
 - c. Include following information in concrete mix design:
 - 1) Proportions of cement, fine and coarse aggregate, and water.
 - 2) Water-cement ratio, design strength, slump and air content.
 - 3) Type of cement and sieve analysis of coarse and fine aggregates.
 - 4) Type and dosage of admixtures.
 - 5) Special requirements for pumping
 - 6) Range of ambient temperature and humidity for which design is valid.
 - 7) Special characteristics of mix which require precautions in mixing, placing, or finishing techniques to achieve finished product, specified.
 - 8) Placing time limits based on ambient air temperature, concrete temperature, and as required clearly state working time.
 - 2. Batch Delivery Tickets: Submit sample tickets indicating information to be supplied.

1.5 PROJECT RECORD DOCUMENTS

- A. Accurately record actual locations of embedded utilities and components which are concealed from view.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301.
- B. Maintain one copy of each document on-site.
- C. Acquire cement and aggregate from same source for all Work.
- D. Conform to ACI 305.1 when concreting during hot weather.

- E. Conform to ACI 306.1 when concreting during cold weather.

1.7 COORDINATION

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

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cement: ASTM C150, Type I or II or I/II, or ASTM C595, Type IL.
- B. Fine and Coarse Aggregates: ASTM C33, maximum size as indicated in the Concrete Notes shown on the Drawings.
 - 1. #67 coarse aggregate for slabs and walls.

2.2 ADMIXTURES

- A. Air Entrainment: ASTM C260.
- B. Water Reducing: ASTM C494 Type A.
- C. Use set-controlling admixtures only when accepted by the A/E. Set controlling admixture, Type C - accelerating, Type D - water reducing and retarding, Type E - water reducing and accelerating admixture as reviewed by the independent testing laboratory and the A/E.
- D. Super Plasticizing: Use PSI Super super plasticizer (high-range water-reducer) as manufactured by Gifford-Hill and Company, Inc., conforming to the requirements of ASTM C494, Type F/G in accordance with manufacturers recommendations.
- E. The manufacturer is acceptable contingent upon the products' compliance with the specification.
- F. Calcium chloride is prohibited. Do not use admixture containing more than 0.1 percent chloride ions. Submit written certification of maximum chloride ion content with mix design.
- G. Water: Use City water.
- H. Fly Ash, Slag, and Pozzolans: Prohibited. Obtain Architect/Engineer Representative's approval to use other admixtures.
- I. Silica Fume: ASTM C1240.

2.3 RELATED MATERIALS

- A. Bonding Agent: Two component modified epoxy resin.
- B. Vapor Barrier:
 - 1. Ten mils thick polyethylene sheeting, clear color, resistant to decay in accordance with ASTM E154.
 - 2. Vapor Barrier Joint Tape: 3M, No. 890 glass filament acetate tape.

2.4 NON-SHRINK GROUT

- A. Non-shrink grout for grouting under base plates.
- B. Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 7000 psi.
 - 1. ASTM C1107

2.5 EPOXY GROUT

- A. Epoxy grout for grouting anchor bolts.
- B. Three components consisting of 100 percent solids epoxy resins, special hardeners and specially graded aggregates.
- C. Product: Sure-grip Epoxy Grout (J-54), Dayton Superior Corp, Oregon, IL, (800) 745-3700.

2.6 JOINT DEVICES AND FILLER MATERIALS

- A. Joint (Sealant) Filler; Re: Joints and sealants in Division 07.
- B. Preformed Joint Filler: 1/2-inch, performed joint filler, ASTM D1751, asphalt impregnated fiberboard nonextruding type or 1/2-inch thick, preformed neoprene, ASTM D1752, Type I. Ensure compatibility with joint filler/sealant.

2.7 ACCESSORIES

- A. Form Coating: For all exposed concrete, use non-staining form coating as manufactured by:
 - 1. "Non-Crete," The Non-Crete Company, Omaha, Nebraska.
 - 2. "Formcel," Lambert Corporation, Houston, Texas.
- B. Curing Materials:
 - 1. Use resin base liquid concrete curing compound complying with ASTM C309, Type I, with fugitive dye to provide uniformity of color, application and providing 95 percent or more retention of the mixing water for 7 days or more. Compound shall be compatible with any materials (paint, resilient flooring, etc.) which will be applied to the concrete surfaces.

Do not cure with this compound any surfaces intended to receive clear hardener or penetrating sealer.

2. Dissipating curing compound shall be liquid membrane-forming compound, complying with ASTM C309, which provides an initial cure for concrete, then begins to chemically break down and wear off the surface within 2 to 4 weeks. Use "Kurez DR," as manufactured by the Euclid Chemical Company, or approved equal. Use of this product shall be limited to floors receiving penetrating sealer or cementitious topping.
3. Curing and sealing compound shall be an acrylic sealer equal to "Sealtight CS-309" as manufactured by W.R. Meadows, Incorporated, or "Sealco 309" as manufactured by the Gifford Hill Company. Use of this product shall be limited exclusively to permanently exposed concrete surfaces not specified to receive a penetrating sealer or liquid hardener. Comply with ASTM C309.

C. Finishing Materials:

1. Floor hardener shall be a penetrating liquid, for subsequent (not integral) application and shall be "Lapidolith," as manufactured by Sonneborn Building Products, or Ashford Formula or approved equal. See schedule for location of floor hardener. No combination curing and hardener material will be considered in lieu of hardener material specified.
2. Cement floor leveling compound for interior applications shall be SikaSet Underlayment, by Sika Corporation, or approved equal. Cement floor leveling compound for exterior applications shall be SikaTop 122, by Sika Corporation, or approved equal.
3. Retarder shall be "E.A.C. Super Tuf-coat 66," as manufactured by Preco Chemical Corporation. Color shall be as recommended by the manufacturer.

2.8 CONCRETE MIX

- A. Mix and deliver concrete in accordance with ASTM C94.
- B. Use accelerating admixtures in cold weather only when approved by Owner. Use of admixtures will not relax cold weather placement requirements.
- C. Use set retarding admixtures during hot weather only when approved by Owner.
- D. Air-entrain all concrete in accordance with ACI 318, exposure class F1
- E. Water-cement ratio shall be 0.45 or less.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify requirements for concrete cover over reinforcement.
- B. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

3.2 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

3.3 PLACING CONCRETE

- A. Conform with ACI 304 and the following.
- B. Convey concrete from the mixer to the forms as rapidly as practical and by methods which will prevent segregation or loss of ingredients.
- C. Deposit as nearly as practical in its final position.
- D. Provide chutes so that the concrete slides in the chute and does not flow.
- E. Where a vertical drop greater than 5 feet is necessary, place concrete through tremies or similar devices to prevent segregation.
- F. Place concrete before the initial set has occurred, and in no event after it has contained its water content for more than 1-1/2 hours. Concrete supplier shall provide placing time limitations.
- G. Unless otherwise specified, place all concrete upon clean, damp surfaces, free from water, or upon properly consolidated fills, but never upon soft mud, dry porous earth, or frozen ground.
- H. Compact the concrete and work it in an approved manner into all corners and angles of the forms and around reinforcement in a manner to prevent segregation of the coarse aggregate.
- I. Construct forms for the lifts of vertical walls to make all parts of the walls easily accessible for the placement, spading and consolidation of the concrete as specified.
- J. Deposit concrete in the forms as nearly as practical in its final position to avoid re-handling and to maintain, until the completion of the unit, a plastic surface approximately horizontal. Under no circumstances shall concrete that is partially hardened be deposited in the Work. Deposit concrete continuously and as rapidly as practical until the unit of operation is completed.
- K. Consolidate all concrete by vibration so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms, eliminating all air or stone pockets which may cause honeycombing, pitting, or planes of weakness. Conform with ACI 309 and the following.
- L. Mechanical vibrators shall have a minimum frequency of 7000 vibrations per minute and shall be operated by competent workmen. Over-vibrating and use of vibrators to transport concrete within forms shall not be allowed. Insert vibrators and withdraw at many points, from 18 inches to 30 inches apart for a 5- to 15-second duration. Permit the vibrators to sink as deep while running as their own weight will readily take them.
- M. Keep three spare emergency vibrators on the Site during all concrete placing operations.

Cast-In-Place Concrete

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- N. Furnish vibrators of the internal type; apply directly to the concrete and not through the forms, except in sections too thin to permit the insertion of the internal type, in which case form vibrators may be employed, with the approval of the A/E.
- O. Carry all top surfaces slightly above the forms and strike off by board finish when settlement has taken place, forcing out all excess water.
- P. After the concrete has taken its initial set, prevent impact or loads on forms or on the ends of projecting reinforcement.
- Q. Add concrete to compensate for the settlement produced by vibration, and to bring the surface to the elevation required.
- R. Bonding: In placing fresh concrete to set concrete, remove all loose and foreign materials from Work already in place. Slush set concrete surface with bonding agent and scrub with wire brooms and leave moist when the new concrete is place in accordance with manufacturer recommendations. Ensure complete bonding of the new concrete to the set concrete.
- S. Make the operation of placing concrete continuous between vertical construction joints. Make the vertical construction joints at approximately the center of a panel or beam with vertical bulkheads to the full depth. Place the scheduled or detailed reinforcement continuously through the joints.

3.4 CONCRETE FINISHING

- A. General:
 - 1. Finish concrete floor surfaces in accordance with ACI 302 AND ACI 304.
 - 2. Uniformly spread, screed, and float concrete. Do not use grate tampers or mesh rollers. Do not spread concrete by vibration.
 - 3. In areas with floor drains, maintain floor level at walls and pitch surfaces uniformly to drains as indicated on the Drawings.
 - 4. Ensure floor surfaces are depressed sufficiently to accommodate finish materials.
- B. As-Cast Finished:
 - 1. Rough Form Finish:
 - a. Provide surfaces true to line and plane with no specific requirements for selected facing materials.
 - b. Patch tie holes and defects and rub down fins exceeding 1/4 inch (6 mm) in height with wooden blocks.
 - c. Otherwise, leave surfaces with the texture imparted by the forms.
 - 2. Smooth Form Finish:
 - a. Produce smooth, hard, uniform finish in the same manner as rough form finish.
 - b. Remove all fins and patch all tie holes and defects.
 - 3. Smooth Rubbed Finish:
 - a. Complete all patching immediately after forms have been removed. Complete rubbing within 1 day after from removal.

- b. Wet surfaces and rub grout with Carborundum brick, cement from the rubbing process or similar abrasive until a uniform texture and color is achieved.
- C. Slab Finishes:
 - 1. Scratched Finish:
 - a. After the concrete has been placed, struck off, consolidated and leveled, roughen the surface with stiff brushes or rakes before final set.
 - b. Ensure that finish is true to plane within 1/4 inch in 3 feet as determined by a 3-foot straightedge placed anywhere on the slab in any direction.
 - 2. Floated Finish:
 - a. After the concrete has been placed, struck off, consolidated, and leveled, do not work the concrete further until ready for floating.
 - b. Floating is to begin when the water sheen has disappeared, and when the mix has stiffened sufficiently to permit the proper operation of a power-driven float.
 - c. Then consolidate the surface with power-driven floats.
 - d. Hand float with wood or corkfaced floats used in locations inaccessible to the power-driven machine.
 - e. Recheck trueness of surface at this stage with a 10-foot straightedge applied at not less than two different angles.
 - f. Cut down all high spots and fill all low spots during the initial floating operation.
 - g. Refloat the slab immediately to a uniform, smooth, granular texture.
 - h. Ensure that finish is true to plane within 1/4 inch in 10 feet as determined by a 10-foot straightedge placed anywhere on the slab in any direction.
 - 3. Troweled Finish:
 - a. After the concrete has received a power float finish as specified above, finish the surface initially with power trowels, and finally with hand trowels.
 - b. After power floating, provide a power trowel finish to produce a smooth surface free of defects other than minor trowel marks.
 - c. Perform additional trowelings by hand after the surface has hardened sufficiently.
 - d. Perform the final troweling when a ringing sound is produced as the trowel is moved over the surface.
 - e. Consolidate the surface thoroughly by hand troweling operations.
 - f. Make certain that the finished surface is free of any trowel marks and uniform in texture and appearance.
 - g. On surfaces intended to receive floor coverings, remove by grinding any defects on sufficient magnitude to show through the floor covering.
 - h. Finish slabs maintaining surface flatness and levelness tolerance, overall value FF 30/FL 20, and minimum local value FF 25/FL 15.
 - 4. Broom Finish:
 - a. Perform floating as specified above.
 - b. After excess water has been removed, provide a transverse scored texture produced by drawing a stiff broom across the surface.
- D. Schedule of Finishes for Formed Surfaces:
 - 1. As Cast Rough Form Finish: All concrete surfaces not exposed to view.
 - 2. As Cast Smooth Form Finish: All concrete surfaces not exposed to view after application of finish material.

3. Smooth Rubbed Finish: All interior and exterior concrete surfaces exposed to view.

E. Schedule of Finishes for Slab Surfaces:

1. Scratched Finish: Slabs and surfaces to receive bonded concrete toppings.
2. Floated Finish: Surface scheduled to receive roofing or waterproofing membranes and bonded cementitious setting beds.
3. Troweled Finish: Floor surfaces scheduled as exposed, or to receive floor covering.
4. Broom Finish: Exterior horizontal surfaces and walkway surfaces.
5. Steel Trowel and Fine Broom Finish: Floors to receive “thin-set” (“dry-set”) floor tile.

3.5 CURING AND PROTECTION

- A. Immediately after placement, protect concrete from moisture loss, premature drying, excessively hot or cold temperatures, and mechanical injury for at least 7 days.
- B. Conform to ACI 308.
- C. Prevent rapid drying at the end of the curing period.
- D. Accomplish curing by one of the following methods:
 1. Ponding or continuous sprinkling.
 2. Absorptive mats or fabrics (burlap) kept continuously wet.
 3. Use curing compounds as specified. Do not use compounds on any surface which will receive additional concrete or where concrete hardeners or terrazzo floors are scheduled to be installed. Remove the compound film from all exposed surfaces at the end of the curing period.
 4. Use non-staining waterproof paper or polyethylene sheeting as specified. Lap joints 12 inches and weight in place.

3.6 PLACING GROUT

- A. Place grout in accordance with manufacturer’s recommendations.
- B. Cure grout in accordance with manufacturer's recommendations.

3.7 PATCHING

- A. Allow Owner’s Representative to inspect concrete surfaces immediately upon removal of forms.
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Owner’s Representative upon discovery.
- C. Patch imperfections as directed and in accordance with ACI 301.

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

3.9 TESTING LABORATORY SERVICES

- A. Contractor shall hire a testing lab to perform the following inspections and tests:
 - 1. Perform field inspection and testing in accordance with ACI 301.
 - 2. Review proposed mix design of each class of concrete to verify conformance with the Contract Documents.
 - 3. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.
 - 4. Sampling and Testing Concrete: Concrete used shall be sampled and tested by testing laboratory using techniques certified by ACI to determine acceptability as required by ACI 318 and to demonstrate conformance with specified properties as follows:
 - a. Sampling Fresh Concrete: ASTM C172.
 - b. Slump: ASTM C143; one test for each set of compressive strength test specimens.
 - c. Air Content: ASTM C231 pressure method for normal weight concrete; one for each set of compressive strength specimens.
 - d. Concrete Temperature: ASTM C1064; test concrete hourly when air temperature is 40 F and below, and when 80 F and above; and when each set of compression test specimens is made.
 - e. Compressive Strength Specimens: ASTM C31; one set of three standard cylinders for each 75 cubic yards or fraction thereof, of each concrete type placed on any 1 day, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens.
 - f. Compressive Strength Test: ASTM C39; one specimen tested at 7 days, two at 28 days, and one retained in reserve for later testing if required. When frequency of testing will provide less than five strength tests for given class of concrete, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 - 5. Evaluation and Acceptance:
 - a. If the measured slump, or air content of air entrained concrete falls outside the specified limits, a check test shall be made immediately on another portion of the same sample. In the event of a second failure, the concrete shall be considered to have failed to meet the requirements of the Specifications, and shall not be used in concrete operations in the structure.
 - b. The strength level of the concrete will be considered satisfactory if the averages of all sets of three consecutive strength test results are equal to, or exceed specified strength and no individual test result (average of two cylinders) is below specified strength by more than 500 psi.

- c. Completed concrete Work will be accepted when the requirements of the "Specifications for Structural Concrete for Buildings" ACI 301, Chapter 18, have been met.
 - d. In any case where the average strength of the laboratory control cylinders, as shown by the tests for any portion of the structure, falls below the minimum ultimate compressive strength herein before specified, the Contractor shall provide improved curing conditions of temperature and moisture and/or purpose adjustments to the mix design to secure the required strength. Also, if the average strength of the laboratory control cylinders should follow the core test procedure set forth in ACI 301, Chapter 17 in locations approved by the Architect. At least three cores shall be taken for each strength test more than 500 psi below indicate, in the opinion of the Architects, that the strength of the structure is inadequate, such replacement, load testing, or strengthening, as may be ordered by the Architect, shall be provided by the Contractor without cost to the Owner.
6. Concrete Test Reports:
- a. Quality Assurance: ACI 311.
 - b. Complete and distribute report immediately after inspections and tests are complete.
 - a. If the report indicates non-conformance with the Contract Documents, then a probable cause and a recommendation for corrective action shall be included.
 - c. Comply with ACI 311, "Guide for Concrete Inspection."
 - d. If the testing laboratory observes a trend of decreasing quality of the concrete due to weather conditions or other cause, then the testing laboratory shall notify the A/E and provide a proactive corrective action recommendation before concrete falls below specified requirement.
 - e. The testing laboratory shall control the addition of water to the concrete at the Site and the length of time the concrete is allowed to remain in the truck before placement. The inspector shall compare the mixture with the significant deviation to the A/E, Contractor and concrete supplier. Corresponding adjustments shall be made before the concrete is discharged, or the load shall be rejected and not placed.
 - f. The testing laboratory shall certify each delivery ticket indicating class of concrete delivered (or poured), amount of water added and the time at which the cement and aggregate was discharged into the truck, and the time at which the concrete was discharged from the truck.

END OF SECTION

03 35 19 COLORED AND CHEMICALLY STAINED CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Dry Shake Color Hardener.
 - 2. Imprinting Tool.
 - 3. Powder Antiquing Release Agent.
 - 4. Sealers and coatings.
- B. Related Sections:
 - 1. Section 03 10 00 "Concrete Formwork."
 - 2. Section 03 20 00 "Reinforcing Steel."
 - 3. Section 03 30 00 "Cast-In-Place Concrete."

1.2 SUBMITTALS

- A. Contractor shall submit specified manufacturer's complete technical data sheets for all products to be used, including installation instructions.
- B. Contractor to submit color chart for approval of colors selected for mockups.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer of specified stain, integral color and sealer shall have a minimum 10 years of experience in the production of the specified products.
- B. Contractor Qualifications:
 - 1. Contractor must have a minimum 3 years of experience in integral colored concrete and staining applications and successfully completed not less than six projects comparable in scale and complexity.
 - 2. Statement of Contractor Qualifications: Submit list of at least six completed projects including project name, project address and owner contact information.
- C. Regulatory Requirements: Products shall comply with the United States Clean Air Act for maximum Volatile Organic Compound (VOC) content as specified in this Section.
- D. Mockups and Field Samples: Prepare field sample at the Site for Owner's review and approval. Contractor to provide a maximum of three mockups per paving type on the Drawings.
 - 1. Samples shall be constructed on-site and shall be 2 feet by 12 feet.
 - 2. Construct sample-using processes and techniques intended for use on permanent Work, including curing procedures. Include samples of control, construction, and expansion joints in sample panels.

3. Sample shall be poured stained and sealed by the individual workers who will actually be performing the Work for the Project.
4. Obtain written approval of the sample from project Landscape Architect before start of Work.
5. Retain approved samples through completion of the Work for use as a quality standard for finished Work.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver the specified products in original, unopened containers with legible manufacturer's identification and information.
- B. Store specified products in conditions recommended by the manufacturer.

1.5 JOB SITE CONDITIONS

- A. Environmental Conditions: Maintain an ambient temperature of between 50 F and 90 F during application and at least 48 hours after application.
- B. Protection: Precautions shall be taken to avoid damage or contamination of any surfaces near the work zone. Protect completed stain Work from moisture or contamination.

1.6 PRE-JOB CONFERENCE

- A. One week prior to the placement of colored concrete and chemical stain a meeting will be held to discuss the Project and application of materials.
- B. The Landscape Architect, General Contractor, Subcontractor and a manufacturer's representative will be present to review mockups.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Dry-shake Colored Hardener:
 1. L.M. Scofield Dry-shake Colored Hardener: LITHOCHROME® Color Hardener, Sika Corporation; factory proportioned, mixed, and packaged, ready-to-use surface hardener.
 - a. Color: A-55 Pecan Tan, accented with A-29 Terra Cotta.
 2. Or approved equal.
- B. Imprinting Tools:
 1. L.M. Scofield LITHOTEX® Pavecrafters® "Fractured Earth Embossing Skin, Sika Corporation.
 2. Or approved equal.

- C. Powder Antiquing Release Agent:
 - 1. L.M. Scofield LITHOCHROME® Antiquing Release Pro, Sika Corporation.
 - a. Color: A-33 Classic Gray.\
 - 2. Or approved equal.
- D. Penetrating Sealer/Coating:
 - 1. L.M. Scofield Cureseal-350™ Semi Gloss, Sika Corporation. Curing and sealing compound shall comply with ASTM C309 and be of same manufacturer as colored admixture, for use with integrally colored concrete.
 - a. The Owner will approve the colors based on the constructed mockup.
 - 2. Or approved equal.
- E. Substitutions: The use of any products other than those specified will be considered providing that the Contractor requests its use in writing within 7 days prior to bid date. This request shall be accompanied by:
 - 1. A certificate of compliance from the material manufacturer stating that the proposed products meet or exceed the requirements for this Section.
 - 2. Documented proof that the proposed material has a ten 10-year proven record of performance for staining concrete substrates, confirmed by at least five local projects that the Landscape Architect could examine.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Contractor shall examine areas and conditions under which Work will be performed and identify conditions detrimental to proper and timely completion of Work. Do not proceed until unsatisfactory conditions have been corrected.

3.2 COLORED CONCRETE PAVING

- A. The area to receive Dry Shake colored concrete shall have the sub-grade prepared as required as for any concrete slab or grade.
- B. The formwork shall be installed in accordance with the Drawings. The slab thickness shall be consistent with that of ordinary slabs under the same conditions and as shown on the Drawings.
- C. Provide reinforcement as specified.
- D. Control joints and/or expansion joints shall be provided in accordance with the Drawings and the guidelines established by the American Concrete Institute. As with any concrete slab, Bomanite colored concrete usually contains construction joints, control joints and expansion joints. The Contractor shall advise and work with the Landscape Architect to determine the best location for these joints to minimize the visibility of the joints and to minimize unsightly cracking.
- E. The expansion joint filler color to be approved by Landscape Architect.

- F. The concrete shall be placed and screeded to the finished grade, and floated to a uniform surface using standard finishing techniques.
- G. After the initial curing period, the surface of the slab shall be sealed.

3.3 APPLICATION OF PENETRATING, REACTIVE, SEALER/COATING

- A. Surface should be prepared in accordance with manufacturer's directions and allow the concrete substrate to completely dry.
- B. The surface shall be protected by a product produced by the manufacturer of the chemical stain.
- C. Apply at the following rates: Per manufacturer's directions.
 - 1. Hand-Pump Sprayer: Between 100 to 200 square feet per gallon.
 - 2. Lambswool Roller, Max. 3/8-inch nap, 100 to 200 square feet per gallon.
- D. Maintain a wet edge at all times.
- E. Only one coat is generally required for untreated or stripped concrete.
- F. If a second coat is to be applied, allow sealer to completely dry before applying additional coats.

3.4 PROTECTION

- A. Protect surface treated with penetrating, reactive sealer/coating until dry.
- B. Remove no forms for at least 8 hours after initial set. Protect Work from pedestrian and automotive traffic for a period of 3 days after pouring.

END OF SECTION

05 50 00 METAL FABRICATIONS

PART 1 - GENERAL

1.1 SCOPE

- A. Provide miscellaneous metal work as detailed and as specified herein.

1.2 SUBMITTALS

- A. Shop Drawings: "Shop Drawings, Product Data, and Samples Submittals." Drawings shall indicate each item being furnished including materials, quantities, sizes, shapes, size and types of anchors, locations finish types and installation details.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Miscellaneous Structural Steel: ASTM A572, Grade 50.
- B. Bolts: ASTM F1554, Grade 55, S-1.
- C. Steel Pipe: ASTM A53 black seamless pipe, Grade B, Schedule 40, free of pits and abrasions.
- D. HSS rectangular and rounds: As indicated.
- E. Aluminum Extruded: ASTM B221, Alloy 6063-T5.
- F. Primer: Tnemec Series 60 Hi-Build Epoxy Line 5.0 mils thick dry minimum coat.
- G. Surface Paint: Tnemec Series 73 Endurashield III, two coats at a min. of 4.0 mils thick per coat dry.
- H. Setting Grout: Pro-Loc, non-shrink, setting grout.
- I. Stainless Steel Bolts: Conform to ASTM F593-91.

2.2 ITEMS OF WORK - FABRICATED

- A. Miscellaneous Steel and Aluminum Shapes: Channels, wide flange shapes, angles, plates, pipe, tubing, connections and bolts where shown and detailed on the Drawings.
- B. Shop fabricate sections in maximum lengths possible for final installation in the field.

- C. All welds shall be in accordance with AWS D1.1.
- D. All steel fabrication shall be in accordance with AISC 360.

2.3 FINISHES

- A. Galvanized Finish: Zinc-coating conforming to ASTM A123 and ASTM A153 or F2329.
 - 1. All steel shall be hot-dip galvanized unless otherwise specified.
 - 2. Prepare and prime with zinc compatible primer for top coating.
- B. Topcoat color to be black. Coordinate sheen with Architect.
- C. Anodizing:
 - 1. Finish exposed surfaces in accordance with NAAMM Metal Finishes Manual.
 - 2. Aluminum: NAAMM AMP 501, (Clear anodized natural finish).
 - 3. Mill Finish: AAMIO, as fabricated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Work shall be made and erected square, plumb, straight and true, accurate fitted, and with tight joints and intersections. Work shall be adequately reinforced and anchored in place. Welding shall conform to best modern practice to be of adequate strength and durability, with jointing made tight, flush and in true plane with base metals, clean and smooth. Form exterior joints to exclude water. Welded connections in exposed members shall be ground smooth and polished. Install stock manufactured items in accordance with manufacturer's directions. Leave items plumb, level and securely fastened.

3.2 DISSIMILAR MATERIALS

- A. Where aluminum surfaces will contact steel, other incompatible metals, masonry, stone or concrete, keep the aluminum surfaces from direct contact with such dissimilar material by painting the incompatible metal with prime coat of zinc chrome primer followed by one or two coats of aluminum metal paint or other suitable protective coating excluding those containing lead pigmentation.

END OF SECTION

11 60 00 SITE FURNISHINGS AND PARK EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A.** The Drawings, Standard General Conditions of Contract, Supplementary Conditions and NCTCOG 4th edition Specification Sections apply to Work of this Section.

1.2 DESCRIPTION

- A.** General: Furnish and supply all labor, equipment, materials and incidentals necessary to assemble, install and otherwise construct park equipment as listed under products.

1.3 QUALITY ASSURANCE

- A.** Safety:
 - 1. All equipment shall be free of sharp edges and corners, and extremely rough surfaces.
 - 2. All raised platforms shall have handrails.
 - 3. Wood shall be pressure treated with a non-toxic preservative.
- B.** Allowable Tolerances:
 - 1. Metals shall be straight or at design radii or bends, without kinks, bends, and crimps and shall be true to shape.
 - 2. All metal parts and hardware shall be hot dip galvanized, have electrostatically bonded colors, or have an approved corrosion-resistant coating.
 - 3. Wood shall be structurally sound and free of heart centers.
 - 4. Wood shall not be noticeably warped or bowed and shall be free of large checks, splinters and waves.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A.** Protect from inclement weather; wet, damp, extreme heat or cold.
- B.** Keep manufacturers' labels, installation instructions, and warranty information.
- C.** Store wood in a manner to prevent warpage and/or bowing.
- D.** Delivery times for equipment will be taken into account by the Contractor as Work proceeds. Late deliveries will not be accepted as a reason to extend the completion date for the Project.

1.5 SUBMITTALS

- A.** General:

1. The Contractor shall submit to the Landscape Architect manufacturers' catalog information sheets, installation details and a listing of model numbers and option numbers of each piece of equipment that the Contractor proposes to install.
2. The Contractor's submittals shall be approved by the Landscape Architect prior to ordering of equipment.

1.6 JOB CONDITIONS

- A. The Contractor shall be responsible for protection of unfinished Work and shall be responsible for the safety of park users utilizing unfinished equipment.

PART 2 - PRODUCTS

2.1 SITE FURNISHINGS

- A. General:
 1. All equipment and materials shall be new, unused and the standard product of the manufacturer.
- B. Site Furnishings:
 1. 6-Foot Benches:
 - a. Victor Stanley Steelsites RB-28 (6-foot long plastic bench with backrest).
 - b. Color of Steel Frame: Black.
 - c. Supplier/Rep:
Johnathon Withrow,
jonathonw@victorstanley.com
1.800.368.2573 x 346 (USA+Canada)
TEL 301.855.8300 x 346
 - d. Or equal approved by owner's representative.
 2. Trash Receptacle:
 - a. Victor Stanley Steelsites T-32 (36 Gallon, with rain bonnet).
 - b. Color of Steel Frame: Black
 - c. Color of Plastic Bin: Black
 - d. Supplier/Rep:
Johnathon Withrow,
jonathonw@victorstanley.com
1.800.368.2573 x 346 (USA+Canada)
TEL 301.855.8300 x 346
 - e. Or equal approved by owner's representative.

3. Bike Repair Station:
 - a. Dero, Playcore fixit series (w/ air pump kit)
 - b. Color of Steel: Red
 - c. Supplier/Rep:
Dero HQ
(888) 337-6729 : Toll Free
(612) 359-0689 : Local
(612) 331-2731 : Fax
Office Hours:
8:00AM – 5:00PM Central
Mailing Address:
42 Northern Stacks Dr, Suite 100
Minneapolis, MN 55421
 - d. Or equal approved by owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install site furnishings and park equipment in the exact locations shown on the Drawings and in strict conformation with the manufacturers' instructions.

END OF SECTION

31 00 00 EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Drawings, geotechnical investigation report, Standard General Conditions of Contract, Supplementary Conditions and NTCOG 4th edition Specification Sections apply to Work of this Section.

1.2 DESCRIPTION

- A. Staking.
- B. Excavation.
- C. Filling.
- D. Preparation of Raw Subgrade.

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 32 91 19.13 "Topsoil."

1.4 PROTECTION

- A. Protect all reference points, benchmarks and property corner monuments from damage or dislocation. Replace or repair immediately all points damaged, destroyed or dislocated.
- B. Sprinkle and dampen all dusty material from the beginning of Work to its completion.
- C. Protect and maintain all conduits, inlets, sewers, pipes and wires that are to remain.
- D. Provide, erect and maintain all lights, barricades, warning signs and guards as necessary for the protection of roads, sidewalks and all adjoining structures.
- E. Shore and use sheet piling to prevent caving of earth banks and side walls of trenches as required by OSHA and State Regulations for safety.
- F. Cover holes and trenches when Work is not in progress. Fence or barricade changes of grade more than 45 degrees and more than 3 feet in height.
- G. Remove shoring, sheet piling and protection as Work progresses. Temporary wood shall not be left in concrete or fill.

- H. Keep trenches and excavated areas free from water by pumping or draining. Grade to drain surface water away from excavations, distributing discharge to prevent excessive erosion.
- I. Protect adjacent lawn or surface areas outside the construction limits from damage. If damaged as a result of building operations or storage of materials, clear off debris and restore to original grades and condition.
- J. Protect finished subgrade from erosion, as directed by the Owner's Representative Engineer, by the use of organic erosion netting or fabric and/or the use of hay bale barricades. All areas of erosion are to be repaired and compacted, by the Contractor and approved by the Owner's Representative.

1.5 CLASSIFICATION OF EXCAVATION

- A. No consideration will be given to the nature of the materials, and all excavation will be designated as unclassified excavation.

1.6 DEFINITIONS

- A. Satisfactory Materials: Materials classified in Unified Soil Classification System as GW, SP, GC, GM, SW, SP, SM, SC, CL and CH.
- B. Unsatisfactory Materials: Materials classified in Unified Soil Classification System as Pt, OH, OL, ML and MH.
- C. Cohesionless and Cohesive Materials: Cohesive materials include materials classified as GC, SC, ML, CL, MH and CH. Cohesionless materials include materials classified in Unified Soil Classification System as GW, GP, SW and GP. Materials classified as GM and SM will be identified as cohesionless only when the fines have a plasticity index of zero. Testing required for classifying materials shall be in accordance with ASTM C136, D422 and D1140.
- D. Degree of Compaction: Degree of compaction is a percentage of the maximum density obtained by the test procedure presented in ASTM D698.
- E. Topsoil: Topsoil shall be defined as natural, friable surface soil possessing the characteristics of representative soils in the vicinity that produce heavy growth of crops, grass or other vegetation.
- F. Existing Grades: Existing grades shall be defined as grades which are represented by contours on the Drawings.

1.7 BLASTING

- A. Blasting will not be permitted.

1.8 UTILIZATION OF EXCAVATED MATERIALS

- A. All unsatisfactory materials removed from excavations shall be disposed of offsite at locations at the cost of the Contractor. Satisfactory material removed from excavations shall be used, insofar as practicable, in the construction of fills, subgrades, bedding, and for similar purposes. No satisfactory excavated material shall be wasted without specific written authorization. No excavated material shall be disposed of in such a manner as to endanger a partly finished structure, impair the efficiency or appearance of any structure, or be detrimental to the completed Work in any way.

1.9 FIELD TESTING CONTROL

- A. Field density testing shall be performed by an Independent Testing Laboratory selected by the Contractor and approved by the Owner. Costs of initial testing will be paid by the Contractor. Should the material fail to meet the specified density, material shall be scarified, recompact and tested until specified densities are obtained. All subsequent testing of material shall be paid by the Contractor.

1.10 SUBGRADE PREPARATION

- A. Refer to Geotechnical Investigation for subgrade preparation design requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Approved Excavated Material and Select Fill:
 - 1. Excavated material determined by the testing laboratory to be suitable for use in embankment and backfill shall be used after freeing it of rock larger than 2 inches in greatest dimension for backfill.
 - 2. Clayey sands free of organic materials and having a plasticity index between 4 and 15, a liquid limit between 20 and 40 and between 20 and 45 percent passing a No. 200 sieve. Submit tests to Engineer as directed, verify in that select fill meets these requirements.

PART 3 - EXECUTION

3.1 GENERAL

- A. Construction surveying, staking and layout shall be performed at the Contractor's expense by a surveyor licensed in the State of Texas (RPS).
- B. The rough grading shall be performed to the lines and elevations indicated on the Drawings in accordance with these specifications. Should the Contractor, through negligence or other fault, excavate below the designated lines, he shall replace the excavation with approved materials,

in an approved manner and condition, at its own expense. The Owner's Representative shall have complete control over the excavation, moving, placing and disposition of all materials and shall determine the suitability of material to be placed in embankments. All material determined unsuitable shall be disposed of off-site or in waste areas as directed. Topsoil shall not be used in fills or in subgrades but shall be stockpiled, handled and placed as directed.

- C. The Contractor shall inform and satisfy himself as to the character, quantity and distribution of all material to be excavated
- D. If it is necessary to interrupt existing surface drainage, sewers or underdrainage, conduits, utilities or similar underground structure, or parts thereof, the Contractor shall be responsible for and shall take all necessary precautions to protect and preserve or provide temporary services. When such facilities are encountered, the Contractor shall notify the Consultants who shall arrange for their removal, if necessary. The Contractor shall, at its own expense, satisfactorily repair all damage to such facilities or structures which may result from any of its operations during the period of the Contract.

3.2 STRIPPING OF TOPSOIL

- A. As directed by the Owner's Representative, topsoils shall be stripped to a depth of 6 inches. Topsoil shall be transported and deposited in stockpiles. Topsoil shall be kept separate from other excavated materials, brush, litter, objectionable weeds, roots, stones larger than 2 inches in diameter, and other materials that would interfere with planting and maintenance operations.

3.3 EXCAVATION

- A. The Contractor shall perform excavation of every type of material encountered within the limits of the Project to the lines, grades and elevations indicated and as specified herein. Grading shall be in conformity with the Drawings and the tolerances specified in Paragraph 3.08 - Finishing. Satisfactory excavated materials shall be transported to and placed in fill within the limits of the Work. Unsatisfactory materials encountered within the limits of the Work shall be excavated below grade and replaced with satisfactory materials as directed. Unsatisfactory excavated material shall become the property of the Contractor and shall be disposed of off-site. During construction, excavation and fill shall be performed in a manner and sequence that will provide proper drainage at all times.

3.4 BACKFILL

- A. Backfill adjacent to any and all types of structures shall be placed and compacted to at least 95 percent of its maximum dry density in accordance with ASTM D698, at optimum moisture minus 2 points to plus 2 points, in such a manner as to prevent wedging action or eccentric loading upon or against any structure. Ground surface on which backfill is to be placed shall be prepared as specified in Paragraph 3.05 - Preparation of Ground Surface for Fill. Compaction requirements for backfill materials shall also conform to the applicable portion of Paragraphs 3.05 - Preparation of Ground Surface for Fill, 3.06 - Fills, and 3.07 - Raw Subgrade Preparation,

below. Compaction shall be accomplished by sheepfoot rollers, pneumatic-tired rollers, steel wheeled rollers, vibratory compactors, or other approved equipment well-suited to the material being compacted.

3.5 PREPARATION OF GROUND SURFACE FOR FILL

- A. Ground surface on which fill is to be placed shall be stripped of live, dead or decayed vegetation, rubbish, debris, and other unsatisfactory material; plowed, disked, or otherwise broken up; pulverized; moistened or aerated as necessary; thoroughly mixed; and compacted to at least 95 percent of maximum density at paved areas and a maximum of 90 percent at turf areas in accordance with ASTM D698, at a moisture content between the optimum moisture value and 5 percent above optimum. Compaction shall be accomplished by sheepfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment well-suited to the material being compacted. The prepared ground surface shall be scarified and moistened or aerated as required just prior to placement of fill materials to ensure adequate bond between fill and the prepared ground surface.

3.6 FILLS

- A. Earth Fills: Earth fills shall be constructed from satisfactory materials free of organic or frozen material and rocks with any dimension greater than 6 inches. The material shall be placed in successive horizontal layers of loose material not more than 8 inches in depth. Each layer shall be spread uniformly on a soil surface that has been moistened or aerated as necessary and scarified or otherwise broken up in such a manner that the fill will bond with the surface on which it is placed. After spreading, each layer shall be plowed, disked, or otherwise broken up; moistened or aerated as necessary; thoroughly mixed; and compacted to at least 95 percent of its maximum dry density at paved areas and a maximum of 90 percent of its maximum dry density at turf areas in accordance with ASTM D698, at moisture contents between optimum and 5 percent above optimum. Compaction requirements for the upper portion of earth fills forming subgrade for pavements shall be identical with those requirements specified in Paragraph 3.07 - Raw Subgrade Preparation. Compaction shall be accomplished by sheepfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment well-suited to the material being compacted.

3.7 RAW SUBGRADE PREPARATION

- A. Construction: Raw subgrade shall be shaped to line, grade and cross-section and compacted as specified. This operation shall include plowing, disking and any moistening or aerating required to contain specified compaction. Soft or otherwise unsatisfactory material shall be removed and replaced with satisfactory excavated material or other approved material as directed. Rock encountered in the cut section shall be excavated to a depth of 6 inches below finished grade for the raw subgrade. Low areas resulting from removal of unsatisfactory material or excavation of rock shall be brought up to required grade with satisfactory materials, and the entire subgrade shall be shaped to line, grade and cross-section and compacted as specified.

- B. Compaction: Compaction shall be accomplished by sheepsfoot rollers, pneumatic tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment well-suited to the material being compacted. Subgrade shall be compacted to at least 95 percent of its maximum dry density in accordance with ASTM D698, at a moisture content between optimum and 5 percent above the optimum moisture value, for a minimum depth of 6 inches.

3.8 FINISHING

- A. The surface of all excavations, fills, and raw subgrades shall be finished to a smooth and compact surface in accordance with the lines, grades and cross-sections or elevation shown. The degree of finish for all graded areas shall be within 0.1 feet of the grades and elevations indicated. All finish grades will be checked by an Owner's Representative in a random manner, as to ensure proper grades prior to approval of the Work.

3.9 RAW SUBGRADE AND FILL OR EMBANKMENT PROTECTION

- A. During construction, fills and excavations shall be kept shaped and drained. Ditches and drains along raw subgrade shall be maintained in such a manner as to drain effectively at all times. The finished raw subgrade shall not be disturbed by traffic or other operation and shall be protected and maintained by the Contractor in a satisfactory condition.

END OF SECTION

31 23 00 EXCAVATING, BACKFILLING, AND COMPACTING FOR UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Drawings, Standard General Conditions of Contract, Supplementary Conditions and NCTCOG 4th edition Specification Sections apply to Work of this Section.

1.2 DESCRIPTION

- A. This Section governs all excavation required for the construction of water, sanitary sewer, storm drain, and miscellaneous utility lines and for the backfilling around completed utility and storm drain lines to the level of the existing or finished ground, all in conformity with the locations, lines and grades shown on the Drawings and in accordance with these specifications. This Section also covers the pumping or bailing and drainage, and all sheeting and bracing of trench walls.
- B. Refer to the Geotechnical Investigation Report for additional backfilling and compacting requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials for bedding will include sandy gravel and crushed rock. These bedding materials should be clean and homogenous and free of mud, silt, clay lumps or clods, vegetation and/or debris.

1. The sandy gravel shall have:

Sieve	Percent
Passing 2 inch sieve	100
Passing 1 inch sieve	90-100
Passing 1/2 inch sieve	50-80
Passing No. 4 sieve	30-60
Passing No. 100 sieve	0-5

2. All material passing the No. 40 sieve shall have a liquid limit of not more than 25 and a plasticity index of not more than 6.

3. Crushed rock shall be graded as follows:

Sieve	Percent
Passing 1 inch sieve	100
Passing 3/4 inch sieve	90-100
Passing 1/2 inch sieve	20-55
Passing 3/8 inch sieve	0-15

Sieve	Percent
Passing No. 4 sieve	0-5

- B. Materials for backfill above the bedding material shall consist of random materials from the excavation. The backfill should be free of any appreciable amount of gravel or stone particles larger than 4 inches, in any dimension, and should be free of mud, silt, clay lumps or clods, vegetation and/or debris.

PART 3 - EXECUTION

3.1 EXCAVATION AND TRENCH PROTECTION

- A. The walls and faces of all excavations and excavated trenches more than 5 feet deep or with evident hazardous ground movement in which workers are exposed to danger from moving ground shall be guarded by a shoring system, sloping of the ground, or other equivalent means. The determination of the angle of repose and the design of the supporting system shall be based on careful evaluation of the depth of cut, material, changes in material, water content variations, and external loadings. The minimum requirements for determining the angle of repose and for the shoring of excavations or trenches shall be in accordance with Subpart P - Excavations, Trenching and Shoring, Section 1926.650 thru Section 1926.652, as amended and with appendices, of the Construction Safety and Health Regulations, Occupational Safety and Health Administration, U.S. Department of Labor.
- B. Shoring shall be used when the location of the trench is in a restricted clearing area, or within close proximity to other utility lines or structures. Existing vegetation may not be damaged or removed to accomplish a required angle of repose. Shoring will have to be used in such cases.
- C. Trench side slopes must meet Occupational Safety and Health Administration (OSHA) standards. Sheet piling, shoring and bracing will be required when side slope standards are not met. A pull box, meeting OSHA standards, will be acceptable.
- D. The Contractor will submit detailed drawings and specifications for trench safety systems that meet OSHA standards when excavation will exceed a depth of 5 feet. These drawings must be sealed by an Engineer registered by the State of Texas and submitted prior to formal execution of the Contract.

3.2 TRENCHES

- A. Prior to installation of any on-site subsurface utilities (water, sanitary sewer, drainage culverts, electrical, etc.) all rough grading shall be complete in all areas and roads to within plus or minus 0.10 feet.
- B. Utilities shall be constructed in open cut trenches with vertical or a combination of vertical or sloped sides. Trenches shall be sheet piling and braced to the extent necessary to maintain stability of excavation and provide full safety for workmen throughout the construction period. Adequacy of the sheet piling and bracing shall be the responsibility of the Contractor. Also,

Department of Labor "Safety and Health Regulations for Construction" dated April 17, 1971, shall be adhered to by this Contract at all times.

- C. The pipe should be placed on a minimum bedding material thickness below the pipe and extend up the sides of the trench. Large clods of backfill material will be broken down into smaller particles before placement. The backfill should be placed in loose layers not exceeding 6 inches in depth (loose measurement) and each layer will be compacted to not less than 95 percent of the maximum dry density. Moisture content of the backfill should be between the optimum moisture value and 5 percent above optimum.
- D. For pipe utilities and storm drain lines of all types, where the soil encountered at established grade is a quicksand, muck, or similar unstable material the following procedure shall be used unless other methods are called for on the Drawings: All unstable soil shall be removed to a depth of 2 feet below bottom of storm drain line for drain lines 2 feet or more in height and to a depth equal to the height of the line for storm drain lines less than 2 feet in height. Such excavation shall be carried at least 1 foot beyond the horizontal limits on all sides. All unstable soil so removed shall be replaced with sandy gravel material, consisting of hard durable particles or fragments of granular aggregates mixed or blended with fine sand, clay, stone dust or other similar binding or filler materials to provide a uniform mixture with gradations of materials as shown in Paragraph 2.01.
- E. After placement, the sand gravel material shall be wetted if necessary and shall be compacted by mechanical tamping as required to provide a stable foundation for the storm drain and utility line. Jetting will not be permitted.
- F. Any rock adjacent to the excavation which has been loosened by excavation methods, shall be removed and replaced with approved compacted backfill material.

3.3 SHAPING OF TRENCH BOTTOM

- A. The trench bottom shall be undercut a minimum depth sufficient to accommodate the class of bedding indicated on the Drawings or specified in these specifications.

3.4 DEWATERING TRENCH

- A. Pipelines shall not be constructed or laid in a trench in the presence of water. All water shall be removed from the trench sufficiently prior to the utility placing operation to ensure a dry, firm bed on which to place the pipe and the trench shall be maintained in such dewatered condition until all piping is set. Removal of water may be accomplished by bailing, pumping or by a well-point installation as conditions warrant.
- B. Backfill shall be placed as soon as practicable after laying, bedding and jointing of pipe.

3.5 REMOVING OLD STRUCTURES

- A. When old masonry structures or foundations are encountered in the excavation, such obstructions shall be removed for the full width of the trench and to a depth of 1 foot below the bottom of the trench.

3.6 PROTECTION OF UTILITIES

- A. The Contractor shall conduct its Work such that measures are taken to maintain the stability and otherwise protect existing structures and utilities required to remain in place. Particular care shall be exercised to avoid the cutting or breakage of existing utility lines, other contractors' utility lines and underground telephone and radio communication cables.
- B. The Contractor shall inform utility owners and the Owner sufficiently in advance of the Contractor's operations to enable such utility owners to reroute, provide temporary detours or to make other adjustments to utility lines in order that the Contractor may proceed with its Work with a minimum of delay and expense. The Contractor shall cooperate with all utility owners concerned in effecting any utility adjustments necessary and shall not hold the Owner liable for any expense due to delay or additional work because of conflicts.
- C. The Contractor shall call Texas 811 at least 48 hours prior to construction.

3.7 SURPLUS EXCAVATED MATERIALS

- A. All materials from excavation operations not required or not suitable for backfilling shall become the property of the Contractor and shall be disposed of off-site.

3.8 BACKFILL

- A. After the bedding has been prepared and the pipes installed, selected materials from excavation or borrow shall be placed along both sides of the pipe equally, in uniform layers not exceeding 6 inches in depth (loose measurement), wetted using enough water to facilitate compaction if required, and thoroughly compacted to the required density. Excess wetting or jetting will not be permitted. Material for backfill shall be free from stones of such size as to interfere with compaction and shall be free from large lumps which will not break down readily under compaction. The Owner shall have the right to reject any material containing more than 20 percent by weight of material retained on a 3-inch sieve, or material excavated in such a manner as to produce large lumps not easily broken down or which cannot be spread in loose layers.
- B. Filling and/or backfilling shall be continued in this manner to the elevation of the top of the pipe. Special care shall be taken to secure thorough compaction of the materials placed under the haunches of the pipe. All fill or backfill below the top of pipe shall be compacted in the manner prescribed above. The backfill above the pipe shall be placed in loose layers not exceeding 8 inches in depth. Successive layers shall be added and thoroughly compacted by hand or pneumatic tampers or by mechanical compaction equipment approved by the Owner until the trench is completely filled and brought to the elevation of the existing ground or the top of the

proposed subgrade, whichever is lower. Backfilling shall be done in such a manner as to avoid injurious top or side pressures on the pipe.

- C. Where trench excavation is in rock, shale or other incompressible material, excavate to at least 6 inches below the pipe and refill to grade with sand or gravel firmly compacted, then backfill as above following the installation of the pipe.
- D. All backfill below proposed finished grade shall be compacted in accordance with Section 31 00 00 "Earthwork."
- E. Compaction control tests shall be made in accordance with Owner's requirements.

END OF SECTION

31 23 10 STRUCTURAL EXCAVATION AND BACKFILL

1.00 GENERAL

1.01 SUMMARY

- A. This Section specifies excavation, backfill materials, backfill placement and compaction procedures, and other construction activities incidental to project structures.
- B. The Specification does not include excavation and backfilling for utility lines, manholes, valve boxes, and other minor structures related to utility lines. Refer to Section 31 23 33 "Trenching and Backfill" for utility line related excavation and backfill.

1.02 QUALIFICATION ASSURANCE

- A. Testing Agency: An independent testing agency that is AASHTO accredited.

1.03 SUBMITTALS

- A. Submittals shall be in accordance with Section 01 33 00 "Document Management" and shall include:
 - 1. Provide list of compaction equipment to be used.
 - 2. Backfill material classifications: For each soil or aggregate backfill material provide a certification by the testing agency.
 - 3. Compaction Test Results: Submit test results within 24 hours of successful testing.

1.04 STANDARDS

- A. Material classification, placing, and testing shall be in compliance with the latest revisions of the following standards, unless otherwise noted in the Contract Documents.
 - 1. ASTM International (ASTM) Standards:

ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³ (600 kN-m/m ³))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
ASTM D2487	Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D4253	Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
ASTM D6938	Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

- B. Any other testing required by these specifications and not specifically referenced to a standard shall be performed under ASTM or other appropriate standards as designated by the Engineer.

1.05 DELIVERY AND STORAGE

- A. Deposit material to be used for backfill in storage piles at points convenient for handling of the material during the backfilling operations and as required to prevent contamination with other materials.

1.06 JOB CONDITIONS

- A. Review the Site and determine the conditions which may affect the structural excavation, prior to the commencement of the excavation.

2.00 PRODUCTS

2.01 BACKFILL MATERIALS

- A. Structural Fill Backfill: flexible base in accordance with TxDOT 2014 Standard Specifications, Item 247, Grade 1-2, Type D

2.02 COMPACTION EQUIPMENT

- A. Compaction equipment shall conform to the following requirements.
 - 1. Hand-Directed Compaction Equipment: Use power tampers and vibratory plate compactors in areas where it is impracticable or unacceptable to use heavy compaction equipment.

3.00 EXECUTION

3.01 PREPARATION

- A. Clear and grub the area to be excavated prior to the start of excavation. Remove the surficial vegetation, waste and soils to a minimum depth of 6 inches. Depth of removal shall not be less than that required to remove trees, shrubs, stumps, roots, and other organic material above and below ground from within the area to be excavated. Ensure below grade organic material is removed to a minimum depth of 18 inches below bottom of footing/structure.

3.02 EXCAVATION FOR FOUNDATIONS

- A. General: Excavate subgrade to the depth indicated on Drawings, +/- 0.1 feet tolerance. Extend limits of the excavation beyond the perimeter of the foundations as indicated on the Drawings.
 - 1. Exposed subgrade surfaces shall be level and of sound, stable material; free of mud, frost, snow, or ice. Testing agency or Owner's representative shall confirm exposed subgrade is a suitable bearing material based on the Construction Documents.
 - 2. Proof the exposed subgrade by making two passes with hand-directed equipment. Do not proof roll wet or saturated subgrades. Do not proof the exposed subgrade below rip rap.

3. Where unsound or unstable material is uncovered, notify Owner's representative. Remove objectionable material and replace after approval is received from Owner's representative. Replacement material shall be compacted structural fill.
- B. When the material encountered at footing bearing elevation is found to be partially rock or incompressible material, but otherwise satisfactory for the foundation, remove the incompressible material to a depth of 6 inches below the footing grade and 12 inches on each side and backfill with compacted select fill.
- C. Excavation Safety: All excavations shall be in accordance with OSHA requirements.

3.03 WATER IN FOUNDATION EXCAVATIONS

- A. General:
 1. Prevent water infiltration into foundation excavations. Remove standing water from excavation prior to placing concrete. If removal of standing water is not possible due to continuous water infiltration, then contact Owner's representative for additional direction regarding placing concrete underwater.
 2. Do not dewater a foundation excavation while placing concrete or for a period of at least 24 hours after concrete placement.
- B. Rock Foundation Subgrade: If rock material becomes weathered due to water infiltration, then remove weathered material and provide rock replacement material to restore foundation subgrade elevation.
- C. Soil Foundation Subgrade: If foundation subgrade becomes saturated do not disturb the subgrade. Wait for water to evacuate the subgrade and subgrade surface to adequately stiffen prior to placing concrete. If subgrade is disturbed, then wait until subgrade has dried out, excavate disturbed subgrade and provide replacement material as indicated above.

3.04 COMPACTED BACKFILL

- A. General: Backfill excavated spaces and areas not occupied by the permanent structure.
 1. Backfill behind a retaining wall or basement-type wall shall not be placed until the concrete has reached its 28-day compressive strength or 7 days, whichever is longer.
 2. Unless otherwise indicated on Drawings, structures with a top slab shall not backfilled until the top slab has been in place at least 4 days.
 3. Structures with soil on opposing (opposite) sides shall be backfilled to prevent uneven loading of the structure – evenly raise backfill on opposing sides of the structure. The maximum differential backfill height between opposing sides is 1 foot.
 4. Do not permit compaction within 3 feet of structures until the structure is braced against compaction pressures.
 5. Maximum Loose Lift Height:
 - a. Hand-Directed Compaction Equipment: 4 inches.
 6. Previous Compacted Layer: If backfill placement occurs over a period of time greater than 24 hours, then scarify and recompact the previous day's final compacted layer.
 - a. Scarify and Recompact: 4-inch depth; adjust the moisture content; recompact.

- b. Saturated subgrades shall not be worked on until sufficiently dry and harden so as not to be rutted with compaction equipment. Scarify and recompact layers damaged by weather or construction equipment.
- B. Moisture: Prior to compacting backfill, mix and aerate or water the loose lift backfill material as necessary to adjust the moisture content and evenly distribute throughout. The material shall contain moisture within the limits specified below.
 1. In accordance with ASTM D6938, determine the optimum moisture content for the maximum dry density.
 2. Backfill moisture content shall be as indicated in Table 1, "Compacted Fill."
 3. Aggregate fill: Completely cohesionless materials, shall be at a moisture content which will allow use of the specified compaction equipment and consistent achievement of the specified density.
- C. Compaction: As required to achieve the specified density, increase the number of passes above the minimum specified and/or modify the weight of the equipment.
 1. Determine the maximum dry density in accordance with ASTM D698 for cohesive soils and ASTM D4253 for cohesionless soils.
 2. Minimum number of passes for all compacted fill types: 8.
 3. Cohesive Soils: A tamping compactor or tamping compactor followed by a pneumatic roller shall be used.
 4. Cohesionless or low cohesive soils: A vibratory roller or vibratory plate compactors shall be required if the material is cohesionless or with less than 15 percent passing the No. 200 sieve. Confirm applicability of vibratory compaction equipment in the field.
 5. Overlap passes a minimum of 1 feet for heavy compaction equipment and 50 percent of the baseplate width for hand-directed equipment.
 6. Backfill density shall be as indicated in Table 1, "Compacted Fill."

Table 1: Compacted Fill			
Backfill Type	Density ¹	Moisture Content ^{2,3}	Comments
Structural fill	95%	-0% to +2%	N/A

¹ The percentage indicated is the minimum required percentage of the maximum dry density as determined by the applicable ASTM.

² Range indicated is the acceptable tolerance with respect to the optimum moisture content.

³ Completely cohesionless materials, shall be at a moisture content which will allow use of the specified compaction equipment and result in consistent achievement of the specified density.

3.05 FIELD QUALITY CONTROL

- A. Contractor is responsible for the costs involved in providing an approved testing agency to perform quality control testing of backfill operations and verification of subgrade bearing

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material. The testing laboratory shall make tests of in-place density and moisture in accordance with ASTM Standards previously mentioned in this Section. The testing agency shall monitor backfill operations continuously or at intervals acceptable to the Owner's representative. It shall be the responsibility of the Contractor to notify the testing agency a minimum of 2 business days before backfill operations begin.

1. Unless noted otherwise, in-place density tests shall be conducted at a rate of one test per 1500 square feet for every lift.

END OF SECTION

31 25 00 EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish all labor, equipment and materials needed to complete the Work as shown on the Drawings and specified herein.
- B. The Work performed under this Section shall comply with the plan requirements for this Project and with the requirements and intent of the NPDES Storm Water Discharge Permit program to the extent that it applies to this Project.

1.2 RELATED SECTIONS

- A. Section 31 00 00 "Earthwork."
- B. Section 32 92 00 "Sodding."

1.3 QUALITY ASSURANCE

- A. Comply with applicable requirements of all governing authorities having jurisdiction. The Specifications and the Drawings are not represented as being comprehensive, but rather to convey the intent to provide complete slope protection and erosion control for both the Owner's and adjacent property.
- B. Erosion control measures shall be established at the beginning of construction and maintained during the entire length of construction. On-site areas which are subject to severe erosion and off-site areas which are especially vulnerable to damage from erosion and/or sedimentation are to be identified and receive additional erosion control measures as directed by the Owner.
- C. All land-disturbing activities shall be planned and conducted to minimize the size of the area to be exposed at any one time and to minimize the time of exposure.
- D. Surface water runoff originating upgrade of exposed area shall be controlled to reduce erosion and sediment loss during the period of exposure.
- E. When the increase in the peak rates and velocity of storm water runoff resulting from a land-disturbing activity is sufficient to cause accelerated erosion of the receiving ditch or stream, the Contractor shall install measures to control both the velocity and rate of re-lease so as to minimize accelerated erosion and increased sedimentation of the stream as directed by the Owner.
- F. All land-disturbing activities shall be planned and conducted so as to minimize off-site sedimentation damage.

- G. The Contractor shall be responsible for periodically cleaning out and disposing of all sediment once the storage capacity of the drainage feature or structure receiving the sediment is reduced by one-half. The Contractor shall also be responsible for cleaning out and disposing of all sediment at the time of completion of the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Silt Fence Fabric:
 - 1. Mirafi 100X or approved equal.
 - 2. Minimum Bursting Strength: 300 psi.
 - 3. Edges treated to prevent unraveling.
 - 4. Furnished with o-rings or clips to facilitate attachment to woven wire fabric.
- B. Wire Fencing: Steel wire fencing (hog wire) with minimum 14 gauge wire and a maximum 14 gauge wire and a maximum opening of 6 inches.
- C. Posts:
 - 1. Steel, T-section minimum 4 feet 6 inches long, minimum of 1.3 pounds per foot with-out anchor plate.
 - 2. Anchor plate attached before coating.
 - 3. Fabricate with lugs or other approved means to prevent vertical movement from the wire fencing.
- D. Tie Wire: Galvanized in accordance with ASTM A112.
- E. Temporary cover for graded areas shall be undamaged, air dry threshed straw free from weed seeds.

PART 3 - EXECUTION

3.1 CONDITION OF SUBSTRATE

- A. Erosion control measures must be implemented prior to the commencement of any soil disturbing activity.
- B. Stabilize fill and grade of areas to receive soil erosion and sediment control in accordance with Section 31 00 00 "Earthwork". Maintain positive drainage to sediment and erosion control devices during and after grading operations.

3.2 SILT FENCE

- A. Install steel posts on a minimum of 4-foot centers. Minimum embedment of 6 inches.

- B. Minimum height of the silt fence to be 2 feet with a 6-inch clearance between the top of the silt fence and the top of the posts.
- C. Install the steel posts on a slight angle towards the anticipated runoff surface.
- D. Trench in the toe of the silt fence so that the down slope face of the trench is flat and perpendicular to the line of flow.
- E. Minimum trench depth: 6 inches.
- F. Trench width: 6 inches.
- G. Attach wire fence (hog wire) to the posts.
- H. Attach the silt fence fabric to the wire fence (hog wire) and secure with a minimum of two wire ties per post.
- I. Backfill over the silt fence fabric in the trench.
- J. When build-up of soil, silt, or any other material behind the silt fence reaches a height of 6 inches or when the silt fence is no longer functioning efficiently, remove all accumulated material and repair the silt fence as needed.

3.3 DUST CONTROL

- A. Dust control of the Contractor's performance of the Work shall be performed by the Contractor by applying water.
- B. Dust control shall be provided in the amounts and locations as ordered by the Owner's Representative.

3.4 PROTECTION AND MAINTENANCE

- A. Protect erosion and sediment control devices from damage. Repair and replace dikes, silt fences and other measures when damaged by construction, natural and other physical causes. All soil erosion and sediment control devices shall be repaired or replaced at the expense of the Contractor and shall function as originally intended.
- B. Periodically (at least once every 7 days and after each rainfall event) inspect and maintain erosion and sediment control structures, until final stabilization of disturbed ground areas is achieved.
- C. All stock piled soil shall be surrounded by a silt fence to properly control sediment runoff.
- D. Inspection services provided by the Owner's Representatives do not relieve the Contractor's responsibility for inspection and maintenance of the erosion control measures.

- E. The Contractor is responsible for modifying or providing additional erosion control devices to control erosion from its operations on the Site. This may become necessary due to disturbance of additional areas or phasing of the Contractor's operations.

3.5 STAGING AREAS

- A. At such time when the specific location of the staging areas are determined, silt fences, diversions, or equivalent sediment controls are required for all side slope and down slope boundaries of the staging area and shall be provided by the Contractor. The erosion control plan for each staging area shall be approved by the Owner's Representative and devices shall be in place prior to occupation of the staging areas. All relative material and labor to construct and maintain the staging area erosion control plans shall be subsidiary to the other items of Work.

3.6 PAYMENT

- A. Payment for "Erosion Control" shall be on a lump sum basis. The amount bid for this item shall be paid over the duration of the project with the amount paid on each monthly progress estimate determined by the percent complete on all other bid items. This item shall include installation and maintenance of silt fence, construction entrances, inlet protection, rock check dams, other erosion control features, and all costs for preparing, implementing and maintaining a Storm Water Pollution Prevention Plan (SWPPP), from the beginning of construction through final acceptance and establishment of grass coverage, including all fees and costs associated with submitting an NOI and NOT for both the CONTRACTOR and the CITY. It will be the responsibility of the CONTRACTOR to develop a SWPPP. The CONTRACTOR shall submit two (2) copies of the plan to the OWNER for general conformance review. Once the SWPPP is deemed acceptable, the CONTRACTOR shall obtain a National Pollutant Discharge Elimination System (NPDES) permit. The SWPPP is to be kept on the construction site and implemented throughout the construction duration. Once construction is complete, the system shall be dismantled and removed from the site.

PART 4. - Storm Water Prevention Pollution Plan (SWPPP)

It shall be the full responsibility of the CONTRACTOR to acquire and comply with any and all permits as may be required to avoid delay of the project.

Prior to construction, the CONTRACTOR shall comply with Federal and State storm water management regulations. The plan shall employ measures to prevent erosion and siltation from the construction disturbance from reaching stream beds, channels, storm water structures, ponds, etc. The plan shall comply with the requirements of the "Integrated Storm Water Management Design Manual for Construction" published by NCTCOG. In the event of a conflict between these requirements and Federal and State pollution control laws, rules, and regulations or other Federal, State or Local agency laws, rules, and regulations, the more restrictive shall apply. The release of the plan for construction by the CITY in no way relinquishes the CONTRACTOR of all responsibility and liability for the pollution control. The CONTRACTOR shall be solely responsible and liable for all activities at the construction site necessary for

compliance with Federal and State storm water regulations and the Storm Water Pollution Prevention Plan for the site.

The SWPPP shall conform to the following City of Lewisville requirements:

- A. All site specific information required by the TCEQ Construction General Permit (Part III, Section F) must be included in the SWPPP. Restatement of information directly from the Construction General Permit is not acceptable. The CONTRACTOR must describe specifically what measures are planned at the construction site.
- B. All signature documents must be signed and dated prior to submittal for review. This includes SWPPP certifications, Notices of Intent (NOI), Construction Site Notices, and Inspector Delegation Letters. If there are multiple Operators for the project, each Operator's signature documents must be signed and dated. The City of Lewisville will complete its own signature documents during the review process. All forms must be signed by an appropriate signatory authority, and include the person's job title, where required. SWPPPS without the proper signatures will be returned without review.
- C. The specific inspection schedule must be described in the SWPPP. The CONTRACTOR must clearly state whether he will be implementing the 14-day (and within 24 hours after a ½ inch rainfall) schedule, or the 7-day schedule.
- D. The CONTRACTOR must include a copy of the inspection form that will be used. The form must include the required certification statement and allow for signature by the inspector, as required by the Construction General Permit.
- E. The SWPPP must include a section in which to document the dates of the following activities: when major grading activities occur; when construction activities temporarily or permanently cease on a portion of the site; the dates when stabilization measures are initiated. If there is no section for this information, the CONTRACTOR must document the information on the inspection reports, and the CONTRACTOR must state in the SWPPP that the information will be documented in this manner.
- F. The SWPPP must describe what types of temporary and/or permanent stabilization will be implemented at the site. For example, if the plan is to seed the disturbed area and maintain it until a uniform, established vegetative growth is achieved, then this must be detailed in the SWPPP.
- G. The CONTRACTOR must identify the erosion and sediment controls that are planned at the site, including sweeping activities. All structural controls (i.e. silt fence, check dams, rock entrances) must be shown on the site map. The CONTRACTOR must also describe how he plans to maintain those erosion and sediment controls in proper working order.
- H. The SWPPP must include both a General Vicinity Map and a Detailed Site Map. The site map must include all of the information listed in Part III, Section F (g) of the Construction General Permit. The CONTRACTOR may use the Erosion Control map from the Construction Plans, provided that it includes all of the necessary information. It is recommended that a separate site map be developed for the SWPPP, to avoid deficiencies.
- I. The SWPPP must clearly state whether or not any support activities, such as concrete or batch plants, are planned. This is because support activities do not always qualify for coverage under the Construction General Permit, and separate permit coverage may be necessary.

- J. If the project disturbs 10 acres or more with a common drainage location, and a sediment basin is not employed, the rationale for this decision must be documented in the SWPPP. The equivalent erosion and sediment control devices that are to be used must be described.
- K. Allow a minimum of 2 days for review of the SWPPP.
- L. At least two copies of the completed SWPPP must be submitted to the City. One copy will be maintained by the Storm Water Division, and one other copy will be reviewed and returned to the CONTRACTOR.

The cost to the CONTRACTOR for the preparation of the SWPPP for the project shall be incidental to the various items of erosion control. The erosion control plan included in the project construction plans shall be incorporated into the SWPPP. Items required by the SWPPP that are not included as bid items are subsidiary to the various items of erosion control. The various bid items for erosion control shall include all costs for implementing and maintaining the Storm Water Pollution Prevention Plan, from the beginning of construction through final acceptance and establishment of grass coverage.

Any disturbed areas, whether inside or outside the project limits, where construction activities are complete or won't be worked on for 14 days, must be permanently or temporarily stabilized. **Stabilization measures must be initiated no later than one day after completing work in an area or determining that work will be temporarily stopped for more than 14 days in that area.** Temporary stabilization can include the use of erosion blankets such as Curlex or other methods approved by the City inspector. Permanent stabilization will require topsoil and established grass, unless otherwise shown on the project landscaping plans.

Final acceptance of seeded areas will be granted when a sufficient cover of grass is established. Placement of temporary or permanent erosion control measures in unstabilized areas after contract time has expired will be considered subsidiary to this bid item. Once final acceptance of permanent stabilized areas is granted, **the Contractor shall notify the City inspector prior to removing the Construction Site Notice sign and submit the final copy to the City within one week of removal.**

END OF SECTION

32 01 90 PRESERVATION AND PROTECTION OF PLANT MATERIALS

PART 1 - GENERAL

1.1 WORK OF THIS SECTION

- A. The Drawings, Standard General Conditions of Contract, Supplementary Conditions and NCTCOG 4th edition Specification Sections apply to Work of this Section.

1.2 DESCRIPTION

- A. Preservation and protection of native plant materials within the Project Site.

1.3 PROTECTION OF PLANT MATERIALS

- A. It is the intention of this Section that all native plant material at this Project Site not specifically indicated on the Drawings for removal be protected and preserved. Take all necessary precautions to avoid damage or removal of trees, shrubs and other plant materials that are to remain following construction. Specimen trees and other plants within and closely adjacent to construction sites shall be adequately protected by the Contractor, according to Drawings and Specifications. Additional protective measures may be installed by the Contractor at its option to preclude damage by its workmen and equipment.

PART 2 - PRODUCTS

2.1 PLANT PROTECTION DEVICES

- A. Protective plastic construction fencing as indicated on the Drawings.

PART 3 - EXECUTION

3.1 EQUIPMENT AND MATERIAL STORAGE

- A. Contractor to install protective plastic construction fencing in locations indicated on the Drawings prior to beginning construction operations. All tree protection measures shall be removed by the Contractor after final acceptance by the Owner. Maintain protective devices in good order for the duration of the construction period. Also, the Contractor is to maintain the grounds inside and outside of the tree protection areas to the Owner's acceptable standards. Additional protective devices or barriers, required by the Owner during the course of construction, will be added to the Work by Change Order. Protective devices so added are to be installed immediately and shall be maintained in good condition until construction is concluded. Protective devices are further defined to include references in the Specifications, or

notes on the Drawings as to construction limits, clearing limits, work limits or other such notes which indicate the area or right-of-way in which the Contractor must work.

3.2 REPARATION FOR DAMAGES

- A. Unwarranted damages to plant material shall be evaluated by a member of the Owner's staff and instructions issued for the necessary repairs. The Contractor shall accomplish the corrective work as ordered, or may, at its option, provide monetary reimbursement by Change Order reduction to the Contract. The value established by the Owner will be final and shall be based on repairs by a qualified technician approved by the Owner. Plant material destroyed or removed by the Contractor or damaged beyond corrective repair will be evaluated and assessed as outlined above for reparable damage. In the event large irreplaceable plants are destroyed, the Owner will establish a fair value and may, at its discretion, require replacement by installation of several trees or other plants equaling the fair value of the tree(s) or plant(s) destroyed.
- B. The value of plant materials will be determined utilizing \$15.00 per square inch of trunk cross-sectional area taken 4-feet 6-inches above grade.
- C. Plants considered to be of special value to the completed Project are noted on the Drawings and their values cited. Noted plant values will supersede values obtained through the above-referenced formula calculation. Source for determination of value on plant materials: Shade Tree Evaluation - International Arborists Association.

3.3 PLANT PRUNING AND LIMB REMOVAL

- A. Plant protection requirements cited above include authorized pruning and cutting of limbs and major roots. The Contractor is cautioned not to cut, prune or otherwise remove plant parts without prior approval and guidance by the Owner. Major limb removal, which may be required by construction shall be as noted on the Drawings, approved prior to such removal and shall be accomplished by technicians trained and skilled in the work.

3.4 BURNING

- A. Fires and/or burning are prohibited, unless approved and permitted through the City of Lewisville.

END OF SECTION

32 91 19.13 TOPSOIL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Drawings, Standard General Conditions of Contract, Supplementary Conditions and NCTCOG 4th edition Specification Sections apply to Work of this Section.

1.2 DESCRIPTION

- A. This Section governs the preparation of the ground surface for topsoil application, removal of topsoil from designated stockpiles or areas to be stripped from approved sources off the Site, and placement of the topsoil on prepared areas in accordance with this Section at the locations shown on the Drawings or as directed by the Owner.

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 31 00 00 "Earthwork."

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Topsoil:
 - 1. Topsoil shall be the surface layer of soil with no admixture of refuse or any material toxic to plant growth or hazardous to humans and animals, and it shall be free from subsoil and stumps, roots, brush, stones 2 inches or more in diameter, clay lumps or similar objects. Brush and other vegetation which will not be incorporated with the soil during handling operations shall be cut and removed. Ordinary sods and herbaceous growth such as grass and weeds are not to be removed but shall be thoroughly broken up and intermixed with the soil during handling operations. The topsoil or soil mixture, unless otherwise specified or approved, shall have a pH range of approximately 5.5 pH to 7.6 pH when tested in accordance with the methods of testing of the Association of Official Agricultural Chemists in effect on the date of invitation of bids. The organic content shall be not less than 2 percent nor more than 20 percent as determined by the wet-combustion method (chromic acid reduction). There shall be not less than 20 percent nor more than 80 percent of the material passing the 200 mesh sieve as determined by the wash test in accordance with AASHTO T 11.
 - 2. All topsoil to be imported by the Contractor shall conform to the above specifications.
- B. Inspection and Tests: Ten days prior to stripping topsoil for use on Site, the Owner's representative shall be notified of the source of topsoil to be furnished by the Contractor. The

topsoil shall be inspected to determine the depth to which stripping will be permitted. At this time, the Contractor may be required to take representative soil samples from several locations within the area under consideration and to the proposed stripping depths for testing purposes as specified in Paragraph 2.01.A.

PART 3 - EXECUTION

3.1 GENERAL

- A. Areas to receive topsoil include all areas disturbed by construction which are to be revegetated, as indicated on the Drawings, or as instructed by the Owner in writing.
- B. Suitable equipment necessary for proper preparation and treatment of the ground surface, stripping of topsoil, and for the handling and placing of all required materials shall be on hand, in good condition, and approved by the Owner before the various operations are started.

3.2 PREPARING THE GROUND SURFACE

- A. Immediately prior to dumping and spreading the topsoil on any area, the surface shall be loosened by discs or spike-tooth harrows, or by other means approved by the Owner, to a minimum depth of 2 inches to facilitate bonding of the topsoil to the covered subgrade soil. The surface of the area to be topsoiled shall be cleared of all stones larger than 1 inch in any dimension and all litter or other material which may be detrimental to proper bonding, the rise of capillary moisture, or the proper growth of the desired planting. Limited areas, as shown on the Drawings, which are too compact to respond to these operations shall receive scarification by the use of small tillers or hand tools.
- B. Grades on the areas to be topsoiled which have been established by others, as shown on the Drawings, shall be maintained in a true and even condition. Where grades have not been established, the areas shall be smooth-graded and the surface left at the prescribed grades in an even and properly compacted condition to prevent, insofar as practical, the formation of low places or pockets where water will stand.

3.3 OBTAINING TOPSOIL

- A. Prior to the stripping of topsoil from designated areas, any vegetation, briars, stumps and large roots, rubbish or stones found on such areas which may interfere with subsequent operations shall be removed using methods approved by the Owner. Heavy sod or other cover which cannot be incorporated into the topsoil by discing or other means shall be removed.
- B. When suitable topsoil is secured off the Site, the Contractor shall locate and obtain the supply, subject to the approval of the Owner. The Contractor shall notify the Owner sufficiently in advance of operations in order that necessary measurements and tests can be made. The Contractor shall remove the topsoil from approved areas and to the depth as directed. The topsoil shall be hauled to the site of the Work and placed for spreading, or spread as required.

Any topsoil hauled to the site of the Work and stockpiled shall be re-handled and placed without additional compensation.

3.4 PLACING TOPSOIL

- A. The topsoil shall be evenly spread on the prepared areas to a uniform depth of 4 inches after compaction, unless otherwise shown on the Drawings. Spreading shall not be done when the ground or topsoil is frozen, excessively wet, or otherwise in a condition detrimental to the Work. Spreading shall be carried on so that turving operations can proceed with a minimum of soil preparation or tilling.
- B. After spreading, any large stiff clods and hard lumps shall be broken with a pulverizer or by other effective means, and all stones or rocks 1 inch or more in diameter, roots, litter or any foreign matter shall be raked up and disposed of by the Contractor. After spreading is completed, the topsoil shall be satisfactorily compacted by rolling with a cultipacker or by other means approved by the Owner. The compacted topsoil surface shall conform to the required lines, grades and cross-sections. Any topsoil or other dirt falling upon pavements as a result of hauling or handling of topsoil shall be promptly removed.

END OF SECTION

32 92 00 SODDING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Provide materials, labor to install and maintain for the guarantee period all areas sodded.

1.2 RELATED SECTIONS

- A. Section 32 84 23 "Irrigation System."
- B. Section 32 93 00 "Trees, Shrubs, and Groundcover."

1.3 DEFINITIONS

- A. Sod: Thick matting of growing and living grass on a smooth bed free of foreign material, rocks larger than 1 inch in diameter and weeds.
- B. Stand of Grass: A uniform growth of specified grass plants covering all bare ground surface areas designated on the Drawings.

1.4 QUALITY ASSURANCE

- A. Reference Standards:
 - 1. Official Method of Analysis of the Association of Official Analytical Chemists.
 - 2. American Sod Producers Association (ASPA), latest edition.
- B. Source Quality Control:
 - 1. Owner reserves right to inspect and approve the sod before it is cut at the source of the sod.
 - 2. Inspection of sod at the source does not preclude the right of rejection at the Site.

1.5 PROJECT CONDITIONS

- A. Environmental Requirements:
 - 1. Sodding shall be completed on or before August 1 or as approved by Owner.
 - 2. Frozen sod may not be used nor shall sod be placed on frozen ground.
 - 3. In times of drought, special provisions must be made to prevent the drying of the sod. All provisions shall be approved by the Owner.
 - 4. Do not sod when soil is excessively wet or dry.
- B. Protection: Restrict foot and vehicular traffic from sodded areas after laying until final inspection and acceptance.

1.6 GUARANTEE

- A. Substantial Completion: Sod shall be approved as being in accordance with the Specifications upon completion of the installation.
- B. Guarantee Period: A stand of grass for 90 days after Substantial Completion shall be guaranteed.
- C. Maintenance Period:
 - 1. Maintain newly laid sod until entire Project is accepted by the Owner.
 - 2. Any sodded areas that become eroded, damaged or any areas of sod that fail to become established satisfactorily, according to the Owner, shall be repaired and/or replaced at no additional expense to the Owner.
 - 3. Repair construction related damage to other plants or lawns during the maintenance period at no additional expense to the Owner.
 - 4. Maintenance shall consist of, but not be limited to:
 - a. Weeding.
 - b. Watering.
 - c. Mowing and Edging.
 - d. Spraying.
 - e. Fertilizing.
 - f. Repair of Erosion Damage.
- D. Final Acceptance will be provided by the Owner only upon completion of the entire Project and the establishment of a stand of grass as defined herein.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Sod:
 - 1. Species: Buffalo Grass (*Bouteloua dactyloides*) for all areas.
 - 2. The sod shall be free of weeds or undesirable foreign plants, large stones, roots or other materials which might be detrimental to the development of the sod or to future maintenance.
 - 3. Sod shall be cut with approved sod cutters so that after it is placed, but before it is compacted, it shall have a uniform thickness of not less than 3/4 inch. The sod sections shall be cut in uniform widths, not less than 10 inches and in lengths of not less than 18 inches.
 - 4. Sod shall be uniform in color, leaf texture and shoot density.
- B. Fertilizer:
 - 1. Uniform composition.
 - 2. Pelletized.
 - 3. Containing following minimum percentage of plant food by weight:
 - a. Nitrogen: 8 percent.
 - b. Phosphoric Acid: 4 percent.
 - c. Potash: 24 percent.

4. The fertilizer shall be delivered to the Site in bags or other sealed containers, each fully labeled, conforming to the applicable state fertilizer laws, and bearing the name, trade name or trademark and warranty of the producer.
- C. Water: Potable, available on-site. Contractor shall furnish temporary piping, hoses and connections as required.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Check that preceding Work affecting ground surface is completed, properly graded and drains well.
- B. Verify that soil is within allowable range of moisture content.
- C. See that the soil is free of weeds and foreign material immediately before sodding. Remove rocks and stones which are larger than 1 inch in diameter, remove from the Site and dispose of in an approved location.
- D. Do not start Work until conditions are satisfactory. To begin Work indicates acceptance of conditions.

3.2 PREPARATION

- A. All areas to be sodded are to be bladed and graded smooth. All clods shall be removed or be incorporated into existing soil. All debris shall be disposed of off-site at an approved location.
- B. Till fertilizer into top 2 inches of soil at rate of 125 pounds per acre.

3.3 APPLICATION

- A. The sod shall be moist and shall be placed on a moist soil bed.
- B. Sod shall be harvested, delivered and laid within a period of 24 hours, unless a suitable preservation method is approved prior to delivery. Sod not transplanted within this period shall be inspected for acceptance by the Owner prior to its installation.
- C. The sod shall be carefully placed by hand, edge to edge (with no gaps), and with staggered joints in rows parallel with the contours. Do not stretch or overlap sod.
- D. The sod shall immediately be pressed firmly into contact with the soil bed by rolling with approved equipment to provide a true and even surface.
- E. Screened soil of acceptable quality shall be used to fill all cracks between pads of sod; however, the quantity of the top dressing soil shall not be so great as to smother the grass.

- F. The surface of the soil in the sod after compaction shall be flush with or just below adjacent paving.
- G. Water sodded areas to a minimum depth of 2 inches after planting.

3.4 PROTECTION

- A. Immediately after sodding, erect barricades and warning signs as required to protect the areas from traffic until sod is established.

3.5 SOD ESTABLISHMENT

- A. Watering:
 - 1. The sod shall be kept moist from the time of its placement until it has become established and its continued growth ensured.
 - 2. Watering shall be done at a rate which will avoid erosion and excessive runoff.
- B. Mowing:
 - 1. When grass reaches approximately 4 inches in height, mow to 2 to 2-1/2 inches in height.
 - 2. Do not cut off more than 40 percent of grass leaf in single mowing.
 - 3. Do not remove grass clippings.
- C. Repairing: Any areas that become eroded, damaged or any areas of sod that fails to become established satisfactorily, according to the Owner, shall be repaired and/or replaced at no expense to the Owner.

3.6 RESTORATION

- A. Repair damages done to the Site caused by the Contractor at no additional expense to Owner.

3.7 CLEANING

- A. Remove trash and excess materials from the Site.
- B. Maintain paved areas in clean condition.
- C. Remove barriers and signs from the Site at termination of the maintenance period.

END OF SECTION

32 92 19.16 HYDRAULIC SEEDING

ARTICLE 1: GENERAL

1.01 SECTION INCLUDES

- A. Remove stones, sticks, roots and other debris from finish graded areas to receive turf; soil preparation, fertilization, and hydraulic seeding of areas designated for hydraulic seeding or hydromulching as shown on the Drawings.
- B. Establishment of temporary erosion control grass.

1.02 DEFINITIONS

- A. Stand of Grass, Permanent: 150 growing common bermuda grass plants per square foot, to be established within 2 weeks of planting date, on a smooth bed free of foreign material, weeds, and rocks.
- B. Stand of Grass, Temporary: Complete coverage of the non-vegetated areas of the Site at the beginning of the construction period. The temporary grass shall be maintained to a level of growth to establish and maintain erosion control.
- C. Provisional Acceptance: Approval of Hydraulic Seeding as being in conformance with these Specifications upon completion of the installation.
- D. Final Acceptance: Approval of the establishment of a "Stand of Grass" as defined herein, and the assumption of turf maintenance by the Owner.

1.03 SUBMITTALS

- A. Test Reports: Results of seed purity and germination tests.
- B. Certificates: Manufacturer's certification that seed and mulch meet specification requirements.
- C. File all results and certificates with Owner prior to final acceptance.
- D. Maintenance Instructions: Submit to Owner prior to final acceptance.
- E. Test Reports: Submit certification of fertilizer analysis.

1.04 QUALITY ASSURANCE

- A. Meet requirements of Official Method of Analysis of the Association of Official Analytical Chemists.
- B. Source Quality Control: Producer's test for purity and germination of seed, dated within 9 months of sowing and submit to Owner.

1.05 JOB CONDITIONS

- A. Environmental Requirements:
 - 1. Seed between calendar dates from May 1 to August 1. Seeding shall commence no later than August 1.

2. Do not seed when excessively wet or dry.
3. Do not perform seeding or hydromulching when wind exceeds 15 mph.
- B. Do not begin hydraulic seeding operations until the permanent and temporary irrigation systems have been demonstrated to be operable and reliable.
- C. Protection: Restrict foot and vehicular traffic from seeded areas after planting and hydromulching until final inspection and acceptance.

1.06 ESTABLISHMENT AND MAINTENANCE

- A. Provisional Acceptance: Upon completion of Hydraulic Seeding operation, obtain written approval of the installation from the Landscape Architect.
- B. Establishment Period: Establish a stand of grass, as defined herein, in 90 days or less.
- C. Maintenance:
 1. Maintain new seeding until all turf areas are accepted by Owner.
 2. Reseed during this period as required to meet minimum standards at no additional expense to Owner.
 3. Repair damage to other plants or lawns during maintenance period at no additional expense to Owner.
 4. Maintenance shall consist of but not be limited to:
 - a. Weeding.
 - b. Watering.
 - c. Mowing and edging.
 - d. Spraying.
 - e. Fertilizing.
 - f. Temporary erosion control and erosion repair.
- D. Final Acceptance will be provided by Owner only upon establishment of a uniform stand of grass throughout the entire Site. Upon Final Acceptance of the turf, Owner will assume turf maintenance operations.

1.07 RESTORATION

- A. Repair damage done to existing site improvements caused by Contractor.

ARTICLE 2: PRODUCTS

2.01 MATERIALS

- A. Seed - Permanent Grass:
 1. Species: Hulled Common Bermuda Grass (*Cynodon dactylon*) of 98 percent purity.
 2. Percent of Live Seed: 85 percent
 3. Clean, dry, new crop seed.

4. Free of all weeds.
- B. Seed - Temporary Grass:
1. Species: Annual Ryegrass (*Lolium multiflorum*) of 95 percent purity.
 2. Percent of Live Seed: 85 percent.
 3. Clean, dry, new crop seed.
 4. Free of all weeds.
- C. Fertilizer:
1. Pelletized.
 2. Containing following minimum percentage of plant food by weight:
 - a. Nitrogen (N): 8 percent.
 - b. Phosphoric Acid (P2O5): 20 percent.
 - c. Potash (K2O): 8 percent.
 - d. Magnesium (Mg): 5 percent.
 3. A minimum of 25 percent of the total Nitrogen shall be derived from Sulphur coated area: 45 percent from urea, and the remaining 30 percent from monamonium phosphate.
 4. The fertilizer shall be delivered to the Site in bags or other convenient containers, each fully labeled, conforming to the applicable state fertilizer laws, and bearing the name, trade name or trademark, and warranty of the producer.
- D. Mulch:
1. Maximum Moisture Content: 12 percent plus 3 percent, VTM-47
 2. Cellulose Fiber Content: 98.6 percent plus 2 percent, ASTM D586
 3. Ash Content: 1.6 percent maximum, ASTM D586
 4. PH: 6.5 plus 1.
 5. Minimum Water Holding Capacity: 90 percent minimum, VTM-46
 6. Mulch shall be dyed green with a biodegradable dye that does not inhibit plant growth.
 7. Wood fiber mulch shall be packaged in units not exceeding 100 lb. The package shall contain current labels, manufacturer's name and net weight.
- E. Tackifier: Terra Tack AR or Terra Tack II as manufactured by Grass Growers, 424 Cottage Place, Plainfield, New Jersey, 02060.
- F. Water: Potable, available on-site. All water required during construction to be provided by the Contractor until final acceptance. Contractor shall furnish temporary hoses and connections as required.

ARTICLE 3: EXECUTION

3.01 INSPECTION

- A. Contractor shall check that preceding Work affecting ground surface is completed.
- B. Contractor shall verify that soil is within allowable range of moisture content.
- C. Contractor shall see that the soil is free of weeds and foreign material immediately before seeding. Remove rocks and stones which are larger than 2 inches in diameter and remove from the Site.
- D. Contractor shall not start Work until conditions are satisfactory. To begin Work indicates acceptance of conditions.

3.02 PREPARATION

- A. All areas to be seeded are to be bladed and graded smooth. All clods shall be removed or incorporated into existing soil and all debris shall be disposed of off-site.
- B. Soil should be watered to a minimum depth of 4 inches at least 48 hours prior to seeding.

3.03 FERTILIZER

- A. Apply fertilizer twice. The first application shall be performed in a north-south direction. The second application shall be performed in an east-west direction. Both fertilizer applications shall be performed at a rate of 560 lb. per acre.
- B. Disc the first fertilizer application into the soil to a depth of 2 inches to 4 inches.
- C. The second fertilizer application shall be performed concurrently with hydraulic seeding and shall be a surface application.

3.04 HYDRAULIC SEEDING

- A. Apply hydraulic seeding materials with an approved spray applicator equipment suitable for the seed, mulch and stabilizer specified.
- B. Apply materials at the following rates:
 - 1. Mulch with Tackifier: 1600 pounds per acre (36.75 pounds per 1000 square feet).
 - 2. Hulled Common Bermuda Grass: 130 pounds per acre (3 pounds per 1000 square feet).
 - 3. Annual Ryegrass: 350 pounds per acre (8 pounds per 1000 square feet.)
 - 4. Tackifier: As specified by manufacturer.
- C. Water all hydroseeded areas to a minimum depth of 4 inches.

3.05 PROTECTION

- A. Immediately after seeding and hydromulching, erect barricades and warning signs as required to protect seeded areas from traffic until grass is established.

3.06 SEED ESTABLISHMENT

A. Watering:

1. Keep soil moist during seed germination period.
2. Supplement rainfall as required until a stand of grass is established.

B. Mowing:

1. When grass reaches 3 inches in height, mow to 2-1/2 inches in height. Continue mowing operation until Final Acceptance of the turf by Owner.
2. Do not cut off more than 30 percent of grass leaf in single mowing.
3. Do not remove grass clippings.

C. Reseed all bare spots not having a uniform stand of grass at no additional expense to Owner.

D. The Contractor will be required to establish a stand of grass prior to acceptance of the job. A uniform stand of grass shall be defined as a total coverage of the planting soil by the specified turfgrass to the satisfaction of the Owner. The Contractor is responsible for all watering, weeding, and replanting during the time which is necessary to establish a uniform stand of grass.

E. If hydromulching must occur after the date August 15 and before May 1, a cool-season grass mixture will be used temporarily. On April 15, this stand of grass will be scalped and all areas to be seeded will be re-seeded with the previously specified turfgrass. All temporary grassing due to specified planting dates is the responsibility of the Contractor.

3.07 CLEANING

- A. Remove trash and excess materials from the Site.
- B. Maintain paved areas in clean condition.
- C. Remove barriers and signs from the Site at termination of establishment period.

END OF SECTION

32 93 00 TREES, SHRUBS, AND GROUND COVER

PART 1 - GENERAL

1.1 WORK OF THIS SECTION

- A. The Drawings, Standard General Conditions of Contract, Supplementary Conditions and NCTCOG 4th edition Specification Sections apply to Work of this Section.

1.2 DESCRIPTION

- A. Trees, Shrubs, Perennials, Ground Cover, Soil Amendments, Incidental Products and Installation Procedures.
- B. Guarantee and Maintenance.

1.3 DEFINITIONS

- A. AAN: American Association of Nurserymen.
- B. Owner: Owner, Owner's Representative, or designated consultant employee.

1.4 QUALITY ASSURANCE

- A. Contractor Qualifications: Minimum of 3 years of experience on projects of similar characteristics and size.
- B. Reference Standards:
 - 1. American Joint Committee of Horticultural Nomenclature: Standardized Plant Names, Second Edition, 1942.
 - 2. American Association of Nurserymen, Inc., American Standard for Nursery Stock, 1986 (ANSI Publication Z60.1-1986).
 - 3. Official Method of Analysis of the Association of Official Analytical Chemists (AOAC).
- C. Substitution:
 - 1. Install substitutions only upon written approval of the Owner.
 - 2. Submit substitutions possessing same characteristics as plant or material indicated.
 - 3. Do not substitute plants of less cost than plant indicated.
 - 4. Where larger plants are substituted by Contractor, substitute plants of greater value without any additional cost to Owner.
- D. Quality Control:
 - 1. Contractor shall be responsible for all material shown on Drawings. Submit documentation to the Owner with bid that all plant material is available. Any and all substitutions due to unavailability must be requested in writing and submitted with bid.

All plants shall be subject to inspection and approval by the Owner at place of growth or upon delivery to the Site for conformity to the Specifications. Such approval shall not impair the right of inspection and rejection during progress of the Work.

2. The Contractor shall submit specifications of any item being used on-site upon the request of the Owner.
3. At least one plant of each species delivered to the Site will have an identification tag from the supply nursery showing common and botanical plant names. Do not remove tag until after final inspection.

1.5 SUBMITTALS

- A. Certificates:
 1. Test Reports: Submit certification of fertilizer analysis with invoice.
 2. File certificates with Owner prior to material acceptance.
- B. Manufacturer's Product Literature, as Applicable.
- C. Maintenance Instructions: Submit written maintenance schedule for maintaining plant material after completion of job to Owner before the final inspection.

1.6 PRODUCT DELIVER, STORAGE AND HANDLING

- A. Preparation for Delivery:
 1. Pack plant material to protect against climatic, seasonal, and breakage injuries during transit.
 2. Securely cover plant tops with tarpaulin or canvas to minimize windwhipping and drying. Use anti-desiccant only upon approval of Owner.
 3. Pack and ventilate to prevent sweating of plants during transit by rail. Give special attention to insure prompt delivery and careful handling to point of delivery at planting job site.
- B. Delivery:
 1. Deliver fertilizer and soil amendments to Site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trademark and conformance to State law.
 2. The Contractor shall furnish the Owner with two copies of receipts for all amendments specified herein.
 3. Deliver all plants with legible identification labels.
 4. Protect plant material during delivery to prevent damage to root ball or desiccation of leaves.
 5. The Contractor shall notify the Owner 10 days in advance of delivery of all plant materials and shall submit an itemized list of the plants in each delivery.
- C. Storage:
 1. Protect roots of plant material from drying or other possible injury with soil or acceptable material.
 2. Store plant material in an area which is shaded and protected from the weather.

3. Maintain and protect plant material not to be planted immediately upon delivery in a healthy, vigorous condition.
4. Erect temporary fence and store material inside in manner approved by Owner.

D. Handling:

1. The Contractor is cautioned to exercise care in handling, loading, unloading and storing of plant materials. Plant materials that have been damaged in any way will be discarded and if installed, shall be replaced with undamaged materials at the Contractor's expense.
2. Do not drop plants.
3. Do not pick up container or balled plants by stem or trunks.
4. Lift and handle balled plants from bottom of ball.

1.7 JOB CONDITIONS

- A. Protection: Before excavations are made, take precautionary measures to protect lawn areas driven over by vehicles and where soil is temporarily stacked.
- B. Scheduling:
1. Perform actual planting only when weather and soil conditions are suitable in accordance with locally accepted practice.
 2. Install trees, shrubs, perennials and ground cover plants prior to lawn installation.
 3. Coordinate special scheduling with Landscape Irrigation Contractor.

1.8 SAMPLES AND TEST

- A. Owner reserves the right to take and analyze samples of materials for conformity to specifications at any time.
- B. Contractor shall furnish samples upon request by Owner. Rejected materials shall be immediately removed from the Site at Contractor's expense. Cost of testing of materials not meeting specifications shall be paid by Contractor.

1.9 GUARANTEE AND MAINTENANCE

- A. Final Acceptance:
1. The Contractor shall request final acceptance in writing 10 days before the anticipated date.
 2. Planting type, size and number shall be approved by the Owner as being in accordance with the Drawings and Specifications.
 3. Any plant required under this Contract that is dead, or injured, diseased, or not true to its name or size as determined by the Owner shall be immediately removed from the Site and replaced at no additional cost to the Owner.
- B. Guarantee and Replacement:

1. Guarantee plant materials to be in a healthy, vigorous and attractive growing condition for a period of 1 year for shrubs, perennials, ground cover and trees. Guarantee shall begin immediately upon final acceptance by the Owner.
2. During the guarantee period, replace plants which die, become diseased or unhealthy, or are otherwise found to be in a poor condition, as determined by the Owner, at no additional expense to the Owner.
3. The guarantee will not apply to damage or injury to plant materials caused by vandalism, vehicles and storms.
4. Replace guaranteed plants within 15 days of written notification by the Owner.

C. Maintenance Period:

1. Maintain all planting areas until receipt of written final acceptance by the Owner.
2. All replacement of plant material during maintenance and guarantee period shall be with original size and planting mixture as shown on the Drawings.
3. Repair all damages to plants and/or lawns at no additional expense to the Owner.
4. Maintenance shall consist of but not be limited to:
 - a. Weeding.
 - b. Watering.
 - c. Pruning (as directed by the Landscape Architect).
 - d. Spraying.
 - e. Fertilizing.

- D. Final Inspection: At this inspection, all plants must be in a healthy growing condition, weed free, pruning complete and staking and guying secure. Acceptance shall follow upon meeting these requirements.

1.10 SITE OR FIELD VISITS BY THE LANDSCAPE ARCHITECT

- A. The Landscape Architect will visit the Site once to examine plant materials for type, size and character specified. The Landscape Architect will also visit the Site once to examine installed plant materials.
- B. Should additional trips be required due to rejection of plant materials or improper or inadequate completion of the Work, the cost of additional trips will be paid for by the Contractor. Such costs will include the Landscape Architect's time, travel, meals and other miscellaneous related expenses.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Plant Material (See Drawings for Type and Size):
 1. Plants shall conform with State of Texas Regulations for nursery inspections, rules and rating. All plants shall have a normal habit of growth and shall be sound, healthy, vigorous and free of insect infestations, plant diseases, sunscalds, windburn, knots, injuries, fresh abrasions of the bark, excessive abrasions, or other objectionable disfigurements. Tree

trunks shall be sturdy and have well “hardened” systems and vigorous and fibrous root systems which are not root or pot-bound. In the event of disagreement as to condition of root system, the root conditions of the plants furnished by the Contractor in containers will be determined by removal of earth from the roots of not less than two plants nor more than 2 percent of the total number of plants of each species or variety. Where container-grown plants are from several sources, the roots of not less than two plants of each species or variety from each source will be inspected. In case the sample plants inspected are found to be defective, the Owner reserves the right to reject the entire lot or lots of plants represented by the defective samples. The Owner is the sole judge as to acceptability. Any plants rendered unsuitable for planting because of this inspection will be considered as samples and will be provided at the expense of the Contractor.

2. The size and shape of the plants will correspond with that normally expected for species and variety of commercially available nursery stock or as specified on Drawings. The overall shape and the minimum acceptable size of all plants measured before pruning with the branches in normal position shall conform with the AAN Standards. Plants larger in size than specified may be used with the approval of the Owner, but the use of larger plants will cause no change in Contract Price. If the use of larger plants is approved, the ball of earth or spread of roots for each plant will be increased proportionately.
3. All plants not conforming to the requirements herein specified shall be considered defective and such plants, whether in place or not, shall be marked as rejected and immediately removed from the Site and replaced with new plants at the Contractor's expense.
4. Pruning: Trees or plant materials shall be pruned or trimmed prior to delivery. Any alteration of their shape shall be conducted only with the approval and when in the presence of the Owner. In no case will the removal of branch leaders (TIPS) be permitted.
5. Plant material shall be true to botanical and common name and variety.
6. Nursery Grown and Collected Stock:
 - a. All plant material shall be nursery grown stock except as noted on the Drawings or as approved in writing by the Landscape Architect.
 - b. Grown under climatic conditions similar to those in locality of Project.
 - c. Container-grown stock in vigorous, healthy condition, not root-bound or with root system hardened off.
 - d. Use only liner stock plant material which is well established in removable containers or formed homogeneous soil sections.
 - e. If required, provide proof that material was nursery grown. All rejected stock shall be replaced at Contractor's expense.
7. Trees:
 - a. Single straight trunks unless indicated otherwise.
 - b. Trees with weak, thin trunks not capable of support will not be accepted.
 - c. Trees, with a specified trunk caliper of 3 inches or more shall not branch less than 4 feet above finish grade, unless specified as multi-trunk.

B. Imported Topsoil for Prepared Soil Mixtures:

1. Sandy loam from a source approved by the Owner. 100 percent passing through a 1-inch screen.
 - a. Sand (2000 mm to 0.50 mm): 40 to 50 percent.
 - b. Silt (0.050 mm to 0.005 mm): 30 to 40 percent.
 - c. Clay (0.005 mm and smaller): 10 to 30 percent.

2. Free of subsoil, brush, stumps, roots, organic litter, objectionable weeds, clods, shale, stones 1-inch minimum dimension or larger, or other material harmful to grading, planting, plant growth, or maintenance operations.
 3. Presence of vegetative parts of Bermuda grass, Johnson grass, nut grass (*Cyperus rotundus*), and other hard to eradicate weeds or grass will be cause for rejection of topsoil. Contractor must provide written verification as to the absence of such weeds.
- C. Commercial Fertilizer:
1. Uniform composition.
 2. Pelletized.
 3. Containing following minimum percentage of plant food by weight:
 - a. Available Nitrogen: 10 or 12 percent.
 - b. Available Phosphoric Acid: 10 or 12 percent.
 - c. Available Potash: 10 or 12 percent.
- D. Organic Soil Conditioner: Compost as manufactured by Living Earth Technology (214) 869-4332, or approved equal.
- E. Sharp Sand: Clean, washed sand, fine to coarse sizes, free of clay lumps or other objectionable materials.
- F. Water: Potable, available on-site. Contractor shall furnish temporary hoses and connections as required.
- G. Tree Paint: Morrison Tree Seal, Cabot's Tree Paint, or equal.
- H. Pre-Emergence Herbicide: EPTAM or an approved equal.
- I. Steel Edging: 14 Gauge Ryerson, or an approved equal.
- J. Guying and Staking Materials: Refer to Drawings.
- K. Mulch: Twice-shredded hardwood mulch free of insects, debris, trash, weeds, seeds, and other noxious materials as manufactured by Living Earth Technology (214) 869-4332 or an approved equal.
- L. Controlled Release Fertilizer Tablets: Agriform tablets as manufactured by Sierra Chemical Co.; 21-gram tablets with the following percentages of available nutrients by weight:
1. Nitrogen: 28 percent.
 2. Phosphorus: 8 percent.
 3. Potassium: 4 percent
- M. Peat Moss: Canadian, Dutch or German Sphagnum peat moss. Peat moss shall be delivered in original, unopened and unbroken packages.
- N. Soil Acidifier: Dispersul or an approved equal.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Contractor shall verify that established grades are correct and determine locations of all underground utilities prior to beginning planting.
- B. Contractor shall see that all planting areas are free of all weed and foreign material prior to beginning planting.
- C. Contractor shall inspect trees, shrubs, perennials and ground cover plants for injury, insect infestation, and trees and shrubs for improper size and shape.
- D. Contractor shall not begin planting until deficiencies are corrected, or plants replaced. To begin Work indicates acceptance of site conditions.

3.2 PLANT LOCATIONS AND MEASUREMENTS

- A. Stake outline of planting beds on ground.
- B. Stake locations of trees.
- C. Place shrubs and ground cover in indicated locations.
- D. Notify Owner of discrepancies between plants indicated on the Drawings and the actual conditions prior to planting.
- E. Plant locations will be approved by Owner prior to planting.

3.3 FINAL GRADES

- A. Minor modification to grade may be required to establish the final grade.
- B. Fine grading shall insure proper drainage of the Site as determined by the Landscape Architect.
- C. All areas shall be fine graded so that the finished grades will be 1 inch in lawn and 2 inches in shrub and perennial and groundcover areas, below adjacent paved areas, sidewalks, valve boxes, headers, clean-outs, drains, manholes, etc., or as indicated on Drawings.
- D. Surface drainage shall be away from all building foundations at a 2 percent minimum for 5 feet minimum.
- E. All erosion scars shall be filled and compacted prior to planting installation.
- F. Disposal of any unacceptable or excess soil shall be done at location approved by Owner at the expense of the Contractor.

3.4 EXCAVATION FOR PLANTING

- A. Pits:
 - 1. Shape:
 - a. Vertical sides and crowned bottom.
 - b. Plant pits to be circular.
 - 2. Size for Trees: Two times the width of the root ball and 6 inches deeper than root ball.
 - 3. Size for Shrubs: Two times the width of the root ball and 3 inches deeper than root ball.
- B. Perennial and Ground Cover Beds: Excavate existing soil to the depth noted in Paragraph 3.05.
- C. Obstructions Below Ground:
 - 1. Remove rock or underground obstructions to depth of 6 inches below bottom of plant ball or root, measured when plant is properly set at the required grade.
 - 2. If underground obstructions cannot be removed, notify Owner for new instructions.
 - 3. Avoid damaging underground utility lines.
 - 4. Repair damage to existing utilities at no additional expense to Owner.
- D. Disposal of Excess Soil:
 - 1. Use acceptable excess excavated topsoil for filling holes, pits, and beds as directed by the Owner.
 - 2. Dispose of unacceptable or unused excess soil at an off-site location as directed by the Owner at the expense of the Contractor.

3.5 SOIL PREPARATION

- A. Soil Preparation for Shrub, Perennial and Ground Cover Beds:
 - 1. Pre-Plant Weed Control:
 - a. If live perennial weeds exist on-site at the beginning of Work, spray with a non-selective systemic contact herbicide, as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for at least 15 days to allow systemic kill. Apply herbicide in strict accordance with manufacturer's instructions.
 - b. Clear and remove these existing weeds by scraping or grubbing off all plant parts at least 1/4 inch below the surface of the soil over the entire area to be planted.
 - 2. Soil Amendment for Ground Cover Beds:
 - a. Prior to soil amending, the subgrades shall be 6 inches below finish grade to allow for the following amendments and fertilizer. The layer of soil amendments shall be 4 inches deep, leaving a finish grade 2 inches below the adjacent paved areas. Excavation and/or fill may be required to achieve these grades.
 - 1) Application Rates:
 - a) Organic Soil Conditioner: 2-inch deep layer.
 - b) Topsoil: 2-inch deep layer.
 - c) Fertilizer: 10 lb. per 1000 sq. ft. of bed area.
 - b. Amendments shall be uniformly spread and thoroughly cultivated, to a light and friable consistency, by means of a mechanical rototiller into the top 2 inches of subgrade which will make a bed of approximately 6 inches total depth of amended soil.

3. Soil Amendment for Shrub Beds:
 - a. Prior to soil amending the subgrades shall be 10 inches below finish grade to allow for the following amendments and fertilizer. The layer of soil amendments shall be 8 inches deep, leaving a finish grade 2 inches below the adjacent paved areas. Excavation and/or fill may be required to achieve these grades.
 - 1) Application Rates:
 - a) Organic Soil Conditioner: 4-inch deep layer.
 - b) Topsoil: 4-inch deep layer.
 - c) Fertilizer: 10 lb. per 1000 sq. ft. of bed area.
 - b. Amendments shall be uniformly spread and thoroughly cultivated to a light and friable consistency, by means of a mechanical rototiller into the top 8 inches of subgrade which will make a bed of approximately 16" total depth of amended soil.
4. At time of planting, the top 2 inches of all areas to be planted shall be free of stones, stumps, or other deleterious matter 1 inch in diameter or larger and shall be free from all wire, plaster or similar objects that would be a hindrance to planting or maintenance.
5. Pre-Emergence Herbicide: Prior to planting, apply to shrub, perennial and ground cover beds at rates recommended by manufacturer. Incorporate into top 1/2 inch of soil by handraking.

B. Prepared Backfill for Trees and Large Shrubs:

1. Planting mixture for trees and shrubs (5 gallons and larger) shall consist of the following materials:
 - a. Topsoil: 2 parts.
 - b. Peat Moss: 1 part.
 - c. Sharp Sand: 1 part.

3.6 PLANTING INSTALLATION

A. General:

1. Actual planting shall be performed during those periods when weather and soil conditions are suitable and in accordance with locally accepted practice, or as approved by the Owner.
2. Only as many plants as can be planted and watered on that same day shall be distributed in a planting area.
3. Containers shall be opened and plants shall be removed in such a manner that the ball of earth surrounding the roots is not broken and they shall be planted and watered as herein specified immediately after removal from the containers. Containers shall not be opened prior to placing the plants in the planting area.
4. Set plants in pits at level shown on the details.
5. Set plants plumb and rigidly braced in position until planting mixture has been tamped solidly around plant ball.
6. Thoroughly settle plant by watering and tamping planting mixture.
7. Rake planting beds level before and after planting.
8. Thoroughly water trees and shrubs.
9. Stake and guy all trees according to the details.

B. Balled Plants:

1. Place in pit on planting mixture that has been hand-tamped.
 2. Place with burlap intact so location of ground line at top of plant ball will be same as prior to digging.
 3. Remove binding at top of ball and lay top of burlap back 6 inches.
 4. Remove any wire from the entire root ball.
 5. Do not pull wrapping from under ball.
 6. Do not plant if ball is cracked or broken before or during planting process or if stem is loose.
 7. Backfill with planting mixture.
- C. Container-Grown Plants:
1. Cut cans on two sides with an acceptable can cutter.
 2. Do not injure root ball.
 3. Carefully remove plants without injury or damage to root balls.
 4. After removing plant, superficially cut edge roots with knife on three sides.
 5. Place in pit on planting mixture that has been hand-tamped prior to placing plant.
 6. Backfill with planting mixture.
- D. Mulching:
1. Cover watering basins or planting beds evenly with a layer of mulch a minimum of 3 inches deep, after settlement.
 2. Water immediately after mulching.
 3. Hose down planting area with a fine spray to wash mulch off of leaves of plants.
- E. Pruning:
1. Prune minimum necessary to remove injured twigs and branches, deadwood, suckers.
 2. Do not prune evergreens, except to remove injured branches.
 3. Pruning shall not exceed 1/3 branching structure.
 4. Make cuts flush leaving no stubs.
 5. Paint cuts over 3/4-inch diameter with approved tree-wound paint.
- F. Steel Edging:
1. Install where shown on Drawings.
 2. Install per manufacturer's specifications.
- G. Staking and Guying: Staking of all trees shall be completed immediately after planting as indicated on drawings.
- H. Planting of Ground Covers:
1. Ground cover shall be planted in straight rows and evenly spaced, unless otherwise noted, and at intervals called out in the Drawings. Triangular spacing shall be used unless otherwise noted on the Drawings.
 2. Plantings shall be immediately irrigated after planting until the entire area is soaked to the full depth of each root ball.
 3. Care shall be exercised at all times to protect the plants after planting. Any damage to plants by trampling or other operations of this Contract shall be repaired immediately.
- I. Controlled Release Fertilizer: Provide controlled release fertilizer tablets in accordance with the manufacturer's instructions at the following rates:

1. Shrubs - Less than 5 Gallons: None.
2. Shrubs - 5 Gallons or Larger: 2 tablets each.
3. Trees: 1 tablet per 1/2 inch of trunk caliper, measured 1 foot above the top of root ball.

J. Watering:

1. Water as required when soil moisture is below optimum level for best plant growth.
2. Coordinate watering with Owner and recommend watering schedule for areas to be watered with landscape irrigation system as well as those to be watered manually.

3.7 CLEANUP

- A. After planting operations have been completed, remove all trash, excess soil, empty plant containers and rubbish from the property. All scars, ruts or other marks in the ground caused by this work shall be repaired and the ground left in a neat and orderly condition throughout the Site. Contractor shall pick up all trash resulting from this work daily. All trash shall be completely removed from the Site to an approved location.
- B. The Contractor shall wash down all paved areas, leaving the premises in a clean condition.

END OF SECTION

Item 502

Barricades, Signs, and Traffic Handling



1. DESCRIPTION

Provide, install, move, replace, maintain, clean, and remove all traffic control devices shown on the plans and as directed.

2. CONSTRUCTION

Comply with the requirements of Article 7.2., "Safety."

Implement the traffic control plan (TCP) shown on the plans.

Install traffic control devices straight and plumb. Make changes to the TCP only as approved. Minor adjustments to meet field conditions are allowed.

Submit Contractor-proposed TCP changes, signed and sealed by a licensed professional engineer, for approval. The Engineer may develop, sign, and seal Contractor-proposed changes. Changes must conform to guidelines established in the TMUTCD using approved products from the Department's Compliant Work Zone Traffic Control Device List.

Maintain traffic control devices by taking corrective action when notified. Corrective actions include, but are not limited to, cleaning, replacing, straightening, covering, and removing devices. Maintain the devices such that they are properly positioned and spaced, legible, and have retroreflective characteristics that meet requirements day or night and in all weather conditions.

The Engineer may authorize or direct in writing the removal or relocation of project limit advance warning signs. When project limit advance warning signs are removed before final acceptance, provide traffic control in accordance with the TMUTCD for minor operations as approved.

Remove all traffic control devices upon completion of the work as shown on the plans or as directed.

3. MEASUREMENT

Barricades, Signs, and Traffic Handling will be measured by the month. ~~Law enforcement personnel with patrol vehicles will be measured by the hour for each person.~~

4. PAYMENT

- 4.1. **Barricades, Signs, and Traffic Handling.** Except for Contracts with callout work and work orders, the work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Barricades, Signs, and Traffic Handling." This price is full compensation for installation, maintenance, adjustments, replacements, removal, materials, equipment, labor, tools, and incidentals.

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Barricades, Signs, and Traffic Handling." This price is full compensation for installation, maintenance, adjustments, replacements, removal, materials, equipment, labor, tools, and incidentals.

When the plans establish pay items for particular work in the TCP, that work will be measured and paid under pertinent Items.

4.1.1. **Initiation of Payment.** Payment for this Item will begin on the first estimate after barricades, signs, and traffic handling devices have been installed in accordance with the TCP and construction has begun.

4.1.2. **Paid Months.** Monthly payment will be made each succeeding month for this Item provided the barricades, signs, and traffic handling devices have been installed and maintained in accordance with the TCP until the Contract amount has been paid.

If, within the time frame established by the Engineer, the Contractor fails to provide or properly maintain signs and barricades in compliance with the Contract requirements, as determined by the Engineer, the Contractor will be considered in noncompliance with this Item. No payment will be made for the months in question, and the total final payment quantity will be reduced by the number of months the Contractor was in noncompliance.

4.1.3. **Maximum Total Payment Before Acceptance.** The total payment for this Item will not exceed 10% of the total Contract amount before final acceptance in accordance with Article 5.12., "Final Acceptance." The remaining balance will be paid in accordance with Section 502.4.1.5., "Balance Due."

4.1.4. **Total Payment Quantity.** The quantity paid under this Item will not exceed the total quantity shown on the plans except as modified by change order and as adjusted by Section 502.4.1.2., "Paid Months." An overrun of the plans quantity for this Item will not be allowed for approving designs; testing; material shortages; closed construction seasons; curing periods; establishment, performance, test, and maintenance periods; failure to complete the work in the number of months allotted; nor delays caused directly or indirectly by requirements of the Contract.

4.1.5. **Balance Due.** The remaining unpaid months of barricades less non-compliance months will be paid on final acceptance of the project, if all work is complete and accepted in accordance with Article 5.12., "Final Acceptance."

4.1.6. **Contracts with Callout Work and Work Orders.** The work performed and the materials furnished with this Item and measured as provided under "Measurement," will be considered subsidiary to pertinent Items, except for federally funded Contracts.

~~4.2. **Law Enforcement Personnel.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement," will be paid by Contractor for account for "Law Enforcement Personnel." This price is full compensation for furnishing all labor, materials, supplies, equipment, patrol vehicle, fees, and incidentals necessary to complete the work as directed.~~

Item 636

Signs



1. DESCRIPTION

- **Installation.** Furnish, fabricate, and erect aluminum signs. Sign supports are provided for under other Items.
- **Replacement.** Replace existing signs on existing sign supports.
- **Refurbishing.** Refurbish existing aluminum signs on existing sign supports.

2. MATERIALS

- 2.1. **Sign Blanks.** Furnish sign blank substrates in accordance with [DMS-7110](#), "Aluminum Sign Blanks," and in accordance with the types shown on the plans. Use single-piece sheet-aluminum substrates for Type A (small) signs and extruded aluminum substrates for Type G (ground-mounted) or Type O (overhead-mounted) signs.
- 2.2. **Sign Face Retroreflectorization.** Retroreflectorize the sign faces with flat surface reflective sheeting. Furnish sheeting that meets [DMS-8300](#), "Sign Face Materials." Use retroreflective sheeting from the same manufacturer for the entire sign face background. Ensure that sign legend, symbols, borders, and background exhibit uniform color, appearance, and retroreflectivity when viewed both day and night.
- 2.3. **Sign Messages.** Fabricate sign messages to the sizes, types, and colors shown on the plans. Use sign message material from the same manufacturer for the entire message of a sign. Use screen ink and background reflective sheeting that are from the same manufacturer when fabricating signs.
 - Ensure that the screened messages have clean, sharp edges and exhibit uniform color and retroreflectivity. Prevent runs, sags, and voids. Furnish screen inks in accordance with [DMS-8300](#), "Sign Face Materials."
 - Fabricate colored, transparent film legend, and retroreflectorized sheeting legend from materials that meet [DMS-8300](#), "Sign Face Materials."
 - Fabricate non-reflective black film legend from materials meeting [DMS-8300](#), "Sign Face Materials."
 - Furnish direct-applied route markers and other attachments within the parent sign face unless otherwise specified on the plans.
- 2.4. **Hardware.** Use galvanized steel, stainless steel, or dichromate-sealed aluminum for bolts, nuts, washers, lock washers, screws, and other sign assembly hardware. Use plastic or nylon washers to avoid tearing the reflective sheeting. Furnish steel or aluminum products in accordance with [DMS-7120](#), "Sign Hardware."

When dissimilar metals are used, select or insulate metals to prevent corrosion.

3. CONSTRUCTION

- 3.1. **Fabrication.** Sign fabrication plants that produce permanent highway signs must be approved in accordance with DMS-7390, "Permanent Highway Sign Fabrication Plant Qualification." Furnish signs from prequalified fabrication plants listed in the Department's MPL.
- 3.1.1. **Sign Blanks.** Furnish sign blanks to the sizes and shapes shown on the plans and that are free of buckles, warps, burrs, dents, cockles, or other defects. Do not splice individual extruded aluminum panels.

Complete the fabrication of sign blanks, including the cutting and drilling or punching of holes, before cleaning and degreasing. After cleaning and degreasing, ensure the substrate does not come into contact with grease, oils, or other contaminants before the application of the reflective sheeting.

- 3.1.2. **Sheeting Application.** Apply sheeting to sign blanks in conformance with the sheeting manufacturer's recommended procedures.

When using rotational sensitive white sheeting, fabricate signs by applying the sheeting for cut-out legend, symbols, borders, and route marker attachments within the parent sign face with the identification marks or other orientation features in the optimum rotation as identified by the sheeting manufacturer.

Clean and prepare the outside surface of extruded aluminum flanges in the same manner as the sign panel face.

Minimize the number of splices in the sheeting. Overlap the lap-splices by at least 1/4 in. for encapsulated glass bead sheeting unless otherwise recommended by the reflective sheeting manufacturer. Use butt splices for prismatic reflective sheeting. Provide a 1 ft. minimum dimension for any piece of sheeting. Do not splice sheeting for signs fabricated with transparent screen inks or colored transparent films.

- 3.1.3. **Sign Assembly.** Assemble extruded aluminum signs in accordance with the details shown on the plans. Sign face surface variation must not exceed 1/8 in. per foot. Surface misalignment between panels in multi-panel signs must not exceed 1/16 in. at any point.

- 3.1.4. **Decals.** Code and apply sign identification decals in accordance with Item 643, "Sign Identification Decals."

- 3.2. **Storage and Handling.** Ship, handle, and store completed sign blanks and completed signs so that corners, edges, and faces are not damaged. Damage to the sign face that is not visible when viewed at a distance of 50 ft., night or day, will be acceptable. Replace unacceptable signs.

Store all finished signs off the ground and in a vertical position until erected. Store finished sheet aluminum substrate signs in a weatherproof building. Extruded aluminum substrate signs may be stored outside.

Stockpile salvageable materials at the location shown on the plans or as directed. Accept ownership of unsalvageable materials and dispose of them in accordance with federal, state, and local regulations.

- 3.3. **Cleaning.** Wash completed signs in the fabrication shop with a biodegradable cleaning solution acceptable to the manufacturers of the sheeting, colored transparent film, and screen ink to remove grease, oil, dirt, smears, streaks, finger marks, and other foreign material. Wash again before final inspection after erection.

- 3.4. **Installation.** Install signs as shown on the plans or as directed.

- 3.5. **Replacement.** Remove the existing signs from the existing supports and replace with new signs, including mounting hardware, as shown on the plans.

- 3.6. **Refurbishing.** Refurbish existing signs by providing and installing new messages and mounting hardware. Install new retroreflectorized legend and supplemental signs as shown on the plans.

- 3.7. **Documentation.** Provide the following documentation from the sign fabricator with each shipment of furnished signs:

- A notarized original of the Signing Material Statement (Form 2273) with the proper attachments for verification of compliance, and
- A notarized certification stating that the completed signs were fabricated in accordance with this Item and the plans.

4. MEASUREMENT

Each Sign

Signs installed or replaced will be measured by ~~the square foot of the sign face~~. Signs refurbished will be measured by each sign.

This is a plans quantity measurement item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

5. PAYMENT

The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Aluminum Signs," "Replacing Existing Aluminum Signs," or "Refurbishing Aluminum Signs," of the type specified.

- 5.1. **Installation.** This price is full compensation for furnishing and installing new signs and hardware; fabrication of sign panels; treatment of sign panels required before application of the background materials; application of the background materials and messages to the sign panels; furnishing and fabricating frames, wind beams and stiffeners; furnishing bolts, rivets, screws, fasteners, clamps, brackets, and sign support connections; assembling and erecting the signs; preparing and cleaning the signs; and materials, equipment, labor, tools, and incidentals.
- 5.2. **Replacement.** This price is full compensation for furnishing and installing new aluminum signs and hardware; removal of existing signs; fabrication of sign panels; treatment of sign panels required before application of the background materials; application of the background materials and messages to the sign panels; furnishing and fabricating frames, wind beams and stiffeners; furnishing bolts, rivets, screws, fasteners, clamps, brackets, and sign support connections; assembling and erecting the signs; preparing and cleaning the signs; salvaging and disposing of unsalvageable materials; and materials, equipment, labor, tools, and incidentals.
- 5.3. **Refurbishing.** This price is full compensation for modifying existing sign messages; removing and replacing existing route markers, reflectorized legend, or supplemental signs attached to the parent sign; preparing and cleaning the signs; furnishing sheeting and hardware; salvaging and disposing of unsalvageable materials; and materials, equipment, labor, tools, and incidentals.

Item 644

Small Roadside Sign Assemblies



1. DESCRIPTION

- **Installation.** Furnish, fabricate, and erect small roadside sign assemblies or bridge mounted clearance sign assemblies consisting of the signs, sign supports, foundations (when required), and associated mounting hardware.
- **Relocation.** Relocate existing small roadside sign assemblies or bridge mounted clearance sign assemblies, and furnish and fabricate material as required.
- **Removal.** Remove existing small roadside sign assemblies or bridge mounted clearance sign assemblies.

2. MATERIALS

Furnish all materials unless otherwise shown on the plans. Furnish only new materials. Furnish and fabricate materials that comply with the following Items and details shown on the plans:

- Item 421, "Hydraulic Cement Concrete"
- Item 440, "Reinforcement for Concrete"
- Item 441, "Steel Structures"
- Item 442, "Metal for Structures"
- Item 445, "Galvanizing"
- Item 636, "Signs"
- Item 643, "Sign Identification Decals"
- Item 656, "Foundations for Traffic Control Devices"

Use galvanized steel, stainless steel, dichromate sealed aluminum, or other materials shown on the plans for pipe, bolts, nuts, washers, lock washers, screws, and other sign assembly hardware. When dissimilar metals are used, select or insulate metals to prevent corrosion.

3. CONSTRUCTION

Construct foundations in accordance with Item 656, "Foundations for Traffic Control Devices." Plumb sign supports. Do not spring or rake posts to secure proper alignment. Use established safety practices when working near underground or overhead utilities. Consult the appropriate utility company before beginning work.

- 3.1. **Fabrication.** Fabricate sign supports in accordance with Item 441, "Steel Structures." Ensure all components fit properly.

Verify the length of each post for each sign before fabrication to meet field conditions and sign-mounting heights shown on the plans.

Hot-dip galvanize fabricated parts in accordance with Item 445, "Galvanizing." Punch or drill any holes in steel parts or members before galvanizing. Repair galvanizing for any steel part or member damaged during assembly, transit, erection; or for any steel part or member welded, when permitted, after galvanizing. Perform all galvanizing repairs in accordance with Section 445.3.5., "Repairs."

- 3.2. **Installation.** Locate and install sign supports as shown on the plans, unless directed to shift the sign supports within design guidelines to secure a more desirable location or avoid conflict with utilities and underground appurtenances. Stake sign support locations for verification by the Engineer.
- Install stub posts of the type, spacing, orientation, and projection shown on the plans. Remove and replace posts damaged during installation at the Contractor's expense.
- Connect the upper post sections to the stub post sections as shown on the plans. Torque connection bolts as shown on the plans.
- Attach signs to supports in accordance with the plans and pertinent Items.
- 3.3. **Relocation.** Reuse the existing signs as required unless otherwise shown on the plans. Furnish and install new stub posts in new foundations for relocated sign assemblies. Erect the new supports on the new stub posts, and attach the existing signs to the supports in accordance with the plans and pertinent Items. Remove existing foundations to be abandoned in accordance with Section 644.3.4., "Removal."
- 3.4. **Removal.** Remove abandoned concrete foundations to 2 ft. below finish grade unless otherwise shown on the plans. Cut off and remove steel protruding from the remaining concrete. Backfill the remaining hole with material equal in composition and density to the surrounding area. Replace any surfacing with like material to equivalent condition.
- 3.5. **Handling and Storage.** Handle and store existing signs or portions of signs removed so they are not damaged. Prevent any damage to the various sign assembly components. Replace any portion of the sign damaged by the Contractor designated for reuse or salvage, including messages removed.
- Stockpile all removed sign components that will be reused or become the property of the Department at designated locations. Accept ownership of unsalvageable materials, and dispose of them in accordance with federal, state, and local regulations.
- 3.6. **Cleaning.** Wash the entire sign after installation with a biodegradable cleaning solution acceptable to the sign face materials manufacturer to remove dirt, grease, oil smears, streaks, finger marks, and other foreign materials.

4. MEASUREMENT

This Item will be measured as each small roadside assembly or bridge mounted clearance sign assembly installed, removed, or relocated.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Install Small Roadside Sign Assemblies" of the type specified, "Install Bridge Mounted Clearance Sign Assemblies" of the type specified, "Relocate Small Roadside Sign Assemblies" of the type specified, "Relocate Bridge Mounted Clearance Sign Assemblies" of the type specified, "Remove Small Roadside Sign Assemblies," or "Remove Bridge Mounted Clearance Sign Assemblies."

- 5.1. **Installation.** This price is full compensation for furnishing, fabricating, galvanizing, and erecting the supports; constructing foundations including concrete (when required); furnishing complete signs including sign connections and all hardware; attaching the signs to the supports; preparing and cleaning the signs; and materials, equipment, labor, tools, and incidentals.
- 5.2. **Relocation.** This price is full compensation for removing existing sign assemblies and related materials; furnishing and installing new stub posts and new sign supports; constructing foundations including concrete

(when required); and new hardware; reinstallation of signs; preparing and cleaning the signs; salvaging; disposal of unsalvageable materials; removing existing foundations, backfilling, and surface placement; and materials, equipment, labor, tools, and incidentals.

5.3.

Removal. This price is full compensation for removing existing sign assemblies and related materials; salvaging; disposal of unsalvageable materials; removing existing foundations, backfilling, and surface placement; and materials, equipment, labor, tools, and incidentals.

DMS-8220

Hot Applied Thermoplastic

Effective Date: July 2016



1. DESCRIPTION

This Specification governs the materials, composition, quality, sampling, and testing of the following thermoplastic pavement marking materials:

- thermoplastic pavement marking materials, used with reflective glass beads to form a reflective stripe;
- thermoplastic profile pavement marking materials, used with reflective glass beads and a specified profile pattern to produce a reflective stripe and a rumble effect; and
- thermoplastic shadow pavement marking materials, used with a black, colorfast, anti-skid material to form a shadow marking.

2. UNITS OF MEASUREMENTS

The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

3. MATERIAL PRODUCER LIST

The Materials and Pavements Section of the Construction Division (CST/M&P) maintains the Material Producer List (MPL) of all materials conforming to the requirements of this Specification. Materials appearing on the MPL, entitled "[Thermoplastic Pavement Marking Materials](#)," require no further testing unless deemed necessary by the Project Engineer or CST/M&P.

4. BIDDERS' AND SUPPLIERS' REQUIREMENTS

The Department will only purchase or allow on projects those products listed by producer and product code or designation shown on the MPL.

Use of pre-qualified product does not relieve the Contractor of the responsibility to provide product that meets this Specification. The Department may inspect or test material at any time and reject any material that does not meet the specifications.

5. PRE-QUALIFICATION PROCEDURE

- 5.1. **Pre-Qualification Request.** Submit **on company letterhead** a request for evaluation under DMS-8220 to DMS_Prequal@txdot.gov.

Include the following information in the request:

- company name;
- physical and mailing addresses;
- contact person, phone number, and email address;
- type of material; and

- certification that all glass traffic beads contain no more than 200 ppm of arsenic or lead as determined by certified independent (third-party) laboratory in accordance with Environmental Protection Agency testing methods 3052, 6010B, or 6010C.

- 5.2. **Pre-Qualification Sample.** After reviewing the pre-qualification request, the Department will contact the producer to request 50-lb. samples of each color of regular thermoplastic, profile thermoplastic, and shadow marking thermoplastic for laboratory testing and evaluation. Include 5 lb. of the black, colorfast, anti-skid material when submitting shadow marking thermoplastic. Include with the samples current safety data sheets (SDS) that comply with OSHA Hazard Communication Standard 29 CFR 1910.1200.

Submit all materials for pre-qualification at no cost to the Department.

- 5.3. **Laboratory Evaluation.** CST/M&P will notify prospective bidders and suppliers after completion of the laboratory evaluation.

- 5.3.1. **Qualification.** Upon successful completion of the laboratory evaluation, CST/M&P will add to the MPL any regular thermoplastic or shadow marking thermoplastic material approved for use on Department projects.

Provide additional independent certified test reports as outlined in Section 5.1 when requested.

Profile thermoplastic requires an additional field evaluation as specified in Section 5.4 prior to qualification.

Report changes in the composition or in the manufacturing process of any material to CST/M&P. Significant changes reported by the producer, as determined by the Director of CST/M&P, may require a re-evaluation of performance. The Department reserves the right to conduct whatever tests it deems necessary to identify a pre-qualified material and determine if there is a change in the composition, manufacturing process, or quality that may affect its durability or performance. In case of variance, the Department's tests will govern.

- 5.3.2. **Failure.** Producers not qualified under this Specification may not furnish materials for use on Department projects.

Producers failing to qualify may submit a request for re-evaluation after 1 year has elapsed from the date of the original request. CST/M&P may modify this time limit at its discretion. In the request for re-evaluation, document the cause of the issue and corrective action taken.

The Department normally bears the costs of sampling and testing; however, the producer will bear the costs associated with materials failing to conform to the requirements of this Specification. The Director of CST/M&P will assess this cost at the time of testing, and amounts due will be billed to the producer.

- 5.4. **Field Evaluation for Profile Markings.** Upon successful completion of the laboratory evaluation, the Department will contact producers of profile thermoplastic to schedule an additional 1-year field evaluation prior to final approval. All material, installation, and necessary traffic control costs will be at no cost to the Department.

- 5.4.1. **Provisional Qualification.** The Department may grant provisional approval after 6 months and add profile marking materials meeting all performance requirements to the MPL with a provisional designation.

- 5.4.2. **Qualification.** Upon successful completion of the field evaluation, the Department will remove the provisional designation from the MPL to signify full qualification.

Report changes in the composition or in the manufacturing process of any material to CST/M&P. The Department will review significant changes reported, and the material may require a re-evaluation. The Department reserves the right to conduct whatever tests it deems necessary to identify a pre-qualified material and determine if there is a change in the composition, manufacturing process, or quality that may affect its durability or performance.

- 5.4.3. **Failure.** If the material does not meet all performance requirements after the final field evaluation, the Department will remove the material from the MPL. Producers not qualified under this Specification may not furnish materials for Department projects.

Producers failing to qualify may submit a request for re-evaluation after 1 year has elapsed from the date of the original request. CST/M&P may modify this time limit at its discretion. In the request for re-evaluation, the producer must document the cause of the issue and corrective action taken.

- 5.5. **Periodic Evaluation.** The Department reserves the right to conduct random sampling and testing of pre-qualified materials to verify performance and Specification compliance and to perform random audits of documentation. The Department will select random samples from materials submitted on Contracts, will sample in accordance with Tex-862-B, and will test in accordance with Tex-863-B.

Failure of materials to comply with the requirements of this Specification as a result of periodic evaluation may be cause for removal of those materials from the MPL. In case of variance, the Department's tests will govern.

- 5.6. **Disqualification.** Causes for disqualification and removal from the MPL include, but are not limited to:
- falsification of documentation
 - producer fails to report any change in material composition or manufacturing process to CST/M&P,
 - material fails to meet the requirements of this Specification as a result of periodic evaluation,
 - material fails to exhibit the necessary performance requirements for a minimum of 4 years in service, or
 - producer has unpaid charges for failing samples.

- 5.7. **Re-Qualification.** Once the disqualification period established by CST/M&P has elapsed, producers disqualified and removed from the MPL may begin the re-qualification process by submitting a request in accordance with Section 5.1, including additional documentation identifying the cause of the problem and corrective action taken. The re-qualification process will then follow all subsequent Sections of Article 5.

The Department normally bears the costs of sampling and testing; however, the disqualified producer will bear the costs associated with re-qualification. The Director of CST/M&P will assess this cost at the time of re-evaluation, and amounts due will be billed to the producer.

6. MATERIAL REQUIREMENTS

- 6.1. **General Requirements.** Provide thermoplastic pavement marking materials (TPMM) meeting the requirements of AASHTO M 249, with the following additions and exceptions.
- Clearly mark each bag to indicate color, weight, pigment type (for yellow only), and lot or batch number. (A lot or batch is each individual mix or blend that produces a finished product ready for use.)
 - Each bag must contain a minimum of 50 lb. of material.
 - The bag must be composed of a compatible material if designed and intended for placement of the bag and its contents into the melter. Bulk bags must be properly designed and strong enough to avoid spillage and enable easy loading into the melter.
 - Notify CST/M&P if production lots exceed 4,500 lb.
- 6.2. **Pigments.** When washed free of resins by solvent washing, prime and filler pigments must pass a U.S. Standard Sieve Number 200 (Tex-863-B) and must meet the following specific requirements for each pigment.
- 6.2.1. **Prime.**
- The white pigment must be a rutile titanium dioxide meeting the standards of ASTM D 476, Type II or V.

- The yellow pigment must be heat-resistant and weather-stable. The yellow pigment must be a lead and chromate free, organic yellow pigment (C.I. Pigment Yellow 83, opaque version). Do not mix pigment types within a batch. Alternate pigments other than those listed must be evaluated and approved prior to use in the formulation.
- The black pigment must meet the performance requirements described below.

6.2.2. **Filler.** The filler pigment must be calcium carbonate of 95% purity.

6.3. **Binder.** The binder for regular thermoplastic and shadow marking thermoplastic must consist of a mixture of resins, at least one of which is a solid at room temperature, and high boiling point plasticizers. At least one third of the binder composition must be a maleic-modified glyceryl ester of rosin and must be no less than 8% by weight of the entire material formulation.

The binder for profile thermoplastic may be either a binder meeting the requirements specified above for regular thermoplastic or shadow marking thermoplastic or a hydrocarbon resin approved by CST/M&P. The softening point for profile thermoplastic must meet a minimum of 200°F.

The infrared analysis of the resin extract, when taken in accordance with Tex-888-B, must match the spectra on file at CST/M&P.

6.4. **Silica.** The total silica used in the formulation must be in the form of glass traffic beads.

6.5. **Glass Traffic Beads.** Provide glass traffic beads used in the formulation meeting the requirements for AASHTO M 247, Type I.

6.6. **Color.**

6.6.1. **White, Yellow, and Black.** The daytime CIE chromaticity coordinates of the material, when determined in accordance with Tex-839-B, must fall within an area having the following corner points.

Table 1
Daytime CIE Chromaticity Coordinate Corner Points

	1		2		3		4		Brightness
	x	y	x	y	x	y	x	y	Y
White	0.290	0.315	0.310	0.295	0.350	0.340	0.330	0.360	Min 65
Yellow	0.435	0.429	0.510	0.489	0.460	0.400	0.560	0.440	30–60
Black	0.355	0.355	0.305	0.305	0.285	0.325	0.335	0.375	Max 5.0

The white and yellow material must meet the specified color requirements listed in Table 1 for each color before and after weatherometer exposure of 70 hr. for white and 1,000 hr. for yellow. Weatherometer exposure will be in accordance with ASTM G 155 using Exposure Cycle 1 with a quartz inner filter glass and Type "S" Borosilicate outer filter glass.

The nighttime CIE chromaticity coordinates for yellow thermoplastic, when determined utilizing a retroreflectometer capable of measuring night color of pavement markings in accordance with ASTM E 1710, must fall within an area having the following corner points during the life of the stripe.

Table 2
Nighttime CIE Chromaticity Coordinate Corner Points

	1		2		3		4		5	
	x	y	x	y	x	y	x	y	x	y
Yellow	0.53	0.47	0.49	0.44	0.50	0.42	0.51	0.40	0.57	0.43



City of Lewisville

Parks and Recreation

Design Standards

Adopted 2/22/23

Updated 07/22/2024



PARKS & RECREATION DEPARTMENT VISION & MISSION STATEMENT



We will create a thriving community for all through nature
and play by being the best Parks and Recreation Department
in the State of Texas.

We will achieve this vision and mission by:

Connecting communities through recreational and educational opportunities

Developing and maintaining parks, trails, and public spaces

Preserving and restoring our natural resources

EVERYONE **PLAYS** | EVERYONE IS **WELCOME & SAFE** | EVERYONE **KNOWS**

Section 1 – Introduction

A. What is the purpose of this document?

The City of Lewisville Park and Recreation Standards Manual (Standards) aims to ensure that all park facilities in the City are of consistent quality and appearance. In addition, these Standards guarantee compliance with equitable accessibility and safety guidelines for all visitors. This document is a practical companion to the [Healthy Infrastructure Plan](#). These standards follow and complement the [City of Lewisville Unified Development Code \(UDC\)](#), and the [Development Guideline story map](#). Department Standards have designated timeframes for review and updates. If no changes to the Standards are necessary at the time of review, the effective date of the document will not be changed.

B. Who is this document intended for?

Employees at all levels, including directors, program managers, recreation coordinators, operations supervisors, consultants, contractors, and developers benefit from the creation of this handbook. Employees who maintain or construct features in city parks are key users of the Design Standards and are directly involved in the decision-making process.

C. Why was this document created?

The best solutions are frequently interpreted by city employees for the public. The planning process relies heavily on observation, internal and external input, and documentation. In preparation for proposed construction or enhancements, this handbook will assist employees in examining site construction interrelationships and the best solutions for each site.

D. When should this document be utilized?

The planning and budgeting process is where the handbook is best utilized. When construction or enhancements are first considered, it will provide guidance on which areas to observe, evaluate, and document. It is advantageous to develop a plan for the development of the park's subsequent phases, even in the event that suggestions for enhancements to the park exceed the available funding.

Section 2 - Park Development Considerations

The purpose of this section is to provide an outline for planning new park amenities, facilities, or sites. These considerations are only an outline and should be analyzed before choosing the best solutions and moving forward with any design or construction. In addition, all development proposals reflect the goals of the [Healthy Infrastructure Plan](#) and must follow the [City of Lewisville Unified Development Code \(UDC\)](#).

A. Existing Site Conditions and Analysis

The first step in the design and implementation of new park amenities is to understand the existing site conditions that can impact any proposed design, construction, and use of facilities. For the City of Lewisville, nine factors are to be considered, whether the project is a new park, or constructing a new playscape. Since each location is different, additional factors may need to be considered.

These factors are:

- Site Documentation and Connectivity
- Existing Adjacent Properties and Land Uses
- Existing Access
- Existing Park Facilities
- Existing Utilities
- Existing Soils
- Site Drainage
- Existing Wetlands and Wildlife Habitat
- Existing Vegetation and Tree Canopy

1. Site Documentation and Connectivity

All data available through city resources should be researched and collected to provide a history and past usage of the property. These can be gathered through various departments and can include Information Technology (GIS), Planning and Zoning, Public Services, Engineering, and Parks and Recreation.

Site Documentation Checklist

Boundary Survey	
Zoning	
Plats	
Easements	
Flood plain maps	
Connectivity to surrounding area	
Parks and recreation administrative files	

2. Existing Adjacent Properties and Land Uses

Understanding the context of the proposed improvements is critical to determining proper access, parking, and the placement of new recreation amenities.

Adjacent Property Checklist

What types of properties/amenities are nearby?	
Will they have a negative impact on the Park?	
Can new park activities have a negative impact on the adjacent properties?	

3. Existing Access

How will park patrons reach the proposed facilities? Consider existing vehicular, pedestrian, micro-mobility access, and accessible routes.

Access Checklist

Do existing facilities comply with Texas Accessibility Standards?	
Are there adjacent streets? Are adjacent streets busy?	
Do they have traffic signals or stop signs at	

intersections? Are there crosswalks?	
Are there sidewalks with proper ADA ramps? With accessible parking spaces?	
Are there trails, bikeways, or parks that should be linked to the new facilities?	
Can vehicle access and parking be shared?	
What is the current speed limit?	

4. Existing Park Facilities

The type of existing park facilities can vary widely from restrooms to aquatic facilities or athletic fields. It is important to understand the function of existing facilities, their related service utilities, and access routes. It may be that existing facilities present obstructions to the construction of new facilities or may represent an opportunity to have joint usage.

Existing Facility Checklist

Do existing facilities meet CPSC ¹ safety criteria?	
Will the new activities enhance or conflict with use of the existing facilities?	
Will construction of the new facilities conflict with existing facilities and utilities?	

5. Existing Utilities

Safety is the most important concern related to existing utilities. It is critical to protect team members, park users, and workers through the location and mapping of existing utilities. For the purpose of park improvements in Lewisville, existing utilities are divided into two basic categories: overhead utilities and underground utilities. Each category includes multiple utility types. One way to help locate utilities is by researching easements that may run across the site,

¹ The Consumer Product Safety Commission (CPSC)

overhead or underground. A surveyor will be able to perform the research. Also, state law requires that the contractor call “811” to have underground utilities located before beginning digging or excavation. Doing this in the planning and the design stage will help save time later in the project.

**Existing Utilities Checklist
Overhead Utilities**

Electrical lines	
Telephone and cable TV lines	
Lighting fixtures	
Wi-Fi routers	
Other	

Underground Utilities

Water lines	
Sanitary sewer lines	
Storm drain lines	
Natural gas lines	
Electrical lines	
Telephone, data, and cable TV lines	
Irrigation lines	
Other	

6. Existing Soils

Existing soils “tell a story” about construction constraints, and also indicate the suitability for certain trees and grasses. Soils and soil characteristics range widely throughout Lewisville from Blackland Prairie and Eastern Cross Timbers which both may consist of a mix of clay, loam, sand, and silt. The existing soil can influence the design of footings, drainage, plantings. Clay soils have a high

“shrink – swell potential” as soil moisture changes that may require drilled pier footings for buildings or be unsuitable for swimming pools. Sandy soils are highly erosive and leach nutrients easily. Loamy Soils generally have mild slopes and are very suitable for the development of athletic facilities or other park amenities. It is important to understand the characteristics and limitations of soils at each specific site before launching design and construction operations. In addition to reviewing the considerations listed above, a Geotechnical Engineer should be employed on each project with a significant capital expenditure or building structure, including light poles. A soil core sample should be sent to Texas Agriculture Life Extension (Agri-Life) for analysis for all in-house projects.

Existing Soils Checklist

What are the existing soil types?	
Is the soil easily eroded? Is there visible erosion?	
Is the soil expansive?	
Does the soil retain nutrients?	
What is the best foundation or footing for each soil type?	
Has soil sample been sent to Agri-Life for analysis ?	

7. Site Drainage

Whether the planned improvements are large scale major investment projects or simple minor enhancements, the way drainage is managed will contribute to the success or failure of it. It is important to understand the source and patterns of “offsite drainage” which can enter the project area from uphill /upstream sources or can result from water “backing up” to inundate a site. Sources of information regarding general drainage patterns include on-site observations, City of Lewisville drainage and utility maps and Federal Emergency Management Agency (FEMA) maps, which are accessible via the [City website](#). Large scale projects should have a topographic and boundary survey performed to document existing grades and drainage patterns. This should address any issues with

drainage to existing structures or current drainage problems in the park. Even small projects, such as playgrounds or picnic shelters need to include a grading and drainage assessment to provide positive drainage away from the new improvements.

Existing Drainage Checklist

Is runoff flowing into the project area? If so, from where?	
Is runoff going to backflow or surge onto the site, If so, how often?	
In flat areas, how is the site going to drain to enable use most of the time?	
In steep areas, how will erosion be addressed?	

8. Existing Wetlands, Wildlife Habitat and Historic or Cultural

Review potential wetland and habitat impacts during the planning, design, and construction of new facilities. Large scale projects, at major investment parks, may need to have environmental assessments and / or wetland determinations to ensure compliance with federal and state regulations. More importantly, these studies may identify unique features that can enhance the value of resident's outdoor recreation experiences and learning opportunities.

Wetlands & Habitat Checklist

Are wetlands present that are indicated on National Wetland Inventory (NWI) maps?	
Are there other wetlands on site or that may be impacted by construction?	
Does the project drain into a "Waters of the United States"?	
Does the project require a USACE permit or other regulatory agency approval?	
Has a wildlife expert or other qualified naturalist been	

contacted?	
What are the potential wetlands and wildlife habitat impacts?	
Are there any identified or suspected historical properties, archeological sites or other cultural resources present or affected by the project?	
Does site or project require an official review under Section 106 of the National Historic Preservation Act and/or Antiquities Code of Texas?	

9. Existing Vegetation and Tree Canopy

The City of Lewisville is located at the convergence of three significant ecosystems: the Blackland Prairie, the Cross Timbers and the Elm Fork of the Trinity River. It is important to protect, conserve and restore elements of each system.

The Blackland Prairie is characterized by grasses and forbs adapted to grow during periods of rain and drought. Big Bluestem, Indian Grass, Little Bluestem, Beebalm, Prairie Foxglove, Prairie Foxglove, Prairie Larkspur, Narrowleaf Coneflower, Prairie Clover, and many others (including some woody vegetation - sumac, wild plum and possumhaw). Lowland tallgrass prairie stands may include Prairie Cordgrass, Eastern gamagrass, sedges, lowland switchgrass, and Black-eyed susan. An assessment of the vegetation on site should be conducted by a master naturalist. Reference materials can be found in the LLELA and Thrive Nature Park restoration plans.

Understanding an urban forest's structure, function, and value can promote management decisions that will improve human health and environmental quality of the City of Lewisville and its residents. The urban tree canopy includes individual or small clusters of trees that have attained a size to produce a discernible tree canopy on aerial imagery. The City recommends protection of high value replacement trees such as pecans, cedar elm, post oak, and live oak

to contribute and protect and grow the tree canopy of Lewisville. A tree assessment or survey shall follow UDC and City of Lewisville Tree Management plans and guidelines to determine protection or removal of trees.

Existing Vegetation and Tree Canopy Checklist

Are there pollinators or plants or prairie grasses?	
Are there existing trees at site?	

Existing Tree Canopy and Preservation Plan

Purpose - The purpose of this chapter is to preserve, protect and enhance existing trees and the city's natural landscapes to contribute to and improve the overall quality of life, public health, and environment. Trees are an integral part of healthy upland habitats as well as stream and river corridors. In addition, trees are beneficial in:

- reducing stormwater runoff
- improving water quality,
- recharging groundwater,
- controlling erosion and dust,
- abating noise,
- improving air quality through removal of pollutants and provision of oxygen,
- sequestering carbon,
- reducing the urban heat island,
- reducing building energy costs,
- enhancing property values,
- and providing wildlife habitat, including for migratory birds.

The natural environment and native tree species shall be preserved to the greatest extent possible during and after development or redevelopment.

- **Clear-Cutting Prohibited** – No clearcutting of land is allowed.

- **Removal of protected trees shall require prior city approval in the form of a tree survey and tree preservation plan or tree removal permit, as provided for herein unless otherwise exempted:**
- **New Development and Redevelopment** – Protected trees may be removed as part of new development or redevelopment only in accordance with a tree survey and tree preservation plan, meeting the requirements of this article which is approved as part of the development plan and platting process.
- **All Other Protected Tree Removal** – A tree removal permit must be approved prior to removal of individual protected trees from properties to which Section 4.A.1 does not apply.
- **Underbrush and Unprotected Trees** – An underbrush removal permit is required when access to a property being considered for development is needed to perform soil borings, property boundary surveys, to prepare a tree survey, or similar actions and such access requires the removal of underbrush and unprotected trees.
- **Exemption** – Notwithstanding the requirements of this article, no permit shall be required for the tree removal activities as listed in the UDC Section 9. below:

Exemptions – Mitigation shall not be required in the following circumstances, though tree removal permit or tree preservation plan requirements still apply:

Public Utilities – In any existing right-of-way or easement dedicated to a public entity. Mitigation is required for trees in any newly required easements.

When Required by City – If the city requires removal of a protected tree(s).

Removal by Franchised Utility – In addition to rights granted by any applicable easement, utility companies franchised by the city may remove protected trees during or following a period of an emergency that are determined by the company to be a danger to public safety and welfare by interfering with utility service.

Dead or Diseased Trees – If the city approves a tree survey and report from a certified arborist showing that the protected trees proposed to be removed are already dead, dying, or fatally diseased. The city can request any other information deemed necessary to prove the protected trees are dead, dying, or fatally diseased.

As Required by Law – As required by Texas Local Government Code, Section 212.905(h).

Tree Removal Permits

1. An application for a tree removal permit shall be submitted to the Planning Director and shall include:
 - a. The number, species, and health of the protected trees to be removed.
 - b. The location of each protected tree to be removed.
 - c. The size of the land area from which protected trees will be removed; and
 - d. The location of floodplain, open drainageways, or creeks, if any, on the property.
2. In determining whether to grant a tree removal permit, the Planning Director shall consider whether the tree mitigation requirements outlined in this article are met.

Underbrush Removal Permit

1. An underbrush removal permit shall be submitted to the Planning Director and shall include:
 - a. The land area of the site;
 - b. The area that will be impacted by underbrush and unprotected tree removal activities; and
 - c. The location of floodplain, open drainageway, or creeks, if any, on the property.

Tree Survey and Tree Preservation Plan

1. Tree Survey and Tree Preservation Plan Not Required.

For properties with no trees, the applicant shall indicate such on the concept plan or engineering site plan, but no tree survey or tree preservation plan is required.

2. Tree Survey and Tree Preservation Plan Required

- a. Tree surveys and tree preservation plans must be prepared by a civil engineer, certified arborist, landscape architect, or surveyor.
- b. The following information is required for tree surveys and tree preservation plans, but city staff may require additional information as deemed necessary:

- 3. Tree survey** – The exact location, size, condition and common name of each tree that is eight (8) inches DBH and larger. Trees within rights-of-way and other city easements do not have to be shown. If an area is to be left in its natural state and undisturbed during and after construction, the area may be designated as such on the tree survey, and individual identification of protected trees within the area is not required.
- 4. Tree preservation plan** – The exact location of all trees, whether each tree is to be preserved or removed, and the methods by which the trees will be protected during construction.
- 5. Tree Survey Not Required/Tree Preservation Plan Required** – If a property has ten or fewer trees, the DBH and species may be shown on the concept plan or engineering site plan and supplemented with an aerial image instead of a tree survey. A tree preservation plan is required.
- 6. Mitigation Required** – The removal, or damage or destruction during construction, of protected trees requires mitigation in the form of either replacement of the protected trees or payment of a tree mitigation fee in lieu of the replacement of the protected trees as outlined herein.

B. Park Boundaries

- 1. Spatial Definition** - Spatial definition involves the delineation of activity areas and perhaps property boundaries and may be accomplished in many ways.
 - groupings of trees,
 - Unmowed grass areas or tree lines to separate spaces, spatial definition brings outdoor spaces down to human scale.

2. Boundary Definition and Access Control - A number of devices and strategies may be employed to define park boundaries and control access. Ideally the devices used will reflect the character of the park facility as well as the context of the surrounding properties. Recommended elements for boundary definition include:

- **Fences & Gates**

Hot dip galvanized metals will serve well and will blend into the landscape once the metal weathers to a soft gray patina.

- **Bollards**

Bollards are generally used to define and set the perimeter for parking lots and drives and may be manufactured from wood, concrete, metal pipe, and stone – or a combination thereof. Bollards may be used for low level area lighting as well. Bollards may be whimsical and define the facility's purpose, such as the "Baseball" bollards. Parks lend themselves to the use of natural materials for bollards in a creative manner. The materials used for bollards should reflect the location of each park facility. Key considerations in the selection and installation of bollards are the availability of the bollard materials and the ability of Parks staff to install, maintain, and repair the bollards in-house.

- **Other elements may be considered with Director Approval**

C. Coordination with other City Departments

Other City departments, particularly Engineering, Public Services, Planning, and the Information Technology Services (ITS), may have programs or plans that compliment or may facilitate park facility improvements. While this applies primarily to large, major investment projects, smaller projects should also include review by other City departments, including Police and Fire to contribute information regarding emergency access, security enhancements, water conservation initiatives, bicycle trail linkage, and other related information.

Departmental Coordination

Emergency access	Fire	
Access, linkage - Wetland Management	Engineering and Public Services	
Security enhancements	Police	
Access and Connectivity	Planning & Zoning	
Permitting	Neighborhood Services	
Technology	ITS	
Existing Public Infrastructure	Public Services	

D. Regulatory Compliance or Approvals

- a. City of Lewisville
- b. United States Army Corps of Engineers (USACE)
- c. Texas Parks and Wildlife Department (TPWD)
- d. Texas Department of Transportation (TxDOT)
- e. Texas Department of License and Regulation (ADA compliance)
- f. Texas Historical Commission (THS)

Section 3 - Park Facility Standards

The purpose of this section is to provide guidelines for selecting new park elements, amenities and structures. These considerations are only an outline and should be analyzed before choosing the appropriate solutions for each site.

A. Access**1. General**

Access to City park facilities includes more than connections to sidewalks, walkways, trails, and streets. Safe Routes to Parks² is achieved through engagement of the community to properly assess, plan, implement, and sustain

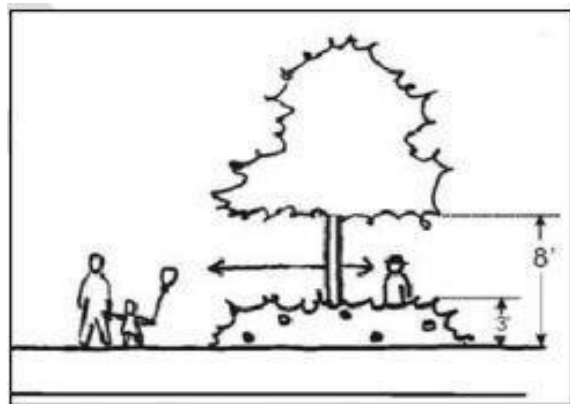
² [Link to Safe Routes to Parks. NRPA](#)

safe and equitable park access utilizing evidence and best practice-based approach.

2. Safety

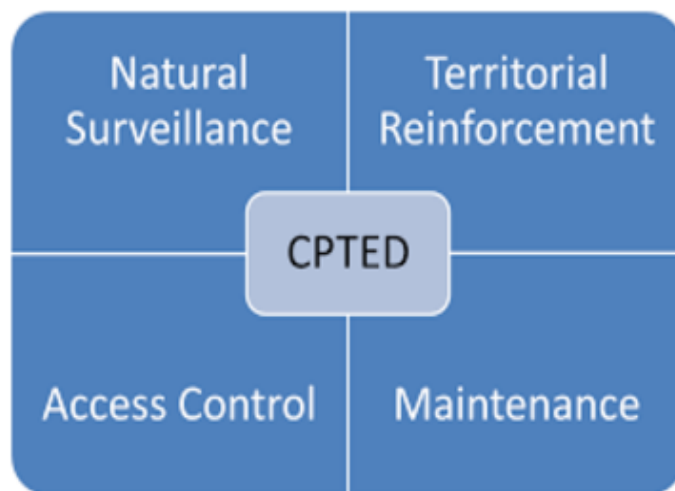
The safety of park patrons is a fundamental consideration in park design. Community Crime Prevention Through Environmental Design (CPTED) is a multidisciplinary and collaborative design approach to foster positive social interactions and deter criminal behaviors in communities. Proponents of CPTED promote proper design, use and management of the built environment to reduce the frequency of criminal activity and the fear of crime, thereby improving community vitality and quality of life. Include CPTED review and participation in each park design effort. Key considerations related to park design and operations include several factors:

- **Natural Surveillance** – design to eliminate hiding places, optimizing visibility and the perception of human activity and supervision as seen in the figure to the right.
- **Natural Access Management** – site design and operation to create real or perceived barriers such as fencing and / or plantings in conjunction with lighting, signage, and artwork to provide pedestrian orientation and wayfinding. By creating a pedestrian friendly environment to make suspicious activity more obvious.
- **Territorial Reinforcement** – use of physical elements, such as art, signage, landscaping, and boundary treatments, to define borders, express ownership, and demonstrate that the space is cared for and protected.
- **Physical Maintenance** – demonstrates community pride of ownership. Incorporation of low maintenance landscaping and building materials, along



with trash pick-up and removal suggests that the community will not accept vandalism or criminal activity.

- **Civility Maintenance** – in addition to posting rules and regulations, proper maintenance and attention to minor violations will reduce inappropriate activities. This includes the use of vandal and graffiti resistant materials and products. Civility Maintenance also includes the imposition of quick, fair and consistent consequences for offenders.
- **Activity Support** – plan and implement safe activities. Foster increased use of a facility by holding special events or celebrations, organized use of sports facilities and supporting use of the facilities by people of all ages and interests.



CPTED Basics

3. Pedestrian and Bicycle Access

Pedestrian access is to be designed for children, adults, and people with disabilities. All parks and facilities must conform to the Texas Accessibility Standards, available at: www.tdlr.texas.gov/ab/abtas.htm

Pedestrian, bicycle, and streetscape improvements are required and determined to be adequate when the proposed new development meets the requirements for new streets and trails in accordance with Articles IX and X of the Lewisville UDC.

- A. Sidewalks and Trails – Sidewalks and trails shall be installed in accordance with Articles IX and X of the City of Lewisville UDC

requirements as well as the Texas Accessibility Standards, PROWAG, the Healthy Infrastructure Plan, and the City's standard details.

B. Walkways

- a. Walkways shall be no less than four (4) feet in width.
- b. Walkways shall be required:
 - i. Connecting any existing or future sidewalk, trails, parks or greenways and primary entrances of all buildings on the site.
 - ii. Connecting building entrances to all on-site facilities, such as parking lots, bicycle facilities, and open space.
 - iii. Up to the building lot line in a manner which will allow walkway connection between adjoining properties and buildings; and
- c. Walkways shall be distinguished from any driving surfaces through the use of colored pavements, bollards, grade changes, pavement markings or combination of treatments.

- C. Pedestrian and bicycle access locations should be selected and designed to give the greatest amount of residents access within a [10 Minute Walk to the Park](#).

4. Vehicles and Parking

Parking and landscaping requirements are outlined in the City's Unified Development Code (UDC).

Table A4 - Recommendations for Parking and Access							
Facility Type	Pocket Parks	Neighborhood Parks	Community Parks	Regional Parks	Linear Parks	Nature & Preserve Parks	Special Use Parks
Entrance Driveway Width	No off street parking	No off street parking	24 ft. Wide Entrance and Exit Drive	24 ft. Wide Entrance and Exit Drive	No off street Parking	24 ft. Wide Entrance and Exit Drive	24 ft. Wide Entrance and Exit Drive
Park Drive Width	No off street parking	No off street parking	24 feet	24 feet	24 feet	24 feet	24 feet
Required Parking	No off street	No off street	N/A	N/A	N/A	N/A	N/A

Spaces	parking	parking					
Emergency Service Access	No off street parking	No off street parking	Point of access	Point of access	N/A	point of access	Point of access
Parking Lot Landscaping	No off street parking	No off street parking	5% of parking lot	5% of parking lot	N/A	5% of parking lot	5% of parking

B. Grading and Drainage

1. General

Site grading is frequently disregarded as a crucial design component. The best use of facilities is made possible by proper site grading, which also creates a tidy, appealing appearance. By removing muddy patches and rutting brought on by maintenance equipment, proper site grading also reduces maintenance. The "Grade to Drain" strategy is straightforward but effective. Always make sure there is an outfall, whether it be for surface drainage or subsurface drainage. Regarding the site, to create high and low points for positive drainage is frequently the most cost-effective option. Importing fill should be considered if regrading to provide positive drainage is not an option. Consideration should be made to consider swales and berms to facilitate drainage. If the site must remain "flat," and surface slopes are unsuitable for positive drainage, subsurface drainage should be considered. Subsurface drainage options include:

- Inlets, piping, and outfalls
- French drains, piping, and outfalls

The French drain system can be used as part of a storm water detention system and to improve storm water quality, whereas a system with inlets enables rapid drainage. In either scenario, the piping needs to exit into a space that directs stormwater away from the construction site.

The current Texas Accessibility Standards must be followed by all facilities. Every project with a construction value over \$50,000 must be examined by an RAS Inspector who has been duly registered. Skate parks and amphitheaters are examples of special use facilities that demand individualized consideration by design and engineering experts with a track record in facility design.

Table B1 – Recommended Minimum and Maximum Slopes for Park Facilities

Facility Type	Minimum Slope	Maximum Slope	Comments
Parking Areas	1%	6%	Handicap parking spaces and aisles must not exceed a 2% slope in any direction.
Trails and Walkways	0.5%	8%	Trails and walkways with a slope greater than 5% are considered ramps. These must have landings and slopes of 2% or less in all directions at 200 ft. intervals. The minimum recommended width is 5 feet to allow a wheelchair to turn around. Trails and walkways should not be designed at the max percentage in order to mitigate ADA compliance issues. This allow for additional leeway during the construction phase.
Playgrounds & Fitness Stations	0.5%	0.5%	Subsurface drainage system required to prevent ponding.
Softball/Baseball Fields	1%	2%	Infield areas that are at 1% should have a subsurface drain system and “infield conditioner” to facilitate drying and maximum field availability.
Football/Soccer Fields	1% (with subdrains)	1.5% (without subdrains)	Football fields should be crowned. Federation Internationale de Football Association (FIFA) regulations allow soccer fields to be sloped in numerous ways. Sloping soccer fields, end-to-end or side-to-side are preferred.
Tennis & Pickleball Courts	0.8%	0.8%	Conform to United States Tennis Association (USTA) and United Pickleball Association (UPA) standards.
Picnic Areas	1%	4.5%	Attempt to avoid ramps by providing walkways, trails, and walking surfaces with slopes within this range.
Splash Pads & Swimming Pool Decks	1%	1%	Conform to 2012 TAS Standards and Texas Administrative Code. Title 25, Chapter 265.
General areas such as Memorials, Community Gardens, and overlooks	1%	4.5%	Grading and drainage must be considered in the design and operation of each project and facility.

2. Design for Accessibility

Projects with a construction budget of \$50,000 or less are not required to have a "Texas Accessibility Standards (TAS) review. However, all projects must comply with TAS. Current standards are available on line at <https://www.tdlr.texas.gov/ab/>

C. Trails and Walkways

Pedestrian trails and walkways can be made of different materials depending on the area, the intended users, safety considerations, and accessibility. While concrete is best for durability and accessibility, it is not the best material for running trails. Design and construction of trail to be consistent with AASHTO recommendations and TMUTCD standards. Private trail agreements should incorporate maintenance requirements so that vegetation bordering the area does not impede public mobility or visibility. Public Art incorporation in trails should be considered.

Table D1 - Concrete, Asphalt Pavement Criteria

Facility Type	Thickness	Compressive Strength (PSI)	Reinforcing	Finish	Joints
Trails, Walkways and Paved Areas (More than 6 Ft. (Wide)	5 Inches Minimum	3,500 (min)	#3 rebar at 18" center each way	Medium brush finish	Expansion joints spaced 40 feet apart. Control joint spacing = trail width

Table D2- Decomposed Granite, Crushed Rock/Brick, Permeable Surface Criteria

Facility Type	Thickness	Compaction	Reinforcing	Finish
Multi-Purpose Trail, Walkways and General Areas	4 inches installed over Geotextile fabric	Machine compaction	Soil Stabilizer	Compact to a smooth, uniform finish that allows wheelchair and bicycle access

Table D3 - Other Material Criteria (Non-Accessible Routes)

Material	Use*	Minimum Thickness	Geotextile Underlayment	Max Longitudinal Slope	Max Cross Slope
Road Millings	T, NT, NC	4"	Yes	8%	3%

Shredded Bark Mulch	T, NT, NC	3"	No	8%	3%
Soil Cement (Polymer)	T, NT, NC, BT	4"	No	8%	3%
Soil (Grade/Compact)	T, NT, NC, BT	n/a	n/a	8%	3%
Recycled Concrete	T, NT, NC, BT	4"	Yes	8%	3%

Other Material Key*	
T	Trail
NT	Nature Trail
NC	Nature Center
BT	Bike Trail



Thrive Nature Park Trail

D. Site Furnishings

1. General

Bicycle racks, picnic tables, trash cans, benches, and water fountains are examples of site furnishings. These types of furniture encourage people to use parks and are an added benefit to their enjoyment. Lewisville PARD aims for consistency in site furnishing materials and workmanship. Below is a list of examples of recommended items for site furnishings and suggestions for a range of materials and cost (i.e. good, better, best).

Any deviation from these recommendations must be approved by the Director.

2. Standards and Equipment Recommendations

a. Bike Racks

Bike racks encourage cyclists to visit park facilities and provide secure parking for their bikes. Good bike racks are those that are double-sided and can hold multiple bikes, a better option is a visually more appealing wave rack. The best option are those that have a logo add-on option or can serve as public art. High traffic cycling areas should consider including a bike repair station.



[Best Option for Bike Racks](#)

b. Picnic Tables and Benches

Rectangle, Square, and Round, natural or recycled plastic panels, expanded metal tables and benches can be considered. UV protection is provided by galvanized dipped expanded metal picnic tables with synthetic planks on the tops and seating. The tops and seats allow for good air flow to stay cool in summer and are able to be power washed for easy cleaning.

Good	Better	Best
Composite Board/Galvanized frame	Recycled lumber construction Club Bench	Plaza Style Bench



[Best Option for Benches](#)

c. Trash Cans

The minimum weight and size of a trash can is 32 gal, the maximum weight and size of a trash can is 55 gal due to staff safety. Any trash can on USACE property must be covered (have a lid).

Good	Better	Best
Drum trash can - painted Purple	Covered trash cans black powder coated Composite/Recycled	Smart Bin or Composite/Recycled



[Best Option for Trash Cans](#)

d. Pet Waste Stations

Pet waste stations should be strategically located near entry and midpoint ways of trails for accessibility. If pet waste stations are stand alone they need to be adjacent to or be integrated with existing trash bins. Maintenance staff prefer not to have an integrated mini trash bin.

e. Restrooms

Public restrooms are an important amenity in large parks to cater visitors' basic needs.

Good	Better	Best
Portable	Composting	Utility Based

Public restrooms are not typically prescribed in small, neighborhood parks.

f. Drinking Fountains

- Drinking fountains should be located near an active water line and placed in high visibility areas preferably under shade and have the following features.
 - ADA & Pet accessible
 - Water Bottle filler
 - Mounted or stand alone



[Best Option for Water Fountain](#)

E. Picnic Pavilions and Shelters

Picnic pavilions and shelters are an important shade and comfort aspect of the parks in Lewisville. Pavilions and shelters should be constructed to complement the topography, withstand the weather, and provide a safe and comfortable environment for park users. Careful consideration should be given to the environment when selecting construction materials.

1. **Pavilions** - Suitable construction materials for picnic pavilions and shelters include:

- Galvanized Steel
- Timber
- Concrete
- Brick/stone Masonry
- Synthetic building materials
 - Synthetic building materials consist of ultra violet (UV) stabilized plastics and recycled plastics are available for use as signs, benches, decking, and playground equipment. Many characteristics make synthetics and plastics very useful. Some considerations include:
 - UV Stabilized Materials
 - 20+ year average life
 - Easy to clean
 - Graffiti & Vandal resistant
 - Splinter free
 - 100% waterproof

- Does not need paint
- Critter Resistant
- Rust/Rot proof
- Impervious to insects
- Nontoxic
- No need for sealants or paint
- Various color choices
- Will not delaminate

2. Fabric Shade Structures - Fabric tensile shade structures are an excellent shade alternative to traditional materials of steel, wood, and canvass. Fabric adds colorful and unique dimensional designs to the traditional shade structure. An important element of fabric shade structures is the use of UV stabilized polyethylene or polypropylene shade netting that is held in place using metal cables and posts. Fabric shades are up to 15 degrees cooler than traditional metal roofs. High winds that are prevalent in Texas require shade structures to withstand winds from 80-130 miles per hour, per state windstorm regulations.

F. Playgrounds and Play Elements

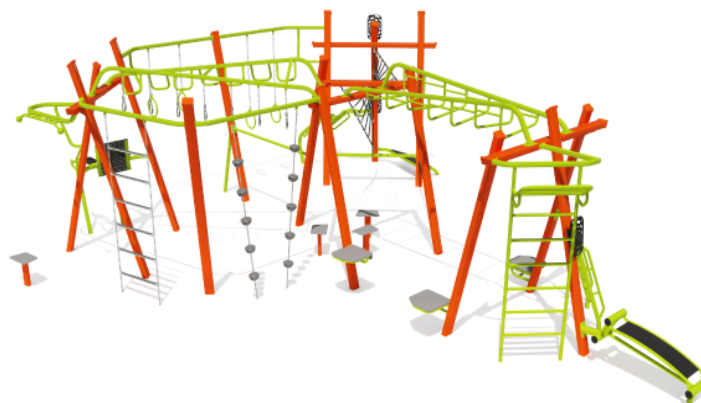
1. Materials and Finishes

Experience has shown that hot dip galvanized, or aluminum structural core park equipment is essential to withstand the Texas climate. The polyester powder coat on play equipment needs to be shielded from dents that could damage the galvanized base and expose the steel to corrosion. Sustainable practices should always be considered into parks and recreation design, operations, and management. Here is a summary of important criteria for playground furnishings and site decor:

Table F1 - Preferred Play Equipment Materials and Finishes			
Equipment	Material	ASTM Designation	Comments
All	Sustainable Manufacturing	ASTM Sustainability Standards	These standards will play a preeminent role in all aspects of sustainability and sustainable development.
Exposed Ferrous Metals	Hot- Dip Zinc Galvanized	ASTM A123	Hot Dip Zinc coating at 2 oz/sq ft. Galvanized after welding and fabrication.
Fasteners	416 Stainless Steel	ASTM A582	Vandal Resistant
Metal Play Element Fittings	Cast Aluminum	ASTM B179, ASTM B26, ASTM B108	-
Metal Play Elements	Extruded Aluminum 6061-T6, 6062-T6, or 6063-T6	ASTM B221	Minimum tensile strength = 39,000 psi
Metal Play Elements	Electrostatic Zinc Galvanized	ASTM B633	Electrostatic Zinc coating at 2 oz/sq ft. Galvanized after welding and fabrication.
Plastic Elements	UV Stabilized Polyethylene or Nylon	ASTM D1248, Type II, Class A, Grade G4	Minimum 5 mm or 3/16-inch wall thickness
Play Structure Finish Material	Polyester Powder Coat	ASTM D3359 for Adhesion, ASTM D822 for weatherability	No scratches allowed prior to acceptance and use by owner.

2. Outdoor Fitness Equipment

Having outdoor fitness equipment at local parks is essential for promoting physical activity, accessibility, inclusivity, community building, and improving mental health. The following [NRPA Blog](#) describes how to make outdoor gyms appealing to everyone. A good fitness equipment is one that has a sample package that covers all major muscle groups. A better fitness equipment is compact, with overhead ladder and available with integrated shade. The best fitness equipment is a comprehensive total body workout that is compact and can serve up to 20 people, also available with integrated shade.



[Best Option for Outdoor Fitness Equipment](#)

G. Safety Surfacing

Safety surfacing is an important and essential aspect to consider for all playgrounds to help prevent injuries to children and provide parents with peace of mind. There are a number of alternatives available; each product offers varying degrees of thickness to provide increasing levels of protection against falls. To determine the required thickness for each playground, the “fall height” is determined using the tallest piece of playground equipment. Below is an overview of each alternative suitable for playground safety surfacing and is listed in the preferred order of preference.

Poured-in-Place-Rubber (PIP) – Constructed from soft, durable rubber. Rubber is long lasting and can be custom designed. Rubber is a very durable, maintenance free surface that provides easy access for wheelchairs. Should have matting in High-Utilized playground areas such as the end of slide.

Playground Synthetic Turf – Synthetic Turf provides a soft, grass like feel without the maintenance required of real grass. Provides a shock absorbing area for running, jumping, landing, and falling, as well as meeting ADA guidelines for wheelchair access. Heat considerations for synthetic turf should be weighed when deciding on a safety surface for children.

Rubber Tiles – Rubber tiles can absorb the shock of running, jumping, and falling of children. Tiles are interlocking and come in a variety of colors. An affordable option that meets ADA guidelines for wheelchair access.

Engineered Wood Fiber (EWF) – is one of the most popular choices for playground surfacing due to its price point, and ability to be replenished as needed. Fiber should be made of 100% virgin wood, sourced to keep out impurities. Wood fibers provide accessibility to support wheelchairs. However, the cons of Maintenance, Safety, and Appearance of EWF should be considered: <https://simplifiedplaygrounds.com/blogs/blog/pros-and-cons-of-engineered-wood-fiber>

EWF	Good	Better	Best
with Director Approval	Synthetic Turf	PIP	PIP with Reinforced Heavy Use Areas

H. Grasses and Turf Types

The types of turf grass that are planted at Lewisville parks and athletic fields are one of the most important features and must be able to withstand the volatile Texas weather. Buffalo grass is preferred for parks, medians and right of ways. There are two types of Bermuda grass, Common Bermuda for high traffic areas of parks and Tifway 419 Bermuda for athletic fields.

1. Parks

- a. Buffalo Grass, *Bouteloua dactyloides*, is a short sod-forming grass requiring as little as 12 inches of water per year. This sustainable, drought tolerant grass is resistant to most diseases and pests and does best when mowed infrequently.
- b. High traffic areas - Common Bermuda grass, *Cynodon dactylon* L. Pers, is a warm season, fine textured turf grass that spreads

laterally by rhizomes and stolons. Extremely drought tolerant, durable, and easy to establish, have deep roots and low disease potential. Not ideal for consistently shaded areas.

2. **Medians & Right of Ways** – Buffalo Grass, *Bouteloua dactyloides*, is a short sod-forming grass requiring as little as 12 inches of water per year. This sustainable, drought tolerant grass is resistant to most diseases and pests and does best when mowed infrequently.
3. **Pollinative Prairies** – native grasses and pollinator mixes are ideal for large open spaces, within the Green Centerpieces and in some medians and right of ways. See section J (page 38) for more detail.

I. Sports Fields

Sports fields' design and dimensions vary by the age, gender, and sponsoring league of the participants. Consideration will be given to recommendations from consultants and design professionals. Table 3 offers general guidelines for the actual playing field sizes. Tifway 419, *Tif 419*, is a Bermuda hybrid with a deep green with a fine texture. When cut at $\frac{3}{4}$ to 1 $\frac{1}{2}$ inches, Tif 419 provides an excellent impact absorbing cushion. It has excellent weed and disease resistance and is a superior choice for athletics fields. In the fall, Tif 419 can be overseeded with Rye grass to protect the grass from winter play while dormant.

Table I1 - Recommended Criteria for Sports Fields

Facility Type	Adult	High School (14-18 years)	Youth	Natural Turf Type
Football	300 ft. x 150 ft.	300 ft. x 150 ft.	240 ft. x 120 ft.	Tif 419 Solid Sod
Soccer	360 ft. x 225 ft.	360 ft. x 225 ft.	180 ft. x 120 ft.	Tif 419 Solid Sod
	<u>Fast Pitch</u> Base Lines = 60 ft. Outfield = 225 ft. <u>Slow Pitch</u> Base Lines = 70 ft.	<u>Fast Pitch</u> Base Lines = 60 ft. Outfield = 225 ft.	N/A	Tif 419 Solid Sod

Softball	Outfield = 300 ft.			
Baseball	Base Lines = 90 ft. Foul Line = 300 ft. Center Field = 350 ft.	Base Lines = 90 ft. Foul Line = 300 ft. Center Field = 350 ft.	Base Lines = 60 ft. Outfield = 200 ft.	Tif 419 Solid Sod
Cricket	Min = 137 meter Max = 150 meter (Diameter)	Min = 137 meter Max = 150 meter (Diameter)	N/A	Tif 419 Solid Sod

J. Landscaping Standards Approved Trees, Shrubs

General - The purpose of this chapter is to establish standards for the installation and maintenance of trees, shrubs, and other plant material to improve the aesthetics, welfare, and natural environment of the city. The addition of trees and other plant materials help to filter air pollution, reduce energy consumption, reduce impacts of urban heat islands, provide a natural habitat for birds, insects, and other animals, increase property values, improve human health, and contribute to a livable community. These standards recognize the value and necessity of water conservation and the use of drought-tolerant plants and trees that are native or adapted to the region's climate, soils, and environment. Compliance with the UDC is required.

Link to UDC: https://library.municode.com/tx/lewisville/codes/unified_development_code

Texas A&M Forest Service Resource

1. Nursery Tree Quality

General - Proper Identification: All trees shall be true to name as ordered or shown on planting plans and shall be labeled individually or in groups by species and cultivar (as appropriate).

Compliance: All trees shall comply with federal and state laws and regulations requiring inspection for plant disease, pests, and weeds. Inspection certificates required by law shall accompany each shipment of plants.

Inspection: The buyer reserves the right to reject trees that do not meet specifications as set forth in these guidelines. If a defect or substandard element can be corrected easily, appropriate remedies shall be applied. If inspection of a root ball

is to be done, the buyer and seller shall have a prior agreement as to the time and place of inspection, number of trees to be inspected, and financial responsibility for the inspected trees.

Delivery: The buyer shall stipulate how many days prior to delivery that delivery notification is needed. Buyer shall stipulate any special considerations to the nursery prior to shipment.

2. Health and Structure Specifications

General - These specifications apply to deciduous, broadleaf evergreen, and coniferous species. They do not apply to palms. Note that leaf characteristics will not be evident on deciduous trees during the dormant season.

Crown: The form and density of the crown shall be typical for a young specimen of the species or cultivar. The leader shall be intact to the very top of the tree.

Leaves: The size, color, and appearance of leaves shall be typical for the time of year and stage of growth of the species or cultivar. Trees shall not show signs of moisture stress as indicated by wilted, shriveled, or dead leaves.

Branches: Shoot growth (length and diameter) throughout the crown shall be appropriate for the age and size of the species or cultivar. Trees shall not have dead, diseased, broken, distorted, or otherwise injured branches.

Trunk: The tree trunk shall be relatively straight, vertical, and free of wounds (except properly made pruning cuts), sunscald areas, conks (fungal fruiting bodies), wood cracks, bleeding areas, signs of boring insects, cankers, girdling ties, or lesions (mechanical injury). The terminal bud on the leader shall be intact to the very top of the tree, and it shall be the highest point on the tree.

Roots: The root system shall be substantially free of injury from biotic (e.g., insects and pathogens) and abiotic (e.g., herbicide toxicity and salt injury) agents. Root distribution shall be uniform throughout the container substrate and shall be appropriate for the species or cultivar. At time of inspection and delivery, the root ball shall be moist throughout. Roots shall not show signs of excess soil moisture conditions as indicated by stunted, discolored, distorted, or dead roots. (Figure 7)



Figure 1.

Trees shall have one relatively straight central leader or be structurally pruned to only leave one central leader (Figure 1).

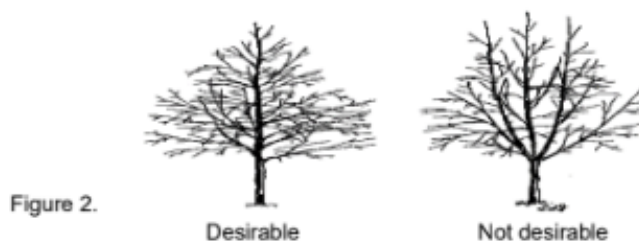


Figure 2.

Main branches (Figure 2) shall be well distributed along the central leader, not clustered together. They shall form a balanced crown appropriate for the cultivar or species.

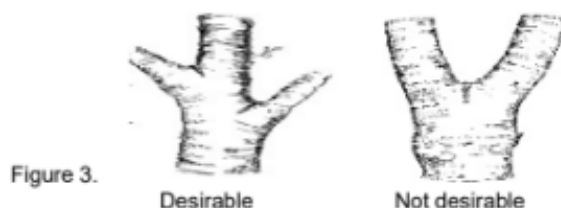


Figure 3.

The diameter of branches (Figure 3) that grow from the central leader, or trunk, shall be no larger than two-thirds (one-half is preferred) the diameter of the trunk measured just above the branch.



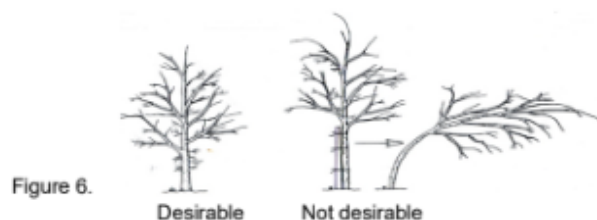
Figure 4.

The largest branches shall be free of bark inclusions that extend into the branch union (Figure 4).



Figure 5.

Small-diameter branches (Figure 5), particularly on trees less than 1-inch caliper, should be present along the lower trunk below the lowest main branch. The trunk shall be free of wounds, sunscald areas, conks (fungal fruiting bodies), wood cracks, bleeding areas, signs of boring insects, cankers, or lesions. Properly made recent or closed pruning cuts are acceptable.



The trunk caliper (diameter) and taper (Figure 6) shall be sufficient so that the tree remains vertical without a stake.



The root collar (the uppermost roots) (Figure 7) shall be within the upper 2 inches of the soil media (substrate). The root collar and the inside portion of the root ball shall be free of defects, including circling, kinked, and stem-girdling roots. Roots at the surface should grow mostly straight to the side of the container. You may need to remove soil near the root collar to inspect for root defects.

The tree shall be well rooted in the soil media. Roots shall be uniformly distributed throughout the container, meaning that roots should not be concentrated at the bottom of the root ball. Some roots should contact the container wall in the top half of the root ball (Figure 7). When the container is removed, the root ball shall remain intact. When the trunk is lifted, both the trunk and root system shall move as one. The imprint of the liner or smaller container shall not be visible (Figure 7).

The root ball shall be moist throughout at the time of inspection and delivery. The roots shall show no signs of excess soil moisture as indicated by poor root growth, root discoloration, distortion, death, or foul odor. The crown shall show no signs of moisture stress as indicated by wilted, shriveled, or dead leaves or branch dieback.

Tree Planting

Selecting quality trees: Planting quality trees begins by selecting the right tree for the right location and choosing vigorous, structurally sound trees from the nursery.



Figure 8. Loosening soil in a large area around the root ball allows for rapid root growth and quick establishment.

Digging the hole: A firm, flat-bottomed hole will prevent trees from sinking. Dig the hole only deep enough to position the root collar 1 to 2 inches above the landscape soil surface (Figure 8). Dig the hole 2 to 3 times the width of the root ball. This loose soil promotes rapid root growth and quick establishment.

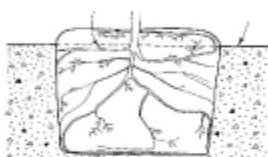


Figure 9. Remove soil and roots growing over the root collar and place collar 1 to 2 inches above soil surface.



Figure 10. Cut roots at to form new roots that grow away from the trunk. Do not cut roots at since the root defects will regrow.



Figure 11. Mulch shall taper to a slightly thinner layer on top of the root-ball.

Installing the tree: Remove soil and roots from the top of the root ball to expose the root collar; cut away any roots that grow over the collar (Figure 9). Cut any roots that circle or mat along the sides and bottom of the root ball (Figure 10). The root collar shall be 1 to 2 inches above the landscape ground level to allow for settling after planting (see Figure 9). Backfill with soil removed from the hole. Minimize air pockets by packing gently and applying water. Build a berm around the root ball to help force water through the root ball.

Mulching: A layer of organic mulch, such as leaf litter, shredded bark, or wood chips, helps protect tree roots from temperature extremes and conserves soil moisture. Mulch also helps prevent grass from competing with the tree for water and nutrients. The mulched area makes it easier to operate mowers and weed eaters without hitting the trunk and compacting soil. Apply mulch to a depth of 2 to 3 inches (Figure 11). Mulch should be kept away from contact with the trunk.



Figure 12. Double



Figure 13. Double staked with splint stake.



Figure 14. Single staked with splint stake.

Staking: The method of staking is dependent on a tree's ability to stand on its own and the location of the planting site. If the tree can stand on its own, it does not need to be staked. Staking is used to hold trees erect, allow the root ball to anchor, and protect the trunk from damage by equipment. The ties around the trunk and to the stakes should not be tight – the tree should be able to move slightly in the wind. Stakes should be removed when the tree can stand on its own and the root ball is anchored. Stakes should be positioned away from the tree and secured to the trunk at the point where the tree stands straight. Do not use wire or any strap that will

girdle the tree or damage the bark. Acceptable staking examples may be seen in Figures 12, 13, and 14. Another acceptable method of staking is the use of tree anchor stakes which are driven completely through the root ball into the firm soil below.

Tree Training in the Early Years

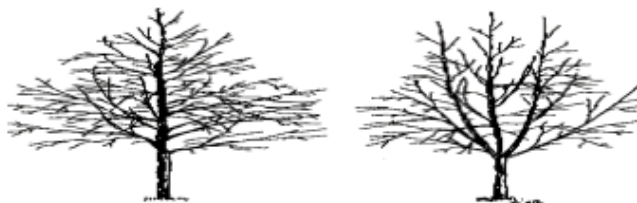


Figure 15. Good tree structure (left); poor structure (right).

Trees with branches spaced along the central leader, or trunk (Figure 15) are stronger than trees with branches clustered together (Figure 15). Prune trees at planting to one central leader by removing or shortening (shown) competing stems (Figure 16). All branches and stems shall be considerably shorter than the central leader after pruning is completed (Figure 16).

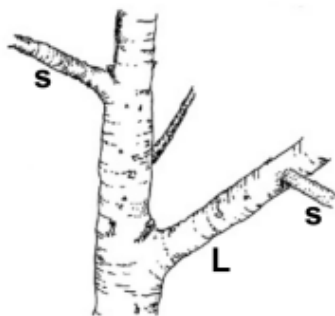


Figure 17. Only large branches need pruning (L). Small branches (S) do not need to be pruned.

Remove or shorten branches that are larger than half the trunk diameter at planting. (Figure 17). The central leader shall be more visible in the crown center after pruning. Only large-diameter branches need to be pruned because they compete with the leader and could be weakly attached (Figure 17, L). Small branches (Figure 17, S) do not need pruning because they will not compete with the leader.

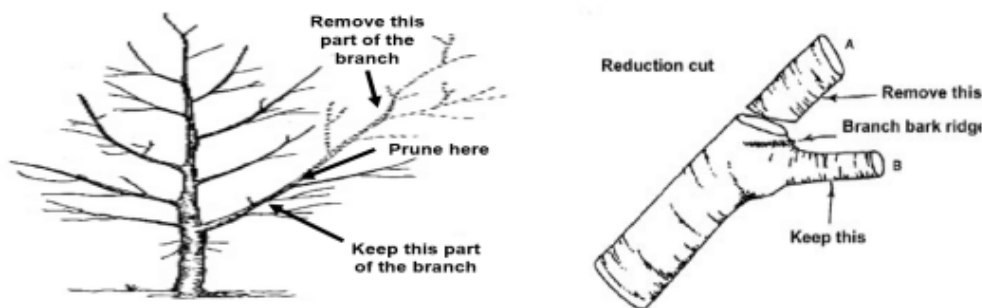


Figure 18. Shortening larger low branches concentrates growth in the leader and improves tree structure.

The best way to shorten large or long stems and branches is to cut them back using a reduction cut to a live lateral branch (Figure 18). This slows growth on the pruned parts and encourages growth in the dominant leader creating sound structure. Reduction cuts can be used on trees at planting to subordinate branches that are codominant (Figure 18). Some upright stems and branches can be removed entirely back to the trunk.

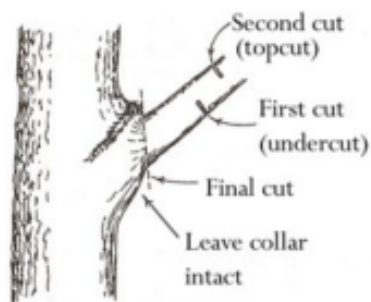


Figure 19. The 3-Cut Method

Remove larger branches by making three cuts (Figure 19). This prevents the bark from peeling or splitting off the trunk below the cut. Make the final cut back to the branch collar (enlarged area around union of branch where it joins the trunk).

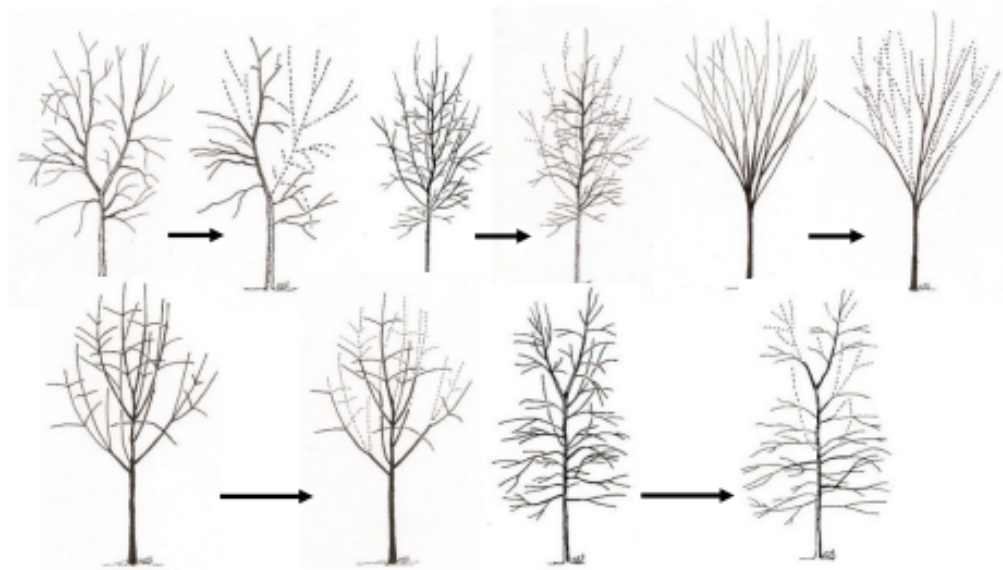


Figure 20. Before and after pruning at planting

Structural Pruning Checklist

1. Develop and maintain a central leader.
2. Prevent branches below the permanent crown from growing larger than half the trunk diameter.
3. Space main branches along the central leader.
4. Reduce vigorous upright stems back to lateral branches or remove entirely (Figure 20).

City of Lewisville Approved Plant Materials Lists

Below is a table of the approved Plant Materials, the most preferred trees are Live Oak, Cedar Elm, Bald Cypress, Bur Oak, Pecan.

EXHIBIT VIII.3.3-2 APPROVED SHADE TREES

SHADE TREES	
Common Name	Scientific Name
Afghan Pine	<i>Pinus eldarica</i>
American Elm ^{1,2}	<i>Ulmus americana</i>
Austrian Pine	<i>Pinus nigra</i>
Bald Cypress ¹	<i>Taxodium distichum</i>
Bigelow Oak ¹	<i>Quercus sinuate</i> var. <i>breviloba</i>
Black Hickory ^{1,2}	<i>Carya texana</i> (aka <i>Carya buckleyi</i>)
Black Locust	<i>Robinia pseudoacacia</i>
Bur Oak ¹	<i>Quercus macrocarpa</i>
Caddo Maple	<i>Acer saccharum</i> "Caddo"
Cedar Elm ^{1,2}	<i>Ulmus crassifolia</i>
Chinquapin Oak ¹	<i>Quercus muhlenbergii</i>
Durand Oak ¹	<i>Quercus sinuata</i> var. <i>sinuata</i>
Green Ash ¹	<i>Fraxinus pennsylvanica</i>
Japanese Black Pine	<i>Pinus thunbergii</i>
Lacebark Elm ²	<i>Ulmus parvifolia</i>
Lacey Oak ¹	<i>Quercus fusiformis</i>
Live Oak ¹	<i>Quercus virginiana</i>
Mexican Sycamore	<i>Platanus mexicana</i>
Monterey Oak (aka Mexican White Oak) ^{1,2}	<i>Quercus polymorpha</i>
Pecan ¹	<i>Carya illinoensis</i>
Pond Cypress	<i>Taxodium accendens</i>
Post Oak ¹	<i>Quercus stellata</i>
Sawtooth Oak	<i>Quercus acutissima</i>
Shumard Red Oak (aka Texas Red Oak) ^{1,2}	<i>Quercus shumardii</i> (aka <i>texana</i>)
Southern Magnolia ^{1,2}	<i>Magnolia grandiflora</i>
Sweetgum ¹	<i>Liquidambar styraciflua</i>
Texas Ash ^{1,2}	<i>Fraxinus texensis</i>
Texas Walnut ¹	<i>Juglans microcarpa</i>
Willow Oak ^{1,2}	<i>Quercus phellos</i>
Winged Elm ^{1,2}	<i>Ulmus alata</i>

¹ Native species, which is preferred but not required.

² Species approved for planting within the right-of-way along Streets and Thoroughfares

EXHIBIT VIII.3.3-3 APPROVED UNDERSTORY TREES

UNDERSTORY TREES	
Common Name	Scientific Name
Carolina Buckthorn ¹	<i>Rhamnus caroliniana</i>
Chittamwood ¹	<i>Sideroxylon lanuginosum</i> (aka <i>Burmelia lanuginosa</i>)
Crepe Myrtle (tree form)	<i>Lagerstroemia indica</i>
Desert Willow ¹	<i>Chilopsis linearis</i>
Eastern Redbud ¹	<i>Cercis canadensis</i>
Eastern Red Cedar ¹	<i>Juniperus virginiana</i>
Eve's Necklace ¹	<i>Sophora affinis</i>
Hawthorne ¹	<i>Crataegus</i> spp.
Hollywood Juniper	<i>Juniperus chinensis</i> 'Torulosa'
Little Gem Magnolia	<i>Magnolia grandiflora</i> 'Little Gem'
Mexican Buckeye ¹	<i>Ungnadia speciosa</i>
Mexican Plum ¹	<i>Prunus mexicana</i>
Mexican Redbud ¹	<i>Cercis canadensis</i> var. <i>mexicana</i>
Possumhaw Holly (aka Deciduous Yaupon Holly) ¹	<i>Ilex decidua</i>
Prairie Flameleaf Sumac ¹	<i>Rhus lanceolata</i>
Red Buckeye ¹	<i>Aesculus pavia</i>
Roughleaf Dogwood ¹	<i>Cornus drummondii</i>
Rusty Blackhaw Viburnum ¹	<i>Viburnum rufidulum</i>
Texas Buckeye ¹	<i>Aesculus arguta</i> /glabra
Texas Mountain Laurel ¹	<i>Sophora secundiflora</i>
Texas Persimmon ¹	<i>Diospyros texana</i>
Texas Redbud ¹	<i>Cercis canadensis</i> var. <i>texensis</i>
Thornless Common Honeylocust ¹	<i>Gleditsia triacanthos</i> var. <i>inermis</i>
Wax Myrtle ¹	<i>Myrica cerifera</i>
Western Soapberry ¹	<i>Sapindus drummondii</i>

¹ Native species, which is preferred but not required.

EXHIBIT VIII.3.3-4 APPROVED SHRUBS

Shrubs	
Common Name	Scientific name
Agarita* ¹	<i>Berberis trifoliolata</i>
American Beautyberry*	<i>Callicarpa americana</i>
Apache Plume*	<i>Fallugia paradox</i>
Aromatic Sumac*	<i>Rhus aromatica</i>
Coralberry* ¹	<i>Symphoricarpos orbiculatus</i>
Dwarf Wax Myrtle* ¹	<i>Myrica pusilla</i>
Dwarf Yaupon Holly*	<i>Ilex vomitoria 'Nana'</i>
Evergreen Sumac* ¹	<i>Rhus virens</i>
Flame Acanthus*	<i>Anisacanthus quadrifidus</i>
Flowering Quince	<i>Chaenomeles japonica</i>
Fragrant Mimosa*	<i>Mimosa borealis</i>
Indian Hawthorn ¹	<i>Rhapiolepis indica</i>
Lindheimer Nolina* ¹	<i>Nolina lindheimeri</i>
Tam Juniper ¹	<i>Juniperus sabina 'Tamariscifolia'</i>
Texas Nolina* ¹	<i>Nolina texana</i>
Turks Cap*	<i>Malvaviscus drummondii</i>

* Native species, which is preferred but not required.

¹ Considered Evergreen

K. Native Plants and Pollinative Prairies

General – Ensure the economic, ecological, and social sustainability of Lewisville's parks, recreation, and open space system.

- A list of eligible small pollinators plant list is attached in the appendix.
- A list of Invasive species to avoid is attached in the appendix.

An "invasive species" is defined as a species that is non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

1. Site requirements

- The site should be at least 10,000 square feet.
- The site should be in a sunny area.
- The site should be 60 feet from any residential home.
- An initial plant survey should be done to assess how many current invasive and native species are at the proposed site.

2. Site preparation

- a. The site will be mowed twice before its seeded.
 - i. After the initial mowing, wait two-three weeks then mow again.
 - ii. Mow as low as possible without destroying equipment.
- b. When applicable till the site using the PTO-60 at a 2 inch depth.
- c. Butterfly Retreat and Blackland Prairie mixes should be used at the lawn and garden rate for establishment.

3. Seeding the site

- a. New sites should be seeded starting in August and completing by the end of November.
- b. The seeds should be mixed with vermiculite at a 50/50 ratio.
- c. The seed mixture will be put out with the Z-spreader.
 - i. The first pass will be north to south.
 - ii. The second pass will be east to west.
- d. Once the seeds have been sown, they will be rolled with a sod roller.
- e. Attach the sod roller to the gator and make several passes to ensure good seed to soil contact.

4. Maintenance

- a. Sites will be monitored once a month for invasive species.
- b. Invasive species will be addressed according to their severity.
 - i. Invasive should account for no more than 20% of the total population.
- c. Sites will be mowed once a year in January.
- d. For the first 5 years sites will be over seeded after the January mowing at the range land rate.
 - a. Mature plants might be needed to establish founder colonies.
 - b. Seed collection should be done twice a year, June and October.
 - c. Seed collection should be done with the aid of volunteers.

L. Illumination

Shielded lighting fixtures shall be used to illuminate portions of the park including parking lots and designated areas, efficient lighting sources should be used such as;

- Light Emitting Diode (LED) fixtures and
- [“Dark Sky”](#) elements should be used.
 - Useful
 - Targeted
 - Low Level
 - Controlled
 - Warm Colored
- LED lights can last for well over 100,000 hours and generally pay for themselves with reduced energy use over a period of a few years. LED lights can also be selected for “whiteness”, color rendition, and contrast, making them ideal for use in public spaces. The “Dark Sky” approach to illumination results in all light being directed toward the ground surface and no higher than 90 degrees from the light source. This results in the use of more efficient fixtures and lamps which do not waste electricity by projecting light into the sky. According to the International Dark Sky Association, installing quality outdoor lighting could cut energy use by 60–70 percent.



Solar Viper LED Solar Lighting

Lighting selection will be evaluated by the Parks and Recreation staff for approval, below are examples of NRPA Low Energy Light Recommendations.

NRPA Low Energy Light Recommendations

Name/Website	Phone Number
<u>Echelon Corporation</u>	408.938.5200
<u>Ephesus Lighting Inc.</u>	315.579.2873
<u>Landscape Forms</u>	800.430.6209
<u>Lithonia Lighting</u>	800.922.9641
<u>Musco Lighting</u>	800.825.6030
<u>Schreder Lighting LLC</u>	847.621.5130
<u>Sol Inc.</u>	800.959.1329

M. Irrigation

1. **General** - It is important for Park Maintenance to have a consistency in the installation, repair and service of their irrigation systems. Below are standards and specific brands used for the parks, ballfields, and flower gardens for the City of Lewisville. The software, controllers and flow meters listed are essential for monitoring the health and efficiency of the irrigation system that can detect flow rates, water leaks and usage. Full Irrigation Specifications for City Parks, Medians, and Facilities can be found here:
 [Irrigation Specifications for City Parks, Medians and Facilities.pdf](#)
2. Standards & Equipment Recommendations
 - Irrigation
 - Hunter Industries - Sprinkler heads, nozzles, bubblers, valves, and wire.
 - Software

- ICC Software - powerful graphic interface allows insertion of actual site photographs, maps, and project renderings. IRRInet-FIU uses wireless and cellular connections.
- Controllers
 - IRRInet systems utilize Motorola controllers to control water functions and reporting to ICC software.
- Flow Meters
 - ARAD Hydrometer used to meter water and electrically activated double chambered irrigation valves.

N. Green Infrastructure & Sustainability

General – The City of Lewisville adopted a Sustainability Master Plan in May 2021. This plan covers how the city as a whole can incorporate sustainability practices. The Parks and Recreation Department continues to develop parks to support sustainability and ecology efforts throughout the city. Strategies are:

a. Parks for Stormwater Management

Parks can be designed to support stormwater management and reduce water consumption. Parks that continually flood can be evaluated and converted into “sponge parks” to absorb water through the incorporation of interpretive wetlands and boardwalks.

b. Low Impact Development

Low Impact Development (LID) is an alternative design strategy that uses natural and engineered infiltration and storage techniques. Typically, these types of techniques are used in developed areas to filter stormwater run-off prior to it re-entering the water system. Park development can utilize LID in a variety of ways:

- **Parking Lots:** Parking lots can utilize a variety of LID techniques such as permeable pavers, porous concrete, gravel lots, or the use of rain gardens/bioretention for landscaped islands. These techniques are used to either capture or slow down water prior to enter the aquifers.

By slowing down this process, native vegetation can break down and filter pollutants out of the water.

- **Ponds:** Pond areas can include diverse riparian buffers to provide enhanced quality and benefits before run-off enters pond areas.
- **Watering:** A variety of water-saving measures can be utilized, including the incorporation of rain barrels and cisterns to collect run-off from rooftops and the utilization of no-mow/natural areas. Rain barrels and cisterns can supplement watering measures for gardens and smaller vegetated spaces.

c. **Sustainability and Technology in Parks**

How parks are designed and maintained have an impact on sustainability and water consumption. Technology should be a key component in the parks system to ensure efficient watering practices and reduced energy needs. Examples of improved technology in parks include, but are not limited to:

- **Maintenance:** By utilizing automatic watering systems and improving monitoring resources for irrigation, streamline watering practices and reduce unnecessary watering.
- **Surfaces:** Utilize alternative surfaces for fields and play structures that require less maintenance and watering. For example, play fields can be replaced with artificial turf.
- **Native Planting:** Native species provide a more natural habitat for wildlife, are compatible with the climate (i.e., drought tolerant) and typically require less watering, maintenance, and fertilizers. Local plants are more resistant to insects and support local biodiversity. The city should continue to incorporate native plantings into their parks and open spaces.

d. **Permeable Pavement for Parking and Walkways**

Permeable paving not only reduces storm water runoff rates, by allowing water to soak into the ground it helps reduce pollution from runoff with oils

and grease from vehicles. As shown in Protection can be used near trees to protect roots and allow oxygen exchange.

e. Recycled Materials

Several recycled materials are being used frequently throughout Texas, including reclaimed asphalt pavement, crushed concrete, and fly ash. Each of these has different permeability characteristics, depending on the gradation and installation. However, they can be used to create a paving that reduces runoff and helps maintain a more natural appearance than concrete or asphalt pavement.

f. Bioswales

Bioswales can be an important part of the storm water detention and storm water quality systems for new construction when incorporated into the project early in the site planning process.

g. Air and Heat Monitors

Install air quality and ambient temperature monitors during an improvement project.

- Air quality sensor:
<https://www2.purpleair.com/products/purpleair-flex>
- The temperature sensor:
<https://www.onsetcomp.com/products/data-loggers/mx2301a>
- The solar radiation shield:
<https://www.onsetcomp.com/products/mounting/m-rsa>

O. Signage, Wayfinding, and Graphics

a. General

Signage, wayfinding, and graphics must have clear messaging and consistency. The Lewisville Parks and Recreation Department has established standards that help orient users to parks, trails, and community amenities; support accessibility for all users; and incorporate the department's brand (PLAY Lewisville) using common design language, fonts, and colors.

b. Standards

The City of Lewisville has two documents that reference signage, wayfinding, and graphics to be used in parks, trails, and community amenities and are attached in the appendix.

- [Park and Trail Wayfinding Signage & landscape Standards](#)
- [PLAY Lewisville Marketing Manual](#)

P. APPENDIX

- [List of Acronyms](#)
- [Park Project Checklist](#)
- [“Good, Better, Best”](#)  Park Dev - Bike Rack and Fitness Equip
- [Lewisville Unified Development Code Park Development Regulations](#)
- [Replacement of Protected Trees and Credits for Preserved Trees](#)
- [Lewisville Pollinator Plants](#)
- [Lewisville Invasive Species -](#)
https://www.texasinvasives.org/plant_database/index.php
- [Parks and Recreation Wayfinding & Signage Plan](#)
- [Healthy Infrastructure Plan](#)

Material found not to meet any of the color requirements during the life of the stripe may subject the manufacturer to removal from the MPL.

- 6.6.2. **Black.** The black pigment must produce a completely opaque, black stripe when applied on the road and after 70 hr. of weatherometer exposure in accordance with ASTM G 155 using Exposure Cycle 1 with a quartz inner filter glass and Type "S" Borosilicate outer filter glass.
- 6.7. **Uniformity.** When sampled in accordance with Tex-862-B, any 100-g sample must be representative of the batch or lot of material.
- 6.8. **Formula.**

Table 3
Thermoplastic Pavement Marking Material

White	% by Weight	Yellow	% by Weight
Binder for Non-Profile	20 Min	Binder for Non-Profile	20 Min
Binder for Profile	18 Min	Binder for Profile	18 Min
Titanium Dioxide	10 Min	C.I. Pigment Yellow 83	1.5 Min
Calcium Carbonate	20–42	Calcium Carbonate	20–42
Glass Traffic Beads	30–45	Glass Traffic Beads	30–45
Total	100	Total	100

Note 1—The above requirements will be determined by testing in accordance with Tex-863-B.

Note 2—Alternate pigments and pigment loading for yellow formulations may be considered if CST/M&P evaluates and approves the alternate formulation prior to use.

Note 3—Black thermoplastic formulations must meet the same binder, glass traffic bead, and calcium carbonate requirements listed above for white and yellow non-profile thermoplastic.

7. **ARCHIVED VERSIONS**

Archived versions are available.

Section B - Material and Performance Specifications

Purpose

This section puts forth the minimum requirements for materials, methods and processes required for a successful completion of a wayfinding and signage project. These requirements are part of industry best practices and shall be included with every signage contract to legally bind the sign fabricator, sign contractor or general contractor to produce signage of the highest quality possible.

This section protects the client from errors, omissions and unwanted/unapproved value engineering from the sign contractor. Each section provides minimum requirements to which the sign fabricator must adhere:

- 1.01: Summary — General requirements of the Specifications.
- 1.02: References — Provides a list of the minimum codes that the sign contractor must understand and abide by when fabricating the signs.
- 1.03: Submittals — Defines the process for providing prototypes, shop drawings, colors and other required submittals for the Owner or Owner’s Representative approval.
- 1.04: Standards — Stipulates minimum acceptable material and submittal standards.
- 1.05: Quality Assurance — Defines the quality assurance responsibility of the signage contractor.
- 1.06: Delivery/Storage/Handling — Defines the protocols to be followed for delivery, storage and handling of signage and materials under contract.
- 1.07: Project/Site Conditions — Defines what to do in the event that the project site is not ready for staging or signage installation.
- 1.08: Warranty — Defines warranty terms for the sign program.
- 1.09: Maintenance — Maintenance documentation and processes to be provided by sign contractor.
- 1.10: Electronic Components — Stipulates minimum requirements for any electronic components which may be part of signage.
- 1.11: Fabrication — Defines the minimum performance requirements for general fabrication processes.
- 1.12: Materials — Stipulates the approved quality and suppliers for specific materials. Some of the materials listed are not used in this sign system, but they are included in the event the sign system is expanded to make such inclusion necessary.
- 1.13: Weather Proofing — Defines terms and liability for weather proofing signage and signage components.
- 1.14: Sign Construction — Defines requirements for structural components of sign systems.
- 1.15: Installation — Defines minimum acceptable practices for installation of signs.
- 1.16: Additional Requirements — Stipulates that the sign contractor must also legally abide by comments and notes depicted in the sign drawings of this manual.

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SECTION 101400, IDENTIFYING DEVICES SPECIFICATIONS

NOTE: These specifications include a wide range of materials and methods, not all of which will apply to each wayfinding project.

1.01 SUMMARY

- A. General: Provide Signage and Graphic Products in accordance with requirements of the Contract Documents.
- B. Work Included: Perform all work necessary to complete and install all sign and graphic products including supports and mounting hardware, as shown on the drawings or inferable therefrom and/or as specified herein in accordance with the requirements of the Contract Documents. Work shall include obtaining all necessary permits from applicable agencies.
- C. Subcontractors: Within 5 working days of notification, the successful bidder shall submit the names of all Subcontractors for review and approval. The approval or disapproval of any Subcontractor will not relieve the Signage Contractor of his responsibility for the performance of the Work as called for under the Contract Documents, nor will approval of a particular Sub-contractor be construed as approval of any particular process or material.
- D. Future Purchase of Signage: Signage Contractor shall furnish cost information for future purchases (guaranteed up to 1 year from substantial completion) for all signs and graphic products in these documents; information shall include costs for items ordered individually as well as minimum order required to obtain price break.
- E. If this specification is a component of a complete Architectural project specification, any conditions or requirements stated within the Signage specification that are less-stringent than those stated in the Architectural project specification do not in any way relieve the Signage Contractor from compliance with the terms of the Architectural project specification. Any conflicting conditions or requirements should be reported to and resolved with fd2s and/or city and Architect.

1.02 REFERENCES

- A. "Americans with Disabilities Act (ADA)" legislation, published in the Department of Justice Federal Register. www.ada.gov
- 1. "ADA Standards for Accessible Design", as published in the revised Titles II and III of the Americans with Disabilities Act of 1990 (ADA) in the Federal Register issued by the Department of Justice on September 15, 2010. The ADA Standards for Accessible Design are, http://www.ada.gov/2010ADASTandards_index.htm or http://www.access-board.gov/ada/
- B. "Architectural Barriers Act (ABA)", current revision, http://www.access-board.gov/aba/ .
- C. "The Americans with Disabilities Act White Paper Update 2006: Guidelines, Best Practices and Innovation for Signs for the Blind and Visually Impaired," published by the Society for Environmental Graphic Design, Society for Environmental Graphic Design; 401 F Street NW, Suite 333; Washington, DC 20001; 202.638.5555, www.segd.org

1.03 SUBMITTALS

- A. Procedures: Not later than 20 working days from the Contract Date, the Signage Contractor shall provide the specified items noted on the Submittal Schedule "APPENDIX A" included at the end of this specification section. Except for the quantities required for producing samples and mockups, fabrication shall not begin nor shall orders be placed for materials until Signage Contractor has obtained approvals on submittals. Signage Contractor shall notify fd2s and/or city (or City) of any items that require excessive lead times and may require expedited ordering.
- B. Signage Contractor's Shop Schedule: Submit for fd2s and/or city information not less than 5 working days from the Contract Date an updated comprehensive fabrication schedule "Exhibit I", if required. Schedule shall be augmented with detail delivery and expected fd2s and/or city and/or city response times for all signage/graphic products, and shall include overview schedule information for anticipated shop activity for each sign type, including delivery of outsourced items, completion of major subcomponents, and any crucial fabrication milestones, especially those that are affected by fd2s and/or city response times. Substantial Completion and Final Due dates shall not be altered, unless otherwise stipulated in writing by Owner and/or Owner's Representative.
- C. Product Data: Submit for fd2s and/or city action, electronic documentation in PDF or other standard format, a material list with technical data documenting the primary function, quality, and performance of each system to be used in the Work or other such primary characteristics as required by the Drawings or Specifications.
- D. Manufacturers' Data: For all non-custom items, materials, subassemblies, etc., submit to fd2s and/or city for review only, electronic

- documentation in PDF or other standard format, manufacturer's specifications and installation instructions for "sign" to show compliance with these specifications.
- E. Shop Drawings: Submit for fd2s and/or city action, electronic documentation in PDF or other standard format, shop drawings for the fabrication and installation of the Work. Prepare details at not less than 3" = 1'-0" minimum scale with critical points at full scale. All shop drawings shall be explicit in depicting materials, material grades and thicknesses, finishes, substructure, footings, fabrication joints, corners, edges, intersections, fasteners and copy composition including letter and line spacing.
 - F. Samples: Submit for fd2s and/or city action, two sets of samples of each finish, color and lettering type required, one set which will be returned with appropriate action noted. Color samples shall be 6" x 6" and shall be on same or similar substrate to finished product and shall be treated with any specified protective films or coatings. Material and metal finish samples shall be 6" x 6" minimum and shall be same gauge as finished product where reasonable. Label samples to indicate product, characteristics, and locations in the Work. Samples will be reviewed for color and appearance only. Compliance with all other requirements is the exclusive responsibility of the Signage Contractor.
 - G. Mock-ups: Submit one of each for fd2s and/or city action as outlined in the "Submittals Schedule" at the end of this specification section. Submittals are required by fd2s and/or city to assist in performing the work in a manner consistent with the Contract Documents and to insure the best possible construction and quality of finished product. They should be identical to the anticipated production run, and should be complete and assembled. These mock-ups will serve as quality control standards throughout the life of the production run. The review of submittals in no way shall relieve the Signage Contractor of responsibility to provide signage of a quality level consistent with these Contract Documents.
 - H. Copy Layouts: Submit a full size PDF or two hard copies for Designer's action, full-size, laser or plotter prints (color or black text on white bond paper) of all UNIQUE sign faces with actual fabrication-ready formatting. Layouts shall be annotated to indicate location, as per Message Schedule and Sign Location Plan conventions. Layouts can be ganged onto a single page/plot not to exceed 30" X 42" Laser prints which, at full-size, will exceed the dimension of 30" x 42" may be submitted at the largest scale that will fit on a 30" x 42" sheet. Output shall be of sufficient resolution that visual integrity of the layout may be inspected, but in no case shall the scale be less than 3" = 1'-0". Samples are to be produced on the same device as that used to produce camera artwork and/or router outlines. Layouts will be reviewed for composition, letterspacing, font usage, and copyfitting. Copy accuracy and/or spelling will not be reviewed; it is the responsibility of the Signage Contractor to conform to the Message Schedule as submitted. Some samples will be required to be submitted at actual size or a specific architectural scale and on the actual final material as noted in Exhibit D - Design Intent Drawings and as requested in the Submittal Schedule "APPENDIX A".
 - I. Structural Drawings/calculations: Submit two copies for fd2s and/or city information. For large, structurally crucial sign types, furnish engineering drawings and calculations to show that maximum stresses and deflections to not exceed performance requirements under full design loading. Drawings and calculations shall be prepared and sealed by a qualified Structural Engineer licensed in the State where the project is located.

1.04 STANDARDS

- A. Provide Sign types of the size, material, images and arrangements made up of special and standard components and construction as shown and specified.
- B. All drawings pertaining to general sign configuration, typography, graphic layout, and sign placement are included.
- C. If there is a conflict, stated dimensions on the drawings shall take precedence over scaled dimensions. Signage Contractor shall verify sign and copy length for proper fit and shall notify fd2s and/or city in writing of any discrepancies in the documents prior to fabrication.
- D. All materials shall be new stock, free from defects impairing strength, durability and appearance.
- E. All fabrication and installation shall be in accordance with highest standards of the trade. All signs and components shall be complete and free from visual and mechanical defects. (Such as unfilled and unfinished seams or exposed fasteners).
- F. All electrical work must comply with UL standards, N.E.C. requirements, and local jurisdictional requirements.
- G. No fabrication or installation materials or procedures shall be used that will in any way change the visual quality or in any manner

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- have an adverse effect on existing materials, surfaces and environment.
- H. All damaged signing surfaces and materials incurred shall be restored to original condition and appearance or replaced by the Signage Contractor.
- 1.05 QUALITY ASSURANCE
- A. Signage Contractor's Quality Assurance Responsibilities: Signage Contractor is solely responsible for quality control of the Work and its installation.
- B. Regulatory Requirements: Signage Contractor is solely responsible for complying with applicable requirements of the laws, codes, ordinances, and regulations of Federal, State, and Municipal authorities having jurisdiction. Obtain necessary approvals and permits from all such authorities.
- 1.06 DELIVERY, STORAGE, AND HANDLING
- A. General: Unless otherwise stipulated or agreed to in writing from the Owner, Signage Contractor is responsible for storage and delivery of all materials until installation. Specific on-site storage needs shall be coordinated with the Owners' representative and/or General Contractor.
- 1.07 PROJECT/SITE CONDITIONS
- A. Weather Conditions: For exterior concrete or painting/finish work, do not proceed with the Work during inclement weather nor when weather forecasts are unfavorable, unless the Work will proceed in accordance with the manufacturer's requirements and instructions.
- B. Site Readiness: Unless otherwise requested, do not install signs until underlying and adjacent surfaces are completed. Coordinate installation timing with all other applicable trades.
- 1.08 WARRANTY
- A. Guarantee: The Signage Contractor shall guarantee all workmanship and material used to manufacture and install the signage product he has furnished as follows: General workmanship and materials shall be guaranteed for a period of one year. Applied finishes (paint, vinyl, silkscreening) shall be guaranteed for a period of seven years. Powder coated finishes shall be guaranteed for a period of 10 years. Electrical components shall be guaranteed to the extent of the electrical components manufacture's guarantee. If during the guarantee period any defects or faulty materials are found, he shall immediately upon notification by the Owner, proceed at his own expense, to replace and repair same, together with any damage to all finishes, fixtures, equipment and furnishings that may be damaged as a result of this defective equipment or workmanship.
- 1.09 MAINTENANCE
- A. Record Drawings: Furnish record drawings annotated with the changes made during shop drawing reviews and/or installation of the Work so as to be a complete set of "as-built and installed" plans. Drawings shall include any applicable wiring diagrams, as well as the locations and methods of any concealed fasteners or access areas. Any installation, service, or removal "tricks" or methods should be communicated graphically/verbally as required.
- B. Maintenance and Removal: Signage Contractor shall provide written instructions for removal of interior signs from wall surfaces including recommended methods for removal of residual adhesives. Signage Contractor shall provide written instructions for the Owner to follow proper maintenance.
- C. Graffiti Resistance: Signage Contractor shall provide written documentation listing each sign that has been treated with a graffiti-resistant film or coating and identifying the product or products used on each. Documentation shall include manufacturer's recommended materials or products to be used for removal of graffiti from each graffiti-resistant film or coating. Signage Contractor shall provide manufacturer's written instructions for maintaining all graffiti-resistant films or coatings used.
- 1.10 ELECTRONIC COMPONENTS
- A. Protection: Protect all electronic components as required by manufacturer and to prevent tampering.
- B. Contamination: Proper measures shall be taken as required by manufacturer to prevent foreign objects or liquids to contaminate the

electronics such as (but not limited to) water, cleaning solutions, sand, dirt and the like.

- C. Ventilation: Ventilation shall be provided to all electronic components as required by the manufacturer of such component. Fabricator shall be liable for overheating of electronic components that render them useless or failure to perform as specified.

PRODUCTS

1.11 FABRICATION: GENERAL

- A. All fabrication shall be executed in such a manner that all edges and corners of finished letter forms and sign substrates are true and clean. Letterforms and signs (unless noted otherwise) with rounded positive and negative corners, nicked, cut or ragged edges, bent or distressed edges etc. will not be accepted.
- B. All finishes shall be executed in such a manner that all surfaces shall have a smooth even finish and are free of any and all irregularities.
- C. All letterforms shall be so aligned as to maintain a baseline parallel to the sign format. Margins shall be maintained as specified by sign type layouts.
- D. All edges of letterforms shall be sharp and clean with no edge buildup or bleeding. All surfaces of letterforms shall be without pinholes.
- E. Sheet metal letterforms and other items shall be cut from rolled sheet of specified gauge, all edges of copy to be perpendicular to copy face, ground smooth and polished to finish as noted on drawings and schedules. No surface deflection, "oil-canning" or warping will be tolerated.
- F. All signs and copy noted on drawings as acid-etched or photopolymer shall be photo chemically etched to a depth of 1/32" unless otherwise shown on the drawings. Etched surfaces shall be paint filled or sprayed in color noted on drawings. All etching shall be executed in such a manner that all edges and corners of finished copy or graphics are true and clean.
- G. All engraving is to be computerized CNC engraving systems. Engraving to be uniform depth of 1/32" with no visible tooling marks.
- H. All copy noted as sandblasted shall be blasted utilizing the appropriate texture of blasting silica to achieve consistent depth. Careful control of nozzle pressure, distance and angle is necessary to prevent distortion.
- I. All silk-screens shall be executed from photo-screens or negatives prepared per specification and drawings. Silkscreen mesh shall be 390 or finer. Signage Contractor shall not use images as shown in the Contract Documents as camera ready art.
- J. All silkscreen printing shall be executed in such a manner that all edges and corners of finished letterforms are true and clean. Letterforms with rounded positive or negative corners, edge buildup or bleedings, etc. will not be accepted.
- K. Preparation, primer and gloss or satin (as indicated) polyurethane acrylic base finish coats to provide weather resistant finish guaranteed for seven (7) years against pitting, peeling, or fading. Polyurethane coating provided for use on surfaces shall have properties of moisture resistance in all weather conditions and shall be guaranteed for seven (7) years against pitting, peeling or fading.
- L. No paints that will prematurely fade, discolor, or de-laminate as a result of ultraviolet light or heat shall be used.
- M. All paints required for lettering including silk-screens and imprinted surfaces shall be a type made for the surface material on which it is applied and recommended by the manufacturer of the paint. Exact identification of all paints shall be noted on shop drawings, together with data describing the method of application and curing, if other than "air" drying.
- N. All paints shall be evenly applied and without pinholes, orange peeling, debris, scratches, application marks, and other imperfections. Workmanship in conjunction with finishes of signage shall conform to the highest standards of the trade.
- O. Primer coats or other surface pretreatments, where recommended by the manufacturer for paints, shall be included in the work as part of the finished surface work at no extra cost to the Owner.
- P. All exterior signs, sign bodies, or sign components that will be installed within reach of pedestrians shall be treated with a graffiti-resistant film or clear coating.
- Q. All adhesives as may be required shall be used in accordance with recommendations made by the manufacturer of the material specified to be laminated or adhered. No adhesives that will fade, discolor or de-laminate as a result of ultraviolet light or heat shall be used and shall not change the color of or deteriorate the materials to which they are to be applied. The adhesives shall be of a non-

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- staining, non-yellowing quality and all visible joints shall be free from air bubbles and other defects.
- R. For the fabrication of general metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, roughness, seam marks, and trade names. Unless the surfaces are to be painted, do not use materials that have stains and discolorations.
 - S. For exposed items of work that include plain flat surfaces in width of more than 50 times the metal thickness, provide sheet stock from the mill that has been stretcher leveled to the highest standard of flatness commercially available.
 - T. Welding, when necessary, shall be of the correct type to minimize permanent distortions of flat surfaces. All welding flux, oxides and discolorations must be removed by pickling or grinding, so that these areas match finish of the adjacent areas. Any damage caused by welding must be repaired by grinding, polishing or buffing.
 - U. Signage Contractor shall be responsible for the accurate seating and leveling of all anchor bolts.
 - V. All illuminated signage shall illuminate evenly without hot or cold spots and without shadowing or show-thru of internal components either when turned on or left off.

1.12 MATERIALS

- A. Anchors and Inserts: Either furnish inserts to be set in concrete work, or provide other anchoring devices as required for the installation of signs as specified on drawings. Furnish cast iron, or malleable iron ore hot dip zinc coated inserts. Provide toothed stainless steel, galvanized or zinc-and-chrome-plated high carbon steel expansion bolt devices for drilled in place anchors.
 1. "Thunderstud", Concrete Wedge Anchor, www.confast.com/products/thunderstud-anchor.aspx
 2. "Kwik Bolt", Hilti Fastening System, www.hilti.com
- B. Metals:
 1. Aluminum: AA Alloy 5052, 6061T6, 6063T6 or as recommended to suit required service and finish. Exposed aluminum is to carry Protective Finish as per this specification.
 2. Steel:
 - a. Materials:
 - i. Steel Pipe shall conform to ASTM A53, Type E. F., or G at fabricators option, Grade A, black finish unless otherwise shown as galvanized standard weight, (Schedule 40).
 - ii. Steel sheet for cold forming shall conform to ASTM A 569, hot-rolled sheet steel of commercial quality, pickled and oiled, free of defects which would impair the work.
 - iii. Galvanized steel sheet shall conform to ASTM A 526, commercial quality.
 - iv. Finishing - Primer: Provide in strict accordance with paint manufacturer's recommendations as required for proper adhesive and application of finish unless steel indicated to receive galvanized finish.
 - v. Finishing - Baked enamel finish: Provide manufacturer's standard baked enamel finish.
- C. Metal Fasteners: Stainless steel or galvanized steel finished to match metal work. For machine screws, comply with Industrial Fastener Institute (IFI), Countersunk Phillips flat head where exposed unless otherwise shown.
- D. Adhesives: Furnish adhesives as required and as manufactured by one of the following or approved equal:
 1. 3M VHB Acrylic Foam Tape 4950, www.3m.com
 2. Silicone adhesive - Ready to use, high performance adhesive. General Electric GE1200 sealant, translucent SCS 1201 or equal, as recommended by manufacturer for bonding condition.
 3. 3M Double Coated Tape 415 Clear, www.3m.com
 4. Dow Corning 999-A Silicone Building & Glazing Sealant 999, http://www.dowcorning.com/content/construction/weather/999a_color_chart.asp
 5. Epoxy - Two component thermosetting epoxy adhesive with 100% solid content.
 6. 3M Dual Lock industrial Velcro, www.3M.com
 7. 3M DP Scotchweld Adhesives, www.3m.com
 8. Lord Engineered Adhesives, www.lord.com
 9. Wood - Contact type, unless otherwise recommended by manufacturer for type of installation required.

E. Coatings

1. Powder Coating with thermally-embedded Image: The process embeds a high resolution image deep into and throughout a super durable powder coated layer. The image is embedded inside the powder and flows seamlessly over edges and corners. It is not a film or a laminate. There are no visible corners and no delamination. The process shall be capable of coating and decorating both flat surfaces and dimensional objects. Coating shall be super durable polyurethane powder coated finish that is resistant to abrasion, humidity and corrosion. It shall be anti-graffiti, scratch resistant and non-combustible. The coating process shall be applicable for both interior and exterior applications. Coating shall withstand high traffic and extreme weather.
 - a. Acceptable Manufacturer: Direct Embed Coating Systems, www.directembedcoating.com
 - b. Acceptable Manufacturer: Alto™ by System Huntington, www.altoaluminum.com
 2. Acrylic Polyurethane Enamel: Provide an aliphatic polyurethane enamel consisting of ultra-violet inhibitors which are lightfast, weather, abrasion and wear resistant. Provide only products that deliver a maximum applied VOC of 2.8 (for latex) or 3.5 (for oil-based) pounds per gallon. Provide products that are Green Seal certified where performance is comparable to higher-VOC products.
 - a. VOC MAP, Matthews Paint, corporateportal.ppg.com/na/refinish/matthews/default.htm
 - b. Grip-Gard, Akzo Nobel, www.signfinishes.com
 3. Protective Finish: For all surfaces noted to receive protective clear finish, apply two coats of clear acrylic polyurethane. Sheen as specified in drawings. Coating shall be compatible with inks or paints applied to surfaces.
 - a. VOC MAP, Matthews Paint, www.corporateportal.ppg.com/na/refinish/matthews/default.htm
 - b. Grip-Gard, Akzo Nobel, www.signfinishes.com
 4. Silk Screen: Enamel inks shall be in colors and sheen as shown and be manufactured by the following or approved equal:
 - a. Nazdar Co., Chicago, IL., www.nazdar.com
 - b. 3M Screen printing Inks 9800 UV Series, www.3mgraphics.com
- F. Vinyl Machine-Cut Artwork: Computer-driven machine cut letters in thickness as specified below, selected from standard colors.
1. Opaque Applications
 - a. 3M 7125 or 7725 Series - 2 mil cast vinyl, www.3m.com
 - b. Avery SC 900 Series - 2 mil cast vinyl, www.averyvinyl.com
 - c. Oracal 951 Series - 2 mil cast vinyl, www.oracal.com
 2. Reflective Applications
 - a. 3M 680 series - 7 mil cast vinyl, www.3m.com
 - b. Avery HV 1200 Reflective, Engineer Grade - 7 mil cast vinyl, www.averyvinyl.com
 - c. Oracal 5500, 5700 and 5800 Series - 5, 6 or 10 mil cast vinyl, www.oracal.com
- G. LED: All units are to carry U.L. certification and are to meet all applicable City, County and/or State codes. Power and load is to be determined on a case by case basis. Signage Contractor is to coordinate power and load requirements with city.
1. LED lighting shall have a minimum of 50,000 hour life prior to reaching 70% of illumination capacity.
 2. Sign contractor is to submit relevant cut sheets and data specifications for each LED product used.
 3. All LED lighting, unless otherwise stipulated in drawings, shall be of the same manufacturer and of the same color temperature.
 4. Unless otherwise stipulated in drawings, illuminated cabinets and letterforms shall be evenly illuminated such that there are no visible hot spots or shadows from internal components. Sign contractor shall get written approval for fabrication of signage that is designed in such a way that even illumination is compromised or not possible. Sign contractor shall get written approval on required sign modifications to produce even illumination which may alter the visual aesthetic of the sign cabinet or letterform.
- H. Graffiti-resistant Films and Coatings: Provide films or coatings appropriate to the material or substrate to which they are applied. Apply films and coatings according to the manufacturers' recommendations.
1. 3M Scotchcal Graphic and Surface Protection Films 8991 and 8991R, www.3m.com

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- 2. DuPont Imron 3.4 HG-C, www.performancecoatings.dupont.com
 - 3. Ecological Coatings 1800 Series Clear Anti-Graffiti Coating, www.ecologicalcoatings.com
 - 4. MaxAll, www.graffitisolutions.com
 - 5. Sherwin Williams Anti graffiti coating https://www.sherwin-williams.com/painting-contractors/business-builders/paint-technology-and-application/sw-article-pro-antigraffiti
 - 6. New Dimensions Solutions Graffiti Shield System, www.ndclean.com
 - 7. Ritama RI-6481 Anti-Graffiti, www.ritrama.com
 - 8. Soy Technologies, LLC, SoyStop Anti-Graffiti Barrier, www.soytek.com
 - 9. Superfrog Signs & Graphics, Frog Shield, www.superfrog.com
 - 10. Tiger Drylac USA, Series 44 Anti-Graffiti, www.tigerdrylac.com
- I. Digitally Printed Graphics: Provide permanent adhesive vinyl film with satin liquid laminate for application to the specified substrate.
- 1. Adhesive Vinyl Film: Avery 2010 vinyl or equal, white. Avery MPI 2120 Matte White vinyl or equal.
 - 2. Solvent based printer: HP DesignJet 10000, 6-color.
 - 3. Inks or toner: UV-resistant.
 - 4. Unless otherwise noted in drawings, apply Avery Dennison High Performance Vinyl "HP" HP DOL 2070 Luster Overlaminate or equal over digital prints.
 - 5. Unless otherwise noted in drawings, the minimum resolution for digital printing on vinyl or other substrate shall be 750 DPI.

1.13 WEATHER PROOFING

- A. Water & Humidity: All exterior sign cabinets shall be sealed as to prevent rain water contamination. Proper venting and drainage shall be provided for humid or wet locations for all exterior or interior sign cabinets. All exposed metal surfaces shall be protected from oxidation.
- B. Heat & Cold: All material used shall be rated to withstand typical hot or cold conditions associated with the region in which they will be installed.
- C. Electronics: All electrical connections and electronic components in exterior signs shall be properly sealed or protected from damage by local weather conditions including heat, cold and water. Electronic components that produce or radiate heat shall be properly vented in accordance with the manufacturer's guidelines. Select equipment that is rated to withstand typical environmental conditions associated with the region or location in which it will be installed.
- D. Sign contractor shall, at his expense, replacement of failed electronic/electrical components which are not rated to withstand typical environmental conditions associated with the region or location in which they are installed or that are not properly installed per the manufacture's recommendations. Furthermore, replacement of failed components shall include other components that are damaged or have been severely affected by the failed component as to render them useless or shorten their lifespan considerably.
- E. Signage Contractor shall not be held liable for any damages caused by natural disasters such as, but not limited to, tornadoes, hurricanes, earthquakes, flooding and the like, unless otherwise noted on the drawings.

EXECUTION

1.14 SIGN CONSTRUCTION

- A. All anchorage is to be reviewed and accepted by fd2s and/or city. Acceptance is not to be construed as an endorsement or review of engineering. fd2s and/or city are to be notified in writing of any conditions detrimental to proper and timely installation of the sign work.
- B. Letters and signs to be structurally designed as required to resist wind loads and thermal movements without distortions or excessive deflections according to local codes and ordinances. Letter and sign fabrication is to be a complete system including all stiffeners, fasteners, welding, sealants, jointing, miscellaneous pieces and material thickness as required to form high quality workmanship. Connections, angles, shapes and details shown are suggestive and are to be sized, reinforced and detailed as required by the Signage Contractor. Details, anchors, or devices, etc. not shown, are to be submitted for review and acceptance by fd2s and/or city before fabrication.

- C. Changes in the visual elements are not to be made without fd2s and/or city review and approval.

1.15 INSTALLATION

- A. Inspect all signs for evidence of damage at the site before installation.
- B. Examine the conditions and substrates under which the installation is to be performed and notify fd2s and/or city in writing of any unsatisfactory condition. Do not proceed with the work until the unsatisfactory conditions have been corrected or subsequent change of location has been indicated.
- C. Follow all recommendations and instructions for installation as provided herein (or by the manufacturer in such a case where instructions are provided). Notify fd2s and/or city in writing if in your judgment such installation will not provide permanent, rigid installation in the existing conditions.
- D. Install letter and sign units and components at the locations shown or scheduled, securely mounted with concealed fasteners, unless otherwise shown, attach signs to substrates in accordance with manufacture's instructions, unless shown. Provide anchorage and fitting; coordinate location in field with fd2s and/or city.
- E. Install, level and plumb at the proper height. Cooperate with other trades for installation of sign units to finish surfaces. Repair or replace damaged units as directed by fd2s and/or city. Installer will coordinate and field measure proper location of sign units, where required, with fd2s and/or city.
- F. All installation procedures and required scheduling are to avoid delays or additional costs and shall be coordinated with fd2s and/or city.
- G. Signage Contractor shall coordinate sign locations with existing mechanical, electrical and plumbing elements and shall notify fd2s and/or city in writing of any visual or physical conflicts.
- H. Protect all adjacent surfaces from damage during installation; promptly repair any such damage should it occur.
- I. Following installation, remove all traces of visible tapes, adhesives, wrappings or refuse from the installation.

1.16 ADDITIONAL REQUIREMENTS

- A. Sign contractor shall include in the "Contract Documents" any specifications noted in the Design Intent drawings.

END OF SECTION 101400

NOTE: Fabricators who have not previously produced signage in this package must submit the following samples for approval prior to fabrication:

- 1. All colors and materials to be used at a minimum size of 4"x4"
- 2. ST-A or B: A full size sample prototype -approved sample can be used in final installation
- 3. ST-101 -103: Partial section at horizontal seam between top and bottom portions at full scale showing all final finishes. Include cardinal direction text and orange stripe.
- 4. ST-104 and 105: Partial section at connection between post and graphic panel at full scale showing all final finishes.
- 5. ST-106: Entire graphic panel with map at full size - approved sample can be used in final installation.
- 6. ST-107 series: Full size panel - approved sample can be used in final installation.
- 7. ST-108: A full size sample prototype -approved sample can be used in final installation.

NOTE: If the project consists of sign types that utilize the same process, it is not necessary to create samples of each element noted above. For example, a project that calls for an ST-101, 102 and 103 need only submit one typical section.

It is highly recommended to perform an in-person review of the completed (perhaps not fully assembled) signage, prior to installation at the fabricator's shop. This is to catch any fabrication errors prior to installing.

	ISSUE DATE	SECTION	DESCRIPTION	PAGE
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END OF SECTION

APPENDIX

Roadway Worker Protection Course Request

Pursuant to the provisions of 49 CFR Part 214, any person who willfully fails to provide worker protection in accordance with those regulations is subject to a civil penalty in the minimal amount of \$2,500.00 per violation.

This form must be completed in its entirety prior to any roadway worker protection (RWP) services being authorized. Services should be requested 15 days in advance of the requirement for such services. Work may not commence until the approved form is returned to the applicant requesting the flagging services.

- Date of Course: _____
- Location of Course: _____
- Number of Attendees: _____

TO BE COMPLETED BY APPLICANT

Roadway Worker Protection Course:

No work or activity shall be conducted less than twenty-five feet (25.0') from the closest rail of any DCTA track (also referred to as "the foul zone") or perform any work in which a catastrophic event could cause equipment, people or materials to enter into the Foul Zone unless DCTA representative Flaggers are present and also within the last 365 days have completed a creditable Roadway Worker Protection Course.

The Roadway Worker Protection Course can be scheduled by calling **Alex Ison (817) 471-7132** or **Mark Richroath (817) 374-3092**. The course cost is **\$1,000.00** and can have multiple attendees for no additional charge up to 50 people. A training venue will need to be provided for classes exceeding 15 people at the requestor's expense. Payment for the course is required prior to, or on the day of the course. **The flagging cost is \$95.00/hour per flagger with an 8 hour minimum and \$95.00/hour for each hour in excess of 8 hours.**

Payment is required upon billing. In the event flagging is required for a period exceeding ten (10) days, a Ten Thousand Dollar (\$10,000.00) retainer will be required. RWP billing will reflect travel time, preparation, and close-down time of up to two hours (per day) beyond work group protection hours.

RWP requests that are not formally canceled before 4:30 PM the business day prior will result in applicant being charged the full 8 hour minimum.

Company information and signature of authorized officer requesting and accepting the financial terms above:

Company Name: _____

Authorizing Officer: _____

Billing Contact: _____ Phone: _____ Email: _____

Billing Address: _____

Purchase Order #: _____

Signature of Authorizing Officer: _____

Applicant to email completed form to flagging@ctcinc.com. Upon receipt of request, CTC will invoice requester for services.

CTC Approval: _____ Date: _____



Innovative approaches
Practical results
Outstanding service

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT NAME	Hebron Parkway	DATE	3/5/2025
CLIENT	City of Lewisville	GROUP	1155
% SUBMITTAL	100% Submittal	PM	Matt Milano

ESTIMATED BY	QC CHECKED BY	FNI PROJECT NUMBER
Matt Milano	Henry Hartshorn	LEW23694

ITEM	DESCRIPTION	Base Bid vs. Alt	QUANTITY	UNIT	UNIT PRICE	TOTAL
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Hebron Parkway						
Unit 1	Miscellaneous					
1	Misc. Demolition		1	LS	\$ 30,000.00	\$30,000.00
2	Traffic Control		1	LS	\$ 25,000.00	\$25,000.00
3	Erosion Control		6000	LF	\$ 10.00	\$60,000.00
4	Misc. Fence Repair		1	LS	\$ 8,000.00	\$8,000.00
5	Temporary Irrigation		1	LS	\$ 20,000.00	\$20,000.00
7	ROW Prep		1	LS	\$ 15,000.00	\$15,000.00
9	Construction Staking and Survey		1	LS	\$ 25,000.00	\$25,000.00
10	Tree Removal		18	EA	\$ 1,200.00	\$21,600.00
11	Tree Protection Fencing		1	LS	\$ 8,000.00	\$8,000.00
12	Utilization of DCTA Flagger near Rail ROW and RWPCR course registration (see appendix in project manual)		1	LS	\$ 20,000.00	\$20,000.00
Unit 2	Trail					
13	12' Wide Concrete Trail (Including Jointing and existing tie-ins)		33,800	SF	\$ 6.50	\$219,700.00
14	Trail Regulatory Signage		1	LS	\$ 2,000.00	\$2,000.00
15	Crosswalk Pavement Markings (Hebron & Railroad Intersection)		1	LS	\$ 4,000.00	\$4,000.00
16	Barrier Free Ramp w/ Detectable Warning Strip		1	EA	\$ 5,000.00	\$5,000.00
17	Trail Grading (Excavation and finish grading)		3500	CY	\$ 30.00	\$105,000.00
18	Turf Grass (Sod disturbed areas) (3' Trail Offset)		18,600	SF	\$ 1.00	\$18,600.00
19	Trail Distance Markers (Marker every 1/4 mile)	Alternate	3	EA	\$ 500.00	\$1,500.00
17	Decorative Pavement (accent bands)		1,076	SF	\$ 15.00	\$16,140.00
19	CIP Concrete Retaining Wall		110	LF	\$ 150.00	\$16,500.00
20	Thermoplastic Trail Markings (Stop Ahead)	Alternate	1	LS	\$ 25,000.00	\$25,000.00
21	6' Metal Benches		1	EA	\$ 3,500.00	\$3,500.00
22	Wayfinding Sign - ST-106 (Trail Map) Including Fabrication and Installation	Alternate	1	EA	\$ 8,500.00	\$8,500.00
23	Wayfinding Sign - ST-106B (Directional Sign) Including Fabrication and Installation	Alternate	2	EA	\$ 7,500.00	\$15,000.00
	Pedestrian Lighting Assembly (Including Fixture, Pole, Accessories, Concrete Footings, Solar Components)	Alternate	2	EA	\$ 35,000.00	\$70,000.00
25	"Big Belly" Smart Trash Receptacle	Alternate	1	EA	\$ 8,000.00	\$8,000.00
Unit 3	Bridge Under-Crossing					
26	Concrete Bridge Under-Crossing Structure		425	LF	\$ 525.00	\$223,125.00
27	Metal Bridge Pedestrian Railings (42" height)		425	LF	\$ 95.00	\$40,375.00
28	Low Overhead Clearance Signs		2	EA	\$ 2,000.00	\$4,000.00
Unit 4	Landscape Planting					
29	Shade Trees (3" Cal.) (Staked and Installed)		16	EA	\$ 950.00	\$15,200.00
30	Small Ornamental Trees (2" Cal.) (Staked and Installed)		34	EA	\$ 750.00	\$25,500.00
31	Evergreen Screening (2" Cal.) (Staked and Installed)		63	EA	\$ 750.00	\$47,250.00
32	Hydro-Mulch (native seed)		106544	SF	\$ 1.50	\$159,816.00
33	12" Concrete Landscape Edge		600	LF	\$ 18.00	\$10,800.00
34	Plant Soil Mix		350	CY	\$ 50.00	\$17,500.00
35	Ground Preparation for hydromulch application		11838	SY	\$ 3.00	\$35,514.00
36	Ground Hardwood Mulch (3" Depth)		250	CY	\$ 42.00	\$10,500.00
37	Permanent Landscape Irrigation System		1	LS	\$ 30,000.00	\$30,000.00

SUBTOTAL	\$	1,391,020
OH&P 15%	\$	208,653
SUBTOTAL	\$	1,599,673
MOBILIZATION 5%	\$	79,984
SUBTOTAL	\$	1,679,657
CONTINGENCY 10%	\$	167,966

PROJECT TOTAL (2025 COSTS)	\$	1,847,622
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COST ESCALATION FACTOR	3.0%	\$	55,429
PROJECT TOTAL (2026 COSTS)		\$	1,903,051

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

NOTES:

- 1 FNI OPCC classified as an AACE Class 3 Estimate with accuracy range or -15 to + 20.
- 2 FNI OPCC does not include costs associated with engineering fees, permits, surveying, etc.



City of Lewisville

RFB #25-115-C

Hebron Parkway Screening, Trail, and Landscape Improvements

Addendum No. 1

The bid document has been amended as follows:

Question: Will any special permits with the railroad company need to be pulled or is all work outside of any railroad easements.

Answer: Yes, please see the appendix in the project manual for the DCTA course application. Please reach out to DCTA for more information on flagger course fees and registration.

Question: The irrigation sheets show what looks like a hatch area in the medians but this is not shown on the legend. What are these areas supposed to represent?

Answer: That hatch should be turned off on the irrigation sheets as it is not relevant to the irrigation design. The median trees and parkway trees are to be irrigated with in-ground tree bubbler irrigation. For all seeding, sodding and misc site repair, temporary irrigation until the time of establishment utilizing a water truck will be needed based on ONCOR requirements.

Question: What are the construction access points that the contractor is allowed to use. Were will construction entrances and staging areas be located?

Answer: The city will allow storing and staging just west of the Kayak launch parking lot and east of the ONCOR easement on the south side of Hebron. It is acceptable If a portion of the parking lot be used if necessary as long as drive access to the launch is not blocked and the parking lot is restored after construction.

Question: L0.03 shows approximately a 4' wide long strip of sloped riprap to remove for the new elevated walkway. However, the sections of the new walkway on S1.02 imply this removal area would need to be at least 12' wide. Please confirm the limits of removal for the elevated walkway.



Answer: It will be 12' wide min. & 13' wide max. The horizontal width of the elevated walkway is 12' wide, and since the rip-rap area is on a slope, it will vary based on slope. Refer to the other structural details for more clarity.

Question: What is the engineer's estimate for this project?

Answer: Refer to document 15 – OPCC in the Files section of Bonfire.

Question: Is an estimated cost available?

Answer: Refer to document 15 – OPCC in the Files section of Bonfire.

Bidders are advised to acknowledge receipt of Addendum No. 1 by filling in the appropriate blanks contained in the Proposal Form and, if applicable, the outer envelope of their bid.

**CITY OF LEWISVILLE
PRE-BID
25-115-C Pre-Bid Meeting
1:00 P.M., Monday, July 28, 2025**

	NAME (PRINT)	COMPANY	PHONE NUMBER	EMAIL ADDRESS
1	Earl Whitaker <i>EW</i>	City of Lewisville	972-219-3764	ewhitaker@cityoflewisville.com
2	Randy Simon <i>RS</i>	City of Lewisville	972-219-3749	rsimon@cityoflewisville.com
3	Kathya Alvarez	chesshir stone	214-690-7170	Kathya@chesshirstoneinc.com
4	Rosa Villanueva	A+C Construction		rosa@acconstruction.us
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