

Exhibit A



REQUEST FOR BIDS

RFB # 26-55-C

LAKE AVALON BOARDWALK AND BRIDGE REPLACEMENT

Bids due by Thursday, March 5, 2026, 2:00 p.m.

Issued on February 7, 2026

SPECIFICATIONS
RFB #26-55-C
Lake Avalon Boardwalk and Bridge Replacement

The City of Lewisville is accepting competitive sealed bids to remove, build and install a boardwalk and bridge at Lake Avalon Park within the City of Lewisville. The boardwalk and bridge are located within the Castle Hills subdivision on the east side of the City that overlooks Lake Avalon.

GENERAL PROVISIONS

- **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 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

Fourth of July
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 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

Demolition

Contractor will conduct all necessary tasks to carefully demolish, remove and dispose of the following items. Contractors will take all necessary precautions to ensure construction debris do not enter the water or damage existing landscaping.

- Existing boardwalk
- Concrete pads on island
- Electrical wire disconnect/cap at bridge
- Bridge removal
- Sidewalk abutments at bridge

Construction of Boardwalk & Bridge

Contractor will utilize construction documents to construct the boardwalk, bridge, abutments and landscaping per specifications.

BID BOND REQUIREMENTS

Bidders are required to submit a Bid Bond (with proper Power of Attorney) from a surety licensed to do business in the State of Texas, payable without recourse to the City of Lewisville, in an amount not less than five (5%) percent of the total amount of the base bid submitted to insure that the successful bidder will enter into a contract and execute all necessary bonds within ten (10) days after notice of award of the contract to them. **This bid security must be uploaded to Bonfire or included in the bid envelope along with the bid sheet for the bidder to be considered responsive.** 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:

A bid bond equal to 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 acceptance.

All bidders are notified that the qualification statement provided in the bid documents must be completed and submitted with the bid proposal. Failure to include this completed form with your bid may cause your bid to be disqualified as non-responsive.

The City is not responsible for any costs associated with the preparation of the bid from any vendor. Also, should a vendor bid an alternate; any test costs to prove equality of product will be at the expense of the vendor, not the City of Lewisville.

Each bidder is expected to inspect the site of the work and to inform himself regarding all local conditions. Ignorance of existing conditions of the site will not be a basis for any changes after the award of the bid.

Bids cannot be altered or amended after the submission deadline. Any interlineation, alteration, or erasure made before opening time must be initialed by the signee of the bid, guaranteeing authenticity.

In conformance with applicable statutes utilizing Federal Davis Bacon Wage Rates as adopted by the General Services Commission, the general prevailing wage rates in the locality in which the work is to be performed have been ascertained and such rate shall be the minimum paid for labor employed on this project; unless federal monies are used, in which case, specific wage decisions will be listed as part of the overall bid documents.

The City of Lewisville reserves the right to reject any and all bids, in whole or in part; to waive any informality in any bid. Award will be issued on the basis of lowest responsible bidder.

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 bidder. 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.

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: 26-55-C
Lake Avalon Boardwalk and Bridge Replacement

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.

A pre-bid meeting will be held at the date and location listed in the Events section of Bonfire.

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 bidder 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 bidder. There is no expressed or implied obligation for the City of Lewisville to reimburse responding BIDDERS 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.

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 vendor selected.

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 BIDDERS, 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.

PRE-BID

A pre-bid conference will be held at the date and time specified on Bonfire. While attendance of the pre-bid conference is not mandatory, it is recommended due to the nature of the project.

PROPOSAL

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

26-55-C Lake Avalon Boardwalk and Bridge Replacement

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 **120 calendar days**. It is specifically stated and understood that the entire construction, including clean up, shall be completed within the above stated time.

Proposal: 26-55-C Lake Avalon Boardwalk and Bridge Replacement

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:

26-55-C Lake Avalon Boardwalk and Bridge Replacement

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:

26-55-C Lake Avalon Boardwalk and Bridge Replacement

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:

26-55-C Lake Avalon Boardwalk and Bridge Replacement

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.

**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**

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.

**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: _____



MCADAMS

4400 STATE HIGHWAY 121, SUITE 800

LEWISVILLE, TEXAS 75056

972-436-9712

TBPE FIRM NO. 19762

TBPLS FIRM NO. 10194440

ENGINEER'S PRELIMINARY OPINION OF PROBABLE COST

PROJECT: Lake Avalon Boardwalk and Bridge

SECTION 100 - DEMOLITION, EXCAVATION AND EROSION CONTROL

PROJECT JOB NUMBER: LEW24009

ITEM NO.	ITEM DESCRIPTION	UNIT	PLAN QUANTITY	UNIT PRICE	TOTAL COST
1	Boardwalk Removal (1888 SF)	LS	1	\$87,000.00	\$87,000.00
2	Concrete Pads on Island Removal (336 SF)	LS	1	\$1,680.00	\$1,680.00
3	Electrical Wire Disconnect/Cap at Bridge	LS	1	\$1,000.00	\$1,000.00
4	Bridge Removal (413 SF)	SF	1	\$30,000.00	\$30,000.00
5	Sidewalk Abutment at Bridge Removal (129 SF)	LS	1	\$1,000.00	\$1,000.00
6	Tree Protection Fence (1277LF)	LS	1	\$2,000.00	\$2,000.00
7	Trunk Protection	EA	3	\$150.00	\$450.00
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
		SUBTOTAL CONST. COST			\$123,130.00
	PREPARED BY:	ABIMBOLA OLORODE			
	REVIEWED BY:	JEFF BENNETT			
	APPROVED BY:	JAMESON PINSON	CONTINGENCY	5%	\$6,156.50
Date:	Wednesday, February 4, 2026		TOTAL DEMO, EXCA. & ECP COST		\$129,286.50



McADAMS

MCADAMS

4400 STATE HIGHWAY 121, SUITE 800

LEWISVILLE, TEXAS 75056

972-436-9712

TBPE FIRM NO. 19762

TBPLS FIRM NO. 10194440

ENGINEER'S PRELIMINARY OPINION OF PROBABLE COST

PROJECT: Lake Avalon Boardwalk and Bridge

SECTION 700 - DISCLAIMERS

PROJECT JOB NUMBER: LEW24009

- 1 Estimate does not include:
 - Mobilization or Insurance
 - Franchise Utility Relocations - gas, electric, telephone, street lights, etc.
 - Offsite Franchise Utility Extensions & Installations - gas, electric, telephone, etc.
 - Impact fees
 - SWPPP Required Inspections during construction (SWPPP Document is included in Engineering Cost)
- 2 The unit prices contained within this preliminary cost opinion are based on an average bid prices, as presented to the Engineer, for similar jobs within the local area over the preceding 6-12 months. Unit prices are subject to change at any time without the Engineer's knowledge. The Engineer is not a professional estimator, for a comprehensive estimate, a professional estimator should be consulted.
- 3 Efforts were made to identify all cost items identified within the project. It is possible that some items have been inadvertently omitted or the quantities may be different than the actual amount depicted within the plans.
- 4 This Preliminary Opinion of Probable Cost assumes that the pavement subgrade treatment is to be lime and not cement stabilized, with a 6% lime added. Actual treatment is to be determined by the Geotechnical Report.
- 5 Demolition price value can vary widely based on means and methods used by contractor and should be considered a placeholder value only.



City of Lewisville
RFB #26-55-C
Lake Avalon Boardwalk and Bridge Replacement

Addendum No. 1

The bid document for the above-referenced project is amended as follows:

Questions from Bonfire:

Question: Is the geotech report going to be made available?

Answer: This has been uploaded to Bonfire as document 17.

Question: What is the engineer's estimate for this project?

Answer: The OPCC has been uploaded to Bonfire as document 15. Engineering cost is not included in the OPCC. PermaTrak will provide their own shop structural drawings/engineering at no additional cost. However, other manufacturers may charge a separate design or engineering fee, and that cost is not included in the OPCC.

Question: It doesn't appear there is any existing trail to be removed/replaced for construction activities. Is the city going to allow for repairs needed to damage trail due to equipment, etc? Include quantities in the bid? Will the trail be closed during construction? Required Signage?

Answer: Yes, the City will require the Contractor to repair any trails or sidewalks damaged during the construction process. A line item has been added to the BidTable for this.

The Contractor will be required to close the trail during construction, but the exact methods will be determined by the City and the Contractor. Any trail closures shall be fenced off utilizing orange construction fencing and signage indicating that the trail is closed.

Question: There is no line item for SWPPP in the breakdown but should be if any will be required.

Answer: A line item has been added to the BidTable.



Question: Please designate the Staging Area and Temporary Construction Fence

Answer: The area outlined in red is a possible staging area, however, the final chosen area will be determined by the City and the Contractor before work begins.



Question: If the pond isn't permitted to be lowered/drained, is the city going to require helical piers and top down construction?

Answer: If the Contractor's means and methods do not allow them to lower the water elevation to build a cofferdam or other method, then yes, they would need to utilize top down construction, similar to what PermaTrak offers with their installation practice, with top down installation of helical piers or pilings. PermaTrak's system seems to be the least impactful and cost-effective.

Question: Sheet L4.01, Detail 02 calls for 12"-18" of compacted subgrade AND 4" to 6" rip rap, it can't be both. Which is the required subgrade beneath the boulders? If the pond can't be lowered, how can obtain compacted subgrade beneath the water level?



Answer: The 4"-6" call out is for the diameter of the rip rap stone that will be the footer for the boulders at a depth of 12" – 18". The Contractor should be able to pump the pond to lower the water elevation a few feet in order to install this. The rip rap could be installed without lowering the water level as well, but compaction may vary.

Questions from Pre-Bid Meeting:

Question: Is Engineering included in GSC?

Answer: Yes.

Question: Are there any requirements for safety or limited work hours in Castle Hills?

Answer: There are no additional requirements aside from what is listed in the specifications.

Question: Are there TXDOT requirements for this project?

Answer: No.

Question: Are there erosion control, SWIPP, or trail closure details, like a safety fence?

Answer: Erosion and SWIPP City requirements have been uploaded to Bonfire as document 16.

Question: Do we have to use PermaTrak?

Answer: No, you can use PermaTrak or equivalent.

Question: Will the lake be able to be drained?

Answer: No.



Question: How will we access the site?

Answer: There is not a dock area. We will have to provide access through the boardwalk area. A staging area can be provided depending on the need.

Question: Can CAD drawings/electronic files be provided to the awarded vendor?

Answer: Yes.

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. Download the current version of the BidTable to submit accurate pricing.



City of Lewisville Standard Operating Procedures Related to Stormwater Pollution Prevention for Municipal Operation and Maintenance Activities

Pollution Prevention/Good Housekeeping

June 2015 – Revised March 2021



This publication was produced by the North Central Texas Council of Governments' Regional Stormwater Management Program.

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Introduction

This document was developed through the North Central Texas Council of Governments’ Regional Stormwater Management Program. It compiles standard operating procedures (SOPs) from other areas in the country that help control the quantity and quality of stormwater produced from municipal activities and is intended to serve as a resource for entities in the North Central Texas region to consider and modify to meet their specific needs when they are developing their own SOPs. See Table 1 for the list of available SOPs. The two main sources are the Piscataqua Region Estuaries Partnership and Partners for a Clean Environment. Although many of these SOPs overlap, it was decided to compile both sets so that entities could decide which one to use—or to pull from both.

Table 1. List of Available Standard Operating Procedures		
Piscataqua Region Estuaries Partnership	Partners for a Clean Environment	Others
Catch Basin Cleaning Storm Drain System Repair and Maintenance Erosion and Sediment Control Landscape Design and Management Storage and Disposal of Fertilizer and Pesticides Fertilizing and Turf Health Application Weed and Pest Control Application Mowing and Irrigation Vehicle and Equipment Storage Vehicle and Equipment Washing Vehicle and Equipment Fueling Spill Cleanup Parts Cleaning Spare Parts Storage Alternative Products Use/Storage/Disposal Petroleum and Chemical Disposal Petroleum and Chemical Handling Petroleum and Chemical Storage – Bulk Petroleum and Chemical Storage – Small Quantity Garbage Storage General Facility Housekeeping Floor Drains Painting Street Sweeping Snow Disposal Deicing Material Storage Deicing Material Application	Facilities and Building Maintenance Fleet and Vehicle Maintenance Fueling and Fuel Spill Cleanup New Construction of Building and Structures Outdoor Special Events and Festivals Outdoor Materials Storage Parking Lot Maintenance Parks, Golf Course, and Open Space Maintenance Pesticide, Fertilizer, and Herbicide Application Pressure Washing and Exterior Surface Cleaning Snow Plowing, Snow Storage, and Deicer Application Spill Prevention, Cleanup, and Reporting Storm Drain System Maintenance Street and Road Maintenance and Repair Street Sweeping, Sweeper Cleaning, and Waste Disposal Utility Installation Projects Waste Management, Storage, and Disposal Waste Transfer Stations and Recycling Collection Centers	Disposal of Horizontal Directional Drilling Wastes for Utility Line Installation (Ohio EPA) Debris Removal from Rivers and Streams (NY Dept. of Environmental Conservation, IN Division of Water) Streambank Stabilization (U.S. Dept. of the Interior, Klamath Basin) Post-Flood Stream Construction (NY Dept. of Environmental Conservation)

Background

SOPs are written instructions that describe the routine to be followed for a specific operation, analysis, or action. The United States Environmental Protection Agency (EPA) sees the development and use of SOPs as an integral part of a successful quality system, providing individuals with the information to perform a job properly. Other benefits include conformance with organizational practices, reduced error occurrences, reduced work effort, and improved data comparability, credibility, and defensibility. SOPs also serve as resources for training. The EPA recommends that the use of SOPs is reviewed and re-enforced by management to make sure that SOPs are written correctly and followed properly. For more information and guidance on preparing SOPs, visit www.epa.gov/quality/sops.html.

As part of the Texas Commission on Environmental Quality (TCEQ) *General Permit to Discharge Under the Texas Pollutant Discharge System*, permittees who operate level 3 or 4 small Municipal Separate Storm Sewer Systems (MS4s) are required to develop facility-specific stormwater management SOPs as part of their permits.

For each high-priority facility identified in the permit, the permittee must develop a SOP that identifies best management practices (BMPs) to be installed, implemented, and maintained to minimize the discharge of pollutants in stormwater from each facility.

According to the general permit, each facility-specific SOP must include a description of BMPs developed to comply with this requirement. These include general good housekeeping, deicing and anti-icing material storage, fueling operations and vehicle maintenance, and equipment and vehicle maintenance. Please see the general permit and/or the stormwater management plan (SWMP) for more information.

A printed or electronic copy of the facility-specific stormwater management SOP (or equivalent existing plan or document) must be maintained and be available for review by the TCEQ. The SOP must be kept on site when possible and must be updated, as necessary.

Objectives

The objectives of this document are the following:

- To help municipalities create a commonly accepted set of standards and guidance
- To assist municipalities in meeting stormwater Phase II requirements

Common Stormwater Pollutants, Sources, and Impacts

On its way to creeks, rivers, and lakes, stormwater runoff can accumulate pollutants such as pesticides, pathogens (bacteria), sediment, oil, gas, and heavy metals. These pollutants can degrade water quality and aquatic habitat, impair ecosystem functions, and harm human health. Recognizing the sources of these pollutants and the impacts of each pollutant can help an individual understand the goals and objectives when managing stormwater. Table 2 summarizes common stormwater pollutants, their sources, and potential impacts.

Table 2: Common Stormwater Pollutants, Sources, and Impacts		
Pollutants	Sources	Impacts
Sediment	Construction sites; eroding streambanks and lakeshores; winter sand and salt application; vehicle/boat washing; agricultural sites	Destruction of plant and fish habitat; transportation of attached oils, nutrients, and other pollutants; increased maintenance costs; flooding
Nutrients (phosphorus, nitrogen)	Fertilizers; malfunctioning septic systems; livestock, bird, and pet waste; vehicle/boat washing; gray water; decaying grass and leaves; sewer overflows; leaking trash containers; leaking sewer lines	Increased potential for nuisance or toxic algal blooms; increased potential for hypoxia/anoxia (low levels of dissolved oxygen, which can kill aquatic organisms)
Hydrocarbons (petroleum compounds)	Vehicle and equipment leaks; vehicle and equipment emissions; fuel spills; improper fuel storage and disposal; equipment cleaning; pesticides	Toxic to human and aquatic life at low levels
Heavy metals	Vehicle brake and tire wear; vehicle/equipment exhaust; batteries; galvanized metal; paint and wood preservatives; fuels, pesticides, and cleaners	Toxic at low levels; drinking water contamination
Pathogens (bacteria)	Livestock, bird, and pet waste; malfunctioning septic systems; sewer overflows; damaged sanitary lines	Risk to human health, leading to closure of shellfish areas and swimming areas; drinking water contamination
Toxic chemicals	Pesticides; dioxins; polychlorinated biphenyls (PCBs); spills, illegal discharges, and leaks	Toxic to human and aquatic life at low levels
Debris/litter	Improper waste disposal and storage; fishing gear; leaking trash containers; cigarette butts; littering	Potential risk to human and aquatic life; aesthetically displeasing

Source: "Guidelines and Standard Operating Procedures: Illicit Discharge Detection and Elimination and Pollution Prevention/Good Housekeeping," November 2006. Courtesy of Piscataqua Region Estuaries Partnership. Available online at http://water.epa.gov/polwaste/npdes/stormwater/upload/NH_IDDE_SOP.pdf.

Standard Operating Procedures from Piscataqua Region Estuaries Partnership

Available online at http://water.epa.gov/polwaste/npdes/stormwater/upload/NH_IDDE_SOP.pdf.

Provided courtesy of Piscataqua Region Estuaries Partnership.

Modified with North Central Texas–specific information.

Note: Cross-references to other SOPs and forms in this set are highlighted so that people writing their procedures can easily spot and remove or otherwise revise these references if they won't be included in their documentation. All "Related Guidance" sections remain as published in the source document.

Catch Basin Cleaning

Purpose: To protect stormwater by maintaining the ability of catch basins to trap sediments, organic matter, and litter. This reduces clogging in the storm drain system as well as the transport of sediments and pollutants into receiving waterbodies.

Always:

- Inspect catch basins for structural integrity and evidence of illicit discharges during cleaning. Use the Catch Basin Cleaning Form or an existing form.
- If there is gross contamination (sewage or oil), stop cleaning and report to supervisor for follow up.
- Stockpile and cover catch basin residuals on an impervious surface that discharges to a sanitary sewer or buffered area until test results are known.
- Test catch basin stockpile as follows:
 - If obviously (by visual and/or olfactory examination) contaminated with sanitary wastewater, animal wastes, oil, gasoline, or other petroleum products, contact Environmental Control Services to test the solids pursuant to the hazardous waste determination requirements in TCEQ's *Guidelines for the Classification and Coding of Industrial and Hazardous Wastes* (PDF available at www.tceq.texas.gov/publications/rg/rg-022.html) and dispose of as follows:
 - If non-hazardous – dispose at any permitted, lined solid waste landfill or other solid waste treatment facility permitted to accept this material.
 - If hazardous – dispose of in accordance with Special Waste Regulations in Texas (see www.tceq.texas.gov/publications/rg/rg-029.html#download/file).
 - If not obviously contaminated,
 - Test for metals, volatile organic compounds (VOCs), and polycyclic aromatic hydrocarbons (PAHs).
 - Compare to the Texas Risk Reduction Program (TRRP) protective concentration levels for reuse. (See www.tceq.texas.gov/remediation/trrp/trrppcls.html.)

Whenever Possible:

- Inspect each catch basin at least annually during catch basin cleaning.
- Create a checklist for catch basins to help classify which catch basins require maintenance and how often.
- Perform street sweeping on an appropriate schedule to reduce the amount of sediment, debris, and organic matter entering the catch basins; this in turn reduces the frequency with which they will need to be cleaned.
- Discharge fluids collected during catch basin cleaning to a sanitary sewer or buffered detention area.

Related Guidance:

NHDES Environmental Fact Sheet: WMD-SW-32 Management of Street Wastes

[illegible]

Storm Drain System Repair and Maintenance

Purpose: To protect stormwater by replacing or repairing components of the storm drain system on a regular basis to prevent a failure of the storm drain system.

Always:

- Practice preventive maintenance for cracks, leaks, and other conditions that could cause breakdowns in the system by identifying condition issues:
 - For catch basins during catch basin cleaning. (See [Catch Basin Cleaning SOP](#).)
 - For outfalls during Illicit Discharge Detection and Elimination (IDDE) inspection.
- Repair defective structures or equipment identified during an inspection as soon as possible.
- Test and dispose of stockpiled materials as described in the [Catch Basin Cleaning SOP](#).
- Document inspections, cleanings, and repairs, and maintain complete records in a record-keeping system. (See “Catch Basin Cleaning” SOP and example documentation for pipes).
- Use appropriate erosion and sediment control practices when performing repairs.

Whenever Possible:

- Practice preventive maintenance for pipes by televising:
 - Prior to reconstruction of roadways, or
 - On a regular schedule beginning with high-priority areas.
- Research and implement new technology that will improve the overall performance of the storm drain system.
- Perform street sweeping on a regular basis to reduce the amount of sediment, debris, and organic matter entering the storm drain system; this in turn reduces the frequency with which the system will need to be cleaned.
- Use documentation of repairs and maintenance to develop a capital improvement and operation and maintenance (O&M) plan for future system maintenance.

Never:

- Never allow defective equipment or structures to go unrepaired.

Related Guidance:

USEPA National Menu of BMPs

NHDES BMPs to Control Nonpoint Source Pollution

Example of documentation of condition issues identified during televising.

INSPECTION REPORT					
DATE:	WORK #:	WEATHER:	OPERATOR:	SECTION NR:	SECTION NAME:
PRESENT:	VEHICLE:	CAMERA:	PRESET:	CLEANED:	RATE:
STREET:		MAP #1:		MH: 874	
CITY:		MAP #2:		MH: 872	
LOCALE:		TAPE #:		TVD LGTH: 208.2 ft	
INSPECT REASON:			PIPE SIZE:	6"	
SECTION TYPE:			MATERIAL:	Clay Tile JT LGTH: 2ft	
AREA:			LINING:	none data	
REMARK:			RSRVD:		
apparent defects in coating throughout line					
1:495	POSITION	OBSERVATION	MPEG	PH	RATE
	0.00	inspection begins at upstream manhole		1a	0
	4.10	roots light		2a, b	3
	37.55	roots light		3a, b	3
	48.60 S1	sag begins, START		4a	2
	51.80 E1	sag ends, END		5a	2
	64.40	service connection, at 08 o'clock		6a, b	2
	92.80	infiltration Running at joint at 03 o'clock		7a, b	4
	93.20	service connection, at 02 o'clock		8a, b	1
	98.75	pipe material changes at this point to SDR 35		9a	2
	100.00	service connection, at 09 o'clock		10a, b	1
	101.20	pipe material changes at this point to clay tile		11a	2
	102.90	offset joint, slight		12a, b	2
	110.65	pipe Broken, from 02 to 09 o'clock		13a, b	5
	130.30 S2	Longitudinal Crack, at 12 o'clock, START		14a, b	3
	131.05 E2	Longitudinal Crack, at 12 o'clock, END		15a	3
	135.20	service connection capped, at 09 o'clock, REMARK: roots medium		16a, b	3
	136.85	Hole in pipe at 07 o'clock		17a, b	4
	146.95	Hole in pipe at 04 o'clock		18a, b	4
	153.40	Longitudinal Crack, at 12 o'clock		19a	3
	154.95	Longitudinal Crack, at 03 o'clock		20a	2
	161.50 S3	Multiple Cracks, from 07 to 03 o'clock, START		21a, b	4
	163.55 E3	Multiple Cracks, from 07 to 02 o'clock, END		22a, b	4
	172.90	Hole in pipe at 12 o'clock		23a, b	4

INSPECTION IMAGES				
CITY:	STREET:	DATE:	SECTION NR:	SECTION NAME:
			1	



IMAGE: 11a, TAPE #: 11/29/2005
101.2FT, pipe material changes at this point to clay tile

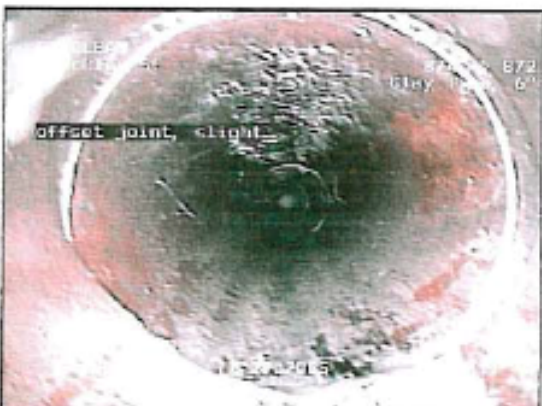


IMAGE: 12a, TAPE #: 11/29/2005
102.9FT, offset joint, slight



IMAGE: 12b, TAPE #: 11/29/2005
102.9FT, offset joint, slight



IMAGE: 13a, TAPE #: 11/29/2005
110.65FT, pipe Broken, from 02 to 09 o'clock

Erosion and Sediment Control

Purpose: To protect stormwater from pollution by reducing or eliminating pollutant loading from land disturbing activities (construction, landscaping, etc.).

Always:

- Use erosion control techniques or devices to stabilize disturbed areas.
- Use effective site planning to avoid sensitive areas.
- Keep land disturbance to a minimum.
- Inspect and maintain erosion control devices.
- Install erosion control devices properly.
- Remove sediment accumulated during construction from permanent BMPs once construction is completed.
- Minimize the amount of bare soil by scheduling phases of construction and stabilization.
- Minimize slope lengths.
- Monitor practices and adjust, maintain, and repair them periodically and after every storm.
- Reduce the velocity of stormwater runoff.
- Prevent erosion by covering bare soil with mulch or other cover.
- Protect existing stormwater structures from sediment by using temporary sediment traps, silt fence, hay bales, or perforated risers.
- Divert clean water around construction site.

Whenever Possible:

- Limit construction activities during months with higher runoff rates.
- Install erosion control blankets when seeding drainage ways.
- Protect natural vegetation, especially near waterbodies, wetlands, and steep slopes.
- Establish vegetative cover with good root systems prior to freeze/thaw cycles.

Never (Except During Life-Threatening, Flooding Conditions):

- Never divert runoff into a sensitive area.
- Never remove temporary measures before construction is complete.

Related Guidance:

NHDES BMPs to Control Nonpoint Source Pollution

NHDES/DOT BMPs for Routine Maintenance Activities in New Hampshire

Stormwater Management Erosion and Sediment Control Handbook for Urban and Developing Areas
(The Green Book)

Landscape Design and Management

Purpose: To protect stormwater by designing and managing landscaping in ways that minimize polluted runoff.

Always:

- Design landscaping by considering soil types, light, drainage, desired maintenance level, and budget.
- Design for ease of maintenance.

Whenever Possible:

- Minimize erosion-prone steep slopes by using techniques such as terracing.
- Use native plants that are pest resistant. Plant the right plant in the right area.
- Manage water runoff by rerouting gutters away from storm drains and maintaining groundcovers between developed areas and waterways (ditches, swales, shorelines).
- Reduce or eliminate mown lawn in unused areas.
- Convert excess lawn to meadow or other natural area.
- Establish setback distances from pavement, storm drains, and waterbodies. Allow these areas to serve as buffers with disease-resistant plants and minimal mowing.

Never:

- Never develop a landscape design without assessing its impact on water quality.
- Never plant trees with a high-water demand (such as weeping willow) near sanitary sewer pipes and storm sewer pipes.

Additional Recommendations:

- Never cause unintended consequences such as:
 - Planting large-variety trees beneath overhead wires.
 - Blocking sight distance at intersections.

Related Guidance:

USEPA National Menu of BMPs

CWP Urban Forestry Manual

Storage and Disposal of Fertilizer and Pesticides

Purpose: To protect stormwater by properly storing and disposing of fertilizers and pesticides (herbicides and fungicides). Because storm drain water is not part of a wastewater treatment system, discharge of these chemicals flows untreated into ponds, creeks, rivers, streams, and lakes.

The EPA defines a pesticide as any substance intended for preventing, destroying, repelling, or mitigating any pest. Pest can include insects, animals, unwanted plants, fungi, bacteria, etc. The term applies to insecticides, herbicides, fungicides, etc.

Always:

- Store fertilizers and pesticides in high, dry locations, according to manufacturer's specifications and applicable regulations.
- Clearly label secondary containers.
- Properly dispose of fertilizers and pesticides according to manufacturer's specifications and applicable regulations.
- Regularly inspect fertilizer and pesticide storage areas for leaks or spills.
- Clean up spills and leaks of pesticides and fertilizers to prevent the chemicals from reaching the storm drain system. (See [Spill Cleanup](#) and [Petroleum and Chemical Disposal SOPs](#).)

Whenever Possible:

- Store pesticides in enclosed areas or in covered impervious containment, preferably in a locked cabinet.
- Order fertilizers and pesticides for delivery as close to time of use as possible to reduce amount stored at facility.
- Order only the amount needed to minimize excess or obsolete materials requiring storage and disposal.
- Use ALL herbicides or pesticides appropriately to minimize the amount of chemicals requiring disposal.
- Do an annual review of storage area and dispose of old, unusable, or obsolete fertilizer or pesticides in accordance with applicable regulations (just before your local Household Hazardous Waste Day).

Never:

- Never dispose of fertilizers or pesticides in storm drains.
- Never leave unlabeled or unstable chemicals in uncontrolled locations.

Related Guidance:

USEPA National Menu of BMPs

Fertilizing and Turf Health Application

Purpose: To protect stormwater by properly storing, applying, and disposing of fertilizers and by maintaining turf health to reduce diseases.

Always:

- Store, use, and dispose of all fertilizers and contaminated wastes according to manufacturer's specifications and applicable regulations.
- Choose seed based on soil types, intended use of area, latest variety research, and/or assessment of past site performance.
- Check 5-day weather forecast to avoid fertilizing before heavy rain or during a drought.

Whenever Possible:

- Apply fertilizers based on a soil testing program, soil type, turf function, and assessment by qualified personnel (conservation commission or municipal arborist, etc.).
- Avoid fertilizing during a drought or when the soil is dry.
- Apply fertilizers during periods of maximum plant uptake (usually fall and spring).
- Avoid combined products such as weed and feed, which do not necessarily target specific problems at the appropriate time.
- Calibrate application equipment to ensure proper application.
- If phosphorus fertilizer is used when reseeding, mix phosphorus into the root zone.
- Use alternative or environmentally friendly products. (See the [Alternative Products Use/Storage/Disposal SOP](#).)
- Use natural compost and organic fertilizers instead of synthetic fertilizers.
- Aerate grassed areas to improve drainage and bring more oxygen to the soil.

Never:

- Never fertilize before a forecasted heavy rainfall.
- Never apply phosphorus fertilizer on bare soil.
- Never deposit fertilizer in the water, into storm drains, or onto impervious surfaces (streets and sidewalks).
- Never apply fertilizer to frozen ground.
- Never clean up spilled fertilizer by rinsing it with water.

Related Guidance:

USEPA National Menu of BMPs

Weed and Pest Control Application

Purpose: To protect stormwater by properly applying pesticides (herbicides and insecticides).

Always:

- Ensure that pesticides are only applied by personnel certified by Texas Department of Agriculture to do so.
- Apply pesticides according to manufacturer's specifications, any requirements specified by the Texas Department of Agriculture, and any local requirements.
- Clean up any spilled chemicals. (See Spill Cleanup and Petroleum and Chemical Disposal SOPs.)
- Use pesticides only when necessary.
- Rinse equipment only when necessary and use rinse water to dilute the next mix if application rates are not exceeded.
- Follow best management practices for setback distances from pavement, storm drains, and waterbodies; allow these areas to serve as buffers with disease-resistant plants and minimal mowing.

Whenever Possible:

- Use alternative methods to control weeds and pests such as Integrated Pest Management strategies, biorational insecticides (natural soaps and oils) or biological controls. (See "Alternative Products Use/Storage/Disposal" SOP.)
- Mix/load pesticides in an area where spills can be contained.
- Pull weeds by hand or mechanically.
- Spot treat only affected areas instead of the entire location.
- Apply pest control at the life stage when the pest is most vulnerable.
- Choose the least toxic pesticides that still achieve results.
- Tolerate low levels of weeds.
- Allow grass to grow 2.5 to 3 inches high, reduce thatch buildup, and aerate soils.
- Reduce seed release of weeds by timing cutting at seed set.

Never:

- Never mix or prepare pesticides near storm drains.
- Never apply controlled pesticides unless certified to do so.
- Never apply pesticides before a heavy rainfall.
- Never discharge rinse water or excess chemicals to storm drain, sewer, or ground surface.

Related Guidance:

USEPA National Menu of BMPs

NHDES Environmental Fact Sheet:

--CO-15 Integrated Pest Management: Controlling Pests Safely

--SP-6 Minimum Shoreland Protection Standards

Mowing and Irrigation

Purpose: To protect stormwater by using proper mowing and watering techniques. Proper mowing and irrigation techniques will reduce organic matter and other pollutants from entering the storm drain system and waterbodies.

Always:

- Mow only as low as needed for the area's intended use.
- Vary mowing pattern to minimize ruts and promote even growth.
- Base irrigation amounts on monitoring for moisture content.
- Water at appropriate times (when no rain is forecasted and at cooler times of day).
- Manage leaves, clippings, and compost so that runoff does not enter the storm drain system or waterbodies.
- Conform to municipal restrictions on mowing in buffers of waterbodies.

Whenever Possible:

- Allow areas to go to meadow or field and mow once or twice per year rather than every week.
- Keep mower blades sharpened to avoid damaging grass leaf tissue.
- Mow when the grass is dry to prevent spread of turf diseases.
- Sweep lawn clippings and debris instead of using water.
- Mulch grass clippings using a mulching mower.
- Fill gas tanks in a controlled location.
- Use rain sensors for irrigation systems.
- Monitor for moisture content before irrigating; avoid irrigating based on timers/schedules.

Never:

- Never dump gas, wastes, or contaminated water down storm drains.
- Never refuel or change the mower oil near storm drains.
- Never leave the mower running in one location (to prevent burning and overcutting of vegetation).

Related Guidance:

USEPA National Menu of BMPs

Vehicle and Equipment Storage

Purpose: To protect stormwater from petroleum products that may drip or leak from vehicles and equipment being stored or from dirt and sediment that accumulate in the storage areas.

Always:

- Inspect parking areas for stains/leaks on a regular basis.
- Use drip pans or adsorbents for leaking vehicles. (Provide a labeled location to empty and store drip pans.)
- Address any known leaks or drips as soon as possible.
- Clean up spills.

Whenever Possible:

- Store vehicles inside where floor drains have been properly connected and registered.
- Store vehicles on paved areas, and street sweep on a regular basis to remove drips/leaks/dirt and dispose of street sweepings properly.
- Maintain vehicles to prevent leaks.

Never:

- Never store leaking vehicles over a storm drain.

Related Guidance:

USEPA National Menu of BMPs

NHPPP Pitstops Manual

Vehicle and Equipment Washing

Purpose: To protect stormwater using proper washing techniques, proper washing locations, and proper disposal of wash water for heavy and light-duty vehicles and equipment.

Always:

- Operate a closed system with wastewater recycling (such as a floor drain discharge to a holding tank), or
- Discharge to a municipal sanitary sewer, or
- Obtain a groundwater discharge permit, or
- Wash fewer than 30 vehicles per week and discharge to the ground surface, if
 - vehicle washing BMPs are followed,
 - the discharge is registered, and
 - the wash water:
 - is not from power washing, steam cleaning, engine cleaning, or undercarriage cleaning,
 - does not contain soaps or other products that contain regulated contaminants, and
 - does not discharge to a surface water.

Whenever Possible:

- Use a commercial car wash for light-duty vehicles.
- Obtain and use drain guards (filter inserts) to catch sediments, petroleum products, etc., that might enter the storm drains as a result of vehicle washing.
- Minimize water and soap use when washing or rinsing vehicles.

Never:

- Never perform engine or undercarriage washing outside.
- Never wash vehicles over a storm drain or near drinking water wells.
- Never discharge wash water to a surface water.

Related Guidance:

NHDES Environmental Fact Sheet:

--WD-WSEB-22-10 Wastewater Discharges from Vehicle Washing

NHDES BMP Rules Env-Wq 401

Vehicle and Equipment Fueling

Purpose: To prevent stormwater contamination originating from vehicle and equipment fueling.

Always:

- Fuel carefully to minimize drips to the ground surface.
- Maintain clean fuel-dispensing areas using dry cleanup methods.
- Clearly label and tag all valves to reduce human error.
- Train employees and subcontractors on proper fueling methods and spill cleanup techniques.
- Maintain fuel storage tanks in accordance with local, state, and federal laws.
- Have absorbent spill cleanup kits and materials available at fueling areas.
- Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.
- When fueling small equipment from portable containers, fuel in a designated area away from storm drains and waterbodies.

Whenever Possible:

- Install a canopy or roof over aboveground storage tanks and fuel transfer areas.
- Regularly inspect fueling equipment for corrosion and structural failure, cracks in foundations, and physical damage to container systems.
- Use designated fueling areas built upon a level impervious surface (hard cement is best). If the area is paved with asphalt, add a protective coating to create an impervious surface, inspect regularly, and street sweep quarterly at a minimum.
- Protect storm drains from fueling areas using berms and dikes.
- Use absorbent material or absorbent pads during fueling to collect leaks.

Never:

- Never “top off” fuel tanks. (Post signs to remind employees.)
- Never hose down or bury a fuel spill.

Related Guidance:

USEPA National Menu of BMPs

NHDES Fact Sheet:

--WD-WSEB-22-6 BMPs for Fueling and Maintenance of Excavation and Earthmoving Equipment

Spill Cleanup

Purpose: To protect stormwater by educating employees on proper spill cleanup procedures, state reporting requirements, and preventative actions.

Petroleum spills involve, but are not limited to, crude oil, gasoline, heating oil, various fuel oils, lubricating oil, hydraulic oil, asphaltic residuals. Hazardous materials spills involve non-oil spills that pose a threat to human health or the environment, such as chemical releases.

Always:

- Stop the source of the spill, if possible to safely do so.
- Contain any liquids, if possible to safely do so.
- If the spill is reportable (see the table at www.tceq.texas.gov/response/spill_rq.html), report it as soon as possible and within 24 hours by phone to SERC/TCEQ. For more information, see www.tceq.texas.gov/response/spills.html.
 - State of Texas Spill-Reporting Hotline and the State Emergency Response Commission (SERC): 1-800-832-8224—24 hours a day
 - TCEQ Regional Office (Region 4, Dallas/Fort Worth), 1-817-588-5800—Monday-Friday, 8 a.m.–5 p.m.
- If the spill causes a fish kill, notify Texas Parks and Wildlife by calling 1-512-389-4848. (See http://tpwd.texas.gov/landwater/water/environconcerns/kills_and_spills/ for more information.)
- Cover the spill with absorbent material. Do not use straw or water. (See “Petroleum and Chemical Disposal” SOP for adsorbent disposal.)
- Report any discharge of hazardous waste immediately (within one hour) to local emergency officials [Environmental Control Services], then contact TCEQ as described above.
- Contact Environmental Control Services. Phone: (972) 219-3510.
- Develop and maintain a Spill Prevention, Control, and Countermeasure (SPCC) Plan if the facility stores more than 1,320 gallons of petroleum.
- Fit petroleum and chemical storage containers with secondary containment structures.
- Keep a spill kit in areas where petroleum or hazardous materials are stored.
- Train employees in spill response procedures and equipment.
- Deploy containment booms if the spill could potentially reach a storm drain or waterbody.
- Position mats to contain drips from equipment or vehicles until they can be repaired.

Whenever Possible:

- Seal the floor with paint to prevent absorption of fluids into concrete.
- Install low-level or low-pressure alarms and/or cut-off systems on hydraulic equipment.

Never:

- Never wash a spill into the storm drain or a water body.
- Never leave a spill without cleaning it up.

Related Guidance:

NHDES Fact Sheets:

WMD-REM-13 Requirements for Reporting Oil and Hazardous Waste Spills and Groundwater Contamination to DES

NHPPP Pitstops Manual

Parts Cleaning

Purpose: To protect stormwater by practicing proper parts-cleaning techniques and disposing of waste cleaners properly.

Always:

- Perform all cleaning in a designated area to minimize the potential for spills.
- Store waste cleaners in properly labeled containers in accordance with regulations.
- Dispose of all waste cleaners properly with a licensed contractor on a regular basis.
- Close the parts-cleaner lid when the container is not in use.

Whenever Possible:

- The variety of cleaners should be minimized to make recycling and disposal simpler.
- Use citrus-based cleaners and dispose of properly.
- Use steam cleaning, pressure washing, or aqueous washers instead of solvents; however, wastewater must be discharged to an oil/water separator (notifying the wastewater treatment plant) or a TCEQ registered holding tank.

Never:

- Never dispose of spent cleaners down the floor drains, sinks, or storm drain, on the ground, or into the air. Disposal by evaporation is also a violation.
- Never dispose of solvents with used oil unless specifically authorized to do so. (Some solvents are compatible with used oil processing, but the solvent type and quantity are determining factors.)
- Never mix or add spent or fresh solvents to used oil.
- Never use gasoline as a cleaner or solvent.
- Never burn spent parts-cleaning fluids in a used oil burner.
- Never use a handheld cleaner in/near the parts cleaner.
- Never mix cleaners.

Related Guidance:

NHPPP Pitstops Manual

Spare Parts Storage

Purpose: To protect stormwater by properly storing spare parts. Improper storage of materials can result in pollutants and toxic materials entering groundwater and surface water supplies.

Always:

- Store spare parts in a designated area.
- Use drip pans for any parts that are dripping.

Whenever Possible:

- Store spare parts inside or under cover.
- Monitor storage areas for staining/leaks on a schedule decided on by the appropriate personnel.
- Clean the majority of petroleum products from the parts that are to be stored.

Related Guidance:

USEPA Manual of BMPs

Alternative Products Use/Storage/Disposal

Purpose: To protect stormwater by using alternative products that are more environmentally friendly.

Always:

- When ordering any product, ask product suppliers, peers, or regulatory agents if there is a more environmentally friendly alternative.

Whenever Possible:

- Use alternative products when deemed appropriate:
 - Instead of solvent-based parts cleaners, use citrus-based cleaners or steam/pressure wash to an oil/water separator or holding tank.
 - Instead of herbicides, use bark mulch.
 - Instead of fertilizer, use compost or manure.
 - Instead of pesticides, plant marigolds, onion, or garlic as deterrents; release or attract beneficial insects.
 - Instead of synthetic adsorbents, use corncob or cellulose products for petroleum spills that can be burned for energy recovery.
- Train employees on the benefits of using alternative products.
- Minimize waste by purchasing recyclable products that have minimal packaging.
- Use less harmful deicers such as calcium magnesium acetate, potassium acetate, or organic deicers.
- Use a "pre-mix" of 4 to 1 sodium chloride and calcium chloride, which is the most cost-effective alternative to straight salt.
- Substitute synthetic fertilizers with natural compost and organic fertilizers to improve soil pH, texture, and fertility, and to reduce leaching to groundwater.
- Use slow-release nitrogen fertilizers.
- Reduce or eliminate mown lawn in areas that are not actively used.
- Consider converting unused turf to a natural area such as a meadow or field.

Related Guidance:

USEPA National Menu of BMPs

NHPPP Pitstop Manual

Petroleum and Chemical Disposal

Purpose: To protect stormwater from petroleum and chemical products due to improper disposal practices.

Always:

- Maintain tracking and manifest, where necessary, of chemicals and petroleum products being disposed or recycled off site.
- Transport used petroleum and chemical products with a licensed transporter and maintain records for three years.
- Train employees on proper disposal practices.
- After draining used oil filters, dispose of the filters with a disposal/recycling company.
- Analyze floor drain solids from the sediment trap for TCEQ to determine if hazardous waste or not.
- Contaminated cloth wipe may be laundered on site or off site, liquid free, and stored in a closed, labeled container.

Whenever Possible:

- Minimize the number of solvents used to reduce the variety of waste generated and to make recycling easier.
- Use safer alternatives. (See the [Alternative Products Use/Storage/Disposal SOP](#).)
- If burning used oil for energy recovery, determine whether the oil is regulated under the used oil recycling rules in 30 Texas Administrative Code (TAC) Chapter 324 or is hazardous waste that must be managed according to the regulations in 30 TAC Chapter 335.

Never:

- Never place hazardous waste in solid waste dumpsters.
- Never pour liquid waste down floor drains, sinks, or outdoor storm drain inlets.
- Never mix petroleum waste and chemical waste.
- Never dispose of any gasoline-contaminated waste in the regular trash. Dispose of it only as a hazardous waste.

Related Guidance:

NHDES Environmental Fact Sheets:

- WMD-HW-6 Contaminated Cloth wipes for Laundering
- WMD-HW-5 Federal and State Regulations: Hazardous Materials and Waste
- WMD-HW-4 Waste Antifreeze

NHPPP Pitstop Manual

Petroleum and Chemical Handling

Purpose: To protect stormwater by properly managing petroleum products and chemicals used by municipalities.

Always:

- Train employees in hazardous material handling, safety, spill cleanup, and reporting on an annual basis.
- Train new employees as soon as possible; training is required prior to work if worksite has a Spill Prevention Control and Countermeasure (SPCC) Plan for petroleum.
- Handle petroleum products and chemicals according to manufacturer's specifications.
- Conduct oil changes indoors for equipment that fits indoors.
- Use proper protective equipment.
- Maintain Safety Data Sheets (SDSs) for all chemicals used.
- Make SDSs available for materials that require special handling, storage, and/or disposal.
- Create a sign-off sheet for employees stating that they know the location of the SDS(s).

Whenever Possible:

- Assess hazardous material needs to minimize the amount and variety of hazardous material in storage.
- Keep an inventory of hazardous materials on hand.
- Transfer materials from one container to another indoors in a well-ventilated area. Properly label containers.

Never:

- Never treat or dispose of hazardous materials unless licensed to do so.
- Never mix petroleum or chemicals unless directed by manufacturer's instructions.

Related Guidance:

USEPA National menu of BMPs

NHPPP Pitstops Manual

Petroleum and Chemical Storage – Bulk

Purpose: To protect stormwater by properly storing bulk petroleum products and chemicals (containers larger than 55 gallons).

Always:

- Store materials away from high-traffic areas, posted with appropriate signage.
- Store materials according to manufacturer's specifications in approved containers and conditions.
- Be prepared for possible spills by having a spill kit nearby.
- Register each aboveground storage tank (AST) and underground storage tank (UST) with TCEQ, even if empty or unused. (For more information, see www.tceq.texas.gov/permitting/registration/pst/Am_I_Regulated.html.)
- Develop and use a Spill Prevention Control and Countermeasure (SPCC) plan if storing more than 1,320 gallons of petroleum (required).
- Store incompatible hazardous materials in separate areas.
- Inspect storage areas for leaks or drips frequently.
- Store bulk items within secondary containment areas if bulk items are stored outside.
- Conduct annual employee training to reinforce proper storage techniques for petroleum and chemical products.

Whenever Possible:

- Store bulk chemicals and petroleum products inside or under cover.
- Provide secondary containment for interior storage.
- Cover transfer areas.

Never:

- Never store bulk chemicals or petroleum products near a storm drain.

Related Guidance:

NHDES Environmental Fact Sheet:

WMD-REM-3 Monthly Inspection Guidelines for ASTs

WMD-OIL-17 Registration of Aboveground Petroleum Storage Tanks

Petroleum and Chemical Storage – Small Quantity

Purpose: To protect stormwater from pollution by properly storing petroleum products or chemicals (containers 55 gallons and smaller).

Always:

- Store materials away from high-traffic areas.
- Store materials according to manufacturer's specifications (e.g., in a flammable materials storage cabinet).
- Dispose of unused or waste materials properly.
- Train employees on proper storage procedures for petroleum and chemical products.
- Store materials in their original containers to maintain appropriate labeling.
- Be prepared for spills by having a spill kit nearby.
- Frequently inspect the storage areas for leaks or spills.
- Conduct annual employee training to reinforce proper storage techniques for petroleum and chemical products.

Never:

- Never store petroleum or chemical products near a floor drain or stormwater inlet.

Related Guidance:

NHDES Environmental Fact Sheet:

WMD-SW-29 Best Management Practices for 55-Gallon Drums

Garbage Storage

Purpose: To protect stormwater from contamination by properly storing garbage. Garbage and leachate can be transported by stormwater and enter the storm drain system and receiving waterbodies.

Always:

- Cover garbage bins to keep garbage and leachate in and wind and rain out.

Whenever Possible:

- Store garbage containers beneath a covered structure or inside to prevent contact with stormwater.
- Install berms, curbing, or vegetation strips around storage areas to control water entering and leaving storage areas.
- Locate dumpsters on a flat concrete surface that does not slope or drain directly into the storm drain system.
- Locate dumpsters and trash cans in convenient, easily observable areas.
- Provide properly labeled recycling bins to reduce the amount of garbage disposed.
- Inspect garbage bins for leaks regularly, and have repairs made immediately by responsible party.
- Keep bins free of improperly discarded trash.
- Provide training to employees to prevent improper disposal of general trash.
- Minimize waste by purchasing recyclable products that have minimal packaging.
- Request and use dumpsters without drain holes.

Never:

- Never place hazardous wastes in a dumpster or trash bin.
- Never place gasoline-contaminated wastes in a rubbish bin. (Small quantities of adsorbents from virgin oil spills are acceptable.)
- Never place oil-contaminated materials that release free draining oil into a rubbish bin.

Related Guidance:

USEPA National Menu of BMPs

General Facility Housekeeping

Purpose: To protect stormwater by maintaining a clean, organized facility.

Always:

- Keep open areas clean and orderly.
- Pick up litter.
- Conduct regular employee training and public education to reinforce proper housekeeping.
- Remove unused scrap/junk materials.
- Store hazardous materials as specified by the manufacturer.

Whenever Possible:

- Store materials and wastes inside or under cover if outside.
- Substitute less toxic or nontoxic materials for toxic ones.
- Perform a routine cleaning of the facility.
- Inspect facility (interiors, exterior, parking areas, etc.) for stains.

Related Guidance:

USEPA National Menu of BMPs

Floor Drains

Purpose: To protect stormwater from pollution caused by discharges of hazardous materials to the subsurface, ground surface, waterway, or storm sewer through floor drains.

Always:

- Keep a spill kit in the vicinity of the floor drains.
- Obtain and use drain mats, adsorbent booms, or covers to keep larger spills out of drains.
- Use floor drains that are (1) connected to a holding tank or (2) connected to the sanitary sewer via an oil/water separator.
- If your floor drains lead to a storm drain, you must have an applicable Texas discharge permit.
- Register holding tanks with the TCEQ.

Whenever Possible:

- Minimize water use or run a dry shop.

Never:

- Never dump hazardous materials down the floor drains.
- Never use floor drains if you are unsure of their discharge location.
- Never store regulated contaminants near a floor drain that discharges directly to the environment.

Related Guidance:

NHDES Environmental Fact Sheets:

-WD-WSEB-22-8 Holding Tanks for Floor Drains

-WD-WSEB-22-9 Protecting Groundwater from Floor Drains and Other Typical Discharges

NHPPP Pit Stops Manual

Painting

Purpose: To protect stormwater by properly storing, using, and disposing of paint and preparation materials.

Always:

- Store waste paints, solvent, and rags in sealed containers.
- Perform abrasive blasting and spray painting in accordance with regulations.
- Properly clean, store, and dispose of paint and associated waste materials.
- Train employees on BMPs concerning painting activities, cleanup, and disposal.

Whenever Possible:

- Replace solvent-based paint with less toxic paints such as latex or water-based paints.
- Practice source reduction—buy only the amount of paint needed.
- Use up, donate, or recycle unused paint.
- Use drop cloths under any painting or preparation activity such as scraping or sandblasting.
- Use techniques such as brushing and rolling to avoid overspray.
- Use vacuum sanders to collect paint dust.
- Perform abrasive blasting and spray painting in an enclosed or covered area that is safe for personnel.

Never:

- Never dispose of paint or waste paint products into the storm drain system, a water body, or onto the ground.

Related Guidance:

NHPPP Pit Stops Manual

NHDES Environmental Fact Sheets:

- WMD-HW-14 Pollution Prevention Tips for Paint
- WMD-HW-6 Contaminated Cloth Wipes for Laundering

Street Sweeping

Purpose: To remove sediment, debris, and other pollutants from streets, parking areas, and paved surfaces through regular, properly timed sweeping schedules.

Always:

- Sweep all public paved streets and parking lots at least once per year, or as often as possible. (Sweeping should also be done as soon as possible after snow/ice melt.)
- Dispose of street sweepings properly. (Reuse is unrestricted if visual evidence of litter, animal waste, and petroleum contamination is absent.)

Whenever Possible:

- Start at the “top” of town and work down.
- Sweep downtown areas more frequently (daily).
- Perform additional sweeping on a seasonal schedule and document areas swept.
- Sweep in locations that generate debris, such as construction entrances, sand/salt loading areas, vehicle fueling areas, and vehicle and equipment storage areas on an as-needed basis.
- Street sweep before a major rain event.
- Use dry vacuum assisted street sweepers (the most effective).
- Maintain street sweeping equipment for maximum effectiveness.
- Cover storage areas or locate storage areas where runoff discharges to a buffer.
- Clean catch basins after streets are swept.

Never:

- Never store street sweepings in areas where stormwater could transport fines to the storm drain system or a waterbody.
- Never purposely sweep into the storm drain system.

Related Guidance:

NHDES Environmental Fact Sheet: WMD-SW-32 Management of Street Wastes

Snow Disposal

Purpose: To protect stormwater by minimizing the impact of snow piles that contain sand, salt, and trash and that generate concentrated releases of pollutants during spring snowmelt conditions.

Always:

- Identify sensitive ecosystems prior to disposal and avoid snow disposal in these areas.
- Clear all debris in snow storage area and properly dispose of it immediately after snowmelt occurs each year that the storage area is in use.

Whenever Possible:

- Select storage locations that do not drain into surface waters and where environmental impacts of spring melt are minimal.
- Store snow on areas that are well above the groundwater table on a flat, vegetated slope.
- Store snow at least 25 feet from the high-water mark of a surface water.
- Store snow at least 75 feet from any private water supply, at least 200 feet from any community water supply, and at least 400 feet from any municipal wells.
- Install a double row of silt fence or equivalent barrier securely between the snow storage area and the high-water mark and inspect periodically throughout the winter season.
- Clear debris in storage area each year prior to snow storage use.
- Avoid disposal on pavement, concrete, and other impervious surfaces.
- Do not pile snow in wooded areas, around trees, or in vegetative buffers.
- Divert run-on of water from areas outside the snow piles.
- Use less harmful deicers such as calcium magnesium acetate, potassium acetate, or organic deicers.

Never:

- Never dispose of snow in wetlands, lakes, streams, rivers, shellfish beds, or mudflats, or near drinking water sources.
- Never store snow in well-head protection areas.

Related Guidance:

NHDES Environmental Fact Sheet: WMB-3 Snow Disposal Guideline
NHDES BMPs to Control Nonpoint Source Pollution

Deicing Material Storage

Purpose: To protect stormwater by properly storing deicing materials. Sand, salt, and other deicing materials used during winter can be transported by runoff into the storm drain system and eventually into waterbodies if not stored properly.

Always:

- Locate sand/salt piles and deicing fluid tanks on flat, impervious sites that are easily protected from overland runoff and away from surface waters.
- Cover sand/salt and salt piles with a polyethylene tarp when indoor storage facilities are not available.

Whenever Possible:

- Contain wash water from trucks used for salting and sanding in a holding tank for disposal or discharge into sanitary sewers.
- Allow rinse water/melt water to drain into vegetated buffers (away from storm drains).
- Locate deicing material stockpiles and tanks at least 100 feet from streams and floodplains.
- Contain stormwater runoff from areas where salt is stored by using buffers to diffuse runoff before entering waterbodies.
- Use diversion berms to minimize run-on to storage areas.
- Clean up “track out” after storm events.

Never:

- Never dispose of wash water from sanding and salting trucks into the storm drain system, a water body, or septic system drain fields.

Related Guidance:

NHDES Environmental Fact Sheet: WMB-4 Road Salt and Water Quality
NHDES BMPs to Control Nonpoint Source Pollution

Deicing Material Application

Purpose: To protect stormwater by improving application techniques of salt, sand, and other deicing materials.

Always:

- Apply sand, salt, or other deicer materials at the minimum amount necessary to ensure safe driving and walking conditions, per manufacturer's instructions.
- Street sweep accumulated salt and sand at the end of the season.

Whenever Possible:

- Inform salt applicators of sensitive areas, such as public water supplies, lakes, ponds, etc., by installing permanent signs.
- Use deicing alternatives such as calcium magnesium acetate, sand, etc., in sensitive areas.
- Use the minimum amount of salt and sand needed to get the job done.
- Use coarse, clean, "washed" sand, which is free of fine particles and dust and easier to clean in the spring.
- Equip all spreaders with ground-speed controllers.
- Train drivers to improve application techniques and reduce losses.
- Consider applying salt in a 4 to 8-foot strip along the centerline of a two-lane road (for less traveled roads).
- Know when to plow and reapply salt. Allow maximum melting by salt before plowing.
- Remove snow manually from driveways and sidewalks.
- Remove deicing materials from the roadway as soon as feasible.

Related Guidance:

NHDES Environment Fact Sheet: WMB-4 Road Salt and Water Quality
NHDES BMPs to Control Nonpoint Source Pollution
NHDOT Winter Maintenance Snow Removal and Ice Control Policy

Standard Operating Procedures from Partners for a Clean Environment (PACE), Boulder County

Available online at www.pacepartners.com/index.php/municipal-stormwater-operations.

Provided courtesy of Partners for a Clean Environment, Boulder County, Colorado.

Revised with North Central Texas–specific information.

Note: Cross-references to other SOPs and forms in this set are highlighted so that people writing their procedures can easily spot and remove or otherwise revise these references if they will not be included in their documentation. All “References and Related Procedures” sections remain as published in the source document.

Facilities and Building Maintenance

Purpose: Stormwater pollution procedures for the maintenance of buildings, facilities, and fixed structures operated or owned by a municipality or county.

Prerequisites

- Employees should attend general stormwater pollution prevention training.

Stormwater Protection Equipment and Materials

- Spill kit and equipment for dry cleanup (socks, absorbent pads, absorbent, broom, and dustpan).
- Inlet protection devices (wattles, drain covers, berms, and/or filter fabric).
- Containers for collecting paint wastes.
- Tarps or ground cloths.

Standard Operating Procedures

Building and Landscape Maintenance

- Maintain the storm drain system (ditches, inlets, catch basins, culverts, drainage channels, or underground lines) on your property. Clean according to established schedules or as visibly needed.
- Do not pressure-wash or hose-off surfaces with soap or chemicals unless wastewater is collected. Do not let wastewater enter storm drains.
- If only cleaning surfaces of ambient dust (with water only), the wastewater can be drained to nearby landscaped/vegetated areas or allowed to pool on-site and evaporate.
- Maintain sprinkler systems as to not over-irrigate. Never water at rates that exceed the infiltration rate of the soil.
- Overflow drains from fountains or decorative ponds should be discharged to the sanitary sewer, drained to a vegetated area, or reused for irrigation. If fountains or decorative ponds are treated with algaecides or other chemicals, the discharge must be approved by the local wastewater treatment facility.
- If paving or sealing a roof, sidewalk, or parking lot, prevent the sealant from reaching the gutters or drains. Use absorbent booms or “pigs” to protect storm drains.
- Use storm drain markers on your property that instruct the public not to dump in storm drains.

Heat Transfer Equipment and HVAC Equipment Cleaning

- Do not allow cooling towers to discharge, leak, or mist-out into roof drains if they drain empty onto pavement, streets, or storm drains. Cooling towers should discharge to the sanitary sewer, if permitted by your local wastewater facility.
- Blow-down from utility boilers may not be discharged outside to pavement or to storm drains. Wastewater should be sent to the sanitary sewer.
- Air conditioner (HVAC) condensate that has been treated with algae inhibitors must be discharged to the sanitary sewer as allowed by the local wastewater treatment facility and not discharged to storm drains.
- Liquid from flushing HVAC or chiller condenser tubes must be captured and disposed of properly. Comply with your city ordinance.

Fire Suppression (Sprinkler) System Testing

- Discharges from chemical suppression systems must be disposed of properly, either in the sanitary sewer or other appropriate disposal methods and must not be allowed to flow outside to paved surfaces that may lead to storm drains.
- For discharges from underground flush tests, fire pump tests, and hydrant flushing, appropriate BMPs should be utilized. (See the Colorado Department of Public Health and Environment's document "[Low Risk Discharge Guidance: Discharges of Potable Water](#)" for examples.)
 - No chemicals are added.
 - Discharge water has not been used for another process (washing, heat exchange, manufacturing, and hydrostatic testing of pipelines or not associated with treated water distribution systems).
 - Discharge shall not cause erosion.
 - Discharge shall not contain solid materials.
 - Discharge shall comply with lawful requirements of applicable local agencies regarding discharges to storm sewer systems.
 - Discharge must not contain residual chlorine at the point where it discharges to surface water in the state. *
 - Removal of any residual chlorine may be achieved by allowing water to stand or pool until no chlorine is detected or by de-chlorination using a potable de-chlorinator.
 - Water should not cause toxicity to vegetation.
 - Promote infiltration to the extent possible.
 - Obtain permission if discharge is to sanitary sewer.
- Discharges from inspector tests, main drain tests, and full flow (back flow) tests are subject to a Hydrostatic Test Water General Permit. The application can be found at www.tceq.texas.gov/permitting/wastewater/general/TXG67_steps.html.
- Discharges disposed of to the sanitary sewer need permission from the local wastewater treatment facility.

Floor Drains and Elevator Shaft Pumps

- Ensure that elevator sump pumps, interior floor drains, and parking garage floor drains are plumbed to the sanitary sewer (not to storm drains).
Note: A Texas discharge permit (see www.tceq.texas.gov/permitting/wastewater/general) may be required if these drains do not go to a sanitary sewer.
- If there are any hydraulic fluid leaks from elevators, ensure proper cleanup.

Janitorial Practices

- Never dump mop water or cleaning wastewater outside in parking lots or storm drains. Dispose of wastewater in a mop sink or other sanitary sewer drain. (This also includes wastewater from automated floor or carpet cleaning equipment.)
- Do not pour, transfer, or dispose of any material outdoors or near a storm drain.

Painting, Staining, and Sandblasting

- Use a ground cloth or oversized tub for paint mixing and tool cleaning. Properly dispose of the wastes.
- Enclose spray-painting operations with tarps or other means, as possible, to minimize wind drift and to contain overspray.
- Clean paintbrushes and tools used to apply water-based paints in sinks plumbed to a sanitary sewer or in portable containers that can be emptied into sanitary sewer drains. Never clean tools over a storm drain or outside.
- Brushes and tools used for oil-based paints, finishes, thinners, solvents, or other materials must be cleaned over a tub or container and the cleaning wastes disposed or recycled at an approved hazardous waste facility. Never clean tools over a storm drain or outside.
- Promptly clean up any spills of paints, cleaners, or other maintenance chemicals or supplies. Follow spill cleanup BMPs.
- When sand blasting exterior surfaces, place tarps or ground cloths beneath the work area to capture sand blasting media and debris. Enclose the sand blasting area with tarps or plastic to protect from wind and to capture airborne particles (dust).
- Cease all sand blasting operations on windy days.

Waste Management

- All waste receptacles must be leak-tight with tight-fitting lids or covers. This includes dumpsters and compactors.
- Keep all container lids closed at all times unless adding or removing material.
- If possible, store waste receptacles (dumpsters) indoors, under a roof or roof overhang, or inside a shed or covered structure.
- Sweep up around outdoor waste containers regularly.
- Ensure proper disposal of grease bins or tallow bins. Clean up any spills or leaks.
- Do not hose-out dumpsters outdoors. Return dumpsters to the disposal company for cleaning at its facility. If dumpsters must be washed, do so in a wash bay or in an area where wastewater will drain to the sanitary sewer.

Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution and know who to contact in case of a spill.

Employee Training

- All applicable employees should be trained annually or biannually in general stormwater pollution prevention—including how to recognize and report illegal connections or discharges. If an employee is at a facility permitted under General Permit TXR050000, annual training is required.

Record Keeping and Documentation

- Keep a list of all employees trained in the facility's Stormwater Pollution Prevention Binder.
- Keep copies of all contracts for building services or other maintenance.
- Which department is responsible for cleaning of storm drains, ditches, or culverts for your municipality? Department: Streets Phone #: (972) 219-3510
- Keep records of any routine cleaning of parking lots, storm drains, or culverts.

References and Related Procedures

PACE Municipal Operations website: <http://pacepartners.com/municipal-operations>

BMPs: *Building Maintenance*

BMPs: *Contracts and Property Leasing*

BMPs: *Good Housekeeping and Spill Prevention*

SOPs: *Spill Prevention, Cleanup, and Reporting*

SOPs: *Waste Management, Storage, and Disposal*

SOPs: *Pressure Washing and Exterior Cleaning*

***surface water in the state:** Lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state (from the mean high water mark [MHW] out 10.36 miles into the Gulf), and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or non-navigable, and including the beds and banks of all water courses and bodies of surface water, that are wholly or partially inside or bordering the state or subject to the jurisdiction of the state; except that waters in treatment systems which are authorized by state or federal law, regulation, or permit, and which are created for the purpose of waste treatment are not considered to be water in the state.

Fleet and Vehicle Maintenance

Purpose: Stormwater pollution prevention procedures for fleet and vehicle maintenance operations including emergency repair operations.

Prerequisites

- Employees should attend general stormwater pollution prevention training.

Stormwater Protection Equipment and Materials

- Weatherproof containers.
- Polly or plastic pallets.
- Drum covers.
- Tarps.
- Spill kit and equipment for dry cleanup (socks, absorbent pads, absorbent, broom, and dustpan).
- Drip pans.

Standard Operating Procedures

Vehicle and Equipment Maintenance

- Move leaking vehicles or equipment indoors or under cover.
- Use drip pans for leaking vehicles that need to be stored outside.
- Contain leaking fluids and tag the vehicle to alert drivers that vehicle is nonoperational.
- Perform all maintenance activities involving fluids indoors only (except in emergency cases).
- Appropriately dispose of wastewater from tire leak check (to a sanitary sewer or interior drain).
- Clean all parts indoors using the appropriate parts washer.
- Wash vehicles in dedicated wash bays that drain to sanitary sewer.

Emergency Maintenance Operations

- Use drip pans underneath vehicles to catch leaks and drips.
- Have spill kits on all response vehicles.
- Move vehicle to an impervious surface if possible (for better spill cleanup).
- Notify your supervisor of spills. (See the Spill Prevention, Cleanup, and Reporting SOP.)

Good Housekeeping and Waste Disposal

- Clean up all spills promptly.
- Transfer fluids from drip pans to the appropriate waste containers immediately.
- Routinely check any equipment stored outside for leaks.
- Maintain oil/water separators according to municipal ordinance or manufacturer's instructions as appropriate.
- Keep lids on dumpsters closed when not in use.
- Develop and maintain a maintenance schedule to check outdoor parking and storage areas for spills and or debris accumulation.
- Inspect parking and fueling areas regularly. Designate employee(s) to perform these inspections.

Contracts and Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution.

Employee Training

- All applicable employees should be trained annually or biannually in stormwater pollution prevention, including how to recognize and report illegal connections or discharges. If an employee is at a facility permitted under General Permit TXR050000, annual training is required.

Record Keeping and Documentation

- Keep a list of all employees trained in the facility's Stormwater Pollution Prevention binder, computer file, or other location: Storm Water Division Office.
- Maintain a current copy of Spill Response Plan in the SWPPP. Maintain a map of storm drain locations on the property. This is located at: Fleet Services and Storm Water Division Offices.
- Keep a map, including the location of storm drain inlets, in the facility's Stormwater Pollution Prevention binder.

References and Related Procedures

PACE Municipal Operations website: <http://pacepartners.com/stormwater/municipal-operations>

BMPs: *Dewatering of Secondary Containment Structures*

BMPs: *Illicit Discharge Reporting*

BMPs: *Outdoor Container Storage*

BMPs: *Liquid Bulk Material Loading and Unloading*

BMPs: *Material Loading and Unloading*

BMPs: *Spill Cleanup*

BMPs: *Good Housekeeping and Spill Prevention*

BMPs: *Vehicle Maintenance and Storage*

BMPs: *Waste Management and Disposal*

SOPs: *Spill Prevention, Cleanup, and Reporting*

SOPs: *Vehicle and Equipment Fueling*

SOPs: *Outdoor Materials Storage*

SOPs: *Waste Management and Disposal*

Fueling and Fuel Spill Cleanup

Purpose: Stormwater pollution prevention procedures for municipal operations where vehicles and/or equipment are fueled with gasoline or diesel fuel. These SOPs also apply to fueling from stationary tanks (above- or underground) and from portable tanks and containers in the field.

Prerequisites

- Employees should attend general stormwater pollution prevention training.

Stormwater Protection Equipment and Materials

- Spill Response Plan with contact information. (This is located at: Fleet and Storm Water offices.)
- Spill kit and equipment for dry cleanup (socks, absorbent pads, absorbent, broom, and dustpan).
- Container for dirty absorbent.
- Storm drain covers (if available).

Standard Operating Procedures

Fueling

- Fuel carefully to minimize drips on the ground.
- Post signage prohibiting “topping off” and describing spill response procedures.
- Require that the person doing the fueling remain present during entire fueling operation. (“Don’t walk away!”)
- Locate the emergency shut-off switch near the fuel island and use it if necessary.
- Keep a spill kit at or near each fueling area.
- Train employees to clean up spills and dirty absorbent.
- Assign employee(s) to inspect the fueling island and equipment regularly. Clean up any dirty absorbent as needed.
- Inspect fueling equipment for cracks, leaks corrosion, or failure.
- Fleet personnel are responsible for inspecting the fuel pumps and area.
- When fueling small equipment in the field like lawn mowers, small sweepers, weed whackers, blowers, portable generators, etc., do so over a paved or concrete area, well away from any storm drains or ditches. When pouring fuel from a portable can, use a funnel.
- If possible, install a roof or canopy over the fueling island. (This is a requirement for new construction.)

Locate Storm Drains

- Locate and block any storm drains on site and ensure that any spilled fuel does not reach drains or waterways.

Fuel Spill Cleanup

- Clean up spills thoroughly and promptly.
- Always use dry methods for cleanup of fuel spills (gas, diesel, or kerosene).
 - Spread absorbents (loose absorbents, sheets, pillows, “pigs,” or socks) on the spill.
 - Sweep up or pick up the absorbed materials.
 - Dispose of wastes properly.
- If fluids are leaking or have spilled on an impermeable surface, such as a road or parking lot, locate the nearest down gradient storm drain and use a dike or berm to block the drain in order to prevent fluids from entering it.
- Put down absorbent on the spill area. Sweep up the contaminated absorbent and remove the berm

or dike from the storm drain. If fluids are leaking or have spilled on a permeable surface, such as gravel, soil, or grass, mark the area then call the State of Texas Spill-Reporting Hotline and the State Emergency Response Commission (SERC) at 1-800-832-8224 (24 hours a day). (See www.tceq.texas.gov/response/spill_rq.html and www.tceq.texas.gov/response/spills.html for more information.)

Report Spills

- Any spill or discharge of any pollutant (e.g., oil, fuels, sediment, paints, hazardous liquids, or super-chlorinated water) that reaches storm drains or enters surface water in the state* must be reported as soon as possible and within 24 hours to:
 - The State of Texas Spill-Reporting Hotline and the SERC at 1-800-832-8224 (24 hours a day) or
 - TCEQ Regional Office (Region 4, Dallas/Fort Worth), 1-817-588-5800—Monday-Friday, 8 a.m.–5 p.m.
(See www.tceq.texas.gov/response/spill_rq.html and www.tceq.texas.gov/response/spills.html for more information.)
- If the spill causes a fish kill, notify Texas Parks and Wildlife by calling 1-512-389-4848. (See http://tpwd.texas.gov/landwater/water/enviroconcerns/kills_and_spills/ for more information.)
- Report spills to the facility supervisor. Phone: (972) 219-3510.
- Report spills that reach storm drains or waterways to your municipal Stormwater Specialist. Phone: (972) 219-3510.

Contracts and Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution.

Employee Training

- All applicable employees should be trained annually or biannually in general stormwater pollution prevention including how to recognize and report illegal connections or discharges. If an employee is at a facility permitted under General Permit TXR050000, annual training is required.

Record Keeping and Documentation

- Keep a list of all employees trained in the facility's Stormwater Pollution Prevention binder or computer file.
- Keep a map of the facility, including storm drain inlets, in the Facility's Stormwater Pollution Prevention binder.
- Maintain a current copy of the Spill Response Plan in Fleet and Storm Water offices.
- Post signs as to whom to report spills to (Facility Supervisor, Stormwater Specialist, Fire Department, TCEQ, etc.).
- Keep copies of all fuel analyses and delivery invoices.

References and Related Procedures

CDPHE *Spill Reporting Brochure*: <https://www.colorado.gov/pacific/cdphe/wq-environmental-spills>

PACE Municipal Operations website: <http://pacepartners.com/stormwater/municipal-operations>

BMPs: *Vehicle and Equipment Fueling*

BMPs: *Spill Cleanup*

SOPs: *Spill Cleanup and Reporting*

***surface water in the state:** Lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state (from the mean high water mark [MHW] out 10.36 miles into the Gulf), and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or non-navigable, and including the beds and banks of all water courses and bodies of surface water, that are wholly or partially inside or bordering the state or subject to the jurisdiction of the state; except that waters in treatment systems which are authorized by state or federal law, regulation, or permit, and which are created for the purpose of waste treatment are not considered to be water in the state.

New Construction of Buildings and Structures

Purpose: Stormwater pollution prevention procedures for new building design, construction, or renovation processes.

Prerequisites

- Employees should attend general stormwater pollution prevention training.
- Texas Construction General Permit for construction activity (if over an acre of soil disturbance.)
www.tceq.texas.gov/permitting/stormwater/TXR15_AIR.html
- Reference the *Preventing Stormwater Pollution at Construction Sites* brochure (see www.nctcog.org/envir/SEEclean/stormwater/pubs/documents/constructionguide_final.pdf).

Stormwater Protection Equipment and Materials

- Storm drain inlet protection (drain covers, berms, rock wattles, sandbags, filter fabric, or plastic).
- Weatherproof containers and drum covers.
- Secondary containment (pallets, containers, and tarps).
- Erosion control BMPs (wattles, stakes, straw bales, berms, and vegetated material).

Standard Operating Procedures

General Construction SOPs

- All construction and renovation activities must use BMPs to the maximum extent practicable regardless of the size of the project or the permits required.
 - Identify storm drains near work zone.
 - Install inlet protection within 25 feet and down gradient of work.
 - Place covers, rock wattles, sandbags, filter fabric, or plastic around or over inlets.
 - Inspect site at the beginning and end of the day to ensure that operations are not contributing sediment or other pollutants to the flow line or storm drain.
 - Clean rights-of-way (streets, medians, and roadways) with brooms or street sweepers as needed.
- Chemicals stored outdoors must be in properly sealed containers. Secondary containment may be necessary if spill potential is high, or the containers are located at or near a sensitive area.
 - Cover dumpsters and/or roll-offs to prevent them from becoming full of water and leaking.

Erosion Control During Construction

- Utilize BMPs to control and reduce erosion from the site to the maximum extent possible. If needed, construct or install permanent BMPs.
- Inspect and maintain all erosion or sediment control devices or equipment installed in erosion-prone areas of construction projects.
- Block storm drain inlets (within 25 feet and down gradient) during construction work. Place covers, rock wattles, sandbags, filter fabric, or plastic around or over inlets to protect them from entry of wastes, dusts, overspray, or slurry.
- Store supplies including cement bags, sand, sealants, and tar under cover (such as a tarp) and away from drainage areas.
- Ensure that temporary stockpiles of soil, sand, and other materials are stored to minimize stormwater pollution. (Do not store piles of materials in the street, near storm drains or gutters unless BMPs are used to protect storm drains from sediment runoff.)

Design Standards: Buildings and Structures

- Design buildings to ensure that runoff from cooling tower wastewater, fueling spills, material handling and storage spills and vehicle or equipment washing, or repairs do not pollute any waterways.
- If it is expected that a building or structure will be pressure washed regularly, design the landscaping and paving to allow wastewater to be channeled for on-site irrigation or collected in pits for collection and disposal.
- Design downspouts to allow rooftop runoff to flow over landscaped areas or porous surfaces.
- Design trash and recycling receptacle areas to be under cover.

Parking Lots

- Consider pervious pavement.
- Consider sheet flow to a grass swale.
- Consider porous, landscaped detention areas.

Storm Drainage Systems

- Consider designing the site with infiltration structures (i.e., rain gardens, downspouts, swales).
- Do not install storm drains near (or at a lower elevation than) fuel or material loading, unloading, or handling areas unless they are equipped with shut-off valves.
- Review the potential stormwater runoff issues and design the storm drainage systems with appropriate BMPs to improve water quality.
- Use storm drain markers that instruct the public not to dump in storm drains.
- All new buildings, renovations, or remodels must have proper sanitary connections for wastewater. Any illicit connections discovered during a remodel, renovation, remodel, or addition must be immediately disconnected and reported.

Material Handling and Storage Areas

- If possible, design new or remodeled facilities so that all work involving industrial materials, chemicals, or wastes will be conducted indoors, under a roof or inside of containment.
- Design outdoor storage areas to have impervious, secondary containment and cover. Secondary containment should be of sufficient capacity to hold the contents of the largest single container plus 4 inches of rainfall. Design the containment so that it contains a blind sump (no outlet) to facilitate pumping out or draining.
- If possible, pave material loading, unloading, and handling areas and locate these areas under a roof, canopy, or overhang to avoid exposure. Concrete should be used rather than asphalt and provided with impervious secondary containment.
- If possible, grade and slope material loading, unloading, and handling areas to avoid stormwater run-on.
- Do not install storm drains downstream of material loading or unloading areas unless they are equipped with shut-off valves.
- Design salt/sand storage facilities to be totally enclosed such as under salt domes or inside of fabricated buildings.
- Design new or renovated facilities with waste or recycling accumulation areas indoors or under a roof.
- If food and grease waste containers must be stored outdoors, design a bermed or dyked area where food and grease wastes can be stored, and stormwater run-on will be diverted.

Vehicle and Equipment Maintenance Areas

- Design all vehicle and equipment washing and repair facilities indoors. Plumb wastewater to a sanitary sewer.
- Design vehicle wash bays that drain wastewater to a sanitary sewer. Consider recycling wash water.

Fueling Areas

- Construct impervious berms or secondary containment around fueling stations or tanks to contain leaks or drips.
- Install impervious pavement around fueling stations to divert run-on stormwater away from fueling stations.
- Install covers or canopies over permanent fueling stations to avoid exposure to stormwater.
- Install oil/water separators in any storm drain inlet that might receive runoff from a fueling area.

Landscape, Lawns, and Vegetated Areas

- Design the vegetated areas to improve the stormwater quality to the maximum extent practicable.
- If possible, design new or re-landscaped facilities with xeriscaping rather than conventional landscaping.
- Use native plants.
- Incorporate Low Impact Development (LID) techniques into all landscape designs.

Swimming Pools

- Connect swimming pools to the sanitary sewer for pool water discharge, when possible. Note: Filter media capture equipment may be required by code to connect a diatomaceous earth pool filter to the sanitary sewer. Consult your plumbing code.

Contracts and Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution.

Employee Training

- All applicable employees must be trained in general stormwater pollution prevention and how to recognize and report illegal connections or discharges.

Record Keeping and Documentation

- Keep a list of all employees trained in Stormwater Pollution Prevention.
- If the site is over an acre, maintain Stormwater Management Plans (SWMPs) and inspection logs.
- Keep copies of inspection reports during construction.
- Keep copies of Texas discharge permits and SWMPs.

References and Related Procedures

PACE Municipal Operations website: <http://pacepartners.com/municipal-operations>

SOPs: *Street Construction and Utility Installation*

SOPs: *Street Maintenance and Repair*

SOPs: *Fueling and Cleanup of Fuel Spills*

SOPs: *Outdoor Materials Storage*

SOPs: *Parking Lot Maintenance*

SOPs: *Pressure Washing and Exterior Cleaning*

SOPs: *Spill Prevention, Cleanup, and Reporting*

SOPs: *Waste Management and Disposal*

BMPs: *Dewatering of Secondary Containment Structures*

BMPs: *Facilities and Building Maintenance*

BMPs: *Good Housekeeping and Spill Prevention*

BMPs: *Illicit Discharge Reporting*

BMPs: *Liquid Bulk Material Loading and Unloading*

State of Colorado Permit Information: [Water quality: commerce and industry permits | Department of Public Health and Environment](#)

Urban Drainage and Flood Control District, Urban Stormwater Drainage Criteria Manual, Volume 3:

<http://www.udfcd.org/>

[KICP's Erosion Control Field Manual](#)

Outdoor Special Events and Festivals

Purpose: Stormwater pollution prevention procedures for outdoor special events to prevent wastes or wastewater from entering storm drains and waterways.

Prerequisites

- Operational Employees should attend general stormwater pollution prevention training.

Stormwater Protection Equipment and Materials

- Covered trash and recycling containers.
- Spill kit and equipment for dry cleanup (socks, absorbent pads, kitty litter, broom, and dustpan).
- Storm drain inlet protection (wattles, berms, and drain covers).
- Wet vac.
- Porto-Potties (staked down).
- Containers for wastewater collection.

Standard Operating Procedures

General Stormwater Protection

- Do not dump any liquids or other material outside.
- Have spill cleanup material on hand and clean up spills immediately.
- Distribute an informational sheet to event coordinators. (An example is available at www.keepitcleanpartnership.org/wp-content/uploads/pdfs/Events%20Resource%20Sheet.pdf.)
- Service portable toilets frequently and have contractor securely stake them down to prevent them from blowing or tipping over.
- Ensure that vendors dispose of their wastewater appropriately. Provide a connection to a sanitary sewer or other container for vendors to dispose of their wastewater.

Waste Management and Disposal

- Provide an adequate number of receptacles to prevent litter.
- Empty waste and recycling containers as needed to prevent overflow.
- Waste and recycling receptacles should be leak tight and have a lid or cover.
- Contact a local solid waste disposal company to help determine the receptacle need for the event.

Pressure Washing After the Event

- If hiring a company to pressure wash, be sure they are capable of collecting all wash water and preventing it from entering the stormwater system.
- Dry clean area as needed. Use absorbents (absorbent, rags, sand, etc.) to clean up spills, sweeping, vacuuming, and scrapping off dried debris. The waste material should be disposed of as solid waste.
- Pressure wash with minimal water.
- If you do not use any chemicals or detergents and are only cleaning surfaces of ambient dust with water, then you may direct the wastewater to nearby landscaping or vegetated area or contain it on site and allow it to evaporate.
- When discharging wash water to landscaping, make sure water is absorbed into vegetated or permeable surfaces (gravel, porous pavement) and does not cause erosion or run off into a storm drain or paved area.
- All other wash water must be captured for proper disposal.

- Solids should be removed from the area prior to pressure washing, and a filter bag or similar filtration device should be used to remove suspended solids from the wastewater.
- Use a wet vacuum to collect wastewater for disposal to the sanitary sewer.
- Contact the municipal Public Works department to street sweep the festival area following the event.

Contracts and Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution.
- Pressure washing companies should fill out the Pressure Washing Service Agreement to ensure that the location of disposal is identified.

Employee Training

- All applicable employees should be trained annually or biannually in general stormwater pollution prevention, including how to recognize and report illegal connections or discharges.

Record Keeping and Documentation

- Keep a list of all employees trained in stormwater pollution prevention.
- Provide event participants with resource materials and information on waste disposal during the event.

References and Related Procedures

PACE Municipal Operations website: <http://pacepartners.com/stormwater/municipal-operations>

BMPs: *Good Housekeeping and Spill Prevention*

BMPs: *Spill Cleanup*

SOPs: *Pressure Washing and Exterior Cleaning*

SOPs: *Waste Management and Disposal*

SOPs: *Spill Prevention, Cleanup, and Reporting*

SOPs: *Outdoor Materials Storage*

Resource Sheet: *Outdoor Special Events for Vendors*

Resource Sheet: *Outdoor Special Events for Event Organizers*

Boulder County Public Health, Temporary Event Application:

<http://www.bouldercounty.org/family/food/pages/foodsafetyprogrammain.aspx>.

Outdoor Materials Storage

Purpose: Stormwater pollution prevention procedures for the prevention of accidental releases of liquid or solid materials stored outdoors in containers, totes, drums, cartons, bulk tanks, bags, or stockpiles.

Prerequisites

- Employees should attend general stormwater pollution prevention training.
- Designate personnel to conduct inspections of outdoor storage areas on a regular basis.

Stormwater Protection Equipment and Materials

- Weatherproof containers.
- Poly or plastic containment pallets.
- Drum covers.
- Tarps.
- Spill kit and equipment for dry cleanup (socks, absorbent pads, absorbent, broom, and dustpan).
- Storm drain inlet protection (wattles, berms, and drain covers).

Standard Operating Procedures

Outdoor Storage Areas

- Store all containers indoors whenever possible. If they must be stored outdoors, place them in a shed or under a roof if possible.
- Chemicals stored outdoors must be in properly sealed containers. Secondary containment may be necessary if spill potential is high, or the containers are located at or near a sensitive area.
- If possible, place all containers on a plastic pallet or other device that elevates them off the ground or pavement and provides containment. This avoids contact with stormwater run-on/runoff.
- Place containers on paved or impervious surfaces and as far from (or at a lower elevation than) storm drain inlets and drainage ditches as possible.
- Provide a spill kit near storage areas.
- Clean up any spills, leaks, or discharges promptly.
- Inspect all containers stored outdoors regularly.
- If a container is found to be leaking, either empty the contents into a leak-tight container or place the entire leaking container inside of a larger leak-tight container. Clean up any spills or leaks promptly.
- Do not drain accumulated water from secondary containment structures unless approved by a supervisor.
- Inspect all containers stored outdoors regularly. Any containers that are leaking must be moved indoors immediately or placed in a leak-tight, “over-pack” container.

Sand, Salt, Dirt, or Gravel Stockpiles

- Store sand/salt inside a building or under a roof.
- If no building is available, cover sand/salt piles with a tarp.
- Contain stormwater runoff from dirt and gravel stockpiles by using barriers or berms.

Bulk Liquid Materials Storage

- Provide impervious secondary containment for all aboveground storage tanks (ASTs), except double-walled tanks, that is sufficient to contain the entire contents of the largest single tank plus

an additional 4 inches of rainfall or 110 percent of the capacity of the potentially stored volume (not just the largest tank).

- Keep drain valves in secondary containment at ASTs locked in the closed position at all times. Open for draining only under supervision.
- Make sure an adequate spill kit with sufficient equipment and supplies is located near storage areas where spills are possible. Clean up any spills, leaks, or discharges immediately.

Contracts and Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution.

Employee Training

- All applicable employees should be trained in general stormwater pollution prevention, including how to recognize and report illegal connections or discharges.

Record Keeping and Documentation

- Keep a list of all employees trained in the facility's Stormwater Pollution Prevention binder or other location.
- Provide a written inspection and maintenance schedule of all areas.
- Keep a map of the facility, including storm drain inlets.
- Keep copies of current Safety Data Sheets for all materials stored outdoors.

References and Related Procedures

PACE Municipal Operations website: <http://pacepartners.com/municipal-operations>

BMPs: *Dewatering of Secondary Containment Structures*

BMPs: *Outdoor Container Storage*

BMPs: *Spill Cleanup*

BMPs: *Good Housekeeping and Spill Prevention*

SOPs: *Snow Plowing, Storage, and Deicer Application*

SOPs: *Spill Prevention, Cleanup and Reporting*

SOPs: *Waste Management, Storage, and Disposal*

Parking Lot Maintenance

Purpose: Stormwater pollution prevention procedures for the general maintenance of municipal parking lots, parking garages, or elevated parking structures.

Prerequisites

- Employees should attend general stormwater pollution prevention training.

Stormwater Protection Equipment and Materials

- Spill kit and equipment for dry cleanup (socks, absorbent pads, absorbent, broom, and dustpan).
- Inlet protection devices (wattles, drain covers, berms, and/or filter fabric).

Standard Operating Procedures

General Maintenance

- Designate staff to conduct maintenance of parking lots and garages including stormwater conveyance systems.
- Clean leaves, trash, sand, and other debris from parking lots, as needed, to prevent debris from reaching any storm drain inlet or storm detention area.
- The parking lots are swept or cleaned: as needed after leaf season in the fall.
- Clean after special events.
- Use storm drain markers to mark any storm drain inlets in or near the parking lot with the message *“Don’t Dump Drains to Creek.”*
- Any automotive spills and/or drips must be cleaned up with dry cleanup methods (absorbents) and disposed of properly.
- For parking garages, ensure that elevator sump pumps and interior floor drains are plumbed to the sanitary sewer (not to storm drains).
- Clean up any trash, spills, or leaks from dumpsters and report leaking dumpsters to the disposal company.

Maintenance of Storm Drains, Culverts, and Detention Areas

- Inspect storm structures, culverts, detention areas, or structural BMPs regularly for debris accumulation. Clean out as needed.
- Contact the appropriate municipal department to clean out any storm drains, structures, or detention/infiltration areas.
Department: Streets Division
Phone: 972-219-3510
- The cleaning frequency is: as needed. Preventive maintenance schedule – 10% of the storm system per year.

Asphalt Paving, Resurfacing, and Concrete Projects

- Reseal or pave on dry days when no rain is expected and stop paving activities well before rainfall is expected.
- Pre-heat, transfer, or load hot asphalt far away from storm drain inlets.
- Protect or block nearby, downstream, storm drain inlets from debris from maintenance work (asphalt cap, chip sealing, concrete breaking, or saw cutting). Leave inlet protection in place until the job is complete. Clean up debris from around inlets and dispose of properly.
- Designate a concrete wash out area on the job site in a grassy or graveled area where pooled

water can soak into the ground. If no wash out area is available, wash out into a container (pool, bucket, or wheelbarrow) and dispose of material properly.

Painting and Striping

- Schedule painting, marking, and striping projects during dry weather only. Cease all activities when rain threatens.
- Use thermoplastic markings in place of paint whenever possible.
- Block nearby storm drain inlets (within 25 feet and down gradient of project) when painting or striping.
- Promptly clean up any spills of paints, cleaners, or other chemicals.

Salt, Sand, or Deicer Application

- Hand-apply deicer or sidewalk salt. Use sparingly.
- If truck-applying salt, sand, or deicer, use the lowest application rate that will be effective. Ensure that the equipment is calibrated to optimum levels according to manufacturer's instructions.
- Avoid applying liquid or solid salt products near storm drain inlets, creeks, drainage ditches, or other waterbodies.

Snow Plowing and Snow Storage

- Do not plow or store excess snow or other debris near creeks or storm drainage systems.
- Snow disposal areas should be located at least 500 feet from or down gradient from any storm drain inlets, drainage ditches, ponds, creeks, or wetlands.
- If possible, store excess snow in a pervious (gravel) area where melt water can infiltrate into the ground and not flow into the storm drain system.
- If snow storage is on a paved area, sweep up the remaining debris after snow melt.
- Excess snow is stored at: Public Services Yard, only if needed.
- If stored on a paved area, how often is the area swept? Not applicable

Contracts and Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution.

Employee Training

- All applicable employees should be trained annually or biannually in general stormwater pollution prevention, including how to recognize and report illegal connections or discharges.

Record Keeping and Documentation

- Keep a log of inspection and maintenance records.
- Keep a log of all employees trained in facility's Stormwater Pollution Prevention binder or computer file. Log is located at: Storm Water Division Office

References and Related Procedures

PACE Municipal Operations website: <http://pacepartners.com/stormwater/municipal-operations>

SOPs: *Snow Plowing, Storage, and Deicer Application*

SOPs: *Street Sweeping, Cleaning, and Waste Disposal*

SOPs: *Waste Management and Disposal*

SOPs: *Street Maintenance and Repair*

SOPs: *Storm Drain System Maintenance*

SOPs: *Spill Prevention, Cleanup, and Reporting*

SOPs: *Pressure Washing and Exterior Surface Cleaning*

BMPs: *Facility and Building Maintenance*

BMPs: *Dry Material Loading and Unloading*

Parks, Golf Course, and Open Space Maintenance

Purpose: Stormwater pollution prevention procedures for maintenance of parks, golf courses, and open space properties.

Prerequisites

- Employees should attend general stormwater pollution prevention training.

Stormwater Protection Equipment and Materials

- Spill kit and equipment for dry cleanup (socks, absorbent pads, absorbent, broom, and dustpan).
- Inlet protection devices (wattles, drain covers, berms, sandbags, and/or filter fabric).
- Mulching mowers.
- Automatic timers.
- Rainfall sensors.
- Evapotranspiration (ET) controllers.
- Manufacturer's recommendations for application and storage of pesticides.

Standard Operating Procedures

General

- Never dump any liquids or other materials outside. Dispose of all liquids and materials appropriately (generally in a sanitary sewer).
- Ensure that the storm drains, ditches, inlets, catch basins, drainage channels, or underground lines on the property are properly maintained.
- Catch basins, inlets, and culverts are scheduled to be cleaned as needed. Preventive maintenance schedule – 10% of the storm system per year. If additional cleaning or maintenance is needed, notify the Streets Division Supervisor.
- Keep all outdoor work areas neat and tidy. Sweep around work areas after each shift and properly dispose of all wastes.
- If possible, do not hose down outdoor work areas or trash/waste container storage areas. If these areas must be washed, ensure that the wash water will enter the sanitary sewer or a landscaped area. Do not use soap. (See the [Pressure Washing and Exterior Cleaning SOP](#).)

Irrigation Systems

- Set sprinklers to water at rates less than the infiltration rate of the soil, to water evenly over the vegetated area, and to minimize the amount of water falling on impervious surfaces.
- Automatic timers should be used on all irrigation equipment to minimize runoff and over irrigation. Monitor soil moisture content and adjust timer settings appropriately.
- Always replace or repair broken or leaking sprinkler heads as soon as possible.
- To report an irrigation problem or concern, contact the Parks and Recreation Supervisor.

Landscaping, Lawn, Vegetation Maintenance

- Whenever possible, mulch-mow grasses.
- Sweep grass clippings and other vegetation debris from sidewalks or streets back onto grassy areas.
- Dispose of lawn clippings, leaves, tree trimmings, or other landscape waste appropriately.
- If possible, dispose of organic wastes by mulching or composting. If mulching or composting is not possible, dispose of organic wastes at an approved disposal facility.

- If possible, control soil erosion by seeding, sod, mats, mulching, terracing, or other effective methods. Use mulch or other erosion control methods to prevent erosion of exposed soils and flowerbeds.
- Do not apply bark or mulch on top of plastic sheeting unless the area is enclosed by a barrier-like lawn edging or it is far from a storm drain inlet. (Bark on plastic is easily washed off by heavy rainfall.)
- Design new or re-landscaped areas using xeriscape and Low Impact Development (LID) techniques to the maximum extent possible. Use hardy plant materials appropriate to the climate.
- Always follow the “Fertilizer, Herbicide, and Pesticide Application” SOP.

Buildings and Structures

- Do not discharge waste and/or wastewater from cleaning and repair of exterior surfaces into the Municipal Separate Storm Sewer System (MS4). If you do not use any chemicals or detergents and are only cleaning surfaces of ambient dust, then you may direct the wastewater to nearby landscaping or vegetated area or contain it onsite and allow it to evaporate.
- Always follow the “Pressure Washing and Exterior Cleaning” SOP when power washing buildings or structures.
- Use inlet protection devices such as wattles, berms, or drain covers when constructing or repairing paved sidewalks, driveways, or other structures to protect any storm drain inlets or ditches that are within 25 feet or are at the same or lower elevation than the work area.
- If possible, use rub-on techniques for graffiti removal or repaint over the affected areas.
- If pressure washing graffiti, capture any wastewater, debris, solvent wastes, or solid wastes from graffiti removal with tarps or wet vacs and dispose of in sanitary sewer.

Vehicle and Equipment Washing and Storage

- Vehicles, equipment, and mowers are washed at Fleet Maintenance wash bay (1100 N. Kealy), which drains to the sanitary sewer or an approved holding tank or infiltration area.
- Vehicles and mowers may also be washed at a commercial or other designated car washing facility.
- If possible, perform all maintenance and repair work inside shop. (Only emergency repairs and maintenance activities that do not involve fluids may be performed outdoors.)
- Do not store leaking vehicles or equipment outdoors. Contain the leak, repair immediately, or move indoors and repair.
- Notify the Fleet Supervisor when leaving a leaking vehicle at Fleet Services or at your shop.

Painting and Staining

- Do not clean tools and brushes over or near a storm drain.
- Use a ground cloth or oversized tub for paint mixing and tool cleaning. Properly dispose of the wastes. Avoid performing activities near storm drains.
- Enclose spray-painting operations with tarps or other means to minimize wind drift and to contain overspray.
- Clean paint brushes and tools used to apply water-based paints in sinks plumbed to a sanitary sewer or in portable containers that can be emptied into sanitary sewer drains.
- Clean brushes and tools used for oil-based paints, finishes, thinners, solvents, or other materials over a tub or container and dispose of the cleaning wastes at an approved hazardous waste facility.
- Immediately clean up any spills of paints, cleaners or other maintenance chemicals or supplies. (See the [Spill Prevention, Cleanup, and Reporting SOP](#).)
- Store paints, stains, and solvents inside, or under cover and with secondary containment (as per manufacturer’s recommendations).

Swimming Pool Maintenance

- Do not discharge pool water to a street or storm drain when draining pools or hot tubs, unless dechlorinated. Discharge water to vegetated landscape or the sanitary sewer if permitted to do so. If using the storm drain system to discharge de-chlorinated pool water, be sure that the discharge does not violate Texas Surface Water Quality Standards. Never clean pool filters in the parking lot or near a storm drain.
- Minimize hosing down pool decks or sidewalks if the wash water will flow to pavement, the street, or the storm sewer system.
- Direct wash water to landscaped or grassy areas or to sanitary sewer when possible.
- Store all pool chemicals indoors and under cover.

Contracts and Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution.

Employee Training

- All applicable employees should be trained annually in general stormwater pollution prevention, including how to recognize and report illegal connections or discharges.

Record Keeping and Documentation

- Keep a list of all employees trained in the department's Stormwater Pollution Prevention binder or computer file.
- Records of all maintenance activities are by the applicable department/division.

References and Related Procedures

PACE Municipal Operations website: <http://pacepartners.com/municipal-operations>

SOPs: *Pesticide and Fertilizer Application*

SOPs: *Fueling and Cleanup of Fuel Spills*

SOPs: *Outdoor Materials Storage*

SOPs: *Parking Lot Maintenance*

SOPs: *Pressure Washing and Exterior Cleaning*

SOPs: *Spill Prevention, Cleanup, and Reporting*

SOPs: *Waste Management and Disposal*

BMPs: *Facilities and Building Maintenance*

BMPs: *Good Housekeeping and Spill Prevention*

BMPs: *Illicit Discharge Reporting*

BMPs: *Landscape and Lawn Maintenance*

BMPs: *Outdoor Container Storage*

BMPs: *Spill Cleanup*

CDPHE: [Low Risk Guidance: Discharges of pools, hot tubs, decorative fountains and other facilities](#)

Pesticide, Fertilizer, and Herbicide Application

Purpose: Stormwater pollution prevention procedures for storage, mixing, disposal, and application of fertilizers, herbicides, and pesticides.

Prerequisites

- Employees should attend general stormwater pollution prevention training.
- Ensure compliance with Texas Pesticide Regulations and EPA's Pesticide Container and Containment Rule.
- Pesticide application must be done only under the supervision of a certified pesticide applicator or qualified supervisor.
- All employees who handle or apply fertilizers, herbicides, or pesticides should be trained on the most recent Safety Data Sheets (SDSs).

Stormwater Protection Equipment and Materials

- ANSI approved sprayers.
- Poly-pallets or plastic containment pallets and pails for secondary containment.
- Proper personal protective equipment (rubber gloves and protective eyewear).
- Spill kits and equipment for dry cleanup (socks, absorbent pads, absorbent, broom, and dustpan).
- All pesticide application equipment must be capable of immediate shut-off in the event of an emergency.
- Manufacturer's instructions for use and disposal of material.
- SDSs for all chemicals.
- EPA or State General Pesticide Permit:
www.tceq.texas.gov/permitting/wastewater/general/pestgpair

Standard Operating Procedures

General

- Always follow the manufacturer's recommendations for mixing, application, and disposal.
- Follow the IPM Plan. Use manual and/or mechanical methods for weed/pest control and vegetation removal wherever possible rather than chemical methods. When chemicals are required, use the least toxic method to control animal and plant pests. Pheromone-based traps and sticky paper are often more effective than chemicals and are protective of water quality. Beneficial organisms should be promoted and protected whenever/wherever possible.
- When chemicals are used, use the most biodegradable product that will accomplish the desired goal.

Mixing

- Follow all manufacturer's recommendations for mixing, applying, and handling of fertilizers, herbicides, and pesticides.
- Mix fertilizers, herbicides, or pesticides inside a protected area with impervious secondary containment (preferably indoors) so that spills or leaks will not contact soils.
- Fertilizers, herbicides, or pesticides are mixed at these locations: Parks and Recreation Operations Center.
- Label all containers.
- Always mix only the minimum amount of fertilizers, herbicides, or pesticides that will be needed for the immediate job.
- If possible, use rinse water from the cleaning of containers and application equipment as a dilution

for the next batch.

Application

- Always follow all federal and state regulations governing use, storage, and disposal of fertilizers, herbicides, or pesticides and training of pesticide applicators (“Read the Label”).
- Time the application of fertilizers, herbicides, or pesticides to coincide with the manufacturer’s recommendation for best results. (For example, do not apply during a heavy rainfall or if a heavy rainfall is expected, and do not apply immediately before an irrigation cycle.)
- If possible, avoid broadcast spraying of pesticides. Choose an appropriate method of application such that application does not exceed the problem area. (Fertilizer may be broadcast sprayed.)
- Spot spray pesticides on infested areas whenever possible rather than treating a larger area. Do not use pesticides on a regular (preventive) basis. Apply only when there is an actual pest problem.
- Avoid applying fertilizers, herbicides, or pesticides in or near any drainage ditch, creek, pond, or seasonal streambed.
- Designate “no spray zones” and/or buffer areas around water features (ponds, lakes, or streams).
- Buffer zone = 50 feet.
- If possible, avoid applying fertilizers, herbicides, or pesticides within 50 feet of any surface water or storm drainage structure.
- Whenever possible, use granular fertilizers, herbicides, or pesticides, as they result in lower application losses.

Cleanup

- Always follow all federal and state regulations governing use, storage, and disposal of fertilizers, herbicides, or pesticides and training of pesticide applicators (“Read the Label”).
- Always follow all manufacturer’s recommendations for cleaning up and handling of fertilizers, herbicides, or pesticides.
- Sweep pavements or sidewalks where fertilizers or other solid chemicals have fallen, sweeping them back onto grassy areas.
- Promptly clean up any spills or leaks of fertilizers, herbicides, or pesticides.
- Make sure all containers are clearly labeled.
- Try to use the entire batch on target areas. Use up excess chemicals on the target pest or vegetated area or dispose of as hazardous waste.
- Dispose of excess and leftover chemicals and empty expired fertilizers, herbicides, or pesticides according to the instructions on the label. If possible, use the triple rinsate from empty containers and/or rinsate from sprayer cleaning as dilution for the next batch.
- Never pour triple rinsate from empty containers and/or rinsate from sprayer cleaning onto ground or into any drainage system.

Storage

- Always follow all federal and state regulations governing use, storage, and disposal of fertilizers, herbicides, or pesticides and training of pesticide applicators (“Read the Label”).
- Store fertilizers, herbicides, or pesticides inside a protected area with impervious secondary containment (preferably indoors) so that spills or leaks will not contact soils.
- Chemicals and pesticides are stored at: Parks and Recreation Operations Center. (This area should be indoors or have secondary containment so that spills or leaks will not contact soils.)

- All containers must be clearly and correctly labeled.

Contracts and Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution.

Employee Training

- All applicable employees should be trained annually or biannually in general stormwater pollution prevention, including how to recognize and report illegal connections or discharges. If an employee is at a facility permitted under General Permit TXR050000, annual training is required.
- Pesticide application must be done only under the supervision of a certified pesticide applicator or qualified supervisor.
- All employees who handle or apply pesticides or herbicides should be trained on the most recent SDSs.
- Train employees on the proper methods for cleaning up spills or leaks of pesticides, herbicides, and fertilizers. (Refer to the Spill Prevention, Cleanup, and Response SOP for more details.)

Record Keeping and Documentation

- Keep a list of all employees trained in the facility's Stormwater Pollution Prevention binder or computer file.
- Records of pesticide application activities are kept at: Parks and Recreation Operations Center.
- An inventory of fertilizers, herbicides, and pesticides including expiration dates are kept at: Parks and Recreation Operations Center.
- Copies of SDSs for all pesticides, fertilizers, and other hazardous products are kept at: Parks and Recreation Operations Center.

References and Related Procedures

PACE Municipal Operations website: <http://pacepartners.com/municipal-operations>

SOPs: *Parks, Golf Course, and Open Space Maintenance*

SOPs: *Fueling and Fuel Spills*

SOPs: *Outdoor Material Storage*

SOPs: *Parking Lot Maintenance*

SOPs: *Pressure Washing and Exterior Cleaning*

SOPs: *Spill Prevention, Cleanup, and Response*

SOPs: *Waste Management and Disposal*

BMPs: *Facilities and Building Maintenance*

BMPs: *Good Housekeeping and Spill Prevention*

BMPs: *Illicit Discharge Reporting*

BMPs: *Landscape and Lawn Maintenance*

BMPs: *Outdoor Container Storage*

BMPs: *Spill Cleanup*

Pressure Washing and Exterior Surface Cleaning

Purpose: Stormwater pollution procedures for the cleaning of exterior surfaces such as sidewalks, building exteriors, and graffiti removal.

Prerequisites

- Employees should attend general stormwater pollution prevention training.

Stormwater Protection Equipment and Materials

- Spill kit and equipment for dry cleanup (socks, absorbent pads, absorbent, broom, and dustpan).
- Wet vacuum and holding tank.
- Storm drain inlet protection devices (drain covers, wattles, booms, and berms).

Standard Operating Procedures

General Surface Cleaning and Pressure Washing

- Use dry cleanup methods prior to any pressure washing. Use absorbents (absorbent, rags, sand, etc.) to clean up spills, sweeping, vacuuming, and scrapping off dried debris. The waste material should be disposed of as solid waste.
- Solids should be removed from the area prior to pressure washing and a filter bag or similar filtration device should be used to remove suspended solids from the wastewater.
- Discharge of any wash water from mobile power washers, directly or via a storm sewer, to surface water in the state* is not authorized under any stormwater permit, either industrial or municipal, and is a violation of the Texas Surface Water Quality Standards.
- If you do not use any chemicals or detergents and are only cleaning surfaces of ambient dust, then you may direct the wastewater to nearby landscaping or vegetated area or contain it onsite and allow it to evaporate. When discharging wash water to landscaping, make sure water is absorbed into vegetated or permeable surfaces (gravel, porous pavement) and does not cause erosion or run off into a storm drain or paved area.
- All other wash water must be captured for proper disposal.
- Pressure wash with minimal water.
- A visible sheen must not be evident in the discharge. Use an absorbent pad or boom to eliminate any oil from the discharge.
- Do not pressure wash an entire building. Spot clean, steam clean, or scrape dirty areas rather than pressure washing the entire structure.

Heat Transfer Equipment and HVAC Equipment Cleaning

- HVAC or chiller condenser tube flushing liquid must be captured and disposed of properly.
- Clean equipment in designated areas and dispose of wash water properly, usually by pouring down a sanitary sewer drain.

Storm Drain Protection

- Prior to pressure washing, identify where all storm drains are located; wash water must not be allowed to flow down gutters or enter storm drains.
- Block or cover all storm drains before pressure washing.
- Determine where water will pool for collection. Use a wet vac to vacuum up the wastewater or allow water to evaporate.

Disposal of Wash Water

- Use a wet vacuum to collect water for disposal to the sanitary sewer.
- Once water is collected, dispose of it properly. Collected wash water may be disposed of into a sanitary sewer drain at the job site or at the contractor's place of business. (First ask for permission from the property owner and the local wastewater treatment plant. A permit may be required prior to disposal to the sanitary sewer. Check with your local wastewater treatment plant for authorization.)
 - DO NOT dispose wastewater to a septic (on-site wastewater) system.

Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution and know whom to contact in case of spill.
- Contractors should fill out the Pressure Washing Service Agreement to ensure that the location of disposal is identified.

Employee Training

- All applicable employees should be trained in general stormwater pollution prevention, including how to recognize and report illegal connections or discharges.

Record Keeping and Documentation

- Keep a list of all employees trained in the facility's Stormwater Pollution Prevention binder or computer file.
- If contracting out pressure washing, have the contractor fill out the Pressure Washing Service Agreement to ensure that the location of disposal is identified.

References and Related Procedures

- PACE Municipal Operations website: <http://pacepartners.com/stormwater/municipal-operations>
- BMPs: *Building Maintenance*
- BMPs: *Contracts and Property Leasing*
- BMPs: *Good Housekeeping and Spill Prevention*
- SOPs: *Spill Prevention, Cleanup, and Reporting*
- CDPHE Low Risk Discharge Guidance: [Discharges from Surface Cosmetic Power Washing Operations to Land](#)

***surface water in the state:** Lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state (from the mean high water mark [MHWM] out 10.36 miles into the Gulf), and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or non-navigable, and including the beds and banks of all water courses and bodies of surface water, that are wholly or partially inside or bordering the state or subject to the jurisdiction of the state; except that waters in treatment systems which are authorized by state or federal law, regulation, or permit, and which are created for the purpose of waste treatment are not considered to be water in the state.

Pressure Washing Service Agreement

Non-stormwater discharges to the storm drainage system are illegal. Both property owner and contractor are responsible for complying. This service agreement is a voluntary tool to ensure that contracted cleaning companies use responsible methods in their cleaning and disposal methods in order to comply with all local regulations. This agreement should be filled out prior to commencement of work, and both parties should retain copies.			
Contractor: Name of Company	Address (Street, City, ZIP)	Phone	Contact

The above contractor agrees to follow all necessary practices **to ensure compliance with local stormwater regulations** at the following address:

Business: _____ Address: _____

Date of service: _____

Check all boxes that apply to surfaces to be cleaned:

- ☐ Building exterior
- ☐ Sidewalk, plaza, patio
- ☐ Parking area/drive-through
- ☐ Dumpster area
- ☐ Paint/graffiti removal
- ☐ Other (describe): _____

Note:
The removal of
manhole covers
is prohibited.

Cleaning methods to be used:

- ☐ Water only
- ☐ Water and soap
- ☐ Wet sand blast
- ☐ Other chemicals: _____
- ☐ Other methods: _____

Precautions to be taken:

- ☐ Dry cleanup (e.g., absorb spilled oil, sweep, vacuum, etc.)
- ☐ Block storm drain
- ☐ Collect wash water for disposal
- ☐ Other precautions: _____

Wash water disposal:

- ☐ Dispose of wash water into indoor sanitary sewer drain (e.g., floor drain, utility sink). Use a drain that has a grease trap, if available. Location of drain to be used: _____

When only using water to clean ambient dust, the following disposal method may be used:

- ☐ Discharge to landscaped area
- ☐ Evaporate on site

Contractor Signature: _____ Date: _____

Go to www.pacepartners.com for more information and an electronic copy of this agreement.

This form was developed by Partners for A Clean Environment (PACE), which has been contracted by the Keep it Clean Partnership (KICP) to provide pollution prevention assistance to local businesses so we can all "keep it clean"!

Snow Plowing, Snow Storage, and Deicer Application

Purpose: Stormwater pollution prevention procedures for snow plowing, snow storage and disposal, and salt, sand or liquid deicer application on roadways.

Prerequisites

- Employees should attend general stormwater pollution prevention training.

Stormwater Protection Equipment and Materials

- Spill kit and equipment for dry cleanup (socks, absorbent pads, absorbent, broom, and dustpan).
- Equipment manufacturer's manuals and operation instructions.
- Inlet protection devices (wattles, drain covers, and berms).

Standard Operating Procedures

Snow Plowing

- Avoid plowing, pushing, blowing, or storing excess snow, deicer, or other debris in or near creeks, watercourses, or storm drainage systems.
- Reduce plowing speed in sensitive areas (near creeks, wetlands, or other water courses) to prevent snow and deicing materials from entering waterways.
- What is the standard plowing speed? 20 mph.
- Follow your city's prioritized plowing route or schedule. This schedule is located at: Public Services Administration.

Snow Storage and Disposal

- Do not dispose of snow in wetlands, lakes, creeks, rivers, and ditches or directly on top of storm drains.
- If central snow disposal areas are used, they should be located at least 500 feet from and down gradient from any waterways, drainage ditches, ponds, creeks, or wetlands.
- Select storage areas that do not drain directly to surface waters and where environmental impacts from spring melt are minimal.
- If possible, store excess snow in a pervious area where melt water can infiltrate into the ground and not into the storm drain system.
- Excess snow is stored at: Public Services Yard, only if absolutely necessary.
- Clean up or sweep any sediment or debris from paved surfaces after snowmelt.
- How often is the area swept? Next regular sweeping cycle, or as needed if excessive.

Salt, Sand, and Liquid Deicer Application

- If truck-applying sand/salt mixture or liquid magnesium chloride, use the lowest application rate that will be effective.
- The application rate is: Brine - 48 gallons/lane mile, Salt - 250 pounds/lane mile.
- The optimal speed for applying deicer products is: Brine – 25 mph, Salt – 15 mph.
- Ensure that the equipment is calibrated to optimum levels according to manufacturer's instructions.
- Establish "low salt or sand areas" near sensitive areas such as wetlands, creeks, rivers, or lakes or directly over waterways and on bridges.
- Use less harmful deicers such as calcium magnesium acetate, potassium acetate, or organic deicers.

Salt and Sand Storage and Loading Areas

- Salt, sand, or other solid products (“Ice Slicer”) should be stored in a covered structure or building or covered with a tarp.
- Salt/sand or other solid product piles should be stored on impervious surfaces with berms or other diversion devices to minimize stormwater run-on and runoff.
- Liquid magnesium chloride tanks shall have secondary containment or equivalent adequate protection to contain all spills and prevent any spilled material from entering surface water in the state. *
- When loading salt/sand mix or liquid deicer, care should be taken not to overfill the truck or tank.
- Loading areas and yards should be swept frequently to prevent salt or sand buildup and runoff.
- Place berms or wattles where runoff leaves the yard to contain any salt waste.

Vehicle Washing

- Always wash sand trucks, snowplows and magnesium chloride tanks in a wash bay or area where wash water drains to the sanitary sewer.
- The wash area is located at: Fleet Service Center.

Contracts and Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution.

Employee Training

- All applicable employees should be trained in general stormwater pollution prevention; this includes how to recognize and report illegal connections or discharges.

Record Keeping and Documentation

- Maintain a master schedule of prioritized snow and sanding routes and the miles or roads plowed or sanded. Location: Public Services Administration.
- Keep copies of manufacturer’s recommendations for equipment calibration, plowing speed, and salt/sand application rates. Location: Public Services Administration.
- Keep records of the amounts of salt/sand, *Ice Slicer*, and/or liquid deicer applied per season. Location: Public Services Administration.
- Keep a list of all employees trained in the facility’s Stormwater Pollution Prevention binder or computer file.

References and Related Procedures

PACE Municipal Operations website: <http://pacepartners.com/municipal-operations>

BMPs: *Salt Storage and Snow Disposal*

BMPs: *Street Sweeping and Road Maintenance*

BMPs: *Spill Cleanup*

BMPs: *Street Sweeping and Road Maintenance*

BMPs: *Vehicle Maintenance and Storage*

BMPs: *Vehicle Washing*

SOPs: *Street Sweeping, Cleaning, and Waste Disposal*

SOPs: *Parking Lot Maintenance*

SOPs: *Fleet and Vehicle Maintenance*

***surface water in the state:** Lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks,

estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state (from the mean high water mark [MHW] out 10.36 miles into the Gulf), and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or non-navigable, and including the beds and banks of all water courses and bodies of surface water, that are wholly or partially inside or bordering the state or subject to the jurisdiction of the state; except that waters in treatment systems which are authorized by state or federal law, regulation, or permit, and which are created for the purpose of waste treatment are not considered to be water in the state.

Spill Prevention, Cleanup, and Reporting

Purpose: Stormwater pollution prevention procedures for spill prevention and cleanup and for reporting spills at municipal yards or facilities.

Prerequisites

- Employees should attend general stormwater pollution prevention training.

Stormwater Protection Equipment and Materials

- Spill Response Plan with contact information.
- Spill kit and equipment for dry cleanup (socks, absorbent pads, absorbent, broom, container for dirty absorbent, and dustpan).
- Storm drain inlet protection (drain covers, booms, and wattles).
- Secondary containment (over pack containers or pallets).

Standard Operating Procedures

Spill Prevention—Materials and Waste Handling and Storage

- If possible, liquid or hazardous materials should be handled, used, stored, repackaged, and transferred indoors or under cover.
- Deliveries of bulk liquids should be supervised. Down gradient storm drain inlets should be covered during deliveries.
- Cover and contain containers, materials, and wastes.
- Keep all containers closed unless adding or removing materials.

Spill Kit Maintenance

- Spill kits are located at the following locations: Public Services/Parks Yard, Fleet Services, Fueling sites, Wastewater Treatment Plant and Water Treatment Plant.
- Each facility is responsible for spill kit(s) inventory and reordering supplies.
- Inspection of spill kit is done after each event. Resupplying is done as needed.

Spill Cleanup and Storm Drain Protection

- Clean up minor spills immediately.
- Block any down gradient storm drains with berms, covers, absorbent socks or “pigs.”
- Never hose down spills or leaks.
- Always use dry cleanup methods for cleanup of fuel spills (gas, diesel, motor oil, or kerosene).
 - Spread absorbents (loose absorbents, sheets, pillows, “pigs,” or socks) on the spill.
 - Sweep up or pick up the absorbed materials.
 - Dispose of wastes properly.
- If fluids are leaking or have spilled on an impermeable surface such as a roadway, locate the nearest down gradient storm drain and dike or berm the drain to prevent fluids from entering it.
- Put down absorbent on the spill area.
- After cleanup, be sure to sweep up the contaminated absorbent and remove the berm or dike at the storm drain.
- If fluids are leaking or have spilled on a permeable surface such as gravel, soil, or grass, mark the area and report the spill to 911 or SERC/TCEQ (see numbers in following section).

Reporting Spills

- Spills or discharges of a reportable quantity of any pollutant (e.g., oil, paints, fuels, hazardous

liquids, sediment, or super-chlorinated water) that reaches storm drains or enters surface waters in the state* must be reported. Report the spill as soon as possible and within 24 hours by phone to SERC/TCEQ. (See www.tceq.texas.gov/response/spill_rq.html and www.tceq.texas.gov/response/spills.html for more information.)

- State of Texas Spill-Reporting Hotline and the State Emergency Response Commission (SERC): **1-800-832-8224**—24 hours a day
- TCEQ Regional Office (Region 4, Dallas/Fort Worth), 1-817-588-5800—Monday-Friday, 8 a.m.–5 p.m.
- If the spill causes a fish kill, notify Texas Parks and Wildlife by calling 1-512-389-4848. (See http://tpwd.texas.gov/landwater/water/environconcerns/kills_and_spills/ for more information.)
- Report spills to your immediate supervisor:
- Report spills that reach storm drains or waterways to your municipal Stormwater Specialist: Phone: (972) 219-3510.

Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution and know who to contact in case of spill.

Employee Training

- All applicable employees should be trained in general stormwater pollution prevention, including how to recognize and report illegal connections or discharges. If a facility stores liquids in underground tanks, specific training is also required for spill prevention and response for those products.

Record Keeping and Documentation

- Keep a Spill Response Plan on site. The plan is located at: Storm Water Division Office.
- Keep a list of all employees trained in the facility's Stormwater Pollution Prevention binder or other location.
- Keep copies of any correspondence with TCEQ if a spill reaches surface waters in the state*.

References and Related Procedures

PACE Municipal Operations website: <http://pacepartners.com/municipal-operations>

SOPs: *Fueling and Fuel Spill Cleanup*

BMPs: *Good Housekeeping and Spill Prevention*

BMPs: *Spill Cleanup*

BMPs: *Liquid Bulk Material Storage, Loading, and Unloading*

BMPs: *Materials Loading and Unloading*

BMPs: *Outdoor Container Storage*

BMPs: *Waste Management and Disposal*

CDPHE Spill Guidance: <https://www.colorado.gov/pacific/cdphe/wq-environmental-spills>

Keep It Clean Partnership, Stormwater Coordinators list:

<http://www.keepitcleanpartnership.org/about-us/contact-us/>

***surface water in the state:** Lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state (from the mean high water mark [MHW] out 10.36 miles into the Gulf), and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or non-navigable, and including the

beds and banks of all water courses and bodies of surface water, that are wholly or partially inside or bordering the state or subject to the jurisdiction of the state; except that waters in treatment systems which are authorized by state or federal law, regulation, or permit, and which are created for the purpose of waste treatment are not considered to be water in the state.

Storm Drain System Maintenance

Purpose: Stormwater pollution prevention procedures for the maintenance of storm drain systems and disposal of the wastes produced from the activity.

Prerequisites

- Employees should attend general stormwater pollution prevention training.

Stormwater Protection Equipment and Materials

- Storm drain maintenance schedule.
- Storm drain system map.
- Vacuum (vac) truck.
- Cameras and/or remotely operated vehicles.

Standard Operating Procedures

Stormwater System Inspection and Maintenance

- Stormwater system should be inspected for structural integrity, evidence of illicit discharges, and to determine areas prone to fast sediment accumulation or confirmed contamination.
- Stormwater system (including inlets, lines, manholes, ditches, detention ponds, and permanent BMPs) should be cleaned and maintained according to an established schedule: 10% of the system is inspected and cleaned, if necessary, each year.
- This schedule is located at: Public Services Administration.
- Report any areas needing attention and schedule repairs ASAP.
- Keep records of “hot spot” areas (areas prone to excessive sediment accumulation aka “Drain List”).
 - Locations of Drain List hot spots: List is maintained by the Streets Division.
 - How often are storm drain inlets cleaned or maintained? Prior to storm event.
 - Time of year cleaned: Year-round.
- Ensure that water from jetting and flushing inlets and lines is not discharged into the storm system. Use a vac truck to vacuum up flush water downstream while jetting and flushing inlets and lines upstream.
- Report any suspected illegal connections or dumping to the municipal Stormwater Specialist: Phone: (972) 219-3510.

Decanting Wastewater from Vac Trucks

- Municipal crews only handle what can be removed by hand. If a vacuum truck is required, a third-party is used.
- Decant areas are located at: Public Works Yard washout pit.

Debris Disposal and Storage

- Store debris from cleaning storm drains in an area that has an impervious surface or liner or in a temporary storage area or container. The debris storage area is located at: Public Services Yard
- Always inspect and maintain the debris storage area. Check area for run-on or runoff or debris scattering.
- Debris should be removed and taken to the permanent disposal site regularly.
- How often is debris disposed of? After each full load. Mud must be allowed to dry first.
Other: _____
- The permanent disposal site is at: Republic Services Landfill.
If debris is suspected to be contaminated, it should be tested to determine the proper disposal

method.

- The hazardous waste testing and disposal company will be determined at the time of need. Municipal departments who need assistance may contact the Solid Waste and Recycling Coordinator: (972) 219-3510.

Ditches and Detention Ponds

- Inspect ditches for signs of erosion.
- Track ditches prone to erosion and set maintenance schedule accordingly.
- Do not apply pesticides or fertilizers in drainage ditches, roadways, or curbs.
- Do not disturb creeks, wetlands, or sensitive wildlife habitat areas without a permit from Army Corps of Engineers (if applicable).
- Inspect detention ponds regularly to ensure proper functioning. Clean and maintain as needed.

Contracts and Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution.

Employee Training

- All applicable employees should be trained in stormwater pollution prevention, including how to recognize and report illegal connections or discharges.

Record Keeping and Documentation

- Keep a written Storm Drain System Inspection and Maintenance Schedule. This schedule is located at Public Services Administration.
- Keep a list of all employees trained. Location: Storm Water Division Office.
- Debris removal records are kept at: Public Services Administration.
- The inventory of hot spot areas where contamination has been confirmed and require frequent inspections is recorded here: Public Services Administration.
- Records of any testing done on debris removed from catch basins is located: Public Services Administration.

References and Related Procedures

PACE Government Operations website: <http://pacepartners.com/stormwater/municipal-operations>

BMPs: *Storm Drain System Maintenance*

BMPs: *Dewatering of Secondary Containment Structures*

BMPs: *Illicit Discharge Reporting*

BMPs: *Outdoor Materials Storage*

BMPs: *Contractor and Lease Language*

BMPs: *Vehicle and Equipment Fueling*

BMPs: *Vehicle Maintenance and Storage*

BMPs: *Vehicle and Equipment Washing*

SOPs: *Parking Lot Maintenance*

SOPs: *Spill Prevention, Cleanup, and Reporting*

Street and Road Maintenance and Repair

Purpose: Stormwater pollution prevention procedures for street maintenance and repair projects including concrete curb and gutter work, concrete pouring, asphalt resurfacing, paving, chip sealing, and striping and marking.

Prerequisites

- Employees should attend general stormwater pollution prevention training.
- Obtain a Texas discharge permit (see www.tceq.texas.gov/permitting/wastewater/general) if you anticipate disturbing one or more acres of soil, and water will enter a storm drainage system or surface waters in the state.

Equipment and Materials

- Inlet protection devices (wattles, drain covers, berms, sandbags, and/or filter fabric).
- Spill kit and equipment for dry cleanup (socks, absorbent pads, absorbent, broom, and dustpan).
- Large shop (wet) vacuum.
- Secondary containment (containers and tarps).
- Storm drainage system map.
- Appropriate personal protective equipment.

Standard Operating Procedures

Storm Drain Protection

- Locate and block storm drain inlets (within 25 feet and/or down gradient from) during maintenance work such as concrete curb and gutter work, resurfacing, paving, striping/marking, or saw cutting.
- Place covers, rock wattles, sandbags, or filter fabric around inlets to protect them from entry of wastes, dusts, overspray, or slurry.
- Inspect site at the beginning and end of the day to ensure that operations are not contributing sediment or other pollutants to the flow line or storm drain.
- Clean rights-of-way (roadways) with brooms or street sweepers—as needed.

Concrete Work

- When saw cutting concrete, use the minimum amount of water. Let the waste slurry dry and then sweep it up before leaving the location. A wet vacuum may also be used to pick up the waste slurry immediately after cutting is complete. Do not allow slurry to reach storm drains.
- Designate a concrete wash out area that is as far as possible from any surface waters, storm drain inlets, or drainage ditches and that is located in a low area where wash water will pool and soak into the ground.
- Concrete trucks must wash out in the wash out area or into a container or a catch basin.
- Maintain the wash out area, inspect it for clean out needs, and check for run-on and runoff. The debris from the wash out area must be taken to a permanent disposal site when the wash out is full and when the project is complete.

Erosion Control and Storage of Materials

- Cover and contain all liquid and solid materials to prevent runoff.
 - Avoid storing piles of materials (soil, sand, gravel) in the street and near storm drains or gutters. If dirt piles must be stored in the street, they must have berms or wattles surrounding them to prevent runoff. Inlet protection should be placed around all down gradient storm drains to prevent sediment from reaching the inlets.
- Excavated material should be placed on the uphill side of trenches to minimize sediment runoff.
- Control erosion to the maximum extent possible. (See the project's SWPPP, the municipality's erosion control code, iSWM guidelines, EPA's menu of BMPs, and the Texas Department of Transportation's erosion/sediment control BMP guidelines. Some helpful links:
http://iswm.nctcog.org/Documents/technical_manual/Construction%20Controls_9-2014.pdf
<http://water.epa.gov/polwaste/npdes/swbmp/>
<http://ftp.dot.state.tx.us/pub/txdot-info/env/storm/5.0sedimentationcontrol.pdf>
http://ftp.dot.state.tx.us/pub/txdot-info/mnt/erosion/product_evaluation/introduction.pdf
- Inspect and maintain all erosion or sediment control devices or equipment installed in erosion-prone areas in road construction projects as per the Stormwater Management Plan (SWMP) or SWPPP.
- Ensure that projects over 1 acre have the proper Texas discharge permits. (See www.tceq.texas.gov/permitting/stormwater/TXR15_AIR.html.)

Painting and Striping

- Schedule painting, marking, and striping projects during dry weather only. Cease all activities when rain threatens.
- Use thermoplastic markings in place of paint whenever feasible.
- Block nearby storm drain inlets (within 25 feet and/or down gradient of project).
- Promptly clean up any spills of paints, cleaners, or other chemicals.

Resurfacing or Paving

- Reseal or pave only on dry days when no rain is expected. Cease all activities when rain threatens.
- If possible, transfer, store, pre-heat, and load hot asphalt far away from storm drain inlets.
- Protect or block downstream storm drain inlets (within 25 feet) from debris from maintenance work (asphalt cap, chip sealing, concrete breaking, or saw cutting). Leave covers or berms in place until the job is complete.

Bridge Repair Work

- When working on bridges, transport and store paint and materials in containers with secure lids.
- Do not transfer, store, or load paint on a bridge.
- Capture waste, scraps, rust, or paint from sanding or painting projects. It may be necessary to suspend nets or tarps below the bridge to catch falling debris. If sanding or sand blasting, use a vacuum bag attachment.

Contracts and Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution.

Employee Training

- All applicable employees should be trained in general stormwater pollution prevention, including how to recognize and report illegal connections or discharges.

Record Keeping and Documentation

- If the disturbance is over 1 acre, obtain the proper TPDES discharge permit.
- Prepare and use a Stormwater Pollution Prevention Plan (SWPPP) and keep copies of all inspection logs. If work is done by a contractor, they are responsible for preparing a SWPPP and conducting inspections.
- Keep a list of all employees trained in Stormwater Pollution Prevention.
- Keep copies of Safety Data Sheets of all products used.

References and Related Procedures

PACE Municipal Operations website: <http://pacepartners.com/stormwater/municipal-operations>

BMPs: *Concrete Pouring*

BMPs: *Contracts and Property Leasing*

BMPs: *Street Sweeping and Maintenance*

BMPs: *Outdoor Materials Storage*

BMPs: *Utility Installation in Roadway*

SOPs: *Street Construction and Utility Installation*

[UDFCD Volume 3](#) and [KICP's Erosion Control Field Manual](#) for erosion control BMP installation

Project's Stormwater Management Plan (SWMP)

Street Sweeping, Sweeper Cleaning, and Waste Disposal

Purpose: Stormwater pollution prevention procedures for the operation of street sweepers, frequency of sweeping, disposal of debris, and cleaning of sweeper.

Prerequisites

- Employees should attend general stormwater pollution prevention training.

Stormwater Protection Equipment and Materials

- List sweepers or other street cleaning equipment:
The City of Lewisville has a contract with Mister Sweeper for street sweeping.

Standard Operating Procedures

Operation of Street Sweepers

- Operate all sweepers according to the manufacturer's recommended procedures.
- Sweeper operating speed must obey speed limit but is determined by contractor.
- Make sure brushes and water spray hoses are functional before leaving the shop.
- Fill the water tank daily or as needed.
- Replace brushes according to the manufacturer's recommendations.

Sweeping Frequency

- Streets should be swept according to an established schedule. The schedule is located at: Public Services Administration.

(Please fill out the table below or place a copy of your schedule here.)

Area	Minimum Frequency (suggested)	Actual Frequency
Main arterials	Every 2 months	Six times per year
Commercial areas	Every 2 months	Six times per year
Residential areas	Every 3 months	Once per year
Winter sand	ASAP after sand has dried out	ASAP after sand has dried out
Outdoor special event	As needed	As needed

- Sweep after outdoor special events and (fairs, festivals, and parades).

Disposal of Sweeper Wastewater and Debris

- Always decant sweeper wastewater at an approved disposal site.
- Decant areas are located at: Republic Services Landfill.
- Inspect and maintain the temporary storage area daily for run-on or runoff or debris scattering.
- Debris should be disposed of regularly or as needed.
- How often is debris disposed of? After each full load.
- The permanent disposal site is located at: Republic Services Landfill.

Cleaning the Sweeper

- The sweeper unit should be cleaned at the contractor's facility, or at location designated by the Streets Division.

- Cleaning and maintenance should be done in accordance with the manufacturer's specifications.
- Always wash sweepers in a wash area or wash bay where runoff can be collected and disposed.
- The wash area is located at: offsite location of contractor's choosing.

Other SOPs

- Do not wash down any streets or curbs for routine cleaning.
- If spills or illegal discharges are seen, report them immediately to the Stormwater Specialist.
Phone: (972) 219-3510.

Contracts and Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution.

Employee Training

- All applicable employees should be trained in stormwater pollution prevention, including how to recognize and report illegal connections or discharges.

Record Keeping and Documentation

- Keep a written street sweeping schedule or prioritized routes. Location: Public Services Admin.
- The number of loads or amount of material removed is recorded in: Public Services Admin.
- The number of miles driven per area or route is recorded in: Public Services Admin.
- Keep a list of all employees trained in the facility's Stormwater Pollution Prevention Plan.

References and Related Procedures

Street sweeper manufacturer's instructions, operating manual, or video

Individual municipality's street sweeping scheduling and routing manual

PACE Stormwater Municipal Operations website: <http://pacepartners.com/stormwater/municipal-operations>

BMPs: *Street Sweeping and Road Maintenance*

BMPs: *Vehicle and Equipment Washing*

BMPs: *Contracts and Property Leasing*

SOPs: *Fueling and Cleanup of Fuel Spills*

SOPs: *New Construction*

SOPs: *Outdoor Events and Festivals*

SOPs: *Parking Lot Maintenance*

SOPs: *Spill Prevention, Cleanup, and Reporting*

SOPs: *Waste Management and Disposal*

SOPs: *Outdoor Materials Storage*

Utility Installation Projects

Purpose: Stormwater pollution prevention procedures for street repairs, construction, and the installation of utilities in the roadway.

Prerequisites

- Employees, project managers, and contractors should attend general stormwater pollution prevention training and/or erosion control training.
- Permits for construction activity (if over 1 acre) and/or permits for dewatering (if water will enter storm drainage system or surface waters in the state). See www.tceq.texas.gov/permitting/wastewater/general.

Stormwater Protection Equipment and Materials

- Inlet protection devices (wattles, drain covers, berms, sandbags, and/or filter fabric).
- Spill kit and equipment for dry cleanup (socks, absorbent pads, absorbent, broom, and dustpan).
- Secondary containment (berms, containers, and tarps).
- Portable toilets (staked down).

Standard Operating Procedures

Storm Drain Protection

- Identify storm drains near work zone.
- Install inlet protection within 25 feet and/or down gradient of work.
- Place covers, rock wattles, sandbags, or filter fabric around or over inlets.
- Inspect site at the beginning and end of the day to ensure that operations are not contributing sediment or other pollutants to the flow line or storm drain.
- Clean dirt and mud in rights-of-way and public roadways with brooms or street sweepers as needed.

Concrete Work, Wash Out, and Disposal

- When saw cutting concrete, use the minimum amount of water possible. Let the waste slurry dry and then sweep it up before leaving the site. A wet vacuum may also be used to pick up the waste slurry immediately after cutting is complete. Do not allow slurry to reach the storm drain.
- Designate a concrete wash out area at each job site that is as far as possible from any surface waters, storm drain inlets, or drainage ditches, and that is located in a low area where wash water will pool and soak into the ground.
- Concrete trucks must wash out in the wash out area or into a container or catch basin.
- Maintain the wash out area, inspect it for clean out needs, and check for run-on and runoff.
- The debris from the wash out area must be taken to a permanent disposal site when the project is complete.

Erosion Control and Storage of Materials

- Cover and contain all liquid and solid materials to prevent runoff.
- Avoid storing piles of materials (soil, sand, gravel) in the street or in the flow line. If dirt piles must be stored in the street, they must have berms or tarps surrounding them to prevent runoff. Rock wattles or socks should be placed in front of all down gradient storm drains to prevent sediment from reaching the inlets.
- Excavated materials should be placed on the uphill side of trenches to minimize sediment runoff.

- Control erosion to the maximum extent possible. Provide permanent erosion control that will remain effective for the life of the street. (See the municipality's erosion control code, ISWM guidelines, EPA's menu of BMPs, and the Texas Department of Transportation's erosion/sediment control BMP guidelines. Some helpful links:
http://iswm.nctcog.org/Documents/technical_manual/Construction%20Controls_9-2014.pdf
<http://water.epa.gov/polwaste/npdes/swbmp/>
<http://ftp.dot.state.tx.us/pub/txdot-info/env/storm/5.0sedimentationcontrol.pdf>
http://ftp.dot.state.tx.us/pub/txdot-info/mnt/erosion/product_evaluation/introduction.pdf
- Inspect and maintain all erosion or sediment control devices or equipment installed in erosion-prone areas as per local requirements or SWPPP.
- Ensure that projects disturbing 1 or more acres have the proper TPDES discharge permits (see www.tceq.texas.gov/permitting/stormwater/TXR15_AIR.html) and Storm Water Pollution Prevention Plans.

Dewatering

- Dewatering activities are prohibited unless managed by appropriate site controls.

Spill Response and Reporting

- Any spill or discharge of a reportable quantity of any pollutant (e.g., oil, sediment, paints, fuels, hazardous liquids, or super-chlorinated water) that reaches storm drains or enters surface waters in the state* must be reported. Report the spill as soon as possible and within 24 hours by phone to SERC/TCEQ. (See www.tceq.texas.gov/response/spill_rq.html and www.tceq.texas.gov/response/spills.html for more information.)
 - State of Texas Spill-Reporting Hotline and the State Emergency Response Commission (SERC): **1-800-832-8224**—24 hours a day
 - TCEQ Regional Office (Region 4, Dallas/Fort Worth), 1-817-588-5800—Monday-Friday, 8 a.m.–5 p.m.
- If the spill causes a fish kill, notify Texas Parks and Wildlife by calling 1-512-389-4848. (See http://tpwd.texas.gov/landwater/water/environconcerns/kills_and_spills/ for more information.)
- Report spills to your immediate supervisor.
- Report spills that reach storm drains or waterways to your municipal Stormwater Specialist: Phone: [\(972\) 219-3510](tel:9722193510).

Waste Management

- Any saw cut slurry or concrete waste must be contained and disposed of as solid waste.
- All containers and dumpsters must be kept closed unless adding or removing materials.
- If applicable, make sure portable toilets are in good working order and are serviced regularly. Check frequently for leaks and ensure that they are adequately anchored to prevent them from tipping over.

Contracts and Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution.

Employee Training

- All applicable employees should be trained in stormwater pollution prevention, including how to recognize and report illegal connections or discharges.

Record Keeping and Documentation

- Keep a list of all employees trained in the facility's Stormwater Pollution Prevention binder.
- If the site is over 1 acre, follow permit conditions and the Storm Water Pollution Prevention Plan (SWPPP) and keep copies of inspections.

References and Related Procedures

PACE Municipal Operations website: <http://pacepartners.com/municipal-operations>

BMPs: *Street Sweeping and Road Maintenance*

BMPs: *Potable Water Line Discharge*

BMPs: *Utility Installation*

BMPs: *Dewatering of Secondary Containment Structures*

BMPs: *Sanitary Sewer Backup*

BMPs: *Street Maintenance and Repair*

SOPs: *Spill Prevention, Cleanup, and Reporting*

SOPs: *Storm Drain System Maintenance*

Urban Drainage and Flood Control District [UDFCD Volume 3](#)

[KICP's Erosion Control Field Manual](#) for erosion control BMP installation.

***surface water in the state:** Lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state (from the mean high water mark [MHW] out 10.36 miles into the Gulf), and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or non-navigable, and including the beds and banks of all water courses and bodies of surface water, that are wholly or partially inside or bordering the state or subject to the jurisdiction of the state; except that waters in treatment systems which are authorized by state or federal law, regulation, or permit, and which are created for the purpose of waste treatment are not considered to be water in the state.

Waste Management, Storage, and Disposal

Purpose: Stormwater pollution prevention procedures for proper management, handling and storage of waste, trash, or garbage to prevent the discharge of pollutants to stormwater from waste handling and disposal.

Prerequisites

- Employees should attend general stormwater pollution prevention training.
- Employees should be trained in the procedures in this SOP and should refer to the materials in the *References and Related Procedures* section of this SOP.

Stormwater Protection Equipment and Materials

- Dumpster covers or lids.
- Tarps.
- Spill kit and equipment for dry cleanup (socks, absorbent pads, absorbent, broom, and dustpan).
- Berms.

Standard Operating Procedures

Waste Management, Storage and Disposal

- All waste receptacles should be leak-tight with tight-fitting lids or covers. Plastic liners can be used to ensure leak tightness.
- Keep lids on dumpsters closed at all times unless adding or removing material.
- Place waste receptacles indoors or under a roof or overhang whenever possible.
- Locate dumpsters on a flat, paved surface and, if possible, install berms or curbs around the storage area to prevent run-on and runoff.
- Sweep up around outdoor waste containers regularly.
- Arrange for wastes to be picked up regularly and disposed of at approved disposal facilities.
- Waste disposal company: Republic Services Phone: (972) 316-0789.
- Never place hazardous materials, liquids or liquid-containing wastes in a dumpster or trash receptacle. If liquid wastes must be disposed in the trash, absorb them with absorbents before disposal.
- Nonhazardous liquid waste must be disposed in the sanitary sewer (if approved) or transported to a disposal site that will accept that type of wastewater.
- Do not wash out waste containers or dumpsters outdoors unless the wastewater drains to sanitary sewer or wash containers/dumpsters in a wash bay or floor drain that goes to the sanitary sewer.
- When working in the field, place all wastes in appropriate containers near the work site. If no public containers are available, containerize or bag the wastes and bring them back to the shop for proper disposal.
- Minimize waste by purchasing recyclable products that have minimal packaging. Recycle cardboard, plastics, and paper products as accepted by your local recycling agency.

Contracts and Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution.

Employee Training

- All applicable employees should be trained in general stormwater pollution prevention, including how to recognize and report illegal connections or discharges.

Record Keeping and Documentation

- Keep a list of all employees trained in the facility's Stormwater Pollution Prevention binder or other location: Storm Water Division Office.
- Keep records on all wastes disposed of including hazardous waste manifests, trash removal statements (bills), receipts, or invoices from recyclers.

References and Related Procedures

PACE Municipal Operations website: <http://pacepartners.com/stormwater/municipal-operations>

BMPs: *Waste Management and Disposal*

BMPs: *Good Housekeeping*

BMPs: *Outdoor Materials Storage*

BMPs: *Spill Cleanup*

BMPs: *Facilities and Building Maintenance*

BMPs: *Good Housekeeping and Spill Prevention*

SOPs: *Spill Prevention, Cleanup, and Reporting*

SOPs: *Pressure Washing and Exterior Surface Cleaning*

Waste Transfer Stations and Recycling Collection Centers

Purpose: Stormwater pollution prevention procedures for proper management and storage of waste, trash, and recycling materials at residential waste transfer stations and recycling drop-off collection centers.

Prerequisites

- Employees should attend general stormwater pollution prevention training.

Stormwater Protection Equipment and Materials

- Dumpster covers.
- Tarps.
- Spill kit and equipment for dry cleanup (socks, absorbent pads, absorbent, broom, and dustpan).
- Berms.

Standard Operating Procedures

Waste Management, Storage and Disposal

- All waste and recycle receptacles must be leak-tight with tight-fitting lids or covers. Plastic liners can be used to ensure leak tightness.
- Keep lids on dumpsters and containers closed at all times unless adding or removing material.
- Place waste or recycle receptacles indoors or under a roof or overhang whenever possible.
- Locate dumpsters on a flat, paved surface and install berms or curbs around the storage area to prevent run-on and runoff.
- Sweep up around outdoor waste containers regularly.
- Clean up any liquid leaks or spills with dry cleanup methods. (See the [Spill Prevention, Cleanup, and Reporting SOP](#).)
- Arrange for wastes or recyclables to be picked up regularly and disposed at approved disposal facilities.
- Waste/recycle disposal company: [Republic Services](#) Phone: [\(972\) 316-0789](#).
- Never place hazardous materials, liquids, or liquid-containing wastes in a dumpster, recycling, or trash receptacle.
- If any liquid, nonhazardous waste is generated, it must be disposed in the sanitary sewer (if approved) or transported to a disposal site that will accept that type of wastewater.
- Do not wash out waste or recycling containers or dumpsters outdoors or in a parking lot.
- Containers, compactors, and dumpsters should be returned to the waste disposal contractor for cleaning at the contractor's facility.

Contracts and Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper BMPs to prevent stormwater pollution.

Employee Training

- All applicable employees must be trained in general stormwater pollution prevention including how to recognize and report illegal connections or discharges.

Record Keeping and Documentation

- Keep a list of all employees trained in the facility's Stormwater Pollution Prevention Plan binder or other location.
- Keep records on all wastes disposed of, including hazardous waste manifests, trash removal statements (bills), receipts, or invoices from recyclers.

References and Related Procedures

PACE Municipal Operations website: <http://pacepartners.com/municipal-operations>

BMPs: *Facilities and Building Maintenance*

BMPs: *Waste Management and Disposal*

BMPs: *Good Housekeeping*

BMPs: *Outdoor Container Storage*

BMPs: *Spill Cleanup*

SOPs: *Waste Management and Disposal*

SOPs: *Pressure Washing and Exterior Surface Cleaning*

SOPs: *Spill Prevention, Cleanup, and Reporting*

Other SOPs

Disposal of Horizontal Directional Drilling Wastes for Utility Line Installation

Available online at

www.epa.state.oh.us/Portals/0/general%20pdfs/HorizontalDirectionalDrillingforUtilityLineInstallation.pdf.

Provided courtesy of Ohio EPA, Surface Water Division.

Modified with North Central Texas–specific information.

Purpose: To properly manage drill cuttings and spent drilling fluids from horizontal directional drilling activity using measures to prevent stormwater erosion and runoff from entering a stream, waterbody, or wetland.

Prerequisites

- A Texas discharge permit (see www.tceq.texas.gov/permitting/wastewater/general) may be required if water will enter storm drainage system or surface waters in the state.

Managing Drill Cuttings and Spent Drilling Fluids

- Spent drilling fluids containing solely bentonite clay are considered “earthen material” and may be buried or land applied on location within the right-of-way of the drilling operation or at a designated property.
- Drill cuttings resulting from horizontal directional drilling using solely bentonite clay and water are also considered “earthen material” and may be managed similarly.
- Spent drilling fluids containing refined oil-based substances or other commercially produced additives are defined as an industrial waste and must be disposed at a municipal solid waste landfill or other location authorized by TCEQ to accept this type of waste. Prior to landfill disposal, these spent drilling fluids may require solidification in order to pass the paint-filter test.
- Ensure burial and land application activities prevent runoff, transport of material to surface water, or contamination of ground water resources by employing the below BMPs.

BMPs for Burial of Drill Cuttings and/or Spent Drilling Fluids on Location or at a Designated Property

- For an on-location burial option, the site should be fully contained within the right-of-way of the utility or transmission line being installed.
- The spent drilling fluids and drill cuttings should be buried in either an excavated pit or mixed with topsoil removed from the utility right-of-way during utility line construction/installation purposes, if appropriate, at a ratio of one to one.
- The material should be buried in a manner to prevent ponding or transport of stormwater through the material (for example, crested in the middle and a slope to edge of disposal area).
- The burial location should not be in sensitive hydrogeological areas (for example, shallow ground water, shallow sand and gravel lenses or fractured bedrock, etc.).
- The burial location should be at least 100 feet from any permanent surface water.
- The burial location should be a minimum of 100 feet from any potable water supply well and 300 feet from any large supply public water supply well.
- The burial location should be managed and have BMPs applied similarly to any construction site regulated through the construction stormwater program, which includes seeding, stabilization, and the installation of sediment controls. The main goal of this action is to ensure that sediment-laden water is not discharged to a water resource.

BMPs for Land Application of Drill Cuttings or Spent Drilling Fluids

- The material should not be land applied during a precipitation event or when a significant rain event is forecast within 24 hours.
- The material should not be land applied in a fashion that would result in ponding on the surface of the ground.
- The material should not be land applied on property with a slope greater than 15 percent.
- The material should not be land applied on frozen or snow-covered ground.
- The material should not be land applied within 50 feet of any surface waters of the state (for example, river, stream, ditch, swale, pond, etc.).
- The land application area should not be located in sensitive hydrogeological areas (for example, shallow groundwater, shallow sand and gravel lenses or fractured bedrock, etc.).
- The material should not be land applied within 100 feet of any private or public potable water source.

Related Guidance

ODNR's Best Management Practices for Oil and Gas Well Site Construction

(www.dnr.state.oh.us/Portals/11/oil/pdf/BMP_OIL_GAS_WELL_SITE_CONST.pdf)

ODNR's Rainwater and Land Development Manual

(www.dnr.state.oh.us/water/rainwater/default/tabid/9186/Default.aspx)

Debris Removal from Rivers and Streams

Available online at www.dec.ny.gov/docs/permits_ej_operations_pdf/woodydebrisfact.pdf.

Provided courtesy of New York State's Department of Environmental Conservation.

Modified with North Central Texas-specific information.

Purpose: To protect stormwater by retaining woody debris that helps stabilize the stream and slow down highly erosive storm-induced stream flows. Best management practices should be used for properly removing debris.

Prerequisites

- A Texas construction general permit and/or a 404d permit with the Corps of Engineers may be required if the project requires disturbance of the stream bed or banks, such as installation/repair/replacements of culverts or bridges, excavating sand and gravel, digging embedded debris from the streambed or the use of motorized equipment such as a tractor, backhoe, bulldozer, four-wheel drive truck, etc., in the stream channel or anywhere below the top of the banks.

General Guidance

- Leave in place any woody debris that does not pose a hazard. Woody debris helps stabilize the stream, reduce erosion, and slow down highly erosive storm-induced stream flows. Brush and fallen trees in a creek also provide food, shelter, and other benefits to fish and wildlife.
- Woody debris posing a risk to infrastructure (such as blocking bridge and culvert openings) and homes should be removed.
- Without a permit, fallen trees and debris may be pulled from the stream by motorized equipment operating from the top of the banks using winches, chains, and or cables. Equipment may not be operated in the water and any increase in stream turbidity from the removal must be avoided.
- Handheld tools, such as chainsaws, axes, handsaws, etc., may be used to cut up the debris into manageable sized pieces.
- Downed trees that are still attached to the banks should be cut off near the stump. Do not grub (pull out) tree stumps from the bank. Stumps hold the bank from eroding.
- All trees, brush, and trash that is removed from the channel should not be left on the floodplain. Trash should be properly disposed of at a waste management facility.

Streambank Stabilization

Available online at <http://klamathrestoration.gov/Draft-EIS-EIR/download-draft-eis-eir> (Appendix B).

Provided courtesy of U.S. Department of the Interior, Klamath River EIS 2012.

Modified with North Central Texas-specific information.

Purpose: To minimize disturbance from instream construction and minimize degradation of water quality during deconstruction, construction, and restoration activities.

Prerequisites

Consultation with TCEQ and Texas Parks & Wildlife may be necessary. Consultation with the U.S. Army Corps of Engineers is required for most soil-disturbing work in or near a stream as required by the 404(d)-permit program.

Measures to Minimize Disturbance from Instream Construction

- If the stream channel is seasonally dry, construction should occur during this dry period.
- Debris, soil, silt, excessive bark, rubbish, creosote-treated wood, raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to aquatic life should be prevented from contaminating the soil and/or entering surface waters in the state. Any of these materials, placed within or where they may enter a stream or lake, by the applicant or any party working under contract, or with permission of the applicant, shall be removed immediately. During project activities, trash will be properly contained, removed from the work site, and disposed of daily.
- Where feasible, the construction shall occur from the bank or on a temporary pad underlain with filter fabric.
- No mechanized equipment (e.g., internal combustion hand tools) will enter wetted channels.
- Use of heavy equipment shall be avoided in a channel bottom with rocky or cobbled substrate. If access to the work site requires crossing a rocky or cobbled substrate, a rubber tire loader/backhoe is the preferred vehicle. Only after this option has been determined infeasible will the use of tracked vehicles be considered. The amount of time this equipment is stationed, working, or traveling within the creek bed shall be minimized. When heavy equipment is used, woody debris and vegetation on banks and in the channel shall not be disturbed if outside of the project's scope.
- All mechanized equipment working in the stream channel or within 25 feet of a wetted channel shall have a double containment system for diesel and oil fluids. Hydraulic fluids in mechanical equipment working within the stream channel shall not contain organophosphate esters. Vegetable-based hydraulic fluids are preferred.
- The use or storage of petroleum-powered equipment shall be accomplished in a manner to prevent the potential release of petroleum materials into surface waters in the state.
- Areas for fuel storage, refueling, and servicing of construction equipment must be located in an upland location.
- Prior to equipment use, clean all equipment to remove external oil, grease, dirt, or mud. Wash sites must be located in upland locations so wash water does not flow into the stream channel or adjacent wetlands.
- All construction equipment must be in good working condition, showing no signs of fuel or oil leaks. Prior to construction, all mechanical equipment shall be thoroughly inspected and evaluated for the potential of fluid leakage. All questionable motor oil, coolant, transmission fluid, and hydraulic fluid hoses, fitting, and seals shall be replaced. The operator shall document in writing all hoses, fittings,

and seals replaced and shall keep this documentation until the completion of operations. All mechanical equipment shall be inspected daily to ensure there are no motor oil, transmission fluid, hydraulic fluid, or coolant leaks. All leaks shall be repaired in the equipment staging area or other suitable location prior to resumption of construction activity.

- Oil absorbent and spill containment materials shall be located on site when mechanical equipment is in operation with 100 feet of the proposed watercourse crossings. If a spill occurs, no additional work shall commence in-channel until (1) the mechanical equipment is inspected by the operator and the leak has been repaired, (2) the spill has been contained, and (3) appropriate authorities are contacted and have evaluated the impacts of the spill.

If the spill is reportable (see the table at www.tceq.texas.gov/response/spill_rq.html), report it as soon as possible and within 24 hours by phone to SERC/TCEQ. For more information, see www.tceq.texas.gov/response/spills.html.

- State of Texas Spill-Reporting Hotline and the State Emergency Response Commission (SERC): 1-800-832-8224—24 hours a day
- TCEQ Regional Office (Region 4, Dallas/Fort Worth), 1-817-588-5800—Monday-Friday, 8 a.m.–5 p.m.

If the spill causes a fish kill, notify Texas Parks and Wildlife by calling 1-512-389-4848. (See http://tpwd.texas.gov/landwater/water/environconcerns/kills_and_spills/ for more information.)

Measures to Minimize Degradation of Water Quality During Deconstruction, Construction, and Restoration Activities

General Erosion Control During Construction

- When appropriate, isolate the construction area from flowing water until project materials are installed and erosion protection is in place.
- Effective erosion control measures shall be always in place during construction. Do not start construction until all temporary control devices (silt fences, bales of sterile, weed-free straw, etc.) are in place downslope or downstream of project site within the riparian area. The devices shall be properly installed at all location where the likelihood of sediment input exists. These devices shall be in place during and after construction activities for the purposes of minimizing fine sediment and sediment/water slurry input to flowing water and of detaining sediment-laden water on site. If continued erosion is likely to occur after construction is completed, then appropriate erosion prevention measures shall be implemented and maintained until erosion has subsided. Erosion control devices such as coir rolls or erosion control blankets will not contain plastic netting of a mesh size that would entrain reptiles and amphibians.
- Sediment shall be removed from sediment controls once it has reached one-third of the exposed height of the control. Whenever straw bales are used, they shall be staked and dug into the ground 12 cm and only sterile, weed free straw shall be utilized. Catch basins shall be maintained so that no more than 15 cm of sediment depth accumulates within traps or sumps.
- Sediment-laden water created by construction activity shall be filtered before it leaves the right-of-way or enters the stream network or an aquatic resource area.
- The operator/project applicant is required to inspect and repair/maintain all practices prior to and after any storm event, at 24-hour intervals during extended storm events, and a minimum of every two weeks until all erosion control measures have been completed.

Guidelines for Temporary Stockpiling

- Minimize temporary stockpiling of material. Stockpile excavated material in areas where it cannot enter the stream channel. Prior to start of construction, determine if such sites are available at or near the project location. If nearby sites are unavailable, determine location where material will be deposited. Establish locations to deposit spoils well away from watercourses with the potential to deliver sediment into streams. Spoils shall be contoured to disperse runoff and stabilized with mulch and native vegetation. Use devices such as plastic sheeting held down with rocks or sandbags over stockpiles, silt fences, or berms to minimize movement of exposed or stockpiled soils.
- If feasible, conserve topsoil for reuse at project location or use in other areas. End haul spoils away from watercourses as soon as possible to minimize potential sediment delivery.

Minimizing Potential Scour

- When needed, utilize instream grade control structures to control channel scour, sediment routing, and headwall cutting.
- For relief culverts or structures, if a pipe or structure that empties into a stream is installed, an energy dissipater shall be installed to reduce bed and bank scour. This does not apply to culverts in fish-bearing streams.
- The toe of rock slope protection used for streambank stabilization shall be placed below bed scour to ensure stability.

Post-Construction Erosion Control

- Immediately after project completion and before close of seasonal work window, stabilize all exposed soil with mulch, seeding, and/or placement of erosion control blankets. Remove all artificial erosion control devices after the project area has fully stabilized. All exposed soil present in and around the project site shall be stabilized within 7 days. Erosion control devices such as coir rolls or erosion control blankets will not contain plastic netting of a mesh size that would entrain reptiles and amphibians.
- All bare and/or disturbed slopes (> 10' x 10' of bare mineral soil) will be treated with erosion control measures such as hay bales, netting, fiber rolls, and hydroseed as permanent erosion control measures.
- Where straw, mulch, or slash is used as erosion control on bare mineral soil, the minimum coverage shall be 95 percent with a minimum depth of two inches.
- When seeding is used as an erosion control measure, only natives will be used. Sterile, weed-free straw is required when hay bales are used as an erosion control measure.

***surface water in the state:** Lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state (from the mean high water mark [MHW] out 10.36 miles into the Gulf), and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or non-navigable, and including the beds and banks of all water courses and bodies of surface water, that are wholly or partially inside or bordering the state or subject to the jurisdiction of the state; except that waters in treatment systems which are authorized by state or federal law, regulation, or permit, and which are created for the purpose of waste treatment are not considered to be water in the state.

Post-Flood Stream Construction

Available online at www.dec.ny.gov/docs/administration_pdf/postfloodguid.pdf.

Provided courtesy of New York State's Department of Environmental Conservation.

Modified with North Central Texas-specific information.

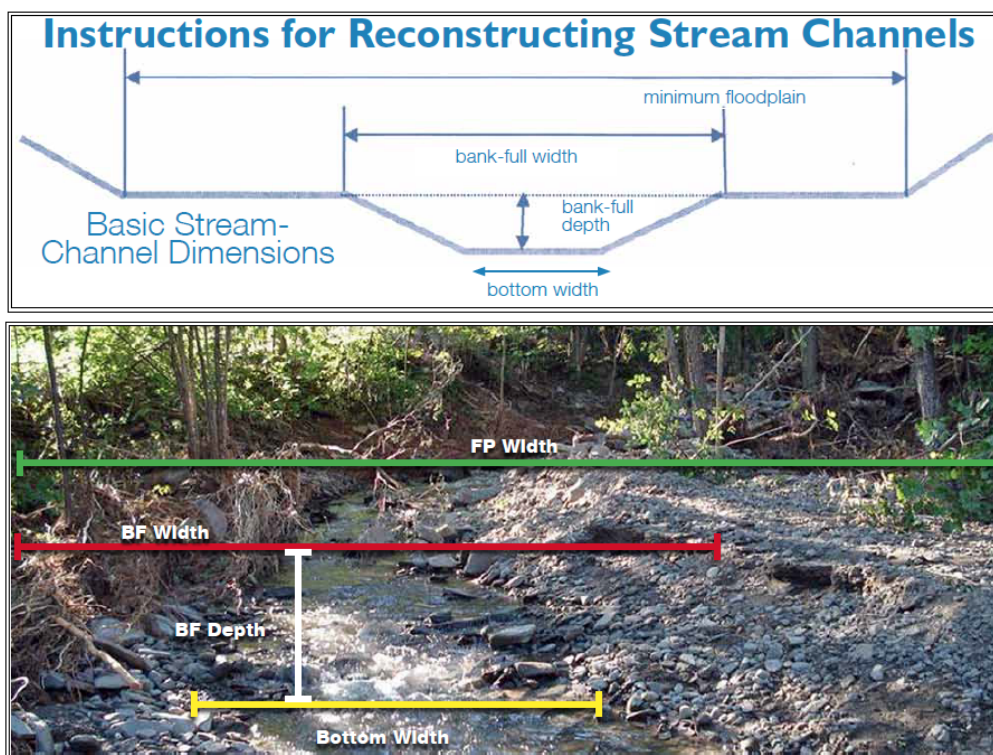
Purpose: To provide guidelines for post-flood stream repairs that assist in minimizing adverse impacts and the need for subsequent repairs.

Emergency Repairs

- Handle repairs in a timely manner, considering long-term effects such as fish habitat protection, and avoid contributing to future flooding problems.
- To properly repair streams:
 1. Clear debris and log jams at bridges and culverts.
 - Remove only the debris necessary to reestablish original stream-channel dimensions.
 - Do not use cleared debris to build berms on top of streambanks.
 2. Clear gravel deposits clogging the stream.
 - Remove gravel deposits to pre-flood grade level only.
 - When possible, relocate gravel deposits to areas where gravel was scoured away.
 3. Reconstruct the stream channel.
 - Do not build permanent berms on top of streambanks. If you need to temporarily pile material on banks, be sure to remove it when you are done. Berms block streams from spilling into their natural floodplains and may result in increased flooding, channel scouring, or erosion caused by higher streamflow velocities and flood elevations. Also, berms are generally not engineered to withstand flood forces and will likely blow out during the next flood, increasing damage and erosion in adjacent areas.
 - Do not attempt to deepen or widen the channel. Over-excavating the stream channel will have the same effects as berms, increasing flood risks to the site or downstream areas by increasing streamflow velocities and bank erosion, or sediment deposits in the channel.
 - Only remove the amount of debris necessary to reestablish original stream-channel dimensions. See "Reconstruct the stream channel to pre-flood, bank-full dimensions" in the next section.

Post-Emergency Repairs

After the emergency response, more measured and deliberate stream repair work should begin in order to return the channel to pre-flood conditions. The best model for managing high volumes of floodwater in a stream channel is one that slows the flow of floodwaters and increases their retention over an entire watershed, spreading them out instead of concentrating them in one area.



Source: New York State's Department of Environmental Conservation.

1. Reconstruct the stream channel to pre-flood, bank-full dimensions.
 - Proper stream-channel dimensions can be obtained by measuring an undamaged or "reference" stream reach immediately upstream or downstream of the planned worksite. (If an undamaged stream reach comparable to the damaged section is difficult to find, you may need to determine proper channel/bank-full dimensions using other methods.)
2. Avoid creating a head cut (an abrupt vertical drop).
 - Installing rock cross-vanes or another similar in-stream structure may be required.
 - Seek technical assistance from your county's soil and water conservation district or TCEQ.
3. Avoid scouring/down-cutting (increasing channel depth).
 - Reconstructing the channel to bank-full dimensions, the appropriate grade, and with as much floodplain access or bench as available room allows should minimize channel scouring and bank erosion afterward.
4. Repair eroded banks.
 - If space allows, slope eroding banks to a stable slope, such as 3:1 (units of width to units of elevation) or flatter. Slope protection or erosion-control methods may be required. Slopes of as much as 2:1 may be considered when using rocks or other stable materials.
 - To prevent future erosion on a river bend, incorporate rock vanes to deflect current away from the bank.

Important Notes on Water Quality

- All actions that cause erosion or affect water quality should be minimized to the greatest extent practicable, including the release of turbid (muddy) water.
- Machinery should be operated from the streambanks, avoiding use in flowing water to the greatest extent practicable.

Related Guidance

Delaware County Soil and Water Conservation District's (DCSWCD) *Post-Flood Emergency Stream Intervention Training Manual*
(www.dec.ny.gov/lands/86450.html)

GEOTECHNICAL ENGINEERING REPORT

LAKE AVALON PARK

799 Lady of the Lake Boulevard
Lewisville, Texas

UES Project No. G253147-Revision 1
October 1, 2025

Prepared for:

CITY OF LEWISVILLE

P.O. Box 299002
Lewisville, Texas, 75029
Attention: Mr. Marcus Gallegos

Prepared by:





UES
2209 Wisconsin Street
Dallas, Texas 75229
972-620-8911 TeamUES.com
TBPELS Firm No. 813

October 1, 2025

City of Lewisville
P.O. Box 299002
Lewisville, Texas, 75029

Attention: Mr. Marcus Gallegos

Re: Geotechnical Engineering Report
Lake Avalon Park
799 Lady of the Lake Boulevard
Lewisville, Texas
UES Project No. G253147-Revision 1

UES has performed a Geotechnical Exploration for the project referenced above. This study was authorized by Mr. Marcus Gallegos on July 8, 2025, using a Professional Services Agreement for Lake Avalon Park Geotechnical Services, and performed in accordance with UES Proposal No.113380-rev1 dated June 23, 2025.

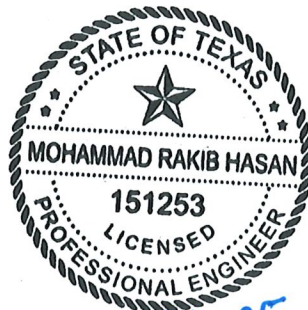
is the previously submitted report (UES Project No. G253147 dated September 15, 2025) has been revised herein to provide helical pier foundation recommendations for the proposed bridges and boardwalk structures.

The results of this exploration, together with our recommendations, are presented in the accompanying report, an electronic copy of which is being transmitted herewith.

UES appreciates the opportunity to be of service on this project. If we can be of further assistance, such as providing materials testing services during construction, please contact our office.

Sincerely,

Benjamin Clarke, E.I.T.
Geotechnical Project Manager



10/1/2025

Mohammad Rakib Hasan, Ph.D., P.E.
Senior Geotechnical Engineer

UES
TBPELS Firm No. 813

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APPENDICES

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1.0 INTRODUCTION

Purpose and Scope. The purpose of this geotechnical study was to evaluate some of the physical and engineering properties of subsurface materials at selected locations on the subject site to develop geotechnical engineering design parameters and recommendations for the proposed project. To accomplish this, the scope of this study included field exploration consisting of drilling test borings and collecting samples of the subsurface materials, performing laboratory testing on selected samples obtained during the field exploration, performing engineering analysis and evaluation of the subsurface conditions with respect to the project characteristics, and development of geotechnical recommendations suitable for the proposed project. The scope of services did not include an environmental assessment of the site.

Limitations. Recommendations provided in this report were developed from information obtained in test borings depicting subsurface conditions only at the specific boring locations and at the particular time designated on the logs. Subsurface conditions at other locations may differ from those observed at the boring locations, and subsurface conditions at boring locations may vary at different times of the year. The scope of work may not fully define the variability of subsurface materials and conditions that are present on the site. The nature and extent of variations between borings may not become evident until construction. If significant variations then appear evident, our office should be contacted to re-evaluate our recommendations after performing on-site observations and possibly other tests.

Project Location. The project site is situated within Lake Avalon Park which is located at 799 Lady of the Lake Boulevard in Lewisville, Texas. A site plan illustrating the general outline of the property, with UES's boring locations noted on it, is provided as the Boring Location Plan – Figure 1, included in Appendix A.

Project Description. Present plans provide for the replacement of the existing boardwalk and pedestrian bridge at Lake Avalon Park. It is anticipated the boardwalk and the pedestrian bridge will be supported by either straight shaft drilled piers or helical piers.

Loading Information. Based on information provided by the project team, we understand that the maximum pier load for the structures will be 20 kips. *Any change in the structural loads should be brought to our attention to review the design and assess the suitability of the recommendations provided.*

Site Grading. The site grading plan was not available at the time of writing this report. Our recommendations provided herein are on the basis that cuts and fills of less than 1 ft will be required to bring the site to grade. When the site grading plan becomes available, we should be notified and allowed to review the site grading plan to assess and modify our recommendations, as necessary.

2.0 SITE CONDITIONS

Review of Aerial Images. Review of aerial images available from Google Earth™ indicates the project site was a relatively open field covered with grassy vegetation, scattered trees, and existing boardwalk and pedestrian walking trails along the north-east perimeter of Lake Avalon. Due to the intermittent nature and relatively low resolution of aerial photographs, as well as lack of provided information regarding the past land use of the site, our review should not be interpreted as eliminating the possibility of past activities on site which could detrimentally affect future construction. No additional information was provided for this study regarding previous site activities or development.

Topography. According to maps available from the North Central Texas Council of Governments (NCTCOG, found at www.dfwmaps.com), the topography of the site slopes downward from east to west toward Lake Avalon with a maximum surficial elevation change of about 14 ft (about Elev. 510 ft to 496 ft).

3.0 FIELD EXPLORATION

Test Borings. The field exploration for this project included performing a total of three (3) test borings to a depth of 50 ft each in general accordance with ASTM Standard D420. Boring depths were measured from the existing ground surface at the respective boring location at time of the field exploration. **It should be noted that a fourth boring is recommended to be conducted in the vicinity of the proposed replacement boardwalk once Lake Avalon has been drained.**

Summary of Boring Depths and Locations		
Boring Identification	Depth, feet	Location
B-1 & B-2	50	Boardwalk
B-3	50	Pedestrian Bridge

The test borings were advanced using standard rotary drilling equipment at the approximate locations as shown on Figure 1, included in Appendix A. The boring locations were not surveyed. UES located the borings in the field using a hand-held GPS unit with lateral accuracy of ± 20 ft. Therefore, the boring locations should be considered approximate.

Relatively Undisturbed Soil Sampling. Cohesive soil samples were generally obtained using Shelby tube samplers in general accordance with ASTM D1587. The Shelby tube sampler consists of a thin- or thick-walled steel tube with a sharp cutting edge connected to a head equipped with a ball valve threaded for rod connection. The tube is pushed into the undisturbed soils by the hydraulic pulldown of the drilling rig. The soil specimens were extruded from the tube in the field, logged and tested for consistency using a hand penetrometer, then sealed and packaged to maintain "in situ" moisture content.

The consistency of relatively undisturbed soil samples was evaluated in the field using a calibrated hand penetrometer. For this test, a 0.25-inch diameter piston is pushed into the undisturbed sample at a constant rate to a depth of 0.25-inch. The results of these tests are tabulated at the respective sample depths as shown on the boring logs. When the capacity of the penetrometer is exceeded, the value is tabulated as 4.5+. One representative portion of each sample was sealed in a plastic bag for use in future visual evaluation and possible testing in the laboratory.

The subsurface samples will be retained in the laboratory for at least 14 days and then discarded unless the Client requests otherwise.

Texas Cone Penetration (TCP). A modified version of the Texas Cone Penetrometer (TCP) test was used to assess the apparent in-place strength characteristics of the rock type materials. The TCP test consists of a 3-inch diameter steel cone driven by a 170-pound hammer dropped 24 inches (340 ft-pounds of energy) and is the basis for TxDOT strength correlations. In the modified version used for this study, a 140-pound hammer is dropped 30-inches for completion of the field test. Depending on the resistance (strength) of the materials, either the number of blows of the hammer required to provide 12 inches of penetration, or the inches of penetration of the cone due to 100 blows of the hammer are recorded on the field logs and are shown on the boring logs as "TX Cone" (reference: TxDOT Test Method TEX 132-E). The subsurface samples will be retained in the laboratory for at least 14 days and then discarded unless the Client requests otherwise.

4.0 SUBSURFACE CONDITIONS

4.1 Geology

Geologic Formation. Based on the Geologic Atlas of Texas (Sherman Sheet) from the Texas Bureau of Economic Geology, published by the University of Texas at Austin, and the subsurface materials encountered in the test borings, the project site is mapped in the **Eagle Ford (Kef)** formation. The Bureau of Economic Geology describes the Eagle Ford as composed predominantly of shale with occasional platy beds of sandstone and limestone. Residual overburden soils associated with the Eagle Ford formation generally consist of clay and shaly clay with very high shrink/swell potential.

4.2 Subsurface Lithology

Stratigraphy. Descriptions of the various strata and their approximate depths and thickness per the Unified Soil Classification System (USCS) are provided. Terms and symbols used in the USCS are presented in Appendix B following the Boring Logs.

Subsurface materials encountered in the test borings generally consisted of high plasticity clay (CH) and shaly clay (CH) soils that extended to depths of 27 to 33 ft below the existing ground surface. The clay and shaly clay soils were underlain by gray shale that extended to the 50 ft boring termination depth. Based on visual inspection of the obtained samples,

the upper 4 to 6 ft of clayey soil encountered in the borings were classified as fill. Depths referenced in this report are measured from the existing ground surface at the respective boring location at time of the field exploration.

It should be noted that the depths provided above and on the boring logs are based on our Field Technician's and Engineer's interpretation of conditions believed to exist between actual samples retrieved. Therefore, information on the boring logs contains both factual and interpretive information. Lines delineating subsurface strata are approximate and the actual transition between strata may be gradual or not clearly defined. In addition, variations may occur between or beyond the boring locations.

4.3 Groundwater Observations

Groundwater Levels. Groundwater levels encountered in the borings during this study are identified in the table below. Depths referenced in this report and in the following table are measured from the existing ground surface at the respective boring location at time of the field exploration.

Summary of Groundwater Level Observations		
Boring No.	Depth Groundwater Initially Encountered (feet)	Groundwater Depth Upon Completion of Drilling (feet)
B-1	30	36
B-2	Not Encountered	Not Encountered
B-3	Not Encountered	Not Encountered

Long-term Groundwater Monitoring. These groundwater observations are those that were present at the time the borings were drilled. The depth and amount of water encountered in an open borehole largely depends on the permeability of the soils encountered at the boring location. It is common to encounter seasonal groundwater within the existing fill material, in the native clayey matrix and near the soil/rock (shale) interface or from fractures in the rock, particularly during or after periods of precipitation. In relatively impervious soils (clayey soils) and shale, a suitable estimate of the groundwater depths generally requires long-term monitoring. Long-term monitoring of groundwater conditions via piezometers or groundwater monitoring wells was not performed during this study and was beyond the scope of this study. Long-term monitoring can reveal groundwater levels materially different than those measured in the borings.

Groundwater Fluctuations. Subsurface groundwater fluctuations can occur. Future construction activities can alter the surface and subsurface drainage characteristics of this site. Seasonal variations, temperature, land-use, proximity to water bodies, and rainfall can also influence groundwater levels. UES recommends that the contractor verifies the groundwater elevation before construction starts.

4.1 Seismic Site Classification

The Site Class assigned for seismic design considers various factors, such as the soil profile (whether it's soil or rock), shear wave velocity, and strength, averaged over a depth of 100 feet. Since the borings didn't reach depths of 100 feet, UES made determinations under the assumption that the subsurface materials beneath the borehole bottoms resembled those encountered at the termination depth. Following the guidelines outlined in Section 1613.2.2 of the 2024 International Building Code and Table 20.2-1 in the 2022 ASCE-7, UES recommends using Site Class C for seismic design purposes at this location.

5.0 LABORATORY TESTING

UES performs visual classification and laboratory tests, as appropriate, to define pertinent engineering characteristics of the soils encountered. Laboratory tests are performed in general accordance with ASTM and/or other applicable standards. Test results are included at the respective sample depths on the boring logs. Laboratory tests and procedures performed for this geotechnical study are summarized in the following table.

Summary of Laboratory and Procedures	
Test Procedure	Description
ASTM D4220	Standard Practices for Preserving and Transporting Soil Samples
ASTM D2487	Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D2488	Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)
ASTM D2216	Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D2166	Standard Test Method for Unconfined Compressive Strength of Cohesive Soil
ASTM D4546	Standard Test Methods for One-Dimensional Swell or Settlement Potential of Cohesive Soils

6.0 RECOMMENDATIONS

6.1 Existing Fill and Demolition

As discussed, existing fill was encountered in the test borings, and it is anticipated that existing boardwalk and pedestrian bridge structures will be demolished.

6.1.1 Uncontrolled Fill

Existing Fill. As discussed, the upper 4 to 6 ft of clayey material encountered in the borings were visually classified as fill material. The depth of the fill could be greater in other locations on the site. It is not known if this fill was placed under engineering supervision with compaction records. If compaction records for this fill cannot be obtained, the existing fill should be considered as uncontrolled fill.

Uncontrolled fill is generally not considered suitable for support of foundations due to the risk of under-compacted zones resulting in failures of weak soil and/or indeterminate levels of settlement. Any existing uncontrolled fill should be removed from the dock ramp pad area, and any area sensitive to settlement, and replaced with engineered fill as recommended in Section 6.3.6. The excavated materials may be suitable for reuse as engineered fill provided they are free of organics, boulders, rubble, and other debris. The lateral extent, depth and nature of the existing fill are not known. Test pits could be performed prior to construction to verify the presence, lateral extent, depth, and nature of the existing fill materials. UES can provide this service if desired.

6.1.2 Demolition

Applicability. Recommendations in this section apply to the removal of any existing foundations, utilities or pavement which may be present on this site.

General. Special care should be taken in the demolition and removal of existing floor slabs, foundations, utilities and pavements to minimize disturbance of the subgrade. Excessive disturbance of the subgrade resulting from demolition activities can have serious detrimental effects on planned foundation and paving elements.

Existing Foundations. Existing foundations are typically slabs, shallow footings, or drilled piers. If slab or shallow footings are encountered, they should be completely removed. If drilled piers are encountered, they should be cut off at an elevation at least 24 inches below proposed grade beams/footings or the final subgrade elevation, whichever is deeper. The remainder of the drilled pier should remain in place. Foundation elements to remain in place should be surveyed and superimposed on the proposed development plans to determine the potential for obstructions to the planned construction. UES should be contacted if drilled piers are to be excavated and removed completely. Additional earthwork activities will be required to make the site suitable for new construction if the piers are to be removed completely.

Existing Utilities. Existing utilities and bedding to be abandoned should be completely removed. Existing utilities and bedding may be abandoned in place if they do not interfere with planned development. Utilities which are abandoned in place should be properly pressure-grouted to completely fill the utility.

Backfill. Excavations resulting from the excavation of existing foundations and utilities should be backfilled in accordance with Section 6.3.6.

Other Buried Structures. Other types of buried structures (wells, cisterns, etc.) could be located on the site. If encountered, UES should be contacted to address these types of structures on a case-by-case basis.

6.2 Potential Movement of Expansive Soil

Estimated Potential Movement. Our findings indicate grade supported structures within 1 ft of existing grade could experience post construction movements on the order of about 6 inches due to shrinking and swelling of expansive soils (active clays). For the purpose of this report, movement due to shrinking and swelling of active clays will be referred to as potential vertical movement (PVR).

Method of Estimation. PVR estimated in general accordance with methods outlined by Texas Department of Transportation (TxDOT) Test Method Tex-124-E, from results of absorption swell tests, and engineering judgment and experience. Estimated PVR calculated assuming the moisture content of the in-situ soil within the normal zone of seasonal moisture content change varies between a “dry” condition and a “wet” condition as defined by Tex-124-E. Also, it was assumed a 1 psi surcharge load from the foundation acts on the subgrade soils. Movements exceeding our estimates could occur if positive drainage of surface water is not maintained or if soils are subject to an outside water source, such as leakage from a utility line or subsurface moisture migration from off-site locations.

Assumptions. PVR was estimated based on the assumption that any fill used to raise the grade consists of onsite or similar soil with a plasticity index (PI) of 50 or less. The use of fill material with a PI greater than 50 could result in potential movements exceeding our estimates.

6.3 Earthwork

Variations in subsurface conditions could be encountered during construction. To permit correlation between test boring data and actual subsurface conditions encountered during construction, it is recommended a registered Professional Engineering firm be retained to observe construction procedures and materials.

Some construction problems, particularly degree or magnitude, cannot be reasonably anticipated until the course of construction. The recommendations offered in the following paragraphs are intended not to limit or preclude other conceivable solutions, but rather to provide our observations based on our experience and understanding of the project characteristics and subsurface conditions encountered in the borings.

6.3.1 Excavation Safety Considerations

Excavation Safety. The contractor is responsible for designing any excavation slopes, temporary sheeting or shoring. Design of these structures should include any imposed surface surcharges. Construction site safety is the sole responsibility of the contractor, who shall also be solely responsible for the means, methods and sequencing of construction operations. The contractor should also be aware that slope height, slope inclination or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state and/or federal safety regulations, such as OSHA

Health and Safety Standard for Excavations, 29 CFR Part 1926, or successor regulations. Stockpiles should be placed well away from the edge of the excavation and their heights should be controlled so they do not surcharge the sides of the excavation. Surface drainage should be carefully controlled to prevent flow of water over the slopes and/or into the excavations. Construction slopes should be closely observed for signs of mass movement, including tension cracks near the crest or bulging at the toe. If potential stability problems are observed, a geotechnical engineer should be contacted immediately. Shoring, bracing or underpinning required for the project (if any) should be designed by a professional engineer registered in the State of Texas.

Site Preparation and Proofroll

Site Clearing. In the area of improvements, all concrete, trees, stumps, brush, debris, septic tanks, abandoned structures, roots, vegetation, rubbish and any other undesirable matter should be removed and properly disposed.

Proofroll. Pedestrian bridge and boardwalk subgrades should be proofrolled in accordance with TX-DOT Specification Item 216 with a fully loaded tandem axle dump truck or similar pneumatic-tire equipment weighing at least 25 tons to locate areas of loose subgrade. In areas to be cut, the proofroll should be performed after the final grade is established. In areas to be filled, the proofroll should be performed prior to fill placement. Areas of loose or soft subgrade encountered in the proofroll should be removed and replaced with engineered fill, moisture conditioned (dried or wetted, as needed) and compacted in place. Prior to placement of any fill, the exposed soil subgrade should then be scarified to a minimum depth of 6 inches and recompacted as outlined in Section 6.3.6.

6.3.3 Construction Considerations

Maintenance of Subgrade during Construction. While the exposed subgrade is expected to remain relatively stable initially, unstable conditions may arise during general construction activities, particularly if the soil is exposed to wet weather conditions and repetitive construction traffic. The use of lighter construction equipment can help minimize disturbance to the subgrade. In the event of unstable conditions, stabilization measures will be necessary. After grading is completed, it's crucial to maintain the moisture content of the subgrade before proceeding with pavement construction. Minimizing construction traffic over the finished subgrade is advisable. If the subgrade becomes frozen, desiccated, saturated, or disturbed, the affected material should either be removed or treated by scarification, moisture conditioning, and recompaction before pavement construction begins. UES should be retained to observe earthwork and to perform necessary tests and observations during subgrade preparation.

Fill on Existing Slopes. If fill is to be placed on existing slopes (natural or constructed) steeper than six horizontal to one vertical (6:1), the fill materials should be benched into the existing slopes in such a manner as to provide a minimum bench-key width of five (5) ft.

This should provide a good contact between the existing soils and new fill materials, reduce potential sliding planes, and allow relatively horizontal lift placements.

6.3.4 Grading, Drainage and Other Considerations

Efforts should be made to minimize the excessive wetting or drying of the underlying soil, as it can lead to swelling and shrinkage of these soil layers. Standard construction practices of providing good surface water drainage should be used. A positive slope of the ground away from any foundation should be provided. Ditches or swales should be provided to carry the run-off water both during and after construction.

In areas with pavement or sidewalks adjacent to the structures, a positive seal must be maintained between the structures and the pavement or sidewalk to minimize seepage of water into the underlying supporting soils. Post-construction movement of pavement and flatwork is common. Normal maintenance should include inspection of all joints in paving and sidewalks, etc. as well as re-sealing where necessary.

Since granular bedding backfill is used for most utility lines, the backfilled trench should not become a conduit and allow access for surface or subsurface water to travel toward the new structures.

6.3.5 Groundwater Control

Groundwater was encountered at depths of about 30 to 36 ft below the existing ground surface in Boring 1. However, from our experience, shallower groundwater seepage could be encountered in excavations for foundations, utilities and other general excavations at this site. The risk of seepage increases with depth of excavation and during or after periods of precipitation. The risk of seepage is also increased where shale is exposed in excavations and slopes or is near final grade. Standard sump pits and pumping may be adequate to control seepage on a local basis.

If groundwater is encountered during excavation, dewatering to bring the groundwater below the bottom of excavations may be required. Dewatering could consist of standard sump pits and pumping procedures, which may be adequate to control seepage on a local basis during excavation. Supplemental dewatering will be required in areas where standard sump pits and pumping is not effective. Supplemental dewatering could include submersible pumps in slotted casings, well points, or eductors. For supplemental dewatering, the contractor should submit a groundwater control plan, prepared by a licensed engineer experienced in that type of work.

6.3.6 Fill Compaction

General Fill. Clay soils used for general fill with a plasticity index equal to or greater than 25 should be compacted to a dry density between 93 and 98 percent of standard Proctor maximum dry density (ASTM D698). The compacted moisture content of the clays during placement should be within the range of +2 to +6 percentage points of the material's

optimum moisture. Clay soils used for general fill with a plasticity index less than 25 should be compacted to a dry density of at least 95 percent of standard Proctor maximum dry density (ASTM D698). The compacted moisture content of the clays during placement should be within the range of -1 to +3 percentage points of the material's optimum moisture.

Fill Restrictions. General fill should consist of those materials meeting the requirements stated. Fill soils should not contain material greater than 4 inches in any direction, debris, vegetation, waste material, environmentally contaminated material, or any other unsuitable material. Non-expansive fill and general fill should be placed in loose lifts not exceeding 8 inches.

6.3.7 Utilities

Bedding. Pipe bedding and pipe-zone backfill for underground utilities should meet the requirements of the pipe manufacturer. If no manufacturer requirement exists, then pipe bedding should be placed in accordance with applicable municipal or TxDOT requirements. Unless specified otherwise, the pipe-zone generally consists of all materials surrounding the pipe in the trench from six (6) inches below the pipe to 12 inches above the pipe. Since granular bedding backfill is used for most utility lines, the backfilled trench should not become a conduit and allow access for surface or subsurface water to travel toward the new structure. Concrete cut-off collars or clay plugs should be provided where utility lines cross structures to prevent water from traveling in the trench backfill and entering beneath the structure. At least 1 ft of soil cover should exist between concrete plugs and structural elements. Local municipality or jurisdiction take precedence over pipe bedding recommendations herein.

Backfill. The trench backfill for utilities should be properly placed and compacted as outlined in Section 6.3.6 and in accordance with requirements of local City standards.

Trench Settlement. Even if fill is properly compacted, fills in excess of about 10 ft are still subject to settlements over time of up to about 1 to 2 percent of the total fill thickness. This should be considered when designing pavement over utility lines and/or other areas with deep fill. Where utility lines are deeper than 10 ft, the fill/backfill below 10 ft should be compacted to at least 100 percent of standard Proctor maximum dry density (ASTM D698) and within -2 to +2 percentage points of the material's optimum moisture content. The portion of the fill/backfill shallower than 10 ft should be compacted as previously outlined. Density tests should be performed on each lift (maximum 12-inch thick) and should be performed as the trench is backfilled. Local municipality or jurisdiction take precedence over trench backfill recommendations herein.

Trench Excavation. If utility trenches or other excavations extend to a depth of 5 ft or more below construction grade, the contractor or others shall be required to develop an excavation safety plan to protect personnel entering the excavation or excavation vicinity. The collection of specific geotechnical data and the development of such a plan, which could include designs for sloping and benching or various types of temporary shoring, is beyond the scope of this study. Any such designs and safety plans shall be developed in accordance with current OSHA guidelines and other applicable industry standards.

6.3.8 Deep Fill Considerations

Deep Fill Compaction. Fills placed deeper than 10 ft should be compacted to at least 100 percent of standard Proctor maximum dry density (ASTM D698) and within -2 to $+2$ percentage points of the material's optimum moisture content. The portion of the fill/backfill shallower than 10 ft should be compacted as previously outlined. Density tests should be performed on each lift (maximum 12-inch thick) and should be performed as the trench is backfilled.

Deep Fill Settlement. Even if fill is properly placed and compacted as recommended herein, fills more than about 10 ft deep can still settle about 1 to 2 percent of its thickness due to its own weight, independent of external loads. This settlement generally begins as soon as lift placement begins. However, settlement can still occur for a period of time after completion of fill placement. The time required for settlement to occur is a function of soil type, pore water, and drainage path conditions and can vary widely. As a result, some fill-related settlement should be expected before and after final lifts are placed. Movement of grade supported structures (foundations, flatwork, etc.) related to settling fill can be reduced by allowing as much time as possible between the time the fill placement is completed and construction of the grade supported structure. If this risk of post construction settlement of deep fills is not acceptable, survey monitoring of constructed fills can be performed to evaluate the rate and magnitude of settlement prior to construction of structures on the fill. UES can provide this service if desired.

6.4 Foundation System

Appropriate Foundation Types. The following foundation types are generally appropriate to the project and site based on the geotechnical conditions encountered:

- Straight shaft drilled piers.
- Helical Piers (Alternative).

Foundation Determination. Foundation loading assumptions used in preparation of the following recommendations are summarized in Section 1.0. Final determination of the foundation type to be utilized for this project should be made by the Structural Engineer based on loading, economic factors and risk tolerance.

Avoidance of Mixing Foundation Types. Mixing of foundation types for a given structure should be avoided. Where mixing foundation types is required for a given structure, we should be contacted to review the foundation plans prepared by the Structural Engineer prior to construction. Mixed foundation types can have incompatible movement characteristics.

Foundations Adjacent to Slopes. Foundations placed too close to adjacent slopes steeper than 5H:1V may experience reduced bearing capacities and/or excessive settlement. Recommendations provided herein assume foundations are not close enough to adjacent slopes in excess of 5H:1V to be detrimentally affected.

Therefore, foundations closer than 5 times the depth of adjacent slopes, pits, or excavations in excess of 5H:1V should be brought to UES's attention to review the appropriateness of our recommendations.

Foundation Plan Review. UES should be provided with final foundation plans, details and related structural loads, with adequate time to review, prior to finalizing the design to verify conformance with recommendations presented herein.

6.4.1 Straight Shaft Drilled Piers

Applicability. Straight shaft drilled pier foundations bearing at least 5 ft in gray shale as described in this section are appropriate for the proposed replacement boardwalk and pedestrian bridge. Straight shaft drilled piers should have adequate length to resist axial, lateral, and uplift forces. Straight shaft drilled piers should also have a diameter of at least 18 inches.

Axial Resistance. For the design of the drilled shaft foundations, we recommend the following geotechnical parameters:

Axial Capacities of Straight Shaft Drilled Piers			
Bearing Stratum	Allowable Skin Friction in Compression (ksf) ^{1, 2}	Allowable Skin Friction in Uplift Resistance (ksf) ^{1, 2}	Allowable End Bearing Pressure (ksf) ^{3, 4}
Properly Compacted Fill Material and Native Clay Soils to 15 ft below Final Grade	Neglect	Neglect	Not Applicable
Clay Soils at least 15 ft Below Final Grade and Upper 5 ft of Gray Shale	0.4	0.3	Not Applicable
Deeper than 5 ft Below the Surface of Gray Shale (about 32 ft below existing at Boring 1 and at depths of about 37 to 38 ft below existing grades in Borings 2 and 3)	5.2	4.1	35.0
<u>Notes:</u> 1. Neglect skin friction in the upper 5 ft of gray shale and above the bottom of temporary casing. 2. Allowable Skin Friction based on a factor of safety = 2. 3. Allowable End Bearing Capacity based on a factor of safety = 3. 4. The test borings for this project extended to a maximum depth of 50 feet below the existing ground surface. Drilled piers utilizing end bearing to derive part of their capacity should not be drilled deeper than 50 ft below the existing ground surface. Piers drilled to depths of 45 to 50 feet should consider skin friction resistance only. Deeper test borings will be required if it is desired to utilize end bearing resistance below a depth of 45 feet or if piers will extend below a depth of 50 ft.			

Uplift. Each pier should be designed with sufficient full-length reinforcing steel and a sufficient embedment into the gray shale to resist the uplift pressure (soil-to-pier adhesion) due to potential soil swell along the shaft from post construction heave and other uplift forces applied by structural loadings. The magnitude of uplift adhesion due to

soil swell along the pier shaft cannot be defined accurately and can vary according to the actual in-place moisture content of the soils during construction. It is estimated this uplift adhesion will not exceed about 2.2 ksf. This soil adhesion is approximated to act uniformly over the portion of the shaft situated within 12 ft of finished exterior grades. Uplift adhesion due to soil heave can be neglected over the portion of the pier shaft in contact with any non-expansive material.

Lateral Resistance. For resistance of lateral loads on straight shaft drilled piers, we recommend the following LPILE design parameters.

Design Parameters For L-Pile		
Material	Properly Compacted Fill Material, Native Clay Soils, and Upper 5 ft of Gray Shale ¹	Gray Shale (Below At Least 5 ft of Penetration)
L-Pile p-y Model	Stiff clay with Free Water	Weak Rock
Effective Unit Weight (γ), pci	0.069	0.078
Undrained Cohesion (c), psi	7.0	-
Rock Uniaxial Compressive Strength (q_u), psi	-	290
Rock Mass Modulus (E_r), psi	-	29,000
Rock Quality Designation (RQD) ² , %	-	70-90
Rock Strain Factor (k_{rm})	-	0.0005
¹ Resistance of clay soils situated within 4 ft of final exterior grades and any fill soils should be neglected due to potential soil shrinkage and disturbance.		
² Rock Quality Designation (RQD) is based on our area experience and the results of the field exploration. Rock coring was not performed for this investigation.		

Pier Caps, Abutments and Wing Walls. All pier caps, abutments and wing walls connecting piers should be constructed with a nominal 12-inch void space between the underlying active clays and the bottom of the pier caps, abutments and wing walls connecting piers. Pier caps, abutments and wing walls connecting piers should be formed and not cast in earthen trenches. Commercially available cardboard box forms (cartons) are made for this purpose. The cardboard cartons should extend the full length and width of the pier caps, abutments and wing walls. Prior to concrete placement, cartons should be inspected to verify they are firm, properly placed, and capable of supporting wet concrete. Some type of permanent soil retainer, such as pre-cast concrete panels, must be provided to prevent soils from sloughing into the void space. Additionally, backfill soils placed adjacent to pier caps, abutments and wing walls must be compacted as outlined in Section 6.3.6.

Pier Spacing. Piers should not be spaced closer than three shaft diameters center to center to use the above-recommended bearing capacities (diameter of larger shaft). A reduction factor of 75 percent should be used for piers placed 2 to 3 diameters apart, measured from center to center. A reduction factor of 40 percent should be used for piers placed less than 2 shaft diameters apart, measured center to center. The reduction factors should be applied to allowable end bearing and allowable skin friction.

Settlement. Foundation settlement for drilled piers constructed as described herein should be about 1 inch or less.

Groundwater. Groundwater was initially encountered in Boring 1 at a depth as shallow as 30 feet during drilling and measured at a depth of 36 feet after completion of drilling operations. Groundwater should be expected to be encountered during pier excavation and the risk of groundwater seepage is increased during or after periods of precipitation. Submersible pumps may be capable of controlling seepage in the pier excavation to allow for concrete placement. **If water-bearing soil layers are encountered, temporary casing and/or slurry displacement method will likely be required for drilled piers.**

Temporary Casing. Temporary casing should be seated in the clayey soils and/or shale below the depth of seepage, and all water and loosened material should be removed from the cased excavation before starting the design penetration. As casing is extracted, care should be taken to maintain a positive head of plastic concrete and minimize the potential for intrusion of water seepage. UES should be contacted for further evaluation and recommendations if groundwater seepage or caving soils are encountered.

In some cases, it may not be possible to effectively seal off groundwater seepage with the use of temporary casing. If groundwater cannot be controlled by the use of casing, underwater placement of pier concrete will be considered. Special mix designs are usually required for tremied or pumped concrete. Proper concreting procedures should include placement of concrete from the bottom to the top of the pier using a sealed tremie or pumped concrete. The tremie should be maintained at least 5 ft into the wet concrete during placement. It is recommended a separate bid item be provided for casing and underwater concrete placement on the contractors' bid schedule.

Applicable TxDOT Standards. Drilled pier foundations should be constructed in accordance with the requirements of TxDOT Item 416 (standard specification for construction of drilled pier foundations). ***This specification includes requirements for construction using casing, as appropriate.***

Construction Observation. The construction of all piers should be observed to verify compliance with design assumptions and to verify:

1. the bearing stratum;
2. the removal of all smear zones and cuttings;
3. that groundwater seepage, when encountered, is correctly handled;
4. that the shafts are vertical (within acceptable tolerance); and
5. ensure that the top of the shafts in contact with clay are not enlarged (mushroom-shaped).

Concrete Placement. Concrete should be placed immediately after the excavation has been completed. In no event should a pier excavation be allowed to remain open for more than 8 hours. Concrete should have a slump of 5 to 7 inches and should not be allowed to strike the shaft sidewall or steel reinforcement during placement.

6.4.2 Helical Piers (Alternative)

General. Based on loading information provided by the client, helical piers could be considered for the pedestrian bridge and boardwalk as an alternative to straight shaft drilled piers. Helical piers are a manufactured foundation element consisting of a centralized steel shaft and one or more helical bearing plates at the bottom of the shaft. The helical plates are formed with a uniform-pitch screw thread, and the pier is installed by rotating it into the ground to the desired depth or refusal. The helical plate(s) provides end bearing resistance due to gravity loads and uplift resistance due to swelling of high shrink-swell active clays such as encountered at the boring locations.

There are generally two modes of helical pier behavior; individual helix and group helix. In the case of individual helix, each helix acts independently of the other and the total helical pier capacity is based on the sum of the bearing capacities of the individual helixes. In the case of group helix, the total helical pier capacity is based on the bearing capacity of the bottom helix and skin friction developed from a cylinder of soil developed between the helixes. Independent helix capacity occurs when helixes are widely spaced (about 3 or more helix diameters apart) and group helix capacity occurs when helixes are spaced closely together (less than about 3 helix diameters).

Foundation Depth. Helical piers should bear in native clayey soils at a depth of at least 18 ft below final grade. In addition, helical piers should be installed such that the upper most helix is situated at a depth of at least 12 ft below final grade.

Bearing Capacity. For helical piers bearing at a depth of at least 18 ft below final grade exhibiting independent helix behavior, pier capacity can be calculated by summing the allowable end bearing pressures of 3.0 ksf applied to the lowermost helix and a reduced bearing capacity of 1.5 ksf applied to any overlying helixes. For helical piers exhibiting group helix behavior, pier capacity can be calculated by summing the allowable bearing pressure of 3.0 ksf applied to the lowermost helix with an allowable skin friction of 300 psf taken over the surface of the soil cylinder developed between the lowermost helix and any overlying helixes.

The minimum helix diameter must be sized to prevent the bearing soils from being overstressed and to develop sufficient uplift capacity to overcome the potential uplift forces acting on the pier. The helix portion should be at least three (3) times the width of the shaft. The minimum clear spacing between edges of adjacent piers should be at least two (2) helix diameters (based on the larger helix). Normal elastic settlement of helical piers under loading is estimated at less than about 1 inch.

Uplift. Each helical pier should be designed to resist the uplift pressure (soil-to-pier adhesion) due to potential soil swell along the shaft from post construction heave and other uplift forces applied by structural loadings. The magnitude of uplift adhesion due to soil swell along the pier shaft cannot be defined accurately and can vary according to the actual in-place moisture content of the soils during construction. It is estimated this uplift

adhesion will not exceed about 2.2 ksf. This soil adhesion is approximated to act uniformly over the portion of the shaft situated within 12 ft of finished exterior grades. Uplift adhesion due to soil heave can be neglected over the portion of the pier shaft in contact with any non-expansive material.

Design. From our experience, helical piers are frequently designed and installed by specialty contractors with capacities in excess of those calculated by conventional static analysis. Helical piers should be designed by a professional engineer and should be installed per the manufacturer's requirements. Helical piers should be load tested to verify the pier is capable of supporting the design load. Load tests can also be utilized to maximize the foundation load, thereby reducing the number of piers. We recommend performing at least one helical pier load test. UES can assist in design, implementation, and evaluation of a pier load test if desired.

Lateral Capacity. Lateral analysis for helical piers constructed at the site can be performed using the LPILE design parameters provided in Section 6.4.1.

Pier Caps, Abutments and Wing Walls. All pier caps, abutments and wing walls connecting piers should be constructed with a nominal 12-inch void space between the underlying active clays and the bottom of the pier caps, abutments and wing walls connecting piers. Pier caps, abutments and wing walls connecting piers should be formed and not cast in earthen trenches. Commercially available cardboard box forms (cartons) are made for this purpose. The cardboard cartons should extend the full length and width of the pier caps, abutments and wing walls. Prior to concrete placement, cartons should be inspected to verify they are firm, properly placed, and capable of supporting wet concrete. Some type of permanent soil retainer, such as pre-cast concrete panels, must be provided to prevent soils from sloughing into the void space. Additionally, backfill soils placed adjacent to pier caps, abutments and wing walls must be compacted as outlined in Section 6.3.6.

6.5 Lateral Earth Pressures

Abutment walls and associated wing walls for the bridges and boardwalk should be designed to resist the expected lateral earth pressures. The magnitude of lateral earth pressure against the walls is dependent on the method of backfill placement, type of backfill soil, drainage provisions, and type of wall (rigid or yielding) after placement of the backfill. Experience demonstrates when a wall is held rigidly against horizontal movement (restrained at the top), the lateral pressure (at-rest lateral earth pressure) against the wall is greater than the normally assumed active pressure. Yielding walls (rotation at the top of the wall on the order of 0.1 to 0.4 percent of the wall height) can be designed for active earth pressures (k_a) but rigid walls should be designed for higher at-rest lateral earth pressures (k_o). Walls should be designed using the equivalent fluid pressures provided in the following table, considering a triangular stress distribution and assuming a horizontal ground surface extending backward from the top of the wall. The equivalent fluid pressures provided do not include a factor of safety.

Lateral Earth Pressures Ground Surface Slope of 8H:1V or Flatter at Top of Wall			
Material	Condition	Equivalent Fluid Pressure, pcf	
		Drained	Undrained
Free-Draining Granular Soil $\Phi=35^\circ$, $Y_T=125$ pcf	At-Rest, $k_o=0.43$	53	89
	Active, $k_a=0.27$	34	79
On-Site Clayey Soil $\Phi=15^\circ$, $Y_T=120$ pcf	At-Rest, $k_o=0.74$	--	105
	Active, $k_a=0.59$	--	96
Φ – Internal friction and Y_T – Total Unit Weight			

Free-draining granular backfill material should be a clean, non-plastic, relatively well-graded granular backfill consisting of either sand, gravel, or a sand and gravel mixture (no more than 5 percent finer than the No. 200 sieve size). A material meeting the gradation requirements of ASTM C33 No. 57 or 67 type material could be used for this purpose. To reduce surface water seepage into the free-draining granular backfill, the top 1 ft of the backfill should consist of on-site clay soil with a plasticity index of at least 25. The free-draining granular backfill should extend outward at least 2 ft from the base of the wall and then extend upward on a 1 (horizontal) to 2 (vertical) slope. The free-draining granular backfill should be separated from the adjacent native soils using a non-woven filter fabric (Mirafi 140N, or equivalent) to prevent intrusion of native soils into the free-draining granular backfill.

Complete drainage of the free-draining granular material should be provided to prevent the development of hydrostatic pressures behind the wall. A typical drainage system should consist of perforated plastic drain pipes placed in filter trenches excavated parallel to the base of the walls for their entire length. The drain pipes should be positioned at a depth lower than the bottom elevation of the wall and should also be wrapped with filter fabric (Mirafi 140N, or equivalent). A perimeter drain system is beneficial regardless of the type of backfill used behind the wall. As a minimum, a system of weepholes should be provided for free standing walls, although weep holes by themselves are not sufficient to prevent the occasional buildup of hydrostatic pressure.

The effects of surcharge loading must also be considered. The surcharge load should be multiplied by the applicable coefficient of earth pressure from the table above, and the result applied as a uniform lateral pressure over the full height of the wall.

Lightweight, hand-controlled vibrating plate compactors are recommended for compaction of backfill adjacent to walls to reduce the possibility of increases in lateral pressures due to over-compaction. Heavy compaction equipment should not be operated within a distance equal to the height of the wall or at least 10 ft from the wall or whichever is greater. Also, compaction of backfill soils behind walls should not exceed 100 percent standard Proctor maximum dry density (ASTM D698) to further limit lateral earth pressures against walls.

6.6 Approach Embankment Fill and Potential Movements

We anticipate on-site clay material will compose most of the fill for the approach embankments for the boardwalk and pedestrian bridges. Fill placed within 10 ft of final grade should be compacted to at least 95 percent of the material's maximum dry density as determined by standard Proctor (ASTM D698) moisture-density tests. Fill soils placed at depths below 10 ft of final grade should be compacted to at least 100 percent of the material's maximum dry density. Additional recommendations for fill compaction are presented in Section 6.3.6. Even if fill is properly placed and compacted, relatively deep fills (in excess of about 10 ft) are subject to settlement due to compression of the fill from self-weight. The portion of fill placed below 10 ft of final grade could be subject to settlement of up to about 1 to 2 percent. This could cause differential movement between the any pavements/sidewalk and the bridge deck and boardwalk. In addition to settlement of fill material, clay soils are subject to changes in volume due to seasonal changes in moisture content. We estimate soil-related movements on the order of about 6 inches.

7.0 LIMITATIONS/GENERAL COMMENTS

As with any geotechnical engineering report, this report presents technical information and provides detailed technical recommendations for civil and structural engineering design and construction purposes. UES, by necessity, has assumed the user of this document possesses the technical acumen to understand and properly utilize the information and recommendations provided herein. UES strives to be clear in its presentation and, like the user, does not want potentially detrimental misinterpretation or misunderstanding of this report. Therefore, we encourage any user of this report with questions regarding its content to contact UES for clarification. Clarification will be provided verbally and/or issued by UES in the form of a report addendum, as appropriate.

Professional services provided in this geotechnical exploration were performed, findings obtained, and recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. The scope of services provided herein does not include an environmental assessment of the site or investigation for the presence or absence of hazardous materials in the soil, surface water or groundwater. UES, upon written request, can be retained to provide these services.

UES is not responsible for conclusions, opinions or recommendations made by others based on this data. Information contained in this report is intended for the exclusive use of the Client (and their designated design representatives), and is related solely to design of the specific structures outlined in Section 1.0. No party other than the Client (and their designated design representatives) shall use or rely upon this report in any manner whatsoever unless such party shall have obtained UES's written acceptance of such intended use. Any such third party using this report after obtaining UES's written acceptance shall be bound by the limitations and limitations of liability contained herein, including UES's liability being limited to the fee paid to it for this report. Recommendations presented in this report should not be used for design of any other structures except those specifically described in this report. In all areas of this report in which UES may provide

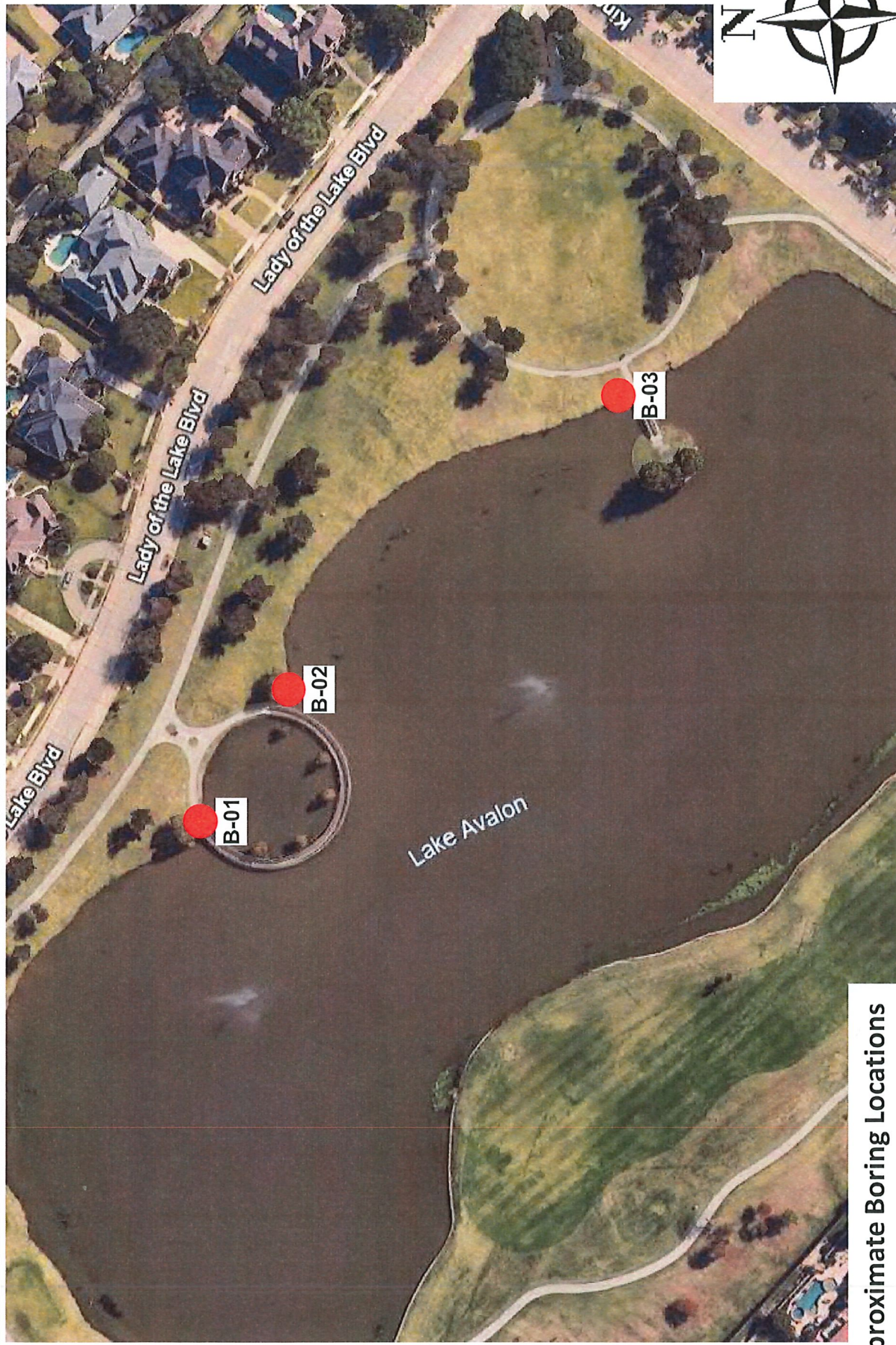
additional services if requested to do so in writing, it is presumed that such requests have not been made if not evidenced by a written document accepted by UES. Further, subsurface conditions can change with passage of time. Recommendations contained herein are not considered applicable for an extended period of time after the completion date of this report. It is recommended our office be contacted for a review of the contents of this report for construction commencing more than one (1) year after completion of this report. Non-compliance with any of these requirements by the Client or anyone else shall release UES from any liability resulting from the use of, or reliance upon, this report.

Recommendations provided in this report are based on our understanding of information provided by the Client about characteristics of the project. If the Client notes any deviation from the facts about project characteristics, UES should be contacted immediately since this may materially alter the recommendations. Further, UES is not responsible for damages resulting from workmanship of designers or contractors. It is recommended the Owner retain qualified personnel, such as a Geotechnical Engineering firm, to verify construction is performed in accordance with plans and specifications.

Appendix A

Boring Location Plan – Figure 1





● Approximate Boring Locations

Boring Location Plan
Figure 1



Geotechnical Engineering Report
Lake Avalon Park
799 Lady of the Lake Boulevard
Lewisville, Texas
UES Report No. G253147

Appendix B

Boring Logs Key to Soil Symbols and Classifications



SOIL BORING NUMBER: B-01

Page 1 of 1

PROJECT NAME Lake Avalon Park

PROJECT NUMBER G253147

DATE STARTED 07/31/2025 **COMPLETED** 07/31/2025

PROJECT LOCATION Lewisville, Texas

CLIENT City of Lewisville

LATITUDE / LONGITUDE N/A

DRILLING METHOD Auger

BORING ELEVATION N/A

NOTES -

HAMMER WEIGHT 140 **HAMMER DROP** 30

[illegible]

[illegible]

[illegible]



KEY TO SOIL SYMBOLS AND CLASSIFICATIONS

SOIL & ROCK SYMBOLS

	(CH), High Plasticity CLAY
	(CL), Low Plasticity CLAY
	(SC), CLAYEY SAND
	(SP), Poorly Graded SAND
	(SW), Well Graded SAND
	(SM), SILTY SAND
	(ML), SILT
	(MH), Elastic SILT
	LIMESTONE
	SHALE / MARL
	SANDSTONE
	(GP), Poorly Graded GRAVEL
	(GW), Well Graded GRAVEL
	(GC), CLAYEY GRAVEL
	(GM), SILTY GRAVEL
	(OL), ORGANIC SILT
	(OH), ORGANIC CLAY
	FILL

SAMPLING SYMBOLS

	SHELBY TUBE (3" OD except where noted otherwise)
	SPLIT SPOON (2" OD except where noted otherwise)
	AUGER SAMPLE
	TEXAS CONE PENETRATION
	ROCK CORE (2" ID except where noted otherwise)

RELATIVE DENSITY OF COHESIONLESS SOILS (blows/ft)

VERY LOOSE	0 TO 4
LOOSE	5 TO 10
MEDIUM	11 TO 30
DENSE	31 TO 50
VERY DENSE	OVER 50

SHEAR STRENGTH OF COHESIVE SOILS (tsf)

VERY SOFT	LESS THAN 0.25
SOFT	0.25 TO 0.50
FIRM	0.50 TO 1.00
STIFF	1.00 TO 2.00
VERY STIFF	2.00 TO 4.00
HARD	OVER 4.00

RELATIVE DEGREE OF PLASTICITY (PI)

LOW	4 TO 15
MEDIUM	16 TO 25
HIGH	26 TO 35
VERY HIGH	OVER 35

RELATIVE PROPORTIONS (%)

TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	36 TO 50

PARTICLE SIZE IDENTIFICATION (DIAMETER)

BOULDERS	8.0" OR LARGER
COBBLES	3.0" TO 8.0"
COARSE GRAVEL	0.75" TO 3.0"
FINE GRAVEL	5.0 mm TO 3.0"
COURSE SAND	2.0 mm TO 5.0 mm
MEDIUM SAND	0.4 mm TO 5.0 mm
FINE SAND	0.07 mm TO 0.4 mm
SILT	0.002 mm TO 0.07 mm
CLAY	LESS THAN 0.002 mm

**CITY OF LEWISVILLE
PRE-BID
RFB #26-55-C Pre-Bid Meeting
11:00 A.M., Wednesday, February 18, 2026**

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7	~~Marcus Gallegos~~	~~—————~~	~~—————~~	~~—————~~
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