

Investigation on some properties of hardened cement-Biogenic ash composites

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Abstract

This work deals with investigation and optimization of compressive strength of hardened cement-walnut shell ash composite. The impact of the ash content and water/cement ratio on compressive strength were optimized and molded using statistical software. The results obtained revealed that the bio ash can be used as green binder to replace cement partially. The optimum strength for the cement-ash composites is obtained at the level of 22 wt. % of walnut shell ash as replaced by cement using $W/C=0.42$. However, higher compressive strength could be achieved using $W/C= 0.37$. Also, the average densities and water absorption % of the experimental results were analyzed and correlated with the ash content and water/cement ratio. The results showed that incorporation of the bio ash resulted in improvement of the compressive strength, decreasing the density and slightly increase the water absorption. Portland cement binder is prepared and tested for comparison purposes.

المخلص

يتضمن العمل استقصاء وامكانية تحسين قوة انضغاط تركيبات محضرة من السنن المتصلب المحتوي على رماد قشور الجوز.

تم دراسة تأثير محتوى الرماد الحيوي ونسبة الماء / الأسممنت على مقاومة الانضغاط باستخدام برنامج إحصائي رياضي. أوضحت النتائج التي تم الحصول عليها أن الرماد الحيوي يمكن استخدامه كمادة رابطة خضراء لاستبدال السنن جزئياً. تم التوصل إلى قوة انضغاط مثلي للتركيبات لمحضره عند محتوى رماد قشرة الجوز 22% وزنا من السنن وباستخدام نسية ماء / سنن = 0.42. ومع ذلك ، يمكن تحقيق قوة انضغاط أعلى باستخدام نسية ماء / سنن = 0.37. كما تم حساب وتحليل قيم متوسط الكثافة ونسبة امتصاص الماء التجريبية وربطها رياضياً بقيم محتوى الرماد ونسبة الماء / الأسممنت. أظهرت النتائج أن دمج الرماد الحيوي أدى إلى تحسين مقاومة الانضغاط وتقليل الكثافة. كما أدى إلى زيادة امتصاص الماء بشكل طفيف. تم تحضير تركيبات السنن البورتلاندي واختبارها لأغراض المقارنة.

پوخته

ئەم کاره باس له لىكۆلىنەوە و باشکەرنى ھىزى پەستانى بىكھاتەمى خۆلەمەيشى توپىكلى چىمەنتو-گۆيىزى رەقىراوه دەكەت. كارىگەرى رىزەرى خۆلەمەيش و رىزەرى ئاو/چىمەنتو لەسەر ھىزى پەستان باشتر كرا و بە بەكار ھىننەن نەرمەكالايمەكى ئامارى قالب كرا. ئەو ئەنچامانەمى بەدەست ھاتوون دەريانخستووه كە دەتوانرىت خۆلەمەيشى بايق و مەكى بەستەرە سەزى بەكار بەنېرىت بۇ گۈرىنى چىمەنتو بەشىۋىمەكى بەشەكى. بەھىزى گۈنجاو بۇ بىكھاتەكەنلى چىمەنتو-خۆلەمەيش بەدەست دېت بە بەكار ھىننەن رىزەرى 22% خۆلەمەيشى توپىكلى گۆيىز لە جىاتى چىمەنتو بە بەكار ھىننەن $W/C=0.42$. بەلام دەتوانرىت ھىزى پەستانى بەرزىت بەدەست بەنېرىت بە بەكار ھىننەن $W/C=0.37$. هەروەھا، تىكىرای چىرى و % مەزىنى ئاوى ئەنچامەكەنلى تاقىكىردىنەمكەن شىكەنەوە و پەيپەنلىكىان بە رىزەرى خۆلەمەيش و رىزەرى ئاو/چىمەنتووه ھەبۇو. ئەنچامەكەن دەريانخست كە تىكەنلىكەن خۆلەمەيشى بايق بۇ وەته ھۆى باشىر بۇونى ھىزى پەستان، كەمبوون نەمەنەوە چىرى و كەمەنەك زىادەكەن ھەلەمژىنى ئاو. بەستەرە چىمەنتوپۇر تىلەن ئامادە دەكىرىت و تاقى دەكىرىتىووه بۇ مەبىستى بەراور دەكەن.

Research link

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About Soran University

[Soran University \(SUN\)](#) is located in the city of Soran, which is about a two-hour drive north-east of [Erbil](#) (Arbil, Hewlér), the capital of the [Kurdistan Region](#) of Iraq (KRIQ). The city is flanked by the famous Korek, Zozik, Henderén, and Biradost mountains. The medieval mountain village of [Rewandiz \(Rawanduz\)](#) (رواندز) is a stone-cast away, and the two cities share this lovely, harmonious upland. While waiting for its green, environmentally friendly building to be erected on a hilltop overlooking the cities of Soran and Rewandiz, its existing city campus has been meticulously set out to accommodate the lovely natural landscape. The new campus will be the first of its type, being walkable, balanced, powered by renewable energy, and compliant with all international environmental regulations. There are 5 Faculties in [SUN](#); [Faculty of Arts](#) (FAAR), [Faculty of Science](#) (FSCN), [Faculty of Education](#) (FEDU), [Faculty of Law](#), Political Science, and Management (FLAW/PSM), and [Faculty of Engineering](#) (FENG). Also, there is SUN research centre. Moreover, at SUN, there is a Language Center. SUN signed many Memoranda of Understandings (MoU) with many International Universities,

How to get here

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