

NOVEMBER 6, 2019

# **WATERSHED ANALYSIS**

## **MARTINDALE**

## **168 ACRE TRACT**

***JAMES W. GARTRELL, JR., PE, RPLS***

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TEXAS P.E. #22590 - TEXAS R.P.L.S. #1445

*GULF COAST ENGINEERING & SURVEYING*

*TBPE FIRM #4534 - TBPLS FIRM #10061900  
P.O. BOX 382 LA MARQUE, TEXAS 77568  
409 / 935-2462 TEXAS CITY 281 / 488-6969 HOUSTON*

NOVEMBER 6, 2019

RE: SEABREEZE MARTINDALE 168 acre tract  
ON-SITE OFF-SITE DRAINAGE - DETENTION

PRELIMINARY FINDINGS:

EXTREME EVENT OVERFLOW DESIGN:

RAINFALL, 6 HOUR TIME PERIOD, 100 YEAR STORM 6.5 TO 7 INCHES

TXDOT DETENTION ESTIMATED AS 6 INCHES FOR DEVELOPED AREA

TOTAL WATERSHED AREA: 1,020 ACRES (+/-)  
GOES THROUGH THE BOX CULVERT UNDER S.H. 80

PROPOSED TRACT TO BE DEVELOPMENT: 168 ACRES

ADJOINING WATERSHED FLOWING THROUGH THE 168 ACRES:

WATERSHED ADJOINING 168 ACRES  
ALONG THE RIGHT PROPERTY LINE - 41 ACRES

WATERSHED ADJOINING 168 ACRES  
ALONG THE REAR PROPERTY LINE - 391 ACRES

WATERSHED ADJOINING 168 ACRES  
ALONG THE LEFT PROPERTY LINE - 146 ACRES

TOTAL ADJOINING WATERSHED ACREAGES  
DRAINING ONTO THE 168 ACRES - 578 ACRES

TXDOT REQUIRES DRAINAGE ANALYSIS OF TOTAL 578 ACRES TO  
PERMIT ACCESS FOR 168 ACRES. DRAINAGE/DETENTION FOR  
168 ACRES AND DRAINAGE FOR TOTAL PART OF WATERSHED 578 ACRES.

WATERSHED ANALYSIS PAGE "B"

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SUMMARY:

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TOTAL WATERSHED 1,020 ACRES  
WATERSHED 168 ACRE TRACT PLUS  
ADJOINING PROPERTY DRAINING  
ONTO 168 ACRE TRACT  
(168+41+391+146= 578 ACRES) 578 ACRES

TXDOT REQUIRED DRAINAGE/  
DETENTION DESIGN 578 ACRES

578 ACRES IS 57% OF THE TOTAL WATERSHED  
OVER ONE-HALF OF THE WATERSHED FLOWS  
THROUGH THIS 168 ACRE TRACT  
THIS 168 ACRE TRACT IS ONLY 22% OF THE  
TOTAL 578 ACRES DRAINING THROUGH THIS  
PROPERTY

PAGE - 2:

578 ACRES EXTREME STORM EVENT FLOW

PAGE - 3:

PRELIMINARY DETENTION AREAS TO CONTAIN ADJOINING PROPERTY  
STORM FLOW TO METER SAME PER TXDOT REQUIREMENTS. AN  
ALTERNATE DESIGN WOULD REQUIRE LARGE STORM SEWERS

PAGE - 4:

SLOPE ACROSS PROPERTY. TOTAL FALL OF 21.0 FEET

DESIGN OF STANDARD RV RESORT WOULD BE NO PROBLEM IF THERE  
WAS NO SURFACE FLOW ONTO THE 168 ACRES FROM THE ADJOINING  
PROPERTIES.

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TERRACE DESIGN BECAUSE OF STORM FLOW FROM ADJOINING PROPERTY  
THIS TRACT (168 ACRES) LIES AT THE BOTTOM END OF A LARGE  
(1,020 ACRE TRACT) WATERSHED.

DESIGN UNDER THESE CONDITIONS WILL RESULT IN SIGNIFICANT  
CONSTRUCTION COSTS WITH THE PROPERTY STILL SUBJECT TO EXTREME  
STORM FLOW THROUGH THE CENTER OF THE COMPLETED DEVELOPMENT.

ALL PROPERTY CAN BE DEVELOPED WITH THE ONLY CONTROLLING FACTOR BEING  
CONSTRUCTION COST AND THE DESIRED RETURN REQUIRED BY THE DEVELOPER.

WATERSHED ANALYSIS PAGE "A"

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(52% DESIGN FLOW)

391 ACRES



168  
ACRES

(22%  
DESIGN  
FLOW)

146 ACRES

(20%  
DESIGN  
FLOW)

41 ACRES

(5%  
DESIGN  
FLOW)

S.H.  
80

578  
ACRES

DESIGN  
OUTFALL  
FOR  
TXDOT  
PERMIT  
578 ACRES

TXDOT  
BOX  
CULVERT

TOTAL  
WATERSHED

1,020 ACRES

578 ACRES  
57% OF TOTAL  
WATERSHED

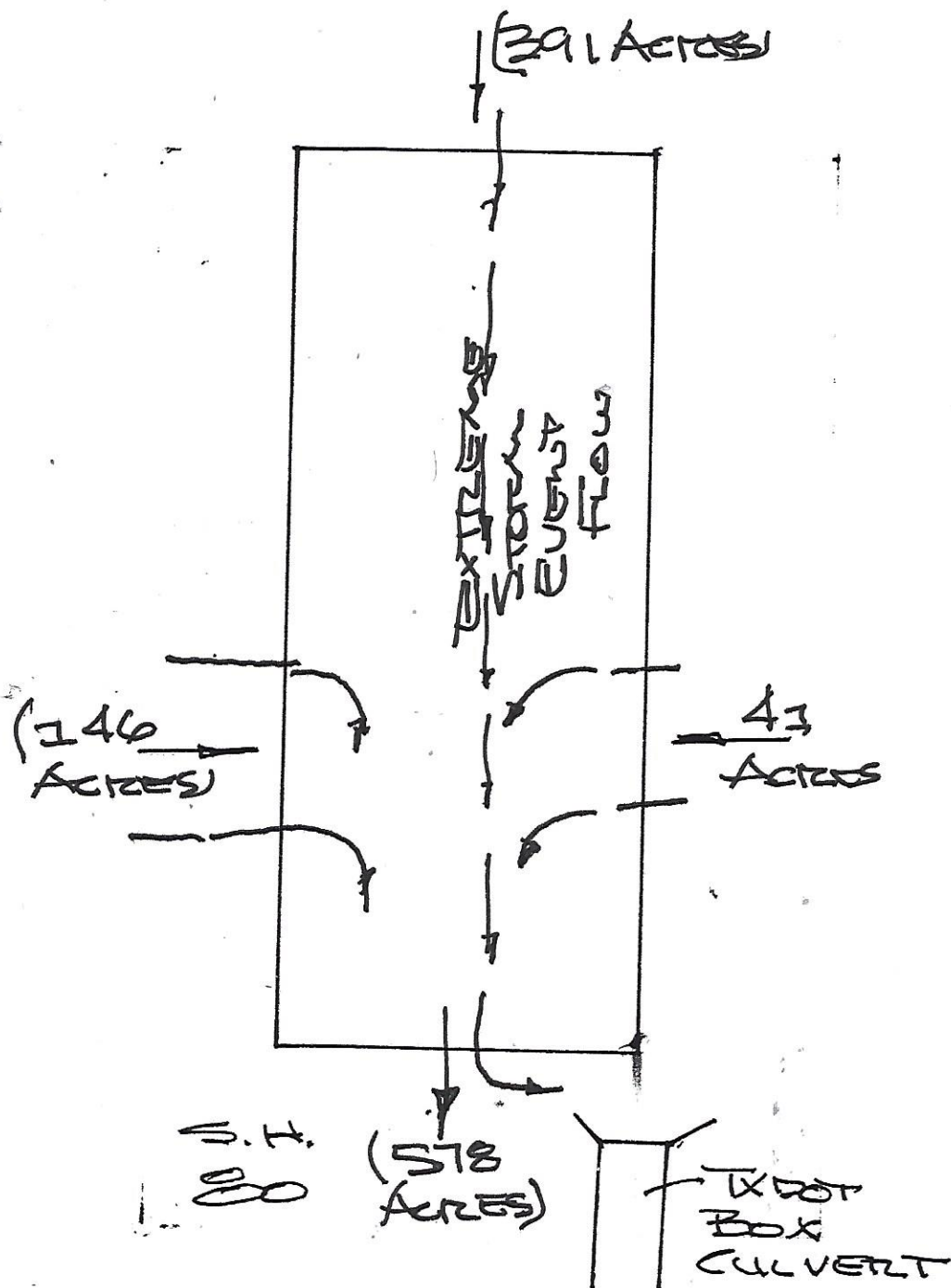
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578 Acres  
EXTREME  
STORM EVENT  
FLOW

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**TOTAL  
WATERSHED**

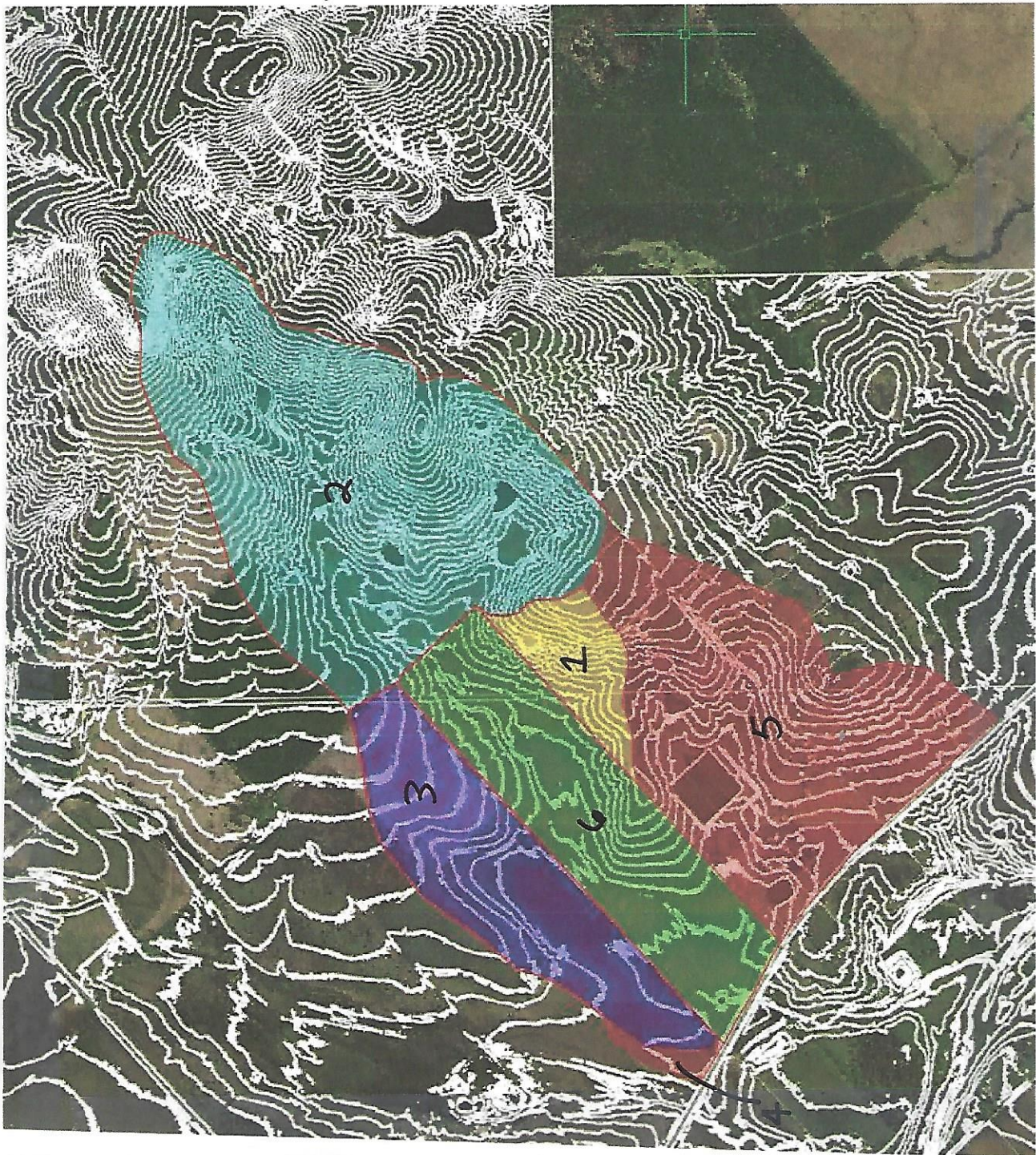
1	-	41	ACS
2	-	391	ACS
3	-	146	ACS
4	-	8	ACS
5	-	266	ACS
6	-	168	ACS
			<hr/>
			1020 ACS

**ACROSS PROPERTY**

1	-	41	ACS
2	-	391	ACS
3	-	146	ACS
			<hr/>
			578 ACS

**PLUS PROPERTY**

6	-	168	ACS
			<hr/>
			746 ACS



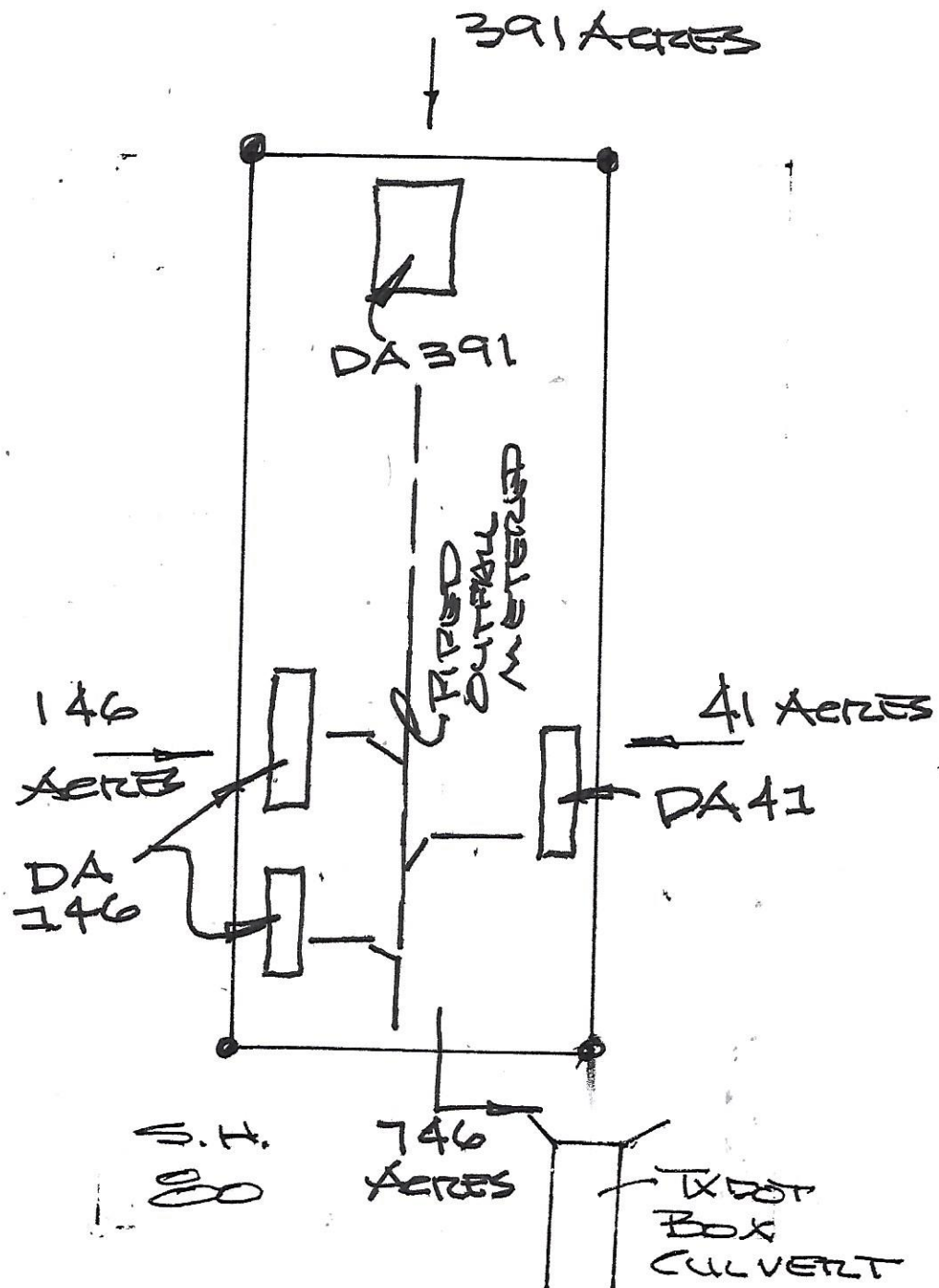
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RETENTION AREAS  
WITH METERED  
OUTFALL FOR  
ADJACENT WATERSHEDS

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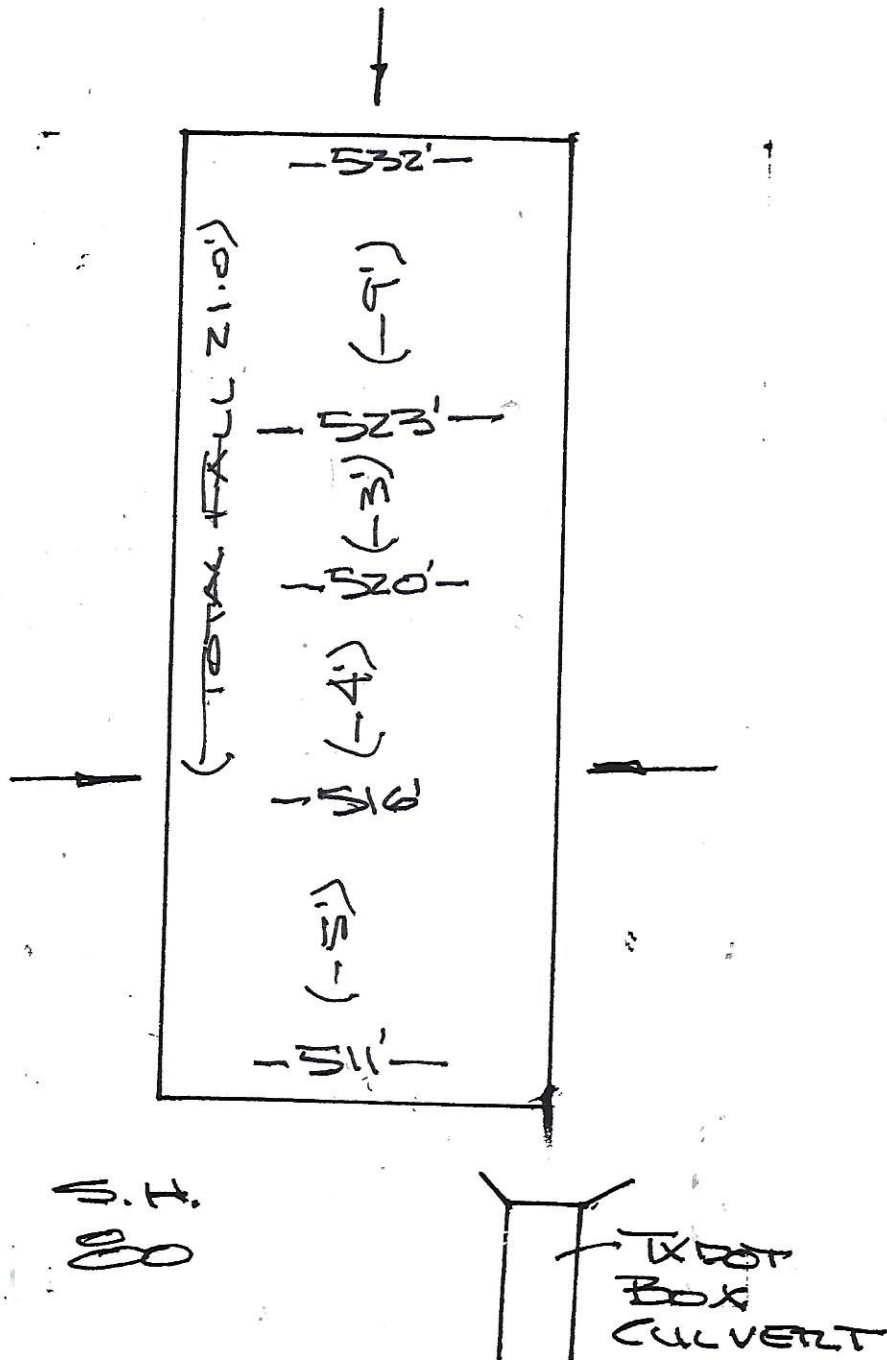
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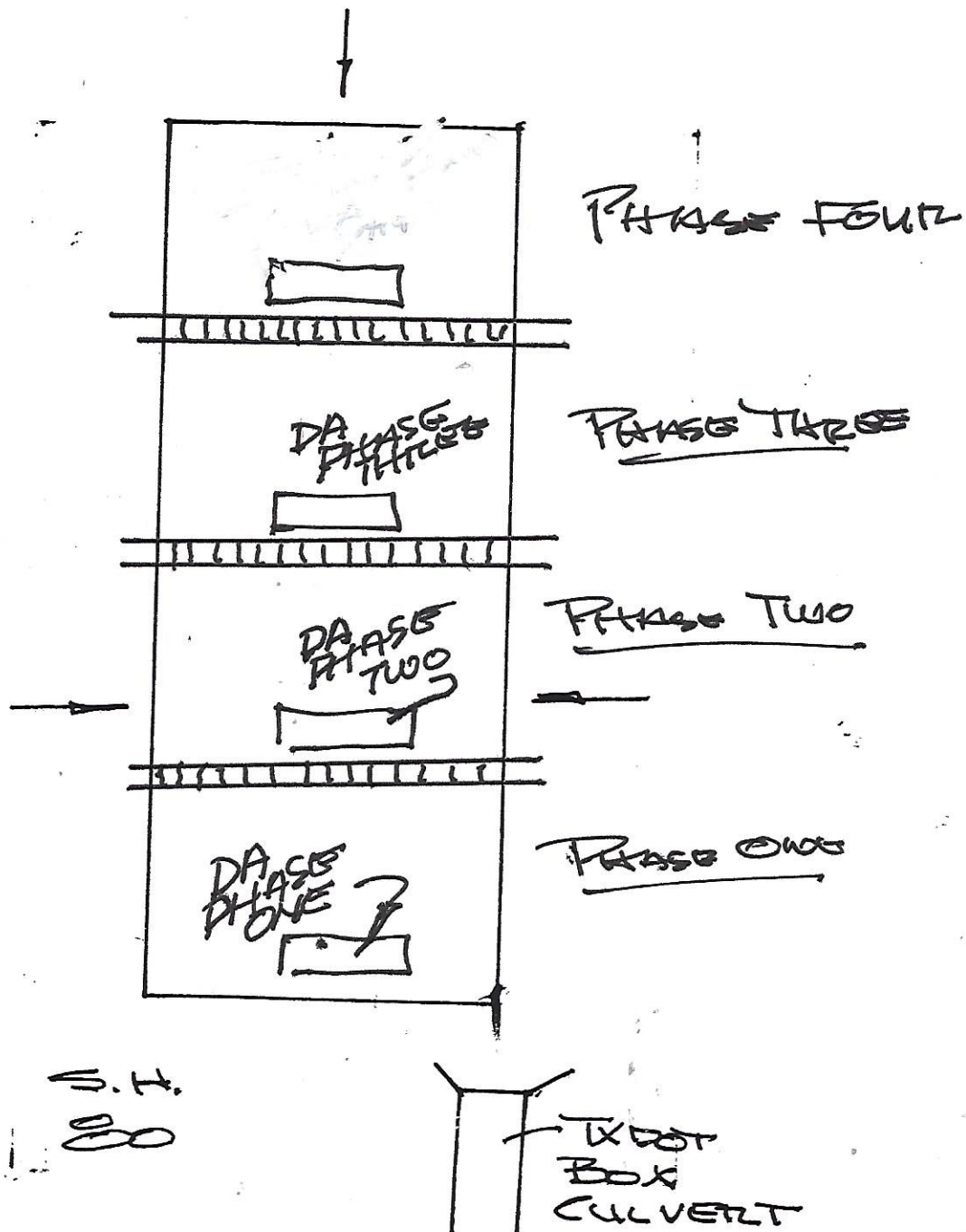
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TERRACE DEVELOPMENT



TERRACE DESIGN  
BECAUSE OF  
STORM FLOW FROM  
ADJOINING PROPERTY

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11/26/19

RE: MARTINDALE 168 ACRE TRACT

1. DRAINAGE FROM "REAR" 391 ACRES ON TO 168 ACRE TRACT REQUIRED TO BE DETAINED WITH CONTINUOUS WITH CONTROLLED FLOW RELEASE (TXDOT)  
DRAINAGE VOLUME: 3,202,200 CUBIC FEET (23,954,119 GALLONS)  
DETENTION AREA: (1270' X 500'): 14.58 ACRES  
DETENTION EXCAVATION: 351,887 CUBIC YARDS (36,665 TRUCK LOADS)
2. REAR ONE-HALF TRACT DEVELOPED:  
"DEVELOPED" DETENTION VOLUME: 2,127,060 CUBIC FEET (15,917,513 GALLONS)  
DETENTION AREA: (1250' X 440'): 12.63 ACRES  
DETENTION EXCAVATION: 132,407 CUBIC YARDS (13,792 TRUCK LOADS)
3. FRONT ONE-HALF TRACT DEVELOPED:  
"DEVELOPED" DETENTION VOLUME: 1,389,960 CUBIC FEET (10,397,622 GALLONS)  
DETENTION AREA (1070' X 400'): 9.83 ACRES  
DETENTION EXCAVATION: 87,185 CUBIC YARDS (9,083 TRUCK LOADS)

REMAINING TO CALCULATE TABULATION:

DRAINAGE ONTO 168 ACRE TRACT FROM RIGHT SIDE

DRAINAGE ONTO 168 ACRE TRACT FROM LEFT SIDE