| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 71.2501 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 71.5006 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 71.7500 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 72.0004 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 72.2500 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 72.5003 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 72.7503 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 73.0000 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 73.2502 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 73.5003 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 73.7504 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 74.0005 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 74.2504 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 74.5005 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 74.7503 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 75.0002 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 75.2502 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 75.5003 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 75.7505 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 76.0002 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 76.2504 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 76.5002 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 76.7500 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 77.0001 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 77.2504 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 77.5001 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 77.7502 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 78.0001 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 78.2504 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 78.5004 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 78.7502 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 79.0005 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 79.2500 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 79.5002 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 79.7503 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 80.0004 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 80.2506 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 80.5001 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 80.7506 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 81.0004 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 81.2503 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 81.5005 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 81.7502 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 82.0003 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 82.2501 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 82.5002 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 82.7506 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 83.0006 | 13.05 |

| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 83.2506 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 83.5005 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 83.7503 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 84.0005 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 84.2505 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 84.5004 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 84.7504 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 85.0006 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 85.2505 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 85.5003 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 85.7502 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 86.0004 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 86.2503 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 86.5003 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 86.7507 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 87.0004 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 87.2504 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 87.5006 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 87.7507 | 13.05 |
| Recovery | 12 Days | Wetland Preserve Tract | 88.0008 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 88.2511 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 88.5009 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 88.7504 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 89.0008 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 89.2501 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 89.5002 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 89.7506 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 90.0004 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 90.2512 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 90.5003 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 90.7501 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 91.0007 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 91.2511 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 91.5005 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 91.7504 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 92.0005 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 92.2503 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 92.5002 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 92.7509 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 93.0007 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 93.2508 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 93.5001 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 93.7504 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 94.0010 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 94.2501 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 94.5001 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 94.7503 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 95.0004 | 13.04 |

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| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 95.2507 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 95.5002 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 95.7505 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 96.0003 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 96.2503 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 96.5007 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 96.7503 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 97.0003 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 97.2509 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 97.5000 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 97.7504 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 98.0010 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 98.2507 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 98.5003 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 98.7501 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 99.0003 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 99.2508 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 99.5004 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 99.7504 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 100.0011 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 100.2505 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 100.5004 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 100.7506 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 101.0008 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 101.2503 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 101.5001 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 101.7501 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 102.0006 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 102.2505 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 102.5007 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 102.7505 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 103.0010 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 103.2506 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 103.5008 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 103.7506 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 104.0005 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 104.2507 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 104.5009 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 104.7500 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 105.0005 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 105.2506 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 105.5010 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 105.7509 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 106.0003 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 106.2502 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 106.5006 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 106.7508 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 107.0007 | 13.04 |

| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 107.2504 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 107.5009 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 107.7509 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 108.0000 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 108.2504 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 108.5010 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 108.7501 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 109.0003 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 109.2510 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 109.5012 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 109.7504 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 110.0007 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 110.2502 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 110.5011 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 110.7502 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 111.0010 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 111.2504 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 111.5005 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 111.7502 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 112.0002 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 112.2501 | 13.04 |
| Recovery | 12 Days | Wetland Preserve Tract | 112.5011 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 112.7501 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 113.0004 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 113.2504 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 113.5008 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 113.7504 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 114.0000 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 114.2500 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 114.5001 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 114.7501 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 115.0005 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 115.2504 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 115.5010 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 115.7504 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 116.0008 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 116.2501 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 116.5011 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 116.7505 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 117.0006 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 117.2501 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 117.5012 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 117.7501 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 118.0012 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 118.2502 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 118.5001 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 118.7503 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 119.0006 | 13.03 |

| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 119.2509 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 119.5006 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 119.7508 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 120.0001 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 120.2513 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 120.5004 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 120.7504 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 121.0006 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 121.2505 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 121.5005 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 121.7517 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 122.0003 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 122.2501 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 122.5004 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 122.7513 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 123.0017 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 123.2503 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 123.5008 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 123.7505 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 124.0007 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 124.2516 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 124.5011 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 124.7502 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 125.0004 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 125.2506 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 125.5006 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 125.7504 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 126.0008 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 126.2511 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 126.5006 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 126.7507 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 127.0007 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 127.2501 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 127.5008 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 127.7504 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 128.0010 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 128.2507 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 128.5007 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 128.7509 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 129.0006 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 129.2511 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 129.5015 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 129.7502 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 130.0002 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 130.2500 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 130.5023 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 130.7513 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 131.0018 | 13.03 |

| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 131.2518 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 131.5024 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 131.7511 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 132.0008 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 132.2510 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 132.5009 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 132.7505 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 133.0010 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 133.2518 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 133.5019 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 133.7518 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 134.0027 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 134.2510 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 134.5007 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 134.7513 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 135.0004 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 135.2510 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 135.5001 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 135.7515 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 136.0012 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 136.2510 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 136.5010 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 136.7501 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 137.0001 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 137.2527 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 137.5015 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 137.7512 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 138.0010 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 138.2508 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 138.5006 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 138.7525 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 139.0002 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 139.2511 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 139.5001 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 139.7515 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 140.0018 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 140.2523 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 140.5000 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 140.7504 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 141.0012 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 141.2508 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 141.5005 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 141.7503 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 142.0012 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 142.2504 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 142.5017 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 142.7524 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 143.0025 | 13.03 |

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| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 143.2523 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 143.5001 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 143.7507 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 144.0010 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 144.2513 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 144.5020 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 144.7525 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 145.0016 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 145.2527 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 145.5012 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 145.7508 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 146.0039 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 146.2527 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 146.5027 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 146.7509 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 147.0005 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 147.2531 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 147.5031 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 147.7517 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 148.0008 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 148.2533 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 148.5026 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 148.7538 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 149.0018 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 149.2535 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 149.5020 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 149.7518 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 150.0000 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 150.2538 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 150.5038 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 150.7526 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 151.0013 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 151.2514 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 151.5014 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 151.7532 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 152.0026 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 152.2529 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 152.5005 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 152.7524 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 153.0013 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 153.2500 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 153.5033 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 153.7542 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 154.0036 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 154.2516 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 154.5011 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 154.7508 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 155.0001 | 13.03 |

| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 155.2510 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 155.5002 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 155.7513 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 156.0004 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 156.2507 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 156.5001 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 156.7509 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 157.0007 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 157.2509 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 157.5007 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 157.7531 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 158.0026 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 158.2516 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 158.5021 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 158.7506 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 159.0010 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 159.2535 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 159.5020 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 159.7524 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 160.0033 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 160.2533 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 160.5025 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 160.7528 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 161.0022 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 161.2511 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 161.5054 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 161.7526 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 162.0048 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 162.2535 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 162.5008 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 162.7520 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 163.0018 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 163.2513 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 163.5021 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 163.7512 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 164.0020 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 164.2501 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 164.5024 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 164.7529 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 165.0038 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 165.2539 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 165.5014 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 165.7515 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 166.0023 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 166.2515 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 166.5004 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 166.7513 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 167.0011 | 13.03 |

| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 167.2515 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 167.5028 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 167.7503 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 168.0006 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 168.2511 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 168.5013 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 168.7506 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 169.0016 | 13.03 |
| Recovery | 12 Days | Wetland Preserve Tract | 169.2506 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 169.5005 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 169.7522 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 170.0008 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 170.2522 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 170.5004 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 170.7514 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 171.0029 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 171.2509 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 171.5008 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 171.7520 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 172.0021 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 172.2518 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 172.5013 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 172.7502 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 173.0001 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 173.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 173.5006 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 173.7523 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 174.0012 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 174.2505 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 174.5012 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 174.7510 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 175.0002 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 175.2516 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 175.5006 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 175.7517 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 176.0006 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 176.2510 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 176.5024 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 176.7505 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 177.0008 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 177.2523 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 177.5022 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 177.7515 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 178.0008 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 178.2518 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 178.5029 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 178.7513 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 179.0009 | 13.02 |

← Full recovery to initial stage approximately 7 days after end of design storm event.

| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 179.2512 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 179.5007 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 179.7518 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 180.0011 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 180.2504 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 180.5023 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 180.7506 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 181.0024 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 181.2508 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 181.5016 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 181.7505 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 182.0078 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 182.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 182.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 182.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 183.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 183.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 183.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 183.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 184.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 184.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 184.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 184.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 185.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 185.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 185.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 185.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 186.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 186.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 186.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 186.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 187.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 187.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 187.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 187.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 188.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 188.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 188.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 188.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 189.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 189.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 189.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 189.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 190.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 190.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 190.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 190.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 191.0077 | 13.02 |

| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 191.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 191.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 191.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 192.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 192.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 192.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 192.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 193.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 193.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 193.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 193.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 194.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 194.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 194.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 194.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 195.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 195.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 195.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 195.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 196.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 196.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 196.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 196.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 197.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 197.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 197.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 197.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 198.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 198.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 198.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 198.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 199.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 199.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 199.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 199.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 200.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 200.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 200.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 200.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 201.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 201.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 201.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 201.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 202.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 202.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 202.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 202.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 203.0077 | 13.02 |

| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 203.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 203.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 203.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 204.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 204.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 204.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 204.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 205.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 205.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 205.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 205.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 206.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 206.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 206.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 206.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 207.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 207.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 207.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 207.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 208.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 208.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 208.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 208.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 209.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 209.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 209.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 209.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 210.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 210.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 210.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 210.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 211.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 211.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 211.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 211.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 212.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 212.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 212.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 212.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 213.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 213.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 213.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 213.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 214.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 214.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 214.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 214.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 215.0077 | 13.02 |

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| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 215.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 215.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 215.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 216.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 216.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 216.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 216.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 217.0027 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 217.2543 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 217.5010 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 217.7518 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 218.0027 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 218.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 218.5060 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 218.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 219.0043 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 219.2568 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 219.5043 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 219.7518 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 220.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 220.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 220.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 220.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 221.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 221.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 221.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 221.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 222.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 222.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 222.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 222.7560 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 223.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 223.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 223.5027 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 223.7577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 224.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 224.2527 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 224.5010 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 224.7560 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 225.0077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 225.2577 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 225.5077 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 225.7543 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 226.0060 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 226.2510 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 226.5046 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 226.7524 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 227.0003 | 13.02 |

| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 227.2557 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 227.5046 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 227.7505 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 228.0041 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 228.2532 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 228.5046 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 228.7551 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 229.0026 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 229.2534 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 229.5017 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 229.7519 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 230.0038 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 230.2506 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 230.5020 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 230.7534 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 231.0012 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 231.2565 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 231.5026 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 231.7514 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 232.0022 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 232.2506 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 232.5027 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 232.7541 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 233.0044 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 233.2526 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 233.5046 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 233.7522 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 234.0032 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 234.2537 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 234.5038 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 234.7528 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 235.0004 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 235.2542 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 235.5022 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 235.7502 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 236.0041 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 236.2536 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 236.5035 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 236.7523 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 237.0017 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 237.2549 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 237.5058 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 237.7513 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 238.0017 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 238.2525 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 238.5004 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 238.7520 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 239.0031 | 13.02 |

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| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 239.2552 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 239.5060 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 239.7557 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 240.0005 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 240.2513 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 240.5002 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 240.7539 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 241.0001 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 241.2509 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 241.5002 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 241.7517 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 242.0006 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 242.2550 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 242.5023 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 242.7544 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 243.0017 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 243.2506 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 243.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 243.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 244.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 244.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 244.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 244.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 245.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 245.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 245.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 245.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 246.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 246.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 246.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 246.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 247.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 247.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 247.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 247.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 248.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 248.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 248.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 248.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 249.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 249.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 249.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 249.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 250.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 250.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 250.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 250.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 251.0003 | 13.02 |

| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 251.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 251.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 251.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 252.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 252.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 252.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 252.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 253.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 253.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 253.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 253.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 254.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 254.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 254.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 254.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 255.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 255.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 255.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 255.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 256.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 256.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 256.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 256.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 257.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 257.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 257.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 257.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 258.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 258.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 258.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 258.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 259.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 259.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 259.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 259.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 260.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 260.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 260.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 260.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 261.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 261.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 261.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 261.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 262.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 262.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 262.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 262.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 263.0003 | 13.02 |

| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 263.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 263.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 263.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 264.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 264.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 264.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 264.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 265.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 265.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 265.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 265.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 266.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 266.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 266.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 266.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 267.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 267.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 267.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 267.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 268.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 268.2561 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 268.5053 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 268.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 269.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 269.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 269.5036 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 269.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 270.0036 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 270.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 270.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 270.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 271.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 271.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 271.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 271.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 272.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 272.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 272.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 272.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 273.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 273.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 273.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 273.7511 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 274.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 274.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 274.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 274.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 275.0003 | 13.02 |

| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 275.2520 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 275.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 275.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 276.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 276.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 276.5053 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 276.7561 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 277.0020 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 277.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 277.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 277.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 278.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 278.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 278.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 278.7536 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 279.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 279.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 279.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 279.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 280.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 280.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 280.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 280.7545 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 281.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 281.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 281.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 281.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 282.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 282.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 282.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 282.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 283.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 283.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 283.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 283.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 284.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 284.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 284.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 284.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 285.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 285.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 285.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 285.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 286.0003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 286.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 286.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 286.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 287.0003 | 13.02 |

| Scenario | Sim | Node Name | Relative Time [hrs] | Stage [ft] |
|---|---|---|---|---|
| Recovery | 12 Days | Wetland Preserve Tract | 287.2503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 287.5003 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 287.7503 | 13.02 |
| Recovery | 12 Days | Wetland Preserve Tract | 288.0003 | 13.02 |

## APPENDIX F

**Geotechnical Report Information**

# GEOTECHNICAL ENGINEERING EVALUATION
# MARINER VILLAGE SQUARE
# MARTIN COUNTY, FLORIDA

AACE FILE NO. 15-185

AACE

ANDERSEN ANDRE CONSULTING ENGINEERS, INC.

573 SW Biltmore Street
Port St. Lucie, Florida 34983
Ph: 772-807-9191 Fx: 772-807-9192
www.aaceinc.com

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# GEOTECHNICAL ENGINEERING EVALUATION
# MARINER VILLAGE SQUARE
# MARTIN COUNTY, FLORIDA

AACE FILE NO. 15-185

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ANDERSEN ANDRE CONSULTING ENGINEERS, INC.
Geotechnical Engineering
Construction Materials Testing
Environmental Consulting

AACE File No. 15-185
November 19, 2015

Bowman Consulting
301 SE Ocean Boulevard, Suite 301
Stuart, FL 34994

Attention: Mr. Jerry Compton
Vice President

**GEOTECHNICAL ENGINEERING EVALUATION**
**MARINER VILLAGE SQUARE**
**MARTIN COUNTY, FLORIDA**

## 1.0 INTRODUCTION

In accordance with your request and authorization, Andersen Andre Consulting Engineers, Inc. (hereinafter referred to as AACE) has completed a subsurface exploration and geotechnical engineering analyses for the above referenced project. The purpose of performing this exploration was to explore shallow soil types and groundwater levels as they relate to the proposed mixed-use residential and commercial construction, and restrictions which these soil and groundwater conditions may place on the proposed site development. Our work included limited land clearing, Standard Penetration Test (SPT) borings, auger borings, soil hydraulic conductivity testing, laboratory testing, and engineering analysis. This report documents our explorations and tests, presents our findings, and summarizes our conclusions and recommendations.

## 2.0 EXECUTIVE SUMMARY

The following summary is intended to provide a brief overview of our findings and recommendations; however, the report should be read in its entirety by the project design team members.

- The proposed building sites, at the locations explored, were found to be underlain by soils which are generally satisfactory to support the proposed one- to three-story construction on conventional spread foundations. A maximum design foundation bearing pressure of 2,500 pounds per square foot (psf) is recommended for the proposed structures.

- Typical pavement sections consisting of an asphaltic or rigid concrete wearing surface atop a calcareous base, followed by a stabilized subgrade on compacted natural soils are considered appropriate for the project, provided adequate separation between the pavement section and the seasonal high water table elevation can be maintained.

- Site preparation procedures will include clearing, stripping and grubbing of all surface vegetation and organic topsoil, reclamation of ponds and ditches, followed by proofrolling of building and pavement areas.

- The groundwater table was encountered at depths of about 4.5 to 6.5 feet below the existing grades, with this range likely attributed to similar, localized minor variations in site topography.



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## 3.0 SITE INFORMATION AND PROJECT UNDERSTANDING

### *3.1 Site Location and Description*

The subject 18.4-acre (±) site is located on the west side of South Federal Highway (US-1), approximately 1.5 miles south of Cove Road, in Stuart, Martin County, Florida (within Section 31, Township 38 South, Range 42 East). The location of the subject site is graphically depicted on the Site Vicinity Map (2014 aerial photograph) as well as on a reproduction of the 1983 USGS Quadrangle Map of "Gomez, Florida", both presented as our Figure No. 1. The USGS Quadrangle Map depicts the subject property as being relatively level with an average surface elevation of about 15 feet relative to the National Geodetic Vertical Datum of 1929.

The site is currently idle and undeveloped. Minor portions of the site are currently accessible by vehicle, while the remainder of the site is covered with relatively dense vegetation. Remnants of a few overgrown, former trails/unpaved roadways are visible within the vegetation. Further, a few shallow ditches were observed during our site visits.

Based on our review of the provided "Preliminary Environmental Assessment" report (prepared by Saskowsky & Associates and dated 10/12/15), the majority of the site is characterized as "disturbed uplands" while the southeast portion of the site described as "pine flatwoods". Further, an approximately 2-acre wetland is located on the south-central portion of the site. Finally, an approximately 0.7-acre pond is located on the southwest portion of the site and an approximately 0.2-acre pond is located on the north-central portion of the site.

### *3.2 Review of USDA Soil Survey*

According to the USDA NRCS Web Soil Survey, two (2) shallow soil types are located within the subject site:

- Waveland and Immokalee fine sands (Map Unit Symbol 4)
- Placid and Basinger fine sands, depressional (Map Unit Symbol 13)

These soil types are both noted to be composed of sandy marine deposits originating from flatwoods and depressions on marine terraces, and consist of fine sands and loamy fine sands to depths in excess of 80 inches.

The approximate location of the subject site is shown superimposed on an aerial photograph (obtained from the USDA Web Soil Survey) on Figure No. 1, along with summary descriptions of the above referenced soil types (obtained from the USDA Soil Survey Manuscript of Martin County). The USDA Web Soil Survey summary report is included in Appendix I.

### *3.3 Project Understanding*

Based on our review of the forwarded Mariner Village Conceptual Site Plan 'B' (prepared by Lucido & Associates, undated), we understand that the subject site is proposed to be developed with the following features:

- A single-story restaurant (6,000 sqft)
- Two single-story retail buildings (10,000 sqft each)
- A two- to three-story nursing home (130 beds, approximate footprint 65,000 sqft)
- A two- to three-story assisted living facility (130 beds, approximate footprint 65,000 sqft)

Additionally, open space and stormwater treatment areas account for about 3.5 acres of the remainder of the site.

We have not been provided with any specific structural information for the proposed structure(s), however, we expect that they will be supported by load-bearing masonry walls or possibly concrete tilt-up panels and isolated columns. For the single-story construction, we expect maximum wall loads of 1-2 kips per lineal foot and maximum column loads of 150 kips. However, for the two - to three-story nursing home and assisted living facility somewhat heavier loads are expected, on the order of 8-10 kips per lineal foot (walls) and up to 500 kips (columns).

Additional site improvements include internal driveways, parking areas, and retention ponds. We expect that 1-2 feet of fill will be placed across the site to raise the current grades.

Details of the provided Site Plan are presented as our Field Work Location Plan, Figure No. 2.

## 4.0 FIELD EXPLORATION PROGRAM

To explore subsurface conditions at the site, the exploration program summarized in Table 1 below was completed:

**Table 1 - Field Exploration Program**

| Field Work Type | Standard | # of Borings | Depth Below Grade [feet] | Location |
|---|---|---|---|---|
| Standard Penetration Test (SPT) | ASTM D1586 | 11 | 15-25 | Refer to Figure No. 2 |
| Auger | ASTM D1452 | 20 | 5 | Refer to Figure No. 2 |
| Soil Hydraulic Conductivity Test | SFWMD ERPIM(1) | 4 | 6 | Refer to Figure No. 2 |

Note to Table 1: (1) SFWMD Environmental Resource Permit Information Manual, Volume IV (2009 Version)

Prior to mobilizing crews and equipment to the site, a minor land clearing (exotic vegetation removal) was completed on the site on November 7-8, 2015, as permitted by AACE through Martin County Growth Management. Following this limited clearing operation, our field exploration program was then completed in the period November 11-16, 2015.

The field work locations shown on Figure No. 2 were determined in the field by our field crew using obtained aerial photographs superimposed onto the provided site plan, and a hand-held WAAS-enabled GPS instrument. The locations should be considered accurate only to the degree implied by the method of measurement used. We preliminarily anticipate that the actual locations are within 15 feet of those shown on Figure No. 2.

Summaries of AACE's field procedures are included on the attached Sheet No. 1 and the individual boring and test profiles are presented on the attached on Sheets No. 2 through 6. Samples obtained during performance of the borings were visually classified in the field, and representative portions of the samples were transported to our laboratory in sealed sample jars for further classification. The soil samples recovered from our explorations will be kept in our laboratory for 60 days, then discarded unless you specifically request otherwise.

## 5.0 OBSERVED SUBSURFACE CONDITIONS

### 5.1 General Soil Conditions

Detailed subsurface conditions are illustrated on the soil boring profiles presented on the attached Sheets No. 2 through 6. The stratification of the boring profiles represents our interpretation of the field boring logs and the results of laboratory examinations of the recovered samples. The stratification lines represent the approximate boundary between soil types. The actual transitions may be more gradual than implied.

In general, the following general soil profile was encountered in the borings performed:

**Table 2 - Generalized Soil Profile**

| Approximate Depth Below Existing Grade (feet) | General Soil Description |
|---|---|
| 0 to 0.5(±) | Topsoil (sands with organics/roots) |
| 0.5(±) to 4-5 | Loose to moderately dense fine sands (SP) [gray, brown, tan] |
| 4-5 to 7-8 | Medium dense fine sands (SP) and slightly silty fine sands (SP-SM) with hardpan fragments and traces of organics/slightly organic [dark brown, brown, hardpan-type] |
| 7-8 to 13-18 | Loose to medium dense fine sands (SP) [gray, brown] |
| 13-18 to 25 | Medium dense to dense fine sands (SP) with shell fragments [gray] |

The above soil profile is outlined in general terms only. Please refer to the attached Sheets No. 2 through 6 for individual soil profile details.

### 5.2 Measured Groundwater Level

The groundwater table depth as encountered in the borings during the field investigations is shown adjacent to the soil profiles on the attached Sheets No. 2 through 4. As can be seen, the groundwater table was generally encountered at depths ranging from about 4.5 feet to about 6.5 feet below the existing ground surface, with this range likely attributed to similar, localized variations in site topography. Fluctuations in groundwater levels should be anticipated throughout the year primarily due to seasonal variations in rainfall and other factors that may vary from the time the borings were conducted.

### 5.3 Estimated Normal Seasonal High Groundwater Table

The groundwater table will fluctuate seasonally, primarily based on rainfall. The normal seasonal high groundwater level is likely during the rainy season in Southeast Florida, typically between June and September of each year. The water table elevations associated with a 100-year flood level (or during an extreme storm event) would be much higher than the normal seasonal high water table elevation. The normal seasonal high groundwater table can also be influenced by the presence of relief points such as canals, lakes, ponds, swamps, etc., as well as by the drainage characteristics of the in-situ soils.

Based upon our field exploration, our observation of recovered soil samples and on review of the soil survey, we estimate that the normal seasonal high groundwater level at the boring locations is about 1 to 2 feet above the levels encountered in the borings.

The estimated normal seasonal high groundwater levels do not provide any assurance that the groundwater levels will not exceed these estimated levels during any given year in the future. Drainage impediments, storm events or other such occurrences may result in groundwater levels exceeding our estimates. Further, as noted, it should be expected that rainwater will perch atop the encountered slightly silty hardpan-type soils after periods of intense or prolonged rainfall events at depths shallower than the normal seasonal high level, possibly for extended periods of time.

If a more accurate determination of the seasonal groundwater level variations on this site is prudent for the design of the project, we would recommend installing a number of piezometers and performing periodic monitoring of the ambient groundwater levels.

### *5.4 Soil Hydraulic Conductivity Testing*

Four (4) soil hydraulic conductivity tests were performed at the locations shown on Figure No. 2. In general, the tests were performed in substantial accordance with methods described in the South Florida Water Management District (SFWMD) Environmental Resource Permit Information Manual (ERPIM), Volume IV, and yielded hydraulic conductivity values as follows:

**Table 3 - Soil Hydraulic Conductivity Results**

| Test No. | Groundwater Depth (ft-bls) | Flow Rate, Q (cfs) | Hydraulic Conductivity, K (cfs/sqf - ft head) | Estimated Equivalent Infiltration Rate (ft/day) |
|---|---|---|---|---|
| EX-1 | Not Encountered (> 6) | $7.1 \times 10^{-3}$ | $2.4 \times 10^{-4}$ | 20 |
| EX-2 | Not Encountered (> 6) | $8.9 \times 10^{-3}$ | $3.0 \times 10^{-4}$ | 25 |
| EX-3 | Not Encountered (> 6) | $5.8 \times 10^{-3}$ | $2.0 \times 10^{-4}$ | 17 |
| EX-4 | 5.3 | $4.2 \times 10^{-3}$ | $1.4 \times 10^{-4}$ | 12 |

The results from Table 3 are also shown on Sheet No. 6 along with the encountered soil profiles at the four test locations. We recommend utilizing a factor of safety of 2 when using the k-values presented herein in the design of stormwater runoff retention and detention facilities.

## 6.0 LABORATORY TESTING PROGRAM

Our drillers observed the soil recovered from the SPT sampler and the augers, placed the recovered soil samples in moisture proof containers, and maintained a log for each boring. The recovered soil samples, along with the field boring logs, were transported to our Port St. Lucie soils laboratory where they were visually examined by AACE's project engineer to determine their engineering classification. The visual classification of the samples was performed in accordance with the Unified Soil Classification System, USCS.

Representative samples were selected for limited index laboratory testing, consisting of moisture content tests (ASTM D2216), percent fines tests (ASTM D1140) and organic content tests (ASTM D2974). These tests were performed to aid in classifying the soils and to help evaluate the general engineering characteristics of the site soils. The results of our classifications and laboratory analyses are included in Appendix II and presented on the soil boring profiles on Sheets No. 2 through 6.

## 7.0 GEOTECHNICAL ENGINEERING EVALUATION

### *7.1 General*

Based on the findings of our site exploration, our evaluation of subsurface conditions, and judgment based on our experience with similar projects, we conclude that the soils underlying this site are generally satisfactory to support the proposed one- to three-story construction on conventional spread foundations. However, in our opinion, the bearing capacity of the loose near-surface soils should be improved in order to reduce the risk of unsatisfactory foundation performance. The general soil improvement we recommend includes proofrolling the individual building sites site with a heavy vibratory roller.

Following are specific recommendations for site preparation procedures, foundation design, and pavement systems for the project.

### *7.2 Site Preparation Recommendations*

#### 7.2.1 Clearing

The individual building areas within lines five feet outside construction perimeters, and the areas to be paved, should be cleared, grubbed and stripped of all surface vegetation, trash, debris and topsoil. Stumps should be removed entirely and their excavations backfilled with granular fill placed and compacted in thin lifts (see below for compaction criteria).

#### 7.2.2 Pond and Ditch Reclamation

We understand that at least the northern, smaller pond will need to be reclaimed as part of the site development plans. The depth of this pond is unknown, however, based on the size of it (approximately 80 feet by 120 feet, obtained from aerial photograph measurements) and using typical stable slopes for sandy soils, it is assumed that it is less than 10 feet deep. To properly reclaim this pond, it will need to be dewatered to allow for removal of bottom sediments and organic deposits. Following the cleaning of the dewatered pond, clean granular backfill should be placed in one-foot thick, individually compacted lifts to produce dry densities not less than 95 percent of the modified Proctor (ASTM D1557) maximum dry density of the compacted material. The observed minor ditches should be cleared/cleaned and backfilled/compacted similarly.

#### 7.2.3 Site Compaction Procedures

Following clearing and reclamation of the pond and ditches, the proposed building, roadways, and parking areas should be proofrolled with a 10 ton (minimum) vibratory roller; any soft, yielding soils detected should be excavated and replaced with clean, compacted backfill that conforms with the recommendations below. Sufficient passes should be made during the proofrolling operations to produce dry densities not less than 95 percent of the modified Proctor (ASTM D1557) maximum dry density of the compacted material to depths of 2 feet below the compacted surface, or 2 feet below the bottom of footings, whichever is lower. In any case, the building and parking areas should receive not less than 10 overlapping passes, half of them in each of two perpendicular directions.

After the exposed surface has been proofrolled and tested to verify that the desired dry density has been obtained, the building and pavement areas may be filled to the desired grades. All fill material should conform to the recommendations below. It should be placed in uniform layers not exceeding 12 inches in loose thickness. Each layer should be compacted to a dry density not less than 95 percent of its modified Proctor (ASTM D1557) maximum value.

After completion of the general site preparations discussed above, the bottom of foundation excavations dug through the compacted natural ground, fill or backfill, should be compacted so as to densify soils loosened during or after the excavation process, or washed or sloughed into the excavation prior to the placement of forms. A vibratory, walk-behind plate compactor can be used for this final densification immediately prior to the placement of reinforcing steel, with previously described density requirements to be maintained below the foundation level.

The groundwater must be lowered if needed to allow maintaining the required density level and a firm working surface for the placement of the foundations. It is not expected that the ambient groundwater level will adversely affect the project following placement of fill to raise the site grades, however, any deeper foundations, elevator pits, and partial subgrade levels (if any) may require dewatering measures. Typically, a given foundation excavation can be overexcavated 6 to 12 inches or so and 57-stone (pea gravel) be placed in compacted lifts of 3 inches to bridge the water. The water can then be collected in a small "sump" and removed with a portable pump. These lifts should be tested using penetrometer probes to verify that they are firm and unyielding. A temporary well point system may be needed for the construction of elevator pits or any partial subgrade levels (if any).

Following removal of foundation forms, backfill around foundations should be placed in lifts six inches or less in thickness, with each lift individually compacted with a plate tamper. The backfill should be compacted to a dry density of at least 95 percent of the modified Proctor (ASTM D-1557) maximum dry density.

<u>7.2.4 Fill Material and Stormwater Treatment Pond Excavation</u>

All fill material under the buildings and pavement should consist of clean sands free of organics and other deleterious materials. The fill material should have not more than 12 percent by dry weight passing the U.S. No. 200 sieve, and no particle larger than 3 inches in diameter. Backfill behind walls, if any, should be particularly pervious, with not more than 4 percent by dry weight passing the U.S. #200 sieve.

The encountered shallow fine sands (SP) and slightly silty fine sands (SP-SM) are generally considered to be suitable for use as structural fill, and utility and pipe trench backfill. However, the encountered hardpan-type soils (slightly silty weakly cemented fine sands (SP-SM) can be difficult to excavate, potentially requiring special equipment. Should excavation result in hardpan-type soils appearing as "boulder-size" chunks of cemented soils we recommend that the contractor segregate these materials from the sandy materials. It is likely that, with additional processing, any such hardpan boulders can be adequately broken down and used as fill, backfill, or otherwise.

### *7.3 Building Foundation and Slab Design*

After the foundation soils have been prepared as recommended above, the site should be suitable for supporting the proposed construction on conventional shallow foundations proportioned for an allowable bearing stress of 2,500 pounds per square foot [psf], or less.

To provide an adequate factor of safety against a shearing failure in the subsoils, all continuous foundations should be at least 18 inches wide, and all individual column footings should have a minimum width of 24 inches. Exterior foundations should bear at least 18 inches below adjacent outside final grades.

Based upon the boring information and the assumed loading conditions, we estimate that the recommended allowable bearing stress will provide a minimum factor of safety in excess of two 805
against bearing capacity failure. With the site prepared and the foundations designed and constructed as recommended, we anticipate total settlements of one inch or less, and differential settlement between adjacent similarly loaded footings of less than one-quarter of an inch. Because

of the granular nature of the subsurface soils, the majority of the settlements should occur during construction; post-construction settlement should be minimal.

We recommend that representatives of AACE inspect all footing excavations in order to verify that footing bearing conditions are consistent with expectations. Foundation concrete should not be cast over a foundation surface containing topsoil or organic soils, trash of any kind, surface made muddy by rainfall runoff, or groundwater rise, or loose soil caused by excavation or other construction work. Reinforcing steel should also be clean at the time of concrete casting. If such conditions develop during construction, the reinforcing steel must be lifted out and the foundation surface reconditioned and approved by AACE.

After the ground surface is proofrolled and filled, if necessary, as recommended in this report, the floor slab can be placed directly on the prepared subgrade. For design purposes, we recommend using a subgrade reaction modulus of 200 pounds per cubic inch (pci) for the compacted shallow sands. In our opinion, a highly porous base material is not necessary. We recommend to use a minimum of 10 mil polyolefin film as the main component of a vapor barrier system.

## 8.0 PAVEMENT RECOMMENDATIONS

We have not been provided with traffic loadings for this project and consequently, we have included two flexible pavement designs for alternate traffic volumes and types. In addition, recommendations for a rigid pavement design are presented for use in delivery areas and dumpster pads.

### *8.1 General*

The flexible pavement designs are based on structural number analyses with the stated estimated daily traffic volumes for a 15-year pavement design life. If loading conditions differ greatly from those presented, additional pavement design analyses should be performed.

We recommend that the pavement sections be installed late in construction when most heavy construction traffic has ceased. If base material is placed during construction to provide a working surface it should be proofrolled, leveled, and thickened as required prior to paving at the end of construction (EOC).

### *8.2 Flexible Pavement Sections*

We recommend a pavement section consisting of an asphaltic concrete wearing surface on a calcareous base course supported on stabilized subbase over well-compacted subgrade.

After clearing and proofrolling the site surface as previously recommended, the surficial soils should be suitable to support the pavement sections. The embankment material should be compacted to a dry density of 98 percent of the modified Proctor (ASTM D1557/AASHTO T-180) maximum dry density of the compacted soil to a depth of one foot below the surface.

#### 8.2.1 Stabilized Subgrade

The subbase material to a depth of twelve inches should have a minimum Limerock Bearing Ratio (LBR) value (FDOT FM 5-515) of 40 and it should be compacted to at least 98 percent of its modified Proctor (ASTM D1557 or AASHTO T-180) maximum dry density.

8.2.2 Base Course

The base course may consist of crushed limerock or coquina and should have a minimum Limerock Bearing Ratio (LBR) value (FDOT FM 5-515) of 100. We recommend a base course at least six inches thick for standard pavements and a base course of ten inches for heavy-duty pavements. The 6-inch base course may be placed and compacted in a single layer, however, the 10-inch base course should be placed and compacted in two layers. All base course material should be compacted to at least 98 percent of its modified Proctor maximum dry density.

8.2.3 Asphalt Surface

We recommend an FDOT Type SP-9.5 or SP-12.5 asphaltic wearing surface. We recommend a wearing surface 1.5 inches thick on standard pavement and 2.0 inches thick on heavy-duty pavement. The two-inch wearing surface should be placed and compacted in two layers. Care must be exercised to place the asphalt over dry, well primed base material.

8.2.4 Flexible Pavement Summary

The above recommendations should provide high quality pavement. If greater risk of more frequent pavement maintenance and repair is acceptable, then the above recommendations could be relaxed somewhat. Table 4 summarizes the recommended flexible pavement sections.

**Table 4 - Flexible Pavement Summary**

| Traffic Group | Thickness [inches] | | | Structural Number |
|---|---|---|---|---|
| | Stabilized Subgrade | Base Course | Asphalt Surface | |
| Light Duty (interior roads): Auto parking area, light panel and pickup trucks; average gross vehicle weight of 4,000 lbs. | 12 | 6 | 1.5 | 2.7 |
| Heavy Duty: Bus drop-off areas, delivery trucks; average gross vehicle weight of 25,000 lbs | 12 | 10 | 2 | 3.6 |

***8.3 Rigid Pavement Sections***

After clearing and proofrolling the site surface as previously recommended, the surficial soils should be suitable to support the pavement sections. The subgrade material should be compacted to a dry density of 98 percent of the modified Proctor (ASTM D1557 or AASHTO T-180) maximum dry density of the compacted soil to a depth of two feet below the surface. The subgrade surface should be saturated immediately prior to concrete placement to provide adequate moisture for curing of the concrete.

We recommend a five-inch thick pavement section of unreinforced Portland cement concrete. The concrete should have a minimum 28-day compressive strength of 4,000 psi. Construction control joints should be placed no more than 15 feet apart in either direction and should be at least one-quarter of the thickness of the concrete. They should be cut as soon as the concrete will support the crew and equipment (8 to 12 hours). The concrete should be cured by moist curing or by application of a liquid curing compound.

### *8.4 Curbing*

The curbing around landscaped areas adjacent to pavement should be constructed with full-depth curb sections. Use of extruded curb sections that lie directly above the final asphalt surface, or omission of the curbing, can allow migration of irrigation water from the landscaped areas. The excess water often causes separation of the asphalt wearing surface from the base and softening of the base material, resulting in early deterioration of the pavement.

## 9.0 QUALITY ASSURANCE AND TESTING FREQUENCY

We recommend establishing a comprehensive quality control program to verify that all site preparation and foundation and pavement construction is conducted in accordance with the appropriate plans and specifications. Materials testing and inspection services should be provided by Andersen Andre Consulting Engineers, Inc.

An experienced engineering technician should monitor the reclamation of ditches, excavation of unsuitable organic debris (if any), as well as all stripping and grubbing, on a full-time basis to verify that deleterious materials have been removed. The technician should observe the proof-rolling operation to verify that the appropriate number of passes are applied to the subgrade. In-situ density tests should be conducted during filling activities and below all footings, floor slabs and pavement areas to verify that the required densities have been achieved. In-situ density values should be compared to laboratory Proctor moisture-density results for each of the different natural and fill soils encountered. Finally, we recommend inspecting and testing the construction materials for the foundations and other structural components.

In Southeast Florida, earthwork testing is typically performed on an on-call basis when the contractor has completed a portion of the work. The test result from a specific location is only representative of a larger area if the contractor has used consistent means and methods and the soils and lift thicknesses are practically uniform throughout. The frequency of testing can be increased and full-time construction inspection can be provided to account for variations. We recommend that the following minimum testing frequencies be utilized:

- In proposed parking areas, a minimum frequency of one in-place density test for each 5,000 square feet of area should be used. The existing, natural ground should be tested to a depth of 12 inches at the prescribed frequency. Each 12-inch lift of fill, as well as the stabilized subgrade (where applicable) and base should be tested at this frequency.

- Utility backfill should be tested at a minimum frequency of one in-place density test for each 12-inch lift for each 200 lineal feet of pipe. Additional tests should be performed in backfill for manholes, inlets, etc.

- In proposed structural areas, the minimum frequency of in-place density testing should be one test for each 2,000 square feet of structural area. In-place density testing should be performed at this minimum frequency for a depth of 2 feet below natural ground and for every 1-foot lift of fill placed in the structural area. In addition, density tests should be performed in each column footing for a depth of 2 feet below the bearing surface. For continuous or wall footings, density tests should be performed at a minimum frequency of one test for every 50 lineal feet of footing, and for a depth of 2 feet below the bearing surface.

Representative samples of the various natural ground and fill soils, as well as stabilized subgrade (where applicable) and base materials should be obtained and transported to our laboratory for Proctor compaction tests. These tests will determine the maximum dry density and optimum moisture content for the materials tested and will be used in conjunction with the results of the in-place density tests to determine the degree of compaction achieved.

## 10.0 CLOSURE

The geotechnical evaluation submitted herein is based on the data obtained from the soil boring profiles presented on Sheets No. 2 through 6, and our understanding of the project as previously described. Limitations and conditions to this report are presented in Appendix III.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices for the exclusive use of Bowman Consulting. No other warranty, expressed or implied, is made.

We are pleased to be of assistance to you on this phase of your project. When we may be of further service to you or should you have any questions, please contact us.

Sincerely,
ANDERSEN ANDRE CONSULTING ENGINEERS, INC.
Certification of Authorization No. 26794

PETER GREGERS ANDERSEN LICENSE No. 57956 STATE OF FLORIDA PROFESSIONAL ENGINEER

Peter G. Andersen, P.E.
Principal Engineer
Fla. Reg. No. 57956

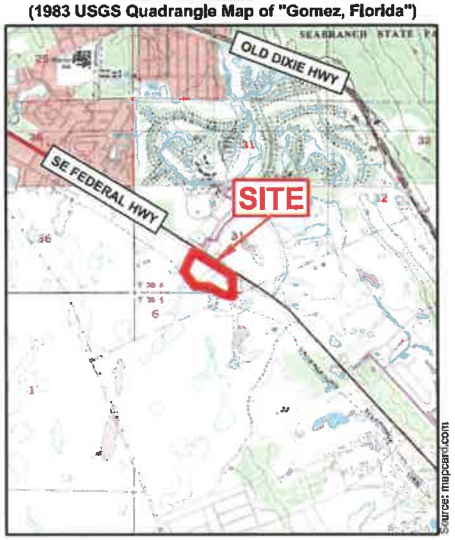
David P. Andre, P.E.
Principal Engineer
Fla. Reg. No. 53969
11/19/15

PGA/DPA:pa

## 2014 AERIAL PHOTOGRAPH


Source: mapcard.com

## USGS TOPOGRAPHIC MAP
(1983 USGS Quadrangle Map of "Gomez, Florida")




Source: mapcard.com

N
W E
S

NOT TO SCALE

...within Section 31
Township 38 South
Range 42 East

## USDA SOIL SURVEY MAP


Source: USDA Web Soil Survey

**USDA SOIL TYPES WITHIN SITE BOUNDARIES**
4 - Waveland and Immokalee fine sands
13 - Placid and Basinger fine sands, depressional

**Summary of USDA Web Soil Survey**

| Map Unit Symbol | Map Unit | Landform | Parent Materials | Typical Profile (depths in inches) | Natural Drainage Class | $K_{sat}$ (in/hr)[1] | Natural Depth to Water Table (in) | Depth (in) [Permeability (in/hr)][2] |
|---|---|---|---|---|---|---|---|---|
| 4 | Waveland and Immokalee fine sands | Flatwoods on marine terraces | Sandy marine deposites | 0-47 fine sand<br>47-77 loamy fine sand<br>77-99 fine sand | Poorly drained | 0.06 to 0.20 | 6 to 18 | 0-43 [>6.0]<br>43-91 [<0.2]<br>91-99 [2.0-20] |
| 13 | Placid and Basinger fine sands, depressional | Depressions on marine terraces | Sandy marine deposites | 0-80 fine sand | Very poorly drained | 6 to 20 | ~0 | 0-80 [6-20] |

Notes:
(1) $K_{sat}$ defined as "Capacity of the most limiting layer to transmit water"
(2) From USDA Soil Survey Manuscipt of Martin County (1981)

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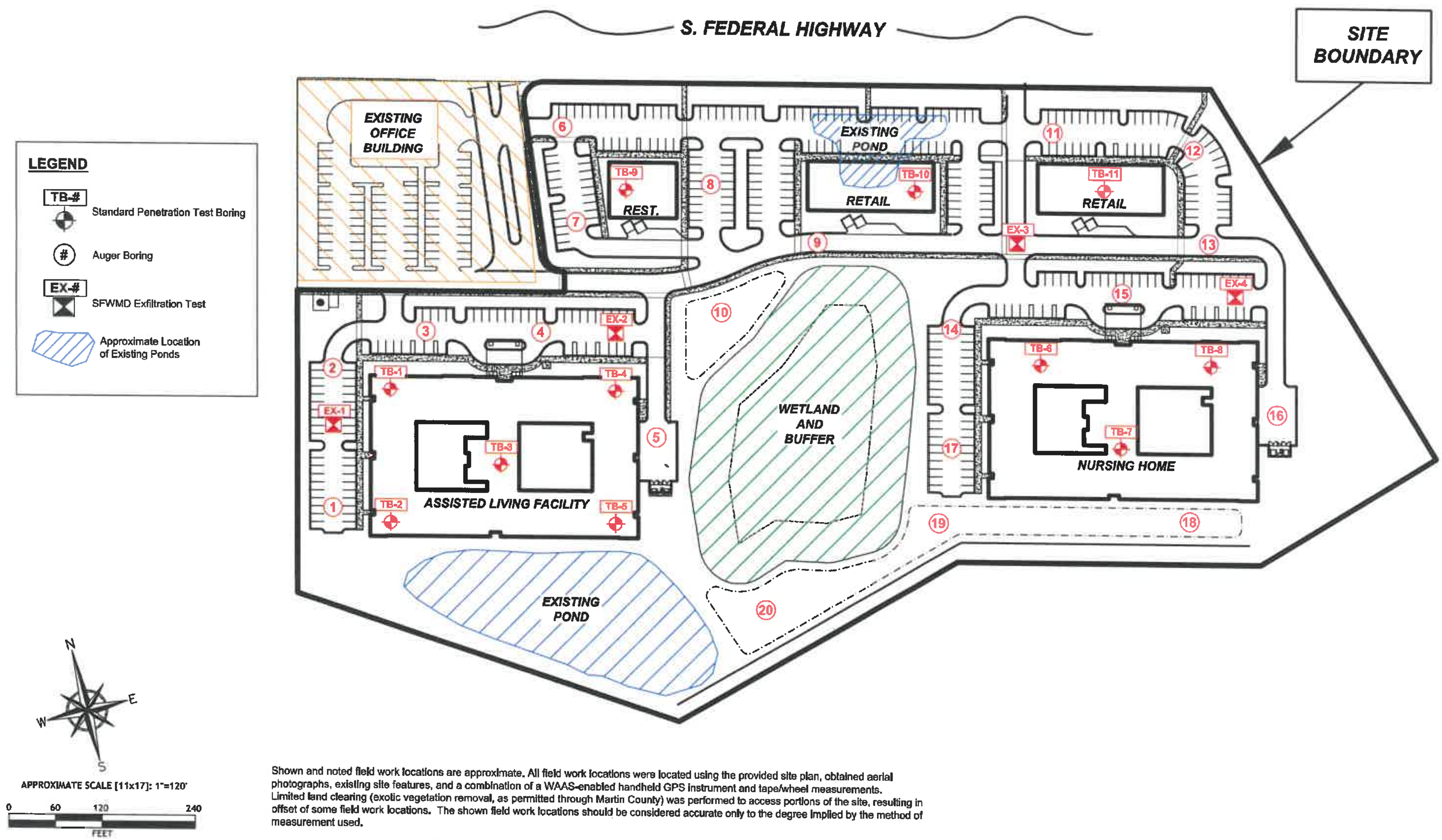
Certificate of Authorization No. 26794

SITE VICINITY MAPS

GEOTECHNICAL ENGINEERING EVALUATION
MARINER VILLAGE SQUARE
MARTIN OUNTY, FLORIDA

| | |
|---|---|
| Drawn by: PGA | Date: November 2015 |
| Checked by: DPA | Date: November 2015 |
| AACE File No: 15-185 | Figure No. 1 |




Shown and noted field work locations are approximate. All field work locations were located using the provided site plan, obtained aerial photographs, existing site features, and a combination of a WAAS-enabled handheld GPS instrument and tape/wheel measurements. Limited land clearing (exotic vegetation removal, as permitted through Martin County) was performed to access portions of the site, resulting in offset of some field work locations. The shown field work locations should be considered accurate only to the degree implied by the method of measurement used.

Figure No. 2 Source: Conceptual Site Plan 'B' by Lucido & Associates

| | | | | |
|---|---|---|---|---|
| **ANDERSEN ANDRE CONSULTING ENGINEERS, INC.**<br>573 SW Biltmore Street, Port St. Lucie, FL 34983 772-807-9191 www.AACEInc.com<br>Certificate of Authorization No. 26794 | **FIELD WORK LOCATION PLAN** | GEOTECHNICAL ENGINEERING EVALUATION<br>MARINER VILLAGE SQUARE<br>MARTIN OUNTY, FLORIDA | Drawn by: PGA<br>Checked by: DPA<br>AACE File No: 15-185 | Date: November 2015<br>Date: November 2015<br>**Figure No. 2** |

# SOIL BORING, SAMPLING AND TESTING METHODS

(abbreviated version for project specific methods and soil conditions)

**GENERAL**

Andersen Andre Consulting Engineers, Inc. (AACE) borings describe subsurface conditions only at the locations drilled and at the time drilled. They provide no information about subsurface conditions below the bottom of the boreholes. At locations not explored, surface conditions that differ from those observed in the borings may exist and should be anticipated.

The information reported on our boring logs is based on our drillers' logs and on visual examination in our laboratory of disturbed soil samples recovered from the borings. The distinction shown on the logs between soil types is approximate only. The actual transition from one soil to another may be gradual and indistinct.

The groundwater depth shown on our boring logs is the water level the driller observed in the borehole when it was drilled. These water levels may have been influenced by the drilling procedures, especially in borings made by rotary drilling with bentonitic drilling mud. An accurate determination of groundwater level requires long-term observation of suitable monitoring wells. Fluctuations in groundwater levels throughout the year should be anticipated.

The absence of a groundwater level on certain logs indicates that no groundwater data is available. It does not mean that groundwater will not be encountered at that boring location at some other point in time.

**HAND AUGER BORINGS**

Hand auger borings are used, if soil conditions are favorable, when the soil strata are to be determined within a shallow (approximately 5-foot [1.5m]) depth or when access is not available to power drilling equipment. A 3-inch (75mm) diameter hand bucket auger with a cutting head is simultaneously turned and pressed into the ground. The bucket auger is retrieved at approximately 6-inch (0.15m) interval and its contents emptied for inspection. On occasion post-hole diggers are used, especially in the upper 3 feet (1m) or so. Penetrometer probings can be used in the upper 5 feet (1.5m) to determine the relative density of the soils. The soil sample obtained is described and representative samples put in bags or jars and transported to the AACE soils laboratory for classification and testing, if necessary.

**STANDARD PENETRATION TEST**

The Standard Penetration Test (SPT) is a widely accepted method of in situ testing of foundation soils (ASTM D-1586). A 2-foot (0.6m) long, 2-inch (50mm) O.D. split-barrell sampler attached to the end of a string of drilling rods is driven 24 inches (0.60m) into the ground by successive blows of a 140-pound (63.5 Kg) hammer freely dropping 30 inches (0.76m). The number of blows needed for each 6 inches (0.15m) increments penetration is recorded. The sum of the blows required for penetration of the middle two 6-inch (0.15m) increments of penetration constitutes the test result of N-value. After the test, the sampler is extracted from the ground and opened to allow visual description of the retained soil sample. The N-value has been empirically correlated with various soil properties allowing a conservative estimate of the behavior of soils under load. The following tables relate N-values to a qualitative description of soil density for cohesionless soils:

Cohesionless Soils:

| N-Value | Description |
|---|---|
| 0 to 4 | Very loose |
| 4 to 10 | Loose |
| 10 to 30 | Medium dense |
| 30 to 50 | Dense |
| Above 50 | Very dense |

Cohesive Soils:

| N-Value | Description | Qu |
|---|---|---|
| 0 to 2 | Very soft | Below 0.25 tsf (25 kPa) |
| 2 to 4 | Soft | 0.25 to 0.50 tsf (25 to 50 kPa) |
| 4 to 8 | Medium stiff | 0.50 to 1.0 tsf (50 to 100 kPa) |
| 8 to 15 | Stiff | 1.0 to 2.0 tsf (100 to 200 kPa) |
| 15 to 30 | Very stiff | 2.0 to 4.0 tsf (200 to 400 kPa) |
| Above 30 | Hard | Above 4.0 tsf (400 kPa) |

The tests are usually performed at 5 foot (1.5m) intervals. However, more frequent or continuous testing is done by AACE through depths where a more accurate definition of the soils is required. The test holes are advanced to the test elevations by rotary drilling with a cutting bit, using circulating fluid to remove the cuttings and hold the fine grains in suspension. The circulating fluid, which is bentonitic drilling mud, is also used to keep the hole open below the water table by maintaining an excess hydrostatic pressure inside the hole. In some soil deposits, particularly highly pervious ones, flush-coupled casing must be driven to just above the testing depth to keep the hole open and/or prevent the loss of circulating fluid. After completion of a test borings, the hole is kept open until a steady state groundwater level is recorded. The hole is then sealed by backfilling, either with accumulated cuttings or lean cement.

Representative split-spoon samples from each sampling interval and from different strata are brought to our laboratory in air-tight jars for classification and testing, if necessary. Afterwards, the samples are discarded unless prior arrangement have been made.

**SFWMD EXFILTRATION TESTS (USUAL CONDITION TEST)**

In order to estimate the hydraulic conductivity of the upper soils, constant head or falling head exfiltration tests can be performed. These tests are performed in accordance with methods described in the South Florida Water Management District (SFWMD) Permit Information Manual, Volume IV. In brief, for the "Usual Condition Test", a 6 to 9 inch diameter hole is augered to depths of about 5 to 7 feet; the bottom one foot is filled with 57-stone; and a 6-foot long slotted PVC pipe is lowered into the hole. The distance from the groundwater table and to the ground surface is recordedand the hole is then saturated for 10 minutes with the water level maintained at the ground surface.

If a constant head test is performed, the rate of pumping will be recorded at fixed intervals of 1 minute for a total of 10 minutes, following the saturation period.

**LABORATORY TEST METHODS**

Soil samples returned to the AACE soils laboratory are visually observed by a geotechnical engineer or a trained technician to obtain more accurate description of the soil strata. Laboratory testing is performed on selected samples as deemed necessary to aid in soil classification and to help define engineering properties of the soils. The test results are presented on the soil boring logs at the depths at which the respective sample was recovered, except that grain size distributions or selected other test results may be presented on separate tables, figures or plates as discussed in this report. The soil descriptions shown on the logs are based upon visual-manual procedures in accordance with local practice. Soil classification is performed in general accordance with the United Soil Classification System (ASTM D-2487) and is also based on visual-manual procedures.

**THE PROJECT SOIL DESCRIPTION PROCEDURE FOR SOUTHEAST FLORIDA**

For use with the ASTM D-2487 Unified Soil Classification System

**CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES**

BOULDERS (>12" [300 MM]) and COBBLES (3" [75 MM] TO 12" [300 MM]):

GRAVEL: Coarse Gravel: 3/4" (19 mm) to 3" (75 mm)
Fine Gravel: No. 4 (4.75 mm) Sieve to 3/4" (19 mm)

Descriptive adjectives:
- 0 - 5% - no mention of gravel in description
- 5 - 15% - trace
- 15 - 29% - some
- 30 - 49% - gravelly (shell, limerock, cemented sands)

SANDS:

COARSE SAND: No. 10 (2 mm) Sieve to No. 4 (4.75 mm) Sieve
MEDIUM SAND: No. 40 (425 μm) Sieve to No. 10 (2 mm) Sieve
FINE SAND: No. 200 (75 μm) Sieve to No. 40 (425 μm) Sieve

Descriptive adjectives:
- 0 - 5% - no mention of sand in description
- 5 - 15% - trace
- 15 - 29% - some
- 30 - 49% - sandy

SILT/CLAY: < #200 (75μm) Sieve

SILTY OR SILT: PI < 4
SILTY CLAYEY OR SILTY CLAY: 4 ≤ PI ≤ 7
CLAYEY OR CLAY: PI > 7

Descriptive adjectives:
- < - 5% - clean (no mention of silt or clay in description)
- 5 - 15% - slightly
- 16 - 35% - clayey, silty, or silty clayey
- 36 - 49% - very

ORGANIC SOILS:

| Organic Content | Descriptive Adjectives | Classification |
|---|---|---|
| 0 - 2.5% | Usually no mention of org. | See Above |
| 2.6 - 5% | slightly organic | add "with organic fines" to group name |
| 5 - 30% | organic | SM with organic fines |
| | | Organic Silt (OL) |
| | | Organic Clay (OL) |
| | | Organic Silt (OH) |
| | | Organic Clay (OH) |

## NOTES:

| | |
|---|---|
| TB-# | STANDARD PENETRATION TEST (SPT) BORING [ASTM D1586] |
| AB-# | AUGER BORING (ASTM D1452) |
| EX-# | SFWMD EXFILTRATION TEST |
| N | SPT RESISTANCE IN BLOWS PER FOOT |
| X.X' ▽ | GROUNDWATER TABLE (GWT) MEASURED ON THE DATE DRILLED |
| N.E. | NOT ENCOUNTERED |
| EOB | END OF BORING |
| BLS | BELOW LAND SURFACE |
| SP, SP-SM, ETC: | UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) USCS GROUPS DETERMINED BY VISUAL CLASSIFICATION, EXCEPT FOR NOTED LABORATORY TEST RESULTS. |
| MC | NATURAL MOISTURE CONTENT IN PERCENT [ASTM D2216] |
| OC | ORGANIC CONTENT IN PERCENT [ASTM D2974] |
| -200 | PERCENT PASSING NO. 200 SIEVE SIZE (PERCENT FINES) [ASTM D1140] |

SPT BORING DATA
DRILL CREW: CL/AACE
DRILL RIG: CME-45
DRILL METHOD: ROTARY-WASH W. BENTONITE DRILLING SLURRY
SPT DATA:
SPOON I.D. = 1.375"
SPOON O.D. = 2.0"
HAMMER DROP = 30"
HAMMER WEIGHT = 140 lbs.
HAMMER TYPE = MANUAL

SFWMD EXFILTRATION TESTS

| | |
|---|---|
| Q | STABILIZED FLOW RATE |
| d | DIAMETER OF TEST HOLE |
| H2 | HYDROSTATIC COLUMN |
| Ds | SATURATED HOLE DEPTH (BY GWT) NOTE: IF 0, GWT NOT ENCOUNTERED |

## LEGEND:

- TOPSOIL
- FINE SAND (SP)
- SLIGHTLY SILTY FINE SAND (SP-SM) W. HARDPAN FRAGMENTS [HARDPAN-TYPE]

ANDERSEN ANDRE CONSULTING ENGINEERS, INC.
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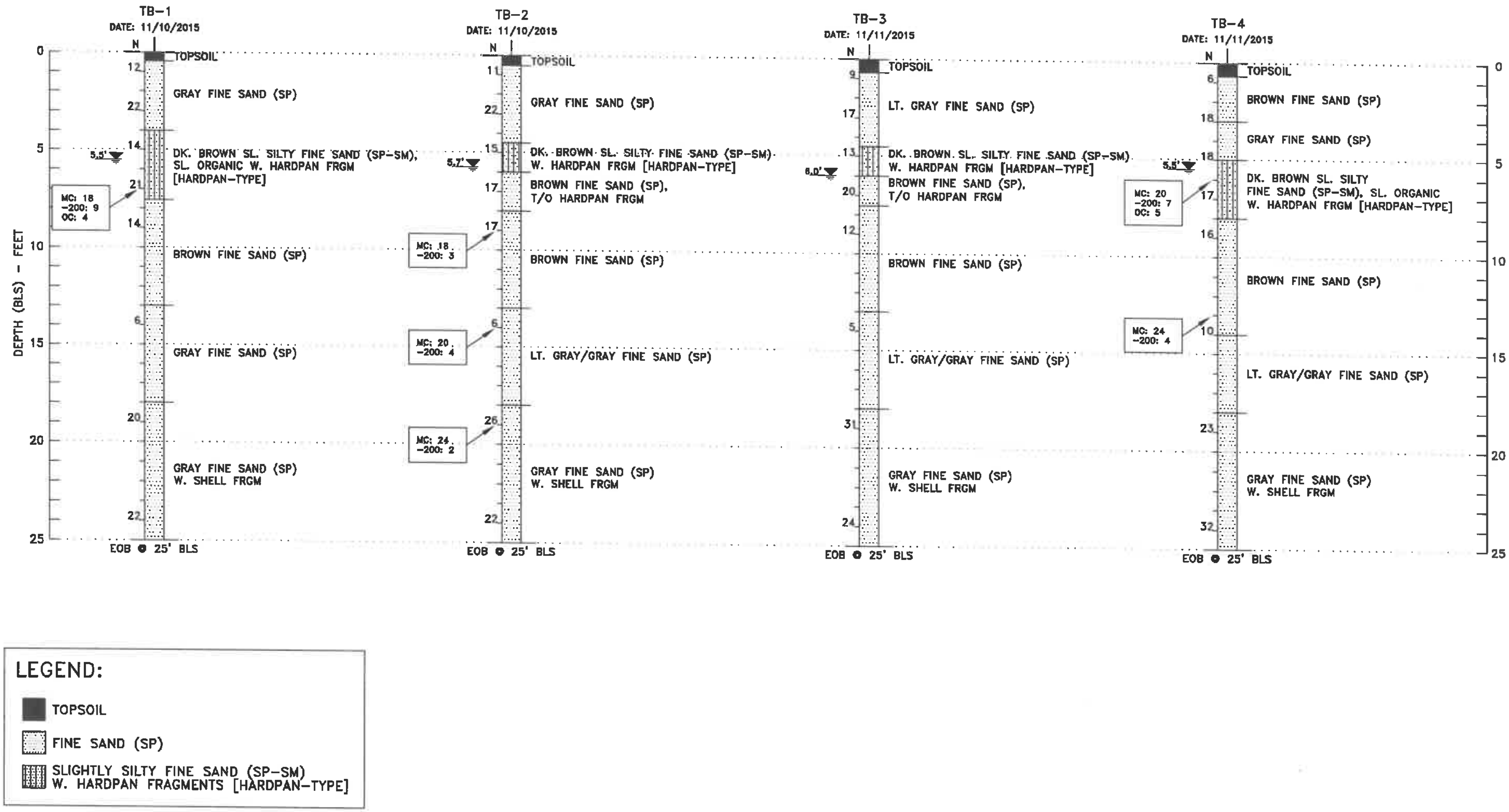
Certificate of Authorization No. 26794

GENERAL NOTES

GEOTECHNICAL ENGINEERING EVALUATION
MARINER VILLAGE SQUARE
MARTIN OUNTY, FLORIDA

| | |
|---|---|
| Drawn by: PGA | Date: November 2015 |
| Checked by: DPA | Date: November 2015 |
| AACE File No: 15-185 | Sheet No. 1 |

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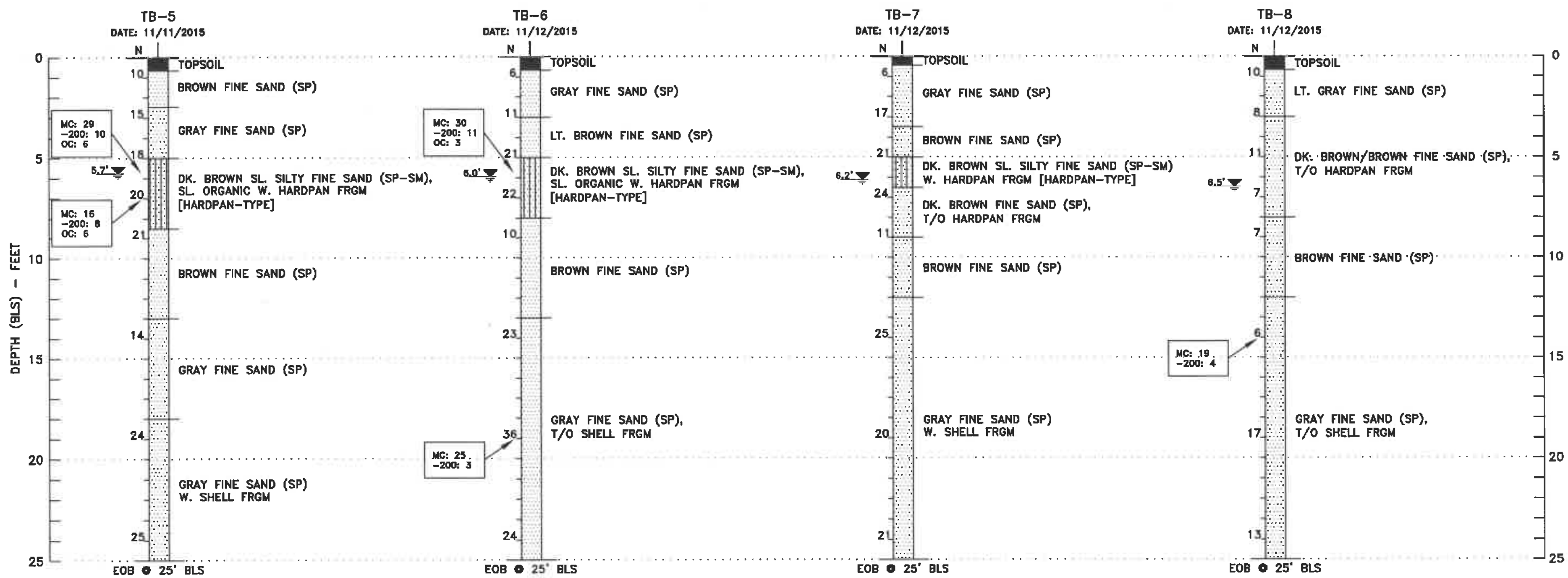
**SOIL BORING PROFILES**

GEOTECHNICAL ENGINEERING EVALUATION
MARINER VILLAGE SQUARE
MARTIN OUNTY, FLORIDA

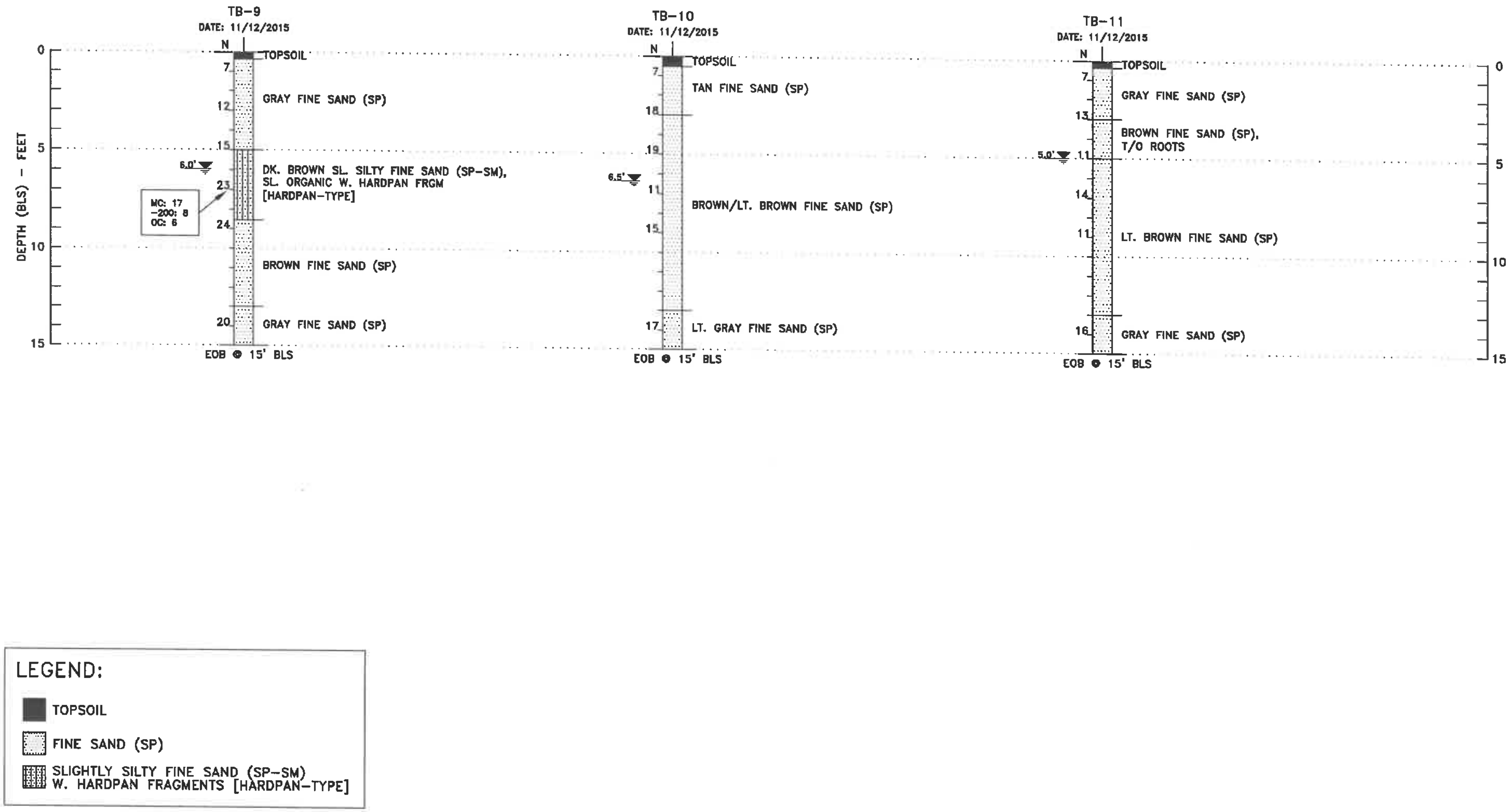
| | |
|---|---|
| Drawn by: PGA | Date: November 2015 |
| Checked by: DPA | Date: November 2015 |
| AACE File No: 15-185 | **Sheet No. 2** |




LEGEND:

- TOPSOIL
- FINE SAND (SP)
- SLIGHTLY SILTY FINE SAND (SP-SM) W. HARDPAN FRAGMENTS [HARDPAN-TYPE]

| | | | | |
|---|---|---|---|---|
| **ANDERSEN ANDRE CONSULTING ENGINEERS, INC.**<br>573 SW Biltmore Street, Port St. Lucie, FL 34983 772-807-9191 www.AACEInc.com<br>Certificate of Authorization No. 26794 | SOIL BORING PROFILES | GEOTECHNICAL ENGINEERING EVALUATION<br>MARINER VILLAGE SQUARE<br>MARTIN OUNTY, FLORIDA | Drawn by: PGA<br>Checked by: DPA<br>AACE File No: 15-185 | Date: November 2015<br>Date: November 2015<br>Sheet No. 3 |

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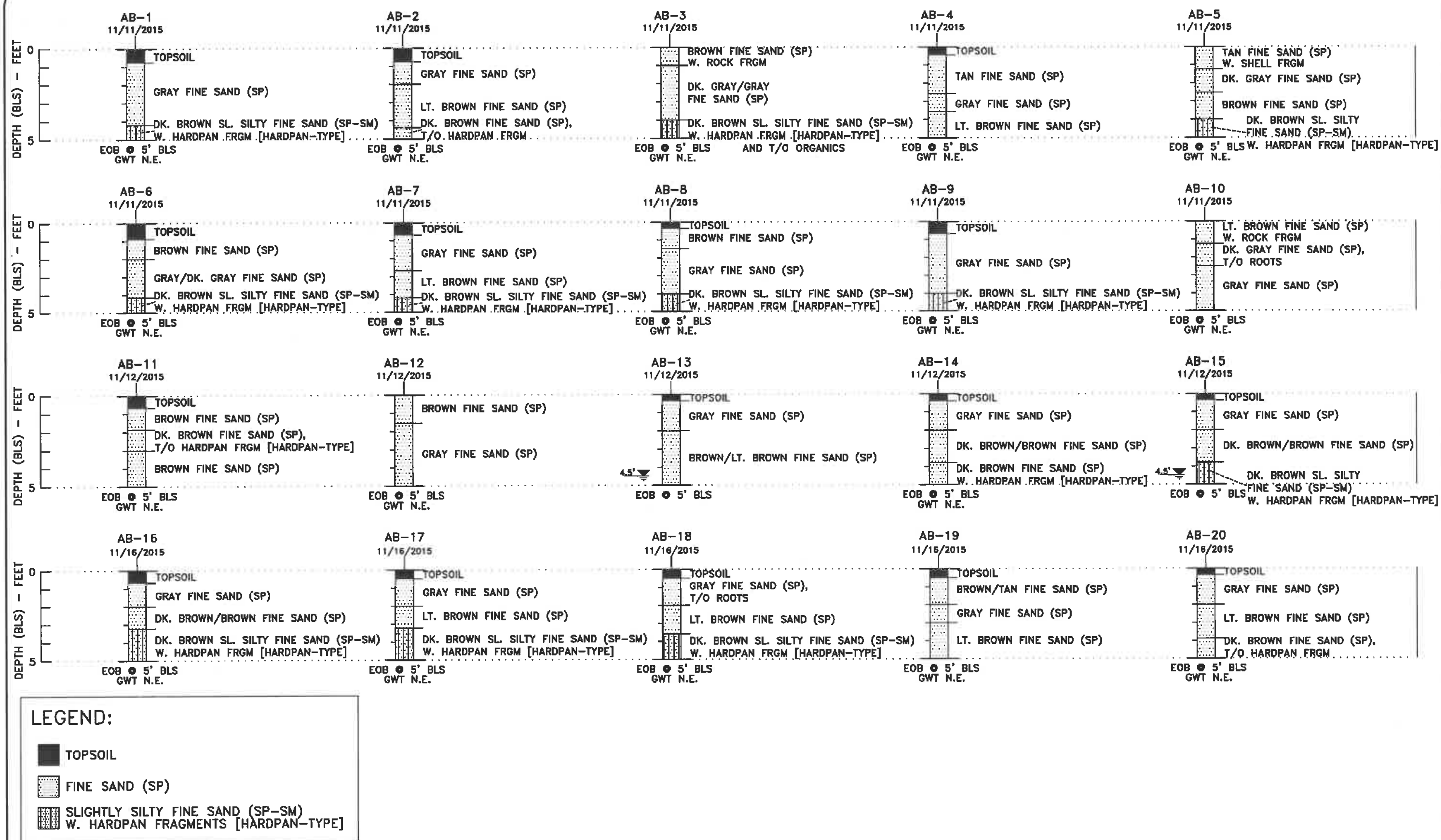
**SOIL BORING PROFILES**

GEOTECHNICAL ENGINEERING EVALUATION
MARINER VILLAGE SQUARE
MARTIN OUNTY, FLORIDA

| | |
|---|---|
| Drawn by: PGA | Date: November 2015 |
| Checked by: DPA | Date: November 2015 |
| AACE File No: 15-185 | **Sheet No. 4** |

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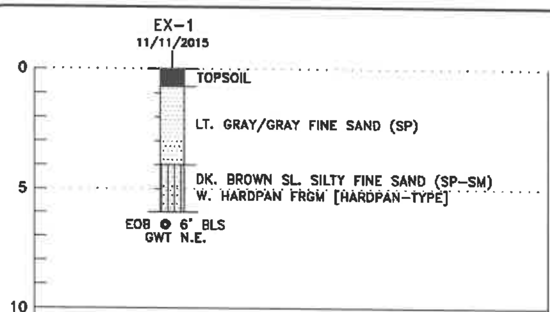
**SOIL BORING PROFILES**

GEOTECHNICAL ENGINEERING EVALUATION
MARINER VILLAGE SQUARE
MARTIN OUNTY, FLORIDA

| | |
|---|---|
| Drawn by: PGA | Date: November 2015 |
| Checked by: DPA | Date: November 2015 |
| AACE File No: 15-185 | Sheet No. 5 |

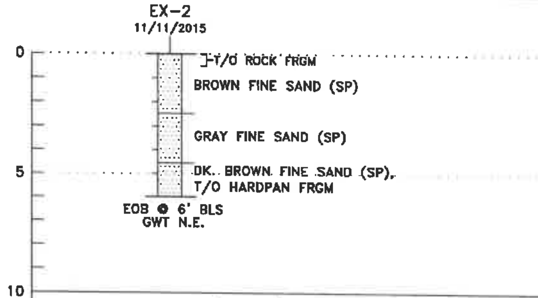



## TEST SUMMARY (EX-1):

Q = $7.1 \times 10^{-3}$ CFS
d = 0.5 FT
$H_2$ = 6+ FT
Ds = 0 FT

K = $2.4 \times 10^{-4}$ CFS/SQ.FT. – FT. HD.

This value is an ultimate value and an appropriate factor of safety should be used in the design of drainage improvements.

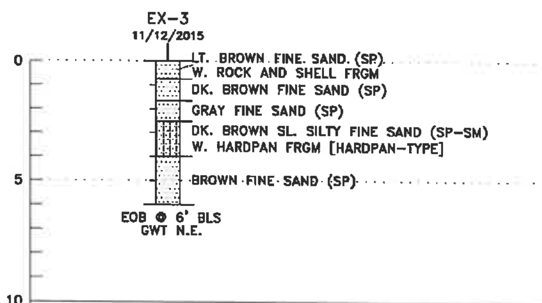



## TEST SUMMARY (EX-2):

Q = $8.9 \times 10^{-3}$ CFS
d = 0.5 FT
$H_2$ = 6+ FT
Ds = 0 FT

K = $3.0 \times 10^{-4}$ CFS/SQ.FT. – FT. HD.

This value is an ultimate value and an appropriate factor of safety should be used in the design of drainage improvements.

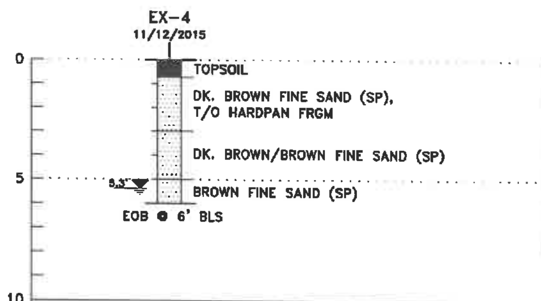



## TEST SUMMARY (EX-3):

Q = $5.8 \times 10^{-3}$ CFS
d = 0.5 FT
$H_2$ = 6+ FT
Ds = 0 FT

K = $2.0 \times 10^{-4}$ CFS/SQ.FT. – FT. HD.

This value is an ultimate value and an appropriate factor of safety should be used in the design of drainage improvements.




## TEST SUMMARY (EX-4):

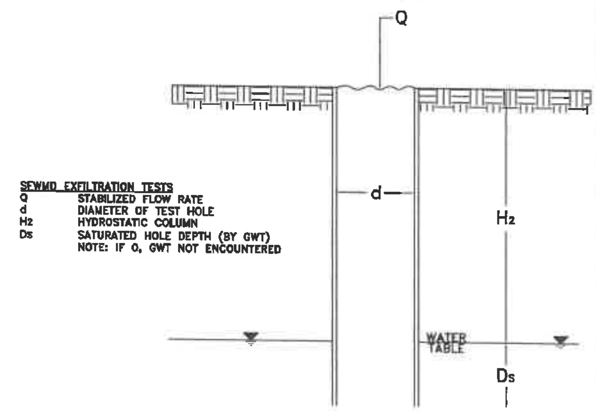
Q = $4.2 \times 10^{-3}$ CFS
d = 0.5 FT
$H_2$ = 5.3 FT
Ds = 0.7 FT

K = $1.4 \times 10^{-4}$ CFS/SQ.FT. – FT. HD.

This value is an ultimate value and an appropriate factor of safety should be used in the design of drainage improvements.

## EXFILTRATION TEST CONFIGURATION

(Not To Scale)




## LEGEND:

- TOPSOIL
- FINE SAND (SP)
- SLIGHTLY SILTY FINE SAND (SP-SM) W. HARDPAN FRAGMENTS [HARDPAN-TYPE]

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**EXFILTRATION TEST RESULTS**

GEOTECHNICAL ENGINEERING EVALUATION
MARINER VILLAGE SQUARE
MARTIN OUNTY, FLORIDA

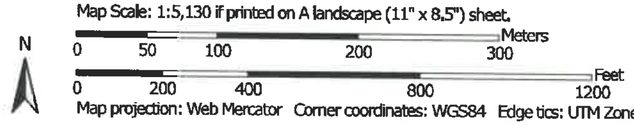
| | |
|---|---|
| Drawn by: PGA | Date: November 2015 |
| Checked by: DPA | Date: November 2015 |
| AACE File No: 15-185 | **Sheet No. 6** |

# APPENDIX I

## USDA Soil Survey Information

## Soil Map—Martin County, Florida
(Mariner Square Village)


Map Scale: 1:5,130 if printed on A landscape (11" x 8.5") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Martin County, Florida
Survey Area Data: Version 13, Sep 21, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 14, 2015—May 8, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend

| Martin County, Florida (FL085) | | | |
|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in AOI** | **Percent of AOI** |
| 4 | Waveland and Immokalee fine sands | 87.7 | 82.9% |
| 13 | Placid and Basinger fine sands, depressional | 15.2 | 14.3% |
| 99 | Water | 3.0 | 2.8% |
| **Totals for Area of Interest** | | **105.8** | **100.0%** |

# Martin County, Florida

## 4—Waveland and Immokalee fine sands

### Map Unit Setting

*National map unit symbol:* 1jq7n
*Mean annual precipitation:* 56 to 64 inches
*Mean annual air temperature:* 72 to 79 degrees F
*Frost-free period:* 350 to 365 days
*Farmland classification:* Farmland of unique importance

### Map Unit Composition

*Immokalee and similar soils:* 40 percent
*Waveland and similar soils:* 40 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Waveland

#### Setting

*Landform:* Flatwoods on marine terraces
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Sandy marine deposits

#### Typical profile

*A - 0 to 4 inches:* fine sand
*Eg - 4 to 43 inches:* fine sand
*Bh1 - 43 to 47 inches:* fine sand
*Bh2 - 47 to 77 inches:* loamy fine sand
*Cg1 - 77 to 91 inches:* fine sand
*Cg2 - 91 to 99 inches:* fine sand

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* 30 to 50 inches to ortstein
*Natural drainage class:* Poorly drained
*Runoff class:* High
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Sodium adsorption ratio, maximum in profile:* 4.0
*Available water storage in profile:* Very low (about 1.0 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* A/D
*Other vegetative classification:* South Florida Flatwoods (R156BY003FL), Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

**Description of Immokalee**

**Setting**

*Landform:* Flatwoods on marine terraces
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Convex
*Across-slope shape:* Linear
*Parent material:* Sandy marine deposits

**Typical profile**

*A - 0 to 6 inches:* fine sand
*E - 6 to 35 inches:* fine sand
*Bh - 35 to 54 inches:* fine sand
*BC - 54 to 80 inches:* fine sand

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Natural drainage class:* Poorly drained
*Runoff class:* High
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Sodium adsorption ratio, maximum in profile:* 4.0
*Available water storage in profile:* Low (about 5.3 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* B/D
*Other vegetative classification:* South Florida Flatwoods (R156BY003FL), Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

**Minor Components**

**Basinger**

*Percent of map unit:* 4 percent
*Landform:* Drainageways on marine terraces
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Other vegetative classification:* Slough (R156BY011FL), Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

**Lawnwood**

*Percent of map unit:* 4 percent
*Landform:* Marine terraces on flatwoods
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Other vegetative classification:* South Florida Flatwoods (R156BY003FL), Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

**Placid**

*Percent of map unit:* 3 percent
*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Other vegetative classification:* Freshwater Marshes and Ponds (R156BY010FL), Sandy soils on stream terraces, flood plains, or in depressions (G156BC145FL)

**Jonathan**

*Percent of map unit:* 3 percent
*Landform:* Rises on marine terraces
*Landform position (three-dimensional):* Interfluve
*Down-slope shape:* Convex
*Across-slope shape:* Linear
*Other vegetative classification:* South Florida Flatwoods (R156BY003FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G156BC121FL)

**Nettles**

*Percent of map unit:* 3 percent
*Landform:* Flatwoods on marine terraces
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Other vegetative classification:* South Florida Flatwoods (R156BY003FL), Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

**Salerno**

*Percent of map unit:* 3 percent
*Landform:* Flatwoods on marine terraces
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear

*Other vegetative classification:* South Florida Flatwoods (R156BY003FL), Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

## Data Source Information

Soil Survey Area: Martin County, Florida
Survey Area Data: Version 13, Sep 21, 2015

# Martin County, Florida

## 13—Placid and Basinger fine sands, depressional

### Map Unit Setting

*National map unit symbol:* 1jq7x
*Mean annual precipitation:* 56 to 64 inches
*Mean annual air temperature:* 72 to 79 degrees F
*Frost-free period:* 350 to 365 days
*Farmland classification:* Farmland of unique importance

### Map Unit Composition

*Placid and similar soils:* 45 percent
*Basinger and similar soils:* 40 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Placid

#### Setting

*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Parent material:* Sandy marine deposits

#### Typical profile

*A - 0 to 17 inches:* fine sand
*Cg - 17 to 80 inches:* fine sand

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Natural drainage class:* Very poorly drained
*Runoff class:* Negligible
*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (5.95 to 19.98 in/hr)
*Depth to water table:* About 0 inches
*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Sodium adsorption ratio, maximum in profile:* 4.0
*Available water storage in profile:* Moderate (about 6.1 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7w
*Hydrologic Soil Group:* A/D

*Other vegetative classification:* Freshwater Marshes and Ponds (R156BY010FL), Sandy soils on stream terraces, flood plains, or in depressions (G156BC145FL)

### Description of Basinger

#### Setting

*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Parent material:* Sandy marine deposits

#### Typical profile

*A - 0 to 4 inches:* fine sand
*Eg - 4 to 22 inches:* fine sand
*Bh/Eg - 22 to 42 inches:* fine sand
*Cg - 42 to 80 inches:* fine sand

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Natural drainage class:* Very poorly drained
*Runoff class:* Negligible
*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (5.95 to 19.98 in/hr)
*Depth to water table:* About 0 inches
*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Sodium adsorption ratio, maximum in profile:* 4.0
*Available water storage in profile:* Low (about 5.8 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7w
*Hydrologic Soil Group:* A/D
*Other vegetative classification:* Freshwater Marshes and Ponds (R156BY010FL), Sandy soils on stream terraces, flood plains, or in depressions (G156BC145FL)

### Minor Components

#### Lawnwood

*Percent of map unit:* 8 percent
*Landform:* Marine terraces on flatwoods
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Other vegetative classification:* South Florida Flatwoods (R156BY003FL), Sandy soils on flats of mesic or hydric lowlands (G156BC141FL)

**Sanibel**

*Percent of map unit:* 7 percent
*Landform:* Depressions on marine terraces
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Other vegetative classification:* Freshwater Marshes and Ponds (R156BY010FL), Organic soils in depressions and on flood plains (G156BC645FL)

## Data Source Information

Soil Survey Area: Martin County, Florida
Survey Area Data: Version 13, Sep 21, 2015

# APPENDIX II

## Laboratory Testing Results

AACE

## ANDERSEN ANDRE CONSULTING ENGINEERS, INC.

**Moisture Content (ASTM D2216), Percent Fines Passing US No. 200 Sieve (ASTM D1140)**

Job No: **15-185** Location: **Martin County, FL** Date: **11/16/15**

Project: **Mariner Square Village** Station: **NA** Technician **RL**

| *Sample ID* | *Pan #* | *Tare weight [grams]* | *Wet Weight Before Wash* | *Dry Weight Before wash* | | *Water Weight [grams]* | *Dry Weight After wash* | | ***Moisture (%)*** | ***Fines (%)*** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Soil + tare weight [grams]* | *Soil + tare weight [grams]* | *Soil weight [grams]* | | *Soil + tare weight [grams]* | *Soil weight [grams]* | | |
| TB-1 #4 | T15 | 85.6 | 206.5 | 188.2 | 102.6 | 18.3 | 178.6 | 93.0 | **18** | **9** |
| TB-4 #3 | P36 | 86.7 | 207.6 | 187.8 | 101.1 | 19.8 | 180.5 | 93.8 | **20** | **7** |
| TB-5 #3 | P37 | 88.2 | 205.4 | 178.9 | 90.7 | 26.5 | 170.1 | 81.9 | **29** | **10** |
| TB-5 #5 | P43 | 87.2 | 201.1 | 185.7 | 98.5 | 15.4 | 178.0 | 90.8 | **16** | **8** |
| TB-6 #3 | P38 | 86.7 | 201.0 | 174.9 | 88.2 | 26.1 | 165.4 | 78.7 | **30** | **11** |
| TB-9 #3 | P22 | 86.3 | 195.3 | 179.2 | 92.9 | 16.1 | 172.0 | 85.7 | **17** | **8** |
| TB-2 #5 | T6 | 86.2 | 211.2 | 192.2 | 106.0 | 19.0 | 189.1 | 102.9 | **18** | **3** |
| TB-2 #6 | T17 | 85.7 | 195.6 | 177.0 | 91.3 | 18.6 | 172.9 | 87.2 | **20** | **4** |
| TB-2 #7 | T22 | 86.8 | 212.7 | 188.3 | 101.5 | 24.4 | 186.2 | 99.4 | **24** | **2** |
| TB-4 #6 | P1 | 86.1 | 207.3 | 183.7 | 97.6 | 23.6 | 179.8 | 93.7 | **24** | **4** |
| TB-6 #7 | P27 | 87.2 | 215.9 | 190.2 | 103.0 | 25.7 | 186.9 | 99.7 | **25** | **3** |
| TB-8 #5 | P23 | 85.9 | 199.3 | 181.0 | 95.1 | 18.3 | 177.1 | 91.2 | **19** | **4** |

## ANDERSEN ANDRE CONSULTING ENGINEERS, INC.

AACE

### Organic Content Work Sheet (AASHTO T-267 / ASTM D2974)

Project Name: Mariner Square Village
File Number: 15-185
Sample Location: Varies
Sample Description: Refer to Log

USCS/AASHTO: NA
Date Sampled: Varies
Date Tested: 11/16/2015
Tested By: SM

Loss On Ignition (LO) Test

| | | |
|---|---|---|
| | Sample ID | TB-1 #4 |
| | Sample Location | As noted on log |
| | Depth | As noted on log |
| | Tare Number | P13 |
| | Wt. Of Tare (g) - A | 22.3 |
| b.i. | Wt. Of Tare+Soil+Orgn (g) - B | 63.8 |
| a.i. | Wt. Tare+Soil (g) - C | 62.2 |
| | % Organics: 100x(B-C)/(B-A) | 4 |

Loss On Ignition (LO) Test

| | | |
|---|---|---|
| | Sample ID | TB-4 #3 |
| | Sample Location | As noted on log |
| | Depth | As noted on log |
| | Tare Number | P95 |
| | Wt. Of Tare (g) - A | 24.1 |
| b.i. | Wt. Of Tare+Soil+Orgn (g) - B | 60.3 |
| a.i. | Wt. Tare+Soil (g) - C | 58.3 |
| | % Organics: 100x(B-C)/(B-A) | 6 |

Loss On Ignition (LO) Test

| | | |
|---|---|---|
| | Sample ID | TB-3 #3 |
| | Sample Location | As noted on log |
| | Depth | As noted on log |
| | Tare Number | P60 |
| | Wt. Of Tare (g) - A | 27.8 |
| b.i. | Wt. Of Tare+Soil+Orgn (g) - B | 52.8 |
| a.i. | Wt. Tare+Soil (g) - C | 51.5 |
| | % Organics: 100x(B-C)/(B-A) | 5 |

Loss On Ignition (LO) Test

| | | |
|---|---|---|
| | Sample ID | TB-6 #3 |
| | Sample Location | As noted on log |
| | Depth | As noted on log |
| | Tare Number | P42 |
| | Wt. Of Tare (g) - A | 22.5 |
| b.i. | Wt. Of Tare+Soil+Orgn (g) - B | 59.9 |
| a.i. | Wt. Tare+Soil (g) - C | 58.8 |
| | % Organics: 100x(B-C)/(B-A) | 3 |

Loss On Ignition (LO) Test

| | | |
|---|---|---|
| | Sample ID | TB-9 #3 |
| | Sample Location | As noted on log |
| | Depth | As noted on log |
| | Tare Number | P8 |
| | Wt. Of Tare (g) - A | 27.8 |
| b.i. | Wt. Of Tare+Soil+Orgn (g) - B | 53.0 |
| a.i. | Wt. Tare+Soil (g) - C | 51.5 |
| | % Organics: 100x(B-C)/(B-A) | 6 |

Loss On Ignition (LO) Test

| | | |
|---|---|---|
| | Sample ID | |
| | Sample Location | |
| | Depth | |
| | Tare Number | |
| | Wt. Of Tare (g) - A | |
| b.i. | Wt. Of Tare+Soil+Orgn (g) - B | |
| a.i. | Wt. Tare+Soil (g) - C | |
| | % Organics: 100x(B-C)/(B-A) | |

Loss On Ignition (LO) Test

| | | |
|---|---|---|
| | Sample ID | TB-5 #5 |
| | Sample Location | As noted on log |
| | Depth | As noted on log |
| | Tare Number | P18 |
| | Wt. Of Tare (g) - A | 24.1 |
| b.i. | Wt. Of Tare+Soil+Orgn (g) - B | 56.3 |
| a.i. | Wt. Tare+Soil (g) - C | 54.3 |
| | % Organics: 100x(B-C)/(B-A) | 6 |

Loss On Ignition (LO) Test

| | | |
|---|---|---|
| | Sample ID | |
| | Sample Location | |
| | Depth | |
| | Tare Number | |
| | Wt. Of Tare (g) - A | |
| b.i. | Wt. Of Tare+Soil+Orgn (g) - B | |
| a.i. | Wt. Tare+Soil (g) - C | |
| | % Organics: 100x(B-C)/(B-A) | |

Notes: b.i - before ignition, a.i - after ignition
report organics to 0.1%

# APPENDIX III

## AACE Project Limitations and Conditions

## ANDERSEN ANDRE CONSULTING ENGINEERS, INC.

(revised January 24, 2007)

# *Project Limitations and Conditions*

Andersen Andre Consulting Engineers, Inc. has prepared this report for our client for his exclusive use, in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made herein. Further, the report, in all cases, is subject to the following limitations and conditions:

### VARIABLE/UNANTICIPATED SUBSURFACE CONDITIONS

The engineering analysis, evaluation and subsequent recommendations presented herein are based on the data obtained from our field explorations, at the specific locations explored on the dates indicated in the report. This report does not reflect any subsurface variations (e.g. soil types, groundwater levels, etc.) which may occur adjacent or between borings.

The nature and extent of any such variations may not become evident until construction/excavation commences. In the event such variations are encountered, Andersen Andre Consulting Engineers, Inc. may find it necessary to (1) perform additional subsurface explorations, (2) conduct in-the-field observations of encountered variations, and/or re-evaluate the conclusions and recommendations presented herein.

We at Andersen Andre Consulting Engineers, Inc. recommend that the project specifications necessitate the contractor immediately notifying Andersen Andre Consulting Engineers, Inc., the owner and the design engineer (if applicable) if subsurface conditions are encountered that are different from those presented in this report.

No claim by the contractor for any conditions differing from those expected in the plans and specifications, or presented in this report, should be allowed unless the contractor notifies the owner and Andersen Andre Consulting Engineers, Inc. of such differing site conditions. Additionally, we recommend that all foundation work and site improvements be observed by an Andersen Andre Consulting Engineers, Inc. representative.

### SOIL STRATA CHANGES

Soil strata changes are indicated by a horizontal line on the soil boring profiles (boring logs) presented within this report. However, the actual strata's changes may be more gradual and indistinct. Where changes occur between soil samples, the locations of the changes must be estimated using the available information and may not be at the exact depth indicated.

### SINKHOLE POTENTIAL

Unless specifically requested in writing, a subsurface exploration performed by Andersen Andre Consulting Engineers, Inc. is not intended to be an evaluation for sinkhole potential.

## MISINTERPRETATION OF SUBSURFACE SOIL EXPLORATION REPORT

Andersen Andre Consulting Engineers, Inc. is responsible for the conclusions and recommendations presented herein, based upon the subsurface data obtained during this project. If others render conclusions or opinions, or make recommendations based upon the data presented in this report, those conclusions, opinions and/or recommendations are not the responsibility of Andersen Andre Consulting Engineers, Inc.

## CHANGED STRUCTURE OR LOCATION

This report was prepared to assist the owner, architect and/or civil engineer in the design of the subject project. If any changes in the construction, design and/or location of the structures as discussed in this report are planned, or if any structures are included or added that are not discussed in this report, the conclusions and recommendations contained in this report may not be valid. All such changes in the project plans should be made known to Andersen Andre Consulting Engineers, Inc. for our subsequent re-evaluation.

## USE OF REPORT BY BIDDERS

Bidders who are reviewing this report prior to submission of a bid are cautioned that this report was prepared to assist the owners and project designers. Bidders should coordinate their own subsurface explorations (e.g.; soil borings, test pits, etc.) for the purpose of determining any conditions that may affect construction operations. Andersen Andre Consulting Engineers, Inc. cannot be held responsible for any interpretations made using this report or the attached boring logs with regard to their adequacy in reflecting subsurface conditions which may affect construction operations.

## IN-THE-FIELD OBSERVATIONS

Andersen Andre Consulting Engineers, Inc. attempts to identify subsurface conditions, including soil stratigraphy, water levels, zones of lost circulation, "hard" or "soft" drilling, subsurface obstructions, etc. However, lack of mention in the report does not preclude the presence of such conditions.

## LOCATION OF BURIED OBJECTS

Users of this report are cautioned that there was no requirement for Andersen Andre Consulting Engineers, Inc. to attempt to locate any man-made, underground objects during the course of this exploration, and that no attempts to locate any such objects were performed. Andersen Andre Consulting Engineers, Inc. cannot be responsible for any buried man-made objects which are subsequently encountered during construction.

## PASSAGE OF TIME

This report reflects subsurface conditions that were encountered at the time/date indicated in the report. Significant changes can occur at the site during the passage of time. The user of the report recognizes the inherent risk in using the information presented herein after a reasonable amount of time has passed. We recommend the user of the report contact Andersen Andre Consulting Engineers, Inc. with any questions or concerns regarding this issue.

# Important Information about Your

# Geotechnical Engineering Report

*Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.*

*While you cannot eliminate all such risks, you can manage them. The following information is provided to help.*

## Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

## Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

## A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

## Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

## Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

## A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

### A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

### Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

### Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

### Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

### Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

### Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

### Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE THE GEOPROFESSIONAL BUSINESS ASSOCIATION

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IIGER03135.0MRP

# Mariner Village PUD

# STORMWATER MANAGEMENT REPORT

## Phase 2

US Highway 1
Martin County, Florida

| | |
|---|---|
| Parcel IDs: | 31-38-42-000-014-00010-6 |
| | 31-38-42-008-000-00001-8 |
| | 31-38-42-008-000-00002-7 |
| | 31-38-42-008-000-00003-6 |
| | 31-38-42-008-000-00010-7 |
| | 31-38-42-008-000-00030-3 |
| | 31-38-42-008-000-00041-0 |
| | 31-38-42-008-000-00042-9 |

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# Table of Contents

## 1. PROJECT SUMMARY

The proposed site improvements will consist of redesigning the existing stormwater system, extending the existing internal roadway to connect to the additional existing driveway connection on US Highway 1, and constructing a Self-Storage Facility (Lot 2), along with its supporting infrastructure for parking, driveways, drainage and utilities. The proposed project will be completed in multiple phases. The majority of the overall stormwater management infrastructure for the development will be constructed during Phase 2 which includes Lot 2 and driveway connection. The overall stormwater management system has been designed to accommodate the two future development areas (Lot 3 and Lot 4). Lot 4 will be required to provide additional stormwater treatment area before contributing to the overall stormwater management system. There is an existing wetland located towards the center of the site. The existing wetland is proposed to remain in its current state (except for exotic removal and removal of debris), and a 50' wetland buffer will be provided. The project has an existing permitted outfall to the US Highway 1 Right-of-Way swale system.

## 2. SITE CONDITIONS

### 2.1 Existing Conditions

The project (Mariner Village) is located at the southwest corner of SE Federal Highway and SE Mariner Sands Drive, in Martin County, Florida. The site is approximately 20.28 acres. The site is mostly undeveloped. However, there is an existing office building at the northeast corner of the site with associated parking and access drives. There are also two existing lakes, an existing drainage ditch and an existing wetland at the project location. Existing residential developments, which are a part of the overall Mariner Village PUD, border the property to the north and west; SE Federal Highway borders the property to the east; with vacant property to the south. The project site has an existing vegetative cover consisting of ground shrubbery and various trees. Martin County, South Florida Water Management District (SFWMD) and the Florida Department of Transportation (FDOT) have reviewing authority over the project's proposed surface water management system.

The surrounding properties do not contribute runoff to the site. The existing site elevations range from approximately 14.0 to 16.0 feet (NAVD88). However, the existing elevations are lower within the existing lakes, drainage ditch and wetland. The existing lake in the northwest corner of the site is approximately 1.08 acres in size with an existing bottom elevation of approximately -4.5 ft, NAVD and the existing lake in the southeast corner of the site is approximately 0.21 acres in size with an existing bottom elevation of approximately 4.5 ft, NAVD.

During rainfall events, the stormwater on site currently stages up and is collected by the existing on-site lakes, ditches and wetland. They are interconnected via existing pipes and structures. The existing stormwater system ultimately discharges via the existing control structure in the southeastern lake and outfalls to the FDOT roadside ditch along the west side of US Highway 1. This roadside ditch ultimately discharges to the Manatee Pocket.

There is an existing SFWMD permit for the Project site (SFWMD Permit No. 43-00405-S). Excerpts of this permit are provided in Appendix C. This permit established a design discharge of 6 cfs for the 25-year 72-hour storm event for the project site. The outfall is through a permitted control structure to US Highway 1 and an associated swale system. This control structure has been constructed and is operational.

### 2.2 Proposed Conditions

The proposed site improvements will consist of a redesign of the existing stormwater system, an extension of the existing internal roadway to connect to the additional existing driveway connection to US Highway 1 and construction of a Self-Storage Facility (Lot 2), along with supporting infrastructure for parking, driveways, drainage and utilities. The majority of the overall stormwater management system will be constructed during Phase 2. The stormwater management system will provide full water quality and nutrient removal (net improvement) for the Phase 2 development. Portions of Lot 3 will be cleared and graded to connect the stormwater management system to the existing outfall. There is an existing wetland located near the center of the site. This wetland is proposed to remain as-is (except for exotic removal and removal of debris), and a 50-foot buffer will be provided around the wetland.

Stormwater runoff will be collected via inlets and conveyed to dry retention areas which then outfall to the existing lake in the northwest corner of the site. The existing lake currently discharges to the existing wetland, and this connection is proposed to remain. The wetland currently discharges to the existing lake in the southeast corner of the site, and then ultimately to an existing outfall structure. This eastern lake is proposed to be filled in, and stormwater conveyance will be provided from the wetland to a new proposed control structure with new storm pipes. The proposed control structure will outfall to the existing storm manhole located in the US Highway 1 right-of-way.

## 3. GEOTECHNICAL INFORMATION

The USDA/NRCS Soil Survey indicates the majority of the site soils consist of Waveland and Immokalee Fine Sands, and a smaller percentage consisting of Placid and Basinger Fine Sands, depressional (See the Soils Map in Appendix A). These soil types are poorly drained, with a hydraulic soil group of A/D. They are noted to be composed of sandy marine deposits originating from flatwoods and depressions on marine terraces and consist of fine sands and loamy fine sands to depths in excess of 80 inches.

A preliminary geotechnical exploration of the property was performed by Andersen Andre Consulting Engineers, Inc. (AACE) and is referenced herein as the Geotechnical Engineering Exploration and is provided in Appendix F. This report shows that the subsurface soils consist of primarily loose to medium dense fine sands, but occasionally slightly silty sands with a hardpan fragments and traces of organics from 4-5 and 7-8 feet below existing ground surface.

Based on the geotechnical investigations, the anticipated normal seasonal high groundwater level elevation is approximately 1-2 feet above the levels encountered in the borings. Therefore, the estimated normal seasonal high groundwater level is 12.0' (NAVD88).

# 4. LAND USE BREAKDOWNS

## 4.1 Existing Land Use Breakdown

The existing areas are as follows:

| Area Description | Acres |
|---|---|
| Site Area (Vacant) | 14.74 |
| Office Building | 0.19 |
| Office Pavement | 1.32 |
| Office Open Space | 0.40 |
| Lake | 0.98 |
| Lake Bank | 0.63 |
| Wetland | 0.90 |
| Wetland Buffer | 1.13 |
| ***Total Existing Site Area:*** | ***20.28*** |

## 4.2 Proposed Land Use Breakdown

The proposed areas are as follows:

| Area Description | Acres |
|---|---|
| Existing Office/Entrance | 1.90 |
| Lot 2 | 3.04 |
| Lot 3* | 2.69 |
| Lot 4* | 5.50 |
| Proposed Road | 0.51 |
| Existing Lake | 1.50 |
| Dry Retention Area No. 1 | 0.95 |
| Dry Retention Area No. 2 | 0.21 |
| Wetland Preserve Tract | 2.67 |
| Upland Preserve Tract* | 0.76 |
| Landscape Buffer* | 0.55 |
| **Please note these areas are not part of the contributing drainage areas for Phase 2.* | |
| ***Total Project Area:*** | ***20.28*** |

# 5. OBJECTIVE/METHODOLOGY

## 5.1 Proposed Site

The proposed Mariner Village surface water management system will provide water quality treatment for all contributing areas within the project's perimeter berm. The Upland Preserve Tract (area outside of the project's perimeter berm) will be excluded from water quality treatment, since it will remain natural and will not generate stormwater runoff that requires treatment. Water quality and nutrient removal for the proposed project will be achieved within the proposed dry retention areas and the on-site lake. All water quality and required nutrient loading reduction will be provided before entering the on-site wetland. Discharge to FDOT's drainage system along US Highway 1 will be controlled via a new control structure.

## 6. WATER QUALITY

A minimum of one-half inch of dry pre-treatment will be provided. The SFWMD requires water quality treatment of the first inch of runoff over the entire project site or 2.5-inches times the percent imperviousness, whichever is greater. In addition, due to the ultimate discharge to an impaired water body, SFWMD requires that 150% of the required water quality volume be provided prior to discharge. Martin County requires water quality treatment for 3-inches times the percent imperviousness. Water quality will be provided to meet both agency's criteria. Detailed calculations have been provided in Appendix D.

The previous approvals for this project site from Martin County, SFWMD and FDOT did not require nutrient removal. However, additional treatment volume has been provided for nutrient removal based on a net improvement (with a maximum of 90%) for pre-construction vs. post-construction analysis. The target removal efficiency for Nitrogen is 68.8% and Phosphorus is 90.0%. The required nutrient loading removal will be met through the on-site dry retention areas and existing lake. Detailed calculations and results of this analysis can be found in Appendix D.

## 7. PEAK RATE ATTENTUATION

The existing FDOT drainage ditch along the west side of US Highway 1, adjacent to the project site is the receiving body for this project. According to SFWMD Permit No. 43-00405-S, the allowable discharge for the project is 6 cfs for the 25-year 72-hour storm event.

The proposed control structure was used to limit the discharge from the site and to route the 10-year 24-hour and 25-year 72-hour storm events, which were used to check the critical on-site design elevations of pavement and perimeter berm, respectively. The finished floor elevation was designed based on zero discharge for the 100-year 72-hour storm event. The ICPR inputs and results for post-development conditions are in Appendix E.

The on-site wet season water table has been assumed at elevation 12.0' NAVD. During the modeling the existing lake and wetland have their initial stages set to the control elevation, 13.00' and 13.02' respectfully. There is no storage credit given for the volumes between the wet season water table and the control elevations.

The following rainfall events were assigned:

| Description | Storm Event | Rainfall (Inches) |
|---|---|---|
| Pavement Elevation | 10-year 24-hour | 7.5 |
| Perimeter Berm Elevation | 25-year 72-hour | 12.5 |
| Finished Floor Elevation | 100-year 72-hour | 15.0 |

## 8. ANALYSIS AND RESULTS

### 8.1 Required Treatment Volumes

Water quality will be provided in the on-site dry retention areas and existing on-site lake.

| Phase 2 Required Volumes | Volume (ac-ft) |
|---|---|
| **SFWMD** | |
| Dry Pretreatment | 0.34 |
| 1" Over Project Area | 0.68 |
| 2.5" Times Percent Imperviousness | 0.81 |
| **Controlling Volume** | **0.81** |
| **Controlling Volume x 150%** | **1.22** |
| | |
| **Martin County** | |
| **3.0" Times Percent Imperviousness** | **1.10** |

### 8.2 Dry Pre-Treatment

The total dry pre-treatment volume required is 0.34 ac-ft. The total dry pre-treatment volume provided by the two proposed dry retention areas is 0.98 ac-ft. Therefore, the dry pre-treatment requirement will be met with Phase 2.

| Description | Elevation (ft, NAVD) | Volume (ac-ft) |
|---|---|---|
| Dry Retention Area No. 1 | 14.25 | 0.82 |
| Dry Retention Area No. 2 | 14.10 | 0.16 |
| ***Total Dry Pre-Treatment Volume:*** | | ***0.98*** |

### 8.3 SFWMD Water Quality

The total water quality volume required by SFWMD is 1.22 ac-ft. SFWMD allows 100% water quality credit for "retention" and "dry detention". Therefore, the total water quality volume provided by the two proposed dry retention areas is 0.98 ac-ft and by the existing on-site lake is 2.41 ac-ft. Therefore, the water quality requirement will be met with Phase 2.

| Description | Elevation (ft, NAVD) | Volume (ac-ft) |
|---|---|---|
| Dry Retention Area No. 1 (Retention Credit) | 13.40 | 0.23 |
| Dry Retention Area No. 1 (Detention Credit) | 14.25 | 0.59 |
| Dry Retention Area No. 2 (Retention Credit) | 13.50 | 0.07 |
| Dry Retention Area No. 2 (Detention Credit) | 14.10 | 0.09 |
| Existing Lake (Retention Credit) | 13.26 | 1.18 |
| Existing Lake (Detention Credit) | 14.43 | 1.23 |
| ***Total Volume Provided:*** | | ***3.39*** |

## 8.4 Martin County Water Quality

The total water quality volume required by Martin County is 1.10 ac-ft. Martin County allows 100% water quality credit for "dry and wet retention", 75% credit for "dry detention" and 50% credit for "wet detention". Therefore, the total water quality volume provided by the two proposed dry retention areas is 0.81 ac-ft (retention and detention credits) and by the existing on-site lake is 1.79 ac-ft (retention and detention credits). Therefore, the water quality requirement will be met with Phase 2.

| Description | Elevation (ft, NAVD) | Volume (ac-ft) |
|---|---|---|
| Dry Retention Area No. 1 (Retention Credit) | 13.40 | 0.23 |
| Dry Retention Area No. 1 (Detention Credit) | 14.25 | 0.44 |
| Dry Retention Area No. 2 (Retention Credit) | 13.50 | 0.07 |
| Dry Retention Area No. 2 (Detention Credit) | 14.10 | 0.07 |
| Existing Lake (Retention Credit) | 13.26 | 1.18 |
| Existing Lake (Detention Credit) | 14.43 | 0.61 |
| ***Total Volume Provided:*** | | ***2.60*** |

## 8.5 Nutrient Removal

The following nutrient removal is provided through the on-site dry retention areas and the existing on-site lake:

| Nutrient to be Removed | Required (%) | Provided (%) |
|---|---|---|
| Total Nitrogen | 68.8 | 94.4 |
| Total Phosphorus | 90.0 | 97.9 |

### 8.6 Flood Protection

The following information is based on the stormwater calculations:

| Description | Design Criteria | Permitted Allowable Peak Discharge (cfs) | Post-Dev. Peak Discharge (cfs) | Previous Permitted Elevation (ft, NGVD) | Previous Permitted Elevation (ft, NAVD) | Calculated Elevation (ft, NAVD) | Design Elevation (ft, NAVD) |
|---|---|---|---|---|---|---|---|
| Pavement Elevation | 10-year 24-hour | - | 2.38 | - | - | 14.72 | 15.10 |
| Perimeter Berm Elevation | 25-year 72-hour | 6 | 5.27 | 16.9 | 15.44 | 15.24 | 15.60 |
| Finished Floor Elevation | 100-year 72-hour (Zero Discharge) | 0 | 0 | 18.0 | 16.54 | 16.00 | 17.00 |
| Existing Finished Floor Elevation | 100-year 72-hour (Zero Discharge) | 0 | 0 | 18.0 | 16.54 | 15.99 | 16.54* |

**Note: This is the existing permitted elevation for the Existing Office.*

### 8.7 Recovery Analysis

Martin County requires that projects recovery half of their treatment volume within 5 days and recover 90% of 25-year 3-day storm event in 12 days. In the flood protection models the existing lake and wetland retention volumes were ignored and initial stages were set at the control elevation. A recovery analysis has been provided in Appendix E that provides assurance that the recovery of the stormwater treatment areas is achieved.

## 9. LEGAL POSITIVE OUTFALL

Legal positive outfall exists on-site, since the site currently discharges to the FDOT roadway stormwater system. The SFWMD previously issued a permit for the site with an allowable discharge of 6 cfs for the 25-year 72-hour storm event. The post-development peak discharge for the 25-year 72-hour storm event is 5.27 cfs for the project.

## 10. CONCLUSION

In summary, the proposed improvements meet all current development criteria for the project site as required by the Martin County, SFWMD and FDOT. Water treatment and attenuation will be provided in the proposed dry retention areas and on-site existing lake prior to discharging to the wetland. The proposed stormwater management system will retain the 25-year 72-hour storm event on-site. No negative impacts are anticipated due to the implementation of the proposed Mariner Village stormwater system.

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**APPENDIX A**

**Project Information and Maps**


Site Location Map
Mariner Village
Site Location
SE Federal Hwy
SE Winged Foot Dr
SE Lexington Ave
SE Mariner Sands Dr
SE Baltusrol Terrace
SE Barrington Dr
SE Pacific Dr
SE Georgetown Pl
SE Bunker Hill Dr
SE Farmington Pl
Old Dixie Hwy
SE Crooked Oak Ave
SE Seabranch Blvd
SE Seagate Ln
SE Mizner Pl
Sourwood Dr

# Hydrologic Soil Group—Martin County, Florida
(Mariner Village)


849

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Lines**
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Points**
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Martin County, Florida
Survey Area Data: Version 17, Sep 17, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 14, 2015—May 8, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

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# Hydrologic Soil Group

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 4 | Waveland and Immokalee fine sands | A/D | 20.4 | 75.6% |
| 13 | Placid and Basinger fine sands, depressional | A/D | 6.6 | 24.4% |
| **Totals for Area of Interest** | | | **27.0** | **100.0%** |

## Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

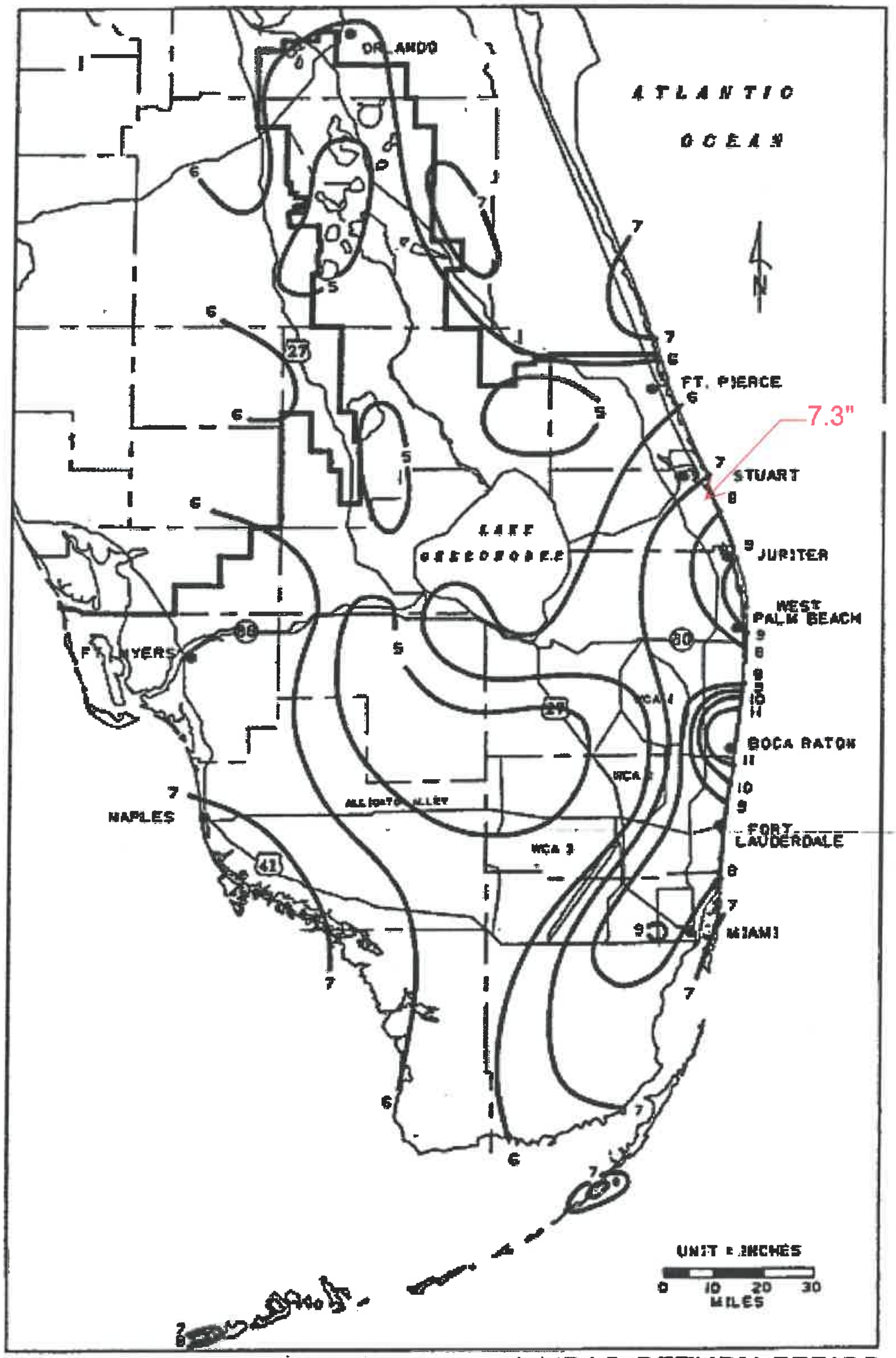


FIGURE C-4. 1-DAY RAINFALL: 10-YEAR RETURN PERIOD

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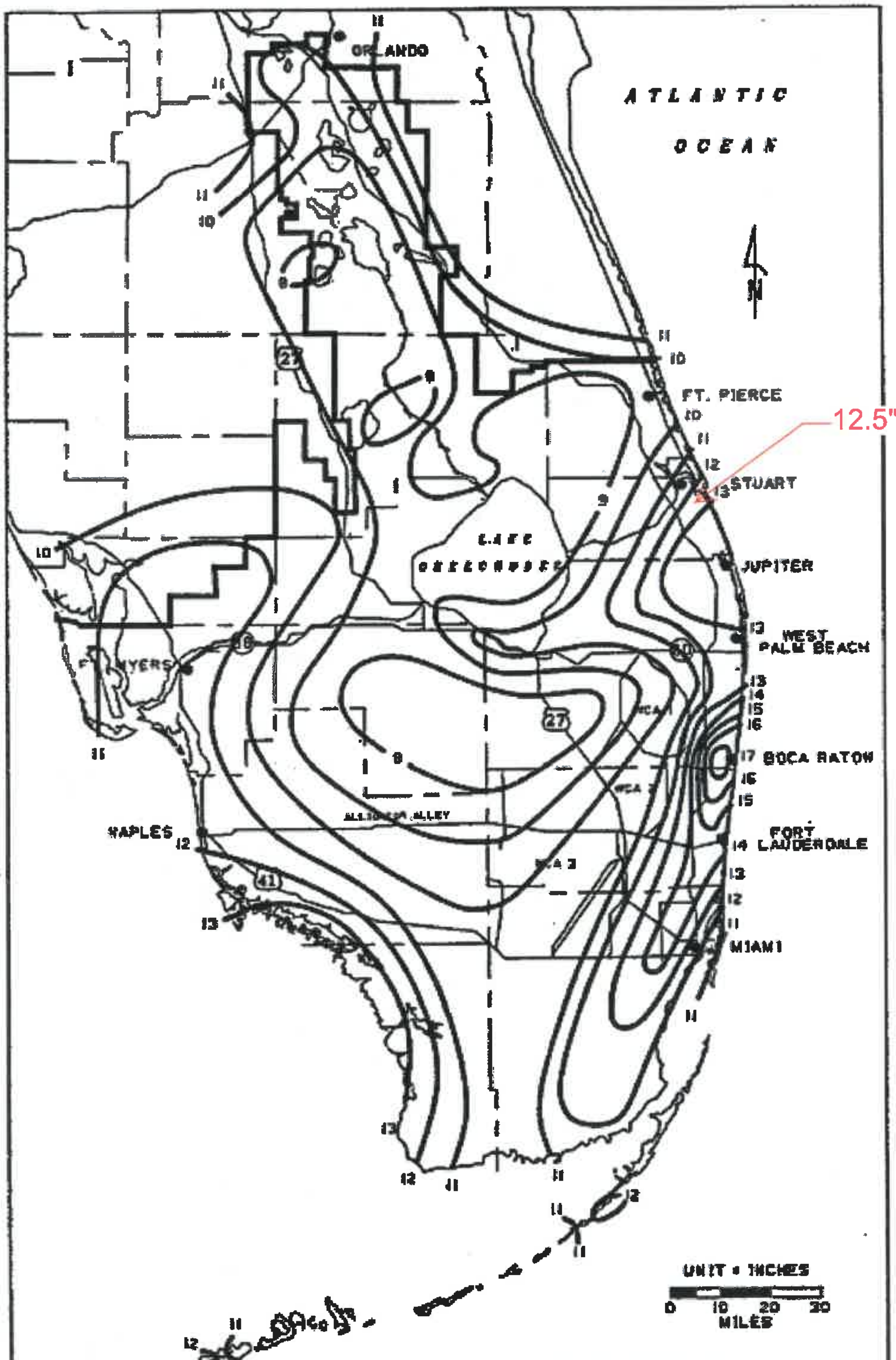



FIGURE C-8. 3-DAY RAINFALL: 25-YEAR RETURN PERIOD

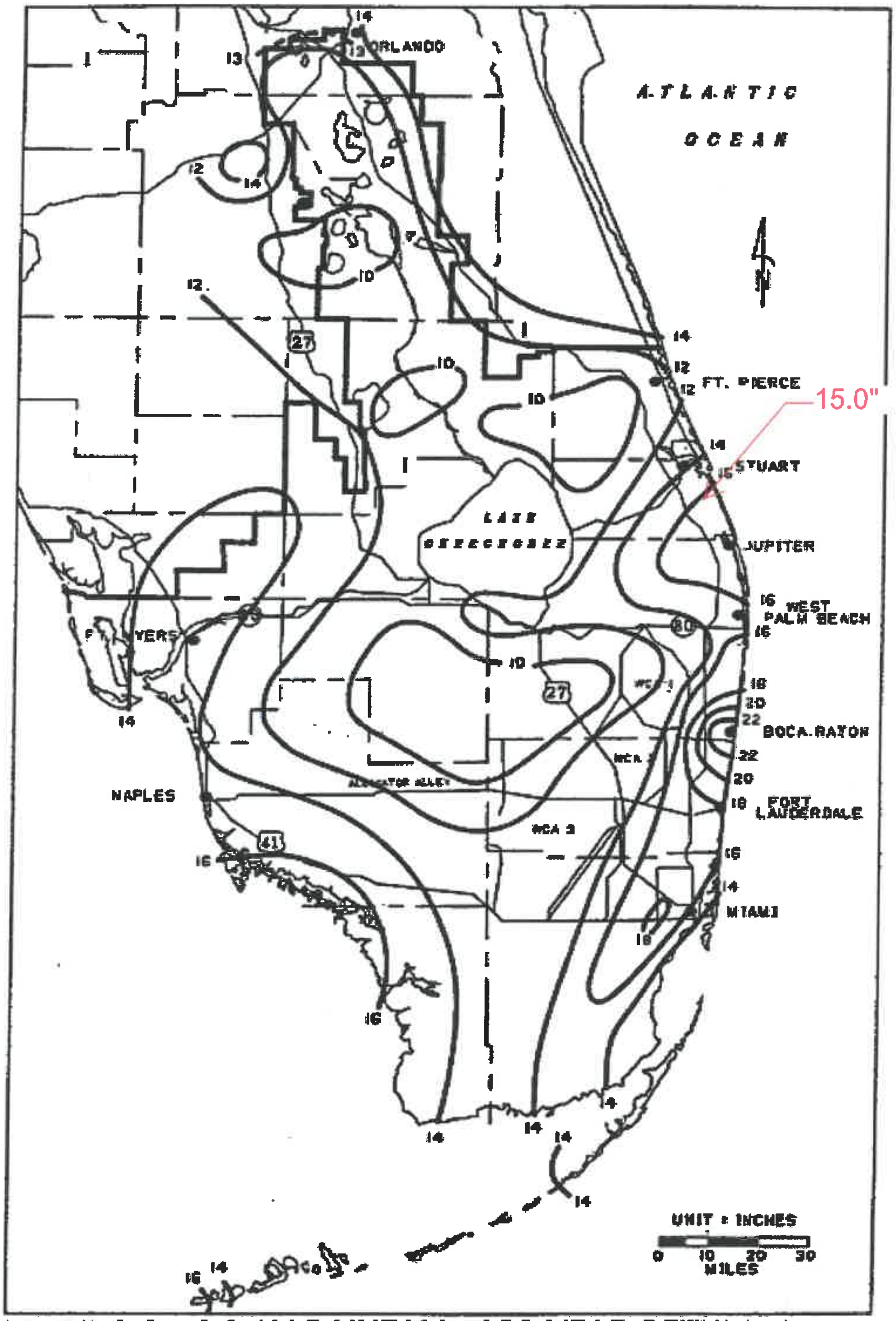
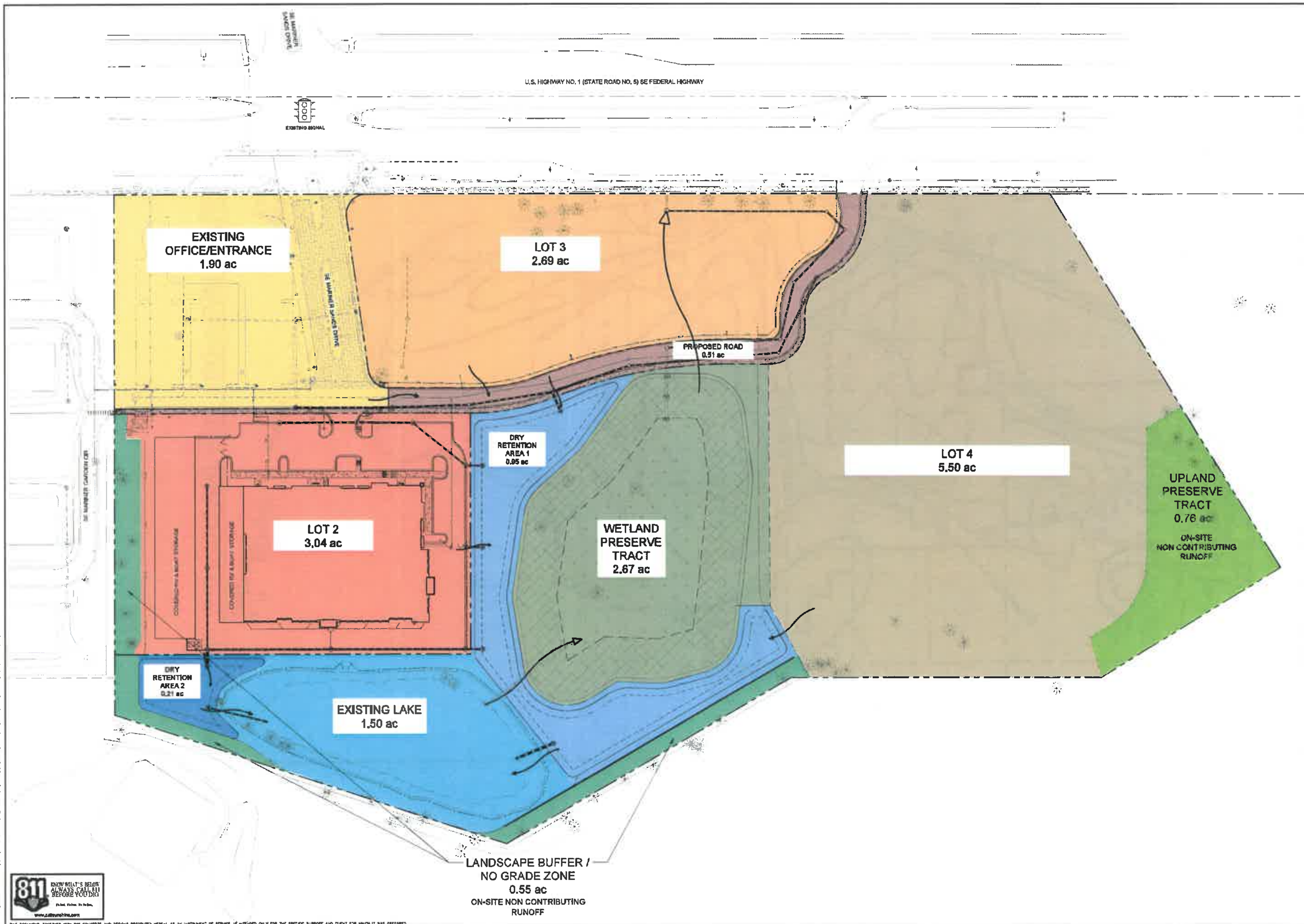



FIGURE C-9. 3-DAY RAINFALL: 100-YEAR RETURN PERIOD

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MARINER VILLAGE SQUARE PUD
LOT 2 - BEE SAFE STORAGE
RUNOFF EXHIBIT

MARTIN COUNTY FLORIDA

PROJECT NO. 010318-02-004

PLAN STATUS

| DATE | DESCRIPTION | |
|---|---|---|
| LL | GC/JB | GMB |
| DESIGN | DRAWN | CHKD |

SCALE AS SHOWN
JOB No. 010318-02-004
DATE 07/30/2019
FILE No. EXHIBIT
SHEET R1

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**APPENDIX B**

**Datum Conversion Information**

Questions concerning the VERTCON process may be mailed to NGS

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**Latitude: 27.1190**

**Longitude: 080.1841**

**NGVD 29 height: 10.0 ft**

**Datum shift(NAVD 88 minus NGVD 29): -1.463 feet**

**Converted to NAVD 88 height: 8.537 feet**

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## APPENDIX C

**Excerpts from Previous Permit**

SURFACE WATER MANAGEMENT EVALUATION

APPLICATION NUMBER 05306-D DATE: November 6, 1987

PROJECT NAME: Mariner Village Square

LOCATION: Martin COUNTY

SECTION 31 , TOWNSHIP 38 SOUTH, RANGE 42 EAST

PROJECT AREA 20.3 ACRES DRAINAGE AREA 20.3 ACRES

FACILITIES:

1. EXISTING: U.S Highway 1 and an associated swale system is located adjacent to the east side of this site.

2. PROPOSED: A 20.3-acre commercial development with a system of drop inlets and storm water piping to direct runoff to 2.4 acres of on-site lakes and a vegetated preserve area. Outfall from the site is to the road side swale along the west side of U.S. Highway 1 via a control structure located in the most easterly lake.

The outfall structure will consist of 1-82 degree V-notch weir with an invert at elevation 15.6 feet NGVD, 1-4" high by 6" wide rectangular orifice with an invert at elevation 15.0 feet NGVD and 38 LF of 24" diameter RCP culvert leading to the swale along U.S. Highway 1. Eventual outfall is to the Manatee Pocket.

3. PROPOSED THIS PHASE: Phase I (4.1 acres) will consist of a bank and office complex to be located at the northeast corner of the site, construction of the water management areas and installation of the outfall structure.

DRAINAGE BASIN Manatee Pocket    RECEIVING BODY U.S. Highway 1 Roadside swale

RUN OFF FORMULA Pre- vs Post-Development    ALLOWABLE DISCHARGE 6 CFS

REQUIRED DETENTION 2.3 AC-FT
DETENTION METHOD on-site lakes
DETENTION PROVIDED 2.4 AC-FT

| | | |
|---|---|---|
| FLOOD PROTECTION | | |
| LOCAL ROAD CRITERIA | N/A | YEAR, N/A HOUR STORM |
| FLOOD CONTOUR | N/A | FEET NGVD |
| MINIMUM ROAD GRADE | N/A | FEET NGVD |
| PARKING LOT CRITERIA | 5 | YEAR, 1 HOUR STORM |
| FLOOD CONTOUR | 15.8 | FEET NGVD |
| MINIMUM PARKING LOT GRADE | 16.6 | FEET NGVD |
| BASIN DESIGN FREQUENCY | 25 | YEAR, 72 HOUR STORM |
| FLOOD CONTOUR | 16.9 | FEET NGVD |
| DESIGN DISCHARGE | 6 | CFS |
| 100 YEAR FLOOD | | |
| FLOOD CONTOUR | 17.6 | FEET NGVD |
| MINIMUM FLOOR ELEVATION | 18.0 | FEET NGVD |
| FIA FLOOD ELEVATION | N/A | FEET NGVD |

**APPENDIX D**

**Site Calculations**

## AREA/LAND USE CALCULATIONS

### ON-SITE AREAS CONTRIBUTING TO THE STORMWATER SYSTEM

| Description | Area | | Percentage |
|---|---|---|---|
| | (SF) | (Acres) | |
| **Existing Office** | **82,966** | **1.90** | **100%** |
| **Impervious Area** | **65,712** | **1.51** | **79%** |
| Buildings | 8,250 | 0.19 | 10% |
| Pavement | 31,449 | 0.72 | 38% |
| Existing Entrance | 26,013 | 0.60 | 31% |
| **Pervious Area** | **17,254** | **0.40** | **21%** |
| Open Space | 17,254 | 0.40 | 21% |

| Description | Area | | Percentage |
|---|---|---|---|
| | (SF) | (Acres) | |
| **Lot 2 (Bee Safe Storage)** | **132,450** | **3.04** | **100%** |
| **Impervious Area** | **103,132** | **2.37** | **78%** |
| Buildings | 38,475 | 0.88 | 29% |
| Pavement | 52,124 | 1.20 | 39% |
| Covered Pavement | 12,533 | 0.29 | 9% |
| **Pervious Area** | **29,318** | **0.67** | **22%** |
| Open Space | 29,318 | 0.67 | 22% |

| Description | Area | | Percentage |
|---|---|---|---|
| | (SF) | (Acres) | |
| **Proposed Road** | **22,356** | **0.51** | **100%** |
| **Impervious Area** | **22,356** | **0.51** | **100%** |
| Pavement | 22,356 | 0.51 | 100% |
| **Pervious Area** | **0** | **0.00** | **0%** |
| Open Space | 0 | 0.00 | 0% |

| Description | Area | | Percentage |
|---|---|---|---|
| | (SF) | (Acres) | |
| **Existing Lake** | **65,211** | **1.50** | **100%** |
| **Impervious Area** | **38,767** | **0.89** | **59%** |
| Existing Lake | 38,767 | 0.89 | 59% |
| **Pervious Area** | **26,444** | **0.61** | **41%** |
| Exsting Lake Bank | 8,119 | 0.19 | 12% |
| Lake Open Space | 18,325 | 0.42 | 28% |

## AREA/LAND USE CALCULATIONS

| Description | Area | | Percentage |
|---|---|---|---|
| | (SF) | (Acres) | |
| **Dry Retention Areas** | **50,761** | **1.17** | **100%** |
| **Impervious Area** | **0** | **0.00** | **0%** |
| Pavement | 0 | 0.00 | 0% |
| **Pervious Area** | **50,761** | **1.17** | **100%** |
| Dry Retention Area No. 1 | 41,579 | 0.95 | 82% |
| Dry Retention Area No. 2 | 9,182 | 0.21 | 18% |

| Description | Area | | Percentage |
|---|---|---|---|
| | (SF) | (Acres) | |
| **Wetland Preserve Tract** | **116,247** | **2.67** | **100%** |
| **Impervious Area** | **39,130** | **0.90** | **34%** |
| Wetland | 39,130 | 0.90 | 34% |
| **Pervious Area** | **77,117** | **1.77** | **66%** |
| Wetland Buffer | 49,367 | 1.13 | 42% |
| Wetland Open space | 27,750 | 0.64 | 24% |

## AREA/LAND USE CALCULATIONS

### ON-SITE AREAS NOT CONTRIBUTING TO THE STORMWATER SYSTEM

| Description | Area | | Percentage |
|---|---|---|---|
| | (SF) | (Acres) | |
| **Lot 3** | **117,032** | **2.69** | **100%** |
| **Impervious Area** | **0** | **0.00** | **0%** |
| Buildings | 0 | 0.00 | 0% |
| Pavement | 0 | 0.00 | 0% |
| **Pervious Area** | **117,032** | **2.69** | **100%** |
| Open Space | 117,032 | 2.69 | 100% |

| Description | Area | | Percentage |
|---|---|---|---|
| | (SF) | (Acres) | |
| **Lot 4** | **239,525** | **5.50** | **100%** |
| **Impervious Area** | **0** | **0.00** | **0%** |
| Buildings | 0 | 0.00 | 0% |
| Pavement | 0 | 0.00 | 0% |
| **Pervious Area** | **239,525** | **5.50** | **100%** |
| Open Space | 239,525 | 5.50 | 100% |

| Description | Area | | Percentage |
|---|---|---|---|
| | (SF) | (Acres) | |
| **Upland Preserve Tract** | **33,000** | **0.76** | **100%** |
| **Impervious Area** | **0** | **0.00** | **0%** |
| Pavement | 0 | 0.00 | 0% |
| **Pervious Area** | **33,000** | **0.76** | **100%** |
| Open Space | 33,000 | 0.76 | 100% |

| Description | Area | | Percentage |
|---|---|---|---|
| | (SF) | (Acres) | |
| **Landscape Buffer Area** | **23,961** | **0.55** | **100%** |
| **Impervious Area** | **0** | **0.00** | **0%** |
| Pavement | 0 | 0.00 | 0% |
| **Pervious Area** | **23,961** | **0.55** | **100%** |
| Open Space | 23,961 | 0.55 | 100% |

**CURVE NUMBER AND TIME OF CONCENTRATION**

| Name | Total Area (acres) | Pervious Area (acres) | Pervious CN | Impervious Area (acres) | Impervious CN | Weighted CN |
|---|---|---|---|---|---|---|
| **On-Site** | | | | | | |
| Existing Office/Entrance | 1.90 | 0.40 | 74 | 1.51 | 98 | 93.0 |
| Proposed Road | 0.51 | 0.00 | 74 | 0.51 | 98 | 98.0 |
| Lot 2 (Bee Safe Storage) | 3.04 | 0.67 | 74 | 2.37 | 98 | 92.7 |
| Lot 3* | 2.69 | 2.69 | 74 | 0.00 | 98 | 74.0 |
| Lot 4* | 5.50 | 5.50 | 74 | 0.00 | 98 | 74.0 |
| Existing Lake | 1.50 | 0.61 | 74 | 0.89 | 98 | 88.3 |
| Dry Retention Area No. 1 | 0.95 | 0.95 | 74 | 0.00 | 98 | 74.0 |
| Dry Retention Area No. 2 | 0.21 | 0.21 | 74 | 0.00 | 98 | 74.0 |
| Wetland Preserve Tract | 2.67 | 1.77 | 74 | 0.90 | 98 | 82.1 |
| Upland Preserve Tract* | 0.76 | 0.76 | 74 | 0.00 | 98 | 74.0 |
| Landscape Buffer Area* | 0.55 | 0.55 | 74 | 0.00 | 98 | 74.0 |
| **Total** | **20.28** | **14.10** | | **6.18** | | |

** Noncontributing area*

## STAGE/STORAGE COMPUTATIONS

### Existing Office

| | Pavement | Open |
|---|---|---|
| Area (ac) | 1.32 | 0.40 |
| | L | L |
| Starting Elev (ft) | 15.10 | 14.00 |
| Ending Elev (ft) | 16.70 | 16.70 |

| Stage NAVD | Linear Storage ac-ft | Linear Storage ac-ft | Total Storage ac-ft |
|---|---|---|---|
| 14.00 | 0.000 | 0.000 | 0.000 |
| 14.50 | 0.000 | 0.018 | 0.018 |
| 15.00 | 0.000 | 0.073 | 0.073 |
| 15.50 | 0.066 | 0.165 | 0.231 |
| 16.00 | 0.334 | 0.293 | 0.627 |
| 16.50 | 0.808 | 0.458 | 1.266 |
| 17.00 | 1.468 | 0.656 | 2.124 |
| 17.50 | 2.127 | 0.855 | 2.982 |
| 18.00 | 2.787 | 1.053 | 3.839 |

**STAGE/STORAGE COMPUTATIONS**

**Lot 2 (Bee Safe Storage)**

| | Pavement | Open |
|---|---|---|
| Area (ac) | 1.20 | 0.67 |
| | L | L |
| Starting Elev (ft) | 15.10 | 14.00 |
| Ending Elev (ft) | 17.00 | 16.50 |

| Stage NAVD | Linear Storage ac-ft | Linear Storage ac-ft | Total Storage ac-ft |
|---|---|---|---|
| 14.00 | 0.000 | 0.000 | 0.000 |
| 14.50 | 0.000 | 0.034 | 0.034 |
| 15.00 | 0.000 | 0.135 | 0.135 |
| 15.50 | 0.050 | 0.303 | 0.353 |
| 16.00 | 0.255 | 0.538 | 0.794 |
| 16.50 | 0.617 | 0.841 | 1.459 |
| 17.00 | 1.137 | 1.178 | 2.315 |
| 17.50 | 1.735 | 1.514 | 3.249 |
| 18.00 | 2.333 | 1.851 | 4.184 |

**STAGE/STORAGE COMPUTATIONS**

**Proposed Road**

| | Pavement |
|---|---|
| Area (ac) | 0.51 |
| | L |
| Starting Elev (ft) | 15.10 |
| Ending Elev (ft) | 16.50 |

| Stage NAVD | Linear Storage ac-ft | Total Storage ac-ft |
|---|---|---|
| 15.10 | 0.000 | 0.000 |
| 15.60 | 0.046 | 0.046 |
| 16.10 | 0.183 | 0.183 |
| 16.60 | 0.440 | 0.440 |
| 17.10 | 0.697 | 0.697 |
| 17.60 | 0.953 | 0.953 |
| 18.10 | 1.210 | 1.210 |
| 18.60 | 1.466 | 1.466 |
| 19.10 | 1.723 | 1.723 |

## STAGE/STORAGE COMPUTATIONS

**Existing Lake**

| | Exist. Lake Bank | Exist. Lake Bottom | Open |
|---|---|---|---|
| Area (ac) | 0.19 | 0.89 | 0.42 |
| | L | V | L |
| Starting Elev (ft) | 12.00 | 12.00 | 14.00 |
| Ending Elev (ft) | 14.50 | | 15.50 |

| Stage NAVD | Linear Storage ac-ft | Vertical Storage ac-ft | Linear Storage ac-ft | Total Storage ac-ft | |
|---|---|---|---|---|---|
| 12.00 | 0.000 | 0.000 | 0.000 | 0.000 | |
| 12.50 | 0.009 | 0.445 | 0.000 | 0.454 | |
| 13.00 | 0.037 | 0.890 | 0.000 | 0.927 | *Wet Retention Provided for WQ and Nutrient Calculations* |
| 13.26 | 0.059 | 1.121 | 0.000 | 1.181 | |
| 13.50 | 0.084 | 1.335 | 0.000 | 1.419 | |
| 14.00 | 0.149 | 1.780 | 0.000 | 1.929 | *Wet Detention Provided for WQ and Nutrient Calculations* |
| 14.43 | 0.220 | 2.163 | 0.026 | 2.409 | |
| 14.50 | 0.233 | 2.225 | 0.035 | 2.493 | |
| 15.00 | 0.326 | 2.670 | 0.140 | 3.136 | |
| 15.50 | 0.419 | 3.115 | 0.316 | 3.850 | |
| 16.00 | 0.513 | 3.560 | 0.526 | 4.598 | |
| 16.50 | 0.606 | 4.005 | 0.736 | 5.347 | |
| 17.00 | 0.699 | 4.450 | 0.947 | 6.095 | |
| 17.50 | 0.792 | 4.895 | 1.157 | 6.844 | |
| 18.00 | 0.885 | 5.340 | 1.367 | 7.592 | |

Wet Retention Provided = 1.18 ac-ft at Elev = 13.26 ft, NAVD

Wet Detention Provided = 1.23 ac-ft at Elev = 14.43 ft, NAVD

## STAGE/STORAGE COMPUTATIONS

### Dry Retention Area No. 1

| | Dry Retention Bank | Dry Retention Bottom |
|---|---|---|
| Area (ac) | 0.37 | 0.58 |
| | L | V |
| Starting Elev (ft) | 13.00 | 13.00 |
| Ending Elev (ft) | 16.00 | |

| Stage NAVD | Linear Storage ac-ft | Vertical Storage ac-ft | Total Storage ac-ft | |
|---|---|---|---|---|
| 13.00 | 0.000 | 0.000 | 0.000 | |
| 13.40 | 0.000 | 0.233 | 0.233 | *Dry Retention Provided for WQ and Nutrient Calculations |
| 13.50 | 0.015 | 0.291 | 0.307 | |
| 14.00 | 0.062 | 0.583 | 0.645 | |
| 14.25 | 0.097 | 0.729 | 0.825 | *Dry Detention Provided for WQ Calculations |
| 14.50 | 0.139 | 0.874 | 1.014 | |
| 15.00 | 0.248 | 1.166 | 1.413 | |
| 15.50 | 0.387 | 1.457 | 1.844 | |
| 16.00 | 0.558 | 1.748 | 2.306 | |
| 16.50 | 0.743 | 2.040 | 2.783 | |
| 17.00 | 0.929 | 2.331 | 3.261 | |
| 17.50 | 1.115 | 2.623 | 3.738 | |
| 18.00 | 1.301 | 2.914 | 4.215 | |

Dry Retention Provided = 0.23 ac-ft at Elev = 13.40 ft, NAVD

Dry Detention Provided = 0.59 ac-ft at Elev = 14.25 ft, NAVD

**STAGE/STORAGE COMPUTATIONS**

**Dry Retention Area No. 2**

| | Dry Retention Bank | Dry Retention Bottom |
|---|---|---|
| Area (ac) | 0.09 | 0.12 |
| | L | V |
| Starting Elev (ft) | 13.00 | 13.00 |
| Ending Elev (ft) | 16.00 | |

| Stage NAVD | Linear Storage ac-ft | Vertical Storage ac-ft | Total Storage ac-ft | |
|---|---|---|---|---|
| 13.00 | 0.000 | 0.000 | 0.000 | |
| 13.50 | 0.004 | 0.060 | 0.064 | *Dry Retention Provided for WQ and Nutrient Calculations* |
| 14.00 | 0.015 | 0.121 | 0.136 | |
| 14.10 | 0.018 | 0.133 | 0.151 | *Dry Detention Provided for WQ Calculations* |
| 14.50 | 0.034 | 0.181 | 0.215 | |
| 15.00 | 0.060 | 0.241 | 0.301 | |
| 15.50 | 0.094 | 0.301 | 0.395 | |
| 16.00 | 0.135 | 0.362 | 0.497 | |
| 16.50 | 0.180 | 0.422 | 0.602 | |
| 17.00 | 0.225 | 0.482 | 0.708 | |
| 17.50 | 0.271 | 0.543 | 0.813 | |
| 18.00 | 0.316 | 0.603 | 0.919 | |

Dry Retention Provided = 0.07 ac-ft at Elev = 13.50 ft, NAVD

Dry Detention Provided = 0.09 ac-ft at Elev = 14.10 ft, NAVD

## STAGE/STORAGE COMPUTATIONS

### Wetland Preserve Tract

| | Wetland Buffer | Wetland | Open |
|---|---|---|---|
| Area (ac) | 1.13 | 0.90 | 0.64 |
| | L | V | L |
| Starting Elev (ft) | 12.00 | 12.00 | 14.00 |
| Ending Elev (ft) | 14.00 | | 16.25 |

| Stage NAVD | Linear Storage ac-ft | Vertical Storage ac-ft | Linear Storage ac-ft | Total Storage ac-ft |
|---|---|---|---|---|
| 12.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 12.50 | 0.071 | 0.449 | 0.000 | 0.520 |
| 13.00 | 0.283 | 0.898 | 0.000 | 1.182 |
| 13.50 | 0.637 | 1.347 | 0.000 | 1.985 |
| 14.00 | 1.133 | 1.797 | 0.000 | 2.930 |
| 14.50 | 1.700 | 2.246 | 0.035 | 3.981 |
| 15.00 | 2.267 | 2.695 | 0.142 | 5.103 |
| 15.50 | 2.833 | 3.144 | 0.319 | 6.296 |
| 16.00 | 3.400 | 3.593 | 0.566 | 7.559 |
| 16.50 | 3.967 | 4.042 | 0.885 | 8.894 |
| 17.00 | 4.533 | 4.492 | 1.203 | 10.228 |
| 17.50 | 5.100 | 4.941 | 1.522 | 11.562 |
| 18.00 | 5.667 | 5.390 | 1.840 | 12.897 |

## STAGE/STORAGE COMPUTATIONS

**Lot 3**

| | Pavement | Open | |
|---|---|---|---|
| Area (ac) | 0.00 | 2.69 | |
| | L | L | |
| Starting Elev (ft) | 15.10 | 14.00 | |
| Ending Elev (ft) | 17.00 | 17.00 | |

| Stage NAVD | Linear Storage ac-ft | Linear Storage ac-ft | Total Storage ac-ft |
|---|---|---|---|
| 14.00 | 0.000 | 0.000 | 0.000 |
| 14.50 | 0.000 | 0.112 | 0.112 |
| 15.00 | 0.000 | 0.448 | 0.448 |
| 15.50 | 0.000 | 1.008 | 1.008 |
| 16.00 | 0.000 | 1.791 | 1.791 |
| 16.50 | 0.000 | 2.799 | 2.799 |
| 17.00 | 0.000 | 4.030 | 4.030 |
| 17.50 | 0.000 | 5.373 | 5.373 |
| 18.00 | 0.000 | 6.717 | 6.717 |

**STAGE/STORAGE COMPUTATIONS**

**Lot 4**

| | Pavement | Open |
|---|---|---|
| Area (ac) | 0.00 | 5.50 |
| | L | L |
| Starting Elev (ft) | 15.15 | 14.00 |
| Ending Elev (ft) | 17.00 | 17.00 |

| Stage NAVD | Linear Storage ac-ft | Linear Storage ac-ft | Total Storage ac-ft |
|---|---|---|---|
| 14.00 | 0.000 | 0.000 | 0.000 |
| 14.50 | 0.000 | 0.229 | 0.229 |
| 15.00 | 0.000 | 0.916 | 0.916 |
| 15.50 | 0.000 | 2.062 | 2.062 |
| 16.00 | 0.000 | 3.666 | 3.666 |
| 16.50 | 0.000 | 5.728 | 5.728 |
| 17.00 | 0.000 | 8.248 | 8.248 |
| 17.50 | 0.000 | 10.997 | 10.997 |
| 18.00 | 0.000 | 13.747 | 13.747 |

## WATER QUALITY CALCULATIONS

### WATER QUALITY CALCULATIONS PER SFWMD

**Criteria 1 = 1/2 inch of Runoff Over the Project Site:**

*Dry Pre-Treatment Volume:*
*(Does not include Wetland Preserve Tract or Non-Contributing Areas)*

1/2 inch x 1-ft/12-in x 8.12 (Project Area (acres)) = 0.34 ac-ft (Dry Pre-treatment Volume)

**Per SFWMD, Water Quality shall be provided to meet Critera 2 or 3, whichever is greater:**
**Criteria 2 = 1 inch of Runoff Over the Project Site:**

*WQ Treatment Volume:*
*(Does not include Wetland Preserve Tract or Non-Contributing Areas)*

1 inch x 1-ft/12-in x 8.12 (Project Area (acres)) = 0.68 ac-ft (WQ Treatment Volume)

**Criteria 3 = 2.5 Inches Times the Percent Impervious:**

*Site Area for WQ:*
*(Does not include Non-Contributing Areas)*

10.79 (Project Area (acres)) - ( 0.89 (Lakes WSWT Area (acres)) + 2.67 (Wetlands (acres)) + 1.07 (Roofs (acres)) ) = 6.16 acres (Site Area for WQ)

*Impervious Area for WQ:*

6.16 (Site Area for WQ (acres)) - 2.84 (Pervious Area (acres)) = 3.32 acres (Impervious Area for WQ)

*Percent Imperviousness for WQ:*

Impervious Area for WQ / Site Area for WQ = 3.32 / 6.16 = 53.9%

*2.5-in x % Impervious:*

2.5 Inches x 53.9% (Percent Impervious) = 1.35 inches

*Treated Volume:*

1-ft/12-in x 1.35 (Inches to be Treated (inches)) x ( 10.79 (Project Area (acres)) - 0.89 (Lakes WSWT Area (acres)) - 2.67 (Wetlands (acres)) ) = 0.81 ac-ft (Treated Volume)

| | | | |
|---|---|---|---|
| **Controlling SFWMD Water Quality Volume** | = | **0.81** | ac-ft |



| | | | |
|---|---|---|---|
| **150% Water Quality Volume Required for Discharge into an Impaired Water Body** | = | **1.22** | ac-ft |

### WATER QUALITY CALCULATIONS PER MARTIN COUNTY