

Introduction

Abstract

This Master's thesis seeks to develop design guidelines for hairpin rebar splices in reinforced concrete. Opposing hairpin splices are made up of 180 degree bent bars with the hoops overlapping in alternating directions. These are typically used for precast panel joints but can also be used in cast in place applications. These splices currently do not have a defined design criteria. This experiment aimed to determine a design criteria for a rebar splice that makes use of opposing hairpin shaped overlapping bars. The current design criteria makes use of a standard hook development criteria to determine a splice length. This method is made up of doubling the development length for the hooks so that in theory every point linearly along the splice has bars developed. Although this method does ensure strength requirements, it is conservative in that it does not make use of the core concrete that is enclosed by both opposing bars. This enclosed core would need to fail in order for the splice to fail. The failure mode for this core is torsion. When reviewing the failure mechanism, and therefore, the strength, the necessary overlap can be reduced substantially. The experimental data developed for this thesis confirmed this statement.