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JUDUL : THE EFFECT OF OVER DOSAGE OF CONCRETE RETARDER DARATARD 40 IN CONCRETE

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THE EFFECT OF OVER DOSAGE OF CONCRETE RETARDER DARATARD 40 IN CONCRETE

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A project report submitted in partial fulfillment of the requirements for the award of the degree of Master of Engineering (Civil – Structure)

Faculty of Civil Engineering
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NOVEMBER 2005

I declare that this thesis entitled "The Effect of Over Dosage of Concrete Retarder Daratard 40 in Concrete" is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree.

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Especially dedicated
to my beloved family

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ABSTRACT

More than 70 % of insitu concrete is produced now by the ready mixed concrete industry in Malaysia. With the increases in economic growth and demand for highrise buildings as well as infrastructures make the industry to determine its own standards of the production by trial mixed design. The issues involves in the properties of fresh concrete during the casting stage. A high degree of workability is planned to speed up the construction. The suitable concrete retarder is being used in the fresh concrete to avoid the formation of cold joint due to time needed to place a large volume of concrete in a continuous operation. The chances to over dosage the concrete with retarder become so great and critical at the construction site. Sometimes it takes 2 to 3 days for the concrete to set and harden. It creates many doubt and disputes to engineers in the industries about the strength and durability of the concrete in long run. The study of behavior of the concrete with different dosage of retarder Daratard 40 has been conducted in the lab test prior to practical concrete practice. The investigation may help the industry to achieve the optimum dosage of concrete retarder without compromising the concrete strength. The relationships between slump test and optimum dosage of the Daratard 40 concrete retarder has been established from the study. Slump test a cheap, suitable and more reliable testing method use to detect the cause of over dosage in fresh concrete consent on consistency before placing and compaction works at the site.

ABSTRAK

Pada masa kini sebanyak 70 % konkrit tuang disitu menggunakan konkrit siap bancur (ready mixed concrete) dalam industri konkrit di Malaysia. Dengan perkembangan ekonomi yang pesat dan bertambahnya keperluan bangunan pencakar langit serta infrastruktur/kemudahan asas membolehkan industri pengeluar konkrit siap bancur menyediakan rekabentuk bancuhan konkrit mereka tersendiri secara cubaan (trial mix). Kesan dan masalah yang dihadapi oleh konkrit yang baru siap bancur (fresh concrete) dari segi sifat (properties) semasa konkrit dalam proses penuangan di tapak bina adalah perlu dikaji. Bagi mempercepatkan dan memudahkan sesuatu proses kerja pembinaan, konkrit pada tahap darjah kebolehankerjaan (slump) yang tinggi dan praktikal sangat diperlukan supaya kerja pembinaan itu senang di bina. Bahan kimia seperti bahan campur kelambatan (concrete retarder) digunakan dalam industri konkrit siap bancur bagi tujuan mengelakkan pembentukan sambungan sejuk (cold joint) semasa proses pemejalan konkrit dan penuangan konkrit dalam isipadu dan keluasan yang besar dengan cara operasi yang berterusan. Kebarangkalian bagi menambahkan dos bahan campur kelambatan yang berpatutan adalah amat tinggi dan kritikal semasa menerima konkrit di tapak bina. Ini adalah kerana kecuaian operator yang tidak sengaja dilakukan semasa membancur konkrit siap bancur di tapak lokasi yang lain dan berjauhan dari tapak bina yang sediada. Kadangkala 2 hingga 3 hari konkrit yang tuang dalam papan acuan tidak akan keras dan menjadi pejal. Ini menjadikan banyak tanda tanya dan bahan perbahasan dikalangan jurutera dalam industri pembinaan mengenai tahap kekuatan dan ketahanan ataupun tempoh perkhidmatan disepanjang hayat struktur konkrit tersebut. Satu kajian mengenai sifat konkrit akibat dos yang berbeza terutamanya berlebihan dos kepada bahan tambah kelambatan dalam konkrit telah dijalankan dalam makmal, ianya mirip dengan keadaan sebenar

yang berlaku di tapak bina. Hasil kajian ini akan membantu industri konkrit untuk menetapkan nilai optimum dos bahan tambah konkrit Daratard 40 dengan kekuatan izin konkrit yang maksimum. Hubungan diantara kebolehkerjaan (slump) dan nilai optimum dos bahan tambah konkrit dapat dijadikan sebagai pedoman. Satu alat pemantau/pengukuran seperti kebolehkerjaan (slump test equipments) yang murah serta sesuai dengan keadaan tapak bina dapat membantu mengesan dos bahan tambah konkrit yang berlebihan dalam konkrit sebelum dituangkan kedalam papan acuan serta pemadatan konkrit.

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Ø	=	Diameter of cylinder
C	=	Compressive strength
P	=	Applied load
W	=	Width of cube
L	=	Length of cube
d	=	Depth of penetration of water
h	=	Absorption of water
$\mathbf{M_w}$	=	Mass increases in the specimen due to immersion of water
$\mathbf{M_d}$	=	Mass of dry specimen

LIST OF APPENDIXES