STATE OF TEXAS §
§
COUNTY OF FORT BEND §

AGREEMENT FOR PROFESSIONAL ENGINEERING SERVICES

THIS AGREEMENT is made and entered into by and between Fort Bend County, (hereinafter "County"), a body corporate and politic under the laws of the State of Texas, and Binkley & Barfield, Inc., (hereinafter "Contractor"), a company authorized to conduct business in the State of Texas.

WITNESSETH

WHEREAS, County desires that Contractor provide professional Schematic and Environmental Design, and the Plans, Specification, and Estimate Design Services for the FM 521 from SH 6 to the Brazoria County Line Project No. 17111 under the 2017 Mobility Bond Program (hereinafter "Services") pursuant to SOQ 14-025; and

WHEREAS, County has determined Contractor is the most highly qualified provider of the desired Services on the basis of demonstrated competence and qualifications, and County and Contractor have negotiated to reach a fair and reasonable amount of compensation for the provision of such Services, as required under Chapter 2254 of the Texas Government Code; and

WHEREAS, Contractor represents that it is qualified and desires to perform such services.

NOW, THEREFORE, in consideration of the mutual covenants and conditions set forth below, the parties agree as follows:

AGREEMENT

Section 1. Scope of Services

Contractor shall render the professional engineering services as described in Contractor's Proposal dated December 19, 2019, attached hereto as Exhibit A, and incorporated herein for all purposes.

Section 2. Personnel

2.1 Contractor represents that it presently has, or is able to obtain, adequate qualified personnel in its employment for the timely performance of the Scope of Services required under this Agreement and that Contractor shall furnish and maintain, at its own expense, adequate and sufficient personnel, in the opinion of County, to perform the Scope of Services when and as required and without delays.

2.2 All employees of Contractor shall have such knowledge and experience as will enable them to perform the duties assigned to them. Any employee of Contractor who, in the

opinion of County, is incompetent or by his conduct becomes detrimental to the project shall, upon request of County, immediately be removed from association with the project.

Section 3. Compensation and Payment

3.1 Contractor's fees shall be calculated at the rates set forth in the attached Exhibit A. The Maximum Compensation for the performance of Services within the Scope of Services described in Exhibit A is five million four hundred fifty-two thousand two hundred fifty dollars and no/100 ($5,452,250.00) as set forth in Exhibit A. In no case shall the amount paid by County under this Agreement exceed the Maximum Compensation without a written agreement executed by the parties.

3.2 All performance of the Scope of Services by Contractor including any changes in the Scope of Services and revision of work satisfactorily performed will be performed only when approved in advance and authorized by County.

3.3 County will pay Contractor based on the following procedures: Upon completion of the tasks identified in the Scope of Services, Contractor shall submit to County staff person designated by the County Engineer, one (1) electronic (pdf) copy of the invoice showing the amounts due for services performed in a form acceptable to County. County shall review such invoices and approve them within 30 calendar days with such modifications as are consistent with this Agreement and forward same to the Auditor for processing. County shall pay each such approved invoice within thirty (30) calendar days. County reserves the right to withhold payment pending verification of satisfactory work performed.

Section 4. Limit of Appropriation

4.1 Contractor clearly understands and agrees, such understanding and agreement being of the absolute essence of this Agreement, that County shall have available the total maximum sum of five million four hundred fifty-two thousand two hundred fifty dollars and no/100 ($5,452,250.00) specifically allocated to fully discharge any and all liabilities County may incur.

4.2 Contractor does further understand and agree, said understanding and agreement also being of the absolute essence of this Agreement, that the total maximum compensation that Contractor may become entitled to and the total maximum sum that County may become liable to pay to Contractor shall not under any conditions, circumstances, or interpretations thereof exceed five million four hundred fifty-two thousand two hundred fifty dollars and no/100 ($5,452,250.00).

Section 5. Time of Performance

Time for performance of the Scope of Services under this Agreement shall begin with receipt of the Notice to Proceed and end no later than December 31, 2022. Contractor shall complete the tasks described in the Scope of Services, within this time or within such additional time as may be extended by the County.

Section 6. Modifications and Waivers

6.1 The parties may not amend or waive this Agreement, except by a written agreement executed by both parties.

6.2 No failure or delay in exercising any right or remedy or requiring the satisfaction of any condition under this Agreement, and no course of dealing between the parties, operates as a waiver or estoppel of any right, remedy, or condition.

6.3 The rights and remedies of the parties set forth in this Agreement are not exclusive of, but are cumulative to, any rights or remedies now or subsequently existing at law, in equity, or by statute.

Section 7. Termination

7.1 Termination for Convenience – County may terminate this Agreement at any time upon forty-eight (48) hours written notice.

7.2 Termination for Default

7.2.1 County may terminate the whole or any part of this Agreement for cause in the following circumstances:

7.2.1.1 If Contractor fails to perform services within the time specified in the Scope of Services or any extension thereof granted by the County in writing;

7.2.1.2 If Contractor materially breaches any of the covenants or terms and conditions set forth in this Agreement or fails to perform any of the other provisions of this Agreement or so fails to make progress as to endanger performance of this Agreement in accordance with its terms, and in any of these circumstances does not cure such breach or failure to County's reasonable satisfaction within a period of ten (10) calendar days after receipt of notice from County specifying such breach or failure.

7.2.2 If, after termination, it is determined for any reason whatsoever that Contractor was not in default, or that the default was excusable, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the County in accordance with Section 7.1 above.

7.3 Upon termination of this Agreement, County shall compensate Contractor in accordance with Section 3, above, for those services which were provided under this Agreement prior to its termination and which have not been previously invoiced to County. Contractor's final invoice for said services will be presented to and paid by County in the same manner set forth in Section 3 above.

7.4 If County terminates this Agreement as provided in this Section, no fees of any type, other than fees due and payable at the Termination Date, shall thereafter be paid to Contractor.

Section 8. Ownership and Reuse of Documents

All documents, data, reports, research, graphic presentation materials, etc., developed by Contractor as a part of its work under this Agreement, shall become the property of County upon completion of this Agreement, or in the event of termination or cancellation thereof, at the time of payment under Section 3 for work performed. Contractor shall promptly furnish all such data and material to County on request.

Section 9. Inspection of Books and Records

Contractor will permit County, or any duly authorized agent of County, to inspect and examine the books and records of Contractor for the purpose of verifying the amount of work performed under the Scope of Services. County's right to inspect survives the termination of this Agreement for a period of four years.

Section 10. Insurance

10.1 Prior to commencement of the Services, Contractor shall furnish County with properly executed certificates of insurance which shall evidence all insurance required and provide that such insurance shall not be canceled, except on 30 days' prior written notice to County. Contractor shall provide certified copies of insurance endorsements and/or policies if requested by County. Contractor shall maintain such insurance coverage from the time Services commence until Services are completed and provide replacement certificates, policies and/or endorsements for any such insurance expiring prior to completion of Services. Contractor shall obtain such insurance written on an Occurrence form (or a Claims Made form for Professional Liability insurance) from such companies having Best's rating of A/VII or better, licensed or approved to transact business in the State of Texas, and shall obtain such insurance of the following types and minimum limits:

10.1.1 Workers' Compensation insurance. Substitutes to genuine Workers' Compensation Insurance will not be allowed.

10.1.2 Employers' Liability insurance with limits of not less than $1,000,000 per injury by accident, $1,000,000 per injury by disease, and $1,000,000 per bodily injury by disease.

10.1.3 Commercial general liability insurance with a limit of not less than $1,000,000 each occurrence and $2,000,000 in the annual aggregate. Policy shall cover liability for bodily injury, personal injury, and property damage and products/completed operations arising out of the business operations of the policyholder.

10.1.4 Business Automobile Liability insurance with a combined Bodily Injury/Property Damage limit of not less than $1,000,000 each accident. The policy shall cover liability arising from the operation of licensed vehicles by policyholder.

10.1.5 Professional Liability insurance may be made on a Claims Made form with limits not less than $1,000,000.

10.2 County and the members of Commissioners Court shall be named as additional insured to all required coverage except for Workers' Compensation and Professional Liability. All Liability policies including Workers' Compensation written on behalf of Contractor shall contain a waiver of subrogation in favor of County and members of Commissioners Court.

10.3 If required coverage is written on a claims-made basis, Contractor warrants that any retroactive date applicable to coverage under the policy precedes the effective date of the contract; and that continuous coverage will be maintained or an extended discovery period will be exercised for a period of 2 years beginning from the time that work under the Agreement is completed.

Section 11. Indemnity

CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS COUNTY AGAINST LOSSES, LIABILITIES, CLAIMS, AND CAUSES OF ACTION, INCLUDING THE REIMBURSEMENT OF COUNTY'S REASONABLE ATTORNEYS FEES IN PROPORTION TO CONTRACTOR'S LIABILITY, ARISING FROM ACTIVITIES OF CONTRACTOR, ITS AGENTS, SERVANTS OR EMPLOYEES, PERFORMED UNDER THIS AGREEMENT THAT RESULT FROM THE NEGLIGENT ACT, INTENTIONAL TORT, ERROR, OR OMISSION OF CONTRACTOR OR ANY OF CONTRACTOR'S AGENTS, SERVANTS OR EMPLOYEES.

Section 12. Confidential and Proprietary Information

12.1 Contractor acknowledges that it and its employees or agents may, in the course of performing their responsibilities under this Agreement, be exposed to or acquire information that is confidential to County. Any and all information of any form obtained by Contractor or its employees or agents from County in the performance of this Agreement shall be deemed to be confidential information of County ("Confidential Information"). Any reports or other documents or items (including software) that result from the use of the Confidential Information by Contractor shall be treated with respect to confidentiality in the same manner as the Confidential Information. Confidential Information shall be deemed not to include information that (a) is or becomes (other than by disclosure by Contractor) publicly known or is contained in a publicly available document; (b) is rightfully in Contractor's possession without the obligation of nondisclosure prior to the time of its disclosure under this Agreement; or (c) is independently developed by employees or agents of Contractor who can be shown to have had no access to the Confidential Information.

12.2 Contractor agrees to hold Confidential Information in strict confidence, using at least the same degree of care that Contractor uses in maintaining the confidentiality of its own confidential information, and not to copy, reproduce, sell, assign, license, market, transfer or otherwise dispose of, give, or disclose Confidential Information to third parties or use Confidential Information for any purposes whatsoever other than the provision of Services to County hereunder, and to advise each of its employees and agents of their obligations to keep Confidential Information confidential. Contractor shall use its best efforts to assist County in identifying and preventing any unauthorized use or disclosure of any Confidential Information. Without limitation of the foregoing, Contractor shall advise County

immediately in the event Contractor learns or has reason to believe that any person who has had access to Confidential Information has violated or intends to violate the terms of this Agreement and Contractor will at its expense cooperate with County in seeking injunctive or other equitable relief in the name of County or Contractor against any such person. Contractor agrees that, except as directed by County, Contractor will not at any time during or after the term of this Agreement disclose, directly or indirectly, any Confidential Information to any person, and that upon termination of this Agreement or at County's request, Contractor will promptly turn over to County all documents, papers, and other matter in Contractor's possession which embody Confidential Information.

12.3 Contractor acknowledges that a breach of this Section, including disclosure of any Confidential Information, or disclosure of other information that, at law or in equity, ought to remain confidential, will give rise to irreparable injury to County that is inadequately compensable in damages. Accordingly, County may seek and obtain injunctive relief against the breach or threatened breach of the foregoing undertakings, in addition to any other legal remedies that may be available. Contractor acknowledges and agrees that the covenants contained herein are necessary for the protection of the legitimate business interest of County and are reasonable in scope and content.

12.4 Contractor in providing all services hereunder agrees to abide by the provisions of any applicable Federal or State Data Privacy Act.

12.5 Contractor expressly acknowledges that County is subject to the Texas Public Information Act, TEX. GOV'T CODE ANN. §§ 552.001 *et seq.*, as amended, and notwithstanding any provision in the Agreement to the contrary, County will make any information related to the Agreement, or otherwise, available to third parties in accordance with the Texas Public Information Act. Any proprietary or confidential information marked as such provided to County by Consultant shall not be disclosed to any third party, except as directed by the Texas Attorney General in response to a request for such under the Texas Public Information Act, which provides for notice to the owner of such marked information and the opportunity for the owner of such information to notify the Attorney General of the reasons why such information should not be disclosed.

Section 13. Independent Contractor

13.1 In the performance of work or services hereunder, Contractor shall be deemed an independent contractor, and any of its agents, employees, officers, or volunteers performing work required hereunder shall be deemed solely as employees of contractor or, where permitted, of its subcontractors.

13.2 Contractor and its agents, employees, officers, or volunteers shall not, by performing work pursuant to this Agreement, be deemed to be employees, agents, or servants of County and shall not be entitled to any of the privileges or benefits of County employment.

Section 14. Notices

14.1 Each party giving any notice or making any request, demand, or other communication (each, a "Notice") pursuant to this Agreement shall do so in writing and shall use one of the following methods of delivery, each of which, for purposes of this Agreement, is a writing: personal delivery, registered or certified mail (in each case, return receipt requested and postage prepaid), or nationally recognized overnight courier (with all fees prepaid).

14.2 Each party giving a Notice shall address the Notice to the receiving party at the address listed below or to another address designated by a party in a Notice pursuant to this Section:

County:	Fort Bend County Engineering Department Attn: County Engineer 301 Jackson Street Richmond, Texas 77469
With a copy to:	Fort Bend County Attn: County Judge 401 Jackson Street, 1st Floor Richmond, Texas 77469
Contractor:	Binkley & Barfield, Inc. 1710 Seamist Drive Houston, Texas 77008

14.3 A Notice is effective only if the party giving or making the Notice has complied with subsections 14.1 and 14.2 and if the addressee has received the Notice. A Notice is deemed received as follows:

14.3.1 If the Notice is delivered in person, or sent by registered or certified mail or a nationally recognized overnight courier, upon receipt as indicated by the date on the signed receipt.

14.3.2 If the addressee rejects or otherwise refuses to accept the Notice, or if the Notice cannot be delivered because of a change in address for which no Notice was given, then upon the rejection, refusal, or inability to deliver.

Section 15. Compliance with Laws

Contractor shall comply with all federal, state, and local laws, statutes, ordinances, rules and regulations, and the orders and decrees of any courts or administrative bodies or tribunals in any matter affecting the performance of this Agreement, including, without limitation, Worker's Compensation laws, minimum and maximum salary and wage statutes and regulations, licensing laws and regulations. When required by County, Contractor shall furnish County with certification of compliance with said laws, statutes, ordinances, rules, regulations, orders, and decrees above specified.

Section 16. Standard of Care

Contractor represents shall perform the Services to be provided under this Agreement with the professional skill and care ordinarily provided by competent engineers practicing under the same or similar circumstances and professional license. Further, Contractor shall perform the Services as expeditiously as is prudent considering the ordinary professional skill and care of a competent engineer.

Section 17. Assignment

17.1 Neither party may assign any of its rights under this Agreement, except with the prior written consent of the other party. That party shall not unreasonably withhold its consent. All assignments of rights are prohibited under this subsection, whether they are voluntarily or involuntarily, by merger, consolidation, dissolution, operation of law, or any other manner.

17.2 Neither party may delegate any performance under this Agreement.

17.3 Any purported assignment of rights or delegation of performance in violation of this Section is void.

Section 18. Applicable Law

The laws of the State of Texas govern all disputes arising out of or relating to this Agreement. The parties hereto acknowledge that venue is proper in Fort Bend County, Texas, for all legal actions or proceedings arising out of or relating to this Agreement and waive the right to sue or be sued elsewhere. Nothing in the Agreement shall be construed to waive the County's sovereign immunity.

Section 19. Successors and Assigns

County and Contractor bind themselves and their successors, executors, administrators and assigns to the other party of this Agreement and to the successors, executors, administrators and assigns of the other party, in respect to all covenants of this Agreement.

Section 20. Third Party Beneficiaries

This Agreement does not confer any enforceable rights or remedies upon any person other than the parties.

Section 21. Severability

If any provision of this Agreement is determined to be invalid, illegal, or unenforceable, the remaining provisions remain in full force, if the essential terms and conditions of this Agreement for each party remain valid, binding, and enforceable.

Section 22. Publicity

Contact with citizens of Fort Bend County, media outlets, or governmental agencies shall be the sole responsibility of County. Under no circumstances whatsoever, shall Contractor release any material or information developed or received in the performance of the Services hereunder without the express written permission of County, except where required to do so by law.

Section 23. Captions

The section captions used in this Agreement are for convenience of reference only and do not affect the interpretation or construction of this Agreement.

Section 24. Conflict

In the event there is a conflict between this Agreement and the attached exhibits, this Agreement controls.

Section 25. Certain State Law Requirements for Contracts

25.1 Agreement to Not Boycott Israel Chapter 2271 Texas Government Code: By signature below, Contractor verifies that if Contractor employs ten (10) or more full-time employees and this Agreement has a value of $100,000 or more, Contractor does not boycott Israel and will not boycott Israel during the term of this Agreement.

25.2 Texas Government Code Section 2251.152 Acknowledgment: By signature below, Contractor represents pursuant to Section 2252.152 of the Texas Government Code, that Contractor is not listed on the website of the Comptroller of the State of Texas concerning the listing of companies that are identified under Section 806.051, Section 807.051 or Section 2253.153.

Section 26. Human Trafficking

BY ACCEPTANCE OF AGREEMENT, CONTRACTOR ACKNOWLEDGES THAT THE COUNTY IS OPPOSED TO HUMAN TRAFFICKING AND THAT NO COUNTY FUNDS WILL BE USED IN SUPPORT OF SERVICES OR ACTIVITIES THAT VIOLATE HUMAN TRAFFICKING LAWS.

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IN WITNESS WHEREOF, the parties hereto have signed or have caused their respective names to be signed to multiple counterparts to be effective on the date signed by the last party hereto.

FORT BEND COUNTY

KP George, County Judge

2-25-2020
Date

ATTEST:

Laura Richard
Laura Richard, County Clerk

BINKLEY & BARFIELD, INC

Authorized Agent – Signature

David A. Hamilton, P.E.
Authorized Agent – Printed Name

Executive Vice President
Title

2/13/20
Date

APPROVED:

J. Stacy Slawinski, P.E., County Engineer

APPROVED AS TO LEGAL FORM:

Marcus D. Spencer, First Assistant County Attorney

AUDITOR'S CERTIFICATE

I hereby certify that funds are available in the amount of $5,452,250.00 to accomplish and pay the obligation of Fort Bend County under this contract.

Robert Ed Sturdivant, County Auditor

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EXHIBIT A

Binkley & Barfield
consulting engineers

December 19, 2019

Mr. Stacy Slawinski, P.E.
Fort Bend County Engineering Department
301 Jackson Street
Richmond, Texas 77469

Re: Proposal for Professional Services - FM 521 from SH 6 to the Brazoria County Line

Dear Mr. Slawinski:

Binkley & Barfield, Inc. (BBI) is pleased to submit for your approval the scope and fee proposal for the Schematic and Environmental Design and the Plans, Specification, and Estimate (PS&E) Design Services for the FM 521 expansion project from SH 6 to the Brazoria County Line.

This proposal covers the Schematic Design to create a Preliminary Layout of the FM 521 Expansion, as well as the final PS&E design to create the final bid package in conformance with TxDOT criteria, policies, and procedures. The Schematic Design effort includes but is not limited to field survey, Right-of-Way Mapping, geotechnical investigation, drainage report, and existing and proposed traffic study. The PS&E effort includes but is not limited to Roadway, Bridge, and Drainage design; Traffic Signals; Traffic Control Plans with Construction Sequencing; and Utility Coordination. The scope includes the design of the Railroad Overpass. BBI will serve as the County's Project Design Lead/Prime Consultant for the assignment. The team consists of Halff Associates, HJ Consulting, CP&Y, TEDSI, TLC, Earth Engineering, Weisser Engineering and Surveying, Cobb Fendley & Associates, and Landtech, Inc. This scope and fee does not include the environmental scope which is contracted separately.

Attached you will find our Fee Proposal (Attachment A), Scope of Services (Attachment B), and Schedule of Milestone Submittals (Attachment C) for the subject Project. We ask for your approval and preparation of a contract for a lump sum amount of **$5,452,250,** as supported by the attached documents.

If you have any questions or require further information, please give me a call or send me an email.

Sincerely,

Binkley & Barfield, Inc.
Consulting Engineers

Kevin A Mineo...

Kevin A. Mineo, P.E.
Senior Project Manager - Transportation Group

CC: David Hamilton, P.E.

ATTACHMENT A
FEE SUMMARY

WORK ELEMENT	Engineering Fees	Consultant
Schematic Engineering		
Data Collection/ DCC/DSR	$ 35,000	BBI
Schematic	$ 350,000	BBI
TCP	$ 45,000	HJ
Cost Estimates/Schedule	$ 25,000	BBI
Traffic Study	$ 183,000	TEDSI
Railroad Coordination	$ 20,000	HJ
Agency Coordination (VE/MAPO)	$ 35,000	BBI
Utility Coordination	$ 50,000	HJ
Project Management	$ 90,000	BBI
Extras		
Project Initiation & Planning	$ 30,000	BBI
Survey		
Segment 1	$ 59,000	Weisser
Segment 2	$ 73,381	CFA
Segment 3	$ 89,500	Landtech
ROW Parcel Mapping		
Segment 1	$ 76,000	Weisser
Segment 2	$ 93,714	CFA
Segment 3	$ 88,950	Landtech
Geotechnical	$ 277,480	Earth
Drainage Impact Study	$ 401,000	Halff
SUE	$ 260,000	CPY
Subtotal	**$ 2,282,025**	

ATTACHMENT A
FEE SUMMARY (continued)

WORK ELEMENT	Engineering Fees	Consultant
Final PS&E Engineering		
Roadway Design	$ 595,000	BBI
Drainage Design	$ 269,500	Halff
Drainage Design	$ 245,000	HJ
Traffic - Signing & Pavement Marking	$ 125,000	HJ
Traffic - Signals	$ 138,000	TEDSI
Traffic - Illumination & CTMS	$ 148,000	TEDSI
Miscellaneous Roadway & TCP		
Miscellaneous Roadway (TCP)	$ 275,000	BBI
Miscellaneous Roadway (SW3P)	$ 40,000	TLC
Miscellaneous Roadway (Specs/General Notes/Estimate)	$ 200,000	BBI
Structural Design - RR Overpass	$ 120,000	CPY
Structural Design - RR Retaining Wall	$ 70,000	CPY
Structural Design - 2 Stream Crossings	$ 200,000	BBI
Project Management	$ 286,725	BBI
Extras		
Utility Coordination	$ 200,000	BBI
Items as Authorized by County	$ 40,000	BBI
Subtotal	**$ 2,952,225**	
Bid/Construction Phase Services		
BBI	$ 90,000	BBI
Halff	$ 36,000	Halff
TEDSI	$ 36,000	Tedsi
HJ	$ 36,000	HJ
CPY	$ 20,000	CPY
Subtotal	**$ 218,000**	
Total Management & Engineering Fees	**$ 5,452,250**	

ATTACHMENT B

SERVICES TO BE PROVIDED BY THE ENGINEER

County: Fort Bend
Highway: FM 521
CSJ: 011-03-064

The Engineer shall provide engineering services required for the development of a schematic design layout, public involvement, permit procurement, data collection analysis, mitigation and remediation, monitoring, traffic engineering and operations including traffic simulations and 3-D modeling, and surveying and mapping for FM 521 from SH 6 to the Brazoria County Line (CR 56) in Fort Bend County.

The Engineer shall also provide engineering services required for the preparation of plans, specifications and estimates (PS&E) and related documents, for FM 521 from SH 6 to the Brazoria County Line (CR 56) in Fort Bend County. These services may include, but are not limited to, preparing roadway and bridge design, retaining wall design, hydrologic and hydraulic design, traffic signal design, survey, utility adjustment coordination, subsurface utility engineering, survey, geotechnical data collection,.

GENERAL REQUIREMENTS

1.1. Design Criteria. The Engineer shall prepare all work in accordance with the latest version of applicable County and State procedures, specifications, manuals, guidelines, standard drawings, and standard specifications or previously approved special provisions and special specifications, which include: the *PS&E Preparation Manual*, *Roadway Design Manual*, *Hydraulic Design Manual*, the *Texas Manual on Uniform Traffic Control Devices* (TMUTCD), *Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (latest Edition)*, and other State approved manuals. When design criteria are not identified in County or State manuals, the Engineer shall notify the County and refer to the American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Street,* (latest Edition). In addition, the Engineer shall follow the County's guidelines in developing the Plan, Specification, and Estimate (PS&E) package. The Engineer shall prepare each PS&E package in a form suitable for letting through the State' construction contract bidding and awarding process.

1.2. Right-of-Entry and Coordination. The Engineer shall notify the County and secure permission to enter private property to perform any surveying, environmental, engineering or geotechnical activities needed off State right-of-way. The Engineer shall not commit acts which would result in damages to private property, and the Engineer shall make every effort to comply with the wishes and address the concerns of affected private property owners. The Engineer shall contact each property owner prior to any entry onto the owner's property.

The Engineer shall notify the County and coordinate with adjacent engineers on all controls at project interfaces. The Engineer shall document the coordination effort, and each engineer shall provide written concurrence regarding the agreed project controls and interfaces. In the event the Engineer and the other adjacent engineers are unable to agree, the Engineer and each adjacent engineer shall meet jointly with the County for resolution. The County will have authority over the Engineer's disagreements and the County's decision will be final.

1.3. Progress Reporting and Invoicing. The Engineer shall conduct monthly project reviews, prepare monthly Progress Reports and Invoices for review and approval. Progress Reports shall include a brief discussion of the activities conducted during the reporting period and activities planned for the upcoming month and describe any problems/delays encountered and remedial actions needed and/or exercised to alleviate the same.

The Engineer shall prepare a design time schedule and an estimated construction contract time schedule, using the latest version of Primavera software or any approved programs. The schedules shall indicate tasks, subtasks, critical dates, milestones, deliverables and review requirements in a format that depicts the interdependence of the various items. The Engineer shall provide assistance in interpreting the schedules. The Engineer shall schedule milestone submittals at 30%, 60%, 90% and final project completion phases. The Engineer shall advise the County in writing if the Engineer is not able to meet the scheduled milestone review date.

Final payment is contingent upon the County's receipt and confirmation by the County's Project Manager that the electronic files run and is formatted in accordance the County's Standards and all review comments are addressed.

1.4. Traffic Control. The Engineer shall provide all planning, labor, and equipment to develop and to execute each Traffic Control Plan (TCP) needed by the Engineer to perform services under this contract. The Engineer shall comply with the requirements of the most recent edition of the TMUTCD. The Engineer shall submit a copy of each TCP to the County and State for approval prior commencing any work on any County roadway. The Engineer shall provide all signs, flags, and safety equipment needed to execute the approved TCP. The Engineer shall notify the County in writing twenty-four (24) hours in advance of executing each TCP requiring a lane closure and shall have received written concurrence from the County prior to beginning the lane closure. The Engineer's field crew shall possess a copy of the approved TCP on the job site at all times and shall make the TCP available to the County for inspection upon request. The Engineer shall assign charges for any required traffic control to the applicable function code.

1.5. State-Controlled Waters. The placement of a new structure or modification of an existing structure(s) within State-Controlled waters will require confirmation that said structure(s) lie within the General Land Office (GLO) state owned land and whether the

crossing is tidally influenced or not. Consequently, the Engineer shall request, as early in the design process as possible, that the State determine whether the proposed improvements are found within the tidal GLO, is a submerged GLO property or a non-tidal GLO property. The County may request assistance from the Engineer to prepare an exhibit demonstrating the location of the proposed improvements on the GLO State Owned Map for the project location of an assigned State's District.

1.6. Coordination. The Engineer shall coordinate issues and communications with County's internal resource areas through the County's Project Manager. The County will communicate the resolution of issues and provide the Engineer direction through the County's Project Manager.

1.7. Quality Assurance (QA) and Quality Control (QC). The Engineer shall provide peer review at all levels. For each deliverable, the Engineer shall have some evidence of their internal review and mark-up of that deliverable as preparation for submittal. A milestone submittal is not considered complete unless the required milestone documents and associated internal red-line mark-ups are submitted. The County's Project Manager may require the Engineer to submit the Engineer's internal mark-up (red-lines) or comments developed as part the Engineer's quality control step. When internal mark-ups are requested by the County in advance, the County, at its sole discretion, may reject the actual deliverable should the Engineer fail to provide the evidence of quality control. The Engineer shall clearly label each document submitted for quality assurance as an internal mark-up document.

The Engineer shall perform QA and QC on all survey procedures, field surveys, data, and products prior to delivery to the County. If, at any time, during the course of reviewing a survey submittal it becomes apparent to the County that the submittal contains errors, omissions, or inconsistencies, the County may cease its review and immediately return the submittal to the Engineer for appropriate action by the Engineer. A submittal returned to the Engineer for this reason is not a submittal for purposes of the submission schedule.

1.8. Use of the State's Standards. The Engineer shall identify and insert as frequently as is feasible the applicable, current State's Standard Details, District Standard Details, or miscellaneous details that have been approved for use in the plan. The Engineer shall sign, seal, and date each Standard and miscellaneous detail if the Standard selected has not been adopted for use in a District. The Engineer shall obtain approval for use of these details during the early stages of design from the County or State Project Manager or designated State Area Engineer. In addition, these details shall be accompanied by the appropriate general notes, special specifications, special provisions, and method of payment. The Engineer shall retain the responsibility for the appropriate selection of each Standard identified for use within their design.

1.9. Organization of Plan Sheets. The PS&E shall be complete and organized in accordance with the latest edition of the State's PS&E Preparation Manual. The PS&E

package shall be suitable for the bidding and awarding of a construction contract, and in accordance with the latest State's policies and procedures, and the District's PS&E Checklist.

1.10. Organization of Design Project Folder and Files (Electronic Project Files). The Engineer shall organize the electronic project files in accordance with the State's File Management System (FMS) format. With the approval of the State, the Engineer may maintain the project files in the State's ProjectWise container

TASK DESCRIPTIONS AND FUNCTION CODES

The Engineer shall categorize each task performed to correspond with the Function Codes (FC) and Task Descriptions.

FUNCTION CODE 102(110) – FEASIBILITY STUDIES

ROUTE AND DESIGN STUDIES

110.1. Schematic Design. The Engineer shall prepare an alignment and proposed roadway schematic layout to include projected traffic volumes, existing and proposed typical sections. The Engineer shall furnish Microsoft Office, Microstation V8i-Geopak, and Openroads computer generated media containing the roadway schematic layout to the County. All supporting attachments and exhibits shall accompany the schematic layout. The Engineer shall obtain, review, and evaluate existing and twenty-year projected traffic data for use in the preparation of the schematic design layout. The data shall be utilized in accordance with the requirements for schematic development and consistent with the policies of the County.

The Engineer shall prepare preliminary drawings to identify any potential adverse impacts within the project corridor. Identification of all existing and proposed utilities (public and private), structures, burial grounds, neighborhood communities, historical landmarks, and undeveloped areas is required. Any potential utility conflicts and structural impediments must be identified as such. The Engineer shall render assistance to the County for agency meetings as necessary during the development of the schematic design as requested by the County. The Engineer shall also render assistance to the County for public meetings and a public hearing as requested.

An itemization of the schematic design and engineering work activity to be performed under this contract is detailed below. All designs shall be prepared in accordance with the latest version of: TxDOT Roadway Design Manual, TxDOT Project Development Process Manual, AASHTO Policy on Geometric Design of Highways and Streets, TxDOT Standard Specifications for Construction of Highways, Streets, and Bridges, TxDOT Traffic Operations Manual on Highway Operations, and Highway Capacity Manual - Transportation Research Board.

The schematic layout shall adhere to a design scale of 1 in. = 100 ft. The schematic layout, exhibits, and attachments shall be developed in English units. All Microsoft Office, Microstation V8i-Geopak, and Microstation Openroads computer graphic files furnished to the County must be submitted in electronic format. Schematics shall follow TxDOT standards, the schematic shall also follow the CADD standards used by the TxDOTy and shall be submitted as an original document, accompanied with an original Microstation V8i formatted graphics file. Final copies of the schematic design shall be signed by a professional engineer licensed in the State of Texas.

Schematic Design Work Outline:

Develop Base Maps

The base maps to be used for the analysis and proposed schematic layout shall be developed by the Engineer from existing construction and right of way (ROW) plans as available. The Engineer shall re-establish the existing centerline horizontal alignments for all roadways, identify existing ROW, property owners and the approximate location of major utilities in the preparation of base maps.

Planimetrics and Aerial Mapping

Planimetrics, Digital Terrain Modeling (DTM), and aerial photographs shall be furnished to the Engineer by the County, if available.

Analyze Existing Conditions

Using collected data and base maps, the Engineer shall develop an overall analysis of the existing conditions in order to develop the schematic design. The analysis shall include, but not be limited to the following:

a. ROW determination
b. Horizontal alignment
c. Profile grades
d. Pavement cross slopes and pavement type
e. Soil Exploration
f. Geotechnical Testing (Proposed Bridge Locations only)
g. Intersection design and analysis
h. Sight distance
i. Level-of-service
j. Locations of critical constraints
k. Drainage
l. Traffic control and construction phasing sequence

Deliverable Schematic

The Engineer shall consider the following in the analysis to optimize the design:

- Efficient use of the allocated ROW
- Control of Access (COA) and driveway locations
- Roadway and intersection geometry
- Cross Sections
- Bicycle and Pedestrian design
- Drainage and Hydraulic design
- Stopping Sight distance
- Level-of-service
- Traffic and signal operations
- Construction, ROW, easement, and utility costs
- Construction sequencing
- Traffic control during construction
- Roadside safety appurtenances
- Large guide signage
- Environmental mitigation (For example: Noise Walls, Storm Water Best Management Practices (BMP's), etc.)
- Bridge Layouts and Clearance
- Railroads (if applicable)
- Interface with existing High Occupancy Vehicle (HOV) Lane, Managed Lanes, and park-and-ride facilities
- Accommodation of ultimate corridor configuration.
- Accommodation of future cross street expansion as described in local thoroughfare plan if applicable.
- Avoidance of utility lines if feasible.
- Impact of construction delays from utility relocations.

Project Management and Coordination

- The Engineer shall direct and coordinate the various elements and activities associated with developing the design schematic.
- The Engineer shall prepare the detailed graphic Project Work Schedule indicating tasks, critical dates, milestones, deliverables and State review requirements. The Project Work Schedule will depict the order of the various tasks, milestones, and deliverables. The Engineer shall review and provide comments on its elements of the schedule to the County.
- The Engineer shall submit written monthly Progress Reports to the County.
- The Engineer shall prepare subcontracts for subconsultants, direct and monitor subconsultants activities, and review subconsultant work and invoices.
- The Engineer shall provide ongoing quality assurance and quality control to ensure completeness of product and compliance with the State and County procedures.

- The Engineer shall prepare and submit invoices.
- The Engineer shall conduct a site visit in the AM and PM peak hour and develop a technical report that includes photographs outlining the findings and observations.

Data Collection

The Engineer shall conduct field reconnaissance and collect data as necessary to complete the schematic design. Data shall include the following information. Items "a" to "g" will be obtained from the State, if available, while items "h" to "l" will be obtained from other agencies as required.

a. Available Corridor Major Investment Studies
b. Design data from record drawings of existing and proposed facilities
c. Existing and future design year traffic data
d. Roadway inventory information, including the number of lanes, speed limits, pavement widths and rating, bridge widths and ratings, and ROW widths
e. Aerial photos, planimetric mapping, and DTM
f. Environmental Data
g. Previously prepared drainage studies
h. Adopted land use maps and plans as available
i. Federal Emergency Management Agency (FEMA) Flood Boundary Maps and Flood Insurance Studies and Models
j. Public and private utility information
k. Plat research for adjacent properties as available.
l. Local Major Thoroughfare Plan.

Roadway Design Criteria

The Engineer shall develop the roadway design criteria based on the TxDOT Roadway Design Manual and AASHTO Policy on Geometric Design of Highways and Streets guidelines. The design criteria shall include the following roadway design elements: design speed, lane and shoulder widths, pavement structure and slopes, horizontal curvatures, horizontal and vertical clearances, range of vertical profile grades, and side slopes.

Preliminary Design Conference

The Engineer shall prepare and submit a preliminary Design Summary Report (DSR) to the County and State for review and approval and shall attend an initial Kick-Off Meeting to establish and agree on fundamental aspects and concepts and to establish the basic features and design criteria for the project.

Schematic Design – General Tasks

a. ROW/Property Base Map

The Engineer shall obtain information on existing ROW and property information from as-built plans, ROW maps, and tax records and prepare a base map depicting the information.

b. Utility Base Map

The Engineer shall obtain information on existing utilities from utility owners and shall conduct investigations to identify and evaluate all known existing and proposed public and private utilities. The Engineer shall identify potential conflicts and attempt to minimize the potential adverse utility impacts in the preparation of the schematic design. The Engineer shall prepare a base map depicting the utility locations.

c. Typical Sections

The Engineer shall develop both existing and proposed typical sections that depict the number and type of lanes, shoulders, median width, curb offsets, cross slope, border width, clear zone widths, and ROW limits.

d. Environmental Constraints

The Engineer shall consider impacts to environmentally sensitive sites (as identified by the Environmental Engineer) during the schematic design process. The environmental sensitive sites may include historic structures, cemeteries, residential areas, historical landmarks, and farmland.

e. Drainage

The Engineer shall use data from as-built plans and FEMA maps to locate drainage out falls and to determine existing storm sewer, bridges and culvert sizes, design flows, and water surface elevations for use in the design of roadway geometry. The Engineer shall conduct a Preliminary Drainage Impacts and Mitigation Study to determine and evaluate the adequacy of the ROW needed to accommodate the proposed roadway and drainage system. The study shall estimate the impacts to abutting properties and the 100-year floodplain due to proposed highway improvements, recommend a mitigation plan, estimate the water surface elevations for the 2, 5, 10, 25, 50 and 100 year storm events, identify and locate outfalls, drainage outfall descriptions, provide overall drainage area map, sub-drainage area map, storm water detention facilities, and provide a drainage study report identifying the results of the study. The drainage report, signed and sealed by a professional engineer, shall include applicable hydrologic and hydraulic models such as HEC-RAS, HEC-HMS,

HY-8, WinStorm and other applicable models. The Engineer shall evaluate the adequacy of the existing drainage structures.

f. ROW Requirements

The Engineer shall determine the ROW requirements based on the proposed alignment, typical sections, access control, terrain, construction requirements, drainage, clear zone, maintenance, and environmental mitigation requirements.

g. Construction Sequence

The Engineer shall consider the requirements for construction and traffic control throughout the development of schematic design to ensure that the proposed design can be constructed.

h. Design Exceptions

The Engineer shall identify design exceptions and waivers, and shall document the necessity for each design exception or waiver.

i. Traffic Data and Projections

The Engineer shall develop the opening-year, design-year (opening year +20) and pavement design year (opening year + 30) travel forecasts, and related traffic analysis in coordination with State Transportation and Programming Division (TPP). The developed traffic projections shall be utilized for design and environmental analysis. The Engineer shall develop traffic forecasts for the main lanes, ramps, cross streets, interchanges, intersections, and frontage roads for no-build and build alternatives. These projections shall include graphic representations of the anticipated daily movements along the corridor (suitable for inclusion in the design schematic and environmental document) and the Traffic Analysis for Highway Design table. The Engineer shall prepare a Traffic Projections Methodology memo, based on the information provided in the traffic analysis package. The Engineer shall review the proposed methodology with the State and shall refine it based on these discussions. Traffic volumes developed by the Engineer shall be submitted to TPP for review and approval, and the Engineer shall revise the traffic volumes based on TPP's comments.

j. Traffic and Operational Analysis

The Engineer shall review and analyze traffic data (including percent trucks, design hourly volume, and directional distribution), existing roadway features (including number of lanes, offset to obstructions, lane widths, and intersection operation and geometry), traffic flow patterns, accident patterns and frequencies, and transit and

traffic operations. A detailed SYNCRO analysis shall be performed for the current year using current traffic and geometric conditions and for the design year using traffic projections and proposed geometric designs to compare different geometric alternatives. Results of this analysis shall be incorporated into the schematic design.

Specific tasks shall include:

1. Data Collection

The following traffic data shall be collected for this project:

1.1. Existing traffic data (ADT, hourly distribution, directional distribution, percent trucks) for FM 521 and intersecting roadways within the project limits

1.2. Existing Roadway Features including the following:
- Number of Lanes
- Offset to obstructions
- Lane Widths
- Intersection operation and geometry
- Traffic Flow Patterns

1.3. Crash patterns and frequencies (obtained from State and local sources) for the project limits along FM 521

1.4. Existing 24-hr Bi-directional Classification Volumes at the following locations:
- FM 521 south of SH 6
- FM 521 just north of Sienna Parkway
- FH 521 north of CR 56

1.5. Existing Weekday Peak Hour (7:00-9:00 a.m. and 4:00-6:00 p.m.) Turning Movement Counts at the following locations:
- FM 521 at SH 6 Eastbound Frontage Road
- FM 521 at SH 6 Westbound Frontage Road

1.6. Existing Weekday 24-hr Turning Movement Counts at the following locations:
- FM 521 at Sienna Parkway
- FM 521 at Glendale Lakes
- FM 521 at Southern Colony Avenue
- FM 521 at CR 57/Juliff Manvel Road
- FM 521 at CR 56

1.7. Future Design Year traffic data (AADT, DDHV, directional distribution, percent trucks) for FM 521 and intersecting roadways within the project limits as provided by the Transportation Planning and Programming division of TxDOT (TPP)

1.8. Future traffic data from adjacent projects (to be provided by the County or State), if available

1.9. Conduct a field visit (one person, one day) to observe traffic operations and record existing roadway features in Item 1.2 at the intersections listed in 1.5 and 1.6 above.

1.10. Deliverable

The Engineer shall submit an existing traffic report detailing traffic data collection, data reduction, and the findings. Two (2) 8-1/2" X 11" reports in draft form will be submitted to State for review and comments. Six (6) final reports (5 - bound and 1 - unbound) and in electronic form (native and in .pdf) that incorporate State's comments will be submitted to the State.

2. Traffic Projections Methodology

2.1. The Engineer shall develop a proposed methodology for estimating traffic projections for each component of the corridor improvements as follows:

- These projections will be developed for Opening year, Design year (Opening year + 20 years), and Pavement design year (Design year + 10 years) for one alternative. This methodology will be based on existing traffic counts, historical traffic data, and travel demand model results. The methodology will include the capture of known developments that may impact traffic along FM 521.
- Review the proposed methodology with the County and State and refine it based on discussions and comments.

2.2. Deliverable

- The Engineer shall submit a memorandum outlining the methodology to be used for estimating traffic projections. Three (3) memorandums in draft form will be submitted to the County and State for review and comments. Six (6) final memos that incorporate comments will be submitted to the County and State.

3. Determine Traffic Projections

3.1. The Engineer shall Develop the traffic projections for the significant roadway segments and cross streets within the study corridor, based on the approved methodology. The projected traffic data include:

- Annualized Average Daily Traffic (AADT) and Design Hourly Volume (DHV) for all proposed facilities in the corridor.
- Percent trucks for both the AADT and DHV
- Directional distribution
- K factor (DHV/AADT)
- Vehicle classification - light duty, medium duty, and heavy duty
- Input the traffic projection results into the Traffic Analysis for Highway Design tables for one alternative, and will generate any necessary Traffic Projections Graphics for one alternative. The Traffic Projections Graphics

will be developed from straight line diagrams of the corridor provided by the County/State.

3.2. Review the Traffic Analysis for Highway Design tables and Traffic Projections Graphics with TPP, and the County. Based on comments received, the Engineer will revise and finalize the tables and graphics.

3.3. Prepare Draft Traffic Projections Report suitable for County and State review.

3.4. Deliverable

- Submit the straight-line diagram for one alternative with the traffic volumes outlined in previous tasks. The straight line diagrams will be in hard copy form as well as in electronic form.
- Submit the Traffic Analysis for Highway Design table for each alternative in hard copy form as well as electronic form.
- Three (3) copies of the draft graphics and tables listed above will be submitted to the County and State for review and comments. Six (6) copies of the final graphics and tables that incorporate comments will be submitted to the County and State.

4. Traffic and Operational Analysis

4.1. The Engineer shall review the data collected in Item 1. above and prepare a detailed traffic analysis using Highway Capacity Manual methodologies (SYNCHRO) for following seven intersections for existing and design year conditions:

- FM 521 at SH 6 Eastbound Frontage Road
- FM 521 at SH 6 Westbound Frontage Road
- FM 521 at Sienna Parkway
- FM 521 at Glendale Lakes
- FM 521 at Southern Colony Avenue
- FM 521 at CR 57/Juliff Manvel Road
- FM 521 at CR 56

The traffic and operational analysis shall determine the projected Level of Service for the seven intersections. The Engineer shall prepare recommendations for the roadway and intersection geometries for each of the above seven intersections based upon this analysis.

5. Documentation of Findings

5.1. The Engineer shall produce a letter report documenting operational analysis for the study area. The Engineer shall coordinate with the County and State to address any comments or questions regarding the report and findings.

k. Bicycle and Pedestrian Accommodations

The Engineer shall comply with the federal policy statement on Bicycle and Pedestrian Accommodations Regulations and Recommendations by United States Department of Transportation (USDOT). This policy encourages the incorporation of safe and convenient walking and bicycling facilities into transportation projects. The inclusion of bicycle and pedestrian facilities shall be considered when the project is scoped. Public input when applicable, as well as local city and metropolitan planning organization for bicycle and pedestrian plans shall be considered.

Conceptual Design Schematics

The Engineer shall develop conceptual design schematics in MicroStation format to evaluate various methods of handling traffic while providing access in key areas. It is anticipated that a single design alternative that optimizes traffic flow and access shall be produced. The conceptual schematics shall be plan view only. Profile work shall be done only to the extent necessary to lay out the proper horizontal geometry.

The schematics shall contain the following design elements:

- Roadway alignment
- Pavement edges, face of curbs and shoulder lines
- Typical sections of existing and proposed roadways
- Proposed structure locations
- Preliminary ROW requirements and control-of-access locations
- Direction of traffic flow and the number of lanes on all roadways
- Existing and projected traffic volumes

Geometric Design Schematics

The Engineer shall develop geometric design schematics based on the conceptual schematics after the basic layout, lane arrangement, and ROW requirements depicted on the conceptual schematics is approved.

The geometric schematic plan view shall contain the following design elements:

a. Geopak calculated roadway alignments for mainlanes, ramps, bridges, frontage roads and cross streets at grade separations and horizontal curve data shown in tabular format
b. Pavement edges, curb lines, sidewalks for all roadway improvements
c. Typical sections of existing and proposed roadways
d. Proposed structure locations, bridge layouts including abutment, bent and rail locations
e. Existing and proposed major utilities

f. Existing property lines and respective property ownership information
g. ROW requirements adequate for preparation of ROW maps
h. Control-of-access limits
i. Existing and projected traffic volumes
j. Location and text of the proposed mainlane guide signs and the preliminary locations for changeable message signs
k. Lane lines, shoulder lines, and direction of traffic flow arrows indicating the number of lanes on all roadways
l. Superelevation and transition design data

The geometric schematic profile view shall contain the following design elements:

a. Calculated profile grade and vertical curve data including "K" values for the mainlanes
b. Existing ground line profiles along the mainlanes
c. Grade separations
d. Calculated vertical clearances at grade separations

Cross Sections

The Engineer shall use Geopak to generate preliminary cross-sections every 100 feet in conjunction with the Geometric Schematic. The Engineer shall determine earthwork volumes for use in the cost estimate, and shall prepare roll plots of the cross-sections.

Retaining Walls

The Engineer shall prepare preliminary retaining concepts to be shown on schematics, typical sections, and cross sections.

- Determine if any additional walls are required and verify the need for and length of the retaining wall as shown on the ultimate schematic.
- Compute and tabulate retaining wall quantities for preliminary design milestone plans submittal.

Preliminary Construction Sequence

The Engineer shall prepare a Preliminary Construction Sequence Layout in conjunction with the Geometric Schematic depicting the phasing and traffic detours anticipated to construct the proposed design.

Preliminary Cost Estimate

The Engineer shall prepare a preliminary cost estimate for the project, including the costs of construction and eligible utility adjustments. Current County unit bid prices shall be used in preparation of the estimate.

Engineering Summary Report

The Engineer shall prepare a report to summarize the design criteria, traffic analysis, preliminary cost estimate and basis of estimate, construction sequence description, and utility conflict issues.

Value Engineering Study

If requested by the State, the Engineer shall provide a Certified Value Engineering Specialist (CVS), prepare exhibits, schedule, and conduct a Value Engineering (VE) study, or the Engineer shall provide staff to participate in a Value Engineering (VE) study.

Design Concept Conference

In accordance with the State's Project Development Process Manual, the Engineer, in cooperation with the County and State, shall plan, attend and document the Design Concept Conference (DCC) to be held prior to the 30 percent milestone submittal. In preparation for the DCC, the Engineer shall complete a State's Design Summary Report to serve as a checklist for the minimum required design considerations. The conference will provide for a brainstorming session in which decision makers, stakeholders and technical personnel may discuss and agree on:

- Roadway and drainage design parameters
- Engineering and environmental constraints
- Project development schedule
- Other issues as identified by the County
- Identify any Design Exceptions and Waivers
- Preliminary Construction Cost Estimate

Data Collection

The Engineer shall conduct field reconnaissance and collect data as necessary to complete the schematic design. Data shall include the following information. Items "a" to "g" will be obtained from the State, if available, while items "h" to "l" will be obtained from other agencies as required.

a. Available Corridor Major Investment Studies
b. Design data from record drawings of existing and proposed facilities
c. Existing and future design year traffic data
d. Roadway inventory information, including the number of lanes, speed limits, pavement widths and rating, bridge widths and ratings, and ROW widths
e. Aerial photos, planimetric mapping, and DTM
f. Environmental Data
g. Previously prepared drainage studies
h. Adopted land use maps and plans as available
i. Federal Emergency Management Agency (FEMA) Flood Boundary Maps and Flood Insurance Studies and Models

j. Public and private utility information
k. Plat research for adjacent properties as available.
l. Local Major Thoroughfare Plan.

Roadway Design Criteria

The Engineer shall develop the roadway design criteria based on the TxDOT Roadway Design Manual and AASHTO Policy on Geometric Design of Highways and Streets guidelines. The design criteria shall include the following roadway design elements: design speed, lane and shoulder widths, pavement structure and slopes, horizontal curvatures, horizontal and vertical clearances, range of vertical profile grades, and side slopes.

Geotechnical Borings and Investigations

The Engineer shall determine the location of proposed soil borings for bridge design, embankment settlement analysis, retaining walls, slope stability and along storm drain alignment in accordance with the latest edition of the State's Geotechnical Manual. The County will review and provide comments for a boring layout submitted by the Engineer showing the general location and depths of the proposed borings. Once the Engineer receives the County's and State's review comments they shall perform soil borings (field work), soil testing and prepare the boring logs in accordance with the latest edition of the State's Geotechnical Manual and State District's procedures and design guidelines.

1. All geotechnical work should be performed in accordance with the latest version of the State's Geotechnical Manual. All testing shall be performed in accordance with the latest version of the State's Manual of Test Procedures. American Society for Testing Materials (ASTM) test procedures can be used only in the absence of the State's procedures. All soil classification should be done in accordance with the Unified Soil Classification System.

2. If applicable, the Engineer shall perform any retaining wall analyses to include the settlement analysis. This analysis must include the computation of the factor of safety for bearing capacity, global stability, overturning and sliding. In addition, the Engineer shall include allowable bearing pressure, passive earth pressure, friction factor, settlement analysis (consolidation report) and lateral earth pressure for the retaining walls.

3. If applicable, the Engineer shall perform soil borings, coring for pavement removal items, piezometric readings, testing and analysis to include slope stability analysis, settlement analysis, and foundation design recommendations along storm drain alignment, retaining walls, overhead sign structures, bridges, embankments and any temporary soil retaining systems.

4. The Engineer shall provide a signed, sealed and dated geotechnical report which contains, but is not limited to, soil boring locations, boring logs, laboratory test

results, generalized subsurface conditions, ground water conditions, piezometer data, analyses and recommendations for settlement and slope stability of the earthen embankments, skin friction tables and design capacity curves including skin friction and point bearing. The skin friction tables and design capacity curves must be present for piling and drilled shaft foundation.

5. If applicable, the Engineer shall perform scour analysis to include Grain Size distribution curves with D50 value.

6. The Engineer shall sign, seal and date soil boring sheets to be used in the PS&E package. The preparation of soil boring sheets must be in accordance with a County standards.

7. Foundation Studies: The Engineer shall coordinate with the County to determine the location of soil borings to be drilled along the retaining wall alignments. The soil borings shall be a minimum of 35 feet. Spacing of soil borings shall not exceed 500 feet. The Engineer shall provide a boring layout for the County's review and comment.

8. The Engineer shall incorporate soil boring data sheets prepared, signed, sealed, and dated by the Geotechnical Engineer. The soil boring sheets shall be in accordance with the State's WINCORE software as can be found on the Texas Department of Transportation (TxDOT) website.

Agency Coordination and Public Involvement

- The Engineer shall assist the County in conducting meetings with various agencies to discuss and review the schematic design. The Engineer shall document and respond to issues related to the schematic design.
- The Engineer shall prepare exhibits and participate in a Value Engineering (VE) study.
- The Engineer shall assist in conducting one public meeting and one public hearing during the project development process. The Engineer shall prepare schematic exhibits, constraints maps, other necessary exhibits, and assist the County in the presentation.
- The Engineer shall participate in one Meeting with Affected Property Owners (MAPO) located within or near the project's study area.

Schematic Design Project Deliverables

In conjunction with the performance of the foregoing services, the Engineer shall provide the following draft and final documents and associated electronic files:

- Two (2) draft copies of the Design Summary Report (DSR)
- Two (2) draft copies of the Preliminary Drainage Study
- Two (2) draft copies of the Geometric Schematic layouts (1 inch = 100 feet)

- Four (4) final copies of the Geometric Schematic layouts (1 inch = 100 feet)
- Two (2) draft copies of the Supplemental Profiles rolls (cross streets)
- Four (4) final copies of the Supplemental Profiles rolls (cross streets)
- One (1) copy of the Preliminary Cross-Sections in a roll plot format
- Two (2) final copies of the Design Summary Report (DSR)
- Two (2) final copies of Form 1002 (Basic Design Criteria)
- Four (4) final copies of the Preliminary Drainage Study
- Four (4) final copies of Geotechnical report
- Two (2) copies of the Preliminary Construction Sequence Layouts
- Electronic files shall be furnished to the County and State on a USB. Files should include in originals, DGN, PDF and KMZ format. PDF of final schematic and engineering reports to be sign and seal by the Engineer.

FUNCTION CODE 120(120) – SOCIAL/ECON/ENVIRON STUDIES

Included under a separate contract

FUNCTION CODE 130(130) – RIGHT-OF-WAY (ROW) DATA

General Standards for Surveying

General Standards for Surveying

All surveys must meet or exceed the standards set in the Professional Land Surveying Practices Act, the General Rules of Procedures and Practices promulgated by the Texas Board of Professional Land Surveying (TBPLS), and the Texas Department of Transportation (TxDOT) TxDOT Survey Manual, latest edition, and shall be accomplished in an organized and professional manner, subject to the approval of the County. The Engineer's Surveyor shall use the State's *ROW Vol. 1 – Procedures Preliminary to Release*, (online at: http://onlinemanuals.txdot.gov/txdotmanuals/ppr/index.htm) and the TxDOT Survey Manual, latest edition, as the basis for the format and preparation of all right-of-way documents produced, including Right-of-Way (ROW) maps, property descriptions (including parcel plats), and other Right-of-Way work products, unless otherwise specified by the County.

The Engineer's Surveyor shall use the North American Datum of 1983 (NAD83), Texas Coordinate System of 1983 (State Plane Coordinates), applicable to the zone or zones in which the work is performed, with values in U.S. Survey Feet, as the basis for all horizontal coordinates derived, unless otherwise directed by the County. The Engineer's Surveyor shall use the datum adjustment currently in use by the State unless otherwise specified by the County.

Project or surface coordinates must be calculated by applying a Combined Adjustment Factor (CAF) to State Plane Coordinate values. The County may direct the Engineer's Surveyor to use a specific CAF for a project to: a) match existing or ongoing projects, b) conform to a county-wide surface adjustment factor, or c) be calculated specifically for the project area.

Elevations must be based on the North American Vertical Datum 88 (NAVD88), unless otherwise specified by the County.

All GPS work, whether primary control surveys or other, must meet or exceed the current TxDOT Survey Manual, latest edition, to the order of accuracy specified in the categories listed below or in a work authorization. If the order of accuracy is not specified in this Contract or in a work authorization, the work must meet or exceed the order of accuracy specified in the publications listed in this paragraph.

All conventional horizontal and vertical control surveys must meet or exceed the TxDOT Survey Manual, latest edition, and the Texas Society of Professional Surveyors (TSPS) Manual of Practice for Land Surveying in the State of Texas, latest edition, to the order of accuracy specified, and in the categories listed below or in a work authorization. If the order of accuracy is not specified in this Contract or in a work authorization, the work must meet or exceed the order of accuracy specified in the publications listed in this paragraph.
In order to ensure accuracy and accountability of the services provided under this Contract, the County may require the Engineer's Surveyor to certify work performed under this Contract as true and correct according to FGCS standards, the TxDOT Survey Manual, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.

The Engineer's Surveyor shall provide temporary signing and traffic control in and around survey operations; the signing and traffic control shall comply with provisions of the Texas Manual of Uniform Traffic Control Devices. All signs, flags and safety equipment shall be provided by the Engineer's Surveyor. The Engineer's Surveyor shall notify the Public Information Office of the District where the work is to be performed at least five working days in advance of any lane closures.

The Engineer's Surveyor shall provide all personnel, equipment, and materials necessary for the performance of the activities required by this agreement or by any work authorization.

The Engineer's Surveyor shall provide Survey Data (original and processed) to the County on a compact disk or other approved medium. The Survey Data must be fully compatible with the County's computer system and with programs in use by the County at the time of the submission, without further modification or conversion. The current program formats used by the County are: *Microsoft Office Word 2010* for word processing, *MicroStation V8i* and *GEOPAK Survey* for graphics applications and ArcGIS for its Geo-Database platform.

Data collection programs must be compatible with the current import formats allowed by *GEOPAK Survey* and be attributed with current Feature Codes. These programs may be replaced at the discretion of the County.

Variations from these software applications or other requirements listed above shall only be allowed if requested in writing by the Engineer's Surveyor and approved by the County.

The Engineer's Surveyor shall perform Quality Control/Quality Assurance on all procedures, field surveys, data, and products prior to delivery to the County. The County may also require the Engineer's Surveyor to review the survey work performed by other surveyors. If, at any time, during the course of reviewing a submittal of any item it becomes apparent to the County that the submittal contains errors, omissions, and inconsistencies, the County may cease its review and return the submittal to the Engineer's Surveyor immediately for appropriate action by the Engineer's Surveyor. A submittal returned to the Engineer's Surveyor for this reason is not a submittal for purposes of the submission schedule.

The Standards for services that are not boundary-related but that relate to surveying for engineering projects may be determined by the construction specifications, design specifications, or as specified by the County.

Specific Work To Be Performed

The Engineer's Surveyor shall perform surveying services for projects and locations as directed by the County per the function codes and description of work provided below.

A. ROW MAPPING

ROW Mapping includes the performance of on the ground surveys and preparation of parcel maps, legal descriptions (metes and bounds descriptions), and right-of-way maps.

1. PURPOSE

The purpose of right-of-way mapping is to prepare documents suitable for the acquisition of real property interests and the probable issuance of a title policy.

2. DEFINITIONS

For purposes of this Contract, the following definitions shall apply:

- Abstract Map (Working Sketch) – A drawing to scale prepared from record documents depicting proposed right-of-way lines, existing right-of-way lines, easement lines, and private property lines with relevant grantee names, recording data, and recording dates.

- Closure/Area Calculation Sheet – A computer generated print-out of the area and the perimeter bearings, distances, curve data, and coordinates of an individual parcel of land to be acquired.
- Denial of Access Line – A line which indicates specific location where access to the roadway is denied.

- Property Description – A document prepared as an exhibit for the conveyance of a property interest, reflecting a boundary survey, signed and sealed by a Registered Professional Land Surveyor (RPLS), attached to an acquisition deed as Exhibit A, and consists of the following two (2) parts:
  - A written metes and bounds description delineating the area and the boundary and describing the location of an individual parcel of land unique to all other parcels of land.
  - A parcel plat – An 8 ½ inch by 11 inch formatted drawing to scale depicting all the information shown on the right-of-way map regarding an individual parcel of land to be acquired.
- Owner – The most current title holder of record as determined by a study of the Real Property Records.
- Parent Tract – A unit or contiguous units of land under one ownership, comprising a single marketable tract of land consistent with the principle of highest and best use.
  - A parent tract may be described by a single instrument or several instruments. A single parent tract cannot be severed by a public right-of-way, easement, or separate ownership which destroys unity of use.
- Parent Tract Inset – A small line drawing, to an appropriate scale, of the parent tract perimeter placed upon the right-of-way map in the proximity of the respective parcel. Parent tract insets are used in cases where the parent tract cannot be shown to the same scale as the right-of-way map. Since parent tract insets are used to identify the limits and location of parent tracts, they must include public right-of-ways, utility easements and fee strips, and identifiable water courses which bound the parent tract.
- Point of Beginning (P.O.B.) – A corner of the parcel of land to be acquired, located on the proposed right-of-way line and being the beginning terminus of the first course of the property description.
- Point of Commencing (P.O.C.) – A monumented property corner which can be identified in the Real Property Records and is located outside the proposed right-of-way corridor. For title purposes, the point of commencing must be a monumented back corner of the parent tract. In the event a monumented back corner of the parent tract cannot be recovered, the nearest identifiable monumented property corner located outside the proposed right-of-way corridor may be used.

- Preliminary Right-of-Way Layout – A drawing to scale depicting proposed right-of-way lines; existing right-of-way lines; proposed pavement; access denial lines; the proposed centerline alignment, private property lines; easement lines; visible improvements; visible utilities; and the station and offset from the centerline alignment to each Point of Curvature (PC), Point of Tangency (PT), and angle point in the proposed right-of-way lines and to each PC, PT, and angle point in the existing right-of-way lines in areas of no proposed acquisition.

- Right-of-Way Maps – A series of 22 inch by 34 inch drawings to scale depicting the results of relevant elements of records research, field work, analysis, computation, and map making required to determine title, delineate areas and boundaries, and locate and describe utilities and improvements to the extent necessary to appraise the value and negotiate the acquisition of individual parcels of private land for a proposed right-of-way project.

3. PROCEDURE

All standards, procedures and equipment used by the Engineer's Surveyor shall be such that, at a minimum, the results of the survey shall be in compliance with the "Precision and Accuracy Requirements" set forth by the latest Board Rule as promulgated by the Texas Board of Professional Land Surveying (TBPLS).

3.1. Abstract Map (Working Sketch)

The Engineer's Surveyor shall prepare an abstract map sufficient to determine the following:

- Any and all interests of public record held in the land to be acquired.
- The total record holdings to be acquired from an owner contiguous to a land.
- Any and all interests in land held in common to be acquired (shopping mall parking lots, subdivision reserves, etc.)
- Any and all improvements proposed by other agencies which may have a bearing on project development.
- All called monuments, bearings, and distances as per recorded information.

3.2. Right-of-Way Map

The Engineer's Surveyor shall field locate items such as: property corners, existing right-of-way markers, improvements, and visible utilities. The Engineer's Surveyor shall verify and update the planimetric file as directed by the County & State.

The Engineer's Surveyor shall prepare a right-of-way map for each proposed right-of-way project. A right-of-way map must include a title sheet, an index sheet, a survey control index sheet, a horizontal control data sheet, and sufficient plan sheets to cover the proposed project, and other sheets as directed by the State. The State has developed standard title sheets, index sheets, and plan sheets, copies of which the Engineer's Surveyor shall request and secure for all purposes of this Contract.

By mutual agreement between the TBPLS and the State, right-of-way maps need not be signed and sealed by a RPLS.

Plan sheets must include, but need not be limited to, the following items of information:

Plan sheets must include, but need not be limited to, the following items of information:

- Proposed right-of-way lines delineated with appropriate bearings, distances, and curve data. Curve data must include the radius, delta angle, arc length, and long chord bearing and distance.
- Existing right-of-way lines delineated with appropriate bearings, distances, and curve data to the extent necessary to describe the individual parcels of land to be acquired. Curve data must include the radius, delta angle, arc length, and long chord bearing and distance.
- The proposed project baseline alignment delineated with appropriate bearings, distances, and curve data. Curve data must include the station of the curve, Point of Intersection (PI), radius, delta angle, arc length, tangent length, long chord bearing and distance, and the N and E coordinates of the curve PI. All alignment PCs, PTs, and even 500 foot stations must be labeled as to station.
- Proposed paving lines combined with relevant existing paving lines must be shown to the extent necessary to compile a complete picture of proposed traffic movements. Proposed paving on the final product submitted to the County must be shaded with a dot pattern or highlighted by some other means acceptable to the County.
- Denial of Access lines must be shown sufficiently to indicate areas where access is to be denied and where access is to be permitted.
- Private property lines must be delineated with appropriate bearings, distances, and curve data to the extent necessary to describe the individual parcels of land to be acquired. Curve data shall include the radius, delta angle, arc length, and long chord bearing and distance.
- League lines and survey lines must be shown and identified by name and abstract number.
- County lines and city limit lines must be located and identified by name.

- A north arrow must be shown on each sheet, and, if possible, located in the upper right corner of the sheet.
- Monumentation set or found must be shown and described as to material and size.
- A station and offset must be shown for each PC, PT, and angle point in the proposed right-of-way lines. Stations and offsets shall be shown with respect to the proposed centerline alignment.
- Intersecting and adjoining public right-of-ways must be shown and identified by name, right-of-way width, and recording data.
- Railroads must be shown and identified by name, right-of-way width, and recording data.
- Utility corridors must be identified as to easement or fee.
- Easements and fee strips must be shown and identified by width, owner, and recording data.
- Building lines or set-back lines must be shown and identified.
- Visible improvements located within the proposed right-of-way corridor or within 50 feet of a proposed right-of-way line must be shown and identified.
- Structures must be identified as commercial or residential, by number of stories, and as to type (brick, wood frame, etc.).
- Structures which are severed by a proposed right-of-way line must be dimensioned to the extent necessary to completely delineate the severed parts.
- Parking areas, billboards, and other on-premise signs which are severed by proposed right-of-way line must be dimensioned to the extent necessary to delineate that portion of the parking area, billboard, or sign which is located within the proposed right-of-way corridor.
- In cases where structures are located outside the proposed right-of-way corridor and within ten feet of a proposed right-of-way line, the shortest distance between the structure and the proposed right-of-way line must be shown.
- If the structure is an element of the planimetric furnished to the Engineer's Surveyor by the County, the Engineer's Surveyor may snap to the structure to determine the shortest distance to the proposed right-of-way line. However, if the distance is less than three feet, the Engineer's Surveyor shall verify the distance in the field.
- Visible utilities located within the proposed right-of-way corridor or within 50 feet of a proposed right-of-way line must be shown and identified.
- Visible location of vents and filler caps of underground fuel storage tanks situated within the proposed right-of-way corridor or within 50 feet of the corridor must be determined and shown.
- Points of commencing and points of beginning must be shown and labeled. Points of beginning must be shown with their respective N and E surface

coordinates. As an exception, a point of commencing will not be required in the case of a total taking without a remainder.

- Each parcel of land to be acquired must be identified by a parcel number which shall appear in the ownership tabulation and on the right-of-way map in the proximity of the respective parcel. If the Engineer's Surveyor is unfamiliar with the criteria used by the County to assign parcel numbers, the Engineer's Surveyor shall seek the assistance of the County at the time the abstract map is complete.
- An ownership tabulation must be shown that includes the parcel number, existing area of the parent tract, lot(s) and block(s) constituting the parent tract when applicable, owner's name, type of conveyance, film code, county clerk's file number, taking area, and remaining area of the parent tract located left and right of the centerline alignment or both. Types of conveyance, film code and file numbers refer to conveyances to the County and will be added to the right-of way map by the County at a later date. The Engineer's Surveyor must provide several blank lines in the tabulation block to facilitate future map additions.
- A parent tract inset must be shown for each parent tract which cannot be shown to scale on the right-of-way map. The use of broken scale lines must be avoided. When parent tract insets are used, the point of commencing with the appropriate bearing and distance to the point of beginning may be shown on the parent tract inset.
- A note must be included on the title sheet and each map sheet stating the source of bearings, coordinates, and datum used. The note must also include the National Geodetic Survey (NGS) or other basis monument(s) name or identification number, State Plane Coordinate zone information, EPOCH information, Grid or Surface values and the Combined Adjustment Factor or Surface Adjustment Factor.
- Appropriate notes must be included on the title sheet and each map sheet stating the following:
  - Month(s) and year abstracting upon which the map is based.
  - Month(s) and year field surveys were conducted upon which the map is based.
  - Month and year the map was completed by the Engineer's Surveyor.
- The right-of-way Control-Section-Job (CSJ) number, if available, shall be shown on each right-of-way map sheet.
- The Engineer's Surveyor shall Place four Tick Marks, one in each quadrant of the map sheet, showing the Latitude and Longitude (Lat/Long) and the surface coordinate of each mark. The tick marks may be placed on the match lines of each map sheet, if convenient. A foot note must also be placed on the sheet defining the tick marks as Lat/Long in Decimal Degrees.

3.3. Exhibits

The Engineer's Surveyor shall prepare a Property Description for each parcel or tract consisting of two parts: (1) a metes and bounds description of the property and (2) a parcel plat. Each part of a Property Description must be signed and sealed by a RPLS.

1. Metes and bounds description

A metes and bounds description must be prepared for each parcel of land to be acquired. The State has developed standard formats for metes and bounds descriptions, copies of which the Engineer's Surveyor shall request and secure for all purposes of this Contract. Metes and bounds descriptions must include, but need not be limited to, the following items of information:

- State, County, and Survey within which the proposed parcel of land to be acquired is located.
- A reference to unrecorded and recorded subdivisions by name, lot, block, and recording data to the extent applicable.
- A reference by name to the grantor and grantee, date and recording data of the most current instrument(s) of conveyance describing the parent tract.
-
- Where possible, the Engineer shall use execution dates in deed references as opposed to recording or filing dates. In any case, the metes and bounds description shall make clear which date is being used.
- A point of commencing.
- A point of beginning with the appropriate N and E surface coordinates.
- A series of courses, identified by number and proceeding in a clockwise direction, describing the perimeter of the parcel of land to be acquired, and delineated with appropriate bearings, distances, and curve data.

  Curve data must include the radius, delta angle, arc length, and long chord bearing and distance.

  Each course must be identified either as a proposed right-of-way line, an existing right-of-way line, or a property line of the parent tract. Each property line of the parent tract must be described with an appropriate adjoiner call.

- A description of all monumentation set or found shall include, as a minimum, size and material.

- A reference to the source of bearings, coordinates, and datum used.

2. Parcel plat

   A parcel plat must be prepared for each parcel of land to be acquired. The State has developed standard formats for parcel plats, copies of which the Engineer's Surveyor shall request and secure for all purposes in this Contract. Parcel plats must include each and every item of information shown on the right-of-way map which concerns the individual parcel.

4. Adherence to Standards

For purposes of clarity, consistency, and ease of understanding, the County, as an acquiring agency of private property for public use, has adopted standards and formats for right-of-way mapping which have proven to facilitate the processes of negotiation, appraisal, relocation assistance, and condemnation. The Engineer's Surveyor shall adhere to these standards and formats to every extent possible to ensure that the needs of the County are met.

5. General Specifications

For purposes of this Contract, the following general specifications for right-of-way mapping apply:

- Completed right-of-way maps must be submitted to the County in both Microstation CADD files and Adobe PDF format that conform to producing a final print or plot which is 22 inches by 34 inches in size with a 21 inch by 32 inch printed border positioned ½ inch from the top, bottom, and right edge of the sheet.
- Parcel plats must be submitted to the County on 8 ½ inch by 11 inch bond paper with respective borders of 7 ½ inches by 10 inches, positioned ½ inch from the top, bottom, and right edge of the sheet. Match lines must be used where more than one sheet is required.
- Right-of-way maps must be drawn to a scale of 1 inch = 50 feet. An appropriate scale other than 1 inch = 50 feet may be used on some proposed right-of-way projects with prior approval by the County.
- The smallest size lettering acceptable on a right-of-way map shall be 1/10 of one inch (Leroy #100) because right-of-way maps are reduced in size by one-half for archiving purposes. A right-of-way map which contains any lettering smaller than 1/10 of one inch will not be accepted by the County.
- Parcel plats must be drawn to a preferred scale of 1 inch = 50 feet. An appropriate scale other than 1 inch = 50 feet may be used on some proposed right-of-way projects with prior approval by the County. In the case of a very large parcel which

would be difficult to show with clarity on a single 8 ½ inch by 11 inch sheet, the Engineer's Surveyor shall use multiple 8 ½ inch by 11 inch sheets with matching lines.

- The smallest size lettering acceptable on a parcel plat shall be 0.06 of an inch (Leroy #60).
- Property descriptions shall be submitted on 8 ½ inch by 11 inch bond paper.
- The Engineer's Surveyor shall obtain County approval prior to using a paper product not previously approved by the County.

6. General Requirements

For purposes of this Contract, the following general requirements shall apply:

- Copies of instruments of record submitted to the County must be indexed by parcel number.
- Coordinates appearing on right-of-way maps, on parcel plats, and in property descriptions must be surface coordinates based on the Texas Coordinate System. The appropriate combined adjustment factors (sea level factor multiplied by the scale factor) for each zone of the coordinate system, which have been developed by the County, must be noted. In order to obtain surface coordinates, the Engineer's Surveyor shall multiply grid coordinates by the appropriate combined adjustment factor for each zone, as provided by the County (The Grid coordinates multiplied by the combined adjustment factor = surface coordinates).
- Line and curve tables may be used when necessary.
- The number of centerline alignment stations to be shown on a single plan sheet are restricted to the extent necessary to allow approximately four inches between match lines and sheet borders for future details and notes.
- A minimum four **inch** by four inch space shall be reserved at the bottom right corner of each map sheet for future revision notes.
- Based on the discretion and direction of the County, a 5/8 inch Iron Rod with the County's Aluminum Cap (or other appropriate monument) may be set on the proposed right-of-way line, and may be replaced at a later date with the County's Type II right-of-way marker.

  When the County's 5/8" iron rod with the County's Aluminum Cap is set for PCs, PTs, PIs, and 1500 foot stations, the double asterisk symbol (**) must be shown on the map sheets and written into and shown in the property description and must be accompanied by the following note:

  **The monument described and set may be replaced with the County's Type II right-of-way marker upon the completion of the construction project, under the supervision of a RPLS, either employed or retained by the County.

DELIVERABLES

In preparing right-of-way maps, the following are required:

- An Abstract Map (Working Sketch) of the current record title holders.
- A Preliminary Map showing the proposed schematic and existing right-of-way.
- A Right-of-Way map for the project limits under cover of Title Sheet, Index Sheet, Control Data Sheet, and Exhibits of the property descriptions and parcel plats.
- Documentation stating that the appropriate monuments were set on the proposed right-of-way lines at intersecting property lines, and at all PCs, PTs, angle points, intersecting right-of-way lines of side streets, and at 1,500 foot stations.
- Documentation stating that the appropriate monuments were set on the existing right-of-way lines in areas of no acquisition at all PCs, PTs, angle points, and 1,500 foot stations, and as directed by the State.
- The Engineer's Surveyor's report, outlining the approach, reasons or basis for the existing right-of-way determination, and conclusions made.
- A copy of the State's right-of-way mapping check list, signed by the Engineer's Surveyor.

B. Traffic Control

The Engineer's Surveyor shall control traffic in and near surveying operations adequately to comply with provisions of the latest edition of the Texas Manual on Uniform Traffic Control Devices – Part VI which can be found on the State's internet site.

In the event field crew personnel must divert traffic or close traveled lanes, a Traffic Control Plan based upon principles outlined in the latest edition of the Texas Manual on Uniform Traffic Control Devices – Part VI shall be prepared by the Engineer's Surveyor and approved by the State prior to commencement of field work. A copy of the approved plan shall be in the possession of field crew personnel on the job site at all times and shall be made available to the State's personnel for inspection upon request.

C. Underground Excavation

The Engineer's Surveyor shall contact the "Texas Excavation Safety System, Inc." (DIGTESS), or call telephone number 811, to mark underground utilities prior to digging the holes for monuments, as necessary. The Engineer's Surveyor shall maintain documentation of all notification calls. The Engineer's Surveyor shall comply with the States excavation laws as they appear in the Texas Administrative Code (TAC).

D. Preventative Measures to Prevent the Spread of Oak Wilt Contamination

The Engineer's Surveyor shall take the following preventive measures while cutting, pruning, or removing oak trees in counties which have confirmed cases of Oak Wilt or at the direction of the State:

- When possible, employ alternative methods instead of pruning or cutting oak trees.
- When possible, perform necessary pruning and cutting of healthy trees during the winter months of January and February when Sap Beetles are least active. Also, if possible, avoid pruning or cutting during Spring months when Sap Beetles are most active.
- Treat wounds with pruning paint in Oak Wilt infected counties to discourage insects, especially during warm weather.
- Sterilize all pruning tools between each tree with either Lysol™ spray or a 70 percent rubbing alcohol solution. The use of chlorine bleach solutions to sterilize pruning tools is discouraged due to premature oxidation or rusting of steel parts.
- Destroy the tree cuttings by burning or burying the wood, or dispose of the wood in another approved method.

E. Additional Requirements

1. Adherence to schedule
   If at any time during the Contract Period the Engineer's Surveyor determines that it is unable to meet a scheduled submission date, the Engineer's Surveyor shall notify the County in writing immediately. This notification shall consist of an explanation as to the reason(s) for the delay and a revised submission schedule, which shall to the extent possible, incorporate a plan to recover days lost as a result of subject delay.

   If at any time during the Contract Period the Engineer's Surveyor encounters unforeseen circumstances which may materially affect the scope, complexity or character of the work authorized by the County, the Engineer's Surveyor shall notify the County in writing immediately with a complete description of the circumstances encountered.

2. Right-of-Entry
   It shall be the responsibility of the Engineer's Surveyor to secure permission to enter private property for purposes of survey. **It is the stated policy of the State to make every effort to maintain positive relations with the general public.** In pursuance of that policy, the Engineer's Surveyor shall not commit acts which will result in damages to private property and the Engineer's Surveyor shall make

every effort to comply with the wishes and address the concerns of private property owners.

F. Utility Adjustment Coordination.

Utility Adjustment Coordination shall include utility coordination meetings with individual utility companies, communication and coordination with utilities, and preparation of utility agreement assemblies including utility agreements, joint use agreements, and advanced funding agreements.

1. Utility Coordination

The Utility Coordinator shall perform utility coordination and liaison activities with involved utility owners, their consultants, and the County to achieve timely project notifications, formal coordination meetings, conflict analysis and resolution. The Utility Coordinator shall act as the "Responsible Party" as indicated in the State's– Utility Cooperative Management Process (See the State's ROW Utility Manual, chapter 2).

a. The Utility Coordinator shall coordinate all activities with the County, or their designee, to facilitate the orderly progress and timely completion of the design phase.
b. The Utility Coordinator shall coordinate with the local utilities committees to present a foot print of the State's projects with represented utility companies and owners. The Utility Coordinator shall also coordinate with any other utility committees which may include county, city, or other officials, if needed.
c. The Utility Coordinator shall provide initial project notification letters to all affected utility companies, owners, and other concerned parties.
d. The Utility Coordinator shall provide a Utility Contact List for each project with all information such as: (i) Owner's Name; (ii) Contact Person; (iii) Telephone Numbers; (iv) Emergency Contact Number;
(v) E-mail addresses; (vi) as well as all pertinent information concerning their respective affected utilities and facilities, including but not limited to: size, number of poles, material, and other information which readily identifies the utilities companies' facilities.
e. The Utility Coordinator shall advise utility companies and owners of the general characteristics of the Project and provide an illustration of the project footprint for mark-up of the utility facility locations that occupy the project area.

2. Utility Agreements for Utility Adjustments.

The Utility Coordinator shall coordinate with utilities that conflict with highway construction or the "Utility Accommodation Rules" (UAR), and make the utility company aware of these conflicts. The Utility Coordinator shall assist the utility

companies in the preparation of required agreements associated with the funding of adjustments and the occupation of State right of way.

a. Utility Agreement Assemblies: A packaged agreement consisting of a Utility Joint Use Acknowledgement, Standard Utility Agreements, Plans on 11x17 sheets, Statement of contract work form, Affidavit form and copy of recorded easement, schedule of work and various attachments as detailed in the UAR and the State's Utility Manual.
b. The Utility Coordinator shall submit the required number of executed copies of the Utility Agreement assemblies, which include the appropriate Forms as detailed in the UAR and supplied by the State, a copy of the recorded easement Deed, plans, and estimate to the State by letter recommending approval. The utility should be reimbursed eligible costs incurred within their easement limits for replacement in kind, as detailed in the UAR. The transmittal should also provide a description of the work being done as well as the estimated cost and schedule of work. The Utility Coordinator shall not perform engineering of relocation plans relative to a particular Utility Agreement under this supplemental as this is a cost of Right of Way that is subsidiary to the specific Utility Agreement.
c. The Utility Coordinator shall be solely responsible for determining which utilities will be installed by Agreement. The Utility Coordinator shall Process all form ROW-U-JUAA's and Utility Agreements, determine necessity of any Escrow Agreements, and forward to the State for final approval.
d. The Engineer, with the assistance of the Utility Coordinator, shall be responsible for the timely coordination, review and submittal of all documentation to be included in all the Utility Agreements, with such documents conforming to the requirements of 23 C.F.R. Section 645A. The Engineer, with the assistance of the Utility Coordinator, shall assist in the preparation, compilation, gathering, and collection of all required and supporting documents to be included with the Utility Agreements.
e. For each Utility, the Utility Coordinator shall obtain the records for all utility owners' costs in accordance with 23 C.F.R. Section 645A, in a format that is compatible with the estimate attached to the Utility Adjustment Agreement and with sufficient detail for analysis. The totals for labor, overhead, construction costs, travel, transportation, equipment, materials, supplies and other services shall be shown in such a manner as to permit comparison with the approved estimate.
f. The Engineer shall maintain a complete set of records for all Utility Adjustment Costs for each Utility for a period of time sufficient to complete all final payments to the utility companies or owners.

F. Utility Adjustment Coordination.

Utility Engineering includes the identification of utility conflicts, coordination, compliance with the UAR, and resolution of utility conflicts. The Engineer shall coordinate all activities with the County, State, or the State's designee, to facilitate the orderly progress and timely completion of the County's design phase.

1. Coordination of engineering activities

a. Utility Layout: The Engineer shall maintain a utility layout in the latest version of Micro Station used by the State. This layout shall include all existing utilities which are to remain in place or be abandoned, and all adjusted utilities. This layout shall be utilized to monitor the necessity and evaluate alternatives. The Utility Engineer shall utilize the layout of existing utilities as prepared, if available, and make a determination of the following:
   - Facilities in conflict with the proposed project that are to be relocated.
   - Facilities to be abandoned in place.
   - Facilities to remain in service and in place as a result roadway design adjustments and meeting the current UAR.
   - The Utility Engineer shall be responsible for determining if there are additional facilities, not shown in the Subsurface Utility Engineering (SUE) documents, which require relocation. The Engineer shall coordinate this information with the County immediately upon discovery.

2. Public and Induvial meetings with utility companies

As required, to facilitate utility conflict identification and resolution, the Engineer shall:

a. Establish contact with all existing utilities within and adjacent to the project limits and set up utility coordination meetings to discuss concepts and options for construction.
b. Schedule all utility coordination meetings and ensure compatibility with the schedule of the County.
c. Set agenda for all coordination meetings as directed by the County.
d. Establish and promote the desired agenda and methodologies for utility construction within the project limits. The agenda and methodologies will consist primarily of promoting the construction of utilities as a part of the Highway Contract.
e. Orientation: Prepare and present, in collaboration with the Couty, instruction and orientation sessions as required. The instruction shall introduce the

   SUE Plans, the proposed utility layout, processes, demonstrate the technology and facilitate the preparation of work orders, billings, and

contract related documentation as it pertains to utility adjustment work.

f. Initial Project Meeting: Attend an initial meeting and an on-site inspection (when appropriate) to ensure familiarity with existing conditions, project requirements and prepare a written report of the meeting.
g. Work Plan: Develop a work plan including a list of the tasks to be performed, a schedule and an estimate. The work plan must satisfy the requirements of the project and must be approved by the State prior to commencing work.
h. Progress Meetings: Meet with the County and State periodically to coordinate the work effort and resolve problems and prepare a written report of such meetings.

3. **Review of Utility's proposed adjustments**

   a. Evaluate Alternatives: The Utility Engineer shall evaluate alternatives in the adjustment of utilities balancing the needs of both the State and the Utility.
   b. Review Estimates and Schedules: The Utility Engineer shall review the utility adjustment estimates for reasonableness of cost and the timely scheduling of the adjustment.
   c. The Utility Engineer shall review plans for compliance with Utility Accommodation Rules and proposed location data. The responsibility for quality and accuracy of Utility adjustment plans will remain with the Utility Company.
   d. The Utility Engineer shall inspect traffic control setup. Ensure necessary traffic control, labor and equipment is utilized where applicable during the utility relocation process. The Utility Engineer shall ensure compliance with the regulations of the most recent edition of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD). The Utility Engineer must obtain approval from the State concerning the proposed method of handling traffic prior to allowing commencement of work.

4. **Third Parties.** The Engineer shall not provide services for the sole benefit of third parties.

5. **Proposed Utility Layout**. The Engineer shall prepare a signed and sealed Proposed Utility Layout in the latest version of Micro Station used by the State that can be overlaid on the base file with drainage. The Engineer shall:
   - Ensure all facilities conflicts have been resolved.
   - Ensure all stakeholders have concurred with the various alignments.
   - Establish the sequence of construction for all utility relocation work whether it is included as a part of the Highway Construction or not.
   - Determine which utilities will be built as part of the contract.
   - Determine which facilities will be relocated prior to construction.

6. **Utility Certification and Special Provisions.** The Utility Engineer shall submit upon request from the State, a Utility Certification or a Special Provisions report. The Utility Certification or Special Provisions report will certify that all utilities are clear for highway construction. However, if the utility adjustments are not complete prior to highway project letting, a Special Provision shall be required outlining all outstanding utility conflicts and their effects on highway construction. Furthermore, a Utility Clearance schedule, signed by the utility owner shall be provided with the certification as noted above. The formats for the Certification and the Clearance schedule will be provided by the State.
7. **Utility Certification and Special Provisions.** The Utility Engineer shall submit upon request from the State, a Utility Certification or a Special Provisions report. The Utility Certification or Special Provisions report will certify that all utilities are clear for highway construction. However, if the utility adjustments are not complete prior to highway project letting, a Special Provision shall be required outlining all outstanding utility conflicts and their effects on highway construction. Furthermore, a Utility Clearance schedule, signed by the utility owner shall be provided with the certification as noted above. The formats for the Certification and the Clearance schedule will be provided by the State.

8. The Utility Coordinator shall submit the required number of executed copies of the Utility Agreement assemblies, which include the appropriate Forms as detailed in the UAR and supplied by the State, a copy of the recorded easement Deed, plans, and estimate to the State by letter recommending approval. The Transmittal letter should include the following statement "The proposed utility adjustment will not conflict with proposed highway construction and will comply with UAR. The utility should be reimbursed eligible costs incurred within their easement limits for replacement in kind." The transmittal should also provide a description of the work being done as well as the estimated cost and schedule of work. The Engineer shall not perform engineering of relocation plans relative to a particular Utility Agreement under this contract as this is a cost of Right of Way that is subsidiary to the specific Utility Agreement.

FUNCTION CODE 145(145, 164) – MANAGING CONTRACTED

PROJECT MANAGEMENT AND ADMINISTRATION

The Engineer, in association with the County's Project Manager shall be responsible for directing and coordinating all activities associated with the project to comply with County policies and procedures, and to deliver that work on time.

Project Management and Coordination. The Engineer shall coordinate all subconsultant activity to include quality of and consistency of plans and administration of the invoices and monthly progress reports. The Engineer shall coordinate with

necessary local entities.

The Engineer shall:

- Prepare monthly written progress reports for each project.
- Develop and maintain a detailed project schedule to track project conformance to Exhibit C, Work Schedule, for each work authorization. The schedule submittals shall be hard copy and electronic format.
- Meet on a scheduled basis with the County to review project progress.
- Prepare, distribute, and file both written and electronic correspondence.
- Prepare and distribute meeting minutes.
- Document phone calls and conference calls as required during the project to coordinate the work for various team members.

FUNCTION CODE 160(150) – ROADWAY DESIGN

Design Surveys and Construction Surveys

Design Surveys and Construction Surveys include performance of surveys associated with the gathering of survey data for topography, cross-sections, and other related work in order to design a project, or during layout and staking of projects for construction.

1. Purpose
   The purpose of a design survey is to provide field data in support of transportation systems design.

   The purpose of a construction survey is to provide field data in support of highway construction.

2. Definitions
   A design survey is defined as the combined performance of research, field work, analysis, computation, and documentation necessary to provide detailed topographic (3-dimensional) mapping of a project site. A design survey may include, but need not be limited to locating existing right-of-way, cross-sections or data to create cross-sections and Digital Terrain Models (DTM), horizontal and vertical location of utilities and improvements, detailing of bridges and other structures, review of right-of-way maps, establishing control points, etc.

   A construction survey is defined as the combined performance of reconnaissance, field work, analysis, computation, and documentation necessary to provide the horizontal and vertical position of specific ground

points to be used by the construction contractor for determining lines and grades.

3. Tasks to Be complete

3.1. Design Surveys

The County request design surveys on FM 521. The Surveys shall perform tasks including, but not limited to the following:

- Obtain or collect data to create cross-sections and digital terrain models.
- Locate existing utilities based on visual evidence and utilities based on maps, plans, and marked by "One Call" within the project limits.
- Locate topographical features and existing improvements.
- Provide details of existing bridge structures.
- Provide details of existing drainage features, (e.g., culverts, manholes, etc.).
- Locate wetlands as delineated by others.
- Establish additional and verify existing control points. Horizontal and Vertical control ties must be made and tabulated, to other control points in the vicinity, which were established by other sources such as, the National Geodetic Survey (NGS), and the Federal Emergency Management Agency (FEMA), and any other local entities as directed by the County.
- Locate existing right-of-ways.
- Review right-of-way maps.
- Locate boreholes.
- Perform hydrographic surveys.
- Update existing control data and prepare survey control data sheets, as directed by the County for inclusion into a construction plan set.

The Surveyors shall also prepare a *Survey Control Index Sheet* and a *Horizontal and Vertical Control Sheet(s)*, signed, sealed and dated by the professional engineer in direct responsible charge of the surveying and the responsible RPLS for insertion into the plan set. The *Survey Control Index Sheet* shows an overall view of the project control and the relationship or primary monumentation and control used in the preparation of the project; whereas, the *Horizontal and Vertical Control sheet(s)* identifies the primary survey control and the survey control monumentation used in the preparation of the project. Both the *Survey Control Index Sheet* and the *Horizontal and Vertical Control Sheet(s)* must be used in conjunction with each other as a set. The State's forms for these sheets can be downloaded from the State's website.

The following information shall be shown on the *Survey Control Index Sheet:*

- Overall view of the project and primary control monuments set for control of the project
- Identification of the control points
- Baseline or centerline
- Graphic (Bar) Scale
- North Arrow
- Placement of note *"The survey control information has been accepted and incorporated into this PS&E"* which shall be signed, sealed and dated by a Texas Professional Engineer employed by the County
- RPLS signature, seal, and date
- The State's title block containing District Name, County, Highway, and CSJ

The following information shall be shown on all *Horizontal and Vertical Control Sheets*:

- Location for each control point, showing baseline or centerline alignment and North arrow.
- Station and offset (with respect to the baseline or centerline alignments) of each identified control point.
- Basis of Datum for horizontal control (base control monument/benchmark name, number, datum).
- Basis of Datum for the vertical control (base control monument, benchmark name, number, datum).
- Date of current adjustment of the datum.
- Monumentation set for Control (Description, District name/number and Location ties).
- Surface Adjustment Factor and unit of measurement.
- Coordinates (State Plan Coordinates [SPC] Zone and surface or grid).
- Relevant metadata.
- Graphic (Bar) Scale.
- Placement of note "*The survey control information has been accepted and incorporated into this PS&E"* which shall be signed, sealed and dated by a Texas Professional Engineer employed by the County.
- RPLS signature, seal and date.
- The State's title block containing District Name, County, Highway, and CSJ.

3.2. Construction Surveys

The County will request construction surveys on an as needed basis. The Surveys shall perform tasks including, but not limited to the following:

- Stake existing or proposed right-of-ways.
- Stake existing or proposed baseline/centerline.
- Stake proposed bridge structures.
- Stake proposed drainage structures (e.g., manholes, culverts, etc.).
- Set grade stakes.
- Recover and check existing control points.
- Establish additional control points.
- Check elevations and locations of structures.
- Determine and resolve conflicts associated with survey data.

4. Technical Requirements

4.1. Design surveys and construction surveys must be performed under the supervision of a RPLS currently registered with the TBPLS.

4.2. Horizontal ground control used for design surveys and construction surveys, furnished to the Surveyor by the State or based on acceptable methods conducted by the Surveyor, must meet the standards of accuracy required by the State & County.

Reference may be made to standards of accuracy for horizontal control traverses, as described in the TxDOT Survey Manual, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.

4.3. Vertical ground control used for design surveys and construction surveys, furnished to the Surveyor by the State or based on acceptable methods conducted by the Surveyor, must meet the standards of accuracy required by the State & County.

Reference may be made to standards of accuracy for vertical control traverses, as described in the TxDOT Survey Manual, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.

4.4. Side shots or short traverse procedures used to determine horizontal and vertical locations must meet the following criteria:

i. Side shots or short traverses must begin and end on horizontal and vertical ground control as described above.
ii. Standards, procedures, and equipment (may be GPS Equipment, LiDAR, Total Stations, etc.) used must be such that horizontal locations relative to the control may be reported within the following limits:
    - Bridges and other roadway structures: less than 0.1 of one foot.
    - Utilities and improvements: less than 0.2 of one foot.
    - Cross-sections and profiles: less than 1 foot.
    - Bore holes: less than 3 feet.
iii. Standards, procedures, and equipment (may be GPS Equipment, LiDAR, Total Stations, etc.) used must be such that vertical locations relative to the control may be reported within the following limits:
    - Bridges and other roadway structures: less than 0.02 of one foot.
    - Utilities and improvements: less than 0.1 of one foot.
    - Cross-sections and profiles: less than 0.2 of one foot.
    - Bore holes: less than 0.5 of one foot.

5. Automation Requirements

a. Planimetric design files (DGN) must be fully compatible with the State's *MicroStation V8i* graphics program without further modification or conversion.
b. Electronically collected and processed field survey data files must be fully compatible with the State's computer systems without further modification or conversion. All files must incorporate only those feature codes currently being used by the State.
c. DTM must be fully compatible with the State's *GEOPAK* system without further modification or conversion. All DTM must be fully edited and rectified to provide a complete digital terrain model with all necessary break lines.

DELIVERABLES

The deliverables to be specified in individual work authorizations for design surveys and construction surveys shall be any combination of the following:

- Digital Terrain Models (DTM) and the Triangular Irregular Network (TIN) files in a format acceptable by the State.
- Maps, plans, or sketches prepared by the Surveyor showing the results of field surveys.

- Computer printouts or other tabulations summarizing the results of field surveys.
- Digital files or media acceptable by the State and County containing field survey data (ASCII Data files).
- Maps, plats, plans, sketches, or other documents acquired from utility companies, private corporations, or other public agencies, the contents of which are relevant to the survey.
- Field survey notes, as electronic and hard copies.
- An 8 ½ inch by 11 inch survey control data sheet for each control point which must include, but need not be limited to, a location sketch, a physical description of the point including a minimum of two reference ties, surface coordinates, a surface adjustment factor, elevation, and the horizontal and vertical datums used. A pre-formatted survey control data sheet form in MicrosoftOffice Word 2010 format will be provided by the State.
- A digital and hard copy of all computer printouts of horizontal and vertical conventional traverses, GPS analysis and results, and survey control data sheets.
- All GEOPAK GPK files and/or OpenRoads GEOPAK files.
- Survey reports in a format requested by the State.

FUNCTION CODE 160(160) - ROADWAY DESIGN

ROADWAY DESIGN CONTROLS

The Engineer shall inform the County of changes made from previous initial meetings regarding each exception, waiver, and variance that may affect the design. The Engineer shall cease all work under this task until the exceptions, waivers, and variances have been resolved between the Engineer and the County unless otherwise directed by the County to proceed. The Engineer shall identify, prepare exhibits, and complete all necessary forms for Design Exceptions and Waivers within project limits prior to the 30% Submittal. These exceptions shall be provided to the County for coordination and processing of approvals.

160.1. Roadway Design.

The Engineer shall provide roadway plan and profile drawings using CADD standards as required by the County. The drawings must consist of a planimetric file of existing features and files of the proposed improvements. The roadway base map must contain line work that depicts existing surface features obtained from the schematic drawing. Existing major subsurface and surface utilities must be shown if requested by the County. Existing and proposed right-of-way lines must be shown. Plan and

Profile must be shown on separate or same sheets (this depends upon width of pavement) for main lanes, frontage roads, and direct connectors.

The plan view must contain the following design elements:

1. Calculated roadway centerlines for mainlanes, ramps, cross streets and frontage roads, as applicable. Horizontal control points must be shown. The alignments must be calculated using GEOPAK.
2. Pavement edges for all improvements (mainlanes, cross streets, driveways and frontage roads, if applicable).
3. Lane and pavement width dimensions.
4. The geometrics of ramps, auxiliary and managed lanes.
5. Proposed structure locations, lengths, and widths.
6. Direction of traffic flow on all roadways. Lane lines and arrows indicating the number of lanes must also be shown.
7. Drawing scale shall be 1"=100'
8. Control of access line, ROW lines and easements.
9. Begin and end superelevation transitions and cross slope changes.
10. Limits of riprap, block sod, and seeding.
11. Existing utilities and structures.
12. Benchmark information.
13. Radii call outs, curb location, Concrete Traffic Barrier (CTB), guard fence, crash safety items and American with Disabilities Act Accessibility Guidelines (ADAAG) compliance items.

The profile view must contain the following design elements:

1. Calculated profile grade for proposed mainlanes (cite direction), direct connectors, ramps, cross streets and frontage roads, if applicable. Vertical curve data, including "K" values must be shown.
2. Existing and proposed profiles along the proposed centerline of the mainlanes, the outside shoulder line of ramps, and the outside gutter line of the designated (north, south, east or west) bound frontage roads.
3. Water surface elevations at major stream crossing for 2, 5, 10, 25, 50, and 100 year storms.
4. Calculated vertical clearances at grade separations and overpasses, taking into account the appropriate superelevation rate, superstructure depth and required clearance.
5. The location of interchanges, mainlanes, grade separations and ramps (shall include cross sections of any proposed or existing roadway, structure, or utility crossing).
6. Drawing vertical scale to be 1"=10'.

160.3. Typical Sections: The Engineer shall prepare typical sections for all proposed and existing roadways and structures. Typical sections must include width of travel lanes, shoulders, outer separations, border widths, curb offsets, managed lanes, and ROW. The typical section must also include Proposed Profile Gradeline (PGL), centerline, pavement design, longitudinal joints, side slopes, sodding or seeding limits, concrete traffic barriers and sidewalks, if required, station limits, common proposed and existing structures including retaining walls, existing pavement removal, riprap, limits of embankment and excavation, etc.

160.4. Mainlane Design: The Engineer shall provide the design of mainlanes with full shoulders, frontage roads, entrance and exit ramps, managed lanes and auxiliary lanes. The design must be consistent with the approved schematic or refined schematic and the current *TxDOT Roadway Design Manual*.

160.5. Cross Streets. The Engineer shall provide an intersection layout detailing the pavement design and drainage design at the intersection of each cross street. The layout must include the horizontal and vertical alignments, curb returns, geometrics, transition length, stationing, pavement, drainage details, and American with Disabilities Act Accessibility Guidelines (ADAAG) compliance items. The Engineer shall design for full pavement width to the ROW and provide a transition to the existing roadway.

160.6. Cut and Fill Quantities. The Engineer shall develop an earthwork analysis to determine cut and fill quantities and provide final design cross sections at 100 feet intervals. Cross sections must be delivered in standard GEOPAK format on 11"x17" sheets or roll plots and electronic files. The Engineer shall provide all criteria and input files used to generate the design cross sections. Cross sections and quantities must include existing pavement removals. Annotation shall include at a minimum existing and proposed ROW, side slopes (front & back), profiles, etc.

The Engineer shall submit 2 sets of drawings (if requested) at the 30%, 60%, 90%, and 95% and final submittals, respectively. If requested by the County, the Engineer shall also submit the current OpenRoads generated 3D model for each submittal.

160.7. Plan Preparation. The Engineer shall prepare roadway plans, profiles and typical sections for the proposed improvements. The drawings will provide an overall view of the roadway and existing ground elevations with respect to the various storm design frequencies for the length of the project. This will enable the County to determine the most feasible proposed roadway profile. The County will approve the proposed profiles, 3D models (if applicable), and cross sections before the Engineer continues with the subsequent submittals. This scope of services and the corresponding cost proposal are based on the Engineer preparing plans to construct main lanes, and cross streets at intersections. The roadway plans must consist of the

types and be organized in the sequence as described in the *PS&E Preparation manual.*

160.8. Wetlands Information. From the information provided by the E, the wetland areas are to be staked, fenced and the delineation surveyed by the Engineer. The survey data must be electronically transferred to the Plan and Profile (P&P) sheets and the volumes calculated for the delineated areas.

160.9. Pavement Design. If applicable, the Engineer shall incorporate the pavement design developed by the County for this project. If the pavement design is not available, the County may request the Engineer to perform pavement design and submit to County for review and approval.

160.10. Pedestrian and Bicycle Facilities. The Engineer shall coordinate with the County to incorporate pedestrian and bicycle facilities as required or shown on the project's schematic. All pedestrian and bicycle facilities must be designed in accordance with the latest Americans with Disabilities Act Accessibility Guidelines (ADAAG), the Texas Accessibility Standards (TAS), and the AASHTO Guide for the Development of Bicycle Facilities

FUNCTION CODE 160(161) - ROADWAY DESIGN

DRAINAGE

161.1. Data Collection. The Engineer shall provide the following data collection services:

1. Conduct field inspections to observe current conditions and the outfall channels, the cross drainage structures, drainage easements, the tributary channel, and land development projects that contribute flow to the tributary. Document field inspections with digital photos.
2. Collect available applicable data including GIS data and maps, site survey data, construction plans, previous reports and studies, and readily available rainfall history for the area. Particular sources of data collected must include, but are not limited to, the State, County, and Federal Emergency Management Agency (FEMA).
3. Collect available Flood Insurance Rate Maps (FIRMs), Flood Insurance Study (FIS) study data, and models.
4. Review survey data and coordinate any additional surveying needs with County.
6. Meet with local government officials to obtain historical flood records. Interview local residents or local government employees to obtain additional high-water

information if available. Obtain frequency of road closure and any additional high-water information from the District Maintenance office.

161.2. Hydrologic Studies. The Engineer shall provide the following services:

1. Incorporate in the hydrologic study a thorough evaluation of the methodology available, comparison of the results of two or more methods, and calibration of results against measured data, if available.
2. Calculate discharges using appropriate hydrologic methods and as approved by the County.
3. Consider the pre-construction and post-construction conditions in the hydrologic study, as required in the individual Work Authorization.
4. Obtain the drainage area boundaries and hydrologic parameters such as impervious covered areas, and overland flow paths and slopes from appropriate sources including, but are not limited to, topographic maps, GIS modeling, construction plans, and existing hydrologic studies. The Engineer shall not use existing hydrologic studies without assessing of their validity. If necessary, obtain additional information such as local rainfall from official sites such as airports.
5. Include, at a minimum, the "design" frequency to be specified in the Work Authorization and the 1% Annual Exceedance Probability (AEP) storm frequency. The report must include the full range of frequencies (50%, 20% 10%, 4%, 2%, 1%, and 0.2% AEP).

161.3. Complex Hydraulic Design and Documentation.

The Engineer shall provide the following services:

1. Gather information regarding existing drainage facilities and features from existing plans and other available studies or sources.
2. Perform hydraulic design and analysis using appropriate hydraulic methods, which may include computer models such as HEC-RAS, unsteady HEC-RAS or 2D models such as SWMM. 2D models shall not be developed without the express permission of the County. Data entry for appropriate hydraulic computer programs shall consist of a combination of both on-the-ground survey and other appropriate sources including but not limited to topographic maps, GIS modeling, and construction plans and existing hydrologic studies.
3. Consider pre-construction, present and post-construction conditions, as well as future widening, as determined in the Work Authorization.
4. Quantify impacts, beneficial or adverse, in terms of increases in peak flow rates and water surface elevations for the above listed hydraulic conditions and hydrologic events. Impacts will be determined both upstream and downstream of the bridge crossings.

5. If required in the individual Work Authorization, compute right of way corridor 1% AEP flood plain volumes for existing and proposed roadway elevations. The Engineer shall provide mitigation to offset a decrease in 1% AEP flood plain volumes.
6. Use hydrograph calculations and peak flows to determine the storage required.
7. If necessary, present mitigation measures along with the advantages and disadvantages of each. Each method must consider the effects on the entire area. Include approximate construction costs in the report.
8. Provide hand calculations which quantify the cut and fill within the 1% AEP flood plain, if any.

161.4. Storm Drains

The Engineer shall provide the following services:

1. Design and analyze storm drains using software as approved by the County.
2. Size inlets, laterals, trunk line and outfall. Develop designs that minimize the interference with the passage of traffic or incur damage to the highway and local property in accordance with the State's Hydraulic Design Manual, District criteria and any specific guidance provided by the County. Storm drain design software shall be selected as directed by the Work Authorization.
3. Determine hydraulic grade line starting at the outfall channel for each storm drain design. Use the design water surface elevation of the outfall as the starting basis (tailwater) for the design of the proposed storm sewer system.
4. Calculate manhole headlosses. Compute manhole head losses as per FHWA's HEC-22.
5. Limit discharge into existing storm drains and existing outfalls to the capacity of the existing system, which will be determined by the Engineer. Evaluate alternate flow routes or detention, if necessary, to relieve system overload. Determine the amount of the total detention storage to control storm drain runoff for the design frequency based on hydrograph routing for the full range of frequencies (50%, 20% 10%, 4%, 2%, 1%, and 0.2% AEP), as well as a rough estimate of the available on-site volume. When oversized storm drains are used for detention, the Engineer shall evaluate the hydraulic gradeline throughout the whole system, within project limits, for the design frequency or frequencies. The Engineer shall coordinate with the County any proposed changes to the detention systems. The County will assess the effects of such changes on the comprehensive drainage studies.
6. Identify areas requiring trench protection, excavation, shoring, and de-watering.

161.5. Cross-Drainage Structures: The Engineer shall provide the following services:

1. Determine drainage areas and flows for cross culvert drainage systems.

2. Determine the sizing of the drainage crossings. The scope may include extending, adjusting or replacing non bridge-class culvert crossing or crossings as specified in the Work Authorization. Develop designs that minimize the interference with the passage of traffic or cause damage to the highway and local property in accordance with the State's Hydraulic Design Manual, District criteria and any specific guidance provided by the County. Cross drainage design shall be performed using HY-8 or HEC RAS.

161.6. Temporary Drainage Facilities:

The Engineer shall provide the following services:

1. Develop plans for all temporary drainage facilities necessary to allow staged construction of the project and to conform with the phasing of adjacent construction projects without significant impact to the hydraulic capacity of the area. Drainage area maps are not required for temporary drainage.

161.7. Scour Analysis. The Engineer shall provide the following services:

1. Perform a scour analysis for each proposed bridge structure.

2. Prepare each scour analysis using a State-approved methodology listed in the Work Authorization. The Engineer shall select the methodology based on the site conditions such as the presence of cohesive or cohesionless soil, rock or depth of rock, proposed foundation type, and existing site performance. The Engineer shall follow the methodology outlined in the State Geotechnical Manual. The Engineer shall coordinate with the County prior to commencing any work on any Stream Migration Study. This coordination must include consultation with the appropriate County technical expert.

3. Provide the County the potential scour depths, envelope and any recommended countermeasures including bridge design modifications and/or revetment.

161.8. Environmental Permits:

The Engineer shall notify the County project manager when site conditions may require environmental permits such as Nationwide Permit, §404 Individual Permits (including mitigation and monitoring) and U. S. Coast Guard and U.S. Army Corps of Engineers §10 Permits.

161.9. Plans, Specifications and Estimates (PS&E) Development for Hydraulics:

The Engineer shall provide the following services:

a. Prepare the PS&E package in accordance with the applicable requirements of the State's specifications, standards, and manuals, including the PS&E Preparation Manual. Anticipated sheets will include:

- Storm Drain Plan/Profile Sheets
- Hydrologic Data Sheets
- Hydraulic Data Sheets
- Detention Pond Layouts & Details
- Drainage Are Maps
- Culvert Layout Sheets
- Hydraulic data sheets for all bridges or cross drainage structures
- Layouts for Outfall Channels within ROW
- Bridge Deck Drainage System Layouts
- Standard Details
- Details for non-standard inlets, manholes and junction boxes
- Drainage details for outlet protection, outlet structures and utility accommodation structures
- All other relevant sheets
- Scour Data Sheets (if applicable)

b. Identify areas requiring trench protection, excavation, shoring and de-watering.
c. Identify pipe strength requirements.
d. Prepare drainage facility quantity summaries.
e. Identify potential utility conflicts and, if feasible, design to mitigate or avoid those identified conflicts.
f. Consider pedestrian facilities, utility impacts, driveway grades, retaining wall and concrete traffic barrier drainage impacts.
g. Identify existing ground elevation profiles at the ROW lines on storm sewer plan and profile sheets.

FUNCTION CODE 160(162) - ROADWAY DESIGN

SIGNING, PAVEMENT MARKINGS AND SIGNALIZATION (PERMANENT)

163.1. Signing. The Engineer shall prepare drawings, specifications, and details for all signs. The Engineer shall coordinate with the County (and other Engineers as required) for overall temporary, interim and final signing strategies and placement of signs outside contract limits. The Engineer shall:

- Prepare sign detail sheets for large guide signs showing dimensions, lettering, shields, borders, corner radii, etc., and shall provide a summary of large and small signs to be removed, relocated, or replaced.
- Designate the shields to be attached to guide signs.
- Illustrate and number the proposed signs on plan sheets.
- Select each sign foundation from County Standards.

163.2. Pavement Marking. The Engineer shall detail both permanent and temporary pavement markings and channelization devices on plan sheets. The Engineer shall coordinate with the County (and other Engineers as required) for overall temporary, interim, and final pavement marking strategies. The Engineer shall select Pavement markings from the latest County or State standards.

The Engineer shall provide the following information on sign and pavement marking layouts:

- Roadway layout.
- Center line with station numbering.
- Designation of arrow used on exit direction signs
- Culverts and other structures that present a hazard to traffic.
- Location of utilities.
- Existing signs to remain, to be removed, to be relocated or replaced.
- Proposed signs (illustrated, numbered and size).
- Proposed overhead sign bridges to remain, to be revised, removed, relocated, or replaced.
- Proposed overhead sign bridges, indicating location by plan.
- Proposed markings (illustrated and quantified) which include pavement markings, object markings and delineation.
- Quantities of existing pavement markings to be removed.
- Proposed delineators, object markers, and mailboxes.
- The location of interchanges, mainlanes, grade separations, frontage roads and ramps.
- The number of lanes in each section of proposed highway and the location of changes in numbers of lanes.
- Right-of-way limits.
- Direction of traffic flow on all roadways.

162.3. Traffic Warrant Studies. The Engineer shall prepare a traffic signal warrant study to support their recommendation for the continuous activation of an existing traffic signal or a proposed traffic signal based on projected volumes. Each warrant study must include addressing pedestrian signals along with obtaining both traffic and pedestrian counts. Signal warrant studies shall be conducted for the following intersections:

- FM 521 and Sienna Parkway
- FM 521 and Glendale Lakes
- FM 521 and Southern Colony Avenue
- FM 521 and CR 57/Juliff Manvel Road
- FM 521 and CR 56

The Engineer shall implement each proposed traffic signal improvement within existing County ROW unless otherwise approved by the County. The Engineer shall refer to latest version of the *TMUTCD*, *Traffic Signal Manual*, and the State's roadway and traffic standards for work performed for either temporary or permanent traffic signals. The Engineer shall develop and include a timing plan for each signal improvement.

162.4. Traffic Signals. Based upon the results of the Traffic Warrant Studies, the Engineer shall identify and prepare Traffic Signal Plans for all warranted traffic signals. The Engineer shall confirm the power source for all signals and coordinate with the appropriate utility agency. Traffic Signal Plans must be signed and sealed by a Texas Registered Professional Engineer. The Engineer shall develop all quantities, general notes, specifications and incorporate the appropriate agency standards required to complete construction. Traffic signal poles, fixtures, signs, and lighting must be designed per the Green Ribbon Report recommendations and standards.

The Engineer shall provide the following information in the Traffic Signal Plans:

1. Layout
    - a. Estimate and quantity sheet
        - (1) List of all bid items
        - (2) Bid item quantities
        - (3) Specification item number
        - (4) Paid item description and unit of measure
    - b. Basis of estimate sheet (list of materials)
    - c. General notes and specification data.
    - d. Condition diagram
        - (1) Highway and intersection design features
        - (2) Roadside development
        - (3) Traffic control including illumination
    - e. Plan sheet(s)
        - (1) Existing traffic control that will remain (signs and markings)
        - (2) Existing utilities
        - (3) Proposed highway improvements
        - (4) Proposed installation
        - (5) Proposed additional traffic controls
        - (6) Proposed illumination attached to signal poles.
        - (7) Proposed power pole source
    - f. Notes for plan layout
    - g. Phase sequence diagram(s)
        - (1) Signal locations
        - (2) Signal indications

(3) Phase diagram
(4) Signal sequence table
(5) Flashing operation (normal and emergency)
(6) Preemption operation (when applicable)
(7) Contact responsible Agency to obtain interval timing, cycle length and offset

h. Construction detail sheets(s)
(1) Poles (State standard sheets)
(2) Detectors
(3) Pull Box and conduit layout
(4) Controller Foundation standard sheet
(5) Electrical chart

i. Marking details (when applicable)
j. Aerial or underground interconnect details (when applicable)

2. General Requirements
a. Contact local utility company
(1) Confirm power source
b. Prepare governing specifications and special provisions list
c. Prepare project estimate
d. Conduct traffic counts and prepare Traffic Signal Warrant Studies for all proposed and existing traffic signals at designated locations.

3. Summary of Quantities
a. Small signs tabulation

4. Sign Detail Sheets
a. All signs except route markers
b. Dimensioning (letters, shields, borders, etc.)
c. Designation of shields attached to guide signs

FUNCTION CODE 160(163) - ROADWAY DESIGN

MISCELLANEOUS (ROADWAY)

The Engineer shall provide the following services:

163.1 Retaining Walls and Miscellaneous Structures. The Engineer shall develop each retaining wall design and determine the location of each soil boring needed for the foundation design of each retaining wall in accordance with the *Geotechnical Manual.* Prior to preparation of retaining wall layouts. The Engineer shall submit early in the plan preparation the retaining wall layouts to obtain approval from the State. The Engineer shall incorporate all necessary information from above referenced manuals

and respective checklists into the retaining wall layouts. For stage construction, the Engineer shall indicate limits of existing retaining walls for removal and reconstruction, and determine limits of temporary retaining walls to be shown on the TCP.

The approximate limits of each retaining wall shall be based on Station or length. The Engineer shall notify the State the type of retaining walls that will be used for and Cut and Fill location. Retaining wall types must include:

- Spread Footing Walls (High Footing Pressure Design and Low Footing Pressure Design). The Engineer shall select a spread footing wall for fill situation when considerable room behind the walls is available for forming, constructing, and backfilling the footings and stem. The Engineer shall notify the State when the quantity is less than 1000 square feet to have as option in the plans to cast in place a spread footing wall design. This selection has to be approved to State
- Mechanically Stabilized Earth (MSE) Walls. The Engineer shall prepare the retaining wall layouts showing plan and profile or retaining walls for design by a State approved vendor. The Engineer is responsible for design of geometry and wall stability. The Engineer shall incorporate a slope of 4:1 or flatter from the existing and finished ground line elevation to the face of the retaining wall.
- Concrete Block Walls (Structural and Landscape)
- Tied Back Walls
- Soil Nailed Walls
- Rock Nailed Walls
- Drilled Shaft Walls
- Temporary MSE Walls.

The Engineer shall provide layouts (scale 1"=100'), elevations, quantity estimate, summary of quantities, typical cross sections and structural details of all retaining walls within the project. Approximate lengths of the retaining walls as shown on the schematic are listed as below. The Engineer shall determine if any additional walls are required and verify the need for and length of the retaining walls as shown on the schematic.

If applicable, the State or County will provide architectural standard drawings. The Engineer shall incorporate architectural standard drawings into design details. The specific requirements for each item are as follows:

1. Layout Plan
   a. Designation of reference line
   b. Beginning and ending retaining wall stations
   c. Offset from reference line

d. Horizontal curve data
e. Total length of wall
f. Indicate face of wall
g. All wall dimensions and alignment relations (alignment data as necessary)
h. Soil boring locations
i. Drainage, signing, lightning, etc. that is mounted on or passing through the wall
j. Subsurface drainage structures or utilities which could be impacted by wall construction.

2. Elevation
   a. Top of wall elevations
   b. Existing and finished ground line elevations
   c. Vertical limits of measurement for payment
   d. Type, limits and anchorage details of railing (only if Traffic Railing foundation standard is not being used on this project)
   e. Top and bottom of wall profiles plotted at correct station & elevation
   f. Underdrains
   g. Any soil improvement, if applicable
   h. Drainage, signing, lighting etc. as noted above
   i. Drainage structures and utilities as noted above

3. Sectional View
   a. Reinforced volume
   b. Underdrain location
   c. Soil improvements, if applicable.

4. General Guidelines for Retaining Walls
   a. The Engineer shall perform design calculations to check the external stability of the walls including slope stability, bearing, sliding and overturning and detail drawings in accordance with the standard requirements of the State
   b. For retaining wall submittals, the Engineer shall check State's Bridge Division website for current requirements.

163.2 Traffic Control Plan, Detours, Sequence of Construction. The Engineer shall prepare Traffic Control Plans (TCP) including TCP typical sections, for the project. The Engineer shall complete Form 2229-Significant Project Procedures along with Page 4 of Form 1002, specifically titled Accelerated Construction Procedures. A detailed TCP must be developed in accordance with the latest edition of the TMUTCD. The Engineer shall implement the current Barricade and Construction (BC) standards and TCP standards as applicable. The Engineer shall interface and coordinate phases of work, including the TCP, with adjacent Engineers. The Engineer shall:

1. Provide a written narrative of the construction sequencing and work activities per phase and determine the existing and proposed traffic control devices (regulatory signs, warning signs, guide signs, route markers, construction pavement markings, barricades, flag personnel, temporary traffic signals, etc.) to be used to handle traffic during each construction sequence. The Engineer shall show proposed traffic control devices at grade intersections during each construction phase (stop signs, flagperson, signals, etc.). The Engineer shall show temporary roadways, ramps, structures (including railroad shoo-fly) and detours required to maintain lane continuity throughout the construction phasing. If temporary shoring is required, prepare layouts and show the limits on the applicable TCP.
2. Coordinate with the County and State in scheduling a Traffic Control Workshop and submittal of the TCP for approval by the Traffic Control Approval Team (TCAT). The Engineer shall assist the County in coordinating mitigation of impacts to adjacent schools, emergency vehicles, pedestrians, bicyclists and neighborhoods.
3. Develop each TCP to provide continuous, safe access to each adjacent property during all phases of construction and to preserve existing access. The Engineer shall notify the County in the event existing access must be eliminated, and must receive approval from the County prior to any elimination of existing access.
4. Design temporary drainage to replace existing drainage disturbed by construction activities or to drain detour pavement. The Engineer shall show horizontal and vertical location of culverts and required cross sectional area of culverts.
5. Prepare each TCP in coordination with the County and State. The TCP must include interim signing for every phase of construction. Interim signing must include regulatory, warning, construction, route, and guide signs. The Engineer shall interface and coordinate phases of work, including the TCP, with adjacent Engineers, which are responsible for the preparation of the PS&E for adjacent projects.
6. Maintain continuous access to abutting properties during all phases of the TCP. The Engineer shall develop a list of each abutting property along its alignment. The Engineer shall prepare exhibits for and attend meetings with the public, as requested by the County or State.
7. Make every effort to prevent detours and utility relocations from extending beyond the proposed Right-of-way lines. If it is necessary to obtain additional permanent or temporary easements and Right-of-Entry, the Engineer shall notify the County in writing of the need and justification for such action. The Engineer shall identify and coordinate with all utility companies for relocations required.

8. Describe the type of work to be performed for each phase of sequence of construction and any special instructions (e.g. storm drain, culverts, bridges, railing, illumination, signals, retaining walls, signing, paving surface sequencing or concrete placement, ROW restrictions, utilities, etc.) that the contractor should be made aware to include limits of construction, obliteration, and shifting or detouring of traffic prior to the proceeding phase.
9. Include the work limits, the location of channelizing devices, positive barrier, location and direction of traffic, work area, stations, pavement markings, and other information deemed necessary for each phase of construction.
10. Identify and delineate any outstanding ROW parcels.
11. Delineate areas of wetlands on traffic control plans.

163.5. Temporary Traffic Signals and Illumination: The Engineer shall immediately notify the County if the Engineer determines that an existing traffic signal or roadway illumination will be affected by the project. The Engineer shall address the adjustment or realignment of traffic signal heads and the use of detection for mainlanes and side streets on the plans as directed by the County. The Engineer shall obtain traffic movement counts to address any new timing plans to minimize the impact during construction and to determine the storage length needed for left and right turn movements. The Engineer shall address lighting of signalized intersections and shall coordinate with local utilities as approved by the County.

163.6. Illumination. The Engineer shall refer to TxDOT's *Highway Illumination Manual* and other deemed necessary County and State approved manuals for design of continuous lighting and safety lighting for all conventional, high-mast, and underpass lighting. The Engineer shall include safety lighting as part of each design on each flashing beacon and traffic signal. The Engineer shall provide a preliminary layout for initial review and approval by the County. The Engineer shall prepare circuit wiring diagrams showing the number of luminaries on each circuit, electrical conductors, length of runs, service pole assemblies. Underpass lighting must be used on all structures within each project. The Engineer shall integrate existing illumination within the project limits into the proposed design. The Engineer shall coordinate with the County and TxDOT to determine the location of proposed high-mast, conventional, and underpass lighting.

163.7. Stormwater Pollution Prevention Plans (SW3P). The Engineer shall develop SW3P, on separate sheets from (but in conformance with) the TCP, to minimize potential impact to receiving waterways. The SW3P must include text describing the plan, quantities, type, phase and locations of erosion control devices and any required permanent erosion control.

163.8. SUBSURFACE UTILITY ENGINEERING:

Utility Engineering Investigation include utility investigations subsurface and above ground prepared in accordance with AASHTO standards [ASCE C-1 38-02 (http://www.fhwa.dot.gov/programadmin/asce.cfm)] and Utility Quality Levels as follows.

A. UTILITY QUALITY LEVELS

Utility Quality Levels are defined in cumulative order (least to greatest) as follows:

1. Quality Level D - Existing Records: Utilities are plotted from review of available existing records.
2. Quality Level C - Surface Visible Feature Survey: Quality level "D" information from existing records is correlated with surveyed surface-visible features. Includes Quality Level D information. If there are variances in the designated work area of Level D, a new schematic or plan layout will be necessary to identify the limits of the proposed project and the limits of the work area required for the work authorization; including highway stations, limits within existing or proposed right of way, additional areas outside the proposed right of way, and distances or areas to be included along existing intersecting roadways.
3. Quality Level B - Designate: Two-dimensional horizontal mapping. This information is obtained through the application and interpretation of appropriate non-destructive surface geophysical methods. Utility indications are referenced to established survey control. Incorporates quality levels C and D information to produce Quality Level B. If there are variances in the designated work area of Level D, a new schematic or plan layout will be necessary to identify the limits of the proposed project and the limits of the work area required for the work authorization; including highway stations, limits within existing or proposed right of way, additional areas outside the proposed right of way, and distances or areas to be included along existing intersecting roadways.
4. Quality Level A - Locate (Test Hole): Three-dimensional mapping and other characterization data. This information is obtained through exposing utility facilities through test holes and measuring and recording (to appropriate survey control) utility/environment data. Incorporates quality levels B, C and D information to produce Quality Level A.\

B. DESIGNATE (QUALITY LEVEL B)

Designate means to indicate the horizontal location of underground utilities by the application and interpretation of appropriate non-destructive surface geophysical

techniques and reference to established survey control. Designate (Quality Level B) Services are inclusive of Quality levels C and D.

The Engineer shall:

1. As requested by the County compile "As Built" information from plans, plats and other location data as provided by the utility owners.
2. Coordinate with utility owner when utility owner's policy is to designate their own facilities at no cost for preliminary survey purposes. The Engineer shall examine utility owner's work to ensure accuracy and completeness.
3. Designate, record, and mark the horizontal location of the existing utility facilities and their service laterals to existing buildings using non-destructive surface geophysical techniques. No storm drain facilities are to be designated unless authorized by the County. A non-water base paint, utilizing the APWA color code scheme, must be used on all surface markings of underground utilities.
4. Correlate utility owner records with designating data and resolve discrepancies using professional judgment. A color-coded composite utility facility plan with utility owner names, quality levels, line sizes and subsurface utility locate (test hole) locations, shall be prepared and delivered to the County. It is understood by both the Engineer and the County that the line sizes of designated utility facilities detailed on the deliverable are from the best available records and that an actual line size is normally determined from a test hole vacuum excavation. A note must be placed on the designate deliverable only that states "lines sizes are from best available records". All above ground appurtenance locations must be included in the deliverable to the County. This information shall be provided in the latest version of Micro Station or Geopak used by the County. The electronic file will be delivered on CD or DVD, as required by the County. A hard copy is required and must be signed, sealed, and dated by the Engineer. When requested by the County, the designated utility information must be over laid on the County's design plans.
5. Determine and inform the County of the approximate utility depths at critical locations as determined by the County. This depth indication is understood by both the Engineer and the County to be approximate only and is not intended to be used preparing the right of way and construction plans.
6. Provide a monthly summary of work completed and in process with adequate detail to verify compliance with agreed work schedule.
7. Close-out permits as required.
8. Clearly identify all utilities that were discovered from quality levels C and D investigation, but cannot be depicted in quality level B standards. These utilities must have a unique line style and symbology in the designate (Quality Level B) deliverable.

9. Comply with all applicable County policy and procedural manuals. Incorporate in the hydrologic study a thorough evaluation of the methodology available, comparison of the results of two or more methods, and calibration of results against measured data, if available.

C. SUBSURFACE UTILITY LOCATE (TEST HOLE) SERVICE (QUALITY LEVEL A)

Locate means to obtain precise horizontal and vertical position, material type, condition, size and other data that may be obtainable about the utility facility and its surrounding environment through exposure by non-destructive excavation techniques that ensures the integrity of the utility facility. Subsurface Utility Locate (Test Hole) Services (Quality Level A) are inclusive of Quality Levels B, C, and D.

The Engineer shall:

1. Review requested test hole locations and advise the County in the development of an appropriate locate (test hole) work plan relative to the existing utility infrastructure and proposed highway design elements.
2. Coordinate with utility owner inspectors as may be required by law or utility owner policy.
3. Neatly cut and remove existing pavement material, such that the cut not to exceed 0.10 square meters (1.076 square feet) unless unusual circumstances exist.
4. Measure and record the following data on an appropriately formatted test hole data sheet that has been sealed and dated by the Engineer:
   a. Elevation of top and/or bottom of utility tied to the datum of the furnished plan.
   b. Identify a minimum of two benchmarks utilized. Elevations shall be within an accuracy of 15mm (.591 inches) of utilized benchmarks.
   c. Elevation of existing grade over utility at test hole location.
   d. Horizontal location referenced to project coordinate datum.
   e. Outside diameter of pipe or width of duct banks and configuration of non- encased multi-conduit systems.
   f. Utility facility material(s).
   g. Utility facility condition.
   h. Pavement thickness and type.
   i. Coating/Wrapping information and condition.
   j. Unusual circumstances or field conditions.
5. Excavate test holes in such a manner as to prevent any damage to wrappings, coatings, cathodic protection or other protective coverings and features. Water excavation can only be utilized with written approval from the County.

6. Be responsible for any damage to the utility during the locating process. In the event of damage, the Engineer shall stop work, notify the appropriate utility facility owner, the County and appropriate regulatory agencies. The regulatory agencies include, but are not limited to the Railroad Commission of Texas and the Texas Commission on Environmental Quality. The Engineer shall not resume work until the utility facility owner has determined the corrective action to be taken. The Engineer shall be liable for all costs involved in the repair or replacement of the utility facility.

7. Back fill all excavations with appropriate material, compact backfill by mechanical means, and restore pavement and surface material. The Engineer shall be responsible for the integrity of the backfill and surface restoration for a period of three years. Install a marker ribbon throughout the backfill.

8. Furnish and install a permanent above ground marker (as specified by the County, directly above center line of the utility facility.

9. Provide complete restoration of work site and landscape to equal or better condition than before excavation. If a work site and landscape is not appropriately restored, the Engineer shall return to correct the condition at no extra charge to the County.

10. Plot utility location position information to scale and provide a comprehensive utility plan sign and sealed by the responsible Engineer. This information shall be provided in the latest version of Micro Station or Geopak format used by the County. The electronic file will be delivered on C.D or DVD. When requested by the County, the Locate information must be over laid on the County's design plans.

11. Return plans, profiles, and test hole data sheets to the County. If requested, conduct a review of the findings with the County.

12. Close-out permits as required.

163.9. Compute and Tabulate Quantities. The Engineer shall provide the summaries and quantities within all formal submittals.

163.10. Miscellaneous Structural Details. The Engineer shall provide necessary details required to supplement standard details.

163.11. Agreements (Railroad, *etc.*) and Layouts. The Engineer shall prepare each railroad or other agency agreement, exhibit, and layout sheet in accordance with the requirements of each railroad and as directed by the County. The Engineer shall coordinate with each railroad or agency and the County to determine submittal requirements, processing schedules, and exhibit formats. The Engineer shall submit each exhibit to the County for review and processing.

163.12. Testimony for Right of Way Hearings. If required, the Engineer shall support and testify in possible Right of Way hearings, as the Engineer of Record for the project. As requested by the State or the Attorney General's office, the Engineer shall be required to do the following:

- Research, study, analyze and review the project and the assigned parcels for acquisition;
- Prepare litigation designs and standard 8.5 x 11 inch, 11 x 17 inch or 24 x 36 inch paper exhibits. These deliverables are considered to be litigation documents and not engineering documents requiring a P.E. seal;
- Be available to prepare for and testify at hearings, depositions and trials, and;
- Be available to assist and consult with the Attorney General's Office, with case preparation.

163.13. Estimate. The Engineer shall independently develop and report quantities necessary to construct the contract in standard State bid format at the specified milestones and Final PS&E submittals. The Engineer shall prepare each construction cost estimates using Estimator or any approved method. The estimate shall be provided at each milestone submittal per County requirement.

163.14. Contract time determination. The Engineer shall prepare a detailed contract time estimate to determine the approximate time required for construction of the project in calendar and working days (based on the County standard definitions of calendar and working days) at the 95% and Final PS&E milestone. The schedule must include tasks, subtasks, critical dates, milestones, deliverables, and review requirements in a format which depicts the interdependence of the various items and adjacent construction packages. The Engineer shall provide assistance to the County in interpreting the schedule.

163.15. Specifications and General Notes. The Engineer shall identify necessary standard specifications, special specifications, special provisions and the appropriate reference items. The Engineer shall prepare General Notes from the District's *Master List of General Notes*, Special Specifications and Special Provisions for inclusion in the plans and bidding documents. The Engineer shall provide General Notes, Special Specifications and Special Provisions in the required format.

163.16. Constructability Review. The Engineer shall provide Independent Quality Review of the constructability PS&E sets.

The Engineer shall perform constructability reviews at major project design milestones (e.g. 30%, 60%, 90%, 95%, and final plan) to identify potential constructability issues and options that would provide substantial time savings during construction. The constructability review must be performed for all roadway

and structural elements such as Sequence of Work/Traffic Control, Drainage (Temporary and Permanent), Storm Water Pollution Prevention Plan (SW3P), Environmental Permits, Issues and Commitments (EPIC) addressed, identify Utility conflicts; ensuring accuracy and appropriate use of Items, Quantities, General Notes, Standard and Special Specifications, Special Provisions, Contract Time/Schedule, Standards; and providing detailed comments in an approved format. Reviews must be captured in a Constructability Log identifying areas of concern and potential conflict. The Engineer shall provide the results of all Constructability reviews and recommendations to the County at major project design milestone submittals.

FUNCTION CODE 160(165) – ROADWAY DESIGN

Traffic Management Systems (Permanent)

The Engineer shall design fiber optic cable for the entire length of FM 521. The Engineer shall prepare the design and details for conduit and cable and other relevant detail. Design specifications shall be defined in the work authorization. The Engineer shall also coordinate with the State Computerized Transportation Management Systems (CTMS) Section should the State have a computerized traffic management system under construction or in place and operating within the project limits.

FUNCTION CODE 160(170) – ROADWAY DESIGN

BRIDGE DESIGN

170.1. Bridge Layout. The Engineer shall prepare a bridge layout plan sheet for each bridge and bridge class culvert. The Engineer shall determine the location of each soil boring needed for foundation design in accordance with the *Geotechnical Manual*.

Description	Approx. Length	Approx. Width
FM 521 @ Creek by Fenn Rd	90 ft	82 ft
FM 521 @ Creek by Miller Rd-NB	90 ft	36.5 ft
FM 521 @ Creek by Miller Rd-SB	90 ft	30 ft
FM 521 @ BNSF	600 ft	60 ft

Prior to preparation of each bridge layout, the Engineer shall prepare a comparative cost analysis of bridge structures to determine: (1) the optimum bridge beams for vertical clearance over railroads, roadway, or waterways, (2) the optimum bridge

structure versus roadway embankment, pavement, soil stabilization, and retaining walls, and (3) to determine optimum in bridge beams for the direct connectors.

The Engineer shall submit a bridge layout for each structure early in the plan preparation process to obtain approval from the State and County. The Engineer shall comply with all relevant sections of the latest edition of the *State's LRFD Bridge Design Manual, Bridge Project Development Manual, Bridge Detailing Guide, and AASHTO LRFD Bridge Design Specifications and respective checklists*. Each bridge layout sheet must include bridge typical sections, structural dimensions, abutment and bent locations, superstructure and substructure types. The Engineer shall locate and plot all soil borings and utilities, show proposed retaining walls, and, for staged construction, indicate limits of existing bridge for removal and reconstruction.

170.2. **Bridge Detail Summary.** The Engineer shall prepare total bridge quantities, estimates, and summary sheets for each bridge or bridge class culvert.

170.3. **Bridge Structural Details.** The Engineer shall prepare each structural design and develop detailed structural drawings of all required details in compliance with above-listed manuals and guidelines. The Engineer shall assemble and complete all applicable State Standard Details sheets.

Additionally, the Engineer shall:

- Perform calculations for design of bridge abutments.
- Perform calculations for bridge slab design.
- Perform calculations to determine elevations of bridge substructure and super structure elements.
- Perform calculations for bridge box beam design.
- Prepare necessary foundation details and plan sheets.
- Prepare plan sheets for abutment design.
- Prepare plan sheets for additional abutment details.
- Prepare framing plan and slab plan sheets.
- Compute and prepare tables for slab and bearing seat elevations, dead load deflections, etc.
- Design beams and prepare beam design tables.
- Prepare special provisions and special specifications in accordance to the above-listed manuals and guidelines.

FUNCTION CODE 309(309) – DESIGN VERIF/CHANGES/ALTER

CONSTRUCTION PHASE SERVICES

The Engineer shall provide Construction Phase Services at the written request of the County's Project Manager. The written request must include a description of the work

requested, a mutually agreed upon time limit, and any special instructions for coordination and submittal. These services shall include, but are not limited to the following:

1. Attend preconstruction meeting
2. Attend partnering meeting
3. Attend field meetings and make visits to site
4. Calculate quantities and assist the area engineer in preparing change orders
5. Review and approval of shop drawings
6. Review and approval of forming details
7. Responding to requests for information (RFIs)
8. Providing minor redesign (major redesign should be handled with a contract supplement), which will include changes to the affected plan sheets and an updated copy of the 3D model (if applicable).
9. Answering general questions
10. Providing clarification
11. Other project related tasks in support of the County during construction

Deliverables

Plans

The Engineer shall provide the following information at each submittal:

1. 30% Plans Submittal

    1.1. One set of 11" x 17" plan sheets for the County Review.
    1.2. Two sets of 11" x 17" plan sheets for the State District Review.
    1.3. Estimate of construction cost.
    1.4. Engineer's internal QA and QC markup set.
    1.5. Form 1002 and Design Exceptions with existing and proposed typical sections, location map and design exception exhibits.
    1.6. If applicable, a Preliminary 3D model, in DGN format, created using Bentley's OpenRoads, OpenBridge and/or 3D MicroStation\Civil tools, and with detail to verify the design of the 30% plan sheets.

2. Between 30% Submittal and 60% Submittal:
    2.1. Eight sets of 11" x 17" bridge and retaining wall layouts for the State District review.
    2.2. External stability analysis for retaining walls.
    2.3. One set of a roll format TCP phasing layouts, one .pdf of plan sheets for TCP concept, and significant project procedures form (State Form 2229) to present at the TCAT for the State review.
    2.4. One set of a roll format of illumination plan concept to State review.

2.5. For Division Hydraulic Review of existing Bridge Class Culverts, five sets of 11" x 17" Bridge Class Culvert Plan and Profile sheets and Hydrology & Hydraulics sheets, include project title sheet and project layout sheet

3. 60% Plans Submittal:

3.1. One set of 11" x 17" plan sheets for the County Review.
3.2. Two sets of 11" x 17" plan sets for the State District review.
3.3. Estimate of construction cost.
3.4. Engineer's internal QA and QC marked up set.
3.5. One set of a roll format TCP phasing layouts, one .pdf of plan sheets for TCP concept, and significant project procedures form (State Form 2229) to present at the TCAT for the State review.
3.6. If applicable, a preliminary 3D model, in DGN format, created using Bentley's OpenRoads, OpenBridge and/or 3D MicroStation\Civil tools, and with detail to verify the design of the 60% plan sheets. The level of detail of the surface and subsurface features will be at the direction of the County.

4. Review Submittal (90%)

4.1. One set of 11" x 17" plan sheets for the County Review.
4.2. Two sets of 11" x 17" plan sheets for the State District Review.
4.3. Estimate of construction cost.
4.4. Marked up general notes
4.5. Construction schedule.
4.6. New Special Specifications and Special Provisions with Form 1814, if applicable.
4.7. Engineer's internal QA and QC marked up set.
4.8. Other supporting documents.
4.9. If applicable, a detailed 3D model, in DGN format, created using Bentley's OpenRoads, OpenBridge and/or 3D MicroStation\Civil tools, and with detail to verify the design of the 90% plan sheets. The level of detail of the surface and subsurface features will be at the direction of the County.

5. Review Submittal (95%):

5.1. One set of 11" x 17" plan sheets for the County Review.
5.2. Two sets of 11" x 17" plan sheets for the State district review
5.3. List of governing Specifications and Special Provisions in addition to those required.
5.4. Marked up general notes.
5.5. Plans estimate.

5.6. New Special Specifications and Special Provisions with Form 1814, if applicable.
5.7. Triple Zero Special Provisions.
5.8. Engineer sign, seal and date supplemental sheets (8 ½" x 11").
5.9. Contract time determination summary.
5.10. Significant project procedures form.
5.11. Right-of-Way and utilities certification.
5.12. Temporary road closure letters.
5.13. Construction speed zone request.
5.14. Engineer's internal QA and QC marked-up set.
5.15. Other supporting documents.
5.16. If applicable, a detailed 3D model, in DGN format, created using Bentley's OpenRoads, OpenBridge and/or 3D MicroStation\Civil tools, and with detail to verify the design of the 95% plan sheets. The level of detail of the surface and subsurface features will be at the direction of the County.

6. Final submittal (100%).

6.1. One paper sets of 11" x 17"
6.2. Revised supporting documents from 95% review comments.
6.3. If applicable, a final 3D model, in DGN format, LandXML format and other format (as directed by the County) created using Bentley's OpenRoads, OpenBridge and/or 3D MicroStation\Civil tools. The level of detail of the surface and subsurface features will be at the direction of the County.

Electronic Copies

The Engineer shall furnish the County with a USB, CD or DVD of the final plans in the format of current CADD system used by the County, .pdf format.

The Engineer shall also provide separate CD or DVD containing cross section information (in dgn, XLR, & ASCII formats) for the County contractor to use.

The Engineer shall provide an electronic copy of Primavera file or the latest scheduling program used by the County for construction time estimate.

Calculations

The Engineer shall provide the following:

A 3-ring binder with all quantity and non-structural design calculations.

A bound copy of all engineering calculations, analysis, input calculations, quantities, geometric designs (GEOPAK GPK files), etc. relating to the project's

structural elements. Project structural elements include, but are not limited to: bridges, retaining walls, overhead sign foundations, high-mast illumination foundations, non-standard culverts, custom headwalls and drainage appurtenances.

Working copies of all spreadsheets and output from any programs utilized on a CD or DVD in a universally reliable format.

The Engineer may provide the calculations in .pdf format in lieu of the bound hard copies. The .pdf file should be submitted on a CD,DVD, or in ProjectWise (if applicable).

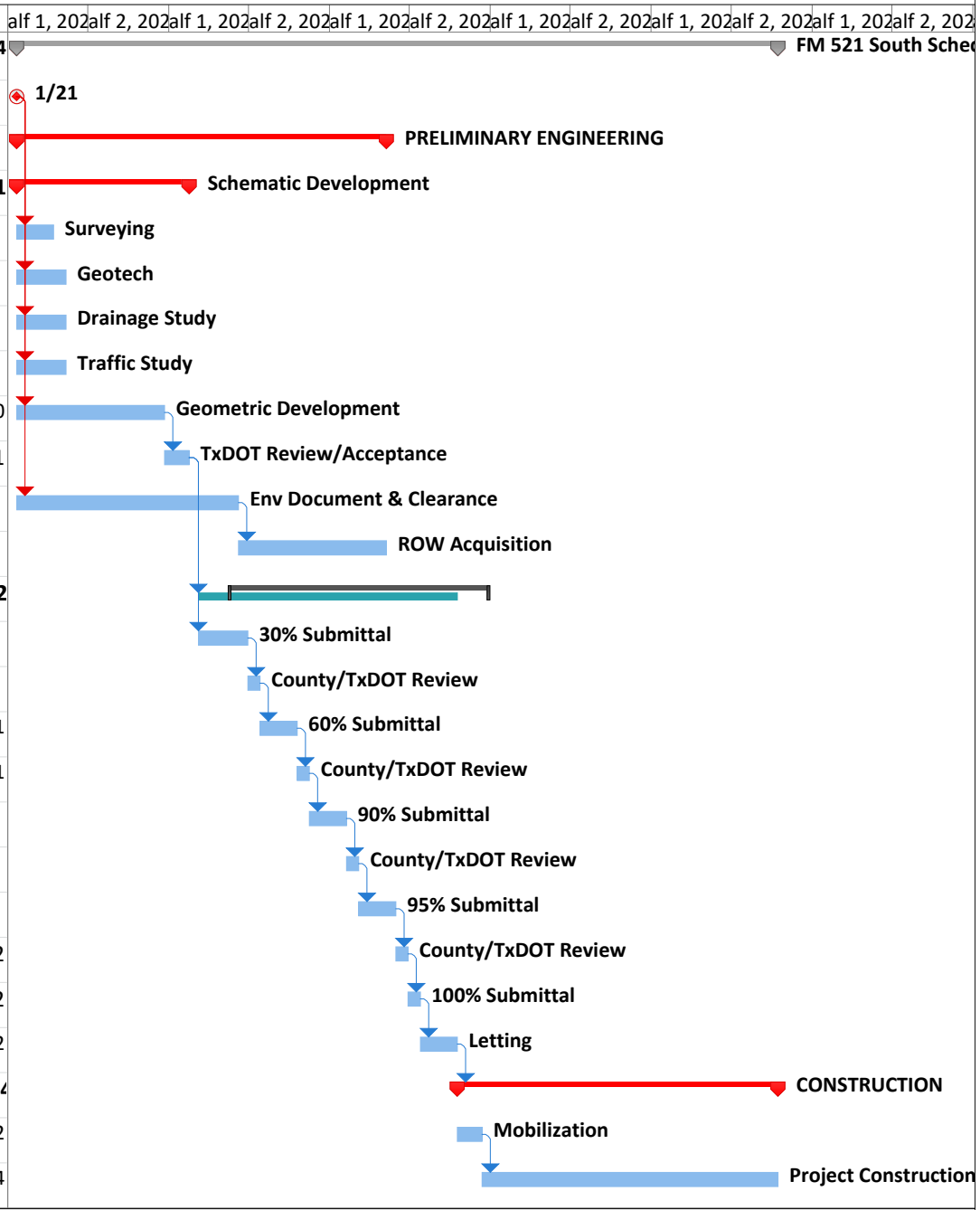
SERVICES NOT INCLUDED IN SCOPE OR FEE PROPOSAL

1. Flood Plain Studies and Reclamation plans;
2. CLOMR & LOMR preparation and coordination;
3. Design of any utilities within project limits;
4. Title Research required for Boundary and Final Plat;
5. Negotiations with adjacent property owners;
6. Improvement Survey once project is complete;
7. Filing and permit fees;
8. Large Signing or new/special sign design.
9. Design of pump stations that may be required for detention.
10. Environmental impact statements, assessments and permitting, including Nationwide and Individual 404 Permits and Wetlands identification, exhibits, and mitigation;
11. Landscaping, irrigation or hardscape design.
12. Design support and testify as the Engineer of Record at Right of Way hearings, and construction phase services necessary to support the design process

ATTACHMENT C

FM 521 from Brazoria CL to SH 6 | FM 521 South Schedule | Fort Bend County

Task Name	Duration	Start	Finish
FM 521 South Schedule	**1235 days**	**Tue 1/21/20**	**Mon 10/14/24**
CONTRACT EXECUTION	*0 days*	*Tue 1/21/20*	*Tue 1/21/20*
PRELIMINARY ENGINEERING	**600 days**	**Tue 1/21/20**	**Mon 5/9/22**
Schematic Development	**280 days**	**Tue 1/21/20**	**Mon 2/15/21**
Surveying	3 mons	Tue 1/21/20	Mon 4/13/20
Geotech	4 mons	Tue 1/21/20	Mon 5/11/20
Drainage Study	4 mons	Tue 1/21/20	Mon 5/11/20
Traffic Study	4 mons	Tue 1/21/20	Mon 5/11/20
Geometric Development	12 mons	Tue 1/21/20	Mon 12/21/20
TxDOT Review/Acceptance	2 mons	Tue 12/22/20	Mon 2/15/21
Env Document & Clearance	18 mons	Tue 1/21/20	Mon 6/7/21
ROW Acquisition	12 mons	Tue 6/8/21	Mon 5/9/22
FINAL ENGINEERING (PS&E)	**420 days**	**Wed 5/19/21**	**Tue 12/27/22**
30% Submittal	4 mons	Tue 3/9/21	Mon 6/28/21
County/TxDOT Review	1 mon	Tue 6/29/21	Mon 7/26/21
60% Submittal	3 mons	Tue 7/27/21	Mon 10/18/21
County/TxDOT Review	1 mon	Tue 10/19/21	Mon 11/15/21
90% Submittal	3 mons	Tue 11/16/21	Mon 2/7/22
County/TxDOT Review	1 mon	Tue 2/8/22	Mon 3/7/22
95% Submittal	3 mons	Tue 3/8/22	Mon 5/30/22
County/TxDOT Review	1 mon	Tue 5/31/22	Mon 6/27/22
100% Submittal	1 mon	Tue 6/28/22	Mon 7/25/22
Letting	3 mons	Tue 7/26/22	Mon 10/17/22
CONSTRUCTION	**520 days**	**Tue 10/18/22**	**Mon 10/14/24**
Mobilization	2 mons	Tue 10/18/22	Mon 12/12/22
Project Construction	24 mons	Tue 12/13/22	Mon 10/14/24



42 C

CERTIFICATE OF INTERESTED PARTIES

FORM 1295

Complete Nos. 1 - 4 and 6 if there are interested parties.
Complete Nos. 1, 2, 3, 5, and 6 if there are no interested parties.

OFFICE USE ONLY
CERTIFICATION OF FILING

Certificate Number:
2020-582913

Date Filed:
01/30/2020

Date Acknowledged:
02/25/2020

1 Name of business entity filing form, and the city, state and country of the business entity's place of business.
Binkley & Barfield, Inc.
Houston, TX United States

2 Name of governmental entity or state agency that is a party to the contract for which the form is being filed.
Fort Bend County

3 Provide the identification number used by the governmental entity or state agency to track or identify the contract, and provide a description of the services, goods, or other property to be provided under the contract.
17111
Consulting Engineering Services related to FM 521 from SH 6 to the Brazoria County Line.

4 Name of Interested Party	City, State, Country (place of business)	Nature of interest (check applicable)	
		Controlling	Intermediary
Binkley, James Brett	Houston, TX United States	X	
Barfield, P. E., Larry	Houston, TX United States	X	
Hamilton, P.E., David	Houston, TX United States	X	
Laham, P.E., Youssef	Houston, TX United States	X	
Williams, RPLS, Steven	Houston, TX United States	X	

5 Check only if there is NO Interested Party. ☐

6 UNSWORN DECLARATION

My name is _____, and my date of birth is _____.

My address is _____, _____, _____, _____, _____.
(street) (city) (state) (zip code) (country)

I declare under penalty of perjury that the foregoing is true and correct.

Executed in _____ County, State of _____, on the _____ day of _____, 20_____.
(month) (year)

_____
Signature of authorized agent of contracting business entity
(Declarant)