

EXHIBIT B - WORK ORDER

MAPS # 2016-1066

MAPS DATE: 01/20/2017

CONSULTANT
NAME

Pacheco Koch Consulting Engineers, LLC

Pursuant to and subject to the referenced Master Agreement for Professional Services (MAPS), between the Town of Little Elm, Texas ("Owner"), and Consultant, Owner hereby requests that Consultant perform, and Consultant agrees to perform, the work described below upon the terms set forth in said MAPS and in this Work Order:

Work Order #: 7

Consultant Project #: 007

Project Name: Hill Lane Drainage Improvements

INVOICE SUBMITTAL

Billing Period:	Monthly-Through the end of each month, billed by the 10th of the following month.
Invoice Mailing Instructions:	<div>Mail to: Town of Little Elm Accounts Payable 100 W. Eldorado Pkwy. Little Elm, TX 75068</div> <div>Email to: accounts.payable@littleelm.org</div> <div>Include work order number, PO number, billing period, and project name,</div>

OWNER OPTIONAL INFORMATION:

1. **Work Site:** Consultant Offices unless otherwise stated.
2. **Work to be performed:** All work shall be in accordance with the scope listed below and as listed in the Master Agreement for Professional Services.
3. **Drawings / Plans are not attached.**
4. **Date and Time to Commence:** Upon Receipt of Purchase Order and Sign Work Order.
5. **Other:**

CONSULTANT PROVIDED INFORMATION:

1. **Scope of Work:** See Exhibit C
2. **Time Line:** See Exhibit C
3. **Compensation:** See Exhibit D

ACCEPTANCE:

This Work Order is accepted on the terms set forth herein and in the MAPS referenced above, as indicated by the signatures below.

TOWN OF LITTLE ELM**CONSULTANT**

Matthew Mueller, Town Manager

Signature

Brian D. O'Neill, PE, CFM, Director Public
Infrastructure

Printed Name & Title

Date

Date

EXHIBIT C

SPECIAL ENGINEERING SERVICES FOR HILL LANE DRAINAGE IMPROVEMENTS

The project will include:

- Drainage Analysis of existing channel
- Design of Drainage Improvements of channel
- Environmental Pre-Construction Services
- Geotechnical Engineering of existing channel
- Topographic Survey of existing channel
- Preparing Easement Documents

The scope of work for Special Engineering Services involves Preliminary and Final Design, Project Plans, Specifications and Estimates on Channel. Plan sheets will be added to the Hill Lane Paving Improvements project.

I. DRAINAGE ANALYSIS AND DESIGN SERVICES

In conjunction with the Hill Lane Paving Improvements Project (PROJECT), there is the need for analysis and design of an earthen drainage channel diversion from Lonesome Dove Road to W. Dickson Lane (Approx. 1,200 LF) west of Hill Lane. The channel will be sized and designed to handle diverted flow from Hill Lane to meet current Town of Little Elm drainage criteria.

A. Hydrologic, Hydraulic and Erosion Analyses:

1. The CONSULTANT will conduct a field visit to walk existing drainage channel from Lonesome Dove Road to W. Dickson Lane to observe and photograph existing conditions.
2. The CONSULTANT will perform hydrologic calculations to determine existing and proposed design discharges to the earthen drainage channel diversion from Lonesome Dove Road to W. Dickson Lane (Approx. 1,200 LF) west of Hill Lane.
3. The CONSULTANT will prepare a hydraulic model for existing and proposed channel conditions to evaluate the existing channel capacity and conceptually size the proposed channel to convey the design discharges.
4. The CONSULTANT will perform an erosion assessment of the proposed channel. The hydraulic model will be used to aid in determining maximum allowable shear stress and channel velocity for potential erosion protection improvements.
5. CONSULTANT will perform QA/QC of existing conditions analyses.

B. Preliminary (60%) Design Plans and Specifications

At such time as CONSULTANT is directed by OWNER, CONSULTANT shall prepare preliminary design plans, including a detailed demolition and protection plan sheets,

detailed plan and profile sheets for proposed channel improvements, quantity sheets, and construction details. Preliminary plans will be of sufficient detail for submission for franchise utility review. The requirements for preliminary plans will be in accordance with the Town of Little Elm Design Criteria Standards. An updated preliminary opinion of probable construction cost for proposed capital improvements will be submitted. The CONSULTANT will perform QA/QC of preliminary plans. A preliminary plans review meeting and project walkthrough with the OWNER will be conducted. Preliminary plans must be approved by OWNER prior to CONSULTANT commencing with the preparation of final design plans.

C. Final (90% and 100%) Design Plans and Specifications

Upon acceptance of preliminary plans by the City, the Engineer shall prepare final design plans and specifications. Final plans shall be consistent with previous sections and shall include: Right-of-way plans and documents, final construction plans, erosion control, traffic control and project phasing sheets, bid proposal and special specifications as required. An updated final opinion of probable construction cost for proposed capital improvements will be submitted. The CONSULTANT will perform QA/QC and constructability review of final plans.

II. ENVIRONMENTAL – PRE-CONSTRUCTION SERVICES

A. Onsite Wetland Delineation and Wetland Delineation Report

CONSULTANT will field delineate the boundaries of wetlands and waterways in the field using the routine determination method set forth in the Corps of Engineers Wetlands Delineation Manual (U.S. Army Corps of Engineers, 1987) and using the wetland determination data form provided in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the appropriate region. Delineated wetlands will be located via GPS in the field and classified according to Wetlands of the United States (U.S. Fish and Wildlife Service Circular 39; Shaw and Fredine, 1971) and Wetlands and Deepwater Habitats of the United States (FWS/OBS Publication 79/31; Cowardin *et al.*, 1979). Drainages within the Delineation Area will be considered non-wetland Water of the United States (WOTUS), as they may not exhibit all parameters required for wetlands (i.e., predominance of hydrophytes, hydric soils, and jurisdictional hydrology). Accordingly, their boundaries will be delineated in the field by documenting their Ordinary High-Water Marks (OHWMs), as determined according to the USACE Regulatory Guidance Letter No. 05-05 (U.S. Army Corps of Engineers 2005).

CONSULTANT will prepare a written report and wetland boundary map to describe the wetlands and summarize the soils, vegetation, and hydrology observed in the field. The report will include text, data forms, and supporting maps. CONSULTANT will submit the report in digital (PDF) format to regulatory agencies. The report will include the appropriate application forms and supporting exhibits to request to request a Boundary Confirmation from the U.S. Army Corps of Engineers (USACE), which regulates the discharge of

dredged or fill material into Waters of the United States under Section 404 of the Clean Water Act.

If required by the USACE, CONSULTANT will coordinate with agencies and arrange an onsite meeting and field visit to review the wetland delineation and request agency concurrence under the federal wetland regulatory program. One CONSULTANT staff member will attend the agency field review/concurrence meeting.

WETLAND DELINEATION ASSUMPTIONS

1. The delineation will include a 200-foot either side of channel corridor along 1,714 linear feet of channel located north of West Dickenson Lane, extending north to Hill Lane in Little Elm, Texas.
2. Weather conditions will not prevent soils, hydrology, and vegetation from being properly analyzed.
3. The U.S. Army Corps of Engineers will not request additional documentation to support their review.
4. Delineated boundaries will be located using a sub-meter GPS unit, traditional survey of wetland boundaries can be completed, if needed, under a separate task.
5. No additional intensive hydrologic studies, or mapping of subsurface drain tile will be required.
6. Not more than one site visit will be necessary to gain agency acceptance of the delineated wetland boundary, and the wetland boundaries will be accepted by regulatory agencies with only minor changes.
7. OWNER will pay all applicable application fees.

B. USACE Approved Jurisdictional Determination Request

If the stream is ephemeral and likely not a Waters of the US, at the request of the OWNER, CONSULTANT will prepare and submit an Official Jurisdictional Determination (JD) memo with supporting data to the USACE. This official JD will include a copy of the Wetland Delineation Report and a memo summary of the wetlands and watercourses in the project area. CONSULTANT will include all wetlands and watercourses delineated for the project. CONSULTANT will include their opinion of the Jurisdictional Status of each wetland and watercourse and supporting mapping and information.

AJD REQUEST ASSUMPTIONS

1. CONSULTANT will submit the AJD request using most recently available USEPA issued guidance on AJD determinations and if it is determined that the project is likely to contain non-jurisdictional Waters of the US.

C. Pre-Application Meeting with USACE

CONSULTANT will submit the Wetland Delineation Report drafted in Task 1 above, along with a cover memo requesting the AJD and assignment of a Project Manager in Task 2

above and a request to set up a Pre-Permitting meeting to the Fort Worth District of the USACE. CONSULTANT will schedule and attend and provide technical support at the Permitting Pre-Application Meeting with the U.S. Army Corps of Engineers. CONSULTANT will prepare and provide an agenda for the meeting and all exhibits needed for the meeting. This meeting will be to review the potential permitting required for the proposed impacts onsite.

D. Non-Reporting Nationwide Permitting Memo (If Needed)

Given the drainage and linear water feature that exists within the project area, CONSULTANT assumes that some wetlands and/or watercourses impacts will be unavoidable, requiring potential consultation and permitting through the USACE. If the project will require only minor amounts of wetland fill for construction, channel modification and road crossings, the project will likely qualify as non-reporting under Nationwide Permits 3, 13, or 14 (i.e., No Pre-Construction Notification required).

CONSULTANT will quantify wetland impacts for the project. For purposes of this work scope, CONSULTANT has assumed that no permanent fill over 1/10th acre per impact will be necessary to ensure the project will not require pre-construction notification to the USACE. CONSULTANT will confirm that the proposed project impacts to wetlands and waters fall below pre-construction notification thresholds under the appropriate Nationwide Permit. CONSULTANT will prepare the necessary report and supporting documents for OWNER to adequately document these findings but will not submit the information to the U.S. Army Corps of Engineers unless specifically requested by the OWNER. We have assumed only one iteration of wetland impact assessment will be needed and that detailed functional assessment of wetlands will not be necessary.

Assumptions:

- There will be no coordination with the USACE to confirm applicability of the No PCN assumption under Section 404 of the Federal Clean Water Act.
- CONSULTANT will rely on the Wetland Delineation Report, the T&E Survey Report and the Field Cultural Resources Survey for the No-PCN memo and will not complete any coordination with the U.S. Army Corps of Engineers or the USFWS for the project.

Deliverables:

CONSULTANT will provide one draft of the Memo to OWNER for review and comment. The Memo will then be finalized based on OWNER's comments.

The Memo and supporting documentation will be provided in Word and PDF format; hard copies may be provided upon request.

E. U.S. Army Corps of Engineers Pre-Construction Notification Package Submittal

As CONSULTANT understands the project, a segment of a watercourse is proposed to be impacted for stormwater management and conveyance on this site. If the watercourse is

determined to be a Jurisdictional Water of the U.S., Nationwide Permit 43 covers Waters of the US impacts for Stormwater Management Facilities up to ½ acre. Under Nationwide Permit 43, any impact on the project will require Pre-Construction Notification. Mitigation is also required for any watercourse impacts exceeding 3/100th of an acre (1,306 square feet) and for any wetland impacts exceeding 1/10th of an acre (4,356 square feet). CONSULTANT has assumed that the project will require only minor amounts of wetland fill for site development (less than 0.5-acre).

CONSULTANT will prepare a package that meets the requirements for Pre-Construction Notification to the Fort Worth District of the US Army Corps of Engineers under the Federal Clean Water Act. CONSULTANT will prepare the wetland application narrative and supporting exhibits. The Pre-Construction Notification Package to the USACE will include:

- A completed US Army Corps of Engineers Nationwide Permit Pre-Construction Notification (PCN) 43 form as required by the Fort Worth District,
- A Project Description, including proposed activity, name of impacted waters, location,
- A Wetland Boundary Map showing existing wetland sizes and classifications,
- A Grading Plan depicting areas of wetland fill/excavation,
- Other exhibits, including a site location map, soils mapping.
- A TX RAM Stream Assessment will be completed for the watercourse.
- A wetland sequencing narrative (alternatives, wetland avoidance, impact minimization), and
- Tables summarizing wetland fill and replacement area(s).

Schedule:

The Pre-Construction Notification Package can be provided within 20 business days of receiving the project layout and associated GIS shapefiles.

Assumptions

1. A Pre-Application meeting with the USACE will be completed for the project.
2. A final layout with all proposed infrastructure will be available at the time CONSULTANT begins work on the permitting application, and the layout (and waters impacts) will not change during application preparation and following submittal to the Corps.
3. If wetland mitigation is required, agencies will agree to purchasing wetland and/or stream credit replacement credits from an approved, off-site bank rather than constructing wetlands on-site. The wetland replacement will occur at an approved off-site location through the wetland bank program, and the cost of wetland banking credits, and any associated fees, will be paid by OWNER.
4. The project will not require extensive investigation of alternative replacement sites or suitable wetland banking locations.

5. The proposed site plan will not require more than 0.5-acre of wetland or watercourse impact.
6. A typical level of responses will be received during the comment period, which can be addressed in approximately 15 hours of staff time.
7. The OWNER will provide CONSULTANT with proof of property rights or ownership, and adjoining landowner contact information, if needed.
8. Time over and above the 10 planned hours for the preparation and coordination of wetland bank credit withdrawal documents to support the purchase of wetland credits from a certified wetland bank (if approved by agencies) will be completed on an additional, hourly basis.
9. OWNER will pay all application fees.

F. U.S. Army Corps of Engineers Individual Permit

If the project exceeds the allowable impacts under applicable Nationwide Permits, CONSULTANT will prepare an Individual Permit application package that meets the requirements of the Federal Clean Water Act. The wetland permit application will be submitted to the USACE, and other agencies that routinely review and comment on wetland replacement plans. Please note that the timing for approval of Individual Permit approvals can exceed 12 months. The Wetland Individual Permit Application required under the USACE will include:

- A completed USACE Individual Permit Application Form
- A Project Description,
- A Wetland/Watercourses Boundary Map showing existing wetland and watercourse sizes and classifications,
- A Grading Plan depicting areas of wetland fill/excavation,
- A Wetland Replacement Plan showing mitigation bank location and credits to be used,
- Other exhibits, including a site location map, soils mapping, and alternative design(s).
- A wetland sequencing narrative (detailed alternatives, wetland avoidance, impact minimization including multiple site layouts),
- A detailed onsite wetland avoidance analysis and a detailed off-site alternate sites analysis,
- Tables summarizing wetland fill and replacement area(s),
- Evidence of ownership or development rights from the applicant

CONSULTANT will coordinate a meeting to expedite the response to comments and issue resolution. This task includes telephone and email coordination, one comment response document, and one meeting attended by one CONSULTANT staff member. Because it is difficult to predict the number and complexity of potential agency comments to the permit application, responses to agency comments beyond the efforts noted above, will be billed on an additional, hourly basis.

Assumptions

1. Agencies will agree to purchasing wetland replacement credits from an approved, off-site wetland bank rather than constructing wetlands on-site.
2. The Fort Worth District of the U.S. Army Corps of Engineers will accept the permit application with few revisions.
3. The OWNER will provide CONSULTANT with proof of property rights or ownership, and adjoining landowner contact information, if needed.
4. All applicable application fees will be paid by OWNER.
5. Any detailed Cultural Resource Reviews and Threatened/Rare Species surveys required will be completed as separate scopes of work.
6. The OWNER will provide assistance in preparing the detailed off-site alternatives analysis required under an individual Permit.

G. Threatened, Rare and Endangered Species Survey

CONSULTANT will perform a desktop and field-based habitat assessment for the Project. The habitat assessment will provide information on habitat quality and types that may support species protected under the state Endangered Species Act (state ESA), federal Endangered Species Act (ESA) and Bald and Golden Eagle Protection Act (BGEPA ("T&E species"))

As such, prior to mobilization, this task includes obtaining a USFWS Information for Planning and Consultation (IPaC) report and Texas Natural Diversity Database (TNDD) natural heritage data for T&E species documented within the region and necessary for the permit.

The field work will primarily be focused on the Project Area, in which vegetative communities and landscape features such as drainages and washes, water impoundments, wetland areas, forests, and hillsides will be reviewed for their potential to support T&E species that appeared in the desktop-level review. Incidental wildlife sightings will also be documented.

A determination for probability of species occurrence (none, low, moderate, or high) will be made based on observed site conditions. Each species reviewed will conclude with a recommendation of need for further assessment of potential impacts from the proposed Project, as appropriate.

CONSULTANT will prepare a Wildlife Habitat Assessment memo. The report will include an introduction, methods, results, conclusions, tables, maps, list of special status species, and species risk factors. Exhibits will include landcover, land/water features, and habitats that may merit avoidance. The draft memo will be submitted to OWNER for review and comment. CONSULTANT will incorporate one round of OWNER comments into a final memo, and one electronic final report in PDF format will be provided to OWNER.

H. Cultural Resources Survey

This Survey will be carried out in support of a USACE non-reporting permit. Coordination with the USACE or THC will not be required, but methods will comply with appropriate agency guidelines.

While the Texas Historical Commission (THC) does not license or regulate historic preservation professionals, it does recommend that surveys be conducted by a qualified professional who meets the Secretary of the Interior's qualifications as outlined in 36CFR61. Mr. Joel Butler, who will serve as Principal Investigator for the project, meets these qualifications. He has over 20 years of archaeological and cultural resources experience. CONSULTANT routinely assists OWNERS in compliance with federal, state, and local cultural resource laws.

The scope of this work could be affected by the requirements of Section 106 of the National Historic Preservation Act of 1966 (NHPA), the National Environmental Policy Act (NEPA) and 36CFR800, procedures of the Advisory Council on Historic Preservation for the preservation of historic properties. Section 106 can be triggered if this Project is considered for federal assistance, requires a federal license or permit, or impacts land under federal jurisdiction. This Project is being carried out as an intensive survey conducted to satisfy requirements of General Condition 20 of a USACE Nationwide Permit (non-reporting) which is used to comply with Section 106 review.

Pre-field Preparation

CONSULTANT will check the Texas Archeological Sites Atlas to identify any sites already recorded in the Project vicinity and identify the types of sites that may be present.

Archaeological Fieldwork

CONSULTANT will mobilize archaeologists to carry out the survey. Fieldwork will be carried out to comply with General Condition 20 of a non-reporting USACE Nationwide Permit; should the Project come under THC or additional federal review (including USACE preconstruction notification or other reporting), additional coordination and/or fieldwork may be required.

Fieldwork will be carried out per THC guidelines and will consist of visual inspection of the entire Project supplemented with shovel testing in undisturbed areas. Any sites discovered will be shovel tested, recorded, and recommendations will be provided for their eligibility as National Register Properties. It is estimated that up to 10 tests will be excavated during fieldwork, plus additional tests should archaeological sites be encountered. Soils in the Project have archaeological potential to less than 80 cm and are not in an alluvial depositional environment, therefore, no backhoe or other deep testing is proposed.

Reporting

CONSULTANT will create a technical field survey report summarizing field findings, site descriptions, and recommendations (if necessary) for avoidance and/or further investigations. The report will be provided to the OWNER in digital format and, if requested, hard copy. Because the proposed Project is being undertaken for USACE non-reporting purposes, no federal or state agency coordination is proposed, but should satisfy USACE and THC requirements should the report be reviewed at a later date.

Assumptions

1. Field survey will take place in one mobilization.
2. The OWNER will obtain landowner access and inform CONSULTANT of any special concerns identified by the landowners.
3. Weather and general field conditions will be appropriate for work to proceed uninhibited.
4. CONSULTANT is not responsible for delays outside of their control including land access and weather/field conditions. Delays that occur once fieldwork has commenced may incur additional costs.
5. Backhoe trenching will not be carried out as part of this survey.
6. This scope assumes one archaeological site. Should additional sites be encountered, additional cost may be incurred.
7. This scope does not include NRHP/SAL testing, mitigation, or negotiations with USACE/THC for mitigation measures. Should the USACE and/or THC require further evaluations or mitigation, an additional scope and fee will be developed upon the OWNER's request.
8. It is assumed one round of edits to the report based on OWNER comments.

Compensation

Tasks 1-3 are a necessary first step to determine which of the permitting options 4-5 are needed. Tasks 7 and 8 are necessary to support permitting.

III. GEOTECHNICAL INVESTIGATION

- A. Through a qualified subcontractor, CONSULTANT will perform soil investigations, including field and laboratory tests, borings, related engineering analysis and recommendations for determining soil conditions will be made.
- B. Field and laboratory analysis will be made at reasonable intervals along the project alignment.
- C. Earthwork recommendations, construction considerations, and a global stability analysis will be prepared based on the results.

IV. TOPOGRAPHIC SURVEY

CONSULTANT will perform an on the ground survey of the property under the direct supervision of a Registered Professional Land Surveyor.

Included in this item:

- A. Location of permanent improvements on, and immediately adjacent to, the site.
- B. Spot elevations on a 50-foot grid.
- C. Contours on one-foot intervals.

- D. Top of curb and gutter elevations for paving on, and immediately adjacent to, the site.
- E. Locations, common name and trunk diameter of trees over #-inches in caliper or the outline of heavily wooded areas.
- F. Location of visible utilities and appurtenances.
- G. Location and sizes of underground utilities based on available record information.
- H. CONSULTANT will graphically plot, if any, the Special Flood Hazard Area from the Flood Insurance Rate Map (FIRM), published by Federal Emergency Management Agency (FEMA), for this area.
- I. Graphical depiction of site boundaries adjacent to the survey area based upon the current deed or plat. If the site is platted, we will graphically show easements defined on the plat. This depiction is approximate and the work does not include boundary research or review of found monumentation.

Not included in this item:

- A. Species names of trees.
- B. Trees less than #-inches in diameter.
- C. Tree locations and identification in heavily wooded areas.
- D. Boundary surveying.
- E. Research or review of easements that may affect the subject tract.
- F. Subsurface utility engineering services.
- G. Parking spaces in parking garages.
- H. Location of irrigation control valves.

V. TOPOGRAPHIC SURVEY

Based on a boundary survey of the site prepared by our office, Westwood will prepare separate instrument dedication documents for water, sanitary sewer, storm sewer, drainage, public utility, and/or franchise utility easements required as a part of development of the site.

Included in this item:

- A. Dedication statements, survey exhibits and metes and bounds descriptions for each easement.
- B. Coordination with City and/or franchise utility company staff for review and approval of each easement.
- C. Coordination with Owners attorney regarding preparation of "Front End" legal documents to be prepared by the attorney.

Not included in this item:

- A. Coordination with property owners.
- B. Monumentation of easement corners.
- C. Preparation of "Front End" legal documents (to be provided by Owner's attorney).

EXHIBIT D

COMPENSATION FOR SPECIAL ENGINEERING SERVICES FOR HILL LANE DRAINAGE IMPROVEMENTS

Consultant proposes to provide the services described above on a Fixed Fee basis for a total fee, inclusive of direct reimbursable costs, as follows:

Special Services

Drainage Analysis & Channel Design Services	\$ 50,000.00
Onsite Wetland Delineation	\$ 4,000.00
AJD Request	\$ 2,500.00
Pre-Application Meeting with USACE	\$ 3,500.00
Geotechnical Engineering	\$ 18,200.00
Design Survey	\$ 10,000.00
<u>Easement Documents (5 @ 2,500)</u>	<u>\$ 12,500.00</u>

TOTAL \$100,700.00

Special Services if needed

Non-Reporting Nationwide Permitting	
Permitting Memo	\$ 7,500.00
U.S. Army Corps of Engineers Pre-Construction	
Notification Package Submittal	\$ 8,500.00
U.S. Army Corps of Engineers	
Individual Permit Package Submittal	\$ 45,000.00
Threatened, Rare	
and Endangered Species	\$ 10,100.00
<u>Cultural Resources Survey</u>	<u>\$ 10,100.00</u>

TOTAL \$ 81,200.00

Please note that the fees above are based on the assumption that Consultant will perform the above services all together for this project. In the event any item is deleted from the scope of work, Consultant reserves the right to adjust the fees for other items as appropriate.