

SOILS FROM THREE DIFFERENT QUARRY SITES AS APPLIED TO ROAD
WORKS

BASED ON THE REQUIREMENTS SET BY DPWH

A Research Study presented to Faculty of Civil Engineering
College of Engineering, Architecture and Technology
De La Salle University-Dasmariñas
Dasmariñas City

In partial fulfilment of requirements for the course
Bachelor of Science in Civil Engineering

Submitted by:

Balacuit, Emmanuel

Bermejo, Neil Glenn

Castano, Mark Czar Paulo

Yapinchay, Oscar Robert

CEE 51

Table of Contents

Title Page	ii
Approval Sheet -----	iii
Acknowledgement -----	iv
Abstract -----	iv
Chapter I	
Background of the Study	
1.1. Introduction -----	1
1.2. Statement of the Problem -----	2
1.3. Significance of the Study -----	2
1.4. Scope and Delimitation -----	3
1.5. Objective -----	3
1.6. Theoretical Framework-----	4
1.7. Definition of Terms-----	6
Chapter II	
Review of Related Literature	
2.1. Embankment -----	8
2.2. Sub-grade Materials -----	8
2.3. Road Works -----	10
2.4. California Bearing Ratio (CBR) -----	10
2.5. Atterberg Limits -----	11
2.6. Compaction -----	12
2.7. Soil Classification -----	13
Chapter III	
Methods of Research and Procedures	
3.1. Data Gathering and Investigation -----	15
3.2. Data Analysis-----	16
Chapter IV	
Data Presentation, Analysis and Interpretation -----	17
Chapter V	
5.1. Summary of Findings-----	29
5.2. Conclusion -----	30
5.3. Recommendation -----	31
Bibliography -----	32
Appendix A: Tables of Results	
Appendix B: Procedures	
Appendix C: Site Locations	

List of Tables

Table 4.1-1 Sieve Analysis from Brgy Sahod Ulan Tanza, Cavite----	17
Table 4.1-2 Sieve Analysis from Brgy San Jose, GMA Cavite-----	18
Table 4.1-3 Sieve Analysis from Ayala West Grove Silang, Cavite--	19
Table 4.2-1 Properties of soil sample from Ayala West Grove Silang -----	20
Table 4.2-2 Properties of soil sample from Brgy Sahud Ulan Tanza Cavite -----	21
Table 4.2-3 Properties of soil sample from Brgy San Jose Gma Cavite -----	22
Table 5.2-1 Soil Sample Results -----	22

List of Figures‘

Figure 4-1 Combines Moisture Content and Dry Density Relationship -----	23
Figure 4-2 Liquid Limit Test of Ayala West Grove Soil Sample-----	24
Figure 4-3 Liquid Limit Test of Brgy San Jose GMA CaviteSoil Sample-----	25
Figure 4-4 CBR of Ayala West Grove Silang Cavite Soil Sample---	26
Figure 4-5 CBR of Barangay San Jose Cavite Soil Sample-----	27
Figure 4-6 CBR of Barangay Sahod Ulan Tanza, Cavite-----	28



Abstract

This comparative research aims to determine the suitable soil for backfill material used in road works. The research aims to show criteria for sub-grade materials, if the said soil samples, gathered from the different quarry sites, measures up to the criteria set for the roadwork, and to provide a suitable source of subgrades for road works.

This research covers the study of the compliance of each soil samples taken from three different quarry locations to the requirements set for roads. Three soil samples were taken from three locations: Brgy. San Jose GMA, Cavite; Ayala West Grove Silang, Cavite; and Brgy. Sahud Ulan Tanza, Cavite. Sieve analysis (ASTM D 422), Atterberg limit (ASTM D 4318), Moisture density relations of soil using modified effort (ASTM 1556), California bearing of laboratory compacted soils (AASHTO T-193), Soil classification (ASTM D 4387) were the reported tests on backfill material.

Findings of the research show that a soil with high value of plasticity index is clayey which is prone to liquefaction. In conclusion, the soil from Brgy. Sahud Ulan Tanza, Cavite, which is sited at $14^{\circ} 20' 36.55''$ N $120^{\circ} 49' 45.59''$ E, is most suitable among the three sources for backfill material not only because of its plasticity index, but also because it has a high value of bearing capacity.