

CHAPTER I

INTRODUCTION

1.1 Origin and Importance of Study

For 21st Century, the member countries of the Association Southeast Asian Nations (ASEAN) have signed memorandums of understanding to extend road network between members as transportation is the important for thinking all of economics and social development. Hence, road construction has expanded.

High quality materials for road construction have continually been depleted and resources are not found where road construction takes place. Techniques to employ reclaimed asphalt pavement (RAP) aggregate therefore are an interesting concept and should be considered because the reclaimed asphalt pavement materials can reduce expenditures and consumption.

With increasing fuel prices, this research comparing foamed asphalt and Portland cement with recycled pave materials in road construction can help determine method to reduce transport costs and purchase costs of new materials.

Road construction in Thailand is still a major focus for the government, likewise in Lao P.D.R, where the government has allocated 40-60% of the nation budget for road construction in 2002 to 2010.

This research studies the asphalt concrete surface and base course at Phitsanulok-Uttradit section1. The RAP aggregate consists of 25% asphalt concrete and 75% of base course stabilized by foamed asphalt and Portland cement, both stabilizing agents. A comparison was made of foamed asphalt and Portland cement as suitable materials for road construction in Phisanulok-Uttradit to determine which is best for different conditions.

1.2. Objectives

1. Study foamed asphalt procedure, and use to stabilize RAP and virgin aggregate in road construction
2. Study application of foamed asphalt technique to determine suitable proportions in the highway construction
3. Study characteristics of RAP and virgin aggregates, (RAP consist of asphalt concrete 25% and base course 75%)
4. Study mix design results of foamed asphalt material properties with different RAP and virgin aggregate proportions
5. Study mix design results of Portland cement with 100%RAP aggregate while changing cement contents
6. Study the advantage and disadvantage of foamed asphalt as a stabilizer
7. Study of the advantage and disadvantage of Portland cement stabilizer.

1.3. Scope of Study

1. Asphalt cement AC 60/70 Grade, from Shell Company, Ltd.
2. RAP and virgin aggregates, from Phitsanulok-Uttradit section1
3. Foamed asphalt mixtures
 - RAP aggregate 100: Virgin aggregate 0 (by weight)
 - RAP aggregate 50: Virgin aggregate 50
 - RAP aggregate 00: Virgin aggregate 100
4. Portland cement mixtures
 - RAP 100%: Portland cement 2.0%
 - RAP 100%: Portland cement 3.0%
 - RAP 100%: Portland cement 4.0%
 - RAP 100%: Portland cement 5.0%
5. Type I Portland cement

6. Compaction test by superpave method
7. This research was conducted in a laboratory only. The results reflect the proportions of foamed asphalt and Portland cement material properties in real work.

1.4. Specification of Test Materials

1. Asphalt cement AC 60/70 Grade
2. Type I Portland cement
3. RAP aggregate
4. Virgin aggregate
5. All RAP and Virgin aggregate represent materials for road construction.

1.5. Study Procedure

1. Study theory and related to cold recycling including the Thai highway department, seminar
2. Assign study parameters and schedule testing
3. RAP aggregate assign, Asphalt cement AC 60/70, Portland cement type I, virgin aggregate to used in study
4. Results and analysis, conclusions and recommendations.

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1.6. Expectations

1. To compare of foamed asphalt and Portland cement stabilized on recycling pavement materials
2. To know and how to use the foamed asphalt procedure for RAP aggregate stabilized to reconstruction
3. To know the advantages and disadvantages of foamed asphalt and Portland cement stabilized in highway materials
4. Application foamed asphalt and Portland cement technique on recycling pavement materials to reconstruction
5. To know the criterion of RAP aggregate for developed of old materials reused as possible as region
6. To know the suitability materials for foamed asphalt or Portland cement stabilized each the region.



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