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Title : STRUCTURAL PERFORMANCE OF MALE-FEMALE INTERLOCKING PANEL (M-FiP) CONNECTION USING CRUSHED CONCRETE WASTE AGGREGATE (CCwA)

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This research investigates the performance of male-female interlocking panel joint connection for precast panel applications. The research involved experimental laboratory work testing of twenty four (24) set of male-female interlocking panel (M-FiP) with and without bar as connector mechanism and used cement grout as wet joint binder. The dimensions size of the panel are 900 mm x 500 mm x 75 mm, was prepared using Grade 30 of concrete strength by used Crushed Concrete waste Aggregate (CCwA) size 10 mm and 20 mm as a major component material in concrete mix production. The concrete mix has been designed with water cement ratio of 0.50 and reinforced with B7 rectangular steel fabric type. Due to use recycled aggregate material in production new concrete mix, the fresh and hardened test was conducted to confirm the properties as satisfy according to the standard. The aspect (H/L) and slenderness ratio (H/t) of the panel are 0.55 and 6.67 respectively. In order to investigate the male and female performance the two pilot tests has been conducted in studied the bonding strength and ductility behavior of this joint connection. A total of twelve (12) set of male and female specimens with size dimension of 75 mm x 500 mm x 200 mm were cast and tested for two types

of testing. Eight (8) set were prepared for pullout testing and another four set were prepared for flexural beam testing. Based on the result in bonding strength analysis due to hardened cement grout strength was showed satisfactory bonding between bar connector and cement grout in M-FiP specimens. The bond strength was increased linearly with the age of cement grout strength. For bending test on M-FiP specimen results was indicated that the specimens with bar connector resulted in better performance in term of ductility behavior and pre-cracked controlled compared to specimen without bar connector under bending condition. In all M-FiP samples that have been constructed, it was divided into two experimental setup conditions which are under vertical and horizontal setup condition. These conditions were conducted due to investigate the performance and ductility behavior of M-FiP at joint connection under vertical and horizontal loading respectively. The influence of bar connector and loading distribution types was studied and discussed. The success of this research were provided a new method in jointing system of precast panel due to simple and fast installation process.