

**CIVL 1101 Civil Engineering Measurements**  
**Filter Project Report Content Evaluation Criteria**  
**Fall 2023**

**Name:** \_\_\_\_\_

Section	Topic	Item	✓	
Introduction	Background	Doris Paanee		
		Portable water treatment		
		Problem constraints on lab filter		
		Problem constraints on filter operation		
	Objectives	Filter efficiency > 40,000 ml		
		Maximize flowrate		
		Minimize turbidity (>95% NTU removed)		
	Tasks	Construction water filter		
		Vary flowrate		
		Vary filter media		
Methods/Procedures	Filter operation	Diagram of the water treatment system (WTS)		
		Processes identified on WTS diagram		
		Coagulation		
		Flocculation		
		Sedimentation		
		Filtration		
		Effects of flowrate on the filter performance		
	Filter construction and backwash	Filter materials		
		Role of anthracite in filter		
		Role of fine sand in filter		
		Purpose of backwash		
		Backwash time		
	Turbidity definition and measurement	Turbidity		
		Units of measure		
		Measurement device		
	Analysis of filter media	Filter sand - Particle-size plot		
		Filter sand - D <sub>10</sub>		
		Filter sand - D <sub>30</sub>		
		Filter sand - D <sub>60</sub>		
		Filter sand - Effective size		
		Filter sand - C <sub>u</sub>		
		Anthracite - Particle-size plot		
		Anthracite - D <sub>10</sub>		
		Anthracite - D <sub>30</sub>		
		Anthracite - D <sub>60</sub>		
		Anthracite - Effective size		
		Anthracite - C <sub>u</sub>		
	Calculation of filter efficiency	Incremental volume		
		Volume treated		
		Incremental turbidity		
		Average turbidity		
		%Turbidity (NTU) removed		
		Filter efficiency		
	Analysis of filter data	Table of filter data from Week #1		
		Plot of filter efficiency		
		Plot of turbidity removed		
		Best filter		
		Best filter rationale		
		Best flowrate		
		Best flowrate rationale		
		Flowrate effects on filter efficiency		
	Discussion	Strengths/weakness of filter design	Strength	
			Weakness	
			Final filter efficiency	
			Final %turbidity (NTU) removed	