

# Modification of Concrete Composition Doped by Sewage Sludge Fly Ash and Its Effect on Compressive Strength

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**Table S1.** Strength test results of C8/10 class concrete.

| S.No.                     | Sample weight<br>[kg] | Density<br>[kg/dm <sup>3</sup> ] | Destructive force<br>[kN] | Compressive strength<br>[Mpa] |
|---------------------------|-----------------------|----------------------------------|---------------------------|-------------------------------|
| 1                         | 7.393                 | 2.191                            | 308                       | 13.7                          |
| 2                         | 7.389                 | 2.189                            | 313                       | 13.9                          |
| 3                         | 7.390                 | 2.190                            | 311                       | 13.8                          |
| 4                         | 7.394                 | 2.191                            | 307                       | 13.6                          |
| 5                         | 7.391                 | 2.19                             | 290                       | 12.9                          |
| 6                         | 7.354                 | 2.179                            | 318                       | 14.1                          |
| <b>Average</b>            | <b>7.385</b>          | <b>2.188</b>                     | <b>307.83</b>             | <b>13.67</b>                  |
| <b>Standard deviation</b> | 0.015                 | 0.005                            | 9.58                      | 0.41                          |

**Table S2.** Strength test results of C12/15 class concrete.

| S.No.                     | Sample weight<br>[kg] | Density<br>[kg/dm <sup>3</sup> ] | Destructive force<br>[kN] | Compressive strength<br>[Mpa] |
|---------------------------|-----------------------|----------------------------------|---------------------------|-------------------------------|
| 1                         | 7.601                 | 2.252                            | 502                       | 22.3                          |
| 2                         | 7.605                 | 2.253                            | 620                       | 27.6                          |
| 3                         | 7.560                 | 2.240                            | 589                       | 26.2                          |
| 4                         | 7.556                 | 2.239                            | 412                       | 18.3                          |
| 5                         | 7.603                 | 2.253                            | 452                       | 20.1                          |
| 6                         | 7.603                 | 2.253                            | 435                       | 19.3                          |
| <b>Average</b>            | <b>7.588</b>          | <b>2.248</b>                     | <b>501.67</b>             | <b>22.3</b>                   |
| <b>Standard deviation</b> | 0.023                 | 0.007                            | 85.53                     | 3.82                          |

**Table S3.** Strength test results of C16/20 class concrete.

| S.No. | Sample weight<br>[kg] | Density<br>[kg/dm <sup>3</sup> ] | Destructive force<br>[kN] | Compressive strength<br>[Mpa] |
|-------|-----------------------|----------------------------------|---------------------------|-------------------------------|
| 1     | 7.810                 | 2.314                            | 666                       | 29.6                          |
| 2     | 7.779                 | 2.305                            | 643                       | 28.6                          |
| 3     | 7.691                 | 2.279                            | 614                       | 27.3                          |
| 4     | 7.773                 | 2.303                            | 652                       | 29.0                          |

|                           |              |              |            |              |
|---------------------------|--------------|--------------|------------|--------------|
| 5                         | 7.793        | 2.309        | 680        | 30.2         |
| 6                         | 7.783        | 2.306        | 711        | 31.6         |
| <b>Average</b>            | <b>7.771</b> | <b>2.303</b> | <b>661</b> | <b>29.38</b> |
| <b>Standard deviation</b> | 0.041        | 0.012        | 33.17      | 1.46         |

Table S4. Strength test results of C20/25 class concrete.

| S.No.                     | Sample weight<br>[kg] | Density<br>[kg/dm <sup>3</sup> ] | Destructive force<br>[kN] | Compressive strength<br>[Mpa] |
|---------------------------|-----------------------|----------------------------------|---------------------------|-------------------------------|
| 1                         | 7.712                 | 2.285                            | 711                       | 31.6                          |
| 2                         | 7.707                 | 2.284                            | 709                       | 31.5                          |
| 3                         | 7.680                 | 2.276                            | 727                       | 32.3                          |
| 4                         | 7.726                 | 2.289                            | 713                       | 31.7                          |
| 5                         | 7.602                 | 2.252                            | 688                       | 30.6                          |
| 6                         | 7.614                 | 2.256                            | 734                       | 32.6                          |
| <b>Average</b>            | <b>7.673</b>          | <b>2.274</b>                     | <b>713.67</b>             | <b>31.72</b>                  |
| <b>Standard deviation</b> | 0.053                 | 0.016                            | 15.99                     | 0.70                          |

Table S5. Strength test results of C25/30 class concrete.

| S.No.                     | Sample weight<br>[kg] | Density<br>[kg/dm <sup>3</sup> ] | Destructive force<br>[kN] | Compressive strength<br>[Mpa] |
|---------------------------|-----------------------|----------------------------------|---------------------------|-------------------------------|
| 1                         | 7.694                 | 2.280                            | 843                       | 37.5                          |
| 2                         | 7.709                 | 2.284                            | 850                       | 37.8                          |
| 3                         | 7.687                 | 2.278                            | 841                       | 37.4                          |
| 4                         | 7.637                 | 2.263                            | 802                       | 35.6                          |
| 5                         | 7.645                 | 2.265                            | 823                       | 36.6                          |
| 6                         | 7.558                 | 2.239                            | 770                       | 34.2                          |
| <b>Average</b>            | <b>7.655</b>          | <b>2.268</b>                     | <b>821.5</b>              | <b>36.52</b>                  |
| <b>Standard deviation</b> | 0.055                 | 0.016                            | 30.62                     | 1.39                          |

Table S6. Strength test results of C30/37 class concrete.

| S.No.                     | Sample weight<br>[kg] | Density<br>[kg/dm <sup>3</sup> ] | Destructive force<br>[kN] | Compressive strength<br>[Mpa] |
|---------------------------|-----------------------|----------------------------------|---------------------------|-------------------------------|
| 1                         | 7.701                 | 2.282                            | 999                       | 44.4                          |
| 2                         | 7.758                 | 2.299                            | 1018                      | 45.2                          |
| 3                         | 7.662                 | 2.270                            | 1148                      | 51.0                          |
| 4                         | 7.708                 | 2.284                            | 960                       | 42.7                          |
| 5                         | 7.705                 | 2.283                            | 1184                      | 52.6                          |
| 6                         | 7.807                 | 2.313                            | 1101                      | 48.9                          |
| <b>Average</b>            | <b>7.723</b>          | <b>2.288</b>                     | <b>1068.3</b>             | <b>47.47</b>                  |
| <b>Standard deviation</b> | 0.051                 | 0.015                            | 89.30                     | 3.95                          |

**Table S7.** Strength test results of C35/45 class concrete.

| S.No.                     | Sample weight<br>[kg] | Density<br>[kg/dm <sup>3</sup> ] | Destructive force<br>[kN] | Compressive strength<br>[Mpa] |
|---------------------------|-----------------------|----------------------------------|---------------------------|-------------------------------|
| 1                         | 7.792                 | 2.309                            | 1243                      | 55.2                          |
| 2                         | 7.837                 | 2.322                            | 1276                      | 56.7                          |
| 3                         | 7.790                 | 2.308                            | 1199                      | 53.3                          |
| 4                         | 7.76                  | 2.299                            | 1224                      | 54.4                          |
| 5                         | 7.817                 | 2.316                            | 1257                      | 55.9                          |
| 6                         | 7.704                 | 2.283                            | 1246                      | 55.4                          |
| <b>Average</b>            | <b>7.783</b>          | <b>2.306</b>                     | <b>1240.83</b>            | <b>55.15</b>                  |
| <b>Standard deviation</b> | 0.047                 | 0.014                            | 26.69                     | 1.18                          |