

Table 1. Results of the Road Inventory (1/2)

| SURVEY POINT | NAME OF ROAD                             | WIDTH (M) | NO. OF LANE | DIVIDED ROAD OR NOT | PEDESTRIAN PLATFORM | AUTHORISED PARKING SPACE | AVERAGE VELOCITY (KM/H) | COMMENTS      |
|--------------|--|-----------|-------------|---------------------|---------------------|--------------------------|-------------------------|---------------|
| 1            | Galle Face Road                          | 20.0      | 4           | •                   | •                   |                          | 40                      |               |
| 2            | Baladaksha Mawatha                       | 13.6      | 2           | •                   | •                   |                          | 30                      |               |
| 3            | -do-                                     | 8.2       | 2           | •                   | •                   |                          | 30                      |               |
| 4            | Sir H. Marikar Mawatha                   | 8.2       | 2           | •                   | •                   |                          | 30                      |               |
| 5            | Kollupitiya Road                         | 16.0      | 4           | •                   | •                   |                          | 40                      |               |
| 6            | Bambalapitiya Road                       | 20.0      | 4           | •                   | •                   | •                        | 40                      |               |
| 7            | Dickman's Road                           | 7.3       | 2           | •                   | •                   |                          | 30                      |               |
| 8            | Havelock Road                            | 12.5      | 2           | •                   | •                   |                          | 40                      |               |
| 9            | T'gasyaya Road                           | 12.5      | 2           | •                   | •                   |                          | 40                      |               |
| 10           | -do-                                     | 6.6       | 2           | •                   | •                   |                          | 30                      |               |
| 11           | Kirula Road                              | 7.2       | 2           | •                   | •                   |                          | 30                      |               |
| 12           | Narahenpita Road                         | 6.85      | 2           | •                   | •                   |                          | 30                      | Pavement bad  |
| 13           | Elvittigala Mawatha                      | 7.1       | 2           | •                   | •                   |                          | 40                      |               |
| 14           | -do-                                     | 9.2       | 2           | •                   | •                   |                          | 30                      | Heavy traffic |
| 15           | -do-                                     | 9.8       | 2           | •                   | •                   |                          | 30                      |               |
| 16           | Baudhaloka Mawatha                       | 12.4      | 2           | •                   | •                   |                          | 40                      |               |
| 17           | -do-                                     | 14.5      | 2           | •                   | •                   |                          | 40                      |               |
| 18           | -do-                                     | 11.6      | 2           | •                   | •                   |                          | 30                      |               |
| 19           | -do-                                     | 11.8      | 2           | •                   | •                   | •                        | 30                      | Heavy traffic |
| 20           | Sir DB Jayatilaka M'tha                  | 15.0      | 3           | •                   | •                   | •                        | 30                      | One way       |
| 21           | Leyden Bastian Road                      | 10.8      | 2           | •                   | •                   | •                        | 30                      | One way       |
| 22           | Main Street                              | 21.8      | 4           | •                   | •                   | •                        | 30                      | Heavy traffic |
| 23           | -do-                                     | 9.0       | 2           | •                   | •                   |                          | 30                      | Many lorries  |
| 24           | H.M. Abdul Cader Road                    | 11.7      | 2           | •                   | •                   |                          | 40                      | Many lorries  |
| 25           | St. Anthony (Kochikade Rd.)              | 22.0      | 4           | •                   | •                   |                          | 35                      |               |
| 26           | Srimath Ramanathan M'tha                 | 7.6       | 2           | •                   | •                   |                          | 40                      |               |
| 27           | -do-                                     | 10.0      | 2           | •                   | •                   |                          | 40                      |               |
| 28           | Aluthmawatte Road                        | 7.3       | 1.5         | •                   | •                   |                          | 20                      |               |
| 29           | -do-                                     | 7.2       | 1.5         | •                   | •                   |                          | 20                      |               |
| 30           | Madampitiya Road                         | 5.5       | 1.5         | •                   | •                   |                          | 20                      | Housing area  |
| 31           | K. Cyril C. Perera M'tha                 | 7.5       | 1.5         | •                   | •                   |                          | 20                      |               |
| 32           | -do-                                     | 8.2       | 2           | •                   | •                   |                          | 30                      | Housing area  |
| 33           | -do-                                     | 9.1       | 2           | •                   | •                   |                          | 30                      |               |
| 34           | -do-                                     | 6.8       | 1.5         | •                   | •                   | •                        | 30                      | Lorries       |
| 35           | George R. De Silva M'tha                 | 20.0      | 4           | •                   | •                   |                          | 30                      | Heavy traffic |
| 36           | Horton Place                             | 7.2       | 1.5         | •                   | •                   |                          | 30                      | Resid. area   |
| 37           | -do-                                     | 11.3      | 2           | •                   | •                   |                          | 40                      |               |
| 38           | D.S. Senanayake M'tha                    | 8.2       | 2           | •                   | •                   |                          | 25                      | Heavy traffic |
| 39           | Independence Square                      | 10.6      | 2           | •                   | •                   |                          | 30                      | One way       |
| 40           | Avenue                                   | 12.8      | 2           | •                   | •                   |                          | 40                      | Good way      |
| 41           | Albert Crescent                          | 20.0      | 4           | •                   | •                   |                          | 40                      | Good way      |
| 42           | A. Coomaraswamy M'tha                    | 20.0      | 4           | •                   | •                   |                          | 40                      | Good way      |
| 43           | -do-                                     | 12.0      | 2           | •                   | •                   |                          | 40                      |               |
| 44           | -do-                                     | 8.8       | 2           | •                   | •                   | •                        | 40                      |               |
| 45           | -do-                                     | 15.0      | 4           | •                   | •                   |                          | 30                      |               |
| 46           | Hulftsdorf Street                        | 5.4       | 1           | •                   | •                   | •                        | 35                      | Congested     |
| 47           | -do-                                     | 10.0      | 1           | •                   | •                   |                          | 20                      | Oneway        |
| 48           | Hussainia Street                         | 4.8       | 1           | •                   | •                   |                          | 20                      | One way       |
| 49           | Haha Vidyalaya M'tha                     | 11.8      | 2           | •                   | •                   |                          | 20                      | One way       |
| 50           | Jethawana Road                           | 22.0      | 4           | •                   | •                   | •                        | 30                      |               |
| 51           | St. Joseph's Street                      | 9.9       | 2           | •                   | •                   | •                        | 40                      | Business area |
| 52           | Layard's Broadway                        | 9.1       | 2           | •                   | •                   | •                        | 50                      | Lorries       |
| 53           | Sri Sumanatissa M'tha                    | 22.0      | 4           | •                   | •                   | •                        | 25                      |               |
| 54           | Maradana Road                            | 9.4       | 2           | •                   | •                   | •                        | 40                      | Business area |
| 55           | Madampitiya Road                         | 5.2       | 2           | •                   | •                   |                          | 20                      | One way       |
| 56           | -do-                                     | 12.4      | 2           | •                   | •                   |                          | 30                      | Bus service   |
| 57           | Prince of Wales Ave. (near Victoria Br.) | 11.6      | 2           | •                   | •                   |                          | 30                      |               |

Table 2. Results of the Road Inventory (2/2)

| SURVEY POINT | NAME OF ROAD                               | WIDTH (M) | NUMBER OF LANES | DIVIDED ROAD OR NOT | PEDESTRIAN PLATFORM | AUTHORIZED PARKING | AVERAGE VELOCITY (KM/H) | COMMENTS        |
|--------------|--|-----------|-----------------|---------------------|---------------------|--------------------|-------------------------|-----------------|
| 58           | Victoria Bridge                            | 7.6       | 1,5             | -                   | -                   | -                  | 30                      | Victoria Bridge |
| 59           | Pellyagoda                                 | 11.0      | 2               | -                   | -                   | -                  | 40                      |                 |
| 60           | New Bridge                                 | 18.0      | 4               | ●                   | ●                   | -                  | 40                      | New Bridge      |
| 61           |  | 20.0      | 4               | ●                   | ●                   | -                  | 40                      |                 |
| 62           | Prince of Wales Ave.                       | 10.2      | 2               | -                   | -                   | ●                  | 35                      | Lorries         |
| 63           | -do-                                       | 12.0      | 2               | ●                   | ●                   | -                  | 35                      |                 |
| 64           | Dr. Danister de Silva (Baseline Road)      | 18.0      | 4               | ●                   | -                   | -                  | 40                      |                 |
| 65           | Stace Road                                 | 6.3       | 2               | -                   | -                   | -                  | 20                      | Roadside bad    |
| 66           | Avissawella Road                           | 6.6       | 2               | -                   | -                   | -                  | -                       | -do-            |
| 67           | Dr. Danister de Silva M'tha (Baseline Rd.) | 24.0      | 2               | -                   | -                   | -                  | 40                      |                 |
| 68           | -do-                                       | 8.0       | 2               | -                   | -                   | -                  | 30                      | Heavy traffic   |
| 69           | -do-                                       | 9.7       | 2               | -                   | -                   | -                  | 30                      |                 |
| 70           | -do-                                       | 6.4       | 2               | -                   | -                   | ●                  | 30                      | Heavy traffic   |
| 71           | -do-                                       | 6.4       | 2               | -                   | -                   | ●                  | 30                      |                 |
| 72           | H.M. Ishak li'tha (Dematagoda Rd.)         | 8.6       | 2               | -                   | -                   | -                  | 30                      |                 |
| 73           | -do-                                       | 5.4       | 2               | -                   | -                   | -                  | 20                      |                 |
| 74           | Varadana Rd.                               | 18.5      | 2               | -                   | -                   | ●                  | 30                      |                 |
| 75           | York Street                                | 27.2      | 3               | -                   | -                   | ●                  | 20                      | One way         |
| 76           | Chatham Street                             | 23.0      | 3               | -                   | -                   | ●                  | 20                      | One way         |
| 77           | Lotus Road                                 | 17.0      | 2               | -                   | -                   | ●                  | 30                      | One way         |
| 78           | -do-                                       | 16.6      | 4               | -                   | -                   | ●                  | 30                      |                 |
| 79           | Sir B. Jayatilaka M'tha                    | 25.3      | 3               | -                   | -                   | ●                  | 30                      | One way         |
| 80           | York Street                                | 17.3      | 2               | -                   | -                   | ●                  | 30                      | One way         |
| 81           | Olcott Mawatha                             | 22.6      | 4               | -                   | -                   | ●                  | 30                      | Buses           |
| 82           |  | 20.0      | 4               | ●                   | ●                   | -                  | 35                      |                 |
| 83           | D.R. Nijewardhana M'tha                    | 18.2      | 4               | -                   | -                   | ●                  | 40                      |                 |
| 84           | Kumaran Ratnam Road                        | 14.0      | 4               | -                   | -                   | ●                  | 35                      |                 |
| 85           | C. Gardiner M'tha                          | 16.7      | 4               | -                   | -                   | ●                  | 35                      |                 |
| 86           | Ward Place                                 | 11.8      | 4               | ●                   | ●                   | -                  | 40                      |                 |
| 87           | E.W. Perera M'tha                          | 6.7       | 2               | -                   | -                   | ●                  | 30                      | One way         |
| 88           | -do-                                       | 10.8      | 2               | -                   | -                   | -                  | 30                      | Hospital        |
| 89           | A. Rajakaruna M'tha                        | 6.7       | 2               | -                   | -                   | -                  | 20                      |                 |
| 90           | Dr. Danister de S.M'tha                    | 12.2      | 2               | -                   | -                   | -                  | 30                      |                 |
| 91           | -do-                                       | 8.5       | 2               | -                   | -                   | -                  | 20                      |                 |
| 92           | D.S. Senanayake M'tha                      | 9.4       | 2               | -                   | -                   | -                  | 25                      | Pedestrian      |
| 93           | Castle Street                              | 9.4       | 2               | -                   | -                   | -                  | 20                      |                 |
| 94           | Union Place                                | 13.4      | 2               | ●                   | -                   | ●                  | 30                      |                 |
| 95           | -do-                                       | 13.0      | 2               | -                   | -                   | ●                  | 30                      |                 |
| 96           | Sir James Peiris M'tha                     | 11.8      | 2               | -                   | -                   | ●                  | 40                      |                 |
| 97           | Muttiah Road                               | 10.5      | 2               | -                   | -                   | ●                  | 40                      |                 |
| 98           | Sir H. Fernando M'tha                      | 11.0      | 2               | ●                   | ●                   | -                  | 40                      |                 |
| 99           | Reid Avenue                                | 14.4      | 2               | -                   | -                   | ●                  | 40                      |                 |
| 100          | Havelock Road                              | 11.3      | 2               | -                   | -                   | ●                  | 40                      |                 |
| 101          | Maya Avenue                                | 10.6      | 2               | -                   | -                   | ●                  | 40                      |                 |
| 102          | Havelock Road                              | 5.9       | 2               | -                   | -                   | -                  | 30                      |                 |
| 103          | W.A. Silva M'tha                           | 6.4       | 2               | -                   | -                   | -                  | 20                      |                 |
| 104          | Pamankade Road                             | 6.4       | 2               | -                   | -                   | -                  | 20                      |                 |
| 105          | Mugegoda Road                              | 12.7      | 4               | -                   | -                   | -                  | 30                      | Heavy traffic   |
| 106          | Kirulapone Ave.                            | 8.4       | 2               | -                   | -                   | -                  | 30                      | House           |
| 107          | -do-                                       | 8.4       | 2               | -                   | -                   | -                  | 30                      | House           |
| 108          | Poltengoda Road                            | 15.0      | 4               | ●                   | ●                   | -                  | 40                      |                 |
| 109          | Oceans Road                                | 8.8       | 2               | -                   | -                   | ●                  | 30                      |                 |
| 110          | Messenger Street                           | 7.9       | 2               | -                   | -                   | ●                  | 30                      |                 |
| 111          | Olcott Mawatha                             | 18.0      | 4               | ●                   | ●                   | -                  | 35                      | Heavy traffic   |
| 112          | Hihindu Mawatha                            | 8.2       | 2               | -                   | -                   | ●                  | 30                      |                 |

Note : ● : Yes or available  
 - : No or not available A2-2

Table 3. Colombo Port Traffic Trip Distribution by Vehicle Types and Zones - February, 1983

| Zone<br>Type<br>of vehicles | 01   | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 69  | Oth-<br>ers | To-<br>tal | Per-<br>% |
|-----------------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------|------------|-----------|
| Car                         | 426  | 11  | 51  | 28  | 32  | 73  | 01  | 12  | 01  | 25  | 27  | 22  | 38  | 87  | 35  | 08  | 15  | 10  | 337         | 1239       | 14.0      |
| Van                         | 534  | 08  | 39  | 60  | 48  | 78  | 01  | 30  | 10  | 18  | 14  | 26  | 20  | 40  | 12  | 09  | 06  | 13  | 279         | 1245       | 14.0      |
| Middle<br>Lorry             | 186  | 16  | 68  | 31  | 57  | 71  | 02  | 36  | 16  | 11  | 09  | 10  | 07  | 18  | 05  | 12  | 00  | 10  | 249         | 814        | 9.2       |
| Heavy Lorry                 | 528  | 24  | 202 | 82  | 254 | 182 | 16  | 204 | 210 | 83  | 30  | 46  | 18  | 33  | 69  | 35  | 04  | 24  | 1035        | 3079       | 34.7      |
| Container                   | 20   | 01  | 13  | 04  | 21  | 07  | 02  | 13  | 11  | 02  | 00  | 03  | 00  | 01  | 01  | 00  | 00  | 04  | 64          | 167        | 1.9       |
| Taxi                        | 25   | 00  | 05  | 00  | 00  | 00  | 00  | 00  | 00  | 00  | 00  | 00  | 00  | 00  | 00  | 00  | 00  | 00  | 10          | 40         | 0.5       |
| Tricycle                    | 06   | 00  | 04  | 00  | 00  | 02  | 00  | 00  | 00  | 00  | 00  | 00  | 00  | 00  | 00  | 00  | 00  | 00  | 02          | 14         | 0.2       |
| Motor Cycle                 | 520  | 32  | 106 | 96  | 68  | 82  | 05  | 41  | 39  | 34  | 26  | 35  | 24  | 57  | 38  | 11  | 09  | 08  | 830         | 2061       |           |
| All Others                  | 79   | 02  | 14  | 12  | 07  | 07  | 01  | 04  | 08  | 01  | 02  | 01  | 03  | 09  | 00  | 01  | 01  | 03  | 27          | 198        | 2.2       |
| Total                       | 2324 | 94  | 596 | 313 | 487 | 522 | 28  | 340 | 295 | 164 | 108 | 143 | 110 | 245 | 155 | 76  | 35  | 62  | 2833        | 8857       | 100.00    |
| Percentage                  | 26.2 | 1.0 | 6.7 | 3.5 | 5.5 | 5.9 | 0.3 | 3.8 | 3.3 | 1.9 | 1.2 | 1.6 | 1.2 | 2.8 | 1.8 | 0.9 | 0.4 | 0.7 | 32.0        | 100        |           |
| Heavy Vehi...               | 734  | 41  | 283 | 117 | 332 | 260 | 20  | 253 | 237 | 96  | 39  | 59  | 25  | 52  | 70  | 47  | 04  | 38  | 1348        | 4060       | 45.6      |
| Goods Vehi...               | 1268 | 49  | 322 | 177 | 380 | 358 | 21  | 283 | 247 | 104 | 53  | 85  | 45  | 92  | 82  | 56  | 10  | 41  | 1627        | 5305       | 59.9      |
| Passenger<br>Vehicles       | 977  | 43  | 166 | 124 | 100 | 157 | 06  | 53  | 40  | 59  | 53  | 57  | 62  | 144 | 73  | 19  | 24  | 18  | 1179        | 3354       | 37.9      |

Table 4. Colombo Port Traffic Trip Distribution by Gates and Zones - February, 1983

| Zone       | 01   | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 69  | Other | Total | Per-<br>cent |
|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|--------------|
| 1.9        | 44   | 02  | 11  | 05  | 09  | 10  | 00  | 07  | 06  | 03  | 02  | 03  | 02  | 05  | 03  | 01  | 00  | 00  | 54    | 168   | 34.2         |
| 32.3       | 751  | 30  | 193 | 101 | 157 | 169 | 09  | 110 | 95  | 53  | 35  | 46  | 36  | 79  | 50  | 25  | 11  | 20  | 915   | 2861  | 39.6         |
| 4.1        | 95   | 04  | 24  | 13  | 20  | 21  | 01  | 14  | 12  | 07  | 04  | 06  | 05  | 10  | 06  | 03  | 01  | 03  | 116   | 363   | 26.2         |
| 35.5       | 825  | 33  | 212 | 111 | 173 | 185 | 10  | 121 | 105 | 58  | 38  | 51  | 39  | 87  | 55  | 27  | 12  | 22  | 1005  | 3144  | 73.8         |
| 8.9        | 137  | 06  | 35  | 19  | 29  | 31  | 02  | 20  | 17  | 10  | 06  | 08  | 07  | 15  | 09  | 05  | 02  | 04  | 167   | 523   | 26.2         |
| 12.8       | 298  | 12  | 76  | 39  | 62  | 67  | 04  | 44  | 38  | 21  | 14  | 18  | 14  | 31  | 20  | 10  | 05  | 08  | 363   | 1134  |              |
| 7.5        | 174  | 07  | 45  | 23  | 37  | 39  | 02  | 26  | 22  | 12  | 08  | 18  | 08  | 18  | 12  | 06  | 03  | 05  | 213   | 664   |              |
| 100 Total  | 2324 | 94  | 596 | 313 | 487 | 522 | 28  | 340 | 295 | 164 | 108 | 143 | 110 | 245 | 155 | 76  | 35  | 62  | 2883  | 8857  |              |
| Percentage | 26.2 | 1.1 | 6.7 | 3.5 | 5.5 | 5.9 | 0.3 | 3.8 | 3.3 | 1.9 | 1.2 | 1.6 | 1.2 | 2.8 | 1.8 | 0.9 | 0.4 | 0.7 | 32.0  | 100   |              |

Table 5. Results of Projection of Population and Number of Workers by Traffic Zone for the Year 1990 (1/2)

Unit: 10<sup>3</sup> persons

| No. of Traffic Zone | Population | No. of Workers by Industrial Sector |           |          |
|---------------------|------------|-------------------------------------|-----------|----------|
|                     |            | Primary                             | Secondary | Tertiary |
| 1                   | 17.0       | 0.5                                 | 17.1      | 181.1    |
| 2                   | 69.7       | -                                   | 7.5       | 25.6     |
| 3                   | 65.1       | -                                   | 2.0       | 51.4     |
| 4                   | 19.6       | 0.2                                 | 8.7       | 43.8     |
| 5                   | 55.4       | 0.9                                 | 10.9      | 20.7     |
| 6                   | 35.2       | -                                   | 2.8       | 6.6      |
| 7                   | 16.6       | -                                   | 2.3       | 4.4      |
| 8                   | 37.7       | -                                   | 3.2       | 13.9     |
| 9                   | 73.6       | -                                   | 6.8       | 18.7     |
| 10                  | 27.8       | -                                   | 4.0       | 7.6      |
| 11                  | 22.2       | 0.2                                 | 0.2       | 20.4     |
| 12                  | 15.1       | -                                   | 4.8       | 42.3     |
| 13                  | 13.0       | -                                   | 1.6       | 39.9     |
| 14                  | 32.7       | 0.1                                 | 1.4       | 8.3      |
| 15                  | 55.0       | -                                   | 8.0       | 10.9     |
| 16                  | 36.6       | -                                   | 1.4       | 10.2     |
| 17                  | 51.3       | -                                   | 4.6       | 6.6      |
| 18                  | 190.6      | 0.6                                 | 12.0      | 41.6     |
| 19                  | 162.1      | 0.6                                 | 8.1       | 35.8     |
| 20                  | 45.0       | 0.1                                 | 1.0       | 2.0      |
| 21                  | 53.0       | 0.2                                 | 1.2       | 2.2      |
| 22                  | 110.6      | 0.4                                 | 7.9       | 4.7      |
| 23                  | 23.0       | 0.3                                 | 0.6       | 1.5      |
| 24                  | 64.6       | 0.4                                 | 1.0       | 6.5      |
| 25                  | 119.1      | 0.7                                 | 4.2       | 14.4     |
| 26                  | 158.3      | 0.9                                 | 5.6       | 13.9     |
| 27                  | 71.1       | 0.8                                 | 8.2       | 1.8      |
| 28                  | 182.1      | 5.5                                 | 8.4       | 14.6     |
| 29                  | 30.7       | 0.1                                 | 4.7       | 3.2      |
| 30                  | 40.9       | 0.1                                 | 7.5       | 2.0      |
| 31                  | 51.1       | 0.2                                 | 3.0       | 2.7      |
| 32                  | 21.9       | 0.1                                 | 1.5       | 1.2      |
| 33                  | 42.3       | 0.3                                 | 5.1       | 2.9      |
| 34                  | 33.1       | 1.5                                 | 3.2       | 17.5     |

Table 6. Results of Projection of Population and Number of Workers by Traffic Zone for the Year 1990 (2/2)

Unit: 10<sup>3</sup> persons

| No. of Traffic Zone | Population | No. of Workers by Industrial Sector |           |          |
|---------------------|------------|-------------------------------------|-----------|----------|
|                     |            | Primary                             | Secondary | Tertiary |
| 35                  | 39.6       | 0.4                                 | 2.1       | 3.7      |
| 36                  | 44.5       | 0.5                                 | 1.0       | 4.0      |
| 37                  | 24.7       | 0.2                                 | 1.2       | 2.9      |
| 38                  | 27.2       | 0.1                                 | 2.4       | 8.0      |
| 39                  | 34.7       | 0.5                                 | 21.7      | 6.9      |
| 40                  | 44.5       | 0.3                                 | 68.0      | 10.0     |
| 41                  | 120.1      | 4.0                                 | 7.4       | 7.2      |
| 42                  | 21.9       | 1.3                                 | 1.4       | 2.9      |
| 43                  | 75.2       | 1.2                                 | 9.9       | 13.9     |
| 44                  | 29.4       | 1.1                                 | 11.9      | 2.9      |
| 45                  | 125.2      | 5.6                                 | 26.3      | 5.6      |
| 46                  | 123.1      | 7.5                                 | 11.9      | 2.9      |
| 47                  | 115.3      | 7.8                                 | 8.9       | 4.4      |
| 48                  | 112.4      | 8.1                                 | 1.0       | 6.6      |
| 49                  | 112.6      | 8.6                                 | 3.4       | 0.7      |
| 50                  | 138.6      | 9.0                                 | 0.4       | 2.2      |
| 51                  | 107.2      | 8.4                                 | 0.6       | 14.9     |
| 52                  | 107.8      | 8.5                                 | 0.2       | 0.7      |
| 53                  | 98.9       | 8.2                                 | 1.6       | 5.1      |
| 54                  | 280.6      | 12.7                                | 8.7       | 7.3      |
| 55                  | 123.6      | 6.8                                 | 1.6       | 5.1      |
| 56                  | 273.2      | 37.4                                | 2.6       | 2.9      |
| 57                  | 248.6      | 39.1                                | 2.4       | 7.3      |
| 58                  | 2,152.9    | 309.4                               | 193.8     | 216.8    |
| 59                  | 918.8      | 220.6                               | 52.6      | 65.9     |
| 60                  | 753.0      | 145.8                               | 66.5      | 75.4     |
| 61                  | 1,411.5    | 288.9                               | 85.8      | 109.3    |
| 62                  | 525.4      | 75.8                                | 63.7      | 50.9     |
| 63                  | 1,551.8    | 428.5                               | 116.3     | 209.2    |
| 64                  | 1,175.6    | 460.2                               | 38.8      | 90.4     |
| 65                  | 927.1      | 123.2                               | 30.5      | 47.1     |
| 66                  | 1,231.5    | 237.1                               | 73.7      | 88.7     |
| 67                  | 2,312.4    | 353.5                               | 124.3     | 172.3    |

Table 7. Results of Projection of Population and Number of Workers by Traffic Zone for the Year 2000 (1/2)

Unit: 10<sup>3</sup> persons

| No. of Traffic Zone | Population | No. of Workers by Industrial Sector |           |          |
|---------------------|------------|-------------------------------------|-----------|----------|
|                     |            | Primary                             | Secondary | Tertiary |
| 1                   | 17.0       | 0.4                                 | 17.5      | 238.3    |
| 2                   | 70.3       | -                                   | 10.0      | 33.6     |
| 3                   | 45.7       | -                                   | 4.9       | 67.8     |
| 4                   | 19.7       | 0.2                                 | 11.7      | 57.7     |
| 5                   | 55.5       | 0.8                                 | 16.2      | 27.4     |
| 6                   | 35.2       | -                                   | 4.1       | 8.5      |
| 7                   | 18.4       | -                                   | 4.8       | 6.3      |
| 8                   | 37.8       | -                                   | 4.4       | 18.1     |
| 9                   | 78.5       | -                                   | 9.5       | 24.5     |
| 10                  | 30.6       | -                                   | 5.4       | 10.1     |
| 11                  | 27.9       | 0.2                                 | 0.2       | 26.9     |
| 12                  | 15.2       | -                                   | 6.5       | 55.7     |
| 13                  | 13.1       | -                                   | 2.5       | 52.9     |
| 14                  | 38.5       | 0.1                                 | 2.6       | 11.1     |
| 15                  | 59.5       | -                                   | 10.9      | 14.4     |
| 16                  | 40.4       | -                                   | 2.1       | 13.5     |
| 17                  | 58.5       | -                                   | 6.3       | 8.6      |
| 18                  | 210.6      | 0.6                                 | 15.8      | 54.8     |
| 19                  | 197.5      | 0.6                                 | 10.9      | 47.1     |
| 20                  | 49.7       | 0.1                                 | 1.4       | 2.9      |
| 21                  | 56.6       | 0.2                                 | 1.6       | 2.2      |
| 22                  | 118.1      | 0.4                                 | 8.5       | 6.4      |
| 23                  | 24.2       | 0.3                                 | 1.2       | 1.9      |
| 24                  | 75.0       | 0.5                                 | 1.6       | 8.1      |
| 25                  | 148.8      | 0.8                                 | 8.7       | 18.0     |
| 26                  | 210.7      | 1.0                                 | 7.9       | 18.2     |
| 27                  | 72.7       | 1.0                                 | 12.4      | 2.4      |
| 28                  | 240.0      | 5.7                                 | 12.7      | 19.2     |
| 29                  | 35.6       | 0.1                                 | 6.4       | 5.3      |
| 30                  | 46.0       | 0.2                                 | 9.9       | 2.9      |
| 31                  | 55.3       | 0.2                                 | 4.1       | 3.9      |
| 32                  | 24.2       | 0.1                                 | 1.7       | 2.0      |
| 33                  | 50.6       | 0.3                                 | 6.7       | 3.8      |
| 34                  | 43.6       | 1.6                                 | 4.3       | 23.0     |

Table 8. Results of Projection of Population and Number of Workers by Traffic Zone for the Year 2000 (2/2)

Unit: 10<sup>3</sup> persons

| No. of Traffic Zone | Population | No. of Workers by Industrial Sector |           |          |
|---------------------|------------|-------------------------------------|-----------|----------|
|                     |            | Primary                             | Secondary | Tertiary |
| 35                  | 48.2       | 0.5                                 | 2.4       | 4.8      |
| 36                  | 55.5       | 0.6                                 | 1.4       | 5.5      |
| 37                  | 28.4       | 0.2                                 | 1.8       | 3.8      |
| 38                  | 29.6       | 0.1                                 | 2.7       | 10.6     |
| 39                  | 42.2       | 0.6                                 | 48.7      | 9.6      |
| 40                  | 72.5       | 0.4                                 | 87.6      | 14.0     |
| 41                  | 176.7      | 4.0                                 | 7.8       | 11.0     |
| 42                  | 28.1       | 1.6                                 | 1.8       | 3.8      |
| 43                  | 79.6       | 1.1                                 | 11.4      | 18.3     |
| 44                  | 35.1       | 1.1                                 | 16.0      | 3.8      |
| 45                  | 170.6      | 5.6                                 | 60.5      | 8.0      |
| 46                  | 141.1      | 7.8                                 | 15.9      | 3.8      |
| 47                  | 114.0      | 7.9                                 | 12.0      | 5.8      |
| 48                  | 118.2      | 8.5                                 | 1.4       | 8.6      |
| 49                  | 133.3      | 9.4                                 | 4.6       | 1.0      |
| 50                  | 176.5      | 9.4                                 | 0.6       | 2.9      |
| 51                  | 104.0      | 8.7                                 | 0.7       | 19.8     |
| 52                  | 119.1      | 8.7                                 | 0.3       | 1.0      |
| 53                  | 91.3       | 8.5                                 | 2.1       | 6.7      |
| 54                  | 321.1      | 13.0                                | 12.6      | 9.6      |
| 55                  | 140.6      | 7.3                                 | 2.0       | 6.7      |
| 56                  | 304.4      | 39.4                                | 3.9       | 3.8      |
| 57                  | 282.9      | 41.2                                | 3.5       | 9.6      |
| 58                  | 2,498.5    | 378.9                               | 277.6     | 306.9    |
| 59                  | 1,076.9    | 278.7                               | 75.4      | 93.4     |
| 60                  | 840.1      | 186.4                               | 95.2      | 106.8    |
| 61                  | 1,670.7    | 367.8                               | 122.9     | 154.7    |
| 62                  | 563.3      | 99.6                                | 91.2      | 72.1     |
| 63                  | 1,631.2    | 545.7                               | 166.5     | 296.2    |
| 64                  | 1,187.4    | 584.3                               | 55.6      | 128.1    |
| 65                  | 1,334.4    | 169.0                               | 43.6      | 66.7     |
| 66                  | 1,801.3    | 277.6                               | 88.1      | 127.0    |
| 67                  | 3,235.2    | 438.0                               | 167.9     | 244.1    |



Table 9. Outline of the GCEC Projects/Plans

| Name of Project/Plan               | Summary of Content   | Physical Progress   | No. of Traffic Zone | Evaluation of Attainment  |
|------------------------------------|--|---|---------------------|---|
| 1. Katunayake IPZ (KIPZ)           | Industrial site. Divided into 3 phases -<br>Phase I : 280 acres<br>Phase II : 130 "<br>Phase III : 80 "<br>Promotion of export-oriented light industries.<br>No. of workers : 46,000 | Almost all sites are completed.   | 40                  | 1985, full attainment of target.  |
| 2. Biyagama IPZ (BIPZ)             | Industrial site (450 acres)<br>Promotion of export-oriented heavy industries.<br>No. of workers : 30,000   | Plantation land, reserved for the project sites. Connecting road, under construction.                         | 45                  | Site preparation during 1983-1990. 1995, attainment of target.                                      |
| 3. Third IPZ                       | Industrial site, following KIPZ & BIPZ   | Only proposed. At the stage of site selection (Wellisara or North Ja-Ela).                                    | 35 or 39            | Site preparation during 1988-1995. 2000, attainment of target. Possibly in Zone 39. 18,000 workers. |
| 4. Seeduva - Katunayake Township   | Expatriate housing, worker housing and ancillary facilities. 500 houses in total. (690 acres)  | Ongoing. Some foreign investors have leased the land lots.  | 40                  | Completion in 2000.   |
| 5. Katana Township                 | Worker housing. (228 acres)<br>Housing for 4,000 workers and flats for 12,000 workers.   | Under preparation of land reservation.  | 41                  | Completion in 2000.   |
| 6. Keddolkele Township             | New township south of Negombo City.<br>Divided into two stages:<br>Stage I : 276 acres<br>Stage II : 74 "<br>To cater for 5,000 persons.   | Ongoing, construction of sites.   | 43                  | Completion in 1990.   |
| 7. Sapugaskanda Industrial Cluster | Heavy/Chemical industrial site around the oil refinery.  | Designated by GCEC as special industrial zone. Polluting industries should be located within the demarcation. | 45                  | 3 or 4 new factories in every 5 years.  |
| 8. Pellyagoda Warehousing Project  | As proposed by UDA (261 acres). Provision of housing, industrial and warehousing sites.  | Ongoing.  | 29                  | 1985, site completion. 1990, in full commission.  |

Table 10 Outline of the UDA Projects/Plans (1/2)

| Name of Project/Plan                  | Summary of Content  | Physical Progress   | No. of Traffic Zone | Evaluation of Attainment                             |
|---------------------------------------|---|---|---------------------|--|
| 1. Sri Jayawardhanapura (Kotte)       | New Parliament building on an island (13 acres) in the lake.  | Almost all are finished, except for administrative complexes.                                 | 22                  | -  |
|                                       | Administrative complexes at Pellawatte and Battaramulla.  |   | 24                  | 1985, completion and functions shifted.              |
|                                       | Hospital and ceremonial approach road, and other facilities.  |   | 22                  | -  |
|                                       | Housing scheme at Wickramasinghapura in association with NHDA (705 housing units).  |   | 27                  | 1985, people reside.                                 |
| 2. Echelon Square                     | Redevelopment with the demolition of Army barrack. 2 hotel companies and 2 commercial companies have leased the lots.             | New buildings under construction.   | 1                   | 1985, 2/3 completion. 1990, full completion.         |
| 3. Lotus Centre (Chalmers Granaries)  | Warehouses and other buildings to be demolished. New office building and national square to be established.                       | The function of food stores has already shifted to Orugodavatte.                              | 1                   | 1985, demolition. 1995, new building constructed.    |
| 4. St. John's Market                  | Construction of new fish market along St. John's Street.  | Constructed already.  | 1                   | Client to be shifted very soon.                      |
| 5. Old Town Hall and Edinburgh Market | Preservation as historical buildings, not using for the commercial purpose but for community purpose.                             | The function of the market shifted already.   | 1                   | -  |
| 6. Vegetable market, Kachcheri Road   | Construction of a new multi-storied market place at Kachcheri Road. Phase I and Phase II (extension).                             | Under construction of the market (Phase I). Extension (Phase II) will follow that completion. | 1                   | 1985, Phase I completion. 1995, Phase II completion. |
| 7. Shopping Complex, Ferguson's Road  | Construction of a supermarket utilising the land reserved by UDA.   | Under preparation.  | 5                   | 1985, completion                                     |
| 8. Orugodavatte Food Stores           | Construction of warehousing for the replacement with the functions of Chalmers Granaries. 11 storehouses in the site of 20 acres. | Completed. Power of handling already handed over to the Food Dept.                            | 8                   | -  |

Table 10 Outline of the UDA Projects/Plans (2/2)

| Name of Project/Plan                             | Summary of Content   | Physical Progress   | No. of Traffic Zone    | Evaluation of Attainment   |
|--|--|---|------------------------|--|
| 9. Athurugiriya                                  | Athurugiriya industrial site for heavy industry with Steel Corporation factory as a centre. (Worker housing, 300-400 units)  | Sites have leased to private companies. Factories locating.     | 27                     | Beginning in construction very soon, 2 or 3 new factories in every 5 year. Site completion by 1985. Factories in full operation by 2000. After 2000. |
|  | Pannipitiya industrial site (5 ha, worker housing 700-800 units).  | Site under construction.  | 25                     |  |
|  | Homagama industrial site.  | Only the site area designated.                                  | 28                     |  |
| 10. Ratmalana Industrial Site                    | Site for light/heavy industries near to the Ratmalana Airport (7 ha) Approach road construction.   | 3/4 of land lots have been leased already.                      | 18                     | 1988, factory full completion. 1990, in full commission.   |
| 11. Vanchikavatte Integrated Development Project | Redevelopment of the triangle area in Maradana. Land acquisition by UDA plot by plot. Mainly for commercial and residential purposes. Small-scale industries are to be located.                                  | Gradually progressed.   | 3                      | 1995, completion of redevelopment.   |
| 12. Peliyagaoda Integrated Development Project   | Warehousing, small-scale industrial site and housing development. Site area 261 acres: light industries 89, warehousing 88, low cost housing 21, middle income housing 31, commercial and offices 17 and others. | Reclamation of marsh finished. Under the preparation of sites.  | 29                     | 1985, site completion. 1990, full completion.  |
| 13. Educational, Social and Cultural Complex     | Race course redevelopment. Sugathadasa Stadium expansion. Housing for Tower Hall artists.  | Proposal.   | 11                     | 2000.  |
|  |  | Under implementation.   | 8                      | 1985.  |
|  |  | Proposal.   | 18                     | 1990.  |
| 14. Slum and shanty upgrading programme          | All over Colombo City, in small areas of slum and shanty. Partly depending on foreign aids.  | Under implementation.   | Scattered in CMC Area. | -  |
| 15. Bloemendhal Development Project              | Reclamation of marsh of 250 acres. Housing for 600 shanty families in 12 acres. Site 77 acres: residential 12, commercial 4, industry 13, warehousing 45, public use 3.  | Proposals, Implementation handed over to the Reclamation Board. | 5 and 7                | 2000, completion.  |

Table 11. Outline of Projects Carried out by the NIIDA and Planning by the Town and Country Planning Department

| Agency   | Name of Project                          | Summary of Content   | Physical Progress   | No. of Traffic Zone                        |
|--|--|--|---|--|
| 1. National Housing Development Authority (NHDA) | a. Malligawatte Housing Scheme           | 2,500 housing units to be constructed on reclaimed marsh land. | 1,500 units already completed. 400 units to be constructed in 4 or 5 years. | 9  |
|  | b. Soysapura Flats                       | 1,058 housing units.   | Constructed, already people living.   | 18   |
|  | c. Jayawardene-gama (Wickramasinghapura) | 705 housing units in Kaduwella AGA Division.                   | Completed. Now under advertising.   | 27   |
|  | d. Matthegoda Scheme                     | 1,201 units in Homagama UC Area.                               | Completed. To be advertised soon.   | 28   |
|  | e. Maharagama                            | 501 units.   | Completed.  | 25   |
|  | f. Raddoluva Special Housing Project     | 2,022 units in the south-east of the KIPZ.                     | Completed.  | 41   |
|  | g. Ranpokunawatte Housing Scheme         | 1,610 units in Attanagalla AGA Division.                       | Proposal, not commenced.  | 51   |
|  | h. Model Villages                        | Housing complex construction in rural areas. (40-60 units)     | Ongoing. Colombo (2)<br>Gampaha (5)<br>Kalutara (12)                        | 20, 25<br>39, 46, 49, 50, 51<br>54, 56, 57 |
|  | i. Electoral Houses                      | Housing Development in each Electorate. (10-100 units).        | Ongoing.  | Scattered in various zones.                |
|  | j. Aided Self-help Housing Construction  | Housing construction aided by the public funds.                | Ongoing.  | Scattered in various zones.                |
| 2. Town and Country Planning Department          | a. Ragaza                                | Town planning in the east of railway.                          | Executed by Ragaza TC under the DDC.  | 36   |
|  | b. Gampaha                               | Town planning.   | Proposal.   | 47   |
|  | c. Kiribathogoda                         | Town planning.   | Proposal.   | 31   |
|  | d. Ja-Ela                                | Town planning.   | Proposal.   | 38   |
|  | e. Wattala-Mabole                        | Town planning in association with CCEC.                        | Executed by CCEC.   | 32   |
|  | f. Kelaniya Rajamaha Vihara              | Planning for a new town and the sacred area.                   | Proposal.   | 30   |
|  | g. Kotte Temple                          | Planning for the sacred area.                                  | Proposal.   | 22   |

Table 12. The Results of Interview Survey to Companies Possessing Container Yards and Warehouses

| Name of Company   | Extent of Area (Acres) | Number of Employees | Volume of Traffic |              |             | Vehicles/Day |
|---|------------------------|---------------------|-------------------|--------------|-------------|--------------|
|   |                        |                     | Containers        | Lorries      | Private Car |              |
| 1. Bartleet Freighters Ltd., 100, Negombo Road, Mattala.                  | 1.1                    | 204                 | 17                | 4            | 12          |              |
| 2. C.W. Mackie & Co. Ltd., 129 & 133, Sri Wickrema Mawatha, Colombo 15.   | 1.0                    | 125                 | 10 (Maximum)      | 8            |             |              |
| 3. Aitken Spence Co. Ltd., 170, Sri Wickrema Mawatha, Colombo 15.         | 1.0                    | 100                 | 70                | 10           |             |              |
| 4. McLaren's Container Depot, No. 776, Negombo Road Mattumagala, Welisara | 4.1                    | -                   | 53                | 45           |             |              |
| 5. Cargo Boat Despatch Company Limited, 97/1, Negombo Road, Peliyagoda.   | -                      | 6                   | 4                 | -            |             |              |
| 6. Tainerport (Pte.) Ltd., 97, Negombo Road, Peliyagoda.                  | 1.1                    | 5                   | 15                | -            |             |              |
| 7. East West Enterprises Limited, 346/3, Dutugemunu Mawatha, Peliyagoda.  | 10                     | 140                 | 5                 | 25           | -           |              |
| 8. Ceylon Shipping Lines Limited, 2/6, Avissavella Road, Orugodawatte.    | 5                      | 80                  | 185               | 15           | -           |              |
| 9. Bartleet Stores Limited, 651, Bloemendhal Road, Colombo 13.            | 1                      | 45                  | -                 | 30 (Maximum) |             |              |
| 10. Trico Maritime Co. Ltd., 651, Bloemendhal Road, Colombo 13.           | 1                      | 40                  | 2                 | -            | -           |              |

Table 1.3. Trip Generation and Attraction by Compressed Traffic Zones

Unit : Trip-Ends

| Item<br>Year<br>Zone | Car & Taxi |       | Bus    |      | Van & Medium<br>Lorry |       | Heavy Lorry &<br>Container |       | Motorcycle |       | All Types of Vehicles |       |       |       |       |        |        |
|----------------------|------------|-------|--------|------|-----------------------|-------|----------------------------|-------|------------|-------|-----------------------|-------|-------|-------|-------|--------|--------|
|                      | 1983       | 1990  | 1983   | 1990 | 1983                  | 1990  | 1983                       | 1990  | 1983       | 1990  | 1983                  | 1990  |       |       |       |        |        |
| 1                    | 11881      | 19863 | 41470  | -    | 9213                  | 15933 | 32781                      | 5900  | 10068      | 20792 | 7266                  | 11546 | 22859 | 34260 | 36147 | 113750 |        |
| 2                    | 1283       | 3876  | 8884   | 453  | 899                   | 3168  | 7500                       | 560   | 3010       | 7181  | 707                   | 2105  | 4837  | 3902  | 11391 | 26504  |        |
| 3                    | 2368       | 4121  | 8973   | 1178 | 1456                  | 2580  | 5686                       | 723   | 1325       | 2881  | 1574                  | 2683  | 5777  | 7299  | 9871  | 21194  |        |
| 4                    | 1310       | 2816  | 6054   | 513  | 899                   | 2028  | 4496                       | 394   | 1058       | 2308  | 1008                  | 2091  | 4469  | 4114  | 6641  | 14040  |        |
| 5                    | 461        | 791   | 1739   | 756  | 1460                  | 330   | 571                        | 175   | 245        | 450   | 345                   | 590   | 1283  | 2032  | 2404  | 4891   |        |
| 6                    | 791        | 1378  | 3156   | 263  | 965                   | 658   | 1144                       | 2643  | 274        | 450   | 778                   | 1330  | 3035  | 2764  | 3412  | 7719   |        |
| 7                    | 222        | 422   | 912    | 321  | 595                   | 1217  | 254                        | 500   | 1061       | 966   | 201                   | 377   | 817   | 1237  | 1996  | 4156   |        |
| 8                    | 728        | 1242  | 2778   | 224  | 359                   | 563   | 890                        | 2012  | 263        | 596   | 711                   | 1159  | 2565  | 2434  | 3088  | 6651   |        |
| 9                    | 1023       | 1844  | 4730   | 746  | 1350                  | 2102  | 986                        | 1810  | 4824       | 374   | 687                   | 1940  | 4966  | 4228  | 5691  | 13596  |        |
| 10                   | 2048       | 2593  | 4475   | 465  | 192                   | 201   | 1179                       | 2086  | 352        | 595   | 501                   | 249   | 350   | 4545  | 5472  | 9033   |        |
| 11                   | 1009       | 1799  | 3666   | 622  | 883                   | 1451  | 888                        | 1619  | 3370       | 511   | 912                   | 1950  | 1947  | 3562  | 5213  | 10435  |        |
| 12                   | 452        | 732   | 1935   | 628  | 875                   | 1550  | 296                        | 487   | 1032       | 89    | 152                   | 321   | 516   | 1793  | 2245  | 4439   |        |
| 13                   | 412        | 620   | 1187   | 214  | 262                   | 396   | 333                        | 518   | 1033       | 129   | 212                   | 458   | 425   | 1371  | 1616  | 3074   |        |
| 14                   | 88         | 134   | 262    | 100  | 450                   | 594   | 73                         | 113   | 230        | 52    | 83                    | 173   | 44    | 357   | 781   | 1259   |        |
| 15                   | 87         | 142   | 297    | 88   | 135                   | 270   | 59                         | 211   | 44         | 73    | 66                    | 102   | 102   | 344   | 449   | 938    |        |
| 16                   | 96         | 135   | 274    | 210  | 270                   | 426   | 65                         | 104   | 214        | 55    | 93                    | 196   | 43    | 459   | 604   | 1109   |        |
| 17                   | 352        | 518   | 1173   | 143  | 172                   | 236   | 260                        | 406   | 885        | 148   | 233                   | 790   | 306   | 338   | 742   | 1209   |        |
| 18                   | 278        | 523   | 1065   | 0    | 0                     | 0     | 246                        | 505   | 1046       | 306   | 661                   | 1291  | 327   | 626   | 1182  | 1157   |        |
| 19                   | 759        | 1345  | 2712   | 0    | 8                     | 9     | 478                        | 901   | 1850       | 357   | 677                   | 1370  | 482   | 785   | 1560  | 2076   |        |
| 20                   | 1068       | 1760  | 3655   | 0    | 147                   | 154   | 827                        | 1484  | 3047       | 656   | 1140                  | 2422  | 616   | 982   | 2021  | 3167   |        |
| 21                   | 237        | 418   | 896    | 0    | 0                     | 0     | 214                        | 376   | 794        | 317   | 581                   | 1219  | 135   | 222   | 454   | 903    |        |
| 22                   | 204        | 334   | 712    | 0    | 0                     | 0     | 151                        | 269   | 578        | 229   | 412                   | 953   | 53    | 81    | 176   | 637    |        |
| 23                   | 99         | 149   | 338    | 0    | 0                     | 0     | 50                         | 90    | 211        | 75    | 122                   | 283   | 72    | 21    | 45    | 226    |        |
| 24                   | 646        | 1038  | 2173   | 0    | 154                   | 162   | 570                        | 938   | 2019       | 483   | 835                   | 1917  | 168   | 264   | 556   | 1867   |        |
| 25                   | 446        | 799   | 1688   | 0    | 207                   | 216   | 345                        | 602   | 1348       | 601   | 1033                  | 2356  | 131   | 217   | 478   | 1523   |        |
| 26                   | 182        | 357   | 848    | 24   | 0                     | 0     | 233                        | 453   | 1064       | 525   | 994                   | 2192  | 56    | 103   | 240   | 1020   |        |
| 27                   | 1216       | 1962  | 4377   | 0    | 0                     | 0     | 1967                       | 1707  | 5969       | 3104  | 5259                  | 10385 | 1952  | 2581  | 3714  | 8239   |        |
| Total                | 29726      | 51711 | 110028 | 6948 | 1121                  | 19699 | 23427                      | 41401 | 90521      | 16900 | 31991                 | 67872 | 19724 | 30985 | 66437 | 96725  | 128051 |
|                      |            |       |        |      |                       |       |                            |       |            |       |                       |       |       |       |       |        | 306859 |

Table 14. Railway Passenger Trips – March 1979

Unit : Passengers/Month

| Railway Station | Ordinary Tickets |        | Season Tickets |        |          |        |
|-----------------|------------------|--------|----------------|--------|----------|--------|
|                 | Maradana         | Fort   | Maradana       | Fort   | Maradana | Fort   |
| Maradana        | -                | 11,460 | -              | 16,865 | -        | 1,200  |
| Fort            | 16,865           | -      | 11,460         | -      | 760      | -      |
| Kelaniya        | 10,144           | 3,909  | 18,238         | 6,646  | 26,280   | 43,440 |
| Manawasala      | 3,618            | 5,863  | 3,300          | 4,771  | 10,280   | 15,600 |
| Hunupitiya      | 11,266           | 5,779  | 10,127         | 7,074  | 23,240   | 37,000 |
| Enderanulla     | 10,169           | 4,147  | 10,195         | 3,671  | 24,520   | 25,320 |
| Horape          | 2,240            | 2,239  | 951            | 1,744  | 5,520    | 3,680  |
| Ragaza          | 17,489           | 16,494 | 16,984         | 21,528 | 40,080   | 82,560 |
| Peralanda       | 1,540            | 1,031  | 1,162          | 941    | 4,400    | 12,160 |
| Kandana         | 1,209            | 1,910  | 1,406          | 1,929  | 9,400    | 21,120 |
| Kapuwatta       | 408              | 181    | 479            | 400    | 2,680    | 4,920  |
| Jaela           | 1,809            | 993    | 2,108          | 1,813  | 15,440   | 30,960 |
| Tudella         | 248              | 292    | 235            | 336    | 1,080    | 3,880  |
| Kudahakapola    | 1,217            | 544    | 799            | 415    | 4,160    | 7,960  |
| Alawatupitiya   | 604              | 426    | 279            | 317    | 1,240    | 5,400  |
| Seedura         | 1,257            | 1,301  | 919            | 814    | 5,640    | 10,320 |
| Air port        | 84               | 169    | 211            | 374    |          |        |
| Katunayake      | 192              | 824    | 412            | 554    | 3,000    | 6,880  |
| Kurana          | 402              | 353    | 275            | 374    | 3,160    | 6,080  |
| Negombo         | 1,029            | 1,010  | 1,336          | 1,969  | 6,720    | 2,080  |

Source : Sri Lanka Government Railway.

Table 15. Railway Time Table between Maradana and Negombo Stations

| Station of Origin<br>Destination | Formation   | Accommodation | UP                      |                      | DOWN                   |                       |
|----------------------------------|-------------|---------------|-------------------------|----------------------|------------------------|-----------------------|
|                                  |             |               | Maradana<br>(Departure) | Negombo<br>(Arrival) | Negombo<br>(Departure) | Maradana<br>(Arrival) |
| Fort Nattandiya                  | Double P    | 2000          | 01.15                   | 02.41                | 04.43                  | 06.15                 |
| Kollupitiya                      | Goods       | -             | 02.04                   | 03.06                | 15.00                  | 00.10                 |
| Kelaniya                         | Kakapalliya | -             | 02.30                   | 03.40                | 09.40                  | 11.10                 |
| Maradana                         | Negombo     | 2000          | 03.25                   | 04.20                | 05.55                  | 07.23                 |
| Fort Puttalam                    | 3Tcc 2Tvw   | 600           | 03.40                   | 05.25                | 14.05                  | 16.05                 |
| Fort Negombo                     | Single P    | 1000          | 04.45                   | 06.54                | 07.14                  | 08.44                 |
| Fort Kakapalliya                 | Single P    | 1000          | 05.10                   | 06.59                | 07.56                  | 09.13                 |
| Fort Kakapalliya                 | Single P    | 1000          | 05.20                   | 07.26                | 08.30                  | 09.50                 |
| Fort Negombo                     | 7Tcc 2Tvw   | 1200          | 06.10                   | 08.01                | 10.00                  | 11.26                 |
| Maradana                         | Kochchikade | 1240          | 09.10                   | 10.43                | 11.20                  | 12.51                 |
| Kollupitiya                      | Goods       | -             | 10.00                   | 13.20                | 15.00                  | 17.00                 |
| Maradana                         | Chilaw      | 1050          | 10.40                   | 12.21                | 17.55                  | 20.22                 |
| Fort (M) Nattandiya              | Single P    | 620           | 12.40                   | 14.18                | 16.18                  | 17.50                 |
| Fort (M) Puttalam                | 3Tcc 2Tvw   | 600           | 14.02                   | 15.33                | 08.05                  | 10.20                 |
| Fort (M) Kakapalliya             | Single P    | 1000          | 15.32                   | 16.55                | 17.57                  | 19.12                 |
| Fort (M) Negombo                 | Double P    | 2000          | 16.25                   | 17.49                | 18.40                  | 20.28                 |
| Fort (M) Bangadeniya             | 9Tcc 2Tvw   | 1500          | 17.00                   | 18.02                | 06.59                  | 08.00                 |
| Fort (M) Negombo                 | Single P    | 1000          | 17.05                   | 18.32                | 20.00                  | 21.18                 |
| Fort (M) Chilaw                  | 10Tcc 2Tvw  | 1650          | 17.45                   | 19.10                | 06.23                  | 07.44                 |
| Fort (M) Chilaw                  | 9Tcc 2Tvw   | 1500          | 18.25                   | 19.53                | 05.28                  | 06.52                 |
| Fort (M) Negombo                 | Single P    | 620           | 20.14                   | 21.48                | 22.10                  | 23.43                 |
| Fort (M) Negombo                 | Single P    | 620           | 21.29                   | 22.57                | 23.10                  | 00.00                 |
|                                  |             | 2200          |                         |                      |                        |                       |

Note - (M) Destination at Maradana - Source : Sri Lanka Government Railway

Fig. 22. Mass Curve



**Table 16. Distance, Travel Time and Fare by Train from Fort Station**

| From Fort<br>To | Distance<br>(KM) | Travel-Time<br>(Min.) | Fare (Rs.) |           |           |
|-----------------|------------------|-----------------------|------------|-----------|-----------|
|                 |                  |                       | 1st Class  | 2nd Class | 3rd Class |
| Maradana        | 1.89             | 6                     | 3.00       | 2.00      | 1.00      |
| Dematagoda      | 3.62             | 11                    | 3.00       | 2.00      | 1.00      |
| Kelaniya        | 6.87             | 17                    | 5.80       | 3.60      | 1.60      |
| Hunupitiya      | 10.02            | 22                    | 5.80       | 3.60      | 1.60      |
| Ragaza          | 15.54            | 31                    | 8.00       | 5.20      | 2.30      |
| Peralanda       | 17.07            | 35                    | 9.00       | 5.80      | 2.60      |
| Kandana         | 18.82            | 39                    | 9.50       | 6.10      | 2.70      |
| Kapuwatta       | 20.55            | 41                    | 10.50      | 6.80      | 3.00      |
| Ja-ela          | 22.15            | 45                    | 11.50      | 7.40      | 3.30      |
| Kudanakapola    | 25.17            | 51                    | 13.00      | 8.40      | 3.70      |
| Alawatupitiya   | 26.50            | 55                    | 13.50      | 8.70      | 3.80      |
| Seeduwa         | 28.05            | 59                    | 14.50      | 9.30      | 4.10      |
| Liyanagegulla   | 30.12            | 64                    | 15.50      | 10.00     | 4.40      |
| Air Port        | 33.43            | 66                    | 17.00      | 10.90     | 4.80      |
| Katunayake      | 32.44            | 70                    | 16.50      | 10.60     | 4.70      |
| Kurana          | 35.30            | 75                    | 18.00      | 11.60     | 5.10      |
| Negombo         | 38.84            | 83                    | 28.30      | 12.50     | 5.50      |

Source : Sri Lanka Government Railway

**Table 17. Distance, Travel Time and Fare by Bus from Pettah Bus Terminal**

| From Pettah<br>To | Distance<br>(KM) | Travel Time<br>(Min.) | Fare<br>(Rs.) |
|-------------------|------------------|-----------------------|---------------|
| Peliyagoda        | 6.11             | 15                    | 1.50          |
| Wattala           | 8.00             | 18                    | 2.00          |
| Kelisara          | 13.99            | 25                    | 2.50          |
| Kandana           | 16.73            | 28                    | 3.00          |
| Ja-ela            | 20.11            | 33                    | 3.50          |
| Tudella           | 20.91            | 35                    | 3.50          |
| Dandugama         | 22.52            | 38                    | 3.50          |
| Seedura           | 26.22            | 40                    | 3.50          |
| Katunayake        | 30.57            | 47                    | 3.75          |
| Kurana            | 31.53            | 49                    | 4.25          |
| Negombo           | 37.00            | 59                    | 4.50          |

Scale: 1:1000

**Fig. 22. Mass Curve**

Table 18. Inventory of Flood Relief and Drainage Structures

| No. | Location                                     | Existing Structure | Flooding                        |                        | Existing Condition |        |     | Remarks |   |
|-----|--|--------------------|---------------------------------|------------------------|--------------------|--------|-----|---------|---|
|     |  |                    | Height                          | Frequency              | Durability         | State  | Use |         |   |
| 1   | Durgamchettu (1)                             | N                  | 1 <sup>st</sup> above field     | Once in a yr.          | 10                 | N.F.   | U   | N       | Canal 1st-2 <sup>nd</sup> 2005          |
| 2   | (2) Kallani Sanga site                       | N                  | 2 <sup>nd</sup> above field     | -30-                   |                    | F      |     |         | Near culchrest                          |
| 3   | Old railway structure (Siddavalle-Me) (2)    | BR 45              | 1 <sup>st</sup> above road      |                        |                    | FA     |     |         | Abandoned structure                     |
| 4   | Railway bridge                               | BR 2x7.5           | 2 <sup>nd</sup> above field     |                        |                    | F.FA   |     |         |   |
| 5   | Old Ratnapura Rd.                            | BR                 | 2 <sup>nd</sup> above road      |                        |                    | N      |     |         | Normal flood 1 <sup>st</sup> above road |
| 6   | Railway near STA 5                           | BR 14.0, 6.5       | Above roadway br.               | 2-3 times in a yr.     |                    | N      | U   | N       |   |
| 7   | Road (Thorane-Telengipatha)                  | BR 3.5             | Below bridge                    |                        |                    | FA.N   | U   | N       | Approach road submerged                 |
| 8   | Road (6 mile post Randy Rd. - Kumbhiga) site | BO 15x15           | Below bridge                    |                        |                    | N.FA   | U   | N       |   |
| 9   | -30-   | (2) P 0.2x1        | Above road                      | Once in a yr.          |                    | FA     | U   | N       |   |
| 10  | Railway near STA 9                           | BR 6.5, P 0.2x1    | 1.3 <sup>rd</sup> below railway | Once in 2-3 yrs.       | 20                 | N.FA   | U   | N       |   |
| 11  | Road (Mittala-Katevatta)                     | BR 3.5             | Bottom of br.                   | Once or twice in a yr. | 10                 | N      | U   | N       |   |
| 12  | Road   | BR 5.5x2           | Top of bridge                   | 2-3 times in a yr.     | 2-30               | N      | U   | N       |   |
| 13  | Railway near STA 13                          | BR 2x7.5           | 0.8 below railway               |                        |                    | N      | U   | N       |   |
| 14  | Railway near STA 10-500                      | BR 2x7.5           | -30-                            |                        |                    | N      | U   | N       |   |
| 15  | Road (Mihara J. - Kurga J) near STA 11-500   | P 8 1500           | 0.7 above road                  | Once in 10 yrs.        | 50                 | N      | U   | N       |   |
| 16  | -30- near Army Base                          | BR 3.2, P 1.2      | Above br.                       | Once in a yr.          | 10                 | N      | U   | N       |   |
| 17  | Road (Kurga-Mahabaga)                        | BR 3.0             | 1 <sup>st</sup> above bridge    | Once in 8 yrs.         | 10                 | N      | U   | N       | Water reaches at gas station            |
| 18  | Road (Paralanda-Kurga J)                     | BO 12x0.8, 12x0.8  | 0.5 above road                  | Once in a yr.          | 20                 | N.FA   | U   | N       |   |
| 19  | Railway (Kurga-Keguda)                       | BR 6.5             | 0.5 below railway               | Once in 10 yrs.        | 30                 | N.FA   | U   | N       |   |
| 20  | Road (Polpattakalane-Kespala)                | BO 2x0.1x0.5       | Below slab                      |                        |                    | FA     | U   | N       | Irrigation                              |
| 21  | Road (Goravilla-Ja-Ela)                      | BR 2.4, BO 0.2x0.5 | Above road                      | Once in 5 yrs.         | 50                 | FA     | U   | N       | Irrigation                              |
| 22  | Road (Polpattakalane)                        | BR 0.2             | 0.5 above br.                   | Once in 5 yrs.         | 40                 | FA     | U   | N       | Irrigation                              |
| 23  | Road (Kumbhiga-Kumbhiga-Kumbhiga)            | BR 3.1             | 0.5 above br.                   | Once in a yr.          | 10                 | FA     | U   | N       | Irrigation                              |
| 24  | Road (Mihara-Kumbhiga)                       | BO 0.2x0.5         | 0.3 above culvert               | Once in 4 yrs.         | 30                 | FA     | U   | N       | Irrigation                              |
| 25  | Road (Mihara-Kumbhiga)                       | BR 3.5             | 0.3 above rd.                   | Once in a yr.          | 20                 | FA     | U   | N       | Irrigation                              |
| 26  | Road (Ja-Ela - Goravilla)                    | P 1.5x1, 0.5x2     | 0.7 above rd.                   | Once in 8 yrs.         | 10                 | FA     | U   | N       | Irrigation                              |
| 27  | Ja-Ela Gya                                   | Road               | 1.5 above water-slag field      | Twice in a yr.         | 10                 | FA     | U   | S       | Length of Waterway 15                   |
| 28  | Datta  | Road               | Above field                     | Once in a yr.          | 20                 | F.FA.N | U   | N       |   |
| 29  | Katugala-Kumbhiga                            | Road               | 0.5 above pipeline              | Every year             | 30                 | FA     | U   | N       | Irrigation                              |
| 30  | Drainage canal of Housing Scheme             | Road               |                                 |                        |                    | FA     | U   | N       |   |
| 31  | Tangola Area                                 | Road               | 0.3 above road                  | Every year             | 20                 | FA     | U   | N       | Waterway 0.2x1                          |
| 32  | Paralanda Gya                                | Road               | 0.5 above road                  |                        |                    | F.FA   | U   | S       | At first electric post on RFP side      |

Table 19. Inventory of Existing Crossing Roads

| No. | Name                                       | Class | Total Width (m) | Carriage Width (m) | EXISTING CONDITION |          |        |         |             | Remarks |
|-----|--|-------|-----------------|--------------------|--------------------|----------|--------|---------|-------------|---------|
|     |  |       |                 |                    | Pave-ment          | Land Use | Detour | Traffic | Bus Traffic |         |
| 1   | Old Kalyanpura Road                        | A     | 7.4             | 5.0                | A                  | H,F      | D      | N       | Y           |         |
| 2   | Kelani Road                                | B     | 9.0             | 7.0                | A                  | H        | D      | N       | Y           |         |
| 3   | Increase-Telangapatha                      | C     | 6.5             | 3.7                | A                  | H,F      | D      | N       | Y           |         |
| 4   | 6 Mile Post (Candy Rd.) - Kumpillya        | C     | 7.5             | 3.4                | A                  | FA       | P      | S       | N           |         |
| 5   | 6 Mile Post (Candy Rd.) - Mittala          | C     | 6.0             | 3.4                | A                  | H,F      | P      | N       | Y           |         |
| 6   | Colagasa-Kumpillya (New Rd.)               | D     | 15.5            | 6.9                | A                  | H,F      | P      | N       | Y           |         |
| 7   | Kumpillya (Between Kumbha)                 | D     | 4.0             | 2.5                | A                  | H        | P      | S       | N           |         |
| 8   | Kiribathgoda-Peweldana (Candy Rd.)         | C     | 8.2             | 4.4                | A                  | H        | P      | S       | Y           |         |
| 9   | Mattala-Kalavatha                          | E     | 8.1             | 4.9                | A                  | H        | D      | N       | Y           |         |
| 10  | Enderanulla St. - Enderanulla J.           | C     | 6.6             | 4.0                | A                  | H        | D      | S       | Y           |         |
| 11  | Keehenkoda J. - Enderanulla J.             | D     | 6.5             | 2.7                | G                  | H        | P      | S       | N           |         |
| 12  | Kabara J. - Rajaya J.                      | B     | 7.0             | 2.8                | A                  | H        | P      | S       | N           |         |
| 13  | Rajaya J. - Rajaya J.                      | E     | 5.5             | 3.0                | E                  | H,F      | P      | S       | N           |         |
| 14  | Rajaya J. - Rajaya chilly path             | D     | 3.0             | 2.3                | A                  | H        | P      | S       | N           |         |
| 15  | Rajaya J. - Kalavatha                      | E     | 2.8             | 4.4                | E                  | H        | P      | S       | N           |         |
| 16  | Rajaya - Kalavatha                         | C     | 9.7             | 5.4                | A                  | H        | P      | N       | Y           |         |
| 17  | Purialanda - Rajaya J.                     | E     | 2.6             | 2.6                | G                  | PL       | P      | S       | N           |         |
| 18  | Feeder Road                                | D     | 4.4             | 3.3                | G                  | H        | P      | S       | N           |         |
| 19  | -do-                                       | E     | 2.9             | -                  | G                  | H,PL     | P      | S       | N           |         |
| 20  | Rajaya-Pollimkulura                        | D     | 6.1             | 2.9                | A                  | F        | P      | S       | N           |         |
| 21  | Pollimkulura Boys Town                     | D     | 6.2             | 2.4                | A                  | H        | P      | S       | N           |         |
| 22  | Korupalanda - Velpala                      | D     | 5.3             | 3.0                | G                  | H,PL     | P      | S       | N           |         |
| 23  | Boys Town 2. - Batagasa J. (1)             | D     | 5.4             | 2.2                | A                  | H        | P      | S       | N           |         |
| 24  | Boys Town 2. - Batagasa J. (2)             | D     | 5.0             | 2.4                | A                  | H,PL     | P      | S       | N           |         |
| 25  | Kandara - Batagasa                         | C     | 7.4             | 4.5                | A                  | H        | P      | N       | Y           |         |
| 26  | Pollimkulura - Kospalana                   | D     | 6.3             | 2.3                | G                  | PL       | P      | S       | N           |         |
| 27  | Garenillo - Ja-Ela                         | D     | 5.3             | 2.0                | A                  | H,FA     | P      | S       | Y           |         |
| 28  | Pollimkulura                               | D     | 6.2             | 2.3                | G                  | PL       | P      | S       | N           |         |
| 29  | Gihon-Batagasa - Bivardana                 | D     | 8.5             | 3.0                | A                  | PL,FA    | P      | S       | Y           |         |
| 30  | Bandigoda - Bivardana                      | E     | 3.2             | -                  | E                  | H,F      | P      | S       | N           |         |
| 31  | Feeder Rd. (for pedestrians only to Jaddy) | E     | 3.3             | -                  | E                  | H,PL     | P      | S       | N           |         |
| 32  | Bandigoda - Bivardana North                | E     | 4.6             | 2.4                | E                  | PL       | P      | S       | N           |         |
| 33  | Ja-Ela - Garenillo                         | C     | 8.0             | 3.6                | A                  | H        | P      | N       | Y           |         |
| 34  | Yakkanna J. - Yakkanna                     | D     | 5.9             | 2.5                | G                  | H        | P      | S       | N           |         |
| 35  | Etala (1)                                  | E     | 2.0             | -                  | E                  | H        | P      | S       | N           |         |
| 36  | Etala (2)                                  | E     | 2.4             | -                  | E                  | H        | P      | S       | N           |         |
| 37  | Etala (3)                                  | E     | 3.3             | -                  | E                  | H        | P      | S       | N           |         |
| 38  | Etala - Kalavatha                          | C     | 9.3             | 5.0                | A                  | H,PL     | P      | N       | Y           |         |
| 39  | Etala (4)                                  | D     | 9.0             | 2.6                | E                  | F        | P      | S       | N           |         |
| 40  | Etala (5)                                  | E     | 3.7             | -                  | E                  | F        | P      | S       | N           |         |
| 41  | Kasigawatta - Kelugoda                     | C     | 12.3            | 5.7                | A                  | H,F      | P      | N       | Y           |         |
| 42  | Stellak Kumbha                             | D     | 5.8             | 3.3                | G                  | H,F      | P      | S       | N           |         |
| 43  | Seedasa Road                               | B     | 10.0            | 4.4                | A                  | H,F      | P      | N       | Y           |         |
| 44  | Kumbhagalliya Road (1)                     | E     | 3.6             | 2.5                | E                  | H,PL     | P      | S       | N           |         |
| 45  | " (2)                                      | E     | 4.0             | 2.0                | E                  | H,PL     | P      | S       | N           |         |
| 46  | Uvula Road (Garenillo) (1)                 | D     | 7.2             | 3.0                | A                  | H,PL     | P      | N       | Y           |         |
| 47  | -do- (2)                                   | E     | 4.5             | 2.4                | E                  | H,PL     | P      | S       | N           |         |
| 48  | -do- (3)                                   | D     | 6.2             | 3.0                | E                  | H,PL     | P      | N       | N           |         |
| 49  | -do- (4)                                   | E     | 5.0             | 3.0                | E                  | H,PL     | P      | S       | N           |         |
| 50  | Garenillo (1)                              | E     | 4.5             | 2.5                | E                  | H,PL     | P      | S       | N           |         |

No. 11 Divided by 0.90

Fig. 22. Mass Curve

Table 20. Discharge and Proposed Structure of Flood Relief Opening and Drainage

| Drainage No. | Length of Waterbed (K) |                | Elevation (K)  |                |                | Discharge Area (K <sup>2</sup> ) |                | Run-off Coef.  |                | Time of Concentration (mins) | Fallsfall Intensity (mm/hr) |     |     | Discharge (m <sup>3</sup> /Sec) |                 |                 | Proposed Structure                           | Remarks   |
|--------------|------------------------|----------------|----------------|----------------|----------------|----------------------------------|----------------|----------------|----------------|------------------------------|-----------------------------|-----|-----|---------------------------------|-----------------|-----------------|--|---|
|              | L <sub>1</sub>         | L <sub>2</sub> | H <sub>1</sub> | H <sub>2</sub> | H <sub>0</sub> | A <sub>1</sub>                   | A <sub>2</sub> | C <sub>1</sub> | C <sub>2</sub> |                              | 10                          | 25  | 50  | Q <sub>10</sub>                 | Q <sub>25</sub> | Q <sub>50</sub> |  |   |
|              |                        |                |                |                |                |                                  |                |                |                |                              |                             |     |     |                                 |                 |                 |  |   |
| 1            | 0.6                    | 1.5            | 12.5           | 5.0            | 3.5            | 1.05                             | -              | 0.5            | -              | 86                           | 36                          | 42  | 46  | 7.3                             | 8.5             | 9.3             | RR 2x10 <sup>2</sup>                         | Existing structure on R <sub>1</sub> L <sub>1</sub> 10 <sup>2</sup>         |
| 2            | 0.4                    | 1.2            | 12.5           | 5.0            | 4.5            | 1.41                             | -              | 0.5            | -              | 97                           | 34                          | 39  | 44  | 6.4                             | 7.6             | 8.6             | RR 2 <sup>2</sup>                            |   |
| 3            | 0.4                    | 0.5            | 27.5           | 10.0           | 5.5            | 0.35                             | -              | 0.5            | -              | 23                           | 71                          | 83  | 92  | 3.4                             | 4.0             | 4.3             | 1/16 <sup>2</sup>                            |   |
| 4            | 0.2                    | 0.4            | 12.5           | 7.5            | 5.5            | 0.63                             | -              | 0.5            | -              | 18                           | 80                          | 100 | 105 | 7.0                             | 8.7             | 9.1             | RR 10 <sup>2</sup>                           | Existing structure on bypass 4-6.1 <sup>2</sup>                             |
| 5            | 0.4                    | 0              | 15             | 5.0            | 5              | 0.15                             | -              | 0.5            | -              | 7                            | 106                         | 123 | 136 | 7.7                             | 8.5             | 8.8             | 1/1.5  | Interst. No. 10   |
| 6            | 2.3                    | 0              | 12.5           | 5.0            | 5              | 2.85                             | 0.72           | 0.4            | 0.7            | 64                           | 62                          | 63  | 54  | 19.3                            | 22.4            | 24.9            | RR 10 <sup>2</sup> & 1/1.5                   | -30-  |
| 7            | 0.5                    | 0              | 20             | 5.0            | 5              | 0.09                             | -              | 0.5            | -              | 8                            | 106                         | 123 | 136 | 1.3                             | 1.5             | 1.7             | 1/1.2  |   |
| 8            | 0.5                    | 0.7            | 22.5           | 5.0            | 4.5            | 0.64                             | -              | 0.5            | -              | 56                           | 85                          | 52  | 57  | 4.0                             | 4.4             | 5.0             | RR 1/2 <sup>2</sup>                          |   |
| 9            | 0.2                    | 0              | 22.5           | 4.0            | 4.0            | 0.64                             | -              | 0.5            | -              | 2                            | 106                         | 123 | 136 | 0.5                             | 0.4             | 0.7             | 1/0.9  |   |
| 10           | 11.0                   | 0              | 35             | 5.0            | 3.6            | 29.59                            | 9.23           | 0.4            | 0.7            | 130                          | 77                          | 76  | 20  | 112.8                           | 113.3           | 113.6           | RR 2x10 <sup>2</sup> , RR 10 <sup>2</sup> x2 | Interst. No. 13, 14   |
| 11           | 0.3                    | 0              | 18             | 5.0            | 5              | 0.06                             | -              | 0.5            | -              | 5                            | 106                         | 123 | 136 | 0.0                             | 1.0             | 1.1             | 1/0.9  |   |
| 12           | 0.4                    | 0              | 15             | 5.0            | 4.0            | 0.13                             | -              | 0.5            | -              | 7                            | 106                         | 123 | 136 | 1.9                             | 2.2             | 2.4             | 1/1.5  |   |
| 13           | 3.0                    | 0              | 30             | 4.0            | 4.0            | 3.68                             | 0.47           | 0.4            | 0.7            | 55                           | 65                          | 53  | 50  | 18.5                            | 22.9            | 25.1            | RR 10 <sup>2</sup>                           | Railway br. 5 <sup>2</sup>  |
| 14           |                        |                |                |                |                |                                  |                |                |                |                              |                             |     |     |                                 |                 |                 | RR 2 <sup>2</sup>                            |   |
| 15           | 2.3                    | 0              | 30             | 4.0            | 4.0            | 1.61                             | 0.40           | 0.4            | 0.7            | 41                           | 53                          | 62  | 64  | 13.6                            | 15.0            | 17.4            | RR 10 <sup>2</sup>                           | Interst. No. 13   |
| 16           | 0.6                    | 0              | 34.0           | 10             | 10             | 0.20                             | -              | 0.5            | -              | 8                            | 106                         | 123 | 136 | 2.9                             | 3.4             | 3.7             | RR 2 <sup>2</sup>                            |   |
| 17           | 0.3                    | 0              | 34.0           | 15             | 15             | 0.07                             | -              | 0.5            | -              | 6                            | 106                         | 123 | 136 | 1.0                             | 1.1             | 1.3             | 1/1.2  |   |
| 18           | 0.3                    | 2.2            | 39.0           | 5              | 2.2            | 2.32                             | 0.32           | 0.1            | 0.7            | 55                           | 54                          | 40  | 41  | 12.2                            | 14.3            | 15.0            | RR 1/2 <sup>2</sup> , 1/1.2                  | Interst. No. 20   |
| 19           | 1.1                    | 4.4            | 30             | 5              | 2.0            | 2.64                             | 1.55           | 0.4            | 0.7            | 227                          | 24                          | 27  | 31  | 27.6                            | 31.0            | 36.0            | RR 2x10 <sup>2</sup>                         | Interst. No. 21, 22, 23   |
| 20           | 0.4                    | 0.7            | 34.5           | 5              | 2.0            | 0.43                             | -              | 0.5            | -              | 29                           | 63                          | 71  | 79  | 4.1                             | 4.6             | 5.1             | 1/1.5 x 2                                    | Interst. No. 24   |
| 21           | 0.3                    | 0              | 24.0           | 2.5            | 2.5            | 0.13                             | -              | 0.5            | -              | 4                            | 106                         | 123 | 136 | 1.8                             | 2.2             | 2.4             | 1/1.5  |   |
| 22           | 1.1                    | 6.5            | 30             | 5              | 2.0            | 11.69                            | 2.00           | 0.4            | 0.7            | 329                          | 19                          | 21  | 23  | 30.8                            | 34.0            | 37.3            | RR 2x10 <sup>2</sup>                         | Interst. No. 25, 26   |
| 23           | 1.1                    | 0              | 8.0            | 2.5            | -              | 0.44                             | -              | 0.5            | -              | 31                           | 63                          | 71  | 78  | 3.7                             | 4.3             | 4.7             | 1/1.2  |   |
| 24           | 1.9                    | 0              | 10             | 2.5            | -              | 2.36                             | -              | 0.5            | -              | 53                           | 42                          | 43  | 53  | 13.1                            | 16.0            | 17.3            | RR 1/2 <sup>2</sup>                          | Existing structure RR 1/2 <sup>2</sup> , RR 2 <sup>2</sup> x10 <sup>2</sup> |
| 25           | 0.5                    | 0              | 3.0            | 2.5            | -              | 0.13                             | -              | 0.5            | -              | 32                           | 53                          | 63  | 75  | 1.0                             | 1.2             | 1.3             | 1/1.0  | Existing pipe 1/1.2   |
| 26           | 1.7                    | 0              | 7.5            | 2.5            | -              | 1.64                             | -              | 0.5            | -              | 56                           | 46                          | 53  | 54  | 6.6                             | 7.6             | 8.3             | RR 10 <sup>2</sup>                           | Interst. No. 28   |
| 27           | 0.8                    | 0              | 7.5            | 2.5            | -              | 0.34                             | -              | 0.5            | -              | 22                           | 72                          | 86  | 93  | 3.4                             | 3.9             | 4.3             | 1/1.5x2                                      |   |
| 28           | 0.5                    | 1.1            | 30             | 5              | 2.5            | 2.53                             | -              | 0.5            | -              | 52                           | 48                          | 54  | 59  | 16.1                            | 18.9            | 20.7            | RR 16 <sup>2</sup>                           | Interst. No. 29   |
| 29           | 1.5                    | 0              | 25             | 5              | -              | 1.12                             | -              | 0.5            | -              | 27                           | 64                          | 75  | 83  | 5.9                             | 11.5            | 12.9            | RR 5 <sup>2</sup>                            | Interst. No. 30   |
| 30           | 0.3                    | 0              | 12.5           | 1.5            | -              | 0.11                             | -              | 0.5            | -              | 7                            | 106                         | 123 | 136 | 1.6                             | 1.8             | 2.0             | 1/1.5  |   |
| 31           | 0.1                    | 0              | 12.5           | 5              | -              | 0.41                             | -              | 0.5            | -              | 22                           | 72                          | 84  | 93  | 4.1                             | 4.7             | 5.3             | RR 2 <sup>2</sup>                            |   |
| 32           | 0.8                    | 0              | 10             | 3.5            | -              | 0.37                             | -              | 0.5            | -              | 20                           | 75                          | 82  | 86  | 3.8                             | 4.5             | 4.9             | RR 2 <sup>2</sup>                            |   |
| 33           | 0.6                    | 0              | 12.5           | 3.5            | -              | 0.27                             | -              | 0.5            | -              | 18                           | 80                          | 93  | 105 | 3.0                             | 3.4             | 3.9             | RR 2 <sup>2</sup>                            | Interst. No. 31   |
| 34           | 0.6                    | 0              | 10             | 5              | -              | 0.27                             | -              | 0.5            | -              | 16                           | 80                          | 100 | 111 | 3.2                             | 3.7             | 4.2             | RR 2 <sup>2</sup>                            |   |
| 35           | 0.6                    | 0              | 12.5           | 5              | -              | 0.24                             | -              | 0.5            | -              | 14                           | 93                          | 107 | 120 | 3.1                             | 3.5             | 4.0             | RR 2 <sup>2</sup>                            |   |
| 36           | 0.6                    | 0              | 30             | 5              | -              | 0.20                             | -              | 0.5            | -              | 8                            | 106                         | 123 | 136 | 2.9                             | 3.4             | 3.7             | RR 2 <sup>2</sup>                            |   |

\*Intensity of Flood Area (Appendix)

NOTE: When time of concentration is less than 10 mins, rainfall intensity for 10 mins. is adopted.

Table 21. Cost List of Major Materials

(in Rs. of 1983 price)

| Material              | Description                          | Unit           | Market cost |
|-----------------------|--------------------------------------|----------------|-------------|
| Steel bar             | Mild steel                           | t              | 8,650.0     |
| H shaped steel        | 300x300x10x15                        | t              | 4,140.0     |
|                       | for steel                            | t              | 9,460.0     |
| Cement                | Poltrand                             | t              | 1,590.0     |
| Asphalt               | Grade (80-100)                       | l              | 6.3         |
| Wood                  | Plank 25x300x1000                    | each           | 44.9        |
|                       | Scantling 100x150x5000               | H <sup>3</sup> | 88.4        |
| Aggregate             | Sand                                 | H <sup>3</sup> | 85.0        |
|                       | Gravel                               | H <sup>3</sup> | 76.5        |
|                       | Crushed rock (1 <sup>st</sup> -0)    | H <sup>3</sup> | 318.8       |
|                       | Crushed rock (3 <sup>rd</sup> -0)    | H <sup>3</sup> | 350.6       |
|                       | Crushed rock (2 <sup>nd</sup> -0)    | H <sup>3</sup> | 191.3       |
|                       | Rubble                               | H <sup>3</sup> | 106.3       |
| Ready Mixed Concrete  | Class P (Ock=350kg/cm <sup>2</sup> ) | H <sup>3</sup> | 1,980.0     |
|                       | Class A (Ock=240kg/cm <sup>2</sup> ) | H <sup>3</sup> | 1,680.0     |
|                       | Class B (Ock=210kg/cm <sup>2</sup> ) | H <sup>3</sup> | 1,600.0     |
|                       | Class C (Ock=180kg/cm <sup>2</sup> ) | H <sup>3</sup> | 1,500.0     |
| Pressed concrete beam | Length 10 <sup>m</sup>               | each           | 6,742.0     |
|                       | Length 13 <sup>m</sup>               | each           | 9,290.0     |
|                       | Length 16 <sup>m</sup>               | each           | 13,500.0    |
| RCC Pile              | 355x355x10                           | each           | 8,748.4     |
| RC Pipe (10m)         | ∅ 600(610x2438)                      | each           | 1,045.7     |
|                       | ∅ 900(914x1219)                      | each           | 888.5       |
|                       | ∅1200(1219x1219)                     | each           | 1,307.6     |
|                       | ∅1500(1524x1219)                     | each           | 2,282.5     |
|                       | ∅1800(1829x2438)                     | each           | 5,972.3     |

Fig. 22. Mass Curve

X-59

Table 22. CIF Prices of Machinery and Plant

(cost in Rs.)

| No. | Machinery & Plant                    | Class | CIF Price | Local Charge | No. | Machinery & Plant                     | Class | CIF Price  | Local Charge |
|-----|--------------------------------------|-------|-----------|--------------|-----|---------------------------------------|-------|------------|--------------|
| 1   | Bull dozer 11 ton soft ground        |       | 1,530,000 | 7,500        | 25  | Vibration Roller 3.5 ton              |       | 339,000    | 1,000        |
| 2   | " " 15-17 ton                        |       | 2,660,000 | 13,000       | 26  | " " 10 ton                            |       | 1,096,000  | 7,000        |
| 3   | " " 19 ton                           |       | 3,620,000 | 13,000       | 27  | Sheep-foot Roller 6-12 ton            |       | 756,000    | 6,500        |
| 4   | " " 19 ton with Ripper               |       | 2,910,000 | 13,000       | 28  | Vibration Compacting Plate 90 Kg      |       | 96,000     | 1,000        |
| 5   | " " 25 ton with Ripper               |       | 4,070,000 | 14,500       | 29  | Air Compressor 5 m <sup>3</sup> /min  |       | 202,000    | 4,000        |
| 6   | Loader 1.0 m <sup>3</sup> wheel type |       | 787,000   | 7,500        | 30  | Air Compressor 10 m <sup>3</sup> /min |       | 415,000    | 5,000        |
| 7   | " " 1.5 m <sup>3</sup> wheel type    |       | 1,124,000 | 8,500        | 31  | Wheel Crane 5 ton                     |       | 857,000    | 1,500        |
| 8   | " " 2.1 m <sup>3</sup> crawler type  |       | 3,100,000 | 14,000       | 32  | Crawler crane 10-15 ton               |       | 1,988,000  | 8,000        |
| 9   | " " 3.0 m <sup>3</sup> wheel type    |       | 1,910,000 | 10,000       | 33  | Truck crane 25 ton                    |       | 2,117,000  | 14,000       |
| 10  | Back-hoe 0.3 m <sup>3</sup>          |       | 540,000   | 12,500       | 34  | Crawler crane 40 ton                  |       | 4,218,000  | 18,000       |
| 11  | " " 0.6 m <sup>3</sup>               |       | 1,012,000 | 15,000       | 35  | Diesel Pile Hammer with 2.5 ton Run   |       | 4,650,000  | 10,000       |
| 12  | " " 1.2 m <sup>3</sup>               |       | 1,124,000 | 17,500       | 36  | Belt Conveyor 10 m                    |       | 250,000    | 1,000        |
| 13  | Power shovel 1.2 m <sup>3</sup>      |       | 1,898,000 | 18,000       | 37  | Power Broom 2.4 m                     |       | 1,459,000  | 1,500        |
| 14  | Clan shell 0.6 m <sup>3</sup>        |       | 2,249,000 | 15,000       | 38  | Asphalt Distributer                   |       | 1,068,000  | 5,000        |
| 15  | Pickup 2 ton truck                   |       | 209,000   | 1,000        | 39  | Asphalt Finisher                      |       | 877,000    | 5,000        |
| 16  | " " 4 ton truck                      |       | 309,000   | 1,000        | 40  | Portable Generator 60 KVA             |       | 199,000    | 5,000        |
| 17  | Concrete Mixer 3.5 m <sup>3</sup>    |       | 765,000   | 1,500        | 41  | " " 100 KVA                           |       | 312,000    | 6,000        |
| 18  | Dump Truck 6 ton                     |       | 449,000   | 4,000        | 42  | " " 200 KVA                           |       | 630,000    | 7,500        |
| 19  | " " 8 ton                            |       | 676,000   | 6,000        | 43  | Portable Crushing Plant 50 ton        |       | 5,451,000  | 25,000       |
| 20  | Water Truck 6-10 ton                 |       | 538,000   | 6,000        | 44  | Asphalt Mixing Plant 50 ton           |       | 5,317,000  | 20,000       |
| 21  | Mortar Grader 3.7 m                  |       | 1,818,000 | 8,500        | 45  | Soil Mixing Plant 150 ton             |       | 2,700,000  | 20,000       |
| 22  | Tyre Roller 6-10 ton                 |       | 571,000   | 6,000        | 46  | Dredger 1100 PH                       |       | 29,440,000 | 50,000       |
| 23  | " " 10-20 ton                        |       | 689,000   | 9,500        |     |                                       |       |            |              |
| 24  | Road Roller 10-15 ton                |       | 715,000   | 9,500        |     |                                       |       |            |              |

Table 23. Duty Rate

| (Tariff Heading No.) |   |               |
|----------------------|---|---------------|
| (25.22)              | 1) Lime stone   | 12.5%         |
| (25.23)              | 2) Portland cement & Clinker  | free          |
| (26.02,03)           | 3) Slag or ash from manufacture of iron   | 5%            |
| (27.06)              | 4) Tar distilled from coal  | 5%            |
| (27.10)              | 5) Kerosene & Crude oil   | free          |
|                      | Fuel oil & lubricating oil  | 5%            |
| (27.14)              | 6) Petroleum bitumen from industrial asphalt  | 25%           |
| (27.15)              | 7) Natural asphalt, asphalt rock or tar sand  | 50%           |
| (27.16)              | 8) Cut backs asphalt, mixture of natural asphalt                                    | 50%           |
| (68.11)              | 9) Concrete pipes & fittings  | 50%           |
| (73.10)              | 10) Bars and rods of iron or steel  | 25%           |
|                      | Wire rods of iron   | 12.5%         |
| (73.11-15)           | 11) Angles, shapes of V.I.H. and sheet piling                                       | 5%            |
| (73.06)              | 12) Ingots of iron  | 5%            |
| (73.17)              | 14) Tubes and pipes of cast iron  | 50%           |
| (73.25)              | 15) Stranded wire, cables   | 25%           |
| (73.27)              | 16) Gauge, fencing, netting   | 50%           |
| (73.31)              | 17) Nail, staples   | 25%           |
|                      | 18) Machinery   |               |
| (84.22)              | A. Lifting, handling, loading   | 12.5%         |
| (84.23)              | B. Excavating shovel, bulldozer   | 5%            |
| (84.56)              | C. Crushing mixing plant  | 5%            |
|                      | 20) Electrical equipment & goods  |               |
| (85.01)              | A. Generator  | free          |
| (85.09)              | B. Lighting & signalling  | 50%           |
| (85.10)              | C. Portable battery   | 100%          |
| (85.11)              | D. Welding machine  | 50%           |
|                      | 21) Automobiles   |               |
| (87.01)              | A. Road tractor   | 5%            |
| (87.02)              | B. Sedan  | over 40%-120% |
| (87.02)              | C. Mini bus 10-15 persons   | 25%           |
|                      | over 15 persons   | 7.5%          |
| (87.03)              | D. Road sweeper, crane etc  | 25%           |
| (87.06)              | E. Parts & accessories of motor vehicles  | 35%           |
| (87.09)              | F. Motorcycles auto cycles  | 12.5%         |
| (89.01-05)           | 22) Ship, boats, other vessels but, yachts and other vessels for pleasure or sports | 25%           |

W.C. 11 Divided by 0.90

Fig. 22. Mass Curve



Table 24. Machine Operation Cost

(Rs.)

|                                     | Total | Foreign | Local | Tax |
|-------------------------------------|-------|---------|-------|-----|
| Bull Dozer 11 ton                   | 1,608 | 1,435   | 116   | 57  |
| ▪ 15-17 ton                         | 2,607 | 2,399   | 120   | 88  |
| ▪ 19 ton                            | 3,326 | 3,102   | 120   | 104 |
| ▪ 19 ton with Repper                | 3,135 | 2,892   | 120   | 123 |
| Wheel Loader 1.5 m <sup>3</sup>     | 1,498 | 1,316   | 117   | 65  |
| Crawler loader 2.1 m <sup>3</sup>   | 2,895 | 2,694   | 121   | 80  |
| Wheel Loader 3.0 m <sup>3</sup>     | 2,721 | 2,472   | 118   | 131 |
| Back hoe 0.6 m <sup>3</sup>         | 1,239 | 1,066   | 120   | 53  |
| ▪ 1.2 m <sup>3</sup>                | 1,686 | 1,474   | 121   | 91  |
| Power shovel                        | 2,089 | 1,877   | 121   | 91  |
| Clamshell 0.6 m <sup>3</sup>        | 1,973 | 1,796   | 120   | 57  |
| Pickup truck 4 ton                  | 966   | 818     | 89    | 59  |
| Pump Truck 6 ton                    | 846   | 724     | 91    | 31  |
| ▪ 8 ton                             | 982   | 853     | 92    | 37  |
| Mortar Grader 3.7 m                 | 2,547 | 2,380   | 117   | 50  |
| Tyre Roller 6-10 ton                | 621   | 485     | 115   | 21  |
| ▪ 10-20 ton                         | 819   | 670     | 117   | 32  |
| Road Roller 10-15 ton               | 813   | 664     | 117   | 32  |
| Vibration Roller 10 ton             | 1,040 | 896     | 116   | 28  |
| Vibration Plate Compactor           | 230   | 132     | 89    | 9   |
| Air Compressor 5m <sup>3</sup> /min | 683   | 549     | 91    | 43  |
| ▪ 10m <sup>3</sup> /min             | 1,316 | 1,137   | 91    | 88  |
| Wheel crane 5 ton                   | 752   | 623     | 113   | 16  |
| Crawler crane 10-15 ton             | 1,524 | 1,379   | 117   | 28  |
| Truck crane 25 ton                  | 1,719 | 1,561   | 120   | 38  |
| Crawler Crane 40 ton                | 2,985 | 2,819   | 122   | 44  |
| Diesel Pile Hammer 2.5ton           | 3,670 | 3,473   | 118   | 79  |
| Power broom 2.4                     | 1,733 | 1,478   | 113   | 142 |
| Asphalt Distributer                 |       |         |       |     |
| 4000 l                              | 2,179 | 1,960   | 116   | 103 |
| Asphalt Finisher 3.6 m              | 1,616 | 1,434   | 117   | 65  |
| Portable Generator                  |       |         |       |     |
| 100 KVA                             | 1,712 | 1,490   | 92    | 130 |
| Portable Generator                  |       |         |       |     |
| 200 KVA                             | 2,272 | 2,017   | 93    | 162 |

Table 25. Results of Unit Cost Analysis

|                           |                                | (in Rs. of 1983 price) |           |         |        |          |
|---------------------------|--------------------------------|------------------------|-----------|---------|--------|----------|
| Item                      | Sub-item                       | Unit                   | Unit Cost |         |        | Total    |
|                           |                                |                        | Foreign   | Local   | Tax    |          |
| <b>EARTH WORK</b>         |                                |                        |           |         |        |          |
| <b>Cut &amp; Fill</b>     |                                |                        |           |         |        |          |
|                           | Clearing & Grubbing            | M <sup>2</sup>         | 16.19     | 4.12    | 1.20   | 21.51    |
|                           | Cutting & Filling              | M <sup>3</sup>         | *-1       | -       | -      | -        |
|                           | Borrow Filling                 | M <sup>3</sup>         | *-1       | -       | -      | -        |
| <b>Soft Ground</b>        |                                |                        |           |         |        |          |
|                           | Sand Mat                       | M <sup>3</sup>         | 63.47     | 142.70  | 17.03  | 223.20   |
|                           | -do-                           | M <sup>3</sup>         | 101.11    | 146.67  | 19.57  | 267.35   |
|                           | Sand Drain Pile                | M                      | 87.17     | 11.88   | 5.08   | 104.13   |
|                           | Sand Compaction Pile           | M                      | 195.49    | 23.91   | 11.63  | 231.03   |
| <b>Others</b>             |                                |                        |           |         |        |          |
|                           | Slope Protection Tuff Patching | M <sup>2</sup>         | 0.39      | 54.26   | 3.07   | 57.72    |
|                           | Box Culverts                   | each                   | *-2       | -       | -      | -        |
|                           | Pipe Culverts                  | each                   | *-2       | -       | -      | -        |
|                           | Drainage                       | KM                     | 102,194   | 515,476 | 40,196 | 657,866  |
|                           | -do-                           | KM                     | 76,646    | 386,607 | 30,147 | 493,400  |
| <b>PAVING WORK</b>        |                                |                        |           |         |        |          |
|                           | Surface Course                 | ton <sub>2</sub>       | 903.20    | 65.62   | 78.82  | 1,047.64 |
|                           | Tack Coat                      | M                      | 1.78      | 0.07    | 0.17   | 2.02     |
|                           | Binder Course                  | ton <sub>2</sub>       | 759.69    | 66.55   | 71.77  | 898.21   |
|                           | Prime Coat                     | M                      | 6.33      | 0.07    | 0.60   | 7.00     |
|                           | Base Course                    | ton                    | 517.44    | 183.39  | 61.91  | 762.74   |
|                           | -do-                           | M <sup>3</sup>         | 346.60    | 55.25   | 23.34  | 425.19   |
|                           | Sub Base                       | M <sup>3</sup>         | 217.93    | 96.36   | 20.65  | 334.94   |
|                           | Course                         | M <sup>3</sup>         | 290.38    | 20.79   | 29.19  | 340.36   |
|                           | Shoulder                       | M <sup>2</sup>         | 118.79    | 18.89   | 5.04   | 147.72   |
|                           | Pavement Curve                 | M                      | 14.92     | 249.51  | 12.39  | 276.82   |
|                           | -do-                           | M                      | 51.16     | 10.27   | 4.88   | 66.31    |
|                           | Lane Mark                      | M                      | 11.51     | 0.07    | 0.38   | 11.96    |
| <b>MISCELLANEOUS WORK</b> |                                |                        |           |         |        |          |
|                           | Median Strip                   | M                      | 132.13    | 158.81  | 18.73  | 309.67   |
|                           | Guard Rail                     | M                      | 1,027.30  | 16.80   | 32.16  | 1,076.26 |
|                           | Illumination                   | each                   | 1626,797  | 49,002  | 56,637 | 1732,436 |
|                           | Traffic Signal                 | each                   | 914,246   | 10,317  | 28,835 | 953,398  |
|                           | Road Sign                      | LS                     | *-3       | -       | -      | -        |
|                           | fence                          | M                      | 781.52    | 54.61   | 33.34  | 869.47   |
|                           | -do-                           | M                      | -         | 69.68   | 4.21   | 73.89    |
|                           | Frontage Rd.                   | M                      | 319.96    | 140.04  | 29.02  | 489.02   |
|                           | Pave.                          |                        |           |         |        |          |
| <b>BRIDGE</b>             |                                |                        |           |         |        |          |
|                           | Highway Bridge                 | each                   | *-4       | -       | -      | -        |
|                           | Over Bridge                    | each                   | *-4       | -       | -      | -        |

Note: \*-1 : See TABLE 7-  
 \*-2 : See TABLE 7-  
 \*-3 : See TABLE 7-  
 \*-4 : See TABLE 7-

\* (1) Divided by 0.90

Fig. 22. Mass Curve

Table 26. Unit Cost of Cut and Fill

(In Rs. at 1983 price)

| Item                         | Sub-Item        | Unit           | Unit Cost |       |      |       |
|------------------------------|-----------------|----------------|-----------|-------|------|-------|
|                              |                 |                | Foreign   | Local | Tax  | Total |
| <b>Cutting &amp; Filling</b> |                 |                |           |       |      |       |
| L = 80 <sup>m</sup>          | Bulldozer Work  | M <sup>3</sup> | 30.16     | 3.87  | 1.92 | 35.95 |
| = 1 <sup>km</sup>            | Dump Truck Work | M <sup>3</sup> | 30.77     | 4.81  | 2.06 | 37.64 |
| = 2                          | -do-            | M <sup>3</sup> | 38.95     | 5.55  | 2.60 | 47.10 |
| = 3                          | -do-            | M <sup>3</sup> | 47.13     | 6.28  | 3.13 | 56.54 |
| = 4                          | -do-            | M <sup>3</sup> | 55.73     | 7.05  | 3.76 | 66.53 |
| = 5                          | -do-            | M <sup>3</sup> | 64.32     | 7.81  | 4.38 | 76.51 |
| = 6                          | -do-            | M <sup>3</sup> | 73.64     | 8.94  | 5.01 | 87.60 |
| <b>Borrow Filling</b>        |                 |                |           |       |      |       |
| L = 7 <sup>km</sup>          | -do-            | M <sup>3</sup> | 59.07     | 15.50 | 4.32 | 78.89 |
| = 10                         | -do-            | M <sup>3</sup> | 75.54     | 18.10 | 5.47 | 99.11 |

Note : Material Carriage Distance

Table 27. Unit Cost of Road Sign

(in Rs. at 1983 price)

| Item             | Unit | Unit Cost |        |       |         |
|------------------|------|-----------|--------|-------|---------|
|                  |      | Foreign   | Local  | Tax   | Total   |
| <b>Road Sign</b> |      |           |        |       |         |
| Double Pole Type | Each | 70,298    | 4,982  | 2,689 | 77,969  |
| Hang Over Type   | Each | 36,852    | 3,471  | 1,304 | 41,627  |
| Over Head Type   | Each | 66,733    | 54,719 | 7,367 | 126,819 |

Table 28. Main Construction Quantities (Project A, B)

| ITEM             | DESCRIPTION          | CLASS                    | Unit           | QUANTITY |         |         |          |          |  |  |
|------------------|----------------------|--------------------------|----------------|----------|---------|---------|----------|----------|--|--|
|                  |                      |                          |                | P-1(S)   | P-3(H)  | K-1(A)  | K-2(A)   | K-3(A)   |  |  |
| EARTH WORK       | Cleaning & Grubbing  |                          | m <sup>2</sup> | 14,400   | 173,000 | 230,000 | 242,000  | 242,000  |  |  |
|                  | Cutting & Filling    | Soil                     | m <sup>3</sup> | 2,400    | 394,000 | 632,000 | 291,000  | 291,000  |  |  |
|                  | Borrow Filling       | do-                      | m <sup>3</sup> | 607,000  | 26,800  | 128,000 | 350,000  | 350,000  |  |  |
|                  | Sand Mat             |                          | m <sup>2</sup> | 100,000  |         |         |          |          |  |  |
| Soft Ground Work | Sand Drain Pile      | φ0.40                    | m              | 91,800   |         |         |          |          |  |  |
|                  | Sand Compaction Pile | φ0.70                    | m              | 56,700   |         |         |          |          |  |  |
| Others           | Slope Protection     | Turf Patching            | m <sup>2</sup> | 53,400   | 54,800  | 82,800  | 98,900   | 98,900   |  |  |
|                  | Box-Culvert          | 8.0x5.0                  | each           | 1        | 1       | 1       | 1        | 1        |  |  |
|                  |                      | 5.0x3.0                  | each           | 2        | 2       | 3       | 3        | 3        |  |  |
|                  |                      | φ1.80, 1.50              | each           | 2        | 2       | 3       | 3        | 3        |  |  |
|                  |                      | φ1.20, 0.90              | each           | 3        | 3       | 3       | 3        | 3        |  |  |
|                  |                      |                          | km             | 2.51     | 2.40    | 7.01    | 8.23     | 8.76     |  |  |
|                  | Road Drainage        | Asphalt                  | ton            | (4,300)  | (5,230) | (1,200) | (12,600) | (14,300) |  |  |
|                  | Surface Course       | do-                      | ton            | 11,400   | 14,300  | 22,000  | 24,500   | 28,000   |  |  |
|                  | Binder Course        | Bituminous Stabilization | ton            | 5,350    | 8,340   | 22,000  | 24,500   | 21,000   |  |  |
|                  | Base Course          | Crushed Stone            | m <sup>3</sup> | 7,100    | 6,710   | 20,000  | 16,700   | 19,100   |  |  |
| Carriage Way     | Sub Base Course      | Gravel and C. Stone      | m <sup>3</sup> | 7,600    | 8,940   | 20,000  |          |          |  |  |
|                  |                      | Soil Cement              | m <sup>3</sup> |          |         | 16,700  | 18,100   | 18,100   |  |  |
|                  | Shoulder Pavement    |                          | m <sup>2</sup> | 12,000   | 27,300  | 30,400  | 38,200   | 38,200   |  |  |
|                  | Curve                | P.C. Curve               | m              | 6,880    | 1,360   |         |          |          |  |  |
| Others           |                      | Asphaltic Curve          | m              | 8,880    | 17,760  | 2,420   | 2,460    | 3,400    |  |  |
|                  | Lane Mark            | Paint                    | m              |          | 40,000  | 44,100  | 51,100   | 51,100   |  |  |
|                  | Median Strip         |                          | m              |          | 7,010   | 8,230   | 8,030    | 8,030    |  |  |
|                  | Guard Rail           | Steel                    | m              | 3,730    | 10,900  | 9,660   | 9,840    | 17,000   |  |  |
| Miscellaneous    | Flumination          |                          | vol            | 0.5      | 1.5     | 2.0     | 1.0      | 1.5      |  |  |
|                  | Traffic Signal       |                          | vol            | 2.5      |         |         |          |          |  |  |
|                  | Road Sign            |                          | Lr             | 1.0      | 1.5     | 2.0     | 1.0      | 1.5      |  |  |
|                  | Fence                | Panel Fence              | m              | 3,030    | 2,400   |         |          |          |  |  |
|                  |                      | Barbed Wire Fence        | m              |          | 3,050   | 14,000  | 16,500   | 19,500   |  |  |
|                  | Frontage Road        |                          | m              |          |         |         |          |          |  |  |
| Main Road        |                      | 10x15m                   | m <sup>2</sup> | 282.5    | 175     | 1,102.5 | 1,085    | 577.5    |  |  |
|                  |                      | 15x35m                   | m <sup>2</sup> | 612.5    | 982.5   | 455     | 880      | 945      |  |  |
|                  |                      | 35x80m                   | m <sup>2</sup> |          |         | 910     |          | 1,400    |  |  |
| Crossing Road    |                      | L=28m                    | m <sup>2</sup> |          |         | 683.6   | 1,548.4  | 683.6    |  |  |
|                  |                      | L=56m                    | m <sup>2</sup> |          |         | 442.4   | 442.4    |          |  |  |

\*6. 1: Divided by 0.95

Fig. 22. Mass Curve

Table 29. Main Construction Quantities (Project A)

| ITEM          | DESCRIPTION          | CLASS                    | Unit           | QUANTITY |         |         |         |        |
|---------------|----------------------|--------------------------|----------------|----------|---------|---------|---------|--------|
|               |                      |                          |                | X-1      | X-2     | X-3     | X-4     |        |
| EARTH WORK    | Cutting & Grabbage   |                          | m              | 173,000  | 200,000 | 259,000 | 312,000 |        |
|               | Excavation & Filling | Sd)                      | m              | 315,000  | 300,000 | 255,000 | 217,000 |        |
|               | Fill                 | -60-                     | m              | 73,300   | 13,100  | 372,000 | 207,000 |        |
|               | Soft Ground Work     | 0.70                     | m              | 54,800   | 82,800  | 27,400  | 49,400  |        |
|               | Others               | Sand Drain Pile          | 0.70           | m        | 54,800  | 82,800  | 27,400  | 49,400 |
|               |                      | Sand Compaction Pile     | 0.70           | m        | 54,800  | 82,800  | 27,400  | 49,400 |
|               |                      | Slope Protection         | 0.05           | m        | 54,800  | 82,800  | 27,400  | 49,400 |
|               |                      | Box-Culvert              | 3.0x3.0        | each     | 2       | 3       | 3       | 3      |
|               |                      | Pile-Culvert             | 1.80x1.30      | each     | 2       | 3       | 3       | 3      |
|               |                      |                          | 1.20x0.80      | each     | 2       | 3       | 3       | 3      |
| PAVING WORK   | Road Drainage        |                          | m              | 7,700    | 13,200  | 8,700   | 9,700   |        |
|               | Shoulder Course      | Asphalt                  | ton            | 6,000    | 6,000   | 11,000  | 14,100  |        |
|               | Base Course          | -40-                     | ton            | 12,700   | 12,700  | 11,000  | 13,500  |        |
|               | Carriage Way         | Bituminous Stabilization | ton            | 12,700   | 12,700  | 11,000  | 13,500  |        |
|               |                      | Gravelled Stone          | m              | 11,600   | 9,300   | 1,200   | 8,800   |        |
|               | Others               | Sub Base Course          | m              | 11,600   | 9,300   | 1,200   | 8,800   |        |
|               |                      | Shoulder Pavement        | m              | 27,200   | 30,400  | 36,500  | 44,100  |        |
|               |                      | Curve                    | m              | 27,200   | 30,400  | 36,500  | 44,100  |        |
|               |                      | Lane Mark                | m              | 2,400    | 3,400   | 1,200   | 1,700   |        |
|               | MISCELLANEOUS WORK   | Medial Strip             | m              | 2,400    | 3,400   | 1,200   | 1,700   |        |
| Guard Rail    |                      | m                        | 2,400          | 3,400    | 1,200   | 1,700   |         |        |
| Plantation    |                      | m                        | 2,400          | 3,400    | 1,200   | 1,700   |         |        |
| Steel         |                      | m                        | 2,400          | 3,400    | 1,200   | 1,700   |         |        |
| Miscellaneous |                      | Castable Stone           | m <sup>3</sup> | 1.0      | 1.0     | 1.0     | 1.0     |        |
|               |                      | Road Sign                | nos            | 1.0      | 1.0     | 1.0     | 1.0     |        |
| Others        |                      | Panor                    | nos            | 1.0      | 1.0     | 1.0     | 1.0     |        |
|               |                      | Panel                    | nos            | 1.0      | 1.0     | 1.0     | 1.0     |        |
| BRIDGE        |                      | Frontage Road            | m              | 14,000   | 16,500  | 19,500  | 23,500  |        |
|               |                      | Main Road                | 15m            | m        | 631.9   | 623.9   | 201.4   | 503.5  |
|               | 12m                  |                          | m              | 761.5    | 568.5   | 545.2   | 277.5   |        |
|               | Crossing Road        | 15m                      | m              | 324.3    | 265     | 265     | 265     |        |
|               |                      | 12m                      | m              | 663.6    | 1,277.2 | 641.8   | 760     |        |
|               | Over Bridge          | 15m                      | m              | 642.4    | 1,022.4 | 641.8   | 760     |        |

Table 30. Project Construction Cost (Case-5), (Financial)

(in million RS)

| ITEM                     | SECTION | PROJECT (0) |            |            | PROJECT (A) |            |            | TOTAL REMARKS |                  |              |                       |  |
|--------------------------|---------|-------------|------------|------------|-------------|------------|------------|---------------|------------------|--------------|-----------------------|--|
|                          |         | P-1<br>(L)  | P-2<br>(B) | P-3<br>(C) | X-1<br>(B)  | X-2<br>(B) | X-3<br>(B) |               |                  |              |                       |  |
| EARTH WORK               |         | 31.78       | -          | 53.96      | 52.15       | 68.33      | 55.93      | 181.46        | 272.23 (33%) * 2 |              |                       |  |
| PAVING WORK              |         | 18.00       | 2.71       | 31.76      | 59.60       | 62.91      | 61.36      | 21.70         | 305.66           | 282.20 (32%) |                       |  |
| MISCELLANEOUS WORK       |         | 10.53       | 5.18       | 21.00      | 42.87       | 26.74      | 30.55      | 6.14          | 87.69            | 130.56 (16%) |                       |  |
| BRIDGE                   |         | 9.00        | -          | 10.00      | 1.47        | 41.45      | 40.36      | 36.75         | 1.00             | 129.05       | 150.30 (19%)          |  |
| CONSTRUCTION COST        |         | 70.00       | 7.89       | 117.72     | 15.12       | 179.44     | 205.36     | 184.59        | 34.47            | 603.86       | 815.29 (66%)*3 (100%) |  |
| LAND ACQUISITION         |         | 33.30       | -          | -          | -           | 46.04      | 40.64      | 51.65         | 8.10             | 146.52       | 180.11 (15%)          |  |
| CONTINGENCY              |         | 15.63       | 1.18       | 17.07      | 2.27        | 33.82      | 36.90      | 35.45         | 6.40             | 112.57       | 140.32 (12%)          |  |
| ENGINEERING SURVIVE etc. |         | 7.06        | 0.70       | 11.78      | 1.51        | 17.94      | 20.54      | 18.46         | 3.45             | 60.30        | 81.53 (7%)            |  |
| PROJECT COST             |         | 126.68      | 9.80       | 147.27     | 16.90       | 277.24     | 303.44     | 290.15        | 52.91            | 928.34       | 1,226.25 (100%)       |  |
| ROAD LENGTH (M)          |         | 1.50        | 1.30       | 2.90       | ...         | 7.14       | 6.30       | 9.21          | ...              | 25.44        | 31.20                 |  |
| TOTAL COST/ROAD LENGTH   |         | 81.30       | 7.60       | 50.80      | ...         | 38.80      | 46.20      | 29.30         | ...              | 36.30        | 39.30                 |  |

NOTE \* 1 OTHERS \* 2 ( ) : percentage of construction cost  
 \* 3 ( ) : percentage of project cost

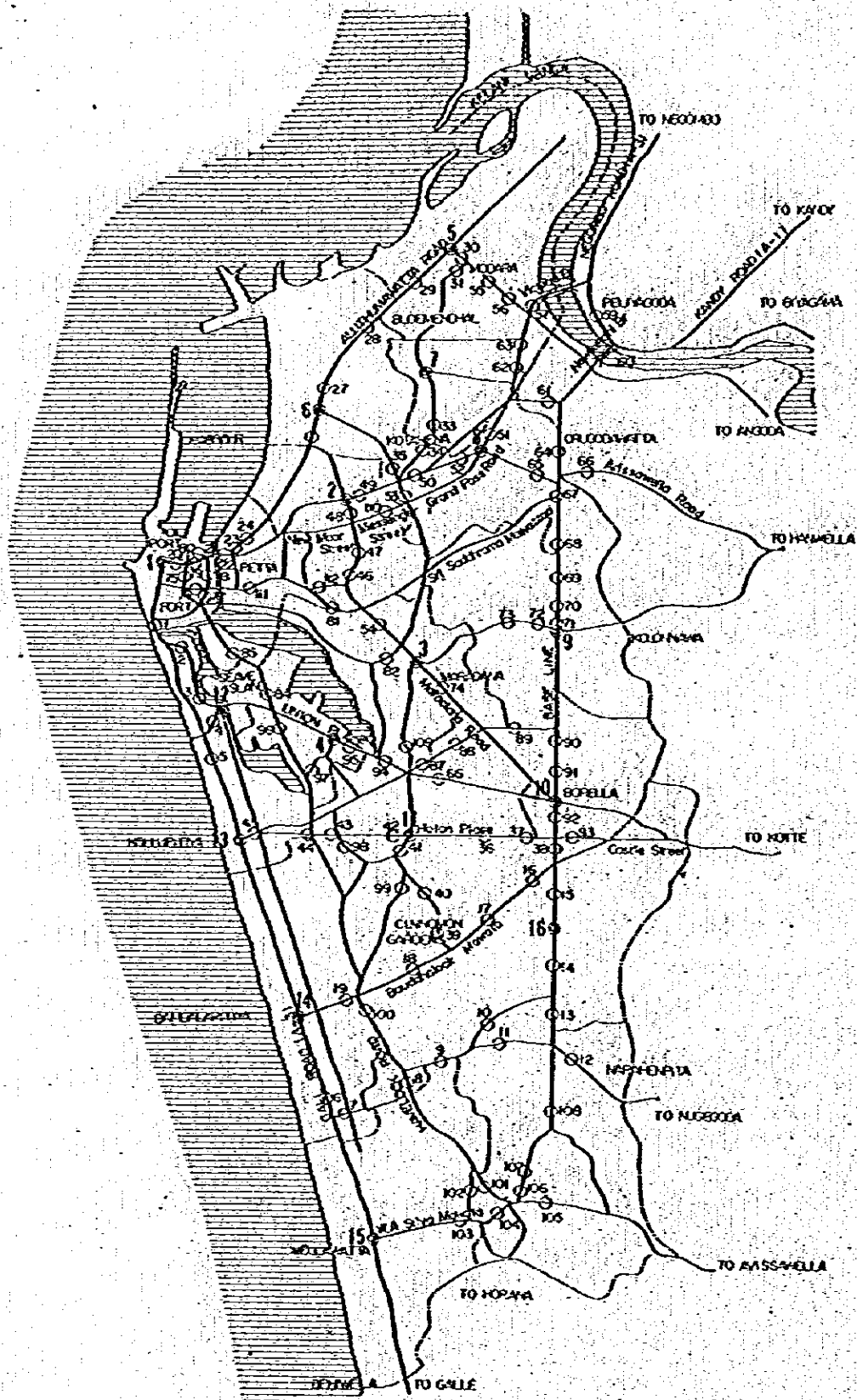


Fig. 1. The Survey Points of the Road Inventory

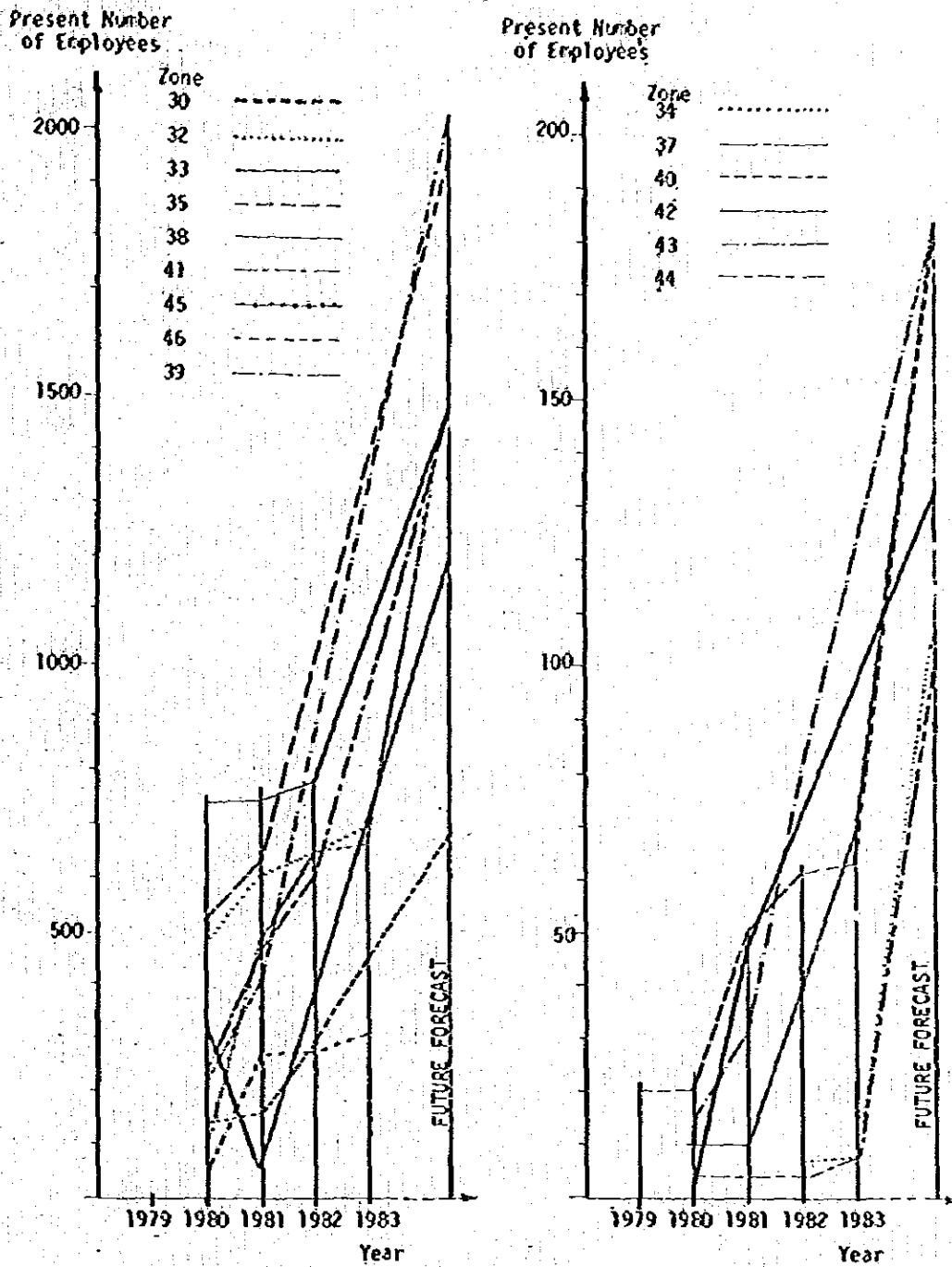


Fig. 4. Number of Private Companies by Zone

W.C. 11 Divided by 0.90

Fig. 22. Mass Curve



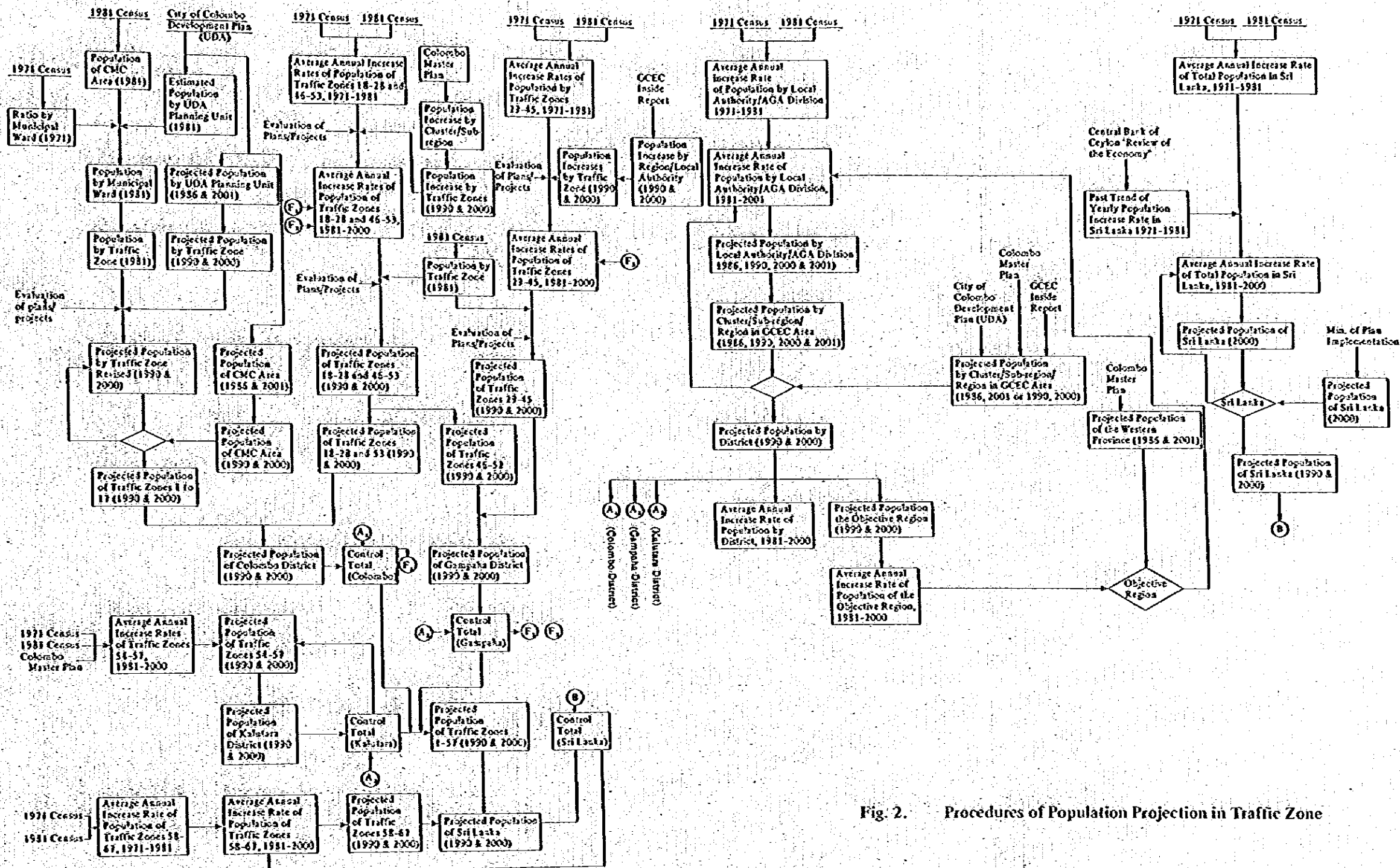


Fig. 2. Procedures of Population Projection in Traffic Zone

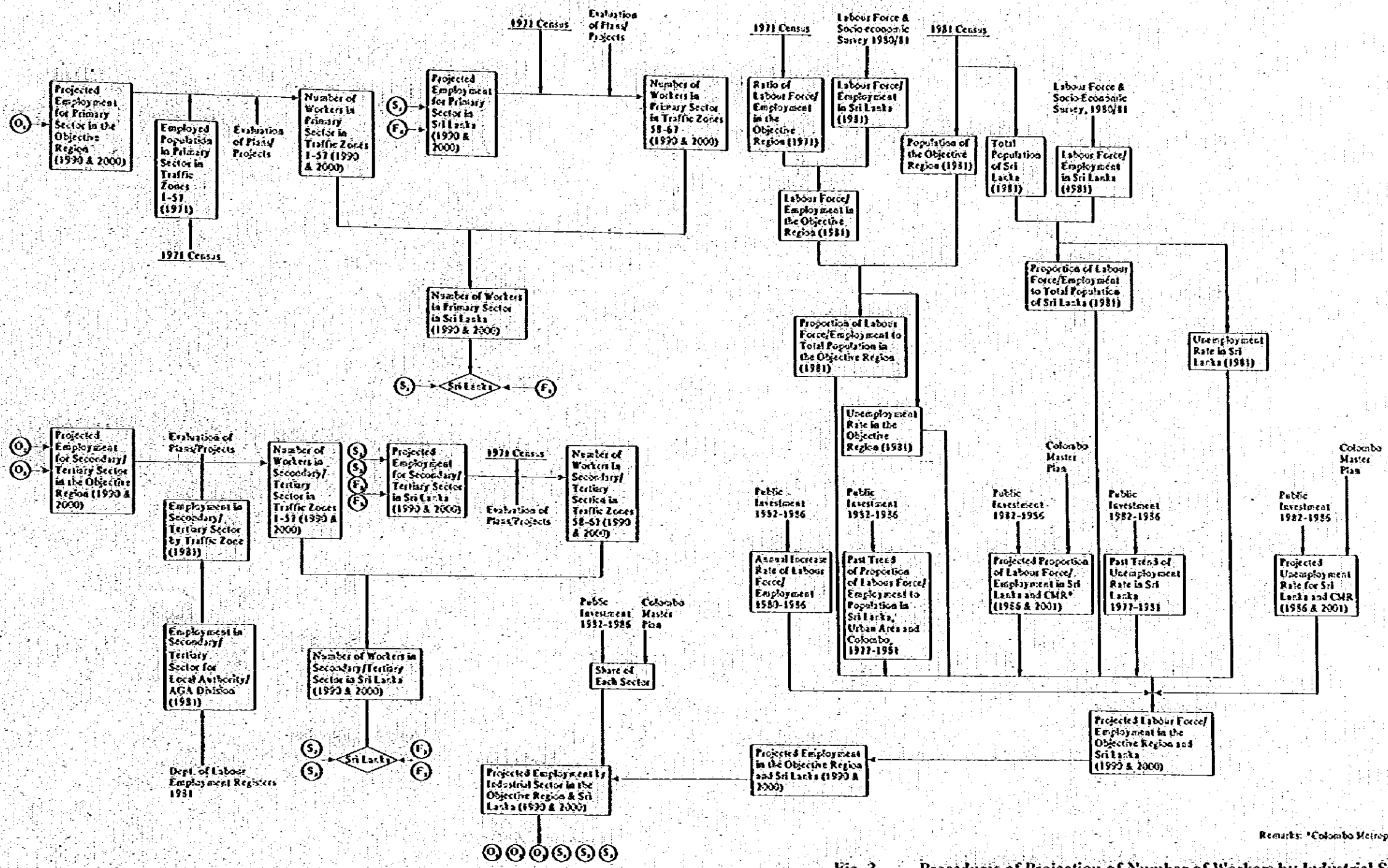


Fig. 3. Procedures of Projection of Number of Workers by Industrial Sector and Traffic Zone



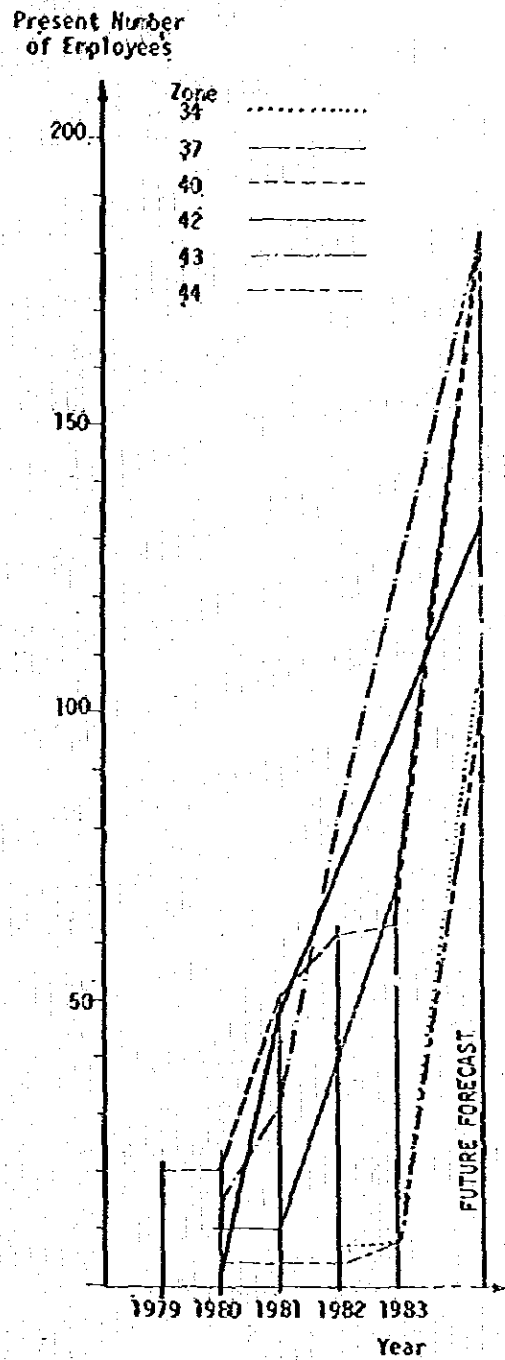
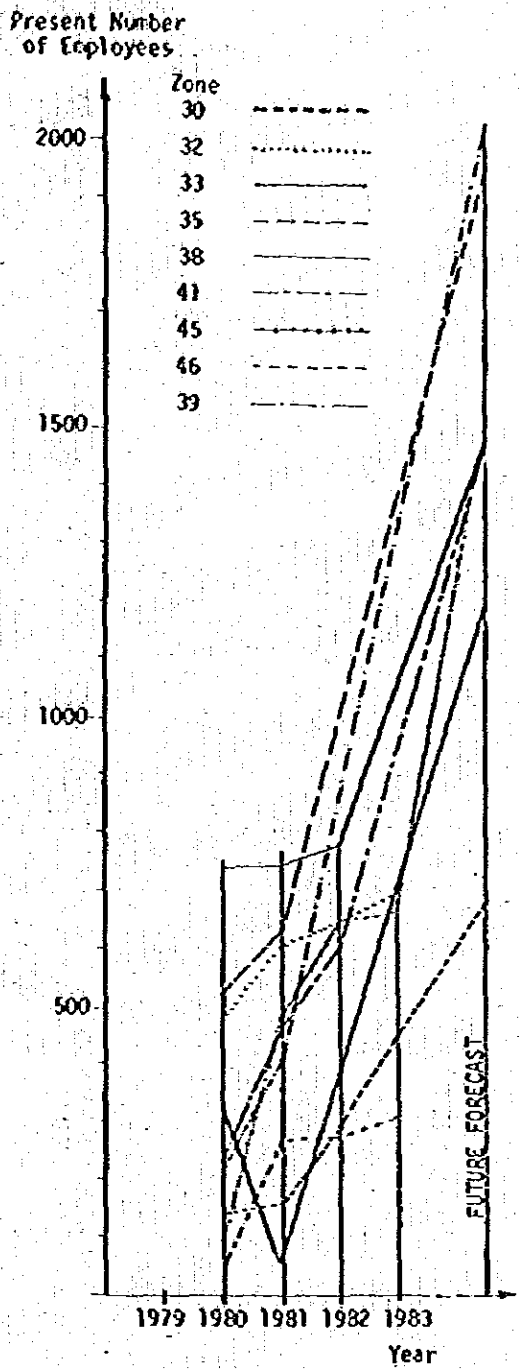


Fig. 4. Number of Private Companies by Zone

Fig. 22. Mass Curve

Fig. 22. Mass Curve

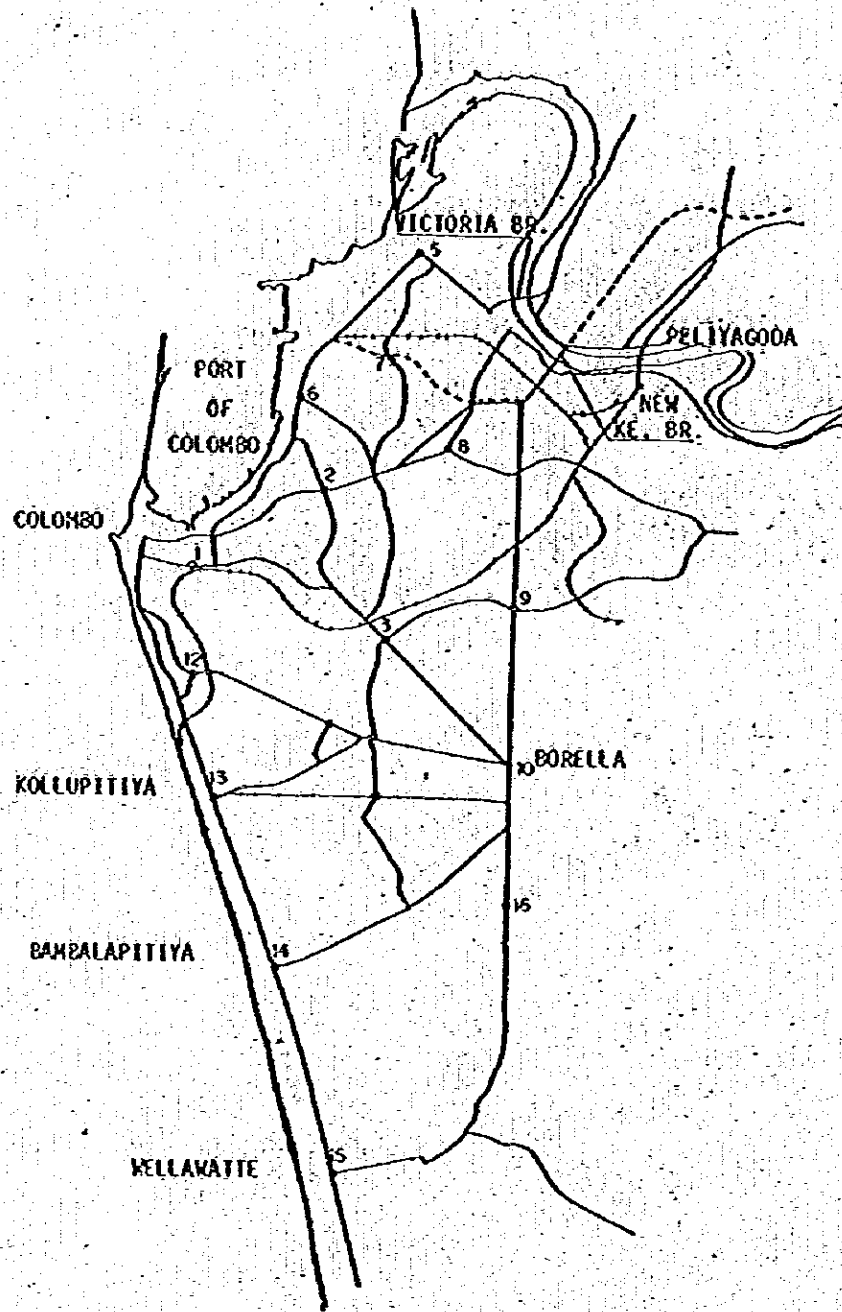


Fig. 5. Road Network for Traffic Assignment within Colombo

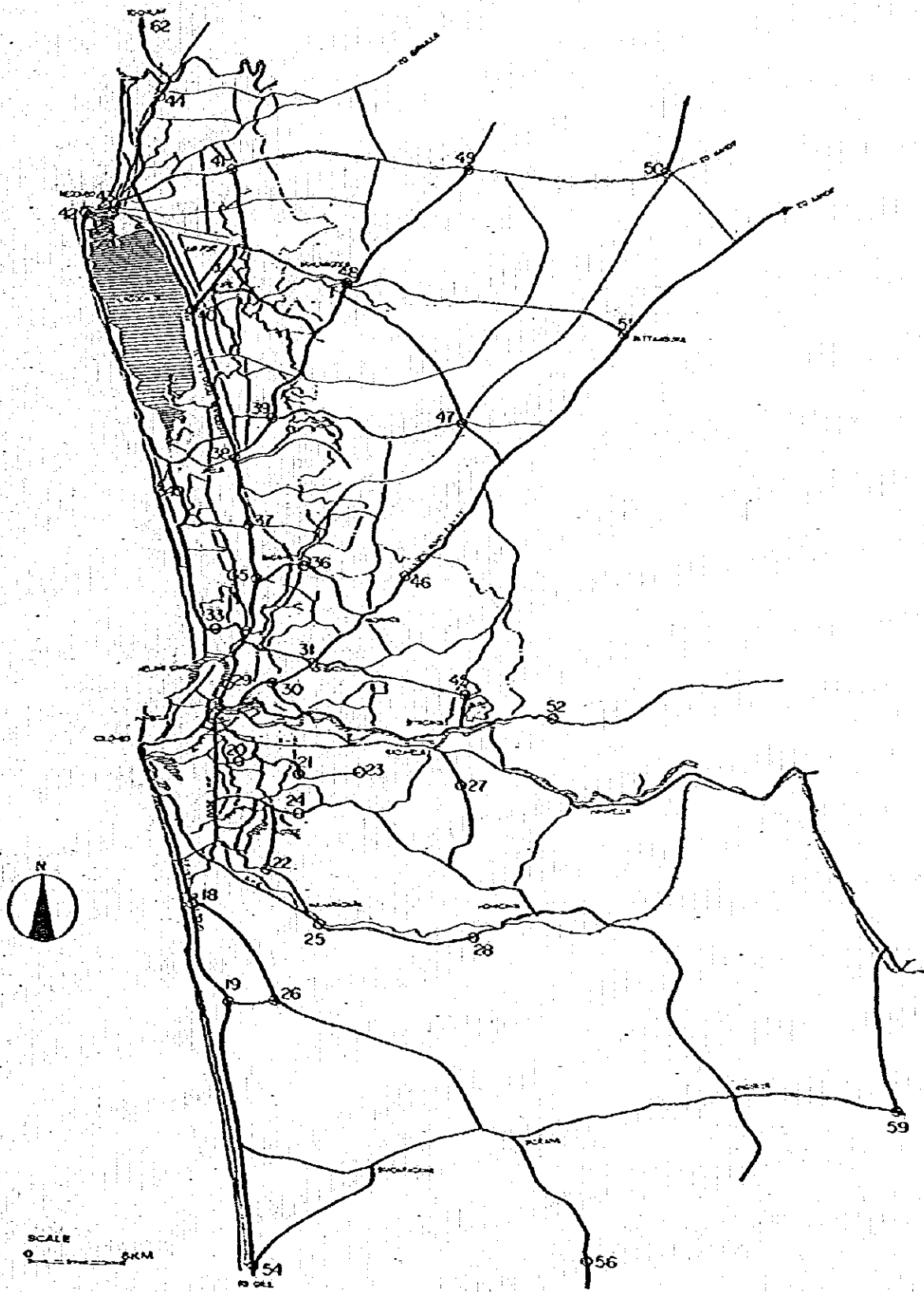


Fig. 6. Road Network for Traffic Assignment – Objective Area –

X-75 Divided by 0.90

Fig. 22. Mass Curve

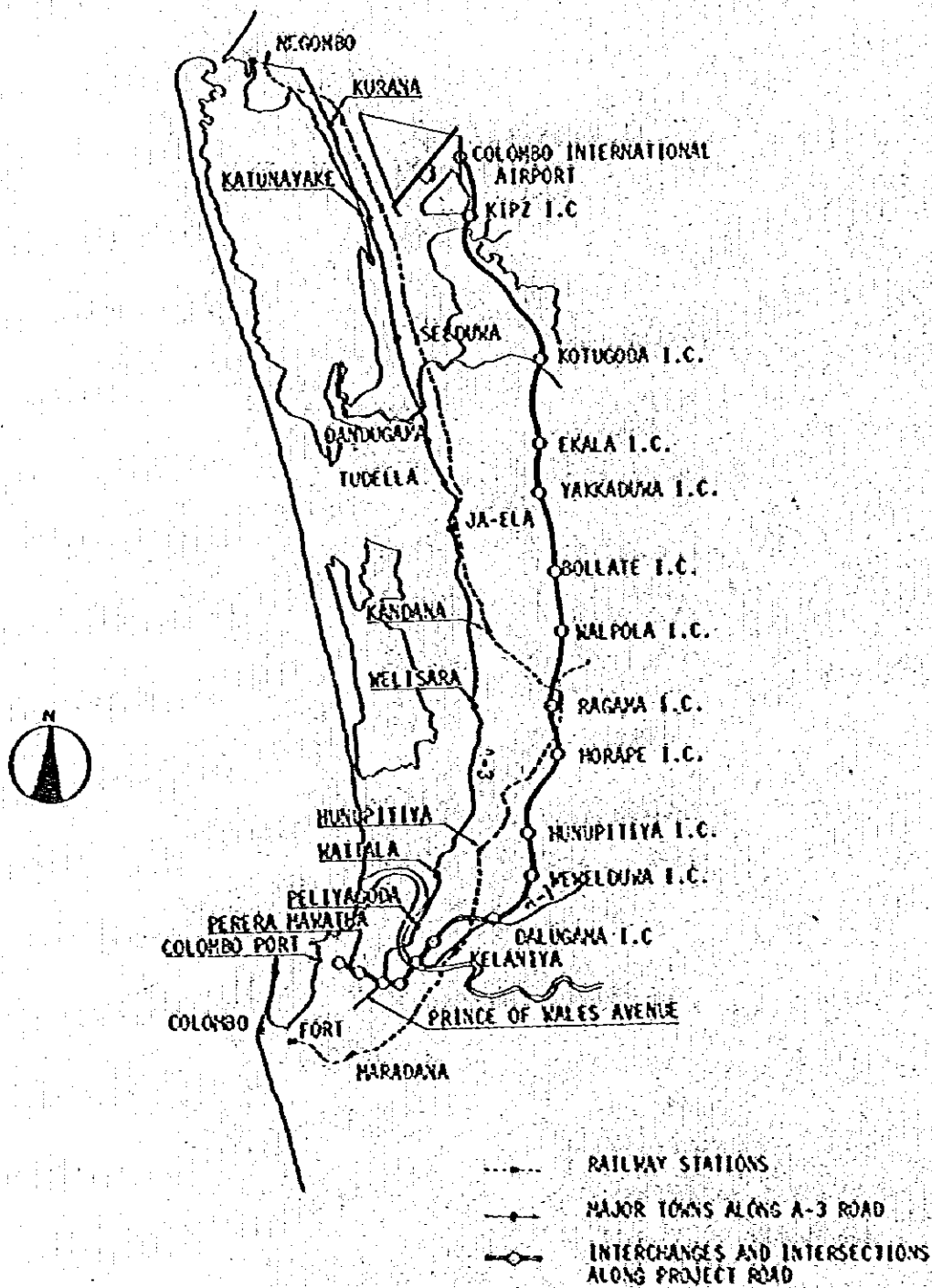


Fig. 7. Geographical Relationship among Expressway, Railway and A-3 Road

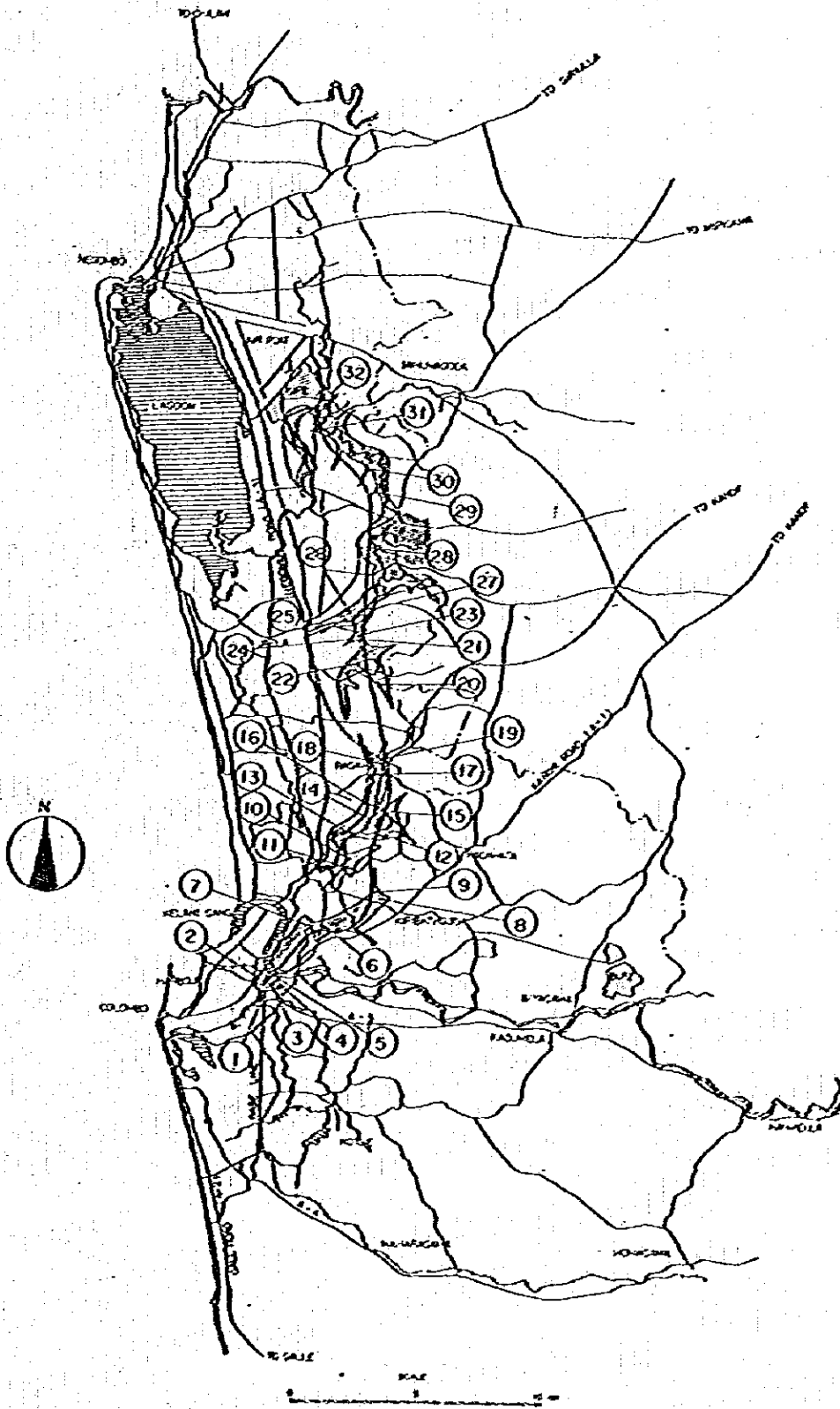


Fig. 8. Location of Existing Flood Relief Drainage Structures



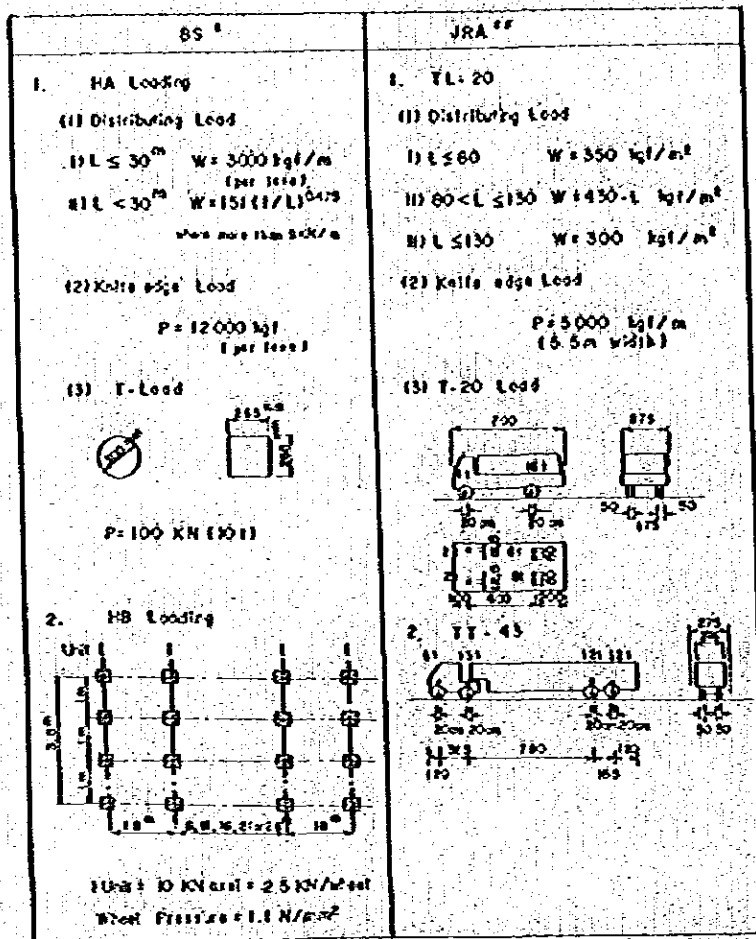


Fig. 9. Comparison of BS and JRA Loads

<sup>a</sup> BS : British Standards  
<sup>aa</sup> JRA : Japan Road Association

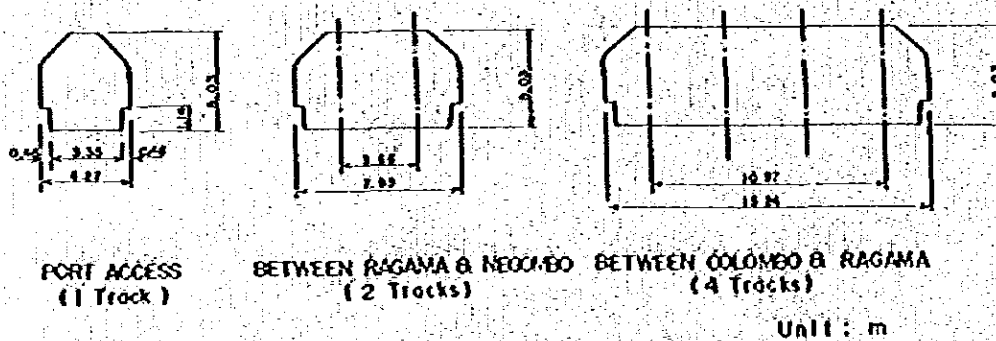
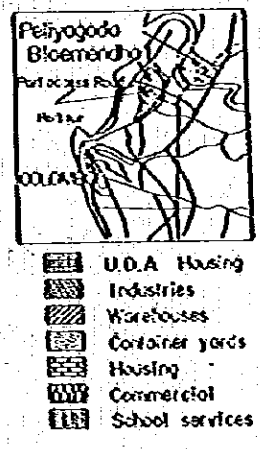
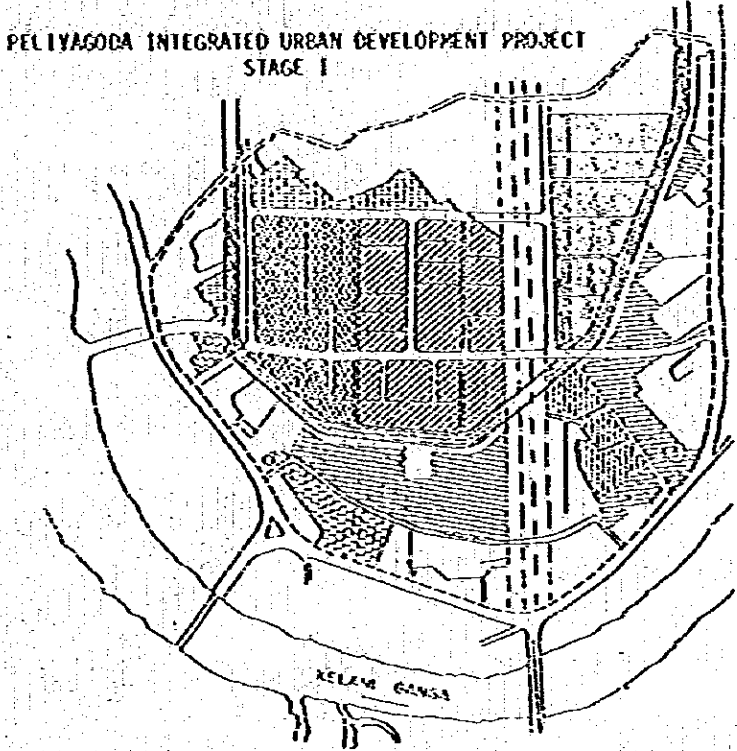
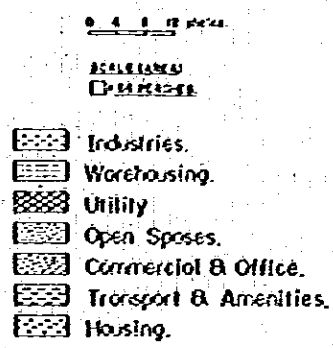
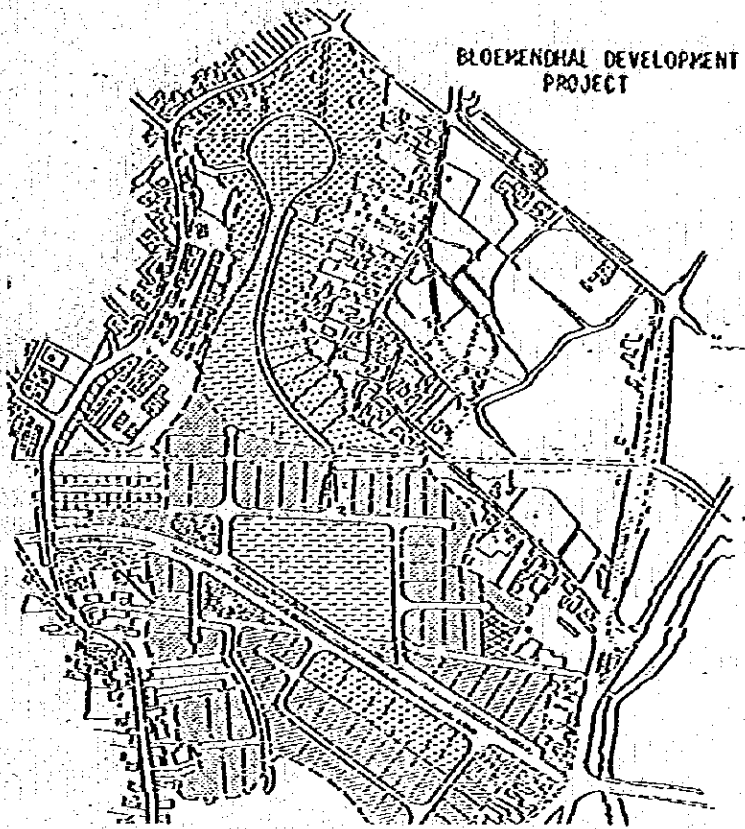


Fig. 10. Standard Gauge of Railway



**Fig. 11. Peliyagoda and Bloemendhal Development Projects**

X. 1: Divided by 0.90

**Fig. 22. Mass Curve**

DIAMOND TYPE INTERCHANGE

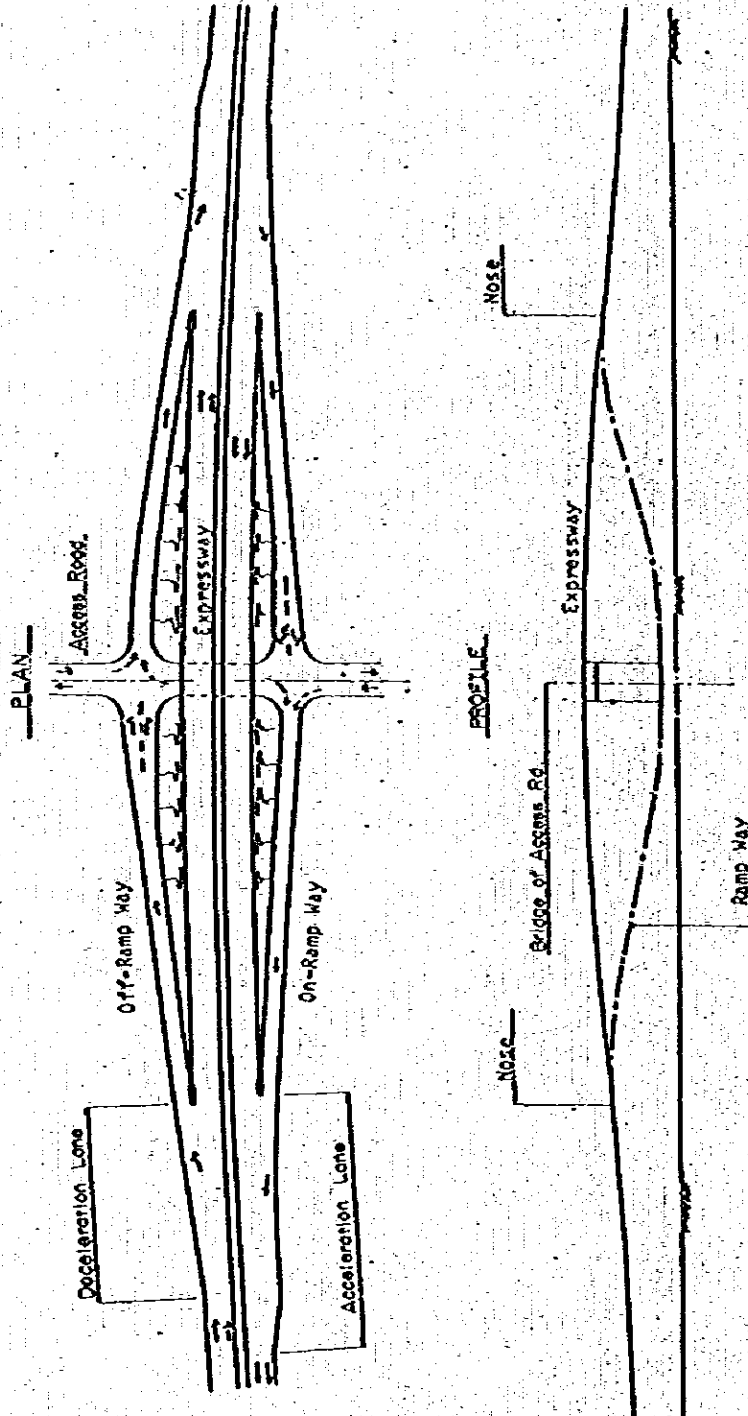


Fig. 12. Standard Plan of Interchange

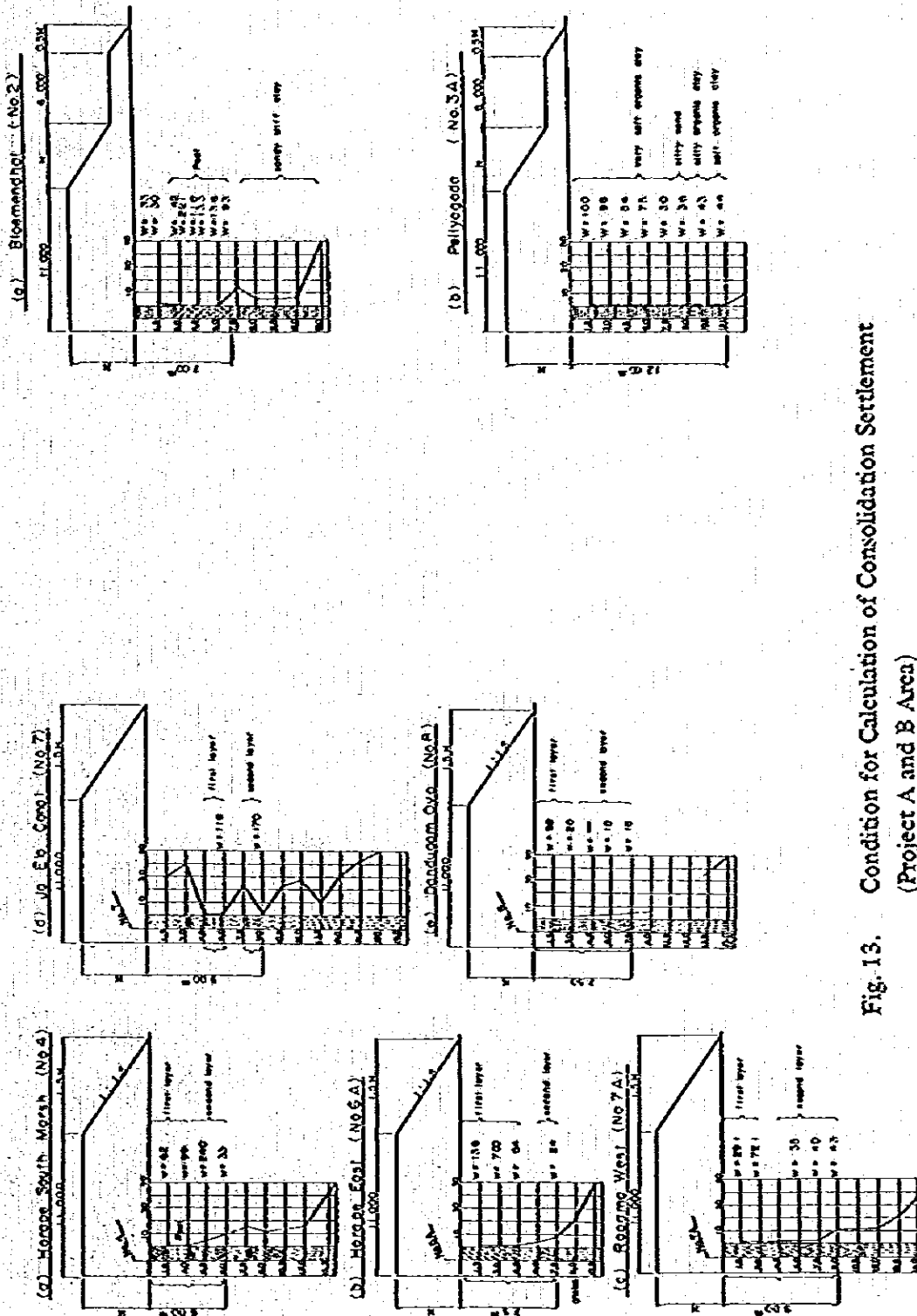


Fig. 13. Condition for Calculation of Consolidation Settlement  
(Project A and B Area)

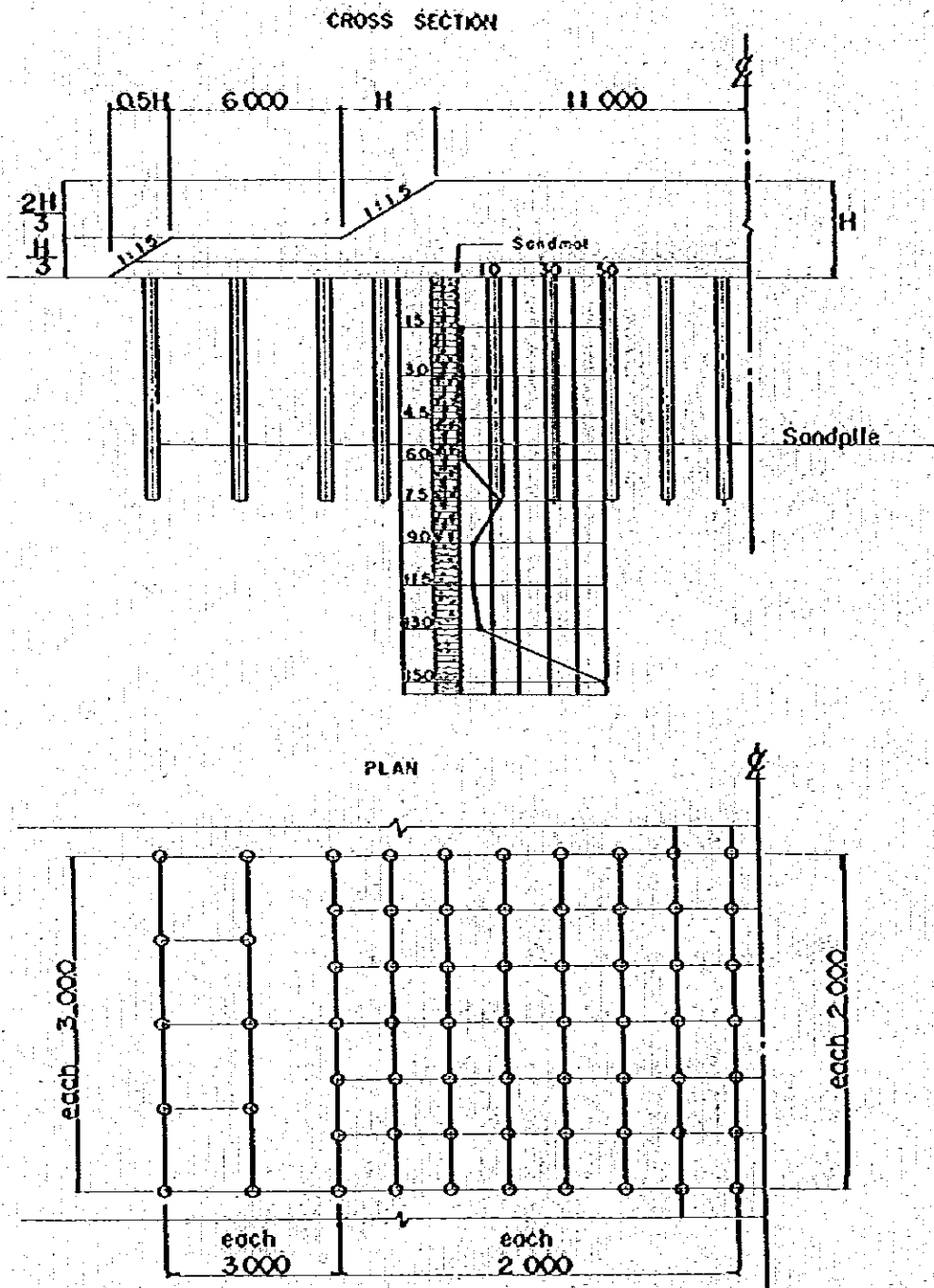
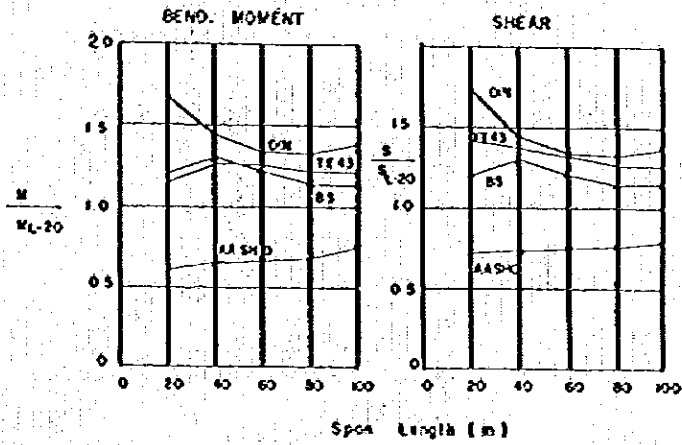


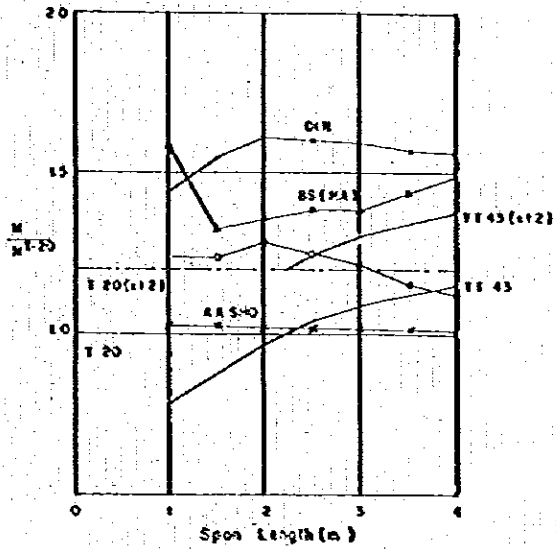
Fig. 14. Sand Pile Arrangement

Design Bending Moment and Shear (including impact)  
for Main Girders



X-11 Divided by 0.90

Design Bending Moment (including impact) for  
Reinforced Concrete Slabs



§ Slabs supported by main girders or stringers.

$M_{T-20}$  = bending moment due to T-20 loading,  
 $M$  = bending moment due to design loadings used in different countries.

Fig. 22. Mass Curve

Fig. 15. Design Bending Moment and Shear (Including Impact)



LIST OF MAIN STRUCTURES ALONG P1-P3 SECTION

| No. | Name of Structure | Total width of Bridge (m) | Length of Bridge (m) | Span No. | Type of Bridge | Material | Remarks |
|-----|-------------------|---------------------------|----------------------|----------|----------------|----------|---------|
| 1   | 1st Bridge        | 20.00                     | 15.00                | 1        | Beam Bridge    | RC       |         |
| 2   | 2nd Bridge        | 20.00                     | 15.00                | 2        | Beam Bridge    | RC       |         |
| 3   | 3rd Bridge        | 20.00                     | 15.00                | 3        | Beam Bridge    | RC       |         |
| 4   | 4th Bridge        | 20.00                     | 15.00                | 4        | Beam Bridge    | RC       |         |
| 5   | 5th Bridge        | 20.00                     | 15.00                | 5        | Beam Bridge    | RC       |         |
| 6   | 6th Bridge        | 20.00                     | 15.00                | 6        | Beam Bridge    | RC       |         |
| 7   | 7th Bridge        | 20.00                     | 15.00                | 7        | Beam Bridge    | RC       |         |
| 8   | 8th Bridge        | 20.00                     | 15.00                | 8        | Beam Bridge    | RC       |         |
| 9   | 9th Bridge        | 20.00                     | 15.00                | 9        | Beam Bridge    | RC       |         |
| 10  | 10th Bridge       | 20.00                     | 15.00                | 10       | Beam Bridge    | RC       |         |

1. RC: Reinforced Concrete; 2. M: Mortar; 3. S: Stone; 4. C: Cement; 5. G: Gravel; 6. S.S: Stainless Steel; 7. S.P: Special Purpose; 8. S.P.C: Special Purpose Concrete; 9. S.P.C.C: Special Purpose Concrete Cement; 10. S.P.C.C.C: Special Purpose Concrete Cement Cement.

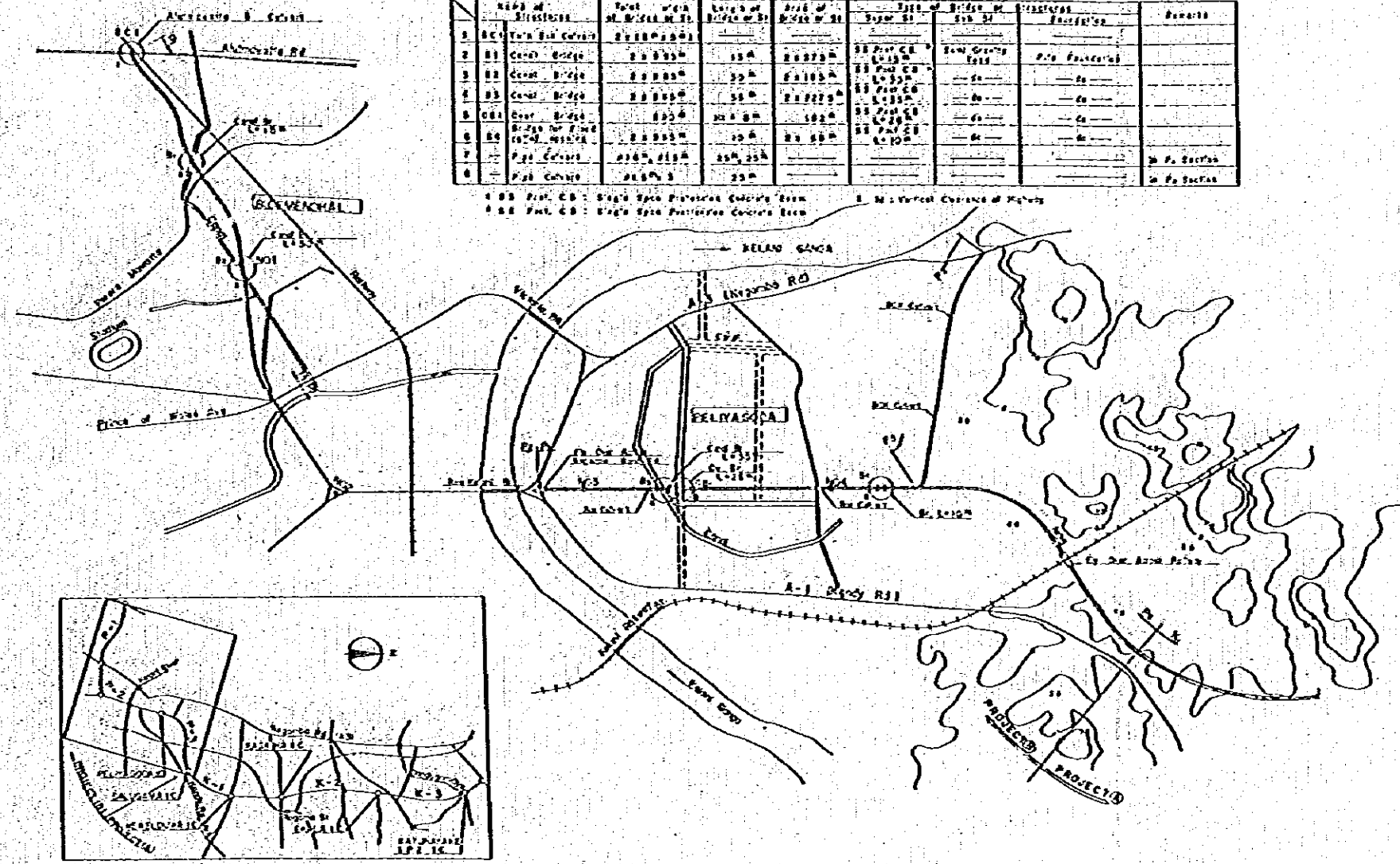
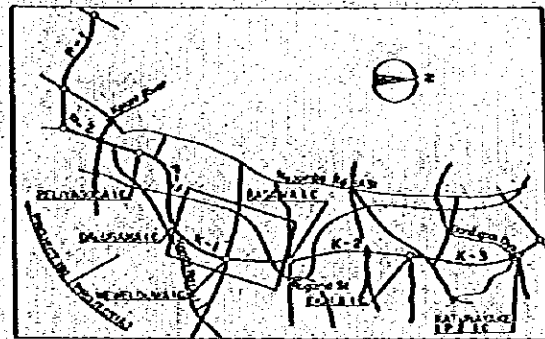


Fig. 16. Location of Structures along P1 ~ P3 Section





LIST OF MAIN STRUCTURES ALONG K1 SECTION

| No. | Name of Structure | Span of Bridge or Length of Box Culvert | Length of Bridge or Length of Box Culvert | Area of Deck or Area of Box Culvert | Type of Bridge or Type of Box Culvert | Substratum                   | Remarks          |                           |
|-----|-------------------|---|---|-------------------------------------|---------------------------------------|------------------------------|------------------|---------------------------|
| 1   | BB                | Bridge                                  | 2 x 8.55 <sup>m</sup>                     | 10 <sup>m</sup>                     | 2 x 8.55 <sup>m</sup>                 | 28 Pile CB L=10 <sup>m</sup> | Soft Gravel      | Pile Foundation           |
| 2   | CB1               | Box Culvert                             | 3 <sup>m</sup> x 2 <sup>m</sup>           |                                     |                                       |                              |                  |                           |
| 3   | CB2               | Box Culvert                             | 3 <sup>m</sup> x 2 <sup>m</sup>           |                                     |                                       |                              |                  |                           |
| 4   | BB                | Bridge for Road                         | 2 x 8.55 <sup>m</sup>                     | 10 <sup>m</sup>                     | 2 x 8.55 <sup>m</sup>                 | 28 Pile CB L=10 <sup>m</sup> | Soft Gravel      | Pile Foundation           |
| 5   | CB3               | Box Culvert                             | 10.75 <sup>m</sup>                        | 10 <sup>m</sup>                     | 2 x 8.55 <sup>m</sup>                 | 28 Pile CB L=10 <sup>m</sup> | Harder & stiffer | Spread Foundation         |
| 6   | CB4               | Box Culvert                             | 3 <sup>m</sup> x 2 <sup>m</sup>           | 25 <sup>m</sup>                     |                                       |                              |                  |                           |
| 7   | CB5               | Box Culvert                             | 3 <sup>m</sup> x 2 <sup>m</sup>           | 25 <sup>m</sup>                     |                                       |                              |                  |                           |
| 8   | BB                | Bridge for Road                         | 2 x 8.55 <sup>m</sup>                     | 10 <sup>m</sup>                     | 2 x 8.55 <sup>m</sup>                 | 28 Pile CB L=10 <sup>m</sup> | Soft Gravel      | Pile Foundation           |
| 9   | CB6               | Box Culvert                             | 10.75 <sup>m</sup>                        | 10 <sup>m</sup>                     | 2 x 8.55 <sup>m</sup>                 | 28 Pile CB L=10 <sup>m</sup> | Harder & stiffer | Spread Foundation         |
| 10  | CB7               | Box Culvert                             | 3 <sup>m</sup> x 2 <sup>m</sup>           | 25 <sup>m</sup>                     |                                       |                              |                  |                           |
| 11  | CB8               | Box Culvert                             | 3 <sup>m</sup> x 2 <sup>m</sup>           | 25 <sup>m</sup>                     |                                       |                              |                  |                           |
| 12  | CB9               | Box Culvert                             | 3 <sup>m</sup> x 2 <sup>m</sup>           | 25 <sup>m</sup>                     |                                       |                              |                  |                           |
| 13  | BB                | Bridge for Road                         | 2 x 8.55 <sup>m</sup>                     | 2 x 8.55 <sup>m</sup>               | 2 x 8.55 <sup>m</sup>                 | 28 Pile CB L=10 <sup>m</sup> | Soft Gravel      | Pile Foundation           |
| 14  | CB10              | Box Culvert                             | 3 <sup>m</sup> x 2 <sup>m</sup>           | 25 <sup>m</sup>                     |                                       |                              |                  |                           |
| 15  | CB11              | Box Culvert                             | 3 <sup>m</sup> x 2 <sup>m</sup>           | 25 <sup>m</sup>                     |                                       |                              |                  |                           |
| 16  | BB                | Bridge                                  | 2 x 8.55 <sup>m</sup>                     | 10 <sup>m</sup>                     | 2 x 8.55 <sup>m</sup>                 | 28 Pile CB L=10 <sup>m</sup> | Soft Gravel      | Spread or Pile Foundation |
| 17  | BB                | Bridge for Road                         | 2 x 8.55 <sup>m</sup>                     | 10 <sup>m</sup>                     | 2 x 8.55 <sup>m</sup>                 | 28 Pile CB L=10 <sup>m</sup> | Soft Gravel      | Pile Foundation           |
| 18  | BB                | Bridge for Road                         | 2 x 8.55 <sup>m</sup>                     | 10 <sup>m</sup>                     | 2 x 8.55 <sup>m</sup>                 | 28 Pile CB L=10 <sup>m</sup> | Soft Gravel      | Pile Foundation           |
| 19  | CB12              | Box Culvert                             | 3 <sup>m</sup> x 2 <sup>m</sup>           | 25 <sup>m</sup>                     |                                       |                              |                  |                           |
| 20  | BB                | Bridge for Road                         | 2 x 8.55 <sup>m</sup>                     | 10 <sup>m</sup>                     | 2 x 8.55 <sup>m</sup>                 | 28 Pile CB L=10 <sup>m</sup> | Soft Gravel      | Pile Foundation           |
| 21  | CB13              | Box Culvert                             | 3 <sup>m</sup> x 2 <sup>m</sup>           | 25 <sup>m</sup>                     |                                       |                              |                  |                           |

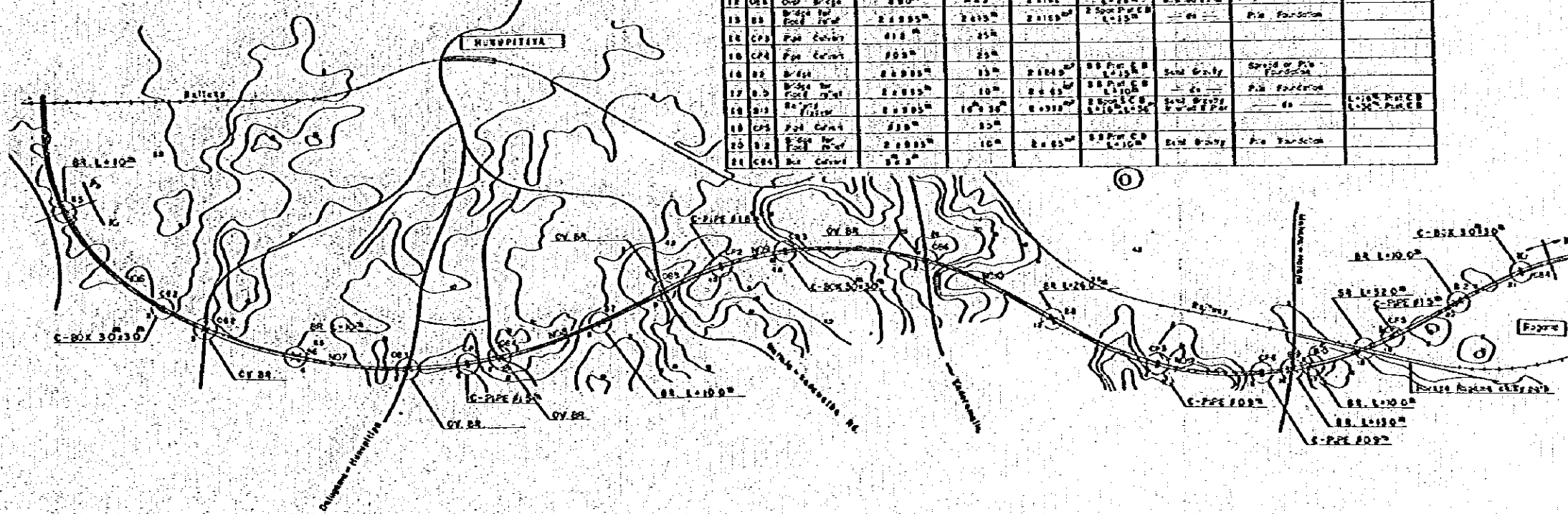


Fig. 17. Location of Structures along K-1 Section

LIST OF MAIN STRUCTURES ALONG K2 SECTION

| No. | Name of Structure | Total Width of Bridge or Sl. | Length of Bridge or Sl. | Area of Bridge or Sl. | Type of Bridge or Structure |               |            | Remarks |
|-----|-------------------|------------------------------|-------------------------|-----------------------|-----------------------------|---------------|------------|---------|
|     |                   |                              |                         |                       | Span No.                    | Sub Sl.       | Foundation |         |
| 1   | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 2   | Box Culvert       | 3.0 x 3.0M                   | 10M                     | 0.90M <sup>2</sup>    | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 3   | Box Culvert       | 3.0 x 3.0M                   | 10M                     | 0.90M <sup>2</sup>    | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 4   | Box Culvert       | 3.0 x 3.0M                   | 10M                     | 0.90M <sup>2</sup>    | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 5   | Box Culvert       | 3.0 x 3.0M                   | 10M                     | 0.90M <sup>2</sup>    | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 6   | Box Culvert       | 3.0 x 3.0M                   | 10M                     | 0.90M <sup>2</sup>    | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 7   | Over Bridge       | 8.50M                        | 101.50M                 | 2.1825M <sup>2</sup>  | 2 Spans                     | 1st. Concrete | Spread F.  |         |
| 8   | Box Culvert       | 3.0 x 3.0M                   | 10M                     | 0.90M <sup>2</sup>    | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 9   | Over Bridge       | 8.50M                        | 101.50M                 | 2.1825M <sup>2</sup>  | 2 Spans                     | 1st. Concrete | Spread F.  |         |
| 10  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 11  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 12  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 13  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 14  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 15  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 16  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 17  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 18  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 19  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 20  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 21  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 22  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 23  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 24  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 25  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |
| 26  | Over Bridge       | 10.75M                       | 181.10M                 | 2.1381M <sup>2</sup>  | 1 Span                      | 1st. Concrete | Spread F.  |         |

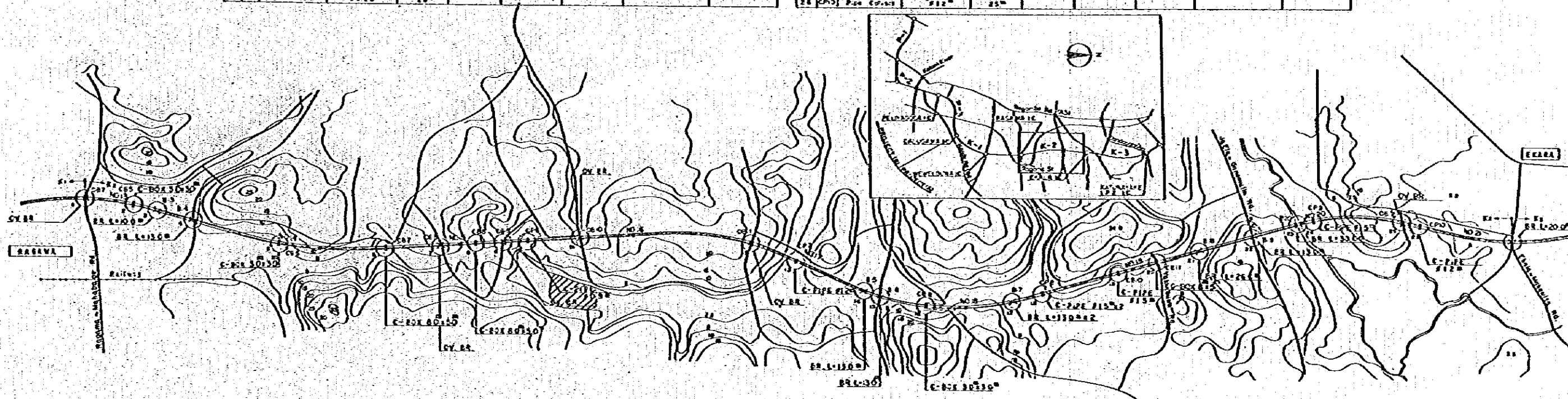


Fig. 18. Location of Structures along K-2 Section

LIST OF MAIN STRUCTURES ALONG K<sub>3</sub> SECTION

| No. | Name of Structure | Span Width of Bridge or Sl. | Length of Bridge or Sl. | Area of Bridge or Sl.   | Type of Bridge or Sl. | Structure    | Foundation | Remarks |
|-----|-------------------|-----------------------------|-------------------------|-------------------------|-----------------------|--------------|------------|---------|
| 1   | B21               | 2 x 9.95m                   | 20m                     | 2 x 199.0m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 2   | B22               | 2 x 9.95m                   | 13m                     | 2 x 124.4m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 3   | CP1               | 2 x 9.95m                   | 25m                     | 2 x 248.8m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 4   | B23               | 2 x 9.95m                   | 10m                     | 2 x 99.5m <sup>2</sup>  | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 5   | CP2               | 2 x 9.95m                   | 28m                     | 2 x 298.6m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 6   | B24               | 2 x 9.95m                   | 13m                     | 2 x 124.4m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 7   | CP3               | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 8   | B25               | 2 x 9.95m                   | 10m                     | 2 x 99.5m <sup>2</sup>  | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 9   | CP4               | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 10  | CP5               | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 11  | CP6               | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 12  | CP7               | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 13  | CP8               | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 14  | CP9               | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 15  | CP10              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 16  | CP11              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 17  | CP12              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 18  | CP13              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 19  | CP14              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 20  | CP15              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 21  | CP16              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 22  | CP17              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 23  | CP18              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 24  | CP19              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 25  | CP20              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 26  | CP21              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 27  | CP22              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 28  | CP23              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 29  | CP24              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 30  | CP25              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 31  | CP26              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 32  | CP27              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 33  | CP28              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 34  | CP29              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |
| 35  | CP30              | 2 x 9.95m                   | 27m                     | 2 x 273.7m <sup>2</sup> | 11 Pile CB            | Self Gravity | Spread F.  |         |

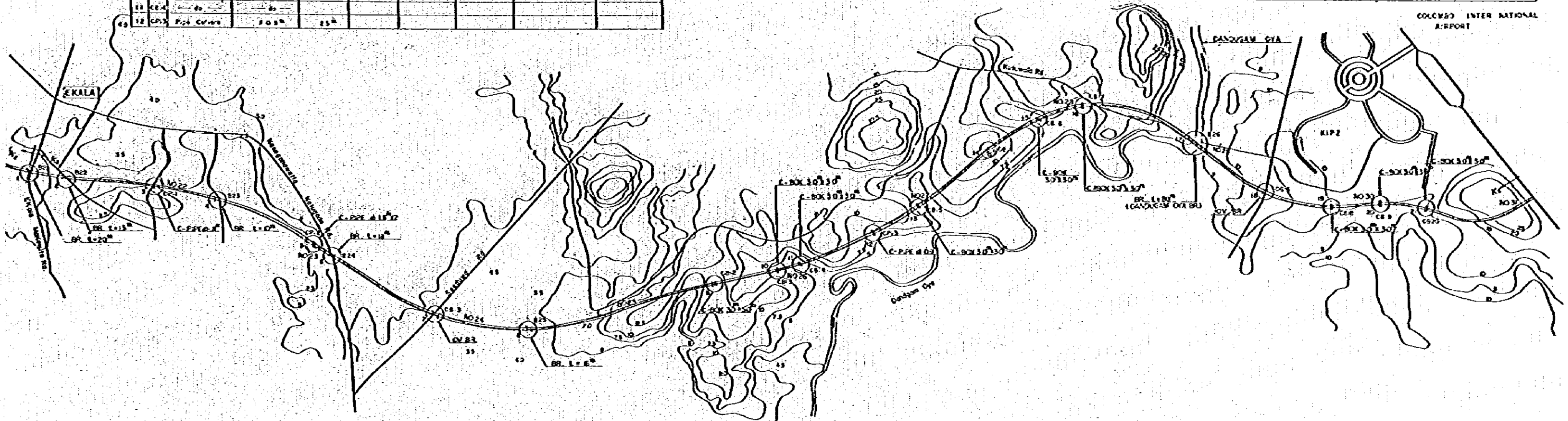
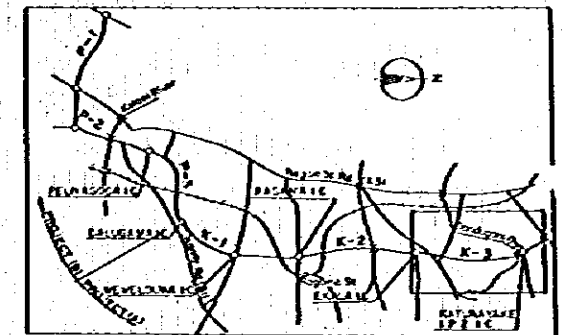


Fig. 19. Location of Structures along K-3 Section



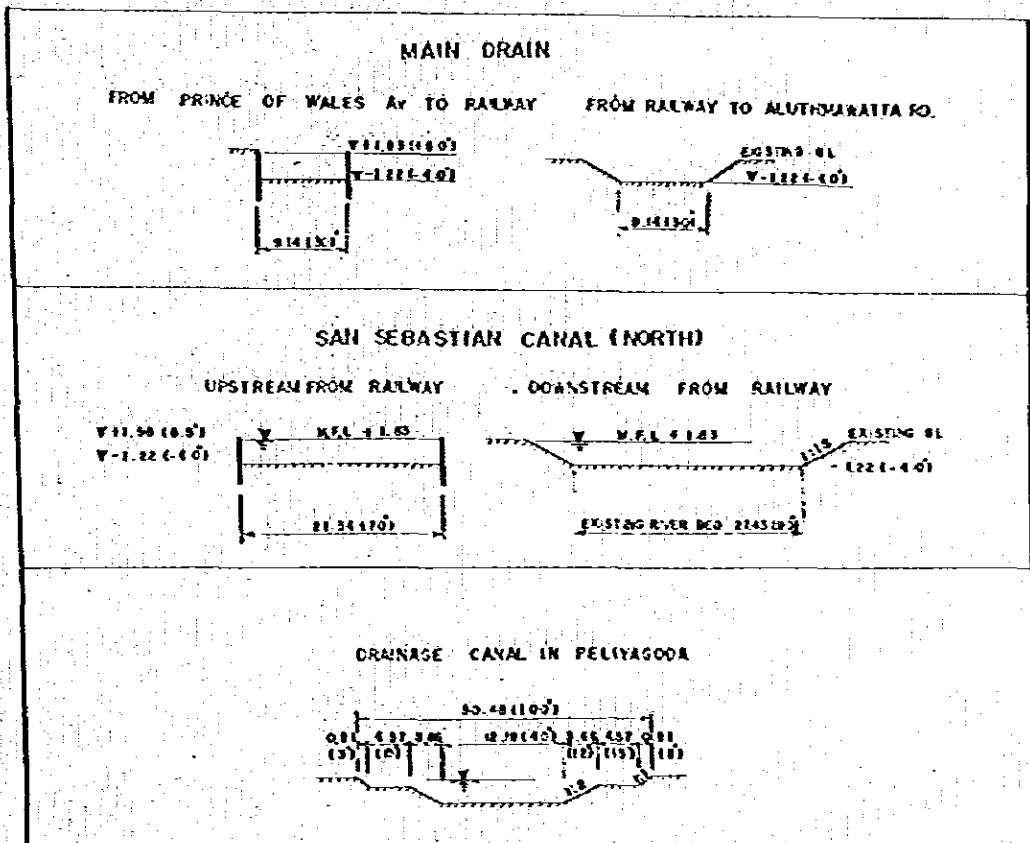
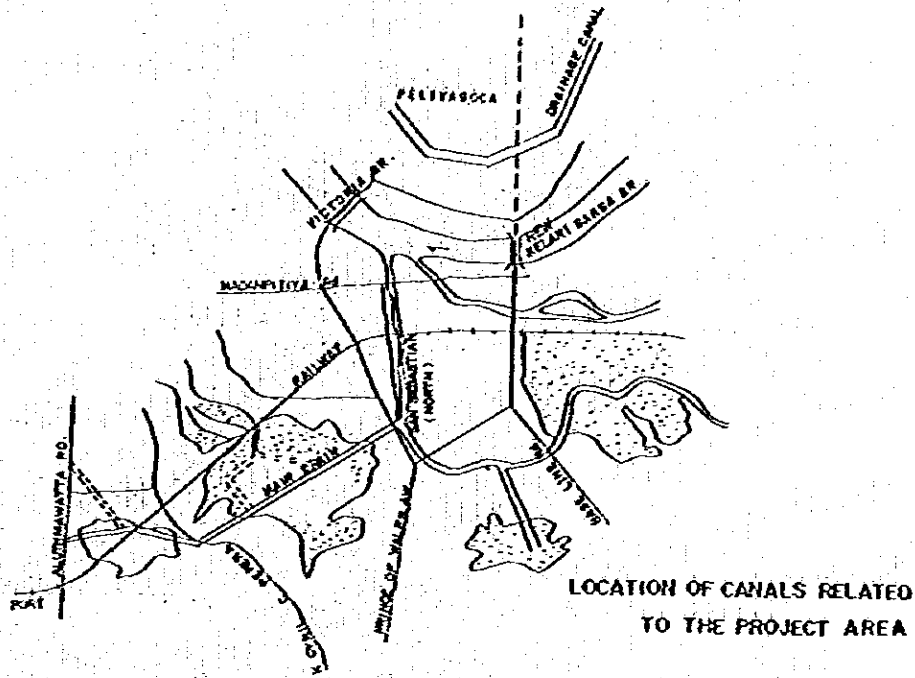
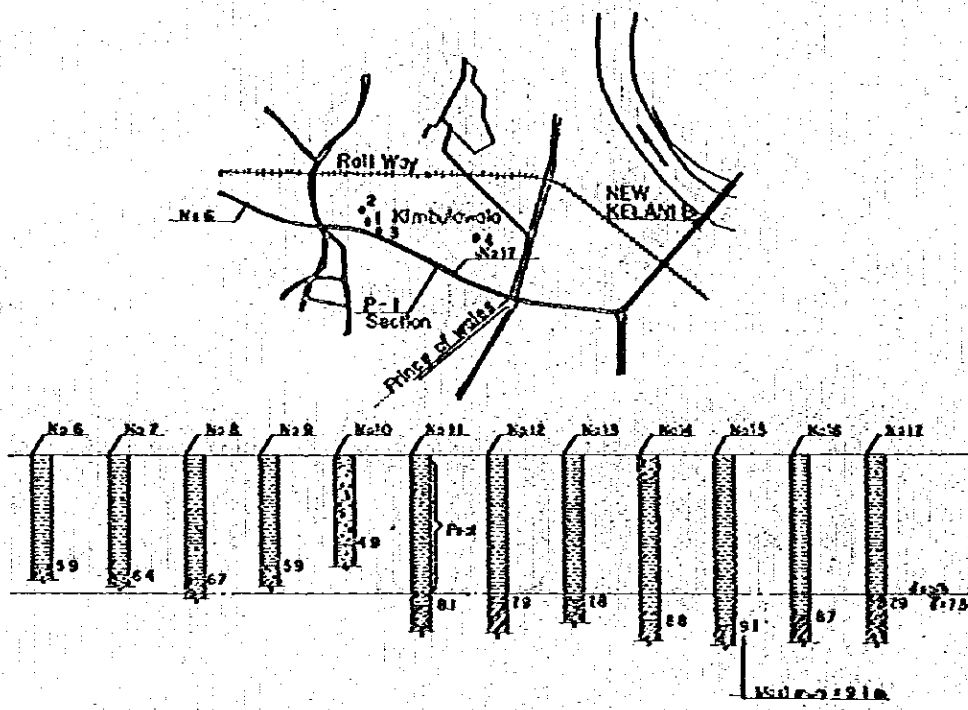


Fig. 20. Typical Cross Sections of Canals



Core Resistance

| Depth (m) | 1  | 2  | 3   | 4  |
|-----------|----|----|-----|----|
| 0-10      |    |    |     |    |
| 1.2       | 12 |    |     |    |
| 1.4       | 14 |    |     |    |
| 1.6       | 16 |    |     |    |
| 1.8       | 18 |    |     |    |
| 2.0       | 20 |    |     |    |
| 2.2       | 30 |    |     |    |
| 2.4       | 24 |    |     |    |
| 2.6       | 27 |    |     |    |
| 2.8       | 28 |    |     |    |
| 3.0       | 33 |    |     |    |
| 3.2       | 36 |    |     |    |
| 3.4       | 37 |    |     |    |
| 3.6       | 39 |    |     |    |
| 3.8       | 39 |    |     |    |
| 4.0       | 46 | 35 | 37  | 1  |
| 4.2       | 48 | 30 | 42  | 60 |
| 4.4       | 60 | 35 | 38  | 45 |
| 4.6       | 60 | 35 | 44  | 55 |
| 4.8       | 67 | 35 | 60  | 80 |
| 5.0       | 62 | 45 | 60  | 75 |
| 5.2       | 70 | 40 | 80  | 90 |
| 5.4       | 71 | 48 | 138 | 80 |
| 5.6       | 77 | 60 |     | 80 |
| 5.8       | 77 | 38 |     | 70 |
| 6.0       | 82 | 80 |     |    |

Fig. 21. Results of Auger Boring (Existing Data)

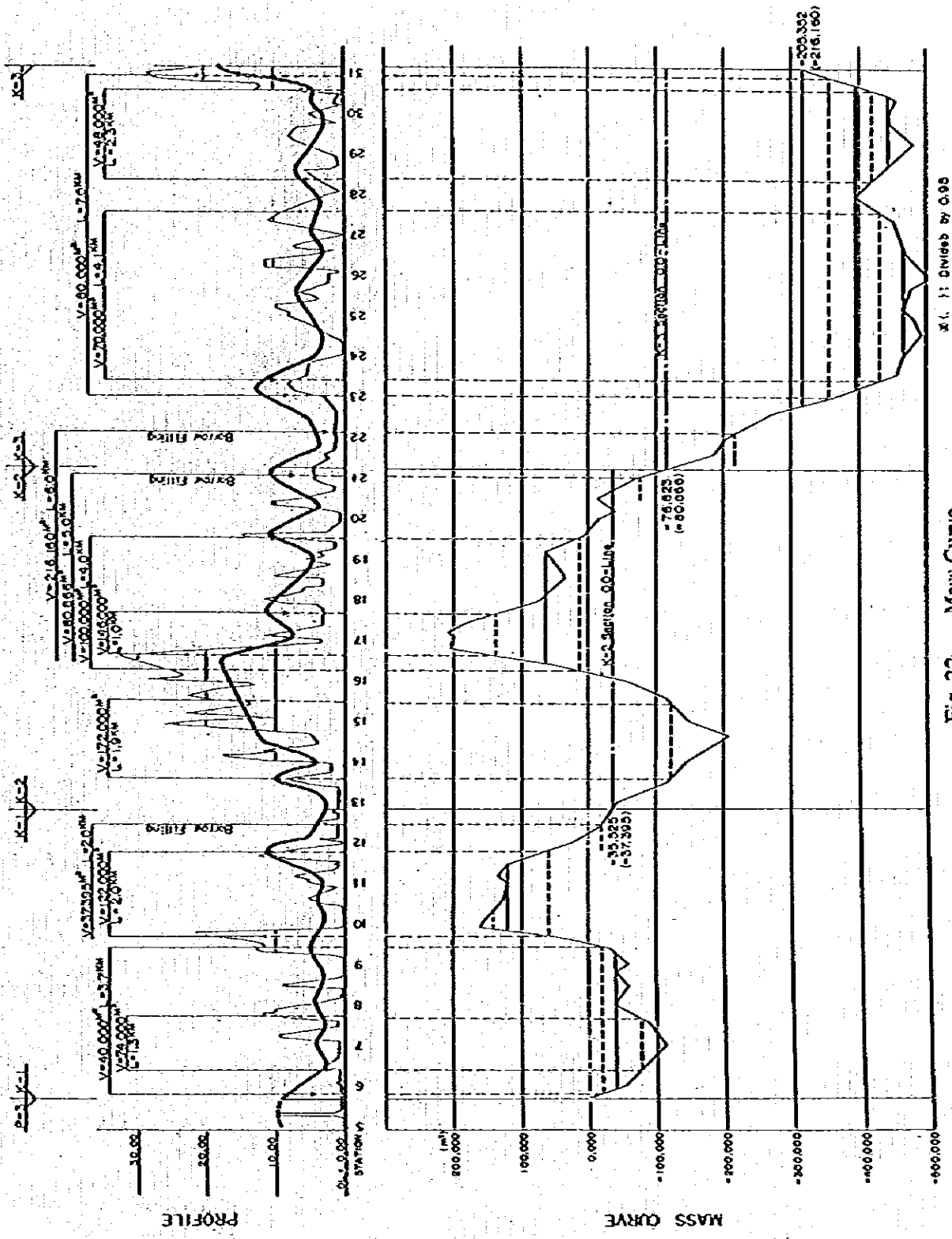


Fig. 22. Mass Curve







JICA