TRIANGULAR STONE BUTTRESS CROSS-SECTION DESIGNED TO MITIGATE DAMP

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MSc Thesis

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Triangular Stone Buttress Cross-Section Designed To Mitigate Damp

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ABSTRACT

This paper addresses the problem of staining on stone buttresses and their adjacent stone walls due to damp. It hypothesizes a potential geometric cross-section design solution for buttresses to mitigate the effects of staining on stone surfaces by testing triangular cross-sectional properties and comparing all 3 variations in separate test cases to a traditional rectangular cross-section. Through Computational Fluid Dynamic (CFD) analysis, there appears slight variations in results in regard to the fluid flows over the 4 cross-sections in question, but not enough definitive data to draw any decisive conclusions. Results indicate that an equilateral (60°, 60°, 60°) triangular cross-section stone buttress may be able to increase drying times both along the buttress in question and its adjacent walls due to the triangular sides having increased exposure to sunlight throughout the annual sun-cycle as opposed to a rectangular cross-section. While the equilateral cross-section's structural resistance capacity is not quite that of the rectangular section, its mitigating shadowing effects are noteworthy enough to merit its continued research, and potential future implementation for damp mitigation.

TABLE OF CONTENTS

ABSTRACT 03

1.0 ACKNOWLEDGMENTS 06

2.0 INTRODUCTION 07

3.0 BACKGROUND 12

4.0 LITERATURE REVIEW 18

5.0 CAUSES 22

6.0 CFD ANALYSIS: METHODS + DATA 26
- 6.1 CFD Synopsis 26
- 6.2 Background 28
- 6.3 Data Methodology 29
- 6.4 Conducting Experiment 32
- 6.5 Results 35

7.0 SHADOWING EFFECTS: METHODS + DATA 38
- 7.1 Shadowing Effects Synopsis 38
- 7.2 Background 39
- 7.3 Data Methodology 42
- 7.4 Conducting Experiment 49
- 7.5 Results 51

8.0 STRUCTURAL ANALYSIS: METHODS + DATA 53
- 8.1 Structural Analysis Synopsis 53
- 8.2 Background 54
- 8.3 Data Methodology 56
- 8.4 Conducting Experiment 60
- 8.5 Results 66

9.0 DISCUSSION 67
- 9.1 CFD Analysis 67
- 9.2 Shadowing Effects 70
- 9.3 Structural Analysis 72
- 9.4 General 73

10.0 CONCLUSIONS 77

11.0 THE WAY FORWARD 79

12.0 REFERENCES 82

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