

Detention Volume Calculations				Detention Volume Calculations			
<b>Project</b>	Travel Centers of America			<b>Project</b>	Travel Centers of America		
<b>Job No.</b>	TCATA0968			<b>Job No.</b>	TCATA0968		
<b>Engineer</b>	Steven Kirkpatrick			<b>Engineer</b>	Steven Kirkpatrick		
<b>Date</b>	2/19/2007			<b>Date</b>	2/19/2007		
<b>Page</b>	2	of	2	<b>Page</b>	2	of	2
<b>Detention System</b>	Existing TravelCenter Site 100yr			<b>Detention System</b>	Expansion 100yr		
Q=CiA				Q=CiA			
<b>Existing Conditions</b>		<b>Proposed Conditions</b>		<b>Existing Conditions</b>		<b>Proposed Conditions</b>	
A =	8.7 ac	C =	0.90	A =	2.5 ac	C =	0.60
C =	0.6	Tc =	10 min	C =	0.35	Tc =	10 min
Tc =	10 min	I <sub>100</sub> =	9.8 in/hr	Tc =	20 min	I <sub>100</sub> =	9.8 in/hr
I <sub>100</sub> =	9.8 in/hr	Q <sub>100</sub> =	51.16 cfs	I <sub>100</sub> =	8.3 in/hr	Q <sub>100</sub> =	14.70 cfs
Q <sub>100</sub> =	51.16 cfs	Q <sub>100</sub> =	76.73 cfs	Q <sub>100</sub> =	7.26 cfs	Q <sub>100</sub> =	14.70 cfs
<b>Flow for Various Storm Durations</b>		<b>Storage Calculations</b>		<b>Flow for Various Storm Durations</b>		<b>Storage Calculations</b>	
Duration (min)	I (in/hr)	C	Q (cfs)	Duration (min)	Inflow (cf)	Outflow (cf)	Storage (cf)
10	9.8	0.9	76.73	10	46040.40	30693.60	15346.80
15	9.0	0.9	70.47	15	63423.00	38367.00	25056.00
20	8.3	0.9	64.99	20	77986.80	46040.40	31946.40
30	6.9	0.9	54.03	30	97248.60	61387.20	35861.40
40	5.8	0.9	45.41	40	108993.60	76734.00	32259.60
50	5.0	0.9	39.15	50	117450.00	92080.80	25369.20
60	4.5	0.9	35.24	60	126846.00	107427.60	19418.40
70	4.0	0.9	31.32	70	131544.00	122774.40	8769.60
80	3.7	0.9	28.97	80	139060.80	138121.20	939.60
90	3.5	0.9	27.41	90	147987.00	153468.00	-5481.00
100	3.0	0.9	23.49	100	140940.00	168814.80	-27874.80
<b>Maximum Storage Volume =</b> 35861.40 cf				<b>Maximum Storage Volume =</b> 9986.25 cf			

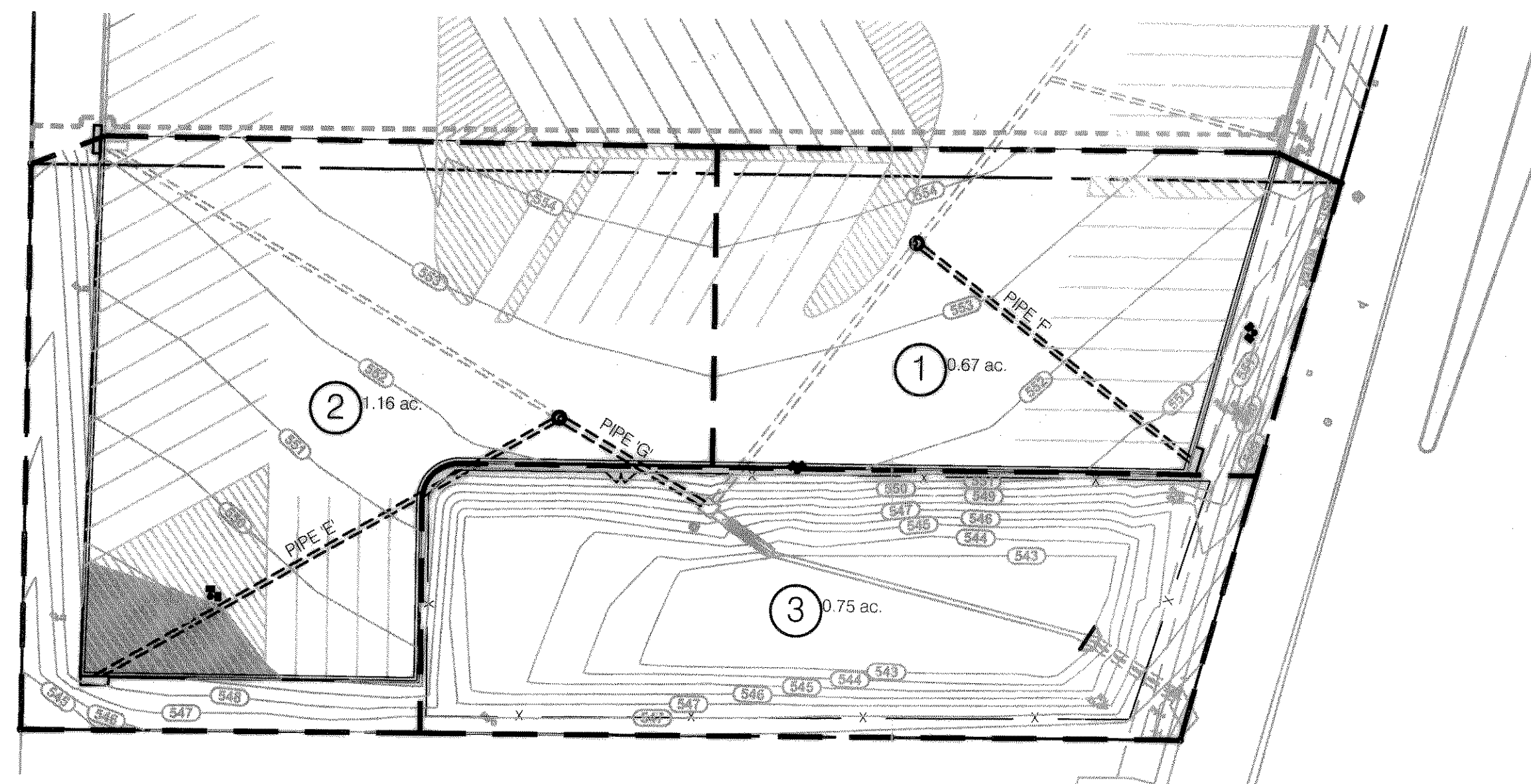
Storage Required	From Existing Site	From Expansion	Total (c.f.)
	35861.40	9986.25	45,848
<b>Q existing</b>	<b>Q expansion</b>	<b>Q Allowable (cfs)</b>	
51.16	7.26	58.42	

AS-BUILT DETENTION PROVIDED = 49,438 CU FT

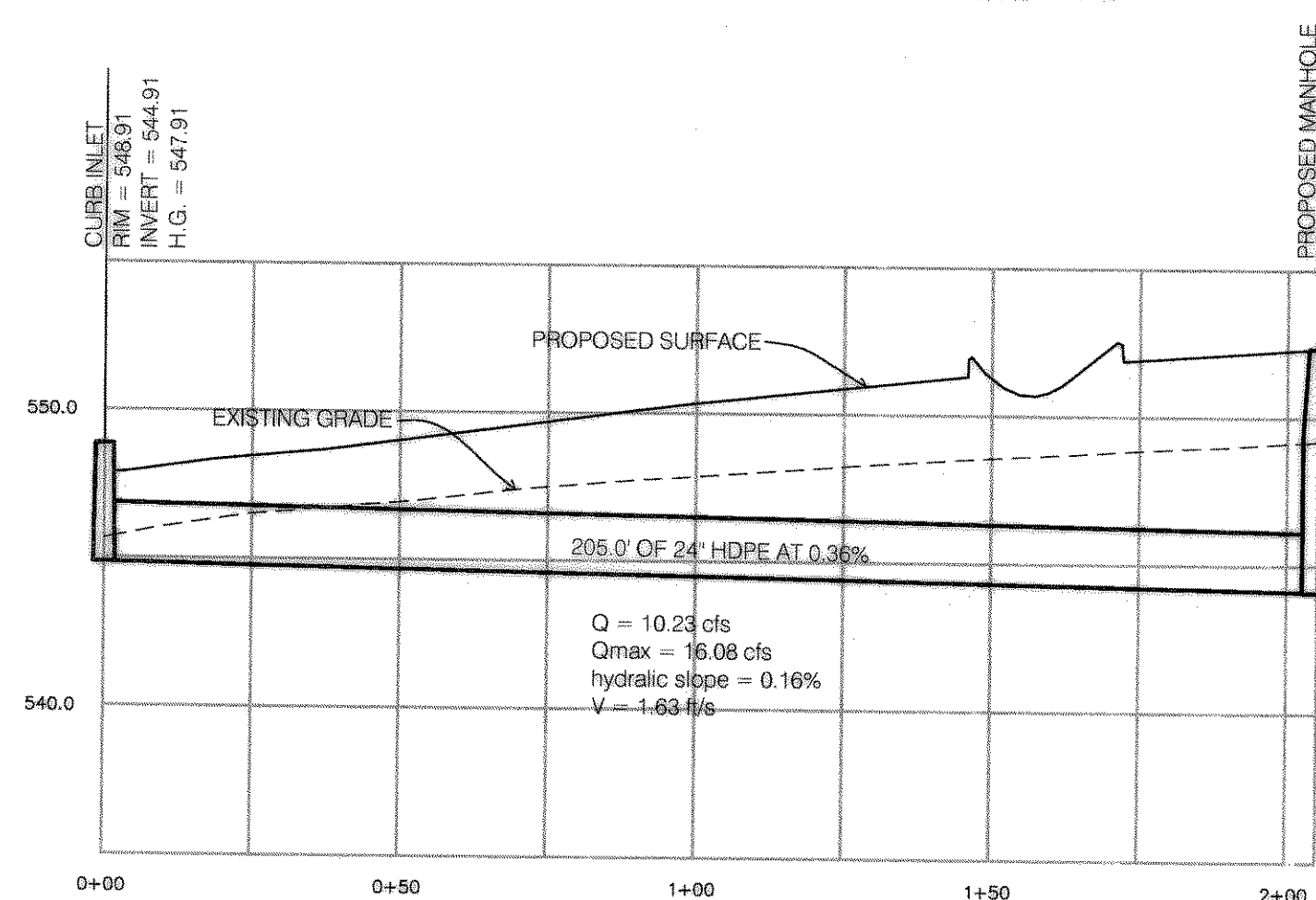
Storm	Q(culv)	Q(orif)	Q total	Q allowed
100yr	32.48	21.27	53.75	58.42
50yr	30.71	20.12	50.83	53.54
25yr	28.79	18.87	47.65	49.54
10yr	26.33	17.26	43.59	43.70

Notes: Q total is less than Q allowed for all storm events.

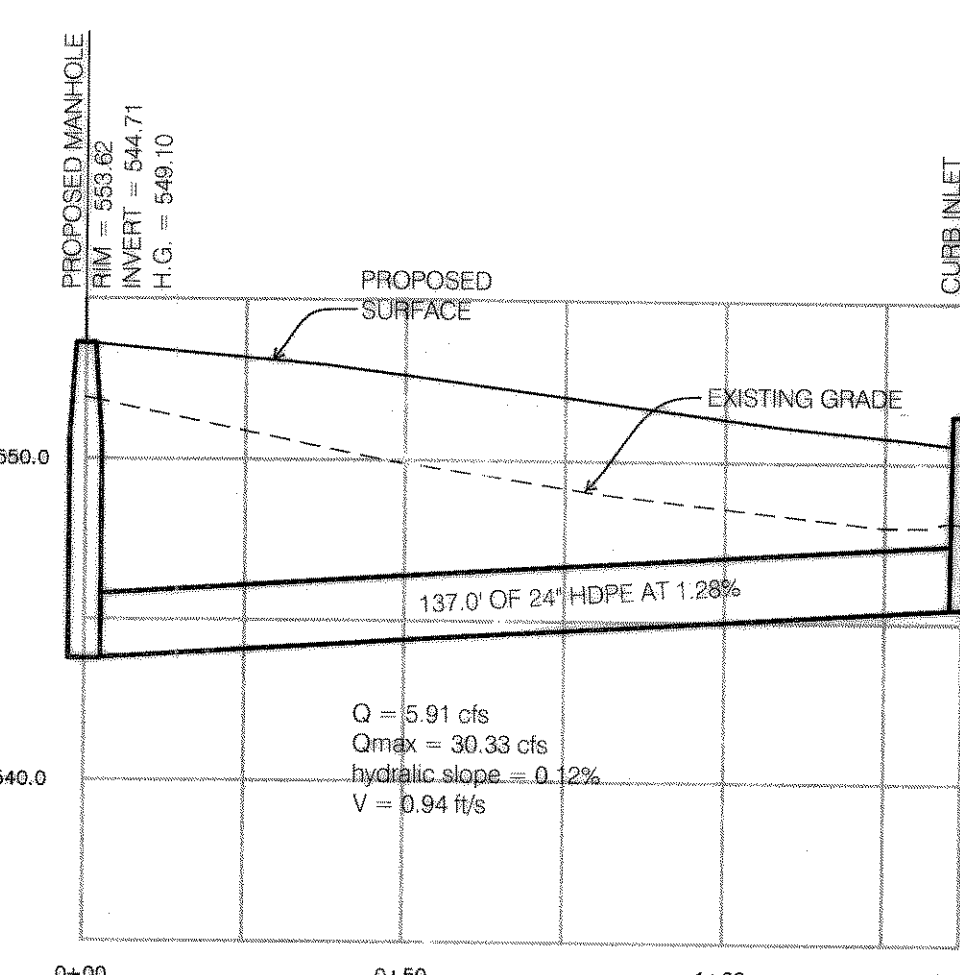
ANALYSIS OF EXISTING STORM SEWER OUTLET PIPES REVEALED AN ACTUAL OUTFLOW 'Q' VALUE SLIGHTLY LARGER THAN THE ALLOWABLE OUTFLOW DUE TO NEW POND GEOMETRY. AS A RESULT, THE CAPACITY OF ONE EXISTING CULVERT IN THE OUTLET STRUCTURE IS RESTRICTED WITH THE USE OF A PLATE WHICH REDUCES THE EFFECTIVE AREA OF THE CULVERT. THE NEW OUTFLOW WAS DETERMINED BY CALCULATING FLOW THROUGH ONE CULVERT WHICH IS FULL (Q<sub>culv</sub>) AS WELL AS THE FLOW THROUGH THE OTHER CULVERT WHICH IS RESTRICTED AT THE INLET (Q<sub>orif</sub>). THE FLOW THROUGH EACH OF THE PIPES IS ADDED TO DETERMINE THE TOTAL FLOW LEAVING THE POND.



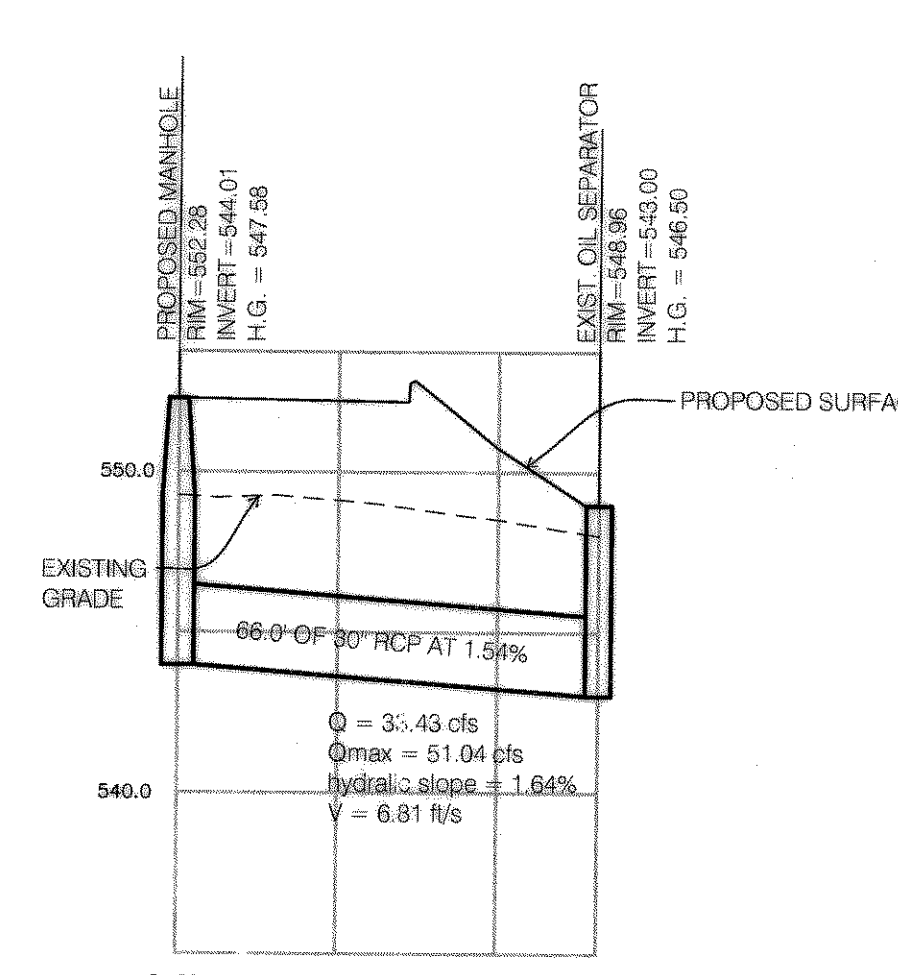
**DRAINAGE AREA MAP**  
SCALE: 1" = 50'



**PIPE 'E' PROFILE**  
SCALE: 1" = 30'



**PIPE 'F' PROFILE**  
SCALE: 1" = 30'



**PIPE 'G' PROFILE**  
SCALE: 1" = 30'

TO THE BEST OF OUR KNOWLEDGE, WD PARTNERS, HERBY STATES THAT THIS PLAN IS AS-BUILT/RECORD DRAWINGS. THE INFORMATION PROVIDED IS BASED ON SURVEYING CONDUCTED AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

SCALE: 1" = 30.00'



**CALL BEFORE YOU DIG!**  
TEXAS LAW REQUIRES EXCAVATORS TO NOTIFY THE TEXAS NOTIFICATION SYSTEM AT LEAST TWO (2) WORKING DAYS BUT NOT MORE THAN FOURTEEN (14) CALENDAR DAYS PRIOR TO EXCAVATION.  
www.onecalltexas.com  
One-Call Board of Texas  
1-800-545-6005