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## APPENDIX

### A.1 Area of Concrete Push-Out Failure Surface

Lloyd and Wright (1990) expressions for  $A_c$

For single studs,

$$A_c (ss) = 2w_1 (w_1^2/4 + h_p^2)^{1/2} + w_1 (w_1^2 + 2h_p^2)^{1/2} + 2w_2 (3D_p^2)^{1/2}$$

For double studs,

$$A_c (ds) = A_c (ss) + 2s (w_1^2/4 + h_p^2)^{1/2}$$

For off-center studs, the following expressions may be used,

$$\begin{aligned} A_c &= (w_1/2 + x) ((w_1/2 + x)^2 + h_p^2)^{1/2} + (3w_1/2 + x) ((w_1/2 - x)^2 + h_p^2)^{1/2} + \\ &w_1 (4 (w_1/2 + x)^2 + 2h_p^2)^{1/2} + 2w_2 (3D_p^2)^{1/2} + \\ &s ((w_1/2 + x)^2 + h_p^2)^{1/2} + (w_1/2 - x)^2 + h_p^2)^{1/2} \end{aligned}$$

where x is the positive to the front of the trough.

$h_p$  = projected height of stud =  $H_s - h_r$  (in.)

$w_1$  = overall trough width (in.)

$w_2$  = width of trough bottom flange (in.)

$s$  = transverse spacing of studs (in.)

$H_s$  = overall stud height (in.)

$h_r$  = metal deck rib height (in.)

#### For Configuration 3, concrete failure surface area in $mm^2$

|            |   |                             |
|------------|---|-----------------------------|
| $w_1$      | = | 180                         |
| $w_2$      | = | 140                         |
| $h_r, D_p$ | = | 51                          |
| $h_p$      | = | 29                          |
| $x$        | = | 55                          |
| $s$        | = | 0                           |
| Area       | = | <u>113667mm<sup>2</sup></u> |

#### For Configuration 1, concrete failure surface area in $mm^2$

$$\text{Cylinder surface area} = \pi d h = \pi \times 114 \times 925 = \underline{331414mm^2}$$

#### For Configuration 2, concrete failure surface area in $mm^2$

$$\begin{aligned} \text{Cylinder surface area} + \text{two steel strip area} &= \pi d h + 2 (2 lh) \\ &= \pi \times 114 \times 925 + 2 \times (2 \times 25.4 \times 925) \\ &= \underline{425394mm^2} \end{aligned}$$

## A.2 Stud Shear Connector Resistance (according to ENV 1994-1-1:1992)

The design shear resistance ( $P_{Rd}$ ) of a shear connector is

$$P_{Rd} = 0.29 \alpha \times d^2 (f_{ck} E_{cm})^{1/2} / \gamma_v$$

or

$$P_{Rd} = 0.8 f_u (\pi d^2 / 4) / \gamma_v$$

which ever smaller

$$\text{Shear Reduction Factor} = \text{SRF} = (0.7/N_R^{0.5}) (H_s/h_r - 1) (w_r/h_r)$$

where  $\gamma_v$  = partial safety factor for connectors = 1.25

$f_{ck}$  = characteristic cylinder strength of concrete  $\text{Nmm}^{-2} = 0.8 \times f_u$

$E_{cm}$  = modulus of elasticity of concrete  $\text{Nmm}^{-2} = 9.1 \times f_u^{0.33}$

$f_u$  = ultimate tensile strength of material of stud (maximum value  $500 \text{ Nmm}^{-2}$ )

$d$  = diameter of stud mm

$\alpha$  =  $0.2 [(H_s/d) + 1]$  for  $3 \leq H_s/d \leq 4$

$\alpha$  = 1 for  $H_s/d \geq 4$

$N_R$  = number of studs per rib

### Typical Calculation for Headed Studs for Sample C30-20-3-ssp

$$P_{Rd} = 0.8 f_u (\pi d^2 / 4) / \gamma_v$$

$$= 0.8 \times 500 \times (\pi \times 19^2 / 4) / 1.25$$

$$= \underline{91\text{kN}}$$

$$P_{Rd} = 0.29 \alpha \times d^2 (f_{ck} E_{cm})^{1/2} / \gamma_v$$

$$= 0.29 \times 1 \times 19^2 \times (32 \times 30.7 / 1000)^{1/2} / 1.25$$

$$= \underline{83\text{kN}}$$

$$(P_{Rd})_{\text{minimum}} = \underline{83\text{kN}}$$

$$\text{SRF} = (0.7/N_R^{0.5}) (H_s/h_r - 1) (w_r/h_r), w_r = \text{average trough width} = 160\text{mm}$$

$$= (0.7/1^{0.5}) \times (80/51-1) \times (160/51)$$

$$= \underline{1.25}$$

According to EN 1994-1-1 Draft No. 2: Design of composite steel and concrete structures, 2001;

For Profile sheeting with holes and studs 19mm in diameter

$$\text{SRF} = 0.6$$

$$P_{Rd} = 0.6 \times 83 = 50\text{kN}$$

### A.3 Sieve Analysis of Fine Aggregate

| Sieve Size (mm) | Weight of retained sand plus tray (g) | Weight of tray (g) | Weight of retained sand (g) | % passing |
|-----------------|---------------------------------------|--------------------|-----------------------------|-----------|
| 3.350           | 634.2                                 | 603.2              | 31.0                        | 97.74     |
| 2.800           | 604.1                                 | 577.5              | 26.6                        | 95.81     |
| 2.360           | 570.9                                 | 544.7              | 26.2                        | 93.90     |
| 1.700           | 646.8                                 | 528.3              | 118.5                       | 85.27     |
| 1.400           | 612.3                                 | 513.0              | 99.3                        | 78.04     |
| 1.180           | 597.5                                 | 510.0              | 87.5                        | 71.67     |
| 1.000           | 620.0                                 | 503.6              | 116.4                       | 63.20     |
| 0.850           | 584.4                                 | 484.4              | 100.0                       | 55.92     |
| 0.710           | 599.5                                 | 475.6              | 123.9                       | 46.89     |
| 0.600           | 615.9                                 | 471.4              | 144.5                       | 36.37     |
| 0.500           | 570.4                                 | 450.1              | 120.3                       | 27.62     |
| 0.425           | 549.7                                 | 451.9              | 97.8                        | 20.50     |
| 0.355           | 536.5                                 | 442.2              | 94.3                        | 13.63     |
| 0.300           | 473.3                                 | 432.6              | 40.7                        | 10.67     |
| 0.250           | 494.8                                 | 422.1              | 72.7                        | 5.37      |
| 0.212           | 445.4                                 | 418.0              | 27.4                        | 3.38      |
| 0.150           | 437.3                                 | 407.1              | 30.2                        | 1.18      |
| 0.075           | 414.1                                 | 400.8              | 13.3                        | 0.21      |
| 0.000           | 548.0                                 | 545.1              | 2.9                         | 0.00      |



### A.6 Mechanical Properties of Coarse Aggregates

|             |        |
|-------------|--------|
| <b>20mm</b> |        |
|             | (g)    |
| A           | 560.5  |
| B           | 2985.6 |
| C           | 2630.0 |
| D           | 558.3  |

A= Weight of saturated surface dry aggregate

B= Weight of container with the aggregate and filled with water

C= Weight of container filled with water

D= Weight of aggregate in air @ oven dried condition.

|   |       |
|---|-------|
| <b>20mm</b>   |       |
| Relative density on saturated and surface dried basis | 2.735 |
| Apparent relative density                             | 2.754 |
| Relative density on an oven dried basis               | 2.725 |
| water absorption (as a % of dry mass)                 | 0.394 |
| Void ratio  | 0.488 |

### A.7 Concrete Mix Proportions and Cube Compressive Strength Test Results

|                   |           |   |      |
|-------------------|-----------|---|------|
| <b>Mix Design</b> |           | <b>Results</b>                              |      |
| <b>Grade 45</b>   |           |   |      |
| W / C Ratio       | 0.4       | Slump (mm)                                  | 60   |
| Cement            | 475 kg    | wet density ( $\text{kgm}^{-3}$ )           | 2506 |
| Sand              | 707.2 kg  | dry density ( $\text{kgm}^{-3}$ )           | 2458 |
| Aggregate (20mm)  | 1060.8 kg | 7 days cube strength ( $\text{Nmm}^{-2}$ )  | 30   |
| Water             | 190 kg    | 28 days cube strength ( $\text{Nmm}^{-2}$ ) | 45   |

|                   |           |   |      |
|-------------------|-----------|---|------|
| <b>Mix Design</b> |           | <b>Results</b>                              |      |
| <b>Grade 30</b>   |           |   |      |
| W / C Ratio       | 0.5       | Slump (mm)                                  | 90   |
| Cement            | 380 kg    | wet density ( $\text{kgm}^{-3}$ )           | 2477 |
| Sand              | 838.4 kg  | dry density ( $\text{kgm}^{-3}$ )           | 2454 |
| Aggregate (20mm)  | 1024.6 kg | 7 days cube strength ( $\text{Nmm}^{-2}$ )  | 23   |
| Water             | 190 kg    | 28 days cube strength ( $\text{Nmm}^{-2}$ ) | 34.5 |

| <b>Mix Design</b>      |                   |   |      |
|------------------------|-------------------|---|------|
| <b>Grade 20</b>        |                   | <b>Results</b>                              |      |
| <b>Volume batching</b> | 1 cement: 2 sand: | 4 aggregate (20mm)                          |      |
| (For practical easy    | volumes are       | converted to weights)                       |      |
| W / C Ratio            | 0.55              | Slump (mm)                                  | 50   |
| Cement                 | 313.0 kg          | wet density ( $\text{kgm}^{-3}$ )           | 2453 |
| Sand                   | 655.9 kg          | dry density ( $\text{kgm}^{-3}$ )           | 2429 |
| Aggregate (20mm)       | 1340.4 kg         | 7 days cube strength ( $\text{Nmm}^{-2}$ )  | 24   |
| Water                  | 172.1 kg          | 28 days cube strength ( $\text{Nmm}^{-2}$ ) | 32   |

#### A.8 Moisture Content of Sand and Aggregates for Typical Sample (C30-20-3-ssp)

| <b>Sand</b>                           |       |
|---------------------------------------|-------|
| Weight of empty container (g)         | 97.1  |
| Weight of wet sand with container (g) | 340.4 |
| Weight of dry sand with container (g) | 333.4 |
| <b>Moisture content</b>               | 0.029 |

| <b>Metal (20mm)</b>                   |       |
|---------------------------------------|-------|
| Weight of empty container (g)         | 85.6  |
| Weight of wet sand with container (g) | 637.6 |
| Weight of dry sand with container (g) | 635.9 |
| <b>Moisture content</b>               | 0.003 |

#### A.9 Push- Out Test Results

Test results summaries are given in Table A.9.1, 9.2, 9.3. Each sample test results are given below and in some test results failure load is not shown (configuration 1 samples; s2-c30-20-1-iii, s3-c30-20-1-i, s8-c45-25-1-iii, s13-c20-25-1-i, configuration 2 sample; s25-c45-25-2-iii, and configuration 3 all results) due limitations (measuring displacements) at the testing, but failure loads are in summary. In test results “N” refers to “noise” and “C” refers to “first cracking”.

Following letters were used with push out test results.

With configuration 1 and 2

- CS – vertical displacement of south side concrete
- CN – vertical displacement of north side concrete
- SS – vertical displacement of steel tube

With configuration 3

- SV – vertical displacement of concrete
- TV – vertical displacement of steel tube
- PS – horizontal displacement of steel deck (placed between middle of two studs)
- SHT – horizontal displacement of concrete at top shear stud
- SHB – horizontal displacement of concrete at bottom shear stud

**Table A.9.1: Configuration-1 Summary**

**Ac = 331414mm<sup>2</sup>**

| <b>Configuration</b> | <b>Cube strength (Nmm-2)</b> | <b>Failur load (kN)</b> | <b>First crack load (kN)</b> | <b>First crack load / Failure load</b> |
|----------------------|------------------------------|-------------------------|------------------------------|--|
| s2-c30-20-1-iii      | 38.2                         | 496                     | 392                          | 0.79                                   |
| s3-c30-20-1-i        | 36.4                         | 501                     | 350                          | 0.70                                   |
| s4-c30-20-1-ii       | 33.6                         | 501                     | 470                          | 0.94                                   |
| s5-c30-25-1-iii      | 26.8                         | 517                     | 438                          | 0.85                                   |
| s6-c30-25-1-ii       | 30.7                         | 589                     | 459                          | 0.78                                   |
| s7-c30-25-1-i        | 33.5                         | 569                     | 522                          | 0.92                                   |
| s8-c45-25-1-iii      | 48.2                         | 678                     | 366                          | 0.54                                   |
| s9-c45-25-1-i        | 45.1                         | 772                     | 511                          | 0.66                                   |
| s10-c30-25-1-ii      | 48.3                         | 933                     | 933                          | 1.00                                   |
| s11-c20-25-1-ii      | 32.5                         | 428                     | 418                          | 0.98                                   |
| s12-c20-25-1-iii     | 32.0                         | 574                     | 496                          | 0.86                                   |
| s13-c20-25-1-i       | 23.1                         | 501                     | 392                          | 0.78                                   |
| s14-c30-30-1-iii     | 41.7                         | 678                     | 527                          | 0.78                                   |
| s15-c30-30-1-ii      | 32.3                         | 527                     | 522                          | 0.99                                   |
| s16-c30-30-1-i       | 25.3                         | 444                     | 418                          | 0.94                                   |

**Table A.9.2: Configuration-2 Summary****Ac = 425394mm<sup>2</sup>**

| <b>Configuration</b> | <b>Cube strength (Nmm-2)</b> | <b>Failur load (kN)</b> | <b>First crack load (kN)</b> | <b>First crack load / Failure load</b> |
|----------------------|------------------------------|-------------------------|------------------------------|--|
| s17-c30-30-2-i       | 34.2                         | 746                     | 688                          | 0.92                                   |
| s18-c30-30-2-ii      | 37.9                         | 808                     | 678                          | 0.84                                   |
| s19-c30-30-2-iii     | 33.8                         | 704                     | 589                          | 0.84                                   |
| s20-c30-20-2-i       | 43.1                         | 730                     | 574                          | 0.79                                   |
| s21-c30-20-2-ii      | 38.0                         | 845                     | 704                          | 0.83                                   |
| s31-c30-20-2-iii     | 45.5                         | 626                     | 522                          | 0.83                                   |
| s22-c30-25-2-i       | 35.8                         | 694                     | 496                          | 0.71                                   |
| s26-c30-25-2-ii      | 31.3                         | 803                     | 761                          | 0.95                                   |
| s30-c30-25-2-iii     | 38.5                         | 798                     | 642                          | 0.80                                   |
| s23-c45-25-2-i       | 47.9                         | 704                     | 563                          | 0.80                                   |
| s24-c45-25-2-ii      | 46.3                         | 626                     | 470                          | 0.75                                   |
| s25-c45-25-2-iii     | 40.4                         | 652                     | 548                          | 0.84                                   |
| s27-c20-25-2-i       | 24.0                         | 699                     | 605                          | 0.87                                   |
| s28-c20-25-2-ii      | 31.8                         | 740                     | 647                          | 0.87                                   |
| s29-c20-25-2-iii     | 30.0                         | 746                     | 642                          | 0.86                                   |

**Table A.9.3: Configuration-3 Summary**

**Ac = 227334mm<sup>2</sup>**

| <b>Configuration</b> | <b>Cube strength (Nmm-2)</b> | <b>Failur load (kN)</b> | <b>First crack load (kN)</b> | <b>First crack load / Failure load</b> |
|----------------------|------------------------------|-------------------------|------------------------------|--|
| s32-c30-20-3-ssp     | 40.0                         | 121.2                   | 86                           | 0.71                                   |
| s33-c30-20-3-w       | 39.8                         | 121                     | 121                          | 1.00                                   |
| s34-c30-20-3-cfst-w  | 36.9                         | 128.3                   | 57                           | 0.44                                   |
| s35-c30-30-3-ssp     | 32.8                         | 135.4                   | 57                           | 0.42                                   |
| s36-c30-30-3-cfst-w  | 36.4                         | 155.3                   | 114                          | 0.73                                   |
| s37-c30-30-3-w       | 38.6                         | 156.7                   | 93                           | 0.59                                   |
| s38-c30-25-3-ssp     | 44.3                         | 151.1                   | 64                           | 0.42                                   |
| s39-c30-25-3-cfst-w  | 39.2                         | 149.6                   | 51                           | 0.34                                   |
| s40-c30-25-3-w       | 37.8                         | 131.2                   | 71                           | 0.54                                   |
| s41-c45-25-3-ssp     | 51.7                         | 192.2                   | 93                           | 0.48                                   |
| s42-c45-25-3-cfst-w  | 49.8                         | 192.2                   | 78                           | 0.41                                   |
| s43-c45-25-3-w       | 51.1                         | 168.1                   | 94                           | 0.56                                   |
| s44-c20-25-3-w       | 25.0                         | 125.5                   | 51                           | 0.41                                   |
| s45-c20-25-3-cfst-w  | 31.1                         | 168.1                   | 128                          | 0.76                                   |
| s46-c20-25-3-ssp     | 27.5                         | 149.6                   | 128                          | 0.86                                   |

**Table A.9.4: Sample 2 (C30-20-1-iii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 17        | 0.02                 | 0.26                 | 0.01                 | 0.015                              | 0.245                                 |
| 32        | 0.08                 | 0.29                 | 0.03                 | 0.055                              | 0.235                                 |
| 48        | 0.15                 | 0.26                 | 0.03                 | 0.09                               | 0.17                                  |
| 64        | 0.23                 | 0.21                 | 0.03                 | 0.13                               | 0.08                                  |
| 79        | 0.33                 | 0.27                 | 0.05                 | 0.19                               | 0.08                                  |
| 95        | 0.34                 | 0.44                 | 0.08                 | 0.21                               | 0.23                                  |
| 110       | 0.4                  | 0.57                 | 0.08                 | 0.24                               | 0.33                                  |
| 126       | 0.49                 | 0.68                 | 0.08                 | 0.285                              | 0.395                                 |
| 142       | 0.7                  | 0.87                 | 0.06                 | 0.38                               | 0.49                                  |
| 157       | 0.82                 | 1.1                  | 0.06                 | 0.44                               | 0.66                                  |
| 173       | 0.95                 | 1.17                 | 0.06                 | 0.505                              | 0.665                                 |
| 189       | 1.06                 | 1.25                 | 0.06                 | 0.56                               | 0.69                                  |
| 204       | 1.21                 | 1.55                 | 0.09                 | 0.65                               | 0.9                                   |
| 220       | 1.33                 | 1.79                 | 0.31                 | 0.82                               | 0.97                                  |
| 235       | 1.44                 | 2                    | 0.41                 | 0.925                              | 1.075                                 |
| 251       | 1.49                 | 2.15                 | 0.45                 | 0.97                               | 1.18                                  |
| 267       | 1.6                  | 2.36                 | 0.62                 | 1.11                               | 1.25                                  |
| 282       | 1.74                 | 2.64                 | 0.74                 | 1.24                               | 1.4                                   |
| 298       | 2.01                 | 3.22                 | 0.96                 | 1.485                              | 1.735                                 |
| 313       | 2.18                 | 3.35                 | 0.99                 | 1.585                              | 1.765                                 |
| 340       | 2.61                 | 4.07                 | 1.01                 | 1.81                               | 2.26                                  |
| 366       | 2.67                 | 4.18                 | 1.03                 | 1.85                               | 2.33                                  |
| 392-N, C  | 2.7                  | 4.35                 | 1.05                 | 1.875                              | 2.475                                 |
| 418       | 2.79                 | 4.57                 | 1.09                 | 1.94                               | 2.63                                  |
| 444       | 2.82                 | 4.67                 | 1.12                 | 1.97                               | 2.7                                   |
| 470       | 2.89                 | 4.88                 | 1.22                 | 2.055                              | 2.825                                 |

**Table A.9.5: Test Panel Concrete Cube Strength (C30-20-1-iii)**

| Cast Date: 25-02-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 21-03-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.65        | 88            | 36.88                         | 2415                             |
| II                      | 153x153x153 | 8.7         | 94            | 39.39                         | 2429                             |
| III                     | 153x153x153 | 8.7         | 91.4          | 38.30                         | 2429                             |
| IV                      | 153x153x153 | 8.7         | 91.4          | 38.30                         | 2429                             |
| Mean                    |             |             |               | 38.19                         | 2424                             |

**Table A.9.6: CFST Concrete Cube Strength (C30-20-1-iii)**

| Cast Date: 19-02-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 21-03-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.55        | 94.8          | 39.73                         | 2387                             |
| II                      | 153x153x153 | 8.5         | 90            | 37.72                         | 2373                             |
| III                     | 153x153x153 | 8.5         | 88.8          | 37.21                         | 2373                             |
| IV                      | 153x153x153 | 8.55        | 94.8          | 39.73                         | 2387                             |
| Mean                    |             |             |               | 38.22                         | 2378                             |



**Table A.9.7: Sample 3 (C30-20-1-i)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 17        | 0.005                | 0.01                 | 0.01                 | 0.0075                             | 0.0025                                |
| 32        | 0.01                 | 0.01                 | 0.02                 | 0.015                              | -0.005                                |
| 48        | 0.015                | 0.08                 | 0.02                 | 0.0175                             | 0.0625                                |
| 64        | 0.02                 | 0.11                 | 0.025                | 0.0225                             | 0.0875                                |
| 79        | 0.03                 | 0.16                 | 0.025                | 0.0275                             | 0.1325                                |
| 95        | 0.04                 | 0.21                 | 0.025                | 0.0325                             | 0.1775                                |
| 110       | 0.06                 | 0.28                 | 0.03                 | 0.045                              | 0.235                                 |
| 126       | 0.08                 | 0.37                 | 0.04                 | 0.06                               | 0.31                                  |
| 142       | 0.2                  | 0.47                 | 0.09                 | 0.145                              | 0.325                                 |
| 157       | 0.21                 | 0.56                 | 0.14                 | 0.175                              | 0.385                                 |
| 173       | 0.23                 | 0.61                 | 0.19                 | 0.21                               | 0.4                                   |
| 189       | 0.24                 | 0.68                 | 0.24                 | 0.24                               | 0.44                                  |
| 204       | 0.25                 | 0.79                 | 0.3                  | 0.275                              | 0.515                                 |
| 220       | 0.25                 | 0.95                 | 0.39                 | 0.32                               | 0.63                                  |
| 235       | 0.27                 | 1                    | 0.41                 | 0.34                               | 0.66                                  |
| 251       | 0.28                 | 1.07                 | 0.41                 | 0.345                              | 0.725                                 |
| 267       | 0.22                 | 1.14                 | 0.47                 | 0.345                              | 0.795                                 |
| 282       | 0.27                 | 1.23                 | 0.49                 | 0.38                               | 0.85                                  |
| 298       | 0.31                 | 1.3                  | 0.51                 | 0.41                               | 0.89                                  |
| 313       | 0.34                 | 1.37                 | 0.51                 | 0.425                              | 0.945                                 |
| 329       | 0.37                 | 1.48                 | 0.58                 | 0.475                              | 1.005                                 |
| 350- C    | 0.43                 | 1.58                 | 0.61                 | 0.52                               | 1.06                                  |
| 360       | 0.46                 | 1.69                 | 0.65                 | 0.555                              | 1.135                                 |
| 376       | 0.5                  | 1.75                 | 0.67                 | 0.585                              | 1.165                                 |
| 392       | 0.54                 | 1.81                 | 0.7                  | 0.62                               | 1.19                                  |
| 407       | 0.58                 | 1.92                 | 0.73                 | 0.655                              | 1.265                                 |
| 423       | 0.62                 | 2.01                 | 0.77                 | 0.695                              | 1.315                                 |
| 438       | 0.65                 | 2.1                  | 0.8                  | 0.725                              | 1.375                                 |
| 454- N    | 0.67                 | 2.23                 | 0.84                 | 0.755                              | 1.475                                 |
| 470       | 0.68                 | 2.34                 | 0.86                 | 0.77                               | 1.57                                  |
| 485       | 0.69                 | 2.5                  | 0.92                 | 0.805                              | 1.695                                 |

**Table A.9.8: Test Panel Concrete Cube Strength (C30-20-1-i)**

| Cast Date: 22-02-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 23-03-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.7         | 87            | 36.43                         | 2424                             |
| II                      | 153x153x154 | 8.6         | 87            | 36.46                         | 2401                             |
| III                     | 153x153x154 | 8.75        | 85.8          | 35.96                         | 2443                             |
| IV                      | 153x153x153 | 8.7         | 88            | 36.88                         | 2429                             |
| Mean                    |             |             |               | 36.43                         | 2424                             |

**Table A.9.9: CFST Concrete Cube Strength (C30-20-1-i)**

| Cast Date: 29-02-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 23-03-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.60        | 100           | 41.91                         | 2401                             |
| II                      | 153x153x153 | 8.50        | 97            | 40.65                         | 2373                             |
| III                     | 153x153x153 | 8.60        | 100           | 41.91                         | 2401                             |
| IV                      | 153x153x153 | 8.70        | 103           | 43.16                         | 2429                             |
| Mean                    |             |             |               | 41.91                         | 2401                             |



**Table A.9.10: Sample 4 (C30-20-1-ii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 17        | 0.05                 | 0.19                 | 0.02                 | 0.035                              | 0.155                                 |
| 32        | 0.07                 | 0.35                 | 0.07                 | 0.07                               | 0.28                                  |
| 48        | 0.09                 | 0.55                 | 0.09                 | 0.09                               | 0.46                                  |
| 64        | 0.09                 | 0.65                 | 0.1                  | 0.095                              | 0.555                                 |
| 79        | 0.1                  | 0.74                 | 0.12                 | 0.11                               | 0.63                                  |
| 95        | 0.11                 | 0.85                 | 0.15                 | 0.13                               | 0.72                                  |
| 110       | 0.12                 | 0.93                 | 0.16                 | 0.14                               | 0.79                                  |
| 126       | 0.13                 | 1.01                 | 0.18                 | 0.155                              | 0.855                                 |
| 142       | 0.13                 | 1.1                  | 0.19                 | 0.16                               | 0.94                                  |
| 157       | 0.13                 | 1.18                 | 0.21                 | 0.17                               | 1.01                                  |
| 178       | 0.13                 | 1.29                 | 0.23                 | 0.18                               | 1.11                                  |
| 189       | 0.13                 | 1.34                 | 0.25                 | 0.19                               | 1.15                                  |
| 12        | 0.01                 | 0.68                 | 0.1                  | 0.055                              | 0.625                                 |
| 22        | 0.03                 | 0.79                 | 0.1                  | 0.065                              | 0.725                                 |
| 32        | 0.04                 | 0.87                 | 0.12                 | 0.08                               | 0.79                                  |
| 48        | 0.05                 | 1.01                 | 0.13                 | 0.09                               | 0.92                                  |
| 74        | 0.08                 | 1.14                 | 0.16                 | 0.12                               | 1.02                                  |
| 84        | 0.09                 | 1.19                 | 0.16                 | 0.125                              | 1.065                                 |
| 100       | 0.11                 | 1.25                 | 0.17                 | 0.14                               | 1.11                                  |
| 116       | 0.12                 | 1.3                  | 0.18                 | 0.15                               | 1.15                                  |
| 126       | 0.14                 | 1.35                 | 0.19                 | 0.165                              | 1.185                                 |
| 142       | 0.15                 | 1.39                 | 0.2                  | 0.175                              | 1.215                                 |
| 157       | 0.16                 | 1.45                 | 0.22                 | 0.19                               | 1.26                                  |
| 173       | 0.13                 | 1.5                  | 0.25                 | 0.19                               | 1.31                                  |
| 189       | 0.13                 | 1.54                 | 0.27                 | 0.2                                | 1.34                                  |
| 1         | -0.02                | 0.86                 | 0.09                 | 0.035                              | 0.825                                 |
| 22        | 0.02                 | 1.05                 | 0.12                 | 0.07                               | 0.98                                  |
| 58        | 0.04                 | 1.25                 | 0.15                 | 0.095                              | 1.155                                 |
| 131       | 0.11                 | 1.48                 | 0.17                 | 0.14                               | 1.34                                  |
| 189       | 0.16                 | 1.63                 | 0.24                 | 0.2                                | 1.43                                  |
| 12        | 0.02                 | 0.88                 | 0.1                  | 0.06                               | 0.82                                  |
| 22        | 0.05                 | 0.95                 | 0.11                 | 0.08                               | 0.87                                  |
| 53        | 0.13                 | 1.17                 | 0.13                 | 0.13                               | 1.04                                  |
| 131       | 0.16                 | 1.49                 | 0.19                 | 0.175                              | 1.315                                 |
| 189       | 0.19                 | 1.63                 | 0.27                 | 0.23                               | 1.4                                   |
| 6         | -0.03                | 1.1                  | 0.12                 | 0.045                              | 1.055                                 |
| 22        | -0.01                | 1.17                 | 0.13                 | 0.06                               | 1.11                                  |
| 53        | 0.02                 | 1.35                 | 0.18                 | 0.1                                | 1.25                                  |
| 131       | 0.08                 | 1.57                 | 0.22                 | 0.15                               | 1.42                                  |
| 189       | 0.13                 | 1.68                 | 0.29                 | 0.21                               | 1.47                                  |
| 19        | 0                    | 1.16                 | 0.2                  | 0.1                                | 1.06                                  |
| 58        | 0.02                 | 1.34                 | 0.22                 | 0.12                               | 1.22                                  |
| 131       | 0.07                 | 1.58                 | 0.25                 | 0.16                               | 1.42                                  |
| 189       | 0.1                  | 1.72                 | 0.34                 | 0.22                               | 1.5                                   |
| 22        | 0.02                 | 1.27                 | 0.28                 | 0.15                               | 1.12                                  |
| 58        | 0.025                | 1.42                 | 0.29                 | 0.1575                             | 1.2625                                |
| 142       | 0.07                 | 1.64                 | 0.34                 | 0.205                              | 1.435                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 189       | 0.1                  | 1.74                 | 0.36                 | 0.23                               | 1.51                                  |
| 22        | 0                    | 1.22                 | 0.26                 | 0.13                               | 1.09                                  |
| 58        | 0.01                 | 1.42                 | 0.28                 | 0.145                              | 1.275                                 |
| 131       | 0.06                 | 1.64                 | 0.31                 | 0.185                              | 1.455                                 |
| 189       | 0.1                  | 1.76                 | 0.34                 | 0.22                               | 1.54                                  |
| 12        | -0.03                | 1.25                 | 0.19                 | 0.08                               | 1.17                                  |
| 27        | 0                    | 1.33                 | 0.19                 | 0.095                              | 1.235                                 |
| 64        | 0.01                 | 1.49                 | 0.22                 | 0.115                              | 1.375                                 |
| 136       | 0.07                 | 1.67                 | 0.25                 | 0.16                               | 1.51                                  |
| 189       | 0.11                 | 1.77                 | 0.29                 | 0.2                                | 1.57                                  |
| 22        | 0                    | 1.32                 | 0.26                 | 0.13                               | 1.19                                  |
| 53        | 0.01                 | 1.49                 | 0.28                 | 0.145                              | 1.345                                 |
| 136       | 0.08                 | 1.69                 | 0.29                 | 0.185                              | 1.505                                 |
| 189       | 0.12                 | 1.79                 | 0.32                 | 0.22                               | 1.57                                  |
| 27        | -0.01                | 1.72                 | 0.2                  | 0.095                              | 1.625                                 |
| 53        | -0.01                | 1.92                 | 0.21                 | 0.1                                | 1.82                                  |
| 131       | 0.06                 | 1.69                 | 0.21                 | 0.135                              | 1.555                                 |
| 189       | 0.11                 | 1.79                 | 0.26                 | 0.185                              | 1.605                                 |
| 22        | -0.03                | 1.1                  | 0.19                 | 0.08                               | 1.02                                  |
| 58        | -0.02                | 1.35                 | 0.2                  | 0.09                               | 1.26                                  |
| 136       | 0.03                 | 1.72                 | 0.26                 | 0.145                              | 1.575                                 |
| 189       | 0.065                | 1.87                 | 0.3                  | 0.1825                             | 1.6875                                |
| 17        | -0.07                | 1.23                 | 0.2                  | 0.065                              | 1.165                                 |
| 53        | -0.04                | 1.48                 | 0.21                 | 0.085                              | 1.395                                 |
| 131       | 0.01                 | 1.76                 | 0.24                 | 0.125                              | 1.635                                 |
| 189       | 0.06                 | 1.89                 | 0.3                  | 0.18                               | 1.71                                  |
| 27        | -0.04                | 1.32                 | 0.25                 | 0.105                              | 1.215                                 |
| 58        | -0.03                | 1.54                 | 0.25                 | 0.11                               | 1.43                                  |
| 136       | 0.02                 | 1.79                 | 0.28                 | 0.15                               | 1.64                                  |
| 189       | 0.06                 | 1.9                  | 0.31                 | 0.185                              | 1.715                                 |
| 22        | -0.01                | 1.48                 | 0.23                 | 0.11                               | 1.37                                  |
| 61        | 0                    | 1.62                 | 0.24                 | 0.12                               | 1.5                                   |
| 136       | 0.06                 | 1.8                  | 0.25                 | 0.155                              | 1.645                                 |
| 189       | 0.1                  | 1.91                 | 0.29                 | 0.195                              | 1.715                                 |
| 19        | -0.02                | 1.38                 | 0.2                  | 0.09                               | 1.29                                  |
| 64        | 0.01                 | 1.58                 | 0.2                  | 0.105                              | 1.475                                 |
| 136       | 0.07                 | 1.81                 | 0.23                 | 0.15                               | 1.66                                  |
| 189       | 0.1                  | 1.91                 | 0.29                 | 0.195                              | 1.715                                 |
| 25        | -0.01                | 1.38                 | 0.2                  | 0.095                              | 1.285                                 |
| 64        | 0.03                 | 1.56                 | 0.2                  | 0.115                              | 1.445                                 |
| 131       | 0.09                 | 1.82                 | 0.24                 | 0.165                              | 1.655                                 |
| 189       | 0.11                 | 1.95                 | 0.31                 | 0.21                               | 1.74                                  |
| 22        | -0.05                | 0.85                 | 0.27                 | 0.11                               | 0.74                                  |
| 58        | -0.05                | 1.22                 | 0.28                 | 0.115                              | 1.105                                 |
| 131       | -0.04                | 1.68                 | 0.34                 | 0.15                               | 1.53                                  |
| 189       | 0.02                 | 1.99                 | 0.34                 | 0.18                               | 1.81                                  |
| 27        | -0.04                | 1.41                 | 0.24                 | 0.1                                | 1.31                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 56        | -0.01                | 1.6                  | 0.24                 | 0.115                              | 1.485                                 |
| 136       | 0.06                 | 1.87                 | 0.24                 | 0.15                               | 1.72                                  |
| 189       | 0.11                 | 2                    | 0.28                 | 0.195                              | 1.805                                 |
| 17        | -0.03                | 1.2                  | 0.2                  | 0.085                              | 1.115                                 |
| 58        | 0.03                 | 1.55                 | 0.2                  | 0.115                              | 1.435                                 |
| 131       | 0.09                 | 1.87                 | 0.24                 | 0.165                              | 1.705                                 |
| 189       | 0.13                 | 2.01                 | 0.32                 | 0.225                              | 1.785                                 |
| 17        | -0.02                | 1.2                  | 0.2                  | 0.09                               | 1.11                                  |
| 58        | 0.04                 | 1.52                 | 0.2                  | 0.12                               | 1.4                                   |
| 131       | 0.1                  | 1.88                 | 0.23                 | 0.165                              | 1.715                                 |
| 189       | 0.14                 | 2.02                 | 0.32                 | 0.23                               | 1.79                                  |
| 17        | -0.02                | 1.57                 | 0.28                 | 0.13                               | 1.44                                  |
| 64        | 0                    | 1.76                 | 0.28                 | 0.14                               | 1.62                                  |
| 134       | 0.05                 | 1.96                 | 0.28                 | 0.165                              | 1.795                                 |
| 189       | 0.09                 | 2.06                 | 0.34                 | 0.215                              | 1.845                                 |
| 22        | -0.03                | 1.53                 | 0.27                 | 0.12                               | 1.41                                  |
| 61        | 0.01                 | 1.74                 | 0.28                 | 0.145                              | 1.595                                 |
| 131       | 0.06                 | 1.94                 | 0.28                 | 0.17                               | 1.77                                  |
| 189       | 0.1                  | 2.06                 | 0.34                 | 0.22                               | 1.84                                  |
| 19        | -0.05                | 1.62                 | 0.28                 | 0.115                              | 1.505                                 |
| 53        | -0.03                | 1.78                 | 0.29                 | 0.13                               | 1.65                                  |
| 131       | 0.03                 | 1.97                 | 0.31                 | 0.17                               | 1.8                                   |
| 191       | 0.08                 | 2.09                 | 0.35                 | 0.215                              | 1.875                                 |
| 14        | -0.07                | 1.45                 | 0.2                  | 0.065                              | 1.385                                 |
| 58        | -0.01                | 1.74                 | 0.26                 | 0.125                              | 1.615                                 |
| 131       | 0.06                 | 1.97                 | 0.3                  | 0.18                               | 1.79                                  |
| 189       | 0.1                  | 2.08                 | 0.37                 | 0.235                              | 1.845                                 |
| 12        | -0.1                 | 1.54                 | 0.3                  | 0.1                                | 1.44                                  |
| 53        | -0.04                | 1.78                 | 0.21                 | 0.085                              | 1.695                                 |
| 131       | 0.05                 | 1.98                 | 0.236                | 0.143                              | 1.837                                 |
| 189       | 0.12                 | 2.1                  | 0.28                 | 0.2                                | 1.9                                   |
| 209       | 0.14                 | 2.15                 | 0.32                 | 0.23                               | 1.92                                  |
| 230       | 0.17                 | 2.21                 | 0.35                 | 0.26                               | 1.95                                  |
| 251       | 0.19                 | 2.28                 | 0.36                 | 0.275                              | 2.005                                 |
| 272       | 0.24                 | 2.37                 | 0.38                 | 0.31                               | 2.06                                  |
| 293       | 0.27                 | 2.48                 | 0.42                 | 0.345                              | 2.135                                 |
| 313       | 0.3                  | 2.58                 | 0.49                 | 0.395                              | 2.185                                 |
| 334       | 0.34                 | 2.74                 | 0.55                 | 0.445                              | 2.295                                 |
| 360       | 0.36                 | 2.83                 | 0.63                 | 0.495                              | 2.335                                 |
| 376       | 0.38                 | 2.93                 | 0.68                 | 0.53                               | 2.4                                   |
| 397- N    | 0.44                 | 3.07                 | 0.75                 | 0.595                              | 2.475                                 |
| 428       | 0.5                  | 3.29                 | 0.86                 | 0.68                               | 2.61                                  |
| 444       | 0.52                 | 3.38                 | 0.92                 | 0.72                               | 2.66                                  |
| 459       | 0.53                 | 3.55                 | 0.96                 | 0.745                              | 2.805                                 |
| 470- C    | 0.54                 | 3.74                 | 1.01                 | 0.775                              | 2.965                                 |
| 480       | 0.56                 | 3.9                  | 1.07                 | 0.815                              | 3.085                                 |
| 485       | 0.58                 | 3.97                 | 1.07                 | 0.825                              | 3.145                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 491       | 0.6                  | 4.06                 | 1.07                 | 0.835                              | 3.225                                 |
| 501       | 0.66                 | 4.25                 | 1.07                 | 0.865                              | 3.385                                 |

**Table A.9.11: Test Panel Concrete Cube Strength (C30-20-1-ii)**

| Cast Date: 07-03-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 05-04-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.6         | 79.6          | 33.36                         | 2401                             |
| II                      | 153x153x153 | 8.7         | 82            | 34.36                         | 2429                             |
| III                     | 153x153x153 | 8.65        | 79            | 33.11                         | 2415                             |
| IV                      | 153x153x153 | 8.65        | 79            | 33.11                         | 2415                             |
| Mean                    |             |             |               | 33.61                         | 2415                             |

**Table A.9.12: CFST Concrete Cube Strength (C30-20-1-ii)**

| Cast Date: 29-02-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 05-04-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.6         | 100           | 41.91                         | 2401                             |
| II                      | 153x153x154 | 8.5         | 98            | 41.07                         | 2373                             |
| III                     | 153x153x154 | 8.55        | 99.2          | 41.57                         | 2387                             |
| IV                      | 153x153x153 | 8.55        | 99            | 41.6                          | 2388                             |
| Mean                    |             |             |               | 41.52                         | 2387                             |

**Table A.9.13: Sample 5 (C30-25-1-iii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 17        | 0.04                 | 0.22                 | 0.01                 | 0.025                              | 0.195                                 |
| 32        | 0.1                  | 0.37                 | 0.07                 | 0.085                              | 0.285                                 |
| 48        | 0.14                 | 0.47                 | 0.1                  | 0.12                               | 0.35                                  |
| 69        | 0.21                 | 0.54                 | 0.13                 | 0.17                               | 0.37                                  |
| 79        | 0.29                 | 0.65                 | 0.13                 | 0.21                               | 0.44                                  |
| 95        | 0.32                 | 0.72                 | 0.16                 | 0.24                               | 0.48                                  |
| 110       | 0.4                  | 0.82                 | 0.2                  | 0.3                                | 0.52                                  |
| 126       | 0.44                 | 0.86                 | 0.22                 | 0.33                               | 0.53                                  |
| 142       | 0.48                 | 0.93                 | 0.25                 | 0.365                              | 0.565                                 |
| 157       | 0.51                 | 0.98                 | 0.29                 | 0.4                                | 0.58                                  |
| 178       | 0.52                 | 1.03                 | 0.35                 | 0.435                              | 0.595                                 |
| 189       | 0.54                 | 1.09                 | 0.36                 | 0.45                               | 0.64                                  |
| 27        | 0.43                 | 0.71                 | 0.31                 | 0.37                               | 0.34                                  |
| 32        | 0.43                 | 0.67                 | 0.31                 | 0.37                               | 0.3                                   |
| 48        | 0.43                 | 0.79                 | 0.31                 | 0.37                               | 0.42                                  |
| 64        | 0.44                 | 0.85                 | 0.31                 | 0.375                              | 0.475                                 |
| 79        | 0.46                 | 0.9                  | 0.31                 | 0.385                              | 0.515                                 |
| 95        | 0.48                 | 0.96                 | 0.31                 | 0.395                              | 0.565                                 |
| 110       | 0.49                 | 0.99                 | 0.32                 | 0.405                              | 0.585                                 |
| 126       | 0.51                 | 1.02                 | 0.33                 | 0.42                               | 0.6                                   |
| 142       | 0.52                 | 1.06                 | 0.34                 | 0.43                               | 0.63                                  |
| 157       | 0.54                 | 1.08                 | 0.36                 | 0.45                               | 0.63                                  |
| 173       | 0.58                 | 1.14                 | 0.39                 | 0.485                              | 0.655                                 |
| 189       | 0.59                 | 1.15                 | 0.4                  | 0.495                              | 0.655                                 |
| 12        | 0.46                 | 0.7                  | 0.28                 | 0.37                               | 0.33                                  |
| 53        | 0.5                  | 0.9                  | 0.28                 | 0.39                               | 0.51                                  |
| 131       | 0.57                 | 1.11                 | 0.35                 | 0.46                               | 0.65                                  |
| 189       | 0.67                 | 1.24                 | 0.39                 | 0.53                               | 0.71                                  |
| 27        | 0.51                 | 0.67                 | 0.35                 | 0.43                               | 0.24                                  |
| 53        | 0.51                 | 0.8                  | 0.35                 | 0.43                               | 0.37                                  |
| 131       | 0.58                 | 1.09                 | 0.36                 | 0.47                               | 0.62                                  |
| 189       | 0.64                 | 1.22                 | 0.4                  | 0.52                               | 0.7                                   |
| 22        | 0.51                 | 0.66                 | 0.34                 | 0.425                              | 0.235                                 |
| 53        | 0.51                 | 0.84                 | 0.34                 | 0.425                              | 0.415                                 |
| 131       | 0.6                  | 1.13                 | 0.37                 | 0.485                              | 0.645                                 |
| 189       | 0.66                 | 1.25                 | 0.4                  | 0.53                               | 0.72                                  |
| 27        | 0.55                 | 0.77                 | 0.35                 | 0.45                               | 0.32                                  |
| 53        | 0.55                 | 0.9                  | 0.35                 | 0.45                               | 0.45                                  |
| 131       | 0.63                 | 1.18                 | 0.38                 | 0.505                              | 0.675                                 |
| 189       | 0.68                 | 1.29                 | 0.43                 | 0.555                              | 0.735                                 |
| 27        | 0.54                 | 0.78                 | 0.35                 | 0.445                              | 0.335                                 |
| 53        | 0.57                 | 0.99                 | 0.35                 | 0.46                               | 0.53                                  |
| 131       | 0.65                 | 1.19                 | 0.39                 | 0.52                               | 0.67                                  |
| 189       | 0.7                  | 1.3                  | 0.43                 | 0.565                              | 0.735                                 |
| 22        | 0.58                 | 0.7                  | 0.35                 | 0.465                              | 0.235                                 |
| 53        | 0.58                 | 0.86                 | 0.35                 | 0.465                              | 0.395                                 |
| 131       | 0.64                 | 1.18                 | 0.37                 | 0.505                              | 0.675                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 189       | 0.69                 | 1.29                 | 0.41                 | 0.55                               | 0.74                                  |
| 27        | 0.56                 | 0.88                 | 0.35                 | 0.455                              | 0.425                                 |
| 53        | 0.6                  | 1.02                 | 0.35                 | 0.475                              | 0.545                                 |
| 131       | 0.67                 | 1.22                 | 0.39                 | 0.53                               | 0.69                                  |
| 189       | 0.71                 | 1.34                 | 0.43                 | 0.57                               | 0.77                                  |
| 27        | 0.56                 | 0.7                  | 0.36                 | 0.46                               | 0.24                                  |
| 53        | 0.57                 | 0.87                 | 0.36                 | 0.465                              | 0.405                                 |
| 131       | 0.64                 | 1.18                 | 0.36                 | 0.5                                | 0.68                                  |
| 189       | 0.69                 | 1.3                  | 0.41                 | 0.55                               | 0.75                                  |
| 27        | 0.55                 | 0.58                 | 0.36                 | 0.455                              | 0.125                                 |
| 53        | 0.56                 | 0.81                 | 0.36                 | 0.46                               | 0.35                                  |
| 131       | 0.63                 | 1.12                 | 0.37                 | 0.5                                | 0.62                                  |
| 189       | 0.68                 | 1.28                 | 0.41                 | 0.545                              | 0.735                                 |
| 22        | 0.55                 | 0.66                 | 0.37                 | 0.46                               | 0.2                                   |
| 53        | 0.56                 | 0.83                 | 0.36                 | 0.46                               | 0.37                                  |
| 131       | 0.64                 | 1.15                 | 0.37                 | 0.505                              | 0.645                                 |
| 189       | 0.68                 | 1.29                 | 0.41                 | 0.545                              | 0.745                                 |
| 22        | 0.55                 | 0.6                  | 0.37                 | 0.46                               | 0.14                                  |
| 53        | 0.56                 | 0.8                  | 0.37                 | 0.465                              | 0.335                                 |
| 131       | 0.64                 | 1.18                 | 0.38                 | 0.51                               | 0.67                                  |
| 189       | 0.69                 | 1.3                  | 0.41                 | 0.55                               | 0.75                                  |
| 22        | 0.56                 | 0.75                 | 0.36                 | 0.46                               | 0.29                                  |
| 53        | 0.59                 | 0.78                 | 0.36                 | 0.475                              | 0.305                                 |
| 131       | 0.65                 | 1.22                 | 0.38                 | 0.515                              | 0.705                                 |
| 189       | 0.7                  | 1.35                 | 0.41                 | 0.555                              | 0.795                                 |
| 27        | 0.55                 | 0.54                 | 0.39                 | 0.47                               | 0.07                                  |
| 53        | 0.56                 | 0.81                 | 0.39                 | 0.475                              | 0.335                                 |
| 131       | 0.64                 | 1.16                 | 0.39                 | 0.515                              | 0.645                                 |
| 189       | 0.69                 | 1.31                 | 0.43                 | 0.56                               | 0.75                                  |
| 27        | 0.55                 | 0.38                 | 0.38                 | 0.465                              | -0.085                                |
| 53        | 0.55                 | 0.53                 | 0.38                 | 0.465                              | 0.065                                 |
| 131       | 0.62                 | 0.99                 | 0.38                 | 0.5                                | 0.49                                  |
| 189       | 0.67                 | 1.26                 | 0.43                 | 0.55                               | 0.71                                  |
| 27        | 0.52                 | 0.21                 | 0.39                 | 0.455                              | -0.245                                |
| 53        | 0.52                 | 0.44                 | 0.39                 | 0.455                              | -0.015                                |
| 136       | 0.61                 | 1.05                 | 0.39                 | 0.5                                | 0.55                                  |
| 189       | 0.66                 | 1.27                 | 0.43                 | 0.545                              | 0.725                                 |
| 27        | 0.55                 | 0.72                 | 0.39                 | 0.47                               | 0.25                                  |
| 53        | 0.57                 | 0.94                 | 0.39                 | 0.48                               | 0.46                                  |
| 131       | 0.65                 | 1.25                 | 0.4                  | 0.525                              | 0.725                                 |
| 189       | 0.7                  | 1.37                 | 0.43                 | 0.565                              | 0.805                                 |
| 22        | 0.55                 | 0.7                  | 0.39                 | 0.47                               | 0.23                                  |
| 53        | 0.56                 | 0.85                 | 0.39                 | 0.475                              | 0.375                                 |
| 131       | 0.63                 | 1.21                 | 0.39                 | 0.51                               | 0.7                                   |
| 189       | 0.69                 | 1.36                 | 0.44                 | 0.565                              | 0.795                                 |
| 22        | 0.56                 | 0.75                 | 0.4                  | 0.48                               | 0.27                                  |
| 53        | 0.6                  | 1.02                 | 0.4                  | 0.5                                | 0.52                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 0.65                 | 1.26                 | 0.4                  | 0.525                              | 0.735                                 |
| 189       | 0.7                  | 1.38                 | 0.45                 | 0.575                              | 0.805                                 |
| 22        | 0.55                 | 0.57                 | 0.39                 | 0.47                               | 0.1                                   |
| 53        | 0.57                 | 0.85                 | 0.39                 | 0.48                               | 0.37                                  |
| 131       | 0.63                 | 1.17                 | 0.4                  | 0.515                              | 0.655                                 |
| 189       | 0.68                 | 1.33                 | 0.45                 | 0.565                              | 0.765                                 |
| 17        | 0.55                 | 0.61                 | 0.38                 | 0.465                              | 0.145                                 |
| 53        | 0.57                 | 0.9                  | 0.38                 | 0.475                              | 0.425                                 |
| 131       | 0.64                 | 1.21                 | 0.4                  | 0.52                               | 0.69                                  |
| 189       | 0.69                 | 1.28                 | 0.45                 | 0.57                               | 0.71                                  |
| 22        | 0.52                 | 0.26                 | 0.4                  | 0.46                               | -0.2                                  |
| 53        | 0.53                 | 0.59                 | 0.4                  | 0.465                              | 0.125                                 |
| 131       | 0.63                 | 1.11                 | 0.41                 | 0.52                               | 0.59                                  |
| 189       | 0.68                 | 1.32                 | 0.45                 | 0.565                              | 0.755                                 |
| 27        | 0.54                 | 0.6                  | 0.4                  | 0.47                               | 0.13                                  |
| 53        | 0.57                 | 0.89                 | 0.4                  | 0.485                              | 0.405                                 |
| 131       | 0.67                 | 1.19                 | 0.41                 | 0.54                               | 0.65                                  |
| 189       | 0.69                 | 1.38                 | 0.45                 | 0.57                               | 0.81                                  |
| 22        | 0.55                 | 0.52                 | 0.4                  | 0.475                              | 0.045                                 |
| 53        | 0.55                 | 0.8                  | 0.4                  | 0.475                              | 0.325                                 |
| 131       | 0.64                 | 1.22                 | 0.41                 | 0.525                              | 0.695                                 |
| 189       | 0.69                 | 1.37                 | 0.46                 | 0.575                              | 0.795                                 |
| 17        | 0.54                 | 0.52                 | 0.4                  | 0.47                               | 0.05                                  |
| 53        | 0.56                 | 0.78                 | 0.4                  | 0.48                               | 0.3                                   |
| 131       | 0.65                 | 1.21                 | 0.41                 | 0.53                               | 0.68                                  |
| 189       | 0.7                  | 1.36                 | 0.45                 | 0.575                              | 0.785                                 |
| 204       | 0.71                 | 1.4                  | 0.47                 | 0.59                               | 0.81                                  |
| 220       | 0.73                 | 1.44                 | 0.49                 | 0.61                               | 0.83                                  |
| 235       | 0.76                 | 1.48                 | 0.5                  | 0.63                               | 0.85                                  |
| 251       | 0.8                  | 1.52                 | 0.53                 | 0.665                              | 0.855                                 |
| 267       | 0.83                 | 1.57                 | 0.56                 | 0.695                              | 0.875                                 |
| 282       | 0.87                 | 1.63                 | 0.6                  | 0.735                              | 0.895                                 |
| 298       | 0.92                 | 1.7                  | 0.65                 | 0.785                              | 0.915                                 |
| 313       | 0.96                 | 1.75                 | 0.69                 | 0.825                              | 0.925                                 |
| 329       | 1.01                 | 1.81                 | 0.74                 | 0.875                              | 0.935                                 |
| 345       | 1.05                 | 1.97                 | 0.77                 | 0.91                               | 1.06                                  |
| 360       | 1.1                  | 1.99                 | 0.85                 | 0.975                              | 1.015                                 |
| 376       | 1.1                  | 2.08                 | 0.95                 | 1.025                              | 1.055                                 |
| 392       | 1.12                 | 2.15                 | 1.01                 | 1.065                              | 1.085                                 |
| 407       | 1.15                 | 2.25                 | 1.02                 | 1.085                              | 1.165                                 |
| 423       | 1.18                 | 2.33                 | 1.09                 | 1.135                              | 1.195                                 |
| 438- C,N  | 1.21                 | 2.46                 | 1.05                 | 1.13                               | 1.33                                  |
| 454       | 1.26                 | 2.55                 | 1.24                 | 1.25                               | 1.3                                   |
| 459       | 1.26                 | 2.6                  | 1.27                 | 1.265                              | 1.335                                 |
| 464       | 1.26                 | 2.65                 | 1.29                 | 1.275                              | 1.375                                 |
| 470       | 1.27                 | 2.7                  | 1.31                 | 1.29                               | 1.41                                  |
| 475       | 1.29                 | 2.75                 | 1.31                 | 1.3                                | 1.45                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 480       | 1.3                  | 2.79                 | 1.32                 | 1.31                               | 1.48                                  |
| 485       | 1.32                 | 2.85                 | 1.33                 | 1.325                              | 1.525                                 |
| 491       | 1.36                 | 2.94                 | 1.34                 | 1.35                               | 1.59                                  |
| 496       | 1.38                 | 3.02                 | 1.35                 | 1.365                              | 1.655                                 |
| 501       | 1.4                  | 3.06                 | 1.36                 | 1.38                               | 1.68                                  |
| 506       | 1.42                 | 3.15                 | 1.36                 | 1.39                               | 1.76                                  |
| 517       | 1.45                 | 3.4                  | 1.36                 | 1.405                              | 1.995                                 |

**Table A.9.14:** Test Panel Concrete Cube Strength (C30-25-1-iii)

| Cast Date: 07-04-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 03-05-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.45        | 64.6          | 27.07                         | 2359                             |
| II                      | 153x153x153 | 8.5         | 64.4          | 26.99                         | 2373                             |
| III                     | 153x153x153 | 8.5         | 63.4          | 26.57                         | 2373                             |
| IV                      | 153x153x153 | 8.5         | 63.4          | 26.57                         | 2373                             |
| Mean                    |             |             | 63.2          | 26.80                         | 2370                             |

**Table A.9.15:** CFST Concrete Cube Strength (C30-25-1-iii)

| Cast Date: 19-03-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 03-05-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.55        | 82            | 34.36                         | 2387                             |
| II                      | 153x153x154 | 8.5         | 85            | 35.62                         | 2373                             |
| III                     | 153x153x154 | 8.4         | 84.2          | 35.29                         | 2345                             |
| IV                      | 153x153x153 | 8.55        | 82            | 34.36                         | 2387                             |
| Mean                    |             |             |               | 35.09                         | 2369                             |

**Table A.9.16: Sample 6 (C30-25-1-ii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 17        | 0.01                 | 0.35                 | 0                    | 0.005                              | 0.345                                 |
| 32        | 0.02                 | 0.66                 | 0.04                 | 0.03                               | 0.63                                  |
| 48        | 0.02                 | 0.88                 | 0.07                 | 0.045                              | 0.835                                 |
| 69        | 0.01                 | 1.08                 | 0.1                  | 0.055                              | 1.025                                 |
| 79        | 0.01                 | 1.21                 | 0.13                 | 0.07                               | 1.14                                  |
| 95        | -0.01                | 1.39                 | 0.16                 | 0.075                              | 1.315                                 |
| 110       | -0.01                | 1.55                 | 0.19                 | 0.09                               | 1.46                                  |
| 126       | -0.02                | 1.69                 | 0.24                 | 0.11                               | 1.58                                  |
| 142       | -0.03                | 1.8                  | 0.26                 | 0.115                              | 1.685                                 |
| 157       | -0.04                | 1.91                 | 0.3                  | 0.13                               | 1.78                                  |
| 173       | -0.11                | 2                    | 0.36                 | 0.125                              | 1.875                                 |
| 189       | -0.19                | 2.19                 | 0.37                 | 0.09                               | 2.1                                   |
| 209       | -0.3                 | 2.38                 | 0.37                 | 0.035                              | 2.345                                 |
| 32        | -0.22                | 0.81                 | 0.21                 | -0.005                             | 0.815                                 |
| 48        | -0.22                | 0.9                  | 0.21                 | -0.005                             | 0.905                                 |
| 69        | -0.24                | 0.99                 | 0.23                 | -0.005                             | 0.995                                 |
| 79        | -0.25                | 1.05                 | 0.24                 | -0.005                             | 1.055                                 |
| 95        | -0.27                | 1.11                 | 0.26                 | -0.005                             | 1.115                                 |
| 110       | -0.29                | 1.18                 | 0.27                 | -0.01                              | 1.19                                  |
| 126       | -0.29                | 1.22                 | 0.29                 | 0                                  | 1.22                                  |
| 142       | -0.3                 | 1.27                 | 0.3                  | 0                                  | 1.27                                  |
| 157       | -0.32                | 1.33                 | 0.32                 | 0                                  | 1.33                                  |
| 173       | -0.32                | 1.37                 | 0.32                 | 0                                  | 1.37                                  |
| 189       | -0.34                | 1.42                 | 0.33                 | -0.005                             | 1.425                                 |
| 209       | -0.35                | 1.47                 | 0.35                 | 0                                  | 1.47                                  |
| 17        | -0.21                | 0.68                 | 0.21                 | 0                                  | 0.68                                  |
| 53        | -0.22                | 0.96                 | 0.23                 | 0.005                              | 0.955                                 |
| 131       | -0.31                | 1.3                  | 0.29                 | -0.01                              | 1.31                                  |
| 209       | -0.39                | 1.5                  | 0.33                 | -0.03                              | 1.53                                  |
| 32        | -0.27                | 0.91                 | 0.2                  | -0.035                             | 0.945                                 |
| 53        | -0.28                | 1.03                 | 0.22                 | -0.03                              | 1.06                                  |
| 131       | -0.34                | 1.33                 | 0.27                 | -0.035                             | 1.365                                 |
| 209       | -0.41                | 1.54                 | 0.32                 | -0.045                             | 1.585                                 |
| 27        | -0.28                | 0.87                 | 0.19                 | -0.045                             | 0.915                                 |
| 53        | -0.3                 | 1.06                 | 0.21                 | -0.045                             | 1.105                                 |
| 131       | -0.38                | 1.38                 | 0.28                 | -0.05                              | 1.43                                  |
| 209       | -0.43                | 1.57                 | 0.32                 | -0.055                             | 1.625                                 |
| 27        | -0.29                | 0.91                 | 0.19                 | -0.05                              | 0.96                                  |
| 53        | -0.3                 | 1.09                 | 0.22                 | -0.04                              | 1.13                                  |
| 131       | -0.37                | 1.39                 | 0.27                 | -0.05                              | 1.44                                  |
| 209       | -0.43                | 1.57                 | 0.32                 | -0.055                             | 1.625                                 |
| 12        | -0.3                 | 0.77                 | 0.19                 | -0.055                             | 0.825                                 |
| 53        | -0.3                 | 1.08                 | 0.22                 | -0.04                              | 1.12                                  |
| 131       | -0.37                | 1.41                 | 0.28                 | -0.045                             | 1.455                                 |
| 209       | -0.43                | 1.59                 | 0.33                 | -0.05                              | 1.64                                  |
| 17        | -0.29                | 0.84                 | 0.19                 | -0.05                              | 0.89                                  |
| 53        | -0.31                | 1.12                 | 0.21                 | -0.05                              | 1.17                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | -0.39                | 1.42                 | 0.26                 | -0.065                             | 1.485                                 |
| 209       | -0.45                | 1.58                 | 0.31                 | -0.07                              | 1.65                                  |
| 38        | -0.32                | 1.06                 | 0.19                 | -0.065                             | 1.125                                 |
| 53        | -0.33                | 1.14                 | 0.22                 | -0.055                             | 1.195                                 |
| 131       | -0.39                | 1.45                 | 0.27                 | -0.06                              | 1.51                                  |
| 209       | -0.45                | 1.62                 | 0.32                 | -0.065                             | 1.685                                 |
| 32        | -0.31                | 1.01                 | 0.21                 | -0.05                              | 1.06                                  |
| 53        | -0.32                | 1.14                 | 0.24                 | -0.04                              | 1.18                                  |
| 131       | 0.4                  | 1.46                 | 0.28                 | 0.34                               | 1.12                                  |
| 209       | -0.46                | 1.62                 | 0.32                 | -0.07                              | 1.69                                  |
| 22        | -0.31                | 0.93                 | 0.2                  | -0.055                             | 0.985                                 |
| 53        | -0.33                | 1.15                 | 0.22                 | -0.055                             | 1.205                                 |
| 131       | -0.39                | 1.47                 | 0.28                 | -0.055                             | 1.525                                 |
| 209       | -0.46                | 1.63                 | 0.32                 | -0.07                              | 1.7                                   |
| 17        | -0.32                | 0.92                 | 0.22                 | -0.05                              | 0.97                                  |
| 53        | -0.31                | 1.12                 | 0.22                 | -0.045                             | 1.165                                 |
| 131       | -0.39                | 1.5                  | 0.29                 | -0.05                              | 1.55                                  |
| 209       | -0.46                | 1.64                 | 0.33                 | -0.065                             | 1.705                                 |
| 27        | -0.32                | 1.02                 | 0.23                 | -0.045                             | 1.065                                 |
| 53        | -0.33                | 1.18                 | 0.23                 | -0.05                              | 1.23                                  |
| 131       | -0.4                 | 1.49                 | 0.28                 | -0.06                              | 1.55                                  |
| 209       | -0.46                | 1.64                 | 0.31                 | -0.075                             | 1.715                                 |
| 12        | -0.25                | 0.82                 | 0.29                 | 0.02                               | 0.8                                   |
| 53        | -0.32                | 1.17                 | 0.29                 | -0.015                             | 1.185                                 |
| 131       | -0.41                | 1.52                 | 0.29                 | -0.06                              | 1.58                                  |
| 209       | -0.49                | 1.65                 | 0.31                 | -0.09                              | 1.74                                  |
| 27        | -0.33                | 0.98                 | 0.2                  | -0.065                             | 1.045                                 |
| 53        | -0.34                | 1.16                 | 0.21                 | -0.065                             | 1.225                                 |
| 131       | -0.42                | 1.49                 | 0.26                 | -0.08                              | 1.57                                  |
| 209       | -0.48                | 1.64                 | 0.29                 | -0.095                             | 1.735                                 |
| 27        | -0.31                | 0.9                  | 0.19                 | -0.06                              | 0.96                                  |
| 53        | -0.34                | 1.14                 | 0.21                 | -0.065                             | 1.205                                 |
| 131       | -0.42                | 1.48                 | 0.25                 | -0.085                             | 1.565                                 |
| 209       | -0.48                | 1.64                 | 0.29                 | -0.095                             | 1.735                                 |
| 27        | -0.32                | 0.88                 | 0.19                 | -0.065                             | 0.945                                 |
| 53        | -0.34                | 1.11                 | 0.2                  | -0.07                              | 1.18                                  |
| 131       | -0.42                | 1.47                 | 0.25                 | -0.085                             | 1.555                                 |
| 209       | -0.49                | 1.65                 | 0.3                  | -0.095                             | 1.745                                 |
| 1         | -0.28                | 0.57                 | 0.16                 | -0.06                              | 0.63                                  |
| 53        | -0.35                | 1.17                 | 0.19                 | -0.08                              | 1.25                                  |
| 131       | -0.43                | 1.51                 | 0.25                 | -0.09                              | 1.6                                   |
| 209       | -0.5                 | 1.64                 | 0.29                 | -0.105                             | 1.745                                 |
| 17        | -0.32                | 0.91                 | 0.19                 | -0.065                             | 0.975                                 |
| 53        | -0.37                | 1.21                 | 0.2                  | -0.085                             | 1.295                                 |
| 131       | -0.44                | 1.49                 | 0.24                 | -0.1                               | 1.59                                  |
| 209       | -0.5                 | 1.65                 | 0.29                 | -0.105                             | 1.755                                 |
| 32        | -0.35                | 1.1                  | 0.23                 | -0.06                              | 1.16                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 53        | -0.35                | 1.18                 | 0.24                 | -0.055                             | 1.235                                 |
| 131       | -0.38                | 1.55                 | 0.32                 | -0.03                              | 1.58                                  |
| 209       | -0.42                | 1.72                 | 0.4                  | -0.01                              | 1.73                                  |
| 27        | -0.36                | 1.07                 | 0.25                 | -0.055                             | 1.125                                 |
| 53        | -0.36                | 1.22                 | 0.25                 | -0.055                             | 1.275                                 |
| 131       | -0.42                | 1.52                 | 0.29                 | -0.065                             | 1.585                                 |
| 209       | -0.46                | 1.73                 | 0.37                 | -0.045                             | 1.775                                 |
| 17        | -0.35                | 0.98                 | 0.21                 | -0.07                              | 1.05                                  |
| 53        | -0.35                | 1.21                 | 0.22                 | -0.065                             | 1.275                                 |
| 131       | -0.4                 | 1.53                 | 0.31                 | -0.045                             | 1.575                                 |
| 209       | -0.44                | 1.74                 | 0.39                 | -0.025                             | 1.765                                 |
| 22        | -0.35                | 1                    | 0.22                 | -0.065                             | 1.065                                 |
| 53        | -0.36                | 1.22                 | 0.22                 | -0.07                              | 1.29                                  |
| 131       | -0.42                | 1.58                 | 0.3                  | -0.06                              | 1.64                                  |
| 209       | -0.47                | 1.74                 | 0.37                 | -0.05                              | 1.79                                  |
| 17        | -0.33                | 0.96                 | 0.2                  | -0.065                             | 1.025                                 |
| 53        | -0.37                | 1.24                 | 0.22                 | -0.075                             | 1.315                                 |
| 131       | -0.42                | 1.58                 | 0.3                  | -0.06                              | 1.64                                  |
| 209       | -0.48                | 1.73                 | 0.37                 | -0.055                             | 1.785                                 |
| 12        | -0.33                | 0.91                 | 0.21                 | -0.06                              | 0.97                                  |
| 53        | -0.36                | 1.23                 | 0.22                 | -0.07                              | 1.3                                   |
| 131       | -0.43                | 1.58                 | 0.29                 | -0.07                              | 1.65                                  |
| 209       | -0.46                | 1.74                 | 0.37                 | -0.045                             | 1.785                                 |
| 6         | -0.33                | 0.8                  | 0.2                  | -0.065                             | 0.865                                 |
| 53        | -0.32                | 1.21                 | 0.26                 | -0.03                              | 1.24                                  |
| 131       | -0.37                | 1.58                 | 0.36                 | -0.005                             | 1.585                                 |
| 209       | -0.41                | 1.78                 | 0.45                 | 0.02                               | 1.76                                  |
| 235       | -0.42                | 1.83                 | 0.49                 | 0.035                              | 1.795                                 |
| 261       | -0.44                | 1.89                 | 0.54                 | 0.05                               | 1.84                                  |
| 287       | -0.47                | 1.99                 | 0.64                 | 0.085                              | 1.905                                 |
| 313       | -0.51                | 2.11                 | 0.73                 | 0.11                               | 2                                     |
| 340       | -0.58                | 2.25                 | 0.86                 | 0.14                               | 2.11                                  |
| 366       | -0.63                | 2.39                 | 0.98                 | 0.175                              | 2.215                                 |
| 392       | -1.12                | 2.8                  | 1.18                 | 0.03                               | 2.77                                  |
| 418       | -1.23                | 2.96                 | 1.26                 | 0.015                              | 2.945                                 |
| 444       | -1.39                | 3.2                  | 1.38                 | -0.005                             | 3.205                                 |
| 454       | -1.54                | 3.39                 | 1.53                 | -0.005                             | 3.395                                 |
| 459- C    | -1.58                | 3.47                 | 1.56                 | -0.01                              | 3.48                                  |
| 470       | -1.63                | 3.54                 | 1.62                 | -0.005                             | 3.545                                 |
| 475       | -1.7                 | 3.6                  | 1.66                 | -0.02                              | 3.62                                  |
| 480       | -1.72                | 3.65                 | 1.68                 | -0.02                              | 3.67                                  |
| 485       | -1.78                | 3.71                 | 1.71                 | -0.035                             | 3.745                                 |
| 496       | -1.8                 | 3.78                 | 1.75                 | -0.025                             | 3.805                                 |
| 501       | -1.91                | 3.86                 | 1.8                  | -0.055                             | 3.915                                 |
| 506       | -1.98                | 3.9                  | 1.82                 | -0.08                              | 3.98                                  |
| 511       | -2.05                | 3.99                 | 1.85                 | -0.1                               | 4.09                                  |
| 517       | -2.13                | 4.09                 | 1.85                 | -0.14                              | 4.23                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 522       | -3.09                | 4.56                 | 1.91                 | -0.59                              | 5.15                                  |
| 532- N    | -3.58                | 4.99                 | 1.99                 | -0.795                             | 5.785                                 |
| 537       | -3.65                | 5.05                 | 2.02                 | -0.815                             | 5.865                                 |
| 543       | -3.73                | 5.14                 | 2.05                 | -0.84                              | 5.98                                  |
| 548       | -3.8                 | 5.24                 | 2.1                  | -0.85                              | 6.09                                  |
| 553       | -3.88                | 5.32                 | 2.15                 | -0.865                             | 6.185                                 |
| 563       | -3.91                | 5.4                  | 2.2                  | -0.855                             | 6.255                                 |
| 569       | -3.96                | 5.48                 | 2.25                 | -0.855                             | 6.335                                 |
| 574       | -3.99                | 5.57                 | 2.32                 | -0.835                             | 6.405                                 |
| 584       | -4.03                | 5.7                  | 2.39                 | -0.82                              | 6.52                                  |
| 589       | -4.11                | 5.92                 | 2.52                 | -0.795                             | 6.715                                 |

**Table A.9.17: Test Panel Concrete Cube Strength (C30-25-1-ii)**

| Cast Date: 07-04-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 10-06-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.55        | 83.2          | 34.87                         | 2387                             |
| II                      | 153x153x153 | 8.6         | 70            | 29.33                         | 2401                             |
| III                     | 153x153x153 | 8.6         | 66.4          | 27.83                         | 2401                             |
| IV                      | 153x153x153 | 8.6         | 66.4          | 27.83                         | 2401                             |
| Mean                    |             |             |               | 30.68                         | 2397                             |

**Table A.9.18: CFST Concrete Cube Strength (C30-25-1-ii)**

| Cast Date: 14-03-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 10-06-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.5         | 76.6          | 32.10                         | 2373                             |
| II                      | 153x153x154 | 8.5         | 76.6          | 32.10                         | 2373                             |
| III                     | 153x153x154 | 8.5         | 78            | 32.69                         | 2373                             |
| IV                      | 153x153x153 | 8.5         | 78            | 32.69                         | 2373                             |
| Mean                    |             |             |               | 32.39                         | 2373                             |

**Table A.9.19: Sample 7 (C30-25-1-i)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 17        | 0                    | 0.06                 | 0                    | 0                                  | 0.06                                  |
| 32        | 0.01                 | 0.16                 | 0.01                 | 0.01                               | 0.15                                  |
| 48        | 0.05                 | 0.28                 | 0.02                 | 0.035                              | 0.245                                 |
| 64        | 0.07                 | 0.45                 | 0.05                 | 0.06                               | 0.39                                  |
| 79        | 0.08                 | 0.54                 | 0.05                 | 0.065                              | 0.475                                 |
| 95        | 0.09                 | 0.64                 | 0.05                 | 0.07                               | 0.57                                  |
| 110       | 0.09                 | 0.74                 | 0.05                 | 0.07                               | 0.67                                  |
| 126       | 0.09                 | 0.89                 | 0.05                 | 0.07                               | 0.82                                  |
| 142       | 0.09                 | 0.99                 | 0.05                 | 0.07                               | 0.92                                  |
| 157       | 0.09                 | 1.13                 | 0.08                 | 0.085                              | 1.045                                 |
| 173       | 0.09                 | 1.25                 | 0.12                 | 0.105                              | 1.145                                 |
| 189       | 0.09                 | 1.45                 | 0.15                 | 0.12                               | 1.33                                  |
| 209       | 0.09                 | 1.7                  | 0.18                 | 0.135                              | 1.565                                 |
| 22        | -0.06                | 0.32                 | 0.08                 | 0.01                               | 0.31                                  |
| 32        | -0.06                | 0.32                 | 0.08                 | 0.01                               | 0.31                                  |
| 48        | -0.06                | 0.39                 | 0.07                 | 0.005                              | 0.385                                 |
| 64        | -0.05                | 0.45                 | 0.08                 | 0.015                              | 0.435                                 |
| 79        | -0.04                | 0.49                 | 0.09                 | 0.025                              | 0.465                                 |
| 95        | -0.03                | 0.53                 | 0.1                  | 0.035                              | 0.495                                 |
| 110       | -0.01                | 0.59                 | 0.11                 | 0.05                               | 0.54                                  |
| 126       | 0                    | 0.63                 | 0.12                 | 0.06                               | 0.57                                  |
| 142       | 0                    | 0.67                 | 0.12                 | 0.06                               | 0.61                                  |
| 157       | 0                    | 0.71                 | 0.13                 | 0.065                              | 0.645                                 |
| 173       | 0                    | 0.75                 | 0.13                 | 0.065                              | 0.685                                 |
| 189       | 0                    | 0.78                 | 0.14                 | 0.07                               | 0.71                                  |
| 209       | 0                    | 0.85                 | 0.15                 | 0.075                              | 0.775                                 |
| 22        | -0.14                | 0.49                 | 0.02                 | -0.06                              | 0.55                                  |
| 53        | -0.11                | 0.5                  | 0.01                 | -0.05                              | 0.55                                  |
| 131       | -0.07                | 0.79                 | 0.12                 | 0.025                              | 0.765                                 |
| 209       | -0.01                | 1.02                 | 0.16                 | 0.075                              | 0.945                                 |
| 27        | -0.13                | 0.61                 | 0.08                 | -0.025                             | 0.635                                 |
| 53        | -0.13                | 0.72                 | 0.08                 | -0.025                             | 0.745                                 |
| 131       | -0.07                | 0.85                 | 0.11                 | 0.02                               | 0.83                                  |
| 209       | -0.01                | 1.21                 | 0.2                  | 0.095                              | 1.115                                 |
| 17        | -0.15                | 0.79                 | 0.06                 | -0.045                             | 0.835                                 |
| 53        | -0.13                | 0.93                 | 0.06                 | -0.035                             | 0.965                                 |
| 131       | -0.05                | 1.17                 | 0.11                 | 0.03                               | 1.14                                  |
| 209       | 0                    | 1.38                 | 0.19                 | 0.095                              | 1.285                                 |
| 32        | -0.1                 | 0.99                 | 0.05                 | -0.025                             | 1.015                                 |
| 53        | -0.1                 | 1.1                  | 0.15                 | 0.025                              | 1.075                                 |
| 131       | -0.7                 | 1.37                 | 0.18                 | -0.26                              | 1.63                                  |
| 209       | 0                    | 1.57                 | 0.26                 | 0.13                               | 1.44                                  |
| 27        | -0.14                | 0.68                 | 0.08                 | -0.03                              | 0.71                                  |
| 53        | -0.14                | 0.9                  | 0.18                 | 0.02                               | 0.88                                  |
| 131       | -0.09                | 1.42                 | 0.28                 | 0.095                              | 1.325                                 |
| 209       | -0.04                | 1.73                 | 0.38                 | 0.17                               | 1.56                                  |
| 27        | -0.12                | 0.22                 | 0.26                 | 0.07                               | 0.15                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 53        | -0.12                | 0.4                  | 0.26                 | 0.07                               | 0.33                                  |
| 131       | -0.06                | 0.67                 | 0.3                  | 0.12                               | 0.55                                  |
| 209       | 0                    | 0.84                 | 0.38                 | 0.19                               | 0.65                                  |
| 27        | -0.01                | 0.47                 | 0.23                 | 0.11                               | 0.36                                  |
| 53        | -0.01                | 0.56                 | 0.23                 | 0.11                               | 0.45                                  |
| 131       | -0.04                | 0.76                 | 0.23                 | 0.095                              | 0.665                                 |
| 209       | 0.02                 | 0.93                 | 0.33                 | 0.175                              | 0.755                                 |
| 27        | -0.1                 | 0.53                 | 0.11                 | 0.005                              | 0.525                                 |
| 53        | -0.1                 | 0.63                 | 0.19                 | 0.045                              | 0.585                                 |
| 131       | -0.03                | 0.82                 | 0.2                  | 0.085                              | 0.735                                 |
| 209       | 0.02                 | 0.99                 | 0.3                  | 0.16                               | 0.83                                  |
| 27        | -0.09                | 0.52                 | 0.14                 | 0.025                              | 0.495                                 |
| 53        | -0.09                | 0.64                 | 0.13                 | 0.02                               | 0.62                                  |
| 131       | -0.02                | 0.85                 | 0.17                 | 0.075                              | 0.775                                 |
| 209       | 0.02                 | 1.03                 | 0.25                 | 0.135                              | 0.895                                 |
| 22        | -0.14                | 0.63                 | 0.18                 | 0.02                               | 0.61                                  |
| 53        | -0.11                | 0.73                 | 0.18                 | 0.035                              | 0.695                                 |
| 131       | -0.04                | 0.92                 | 0.2                  | 0.08                               | 0.84                                  |
| 209       | 0.02                 | 1.07                 | 0.28                 | 0.15                               | 0.92                                  |
| 32        | -0.07                | 0.67                 | 0.15                 | 0.04                               | 0.63                                  |
| 53        | -0.07                | 0.73                 | 0.15                 | 0.04                               | 0.69                                  |
| 131       | -0.01                | 0.93                 | 0.15                 | 0.07                               | 0.86                                  |
| 209       | 0.04                 | 1.09                 | 0.22                 | 0.13                               | 0.96                                  |
| 27        | -0.08                | 0.63                 | 0.12                 | 0.02                               | 0.61                                  |
| 53        | -0.08                | 0.74                 | 0.12                 | 0.02                               | 0.72                                  |
| 131       | 0                    | 0.92                 | 0.15                 | 0.075                              | 0.845                                 |
| 209       | 0.03                 | 1.14                 | 0.21                 | 0.12                               | 1.02                                  |
| 32        | -0.09                | 0.74                 | 0.2                  | 0.055                              | 0.685                                 |
| 53        | -0.09                | 0.8                  | 0.2                  | 0.055                              | 0.745                                 |
| 131       | -0.01                | 1.02                 | 0.2                  | 0.095                              | 0.925                                 |
| 209       | 0.03                 | 1.17                 | 0.24                 | 0.135                              | 1.035                                 |
| 27        | -0.08                | 0.66                 | 0.11                 | 0.015                              | 0.645                                 |
| 53        | -0.08                | 0.77                 | 0.11                 | 0.015                              | 0.755                                 |
| 131       | 0                    | 1.03                 | 0.14                 | 0.07                               | 0.96                                  |
| 209       | 0.02                 | 1.19                 | 0.21                 | 0.115                              | 1.075                                 |
| 22        | -0.11                | 0.64                 | 0.08                 | -0.015                             | 0.655                                 |
| 53        | -0.07                | 0.81                 | 0.08                 | 0.005                              | 0.805                                 |
| 136       | -0.01                | 1.06                 | 0.15                 | 0.07                               | 0.99                                  |
| 209       | 0                    | 1.21                 | 0.22                 | 0.11                               | 1.1                                   |
| 27        | -0.09                | 0.72                 | 0.08                 | -0.005                             | 0.725                                 |
| 53        | -0.07                | 0.86                 | 0.08                 | 0.005                              | 0.855                                 |
| 131       | 0                    | 1.08                 | 0.12                 | 0.06                               | 1.02                                  |
| 209       | 0.01                 | 1.24                 | 0.21                 | 0.11                               | 1.13                                  |
| 27        | -0.13                | 0.83                 | 0.18                 | 0.025                              | 0.805                                 |
| 53        | -0.13                | 0.93                 | 0.19                 | 0.03                               | 0.9                                   |
| 131       | -0.06                | 1.12                 | 0.21                 | 0.075                              | 1.045                                 |
| 209       | -0.03                | 1.28                 | 0.28                 | 0.125                              | 1.155                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | -0.08                | 0.75                 | 0.07                 | -0.005                             | 0.755                                 |
| 53        | -0.08                | 0.84                 | 0.07                 | -0.005                             | 0.845                                 |
| 136       | -0.01                | 1.12                 | 0.11                 | 0.05                               | 1.07                                  |
| 209       | 0                    | 1.28                 | 0.19                 | 0.095                              | 1.185                                 |
| 27        | -0.12                | 0.84                 | 0.13                 | 0.005                              | 0.835                                 |
| 53        | -0.1                 | 0.93                 | 0.13                 | 0.015                              | 0.915                                 |
| 131       | -0.03                | 1.16                 | 0.16                 | 0.065                              | 1.095                                 |
| 209       | -0.02                | 1.3                  | 0.23                 | 0.105                              | 1.195                                 |
| 27        | -0.09                | 0.81                 | 0.08                 | -0.005                             | 0.815                                 |
| 53        | -0.08                | 0.92                 | 0.07                 | -0.005                             | 0.925                                 |
| 131       | -0.02                | 1.17                 | 0.12                 | 0.05                               | 1.12                                  |
| 209       | -0.01                | 1.32                 | 0.21                 | 0.1                                | 1.22                                  |
| 22        | -0.1                 | 0.82                 | 0.07                 | -0.015                             | 0.835                                 |
| 53        | -0.09                | 0.96                 | 0.06                 | -0.015                             | 0.975                                 |
| 136       | -0.04                | 1.2                  | 0.12                 | 0.04                               | 1.16                                  |
| 209       | -0.01                | 1.32                 | 0.2                  | 0.095                              | 1.225                                 |
| 27        | -0.1                 | 0.55                 | 0.06                 | -0.02                              | 0.57                                  |
| 53        | -0.11                | 0.84                 | 0.06                 | -0.025                             | 0.865                                 |
| 131       | -0.08                | 1.17                 | 0.1                  | 0.01                               | 1.16                                  |
| 209       | -0.08                | 1.35                 | 0.2                  | 0.06                               | 1.29                                  |
| 32        | -0.17                | 1                    | 0.12                 | -0.025                             | 1.025                                 |
| 53        | -0.17                | 1.05                 | 0.12                 | -0.025                             | 1.075                                 |
| 131       | -0.1                 | 1.24                 | 0.17                 | 0.035                              | 1.205                                 |
| 209       | -0.08                | 1.39                 | 0.24                 | 0.08                               | 1.31                                  |
| 22        | -0.19                | 0.95                 | 0.13                 | -0.03                              | 0.98                                  |
| 53        | -0.18                | 1.07                 | 0.13                 | -0.025                             | 1.095                                 |
| 131       | -0.1                 | 1.27                 | 0.18                 | 0.04                               | 1.23                                  |
| 209       | -0.07                | 1.4                  | 0.25                 | 0.09                               | 1.31                                  |
| 241       | -0.07                | 1.46                 | 0.27                 | 0.1                                | 1.36                                  |
| 261       | -0.06                | 1.5                  | 0.28                 | 0.11                               | 1.39                                  |
| 287       | -0.05                | 1.58                 | 0.32                 | 0.135                              | 1.445                                 |
| 313       | -0.04                | 1.65                 | 0.35                 | 0.155                              | 1.495                                 |
| 340       | -0.02                | 1.77                 | 0.42                 | 0.2                                | 1.57                                  |
| 366       | 0                    | 1.86                 | 0.48                 | 0.24                               | 1.62                                  |
| 397- N    | 0.03                 | 2                    | 0.58                 | 0.305                              | 1.695                                 |
| 418       | 0.07                 | 2.12                 | 0.6                  | 0.335                              | 1.785                                 |
| 449       | 0.1                  | 2.35                 | 0.66                 | 0.38                               | 1.97                                  |
| 454       | 0.11                 | 2.45                 | 0.69                 | 0.4                                | 2.05                                  |
| 459       | 0.11                 | 2.52                 | 0.73                 | 0.42                               | 2.1                                   |
| 470       | 0.11                 | 2.57                 | 0.75                 | 0.43                               | 2.14                                  |
| 475       | 0.11                 | 2.64                 | 0.78                 | 0.445                              | 2.195                                 |
| 480       | 0.12                 | 2.71                 | 0.8                  | 0.46                               | 2.25                                  |
| 485       | 0.12                 | 2.75                 | 0.83                 | 0.475                              | 2.275                                 |
| 496       | 0.12                 | 2.78                 | 0.85                 | 0.485                              | 2.295                                 |
| 501       | 0.12                 | 2.84                 | 0.89                 | 0.505                              | 2.335                                 |
| 506       | 0.12                 | 2.9                  | 0.9                  | 0.51                               | 2.39                                  |
| 517       | 0.12                 | 2.9                  | 0.91                 | 0.515                              | 2.385                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 522- C    | 0.14                 | 3                    | 1.02                 | 0.58                               | 2.42                                  |
| 527       | 0.15                 | 3.1                  | 1.05                 | 0.6                                | 2.5                                   |
| 532       | 0.16                 | 3.16                 | 1.06                 | 0.61                               | 2.55                                  |
| 537       | 0.18                 | 3.2                  | 1.18                 | 0.68                               | 2.52                                  |
| 543       | 0.2                  | 3.25                 | 1.19                 | 0.695                              | 2.555                                 |
| 548       | 0.22                 | 3.33                 | 1                    | 0.61                               | 2.72                                  |
| 553       | 0.25                 | 3.4                  | 1.01                 | 0.63                               | 2.77                                  |
| 558       | 0.26                 | 3.49                 | 1.01                 | 0.635                              | 2.855                                 |
| 563       | 0.27                 | 3.6                  | 1.01                 | 0.64                               | 2.96                                  |
| 569       | 0.3                  | 3.7                  | 1.01                 | 0.655                              | 3.045                                 |

**Table A.9.20: Test Panel Concrete Cube Strength (C30-25-1-i)**

| Cast Date: 11-04-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 04-05-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.65        | 80            | 33.53                         | 2415                             |
| II                      | 153x153x153 | 8.7         | 81.2          | 34.03                         | 2429                             |
| III                     | 153x153x153 | 8.55        | 82.8          | 34.70                         | 2387                             |
| IV                      | 153x153x153 | 8.6         | 75.4          | 31.60                         | 2401                             |
| Mean                    |             |             |               | 33.46                         | 2408                             |

**Table A.9.21: CFST Concrete Cube Strength (C30-25-1-i)**

| Cast Date: 14-03-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 04-05-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.6         | 81.4          | 34.11                         | 2401                             |
| II                      | 153x153x154 | 8.4         | 80.8          | 33.86                         | 2345                             |
| III                     | 153x153x154 | 8.8         | 82            | 34.36                         | 2457                             |
| IV                      | 153x153x153 | 8.6         | 81.4          | 34.11                         | 2401                             |
| Mean                    |             |             |               | 34.11                         | 2401                             |

**Table A.9.22: Sample 8 (C45-25-1-iii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.04                 | 0.42                 | 0.08                 | 0.06                               | 0.36                                  |
| 53        | 0.12                 | 1.07                 | 0.16                 | 0.14                               | 0.93                                  |
| 79        | 0.28                 | 1.4                  | 0.26                 | 0.27                               | 1.13                                  |
| 105       | 0.33                 | 1.99                 | 0.35                 | 0.34                               | 1.65                                  |
| 131       | 1.04                 | 2.94                 | 0.66                 | 0.85                               | 2.09                                  |
| 157       | 1.19                 | 3.24                 | 0.75                 | 0.97                               | 2.27                                  |
| 183       | 1.54                 | 3.31                 | 0.91                 | 1.225                              | 2.085                                 |
| 209       | 1.8                  | 4.1                  | 1.1                  | 1.45                               | 2.65                                  |
| 1         | 0.72                 | 0.21                 | 0.75                 | 0.735                              | -0.525                                |
| 53        | 0.68                 | 0.35                 | 0.87                 | 0.775                              | -0.425                                |
| 79        | 0.78                 | 0.69                 | 1.01                 | 0.895                              | -0.205                                |
| 105       | 0.84                 | 0.89                 | 1.08                 | 0.96                               | -0.07                                 |
| 131       | 0.84                 | 1.04                 | 1.1                  | 0.97                               | 0.07                                  |
| 157       | 0.9                  | 1.17                 | 1.14                 | 1.02                               | 0.15                                  |
| 183       | 0.94                 | 1.31                 | 1.2                  | 1.07                               | 0.24                                  |
| 209       | 1.02                 | 1.54                 | 1.28                 | 1.15                               | 0.39                                  |
| 17        | 0.78                 | 1.49                 | 0.05                 | 0.415                              | 1.075                                 |
| 53        | 0.85                 | 1.85                 | 0.1                  | 0.475                              | 1.375                                 |
| 131       | 1                    | 2.37                 | 0.2                  | 0.6                                | 1.77                                  |
| 209       | 1.16                 | 2.7                  | 0.28                 | 0.72                               | 1.98                                  |
| 22        | 0.91                 | 1.46                 | 0.05                 | 0.48                               | 0.98                                  |
| 53        | 0.98                 | 1.94                 | 0.15                 | 0.565                              | 1.375                                 |
| 131       | 1.12                 | 2.58                 | 0.25                 | 0.685                              | 1.895                                 |
| 209       | 1.2                  | 2.86                 | 0.26                 | 0.73                               | 2.13                                  |
| 22        | 0.02                 | 1.92                 | 0.14                 | 0.08                               | 1.84                                  |
| 53        | 0.05                 | 2.19                 | 0.2                  | 0.125                              | 2.065                                 |
| 131       | 0.14                 | 2.65                 | 0.25                 | 0.195                              | 2.455                                 |
| 209       | 0.18                 | 2.95                 | 0.36                 | 0.27                               | 2.68                                  |
| 38        | 0.09                 | 1.15                 | 0.24                 | 0.165                              | 0.985                                 |
| 58        | 0.11                 | 1.35                 | 0.25                 | 0.18                               | 1.17                                  |
| 131       | 0.19                 | 1.77                 | 0.25                 | 0.22                               | 1.55                                  |
| 209       | 0.29                 | 2.1                  | 0.37                 | 0.33                               | 1.77                                  |
| 32        | 0.11                 | 1.21                 | 0.25                 | 0.18                               | 1.03                                  |
| 53        | 0.13                 | 1.38                 | 0.26                 | 0.195                              | 1.185                                 |
| 131       | 0.21                 | 1.87                 | 0.31                 | 0.26                               | 1.61                                  |
| 209       | 0.28                 | 2.17                 | 0.42                 | 0.35                               | 1.82                                  |
| 27        | 0.13                 | 1.14                 | 0.25                 | 0.19                               | 0.95                                  |
| 53        | 0.17                 | 1.43                 | 0.27                 | 0.22                               | 1.21                                  |
| 131       | 0.27                 | 1.97                 | 0.33                 | 0.3                                | 1.67                                  |
| 209       | 0.35                 | 2.25                 | 0.44                 | 0.395                              | 1.855                                 |
| 17        | 0.11                 | 1.1                  | 0.27                 | 0.19                               | 0.91                                  |
| 53        | 0.13                 | 1.61                 | 0.33                 | 0.23                               | 1.38                                  |
| 131       | 0.21                 | 2.01                 | 0.43                 | 0.32                               | 1.69                                  |
| 209       | 0.28                 | 2.34                 | 0.45                 | 0.365                              | 1.975                                 |
| 27        | 0.18                 | 1.24                 | 0.33                 | 0.255                              | 0.985                                 |
| 53        | 0.22                 | 1.61                 | 0.34                 | 0.28                               | 1.33                                  |
| 131       | 0.32                 | 2.17                 | 0.46                 | 0.39                               | 1.78                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 0.44                 | 2.47                 | 0.56                 | 0.5                                | 1.97                                  |
| 38        | 0.24                 | 1.17                 | 0.31                 | 0.275                              | 0.895                                 |
| 53        | 0.26                 | 1.42                 | 0.32                 | 0.29                               | 1.13                                  |
| 131       | 0.44                 | 2.19                 | 0.5                  | 0.47                               | 1.72                                  |
| 209       | 0.58                 | 2.58                 | 0.68                 | 0.63                               | 1.95                                  |
| 22        | 0.25                 | 1.4                  | 0.35                 | 0.3                                | 1.1                                   |
| 53        | 0.31                 | 1.69                 | 0.36                 | 0.335                              | 1.355                                 |
| 131       | 0.51                 | 2.25                 | 0.52                 | 0.515                              | 1.735                                 |
| 209       | 0.59                 | 2.6                  | 0.65                 | 0.62                               | 1.98                                  |
| 22        | 0.29                 | 1.81                 | 0.22                 | 0.255                              | 1.555                                 |
| 53        | 0.35                 | 2.4                  | 0.25                 | 0.3                                | 2.1                                   |
| 131       | 0.56                 | 3.25                 | 0.59                 | 0.575                              | 2.675                                 |
| 209       | 0.74                 | 3.66                 | 0.76                 | 0.75                               | 2.91                                  |
| 17        | 0.33                 | 1.3                  | 0.11                 | 0.22                               | 1.08                                  |
| 53        | 0.45                 | 2.31                 | 0.21                 | 0.33                               | 1.98                                  |
| 131       | 0.63                 | 3.37                 | 0.63                 | 0.63                               | 2.74                                  |
| 209       | 0.73                 | 3.75                 | 0.8                  | 0.765                              | 2.985                                 |
| 27        | 0.49                 | 2.35                 | 0.5                  | 0.495                              | 1.855                                 |
| 53        | 0.45                 | 2.79                 | 0.5                  | 0.475                              | 2.315                                 |
| 131       | 0.62                 | 3.5                  | 0.58                 | 0.6                                | 2.9                                   |
| 209       | 0.68                 | 3.78                 | 0.65                 | 0.665                              | 3.115                                 |
| 17        | 0.32                 | 2.49                 | 0.36                 | 0.34                               | 2.15                                  |
| 53        | 0.34                 | 3.07                 | 0.47                 | 0.405                              | 2.665                                 |
| 131       | 0.36                 | 3.49                 | 0.62                 | 0.49                               | 3                                     |
| 209       | 0.43                 | 4.04                 | 1                    | 0.715                              | 3.325                                 |
| 6         | 0.3                  | 2.89                 | 0.8                  | 0.55                               | 2.34                                  |
| 53        | 0.3                  | 3.41                 | 0.95                 | 0.625                              | 2.785                                 |
| 131       | 0.34                 | 3.89                 | 1.08                 | 0.71                               | 3.18                                  |
| 209       | 0.34                 | 4.6                  | 0.74                 | 0.54                               | 4.06                                  |
| 22        | 0.32                 | 3.7                  | 0.53                 | 0.425                              | 3.275                                 |
| 53        | 0.31                 | 4.07                 | 0.61                 | 0.46                               | 3.61                                  |
| 131       | 0.3                  | 4.5                  | 0.79                 | 0.545                              | 3.955                                 |
| 209       | 0.35                 | 4.74                 | 0.94                 | 0.645                              | 4.095                                 |
| 6         | 0.25                 | 3.33                 | 0.55                 | 0.4                                | 2.93                                  |
| 53        | 0.35                 | 4.11                 | 0.68                 | 0.515                              | 3.595                                 |
| 131       | 0.42                 | 4.62                 | 0.8                  | 0.61                               | 4.01                                  |
| 209       | 0.52                 | 4.85                 | 0.95                 | 0.735                              | 4.115                                 |
| 17        | 0.34                 | 3.32                 | 0.6                  | 0.47                               | 2.85                                  |
| 53        | 0.44                 | 4.02                 | 0.69                 | 0.565                              | 3.455                                 |
| 131       | 0.51                 | 4.62                 | 0.86                 | 0.685                              | 3.935                                 |
| 209       | 0.6                  | 4.89                 | 0.9                  | 0.75                               | 4.14                                  |
| 17        | 0.42                 | 3.56                 | 0.64                 | 0.53                               | 3.03                                  |
| 53        | 0.48                 | 4.09                 | 0.7                  | 0.59                               | 3.5                                   |
| 131       | 0.55                 | 4.7                  | 0.79                 | 0.67                               | 4.03                                  |
| 209       | 0.59                 | 4.94                 | 0.95                 | 0.77                               | 4.17                                  |
| 27        | 0.56                 | 0.75                 | 0.4                  | 0.48                               | 0.27                                  |
| 53        | 0.6                  | 1.02                 | 0.4                  | 0.5                                | 0.52                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 0.44                 | 2.47                 | 0.56                 | 0.5                                | 1.97                                  |
| 215       | 0.24                 | 1.17                 | 0.31                 | 0.275                              | 0.895                                 |
| 27        | 0.26                 | 1.42                 | 0.32                 | 0.29                               | 1.13                                  |
| 53        | 0.44                 | 2.19                 | 0.5                  | 0.47                               | 1.72                                  |
| 131       | 0.58                 | 2.58                 | 0.68                 | 0.63                               | 1.95                                  |
| 209       | 0.25                 | 1.4                  | 0.35                 | 0.3                                | 1.1                                   |
| 27        | 0.31                 | 1.69                 | 0.36                 | 0.335                              | 1.355                                 |
| 53        | 0.51                 | 2.25                 | 0.52                 | 0.515                              | 1.735                                 |
| 131       | 0.59                 | 2.6                  | 0.65                 | 0.62                               | 1.98                                  |
| 209       | 0.29                 | 1.81                 | 0.22                 | 0.255                              | 1.555                                 |
| 27        | 0.35                 | 2.4                  | 0.25                 | 0.3                                | 2.1                                   |
| 53        | 0.56                 | 3.25                 | 0.59                 | 0.575                              | 2.675                                 |
| 131       | 0.74                 | 3.66                 | 0.76                 | 0.75                               | 2.91                                  |
| 209       | 0.33                 | 1.3                  | 0.11                 | 0.22                               | 1.08                                  |
| 1- N      | 0.45                 | 2.31                 | 0.21                 | 0.33                               | 1.98                                  |
| 53        | 0.63                 | 3.37                 | 0.63                 | 0.63                               | 2.74                                  |
| 131       | 0.73                 | 3.75                 | 0.8                  | 0.765                              | 2.985                                 |
| 209       | 0.49                 | 2.35                 | 0.5                  | 0.495                              | 1.855                                 |
| 235       | 0.45                 | 2.79                 | 0.5                  | 0.475                              | 2.315                                 |
| 261       | 0.62                 | 3.5                  | 0.58                 | 0.6                                | 2.9                                   |
| 287       | 0.68                 | 3.78                 | 0.65                 | 0.665                              | 3.115                                 |
| 313       | 0.32                 | 2.49                 | 0.36                 | 0.34                               | 2.15                                  |
| 340       | 0.34                 | 3.07                 | 0.47                 | 0.405                              | 2.665                                 |
| 366- C    | 0.36                 | 3.49                 | 0.62                 | 0.49                               | 3                                     |
| 392       | 0.43                 | 4.04                 | 1                    | 0.715                              | 3.325                                 |
| 418       | 0.3                  | 2.89                 | 0.8                  | 0.55                               | 2.34                                  |
| 444       | 0.3                  | 3.41                 | 0.95                 | 0.625                              | 2.785                                 |
| 449       | 0.34                 | 3.89                 | 1.08                 | 0.71                               | 3.18                                  |
| 454       | 0.34                 | 4.6                  | 0.74                 | 0.54                               | 4.06                                  |
| 459       | 0.32                 | 3.7                  | 0.53                 | 0.425                              | 3.275                                 |
| 464       | 0.31                 | 4.07                 | 0.61                 | 0.46                               | 3.61                                  |
| 470       | 0.3                  | 4.5                  | 0.79                 | 0.545                              | 3.955                                 |
| 475       | 0.35                 | 4.74                 | 0.94                 | 0.645                              | 4.095                                 |
| 480       | 0.25                 | 3.33                 | 0.55                 | 0.4                                | 2.93                                  |
| 491       | 0.35                 | 4.11                 | 0.68                 | 0.515                              | 3.595                                 |
| 496       | 0.42                 | 4.62                 | 0.8                  | 0.61                               | 4.01                                  |
| 511       | 0.52                 | 4.85                 | 0.95                 | 0.735                              | 4.115                                 |
| 517       | 0.34                 | 3.32                 | 0.6                  | 0.47                               | 2.85                                  |
| 522       | 0.44                 | 4.02                 | 0.69                 | 0.565                              | 3.455                                 |
| 532       | 0.51                 | 4.62                 | 0.86                 | 0.685                              | 3.935                                 |
| 537       | 0.6                  | 4.89                 | 0.9                  | 0.75                               | 4.14                                  |
| 548       | 0.42                 | 3.56                 | 0.64                 | 0.53                               | 3.03                                  |
| 563       | 0.48                 | 4.09                 | 0.7                  | 0.59                               | 3.5                                   |
| 569       | 0.55                 | 4.7                  | 0.79                 | 0.67                               | 4.03                                  |
| 574       | 0.59                 | 4.94                 | 0.95                 | 0.77                               | 4.17                                  |
| 584       | 0.56                 | 0.75                 | 0.4                  | 0.48                               | 0.27                                  |
| 589       | 0.6                  | 1.02                 | 0.4                  | 0.5                                | 0.52                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 600       | 1.3                  | 2.79                 | 1.32                 | 1.31                               | 1.48                                  |
| 605       | 1.32                 | 2.85                 | 1.33                 | 1.325                              | 1.525                                 |
| 610       | 1.36                 | 2.94                 | 1.34                 | 1.35                               | 1.59                                  |
| 636       | 1.38                 | 3.02                 | 1.35                 | 1.365                              | 1.655                                 |
| 642       | 1.4                  | 3.06                 | 1.36                 | 1.38                               | 1.68                                  |
| 647       | 1.42                 | 3.15                 | 1.36                 | 1.39                               | 1.76                                  |
| 657       | 1.45                 | 3.4                  | 1.36                 | 1.405                              | 1.995                                 |

**Table A.9.23:** Test Panel Concrete Cube Strength (C45-25-1-iii)

| Cast Date: 15-06-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 08-08-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.6         | 117.4         | 49.20                         | 2401                             |
| II                      | 153x153x153 | 8.6         | 117.8         | 49.37                         | 2401                             |
| III                     | 153x153x153 | 8.6         | 111.2         | 46.60                         | 2401                             |
| IV                      | 153x153x153 | 8.7         | 114           | 47.77                         | 2429                             |
| Mean                    |             |             |               | 48.23                         | 2408                             |

**Table A.9.24:** CFST Concrete Cube Strength (C45-25-1-iii)

| Cast Date: 19-03-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 03-05-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.5         | 85            | 35.62                         | 2373                             |
| II                      | 153x153x154 | 8.4         | 84.2          | 35.29                         | 2345                             |
| III                     | 153x153x154 | 8.55        | 82            | 34.36                         | 2387                             |
| IV                      | 153x153x153 | 8.55        | 82            | 34.36                         | 2387                             |
| Mean                    |             |             |               | 35.09                         | 2369                             |

**Table A.9.25: Sample 9 (C45-25-1-i)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.07                 | 0.79                 | 0.13                 | 0.1                                | 0.69                                  |
| 53        | 0.15                 | 1.15                 | 0.14                 | 0.145                              | 1.005                                 |
| 79        | 0.27                 | 1.39                 | 0.07                 | 0.17                               | 1.22                                  |
| 105       | 0.42                 | 1.58                 | 0.08                 | 0.25                               | 1.33                                  |
| 131       | 0.7                  | 1.88                 | 0.1                  | 0.4                                | 1.48                                  |
| 157       | 0.81                 | 2.07                 | 0.15                 | 0.48                               | 1.59                                  |
| 183       | 0.89                 | 2.25                 | 0.29                 | 0.59                               | 1.66                                  |
| 209       | 0.96                 | 2.4                  | 0.45                 | 0.705                              | 1.695                                 |
| 12        | 0.81                 | 2.79                 | 0.34                 | 0.575                              | 2.215                                 |
| 27        | 0.82                 | 2.89                 | 0.36                 | 0.59                               | 2.3                                   |
| 53        | 0.85                 | 3                    | 0.4                  | 0.625                              | 2.375                                 |
| 79        | 0.9                  | 3.13                 | 0.44                 | 0.67                               | 2.46                                  |
| 105       | 0.94                 | 3.21                 | 0.46                 | 0.7                                | 2.51                                  |
| 131       | 0.96                 | 3.29                 | 0.48                 | 0.72                               | 2.57                                  |
| 157       | 1                    | 3.37                 | 0.51                 | 0.755                              | 2.615                                 |
| 183       | 1.02                 | 3.44                 | 0.53                 | 0.775                              | 2.665                                 |
| 209       | 1.05                 | 3.54                 | 0.56                 | 0.805                              | 2.735                                 |
| 38        | 0.91                 | 2.98                 | 0.45                 | 0.68                               | 2.3                                   |
| 53        | 0.92                 | 3.04                 | 0.46                 | 0.69                               | 2.35                                  |
| 131       | 1.01                 | 3.3                  | 0.51                 | 0.76                               | 2.54                                  |
| 209       | 1.09                 | 3.54                 | 0.56                 | 0.825                              | 2.715                                 |
| 22        | 0.92                 | 2.99                 | 0.45                 | 0.685                              | 2.305                                 |
| 53        | 0.96                 | 3.16                 | 0.48                 | 0.72                               | 2.44                                  |
| 131       | 1.05                 | 3.42                 | 0.55                 | 0.8                                | 2.62                                  |
| 209       | 1.11                 | 3.63                 | 0.6                  | 0.855                              | 2.775                                 |
| 27        | 0.95                 | 2.16                 | 0.47                 | 0.71                               | 1.45                                  |
| 53        | 0.98                 | 2.25                 | 0.5                  | 0.74                               | 1.51                                  |
| 131       | 1.05                 | 2.5                  | 0.57                 | 0.81                               | 1.69                                  |
| 209       | 1.11                 | 2.67                 | 0.63                 | 0.87                               | 1.8                                   |
| 22        | 0.95                 | 2.25                 | 0.47                 | 0.71                               | 1.54                                  |
| 53        | 0.96                 | 2.36                 | 0.55                 | 0.755                              | 1.605                                 |
| 131       | 1.04                 | 2.59                 | 0.63                 | 0.835                              | 1.755                                 |
| 209       | 1.07                 | 2.76                 | 0.7                  | 0.885                              | 1.875                                 |
| 17        | 0.96                 | 2.18                 | 0.72                 | 0.84                               | 1.34                                  |
| 53        | 0.97                 | 2.39                 | 0.62                 | 0.795                              | 1.595                                 |
| 131       | 1.03                 | 2.63                 | 0.7                  | 0.865                              | 1.765                                 |
| 209       | 1.07                 | 2.79                 | 0.75                 | 0.91                               | 1.88                                  |
| 22        | 0.92                 | 2.06                 | 0.65                 | 0.785                              | 1.275                                 |
| 53        | 0.97                 | 2.27                 | 0.72                 | 0.845                              | 1.425                                 |
| 131       | 1.08                 | 2.55                 | 0.75                 | 0.915                              | 1.635                                 |
| 209       | 1.12                 | 2.77                 | 0.77                 | 0.945                              | 1.825                                 |
| 22        | 1.01                 | 2.85                 | 0.59                 | 0.8                                | 2.05                                  |
| 64        | 1.01                 | 3.35                 | 0.74                 | 0.875                              | 2.475                                 |
| 131       | 1.08                 | 3.64                 | 0.77                 | 0.925                              | 2.715                                 |
| 209       | 1.11                 | 3.83                 | 0.79                 | 0.95                               | 2.88                                  |
| 22        | 0.95                 | 2.18                 | 0.74                 | 0.845                              | 1.335                                 |
| 53        | 1                    | 2.39                 | 0.77                 | 0.885                              | 1.505                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 1.09                 | 2.66                 | 0.79                 | 0.94                               | 1.72                                  |
| 209       | 1.13                 | 2.84                 | 0.81                 | 0.97                               | 1.87                                  |
| 32        | 0.98                 | 2.32                 | 0.73                 | 0.855                              | 1.465                                 |
| 53        | 1.01                 | 2.46                 | 0.77                 | 0.89                               | 1.57                                  |
| 131       | 1.07                 | 2.72                 | 0.78                 | 0.925                              | 1.795                                 |
| 209       | 1.1                  | 2.87                 | 0.83                 | 0.965                              | 1.905                                 |
| 27        | 0.97                 | 2.3                  | 0.77                 | 0.87                               | 1.43                                  |
| 53        | 1.01                 | 2.45                 | 0.81                 | 0.91                               | 1.54                                  |
| 131       | 1.09                 | 2.72                 | 0.83                 | 0.96                               | 1.76                                  |
| 209       | 1.12                 | 2.88                 | 0.85                 | 0.985                              | 1.895                                 |
| 32        | 0.02                 | 2.44                 | 0.8                  | 0.41                               | 2.03                                  |
| 53        | 1.02                 | 2.51                 | 0.81                 | 0.915                              | 1.595                                 |
| 131       | 1.07                 | 2.75                 | 0.84                 | 0.955                              | 1.795                                 |
| 209       | 1.1                  | 2.9                  | 0.88                 | 0.99                               | 1.91                                  |
| 32        | 0.98                 | 2.52                 | 0.78                 | 0.88                               | 1.64                                  |
| 53        | 0.98                 | 2.58                 | 0.81                 | 0.895                              | 1.685                                 |
| 131       | 1.03                 | 2.76                 | 0.88                 | 0.955                              | 1.805                                 |
| 209       | 1.07                 | 2.9                  | 0.93                 | 1                                  | 1.9                                   |
| 17        | 0.93                 | 2.44                 | 0.79                 | 0.86                               | 1.58                                  |
| 53        | 0.96                 | 2.6                  | 0.87                 | 0.915                              | 1.685                                 |
| 131       | 1.03                 | 2.79                 | 0.92                 | 0.975                              | 1.815                                 |
| 215       | 1.07                 | 2.93                 | 0.97                 | 1.02                               | 1.91                                  |
| 27        | 0.94                 | 2.52                 | 0.83                 | 0.885                              | 1.635                                 |
| 53        | 0.95                 | 2.64                 | 0.88                 | 0.915                              | 1.725                                 |
| 131       | 1.02                 | 2.82                 | 0.96                 | 0.99                               | 1.83                                  |
| 209       | 1.07                 | 2.95                 | 1.01                 | 1.04                               | 1.91                                  |
| 27        | 0.96                 | 2.54                 | 0.85                 | 0.905                              | 1.635                                 |
| 53        | 0.97                 | 2.66                 | 0.91                 | 0.94                               | 1.72                                  |
| 131       | 1.04                 | 2.85                 | 1                    | 1.02                               | 1.83                                  |
| 209       | 1.07                 | 2.97                 | 1.03                 | 1.05                               | 1.92                                  |
| 27        | 0.9                  | 2.56                 | 0.92                 | 0.91                               | 1.65                                  |
| 53        | 0.92                 | 2.7                  | 0.99                 | 0.955                              | 1.745                                 |
| 131       | 0.99                 | 2.89                 | 1.05                 | 1.02                               | 1.87                                  |
| 209       | 1.03                 | 3.01                 | 1.09                 | 1.06                               | 1.95                                  |
| 32        | 0.87                 | 2.7                  | 1                    | 0.935                              | 1.765                                 |
| 53        | 0.89                 | 2.76                 | 1.05                 | 0.97                               | 1.79                                  |
| 131       | 0.97                 | 2.95                 | 1.1                  | 1.035                              | 1.915                                 |
| 209       | 1.02                 | 3.09                 | 1.14                 | 1.08                               | 2.01                                  |
| 32        | 0.82                 | 2.65                 | 1.04                 | 0.93                               | 1.72                                  |
| 53        | 0.83                 | 2.75                 | 1.07                 | 0.95                               | 1.8                                   |
| 131       | 0.94                 | 2.99                 | 1.15                 | 1.045                              | 1.945                                 |
| 209       | 0.98                 | 3.14                 | 1.19                 | 1.085                              | 2.055                                 |
| 32        | 0.81                 | 2.68                 | 1.11                 | 0.96                               | 1.72                                  |
| 53        | 0.82                 | 2.79                 | 1.14                 | 0.98                               | 1.81                                  |
| 131       | 0.83                 | 3.01                 | 1.2                  | 1.015                              | 1.995                                 |
| 209       | 0.98                 | 3.16                 | 1.24                 | 1.11                               | 2.05                                  |
| 32        | 0.81                 | 2.78                 | 1.17                 | 0.99                               | 1.79                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 53        | 0.84                 | 2.85                 | 1.18                 | 1.01                               | 1.84                                  |
| 136       | 0.93                 | 3.05                 | 1.25                 | 1.09                               | 1.96                                  |
| 209       | 0.98                 | 3.18                 | 1.27                 | 1.125                              | 2.055                                 |
| 27        | 0.75                 | 2.72                 | 1.19                 | 0.97                               | 1.75                                  |
| 53        | 0.82                 | 2.89                 | 1.2                  | 1.01                               | 1.88                                  |
| 131       | 0.92                 | 3.07                 | 1.28                 | 1.1                                | 1.97                                  |
| 209       | 0.99                 | 3.21                 | 1.3                  | 1.145                              | 2.065                                 |
| 27        | 0.69                 | 2.54                 | 1.15                 | 0.92                               | 1.62                                  |
| 53        | 0.75                 | 2.83                 | 1.19                 | 0.97                               | 1.86                                  |
| 131       | 0.87                 | 3.08                 | 1.29                 | 1.08                               | 2                                     |
| 209       | 0.92                 | 3.24                 | 1.35                 | 1.135                              | 2.105                                 |
| 22        | 0.69                 | 2.68                 | 1.17                 | 0.93                               | 1.75                                  |
| 53        | 0.76                 | 2.92                 | 1.24                 | 1                                  | 1.92                                  |
| 131       | 0.87                 | 3.13                 | 1.33                 | 1.1                                | 2.03                                  |
| 209       | 0.93                 | 3.27                 | 1.41                 | 1.17                               | 2.1                                   |
| 22        | 0.69                 | 2.68                 | 1.17                 | 1.06                               | 2.27                                  |
| 53        | 0.76                 | 2.92                 | 1.24                 | 1.1                                | 2.31                                  |
| 131       | 0.87                 | 3.13                 | 1.33                 | 1.155                              | 2.355                                 |
| 209       | 0.93                 | 3.27                 | 1.41                 | 1.2                                | 2.42                                  |
| 235       | 0.95                 | 3.33                 | 1.46                 | 1.245                              | 2.485                                 |
| 261       | 0.96                 | 3.41                 | 1.51                 | 1.28                               | 2.53                                  |
| 287       | 0.98                 | 3.51                 | 1.59                 | 1.34                               | 2.57                                  |
| 313       | 0.99                 | 3.62                 | 1.67                 | 1.41                               | 2.57                                  |
| 340       | 0.99                 | 3.73                 | 1.77                 | 1.48                               | 2.67                                  |
| 366       | 1.03                 | 3.81                 | 1.82                 | 1.51                               | 2.66                                  |
| 392       | 1.05                 | 3.91                 | 1.87                 | 1.54                               | 2.65                                  |
| 418       | 1.09                 | 3.98                 | 1.93                 | 1.58                               | 2.63                                  |
| 444       | 1.15                 | 4.09                 | 1.99                 | 1.615                              | 2.635                                 |
| 449       | 1.19                 | 4.15                 | 2.04                 | 1.645                              | 2.625                                 |
| 454       | 1.2                  | 4.17                 | 2.05                 | 1.65                               | 2.67                                  |
| 459       | 1.21                 | 4.19                 | 2.06                 | 1.665                              | 2.685                                 |
| 464       | 1.23                 | 4.21                 | 2.08                 | 1.68                               | 2.7                                   |
| 470       | 1.24                 | 4.25                 | 2.1                  | 1.695                              | 2.715                                 |
| 475       | 1.25                 | 4.27                 | 2.11                 | 1.705                              | 2.735                                 |
| 480- N    | 1.25                 | 4.32                 | 2.12                 | 1.685                              | 2.635                                 |
| 485       | 1.27                 | 4.35                 | 2.13                 | 1.7                                | 2.65                                  |
| 491       | 1.28                 | 4.38                 | 2.14                 | 1.71                               | 2.67                                  |
| 496       | 1.29                 | 4.41                 | 2.15                 | 1.72                               | 2.69                                  |
| 501       | 1.3                  | 4.44                 | 2.16                 | 1.73                               | 2.71                                  |
| 511- C    | 1.31                 | 4.48                 | 2.18                 | 1.745                              | 2.735                                 |
| 522       | 1.32                 | 4.52                 | 2.21                 | 1.765                              | 2.755                                 |
| 527       | 1.32                 | 4.56                 | 2.24                 | 1.78                               | 2.78                                  |
| 532       | 1.36                 | 4.6                  | 2.28                 | 1.82                               | 2.78                                  |
| 537       | 1.39                 | 4.65                 | 2.29                 | 1.84                               | 2.81                                  |
| 548       | 1.4                  | 4.68                 | 2.31                 | 1.855                              | 2.825                                 |
| 553       | 1.41                 | 4.71                 | 2.32                 | 1.865                              | 2.845                                 |
| 563       | 1.43                 | 4.74                 | 2.34                 | 1.885                              | 2.855                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 574       | 1.45                 | 4.78                 | 2.36                 | 1.905                              | 2.875                                 |
| 584       | 1.47                 | 4.83                 | 2.39                 | 1.93                               | 2.9                                   |
| 589       | 1.48                 | 4.86                 | 2.41                 | 1.945                              | 2.915                                 |
| 600       | 1.51                 | 4.9                  | 2.43                 | 1.97                               | 2.93                                  |
| 610       | 1.52                 | 4.94                 | 2.44                 | 1.98                               | 2.96                                  |
| 615       | 1.55                 | 4.98                 | 2.45                 | 2                                  | 2.98                                  |
| 626       | 1.57                 | 5.02                 | 2.46                 | 2.015                              | 3.005                                 |
| 574       | 1.45                 | 4.78                 | 2.36                 | 1.905                              | 2.875                                 |
| 584       | 1.47                 | 4.83                 | 2.39                 | 1.93                               | 2.9                                   |
| 589       | 1.48                 | 4.86                 | 2.41                 | 1.945                              | 2.915                                 |
| 600       | 1.51                 | 4.9                  | 2.43                 | 1.97                               | 2.93                                  |
| 610       | 1.52                 | 4.94                 | 2.44                 | 1.98                               | 2.96                                  |
| 615       | 1.55                 | 4.98                 | 2.45                 | 2                                  | 2.98                                  |
| 626       | 1.57                 | 5.02                 | 2.46                 | 2.015                              | 3.005                                 |
| 631       | 1.62                 | 5.09                 | 2.47                 | 2.045                              | 3.045                                 |
| 636       | 1.75                 | 5.23                 | 2.48                 | 2.115                              | 3.115                                 |
| 652       | 1.83                 | 5.31                 | 2.48                 | 2.155                              | 3.155                                 |
| 657       | 1.87                 | 5.35                 | 2.48                 | 2.175                              | 3.175                                 |
| 662       | 1.88                 | 5.38                 | 2.48                 | 2.18                               | 3.2                                   |
| 673       | 1.9                  | 5.42                 | 2.48                 | 2.19                               | 3.23                                  |
| 678       | 1.92                 | 5.46                 | 2.48                 | 2.2                                | 3.26                                  |
| 688       | 1.95                 | 5.51                 | 2.5                  | 2.225                              | 3.285                                 |
| 699       | 1.95                 | 5.57                 | 2.52                 | 2.235                              | 3.335                                 |
| 704       | 1.98                 | 5.6                  | 2.54                 | 2.26                               | 3.34                                  |
| 714       | 1.99                 | 5.64                 | 2.57                 | 2.28                               | 3.36                                  |
| 725       | 2.01                 | 5.67                 | 2.59                 | 2.3                                | 3.37                                  |
| 730       | 2.03                 | 5.7                  | 2.61                 | 2.32                               | 3.38                                  |
| 735       | 2.05                 | 5.73                 | 2.64                 | 2.345                              | 3.385                                 |
| 740       | 2.06                 | 5.77                 | 2.65                 | 2.355                              | 3.415                                 |
| 756       | 2.08                 | 5.81                 | 2.66                 | 2.37                               | 3.44                                  |
| 761       | 2.09                 | 5.85                 | 2.67                 | 2.38                               | 3.47                                  |
| 772       | 2.11                 | 5.92                 | 2.67                 | 2.39                               | 3.53                                  |

**Table A.9.26: Test Panel Concrete Cube Strength (C45-25-1-i)**

| Cast Date: 14-07-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 06-09-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.85        | 84.2          | 35.75                         | 2471                             |
| II                      | 153x153x153 | 8.85        | 84.2          | 35.75                         | 2471                             |
| III                     | 153x153x153 | 8.8         | 125           | 54.50                         | 2457                             |
| IV                      | 153x153x153 | 8.8         | 125           | 54.50                         | 2457                             |
| Mean                    |             |             |               | 45.13                         | 2464                             |

**Table A.9.27: CFST Concrete Cube Strength (C45-25-1-i)**

| Cast Date: 10-05-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 06-09-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.15        | 54            | 22.63                         | 2276                             |
| II                      | 153x153x154 | 8.15        | 54            | 22.63                         | 2276                             |
| III                     | 153x153x154 | 8.3         | 90.8          | 38.05                         | 2317                             |
| IV                      | 153x153x153 | 8.3         | 90.8          | 38.05                         | 2317                             |
| Mean                    |             |             |               | 32.91                         | 2303                             |



**Table A.9.28:** Sample 10 (C45-25-1-ii)

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.02                 | 0.17                 | 0                    | 0.01                               | 0.16                                  |
| 53        | 0.05                 | 0.33                 | 0.04                 | 0.045                              | 0.285                                 |
| 79        | 0.15                 | 0.51                 | 0.18                 | 0.165                              | 0.345                                 |
| 105       | 0.24                 | 0.65                 | 0.3                  | 0.27                               | 0.38                                  |
| 131       | 0.37                 | 0.89                 | 0.43                 | 0.4                                | 0.49                                  |
| 157       | 0.48                 | 1.15                 | 0.63                 | 0.555                              | 0.595                                 |
| 183       | 0.55                 | 1.29                 | 0.69                 | 0.62                               | 0.67                                  |
| 209       | 0.64                 | 1.42                 | 0.8                  | 0.72                               | 0.7                                   |
| 27        | 0.47                 | 1.13                 | 0.75                 | 0.61                               | 0.52                                  |
| 53        | 0.48                 | 1.18                 | 0.77                 | 0.625                              | 0.555                                 |
| 79        | 0.51                 | 1.23                 | 0.81                 | 0.66                               | 0.57                                  |
| 105       | 0.54                 | 1.28                 | 0.85                 | 0.695                              | 0.585                                 |
| 131       | 0.55                 | 1.33                 | 0.88                 | 0.715                              | 0.615                                 |
| 157       | 0.56                 | 1.4                  | 0.93                 | 0.745                              | 0.655                                 |
| 183       | 0.58                 | 1.49                 | 1                    | 0.79                               | 0.7                                   |
| 209       | 0.61                 | 1.56                 | 1.1                  | 0.855                              | 0.705                                 |
| 22        | 0.46                 | 1.27                 | 0.98                 | 0.72                               | 0.55                                  |
| 53        | 0.48                 | 1.36                 | 1.02                 | 0.75                               | 0.61                                  |
| 131       | 0.55                 | 1.5                  | 1.15                 | 0.85                               | 0.65                                  |
| 209       | 0.6                  | 1.66                 | 1.35                 | 0.975                              | 0.685                                 |
| 22        | 0.45                 | 1.35                 | 1.18                 | 0.815                              | 0.535                                 |
| 53        | 0.47                 | 1.45                 | 1.21                 | 0.84                               | 0.61                                  |
| 131       | 0.55                 | 1.59                 | 1.33                 | 0.94                               | 0.65                                  |
| 209       | 0.6                  | 1.74                 | 1.43                 | 1.015                              | 0.725                                 |
| 22        | 0.48                 | 1.42                 | 1.25                 | 0.865                              | 0.555                                 |
| 53        | 0.49                 | 1.5                  | 1.28                 | 0.885                              | 0.615                                 |
| 131       | 0.55                 | 1.64                 | 1.4                  | 0.975                              | 0.665                                 |
| 209       | 0.6                  | 1.79                 | 1.47                 | 1.035                              | 0.755                                 |
| 27        | 0.39                 | 1.17                 | 1.32                 | 0.855                              | 0.315                                 |
| 64        | 0.39                 | 1.35                 | 1.38                 | 0.885                              | 0.465                                 |
| 131       | 0.41                 | 1.63                 | 1.49                 | 0.95                               | 0.68                                  |
| 209       | 0.44                 | 1.89                 | 1.7                  | 1.07                               | 0.82                                  |
| 22        | 0.28                 | 1.18                 | 1.52                 | 0.9                                | 0.28                                  |
| 53        | 0.36                 | 1.64                 | 1.52                 | 0.94                               | 0.7                                   |
| 131       | 0.47                 | 1.78                 | 1.63                 | 1.05                               | 0.73                                  |
| 209       | 0.56                 | 1.91                 | 1.69                 | 1.125                              | 0.785                                 |
| 22        | 0.41                 | 0.54                 | 1.46                 | 0.935                              | -0.395                                |
| 53        | 0.45                 | 0.68                 | 1.5                  | 0.975                              | -0.295                                |
| 131       | 0.54                 | 0.81                 | 1.62                 | 1.08                               | -0.27                                 |
| 209       | 0.61                 | 0.93                 | 1.69                 | 1.15                               | -0.22                                 |
| 22        | 0.49                 | 0.62                 | 1.46                 | 0.975                              | -0.355                                |
| 53        | 0.53                 | 0.71                 | 1.48                 | 1.005                              | -0.295                                |
| 131       | 0.61                 | 0.84                 | 1.58                 | 1.095                              | -0.255                                |
| 209       | 0.68                 | 0.98                 | 1.63                 | 1.155                              | -0.175                                |
| 27        | 0.54                 | 0.68                 | 1.48                 | 1.01                               | -0.33                                 |
| 53        | 0.57                 | 0.74                 | 1.49                 | 1.03                               | -0.29                                 |
| 131       | 0.64                 | 0.87                 | 1.59                 | 1.115                              | -0.245                                |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 0.7                  | 0.99                 | 1.65                 | 1.175                              | -0.185                                |
| 27        | 0.55                 | 0.28                 | 1.49                 | 1.02                               | -0.74                                 |
| 53        | 0.57                 | 0.76                 | 1.53                 | 1.05                               | -0.29                                 |
| 131       | 0.61                 | 0.89                 | 1.64                 | 1.125                              | -0.235                                |
| 209       | 0.66                 | 1                    | 1.7                  | 1.18                               | -0.18                                 |
| 32        | 0.55                 | 0.74                 | 1.53                 | 1.04                               | -0.3                                  |
| 53        | 0.56                 | 0.78                 | 1.55                 | 1.055                              | -0.275                                |
| 131       | 0.6                  | 0.89                 | 1.66                 | 1.13                               | -0.24                                 |
| 209       | 0.65                 | 1.01                 | 1.73                 | 1.19                               | -0.18                                 |
| 32        | 0.54                 | 0.75                 | 1.54                 | 1.04                               | -0.29                                 |
| 53        | 0.56                 | 0.78                 | 1.56                 | 1.06                               | -0.28                                 |
| 131       | 0.6                  | 0.9                  | 1.67                 | 1.135                              | -0.235                                |
| 209       | 0.65                 | 1.02                 | 1.75                 | 1.2                                | -0.18                                 |
| 27        | 0.54                 | 0.73                 | 1.52                 | 1.03                               | -0.3                                  |
| 53        | 0.57                 | 0.79                 | 1.55                 | 1.06                               | -0.27                                 |
| 131       | 0.61                 | 0.9                  | 1.67                 | 1.14                               | -0.24                                 |
| 209       | 0.66                 | 1.03                 | 1.73                 | 1.195                              | -0.165                                |
| 27        | 0.51                 | 0.7                  | 1.54                 | 1.025                              | -0.325                                |
| 53        | 0.54                 | 0.78                 | 1.58                 | 1.06                               | -0.28                                 |
| 131       | 0.59                 | 0.92                 | 1.7                  | 1.145                              | -0.225                                |
| 209       | 0.63                 | 1.04                 | 1.78                 | 1.205                              | -0.165                                |
| 22        | 0.49                 | 0.68                 | 1.55                 | 1.02                               | -0.34                                 |
| 53        | 0.53                 | 0.79                 | 1.59                 | 1.06                               | -0.27                                 |
| 131       | 0.58                 | 0.93                 | 1.72                 | 1.15                               | -0.22                                 |
| 209       | 0.61                 | 1.06                 | 1.8                  | 1.205                              | -0.145                                |
| 22        | 0.55                 | 0.71                 | 1.53                 | 1.04                               | -0.33                                 |
| 53        | 0.58                 | 0.81                 | 1.57                 | 1.075                              | -0.265                                |
| 131       | 0.62                 | 0.93                 | 1.69                 | 1.155                              | -0.225                                |
| 209       | 0.66                 | 1.06                 | 1.76                 | 1.21                               | -0.15                                 |
| 27        | 0.55                 | 0.73                 | 1.54                 | 1.045                              | -0.315                                |
| 53        | 0.58                 | 0.81                 | 1.57                 | 1.075                              | -0.265                                |
| 131       | 0.62                 | 0.95                 | 1.7                  | 1.16                               | -0.21                                 |
| 209       | 0.66                 | 1.08                 | 1.79                 | 1.225                              | -0.145                                |
| 27        | 0.55                 | 0.76                 | 1.55                 | 1.05                               | -0.29                                 |
| 53        | 0.57                 | 0.82                 | 1.58                 | 1.075                              | -0.255                                |
| 131       | 0.62                 | 0.95                 | 1.71                 | 1.165                              | -0.215                                |
| 209       | 0.66                 | 1.08                 | 1.79                 | 1.225                              | -0.145                                |
| 22        | 0.54                 | 0.75                 | 1.56                 | 1.05                               | -0.3                                  |
| 53        | 0.57                 | 0.83                 | 1.6                  | 1.085                              | -0.255                                |
| 131       | 0.62                 | 0.96                 | 1.71                 | 1.165                              | -0.205                                |
| 209       | 0.67                 | 1.09                 | 1.78                 | 1.225                              | -0.135                                |
| 27        | 0.56                 | 0.78                 | 1.57                 | 1.065                              | -0.285                                |
| 53        | 0.57                 | 0.83                 | 1.6                  | 1.085                              | -0.255                                |
| 131       | 0.62                 | 0.97                 | 1.72                 | 1.17                               | -0.2                                  |
| 209       | 0.67                 | 1.09                 | 1.8                  | 1.235                              | -0.145                                |
| 27        | 0.56                 | 0.73                 | 1.55                 | 1.055                              | -0.325                                |
| 53        | 0.6                  | 0.81                 | 1.57                 | 1.085                              | -0.275                                |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 0.66                 | 0.97                 | 1.67                 | 1.165                              | -0.195                                |
| 209       | 0.72                 | 1.11                 | 1.75                 | 1.235                              | -0.125                                |
| 22        | 0.55                 | 0.75                 | 1.57                 | 1.06                               | -0.31                                 |
| 53        | 0.57                 | 0.85                 | 1.61                 | 1.09                               | -0.24                                 |
| 131       | 0.63                 | 0.98                 | 1.73                 | 1.18                               | -0.2                                  |
| 209       | 0.67                 | 1.11                 | 1.81                 | 1.24                               | -0.13                                 |
| 17        | 0.54                 | 0.72                 | 1.55                 | 1.045                              | -0.325                                |
| 53        | 0.58                 | 0.84                 | 1.6                  | 1.09                               | -0.25                                 |
| 131       | 0.64                 | 0.99                 | 1.72                 | 1.18                               | -0.19                                 |
| 209       | 0.68                 | 1.12                 | 1.8                  | 1.24                               | -0.12                                 |
| 32        | 0.54                 | 0.82                 | 1.64                 | 1.09                               | -0.27                                 |
| 53        | 0.55                 | 0.86                 | 1.65                 | 1.1                                | -0.24                                 |
| 131       | 0.6                  | 1.01                 | 1.78                 | 1.19                               | -0.18                                 |
| 209       | 0.64                 | 1.14                 | 1.85                 | 1.245                              | -0.105                                |
| 32        | 0.54                 | 0.82                 | 1.64                 | 1.145                              | 0.025                                 |
| 53        | 0.55                 | 0.86                 | 1.65                 | 1.16                               | 0.05                                  |
| 131       | 0.6                  | 1.01                 | 1.78                 | 1.23                               | 0.04                                  |
| 209       | 0.64                 | 1.14                 | 1.85                 | 1.29                               | 0.04                                  |
| 235       | 0.65                 | 1.17                 | 1.88                 | 1.325                              | 0.075                                 |
| 261       | 0.67                 | 1.21                 | 1.9                  | 1.355                              | 0.165                                 |
| 287       | 0.68                 | 1.27                 | 1.94                 | 1.385                              | 0.205                                 |
| 313       | 0.7                  | 1.33                 | 1.98                 | 1.42                               | 0.23                                  |
| 340       | 0.73                 | 1.4                  | 2.01                 | 1.445                              | 0.325                                 |
| 366       | 0.77                 | 1.52                 | 2.08                 | 1.49                               | 0.34                                  |
| 392       | 0.81                 | 1.59                 | 2.1                  | 1.515                              | 0.395                                 |
| 418       | 0.83                 | 1.65                 | 2.1                  | 1.525                              | 0.455                                 |
| 444       | 0.86                 | 1.71                 | 2.11                 | 1.535                              | 0.475                                 |
| 470       | 0.88                 | 1.77                 | 2.15                 | 1.555                              | 0.485                                 |
| 496       | 0.9                  | 1.83                 | 2.18                 | 1.575                              | 0.495                                 |
| 522       | 0.93                 | 1.91                 | 2.23                 | 1.605                              | 0.485                                 |
| 527       | 0.95                 | 1.98                 | 2.27                 | 1.63                               | 0.49                                  |
| 532       | 0.96                 | 2.01                 | 2.29                 | 1.645                              | 0.515                                 |
| 543       | 0.96                 | 2.04                 | 2.31                 | 1.66                               | 0.52                                  |
| 548       | 0.97                 | 2.07                 | 2.33                 | 1.65                               | 0.42                                  |
| 558       | 0.98                 | 2.09                 | 2.35                 | 1.665                              | 0.425                                 |
| 563       | 0.99                 | 2.12                 | 2.37                 | 1.68                               | 0.44                                  |
| 569       | 1                    | 2.16                 | 2.38                 | 1.69                               | 0.47                                  |
| 584       | 1.01                 | 2.18                 | 2.4                  | 1.705                              | 0.475                                 |
| 589       | 1.01                 | 2.21                 | 2.41                 | 1.71                               | 0.5                                   |
| 595       | 1.01                 | 2.23                 | 2.43                 | 1.72                               | 0.51                                  |
| 605       | 1.01                 | 2.25                 | 2.45                 | 1.73                               | 0.52                                  |
| 610       | 1.01                 | 2.27                 | 2.46                 | 1.735                              | 0.535                                 |
| 615       | 1.01                 | 2.29                 | 2.47                 | 1.74                               | 0.55                                  |
| 621       | 1.01                 | 2.31                 | 2.48                 | 1.745                              | 0.565                                 |
| 626       | 1.01                 | 2.33                 | 2.5                  | 1.755                              | 0.575                                 |
| 636       | 1.01                 | 2.38                 | 2.52                 | 1.765                              | 0.615                                 |
| 642       | 1.02                 | 2.4                  | 2.54                 | 1.78                               | 0.62                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 647       | 1.02                 | 2.41                 | 2.55                 | 1.785                              | 0.625                                 |
| 662       | 1.02                 | 2.43                 | 2.57                 | 1.795                              | 0.635                                 |
| 668       | 1.02                 | 2.45                 | 2.58                 | 1.8                                | 0.65                                  |
| 673       | 1.02                 | 2.46                 | 2.59                 | 1.805                              | 0.655                                 |
| 678       | 1.02                 | 2.48                 | 2.6                  | 1.81                               | 0.67                                  |
| 688       | 1.02                 | 2.49                 | 2.61                 | 1.815                              | 0.675                                 |
| 694       | 1.02                 | 2.51                 | 2.63                 | 1.825                              | 0.685                                 |
| 704- N    | 1.02                 | 2.53                 | 2.64                 | 1.83                               | 0.7                                   |
| 709       | 1.03                 | 2.54                 | 2.65                 | 1.84                               | 0.7                                   |
| 714       | 1.03                 | 2.55                 | 2.65                 | 1.84                               | 0.71                                  |
| 720       | 1.04                 | 2.57                 | 2.66                 | 1.85                               | 0.72                                  |
| 725       | 1.04                 | 2.58                 | 2.67                 | 1.855                              | 0.725                                 |
| 730       | 1.05                 | 2.62                 | 2.68                 | 1.865                              | 0.755                                 |
| 735       | 1.05                 | 2.65                 | 2.69                 | 1.87                               | 0.78                                  |
| 740       | 1.05                 | 2.66                 | 2.71                 | 1.88                               | 0.78                                  |
| 746       | 1.05                 | 2.67                 | 2.72                 | 1.885                              | 0.785                                 |
| 751       | 1.05                 | 2.69                 | 2.74                 | 1.895                              | 0.795                                 |
| 756       | 1.05                 | 2.7                  | 2.75                 | 1.9                                | 0.8                                   |
| 761       | 1.05                 | 2.72                 | 2.76                 | 1.905                              | 0.815                                 |
| 766       | 1.05                 | 2.73                 | 2.78                 | 1.915                              | 0.815                                 |
| 772       | 1.05                 | 2.75                 | 2.79                 | 1.92                               | 0.83                                  |
| 777       | 1.05                 | 2.76                 | 2.8                  | 1.925                              | 0.835                                 |
| 782       | 1.06                 | 2.8                  | 2.82                 | 1.94                               | 0.86                                  |
| 787       | 1.06                 | 2.81                 | 2.83                 | 1.945                              | 0.865                                 |
| 792       | 1.07                 | 2.83                 | 2.84                 | 1.955                              | 0.875                                 |
| 798       | 1.07                 | 2.84                 | 2.84                 | 1.955                              | 0.885                                 |
| 803       | 1.08                 | 2.86                 | 2.85                 | 1.965                              | 0.895                                 |
| 808       | 1.08                 | 2.88                 | 2.85                 | 1.965                              | 0.915                                 |
| 813       | 1.09                 | 2.89                 | 2.86                 | 1.975                              | 0.915                                 |
| 824       | 1.09                 | 2.91                 | 2.86                 | 1.975                              | 0.935                                 |
| 829       | 1.1                  | 2.92                 | 2.86                 | 1.98                               | 0.94                                  |
| 834       | 1.1                  | 2.95                 | 2.87                 | 1.985                              | 0.965                                 |
| 845       | 1.11                 | 2.99                 | 2.88                 | 1.995                              | 0.995                                 |
| 850       | 1.12                 | 3.01                 | 2.89                 | 2.005                              | 1.005                                 |
| 855       | 1.12                 | 3.03                 | 2.9                  | 2.01                               | 1.02                                  |
| 860       | 1.12                 | 3.05                 | 2.9                  | 2.01                               | 1.04                                  |
| 865       | 1.12                 | 3.06                 | 2.91                 | 2.015                              | 1.045                                 |
| 871       | 1.13                 | 3.07                 | 2.92                 | 2.025                              | 1.045                                 |
| 876       | 1.13                 | 3.09                 | 2.92                 | 2.025                              | 1.065                                 |
| 881       | 1.13                 | 3.12                 | 2.93                 | 2.03                               | 1.09                                  |
| 886       | 1.14                 | 3.14                 | 2.93                 | 2.035                              | 1.105                                 |
| 902       | 1.16                 | 3.19                 | 2.94                 | 2.05                               | 1.14                                  |
| 907       | 1.17                 | 3.24                 | 2.95                 | 2.06                               | 1.18                                  |
| 912       | 1.18                 | 3.27                 | 2.95                 | 2.065                              | 1.205                                 |
| 917       | 1.18                 | 3.29                 | 2.96                 | 2.07                               | 1.22                                  |
| 928       | 1.18                 | 3.31                 | 2.98                 | 2.08                               | 1.23                                  |
| 933- C    | 1.19                 | 3.35                 | 2.98                 | 2.085                              | 1.265                                 |

**Table A.9.29: Test Panel Concrete Cube Strength (C45-25-1-ii)**

| Cast Date: 18-07-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 07-09-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.6         | 118.8         | 50.44                         | 2401                             |
| II                      | 153x153x153 | 8.55        | 112.6         | 47.81                         | 2387                             |
| III                     | 153x153x153 | 8.5         | 112.4         | 47.73                         | 2373                             |
| IV                      | 153x153x153 | 8.55        | 111           | 47.13                         | 2387                             |
| Mean                    |             |             |               | 48.28                         | 2387                             |

**Table A.9.30: CFST Concrete Cube Strength (C45-25-1-ii)**

| Cast Date: 10-05-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 07-09-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.25        | 97            | 40.84                         | 2303                             |
| II                      | 153x153x154 | 8.25        | 97.4          | 40.82                         | 2303                             |
| III                     | 153x153x154 | 8.25        | 97.4          | 40.82                         | 2303                             |
| IV                      | 153x153x153 | 8.25        | 97.5          | 40.86                         | 2303                             |
| Mean                    |             |             |               | 40.83                         | 2303                             |



**Table A.9.31: Sample 11 (C20-25-1-ii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.75                 | 0.65                 | 0.19                 | 0.47                               | 0.18                                  |
| 53        | 0.9                  | 1.06                 | 0.37                 | 0.635                              | 0.425                                 |
| 79        | 0.95                 | 1.65                 | 0.54                 | 0.745                              | 0.905                                 |
| 105       | 1.2                  | 2                    | 0.67                 | 0.935                              | 1.065                                 |
| 131       | 1.43                 | 2.39                 | 0.9                  | 1.165                              | 1.225                                 |
| 157       | 1.59                 | 2.56                 | 1                    | 1.295                              | 1.265                                 |
| 183       | 1.8                  | 2.82                 | 1.23                 | 1.515                              | 1.305                                 |
| 209       | 1.9                  | 3.05                 | 1.5                  | 1.7                                | 1.35                                  |
| 22        | 0.72                 | 2.79                 | 1.16                 | 0.94                               | 1.85                                  |
| 53        | 0.73                 | 2.92                 | 1.35                 | 1.04                               | 1.88                                  |
| 79        | 0.77                 | 2.98                 | 1.45                 | 1.11                               | 1.87                                  |
| 105       | 0.82                 | 3.05                 | 1.48                 | 1.15                               | 1.9                                   |
| 131       | 0.84                 | 3.11                 | 1.55                 | 1.195                              | 1.915                                 |
| 157       | 0.85                 | 3.22                 | 1.7                  | 1.275                              | 1.945                                 |
| 183       | 0.86                 | 3.4                  | 1.95                 | 1.405                              | 1.995                                 |
| 209       | 0.86                 | 3.62                 | 2.2                  | 1.53                               | 2.09                                  |
| 22        | 0.62                 | 2.19                 | 1.91                 | 1.265                              | 0.925                                 |
| 53        | 0.63                 | 2.3                  | 2.06                 | 1.345                              | 0.955                                 |
| 131       | 0.76                 | 2.56                 | 2.2                  | 1.48                               | 1.08                                  |
| 209       | 0.83                 | 2.75                 | 2.4                  | 1.615                              | 1.135                                 |
| 32        | 0.49                 | 2.4                  | 2.22                 | 1.355                              | 1.045                                 |
| 53        | 0.58                 | 2.47                 | 2.3                  | 1.44                               | 1.03                                  |
| 131       | 0.62                 | 2.78                 | 2.52                 | 1.57                               | 1.21                                  |
| 209       | 0.76                 | 3.24                 | 3.2                  | 1.98                               | 1.26                                  |
| 32        | 0.58                 | 2.85                 | 3                    | 1.79                               | 1.06                                  |
| 53        | 0.58                 | 2.92                 | 3.09                 | 1.835                              | 1.085                                 |
| 131       | 0.65                 | 3.18                 | 3.22                 | 1.935                              | 1.245                                 |
| 209       | 0.78                 | 3.49                 | 3.65                 | 2.215                              | 1.275                                 |
| 27        | 0.52                 | 3.08                 | 3.44                 | 1.98                               | 1.1                                   |
| 53        | 0.52                 | 3.16                 | 3.52                 | 2.02                               | 1.14                                  |
| 131       | 0.69                 | 3.4                  | 3.67                 | 2.18                               | 1.22                                  |
| 209       | 0.81                 | 3.61                 | 3.85                 | 2.33                               | 1.28                                  |
| 27        | 0.5                  | 3.21                 | 3.59                 | 2.045                              | 1.165                                 |
| 53        | 0.53                 | 3.28                 | 3.68                 | 2.105                              | 1.175                                 |
| 131       | 0.69                 | 3.53                 | 3.83                 | 2.26                               | 1.27                                  |
| 209       | 0.74                 | 3.73                 | 4.05                 | 2.395                              | 1.335                                 |
| 17        | 0.48                 | 3.2                  | 3.74                 | 2.11                               | 1.09                                  |
| 53        | 0.53                 | 3.44                 | 3.91                 | 2.22                               | 1.22                                  |
| 131       | 0.62                 | 3.69                 | 4.09                 | 2.355                              | 1.335                                 |
| 209       | 0.72                 | 3.95                 | 4.3                  | 2.51                               | 1.44                                  |
| 27        | 0.56                 | 3.52                 | 4.1                  | 2.33                               | 1.19                                  |
| 53        | 0.55                 | 3.6                  | 4.19                 | 2.37                               | 1.23                                  |
| 131       | 0.6                  | 3.82                 | 4.34                 | 2.47                               | 1.35                                  |
| 209       | 0.69                 | 4.12                 | 4.55                 | 2.62                               | 1.5                                   |
| 32        | 0.56                 | 3.7                  | 4.34                 | 2.45                               | 1.25                                  |
| 53        | 0.56                 | 3.74                 | 4.41                 | 2.485                              | 1.255                                 |
| 131       | 0.56                 | 3.92                 | 4.56                 | 2.56                               | 1.36                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 0.66                 | 4.2                  | 4.68                 | 2.67                               | 1.53                                  |
| 22        | 0.59                 | 3.62                 | 4.35                 | 2.47                               | 1.15                                  |
| 53        | 0.59                 | 3.8                  | 4.49                 | 2.54                               | 1.26                                  |
| 131       | 0.59                 | 4.04                 | 4.65                 | 2.62                               | 1.42                                  |
| 209       | 0.69                 | 4.23                 | 4.78                 | 2.735                              | 1.495                                 |
| 27        | 0.63                 | 3.76                 | 4.49                 | 2.56                               | 1.2                                   |
| 53        | 0.63                 | 3.82                 | 4.55                 | 2.59                               | 1.23                                  |
| 131       | 0.64                 | 4.09                 | 4.7                  | 2.67                               | 1.42                                  |
| 209       | 0.75                 | 4.31                 | 4.8                  | 2.775                              | 1.535                                 |
| 22        | 0.65                 | 3.73                 | 4.5                  | 2.575                              | 1.155                                 |
| 53        | 0.65                 | 3.86                 | 4.61                 | 2.63                               | 1.23                                  |
| 131       | 0.67                 | 4.14                 | 4.74                 | 2.705                              | 1.435                                 |
| 209       | 0.76                 | 4.34                 | 4.88                 | 2.82                               | 1.52                                  |
| 27        | 0.59                 | 3.8                  | 4.62                 | 2.605                              | 1.195                                 |
| 53        | 0.59                 | 3.92                 | 4.75                 | 2.67                               | 1.25                                  |
| 131       | 0.59                 | 4.11                 | 4.93                 | 2.76                               | 1.35                                  |
| 209       | 0.71                 | 4.34                 | 5.12                 | 2.915                              | 1.425                                 |
| 17        | 0.36                 | 3.78                 | 4.8                  | 2.58                               | 1.2                                   |
| 53        | 0.37                 | 3.99                 | 4.98                 | 2.675                              | 1.315                                 |
| 131       | 0.68                 | 4.25                 | 5.02                 | 2.85                               | 1.4                                   |
| 209       | 0.86                 | 4.48                 | 5.12                 | 2.99                               | 1.49                                  |
| 27        | 0.58                 | 4                    | 4.87                 | 2.725                              | 1.275                                 |
| 53        | 0.6                  | 4.07                 | 4.94                 | 2.77                               | 1.3                                   |
| 131       | 0.74                 | 4.31                 | 5.05                 | 2.895                              | 1.415                                 |
| 209       | 0.89                 | 4.5                  | 5.14                 | 3.015                              | 1.485                                 |
| 27        | 0.7                  | 4                    | 4.82                 | 2.76                               | 1.24                                  |
| 53        | 0.7                  | 4.07                 | 4.93                 | 2.815                              | 1.255                                 |
| 136       | 0.81                 | 4.35                 | 5.04                 | 2.925                              | 1.425                                 |
| 209       | 0.9                  | 4.5                  | 5.13                 | 3.015                              | 1.485                                 |
| 22        | 0.68                 | 3.92                 | 4.81                 | 2.745                              | 1.175                                 |
| 53        | 0.72                 | 4.05                 | 4.92                 | 2.82                               | 1.23                                  |
| 131       | 0.82                 | 4.35                 | 5.05                 | 2.935                              | 1.415                                 |
| 209       | 0.9                  | 4.52                 | 5.15                 | 3.025                              | 1.495                                 |
| 27        | 0.72                 | 4                    | 4.88                 | 2.8                                | 1.2                                   |
| 53        | 0.72                 | 4.12                 | 4.96                 | 2.84                               | 1.28                                  |
| 131       | 0.83                 | 4.37                 | 5.07                 | 2.95                               | 1.42                                  |
| 209       | 0.92                 | 4.55                 | 5.16                 | 3.04                               | 1.51                                  |
| 17        | 0.56                 | 3.92                 | 4.87                 | 2.715                              | 1.205                                 |
| 53        | 0.65                 | 4.1                  | 4.99                 | 2.82                               | 1.28                                  |
| 131       | 0.8                  | 4.38                 | 5.1                  | 2.95                               | 1.43                                  |
| 209       | 0.91                 | 4.54                 | 5.2                  | 3.055                              | 1.485                                 |
| 27        | 0.74                 | 3.99                 | 4.87                 | 2.805                              | 1.185                                 |
| 53        | 0.75                 | 4.09                 | 4.97                 | 2.86                               | 1.23                                  |
| 131       | 0.86                 | 4.4                  | 5.1                  | 2.98                               | 1.42                                  |
| 209       | 0.94                 | 4.55                 | 5.2                  | 3.07                               | 1.48                                  |
| 27        | 0.74                 | 3.99                 | 4.89                 | 2.815                              | 1.175                                 |
| 53        | 0.76                 | 4.11                 | 4.99                 | 2.875                              | 1.235                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 0.87                 | 4.4                  | 5.1                  | 2.985                              | 1.415                                 |
| 209       | 0.97                 | 4.56                 | 5.2                  | 3.085                              | 1.475                                 |
| 12        | 0.56                 | 3.86                 | 4.85                 | 2.705                              | 1.155                                 |
| 53        | 0.7                  | 4.12                 | 5.01                 | 2.855                              | 1.265                                 |
| 131       | 0.86                 | 4.41                 | 5.13                 | 2.995                              | 1.415                                 |
| 209       | 0.95                 | 4.58                 | 5.23                 | 3.09                               | 1.49                                  |
| 27        | 0.79                 | 4                    | 4.9                  | 2.845                              | 1.155                                 |
| 53        | 0.8                  | 4.09                 | 4.96                 | 2.88                               | 1.21                                  |
| 131       | 0.88                 | 4.39                 | 5.06                 | 2.97                               | 1.42                                  |
| 209       | 0.98                 | 4.59                 | 5.15                 | 3.065                              | 1.525                                 |
| 27        | 0.79                 | 4                    | 4.9                  | 2.845                              | 1.155                                 |
| 53        | 0.8                  | 4.09                 | 4.96                 | 2.88                               | 1.21                                  |
| 131       | 0.88                 | 4.39                 | 5.06                 | 2.97                               | 1.42                                  |
| 209       | 0.98                 | 4.59                 | 5.15                 | 3.065                              | 1.525                                 |
| 32        | 0.76                 | 4.1                  | 4.98                 | 2.87                               | 1.23                                  |
| 53        | 0.78                 | 4.22                 | 5.05                 | 2.915                              | 1.305                                 |
| 142       | 0.92                 | 4.48                 | 5.15                 | 3.035                              | 1.445                                 |
| 209       | 0.99                 | 4.6                  | 5.23                 | 3.11                               | 1.49                                  |
| 235       | 1.02                 | 4.65                 | 5.28                 | 3.15                               | 1.5                                   |
| 261       | 1.07                 | 4.74                 | 5.32                 | 3.195                              | 1.545                                 |
| 287       | 1.13                 | 4.82                 | 5.39                 | 3.26                               | 1.56                                  |
| 313       | 1.13                 | 4.9                  | 5.5                  | 3.315                              | 1.585                                 |
| 340       | 1.13                 | 5.09                 | 5.65                 | 3.39                               | 1.7                                   |
| 366       | 1.13                 | 5.4                  | 5.9                  | 3.515                              | 1.885                                 |
| 366       | 1.13                 | 5.58                 | 6.11                 | 3.62                               | 1.96                                  |
| 418- N,C  | 1.13                 | 5.92                 | 6.34                 | 3.735                              | 2.185                                 |
| 428       | 1.09                 | 6.44                 | 6.7                  | 3.895                              | 2.545                                 |

**Table A.9.32: Test Panel Concrete Cube Strength (C20-25-1-ii)**

| Cast Date: 22-07-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 08-09-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.85        | 78.4          | 33.29                         | 2471                             |
| II                      | 153x153x153 | 8.85        | 78.4          | 33.29                         | 2471                             |
| III                     | 153x153x153 | 8.7         | 75.6          | 32.10                         | 2429                             |
| IV                      | 153x153x153 | 8.85        | 73.8          | 31.34                         | 2471                             |
| Mean                    |             |             |               | 32.50                         | 2461                             |

**Table A.9.33: CFST Concrete Cube Strength (C20-25-1-ii)**

| Cast Date: 26-05-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 08-09-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.6         | 79            | 33.11                         | 2401                             |
| II                      | 153x153x154 | 8.4         | 75            | 31.43                         | 2345                             |
| III                     | 153x153x154 | 8.6         | 79            | 33.11                         | 2401                             |
| IV                      | 153x153x153 | 8.8         | 83            | 34.78                         | 2457                             |
| Mean                    |             |             |               | 33.11                         | 2401                             |



**Table A.9.34: Sample 12 (C20-25-1-iii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.35                 | 0.39                 | 0.11                 | 0.23                               | 0.16                                  |
| 53        | 0.68                 | 0.85                 | 0.3                  | 0.49                               | 0.36                                  |
| 79        | 0.84                 | 1.12                 | 0.43                 | 0.635                              | 0.485                                 |
| 105       | 0.92                 | 1.35                 | 0.53                 | 0.725                              | 0.625                                 |
| 131       | 1.09                 | 1.55                 | 0.68                 | 0.885                              | 0.665                                 |
| 157       | 1.23                 | 1.77                 | 0.8                  | 1.015                              | 0.755                                 |
| 183       | 1.34                 | 1.93                 | 0.9                  | 1.12                               | 0.81                                  |
| 209       | 1.46                 | 2.05                 | 0.95                 | 1.205                              | 0.845                                 |
| 27        | 0.58                 | 1.75                 | 0.79                 | 0.685                              | 1.065                                 |
| 53        | 0.58                 | 1.78                 | 0.75                 | 0.665                              | 1.115                                 |
| 79        | 0.58                 | 1.85                 | 0.79                 | 0.685                              | 1.165                                 |
| 105       | 0.58                 | 1.93                 | 0.83                 | 0.705                              | 1.225                                 |
| 131       | 0.58                 | 1.98                 | 0.86                 | 0.72                               | 1.26                                  |
| 157       | 0.58                 | 2.3                  | 0.9                  | 0.74                               | 1.56                                  |
| 183       | 0.58                 | 2.09                 | 0.93                 | 0.755                              | 1.335                                 |
| 209       | 0.58                 | 2.18                 | 0.93                 | 0.755                              | 1.425                                 |
| 17        | 0.55                 | 1.33                 | 0.62                 | 0.585                              | 0.745                                 |
| 53        | 0.57                 | 1.56                 | 0.6                  | 0.585                              | 0.975                                 |
| 131       | 0.52                 | 1.9                  | 0.6                  | 0.56                               | 1.34                                  |
| 209       | 0.48                 | 2.19                 | 0.72                 | 0.6                                | 1.59                                  |
| 12        | 0.1                  | 1.51                 | 0.62                 | 0.36                               | 1.15                                  |
| 53        | 0.19                 | 2.47                 | 0.48                 | 0.335                              | 2.135                                 |
| 136       | -0.01                | 3.17                 | 0.75                 | 0.37                               | 2.8                                   |
| 209       | 0.03                 | 3.31                 | 0.85                 | 0.44                               | 2.87                                  |
| 38        | 0.3                  | 3.09                 | 0.75                 | 0.525                              | 2.565                                 |
| 53        | 0.3                  | 3.11                 | 0.81                 | 0.555                              | 2.555                                 |
| 131       | 0.32                 | 3.27                 | 0.9                  | 0.61                               | 2.66                                  |
| 209       | 0.32                 | 3.4                  | 0.95                 | 0.635                              | 2.765                                 |
| 27        | 0.3                  | 3.03                 | 0.8                  | 0.55                               | 2.48                                  |
| 53        | 0.35                 | 3.13                 | 0.86                 | 0.605                              | 2.525                                 |
| 131       | 0.6                  | 3.29                 | 0.94                 | 0.77                               | 2.52                                  |
| 209       | 0.63                 | 3.43                 | 0.99                 | 0.81                               | 2.62                                  |
| 32        | -0.03                | 2.94                 | 0.03                 | 0                                  | 2.94                                  |
| 53        | -0.06                | 2.98                 | 0.07                 | 0.005                              | 2.975                                 |
| 131       | 0.02                 | 3.31                 | 0.14                 | 0.08                               | 3.23                                  |
| 209       | 0.23                 | 3.5                  | 0.23                 | 0.23                               | 3.27                                  |
| 27        | 0.12                 | 2.93                 | 0.13                 | 0.125                              | 2.805                                 |
| 53        | 0.53                 | 3                    | 0.19                 | 0.36                               | 2.64                                  |
| 131       | 0.68                 | 3.34                 | 0.25                 | 0.465                              | 2.875                                 |
| 209       | 1.11                 | 3.54                 | 0.27                 | 0.69                               | 2.85                                  |
| 38        | 0.99                 | 3.11                 | 0.09                 | 0.54                               | 2.57                                  |
| 53        | 0.99                 | 3.18                 | 0.11                 | 0.55                               | 2.63                                  |
| 131       | 1.31                 | 3.39                 | 0.14                 | 0.725                              | 2.665                                 |
| 209       | 1.65                 | 3.53                 | 0.17                 | 0.91                               | 2.62                                  |
| 27        | 0.39                 | 2.68                 | 0.14                 | 0.265                              | 2.415                                 |
| 53        | 0.38                 | 3.03                 | 0.21                 | 0.295                              | 2.735                                 |
| 131       | 0.94                 | 3.43                 | 0.23                 | 0.585                              | 2.845                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 1.1                  | 3.57                 | 0.27                 | 0.685                              | 2.885                                 |
| 27        | 0.72                 | 2.94                 | 0.11                 | 0.415                              | 2.525                                 |
| 53        | 0.72                 | 3.12                 | 0.12                 | 0.42                               | 2.7                                   |
| 131       | 1.1                  | 3.42                 | 0.16                 | 0.63                               | 2.79                                  |
| 209       | 1.43                 | 3.55                 | 0.2                  | 0.815                              | 2.735                                 |
| 27        | 0.68                 | 2.91                 | 0.08                 | 0.38                               | 2.53                                  |
| 53        | 0.78                 | 3.2                  | 0.12                 | 0.45                               | 2.75                                  |
| 131       | 1.16                 | 3.45                 | 0.18                 | 0.67                               | 2.78                                  |
| 209       | 1.49                 | 3.59                 | 0.22                 | 0.855                              | 2.735                                 |
| 32        | 1.32                 | 2.28                 | 0.01                 | 0.665                              | 1.615                                 |
| 53        | 1.32                 | 2.31                 | 0.02                 | 0.67                               | 1.64                                  |
| 131       | 1.65                 | 2.43                 | 0.04                 | 0.845                              | 1.585                                 |
| 209       | 1.76                 | 2.55                 | 0.04                 | 0.9                                | 1.65                                  |
| 27        | 1.39                 | 2.19                 | -0.04                | 0.675                              | 1.515                                 |
| 53        | 1.38                 | 2.29                 | 0.01                 | 0.695                              | 1.595                                 |
| 131       | 1.63                 | 2.47                 | 0.09                 | 0.86                               | 1.61                                  |
| 209       | 1.72                 | 2.58                 | 0.14                 | 0.93                               | 1.65                                  |
| 27        | 1.4                  | 2.2                  | -0.1                 | 0.65                               | 1.55                                  |
| 53        | 1.45                 | 2.38                 | -0.05                | 0.7                                | 1.68                                  |
| 131       | 1.7                  | 2.44                 | -0.01                | 0.845                              | 1.595                                 |
| 209       | 1.78                 | 2.55                 | 0.02                 | 0.9                                | 1.65                                  |
| 27        | 0.84                 | 1.82                 | 0.03                 | 0.435                              | 1.385                                 |
| 53        | 0.75                 | 2.14                 | 0.16                 | 0.455                              | 1.685                                 |
| 131       | 1.15                 | 2.49                 | 0.22                 | 0.685                              | 1.805                                 |
| 209       | 1.46                 | 2.64                 | 0.23                 | 0.845                              | 1.795                                 |
| 22        | 1.26                 | 2.06                 | -0.03                | 0.615                              | 1.445                                 |
| 53        | 1.26                 | 2.3                  | 0.04                 | 0.65                               | 1.65                                  |
| 131       | 1.66                 | 2.49                 | 0.18                 | 0.92                               | 1.57                                  |
| 209       | 1.79                 | 2.59                 | 0.09                 | 0.94                               | 1.65                                  |
| 27        | 1.42                 | 2.23                 | -0.03                | 0.695                              | 1.535                                 |
| 53        | 1.5                  | 2.35                 | 0                    | 0.75                               | 1.6                                   |
| 131       | 1.73                 | 2.48                 | 0.03                 | 0.88                               | 1.6                                   |
| 209       | 1.81                 | 2.6                  | 0.03                 | 0.92                               | 1.68                                  |
| 27        | 1.51                 | 2.3                  | -0.02                | 0.745                              | 1.555                                 |
| 53        | 1.49                 | 2.34                 | 0.05                 | 0.77                               | 1.57                                  |
| 131       | 1.66                 | 2.53                 | 0.12                 | 0.89                               | 1.64                                  |
| 220       | 1.76                 | 2.67                 | 0.16                 | 0.96                               | 1.71                                  |
| 27        | 1.35                 | 2.22                 | 0.04                 | 0.695                              | 1.525                                 |
| 53        | 1.34                 | 2.33                 | 0.1                  | 0.72                               | 1.61                                  |
| 131       | 1.46                 | 2.58                 | 0.17                 | 0.815                              | 1.765                                 |
| 209       | 1.55                 | 2.68                 | 0.24                 | 0.895                              | 1.785                                 |
| 27        | 1.12                 | 2.15                 | 0.13                 | 0.625                              | 1.525                                 |
| 131       | 1.34                 | 2.58                 | 0.23                 | 0.785                              | 1.795                                 |
| 209       | 1.44                 | 2.71                 | 0.29                 | 0.865                              | 1.845                                 |
| 27        | 0.75                 | 2.1                  | 0.2                  | 0.475                              | 1.625                                 |
| 53        | 0.72                 | 2.15                 | 0.24                 | 0.48                               | 1.67                                  |
| 131       | 0.72                 | 2.51                 | 0.34                 | 0.53                               | 1.98                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 0.9                  | 2.74                 | 0.39                 | 0.645                              | 2.095                                 |
| 32        | 0.4                  | 1.98                 | 0.24                 | 0.32                               | 1.66                                  |
| 53        | 0.4                  | 2.14                 | 0.28                 | 0.34                               | 1.8                                   |
| 136       | 0.76                 | 2.55                 | 0.36                 | 0.56                               | 1.99                                  |
| 209       | 0.89                 | 2.74                 | 0.41                 | 0.65                               | 2.09                                  |
| 32        | 0.55                 | 1.89                 | 0.11                 | 0.33                               | 1.56                                  |
| 53        | 0.92                 | 2.41                 | 0.11                 | 0.515                              | 1.895                                 |
| 131       | 1.48                 | 2.58                 | 0.14                 | 0.81                               | 1.77                                  |
| 209       | 1.78                 | 2.67                 | 0.15                 | 0.965                              | 1.705                                 |
| 27        | 1.19                 | 1.09                 | 0                    | 0.595                              | 0.495                                 |
| 53        | 1.19                 | 1.34                 | 0.03                 | 0.61                               | 0.73                                  |
| 131       | 1.55                 | 1.57                 | 0.15                 | 0.85                               | 0.72                                  |
| 209       | 1.7                  | 1.48                 | 0.18                 | 0.94                               | 0.54                                  |
| 27        | 1.19                 | 1.09                 | 0                    | 0.595                              | 0.495                                 |
| 53        | 1.19                 | 1.34                 | 0.03                 | 0.61                               | 0.73                                  |
| 131       | 1.55                 | 1.57                 | 0.15                 | 0.85                               | 0.72                                  |
| 209       | 1.7                  | 1.48                 | 0.18                 | 0.94                               | 0.54                                  |
| 235       | 1.75                 | 1.72                 | 0.2                  | 0.975                              | 0.745                                 |
| 261       | 1.75                 | 1.76                 | 0.22                 | 0.985                              | 0.775                                 |
| 287       | 1.75                 | 1.8                  | 0.23                 | 0.99                               | 0.81                                  |
| 313       | 1.75                 | 1.85                 | 0.28                 | 1.015                              | 0.835                                 |
| 340       | 1.77                 | 1.88                 | 0.3                  | 1.035                              | 0.845                                 |
| 366       | 1.8                  | 1.95                 | 0.33                 | 1.065                              | 0.885                                 |
| 392       | 1.84                 | 1.99                 | 0.38                 | 1.11                               | 0.88                                  |
| 418       | 1.89                 | 2.05                 | 0.42                 | 1.155                              | 0.895                                 |
| 433       | 1.93                 | 2.11                 | 0.46                 | 1.195                              | 0.915                                 |
| 438       | 1.96                 | 2.16                 | 0.49                 | 1.225                              | 0.935                                 |
| 454- N    | 1.99                 | 2.19                 | 0.51                 | 1.25                               | 0.94                                  |
| 470       | 2.01                 | 2.23                 | 0.53                 | 1.27                               | 0.96                                  |
| 480       | 2.04                 | 2.27                 | 0.56                 | 1.3                                | 0.97                                  |
| 496- C    | 2.04                 | 2.38                 | 0.59                 | 1.315                              | 1.065                                 |
| 501       | 2.04                 | 2.46                 | 0.67                 | 1.355                              | 1.105                                 |
| 511       | 2.04                 | 2.5                  | 0.68                 | 1.36                               | 1.14                                  |
| 522       | 2.08                 | 2.61                 | 0.71                 | 1.395                              | 1.215                                 |
| 527       | 2.09                 | 2.65                 | 0.73                 | 1.41                               | 1.24                                  |
| 543       | 2.09                 | 2.71                 | 0.74                 | 1.415                              | 1.295                                 |
| 553       | 2.08                 | 2.79                 | 0.78                 | 1.43                               | 1.36                                  |
| 569       | 2.09                 | 2.9                  | 0.81                 | 1.45                               | 1.45                                  |
| 574       | 2.09                 | 3.15                 | 0.88                 | 1.485                              | 1.665                                 |

**Table A.9.35: Test Panel Concrete Cube Strength (C20-25-1-iii)**

| Cast Date: 25-07-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 09-09-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.8         | 84            | 35.67                         | 2457                             |
| II                      | 153x153x153 | 8.75        | 76.4          | 32.44                         | 2443                             |
| III                     | 153x153x153 | 8.5         | 67.6          | 28.70                         | 2373                             |
| IV                      | 153x153x153 | 8.75        | 73.8          | 31.34                         | 2443                             |
| Mean                    |             |             |               | 32.04                         | 2429                             |

**Table A.9.36: CFST Concrete Cube Strength (C20-25-1-iii)**

| Cast Date: 26-05-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 09-09-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 7.25        | 61.4          | 25.73                         | 2024                             |
| II                      | 153x153x154 | 6.5         | 63            | 26.401                        | 1815                             |
| III                     | 153x153x154 | 7.25        | 61.4          | 25.731                        | 2024                             |
| IV                      | 153x153x153 | 8.0         | 59.8          | 25.060                        | 2234                             |
| Mean                    |             |             |               | 25.731                        | 2024                             |



**Table A.9.37: Sample 13 (C20-25-1-i)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 3.46                 | 0.85                 | 0.84                 | 2.15                               | -1.3                                  |
| 53        | 4.45                 | 1.57                 | 1.13                 | 2.79                               | -1.22                                 |
| 79        | 4.65                 | 1.81                 | 1.52                 | 3.085                              | -1.275                                |
| 105       | 4.66                 | 2.43                 | 1.98                 | 3.32                               | -0.89                                 |
| 131       | 4.66                 | 3.11                 | 2.68                 | 3.67                               | -0.56                                 |
| 157       | 4.66                 | 3.5                  | 3.3                  | 3.98                               | -0.48                                 |
| 183       | 4.66                 | 3.9                  | 4.3                  | 4.48                               | -0.58                                 |
| 209       | 4.53                 | 4.18                 | 4.62                 | 4.575                              | -0.395                                |
| 1         | 4.34                 | 0.42                 | 3.75                 | 4.045                              | -3.625                                |
| 27        | 4.35                 | 0.22                 | 3.79                 | 4.07                               | -3.85                                 |
| 53        | 4.35                 | 1.08                 | 3.8                  | 4.075                              | -2.995                                |
| 100       | 4.35                 | 1.67                 | 3.8                  | 4.075                              | -2.405                                |
| 131       | 4.85                 | 1.88                 | 3.8                  | 4.325                              | -2.445                                |
| 157       | 5.64                 | 2.05                 | 3.8                  | 4.72                               | -2.67                                 |
| 189       | 5.64                 | 2.24                 | 3.8                  | 4.72                               | -2.48                                 |
| 209       | 5.39                 | 2.42                 | 3.8                  | 4.595                              | -2.175                                |
| 17        | 5                    | 1.61                 | 3.54                 | 4.27                               | -2.66                                 |
| 53        | 5                    | 2.37                 | 3.56                 | 4.28                               | -1.91                                 |
| 131       | 5                    | 3                    | 3.56                 | 4.28                               | -1.28                                 |
| 209       | 5.65                 | 3.54                 | 3.56                 | 4.605                              | -1.065                                |
| 6         | 4.12                 | 2.28                 | 3.63                 | 3.875                              | -1.595                                |
| 53        | 4.12                 | 3.68                 | 3.65                 | 3.885                              | -0.205                                |
| 131       | 4.85                 | 4.3                  | 3.65                 | 4.25                               | 0.05                                  |
| 209       | 4.69                 | 4.68                 | 3.65                 | 4.17                               | 0.51                                  |
| 27        | 0                    | 0                    | 0                    | 0                                  | 0                                     |
| 53        | 0.04                 | 0.46                 | 0.1                  | 0.07                               | 0.39                                  |
| 131       | 0.18                 | 1.15                 | 0.39                 | 0.285                              | 0.865                                 |
| 209       | 0.4                  | 1.55                 | 0.65                 | 0.525                              | 1.025                                 |
| 32        | 0                    | 0.18                 | 0.38                 | 0.19                               | -0.01                                 |
| 64        | -0.01                | 0.44                 | 0.53                 | 0.26                               | 0.18                                  |
| 131       | 0.06                 | 0.87                 | 0.78                 | 0.42                               | 0.45                                  |
| 209       | 0.18                 | 1.49                 | 1.12                 | 0.65                               | 0.84                                  |
| 27        | -0.08                | 0.9                  | 0.47                 | 0.195                              | 0.705                                 |
| 53        | -0.08                | 1.34                 | 0.55                 | 0.235                              | 1.105                                 |
| 131       | 0.05                 | 2                    | 0.94                 | 0.495                              | 1.505                                 |
| 209       | 0.17                 | 2.5                  | 1.25                 | 0.71                               | 1.79                                  |
| 27        | 0.06                 | 1.32                 | 0.35                 | 0.205                              | 1.115                                 |
| 53        | 0.06                 | 1.66                 | 0.42                 | 0.24                               | 1.42                                  |
| 131       | 0.18                 | 2.33                 | 0.75                 | 0.465                              | 1.865                                 |
| 209       | 0.28                 | 2.73                 | 1.08                 | 0.68                               | 2.05                                  |
| 32        | -0.14                | -1.46                | 0.17                 | 0.015                              | -1.475                                |
| 53        | -0.1                 | 0.16                 | 0.38                 | 0.14                               | 0.02                                  |
| 131       | 0.09                 | 1.11                 | 0.75                 | 0.42                               | 0.69                                  |
| 209       | 0.22                 | 1.58                 | 1.1                  | 0.66                               | 0.92                                  |
| 27        | -0.05                | -0.17                | 0.21                 | 0.08                               | -0.25                                 |
| 53        | 0                    | 0.4                  | 0.38                 | 0.19                               | 0.21                                  |
| 131       | 0.14                 | 1.23                 | 0.74                 | 0.44                               | 0.79                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 0.22                 | 2.64                 | 1.12                 | 0.67                               | 1.97                                  |
| 27        | 0.09                 | 0.4                  | 0.16                 | 0.125                              | 0.275                                 |
| 53        | 0.16                 | 1.65                 | 0.11                 | 0.135                              | 1.515                                 |
| 131       | 0.29                 | 2.5                  | 0.58                 | 0.435                              | 2.065                                 |
| 209       | 0.38                 | 2.88                 | 1                    | 0.69                               | 2.19                                  |
| 12        | 0.04                 | -0.89                | -0.07                | -0.015                             | -0.875                                |
| 53        | 0.13                 | 0.62                 | 0.13                 | 0.13                               | 0.49                                  |
| 131       | 0.31                 | 1.58                 | 0.65                 | 0.48                               | 1.1                                   |
| 209       | 0.38                 | 1.95                 | 0.94                 | 0.66                               | 1.29                                  |
| 27        | 0.11                 | 0.6                  | 0.22                 | 0.165                              | 0.435                                 |
| 53        | 0.14                 | 1.49                 | 0.22                 | 0.18                               | 1.31                                  |
| 131       | 0.28                 | 2.59                 | 0.76                 | 0.52                               | 2.07                                  |
| 209       | 0.35                 | 2.93                 | 0.93                 | 0.64                               | 2.29                                  |
| 27        | 0.21                 | 1.62                 | 0.41                 | 0.31                               | 1.31                                  |
| 53        | 0.25                 | 2.07                 | 0.44                 | 0.345                              | 1.725                                 |
| 131       | 0.34                 | 2.7                  | 0.73                 | 0.535                              | 2.165                                 |
| 209       | 0.4                  | 3                    | 0.9                  | 0.65                               | 2.35                                  |
| 27        | 0.22                 | 0.67                 | 0.4                  | 0.31                               | 0.36                                  |
| 53        | 0.24                 | 1.02                 | 0.42                 | 0.33                               | 0.69                                  |
| 131       | 0.35                 | 1.74                 | 0.75                 | 0.55                               | 1.19                                  |
| 209       | 0.4                  | 2.05                 | 0.9                  | 0.65                               | 1.4                                   |
| 27        | 0.29                 | 1.38                 | 0.36                 | 0.325                              | 1.055                                 |
| 53        | 0.33                 | 1.95                 | 0.36                 | 0.345                              | 1.605                                 |
| 131       | 0.42                 | 2.67                 | 0.57                 | 0.495                              | 2.175                                 |
| 209       | 0.53                 | 3.09                 | 0.8                  | 0.665                              | 2.425                                 |
| 27        | 0.36                 | 0                    | 0.33                 | 0.345                              | -0.345                                |
| 53        | 0.49                 | 0.62                 | 0.26                 | 0.375                              | 0.245                                 |
| 131- N    | 0.52                 | 1.6                  | 0.49                 | 0.505                              | 1.095                                 |
| 209       | 0.68                 | 2.2                  | 0.72                 | 0.7                                | 1.5                                   |
| 27        | 0.31                 | 0.48                 | 0.37                 | 0.34                               | 0.14                                  |
| 53        | 0.4                  | 1.36                 | 0.45                 | 0.425                              | 0.935                                 |
| 131       | 0.54                 | 2.06                 | 0.72                 | 0.63                               | 1.43                                  |
| 209       | 0.59                 | 2.39                 | 0.86                 | 0.725                              | 1.665                                 |
| 27        | 0.39                 | 1.24                 | 0.54                 | 0.465                              | 0.775                                 |
| 53        | 0.41                 | 1.45                 | 0.53                 | 0.47                               | 0.98                                  |
| 131       | 0.52                 | 2.12                 | 0.78                 | 0.65                               | 1.47                                  |
| 209       | 0.61                 | 2.44                 | 0.85                 | 0.73                               | 1.71                                  |
| 27        | 0.43                 | 0.75                 | 0.41                 | 0.42                               | 0.33                                  |
| 53        | 0.45                 | 1.36                 | 0.42                 | 0.435                              | 0.925                                 |
| 131       | 0.58                 | 2.14                 | 0.73                 | 0.655                              | 1.485                                 |
| 209       | 0.64                 | 2.45                 | 0.82                 | 0.73                               | 1.72                                  |
| 27        | 0.42                 | 1.26                 | 0.52                 | 0.47                               | 0.79                                  |
| 64        | 0.47                 | 1.48                 | 0.6                  | 0.535                              | 0.945                                 |
| 131       | 0.56                 | 2.2                  | 0.79                 | 0.675                              | 1.525                                 |
| 209       | 0.63                 | 2.51                 | 0.84                 | 0.735                              | 1.775                                 |
| 27        | 0.28                 | 1.3                  | 0.73                 | 0.505                              | 0.795                                 |
| 209       | 0.22                 | 2.64                 | 1.12                 | 0.67                               | 1.97                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.28                 | 1.3                  | 0.73                 | 0.505                              | 0.795                                 |
| 53        | 0.34                 | 1.69                 | 0.77                 | 0.555                              | 1.135                                 |
| 131       | 0.46                 | 2.25                 | 0.9                  | 0.68                               | 1.57                                  |
| 209       | 0.55                 | 2.59                 | 0.93                 | 0.74                               | 1.85                                  |
| 17        | 0.29                 | 1.25                 | 0.72                 | 0.505                              | 0.745                                 |
| 53        | 0.31                 | 1.67                 | 0.79                 | 0.55                               | 1.12                                  |
| 131       | 0.4                  | 2.22                 | 0.97                 | 0.685                              | 1.535                                 |
| 209       | 0.47                 | 2.58                 | 0.96                 | 0.715                              | 1.865                                 |
| 27        | 0.26                 | 1.42                 | 0.85                 | 0.555                              | 0.865                                 |
| 53        | 0.28                 | 1.72                 | 0.93                 | 0.605                              | 1.115                                 |
| 131       | 0.76                 | 2.22                 | 0.98                 | 0.87                               | 1.35                                  |
| 209       | 0.44                 | 2.64                 | 0.94                 | 0.69                               | 1.95                                  |
| 27        | 0.31                 | 1.41                 | 0.78                 | 0.545                              | 0.865                                 |
| 53        | 0.35                 | 1.92                 | 0.88                 | 0.615                              | 1.305                                 |
| 131       | 0.43                 | 2.45                 | 0.98                 | 0.705                              | 1.745                                 |
| 209       | 0.5                  | 2.75                 | 0.9                  | 0.7                                | 2.05                                  |
| 235       | 0.51                 | 2.82                 | 0.86                 | 0.685                              | 2.135                                 |
| 261       | 0.55                 | 3.01                 | 0.84                 | 0.695                              | 2.315                                 |
| 287       | 0.55                 | 3.24                 | 0.99                 | 0.77                               | 2.47                                  |
| 313       | 0.61                 | 3.4                  | 1.04                 | 0.825                              | 2.575                                 |
| 340       | 0.66                 | 3.61                 | 1.19                 | 0.925                              | 2.685                                 |
| 366       | 0.74                 | 3.85                 | 1.29                 | 1.015                              | 2.835                                 |
| 392- C    | 0.81                 | 4.2                  | 1.62                 | 1.215                              | 2.985                                 |

**Table A.9.38:** Test Panel Concrete Cube Strength (C20-25-1-i)

| Cast Date: 08-08-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 03-10-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.75        | 33.6          | 14.27                         | 2443                             |
| II                      | 153x153x153 | 8.75        | 54.6          | 23.18                         | 2443                             |
| III                     | 153x153x153 | 8.7         | 58.8          | 24.97                         | 2429                             |
| IV                      | 153x153x153 | 8.8         | 70.8          | 30.06                         | 2457                             |
| Mean                    |             |             |               | 23.12                         | 2443                             |

**Table A.9.39:** CFST Concrete Cube Strength (C20-25-1-i)

| Cast Date: 26-05-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 03-10-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.45        | 76.8          | 32.18                         | 2359                             |
| II                      | 153x153x154 | 8.6         | 75.6          | 31.68                         | 2401                             |
| III                     | 153x153x154 | 8.3         | 78            | 32.69                         | 2317                             |
| IV                      | 153x153x153 | 8.45        | 76.8          | 32.18                         | 2359                             |
| Mean                    |             |             |               | 32.18                         | 2359                             |

**Table A.9.40: Sample 14 (C30-30-1-iii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.12                 | 0.98                 | 0.12                 | 0.12                               | 0.86                                  |
| 53        | 0.24                 | 1.58                 | 0.2                  | 0.22                               | 1.36                                  |
| 79        | 0.35                 | 1.8                  | 0.29                 | 0.32                               | 1.48                                  |
| 105       | 0.41                 | 1.96                 | 0.37                 | 0.39                               | 1.57                                  |
| 131       | 0.46                 | 2.04                 | 0.44                 | 0.45                               | 1.59                                  |
| 157       | 0.52                 | 2.25                 | 0.5                  | 0.51                               | 1.74                                  |
| 183       | 0.57                 | 2.37                 | 0.62                 | 0.595                              | 1.775                                 |
| 209       | 0.61                 | 2.45                 | 0.69                 | 0.65                               | 1.8                                   |
| 32        | 0.32                 | 1.67                 | 0.57                 | 0.445                              | 1.225                                 |
| 53        | 0.32                 | 2.09                 | 0.63                 | 0.475                              | 1.615                                 |
| 79        | 0.34                 | 2.22                 | 0.66                 | 0.5                                | 1.72                                  |
| 110       | 0.37                 | 2.29                 | 0.68                 | 0.525                              | 1.765                                 |
| 131       | 0.37                 | 2.32                 | 0.69                 | 0.53                               | 1.79                                  |
| 157       | 0.38                 | 2.37                 | 0.71                 | 0.545                              | 1.825                                 |
| 183       | 0.39                 | 2.42                 | 0.75                 | 0.57                               | 1.85                                  |
| 209       | 0.42                 | 2.48                 | 0.78                 | 0.6                                | 1.88                                  |
| 32        | 0.4                  | 1.85                 | 0.46                 | 0.43                               | 1.42                                  |
| 53        | 0.44                 | 2.1                  | 0.51                 | 0.475                              | 1.625                                 |
| 131       | 0.53                 | 2.37                 | 0.68                 | 0.605                              | 1.765                                 |
| 209       | 0.64                 | 2.55                 | 0.79                 | 0.715                              | 1.835                                 |
| 27        | 0.45                 | 1.69                 | 0.45                 | 0.45                               | 1.24                                  |
| 53        | 0.47                 | 2.11                 | 0.51                 | 0.49                               | 1.62                                  |
| 79        | 0.51                 | 2.25                 | 0.59                 | 0.55                               | 1.7                                   |
| 131       | 0.57                 | 2.4                  | 0.65                 | 0.61                               | 1.79                                  |
| 209       | 0.65                 | 2.55                 | 0.8                  | 0.725                              | 1.825                                 |
| 22        | 0.48                 | 1.5                  | 0.4                  | 0.44                               | 1.06                                  |
| 53        | 0.51                 | 2.12                 | 0.48                 | 0.495                              | 1.625                                 |
| 142       | 0.61                 | 2.43                 | 0.68                 | 0.645                              | 1.785                                 |
| 209       | 0.66                 | 2.57                 | 0.79                 | 0.725                              | 1.845                                 |
| 27        | 0.58                 | 1.96                 | 0.4                  | 0.49                               | 1.47                                  |
| 53        | 0.58                 | 2.12                 | 0.43                 | 0.505                              | 1.615                                 |
| 131       | 0.65                 | 2.36                 | 0.53                 | 0.59                               | 1.77                                  |
| 209       | 0.76                 | 2.53                 | 0.68                 | 0.72                               | 1.81                                  |
| 27        | 0.56                 | 1.76                 | 0.38                 | 0.47                               | 1.29                                  |
| 53        | 0.59                 | 2.12                 | 0.43                 | 0.51                               | 1.61                                  |
| 131       | 0.69                 | 2.46                 | 0.59                 | 0.64                               | 1.82                                  |
| 209       | 0.75                 | 2.57                 | 0.7                  | 0.725                              | 1.845                                 |
| 27        | 0.6                  | 1.94                 | 0.4                  | 0.5                                | 1.44                                  |
| 53        | 0.6                  | 2.15                 | 0.44                 | 0.52                               | 1.63                                  |
| 131       | 0.71                 | 2.44                 | 0.56                 | 0.635                              | 1.805                                 |
| 209       | 0.75                 | 2.58                 | 0.7                  | 0.725                              | 1.855                                 |
| 27        | 0.65                 | 1.85                 | 0.26                 | 0.455                              | 1.395                                 |
| 53        | 0.65                 | 2.12                 | 0.33                 | 0.49                               | 1.63                                  |
| 131       | 0.75                 | 2.4                  | 0.52                 | 0.635                              | 1.765                                 |
| 209       | 0.79                 | 2.55                 | 0.65                 | 0.72                               | 1.83                                  |
| 27        | 0.59                 | 1.89                 | 0.43                 | 0.51                               | 1.38                                  |
| 53        | 0.59                 | 2.19                 | 0.52                 | 0.555                              | 1.635                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 0.67                 | 2.48                 | 0.67                 | 0.67                               | 1.81                                  |
| 209       | 0.74                 | 2.63                 | 0.78                 | 0.76                               | 1.87                                  |
| 27        | 0.6                  | 1.82                 | 0.42                 | 0.51                               | 1.31                                  |
| 53        | 0.62                 | 2.2                  | 0.48                 | 0.55                               | 1.65                                  |
| 131       | 0.71                 | 2.51                 | 0.66                 | 0.685                              | 1.825                                 |
| 209       | 0.76                 | 2.63                 | 0.76                 | 0.76                               | 1.87                                  |
| 22        | 0.56                 | 1.53                 | 0.43                 | 0.495                              | 1.035                                 |
| 53        | 0.59                 | 2.22                 | 0.54                 | 0.565                              | 1.655                                 |
| 136       | 0.7                  | 2.51                 | 0.68                 | 0.69                               | 1.82                                  |
| 209       | 0.75                 | 2.63                 | 0.78                 | 0.765                              | 1.865                                 |
| 27        | 0.61                 | 1.9                  | 0.45                 | 0.53                               | 1.37                                  |
| 58        | 0.61                 | 2.25                 | 0.59                 | 0.6                                | 1.65                                  |
| 131       | 0.69                 | 2.51                 | 0.7                  | 0.695                              | 1.815                                 |
| 209       | 0.75                 | 2.64                 | 0.8                  | 0.775                              | 1.865                                 |
| 22        | 0.57                 | 1.54                 | 0.43                 | 0.5                                | 1.04                                  |
| 53        | 0.6                  | 2.23                 | 0.51                 | 0.555                              | 1.675                                 |
| 131       | 0.72                 | 2.51                 | 0.66                 | 0.69                               | 1.82                                  |
| 215       | 0.76                 | 2.64                 | 0.77                 | 0.765                              | 1.875                                 |
| 27        | 0.6                  | 1.91                 | 0.47                 | 0.535                              | 1.375                                 |
| 53        | 0.6                  | 2.24                 | 0.56                 | 0.58                               | 1.66                                  |
| 131       | 0.7                  | 2.52                 | 0.7                  | 0.7                                | 1.82                                  |
| 209       | 0.77                 | 2.65                 | 0.79                 | 0.78                               | 1.87                                  |
| 27        | 0.61                 | 1.93                 | 0.5                  | 0.555                              | 1.375                                 |
| 53        | 0.61                 | 2.23                 | 0.56                 | 0.585                              | 1.645                                 |
| 131       | 0.7                  | 2.52                 | 0.7                  | 0.7                                | 1.82                                  |
| 209       | 0.77                 | 2.65                 | 0.8                  | 0.785                              | 1.865                                 |
| 22        | 0.56                 | 1.71                 | 0.51                 | 0.535                              | 1.175                                 |
| 53        | 0.57                 | 2.22                 | 0.62                 | 0.595                              | 1.625                                 |
| 131       | 0.68                 | 2.53                 | 0.75                 | 0.715                              | 1.815                                 |
| 209       | 0.75                 | 2.65                 | 0.82                 | 0.785                              | 1.865                                 |
| 6         | 0.42                 | 0.68                 | 0.44                 | 0.43                               | 0.25                                  |
| 53        | 0.52                 | 2.24                 | 0.65                 | 0.585                              | 1.655                                 |
| 131       | 0.63                 | 2.52                 | 0.74                 | 0.685                              | 1.835                                 |
| 215       | 0.7                  | 2.68                 | 0.76                 | 0.73                               | 1.95                                  |
| 27        | 0.54                 | 1.6                  | 0.54                 | 0.54                               | 1.06                                  |
| 53        | 0.56                 | 2.25                 | 0.67                 | 0.615                              | 1.635                                 |
| 131       | 0.67                 | 2.53                 | 0.75                 | 0.71                               | 1.82                                  |
| 209       | 0.73                 | 2.67                 | 0.76                 | 0.745                              | 1.925                                 |
| 27        | 0.65                 | 1.95                 | 0.48                 | 0.565                              | 1.385                                 |
| 53        | 0.65                 | 2.22                 | 0.51                 | 0.58                               | 1.64                                  |
| 131       | 0.76                 | 2.52                 | 0.63                 | 0.695                              | 1.825                                 |
| 209       | 0.79                 | 2.63                 | 0.73                 | 0.76                               | 1.87                                  |
| 27        | 0.65                 | 1.95                 | 0.48                 | 0.565                              | 1.385                                 |
| 53        | 0.65                 | 2.25                 | 0.52                 | 0.585                              | 1.665                                 |
| 142       | 0.75                 | 2.56                 | 0.68                 | 0.715                              | 1.845                                 |
| 209       | 0.79                 | 2.66                 | 0.75                 | 0.77                               | 1.89                                  |
| 27        | 0.69                 | 2.07                 | 0.46                 | 0.575                              | 1.495                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 53        | 0.69                 | 2.22                 | 0.48                 | 0.585                              | 1.635                                 |
| 131       | 0.77                 | 2.51                 | 0.62                 | 0.695                              | 1.815                                 |
| 209       | 0.8                  | 2.64                 | 0.73                 | 0.765                              | 1.875                                 |
| 22        | 0.65                 | 1.66                 | 0.36                 | 0.505                              | 1.155                                 |
| 53        | 0.69                 | 2.21                 | 0.42                 | 0.555                              | 1.655                                 |
| 131       | 0.78                 | 2.49                 | 0.58                 | 0.68                               | 1.81                                  |
| 209       | 0.81                 | 2.63                 | 0.71                 | 0.76                               | 1.87                                  |
| 32        | 0.65                 | 2.18                 | 0.55                 | 0.6                                | 1.58                                  |
| 53        | 0.66                 | 2.26                 | 0.58                 | 0.62                               | 1.64                                  |
| 131       | 0.74                 | 2.55                 | 0.7                  | 0.72                               | 1.83                                  |
| 209       | 0.78                 | 2.68                 | 0.77                 | 0.775                              | 1.905                                 |
| 27        | 0.58                 | 1.74                 | 0.58                 | 0.58                               | 1.16                                  |
| 53        | 0.61                 | 2.24                 | 0.63                 | 0.62                               | 1.62                                  |
| 131       | 0.74                 | 2.55                 | 0.72                 | 0.73                               | 1.82                                  |
| 209       | 0.78                 | 2.66                 | 0.76                 | 0.77                               | 1.89                                  |
| 27        | 0.58                 | 1.74                 | 0.58                 | 0.58                               | 1.16                                  |
| 53        | 0.61                 | 2.24                 | 0.63                 | 0.62                               | 1.62                                  |
| 131       | 0.74                 | 2.55                 | 0.72                 | 0.73                               | 1.82                                  |
| 209       | 0.78                 | 2.66                 | 0.76                 | 0.77                               | 1.89                                  |
| 235       | 0.79                 | 2.69                 | 0.77                 | 0.78                               | 1.91                                  |
| 261       | 0.81                 | 2.74                 | 0.78                 | 0.795                              | 1.945                                 |
| 287       | 0.82                 | 2.79                 | 0.79                 | 0.805                              | 1.985                                 |
| 313       | 0.84                 | 2.84                 | 0.82                 | 0.83                               | 2.01                                  |
| 340       | 0.86                 | 2.89                 | 0.84                 | 0.85                               | 2.04                                  |
| 366       | 0.89                 | 2.94                 | 0.85                 | 0.87                               | 2.07                                  |
| 392       | 0.91                 | 2.99                 | 0.88                 | 0.895                              | 2.095                                 |
| 418       | 0.95                 | 3.04                 | 0.89                 | 0.92                               | 2.12                                  |
| 444       | 0.98                 | 3.09                 | 0.91                 | 0.945                              | 1.91                                  |
| 470       | 1.03                 | 3.11                 | 0.94                 | 0.985                              | 1.945                                 |
| 496       | 1.06                 | 3.22                 | 0.97                 | 1.015                              | 1.985                                 |
| 522- N    | 1.1                  | 3.29                 | 0.99                 | 1.045                              | 2.01                                  |
| 527- C    | 1.14                 | 3.38                 | 1                    | 1.07                               | 2.04                                  |
| 537       | 1.14                 | 3.4                  | 1.02                 | 1.08                               | 2.07                                  |
| 548       | 1.15                 | 3.42                 | 1.02                 | 1.085                              | 2.095                                 |
| 553       | 1.15                 | 3.44                 | 1.03                 | 1.09                               | 2.12                                  |
| 558       | 1.15                 | 3.47                 | 1.04                 | 1.095                              | 2.145                                 |
| 574       | 1.16                 | 3.49                 | 1.05                 | 1.105                              | 2.125                                 |
| 579       | 1.18                 | 3.52                 | 1.07                 | 1.125                              | 2.205                                 |
| 589       | 1.18                 | 3.53                 | 1.08                 | 1.13                               | 2.245                                 |
| 600       | 1.19                 | 3.56                 | 1.09                 | 1.14                               | 2.31                                  |
| 610       | 1.19                 | 3.58                 | 1.1                  | 1.145                              | 2.32                                  |
| 615       | 1.2                  | 3.61                 | 1.11                 | 1.155                              | 2.335                                 |
| 626       | 1.21                 | 3.65                 | 1.13                 | 1.17                               | 2.35                                  |
| 636       | 1.21                 | 3.68                 | 1.15                 | 1.18                               | 2.375                                 |
| 642       | 1.21                 | 3.72                 | 1.16                 | 1.185                              | 2.385                                 |
| 652       | 1.22                 | 3.77                 | 1.17                 | 1.195                              | 2.395                                 |
| 668       | 1.22                 | 3.84                 | 1.18                 | 1.2                                | 2.4                                   |
| 678       | 1.23                 | 3.97                 | 1.2                  | 1.215                              | 2.42                                  |

**Table A.9.41: Test Panel Concrete Cube Strength (C30-30-1-iii)**

| Cast Date: 15-08-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 10-10-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.65        | 99            | 41.49                         | 2415                             |
| II                      | 153x153x153 | 8.8         | 89.4          | 37.46                         | 2457                             |
| III                     | 153x153x153 | 8.7         | 104.8         | 43.92                         | 2429                             |
| IV                      | 153x153x153 | 8.75        | 105           | 44.00                         | 2443                             |
| Mean                    |             |             |               | 41.72                         | 2436                             |

**Table A.9.42: CFST Concrete Cube Strength (C30-30-1-iii)**

| Cast Date: 31-05-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 10-10-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.2         | 83            | 34.78                         | 2289                             |
| II                      | 153x153x154 | 8.2         | 83            | 34.78                         | 2289                             |
| III                     | 153x153x154 | 8.3         | 95            | 39.81                         | 2317                             |
| IV                      | 153x153x153 | 8.3         | 95            | 39.81                         | 2317                             |
| Mean                    |             |             |               | 38.14                         | 2308                             |



**Table A.9.43: Sample 15 (C30-30-1-ii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.18                 | 0.96                 | 0.1                  | 0.14                               | 0.82                                  |
| 53        | 0.21                 | 2.13                 | 0.25                 | 0.23                               | 1.9                                   |
| 79        | 0.22                 | 2.53                 | 0.4                  | 0.31                               | 2.22                                  |
| 105       | 0.23                 | 2.73                 | 0.45                 | 0.34                               | 2.39                                  |
| 131       | 0.25                 | 2.93                 | 0.51                 | 0.38                               | 2.55                                  |
| 157       | 0.29                 | 3.1                  | 0.59                 | 0.44                               | 2.66                                  |
| 183       | 0.31                 | 3.23                 | 0.66                 | 0.485                              | 2.745                                 |
| 209       | 0.32                 | 3.36                 | 0.75                 | 0.535                              | 2.825                                 |
| 38        | 0.22                 | 0.99                 | 0.17                 | 0.195                              | 0.795                                 |
| 53        | 0.62                 | 2.82                 | -0.18                | 0.22                               | 2.6                                   |
| 79        | 1.08                 | 3.59                 | -0.2                 | 0.44                               | 3.15                                  |
| 105       | 1.17                 | 3.81                 | -0.2                 | 0.485                              | 3.325                                 |
| 131       | 1.26                 | 4.04                 | -0.2                 | 0.53                               | 3.51                                  |
| 157       | 1.33                 | 4.22                 | -0.19                | 0.57                               | 3.65                                  |
| 194       | 1.35                 | 4.33                 | -0.16                | 0.595                              | 3.735                                 |
| 209       | 1.35                 | 4.4                  | -0.08                | 0.635                              | 3.765                                 |
| 27        | 0.39                 | 2.83                 | -0.34                | 0.025                              | 2.805                                 |
| 53        | 0.39                 | 3.75                 | -0.4                 | -0.005                             | 3.755                                 |
| 79        | 0.43                 | 4.3                  | -0.37                | 0.03                               | 4.27                                  |
| 131       | 0.43                 | 4.46                 | -0.3                 | 0.065                              | 4.395                                 |
| 157       | 0.44                 | 4.58                 | -0.22                | 0.11                               | 4.47                                  |
| 209       | 0.48                 | 4.74                 | -0.15                | 0.165                              | 4.575                                 |
| 27        | 0.3                  | 2.94                 | -0.4                 | -0.05                              | 2.99                                  |
| 53        | 0.25                 | 3.36                 | -0.3                 | -0.025                             | 3.385                                 |
| 131       | 0.33                 | 4.12                 | -0.18                | 0.075                              | 4.045                                 |
| 209       | 0.41                 | 4.51                 | -0.04                | 0.185                              | 4.325                                 |
| 22        | 0.14                 | 2.31                 | -0.35                | -0.105                             | 2.415                                 |
| 53        | 0.2                  | 3.62                 | -0.3                 | -0.05                              | 3.67                                  |
| 136       | 0.32                 | 4.16                 | -0.13                | 0.095                              | 4.065                                 |
| 209       | 0.38                 | 4.5                  | 0                    | 0.19                               | 4.31                                  |
| 27        | 0.34                 | 2.66                 | -0.37                | -0.015                             | 2.675                                 |
| 53        | 0.35                 | 3.85                 | -0.29                | 0.03                               | 3.82                                  |
| 131       | 0.4                  | 4.39                 | -0.18                | 0.11                               | 4.28                                  |
| 209       | 0.46                 | 4.7                  | -0.05                | 0.205                              | 4.495                                 |
| 27        | 0.29                 | 3.22                 | -0.31                | -0.01                              | 3.23                                  |
| 53        | 0.28                 | 3.73                 | -0.35                | -0.035                             | 3.765                                 |
| 131       | 0.34                 | 4.17                 | -0.12                | 0.11                               | 4.06                                  |
| 209       | 0.39                 | 4.53                 | 0.03                 | 0.21                               | 4.32                                  |
| 27        | 0.35                 | 3.23                 | -0.31                | 0.02                               | 3.21                                  |
| 53        | 0.35                 | 3.88                 | -0.24                | 0.055                              | 3.825                                 |
| 131       | 0.36                 | 4.25                 | -0.09                | 0.135                              | 4.115                                 |
| 209       | 0.4                  | 4.54                 | 0.03                 | 0.215                              | 4.325                                 |
| 32        | 0.34                 | 3.29                 | -0.3                 | 0.02                               | 3.27                                  |
| 53        | 0.34                 | 3.79                 | -0.24                | 0.05                               | 3.74                                  |
| 131       | 0.38                 | 4.26                 | -0.08                | 0.15                               | 4.11                                  |
| 209       | 0.39                 | 4.32                 | 0.05                 | 0.22                               | 4.1                                   |
| 38        | 0.38                 | 3.58                 | -0.25                | 0.065                              | 3.515                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 53        | 0.38                 | 3.93                 | -0.21                | 0.085                              | 3.845                                 |
| 131       | 0.38                 | 4.27                 | -0.09                | 0.145                              | 4.125                                 |
| 209       | 0.41                 | 4.6                  | 0.04                 | 0.225                              | 4.375                                 |
| 27        | 0.38                 | 3.12                 | -0.28                | 0.05                               | 3.07                                  |
| 53        | 0.38                 | 3.86                 | -0.23                | 0.075                              | 3.785                                 |
| 131       | 0.38                 | 4.27                 | -0.1                 | 0.14                               | 4.13                                  |
| 209       | 0.4                  | 4.55                 | 0.05                 | 0.225                              | 4.325                                 |
| 27        | 0.34                 | 2.85                 | -0.31                | 0.015                              | 2.835                                 |
| 53        | 0.34                 | 3.76                 | -0.24                | 0.05                               | 3.71                                  |
| 131       | 0.4                  | 4.29                 | -0.08                | 0.16                               | 4.13                                  |
| 209       | 0.41                 | 4.58                 | 0.05                 | 0.23                               | 4.35                                  |
| 27        | 0.35                 | 3.04                 | -0.3                 | 0.025                              | 3.015                                 |
| 53        | 0.35                 | 3.85                 | -0.23                | 0.06                               | 3.79                                  |
| 131       | 0.4                  | 4.36                 | -0.1                 | 0.15                               | 4.21                                  |
| 209       | 0.42                 | 4.63                 | 0.05                 | 0.235                              | 4.395                                 |
| 27        | 0.33                 | 2.7                  | -0.33                | 0                                  | 2.7                                   |
| 53        | 0.36                 | 3.86                 | -0.23                | 0.065                              | 3.795                                 |
| 142       | 0.4                  | 4.37                 | -0.5                 | -0.05                              | 4.42                                  |
| 209       | 0.41                 | 4.62                 | 0.06                 | 0.235                              | 4.385                                 |
| 22        | 0.32                 | 2.54                 | -0.33                | -0.005                             | 2.545                                 |
| 53        | 0.33                 | 3.87                 | -0.23                | 0.05                               | 3.82                                  |
| 136       | 0.39                 | 4.3                  | -0.07                | 0.16                               | 4.14                                  |
| 209       | 0.42                 | 4.62                 | 0.06                 | 0.24                               | 4.38                                  |
| 27        | 0.37                 | 3.27                 | -0.25                | 0.06                               | 3.21                                  |
| 53        | 0.37                 | 3.91                 | -0.2                 | 0.085                              | 3.825                                 |
| 131       | 0.4                  | 4.35                 | -0.06                | 0.17                               | 4.18                                  |
| 209       | 0.43                 | 4.67                 | 0.05                 | 0.24                               | 4.43                                  |
| 27        | 0.34                 | 3.05                 | -0.3                 | 0.02                               | 3.03                                  |
| 53        | 0.35                 | 3.88                 | -0.21                | 0.07                               | 3.81                                  |
| 131       | 0.4                  | 4.33                 | -0.06                | 0.17                               | 4.16                                  |
| 209       | 0.43                 | 4.67                 | 0.07                 | 0.25                               | 4.42                                  |
| 27        | 0.34                 | 3.12                 | -0.3                 | 0.02                               | 3.1                                   |
| 53        | 0.34                 | 3.84                 | -0.23                | 0.055                              | 3.785                                 |
| 131       | 0.4                  | 4.32                 | -0.06                | 0.17                               | 4.15                                  |
| 209       | 0.43                 | 4.67                 | 0.06                 | 0.245                              | 4.425                                 |
| 27        | 0.34                 | 2.77                 | -0.31                | 0.015                              | 2.755                                 |
| 53        | 0.36                 | 3.91                 | -0.21                | 0.075                              | 3.835                                 |
| 131       | 0.41                 | 4.41                 | -0.06                | 0.175                              | 4.235                                 |
| 209       | 0.45                 | 4.72                 | 0.05                 | 0.25                               | 4.47                                  |
| 27        | 0.4                  | 3.07                 | -0.28                | 0.06                               | 3.01                                  |
| 53        | 0.4                  | 4                    | -0.18                | 0.11                               | 3.89                                  |
| 131       | 0.42                 | 4.45                 | -0.08                | 0.17                               | 4.28                                  |
| 209       | 0.46                 | 4.77                 | 0.04                 | 0.25                               | 4.52                                  |
| 27        | 0.44                 | 3.24                 | -0.3                 | 0.07                               | 3.17                                  |
| 53        | 0.44                 | 4.15                 | -0.22                | 0.11                               | 4.04                                  |
| 131       | 0.45                 | 4.57                 | -0.09                | 0.18                               | 4.39                                  |
| 209       | 0.5                  | 4.84                 | 0.01                 | 0.255                              | 4.585                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.45                 | 3.13                 | -0.29                | 0.08                               | 3.05                                  |
| 58        | 0.46                 | 4.12                 | -0.25                | 0.105                              | 4.015                                 |
| 131       | 0.49                 | 4.66                 | -0.11                | 0.19                               | 4.47                                  |
| 209       | 0.51                 | 4.88                 | 0                    | 0.255                              | 4.625                                 |
| 27        | 0.46                 | 3.12                 | -0.28                | 0.09                               | 3.03                                  |
| 53        | 0.47                 | 4.11                 | -0.24                | 0.115                              | 3.995                                 |
| 136       | 0.5                  | 4.74                 | -0.12                | 0.19                               | 4.55                                  |
| 209       | 0.57                 | 4.96                 | 0.01                 | 0.29                               | 4.67                                  |
| 27        | 0.45                 | 2.79                 | -0.3                 | 0.075                              | 2.715                                 |
| 53        | 0.47                 | 4.08                 | -0.27                | 0.1                                | 3.98                                  |
| 136       | 0.51                 | 4.74                 | -0.09                | 0.21                               | 4.53                                  |
| 209       | 0.57                 | 4.96                 | 0.01                 | 0.29                               | 4.67                                  |
| 27        | 0.49                 | 3.22                 | -0.35                | 0.07                               | 3.15                                  |
| 53        | 0.49                 | 4.2                  | -0.29                | 0.1                                | 4.1                                   |
| 131       | 0.54                 | 4.82                 | -0.19                | 0.175                              | 4.645                                 |
| 209       | 0.59                 | 5.02                 | -0.04                | 0.275                              | 4.745                                 |
| 27        | 0.49                 | 3.22                 | -0.35                | 0.07                               | 3.15                                  |
| 53        | 0.49                 | 4.2                  | -0.29                | 0.1                                | 4.1                                   |
| 131       | 0.54                 | 4.82                 | -0.19                | 0.175                              | 4.645                                 |
| 209       | 0.59                 | 5.02                 | -0.04                | 0.275                              | 4.745                                 |
| 235       | 0.55                 | 5.07                 | 0                    | 0.275                              | 4.795                                 |
| 261       | 0.61                 | 5.11                 | 0.05                 | 0.33                               | 4.78                                  |
| 287       | 0.64                 | 5.15                 | 0.09                 | 0.365                              | 4.785                                 |
| 313       | 0.7                  | 5.23                 | 0.11                 | 0.405                              | 4.825                                 |
| 340       | 0.72                 | 5.28                 | 0.16                 | 0.44                               | 4.84                                  |
| 366       | 0.77                 | 5.36                 | 0.23                 | 0.5                                | 4.86                                  |
| 392       | 0.79                 | 5.42                 | 0.27                 | 0.53                               | 4.89                                  |
| 418       | 0.82                 | 5.5                  | 0.32                 | 0.57                               | 4.93                                  |
| 444       | 0.88                 | 5.55                 | 0.32                 | 0.6                                | 4.795                                 |
| 470       | 0.89                 | 5.61                 | 0.32                 | 0.605                              | 4.78                                  |
| 496- N    | 0.9                  | 5.68                 | 0.32                 | 0.61                               | 4.785                                 |
| 522- C    | 0.91                 | 5.8                  | 0.34                 | 0.625                              | 4.825                                 |
| 527       | 0.96                 | 6.15                 | 0.35                 | 0.655                              | 4.84                                  |
| 517       | 1.02                 | 6.93                 | 0.62                 | 0.82                               | 4.86                                  |

**Table A.9.44: Test Panel Concrete Cube Strength (C30-30-1-ii)**

| Cast Date: 23-08-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 14-10-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.85        | 63            | 26.40                         | 2471                             |
| II                      | 153x153x153 | 8.85        | 89.2          | 37.38                         | 2471                             |
| III                     | 153x153x153 | 8.75        | 78            | 32.69                         | 2443                             |
| IV                      | 153x153x153 | 8.7         | 78            | 32.69                         | 2429                             |
| Mean                    |             |             |               | 32.29                         | 2454                             |

**Table A.9.45: CFST Concrete Cube Strength (C30-30-1-ii)**

| Cast Date: 31-05-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 14-10-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.5         | 83            | 34.78                         | 2373                             |
| II                      | 153x153x154 | 8.5         | 83            | 34.78                         | 2373                             |
| III                     | 153x153x154 | 8           | 83.6          | 35.03                         | 2234                             |
| IV                      | 153x153x153 | 8           | 83.6          | 35.03                         | 2234                             |
| Mean                    |             |             |               | 34.95                         | 2280                             |



**Table A.9.46: Sample 16 (C30-30-1-i)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | -0.08                | -1.85                | 0.52                 | 0.22                               | -2.07                                 |
| 53        | 0.05                 | 3.59                 | 0.8                  | 0.425                              | 3.165                                 |
| 79        | 0.26                 | 4.1                  | 0.98                 | 0.62                               | 3.48                                  |
| 105       | 0.61                 | 4.38                 | 1.04                 | 0.825                              | 3.555                                 |
| 131       | 0.91                 | 4.59                 | 1.13                 | 1.02                               | 3.57                                  |
| 157       | 0.95                 | 4.62                 | 1.13                 | 1.04                               | 3.58                                  |
| 183       | 1.04                 | 4.78                 | 1.13                 | 1.085                              | 3.695                                 |
| 209       | 1.29                 | 4.94                 | 1.13                 | 1.21                               | 3.73                                  |
| 27        | 0.65                 | 1.93                 | 0.17                 | 0.41                               | 1.52                                  |
| 53        | 0.36                 | 3.15                 | 0.17                 | 0.265                              | 2.885                                 |
| 79        | 0.33                 | 3.58                 | 0.17                 | 0.25                               | 3.33                                  |
| 105       | 0.38                 | 3.81                 | 0.3                  | 0.34                               | 3.47                                  |
| 131       | 0.47                 | 4.05                 | 0.48                 | 0.475                              | 3.575                                 |
| 157       | 0.59                 | 4.3                  | 0.6                  | 0.595                              | 3.705                                 |
| 183       | 0.78                 | 4.48                 | 0.7                  | 0.74                               | 3.74                                  |
| 209       | 0.95                 | 4.7                  | 0.71                 | 0.83                               | 3.87                                  |
| 32        | 0.62                 | 3.26                 | 0.39                 | 0.505                              | 2.755                                 |
| 53        | 0.62                 | 3.97                 | 0.49                 | 0.555                              | 3.415                                 |
| 79        | 0.72                 | 4.23                 | 0.53                 | 0.625                              | 3.605                                 |
| 105       | 0.81                 | 4.36                 | 0.59                 | 0.7                                | 3.66                                  |
| 131       | 0.89                 | 4.49                 | 0.62                 | 0.755                              | 3.735                                 |
| 209       | 1.18                 | 4.86                 | 0.71                 | 0.945                              | 3.915                                 |
| 32        | 0.81                 | 3.53                 | 0.36                 | 0.585                              | 2.945                                 |
| 53        | 0.83                 | 4.12                 | 0.41                 | 0.62                               | 3.5                                   |
| 131       | 1.17                 | 4.7                  | 0.52                 | 0.845                              | 3.855                                 |
| 209       | 1.35                 | 4.91                 | 0.64                 | 0.995                              | 3.915                                 |
| 12        | 0.28                 | 1.09                 | 0.38                 | 0.33                               | 0.76                                  |
| 53        | 0.23                 | 2.41                 | 0.5                  | 0.365                              | 2.045                                 |
| 131       | 0.15                 | 3.71                 | 0.61                 | 0.38                               | 3.33                                  |
| 209       | 0.54                 | 4.14                 | 0.55                 | 0.545                              | 3.595                                 |
| 27        | 0.04                 | 2.56                 | 0.24                 | 0.14                               | 2.42                                  |
| 53        | 0.06                 | 3.27                 | 0.3                  | 0.18                               | 3.09                                  |
| 131       | 0.44                 | 3.94                 | 0.35                 | 0.395                              | 3.545                                 |
| 209       | 0.64                 | 4.2                  | 0.37                 | 0.505                              | 3.695                                 |
| 27        | -0.32                | 2.63                 | 0.4                  | 0.04                               | 2.59                                  |
| 53        | -0.33                | 2.85                 | 0.54                 | 0.105                              | 2.745                                 |
| 131       | 0.05                 | 3.71                 | 0.68                 | 0.365                              | 3.345                                 |
| 215       | 0.46                 | 4.06                 | 0.7                  | 0.58                               | 3.48                                  |
| 27        | 0.32                 | 2.28                 | 0                    | 0.16                               | 2.12                                  |
| 53        | 0.42                 | 3.61                 | 0.08                 | 0.25                               | 3.36                                  |
| 131       | 0.6                  | 4.12                 | 0.18                 | 0.39                               | 3.73                                  |
| 209       | 0.84                 | 4.39                 | 0.32                 | 0.58                               | 3.81                                  |
| 27        | 0.69                 | 2.76                 | -0.29                | 0.2                                | 2.56                                  |
| 53        | 0.72                 | 3.58                 | -0.23                | 0.245                              | 3.335                                 |
| 131       | 0.85                 | 4.15                 | 0                    | 0.425                              | 3.725                                 |
| 209       | 0.97                 | 4.42                 | 0.18                 | 0.575                              | 3.845                                 |
| 27        | 0.38                 | 2.91                 | 0.26                 | 0.32                               | 2.59                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 53        | 0.36                 | 3.56                 | 0.36                 | 0.36                               | 3.2                                   |
| 131       | 0.65                 | 4.12                 | 0.44                 | 0.545                              | 3.575                                 |
| 209       | 0.8                  | 4.38                 | 0.58                 | 0.69                               | 3.69                                  |
| 27        | 0.48                 | 2.43                 | 0.13                 | 0.305                              | 2.125                                 |
| 53        | 0.55                 | 3.76                 | 0.28                 | 0.415                              | 3.345                                 |
| 131       | 0.78                 | 4.23                 | 0.42                 | 0.6                                | 3.63                                  |
| 209       | 0.88                 | 4.44                 | 0.54                 | 0.71                               | 3.73                                  |
| 27        | 0.17                 | 2.66                 | 0.43                 | 0.3                                | 2.36                                  |
| 53        | 0.14                 | 3.42                 | 0.55                 | 0.345                              | 3.075                                 |
| 131       | 0.61                 | 4.13                 | 0.61                 | 0.61                               | 3.52                                  |
| 209       | 0.73                 | 4.37                 | 0.65                 | 0.69                               | 3.68                                  |
| 22        | 0.59                 | 2.62                 | 0.04                 | 0.315                              | 2.305                                 |
| 53        | 0.66                 | 3.88                 | 0.16                 | 0.41                               | 3.47                                  |
| 131       | 0.85                 | 4.3                  | 0.25                 | 0.55                               | 3.75                                  |
| 215       | 0.98                 | 4.55                 | 0.35                 | 0.665                              | 3.885                                 |
| 27        | 0.42                 | 3.25                 | 0.16                 | 0.29                               | 2.96                                  |
| 53        | 0.68                 | 3.93                 | 0.25                 | 0.465                              | 3.465                                 |
| 131       | 0.82                 | 4.25                 | 0.32                 | 0.57                               | 3.68                                  |
| 209       | 0.96                 | 4.53                 | 0.47                 | 0.715                              | 3.815                                 |
| 27        | 0.67                 | 3.15                 | 0.07                 | 0.37                               | 2.78                                  |
| 53        | 0.73                 | 3.98                 | 0.15                 | 0.44                               | 3.54                                  |
| 131       | 0.91                 | 4.38                 | 0.25                 | 0.58                               | 3.8                                   |
| 209       | 1                    | 4.58                 | 0.34                 | 0.67                               | 3.91                                  |
| 27        | 0.74                 | 3.48                 | 0.08                 | 0.41                               | 3.07                                  |
| 53        | 0.74                 | 3.92                 | 0.14                 | 0.44                               | 3.48                                  |
| 131       | 0.92                 | 4.38                 | 0.25                 | 0.585                              | 3.795                                 |
| 209       | 1.01                 | 4.58                 | 0.34                 | 0.675                              | 3.905                                 |
| 27        | 0.73                 | 3.43                 | 0.12                 | 0.425                              | 3.005                                 |
| 53        | 0.77                 | 3.99                 | 0.15                 | 0.46                               | 3.53                                  |
| 131       | 0.92                 | 4.39                 | 0.26                 | 0.59                               | 3.8                                   |
| 209       | 1.01                 | 4.59                 | 0.37                 | 0.69                               | 3.9                                   |
| 27        | 0.79                 | 3.71                 | 0.11                 | 0.45                               | 3.26                                  |
| 53        | 0.8                  | 4.01                 | 0.16                 | 0.48                               | 3.53                                  |
| 131       | 0.94                 | 4.4                  | 0.27                 | 0.605                              | 3.795                                 |
| 209       | 1.01                 | 4.6                  | 0.4                  | 0.705                              | 3.895                                 |
| 27        | 0.79                 | 3.26                 | -0.05                | 0.37                               | 2.89                                  |
| 53        | 0.82                 | 4                    | 0.09                 | 0.455                              | 3.545                                 |
| 131       | 0.96                 | 4.39                 | 0.19                 | 0.575                              | 3.815                                 |
| 209       | 1.05                 | 4.6                  | 0.31                 | 0.68                               | 3.92                                  |
| 27        | 0.72                 | 3.46                 | 0.18                 | 0.45                               | 3.01                                  |
| 53        | 0.74                 | 3.95                 | 0.24                 | 0.49                               | 3.46                                  |
| 136       | 0.91                 | 4.4                  | 0.38                 | 0.645                              | 3.755                                 |
| 209       | 0.99                 | 4.58                 | 0.47                 | 0.73                               | 3.85                                  |
| 27        | 0.88                 | 3.54                 | -0.15                | 0.365                              | 3.175                                 |
| 53        | 0.88                 | 3.97                 | -0.05                | 0.415                              | 3.555                                 |
| 131       | 1                    | 4.4                  | 0.16                 | 0.58                               | 3.82                                  |
| 215       | 1.07                 | 4.62                 | 0.33                 | 0.7                                | 3.92                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.85                 | 3.62                 | 0                    | 0.425                              | 3.195                                 |
| 53        | 0.86                 | 4                    | 0.05                 | 0.455                              | 3.545                                 |
| 131       | 0.98                 | 4.4                  | 0.21                 | 0.595                              | 3.805                                 |
| 209       | 1.07                 | 4.62                 | 0.34                 | 0.705                              | 3.915                                 |
| 27        | 0.89                 | 3.4                  | -0.17                | 0.36                               | 3.04                                  |
| 53        | 0.91                 | 3.88                 | -0.09                | 0.41                               | 3.47                                  |
| 131       | 1.05                 | 4.35                 | 0.09                 | 0.57                               | 3.78                                  |
| 209       | 1.13                 | 4.59                 | 0.24                 | 0.685                              | 3.905                                 |
| 27        | 0.83                 | 3.24                 | 0.03                 | 0.43                               | 2.81                                  |
| 53        | 0.88                 | 4.03                 | 0.12                 | 0.5                                | 3.53                                  |
| 131       | 1                    | 4.42                 | 0.23                 | 0.615                              | 3.805                                 |
| 209       | 1.08                 | 4.62                 | 0.34                 | 0.71                               | 3.91                                  |
| 27        | 0.83                 | 3.52                 | 0.11                 | 0.47                               | 3.05                                  |
| 53        | 0.85                 | 4                    | 0.16                 | 0.505                              | 3.495                                 |
| 131       | 0.98                 | 4.44                 | 0.29                 | 0.635                              | 3.805                                 |
| 209       | 1.06                 | 4.62                 | 0.39                 | 0.725                              | 3.895                                 |
| 27        | 0.83                 | 3.52                 | 0.11                 | 0.47                               | 3.05                                  |
| 53        | 0.85                 | 4                    | 0.16                 | 0.505                              | 3.495                                 |
| 131       | 0.98                 | 4.44                 | 0.29                 | 0.635                              | 3.805                                 |
| 209       | 1.06                 | 4.62                 | 0.39                 | 0.725                              | 3.895                                 |
| 235       | 1.08                 | 4.67                 | 0.42                 | 0.75                               | 3.92                                  |
| 261       | 1.11                 | 4.74                 | 0.45                 | 0.78                               | 3.96                                  |
| 287       | 1.14                 | 4.8                  | 0.51                 | 0.825                              | 3.975                                 |
| 313       | 1.19                 | 4.87                 | 0.56                 | 0.875                              | 3.995                                 |
| 340       | 1.24                 | 4.96                 | 0.61                 | 0.925                              | 4.035                                 |
| 366       | 1.26                 | 5.1                  | 0.66                 | 0.96                               | 4.14                                  |
| 392       | 1.32                 | 5.3                  | 0.71                 | 1.015                              | 4.285                                 |
| 418- N,C  | 1.35                 | 5.55                 | 0.79                 | 1.07                               | 4.48                                  |
| 444       | 1.51                 | 6.1                  | 1.01                 | 1.26                               | 4.84                                  |

**Table A.9.47: Test Panel Concrete Cube Strength (C30-30-1-i)**

| Cast Date: 05-09-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 21-10-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.35        | 63            | 26.40                         | 2331                             |
| II                      | 153x153x153 | 8.35        | 60.6          | 25.40                         | 2331                             |
| III                     | 153x153x153 | 8.35        | 66            | 27.66                         | 2331                             |
| IV                      | 153x153x153 | 8.35        | 52            | 21.79                         | 2331                             |
| Mean                    |             |             |               | 25.31                         | 2331                             |

**Table A.9.48: CFST Concrete Cube Strength (C30-30-1-i)**

| Cast Date: 31-05-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 21-10-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.45        | 84            | 35.20                         | 2359                             |
| II                      | 153x153x154 | 8.45        | 84            | 35.20                         | 2359                             |
| III                     | 153x153x154 | 8.45        | 83            | 34.78                         | 2359                             |
| IV                      | 153x153x153 | 8.45        | 83            | 34.78                         | 2359                             |
| Mean                    |             |             |               | 34.92                         | 2359                             |



**Table A.9.49: Sample 17 (C30-30-2-i)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.12                 | 1.81                 | 0.16                 | 0.14                               | 1.67                                  |
| 53        | 0.14                 | 2.77                 | 0.24                 | 0.19                               | 2.58                                  |
| 84        | 0.22                 | 3.11                 | 0.33                 | 0.275                              | 2.835                                 |
| 105       | 0.23                 | 3.23                 | 0.38                 | 0.305                              | 2.925                                 |
| 131       | 0.25                 | 3.39                 | 0.46                 | 0.355                              | 3.035                                 |
| 157       | 0.28                 | 3.51                 | 0.5                  | 0.39                               | 3.12                                  |
| 183       | 0.31                 | 3.63                 | 0.55                 | 0.43                               | 3.2                                   |
| 209       | 0.36                 | 3.75                 | 0.59                 | 0.475                              | 3.275                                 |
| 27        | 0.35                 | 2.47                 | 0.32                 | 0.335                              | 2.135                                 |
| 53        | 0.36                 | 3.19                 | 0.37                 | 0.365                              | 2.825                                 |
| 79        | 0.37                 | 3.44                 | 0.42                 | 0.395                              | 3.045                                 |
| 105       | 0.38                 | 3.53                 | 0.44                 | 0.41                               | 3.12                                  |
| 131       | 0.38                 | 3.61                 | 0.47                 | 0.425                              | 3.185                                 |
| 157       | 0.39                 | 3.69                 | 0.51                 | 0.45                               | 3.24                                  |
| 183       | 0.4                  | 3.74                 | 0.54                 | 0.47                               | 3.27                                  |
| 209       | 0.42                 | 3.81                 | 0.57                 | 0.495                              | 3.315                                 |
| 27        | 0.41                 | 2.33                 | 0.33                 | 0.37                               | 1.96                                  |
| 53        | 0.42                 | 3.22                 | 0.38                 | 0.4                                | 2.82                                  |
| 136       | 0.45                 | 3.68                 | 0.49                 | 0.47                               | 3.21                                  |
| 209       | 0.49                 | 3.82                 | 0.55                 | 0.52                               | 3.3                                   |
| 27        | 0.39                 | 2.44                 | 0.35                 | 0.37                               | 2.07                                  |
| 53        | 0.4                  | 3.3                  | 0.4                  | 0.4                                | 2.9                                   |
| 131       | 0.46                 | 3.7                  | 0.48                 | 0.47                               | 3.23                                  |
| 209       | 0.51                 | 3.84                 | 0.55                 | 0.53                               | 3.31                                  |
| 27        | 0.35                 | 1.29                 | 0.33                 | 0.34                               | 0.95                                  |
| 53        | 0.36                 | 2.73                 | 0.36                 | 0.36                               | 2.37                                  |
| 131       | 0.46                 | 3.65                 | 0.46                 | 0.46                               | 3.19                                  |
| 209       | 0.51                 | 3.85                 | 0.54                 | 0.525                              | 3.325                                 |
| 27        | 0.45                 | 1.95                 | 0.33                 | 0.39                               | 1.56                                  |
| 53        | 0.46                 | 2.85                 | 0.35                 | 0.405                              | 2.445                                 |
| 136       | 0.56                 | 3.65                 | 0.46                 | 0.51                               | 3.14                                  |
| 209       | 0.63                 | 3.83                 | 0.53                 | 0.58                               | 3.25                                  |
| 27        | 0.49                 | 1.37                 | 0.29                 | 0.39                               | 0.98                                  |
| 53        | 0.5                  | 2.34                 | 0.34                 | 0.42                               | 1.92                                  |
| 131       | 0.63                 | 3.4                  | 0.38                 | 0.505                              | 2.895                                 |
| 220       | 0.7                  | 3.81                 | 0.49                 | 0.595                              | 3.215                                 |
| 27        | 0.49                 | 1.25                 | 0.29                 | 0.39                               | 0.86                                  |
| 53        | 0.52                 | 2.49                 | 0.35                 | 0.435                              | 2.055                                 |
| 131       | 0.47                 | 3.49                 | 0.4                  | 0.435                              | 3.055                                 |
| 209       | 0.7                  | 3.8                  | 0.49                 | 0.595                              | 3.205                                 |
| 27        | 0.52                 | 1.12                 | 0.3                  | 0.41                               | 0.71                                  |
| 53        | 0.55                 | 2.47                 | 0.32                 | 0.435                              | 2.035                                 |
| 131       | 0.68                 | 3.49                 | 0.39                 | 0.535                              | 2.955                                 |
| 209       | 0.72                 | 3.83                 | 0.5                  | 0.61                               | 3.22                                  |
| 27        | 0.51                 | 1.31                 | 0.37                 | 0.44                               | 0.87                                  |
| 53        | 0.51                 | 2.34                 | 0.4                  | 0.455                              | 1.885                                 |
| 131       | 0.59                 | 3.75                 | 0.52                 | 0.555                              | 3.195                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 0.65                 | 3.89                 | 0.56                 | 0.605                              | 3.285                                 |
| 27        | 0.54                 | 2.12                 | 0.37                 | 0.455                              | 1.665                                 |
| 53        | 0.56                 | 3.19                 | 0.34                 | 0.45                               | 2.74                                  |
| 131       | 0.45                 | 3.73                 | 0.48                 | 0.465                              | 3.265                                 |
| 209       | 0.68                 | 3.9                  | 0.55                 | 0.615                              | 3.285                                 |
| 32        | 0.55                 | 2.59                 | 0.38                 | 0.465                              | 2.125                                 |
| 53        | 0.57                 | 3.28                 | 0.36                 | 0.465                              | 2.815                                 |
| 131       | 0.63                 | 3.77                 | 0.52                 | 0.575                              | 3.195                                 |
| 209       | 0.65                 | 3.92                 | 0.58                 | 0.615                              | 3.305                                 |
| 27        | 0.44                 | 2.6                  | 0.4                  | 0.42                               | 2.18                                  |
| 53        | 0.44                 | 3.43                 | 0.44                 | 0.44                               | 2.99                                  |
| 131       | 0.46                 | 3.76                 | 0.53                 | 0.495                              | 3.265                                 |
| 209       | 0.53                 | 3.95                 | 0.6                  | 0.565                              | 3.385                                 |
| 27        | 0.52                 | 2.47                 | 0.36                 | 0.44                               | 2.03                                  |
| 53        | 0.53                 | 3.42                 | 0.43                 | 0.48                               | 2.94                                  |
| 131       | 0.58                 | 3.8                  | 0.53                 | 0.555                              | 3.245                                 |
| 220       | 0.61                 | 3.96                 | 0.59                 | 0.6                                | 3.36                                  |
| 27        | 0.55                 | 2.4                  | 0.36                 | 0.455                              | 1.945                                 |
| 53        | 0.57                 | 3.29                 | 0.37                 | 0.47                               | 2.82                                  |
| 142       | 0.64                 | 3.8                  | 0.54                 | 0.59                               | 3.21                                  |
| 209       | 0.67                 | 3.95                 | 0.59                 | 0.63                               | 3.32                                  |
| 22        | 0.54                 | 1.95                 | 0.37                 | 0.455                              | 1.495                                 |
| 53        | 0.59                 | 3.17                 | 0.36                 | 0.475                              | 2.695                                 |
| 131       | 0.66                 | 3.73                 | 0.49                 | 0.575                              | 3.155                                 |
| 215       | 0.7                  | 3.94                 | 0.58                 | 0.64                               | 3.3                                   |
| 27        | 0.57                 | 1.99                 | 0.37                 | 0.47                               | 1.52                                  |
| 53        | 0.59                 | 2.85                 | 0.36                 | 0.475                              | 2.375                                 |
| 131       | 0.7                  | 3.67                 | 0.45                 | 0.575                              | 3.095                                 |
| 209       | 0.73                 | 3.9                  | 0.53                 | 0.63                               | 3.27                                  |
| 27        | 0.58                 | 2.07                 | 0.36                 | 0.47                               | 1.6                                   |
| 53        | 0.59                 | 2.84                 | 0.35                 | 0.47                               | 2.37                                  |
| 131       | 0.71                 | 3.6                  | 0.44                 | 0.575                              | 3.025                                 |
| 215       | 0.76                 | 3.88                 | 0.51                 | 0.635                              | 3.245                                 |
| 27        | 0.59                 | 0.75                 | 0.35                 | 0.47                               | 0.28                                  |
| 53        | 0.59                 | 2.93                 | 0.36                 | 0.475                              | 2.455                                 |
| 131       | 0.63                 | 3.8                  | 0.52                 | 0.575                              | 3.225                                 |
| 209       | 0.67                 | 3.95                 | 0.59                 | 0.63                               | 3.32                                  |
| 27        | 0.54                 | 2.62                 | 0.39                 | 0.465                              | 2.155                                 |
| 53        | 0.54                 | 3.48                 | 0.46                 | 0.5                                | 2.98                                  |
| 142       | 0.58                 | 3.85                 | 0.54                 | 0.56                               | 3.29                                  |
| 209       | 0.6                  | 3.97                 | 0.58                 | 0.59                               | 3.38                                  |
| 27        | 0.56                 | 2.36                 | 0.37                 | 0.465                              | 1.895                                 |
| 53        | 0.59                 | 3.16                 | 0.39                 | 0.49                               | 2.67                                  |
| 131       | 0.66                 | 3.76                 | 0.5                  | 0.58                               | 3.18                                  |
| 215       | 0.69                 | 3.95                 | 0.58                 | 0.635                              | 3.315                                 |
| 27        | 0.62                 | 2.09                 | 0.4                  | 0.51                               | 1.58                                  |
| 53        | 0.6                  | 2.95                 | 0.37                 | 0.485                              | 2.465                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 136       | 0.7                  | 3.71                 | 0.47                 | 0.585                              | 3.125                                 |
| 209       | 0.72                 | 3.94                 | 0.57                 | 0.645                              | 3.295                                 |
| 22        | 0.52                 | 2.45                 | 0.4                  | 0.46                               | 1.99                                  |
| 53        | 0.52                 | 3.49                 | 0.45                 | 0.485                              | 3.005                                 |
| 131       | 0.55                 | 3.84                 | 0.52                 | 0.535                              | 3.305                                 |
| 209       | 0.6                  | 4                    | 0.58                 | 0.59                               | 3.41                                  |
| 22        | 0.49                 | 2.46                 | 0.43                 | 0.46                               | 2                                     |
| 53        | 0.49                 | 3.44                 | 0.44                 | 0.465                              | 2.975                                 |
| 136       | 0.54                 | 3.85                 | 0.53                 | 0.535                              | 3.315                                 |
| 209       | 0.57                 | 3.99                 | 0.58                 | 0.575                              | 3.415                                 |
| 27        | 0.53                 | 2.78                 | 0.43                 | 0.48                               | 2.3                                   |
| 53        | 0.53                 | 3.49                 | 0.46                 | 0.495                              | 2.995                                 |
| 131       | 0.59                 | 3.85                 | 0.53                 | 0.56                               | 3.29                                  |
| 209       | 0.59                 | 4                    | 0.58                 | 0.585                              | 3.415                                 |
| 27        | 0.53                 | 2.78                 | 0.43                 | 0.48                               | 2.3                                   |
| 53        | 0.53                 | 3.49                 | 0.46                 | 0.495                              | 2.995                                 |
| 131       | 0.59                 | 3.85                 | 0.53                 | 0.56                               | 3.29                                  |
| 209       | 0.59                 | 4                    | 0.58                 | 0.585                              | 3.415                                 |
| 235       | 0.61                 | 4.04                 | 0.6                  | 0.605                              | 3.435                                 |
| 261       | 0.62                 | 4.07                 | 0.62                 | 0.62                               | 3.45                                  |
| 287       | 0.63                 | 4.12                 | 0.65                 | 0.64                               | 3.48                                  |
| 313       | 0.65                 | 4.17                 | 0.67                 | 0.66                               | 3.51                                  |
| 340       | 0.66                 | 4.22                 | 0.7                  | 0.68                               | 3.54                                  |
| 366       | 0.68                 | 4.26                 | 0.72                 | 0.7                                | 3.56                                  |
| 392       | 0.7                  | 4.3                  | 0.75                 | 0.725                              | 3.575                                 |
| 418       | 0.72                 | 4.34                 | 0.78                 | 0.75                               | 3.59                                  |
| 444       | 0.74                 | 4.39                 | 0.82                 | 0.78                               | 3.61                                  |
| 470       | 0.75                 | 4.42                 | 0.84                 | 0.795                              | 3.625                                 |
| 496       | 0.77                 | 4.48                 | 0.87                 | 0.82                               | 3.66                                  |
| 522       | 0.8                  | 4.54                 | 0.9                  | 0.85                               | 3.69                                  |
| 532       | 0.83                 | 4.58                 | 0.92                 | 0.875                              | 3.705                                 |
| 543       | 0.84                 | 4.61                 | 0.93                 | 0.885                              | 3.725                                 |
| 558       | 0.86                 | 4.65                 | 0.94                 | 0.9                                | 3.75                                  |
| 574       | 0.88                 | 4.69                 | 0.96                 | 0.92                               | 3.77                                  |
| 589       | 0.9                  | 4.74                 | 0.97                 | 0.935                              | 3.805                                 |
| 605- N    | 0.91                 | 4.78                 | 0.99                 | 0.95                               | 3.83                                  |
| 626       | 0.93                 | 4.84                 | 1.01                 | 0.97                               | 3.87                                  |
| 636       | 0.93                 | 4.9                  | 1.02                 | 0.975                              | 3.925                                 |
| 652       | 0.93                 | 4.96                 | 1.04                 | 0.985                              | 3.975                                 |
| 668       | 0.93                 | 5.02                 | 1.06                 | 0.995                              | 4.025                                 |
| 678       | 0.95                 | 5.1                  | 1.09                 | 1.02                               | 4.08                                  |
| 688- C    | 0.95                 | 5.12                 | 1.12                 | 1.035                              | 4.085                                 |
| 709       | 1                    | 5.3                  | 1.17                 | 1.085                              | 4.215                                 |
| 720       | 1                    | 5.37                 | 1.2                  | 1.1                                | 4.27                                  |
| 730       | 1                    | 5.49                 | 1.25                 | 1.125                              | 4.365                                 |
| 740       | 1.02                 | 5.7                  | 1.27                 | 1.145                              | 4.555                                 |
| 746       | 1.02                 | 6.08                 | 1.27                 | 1.145                              | 4.935                                 |

**Table A.9.50: Test Panel Concrete Cube Strength (C30-30-2-i)**

| Cast Date: 12-09-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 25-10-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.55        | 82            | 34.36                         | 2387                             |
| II                      | 153x153x153 | 8.45        | 79            | 33.11                         | 2359                             |
| III                     | 153x153x153 | 8.45        | 79.4          | 33.27                         | 2359                             |
| IV                      | 153x153x153 | 8.5         | 85.8          | 35.96                         | 2373                             |
| Mean                    |             |             |               | 34.18                         | 2370                             |

**Table A.9.51: CFST Concrete Cube Strength (C30-30-2-i)**

| Cast Date: 27-07-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 25-10-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.55        | 97.8          | 40.99                         | 2387                             |
| II                      | 153x153x154 | 8.7         | 95.6          | 40.06                         | 2429                             |
| III                     | 153x153x154 | 8.55        | 97.8          | 40.99                         | 2387                             |
| IV                      | 153x153x153 | 8.4         | 100           | 41.91                         | 2345                             |
| Mean                    |             |             |               | 40.99                         | 2387                             |



**Table A.9.52: Sample 18 (C30-30-2-ii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.11                 | 1.93                 | 0.16                 | 0.135                              | 1.795                                 |
| 53        | 0.21                 | 2.88                 | 0.27                 | 0.24                               | 2.64                                  |
| 79        | 0.29                 | 3.28                 | 0.36                 | 0.325                              | 2.955                                 |
| 105       | 0.34                 | 3.55                 | 0.42                 | 0.38                               | 3.17                                  |
| 131       | 0.39                 | 3.81                 | 0.46                 | 0.425                              | 3.385                                 |
| 157       | 0.41                 | 4.1                  | 0.56                 | 0.485                              | 3.615                                 |
| 183       | 0.45                 | 4.22                 | 0.6                  | 0.525                              | 3.695                                 |
| 209       | 0.5                  | 4.33                 | 0.65                 | 0.575                              | 3.755                                 |
| 27        | 0.33                 | 2.2                  | 0.47                 | 0.4                                | 1.8                                   |
| 53        | 0.37                 | 2.97                 | 0.46                 | 0.415                              | 2.555                                 |
| 79        | 0.42                 | 3.35                 | 0.5                  | 0.46                               | 2.89                                  |
| 105       | 0.45                 | 3.66                 | 0.56                 | 0.505                              | 3.155                                 |
| 131       | 0.48                 | 3.88                 | 0.57                 | 0.525                              | 3.355                                 |
| 157       | 0.52                 | 4.06                 | 0.63                 | 0.575                              | 3.485                                 |
| 183       | 0.55                 | 4.2                  | 0.67                 | 0.61                               | 3.59                                  |
| 209       | 0.69                 | 4.31                 | 0.73                 | 0.71                               | 3.6                                   |
| 27        | 0.37                 | 2.3                  | 0.5                  | 0.435                              | 1.865                                 |
| 53        | 0.41                 | 3.04                 | 0.53                 | 0.47                               | 2.57                                  |
| 131       | 0.53                 | 3.73                 | 0.65                 | 0.59                               | 3.14                                  |
| 209       | 0.62                 | 4.15                 | 0.69                 | 0.655                              | 3.495                                 |
| 27        | 0.43                 | 2.17                 | 0.6                  | 0.515                              | 1.655                                 |
| 53        | 0.45                 | 2.98                 | 0.6                  | 0.525                              | 2.455                                 |
| 147       | 0.55                 | 3.16                 | 0.78                 | 0.665                              | 2.495                                 |
| 209       | 0.59                 | 3.47                 | 0.83                 | 0.71                               | 2.76                                  |
| 27        | 0.38                 | 1.78                 | 0.69                 | 0.535                              | 1.245                                 |
| 53        | 0.38                 | 2.43                 | 0.73                 | 0.555                              | 1.875                                 |
| 131       | 0.44                 | 3.2                  | 0.82                 | 0.63                               | 2.57                                  |
| 209       | 0.49                 | 3.47                 | 0.89                 | 0.69                               | 2.78                                  |
| 27        | 0.28                 | 1.7                  | 0.72                 | 0.5                                | 1.2                                   |
| 53        | 0.31                 | 2.49                 | 0.74                 | 0.525                              | 1.965                                 |
| 131       | 0.38                 | 3.3                  | 0.88                 | 0.63                               | 2.67                                  |
| 209       | 0.45                 | 3.54                 | 0.95                 | 0.7                                | 2.84                                  |
| 27        | 0.19                 | 1.44                 | 0.83                 | 0.51                               | 0.93                                  |
| 53        | 0.18                 | 2.21                 | 0.85                 | 0.515                              | 1.695                                 |
| 131       | 0.28                 | 3.16                 | 0.92                 | 0.6                                | 2.56                                  |
| 209       | 0.37                 | 3.52                 | 1                    | 0.685                              | 2.835                                 |
| 27        | 0.26                 | 1.85                 | 0.82                 | 0.54                               | 1.31                                  |
| 53        | 0.26                 | 2.56                 | 0.85                 | 0.555                              | 2.005                                 |
| 131       | 0.36                 | 3.34                 | 0.92                 | 0.64                               | 2.7                                   |
| 215       | 0.43                 | 3.58                 | 1                    | 0.715                              | 2.865                                 |
| 32        | 0.07                 | 1.02                 | 1.01                 | 0.54                               | 0.48                                  |
| 53        | 0.09                 | 2.21                 | 1.03                 | 0.56                               | 1.65                                  |
| 131       | 0.26                 | 3.2                  | 1.01                 | 0.635                              | 2.565                                 |
| 209       | 0.36                 | 3.51                 | 1.05                 | 0.705                              | 2.805                                 |
| 27        | 0.17                 | 1.16                 | 0.91                 | 0.54                               | 0.62                                  |
| 53        | 0.22                 | 2.46                 | 0.88                 | 0.55                               | 1.91                                  |
| 136       | 0.34                 | 3.3                  | 0.98                 | 0.66                               | 2.64                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 0.41                 | 3.55                 | 1.05                 | 0.73                               | 2.82                                  |
| 27        | 0.19                 | 1.54                 | 0.96                 | 0.575                              | 0.965                                 |
| 58        | 0.17                 | 2.45                 | 1.03                 | 0.6                                | 1.85                                  |
| 131       | 0.24                 | 3.1                  | 1.12                 | 0.68                               | 2.42                                  |
| 209       | 0.33                 | 3.44                 | 1.14                 | 0.735                              | 2.705                                 |
| 27        | 0.05                 | 0.77                 | 0.26                 | 0.155                              | 0.615                                 |
| 53        | 0.04                 | 2.03                 | 0.34                 | 0.19                               | 1.84                                  |
| 131       | 0.13                 | 2.94                 | 0.4                  | 0.265                              | 2.675                                 |
| 209       | 0.3                  | 3.43                 | 0.2                  | 0.25                               | 3.18                                  |
| 1         | 0                    | 0                    | 0                    | 0                                  | 0                                     |
| 27        | 0.03                 | 2.03                 | 0.15                 | 0.09                               | 1.94                                  |
| 53        | 0.1                  | 3.51                 | 0.17                 | 0.135                              | 3.375                                 |
| 131       | 0.38                 | 4.67                 | 0.26                 | 0.32                               | 4.35                                  |
| 209       | 0.48                 | 5                    | 0.26                 | 0.37                               | 4.63                                  |
| 32        | 0.38                 | 3.28                 | 0.03                 | 0.205                              | 3.075                                 |
| 53        | 0.4                  | 4.06                 | 0.05                 | 0.225                              | 3.835                                 |
| 131       | 0.52                 | 4.9                  | 0.11                 | 0.315                              | 4.585                                 |
| 220       | 0.61                 | 5.19                 | 0.17                 | 0.39                               | 4.8                                   |
| 27        | 0.39                 | 3.15                 | 0.02                 | 0.205                              | 2.945                                 |
| 53        | 0.42                 | 4.08                 | 0.05                 | 0.235                              | 3.845                                 |
| 131       | 0.53                 | 4.88                 | 0.1                  | 0.315                              | 4.565                                 |
| 209       | 0.59                 | 5.16                 | 0.2                  | 0.395                              | 4.765                                 |
| 27        | 0.38                 | 3                    | 0                    | 0.19                               | 2.81                                  |
| 53        | 0.41                 | 4.02                 | 0.08                 | 0.245                              | 3.775                                 |
| 131       | 0.53                 | 4.88                 | 0.12                 | 0.325                              | 4.555                                 |
| 209       | 0.63                 | 5.2                  | 0.17                 | 0.4                                | 4.8                                   |
| 22        | 0.21                 | 2.26                 | 0.16                 | 0.185                              | 2.075                                 |
| 53        | 0.3                  | 3.86                 | 0.18                 | 0.24                               | 3.62                                  |
| 131       | 0.48                 | 4.21                 | 0.21                 | 0.345                              | 3.865                                 |
| 225       | 0.6                  | 5.17                 | 0.23                 | 0.415                              | 4.755                                 |
| 27        | 0.24                 | 2.59                 | 0.14                 | 0.19                               | 2.4                                   |
| 53        | 0.3                  | 3.82                 | 0.2                  | 0.25                               | 3.57                                  |
| 131       | 0.46                 | 4.76                 | 0.25                 | 0.355                              | 4.405                                 |
| 209       | 0.55                 | 5.08                 | 0.28                 | 0.415                              | 4.665                                 |
| 27        | 0.43                 | 3.45                 | 0.04                 | 0.235                              | 3.215                                 |
| 53        | 0.47                 | 4.12                 | 0.04                 | 0.255                              | 3.865                                 |
| 131       | 0.57                 | 4.97                 | 0.14                 | 0.355                              | 4.615                                 |
| 220       | 0.63                 | 5.22                 | 0.21                 | 0.42                               | 4.8                                   |
| 27        | 0.4                  | 3.19                 | 0.05                 | 0.225                              | 2.965                                 |
| 53        | 0.43                 | 4.13                 | 0.06                 | 0.245                              | 3.885                                 |
| 131       | 0.54                 | 4.91                 | 0.15                 | 0.345                              | 4.565                                 |
| 209       | 0.62                 | 5.19                 | 0.21                 | 0.415                              | 4.775                                 |
| 27        | 0.51                 | 3.5                  | -0.09                | 0.21                               | 3.29                                  |
| 58        | 0.52                 | 4.25                 | 0                    | 0.26                               | 3.99                                  |
| 131       | 0.58                 | 4.95                 | 0.11                 | 0.345                              | 4.605                                 |
| 209       | 0.65                 | 5.23                 | 0.17                 | 0.41                               | 4.82                                  |
| 27        | 0.14                 | 2.16                 | 0.21                 | 0.175                              | 1.985                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 53        | 0.13                 | 3.02                 | 0.26                 | 0.195                              | 2.825                                 |
| 136       | 0.18                 | 4.3                  | 0.41                 | 0.295                              | 4.005                                 |
| 209       | 0.29                 | 4.86                 | 0.44                 | 0.365                              | 4.495                                 |
| 27        | 0.23                 | 3.23                 | 0.19                 | 0.21                               | 3.02                                  |
| 53        | 0.28                 | 4                    | 0.22                 | 0.25                               | 3.75                                  |
| 131       | 0.48                 | 4.79                 | 0.27                 | 0.375                              | 4.415                                 |
| 209       | 0.58                 | 5.11                 | 0.32                 | 0.45                               | 4.66                                  |
| 27        | 0.41                 | 3.28                 | 0.09                 | 0.25                               | 3.03                                  |
| 53        | 0.46                 | 4.12                 | 0.09                 | 0.275                              | 3.845                                 |
| 131       | 0.57                 | 4.95                 | 0.15                 | 0.36                               | 4.59                                  |
| 215       | 0.66                 | 5.24                 | 0.21                 | 0.435                              | 4.805                                 |
| 27        | 0.48                 | 3.63                 | 0.04                 | 0.26                               | 3.37                                  |
| 53        | 0.49                 | 4.2                  | 0.08                 | 0.285                              | 3.915                                 |
| 131       | 0.58                 | 4.96                 | 0.16                 | 0.37                               | 4.59                                  |
| 209       | 0.65                 | 5.21                 | 0.23                 | 0.44                               | 4.77                                  |
| 27        | 0.48                 | 3.63                 | 0.04                 | 0.26                               | 3.37                                  |
| 53        | 0.49                 | 4.2                  | 0.08                 | 0.285                              | 3.915                                 |
| 131       | 0.58                 | 4.96                 | 0.16                 | 0.37                               | 4.59                                  |
| 209       | 0.65                 | 5.21                 | 0.23                 | 0.44                               | 4.77                                  |
| 241       | 0.65                 | 5.24                 | 0.25                 | 0.45                               | 4.79                                  |
| 261       | 0.67                 | 5.29                 | 0.28                 | 0.475                              | 4.815                                 |
| 287       | 0.7                  | 5.34                 | 0.3                  | 0.5                                | 4.84                                  |
| 313       | 0.72                 | 5.4                  | 0.32                 | 0.52                               | 4.88                                  |
| 340       | 0.75                 | 5.49                 | 0.35                 | 0.55                               | 4.94                                  |
| 366       | 0.8                  | 5.56                 | 0.37                 | 0.585                              | 4.975                                 |
| 392       | 0.81                 | 5.6                  | 0.4                  | 0.605                              | 4.995                                 |
| 418       | 0.87                 | 5.69                 | 0.42                 | 0.645                              | 5.045                                 |
| 444       | 0.9                  | 5.75                 | 0.43                 | 0.665                              | 5.085                                 |
| 470       | 0.95                 | 5.83                 | 0.45                 | 0.7                                | 5.13                                  |
| 496       | 1                    | 5.89                 | 0.46                 | 0.73                               | 5.16                                  |
| 522       | 1.04                 | 5.97                 | 0.48                 | 0.76                               | 5.21                                  |
| 532       | 1.06                 | 6.01                 | 0.49                 | 0.775                              | 5.235                                 |
| 548       | 1.09                 | 6.06                 | 0.51                 | 0.8                                | 5.26                                  |
| 574       | 1.13                 | 6.12                 | 0.52                 | 0.825                              | 5.295                                 |
| 584       | 1.16                 | 6.18                 | 0.54                 | 0.85                               | 5.33                                  |
| 600       | 1.19                 | 6.21                 | 0.56                 | 0.875                              | 5.335                                 |
| 615       | 1.22                 | 6.26                 | 0.57                 | 0.895                              | 5.365                                 |
| 626       | 1.24                 | 6.31                 | 0.58                 | 0.91                               | 5.4                                   |
| 636       | 1.27                 | 6.38                 | 0.58                 | 0.925                              | 5.455                                 |
| 652- N    | 1.29                 | 6.41                 | 0.58                 | 0.935                              | 5.475                                 |
| 668       | 1.3                  | 6.49                 | 0.59                 | 0.945                              | 5.545                                 |
| 678- C    | 1.32                 | 6.53                 | 0.6                  | 0.96                               | 5.57                                  |
| 688       | 1.35                 | 6.62                 | 0.6                  | 0.975                              | 5.645                                 |
| 699       | 1.35                 | 6.64                 | 0.61                 | 0.98                               | 5.66                                  |
| 709       | 1.37                 | 6.67                 | 0.61                 | 0.99                               | 5.68                                  |
| 720       | 1.38                 | 6.71                 | 0.62                 | 1                                  | 5.71                                  |
| 730       | 1.4                  | 6.78                 | 0.63                 | 1.015                              | 5.765                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 740       | 1.4                  | 6.83                 | 0.64                 | 1.02                               | 5.81                                  |
| 751       | 1.41                 | 6.88                 | 0.64                 | 1.025                              | 5.855                                 |
| 761       | 1.42                 | 6.93                 | 0.65                 | 1.035                              | 5.895                                 |
| 772       | 1.43                 | 7                    | 0.67                 | 1.05                               | 5.95                                  |
| 782       | 1.43                 | 7.09                 | 0.69                 | 1.06                               | 6.03                                  |
| 787       | 1.43                 | 7.22                 | 0.71                 | 1.07                               | 6.15                                  |
| 798       | 1.43                 | 7.36                 | 0.73                 | 1.08                               | 6.28                                  |
| 808       | 1.46                 | 7.54                 | 0.77                 | 1.115                              | 6.425                                 |

**Table A.9.53: Test Panel Concrete Cube Strength (C30-30-2-ii)**

| Cast Date: 13-09-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 02-11-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.55        | 93.8          | 39.31                         | 2387                             |
| II                      | 153x153x153 | 8.6         | 90.4          | 37.88                         | 2401                             |
| III                     | 153x153x153 | 8.6         | 91.8          | 38.47                         | 2401                             |
| IV                      | 153x153x153 | 8.6         | 85.8          | 35.96                         | 2401                             |
| Mean                    |             |             |               | 37.90                         | 2398                             |

**Table A.9.54: CFST Concrete Cube Strength (C30-30-2-ii)**

| Cast Date: 27-07-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 02-11-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.55        | 97.8          | 40.99                         | 2387                             |
| II                      | 153x153x154 | 8.7         | 95.6          | 40.06                         | 2429                             |
| III                     | 153x153x154 | 8.55        | 97.8          | 40.99                         | 2387                             |
| IV                      | 153x153x153 | 8.4         | 100           | 41.91                         | 2345                             |
| Mean                    |             |             |               | 40.99                         | 2387                             |

**Table A.9.55: Sample 19 (C30-30-2-iii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.1                  | 0.18                 | 0.1                  | 0.1                                | 0.08                                  |
| 53        | 0.22                 | 0.37                 | 0.25                 | 0.235                              | 0.135                                 |
| 79        | 0.28                 | 0.47                 | 0.31                 | 0.295                              | 0.175                                 |
| 105       | 0.33                 | 0.6                  | 0.41                 | 0.37                               | 0.23                                  |
| 131       | 0.34                 | 0.79                 | 0.46                 | 0.4                                | 0.39                                  |
| 157       | 0.49                 | 0.96                 | 0.54                 | 0.515                              | 0.445                                 |
| 183       | 0.45                 | 1.15                 | 0.6                  | 0.525                              | 0.625                                 |
| 209       | 0.52                 | 1.36                 | 0.68                 | 0.6                                | 0.76                                  |
| 17        | 0.32                 | 0.85                 | 0.43                 | 0.375                              | 0.475                                 |
| 53        | 0.31                 | 0.86                 | 0.46                 | 0.385                              | 0.475                                 |
| 79        | 0.32                 | 0.98                 | 0.52                 | 0.42                               | 0.56                                  |
| 105       | 0.36                 | 1.09                 | 0.55                 | 0.455                              | 0.635                                 |
| 131       | 0.4                  | 1.18                 | 0.58                 | 0.49                               | 0.69                                  |
| 157       | 0.44                 | 1.27                 | 0.61                 | 0.525                              | 0.745                                 |
| 183       | 0.48                 | 1.35                 | 0.65                 | 0.565                              | 0.785                                 |
| 209       | 0.51                 | 1.44                 | 0.71                 | 0.61                               | 0.83                                  |
| 1         | 0.18                 | 0.57                 | 0.3                  | 0.24                               | 0.33                                  |
| 27        | 0.21                 | 0.75                 | 0.44                 | 0.325                              | 0.425                                 |
| 53        | 0.23                 | 0.91                 | 0.48                 | 0.355                              | 0.555                                 |
| 131       | 0.38                 | 1.24                 | 0.63                 | 0.505                              | 0.735                                 |
| 209       | 0.49                 | 1.5                  | 0.73                 | 0.61                               | 0.89                                  |
| 17        | 0.32                 | 0.86                 | 0.47                 | 0.395                              | 0.465                                 |
| 53        | 0.32                 | 0.97                 | 0.54                 | 0.43                               | 0.54                                  |
| 131       | 0.39                 | 1.3                  | 0.65                 | 0.52                               | 0.78                                  |
| 209       | 0.49                 | 1.54                 | 0.75                 | 0.62                               | 0.92                                  |
| 32        | 0.36                 | 0.99                 | 0.6                  | 0.48                               | 0.51                                  |
| 53        | 0.36                 | 1.04                 | 0.57                 | 0.465                              | 0.575                                 |
| 131       | 0.39                 | 1.34                 | 0.66                 | 0.525                              | 0.815                                 |
| 209       | 0.48                 | 1.56                 | 0.75                 | 0.615                              | 0.945                                 |
| 27        | 0.35                 | 0.99                 | 0.55                 | 0.45                               | 0.54                                  |
| 53        | 0.35                 | 1.04                 | 0.57                 | 0.46                               | 0.58                                  |
| 131       | 0.39                 | 1.37                 | 0.67                 | 0.53                               | 0.84                                  |
| 209       | 0.48                 | 1.57                 | 0.75                 | 0.615                              | 0.955                                 |
| 32        | 0.38                 | 1.06                 | 0.6                  | 0.49                               | 0.57                                  |
| 53        | 0.38                 | 1.08                 | 0.6                  | 0.49                               | 0.59                                  |
| 131       | 0.4                  | 1.39                 | 0.69                 | 0.545                              | 0.845                                 |
| 209       | 0.48                 | 1.59                 | 0.76                 | 0.62                               | 0.97                                  |
| 12        | 0.34                 | 0.91                 | 0.5                  | 0.42                               | 0.49                                  |
| 53        | 0.34                 | 1.08                 | 0.58                 | 0.46                               | 0.62                                  |
| 131       | 0.4                  | 1.39                 | 0.68                 | 0.54                               | 0.85                                  |
| 209       | 0.48                 | 1.61                 | 0.78                 | 0.63                               | 0.98                                  |
| 32        | 0.38                 | 1.07                 | 0.62                 | 0.5                                | 0.57                                  |
| 53        | 0.38                 | 1.09                 | 0.6                  | 0.49                               | 0.6                                   |
| 131       | 0.4                  | 1.41                 | 0.69                 | 0.545                              | 0.865                                 |
| 209       | 0.48                 | 1.62                 | 0.77                 | 0.625                              | 0.995                                 |
| 27        | 0.37                 | 1.07                 | 0.59                 | 0.48                               | 0.59                                  |
| 53        | 0.37                 | 1.09                 | 0.6                  | 0.485                              | 0.605                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 0.4                  | 1.44                 | 0.72                 | 0.56                               | 0.88                                  |
| 209       | 0.48                 | 1.64                 | 0.78                 | 0.63                               | 1.01                                  |
| 27        | 0.38                 | 1.11                 | 0.61                 | 0.495                              | 0.615                                 |
| 53        | 0.38                 | 1.12                 | 0.62                 | 0.5                                | 0.62                                  |
| 131       | 0.4                  | 1.44                 | 0.72                 | 0.56                               | 0.88                                  |
| 209       | 0.48                 | 1.64                 | 0.79                 | 0.635                              | 1.005                                 |
| 27        | 0.39                 | 1.12                 | 0.62                 | 0.505                              | 0.615                                 |
| 53        | 0.39                 | 1.13                 | 0.62                 | 0.505                              | 0.625                                 |
| 131       | 0.4                  | 1.45                 | 0.73                 | 0.565                              | 0.885                                 |
| 209       | 0.48                 | 1.65                 | 0.79                 | 0.635                              | 1.015                                 |
| 22        | 0.37                 | 1.06                 | 0.58                 | 0.475                              | 0.585                                 |
| 53        | 0.37                 | 1.12                 | 0.61                 | 0.49                               | 0.63                                  |
| 131       | 0.4                  | 1.46                 | 0.73                 | 0.565                              | 0.895                                 |
| 209       | 0.48                 | 1.67                 | 0.8                  | 0.64                               | 1.03                                  |
| 27        | 0.38                 | 1.11                 | 0.61                 | 0.495                              | 0.615                                 |
| 53        | 0.38                 | 1.14                 | 0.63                 | 0.505                              | 0.635                                 |
| 131       | 0.41                 | 1.48                 | 0.75                 | 0.58                               | 0.9                                   |
| 209       | 0.48                 | 1.68                 | 0.81                 | 0.645                              | 1.035                                 |
| 22        | 0.38                 | 1.09                 | 0.59                 | 0.485                              | 0.605                                 |
| 53        | 0.38                 | 1.13                 | 0.63                 | 0.505                              | 0.625                                 |
| 131       | 0.4                  | 1.48                 | 0.74                 | 0.57                               | 0.91                                  |
| 209       | 0.48                 | 1.69                 | 0.81                 | 0.645                              | 1.045                                 |
| 27        | 0.38                 | 1.12                 | 0.63                 | 0.505                              | 0.615                                 |
| 53        | 0.38                 | 1.15                 | 0.64                 | 0.51                               | 0.64                                  |
| 131       | 0.4                  | 1.49                 | 0.75                 | 0.575                              | 0.915                                 |
| 209       | 0.48                 | 1.69                 | 0.82                 | 0.65                               | 1.04                                  |
| 22        | 0.38                 | 1.1                  | 0.61                 | 0.495                              | 0.605                                 |
| 53        | 0.38                 | 1.16                 | 0.64                 | 0.51                               | 0.65                                  |
| 131       | 0.41                 | 1.5                  | 0.76                 | 0.585                              | 0.915                                 |
| 209       | 0.48                 | 1.69                 | 0.82                 | 0.65                               | 1.04                                  |
| 27        | 0.38                 | 1.08                 | 0.62                 | 0.5                                | 0.58                                  |
| 53        | 0.38                 | 1.06                 | 0.64                 | 0.51                               | 0.55                                  |
| 131       | 0.41                 | 1.51                 | 0.75                 | 0.58                               | 0.93                                  |
| 209       | 0.48                 | 1.7                  | 0.83                 | 0.655                              | 1.045                                 |
| 27        | 0.38                 | 1.13                 | 0.63                 | 0.505                              | 0.625                                 |
| 53        | 0.38                 | 1.17                 | 0.65                 | 0.515                              | 0.655                                 |
| 131       | 0.41                 | 1.52                 | 0.75                 | 0.58                               | 0.94                                  |
| 209       | 0.48                 | 1.71                 | 0.83                 | 0.655                              | 1.055                                 |
| 27        | 0.38                 | 1.1                  | 0.62                 | 0.5                                | 0.6                                   |
| 53        | 0.38                 | 1.17                 | 0.65                 | 0.515                              | 0.655                                 |
| 131       | 0.42                 | 1.53                 | 0.77                 | 0.595                              | 0.935                                 |
| 209       | 0.48                 | 1.71                 | 0.84                 | 0.66                               | 1.05                                  |
| 27        | 0.37                 | 1.14                 | 0.62                 | 0.495                              | 0.645                                 |
| 53        | 0.37                 | 1.17                 | 0.65                 | 0.51                               | 0.66                                  |
| 131       | 0.41                 | 1.53                 | 0.77                 | 0.59                               | 0.94                                  |
| 209       | 0.48                 | 1.72                 | 0.84                 | 0.66                               | 1.06                                  |
| 32        | 0.38                 | 1.14                 | 0.64                 | 0.51                               | 0.63                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 53        | 0.38                 | 1.19                 | 0.65                 | 0.515                              | 0.675                                 |
| 131       | 0.41                 | 1.53                 | 0.77                 | 0.59                               | 0.94                                  |
| 209       | 0.49                 | 1.73                 | 0.84                 | 0.665                              | 1.065                                 |
| 27        | 0.38                 | 1.19                 | 0.64                 | 0.51                               | 0.68                                  |
| 53        | 0.38                 | 1.2                  | 0.67                 | 0.525                              | 0.675                                 |
| 131       | 0.41                 | 1.54                 | 0.78                 | 0.595                              | 0.945                                 |
| 209       | 0.48                 | 1.73                 | 0.85                 | 0.665                              | 1.065                                 |
| 27        | 0.37                 | 1.14                 | 0.62                 | 0.495                              | 0.645                                 |
| 53        | 0.37                 | 1.19                 | 0.66                 | 0.515                              | 0.675                                 |
| 131       | 0.41                 | 1.53                 | 0.78                 | 0.595                              | 0.935                                 |
| 209       | 0.48                 | 1.74                 | 0.85                 | 0.665                              | 1.075                                 |
| 32        | 0.39                 | 1.19                 | 0.65                 | 0.52                               | 0.67                                  |
| 53        | 0.4                  | 1.19                 | 0.66                 | 0.53                               | 0.66                                  |
| 131       | 0.41                 | 1.54                 | 0.78                 | 0.595                              | 0.945                                 |
| 209       | 0.48                 | 1.73                 | 0.85                 | 0.665                              | 1.065                                 |
| 32        | 0.39                 | 1.19                 | 0.65                 | 0.52                               | 0.67                                  |
| 53        | 0.4                  | 1.19                 | 0.66                 | 0.53                               | 0.66                                  |
| 131       | 0.41                 | 1.54                 | 0.78                 | 0.595                              | 0.945                                 |
| 209       | 0.48                 | 1.73                 | 0.85                 | 0.665                              | 1.065                                 |
| 235       | 0.5                  | 1.8                  | 0.87                 | 0.685                              | 1.115                                 |
| 261       | 0.53                 | 1.89                 | 0.91                 | 0.72                               | 1.17                                  |
| 287       | 0.57                 | 1.99                 | 0.94                 | 0.755                              | 1.235                                 |
| 313       | 0.61                 | 2.1                  | 1                    | 0.805                              | 1.295                                 |
| 340       | 0.67                 | 2.24                 | 1.08                 | 0.875                              | 1.365                                 |
| 366- N    | 0.73                 | 2.38                 | 1.17                 | 0.95                               | 1.43                                  |
| 392       | 0.76                 | 2.49                 | 1.22                 | 0.99                               | 1.5                                   |
| 418       | 0.8                  | 2.6                  | 1.28                 | 1.04                               | 1.56                                  |
| 444       | 0.84                 | 2.7                  | 1.34                 | 1.09                               | 1.61                                  |
| 470       | 0.88                 | 2.8                  | 1.38                 | 1.13                               | 1.67                                  |
| 496       | 0.92                 | 2.89                 | 1.43                 | 1.175                              | 1.715                                 |
| 522       | 0.98                 | 3.03                 | 1.49                 | 1.235                              | 1.795                                 |
| 537       | 1.02                 | 3.12                 | 1.54                 | 1.28                               | 1.84                                  |
| 553       | 1.05                 | 3.2                  | 1.55                 | 1.3                                | 1.9                                   |
| 574       | 1.09                 | 3.32                 | 1.59                 | 1.34                               | 1.98                                  |
| 589- C    | 1.14                 | 3.42                 | 1.63                 | 1.385                              | 2.035                                 |
| 605       | 1.17                 | 3.51                 | 1.7                  | 1.435                              | 2.075                                 |
| 626       | 1.22                 | 3.62                 | 1.75                 | 1.485                              | 2.135                                 |
| 647       | 1.25                 | 3.72                 | 1.79                 | 1.52                               | 2.2                                   |
| 662       | 1.3                  | 3.86                 | 1.83                 | 1.565                              | 2.295                                 |
| 678       | 1.38                 | 4.1                  | 1.85                 | 1.615                              | 2.485                                 |
| 694       | 1.45                 | 4.35                 | 1.87                 | 1.66                               | 2.69                                  |
| 704       | 1.5                  | 4.65                 | 1.9                  | 1.7                                | 2.95                                  |

**Table A.9.56: Test Panel Concrete Cube Strength (C30-30-2-iii)**

| Cast Date: 15-09-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 10-11-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.45        | 82.4          | 34.53                         | 2359                             |
| II                      | 153x153x153 | 8.5         | 81.4          | 34.11                         | 2373                             |
| III                     | 153x153x153 | 8.6         | 80.6          | 33.78                         | 2401                             |
| IV                      | 153x153x153 | 8.55        | 78.6          | 32.94                         | 2387                             |
| Mean                    |             |             |               | 33.84                         | 2380                             |

**Table A.9.57: CFST Concrete Cube Strength (C30-30-2-iii)**

| Cast Date: 27-07-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 10-11-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.45        | 90.2          | 37.80                         | 2359                             |
| II                      | 153x153x154 | 8.45        | 90.2          | 37.80                         | 2359                             |
| III                     | 153x153x154 | 8.5         | 90.4          | 37.88                         | 2373                             |
| IV                      | 153x153x153 | 8.5         | 90.4          | 37.88                         | 2373                             |
| Mean                    |             |             |               | 37.86                         | 2369                             |



**Table A.9.58: Sample 20 (C30-20-2-i)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.29                 | 0.47                 | 0.54                 | 0.415                              | 0.055                                 |
| 53        | 0.38                 | 0.69                 | 0.8                  | 0.59                               | 0.1                                   |
| 79        | 0.46                 | 0.89                 | 0.97                 | 0.715                              | 0.175                                 |
| 105       | 0.52                 | 1.04                 | 1.08                 | 0.8                                | 0.24                                  |
| 131       | 0.6                  | 1.2                  | 1.21                 | 0.905                              | 0.295                                 |
| 157       | 0.65                 | 1.32                 | 1.3                  | 0.975                              | 0.345                                 |
| 183       | 0.7                  | 1.42                 | 1.36                 | 1.03                               | 0.39                                  |
| 209       | 0.85                 | 1.51                 | 1.43                 | 1.14                               | 0.37                                  |
| 27        | 0.53                 | 1.23                 | 1.2                  | 0.865                              | 0.365                                 |
| 53        | 0.59                 | 1.27                 | 1.25                 | 0.92                               | 0.35                                  |
| 79        | 0.63                 | 1.34                 | 1.31                 | 0.97                               | 0.37                                  |
| 105       | 0.67                 | 1.4                  | 1.35                 | 1.01                               | 0.39                                  |
| 131       | 0.7                  | 1.44                 | 1.38                 | 1.04                               | 0.4                                   |
| 157       | 0.72                 | 1.49                 | 1.41                 | 1.065                              | 0.425                                 |
| 183       | 0.77                 | 1.53                 | 1.43                 | 1.1                                | 0.43                                  |
| 209       | 0.78                 | 1.58                 | 1.47                 | 1.125                              | 0.455                                 |
| 27        | 0.58                 | 1.28                 | 1.25                 | 0.915                              | 0.365                                 |
| 53        | 0.62                 | 1.34                 | 1.3                  | 0.96                               | 0.38                                  |
| 131       | 0.71                 | 1.49                 | 1.41                 | 1.06                               | 0.43                                  |
| 209       | 0.8                  | 1.6                  | 1.5                  | 1.15                               | 0.45                                  |
| 27        | 0.6                  | 1.31                 | 1.27                 | 0.935                              | 0.375                                 |
| 53        | 0.62                 | 1.35                 | 1.31                 | 0.965                              | 0.385                                 |
| 131       | 0.72                 | 1.51                 | 1.42                 | 1.07                               | 0.44                                  |
| 209       | 0.8                  | 1.61                 | 1.5                  | 1.15                               | 0.46                                  |
| 27        | 0.6                  | 1.33                 | 1.29                 | 0.945                              | 0.385                                 |
| 53        | 0.62                 | 1.36                 | 1.33                 | 0.975                              | 0.385                                 |
| 131       | 0.72                 | 1.52                 | 1.43                 | 1.075                              | 0.445                                 |
| 209       | 0.8                  | 1.63                 | 1.51                 | 1.155                              | 0.475                                 |
| 27        | 0.61                 | 1.35                 | 1.3                  | 0.955                              | 0.395                                 |
| 53        | 0.64                 | 1.37                 | 1.33                 | 0.985                              | 0.385                                 |
| 131       | 0.73                 | 1.54                 | 1.44                 | 1.085                              | 0.455                                 |
| 209       | 0.8                  | 1.65                 | 1.52                 | 1.16                               | 0.49                                  |
| 27        | 0.61                 | 1.35                 | 1.3                  | 0.955                              | 0.395                                 |
| 53        | 0.63                 | 1.38                 | 1.34                 | 0.985                              | 0.395                                 |
| 131       | 0.74                 | 1.55                 | 1.45                 | 1.095                              | 0.455                                 |
| 209       | 0.8                  | 1.65                 | 1.53                 | 1.165                              | 0.485                                 |
| 43        | 0.62                 | 1.37                 | 1.32                 | 0.97                               | 0.4                                   |
| 53        | 0.66                 | 1.41                 | 1.36                 | 1.01                               | 0.4                                   |
| 131       | 0.74                 | 1.56                 | 1.45                 | 1.095                              | 0.465                                 |
| 209       | 0.8                  | 1.67                 | 1.54                 | 1.17                               | 0.5                                   |
| 27        | 0.62                 | 1.38                 | 1.32                 | 0.97                               | 0.41                                  |
| 53        | 0.67                 | 1.62                 | 1.36                 | 1.015                              | 0.605                                 |
| 131       | 0.75                 | 1.57                 | 1.46                 | 1.105                              | 0.465                                 |
| 209       | 0.8                  | 1.67                 | 1.54                 | 1.17                               | 0.5                                   |
| 27        | 0.62                 | 1.34                 | 1.33                 | 0.975                              | 0.365                                 |
| 53        | 0.67                 | 1.42                 | 1.37                 | 1.02                               | 0.4                                   |
| 131       | 0.76                 | 1.58                 | 1.46                 | 1.11                               | 0.47                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 0.8                  | 1.68                 | 1.54                 | 1.17                               | 0.51                                  |
| 27        | 0.62                 | 1.39                 | 1.33                 | 0.975                              | 0.415                                 |
| 53        | 0.67                 | 1.43                 | 1.37                 | 1.02                               | 0.41                                  |
| 131       | 0.76                 | 1.59                 | 1.47                 | 1.115                              | 0.475                                 |
| 209       | 0.81                 | 1.68                 | 1.55                 | 1.18                               | 0.5                                   |
| 27        | 0.63                 | 1.39                 | 1.32                 | 0.975                              | 0.415                                 |
| 53        | 0.67                 | 1.44                 | 1.37                 | 1.02                               | 0.42                                  |
| 131       | 0.76                 | 1.59                 | 1.47                 | 1.115                              | 0.475                                 |
| 209       | 0.81                 | 1.69                 | 1.55                 | 1.18                               | 0.51                                  |
| 27        | 0.63                 | 1.41                 | 1.33                 | 0.98                               | 0.43                                  |
| 53        | 0.67                 | 1.44                 | 1.37                 | 1.02                               | 0.42                                  |
| 131       | 0.71                 | 1.6                  | 1.47                 | 1.09                               | 0.51                                  |
| 209       | 0.81                 | 1.7                  | 1.55                 | 1.18                               | 0.52                                  |
| 27        | 0.63                 | 1.42                 | 1.33                 | 0.98                               | 0.44                                  |
| 53        | 0.67                 | 1.45                 | 1.38                 | 1.025                              | 0.425                                 |
| 131       | 0.77                 | 1.6                  | 1.48                 | 1.125                              | 0.475                                 |
| 209       | 0.81                 | 1.7                  | 1.55                 | 1.18                               | 0.52                                  |
| 27        | 0.64                 | 1.42                 | 1.34                 | 0.99                               | 0.43                                  |
| 53        | 0.67                 | 1.45                 | 1.38                 | 1.025                              | 0.425                                 |
| 131       | 0.77                 | 1.62                 | 1.48                 | 1.125                              | 0.495                                 |
| 209       | 0.82                 | 1.71                 | 1.55                 | 1.185                              | 0.525                                 |
| 27        | 0.63                 | 1.42                 | 1.33                 | 0.98                               | 0.44                                  |
| 53        | 0.67                 | 1.46                 | 1.38                 | 1.025                              | 0.435                                 |
| 131       | 0.77                 | 1.62                 | 1.49                 | 1.13                               | 0.49                                  |
| 209       | 0.82                 | 1.72                 | 1.51                 | 1.165                              | 0.555                                 |
| 27        | 0.63                 | 1.42                 | 1.32                 | 0.975                              | 0.445                                 |
| 53        | 0.67                 | 1.46                 | 1.39                 | 1.03                               | 0.43                                  |
| 131       | 0.77                 | 1.62                 | 1.48                 | 1.125                              | 0.495                                 |
| 209       | 0.82                 | 1.72                 | 1.56                 | 1.19                               | 0.53                                  |
| 27        | 0.63                 | 1.43                 | 1.35                 | 0.99                               | 0.44                                  |
| 53        | 0.68                 | 1.48                 | 1.39                 | 1.035                              | 0.445                                 |
| 131       | 0.76                 | 1.62                 | 1.49                 | 1.125                              | 0.495                                 |
| 209       | 0.82                 | 1.72                 | 1.56                 | 1.19                               | 0.53                                  |
| 27        | 0.62                 | 1.42                 | 1.33                 | 0.975                              | 0.445                                 |
| 53        | 0.68                 | 1.48                 | 1.39                 | 1.035                              | 0.445                                 |
| 131       | 0.76                 | 1.63                 | 1.49                 | 1.125                              | 0.505                                 |
| 209       | 0.82                 | 1.73                 | 1.56                 | 1.19                               | 0.54                                  |
| 27        | 0.63                 | 1.43                 | 1.34                 | 0.985                              | 0.445                                 |
| 53        | 0.67                 | 1.47                 | 1.39                 | 1.03                               | 0.44                                  |
| 136       | 0.78                 | 1.64                 | 1.5                  | 1.14                               | 0.5                                   |
| 209       | 0.82                 | 1.73                 | 1.57                 | 1.195                              | 0.535                                 |
| 27        | 0.64                 | 1.45                 | 1.35                 | 0.995                              | 0.455                                 |
| 53        | 0.67                 | 1.48                 | 1.4                  | 1.035                              | 0.445                                 |
| 131       | 0.77                 | 1.64                 | 1.5                  | 1.135                              | 0.505                                 |
| 209       | 0.82                 | 1.73                 | 1.57                 | 1.195                              | 0.535                                 |
| 27        | 0.63                 | 1.43                 | 1.34                 | 0.985                              | 0.445                                 |
| 53        | 0.67                 | 1.48                 | 1.4                  | 1.035                              | 0.445                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 0.77                 | 1.65                 | 1.5                  | 1.135                              | 0.515                                 |
| 209       | 0.82                 | 1.74                 | 1.57                 | 1.195                              | 0.545                                 |
| 27        | 0.63                 | 1.45                 | 1.35                 | 0.99                               | 0.46                                  |
| 53        | 0.68                 | 1.49                 | 1.4                  | 1.04                               | 0.45                                  |
| 131       | 0.77                 | 1.65                 | 1.5                  | 1.135                              | 0.515                                 |
| 209       | 0.82                 | 1.74                 | 1.57                 | 1.195                              | 0.545                                 |
| 27        | 0.63                 | 1.45                 | 1.35                 | 0.99                               | 0.46                                  |
| 53        | 0.68                 | 1.49                 | 1.4                  | 1.04                               | 0.45                                  |
| 131       | 0.77                 | 1.65                 | 1.5                  | 1.135                              | 0.515                                 |
| 209       | 0.82                 | 1.74                 | 1.57                 | 1.195                              | 0.545                                 |
| 27        | 0.63                 | 1.46                 | 1.36                 | 0.995                              | 0.465                                 |
| 53        | 0.68                 | 1.5                  | 1.41                 | 1.045                              | 0.455                                 |
| 131       | 0.76                 | 1.65                 | 1.5                  | 1.13                               | 0.52                                  |
| 209       | 0.82                 | 1.74                 | 1.57                 | 1.195                              | 0.545                                 |
| 27        | 0.65                 | 1.47                 | 1.37                 | 1.01                               | 0.46                                  |
| 53        | 0.68                 | 1.5                  | 1.41                 | 1.045                              | 0.455                                 |
| 131       | 0.77                 | 1.65                 | 1.51                 | 1.14                               | 0.51                                  |
| 209       | 0.82                 | 1.75                 | 1.57                 | 1.195                              | 0.555                                 |
| 27        | 0.65                 | 1.47                 | 1.37                 | 1.01                               | 0.46                                  |
| 53        | 0.68                 | 1.5                  | 1.41                 | 1.045                              | 0.455                                 |
| 131       | 0.77                 | 1.65                 | 1.51                 | 1.14                               | 0.51                                  |
| 209       | 0.82                 | 1.75                 | 1.57                 | 1.195                              | 0.555                                 |
| 235       | 0.84                 | 1.77                 | 1.6                  | 1.22                               | 0.55                                  |
| 261       | 0.87                 | 1.82                 | 1.64                 | 1.255                              | 0.565                                 |
| 287       | 0.9                  | 1.88                 | 1.69                 | 1.295                              | 0.585                                 |
| 313- N    | 0.93                 | 1.93                 | 1.75                 | 1.34                               | 0.59                                  |
| 340       | 1                    | 2                    | 1.81                 | 1.405                              | 0.595                                 |
| 366       | 1.03                 | 3.05                 | 1.88                 | 1.455                              | 1.595                                 |
| 392       | 1.08                 | 3.11                 | 1.95                 | 1.515                              | 1.595                                 |
| 418       | 1.12                 | 3.17                 | 2                    | 1.56                               | 1.61                                  |
| 444       | 1.18                 | 3.25                 | 2.07                 | 1.625                              | 1.625                                 |
| 470       | 1.22                 | 3.32                 | 2.12                 | 1.67                               | 1.65                                  |
| 496       | 1.27                 | 3.41                 | 2.2                  | 1.735                              | 1.675                                 |
| 522       | 1.31                 | 3.48                 | 2.28                 | 1.795                              | 1.685                                 |
| 548       | 1.34                 | 3.59                 | 2.33                 | 1.835                              | 1.755                                 |
| 574- C    | 1.39                 | 3.65                 | 2.37                 | 1.88                               | 1.77                                  |
| 589       | 1.42                 | 3.76                 | 2.41                 | 1.915                              | 1.845                                 |
| 610       | 1.45                 | 3.8                  | 2.43                 | 1.94                               | 1.86                                  |
| 626       | 1.47                 | 3.87                 | 2.45                 | 1.96                               | 1.91                                  |
| 657       | 1.5                  | 3.96                 | 2.5                  | 2                                  | 1.96                                  |
| 678       | 1.52                 | 4.08                 | 2.53                 | 2.025                              | 2.055                                 |
| 699       | 1.54                 | 4.3                  | 2.6                  | 2.07                               | 2.23                                  |
| 709       | 1.58                 | 4.44                 | 2.63                 | 2.105                              | 2.335                                 |
| 730       | 1.6                  | 4.6                  | 2.69                 | 2.145                              | 2.455                                 |
| 470       | 1.42                 | 5.78                 | 2.68                 | 2.05                               | 3.73                                  |

**Table A.9.59: Test Panel Concrete Cube Strength (C30-20-2-i)**

| Cast Date: 19-09-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 16-11-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.55        | 99.6          | 41.74                         | 2387                             |
| II                      | 153x153x153 | 8.65        | 105           | 44.00                         | 2415                             |
| III                     | 153x153x153 | 8.55        | 105.4         | 44.17                         | 2387                             |
| IV                      | 153x153x153 | 8.55        | 101.8         | 42.66                         | 2387                             |
| Mean                    |             |             |               | 43.14                         | 2394                             |

**Table A.9.60: CFST Concrete Cube Strength (C30-20-2-i)**

| Cast Date: 27-07-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 16-11-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.45        | 90.2          | 37.80                         | 2359                             |
| II                      | 153x153x154 | 8.35        | 90            | 37.72                         | 2331                             |
| III                     | 153x153x154 | 8.6         | 90.6          | 37.97                         | 2401                             |
| IV                      | 153x153x153 | 8.5         | 90.4          | 37.88                         | 2373                             |
| Mean                    |             |             |               | 37.86                         | 2369                             |



**Table A.9.61: Sample 21 (C30-20-2-ii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.04                 | 0.4                  | 0.12                 | 0.08                               | 0.32                                  |
| 53        | 0.12                 | 0.72                 | 0.22                 | 0.17                               | 0.55                                  |
| 79        | 0.2                  | 0.99                 | 0.32                 | 0.26                               | 0.73                                  |
| 105       | 0.25                 | 1.15                 | 0.37                 | 0.31                               | 0.84                                  |
| 131       | 0.29                 | 1.3                  | 0.42                 | 0.355                              | 0.945                                 |
| 157       | 0.33                 | 1.43                 | 0.46                 | 0.395                              | 1.035                                 |
| 183       | 0.37                 | 1.53                 | 0.49                 | 0.43                               | 1.1                                   |
| 209       | 0.41                 | 1.62                 | 0.52                 | 0.465                              | 1.155                                 |
| 27        | 0.4                  | 1.08                 | 0.31                 | 0.355                              | 0.725                                 |
| 53        | 0.39                 | 1.23                 | 0.33                 | 0.36                               | 0.87                                  |
| 79        | 0.4                  | 1.35                 | 0.35                 | 0.375                              | 0.975                                 |
| 105       | 0.45                 | 1.45                 | 0.37                 | 0.41                               | 1.04                                  |
| 131       | 0.48                 | 1.52                 | 0.39                 | 0.435                              | 1.085                                 |
| 157       | 0.5                  | 1.61                 | 0.42                 | 0.46                               | 1.15                                  |
| 183       | 0.55                 | 1.66                 | 0.45                 | 0.5                                | 1.16                                  |
| 209       | 0.56                 | 1.72                 | 0.48                 | 0.52                               | 1.2                                   |
| 27        | 0.5                  | 1.09                 | 0.25                 | 0.375                              | 0.715                                 |
| 53        | 0.49                 | 1.23                 | 0.27                 | 0.38                               | 0.85                                  |
| 131       | 0.59                 | 1.57                 | 0.35                 | 0.47                               | 1.1                                   |
| 209       | 0.72                 | 1.79                 | 0.4                  | 0.56                               | 1.23                                  |
| 27        | 0.57                 | 0.97                 | 0.17                 | 0.37                               | 0.6                                   |
| 53        | 0.58                 | 1.16                 | 0.21                 | 0.395                              | 0.765                                 |
| 131       | 0.69                 | 1.55                 | 0.28                 | 0.485                              | 1.065                                 |
| 209       | 0.74                 | 1.82                 | 0.45                 | 0.595                              | 1.225                                 |
| 27        | 0.56                 | 1.29                 | 0.3                  | 0.43                               | 0.86                                  |
| 53        | 0.56                 | 1.41                 | 0.32                 | 0.44                               | 0.97                                  |
| 131       | 0.63                 | 1.69                 | 0.41                 | 0.52                               | 1.17                                  |
| 209       | 0.63                 | 1.82                 | 0.51                 | 0.57                               | 1.25                                  |
| 27        | 0.56                 | 1.22                 | 0.34                 | 0.45                               | 0.77                                  |
| 53        | 0.56                 | 1.38                 | 0.37                 | 0.465                              | 0.915                                 |
| 136       | 0.56                 | 1.65                 | 0.49                 | 0.525                              | 1.125                                 |
| 209       | 0.57                 | 1.79                 | 0.56                 | 0.565                              | 1.225                                 |
| 27        | 0.5                  | 1.23                 | 0.31                 | 0.405                              | 0.825                                 |
| 53        | 0.48                 | 1.41                 | 0.35                 | 0.415                              | 0.995                                 |
| 136       | 0.53                 | 1.71                 | 0.47                 | 0.5                                | 1.21                                  |
| 209       | 0.58                 | 1.84                 | 0.54                 | 0.56                               | 1.28                                  |
| 17        | 0.51                 | 1.13                 | 0.3                  | 0.405                              | 0.725                                 |
| 53        | 0.5                  | 1.43                 | 0.36                 | 0.43                               | 1                                     |
| 131       | 0.56                 | 1.72                 | 0.45                 | 0.505                              | 1.215                                 |
| 209       | 0.61                 | 1.85                 | 0.53                 | 0.57                               | 1.28                                  |
| 27        | 0.51                 | 1.28                 | 0.32                 | 0.415                              | 0.865                                 |
| 53        | 0.51                 | 1.43                 | 0.35                 | 0.43                               | 1                                     |
| 131       | 0.58                 | 1.72                 | 0.44                 | 0.51                               | 1.21                                  |
| 209       | 0.64                 | 1.87                 | 0.52                 | 0.58                               | 1.29                                  |
| 27        | 0.56                 | 1.33                 | 0.35                 | 0.455                              | 0.875                                 |
| 53        | 0.56                 | 1.45                 | 0.36                 | 0.46                               | 0.99                                  |
| 131       | 0.56                 | 1.73                 | 0.46                 | 0.51                               | 1.22                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 0.6                  | 1.86                 | 0.54                 | 0.57                               | 1.29                                  |
| 27        | 0.46                 | 1.27                 | 0.33                 | 0.395                              | 0.875                                 |
| 53        | 0.46                 | 1.45                 | 0.35                 | 0.405                              | 1.045                                 |
| 131       | 0.6                  | 1.73                 | 0.43                 | 0.515                              | 1.215                                 |
| 209       | 0.62                 | 1.87                 | 0.53                 | 0.575                              | 1.295                                 |
| 27        | 0.47                 | 1.28                 | 0.32                 | 0.395                              | 0.885                                 |
| 53        | 0.5                  | 1.42                 | 0.33                 | 0.415                              | 1.005                                 |
| 131       | 0.63                 | 1.74                 | 0.41                 | 0.52                               | 1.22                                  |
| 209       | 0.67                 | 1.88                 | 0.5                  | 0.585                              | 1.295                                 |
| 27        | 0.55                 | 1.31                 | 0.33                 | 0.44                               | 0.87                                  |
| 53        | 0.54                 | 1.45                 | 0.35                 | 0.445                              | 1.005                                 |
| 131       | 0.62                 | 1.75                 | 0.45                 | 0.535                              | 1.215                                 |
| 209       | 0.65                 | 1.88                 | 0.52                 | 0.585                              | 1.295                                 |
| 27        | 0.53                 | 1.3                  | 0.33                 | 0.43                               | 0.87                                  |
| 53        | 0.53                 | 1.46                 | 0.36                 | 0.445                              | 1.015                                 |
| 131       | 0.57                 | 1.75                 | 0.48                 | 0.525                              | 1.225                                 |
| 209       | 0.6                  | 1.87                 | 0.55                 | 0.575                              | 1.295                                 |
| 27        | 0.58                 | 1.3                  | 0.35                 | 0.465                              | 0.835                                 |
| 53        | 0.56                 | 1.46                 | 0.37                 | 0.465                              | 0.995                                 |
| 131       | 0.57                 | 1.75                 | 0.49                 | 0.53                               | 1.22                                  |
| 209       | 0.61                 | 1.88                 | 0.55                 | 0.58                               | 1.3                                   |
| 27        | 0.52                 | 1.31                 | 0.34                 | 0.43                               | 0.88                                  |
| 53        | 0.51                 | 1.47                 | 0.37                 | 0.44                               | 1.03                                  |
| 131       | 0.58                 | 1.76                 | 0.47                 | 0.525                              | 1.235                                 |
| 209       | 0.62                 | 1.88                 | 0.55                 | 0.585                              | 1.295                                 |
| 22        | 0.55                 | 1.24                 | 0.34                 | 0.445                              | 0.795                                 |
| 53        | 0.55                 | 1.45                 | 0.38                 | 0.465                              | 0.985                                 |
| 131       | 0.56                 | 1.75                 | 0.49                 | 0.525                              | 1.225                                 |
| 209       | 0.61                 | 1.88                 | 0.56                 | 0.585                              | 1.295                                 |
| 27        | 0.54                 | 1.37                 | 0.35                 | 0.445                              | 0.925                                 |
| 53        | 0.53                 | 1.49                 | 0.37                 | 0.45                               | 1.04                                  |
| 131       | 0.63                 | 1.76                 | 0.44                 | 0.535                              | 1.225                                 |
| 209       | 0.67                 | 1.9                  | 0.52                 | 0.595                              | 1.305                                 |
| 27        | 0.56                 | 1.33                 | 0.32                 | 0.44                               | 0.89                                  |
| 53        | 0.55                 | 1.47                 | 0.35                 | 0.45                               | 1.02                                  |
| 131       | 0.65                 | 1.76                 | 0.42                 | 0.535                              | 1.225                                 |
| 209       | 0.68                 | 1.9                  | 0.51                 | 0.595                              | 1.305                                 |
| 27        | 0.55                 | 1.3                  | 0.31                 | 0.43                               | 0.87                                  |
| 53        | 0.54                 | 1.46                 | 0.34                 | 0.44                               | 1.02                                  |
| 131       | 0.67                 | 1.76                 | 0.42                 | 0.545                              | 1.215                                 |
| 209       | 0.7                  | 1.9                  | 0.51                 | 0.605                              | 1.295                                 |
| 22        | 0.55                 | 1.28                 | 0.32                 | 0.435                              | 0.845                                 |
| 53        | 0.54                 | 1.49                 | 0.36                 | 0.45                               | 1.04                                  |
| 131       | 0.64                 | 1.74                 | 0.44                 | 0.54                               | 1.2                                   |
| 209       | 0.68                 | 1.9                  | 0.51                 | 0.595                              | 1.305                                 |
| 27        | 0.58                 | 1.34                 | 0.35                 | 0.465                              | 0.875                                 |
| 53        | 0.57                 | 1.5                  | 0.38                 | 0.475                              | 1.025                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 136       | 0.61                 | 1.79                 | 0.47                 | 0.54                               | 1.25                                  |
| 209       | 0.65                 | 1.9                  | 0.54                 | 0.595                              | 1.305                                 |
| 22        | 0.55                 | 1.27                 | 0.34                 | 0.445                              | 0.825                                 |
| 53        | 0.55                 | 1.5                  | 0.38                 | 0.465                              | 1.035                                 |
| 131       | 0.6                  | 1.78                 | 0.47                 | 0.535                              | 1.245                                 |
| 209       | 0.65                 | 1.9                  | 0.54                 | 0.595                              | 1.305                                 |
| 27        | 0.54                 | 1.35                 | 0.33                 | 0.435                              | 0.915                                 |
| 53        | 0.54                 | 1.48                 | 0.35                 | 0.445                              | 1.035                                 |
| 131       | 0.66                 | 1.76                 | 0.42                 | 0.54                               | 1.22                                  |
| 209       | 0.7                  | 1.91                 | 0.51                 | 0.605                              | 1.305                                 |
| 27        | 0.54                 | 1.35                 | 0.32                 | 0.43                               | 0.92                                  |
| 53        | 0.55                 | 1.47                 | 0.34                 | 0.445                              | 1.025                                 |
| 131       | 0.68                 | 1.76                 | 0.41                 | 0.545                              | 1.215                                 |
| 209       | 0.73                 | 1.91                 | 0.48                 | 0.605                              | 1.305                                 |
| 17        | 0.51                 | 1.25                 | 0.3                  | 0.405                              | 0.845                                 |
| 53        | 0.55                 | 1.47                 | 0.34                 | 0.445                              | 1.025                                 |
| 131       | 0.67                 | 1.76                 | 0.41                 | 0.54                               | 1.22                                  |
| 209       | 0.72                 | 1.91                 | 0.49                 | 0.605                              | 1.305                                 |
| 17        | 0.51                 | 1.25                 | 0.3                  | 0.405                              | 0.845                                 |
| 53        | 0.55                 | 1.47                 | 0.34                 | 0.445                              | 1.025                                 |
| 131       | 0.67                 | 1.76                 | 0.41                 | 0.54                               | 1.22                                  |
| 209       | 0.72                 | 1.91                 | 0.49                 | 0.605                              | 1.305                                 |
| 235       | 0.73                 | 1.95                 | 0.51                 | 0.62                               | 1.33                                  |
| 261       | 0.73                 | 1.99                 | 0.53                 | 0.63                               | 1.36                                  |
| 287       | 0.73                 | 2.03                 | 0.56                 | 0.645                              | 1.385                                 |
| 313       | 0.75                 | 2.09                 | 0.59                 | 0.67                               | 1.42                                  |
| 340       | 0.76                 | 2.13                 | 0.61                 | 0.685                              | 1.445                                 |
| 366       | 0.79                 | 2.19                 | 0.63                 | 0.71                               | 1.48                                  |
| 392       | 0.81                 | 2.25                 | 0.66                 | 0.735                              | 1.515                                 |
| 418       | 0.82                 | 2.31                 | 0.7                  | 0.76                               | 1.55                                  |
| 444       | 0.85                 | 2.36                 | 0.72                 | 0.785                              | 1.575                                 |
| 470       | 0.86                 | 2.42                 | 0.75                 | 0.805                              | 1.615                                 |
| 496       | 0.88                 | 2.47                 | 0.76                 | 0.82                               | 1.65                                  |
| 522       | 0.91                 | 2.55                 | 0.78                 | 0.845                              | 1.705                                 |
| 548       | 0.94                 | 2.63                 | 0.81                 | 0.875                              | 1.755                                 |
| 574       | 0.96                 | 2.69                 | 0.83                 | 0.895                              | 1.795                                 |
| 600       | 1                    | 2.78                 | 0.87                 | 0.935                              | 1.845                                 |
| 626       | 1.02                 | 2.85                 | 0.9                  | 0.96                               | 1.89                                  |
| 652       | 1.05                 | 2.9                  | 0.92                 | 0.985                              | 1.915                                 |
| 678       | 1.06                 | 2.98                 | 0.96                 | 1.01                               | 1.97                                  |
| 704- N,C  | 1.09                 | 3.06                 | 0.99                 | 1.04                               | 2.02                                  |
| 740       | 1.12                 | 3.2                  | 1.05                 | 1.085                              | 2.115                                 |
| 740       | 1.15                 | 3.32                 | 1.09                 | 1.12                               | 2.2                                   |
| 766       | 1.16                 | 3.37                 | 1.1                  | 1.13                               | 2.24                                  |
| 782       | 1.18                 | 3.46                 | 1.12                 | 1.15                               | 2.31                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 808       | 1.2                  | 3.53                 | 1.13                 | 1.165                              | 2.365                                 |
| 834       | 1.21                 | 3.66                 | 1.16                 | 1.185                              | 2.475                                 |
| 845       | 1.23                 | 3.9                  | 1.2                  | 1.215                              | 2.685                                 |

**Table A.9.62: Test Panel Concrete Cube Strength (C30-20-2-ii)**

| Cast Date: 23-09-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 25-11-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.55        | 97            | 40.65                         | 2387                             |
| II                      | 153x153x153 | 8.55        | 95            | 39.81                         | 2387                             |
| III                     | 153x153x153 | 8.6         | 91.8          | 38.47                         | 2401                             |
| IV                      | 153x153x153 | 8.55        | 78.8          | 33.02                         | 2387                             |
| Mean                    |             |             |               | 37.99                         | 2391                             |

**Table A.9.63: CFST Concrete Cube Strength (C30-20-2-ii)**

| Cast Date: 27-07-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 25-11-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.45        | 90.2          | 37.80                         | 2359                             |
| II                      | 153x153x154 | 8.35        | 90            | 37.72                         | 2331                             |
| III                     | 153x153x154 | 8.6         | 90.6          | 37.97                         | 2401                             |
| IV                      | 153x153x153 | 8.5         | 90.4          | 37.88                         | 2373                             |
| Mean                    |             |             |               | 37.86                         | 2369                             |

**Table A.9.64:** Sample 31 (C30-20-2-iii)

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.19                 | 0.71                 | 0.42                 | 0.305                              | 0.405                                 |
| 53        | 0.44                 | 1.21                 | 0.69                 | 0.565                              | 0.645                                 |
| 79        | 0.6                  | 1.44                 | 0.75                 | 0.675                              | 0.765                                 |
| 105       | 0.7                  | 1.61                 | 0.82                 | 0.76                               | 0.85                                  |
| 121       | 0.83                 | 1.71                 | 0.9                  | 0.865                              | 0.845                                 |
| 157       | 0.98                 | 1.71                 | 0.75                 | 0.865                              | 0.845                                 |
| 183       | 1.05                 | 1.77                 | 0.78                 | 0.915                              | 0.855                                 |
| 209       | 1.15                 | 1.87                 | 1.02                 | 1.085                              | 0.785                                 |
| 22        | 0.88                 | 1.44                 | 0.75                 | 0.815                              | 0.625                                 |
| 58        | 0.95                 | 1.65                 | 0.95                 | 0.95                               | 0.7                                   |
| 84        | 0.94                 | 1.72                 | 0.97                 | 0.955                              | 0.765                                 |
| 105       | 1.03                 | 1.78                 | 1                    | 1.015                              | 0.765                                 |
| 136       | 1.06                 | 1.86                 | 1.03                 | 1.045                              | 0.815                                 |
| 157       | 1.1                  | 1.92                 | 1.06                 | 1.08                               | 0.84                                  |
| 183       | 1.14                 | 1.96                 | 1.09                 | 1.115                              | 0.845                                 |
| 209       | 1.18                 | 2.02                 | 1.11                 | 1.145                              | 0.875                                 |
| 22        | 0.9                  | 1.58                 | 0.96                 | 0.93                               | 0.65                                  |
| 53        | 0.97                 | 1.71                 | 0.98                 | 0.975                              | 0.735                                 |
| 131       | 1.1                  | 1.86                 | 1.06                 | 1.08                               | 0.78                                  |
| 209       | 1.23                 | 2                    | 1.11                 | 1.17                               | 0.83                                  |
| 27        | 0.92                 | 1.23                 | 0.96                 | 0.94                               | 0.29                                  |
| 58        | 0.99                 | 1.4                  | 0.95                 | 0.97                               | 0.43                                  |
| 131       | 1.15                 | 1.7                  | 1.01                 | 1.08                               | 0.62                                  |
| 209       | 1.27                 | 1.91                 | 1.08                 | 1.175                              | 0.735                                 |
| 22        | 0.91                 | 1.12                 | 0.9                  | 0.905                              | 0.215                                 |
| 53        | 1.01                 | 1.4                  | 0.92                 | 0.965                              | 0.435                                 |
| 131       | 1.18                 | 1.7                  | 1.03                 | 1.105                              | 0.595                                 |
| 209       | 1.31                 | 1.88                 | 1.08                 | 1.195                              | 0.685                                 |
| 27        | 0.96                 | 1.33                 | 1.01                 | 0.985                              | 0.345                                 |
| 53        | 1.02                 | 1.64                 | 0.98                 | 1                                  | 0.64                                  |
| 136       | 1.15                 | 1.92                 | 1.07                 | 1.11                               | 0.81                                  |
| 209       | 1.25                 | 2.1                  | 1.15                 | 1.2                                | 0.9                                   |
| 27        | 0.98                 | 1.6                  | 0.96                 | 0.97                               | 0.63                                  |
| 58        | 1.04                 | 1.75                 | 0.99                 | 1.015                              | 0.735                                 |
| 136       | 1.16                 | 1.99                 | 1.09                 | 1.125                              | 0.865                                 |
| 209       | 1.25                 | 2.18                 | 1.11                 | 1.18                               | 1                                     |
| 27        | 0.98                 | 1.45                 | 0.98                 | 0.98                               | 0.47                                  |
| 53        | 1.04                 | 1.63                 | 1                    | 1.02                               | 0.61                                  |
| 131       | 1.17                 | 1.94                 | 1.09                 | 1.13                               | 0.81                                  |
| 209       | 1.27                 | 2.13                 | 1.14                 | 1.205                              | 0.925                                 |
| 22        | 0.96                 | 1.65                 | 1.03                 | 0.995                              | 0.655                                 |
| 53        | 1.01                 | 1.8                  | 1.03                 | 1.02                               | 0.78                                  |
| 136       | 1.15                 | 2.07                 | 1.13                 | 1.14                               | 0.93                                  |
| 209       | 1.27                 | 2.15                 | 1.16                 | 1.215                              | 0.935                                 |
| 27        | 0.98                 | 1.55                 | 1                    | 0.99                               | 0.56                                  |
| 53        | 1.05                 | 1.75                 | 1.03                 | 1.04                               | 0.71                                  |
| 136       | 1.17                 | 2.01                 | 1.11                 | 1.14                               | 0.87                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 1.23                 | 2.21                 | 1.18                 | 1.205                              | 1.005                                 |
| 27        | 0.97                 | 1.72                 | 1.03                 | 1                                  | 0.72                                  |
| 53        | 1.03                 | 1.88                 | 1.07                 | 1.05                               | 0.83                                  |
| 136       | 1.15                 | 2.1                  | 1.15                 | 1.15                               | 0.95                                  |
| 209       | 1.23                 | 2.27                 | 1.22                 | 1.225                              | 1.045                                 |
| 27        | 0.98                 | 1.49                 | 0.98                 | 0.98                               | 0.51                                  |
| 53        | 1.05                 | 1.65                 | 1.01                 | 1.03                               | 0.62                                  |
| 131       | 1.19                 | 1.96                 | 1.11                 | 1.15                               | 0.81                                  |
| 215       | 1.3                  | 2.18                 | 1.19                 | 1.245                              | 0.935                                 |
| 27        | 0.97                 | 1.48                 | 0.96                 | 0.965                              | 0.515                                 |
| 58        | 1.07                 | 1.77                 | 1.03                 | 1.05                               | 0.72                                  |
| 131       | 1.19                 | 2                    | 1.13                 | 1.16                               | 0.84                                  |
| 209       | 1.29                 | 2.2                  | 1.19                 | 1.24                               | 0.96                                  |
| 22        | 0.99                 | 1.58                 | 1.05                 | 1.02                               | 0.56                                  |
| 53        | 1.05                 | 1.77                 | 1.05                 | 1.05                               | 0.72                                  |
| 136       | 1.18                 | 2.05                 | 1.15                 | 1.165                              | 0.885                                 |
| 209       | 1.25                 | 2.24                 | 1.22                 | 1.235                              | 1.005                                 |
| 27        | 1                    | 1.28                 | 1.05                 | 1.025                              | 0.255                                 |
| 53        | 1.07                 | 1.52                 | 1.03                 | 1.05                               | 0.47                                  |
| 131       | 1.23                 | 1.87                 | 1.1                  | 1.165                              | 0.705                                 |
| 209       | 1.33                 | 2.08                 | 1.18                 | 1.255                              | 0.825                                 |
| 27        | 0.98                 | 1.69                 | 1.08                 | 1.03                               | 0.66                                  |
| 53        | 1.06                 | 1.85                 | 1.1                  | 1.08                               | 0.77                                  |
| 131       | 1.18                 | 2.08                 | 1.18                 | 1.18                               | 0.9                                   |
| 215       | 1.28                 | 2.26                 | 1.23                 | 1.255                              | 1.005                                 |
| 22        | 0.96                 | 1.88                 | 1.11                 | 1.035                              | 0.845                                 |
| 53        | 1.03                 | 2.02                 | 1.14                 | 1.085                              | 0.935                                 |
| 131       | 1.15                 | 2.22                 | 1.21                 | 1.18                               | 1.04                                  |
| 209       | 1.25                 | 2.37                 | 1.28                 | 1.265                              | 1.105                                 |
| 22        | 0.97                 | 1.8                  | 1.14                 | 1.055                              | 0.745                                 |
| 53        | 1.05                 | 1.99                 | 1.16                 | 1.105                              | 0.885                                 |
| 131       | 1.17                 | 2.2                  | 1.23                 | 1.2                                | 1                                     |
| 209       | 1.27                 | 2.37                 | 1.29                 | 1.28                               | 1.09                                  |
| 27        | 0.98                 | 1.91                 | 1.12                 | 1.05                               | 0.86                                  |
| 53        | 1.05                 | 2.06                 | 1.14                 | 1.095                              | 0.965                                 |
| 131       | 1.17                 | 2.23                 | 1.22                 | 1.195                              | 1.035                                 |
| 209       | 1.25                 | 2.36                 | 1.29                 | 1.27                               | 1.09                                  |
| 27        | 0.98                 | 1.96                 | 1.13                 | 1.055                              | 0.905                                 |
| 53        | 1.05                 | 2.1                  | 1.14                 | 1.095                              | 1.005                                 |
| 131       | 1.15                 | 2.28                 | 1.22                 | 1.185                              | 1.095                                 |
| 209       | 1.24                 | 2.43                 | 1.3                  | 1.27                               | 1.16                                  |
| 27        | 0.99                 | 1.76                 | 1.08                 | 1.035                              | 0.725                                 |
| 53        | 1.05                 | 1.9                  | 1.11                 | 1.08                               | 0.82                                  |
| 131       | 1.18                 | 2.15                 | 1.22                 | 1.2                                | 0.95                                  |
| 209       | 1.27                 | 2.23                 | 1.29                 | 1.28                               | 0.95                                  |
| 22        | 1                    | 1.62                 | 0.95                 | 0.975                              | 0.645                                 |
| 53        | 1.08                 | 1.84                 | 1.09                 | 1.085                              | 0.755                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 1.2                  | 2.06                 | 1.19                 | 1.195                              | 0.865                                 |
| 209       | 1.29                 | 2.25                 | 1.26                 | 1.275                              | 0.975                                 |
| 27        | 1.02                 | 1.75                 | 0.98                 | 1                                  | 0.75                                  |
| 53        | 1.07                 | 1.87                 | 1.1                  | 1.085                              | 0.785                                 |
| 131       | 1.2                  | 2.1                  | 1.22                 | 1.21                               | 0.89                                  |
| 209       | 1.28                 | 2.27                 | 1.28                 | 1.28                               | 0.99                                  |
| 27        | 1.05                 | 1.35                 | 1.04                 | 1.045                              | 0.305                                 |
| 53        | 1.11                 | 1.63                 | 1.04                 | 1.075                              | 0.555                                 |
| 131       | 1.24                 | 1.93                 | 1.13                 | 1.185                              | 0.745                                 |
| 209       | 1.32                 | 2.18                 | 1.23                 | 1.275                              | 0.905                                 |
| 27        | 1.05                 | 1.39                 | 1.02                 | 1.035                              | 0.355                                 |
| 53        | 1.11                 | 1.6                  | 1.02                 | 1.065                              | 0.535                                 |
| 131       | 1.26                 | 1.93                 | 1.14                 | 1.2                                | 0.73                                  |
| 209       | 1.34                 | 2.15                 | 1.22                 | 1.28                               | 0.87                                  |
| 27        | 1.03                 | 1.35                 | 0.98                 | 1.005                              | 0.345                                 |
| 53        | 1.12                 | 1.62                 | 1                    | 1.06                               | 0.56                                  |
| 131       | 1.26                 | 1.93                 | 1.14                 | 1.2                                | 0.73                                  |
| 209       | 1.34                 | 2.16                 | 1.21                 | 1.275                              | 0.885                                 |
| 235       | 1.37                 | 2.23                 | 1.24                 | 1.305                              | 0.925                                 |
| 261       | 1.41                 | 2.29                 | 1.26                 | 1.335                              | 0.955                                 |
| 287       | 1.45                 | 2.36                 | 1.28                 | 1.365                              | 0.995                                 |
| 313       | 1.5                  | 2.43                 | 1.3                  | 1.4                                | 1.03                                  |
| 340       | 1.57                 | 2.52                 | 1.33                 | 1.45                               | 1.07                                  |
| 366       | 1.63                 | 2.62                 | 1.38                 | 1.505                              | 1.115                                 |
| 392       | 1.68                 | 2.7                  | 1.41                 | 1.545                              | 1.155                                 |
| 418       | 1.73                 | 2.81                 | 1.48                 | 1.605                              | 1.205                                 |
| 444- N    | 1.77                 | 2.87                 | 1.5                  | 1.635                              | 1.235                                 |
| 470       | 1.84                 | 2.98                 | 1.54                 | 1.69                               | 1.29                                  |
| 496       | 1.85                 | 3.07                 | 1.61                 | 1.73                               | 1.34                                  |
| 522- C    | 1.88                 | 3.18                 | 1.69                 | 1.785                              | 1.395                                 |
| 527       | 1.89                 | 3.32                 | 1.71                 | 1.8                                | 1.52                                  |
| 543       | 1.9                  | 3.37                 | 1.75                 | 1.825                              | 1.545                                 |
| 558       | 1.95                 | 3.42                 | 1.78                 | 1.865                              | 1.555                                 |
| 574       | 1.96                 | 3.46                 | 1.8                  | 1.88                               | 1.58                                  |
| 589       | 1.96                 | 3.55                 | 1.82                 | 1.89                               | 1.66                                  |
| 600       | 1.98                 | 3.65                 | 1.85                 | 1.915                              | 1.735                                 |
| 615       | 2                    | 3.71                 | 1.86                 | 1.93                               | 1.78                                  |
| 626       | 2                    | 3.91                 | 1.89                 | 1.945                              | 1.965                                 |

**Table A.9.65:** Test Panel Concrete Cube Strength (C30-20-2-iii)

| Cast Date: 06-01-2006   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 23-03-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.8         | 94.6          | 39.64                         | 2457                             |
| II                      | 153x153x153 | 8.75        | 114.2         | 47.86                         | 2443                             |
| III                     | 153x153x153 | 8.6         | 111.4         | 46.68                         | 2401                             |
| IV                      | 153x153x153 | 8.6         | 113.6         | 47.61                         | 2401                             |
| Mean                    |             |             |               | 45.45                         | 2426                             |



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**Table A.9.66: Sample 22 (C30-25-2-i)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.17                 | 1.59                 | 0.15                 | 0.16                               | 1.43                                  |
| 53        | 0.27                 | 2.95                 | 0.24                 | 0.255                              | 2.695                                 |
| 79        | 0.33                 | 3.84                 | 0.32                 | 0.325                              | 3.515                                 |
| 105       | 0.39                 | 1.14                 | 0.4                  | 0.395                              | 0.745                                 |
| 131       | 0.42                 | 4.28                 | 0.44                 | 0.43                               | 3.85                                  |
| 157       | 0.5                  | 4.48                 | 0.49                 | 0.495                              | 3.985                                 |
| 183       | 0.52                 | 4.58                 | 0.53                 | 0.525                              | 4.055                                 |
| 209       | 0.56                 | 4.7                  | 0.58                 | 0.57                               | 4.13                                  |
| 22        | 0.43                 | 2.5                  | 0.25                 | 0.34                               | 2.16                                  |
| 53        | 0.45                 | 2.77                 | 0.33                 | 0.39                               | 2.38                                  |
| 79        | 0.51                 | 3.22                 | 0.38                 | 0.445                              | 2.775                                 |
| 105       | 0.5                  | 3.37                 | 0.43                 | 0.465                              | 2.905                                 |
| 131       | 0.53                 | 3.49                 | 0.48                 | 0.505                              | 2.985                                 |
| 157       | 0.56                 | 3.6                  | 0.52                 | 0.54                               | 3.06                                  |
| 183       | 0.59                 | 3.67                 | 0.54                 | 0.565                              | 3.105                                 |
| 209       | 0.63                 | 3.75                 | 0.55                 | 0.59                               | 3.16                                  |
| 27        | 0.25                 | 2.96                 | 0.45                 | 0.35                               | 2.61                                  |
| 53        | 0.25                 | 3.97                 | 0.53                 | 0.39                               | 3.58                                  |
| 131       | 0.4                  | 4.48                 | 0.6                  | 0.5                                | 3.98                                  |
| 209       | 0.51                 | 4.72                 | 0.72                 | 0.615                              | 4.105                                 |
| 27        | 0.54                 | 2.66                 | 0.75                 | 0.645                              | 2.015                                 |
| 53        | 0.6                  | 3.66                 | 0.8                  | 0.7                                | 2.96                                  |
| 131       | 0.25                 | 4.41                 | 0.73                 | 0.49                               | 3.92                                  |
| 209       | 0.47                 | 4.75                 | 0.75                 | 0.61                               | 4.14                                  |
| 32        | 0.36                 | 3.09                 | 0.41                 | 0.385                              | 2.705                                 |
| 53        | 0.4                  | 4.11                 | 0.46                 | 0.43                               | 3.68                                  |
| 136       | 0.49                 | 4.63                 | 0.6                  | 0.545                              | 4.085                                 |
| 215       | 0.56                 | 4.86                 | 0.69                 | 0.625                              | 4.235                                 |
| 27        | 0.41                 | 3.19                 | 0.42                 | 0.415                              | 2.775                                 |
| 53        | 0.42                 | 4.15                 | 0.49                 | 0.455                              | 3.695                                 |
| 136       | 0.5                  | 4.65                 | 0.51                 | 0.505                              | 4.145                                 |
| 209       | 0.56                 | 4.87                 | 0.69                 | 0.625                              | 4.245                                 |
| 32        | 0.48                 | 3.36                 | 0.32                 | 0.4                                | 2.96                                  |
| 53        | 0.51                 | 4                    | 0.34                 | 0.425                              | 3.575                                 |
| 131       | 0.59                 | 4.62                 | 0.48                 | 0.535                              | 4.085                                 |
| 209       | 0.64                 | 4.87                 | 0.6                  | 0.62                               | 4.25                                  |
| 32        | 0.58                 | 3.39                 | 0.34                 | 0.46                               | 2.93                                  |
| 53        | 0.58                 | 4.03                 | 0.36                 | 0.47                               | 3.56                                  |
| 131       | 0.62                 | 4.64                 | 0.5                  | 0.56                               | 4.08                                  |
| 209       | 0.69                 | 4.87                 | 0.59                 | 0.64                               | 4.23                                  |
| 27        | 0.62                 | 2.98                 | 0.3                  | 0.46                               | 2.52                                  |
| 53        | 0.61                 | 4.07                 | 0.37                 | 0.49                               | 3.58                                  |
| 131       | 0.65                 | 4.66                 | 0.5                  | 0.575                              | 4.085                                 |
| 215       | 0.69                 | 4.9                  | 0.61                 | 0.65                               | 4.25                                  |
| 27        | 0.52                 | 3.31                 | 0.28                 | 0.4                                | 2.91                                  |
| 53        | 0.57                 | 4.14                 | 0.36                 | 0.465                              | 3.675                                 |
| 131       | 0.61                 | 4.68                 | 0.53                 | 0.57                               | 4.11                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 0.66                 | 4.91                 | 0.63                 | 0.645                              | 4.265                                 |
| 38        | 0.55                 | 3.53                 | 0.4                  | 0.475                              | 3.055                                 |
| 53        | 0.55                 | 4.22                 | 0.43                 | 0.49                               | 3.73                                  |
| 131       | 0.61                 | 4.7                  | 0.55                 | 0.58                               | 4.12                                  |
| 209       | 0.66                 | 4.9                  | 0.63                 | 0.645                              | 4.255                                 |
| 38        | 0.52                 | 3.6                  | 0.5                  | 0.51                               | 3.09                                  |
| 53        | 0.52                 | 4.11                 | 0.5                  | 0.51                               | 3.6                                   |
| 131       | 0.57                 | 4.68                 | 0.62                 | 0.595                              | 4.085                                 |
| 209       | 0.65                 | 4.91                 | 0.68                 | 0.665                              | 4.245                                 |
| 17        | -0.01                | 2.27                 | 0.55                 | 0.27                               | 2                                     |
| 53        | 0.15                 | 4.04                 | 0.63                 | 0.39                               | 3.65                                  |
| 131       | 0.47                 | 4.62                 | 0.68                 | 0.575                              | 4.045                                 |
| 215       | 0.57                 | 4.87                 | 0.7                  | 0.635                              | 4.235                                 |
| 27        | 0.47                 | 3.09                 | 0.45                 | 0.46                               | 2.63                                  |
| 53        | 0.46                 | 4.18                 | 0.5                  | 0.48                               | 3.7                                   |
| 131       | 0.56                 | 4.72                 | 0.63                 | 0.595                              | 4.125                                 |
| 209       | 0.64                 | 4.95                 | 0.72                 | 0.68                               | 4.27                                  |
| 22        | 0.55                 | 2.85                 | 0.33                 | 0.44                               | 2.41                                  |
| 53        | 0.58                 | 4.1                  | 0.39                 | 0.485                              | 3.615                                 |
| 131       | 0.69                 | 4.69                 | 0.5                  | 0.595                              | 4.095                                 |
| 209       | 0.73                 | 4.93                 | 0.6                  | 0.665                              | 4.265                                 |
| 27        | 0.6                  | 2.86                 | 0.34                 | 0.47                               | 2.39                                  |
| 53        | 0.62                 | 4.16                 | 0.37                 | 0.495                              | 3.665                                 |
| 131       | 0.69                 | 4.71                 | 0.5                  | 0.595                              | 4.115                                 |
| 209       | 0.73                 | 4.93                 | 0.6                  | 0.665                              | 4.265                                 |
| 32        | 0.56                 | 3.44                 | 0.43                 | 0.495                              | 2.945                                 |
| 53        | 0.56                 | 4.25                 | 0.47                 | 0.515                              | 3.735                                 |
| 131       | 0.6                  | 4.75                 | 0.6                  | 0.6                                | 4.15                                  |
| 209       | 0.65                 | 4.96                 | 0.71                 | 0.68                               | 4.28                                  |
| 27        | 0.57                 | 2.91                 | 0.32                 | 0.445                              | 2.465                                 |
| 53        | 0.62                 | 4.04                 | 0.33                 | 0.475                              | 3.565                                 |
| 136       | 0.65                 | 4.74                 | 0.53                 | 0.59                               | 4.15                                  |
| 209       | 0.69                 | 4.95                 | 0.64                 | 0.665                              | 4.285                                 |
| 38        | 0.62                 | 3.51                 | 0.32                 | 0.47                               | 3.04                                  |
| 53        | 0.62                 | 4.26                 | 0.32                 | 0.47                               | 3.79                                  |
| 136       | 0.65                 | 4.76                 | 0.54                 | 0.595                              | 4.165                                 |
| 215       | 0.7                  | 4.97                 | 0.66                 | 0.68                               | 4.29                                  |
| 27        | 0.55                 | 3.2                  | 0.45                 | 0.5                                | 2.7                                   |
| 53        | 0.54                 | 4.24                 | 0.5                  | 0.52                               | 3.72                                  |
| 131       | 0.62                 | 4.77                 | 0.63                 | 0.625                              | 4.145                                 |
| 209       | 0.68                 | 4.96                 | 0.71                 | 0.695                              | 4.265                                 |
| 27        | 0.19                 | 3.41                 | 0.5                  | 0.345                              | 3.065                                 |
| 53        | 0.37                 | 4.13                 | 0.57                 | 0.47                               | 3.66                                  |
| 131       | 0.56                 | 4.17                 | 0.67                 | 0.615                              | 3.555                                 |
| 215       | 0.65                 | 4.96                 | 0.75                 | 0.7                                | 4.26                                  |
| 32        | 0.58                 | 3.41                 | 0.45                 | 0.515                              | 2.895                                 |
| 53        | 0.58                 | 4.2                  | 0.56                 | 0.57                               | 3.63                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 0.62                 | 4.78                 | 0.61                 | 0.615                              | 4.165                                 |
| 209       | 0.69                 | 4.98                 | 0.7                  | 0.695                              | 4.285                                 |
| 27        | 0.61                 | 3.49                 | 0.45                 | 0.53                               | 2.96                                  |
| 58        | 0.61                 | 4.33                 | 0.5                  | 0.555                              | 3.775                                 |
| 131       | 0.64                 | 4.8                  | 0.6                  | 0.62                               | 4.18                                  |
| 209       | 0.71                 | 4.98                 | 0.67                 | 0.69                               | 4.29                                  |
| 27        | 0.63                 | 3.26                 | 0.41                 | 0.52                               | 2.74                                  |
| 53        | 0.63                 | 4.23                 | 0.45                 | 0.54                               | 3.69                                  |
| 131       | 0.63                 | 4.79                 | 0.62                 | 0.625                              | 4.165                                 |
| 209       | 0.69                 | 4.79                 | 0.71                 | 0.7                                | 4.09                                  |
| 22        | 0.6                  | 2.88                 | 0.43                 | 0.515                              | 2.365                                 |
| 53        | 0.6                  | 4.27                 | 0.5                  | 0.55                               | 3.72                                  |
| 131       | 0.64                 | 4.79                 | 0.6                  | 0.62                               | 4.17                                  |
| 209       | 0.7                  | 5                    | 0.7                  | 0.7                                | 4.3                                   |
| 22        | 0.38                 | 2.75                 | 0.49                 | 0.435                              | 2.315                                 |
| 53        | 0.4                  | 3.2                  | 0.56                 | 0.48                               | 2.72                                  |
| 136       | 0.51                 | 3.73                 | 0.7                  | 0.605                              | 3.125                                 |
| 209       | 0.59                 | 4.94                 | 0.77                 | 0.68                               | 4.26                                  |
| 235       | 0.6                  | 5                    | 0.8                  | 0.7                                | 4.3                                   |
| 261       | 0.62                 | 5.05                 | 0.83                 | 0.725                              | 4.325                                 |
| 287       | 0.65                 | 5.12                 | 0.86                 | 0.755                              | 4.365                                 |
| 313- N    | 0.67                 | 5.2                  | 0.9                  | 0.785                              | 4.415                                 |
| 340       | 0.7                  | 5.28                 | 0.93                 | 0.815                              | 4.465                                 |
| 366       | 0.73                 | 5.35                 | 0.96                 | 0.845                              | 4.505                                 |
| 392       | 0.74                 | 5.46                 | 1                    | 0.87                               | 4.59                                  |
| 418       | 0.76                 | 5.55                 | 1.05                 | 0.905                              | 4.645                                 |
| 444       | 0.79                 | 5.64                 | 1.08                 | 0.935                              | 4.705                                 |
| 470       | 0.83                 | 5.7                  | 1.12                 | 0.975                              | 4.725                                 |
| 496- C    | 0.88                 | 5.83                 | 1.17                 | 1.025                              | 4.805                                 |
| 522       | 0.91                 | 5.91                 | 1.19                 | 1.05                               | 4.86                                  |
| 553       | 0.95                 | 6.02                 | 1.21                 | 1.08                               | 4.94                                  |
| 579       | 0.99                 | 6.13                 | 1.24                 | 1.115                              | 5.015                                 |
| 600       | 1.02                 | 6.26                 | 1.22                 | 1.12                               | 5.14                                  |
| 631       | 1.03                 | 6.4                  | 1.34                 | 1.185                              | 5.215                                 |
| 642       | 1.07                 | 6.52                 | 1.43                 | 1.25                               | 5.27                                  |
| 657       | 1.08                 | 6.62                 | 1.48                 | 1.28                               | 5.34                                  |
| 678       | 1.1                  | 6.8                  | 1.54                 | 1.32                               | 5.48                                  |
| 694       | 1.1                  | 7.1                  | 1.6                  | 1.35                               | 5.75                                  |

**Table A.9.67: Test Panel Concrete Cube Strength (C30-25-2-i)**

| Cast Date: 01-12-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 21-02-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.45        | 90            | 37.72                         | 2359                             |
| II                      | 153x153x153 | 8.55        | 88.6          | 37.13                         | 2387                             |
| III                     | 153x153x153 | 8.45        | 83.4          | 34.95                         | 2359                             |
| IV                      | 153x153x153 | 8.5         | 79.2          | 33.19                         | 2373                             |
| Mean                    |             |             |               | 35.75                         | 2370                             |



**Table A.9.68:** Sample 26 (C30-25-2-ii)

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 32        | 0.07                 | 0.32                 | 0.13                 | 0.1                                | 0.22                                  |
| 53        | 0.16                 | 0.68                 | 0.28                 | 0.22                               | 0.46                                  |
| 79        | 0.19                 | 0.85                 | 0.37                 | 0.28                               | 0.57                                  |
| 105       | 0.24                 | 1.1                  | 0.47                 | 0.355                              | 0.745                                 |
| 131       | 0.28                 | 1.32                 | 0.54                 | 0.41                               | 0.91                                  |
| 157       | 0.34                 | 1.46                 | 0.6                  | 0.47                               | 0.99                                  |
| 183       | 0.41                 | 1.61                 | 0.68                 | 0.545                              | 1.065                                 |
| 209       | 0.47                 | 1.76                 | 0.75                 | 0.61                               | 1.15                                  |
| 235       | 0.53                 | 1.88                 | 0.8                  | 0.665                              | 1.215                                 |
| 261       | 0.61                 | 1.99                 | 0.85                 | 0.73                               | 1.26                                  |
| 27        | 0.43                 | 0.36                 | 0.48                 | 0.455                              | -0.095                                |
| 53        | 0.47                 | 0.46                 | 0.53                 | 0.5                                | -0.04                                 |
| 84        | 0.51                 | 1.56                 | 0.58                 | 0.545                              | 1.015                                 |
| 105       | 0.53                 | 1.64                 | 0.63                 | 0.58                               | 1.06                                  |
| 131       | 0.56                 | 1.73                 | 0.67                 | 0.615                              | 1.115                                 |
| 162       | 0.61                 | 1.83                 | 0.73                 | 0.67                               | 1.16                                  |
| 189       | 0.63                 | 1.88                 | 0.76                 | 0.695                              | 1.185                                 |
| 209       | 0.65                 | 1.94                 | 0.8                  | 0.725                              | 1.215                                 |
| 235       | 0.67                 | 1.99                 | 0.84                 | 0.755                              | 1.235                                 |
| 261       | 0.72                 | 2.07                 | 0.88                 | 0.8                                | 1.27                                  |
| 27        | 0.48                 | 1.41                 | 0.48                 | 0.48                               | 0.93                                  |
| 53        | 0.53                 | 1.53                 | 0.55                 | 0.54                               | 0.99                                  |
| 105       | 0.61                 | 1.71                 | 0.64                 | 0.625                              | 1.085                                 |
| 261       | 0.81                 | 2.14                 | 0.86                 | 0.835                              | 1.305                                 |
| 27        | 0.56                 | 1.52                 | 0.53                 | 0.545                              | 0.975                                 |
| 53        | 0.59                 | 1.6                  | 0.56                 | 0.575                              | 1.025                                 |
| 131       | 0.71                 | 1.87                 | 0.68                 | 0.695                              | 1.175                                 |
| 261       | 0.86                 | 2.17                 | 0.84                 | 0.85                               | 1.32                                  |
| 17        | 0.61                 | 1.38                 | 0.43                 | 0.52                               | 0.86                                  |
| 53        | 0.61                 | 1.61                 | 0.55                 | 0.58                               | 1.03                                  |
| 131       | 0.72                 | 1.92                 | 0.71                 | 0.715                              | 1.205                                 |
| 261       | 0.87                 | 2.2                  | 0.85                 | 0.86                               | 1.34                                  |
| 27        | 0.67                 | 1.56                 | 0.51                 | 0.59                               | 0.97                                  |
| 53        | 0.66                 | 1.69                 | 0.56                 | 0.61                               | 1.08                                  |
| 131       | 0.76                 | 1.96                 | 0.69                 | 0.725                              | 1.235                                 |
| 267       | 0.91                 | 2.26                 | 0.85                 | 0.88                               | 1.38                                  |
| 27        | 0.66                 | 1.53                 | 0.49                 | 0.575                              | 0.955                                 |
| 53        | 0.65                 | 1.69                 | 0.55                 | 0.6                                | 1.09                                  |
| 131       | 0.78                 | 1.99                 | 0.69                 | 0.735                              | 1.255                                 |
| 267       | 0.93                 | 2.28                 | 0.84                 | 0.885                              | 1.395                                 |
| 17        | 0.63                 | 1.46                 | 0.46                 | 0.545                              | 0.915                                 |
| 53        | 0.65                 | 1.67                 | 0.54                 | 0.595                              | 1.075                                 |
| 131       | 0.78                 | 2                    | 0.71                 | 0.745                              | 1.255                                 |
| 261       | 0.93                 | 2.28                 | 0.86                 | 0.895                              | 1.385                                 |
| 22        | 0.63                 | 1.55                 | 0.49                 | 0.56                               | 0.99                                  |
| 53        | 0.67                 | 1.73                 | 0.56                 | 0.615                              | 1.115                                 |
| 131       | 0.8                  | 2.02                 | 0.7                  | 0.75                               | 1.27                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 261       | 0.95                 | 2.29                 | 0.84                 | 0.895                              | 1.395                                 |
| 27        | 0.63                 | 1.58                 | 0.56                 | 0.595                              | 0.985                                 |
| 53        | 0.68                 | 1.74                 | 0.56                 | 0.62                               | 1.12                                  |
| 131       | 0.81                 | 2.03                 | 0.71                 | 0.76                               | 1.27                                  |
| 261       | 0.94                 | 2.3                  | 0.85                 | 0.895                              | 1.405                                 |
| 27        | 0.63                 | 1.58                 | 0.56                 | 0.595                              | 0.985                                 |
| 58        | 0.7                  | 1.76                 | 0.57                 | 0.635                              | 1.125                                 |
| 131       | 0.82                 | 2.03                 | 0.7                  | 0.76                               | 1.27                                  |
| 261       | 0.95                 | 2.32                 | 0.85                 | 0.9                                | 1.42                                  |
| 27        | 0.65                 | 1.61                 | 0.5                  | 0.575                              | 1.035                                 |
| 58        | 0.71                 | 1.77                 | 0.58                 | 0.645                              | 1.125                                 |
| 131       | 0.83                 | 2.05                 | 0.71                 | 0.77                               | 1.28                                  |
| 261       | 0.97                 | 2.33                 | 0.84                 | 0.905                              | 1.425                                 |
| 22        | 0.61                 | 1.41                 | 0.5                  | 0.555                              | 0.855                                 |
| 53        | 0.68                 | 1.74                 | 0.6                  | 0.64                               | 1.1                                   |
| 131       | 0.81                 | 2.05                 | 0.74                 | 0.775                              | 1.275                                 |
| 261       | 0.95                 | 2.33                 | 0.87                 | 0.91                               | 1.42                                  |
| 22        | 0.61                 | 1.58                 | 0.5                  | 0.555                              | 1.025                                 |
| 53        | 0.7                  | 1.77                 | 0.58                 | 0.64                               | 1.13                                  |
| 131       | 0.84                 | 2.08                 | 0.74                 | 0.79                               | 1.29                                  |
| 261       | 0.97                 | 2.35                 | 0.86                 | 0.915                              | 1.435                                 |
| 27        | 0.69                 | 1.66                 | 0.52                 | 0.605                              | 1.055                                 |
| 53        | 0.73                 | 1.81                 | 0.58                 | 0.655                              | 1.155                                 |
| 131       | 0.86                 | 2.08                 | 0.71                 | 0.785                              | 1.295                                 |
| 261       | 0.98                 | 2.34                 | 0.85                 | 0.915                              | 1.425                                 |
| 27        | 0.65                 | 1.62                 | 0.51                 | 0.58                               | 1.04                                  |
| 53        | 0.71                 | 1.78                 | 0.58                 | 0.645                              | 1.135                                 |
| 131       | 0.86                 | 2.09                 | 0.72                 | 0.79                               | 1.3                                   |
| 261       | 0.99                 | 2.35                 | 0.85                 | 0.92                               | 1.43                                  |
| 27        | 0.71                 | 1.62                 | 0.5                  | 0.605                              | 1.015                                 |
| 53        | 0.77                 | 1.82                 | 0.58                 | 0.675                              | 1.145                                 |
| 131       | 0.87                 | 2.1                  | 0.71                 | 0.79                               | 1.31                                  |
| 261       | 0.98                 | 2.35                 | 0.85                 | 0.915                              | 1.435                                 |
| 27        | 0.67                 | 1.67                 | 0.53                 | 0.6                                | 1.07                                  |
| 53        | 0.71                 | 1.78                 | 0.59                 | 0.65                               | 1.13                                  |
| 131       | 0.86                 | 2.1                  | 0.73                 | 0.795                              | 1.305                                 |
| 261       | 1                    | 2.37                 | 0.86                 | 0.93                               | 1.44                                  |
| 27        | 0.73                 | 1.68                 | 0.53                 | 0.63                               | 1.05                                  |
| 53        | 0.76                 | 1.84                 | 0.6                  | 0.68                               | 1.16                                  |
| 131       | 0.86                 | 2.11                 | 0.73                 | 0.795                              | 1.315                                 |
| 261       | 0.99                 | 2.37                 | 0.87                 | 0.93                               | 1.44                                  |
| 27        | 0.72                 | 1.7                  | 0.53                 | 0.625                              | 1.075                                 |
| 53        | 0.77                 | 1.84                 | 0.59                 | 0.68                               | 1.16                                  |
| 131       | 0.89                 | 2.13                 | 0.72                 | 0.805                              | 1.325                                 |
| 261       | 1                    | 2.38                 | 0.85                 | 0.925                              | 1.455                                 |
| 27        | 0.69                 | 1.65                 | 0.54                 | 0.615                              | 1.035                                 |
| 53        | 0.72                 | 1.79                 | 0.6                  | 0.66                               | 1.13                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 0.86                 | 2.11                 | 0.75                 | 0.805                              | 1.305                                 |
| 261       | 0.99                 | 2.37                 | 0.87                 | 0.93                               | 1.44                                  |
| 22        | 0.67                 | 1.64                 | 0.53                 | 0.6                                | 1.04                                  |
| 53        | 0.74                 | 1.81                 | 0.59                 | 0.665                              | 1.145                                 |
| 131       | 0.89                 | 2.13                 | 0.73                 | 0.81                               | 1.32                                  |
| 261       | 1.02                 | 2.38                 | 0.85                 | 0.935                              | 1.445                                 |
| 27        | 0.71                 | 1.68                 | 0.54                 | 0.625                              | 1.055                                 |
| 64        | 0.78                 | 1.88                 | 0.61                 | 0.695                              | 1.185                                 |
| 131       | 0.9                  | 2.13                 | 0.72                 | 0.81                               | 1.32                                  |
| 261       | 1.02                 | 2.39                 | 0.8                  | 0.91                               | 1.48                                  |
| 22        | 0.66                 | 1.6                  | 0.51                 | 0.585                              | 1.015                                 |
| 53        | 0.74                 | 1.81                 | 0.6                  | 0.67                               | 1.14                                  |
| 131       | 0.9                  | 2.14                 | 0.72                 | 0.81                               | 1.33                                  |
| 261       | 1.03                 | 2.39                 | 0.85                 | 0.94                               | 1.45                                  |
| 27        | 0.73                 | 1.64                 | 0.46                 | 0.595                              | 1.045                                 |
| 53        | 0.81                 | 1.87                 | 0.56                 | 0.685                              | 1.185                                 |
| 131       | 0.94                 | 2.15                 | 0.7                  | 0.82                               | 1.33                                  |
| 261       | 1.05                 | 2.41                 | 0.82                 | 0.935                              | 1.475                                 |
| 27        | 0.77                 | 1.56                 | 0.4                  | 0.585                              | 0.975                                 |
| 53        | 0.83                 | 1.77                 | 0.47                 | 0.65                               | 1.12                                  |
| 131       | 0.97                 | 2.14                 | 0.65                 | 0.81                               | 1.33                                  |
| 261       | 1.07                 | 2.44                 | 0.8                  | 0.935                              | 1.505                                 |
| 287       | 1.1                  | 2.47                 | 0.82                 | 0.96                               | 1.51                                  |
| 313       | 1.12                 | 2.52                 | 0.85                 | 0.985                              | 1.535                                 |
| 340       | 1.16                 | 2.57                 | 0.88                 | 1.02                               | 1.55                                  |
| 366       | 1.2                  | 2.64                 | 0.9                  | 1.05                               | 1.59                                  |
| 397       | 1.27                 | 2.7                  | 0.93                 | 1.1                                | 1.6                                   |
| 418       | 1.3                  | 2.76                 | 0.96                 | 1.13                               | 1.63                                  |
| 444       | 1.36                 | 2.83                 | 1                    | 1.18                               | 1.65                                  |
| 470       | 1.42                 | 2.93                 | 1.04                 | 1.23                               | 1.7                                   |
| 496       | 1.48                 | 3.03                 | 1.08                 | 1.28                               | 1.75                                  |
| 522       | 1.55                 | 3.12                 | 1.15                 | 1.35                               | 1.77                                  |
| 543       | 1.63                 | 3.27                 | 1.23                 | 1.43                               | 1.84                                  |
| 574- N    | 1.68                 | 3.36                 | 1.28                 | 1.48                               | 1.88                                  |
| 600       | 1.78                 | 3.46                 | 1.32                 | 1.55                               | 1.91                                  |
| 631       | 1.85                 | 3.6                  | 1.39                 | 1.62                               | 1.98                                  |
| 652       | 1.9                  | 3.7                  | 1.42                 | 1.66                               | 2.04                                  |
| 678       | 2.05                 | 3.84                 | 1.5                  | 1.775                              | 2.065                                 |
| 694       | 2.07                 | 3.92                 | 1.54                 | 1.805                              | 2.115                                 |
| 714       | 2.11                 | 4                    | 1.6                  | 1.855                              | 2.145                                 |
| 735       | 2.15                 | 4.18                 | 1.65                 | 1.9                                | 2.28                                  |
| 761- C    | 2.22                 | 4.44                 | 1.75                 | 1.985                              | 2.455                                 |
| 782       | 2.26                 | 4.61                 | 1.88                 | 2.07                               | 2.54                                  |
| 803       | 2.3                  | 4.79                 | 1.9                  | 2.1                                | 2.69                                  |

**Table A.9.69: Test Panel Concrete Cube Strength (C30-25-2-ii)**

| Cast Date: 21-12-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 23-02-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.5         | 74.6          | 31.26                         | 2373                             |
| II                      | 153x153x153 | 8.4         | 74.2          | 31.09                         | 2345                             |
| III                     | 153x153x153 | 8.5         | 74.4          | 31.18                         | 2373                             |
| IV                      | 153x153x153 | 8.55        | 75.6          | 31.68                         | 2387                             |
| Mean                    |             |             |               | 31.30                         | 2370                             |

**Table A.9.70: CFST Concrete Cube Strength (C30-25-2-ii)**

| Cast Date: 27-07-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 23-12-2005 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.2         | 70.1          | 29.38                         | 2289                             |
| II                      | 153x153x154 | 8.25        | 69.6          | 29.17                         | 2303                             |
| III                     | 153x153x154 | 8.15        | 71            | 29.75                         | 2276                             |
| IV                      | 153x153x153 | 8.2         | 70.1          | 29.38                         | 2289                             |
| Mean                    |             |             |               | 29.43                         | 2289                             |



**Table A.9.71: Sample 30 (C30-25-2-iii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.14                 | 0.34                 | 0.1                  | 0.12                               | 0.22                                  |
| 53        | 0.23                 | 0.6                  | 0.2                  | 0.215                              | 0.385                                 |
| 79        | 0.3                  | 0.84                 | 0.28                 | 0.29                               | 0.55                                  |
| 105       | 0.35                 | 0.99                 | 0.33                 | 0.34                               | 0.65                                  |
| 131       | 0.4                  | 1.14                 | 0.38                 | 0.39                               | 0.75                                  |
| 157       | 0.5                  | 1.31                 | 0.44                 | 0.47                               | 0.84                                  |
| 183       | 0.55                 | 1.44                 | 0.49                 | 0.52                               | 0.92                                  |
| 209       | 0.64                 | 1.56                 | 0.53                 | 0.585                              | 0.975                                 |
| 235       | 0.72                 | 1.68                 | 0.55                 | 0.635                              | 1.045                                 |
| 261       | 0.8                  | 1.8                  | 0.6                  | 0.7                                | 1.1                                   |
| 22        | 0.52                 | 0.99                 | 0.28                 | 0.4                                | 0.59                                  |
| 53        | 0.57                 | 1.2                  | 0.32                 | 0.445                              | 0.755                                 |
| 79        | 0.62                 | 1.35                 | 0.36                 | 0.49                               | 0.86                                  |
| 105       | 0.67                 | 1.45                 | 0.39                 | 0.53                               | 0.92                                  |
| 131       | 0.72                 | 1.56                 | 0.43                 | 0.575                              | 0.985                                 |
| 157       | 0.75                 | 1.64                 | 0.45                 | 0.6                                | 1.04                                  |
| 183       | 0.79                 | 1.71                 | 0.46                 | 0.625                              | 1.085                                 |
| 209       | 0.82                 | 1.77                 | 0.48                 | 0.65                               | 1.12                                  |
| 235       | 0.84                 | 1.82                 | 0.5                  | 0.67                               | 1.15                                  |
| 261       | 0.88                 | 1.9                  | 0.53                 | 0.705                              | 1.195                                 |
| 27        | 0.62                 | 1.01                 | 0.28                 | 0.45                               | 0.56                                  |
| 53        | 0.67                 | 1.23                 | 0.28                 | 0.475                              | 0.755                                 |
| 136       | 0.8                  | 1.65                 | 0.44                 | 0.62                               | 1.03                                  |
| 261       | 0.92                 | 1.94                 | 0.51                 | 0.715                              | 1.225                                 |
| 32        | 0.65                 | 1.09                 | 0.29                 | 0.47                               | 0.62                                  |
| 53        | 0.69                 | 1.32                 | 0.43                 | 0.56                               | 0.76                                  |
| 131       | 0.79                 | 1.66                 | 0.43                 | 0.61                               | 1.05                                  |
| 261       | 0.93                 | 1.96                 | 0.54                 | 0.735                              | 1.225                                 |
| 27        | 0.69                 | 0.78                 | 0.26                 | 0.475                              | 0.305                                 |
| 53        | 0.75                 | 1.18                 | 0.27                 | 0.51                               | 0.67                                  |
| 131       | 0.85                 | 1.66                 | 0.4                  | 0.625                              | 1.035                                 |
| 261       | 0.98                 | 1.99                 | 0.54                 | 0.76                               | 1.23                                  |
| 27        | 0.67                 | 0.94                 | 0.24                 | 0.455                              | 0.485                                 |
| 53        | 0.72                 | 1.35                 | 0.3                  | 0.51                               | 0.84                                  |
| 131       | 0.83                 | 1.72                 | 0.45                 | 0.64                               | 1.08                                  |
| 261       | 0.95                 | 2                    | 0.55                 | 0.75                               | 1.25                                  |
| 22        | 0.63                 | 1.1                  | 0.28                 | 0.455                              | 0.645                                 |
| 53        | 0.69                 | 1.36                 | 0.34                 | 0.515                              | 0.845                                 |
| 131       | 0.81                 | 1.73                 | 0.47                 | 0.64                               | 1.09                                  |
| 261       | 0.93                 | 2.02                 | 0.57                 | 0.75                               | 1.27                                  |
| 27        | 0.69                 | 0.83                 | 0.24                 | 0.465                              | 0.365                                 |
| 53        | 0.78                 | 1.32                 | 0.26                 | 0.52                               | 0.8                                   |
| 136       | 0.87                 | 1.76                 | 0.44                 | 0.655                              | 1.105                                 |
| 261       | 0.97                 | 2.04                 | 0.57                 | 0.77                               | 1.27                                  |
| 22        | 0.66                 | 0.78                 | 0.24                 | 0.45                               | 0.33                                  |
| 53        | 0.75                 | 1.25                 | 0.27                 | 0.51                               | 0.74                                  |
| 136       | 0.9                  | 1.8                  | 0.43                 | 0.665                              | 1.135                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 261       | 0.98                 | 2.06                 | 0.55                 | 0.765                              | 1.295                                 |
| 27        | 0.71                 | 0.89                 | 0.28                 | 0.495                              | 0.395                                 |
| 53        | 0.79                 | 1.34                 | 0.3                  | 0.545                              | 0.795                                 |
| 136       | 0.89                 | 1.81                 | 0.45                 | 0.67                               | 1.14                                  |
| 261       | 0.98                 | 2.07                 | 0.57                 | 0.775                              | 1.295                                 |
| 27        | 0.69                 | 0.75                 | 0.26                 | 0.475                              | 0.275                                 |
| 53        | 0.77                 | 1.19                 | 0.29                 | 0.53                               | 0.66                                  |
| 131       | 0.9                  | 1.8                  | 0.42                 | 0.66                               | 1.14                                  |
| 261       | 1                    | 2.09                 | 0.54                 | 0.77                               | 1.32                                  |
| 27        | 0.74                 | 1                    | 0.3                  | 0.52                               | 0.48                                  |
| 53        | 0.8                  | 1.35                 | 0.3                  | 0.55                               | 0.8                                   |
| 136       | 0.9                  | 1.83                 | 0.44                 | 0.67                               | 1.16                                  |
| 261       | 0.99                 | 2.09                 | 0.56                 | 0.775                              | 1.315                                 |
| 22        | 0.69                 | 0.75                 | 0.28                 | 0.485                              | 0.265                                 |
| 53        | 0.78                 | 1.18                 | 0.3                  | 0.54                               | 0.64                                  |
| 131       | 0.92                 | 1.8                  | 0.38                 | 0.65                               | 1.15                                  |
| 261       | 1.01                 | 2.11                 | 0.52                 | 0.765                              | 1.345                                 |
| 38        | 0.79                 | 0.97                 | 0.25                 | 0.52                               | 0.45                                  |
| 69        | 0.85                 | 1.52                 | 0.29                 | 0.57                               | 0.95                                  |
| 136       | 0.93                 | 1.84                 | 0.41                 | 0.67                               | 1.17                                  |
| 261       | 0.99                 | 2.12                 | 0.56                 | 0.775                              | 1.345                                 |
| 17        | 0.65                 | 1.03                 | 0.29                 | 0.47                               | 0.56                                  |
| 53        | 0.75                 | 1.52                 | 0.4                  | 0.575                              | 0.945                                 |
| 131       | 0.82                 | 1.82                 | 0.51                 | 0.665                              | 1.155                                 |
| 261       | 0.94                 | 2.11                 | 0.61                 | 0.775                              | 1.335                                 |
| 27        | 0.73                 | 0.94                 | 0.3                  | 0.515                              | 0.425                                 |
| 53        | 0.81                 | 1.39                 | 0.32                 | 0.565                              | 0.825                                 |
| 131       | 0.91                 | 1.85                 | 0.47                 | 0.69                               | 1.16                                  |
| 261       | 0.99                 | 2.14                 | 0.6                  | 0.795                              | 1.345                                 |
| 27        | 0.73                 | 0.83                 | 0.3                  | 0.515                              | 0.315                                 |
| 53        | 0.81                 | 1.23                 | 0.32                 | 0.565                              | 0.665                                 |
| 131       | 0.95                 | 1.8                  | 0.48                 | 0.715                              | 1.085                                 |
| 261       | 1.05                 | 2.16                 | 0.66                 | 0.855                              | 1.305                                 |
| 17        | 0.65                 | 1.23                 | 0.33                 | 0.49                               | 0.74                                  |
| 53        | 0.73                 | 1.52                 | 0.41                 | 0.57                               | 0.95                                  |
| 116       | 0.8                  | 1.8                  | 0.51                 | 0.655                              | 1.145                                 |
| 261       | 0.95                 | 2.16                 | 0.63                 | 0.79                               | 1.37                                  |
| 12        | 0.6                  | 1.11                 | 0.32                 | 0.46                               | 0.65                                  |
| 53        | 0.72                 | 1.56                 | 0.45                 | 0.585                              | 0.975                                 |
| 131       | 0.81                 | 1.89                 | 0.58                 | 0.695                              | 1.195                                 |
| 261       | 0.95                 | 2.17                 | 0.68                 | 0.815                              | 1.355                                 |
| 17        | 0.63                 | 1.2                  | 0.45                 | 0.54                               | 0.66                                  |
| 53        | 0.7                  | 1.58                 | 0.45                 | 0.575                              | 1.005                                 |
| 136       | 0.82                 | 1.91                 | 0.57                 | 0.695                              | 1.215                                 |
| 261       | 0.94                 | 2.08                 | 0.68                 | 0.81                               | 1.27                                  |
| 6         | 0.59                 | 0.91                 | 0.3                  | 0.445                              | 0.465                                 |
| 53        | 0.76                 | 1.56                 | 0.41                 | 0.585                              | 0.975                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 0.87                 | 1.93                 | 0.55                 | 0.71                               | 1.22                                  |
| 261       | 0.95                 | 2.21                 | 0.67                 | 0.81                               | 1.4                                   |
| 22        | 0.73                 | 0.82                 | 0.34                 | 0.535                              | 0.285                                 |
| 53        | 0.83                 | 1.29                 | 0.36                 | 0.595                              | 0.695                                 |
| 131       | 0.95                 | 1.92                 | 0.51                 | 0.73                               | 1.19                                  |
| 267       | 1.05                 | 2.24                 | 0.66                 | 0.855                              | 1.385                                 |
| 27        | 0.76                 | 1.04                 | 0.36                 | 0.56                               | 0.48                                  |
| 53        | 0.85                 | 1.57                 | 0.39                 | 0.62                               | 0.95                                  |
| 131       | 0.94                 | 1.95                 | 0.55                 | 0.745                              | 1.205                                 |
| 261       | 1                    | 2.24                 | 0.65                 | 0.825                              | 1.415                                 |
| 27        | 0.75                 | 1                    | 0.34                 | 0.545                              | 0.455                                 |
| 53        | 0.83                 | 1.36                 | 0.37                 | 0.6                                | 0.76                                  |
| 136       | 0.97                 | 1.97                 | 0.48                 | 0.725                              | 1.245                                 |
| 261       | 1.05                 | 2.24                 | 0.62                 | 0.835                              | 1.405                                 |
| 27        | 0.79                 | 1.01                 | 0.36                 | 0.575                              | 0.435                                 |
| 53        | 0.85                 | 1.33                 | 0.36                 | 0.605                              | 0.725                                 |
| 136       | 0.98                 | 1.96                 | 0.47                 | 0.725                              | 1.235                                 |
| 277       | 1.07                 | 2.27                 | 0.62                 | 0.845                              | 1.425                                 |
| 27        | 0.79                 | 1.41                 | 0.38                 | 0.585                              | 0.825                                 |
| 58        | 0.82                 | 1.64                 | 0.43                 | 0.625                              | 1.015                                 |
| 131       | 0.9                  | 1.99                 | 0.56                 | 0.73                               | 1.26                                  |
| 261       | 1                    | 2.26                 | 0.67                 | 0.835                              | 1.425                                 |
| 287       | 1.01                 | 2.3                  | 0.69                 | 0.85                               | 1.45                                  |
| 313       | 1.03                 | 2.35                 | 0.7                  | 0.865                              | 1.485                                 |
| 345       | 1.05                 | 2.4                  | 0.72                 | 0.885                              | 1.515                                 |
| 366       | 1.07                 | 2.45                 | 0.73                 | 0.9                                | 1.55                                  |
| 392       | 1.11                 | 2.54                 | 0.77                 | 0.94                               | 1.6                                   |
| 418       | 1.15                 | 2.63                 | 0.82                 | 0.985                              | 1.645                                 |
| 444       | 1.18                 | 2.7                  | 0.88                 | 1.03                               | 1.67                                  |
| 470- N    | 1.23                 | 2.8                  | 0.94                 | 1.085                              | 1.715                                 |
| 496       | 1.31                 | 2.92                 | 0.99                 | 1.15                               | 1.77                                  |
| 522       | 1.39                 | 3.03                 | 1.02                 | 1.205                              | 1.825                                 |
| 543       | 1.45                 | 3.12                 | 1.07                 | 1.26                               | 1.86                                  |
| 569       | 1.51                 | 3.2                  | 1.13                 | 1.32                               | 1.88                                  |
| 595       | 1.6                  | 3.34                 | 1.2                  | 1.4                                | 1.94                                  |
| 621       | 1.64                 | 3.41                 | 1.22                 | 1.43                               | 1.98                                  |
| 642- C    | 1.72                 | 3.55                 | 1.29                 | 1.505                              | 2.045                                 |
| 662       | 1.77                 | 3.72                 | 1.33                 | 1.55                               | 2.17                                  |
| 688       | 1.82                 | 3.8                  | 1.38                 | 1.6                                | 2.2                                   |
| 714       | 1.85                 | 3.92                 | 1.42                 | 1.635                              | 2.285                                 |
| 735       | 1.91                 | 4.06                 | 1.45                 | 1.68                               | 2.38                                  |
| 751       | 1.92                 | 4.18                 | 1.48                 | 1.7                                | 2.48                                  |
| 766       | 1.97                 | 4.35                 | 1.57                 | 1.77                               | 2.58                                  |
| 782       | 2                    | 4.5                  | 1.7                  | 1.85                               | 2.65                                  |
| 798       | 2.02                 | 4.7                  | 1.7                  | 1.86                               | 2.84                                  |

**Table A.9.72: Test Panel Concrete Cube Strength (C30-25-2-iii)**

| Cast Date: 05-01-2006   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 01-03-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.65        | 89.4          | 37.46                         | 2415                             |
| II                      | 153x153x153 | 8.75        | 95.2          | 39.90                         | 2443                             |
| III                     | 153x153x153 | 8.65        | 87.6          | 36.71                         | 2415                             |
| IV                      | 153x153x153 | 8.6         | 95.4          | 39.98                         | 2401                             |
| Mean                    |             |             |               | 38.51                         | 2419                             |



**Table A.9.73: Sample 23 (C45-25-2-i)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.2                  | 0.94                 | 0.19                 | 0.195                              | 0.745                                 |
| 53        | 0.32                 | 1.23                 | 0.34                 | 0.33                               | 0.9                                   |
| 79        | 0.43                 | 1.43                 | 0.44                 | 0.435                              | 0.995                                 |
| 105       | 0.5                  | 1.55                 | 0.52                 | 0.51                               | 1.04                                  |
| 131       | 0.58                 | 1.7                  | 0.59                 | 0.585                              | 1.115                                 |
| 157       | 0.67                 | 1.85                 | 0.66                 | 0.665                              | 1.185                                 |
| 183       | 0.73                 | 1.95                 | 0.72                 | 0.725                              | 1.225                                 |
| 209       | 0.92                 | 2.59                 | 0.91                 | 0.915                              | 1.675                                 |
| 38        | 0.7                  | 1.24                 | 0.69                 | 0.695                              | 0.545                                 |
| 53        | 0.73                 | 1.29                 | 0.72                 | 0.725                              | 0.565                                 |
| 84        | 0.78                 | 1.35                 | 0.78                 | 0.78                               | 0.57                                  |
| 105       | 0.81                 | 1.4                  | 0.82                 | 0.815                              | 0.585                                 |
| 136       | 0.84                 | 1.46                 | 0.87                 | 0.855                              | 0.605                                 |
| 157       | 0.86                 | 1.52                 | 0.9                  | 0.88                               | 0.64                                  |
| 183       | 0.89                 | 1.59                 | 0.95                 | 0.92                               | 0.67                                  |
| 209       | 0.93                 | 1.7                  | 1                    | 0.965                              | 0.735                                 |
| 38        | 0.67                 | 1.18                 | 0.77                 | 0.72                               | 0.46                                  |
| 53        | 0.68                 | 1.21                 | 0.78                 | 0.73                               | 0.48                                  |
| 131       | 0.79                 | 1.44                 | 0.99                 | 0.89                               | 0.55                                  |
| 209       | 0.9                  | 1.71                 | 1.09                 | 0.995                              | 0.715                                 |
| 27        | 0.67                 | 1.21                 | 0.8                  | 0.735                              | 0.475                                 |
| 53        | 0.72                 | 1.27                 | 0.87                 | 0.795                              | 0.475                                 |
| 131       | 0.81                 | 1.49                 | 1.02                 | 0.915                              | 0.575                                 |
| 215       | 0.9                  | 1.74                 | 1.14                 | 1.02                               | 0.72                                  |
| 17        | 0.6                  | 0.9                  | 0.76                 | 0.68                               | 0.22                                  |
| 53        | 0.68                 | 1.04                 | 0.88                 | 0.78                               | 0.26                                  |
| 131       | 0.78                 | 1.33                 | 1.07                 | 0.925                              | 0.405                                 |
| 209       | 0.91                 | 1.73                 | 1.18                 | 1.045                              | 0.685                                 |
| 12        | 0.56                 | 0.71                 | 0.75                 | 0.655                              | 0.055                                 |
| 53        | 0.71                 | 1.17                 | 0.88                 | 0.795                              | 0.375                                 |
| 136       | 0.84                 | 1.55                 | 1.06                 | 0.95                               | 0.6                                   |
| 209       | 0.93                 | 1.85                 | 1.16                 | 1.045                              | 0.805                                 |
| 38        | 0.8                  | 1.5                  | 0.88                 | 0.84                               | 0.66                                  |
| 69        | 0.85                 | 1.58                 | 0.94                 | 0.895                              | 0.685                                 |
| 131       | 0.95                 | 1.76                 | 1.02                 | 0.985                              | 0.775                                 |
| 215       | 1.01                 | 2                    | 1.13                 | 1.07                               | 0.93                                  |
| 27        | 0.77                 | 1.53                 | 0.87                 | 0.82                               | 0.71                                  |
| 53        | 0.82                 | 1.61                 | 0.93                 | 0.875                              | 0.735                                 |
| 131       | 0.92                 | 1.8                  | 1.06                 | 0.99                               | 0.81                                  |
| 209       | 0.99                 | 1.98                 | 1.14                 | 1.065                              | 0.915                                 |
| 32        | 0.82                 | 1.61                 | 0.89                 | 0.855                              | 0.755                                 |
| 53        | 0.85                 | 1.67                 | 0.92                 | 0.885                              | 0.785                                 |
| 131       | 0.78                 | 1.87                 | 1.03                 | 0.905                              | 0.965                                 |
| 215       | 1.04                 | 2.05                 | 1.13                 | 1.085                              | 0.965                                 |
| 27        | 0.72                 | 1.38                 | 0.83                 | 0.775                              | 0.605                                 |
| 53        | 0.78                 | 1.47                 | 0.92                 | 0.85                               | 0.62                                  |
| 131       | 0.87                 | 1.73                 | 1.08                 | 0.975                              | 0.755                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 0.98                 | 2.03                 | 1.17                 | 1.075                              | 0.955                                 |
| 22        | 0.78                 | 1.61                 | 0.83                 | 0.805                              | 0.805                                 |
| 53        | 0.87                 | 1.73                 | 0.92                 | 0.895                              | 0.835                                 |
| 131       | 0.99                 | 1.93                 | 1.04                 | 1.015                              | 0.915                                 |
| 209       | 1.06                 | 2.09                 | 1.13                 | 1.095                              | 0.995                                 |
| 22        | 0.78                 | 1.65                 | 0.83                 | 0.805                              | 0.845                                 |
| 53        | 0.86                 | 1.75                 | 0.92                 | 0.89                               | 0.86                                  |
| 136       | 0.99                 | 1.97                 | 1.06                 | 1.025                              | 0.945                                 |
| 209       | 1.05                 | 2.09                 | 1.14                 | 1.095                              | 0.995                                 |
| 27        | 0.83                 | 1.71                 | 0.87                 | 0.85                               | 0.86                                  |
| 53        | 0.91                 | 1.8                  | 0.94                 | 0.925                              | 0.875                                 |
| 131       | 1.02                 | 1.98                 | 1.04                 | 1.03                               | 0.95                                  |
| 215       | 1.08                 | 2.11                 | 1.14                 | 1.11                               | 1                                     |
| 27        | 0.82                 | 1.7                  | 0.86                 | 0.84                               | 0.86                                  |
| 53        | 0.88                 | 1.8                  | 0.93                 | 0.905                              | 0.895                                 |
| 131       | 1.02                 | 1.99                 | 1.04                 | 1.03                               | 0.96                                  |
| 215       | 1.09                 | 2.12                 | 1.14                 | 1.115                              | 1.005                                 |
| 32        | 0.87                 | 1.75                 | 0.9                  | 0.885                              | 0.865                                 |
| 53        | 0.9                  | 1.81                 | 0.93                 | 0.915                              | 0.895                                 |
| 131       | 1.02                 | 2                    | 1.04                 | 1.03                               | 0.97                                  |
| 209       | 1.09                 | 2.12                 | 1.14                 | 1.115                              | 1.005                                 |
| 22        | 0.83                 | 1.71                 | 0.85                 | 0.84                               | 0.87                                  |
| 53        | 0.89                 | 1.81                 | 0.92                 | 0.905                              | 0.905                                 |
| 131       | 1.02                 | 2                    | 1.04                 | 1.03                               | 0.97                                  |
| 220       | 1.1                  | 2.13                 | 1.14                 | 1.12                               | 1.01                                  |
| 22        | 0.87                 | 1.74                 | 0.85                 | 0.86                               | 0.88                                  |
| 53        | 0.94                 | 1.83                 | 0.91                 | 0.925                              | 0.905                                 |
| 136       | 1.04                 | 2.02                 | 1.04                 | 1.04                               | 0.98                                  |
| 209       | 1.11                 | 2.13                 | 1.13                 | 1.12                               | 1.01                                  |
| 27        | 0.92                 | 1.75                 | 0.86                 | 0.89                               | 0.86                                  |
| 53        | 0.97                 | 1.83                 | 0.9                  | 0.935                              | 0.895                                 |
| 142       | 1.1                  | 2.02                 | 1.03                 | 1.065                              | 0.955                                 |
| 209       | 1.15                 | 2.15                 | 1.11                 | 1.13                               | 1.02                                  |
| 27        | 0.91                 | 1.8                  | 0.88                 | 0.895                              | 0.905                                 |
| 53        | 0.97                 | 1.88                 | 0.91                 | 0.94                               | 0.94                                  |
| 131       | 1.08                 | 2.04                 | 1.03                 | 1.055                              | 0.985                                 |
| 209       | 1.14                 | 2.16                 | 1.12                 | 1.13                               | 1.03                                  |
| 32        | 0.81                 | 1.54                 | 0.9                  | 0.855                              | 0.685                                 |
| 53        | 0.83                 | 1.65                 | 0.94                 | 0.885                              | 0.765                                 |
| 131       | 0.94                 | 1.92                 | 1.1                  | 1.02                               | 0.9                                   |
| 209       | 1.02                 | 2.13                 | 1.2                  | 1.11                               | 1.02                                  |
| 22        | 0.85                 | 1.75                 | 0.86                 | 0.855                              | 0.895                                 |
| 58        | 0.92                 | 1.88                 | 0.94                 | 0.93                               | 0.95                                  |
| 131       | 1.04                 | 2.06                 | 1.06                 | 1.05                               | 1.01                                  |
| 220       | 1.12                 | 2.19                 | 1.16                 | 1.14                               | 1.05                                  |
| 27        | 0.88                 | 1.79                 | 0.86                 | 0.87                               | 0.92                                  |
| 53        | 0.95                 | 1.88                 | 0.9                  | 0.925                              | 0.955                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 136       | 1.09                 | 2.09                 | 1.04                 | 1.065                              | 1.025                                 |
| 209       | 1.13                 | 2.19                 | 1.15                 | 1.14                               | 1.05                                  |
| 17        | 0.85                 | 1.75                 | 0.83                 | 0.84                               | 0.91                                  |
| 53        | 0.95                 | 1.9                  | 0.91                 | 0.93                               | 0.97                                  |
| 131       | 1.09                 | 2.08                 | 1.04                 | 1.065                              | 1.015                                 |
| 209       | 1.15                 | 2.19                 | 1.14                 | 1.145                              | 1.045                                 |
| 17        | 0.88                 | 1.76                 | 0.82                 | 0.85                               | 0.91                                  |
| 53        | 0.98                 | 1.89                 | 0.89                 | 0.935                              | 0.955                                 |
| 142       | 1.1                  | 2.09                 | 1.04                 | 1.07                               | 1.02                                  |
| 209       | 1.15                 | 2.19                 | 1.13                 | 1.14                               | 1.05                                  |
| 43        | 0.95                 | 1.86                 | 0.89                 | 0.92                               | 0.94                                  |
| 53        | 1.01                 | 1.94                 | 0.92                 | 0.965                              | 0.975                                 |
| 131       | 1.1                  | 2.07                 | 1.04                 | 1.07                               | 1                                     |
| 209       | 1.17                 | 2.2                  | 1.14                 | 1.155                              | 1.045                                 |
| 27        | 0.9                  | 1.84                 | 0.9                  | 0.9                                | 0.94                                  |
| 53        | 0.95                 | 1.93                 | 0.95                 | 0.95                               | 0.98                                  |
| 131       | 1.06                 | 2.09                 | 1.07                 | 1.065                              | 1.025                                 |
| 209       | 1.13                 | 2.2                  | 1.16                 | 1.145                              | 1.055                                 |
| 235       | 1.14                 | 2.22                 | 1.19                 | 1.165                              | 1.055                                 |
| 261       | 1.16                 | 2.25                 | 1.22                 | 1.19                               | 1.06                                  |
| 287       | 1.18                 | 2.28                 | 1.24                 | 1.21                               | 1.07                                  |
| 313       | 1.21                 | 2.33                 | 1.28                 | 1.245                              | 1.085                                 |
| 340       | 1.24                 | 2.38                 | 1.33                 | 1.285                              | 1.095                                 |
| 366       | 1.26                 | 2.45                 | 1.35                 | 1.305                              | 1.145                                 |
| 392- N    | 1.3                  | 2.54                 | 1.4                  | 1.35                               | 1.19                                  |
| 418       | 1.33                 | 2.61                 | 1.47                 | 1.4                                | 1.21                                  |
| 444       | 1.35                 | 2.7                  | 1.53                 | 1.44                               | 1.26                                  |
| 470       | 1.38                 | 2.8                  | 1.58                 | 1.48                               | 1.32                                  |
| 501       | 1.44                 | 2.91                 | 1.65                 | 1.545                              | 1.365                                 |
| 522       | 1.48                 | 2.99                 | 1.7                  | 1.59                               | 1.4                                   |
| 548       | 1.55                 | 3.09                 | 1.74                 | 1.645                              | 1.445                                 |
| 563- C    | 1.59                 | 3.24                 | 1.79                 | 1.69                               | 1.55                                  |
| 600       | 1.67                 | 3.46                 | 1.9                  | 1.785                              | 1.675                                 |
| 626       | 1.73                 | 3.57                 | 1.94                 | 1.835                              | 1.735                                 |
| 647       | 1.78                 | 3.68                 | 1.99                 | 1.885                              | 1.795                                 |
| 678       | 1.82                 | 3.91                 | 2.09                 | 1.955                              | 1.955                                 |
| 694       | 1.85                 | 4.32                 | 2.23                 | 2.04                               | 2.28                                  |
| 704       | 1.9                  | 4.6                  | 2.33                 | 2.115                              | 2.485                                 |

**Table A.9.74: Test Panel Concrete Cube Strength (C45-25-2-i)**

| Cast Date: 08-12-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 08-03-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.5         | 122.2         | 51.21                         | 2373                             |
| II                      | 153x153x153 | 8.4         | 110           | 46.10                         | 2345                             |
| III                     | 153x153x153 | 8.5         | 108.8         | 45.59                         | 2373                             |
| IV                      | 153x153x153 | 8.45        | 116           | 48.61                         | 2359                             |
| Mean                    |             |             |               | 47.88                         | 2363                             |



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**Table A.9.75: Sample 24 (C45-25-2-ii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.06                 | 0.5                  | 0.31                 | 0.185                              | 0.315                                 |
| 53        | 0.17                 | 0.86                 | 0.43                 | 0.3                                | 0.56                                  |
| 79        | 0.24                 | 1                    | 0.53                 | 0.385                              | 0.615                                 |
| 110       | 0.28                 | 1.17                 | 0.6                  | 0.44                               | 0.73                                  |
| 136       | 0.32                 | 1.32                 | 0.67                 | 0.495                              | 0.825                                 |
| 157       | 0.33                 | 1.41                 | 0.71                 | 0.52                               | 0.89                                  |
| 183       | 0.33                 | 1.51                 | 0.76                 | 0.545                              | 0.965                                 |
| 209       | 0.34                 | 1.64                 | 0.81                 | 0.575                              | 1.065                                 |
| 235       | 0.34                 | 1.83                 | 0.88                 | 0.61                               | 1.22                                  |
| 261       | 0.37                 | 1.82                 | 0.92                 | 0.645                              | 1.175                                 |
| 22        | 0.25                 | 1.04                 | 0.58                 | 0.415                              | 0.625                                 |
| 53        | 0.29                 | 1.21                 | 0.62                 | 0.455                              | 0.755                                 |
| 79        | 0.32                 | 1.35                 | 0.68                 | 0.5                                | 0.85                                  |
| 105       | 0.33                 | 1.42                 | 0.72                 | 0.525                              | 0.895                                 |
| 131       | 0.34                 | 1.56                 | 0.78                 | 0.56                               | 1                                     |
| 157       | 0.35                 | 1.64                 | 0.82                 | 0.585                              | 1.055                                 |
| 183       | 0.35                 | 1.69                 | 0.86                 | 0.605                              | 1.085                                 |
| 209       | 0.37                 | 1.75                 | 0.9                  | 0.635                              | 1.115                                 |
| 235       | 0.37                 | 1.8                  | 0.93                 | 0.65                               | 1.15                                  |
| 261       | 0.39                 | 1.86                 | 0.98                 | 0.685                              | 1.175                                 |
| 27        | 0.23                 | 1.22                 | 0.72                 | 0.475                              | 0.745                                 |
| 147       | 0.23                 | 1.61                 | 0.93                 | 0.58                               | 1.03                                  |
| 261       | 0.28                 | 1.95                 | 1.1                  | 0.69                               | 1.26                                  |
| 22        | 0.25                 | 1.15                 | 0.64                 | 0.445                              | 0.705                                 |
| 53        | 0.27                 | 1.33                 | 0.7                  | 0.485                              | 0.845                                 |
| 131       | 0.34                 | 1.6                  | 0.82                 | 0.58                               | 1.02                                  |
| 267       | 0.39                 | 1.93                 | 1.02                 | 0.705                              | 1.225                                 |
| 27        | 0.2                  | 1.1                  | 0.72                 | 0.46                               | 0.64                                  |
| 53        | 0.2                  | 1.33                 | 0.8                  | 0.5                                | 0.83                                  |
| 131       | 0.24                 | 1.66                 | 0.95                 | 0.595                              | 1.065                                 |
| 261       | 0.33                 | 1.98                 | 1.1                  | 0.715                              | 1.265                                 |
| 27        | 0.17                 | 1.23                 | 0.77                 | 0.47                               | 0.76                                  |
| 53        | 0.18                 | 1.36                 | 0.83                 | 0.505                              | 0.855                                 |
| 131       | 0.21                 | 1.63                 | 0.99                 | 0.6                                | 1.03                                  |
| 261       | 0.28                 | 1.96                 | 1.16                 | 0.72                               | 1.24                                  |
| 27        | 0.13                 | 0.99                 | 0.84                 | 0.485                              | 0.505                                 |
| 74        | 0.13                 | 1.26                 | 0.96                 | 0.545                              | 0.715                                 |
| 131       | 0.16                 | 1.49                 | 1.07                 | 0.615                              | 0.875                                 |
| 261       | 0.23                 | 1.87                 | 1.27                 | 0.75                               | 1.12                                  |
| 1         | 0.05                 | 0.35                 | 0.4                  | 0.225                              | 0.125                                 |
| 27        | 0.08                 | 0.87                 | 0.8                  | 0.44                               | 0.43                                  |
| 53        | 0.1                  | 1.12                 | 0.9                  | 0.5                                | 0.62                                  |
| 131       | 0.25                 | 1.74                 | 0.98                 | 0.615                              | 1.125                                 |
| 261       | 0.44                 | 1.94                 | 1.04                 | 0.74                               | 1.2                                   |
| 27        | 0.19                 | 1.21                 | 0.77                 | 0.48                               | 0.73                                  |
| 53        | 0.22                 | 1.4                  | 0.84                 | 0.53                               | 0.87                                  |
| 131       | 0.27                 | 1.74                 | 0.98                 | 0.625                              | 1.115                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 261       | 0.38                 | 2.03                 | 1.15                 | 0.765                              | 1.265                                 |
| 32        | 0.23                 | 1.36                 | 0.82                 | 0.525                              | 0.835                                 |
| 53        | 0.23                 | 1.42                 | 0.86                 | 0.545                              | 0.875                                 |
| 136       | 0.29                 | 1.79                 | 1                    | 0.645                              | 1.145                                 |
| 261       | 0.39                 | 2.07                 | 1.13                 | 0.76                               | 1.31                                  |
| 27        | 0.2                  | 1.26                 | 0.82                 | 0.51                               | 0.75                                  |
| 64        | 0.22                 | 1.44                 | 0.92                 | 0.57                               | 0.87                                  |
| 131       | 0.26                 | 1.7                  | 1.05                 | 0.655                              | 1.045                                 |
| 261       | 0.32                 | 2.05                 | 1.24                 | 0.78                               | 1.27                                  |
| 22        | 0.21                 | 1.28                 | 0.8                  | 0.505                              | 0.775                                 |
| 53        | 0.24                 | 1.47                 | 0.86                 | 0.55                               | 0.92                                  |
| 131       | 0.29                 | 1.79                 | 1                    | 0.645                              | 1.145                                 |
| 261       | 0.4                  | 2.1                  | 1.15                 | 0.775                              | 1.325                                 |
| 32        | 0.23                 | 1.26                 | 0.9                  | 0.565                              | 0.695                                 |
| 53        | 0.21                 | 1.4                  | 0.94                 | 0.575                              | 0.825                                 |
| 131       | 0.26                 | 1.72                 | 1.08                 | 0.67                               | 1.05                                  |
| 261       | 0.33                 | 2.09                 | 1.26                 | 0.795                              | 1.295                                 |
| 27        | 0.23                 | 1.36                 | 0.88                 | 0.555                              | 0.805                                 |
| 53        | 0.23                 | 1.43                 | 0.94                 | 0.585                              | 0.845                                 |
| 131       | 0.26                 | 1.73                 | 1.08                 | 0.67                               | 1.06                                  |
| 261       | 0.33                 | 2.07                 | 1.26                 | 0.795                              | 1.275                                 |
| 27        | 0.17                 | 1.06                 | 0.92                 | 0.545                              | 0.515                                 |
| 53        | 0.17                 | 1.27                 | 0.96                 | 0.565                              | 0.705                                 |
| 131       | 0.25                 | 1.71                 | 1.09                 | 0.67                               | 1.04                                  |
| 261       | 0.3                  | 2.08                 | 1.15                 | 0.725                              | 1.355                                 |
| 27        | 0.17                 | 1.18                 | 0.92                 | 0.545                              | 0.635                                 |
| 53        | 0.17                 | 1.29                 | 0.95                 | 0.56                               | 0.73                                  |
| 131       | 0.24                 | 1.7                  | 1.1                  | 0.67                               | 1.03                                  |
| 261       | 0.33                 | 2.07                 | 1.26                 | 0.795                              | 1.275                                 |
| 12        | 0.18                 | 1                    | 0.82                 | 0.5                                | 0.5                                   |
| 53        | 0.19                 | 1.35                 | 0.94                 | 0.565                              | 0.785                                 |
| 131       | 0.25                 | 1.74                 | 1.1                  | 0.675                              | 1.065                                 |
| 261       | 0.33                 | 2.09                 | 1.26                 | 0.795                              | 1.295                                 |
| 22        | 0.21                 | 1.31                 | 0.8                  | 0.505                              | 0.805                                 |
| 58        | 0.25                 | 1.55                 | 0.9                  | 0.575                              | 0.975                                 |
| 136       | 0.31                 | 1.75                 | 1.04                 | 0.675                              | 1.075                                 |
| 261       | 0.37                 | 2.11                 | 1.2                  | 0.785                              | 1.325                                 |
| 12        | 0.2                  | 1.14                 | 0.79                 | 0.495                              | 0.645                                 |
| 53        | 0.25                 | 1.46                 | 0.89                 | 0.57                               | 0.89                                  |
| 131       | 0.3                  | 1.79                 | 1.04                 | 0.67                               | 1.12                                  |
| 261       | 0.35                 | 2.12                 | 1.27                 | 0.81                               | 1.31                                  |
| 12        | 0.23                 | 1.22                 | 0.74                 | 0.485                              | 0.735                                 |
| 53        | 0.3                  | 1.49                 | 0.83                 | 0.565                              | 0.925                                 |
| 131       | 0.37                 | 1.76                 | 0.97                 | 0.67                               | 1.09                                  |
| 261       | 0.46                 | 2.1                  | 1.11                 | 0.785                              | 1.315                                 |
| 32        | 0.22                 | 1.27                 | 0.92                 | 0.57                               | 0.7                                   |
| 53        | 0.22                 | 1.41                 | 0.98                 | 0.6                                | 0.81                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 147       | 0.28                 | 1.8                  | 1.14                 | 0.71                               | 1.09                                  |
| 261       | 0.35                 | 2.1                  | 1.27                 | 0.81                               | 1.29                                  |
| 27        | 0.24                 | 1.37                 | 0.84                 | 0.54                               | 0.83                                  |
| 64        | 0.27                 | 1.57                 | 0.92                 | 0.595                              | 0.975                                 |
| 136       | 0.32                 | 1.85                 | 1.06                 | 0.69                               | 1.16                                  |
| 261       | 0.39                 | 2.11                 | 1.23                 | 0.81                               | 1.3                                   |
| 6         | 0.2                  | 1.09                 | 0.73                 | 0.465                              | 0.625                                 |
| 58        | 0.26                 | 1.53                 | 0.92                 | 0.59                               | 0.94                                  |
| 131       | 0.32                 | 1.83                 | 1.08                 | 0.7                                | 1.13                                  |
| 261       | 0.38                 | 2.1                  | 1.23                 | 0.805                              | 1.295                                 |
| 32        | 0.26                 | 1.42                 | 0.87                 | 0.565                              | 0.855                                 |
| 64        | 0.28                 | 1.57                 | 0.96                 | 0.62                               | 0.95                                  |
| 131       | 0.32                 | 1.82                 | 1.05                 | 0.685                              | 1.135                                 |
| 261       | 0.4                  | 2.14                 | 1.23                 | 0.815                              | 1.325                                 |
| 27        | 0.28                 | 1.44                 | 0.87                 | 0.575                              | 0.865                                 |
| 58        | 0.28                 | 1.6                  | 0.92                 | 0.6                                | 1                                     |
| 136       | 0.35                 | 1.87                 | 1.03                 | 0.69                               | 1.18                                  |
| 261       | 0.46                 | 2.14                 | 1.14                 | 0.8                                | 1.34                                  |
| 17        | 0.24                 | 1.29                 | 0.8                  | 0.52                               | 0.77                                  |
| 53        | 0.28                 | 1.55                 | 0.9                  | 0.59                               | 0.96                                  |
| 131       | 0.35                 | 1.85                 | 1.02                 | 0.685                              | 1.165                                 |
| 261       | 0.44                 | 2.15                 | 1.17                 | 0.805                              | 1.345                                 |
| 287       | 0.45                 | 2.2                  | 1.19                 | 0.82                               | 1.38                                  |
| 313       | 0.48                 | 2.25                 | 1.22                 | 0.85                               | 1.4                                   |
| 340       | 0.48                 | 2.28                 | 1.24                 | 0.86                               | 1.42                                  |
| 366       | 0.49                 | 2.32                 | 1.27                 | 0.88                               | 1.44                                  |
| 392       | 0.5                  | 2.35                 | 1.3                  | 0.9                                | 1.45                                  |
| 418       | 0.51                 | 2.4                  | 1.33                 | 0.92                               | 1.48                                  |
| 444- N    | 0.53                 | 2.44                 | 1.38                 | 0.955                              | 1.485                                 |
| 470- C    | 0.55                 | 2.5                  | 1.42                 | 0.985                              | 1.515                                 |
| 480       | 0.55                 | 2.67                 | 1.5                  | 1.025                              | 1.645                                 |
| 532       | 0.57                 | 2.75                 | 1.54                 | 1.055                              | 1.695                                 |
| 558       | 0.59                 | 2.83                 | 1.6                  | 1.095                              | 1.735                                 |
| 574       | 0.61                 | 2.93                 | 1.63                 | 1.12                               | 1.81                                  |
| 595       | 0.62                 | 3.02                 | 1.66                 | 1.14                               | 1.88                                  |
| 610       | 0.62                 | 3.1                  | 1.69                 | 1.155                              | 1.945                                 |
| 600       | 0.67                 | 3.4                  | 1.73                 | 1.2                                | 2.2                                   |
| 626       | 0.72                 | 3.47                 | 1.84                 | 1.28                               | 2.19                                  |

**Table A.9.76: Test Panel Concrete Cube Strength (C45-25-2-ii)**

| Cast Date: 13-12-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 14-02-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.7         | 108           | 45.26                         | 2429                             |
| II                      | 153x153x153 | 8.6         | 111           | 46.52                         | 2401                             |
| III                     | 153x153x153 | 8.65        | 115.6         | 48.44                         | 2415                             |
| IV                      | 153x153x153 | 8.7         | 107.4         | 45.01                         | 2429                             |
| Mean                    |             |             |               | 46.31                         | 2419                             |



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**Table A.9.77: Sample 25 (C45-25-2-iii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.15                 | 1.34                 | 0.12                 | 0.135                              | 1.205                                 |
| 53        | 0.29                 | 1.79                 | 0.25                 | 0.27                               | 1.52                                  |
| 79        | 0.39                 | 2.12                 | 0.34                 | 0.365                              | 1.755                                 |
| 105       | 0.45                 | 2.38                 | 0.42                 | 0.435                              | 1.945                                 |
| 131       | 0.53                 | 2.68                 | 0.51                 | 0.52                               | 2.16                                  |
| 157       | 0.61                 | 2.97                 | 0.62                 | 0.615                              | 2.355                                 |
| 183       | 0.62                 | 3.22                 | 0.7                  | 0.66                               | 2.56                                  |
| 209       | 0.73                 | 3.5                  | 0.79                 | 0.76                               | 2.74                                  |
| 235       | 0.76                 | 3.84                 | 0.85                 | 0.805                              | 3.035                                 |
| 261       | 0.8                  | 3.92                 | 0.91                 | 0.855                              | 3.065                                 |
| 27        | 0.78                 | 2.17                 | 0.56                 | 0.67                               | 1.5                                   |
| 53        | 0.78                 | 2.56                 | 0.56                 | 0.67                               | 1.89                                  |
| 79        | 0.79                 | 2.89                 | 0.63                 | 0.71                               | 2.18                                  |
| 105       | 0.8                  | 3.14                 | 0.69                 | 0.745                              | 2.395                                 |
| 131       | 0.82                 | 3.39                 | 0.74                 | 0.78                               | 2.61                                  |
| 157       | 0.82                 | 3.62                 | 0.79                 | 0.805                              | 2.815                                 |
| 183       | 0.83                 | 3.77                 | 0.83                 | 0.83                               | 2.94                                  |
| 209       | 0.84                 | 3.93                 | 0.87                 | 0.855                              | 3.075                                 |
| 235       | 0.85                 | 4.08                 | 0.91                 | 0.88                               | 3.2                                   |
| 261       | 0.88                 | 4.22                 | 0.95                 | 0.915                              | 3.305                                 |
| 27        | 0.82                 | 2.25                 | 0.56                 | 0.69                               | 1.56                                  |
| 53        | 0.83                 | 2.6                  | 0.6                  | 0.715                              | 1.885                                 |
| 105       | 0.85                 | 3.44                 | 0.78                 | 0.815                              | 2.625                                 |
| 267       | 0.91                 | 4.3                  | 0.98                 | 0.945                              | 3.355                                 |
| 22        | 0.87                 | 2.06                 | 0.54                 | 0.705                              | 1.355                                 |
| 53        | 0.9                  | 2.89                 | 0.59                 | 0.745                              | 2.145                                 |
| 131       | 0.94                 | 3.75                 | 0.78                 | 0.86                               | 2.89                                  |
| 261       | 1.02                 | 4.5                  | 0.96                 | 0.99                               | 3.51                                  |
| 22        | 0.94                 | 2.22                 | 0.56                 | 0.75                               | 1.47                                  |
| 53        | 0.97                 | 3.05                 | 0.59                 | 0.78                               | 2.27                                  |
| 131       | 1.04                 | 3.9                  | 0.77                 | 0.905                              | 2.995                                 |
| 261       | 1.1                  | 4.61                 | 0.92                 | 1.01                               | 3.6                                   |
| 22        | 0.98                 | 2.4                  | 0.57                 | 0.775                              | 1.625                                 |
| 53        | 1.01                 | 3.19                 | 0.59                 | 0.8                                | 2.39                                  |
| 131       | 1.09                 | 4.05                 | 0.74                 | 0.915                              | 3.135                                 |
| 261       | 1.16                 | 4.72                 | 0.89                 | 1.025                              | 3.695                                 |
| 22        | 1.02                 | 2.33                 | 0.55                 | 0.785                              | 1.545                                 |
| 53        | 1.05                 | 3.21                 | 0.57                 | 0.81                               | 2.4                                   |
| 131       | 1.13                 | 4.13                 | 0.74                 | 0.935                              | 3.195                                 |
| 261       | 1.21                 | 4.73                 | 0.87                 | 1.04                               | 3.69                                  |
| 22        | 1.06                 | 2.5                  | 0.57                 | 0.815                              | 1.685                                 |
| 53        | 1.08                 | 3.25                 | 0.58                 | 0.83                               | 2.42                                  |
| 131       | 1.15                 | 4.12                 | 0.75                 | 0.95                               | 3.17                                  |
| 261       | 1.22                 | 4.76                 | 0.89                 | 1.055                              | 3.705                                 |
| 22        | 1.1                  | 2.4                  | 0.54                 | 0.82                               | 1.58                                  |
| 53        | 1.1                  | 3.1                  | 0.54                 | 0.82                               | 2.28                                  |
| 136       | 1.16                 | 4.15                 | 0.76                 | 0.96                               | 3.19                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 261       | 1.21                 | 4.77                 | 0.92                 | 1.065                              | 3.705                                 |
| 27        | 1.08                 | 2.65                 | 0.61                 | 0.845                              | 1.805                                 |
| 53        | 1.09                 | 3.15                 | 0.64                 | 0.865                              | 2.285                                 |
| 131       | 1.13                 | 4.01                 | 0.82                 | 0.975                              | 3.035                                 |
| 261       | 1.17                 | 4.72                 | 0.97                 | 1.07                               | 3.65                                  |
| 27        | 1.08                 | 2.67                 | 0.62                 | 0.85                               | 1.82                                  |
| 53        | 1.08                 | 3.2                  | 0.65                 | 0.865                              | 2.335                                 |
| 131       | 1.14                 | 4.03                 | 0.84                 | 0.99                               | 3.04                                  |
| 261       | 1.16                 | 4.73                 | 0.99                 | 1.075                              | 3.655                                 |
| 27        | 1.07                 | 2.57                 | 0.63                 | 0.85                               | 1.72                                  |
| 53        | 1.08                 | 3.15                 | 0.67                 | 0.875                              | 2.275                                 |
| 136       | 1.13                 | 3.98                 | 0.87                 | 1                                  | 2.98                                  |
| 261       | 1.14                 | 4.66                 | 1.01                 | 1.075                              | 3.585                                 |
| 22        | 1.1                  | 2.56                 | 0.63                 | 0.865                              | 1.695                                 |
| 53        | 1.1                  | 3.31                 | 0.65                 | 0.875                              | 2.435                                 |
| 131       | 1.17                 | 4.17                 | 0.84                 | 1.005                              | 3.165                                 |
| 261       | 1.2                  | 4.8                  | 0.99                 | 1.095                              | 3.705                                 |
| 22        | 1.1                  | 2.7                  | 0.66                 | 0.88                               | 1.82                                  |
| 53        | 1.1                  | 3.25                 | 0.67                 | 0.885                              | 2.365                                 |
| 136       | 1.17                 | 4.16                 | 0.86                 | 1.015                              | 3.145                                 |
| 261       | 1.19                 | 4.8                  | 1                    | 1.095                              | 3.705                                 |
| 22        | 1.12                 | 2.73                 | 0.66                 | 0.89                               | 1.84                                  |
| 53        | 1.11                 | 3.29                 | 0.66                 | 0.885                              | 2.405                                 |
| 131       | 1.19                 | 4.25                 | 0.83                 | 1.01                               | 3.24                                  |
| 261       | 1.25                 | 4.86                 | 0.98                 | 1.115                              | 3.745                                 |
| 27        | 1.13                 | 2.86                 | 0.66                 | 0.895                              | 1.965                                 |
| 53        | 1.12                 | 3.33                 | 0.67                 | 0.895                              | 2.435                                 |
| 131       | 1.19                 | 4.24                 | 0.86                 | 1.025                              | 3.215                                 |
| 261       | 1.24                 | 4.85                 | 0.99                 | 1.115                              | 3.735                                 |
| 27        | 1.13                 | 2.7                  | 0.64                 | 0.885                              | 1.815                                 |
| 53        | 1.14                 | 3.35                 | 0.63                 | 0.885                              | 2.465                                 |
| 131       | 1.21                 | 4.32                 | 0.79                 | 1                                  | 3.32                                  |
| 261       | 1.31                 | 4.9                  | 0.93                 | 1.12                               | 3.78                                  |
| 27        | 1.17                 | 2.76                 | 0.65                 | 0.91                               | 1.85                                  |
| 53        | 1.15                 | 3.31                 | 0.67                 | 0.91                               | 2.4                                   |
| 126       | 1.2                  | 4.17                 | 0.84                 | 1.02                               | 3.15                                  |
| 261       | 1.26                 | 4.87                 | 0.99                 | 1.125                              | 3.745                                 |
| 27        | 1.13                 | 2.67                 | 0.64                 | 0.885                              | 1.785                                 |
| 53        | 1.15                 | 3.41                 | 0.65                 | 0.9                                | 2.51                                  |
| 131       | 1.22                 | 4.29                 | 0.83                 | 1.025                              | 3.265                                 |
| 261       | 1.28                 | 4.9                  | 0.98                 | 1.13                               | 3.77                                  |
| 22        | 1.15                 | 2.75                 | 0.64                 | 0.895                              | 1.855                                 |
| 53        | 1.15                 | 3.28                 | 0.67                 | 0.91                               | 2.37                                  |
| 136       | 1.21                 | 4.2                  | 0.88                 | 1.045                              | 3.155                                 |
| 261       | 1.23                 | 4.85                 | 1.02                 | 1.125                              | 3.725                                 |
| 27        | 1.16                 | 2.54                 | 0.62                 | 0.89                               | 1.65                                  |
| 53        | 1.16                 | 3.28                 | 0.62                 | 0.89                               | 2.39                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 1.24                 | 4.34                 | 0.78                 | 1.01                               | 3.33                                  |
| 261       | 1.31                 | 4.93                 | 0.97                 | 1.14                               | 3.79                                  |
| 22        | 1.17                 | 2.67                 | 0.64                 | 0.905                              | 1.765                                 |
| 53        | 1.17                 | 3.41                 | 0.62                 | 0.895                              | 2.515                                 |
| 131       | 1.24                 | 4.33                 | 0.81                 | 1.025                              | 3.305                                 |
| 261       | 1.3                  | 4.93                 | 0.98                 | 1.14                               | 3.79                                  |
| 27        | 1.16                 | 2.76                 | 0.65                 | 0.905                              | 1.855                                 |
| 53        | 1.17                 | 3.39                 | 0.64                 | 0.905                              | 2.485                                 |
| 131       | 1.25                 | 4.35                 | 0.8                  | 1.025                              | 3.325                                 |
| 261       | 1.33                 | 4.96                 | 0.98                 | 1.155                              | 3.805                                 |
| 27        | 1.19                 | 2.88                 | 0.65                 | 0.92                               | 1.96                                  |
| 53        | 1.17                 | 3.39                 | 0.67                 | 0.92                               | 2.47                                  |
| 131       | 1.23                 | 4.28                 | 0.86                 | 1.045                              | 3.235                                 |
| 261       | 1.29                 | 4.92                 | 1.01                 | 1.15                               | 3.77                                  |
| 27        | 1.19                 | 2.85                 | 0.65                 | 0.92                               | 1.93                                  |
| 53        | 1.19                 | 3.37                 | 0.64                 | 0.915                              | 2.455                                 |
| 136       | 1.27                 | 4.4                  | 0.74                 | 1.005                              | 3.395                                 |
| 267       | 1.35                 | 4.98                 | 0.92                 | 1.135                              | 3.845                                 |
| 27        | 1.18                 | 2.72                 | 0.64                 | 0.91                               | 1.81                                  |
| 53        | 1.18                 | 3.43                 | 0.63                 | 0.905                              | 2.525                                 |
| 131       | 1.27                 | 4.4                  | 0.76                 | 1.015                              | 3.385                                 |
| 261       | 1.35                 | 4.98                 | 0.93                 | 1.14                               | 3.84                                  |
| 287       | 1.37                 | 5.04                 | 0.95                 | 1.16                               | 3.88                                  |
| 313       | 1.4                  | 5.12                 | 0.97                 | 1.185                              | 3.935                                 |
| 340       | 1.42                 | 5.18                 | 0.99                 | 1.205                              | 3.975                                 |
| 366       | 1.44                 | 5.25                 | 1.02                 | 1.23                               | 4.02                                  |
| 392       | 1.47                 | 5.32                 | 1.05                 | 1.26                               | 4.06                                  |
| 418       | 1.49                 | 5.4                  | 1.09                 | 1.29                               | 4.11                                  |
| 444       | 1.52                 | 5.47                 | 1.12                 | 1.32                               | 4.15                                  |
| 470- N    | 1.55                 | 5.57                 | 1.19                 | 1.37                               | 4.2                                   |
| 496       | 1.6                  | 5.66                 | 1.22                 | 1.41                               | 4.25                                  |
| 522       | 1.64                 | 5.76                 | 1.27                 | 1.455                              | 4.305                                 |
| 548- C    | 1.67                 | 5.86                 | 1.33                 | 1.5                                | 4.36                                  |
| 574       | 1.71                 | 6.06                 | 1.41                 | 1.56                               | 4.5                                   |
| 600       | 1.71                 | 6.11                 | 1.42                 | 1.565                              | 4.545                                 |
| 626       | 1.71                 | 6.2                  | 1.42                 | 1.565                              | 4.635                                 |
| 647       | 1.71                 | 6.4                  | 1.42                 | 1.565                              | 4.835                                 |

**Table A.9.78:** Test Panel Concrete Cube Strength (C45-25-2-iii)

| Cast Date: 19-12-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 08-02-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.5         | 97.6          | 40.90                         | 2373                             |
| II                      | 153x153x153 | 8.45        | 83.2          | 34.87                         | 2359                             |
| III                     | 153x153x153 | 8.5         | 100.4         | 42.07                         | 2373                             |
| IV                      | 153x153x153 | 8.45        | 104.4         | 43.75                         | 2359                             |
| Mean                    |             |             |               | 40.40                         | 2366                             |



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**Table A.9.79: Sample 27 (C20-25-2-i)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.08                 | 1.49                 | 0.12                 | 0.1                                | 1.39                                  |
| 53        | 0.16                 | 2.64                 | 0.23                 | 0.195                              | 2.445                                 |
| 79        | 0.19                 | 3.21                 | 0.27                 | 0.23                               | 2.98                                  |
| 105       | 0.26                 | 3.62                 | 0.33                 | 0.295                              | 3.325                                 |
| 131       | 0.32                 | 3.88                 | 0.38                 | 0.35                               | 3.53                                  |
| 157       | 0.36                 | 4                    | 0.44                 | 0.4                                | 3.6                                   |
| 183       | 0.41                 | 4.11                 | 0.48                 | 0.445                              | 3.665                                 |
| 209       | 0.46                 | 4.22                 | 0.52                 | 0.49                               | 3.73                                  |
| 17        | 0.16                 | 1.14                 | 0.24                 | 0.2                                | 0.94                                  |
| 53        | 0.21                 | 2.9                  | 0.31                 | 0.26                               | 2.64                                  |
| 79        | 0.27                 | 3.47                 | 0.35                 | 0.31                               | 3.16                                  |
| 105       | 0.3                  | 3.72                 | 0.37                 | 0.335                              | 3.385                                 |
| 131       | 0.34                 | 3.92                 | 0.39                 | 0.365                              | 3.555                                 |
| 157       | 0.36                 | 4.1                  | 0.42                 | 0.39                               | 3.71                                  |
| 183       | 0.39                 | 4.19                 | 0.45                 | 0.42                               | 3.77                                  |
| 220       | 0.43                 | 4.3                  | 0.5                  | 0.465                              | 3.835                                 |
| 27        | 0.06                 | 1.19                 | 0.29                 | 0.175                              | 1.015                                 |
| 53        | 0.15                 | 2.8                  | 0.38                 | 0.265                              | 2.535                                 |
| 131       | 0.31                 | 4.04                 | 0.45                 | 0.38                               | 3.66                                  |
| 209       | 0.4                  | 4.3                  | 0.52                 | 0.46                               | 3.84                                  |
| 27        | 0.1                  | 1.33                 | 0.32                 | 0.21                               | 1.12                                  |
| 53        | 0.15                 | 3.16                 | 0.42                 | 0.285                              | 2.875                                 |
| 131       | 0.3                  | 4.1                  | 0.48                 | 0.39                               | 3.71                                  |
| 209       | 0.38                 | 4.33                 | 0.56                 | 0.47                               | 3.86                                  |
| 27        | 0.06                 | 1.35                 | 0.31                 | 0.185                              | 1.165                                 |
| 53        | 0.22                 | 3.11                 | 0.38                 | 0.3                                | 2.81                                  |
| 131       | 0.34                 | 4.04                 | 0.44                 | 0.39                               | 3.65                                  |
| 209       | 0.41                 | 4.33                 | 0.53                 | 0.47                               | 3.86                                  |
| 27        | 0.19                 | 1.15                 | 0.28                 | 0.235                              | 0.915                                 |
| 53        | 0.31                 | 3.33                 | 0.35                 | 0.33                               | 3                                     |
| 131       | 0.38                 | 3.83                 | 0.39                 | 0.385                              | 3.445                                 |
| 209       | 0.47                 | 4.31                 | 0.46                 | 0.465                              | 3.845                                 |
| 27        | 0.17                 | 1.15                 | 0.28                 | 0.225                              | 0.925                                 |
| 53        | 0.22                 | 3.02                 | 0.38                 | 0.3                                | 2.72                                  |
| 131       | 0.39                 | 4                    | 0.43                 | 0.41                               | 3.59                                  |
| 209       | 0.47                 | 4.35                 | 0.5                  | 0.485                              | 3.865                                 |
| 43        | 0.11                 | 0.89                 | 0.27                 | 0.19                               | 0.7                                   |
| 53        | 0.21                 | 3.01                 | 0.4                  | 0.305                              | 2.705                                 |
| 131       | 0.38                 | 4.08                 | 0.45                 | 0.415                              | 3.665                                 |
| 209       | 0.48                 | 4.36                 | 0.5                  | 0.49                               | 3.87                                  |
| 27        | 0.21                 | 0.96                 | 0.28                 | 0.245                              | 0.715                                 |
| 53        | 0.29                 | 2.65                 | 0.36                 | 0.325                              | 2.325                                 |
| 131       | 0.44                 | 3.68                 | 0.38                 | 0.41                               | 3.27                                  |
| 209       | 0.54                 | 4.25                 | 0.43                 | 0.485                              | 3.765                                 |
| 27        | 0.27                 | 1.36                 | 0.3                  | 0.285                              | 1.075                                 |
| 53        | 0.27                 | 2.43                 | 0.35                 | 0.31                               | 2.12                                  |
| 131       | 0.43                 | 3.94                 | 0.42                 | 0.425                              | 3.515                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 0.51                 | 4.35                 | 0.47                 | 0.49                               | 3.86                                  |
| 27        | 0.28                 | 1.94                 | 0.34                 | 0.31                               | 1.63                                  |
| 53        | 0.3                  | 3.27                 | 0.39                 | 0.345                              | 2.925                                 |
| 131       | 0.45                 | 4.04                 | 0.44                 | 0.445                              | 3.595                                 |
| 209       | 0.52                 | 4.42                 | 0.5                  | 0.51                               | 3.91                                  |
| 27        | 0.31                 | 2.38                 | 0.37                 | 0.34                               | 2.04                                  |
| 53        | 0.31                 | 3.38                 | 0.42                 | 0.365                              | 3.015                                 |
| 131       | 0.45                 | 4.16                 | 0.46                 | 0.455                              | 3.705                                 |
| 209       | 0.55                 | 4.45                 | 0.52                 | 0.535                              | 3.915                                 |
| 27        | 0.31                 | 2.07                 | 0.35                 | 0.33                               | 1.74                                  |
| 53        | 0.3                  | 3.15                 | 0.39                 | 0.345                              | 2.805                                 |
| 131       | 0.47                 | 3.99                 | 0.42                 | 0.445                              | 3.545                                 |
| 209       | 0.56                 | 4.39                 | 0.45                 | 0.505                              | 3.885                                 |
| 27        | 0.25                 | 1.48                 | 0.31                 | 0.28                               | 1.2                                   |
| 53        | 0.26                 | 2.84                 | 0.39                 | 0.325                              | 2.515                                 |
| 131       | 0.45                 | 3.99                 | 0.43                 | 0.44                               | 3.55                                  |
| 209       | 0.55                 | 4.42                 | 0.48                 | 0.515                              | 3.905                                 |
| 32        | 0.15                 | 1.26                 | 0.33                 | 0.24                               | 1.02                                  |
| 53        | 0.21                 | 2.96                 | 0.42                 | 0.315                              | 2.645                                 |
| 131       | 0.4                  | 4.17                 | 0.49                 | 0.445                              | 3.725                                 |
| 209       | 0.5                  | 4.46                 | 0.55                 | 0.525                              | 3.935                                 |
| 22        | 0.18                 | 1.32                 | 0.31                 | 0.245                              | 1.075                                 |
| 53        | 0.18                 | 3.23                 | 0.42                 | 0.3                                | 2.93                                  |
| 131       | 0.45                 | 4.19                 | 0.48                 | 0.465                              | 3.725                                 |
| 209       | 0.52                 | 4.47                 | 0.55                 | 0.535                              | 3.935                                 |
| 27        | 0.3                  | 2.64                 | 0.33                 | 0.315                              | 2.325                                 |
| 53        | 0.33                 | 3.15                 | 0.4                  | 0.365                              | 2.785                                 |
| 131       | 0.49                 | 4.02                 | 0.42                 | 0.455                              | 3.565                                 |
| 209       | 0.59                 | 4.47                 | 0.46                 | 0.525                              | 3.945                                 |
| 27        | 0.35                 | 2.06                 | 0.36                 | 0.355                              | 1.705                                 |
| 53        | 0.35                 | 3.31                 | 0.41                 | 0.38                               | 2.93                                  |
| 131       | 0.49                 | 4.12                 | 0.45                 | 0.47                               | 3.65                                  |
| 209       | 0.58                 | 4.48                 | 0.5                  | 0.54                               | 3.94                                  |
| 27        | 0.25                 | 1.31                 | 0.31                 | 0.28                               | 1.03                                  |
| 53        | 0.29                 | 2.98                 | 0.4                  | 0.345                              | 2.635                                 |
| 131       | 0.48                 | 4.1                  | 0.45                 | 0.465                              | 3.635                                 |
| 209       | 0.58                 | 4.45                 | 0.49                 | 0.535                              | 3.915                                 |
| 32        | 0.2                  | 1.36                 | 0.31                 | 0.255                              | 1.105                                 |
| 53        | 0.26                 | 3.11                 | 0.42                 | 0.34                               | 2.77                                  |
| 131       | 0.44                 | 4.25                 | 0.5                  | 0.47                               | 3.78                                  |
| 209       | 0.55                 | 4.5                  | 0.55                 | 0.55                               | 3.95                                  |
| 32        | 0.25                 | 1.55                 | 0.32                 | 0.285                              | 1.265                                 |
| 53        | 0.33                 | 3.23                 | 0.39                 | 0.36                               | 2.87                                  |
| 131       | 0.51                 | 3.98                 | 0.42                 | 0.465                              | 3.515                                 |
| 209       | 0.63                 | 4.44                 | 0.45                 | 0.54                               | 3.9                                   |
| 27        | 0.33                 | 1.6                  | 0.33                 | 0.33                               | 1.27                                  |
| 53        | 0.35                 | 2.93                 | 0.37                 | 0.36                               | 2.57                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 0.53                 | 3.74                 | 0.39                 | 0.46                               | 3.28                                  |
| 209       | 0.63                 | 4.24                 | 0.41                 | 0.52                               | 3.72                                  |
| 27        | 0.3                  | 1.1                  | 0.3                  | 0.3                                | 0.8                                   |
| 53        | 0.33                 | 2.27                 | 0.34                 | 0.335                              | 1.935                                 |
| 131       | 0.54                 | 3.53                 | 0.37                 | 0.455                              | 3.075                                 |
| 209       | 0.63                 | 4.03                 | 0.4                  | 0.515                              | 3.515                                 |
| 27        | 0.3                  | 1.1                  | 0.3                  | 0.3                                | 0.8                                   |
| 53        | 0.31                 | 1.9                  | 0.36                 | 0.335                              | 1.565                                 |
| 131       | 0.36                 | 2.6                  | 0.52                 | 0.44                               | 2.16                                  |
| 209- N    | 0.45                 | 2.8                  | 0.66                 | 0.555                              | 2.245                                 |
| 27        | 0.24                 | 1.72                 | 0.41                 | 0.325                              | 1.395                                 |
| 53        | 0.24                 | 2.74                 | 0.49                 | 0.365                              | 2.375                                 |
| 131       | 0.27                 | 3.52                 | 0.66                 | 0.465                              | 3.055                                 |
| 209       | 0.3                  | 4.35                 | 0.78                 | 0.54                               | 3.81                                  |
| 27        | 0.21                 | 2.48                 | 0.41                 | 0.31                               | 2.17                                  |
| 53        | 0.2                  | 1.87                 | 0.5                  | 0.35                               | 1.52                                  |
| 79        | 0.24                 | 3.39                 | 0.55                 | 0.395                              | 2.995                                 |
| 131       | 0.28                 | 3.57                 | 0.65                 | 0.465                              | 3.105                                 |
| 209       | 0.33                 | 4.73                 | 0.78                 | 0.555                              | 4.175                                 |
| 235       | 0.35                 | 4.84                 | 0.81                 | 0.58                               | 4.26                                  |
| 261       | 0.35                 | 4.88                 | 0.85                 | 0.6                                | 4.28                                  |
| 287       | 0.35                 | 4.97                 | 0.89                 | 0.62                               | 4.35                                  |
| 313       | 0.37                 | 5.09                 | 0.92                 | 0.645                              | 4.445                                 |
| 340       | 0.39                 | 5.2                  | 0.97                 | 0.68                               | 4.52                                  |
| 366       | 0.45                 | 5.3                  | 0.99                 | 0.72                               | 4.58                                  |
| 392       | 0.47                 | 5.37                 | 1.01                 | 0.74                               | 4.63                                  |
| 418       | 0.5                  | 5.45                 | 1.03                 | 0.765                              | 4.685                                 |
| 444       | 0.53                 | 5.54                 | 1.07                 | 0.8                                | 4.74                                  |
| 459       | 0.55                 | 5.58                 | 1.09                 | 0.82                               | 4.76                                  |
| 470       | 0.57                 | 5.64                 | 1.11                 | 0.84                               | 4.8                                   |
| 491       | 0.58                 | 5.69                 | 1.13                 | 0.855                              | 4.835                                 |
| 506       | 0.6                  | 5.76                 | 1.18                 | 0.89                               | 4.87                                  |
| 527       | 0.61                 | 5.81                 | 1.18                 | 0.895                              | 4.915                                 |
| 548       | 0.63                 | 5.88                 | 1.21                 | 0.92                               | 4.96                                  |
| 563       | 0.64                 | 5.93                 | 1.23                 | 0.935                              | 4.995                                 |
| 574       | 0.66                 | 6                    | 1.25                 | 0.955                              | 5.045                                 |
| 589       | 0.67                 | 6.08                 | 1.27                 | 0.97                               | 5.11                                  |
| 605- C    | 0.69                 | 6.16                 | 1.31                 | 1                                  | 5.16                                  |
| 626       | 0.71                 | 6.28                 | 1.33                 | 1.02                               | 5.26                                  |
| 642       | 0.76                 | 6.54                 | 1.4                  | 1.08                               | 5.46                                  |
| 652       | 0.78                 | 6.59                 | 1.41                 | 1.095                              | 5.495                                 |
| 668       | 0.78                 | 6.66                 | 1.42                 | 1.1                                | 5.56                                  |
| 678       | 0.8                  | 6.76                 | 1.44                 | 1.12                               | 5.64                                  |
| 688       | 0.83                 | 6.95                 | 1.46                 | 1.145                              | 5.805                                 |
| 699       | 0.9                  | 7.35                 | 1.49                 | 1.195                              | 6.155                                 |

**Table A.9.80: Test Panel Concrete Cube Strength (C20-25-2-i)**

| Cast Date: 24-12-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 19-01-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.75        | 58.8          | 24.64                         | 2443                             |
| II                      | 153x153x153 | 8.8         | 56            | 23.47                         | 2457                             |
| III                     | 153x153x153 | 8.75        | 57            | 23.89                         | 2443                             |
| IV                      | 153x153x153 | 8.75        | 57.2          | 23.97                         | 2443                             |
| Mean                    |             |             |               | 23.99                         | 2447                             |



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**Table A.9.81: Sample 28 (C20-25-2-ii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.12                 | -0.03                | 0.2                  | 0.16                               | -0.19                                 |
| 53        | 0.23                 | -0.47                | 0.3                  | 0.265                              | -0.735                                |
| 79        | 0.27                 | -0.22                | 0.44                 | 0.355                              | -0.575                                |
| 105       | 0.35                 | -0.04                | 0.5                  | 0.425                              | -0.465                                |
| 131       | 0.41                 | 0.15                 | 0.55                 | 0.48                               | -0.33                                 |
| 157       | 0.44                 | 0.34                 | 0.62                 | 0.53                               | -0.19                                 |
| 183       | 0.45                 | 0.44                 | 0.66                 | 0.555                              | -0.115                                |
| 209       | 0.5                  | 0.59                 | 0.73                 | 0.615                              | -0.025                                |
| 27        | 0.35                 | 0.08                 | 0.51                 | 0.43                               | -0.35                                 |
| 53        | 0.35                 | 0.24                 | 0.56                 | 0.455                              | -0.215                                |
| 79        | 0.39                 | 0.32                 | 0.61                 | 0.5                                | -0.18                                 |
| 105       | 0.42                 | 0.4                  | 0.62                 | 0.52                               | -0.12                                 |
| 131       | 0.42                 | 0.45                 | 0.65                 | 0.535                              | -0.085                                |
| 157       | 0.42                 | 0.53                 | 0.67                 | 0.545                              | -0.015                                |
| 183       | 0.44                 | 0.6                  | 0.7                  | 0.57                               | 0.03                                  |
| 209       | 0.47                 | 0.69                 | 0.73                 | 0.6                                | 0.09                                  |
| 27        | 0.35                 | -0.18                | 0.57                 | 0.46                               | -0.64                                 |
| 53        | 0.35                 | 0.06                 | 0.63                 | 0.49                               | -0.43                                 |
| 131       | 0.36                 | 0.39                 | 0.73                 | 0.545                              | -0.155                                |
| 209       | 0.41                 | 0.65                 | 0.78                 | 0.595                              | 0.055                                 |
| 27        | 0.37                 | -0.15                | 0.57                 | 0.47                               | -0.62                                 |
| 53        | 0.37                 | 0.16                 | 0.64                 | 0.505                              | -0.345                                |
| 131       | 0.38                 | 0.5                  | 0.72                 | 0.55                               | -0.05                                 |
| 209       | 0.45                 | 0.74                 | 0.77                 | 0.61                               | 0.13                                  |
| 27        | 0.41                 | 0.2                  | 0.52                 | 0.465                              | -0.265                                |
| 53        | 0.41                 | 0.35                 | 0.61                 | 0.51                               | -0.16                                 |
| 131       | 0.44                 | 0.58                 | 0.71                 | 0.575                              | 0.005                                 |
| 209       | 0.46                 | 0.76                 | 0.78                 | 0.62                               | 0.14                                  |
| 27        | 0.52                 | -0.34                | 0.49                 | 0.505                              | -0.845                                |
| 53        | 0.51                 | -0.31                | 0.54                 | 0.525                              | -0.835                                |
| 131       | 0.51                 | -0.15                | 0.66                 | 0.585                              | -0.735                                |
| 209       | 0.58                 | 0.01                 | 0.74                 | 0.66                               | -0.65                                 |
| 27        | 0.51                 | -0.05                | 0.53                 | 0.52                               | -0.57                                 |
| 53        | 0.51                 | -0.04                | 0.58                 | 0.545                              | -0.585                                |
| 131       | 0.51                 | -0.15                | 0.7                  | 0.605                              | -0.755                                |
| 209       | 0.57                 | 0                    | 0.76                 | 0.665                              | -0.665                                |
| 27        | 0.5                  | -0.5                 | 0.55                 | 0.525                              | -1.025                                |
| 53        | 0.5                  | -0.4                 | 0.59                 | 0.545                              | -0.945                                |
| 131       | 0.51                 | -0.16                | 0.7                  | 0.605                              | -0.765                                |
| 209       | 0.57                 | 0.01                 | 0.76                 | 0.665                              | -0.655                                |
| 27        | 0.5                  | -0.49                | 0.55                 | 0.525                              | -1.015                                |
| 53        | 0.5                  | -0.36                | 0.59                 | 0.545                              | -0.905                                |
| 131       | 0.52                 | -0.1                 | 0.7                  | 0.61                               | -0.71                                 |
| 209       | 0.59                 | 0.05                 | 0.77                 | 0.68                               | -0.63                                 |
| 22        | 0.51                 | -0.4                 | 0.49                 | 0.5                                | -0.9                                  |
| 53        | 0.53                 | -0.23                | 0.58                 | 0.555                              | -0.785                                |
| 131       | 0.53                 | -0.05                | 0.68                 | 0.605                              | -0.655                                |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 0.6                  | 0.12                 | 0.76                 | 0.68                               | -0.56                                 |
| 22        | 0.54                 | -0.22                | 0.5                  | 0.52                               | -0.74                                 |
| 53        | 0.55                 | -0.09                | 0.54                 | 0.545                              | -0.635                                |
| 131       | 0.58                 | 0.12                 | 0.14                 | 0.36                               | -0.24                                 |
| 209       | 0.42                 | 0.28                 | 0.72                 | 0.57                               | -0.29                                 |
| 27        | 0.5                  | -0.41                | 0.56                 | 0.53                               | -0.94                                 |
| 53        | 0.5                  | -0.28                | 0.6                  | 0.55                               | -0.83                                 |
| 131       | 0.52                 | -0.04                | 0.71                 | 0.615                              | -0.655                                |
| 209       | 0.59                 | 0.14                 | 0.79                 | 0.69                               | -0.55                                 |
| 27        | 0.37                 | -0.93                | 0.6                  | 0.485                              | -1.415                                |
| 53        | 0.37                 | -0.63                | 0.66                 | 0.515                              | -1.145                                |
| 131       | 0.44                 | -0.33                | 0.76                 | 0.6                                | -0.93                                 |
| 209       | 0.53                 | 0.02                 | 0.83                 | 0.68                               | -0.66                                 |
| 17        | 0.4                  | -0.76                | 0.55                 | 0.475                              | -1.235                                |
| 53        | 0.43                 | -0.41                | 0.64                 | 0.535                              | -0.945                                |
| 131       | 0.5                  | -0.08                | 0.74                 | 0.62                               | -0.7                                  |
| 209       | 0.57                 | 0.11                 | 0.83                 | 0.7                                | -0.59                                 |
| 27        | 0.48                 | -0.4                 | 0.58                 | 0.53                               | -0.93                                 |
| 53        | 0.48                 | -0.32                | 0.63                 | 0.555                              | -0.875                                |
| 131       | 0.52                 | -0.02                | 0.74                 | 0.63                               | -0.65                                 |
| 209       | 0.58                 | 0.16                 | 0.83                 | 0.705                              | -0.545                                |
| 27        | 0.48                 | -0.46                | 0.6                  | 0.54                               | -1                                    |
| 53        | 0.48                 | -0.33                | 0.64                 | 0.56                               | -0.89                                 |
| 131       | 0.52                 | 0                    | 0.75                 | 0.635                              | -0.635                                |
| 209       | 0.58                 | 0.15                 | 0.84                 | 0.71                               | -0.56                                 |
| 27        | 0.41                 | -0.68                | 0.6                  | 0.505                              | -1.185                                |
| 53        | 0.41                 | -0.41                | 0.67                 | 0.54                               | -0.95                                 |
| 131       | 0.5                  | -0.07                | 0.76                 | 0.63                               | -0.7                                  |
| 209       | 0.58                 | 0.13                 | 0.84                 | 0.71                               | -0.58                                 |
| 22        | 0.41                 | -0.74                | 0.59                 | 0.5                                | -1.24                                 |
| 53        | 0.42                 | -0.39                | 0.66                 | 0.54                               | -0.93                                 |
| 131       | 0.5                  | -0.03                | 0.76                 | 0.63                               | -0.66                                 |
| 209       | 0.58                 | 0.14                 | 0.84                 | 0.71                               | -0.57                                 |
| 27        | 0.48                 | -0.36                | 0.59                 | 0.535                              | -0.895                                |
| 53        | 0.5                  | -0.22                | 0.64                 | 0.57                               | -0.79                                 |
| 131       | 0.53                 | 0.04                 | 0.74                 | 0.635                              | -0.595                                |
| 209       | 0.59                 | 0.18                 | 0.84                 | 0.715                              | -0.535                                |
| 27        | 0.47                 | -0.44                | 0.59                 | 0.53                               | -0.97                                 |
| 53        | 0.48                 | -0.25                | 0.64                 | 0.56                               | -0.81                                 |
| 131       | 0.53                 | 0.03                 | 0.75                 | 0.64                               | -0.61                                 |
| 209       | 0.6                  | 0.19                 | 0.84                 | 0.72                               | -0.53                                 |
| 27        | 0.53                 | -0.08                | 0.55                 | 0.54                               | -0.62                                 |
| 53        | 0.55                 | 0.02                 | 0.59                 | 0.57                               | -0.55                                 |
| 131       | 0.6                  | 0.22                 | 0.68                 | 0.64                               | -0.42                                 |
| 209       | 0.64                 | 0.35                 | 0.76                 | 0.7                                | -0.35                                 |
| 27        | 0.56                 | 0.02                 | 0.54                 | 0.55                               | -0.53                                 |
| 53        | 0.56                 | 0.11                 | 0.58                 | 0.57                               | -0.46                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 0.62                 | 0.3                  | 0.66                 | 0.64                               | -0.34                                 |
| 209       | 0.67                 | 0.4                  | 0.74                 | 0.705                              | -0.305                                |
| 27        | 0.54                 | -0.18                | 0.57                 | 0.555                              | -0.735                                |
| 53        | 0.55                 | -0.05                | 0.61                 | 0.58                               | -0.63                                 |
| 131       | 0.61                 | 0.2                  | 0.71                 | 0.66                               | -0.46                                 |
| 209       | 0.66                 | 0.37                 | 0.78                 | 0.72                               | -0.35                                 |
| 27        | 0.5                  | -0.31                | 0.57                 | 0.535                              | -0.845                                |
| 53        | 0.51                 | -0.14                | 0.63                 | 0.57                               | -0.71                                 |
| 131       | 0.57                 | 0.15                 | 0.73                 | 0.65                               | -0.5                                  |
| 209       | 0.62                 | 0.31                 | 0.81                 | 0.715                              | -0.405                                |
| 17        | 0.53                 | -0.02                | 0.54                 | 0.535                              | -0.555                                |
| 53        | 0.6                  | 0.15                 | 0.58                 | 0.59                               | -0.44                                 |
| 131       | 0.45                 | 0.38                 | 0.66                 | 0.555                              | -0.175                                |
| 209       | 0.73                 | 0.46                 | 0.73                 | 0.73                               | -0.27                                 |
| 27        | 0.55                 | -0.03                | 0.55                 | 0.55                               | -0.58                                 |
| 53        | 0.56                 | 0.1                  | 0.59                 | 0.575                              | -0.475                                |
| 131       | 0.64                 | 0.37                 | 0.66                 | 0.65                               | -0.28                                 |
| 209       | 0.71                 | 0.45                 | 0.74                 | 0.725                              | -0.275                                |
| 235       | 0.71                 | 0.47                 | 0.76                 | 0.735                              | -0.265                                |
| 261       | 0.73                 | 0.53                 | 0.8                  | 0.765                              | -0.235                                |
| 287       | 0.74                 | 0.58                 | 0.82                 | 0.78                               | -0.2                                  |
| 313       | 0.77                 | 0.64                 | 0.83                 | 0.8                                | -0.16                                 |
| 340       | 0.81                 | 0.72                 | 0.86                 | 0.835                              | -0.115                                |
| 366       | 0.85                 | 0.78                 | 0.89                 | 0.87                               | -0.09                                 |
| 392       | 0.91                 | 0.86                 | 0.92                 | 0.915                              | -0.055                                |
| 418       | 0.96                 | 0.95                 | 0.98                 | 0.97                               | -0.02                                 |
| 444       | 1.03                 | 1.03                 | 1.04                 | 1.035                              | -0.005                                |
| 470       | 1.08                 | 1.14                 | 1.07                 | 1.075                              | 0.065                                 |
| 496       | 1.12                 | 1.24                 | 1.1                  | 1.11                               | 0.13                                  |
| 522       | 1.16                 | 1.35                 | 1.15                 | 1.155                              | 0.195                                 |
| 537       | 1.19                 | 1.43                 | 1.18                 | 1.185                              | 0.245                                 |
| 553       | 1.2                  | 1.51                 | 1.2                  | 1.2                                | 0.31                                  |
| 574       | 1.23                 | 1.6                  | 1.23                 | 1.23                               | 0.37                                  |
| 589       | 1.26                 | 1.72                 | 1.29                 | 1.275                              | 0.445                                 |
| 610       | 1.28                 | 1.78                 | 1.31                 | 1.295                              | 0.485                                 |
| 626       | 1.29                 | 1.86                 | 1.34                 | 1.315                              | 0.545                                 |
| 647- N,C  | 1.35                 | 2.01                 | 1.37                 | 1.36                               | 0.65                                  |
| 662       | 1.38                 | 2.17                 | 1.44                 | 1.41                               | 0.76                                  |
| 678       | 1.39                 | 2.35                 | 1.48                 | 1.435                              | 0.915                                 |
| 694       | 1.42                 | 2.75                 | 1.54                 | 1.48                               | 1.27                                  |
| 709       | 1.42                 | 2.94                 | 1.64                 | 1.53                               | 1.41                                  |
| 725       | 1.42                 | 3.2                  | 1.75                 | 1.585                              | 1.615                                 |
| 730       | 1.43                 | 3.49                 | 1.8                  | 1.615                              | 1.875                                 |
| 740       | 1.44                 | 4.15                 | 1.92                 | 1.68                               | 2.47                                  |

**Table A.9.82: Test Panel Concrete Cube Strength (C20-25-2-ii)**

| Cast Date: 29-12-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 23-01-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.55        | 75.4          | 31.60                         | 2387                             |
| II                      | 153x153x153 | 8.65        | 52.2          | 21.88                         | 2415                             |
| III                     | 153x153x153 | 8.65        | 73            | 30.59                         | 2415                             |
| IV                      | 153x153x153 | 8.65        | 79            | 33.11                         | 2415                             |
| Mean                    |             |             |               | 31.76                         | 2408                             |

**Table A.9.83: CFST Concrete Cube Strength (C20-25-2-ii)**

| Cast Date: 27-11-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 23-01-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 7.8         | 74.8          | 31.35                         | 2178                             |
| II                      | 153x153x154 | 7.8         | 50            | 20.95                         | 2178                             |
| III                     | 153x153x154 | 7.8         | 74.8          | 31.35                         | 2178                             |
| IV                      | 153x153x153 | 7.75        | 71.2          | 29.84                         | 2164                             |
| Mean                    |             |             |               | 27.38                         | 2173                             |



**Table A.9.84: Sample 29 (C20-25-2-iii)**

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 27        | 0.17                 | 1.55                 | 0.12                 | 0.145                              | 1.405                                 |
| 53        | 0.29                 | 3.27                 | 0.19                 | 0.24                               | 3.03                                  |
| 79        | 0.39                 | 4.16                 | 0.27                 | 0.33                               | 3.83                                  |
| 105       | 0.42                 | 4.59                 | 0.38                 | 0.4                                | 4.19                                  |
| 131       | 0.48                 | 4.82                 | 0.45                 | 0.465                              | 4.355                                 |
| 157       | 0.51                 | 5                    | 0.51                 | 0.51                               | 4.49                                  |
| 183       | 0.55                 | 5.14                 | 0.54                 | 0.545                              | 4.595                                 |
| 209       | 0.59                 | 5.23                 | 0.55                 | 0.57                               | 4.66                                  |
| 38        | 0.47                 | 3.38                 | 0.33                 | 0.4                                | 2.98                                  |
| 53        | 0.48                 | 4.19                 | 0.34                 | 0.41                               | 3.78                                  |
| 79        | 0.8                  | 4.61                 | 0.43                 | 0.615                              | 3.995                                 |
| 105       | 0.53                 | 4.77                 | 0.46                 | 0.495                              | 4.275                                 |
| 131       | 0.55                 | 4.89                 | 0.48                 | 0.515                              | 4.375                                 |
| 157       | 0.57                 | 5.02                 | 0.51                 | 0.54                               | 4.48                                  |
| 183       | 0.58                 | 5.12                 | 0.54                 | 0.56                               | 4.56                                  |
| 209       | 0.6                  | 5.22                 | 0.56                 | 0.58                               | 4.64                                  |
| 27        | 0.45                 | 3.33                 | 0.38                 | 0.415                              | 2.915                                 |
| 53        | 0.47                 | 4.6                  | 0.44                 | 0.455                              | 4.145                                 |
| 131       | 0.54                 | 5.06                 | 0.56                 | 0.55                               | 4.51                                  |
| 209       | 0.6                  | 5.31                 | 0.6                  | 0.6                                | 4.71                                  |
| 12        | 0.35                 | 2.5                  | 0.37                 | 0.36                               | 2.14                                  |
| 53        | 0.42                 | 4.59                 | 0.51                 | 0.465                              | 4.125                                 |
| 131       | 0.5                  | 5.27                 | 0.62                 | 0.56                               | 4.71                                  |
| 209       | 0.58                 | 5.48                 | 0.7                  | 0.64                               | 4.84                                  |
| 27        | 0.43                 | 3.69                 | 0.51                 | 0.47                               | 3.22                                  |
| 53        | 0.44                 | 4.66                 | 0.54                 | 0.49                               | 4.17                                  |
| 131       | 0.48                 | 5.36                 | 0.67                 | 0.575                              | 4.785                                 |
| 209       | 0.54                 | 5.59                 | 0.76                 | 0.65                               | 4.94                                  |
| 27        | 0.38                 | 3.71                 | 0.56                 | 0.47                               | 3.24                                  |
| 53        | 0.37                 | 4.56                 | 0.62                 | 0.495                              | 4.065                                 |
| 131       | 0.36                 | 5.4                  | 0.77                 | 0.565                              | 4.835                                 |
| 209       | 0.41                 | 5.69                 | 0.9                  | 0.655                              | 5.035                                 |
| 27        | 0.4                  | 3.63                 | 0.54                 | 0.47                               | 3.16                                  |
| 53        | 0.43                 | 4.87                 | 0.6                  | 0.515                              | 4.355                                 |
| 131       | 0.5                  | 5.45                 | 0.73                 | 0.615                              | 4.835                                 |
| 209       | 0.57                 | 5.71                 | 0.84                 | 0.705                              | 5.005                                 |
| 32        | 0.45                 | 4.36                 | 0.58                 | 0.515                              | 3.845                                 |
| 53        | 0.45                 | 5.04                 | 0.64                 | 0.545                              | 4.495                                 |
| 131       | 0.54                 | 5.43                 | 0.74                 | 0.64                               | 4.79                                  |
| 215       | 0.58                 | 5.73                 | 0.84                 | 0.71                               | 5.02                                  |
| 27        | 0.46                 | 4.07                 | 0.59                 | 0.525                              | 3.545                                 |
| 53        | 0.46                 | 4.97                 | 0.66                 | 0.56                               | 4.41                                  |
| 131       | 0.48                 | 5.5                  | 0.78                 | 0.63                               | 4.87                                  |
| 209       | 0.54                 | 5.73                 | 0.88                 | 0.71                               | 5.02                                  |
| 22        | 0.4                  | 3.61                 | 0.88                 | 0.64                               | 2.97                                  |
| 53        | 0.42                 | 5.03                 | 0.66                 | 0.54                               | 4.49                                  |
| 131       | 0.49                 | 5.55                 | 0.8                  | 0.645                              | 4.905                                 |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 209       | 0.55                 | 5.71                 | 0.88                 | 0.715                              | 4.995                                 |
| 27        | 0.42                 | 4.13                 | 0.62                 | 0.52                               | 3.61                                  |
| 53        | 0.43                 | 5.04                 | 0.68                 | 0.555                              | 4.485                                 |
| 131       | 0.49                 | 5.57                 | 0.8                  | 0.645                              | 4.925                                 |
| 209       | 0.52                 | 5.76                 | 0.9                  | 0.71                               | 5.05                                  |
| 27        | 0.41                 | 3.93                 | 0.6                  | 0.505                              | 3.425                                 |
| 53        | 0.44                 | 5.1                  | 0.68                 | 0.56                               | 4.54                                  |
| 131       | 0.49                 | 5.57                 | 0.8                  | 0.645                              | 4.925                                 |
| 209       | 0.54                 | 5.75                 | 0.9                  | 0.72                               | 5.03                                  |
| 17        | 0.36                 | 3.17                 | 0.54                 | 0.45                               | 2.72                                  |
| 53        | 0.46                 | 4.9                  | 0.62                 | 0.54                               | 4.36                                  |
| 131       | 0.58                 | 5.4                  | 0.74                 | 0.66                               | 4.74                                  |
| 209       | 0.63                 | 5.66                 | 0.84                 | 0.735                              | 4.925                                 |
| 27        | 0.48                 | 3.53                 | 0.52                 | 0.5                                | 3.03                                  |
| 53        | 0.55                 | 4.48                 | 0.52                 | 0.535                              | 3.945                                 |
| 131       | 0.63                 | 5.09                 | 0.61                 | 0.62                               | 4.47                                  |
| 209       | 0.72                 | 5.45                 | 0.7                  | 0.71                               | 4.74                                  |
| 27        | 0.55                 | 3.38                 | 0.52                 | 0.535                              | 2.845                                 |
| 53        | 0.58                 | 4.55                 | 0.54                 | 0.56                               | 3.99                                  |
| 131       | 0.64                 | 5.2                  | 0.64                 | 0.64                               | 4.56                                  |
| 209       | 0.71                 | 5.56                 | 0.75                 | 0.73                               | 4.83                                  |
| 27        | 0.59                 | 3.69                 | 0.44                 | 0.515                              | 3.175                                 |
| 53        | 0.61                 | 4.93                 | 0.45                 | 0.53                               | 4.4                                   |
| 131       | 0.7                  | 5.95                 | 0.57                 | 0.635                              | 5.315                                 |
| 209       | 0.75                 | 6.4                  | 0.71                 | 0.73                               | 5.67                                  |
| 27        | 0.37                 | 4.27                 | 0.62                 | 0.495                              | 3.775                                 |
| 53        | 0.37                 | 5.51                 | 0.71                 | 0.54                               | 4.97                                  |
| 131       | 0.37                 | 6.48                 | 0.84                 | 0.605                              | 5.875                                 |
| 209       | 0.42                 | 6.77                 | 0.98                 | 0.7                                | 6.07                                  |
| 22        | 0.4                  | 4.74                 | 0.61                 | 0.505                              | 4.235                                 |
| 53        | 0.43                 | 5.94                 | 0.71                 | 0.57                               | 5.37                                  |
| 131       | 0.5                  | 6.58                 | 0.84                 | 0.67                               | 5.91                                  |
| 215       | 0.6                  | 6.79                 | 0.9                  | 0.75                               | 6.04                                  |
| 27        | 0.52                 | 4.93                 | 0.58                 | 0.55                               | 4.38                                  |
| 53        | 0.54                 | 6.05                 | 0.67                 | 0.605                              | 5.445                                 |
| 131       | 0.59                 | 6.48                 | 0.77                 | 0.68                               | 5.8                                   |
| 209       | 0.66                 | 6.7                  | 0.84                 | 0.75                               | 5.95                                  |
| 27        | 0.56                 | 4.83                 | 0.57                 | 0.565                              | 4.265                                 |
| 53        | 0.56                 | 5.73                 | 0.58                 | 0.57                               | 5.16                                  |
| 131       | 0.62                 | 6.44                 | 0.76                 | 0.69                               | 5.75                                  |
| 209       | 0.67                 | 6.48                 | 0.83                 | 0.75                               | 5.73                                  |
| 27        | 0.55                 | 4.45                 | 0.57                 | 0.56                               | 3.89                                  |
| 53        | 0.58                 | 5.78                 | 0.59                 | 0.585                              | 5.195                                 |
| 131       | 0.65                 | 6.38                 | 0.72                 | 0.685                              | 5.695                                 |
| 209       | 0.67                 | 6.67                 | 0.82                 | 0.745                              | 5.925                                 |
| 27        | 0.62                 | 3.65                 | 0.51                 | 0.565                              | 3.085                                 |
| 53        | 0.62                 | 4.81                 | 0.5                  | 0.56                               | 4.25                                  |

| Load (kN) | CS-Displacement (mm) | SS-Displacement (mm) | CN-Displacement (mm) | Average Concrete Displacement (mm) | Steel Tube Relative Displacement (mm) |
|-----------|----------------------|----------------------|----------------------|------------------------------------|---------------------------------------|
| 131       | 0.69                 | 5.6                  | 0.6                  | 0.645                              | 4.955                                 |
| 209       | 0.78                 | 6.19                 | 0.72                 | 0.75                               | 5.44                                  |
| 27        | 0.62                 | 3.7                  | 0.5                  | 0.56                               | 3.14                                  |
| 53        | 0.62                 | 4.65                 | 0.52                 | 0.57                               | 4.08                                  |
| 131       | 0.69                 | 5.84                 | 0.64                 | 0.665                              | 5.175                                 |
| 209       | 0.74                 | 6.56                 | 0.84                 | 0.79                               | 5.77                                  |
| 17        | 0.6                  | 3.23                 | 0.52                 | 0.56                               | 2.67                                  |
| 53        | 0.62                 | 4.34                 | 0.55                 | 0.585                              | 3.755                                 |
| 131       | 0.62                 | 5.33                 | 0.77                 | 0.695                              | 4.635                                 |
| 209       | 0.65                 | 5.65                 | 0.86                 | 0.755                              | 4.895                                 |
| 27        | 0.55                 | 4.07                 | 0.62                 | 0.585                              | 3.485                                 |
| 53        | 0.54                 | 4.98                 | 0.68                 | 0.61                               | 4.37                                  |
| 131       | 0.56                 | 5.54                 | 0.83                 | 0.695                              | 4.845                                 |
| 215       | 0.62                 | 5.75                 | 0.91                 | 0.765                              | 4.985                                 |
| 27        | 0.45                 | 4.12                 | 0.69                 | 0.57                               | 3.55                                  |
| 53        | 0.44                 | 5.01                 | 0.76                 | 0.6                                | 4.41                                  |
| 131       | 0.43                 | 5.6                  | 0.88                 | 0.655                              | 4.945                                 |
| 215       | 0.48                 | 5.82                 | 0.98                 | 0.73                               | 5.09                                  |
| 235       | 0.49                 | 5.86                 | 1.01                 | 0.75                               | 5.11                                  |
| 261       | 0.5                  | 5.94                 | 1.06                 | 0.78                               | 5.16                                  |
| 287       | 0.53                 | 5.98                 | 1.08                 | 0.805                              | 5.175                                 |
| 313       | 0.56                 | 6.05                 | 1.14                 | 0.85                               | 5.2                                   |
| 340       | 0.58                 | 6.11                 | 1.2                  | 0.89                               | 5.22                                  |
| 366       | 0.61                 | 6.18                 | 1.23                 | 0.92                               | 5.26                                  |
| 392       | 0.65                 | 6.25                 | 1.29                 | 0.97                               | 5.28                                  |
| 418       | 0.47                 | 6.32                 | 1.33                 | 0.9                                | 5.42                                  |
| 444       | 0.7                  | 6.4                  | 1.38                 | 1.04                               | 5.36                                  |
| 470- N    | 0.72                 | 6.48                 | 1.43                 | 1.075                              | 5.405                                 |
| 496       | 0.73                 | 6.55                 | 1.48                 | 1.105                              | 5.445                                 |
| 522       | 0.74                 | 6.64                 | 1.54                 | 1.14                               | 5.5                                   |
| 548       | 0.76                 | 6.75                 | 1.62                 | 1.19                               | 5.56                                  |
| 574       | 0.77                 | 6.86                 | 1.67                 | 1.22                               | 5.64                                  |
| 600       | 0.79                 | 6.99                 | 1.73                 | 1.26                               | 5.73                                  |
| 626       | 0.83                 | 7.1                  | 1.75                 | 1.29                               | 5.81                                  |
| 642- C    | 0.84                 | 7.28                 | 1.77                 | 1.305                              | 5.975                                 |
| 652       | 0.85                 | 7.47                 | 1.88                 | 1.365                              | 6.105                                 |
| 678       | 0.91                 | 7.56                 | 1.91                 | 1.41                               | 6.15                                  |
| 704       | 0.92                 | 7.75                 | 1.94                 | 1.43                               | 6.32                                  |
| 725       | 0.92                 | 8.05                 | 1.96                 | 1.44                               | 6.61                                  |
| 746       | 0.92                 | 8.31                 | 2.01                 | 1.465                              | 6.845                                 |

**Table A.9.85: Test Panel Concrete Cube Strength (C20-25-2-iii)**

| Cast Date: 30-12-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 02-02-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.8         | 74.8          | 31.35                         | 2457                             |
| II                      | 153x153x153 | 8.75        | 71.2          | 29.84                         | 2443                             |
| III                     | 153x153x153 | 8.7         | 69.6          | 29.17                         | 2429                             |
| IV                      | 153x153x153 | 8.75        | 70.8          | 29.67                         | 2443                             |
| Mean                    |             |             |               | 30.01                         | 2443                             |

**Table A.9.86: CFST Concrete Cube Strength (C20-25-2-iii)**

| Cast Date: 27-11-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 02-02-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 7.7         | 61.4          | 25.73                         | 2150                             |
| II                      | 153x153x154 | 7.6         | 60.6          | 25.40                         | 2122                             |
| III                     | 153x153x154 | 7.7         | 60.6          | 25.40                         | 2150                             |
| IV                      | 153x153x153 | 7.7         | 61.4          | 25.73                         | 2150                             |
| Mean                    |             |             |               | 25.51                         | 2141                             |



**Table A.9.87: Sample 32 (C30-20-3-ssp)**

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|----------------------------------|
| -2        | 0       | 0       | 0        | 0        | 0          | 0                                |
| 6         | 0.25    | 0.12    | 0.19     | 0.14     | 0.165      | 0.13                             |
| 13        | 0.45    | 0.24    | 0.48     | 0.24     | 0.36       | 0.21                             |
| 28        | 0.9     | 0.33    | 1        | 0.47     | 0.735      | 0.57                             |
| 35        | 1.15    | 0.31    | 1.39     | 0.64     | 1.015      | 0.84                             |
| 6         | 0.58    | 0.34    | 0.55     | 0.25     | 0.4        | 0.24                             |
| 13        | 0.75    | 0.37    | 0.72     | 0.33     | 0.525      | 0.38                             |
| 28        | 1.05    | 0.41    | 1.16     | 0.55     | 0.855      | 0.64                             |
| 35        | 1.2     | 0.3     | 1.45     | 0.68     | 1.065      | 0.9                              |
| 6         | 0.6     | 0.35    | 0.61     | 0.29     | 0.45       | 0.25                             |
| 13        | 0.78    | 0.4     | 0.75     | 0.35     | 0.55       | 0.38                             |
| 28        | 1.1     | 0.46    | 1.24     | 0.58     | 0.91       | 0.64                             |
| 35        | 1.23    | 0.23    | 1.48     | 0.7      | 1.09       | 1                                |
| 6         | 0.59    | 0.36    | 0.62     | 0.29     | 0.455      | 0.23                             |
| 13        | 0.79    | 0.41    | 0.76     | 0.35     | 0.555      | 0.38                             |
| 28        | 1.12    | 0.42    | 1.26     | 0.59     | 0.925      | 0.7                              |
| 35        | 1.25    | 0.29    | 1.5      | 0.71     | 1.105      | 0.96                             |
| 6         | 0.63    | 0.39    | 0.67     | 0.32     | 0.495      | 0.24                             |
| 13        | 0.85    | 0.44    | 0.75     | 0.35     | 0.55       | 0.41                             |
| 28        | 1.18    | 0.47    | 1.27     | 0.6      | 0.935      | 0.71                             |
| 35        | 1.3     | 0.47    | 1.5      | 0.71     | 1.105      | 0.83                             |
| 6         | 0.67    | 0.41    | 0.66     | 0.31     | 0.485      | 0.26                             |
| 13        | 0.86    | 0.46    | 0.8      | 0.36     | 0.58       | 0.4                              |
| 28        | 1.19    | 0.49    | 1.3      | 0.61     | 0.955      | 0.7                              |
| 35        | 1.32    | 0.49    | 1.52     | 0.72     | 1.12       | 0.83                             |
| 6         | 0.67    | 0.42    | 0.67     | 0.31     | 0.49       | 0.25                             |
| 13        | 0.87    | 0.47    | 0.81     | 0.36     | 0.585      | 0.4                              |
| 28        | 1.18    | 0.5     | 1.27     | 0.59     | 0.93       | 0.68                             |
| 35        | 1.32    | 0.5     | 1.52     | 0.72     | 1.12       | 0.82                             |
| 6         | 0.68    | 0.44    | 0.68     | 0.32     | 0.5        | 0.24                             |
| 13        | 0.88    | 0.48    | 0.82     | 0.37     | 0.595      | 0.4                              |
| 28        | 1.19    | 0.51    | 1.28     | 0.6      | 0.94       | 0.68                             |
| 35        | 1.32    | 0.51    | 1.54     | 0.72     | 1.13       | 0.81                             |
| 6         | 0.72    | 0.46    | 0.73     | 0.34     | 0.535      | 0.26                             |
| 13        | 0.9     | 0.49    | 0.85     | 0.39     | 0.62       | 0.41                             |
| 28        | 1.2     | 0.51    | 1.2      | 0.61     | 0.905      | 0.69                             |
| 35        | 1.35    | 0.51    | 1.55     | 0.74     | 1.145      | 0.84                             |
| 6         | 0.65    | 0.44    | 0.68     | 0.34     | 0.51       | 0.21                             |
| 13        | 0.9     | 0.49    | 0.85     | 0.39     | 0.62       | 0.41                             |
| 28        | 1.2     | 0.5     | 1.3      | 0.6      | 0.95       | 0.7                              |
| 35        | 1.34    | 0.5     | 1.54     | 0.73     | 1.135      | 0.84                             |
| 6         | 0.7     | 0.45    | 0.73     | 0.34     | 0.535      | 0.25                             |
| 13        | 0.91    | 0.5     | 0.89     | 0.4      | 0.645      | 0.41                             |
| 28        | 1.2     | 0.5     | 1.29     | 0.6      | 0.945      | 0.7                              |
| 35        | 1.34    | 0.5     | 1.54     | 0.73     | 1.135      | 0.84                             |
| 6         | 0.7     | 0.45    | 0.74     | 0.35     | 0.545      | 0.25                             |
| 13        | 0.92    | 0.5     | 0.89     | 0.41     | 0.65       | 0.42                             |
| 28        | 1.2     | 0.5     | 1.29     | 0.6      | 0.945      | 0.7                              |
| 35        | 1.34    | 0.5     | 1.55     | 0.74     | 1.145      | 0.84                             |
| 6         | 0.7     | 0.46    | 0.77     | 0.36     | 0.565      | 0.24                             |
| 13        | 0.9     | 0.5     | 0.89     | 0.41     | 0.65       | 0.4                              |
| 28        | 1.22    | 0.5     | 1.35     | 0.63     | 0.99       | 0.72                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|----------------------------------|
| 35        | 1.37    | 0.5     | 1.57     | 0.75     | 1.16       | 0.87                             |
| 6         | 0.72    | 0.47    | 0.79     | 0.38     | 0.585      | 0.25                             |
| 13        | 0.92    | 0.51    | 0.92     | 0.43     | 0.675      | 0.41                             |
| 28        | 1.23    | 0.5     | 1.26     | 0.64     | 0.95       | 0.73                             |
| 35        | 1.36    | 0.5     | 1.6      | 0.76     | 1.18       | 0.86                             |
| 6         | 0.72    | 0.49    | 0.79     | 0.38     | 0.585      | 0.23                             |
| 13        | 0.91    | 0.52    | 0.93     | 0.43     | 0.68       | 0.39                             |
| 28        | 1.22    | 0.5     | 1.35     | 0.63     | 0.99       | 0.72                             |
| 35        | 1.38    | 0.5     | 1.61     | 0.76     | 1.185      | 0.88                             |
| 6         | 0.73    | 0.48    | 0.81     | 0.39     | 0.6        | 0.25                             |
| 13        | 0.92    | 0.52    | 0.95     | 0.45     | 0.7        | 0.4                              |
| 28        | 1.24    | 0.5     | 1.38     | 0.65     | 1.015      | 0.74                             |
| 35        | 1.38    | 0.5     | 1.61     | 0.77     | 1.19       | 0.88                             |
| 0         | 0.46    | 0.43    | 0.78     | 0.39     | 0.585      | 0.03                             |
| 13        | 0.91    | 0.52    | 0.92     | 0.43     | 0.675      | 0.39                             |
| 28        | 1.25    | 0.5     | 1.4      | 0.46     | 0.93       | 0.75                             |
| 35        | 1.39    | 0.5     | 1.64     | 0.78     | 1.21       | 0.89                             |
| 6         | 0.75    | 0.49    | 0.87     | 0.42     | 0.645      | 0.26                             |
| 13        | 0.93    | 0.52    | 1        | 0.48     | 0.74       | 0.41                             |
| 28        | 1.25    | 0.5     | 1.42     | 0.67     | 1.045      | 0.75                             |
| 35        | 1.39    | 0.5     | 1.65     | 0.78     | 1.215      | 0.89                             |
| 9         | 0.75    | 0.49    | 0.9      | 0.44     | 0.67       | 0.26                             |
| 13        | 0.95    | 0.52    | 1.03     | 0.49     | 0.76       | 0.43                             |
| 28        | 1.26    | 0.5     | 1.45     | 0.69     | 1.07       | 0.76                             |
| 35        | 1.4     | 0.5     | 1.8      | 0.67     | 1.235      | 0.9                              |
| 3         | 0.77    | 0.49    | 0.9      | 0.44     | 0.67       | 0.28                             |
| 13        | 0.93    | 0.52    | 1.03     | 0.49     | 0.76       | 0.41                             |
| 28        | 1.28    | 0.49    | 1.47     | 0.7      | 1.085      | 0.79                             |
| 35        | 1.4     | 0.5     | 1.68     | 0.81     | 1.245      | 0.9                              |
| 6         | 0.78    | 0.49    | 0.91     | 0.45     | 0.68       | 0.29                             |
| 13        | 0.95    | 0.52    | 1.05     | 0.5      | 0.775      | 0.43                             |
| 28        | 1.26    | 0.5     | 1.45     | 0.69     | 1.07       | 0.76                             |
| 35        | 1.4     | 0.5     | 1.66     | 0.81     | 1.235      | 0.9                              |
| 6         | 0.75    | 0.49    | 0.91     | 0.45     | 0.68       | 0.26                             |
| 13        | 0.95    | 0.52    | 1.05     | 0.5      | 0.775      | 0.43                             |
| 28        | 1.27    | 0.5     | 1.48     | 0.71     | 1.095      | 0.77                             |
| 35        | 1.4     | 0.5     | 1.68     | 0.81     | 1.245      | 0.9                              |
| 6         | 0.78    | 0.5     | 0.93     | 0.45     | 0.69       | 0.28                             |
| 13        | 0.96    | 0.52    | 1.05     | 0.5      | 0.775      | 0.44                             |
| 28        | 1.27    | 0.5     | 1.47     | 0.71     | 1.09       | 0.77                             |
| 35        | 1.4     | 0.5     | 1.66     | 0.8      | 1.23       | 0.9                              |
| 6         | 0.75    | 0.49    | 0.92     | 0.45     | 0.685      | 0.26                             |
| 13        | 0.95    | 0.52    | 1.05     | 0.5      | 0.775      | 0.43                             |
| 28        | 1.27    | 0.5     | 1.48     | 0.71     | 1.095      | 0.77                             |
| 35        | 1.4     | 0.5     | 1.68     | 0.81     | 1.245      | 0.9                              |
| 6         | 0.79    | 0.5     | 0.95     | 0.46     | 0.705      | 0.29                             |
| 13        | 0.97    | 0.52    | 1.09     | 0.52     | 0.805      | 0.45                             |
| 28        | 1.27    | 0.5     | 1.48     | 0.71     | 1.095      | 0.77                             |
| 35        | 1.4     | 0.5     | 1.68     | 0.81     | 1.245      | 0.9                              |
| 6         | 0.8     | 0.5     | 0.96     | 0.46     | 0.71       | 0.3                              |
| 13        | 1.02    | 0.51    | 1.15     | 0.55     | 0.85       | 0.51                             |
| 28        | 1.28    | 0.5     | 1.49     | 0.71     | 1.1        | 0.78                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|----------------------------------|
| 35        | 1.4     | 0.5     | 1.67     | 0.81     | 1.24       | 0.9                              |
| 42        | 1.55    | 0.5     | 1.92     | 0.94     | 1.43       | 1.05                             |
| 50        | 1.81    | 0.51    | 2.15     | 1.11     | 1.63       | 1.3                              |
| 57        | 2.08    | 0.53    | 2.57     | 1.26     | 1.915      | 1.55                             |
| 64- N     | 2.5     | 0.56    | 3        | 1.4      | 2.2        | 1.94                             |
| 71        | 3.2     | 0.53    | 3.71     | 1.62     | 2.665      | 2.67                             |
| 78        | 4.03    | 0.48    | 3.77     | 1.98     | 2.875      | 3.55                             |
| 86- C     | 5.3     | 0.45    | 4.66     | 2.34     | 3.5        | 4.85                             |

**Table A.9.88:** Test Panel Concrete Cube Strength (C30-20-3-ssp)

| Cast Date: 08-08-2006   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 04-10-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.4         | 100.8         | 42.80                         | 2345                             |
| II                      | 153x153x153 | 8.6         | 91.4          | 38.81                         | 2401                             |
| III                     | 153x153x153 | 8.5         | 89.8          | 38.13                         | 2373                             |
| IV                      | 153x153x153 | 8.6         | 94.8          | 40.25                         | 2401                             |
| Mean                    |             |             |               | 40.00                         | 2380                             |



**Table A.9.89: Sample 33 (C30-20-3-w)**

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|----------------------------------|
| -2        | 0       | 0       | 0        | 0        | 0          | 0                                |
| 7         | 0.65    | 0       | 0.44     | 0.15     | 0.295      | 0.65                             |
| 13        | 0.95    | 0.05    | 0.7      | 0.22     | 0.46       | 0.9                              |
| 35        | 1.6     | 0.14    | 1.26     | 0.38     | 0.82       | 1.46                             |
| 57        | 2.32    | 0.14    | 1.75     | 0.3      | 1.025      | 2.18                             |
| 6         | 1.57    | 0.3     | 1        | 0.15     | 0.575      | 1.27                             |
| 13        | 1.72    | 0.31    | 1.13     | 0.17     | 0.65       | 1.41                             |
| 35        | 2.09    | 0.3     | 1.48     | 0.24     | 0.86       | 1.79                             |
| 57        | 2.47    | 0.25    | 1.85     | 0.28     | 1.065      | 2.22                             |
| 6         | 1.71    | 0.3     | 1.11     | 0.15     | 0.63       | 1.41                             |
| 13        | 1.82    | 0.3     | 1.21     | 0.16     | 0.685      | 1.52                             |
| 35        | 2.16    | 0.3     | 1.55     | 0.21     | 0.88       | 1.86                             |
| 57        | 2.5     | 0.26    | 1.88     | 0.25     | 1.065      | 2.24                             |
| 6         | 1.75    | 0.29    | 1.17     | 0.15     | 0.66       | 1.46                             |
| 13        | 1.85    | 0.29    | 1.24     | 0.15     | 0.695      | 1.56                             |
| 35        | 2.22    | 0.29    | 1.61     | 0.2      | 0.905      | 1.93                             |
| 57        | 2.56    | 0.27    | 1.92     | 0.25     | 1.085      | 2.29                             |
| 6         | 1.76    | 0.22    | 1.17     | 0.15     | 0.66       | 1.54                             |
| 13        | 1.86    | 0.29    | 1.25     | 0.15     | 0.7        | 1.57                             |
| 35        | 2.25    | 0.29    | 1.63     | 0.2      | 0.915      | 1.96                             |
| 57        | 2.57    | 0.28    | 1.93     | 0.24     | 1.085      | 2.29                             |
| 6         | 1.74    | 0.29    | 1.15     | 0.12     | 0.635      | 1.45                             |
| 13        | 1.86    | 0.3     | 1.25     | 0.15     | 0.7        | 1.56                             |
| 35        | 2.25    | 0.3     | 1.63     | 0.19     | 0.91       | 1.95                             |
| 57        | 2.58    | 0.29    | 1.93     | 0.22     | 1.075      | 2.29                             |
| 6         | 1.8     | 0.23    | 1.21     | 0.13     | 0.67       | 1.57                             |
| 13        | 1.9     | 0.29    | 1.29     | 0.15     | 0.72       | 1.61                             |
| 35        | 2.27    | 0.29    | 1.64     | 0.18     | 0.91       | 1.98                             |
| 57        | 2.59    | 0.29    | 1.95     | 0.22     | 1.085      | 2.3                              |
| 6         | 1.75    | 0.28    | 1.17     | 0.12     | 0.645      | 1.47                             |
| 13        | 1.89    | 0.3     | 1.28     | 0.14     | 0.71       | 1.59                             |
| 35        | 2.29    | 0.3     | 1.66     | 0.18     | 0.92       | 1.99                             |
| 57        | 2.6     | 0.28    | 1.95     | 0.22     | 1.085      | 2.32                             |
| 6         | 1.81    | 0.24    | 1.23     | 0.13     | 0.68       | 1.57                             |
| 13        | 1.92    | 0.29    | 1.31     | 0.14     | 0.725      | 1.63                             |
| 35        | 2.31    | 0.29    | 1.68     | 0.18     | 0.93       | 2.02                             |
| 57        | 2.61    | 0.28    | 1.96     | 0.21     | 1.085      | 2.33                             |
| 6         | 1.75    | 0.28    | 1.18     | 0.11     | 0.645      | 1.47                             |
| 13        | 1.89    | 0.3     | 1.28     | 0.13     | 0.705      | 1.59                             |
| 35        | 2.31    | 0.31    | 1.66     | 0.17     | 0.915      | 2                                |
| 57        | 2.62    | 0.27    | 1.95     | 0.21     | 1.08       | 2.35                             |
| 6         | 1.78    | 0.28    | 1.2      | 0.11     | 0.655      | 1.5                              |
| 13        | 1.91    | 0.3     | 1.29     | 0.13     | 0.71       | 1.61                             |
| 35        | 2.33    | 0.31    | 1.69     | 0.17     | 0.93       | 2.02                             |
| 57        | 2.64    | 0.28    | 1.98     | 0.21     | 1.095      | 2.36                             |
| 6         | 1.81    | 0.28    | 1.24     | 0.12     | 0.68       | 1.53                             |
| 13        | 1.94    | 0.3     | 1.32     | 0.14     | 0.73       | 1.64                             |
| 35        | 2.31    | 0.3     | 1.67     | 0.16     | 0.915      | 2.01                             |
| 57        | 2.64    | 0.28    | 1.99     | 0.21     | 1.1        | 2.36                             |
| 6         | 1.82    | 0.28    | 1.23     | 0.12     | 0.675      | 1.54                             |
| 13        | 1.93    | 0.3     | 1.32     | 0.13     | 0.725      | 1.63                             |
| 35        | 2.32    | 0.3     | 1.67     | 0.16     | 0.915      | 2.02                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|----------------------------------|
| 57        | 2.65    | 0.27    | 2        | 0.21     | 1.105      | 2.38                             |
| 6         | 1.81    | 0.28    | 1.22     | 0.11     | 0.665      | 1.53                             |
| 13        | 1.92    | 0.3     | 1.31     | 0.12     | 0.715      | 1.62                             |
| 35        | 2.31    | 0.3     | 1.67     | 0.16     | 0.915      | 2.01                             |
| 57        | 2.66    | 0.27    | 2        | 0.21     | 1.105      | 2.39                             |
| 6         | 1.82    | 0.28    | 1.22     | 0.11     | 0.665      | 1.54                             |
| 13        | 1.94    | 0.3     | 1.33     | 0.13     | 0.73       | 1.64                             |
| 35        | 2.35    | 0.3     | 1.7      | 0.16     | 0.93       | 2.05                             |
| 57        | 2.67    | 0.27    | 2.01     | 0.21     | 1.11       | 2.4                              |
| 6         | 1.85    | 0.29    | 1.26     | 0.12     | 0.69       | 1.56                             |
| 13        | 1.97    | 0.3     | 1.35     | 0.13     | 0.74       | 1.67                             |
| 35        | 2.35    | 0.3     | 1.71     | 0.16     | 0.935      | 2.05                             |
| 57        | 2.67    | 0.28    | 2.02     | 0.21     | 1.115      | 2.39                             |
| 6         | 1.86    | 0.28    | 1.26     | 0.12     | 0.69       | 1.58                             |
| 13        | 1.98    | 0.3     | 1.35     | 0.13     | 0.74       | 1.68                             |
| 35        | 2.35    | 0.3     | 1.71     | 0.16     | 0.935      | 2.05                             |
| 57        | 2.68    | 0.27    | 2.02     | 0.21     | 1.115      | 2.41                             |
| 6         | 1.85    | 0.28    | 1.25     | 0.11     | 0.68       | 1.57                             |
| 13        | 1.97    | 0.3     | 1.34     | 0.13     | 0.735      | 1.67                             |
| 35        | 2.36    | 0.3     | 1.71     | 0.17     | 0.94       | 2.06                             |
| 57        | 2.69    | 0.28    | 2.04     | 0.21     | 1.125      | 2.41                             |
| 6         | 1.85    | 0.28    | 1.28     | 0.12     | 0.7        | 1.57                             |
| 13        | 2       | 0.3     | 1.37     | 0.14     | 0.755      | 1.7                              |
| 35        | 2.38    | 0.3     | 1.74     | 0.17     | 0.955      | 2.08                             |
| 57        | 2.69    | 0.27    | 2.05     | 0.21     | 1.13       | 2.42                             |
| 6         | 1.86    | 0.28    | 1.26     | 0.12     | 0.69       | 1.58                             |
| 13        | 1.98    | 0.3     | 1.35     | 0.14     | 0.745      | 1.68                             |
| 35        | 2.38    | 0.3     | 1.73     | 0.16     | 0.945      | 2.08                             |
| 57        | 2.7     | 0.28    | 2.05     | 0.21     | 1.13       | 2.42                             |
| 6         | 1.88    | 0.28    | 1.27     | 0.11     | 0.69       | 1.6                              |
| 13        | 1.98    | 0.3     | 1.35     | 0.13     | 0.74       | 1.68                             |
| 35        | 2.38    | 0.3     | 1.73     | 0.16     | 0.945      | 2.08                             |
| 57        | 2.7     | 0.28    | 2.05     | 0.21     | 1.13       | 2.42                             |
| 6         | 1.88    | 0.28    | 1.26     | 0.11     | 0.685      | 1.6                              |
| 13        | 2       | 0.3     | 1.36     | 0.13     | 0.745      | 1.7                              |
| 35        | 2.39    | 0.29    | 1.79     | 0.16     | 0.975      | 2.1                              |
| 57        | 2.71    | 0.28    | 2.05     | 0.21     | 1.13       | 2.43                             |
| 6         | 1.9     | 0.28    | 1.29     | 0.12     | 0.705      | 1.62                             |
| 13        | 2       | 0.3     | 1.38     | 0.13     | 0.755      | 1.7                              |
| 35        | 2.39    | 0.3     | 1.74     | 0.16     | 0.95       | 2.09                             |
| 57        | 2.72    | 0.28    | 2.05     | 0.21     | 1.13       | 2.44                             |
| 6         | 1.88    | 0.28    | 1.28     | 0.12     | 0.7        | 1.6                              |
| 13        | 2       | 0.3     | 1.36     | 0.13     | 0.745      | 1.7                              |
| 35        | 2.4     | 0.3     | 1.75     | 0.16     | 0.955      | 2.1                              |
| 57        | 2.72    | 0.28    | 2.05     | 0.21     | 1.13       | 2.44                             |
| 6         | 1.91    | 0.29    | 1.3      | 0.12     | 0.71       | 1.62                             |
| 13        | 2.01    | 0.3     | 1.38     | 0.13     | 0.755      | 1.71                             |
| 35        | 2.4     | 0.3     | 1.75     | 0.16     | 0.955      | 2.1                              |
| 57        | 2.72    | 0.28    | 2.06     | 0.21     | 1.135      | 2.44                             |
| 6         | 1.9     | 0.28    | 1.28     | 0.11     | 0.695      | 1.62                             |
| 13        | 2       | 0.3     | 1.77     | 0.13     | 0.95       | 1.7                              |
| 35        | 2.41    | 0.3     | 1.76     | 0.17     | 0.965      | 2.11                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|----------------------------------|
| 57        | 2.73    | 0.28    | 2.07     | 0.21     | 1.14       | 2.45                             |
| 64- N     | 2.85    | 0.28    | 2.19     | 0.22     | 1.205      | 2.57                             |
| 71        | 3.05    | 0.35    | 2.32     | 0.21     | 1.265      | 2.7                              |
| 78        | 3.35    | 0.38    | 2.47     | 0.11     | 1.29       | 2.97                             |
| 86        | 3.62    | 0.38    | 2.63     | 0.05     | 1.34       | 3.24                             |
| 93        | 3.98    | 0.38    | 2.78     | -0.05    | 1.365      | 3.6                              |
| 100       | 4.3     | 0.39    | 2.94     | -0.11    | 1.415      | 3.91                             |
| 107       | 4.6     | 0.39    | 3.09     | -0.25    | 1.42       | 4.21                             |
| 114       | 5.1     | 0.39    | 3.33     | -0.4     | 1.465      | 4.71                             |
| 121- C    | 6.3     | 0.4     | 3.42     | -0.11    | 1.655      | 5.9                              |

**Table A.9.90: Test Panel Concrete Cube Strength (C30-20-3-w)**

| Cast Date: 18-08-2006   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 05-10-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.6         | 96            | 40.76                         | 2401                             |
| II                      | 153x153x153 | 8.6         | 93            | 39.49                         | 2401                             |
| III                     | 153x153x153 | 8.7         | 92            | 39.06                         | 2429                             |
| IV                      | 153x153x153 | 8.7         | 94.2          | 40.00                         | 2429                             |
| Mean                    |             |             |               | 39.83                         | 2415                             |



**Table A.9.91: Sample 34 (C30-20-3-CFST-w)**

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|----------------------------------|
| -2        | 0       | 0       | 0        | 0        | 0          | 0                                |
| 1         | 0.02    | 0.04    | 0.11     | 0.04     | 0.075      | -0.02                            |
| 6         | 0.24    | 0.05    | 0.26     | 0.1      | 0.18       | 0.19                             |
| 13        | 0.62    | 0.1     | 0.46     | 0.16     | 0.31       | 0.52                             |
| 35        | 1.51    | 0.28    | 1.11     | 0.37     | 0.74       | 1.23                             |
| 57- C     | 1.77    | 0.4     | 1.71     | 0.6      | 1.155      | 1.37                             |
| 6         | 1       | 0.29    | 0.99     | 0.57     | 0.78       | 0.71                             |
| 13        | 1.1     | 0.34    | 1.08     | 0.58     | 0.83       | 0.76                             |
| 35        | 1.46    | 0.39    | 1.38     | 0.58     | 0.98       | 1.07                             |
| 57        | 1.87    | 0.39    | 1.75     | 0.55     | 1.15       | 1.48                             |
| 6         | 1.11    | 0.33    | 1.13     | 0.6      | 0.865      | 0.78                             |
| 13        | 1.22    | 0.37    | 1.24     | 0.6      | 0.92       | 0.85                             |
| 35        | 1.56    | 0.37    | 1.55     | 0.61     | 1.08       | 1.19                             |
| 57        | 1.95    | 0.38    | 1.91     | 0.61     | 1.26       | 1.57                             |
| 6         | 1.2     | 0.32    | 1.35     | 0.68     | 1.015      | 0.88                             |
| 13        | 1.31    | 0.35    | 1.45     | 0.68     | 1.065      | 0.96                             |
| 35        | 1.68    | 0.37    | 1.76     | 0.68     | 1.22       | 1.31                             |
| 57        | 2.04    | 0.4     | 2.11     | 0.67     | 1.39       | 1.64                             |
| 6         | 1.32    | 0.3     | 1.56     | 0.75     | 1.155      | 1.02                             |
| 13        | 1.38    | 0.32    | 1.61     | 0.75     | 1.18       | 1.06                             |
| 35        | 1.72    | 0.37    | 1.9      | 0.74     | 1.32       | 1.35                             |
| 57        | 2.09    | 0.42    | 2.23     | 0.73     | 1.48       | 1.67                             |
| 6         | 1.28    | 0.29    | 1.59     | 0.78     | 1.185      | 0.99                             |
| 13        | 1.4     | 0.34    | 1.68     | 0.78     | 1.23       | 1.06                             |
| 35        | 1.78    | 0.37    | 2.02     | 0.77     | 1.395      | 1.41                             |
| 57        | 2.15    | 0.45    | 2.35     | 0.76     | 1.555      | 1.7                              |
| 6         | 1.35    | 0.29    | 1.7      | 0.81     | 1.255      | 1.06                             |
| 13        | 1.46    | 0.34    | 1.79     | 0.82     | 1.305      | 1.12                             |
| 35        | 1.83    | 0.38    | 2.1      | 0.8      | 1.45       | 1.45                             |
| 57        | 2.2     | 0.47    | 2.44     | 0.78     | 1.61       | 1.73                             |
| 6         | 1.35    | 0.29    | 1.75     | 0.84     | 1.295      | 1.06                             |
| 13        | 1.5     | 0.34    | 1.85     | 0.84     | 1.345      | 1.16                             |
| 35        | 1.28    | 0.39    | 2.17     | 0.82     | 1.495      | 0.89                             |
| 57        | 2.28    | 0.49    | 2.52     | 0.8      | 1.66       | 1.79                             |
| 6         | 1.48    | 0.3     | 1.9      | 0.85     | 1.375      | 1.18                             |
| 13        | 1.58    | 0.34    | 1.98     | 0.85     | 1.415      | 1.24                             |
| 35        | 1.9     | 0.4     | 2.24     | 0.84     | 1.54       | 1.5                              |
| 57        | 2.31    | 0.49    | 2.6      | 0.81     | 1.705      | 1.82                             |
| 6         | 1.47    | 0.3     | 1.91     | 0.87     | 1.39       | 1.17                             |
| 13        | 1.59    | 0.34    | 2        | 0.88     | 1.44       | 1.25                             |
| 35        | 1.96    | 0.41    | 2.32     | 0.86     | 1.59       | 1.55                             |
| 57        | 2.36    | 0.5     | 2.66     | 0.84     | 1.75       | 1.86                             |
| 6         | 1.45    | 0.29    | 1.9      | 0.87     | 1.385      | 1.16                             |
| 13        | 1.59    | 0.34    | 2        | 0.88     | 1.44       | 1.25                             |
| 35        | 1.99    | 0.42    | 2.35     | 0.86     | 1.605      | 1.57                             |
| 57        | 2.36    | 0.5     | 2.68     | 0.85     | 1.765      | 1.86                             |
| 4         | 1.43    | 0.3     | 1.86     | 0.88     | 1.37       | 1.13                             |
| 13        | 1.59    | 0.34    | 2.01     | 0.9      | 1.455      | 1.25                             |
| 35        | 2.01    | 0.43    | 2.38     | 0.88     | 1.63       | 1.58                             |
| 57        | 2.4     | 0.51    | 2.75     | 0.86     | 1.805      | 1.89                             |
| 6         | 1.5     | 0.3     | 1.98     | 0.9      | 1.44       | 1.2                              |
| 13        | 1.66    | 0.35    | 2.1      | 0.91     | 1.505      | 1.31                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|----------------------------------|
| 35        | 2.06    | 0.45    | 2.45     | 0.9      | 1.675      | 1.61                             |
| 57        | 2.44    | 0.5     | 2.8      | 0.88     | 1.84       | 1.94                             |
| 6         | 1.56    | 0.31    | 2.05     | 0.92     | 1.485      | 1.25                             |
| 13        | 1.69    | 0.35    | 2.15     | 0.92     | 1.535      | 1.34                             |
| 35        | 2.08    | 0.45    | 2.49     | 0.91     | 1.7        | 1.63                             |
| 57        | 2.48    | 0.5     | 2.85     | 0.89     | 1.87       | 1.98                             |
| 6         | 1.5     | 0.29    | 2        | 0.92     | 1.46       | 1.21                             |
| 13        | 1.67    | 0.35    | 2.15     | 0.94     | 1.545      | 1.32                             |
| 35        | 2.12    | 0.46    | 2.54     | 0.92     | 1.73       | 1.66                             |
| 57        | 2.49    | 0.5     | 2.89     | 0.9      | 1.895      | 1.99                             |
| 6         | 1.61    | 0.31    | 2.18     | 0.96     | 1.57       | 1.3                              |
| 13        | 1.74    | 0.37    | 2.15     | 0.96     | 1.555      | 1.37                             |
| 35        | 2.14    | 0.47    | 2.61     | 0.97     | 1.79       | 1.67                             |
| 57        | 2.53    | 0.5     | 2.97     | 0.91     | 1.94       | 2.03                             |
| 4         | 1.53    | 0.29    | 2.08     | 0.96     | 1.52       | 1.24                             |
| 13        | 1.72    | 0.36    | 2.04     | 0.98     | 1.51       | 1.36                             |
| 35        | 2.16    | 0.48    | 2.65     | 0.96     | 1.805      | 1.68                             |
| 57        | 2.51    | 0.5     | 3        | 0.95     | 1.975      | 2.01                             |
| 6         | 1.57    | 0.3     | 2.15     | 0.98     | 1.565      | 1.27                             |
| 13        | 1.74    | 0.37    | 2.28     | 0.99     | 1.635      | 1.37                             |
| 35        | 2.17    | 0.48    | 2.68     | 0.98     | 1.83       | 1.69                             |
| 57        | 2.56    | 0.5     | 3.04     | 0.96     | 2          | 2.06                             |
| 6         | 1.59    | 0.3     | 2.17     | 0.99     | 1.58       | 1.29                             |
| 13        | 1.76    | 0.37    | 2.31     | 0.99     | 1.65       | 1.39                             |
| 35        | 2.21    | 0.49    | 2.73     | 0.99     | 1.86       | 1.72                             |
| 57        | 2.59    | 0.5     | 3.08     | 0.96     | 2.02       | 2.09                             |
| 6         | 1.62    | 0.32    | 2.21     | 0.99     | 1.6        | 1.3                              |
| 13        | 1.76    | 0.37    | 2.31     | 1        | 1.655      | 1.39                             |
| 35        | 2.22    | 0.49    | 2.75     | 1        | 1.875      | 1.73                             |
| 57        | 2.6     | 0.5     | 3.1      | 0.97     | 2.035      | 2.1                              |
| 6         | 1.72    | 0.35    | 2.34     | 1.01     | 1.675      | 1.37                             |
| 13        | 1.84    | 0.4     | 2.42     | 1.01     | 1.715      | 1.44                             |
| 35        | 2.22    | 0.49    | 2.77     | 1.01     | 1.89       | 1.73                             |
| 57        | 2.6     | 0.5     | 3.11     | 0.98     | 2.045      | 2.1                              |
| 6         | 1.72    | 0.35    | 2.34     | 1.01     | 1.675      | 1.37                             |
| 13        | 1.83    | 0.4     | 2.41     | 1.01     | 1.71       | 1.43                             |
| 35        | 2.22    | 0.49    | 2.77     | 1.01     | 1.89       | 1.73                             |
| 57        | 2.6     | 0.51    | 3.11     | 0.98     | 2.045      | 2.09                             |
| 6         | 1.75    | 0.35    | 2.36     | 1.01     | 1.685      | 1.4                              |
| 13        | 1.85    | 0.4     | 2.44     | 1.02     | 1.73       | 1.45                             |
| 35        | 2.25    | 0.49    | 2.8      | 1.01     | 1.905      | 1.76                             |
| 57        | 2.62    | 0.5     | 3.12     | 0.98     | 2.05       | 2.12                             |
| 6         | 1.73    | 0.35    | 2.35     | 1.01     | 1.68       | 1.38                             |
| 13        | 1.84    | 0.4     | 2.42     | 1.01     | 1.715      | 1.44                             |
| 35        | 2.24    | 0.49    | 2.79     | 1.01     | 1.9        | 1.75                             |
| 57        | 2.62    | 0.51    | 3.12     | 0.98     | 2.05       | 2.11                             |
| 6         | 1.71    | 0.34    | 2.32     | 1        | 1.66       | 1.37                             |
| 13        | 2.09    | 0.47    | 2.64     | 1.02     | 1.83       | 1.62                             |
| 35        | 2.26    | 0.5     | 2.8      | 1        | 1.9        | 1.76                             |
| 57        | 2.62    | 0.51    | 3.12     | 0.98     | 2.05       | 2.11                             |
| 6         | 1.7     | 0.33    | 2.29     | 1        | 1.645      | 1.37                             |
| 13        | 1.83    | 0.4     | 2.38     | 1        | 1.69       | 1.43                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|----------------------------------|
| 35        | 2.26    | 0.5     | 2.8      | 1        | 1.9        | 1.76                             |
| 57        | 2.62    | 0.51    | 3.12     | 0.98     | 2.05       | 2.11                             |
| 64        | 2.76    | 0.51    | 3.24     | 0.95     | 2.095      | 2.25                             |
| 71        | 2.92    | 0.51    | 3.32     | 0.94     | 2.13       | 2.41                             |
| 78        | 3.17    | 0.52    | 3.46     | 0.92     | 2.19       | 2.65                             |
| 86        | 3.58    | 0.53    | 3.63     | 0.88     | 2.255      | 3.05                             |
| 93        | 3.9     | 0.53    | 3.72     | 0.83     | 2.275      | 3.37                             |
| 100       | 4.98    | 0.51    | 4.05     | 0.55     | 2.3        | 4.47                             |
| 103       | 6.55    | 0.29    | 4.48     | 0.23     | 2.355      | 6.26                             |
| 114       | 8.2     | 0.18    | 4.7      | 0.1      | 2.4        | 8.02                             |

**Table A.9.92:** Test Panel Concrete Cube Strength (C30-20-3-CFST-w)

| Cast Date: 22-08-2006   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 11-10-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.6         | 89            | 37.79                         | 2401                             |
| II                      | 153x153x153 | 8.6         | 81.8          | 34.73                         | 2401                             |
| III                     | 153x153x153 | 8.6         | 89.6          | 38.04                         | 2401                             |
| IV                      | 153x153x153 | 8.6         | 86.8          | 36.86                         | 2401                             |
| Mean                    |             |             |               | 36.86                         | 2401                             |



**Table A.9.93: Sample 35 (C30-30-3-ssp)**

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|----------------------------------|
| -2        | 0       | 0       | 0        | 0        | 0          | 0                                |
| 6         | 0.5     | 0.03    | 0.47     | 0.21     | 0.34       | 0.47                             |
| 13        | 0.79    | 0.05    | 0.73     | 0.32     | 0.525      | 0.74                             |
| 35        | 1.58    | 0.12    | 1.49     | 0.63     | 1.06       | 1.46                             |
| -2        | 0       | 0       | 0        | 0        | 0          | 0                                |
| 6         | 0.25    | 0.04    | 0.25     | 0.02     | 0.135      | 0.21                             |
| 13        | 0.43    | 0.05    | 0.39     | -0.02    | 0.185      | 0.38                             |
| 35        | 1.05    | 0.07    | 0.98     | -0.08    | 0.45       | 0.98                             |
| 57        | 1.79    | 0.01    | 1.66     | -0.2     | 0.73       | 1.78                             |
| 6         | 1.02    | -0.03   | 0.8      | -0.21    | 0.295      | 1.05                             |
| 13        | 1.15    | -0.01   | 0.89     | -0.21    | 0.34       | 1.16                             |
| 35        | 1.55    | -0.01   | 1.28     | -0.23    | 0.525      | 1.56                             |
| 57        | 1.9     | -0.01   | 1.8      | -0.25    | 0.775      | 1.91                             |
| 6         | 1.22    | -0.07   | 0.99     | -0.25    | 0.37       | 1.29                             |
| 13        | 1.32    | -0.05   | 1.06     | -0.25    | 0.405      | 1.37                             |
| 35        | 1.65    | -0.04   | 1.39     | -0.25    | 0.57       | 1.69                             |
| 57        | 1.95    | -0.04   | 1.9      | -0.25    | 0.825      | 1.99                             |
| 4         | 1.15    | -0.07   | 0.95     | -0.25    | 0.35       | 1.22                             |
| 13        | 1.35    | -0.05   | 1.09     | -0.24    | 0.425      | 1.4                              |
| 35        | 1.72    | -0.05   | 1.5      | -0.26    | 0.62       | 1.77                             |
| 57        | 2.04    | -0.05   | 2.02     | -0.25    | 0.885      | 2.09                             |
| 6         | 1.38    | -0.08   | 1.19     | -0.27    | 0.46       | 1.46                             |
| 13        | 1.46    | -0.06   | 1.26     | -0.27    | 0.495      | 1.52                             |
| 35        | 1.8     | -0.06   | 1.61     | -0.27    | 0.67       | 1.86                             |
| 57        | 2.08    | -0.06   | 2.08     | -0.25    | 0.915      | 2.14                             |
| 6         | 1.35    | -0.09   | 1.15     | -0.26    | 0.445      | 1.44                             |
| 13        | 1.45    | -0.06   | 1.25     | -0.25    | 0.5        | 1.51                             |
| 35        | 1.82    | -0.06   | 1.67     | -0.27    | 0.7        | 1.88                             |
| 57        | 2.08    | -0.06   | 2.1      | -0.25    | 0.925      | 2.14                             |
| 6         | 1.4     | -0.09   | 1.25     | -0.26    | 0.495      | 1.49                             |
| 13        | 1.53    | -0.06   | 1.35     | -0.26    | 0.545      | 1.59                             |
| 35        | 1.83    | -0.06   | 1.7      | -0.26    | 0.72       | 1.89                             |
| 57        | 2.12    | -0.06   | 2.17     | -0.25    | 0.96       | 2.18                             |
| 6         | 1.43    | -0.09   | 1.29     | -0.25    | 0.52       | 1.52                             |
| 13        | 1.53    | -0.08   | 1.32     | -0.25    | 0.535      | 1.61                             |
| 35        | 1.86    | -0.06   | 1.76     | -0.25    | 0.755      | 1.92                             |
| 57- C     | 2.14    | -0.06   | 2.21     | -0.24    | 0.985      | 2.2                              |
| 6         | 1.4     | -0.07   | 1.35     | -0.25    | 0.55       | 1.47                             |
| 13        | 1.52    | -0.06   | 2.43     | -0.25    | 1.09       | 1.58                             |
| 35        | 1.82    | -0.06   | 2.83     | -0.25    | 1.29       | 1.88                             |
| 57        | 2.17    | -0.06   | 3.25     | -0.24    | 1.505      | 2.23                             |
| 6         | 1.45    | -0.07   | 1.4      | -0.25    | 0.575      | 1.52                             |
| 13        | 1.54    | -0.06   | 2.46     | -0.25    | 1.105      | 1.6                              |
| 35        | 1.86    | -0.06   | 2.87     | -0.25    | 1.31       | 1.92                             |
| 57        | 2.2     | -0.06   | 3.3      | -0.24    | 1.53       | 2.26                             |
| 6         | 1.5     | -0.08   | 1.44     | -0.25    | 0.595      | 1.58                             |
| 13        | 1.6     | -0.06   | 1.52     | -0.25    | 0.635      | 1.66                             |
| 35        | 1.88    | -0.06   | 2.89     | -0.25    | 1.32       | 1.94                             |
| 57        | 2.21    | -0.06   | 3.34     | -0.23    | 1.555      | 2.27                             |
| 6         | 1.5     | -0.08   | 1.46     | -0.24    | 0.61       | 1.58                             |
| 13        | 1.59    | -0.06   | 1.52     | -0.24    | 0.64       | 1.65                             |
| 35        | 1.9     | -0.05   | 1.93     | -0.25    | 0.84       | 1.95                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|----------------------------------|
| 57        | 2.23    | -0.05   | 2.37     | -0.23    | 1.07       | 2.28                             |
| 6         | 1.49    | -0.08   | 1.45     | -0.23    | 0.61       | 1.57                             |
| 13        | 1.58    | -0.06   | 1.53     | -0.23    | 0.65       | 1.64                             |
| 35        | 1.93    | -0.06   | 1.99     | -0.24    | 0.875      | 1.99                             |
| 57        | 2.24    | -0.06   | 2.4      | -0.22    | 1.09       | 2.3                              |
| 6         | 1.5     | -0.08   | 1.48     | -0.23    | 0.625      | 1.58                             |
| 13        | 1.6     | -0.06   | 1.55     | -0.23    | 0.66       | 1.66                             |
| 35        | 1.94    | -0.06   | 2        | -0.24    | 0.88       | 2                                |
| 57        | 2.26    | -0.05   | 2.43     | -0.22    | 1.105      | 2.31                             |
| 6         | 1.51    | -0.08   | 1.5      | -0.22    | 0.64       | 1.59                             |
| 13        | 1.61    | -0.06   | 1.58     | -0.22    | 0.68       | 1.67                             |
| 35        | 1.95    | -0.06   | 2.02     | -0.24    | 0.89       | 2.01                             |
| 57        | 2.27    | -0.05   | 2.45     | -0.22    | 1.115      | 2.32                             |
| 6         | 1.5     | -0.08   | 1.48     | -0.22    | 0.63       | 1.58                             |
| 13        | 1.62    | -0.06   | 1.58     | -0.22    | 0.68       | 1.68                             |
| 35        | 1.96    | -0.06   | 2.03     | -0.24    | 0.895      | 2.02                             |
| 57        | 2.28    | -0.06   | 2.46     | -0.21    | 1.125      | 2.34                             |
| 6         | 1.52    | -0.08   | 1.53     | -0.22    | 0.655      | 1.6                              |
| 13        | 1.64    | -0.07   | 1.62     | -0.22    | 0.7        | 1.71                             |
| 36        | 2       | -0.06   | 2.1      | -0.23    | 0.935      | 2.06                             |
| 57        | 2.3     | -0.06   | 2.49     | -0.2     | 1.145      | 2.36                             |
| 6         | 1.54    | -0.08   | 1.56     | -0.21    | 0.675      | 1.62                             |
| 13        | 1.67    | -0.07   | 1.66     | -0.21    | 0.725      | 1.74                             |
| 35        | 1.99    | -0.06   | 2.1      | -0.22    | 0.94       | 2.05                             |
| 57        | 2.3     | -0.06   | 2.52     | -0.2     | 1.16       | 2.36                             |
| 6         | 1.58    | -0.08   | 1.6      | -0.21    | 0.695      | 1.66                             |
| 13        | 1.6     | -0.08   | 1.68     | -0.21    | 0.735      | 1.68                             |
| 35        | 2       | -0.06   | 2.12     | -0.22    | 0.95       | 2.06                             |
| 57        | 2.32    | -0.06   | 2.54     | -0.2     | 1.17       | 2.38                             |
| 6         | 1.55    | -0.09   | 2.6      | -0.2     | 1.2        | 1.64                             |
| 13        | 1.68    | -0.08   | 2.69     | -0.21    | 1.24       | 1.76                             |
| 35        | 2       | -0.06   | 2.15     | -0.21    | 0.97       | 2.06                             |
| 57        | 2.34    | -0.06   | 2.58     | -0.19    | 1.195      | 2.4                              |
| 6         | 1.57    | -0.09   | 1.65     | -0.19    | 0.73       | 1.66                             |
| 13        | 1.68    | -0.08   | 1.72     | -0.2     | 0.76       | 1.76                             |
| 35        | 2.02    | -0.06   | 2.19     | -0.2     | 0.995      | 2.08                             |
| 57        | 2.37    | -0.06   | 2.63     | -0.18    | 1.225      | 2.43                             |
| 6         | 1.58    | -0.09   | 1.67     | -0.19    | 0.74       | 1.67                             |
| 13        | 1.68    | -0.07   | 1.75     | -0.19    | 0.78       | 1.75                             |
| 35        | 2.4     | -0.06   | 2.22     | -0.2     | 1.01       | 2.46                             |
| 57        | 2.4     | -0.06   | 2.65     | -0.18    | 1.235      | 2.46                             |
| 6         | 1.61    | -0.09   | 1.71     | -0.18    | 0.765      | 1.7                              |
| 13        | 1.71    | -0.07   | 1.8      | -0.18    | 0.81       | 1.78                             |
| 35        | 2.05    | -0.06   | 2.25     | -0.19    | 1.03       | 2.11                             |
| 57        | 2.4     | -0.06   | 2.7      | -0.16    | 1.27       | 2.46                             |
| 6         | 1.58    | -0.09   | 1.69     | -0.18    | 0.755      | 1.67                             |
| 13        | 1.71    | -0.08   | 1.8      | -0.18    | 0.81       | 1.79                             |
| 35        | 2.05    | -0.06   | 2.26     | -0.2     | 1.03       | 2.11                             |
| 57        | 2.42    | -0.06   | 2.71     | -0.16    | 1.275      | 2.48                             |
| 6         | 1.64    | -0.09   | 1.76     | -0.18    | 0.79       | 1.73                             |
| 13        | 1.75    | -0.06   | 1.85     | -0.18    | 0.835      | 1.81                             |
| 35        | 2.08    | -0.06   | 2.3      | -0.19    | 1.055      | 2.14                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|----------------------------------|
| 57        | 2.42    | -0.06   | 2.72     | -0.16    | 1.28       | 2.48                             |
| 64        | 2.62    | -0.05   | 2.91     | -0.16    | 1.375      | 2.67                             |
| 71        | 2.85    | -0.05   | 3.12     | -0.19    | 1.465      | 2.9                              |
| 78        | 3.1     | -0.1    | 3.38     | -0.26    | 1.56       | 3.2                              |
| 86        | 3.5     | -0.12   | 3.62     | -0.35    | 1.635      | 3.62                             |
| 93        | 3.7     | -0.13   | 3.85     | -0.48    | 1.685      | 3.83                             |
| 100       | 3.95    | -0.15   | 4.08     | -0.55    | 1.765      | 4.1                              |
| 107       | 4.3     | -0.18   | 4.46     | -0.68    | 1.89       | 4.48                             |
| 114       | 4.9     | -0.19   | 4.85     | -0.72    | 2.065      | 5.09                             |
| 121       | 5.5     | -0.25   | 5.42     | -0.75    | 2.335      | 5.75                             |
| 128       | 6.4     | -0.38   | 5.88     | -0.8     | 2.54       | 6.78                             |

**Table A.9.94:** Test Panel Concrete Cube Strength (C30-30-3-ssp)

| Cast Date: 25-08-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 05-10-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.65        | 82.6          | 35.07                         | 2415                             |
| II                      | 153x153x153 | 8.55        | 71.6          | 30.40                         | 2387                             |
| III                     | 153x153x153 | 8.5         | 84            | 35.67                         | 2373                             |
| IV                      | 153x153x153 | 8.6         | 71.2          | 30.23                         | 2401                             |
| Mean                    |             |             |               | 32.84                         | 2394                             |



**Table A.9.95: Sample 36 (C30-30-3-CFST-w)**

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| -2        | 0       | 0       | 0        | 0        | 0          | 0       | 0               | 0                                |
| 6         | 0.36    | 0.05    | 0.35     | 0.17     | 0.26       | 0.22    | 0.04            | 0.31                             |
| 13        | 0.77    | 0.05    | 0.71     | 0.33     | 0.52       | 0.53    | -0.01           | 0.72                             |
| 35        | 1.62    | 0.08    | 1.45     | 0.65     | 1.05       | 1.02    | 0.03            | 1.54                             |
| 51        | 2.05    | 0.16    | 1.91     | 0.83     | 1.37       | 1.75    | -0.38           | 1.89                             |
| 6         | 1.5     | 0.03    | 1.18     | 0.55     | 0.865      | -0.02   | 0.886           | 1.47                             |
| 13        | 1.62    | 0.08    | 1.32     | 0.6      | 0.96       | -0.02   | 0.981           | 1.54                             |
| 35        | 1.95    | 0.14    | 1.32     | 0.75     | 1.035      | 0.13    | 0.905           | 1.81                             |
| 51        | 2.15    | 0.18    | 1.95     | 0.85     | 1.4        | 0.28    | 1.12            | 1.97                             |
| 6         | 1.6     | 0.05    | 1.26     | 0.58     | 0.92       | -0.15   | 1.07            | 1.55                             |
| 13        | 1.68    | 0.1     | 1.38     | 0.62     | 1          | -0.08   | 1.08            | 1.58                             |
| 35        | 2       | 0.15    | 1.74     | 0.76     | 1.25       | 0.15    | 1.1             | 1.85                             |
| 51        | 2.16    | 0.18    | 1.95     | 0.85     | 1.4        | 0.28    | 1.12            | 1.98                             |
| 6         | 1.58    | 0.05    | 1.22     | 0.56     | 0.89       | -0.18   | 1.07            | 1.53                             |
| 13        | 1.7     | 0.1     | 1.37     | 0.62     | 0.995      | -0.08   | 1.075           | 1.6                              |
| 35        | 2.02    | 0.15    | 1.75     | 0.78     | 1.265      | 0.16    | 1.105           | 1.87                             |
| 51        | 2.21    | 0.18    | 1.98     | 0.85     | 1.415      | 0.3     | 1.115           | 2.03                             |
| 6         | 1.65    | 0.06    | 1.3      | 0.6      | 0.95       | 0.13    | 0.82            | 1.59                             |
| 13        | 1.73    | 0.1     | 1.42     | 0.65     | 1.035      | -0.05   | 1.085           | 1.63                             |
| 35        | 2.05    | 0.17    | 1.77     | 0.78     | 1.275      | 0.18    | 1.095           | 1.88                             |
| 51        | 2.23    | 0.2     | 2        | 0.88     | 1.44       | 0.31    | 1.13            | 2.03                             |
| 6         | 1.66    | 0.07    | 1.3      | 0.6      | 0.95       | -0.12   | 1.07            | 1.59                             |
| 13        | 1.75    | 0.1     | 1.42     | 0.64     | 1.03       | -0.05   | 1.08            | 1.65                             |
| 35        | 2.06    | 0.17    | 1.78     | 0.79     | 1.285      | 0.18    | 1.105           | 1.89                             |
| 51        | 2.25    | 0.19    | 2.01     | 0.88     | 1.445      | 0.31    | 1.135           | 2.06                             |
| 6         | 1.69    | 0.07    | 1.33     | 0.61     | 0.97       | -0.11   | 1.08            | 1.62                             |
| 13        | 1.79    | 0.12    | 1.45     | 0.65     | 1.05       | -0.03   | 1.08            | 1.67                             |
| 35        | 2.09    | 0.17    | 1.79     | 0.79     | 1.29       | 0.19    | 1.1             | 1.92                             |
| 51        | 2.28    | 0.2     | 2.03     | 0.88     | 1.455      | 0.32    | 1.135           | 2.08                             |
| 6         | 1.68    | 0.07    | 1.31     | 0.6      | 0.955      | -0.12   | 1.075           | 1.61                             |
| 13        | 1.79    | 0.11    | 1.45     | 0.65     | 1.05       | -0.03   | 1.08            | 1.68                             |
| 35        | 2.12    | 0.17    | 1.82     | 0.8      | 1.31       | 0.2     | 1.11            | 1.95                             |
| 51        | 2.29    | 0.19    | 2.03     | 0.88     | 1.455      | 0.33    | 1.125           | 2.1                              |
| 6         | 1.69    | 0.07    | 1.31     | 0.6      | 0.955      | -0.12   | 1.075           | 1.62                             |
| 13        | 1.8     | 0.12    | 1.45     | 0.65     | 1.05       | -0.03   | 1.08            | 1.68                             |
| 35        | 2.12    | 0.18    | 1.82     | 0.8      | 1.31       | 0.2     | 1.11            | 1.94                             |
| 51        | 2.3     | 0.21    | 2.04     | 0.88     | 1.46       | 0.34    | 1.12            | 2.09                             |
| 6         | 1.72    | 0.07    | 1.33     | 0.59     | 0.96       | -0.11   | 1.07            | 1.65                             |
| 13        | 1.81    | 0.12    | 1.45     | 0.66     | 1.055      | -0.03   | 1.085           | 1.69                             |
| 35        | 2.14    | 0.18    | 1.84     | 0.81     | 1.325      | 0.22    | 1.105           | 1.96                             |
| 51        | 2.32    | 0.21    | 2.05     | 0.9      | 1.475      | 0.35    | 1.125           | 2.11                             |
| 6         | 1.75    | 0.07    | 1.35     | 0.62     | 0.985      | -0.09   | 1.075           | 1.68                             |
| 13        | 1.85    | 0.12    | 1.49     | 0.68     | 1.085      | 0       | 1.085           | 1.73                             |
| 35        | 2.15    | 0.19    | 1.85     | 0.82     | 1.335      | 0.22    | 1.115           | 1.96                             |
| 51        | 2.34    | 0.2     | 2.05     | 0.9      | 1.475      | 0.35    | 1.125           | 2.14                             |
| 6         | 1.75    | 0.07    | 1.35     | 0.62     | 0.985      | -0.09   | 1.075           | 1.68                             |
| 13        | 1.85    | 0.13    | 1.48     | 0.67     | 1.075      | -0.01   | 1.085           | 1.72                             |
| 35        | 2.16    | 0.18    | 1.85     | 0.81     | 1.33       | 0.22    | 1.11            | 1.98                             |
| 51        | 2.36    | 0.2     | 2.08     | 0.9      | 1.49       | 0.36    | 1.13            | 2.16                             |
| 6         | 1.78    | 0.08    | 1.36     | 0.63     | 0.995      | -0.08   | 1.075           | 1.7                              |
| 13        | 1.86    | 0.13    | 1.49     | 0.68     | 1.085      | 0       | 1.085           | 1.73                             |
| 35        | 2.18    | 0.19    | 1.85     | 0.82     | 1.335      | 0.23    | 1.105           | 1.99                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 2.36    | 0.21    | 2.08     | 0.9      | 1.49       | 0.35    | 1.14            | 2.15                             |
| 6         | 1.79    | 0.08    | 1.39     | 0.64     | 1.015      | -0.06   | 1.075           | 1.71                             |
| 13        | 1.88    | 0.14    | 1.51     | 0.68     | 1.095      | 0.04    | 1.055           | 1.74                             |
| 35        | 2.2     | 0.19    | 1.87     | 0.82     | 1.345      | 0.25    | 1.095           | 2.01                             |
| 51        | 2.38    | 0.21    | 2.09     | 0.9      | 1.495      | 0.36    | 1.135           | 2.17                             |
| 6         | 1.78    | 0.08    | 1.37     | 0.63     | 1          | -0.07   | 1.07            | 1.7                              |
| 13        | 1.88    | 0.14    | 1.5      | 0.68     | 1.09       | 0.01    | 1.08            | 1.74                             |
| 35        | 2.2     | 0.19    | 1.88     | 0.82     | 1.35       | 0.25    | 1.1             | 2.01                             |
| 51        | 2.39    | 0.2     | 2.09     | 0.9      | 1.495      | 0.37    | 1.125           | 2.19                             |
| 6         | 1.8     | 0.08    | 1.4      | 0.65     | 1.025      | -0.05   | 1.075           | 1.72                             |
| 13        | 1.9     | 0.14    | 1.52     | 0.69     | 1.105      | 0.04    | 1.065           | 1.76                             |
| 35        | 2.22    | 0.19    | 1.88     | 0.83     | 1.355      | 0.25    | 1.105           | 2.03                             |
| 51        | 2.4     | 0.2     | 2.1      | 0.91     | 1.505      | 0.38    | 1.125           | 2.2                              |
| 6         | 1.8     | 0.08    | 1.39     | 0.64     | 1.015      | -0.06   | 1.075           | 1.72                             |
| 13        | 1.91    | 0.14    | 1.52     | 0.69     | 1.105      | 0.04    | 1.065           | 1.77                             |
| 35        | 2.22    | 0.19    | 1.89     | 0.83     | 1.36       | 0.25    | 1.11            | 2.03                             |
| 51        | 2.42    | 0.2     | 2.1      | 0.91     | 1.505      | 0.39    | 1.115           | 2.22                             |
| 6         | 1.8     | 0.08    | 1.36     | 0.63     | 0.995      | -0.07   | 1.065           | 1.72                             |
| 13        | 1.89    | 0.13    | 1.5      | 0.68     | 1.09       | 0.01    | 1.08            | 1.76                             |
| 35        | 2.25    | 0.19    | 1.9      | 0.84     | 1.37       | 0.26    | 1.11            | 2.06                             |
| 51        | 2.42    | 0.2     | 1.12     | 0.92     | 1.02       | 0.39    | 0.63            | 2.22                             |
| 6         | 1.8     | 0.08    | 1.38     | 0.63     | 1.005      | -0.07   | 1.075           | 1.72                             |
| 13        | 1.93    | 0.14    | 1.52     | 0.69     | 1.105      | 0.04    | 1.065           | 1.79                             |
| 35        | 2.26    | 0.2     | 1.91     | 0.84     | 1.375      | 0.26    | 1.115           | 2.06                             |
| 51        | 2.43    | 0.2     | 2.13     | 0.92     | 1.525      | 0.39    | 1.135           | 2.23                             |
| 6         | 1.82    | 0.08    | 1.39     | 0.63     | 1.01       | -0.07   | 1.08            | 1.74                             |
| 13        | 1.92    | 0.15    | 1.52     | 0.69     | 1.105      | 0.03    | 1.075           | 1.77                             |
| 35        | 2.28    | 0.19    | 1.91     | 0.85     | 1.38       | 0.27    | 1.11            | 2.09                             |
| 51        | 2.45    | 0.2     | 2.13     | 0.92     | 1.525      | 0.4     | 1.125           | 2.25                             |
| 6         | 1.83    | 0.08    | 1.4      | 0.65     | 1.025      | -0.07   | 1.095           | 1.75                             |
| 13        | 1.94    | 0.15    | 1.53     | 0.69     | 1.11       | 0.04    | 1.07            | 1.79                             |
| 35        | 2.27    | 0.19    | 1.91     | 0.85     | 1.38       | 0.27    | 1.11            | 2.08                             |
| 51        | 2.46    | 0.2     | 2.13     | 0.92     | 1.525      | 0.39    | 1.135           | 2.26                             |
| 6         | 1.84    | 0.08    | 1.4      | 0.64     | 1.02       | -0.06   | 1.08            | 1.76                             |
| 13        | 1.95    | 0.15    | 1.54     | 0.69     | 1.115      | 0.04    | 1.075           | 1.8                              |
| 35        | 2.28    | 0.19    | 1.92     | 0.85     | 1.385      | 0.28    | 1.105           | 2.09                             |
| 51        | 2.47    | 0.2     | 2.15     | 0.93     | 1.54       | 0.4     | 1.14            | 2.27                             |
| 6         | 1.85    | 0.08    | 1.42     | 0.65     | 1.035      | -0.05   | 1.085           | 1.77                             |
| 13        | 1.96    | 0.15    | 1.55     | 0.7      | 1.125      | 0.05    | 1.075           | 1.81                             |
| 35        | 2.29    | 0.19    | 1.93     | 0.84     | 1.385      | 0.28    | 1.105           | 2.1                              |
| 51        | 2.48    | 0.2     | 2.15     | 0.94     | 1.545      | 0.41    | 1.135           | 2.28                             |
| 6         | 1.87    | 0.08    | 1.43     | 0.65     | 1.04       | -0.04   | 1.08            | 1.79                             |
| 13        | 1.98    | 0.15    | 1.57     | 0.7      | 1.135      | 0.05    | 1.085           | 1.83                             |
| 35        | 2.31    | 0.2     | 1.95     | 0.85     | 1.4        | 0.29    | 1.11            | 2.11                             |
| 51        | 2.49    | 0.2     | 2.16     | 0.94     | 1.55       | 0.41    | 1.14            | 2.29                             |
| 6         | 1.88    | 0.09    | 1.45     | 0.65     | 1.05       | -0.04   | 1.09            | 1.79                             |
| 13        | 1.99    | 0.15    | 1.58     | 0.71     | 1.145      | 0.06    | 1.085           | 1.84                             |
| 35        | 2.32    | 0.2     | 1.95     | 0.86     | 1.405      | 0.3     | 1.105           | 2.12                             |
| 51        | 2.5     | 0.2     | 2.16     | 0.93     | 1.545      | 0.42    | 1.125           | 2.3                              |
| 6         | 1.88    | 0.08    | 1.43     | 0.65     | 1.04       | -0.03   | 1.07            | 1.8                              |
| 13        | 1.99    | 0.15    | 1.56     | 0.71     | 1.135      | 0.06    | 1.075           | 1.84                             |
| 35        | 2.32    | 0.2     | 1.95     | 0.85     | 1.4        | 0.29    | 1.11            | 2.12                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 2.51    | 0.2     | 2.18     | 0.94     | 1.56       | 0.42    | 1.14            | 2.31                             |
| 57        | 2.58    | 0.2     | 2.25     | 0.97     | 1.61       | 0.46    | 1.15            | 2.38                             |
| 64        | 2.75    | 0.2     | 2.38     | 0.91     | 1.645      | 0.55    | 1.095           | 2.55                             |
| 71        | 2.95    | 0.2     | 2.52     | 0.85     | 1.685      | 0.54    | 1.145           | 2.75                             |
| 78        | 3.32    | 0.23    | 2.73     | 0.8      | 1.765      | 0.55    | 1.215           | 3.09                             |
| 86        | 3.6     | 0.23    | 2.89     | 0.78     | 1.835      | 0.6     | 1.235           | 3.37                             |
| 93        | 3.88    | 0.23    | 3.08     | 0.8      | 1.94       | 0.68    | 1.26            | 3.65                             |
| 100       | 4.1     | 0.23    | 3.19     | 0.8      | 1.995      | 0.32    | 1.675           | 3.87                             |
| 107       | 4.4     | 0.23    | 3.38     | 0.82     | 2.1        | 0.81    | 1.29            | 4.17                             |
| 114- C    | 4.88    | 0.23    | 3.42     | 0.85     | 2.135      | 0.92    | 1.215           | 4.65                             |
| 121       | 5.35    | 0.23    | 3.78     | 0.85     | 2.315      | 1       | 1.315           | 5.12                             |
| 128       | 6.05    | 0.23    | 3.88     | 0.75     | 2.315      | 0.85    | 1.465           | 5.82                             |
| 135       | 7.5     | 0.23    | 3.99     | 0.75     | 2.37       | 0.81    | 1.56            | 7.27                             |
| 143       | 11.05   | 0       | 4.21     | 0.75     | 2.48       | 1.4     | 1.08            | 11.05                            |
| 145       | 12.8    | 0       | 4.3      | 0.74     | 2.52       | 1.6     | 0.92            | 12.8                             |
| 150       | 13.2    | -0.02   | 4.35     | 0.75     | 2.55       | 1.7     | 0.85            | 13.22                            |

**Table A.9.96: Test Panel Concrete Cube Strength (C30-30-3-CFST-w)**

| Cast Date: 28-08-2008   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 12-10-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.7         | 87.6          | 37.195                        | 2429                             |
| II                      | 153x153x153 | 8.6         | 81            | 34.393                        | 2401                             |
| III                     | 153x153x153 | 8.6         | 85.4          | 36.261                        | 2401                             |
| IV                      | 153x153x153 | 8.55        | 89.2          | 37.874                        | 2387                             |
| Mean                    |             |             |               | 36.431                        | 2405                             |

**Table A.9.97: Sample 37 (C30-30-3-w)**

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| -2        | 0       | 0       | 0        | 0        | 0          | 0       | 0               | 0                                |
| 6         | 0.17    | 0.02    | 0.26     | 0.09     | 0.175      | 0.12    | 0.055           | 0.15                             |
| 13        | 0.35    | 0.11    | 0.5      | 0.21     | 0.355      | 0.27    | 0.085           | 0.24                             |
| 35        | 0.66    | 0.14    | 1.09     | 0.41     | 0.75       | 0.62    | 0.13            | 0.52                             |
| 51        | 1.07    | 0.15    | 1.5      | 0.55     | 1.025      | 0.88    | 0.145           | 0.92                             |
| 3         | 0.49    | 0.21    | 0.56     | 0.22     | 0.39       | 0.32    | 0.07            | 0.28                             |
| 13        | 0.61    | 0.24    | 0.78     | 0.3      | 0.54       | 0.43    | 0.11            | 0.37                             |
| 35        | 0.93    | 0.24    | 1.28     | 0.48     | 0.88       | 0.74    | 0.14            | 0.69                             |
| 51        | 1.13    | 0.24    | 1.58     | 0.59     | 1.085      | 0.92    | 0.165           | 0.89                             |
| 6         | 0.53    | 0.18    | 0.81     | 0.32     | 0.565      | 0.47    | 0.095           | 0.35                             |
| 13        | 0.6     | 0.21    | 0.95     | 0.37     | 0.66       | 0.53    | 0.13            | 0.39                             |
| 35        | 0.98    | 0.21    | 1.36     | 0.51     | 0.935      | 0.79    | 0.145           | 0.77                             |
| 51        | 1.15    | 0.21    | 1.64     | 0.61     | 1.125      | 0.96    | 0.165           | 0.94                             |
| 3         | 0.47    | 0.2     | 0.62     | 0.25     | 0.435      | 0.34    | 0.095           | 0.27                             |
| 13        | 0.67    | 0.24    | 0.9      | 0.35     | 0.625      | 0.5     | 0.125           | 0.43                             |
| 35        | 0.99    | 0.24    | 1.39     | 0.53     | 0.96       | 0.79    | 0.17            | 0.75                             |
| 51        | 1.19    | 0.24    | 1.71     | 0.64     | 1.175      | 0.98    | 0.195           | 0.95                             |
| 4         | 0.59    | 0.2     | 0.8      | 0.32     | 0.56       | 0.45    | 0.11            | 0.39                             |
| 13        | 0.72    | 0.22    | 0.99     | 0.39     | 0.69       | 0.55    | 0.14            | 0.5                              |
| 35        | 1.02    | 0.23    | 1.43     | 0.55     | 0.99       | 0.83    | 0.16            | 0.79                             |
| 51        | 1.2     | 0.23    | 1.75     | 0.66     | 1.205      | 0.99    | 0.215           | 0.97                             |
| 3         | 0.59    | 0.2     | 0.82     | 0.33     | 0.575      | 0.46    | 0.115           | 0.39                             |
| 13        | 0.72    | 0.23    | 1.01     | 0.4      | 0.705      | 0.56    | 0.145           | 0.49                             |
| 35        | 1.03    | 0.23    | 1.48     | 0.58     | 1.03       | 0.86    | 0.17            | 0.8                              |
| 51        | 1.21    | 0.23    | 1.77     | 0.66     | 1.215      | 1.01    | 0.205           | 0.98                             |
| 4         | 0.65    | 0.2     | 0.91     | 0.36     | 0.635      | 0.52    | 0.115           | 0.45                             |
| 13        | 0.75    | 0.22    | 1.09     | 0.42     | 0.755      | 0.6     | 0.155           | 0.53                             |
| 35        | 1.05    | 0.22    | 1.52     | 0.58     | 1.05       | 0.88    | 0.17            | 0.83                             |
| 51        | 1.22    | 0.22    | 1.79     | 0.67     | 1.23       | 1.01    | 0.22            | 1                                |
| 4         | 0.65    | 0.2     | 0.93     | 0.38     | 0.655      | 0.54    | 0.115           | 0.45                             |
| 13        | 0.75    | 0.22    | 1.1      | 0.43     | 0.765      | 0.62    | 0.145           | 0.53                             |
| 35        | 1.05    | 0.22    | 1.54     | 0.59     | 1.065      | 0.9     | 0.165           | 0.83                             |
| 51        | 1.24    | 0.23    | 1.84     | 0.7      | 1.27       | 1.05    | 0.22            | 1.01                             |
| 4         | 0.66    | 0.2     | 1.02     | 0.39     | 0.705      | 0.56    | 0.145           | 0.46                             |
| 13        | 0.75    | 0.22    | 1.11     | 0.44     | 0.775      | 0.63    | 0.145           | 0.53                             |
| 35        | 1.07    | 0.22    | 1.59     | 0.6      | 1.095      | 0.92    | 0.175           | 0.85                             |
| 51        | 1.25    | 0.22    | 1.86     | 0.7      | 1.28       | 1.07    | 0.21            | 1.03                             |
| 6         | 0.73    | 0.19    | 1.08     | 0.43     | 0.755      | 0.63    | 0.125           | 0.54                             |
| 13        | 0.79    | 0.22    | 1.19     | 0.47     | 0.83       | 0.69    | 0.14            | 0.57                             |
| 35        | 1.08    | 0.22    | 1.61     | 0.62     | 1.115      | 0.93    | 0.185           | 0.86                             |
| 51        | 1.26    | 0.22    | 1.88     | 0.72     | 1.3        | 1.08    | 0.22            | 1.04                             |
| 6         | 0.75    | 0.19    | 1.1      | 0.44     | 0.77       | 0.64    | 0.13            | 0.56                             |
| 13        | 0.8     | 0.22    | 1.21     | 0.48     | 0.845      | 0.7     | 0.145           | 0.58                             |
| 35        | 1.1     | 0.22    | 1.65     | 0.63     | 1.14       | 0.97    | 0.17            | 0.88                             |
| 51        | 1.26    | 0.22    | 1.89     | 0.73     | 1.31       | 1.1     | 0.21            | 1.04                             |
| 6         | 0.76    | 0.19    | 1.13     | 0.45     | 0.79       | 0.67    | 0.12            | 0.57                             |
| 15        | 0.85    | 0.22    | 1.28     | 0.5      | 0.89       | 0.75    | 0.14            | 0.63                             |
| 35        | 1.1     | 0.22    | 1.65     | 0.64     | 1.145      | 0.97    | 0.175           | 0.88                             |
| 51        | 1.28    | 0.22    | 1.92     | 0.73     | 1.325      | 1.11    | 0.215           | 1.06                             |
| 6         | 0.75    | 0.19    | 1.12     | 0.45     | 0.785      | 0.66    | 0.125           | 0.56                             |
| 13        | 0.81    | 0.22    | 1.22     | 0.49     | 0.855      | 0.72    | 0.135           | 0.59                             |
| 35        | 1.11    | 0.22    | 1.67     | 0.65     | 1.16       | 0.97    | 0.19            | 0.89                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 1.28    | 0.22    | 1.92     | 0.73     | 1.325      | 1.12    | 0.205           | 1.06                             |
| 6         | 0.79    | 0.19    | 1.19     | 0.48     | 0.835      | 0.71    | 0.125           | 0.6                              |
| 13        | 0.82    | 0.22    | 1.26     | 0.5      | 0.88       | 0.74    | 0.14            | 0.6                              |
| 35        | 1.11    | 0.22    | 1.68     | 0.65     | 1.165      | 0.99    | 0.175           | 0.89                             |
| 51        | 1.28    | 0.22    | 1.92     | 0.73     | 1.325      | 1.12    | 0.205           | 1.06                             |
| 6         | 0.75    | 0.2     | 1.12     | 0.45     | 0.785      | 0.65    | 0.135           | 0.55                             |
| 13        | 0.82    | 0.22    | 1.25     | 0.49     | 0.87       | 0.73    | 0.14            | 0.6                              |
| 35        | 1.12    | 0.22    | 1.7      | 0.66     | 1.18       | 0.99    | 0.19            | 0.9                              |
| 51        | 1.28    | 0.22    | 1.93     | 0.73     | 1.33       | 1.12    | 0.21            | 1.06                             |
| 6         | 0.79    | 0.19    | 1.19     | 0.48     | 0.835      | 0.71    | 0.125           | 0.6                              |
| 13        | 0.83    | 0.22    | 1.28     | 0.51     | 0.895      | 0.75    | 0.145           | 0.61                             |
| 35        | 1.13    | 0.22    | 1.71     | 0.66     | 1.185      | 1       | 0.185           | 0.91                             |
| 51        | 1.29    | 0.22    | 1.95     | 0.74     | 1.345      | 1.13    | 0.215           | 1.07                             |
| 6         | 0.76    | 0.19    | 1.15     | 0.46     | 0.805      | 0.68    | 0.125           | 0.57                             |
| 13        | 0.83    | 0.22    | 1.27     | 0.5      | 0.885      | 0.74    | 0.145           | 0.61                             |
| 35        | 1.13    | 0.22    | 1.71     | 0.66     | 1.185      | 1       | 0.185           | 0.91                             |
| 51        | 1.29    | 0.22    | 1.95     | 0.74     | 1.345      | 1.14    | 0.205           | 1.07                             |
| 6         | 0.76    | 0.19    | 1.16     | 0.46     | 0.81       | 0.69    | 0.12            | 0.57                             |
| 13        | 0.82    | 0.22    | 1.26     | 0.5      | 0.88       | 0.74    | 0.14            | 0.6                              |
| 35        | 1.13    | 0.22    | 1.71     | 0.66     | 1.185      | 1       | 0.185           | 0.91                             |
| 51        | 1.29    | 0.22    | 1.96     | 0.76     | 1.36       | 1.14    | 0.22            | 1.07                             |
| 4         | 0.75    | 0.19    | 1.15     | 0.46     | 0.805      | 0.68    | 0.125           | 0.56                             |
| 13        | 0.83    | 0.22    | 1.27     | 0.51     | 0.89       | 0.75    | 0.14            | 0.61                             |
| 35        | 1.14    | 0.22    | 1.72     | 0.67     | 1.195      | 1       | 0.195           | 0.92                             |
| 51        | 1.3     | 0.22    | 1.97     | 0.75     | 1.36       | 1.15    | 0.21            | 1.08                             |
| 6         | 0.76    | 0.2     | 1.15     | 0.46     | 0.805      | 0.68    | 0.125           | 0.56                             |
| 13        | 0.85    | 0.22    | 1.29     | 0.51     | 0.9        | 0.74    | 0.16            | 0.63                             |
| 35        | 1.14    | 0.22    | 1.72     | 0.67     | 1.195      | 1       | 0.195           | 0.92                             |
| 51        | 1.3     | 0.22    | 1.96     | 0.76     | 1.36       | 1.15    | 0.21            | 1.08                             |
| 6         | 0.81    | 0.2     | 1.24     | 0.5      | 0.87       | 0.74    | 0.13            | 0.61                             |
| 13        | 0.86    | 0.22    | 1.33     | 0.53     | 0.93       | 0.79    | 0.14            | 0.64                             |
| 35        | 1.15    | 0.22    | 1.74     | 0.67     | 1.205      | 1.01    | 0.195           | 0.93                             |
| 51        | 1.3     | 0.22    | 1.98     | 0.76     | 1.37       | 1.16    | 0.21            | 1.08                             |
| 6         | 0.82    | 0.2     | 1.25     | 0.5      | 0.875      | 0.74    | 0.135           | 0.62                             |
| 13        | 0.85    | 0.22    | 1.33     | 0.53     | 0.93       | 0.77    | 0.16            | 0.63                             |
| 35        | 1.15    | 0.22    | 1.74     | 0.68     | 1.21       | 1.01    | 0.2             | 0.93                             |
| 51        | 1.3     | 0.22    | 1.96     | 0.76     | 1.36       | 1.15    | 0.21            | 1.08                             |
| 6         | 0.81    | 0.2     | 1.23     | 0.49     | 0.86       | 0.73    | 0.13            | 0.61                             |
| 13        | 0.86    | 0.22    | 1.32     | 0.53     | 0.925      | 0.78    | 0.145           | 0.64                             |
| 35        | 1.15    | 0.22    | 1.74     | 0.68     | 1.21       | 1.02    | 0.19            | 0.93                             |
| 51        | 1.31    | 0.23    | 1.99     | 0.76     | 1.375      | 1.16    | 0.215           | 1.08                             |
| 6         | 0.84    | 0.2     | 1.26     | 0.5      | 0.88       | 0.75    | 0.13            | 0.64                             |
| 13        | 0.87    | 0.22    | 1.35     | 0.53     | 0.94       | 0.79    | 0.15            | 0.65                             |
| 35        | 1.16    | 0.23    | 1.76     | 0.68     | 1.22       | 1.03    | 0.19            | 0.93                             |
| 51        | 1.31    | 0.23    | 1.99     | 0.76     | 1.375      | 1.16    | 0.215           | 1.08                             |
| 6         | 0.81    | 0.2     | 1.22     | 0.49     | 0.855      | 0.72    | 0.135           | 0.61                             |
| 13        | 0.85    | 0.22    | 1.31     | 0.52     | 0.915      | 0.76    | 0.155           | 0.63                             |
| 35        | 1.15    | 0.23    | 1.75     | 0.68     | 1.215      | 1.02    | 0.195           | 0.92                             |
| 51        | 1.31    | 0.23    | 1.99     | 0.76     | 1.375      | 1.17    | 0.205           | 1.08                             |
| 6         | 0.81    | 0.2     | 1.24     | 0.5      | 0.87       | 0.74    | 0.13            | 0.61                             |
| 13        | 0.85    | 0.22    | 1.32     | 0.52     | 0.92       | 0.77    | 0.15            | 0.63                             |
| 35        | 1.15    | 0.23    | 1.75     | 0.68     | 1.215      | 1.03    | 0.185           | 0.92                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 1.31    | 0.23    | 1.99     | 0.76     | 1.375      | 1.17    | 0.205           | 1.08                             |
| 57        | 1.39    | 0.23    | 2.11     | 0.8      | 1.455      | 1.24    | 0.215           | 1.16                             |
| 64        | 1.49    | 0.23    | 2.24     | 0.85     | 1.545      | 1.32    | 0.225           | 1.26                             |
| 71        | 1.55    | 0.25    | 2.37     | 0.88     | 1.625      | 1.4     | 0.225           | 1.3                              |
| 78        | 1.78    | 0.26    | 2.5      | 0.9      | 1.7        | 1.45    | 0.25            | 1.52                             |
| 86        | 2.06    | 0.26    | 2.62     | 0.91     | 1.765      | 1.5     | 0.265           | 1.8                              |
| 93- C     | 2.4     | 0.27    | 2.8      | 0.88     | 1.84       | 1.51    | 0.33            | 2.13                             |
| 100       | 2.65    | 0.27    | 2.93     | 0.84     | 1.885      | 1.51    | 0.375           | 2.38                             |
| 107       | 2.98    | 0.28    | 3.1      | 0.78     | 1.94       | 1.51    | 0.43            | 2.7                              |
| 114       | 3.55    | 0.21    | 3.3      | 0.72     | 2.01       | 1.51    | 0.5             | 3.34                             |
| 121       | 3.93    | 0.19    | 3.65     | 0.71     | 2.18       | 1.48    | 0.7             | 3.74                             |

**Table A.9.98: Test Panel Concrete Cube Strength (C30-30-3-w)**

| Cast Date: 29-08-2005   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 31-10-2007 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.45        | 84            | 35.67                         | 2359                             |
| II                      | 153x153x153 | 8.6         | 86            | 36.52                         | 2401                             |
| III                     | 153x153x153 | 8.45        | 98.4          | 41.78                         | 2359                             |
| IV                      | 153x153x153 | 8.45        | 94.8          | 40.25                         | 2359                             |
| Mean                    |             |             |               | 38.55                         | 2370                             |



**Table A.9.99: Sample 38 (C30-25-3-ssp)**

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| -2        | 0       | 0       | 0        | 0        | 0          | 0       | 0               | 0                                |
| 6         | 0.64    | 0.1     | 1.22     | 0.25     | 0.735      | 0       | 0.735           | 0.54                             |
| 13        | 1.45    | 0.19    | 2.16     | 0.98     | 1.57       | 0.29    | 1.28            | 1.26                             |
| 35        | 2.5     | 0.2     | 2.81     | 1.99     | 2.4        | 0.4     | 2               | 2.3                              |
| 51        | 3.15    | 0.21    | 3.51     | 2.4      | 2.955      | 0.87    | 2.085           | 2.94                             |
| 6         | 2.89    | 0.17    | 2.1      | 1.17     | 1.635      | 0.57    | 1.065           | 2.72                             |
| 13        | 2.91    | 0.21    | 2.2      | 1.22     | 1.71       | 0.7     | 1.01            | 2.7                              |
| 35        | 3.14    | 0.21    | 2.61     | 1.47     | 2.04       | 0.91    | 1.13            | 2.93                             |
| 51        | 3.44    | 0.23    | 3.05     | 1.73     | 2.39       | 1.22    | 1.17            | 3.21                             |
| 6         | 0.14    | 0.07    | 0.12     | 0.08     | 0.1        | 0.2     | -0.1            | 0.07                             |
| 13        | 0.25    | 0.09    | 0.28     | 0.18     | 0.23       | 0.27    | -0.04           | 0.16                             |
| 35        | 0.8     | 0.11    | 1.91     | 0.55     | 1.23       | 0.57    | 0.66            | 0.69                             |
| 51        | 1.23    | 0.11    | 2.31     | 0.87     | 1.59       | 0.85    | 0.74            | 1.12                             |
| 3         | 0.67    | 0.07    | 1.7      | 0.45     | 1.075      | 0.5     | 0.575           | 0.6                              |
| 13        | 0.79    | 0.11    | 1.85     | 0.52     | 1.185      | 0.57    | 0.615           | 0.68                             |
| 35        | 1.11    | 0.11    | 2.18     | 0.71     | 1.445      | 0.78    | 0.665           | 1                                |
| 51        | 1.29    | 0.12    | 2.42     | 0.85     | 1.635      | 0.93    | 0.705           | 1.17                             |
| 4         | 0.76    | 0.07    | 1.83     | 0.53     | 1.18       | 0.59    | 0.59            | 0.69                             |
| 13        | 0.82    | 0.11    | 2.05     | 0.59     | 1.32       | 0.65    | 0.67            | 0.71                             |
| 35        | 1.11    | 0.11    | 2.25     | 0.75     | 1.5        | 0.8     | 0.7             | 1                                |
| 51        | 1.31    | 0.12    | 2.48     | 0.88     | 1.68       | 0.96    | 0.72            | 1.19                             |
| 3         | 0.75    | 0.07    | 1.84     | 0.52     | 1.18       | 0.6     | 0.58            | 0.68                             |
| 13        | 0.83    | 0.11    | 1.98     | 0.6      | 1.29       | 0.67    | 0.62            | 0.72                             |
| 35        | 1.14    | 0.11    | 2.28     | 0.78     | 1.53       | 0.85    | 0.68            | 1.03                             |
| 51        | 1.31    | 0.12    | 2.5      | 0.89     | 1.695      | 0.97    | 0.725           | 1.19                             |
| 3         | 0.76    | 0.07    | 1.88     | 0.55     | 1.215      | 0.61    | 0.605           | 0.69                             |
| 13        | 0.84    | 0.11    | 2        | 0.62     | 1.31       | 0.7     | 0.61            | 0.73                             |
| 35        | 1.13    | 0.11    | 2.3      | 0.78     | 1.54       | 0.86    | 0.68            | 1.02                             |
| 51        | 1.32    | 0.12    | 2.52     | 0.9      | 1.71       | 1       | 0.71            | 1.2                              |
| 3         | 0.78    | 0.06    | 1.9      | 0.57     | 1.235      | 0.63    | 0.605           | 0.72                             |
| 13        | 0.86    | 0.11    | 2.05     | 0.64     | 1.345      | 0.7     | 0.645           | 0.75                             |
| 35        | 1.15    | 0.12    | 2.33     | 0.8      | 1.565      | 0.89    | 0.675           | 1.03                             |
| 51        | 1.35    | 0.13    | 2.55     | 0.92     | 1.735      | 1.01    | 0.725           | 1.22                             |
| 6         | 0.86    | 0.08    | 1.99     | 0.62     | 1.305      | 0.7     | 0.605           | 0.78                             |
| 13        | 0.89    | 0.11    | 2.08     | 0.66     | 1.37       | 0.74    | 0.63            | 0.78                             |
| 35        | 1.17    | 0.11    | 2.35     | 0.82     | 1.585      | 0.9     | 0.685           | 1.06                             |
| 51        | 1.35    | 0.12    | 2.56     | 0.92     | 1.74       | 1.02    | 0.72            | 1.23                             |
| 6         | 0.88    | 0.08    | 2.01     | 0.63     | 1.32       | 0.71    | 0.61            | 0.8                              |
| 13        | 0.9     | 0.11    | 2.08     | 0.66     | 1.37       | 0.74    | 0.63            | 0.79                             |
| 35        | 1.18    | 0.12    | 2.36     | 0.82     | 1.59       | 0.9     | 0.69            | 1.06                             |
| 51        | 1.35    | 0.13    | 2.56     | 0.92     | 1.74       | 1.02    | 0.72            | 1.22                             |
| 3         | 0.82    | 0.08    | 1.95     | 0.6      | 1.275      | 0.68    | 0.595           | 0.74                             |
| 13        | 0.89    | 0.11    | 2.08     | 0.66     | 1.37       | 0.74    | 0.63            | 0.78                             |
| 35        | 1.19    | 0.11    | 2.36     | 0.82     | 1.59       | 0.9     | 0.69            | 1.08                             |
| 51        | 1.36    | 0.13    | 2.57     | 0.94     | 1.755      | 1.04    | 0.715           | 1.23                             |
| 7         | 0.92    | 0.09    | 2.05     | 0.66     | 1.355      | 0.74    | 0.615           | 0.83                             |
| 13        | 0.94    | 0.12    | 2.12     | 0.7      | 1.41       | 0.77    | 0.64            | 0.82                             |
| 35        | 1.2     | 0.12    | 2.38     | 0.83     | 1.605      | 0.92    | 0.685           | 1.08                             |
| 51        | 1.38    | 0.14    | 2.6      | 0.95     | 1.775      | 1.05    | 0.725           | 1.24                             |
| 4         | 0.86    | 0.08    | 1.99     | 0.62     | 1.305      | 0.7     | 0.605           | 0.78                             |
| 13        | 0.92    | 0.12    | 2.1      | 0.68     | 1.39       | 0.75    | 0.64            | 0.8                              |
| 35        | 1.21    | 0.13    | 2.39     | 0.85     | 1.62       | 0.92    | 0.7             | 1.08                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 1.37    | 0.14    | 2.59     | 0.94     | 1.765      | 1.04    | 0.725           | 1.23                             |
| 4         | 0.87    | 0.08    | 2        | 0.63     | 1.315      | 0.7     | 0.615           | 0.79                             |
| 13        | 0.91    | 0.12    | 2.09     | 0.68     | 1.385      | 0.75    | 0.635           | 0.79                             |
| 35        | 1.21    | 0.13    | 2.39     | 0.85     | 1.62       | 0.92    | 0.7             | 1.08                             |
| 51        | 1.37    | 0.14    | 2.58     | 0.94     | 1.76       | 1.03    | 0.73            | 1.23                             |
| 6         | 0.92    | 0.09    | 2.06     | 0.66     | 1.36       | 0.74    | 0.62            | 0.83                             |
| 13        | 0.94    | 0.11    | 2.12     | 0.7      | 1.41       | 0.77    | 0.64            | 0.83                             |
| 35        | 1.22    | 0.13    | 2.4      | 0.85     | 1.625      | 0.93    | 0.695           | 1.09                             |
| 51        | 1.38    | 0.15    | 2.6      | 0.95     | 1.775      | 1.05    | 0.725           | 1.23                             |
| 4         | 0.9     | 0.08    | 2.02     | 0.65     | 1.335      | 0.72    | 0.615           | 0.82                             |
| 13        | 0.92    | 0.12    | 2.11     | 0.69     | 1.4        | 0.76    | 0.64            | 0.8                              |
| 35        | 1.21    | 0.13    | 2.39     | 0.85     | 1.62       | 0.92    | 0.7             | 1.08                             |
| 51        | 1.38    | 0.15    | 2.61     | 0.95     | 1.78       | 1.05    | 0.73            | 1.23                             |
| 6         | 0.93    | 0.09    | 2.06     | 0.67     | 1.365      | 0.75    | 0.615           | 0.84                             |
| 13        | 0.95    | 0.12    | 2.12     | 0.71     | 1.415      | 0.77    | 0.645           | 0.83                             |
| 35        | 1.22    | 0.14    | 2.4      | 0.85     | 1.625      | 0.93    | 0.695           | 1.08                             |
| 51        | 1.39    | 0.15    | 2.61     | 0.96     | 1.785      | 1.05    | 0.735           | 1.24                             |
| 6         | 0.91    | 0.09    | 2.05     | 0.66     | 1.355      | 0.73    | 0.625           | 0.82                             |
| 13        | 0.94    | 0.13    | 2.12     | 0.7      | 1.41       | 0.77    | 0.64            | 0.81                             |
| 35        | 1.22    | 0.14    | 2.4      | 0.85     | 1.625      | 0.93    | 0.695           | 1.08                             |
| 51        | 1.39    | 0.15    | 2.62     | 0.96     | 1.79       | 1.05    | 0.74            | 1.24                             |
| 6         | 0.91    | 0.09    | 2.05     | 0.66     | 1.355      | 0.73    | 0.625           | 0.82                             |
| 13        | 0.94    | 0.13    | 2.12     | 0.7      | 1.41       | 0.77    | 0.64            | 0.81                             |
| 35        | 1.22    | 0.14    | 2.4      | 0.85     | 1.625      | 0.93    | 0.695           | 1.08                             |
| 51        | 1.39    | 0.15    | 2.62     | 0.96     | 1.79       | 1.06    | 0.73            | 1.24                             |
| 3         | 0.86    | 0.08    | 2        | 0.63     | 1.315      | 0.71    | 0.605           | 0.78                             |
| 13        | 0.93    | 0.12    | 2.12     | 0.69     | 1.405      | 0.77    | 0.635           | 0.81                             |
| 35        | 1.23    | 0.14    | 2.41     | 0.86     | 1.635      | 0.93    | 0.705           | 1.09                             |
| 51        | 1.4     | 0.15    | 2.63     | 0.96     | 1.795      | 1.06    | 0.735           | 1.25                             |
| 6         | 0.94    | 0.1     | 2.08     | 0.68     | 1.38       | 0.75    | 0.63            | 0.84                             |
| 13        | 0.96    | 0.12    | 2.15     | 0.71     | 1.43       | 0.78    | 0.65            | 0.84                             |
| 35        | 1.24    | 0.15    | 2.42     | 0.86     | 1.64       | 0.95    | 0.69            | 1.09                             |
| 51        | 1.4     | 0.16    | 2.64     | 0.98     | 1.81       | 1.06    | 0.75            | 1.24                             |
| 6         | 0.91    | 0.09    | 2.06     | 0.67     | 1.365      | 0.73    | 0.635           | 0.82                             |
| 13        | 0.98    | 0.13    | 2.15     | 0.72     | 1.435      | 0.89    | 0.545           | 0.85                             |
| 35        | 1.24    | 0.15    | 2.42     | 0.86     | 1.64       | 0.95    | 0.69            | 1.09                             |
| 51        | 1.4     | 0.16    | 2.64     | 0.97     | 1.805      | 1.06    | 0.745           | 1.24                             |
| 6         | 0.93    | 0.09    | 2.07     | 0.67     | 1.37       | 0.75    | 0.62            | 0.84                             |
| 13        | 0.95    | 0.13    | 2.14     | 0.71     | 1.425      | 0.78    | 0.645           | 0.82                             |
| 35        | 1.24    | 0.15    | 2.43     | 0.87     | 1.65       | 0.95    | 0.7             | 1.09                             |
| 51        | 1.4     | 0.16    | 2.63     | 0.96     | 1.795      | 1.06    | 0.735           | 1.24                             |
| 4         | 0.91    | 0.09    | 2.05     | 0.67     | 1.36       | 0.74    | 0.62            | 0.82                             |
| 13        | 0.98    | 0.13    | 2.15     | 0.72     | 1.435      | 0.79    | 0.645           | 0.85                             |
| 35        | 1.24    | 0.15    | 2.42     | 0.86     | 1.64       | 0.95    | 0.69            | 1.09                             |
| 51        | 1.41    | 0.16    | 2.65     | 0.98     | 1.815      | 1.07    | 0.745           | 1.25                             |
| 6         | 0.96    | 0.1     | 2.11     | 0.7      | 1.405      | 0.78    | 0.625           | 0.86                             |
| 13        | 1       | 0.13    | 2.18     | 0.73     | 1.455      | 0.8     | 0.655           | 0.87                             |
| 35        | 1.24    | 0.15    | 2.44     | 0.87     | 1.655      | 0.96    | 0.695           | 1.09                             |
| 51        | 1.4     | 0.16    | 2.64     | 0.98     | 1.81       | 1.07    | 0.74            | 1.24                             |
| 6         | 0.96    | 0.1     | 2.11     | 0.7      | 1.405      | 0.78    | 0.625           | 0.86                             |
| 13        | 0.99    | 0.13    | 2.17     | 0.73     | 1.45       | 0.8     | 0.65            | 0.86                             |
| 35        | 1.24    | 0.15    | 2.44     | 0.88     | 1.66       | 0.96    | 0.7             | 1.09                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 1.42    | 0.16    | 2.66     | 0.99     | 1.825      | 1.08    | 0.745           | 1.26                             |
| 57        | 1.55    | 0.16    | 2.75     | 1.03     | 1.89       | 1.12    | 0.77            | 1.39                             |
| 64- C     | 2.13    | 0.17    | 2.89     | 1.66     | 2.275      | 0.97    | 1.305           | 1.96                             |
| 71        | 2.42    | 0.15    | 3.15     | 1.74     | 2.445      | 1.06    | 1.385           | 2.27                             |
| 78        | 2.67    | 0.14    | 3.38     | 1.8      | 2.59       | 1.13    | 1.46            | 2.53                             |
| 86        | 2.93    | 0.15    | 3.6      | 1.86     | 2.73       | 1.23    | 1.5             | 2.78                             |
| 93        | 3.14    | 0.14    | 3.8      | 1.91     | 2.855      | 1.3     | 1.555           | 3                                |
| 100       | 3.58    | 0.13    | 4.15     | 2.01     | 3.08       | 1.47    | 1.61            | 3.45                             |
| 107       | 4.29    | 0.06    | 4.54     | 2.15     | 3.345      | 1.65    | 1.695           | 4.23                             |
| 114       | 4.89    | 0       | 4.85     | 2.21     | 3.53       | 1.77    | 1.76            | 4.89                             |
| 121       | 6.03    | -0.08   | 5.36     | 2.36     | 3.86       | 2       | 1.86            | 6.11                             |
| 128       | 7.7     | -0.08   | 6.1      | 2.65     | 4.375      | 2.37    | 2.005           | 7.78                             |

**Table A.9.100: Test Panel Concrete Cube Strength (C30-25-3-ssp)**

| Cast Date: 09-10-2006   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 11-09-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.5         | 108           | 45.86                         | 2373                             |
| II                      | 153x153x153 | 8.5         | 107.2         | 45.52                         | 2373                             |
| III                     | 153x153x153 | 8.45        | 105           | 44.58                         | 2359                             |
| IV                      | 153x153x153 | 8.55        | 97            | 41.19                         | 2387                             |
| Mean                    |             |             |               | 44.29                         | 2373                             |



**Table A.9.101: Sample 39 (C30-25-3-CFST-w)**

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| -2        | 0       | 0       | 0        | 0        | 0          | 0       | 0               | 0                                |
| 6         | 0.47    | 0.04    | 0.21     | 0.08     | 0.145      | 0.09    | 0.055           | 0.43                             |
| 13        | 0.8     | 0.08    | 0.4      | 0.15     | 0.275      | 0.23    | 0.045           | 0.72                             |
| 35        | 1.75    | 0.16    | 1.02     | 0.4      | 0.71       | 0.62    | 0.09            | 1.59                             |
| 51        | 2.35    | 0.17    | 1.42     | 0.55     | 0.985      | 0.89    | 0.095           | 2.18                             |
| 6         | 1.66    | 0.1     | 1.96     | 0.41     | 1.185      | 0.65    | 0.535           | 1.56                             |
| 13        | 1.78    | 0.14    | 2.06     | 0.44     | 1.25       | 0.7     | 0.55            | 1.64                             |
| 35        | 2.18    | 0.16    | 2.36     | 0.56     | 1.46       | 0.87    | 0.59            | 2.02                             |
| 51        | 2.5     | 0.11    | 2.62     | 0.64     | 1.63       | 1.02    | 0.61            | 2.39                             |
| 6         | 1.83    | 0.08    | 2.25     | 0.54     | 1.395      | 0.81    | 0.585           | 1.75                             |
| 13        | 1.89    | 0.11    | 2.26     | 0.53     | 1.395      | 0.83    | 0.565           | 1.78                             |
| 35        | 2.3     | 0.12    | 2.53     | 0.62     | 1.575      | 0.99    | 0.585           | 2.18                             |
| 51        | 2.62    | 0.12    | 2.77     | 0.71     | 1.74       | 1.12    | 0.62            | 2.5                              |
| 6         | 1.86    | 0.07    | 2.22     | 0.52     | 1.37       | 0.82    | 0.55            | 1.79                             |
| 13        | 1.93    | 0.1     | 2.29     | 0.54     | 1.415      | 0.85    | 0.565           | 1.83                             |
| 35        | 2.41    | 0.11    | 2.61     | 0.66     | 1.635      | 1.05    | 0.585           | 2.3                              |
| 51        | 2.72    | 0.11    | 2.84     | 0.75     | 1.795      | 1.17    | 0.625           | 2.61                             |
| 7         | 1.98    | 0.05    | 2.31     | 0.56     | 1.435      | 0.9     | 0.535           | 1.93                             |
| 13        | 2.06    | 0.07    | 2.38     | 0.58     | 1.48       | 0.93    | 0.55            | 1.99                             |
| 35        | 2.5     | 0.08    | 2.65     | 0.68     | 1.665      | 1.07    | 0.595           | 2.42                             |
| 51-C      | 3.04    | -0.13   | 3.06     | 0.68     | 1.87       | 1.1     | 0.77            | 3.17                             |
| 6         | 2.83    | -0.31   | 2.52     | -0.35    | 1.085      | 0.46    | 0.625           | 3.14                             |
| 13        | 2.9     | -0.28   | 2.64     | -0.37    | 1.135      | 0.47    | 0.665           | 3.18                             |
| 35        | 3.45    | -0.31   | 2.51     | -0.51    | 1          | 0.49    | 0.51            | 3.76                             |
| 51        | 3.8     | -0.34   | 3.05     | -0.7     | 1.175      | 0.49    | 0.685           | 4.14                             |
| 6         | 3.05    | -0.42   | 2.62     | -0.58    | 1.02       | 0.46    | 0.56            | 3.47                             |
| 13        | 3.14    | -0.39   | 2.69     | -0.59    | 1.05       | 0.37    | 0.68            | 3.53                             |
| 35        | 3.61    | -0.039  | 2.92     | -0.67    | 1.125      | 0.4     | 0.725           | 3.649                            |
| 51        | 3.88    | -0.35   | 3.09     | -0.76    | 1.165      | 0.43    | 0.735           | 4.23                             |
| 6         | 3.11    | -0.45   | 2.65     | -0.65    | 1          | 0.32    | 0.68            | 3.56                             |
| 13        | 3.28    | -0.42   | 2.69     | -0.65    | 1.02       | 0.33    | 0.69            | 3.7                              |
| 35        | 3.66    | -0.42   | 2.93     | -0.74    | 1.095      | 0.36    | 0.735           | 4.08                             |
| 51        | 3.95    | -0.34   | 3.12     | -0.8     | 1.16       | 0.41    | 0.75            | 4.29                             |
| 6         | 3.08    | -0.45   | 2.6      | -0.69    | 0.955      | 0.29    | 0.665           | 3.53                             |
| 13        | 3.18    | -0.42   | 2.66     | -0.69    | 0.985      | 0.29    | 0.695           | 3.6                              |
| 35        | 3.7     | -0.41   | 2.92     | -0.79    | 1.065      | 0.31    | 0.755           | 4.11                             |
| 51        | 4.02    | -0.32   | 3.13     | -0.83    | 1.15       | 0.39    | 0.76            | 4.34                             |
| 6         | 3.12    | -0.45   | 2.6      | -0.72    | 0.94       | 0.26    | 0.68            | 3.57                             |
| 13        | 3.22    | -0.43   | 2.67     | -0.72    | 0.975      | 0.28    | 0.695           | 3.65                             |
| 35        | 3.74    | -0.41   | 2.93     | -0.83    | 1.05       | 0.3     | 0.75            | 4.15                             |
| 51        | 4.06    | -0.31   | 3.15     | -0.88    | 1.135      | 0.37    | 0.765           | 4.37                             |
| 6         | 3.21    | -0.47   | 2.66     | -0.76    | 0.95       | 0.26    | 0.69            | 3.68                             |
| 13        | 3.27    | -0.45   | 2.71     | -0.76    | 0.975      | 0.28    | 0.695           | 3.72                             |
| 35        | 3.78    | -0.41   | 2.93     | -0.86    | 1.035      | 0.29    | 0.745           | 4.19                             |
| 51        | 4.02    | -0.3    | 3.15     | -0.89    | 1.13       | 0.36    | 0.77            | 4.32                             |
| 6         | 3.25    | -0.47   | 2.67     | -0.79    | 0.94       | 0.25    | 0.69            | 3.72                             |
| 13        | 3.32    | -0.45   | 2.73     | -0.79    | 0.97       | 0.27    | 0.7             | 3.77                             |
| 35        | 3.82    | -0.4    | 2.95     | -0.88    | 1.035      | 0.29    | 0.745           | 4.22                             |
| 51        | 4.11    | -0.28   | 3.16     | -0.9     | 1.13       | 0.35    | 0.78            | 4.39                             |
| 6         | 3.26    | -0.47   | 2.68     | -0.8     | 0.94       | 0.25    | 0.69            | 3.73                             |
| 13        | 3.32    | -0.46   | 2.73     | -0.8     | 0.965      | 0.26    | 0.705           | 3.78                             |
| 35        | 3.83    | -0.39   | 2.96     | -0.9     | 1.03       | 0.28    | 0.75            | 4.22                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 4.15    | -0.25   | 3.18     | -0.92    | 1.13       | 0.34    | 0.79            | 4.4                              |
| 6         | 3.3     | -0.47   | 2.7      | -0.82    | 0.94       | 0.25    | 0.69            | 3.77                             |
| 13        | 3.36    | -0.46   | 2.75     | -0.82    | 0.965      | 0.26    | 0.705           | 3.82                             |
| 35        | 3.86    | -0.39   | 2.97     | -0.92    | 1.025      | 0.28    | 0.745           | 4.25                             |
| 51        | 4.16    | -0.24   | 3.19     | -0.94    | 1.125      | 0.33    | 0.795           | 4.4                              |
| 6         | 3.3     | -0.48   | 2.69     | -0.83    | 0.93       | 0.24    | 0.69            | 3.78                             |
| 13        | 3.38    | -0.45   | 2.75     | -0.83    | 0.96       | 0.24    | 0.72            | 3.83                             |
| 35        | 3.9     | -0.38   | 2.99     | -0.94    | 1.025      | 0.27    | 0.755           | 4.28                             |
| 51        | 4.19    | -0.22   | 3.2      | -0.95    | 1.125      | 0.33    | 0.795           | 4.41                             |
| 6         | 3.33    | -0.48   | 2.71     | -0.85    | 0.93       | 0.23    | 0.7             | 3.81                             |
| 13        | 3.41    | -0.45   | 2.77     | -0.85    | 0.96       | 0.24    | 0.72            | 3.86                             |
| 35        | 3.9     | -0.38   | 2.99     | -0.95    | 1.02       | 0.27    | 0.75            | 4.28                             |
| 51        | 4.2     | -0.22   | 3.2      | -0.95    | 1.125      | 0.33    | 0.795           | 4.42                             |
| 6         | 3.3     | -0.48   | 2.7      | -0.86    | 0.92       | 0.23    | 0.69            | 3.78                             |
| 13        | 3.4     | -0.46   | 2.76     | -0.86    | 0.95       | 0.23    | 0.72            | 3.86                             |
| 35        | 3.92    | -0.36   | 3        | -0.95    | 1.025      | 0.26    | 0.765           | 4.28                             |
| 51        | 4.23    | -0.2    | 3.22     | -0.98    | 1.12       | 0.33    | 0.79            | 4.43                             |
| 6         | 3.35    | -0.48   | 2.74     | -0.86    | 0.94       | 0.22    | 0.72            | 3.83                             |
| 13        | 3.48    | -0.46   | 2.8      | -0.88    | 0.96       | 0.23    | 0.73            | 3.94                             |
| 35        | 3.95    | -0.35   | 3.01     | -0.86    | 1.075      | 0.27    | 0.805           | 4.3                              |
| 51        | 4.22    | -0.2    | 3.22     | -0.98    | 1.12       | 0.32    | 0.8             | 4.42                             |
| 6         | 3.4     | -0.47   | 2.76     | -0.88    | 0.94       | 0.23    | 0.71            | 3.87                             |
| 13        | 3.47    | -0.45   | 2.81     | -0.89    | 0.96       | 0.24    | 0.72            | 3.92                             |
| 35        | 3.96    | -0.33   | 3.02     | -0.97    | 1.025      | 0.27    | 0.755           | 4.29                             |
| 51        | 4.24    | -0.2    | 3.23     | -0.98    | 1.125      | 0.33    | 0.795           | 4.44                             |
| 6         | 3.27    | -0.48   | 2.67     | -0.86    | 0.905      | 0.2     | 0.705           | 3.75                             |
| 13        | 3.43    | -0.45   | 2.76     | -0.88    | 0.94       | 0.22    | 0.72            | 3.88                             |
| 35        | 3.98    | -0.32   | 3.03     | -0.98    | 1.025      | 0.26    | 0.765           | 4.3                              |
| 51        | 4.26    | -0.18   | 3.25     | -0.99    | 1.13       | 0.33    | 0.8             | 4.44                             |
| 4         | 3.3     | -0.48   | 2.7      | -0.87    | 0.915      | 0.21    | 0.705           | 3.78                             |
| 13        | 3.42    | -0.45   | 2.78     | -0.87    | 0.955      | 0.24    | 0.715           | 3.87                             |
| 35        | 3.98    | -0.32   | 3.05     | -0.98    | 1.035      | 0.27    | 0.765           | 4.3                              |
| 51        | 4.28    | -0.18   | 3.26     | -0.99    | 1.135      | 0.33    | 0.805           | 4.46                             |
| 3         | 3.25    | -0.49   | 2.67     | -0.87    | 0.9        | 0.2     | 0.7             | 3.74                             |
| 13        | 3.43    | -0.45   | 2.78     | -0.87    | 0.955      | 0.24    | 0.715           | 3.88                             |
| 35        | 3.98    | -0.3    | 3.05     | -0.98    | 1.035      | 0.27    | 0.765           | 4.28                             |
| 51        | 4.3     | -0.17   | 3.29     | -0.99    | 1.15       | 0.35    | 0.8             | 4.47                             |
| 6         | 3.4     | -0.46   | 2.8      | -0.88    | 0.96       | 0.25    | 0.71            | 3.86                             |
| 13        | 3.5     | -0.43   | 2.86     | -0.87    | 0.995      | 0.27    | 0.725           | 3.93                             |
| 35        | 4.04    | -0.28   | 3.11     | -0.98    | 1.065      | 0.29    | 0.775           | 4.32                             |
| 51        | 4.3     | -0.17   | 3.33     | -0.99    | 1.17       | 0.37    | 0.8             | 4.47                             |
| 6         | 3.47    | -0.43   | 2.85     | -0.88    | 0.985      | 0.27    | 0.715           | 3.9                              |
| 13        | 3.54    | -0.41   | 2.9      | -0.88    | 1.01       | 0.27    | 0.74            | 3.95                             |
| 35        | 4.05    | -0.26   | 3.13     | -0.97    | 1.08       | 0.3     | 0.78            | 4.31                             |
| 51        | 4.32    | -0.15   | 3.35     | -0.99    | 1.18       | 0.38    | 0.8             | 4.47                             |
| 4         | 3.36    | -0.45   | 2.69     | -0.87    | 0.91       | 0.25    | 0.66            | 3.81                             |
| 13        | 3.54    | -0.4    | 2.89     | -0.87    | 1.01       | 0.28    | 0.73            | 3.94                             |
| 35        | 4.06    | -0.25   | 3.13     | -0.97    | 1.08       | 0.3     | 0.78            | 4.31                             |
| 51        | 4.33    | -0.16   | 3.37     | -0.99    | 1.19       | 0.39    | 0.8             | 4.49                             |
| 6         | 3.48    | -0.39   | 2.88     | -0.87    | 1.005      | 0.28    | 0.725           | 3.87                             |
| 13        | 3.58    | -0.36   | 2.95     | -0.87    | 1.04       | 0.29    | 0.75            | 3.94                             |
| 35        | 4.08    | -0.22   | 3.17     | -0.97    | 1.1        | 0.32    | 0.78            | 4.3                              |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 4.37    | -0.15   | 3.4      | -0.99    | 1.205      | 0.4     | 0.805           | 4.52                             |
| 57        | 4.49    | -0.14   | 3.51     | -1       | 1.255      | 0.43    | 0.825           | 4.63                             |
| 64-N      | 4.68    | -0.12   | 3.63     | -1.08    | 1.275      | 0.36    | 0.915           | 4.8                              |
| 71        | 5.04    | -0.15   | 3.78     | -1.18    | 1.3        | 0.49    | 0.81            | 5.19                             |
| 78        | 5.33    | -0.29   | 3.93     | -1.24    | 1.345      | 0.5     | 0.845           | 5.62                             |
| 86        | 5.8     | -0.4    | 4.03     | -1.35    | 1.34       | 0.52    | 0.82            | 6.2                              |
| 93        | 6.14    | -0.39   | 4.21     | -1.38    | 1.415      | 0.53    | 0.885           | 6.53                             |
| 100       | 6.47    | -0.38   | 4.53     | -1.39    | 1.57       | 0.7     | 0.87            | 6.85                             |
| 107       | 6.95    | -0.22   | 4.83     | -1.39    | 1.72       | 0.79    | 0.93            | 7.17                             |
| 114       | 7.4     | -0.19   | 5.01     | -1.39    | 1.81       | 0.9     | 0.91            | 7.59                             |
| 121       | 8.09    | -0.33   | 5.05     | -1.58    | 1.735      | 0.6     | 1.135           | 8.42                             |
| 124       | 8.94    | -0.37   | 5.15     | -1.6     | 1.775      | 0.66    | 1.115           | 9.31                             |

**Table A.9.102: Test Panel Concrete Cube Strength (C30-25-3-CFST-w)**

| Cast Date: 05-09-2006   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 01-11-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.7         | 90.4          | 38.38                         | 2429                             |
| II                      | 153x153x153 | 8.65        | 93.6          | 39.74                         | 2415                             |
| III                     | 153x153x153 | 8.65        | 92.8          | 39.40                         | 2415                             |
| IV                      | 153x153x153 | 8.6         | 92.8          | 39.40                         | 2401                             |
| Mean                    |             |             |               | 39.23                         | 2415                             |



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**Table A.9.103: Sample 40 (C30-25-3-w)**

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| -2        | 0       | 0       | 0        | 0        | 0          | 0       | 0               | 0                                |
| 6         | 0.18    | 0.04    | 0.21     | 0.09     | 0.15       | 0.14    | 0.01            | 0.14                             |
| 13        | 0.35    | 0.06    | 0.42     | 0.18     | 0.3        | 0.28    | 0.02            | 0.29                             |
| 35        | 0.75    | 0.15    | 0.95     | 0.38     | 0.665      | 0.61    | 0.055           | 0.6                              |
| 51        | 1.05    | 0.21    | 1.32     | 0.5      | 0.91       | 0.83    | 0.08            | 0.84                             |
| 4         | 0.4     | 0.09    | 0.42     | 0.17     | 0.295      | 0.3     | -0.005          | 0.31                             |
| 13        | 0.56    | 0.14    | 0.61     | 0.25     | 0.43       | 0.4     | 0.03            | 0.42                             |
| 35        | 0.87    | 0.19    | 1.04     | 0.41     | 0.725      | 0.78    | -0.055          | 0.68                             |
| 51        | 1.1     | 0.22    | 1.36     | 0.52     | 0.94       | 0.86    | 0.08            | 0.88                             |
| 4         | 0.4     | 0.09    | 0.4      | 0.16     | 0.28       | 0.3     | -0.02           | 0.31                             |
| 13        | 0.59    | 0.15    | 0.43     | 0.25     | 0.34       | 0.41    | -0.07           | 0.44                             |
| 35        | 0.9     | 0.2     | 1.05     | 0.41     | 0.73       | 0.68    | 0.05            | 0.7                              |
| 51        | 1.13    | 0.23    | 1.37     | 0.53     | 0.95       | 0.87    | 0.08            | 0.9                              |
| 6         | 0.51    | 0.12    | 0.53     | 0.21     | 0.37       | 0.38    | -0.01           | 0.39                             |
| 13        | 0.6     | 0.17    | 0.63     | 0.25     | 0.44       | 0.42    | 0.02            | 0.43                             |
| 35        | 0.92    | 0.21    | 1.04     | 0.4      | 0.72       | 0.68    | 0.04            | 0.71                             |
| 51        | 1.14    | 0.24    | 1.36     | 0.52     | 0.94       | 0.86    | 0.08            | 0.9                              |
| 6         | 0.49    | 0.12    | 0.53     | 0.21     | 0.37       | 0.38    | -0.01           | 0.37                             |
| 13        | 0.63    | 0.17    | 0.66     | 0.26     | 0.46       | 0.44    | 0.02            | 0.46                             |
| 35        | 0.94    | 0.21    | 1.06     | 0.41     | 0.735      | 0.68    | 0.055           | 0.73                             |
| 51        | 1.15    | 0.25    | 1.37     | 0.52     | 0.945      | 0.86    | 0.085           | 0.9                              |
| 6         | 0.55    | 0.13    | 0.59     | 0.23     | 0.41       | 0.4     | 0.01            | 0.42                             |
| 13        | 0.64    | 0.18    | 0.67     | 0.26     | 0.465      | 0.44    | 0.025           | 0.46                             |
| 35        | 0.95    | 0.22    | 1.06     | 0.41     | 0.735      | 0.68    | 0.055           | 0.73                             |
| 51        | 1.16    | 0.25    | 1.38     | 0.53     | 0.955      | 0.88    | 0.075           | 0.91                             |
| 6         | 0.53    | 0.12    | 0.54     | 0.21     | 0.375      | 0.38    | -0.005          | 0.41                             |
| 13        | 0.63    | 0.17    | 0.64     | 0.25     | 0.445      | 0.42    | 0.025           | 0.46                             |
| 35        | 0.95    | 0.23    | 1.08     | 0.41     | 0.745      | 0.69    | 0.055           | 0.72                             |
| 51        | 1.16    | 0.25    | 1.38     | 0.52     | 0.95       | 0.87    | 0.08            | 0.91                             |
| 6         | 0.56    | 0.13    | 0.59     | 0.23     | 0.41       | 0.4     | 0.01            | 0.43                             |
| 13        | 0.66    | 0.18    | 0.68     | 0.27     | 0.475      | 0.45    | 0.025           | 0.48                             |
| 35        | 0.95    | 0.22    | 1.05     | 0.41     | 0.73       | 0.68    | 0.05            | 0.73                             |
| 51        | 1.17    | 0.25    | 1.37     | 0.51     | 0.94       | 0.85    | 0.09            | 0.92                             |
| 6         | 0.54    | 0.12    | 0.56     | 0.22     | 0.39       | 0.38    | 0.01            | 0.42                             |
| 13        | 0.64    | 0.18    | 0.65     | 0.25     | 0.45       | 0.43    | 0.02            | 0.46                             |
| 35        | 0.97    | 0.23    | 1.07     | 0.41     | 0.74       | 0.69    | 0.05            | 0.74                             |
| 51        | 1.17    | 0.25    | 1.37     | 0.52     | 0.945      | 0.85    | 0.095           | 0.92                             |
| 4         | 0.53    | 0.12    | 0.53     | 0.21     | 0.37       | 0.38    | -0.01           | 0.41                             |
| 13        | 0.63    | 0.18    | 0.64     | 0.25     | 0.445      | 0.42    | 0.025           | 0.45                             |
| 35        | 0.96    | 0.24    | 1.07     | 0.41     | 0.74       | 0.68    | 0.06            | 0.72                             |
| 51        | 1.17    | 0.25    | 1.35     | 0.51     | 0.93       | 0.84    | 0.09            | 0.92                             |
| 6         | 0.53    | 0.13    | 0.55     | 0.21     | 0.38       | 0.37    | 0.01            | 0.4                              |
| 13        | 0.63    | 0.18    | 0.65     | 0.25     | 0.45       | 0.42    | 0.03            | 0.45                             |
| 35        | 0.97    | 0.23    | 1.07     | 0.41     | 0.74       | 0.68    | 0.06            | 0.74                             |
| 51        | 1.19    | 0.25    | 1.38     | 0.52     | 0.95       | 0.86    | 0.09            | 0.94                             |
| 6         | 0.58    | 0.14    | 0.6      | 0.24     | 0.42       | 0.41    | 0.01            | 0.44                             |
| 13        | 0.67    | 0.2     | 0.69     | 0.27     | 0.48       | 0.47    | 0.01            | 0.47                             |
| 35        | 0.97    | 0.24    | 1.06     | 0.41     | 0.735      | 0.68    | 0.055           | 0.73                             |
| 51        | 1.17    | 0.25    | 1.35     | 0.5      | 0.925      | 0.84    | 0.085           | 0.92                             |
| 6         | 0.57    | 0.14    | 0.6      | 0.24     | 0.42       | 0.41    | 0.01            | 0.43                             |
| 13        | 0.67    | 0.2     | 0.69     | 0.27     | 0.48       | 0.46    | 0.02            | 0.47                             |
| 35        | 0.97    | 0.24    | 1.07     | 0.41     | 0.74       | 0.69    | 0.05            | 0.73                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 1.18    | 0.26    | 1.36     | 0.5      | 0.93       | 0.85    | 0.08            | 0.92                             |
| 6         | 0.53    | 0.13    | 0.55     | 0.21     | 0.38       | 0.38    | 0               | 0.4                              |
| 13        | 0.64    | 0.18    | 0.65     | 0.25     | 0.45       | 0.42    | 0.03            | 0.46                             |
| 35        | 0.99    | 0.25    | 1.08     | 0.41     | 0.745      | 0.7     | 0.045           | 0.74                             |
| 51        | 1.18    | 0.26    | 1.36     | 0.51     | 0.935      | 0.85    | 0.085           | 0.92                             |
| 6         | 0.54    | 0.13    | 0.55     | 0.21     | 0.38       | 0.38    | 0               | 0.41                             |
| 13        | 0.65    | 0.19    | 0.65     | 0.25     | 0.45       | 0.43    | 0.02            | 0.46                             |
| 35        | 0.98    | 0.24    | 1.07     | 0.41     | 0.74       | 0.89    | -0.15           | 0.74                             |
| 51        | 1.19    | 0.26    | 1.37     | 0.51     | 0.94       | 0.85    | 0.09            | 0.93                             |
| 6         | 0.57    | 0.14    | 0.58     | 0.23     | 0.405      | 0.4     | 0.005           | 0.43                             |
| 13        | 0.67    | 0.2     | 0.68     | 0.27     | 0.475      | 0.45    | 0.025           | 0.47                             |
| 35        | 0.99    | 0.25    | 1.09     | 0.42     | 0.755      | 0.7     | 0.055           | 0.74                             |
| 51        | 1.19    | 0.26    | 1.37     | 0.52     | 0.945      | 0.86    | 0.085           | 0.93                             |
| 4         | 0.53    | 0.13    | 0.55     | 0.2      | 0.375      | 0.36    | 0.015           | 0.4                              |
| 13        | 0.66    | 0.19    | 0.67     | 0.26     | 0.465      | 0.44    | 0.025           | 0.47                             |
| 35        | 0.99    | 0.25    | 1.08     | 0.42     | 0.75       | 0.7     | 0.05            | 0.74                             |
| 51        | 1.19    | 0.26    | 1.35     | 0.51     | 0.93       | 0.84    | 0.09            | 0.93                             |
| 6         | 0.55    | 0.14    | 0.56     | 0.22     | 0.39       | 0.39    | 0               | 0.41                             |
| 13        | 0.65    | 0.2     | 0.65     | 0.26     | 0.455      | 0.43    | 0.025           | 0.45                             |
| 35        | 0.98    | 0.25    | 1.06     | 0.41     | 0.735      | 0.68    | 0.055           | 0.73                             |
| 51        | 1.18    | 0.26    | 1.35     | 0.5      | 0.925      | 0.83    | 0.095           | 0.92                             |
| 6         | 0.59    | 0.14    | 0.6      | 0.24     | 0.42       | 0.41    | 0.01            | 0.45                             |
| 13        | 0.67    | 0.2     | 0.68     | 0.27     | 0.475      | 0.44    | 0.035           | 0.47                             |
| 35        | 1       | 0.25    | 1.09     | 0.42     | 0.755      | 0.7     | 0.055           | 0.75                             |
| 51        | 1.19    | 0.26    | 1.37     | 0.52     | 0.945      | 0.86    | 0.085           | 0.93                             |
| 6         | 0.6     | 0.16    | 0.6      | 0.24     | 0.42       | 0.41    | 0.01            | 0.44                             |
| 13        | 0.69    | 0.2     | 0.71     | 0.28     | 0.495      | 0.36    | 0.135           | 0.49                             |
| 35        | 0.99    | 0.25    | 1.07     | 0.42     | 0.745      | 0.7     | 0.045           | 0.74                             |
| 51        | 1.21    | 0.27    | 1.39     | 0.53     | 0.96       | 0.87    | 0.09            | 0.94                             |
| 4         | 0.53    | 0.13    | 0.53     | 0.21     | 0.37       | 0.36    | 0.01            | 0.4                              |
| 13        | 0.65    | 0.2     | 0.65     | 0.26     | 0.455      | 0.42    | 0.035           | 0.45                             |
| 35        | 1       | 0.25    | 1.08     | 0.42     | 0.75       | 0.69    | 0.06            | 0.75                             |
| 51        | 1.2     | 0.27    | 1.36     | 0.52     | 0.94       | 0.86    | 0.08            | 0.93                             |
| 6         | 0.57    | 0.14    | 0.58     | 0.23     | 0.405      | 0.4     | 0.005           | 0.43                             |
| 13        | 0.68    | 0.2     | 0.68     | 0.27     | 0.475      | 0.45    | 0.025           | 0.48                             |
| 35        | 1.01    | 0.25    | 1.09     | 0.42     | 0.755      | 0.7     | 0.055           | 0.76                             |
| 51        | 1.2     | 0.27    | 1.36     | 0.52     | 0.94       | 0.86    | 0.08            | 0.93                             |
| 6         | 0.56    | 0.14    | 0.58     | 0.23     | 0.405      | 0.38    | 0.025           | 0.42                             |
| 13        | 0.65    | 0.2     | 0.65     | 0.26     | 0.455      | 0.42    | 0.035           | 0.45                             |
| 35        | 1       | 0.25    | 1.07     | 0.42     | 0.745      | 0.69    | 0.055           | 0.75                             |
| 51        | 1.2     | 0.27    | 1.35     | 0.52     | 0.935      | 0.86    | 0.075           | 0.93                             |
| 6         | 0.59    | 0.15    | 0.6      | 0.25     | 0.425      | 0.41    | 0.015           | 0.44                             |
| 13        | 0.68    | 0.21    | 0.68     | 0.27     | 0.475      | 0.45    | 0.025           | 0.47                             |
| 35        | 1.01    | 0.25    | 1.09     | 0.42     | 0.755      | 0.7     | 0.055           | 0.76                             |
| 51        | 1.21    | 0.27    | 1.37     | 0.53     | 0.95       | 0.86    | 0.09            | 0.94                             |
| 6         | 0.59    | 0.15    | 0.59     | 0.25     | 0.42       | 0.4     | 0.02            | 0.44                             |
| 13        | 0.68    | 0.21    | 0.68     | 0.27     | 0.475      | 0.44    | 0.035           | 0.47                             |
| 35        | 1       | 0.25    | 1.08     | 0.42     | 0.75       | 0.69    | 0.06            | 0.75                             |
| 51        | 1.2     | 0.27    | 1.37     | 0.52     | 0.945      | 0.86    | 0.085           | 0.93                             |
| 4         | 0.56    | 0.14    | 0.55     | 0.23     | 0.39       | 0.38    | 0.01            | 0.42                             |
| 13        | 0.67    | 0.2     | 0.66     | 0.27     | 0.465      | 0.43    | 0.035           | 0.47                             |
| 35        | 0.99    | 0.26    | 1.06     | 0.42     | 0.74       | 0.68    | 0.06            | 0.73                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 1.21    | 0.27    | 1.38     | 0.52     | 0.95       | 0.87    | 0.08            | 0.94                             |
| 57        | 1.31    | 0.27    | 1.49     | 0.55     | 1.02       | 0.93    | 0.09            | 1.04                             |
| 64- N     | 1.46    | 0.27    | 1.63     | 0.55     | 1.09       | 1       | 0.09            | 1.19                             |
| 71- C     | 1.83    | 0.28    | 1.85     | 0.41     | 1.13       | 1.03    | 0.1             | 1.55                             |
| 78        | 2.05    | 0.3     | 1.98     | 0.31     | 1.145      | 1.03    | 0.115           | 1.75                             |
| 86        | 2.34    | 0.3     | 3.2      | 0.28     | 1.74       | 1.08    | 0.66            | 2.04                             |
| 93        | 2.5     | 0.3     | 3.3      | 0.26     | 1.78       | 1.1     | 0.68            | 2.2                              |
| 100       | 2.85    | 0.29    | 3.55     | 0.25     | 1.9        | 1.2     | 0.7             | 2.56                             |
| 107       | 3.41    | 0.3     | 3.75     | 0.22     | 1.985      | 1.28    | 0.705           | 3.11                             |
| 114       | 7.6     | 0.29    | 4.25     | 0.22     | 2.235      | 1.4     | 0.835           | 7.31                             |
| 121       | 10.62   | 0.31    | 4.65     | 0.29     | 2.47       | 1.39    | 1.08            | 10.31                            |
| 128       | 13.34   | 0.33    | 5.02     | 0.36     | 2.69       | 1.4     | 1.29            | 13.01                            |

**Table A.9.104: Test Panel Concrete Cube Strength (C30-25-3-CFST-w)**

| Cast Date: 11-09-2006   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 09-10-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.45        | 93.6          | 39.74                         | 2359                             |
| II                      | 153x153x153 | 8.5         | 87.2          | 37.03                         | 2373                             |
| III                     | 153x153x153 | 8.4         | 86            | 36.52                         | 2345                             |
| IV                      | 153x153x153 | 8.45        | 89.4          | 37.96                         | 2359                             |
| Mean                    |             |             |               | 37.81                         | 2359                             |



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**Table A.9.105: Sample 41 (C45-25-3-ssp)**

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| -2        | 0       | 0       | 0        | 0        | 0          | 0       | 0               | 0                                |
| 6         | 0.16    | 0.05    | 0.18     | 0.08     | 0.13       | 0.08    | 0.05            | 0.11                             |
| 13        | 0.29    | 0.07    | 0.36     | 0.15     | 0.255      | 0.2     | 0.055           | 0.22                             |
| 35        | 0.73    | 0.18    | 0.99     | 0.47     | 0.73       | 0.27    | 0.46            | 0.55                             |
| 51        | 1       | 0.27    | 1.35     | 0.66     | 1.005      | 0.28    | 0.725           | 0.73                             |
| 6         | 0.52    | 0.13    | 0.87     | 0.45     | 0.66       | 0.08    | 0.58            | 0.39                             |
| 13        | 0.64    | 0.18    | 0.99     | 0.5      | 0.745      | 0.12    | 0.625           | 0.46                             |
| 35        | 0.89    | 0.26    | 1.32     | 0.65     | 0.985      | 0.33    | 0.655           | 0.63                             |
| 51        | 1.06    | 0.28    | 1.58     | 0.78     | 1.18       | 0.5     | 0.68            | 0.78                             |
| 6         | 0.58    | 0.16    | 1.04     | 0.54     | 0.79       | 0.2     | 0.59            | 0.42                             |
| 13        | 0.69    | 0.22    | 1.16     | 0.59     | 0.875      | 0.24    | 0.635           | 0.47                             |
| 35        | 0.95    | 0.28    | 1.52     | 0.76     | 1.14       | 0.48    | 0.66            | 0.67                             |
| 51        | 1.18    | 0.28    | 1.74     | 0.86     | 1.3        | 0.61    | 0.69            | 0.9                              |
| 4         | 0.62    | 0.19    | 1.14     | 0.58     | 0.86       | 0.25    | 0.61            | 0.43                             |
| 13        | 0.71    | 0.23    | 1.21     | 0.62     | 0.915      | 0.28    | 0.635           | 0.48                             |
| 35        | 0.94    | 0.28    | 1.53     | 0.76     | 1.145      | 0.5     | 0.645           | 0.66                             |
| 51        | 1.12    | 0.28    | 1.78     | 0.88     | 1.33       | 0.64    | 0.69            | 0.84                             |
| 6         | 0.63    | 0.2     | 1.15     | 0.59     | 0.87       | 0.28    | 0.59            | 0.43                             |
| 13        | 0.71    | 0.23    | 1.25     | 0.63     | 0.94       | 0.3     | 0.64            | 0.48                             |
| 35        | 0.95    | 0.28    | 1.56     | 0.88     | 1.22       | 0.5     | 0.72            | 0.67                             |
| 51        | 1.13    | 0.28    | 1.82     | 0.9      | 1.36       | 0.67    | 0.69            | 0.85                             |
| 6         | 0.65    | 0.21    | 1.2      | 0.62     | 0.91       | 0.3     | 0.61            | 0.44                             |
| 13        | 0.72    | 0.24    | 1.28     | 0.66     | 0.97       | 0.32    | 0.65            | 0.48                             |
| 35        | 0.98    | 0.29    | 1.61     | 0.81     | 1.21       | 0.55    | 0.66            | 0.69                             |
| 51        | 1.14    | 0.29    | 1.85     | 0.92     | 1.385      | 0.7     | 0.685           | 0.85                             |
| 6         | 0.62    | 0.2     | 1.17     | 0.6      | 0.885      | 0.28    | 0.605           | 0.42                             |
| 13        | 0.74    | 0.25    | 1.29     | 0.66     | 0.975      | 0.33    | 0.645           | 0.49                             |
| 35        | 0.98    | 0.29    | 1.62     | 0.81     | 1.215      | 0.55    | 0.665           | 0.69                             |
| 51        | 1.15    | 0.29    | 1.86     | 0.92     | 1.39       | 0.7     | 0.69            | 0.86                             |
| 4         | 0.62    | 0.2     | 1.19     | 0.61     | 0.9        | 0.29    | 0.61            | 0.42                             |
| 13        | 0.74    | 0.25    | 1.29     | 0.67     | 0.98       | 0.32    | 0.66            | 0.49                             |
| 35        | 0.98    | 0.29    | 1.64     | 0.83     | 1.235      | 0.57    | 0.665           | 0.69                             |
| 51        | 1.16    | 0.29    | 1.9      | 0.94     | 1.42       | 0.71    | 0.71            | 0.87                             |
| 6         | 0.67    | 0.22    | 1.25     | 0.64     | 0.945      | 0.33    | 0.615           | 0.45                             |
| 13        | 0.75    | 0.26    | 1.34     | 0.69     | 1.015      | 0.37    | 0.645           | 0.49                             |
| 35        | 0.98    | 0.29    | 1.65     | 0.84     | 1.245      | 0.57    | 0.675           | 0.69                             |
| 51        | 1.15    | 0.29    | 1.9      | 0.95     | 1.425      | 0.72    | 0.705           | 0.86                             |
| 6         | 0.67    | 0.22    | 1.26     | 0.65     | 0.955      | 0.33    | 0.625           | 0.45                             |
| 13        | 0.76    | 0.25    | 1.34     | 0.69     | 1.015      | 0.38    | 0.635           | 0.51                             |
| 35        | 0.99    | 0.29    | 1.67     | 0.84     | 1.255      | 0.58    | 0.675           | 0.7                              |
| 51        | 1.17    | 0.3     | 1.92     | 0.95     | 1.435      | 0.73    | 0.705           | 0.87                             |
| 4         | 0.63    | 0.21    | 1.21     | 0.63     | 0.92       | 0.3     | 0.62            | 0.42                             |
| 13        | 0.74    | 0.26    | 1.32     | 0.68     | 1          | 0.35    | 0.65            | 0.48                             |
| 35        | 0.98    | 0.29    | 1.66     | 0.84     | 1.25       | 0.58    | 0.67            | 0.69                             |
| 51        | 1.16    | 0.3     | 1.91     | 0.95     | 1.43       | 0.73    | 0.7             | 0.86                             |
| 4         | 0.6     | 0.19    | 1.17     | 0.6      | 0.885      | 0.28    | 0.605           | 0.41                             |
| 13        | 0.73    | 0.25    | 1.31     | 0.66     | 0.985      | 0.34    | 0.645           | 0.48                             |
| 35        | 1.01    | 0.29    | 1.69     | 0.86     | 1.275      | 0.6     | 0.675           | 0.72                             |
| 51        | 1.16    | 0.3     | 1.92     | 0.95     | 1.435      | 0.73    | 0.705           | 0.86                             |
| 3         | 0.55    | 0.16    | 1.09     | 0.57     | 0.83       | 0.23    | 0.6             | 0.39                             |
| 13        | 0.74    | 0.25    | 1.31     | 0.67     | 0.99       | 0.33    | 0.66            | 0.49                             |
| 35        | 1.02    | 0.29    | 1.69     | 0.86     | 1.275      | 0.61    | 0.665           | 0.73                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 1.15    | 0.29    | 1.9      | 0.94     | 1.42       | 0.72    | 0.7             | 0.86                             |
| 6         | 0.66    | 0.22    | 1.24     | 0.64     | 0.94       | 0.32    | 0.62            | 0.44                             |
| 13        | 0.75    | 0.26    | 1.35     | 0.69     | 1.02       | 0.38    | 0.64            | 0.49                             |
| 35        | 1       | 0.29    | 1.69     | 0.85     | 1.27       | 0.59    | 0.68            | 0.71                             |
| 51        | 1.18    | 0.3     | 1.92     | 0.95     | 1.435      | 0.73    | 0.705           | 0.88                             |
| 3         | 0.61    | 0.2     | 1.18     | 0.61     | 0.895      | 0.28    | 0.615           | 0.41                             |
| 13        | 0.73    | 0.26    | 1.3      | 0.67     | 0.985      | 0.34    | 0.645           | 0.47                             |
| 35        | 0.99    | 0.29    | 1.68     | 0.84     | 1.26       | 0.58    | 0.68            | 0.7                              |
| 51        | 1.17    | 0.3     | 1.94     | 0.96     | 1.45       | 0.75    | 0.7             | 0.87                             |
| 6         | 0.65    | 0.22    | 1.25     | 0.64     | 0.945      | 0.32    | 0.625           | 0.43                             |
| 13        | 0.75    | 0.26    | 1.34     | 0.69     | 1.015      | 0.38    | 0.635           | 0.49                             |
| 35        | 1       | 0.29    | 1.7      | 0.85     | 1.275      | 0.59    | 0.685           | 0.71                             |
| 51        | 1.17    | 0.3     | 1.95     | 0.97     | 1.46       | 0.76    | 0.7             | 0.87                             |
| 6         | 0.68    | 0.23    | 1.3      | 0.67     | 0.985      | 0.37    | 0.615           | 0.45                             |
| 13        | 0.76    | 0.26    | 1.36     | 0.7      | 1.03       | 0.39    | 0.64            | 0.5                              |
| 35        | 1.01    | 0.3     | 1.71     | 0.86     | 1.285      | 0.6     | 0.685           | 0.71                             |
| 51        | 1.18    | 0.31    | 1.96     | 0.97     | 1.465      | 0.77    | 0.695           | 0.87                             |
| 6         | 0.64    | 0.22    | 1.25     | 0.65     | 0.95       | 0.32    | 0.63            | 0.42                             |
| 13        | 0.76    | 0.27    | 1.35     | 0.7      | 1.025      | 0.38    | 0.645           | 0.49                             |
| 35        | 1.01    | 0.29    | 1.71     | 0.86     | 1.285      | 0.6     | 0.685           | 0.72                             |
| 51        | 1.17    | 0.3     | 1.95     | 0.97     | 1.46       | 0.76    | 0.7             | 0.87                             |
| 6         | 0.67    | 0.22    | 1.29     | 0.66     | 0.975      | 0.35    | 0.625           | 0.45                             |
| 13        | 0.76    | 0.28    | 1.37     | 0.7      | 1.035      | 0.39    | 0.645           | 0.48                             |
| 35        | 1.01    | 0.3     | 1.72     | 0.86     | 1.29       | 0.6     | 0.69            | 0.71                             |
| 51        | 1.19    | 0.31    | 1.98     | 0.98     | 1.48       | 0.77    | 0.71            | 0.88                             |
| 6         | 0.7     | 0.24    | 1.33     | 0.68     | 1.005      | 0.4     | 0.605           | 0.46                             |
| 13        | 0.78    | 0.28    | 1.4      | 0.73     | 1.065      | 0.41    | 0.655           | 0.5                              |
| 35        | 1.01    | 0.3     | 1.73     | 0.87     | 1.3        | 0.61    | 0.69            | 0.71                             |
| 51        | 1.17    | 0.31    | 1.98     | 0.98     | 1.48       | 0.77    | 0.71            | 0.86                             |
| 6         | 0.63    | 0.21    | 1.22     | 0.63     | 0.925      | 0.3     | 0.625           | 0.42                             |
| 13        | 0.75    | 0.26    | 1.36     | 0.7      | 1.03       | 0.38    | 0.65            | 0.49                             |
| 35        | 1.01    | 0.3     | 1.73     | 0.87     | 1.3        | 0.61    | 0.69            | 0.71                             |
| 51        | 1.19    | 0.31    | 1.98     | 0.98     | 1.48       | 0.78    | 0.7             | 0.88                             |
| 6         | 0.68    | 0.23    | 1.3      | 0.67     | 0.985      | 0.37    | 0.615           | 0.45                             |
| 13        | 0.77    | 0.25    | 1.39     | 0.71     | 1.05       | 0.4     | 0.65            | 0.52                             |
| 35        | 1.02    | 0.3     | 1.74     | 0.88     | 1.31       | 0.62    | 0.69            | 0.72                             |
| 51        | 1.19    | 0.31    | 1.99     | 0.99     | 1.49       | 0.78    | 0.71            | 0.88                             |
| 6         | 0.69    | 0.23    | 1.33     | 0.69     | 1.01       | 0.4     | 0.61            | 0.46                             |
| 13        | 0.77    | 0.28    | 1.4      | 0.72     | 1.06       | 0.41    | 0.65            | 0.49                             |
| 35        | 1       | 0.3     | 1.72     | 0.87     | 1.295      | 0.6     | 0.695           | 0.7                              |
| 51        | 1.19    | 0.32    | 1.99     | 0.99     | 1.49       | 0.78    | 0.71            | 0.87                             |
| 6         | 0.7     | 0.23    | 1.34     | 0.69     | 1.015      | 0.4     | 0.615           | 0.47                             |
| 13        | 0.78    | 0.28    | 1.41     | 0.73     | 1.07       | 0.41    | 0.66            | 0.5                              |
| 35        | 1.02    | 0.3     | 1.75     | 0.88     | 1.315      | 0.62    | 0.695           | 0.72                             |
| 51        | 1.18    | 0.32    | 1.99     | 0.99     | 1.49       | 0.78    | 0.71            | 0.86                             |
| 3         | 0.65    | 0.21    | 1.26     | 0.66     | 0.96       | 0.33    | 0.63            | 0.44                             |
| 13        | 0.76    | 0.28    | 1.38     | 0.71     | 1.045      | 0.4     | 0.645           | 0.48                             |
| 35        | 1.02    | 0.3     | 1.75     | 0.88     | 1.315      | 0.62    | 0.695           | 0.72                             |
| 51        | 1.19    | 0.31    | 2        | 0.99     | 1.495      | 0.78    | 0.715           | 0.88                             |
| 6         | 0.7     | 0.24    | 1.34     | 0.69     | 1.015      | 0.4     | 0.615           | 0.46                             |
| 13        | 0.78    | 0.28    | 1.42     | 0.74     | 1.08       | 0.41    | 0.67            | 0.5                              |
| 35        | 1.01    | 0.3     | 1.74     | 0.88     | 1.31       | 0.62    | 0.69            | 0.71                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 1.19    | 0.32    | 1.99     | 0.99     | 1.49       | 0.78    | 0.71            | 0.87                             |
| 57        | 1.28    | 0.33    | 2.1      | 1.05     | 1.575      | 0.84    | 0.735           | 0.95                             |
| 64        | 1.38    | 0.35    | 2.23     | 1.1      | 1.665      | 0.93    | 0.735           | 1.03                             |
| 71        | 1.48    | 0.36    | 2.35     | 1.16     | 1.755      | 1.01    | 0.745           | 1.12                             |
| 78- N     | 1.65    | 0.36    | 2.5      | 1.23     | 1.865      | 1.11    | 0.755           | 1.29                             |
| 86        | 1.88    | 0.4     | 2.72     | 1.28     | 2          | 1.24    | 0.76            | 1.48                             |
| 93- C     | 2.08    | 0.41    | 2.9      | 1.27     | 2.085      | 1.3     | 0.785           | 1.67                             |
| 100       | 2.51    | 0.41    | 3.25     | 1.25     | 2.25       | 1.38    | 0.87            | 2.1                              |
| 114       | 3.71    | 0.42    | 4        | 1.37     | 2.685      | 1.71    | 0.975           | 3.29                             |
| 128       | 5.4     | 0.44    | 4.84     | 1.54     | 3.19       | 2.15    | 1.04            | 4.96                             |
| 143       | 6.85    | 0.42    | 5.33     | 1.62     | 3.475      | 2.4     | 1.075           | 6.43                             |
| 157       | 8.45    | 0.4     | 5.98     | 1.75     | 3.865      | 2.54    | 1.325           | 8.05                             |
| 164       | 9.34    | 0.4     | 6.25     | 1.82     | 4.035      | 2.55    | 1.485           | 8.94                             |
| 171       | 10.11   | 0.4     | 6.5      | 1.88     | 4.19       | 2.54    | 1.65            | 9.71                             |
| 178       | 11.06   | 0.39    | 7        | 1.9      | 4.45       | 2.54    | 1.91            | 10.67                            |
| 185       | 12.41   | 0.11    | 7.8      | 2.15     | 4.975      | 2.54    | 2.435           | 12.3                             |

**Table A.9.106: Test Panel Concrete Cube Strength (C45-25-3-ssp)**

| Cast Date: 12-09-2006   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 10-10-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.7         | 124           | 52.65                         | 2429                             |
| II                      | 153x153x153 | 8.75        | 111.4         | 47.30                         | 2443                             |
| III                     | 153x153x153 | 8.6         | 125.2         | 53.16                         | 2401                             |
| IV                      | 153x153x153 | 8.75        | 126.2         | 53.58                         | 2443                             |
| Mean                    |             |             |               | 51.67                         | 2429                             |

**Table A.9.107: Sample 42 (C45-25-3-CFST-w)**

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| -2        | 0       | 0       | 0        | 0        | 0          | 0       | 0               | 0                                |
| 6         | 0.59    | 0.04    | 0.37     | 0.21     | 0.29       | 0.2     | 0.09            | 0.55                             |
| 13        | 1       | 0.14    | 0.73     | 0.4      | 0.565      | 0.44    | 0.125           | 0.86                             |
| 35        | 1.88    | 0.16    | 1.55     | 0.83     | 1.19       | 0.98    | 0.21            | 1.72                             |
| 51        | 2.45    | 0.2     | 2.1      | 1.12     | 1.61       | 1.32    | 0.29            | 2.25                             |
| 6         | 1.96    | 0.14    | 0.78     | 0.03     | 0.405      | 0.27    | 0.135           | 1.82                             |
| 13        | 2.09    | 0.18    | 0.93     | 0.12     | 0.525      | 0.33    | 0.195           | 1.91                             |
| 35        | 2.5     | 0.21    | 1.51     | 0.42     | 0.965      | 0.67    | 0.295           | 2.29                             |
| 51        | 2.73    | 0.3     | 1.95     | 0.68     | 1.315      | 0.91    | 0.405           | 2.43                             |
| -2        | 0       | 0       | 0        | 0        | 0          | 0       | 0               | 0                                |
| 7         | 0.22    | 0.04    | 0.25     | 0.14     | 0.195      | 0.1     | 0.095           | 0.18                             |
| 13        | 0.4     | 0.04    | 0.47     | 0.25     | 0.36       | 0.23    | 0.13            | 0.36                             |
| 35        | 0.86    | 0.07    | 1.11     | 0.61     | 0.86       | 0.62    | 0.24            | 0.79                             |
| 51        | 1.14    | 0.16    | 1.52     | 0.82     | 1.17       | 0.86    | 0.31            | 0.98                             |
| 6         | 0.49    | -0.01   | 0.69     | 0.4      | 0.545      | 0.42    | 0.125           | 0.5                              |
| 13        | 0.66    | 0.04    | 0.91     | 0.49     | 0.7        | 0.53    | 0.17            | 0.62                             |
| 35        | 0.99    | 0.12    | 1.33     | 0.72     | 1.025      | 0.78    | 0.245           | 0.87                             |
| 51        | 1.23    | 0.18    | 1.65     | 0.88     | 1.265      | 0.96    | 0.305           | 1.05                             |
| 6         | 0.51    | 0.01    | 0.73     | 0.4      | 0.565      | 0.47    | 0.095           | 0.5                              |
| 13        | 0.69    | 0.05    | 0.94     | 0.52     | 0.73       | 0.57    | 0.16            | 0.64                             |
| 35        | 1.06    | 0.14    | 1.43     | 0.77     | 1.1        | 0.84    | 0.26            | 0.92                             |
| 51        | 1.26    | 0.19    | 1.67     | 0.9      | 1.285      | 0.98    | 0.305           | 1.07                             |
| 4         | 0.44    | 0.01    | 0.61     | 0.34     | 0.475      | 0.38    | 0.095           | 0.43                             |
| 13        | 0.58    | 0.05    | 0.75     | 0.42     | 0.585      | 0.44    | 0.145           | 0.53                             |
| 35        | 1.01    | 0.14    | 1.35     | 0.75     | 1.05       | 0.8     | 0.25            | 0.87                             |
| 51        | 1.26    | 0.19    | 1.67     | 0.91     | 1.29       | 0.98    | 0.31            | 1.07                             |
| 6         | 0.56    | 0       | 0.8      | 0.45     | 0.625      | 0.51    | 0.115           | 0.56                             |
| 13        | 0.74    | 0.07    | 1.01     | 0.56     | 0.785      | 0.61    | 0.175           | 0.67                             |
| 35        | 1.1     | 0.16    | 1.46     | 0.8      | 1.13       | 0.88    | 0.25            | 0.94                             |
| 51        | 1.27    | 0.2     | 1.69     | 0.91     | 1.3        | 0.99    | 0.31            | 1.07                             |
| 6         | 0.58    | 0.01    | 0.82     | 0.46     | 0.64       | 0.52    | 0.12            | 0.57                             |
| 13        | 0.76    | 0.08    | 1.05     | 0.58     | 0.815      | 0.63    | 0.185           | 0.68                             |
| 35        | 1.14    | 0.16    | 1.5      | 0.82     | 1.16       | 0.9     | 0.26            | 0.98                             |
| 51        | 1.29    | 0.2     | 1.7      | 0.92     | 1.31       | 0.99    | 0.32            | 1.09                             |
| 6         | 0.57    | 0.01    | 0.82     | 0.46     | 0.64       | 0.52    | 0.12            | 0.56                             |
| 13        | 0.76    | 0.08    | 1.05     | 0.58     | 0.815      | 0.63    | 0.185           | 0.68                             |
| 35        | 1.15    | 0.18    | 1.52     | 0.83     | 1.175      | 0.92    | 0.255           | 0.97                             |
| 51        | 1.3     | 0.2     | 1.71     | 0.93     | 1.32       | 0.99    | 0.33            | 1.1                              |
| 6         | 0.6     | 0.02    | 0.85     | 0.48     | 0.665      | 0.54    | 0.125           | 0.58                             |
| 13        | 0.78    | 0.08    | 1.06     | 0.59     | 0.825      | 0.65    | 0.175           | 0.7                              |
| 35        | 1.16    | 0.18    | 1.53     | 0.85     | 1.19       | 0.92    | 0.27            | 0.98                             |
| 51        | 1.32    | 0.2     | 1.73     | 0.94     | 1.335      | 0.99    | 0.345           | 1.12                             |
| 6         | 0.64    | 0.02    | 0.9      | 0.5      | 0.7        | 0.57    | 0.13            | 0.62                             |
| 13        | 0.79    | 0.09    | 1.07     | 0.6      | 0.835      | 0.66    | 0.175           | 0.7                              |
| 35        | 1.18    | 0.18    | 1.54     | 0.85     | 1.195      | 0.94    | 0.255           | 1                                |
| 51        | 1.32    | 0.2     | 1.73     | 0.95     | 1.34       | 0.99    | 0.35            | 1.12                             |
| 6         | 0.64    | 0.02    | 0.9      | 0.5      | 0.7        | 0.57    | 0.13            | 0.62                             |
| 13        | 0.77    | 0.09    | 1.05     | 0.59     | 0.82       | 0.65    | 0.17            | 0.68                             |
| 35        | 1.18    | 0.18    | 1.55     | 0.85     | 1.2        | 0.94    | 0.26            | 1                                |
| 51        | 1.34    | 0.21    | 1.75     | 0.75     | 1.25       | 0.99    | 0.26            | 1.13                             |
| 4         | 0.58    | 0.01    | 0.82     | 0.46     | 0.64       | 0.53    | 0.11            | 0.57                             |
| 13        | 0.72    | 0.09    | 1.1      | 0.62     | 0.86       | 0.68    | 0.18            | 0.63                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 35        | 1.19    | 0.17    | 1.55     | 0.85     | 1.2        | 0.94    | 0.26            | 1.02                             |
| 51        | 1.34    | 0.21    | 1.75     | 0.95     | 1.35       | 0.99    | 0.36            | 1.13                             |
| 6         | 0.62    | 0.02    | 0.88     | 0.5      | 0.69       | 0.57    | 0.12            | 0.6                              |
| 13        | 0.81    | 0.1     | 1.09     | 0.61     | 0.85       | 0.68    | 0.17            | 0.71                             |
| 35        | 1.2     | 0.19    | 1.57     | 0.86     | 1.215      | 0.96    | 0.255           | 1.01                             |
| 51        | 1.35    | 0.21    | 1.75     | 0.96     | 1.355      | 0.99    | 0.365           | 1.14                             |
| 6         | 0.61    | 0.02    | 0.87     | 0.49     | 0.68       | 0.57    | 0.11            | 0.59                             |
| 13        | 0.82    | 0.1     | 1.1      | 0.62     | 0.86       | 0.68    | 0.18            | 0.72                             |
| 35        | 1.21    | 0.19    | 1.58     | 0.87     | 1.225      | 0.96    | 0.265           | 1.02                             |
| 51        | 1.35    | 0.21    | 1.75     | 0.96     | 1.355      | 0.99    | 0.365           | 1.14                             |
| 6         | 0.65    | 0.03    | 0.92     | 0.52     | 0.72       | 0.59    | 0.13            | 0.62                             |
| 13        | 0.83    | 0.11    | 1.12     | 0.63     | 0.875      | 0.7     | 0.175           | 0.72                             |
| 35        | 1.21    | 0.19    | 1.58     | 0.87     | 1.225      | 0.96    | 0.265           | 1.02                             |
| 51        | 1.36    | 0.22    | 1.76     | 0.96     | 1.36       | 0.99    | 0.37            | 1.14                             |
| 6         | 0.69    | 0.04    | 0.95     | 0.55     | 0.75       | 0.62    | 0.13            | 0.65                             |
| 13        | 0.85    | 0.12    | 1.15     | 0.64     | 0.895      | 0.71    | 0.185           | 0.73                             |
| 35        | 1.22    | 0.2     | 1.59     | 0.88     | 1.235      | 0.97    | 0.265           | 1.02                             |
| 51        | 1.37    | 0.22    | 1.77     | 0.97     | 1.37       | 0.99    | 0.38            | 1.15                             |
| 6         | 0.66    | 0.03    | 0.92     | 0.52     | 0.72       | 0.6     | 0.12            | 0.63                             |
| 13        | 0.84    | 0.11    | 1.13     | 0.63     | 0.88       | 0.7     | 0.18            | 0.73                             |
| 35        | 1.24    | 0.2     | 1.61     | 0.89     | 1.25       | 0.97    | 0.28            | 1.04                             |
| 51        | 1.38    | 0.22    | 1.78     | 0.98     | 1.38       | 0.99    | 0.39            | 1.16                             |
| 6         | 0.66    | 0.03    | 0.91     | 0.51     | 0.71       | 0.59    | 0.12            | 0.63                             |
| 13        | 0.83    | 0.11    | 1.12     | 0.62     | 0.87       | 0.69    | 0.18            | 0.72                             |
| 35        | 1.24    | 0.2     | 1.6      | 0.88     | 1.24       | 0.97    | 0.27            | 1.04                             |
| 51        | 1.39    | 0.22    | 1.79     | 0.98     | 1.385      | 0.99    | 0.395           | 1.17                             |
| 6         | 0.67    | 0.03    | 0.92     | 0.52     | 0.72       | 0.59    | 0.13            | 0.64                             |
| 13        | 0.86    | 0.12    | 1.15     | 0.65     | 0.9        | 0.71    | 0.19            | 0.74                             |
| 35        | 1.24    | 0.2     | 1.61     | 0.89     | 1.25       | 0.98    | 0.27            | 1.04                             |
| 51        | 1.39    | 0.22    | 1.78     | 0.98     | 1.38       | 0.99    | 0.39            | 1.17                             |
| 6         | 0.67    | 0.03    | 0.92     | 0.53     | 0.725      | 0.6     | 0.125           | 0.64                             |
| 13        | 0.86    | 0.12    | 1.15     | 0.65     | 0.9        | 0.71    | 0.19            | 0.74                             |
| 35        | 1.25    | 0.2     | 1.62     | 0.89     | 1.255      | 0.98    | 0.275           | 1.05                             |
| 51        | 1.4     | 0.23    | 1.8      | 0.99     | 1.395      | 0.99    | 0.405           | 1.17                             |
| 6         | 0.71    | 0.04    | 0.98     | 0.56     | 0.77       | 0.62    | 0.15            | 0.67                             |
| 13        | 0.9     | 0.13    | 1.18     | 0.66     | 0.92       | 0.93    | -0.01           | 0.77                             |
| 35        | 1.26    | 0.2     | 1.63     | 0.9      | 1.265      | 0.99    | 0.275           | 1.06                             |
| 51        | 1.4     | 0.22    | 1.8      | 0.99     | 1.395      | 0.99    | 0.405           | 1.18                             |
| 6         | 0.72    | 0.04    | 0.97     | 0.55     | 0.76       | 0.62    | 0.14            | 0.68                             |
| 13        | 0.88    | 0.12    | 1.15     | 0.65     | 0.9        | 0.7     | 0.2             | 0.76                             |
| 35        | 1.26    | 0.2     | 1.62     | 0.9      | 1.26       | 0.98    | 0.28            | 1.06                             |
| 51        | 1.4     | 0.23    | 1.79     | 0.99     | 1.39       | 1.06    | 0.33            | 1.17                             |
| 6         | 0.7     | 0.04    | 0.95     | 0.55     | 0.75       | 0.61    | 0.14            | 0.66                             |
| 13        | 0.88    | 0.13    | 1.15     | 0.65     | 0.9        | 0.72    | 0.18            | 0.75                             |
| 35        | 1.26    | 0.2     | 1.62     | 0.9      | 1.26       | 0.99    | 0.27            | 1.06                             |
| 51        | 1.41    | 0.23    | 1.8      | 0.99     | 1.395      | 1.09    | 0.305           | 1.18                             |
| 6         | 0.69    | 0.03    | 0.95     | 0.54     | 0.745      | 0.6     | 0.145           | 0.66                             |
| 13        | 0.87    | 0.12    | 1.15     | 0.65     | 0.9        | 0.72    | 0.18            | 0.75                             |
| 35        | 1.27    | 0.21    | 1.63     | 0.9      | 1.265      | 1       | 0.265           | 1.06                             |
| 51        | 1.41    | 0.23    | 1.79     | 0.99     | 1.39       | 1.09    | 0.3             | 1.18                             |
| 6         | 0.72    | 0.05    | 0.99     | 0.56     | 0.775      | 0.62    | 0.155           | 0.67                             |
| 13        | 0.89    | 0.13    | 1.17     | 0.66     | 0.915      | 0.73    | 0.185           | 0.76                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 35        | 1.27    | 0.21    | 1.63     | 0.9      | 1.265      | 1       | 0.265           | 1.06                             |
| 51        | 1.42    | 0.23    | 1.8      | 0.99     | 1.395      | 1.09    | 0.305           | 1.19                             |
| 57        | 1.5     | 0.25    | 1.95     | 1.06     | 1.505      | 1.17    | 0.335           | 1.25                             |
| 64        | 1.67    | 0.26    | 2.15     | 1.17     | 1.66       | 1.27    | 0.39            | 1.41                             |
| 71- N     | 1.97    | 0.29    | 2.48     | 1.21     | 1.845      | 1.42    | 0.425           | 1.68                             |
| 78- C     | 2.32    | 0.3     | 2.7      | 1.1      | 1.9        | 1.4     | 0.5             | 2.02                             |
| 86        | 2.62    | 0.39    | 2.95     | 1.15     | 2.05       | 1.42    | 0.63            | 2.23                             |
| 93        | 2.85    | 0.34    | 3.15     | 1.2      | 2.175      | 1.48    | 0.695           | 2.51                             |
| 100       | 3.21    | 0.22    | 3.35     | 1.23     | 2.29       | 1.55    | 0.74            | 2.99                             |
| 107       | 3.5     | -0.02   | 3.69     | 1.34     | 2.515      | 1.68    | 0.835           | 3.52                             |
| 114       | 3.85    | -0.01   | 4.99     | 1.42     | 3.205      | 1.75    | 1.455           | 3.86                             |
| 121       | 4.15    | -0.05   | 5.13     | 1.47     | 3.3        | 1.83    | 1.47            | 4.2                              |
| 128       | 4.52    | -0.11   | 5.35     | 1.54     | 3.445      | 1.92    | 1.525           | 4.63                             |
| 135       | 5.02    | -0.14   | 5.45     | 1.57     | 3.51       | 1.97    | 1.54            | 5.16                             |
| 143       | 5.86    | -0.22   | 5.61     | 1.61     | 3.61       | 2.07    | 1.54            | 6.08                             |
| 147       | 7.14    | -0.35   | 5.59     | 1.35     | 3.47       | 1.88    | 1.59            | 7.49                             |

**Table A.9.108: Test Panel Concrete Cube Strength (C45-25-3-CFST-w)**

| Cast Date: 13-09-2006   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 08-11-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.7         | 117.2         | 49.76                         | 2429                             |
| II                      | 153x153x153 | 8.6         | 114.4         | 48.57                         | 2401                             |
| III                     | 153x153x153 | 8.75        | 121           | 51.38                         | 2443                             |
| IV                      | 153x153x153 | 8.6         | 116.2         | 49.34                         | 2401                             |
| Mean                    |             |             |               | 49.76                         | 2419                             |

**Table A.9.109: Sample 43 (C45-25-3-w)**

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| -2        | 0       | 0       | 0        | 0        | 0          | 0       | 0               | 0                                |
| 6         | 0.93    | 0.23    | 0.81     | 0.3      | 0.555      | 0.42    | 0.135           | 0.7                              |
| 13        | 1.37    | 0.41    | 1.09     | 0.35     | 0.72       | 0.52    | 0.2             | 0.96                             |
| 35        | 2.21    | 0.66    | 1.69     | 0.49     | 1.09       | 0.81    | 0.28            | 1.55                             |
| 51        | 2.68    | 0.81    | 2.09     | 0.63     | 1.36       | 1.05    | 0.31            | 1.87                             |
| 6         | 2.14    | 0.75    | 1.38     | 0.27     | 0.825      | 0.51    | 0.315           | 1.39                             |
| 13        | 2.18    | 0.75    | 1.46     | 0.31     | 0.885      | 0.56    | 0.325           | 1.43                             |
| 35        | 2.5     | 0.88    | 1.85     | 0.5      | 1.175      | 0.84    | 0.335           | 1.62                             |
| 51        | 2.75    | 0.91    | 2.15     | 0.65     | 1.4        | 1.06    | 0.34            | 1.84                             |
| 6         | 2.15    | 0.75    | 1.36     | 0.25     | 0.805      | 0.5     | 0.305           | 1.4                              |
| 13        | 2.21    | 0.75    | 1.46     | 0.3      | 0.88       | 0.56    | 0.32            | 1.46                             |
| 35        | 2.52    | 0.9     | 1.84     | 0.49     | 1.165      | 0.82    | 0.345           | 1.62                             |
| 51        | 2.74    | 0.91    | 2.15     | 0.64     | 1.395      | 1.05    | 0.345           | 1.83                             |
| 4         | 2.13    | 0.75    | 1.34     | 0.23     | 0.785      | 0.48    | 0.305           | 1.38                             |
| 13        | 2.23    | 0.76    | 1.46     | 0.3      | 0.88       | 0.55    | 0.33            | 1.47                             |
| 35        | 2.56    | 0.91    | 1.85     | 0.5      | 1.175      | 0.84    | 0.335           | 1.65                             |
| 51        | 2.75    | 0.92    | 2.15     | 0.64     | 1.395      | 1.05    | 0.345           | 1.83                             |
| 6         | 2.17    | 0.77    | 1.36     | 0.25     | 0.805      | 0.49    | 0.315           | 1.4                              |
| 13        | 2.27    | 0.79    | 1.5      | 0.31     | 0.905      | 0.57    | 0.335           | 1.48                             |
| 35        | 2.58    | 0.92    | 1.86     | 0.5      | 1.18       | 0.85    | 0.33            | 1.66                             |
| 51        | 2.76    | 0.93    | 2.15     | 0.63     | 1.39       | 1.04    | 0.35            | 1.83                             |
| 4         | 2.08    | 0.73    | 1.25     | 0.19     | 0.72       | 0.4     | 0.32            | 1.35                             |
| 13        | 2.24    | 0.75    | 1.45     | 0.28     | 0.865      | 0.53    | 0.335           | 1.49                             |
| 35        | 2.58    | 0.93    | 1.87     | 0.5      | 1.185      | 0.83    | 0.355           | 1.65                             |
| 51        | 2.77    | 0.93    | 2.15     | 0.65     | 1.4        | 1.05    | 0.35            | 1.84                             |
| 4         | 2.19    | 0.77    | 1.37     | 0.25     | 0.81       | 0.49    | 0.32            | 1.42                             |
| 13        | 2.29    | 0.79    | 1.5      | 0.3      | 0.9        | 0.57    | 0.33            | 1.5                              |
| 35        | 2.61    | 0.93    | 1.9      | 0.51     | 1.205      | 0.87    | 0.335           | 1.68                             |
| 51        | 2.78    | 0.94    | 2.18     | 0.65     | 1.415      | 1.06    | 0.355           | 1.84                             |
| 6         | 2.21    | 0.79    | 1.41     | 0.26     | 0.835      | 0.5     | 0.335           | 1.42                             |
| 13        | 2.31    | 0.8     | 1.52     | 0.32     | 0.92       | 0.59    | 0.33            | 1.51                             |
| 35        | 2.6     | 0.93    | 1.89     | 0.5      | 1.195      | 0.85    | 0.345           | 1.67                             |
| 51        | 2.8     | 0.94    | 2.18     | 0.65     | 1.415      | 1.06    | 0.355           | 1.86                             |
| 7         | 2.28    | 0.83    | 1.52     | 0.31     | 0.915      | 0.54    | 0.375           | 1.45                             |
| 13        | 2.37    | 0.89    | 1.62     | 0.35     | 0.985      | 0.66    | 0.325           | 1.48                             |
| 35        | 2.64    | 0.94    | 1.93     | 0.52     | 1.225      | 0.89    | 0.335           | 1.7                              |
| 51        | 2.81    | 0.95    | 2.17     | 0.64     | 1.405      | 1.05    | 0.355           | 1.86                             |
| 6         | 2.23    | 0.81    | 1.44     | 0.27     | 0.855      | 0.52    | 0.335           | 1.42                             |
| 13        | 2.33    | 0.82    | 1.55     | 0.32     | 0.935      | 0.6     | 0.335           | 1.51                             |
| 35        | 2.62    | 0.94    | 1.89     | 0.5      | 1.195      | 0.87    | 0.325           | 1.68                             |
| 51        | 2.82    | 0.95    | 2.18     | 0.65     | 1.415      | 1.05    | 0.365           | 1.87                             |
| 4         | 2.19    | 0.78    | 1.36     | 0.23     | 0.795      | 0.48    | 0.315           | 1.41                             |
| 13        | 2.29    | 0.79    | 1.48     | 0.29     | 0.885      | 0.55    | 0.335           | 1.5                              |
| 35        | 2.62    | 0.94    | 1.9      | 0.5      | 1.2        | 0.86    | 0.34            | 1.68                             |
| 51        | 2.82    | 0.95    | 2.18     | 0.65     | 1.415      | 1.05    | 0.365           | 1.87                             |
| 6         | 2.27    | 0.83    | 1.48     | 0.29     | 0.885      | 0.56    | 0.325           | 1.44                             |
| 13        | 2.37    | 0.89    | 1.6      | 0.35     | 0.975      | 0.62    | 0.355           | 1.48                             |
| 35        | 2.64    | 0.94    | 1.91     | 0.51     | 1.21       | 0.88    | 0.33            | 1.7                              |
| 51        | 2.83    | 0.95    | 2.18     | 0.65     | 1.415      | 1.05    | 0.365           | 1.88                             |
| 6         | 2.24    | 0.81    | 1.42     | 0.26     | 0.84       | 0.51    | 0.33            | 1.43                             |
| 13        | 2.33    | 0.86    | 1.53     | 0.31     | 0.92       | 0.58    | 0.34            | 1.47                             |
| 35        | 2.63    | 0.95    | 1.9      | 0.5      | 1.2        | 0.86    | 0.34            | 1.68                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 2.85    | 0.95    | 2.19     | 0.65     | 1.42       | 1.06    | 0.36            | 1.9                              |
| 4         | 2.21    | 0.78    | 1.38     | 0.24     | 0.81       | 0.48    | 0.33            | 1.43                             |
| 13        | 2.31    | 0.86    | 1.5      | 0.3      | 0.9        | 0.56    | 0.34            | 1.45                             |
| 35        | 2.64    | 0.95    | 1.91     | 0.5      | 1.205      | 0.88    | 0.325           | 1.69                             |
| 51        | 2.85    | 0.95    | 2.2      | 0.65     | 1.425      | 1.07    | 0.355           | 1.9                              |
| 4         | 2.24    | 0.81    | 1.42     | 0.26     | 0.84       | 0.5     | 0.34            | 1.43                             |
| 13        | 2.35    | 0.88    | 1.55     | 0.32     | 0.935      | 0.59    | 0.345           | 1.47                             |
| 35        | 2.64    | 0.95    | 1.91     | 0.5      | 1.205      | 0.88    | 0.325           | 1.69                             |
| 51        | 2.86    | 0.95    | 2.2      | 0.65     | 1.425      | 1.07    | 0.355           | 1.91                             |
| 6         | 2.24    | 0.8     | 1.42     | 0.25     | 0.835      | 0.51    | 0.325           | 1.44                             |
| 13        | 2.34    | 0.88    | 1.53     | 0.31     | 0.92       | 0.59    | 0.33            | 1.46                             |
| 35        | 2.65    | 0.95    | 1.92     | 0.51     | 1.215      | 0.88    | 0.335           | 1.7                              |
| 51        | 2.87    | 0.96    | 2.21     | 0.65     | 1.43       | 1.08    | 0.35            | 1.91                             |
| 6         | 2.29    | 0.82    | 1.48     | 0.28     | 0.88       | 0.55    | 0.33            | 1.47                             |
| 13        | 2.39    | 0.9     | 1.6      | 0.34     | 0.97       | 0.62    | 0.35            | 1.49                             |
| 35        | 2.66    | 0.95    | 1.92     | 0.52     | 1.22       | 0.88    | 0.34            | 1.71                             |
| 51        | 2.87    | 0.97    | 2.2      | 0.65     | 1.425      | 1.07    | 0.355           | 1.9                              |
| 6         | 2.28    | 0.82    | 1.44     | 0.27     | 0.855      | 0.53    | 0.325           | 1.46                             |
| 13        | 2.37    | 0.88    | 1.57     | 0.32     | 0.945      | 0.6     | 0.345           | 1.49                             |
| 35        | 2.67    | 0.96    | 1.94     | 0.52     | 1.23       | 0.89    | 0.34            | 1.71                             |
| 51        | 2.87    | 0.96    | 2.2      | 0.65     | 1.425      | 1.07    | 0.355           | 1.91                             |
| 4         | 2.24    | 0.81    | 1.41     | 0.25     | 0.83       | 0.5     | 0.33            | 1.43                             |
| 13        | 2.35    | 0.88    | 1.54     | 0.31     | 0.925      | 0.59    | 0.335           | 1.47                             |
| 35        | 2.65    | 0.96    | 1.91     | 0.5      | 1.205      | 0.87    | 0.335           | 1.69                             |
| 51        | 2.86    | 0.97    | 2.18     | 0.64     | 1.41       | 1.06    | 0.35            | 1.89                             |
| 6         | 2.29    | 0.84    | 1.48     | 0.28     | 0.88       | 0.54    | 0.34            | 1.45                             |
| 13        | 2.36    | 0.89    | 1.57     | 0.32     | 0.945      | 0.6     | 0.345           | 1.47                             |
| 35        | 2.68    | 0.97    | 1.93     | 0.51     | 1.22       | 0.89    | 0.33            | 1.71                             |
| 51        | 2.87    | 0.98    | 2.21     | 0.65     | 1.43       | 1.07    | 0.36            | 1.89                             |
| 6         | 2.31    | 0.86    | 1.52     | 0.3      | 0.91       | 0.58    | 0.33            | 1.45                             |
| 13        | 2.42    | 0.92    | 1.65     | 0.36     | 1.005      | 0.67    | 0.335           | 1.5                              |
| 35        | 2.68    | 0.98    | 1.94     | 0.52     | 1.23       | 0.89    | 0.34            | 1.7                              |
| 51        | 2.87    | 0.99    | 2.19     | 0.64     | 1.415      | 1.07    | 0.345           | 1.88                             |
| 6         | 2.35    | 0.87    | 1.57     | 0.32     | 0.945      | 0.6     | 0.345           | 1.48                             |
| 13        | 2.43    | 0.93    | 1.68     | 0.38     | 1.03       | 0.69    | 0.34            | 1.5                              |
| 35        | 2.68    | 0.98    | 1.95     | 0.51     | 1.23       | 0.89    | 0.34            | 1.7                              |
| 51        | 2.88    | 0.99    | 2.19     | 0.64     | 1.415      | 1.07    | 0.345           | 1.89                             |
| 6         | 2.34    | 0.86    | 1.55     | 0.32     | 0.935      | 0.59    | 0.345           | 1.48                             |
| 13        | 2.42    | 0.92    | 1.65     | 0.36     | 1.005      | 0.67    | 0.335           | 1.5                              |
| 35        | 2.68    | 0.98    | 1.93     | 0.51     | 1.22       | 0.88    | 0.34            | 1.7                              |
| 51        | 2.88    | 0.99    | 2.2      | 0.64     | 1.42       | 1.07    | 0.35            | 1.89                             |
| 6         | 2.35    | 0.86    | 1.56     | 0.32     | 0.94       | 0.6     | 0.34            | 1.49                             |
| 13        | 2.43    | 0.93    | 1.67     | 0.37     | 1.02       | 0.69    | 0.33            | 1.5                              |
| 35        | 2.68    | 0.98    | 1.94     | 0.51     | 1.225      | 0.89    | 0.335           | 1.7                              |
| 51        | 2.88    | 0.99    | 2.19     | 0.63     | 1.41       | 1.06    | 0.35            | 1.89                             |
| 4         | 2.28    | 0.84    | 1.46     | 0.27     | 0.865      | 0.53    | 0.335           | 1.44                             |
| 13        | 2.46    | 0.89    | 1.56     | 0.32     | 0.94       | 0.59    | 0.35            | 1.57                             |
| 35        | 2.68    | 0.98    | 1.95     | 0.51     | 1.23       | 0.89    | 0.34            | 1.7                              |
| 51        | 2.89    | 0.99    | 2.21     | 0.65     | 1.43       | 1.07    | 0.36            | 1.9                              |
| 6         | 2.34    | 0.88    | 1.56     | 0.32     | 0.94       | 0.6     | 0.34            | 1.46                             |
| 13        | 2.45    | 0.94    | 1.68     | 0.37     | 1.025      | 0.69    | 0.335           | 1.51                             |
| 35        | 2.69    | 0.99    | 1.95     | 0.52     | 1.235      | 0.9     | 0.335           | 1.7                              |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51-N      | 2.88    | 0.99    | 2.19     | 0.64     | 1.415      | 1.07    | 0.345           | 1.89                             |
| 57        | 2.99    | 0.99    | 2.33     | 0.7      | 1.515      | 1.15    | 0.365           | 2                                |
| 64        | 3.19    | 0.99    | 2.51     | 0.79     | 1.65       | 1.29    | 0.36            | 2.2                              |
| 80        | 3.41    | 0.99    | 2.69     | 0.85     | 1.77       | 1.42    | 0.35            | 2.42                             |
| 78        | 3.59    | 0.99    | 2.81     | 0.9      | 1.855      | 1.51    | 0.345           | 2.6                              |
| 86        | 3.9     | 1.01    | 3.02     | 0.95     | 1.985      | 1.63    | 0.355           | 2.89                             |
| 94-C      | 4.55    | 1.05    | 3.36     | 1.52     | 2.44       | 1.6     | 0.84            | 3.5                              |
| 100       | 4.79    | 1.04    | 3.56     | 1.53     | 2.545      | 1.67    | 0.875           | 3.75                             |
| 107       | 5.05    | 1.04    | 3.75     | 1.53     | 2.64       | 1.75    | 0.89            | 4.01                             |
| 114       | 5.43    | 1.04    | 4.04     | 1.59     | 2.815      | 1.89    | 0.925           | 4.39                             |
| 121       | 5.7     | 1.03    | 4.22     | 1.58     | 2.9        | 2       | 0.9             | 4.67                             |
| 128       | 6.25    | 0.93    | 4.55     | 1.55     | 3.05       | 2.13    | 0.92            | 5.32                             |
| 135       | 7.4     | 0.86    | 5.06     | 1.62     | 3.34       | 2.43    | 0.91            | 6.54                             |
| 138       | 8.8     | 0.79    | 5.35     | 1.58     | 3.465      | 2.53    | 0.935           | 8.01                             |
| 147       | 10.26   | 0.71    | 5.15     | 1.62     | 3.385      | 2.53    | 0.855           | 9.55                             |
| 157       | 14.8    | 0.6     | 5.75     | 1.68     | 3.715      | 2.53    | 1.185           | 14.2                             |

**Table A.9.110: Test Panel Concrete Cube Strength (C45-25-3-w)**

| Cast Date: 16-09-2006   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 08-11-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.6         | 119.2         | 50.61                         | 2401                             |
| II                      | 153x153x153 | 8.6         | 120           | 50.95                         | 2401                             |
| III                     | 153x153x153 | 8.65        | 119.4         | 50.70                         | 2415                             |
| IV                      | 153x153x153 | 8.65        | 122.6         | 52.06                         | 2415                             |
| Mean                    |             |             |               | 51.08                         | 2408                             |

**Table A.9.111: Sample 44 (C20-25-3-w)**

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| -2        | 0       | 0       | 0        | 0        | 0          | 0       | 0               | 0                                |
| 6         | 0.31    | 0.06    | 0.6      | 0.33     | 0.465      | 0.31    | 0.155           | 0.25                             |
| 13        | 0.47    | -0.02   | 0.75     | 0.38     | 0.565      | 0.43    | 0.135           | 0.49                             |
| 35        | 0.89    | -0.09   | 1.18     | 0.55     | 0.865      | 0.67    | 0.195           | 0.98                             |
| 51        | 1.24    | -0.3    | 1.4      | 0.57     | 0.985      | 0.79    | 0.195           | 1.54                             |
| 6         | 0.67    | -0.07   | 0.78     | 0.35     | 0.565      | 0.48    | 0.085           | 0.74                             |
| 13        | 0.75    | -0.11   | 0.88     | 0.38     | 0.63       | 0.5     | 0.13            | 0.86                             |
| 35        | 1.06    | -0.23   | 1.24     | 0.52     | 0.88       | 0.69    | 0.19            | 1.29                             |
| 51        | 1.3     | -0.46   | 1.48     | 0.57     | 1.025      | 0.79    | 0.235           | 1.76                             |
| 6         | 0.67    | -0.1    | 0.75     | 0.3      | 0.525      | 0.46    | 0.065           | 0.77                             |
| 13        | 0.75    | -0.14   | 0.83     | 0.33     | 0.58       | 0.47    | 0.11            | 0.89                             |
| 35        | 1.11    | -0.33   | 1.26     | 0.51     | 0.885      | 0.69    | 0.195           | 1.44                             |
| 51        | 1.33    | -0.57   | 1.48     | 0.53     | 1.005      | 0.75    | 0.255           | 1.9                              |
| 6         | 0.84    | -0.29   | 0.68     | 0.94     | 0.81       | 0.75    | 0.06            | 1.13                             |
| 13        | 0.92    | -0.28   | 0.74     | -0.06    | 0.34       | 0.13    | 0.21            | 1.2                              |
| 35        | 1.34    | -0.76   | 1        | -0.15    | 0.425      | 0.09    | 0.335           | 2.1                              |
| 51        | 1.69    | -1.25   | 1.89     | -0.87    | 0.51       | 0.69    | -0.18           | 2.94                             |
| 6         | 1.02    | -0.96   | 1.45     | -0.68    | 0.385      | 1.13    | -0.745          | 1.98                             |
| 13        | 1.11    | -0.96   | 1.49     | -0.69    | 0.4        | 1.1     | -0.7            | 2.07                             |
| 35        | 1.41    | -1.15   | 1.68     | -0.83    | 0.425      | 1.1     | -0.675          | 2.56                             |
| 51        | 1.75    | -1.63   | 1.84     | -1       | 0.42       | 1.1     | -0.68           | 3.38                             |
| 6         | 1.05    | -1.55   | 1.42     | -0.75    | 0.335      | 1       | -0.665          | 2.6                              |
| 13        | 1.15    | -1.43   | 1.46     | -0.78    | 0.34       | 1.02    | -0.68           | 2.58                             |
| 35        | 1.51    | -1.55   | 1.64     | -0.95    | 0.345      | 1.04    | -0.695          | 3.06                             |
| 51        | 1.78    | -2.01   | 1.81     | -1.05    | 0.38       | 1       | -0.62           | 3.79                             |
| -2        | 0       | 0       | 0        | 0        | 0          | 0.94    | -0.94           | 0                                |
| 7         | 0.16    | 0       | 0.15     | 0.02     | 0.085      | 0       | 0.085           | 0.16                             |
| 13        | 0.27    | 0       | 0.19     | -0.03    | 0.08       | 0.02    | 0.06            | 0.27                             |
| 35        | 0.72    | 0.05    | 0.43     | -0.026   | 0.202      | 0.02    | 0.182           | 0.67                             |
| 51        | 1.02    | 0.14    | 0.65     | -0.4     | 0.125      | -0.04   | 0.165           | 0.88                             |
| 6         | 0.14    | -0.05   | 0.08     | -0.09    | -0.005     | -0.05   | 0.045           | 0.19                             |
| 13        | 0.33    | -0.01   | 0.17     | -0.14    | 0.015      | -0.03   | 0.045           | 0.34                             |
| 35        | 0.78    | 0.09    | 0.42     | -0.36    | 0.03       | -0.08   | 0.11            | 0.69                             |
| 51        | 1.07    | 0.14    | 0.63     | -0.49    | 0.07       | -0.19   | 0.26            | 0.93                             |
| 6         | 0.28    | -0.02   | 0.11     | -0.21    | -0.05      | -0.13   | 0.08            | 0.3                              |
| 13        | 0.5     | 0.04    | 0.21     | -0.3     | -0.045     | -0.13   | 0.085           | 0.46                             |
| 35        | 0.79    | -0.1    | 0.39     | -0.43    | -0.02      | -0.2    | 0.18            | 0.89                             |
| 51        | 1.09    | 0.15    | 0.62     | -0.53    | 0.045      | -0.23   | 0.275           | 0.94                             |
| 4         | 0.23    | -0.03   | 0.08     | -0.21    | -0.065     | -0.17   | 0.105           | 0.26                             |
| 13        | 0.4     | 0.02    | 0.15     | -0.27    | -0.06      | -0.16   | 0.1             | 0.38                             |
| 35        | 0.83    | 0.11    | 0.39     | -0.48    | -0.045     | -0.25   | 0.205           | 0.72                             |
| 51-C      | 1.1     | 0.15    | 0.59     | -0.58    | 0.005      | -0.27   | 0.275           | 0.95                             |
| 6         | 0.3     | -0.01   | 0.08     | -0.27    | -0.095     | -0.2    | 0.105           | 0.31                             |
| 13        | 0.42    | 0.03    | 0.15     | -0.32    | -0.085     | -0.2    | 0.115           | 0.39                             |
| 35        | 0.85    | 0.11    | 0.38     | -0.52    | -0.07      | -0.28   | 0.21            | 0.74                             |
| 51        | 1.11    | 0.15    | 0.58     | -0.61    | -0.015     | -0.3    | 0.285           | 0.96                             |
| 4         | 0.25    | -0.02   | 0.05     | -0.28    | -0.115     | -0.22   | 0.105           | 0.27                             |
| 13        | 0.41    | 0.03    | 0.12     | -0.35    | -0.115     | -0.21   | 0.095           | 0.38                             |
| 35        | 0.83    | 0.12    | 0.35     | -0.55    | -0.1       | -0.3    | 0.2             | 0.71                             |
| 51        | 1.13    | 0.16    | 0.57     | -0.63    | -0.03      | -0.32   | 0.29            | 0.97                             |
| 6         | 0.3     | 0       | 0.05     | -0.33    | -0.14      | -0.25   | 0.11            | 0.3                              |
| 13        | 0.42    | 0.04    | 0.1      | -0.38    | -0.14      | -0.25   | 0.11            | 0.38                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 35        | 0.85    | 0.13    | 0.35     | -0.58    | -0.115     | -0.33   | 0.215           | 0.72                             |
| 51        | 1.17    | 0.17    | 0.58     | -0.67    | -0.045     | -0.35   | 0.305           | 1                                |
| 6         | 0.36    | 0.02    | 0.06     | -0.29    | -0.115     | -0.3    | 0.185           | 0.34                             |
| 13        | 0.45    | 0.06    | 0.1      | -0.42    | -0.16      | -0.29   | 0.13            | 0.39                             |
| 35        | 0.86    | 0.74    | 0.33     | -0.62    | -0.145     | -0.38   | 0.235           | 0.12                             |
| 51        | 1.15    | 0.17    | 0.57     | -0.7     | -0.065     | -0.4    | 0.335           | 0.98                             |
| 4         | 0.25    | -0.02   | 0.01     | -0.35    | -0.17      | -0.28   | 0.11            | 0.27                             |
| 13        | 0.46    | 0.05    | 0.1      | -0.43    | -0.165     | -0.28   | 0.115           | 0.41                             |
| 35        | 0.88    | 0.14    | 0.33     | -0.65    | -0.16      | -0.4    | 0.24            | 0.74                             |
| 51        | 1.16    | 0.18    | 0.57     | -0.72    | -0.075     | -0.4    | 0.325           | 0.98                             |
| 6         | 0.39    | 0.03    | 0.05     | -0.45    | -0.2       | -0.33   | 0.13            | 0.36                             |
| 13        | 0.45    | 0.07    | 0.08     | -0.48    | -0.2       | -0.33   | 0.13            | 0.38                             |
| 35        | 0.91    | 0.15    | 0.33     | -0.67    | -0.17      | -0.41   | 0.24            | 0.76                             |
| 51        | 1.17    | 0.18    | 0.56     | -0.74    | -0.09      | -0.42   | 0.33            | 0.99                             |
| 6         | 0.35    | 0.02    | 0.02     | -0.45    | -0.215     | -0.35   | 0.135           | 0.33                             |
| 13        | 0.46    | 0.07    | 0.07     | -0.48    | -0.205     | -0.34   | 0.135           | 0.39                             |
| 35        | 0.91    | 0.15    | 0.33     | -0.7     | -0.185     | -0.44   | 0.255           | 0.76                             |
| 51        | 1.18    | 0.18    | 0.54     | -0.75    | -0.105     | -0.44   | 0.335           | 1                                |
| 6         | 0.33    | 0.02    | 0.01     | -0.45    | -0.22      | -0.36   | 0.14            | 0.31                             |
| 13        | 0.49    | 0.07    | 0.07     | -0.5     | -0.215     | -0.35   | 0.135           | 0.42                             |
| 35        | 0.91    | 0.16    | 0.31     | -0.72    | -0.205     | -0.46   | 0.255           | 0.75                             |
| 51        | 1.18    | 0.18    | 0.53     | -0.77    | -0.12      | -0.47   | 0.35            | 1                                |
| 4         | 0.34    | 0.02    | 0        | -0.46    | -0.23      | -0.36   | 0.13            | 0.32                             |
| 13        | 0.5     | 0.08    | 0.07     | -0.52    | -0.225     | -0.36   | 0.135           | 0.42                             |
| 35        | 0.91    | 0.16    | 0.31     | -0.73    | -0.21      | -0.47   | 0.26            | 0.75                             |
| 51        | 1.18    | 0.19    | 0.52     | -0.78    | -0.13      | -0.47   | 0.34            | 0.99                             |
| 6         | 0.4     | 0.04    | 0.02     | -0.5     | -0.24      | -0.4    | 0.16            | 0.36                             |
| 13        | 0.52    | 0.09    | 0.07     | -0.55    | -0.24      | -0.4    | 0.16            | 0.43                             |
| 35        | 0.91    | 0.16    | 0.3      | -0.74    | -0.22      | -0.47   | 0.25            | 0.75                             |
| 51        | 1.18    | 0.18    | 0.52     | -0.8     | -0.14      | -0.48   | 0.34            | 1                                |
| 6         | 0.38    | 0.03    | 0.01     | -0.5     | -0.245     | -0.4    | 0.155           | 0.35                             |
| 13        | 0.5     | 0.08    | 0.06     | -0.55    | -0.245     | -0.4    | 0.155           | 0.42                             |
| 35        | 0.92    | 0.16    | 0.3      | -0.75    | -0.225     | -0.48   | 0.255           | 0.76                             |
| 51        | 1.19    | 0.09    | 0.52     | -0.8     | -0.14      | -0.49   | 0.35            | 1.1                              |
| 6         | 0.41    | 0.04    | 0.01     | -0.54    | -0.265     | -0.42   | 0.155           | 0.37                             |
| 13        | 0.51    | 0.09    | 0.05     | -0.57    | -0.26      | -0.42   | 0.16            | 0.42                             |
| 35        | 0.93    | 0.16    | 0.3      | -0.77    | -0.235     | -0.5    | 0.265           | 0.77                             |
| 51        | 1.19    | 0.19    | 0.51     | -0.81    | -0.15      | -0.5    | 0.35            | 1                                |
| 6         | 0.4     | 0.04    | 0        | -0.54    | -0.27      | -0.43   | 0.16            | 0.36                             |
| 13        | 0.51    | 0.09    | 0.05     | -0.58    | -0.265     | -0.42   | 0.155           | 0.42                             |
| 35        | 0.93    | 0.17    | 0.3      | -0.78    | -0.24      | -0.5    | 0.26            | 0.76                             |
| 51        | 1.2     | 0.19    | 0.52     | -0.82    | -0.15      | -0.5    | 0.35            | 1.01                             |
| 4         | 0.31    | 0.01    | -0.05    | -0.5     | -0.275     | -0.41   | 0.135           | 0.3                              |
| 13        | 0.54    | 0.09    | 0.05     | -0.59    | -0.27      | -0.42   | 0.15            | 0.45                             |
| 35        | 0.94    | 0.17    | 0.29     | -0.79    | -0.25      | -0.5    | 0.25            | 0.77                             |
| 51        | 1.21    | 0.19    | 0.52     | -0.85    | -0.165     | -0.51   | 0.345           | 1.02                             |
| 6         | 0.37    | 0.04    | -0.02    | -0.53    | -0.275     | -0.42   | 0.145           | 0.33                             |
| 13        | 0.53    | 0.1     | 0.05     | -0.6     | -0.275     | -0.42   | 0.145           | 0.43                             |
| 35        | 0.94    | 0.17    | 0.29     | -0.8     | -0.255     | -0.51   | 0.255           | 0.77                             |
| 51        | 1.22    | 0.2     | 0.52     | -0.87    | -0.175     | -0.52   | 0.345           | 1.02                             |
| 6         | 0.38    | -0.04   | -0.02    | -0.55    | -0.285     | -0.44   | 0.155           | 0.42                             |
| 13        | 0.54    | 0.1     | 0.05     | -0.62    | -0.285     | -0.44   | 0.155           | 0.44                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 35        | 0.94    | 0.18    | 0.28     | -0.81    | -0.265     | -0.52   | 0.255           | 0.76                             |
| 51        | 1.2     | 0.2     | 0.5      | -0.86    | -0.18      | -0.52   | 0.34            | 1                                |
| 57        | 1.34    | 0.2     | 0.61     | -0.91    | -0.15      | -0.52   | 0.37            | 1.14                             |
| 64        | 1.53    | 0.21    | 0.71     | -0.95    | -0.12      | -0.6    | 0.48            | 1.32                             |
| 71        | 1.86    | 0.25    | 0.75     | -1.25    | -0.25      | -0.77   | 0.52            | 1.61                             |
| 78        | 2.08    | 0.31    | 0.86     | -1.35    | -0.245     | -0.82   | 0.575           | 1.77                             |
| 86        | 2.28    | 0.4     | 0.98     | -1.41    | -0.215     | -0.86   | 0.645           | 1.88                             |
| 93        | 2.57    | 0.43    | 1.1      | -1.5     | -0.2       | -0.9    | 0.7             | 2.14                             |
| 100       | 2.97    | 0.38    | 1.12     | -1.78    | -0.33      | -1.23   | 0.9             | 2.59                             |
| 107       | 3.38    | 0.32    | 1.18     | -2       | -0.41      | -1.5    | 1.09            | 3.06                             |
| 114       | 4.07    | 0.6     | 1.35     | -2.13    | -0.39      | -1.62   | 1.23            | 3.47                             |
| 121       | 4.5     | 1       | 1.43     | -2.28    | -0.425     | -1.56   | 1.135           | 3.5                              |

**Table A.9.112: Test Panel Concrete Cube Strength (C20-25-3-w)**

| Cast Date: 19-09-2006   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 07-11-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.6         | 60.8          | 25.82                         | 2401                             |
| II                      | 153x153x153 | 8.55        | 62            | 26.33                         | 2387                             |
| III                     | 153x153x153 | 8.5         | 56            | 23.78                         | 2373                             |
| IV                      | 153x153x153 | 8.65        | 56.8          | 24.12                         | 2415                             |
| Mean                    |             |             |               | 25.01                         | 2394                             |



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**Table A.9.113: Sample 45 (C20-25-3-CFST-w)**

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| -2        | 0       | 0       | 0        | 0        | 0          | 0       | 0               | 0                                |
| 6         | 0.46    | 0.03    | 1.25     | 0.13     | 0.69       | 0.14    | 0.55            | 0.43                             |
| 13        | 0.52    | 0.03    | 1.42     | 0.2      | 0.81       | 0.17    | 0.64            | 0.49                             |
| 35        | 1.05    | 0.04    | 2.01     | 0.49     | 1.25       | 0.63    | 0.62            | 1.01                             |
| 51        | 1.38    | 0.04    | 2.36     | 0.63     | 1.495      | 0.89    | 0.605           | 1.34                             |
| 6         | 0.84    | -0.08   | 1.76     | 0.36     | 1.06       | 0.5     | 0.56            | 0.92                             |
| 13        | 0.9     | -0.06   | 1.85     | 0.4      | 1.125      | 0.53    | 0.595           | 0.96                             |
| 35        | 1.21    | -0.04   | 2.2      | 0.55     | 1.375      | 0.78    | 0.595           | 1.25                             |
| 51        | 1.42    | 0       | 2.46     | 0.68     | 1.57       | 0.96    | 0.61            | 1.42                             |
| 6         | 0.89    | -0.07   | 1.81     | 0.39     | 1.1        | 0.52    | 0.58            | 0.96                             |
| 13        | 0.94    | -0.06   | 1.89     | 0.42     | 1.155      | 0.56    | 0.595           | 1                                |
| 35        | 1.24    | -0.03   | 2.23     | 0.58     | 1.405      | 0.8     | 0.605           | 1.27                             |
| 51        | 1.45    | 0.02    | 2.51     | 0.71     | 1.61       | 0.98    | 0.63            | 1.43                             |
| 6         | 1.87    | -0.08   | 1.81     | 0.39     | 1.1        | 0.52    | 0.58            | 1.95                             |
| 13        | 1.95    | -0.06   | 1.9      | 0.43     | 1.165      | 0.57    | 0.595           | 2.01                             |
| 35        | 2.28    | 0       | 2.29     | 0.61     | 1.45       | 0.84    | 0.61            | 2.28                             |
| 51        | 2.69    | 0.03    | 2.55     | 0.73     | 1.64       | 1       | 0.64            | 2.66                             |
| 4         | 1.86    | -0.08   | 1.79     | 0.38     | 1.085      | 0.52    | 0.565           | 1.94                             |
| 13        | 1.95    | 0.05    | 1.89     | 0.42     | 1.155      | 0.57    | 0.585           | 1.9                              |
| 35        | 2.28    | 0       | 2.29     | 0.61     | 1.45       | 0.85    | 0.6             | 2.28                             |
| 51        | 2.49    | 0.04    | 2.55     | 0.74     | 1.645      | 1       | 0.645           | 2.45                             |
| 6         | 1.91    | -0.06   | 1.86     | 0.41     | 1.135      | 0.55    | 0.585           | 1.97                             |
| 13        | 2       | -0.06   | 1.96     | 0.46     | 1.21       | 0.61    | 0.6             | 2.06                             |
| 35        | 2.29    | 0       | 2.32     | 0.63     | 1.475      | 0.87    | 0.605           | 2.29                             |
| 51        | 2.54    | 0.05    | 2.59     | 0.76     | 1.675      | 1.04    | 0.635           | 2.49                             |
| 6         | 1.92    | -0.07   | 1.86     | 0.41     | 1.135      | 0.56    | 0.575           | 1.99                             |
| 13        | 1.99    | -0.06   | 1.96     | 0.46     | 1.21       | 0.61    | 0.6             | 2.05                             |
| 35        | 2.31    | 0.01    | 2.34     | 0.64     | 1.49       | 0.89    | 0.6             | 2.3                              |
| 51        | 2.54    | 0.05    | 2.6      | 0.76     | 1.68       | 1.04    | 0.64            | 2.49                             |
| 6         | 1.94    | -0.08   | 1.92     | 0.45     | 1.185      | 0.6     | 0.585           | 2.02                             |
| 13        | 2.03    | -0.06   | 2.03     | 0.5      | 1.265      | 0.66    | 0.605           | 2.09                             |
| 35        | 2.44    | 0.02    | 2.39     | 0.66     | 1.525      | 0.92    | 0.605           | 2.42                             |
| 51        | 2.57    | 0.06    | 2.62     | 0.77     | 1.695      | 1.06    | 0.635           | 2.51                             |
| 7         | 1.96    | -0.08   | 1.96     | 0.46     | 1.21       | 0.62    | 0.59            | 2.04                             |
| 13        | 2.04    | -0.06   | 2.05     | 0.5      | 1.275      | 0.68    | 0.595           | 2.1                              |
| 35        | 2.34    | 0.02    | 2.39     | 0.66     | 1.525      | 0.92    | 0.605           | 2.32                             |
| 51        | 2.59    | 0.06    | 2.65     | 0.79     | 1.72       | 1.07    | 0.65            | 2.53                             |
| 6         | 1.96    | -0.08   | 1.96     | 0.46     | 1.21       | 0.63    | 0.58            | 2.04                             |
| 13        | 2.03    | -0.06   | 2.05     | 0.5      | 1.275      | 0.68    | 0.595           | 2.09                             |
| 35        | 2.37    | -0.03   | 2.41     | 0.68     | 1.545      | 0.93    | 0.615           | 2.4                              |
| 51        | 2.67    | 0.07    | 2.67     | 0.8      | 1.735      | 1.09    | 0.645           | 2.6                              |
| 6         | 1.94    | -0.08   | 1.95     | 0.45     | 1.2        | 0.61    | 0.59            | 2.02                             |
| 13        | 2.04    | -0.06   | 2.05     | 0.5      | 1.275      | 0.69    | 0.585           | 2.1                              |
| 35        | 2.39    | -0.03   | 2.43     | 0.69     | 1.56       | 0.96    | 0.6             | 2.42                             |
| 51        | 2.64    | 0.07    | 2.68     | 0.81     | 1.745      | 1.1     | 0.645           | 2.57                             |
| 6         | 1.97    | -0.08   | 1.98     | 0.47     | 1.225      | 0.65    | 0.575           | 2.05                             |
| 13        | 2.05    | -0.06   | 2.07     | 0.52     | 1.295      | 0.7     | 0.595           | 2.11                             |
| 35        | 2.42    | -0.04   | 2.46     | 0.7      | 1.58       | 0.97    | 0.61            | 2.46                             |
| 51        | 2.66    | 0.07    | 2.72     | 0.82     | 1.77       | 1.11    | 0.66            | 2.59                             |
| 6         | 1.99    | -0.09   | 2.02     | 0.5      | 1.26       | 0.68    | 0.58            | 2.08                             |
| 13        | 2.06    | -0.05   | 2.1      | 0.53     | 1.315      | 0.72    | 0.595           | 2.11                             |
| 35        | 2.43    | -0.04   | 2.47     | 0.71     | 1.59       | 0.97    | 0.62            | 2.47                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 2.66    | -0.08   | 2.72     | 0.83     | 1.775      | 1.12    | 0.655           | 2.74                             |
| 6         | 1.97    | -0.08   | 1.98     | 0.48     | 1.23       | 0.65    | 0.58            | 2.05                             |
| 13        | 2.05    | -0.05   | 2.07     | 0.52     | 1.295      | 0.7     | 0.595           | 2.1                              |
| 35        | 2.43    | -0.04   | 2.47     | 0.71     | 1.59       | 0.97    | 0.62            | 2.47                             |
| 51        | 2.65    | 0.08    | 2.71     | 0.82     | 1.765      | 1.12    | 0.645           | 2.57                             |
| 6         | 1.97    | -0.08   | 1.99     | 0.48     | 1.235      | 0.65    | 0.585           | 2.05                             |
| 13        | 2.06    | -0.04   | 2.08     | 0.52     | 1.3        | 0.7     | 0.6             | 2.1                              |
| 35        | 2.43    | 0.04    | 2.47     | 0.71     | 1.59       | 0.97    | 0.62            | 2.39                             |
| 51        | 2.67    | 0.04    | 2.72     | 0.83     | 1.775      | 1.13    | 0.645           | 2.63                             |
| 6         | 1.96    | 0.08    | 1.98     | 0.48     | 1.23       | 0.63    | 0.6             | 1.88                             |
| 13        | 2.05    | -0.07   | 2.06     | 0.52     | 1.29       | 0.7     | 0.59            | 2.12                             |
| 35        | 2.47    | -0.04   | 2.51     | 0.73     | 1.62       | 1       | 0.62            | 2.51                             |
| 51        | 2.67    | 0.05    | 2.72     | 0.83     | 1.775      | 1.12    | 0.655           | 2.62                             |
| 6         | 1.98    | 0.07    | 2.01     | 0.5      | 1.255      | 0.67    | 0.585           | 1.91                             |
| 13        | 2.07    | -0.06   | 2.1      | 0.52     | 1.31       | 0.71    | 0.6             | 2.13                             |
| 35        | 2.44    | -0.03   | 2.48     | 0.72     | 1.6        | 0.98    | 0.62            | 2.47                             |
| 51        | 2.68    | 0.05    | 2.74     | 0.83     | 1.785      | 1.13    | 0.655           | 2.63                             |
| 6         | 2.01    | 0.08    | 2.02     | 0.5      | 1.26       | 0.67    | 0.59            | 1.93                             |
| 13        | 2.07    | 0.06    | 2.11     | 0.54     | 1.325      | 0.72    | 0.605           | 2.01                             |
| 36        | 2.46    | -0.03   | 2.49     | 0.72     | 1.605      | 1       | 0.605           | 2.49                             |
| 51        | 2.68    | 0.05    | 2.74     | 0.84     | 1.79       | 1.14    | 0.65            | 2.63                             |
| 6         | 2.02    | 0.08    | 2.04     | 0.5      | 1.27       | 0.69    | 0.58            | 1.94                             |
| 13        | 2.07    | -0.03   | 2.11     | 0.54     | 1.325      | 0.73    | 0.595           | 2.1                              |
| 35        | 2.47    | 0.05    | 2.51     | 0.73     | 1.62       | 1       | 0.62            | 2.42                             |
| 51        | 2.69    | 0.08    | 2.75     | 0.84     | 1.795      | 1.15    | 0.645           | 2.61                             |
| 6         | 2.01    | -0.06   | 2.04     | 0.5      | 1.27       | 0.69    | 0.58            | 2.07                             |
| 13        | 2.07    | -0.03   | 2.1      | 0.53     | 1.315      | 0.72    | 0.595           | 2.1                              |
| 35        | 2.47    | 0.05    | 2.5      | 0.72     | 1.61       | 1       | 0.61            | 2.42                             |
| 51        | 2.69    | 0.09    | 2.75     | 0.84     | 1.795      | 1.15    | 0.645           | 2.6                              |
| 6         | 2       | -0.06   | 2.01     | 0.5      | 1.255      | 0.68    | 0.575           | 2.06                             |
| 13        | 2.06    | -0.03   | 2.09     | 0.52     | 1.305      | 0.7     | 0.605           | 2.09                             |
| 35        | 2.46    | 0.05    | 2.49     | 0.72     | 1.605      | 1       | 0.605           | 2.41                             |
| 51        | 2.68    | 0.09    | 2.74     | 0.84     | 1.79       | 1.15    | 0.64            | 2.59                             |
| 4         | 1.96    | -0.06   | 1.98     | 0.49     | 1.235      | 0.65    | 0.585           | 2.02                             |
| 13        | 2.06    | -0.03   | 2.07     | 0.52     | 1.295      | 0.7     | 0.595           | 2.09                             |
| 35        | 2.47    | 0.06    | 2.49     | 0.72     | 1.605      | 1       | 0.605           | 2.41                             |
| 51        | 2.7     | 0.09    | 2.76     | 0.85     | 1.805      | 1.16    | 0.645           | 2.61                             |
| 4         | 1.97    | -0.06   | 1.98     | 0.48     | 1.23       | 0.64    | 0.59            | 2.03                             |
| 13        | 2.05    | -0.04   | 2.06     | 0.52     | 1.29       | 0.7     | 0.59            | 2.09                             |
| 35        | 2.48    | 0.06    | 2.51     | 0.73     | 1.62       | 1       | 0.62            | 2.42                             |
| 51        | 2.7     | 0.09    | 2.76     | 0.85     | 1.805      | 1.17    | 0.635           | 2.61                             |
| 6         | 2.01    | -0.06   | 2.04     | 0.5      | 1.27       | 0.7     | 0.57            | 2.07                             |
| 13        | 2.08    | -0.03   | 2.12     | 0.55     | 1.335      | 0.73    | 0.605           | 2.11                             |
| 35        | 2.47    | 0.06    | 2.5      | 0.72     | 1.61       | 1       | 0.61            | 2.41                             |
| 51        | 2.7     | 0.09    | 2.76     | 0.85     | 1.805      | 1.17    | 0.635           | 2.61                             |
| 6         | 1.99    | -0.06   | 2        | 0.48     | 1.24       | 0.64    | 0.6             | 2.05                             |
| 13        | 2.07    | -0.03   | 2.09     | 0.53     | 1.31       | 0.7     | 0.61            | 2.1                              |
| 35        | 2.47    | 0.06    | 2.5      | 0.72     | 1.61       | 1.02    | 0.59            | 2.41                             |
| 51        | 2.69    | 0.09    | 2.75     | 0.85     | 1.8        | 1.16    | 0.64            | 2.6                              |
| 6         | 1.99    | -0.06   | 2        | 0.48     | 1.24       | 0.64    | 0.6             | 2.05                             |
| 13        | 2.1     | -0.03   | 2.11     | 0.55     | 1.33       | 0.72    | 0.61            | 2.13                             |
| 35        | 2.48    | 0.06    | 2.5      | 0.73     | 1.615      | 1       | 0.615           | 2.42                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 2.7     | 0.09    | 2.75     | 0.85     | 1.8        | 1.17    | 0.63            | 2.61                             |
| 57        | 2.81    | 0.1     | 2.89     | 0.91     | 1.9        | 1.23    | 0.67            | 2.71                             |
| 64        | 2.93    | 0.1     | 2.99     | 0.95     | 1.97       | 1.3     | 0.67            | 2.83                             |
| 71- N     | 3.13    | 0.1     | 3.15     | 1.05     | 2.1        | 1.4     | 0.7             | 3.03                             |
| 78        | 3.36    | 0.1     | 3.27     | 1.1      | 2.185      | 1.51    | 0.675           | 3.26                             |
| 86        | 3.62    | 0.1     | 3.44     | 1.15     | 2.295      | 1.68    | 0.615           | 3.52                             |
| 93        | 3.86    | 0.1     | 3.53     | 1.18     | 2.355      | 1.78    | 0.575           | 3.76                             |
| 100       | 4.2     | 0.12    | 3.72     | 1.22     | 2.47       | 1.75    | 0.72            | 4.08                             |
| 107       | 4.99    | 0.09    | 3.85     | 1.25     | 2.55       | 1.87    | 0.68            | 4.9                              |
| 114       | 6.45    | 0.1     | 4.03     | 1.24     | 2.635      | 1.92    | 0.715           | 6.35                             |
| 121       | 8.09    | 0.08    | 5.22     | 1.24     | 3.23       | 2       | 1.23            | 8.01                             |
| 128- C    | 10.65   | 0.1     | 5.43     | 1.22     | 3.325      | 2.1     | 1.225           | 10.55                            |
| 135       | 12.56   | 0.06    | 5.54     | 1.15     | 3.345      | 2.2     | 1.145           | 12.5                             |

**Table A.9.114: Test Panel Concrete Cube Strength (C20-25-3-CFST-w)**

| Cast Date: 20-09-2006   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 07-11-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.7         | 75.4          | 32.01                         | 2429                             |
| II                      | 153x153x153 | 8.75        | 81.6          | 34.65                         | 2443                             |
| III                     | 153x153x153 | 8.65        | 61            | 25.90                         | 2415                             |
| IV                      | 153x153x153 | 8.7         | 75            | 31.85                         | 2429                             |
| Mean                    |             |             |               | 31.10                         | 2429                             |

**Table A.9.115: Sample 46 (C20-25-3-ssp)**

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| -2        | 0       | 0       | 0        | 0        | 0          | 0       | 0               | 0                                |
| 6         | 0.4     | 0.05    | 0.35     | 0.13     | 0.24       | 0.18    | 0.06            | 0.35                             |
| 13        | 0.73    | 0.12    | 0.67     | 0.25     | 0.46       | 0.3     | 0.16            | 0.61                             |
| 35        | 1.68    | 0.26    | 1.65     | 0.65     | 1.15       | 0.91    | 0.24            | 1.42                             |
| 51        | 2.25    | 0.31    | 1.95     | 0.84     | 1.395      | 1.18    | 0.215           | 1.94                             |
| 6         | 1.38    | 0.28    | 1.29     | 0.5      | 0.895      | 0.74    | 0.155           | 1.1                              |
| 13        | 1.61    | 0.37    | 1.46     | 0.56     | 1.01       | 0.78    | 0.23            | 1.24                             |
| 35        | 2.09    | 0.33    | 1.95     | 0.82     | 1.385      | 1.14    | 0.245           | 1.76                             |
| 51        | 2.38    | 0.34    | 1.95     | 0.97     | 1.46       | 1.38    | 0.08            | 2.04                             |
| 6         | 1.64    | 0.25    | 1.75     | 0.71     | 1.23       | 0.95    | 0.28            | 1.39                             |
| 13        | 1.79    | 0.26    | 1.9      | 0.76     | 1.33       | 1.06    | 0.27            | 1.53                             |
| 35        | 2.32    | 0.31    | 1.95     | 1.08     | 1.515      | 1.5     | 0.015           | 2.01                             |
| 51        | 2.65    | 0.31    | 1.95     | 1.25     | 1.6        | 1.76    | -0.16           | 2.34                             |
| 6         | 1.54    | 0.22    | 0        | 1        | 0.5        | 1.38    | -0.88           | 1.32                             |
| 13        | 1.64    | 0.25    | 0.1      | 1.05     | 0.575      | 1.45    | -0.875          | 1.39                             |
| 35        | 2.49    | 0.25    | 0.65     | 1.26     | 0.955      | 1.75    | -0.795          | 2.24                             |
| 51        | 2.79    | 0.26    | 1.05     | 1.42     | 1.235      | 2       | -0.765          | 2.53                             |
| 6         | 2.09    | 0.2     | 0.23     | 1.1      | 0.665      | 1.52    | -0.855          | 1.89                             |
| 13        | 2.15    | 0.21    | 0.3      | 1.13     | 0.715      | 1.55    | -0.835          | 1.94                             |
| 35        | 2.39    | 0.24    | 0.84     | 1.35     | 1.095      | 1.88    | -0.785          | 2.15                             |
| 51        | 2.84    | 0.27    | 1.21     | 1.49     | 1.35       | 2.1     | -0.75           | 2.57                             |
| 6         | 1.08    | 0.18    | 0.37     | 1.17     | 0.77       | 1.62    | -0.85           | 0.9                              |
| 13        | 2.28    | 0.22    | 0.5      | 1.22     | 0.86       | 1.68    | -0.82           | 2.06                             |
| 35        | 2.64    | 0.25    | 0.97     | 1.41     | 1.19       | 1.96    | -0.77           | 2.39                             |
| 51        | 2.9     | 0.28    | 1.34     | 1.55     | 1.445      | 2.17    | -0.725          | 2.62                             |
| 6         | 2.26    | 0.18    | 0.48     | 1.21     | 0.845      | 1.68    | -0.835          | 2.08                             |
| 13        | 2.38    | 0.22    | 0.58     | 1.25     | 0.915      | 1.74    | -0.825          | 2.16                             |
| 35        | 2.7     | 0.26    | 1.11     | 1.47     | 1.29       | 2.05    | -0.76           | 2.44                             |
| 51        | 2.92    | 0.28    | 1.45     | 1.6      | 1.525      | 2.25    | -0.725          | 2.64                             |
| 6         | 2.2     | 0.18    | 0.52     | 1.24     | 0.88       | 1.72    | -0.84           | 2.02                             |
| 13        | 2.34    | 0.21    | 0.66     | 1.29     | 0.975      | 1.78    | -0.805          | 2.13                             |
| 35        | 2.71    | 0.26    | 1.17     | 1.5      | 1.335      | 2.08    | -0.745          | 2.45                             |
| 51        | 2.97    | 0.3     | 1.56     | 1.65     | 1.605      | 2.3     | -0.695          | 2.67                             |
| 6         | 2.17    | 0.21    | 0.6      | 1.28     | 0.94       | 1.76    | -0.82           | 1.96                             |
| 13        | 2.35    | 0.21    | 0.73     | 1.32     | 1.025      | 1.82    | -0.795          | 2.14                             |
| 35        | 2.76    | 0.29    | 1.26     | 1.55     | 1.405      | 2.14    | -0.735          | 2.47                             |
| 51        | 3       | 0.3     | 1.63     | 1.68     | 1.655      | 2.35    | -0.695          | 2.7                              |
| 6         | 2.25    | 0.21    | 0.67     | 1.3      | 0.985      | 1.8     | -0.815          | 2.04                             |
| 13        | 2.42    | 0.23    | 0.84     | 1.37     | 1.105      | 1.88    | -0.775          | 2.19                             |
| 35        | 2.78    | 0.3     | 1.32     | 1.57     | 1.445      | 2.18    | -0.735          | 2.48                             |
| 51        | 3.02    | 0.31    | 1.68     | 1.7      | 1.69       | 2.38    | -0.69           | 2.71                             |
| 6         | 2.3     | 0.21    | 0.79     | 1.35     | 1.07       | 1.88    | -0.81           | 2.09                             |
| 13        | 2.4     | 0.24    | 0.86     | 1.39     | 1.125      | 1.92    | -0.795          | 2.16                             |
| 35        | 2.8     | 0.31    | 1.37     | 1.59     | 1.48       | 2.22    | -0.74           | 2.49                             |
| 51        | 3.05    | 0.32    | 1.74     | 1.74     | 1.74       | 2.42    | -0.68           | 2.73                             |
| 6         | 2.28    | 0.21    | 0.83     | 1.37     | 1.1        | 1.91    | -0.81           | 2.07                             |
| 13        | 2.36    | 0.25    | 0.95     | 1.42     | 1.185      | 1.96    | -0.775          | 2.11                             |
| 35        | 2.84    | 0.32    | 1.45     | 1.62     | 1.535      | 2.26    | -0.725          | 2.52                             |
| 51        | 3.08    | 0.33    | 1.79     | 1.77     | 1.78       | 2.46    | -0.68           | 2.75                             |
| 6         | 2.3     | 0.21    | 0.85     | 1.38     | 1.115      | 1.91    | -0.795          | 2.09                             |
| 13        | 2.49    | 0.26    | 0.98     | 1.43     | 1.205      | 1.99    | -0.785          | 2.23                             |
| 35        | 2.86    | 0.34    | 1.48     | 1.64     | 1.56       | 2.28    | -0.72           | 2.52                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 3.1     | 0.33    | 1.82     | 1.76     | 1.79       | 2.47    | -0.68           | 2.77                             |
| 6         | 2.24    | 0.22    | 0.7      | 1.31     | 1.005      | 1.81    | -0.805          | 2.02                             |
| 13        | 2.42    | 0.24    | 0.89     | 1.39     | 1.14       | 1.92    | -0.78           | 2.18                             |
| 35        | 2.85    | 0.32    | 1.45     | 1.63     | 1.54       | 2.26    | -0.72           | 2.53                             |
| 51        | 3.08    | 0.33    | 1.81     | 1.76     | 1.785      | 2.46    | -0.675          | 2.75                             |
| 6         | 2.35    | 0.22    | 0.91     | 1.4      | 1.155      | 1.95    | -0.795          | 2.13                             |
| 13        | 2.49    | 0.26    | 1.02     | 1.42     | 1.22       | 2.02    | -0.8            | 2.23                             |
| 35        | 2.88    | 0.33    | 1.52     | 1.65     | 1.585      | 2.3     | -0.715          | 2.55                             |
| 51        | 3.11    | 0.34    | 1.87     | 1.79     | 1.83       | 2.51    | -0.68           | 2.77                             |
| 6         | 2.34    | 0.23    | 0.89     | 1.39     | 1.14       | 1.93    | -0.79           | 2.11                             |
| 13        | 2.48    | 0.26    | 1        | 1.34     | 1.17       | 2       | -0.83           | 2.22                             |
| 35        | 2.88    | 0.33    | 1.54     | 1.66     | 1.6        | 2.31    | -0.71           | 2.55                             |
| 51        | 3.13    | 0.34    | 1.89     | 1.8      | 1.845      | 2.52    | -0.675          | 2.79                             |
| 6         | 2.36    | 0.23    | 0.96     | 1.42     | 1.19       | 1.98    | -0.79           | 2.13                             |
| 13        | 2.52    | 0.27    | 1.08     | 1.47     | 1.275      | 2.05    | -0.775          | 2.25                             |
| 35        | 2.89    | 0.33    | 1.56     | 1.68     | 1.62       | 2.33    | -0.71           | 2.56                             |
| 51        | 3.14    | 0.34    | 1.92     | 1.81     | 1.865      | 2.53    | -0.665          | 2.8                              |
| 6         | 2.38    | 0.23    | 0.99     | 1.43     | 1.21       | 1.99    | -0.78           | 2.15                             |
| 13        | 2.51    | 0.27    | 1.08     | 1.47     | 1.275      | 2.05    | -0.775          | 2.24                             |
| 35        | 2.9     | 0.34    | 1.58     | 1.68     | 1.63       | 2.34    | -0.71           | 2.56                             |
| 51        | 3.14    | 0.34    | 1.92     | 1.81     | 1.865      | 2.54    | -0.675          | 2.8                              |
| 6         | 2.38    | 0.23    | 0.99     | 1.44     | 1.215      | 2       | -0.785          | 2.15                             |
| 13        | 2.56    | 0.29    | 1.15     | 1.5      | 1.325      | 2.09    | -0.765          | 2.27                             |
| 35        | 2.92    | 0.34    | 1.63     | 1.7      | 1.665      | 2.37    | -0.705          | 2.58                             |
| 51        | 3.15    | 0.34    | 1.94     | 1.82     | 1.88       | 2.55    | -0.67           | 2.81                             |
| 6         | 2.38    | 0.23    | 0.99     | 1.44     | 1.215      | 2       | -0.785          | 2.15                             |
| 13        | 2.53    | 0.28    | 1.1      | 1.48     | 1.29       | 2.07    | -0.78           | 2.25                             |
| 35        | 2.9     | 0.34    | 1.6      | 1.69     | 1.645      | 2.35    | -0.705          | 2.56                             |
| 51        | 3.16    | 0.34    | 1.95     | 1.82     | 1.885      | 2.55    | -0.665          | 2.82                             |
| 6         | 2.43    | 0.24    | 1.06     | 1.47     | 1.265      | 2.05    | -0.785          | 2.19                             |
| 13        | 2.58    | 0.29    | 1.17     | 1.51     | 1.34       | 2.1     | -0.76           | 2.29                             |
| 35        | 2.93    | 0.34    | 1.65     | 1.71     | 1.68       | 2.38    | -0.7            | 2.59                             |
| 51        | 3.16    | 0.35    | 1.96     | 1.83     | 1.895      | 2.56    | -0.665          | 2.81                             |
| 1         | 2.05    | 0.18    | 0.66     | 1.3      | 0.98       | 1.79    | -0.81           | 1.87                             |
| 13        | 2.46    | 0.26    | 0.98     | 1.43     | 1.205      | 1.98    | -0.775          | 2.2                              |
| 35        | 2.91    | 0.35    | 1.61     | 1.69     | 1.65       | 2.36    | -0.71           | 2.56                             |
| 51        | 3.17    | 0.35    | 1.98     | 1.84     | 1.91       | 2.57    | -0.66           | 2.82                             |
| 6         | 2.37    | 0.24    | 1        | 1.44     | 1.22       | 2.01    | -0.79           | 2.13                             |
| 13        | 2.54    | 0.29    | 1.13     | 1.5      | 1.315      | 2.09    | -0.775          | 2.25                             |
| 35        | 2.94    | 0.35    | 1.68     | 1.72     | 1.7        | 2.4     | -0.7            | 2.59                             |
| 51        | 3.09    | 0.36    | 2.01     | 1.85     | 1.93       | 2.61    | -0.68           | 2.73                             |
| 1         | 2.12    | 0.21    | 0.8      | 1.36     | 1.08       | 1.89    | -0.81           | 1.91                             |
| 13        | 2.52    | 0.28    | 1.08     | 1.47     | 1.275      | 2.05    | -0.775          | 2.24                             |
| 35        | 2.94    | 0.35    | 1.65     | 1.71     | 1.68       | 2.39    | -0.71           | 2.59                             |
| 51        | 3.19    | 0.36    | 2.02     | 1.86     | 1.94       | 2.62    | -0.68           | 2.83                             |
| 6         | 2.46    | 0.26    | 1.14     | 1.5      | 1.32       | 2.1     | -0.78           | 2.2                              |
| 13        | 2.59    | 0.3     | 1.22     | 1.55     | 1.385      | 2.15    | -0.765          | 2.29                             |
| 35        | 2.97    | 0.3     | 1.74     | 1.76     | 1.75       | 2.43    | -0.68           | 2.67                             |
| 51        | 3.2     | 0.36    | 2.05     | 1.88     | 1.965      | 2.63    | -0.665          | 2.84                             |
| 6         | 2.42    | 0.25    | 1.11     | 1.5      | 1.305      | 2.08    | -0.775          | 2.17                             |
| 13        | 2.59    | 0.3     | 1.24     | 1.55     | 1.395      | 2.15    | -0.755          | 2.29                             |
| 35        | 2.98    | 0.35    | 1.75     | 1.75     | 1.75       | 2.45    | -0.7            | 2.63                             |

| Load (kN) | TV (mm) | SV (mm) | SHT (mm) | SHB (mm) | Smean (mm) | PS (mm) | Separation (mm) | Steel Relative Displacement (mm) |
|-----------|---------|---------|----------|----------|------------|---------|-----------------|----------------------------------|
| 51        | 3.22    | 0.36    | 2.1      | 1.89     | 1.995      | 2.65    | -0.655          | 2.86                             |
| 57        | 3.31    | 0.37    | 2.23     | 1.95     | 2.09       | 2.73    | -0.64           | 2.94                             |
| 64        | 3.46    | 0.37    | 2.42     | 1.98     | 2.2        | 2.85    | -0.65           | 3.09                             |
| 71- N     | 3.62    | 0.37    | 2.6      | 2.09     | 2.345      | 2.96    | -0.615          | 3.25                             |
| 78        | 3.88    | 0.36    | 2.85     | 2.18     | 2.515      | 3.09    | -0.575          | 3.52                             |
| 86        | 4.19    | 0.32    | 3.05     | 2.26     | 2.655      | 3.24    | -0.585          | 3.87                             |
| 93        | 4.55    | 0.31    | 3.9      | 2.35     | 3.125      | 3.38    | -0.255          | 4.24                             |
| 100       | 4.94    | 0.33    | 4.5      | 2.42     | 3.46       | 3.5     | -0.04           | 4.61                             |
| 107       | 5.93    | 0.34    | 4.91     | 2.57     | 3.74       | 3.72    | 0.02            | 5.59                             |
| 114       | 7.35    | 0.31    | 5.5      | 2.72     | 4.11       | 3.72    | 0.39            | 7.04                             |
| 121       | 9.25    | 0.27    | 5.4      | 2.98     | 4.19       | 3.72    | 0.47            | 8.98                             |
| 128- C    | 11.5    | 0.2     | 5.4      | 2.18     | 3.79       | 3.72    | 0.07            | 11.3                             |
| 135       | 13.4    | 0.08    | 5.4      | 2.25     | 3.825      | 3.72    | 0.105           | 13.32                            |
| 143       | 13.5    | 0.11    | 5.4      | 2.4      | 3.9        | 3.72    | 0.18            | 13.39                            |

**Table A.9.116: Test Panel Concrete Cube Strength (C20-25-3-ssp)**

| Cast Date: 21-09-2006   |             |             |               |                               |                                  |
|-------------------------|-------------|-------------|---------------|-------------------------------|----------------------------------|
| Tested Date: 06-11-2006 |             |             |               |                               |                                  |
| No                      | Size        | Weight (kg) | Load (M.Tons) | Strength (Nmm <sup>-2</sup> ) | Dry Density (kgm <sup>-3</sup> ) |
| I                       | 153x153x153 | 8.7         | 63.2          | 26.83                         | 2429                             |
| II                      | 153x153x153 | 8.75        | 65.2          | 27.68                         | 2443                             |
| III                     | 153x153x153 | 8.65        | 66            | 28.02                         | 2415                             |
| IV                      | 153x153x153 | 8.7         | 64.2          | 27.26                         | 2429                             |
| Mean                    |             |             |               | 27.45                         | 2429                             |