

BIRKHOFF, HENDRICKS & CARTER, L.L.P.
PROFESSIONAL ENGINEERS

11910 Greenville Ave., Suite 600

Dallas, Texas 75243

Phone (214) 361-7900

www.bhcllp.com

JOHN W. BIRKHOFF, P.E.
GARY C. HENDRICKS, P.E., R.P.L.S.
JOE R. CARTER, P.E.
MATT HICKEY, P.E.
ANDREW MATA, JR., P.E.

DEREK B. CHANEY, P.E., R.P.L.S.
CRAIG M. KERKHOFF, P.E.
JUSTIN R. IVY, P.E.
JULIAN T. LE, P.E.
COOPER E. REINBOLD, P.E.

December 2, 2021

Mr. Scott Holden, P.E.
Public Works Director
City of Lucas
665 Country Club Road
Lucas, Texas 75002

Re: Lemontree and Kingswood Drainage Design

Dear Mr. Holden:

As requested, we prepared the Engineer's Opinions of Probable Construction Cost (EOPCC) for Recommendations 4, 5, and 6 that are described in the Executive Summary for the Lemontree and Kingswood Drainage Design project. We attached two (2) copies of each EOPCC to this letter.

The following lists the recommended order of completion for the recommended projects follows with a brief explanation for the placement in the order, as requested:

1. Recommendation 1 – Claremont Springs Retention/Detention Pond for Phase 1.

City staff indicates the HOA will raise the embankment around the detention/retention pond at no cost to the City. This will alleviate the potential for the pond overtopping during a 100-year event.

2. Recommendation 2 – Future Farmstead Retention/Detention Pond

The developer indicated willingness to oversize the retention/detention pond to help alleviate flooding issues. City staff indicates the larger retention/detention pond will be at HOA no cost to the City. This will mitigate some or all of the slight increase in flow from south of Estates Parkway.

3. Recommendation 3 – Lovejoy High School Detention Pond

The engineer for Lovejoy ISD indicated that the school district intends to make modifications to the existing detention pond including modifying the outfall structure and raising the embankment at no cost to the City. This will allow the pond to function as intended and increase the effectiveness during more frequent rainfall events.

4. Recommendation 5 – Orchard Road Crossing at Outfall from Rimrock

The property owners expressed a willingness to cooperate with the City to improve the channel and the culverts crossing Orchard Road from the property line at the outfall from Rimrock to the east end of the Lemontree Addition. The conceptual design for these improvements includes rock riprap at the west property line (outfall from Rimrock) and a deeper channel with a 6-foot bottom and 8:1 side slopes to a new three barrel 3'h x 5'w box culvert crossing Orchard Road and a deeper channel with a 6-foot bottom and 8:1 side slopes to outfall near the elevation of the channel just east of Lemontree. This project will mitigate most of the current problems in the area of the existing channel.

5. Recommendation 4 – Rimrock Detention Pond

The embankment along the common property line between the Rimrock development and the Lemontree Addition needs to be raised. The conceptual design includes a total of approximately 900 linear feet of additional embankment averaging approximately 10 to 12 -inches in height with rock rip rap on the west side (towards Rimrock) and block sod on the top and east sides. This project will mitigate overtopping during larger storm events and allow pond to function as intended during 100-year events.

6. Recommendation 6 – Lynn Lane Crossing Reid Branch Tributary 1

The existing culverts at Lynn Lane provide capacity for the 5-year frequency storm without overtopping the road. The City requested that any improvement be limited to not exceed the capacity of the existing two 8'h x 10' w culverts downstream at Country Club Road. This limits the maximum area to 160 square feet. The proposed model uses three 5'h x 10' wide culverts to avoid significantly raising Lynn Lane at the crossing and stay with standard size box culverts. This project increases the capacity to pass a 10-year event; however, the 25-year event overtops the road. The 100-year culvert size would require raising Lynn Lane and would be larger than the existing culverts at Country Club Road.

The final report will include recommended improvements to the channels and culverts in the Lemontree Addition and to channels through the Kingswood Addition to provide adequate capacity and allow runoff to be conveyed more efficiently to reduce potential flooding concerns.

Let us know if there are any questions regarding our recommendations. We are available to discuss this report and our recommendations at your convenience.

Sincerely,



Joe R. Carter, P.E., CFM

Enclosures

Client: CITY OF LUCAS, TEXAS
Project: LEMONTREE & KINGSWOOD DRAINAGE DESIGN
ORCHARD ROAD SOUTH CULVERT AND CHANNEL

Date: 2-Dec-21
By: JRC

ENGINEER'S OPINION OF CONSTRUCTION COST

Item No.	Description	Quantity	Unit	Price	Amount
1	Mobilization (at 5% Maximum All Other Items)	1	L.S.	\$ 13,700.00	\$ 13,700.00
2	Prepare Right-of-Way, Clearing and Grubbing	5.5	Sta.	\$ 2,400.00	\$ 13,200.00
3	Unclassified Channel Excavation	1,561	C.Y.	\$ 25.00	\$ 39,025.00
4	Remove Reinf. Concrete Pavement	67	S.Y.	\$ 25.00	\$ 1,675.00
5	Remove Existing 2 - 21" CMP and Headwalls	1	L.S.	\$ 2,200.00	\$ 2,200.00
6	12" to 18" Rock Riprap	408	S.Y.	\$ 200.00	\$ 81,600.00
7	Block Sod	2,622	S.Y.	\$ 7.00	\$ 18,354.00
8	Three 5's x 3'r Box Culverts	40	L.F.	\$ 1,650.00	\$ 66,000.00
9	Type PW Headwalls	2	Ea.	\$ 20,000.00	\$ 40,000.00
10	Construct 6" Flexible Base	67	S.Y.	\$ 30.00	\$ 2,010.00
11	Construct 8" Reinf Concrete Pavement	67	S.Y.	\$ 85.00	\$ 5,695.00
12	Furnish & Install Temporary Erosion Control	1	L.S.	\$ 2,200.00	\$ 2,200.00
13	Remove Temporary Erosion Control	1	L.S.	\$ 1,100.00	\$ 1,100.00
	Subtotal (Without Mobilization) :				\$ 273,059.00
	Subtotal (With Mobilization) :				\$ 286,759.00
	*Drainage and Construction Easements (500' x 60') :	30,000	S.f.	\$ -	\$ -
	Contingencies and Miscellaneous Items :	25%			\$ 71,689.75
	Total :				\$ 358,448.75
	*Surveys and Engineering for Detailed Construction Plans :	20%			\$ -
	* Items Not Included in Cost at Owner's Direction				
	TOTAL WITHOUT EASEMENTS OR DETAILED DESIGN (Rounded Up to Nearest \$10,000) :				\$ 360,000.00

**** DISCLAIMER**

OPINION OF PROBABLE CONSTRUCTION COST IS BASED ON A CONCEPTUAL DESIGN, NOT A DETAILED ENGINEERING DESIGN. THE ACTUAL COST MAY VARY SIGNIFICANTLY DEPENDING ON MANY FACTORS INCLUDING BUT NOT LIMITED TO INFLATION, EASEMENT COST, PHASING AND TEMPORARY ACCESS, TREE MITIGATION, SIZE AND SCOPE OF THE AS BID PROJECT, ENGINEERING AND SURVEYING, WORKING ROOM, MATERIAL AVAILABILITY, UTILITY CONFLICTS, ETC.

Client: CITY OF LUCAS, TEXAS

Date: 2-Dec-21

Project: LEMONTREE & KINGSWOOD DRAINAGE DESIGN
LYNN LANE CULVERT AND CHANNEL

By: JRC

ENGINEER'S OPINION OF CONSTRUCTION COST

Item No.	Description	Quantity	Unit	Price	Amount
1	Mobilization (at 5% Maximum All Other Items)	1	L.S.	\$ 18,800.00	\$ 18,800.00
2	Prepare Right-of-Way, Clearing and Grubbing	2.5	Sta.	\$ 2,400.00	\$ 6,000.00
3	Unclassified Channel & Roadway Excavation	400	C.Y.	\$ 25.00	\$ 10,000.00
4	Remove Reinf. Concrete Pavement	200	S.Y.	\$ 25.00	\$ 5,000.00
5	Remove Existing 8 - 48" RCP and Headwalls	1	L.S.	\$ 12,000.00	\$ 12,000.00
6	12" to 18" Rock Riprap	360	S.Y.	\$ 200.00	\$ 72,000.00
7	Block Sod	800	S.Y.	\$ 7.00	\$ 5,600.00
8	Three 10's x 5'r Box Culverts	40	L.F.	\$ 3,600.00	\$ 144,000.00
9	Type PW Headwalls	2	Ea.	\$ 32,000.00	\$ 64,000.00
10	Construct 6" Flexible Base	200	S.Y.	\$ 30.00	\$ 6,000.00
11	Construct 8" Reinf Concrete Pavement	200	S.Y.	\$ 85.00	\$ 17,000.00
12	Furnish & Install T501 Traffic Rail	100	L.F.	\$ 240.00	\$ 24,000.00
13	Construct 5' Wide Reinf Concrete Sidewalk	84	S.Y.	\$ 90.00	\$ 7,560.00
14	Furnish & Install Temporary Erosion Control	1	L.S.	\$ 2,500.00	\$ 2,500.00
15	Remove Temporary Erosion Control	1	L.S.	\$ 1,250.00	\$ 1,250.00
	Subtotal (Without Mobilization) :				\$ 376,910.00
	Subtotal (With Mobilization) :				\$ 395,710.00
	*Drainage and Construction Easements (50' x 150') :	7,500	S.f.	\$ -	\$ -
	Contingencies and Miscellaneous Items :	25%			\$ 98,927.50
	Total :				\$ 494,637.50
	*Surveys and Engineering for Detailed Construction Plans :	20%			\$ -
	* Items Not Included in Cost at Owner's Direction				
	TOTAL WITHOUT EASEMENTS OR DETAILED DESIGN (Rounded Up to Nearest \$10,000) :				\$ 500,000.00

**** DISCLAIMER**

OPINION OF PROBABLE CONSTRUCTION COST IS BASED ON A CONCEPTUAL DESIGN, NOT A DETAILED ENGINEERING DESIGN. THE ACTUAL COST MAY VARY SIGNIFICANTLY DEPENDING ON MANY FACTORS INCLUDING BUT NOT LIMITED TO INFLATION, EASEMENT COST, PHASING AND TEMPORARY ACCESS, TREE MITIGATION, SIZE AND SCOPE OF THE AS BID PROJECT, ENGINEERING AND SURVEYING, WORKING ROOM, MATERIAL AVAILABILITY, UTILITY CONFLICTS, ETC.