

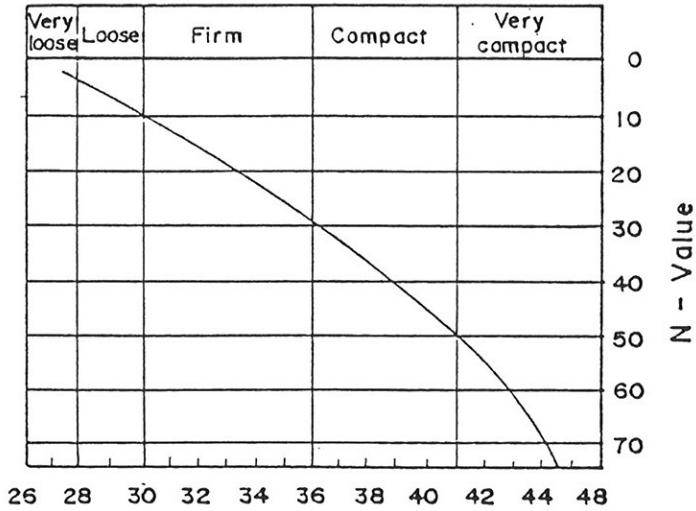
COEFFICIENT OF CONSOLIDATION  
 $\text{Log. } C_v \text{ (cm}^2/\text{Day)}$

FIG. 3-3-2  $\text{Log } C_v - \text{log } P$  DESIGN CURVE

1,000  
700  
500  
400  
300  
200  
100  
70  
50  
30

0.07 0.1 0.2 0.3 0.4 0.5 0.7 1.0 2.0 3.0 4.0 5.0 7.0 10 20

CONSOLIDATION PRESSURE  $\text{log } P \text{ (Kg / cm}^2\text{)}$



INTERNAL FRICTION ANGLE  
( DEGREE )

Figure 3-3-3a  
Relative Chart for N-Value  
and Internal Friction Angle

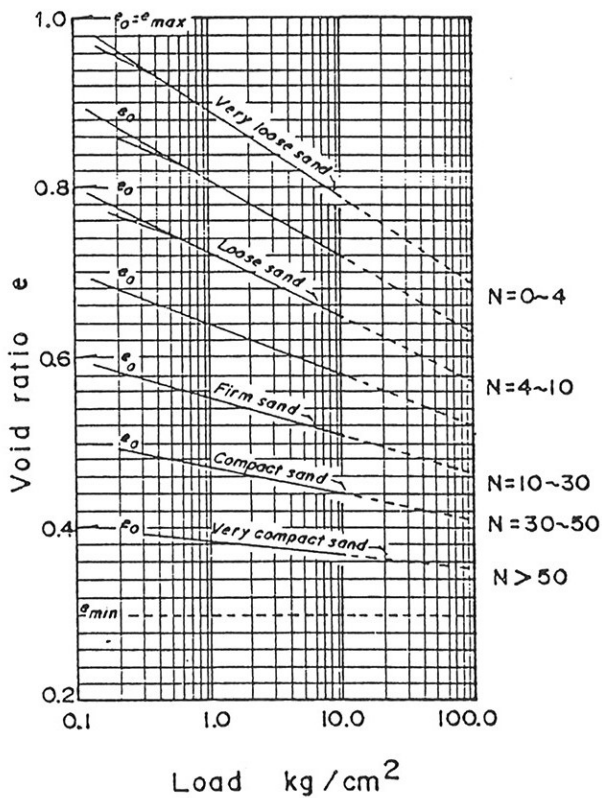


Figure 3-3-3b  
Relative Chart for Load and  
Void Ratio of Sandy Soil

Figure 3-3-3

THE DETAILED DESIGN STUDY OF RAILWAY  
ELECTRIFICATION AND DOUBLE-DOUBLE  
TRACKING OF THE JAVA MAIN LINE PROJECT

RELATIVE CHART FOR N-VALUE AND  
INTERNAL FRICTION ANGLE ( $\phi$ ),  
AND VOID RATIO ( $e$ )

## 4 Materials Investigation

### 4.1 General

This chapter compiles the results of the investigations into the embankment materials, coarse and fine aggregate materials required for the construction of the detailed design study of railway electrification and double-double tracking of the Java Main Line. The materials were sampled and tested by local consulting firms.

Embankment materials were analysed for laterite (red and reddish brown clay) that prevails in the Cikampek area of the eastern band of the project area, up to a maximum of 55 km from Bekasi.

Coarse aggregate consisting of andesite, tuffbrecca, diorite's crushed stone and river gravels were sampled from the vicinity of Cikampek, Gg. Sembung, Gg. Patafaan, Gg. Kecapi, Gg. Lengis up to a maximum of 76 km from Bekasi.

Fine aggregate were tested for samples taken from the Jarong river and Tarum rivers within 65km from Bekasi.

These locations are shown in Fig 4.1.1 ~ Fig.4.1.5 and the material survey summary is shown Tables 4.1.1

Table 4.1.1 Summary of Laboratory Tests

| Item                                       | Unit | Quantity |
|--|------|----------|
| 1) Laboratory Testing for Borrow Sources   |      |          |
| - Natural Water Content.                   | test | 32       |
| - Specific Gravity                         | test | 32       |
| - Grain Size Analysis                      | test | 32       |
| - Atterberg Limit.                         | test | 32       |
| - Compaction Test.                         | test | 16       |
| - California Bearing Test.                 | test | 16       |
| - Unconfined Compression Test              | test | 16       |
| - UU Triaxial Compression Test.            | test | 16       |
| 2) Laboratory Testing for Aggregate Source |      |          |
| - Apparent Specific Gravity                | test | 10       |
| - Absorption                               | test | 10       |
| - Abrasion ratio.                          | test | 5        |
| - Soundness.                               | test | 10       |



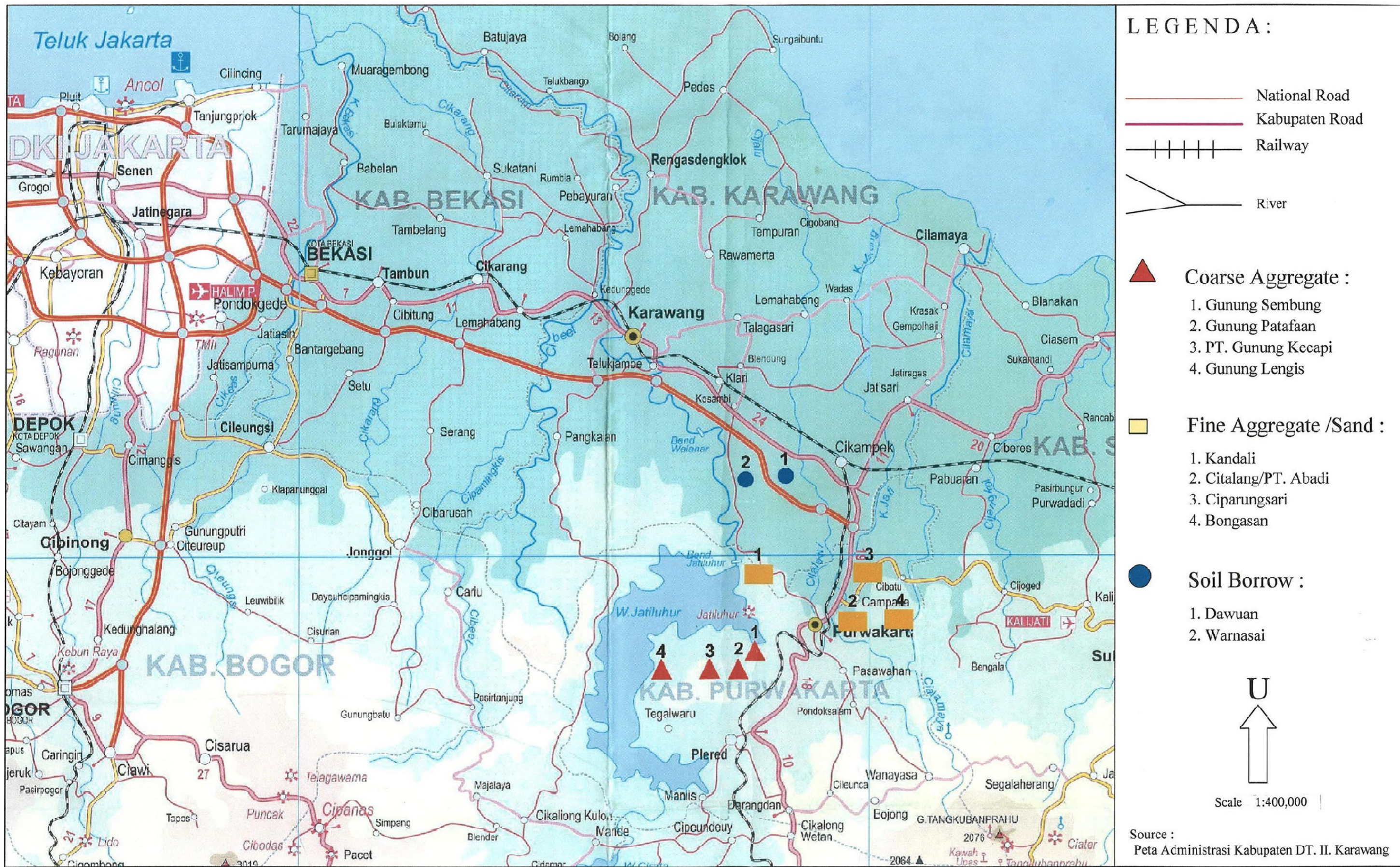


FIGURE 4-1-1

THE DETAILED DESIGN STUDY OF RAILWAY ELECTRIFICATION AND DOUBLE-DOUBLE TRACKING OF THE JAVA MAIN LINE PROJECT

KEY MAP OF LOCATION FOR MATERIAL SOURCES