

## Appendix B - Mixture Proportions

| Mixture ID: <b>BACKFIRE</b>                           |   |            |          | Design Proportions (Non SSD) |  | Actual Batched Proportions |                           | Yielded Proportions          |  |
|---|---|------------|----------|------------------------------|--|----------------------------|---------------------------|------------------------------|--|
| Y <sub>D</sub>  | Design Batch Size (ft <sup>3</sup> ):             |            | 0.173    | Amount (lb/yd <sup>3</sup> ) | Volume (ft <sup>3</sup> )                | Amount (lb)                | Volume (ft <sup>3</sup> ) | Amount (lb/yd <sup>3</sup> ) | Volume (ft <sup>3</sup> )                |
| <b>Cementitious Materials</b>                         |   |            | SG       |                              |  |                            |                           |                              |  |
| CM1   | White Portland Cement                             |            | 3.15     | 533.49                       | 2.714                                    | 3.42                       | 0.017                     | 488.29                       | 2.484                                    |
| CM2   | Silica Fume                                       |            | 2.20     | 14.33                        | 0.104                                    | 0.09                       | 0.001                     | 13.12                        | 0.096                                    |
| CM3   | Metakaolin  |            | 2.60     | 107.26                       | 0.661                                    | 0.69                       | 0.004                     | 98.17                        | 0.605                                    |
| <b>Total Cementitious Materials:</b>                  |   |            |          | 655.08                       | 3.48                                     | 4.20                       | 0.022                     | 599.58                       | 3.18                                     |
| <b>Fibers</b>   |   |            |          |                              |  |                            |                           |                              |  |
| F1  | PVA   |            | 1.30     | 31.61                        | 0.390                                    | 0.20                       | 0.002                     | 28.93                        | 0.357                                    |
| <b>Total Fibers:</b>                                  |   |            |          | 31.61                        | 0.39                                     | 0.20                       | 0.002                     | 28.93                        | 0.36                                     |
| <b>Aggregates</b>                                     |   |            |          |                              |  |                            |                           |                              |  |
| A1  | 3M™ K15   | Abs: 0 %   | 0.15     | 86.74                        | 9.267                                    | 0.56                       | 0.059                     | 79.39                        | 8.482                                    |
| A2  | 3M™ S38HS   | Abs: 0 %   | 0.38     | 48.24                        | 2.034                                    | 0.31                       | 0.013                     | 44.15                        | 1.862                                    |
| <b>Total Aggregates:</b>                              |   |            |          | 134.98                       | 11.30                                    | 0.86                       | 0.072                     | 123.54                       | 10.34                                    |
| <b>Water</b>  |   |            |          |                              |  |                            |                           |                              |  |
| W1  | Water for CM Hydration (W1a + W1b)                |            |          | 485.14                       | 7.775                                    | 3.11                       | 0.050                     | 444.04                       | 7.116                                    |
|   | W1a. Water from Admixtures                        |            | 1.00     | 485.14                       |  | 3.11                       |                           | 444.04                       |  |
|   | W1b. Additional Water                             |            |          | 0.00                         |  | 0.00                       |                           | 0.00                         |  |
| W2  | Water for Aggregates, SSD                         |            | 1.00     | 0.00                         |  | 0.00                       |                           | 0.00                         |  |
| <b>Total Water (W1 + W2):</b>                         |   |            |          | 485.14                       | 7.77                                     | 3.11                       | 0.050                     | 444.04                       | 7.12                                     |
| <b>Solids Content of Latex Admixtures and Dyes</b>    |   |            |          |                              |  |                            |                           |                              |  |
| S1  | Latex   |            | 1.00     | 93.58                        | 1.500                                    | 0.14                       | 0.002                     | 85.65                        | 1.373                                    |
| <b>Total Solids of Admixtures:</b>                    |   |            |          | 93.58                        | 1.50                                     | 0.14                       | 0.002                     | 85.65                        | 1.37                                     |
| <b>Admixtures (including Pigments in Liquid Form)</b> |   |            | % Solids | Dosage (fl oz/cwt)           | Water in Admixture (lb/yd <sup>3</sup> ) | Amount (fl oz)             | Water in Admixture (lb)   | Dosage (fl oz/cwt)           | Water in Admixture (lb/yd <sup>3</sup> ) |
| Ad1   | Silpro C-21 Latex                                 | 9.2 lb/gal | 20%      | 995.90                       | 466.95                                   | 9.96                       | 2.99                      | 911.5                        | 427.39                                   |
| Ad2   | ADVA Cast 575®                                    | 8.9 lb/gal | 40%      | 16.91                        | 7.67                                     | 0.17                       | 0.05                      | 15.5                         | 7.02                                     |
| Ad3   | Eclipse® Floor 200                                | 7.9 lb/gal | 1%       | 26.02                        | 10.52                                    | 0.26                       | 0.07                      | 23.8                         | 9.63                                     |
| <b>Water from Admixtures (W1a):</b>                   |   |            |          |                              | 485.14                                   |                            | 3.11                      |                              | 444.04                                   |
| <b>Cement-Cementitious Materials Ratio</b>            |   |            |          |                              | 0.814                                    |                            | 0.814                     |                              | 0.814                                    |
| <b>Water-Cementitious Materials Ratio</b>             |   |            |          |                              | 0.65                                     |                            | 0.65                      |                              | 0.65                                     |
| <b>Slump, Slump Flow, in.</b>                         |   |            |          |                              | 2.00                                     |                            | 2.00                      |                              | 2.00                                     |
| M   | Mass of Concrete, lbs                             |            |          |                              | 1306.81                                  |                            | 8.37                      |                              | 1196.10                                  |
| V   | Absolute Volume of Concrete, ft <sup>3</sup>      |            |          |                              | 24.45                                    |                            | 0.15                      |                              | 22.37                                    |
| T   | Theoretical Density, lb/ft <sup>3</sup> = (M / V) |            |          |                              | 53.46                                    |                            | 56.08                     |                              | 53.46                                    |
| D   | Design Density, lb/ft <sup>3</sup> = (M / 27)     |            |          |                              | 48.40                                    |                            |                           |                              |  |
| D   | Measured Density, lb/ft <sup>3</sup>              |            |          |                              |  |                            | 44.30                     |                              | 44.300                                   |
| A   | Air Content, % = [(T - D) / T x 100%]             |            |          |                              | 9.46                                     |                            | 21.01                     |                              | 17.13                                    |
| Y   | Yield, ft <sup>3</sup> = (M / D)                  |            |          |                              | 27                                       |                            | 0.1890                    |                              | 27                                       |
| Ry  | Relative Yield = (Y / Y <sub>D</sub> )            |            |          |                              |  |                            | 1.093                     |                              |  |