

EXHIBIT "A"

County Road 317 (Orr Rd) from Stacy Road south to NTMWD Driveway

SCOPE OF ENGINEERING SERVICES

PROJECT DESCRIPTION:

Preparation of construction documents for the upgrading of approximately 3,950 linear feet of CR 317 to a reinforced concrete pavement section. Limits of the project extend from Stacy Road south to the North Texas Municipal Water District (NTMWD) driveway, plus an additional 20 linear feet of asphaltic concrete pavement transition to match the grades and cross sections of the existing asphaltic concrete pavement at the north and south ends of the project. The project includes coordination of the proposed paving improvements with the intersection plans for E Stacy Road and Orr Road based on the E Stacy Road Improvements project (by others), which adds approximately 250 linear feet to the project and is included in the 3,950 linear feet Orr Road project limits. The driving surface width shall be 24-feet and shall follow the existing centerline of roadway. Roadway improvements shall be limited to within the existing right-of-way, and no roadway ditch capacity analysis or ditch improvements are included in the scope. Project includes performing traffic counts and geotechnical investigation for use in developing a proposed pavement section. Project includes a hydrologic analysis of the contributing drainage basins and hydraulic analyses of the existing drainage cross structures (one (1) 84" steel pipe, two (2) 24" corrugated metal pipes and one (1) 42" corrugated metal pipe) within the project limits, including any recommendations for improvements/upgrading as part of the project.

BASIC SERVICES:

A. Design Standards

1. This project shall be designed in accordance with the following:
Texas Department of Transportation, 2014 Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges.
2. All plans submitted to the County shall be signed and sealed in accordance with state law.

B. Investigation and Data Collection

1. Meet with Collin County public works staff to discuss the project.
2. Perform an on-site site inspection.
3. Obtain record drawings.

C. Drainage Analysis

1. Provide hydrologic analysis of drainage discharges based on HEC-HMS, TR-20 or other approved method.
2. Provide hydraulic modeling of existing and proposed conditions through development of U.S. Army Corps of Engineers HEC-RAS models or other approved method.
3. Provide a brief summary of drainage structure replacement/upgrade options for the existing 84" steel pipe, two (2) 24" CMPs and 42" CMP cross drainage structures to present to the County to assist in selecting any replacement structure sizes.

D. Preliminary Design

1. Prepare preliminary construction plans for 60% submittal. Prepare the following sheets (11" x 17") at an appropriate engineering scale:

- a. Cover Sheet with Vicinity Map
- b. General Notes Sheet
- c. Typical Sections
- d. Quantity Sheet
- e. Project Layout Control Sheet
- f. Paving Plan & Profile Sheet
- g. Drainage area Map
- h. Culvert Layout Plans and Details
- i. Standard Details Sheet(s)

Information required can be combined on sheets if the information can be clearly shown and is approved by the Collin County Director of Public Works.

- 2. Prepare an estimate of construction quantities and develop the preliminary statement of probable construction cost.
- 3. Submit two (2) sets of preliminary plans (11" X 17") and outline specifications for review and comment
- 4. Attend review meeting with Collin County, if required.

E. Final Design

- 1. Revise preliminary plans incorporating comments from Collin County.
- 2. Prepare the following sheets in addition to revisions to those prepared during Preliminary Design:
 - a. Erosion Control Sheet
 - b. Stormwater Pollution Prevention Plan
- 3. Finalize construction plans, quantities and construction cost estimate for proposed improvements.
- 4. Submit three (3) sets of 11"x17" final plans and final statement of probable construction cost to the County for review.
- 5. Attend review meeting with Collin County, if required.

F. Bid Phase Services

- 1. Provide a schedule of bid items and prepare the bid documents.
 - a. Contract documents shall be based on boiler plate provided by County and specifications based on *Texas Department of Transportation, 2014 Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges*.
- 2. Furnish plans and bid documents for bidding. Cost for these to be recouped by non-refundable deposit from contractors.
- 3. Maintain a list of plan holders including name, address, phone number, fax number and e-mail address (if available).
- 4. Provide PDF version of bid documents and plans to County for use in uploading to BidSync and/or County website.
- 5. Furnish plans and bid documents for up to three (3) plan review rooms to be determined by the County. These documents are to be furnished at no cost to the plan review rooms.
- 6. Assist County staff in conducting a pre-bid conference, if required.
- 7. Prepare and distribute addenda to bid documents as necessary.
- 8. Evaluate bids and provide contractor recommendation letter.

G. Construction Administration

- 1. Attend pre-construction meeting
- 2. Respond to RFI's.

3. Review material test reports.
4. Review mix designs and shop drawings.
5. Prepare change orders.
6. Conduct final walk-thru with County representative.
7. Prepare construction "Record Drawings" based upon mark-ups and information provided by the construction contractor(s). Submit one blackline set to the County.

SPECIAL SERVICES:

A. Traffic Counts – Perform 48-hour traffic counts using vehicle detection tubes to quantity and classify existing traffic for use in developing a pavement section recommendation.

B. Geo-technical Services

1. Drilling an estimated six (6) test borings to a depth of ten (10) feet including required traffic control
2. Laboratory testing
3. Engineering study which shall include:
 - a. Subsurface soil, rock and groundwater conditions to depths that would be significantly affected by the new pavement.
 - b. Engineering characterization of the subsurface materials encountered
 - c. Data required for design of a new pavement section including subgrade preparation.
 - d. Recommendations regarding earthwork, including grading and excavation, backfilling and compaction, the treatment of in-place soils for the support of pavement, pavement section recommendations and possible construction problems reasonably to be expected.
4. Traffic control during drilling operations.

C. Topographic Survey

1. Topographical survey shall include a detailed on the ground survey of CR 317 (Orr Road) along the following route:
 - a. Starting 350 feet north of the intersection of CR 317 (Orr Road) and E Stacy Road
 - b. West along Stacy Road 100 feet.
 - c. South along CR 317 to 100 feet south of the NTMWD driveway
2. Cross sections along the roadway shall be taken every 50 feet and extend a minimum of 25 feet in each direction from the centerline of the roadways or to any existing fence line or right-of-way.
3. Cross section the main creek channel shall extend to a minimum of 500 feet upstream and 500 feet downstream of the drainage structure crossing. Details shall include and subject to obtaining rights of entry from property owners:
 - a. The existing steel pipe culvert and associated drainage structures if they exist.
 - b. Cross sections of creek both upstream and downstream from culvert at 50 feet, being sure to get the flow line, toes of slopes, tops of banks, 25' beyond the tops of banks and a shot at 150 feet from the centerline of the creek in each direction.
 - c. Channel information (flow line, toes of slopes and tops of banks) at the 250 and 450-foot cross sections upstream and downstream from culverts.
4. Cross section of the two smaller culverts will be detailed the same as the creek above with the exception that the extents of the data will be 100 feet past the

- estimated right of way line and no elevation for flood plain will be collected.
5. Perform a Texas 811 (one call) to request locates of all utilities within the public right of way along the route. All "One Call" marks will be tied, underground utilities not marked and with no visible evidence of existence will not be researched or located.
 6. Locate and identify other visible existing utilities (both overhead and underground). The location of utilities within the right-of-way will be determined as evidenced by on-site observation. The survey does not include or imply the physical location of underground utilities by probing, excavating, SUE or other means.
 7. Along the route locate existing driveways, culverts, ditches, gates, fences, water valves, manholes, signs and other improvements should be located. Driveways will be tied to the limit of the right of way if fenced and if not fenced at 100 feet from the center line of pavement.
 8. Trees 8 inches in diameter or larger and situated within the right-of-way (fence lines) will be located and approximate tree line limits drawn.
 9. Deed research, property location and ownership designation of each adjoining property to the above routes shall be performed.
 10. Right of entry letters will be sent to all land owners along the proposed route.
 11. The route right-of way verification will consist of locating roadway monuments, the property lot corners along CR 317, fences and other forms of roadway limits for reference use and for use in establishing the alignment of the roadway (not a certified boundary survey).
 12. Provide a minimum of two (2) permanent benchmarks (vertical) and two (2) control points. Benchmarks shall not be set in telephone poles or trees located within the project limits. Datum shall be NAVD88 based on GPS observation using Geoid 2012A.
 13. Secure right-of-entry from property owners, as required.

D. Easement Exhibits (4) (if needed)

1. Provide up to four (4) easement documents (if needed) for temporary construction or permanent easements associated with drainage structures. This shall consist of the following:
 - a. Field work to recover sufficient boundary information of parent tract and adjacent tracts to properly delineate limits of property ownership
 - b. Deed research to identify ownership of all parent and adjacent tracts
 - c. Provide preliminary exhibits for review by client prior to setting property corners.
 - d. After exhibits are approved by client set corner monuments at all easement corners.
 - e. Provide certified Exhibit Plat (graphic representation) of proposed easement on 8.5" x 11" paper
 - f. Provide certified Metes and Bounds description on 8.5" X 11" paper and in in Microsoft Word

E. Construction Phasing & Traffic Control Plan

1. Prepare construction phasing & traffic control plans to allow for continuous, safe access for residents/businesses and efficient construction operations to the extent feasible. The traffic control plan shall be designed in accordance with the most current version of the Texas Manual on Uniform Traffic Control Devices.
2. Provide a brief 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.

3. Incorporate applicable standard detail sheets.

- F. Construction Inspection** - Perform specific inspections at major stages of construction and periodic inspections (up to 16 total inspections estimated at 4 per month for 4 months) for general observations to insure construction conforms to the project specifications and plans.

Exclusions

The intent of this scope of services is to include only the services specifically listed herein and no others. Services specifically excluded from this scope of services include, but are not necessarily limited to, the following:

1. Permitting and Coordination
2. Right-of-Way Document Preparation
3. Wetlands Delineation and 404 Permit Application
4. Conversion of Plans from AutoCAD to Microstation
5. Re-establishment of Survey Site Control
6. Floodplain Analysis, FEMA Coordination and/or CLOMR/LOMR
7. Construction Staking
8. On-site safety precautions, programs and responsibility.
9. Subsurface Utility Engineering Services (Level A and Level B)
10. Quality Control and Testing During Construction
11. Technical specifications other than reference to TxDOT specifications
12. Consideration of a future roadway alignment or any existing or proposed thoroughfare design standard other than upgrading the existing paving surface to a 24-foot wide normal crown concrete roadway, generally following the existing profile and draining to existing ditches.

EXHIBIT "B"

County Road 317 (Orr Rd) from Stacy Road south to NTMWD Driveway

PROJECT SCHEDULE

Services shall be completed per the following project development schedule.

ITEM	DAYS	2018									
		JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	
SURVEY	45										
GEOTECHNICAL INVESTIGATION	21										
DRAINAGE ANALYSIS	21										
PRELIMINARY PLANS	75										
FINAL DESIGN	45										
EASEMENT DOCUMENTS (IF REQUIRED)	60										
PROJECT BID	1										
PROJECT AWARD FOR CONSTRUCTION	1										

NOTES:

1. SCHEDULE ASSUMES START DATE OF JANUARY 1, 2019 AND FACTORS IN HOLIDAYS. SCHEDULE WILL BE ADJUSTED PER ACTUAL START DATE DICTATED BY COUNTY. OVERALL LENGTH OF PROJECT WILL NOT CHANGE.
2. SCHEDULE IS APPROXIMATE AND BASED ON A EIGHT (8) MONTH SCHEDULE. SCHEDULE MAY BE ADJUSTED PURSUANT TO COUNTY REQUIREMENTS.

EXHIBIT "C"

**County Road 317 (Orr Rd)
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PAYMENT SCHEDULE

Invoices will be transmitted to the County on a monthly basis based on a percentage of completion up to that time. A derivation of the total contract fee amount is as follows:

<u>BASIC SERVICES</u>	<u>LUMP SUM FEE</u>	<u>SUBTOTAL</u>
Investigation and Data Collection	\$2,600	
Drainage Analysis	\$9,400	
Preliminary Design	\$62,500	
Final Design	\$24,800	
Bid Phase	\$6,900	
Construction Phase	\$7,000	
Basic Services Total		\$113,200
<u>SPECIAL SERVICES</u>		
Traffic Counts	\$800	
Geotech Services (incl. Traffic Control)	\$ 10,250	
Topographic Survey	\$28,875	
Easement Documents (4 @ \$2,800 ea) (if needed)	\$11,200	
Traffic Control Plan & Construction Phasing Plan	\$10,485	
Construction Inspection	\$10,770	
Special Services Total		\$72,380
Expenses		\$ 2,800
Total		\$188,380



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FEE ESTIMATE

Design Survey								Total
Design Survey								\$28,875.00
Easement Documents (4 @ \$2,800 ea) (if needed)								\$11,200.00
Total								\$40,075.00
Geotechnical Investigation								Total
Geotech (including Traffic Control)								\$10,250.00
Total								\$10,250.00
Traffic Counts								Total
Traffic Counts								\$600.00
Total								\$600.00
Investigation and Data Collection								Total
Meet with County	0	4	0	0	0	0	0	4
Site Visit/Data Collection	0	4	0	0	0	0	0	4
Obtain Record Drawings	0	2	0	1	0	0	1	4
Sub-Total Hours	0	10	0	0	0	0	0	12
Rate	\$243.00	\$229.00	\$194.00	\$163.00	\$135.00	\$122.00	\$80.00	\$1,113.00
Sub-Total Manhour Cost	\$0.00	\$2,290.00	\$0.00	\$163.00	\$0.00	\$0.00	\$80.00	\$2,533.00
Preliminary Design								Total
Drainage Analysis								
Site Visit/Verify Survey Work	0	0	0	4	0	0	0	4
Drainage Area Map	0	0	0	8	2	0	0	10
Hydrologic Analysis	0	4	0	8	2	0	0	12
Hydraulic Analysis	0	4	0	8	2	0	0	14
Comparisons and Recommendations	0	5	0	5	0	0	0	10
QA/QC	1	1	0	0	0	0	0	2
Preliminary Plans								
Site Visit/Verify Survey Work	0	2	0	6	0	0	0	8
Establish Project Centerline	0	2	0	2	3	0	0	7
Digital Terrain Model	0	0	0	4	18	0	0	22
Survey Control Plan	0	2	0	4	10	0	0	16
Horizontal Alignment Layout	0	8	0	12	36	0	0	56
Development of ESAL for pavement recommendation	0	2	0	2	0	0	1	5
Typical Roadway Section	0	2	0	2	0	6	0	10
Paving Profile	0	10	0	18	0	38	0	64
Culvert Plan & Profile	0	8	0	24	0	40	0	72
Utility Coordination	0	2	0	4	0	0	2	8
Site Visit to Confirm design	0	0	0	5	0	0	0	5
Cover	0	0	0	0	0	4	0	4
General Notes	0	4	0	4	0	4	1	13
Standard Details	0	4	0	4	0	4	0	12
Standard Drawings	0	1	0	1	0	4	0	6
Consultation with Contractors/Value Engineering	0	2	0	0	0	0	0	2
Coordination with cities, firms and/or agencies	0	8	0	8	0	0	0	8
Quantities	0	8	0	8	0	6	0	20
Construction Cost Estimate	0	4	0	8	0	0	0	12
QA/QC	2	6	0	0	0	0	2	10
Printing & Coordinating Preliminary Plan Submittal	0	4	0	4	0	6	2	16
Project Management	0	8	0	0	0	0	4	12
Meeting with County	0	4	0	0	0	0	0	4
Sub-Total Hours	3	103	0	143	73	110	12	392
Rate	\$243.00	\$229.00	\$194.00	\$163.00	\$135.00	\$122.00	\$80.00	\$1,113.00
Sub-Total Manhour Cost	\$729.00	\$23,597.00	\$0.00	\$23,309.00	\$9,855.00	\$13,420.00	\$960.00	\$47,869.00
Final Design								Total
Plan Revisions	0	8	0	16	0	32	1	57
Erosion Control Plan	0	2	0	8	0	16	0	26
SWPPP	0	2	0	8	0	0	0	14
Miscellaneous Details	0	1	0	2	0	4	0	7
Update Quantities	0	2	0	4	0	6	0	12
Construction Cost Estimate	0	2	0	2	0	0	0	4
QA/QC	1	2	0	0	0	0	1	4
Printing & Coordinating Final Plan Submittal	0	2	0	4	0	8	2	14
Meeting with County	0	4	0	0	0	0	0	4
Coordination with cities, firms and/or agencies	2	0	0	0	0	0	0	2
Incorporate Review Comments	0	2	0	2	0	2	1	7
QA/QC	1	0	0	0	0	0	1	2
Project Management	0	4	0	0	0	2	6	6
Sub-Total Hours	4	31	0	46	0	70	8	159
Rate	\$243.00	\$229.00	\$194.00	\$163.00	\$135.00	\$122.00	\$80.00	\$1,113.00
Sub-Total Manhour Cost	\$972.00	\$7,099.00	\$0.00	\$7,498.00	\$0.00	\$8,540.00	\$640.00	\$14,749.00
Bid Phase								Total
Bid Documents & Specifications	0	6	0	10	0	0	8	24
Coordinate and Distribute Bid Documents and Plans	0	2	0	0	2	6	8	16
Pre-Bid Meeting	0	4	0	0	0	0	1	5
Contractor Questions/R Fi	0	4	0	2	0	0	2	8
Addendums	0	4	0	2	0	0	2	8
Evaluate Bids	0	2	0	0	0	0	2	4
Contractor Recommendation	0	2	0	0	0	0	1	3
Sub-Total Hours	0	18	0	4	2	6	14	44
Rate	\$243.00	\$229.00	\$194.00	\$163.00	\$135.00	\$122.00	\$80.00	\$1,113.00
Sub-Total Manhour Cost	\$0.00	\$4,122.00	\$0.00	\$652.00	\$270.00	\$732.00	\$1,120.00	\$6,996.00
Construction Phase								Total
Pre-Construction Meeting	0	4	0	0	0	0	0	4
Respond to RFIs	1	2	0	2	0	0	1	6
Review Material Test Reports	0	2	0	2	0	0	0	4
Review Mix Designs and Shop Drawings	0	2	0	2	0	0	0	4
Change Order Assistance	0	2	0	2	0	0	3	7
Final Walk Thru	0	4	0	0	0	0	0	4
As-Built Preparation	0	1	0	2	0	5	0	8
As-Built Submittal	0	1	0	0	0	0	1	2
Sub-Total Hours	1	18	0	10	0	5	5	39
Rate	\$243.00	\$229.00	\$194.00	\$163.00	\$135.00	\$122.00	\$80.00	\$1,113.00
Sub-Total Manhour Cost	\$243.00	\$4,122.00	\$0.00	\$1,630.00	\$0.00	\$610.00	\$400.00	\$7,005.00
Construction Inspection								Total
Site Visit/Inspections (4 per month estimated at 3 hr ea)	0	12	0	36	0	0	0	48
Reconing	0	3	0	9	0	0	0	12
Sub-Total Hours	0	15	0	45	0	0	0	48
Rate	\$243.00	\$229.00	\$194.00	\$163.00	\$135.00	\$122.00	\$80.00	\$1,113.00
Sub-Total Manhour Cost	\$0.00	\$3,435.00	\$0.00	\$7,335.00	\$0.00	\$0.00	\$0.00	\$10,770.00
Construction Phasing & Traffic Control Plan								Total
Preliminary Design	0	8	0	16	0	12	0	36
Revisions	0	1	0	2	0	1	0	4
Final Design	0	4	0	4	0	1	0	9
Coordination with agencies, cities and/or County	0	6	0	2	0	0	0	8
Standard Details	0	1	0	1	0	1	0	3
Sub-Total Hours	0	20	0	25	0	15	0	36
Rate	\$243.00	\$229.00	\$194.00	\$163.00	\$135.00	\$122.00	\$80.00	\$1,113.00
Sub-Total Manhour Cost	\$0.00	\$4,580.00	\$0.00	\$4,075.00	\$0.00	\$1,830.00	\$0.00	\$10,485.00
Expenses								Total
Prints, Plots, Deliveries, and Mileage								\$2,800.00
Sub-Total Expenses								\$2,800.00
Total								\$186,873.00
Total Engineering (Total - Survey, Geotech, Traffic Counts, Easement Docs, TCP, Construction Inspection and Expenses)								\$113,043.00

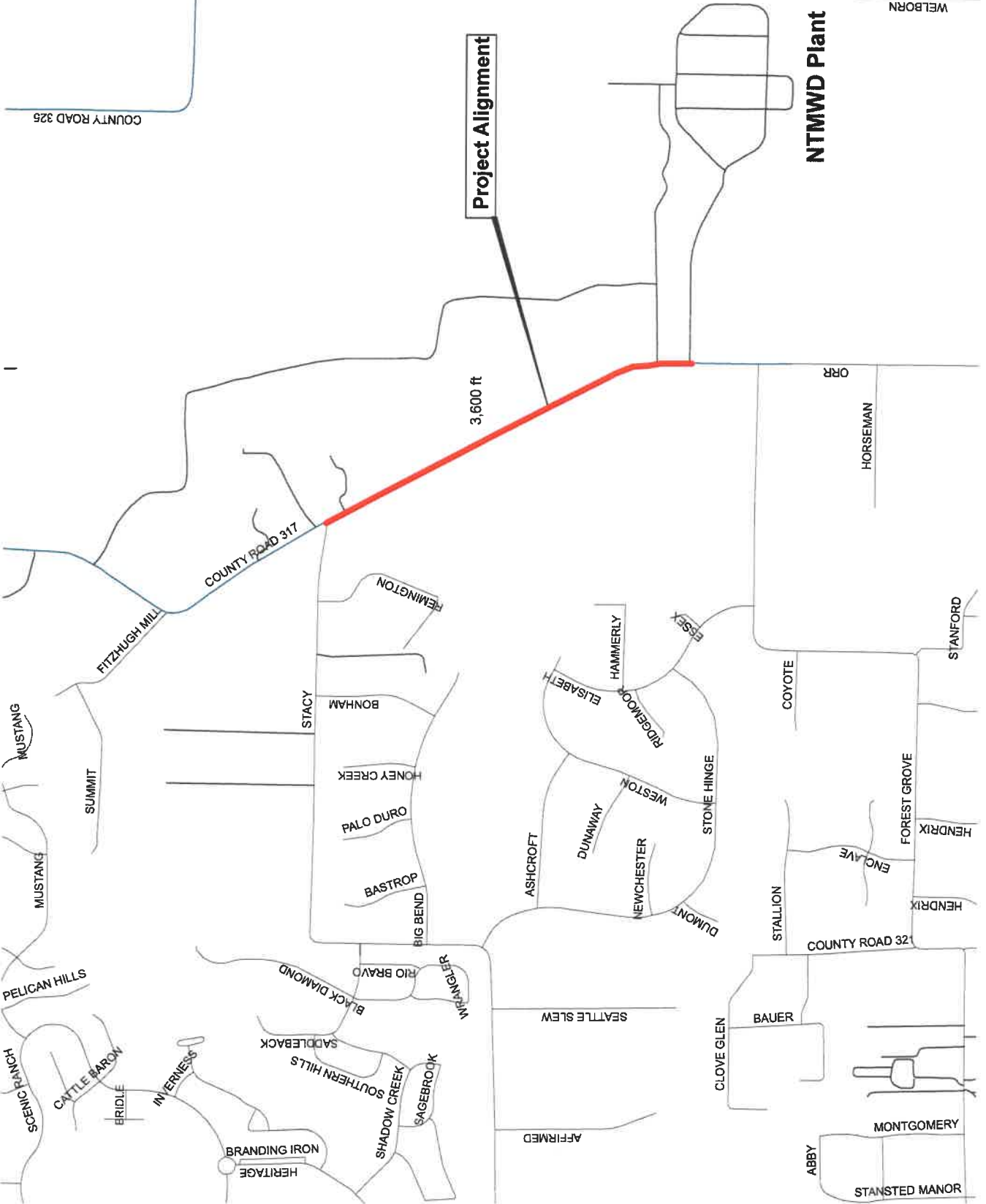
WELBORN

NTMWD Plant

Project Alignment

3,600 ft

COUNTY ROAD 325
COUNTY ROAD 318



Desc	Unit Qty	Unit Price	Total
Remove Existing	SY		
Concrete Pavement	SY	\$10.00	\$112,000
HMAC	43	\$85.00	\$841,500
Lime	196	\$150.00	\$6,450
Lime Treatment	SY	\$200.00	\$39,200
Backfill Edges	STA	\$5.00	\$54,050
Box Culvert	LF	\$300.00	\$10,800
Wing Wall	EA	\$750.00	\$30,000
30" RCP	LF	\$15,000.00	\$30,000
Headwall	EA	\$150.00	\$12,000
42" RCP	LF	\$5,000.00	\$10,000
42" Headwall	EA	\$180.00	\$7,200
Seeding/Sodding	AC	\$9,000.00	\$9,000
Topsoil	SY	\$20,000.00	\$10,000
Erosion Control	LS	\$8.00	\$19,960
Traffic Control	MO	\$2,500.00	\$2,500
Mobilization	LS	\$7,500.00	\$30,000
Contingencies	LS	\$1	\$75,000
Design	LS	\$165,000.00	\$123,750
Testing	LS	\$189,713.00	\$189,713
	1	\$45,000.00	\$45,000
Total			\$1,658,123

Base

County	\$120,000
Fairview	\$37,421
NTMWD	\$1,500,702