



## **SCOPE OF CIVIL ENGINEERING SERVICES**

### **PROJECT DESCRIPTION**

The project includes stabilization of two sections of streambank along Tributary G-1 of Grapevine Creek in Coppell, Texas. Erosion has been observed along the south bank of the creek at two locations where it passes behind houses. Additionally, Walter P Moore (WPM) will provide an assessment of an approximately 1,400 linear foot section of the stream through Hunterwood Park and identify other deficiencies. Limits of study are shown in Exhibit 1. Should the City of Coppell (CITY) wish to include design of additional repair recommendations, additional services will be required.

The scope of services for this project will generally be to provide surveying, structural design, grading plan, cost estimates, erosion control and prepare construction plans, details and special specifications and bidding documents required for construction of these improvements. Limited construction phase services are also included in the project services.

### **BASIC SERVICES**

#### **I. Schematic and Preliminary Engineering Design**

##### **A. Project Management and Oversight**

1. Provide Project Management services including project coordination and communications with CITY, subconsultant coordination, monthly status updates, and maintaining a project schedule, assuming a 180 (calendar) day task order duration.
2. Attend meetings with CITY which will include the project kickoff and 60% design review.
3. QA/QC – Perform internal review of 30% and 60% submittals.

##### **B. Data Collection**

1. Site Visits – Perform engineering field visit for the project location during development of design.
2. Existing Data Review - coordinate with CITY staff to obtain record documents, as-builts, utility plans, street plans, plats, existing easement information, and the like for the project area.

##### **C. Schematic Design Plans (30%)**

1. Provide a schematic plan view of the improvements needed to correct erosion and to stabilize the channel. Determine general dimensions of the heights and lengths of the improvements.
2. Provide an initial construction cost estimate of the improvements for budgetary purposes.

**D. Preliminary Design (60%)**

**1. Prepare Preliminary Plans**

- a) Establish preliminary horizontal and vertical alignment of repairs.
- b) Prepare cross-sections of proposed erosion protection indicating the general orientation of the improvements with respect to the channel.
- c) Establish design concepts for repair of areas of poor drainage and erosion.
- d) Locate utility crossings, adjacent utilities, and other improvements within a limit of twenty feet beyond the proposed improvement at each site.
  - (1) Contact franchise utility companies such as gas, telephone, cable TV, and electricity to obtain record information for horizontal and vertical data for their facilities. Identify which utilities must be protected or relocated.
  - (2) Tie locations of exposed utilities to the local control network. When underground utilities are uncovered, tie locations to the local control network.
- e) Establish preliminary easement needs including permanent and temporary construction easements. Show all existing easements on the plans.
- f) Document and photograph current channel conditions and identify potential locations of construction access and staging.

- 2. Prepare a preliminary opinion of probable cost for the proposed solution. The purpose of the opinion is to confirm that the project is in general accordance with the construction budget. It is not a guarantee of the construction cost.
- 3. Submit to CITY two sets of preliminary plan drawings. 60% plans submittal will contain Cover Sheet, Temporary Erosion Control and Tree Protection, General Notes, Typical Details, Plan, and Sections of the proposed structure.
- 4. Meet with CITY to review and discuss the preliminary plan drawings and engineering comments.
- 5. Distribute one set of preliminary drawings to local utility companies to obtain information regarding impacts to their facilities.

- E. H&H Modeling and Documentation** – A section of this project is located in a FEMA Zone AE floodplain and floodway of Tributary G-1 of Grapevine Creek. The second section of the project is located in the Zone A floodplain of Tributary G-1. It is anticipated that an effective hydraulic model is available for use as a base for the FEMA Zone AE section. The purpose of hydraulic modeling shall be limited to evaluating the impacts of the proposed project. The study area is shown in Exhibit 2.

1. Data Collection

- a) Obtain topographic LiDAR data to supplement field survey.
- b) Obtain effective hydraulic model from CITY. If unavailable, WPM will complete FEMA library request form on behalf of CITY for CITY to submit to FEMA.
- c) Obtain City hydraulic and hydrologic models for the approximately 2,500 linear foot FEMA Zone A section of Tributary G-1 of Grapevine Creek, to be incorporated into a single model with the proposed improvements under this scope of services.

2. Existing Conditions

- a) Using the effective model as a base, develop an existing conditions model to create a base for evaluating proposed channel improvements. No changes to hydrology are anticipated. Topographic survey and most recently available LiDAR data will be used to create the model as follows:
- b) Extend the effective model upstream approximately 2,500 feet through the FEMA Zone A floodplain by incorporating the City hydraulic model.
- c) Update effective model cross-sections through the study area.
- d) Place additional cross-sections as necessary in the extents of the effective model.

3. Proposed Conditions

- a) Using the existing conditions model as a base, update cross-section geometries to reflect preliminary proposed design. It is anticipated that no changes to hydrology will be required.
- b) Execute proposed conditions (multiple profile and floodway) models.
- c) Coordinate with Civil Engineer on necessary modifications to the proposed design to arrive at a final engineering design.
- d) Update the proposed conditions HEC-RAS models to confirm that the channel improvements do not adversely affect stream hydraulics (100-year water surface elevation, valley storage, or stream velocities).

4. Documentation & Review

- a) Provide a memo documenting that the proposed project does not adversely affect stream hydraulics. The report will include a written narrative and summary output tables.
- b) Provide hydraulic workmap exhibits showing existing and proposed floodplains.
- c) Respond to comments from CITY.

## **II. Final Engineering Design**

### **A. Project Management and Oversight**

1. Provide Project Management services including project coordination and communications with CITY, subconsultant coordination, monthly status updates, and maintaining a project schedule, assuming a 180 (calendar) day task order duration.
2. Attend meetings with CITY which will include the 90% design review.
3. QA/QC – Perform internal review of 90% and 100% submittals.

### **B. Final Design (90% and 100% Sealed Submittals)**

1. Meet with CITY to discuss the preliminary design submittal and incorporate comments from into final design plans.
2. Finalize plan for proposed improvements.
3. Revise preliminary plans and incorporate comments from CITY.
4. Incorporate comments from the utility companies. If necessary, coordinate with utility companies to locate and uncover utilities which conflict with the proposed erosion control structure. Tie the location of uncovered utilities to the local control network.
5. Incorporate standard details into the plans and prepare additional details as required.
6. Prepare final technical specifications for the erosion control structures.

### **C. Revise the quantity estimate and prepare a revised estimate of probable construction cost based on the final design of the project.**

### **D. Update hydraulic model and documentation to reflect final design.**

### **E. Assist in preparing final bid documents. CITY will provide standard contract documents for preparation of the project manual. The following information to be supplied by the Engineer shall include:**

1. One copy of the finalized technical specifications.
2. Project specific information for use with CITY standard construction agreement form, including the notice to contractors, bid proposal and contract bid schedule forms.
3. One set of blackline prints of final drawings and one electronic set of final drawings for Purchasing.

- F. Meet with homeowners and/or property owners at prospective construction access locations. Coordinate between owners and CITY regarding this access and CITY preparation of temporary access and construction easements, if required. Engineer will provide the Contractor and CITY with site access information and agreement concepts.
- G. Provide necessary Storm Water Pollution Prevention Concept Plans in accordance with CITY requirements.

### **III. Construction Administration**

- A. The Engineer will assist CITY in the advertisement for bids--prepare Notice to Bidders for required newspaper advertising --and place notice with Texas Contractor magazine and Dodge Report.
- B. Attend the pre-bid conference.
- C. Attend the bid opening and provide tabulation and analysis of the bids received and furnish recommendations on the award of the contract or the appropriate action to be taken by CITY.
  - 1. Evaluate the lowest and second lowest bidder. Bid evaluation will include the contractor's:
    - a) Past work history
    - b) Financial resources
    - c) Physical resources to produce the project
  - 2. Provide a summary of the bid analysis to CITY for use in selection and award of the construction project.
- D. Assist CITY staff in conducting one pre-construction conference with the Contractor.
- E. Assist CITY in arranging for testing of materials and laboratory control during construction, which is to be conducted at CITY's expense.
- F. Perform two site visits to the site each month (maximum of 6 total visits) to observe the progress and the quality of work and to attempt to determine if the work is proceeding in accordance with the Contract Documents. If the Engineer is requested to visit the site more frequently, the requested visits shall be considered an Additional Service. In performing the services above, the Engineer will endeavor to protect CITY against defects and deficiencies; however, it is understood that the Engineer does not guarantee the Contractor's performance, nor is the Engineer responsible for supervision of the Contractor's operation and employees. The Engineer shall not be responsible for the acts or omissions of any person at the Project sites or otherwise performing any of the work of the Project.
- G. Review concrete mix design, samples, catalog data, shop drawings, laboratory tests, shop mill tests of material and test equipment and other submittal information to assure conformity with construction plans. Provide written responses to requests for information or clarification.

- H. Attend coordination meetings with contractors, inspection personnel, and City representatives.
- I. The Engineer will, with assistance from CITY Inspector on the project(s), prepare and process monthly and final pay requests from the Contractor(s) to CITY.
- J. Interpret intent of the drawings and technical specifications for CITY and the Contractor. Respond to contractor's verbal technical questions.
- K. Conduct, in company with CITY representative, a final review of the Project for conformance with the design concept of the Project and general compliance with the Contract Documents.
- L. Revise the construction drawings in accordance with the information furnished by construction Contractor reflecting the changes in the Project made during construction. The Engineer shall submit one set of "as-builts" to the Engineering Inspector for review and approval. Upon approval, CITY shall have the drawings processed in the following quantities and formats:
  - 1. One set of 22" x 34" mylar plans ready for microfilming shall be submitted to the Engineering Department from Design Engineer.
  - 2. Updated digital files of the new construction for use in CITY computerized mapping system.
- M. Prepare FEMA Letter of Map Revision (LOMR) Submittal. The LOMR will include the two wall segments designed under Basic Services of this scope as well as the City's model of the currently FEMA Zone A section of Tributary G-1 of Grapevine Creek. This scope and fee assumes that construction will be completed and LOMR application will be submitted to FEMA within 24 months of notice to proceed.
  - 1. Review record drawings of the constructed improvements to ensure general conformance with proposed conditions.
  - 2. Based on review of record drawings, update the hydraulic model as needed to create the post-project conditions model.
  - 3. Provide a written report on the post-project conditions, including all tables, exhibits and forms required for submittal to FEMA to request a Letter of Map Revision (LOMR). FEMA review fees will be paid by Walter P Moore to be reimbursed by CITY. A budgetary amount of \$8,000 is recommended.
  - 4. Submit the LOMR package to CITY for approval. One (1) round of comments is anticipated.
  - 5. Submit the LOMR package to FEMA for approval. Two (2) rounds of comments are anticipated.

## **SPECIAL SERVICES**

**I. Field Survey** – WPM will contract with PJB Surveying for these services. Each location shall include as follows:

- A. Establishment of two (2) Control Points. Control Points shall be located at stable locations and outside of the anticipated construction area(s). Control Points shall reflect Horizontal and Vertical Control Data. Each Control Point shall include a sketch of location, Horizontal & Vertical Data.
- B. Provide sufficient Field reconnaissance and Office research to recover the general limits of private property, easements, and right-of-way lines in and around the project area.
- C. Topographic survey to capture features along creek in areas of erosion as outlined on Exhibit 1. Sufficient data shall be collected to create one-foot contours. Features shall include but not be limited to:
  - 1. Center, toe and top of bank of channel at 50-foot cross sections. Intermediate cross-sections may be necessary to reflect changes in course.
  - 2. Limits of gabion mattresses and other erosion prevention improvements (rip-rap, energy dissipaters, etc.), if applicable.
  - 3. Location(s) of erosion within creek.
  - 4. Headwalls and other drainage structures
  - 5. Visible utilities, including but not limited to, manholes, valves, blowoffs, utilities markers.
  - 6. Walls

**II. Geotechnical Engineering** – WPM will contract with Reed Engineering for these services.

- A. Field Investigation – Considering the type of structures and anticipated site geology, it is recommended subsurface conditions be evaluated with four sample borings drilled with portable, hand-held drilling equipment. Borings will be extended to the limiting depth of the equipment. Boring depths of 15 feet are estimated for the purposes of this proposal. Borings will be sampled continuously to completion. Samples of cohesive soils will be obtained using three-inch diameter pushed tubes. Observations will be made in the open borings subsequent to drilling to evaluate ground water conditions. Borings will be backfilled with drill cuttings at the completion of field operations.
- B. Laboratory Investigation – Samples will be visually classified in accordance with the Unified Soil Classification System (USCS). Each type of cohesive soil will be evaluated for consistency by use of a pocket penetrometer test. Selected samples will be subjected to classification tests and tests to evaluate strength and deformation characteristics. Anticipated classification tests consist of Atterberg Limits, moisture content, and partial grain size determinations. Strength and deformation will be evaluated by use of unconfined compression tests.

- C. Engineering Services – The results of the field and laboratory investigations will be evaluated and presented with recommendations in a bound report. The report will address the following:
  - 1. Description of the soil and ground water conditions as they relate to the performance and construction of the project.
  - 2. Foundation recommendations, if applicable.
  - 3. Lateral loads for design of the retaining structures.
  - 4. Recommendations for design of permanent soil nails, including allowable pull-out.
  - 5. Earthwork and testing recommendations.

**III. USACE Section 404 Permitting** – WPM will contract with VRX for these services.

- A. Delineations of the boundaries of WOTUS will be conducted within the approximate City of Coppel Hunterwood Park Erosion project area as shown on Exhibit 1.
  - 1. VRX will perform a field investigation of the proposed project areas to determine the extent of observed WOTUS. VRX will follow the 1987 U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual and March 2010 USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual to delineate wetlands, other regulations (e.g., 33 CFR 328.3(e)), guidance to delineate non-wetland WOTUS.
  - 2. WOTUS will be demarcated in the field using pin flags and paint markings. It is assumed that these features will be mapped by Walter P Moore survey crews.
  - 3. Observations on adjacent properties will be noted where feasible.
- B. Waters of the U.S. Delineation Report – Information gathered during the delineation will be incorporated into the Waters of the U.S. Delineation Report. This report will be prepared in accordance with USACE guidelines and shall include the following:
  - 1. General purpose statement regarding the jurisdictional determination.
  - 2. Methods Used:
    - a) Description of the approach used to delineate wetlands and other WOTUS.
    - b) Description of the conventions used to map the limits of WOTUS.



3. Results of the Delineation:
  - a) Vicinity map depicting the locations of the sites and showing the limits of the site investigated.
  - b) Approximate size of areas evaluated for WOTUS.
  - c) Name and characterization of the nearest waterway.
  - d) Description of physical features of the properties.
  - e) Information on existing site conditions for present and past land uses.
  - f) Characterization of hydrology.
  - g) Identification of named waterways.
  - h) Characterization of vegetative communities and dominant species.
  - i) Characterization of soils.
  - j) Description of riparian or upland buffer features.
  - k) Photographs with the date that the photos were taken.
  - l) 100-year floodplain map with project area defined.
  - m) Aerial photograph with project areas defined.
  - n) USGS 7.5-minute topographic quad with project areas defined.
4. Conclusions:
  - a) Description of size/dimensions of WOTUS, such as linear feet and approximate distance between ordinary high-water marks for open waters (streams).
  - b) Map depicting potential WOTUS with the type (e.g., forested wetland) within the project area.

- C. Impact Assessment & Permitting Scenario Letter – VRX will review design plans provided by Walter P. Moore to evaluate impacts to WOTUS, as identified and delineated in the Waters of the U.S. Delineation Report. VRX will calculate impact acreages and provide appropriate Section 404 permitting scenarios. The particular type of permit will be determined as design plans are developed. A letter will be provided addressing the impacts assessment and the permit scenario for the project.

#### ADDITIONAL SERVICES

Additional Services to be performed by Engineer, if authorized by CITY, which are not included in the above-described basic services, are described as follows:

- A. Assisting CITY with public meetings or hearings to inform residents;
- B. Performing title searches and examination of deed records;
- C. Preparing applications and supporting documents for government grants, loans, or planning advances and providing data for detailed applications;
- D. Providing full time site inspection during construction of the project;
- E. Performing designs for trench safety and retaining walls, etc. which are not included in the above Scope of Services;
- F. Revisions to plans as result of revisions after completion of original final design (unless to correct error on original plans);

- G. Appearing before regulatory agencies or courts as an expert witness in any litigation with third parties or condemnation proceedings arising from the development or construction of the Project, including preparation of engineering data and reports for assistance to CITY;
- H. Assisting CITY in claims disputes with the Contractor(s);
- I. Assisting CITY in the defense or prosecution of litigation in connection with or in addition to those services contemplated by this Agreement. Such services, if any, shall be furnished by Engineer on a fee basis negotiated by the respective parties outside of and in addition to this Agreement;
- J. Providing environmental support services including the design and implementation of ecological baseline studies, environmental monitoring, impact assessment and analyses, permitting assistance other than listed in the above Scope of Services, and other assistance required to address environmental issues;
- K. Any Corps of Engineers work including but not limited to wetlands delineation, meetings with the Corps of Engineers staff, wetlands mitigation, or any other work not listed in the Scope of Services;
- L. Attending homeowners and/or Council meetings including preparation of all displays, reports, or other data for use at such meetings;
- M. Preparation of plans and/or specifications related to the relocation of utilities;
- N. Fees for permits and advertising;
- O. Flood plain reclamation plans;
- P. Consulting services by others not included in proposal;
- Q. Inspection and testing services during construction;
- R. Preparation and processing monthly or final construction pay estimates.

**City of Coppel**  
**Tributary G-1 of Grapevine Creek Channel Stabilization**  
**Fee Schedule**

FEE SCHEDULE	Basic Services	Special Services
30% Submittal		
Project Management (Cost Estimate, Meetings, QC, etc.)	\$5,500	
Schematic Design	\$14,900	
Schematic Drafting	\$3,400	
60% Submittal		
Project Management (Cost Estimate, Meetings, QC, etc.)	\$5,500	
Preliminary Design	\$9,800	
Preliminary Drafting	\$3,400	
Hydraulic Modeling & Memo	\$28,700	
90% Submittal & 100% Sealed Submittal		
Project Management (Cost Estimate, Meetings, QC, etc.)	\$9,000	
Final Design	\$12,700	
Final Drafting	\$2,200	
Hydraulic Modeling & Memo	\$3,000	
Construction		
Project Management (Meetings, Submittal Reviews, etc)	\$6,900	
As-Builts	\$800	
Site Visits	\$1,300	
Final Walk Through	\$800	
LOMR Preparation & Submittal	\$34,900	
Special Services		
Geotechnical Study		\$8,000
Topographic Survey		\$9,500
Jursidictional Determination		\$10,140
Reimbursables		\$400
LOMR Submittal Fee (budgetary recommendation)		\$8,000
<b>TOTAL FEE</b>	<b>\$142,800</b>	<b>\$36,040</b>

FEE SUMMARY	Basic Services	Special Services
Schematic Engineering	\$23,800	
Preliminary Engineering	\$47,400	
Final Engineering	\$26,900	
Construction Admin	\$44,700	
Geotechnical Study		\$8,000
Topographic Survey		\$9,500
Jursidictional Determination		\$10,140
Reimbursables		\$400
LOMR Submittal Fee (budgetary recommendation)		\$8,000
<b>TOTAL FEE</b>	<b>\$142,800</b>	<b>\$36,040</b>



# Hunterwood Park

Channel Erosion





# National Flood Hazard Layer FIRMMette



97°0'41"W 32°57'35"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

97°0'3"W 32°57'5"N

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **10/13/2023 at 4:40 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

**City of Coppell**  
**Tributary G-1 of Grapevine Creek Channel Stabilization**  
**Design Schedule**

