

Sand Key Condominiums

Tampa, FL

High strength lightweight concrete is increasingly utilized in office buildings and residential buildings in order to achieve long clear spans. The Sand Key Condominiums were recently constructed in the Sand Key Beach resort area near Tampa, Florida. This 14-storey project is a post-tensioned concrete frame building. The project specifications called for 9,000 psi (62 Mpa) 28 day compressive strength with a maximum calculated equilibrium unit weight (ASTM C567) of 110 pcf (1,760 kg/m³) for the elevated floor slabs. All of this lightweight concrete was placed by pumping through a 5 inch (125 mm) line. As shown in the following data, average 28 day compressive strengths were over 12,000 psi (82.75 Mpa).

| Mix Design Sand Key – Phase II | |
|---|-------------------------------------|
| Materials | Quantities |
| Cement, Type I | 780 lbs. |
| Fly Ash, Class F | 250 lbs. |
| Normal Weight Sand Fine Aggregate | 725 lbs. |
| ½ (12.5 mm) Expanded Slate Coarse Aggregate | 980 lbs. |
| Water | 325 lbs. |
| Total Air (%) | 4.0 +/- 1.5 |
| Water/Cement Ratio | 0.32 |
| Theoretical Plastic Weight | 113.4 pcf (1817 kg/m ³) |

Frequency Distribution: 28 Day compressive Strength Sand Key – Phase II

| Sequence Number | Sample ID | Sample Date | Slump | 28 Day Compressive Strength |
|-----------------|-----------|-------------|------------------|-----------------------------|
| 1 | 1 | 06/08/99 | 8.00 in (205 mm) | 11340 psi (78.2 MPa) |
| 2 | 2 | 06/10/99 | 7.75 in (195 mm) | 12540 psi (86.5 MPa) |
| 3 | 4 | 08/06/99 | 7.75 in (195 mm) | 12105 psi (83.5 MPa) |
| 4 | 7 | 09/01/99 | 8.25 in (210 mm) | 12945 psi (89.3 MPa) |
| 5 | 11 | 10/06/99 | 7.75 in (195 mm) | 11295 psi (77.9 MPa) |
| 6 | 12 | 10/07/99 | 7.50 in (190 mm) | 12775 psi (88.1 MPa) |
| 7 | 15 | 11/03/99 | 7.50 in (190 mm) | 12490 psi (86.1 MPa) |
| 8 | 16 | 11/12/99 | 8.25 in (210 mm) | 12100 psi (83.5 MPa) |
| 9 | 17 | 11/12/99 | 8.50 in (215 mm) | 12495 psi (86.2 MPa) |

