

การเปรียบเทียบการปรับปรุงวัสดุทางเก่าโดยโฟมแอสฟัลต์ และ ปอร์ตแลนด์ซีเมนต์



นาย อนุศักดิ์ ธรรมวงศ์

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จุฬาลงกรณ์มหาวิทยาลัย

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิศวกรรมศาสตรมหาบัณฑิต

สาขาวิชาวิศวกรรมโยธา ภาควิชาวิศวกรรมโยธา

คณะวิศวกรรมศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

ปีการศึกษา 2547

ISBN 974-17-7063-4

ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

COMPARISON OF FOAMED ASPHALT AND PORTLAND CEMENT  
STABILIZED ON RECYCLING PAVEMENT MATERIALS



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A Thesis Submitted in Partial Fulfillment of the Requirements  
for the Degree of Master of Engineering in Civil Engineering  
Department of Civil Engineering  
Faculty of Engineering  
Chulalongkorn University  
Academic Year 2004  
ISBN 974-17-7063-4

Thesis Title                      COMPARISON OF FOAMED ASPHALT AND  
PORTLAND CEMENT STABILIZED ON  
RECYCLING PAVEMENT MATERIALS  
By                                      Mr. Anousak Thammavong  
Field of Study                      Civil Engineering  
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นายอนุศักดิ์ ธรรมวงศ์ : การเปรียบเทียบการปรับปรุงวัสดุทางเก่าโดยโฟมแอสฟัลต์ และ ปอร์ตแลนด์ซีเมนต์ (Comparison of Foamed Asphalt and Portland Cement Stabilized on Recycling Pavement Materials) อ.ที่ปรึกษา : ศาสตราจารย์ ดร. ดิเรก ลาวัญศิริม อาจารย์ที่ปรึกษาร่วม : ดร.ธันวิน สวัสดิศานต์, 173 แผ่น, ISBN 974-17-7063-4

การผสมโฟมแอสฟัลต์เป็นกระบวนการพัฒนาการใช้งานแอสฟัลต์ซีเมนต์ในรูปแบบใหม่ที่ใช้ประโยชน์จากคุณสมบัติของโฟมแอสฟัลต์ซึ่งกระทำโดยการฉีดละอองน้ำและแอสฟัลต์ร้อนเข้าผสมกันทำให้เกิดการขยายตัวของแอสฟัลต์ในรูปของโฟมส่งผลให้ความหนืดของแอสฟัลต์ลดลง ซึ่งจะทำให้มีความสามารถในการกระจายตัวเข้าไปผสมกับวัสดุมวลรวมที่ขึ้นและเย็นได้ดี งานวิจัยนี้เป็นการศึกษาถึงความเป็นไปได้และความเหมาะสมของการนำโฟมแอสฟัลต์มาปรับปรุงคุณภาพของวัสดุชั้นทางเก่าที่เก็บตัวอย่างจากถนนสายพิษณุโลก-อุตรดิตถ์โดยศึกษาถึงความเป็นไปได้ที่จะนำวัสดุชั้นทางเก่าในปริมาณที่แตกต่างกันโดยกำหนดอัตราส่วนจาก 100%, 50% และ 0% มาผสมเข้ากับวัสดุมวลรวมใหม่ ผลการออกแบบพบว่าส่วนผสมที่แตกต่างต้องการปริมาณโฟมแอสฟัลต์ที่แตกต่างกันได้แก่ 2.35%, 2.50% และ 2.90% ตามลำดับ ผลการทดสอบพบว่าส่วนผสมที่มีวัสดุชั้นทางเก่า 100% มีคุณสมบัติด้อยที่สุดใน 3 ส่วนผสม และกรณีทั่วไปส่วนผสมที่มีวัสดุชั้นทางเก่า 0% จะมีคุณสมบัติดีกว่าส่วนผสมที่มีวัสดุชั้นทางเก่า 50% เล็กน้อย

สำหรับส่วนผสมซีเมนต์ใช้วัสดุทางเก่า ร้อยเปอร์เซ็นต์ต่อซีเมนต์ โดยกำหนดอัตราส่วนที่ 100:2, 100:3, 100:4 และ 100:5 เปอร์เซนต์ ผลการทดสอบพบว่าปริมาณซีเมนต์เพิ่มขึ้นส่งผลให้ความต้านทานต่อแรงดึงทางอ้อม ค่าโมดูลัสคืนตัวและกำลังอัดเพิ่มขึ้น

ศูนย์วิทยทรัพยากร  
จุฬาลงกรณ์มหาวิทยาลัย

ภาควิชา วิศวกรรมโยธา  
สาขาวิชา วิศวกรรมโยธา  
ปีการศึกษา 2547

ลายมือชื่อนิสิต.....  
ลายมือชื่ออาจารย์ที่ปรึกษา.....  
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม.....



# # 467 06443 21: MAJOR CIVIL ENGINEERING

KEY WORD: FOAMED ASPHALT / RECLAIMED ASPHALT PAVEMENT / INDIRECT TENSILE STRENGTH / RETAINED STRENGTH / RESILIENT MODULUS / FATIGUE RESISTANCE/ PERMANENCE DEFORMATION.

PORTLAND CEMENT/RECLAIMED ASPHALT PAVEMENT / INDIRECT TENSILE STRENGTH / RESILIENT MODULUS / UNCONFINED COMPRESSIVE STRENGTH.

ANOUSAK THAMMAVONG: COMPARISON OF FOAMED ASPHALT AND PORTLAND CEMENT STABILIZED ON RECYCLING PAVEMENT MATERILAS. THESIS ADVISOR: PROF.DR DIREK LAVANSIRI, Ph.D., THESIS CO-ADVISOR: TUNWIN SVASDISANT, Ph.D. 173pp, ISBN 974-17-7063-4

Foamed asphalt mixing is an innovated process that utilizes the benefits of foamed asphalt cement. Foaming occurs when small amounts of water are added to hot asphalt, thereby increasing the surface area and significantly reducing the viscosity of the asphalt. In this form it is suited for mixing with cold damp aggregates. This research investigated the feasibility and the suitability of foamed asphalt to stabilize reclaimed asphalt pavement (RAP) or recycled material obtained from Phisanoulok–Uttradit project. The RAP was mixed with virgin aggregates at proportions of 100:00, 50:50 and 0:100. The selected foamed asphalt binder was found to be 2.35%, 2.50% and 2.90% for 100%, 50% and 0%RAP mixtures respectively. The laboratory tests of the three foamed asphalt mixtures revealed that in all cases, the 100%RAP mixtures had the poorest properties, while the 0%RAP mixtures generally had slightly better properties than 50%RAP mixtures.

The Portland cement mixture used 100% reclaimed asphalt pavement aggregate per cement content at the proportions (RAP: Cement) of 100:2, 100:3, 100:4 and 100:5. The laboratory tests of the Portland cement stabilized mixtures showed that the higher cement contents result in higher indirect tensile strength, resilient moduli, and

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## ACKNOWLEDGEMENTS

The writer wishes to thank thesis advisor Professor Dr. Direk Lavansiri, for his valuable consultation and suggestions throughout this research project.

The writer also would like to thank Associate Professor Anukalya Isarasena Na Ayudhya, chairman of the thesis committee, and Associate Professor Dr. Sorawit Narupiti, thesis committee member, for their assistance.

The writer would like to thank Dr. Tunwin Svasdisant, thesis co-advisor. Bureau of Road Research and Development of Highways, and Mr. Pornchai Silarom, Bureau of Road Research and Development of Highways, materials facilities.

The writer would like to thank all teachers of the Transportation Engineering Division, students, and classmates as well.

The writer would like to thank Mr. Nuang Legkanai, a technician of the Pavement Material Research Department of Chulalongkorn University, for his help of preparing sample and conducted tests.

The writer would like to thank the AUN/SEED-Net. JICA Program, all program officials, and ISE contacts, who made this study possible.

And lastly, I am grateful to my family, especially to my mother, for their invaluable moral support.

ศูนย์วิทยทรัพยากร  
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