CE1.03 – Water Transmission Line

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Project Overview

The population boom experienced throughout Central Texas has prompted the city of Mustang Ridge to expand its municipal water supply capacity. This project aims to meet that demand and allow for further growth in the surrounding area by transporting 20 MGD of potable water via a 10-mile-long pipeline, as well as provide an elevated storage tank, groundwater storage tank, and disinfection booster station.

Design Considerations

- Maintain a reasonable hydraulic grade across the pipeline
- Minimize impact of construction on surrounding community
- Avoid environmentally and historically sensitive areas
- Ensure most efficient pipeline design and material choice
- Maintain a flow velocity between 3 and 7 feet per second

Sustainability

Credit Category	Applicable	Submitted	Percentage	Applicable
Quality of Life	104	50	48%	200
Leadership	166	78	47%	182
Resource Allocation	166	61	37%	196
Natural World	208	124	60%	232
Climate and Resilience	172	59	34%	190
Total Points / %	816	372	46%	1000

GOLD
46%

Route Selection

Alternative Descriptions

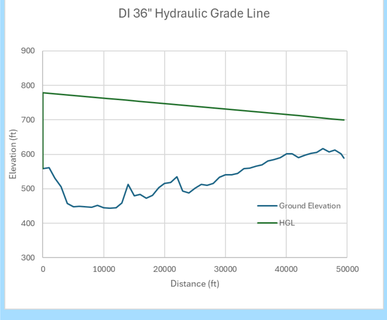
Chosen Alternative:

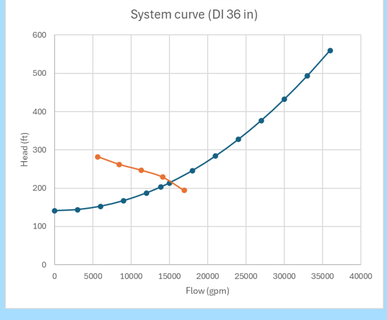
- Route 1 ~ 9.4 miles
- 36" Ductile Iron Piping
- 3 parallel pump system, 1 back up
- Capacity of 20 MGD
- Velocity: 4.42 ft/s
- Head Loss: 203 ft

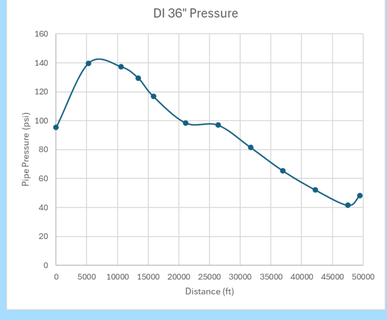
Other Alternatives Considered:

- Route 1 ~ 9.4 miles
- Route 2 ~ 8.5 miles
- 30", 36", 48" pipe sizes
- Ductile Iron, HDPE materials
- 4 parallel pump system, 1 back up
- Capacity of 20 MGD

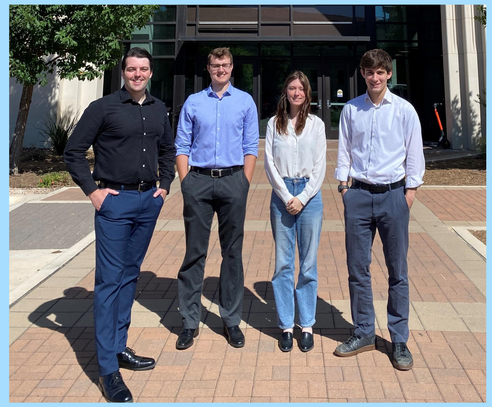
Hydraulic Considerations







Team Members

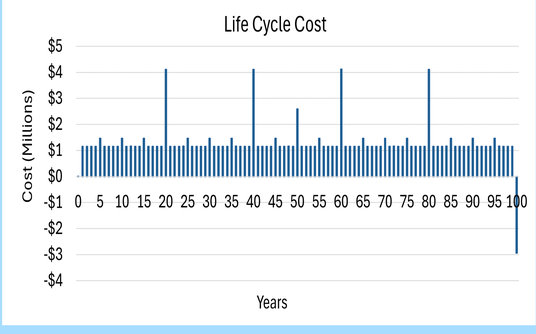


Dylan M, Kallen R, Rachel M, Ben L

Cost Analysis

Capital Cost

Item	Unit	Quantity	Cost	Total Cost
Ductile Iron Pipe	lf	50,000	$232	$11,600,000
Trenching	lf	50,000	$45	$2,250,000
Water Tower	Quantity	1	$6,500,000	$6,500,000
Pump	Quantity	3	$52,000	$400,000
Land	SF	750,000	$4	$3,000,000
Water Storage	Quantity	1	$2,250,000	$2,250,000
Misc	-	0.20	$26,000,000	$5,200,000
				$31,200,000



Total 100-year Life Cycle Cost is $62 Million