Summary of Engineering Costs

Table 1 summarises the total engineering cost for the final project after going through many changes of the scope. Most of the changes was due to the COVID-19 pandemic which limited the travel, site visit and supplies.

Table 1: Final engineering cost breakdown

Personnel	Classification	Hours (hr)	Rate ($/hr)	Cost ($)
	SENG	287.15	50	$14357.5
	ENG	319.5	29	$9265.5
	EIT	0	25	-$
	TECH	379.15	21	$7962.15
Travel	N/A	N/A	N/A	-$
Supplies	N/A	N/A	N/A	-$
Total				**$31585.15**

Cost of Implementing the Design

The total approximate cost for the construction of the Smooth wall 18" HDPE storm design is $17240. This factor depends on the length of pipe, labor, concrete manholes, and sand required to construct the design. The length of pipe was measured to be 525.84 ft and costs $75 per 4.6 feet. The labor required to complete the job was estimated to be 62.5 hours and costs $20 per hours. Construction of concrete manholes costs $6000. The sand required to construct this design was overestimated to be 1052 cubic foot at $35 per 37 cubic foot. The table below shows a breakdown on how the cost was calculated. Prices were based on Arizona department of transportation bid website.

Table 2: Implementing cost Breakdown

Item Description	Item unit	Item unit cost	Item quantity	Total item cost
HDPE 18" pipes (526 ft)	4.6 ft	$75	115	$8,625
Concrete manholes	1	$6,000	1	$6,000
Sand (1052 Cu.ft)	27 Cu.ft	$35	39	$1,365
Labor	1 hour	$20	62.5	$1,250
Total				**$17,240**