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APPENDIX A  
DRY DENSITY AND UNCONFINED  
COMPRESSIVE STRENGTH VS. MOLDING  
MOISTURE CONTENT

Dry Density and Unconfined Compressive Strength VS. Molding  
Moisture Content

| Type of Mix |   | Molding Moisture<br>Content, % | Dry Density,<br>lb/ft <sup>3</sup> | Unconfined Compressive<br>Strength, psi |
|-------------|---|--------------------------------|------------------------------------|---|
| S           | 1 | 6.15                           | 112.4                              | -                                       |
|             | 2 | 7.54                           | 114.5                              | -                                       |
|             | 3 | 10.24                          | 116.6                              | -                                       |
|             | 4 | 12.73                          | 117.6                              | -                                       |
|             | 5 | 14.51                          | 116.9                              | -                                       |
| S+3E        | 1 | 4.44                           | 112.8                              | 13.67                                   |
|             | 2 | 7.73                           | 117.8                              | 5.78                                    |
|             | 3 | 9.47                           | 118.5                              | 4.87                                    |
|             | 4 | 11.21                          | 117.4                              | 4.30                                    |
| S+4E        | 1 | 4.06                           | 113.1                              | 16.00                                   |
|             | 2 | 4.87                           | 115.2                              | 12.40                                   |
|             | 3 | 6.65                           | 118.1                              | 7.41                                    |
|             | 4 | 8.63                           | 118.9                              | 4.64                                    |
|             | 5 | 10.71                          | 117.5                              | -                                       |
| S+5E        | 1 | 4.34                           | 116.0                              | 16.42                                   |
|             | 2 | 5.27                           | 117.4                              | 12.88                                   |
|             | 3 | 6.71                           | 119.2                              | 7.64                                    |
|             | 4 | 7.63                           | 119.6                              | 6.46                                    |
|             | 5 | 9.50                           | 118.7                              | 5.80                                    |
| S+3L        | 1 | 5.03                           | 113.5                              | 11.72                                   |
|             | 2 | 6.20                           | 115.1                              | 13.86                                   |
|             | 3 | 7.19                           | 115.4                              | 12.58                                   |
|             | 4 | 8.96                           | 117.5                              | 8.95                                    |

Dry Density and Unconfined Compressive Strength VS. Molding  
Moisture Content. (Continued)

| Type of Mix | Molding Moisture<br>Content, % | Dry Density,<br>lb/ft <sup>3</sup> | Unconfined Compressive<br>Strength, psi |
|-------------|--------------------------------|------------------------------------|---|
| 5           | 12.61                          | 118.7                              | -                                       |
| 6           | 13.91                          | 118.4                              | -                                       |
| S+3L+2E 1   | 4.18                           | 113.1                              | 21.25                                   |
| 2           | 5.58                           | 114.6                              | 20.21                                   |
| 3           | 7.02                           | 117.0                              | 16.48                                   |
| 4           | 9.35                           | 118.5                              | 9.19                                    |
| 5           | 11.81                          | 119.4                              | -                                       |
| 6           | 13.63                          | 118.1                              | -                                       |
| S+3L+3E 1   | 3.89                           | -                                  | 19.66                                   |
| 2           | 5.21                           | 112.3                              | 22.27                                   |
| 3           | 6.12                           | 114.2                              | 20.10                                   |
| 4           | 8.15                           | 118.8                              | 15.21                                   |
| 5           | 9.84                           | 119.9                              | 10.43                                   |
| 6           | 11.34                          | 119.1                              | -                                       |
| S+3L+4E 1   | 4.35                           | 115.3                              | 22.90                                   |
| 2           | 5.25                           | 116.7                              | 23.64                                   |
| 3           | 6.42                           | 118.7                              | 22.06                                   |
| 4           | 7.61                           | 119.3                              | 17.73                                   |
| 5           | 9.26                           | 120.0                              | 13.91                                   |
| 6           | 11.75                          | 118.3                              | -                                       |
| S+3C 1      | 4.70                           | 115.5                              | 93.97                                   |
| 2           | 6.91                           | 118.0                              | 102.27                                  |
| 3           | 6.90                           | 118.1                              | 88.95                                   |
| 4           | 8.74                           | 119.8                              | 81.83                                   |
| 5           | 11.51                          | 119.5                              | 57.90                                   |

Dry Density and Unconfined Compressive Strength VS. Molding  
Moisture Content. (Continued)

| Type of Mix | Molding Moisture Content, % | Dry Density, lb/ft <sup>3</sup> | Unconfined Compressive Strength, psi |       |
|-------------|-----------------------------|---------------------------------|--------------------------------------|-------|
| S+3C+2E     | 1                           | 4.36                            | 116.1                                | 88.20 |
|             | 2                           | 7.80                            | 119.9                                | 85.03 |
|             | 3                           | 9.71                            | 120.4                                | 70.24 |
|             | 4                           | 11.83                           | 119.0                                | 42.51 |
| S+3C+3E     | 1                           | 3.67                            | 113.4                                | 51.35 |
|             | 2                           | 4.95                            | 116.5                                | 88.50 |
|             | 3                           | 6.57                            | 119.0                                | 85.82 |
|             | 4                           | 8.36                            | 120.9                                | 76.32 |
|             | 5                           | 10.35                           | 120.3                                | 63.01 |
| S+3C+4E     | 1                           | 3.58                            | 115.2                                | 81.07 |
|             | 2                           | 6.90                            | 120.1                                | 76.38 |
|             | 3                           | 7.88                            | 121.1                                | 72.33 |
|             | 4                           | 9.88                            | 120.5                                | 61.09 |
|             | 5                           | 11.01                           | 119.2                                | 49.52 |
| B           | 1                           | 8.68                            | 93.7                                 | -     |
|             | 2                           | 10.40                           | 94.7                                 | -     |
|             | 3                           | 12.01                           | 95.1                                 | -     |
|             | 4                           | 13.90                           | 96.8                                 | -     |
|             | 5                           | 15.24                           | 96.8                                 | -     |
|             | 6                           | 16.80                           | 96.2                                 | -     |
| B+3E        | 1                           | 8.48                            | 99.0                                 | -     |
|             | 2                           | 10.82                           | 99.2                                 | -     |
|             | 3                           | 12.46                           | 98.8                                 | -     |
|             | 4                           | 14.52                           | 98.3                                 | -     |
|             | 5                           | 15.97                           | 97.7                                 | -     |

Dry Density and Unconfined Compressive Strength VS. Molding  
Moisture Content. (Continued)

| Type of Mix | Molding Moisture Content, % | Dry Density, lb/ft <sup>3</sup> | Unconfined Compressive Strength, psi |   |
|-------------|-----------------------------|---------------------------------|--------------------------------------|---|
| B+4E        | 1                           | 8.27                            | 99.8                                 | - |
|             | 2                           | 9.10                            | 100.2                                | - |
|             | 3                           | 10.77                           | 99.9                                 | - |
|             | 4                           | 12.86                           | 98.6                                 | - |
| B+5E        | 1                           | 6.37                            | 101.0                                | - |
|             | 2                           | 8.23                            | 101.5                                | - |
|             | 3                           | 9.98                            | 100.8                                | - |
|             | 4                           | 10.96                           | 100.6                                | - |
|             | 5                           | 13.88                           | 98.2                                 | - |
| B+3L+2E     | 1                           | 7.60                            | 98.3                                 | - |
|             | 2                           | 9.81                            | 98.9                                 | - |
|             | 3                           | 11.57                           | 98.5                                 | - |
|             | 4                           | 13.06                           | 97.9                                 | - |
|             | 5                           | 13.95                           | 97.2                                 | - |
| B+3L+3E     | 1                           | 5.79                            | 98.4                                 | - |
|             | 2                           | 7.77                            | 98.8                                 | - |
|             | 3                           | 9.39                            | 99.0                                 | - |
|             | 4                           | 11.25                           | 98.3                                 | - |
|             | 5                           | 13.28                           | 97.6                                 | - |
| B+3L+4E     | 1                           | 5.48                            | 98.7                                 | - |
|             | 2                           | 6.90                            | 99.0                                 | - |
|             | 3                           | 8.41                            | 99.0                                 | - |
|             | 4                           | 11.67                           | 97.9                                 | - |



Dry Density and Unconfined Compressive Strength VS. Molding  
Moisture Content. (Continued)

| Type of Mix | Molding Moisture<br>Content, % | Dry Density,<br>lb/ft <sup>3</sup> | Unconfined Compressive<br>Strength, psi |   |
|-------------|--------------------------------|------------------------------------|---|---|
| B+3C+2E     | 1                              | 5.5                                | 100.0                                   | - |
|             | 2                              | 7.62                               | 100.4                                   | - |
|             | 3                              | 9.32                               | 101.1                                   | - |
|             | 4                              | 10.25                              | 101.0                                   | - |
|             | 5                              | 12.21                              | 99.6                                    | - |
| B+3C+3E     | 1                              | 5.85                               | 100.8                                   | - |
|             | 2                              | 6.42                               | 100.9                                   | - |
|             | 3                              | 8.21                               | 101.2                                   | - |
|             | 4                              | 10.22                              | 100.6                                   | - |
|             | 5                              | 11.34                              | 100.4                                   | - |
| B+3C+4E     | 1                              | 4.87                               | 100.9                                   | - |
|             | 2                              | 6.13                               | 101.2                                   | - |
|             | 3                              | 8.00                               | 101.1                                   | - |
|             | 4                              | 9.44                               | 100.6                                   | - |
|             | 5                              | 10.88                              | 100.3                                   | - |

APPENDIX B  
SUMMARY OF DETAILED TEST RESULTS  
FOR UNCONFINED AND TRIAXIAL  
COMPRESSION TEST

Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test

| Type of Mix              |   | Molding<br>Moisture<br>Content(%) | Dry<br>Density<br>(lb/ft <sup>3</sup> ) | Curing<br>Time<br>(days) | $\sigma_3$<br>psi | $\sigma_1$<br>psi |
|--------------------------|---|-----------------------------------|---|--------------------------|-------------------|-------------------|
| Silty Sand<br>(Raw soil) | 1 | 8.10                              | 115.01                                  | -                        | 20                | 64.21             |
|                          | 2 | 8.10                              | 114.98                                  | -                        | 40                | 125.08            |
|                          | 3 | 8.10                              | 114.90                                  | -                        | 40                | 134.51            |
|                          | 4 | 8.10                              | 115.07                                  | -                        | 80                | 258.11            |
| S+3E*                    | 1 | 6.65                              | 116.72                                  | 1                        | 0                 | 8.72              |
|                          | 2 | 6.65                              | 116.50                                  | 1                        | 0                 | 6.05              |
|                          | 3 | 6.65                              | 115.98                                  | 1                        | 20                | 73.10             |
|                          | 4 | 6.65                              | 117.23                                  | 1                        | 40                | 136.28            |
|                          | 5 | 6.65                              | 117.50                                  | 1                        | 80                | 258.36            |
| S+3E*                    | 1 | 6.65                              | 117.23                                  | 3                        | 0                 | 10.08             |
|                          | 2 | 6.65                              | 117.01                                  | 3                        | 0                 | 12.82             |
|                          | 3 | 6.65                              | 116.58                                  | 3                        | 20                | 80.27             |
|                          | 4 | 6.65                              | 116.73                                  | 3                        | 40                | 142.51            |
|                          | 5 | 6.65                              | 114.48                                  | 3                        | 40                | 150.90            |
|                          | 6 | 6.65                              | 116.31                                  | 3                        | 80                | 265.23            |
| S+3E*                    | 1 | 6.65                              | 117.32                                  | 7                        | 0                 | 16.42             |
|                          | 2 | 6.65                              | 116.71                                  | 7                        | 0                 | 11.38             |
|                          | 3 | 6.65                              | 116.79                                  | 7                        | 0                 | 16.64             |
|                          | 4 | 6.65                              | 116.18                                  | 7                        | 20                | 93.11             |
|                          | 5 | 6.65                              | 116.20                                  | 7                        | 40                | 157.03            |
|                          | 6 | 6.65                              | 115.98                                  | 7                        | 80                | 282.49            |
| S+3E*                    | 1 | 6.65                              | 117.28                                  | 15                       | 0                 | 24.89             |
|                          | 2 | 6.65                              | 115.92                                  | 15                       | 0                 | 22.53             |
|                          | 3 | 6.65                              | 115.73                                  | 15                       | 20                | 94.23             |

Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test (Continued)

| Type of Mix |       | Molding<br>Moisture<br>Content(%) | Dry<br>Density<br>(lb/ft <sup>3</sup> ) | Curing<br>Time<br>(days) | $\sigma_3$<br>(psi) | $\sigma_1$<br>(psi) |      |
|-------------|-------|-----------------------------------|---|--------------------------|---------------------|---------------------|------|
| S+3E*       | 4     | 6.65                              | 116.75                                  | 15                       | 40                  | 158.82              |      |
|             | 5     | 6.65                              | 116.68                                  | 15                       | 80                  | 274.46              |      |
|             | 1     | 6.65                              | 117.70                                  | 30                       | 0                   | 29.34               |      |
|             | 2     | 6.65                              | 116.65                                  | 30                       | 0                   | 26.12               |      |
|             | 3     | 6.65                              | 116.61                                  | 30                       | 0                   | 27.16               |      |
|             | 4     | 6.65                              | 115.78                                  | 30                       | 20                  | 109.83              |      |
|             | 5     | 6.65                              | 116.82                                  | 30                       | 40                  | 165.01              |      |
|             | 6     | 6.65                              | 117.02                                  | 30                       | 80                  | 297.50              |      |
|             | S+4E* | 1                                 | 6.81                                    | 118.75                   | 1                   | 0                   | 8.13 |
|             |       | 2                                 | 6.81                                    | 118.99                   | 1                   | 0                   | 7.35 |
| 3           |       | 6.81                              | 118.86                                  | 1                        | 20                  | 67.85               |      |
| 4           |       | 6.81                              | 119.02                                  | 1                        | 40                  | 138.73              |      |
| 5           |       | 6.81                              | 118.67                                  | 1                        | 70                  | 227.21              |      |
| 6           |       | 6.81                              | 118.96                                  | 1                        | 80                  | 255.38              |      |
| S+4E*       | 1     | 6.81                              | 119.08                                  | 3                        | 0                   | 12.31               |      |
|             | 2     | 6.81                              | 118.94                                  | 3                        | 0                   | 9.15                |      |
|             | 3     | 6.81                              | 118.21                                  | 3                        | 0                   | 13.04               |      |
|             | 4     | 6.81                              | 119.18                                  | 3                        | 20                  | 77.50               |      |
|             | 5     | 6.81                              | 118.84                                  | 3                        | 40                  | 144.41              |      |
|             | 6     | 6.81                              | 118.89                                  | 3                        | 80                  | 268.19              |      |
| S+4E*       | 1     | 6.81                              | 117.90                                  | 7                        | 0                   | 18.23               |      |
|             | 2     | 6.81                              | 117.63                                  | 7                        | 0                   | 17.61               |      |
|             | 3     | 6.81                              | 118.56                                  | 7                        | 20                  | 79.30               |      |
|             | 4     | 6.81                              | 119.18                                  | 7                        | 40                  | 151.80              |      |
|             | 5     | 6.81                              | 118.75                                  | 7                        | 80                  | 275.72              |      |

Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test (Continued)

| Type of Mix |   | Molding<br>Moisture<br>Content (%) | Dry<br>Density <sub>3</sub><br>(lb/ft <sup>3</sup> ) | Curing<br>Time<br>(days) | $\sigma_3$<br>(psi) | $\sigma_1$<br>(psi) |
|-------------|---|------------------------------------|--|--------------------------|---------------------|---------------------|
| S+4E*       | 1 | 6.81                               | 118.94   | 15                       | 0                   | 19.09               |
|             | 2 | 6.81                               | 118.83   | 15                       | 0                   | 27.33               |
|             | 3 | 6.81                               | 119.03   | 15                       | 0                   | 25.09               |
|             | 4 | 6.81                               | 119.16   | 15                       | 20                  | 107.5               |
|             | 5 | 6.81                               | 119.24   | 15                       | 40                  | 172.02              |
|             | 6 | 6.81                               | 118.84   | 15                       | 80                  | 292.77              |
| S+4E*       | 1 | 6.81                               | 119.41   | 30                       | 0                   | 26.94               |
|             | 2 | 6.81                               | 119.49   | 30                       | 0                   | 29.46               |
|             | 3 | 6.81                               | 119.32   | 30                       | 20                  | 114.0               |
|             | 4 | 6.81                               | 118.52   | 30                       | 40                  | 173.62              |
|             | 5 | 6.81                               | 119.79   | 30                       | 40                  | 199.01              |
|             | 6 | 6.81                               | 119.37   | 30                       | 80                  | 304.09              |
| S+5E*       | 1 | 6.12                               | 118.86   | 1                        | 0                   | 9.58                |
|             | 2 | 6.12                               | 119.04   | 1                        | 0                   | 8.82                |
|             | 3 | 6.12                               | 119.43   | 1                        | 20                  | 70.44               |
|             | 4 | 6.12                               | 119.38   | 1                        | 40                  | 149.78              |
|             | 5 | 6.12                               | 118.76   | 1                        | 40                  | 130.15              |
|             | 6 | 6.12                               | 118.99   | 1                        | 70                  | 220.12              |
| S+5E*       | 1 | 6.12                               | 118.64   | 3                        | 0                   | 15.65               |
|             | 2 | 6.12                               | 119.71   | 3                        | 0                   | 10.65               |
|             | 3 | 6.12                               | 119.66   | 3                        | 0                   | 14.60               |
|             | 4 | 6.12                               | 119.52   | 3                        | 20                  | 76.5                |
|             | 5 | 6.12                               | 119.66   | 3                        | 40                  | 145.06              |
|             | 6 | 6.12                               | 119.69   | 3                        | 80                  | 264.42              |

Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test (Continued)

| Type of Mix |   | Molding<br>Moisture<br>Content (%) | Dry<br>Density<br>(lb/ft <sup>3</sup> ) | Curing<br>Time<br>(days) | $\sigma_3$<br>(psi) | $\sigma_1$<br>(psi) |
|-------------|---|------------------------------------|---|--------------------------|---------------------|---------------------|
| S+5E*       | 1 | 6.12                               | 119.33                                  | 7                        | 0                   | 17.96               |
|             | 2 | 6.12                               | 119.62                                  | 7                        | 0                   | 19.73               |
|             | 3 | 6.12                               | 119.19                                  | 7                        | 20                  | 99.21               |
|             | 4 | 6.12                               | 119.09                                  | 7                        | 40                  | 148.95              |
|             | 5 | 6.12                               | 119.47                                  | 7                        | 40                  | 153.82              |
|             | 6 | 6.12                               | 119.73                                  | 7                        | 80                  | 272.11              |
| S+5E*       | 1 | 6.12                               | 119.88                                  | 15                       | 0                   | 30.26               |
|             | 2 | 6.12                               | 119.88                                  | 15                       | 0                   | 26.80               |
|             | 3 | 6.12                               | 119.88                                  | 15                       | 20                  | 110.03              |
|             | 4 | 6.12                               | 119.92                                  | 15                       | 40                  | 157.49              |
|             | 5 | 6.12                               | 119.92                                  | 15                       | 40                  | 168.18              |
|             | 6 | 6.12                               | 119.52                                  | 15                       | 80                  | 284.61              |
| S+5E*       | 1 | 6.12                               | 119.24                                  | 30                       | 0                   | 33.53               |
|             | 2 | 6.12                               | 119.54                                  | 30                       | 0                   | 29.19               |
|             | 3 | 6.12                               | 119.02                                  | 30                       | 0                   | 30.61               |
|             | 4 | 6.12                               | 119.24                                  | 30                       | 20                  | 115.34              |
|             | 5 | 6.12                               | 119.16                                  | 30                       | 40                  | 182.40              |
|             | 6 | 6.12                               | 119.22                                  | 30                       | 80                  | 291.18              |
| S+5E* *     | 1 | 6.08                               | 117.30                                  | 1                        | 0                   | 51.55               |
|             | 2 | 6.08                               | 117.66                                  | 1                        | 0                   | 61.41               |
|             | 3 | 6.08                               | 117.72                                  | 1                        | 20                  | 121.64              |
|             | 4 | 6.08                               | 117.75                                  | 1                        | 40                  | 177.29              |
|             | 5 | 6.08                               | 118.31                                  | 1                        | 80                  | 298.09              |

Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test (Continued)

| Type of Mix | Molding<br>Moisture<br>Content(%) | Dry<br>Density<br>(lb/ft <sup>3</sup> ) | Curing<br>Time<br>(days) | $\bar{\sigma}_3$<br>(psi) | $\bar{\sigma}_1$<br>(psi) |        |
|-------------|-----------------------------------|---|--------------------------|---------------------------|---------------------------|--------|
| S+5E**      | 1                                 | 6.08                                    | 117.45                   | 3                         | 0                         | 67.62  |
|             | 2                                 | 6.08                                    | 118.57                   | 3                         | 0                         | 66.12  |
|             | 3                                 | 6.08                                    | 118.14                   | 3                         | 20                        | 140.30 |
|             | 4                                 | 6.08                                    | 117.30                   | 3                         | 40                        | 195.04 |
|             | 5                                 | 6.08                                    | 118.09                   | 3                         | 40                        | 232.22 |
|             | 6                                 | 6.08                                    | 117.92                   | 3                         | 80                        | 312.71 |
| S+5E**      | 1                                 | 6.08                                    | 118.23                   | 7                         | 0                         | 105.48 |
|             | 2                                 | 6.08                                    | 118.88                   | 7                         | 0                         | 88.86  |
|             | 3                                 | 6.08                                    | 117.11                   | 7                         | 0                         | 96.62  |
|             | 4                                 | 6.08                                    | 118.04                   | 7                         | 20                        | 172.15 |
|             | 5                                 | 6.08                                    | 118.90                   | 7                         | 40                        | 228.93 |
|             | 6                                 | 6.08                                    | 118.27                   | 7                         | 80                        | 354.13 |
| S+5E**      | 1                                 | 6.08                                    | 118.90                   | 15                        | 0                         | 96.14  |
|             | 2                                 | 6.08                                    | 117.14                   | 15                        | 0                         | 112.99 |
|             | 3                                 | 6.08                                    | 118.61                   | 15                        | 20                        | 178.13 |
|             | 4                                 | 6.08                                    | 118.90                   | 15                        | 40                        | 234.30 |
|             | 5                                 | 6.08                                    | 119.04                   | 15                        | 80                        | 357.68 |
|             | 6                                 | 6.08                                    | 117.69                   | 15                        | 80                        | 338.59 |
| S+5E**      | 1                                 | 6.08                                    | 117.74                   | 30                        | 0                         | 103.17 |
|             | 2                                 | 6.08                                    | 118.82                   | 30                        | 0                         | 103.17 |
|             | 3                                 | 6.08                                    | 117.37                   | 30                        | 20                        | 173.79 |
|             | 4                                 | 6.08                                    | 118.92                   | 30                        | 20                        | 184.83 |
|             | 5                                 | 6.08                                    | 118.23                   | 30                        | 40                        | 226.01 |
|             | 6                                 | 6.08                                    | 118.15                   | 30                        | 80                        | 340.19 |

Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test (Continued)

| Type of Mix | Molding Moisture Content(%) | Dry Density (lb/ft <sup>3</sup> ) | Curing Time (days) | $\sigma_{13}$ (psi) | $\sigma_{11}$ (psi) |        |
|-------------|-----------------------------|-----------------------------------|--------------------|---------------------|---------------------|--------|
| S+3L*       | 1                           | 6.38                              | 114.88             | 1                   | 0                   | 14.77  |
|             | 2                           | 6.38                              | 115.26             | 1                   | 0                   | 14.33  |
|             | 3                           | 6.38                              | 115.17             | 1                   | 20                  | 95.03  |
|             | 4                           | 6.38                              | 115.64             | 1                   | 40                  | 169.58 |
|             | 5                           | 6.38                              | 116.02             | 1                   | 80                  | 299.03 |
| S+3L*       | 1                           | 6.38                              | 116.01             | 3                   | 0                   | 22.25  |
|             | 2                           | 6.38                              | 116.28             | 3                   | 0                   | 21.60  |
|             | 3                           | 6.38                              | 116.31             | 3                   | 0                   | 24.07  |
|             | 4                           | 6.38                              | 115.19             | 3                   | 20                  | 101.12 |
|             | 5                           | 6.38                              | 116.06             | 3                   | 40                  | 155.45 |
|             | 6                           | 6.38                              | 116.02             | 3                   | 80                  | 298.14 |
| S+3L*       | 1                           | 6.38                              | 116.65             | 7                   | 0                   | 30.78  |
|             | 2                           | 6.38                              | 115.68             | 7                   | 0                   | 24.26  |
|             | 3                           | 6.38                              | 115.52             | 7                   | 0                   | 31.59  |
|             | 4                           | 6.38                              | 116.18             | 7                   | 20                  | 101.23 |
|             | 5                           | 6.38                              | 116.46             | 7                   | 40                  | 175.47 |
|             | 6                           | 6.38                              | 116.44             | 7                   | 80                  | 313.27 |
| S+3L*       | 1                           | 6.38                              | 114.75             | 15                  | 0                   | 39.92  |
|             | 2                           | 6.38                              | 114.94             | 15                  | 0                   | 36.54  |
|             | 3                           | 6.38                              | 115.31             | 15                  | 0                   | 43.65  |
|             | 4                           | 6.38                              | 115.79             | 15                  | 20                  | 120.03 |
|             | 5                           | 6.38                              | 116.08             | 15                  | 40                  | 192.64 |
|             | 6                           | 6.38                              | 115.37             | 15                  | 80                  | 326.12 |



Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test (Continued)

| Type of Mix |   | Molding<br>Moisture<br>Content(%) | Dry<br>Density<br>(lb/ft <sup>3</sup> ) | Curing<br>Time<br>(days) | $\sigma_3$<br>(psi) | $\sigma_1$<br>(psi) |
|-------------|---|-----------------------------------|---|--------------------------|---------------------|---------------------|
| S+3L*       | 1 | 6.38                              | 115.85                                  | 30                       | 0                   | 52.65               |
|             | 2 | 6.38                              | 115.96                                  | 30                       | 0                   | 40.60               |
|             | 3 | 6.38                              | 115.23                                  | 30                       | 0                   | 50.71               |
|             | 4 | 6.38                              | 115.85                                  | 30                       | 20                  | 143.90              |
|             | 5 | 6.38                              | 115.18                                  | 30                       | 40                  | 210.50              |
|             | 6 | 6.38                              | 115.20                                  | 30                       | 80                  | 342.47              |
| S+3L+3E*    | 1 | 6.32                              | 115.89                                  | 1                        | 0                   | 21.85               |
|             | 2 | 6.32                              | 115.97                                  | 1                        | 0                   | 20.62               |
|             | 3 | 6.32                              | 116.54                                  | 1                        | 20                  | 75.60               |
|             | 4 | 6.32                              | 116.59                                  | 1                        | 40                  | 138.75              |
|             | 5 | 6.32                              | 116.40                                  | 1                        | 55                  | 192.50              |
| S+3L+3E*    | 1 | 6.32                              | 116.68                                  | 3                        | 0                   | 37.42               |
|             | 2 | 6.32                              | 116.25                                  | 3                        | 0                   | 34.65               |
|             | 3 | 6.32                              | 116.92                                  | 3                        | 20                  | 94.92               |
|             | 4 | 6.32                              | 116.35                                  | 3                        | 40                  | 158.53              |
|             | 5 | 6.32                              | 117.39                                  | 3                        | 70                  | 255.79              |
| S+3L+3E*    | 1 | 6.32                              | 117.66                                  | 7                        | 0                   | 58.10               |
|             | 2 | 6.32                              | 118.25                                  | 7                        | 0                   | 46.73               |
|             | 3 | 6.32                              | 117.02                                  | 7                        | 0                   | 48.10               |
|             | 4 | 6.32                              | 117.78                                  | 7                        | 20                  | 115.58              |
|             | 5 | 6.32                              | 117.54                                  | 7                        | 40                  | 192.21              |
|             | 6 | 6.32                              | 117.32                                  | 7                        | 60                  | 247.96              |
| S+3L+3E*    | 1 | 6.32                              | 116.32                                  | 15                       | 0                   | 70.30               |
|             | 2 | 6.32                              | 116.49                                  | 15                       | 0                   | 74.16               |
|             | 3 | 6.32                              | 115.93                                  | 15                       | 20                  | 126.76              |

Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test (Continued)

| Type of Mix | Molding<br>Moisture<br>Content(%) | Dry<br>Density<br>(lb/ft <sup>3</sup> ) | Curing<br>Time<br>(days) | $\sigma_3$<br>(psi) | $\sigma_1$<br>(psi) |        |
|-------------|-----------------------------------|---|--------------------------|---------------------|---------------------|--------|
| S+3L+3E*    | 4                                 | 6.32                                    | 117.25                   | 15                  | 40                  | 117.46 |
|             | 5                                 | 6.32                                    | 116.72                   | 15                  | 55                  | 237.50 |
|             | 6                                 | 6.32                                    | 115.87                   | 15                  | 70                  | 287.16 |
|             | 1                                 | 6.32                                    | 116.42                   | 30                  | 0                   | 109.04 |
|             | 2                                 | 6.32                                    | 117.19                   | 30                  | 0                   | 96.31  |
|             | 3                                 | 6.32                                    | 117.06                   | 30                  | 0                   | 94.46  |
|             | 4                                 | 6.32                                    | 115.79                   | 30                  | 20                  | 152.63 |
|             | 5                                 | 6.32                                    | 116.21                   | 30                  | 40                  | 223.80 |
|             | 6                                 | 6.32                                    | 115.98                   | 30                  | 70                  | 349.52 |
| S+3L+3E**   | 1                                 | 6.76                                    | 116.48                   | 1                   | 0                   | 54.22  |
|             | 2                                 | 6.76                                    | 117.35                   | 1                   | 0                   | 55.52  |
|             | 3                                 | 6.76                                    | 117.72                   | 1                   | 20                  | 113.00 |
|             | 4                                 | 6.76                                    | 116.59                   | 1                   | 40                  | 184.92 |
|             | 5                                 | 6.76                                    | 116.94                   | 1                   | 80                  | 303.01 |
| S+3L+3E**   | 1                                 | 6.76                                    | 117.33                   | 3                   | 0                   | 114.62 |
|             | 2                                 | 6.76                                    | 117.44                   | 3                   | 0                   | 99.73  |
|             | 3                                 | 6.76                                    | 118.25                   | 3                   | 0                   | 110.44 |
|             | 4                                 | 6.76                                    | 116.78                   | 3                   | 20                  | 191.44 |
|             | 5                                 | 6.76                                    | 117.23                   | 3                   | 40                  | 259.95 |
|             | 6                                 | 6.76                                    | 116.24                   | 3                   | 60                  | 317.50 |
| S+3L+3E**   | 1                                 | 6.76                                    | 117.52                   | 7                   | 0                   | 151.38 |
|             | 2                                 | 6.76                                    | 117.18                   | 7                   | 0                   | 151.54 |
|             | 3                                 | 6.76                                    | 118.04                   | 7                   | 20                  | 220.42 |

Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test (Continued)

| Type of Mix | Molding<br>Moisture<br>Content(%) | Dry<br>Density<br>(lb/ft <sup>3</sup> ) | Curing<br>Time<br>(days) | $\sigma_3$<br>(psi) | $\sigma_1$<br>(psi) |        |
|-------------|-----------------------------------|---|--------------------------|---------------------|---------------------|--------|
|             | 4                                 | 6.76                                    | 118.08                   | 7                   | 40                  | 272.51 |
|             | 5                                 | 6.76                                    | 117.75                   | 7                   | 60                  | 347.39 |
| S+3L+3E**   | 1                                 | 6.76                                    | 117.94                   | 15                  | 0                   | 138.60 |
|             | 2                                 | 6.76                                    | 117.87                   | 15                  | 0                   | 152.86 |
|             | 3                                 | 6.76                                    | 117.95                   | 15                  | 0                   | 147.50 |
|             | 4                                 | 6.76                                    | 117.45                   | 15                  | 20                  | 234.48 |
|             | 5                                 | 6.76                                    | 118.16                   | 15                  | 40                  | 294.57 |
|             | 6                                 | 6.76                                    | 118.42                   | 15                  | 60                  | 357.63 |
| S+3L+3E**   | 1                                 | 6.76                                    | 118.52                   | 30                  | 0                   | 144.44 |
|             | 2                                 | 6.76                                    | 117.37                   | 30                  | 0                   | 158.18 |
|             | 3                                 | 6.76                                    | 117.92                   | 30                  | 0                   | 152.78 |
|             | 4                                 | 6.76                                    | 117.16                   | 30                  | 20                  | 245.97 |
|             | 5                                 | 6.76                                    | 118.13                   | 30                  | 40                  | 313.26 |
|             | 6                                 | 6.76                                    | 117.18                   | 30                  | 80                  | 437.82 |
| S+3C*       | 1                                 | 6.13                                    | 117.68                   | 1                   | 0                   | 104.14 |
|             | 2                                 | 6.13                                    | 118.27                   | 1                   | 0                   | 115.26 |
|             | 3                                 | 6.13                                    | 117.68                   | 1                   | 20                  | 196.66 |
|             | 4                                 | 6.13                                    | 118.48                   | 1                   | 40                  | 284.74 |
|             | 5                                 | 6.13                                    | 118.69                   | 1                   | 80                  | 426.29 |
| S+3C*       | 1                                 | 6.13                                    | 117.29                   | 3                   | 0                   | 159.48 |
|             | 2                                 | 6.13                                    | 117.93                   | 3                   | 0                   | 156.41 |
|             | 3                                 | 6.13                                    | 118.16                   | 3                   | 0                   | 150.31 |
|             | 4                                 | 6.13                                    | 118.45                   | 3                   | 20                  | 225.00 |
|             | 5                                 | 6.13                                    | 117.48                   | 3                   | 40                  | 304.51 |

Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test (Continued)

| Type of Mix | Molding Moisture Content (%) | Dry Density (lb/ft <sup>3</sup> ) | Curing Time (days) | $\sqrt{3}$ (psi) | $\sqrt{1}$ (psi) |        |
|-------------|------------------------------|-----------------------------------|--------------------|------------------|------------------|--------|
|             | 6                            | 6.13                              | 117.62             | 3                | 80               | 470.28 |
| S+3C*       | 1                            | 6.13                              | 118.76             | 7                | 0                | 215.71 |
|             | 2                            | 6.13                              | 117.48             | 7                | 0                | 231.58 |
|             | 3                            | 6.13                              | 117.97             | 7                | 0                | 210.64 |
|             | 4                            | 6.13                              | 117.52             | 7                | 20               | 313.52 |
|             | 5                            | 6.13                              | 117.62             | 7                | 40               | 384.13 |
|             | 6                            | 6.13                              | 118.24             | 7                | 80               | 549.65 |
| S+3C*       | 1                            | 6.13                              | 117.54             | 15               | 0                | 301.52 |
|             | 2                            | 6.13                              | 118.21             | 15               | 0                | 309.97 |
|             | 3                            | 6.13                              | 117.56             | 15               | 20               | 426.94 |
|             | 4                            | 6.13                              | 117.45             | 15               | 40               | 518.90 |
|             | 5                            | 6.13                              | 117.88             | 15               | 60               | 597.88 |
| S+3C*       | 1                            | 6.13                              | 116.78             | 30               | 0                | 310.42 |
|             | 2                            | 6.13                              | 117.10             | 30               | 0                | 392.41 |
|             | 3                            | 6.13                              | 116.92             | 30               | 0                | 345.10 |
|             | 4                            | 6.13                              | 115.84             | 30               | 20               | 485.10 |
|             | 5                            | 6.13                              | 116.70             | 30               | 40               | 560.25 |
|             | 6                            | 6.13                              | 116.60             | 30               | 55               | 619.73 |
| S+3C+3E*    | 1                            | 6.12                              | 118.76             | 0                | 0                | 32.53  |
|             | 2                            | 6.12                              | 118.87             | 0                | 0                | 31.64  |
|             | 3                            | 6.12                              | 118.95             | 0                | 20               | 100.37 |
|             | 4                            | 6.12                              | 118.38             | 0                | 40               | 156.02 |
|             | 5                            | 6.12                              | 118.28             | 0                | 80               | 278.61 |

Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test. (Continued)

| Type of Mix |   | Molding<br>Moisture<br>Content(%) | Dry<br>Density<br>(lb/ft <sup>3</sup> ) | Curing<br>Time<br>(days) | $\sigma_3$<br>(psi) | $\sigma_1$<br>(psi) |
|-------------|---|-----------------------------------|---|--------------------------|---------------------|---------------------|
| S+3C+3E*    | 1 | 6.12                              | 118.49                                  | 1                        | 0                   | 88.60               |
|             | 2 | 6.12                              | 119.24                                  | 1                        | 0                   | 90.74               |
|             | 3 | 6.12                              | 118.19                                  | 1                        | 20                  | 158.16              |
|             | 4 | 6.12                              | 118.66                                  | 1                        | 40                  | 233.52              |
|             | 5 | 6.12                              | 118.93                                  | 1                        | 80                  | 374.95              |
| S+3C+3E*    | 1 | 6.12                              | 118.25                                  | 3                        | 0                   | 120.76              |
|             | 2 | 6.12                              | 118.48                                  | 3                        | 0                   | 131.25              |
|             | 3 | 6.12                              | 118.96                                  | 3                        | 0                   | 126.20              |
|             | 4 | 6.12                              | 119.45                                  | 3                        | 20                  | 209.10              |
|             | 5 | 6.12                              | 119.01                                  | 3                        | 40                  | 285.16              |
|             | 6 | 6.12                              | 118.37                                  | 3                        | 80                  | 424.67              |
| S+3C+3E*    | 1 | 6.12                              | 119.64                                  | 7                        | 0                   | 181.36              |
|             | 2 | 6.12                              | 118.19                                  | 7                        | 0                   | 149.28              |
|             | 3 | 6.12                              | 118.47                                  | 7                        | 0                   | 172.68              |
|             | 4 | 6.12                              | 119.14                                  | 7                        | 20                  | 255.10              |
|             | 5 | 6.12                              | 119.62                                  | 7                        | 40                  | 334.53              |
|             | 6 | 6.12                              | 119.43                                  | 7                        | 80                  | 471.09              |
| S+3C+3E*    | 1 | 6.12                              | 118.38                                  | 15                       | 0                   | 223.48              |
|             | 2 | 6.12                              | 119.26                                  | 15                       | 0                   | 219.10              |
|             | 3 | 6.12                              | 117.87                                  | 15                       | 20                  | 309.82              |
|             | 4 | 6.12                              | 118.42                                  | 15                       | 40                  | 387.51              |
|             | 5 | 6.12                              | 117.35                                  | 15                       | 70                  | 486.31              |

Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test (Continued)

| Type of Mix |    | Molding<br>Moisture<br>Content(%) | Dry<br>Density<br>(lb/ft <sup>3</sup> ) | Curing<br>Time<br>(days) | $\sigma_3$<br>(psi) | $\sigma_1$<br>(psi) |
|-------------|----|-----------------------------------|---|--------------------------|---------------------|---------------------|
| S+3C+3E*    | 1. | 6.12                              | 119.26                                  | 30                       | 0                   | 264.19              |
|             | 2  | 6.12                              | 118.55                                  | 30                       | 0                   | 254.73              |
|             | 3  | 6.12                              | 118.53                                  | 30                       | 20                  | 349.23              |
|             | 4  | 6.12                              | 118.72                                  | 30                       | 40                  | 425.00              |
|             | 5  | 6.12                              | 117.96                                  | 30                       | 70                  | 539.68              |
| S+3C+3E**   | 1  | 6.12                              | 119.19                                  | 1                        | 0                   | 130.63              |
|             | 2  | 6.12                              | 118.72                                  | 1                        | 0                   | 124.76              |
|             | 3  | 6.12                              | 118.95                                  | 1                        | 0                   | 120.30              |
|             | 4  | 6.12                              | 118.38                                  | 1                        | 20                  | 186.50              |
|             | 5  | 6.12                              | 118.76                                  | 1                        | 40                  | 265.85              |
|             | 6  | 6.12                              | 118.50                                  | 1                        | 80                  | 402.97              |
| S+3C+3E**   | 1  | 6.12                              | 118.52                                  | 3                        | 0                   | 211.75              |
|             | 2  | 6.12                              | 118.63                                  | 3                        | 0                   | 208.83              |
|             | 3  | 6.12                              | 118.31                                  | 3                        | 20                  | 307.61              |
|             | 4  | 6.12                              | 119.51                                  | 3                        | 40                  | 385.92              |
|             | 5  | 6.12                              | 118.72                                  | 3                        | 80                  | 532.30              |
| S+3C+3E**   | 1  | 6.12                              | 118.93                                  | 7                        | 0                   | 248.16              |
|             | 2  | 6.12                              | 118.84                                  | 7                        | 0                   | 229.06              |
|             | 3  | 6.12                              | 120.19                                  | 7                        | 20                  | 343.62              |
|             | 4  | 6.12                              | 118.76                                  | 7                        | 40                  | 402.92              |
|             | 5  | 6.12                              | 119.12                                  | 7                        | 80                  | 551.09              |
| S+3C+3E**   | 1  | 6.12                              | 117.63                                  | 15                       | 0                   | 252.09              |
|             | 2  | 6.12                              | 118.48                                  | 15                       | 0                   | 269.21              |
|             | 3  | 6.12                              | 118.85                                  | 15                       | 0                   | 257.16              |

Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test (Continued)

| Type of Mix |   | Molding Moisture Content (%) | Dry Density (lb/ft <sup>3</sup> ) | Curing Time (days) | $\sigma_3$ (psi) | $\sigma_1$ (psi) |
|-------------|---|------------------------------|-----------------------------------|--------------------|------------------|------------------|
| S+3C+3E**   | 4 | 6.12                         | 119.92                            | 15                 | 20               | 370.21           |
|             | 5 | 6.12                         | 118.31                            | 15                 | 40               | 428.50           |
|             | 6 | 6.12                         | 119.02                            | 15                 | 80               | 586.47           |
| S+3C+3E**   | 1 | 6.12                         | 118.69                            | 30                 | 0                | 256.79           |
|             | 2 | 6.12                         | 117.74                            | 30                 | 0                | 243.62           |
|             | 3 | 6.12                         | 118.37                            | 30                 | 20               | 364.17           |
|             | 4 | 6.12                         | 118.26                            | 30                 | 40               | 430.00           |
|             | 5 | 6.12                         | 118.95                            | 30                 | 80               | 507.63           |
| S+3C+4E*    | 1 | 6.90                         | 119.80                            | 1                  | 0                | 72.84            |
|             | 2 | 6.90                         | 120.45                            | 1                  | 0                | 79.91            |
|             | 3 | 6.90                         | 120.58                            | 1                  | 20               | 118.62           |
|             | 4 | 6.90                         | 119.88                            | 1                  | 20               | 137.53           |
| S+3C+4E*    | 5 | 6.90                         | 120.64                            | 1                  | 40               | 195.81           |
|             | 6 | 6.90                         | 120.35                            | 1                  | 80               | 323.42           |
|             | 1 | 6.90                         | 119.22                            | 3                  | 0                | 104.99           |
|             | 2 | 6.90                         | 119.98                            | 3                  | 0                | 99.76            |
|             | 3 | 6.90                         | 119.44                            | 3                  | 20               | 166.16           |
| S+3C+4E*    | 4 | 6.90                         | 120.28                            | 3                  | 40               | 237.08           |
|             | 5 | 6.90                         | 119.99                            | 3                  | 80               | 358.18           |
|             | 1 | 6.90                         | 119.88                            | 7                  | 0                | 146.73           |
|             | 2 | 6.90                         | 119.95                            | 7                  | 0                | 143.79           |
|             | 3 | 6.90                         | 120.65                            | 7                  | 0                | 130.48           |
| S+3C+4E*    | 4 | 6.90                         | 120.19                            | 7                  | 20               | 204.83           |
|             | 5 | 6.90                         | 119.45                            | 7                  | 40               | 273.99           |

Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test (Continued)

| Type of Mix |   | Molding<br>Moisture<br>Content(%) | Dry<br>Density<br>(lb/ft <sup>3</sup> ) | Curing<br>Time<br>(days) | $\sigma_3$<br>(psi) | $\sigma_1$<br>(psi) |
|-------------|---|-----------------------------------|---|--------------------------|---------------------|---------------------|
|             | 6 | 6.90                              | 120.45                                  | 7                        | 80                  | 402.51              |
| S+3C+4E*    | 1 | 6.90                              | 119.03                                  | 15                       | 0                   | 180.68              |
|             | 2 | 6.90                              | 121.02                                  | 15                       | 0                   | 186.74              |
|             | 3 | 6.90                              | 120.16                                  | 15                       | 20                  | 268.51              |
|             | 4 | 6.90                              | 120.38                                  | 15                       | 40                  | 331.40              |
|             | 5 | 6.90                              | 120.97                                  | 15                       | 40                  | 362.00              |
|             | 6 | 6.90                              | 121.02                                  | 15                       | 80                  | 463.86              |
| S+3C+4E*    | 1 | 6.90                              | 120.19                                  | 30                       | 0                   | 215.30              |
|             | 2 | 6.90                              | 119.91                                  | 30                       | 0                   | 209.82              |
|             | 3 | 6.90                              | 119.72                                  | 30                       | 20                  | 312.50              |
|             | 4 | 6.90                              | 120.35                                  | 30                       | 40                  | 370.02              |
|             | 5 | 6.90                              | 120.49                                  | 30                       | 80                  | 517.32              |
| B+4E*       | 1 | 7.20                              | 98.20                                   | 1                        | 20                  | 58.88               |
|             | 2 | 7.20                              | 99.05                                   | 1                        | 40                  | 128.24              |
|             | 3 | 7.20                              | 98.33                                   | 1                        | 80                  | 248.08              |
| B+4E*       | 1 | 7.20                              | 97.90                                   | 3                        | 20                  | 58.72               |
|             | 2 | 7.20                              | 98.06                                   | 3                        | 40                  | 123.70              |
|             | 3 | 7.20                              | 98.41                                   | 3                        | 80                  | 245.57              |
| B+4E*       | 1 | 7.20                              | 98.79                                   | 7                        | 20                  | 61.95               |
|             | 2 | 7.20                              | 98.20                                   | 7                        | 40                  | 124.63              |
|             | 3 | 7.20                              | 98.98                                   | 7                        | 80                  | 239.39              |



Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test (Continued)



| Type of Mix |   | Molding<br>Moisture<br>Content(%) | Dry<br>Density<br>(lb/ft <sup>3</sup> ) | Curing<br>Time<br>(days) | $\sigma_3$<br>(psi) | $\sigma_1$<br>(psi) |
|-------------|---|-----------------------------------|---|--------------------------|---------------------|---------------------|
| B+4E*       | 1 | 7.20                              | 98.98                                   | 15                       | 20                  | 62.12               |
|             | 2 | 7.20                              | 98.81                                   | 15                       | 40                  | 125.91              |
|             | 3 | 7.20                              | 98.98                                   | 15                       | 80                  | 232.71              |
| B+4E*       | 1 | 7.20                              | 99.32                                   | 30                       | 20                  | 61.01               |
|             | 2 | 7.20                              | 99.23                                   | 30                       | 40                  | 127.65              |
|             | 3 | 7.20                              | 99.45                                   | 30                       | 80                  | 232.71              |
| B+5E*       | 1 | 6.50                              | 101.91                                  | 1                        | 20                  | 57.50               |
|             | 2 | 6.50                              | 101.26                                  | 1                        | 40                  | 116.74              |
|             | 3 | 6.50                              | 100.95                                  | 1                        | 80                  | 239.43              |
|             | 4 | 6.50                              | 101.35                                  | 1                        | 80                  | 235.11              |
| B+5E*       | 1 | 6.50                              | 100.98                                  | 3                        | 20                  | 53.07               |
|             | 2 | 6.50                              | 101.28                                  | 3                        | 20                  | 61.09               |
|             | 3 | 6.50                              | 101.17                                  | 3                        | 40                  | 118.07              |
|             | 4 | 6.50                              | 101.36                                  | 3                        | 80                  | 227.12              |
| B+5E*       | 1 | 6.50                              | 101.00                                  | 7                        | 20                  | 63.24               |
|             | 2 | 6.50                              | 101.72                                  | 7                        | 40                  | 120.61              |
|             | 3 | 6.50                              | 101.19                                  | 7                        | 80                  | 239.30              |
| B+5E*       | 1 | 6.50                              | 100.79                                  | 15                       | 20                  | 59.53               |
|             | 2 | 6.50                              | 101.62                                  | 15                       | 40                  | 117.42              |
|             | 3 | 6.50                              | 100.87                                  | 15                       | 80                  | 247.58              |
|             | 4 | 6.50                              | 100.98                                  | 15                       | 80                  | 222.47              |

Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test (Continued)

| Type of Mix | Molding<br>Moisture<br>Content(%) | Dry<br>Density<br>(lb/ft <sup>3</sup> ) | Curing<br>Time<br>(days) | $\sigma_3$<br>(psi) | $\sigma_1$<br>(psi) |
|-------------|-----------------------------------|---|--------------------------|---------------------|---------------------|
| B+5E*       | 1                                 | 6.50                                    | 30                       | 20                  | 71.32               |
|             | 2                                 | 6.50                                    | 30                       | 40                  | 123.57              |
|             | 3                                 | 6.50                                    | 30                       | 60                  | 241.97              |
| B+3C+3E*    | 1                                 | 6.09                                    | 1                        | 20                  | 71.03               |
|             | 2                                 | 6.09                                    | 1                        | 40                  | 127.66              |
|             | 3                                 | 6.09                                    | 1                        | 40                  | 131.62              |
|             | 4                                 | 6.09                                    | 1                        | 80                  | 255.37              |
| B+3C+3E*    | 1                                 | 6.09                                    | 3                        | 20                  | 88.02               |
|             | 2                                 | 6.09                                    | 3                        | 40                  | 152.50              |
|             | 3                                 | 6.09                                    | 3                        | 40                  | 160.11              |
|             | 4                                 | 6.09                                    | 3                        | 80                  | 279.57              |
| B+3C+3E*    | 1                                 | 6.09                                    | 7                        | 20                  | 93.10               |
|             | 2                                 | 6.09                                    | 7                        | 40                  | 156.40              |
|             | 3                                 | 6.09                                    | 7                        | 80                  | 287.39              |
| B+3C+3E*    | 1                                 | 6.09                                    | 15                       | 20                  | 85.74               |
|             | 2                                 | 6.09                                    | 15                       | 20                  | 103.45              |
|             | 3                                 | 6.09                                    | 15                       | 40                  | 166.52              |
|             | 4                                 | 6.09                                    | 15                       | 80                  | 301.02              |
| B+3C+3E*    | 1                                 | 6.09                                    | 30                       | 20                  | 115.23              |
|             | 2                                 | 6.09                                    | 30                       | 40                  | 195.43              |
|             | 3                                 | 6.09                                    | 30                       | 80                  | 314.16              |

Summary of Detailed Test Results for Unconfined and  
Triaxial Compression Test (Continued)

| Type of Mix | Molding<br>Moisture<br>Content(%) | Dry<br>Density<br>(lb/ft <sup>3</sup> ) | Curing<br>Time<br>(days) | $\sqrt{3}$<br>(psi) | $\sqrt{1}$<br>(psi) |        |
|-------------|-----------------------------------|---|--------------------------|---------------------|---------------------|--------|
| B+3C+4E*    | 1                                 | 6.29                                    | 101.79                   | 1                   | 20                  | 64.79  |
|             | 2                                 | 6.29                                    | 101.02                   | 1                   | 40                  | 127.29 |
|             | 3                                 | 6.29                                    | 100.63                   | 1                   | 40                  | 109.44 |
|             | 4                                 | 6.29                                    | 101.29                   | 1                   | 80                  | 241.03 |
| B+3C+4E*    | 1                                 | 6.29                                    | 100.98                   | 3                   | 20                  | 77.12  |
|             | 2                                 | 6.29                                    | 101.19                   | 3                   | 40                  | 137.54 |
|             | 3                                 | 6.29                                    | 101.29                   | 3                   | 80                  | 264.30 |
| B+3C+4E*    | 1                                 | 6.29                                    | 101.39                   | 7                   | 20                  | 94.01  |
|             | 2                                 | 6.29                                    | 101.46                   | 7                   | 40                  | 147.06 |
|             | 3                                 | 6.29                                    | 100.69                   | 7                   | 80                  | 265.82 |
|             | 4                                 | 6.29                                    | 100.96                   | 7                   | 80                  | 240.27 |
| B+3C+4E*    | 1                                 | 6.29                                    | 100.77                   | 15                  | 20                  | 103.00 |
|             | 2                                 | 6.29                                    | 101.15                   | 15                  | 40                  | 154.64 |
|             | 3                                 | 6.29                                    | 100.79                   | 15                  | 80                  | 287.50 |
| B+3C+4E*    | 1                                 | 6.29                                    | 101.49                   | 30                  | 20                  | 112.50 |
|             | 2                                 | 6.29                                    | 101.71                   | 30                  | 40                  | 170.14 |
|             | 3                                 | 6.29                                    | 100.94                   | 30                  | 80                  | 294.19 |

\* Cured in Sealed Plastic Bags

\*\* Air-Dried Curing

APPENDIX C

SUMMARY OF FINAL RESULTS

## Summary of Final Results

| Type of Mix | Curing Time (days) | Moisture Content (%) |            |      | Unconfined Comp. Strength (psi) | Cu (psi) | $\phi_u$ (deg) |
|-------------|--------------------|----------------------|------------|------|---------------------------------|----------|----------------|
|             |                    | at Time of Molding   | After Test | Loss |                                 |          |                |
| S           | -                  | 8.10                 |            | -    | -                               | 0        | 32.0           |
| S+3E*       | 1                  | 6.65                 | 6.06       | 0.59 | 7.38                            | 3.0      | 31.0           |
|             | 3                  | 6.65                 | 5.76       | 0.89 | 11.45                           | 5.0      | 31.5           |
|             | 7                  | 6.65                 | 5.46       | 1.19 | 16.53                           | 8.0      | 31.3           |
|             | 15                 | 6.65                 | 5.12       | 1.53 | 23.71                           | 11.0     | 30.2           |
|             | 30                 | 6.65                 | 4.22       | 2.43 | 27.54                           | 14.0     | 31.2           |
| S+4E*       | 1                  | 6.81                 | 6.36       | 0.45 | 7.74                            | 3.5      | 30.6           |
|             | 3                  | 6.81                 | 6.12       | 0.69 | 12.68                           | 5.5      | 31.0           |
|             | 7                  | 6.81                 | 6.01       | 0.80 | 17.92                           | 8.0      | 31.0           |
|             | 15                 | 6.81                 | 5.32       | 1.49 | 26.21                           | 14.0     | 30.5           |
|             | 30                 | 6.81                 | 4.98       | 1.83 | 28.20                           | 16.0     | 31.0           |
| S+5E*       | 1                  | 6.12                 | 5.66       | 0.46 | 9.20                            | 5        | 28.7           |
|             | 3                  | 6.12                 | 5.51       | 0.61 | 15.12                           | 7.5      | 29.8           |
|             | 7                  | 6.12                 | 5.22       | 0.90 | 18.84                           | 12.5     | 29.0           |
|             | 15                 | 6.12                 | 4.80       | 1.32 | 28.53                           | 15       | 29.2           |
|             | 30                 | 6.12                 | 4.57       | 1.55 | 31.11                           | 17.5     | 28.8           |
| S+5E**      | 1                  | 6.08                 | 3.49       | 2.59 | 56.48                           | 18.0     | 28.5           |
|             | 3                  | 6.08                 | 1.52       | 4.56 | 66.87                           | 25.0     | 29.0           |
|             | 7                  | 6.08                 | 0.61       | 5.47 | 96.99                           | 34.0     | 29.2           |
|             | 15                 | 6.08                 | 0.29       | 5.79 | 104.56                          | 36.0     | 28.7           |
|             | 30                 | 6.08                 | 0.25       | 5.83 | 103.17                          | 35.0     | 28.7           |
| S+3L*       | 1                  | 6.38                 | 6.22       | 0.16 | 14.55                           | 7.0      | 33.2           |
|             | 3                  | 6.38                 | 5.99       | 0.39 | 22.64                           | 7.5      | 33.1           |
|             | 7                  | 6.38                 | 5.89       | 0.49 | 31.8                            | 11.0     | 33.3           |

## Summary of Final Results (Continued)

| Type of Mix | Curing Time (days) | Moisture Content (%) |            |      | Unconfined Comp. Strength (psi) | Cu (psi) | Cu (deg) |
|-------------|--------------------|----------------------|------------|------|---------------------------------|----------|----------|
|             |                    | Molding              | After Test | Loss |                                 |          |          |
| S+3L+3E*    | 15                 | 6.38                 | 5.42       | 0.96 | 40.04                           | 15.0     | 33.2     |
|             | 30                 | 6.38                 | 4.85       | 1.53 | 51.68                           | 17.5     | 34.0     |
|             | 1                  | 6.32                 | 6.05       | 0.27 | 21.24                           | 5.0      | 31.5     |
|             | 3                  | 6.32                 | 5.81       | 0.51 | 36.04                           | 10.0     | 31.6     |
|             | 7                  | 6.32                 | 5.70       | 0.62 | 50.98                           | 15.0     | 32.0     |
|             | 15                 | 6.32                 | 4.82       | 1.50 | 72.23                           | 17.5     | 31.8     |
|             | 30                 | 6.32                 | 4.30       | 2.02 | 95.38                           | 24.0     | 32.5     |
| S+3L+3E**   | 1                  | 6.76                 | 4.15       | 2.61 | 54.87                           | 14.0     | 31.5     |
|             | 3                  | 6.76                 | 1.93       | 4.83 | 112.53                          | 35.0     | 32.0     |
|             | 7                  | 6.76                 | 1.32       | 5.44 | 151.46                          | 45.0     | 31.6     |
|             | 15                 | 6.76                 | 1.07       | 5.69 | 146.32                          | 48.0     | 32.0     |
|             | 30                 | 6.76                 | 0.62       | 6.14 | 151.80                          | 50.0     | 32.2     |
| S+3C*       | 1                  | 6.13                 | 5.79       | 0.34 | 109.70                          | 32.0     | 36.5     |
|             | 3                  | 6.13                 | 5.65       | 0.48 | 155.40                          | 40.0     | 36.8     |
|             | 7                  | 6.13                 | 5.37       | 0.76 | 219.31                          | 58.0     | 36.7     |
|             | 15                 | 6.13                 | 4.81       | 1.32 | 305.74                          | 90.0     | 37.5     |
|             | 30                 | 6.13                 | 4.18       | 1.95 | 349.31                          | 100.0    | 36.9     |
| S+3C+3E*    | 1                  | 6.12                 | 5.70       | 0.42 | 89.67                           | 23.0     | 34.2     |
|             | 3                  | 6.12                 | 5.49       | 0.63 | 126.07                          | 35.0     | 35.0     |
|             | 7                  | 6.12                 | 5.34       | 0.78 | 177.02                          | 47.0     | 35.0     |
|             | 15                 | 6.12                 | 5.04       | 1.08 | 221.29                          | 65.0     | 34.0     |
|             | 30                 | 6.12                 | 4.81       | 1.31 | 259.40                          | 77.5     | 34.0     |

## Summary of Final Results (Continued)

| Type of Mix | Curing Time (days) | Moisture Content (%) |            |      | Unconfined Comp. Strength (psi) | Cu (psi) | $\phi_u$ (deg) |
|-------------|--------------------|----------------------|------------|------|---------------------------------|----------|----------------|
|             |                    | Molding              | After Test | Loss |                                 |          |                |
| S+3C+3E**   | 1                  | 6.12                 | 3.73       | 2.39 | 125.23                          | 35.0     | 33.2           |
|             | 3                  | 6.12                 | 2.40       | 3.72 | 210.29                          | 65.0     | 35.0           |
|             | 7                  | 6.12                 | 1.46       | 4.66 | 238.61                          | 74.0     | 34.0           |
|             | 15                 | 6.12                 | 0.61       | 5.51 | 254.62                          | 77.0     | 34.8           |
|             | 30                 | 6.12                 | 0.53       | 5.59 | 250.20                          | 75.0     | 34.2           |
| S+3C+4E*    | 1                  | 6.90                 | 6.86       | 0.04 | 76.38                           | 17.5     | 31.8           |
|             | 3                  | 6.90                 | 6.31       | 0.59 | 102.36                          | 27.5     | 32.0           |
|             | 7                  | 6.90                 | 6.20       | 0.70 | 145.26                          | 40.0     | 31.8           |
|             | 15                 | 6.90                 | 6.10       | 0.80 | 183.71                          | 57.5     | 32.0           |
|             | 30                 | 6.90                 | 5.75       | 1.15 | 212.56                          | 67.5     | 32.4           |
| B+4E*       | 1                  | 7.20                 | 6.58       | 0.62 | -                               | 0        | 30.3           |
|             | 3                  | 7.20                 | 5.80       | 1.40 | -                               | 0        | 30.5           |
|             | 7                  | 7.20                 | 5.30       | 1.90 | -                               | 0        | 29.5           |
|             | 15                 | 7.20                 | 5.01       | 2.19 | -                               | 1.0      | 28.6           |
|             | 30                 | 7.20                 | 4.26       | 2.94 | -                               | 0        | 29.0           |
| B+5E*       | 1                  | 6.50                 | 6.35       | 0.15 | -                               | 0        | 29.3           |
|             | 3                  | 6.50                 | 6.08       | 0.42 | -                               | 2.5      | 28.0           |
|             | 7                  | 6.50                 | 5.44       | 1.06 | -                               | 2.5      | 29.0           |
|             | 15                 | 6.50                 | 4.72       | 1.78 | -                               | 2.0      | 28.2           |
|             | 30                 | 6.50                 | 4.32       | 2.18 | -                               | 3.0      | 28.6           |
| B+3C+3E*    | 1                  | 6.09                 | 5.40       | 0.69 | -                               | 3.0      | 30.5           |
|             | 3                  | 6.09                 | 4.56       | 1.53 | -                               | 6.0      | 31.6           |
|             | 7                  | 6.09                 | 4.28       | 1.81 | -                               | 8.0      | 31.5           |
|             | 15                 | 6.09                 | 3.93       | 2.16 | -                               | 11.5     | 31.8           |
|             | 30                 | 6.09                 | 3.60       | 2.49 | -                               | 15.0     | 32.0           |

## Summary of Final Results (Continued)

| Type of Mix | Curing Time (days) | Moisture Content (%) |            |      | Unconfined Comp. Strength (psi) | Cu (psi) | $\phi$ (deg) |
|-------------|--------------------|----------------------|------------|------|---------------------------------|----------|--------------|
|             |                    | Molding              | After Test | Loss |                                 |          |              |
| B+3C+4E*    | 1                  | 6.29                 | 5.50       | 0.79 | -                               | 2.0      | 30.0         |
|             | 3                  | 6.29                 | 4.70       | 1.59 | -                               | 4.0      | 31.0         |
|             | 7                  | 6.29                 | 4.42       | 1.87 | -                               | 7.5      | 30.0         |
|             | 15                 | 6.29                 | 3.94       | 2.35 | -                               | 10.0     | 31.5         |
|             | 30                 | 6.29                 | 3.67       | 2.62 | -                               | 12.5     | 31.2         |

\* Cured in Sealed Plastic Bags

\*\* Air-Dried Curing

## Summary of Final Results (Continued)

| Type of Mix | Curing Time (days) | Moisture Content (%) |            |      | Unconfined Comp. Strength (psi) | Cu (psi) | $\phi$ (deg) |
|-------------|--------------------|----------------------|------------|------|---------------------------------|----------|--------------|
|             |                    | Molding              | After Test | Loss |                                 |          |              |
| B+3C+4E*    | 1                  | 6.29                 | 5.50       | 0.79 | -                               | 2.0      | 30.0         |
|             | 3                  | 6.29                 | 4.70       | 1.59 | -                               | 4.0      | 31.0         |
|             | 7                  | 6.29                 | 4.42       | 1.87 | -                               | 7.5      | 30.0         |
|             | 15                 | 6.29                 | 3.94       | 2.35 | -                               | 10.0     | 31.5         |
|             | 30                 | 6.29                 | 3.67       | 2.62 | -                               | 12.5     | 31.2         |

\* Cured in Sealed Plastic Bags

\*\* Air-Dried Curing

## Summary of Final Results (Continued)



## VITA

Mr. Aroon Deopanich obtained a Bachelor Degree in Civil Engineering from Chulalongkorn University in 1971. After graduation he joined the Thai Highway Department in the Division of National Highway Construction.