

**EVALUATION OF LABORATORY AND FIELD
COMPACTION OF
DENSE GRADED AGGREGATE BASE**

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DECLARATION OF THE CANDIDATE AND SUPERVISOR

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ABSTRACT

The optimum compaction is required to provide an effective path to enter energy into unbound material under its Optimum Moisture Content (OMC). To achieve the optimum energy level, the relationship between OMC, Maximum Dry Density (MDD) and Compaction Effort need to be identified at field conditions. But it is difficult to conduct in field scenario and therefore those condition are simulated at laboratory condition to find above parameters. However understanding of the importance of this relationship is a question in local context.

The information of current compaction practices were gathered by conducting questionnaire survey, while laboratory and field studies were carried out to compare compaction behavior of Dense Graded Aggregate Base (DGAB) at different Moisture Contents (MC) and energy levels. Few number of impact compaction tests and vibratory hammer compaction test were conducted to compare with the field trial test results.

The results of field trial study revealed that the higher compaction effort is needed, when compacting at moisture levels which is deviated from OMC. In addition to that Dry Density (DD) is rapidly increased when lesser number of roller passes are applied at MC which is closed OMC. The comparison of field and laboratory test results shows that the vibratory hammer test is suitable to obtain OMC and MDD for field compaction.

Although compaction effort can be minimized when it compacts at MC close its OMC, common practice is achieving the required density at higher MC by applying an ineffective compaction effort while leading to segregate the DGAB layer. Therefore appropriate compaction effort should be identified prior to compaction for relevant MC in order to achieve an effective compaction.

Key words: Compaction, Energy Optimization, Moisture Content, Dry Density

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TABLE OF CONTENT

| | |
|---|-----|
| Declaration of the Candidate and Supervisor..... | i |
| Abstract | ii |
| Acknowledgement..... | iii |
| Table of Content..... | iv |
| List of Figures | vii |
| List of Tables..... | x |
| List of Abbreviations..... | xi |
| 1 Introduction | 1 |
| 1.1 Back Ground..... | 1 |
| 1.2 Objective | 2 |
| 2 Literature survey | 3 |
| 3 Evaluation of dense graded aggregate base compaction methods used in sri lanka 8 | |
| 3.1 Questionnaire Survey | 9 |
| 3.2 Results of the Questionnaire..... | 14 |
| 4 Laboratory compaction methods..... | 17 |
| 4.1 Introduction | 17 |
| 4.2 Laboratory Compaction Test Types | 17 |
| 4.2.1 Impact Compaction Test | 18 |
| 4.2.2 Vibrator Compaction Test Methods..... | 20 |
| 4.2.3 Gyratory Compaction..... | 24 |
| 4.3 Laboratory Compaction Trial Tests..... | 25 |
| 4.3.1 Impact Compaction Methods | 25 |
| 4.3.2 Vibratory hammer compaction method | 31 |

| | | |
|-------|--|----|
| 5 | field compaction trials..... | 35 |
| 5.1 | Introduction | 35 |
| 5.2 | Case study location..... | 35 |
| 5.3 | Specification of Compacting Roller | 37 |
| 5.4 | Field Test Procedure..... | 38 |
| 5.5 | Test Results | 42 |
| 5.6 | Observations | 46 |
| 6 | The effect of higher moisture content on gradation change of dgab..... | 48 |
| 6.1 | Test Results | 49 |
| 7 | Summary and analsis of experimental results | 55 |
| 7.1 | Specification Requirements..... | 55 |
| 7.2 | Data Analysis of Laboratory Compaction Trail Tests..... | 56 |
| 7.3 | Data Analysis of Field Compaction Trail Tests | 59 |
| 7.3.1 | Density Increment with Number of Roller Coverages..... | 59 |
| 7.3.2 | Log (No. of Roller Coverages) Vs dry Density | 63 |
| 7.3.3 | Dry density- Moisture Content curve for field Compaction | 64 |
| 7.4 | Comparison of Laboratory and Field Compactions | 66 |
| 7.5 | Data Analysis of Sieve Analysis Tests..... | 67 |
| 7.5.1 | Top 100mm Layer..... | 67 |
| 7.5.2 | Bottom 100mm Layer | 68 |
| 7.5.3 | Combine Effect of Gradation..... | 69 |
| 8 | conclusions and recomendations..... | 70 |
| 8.1 | Conclusions | 70 |
| 8.2 | Recommendations | 71 |
| | Refference list | 72 |
| | Appendix A: Questionnaire format..... | 73 |

Appendix B: Roller Operating Data..... 74

LIST OF FIGURES

| | |
|--|----|
| Figure 2-1 Field and Lab compaction curve (Ping, Guiyan, Micheal , & Zenghai, 2003) | 3 |
| Figure 2-2 Typical compaction curves for a dense-graded crushed limestone material | 4 |
| Figure 2-3 Comparison of Specifications for High-Performance Granular Base Courses..... | 5 |
| Figure 2-4 Compaction results for Gravel Dense Graded Aggregates (Prochaska, Drnevich, Kim, & Sommer, 2005)..... | 6 |
| Figure 2-5 Field Compaction Test Results of Fined grained Soils (Horpibulsuk, Sudeepng, Chamket, & Chinkulkijniwat, 2012) | 7 |
| Figure 3-1 Compaction of DGAB under high Moisture Condition | 8 |
| Figure 3-2 Constitution of Questionnaire Survey | 9 |
| Figure 3-3 Control the MC of DGAB at stock pile..... | 10 |
| Figure 3-4 Control the MC of DGAB at Site by Mixing | 11 |
| Figure 3-5 Adding water on DGAB & compacting without mixing | 12 |
| Figure 3-6 Watering on DGAB surface while compacting..... | 13 |
| Figure 3-7 Addition of water at different occasion | 14 |
| Figure 3-8 Assessing MC for compaction | 15 |
| Figure 3-9 assessing the compaction | 16 |
| Figure 4-1 Standard Proctor Mold & Hammer | 18 |
| Figure 4-2 Modified Proctor Mold & Hammer | 19 |
| Figure 4-3 Vibration Table..... | 21 |
| Figure 4-4 Vibration compaction Test Mold | 22 |
| Figure 4-5 Vibratory Hammer | 23 |
| Figure 4-6 Gyrator Compactor..... | 24 |
| Figure 4-7 Impact Compact Test Method; (a) Place material, (b) Compaction, (c) Finish of compaction, (d) Weighting of compacted sample | 26 |
| Figure 4-8 Standard Proctor Compaction Test DD-MC Curve | 27 |
| Figure 4-9 Modified Proctor Compaction DD-OMC Curve..... | 28 |
| Figure 4-10 Standard proctor compaction test method with 56 blows Test DD-MC Curve..... | 29 |

| | |
|--|----|
| Figure 4-11 Modified proctor compaction test method with 25 blows DD-MC Curve | 31 |
| Figure 4-12 Vibrator Compaction Test Procedure; (a) sample preparation, (b) Placing of sample for compaction, (c) compaction of the sample, (d) Measure the sample settlement | 32 |
| Figure 4-13 Vibratory Hammer Compaction MC-DD Curve..... | 33 |
| Figure 4-14 MC Loss during Vibrator Hammer compaction test..... | 34 |
| Figure 5-1 Case Study Location..... | 35 |
| Figure 5-2 Road cross Section of Case Study Location..... | 36 |
| Figure 5-3 Field Trial Strip Plan | 36 |
| Figure 5-4 Single Drum Vibratory Compacting Roller | 37 |
| Figure 5-5 Laying of DGAB using a Mortar Grader | 38 |
| Figure 5-6 Field Compaction Testing Procedure; (a) Field compaction, (b) Sample collection for moisture checking, (c) &(d) Field compaction testing by sand replacement method | 39 |
| Figure 5-7 Laying, Compacting & Testing of Second Test Strip | 41 |
| Figure 5-8 DD Vs No of Roller Coverages at Test Strip 1(MC=2.4)..... | 43 |
| Figure 5-9 DD Vs No of Roller Coverages at Test Strip 2(MC=3.3)..... | 43 |
| Figure 5-10 DD Vs No of Roller Coverages at Test Strip 3(MC=4.0)..... | 44 |
| Figure 5-11 DD Vs No of Roller Coverages at Test Strip 4(MC=5.5)..... | 45 |
| Figure 5-12 DD Vs No of Roller Coverages at Test Strip 5(MC=6.9)..... | 45 |
| Figure 5-13 DD Vs No of Roller Coverages at Test Strip 6(MC=9.3)..... | 46 |
| Figure 5-14 Loss of MC with Compaction | 47 |
| Figure 6-1 Segregation of DGAB Layer during the Compaction | 48 |
| Figure 6-2 Gradation curve of Laid Sample | 50 |
| Figure 6-3 Gradation curve of Sample after 4 no of Roller coverages | 52 |
| Figure 6-4 Gradation curve of Sample after 8 no of Roller coverages | 53 |
| Figure 6-5 Gradation curve of Sample after 12 no of Roller coverages | 54 |
| Figure 7-1 MDDs& OMCs of Laboratory Tests..... | 57 |
| Figure 7-2 Variation of MDD & OMC at laboratory Compaction Tests..... | 58 |
| Figure 7-3 Roller Passes Vs Dry Density | 59 |
| Figure 7-4 Dry Density Increment (kg/m ³) at MC= 2.4..... | 60 |

| | |
|---|----|
| Figure 7-5 Dry Density Increment (kg/m ³) at MC= 3.3 | 60 |
| Figure 7-6 Dry Density Increment (kg/m ³) at MC= 4.0 | 61 |
| Figure 7-7 Dry Density Increment (kg/m ³) at MC= 6.9 | 62 |
| Figure 7-8 Dry Density Increment (kg/m ³) at MC= 9.3 | 62 |
| Figure 7-9 Log (No. of Roller Coverages) Vs dry Density..... | 63 |
| Figure 7-10 DD - MC relationship of the field trials | 64 |
| Figure 7-11 MDD & OMC Variation against No of Roller Coverages..... | 65 |
| Figure 7-12 Comparison of Lab & Field Compaction Curves..... | 66 |
| Figure 7-13 Gradation curves of Top 100mm of the DGAB layer at higher moisture content with roller passes are shown in figure 7.17..... | 67 |
| Figure 7-14 Gradation curves of Bottom 100mm Layer..... | 68 |

LIST OF TABLES

| | |
|---|----|
| Table 4-1 Standard Compaction Test Data | 27 |
| Table 4-2 Standard Proctor Compaction Test Results | 27 |
| Table 4-3 Modified Proctor Compaction Test Data..... | 28 |
| Table 4-4 Modified Proctor Compaction Test Results | 28 |
| Table 4-5 Standard proctor compaction test method with 56 blows Test Data | 29 |
| Table 4-6 Standard proctor compaction test method with 56 blows Test Results | 29 |
| Table 4-7 Modified proctor compaction test method with 25 blows Test Data..... | 30 |
| Table 4-8 Modified proctor compaction test method with 25 blows Test Results | 30 |
| Table 4-9 Vibrating Hammer Compaction Data | 33 |
| Table 4-10 Vibratory Hammer Compaction Method Test Results | 33 |
| Table 5-1 Moisture Levels of Test Strips..... | 37 |
| Table 5-2 Field Compaction Test Data Summary..... | 42 |
| Table 6-1 Sieve Analysis Test at sample locations | 49 |
| Table 6-2 Sieve Analysis Test Results of Laid Sample | 49 |
| Table 6-3 Sieve Analysis Test Results of Sample after 4 no of Roller Coverages | 51 |
| Table 6-4 Sieve Analysis Test Results of Sample after 8 no of Roller Coverages | 52 |
| Table 6-5 Sieve Analysis Test Results of Sample after 12 no of Roller Coverages | 53 |
| Table 7-1 Gradation Limits of DGAB (SSCM Table 1701.5)..... | 55 |
| Table 7-2 MDDs, OMCs, Degree of compaction (DOC) & Compaction Energy of Laboratory Tests (Prochaska & Drnevich, 2005) | 56 |
| Table 7-3 MC Range for Lab tests to provide required compaction | 57 |
| Table 7-4 Dry Density Increment (kg/m ³) at MC= 5.5 | 61 |
| Table 7-5 MDD & OMC Data of Field Compaction | 64 |

LIST OF ABBREVIATIONS

| | |
|--------|---|
| ABC | Aggregate Base Course |
| AASHTO | American Association of State Highway and Transportation Officials |
| ASTM | American Society for Testing and Materials |
| BS | British Standard |
| DGAB | Dense Graded Aggregate Base |
| DD | Dry Density |
| DOC | Degree of compaction |
| ICTAD | Institute for Construction Training and Development |
| LHS | Left Hand Side |
| MDD | Maximum Dry Density |
| MC | Moisture Contents |
| OMC | Optimum Moisture Content |
| RDA | Road Development Authority |
| SSCM | Standard Specification for Construction and Maintenance of Road & Bridges |